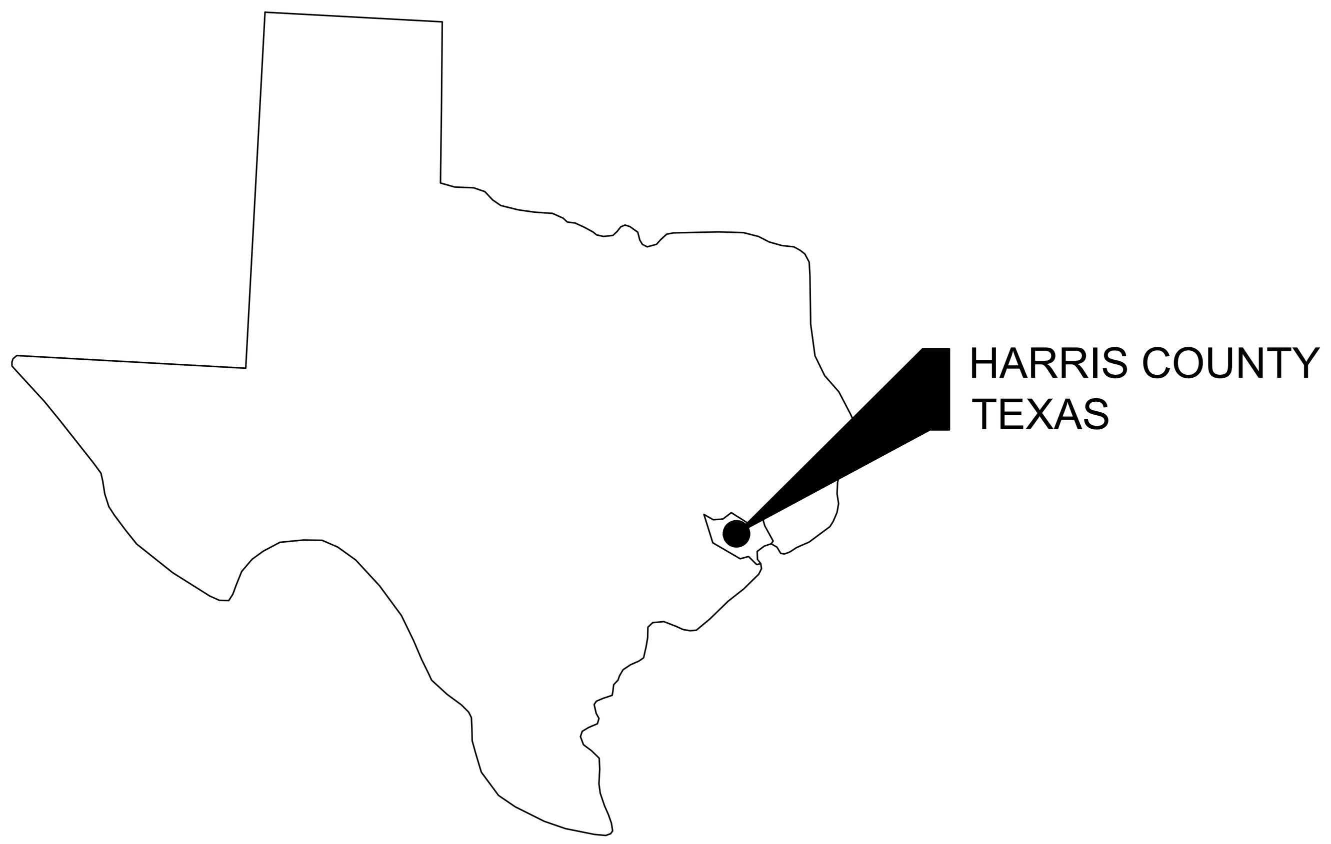
Appendix E
Design Drawing Package

100021355

SAN JACINTO RIVER WASTE PITS
NORTHERN IMPOUNDMENT
PRELIMINARY 30% REMEDIAL DESIGN
HARRIS COUNTY, TEXAS

MAY 2020

11187072-00(010)



STATE OF TEXAS VICINITY MAP

HARRIS COUNTY VICINITY MAP

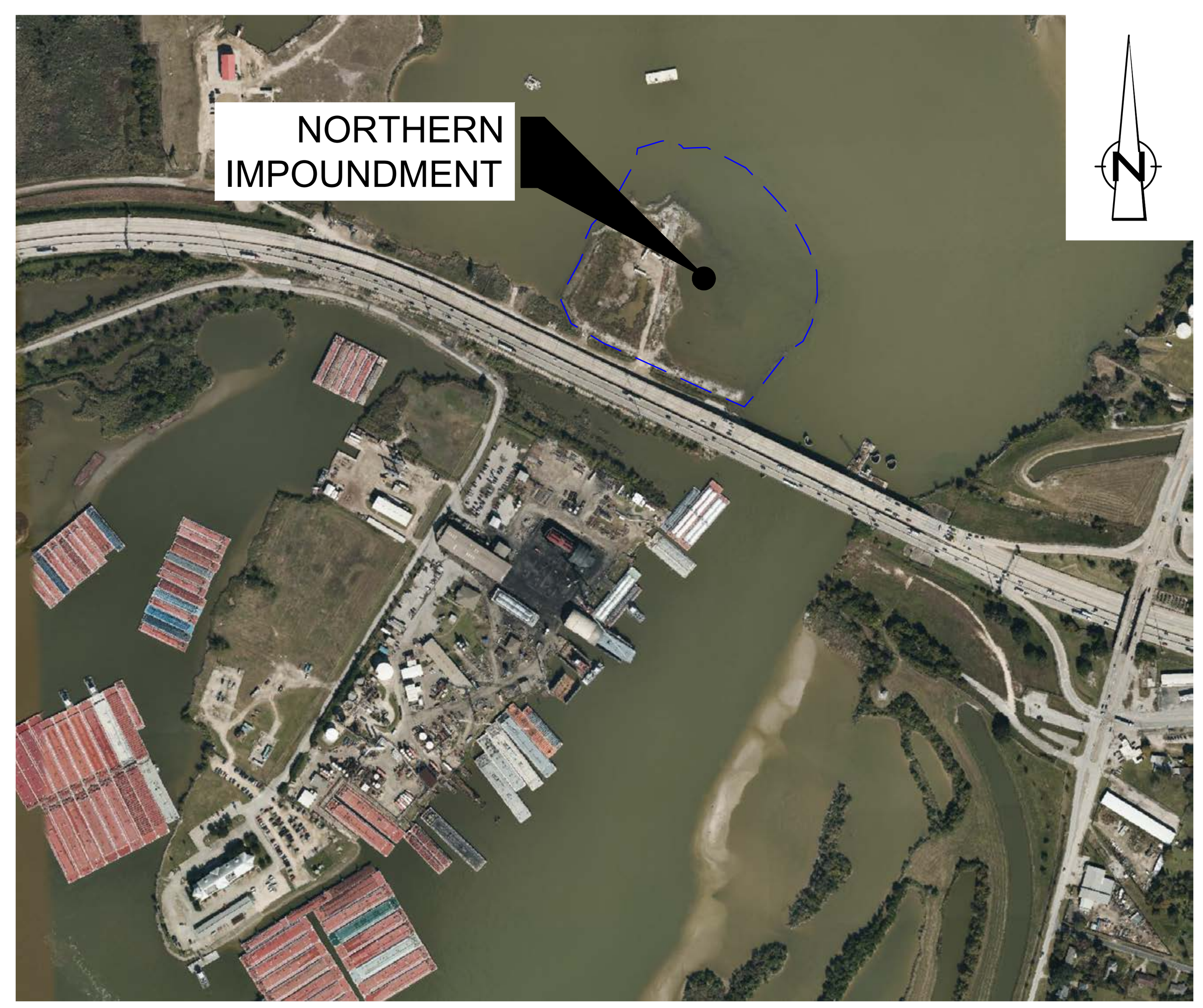


IMAGE - © 2020 Microsoft Corporation © 2020 Digital Globe © CNES (2020) Distribution Airbus DS

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 CELL 1
C-09	EXCAVATION SECTION CELL 1 (1 OF 2)
C-10	EXCAVATION SECTION CELL 1 (2 OF 2)
C-11	PILE LAYOUT PLAN CELL 1
C-12	PILE PROFILE CELL 1
C-13	EXCAVATION PLAN CELL 2
C-14	EXCAVATION SECTION CELL 2
C-15	PILE LAYOUT PLAN CELL 2
C-16	PILE PROFILE CELL 2
C-17	EXCAVATION PLAN CELL 3
C-18	EXCAVATION SECTION CELL 3
C-19	PILE LAYOUT PLAN CELL 3
C-20	PILE PROFILE CELL 3
C-21	EXCAVATION PLAN CELL 4
C-22	EXCAVATION SECTION CELL 4
C-23	PILE LAYOUT PLAN CELL 4
C-24	PILE PROFILE CELL 4
C-25	EXCAVATION PLAN CELL 5
C-26	EXCAVATION SECTION CELL 5
C-27	PILE LAYOUT PLAN CELL 5
C-28	PILE PROFILE CELL 5
C-29	PILE DETAILS
C-30	TYPICAL DETAILS 1 OF 3
C-31	TYPICAL DETAILS 2 OF 3
C-32	TYPICAL DETAILS 3 OF 3
PROCESS FLOW AND INSTRUMENTATION SERIES	
P-01	WATER TREATMENT SYSTEM APPROACH A PROCESS FLOW DIAGRAM/MASS BALANCE
P-02	WATER TREATMENT SYSTEM APPROACH A P&ID (1 OF 2)
P-03	WATER TREATMENT SYSTEM APPROACH A P&ID (2 OF 2)
P-04	WATER TREATMENT SYSTEM APPROACH A PLAN
P-05	WATER TREATMENT SYSTEM APPROACH B PROCESS FLOW DIAGRAM/MASS BALANCE
P-06	WATER TREATMENT SYSTEM APPROACH B P&ID (1 OF 2)
P-07	WATER TREATMENT SYSTEM APPROACH B P&ID (2 OF 2)
P-08	WATER TREATMENT SYSTEM APPROACH B PLAN

PRELIMINARY
NOT FOR CONSTRUCTION
ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 5-28-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 010
GHD TEXAS FIRM REGISTRATION NO. 276

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

Client
SAN JACINTO RIVER WASTE PITS

Project
NORTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	RH	05/28/2020
1	30% CLIENT REVIEW	MW	RH	05/15/2020

Drawn MW	Designer RH
Drafting Check BP	Design Check LL
Project Coordinator CM	Date May 28, 2020
This document shall not be used for construction unless signed and sealed for construction.	Scale N.T.S.
Original Size Arch D	Bar is one inch on original size drawing 0 1"

Project No. 11187072

Title
COVER SHEET

Sheet No.
G-01

Sheet - of -

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 **F** 225 952 2978 **W** www.ghd.com

LEGEND

	TCRA CAP PERIMETER
620	EXISTING CONTOUR INTERVAL
X	FENCELINE
	SHORELINE
	TOP OF BANK
	TOE OF SLOPE
O/H	OVERHEAD ELECTRICAL
	GUARDRAIL
\\	PIPELINE
SJSB002	BORING LOCATION
MW	MONITORING WELL
P.P.	POWER POLE
L.P.	LIGHT POLE
WELL	WELL
	ASPHALT
	CONCRETE
	GRAVEL

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

Client

SAN JACINTO RIVER WASTE PITS

Project

NORTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	RH	05/28/2020
1	30% CLIENT REVIEW	MW	RH	05/15/2020

Drawn MW	Designer RH
Drafting Check BP	Design Check LL
Project Coordinator CM	Date May 28, 2020
This document shall not be used for construction unless signed and sealed for construction.	Scale 1" = 150'
Original Size **Arch D**	Bar is one inch on original size drawing 0 1"

Project No. **11187072**

Title

OVERALL PLAN

PRELIMINARY
NOT FOR CONSTRUCTION

ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 5-28-2020

GHD SERVICES INC.

JOB NO. 11187072 FILE NO. 010
GHD TEXAS FIRM REGISTRATION NO. 276

Sheet No.

