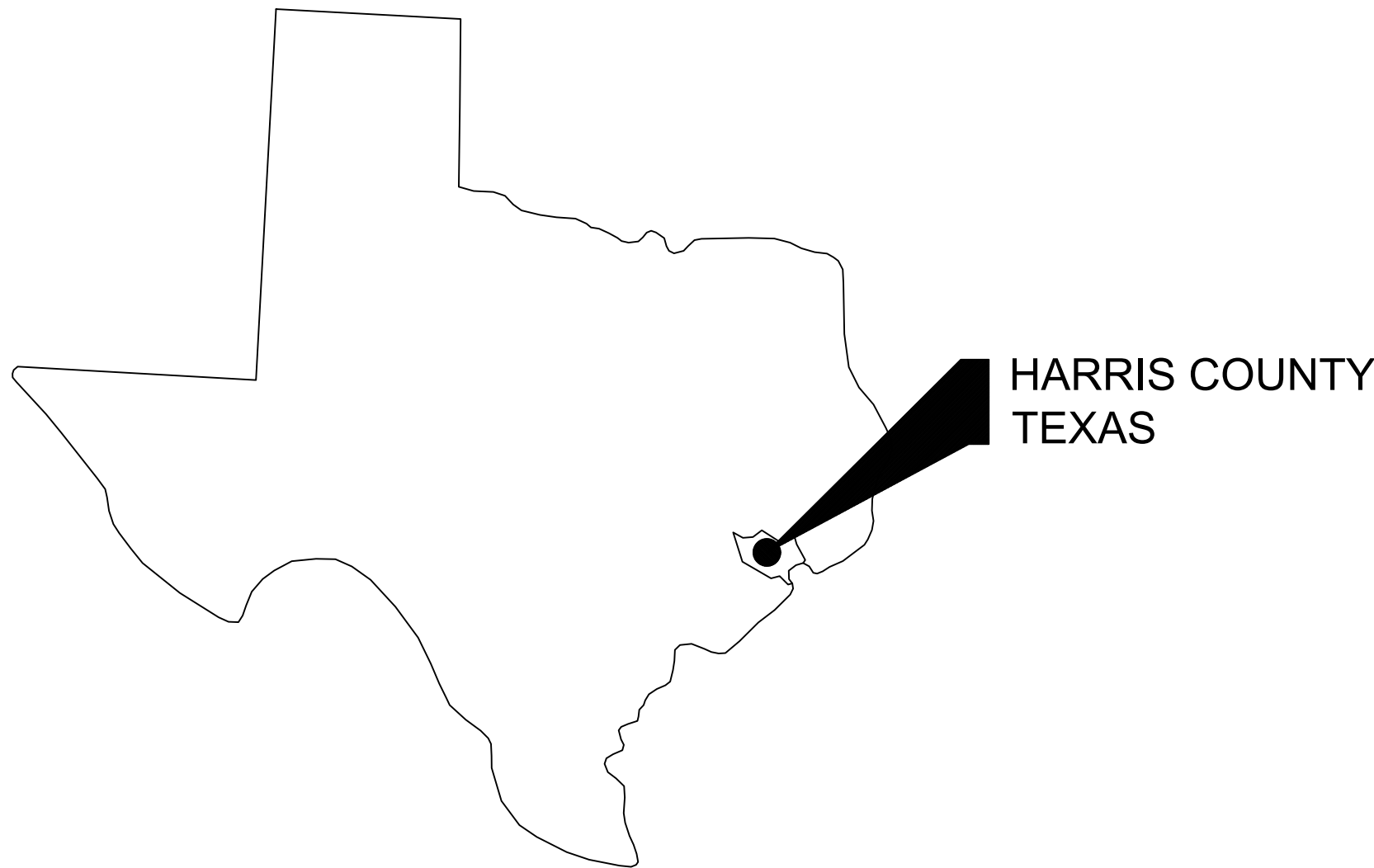


Appendix G

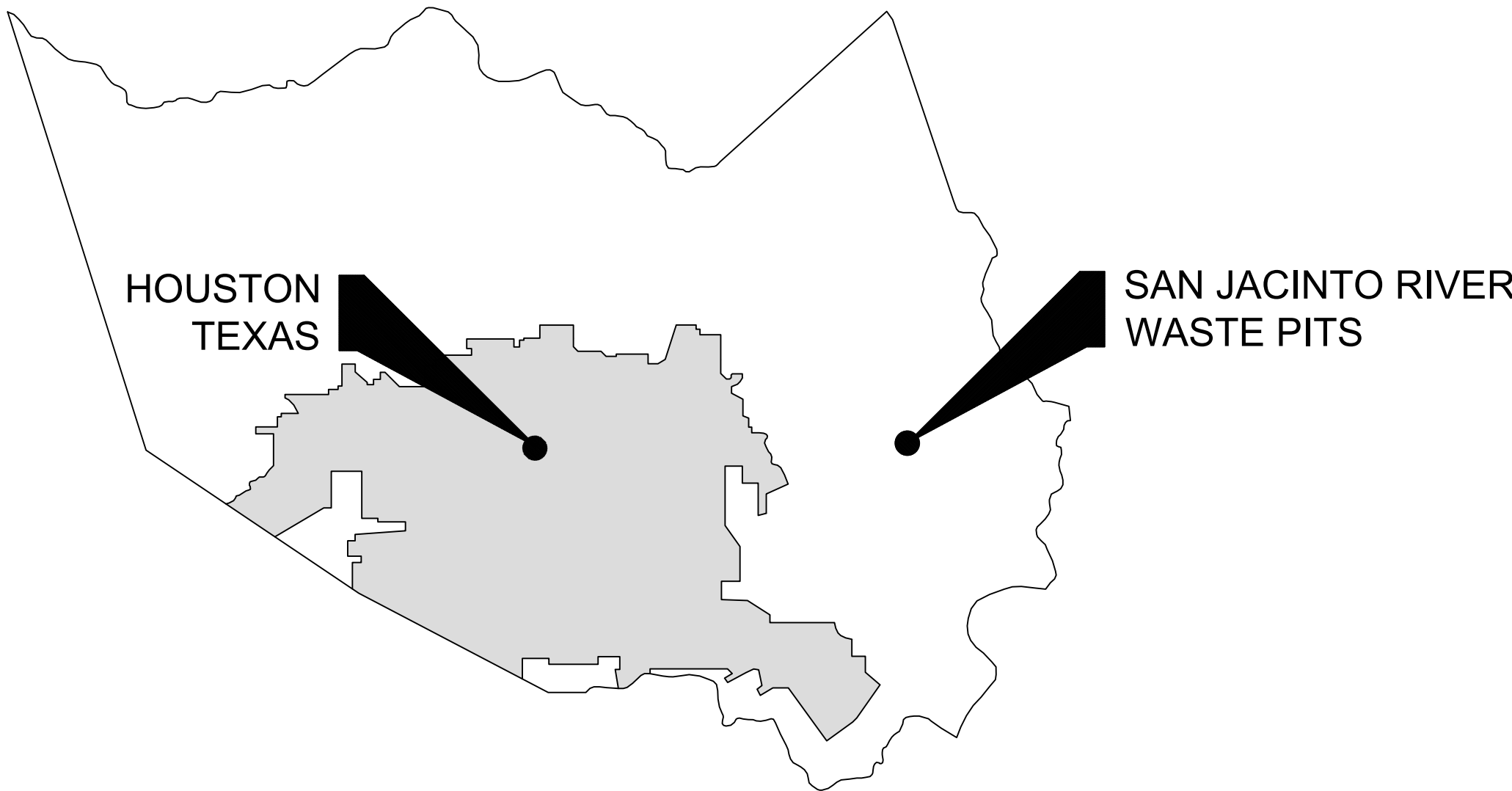
Design Drawing Package

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

JULY 2024
11215702



STATE OF TEXAS
VICINITY MAP



HARRIS COUNTY
VICINITY MAP

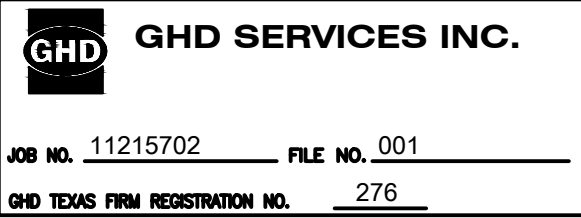


LOCATION MAP



DRAWING NUMBER	DRAWING NAME
GENERAL SERIES	
G-01	COVER SHEET
CIVIL SERIES	
C-01	OVERALL PLAN
C-02	EXISTING CONDITIONS
C-03	SSA AREA AND NORTHERN IMPOUNDMENT WORKS
C-04	SOIL EROSION AND SEDIMENT CONTROL PLAN - OVERALL
C-05	SOIL EROSION AND SEDIMENT CONTROL PLAN - SEASONAL
C-06	SOIL EROSION AND SEDIMENT CONTROL DETAILS
C-07	PROJECT TRAFFIC CONTROL PLAN
C-08	EXCAVATION PLAN - OVERALL
C-09	EXCAVATION PLAN NORTHWEST
C-10	EXCAVATION PLAN NORTHEAST
C-11	EXCAVATION PLAN SOUTHEAST
C-12	EXCAVATION PLAN SOUTHWEST
C-13	EXCAVATION SECTION - 1 OF 6
C-14	EXCAVATION SECTION - 2 OF 6
C-15	EXCAVATION SECTION - 3 OF 6
C-16	EXCAVATION SECTION - 4 OF 6
C-17	EXCAVATION SECTION - 5 OF 6
C-18	EXCAVATION SECTION - 6 OF 6
C-19	TYPICAL SEASONAL EXCAVATION SEQUENCING
C-20	TYPICAL EXCAVATION SEQUENCING - 1 OF 2
C-21	TYPICAL EXCAVATION SEQUENCING - 2 OF 2
C-22	RESTORATION PLAN
C-23	TYPICAL CONSTRUCTION SEQUENCING - 1 OF 2
C-24	TYPICAL CONSTRUCTION SEQUENCING - 2 OF 2
C-25	TYPICAL DETAILS - 1 OF 3
C-26	TYPICAL DETAILS - 2 OF 3
C-27	TYPICAL DETAILS - 3 OF 3
C-28	PILE WALL LAYOUT PLAN
C-29	DOUBLE PILE WALL PLAN AND PROFILE - 1 OF 4
C-30	DOUBLE PILE WALL PLAN AND PROFILE - 2 OF 4
C-31	DOUBLE PILE WALL PLAN AND PROFILE - 3 OF 4
C-32	DOUBLE PILE WALL PLAN AND PROFILE - 4 OF 4
C-33	SOUTH WALL PLAN AND PROFILE - 1 OF 2
C-34	SOUTH WALL PLAN AND PROFILE - 2 OF 2
C-35	DOUBLE PILE WALL SECTIONS - 1 OF 7
C-36	DOUBLE PILE WALL SECTIONS - 2 OF 7
C-37	DOUBLE PILE WALL SECTIONS - 3 OF 7
C-38	DOUBLE PILE WALL SECTIONS - 4 OF 7
C-39	DOUBLE PILE WALL SECTIONS - 5 OF 7
C-40	DOUBLE PILE WALL SECTIONS - 6 OF 7
C-41	DOUBLE PILE WALL SECTIONS - 7 OF 7
C-42	SOUTH WALL SECTIONS - 1 OF 3
C-43	SOUTH WALL SECTIONS - 2 OF 3
C-44	SOUTH WALL SECTIONS - 3 OF 3
C-45	DREDGING NORTHWEST CORNER WORKS PLAN
C-46	DREDGING NORTHWEST CORNER DREDGING CONTROLS
C-47	DREDGING NORTHWEST CORNER DRY EXCAVATION
C-48	DREDGING NORTHWEST CORNER WET EXCAVATION
C-49	DREDGING NORTHWEST CORNER SECTIONS 1 OF 2
C-50	DREDGING NORTHWEST CORNER SECTIONS 2 OF 2
C-51	DREDGING NORTHWEST CORNER SEQUENCING 1 OF 3
C-52	DREDGING NORTHWEST CORNER SEQUENCING 2 OF 3
C-53	DREDGING NORTHWEST CORNER SEQUENCING 3 OF 3
C-54	DREDGING NORTHWEST CORNER FINAL GRADE
C-55	DREDGING NORTHWEST CORNER DREDGING DETAILS
C-56	RESTORATION SECTIONS 1 OF 2
C-57	RESTORATION SECTIONS 2 OF 2
STRUCTURAL SERIES	
S-01	STRUCTURAL NOTES
S-02	STRUCTURAL LAYOUT PLAN
S-03	STRUCTURAL SECTIONS
S-04	STRUCTURAL DETAILS 1 OF 2
S-05	STRUCTURAL DETAILS 2 OF 2
S-06	FRP BARRIER WALL
PROCESS FLOW AND INSTRUMENTATION SERIES	
P-00A	WATER TREATMENT SYSTEM PROCESS FLOW DIAGRAM SYMBOLS
P-00B	WATER TREATMENT SYSTEM PROCESS FLOW DIAGRAM SCHEDULES
P-01	WATER TREATMENT SYSTEM PROCESS FLOW DIAGRAM (BULK WATER)
P-02	WATER TREATMENT SYSTEM PROCESS FLOW DIAGRAM (CONTACT WATER)
P-03	WATER TREATMENT SYSTEM P&ID (BULK WATER) (1 OF 3)
P-04	WATER TREATMENT SYSTEM P&ID (BULK WATER) (2 OF 3)
P-05	WATER TREATMENT SYSTEM P&ID (BULK WATER) (3 OF 3)
P-06	WATER TREATMENT SYSTEM P&ID (CONTACT WATER) (1 OF 4)
P-07	WATER TREATMENT SYSTEM P&ID (CONTACT WATER) (2 OF 4)
P-08	WATER TREATMENT SYSTEM P&ID (CONTACT WATER) (3 OF 4)
P-09	WATER TREATMENT SYSTEM P&ID (CONTACT WATER) (4 OF 4)
P-10	WATER TREATMENT SYSTEM SITE PLAN (BULK WATER)
P-11	WATER TREATMENT SYSTEM EQUIPMENT LAYOUT (BULK WATER)
P-12	WATER TREATMENT SYSTEM SITE PLAN (CONTACT WATER)
P-13	WATER TREATMENT SYSTEM EQUIPMENT LAYOUT (CONTACT WATER) (1 OF 2)
P-14	WATER TREATMENT SYSTEM EQUIPMENT LAYOUT (CONTACT WATER) (2 OF 2)
P-15	MECHANICAL DETAILS 1 OF 1
P-16	HELICAL PILE DETAILS
P-17	MECHANICAL SCHEDULE

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HOEKSTRA, P.E. 147937, WILLIAM ALLEN BEAL, P.E.
137828, SATISH CHILKA, P.E. 145120, AND NORTON
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Client
**SAN JACINTO RIVER
WASTE PITS**

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

6	100% EPA SUBMITTAL	MW	CRH	07/17/2024
No.	Issue	Drawn	Approved	Date
Drawn	MW	Designer	RH	
Drafting	JC	Design	LL	
Check		Check		
Project	CM	Date	Jul 16, 2024	
Coordinator		Scale	N.T.S.	
Original Size	Arch D	Bar is one inch on original size drawing	0	1"

Project No. 11215702

Title
COVER SHEET

Sheet No.

G-01

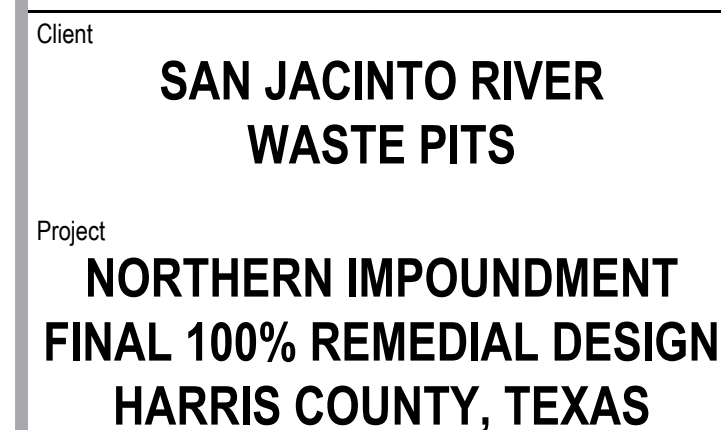
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No.	Issue	Drawn	Approved	Date

Drawn	MW	Designer	RH
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Drafting Check	JC	Design Check	LL
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Project Coordinator CM	Date Jul 16, 2024
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Original Size	Bar is one inch on original size drawing
Arch D	0 1"

Project No. 11215702

Title

**OVERALL
PLAN**

Sheet No.

C-01

Sheet - of -



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 OCEA OCTOBER 2021.
 GEOMEMBRANE LIMITS FROM ANCHOR OCEA DRAWING C-1, GEOMEMBRANE LOCATION PLAN, SAN JACINTO RIVER WASTE PITS SUPERFUND SITE, DECEMBER 2017.
 GEOTEXTILE LIMITS FROM ANCHOR OCEA DRAWING C-2, CAPPING PLAN, SAN JACINTO RIVER WASTE PITS SUPERFUND SITE, DECEMBER 2010.
 TxDOT RIGHT OF WAY FROM A BOUNDARY AND RIGHT-OF-WAY SURVEY OF PORT OF HOUSTON AUTHORITY PROPERTY & HOUSTON FLEETING SERVICES, LLC PROPERTY ALONG STATE HIGHWAY 10 AT THE SAN JACINTO FLEET AREA, IN THE J. T. HARRELL SURVEY, A-330 HARRIS COUNTY, TEXAS, COBBDENFELD, 2402-026-01, JUNE 28, 2024

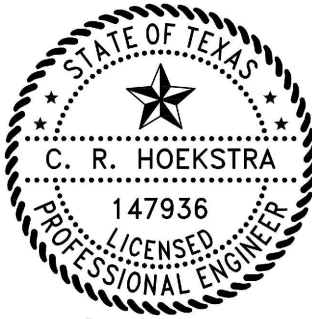
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LEGEND	
---	TXDOT RIGHT OF WAY
---	TORA CAP PERIMETER
---	EXISTING CONTOUR INTERVAL
---	FENCELINE
---	SHORELINE
---	TOP OF BANK
---	TOE OF SLOPE
---	OVERHEAD ELECTRICAL
---	GUARDRAIL
---	PIPELINE
---	BORING LOCATION
---	MONITORING WELL
---	POWER POLE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

Client

SAN JACINTO RIVER WASTE PITS

Project

NORTHERN IMPOUNDMENT FINAL 100% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

6	100% EPA SUBMITTAL	MW	CRH	07/17/2024
No.	Issue	Drawn	Approved	Date
Drawn	MW	Designer RH		
Drafting Check	JC	Design Check	LL	
Project Coordinator	CM	Date	Jul 16, 2024	
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Original Size		Bar is one inch on original size drawing 0  1"		
Arch D				

Project No. 11215702

EXISTING CONDITIONS

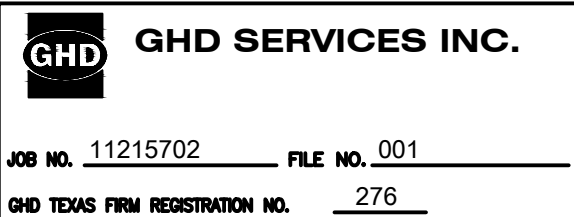
Sheet No.

C-02

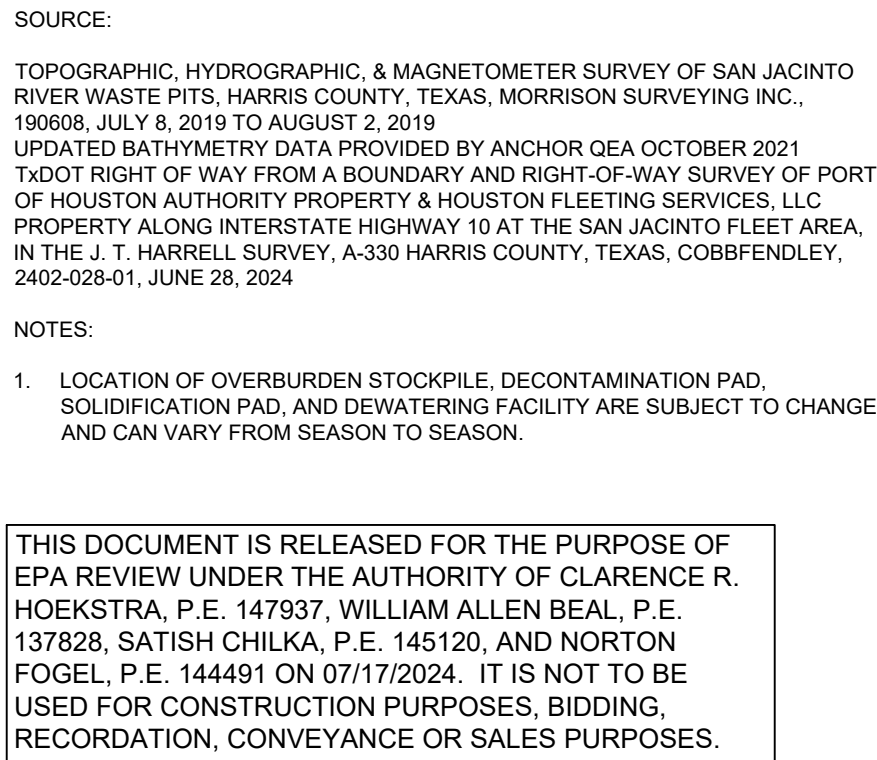
Sheet - of -

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

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A circular professional engineer seal for the State of Texas. The outer ring contains the text "STATE OF TEXAS" at the top and "PROFESSIONAL ENGINEER" at the bottom, separated by small stars. In the center, there is a five-pointed star above the name "C. R. HOEKSTRA". Below the name is the license number "147936" and the word "LICENSED" in a smaller font. The entire seal is enclosed in a decorative, rope-like border.

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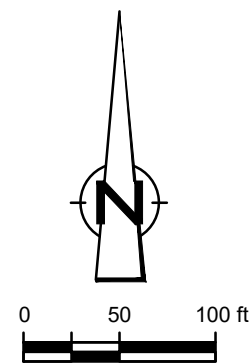
Client

**SAN JACINTO RIVER
WASTE PITS**

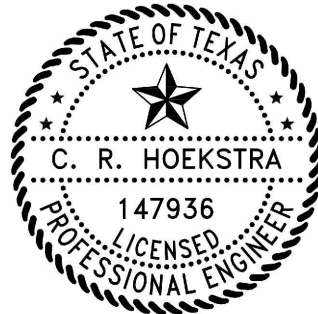
Project

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

Project No.	11215702
Title	
SSA AREA AND NORTHERN IMPOUNDMENT WORKS	
Sheet No.	
C-03	
Sheet	- of -



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

Client
**SAN JACINTO RIVER
WASTE PITS**

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

6	100% EPA SUBMITTAL	MW	CRH	07/17/2024
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No.	Issue	Drawn	Approved	Date
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Drawn	MW	Designer	RH	
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Drafting	JC	Design	LL	
Check		Check		

Project	CM	Date	Jul 16, 2024	
Coordinator				

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

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

Sheet No.

C-04

Sheet - of -

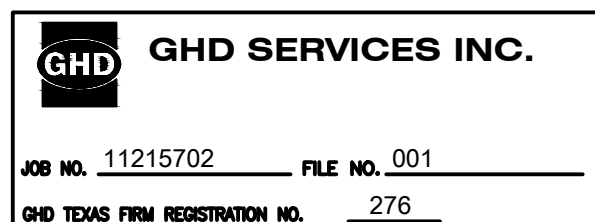
SOURCE:

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UPDATED BATHYMETRY DATA PROVIDED BY ANCHOR GEA OCTOBER 2021

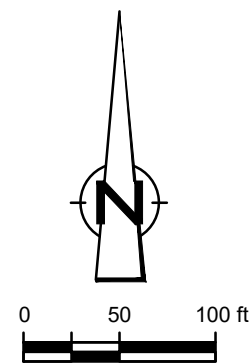
NOTES:

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

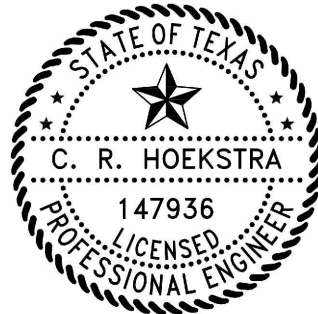
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LEGEND	
	TxDOT RIGHT OF WAY
	TORA CAP PERIMETER
	EXISTING CONTOUR INTERVAL
	FENCELINE
	SHORELINE
	TOP OF BANK
	TOE OF SLOPE
	OVERHEAD ELECTRICAL
	GUARDRAIL
	PIPELINE
	BORING LOCATION
	MONITORING WELL
	POWER POLE
	LIGHT POLE
	WELL
	MATERIAL TO BE EXCAVATED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

Client
**SAN JACINTO RIVER
WASTE PITS**

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

6	100% EPA SUBMITTAL	MW	CRH	07/17/2024
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No.	Issue	Drawn	Approved	Date
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Drawn	MW	Designer	RH	
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Drafting Check	JC	Design Check	LL	
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Project Coordinator	CM	Date	Jul 16, 2024	
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		Scale	1" = 100'	
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Original Size		Bar is one inch on original size drawing		
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Project No.	11215702
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Title
**SOIL EROSION AND
SEDIMENT CONTROL PLAN
SEASONAL**

Sheet No.	
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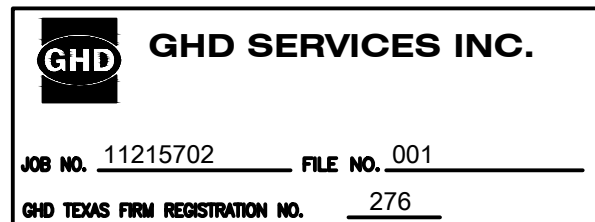
C-05

Sheet - of -

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. TxDOT RIGHT OF WAY IS BASED ON LJA ENGINEERING INC. SURVEY PROVIDED APRIL 3, 2023. TxDOT PRELIMINARY SCHEMATIC IH 10 - HARRIS COUNTY.
 2. LOCATION AND TYPE OF SOIL EROSION AND SEDIMENT CONTROLS ARE SUBJECT TO CHANGE AND CAN VARY FROM SEASON TO SEASON.

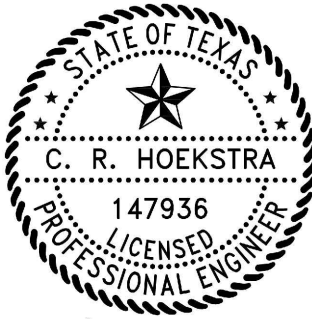
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Client
**SAN JACINTO RIVER
WASTE PITS**

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

5 100% EPA SUBMITTAL MW CRH 07/17/2024

No. Issue Drawn Approved Date

Drawn MW Designer RH

Drafting JC Design LL

Project CM Date Jul 16, 2024

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

Project No. 11215702

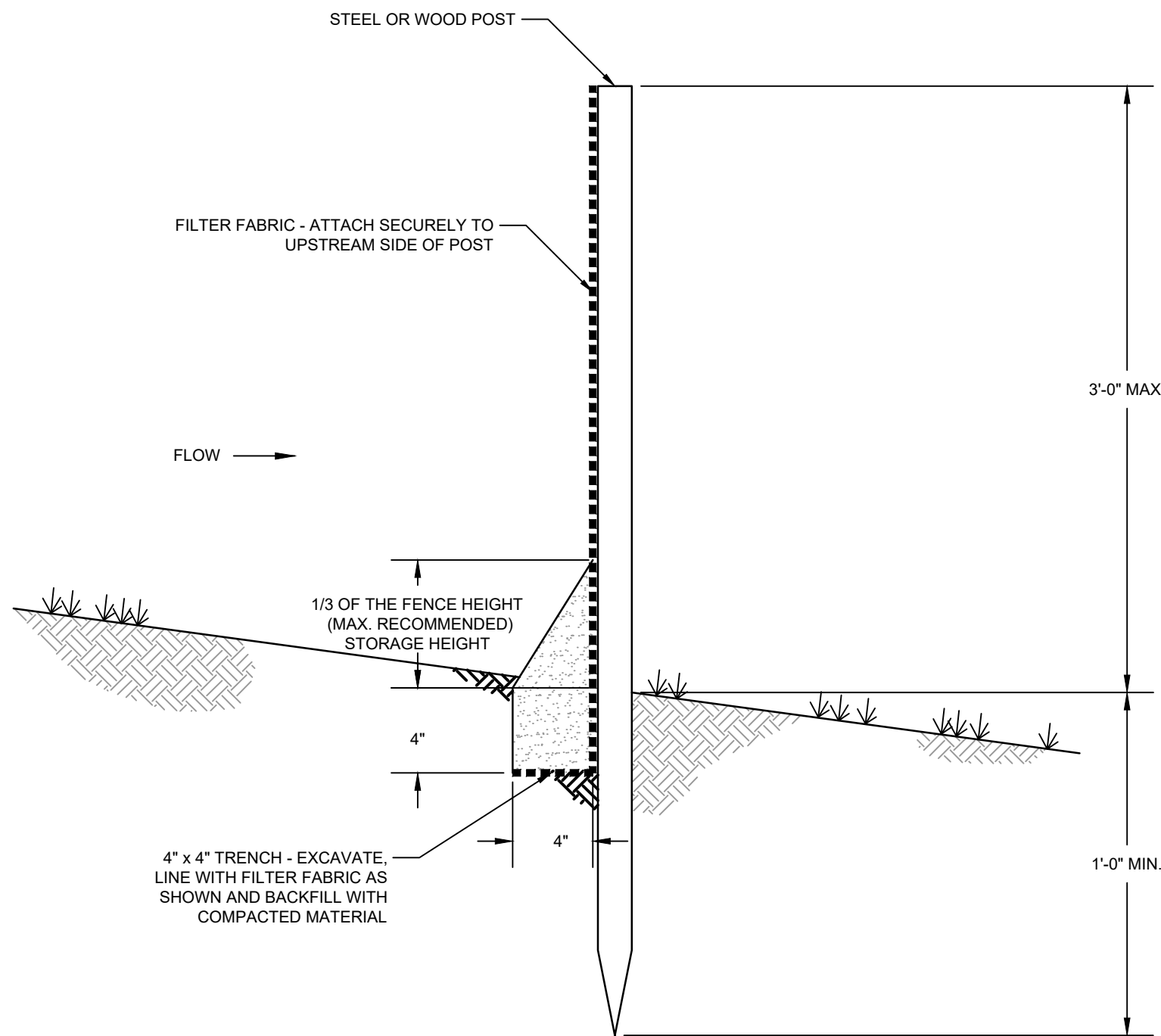
Title

**SOIL EROSION AND
SEDIMENT CONTROL DETAILS**

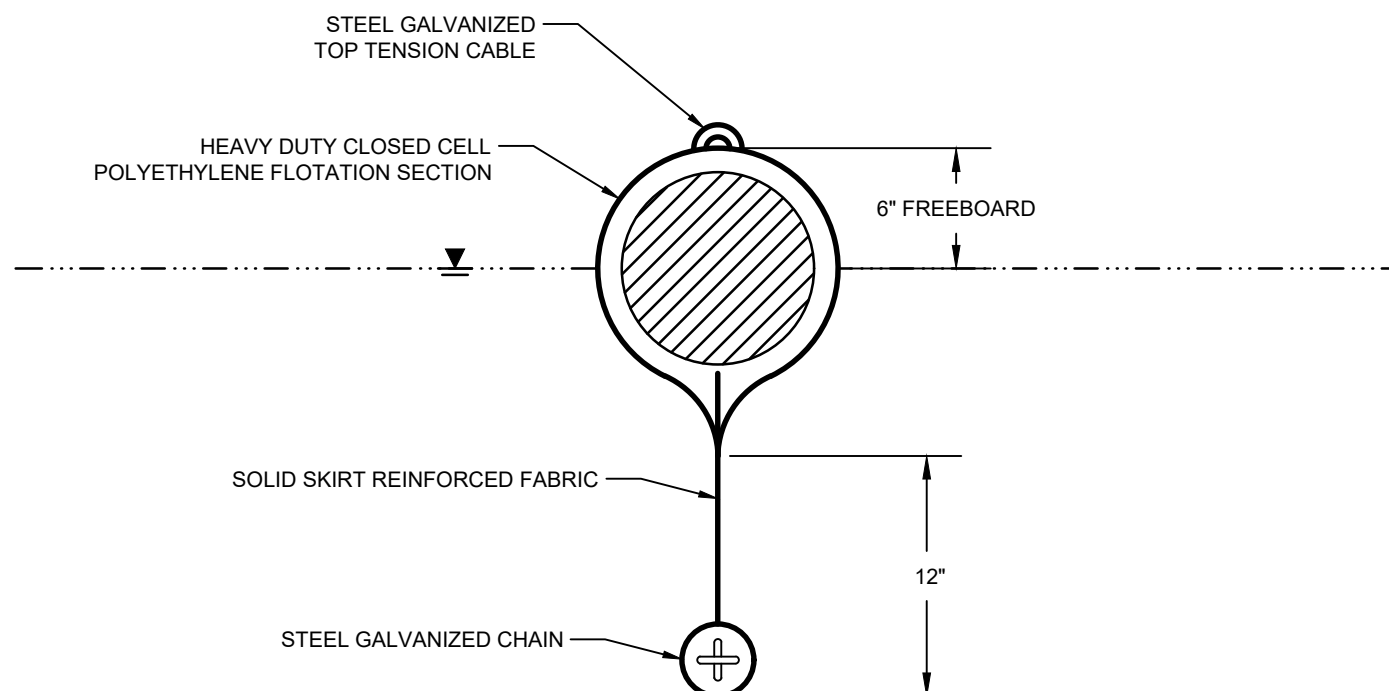
Sheet No.

C-06

Sheet - of -

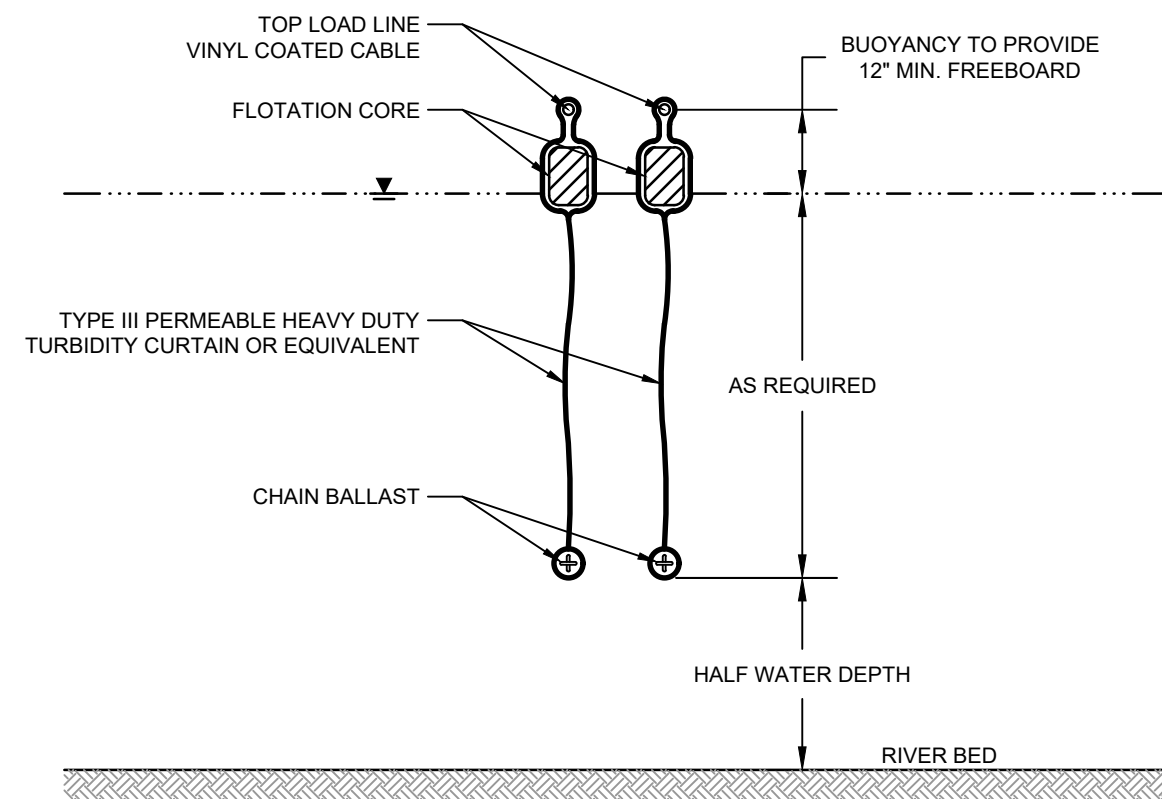


DETAIL 1 TEMPORARY SILT FENCE
N.T.S. C-05



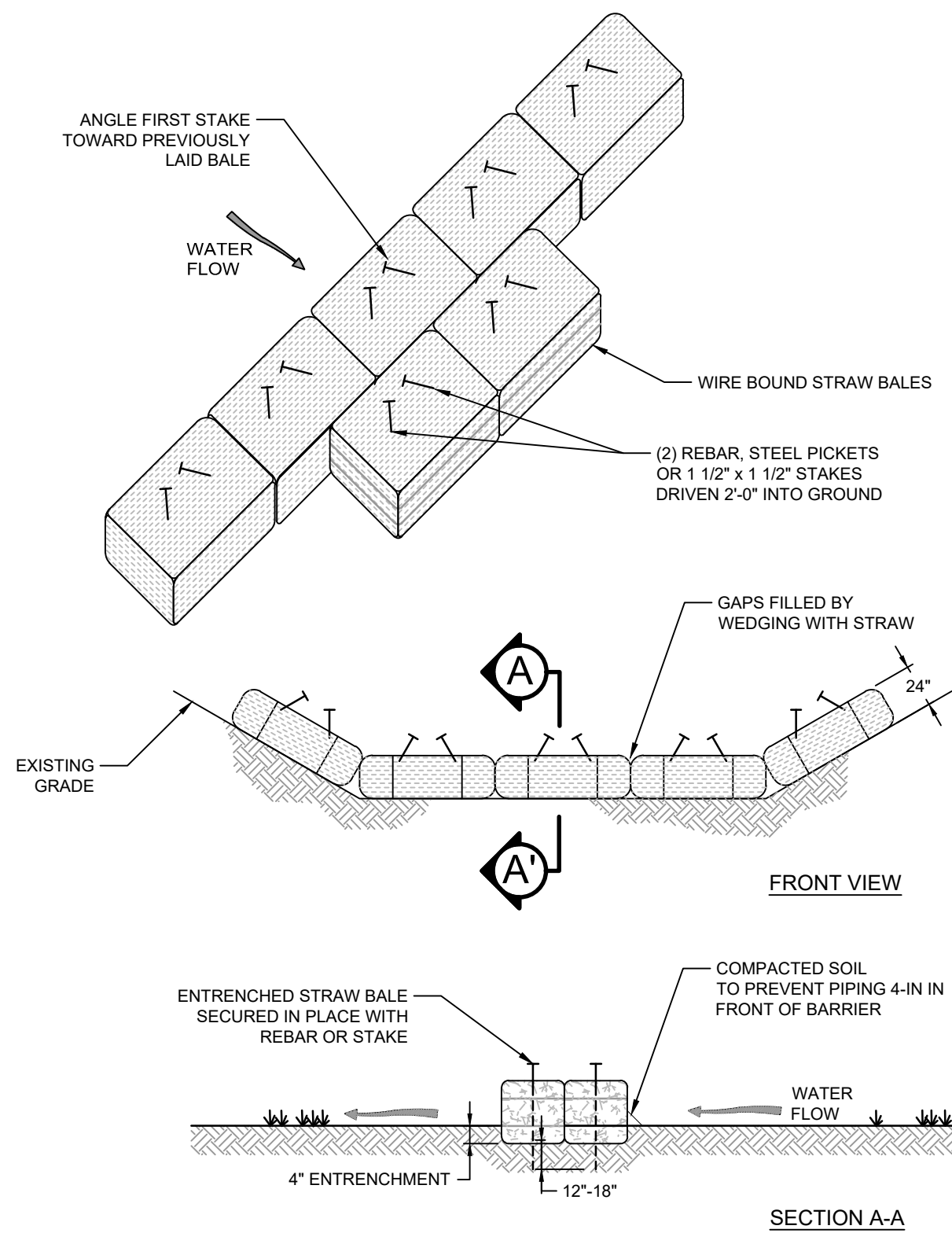
- NOTES
- OIL BOOM SHALL CONFORM TO COAST GUARD OPA 90 REGULATION AND ASTM F-1523
 - OIL BOOM SHALL BE CONTINUOUS TYPE.

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



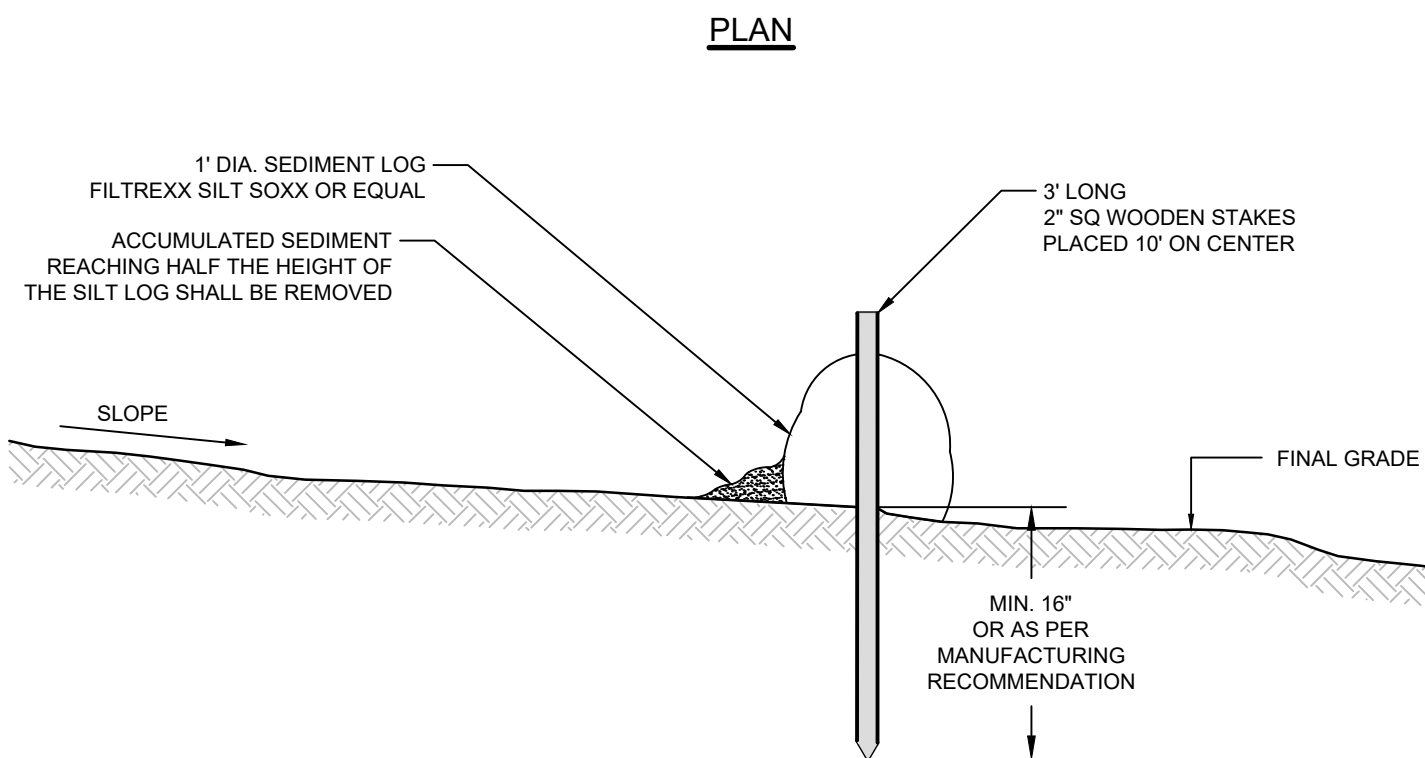
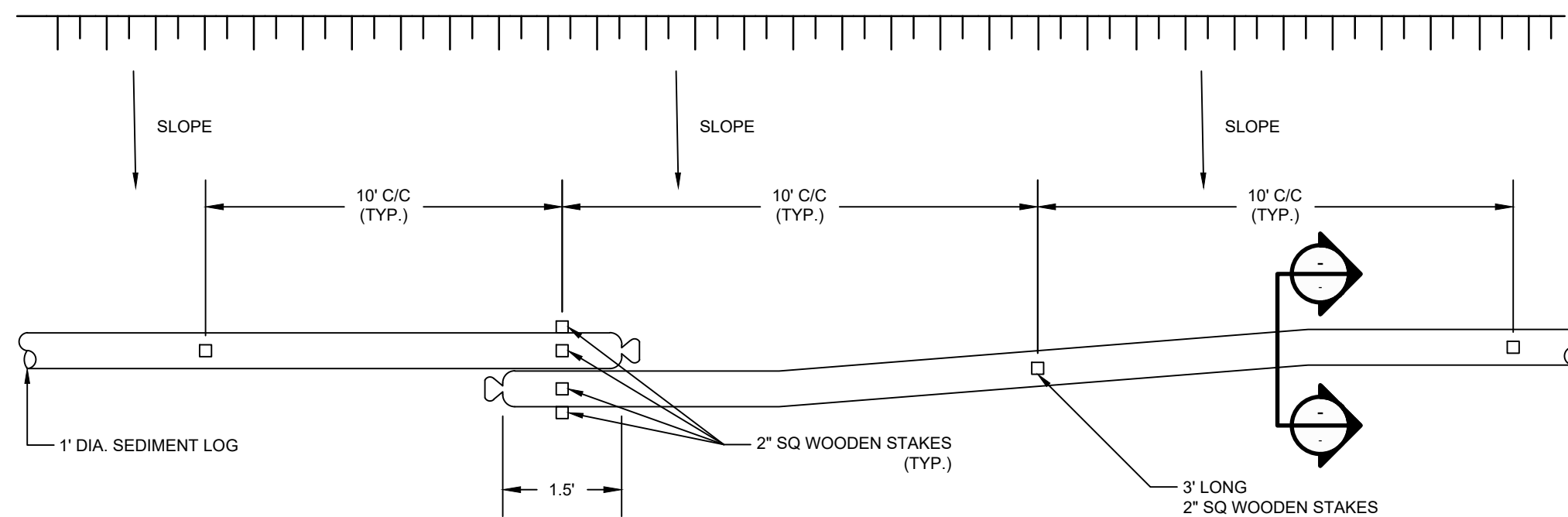
- NOTES
- TURBIDITY CURTAIN SHALL BE TYPE III ACCORDING TO DEPARTMENT OF THE ARMY, US ARMY CORPS OF ENGINEERS WASHINGTON, DC, ENGINEERING AND DESIGN "HANDBOOK FOR THE PREPARATION OF STORM WATER POLLUTION PREVENTION PLANS FOR CONSTRUCTION ACTIVITIES", APPENDIX "D" BMP 27 TURBIDITY CURTAIN, DOCUMENT EP1110-1-16,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

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



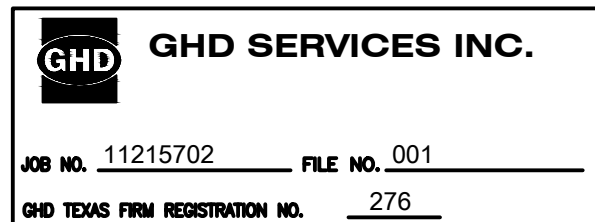
NOTE:
INSTALL SECOND ROW OF STRAW BALES IN BOTTOM OF SWALE ONLY.

DETAIL 4 STRAW BALE BARRIER
N.T.S.

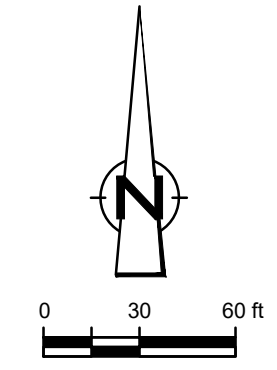


DETAIL 5 SEDIMENT LOG
N.T.S. C-05

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C. R. HOEKSTRA
147936
LICENSED PROFESSIONAL ENGINEER
7/17/2024

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LEGEND

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


■ 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
--- FRP BARRIER WALL
--- TURBIDITY CURTAIN
--- OIL BOOM
--- PLANNED IMPROVEMENTS FOR
--- NORTHERN IMPOUNDMENT ACCESS
--- RAISED BENCH
--- EXTERIOR SCOUR PROTECTION
--- INTERIOR SCOUR PROTECTION

Client **SAN JACINTO RIVER WASTE PITS**

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

6	100% EPA SUBMITTAL	MW	CRH	07/17/2024
No.	Issue	Drawn	Approved	Date
Drawn MW		Designer RH		
Drafting Check JC		Design Check LL		
Project Coordinator CM		Date Jul 16, 2024		
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Original Size		Bar is one inch on original size drawing 0  1"		
Arch D				

Project No. **11215702**

Title

**EXCAVATION PLAN
OVERALL**

Sheet No.

C-08

Sheet - of -

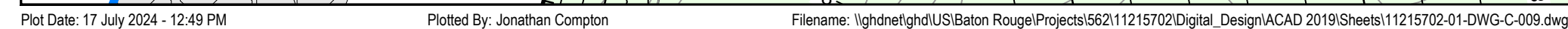
SOURCE:
TOPOGRAPHIC, HYDROGRAPHIC, & MAGNETOMETER SURVEY OF SAN JACINTO RIVER WASTE PITS, HARRIS COUNTY, TEXAS, MORRISON SURVEYING INC., 190608, JULY 9, 2019 TO AUGUST 2, 2019
UPDATED BATHYMETRY DATA PROVIDED BY ANCHOR OEA OCTOBER 2021
TXDOT RIGHT OF WAY FROM A BOUNDARY AND RIGHT-OF-WAY SURVEY OF PORT OF HOUSTON AUTHORITY PROPERTY & HOUSTON FLEETING SERVICES, LLC PROPERTY ALONG INTERSTATE HIGHWAY 10 AT THE SAN JACINTO FLEET AREA, IN THE J. T. HARRELL SURVEY, A-330 HARRIS COUNTY, TEXAS, COBBFENDLEY, 2402-028-01, JUNE 28, 2024

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

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JOB NO. 11215702 FILE NO. 001
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LEGEND

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

Client

SAN JACINTO RIVER WASTE PITS

Project

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

6	100% EPA SUBMITTAL	MW	CRH	07/17/2024
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No.	Issue	Drawn	Approved	Date
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Drawn	MW	Designer	RH
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Drafting Check	JC	Design Check	LL
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Check	Check
Project CM	Date Jul 16, 2024

Coordinator CW	Date Jul 16, 2024
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construction un
construction

Arch D

Project No. **11215702**

Title

**EXCAVATION PLAN
NORTHWEST**

Sheet No.

C-09

Sheet - of

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.
2. EXISTING ACBM COVER OUTSIDE OF THE TCRA CAP PERIMETER MAY BE REMOVED DURING THE REMEDIAL ACTION.

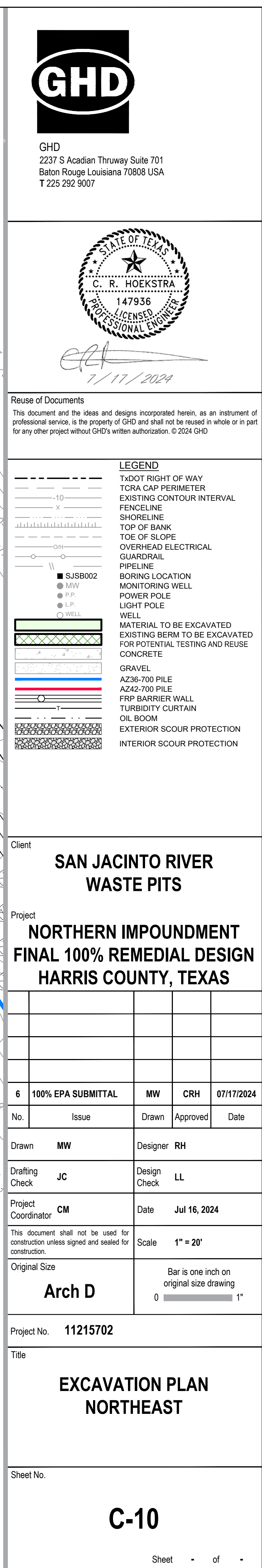
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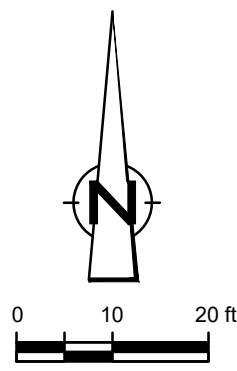
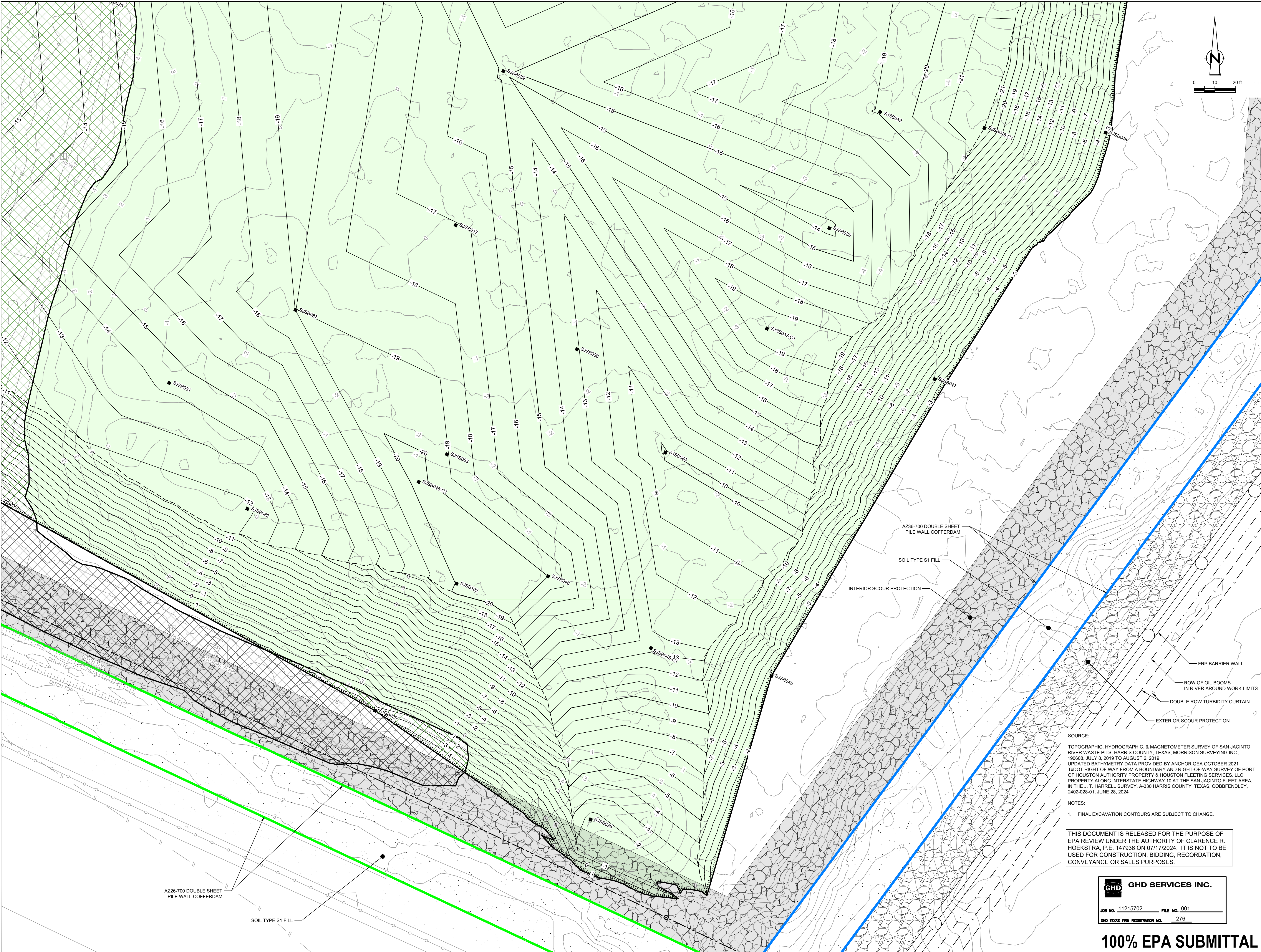


JOB NO. 11215702 FILE NO. 001

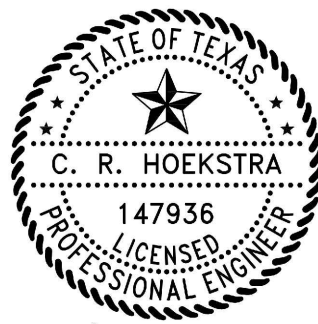
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CRH
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LEGEND	
	TXDOT RIGHT OF WAY
	TORA CAP PERIMETER
	EXISTING CONTOUR INTERVAL
	FENCELINE
	SHORELINE
	TOP OF BANK
	TOE OF SLOPE
	OVERHEAD ELECTRICAL
	GUARDRAIL
	PIPELINE
	BORING LOCATION
	MONITORING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

Client
**SAN JACINTO RIVER
WASTE PITS**

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

5	100% EPA SUBMITTAL	MW	CRH	07/17/2024
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No.	Issue	Drawn	Approved	Date
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Drawn	MW	Designer	RH
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Drafting	JC	Design	LL
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Project	CM	Date	Jul 16, 2024
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Original Size	Scale	1" = 20'
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Arch D	Bar is one inch on original size drawing
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Project No.	11215702
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Title	EXCAVATION PLAN SOUTHEAST
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Sheet No.	
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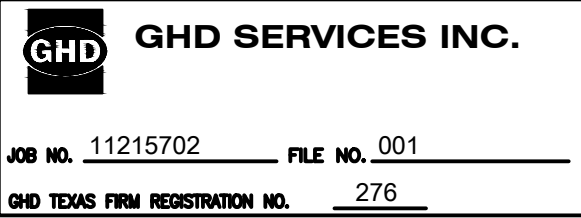
C-11

Sheet - of -

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


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

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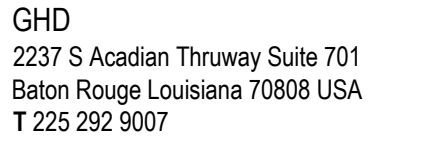


 **GHD SERVICES INC.**

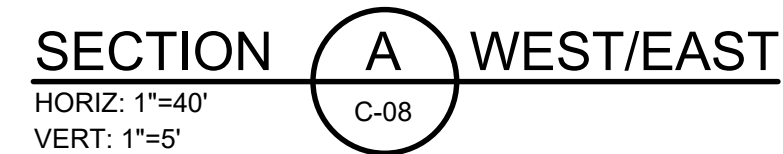
JOB NO. 11215702 FILE NO. 001

GHD TEXAS FIRM REGISTRATION NO. 276

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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.