C-01

Plot Date: 28 May 2020 - 8:46 AM Plotted By: Matt Wolfer Filename: N:\US\Baton Rouge\Legacy\BAT\Shared\Project Work Area\11180000s\11187072 - San Jacinto River Waste Pits Superfund Site - Remedial Design\Design\CAD\Sheets\11187072-00(010)\11187072-00(010)CI\11187072-00(010)CI-WA001.dwg

PRELIMINARY
NOT FOR CONSTRUCTION

ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 5-28-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 010
GHD TEXAS FIRM REGISTRATION NO. 276

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

Reuse of Documents
This document and the ideas and designs incorporated herein, as an instrument of professional service, is the property of GHD and shall not be reused in whole or in part for any other project without GHD's written authorization. © 2020 GHD

LEGEND
TCRA CAP PERIMETER
EXISTING CONTOUR INTERVAL
FENCELINE
SHORELINE
TOP OF BANK
TOE OF SLOPE
OVERHEAD ELECTRICAL
GUARDRAIL
PIPELINE
SJSB002 BORING LOCATION
MW MONITORING WELL
P.P. POWER POLE
L.P. LIGHT POLE
WELL WELL
AREA WITH MATERIAL >30 ng/kg TEQ
ASPHALT
CONCRETE
GRAVEL

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

Client
SAN JACINTO RIVER WASTE PITS

Project
NORTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	RH	05/28/2020
1	30% CLIENT REVIEW	MW	RH	05/15/2020

Drawn MW — Designer RH
Drafting Check BP — Design Check LL
Project Coordinator CM — Date May 28, 2020
This document shall not be used for construction unless signed and sealed for construction. — Scale 1" = 100'
Original Size Arch D — Bar is one inch on original size drawing 0 1"

Project No. 11187072

Title
EXISTING CONDITIONS

Sheet No.
C-02

Sheet - of -

Plot Date: 28 May 2020 - 7:29 AM Plotted By: Matt Wolfer Filename: N:\US\Baton Rouge\Legacy\BAT\Shared\Project Work Area\11180000s\11187072 - San Jacinto River Waste Pits Superfund Site - Remedial Design\Design\CAD\Sheets\11187072-00(010)\11187072-00(010)CI\11187072-00(010)CI-WA002.dwg

NOTES:

1. LOCATION OF OVERBURDEN STOCKPILE, DECONTAMINATION PAD, SOLIDIFICATION PAD, AND DEWATERING FACILITY ARE PRELIMINARY AND SUBJECT TO CHANGE.
2. CELL NUMBERS FOR IDENTIFICATION ONLY AND DO NOT REPRESENT ORDER OF EXCAVATION SEQUENCING.
3. BMP DESIGN IS SUBJECT TO CHANGE BASED ON ADDITIONAL DATA ANALYSIS AND ENGINEERING EVALUATION, AS WELL AS CHANGES IN POTENTIAL WATER SURFACE ELEVATIONS RESULTING FROM UPSTREAM CONDITIONS CURRENTLY UNDER CONSIDERATION, BUT IS SHOWN AS A CANTILEVERED PILE COFFERDAM WITH A TOP OF PILE HEIGHT OF +9' NAVD88 AND IS COMPOSED OF A PAZ66/AZ38-700N PIPE-Z SYSTEM WITH A PILE TIP DEPTH OF -80' NAVD88 AND A HZ 1080M A HZ-M WALL WITH A PILE TIP DEPTH OF -100' NAVD88.
4. PILES SHOWN ON DRAWINGS DO NOT MEET MAXIMUM DEFLECTION CRITERIA TYPICALLY USED FOR PILE WALLS. SECTIONS ARE SHOWN THAT MEET STABILITY AND STRENGTH REQUIREMENTS ONLY. MEETING DEFLECTION CRITERIA WILL LEAD TO EITHER MUCH LARGER PILE SECTIONS OR DIFFERENT WALL TYPE CONCEPTS OR A DIFFERENT DESIGN APPROACH.
5. BASED ON THE PILE DRIVING ANALYSIS PERFORMED, IT IS UNCERTAIN THAT PILES WILL BE ABLE TO BE DRIVEN COMPLETELY AND PRACTICAL REFUSAL OF THE PILES IS POSSIBLE PRIOR TO REACHING REQUIRED PILE TIP DEPTH.
6. HARD PILE DRIVING CONDITIONS COULD LEAD TO LATERAL MOVEMENT OF THE PILES CREATING ALIGNMENT ISSUES.
7. HARD DRIVING CONDITIONS WILL CAUSE VIBRATIONS THROUGH SOIL CAUSING SOIL PARTICLE ACCELERATION. THESE ACCELERATIONS MAY CAUSE SLOPE INSTABILITY. PREDICTION OF DESIGN MAGNITUDE OF SOIL ACCELERATION IS HIGHLY VARIABLE DUE TO VARIABILITY OF SOIL CONDITIONS, TRANSFER OF FORCES FROM PILE TO SOIL, AND AMOUNT OF PILE DRIVING ENERGY REQUIRED DURING ANY PHASE OF DRIVING.
8. CONSIDERATION OF ADDITIONAL DESIGN SECTIONS ALONG EACH LENGTH OF CELL WALL COULD RESULT IN LARGER PILE SECTIONS, INABILITY TO DRIVE PILES TO REQUIRED DEPTH DUE TO DIFFICULT DRIVING CONDITIONS, AND/OR REFUSAL PRIOR TO REQUIRED TIP DEPTH.
9. SCHEDULE AND CONSTRUCTABILITY WILL BE IMPACTED BY THE PREDICTED LARGE PILE SIZES AND DEPTHS AND MAY BE ADDITIONALLY AFFECTED OR DEEMED IMPRACTICAL BY DIFFICULT DRIVING CONDITIONS AND GEOTECHNICAL UNCERTAINTIES.

PRELIMINARY
NOT FOR CONSTRUCTION

ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 5-28-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 010
GHD TEXAS FIRM REGISTRATION NO. 276

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

LEGEND

- TCRA CAP PERIMETER
- 620 EXISTING CONTOUR INTERVAL
- X FENCELINE
- SHORELINE
- TOP OF BANK
- TOE OF SLOPE
- O/H OVERHEAD ELECTRICAL
- GUARDRAIL
- PIPELINE
- SJSB002 BORING LOCATION
- MW MONITORING WELL
- P.P. POWER POLE
- L.P. LIGHT POLE
- WELL WELL
- AREA WITH MATERIAL >30 ng/kg TEQ
- ASPHALT
- CONCRETE
- GRAVEL
- PAZ66/AZ38-700N PILE
- HZ 1080M A PILE

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

Client
SAN JACINTO RIVER WASTE PITS

Project
NORTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	RH	05/28/2020
1	30% CLIENT REVIEW	MW	RH	05/15/2020

Drawn	MW	Designer	RH
Drafting Check	BP	Design Check	LL
Project Coordinator	CM	Date	May 28, 2020
This document shall not be used for construction unless signed and sealed for construction.		Scale	1" = 100'
Original Size	Arch D	Bar is one inch on original size drawing 0 1"	

Project No. 11187072

Title
SSA AREA AND NORTHERN IMPOUNDMENT WORKS

Sheet No.
C-03

Sheet - of -

Plot Date: 28 May 2020 - 12:20 PM
Plotted By: Matt Wolfer
Filename: N:\US\Baton Rouge\Legacy\BAT\Shared\Project Work Area\11180000\11187072 - San Jacinto River Waste Pits Superfund Site - Remedial Design\Design\CAD\Sheets\11187072-00(010)\11187072-00(010)CI-WA003.dwg

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

LEGEND

- TCRA CAP PERIMETER
- EXISTING CONTOUR INTERVAL
- FENCELINE
- SHORELINE
- TOP OF BANK
- TOE OF SLOPE
- OVERHEAD ELECTRICAL
- GUARDRAIL
- PIPELINE
- SJSB002 BORING LOCATION
- MW MONITORING WELL
- P.P. POWER POLE
- L.P. LIGHT POLE
- WELL WELL
- AREA WITH MATERIAL >30 ng/kg TEQ
- ASPHALT
- CONCRETE
- GRAVEL
- SILT FENCE
- TURBIDITY CURTAIN
- OIL BOOM

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

NOTES:

1. LOCATION AND TYPE OF SOIL EROSION AND SEDIMENT CONTROLS ARE PRELIMINARY AND SUBJECT TO CHANGE.

PRELIMINARY
NOT FOR CONSTRUCTION

ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 5-15-2020

GHD SERVICES INC.

JOB NO. 11187072 FILE NO. 010
GHD TEXAS FIRM REGISTRATION NO. 276

Client

SAN JACINTO RIVER WASTE PITS

Project

NORTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	RH	05/28/2020
1	30% CLIENT REVIEW	MW	RH	05/15/2020

Drawn MW	Designer RH
Drafting Check BP	Design Check LL
Project Coordinator CM	Date May 28, 2020
This document shall not be used for construction unless signed and sealed for construction.	Scale 1" = 100'
Original Size Arch D	Bar is one inch on original size drawing 0 1"

Project No. 11187072

Title

SOIL EROSION AND SEDIMENT CONTROL PLAN (OVERALL)

Sheet No.

C-04

Sheet - of -

NOTES:

1. LOCATION AND TYPE OF SOIL EROSION AND SEDIMENT CONTROLS ARE PRELIMINARY AND SUBJECT TO CHANGE.

PRELIMINARY
NOT FOR CONSTRUCTION

ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 5-28-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 010
GHD TEXAS FIRM REGISTRATION NO. 276

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

LEGEND
- TCRA CAP PERIMETER
- EXISTING CONTOUR INTERVAL (620)
- FENCELINE
- SHORELINE
- TOP OF BANK
- TOE OF SLOPE
- OVERHEAD ELECTRICAL (OH)
- GUARDRAIL
- PIPELINE
- BORING LOCATION (SJSB002)
- MONITORING WELL (MW)
- POWER POLE (P.P.)
- LIGHT POLE (L.P.)
- WELL (WELL)
- AREA WITH MATERIAL >30 ng/kg TEQ
- ASPHALT
- CONCRETE
- GRAVEL
- SILT FENCE
- TURBIDITY CURTAIN
- OIL BOOM

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

Client

SAN JACINTO RIVER WASTE PITS

Project

NORTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	RH	05/28/2020
1	30% CLIENT REVIEW	MW	RH	05/15/2020

Drawn	MW	Designer	RH
Drafting Check	BP	Design Check	LL
Project Coordinator	CM	Date	May 28, 2020
This document shall not be used for construction unless signed and sealed for construction.		Scale	1" = 100'
Original Size	Arch D	Bar is one inch on original size drawing 0 1"	

Project No. 11187072

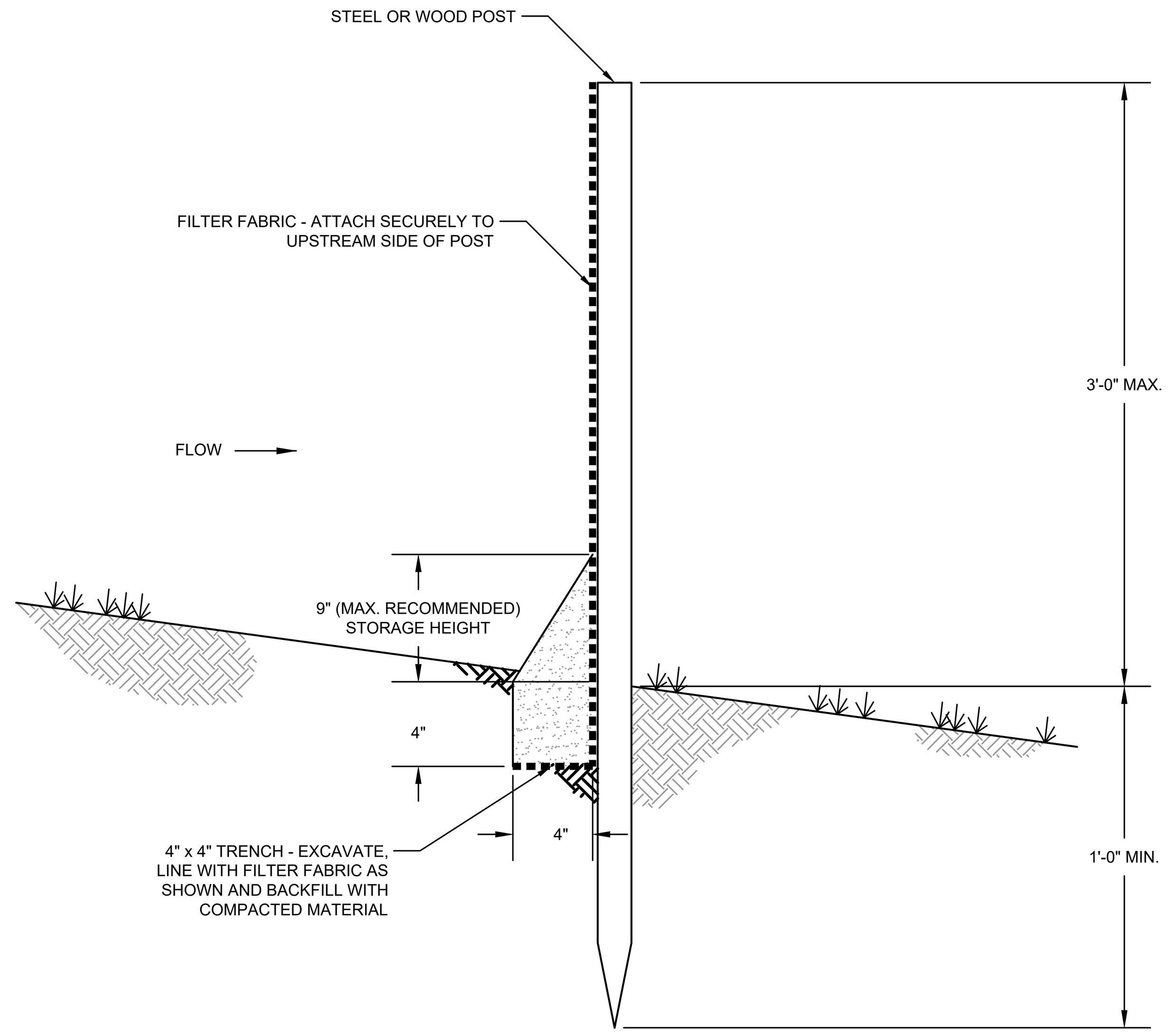
Title

SOIL EROSION AND SEDIMENT CONTROL PLAN (SEASONAL)

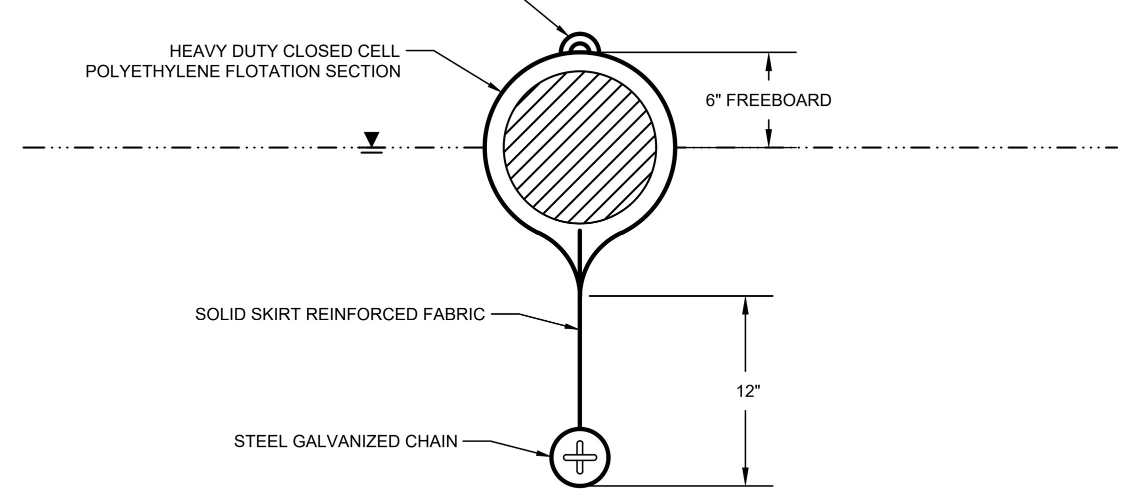
Sheet No.

C-05

Sheet - of -



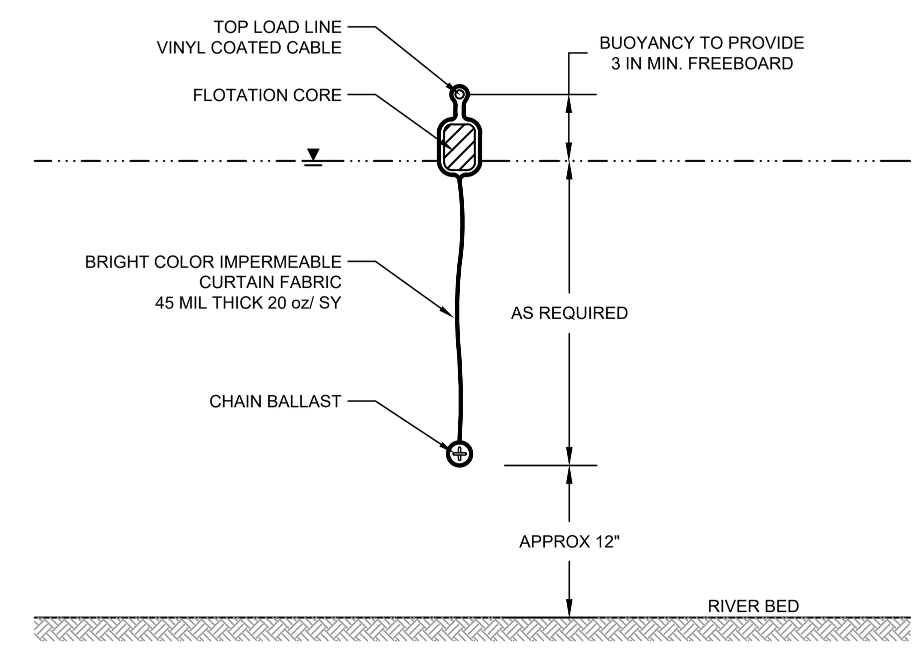
DETAIL 1 TEMPORARY SILT FENCE
N.T.S. C-05



NOTES

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

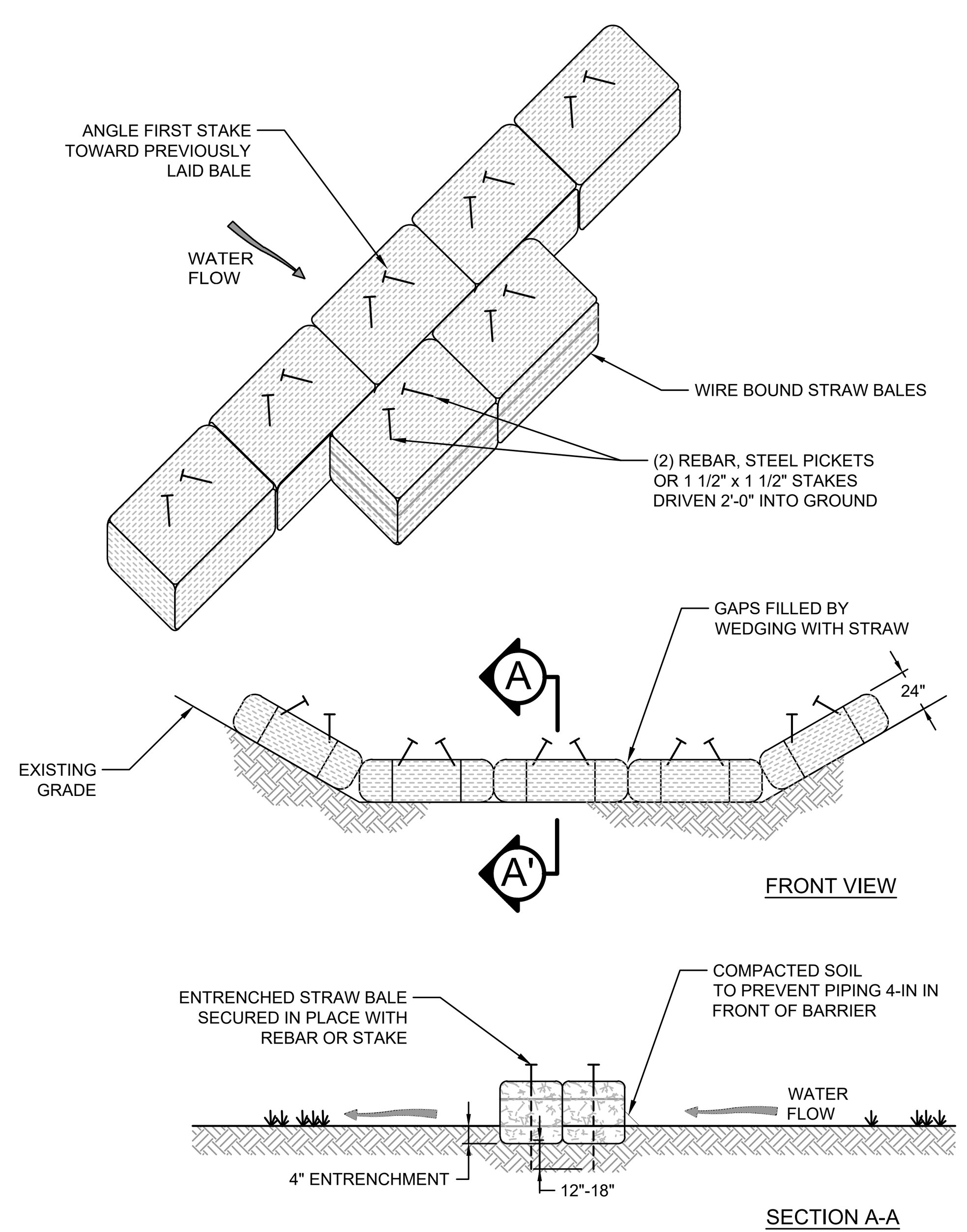
DETAIL 2 NON-ABSORBENT OIL BOOM
N.T.S. C-04



NOTES

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

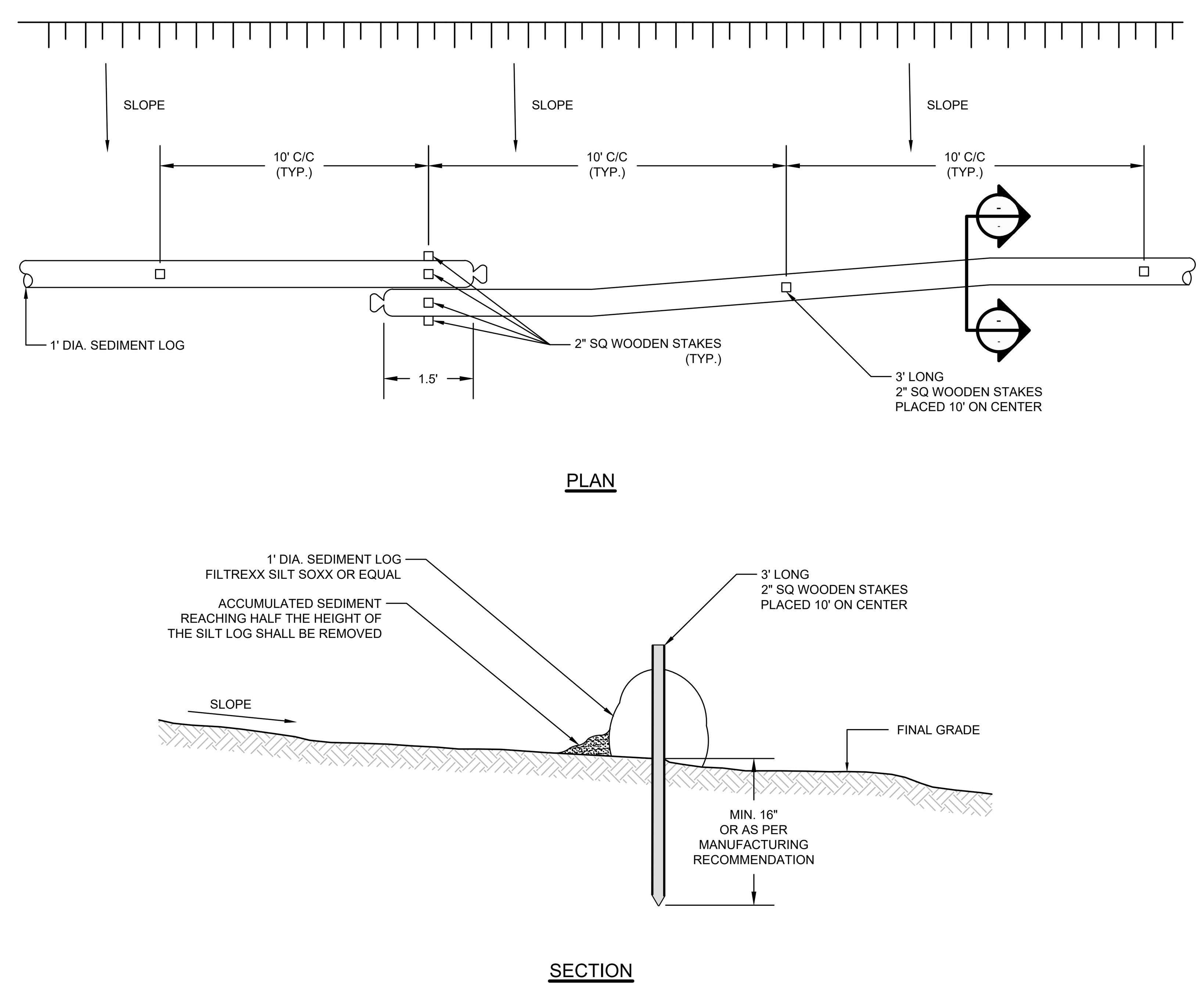
DETAIL 3 TURBIDITY CURTAIN
N.T.S. C-04



NOTE:

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

DETAIL 4 STRAW BALE BARRIER
N.T.S. C-04



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

PRELIMINARY
NOT FOR CONSTRUCTION
ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 5-28-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 010
GHD TEXAS FIRM REGISTRATION NO. 276

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

Client
SAN JACINTO RIVER WASTE PITS

Project
NORTHERN IMPOUNDMENT
PRELIMINARY 30% REMEDIAL DESIGN
HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	RH	05/28/2020
1	30% CLIENT REVIEW	MW	RH	05/15/2020

Drawn	MW	Designer	RH
Drafting Check	BP	Design Check	LL
Project Coordinator	CM	Date	May 28, 2020
This document shall not be used for construction unless signed and sealed for construction.		Scale	N.T.S.
Original Size	Arch D	Bar is one inch on original size drawing 0 1"	