 **GHD SERVICES INC.**

JOB NO. 11215702 FILE NO. 001

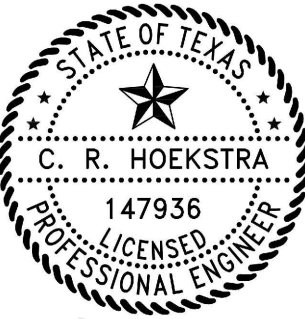
GHD TEXAS FIRM REGISTRATION NO. 276

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Sheet _____ of _____



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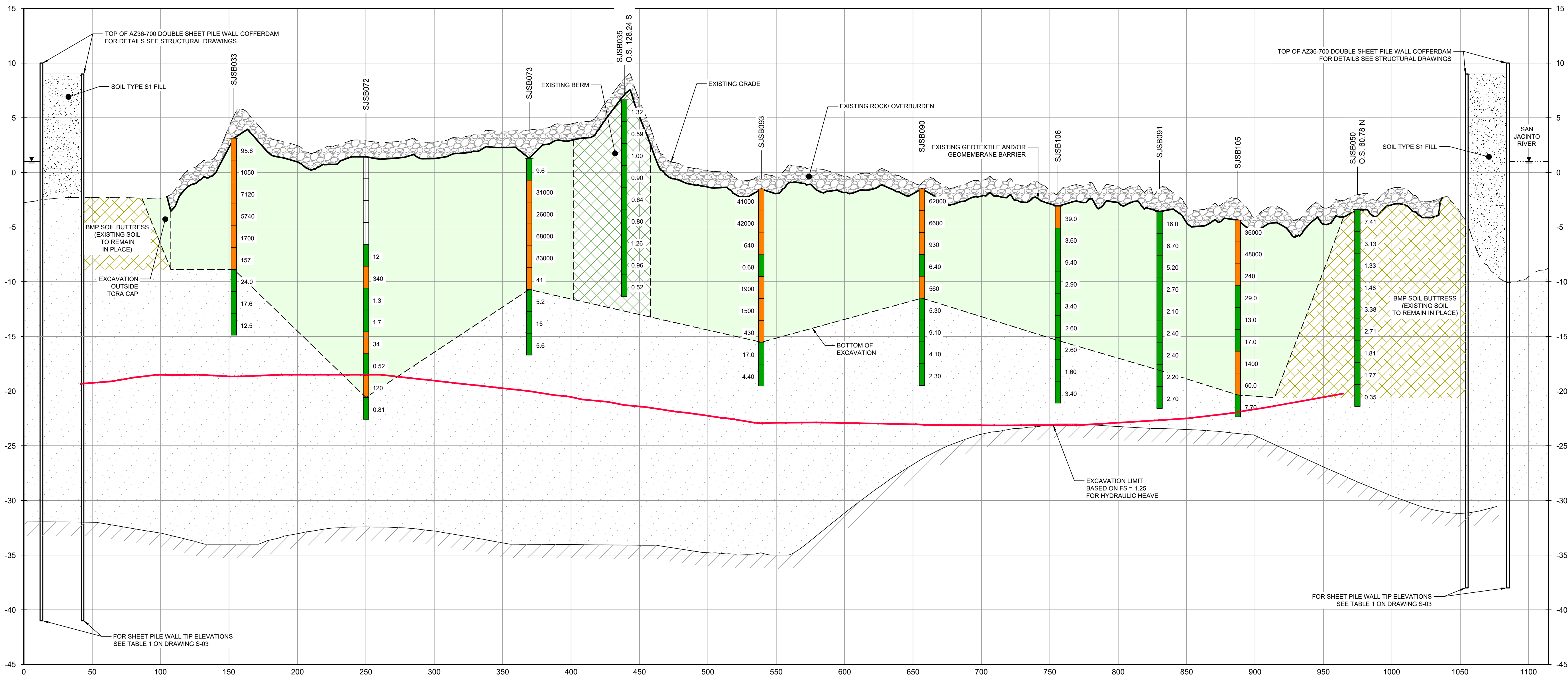
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LEGEND

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



SECTION B WEST/EAST
C-08

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

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GHD SERVICES INC.

JOB NO. 11215702 FILE NO. 001

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Client
SAN JACINTO RIVER WASTE PITS

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

5	100% EPA SUBMITTAL	MW	CRH	07/17/2024
No.	Issue	Drawn	Approved	Date
Drawn	MW	Designer	RH	
Drafting Check	JC	Design Check	LL	
Project Coordinator	CM	Date	Jul 16, 2024	
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Original Size		Bar is one inch on original size drawing 0 1"		
Arch D				

Project No. 11215702

Title
EXCAVATION SECTION 2 OF 6

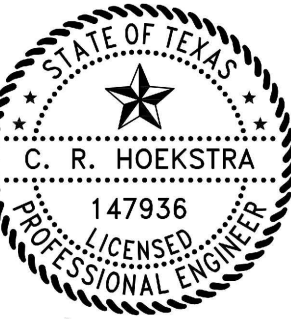
Sheet No.

C-14

Sheet - of -



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- LEGEND**
- SOILS WITH CONCENTRATIONS <30 ng/kg TEQ_{2,3,4} TCDD
 - SOILS WITH CONCENTRATIONS >30 ng/kg TEQ_{2,3,4} 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
FINAL 100% REMEDIAL DESIGN
HARRIS COUNTY, TEXAS**

5	100% EPA SUBMITTAL	MW	CRH	07/17/2024
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No.	Issue	Drawn	Approved	Date
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Drawn	MW	Designer	RH
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Drafting Check	JC	Design Check	LL
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Project Coordinator	CM	Date	Jul 16, 2024
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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

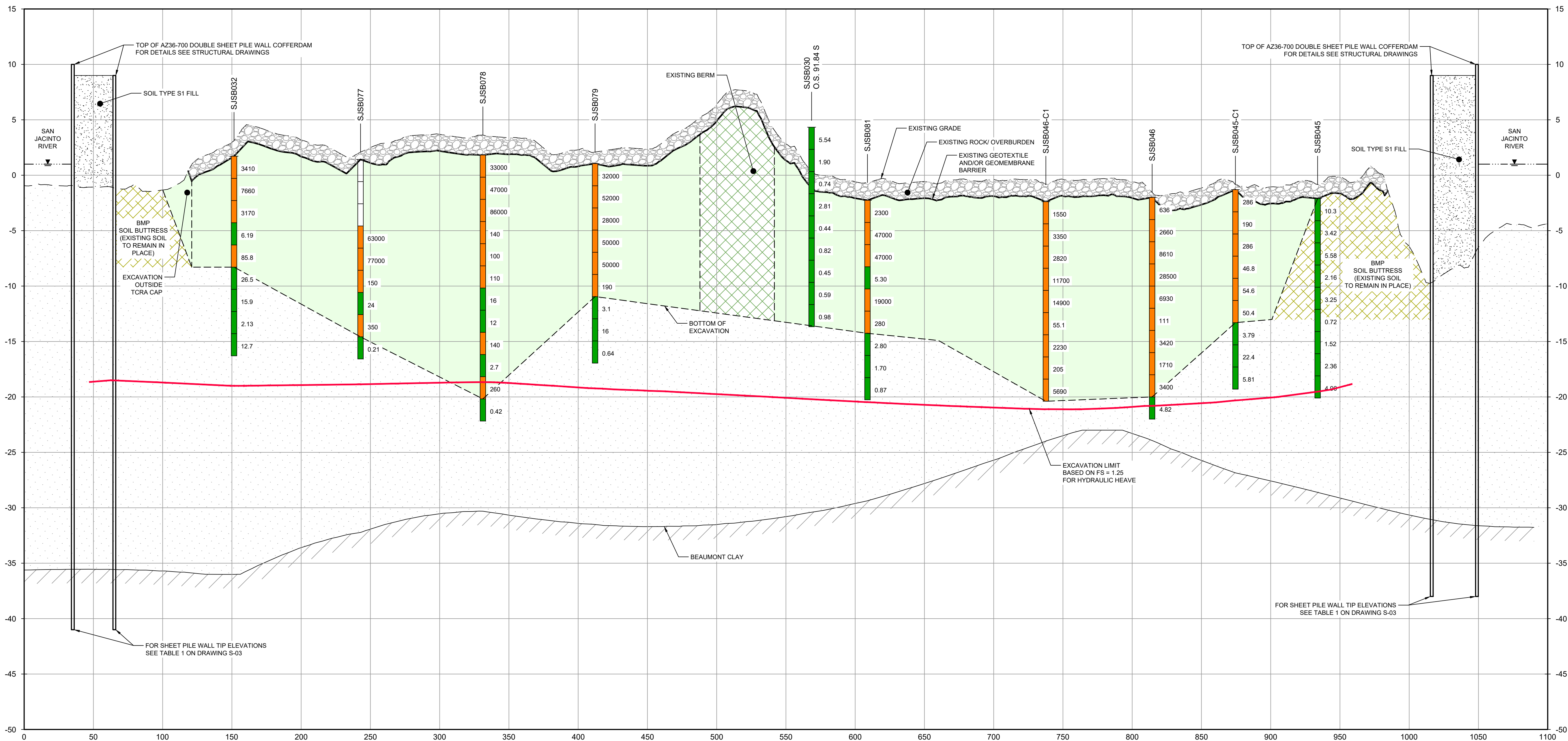
Title

**EXCAVATION SECTION
3 OF 6**

Sheet No.

C-15

Sheet - of -



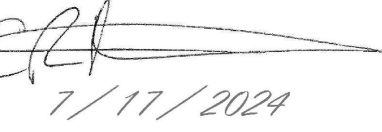
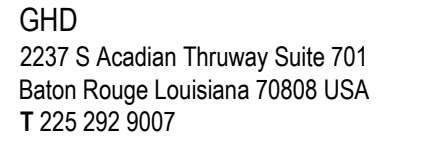
SECTION C WEST/EAST
HORIZ: 1"=40'
VERT: 1"=5'

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

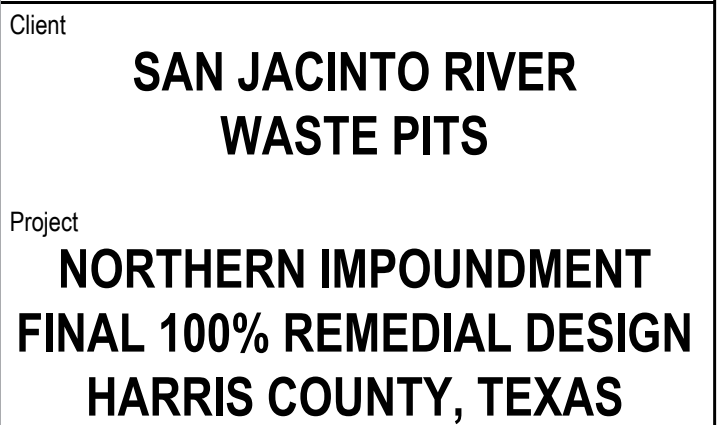
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No.	Issue	Drawn	Approved	Date

Drafting Check	JC	Design Check	LL
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Project No.	11215702
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EXCAVATION SECTION
4 OF 6

C-16



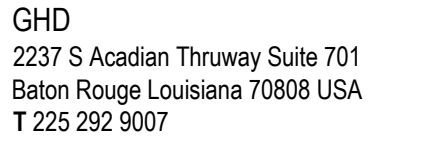
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1. BOTTOM OF EXCAVATION IS SUBJECT TO CHANGE.
2. SCOUR PROTECTION ON INTERIOR AND EXTERIOR SIDE OF COFFERDAM NOT SHOWN. SEE DRAWINGS C-28 TO C-44 FOR LIMITS OF RIPRAP.

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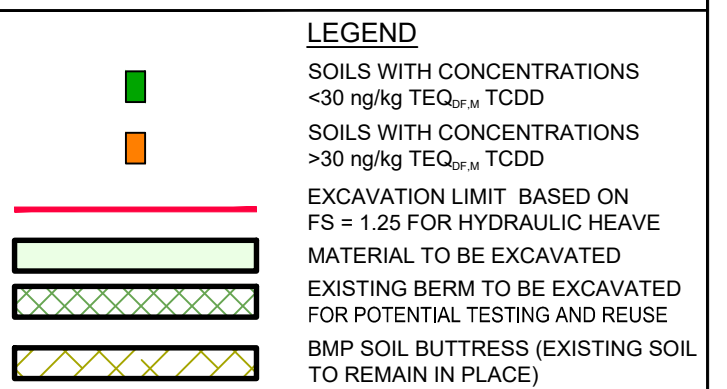


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Client

**SAN JACINTO RIVER
WASTE PITS**

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

6	100% EPA SUBMITTAL	MW	CRH	07/17/2024
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No.	Issue	Drawn	Approved	Date

Drawn	MW	Designer	RH

Drafting Check	JC	Design Check	LL
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Project Coordinator CM	Date Jul 16, 2024
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Original Size	Bar is one inch on original size drawing
Arch D	0  1"

Project No. 11215702

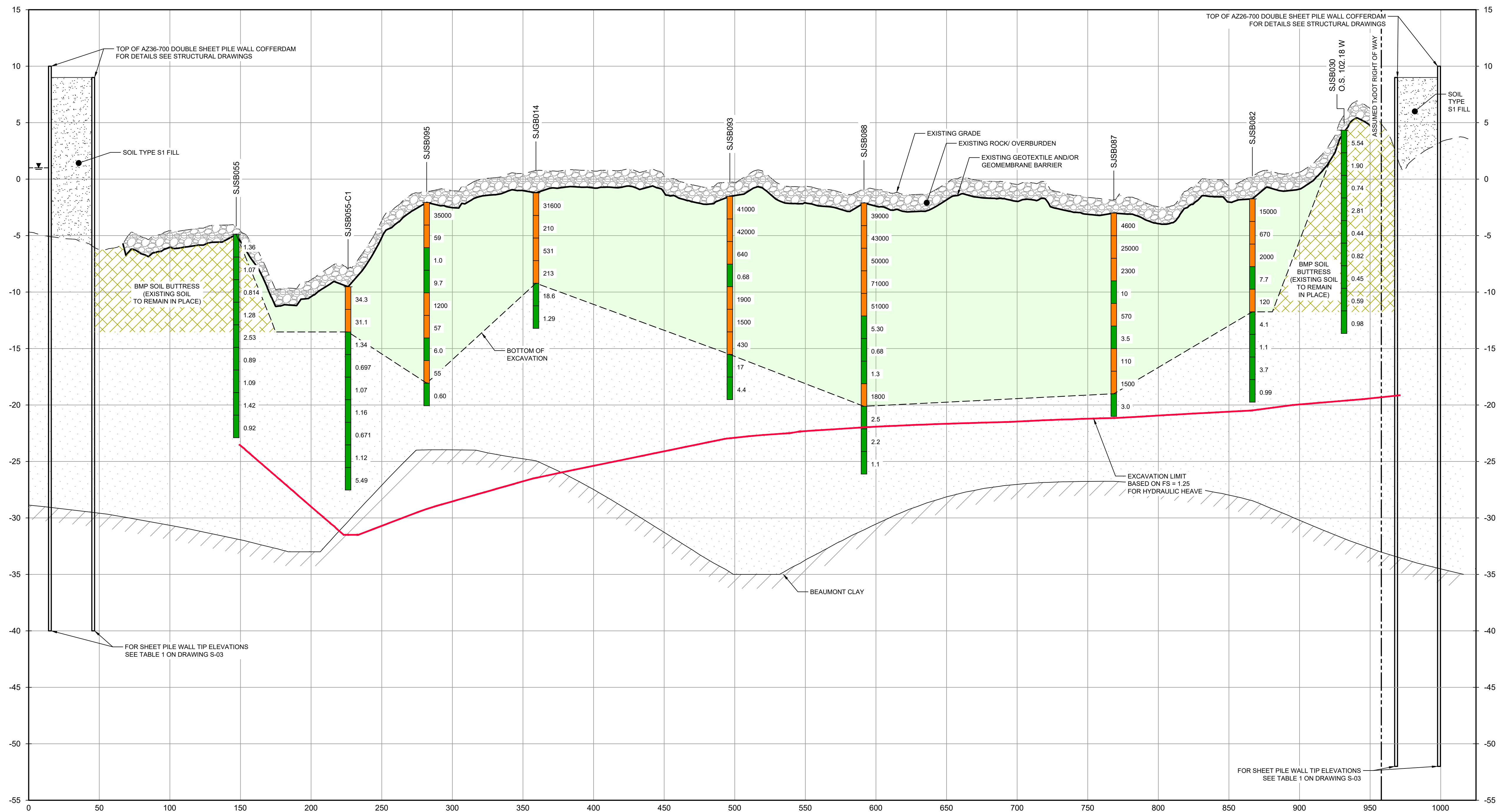
Title

**EXCAVATION SECTION
5 OF 6**

Sheet No.

C-17

Sheet - of -



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

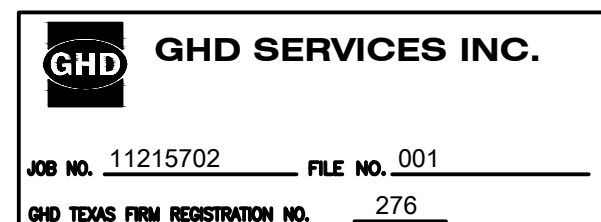
SOURCE:

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

NOTES:

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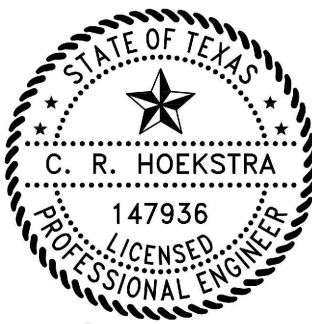
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LEGEND

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- SOILS WITH CONCENTRATIONS >30 ng/kg TEQ_{2,3,4} 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 FINAL 100% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

5	100% EPA SUBMITTAL	MW	CRH	07/17/2024
No.	Issue	Drawn	Approved	Date
Drawn	MW	Designer	RH	
Drafting Check	JC	Design Check	LL	
Project Coordinator	CM	Date	Jul 16, 2024	
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Original Size		Bar is one inch on original size drawing 0  1"		
Arch D				

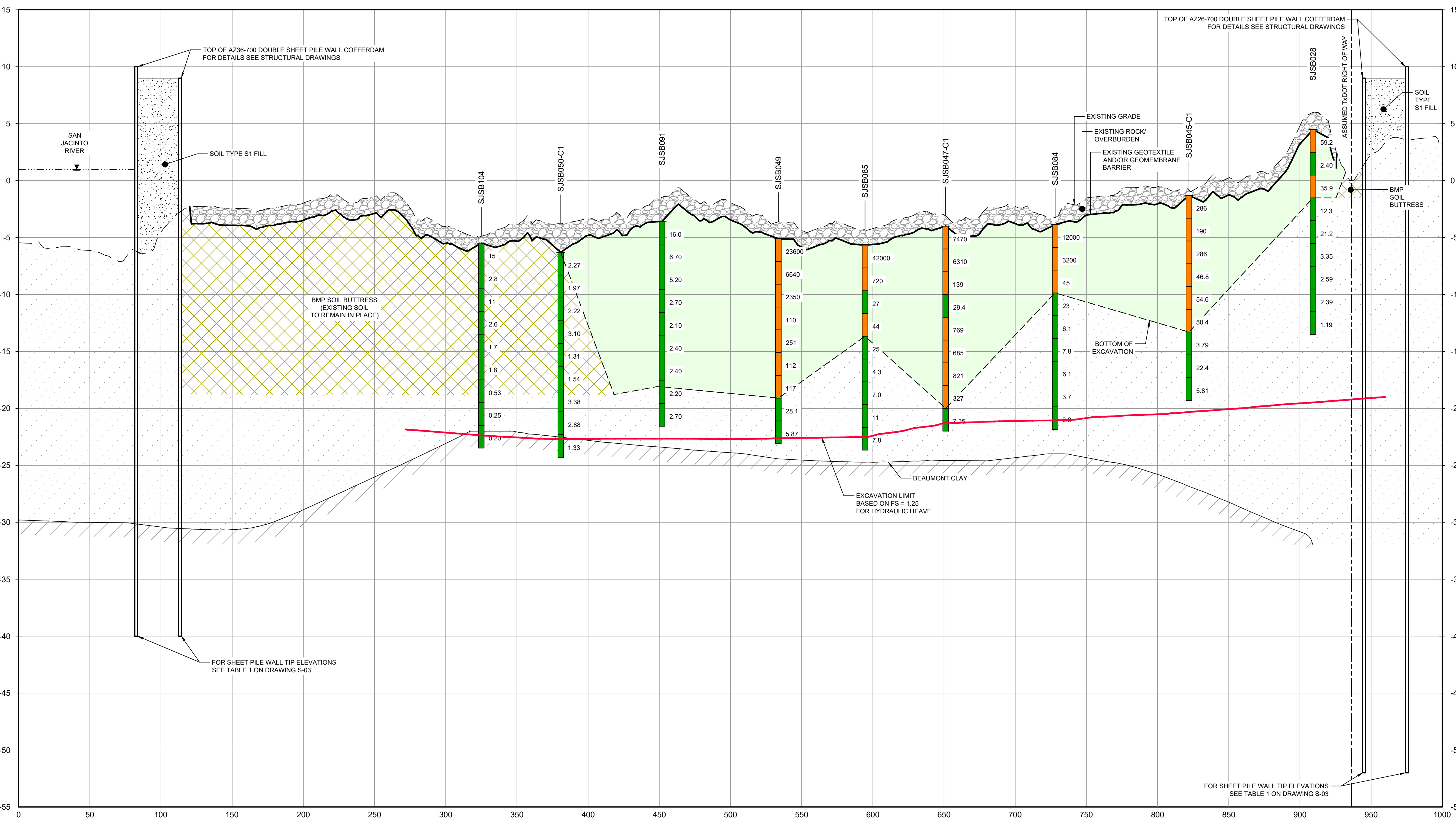
Project No. 11215702

Title
EXCAVATION SECTION 6 OF 6

Sheet No.

C-18

Sheet - of -



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

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

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

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GHD SERVICES INC.

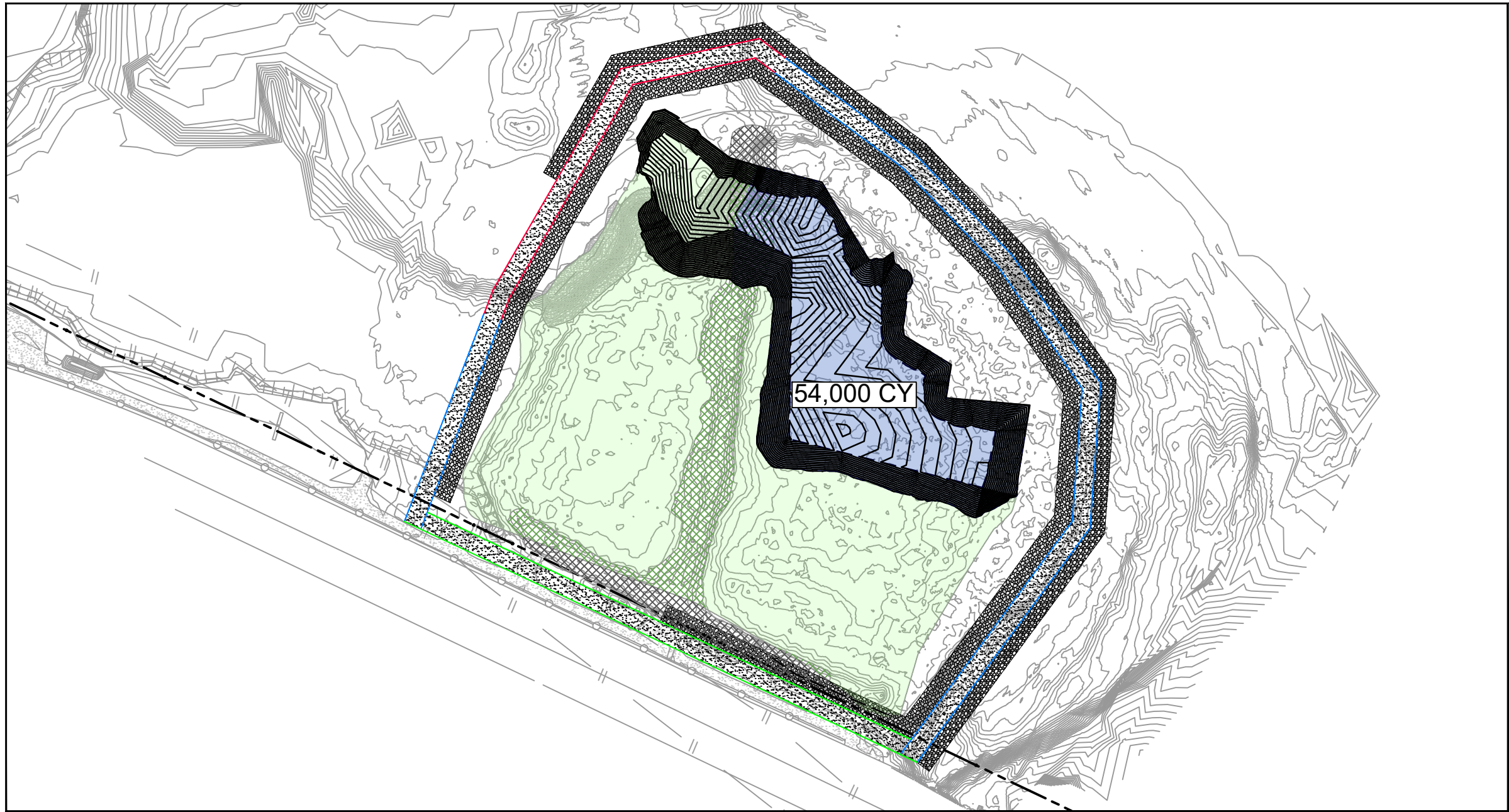
JOB NO. 11215702 FILE NO. 001

GHD TEXAS FIRM REGISTRATION NO. 276

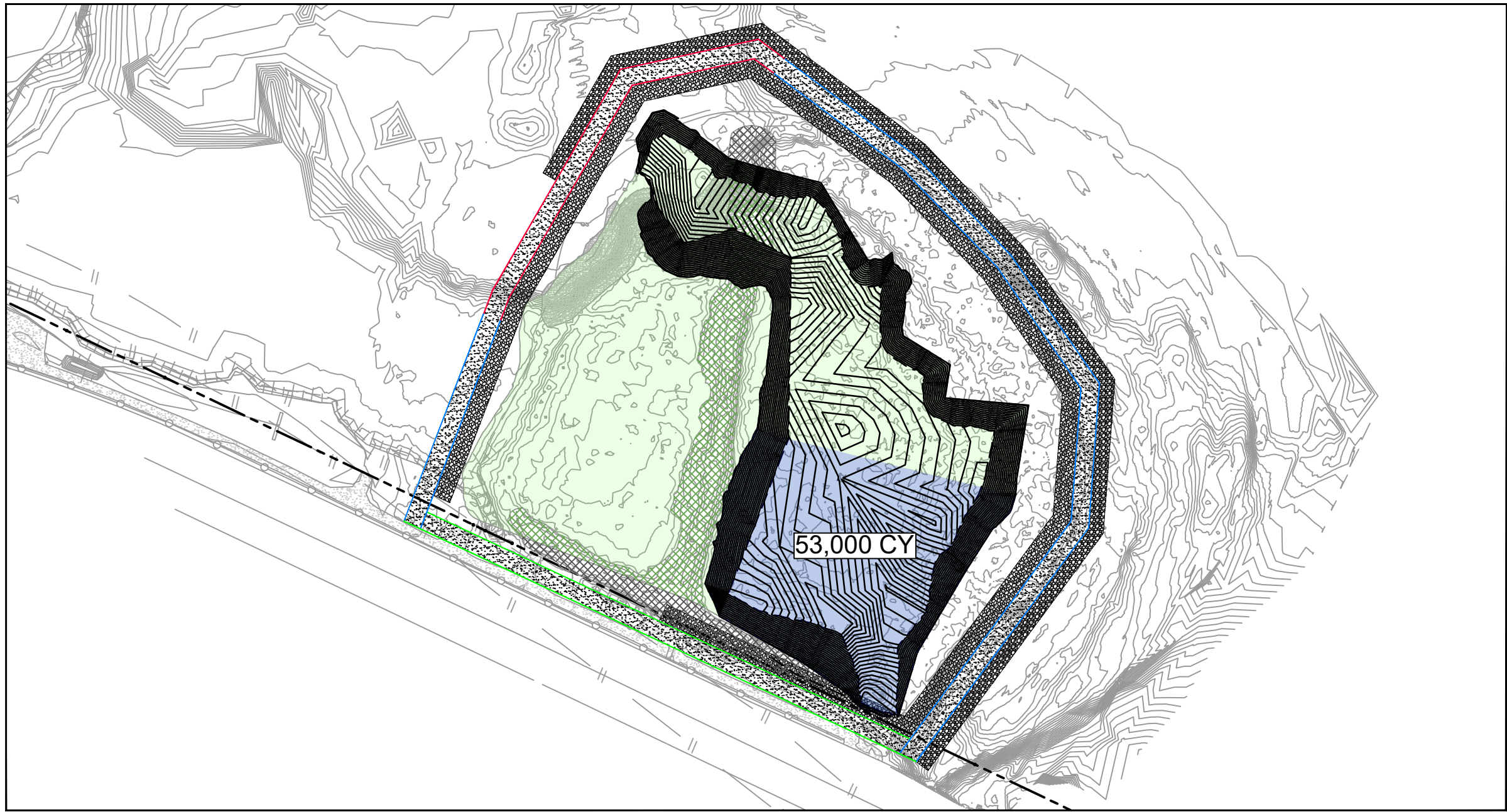
100% EPA SUBMITTAL



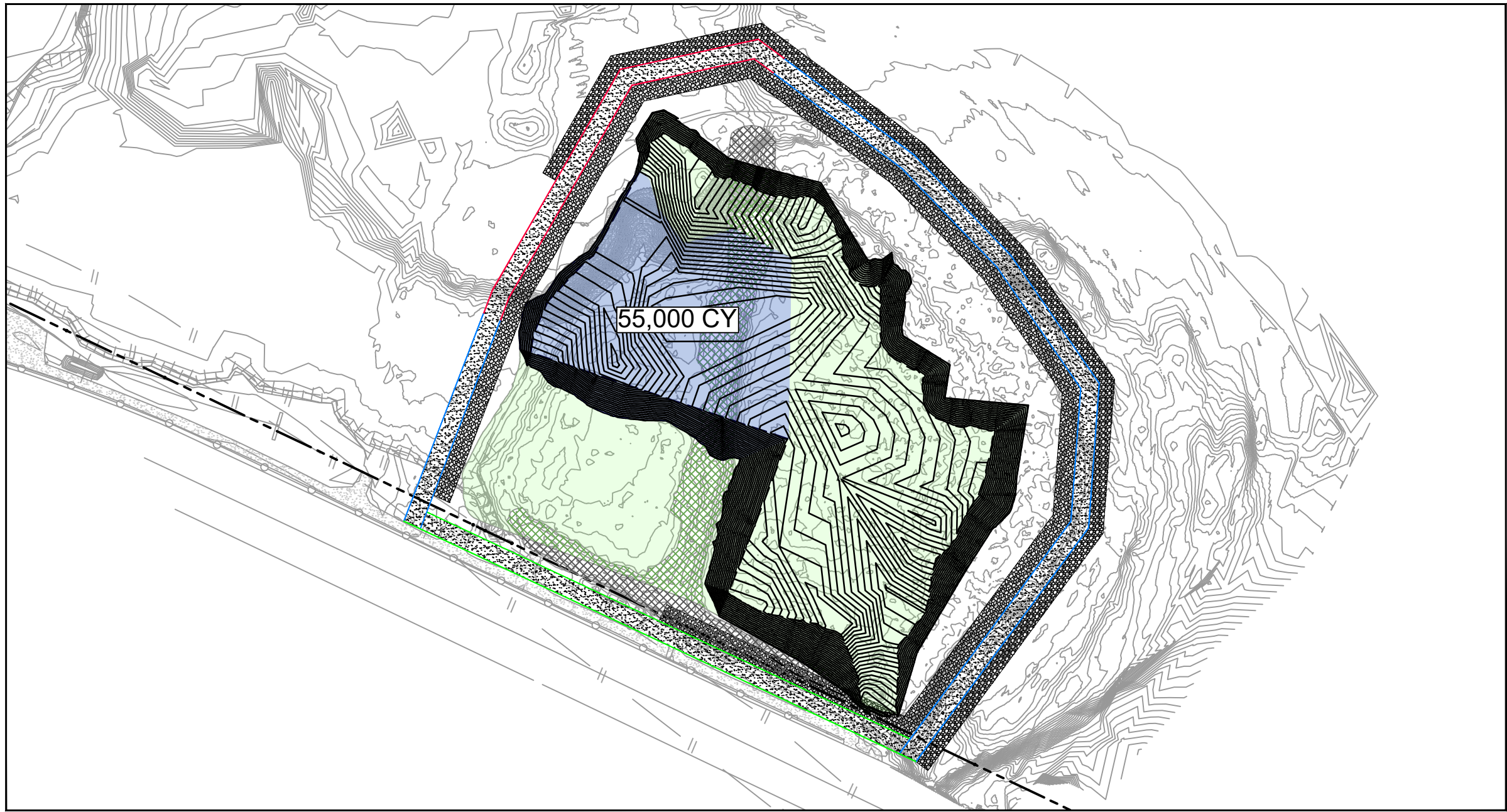
YEAR 2



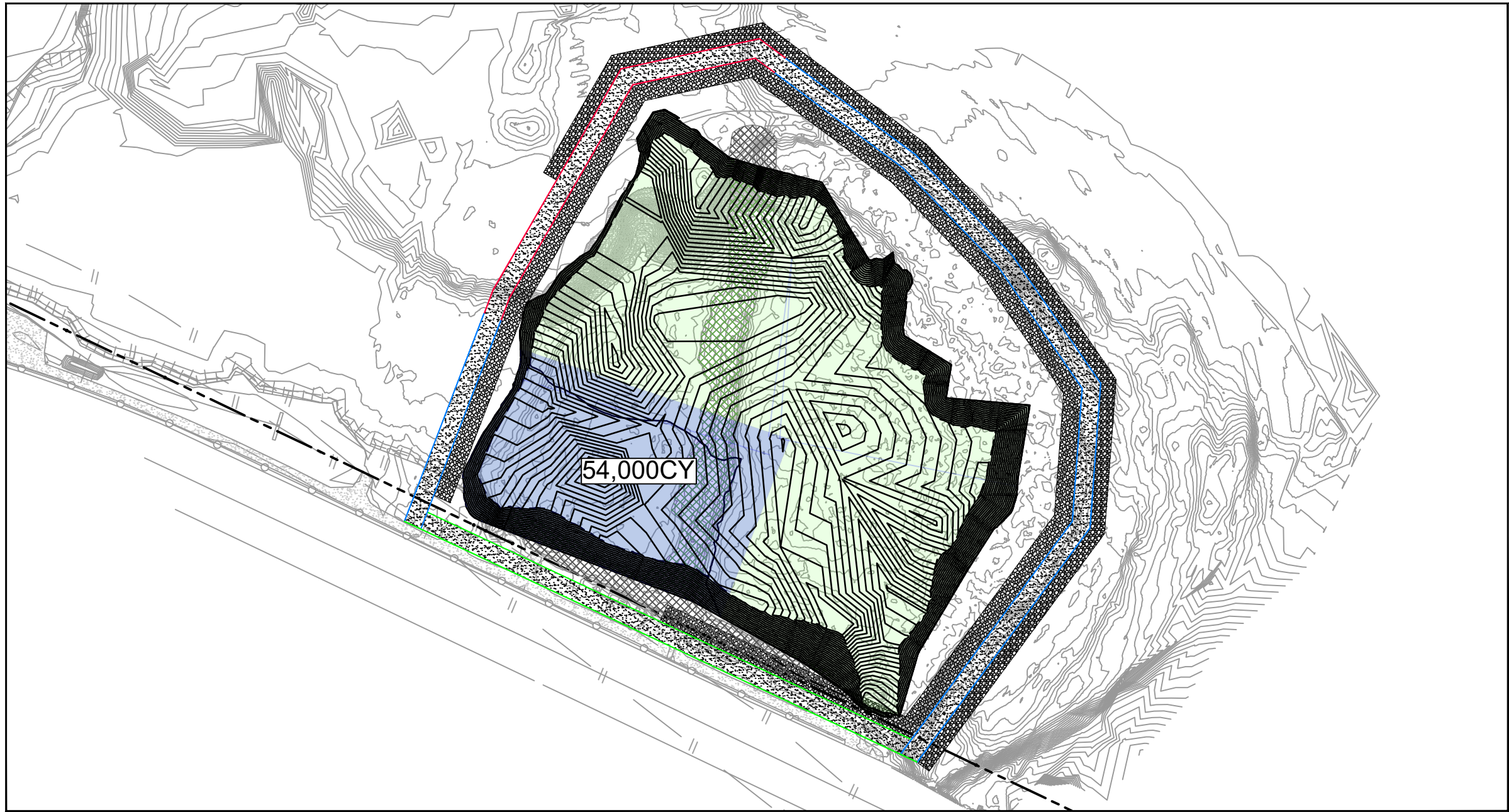
YEAR 3



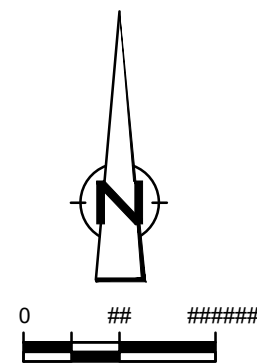
YEAR 4



YEAR 5



YEAR 6



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

Client

**SAN JACINTO RIVER
WASTE PITS**

Project

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

3	100% EPA SUBMITTAL	MW	CRH	07/17/2024
---	--------------------	----	-----	------------

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

Drawn	MW	Designer	RH
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Drafting	JC	Design	LL
----------	----	--------	----

Check		Check	
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Project	CM	Date	Jul 16, 2024
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Coordinator		Scale	1" = 200'
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Original Size	
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Arch D	Bar is one inch on original size drawing 0 1"
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Project No.	11215702
-------------	----------

Title

**SEASONAL EXCAVATION
SEQUENCING
TYPICAL**

Sheet No.

C-19

Sheet - of -

SOURCE:

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

NOTES:

1. 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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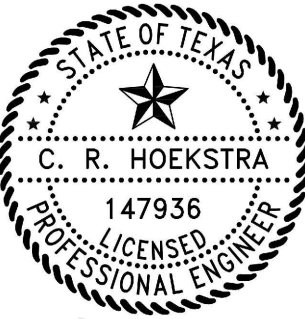
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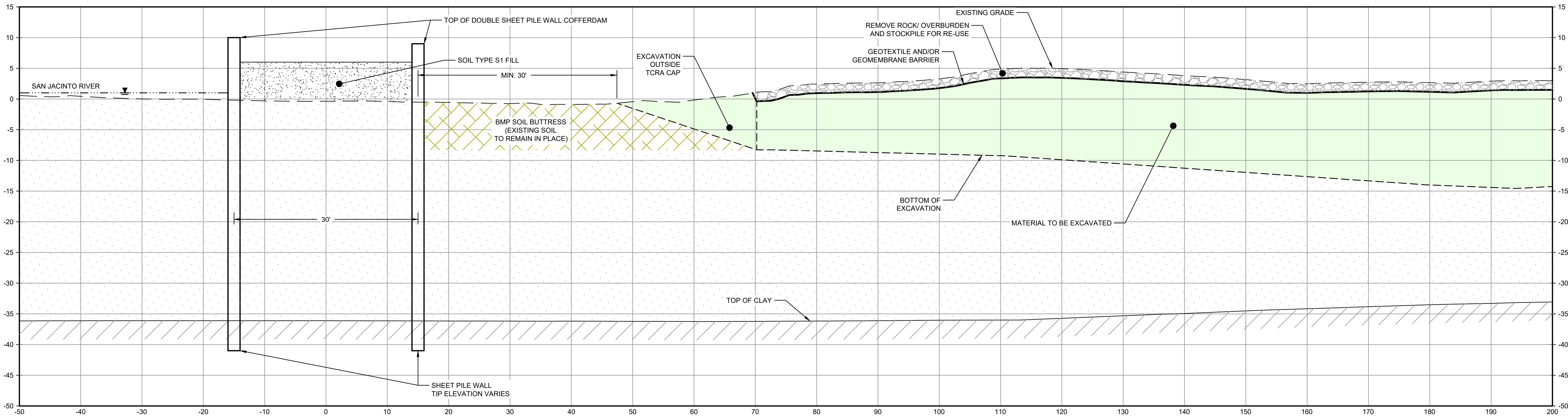


CRH
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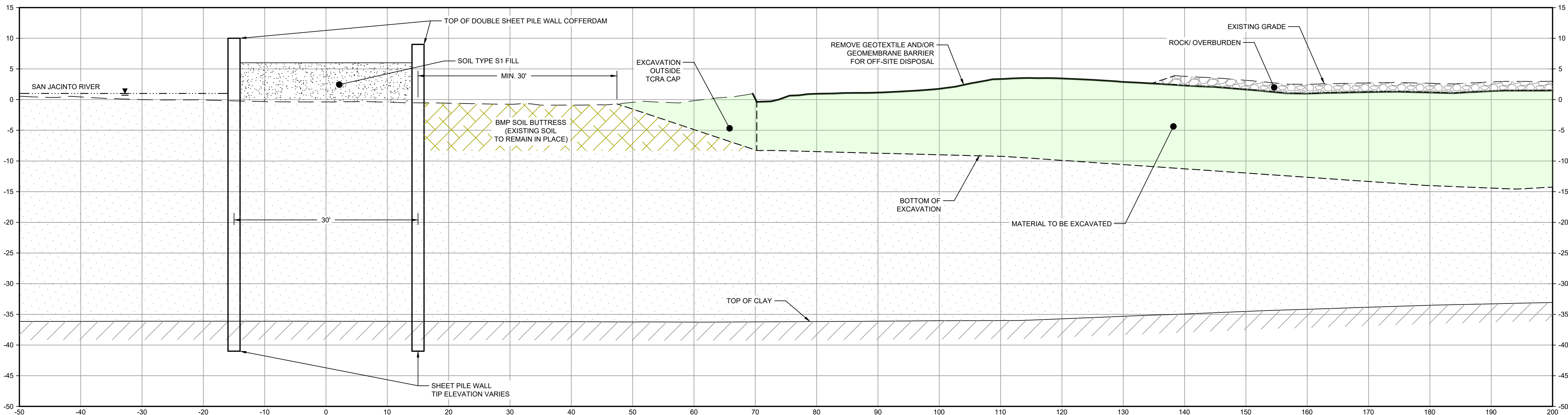
LEGEND

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



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

PHASE 1
1' = 10'

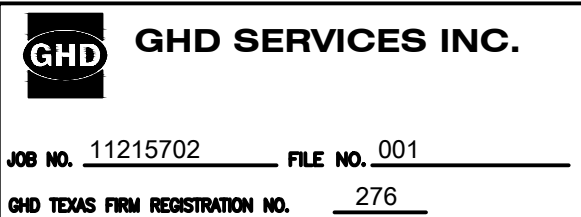


- NOTES:
1. REMOVE ROCK LAYER TO BE STOCKPILED ON SITE. REUSED AS TEMPORARY COVER AT END OF SEASONAL EXCAVATION.

PHASE 2
1' = 10'

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

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Client
**SAN JACINTO RIVER
WASTE PITS**

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

3 100% EPA SUBMITTAL MW CRH 07/17/2024

No. Issue Drawn Approved Date

Drawn MW Designer RH

Drafting JC Design LL

Project Coordinator CM Date Jul 16, 2024

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Scale AS SHOWN

Original Size

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

Project No. 11215702

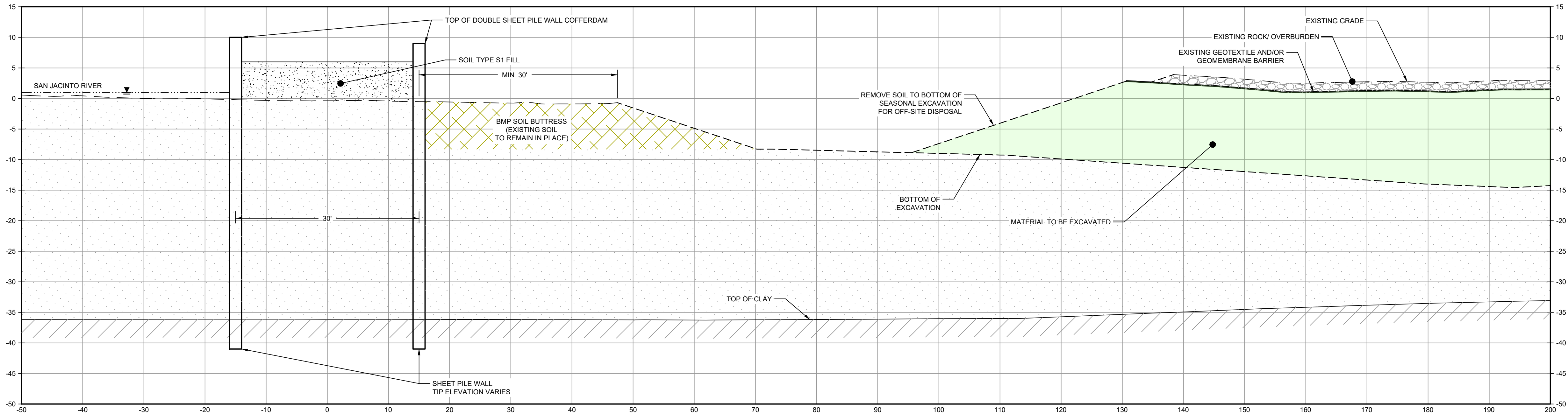
Title

**TYPICAL EXCAVATION
SEQUENCING
1 OF 2**

Sheet No.

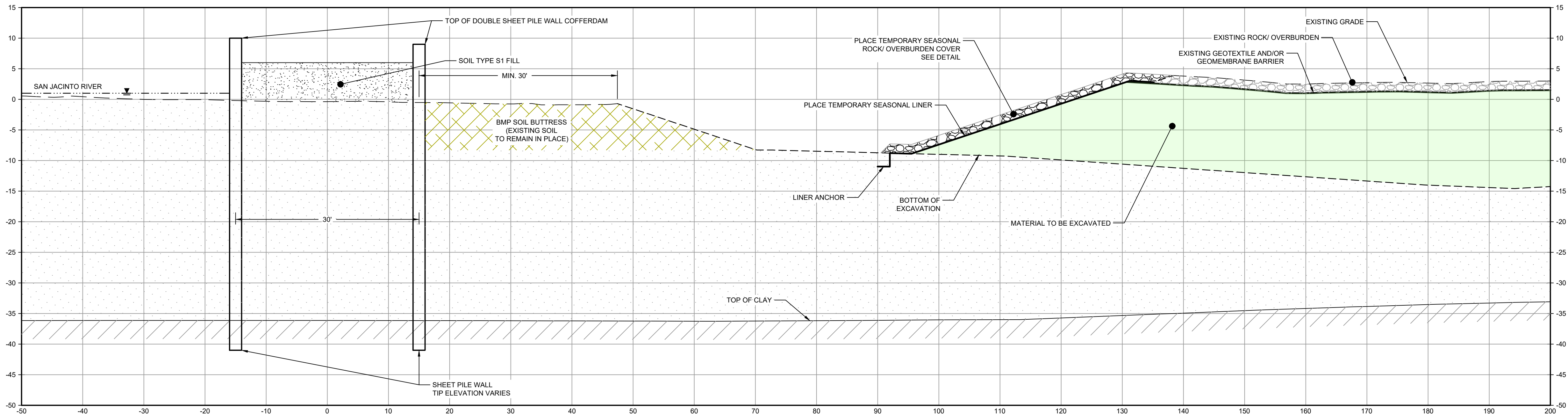
C-20

Sheet - of -



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

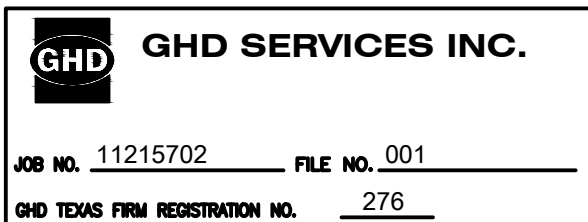
PHASE 3
1' = 10'



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

Client
**SAN JACINTO RIVER
WASTE PITS**

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

3	100% EPA SUBMITTAL	MW	CRH	07/17/2024
No.	Issue	Drawn	Approved	Date
Drawn MW		Designer RH		
Drafting Check JC		Design Check LL		
Project Coordinator CM		Date Jul 16, 2024		
Original Size		Scale AS SHOWN		
		Bar is one inch on original size drawing 0 1"		

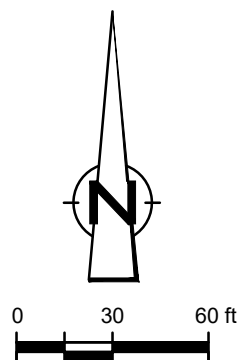
Project No. 11215702

Title
**TYPICAL EXCAVATION
SEQUENCING
2 OF 2**

Sheet No.

C-21

Sheet - of -



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LEGEND

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

Client
**SAN JACINTO RIVER
WASTE PITS**

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

4	100% EPA SUBMITTAL	MW	CRH	07/17/2024
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No.	Issue	Drawn	Approved	Date
-----	-------	-------	----------	------

Drawn	MW	Designer	RH
-------	----	----------	----

Drafting Check	JC	Design Check	LL
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Project Coordinator	CM	Date	Jul 17, 2024
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		Scale	1" = 60'
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Original Size	
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Arch D

Bar is one inch on original size drawing
0 1"

Project No. 11215702

Title

**RESTORATION
PLAN**

Sheet No.