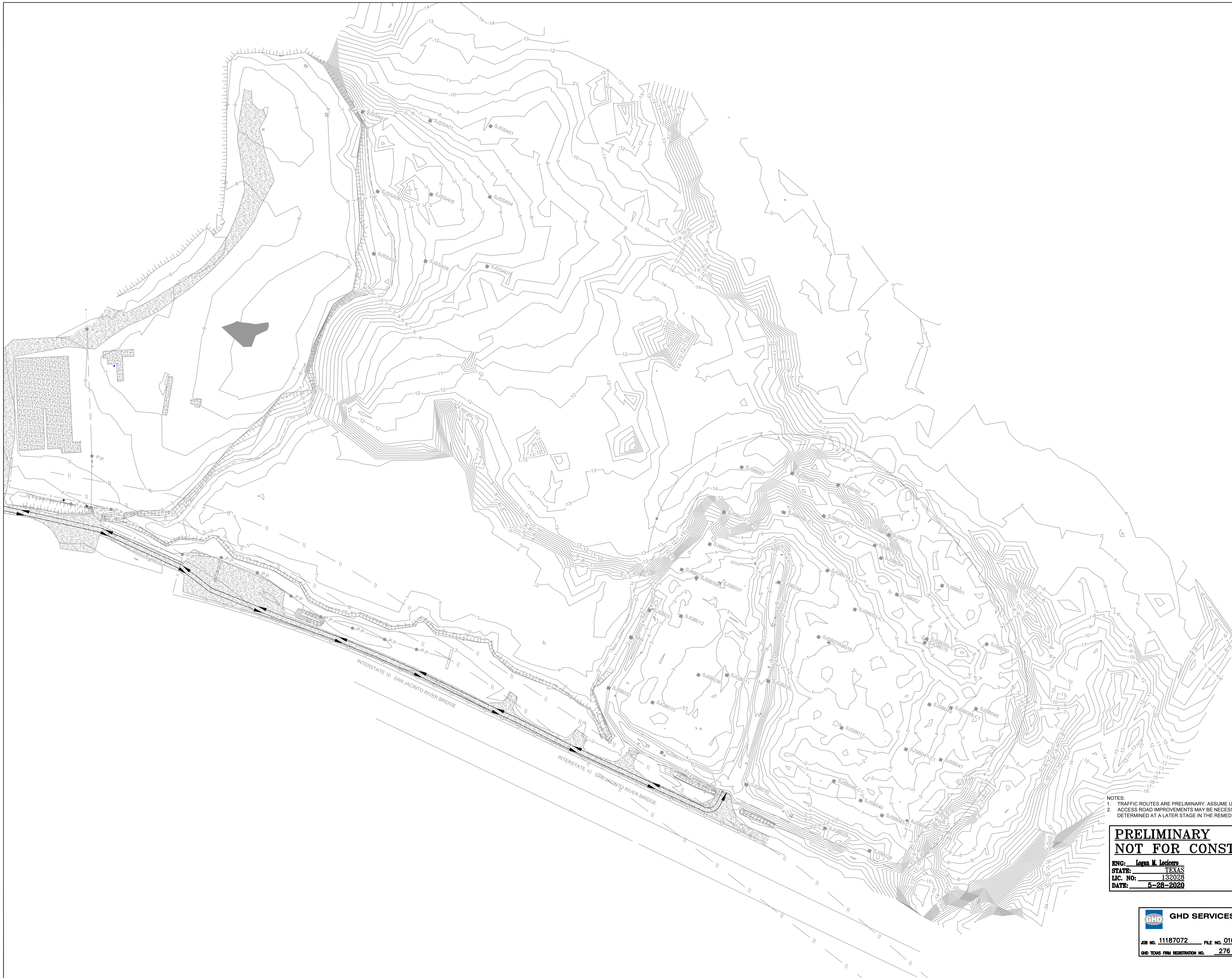
Project No. 11187072

Title
SOIL EROSION AND SEDIMENT CONTROL DETAILS

Sheet No.
C-06

Sheet - of -

Plot Date: 28 May 2020 - 7:31 AM Plotted By: Matt Wolfer Filename: N:\US\Baton Rouge\Legacy\BAT\Shared\Project Work Area\11180000s\11187072 - San Jacinto River Waste Pits Superfund Site - Remedial Design\Design\CAD\Sheets\11187072-00(010)\11187072-00(010)CI\11187072-00(010)CI-WA006.dwg



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

PRELIMINARY
NOT FOR CONSTRUCTION
ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 5-28-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 010
GHD TEXAS FIRM REGISTRATION NO. 276

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 **F** 225 952 2978 **W** www.ghd.com

LEGEND

	TCRA CAP PERIMETER
620	EXISTING CONTOUR INTERVAL
X	FENCELINE
	SHORELINE
	TOP OF BANK
	TOE OF SLOPE
O/H	OVERHEAD ELECTRICAL
	GUARDRAIL
\\	PIPELINE
SJSB002	BORING LOCATION
MW	MONITORING WELL
P.P.	POWER POLE
L.P.	LIGHT POLE
WELL	WELL
	ASPHALT
	CONCRETE
	GRAVEL
	TRAFFIC FLOW

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

Client
SAN JACINTO RIVER WASTE PITS

Project
NORTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	RH	05/28/2020
1	30% CLIENT REVIEW	MW	RH	05/15/2020

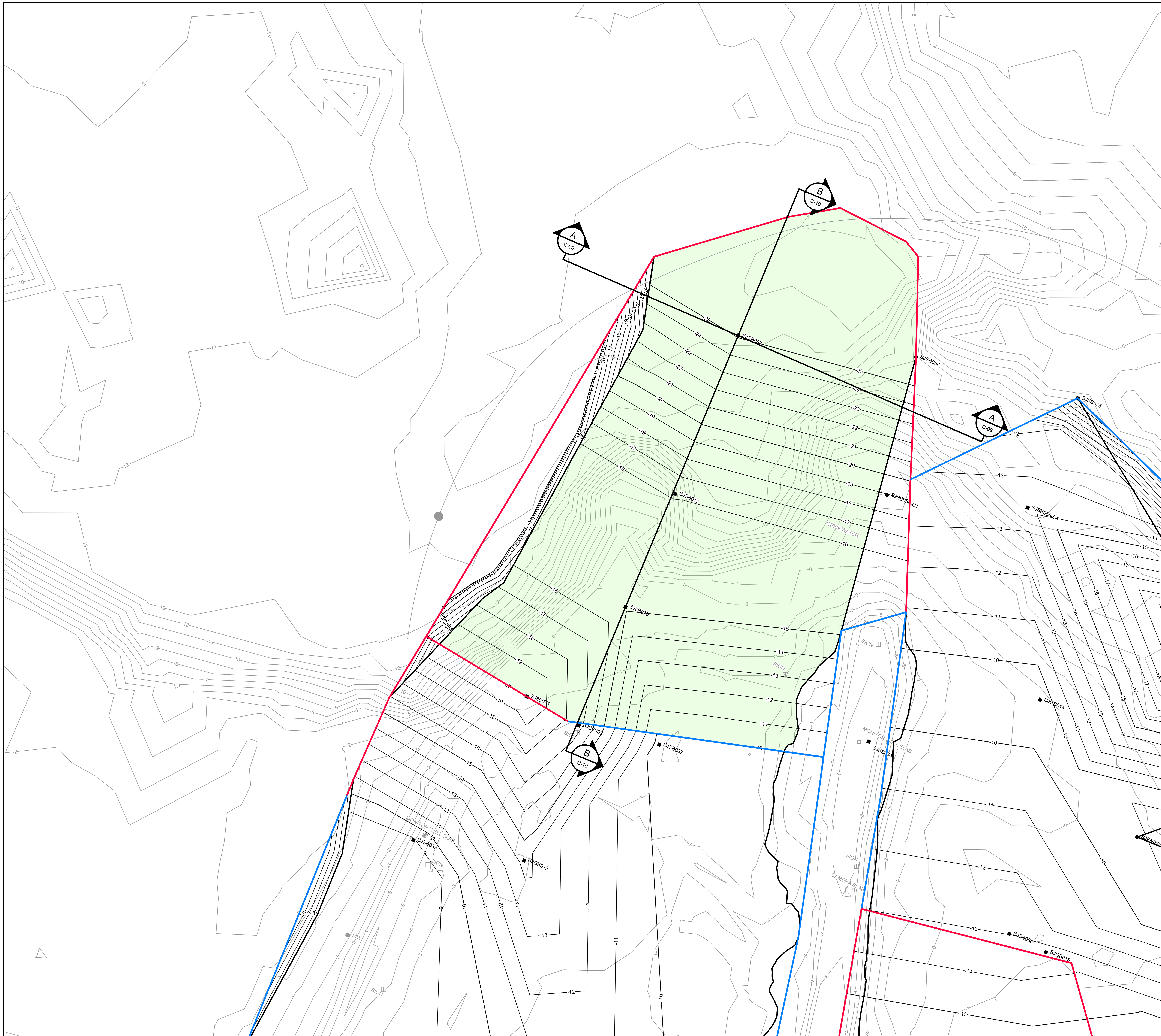
Drawn	MW	Designer	RH
Drafting Check	BP	Design Check	LL
Project Coordinator	CM	Date	May 28, 2020
This document shall not be used for construction unless signed and sealed for construction.		Scale	1" = 100'
Original Size	Arch D	Bar is one inch on original size drawing 0 1"	

Project No. 11187072

Title
PROJECT TRAFFIC CONTROL PLAN

Sheet No.
C-07

Sheet - of -



NOTES:

1. FINAL EXCAVATION CONTOURS ARE SUBJECT TO CHANGE.
2. CELL NUMBERS FOR IDENTIFICATION ONLY AND DO NOT REPRESENT ORDER OF EXCAVATION SEQUENCING.
3. BMP DESIGN IS SUBJECT TO CHANGE BASED ON ADDITIONAL DATA ANALYSIS AND ENGINEERING EVALUATION, AS WELL AS CHANGES IN POTENTIAL WATER SURFACE ELEVATIONS RESULTING FROM UPSTREAM CONDITIONS CURRENTLY UNDER CONSIDERATION, BUT IS SHOWN AS A CANTILEVERED PILE COFFERDAM WITH A TOP OF PILE HEIGHT OF +9' NAVD88 AND IS COMPOSED OF A PAZ66/AZ38-700N PIPE-Z SYSTEM WITH A PILE TIP DEPTH OF -80' NAVD88 AND A HZ 1080M A HZ-M WALL WITH A PILE TIP DEPTH OF -100' NAVD88.
4. PILES SHOWN ON DRAWINGS DO NOT MEET MAXIMUM DEFLECTION CRITERIA TYPICALLY USED FOR PILE WALLS. SECTIONS ARE SHOWN THAT MEET STABILITY AND STRENGTH REQUIREMENTS ONLY. MEETING DEFLECTION CRITERIA WILL LEAD TO EITHER MUCH LARGER PILE SECTIONS OR DIFFERENT WALL TYPE CONCEPTS OR A DIFFERENT DESIGN APPROACH.
5. BASED ON THE PILE DRIVING ANALYSIS PERFORMED, IT IS UNCERTAIN THAT PILES WILL BE ABLE TO BE DRIVEN COMPLETELY AND PRACTICAL REFUSAL OF THE PILES IS POSSIBLE PRIOR TO REACHING REQUIRED PILE TIP DEPTH.
6. HARD PILE DRIVING CONDITIONS COULD LEAD TO LATERAL MOVEMENT OF THE PILES CREATING ALIGNMENT ISSUES.
7. HARD DRIVING CONDITIONS WILL CAUSE VIBRATIONS THROUGH SOIL CAUSING SOIL PARTICLE ACCELERATION. THESE ACCELERATIONS MAY CAUSE SLOPE INSTABILITY. PREDICTION OF DESIGN MAGNITUDE OF SOIL ACCELERATION IS HIGHLY VARIABLE DUE TO VARIABILITY OF SOIL CONDITIONS, TRANSFER OF FORCES FROM PILE TO SOIL, AND AMOUNT OF PILE DRIVING ENERGY REQUIRED DURING ANY PHASE OF DRIVING.
8. CONSIDERATION OF ADDITIONAL DESIGN SECTIONS ALONG EACH LENGTH OF CELL WALL COULD RESULT IN LARGER PILE SECTIONS, INABILITY TO DRIVE PILES TO REQUIRED DEPTH DUE TO DIFFICULT DRIVING CONDITIONS, AND/OR REFUSAL PRIOR TO REQUIRED TIP DEPTH.
9. SCHEDULE AND CONSTRUCTABILITY WILL BE IMPACTED BY THE PREDICTED LARGE PILE SIZES AND DEPTHS AND MAY BE ADDITIONALLY AFFECTED OR DEEMED IMPRACTICAL BY DIFFICULT DRIVING CONDITIONS AND GEOTECHNICAL UNCERTAINTIES.

PRELIMINARY
NOT FOR CONSTRUCTION

ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 5-28-2020

GHD SERVICES INC.

JOB NO. 11187072 FILE NO. 010
GHD TEXAS FIRM REGISTRATION NO. 276

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 **F** 225 952 2978 **W** www.ghd.com

LEGEND

	TCRA CAP PERIMETER
620	EXISTING CONTOUR INTERVAL
X	FENCELINE
	SHORELINE
	TOP OF BANK
	TOE OF SLOPE
O/H	OVERHEAD ELECTRICAL
	GUARDRAIL
\\	PIPELINE
SJSB002	BORING LOCATION
MW	MONITORING WELL
P.P.	POWER POLE
L.P.	LIGHT POLE
WELL	WELL
	AREA WITH MATERIAL >30 ng/kg TEQ
	ASPHALT
	CONCRETE
	GRAVEL
	PAZ66/AZ38-700N PILE
	HZ 1080M A PILE

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

Client

SAN JACINTO RIVER WASTE PITS

Project

NORTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	RH	05/28/2020
1	30% CLIENT REVIEW	MW	RH	05/15/2020

Drawn	MW	Designer	RH
Drafting Check	BP	Design Check	LL
Project Coordinator	CM	Date	May 28, 2020
This document shall not be used for construction unless signed and sealed for construction.		Scale	1" = 30'
Original Size	Arch D	Bar is one inch on original size drawing 0 1"	

Project No. 11187072

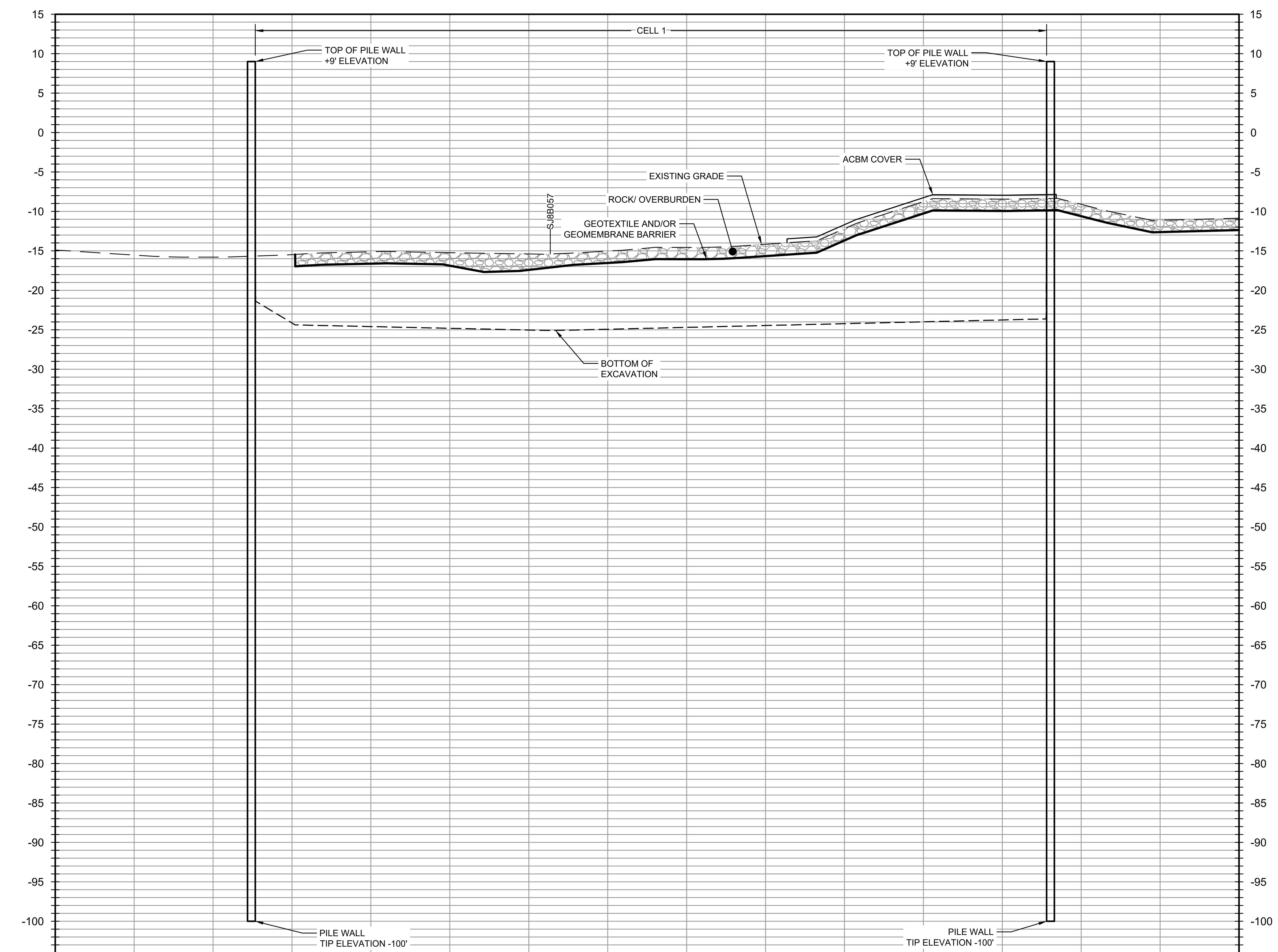
Title

EXCAVATION PLAN CELL 1

Sheet No.

C-08

Sheet - of -



EXIST. ELEV.	15.53	15.79	15.47	15.11	15.23	15.39	15.03	14.56	14.16	12.17	8.75	8.44	9.10	11.11
STA	0+20	0+40	0+60	0+80	1+00	1+20	1+40	1+60	1+80	2+00	2+20	2+40	2+60	2+80

SECTION A EAST/WEST C-08
HORIZ: 1"=20'
VERT: 1"=10'

NOTES:

1. BOTTOM OF EXCAVATION IS SUBJECT TO CHANGE.
2. CELL NUMBERS FOR IDENTIFICATION ONLY AND DO NOT REPRESENT ORDER OF EXCAVATION SEQUENCING.
3. BMP DESIGN IS SUBJECT TO CHANGE BASED ON ADDITIONAL DATA ANALYSIS AND ENGINEERING EVALUATION, AS WELL AS CHANGES IN POTENTIAL WATER SURFACE ELEVATIONS RESULTING FROM UPSTREAM CONDITIONS CURRENTLY UNDER CONSIDERATION, BUT IS SHOWN AS A CANTILEVERED PILE COFFERDAM WITH A TOP OF PILE HEIGHT OF +9' NAVD88 AND IS COMPOSED OF A PAZ66/AZ38-700N PIPE-Z SYSTEM WITH A PILE TIP DEPTH OF -80' NAVD88 AND A HZ 1080M A HZ-M WALL WITH A PILE TIP DEPTH OF -100' NAVD88.
4. PILES SHOWN ON DRAWINGS DO NOT MEET MAXIMUM DEFLECTION CRITERIA TYPICALLY USED FOR PILE WALLS. SECTIONS ARE SHOWN THAT MEET STABILITY AND STRENGTH REQUIREMENTS ONLY. MEETING DEFLECTION CRITERIA WILL LEAD TO EITHER MUCH LARGER PILE SECTIONS OR DIFFERENT WALL TYPE CONCEPTS OR A DIFFERENT DESIGN APPROACH.
5. BASED ON THE PILE DRIVING ANALYSIS PERFORMED, IT IS UNCERTAIN THAT PILES WILL BE ABLE TO BE DRIVEN COMPLETELY AND PRACTICAL REFUSAL OF THE PILES IS POSSIBLE PRIOR TO REACHING REQUIRED PILE TIP DEPTH.
6. HARD PILE DRIVING CONDITIONS COULD LEAD TO LATERAL MOVEMENT OF THE PILES CREATING ALIGNMENT ISSUES.
7. HARD DRIVING CONDITIONS WILL CAUSE VIBRATIONS THROUGH SOIL CAUSING SOIL PARTICLE ACCELERATION. THESE ACCELERATIONS MAY CAUSE SLOPE INSTABILITY. PREDICTION OF DESIGN MAGNITUDE OF SOIL ACCELERATION IS HIGHLY VARIABLE DUE TO VARIABILITY OF SOIL CONDITIONS, TRANSFER OF FORCES FROM PILE TO SOIL, AND AMOUNT OF PILE DRIVING ENERGY REQUIRED DURING ANY PHASE OF DRIVING.
8. CONSIDERATION OF ADDITIONAL DESIGN SECTIONS ALONG EACH LENGTH OF CELL WALL COULD RESULT IN LARGER PILE SECTIONS, INABILITY TO DRIVE PILES TO REQUIRED DEPTH DUE TO DIFFICULT DRIVING CONDITIONS, AND/OR REFUSAL PRIOR TO REQUIRED TIP DEPTH.
9. SCHEDULE AND CONSTRUCTABILITY WILL BE IMPACTED BY THE PREDICTED LARGE PILE SIZES AND DEPTHS AND MAY BE ADDITIONALLY AFFECTED OR DEEMED IMPRACTICAL BY DIFFICULT DRIVING CONDITIONS AND GEOTECHNICAL UNCERTAINTIES.

PRELIMINARY
NOT FOR CONSTRUCTION
ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 5-28-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 010
GHD TEXAS FIRM REGISTRATION NO. 276

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

Client
SAN JACINTO RIVER WASTE PITS

Project
NORTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	RH	05/28/2020
1	30% CLIENT REVIEW	MW	RH	05/15/2020

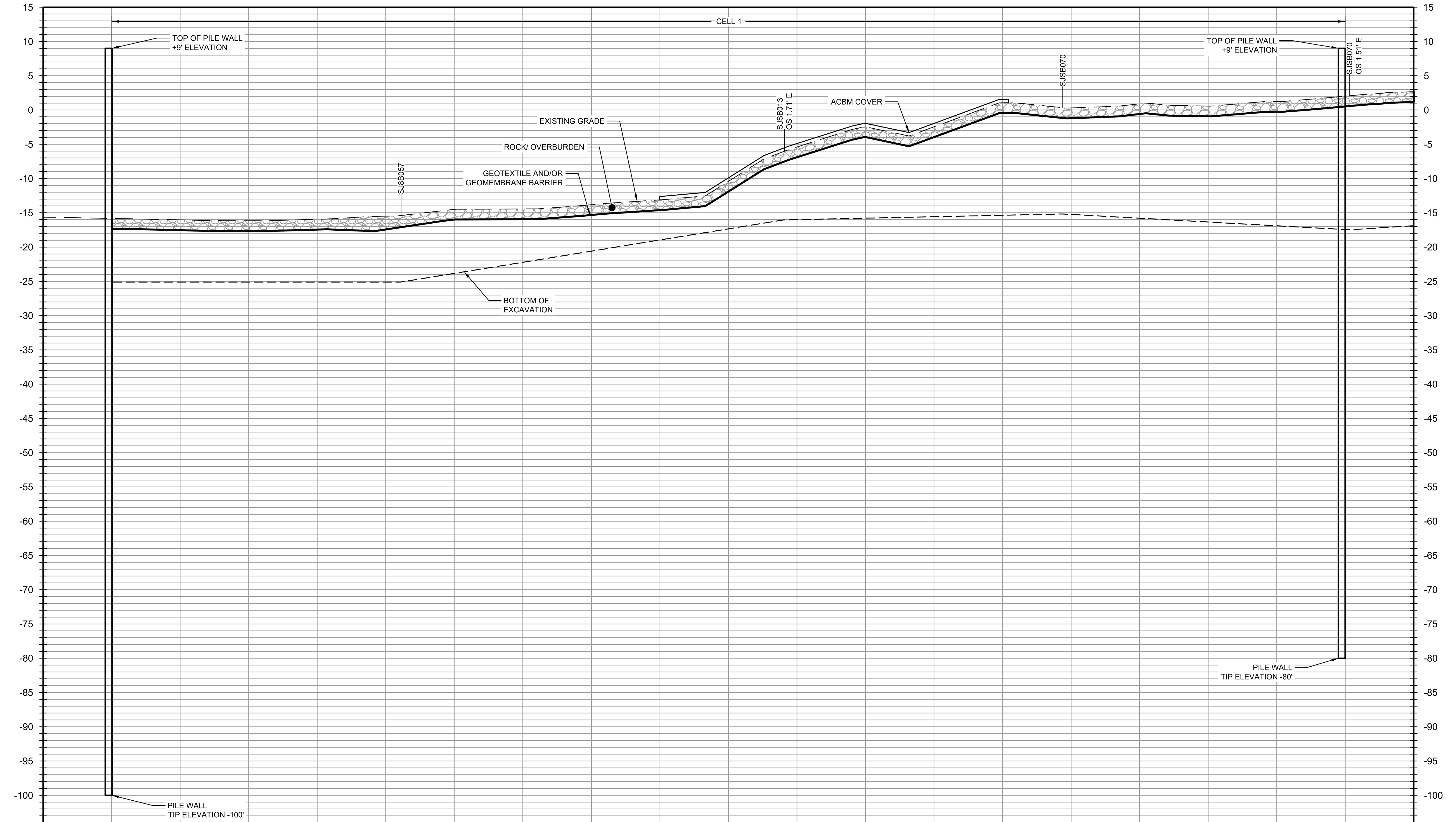
Drawn	MW	Designer	RH
Drafting Check	BP	Design Check	LL
Project Coordinator	CM	Date	May 28, 2020
This document shall not be used for construction unless signed and sealed for construction.		Scale	AS SHOWN
Original Size	Arch D	Bar is one inch on original size drawing 0 1"	

Project No. 11187072

Title
EXCAVATION SECTION CELL 1 (1 OF 2)

Sheet No.
C-09

Sheet - of -



EXIST. ELEV.	15.82	16.04	16.15	15.94	15.48	14.49	14.44	13.82	13.12	10.40	5.40	2.44	2.45	1.05	0.30	0.91	0.58	1.25	2.02	EXIST. ELEV.
STA	0+20	0+40	0+60	0+80	1+00	1+20	1+40	1+60	1+80	2+00	2+20	2+40	2+60	2+80	3+00	3+20	3+40	3+60	3+80	STA

SECTION (B / C-08) NORTH/SOUTH
HORIZ: 1"=20'
VERT: 1"=10'

NOTES:

1. BOTTOM OF EXCAVATION IS SUBJECT TO CHANGE.
2. CELL NUMBERS FOR IDENTIFICATION ONLY AND DO NOT REPRESENT ORDER OF EXCAVATION SEQUENCING.
3. BMP DESIGN IS SUBJECT TO CHANGE BASED ON ADDITIONAL DATA ANALYSIS AND ENGINEERING EVALUATION, AS WELL AS CHANGES IN POTENTIAL WATER SURFACE ELEVATIONS RESULTING FROM UPSTREAM CONDITIONS CURRENTLY UNDER CONSIDERATION, BUT IS SHOWN AS A CANTILEVERED PILE COFFERDAM WITH A TOP OF PILE HEIGHT OF +9' NAVD88 AND IS COMPOSED OF A PAZ66/AZ38-700N PIPE-Z SYSTEM WITH A PILE TIP DEPTH OF -80' NAVD88 AND A HZ 1080M A HZ-M WALL WITH A PILE TIP DEPTH OF -100' NAVD88.
4. PILES SHOWN ON DRAWINGS DO NOT MEET MAXIMUM DEFLECTION CRITERIA TYPICALLY USED FOR PILE WALLS. SECTIONS ARE SHOWN THAT MEET STABILITY AND STRENGTH REQUIREMENTS ONLY. MEETING DEFLECTION CRITERIA WILL LEAD TO EITHER MUCH LARGER PILE SECTIONS OR DIFFERENT WALL TYPE CONCEPTS OR A DIFFERENT DESIGN APPROACH.
5. BASED ON THE PILE DRIVING ANALYSIS PERFORMED, IT IS UNCERTAIN THAT PILES WILL BE ABLE TO BE DRIVEN COMPLETELY AND PRACTICAL REFUSAL OF THE PILES IS POSSIBLE PRIOR TO REACHING REQUIRED PILE TIP DEPTH.
6. HARD PILE DRIVING CONDITIONS COULD LEAD TO LATERAL MOVEMENT OF THE PILES CREATING ALIGNMENT ISSUES.
7. HARD DRIVING CONDITIONS WILL CAUSE VIBRATIONS THROUGH SOIL CAUSING SOIL PARTICLE ACCELERATION. THESE ACCELERATIONS MAY CAUSE SLOPE INSTABILITY. PREDICTION OF DESIGN MAGNITUDE OF SOIL ACCELERATION IS HIGHLY VARIABLE DUE TO VARIABILITY OF SOIL CONDITIONS, TRANSFER OF FORCES FROM PILE TO SOIL, AND AMOUNT OF PILE DRIVING ENERGY REQUIRED DURING ANY PHASE OF DRIVING.
8. CONSIDERATION OF ADDITIONAL DESIGN SECTIONS ALONG EACH LENGTH OF CELL WALL COULD RESULT IN LARGER PILE SECTIONS, INABILITY TO DRIVE PILES TO REQUIRED DEPTH DUE TO DIFFICULT DRIVING CONDITIONS, AND/OR REFUSAL PRIOR TO REQUIRED TIP DEPTH.
9. SCHEDULE AND CONSTRUCTABILITY WILL BE IMPACTED BY THE PREDICTED LARGE PILE SIZES AND DEPTHS AND MAY BE ADDITIONALLY AFFECTED OR DEEMED IMPRACTICAL BY DIFFICULT DRIVING CONDITIONS AND GEOTECHNICAL UNCERTAINTIES.