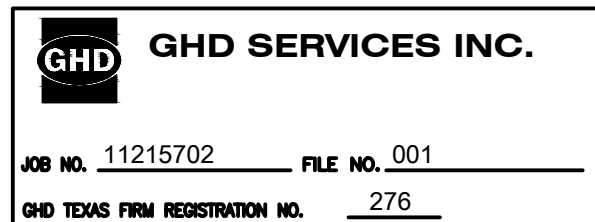
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Sheet - of -

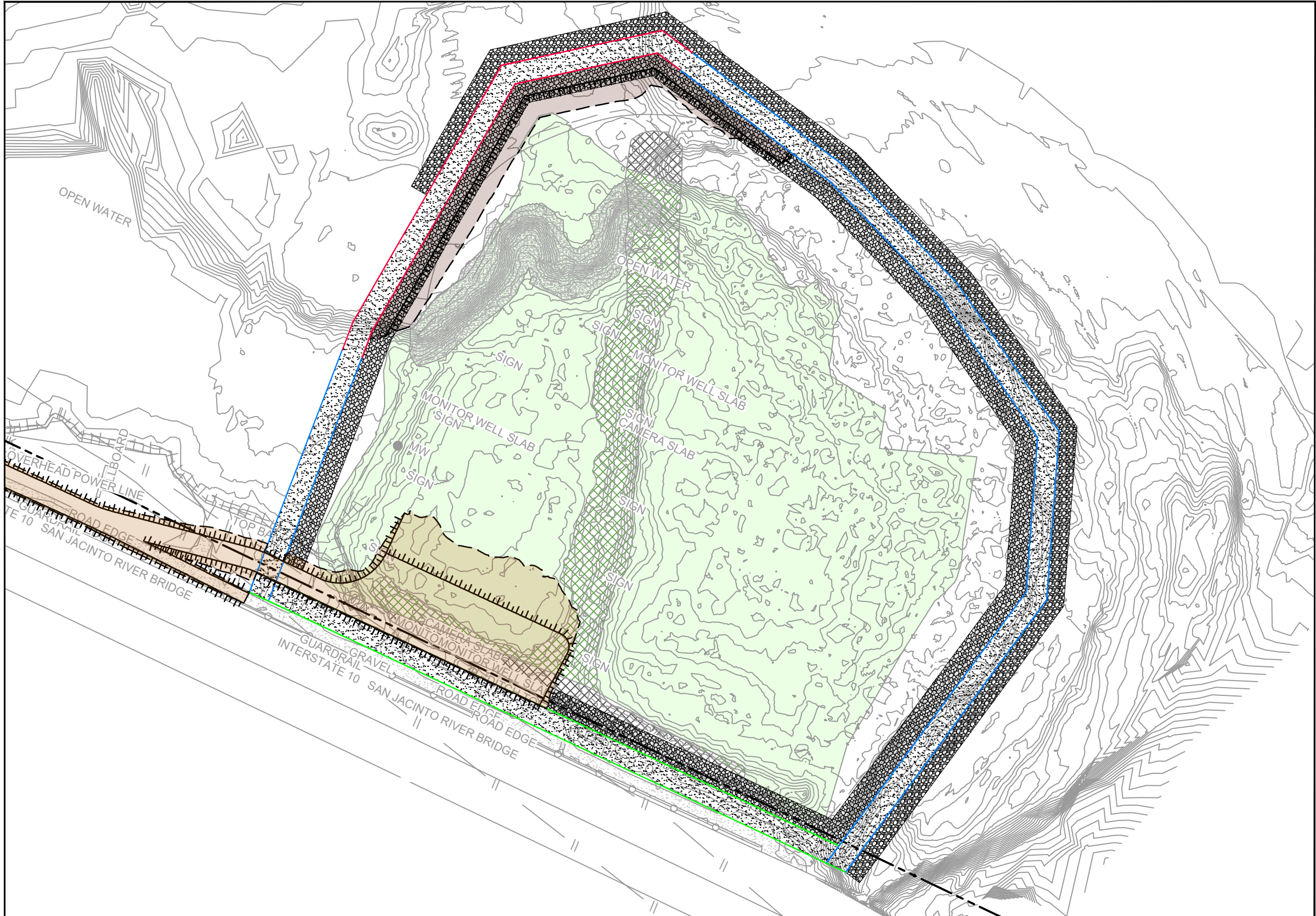
SOURCE:
TOPOGRAPHIC, HYDROGRAPHIC, & MAGNETOMETER SURVEY OF SAN JACINTO RIVER WASTE PITS, HARRIS COUNTY, TEXAS, MORRISON SURVEYING INC., 190608, JULY 8, 2019 TO AUGUST 2, 2019
UPDATED BATHYMETRY DATA PROVIDED BY ANCHOR OEA OCTOBER 2021
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NOTES:
1. FINAL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

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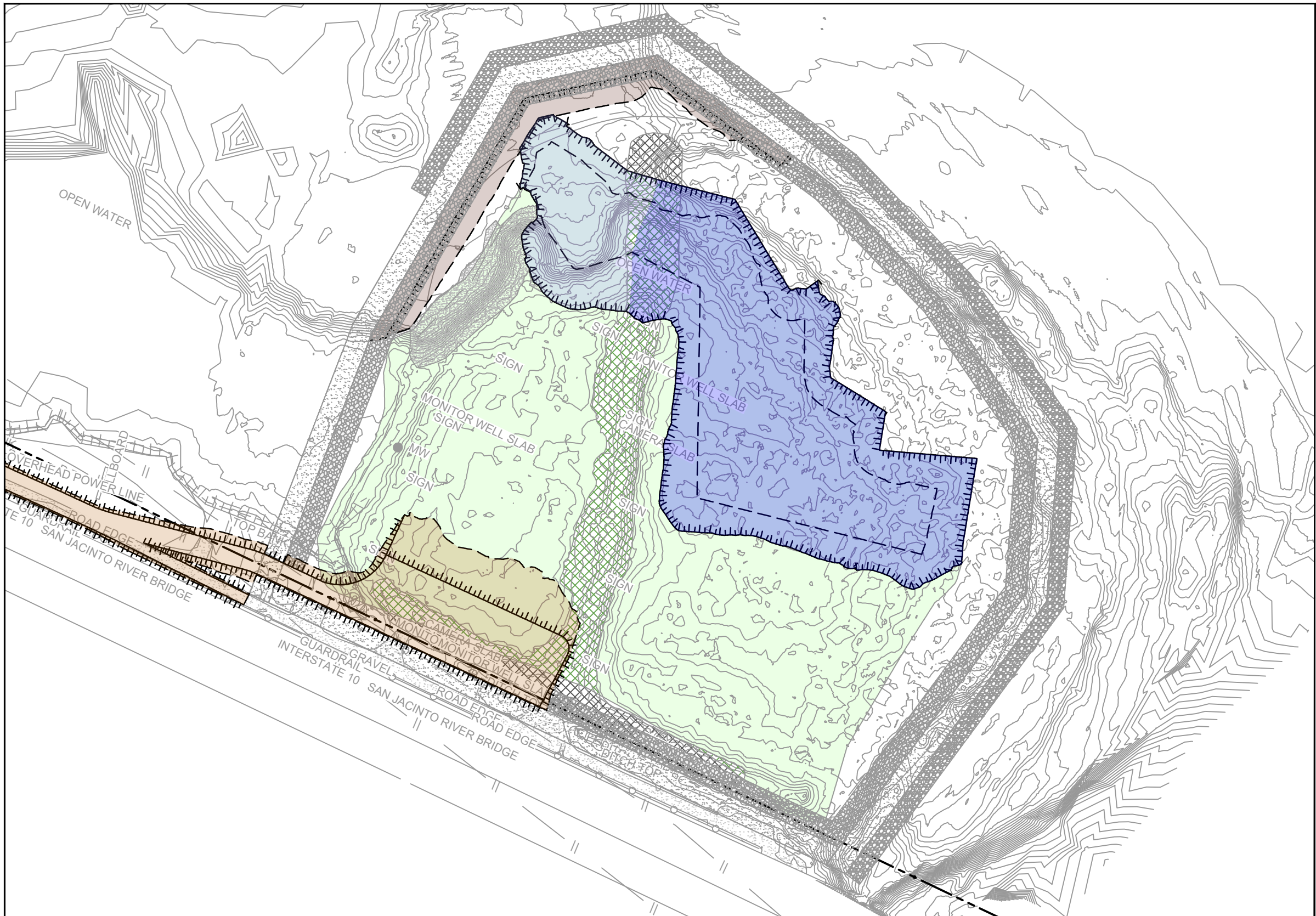
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YEAR 1 - BMP INSTALLATION AND SITE PREPARATION



YEAR 2 - EXCAVATION SEASON 1



YEAR 3 - EXCAVATION SEASON 2



YEAR 4 - EXCAVATION SEASON 3

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

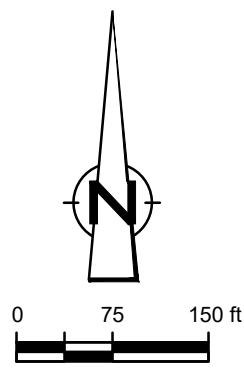
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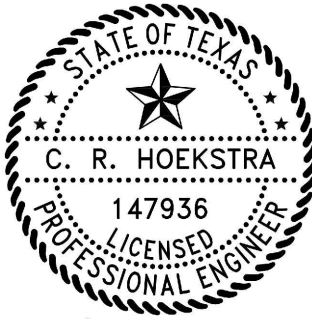
JOB NO. 11215702FILE NO. 001

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

Client
SAN JACINTO RIVER WASTE PITS

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

4	100% EPA SUBMITTAL	MW	CRH	07/17/2024
No.	Issue	Drawn	Approved	Date
Drawn	MW	Designer	RH	
Drafting	JC	Design	LL	
Check		Check		
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Arch D		0 1"		

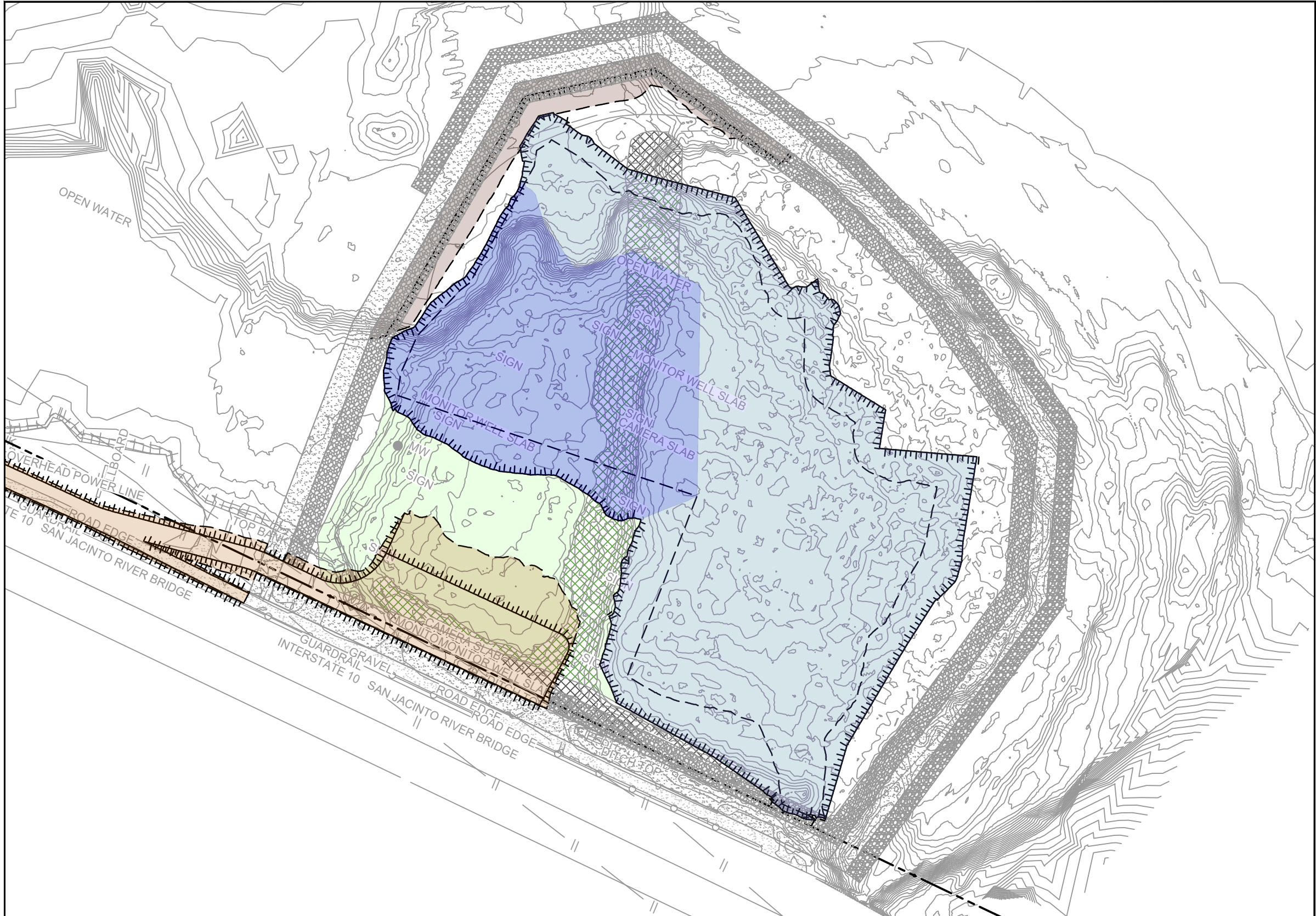
Project No. 11215702
Title

CONSTRUCTION SEQUENCING
1 OF 2

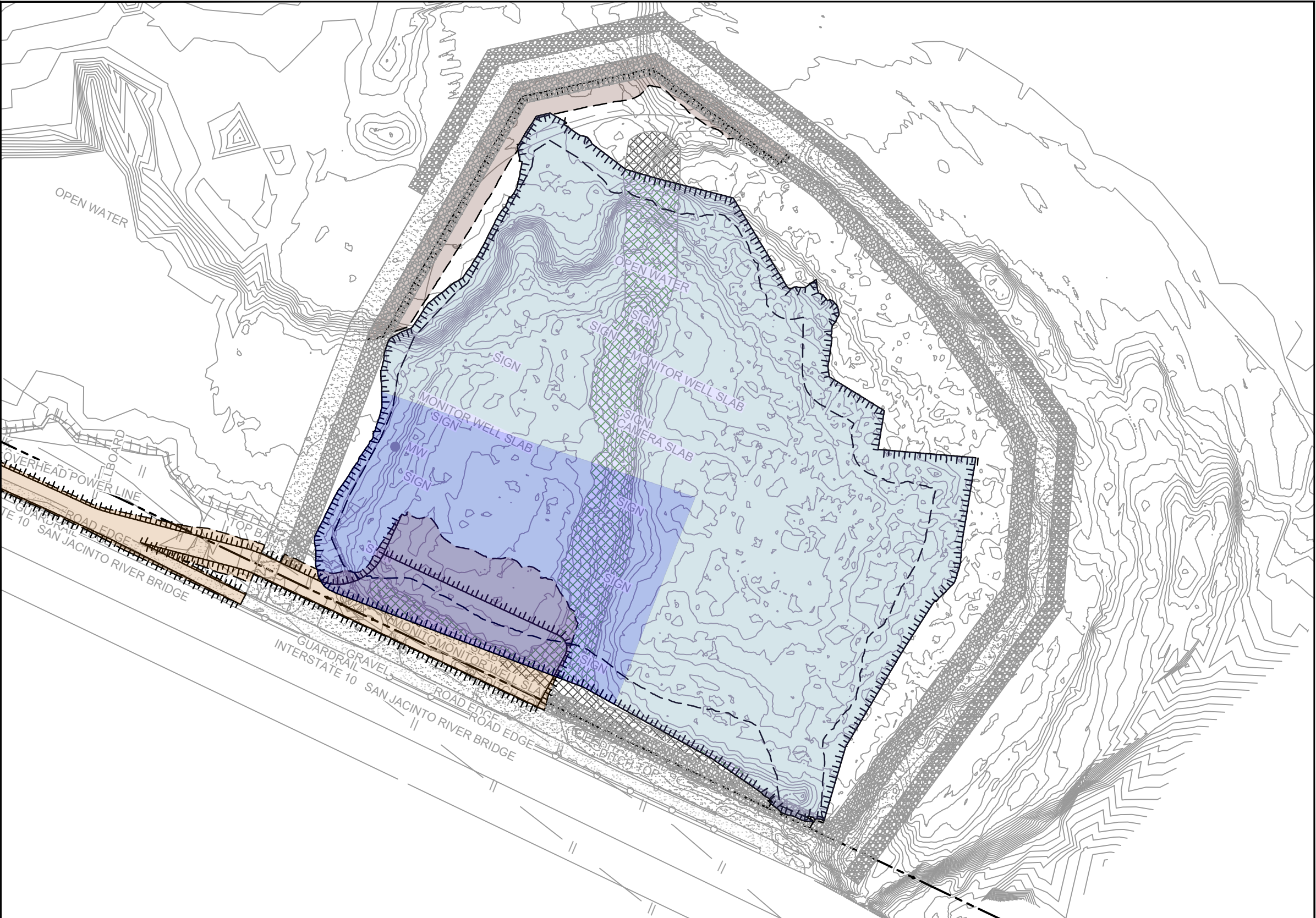
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C-23

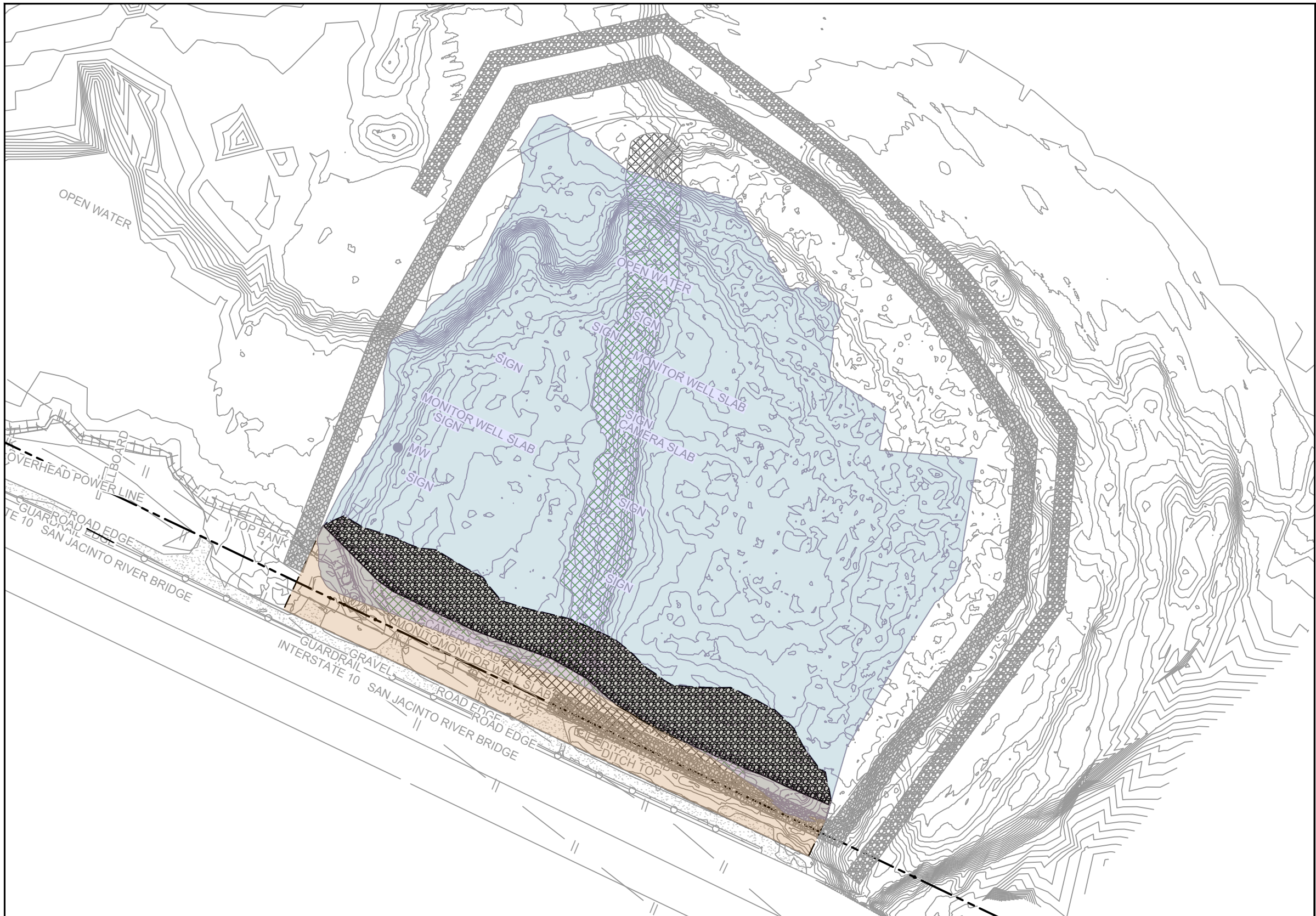
Sheet - of -



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 PITS, HARRIS COUNTY, TEXAS, MORRISON SURVEYING INC., 190608, JULY 8, 2019 TO AUGUST 2, 2019
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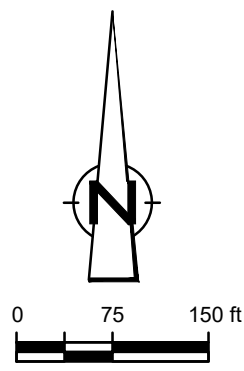
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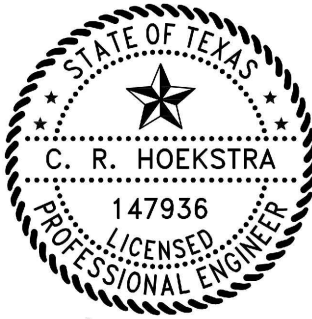
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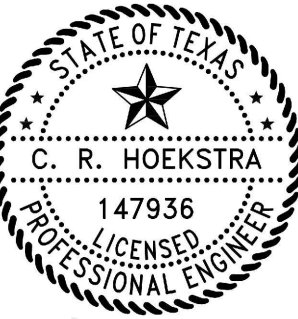
LEGEND	
---	TXDOT RIGHT OF WAY
---	TORA CAP PERIMETER
---	EXISTING CONTOUR INTERVAL
---	FENCELINE
---	SHORELINE
---	TOP OF BANK
---	TOE OF SLOPE
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---	BORING LOCATION
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---	FOR POTENTIAL TESTING AND REUSE
---	EXISTING BERM TO REMAIN
---	CONCRETE
---	GRAVEL
---	AZ26-700 PILE
---	AZ36-700 PILE
---	AZ42-700 PILE
---	PHASE OF EXCAVATION
---	PLANNED IMPROVEMENTS FOR
---	NORTHERN IMPOUNDMENT ACCESS
---	RESTORED AREA
---	INCLUDING TOPSOIL PLACEMENT
---	AND SEEDING TO RIVER LEVEL
---	RAISED BENCH
---	EXTERIOR SCOUR PROTECTION
---	INTERIOR SCOUR PROTECTION

Client				
SAN JACINTO RIVER WASTE PITS				
Project				
NORTHERN IMPOUNDMENT FINAL 100% REMEDIAL DESIGN HARRIS COUNTY, TEXAS				
4	100% EPA SUBMITTAL	MW	CRH	07/17/2024
No.	Issue	Drawn	Approved	Date
Drawn	MW	Designer	RH	
Drafting Check	JC	Design Check	LL	
Project Coordinator	CM	Date	Jul 16, 2024	
		Scale	1" = 150'	
Original Size	Arch D			
	Bar is one inch on original size drawing			

Project No.	11215702
Title	CONSTRUCTION SEQUENCING 2 OF 2
Sheet No.	C-24
Sheet - of -	



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Client
**SAN JACINTO RIVER
WASTE PITS**

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

5	100% EPA SUBMITTAL	MW	CRH	07/17/2024
No.	Issue	Drawn	Approved	Date
Drawn	MW	Designer	RH	
Drafting Check	JC	Design Check	LL	
Project Coordinator	CM	Date	Jul 16, 2024	
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

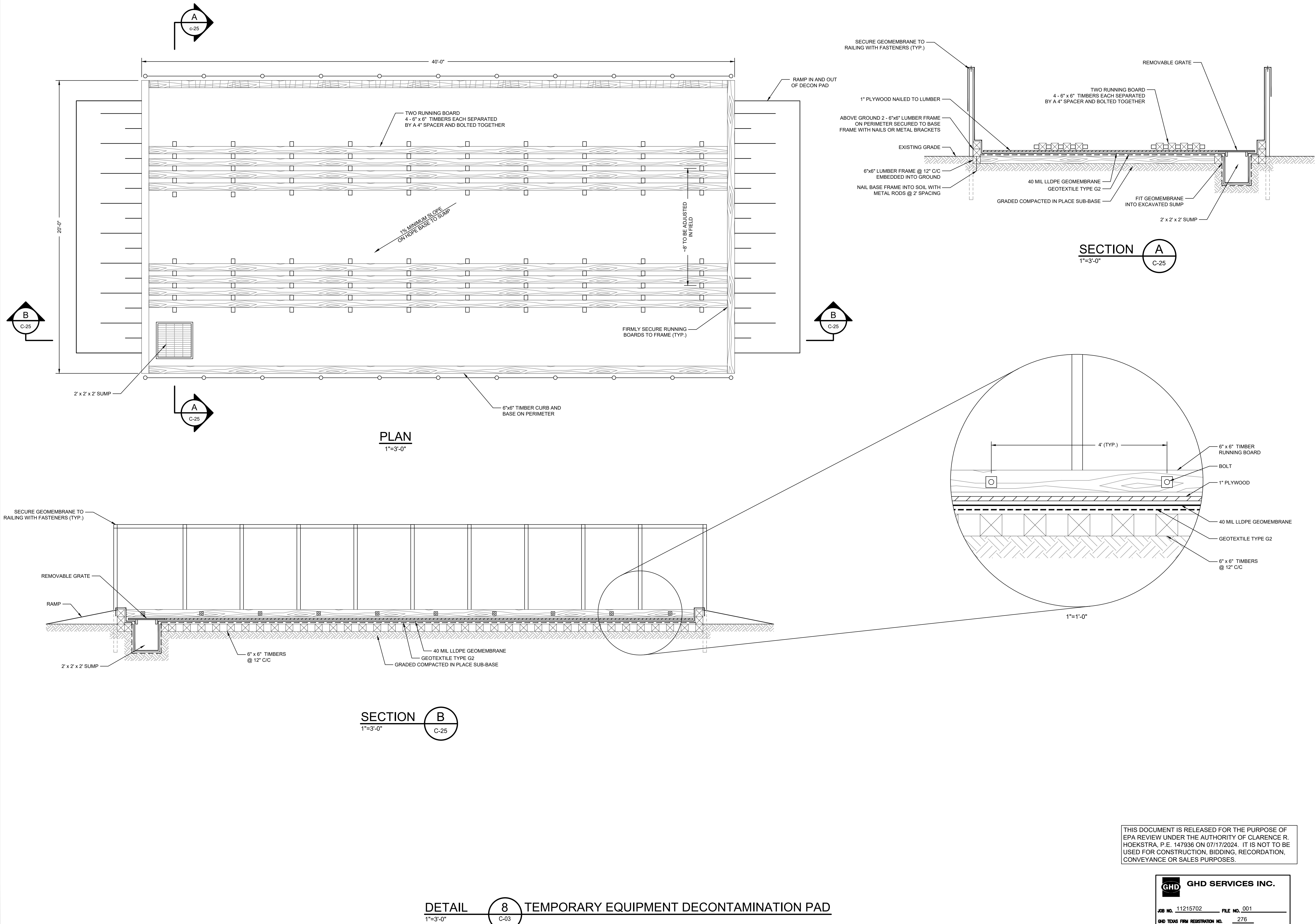
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**TYPICAL DETAILS
1 OF 3**

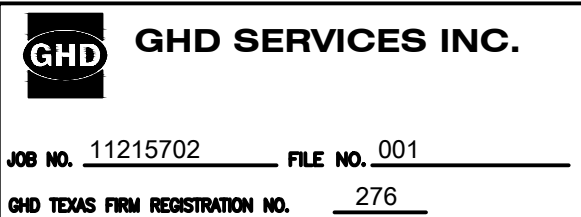
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C-25

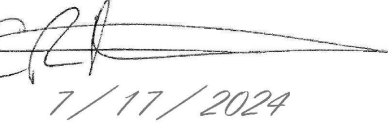
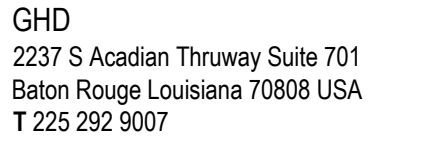
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SAN JACINTO RIVER WASTE PITS

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

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

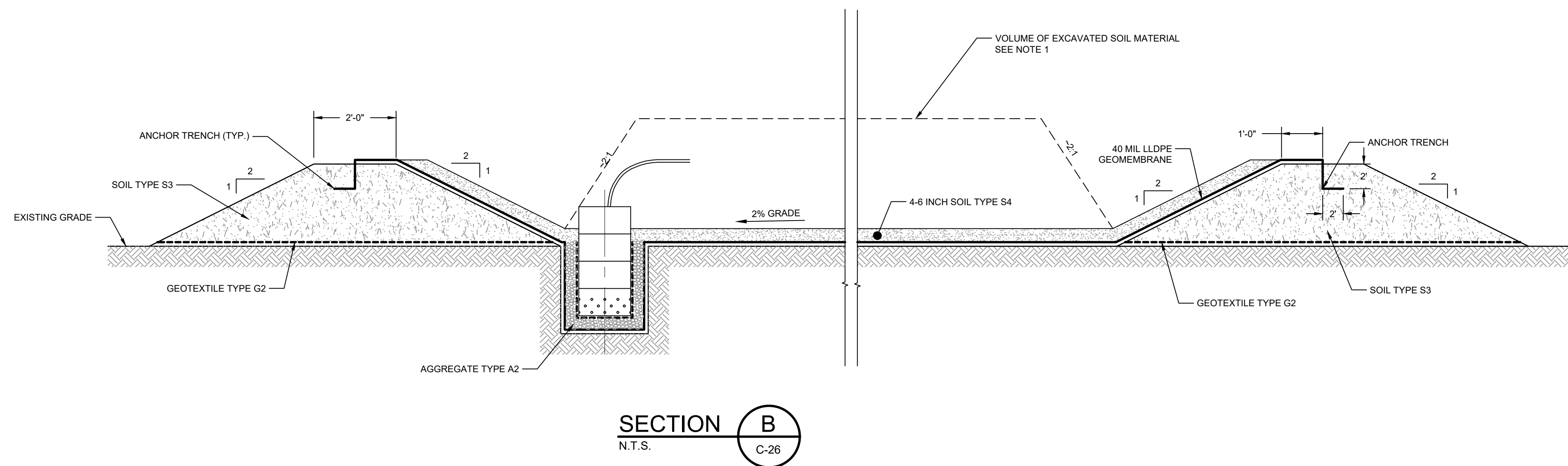
TYPICAL DETAILS
2 OF 3

C-26

Sheet - of -

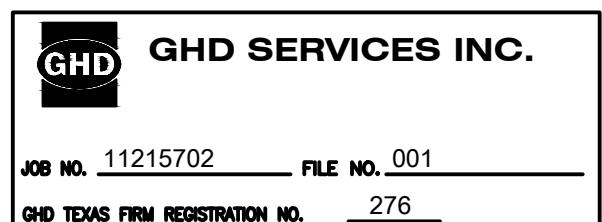


1. TYPICAL DETAILS SHOWN AT DEWATERING AND SOLIDIFICATION AREA MAY BE REVISED BY THE CONTRACTOR. CONTRACTOR'S REVISED DETAILS SHALL BE SUBMITTED FOR REVIEW PRIOR TO CONSTRUCTION.

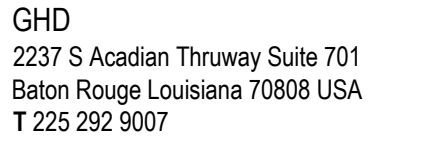


DETAIL 9 TEMPORARY DEWATERING FACILITY
N.T.S. C-03

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

N.T.S.



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Client

SAN JACINTO RIVER WASTE PITS

Project

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

4	100% EPA SUBMITTAL	MW	CBH	07/17/2024
---	--------------------	----	-----	------------

Drawn	MW	Designer	RH
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Design	

Scale **AS SHOWN**

Project No. 11215702

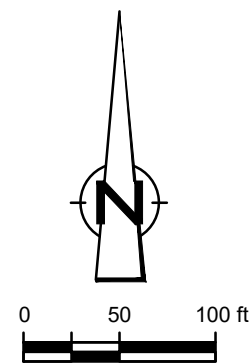
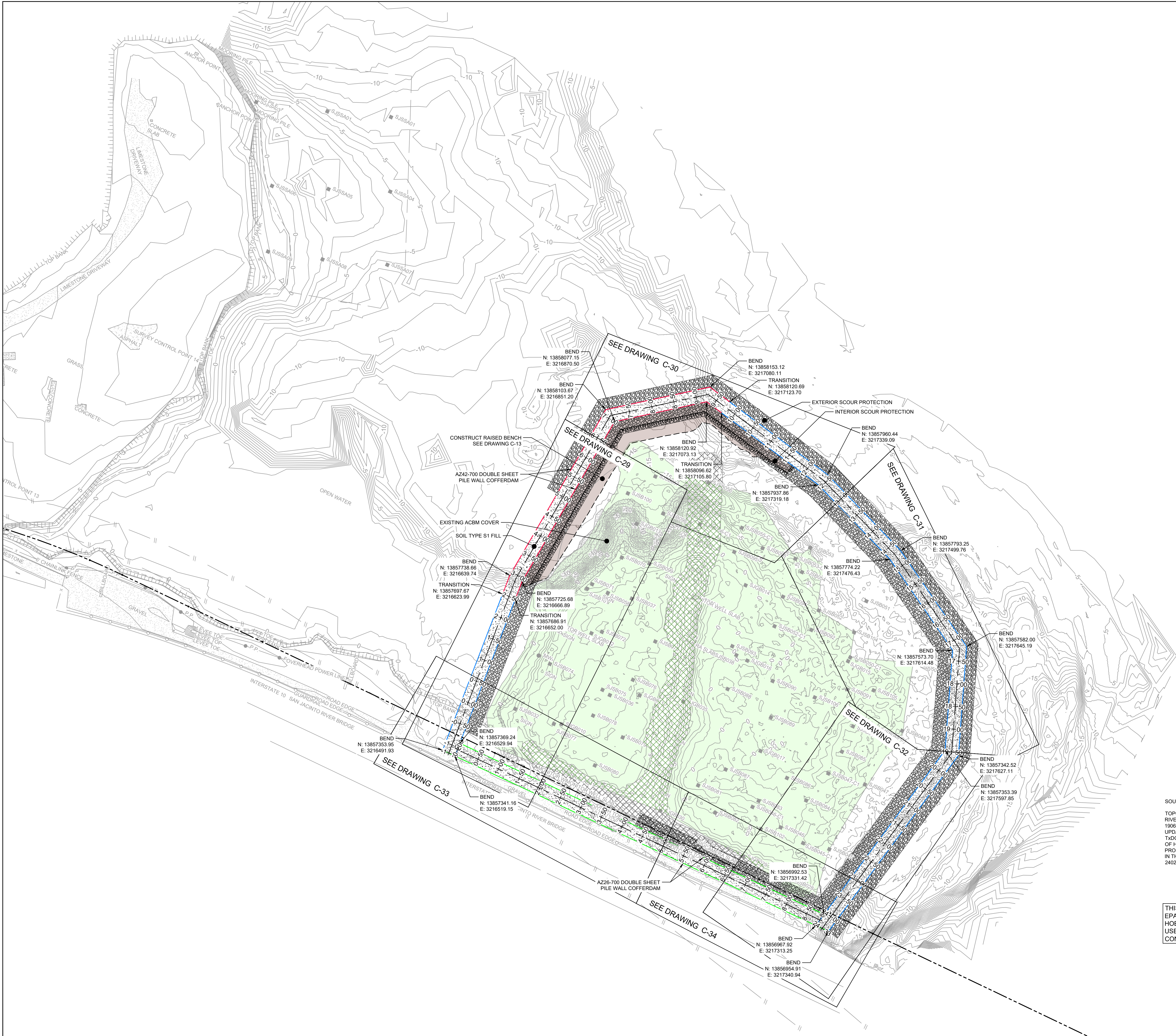
Title

TYPICAL DETAILS
3 OF 3

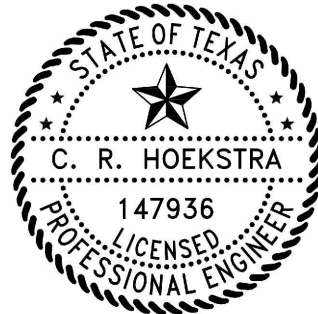
Sheet No. _____

C-27

et - of -



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7/17/2024

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

Client

**SAN JACINTO RIVER
WASTE PITS**

Project

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

6	100% EPA SUBMITTAL	MW	CRH	07/17/2024
---	--------------------	----	-----	------------

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

Drawn	MW	Designer	RH
-------	----	----------	----

Drafting	JC	Design	LL
Check		Check	

Project	CM	Date	Jul 16, 2024
Coordinator			

		Scale	1" = 100'
--	--	-------	-----------

Original Size	
---------------	--

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

Project No. 11215702

Title

**PILE WALL LAYOUT
PLAN**

Sheet No.

C-28

Sheet - of -

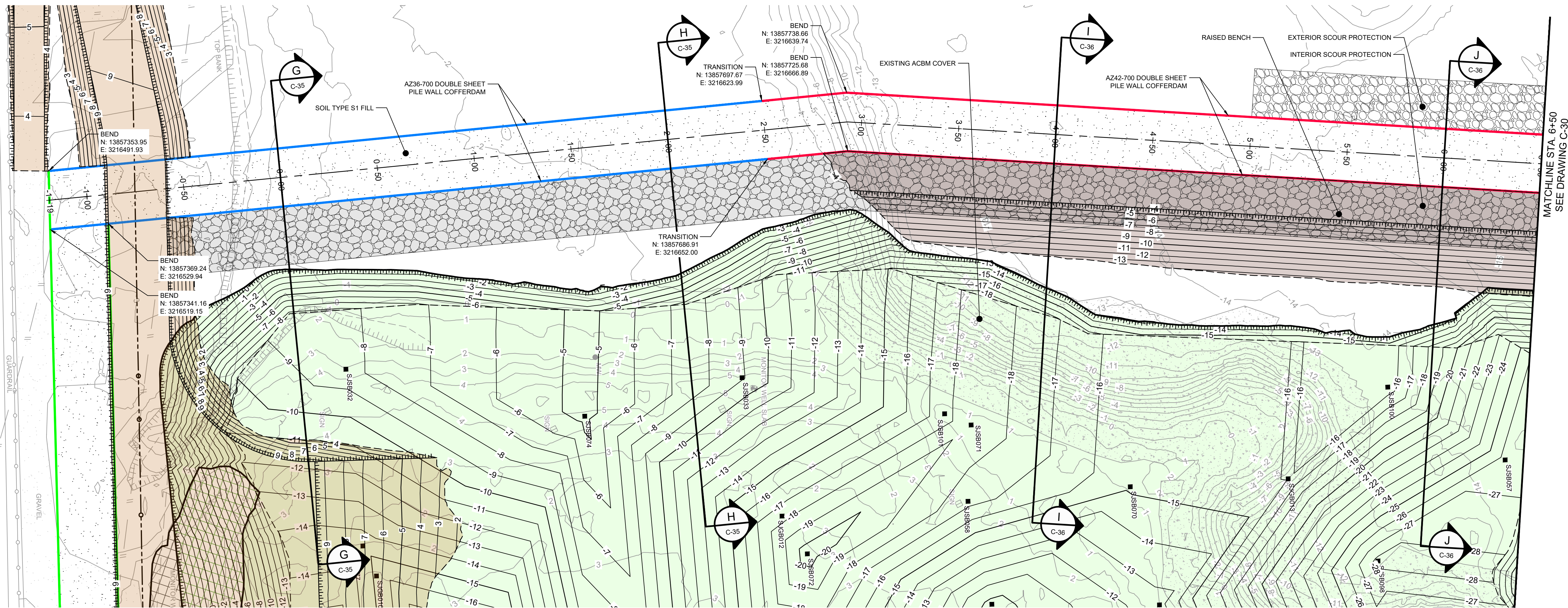
SOURCE:

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

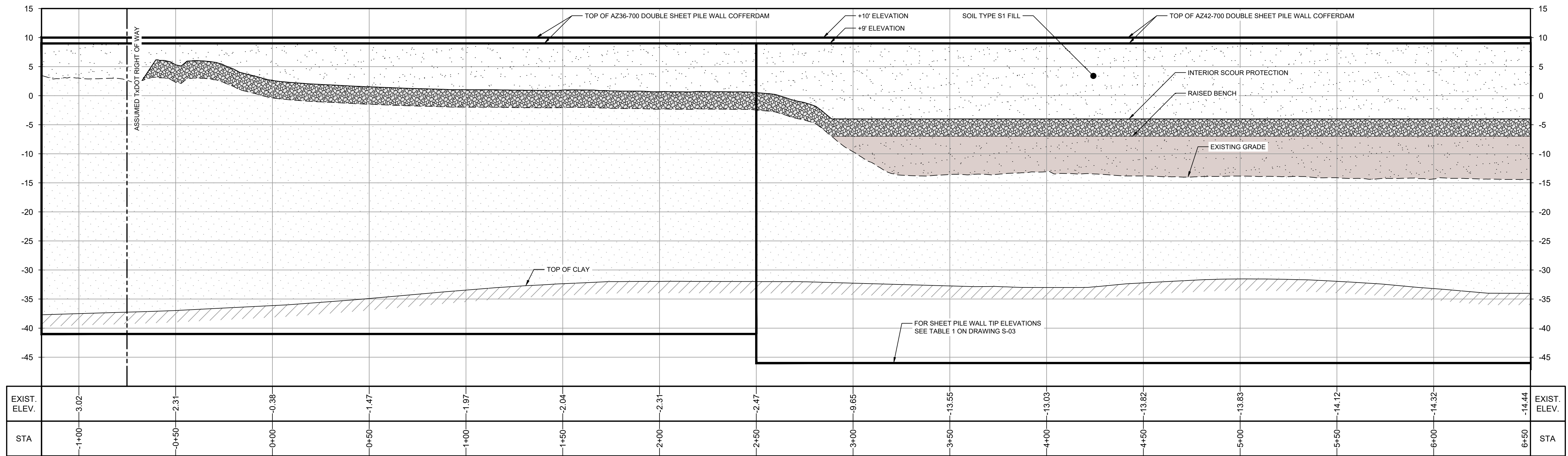
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PLAN
1" = 30'



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

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

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

Client
SAN JACINTO RIVER WASTE PITS

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

6	100% EPA SUBMITTAL	MW	CRH	07/17/2024
No.	Issue	Drawn	Approved	Date
Drawn	MW	Designer	RH	
Drafting Check	JC	Design Check	LL	
Project Coordinator	CM	Date	Jul 16, 2024	
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				

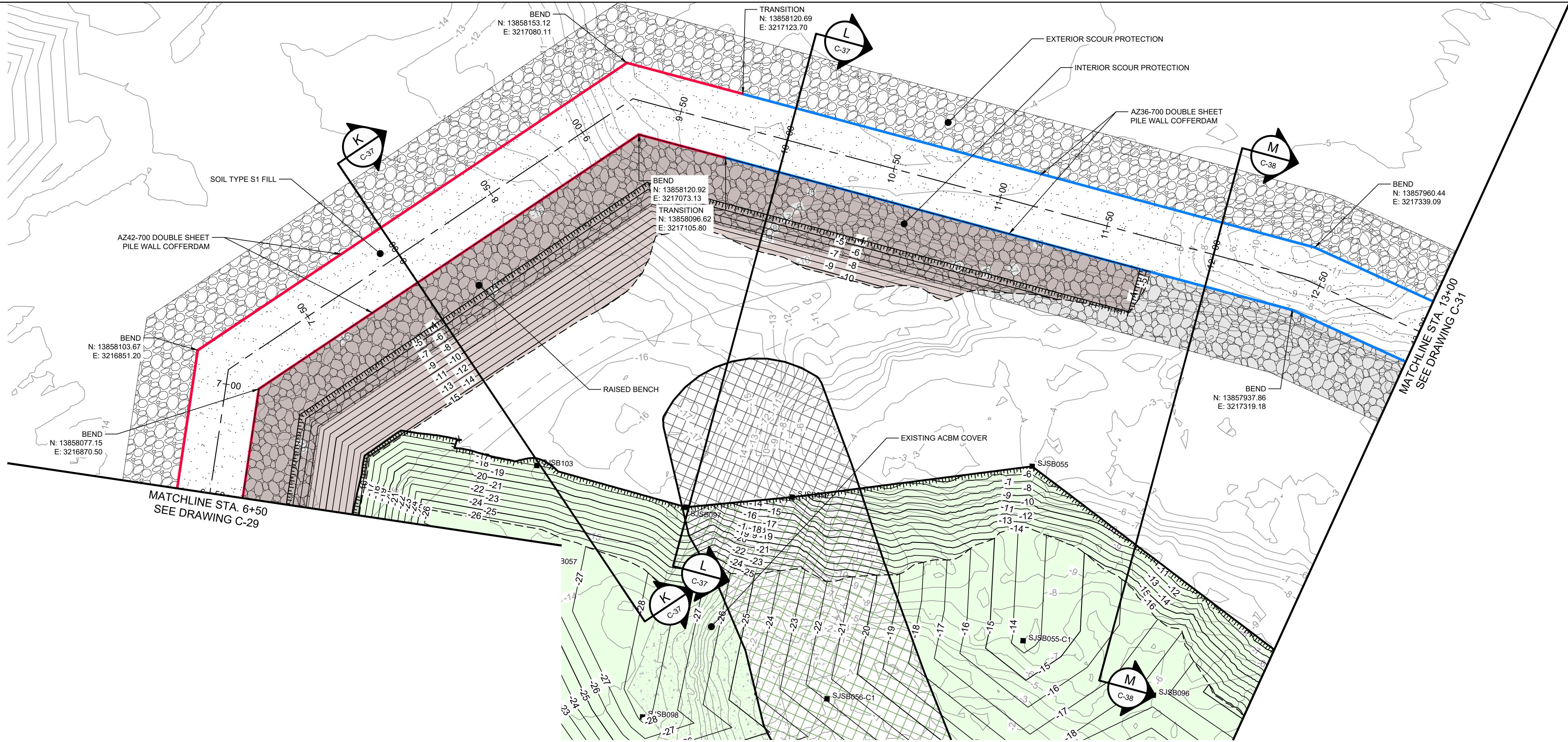
Project No. 11215702

Title
DOUBLE PILE WALL PLAN AND PROFILE 1 OF 4

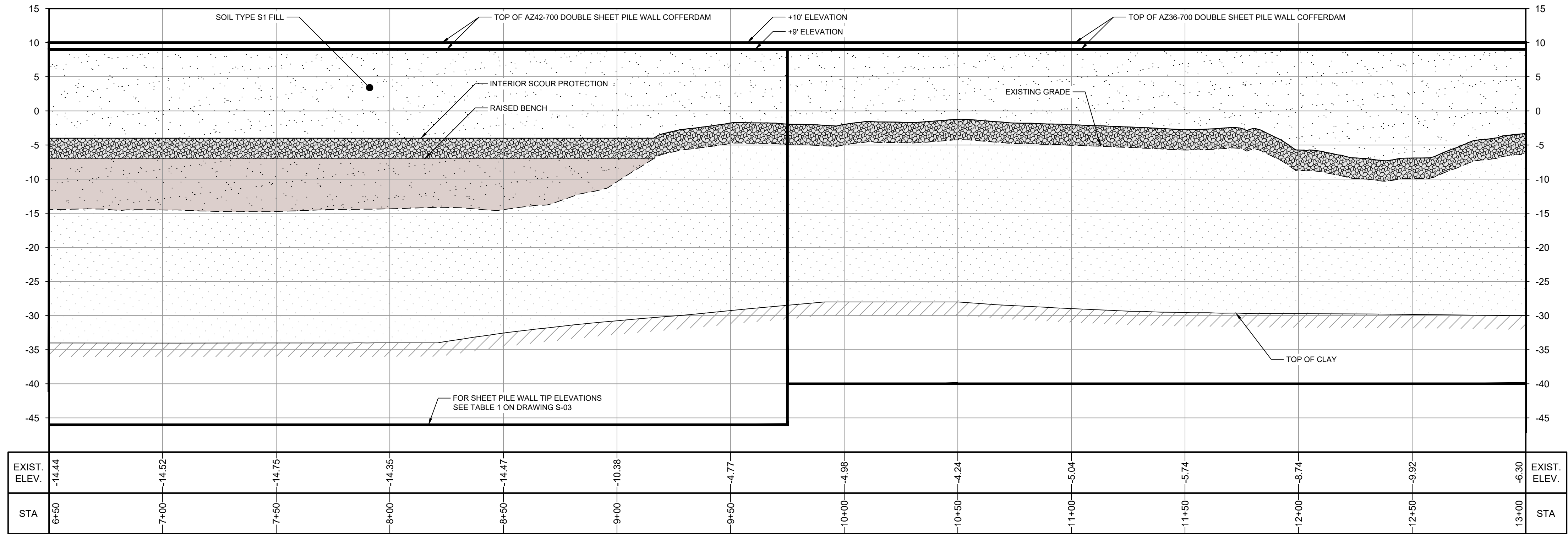
Sheet No.

C-29

Sheet - of -



PLAN
1" = 30'



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

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

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

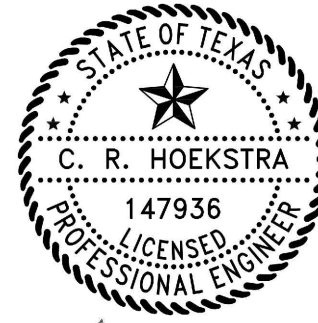
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JOB NO. 11215702 FILE NO. 001
GHD TEXAS FIRM REGISTRATION NO. 276

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

Client
**SAN JACINTO RIVER
WASTE PITS**

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

6	100% EPA SUBMITTAL	MW	CRH	07/17/2024
No.	Issue	Drawn	Approved	Date
Drawn	MW	Designer	RH	
Drafting Check	JC	Design Check	LL	
Project Coordinator	CM	Date	Jul 16, 2024	
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				

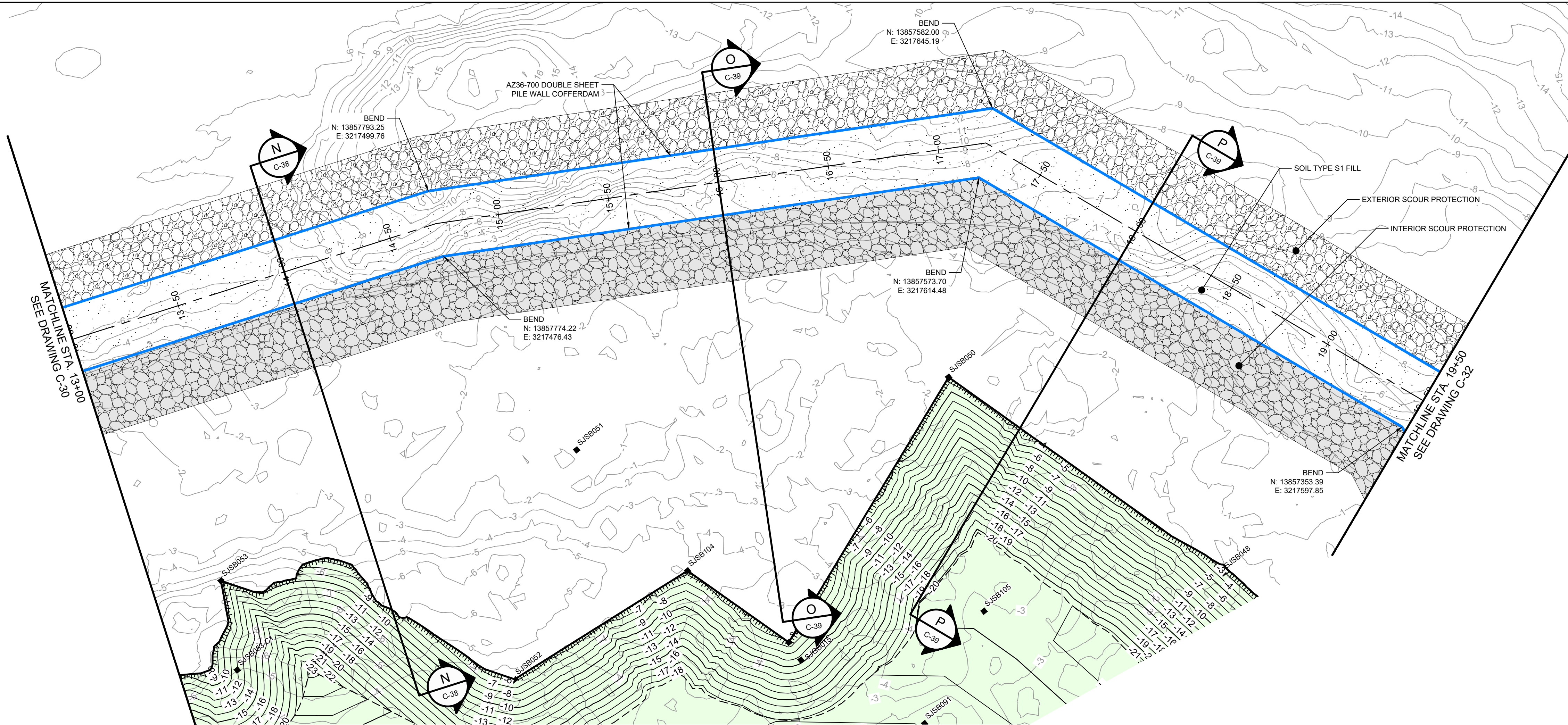
Project No. 11215702

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

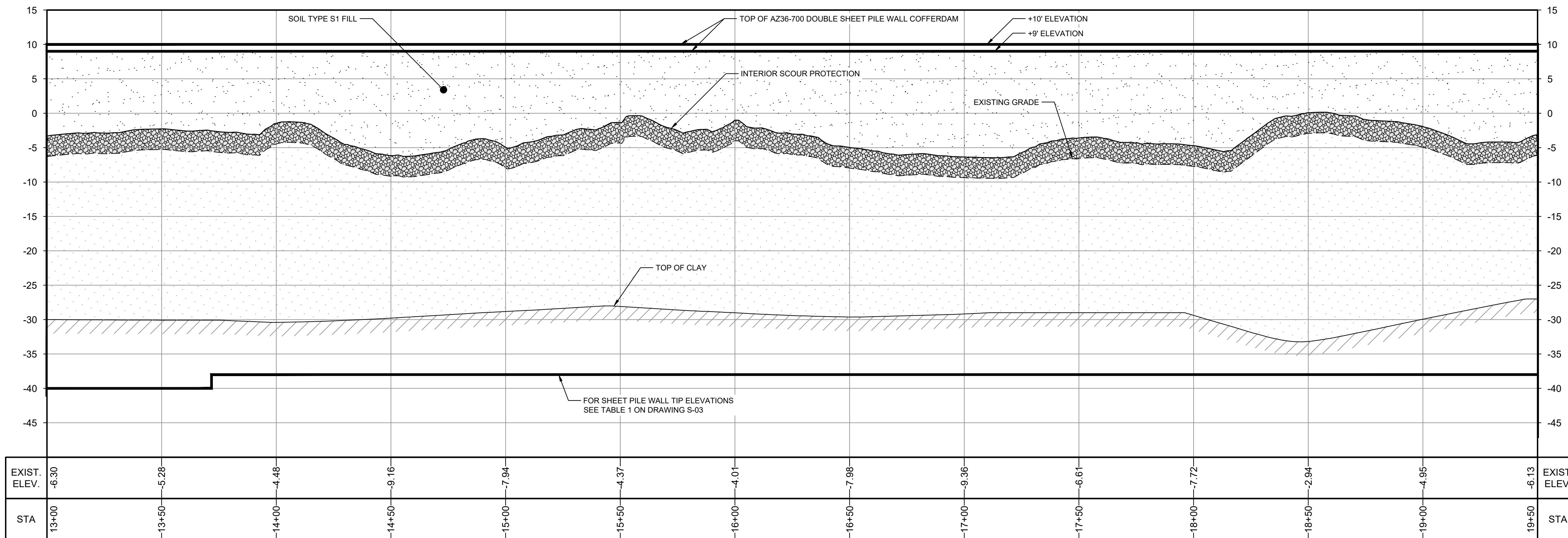
Sheet No.