PRELIMINARY
NOT FOR CONSTRUCTION
ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 5-28-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 010
GHD TEXAS FIRM REGISTRATION NO. 276

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

Client
SAN JACINTO RIVER WASTE PITS

Project
NORTHERN IMPOUNDMENT
PRELIMINARY 30% REMEDIAL DESIGN
HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	RH	05/28/2020
1	30% CLIENT REVIEW	MW	RH	05/15/2020

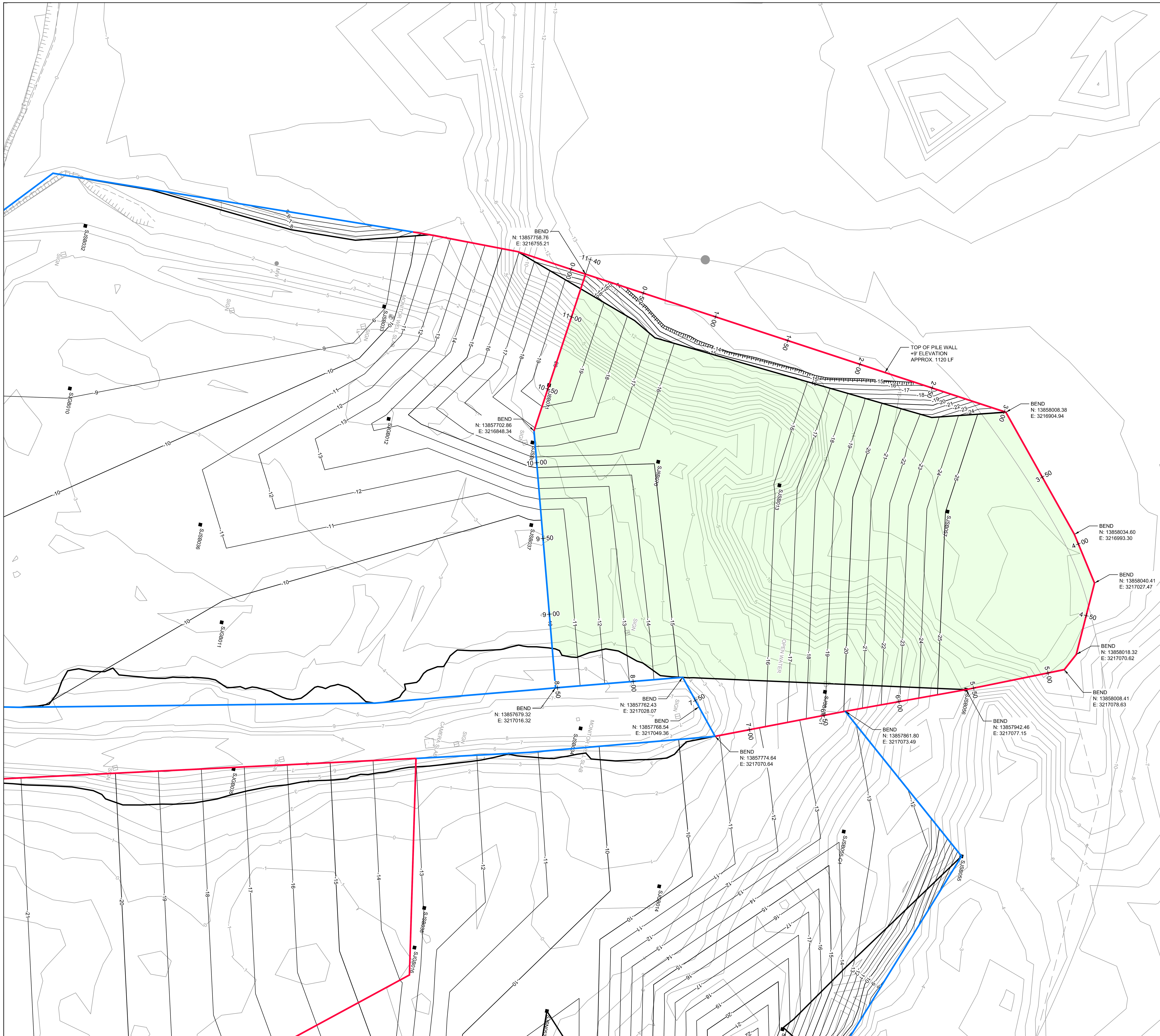
Drawn MW
Designer RH
Drafting Check BP
Design Check LL
Project Coordinator CM
Date May 28, 2020
This document shall not be used for construction unless signed and sealed for construction.
Scale AS SHOWN
Original Size Arch D
Bar is one inch on original size drawing 0 1"

Project No. 11187072

Title
EXCAVATION SECTION
CELL 1
(2 OF 2)

Sheet No.
C-10

Sheet - of -



NOTES:

1. FINAL EXCAVATION CONTOURS ARE SUBJECT TO CHANGE.
2. CELL NUMBERS FOR IDENTIFICATION ONLY AND DO NOT REPRESENT ORDER OF EXCAVATION SEQUENCING.
3. BMP DESIGN IS SUBJECT TO CHANGE BASED ON ADDITIONAL DATA ANALYSIS AND ENGINEERING EVALUATION, AS WELL AS CHANGES IN POTENTIAL WATER SURFACE ELEVATIONS RESULTING FROM UPSTREAM CONDITIONS CURRENTLY UNDER CONSIDERATION, BUT IS SHOWN AS A CANTILEVERED PILE COFFERDAM WITH A TOP OF PILE HEIGHT OF +9' NAVD88 AND IS COMPOSED OF A PAZ66/AZ38-700N PIPE-Z SYSTEM WITH A PILE TIP DEPTH OF -80' NAVD88 AND A HZ 1080M A HZ-M WALL WITH A PILE TIP DEPTH OF -100' NAVD88.
4. PILES SHOWN ON DRAWINGS DO NOT MEET MAXIMUM DEFLECTION CRITERIA TYPICALLY USED FOR PILE WALLS. SECTIONS ARE SHOWN THAT MEET STABILITY AND STRENGTH REQUIREMENTS ONLY. MEETING DEFLECTION CRITERIA WILL LEAD TO EITHER MUCH LARGER PILE SECTIONS OR DIFFERENT WALL TYPE CONCEPTS OR A DIFFERENT DESIGN APPROACH.
5. BASED ON THE PILE DRIVING ANALYSIS PERFORMED, IT IS UNCERTAIN THAT PILES WILL BE ABLE TO BE DRIVEN COMPLETELY AND PRACTICAL REFUSAL OF THE PILES IS POSSIBLE PRIOR TO REACHING REQUIRED PILE TIP DEPTH.
6. HARD PILE DRIVING CONDITIONS COULD LEAD TO LATERAL MOVEMENT OF THE PILES CREATING ALIGNMENT ISSUES.
7. HARD DRIVING CONDITIONS WILL CAUSE VIBRATIONS THROUGH SOIL CAUSING SOIL PARTICLE ACCELERATION. THESE ACCELERATIONS MAY CAUSE SLOPE INSTABILITY. PREDICTION OF DESIGN MAGNITUDE OF SOIL ACCELERATION IS HIGHLY VARIABLE DUE TO VARIABILITY OF SOIL CONDITIONS, TRANSFER OF FORCES FROM PILE TO SOIL, AND AMOUNT OF PILE DRIVING ENERGY REQUIRED DURING ANY PHASE OF DRIVING.
8. CONSIDERATION OF ADDITIONAL DESIGN SECTIONS ALONG EACH LENGTH OF CELL WALL COULD RESULT IN LARGER PILE SECTIONS, INABILITY TO DRIVE PILES TO REQUIRED DEPTH DUE TO DIFFICULT DRIVING CONDITIONS, AND/OR REFUSAL PRIOR TO REQUIRED TIP DEPTH.
9. SCHEDULE AND CONSTRUCTABILITY WILL BE IMPACTED BY THE PREDICTED LARGE PILE SIZES AND DEPTHS AND MAY BE ADDITIONALLY AFFECTED OR DEEMED IMPRACTICAL BY DIFFICULT DRIVING CONDITIONS AND GEOTECHNICAL UNCERTAINTIES.

PRELIMINARY
NOT FOR CONSTRUCTION

ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 5-28-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 010
GHD TEXAS FIRM REGISTRATION NO. 276

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

LEGEND

- TCRA CAP PERIMETER
- EXISTING CONTOUR INTERVAL (620)
- FENCELINE
- SHORELINE
- TOP OF BANK
- TOE OF SLOPE
- OVERHEAD ELECTRICAL (O/H)
- GUARDRAIL
- PIPELINE
- SJSB002 BORING LOCATION
- MW MONITORING WELL
- P.P. POWER POLE
- L.P. LIGHT POLE
- WELL WELL
- AREA WITH MATERIAL >30 ng/kg TEQ
- ASPHALT
- CONCRETE
- GRAVEL
- PAZ66/AZ38-700N PILE
- HZ 1080M A PILE

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

Client
SAN JACINTO RIVER WASTE PITS

Project
NORTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	SC	05/28/2020
1	30% CLIENT REVIEW	MW	SC	05/15/2020

Drawn	MW	Designer	RH
Drafting Check	BP	Design Check	LL
Project Coordinator	CM	Date	May 28, 2020
This document shall not be used for construction unless signed and sealed for construction.		Scale	1" = 30'
Original Size	Arch D	Bar is one inch on original size drawing	0 1"

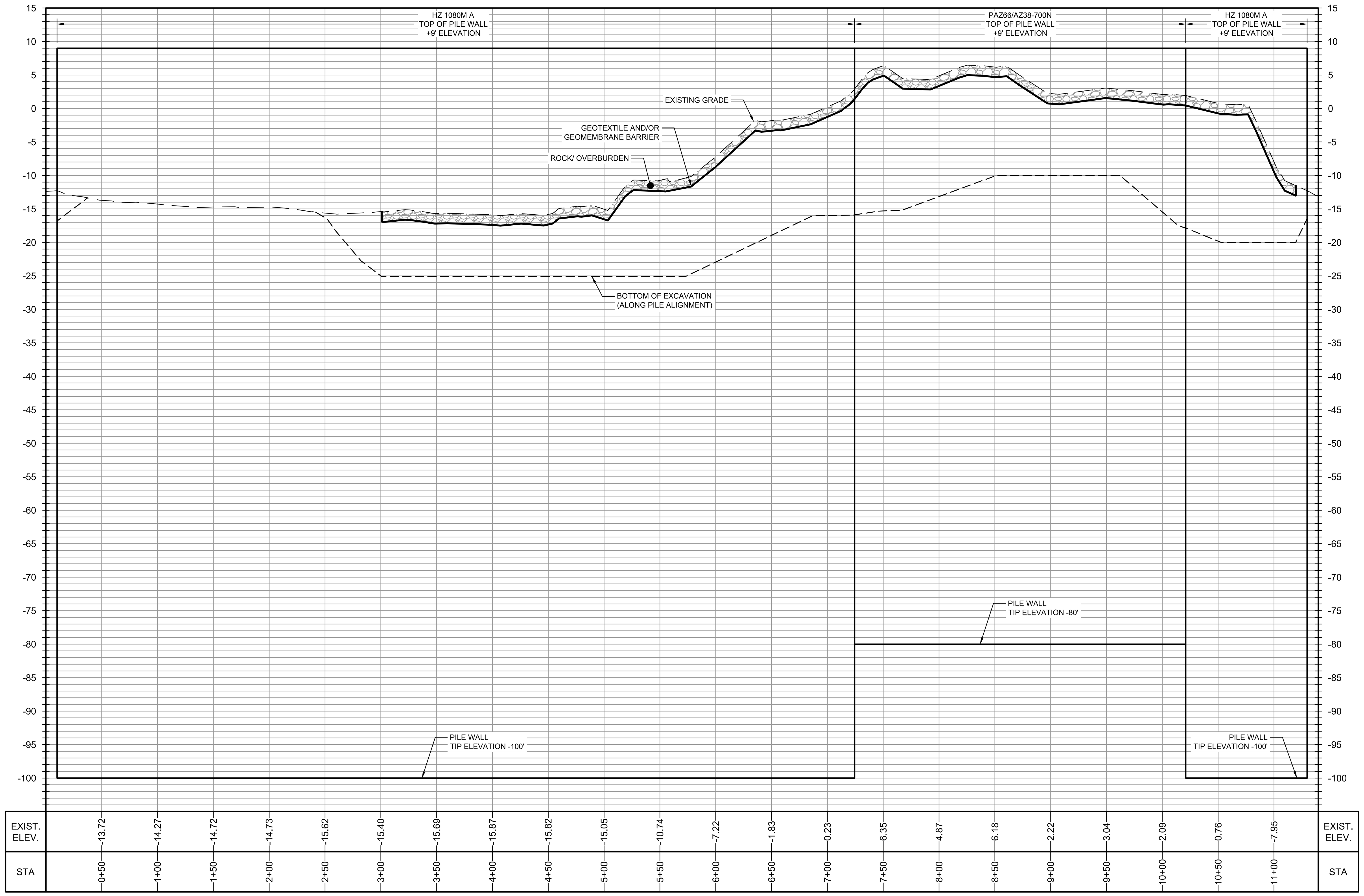
Project No. 11187072

Title
PILE LAYOUT PLAN CELL 1

Sheet No.
C-11

Sheet - of -

Plot Date: 28 May 2020 - 7:59 AM Plotted By: Matt Wolfer Filename: N:\US\Baton Rouge\Legacy\BATShared\Project Work Area\11180000\11187072 - San Jacinto River Waste Pits Superfund Site - Remedial Design\Design\CAD\Sheets\11187072-00(010)\11187072-00(010)CI\11187072-00(010)CI-WA015.dwg



PROFILE

HORIZ: 1" = 60'
VERT: 1" = 10'

NOTES:

1. BOTTOM OF EXCAVATION IS SUBJECT TO CHANGE.
2. CELL NUMBERS FOR IDENTIFICATION ONLY AND DO NOT REPRESENT ORDER OF EXCAVATION SEQUENCING.
3. BMP DESIGN IS SUBJECT TO CHANGE BASED ON ADDITIONAL DATA ANALYSIS AND ENGINEERING EVALUATION, AS WELL AS CHANGES IN POTENTIAL WATER SURFACE ELEVATIONS RESULTING FROM UPSTREAM CONDITIONS CURRENTLY UNDER CONSIDERATION, BUT IS SHOWN AS A CANTILEVERED PILE COFFERDAM WITH A TOP OF PILE HEIGHT OF +9' NAVD88 AND IS COMPOSED OF A PAZ66/AZ38-700N PIPE-Z SYSTEM WITH A PILE TIP DEPTH OF -80' NAVD88 AND A HZ 1080M A HZ-M WALL WITH A PILE TIP DEPTH OF -100' NAVD88.
4. PILES SHOWN ON DRAWINGS DO NOT MEET MAXIMUM DEFLECTION CRITERIA TYPICALLY USED FOR PILE WALLS. SECTIONS ARE SHOWN THAT MEET STABILITY AND STRENGTH REQUIREMENTS ONLY. MEETING DEFLECTION CRITERIA WILL LEAD TO EITHER MUCH LARGER PILE SECTIONS OR DIFFERENT WALL TYPE CONCEPTS OR A DIFFERENT DESIGN APPROACH.
5. BASED ON THE PILE DRIVING ANALYSIS PERFORMED, IT IS UNCERTAIN THAT PILES WILL BE ABLE TO BE DRIVEN COMPLETELY AND PRACTICAL REFUSAL OF THE PILES IS POSSIBLE PRIOR TO REACHING REQUIRED PILE TIP DEPTH.
6. HARD PILE DRIVING CONDITIONS COULD LEAD TO LATERAL MOVEMENT OF THE PILES CREATING ALIGNMENT ISSUES.
7. HARD DRIVING CONDITIONS WILL CAUSE VIBRATIONS THROUGH SOIL CAUSING SOIL PARTICLE ACCELERATION. THESE ACCELERATIONS MAY CAUSE SLOPE INSTABILITY. PREDICTION OF DESIGN MAGNITUDE OF SOIL ACCELERATION IS HIGHLY VARIABLE DUE TO VARIABILITY OF SOIL CONDITIONS, TRANSFER OF FORCES FROM PILE TO SOIL, AND AMOUNT OF PILE DRIVING ENERGY REQUIRED DURING ANY PHASE OF DRIVING.
8. CONSIDERATION OF ADDITIONAL DESIGN SECTIONS ALONG EACH LENGTH OF CELL WALL COULD RESULT IN LARGER PILE SECTIONS, INABILITY TO DRIVE PILES TO REQUIRED DEPTH DUE TO DIFFICULT DRIVING CONDITIONS, AND/OR REFUSAL PRIOR TO REQUIRED TIP DEPTH.
9. SCHEDULE AND CONSTRUCTABILITY WILL BE IMPACTED BY THE PREDICTED LARGE PILE SIZES AND DEPTHS AND MAY BE ADDITIONALLY AFFECTED OR DEEMED IMPRACTICAL BY DIFFICULT DRIVING CONDITIONS AND GEOTECHNICAL UNCERTAINTIES.

PRELIMINARY
NOT FOR CONSTRUCTION

ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 5-28-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 010
GHD TEXAS FIRM REGISTRATION NO. 276

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 **F** 225 952 2978 **W** www.ghd.com

Client
SAN JACINTO RIVER WASTE PITS

Project
NORTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	SC	05/28/2020
1	30% CLIENT REVIEW	MW	SC	05/15/2020

Drawn	MW	Designer	RH
Drafting Check	BP	Design Check	LL
Project Coordinator	CM	Date	May 28, 2020
This document shall not be used for construction unless signed and sealed for construction.		Scale	AS SHOWN

Original Size
Arch D

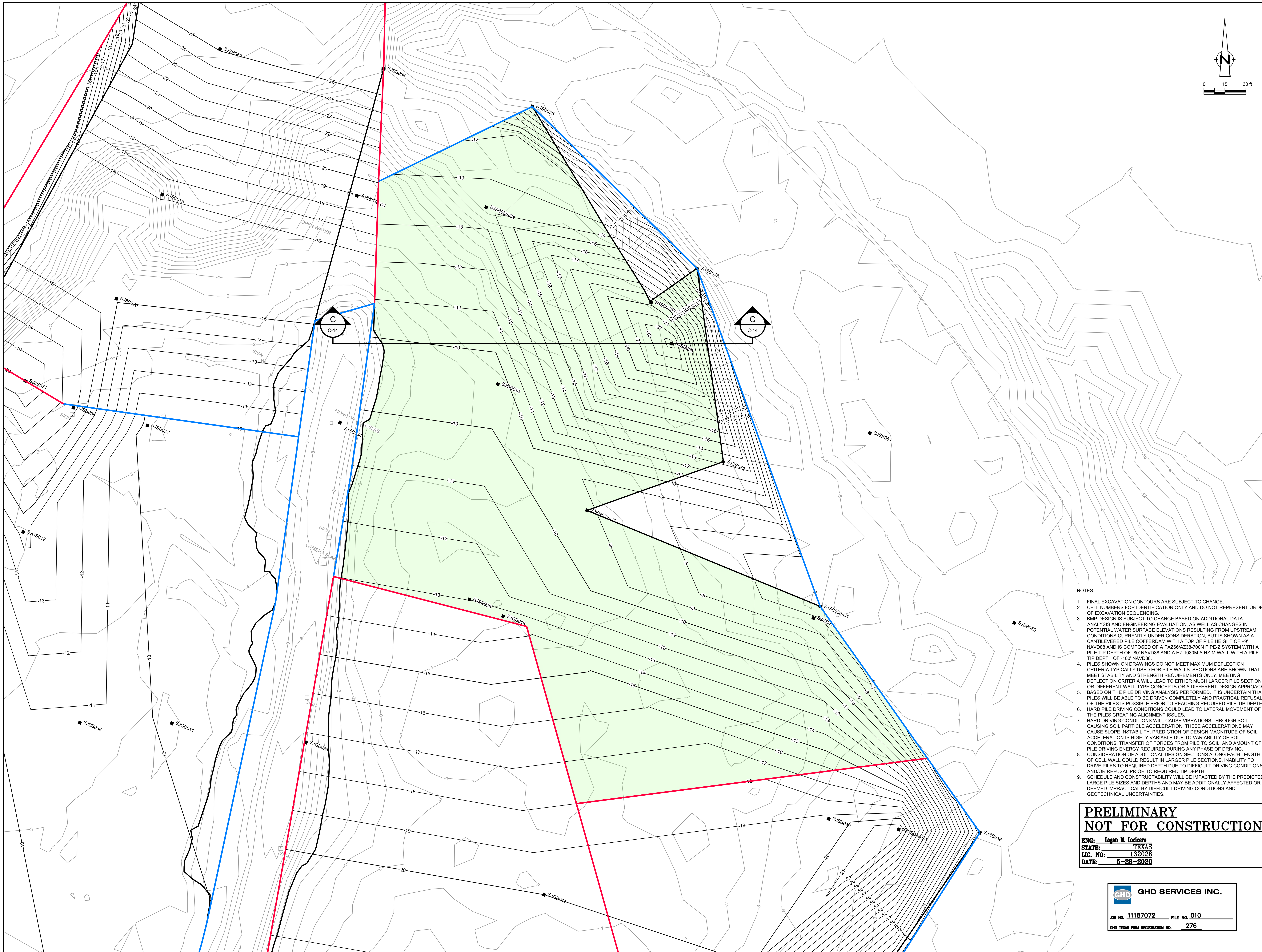
Bar is one inch on original size drawing
0 1"

Project No. **11187072**

Title
PILE PROFILE CELL 1

Sheet No.
C-12

Sheet - of -



NOTES:

1. FINAL EXCAVATION CONTOURS ARE SUBJECT TO CHANGE.
2. CELL NUMBERS FOR IDENTIFICATION ONLY AND DO NOT REPRESENT ORDER OF EXCAVATION SEQUENCING.
3. BMP DESIGN IS SUBJECT TO CHANGE BASED ON ADDITIONAL DATA ANALYSIS AND ENGINEERING EVALUATION, AS WELL AS CHANGES IN POTENTIAL WATER SURFACE ELEVATIONS RESULTING FROM UPSTREAM CONDITIONS CURRENTLY UNDER CONSIDERATION, BUT IS SHOWN AS A CANTILEVERED PILE COFFERDAM WITH A TOP OF PILE HEIGHT OF +9' NAVD88 AND IS COMPOSED OF A PAZ66/AZ38-700N PIPE-Z SYSTEM WITH A PILE TIP DEPTH OF -80' NAVD88 AND A HZ 1080M A HZ-M WALL WITH A PILE TIP DEPTH OF -100' NAVD88.
4. PILES SHOWN ON DRAWINGS DO NOT MEET MAXIMUM DEFLECTION CRITERIA TYPICALLY USED FOR PILE WALLS. SECTIONS ARE SHOWN THAT MEET STABILITY AND STRENGTH REQUIREMENTS ONLY. MEETING DEFLECTION CRITERIA WILL LEAD TO EITHER MUCH LARGER PILE SECTIONS OR DIFFERENT WALL TYPE CONCEPTS OR A DIFFERENT DESIGN APPROACH.
5. BASED ON THE PILE DRIVING ANALYSIS PERFORMED, IT IS UNCERTAIN THAT PILES WILL BE ABLE TO BE DRIVEN COMPLETELY AND PRACTICAL REFUSAL OF THE PILES IS POSSIBLE PRIOR TO REACHING REQUIRED PILE TIP DEPTH.
6. HARD PILE DRIVING CONDITIONS COULD LEAD TO LATERAL MOVEMENT OF THE PILES CREATING ALIGNMENT ISSUES.
7. HARD DRIVING CONDITIONS WILL CAUSE VIBRATIONS THROUGH SOIL CAUSING SOIL PARTICLE ACCELERATION. THESE ACCELERATIONS MAY CAUSE SLOPE INSTABILITY. PREDICTION OF DESIGN MAGNITUDE OF SOIL ACCELERATION IS HIGHLY VARIABLE DUE TO VARIABILITY OF SOIL CONDITIONS, TRANSFER OF FORCES FROM PILE TO SOIL, AND AMOUNT OF PILE DRIVING ENERGY REQUIRED DURING ANY PHASE OF DRIVING.
8. CONSIDERATION OF ADDITIONAL DESIGN SECTIONS ALONG EACH LENGTH OF CELL WALL COULD RESULT IN LARGER PILE SECTIONS, INABILITY TO DRIVE PILES TO REQUIRED DEPTH DUE TO DIFFICULT DRIVING CONDITIONS, AND/OR REFUSAL PRIOR TO REQUIRED TIP DEPTH.
9. SCHEDULE AND CONSTRUCTABILITY WILL BE IMPACTED BY THE PREDICTED LARGE PILE SIZES AND DEPTHS AND MAY BE ADDITIONALLY AFFECTED OR DEEMED IMPRACTICAL BY DIFFICULT DRIVING CONDITIONS AND GEOTECHNICAL UNCERTAINTIES.