C-30

Sheet - of -



PLAN
1" = 30'



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

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

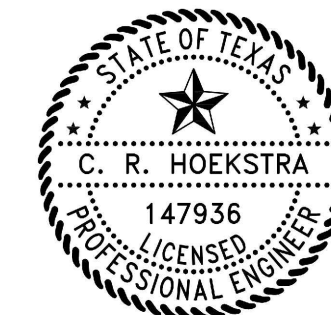
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---	SHORELINE
---	TOP OF BANK
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---	LIGHT POLE
---	WELL
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---	EXISTING BERM TO BE EXCAVATED
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---	CONCRETE
---	GRAVEL
---	AZ36-700 PILE
---	AZ36-700 PILE
---	AZ42-700 PILE
---	EXTERIOR SCOUR PROTECTION
---	INTERIOR SCOUR PROTECTION

Client
SAN JACINTO RIVER WASTE PITS

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

5	100% EPA SUBMITTAL	MW	CRH	07/17/2024
No.	Issue	Drawn	Approved	Date
Drawn	MW	Designer	RH	
Drafting Check	JC	Design Check	LL	
Project Coordinator	CM	Date	Jul 16, 2024	
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Original Size		Bar is one inch on original size drawing 0 1"		
Arch D				

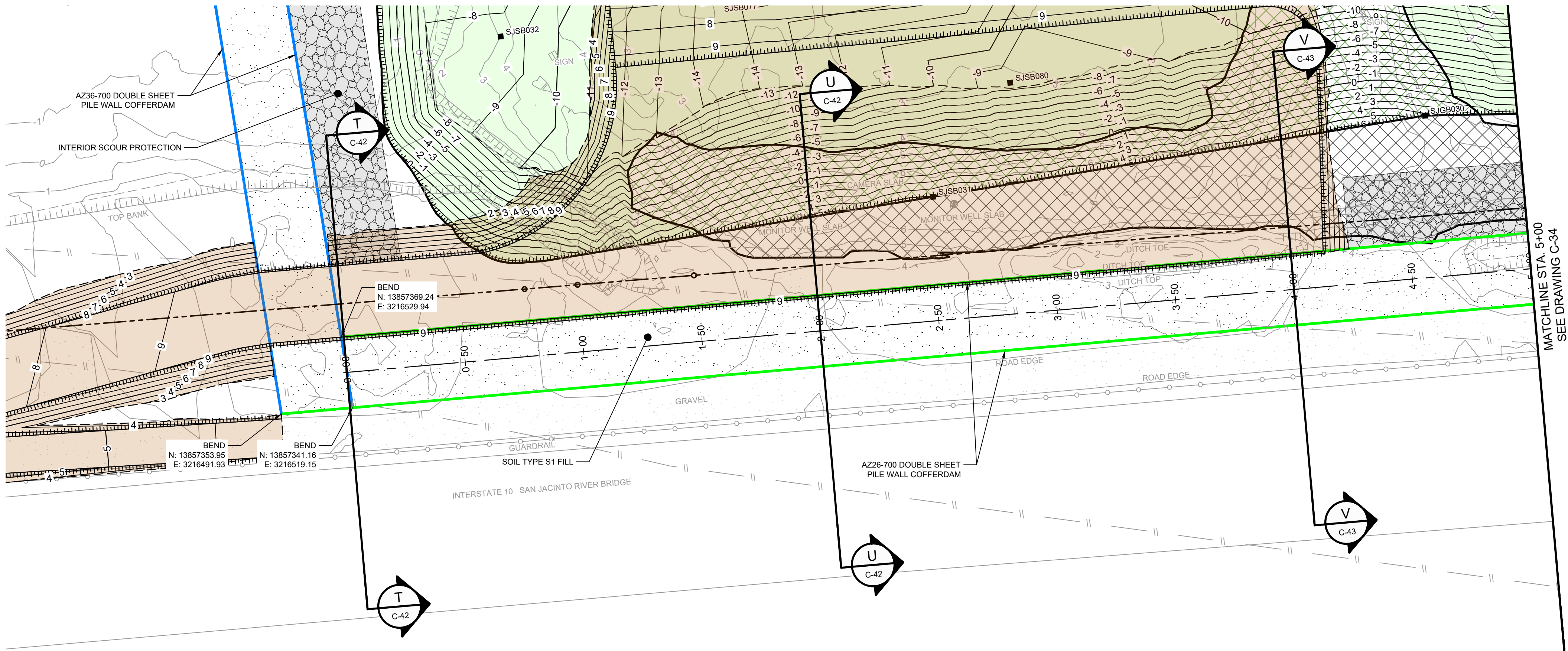
Project No. 11215702

Title
DOUBLE PILE WALL PLAN AND PROFILE 3 OF 4

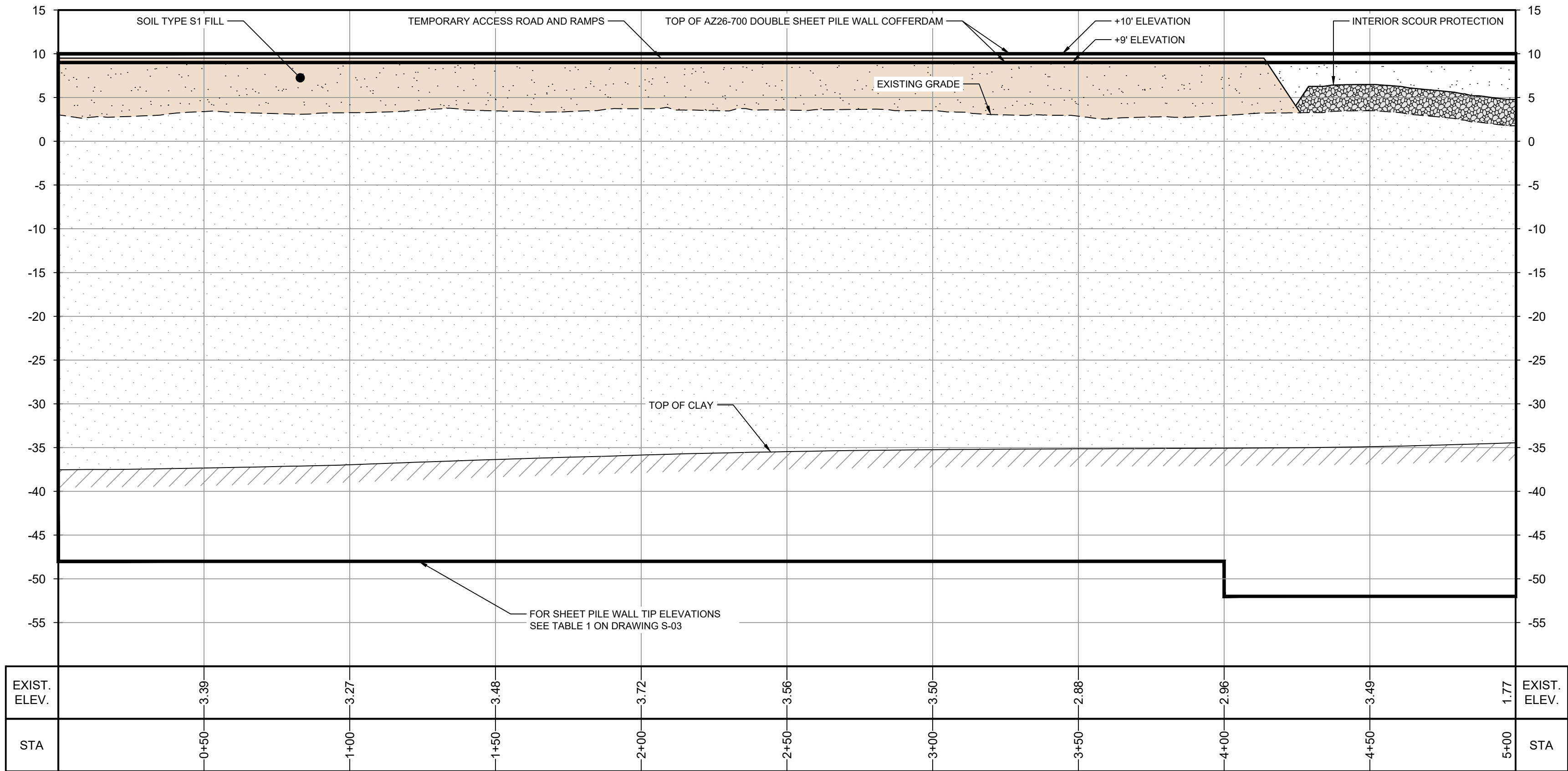
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Sheet - of -



PLAN
1" = 30'

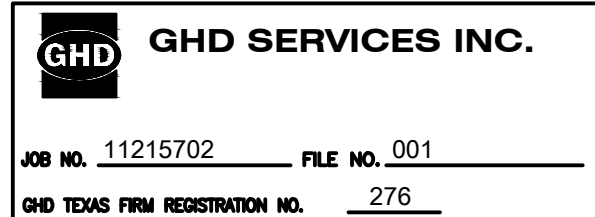


PROFILE
HORIZ: 1" = 30'
VERT: 1" = 10'

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LEGEND	
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---	NORTHERN IMPOUNDMENT ACCESS
---	INTERIOR SCOUR PROTECTION

Client
**SAN JACINTO RIVER
WASTE PITS**

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

5	100% EPA SUBMITTAL	MW	CRH	07/17/2024
No.	Issue	Drawn	Approved	Date
Drawn	MW	Designer	RH	
Drafting Check	JC	Design Check	LL	
Project Coordinator	CM	Date	Jul 16, 2024	
		Scale	AS SHOWN	
Original Size	Arch D Bar is one inch on original size drawing 0 1"			

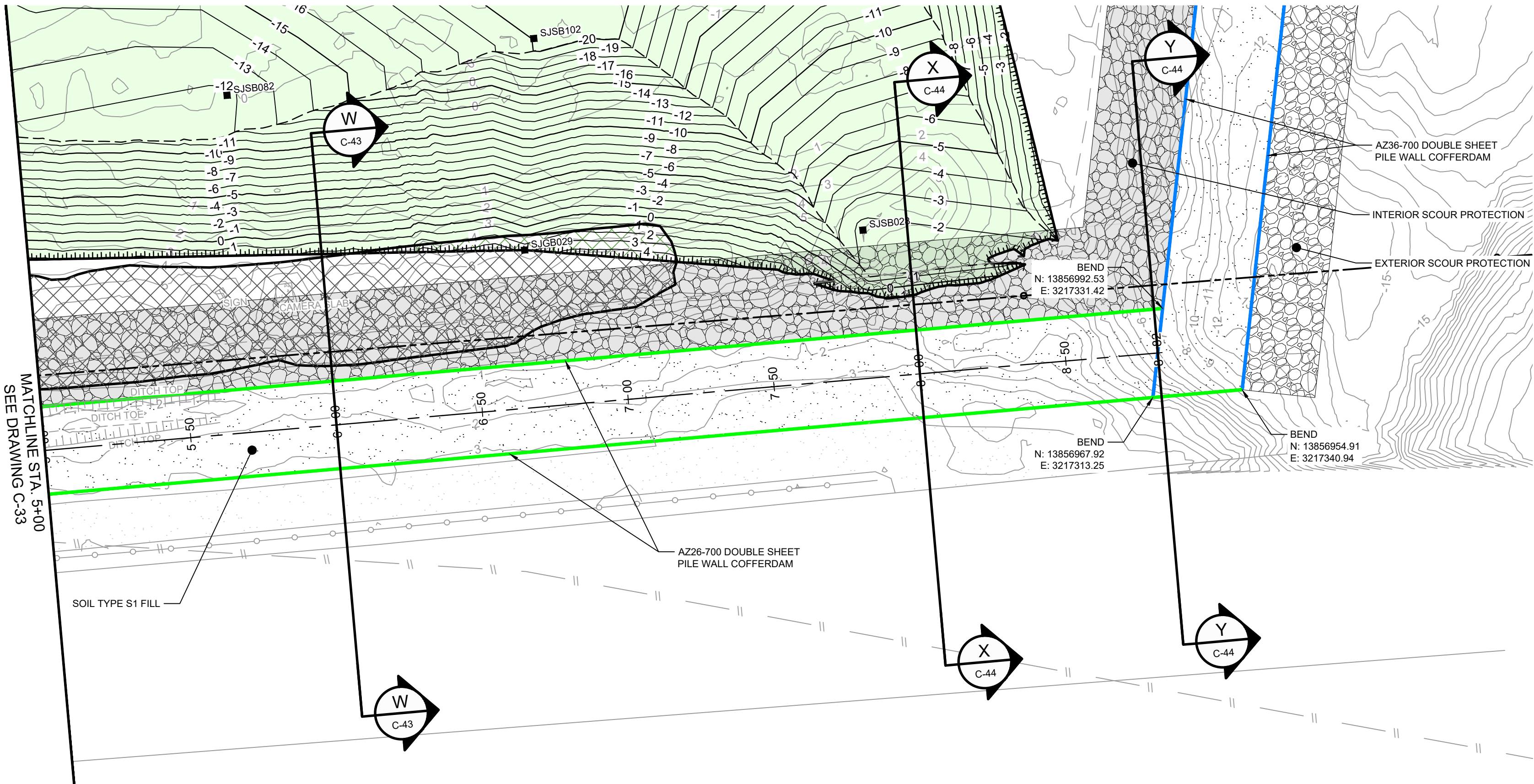
Project No. 11215702

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

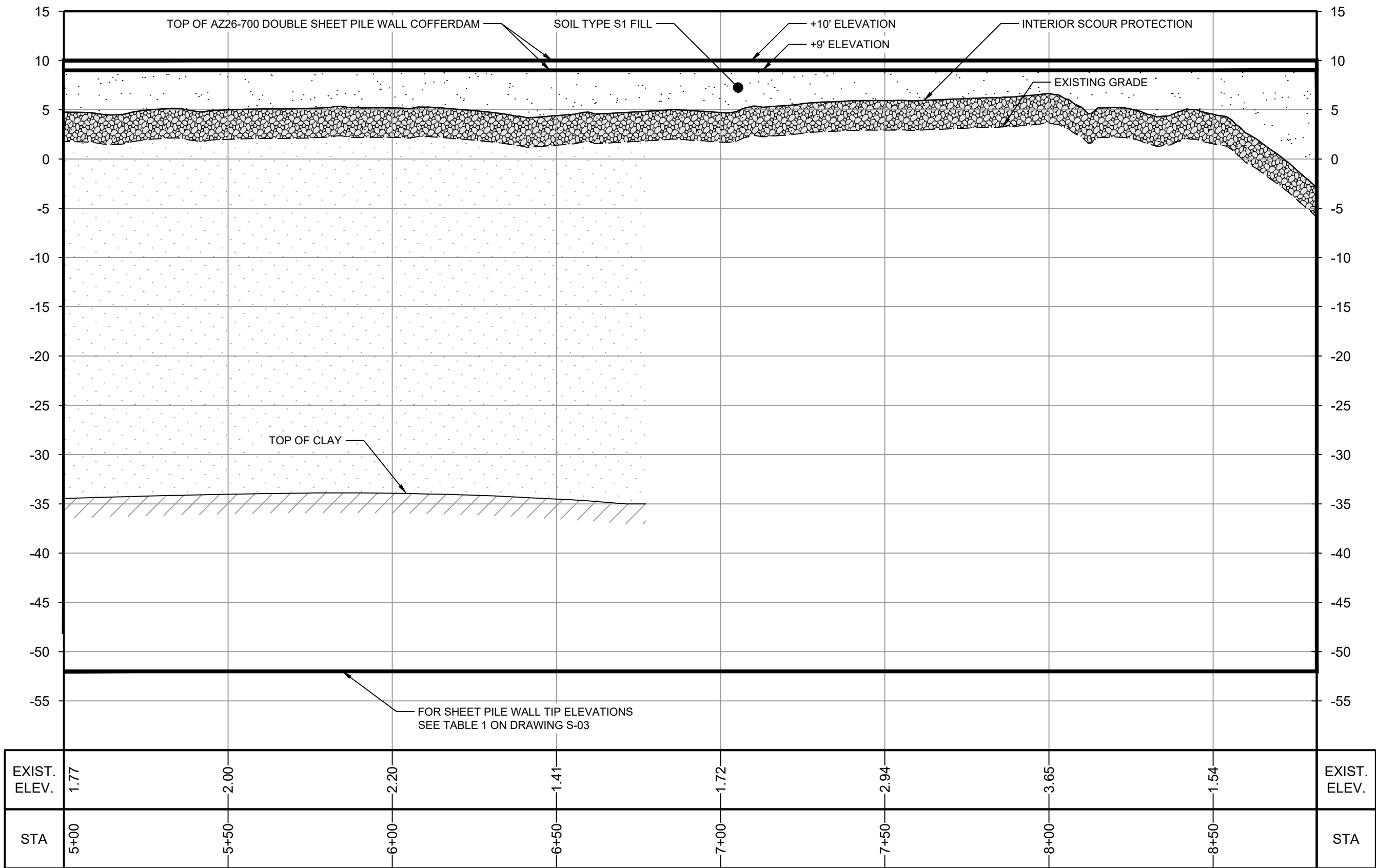
Sheet No.

C-33

Sheet - of -



PLAN
1" = 30'



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

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

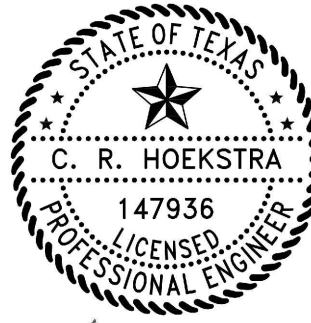
JOB NO. 11215702 FILE NO. 001

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X	FENCELINE
---	SHORELINE
---	TOP OF BANK
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---	AZ26-700 PILE
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---	PLANNED IMPROVEMENTS FOR
---	NORTHERN IMPOUNDMENT ACCESS
---	EXTERIOR SCOUR PROTECTION
---	INTERIOR SCOUR PROTECTION

Client
**SAN JACINTO RIVER
WASTE PITS**

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

5	100% EPA SUBMITTAL	MW	CRH	07/17/2024
No.	Issue	Drawn	Approved	Date
Drawn	MW	Designer	RH	
Drafting	JC	Design	LL	
Check		Check		
Project	CM	Date	Jul 16, 2024	
Coordinator		Scale	AS SHOWN	
Original Size	Arch D	Bar is one inch on original size drawing	0	1"

Project No. 11215702

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

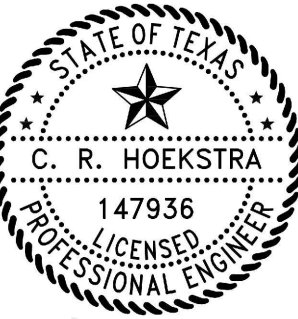
Sheet No.

C-34

Sheet - of -



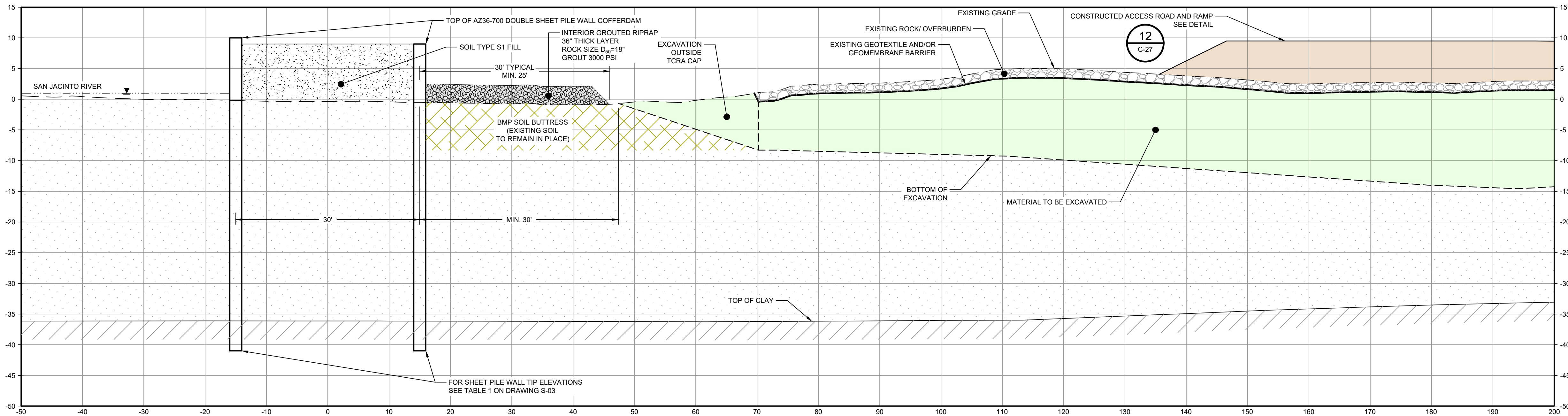
GHD
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Baton Rouge Louisiana 70808 USA
T 225 292 9007



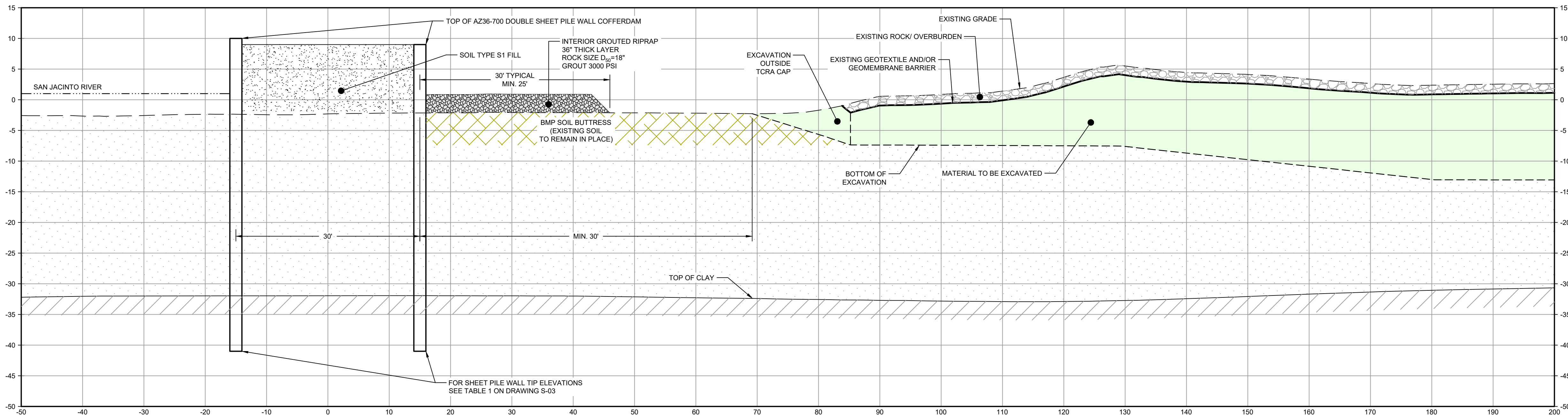
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LEGEND	
	MATERIAL TO BE EXCAVATED
	BMP SOIL BUTTRESS (EXISTING SOIL TO REMAIN IN PLACE)
	PLANNED IMPROVEMENTS FOR NORTHERN IMPOUNDMENT ACCESS
	INTERIOR SCOUR PROTECTION



SECTION **G** STA. 0+00.00
SCALE: 1"=10'



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

- NOTES:
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GHD SERVICES INC.

JOB NO. 11215702 FILE NO. 001

GHD TEXAS FIRM REGISTRATION NO. 276

100% EPA SUBMITTAL

Client
**SAN JACINTO RIVER
WASTE PITS**

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

3	100% EPA SUBMITTAL	MW	CRH	07/17/2024
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No.	Issue	Drawn	Approved	Date
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Drawn	MW	Designer	RH
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Drafting Check	JC	Design Check	LL
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Project Coordinator	CM	Date	Jul 16, 2024
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Original Size	Arch D	Bar is one inch on original size drawing 0 1"
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Project No. 11215702

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

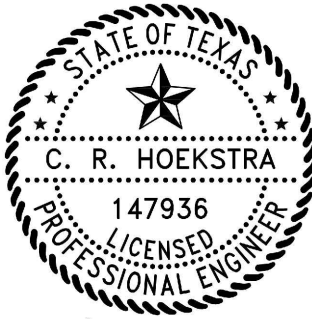
Sheet No.

C-35

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Baton Rouge Louisiana 70808 USA
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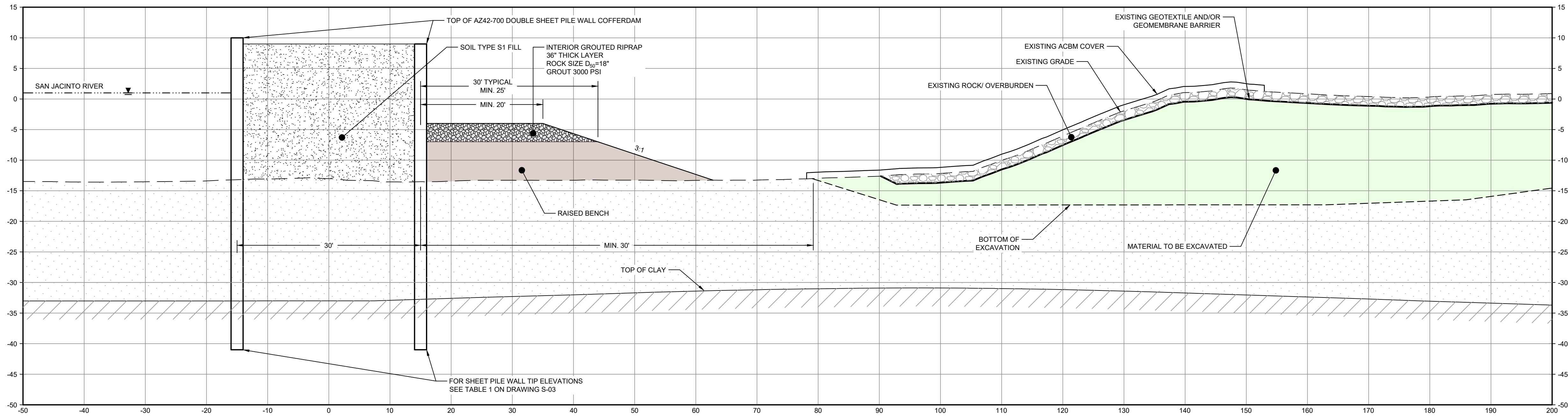


7/17/2024

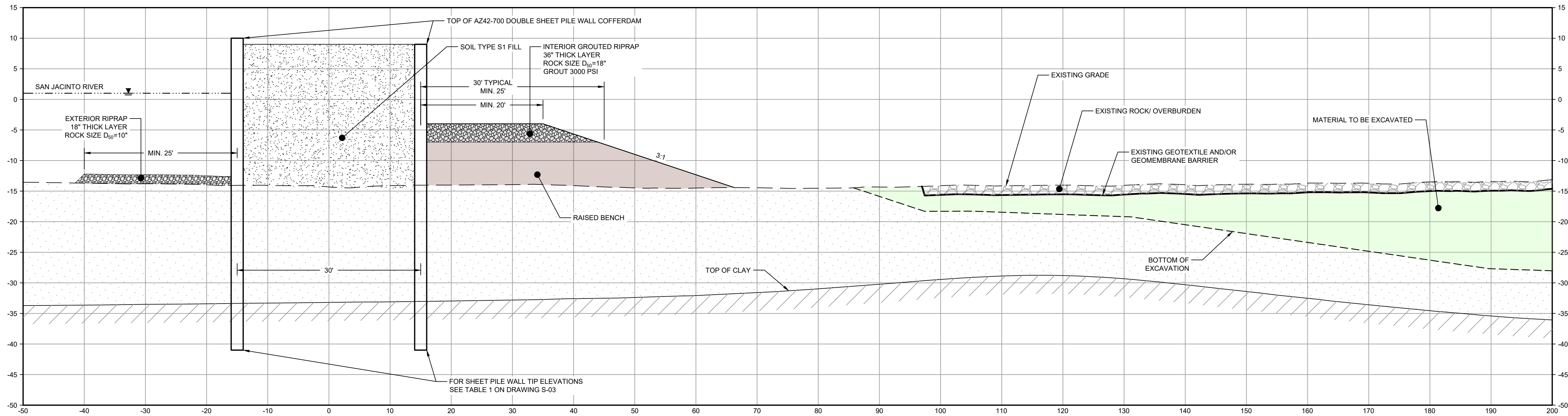
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LEGEND

	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



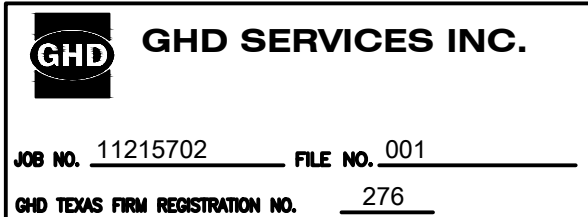
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SCALE: 1"=10'
C-29



SECTION **J** STA. 6+00.00
SCALE: 1"=10'
C-29

- NOTES:
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100% EPA SUBMITTAL

Client
**SAN JACINTO RIVER
WASTE PITS**

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

4	100% EPA SUBMITTAL	MW	CRH	07/17/2024
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No.	Issue	Drawn	Approved	Date
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Drawn	MW	Designer	RH
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Drafting Check	JC	Design Check	LL
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Project Coordinator	CM	Date	Jul 16, 2024
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Original Size	Arch D	Bar is one inch on original size drawing 0 1"
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Project No. 11215702

Title

**DOUBLE PILE WALL SECTIONS
2 OF 7**

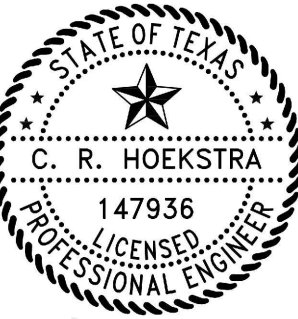
Sheet No.

C-36

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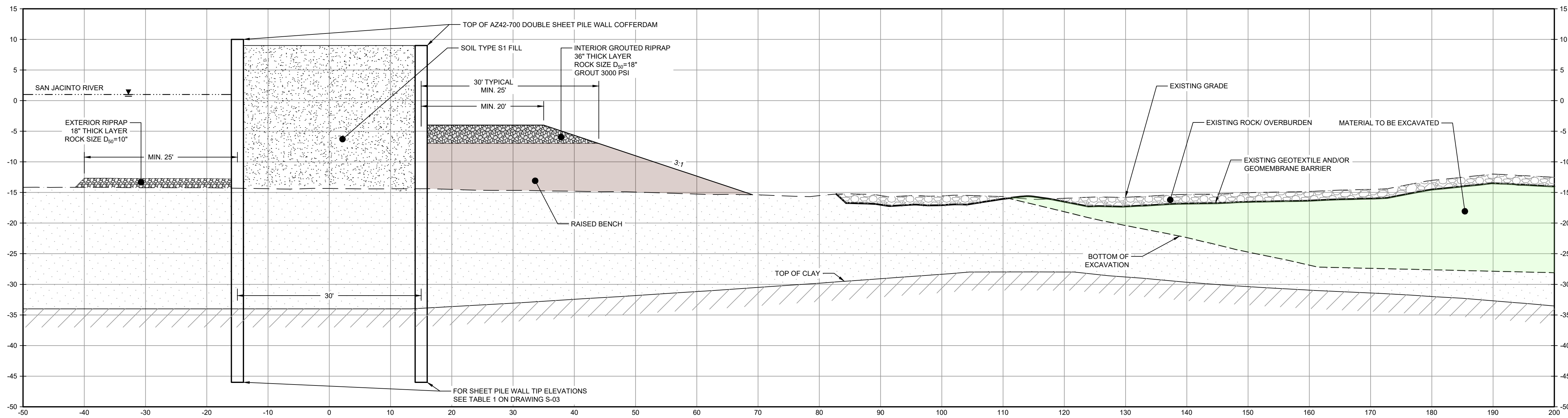
CRH
7/17/2024

Reuse of Documents

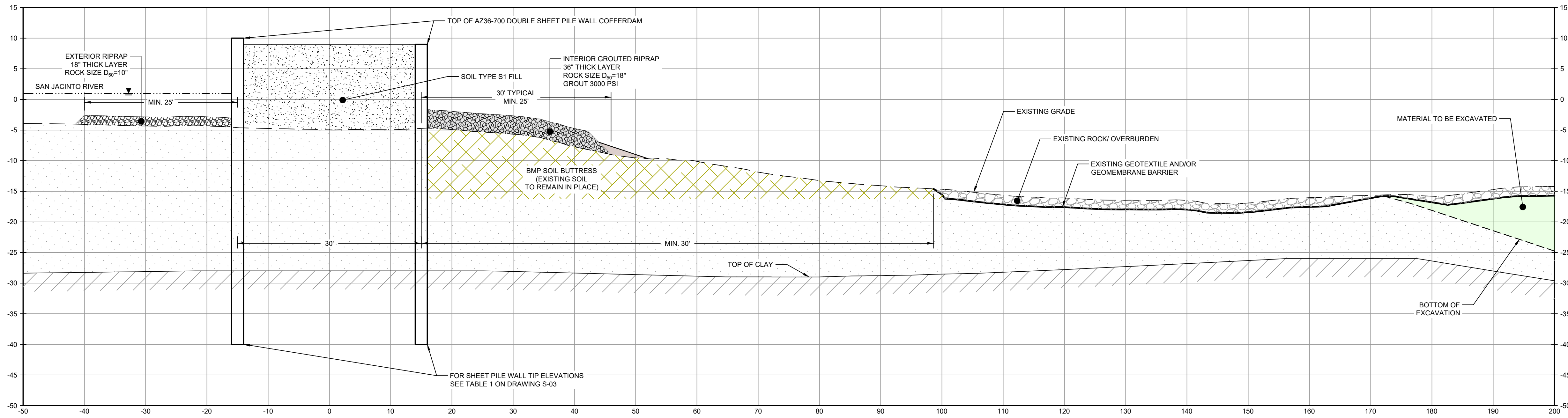
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LEGEND

	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

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

100% EPA SUBMITTAL

Client
**SAN JACINTO RIVER
WASTE PITS**

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

4 100% EPA SUBMITTAL MW CRH 07/17/2024

No.	Issue	Drawn	Approved	Date
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Drawn	MW	Designer	RH
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Drafting Check	JC	Design Check	LL
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Project Coordinator	CM	Date	Jul 16, 2024
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Original Size	Arch D	Bar is one inch on original size drawing 0 1"
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Project No. 11215702

Title

**DOUBLE PILE WALL SECTIONS
3 OF 7**

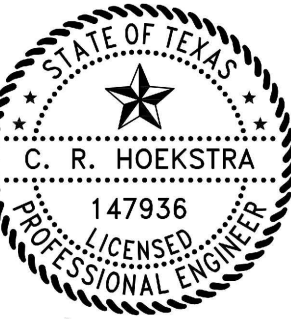
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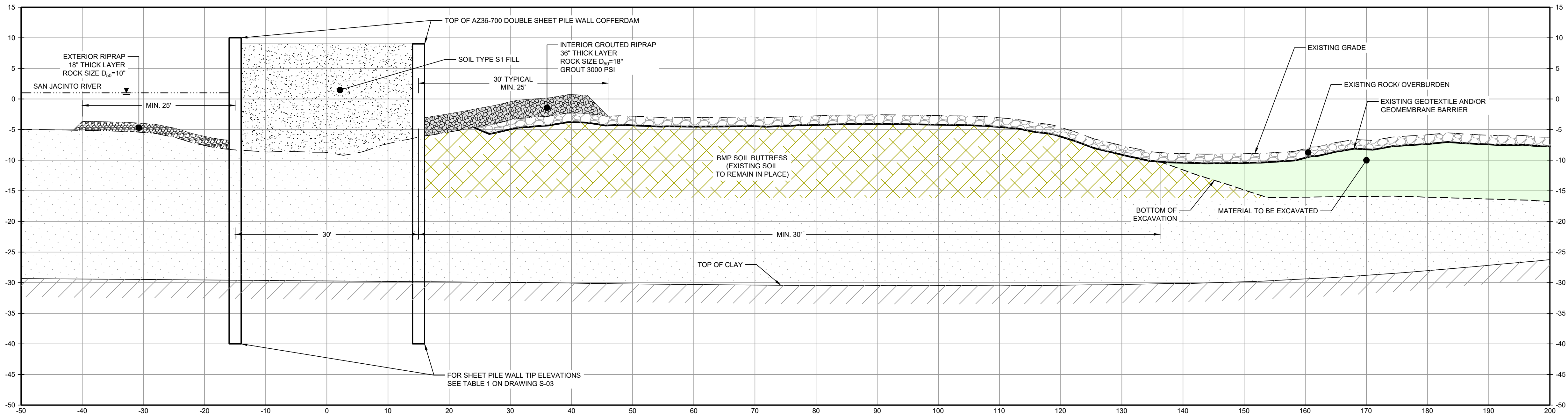
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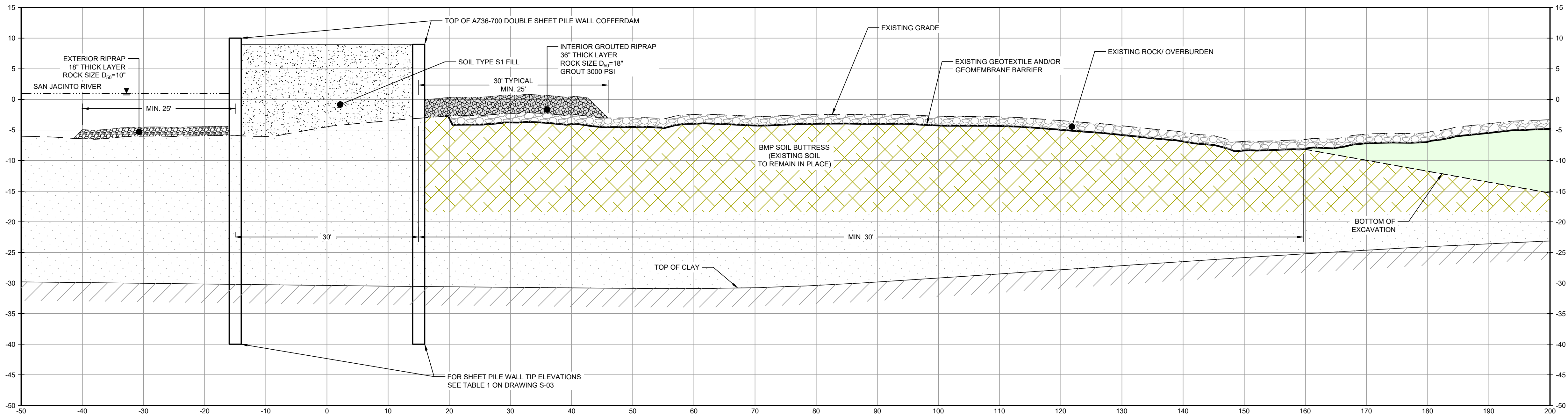
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LEGEND	
	MATERIAL TO BE EXCAVATED
	BMP SOIL BUTTRESS (EXISTING SOIL TO REMAIN IN PLACE)
	EXTERIOR SCOUR PROTECTION
	INTERIOR SCOUR PROTECTION



SECTION **M** STA. 12+00.00
SCALE: 1"=10'
C-30



SECTION **N** STA. 14+00.00
SCALE: 1"=10'
C-31

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GHD SERVICES INC.

JOB NO. 11215702 FILE NO. 001

GHD TEXAS FIRM REGISTRATION NO. 276

100% EPA SUBMITTAL

Client
**SAN JACINTO RIVER
WASTE PITS**

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

3	100% EPA SUBMITTAL	MW	CRH	07/17/2024
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No.	Issue	Drawn	Approved	Date
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Drawn	MW	Designer	RH
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Drafting Check	JC	Design Check	LL
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Project Coordinator	CM	Date	Jul 16, 2024
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Original Size	Arch D	Bar is one inch on original size drawing 0 1"
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Project No. 11215702

Title

**DOUBLE PILE WALL SECTIONS
4 OF 7**

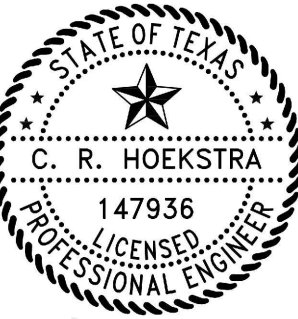
Sheet No.

C-38

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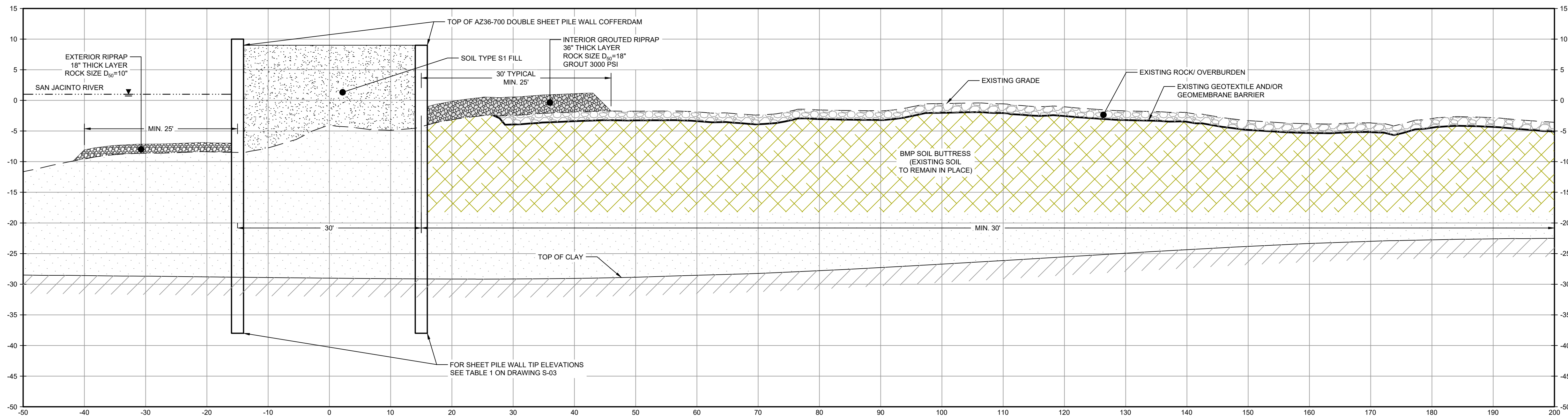
CRH
7/17/2024

Reuse of Documents

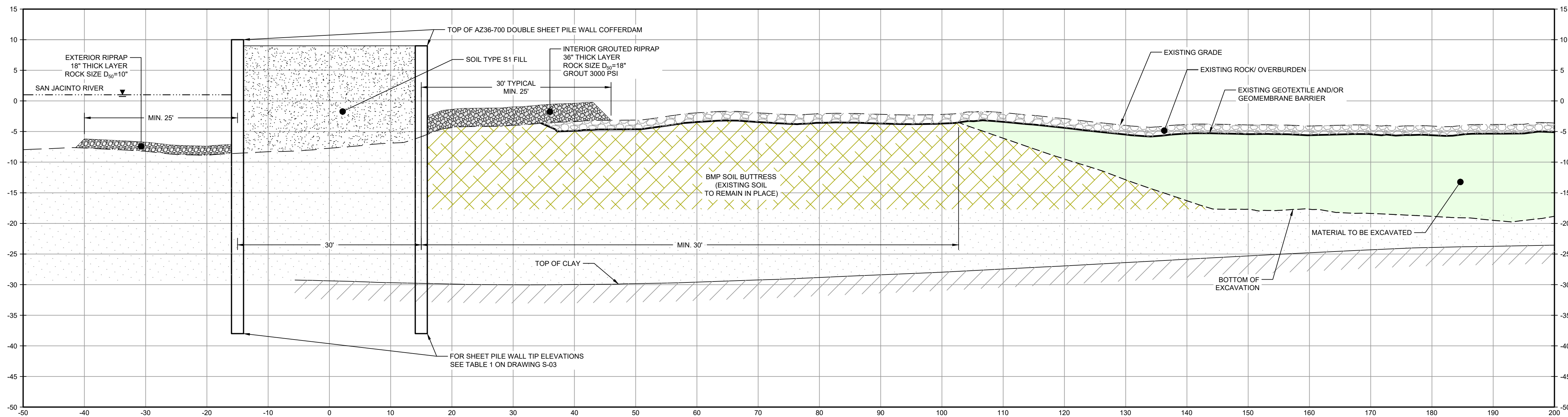
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LEGEND

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



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

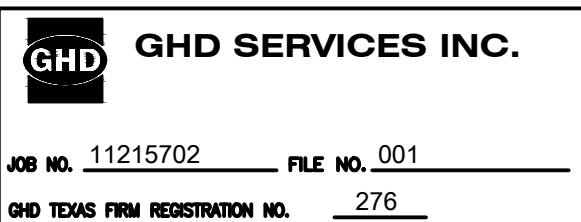


SECTION **P** STA. 18+00.00
SCALE: 1"=10'
C-31

NOTES:

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100% EPA SUBMITTAL

Client
**SAN JACINTO RIVER
WASTE PITS**

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

3 100% EPA SUBMITTAL MW CRH 07/17/2024

No.	Issue	Drawn	Approved	Date
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Drawn	MW	Designer	RH
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Drafting Check	JC	Design Check	LL
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Project Coordinator	CM	Date	Jul 16, 2024
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Original Size	Arch D	Bar is one inch on original size drawing 0 1"
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Project No. 11215702

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

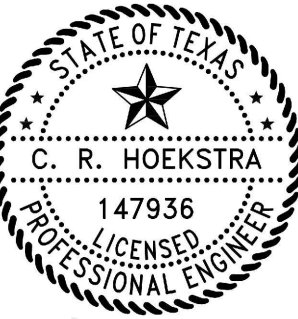
Sheet No.

C-39

Sheet - of -



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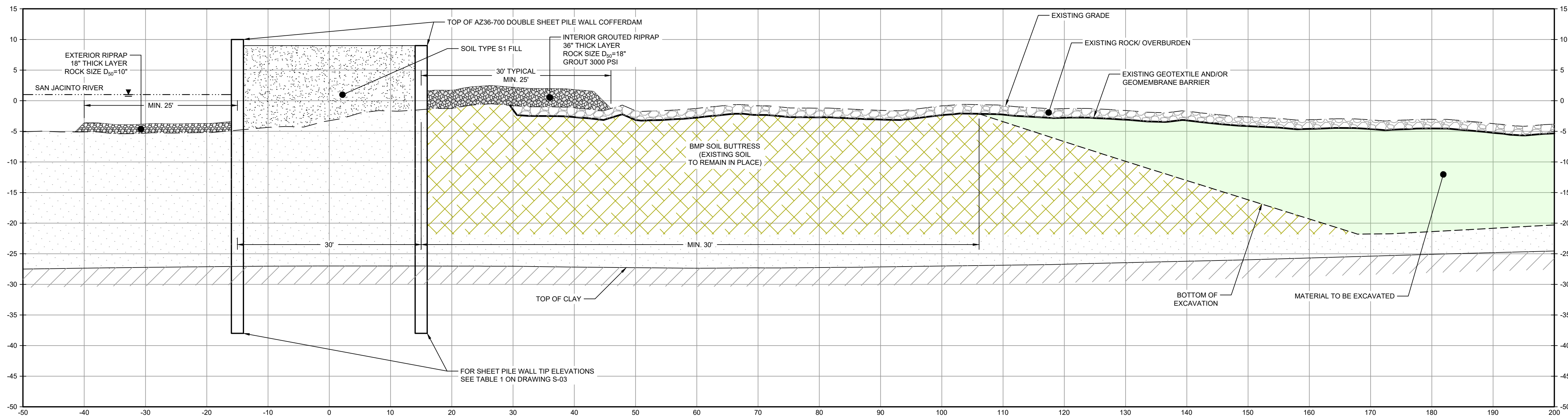
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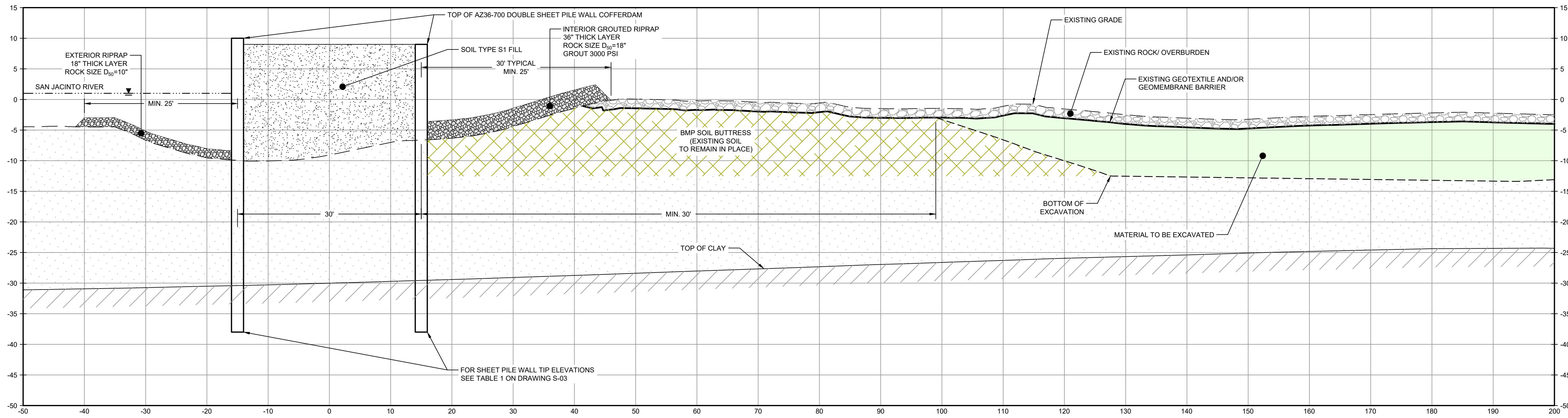
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LEGEND

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



SECTION **Q** STA. 20+00.00
SCALE: 1"=10'
C-32

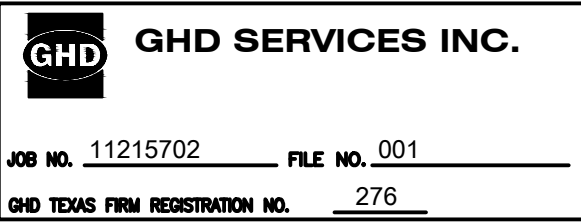


SECTION **R** STA. 22+00.00
SCALE: 1"=10'
C-32

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100% EPA SUBMITTAL

Client
**SAN JACINTO RIVER
WASTE PITS**

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

3 100% EPA SUBMITTAL MW CRH 07/17/2024

No.	Issue	Drawn	Approved	Date
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Drawn	MW	Designer	RH
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Drafting Check	JC	Design Check	LL
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Project Coordinator	CM	Date	Jul 16, 2024
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Original Size	Arch D	Bar is one inch on original size drawing 0 1"
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Project No. 11215702

Title

**DOUBLE PILE WALL SECTIONS
6 OF 7**

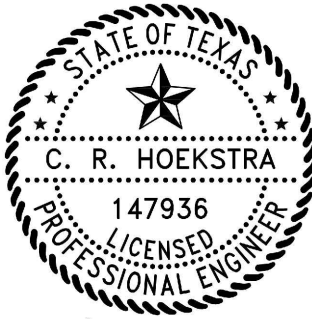
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C-40

Sheet - of -



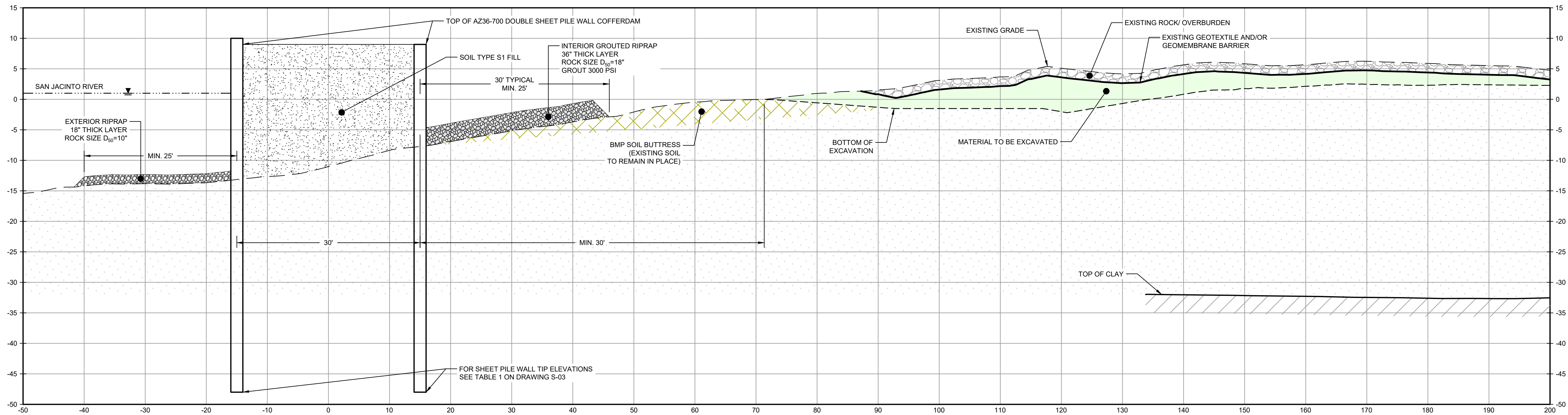
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LEGEND	
	MATERIAL TO BE EXCAVATED
	BMP SOIL BUTTRESS (EXISTING SOIL TO REMAIN IN PLACE)
	EXTERIOR SCOUR PROTECTION
	INTERIOR SCOUR PROTECTION



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

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

100% EPA SUBMITTAL

Client
**SAN JACINTO RIVER
WASTE PITS**

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

3	100% EPA SUBMITTAL	MW	CRH	07/17/2024
No.	Issue	Drawn	Approved	Date
Drawn	MW	Designer	RH	
Drafting Check	JC	Design Check	LL	
Project Coordinator	CM	Date	Jul 16, 2024	
This document shall not be used for construction unless signed and sealed for construction.		Scale	1" = 10'	
Original Size		Bar is one inch on original size drawing 0 1"		
Arch D				

Project No. 11215702

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

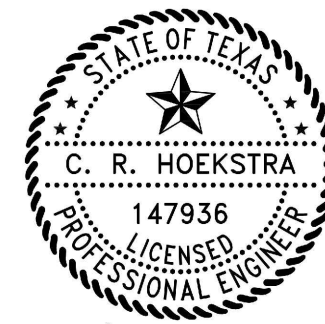
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C-41

Sheet - of -



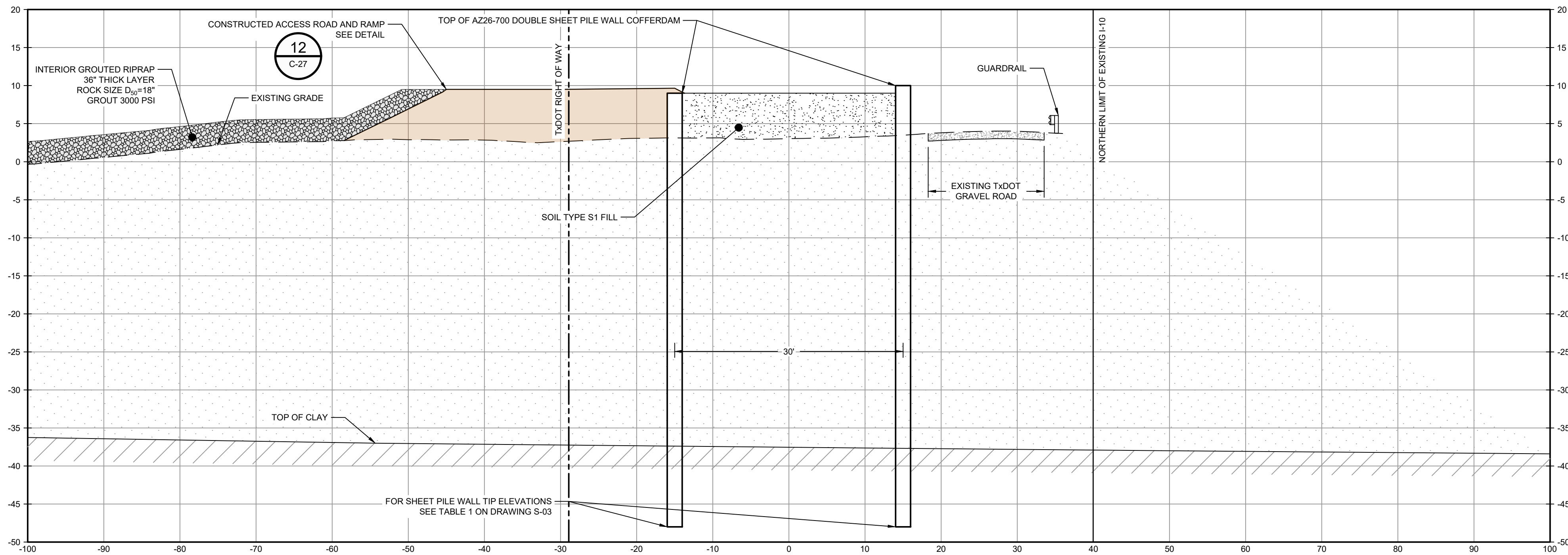
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Baton Rouge Louisiana 70808 USA
T 225 292 9007



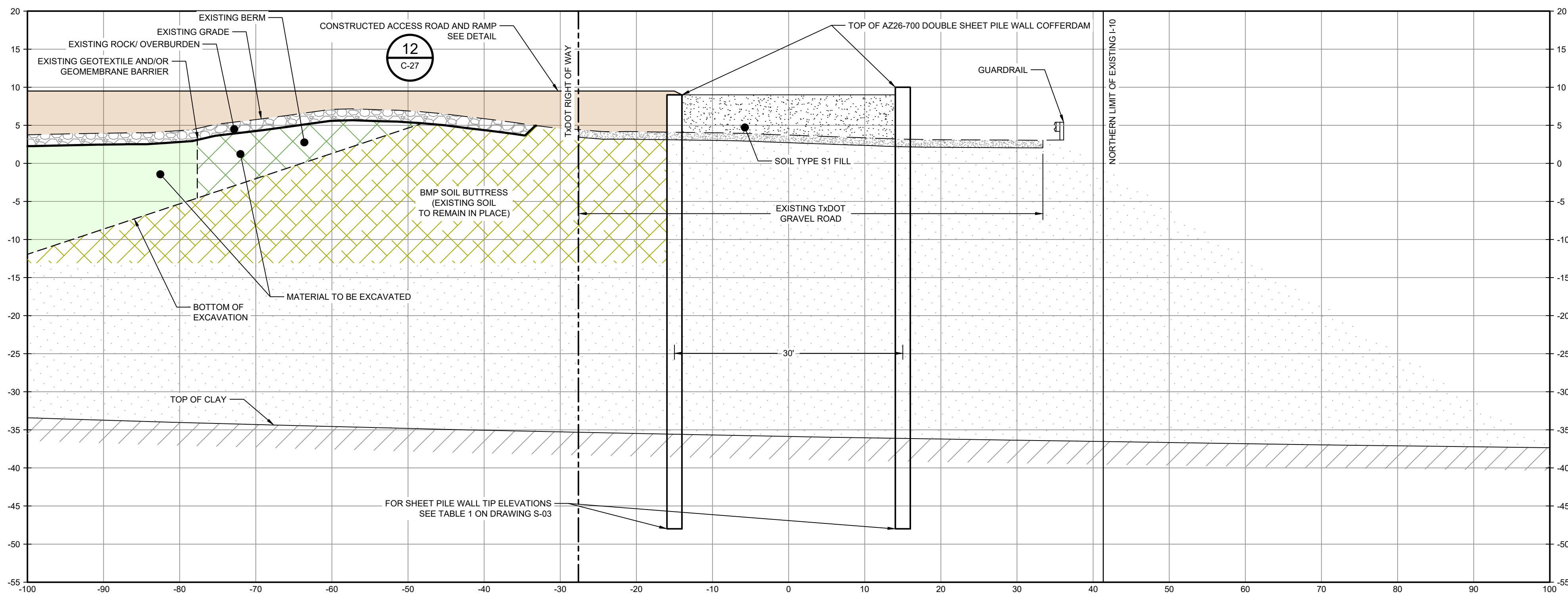
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LEGEND	
	MATERIAL TO BE EXCAVATED
	BMP SOIL BUTTRESS (EXISTING SOIL TO REMAIN IN PLACE)
	PLANNED IMPROVEMENTS FOR NORTHERN IMPOUNDMENT ACCESS
	EXISTING BERM TO BE EXCAVATED FOR POTENTIAL TESTING AND REUSE
	INTERIOR SCOUR PROTECTION



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



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

SOURCE:

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

NOTES:

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

100% EPA SUBMITTAL

Client
**SAN JACINTO RIVER
WASTE PITS**

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

3	100% EPA SUBMITTAL	MW	CRH	07/17/2024
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No.	Issue	Drawn	Approved	Date
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Drawn	MW	Designer	RH
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Drafting Check	JC	Design Check	LL
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Project Coordinator	CM	Date	Jul 16, 2024
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This document shall not be used for construction unless signed and sealed for construction.	Scale	1" = 10'
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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

Title

**SOUTH WALL SECTIONS
1 OF 3**

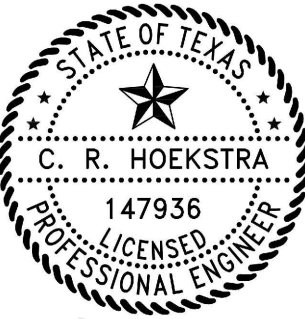
Sheet No.

C-42

Sheet - of -



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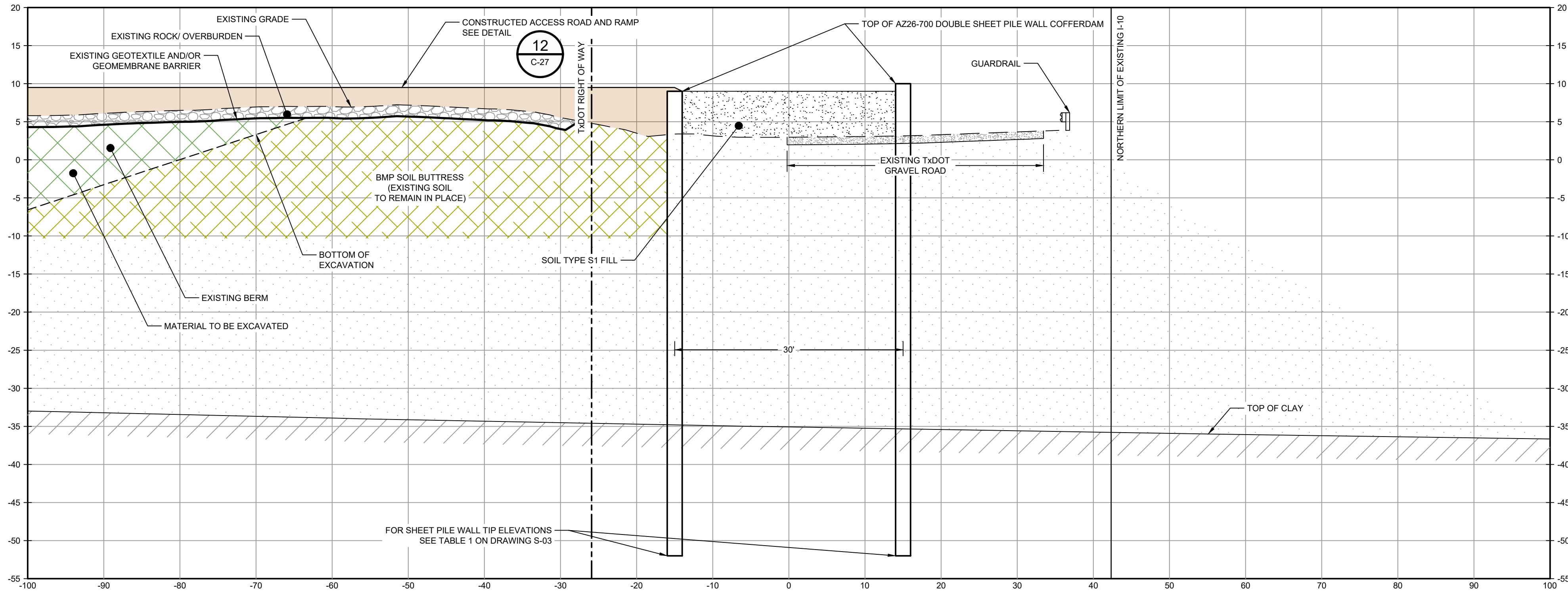
CRH
7/17/2024

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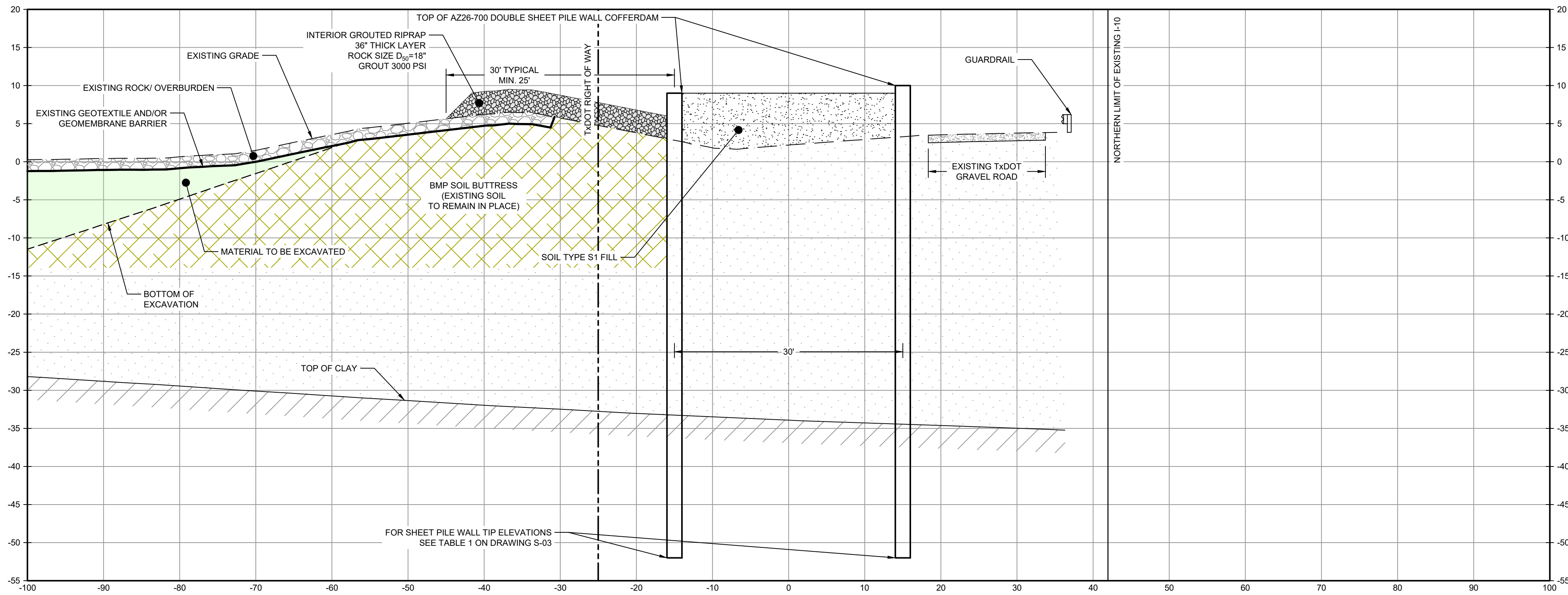
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LEGEND

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



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



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

SOURCE:

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

NOTES:

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Client
**SAN JACINTO RIVER
WASTE PITS**

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

3	100% EPA SUBMITTAL	MW	CRH	07/17/2024
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No.	Issue	Drawn	Approved	Date
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Drawn	MW	Designer	RH
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Drafting Check	JC	Design Check	LL
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Project Coordinator	CM	Date	Jul 16, 2024
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Original Size	Arch D	Bar is one inch on original size drawing 0 1"
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Project No. 11215702

Title
**SOUTH WALL SECTIONS
2 OF 3**

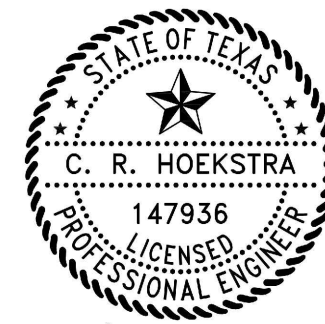
Sheet No.

C-43

Sheet - of -



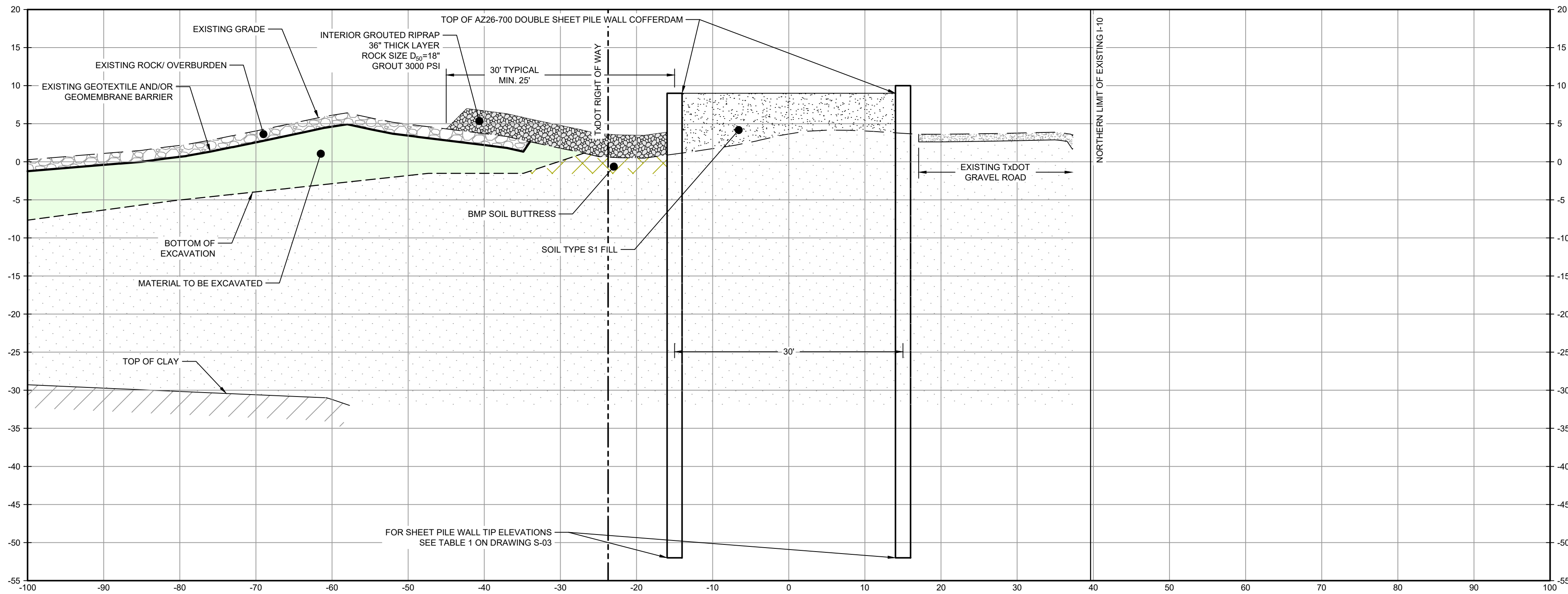
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Baton Rouge Louisiana 70808 USA
T 225 292 9007



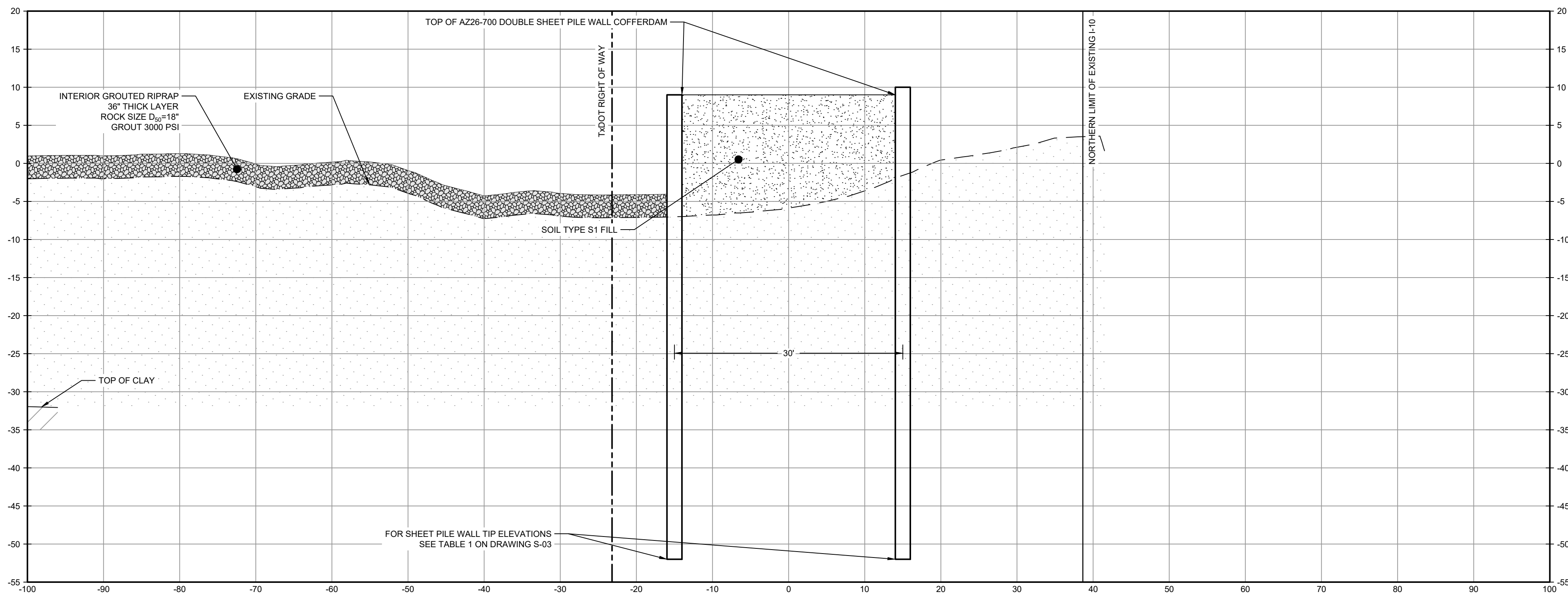
CRH
7/17/2024

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



SECTION **X** STA. 8+00.00
SCALE: 1"=10'
C-34



SECTION **Y** STA. 8+81.52
SCALE: 1"=10'
C-34

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

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

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

100% EPA SUBMITTAL

Client
**SAN JACINTO RIVER
WASTE PITS**

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

3	100% EPA SUBMITTAL	MW	CRH	07/17/2024
No.	Issue	Drawn	Approved	Date
Drawn	MW	Designer	RH	
Drafting Check	JC	Design Check	LL	
Project Coordinator	CM	Date	Jul 16, 2024	
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Original Size		Arch D Bar is one inch on original size drawing 0 1"		

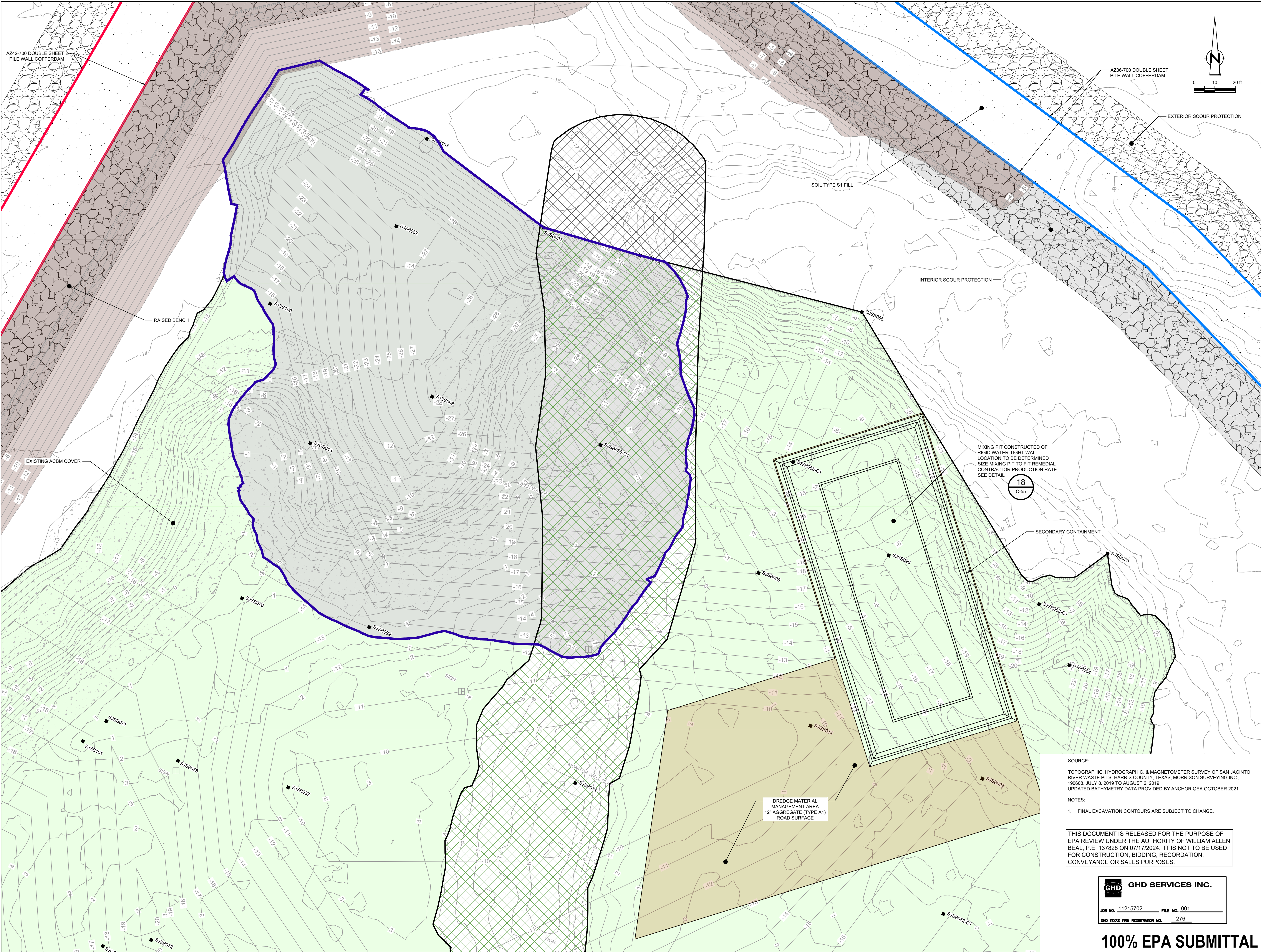
Project No. 11215702

Title
**SOUTH WALL SECTIONS
3 OF 3**

Sheet No.

C-44

Sheet - of -



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LEGEND

- TxDOT RIGHT OF WAY
- TORA CAP PERIMETER
- EXISTING CONTOUR INTERVAL
- FENCELINE
- SHORELINE
- TOP OF BANK
- TOE OF SLOPE
- OVERHEAD ELECTRICAL
- GUARDRAIL
- PIPELINE
- BJSB002 BORING LOCATION
- MW MONITORING WELL
- P.P. POWER POLE
- L.P. 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 FINAL 100% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	100% EPA SUBMITTAL	MW	WB	07/17/2024

Drawn MW Designer RH

Drafting JC Design Check WB

Project Coordinator CM Date Jul 16, 2024

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Original Size

Scale 1" = 20'

Arch D

Bar is one inch on original size drawing

Project No. 11215702

Title

DREDGING NORTHWEST CORNER WORKS PLAN

Sheet No.

C-45

Sheet - of -

Plot Date: 17 July 2024 - 12:59 PM

Plotted By: Jonathan Compton

Filename: \\ghdnet\ghd\US\Baton Rouge\Projects\56211215702\Digital_Design\ACAD 2019\Sheets\11215702-01-DWG-C-045.dwg

100% EPA SUBMITTAL

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 O&A OCTOBER 2021

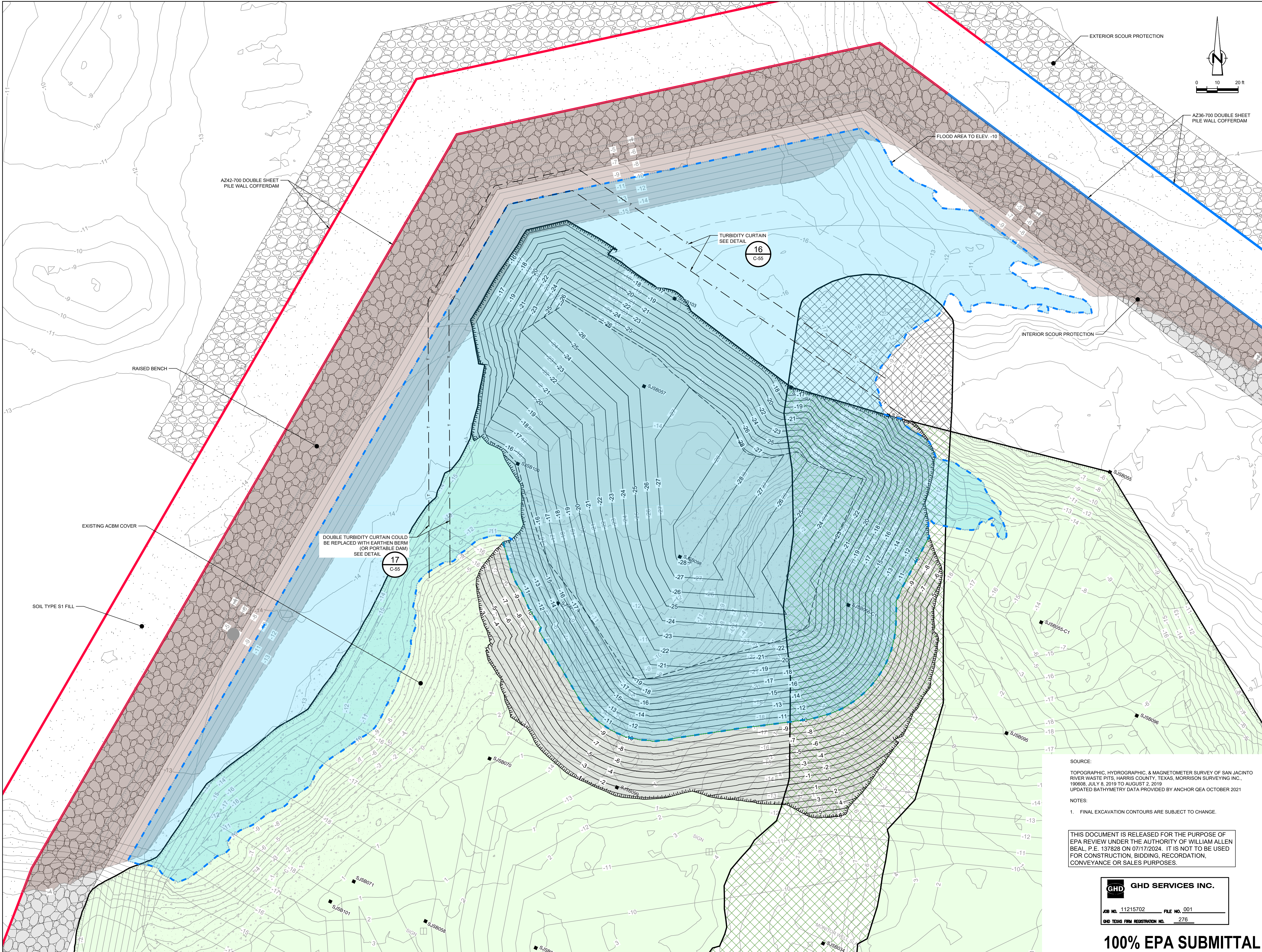
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GHD SERVICES INC.

JOB NO. 11215702 FILE NO. 001

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LEGEND

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

Client

SAN JACINTO RIVER WASTE PITS

Project

NORTHERN IMPOUNDMENT FINAL 100% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	100% EPA SUBMITTAL	MW	WB	07/17/2024

Drawn	MW	Designer	RH
Drafting Check	JC	Design Check	WB

Project Coordinator	CM	Date	Jul 16, 2024
Scale	1" = 20'		

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Original Size

Arch D

Bar is one inch on original size drawing
0 1"

SOURCE:

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GHD SERVICES INC.

JOB NO. 11215702 FILE NO. 001

GHD TEXAS FIRM REGISTRATION NO. 276

Project No. 11215702

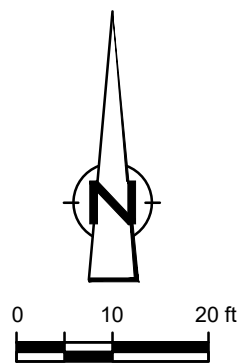
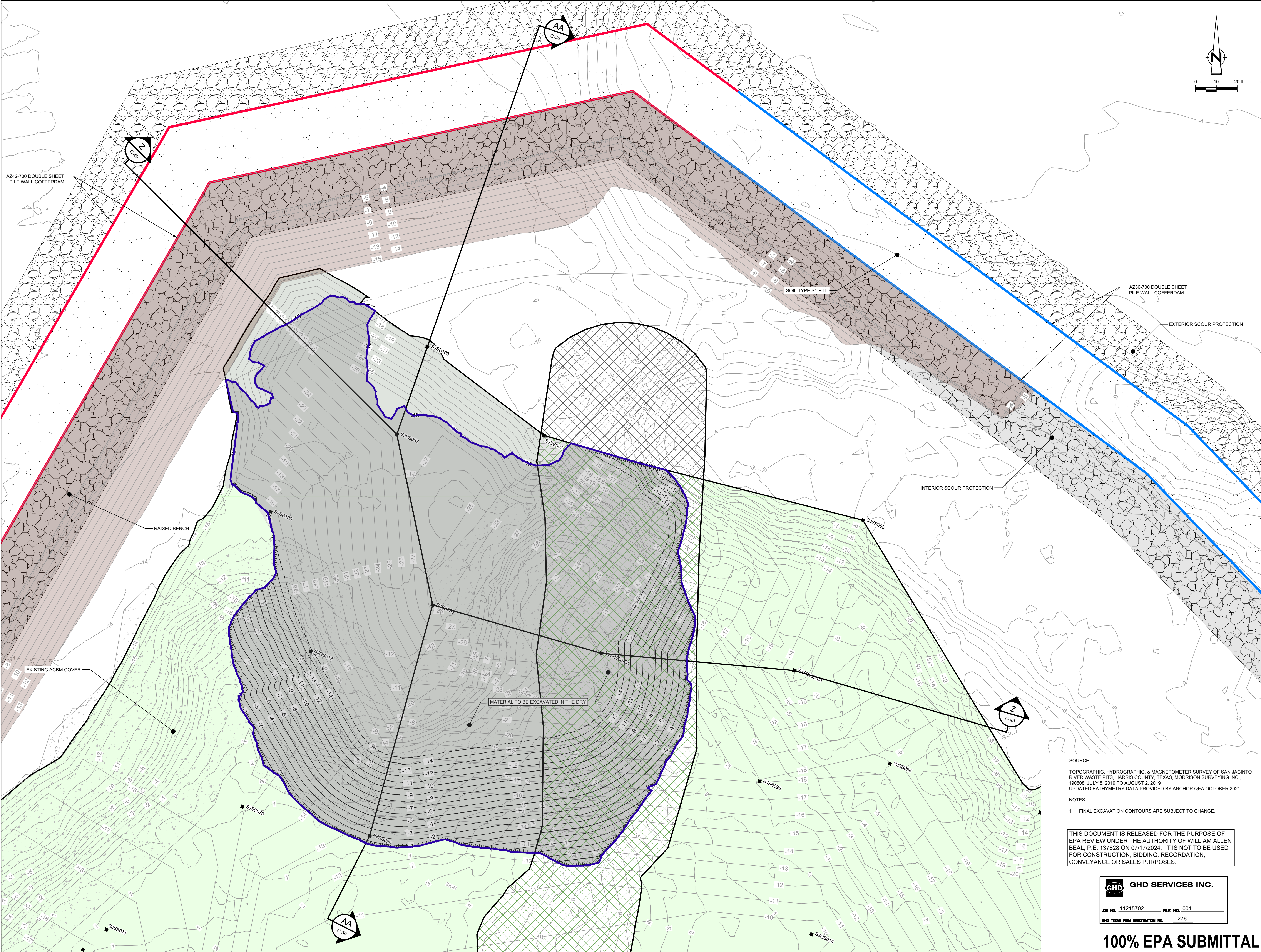
Title

DREDGING NORTHWEST CORNER DREDGING CONTROLS

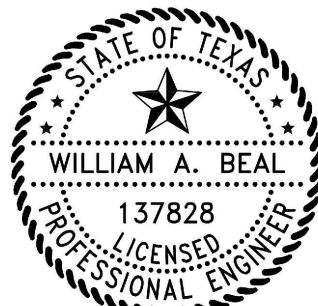
Sheet No.

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LEGEND	
	TXDOT RIGHT OF WAY
	TORA CAP PERIMETER
	EXISTING CONTOUR INTERVAL
	FENCELINE
	SHORELINE
	TOP OF BANK
	TOE OF SLOPE
	OVERHEAD ELECTRICAL
	GUARDRAIL
	PIPELINE
	■ SJSB002
	● BORING LOCATION
	● MONITORING WELL
	● POWER POLE
	● LIGHT POLE
	● WELL
	MATERIAL TO BE EXCAVATED
	EXISTING BERM TO BE EXCAVATED
	FOR POTENTIAL TESTING AND REUSE
	EXISTING BERM TO REMAIN
	NORTHWEST CORNER
	CONCRETE
	GRAVEL
	AZ36-700 PILE
	AZ42-700 PILE
	RAISED BENCH
	MATERIAL TO BE EXCAVATED - DRY
	EXTERIOR SCOUR PROTECTION
	INTERIOR SCOUR PROTECTION

Client

**SAN JACINTO RIVER
WASTE PITS**

Project

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

2	100% EPA SUBMITTAL	MW	WB	07/17/2024
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No.	Issue	Drawn	Approved	Date
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Drawn	MW	Designer	RH
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Drafting	JC	Design	WB
Check		Check	

Project	CM	Date	Jul 16, 2024
Coordinator			

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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	
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**DREDGING
NORTHWEST CORNER
DRY EXCAVATION**

Sheet No.	
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C-47

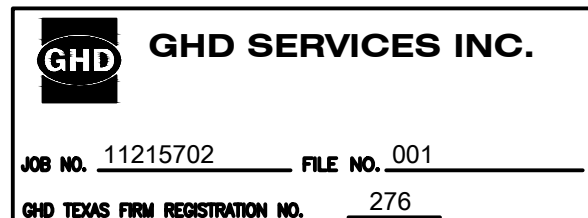
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SOURCE:
TOPOGRAPHIC, HYDROGRAPHIC, & MAGNETOMETER SURVEY OF SAN JACINTO RIVER WASTE PITS, HARRIS COUNTY, TEXAS, MORRISON SURVEYING INC., 190608, JULY 8, 2019 TO AUGUST 2, 2019
UPDATED BATHYMETRY DATA PROVIDED BY ANCHOR OEA OCTOBER 2021

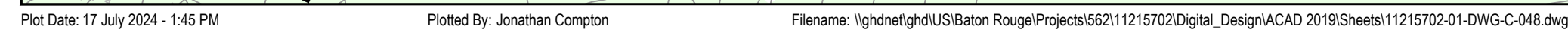
NOTES:

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LEGEND

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

■ SJSB002
 ● M/W
 ● P.P
 ● L.P
 ● WELL

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

NORTHWEST CORNER

CONCRETE
 GRAVEL
 AZ36-700 PILE
 AZ42-700 PILE
 RAISED BENCH

MATERIAL TO BE EXCAVATED - WET
 EXTERIOR SCOUR PROTECTION
 INTERIOR SCOUR PROTECTION

Client

SAN JACINTO RIVER WASTE PITS

Project

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

2	100% EPA SUBMITTAL	MW	WB	07/17/2024
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No.	Issue	Drawn	Approved	Date

Drawn	MW	Designer	RH
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Drafting Check	JC	Design Check	WB
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Project Coordinator CM	Date Jul 16, 2024
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Original Size	Bar is one inch on original size drawing
Arch D	0 1"

Project No. 11215702

Title

DREDGING NORTHWEST CORNER WET EXCAVATION

Sheet No.

C-48

Sheet - of -

SOURCE:

TOPOGRAPHIC, HYDROGRAPHIC, & MAGNETOMETER SURVEY OF SAN JACINTO
RIVER WASTE PITS, HARRIS COUNTY, TEXAS, MORRISON SURVEYING INC.,
190608, JULY 8, 2019 TO AUGUST 2, 2019
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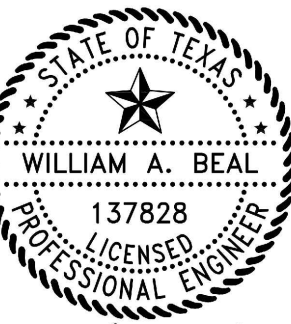
JOB NO. 11215702 FILE NO. 001

OLD TEXAS FIRM REGISTRATION NO. 276

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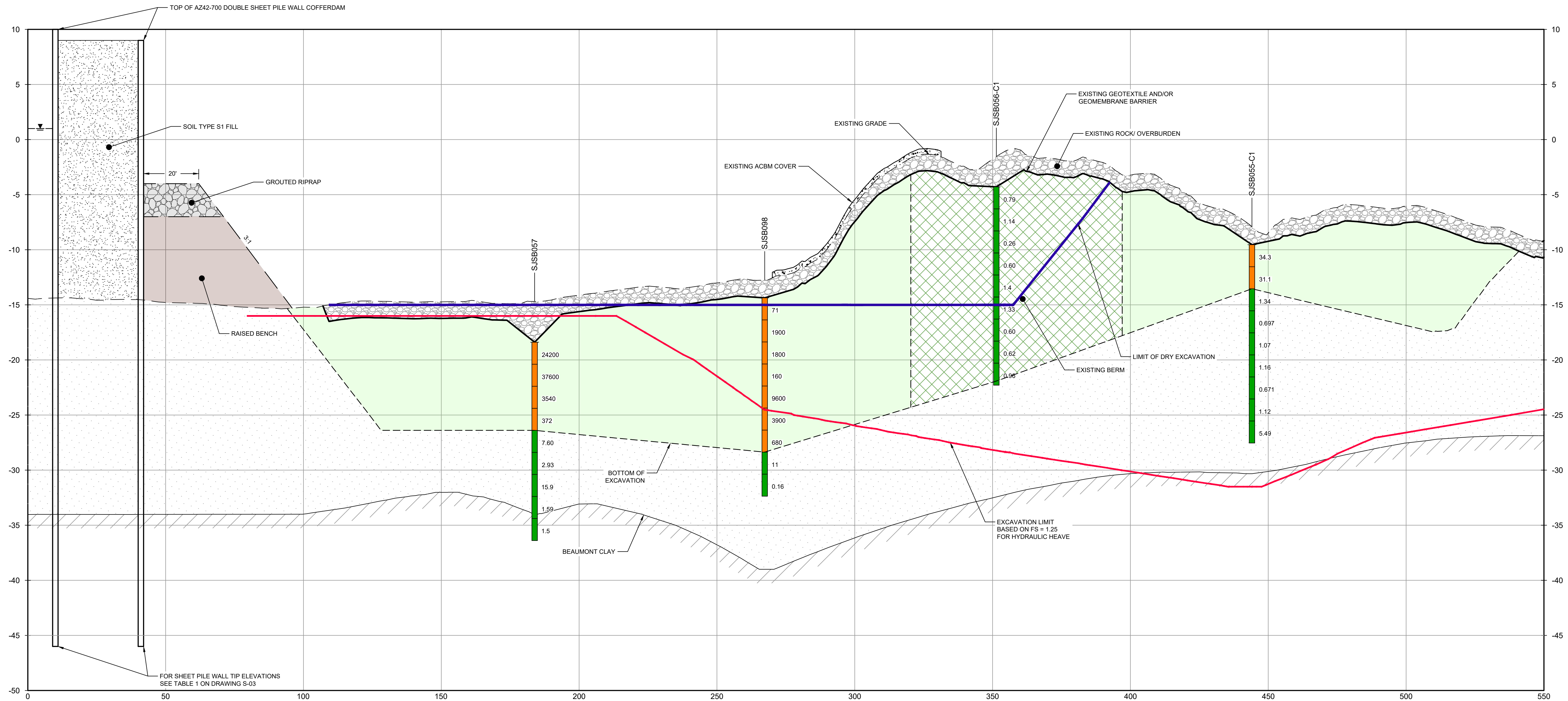


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LEGEND

- SOILS WITH CONCENTRATIONS <30 ng/kg TEQ_{2,3,4} TCDD
- SOILS WITH CONCENTRATIONS >30 ng/kg TEQ_{2,3,4} 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



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

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

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GHD SERVICES INC.

JOB NO. 11215702 FILE NO. 001

GHD TEXAS FIRM REGISTRATION NO. 276

100% EPA SUBMITTAL

Client
**SAN JACINTO RIVER
WASTE PITS**

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

2	100% EPA SUBMITTAL	MW	WB	07/17/2024
No.	Issue	Drawn	Approved	Date
Drawn	MW	Designer	RH	
Drafting Check	JC	Design Check	WB	
Project Coordinator	CM	Date	Jul 16, 2024	
		Scale	AS SHOWN	
Original Size	Arch D			
		Bar is one inch on original size drawing 0 1"		

Project No. 11215702

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

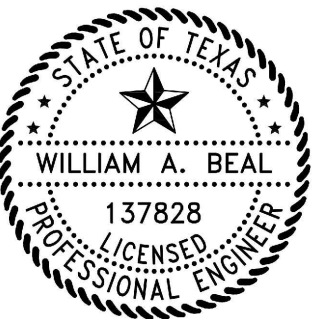
Sheet No.

C-49

Sheet - of -



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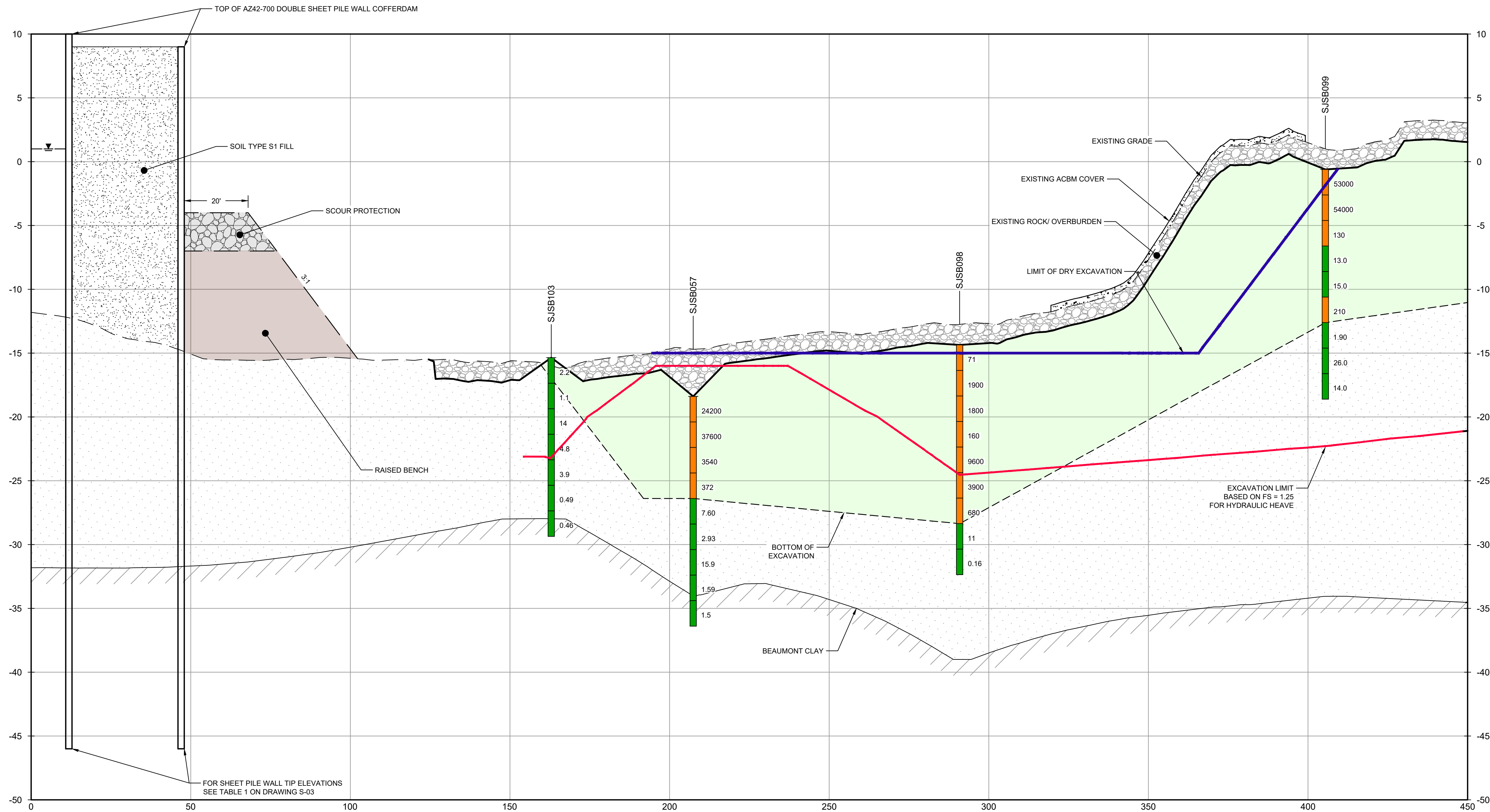


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LEGEND

- SOILS WITH CONCENTRATIONS <30 ng/kg TEQ_{TCDD}
- SOILS WITH CONCENTRATIONS >30 ng/kg TEQ_{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



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

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

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GHD SERVICES INC.

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

100% EPA SUBMITTAL

Client
**SAN JACINTO RIVER
WASTE PITS**

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

2	100% EPA SUBMITTAL	MW	WB	07/17/2024
No.	Issue	Drawn	Approved	Date
Drawn	MW	Designer	RH	
Drafting Check	JC	Design Check	WB	
Project Coordinator	CM	Date	Jul 16, 2024	
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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
SECTIONS 2 OF 2**

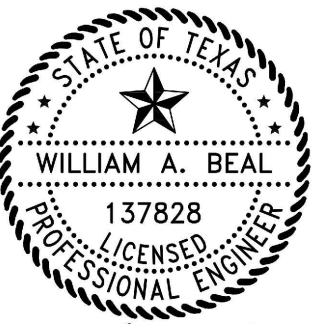
Sheet No.

C-50

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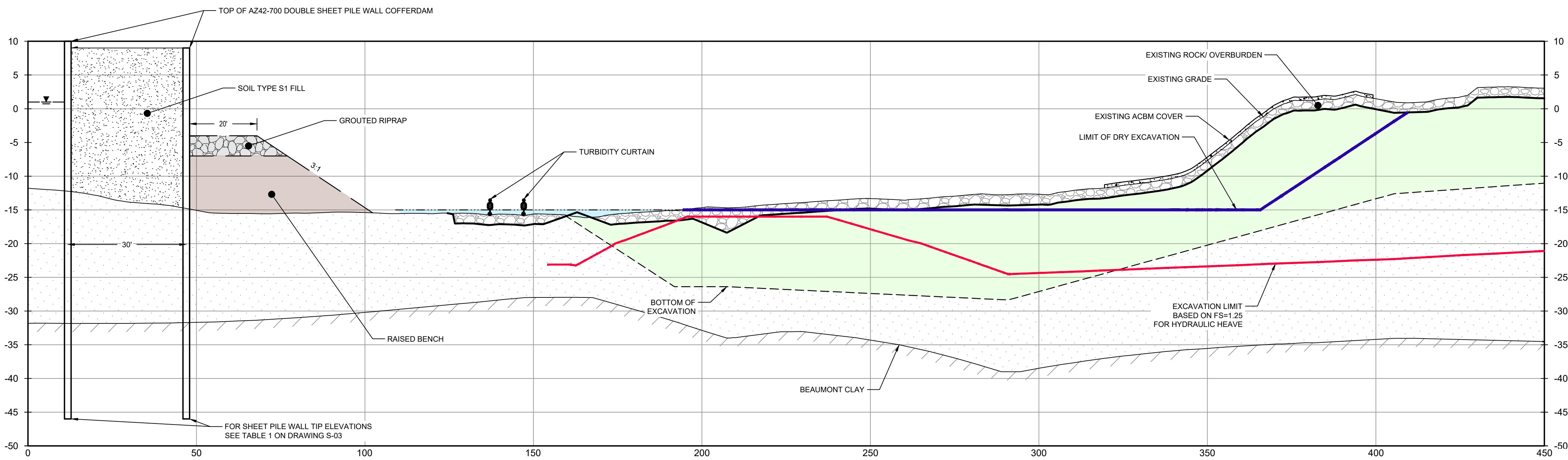
LEGEND
EXCAVATION LIMIT BASED ON
FS = 1.25 FOR HYDRAULIC HEAVE
MATERIAL TO BE EXCAVATED

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

2	100% EPA SUBMITTAL	MW	WB	07/17/2024
No.	Issue	Drawn	Approved	Date
Drawn	MW	Designer	RH	
Drafting Check	JC	Design Check	WB	
Project Coordinator	CM	Date	Jul 16, 2024	
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Original Size		Bar is one inch on original size drawing 0 1"		
Arch D				

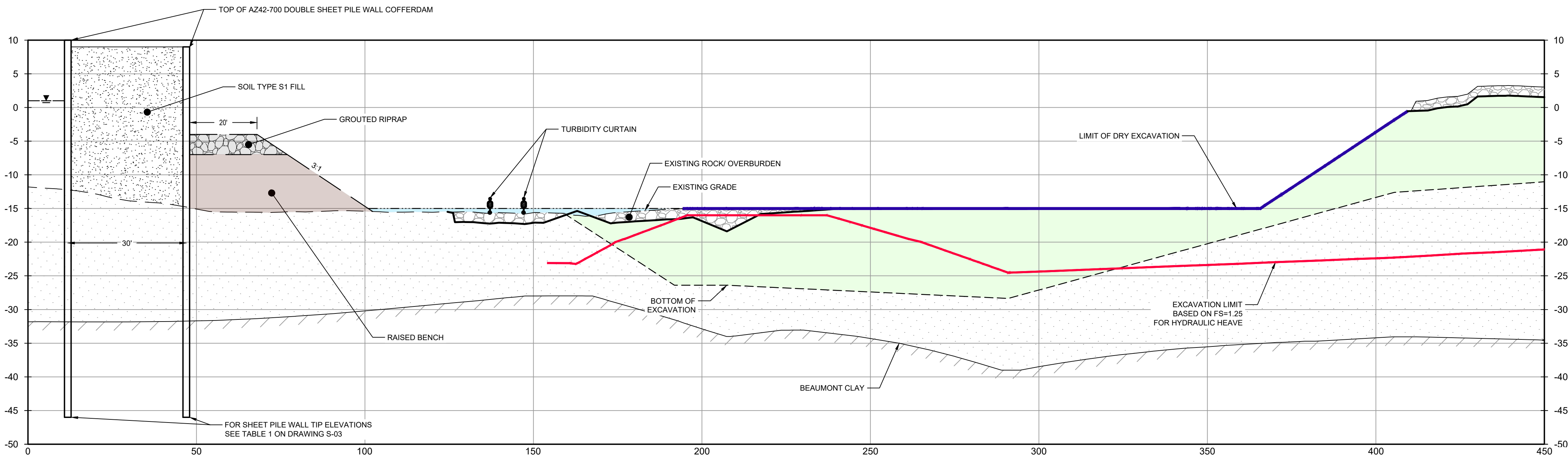
Project No. 11215702
Title
**DREDGING
NORTHWEST CORNER
SEQUENCING 1 OF 3**

Sheet No.
C-51
Sheet - of -



NOTES:
1. DEWATER NORTHWEST CORNER TO EXCAVATION LIMIT BASED ON FS = 1.25 FOR HYDRAULIC HEAVE.

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



NOTES:
1. REMOVE ROCK LAYER TO BE STOCKPILED ON SITE. REUSED AS TEMPORARY COVER AT END OF SEASONAL EXCAVATION.
2. REMOVE GEOMEMBRANE/ GEOTEXTILE / ACBM (IF PRESENT) EXCAVATE MATERIAL ABOVE LIMIT OF DRY EXCAVATION AND DISPOSE OF OFFSITE.

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.

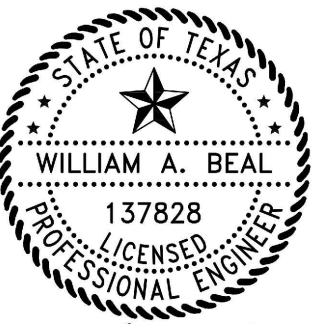
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JOB NO. 11215702 FILE NO. 001
GHD TEXAS FIRM REGISTRATION NO. 276

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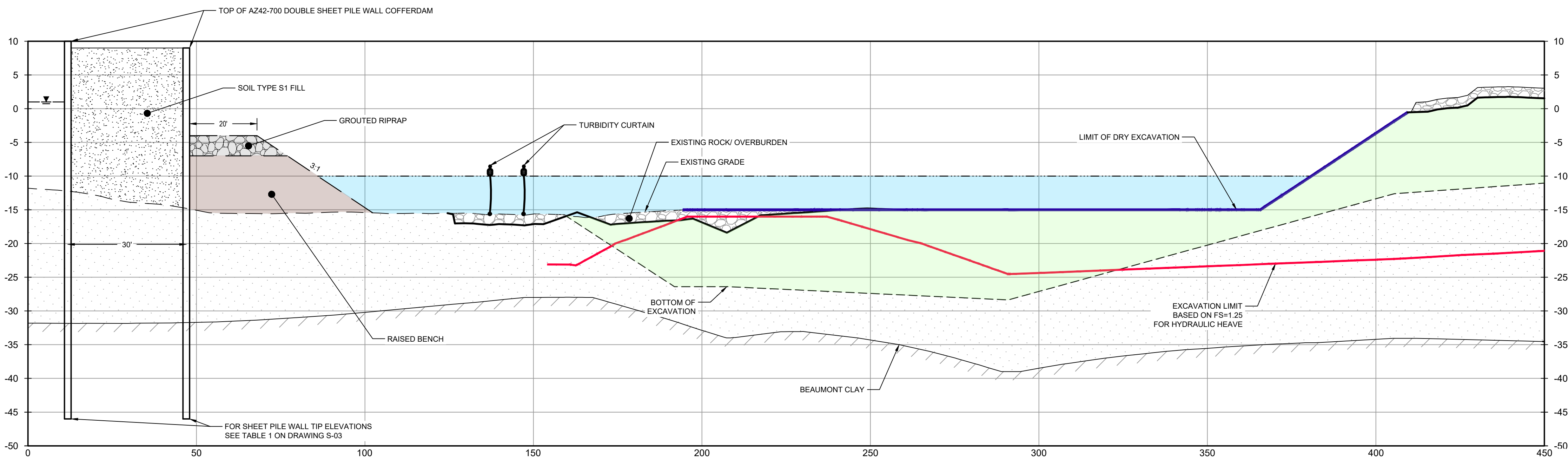
LEGEND
EXCAVATION LIMIT BASED ON
FS = 1.25 FOR HYDRAULIC HEAVE
MATERIAL TO BE EXCAVATED

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

2	100% EPA SUBMITTAL	MW	WB	07/17/2024
No.	Issue	Drawn	Approved	Date
Drawn	MW	Designer	RH	
Drafting Check	JC	Design Check	WB	
Project Coordinator	CM	Date	Jul 16, 2024	
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Original Size		Bar is one inch on original size drawing 0 1"		
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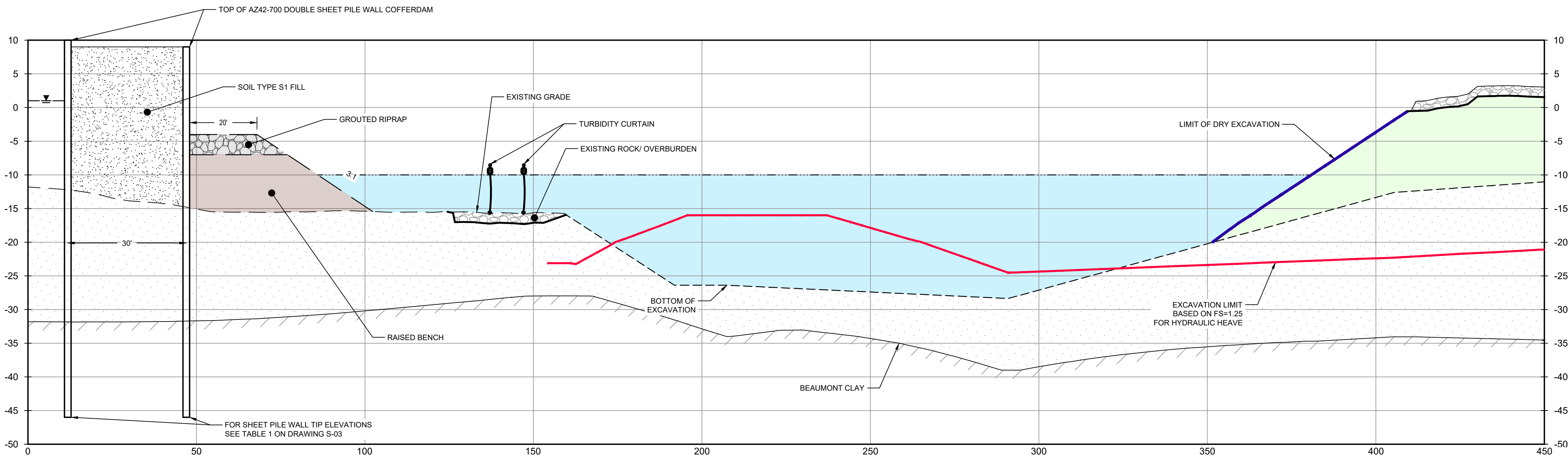
Project No. 11215702
Title
**DREDGING
NORTHWEST CORNER
SEQUENCING 2 OF 3**

Sheet No.
C-52



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

PHASE 3
HORIZ: 1" = 20'
VERT: 1" = 10'




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

PHASE 4
HORIZ: 1" = 20'
VERT: 1" = 10'

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

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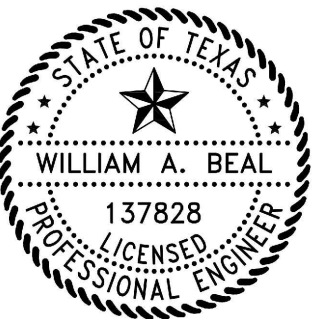
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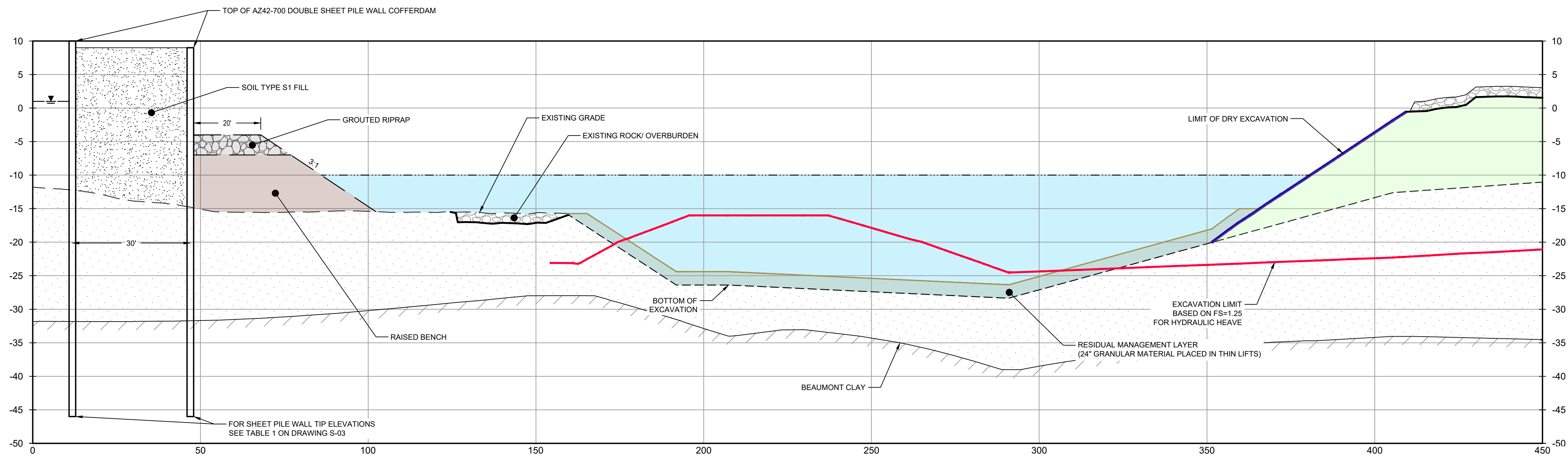
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LEGEND

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

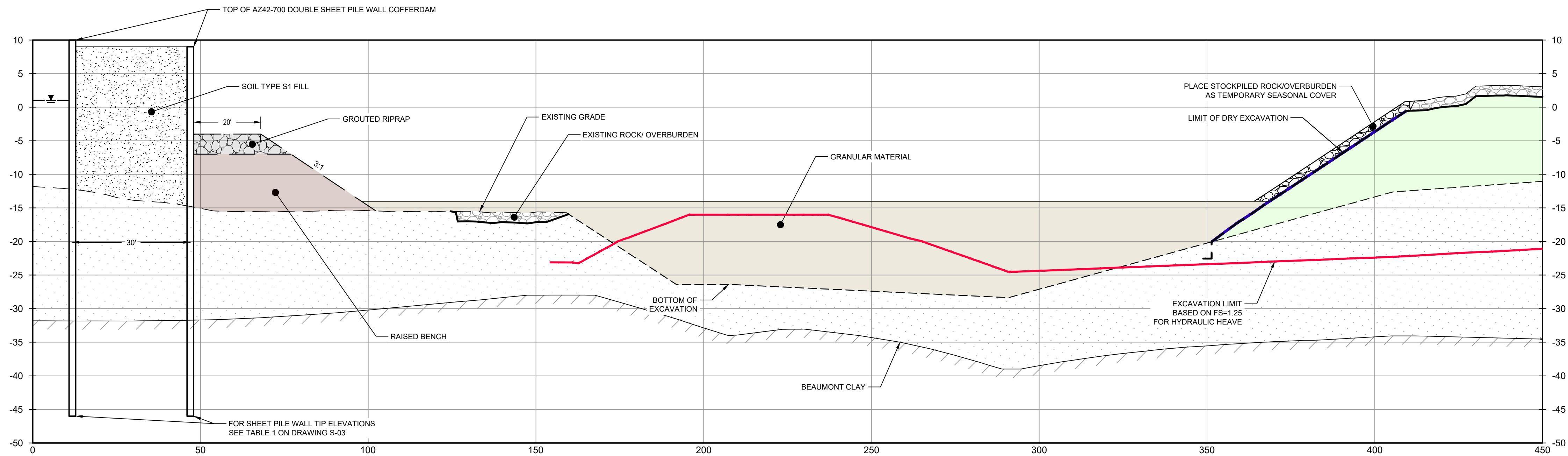


NOTES:

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

PHASE 5

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



NOTES:

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

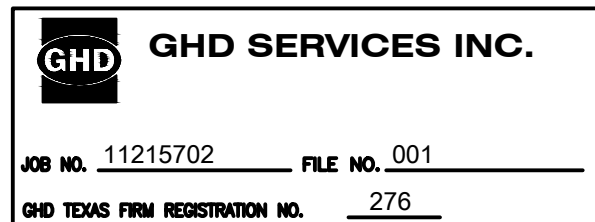
PHASE 6

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

NOTES:

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- 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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Client

**SAN JACINTO RIVER
WASTE PITS**

Project

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

2 100% EPA SUBMITTAL MW WB 07/17/2024

No. Issue Drawn Approved Date

Drawn MW Designer RH

Drafting Check JC Design Check WB

Project Coordinator CM Date Jul 16, 2024

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Scale AS SHOWN

Original Size

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0 1"

Project No. 11215702

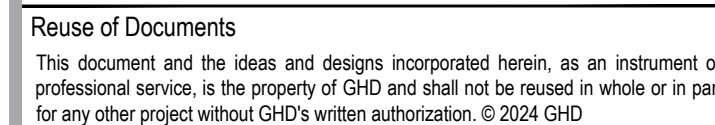
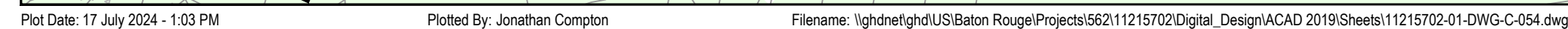
Title

**DREDGING
NORTHWEST CORNER
SEQUENCING 3 OF 3**

Sheet No.

C-53

Sheet - of -



LEGEND

- TxDOT RIGHT OF WAY
- TORA CAP PERIMETER
- EXISTING CONTOUR INTERVAL
- FENCELINE
- SHORELINE
- TOP OF BANK
- EDGE OF SLOPE
- OVERHEAD ELECTRICAL
- GUARDRAIL
- PIPELINE
- BORING LOCATION
- MONITORING WELL
- POWER POLE
- LIGHT POLE
- WELL
- WELL MATERIAL
- EXISTING BERM TO BE EXCAVATED
- FOR POTENTIAL TESTING AND REUSE
- EXISTING BERM TO REMAIN
- NORTHWEST CORNER
- CONCRETE
- GRAVEL
- A236-700 PILE
- A242-700 PILE
- GRAVEL BENCH
- RANDOM MATERIAL
- EXTERIOR SCOUR PROTECTION
- INTERIOR SCOUR PROTECTION

Client

**SAN JACINTO RIVER
WASTE PITS**

Project

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

2	100% EPA SUBMITTAL	MW	WB	07/17/2024	
No.	Issue	Drawn	Approved	Date	
Drawn	MW	Designer RH			
Drafting Check	JC	Design Check	WB		
Project Coordinator	CM	Date	Jul 16, 2024		
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Original Size		Bar is one inch on original size drawing 0 _____ 1"			
Arch D					

Project No.	11215702
Title	<p style="text-align: center;">DREDGING NORTHWEST CORNER FINAL GRADE</p>

Sheet No. **C-54**

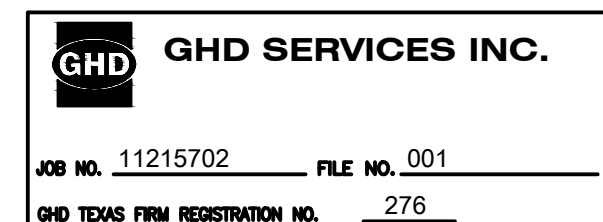
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SOURCE:
TOPOGRAPHIC, HYDROGRAPHIC, & MAGNETOMETER SURVEY OF SAN JACINTO
RIVER WASTE PITS, HARRIS COUNTY, TEXAS, MORRISON SURVEYING INC.,
190608, JULY 8, 2019 TO AUGUST 2, 2019
UPDATED BATHYMETRY DATA PROVIDED BY ANCHOR QEA OCTOBER 2021

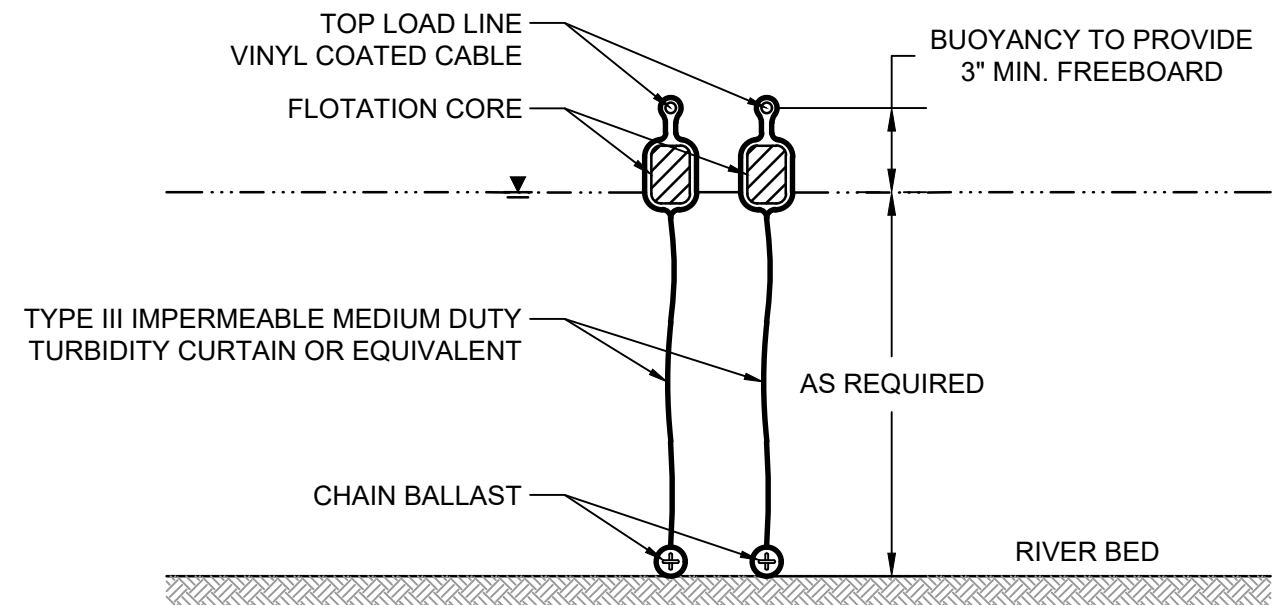
NOTES:

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2. FILL PLACEMENT TO OVERCOME HYDRAULIC HEAVE

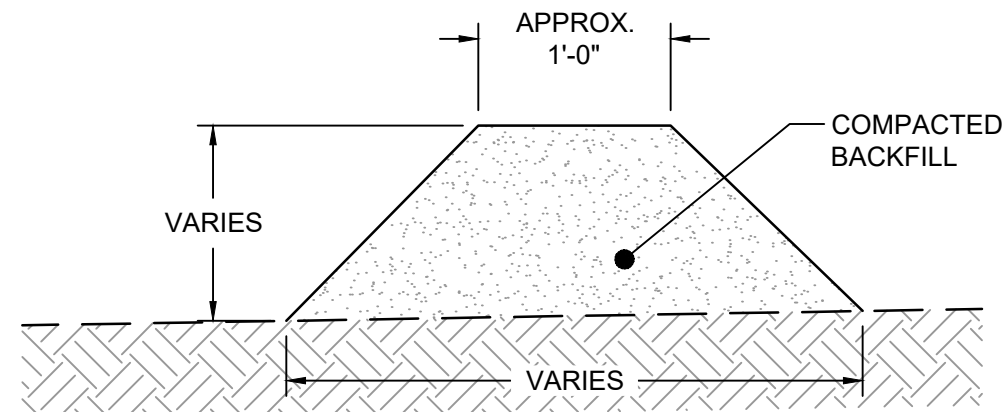
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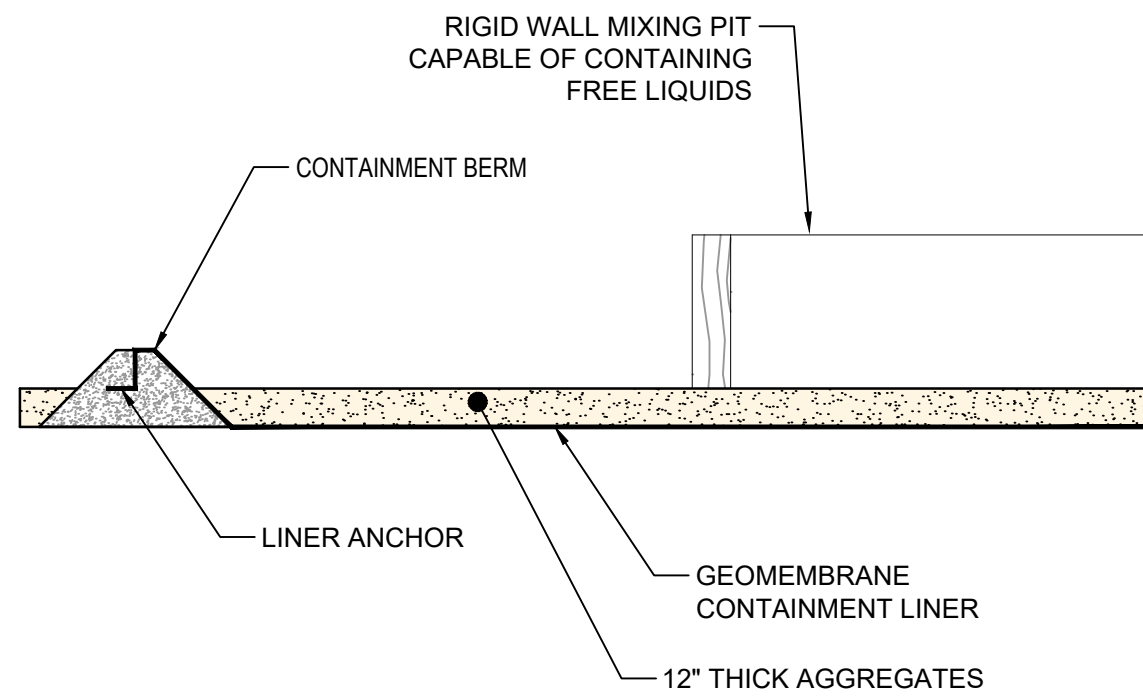
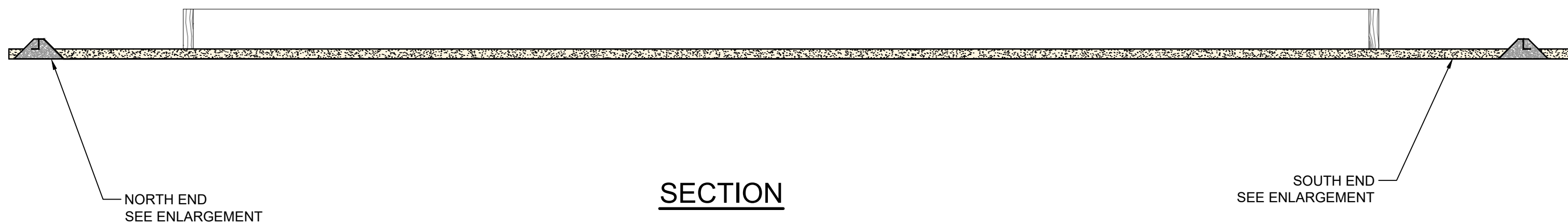


DETAIL 16 DREDGING TURBIDITY CURTAINS
N.T.S. C-46



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

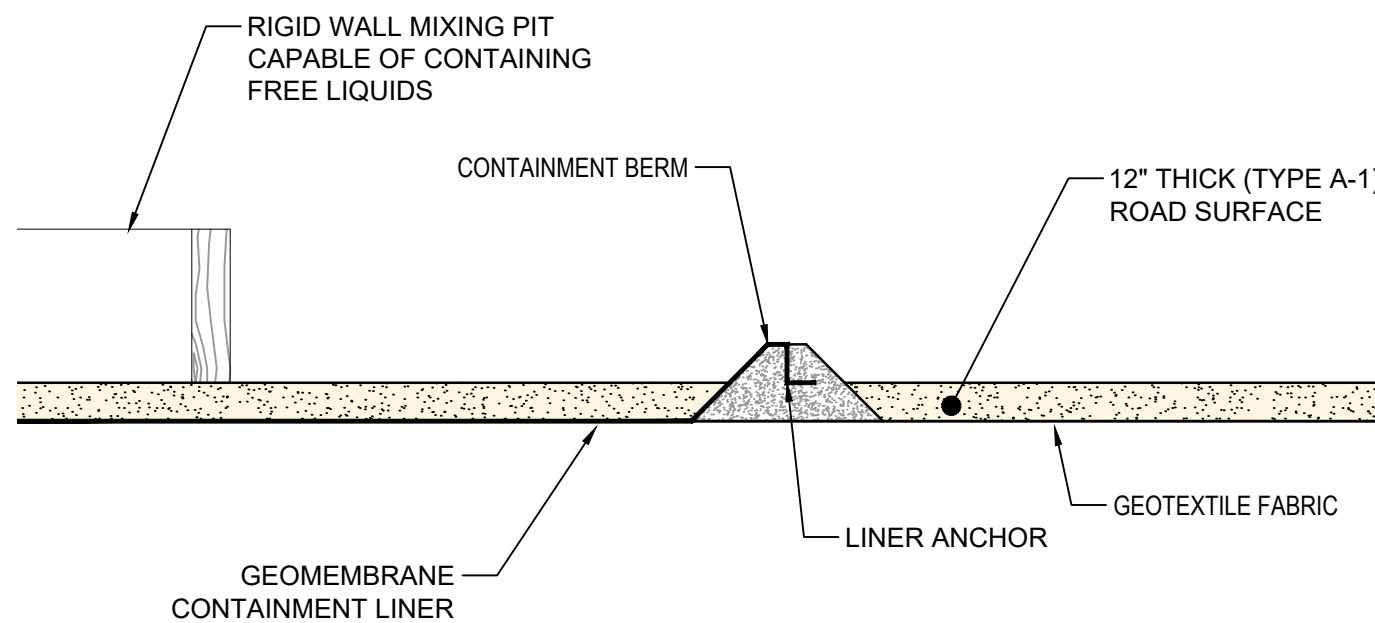
DETAIL 17 DREDGING EARTHEN BERM
N.T.S. C-46



NORTH END

NOTES:
1. DIMENSION TO BE DETERMINED BY CONTRACTOR

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



SOUTH END

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JOB NO. 11215702

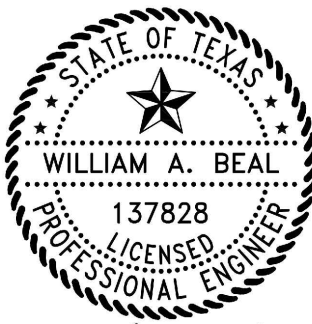
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Client

**SAN JACINTO RIVER
WASTE PITS**

Project

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

2	100% EPA SUBMITTAL	MW	WB	07/17/2024
No.	Issue	Drawn	Approved	Date
Drawn	MW	Designer	RH	
Drafting Check	JC	Design Check	WB	
Project Coordinator	CM	Date	Jul 16, 2024	
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Project No. 11215702

Title

**DREDGING
NORTHWEST CORNER
DREDGING DETAILS**

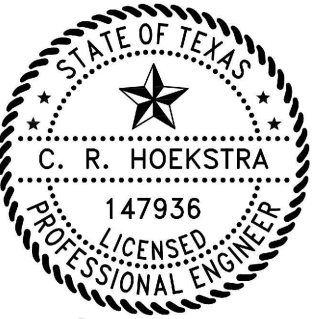
Sheet No.

C-55

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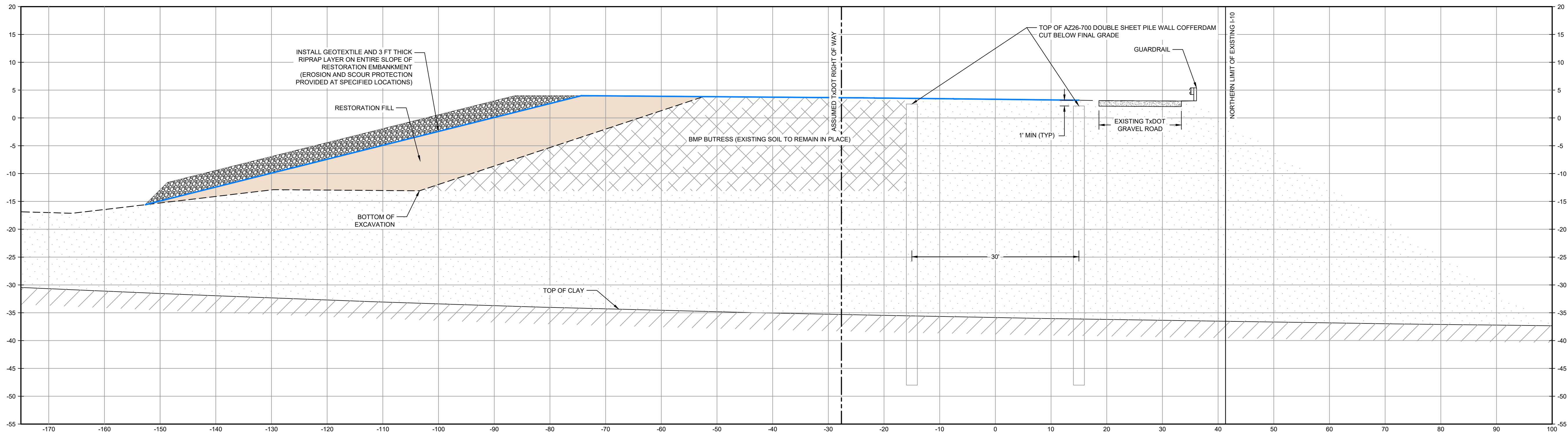
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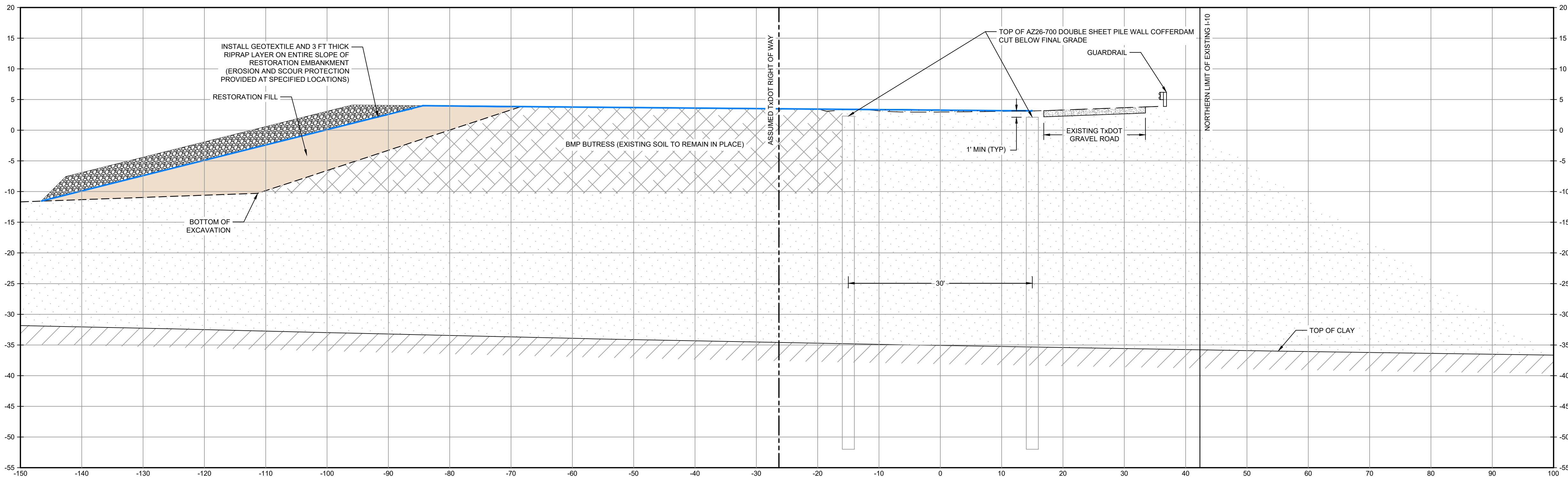
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LEGEND

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



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



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

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

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

GHD SERVICES INC.

JOB NO. 11215702 FILE NO. 001

GHD TEXAS PFW REGISTRATION NO. 276

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Client
**SAN JACINTO RIVER
WASTE PITS**

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**NORTHERN IMPOUNDMENT
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HARRIS COUNTY, TEXAS**

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Drawn	MW	Designer	RH	
Drafting Check	JC	Design Check	WB	
Project Coordinator	CM	Date	Jul 17, 2024	
		Scale	AS SHOWN	
Original Size				
Arch D				
				Bar is one inch on original size drawing 0 1"

Project No. 11215702

Title
**RESTORATION SECTIONS
1 OF 2**

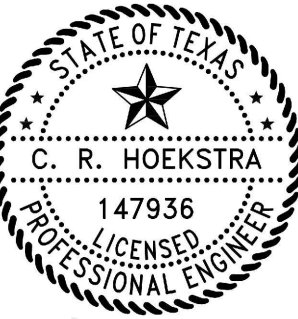
Sheet No.

C-56

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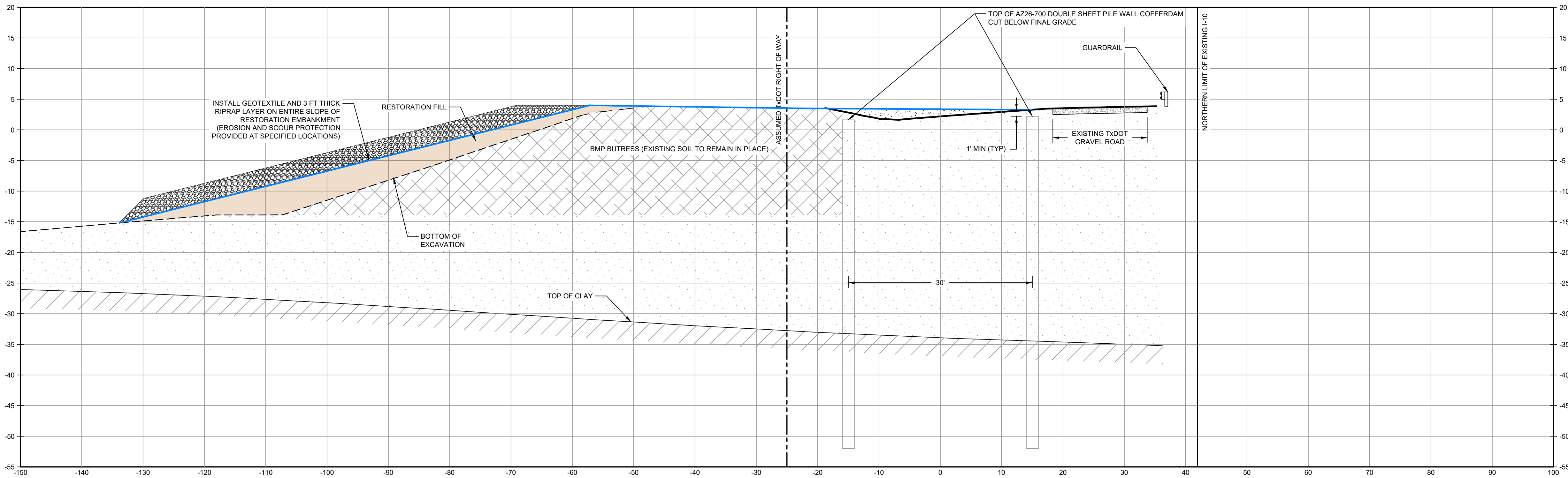
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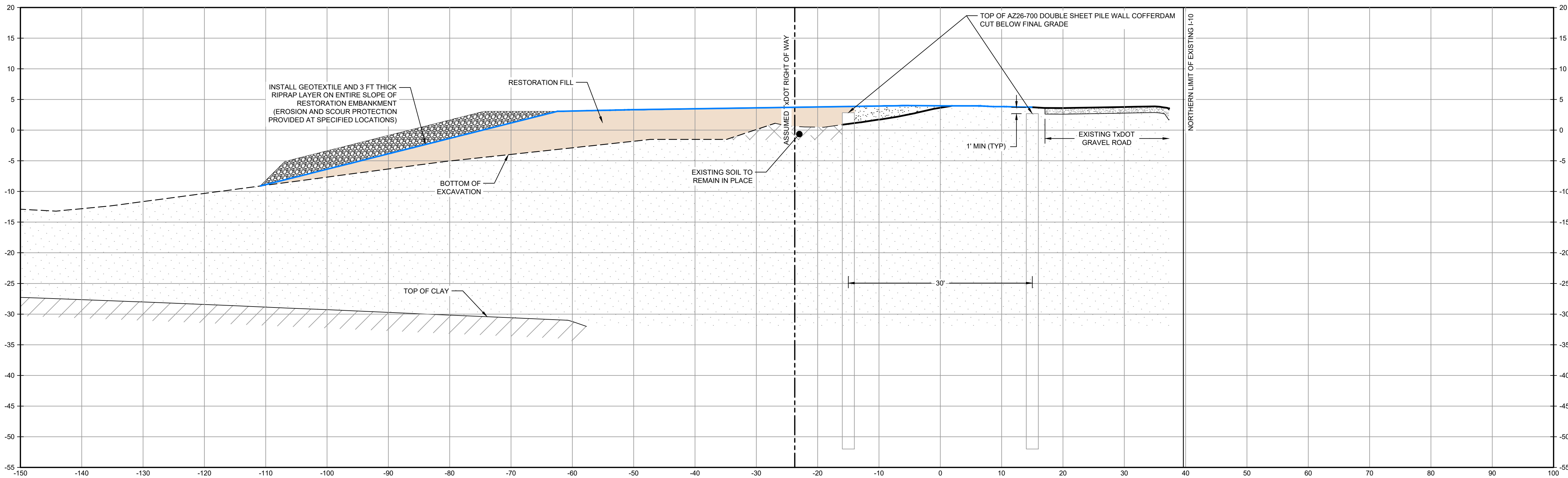
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LEGEND

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



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

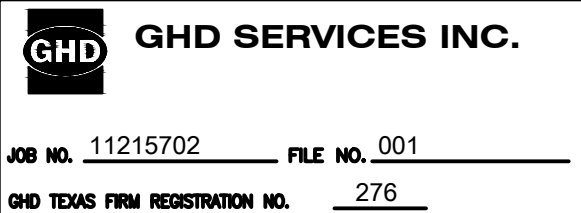


SECTION **X** STA. 8+00.00
SCALE: 1"=10'
C-22

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



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Client
**SAN JACINTO RIVER
WASTE PITS**

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

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Project No. 11215702

Title
**RESTORATION SECTIONS
2 OF 2**

Sheet No.

C-57

Sheet - of -

GENERAL

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

CODES AND GUIDELINES

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

MATERIALS

STEEL:

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

STRUCTURAL STEEL AND MISCELLANEOUS METAL

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

FRP BARRIER WALL

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

CONSTRUCTION SEQUENCE

SECTION C1

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

SECTION C2

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

SECTION C3

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

SECTION C4A

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

SECTION C4

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

SECTION C5

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

SECTION C6, C7

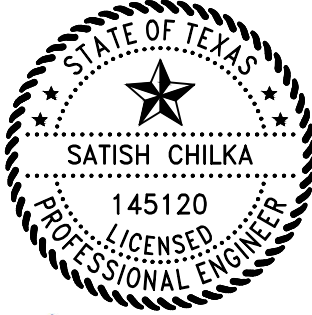
- INSTALL LEFT AND RIGHT SHEET PILE WALL
- CUT BETWEEN THE SHEET PILES TO ELEVATION 0 FT
- INSTALL TIE RODS AT ELEVATION NOTED ON SHEET S-03
- INSTALL FILL UP TO EL. +9 FT UNIFORMLY OVER MIN 6 DAYS
- MINIMUM TIME FOR DEWATERING TO EXISTING MUDLINE: 4 DAYS
- MINIMUM TIME FOR EXCAVATING TO 50% DEPTH: 17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

ABBREVIATIONS

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



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Satish Chilka
07/17/24

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Client

**SAN JACINTO RIVER
WASTE PITS**

Project

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

3	100% EPA REVIEW	DS	SC	07/17/2024
2	90% EPA REVIEW	DS	SC	06/27/2022
No.	Issue	Drawn	Approved	Date
Drawn	DS	Designer	KM	
Drafting Check	MW	Design Check	SC	
Project Coordinator	CM	Date	Jul 17, 2024	
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Original Size		Bar is one inch on original size drawing 0 1"		
Arch D				

Project No. 11215702

Title

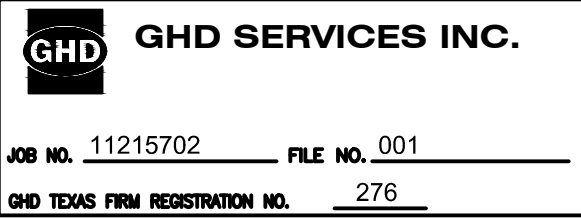
**STRUCTURAL
NOTES**

Sheet No.

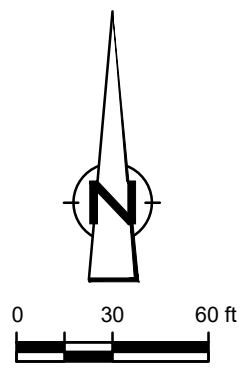
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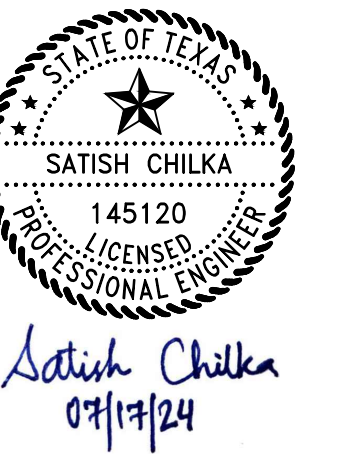
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	LEGEND
----	TxDOT RIGHT OF WAY
----	TCRA CAP PERIMETER
----	EXISTING CONTOUR INTERVAL
----	FENCE LINE
----	SHORELINE
----	TOP OF BANK
----	TOE OF SLOPE
----	OVERHEAD ELECTRICAL
----	GUARDRAIL
----	PIPELINE
----	BORING LOCATION
○	MONITORING WELL
●	POWER POLE
●	LIGHT POLE
○	WELL
----	MATERIAL TO BE EXCAVATED
----	EXISTING BERM TO BE EXCAVATED
----	FOR POTENTIAL TESTING AND REUSE
----	EXISTING BERM TO REMAIN
----	CONCRETE
----	GRAVEL
----	ASPHALT
----	A226-700 PILE
----	A326-700 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
FINAL 100% REMEDIAL DESIGN
HARRIS COUNTY, TEXAS**

3	100% EPA REVIEW	DS	SC	07/17/2024
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No.	Issue	Drawn	Approved	Date
Drawn	DS	Designer KM		

Drafting Check	MW	Design Check	SC
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Project Coordinator	CM	Date	Jul 17, 2024
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Original Size

Arch D

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0  1"

Project No. 11215702

Title

**STRUCTURAL
LAYOUT PLAN**

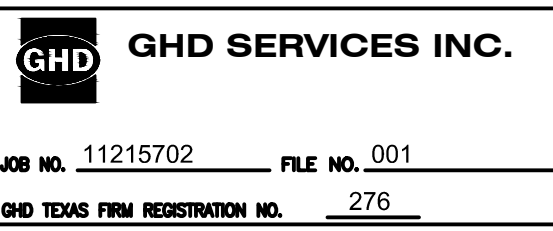
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S-02

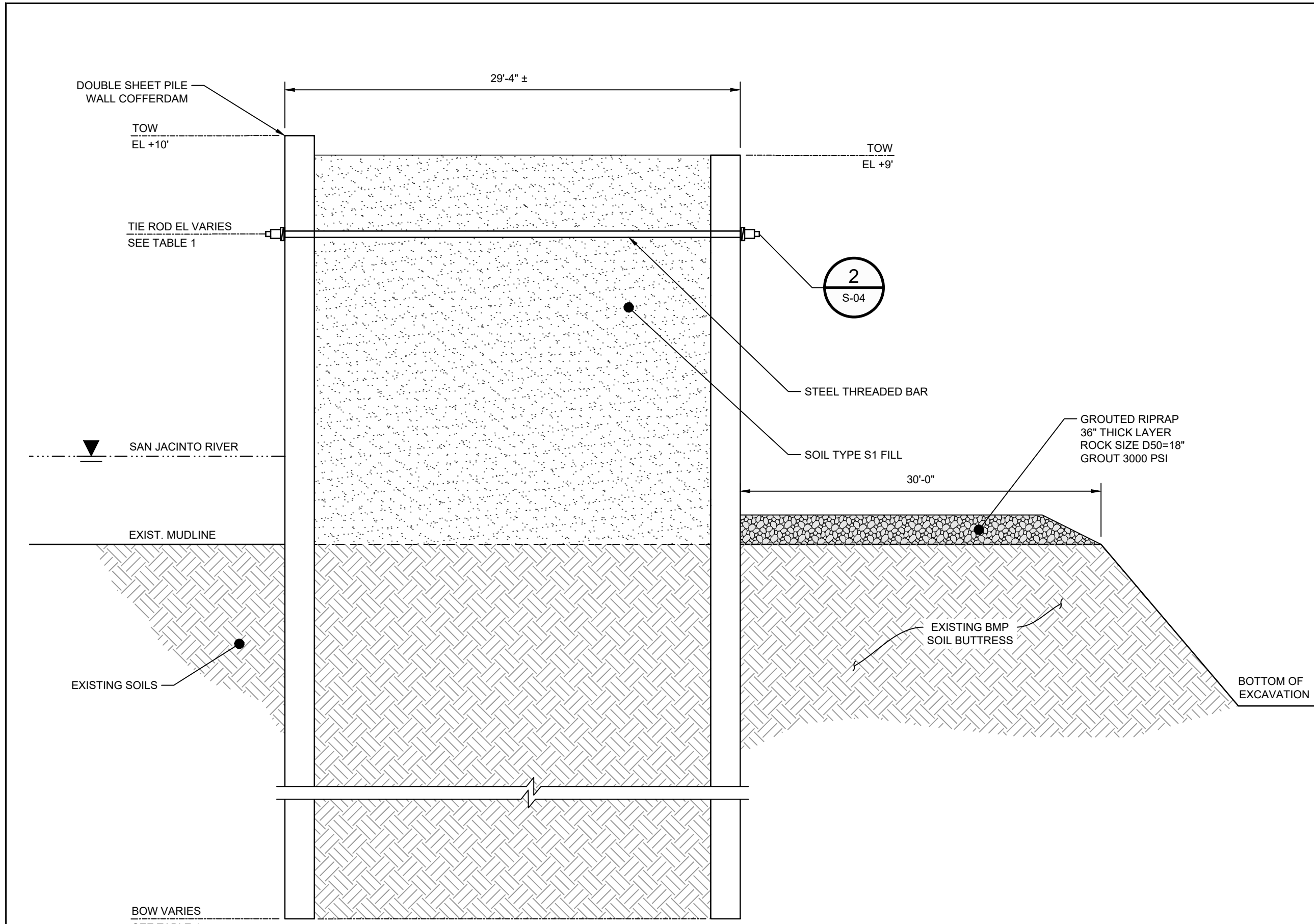
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SOURCE: TOPOGRAPHIC, HYDROGRAPHIC, & MAGNETOMETER
SURVEY OF SAN JACINTO RIVER WASTE PITS, HARRIS COUNTY,
TEXAS. MORRISON SURVEYING INC., 190608 , JULY 8, 2019 TO
AUGUST 2, 2019
UPDATED BATHYMETRY DATA PROVIDED BY ANCHOR QEA
OCTOBER 2021

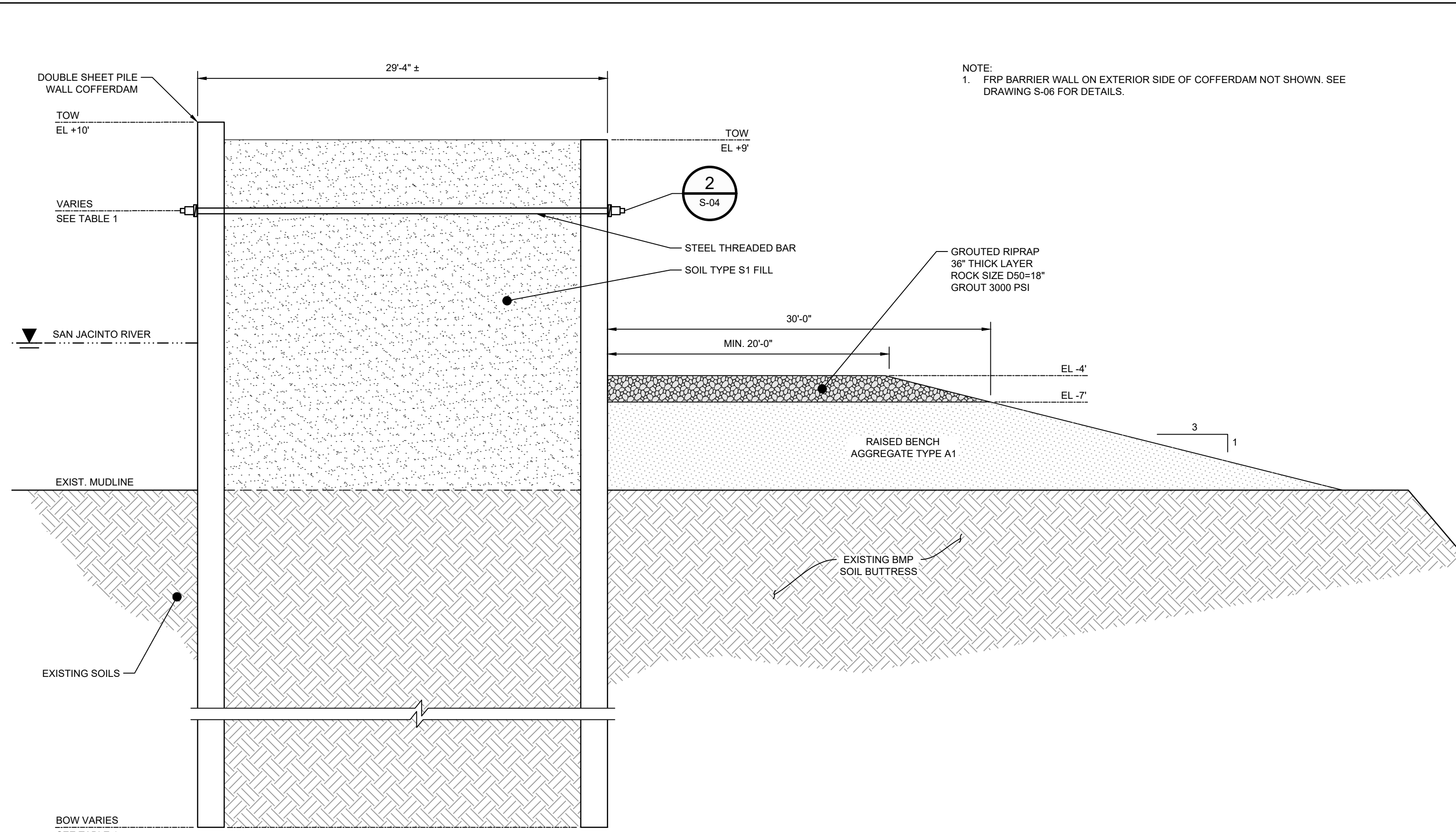
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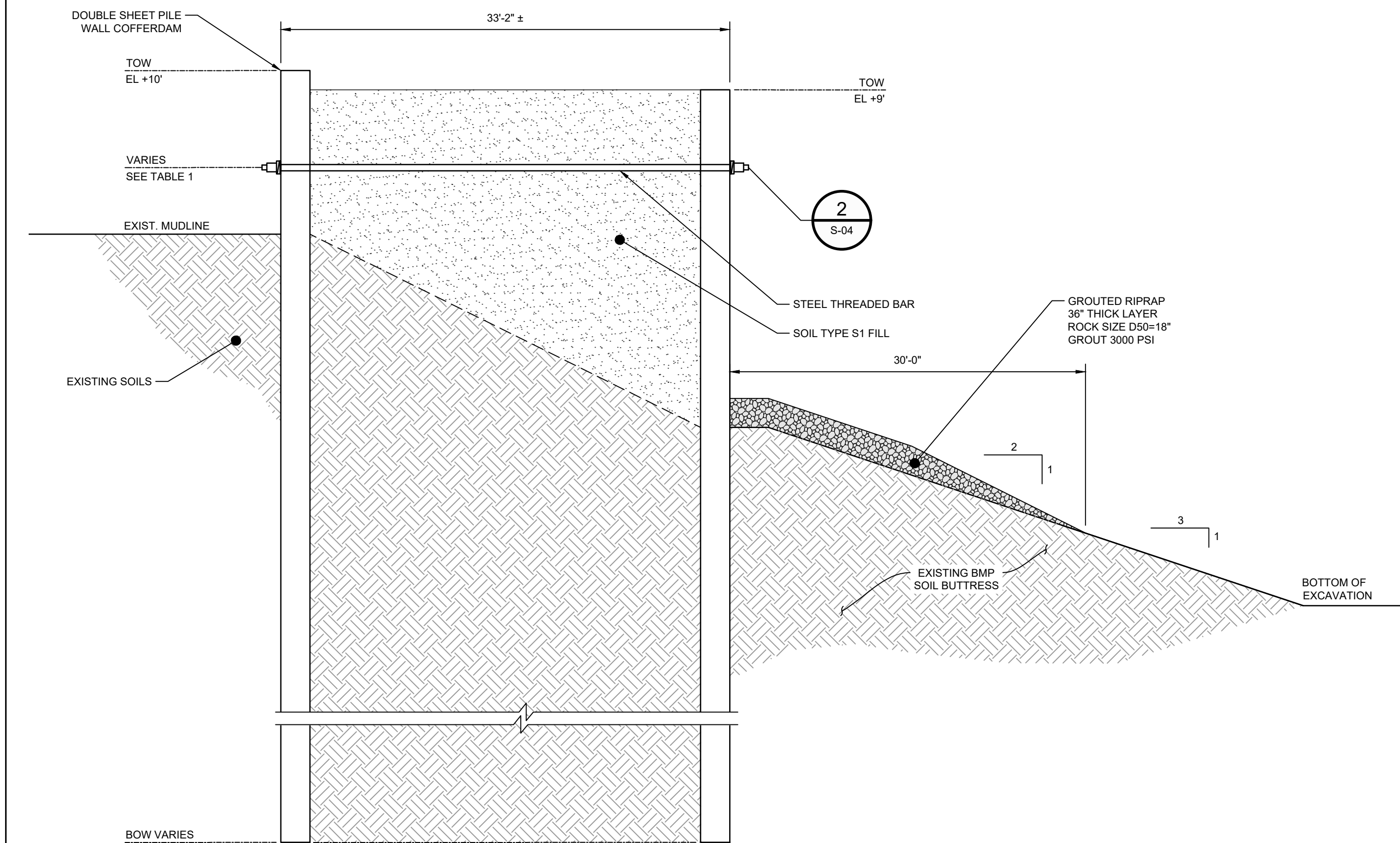
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DETAIL **A** TYPICAL WALL SECTION
N.T.S. S-01



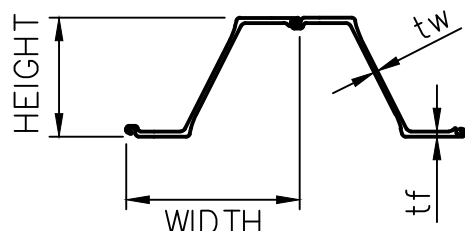
DETAIL **B** TYPICAL WALL SECTION
N.T.S. S-01



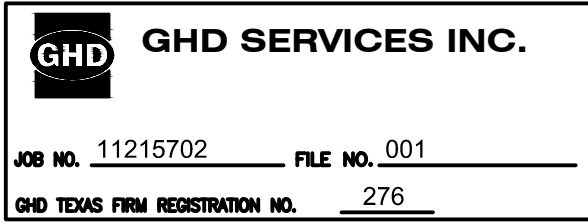
DETAIL **C** TYPICAL WALL SECTION
N.T.S. S-01

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

MINIMUM STEEL SHEET PILE									
SSP SECTION	ASTM	YIELD STRENGTH (KSI)	WIDTH w (IN)	HEIGHT h (IN)	THICKNESS (IN)		WEIGHT		ELASTIC MODULUS (IN 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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**SAN JACINTO RIVER
WASTE PITS**

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

3	100% EPA REVIEW	DS	SC	07/17/2024
2	90% EPA REVIEW	DS	SC	06/27/2022

No.	Issue	Drawn	Approved	Date
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Drawn **DS** Designer **KM**

Drafting Check **MW** Design Check **SC**

Project Coordinator **CM** Date **Jul 17, 2024**

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

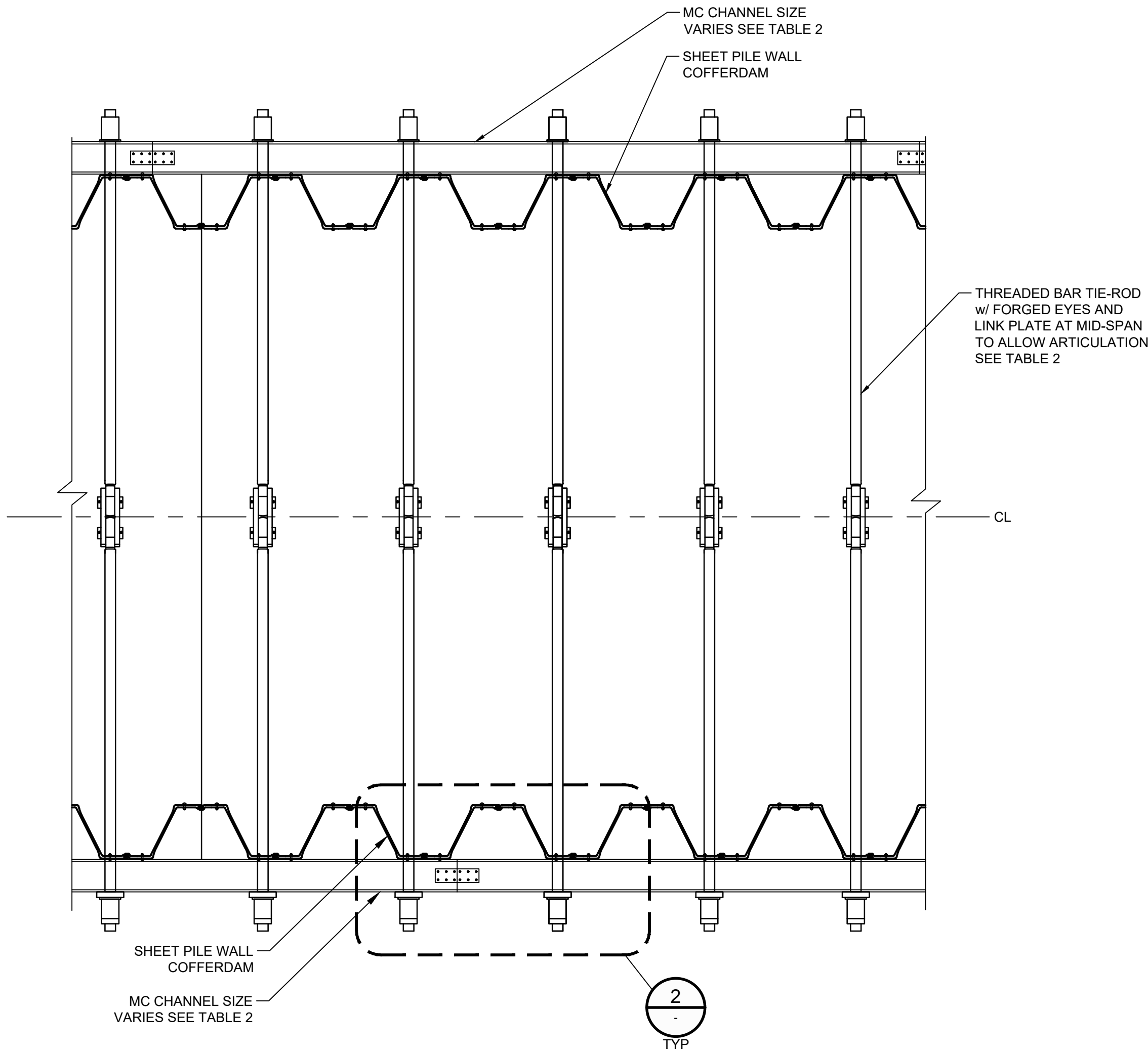
Project No. **11215702**

Title
STRUCTURAL SECTIONS

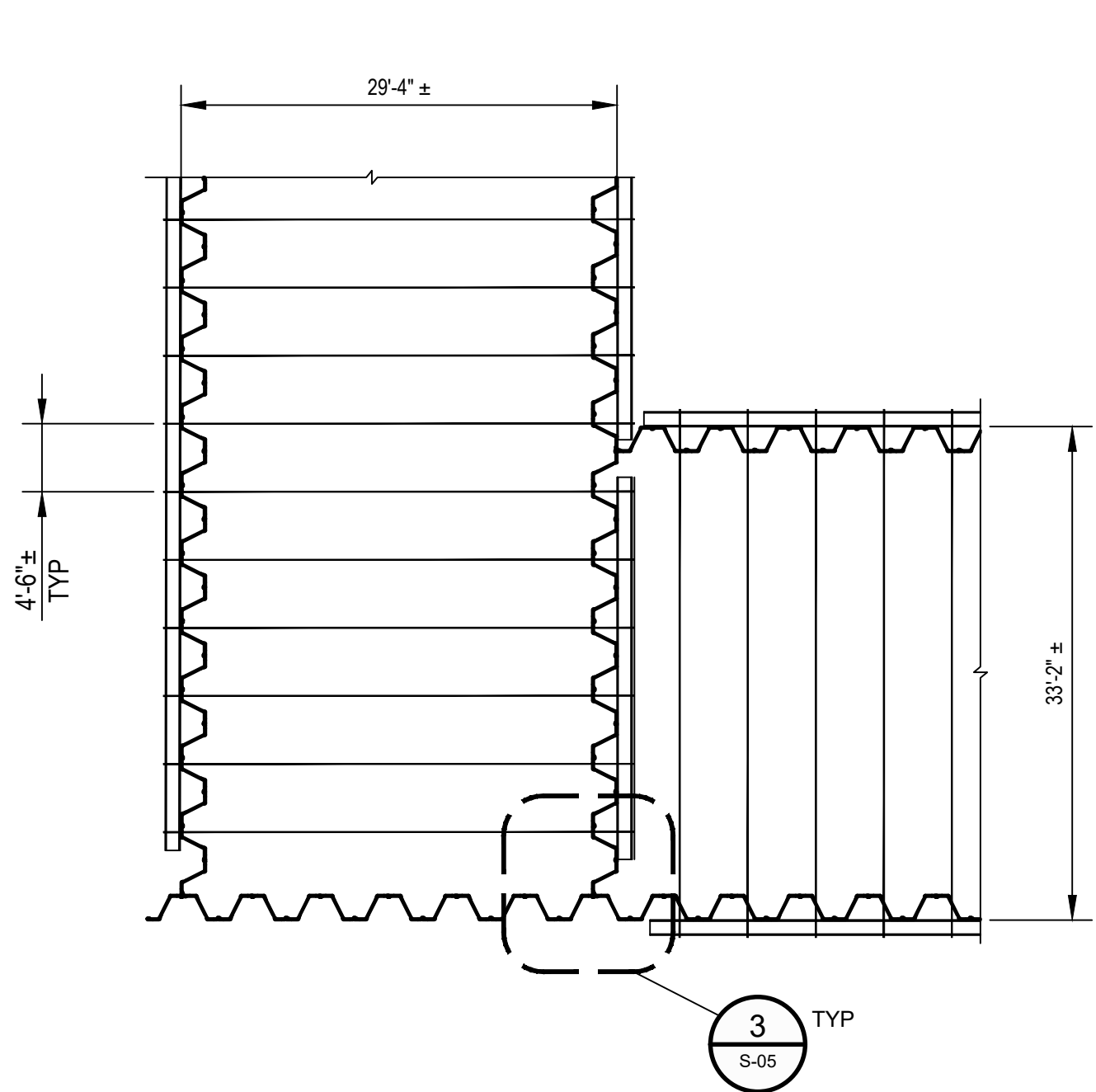
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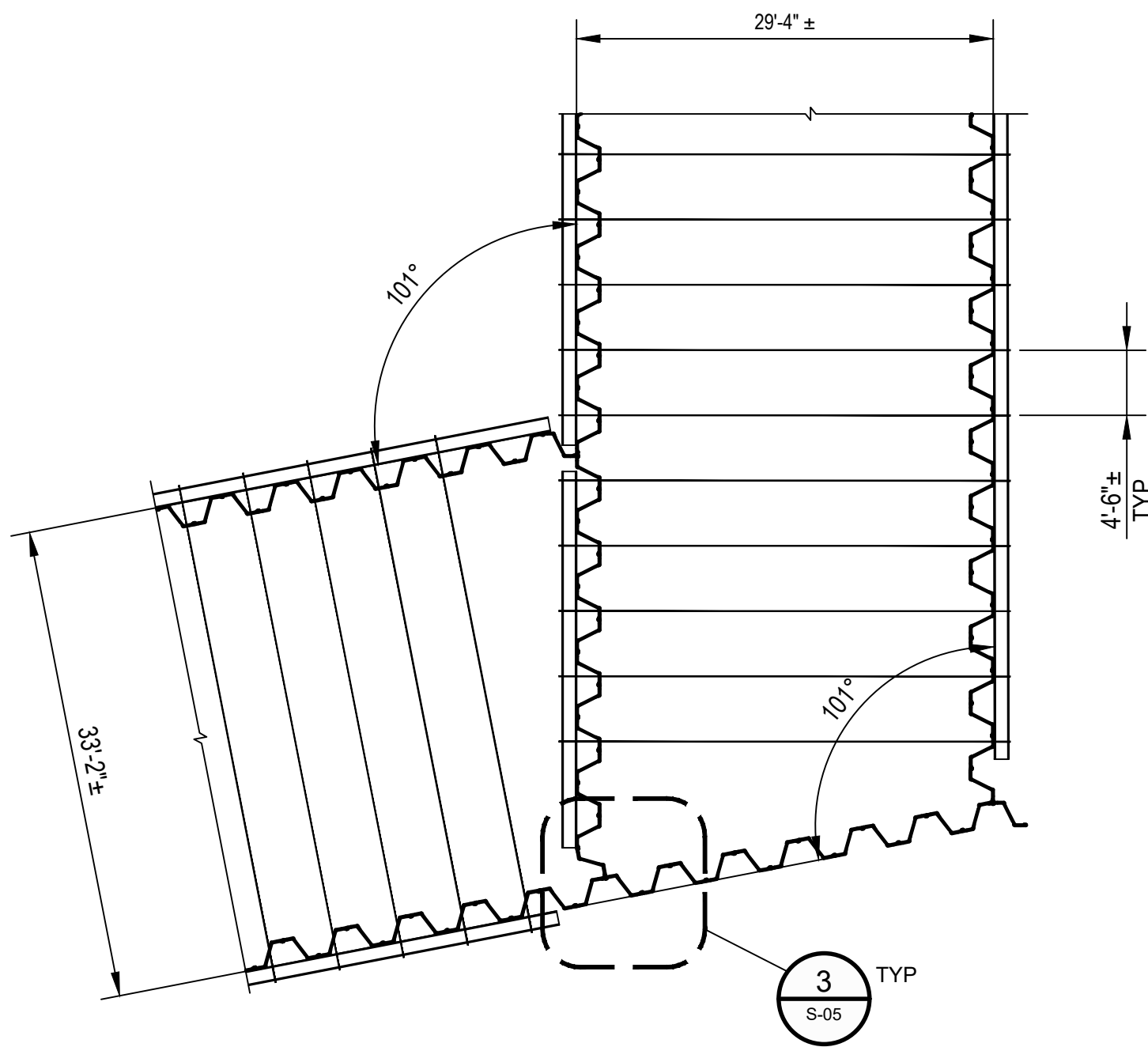
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DETAIL 1 PLAN VIEW
SCALE: 1"=3'-0"



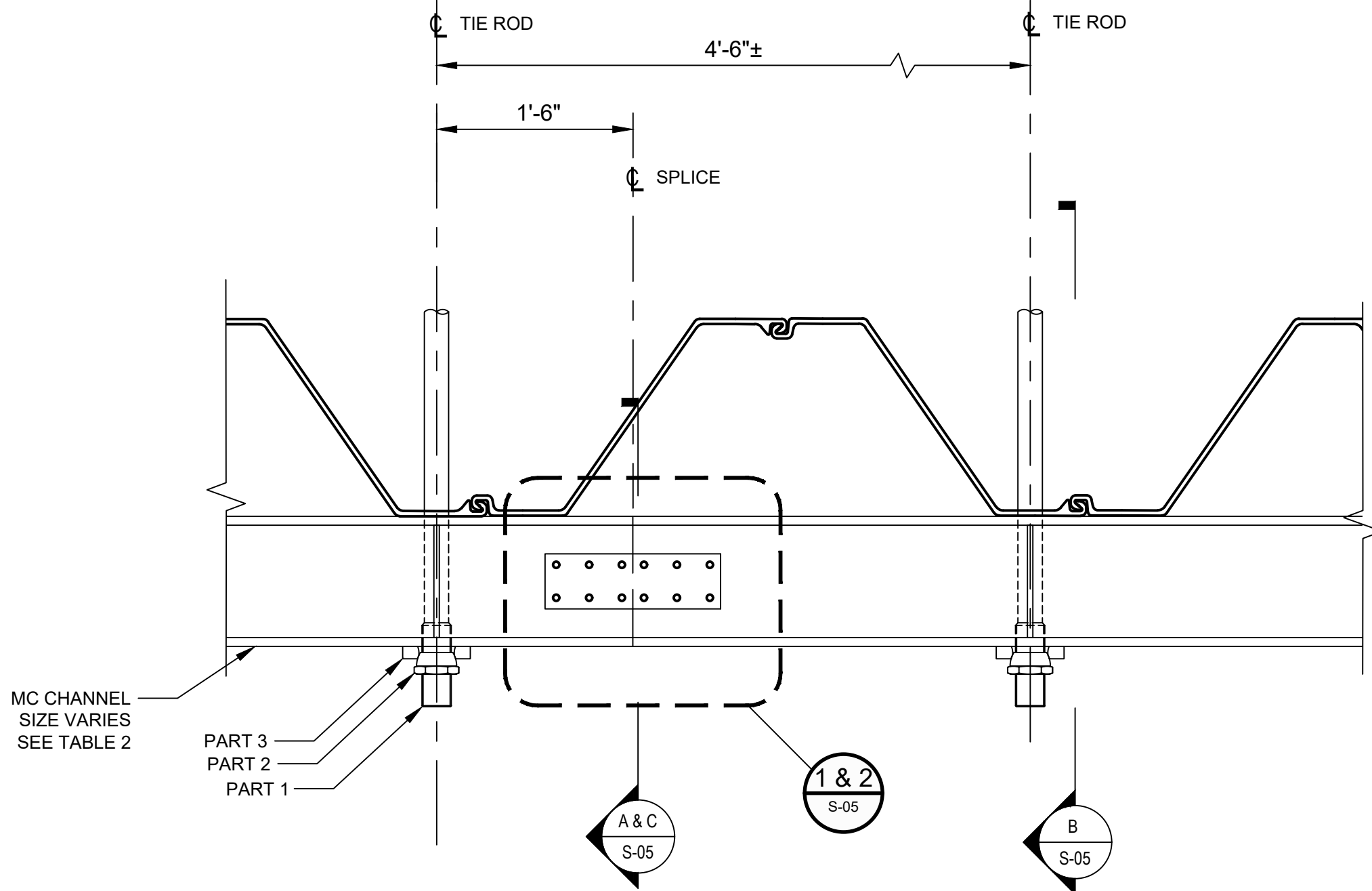
DETAIL 3 PLAN VIEW
SCALE: 3/32"=1'-0"



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

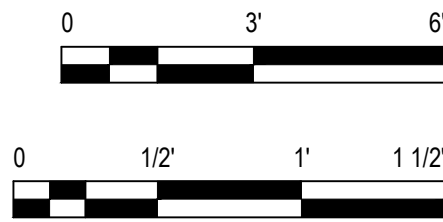
TABLE 2				
WALL SEGMENT	TIE ROD NOMINAL DIAMETER PART 1 (IN)	TIE ROD SPHERICAL NUT O.D. PART 2 (IN)	SPHERICAL BEARING PLATE PART 3 (IN)	WALER SECTION
C1	2.25	4 1/8"	6 1/4" X 7 3/4" X 1 1/8"	MC12 x 35
C2	3.00	4 3/4"	7" X 9" X 1 1/2"	MC18 x 45.8
C3	2.25	4 1/8"	6 1/4" X 7 3/4" X 1 1/8"	MC12 x 35
C4	2.25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

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



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

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



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WASTE PITS**

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

3 100% EPA REVIEW DS SC 07/17/2024

2 90% EPA REVIEW DS SC 08/27/2022

No. Issue Drawn Approved Date

Drawn DS Designer KM

Drafting Check MW Design Check SC

Project Coordinator CM Date Jul 17, 2024

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Original Size Scale AS SHOWN

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Project No. 11215702

Title

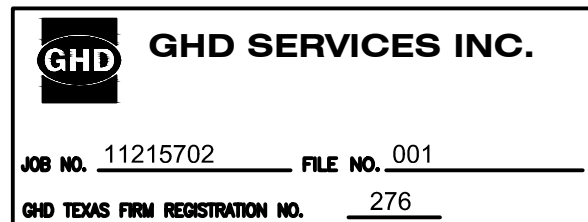
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DETAILS 1 of 2**

Sheet No.

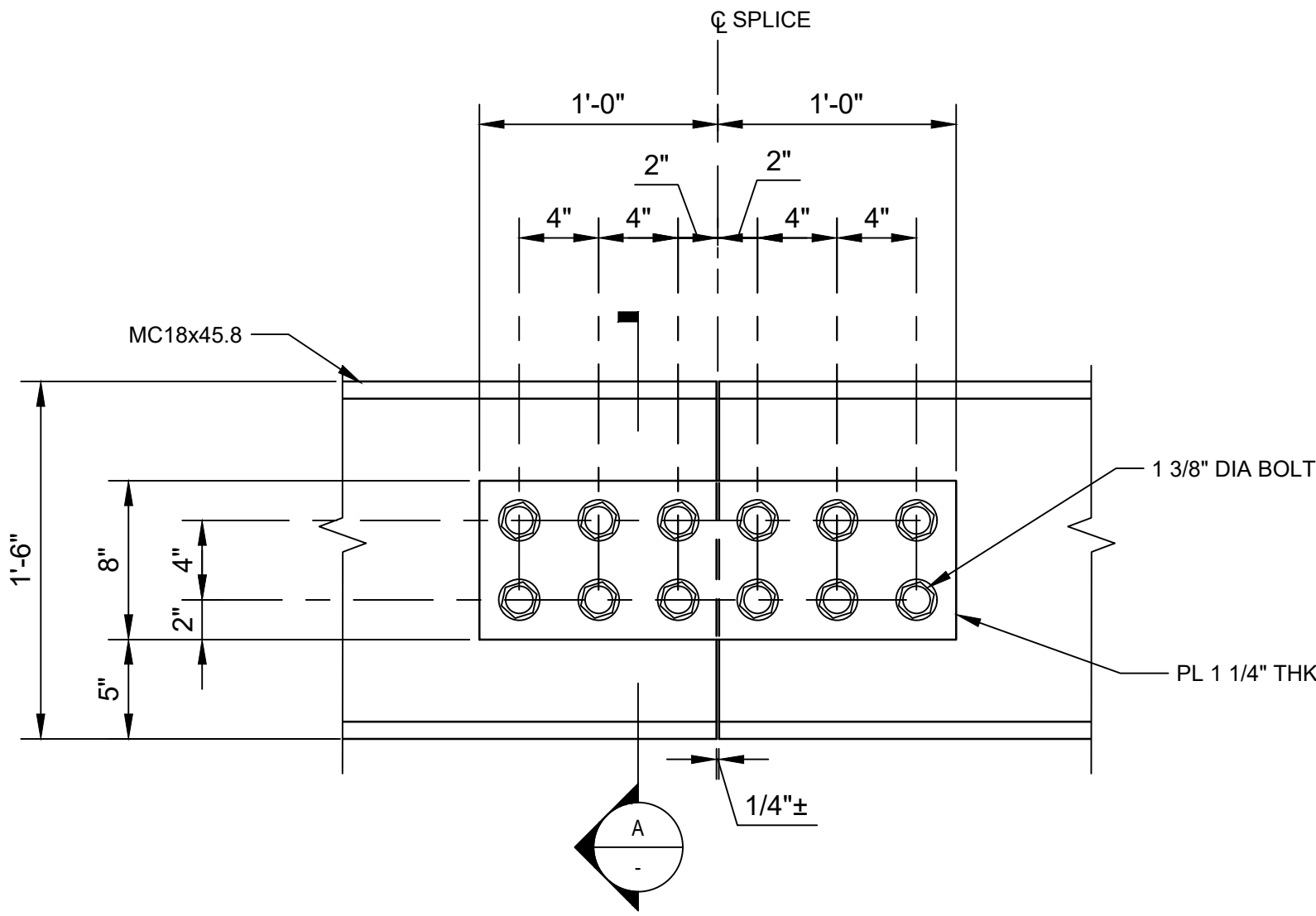
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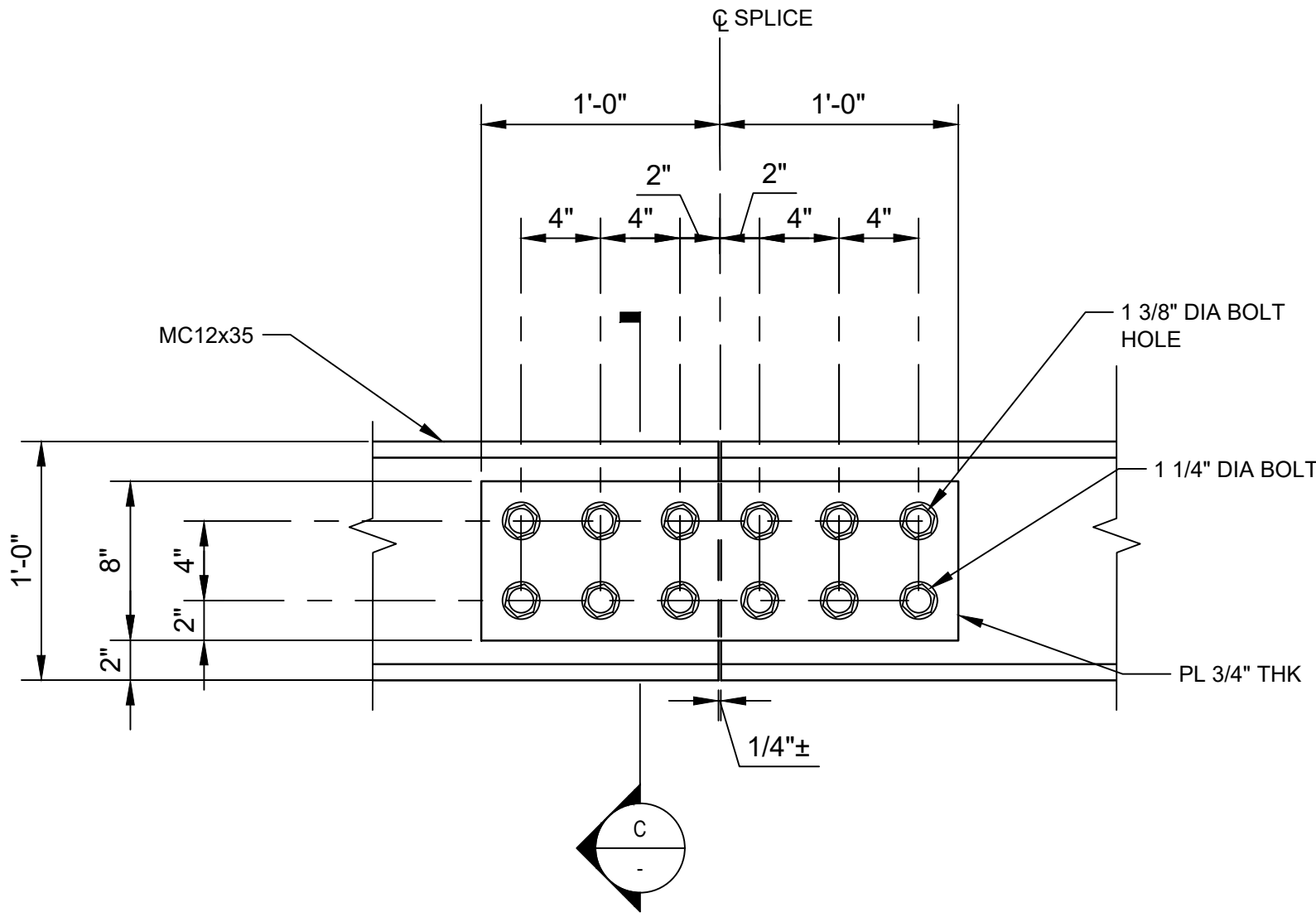
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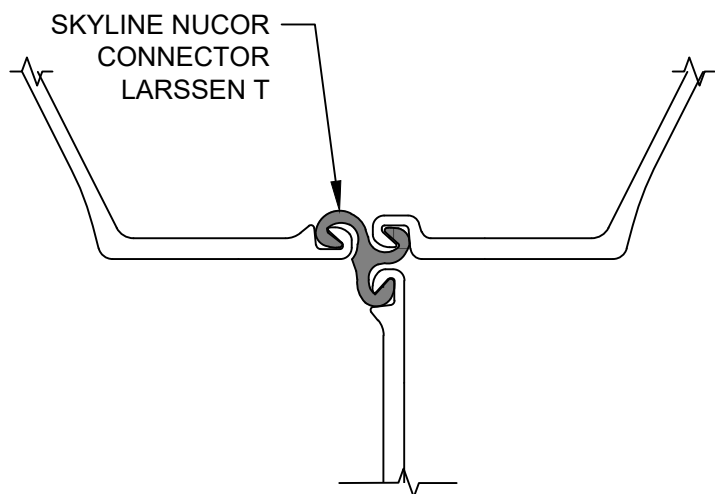
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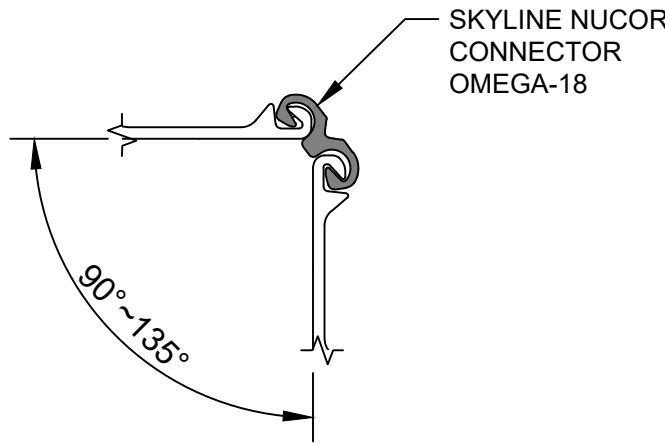
DETAIL 1 PLAN - SPLICE CONNECTION - WALER MC 18X45.8
SCALE: 1 1/2"=1'-0"



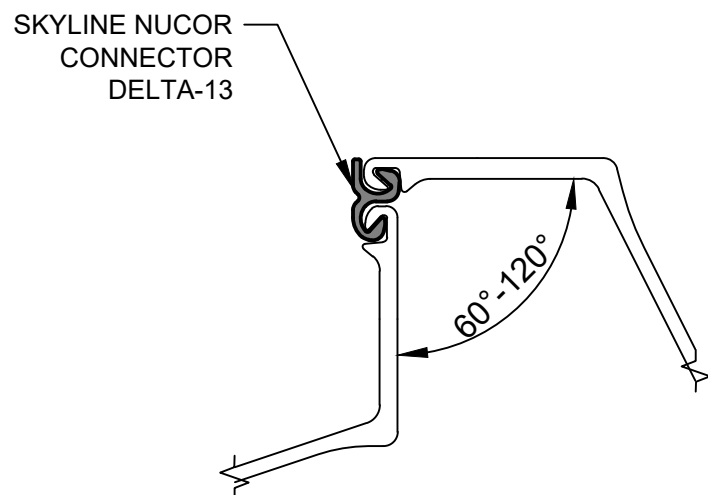
DETAIL 2 PLAN - SPLICE CONNECTION - WALER MC 12X35
SCALE: 1 1/2"=1'-0"



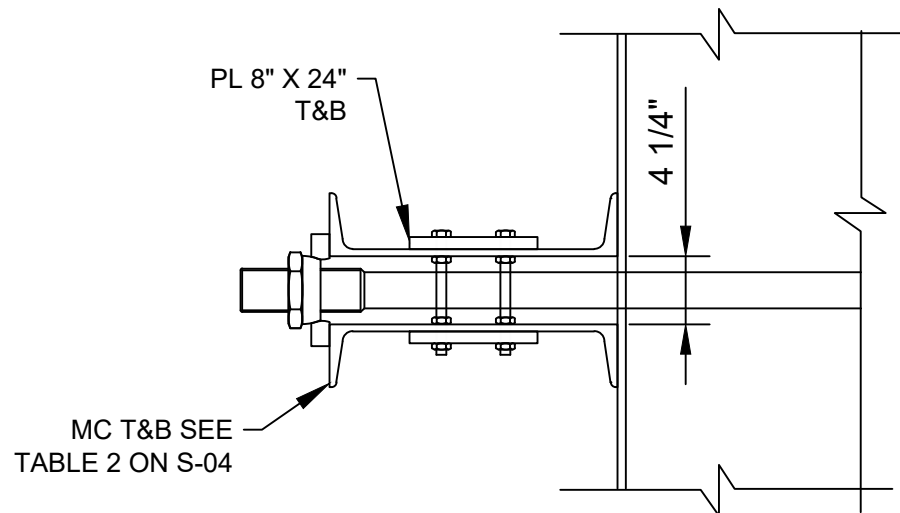
DETAIL 3 THREE SHEET PILE CONNECTOR
SCALE: NTS



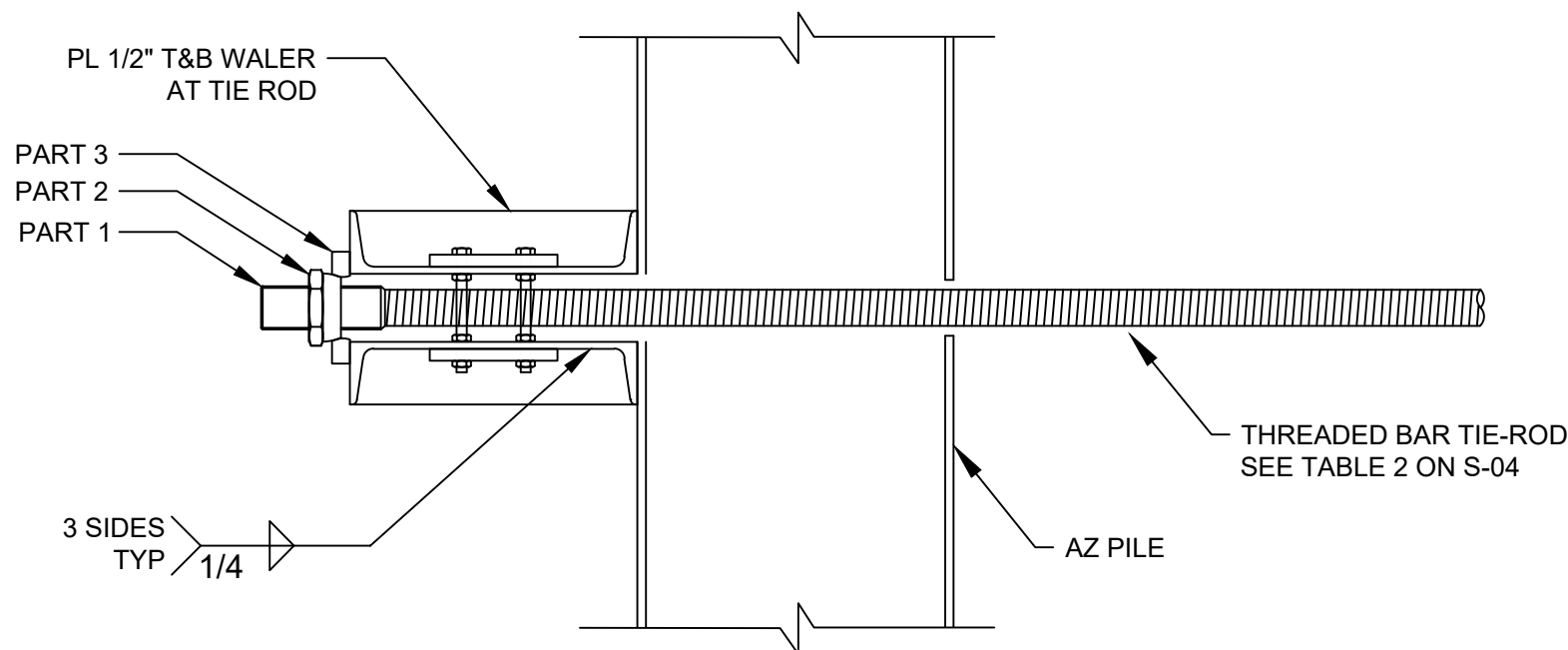
DETAIL 4 CORNER CONNECTOR ALTERNATIVE A
SCALE: NTS



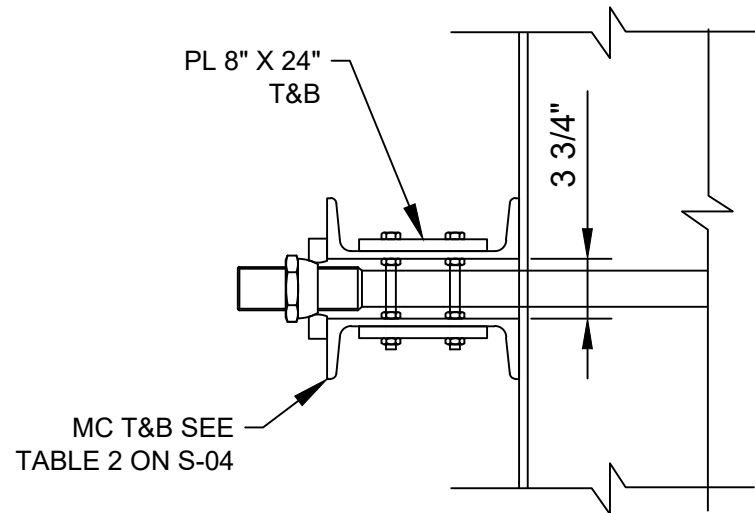
DETAIL 5 CORNER CONNECTOR ALTERNATIVE B
SCALE: NTS



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

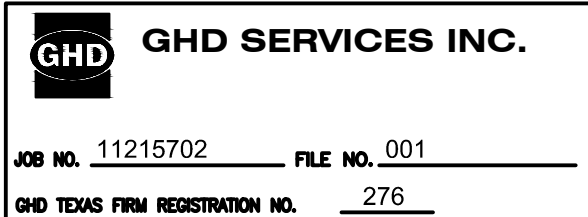


SECTION B TIE ROD CONNECTION
SCALE: 1"=1'-0"



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

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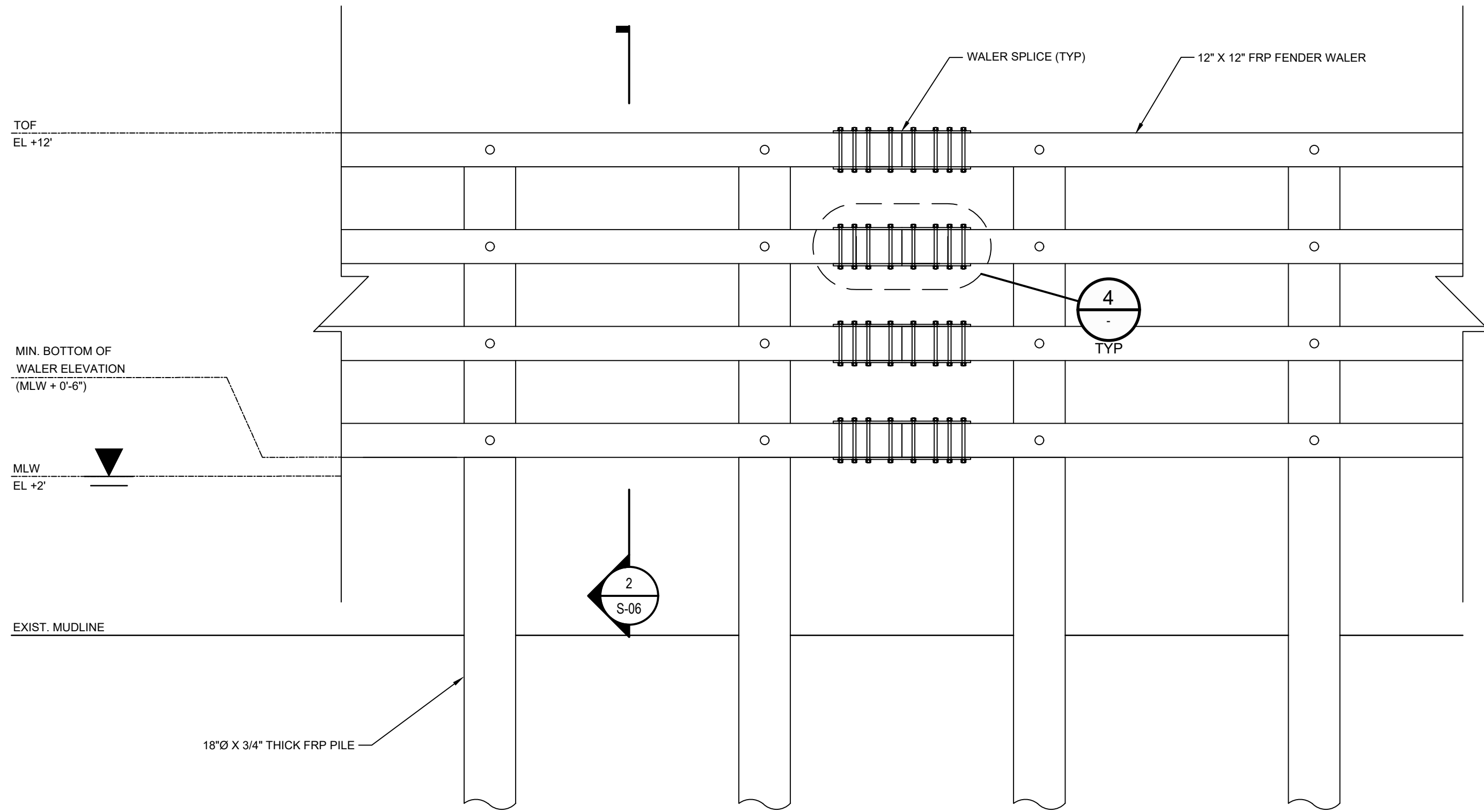
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STRUCTURAL DETAILS 2 OF 2

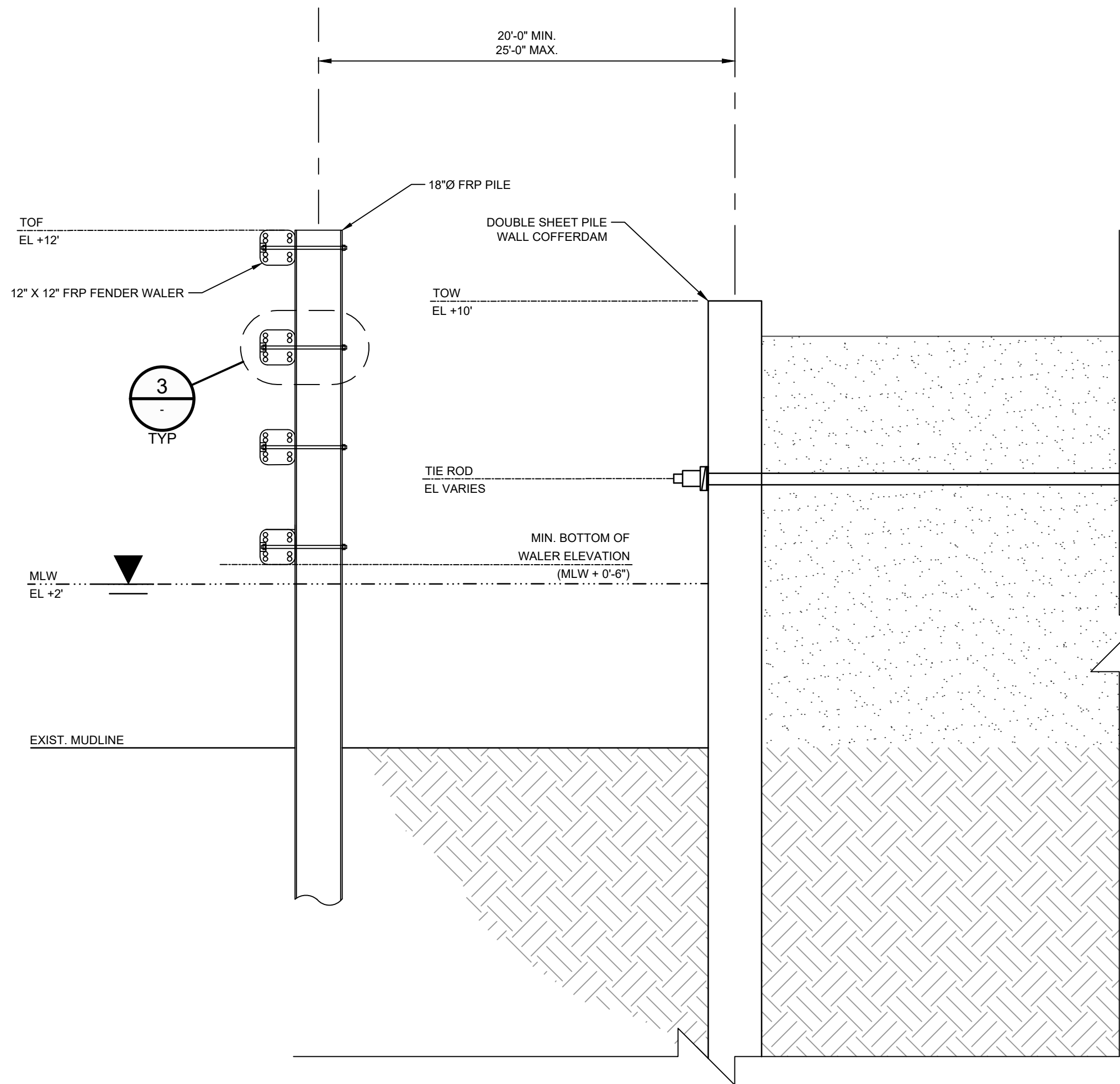
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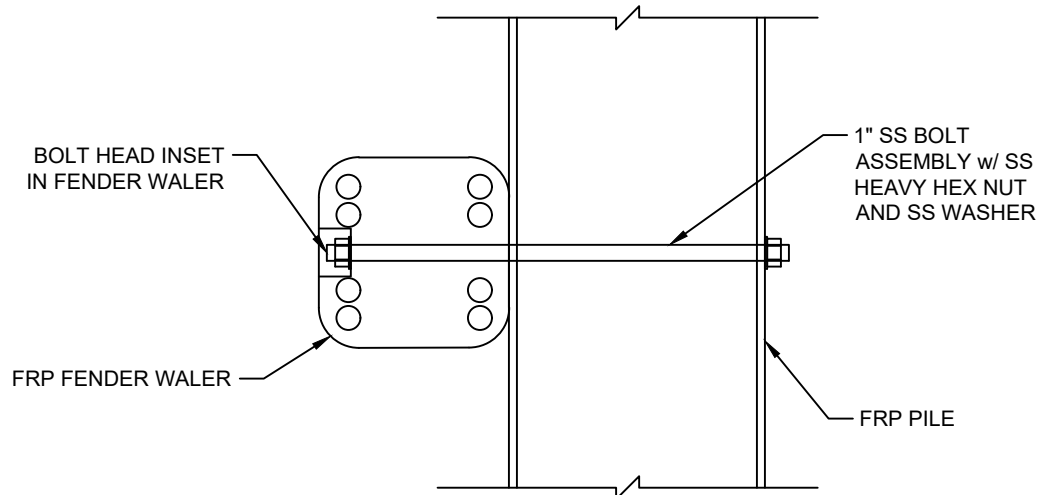
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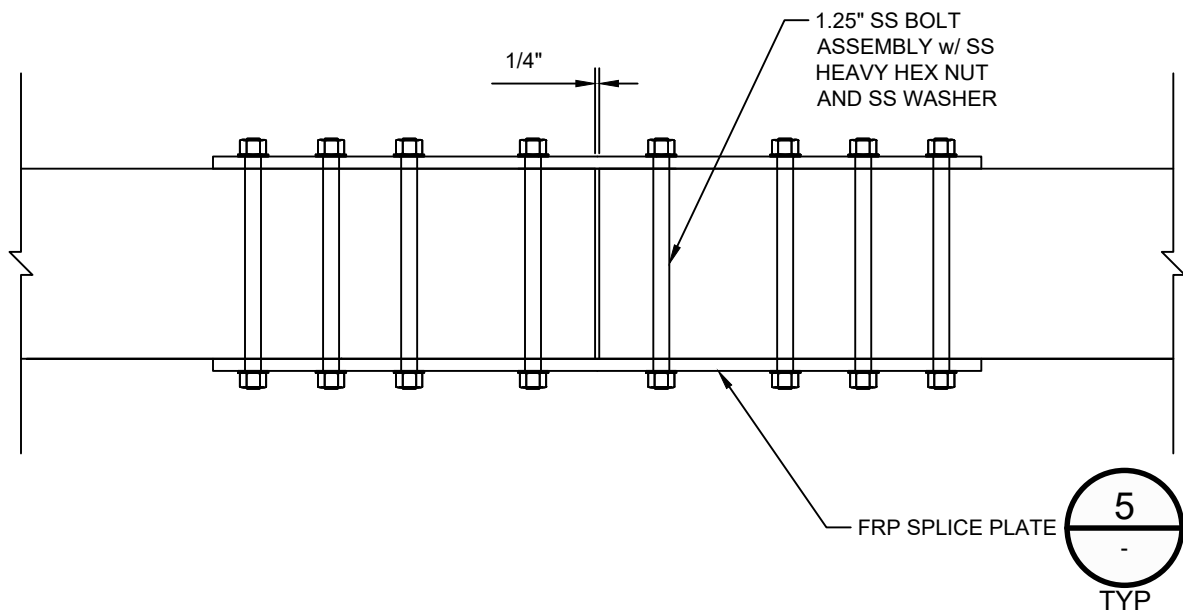
DETAIL 1 TYPICAL FRP BARRIER ELEVATION
SCALE: 1"=3'-0"



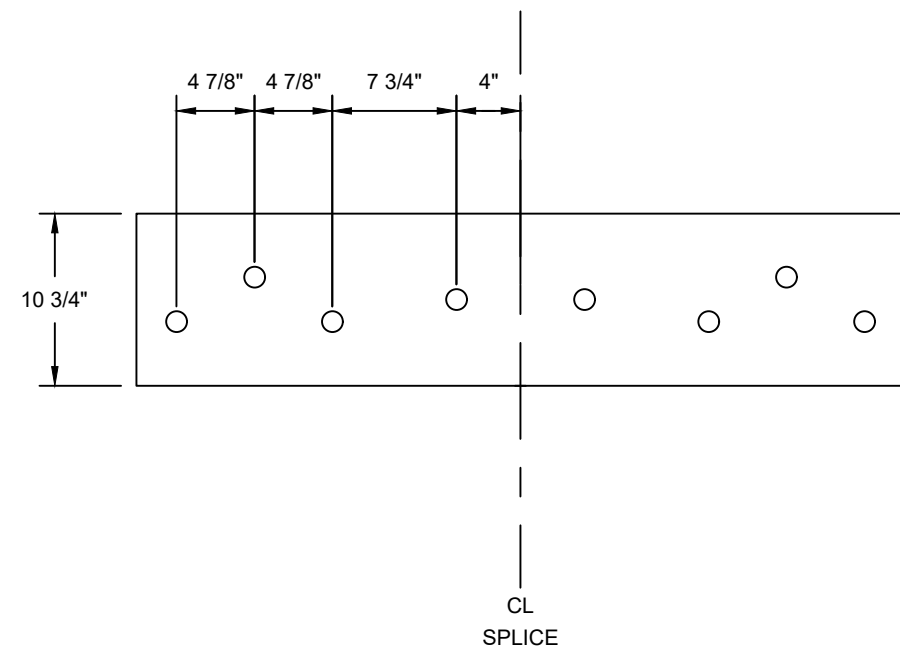
DETAIL 2 TYPICAL FRP BARRIER SECTION
SCALE: 1"=3'-0"



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



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



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

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GHD SERVICES INC.

JOB NO. 11215702

FILE NO. 001

GHD TEXAS FIRM REGISTRATION NO. 276

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WASTE PITS**

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FINAL 100% REMEDIAL DESIGN
HARRIS COUNTY, TEXAS**

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Arch D				

Project No. 11215702

Title
FRP BARRIER WALL

Sheet No.

S-06

Sheet - of -

GENERAL INSTRUMENT SYMBOLS

LOCALLY MOUNTED INSTRUMENTS

PRIMARY PANEL MOUNTED INSTRUMENTS

AUXILIARY PANEL MOUNTED INSTRUMENT (* = PANEL No.1,2,3 ETC.)

BEHIND PANEL MOUNTED INSTRUMENTS

INSTRUMENTS SHARING COMMON HOUSING

PILOT LIGHT
A = AMBER R = RED
B = BLUE W = WHITE
C = CLEAR Y = YELLOW
G = GREEN

INLINE INSTRUMENT/SENSOR

INLINE SENSOR WITH INTEGRAL TRANSMITTER

INLINE SENSOR WITH REMOTE TRANSMITTER

SENSOR WITH INTEGRAL TRANSMITTER

SENSOR WITH REMOTE TRANSMITTER

SPECIALTY PART

TIE-POINT

DISTRIBUTED CONTROL / SHARED DISPLAY INSTRUMENTS

PRIMARY PROCESS CONTROL SYSTEM - USUALLY USED TO INDICATE VIDEO DISPLAY OR HMI. (NORMALLY ACCESSIBLE TO OPERATOR)

BLIND OPERATION (NOT NORMALLY ACCESSIBLE TO OPERATOR)

SECONDARY LOGIC CONTROLLER OR PLC (NORMALLY ACCESSIBLE TO OPERATOR) (* = PANEL No.1,2,3 ETC.)

BLIND OPERATION (NOT NORMALLY ACCESSIBLE TO OPERATOR)

TIE POINT

PRIMARY ELEMENT SYMBOLS

FX

FLOW STRAIGHTENING VANES

PI

DIAPHRAGM SEAL WITH PRESSURE LEAD LINE

PI

DIAPHRAGM SEAL (LINE-MOUNTED)

TW ...

THERMOWELL, THREADED CONNECTION

TW ...

THERMOWELL, FLANGED CONNECTION

TIT ...

TE ...

TEMPERATURE TRANSMITTER INTEGRAL TO SENSOR THREADED INTO THERMOWELL

TW ...

TE ...

TEMPERATURE TRANSMITTER REMOTE FROM SENSOR THREADED INTO THERMOWELL

TW ...

FG

FLOW SIGHT GLASS (LG - LEVEL SIGHT GLASS, SG - GENERAL SIGHT GLASS)

FICV

VARIABLE AREA FLOWMETER WITH INTEGRAL MANUAL ADJUSTING VALVE (SHOWN ON INPUT PORT)

XY ...

SIGNAL CONVERTER (INPUT/OUTPUT)
*E = VOLTAGE P = PNEUMATIC
I = CURRENT B = BINARY (MODBUS, RS485)

pH, ORP, PROBE (DUAL ELEMENT SENSING PROBE)

CONDUCTIVITY, MOISTURE, PROBE (SINGLE ELEMENT SENSING PROBE)

ORIFICE PLATE IN QUICK-CHANGE FITTING

STANDARD PITOT TUBE

AVERAGING PITOT TUBE

TURBINE/PROPELLER FLOW SENSOR

TARGET FLOW SENSOR

MAGNETIC FLOW SENSOR

POSITIVE DISPLACEMENT FLOW SENSOR

THERMAL MASS FLOW SENSOR

SONIC/ULTRASONIC FLOW SENSOR

VORTEX SHEDDING FLOW SENSOR

CORIOILLIS FLOW SENSOR

PRIMARY ELEMENT SYMBOLS (CONT'D)

OPEN CHANNEL WEIR PLATE

OPEN CHANNEL FLUME

DISPLACER INTERNALLY MOUNTED IN VESSEL

BALL FLOAT INTERNALLY MOUNTED IN VESSEL

DIP TUBE OR OTHER PRIMARY ELEMENT AND STILLING WELL

VENTURI TUBE

FLOW NOZZLE

FLOW TUBE

ORIFICE PLATE (FO) OR RESTRICTION ORIFICE (RO)

PROCESS / INSTRUMENT LINES

IA

IA MAY BE REPLACED WITH PA-PLANT AIR, NS-NITROGEN, OR GS-ANY GAS SUPPLY

PRIMARY PROCESS FLOW LINE

SECONDARY PROCESS FLOW LINE

PNEUMATIC SIGNAL

ELECTRICAL SIGNAL

HYDRAULIC SIGNAL

CAPILLARY TUBE, FILLED SYSTEM

ELECTROMAGNETIC OR SONIC SIGNAL (GUIDED)

ELECTROMAGNETIC OR SONIC SIGNAL (NOT GUIDED)

INTERNAL SYSTEM LINK (SOFTWARE OR DATA LINK)

EXTERNAL SYSTEM LINK (SOFTWARE OR DATA LINK)

MECHANICAL LINK

TO / FROM SHEET No.

UTILITY

UTILITY IN/OUT

VALVE SYMBOLS

GATE

GLOBE

CHECK

ANGLE

3 WAY

4 WAY

BUTTERFLY

BALL

PLUG

ECCENTRIC ROTARY DISC

DIAPHRAGM

PINCH

BELLOWS SEALED

UNION

GENERIC DAMPER/LOUVER

VALVE WITH BLIND FLANGE

KNIFE GATE

REDUCER

CLEANOUT

QUILL

SELF-ACTUATED REGULATORS, VALVES, AND OTHER DEVICES

LEVEL REGULATOR WITH MECHANICAL LINKAGE

BACKPRESSURE REGULATOR (SELF CONTAINED)

BACKPRESSURE REGULATOR WITH EXTERNAL TAP (SELF CONTAINED)

PRESSURE REDUCING REGULATOR (SELF CONTAINED)

PRESSURE REDUCING REGULATOR WITH EXTERNAL TAP (SELF CONTAINED)

PRESSURE-REDUCING REGULATOR W/ INTEGRAL OUTLET PRESSURE RELIEF AND/OR PRESSURE GAUGE

PRESSURE RELIEF VALVE

VACUUM RELIEF VALVE

PRESSURE VACUUM RELIEF VALVE

RUPTURE DISC FOR PRESSURE RELIEF

RUPTURE DISC FOR VACUUM RELIEF

MOISTURE TRAP

EQUIPMENT/PIPING SYMBOLS

CENTRIFUGAL PUMP

DIAPHRAGM PUMP

BLOWER

STATIC MIXER

EQUIPMENT INSULATED WITH X" OF INSULATION

REDUCER

SCREW CAP

BLIND FLANGE

FLEXIBLE PIPE

HORN OR SIREN

FILTER/REGULATOR

FILTER/REGULATOR/LUBRICATOR

FLOW CONDITIONER

DRAIN

HOSE CONNECTION

ROTARY PUMP

ACTUATOR SYMBOLS

DIAPHRAGM ACTUATOR

DIAPHRAGM ACTUATOR WITH POSITIONER

PRESSURE-BALANCED DIAPHRAGM ACTUATOR

DOUBLE ACTING PISTON ACTUATOR

PISTON ACTUATOR WITH POSITIONER

ROTARY PISTON ACTUATOR

ROTARY PISTON ACTUATOR WITH POSITIONER

ROTARY MOTOR ACTUATOR

ACTUATOR WITH TOP-MOUNTED OR SIDE-MOUNTED HANDWHEEL

HAND ACTUATOR OR HANDWHEEL

ELECTROHYDRAULIC ACTUATOR

AUTOMATIC RESET ON-OFF SOLENOID ACTUATOR

MANUAL OR REMOTE RESET ON-OFF SOLENOID ACTUATOR

ACTUATOR INDICATIONS

ATO - AIR TO OPEN
ATC - AIR TO CLOSE
FO - FAIL OPEN
FC - FAIL CLOSE
FL - FAIL LOCKED LAST POSITION
FLDO - FAIL LAST POSITION DRIFT OPEN
FLDC - FAIL LAST POSITION DRIFT CLOSE
FI - FAIL INDETERMINATE

INSTRUMENT TO PROCESS/EQUIP. CONNECTIONS

HEAT TRACED LINE

GENERIC INSTRUMENT CONNECTION

SOCKET WELDED CONNECTION

WELDED CONNECTION

FLANGED CONNECTION

THREADED CONNECTION

MISCELLANEOUS SYMBOLS

WL

WATER LEVEL

AIT ### TB

TURBIDITY INDICATING INSTRUMENT

AIT ### pH

pH INDICATING INSTRUMENT

FCV ###

MOTORIZED FLOW CONTROL VALVE

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JOB NO. 11215702 FILE NO. 001

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Client
SAN JACINTO RIVER WASTE PITS

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

1	100% EPA SUBMITTAL	RH		07/17/2024
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Project No. 11215702

Title
WATER TREATMENT SYSTEM PROCESS FLOW DIAGRAM SYMBOLS

Sheet No.

P-000A

Sheet - of -



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

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

Sheet No.

P-000B

Sheet - of -

TYPICAL INTERNATIONAL SOCIETY OF AUTOMATION LETTER COMBINATIONS

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

NOTE: THIS TABLE IS NOT ALL-INCLUSIVE.

OTHER POSSIBLE COMBINATIONS:

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

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

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

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

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

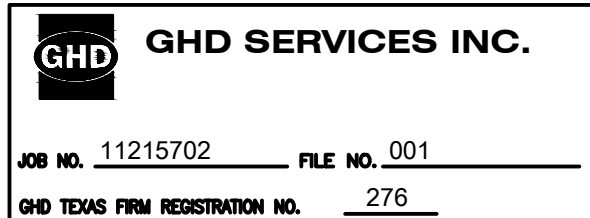
PIPE MATERIAL INDEX
SEE PIPING SPECIFICATIONS FOR DETAILS

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

PIPE INSULATION CODE INDEX
SEE PIPING SPECIFICATIONS FOR DETAILS

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

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**SAN JACINTO RIVER
WASTE PITS**

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

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No.	Issue	Drawn	Approved	Date
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Drafting Check		Design Check	NF	
Project Coordinator	LL	Date	July 17, 2024	
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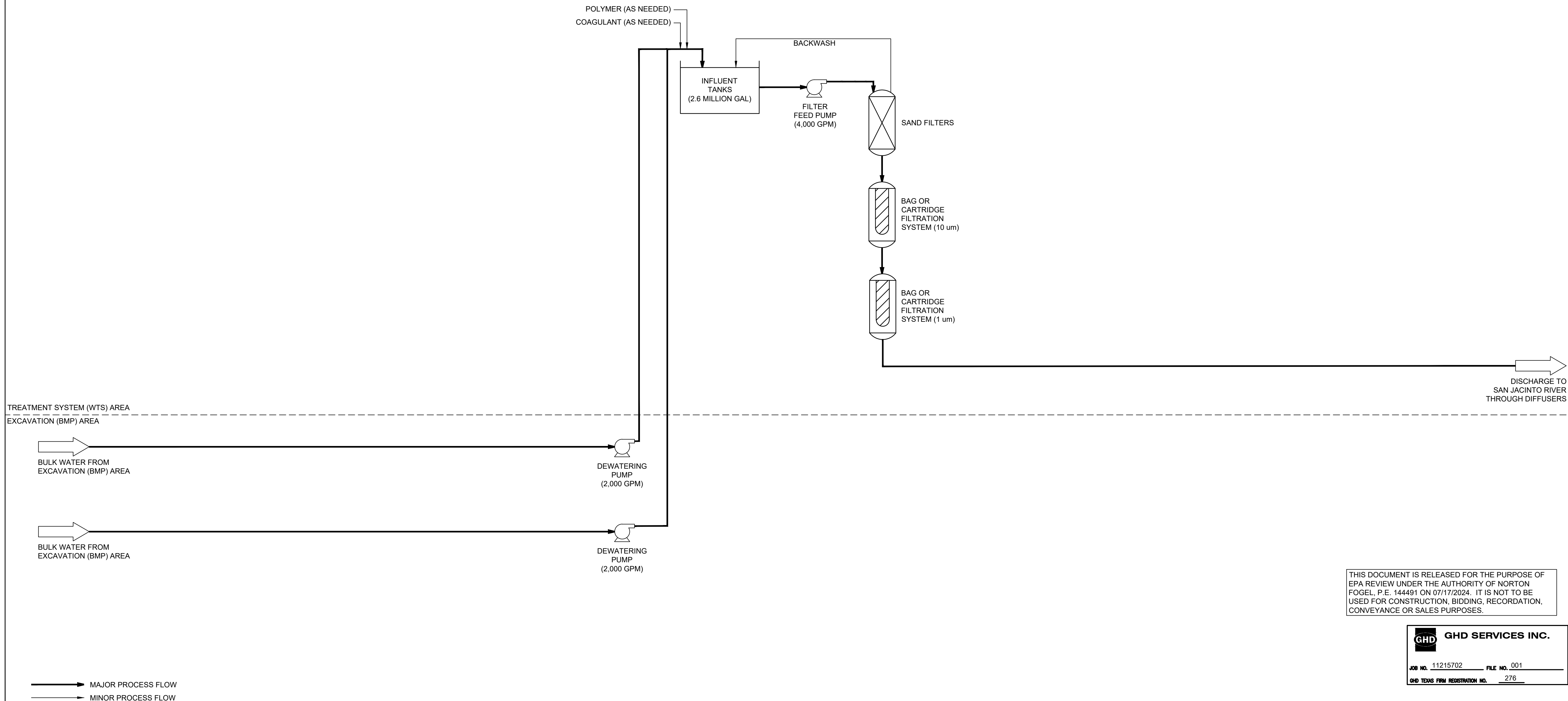
Project No. 11215702

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

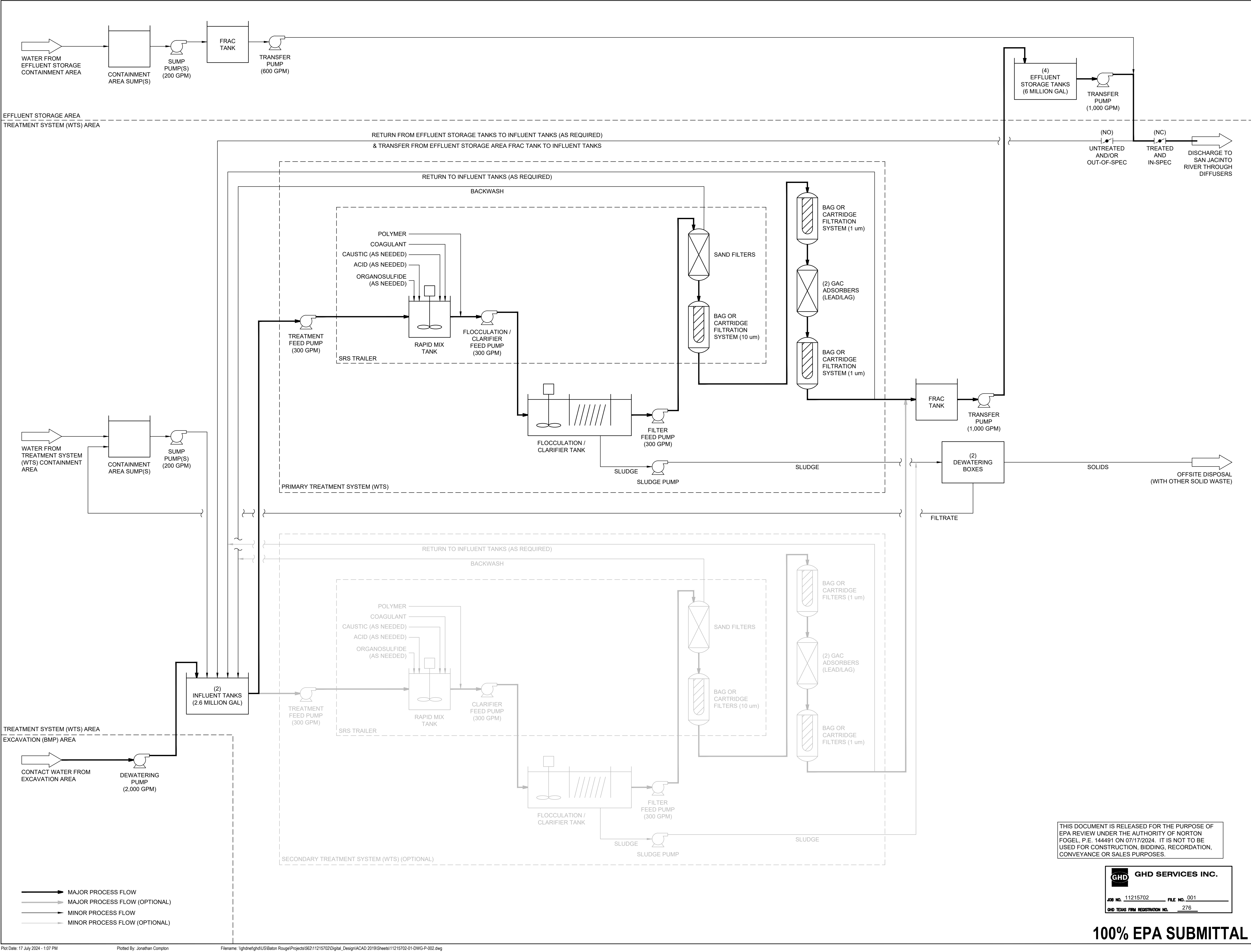
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NORTHERN IMPOUNDMENT FINAL 100% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

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Drawn RHDesigner NF

Drafting CheckDesign CheckNF

Project Coordinator LLDate July 17, 2024

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Project No. 11215702

Title
WATER TREATMENT SYSTEM PROCESS FLOW DIAGRAM (CONTACT WATER)

Sheet No.
P-002

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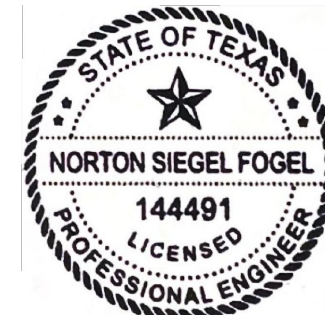
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HARRIS COUNTY, TEXAS**

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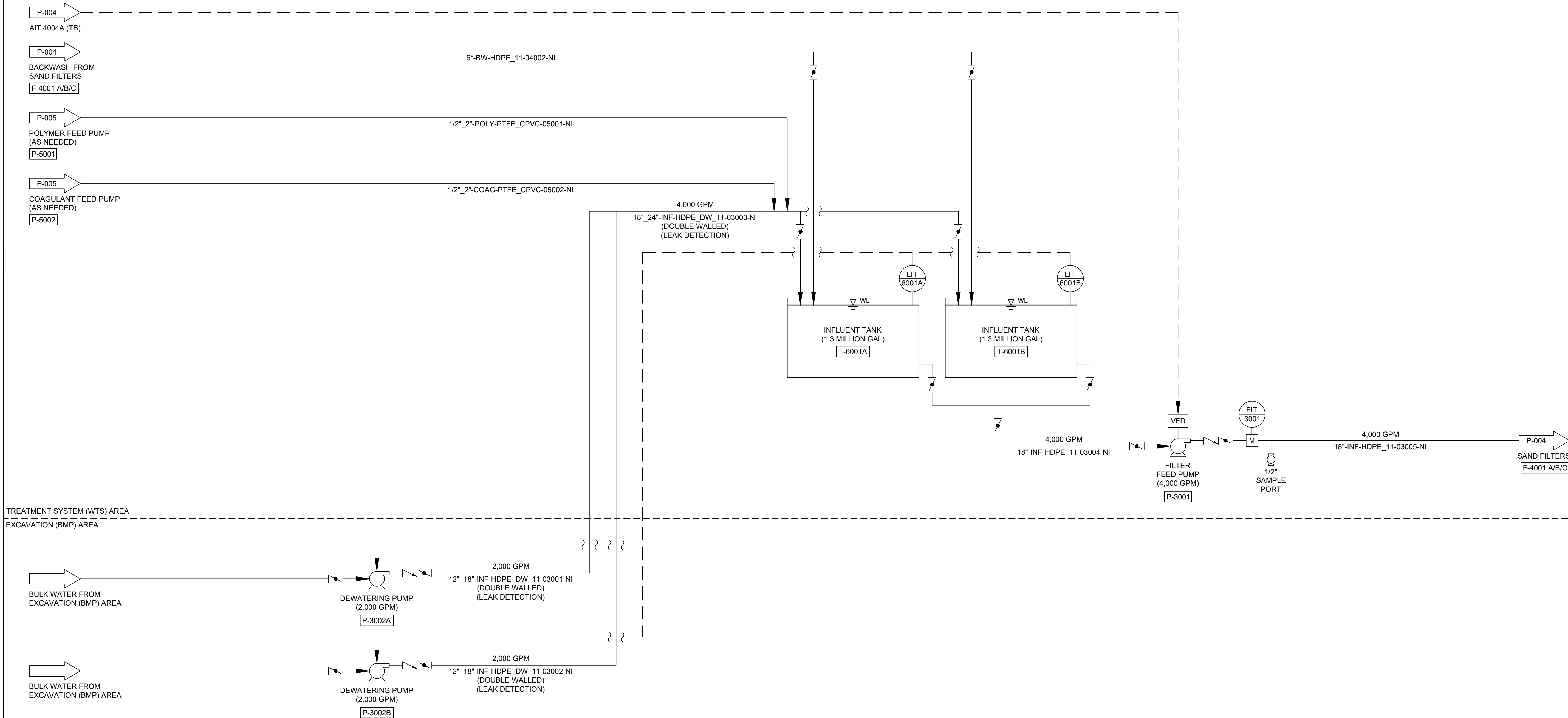
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Title
**WATER TREATMENT SYSTEM
P&ID (BULK WATER)
(1 OF 3)**

Sheet No.

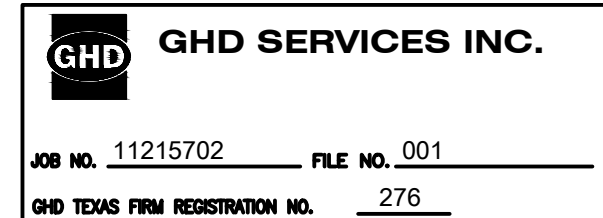
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 - FOR CLARITY NOT ALL SYSTEM ELEMENTS (E.G. VALVES, PIPE SIZES) HAVE BEEN SHOWN.
 - CONTRACTOR SHALL PROVIDE PROVISIONS TO DIRECT EQUIPMENT DECONTAMINATION WATER TO WATER TREATMENT SYSTEM OR TO AN ADJACENT CONTAINMENT AREA WITH PUMPING SYSTEM.
 -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

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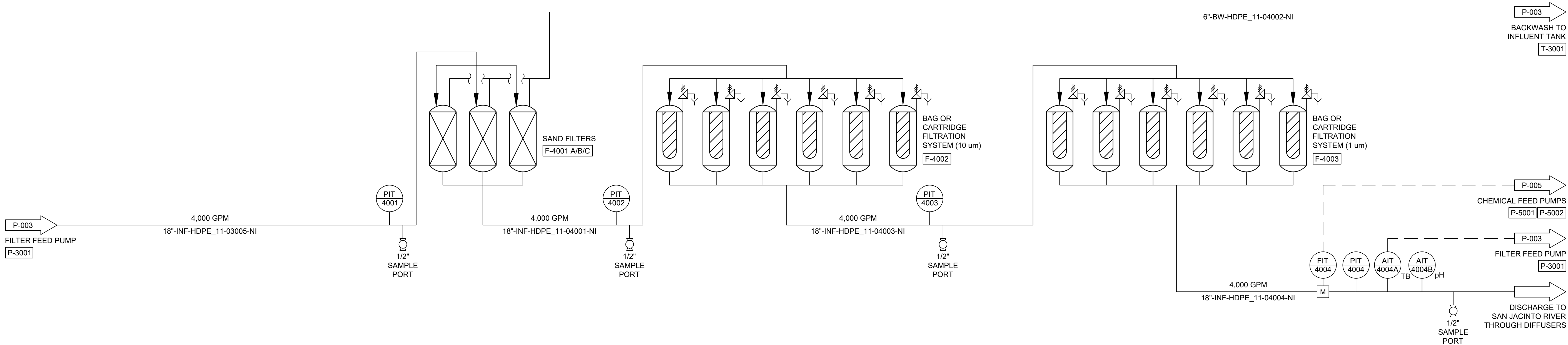


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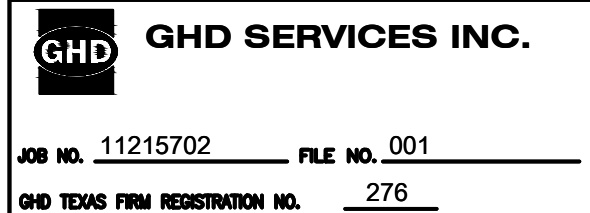
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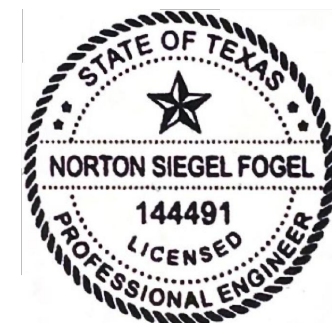
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WATER TREATMENT SYSTEM P&ID (BULK WATER) (2 OF 3)	
Sheet No.	
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Client
**SAN JACINTO RIVER
WASTE PITS**

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

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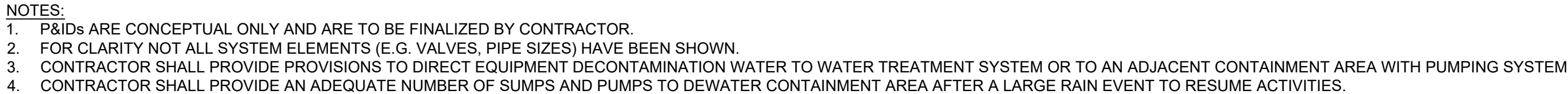
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Title
**WATER TREATMENT SYSTEM
P&ID (BULK WATER)
(3 OF 3)**

Sheet No.

P-005

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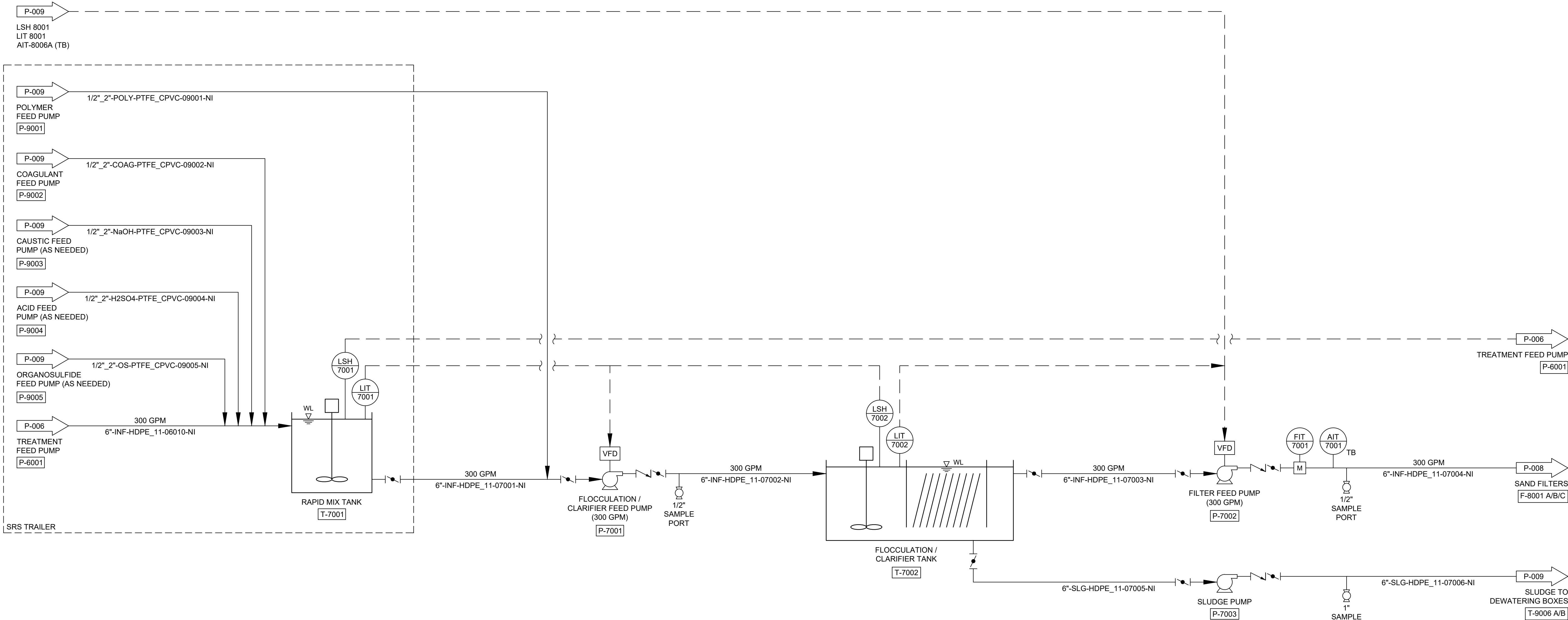
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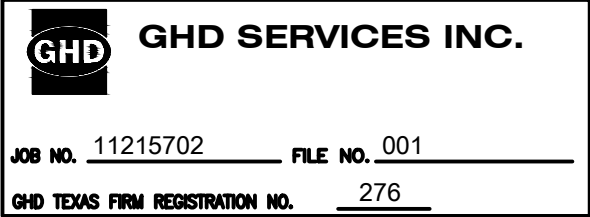
Project No. 11215702
Title
**WATER TREATMENT SYSTEM
P&ID (CONTACT WATER)
(2 OF 4)**

Sheet No.
P-007

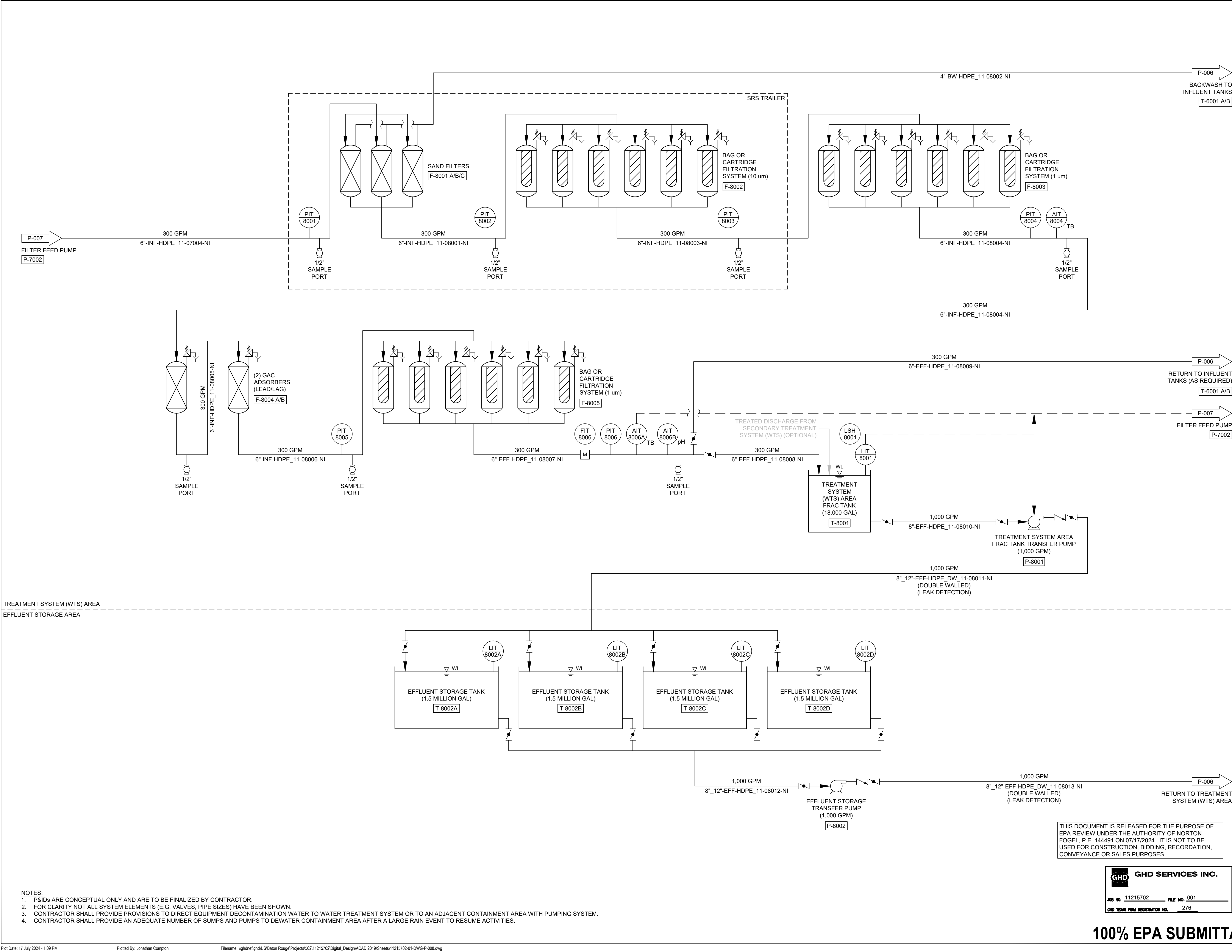


- NOTES:
- P&IDs ARE CONCEPTUAL ONLY AND ARE TO BE FINALIZED BY CONTRACTOR.
 - FOR CLARITY NOT ALL SYSTEM ELEMENTS (E.G. VALVES, PIPE SIZES) HAVE BEEN SHOWN.
 - CONTRACTOR SHALL PROVIDE PROVISIONS TO DIRECT EQUIPMENT DECONTAMINATION WATER TO WATER TREATMENT SYSTEM OR TO AN ADJACENT CONTAINMENT AREA WITH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

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SAN JACINTO RIVER WASTE PITS

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

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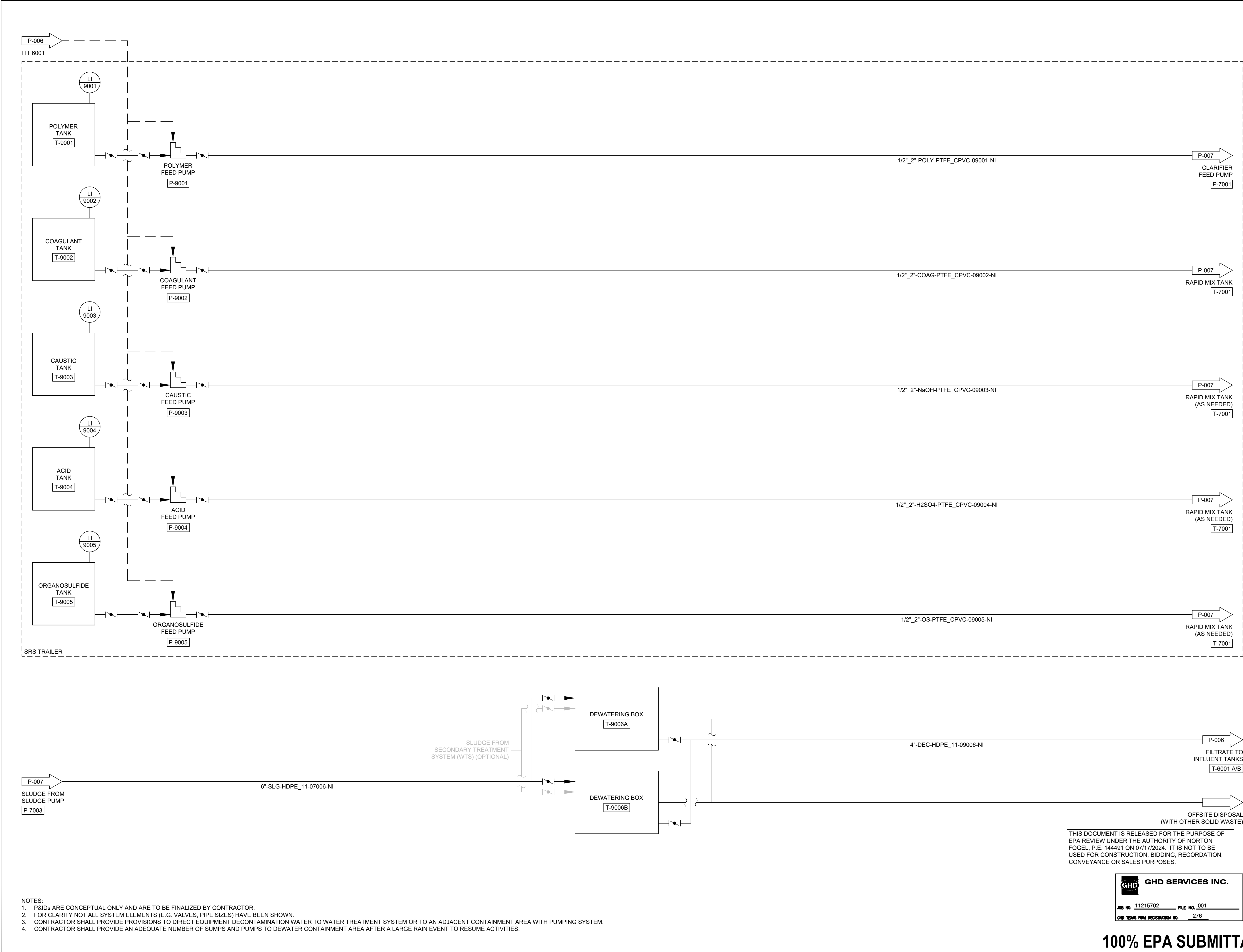
Project No. **11215702**

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

Sheet No.

P-008

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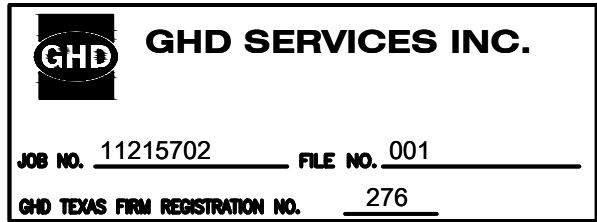
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WATER TREATMENT SYSTEM P&ID (CONTACT WATER) (4 OF 4)

Sheet No.

P-009

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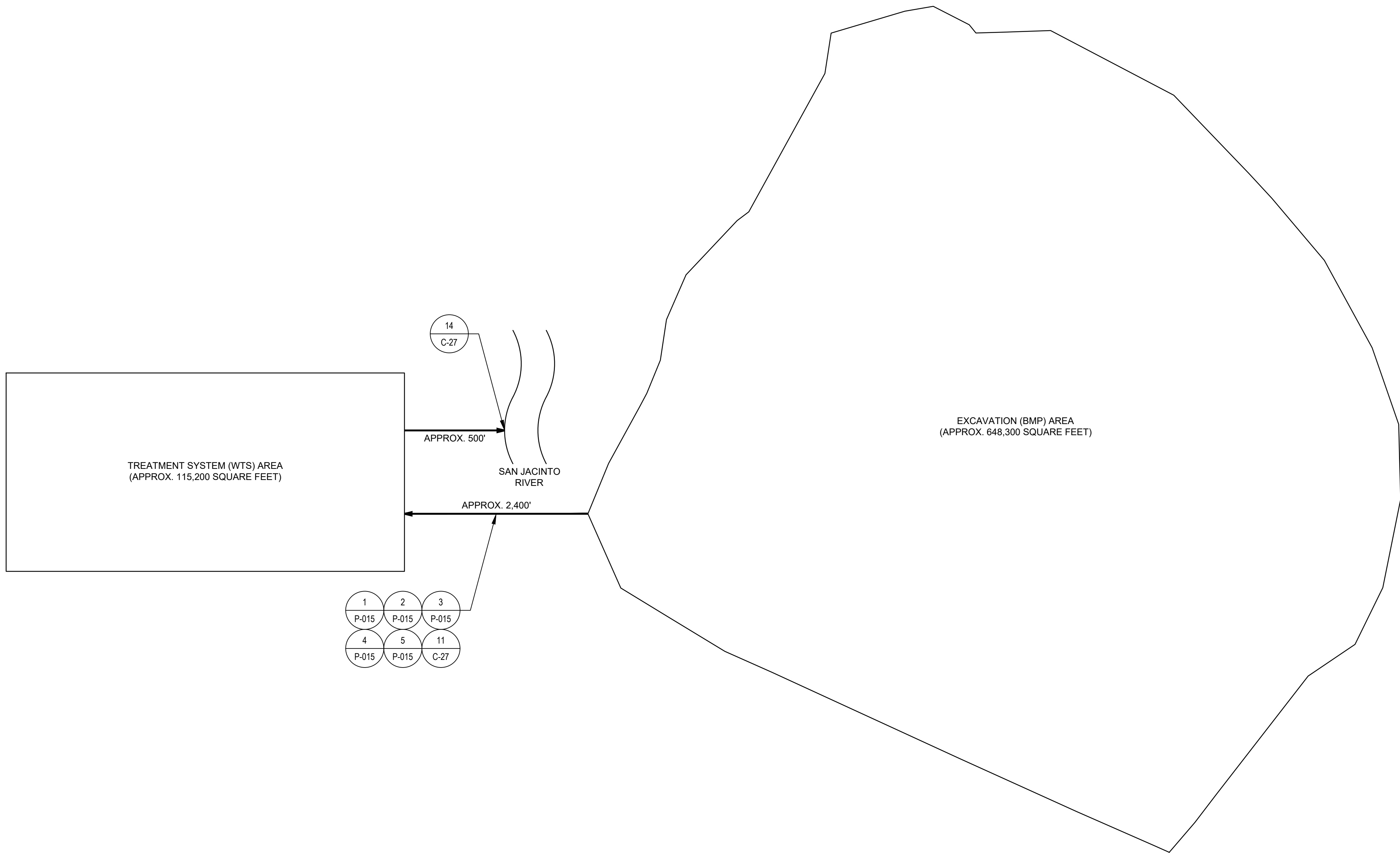
Project No. 11215702

Title
**WATER TREATMENT SYSTEM
SITE PLAN
(BULK WATER)**

Sheet No.

P-010

Sheet - of -



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

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Drafting Check	Design Check	NF
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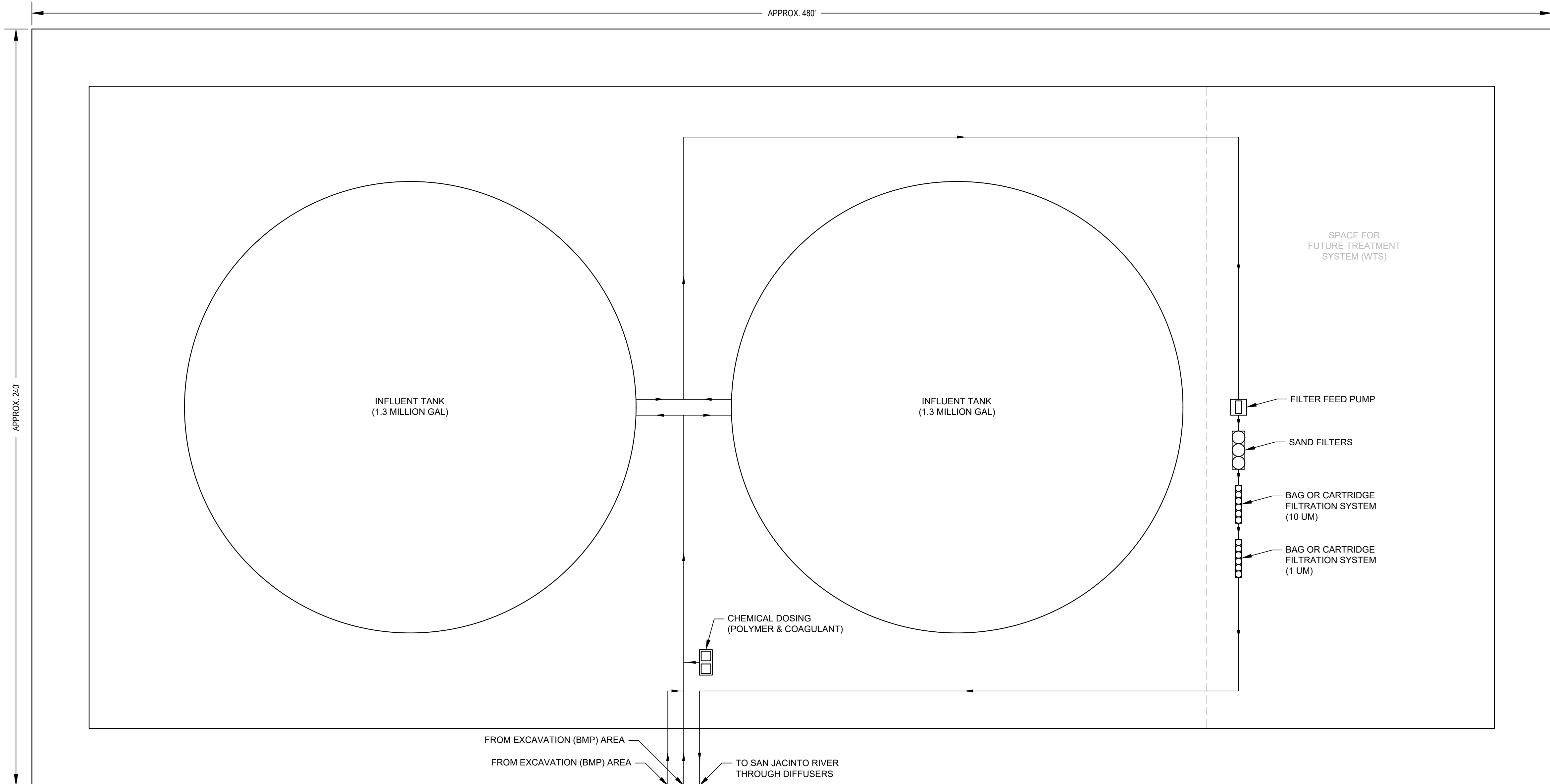
Project No. 11215702

Title
**WATER TREATMENT SYSTEM
EQUIPMENT LAYOUT
(BULK WATER)**

Sheet No.

P-011

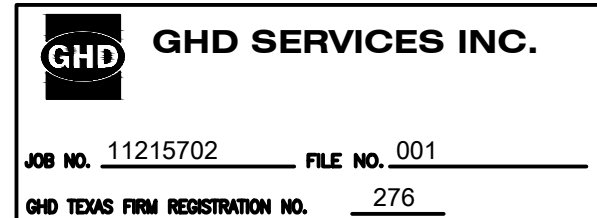
Sheet - of -



TREATMENT SYSTEM (WTS) AREA

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

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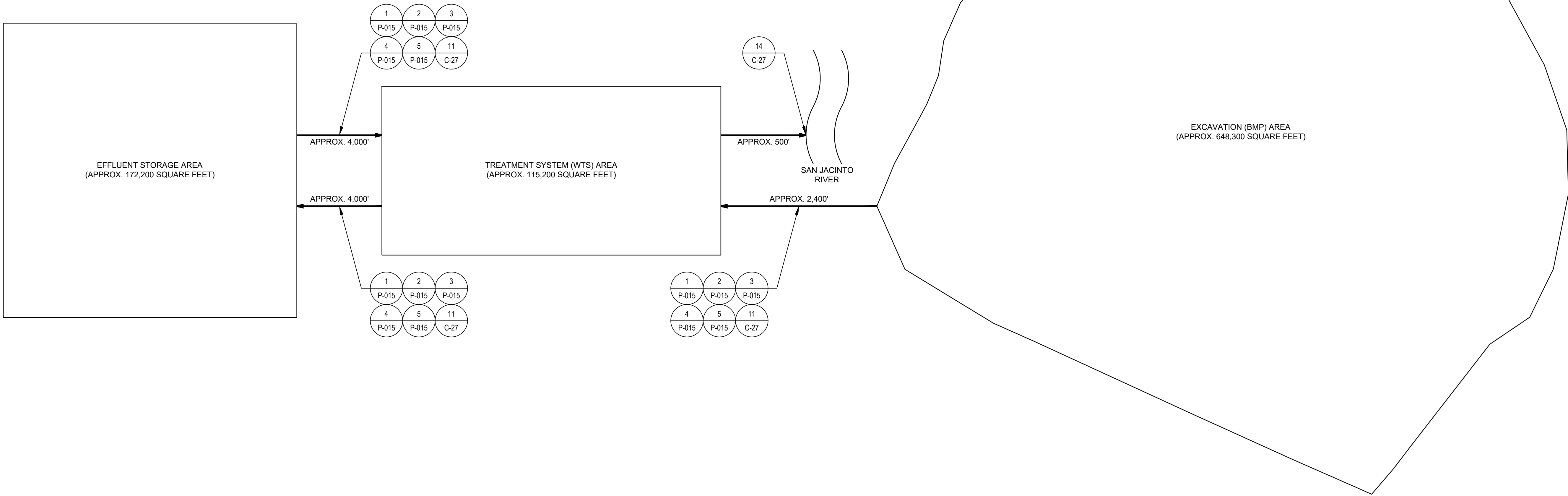
Project No. 11215702

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

Sheet No.

P-012

Sheet - of -



- NOTES:
- SITE PLANS ARE CONCEPTUAL ONLY AND ARE TO BE FINALIZED BY CONTRACTOR.
 - CONTRACTOR SHALL PROVIDE LEAK DETECTION AT LOW POINT ON ALL PIPELINES (SEE DETAIL 4/P-015).
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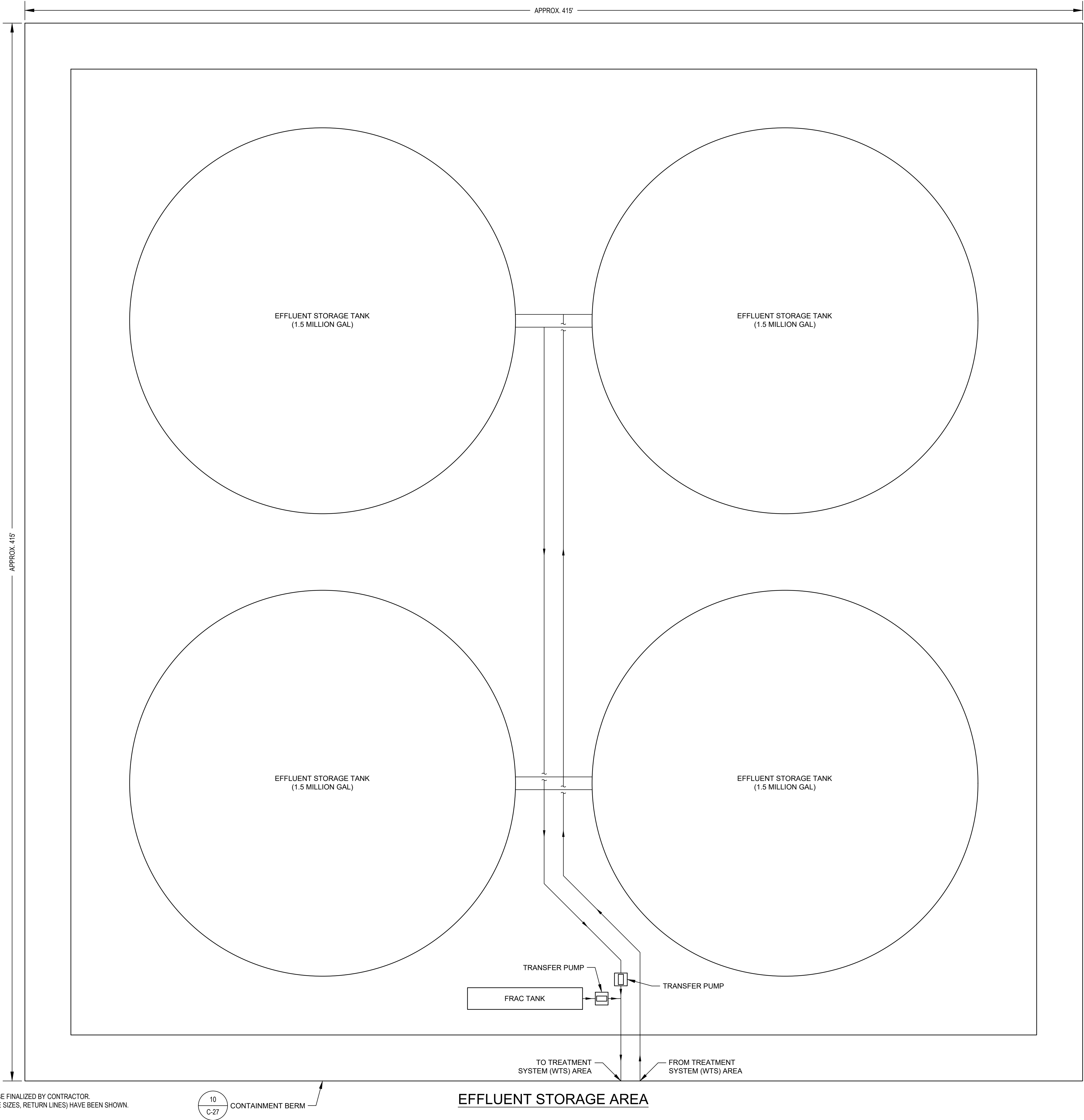
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**NORTHERN IMPOUNDMENT
FINAL 100% REMEDIAL DESIGN
HARRIS COUNTY, TEXAS**

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

Sheet No.

P-013

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Drafting Check	Design Check	NF
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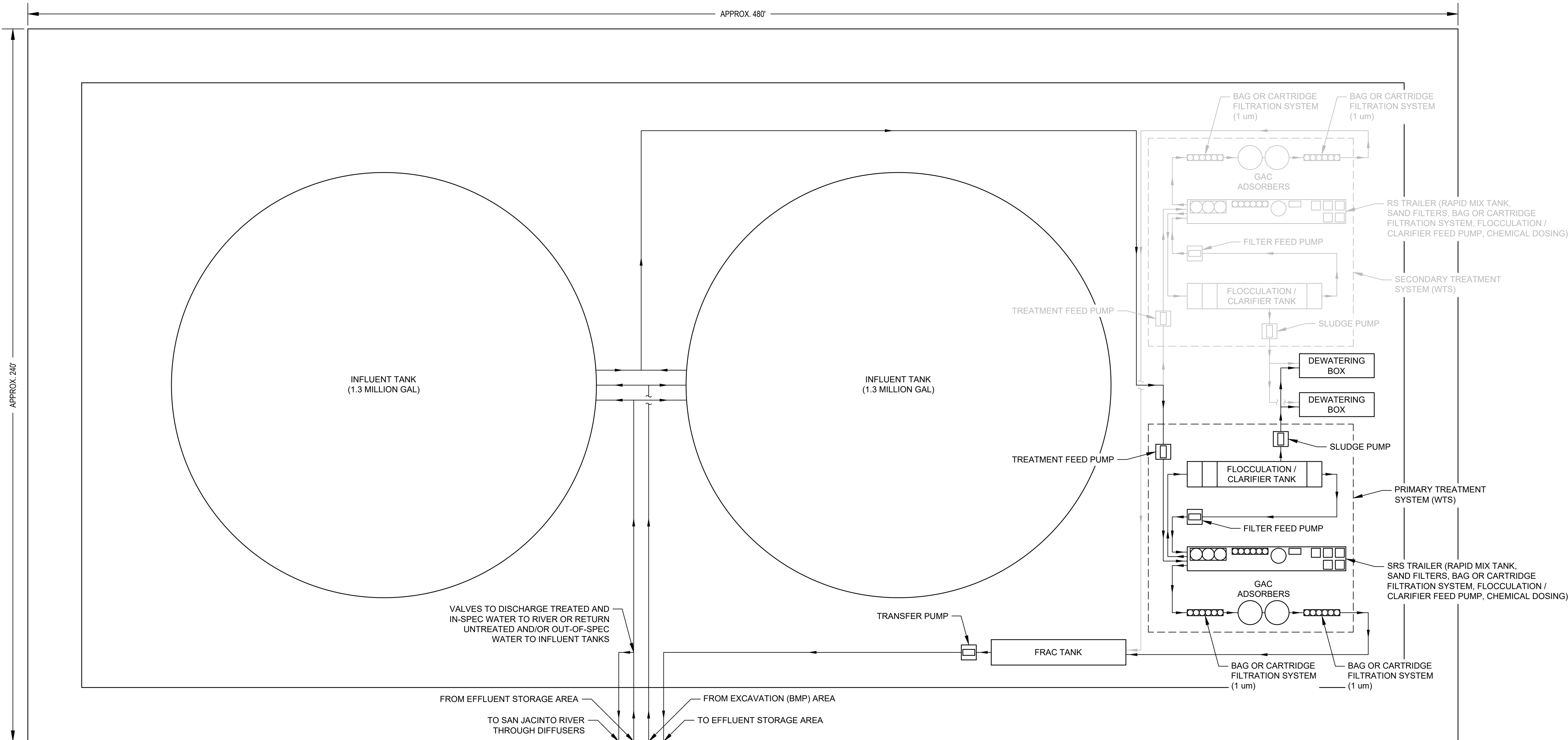
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**WATER TREATMENT SYSTEM
EQUIPMENT LAYOUT
(CONTACT WATER) (2 OF 2)**

Sheet No.

P-014

Sheet - of -

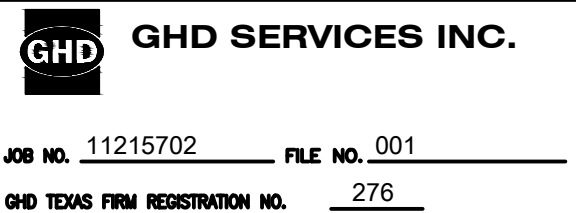


TREATMENT SYSTEM (WTS) AREA

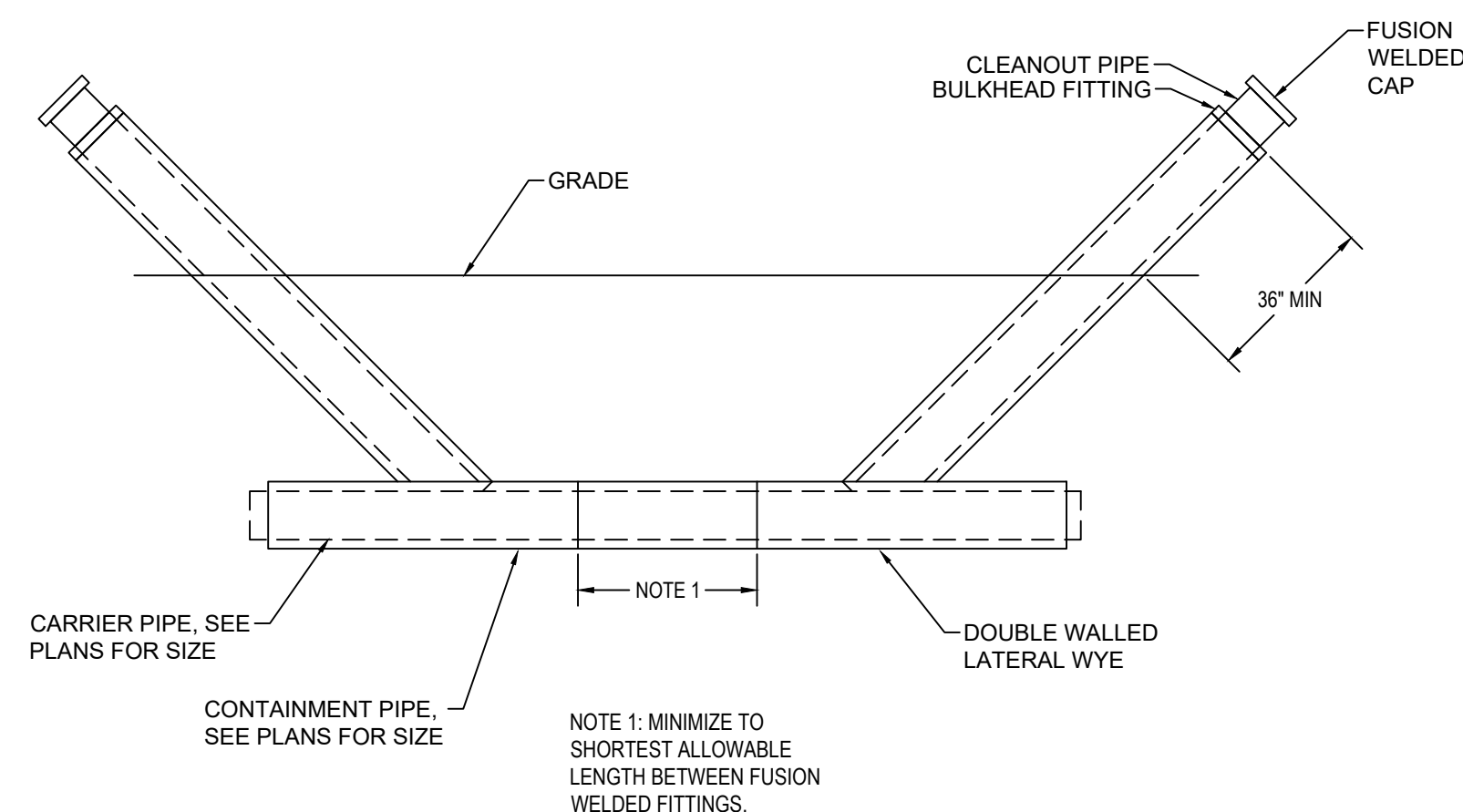
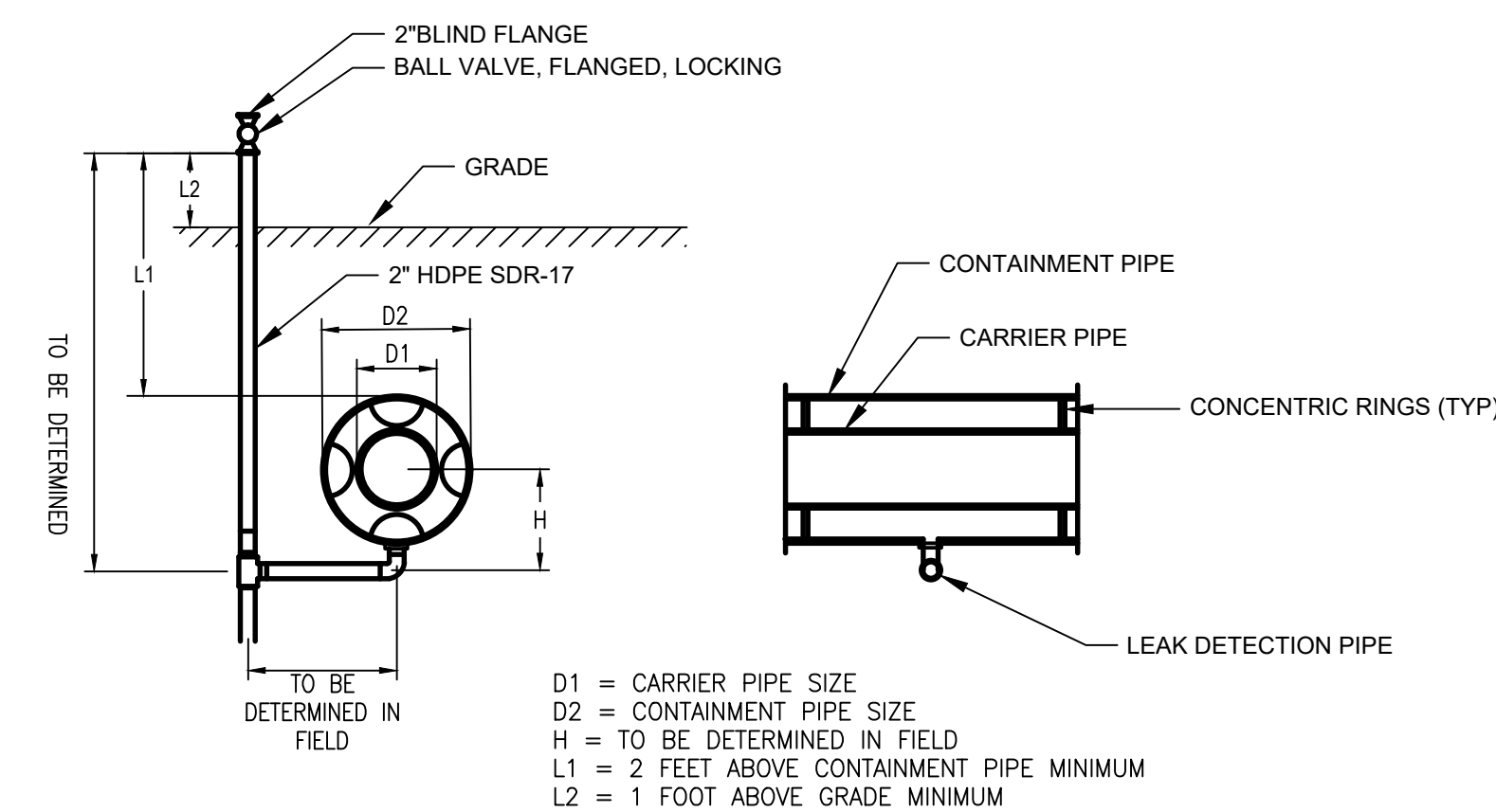
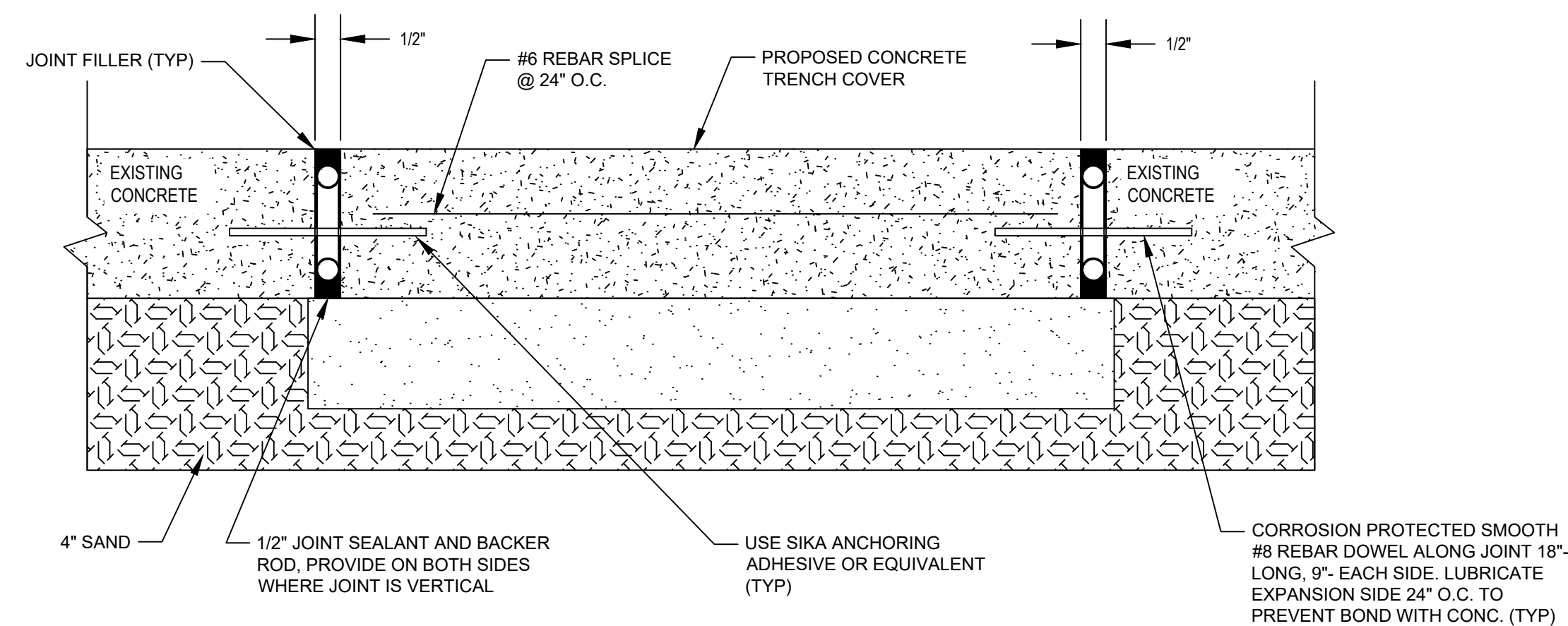
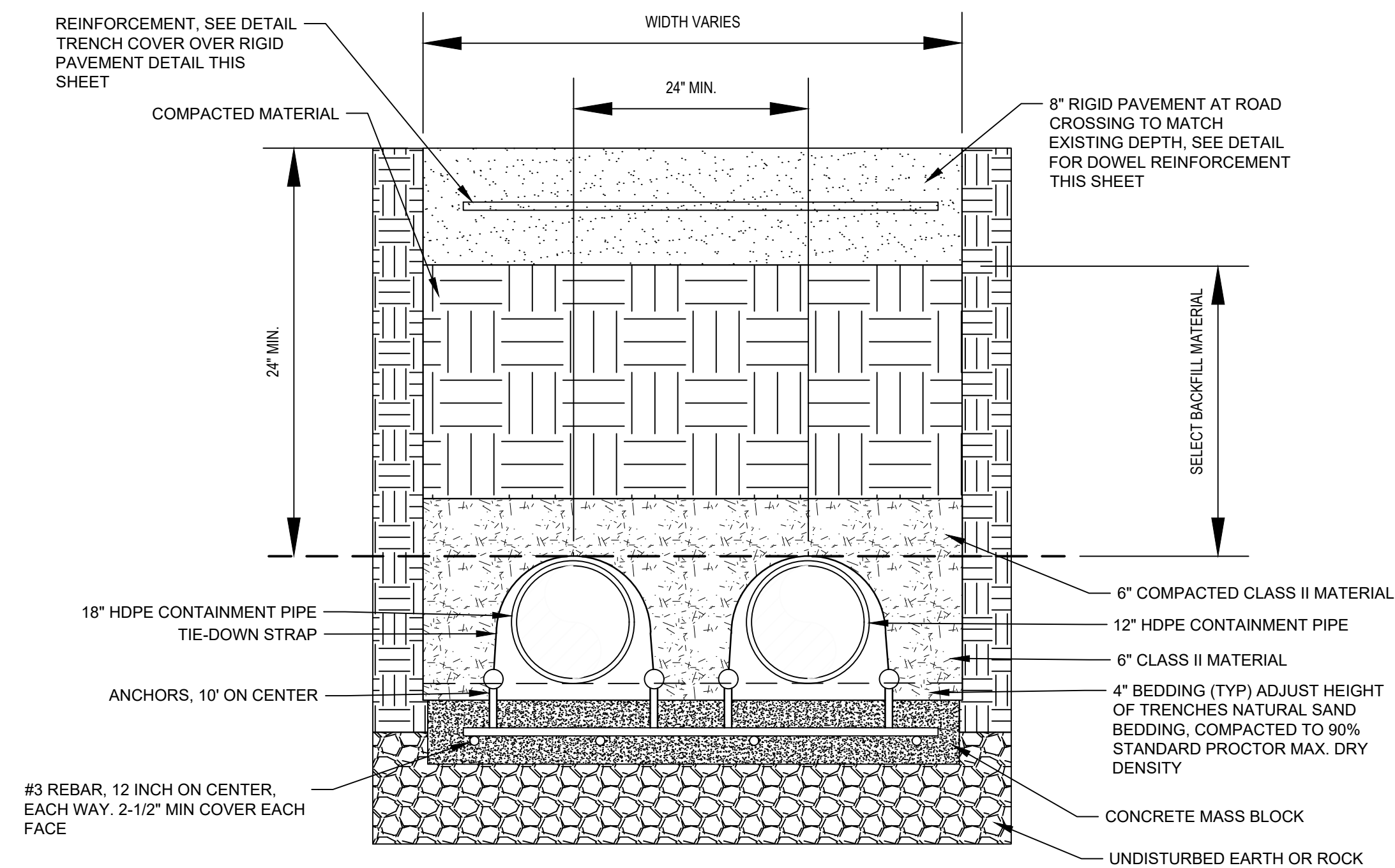
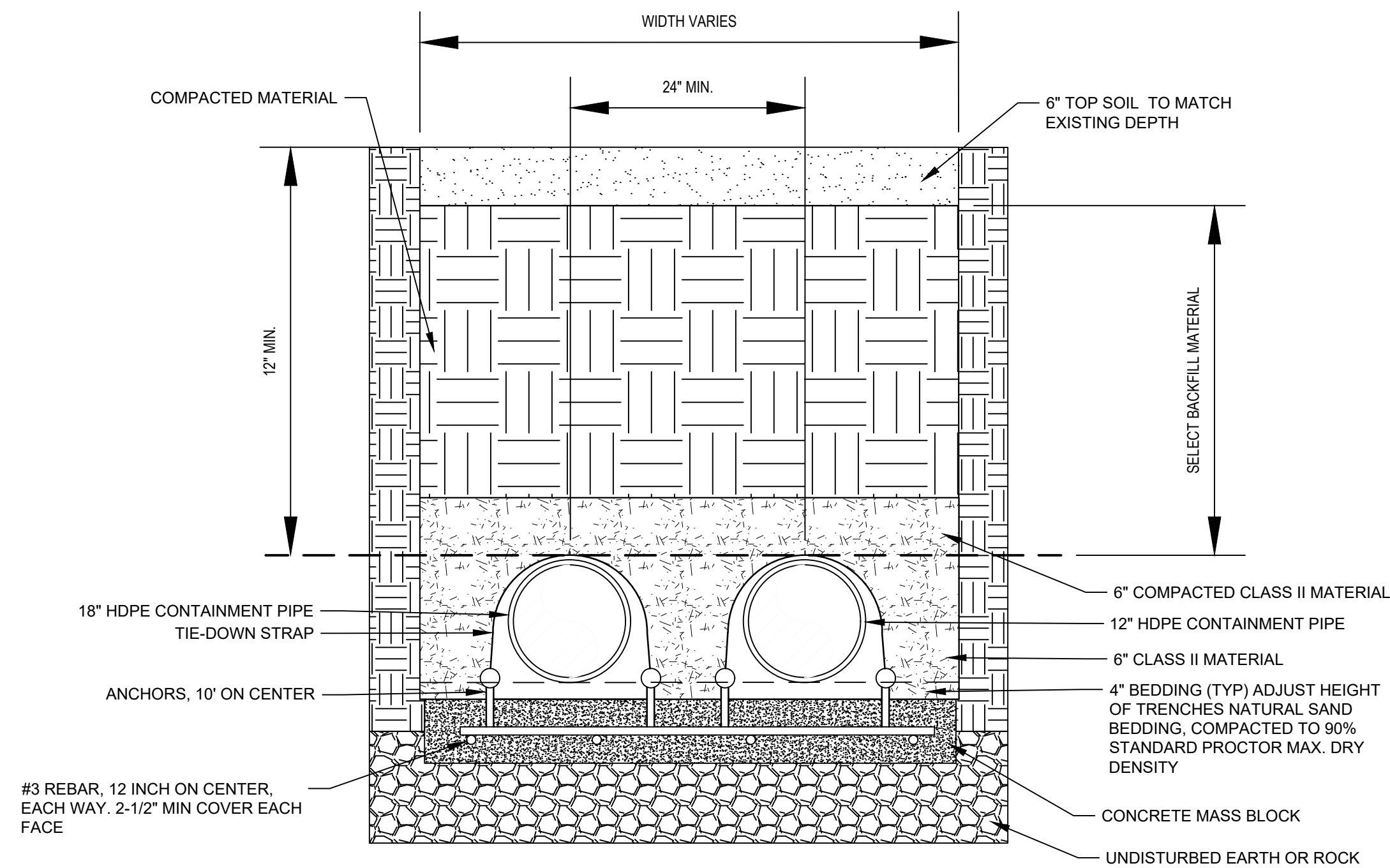
NOTES:

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WASTE PITS**

Project

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FINAL 100% REMEDIAL DESIGN
HARRIS COUNTY, TEXAS**

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Project No. 11215702

Title

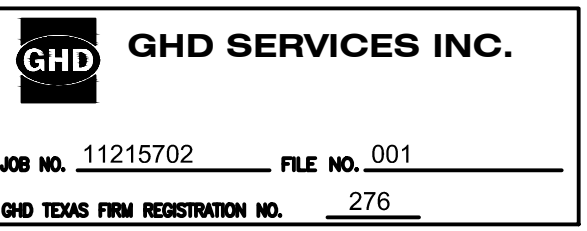
MECHANICAL
DETAILS 1 OF 1

Sheet No. _____

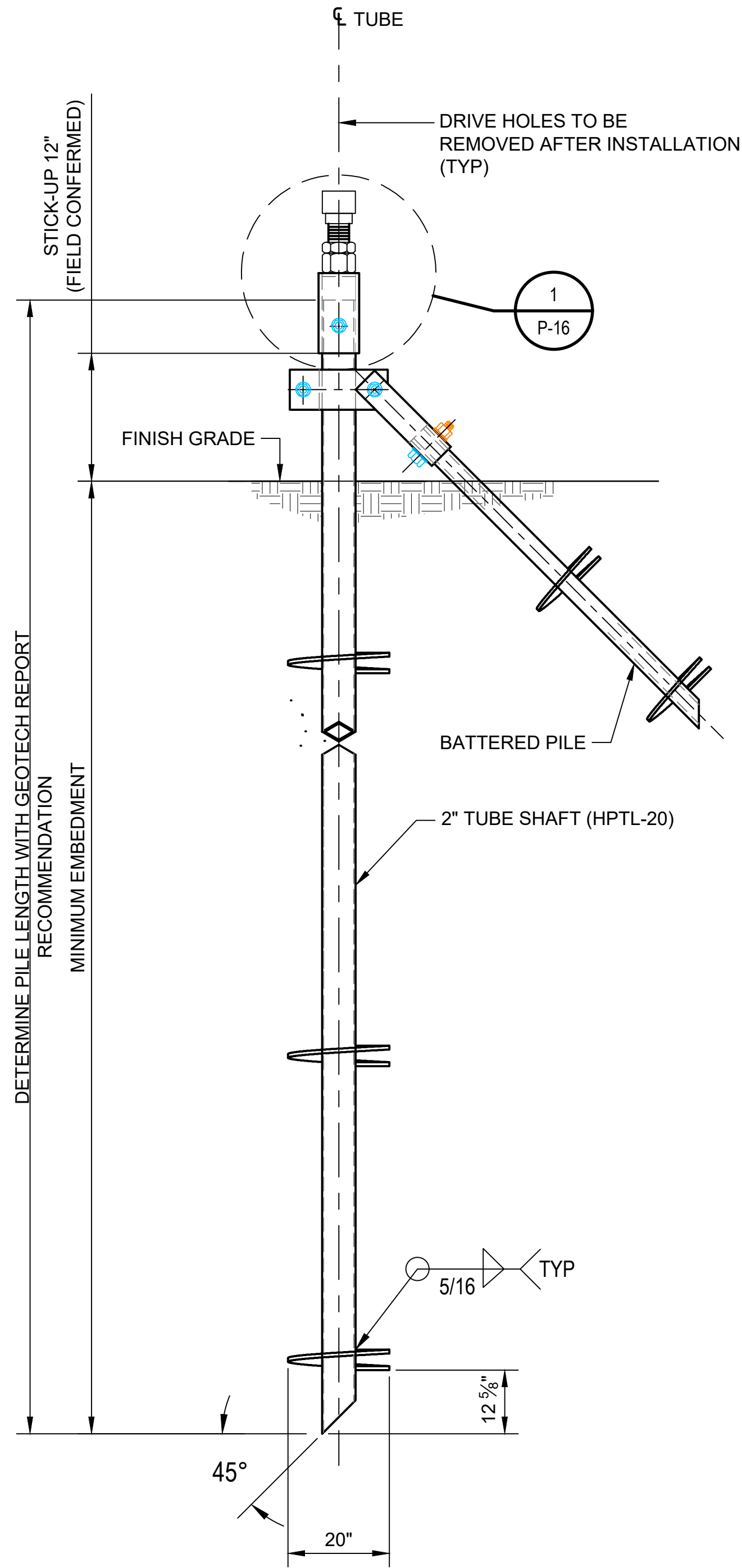
P-015

Sheet - of -

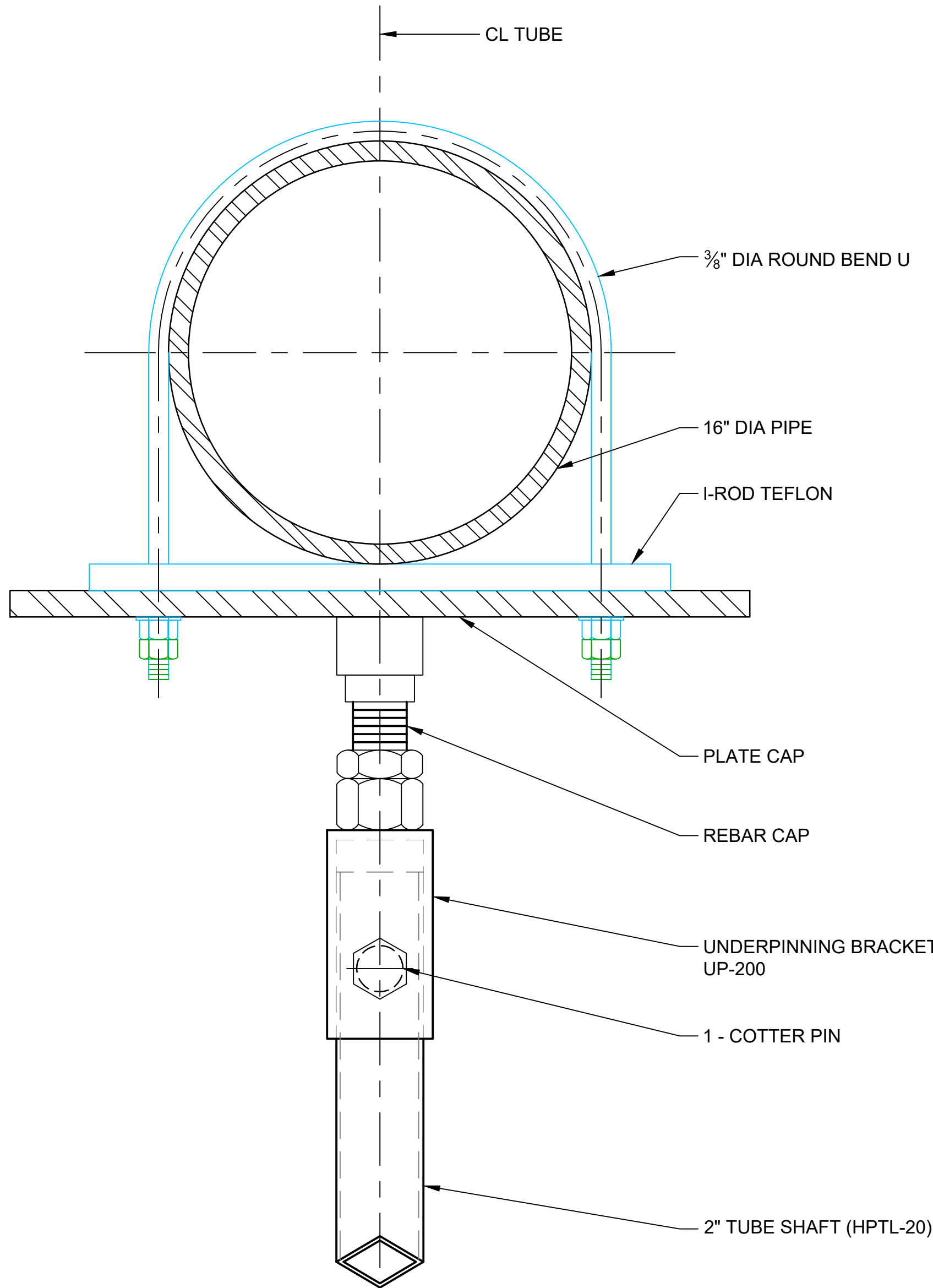
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DETAIL A HELICAL COMPOSITE PILE HPTL-20
SCALE: NTS



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

- NOTES:
- CONTRACTOR TO SUB-CONTRACT GEOTECH ENGINEER LICENSE IN THE STATE OF TEXAS FOR THE DESIGN OF PIPE SUPPORTS.
 - DESIGN CRITERIA
BASIC WIND SPEED, V: 143 mph
WIND EXPOSURE: C

PIPE WEIGHT: 135 bl/ft (ASSUMING 16" STEEL SCH 40 SHELL / 12" HDPE SDR 7)
 - USE BATTERED PILE AT EACH END OF THE PIPE RUN WITH A MAXIMUM OF 100 FT SPACING FOR BATTERED PILES.
 - HARDWARE TO BE HELI-PILE OR APPROVED EQUAL.
- CONTACT:
HELI-PILE
A: 5135 WARD ROAD
WHEATRIDGE, CO 80033
P: 303-423-0591
W: <https://helipile.com>

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**SAN JACINTO RIVER
WASTE PITS**

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

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2	90% EPA REVIEW	DS	SC	06/27/2022
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Project No. 11215702

Title
**HELICAL PILE
DETAILS**

Sheet No.

P-016

Sheet - of -

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



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WASTE PITS**

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

1	100% EPA SUBMITTAL			07/17/2024
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Drawn	EAW	Designer	WSK	
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Title
**MECHANICAL
SCHEDULE**

Sheet No.

P-017

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