PRELIMINARY
NOT FOR CONSTRUCTION

ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 5-28-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 010
GHD TEXAS FIRM REGISTRATION NO. 276

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

LEGEND

- TCRA CAP PERIMETER
- 620 EXISTING CONTOUR INTERVAL
- X FENCELINE
- SHORELINE
- TOP OF BANK
- TOE OF SLOPE
- O/H OVERHEAD ELECTRICAL
- GUARDRAIL
- PIPELINE
- SJSB002 BORING LOCATION
- MW MONITORING WELL
- P.P. POWER POLE
- L.P. LIGHT POLE
- WELL WELL
- AREA WITH MATERIAL >30 ng/kg TEQ
- ASPHALT
- CONCRETE
- GRAVEL
- PAZ66/AZ38-700N PILE
- HZ 1080M A PILE

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

Client
SAN JACINTO RIVER WASTE PITS

Project
NORTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	RH	05/28/2020
1	30% CLIENT REVIEW	MW	RH	05/15/2020

Drawn MW	Designer RH
Drafting Check BP	Design Check LL
Project Coordinator CM	Date May 28, 2020
This document shall not be used for construction unless signed and sealed for construction.	Scale 1" = 30'
Original Size Arch D	Bar is one inch on original size drawing 0 1"

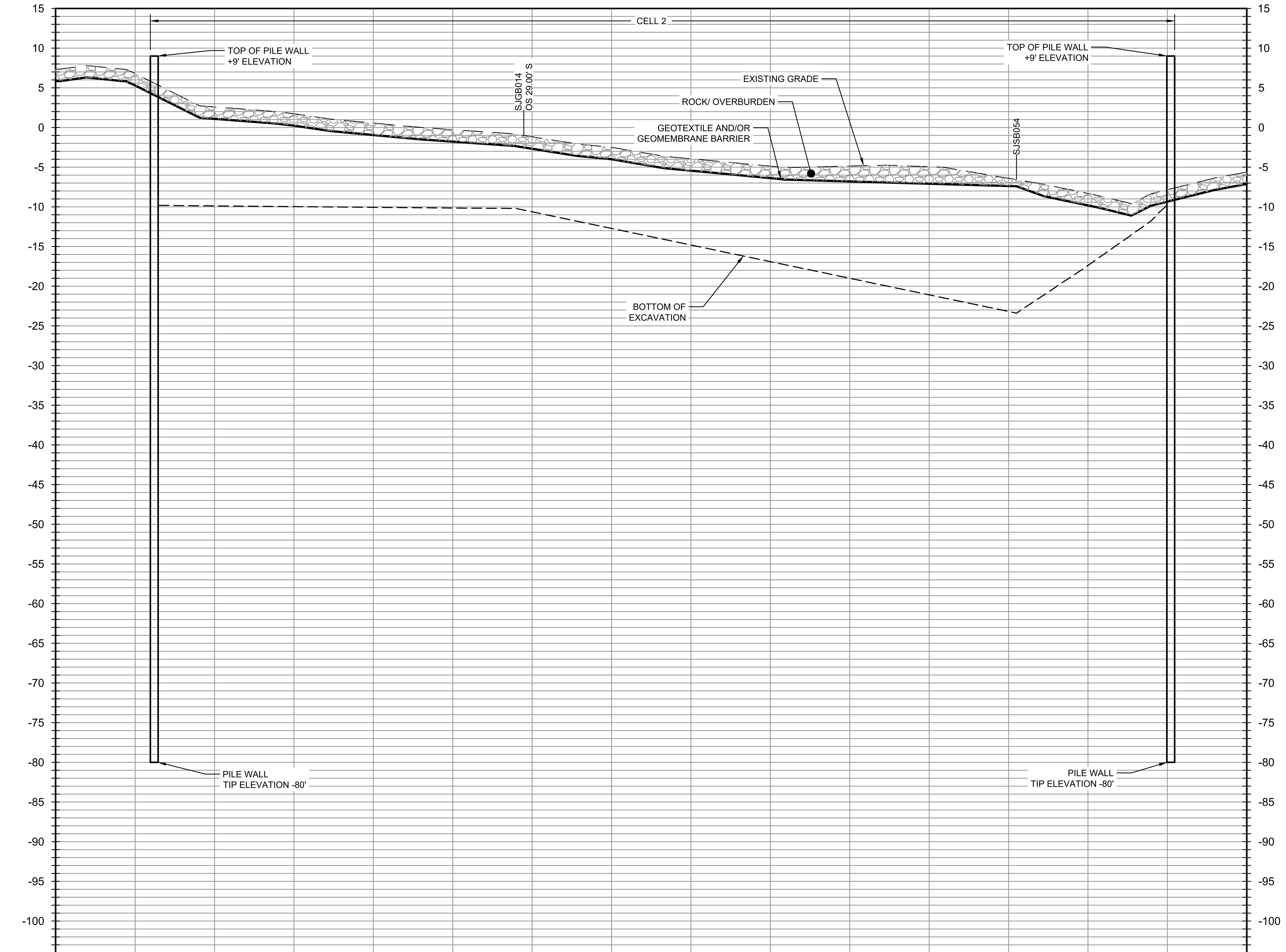
Project No. 11187072

Title
EXCAVATION PLAN CELL 2

Sheet No.
C-13

Sheet - of -

Plot Date: 28 May 2020 - 7:34 AM
Plotted By: Matt Wolfer
Filename: N:\US\Baton Rouge\Legacy\BAT\Shared\Project Work Area\11180000s\11187072 - San Jacinto River Waste Pits Superfund Site - Remedial Design\Design\CAD\Sheets\11187072-00(010)\11187072-00(010)CI\11187072-00(010)CI-WA009.dwg



EXIST. ELEV.	6.79	2.58	1.73	0.55	0.28	-1.18	-2.50	-3.95	-4.88	-4.87	-4.95	-6.41	-8.32	-7.85	EXIST. ELEV.
STA	0+20	0+40	0+60	0+80	1+00	1+20	1+40	1+60	1+80	2+00	2+20	2+40	2+60	2+80	STA

SECTION C
C-13
HORIZ: 1"=20'
VERT: 1"=10'

NOTES:

1. BOTTOM OF EXCAVATION IS SUBJECT TO CHANGE.
2. CELL NUMBERS FOR IDENTIFICATION ONLY AND DO NOT REPRESENT ORDER OF EXCAVATION SEQUENCING.
3. BMP DESIGN IS SUBJECT TO CHANGE BASED ON ADDITIONAL DATA ANALYSIS AND ENGINEERING EVALUATION, AS WELL AS CHANGES IN POTENTIAL WATER SURFACE ELEVATIONS RESULTING FROM UPSTREAM CONDITIONS CURRENTLY UNDER CONSIDERATION, BUT IS SHOWN AS A CANTILEVERED PILE COFFERDAM WITH A TOP OF PILE HEIGHT OF +9' NAVD88 AND IS COMPOSED OF A PAZ66/AZ38-700N PIPE-Z SYSTEM WITH A PILE TIP DEPTH OF -80' NAVD88 AND A HZ 1080M A HZ-M WALL WITH A PILE TIP DEPTH OF -100' NAVD88.
4. PILES SHOWN ON DRAWINGS DO NOT MEET MAXIMUM DEFLECTION CRITERIA TYPICALLY USED FOR PILE WALLS. SECTIONS ARE SHOWN THAT MEET STABILITY AND STRENGTH REQUIREMENTS ONLY. MEETING DEFLECTION CRITERIA WILL LEAD TO EITHER MUCH LARGER PILE SECTIONS OR DIFFERENT WALL TYPE CONCEPTS OR A DIFFERENT DESIGN APPROACH.
5. BASED ON THE PILE DRIVING ANALYSIS PERFORMED, IT IS UNCERTAIN THAT PILES WILL BE ABLE TO BE DRIVEN COMPLETELY AND PRACTICAL REFUSAL OF THE PILES IS POSSIBLE PRIOR TO REACHING REQUIRED PILE TIP DEPTH.
6. HARD PILE DRIVING CONDITIONS COULD LEAD TO LATERAL MOVEMENT OF THE PILES CREATING ALIGNMENT ISSUES.
7. HARD DRIVING CONDITIONS WILL CAUSE VIBRATIONS THROUGH SOIL CAUSING SOIL PARTICLE ACCELERATION. THESE ACCELERATIONS MAY CAUSE SLOPE INSTABILITY. PREDICTION OF DESIGN MAGNITUDE OF SOIL ACCELERATION IS HIGHLY VARIABLE DUE TO VARIABILITY OF SOIL CONDITIONS, TRANSFER OF FORCES FROM PILE TO SOIL, AND AMOUNT OF PILE DRIVING ENERGY REQUIRED DURING ANY PHASE OF DRIVING.
8. CONSIDERATION OF ADDITIONAL DESIGN SECTIONS ALONG EACH LENGTH OF CELL WALL COULD RESULT IN LARGER PILE SECTIONS, INABILITY TO DRIVE PILES TO REQUIRED DEPTH DUE TO DIFFICULT DRIVING CONDITIONS, AND/OR REFUSAL PRIOR TO REQUIRED TIP DEPTH.
9. SCHEDULE AND CONSTRUCTABILITY WILL BE IMPACTED BY THE PREDICTED LARGE PILE SIZES AND DEPTHS AND MAY BE ADDITIONALLY AFFECTED OR DEEMED IMPRACTICAL BY DIFFICULT DRIVING CONDITIONS AND GEOTECHNICAL UNCERTAINTIES.

PRELIMINARY
NOT FOR CONSTRUCTION
ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 5-28-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 010
GHD TEXAS FIRM REGISTRATION NO. 276

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 **F** 225 952 2978 **W** www.ghd.com

Client
SAN JACINTO RIVER WASTE PITS

Project
NORTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	RH	05/28/2020
1	30% CLIENT REVIEW	MW	RH	05/15/2020

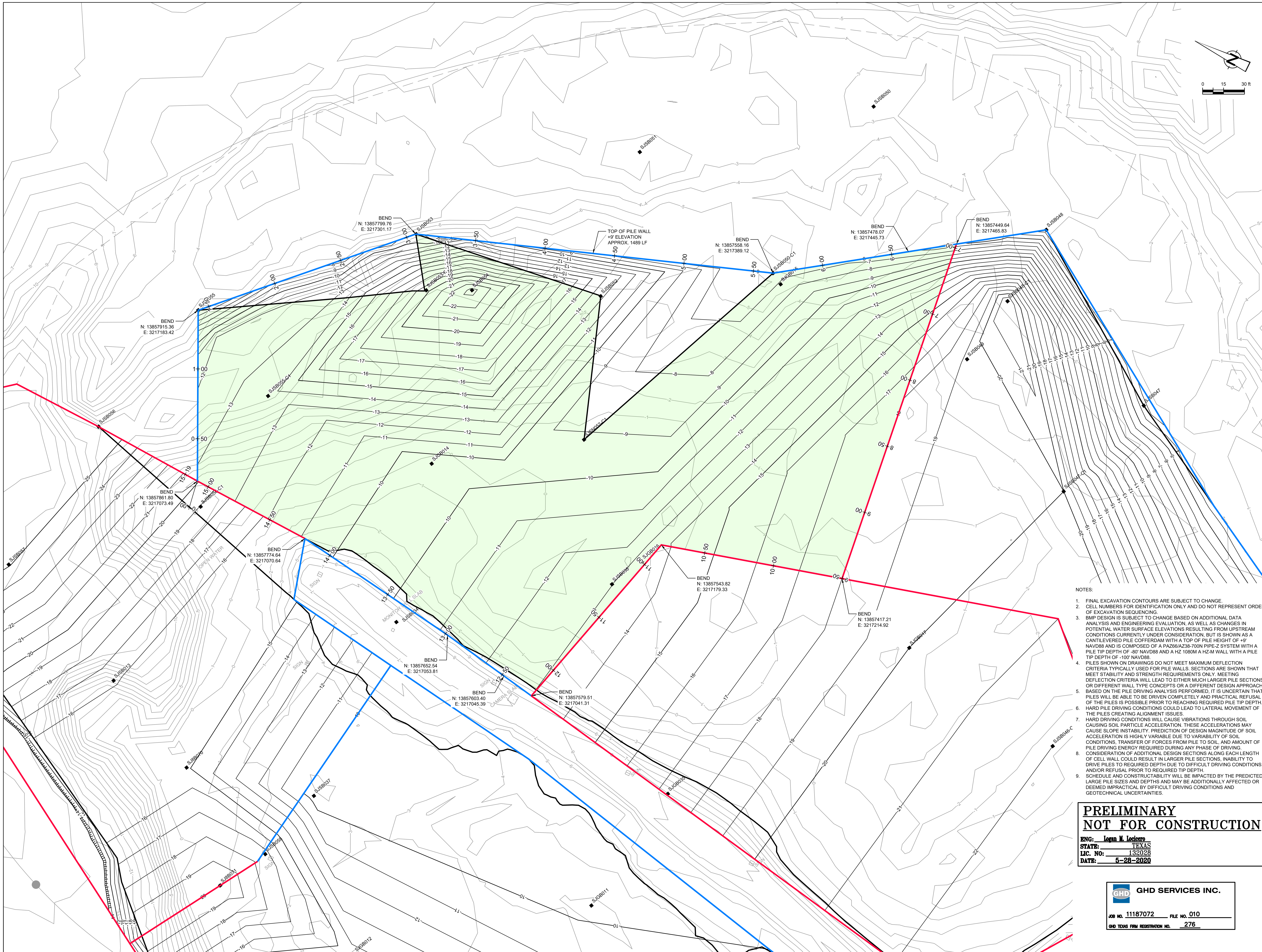
Drawn MW | Designer RH
Drafting Check BP | Design Check LL
Project Coordinator CM | Date May 28, 2020
This document shall not be used for construction unless signed and sealed for construction. | Scale AS SHOWN
Original Size **Arch D** | Bar is one inch on original size drawing 0 1"

Project No. 11187072

Title
EXCAVATION SECTION CELL 2

Sheet No.
C-14

Sheet - of -



NOTES:

1. FINAL EXCAVATION CONTOURS ARE SUBJECT TO CHANGE.
2. CELL NUMBERS FOR IDENTIFICATION ONLY AND DO NOT REPRESENT ORDER OF EXCAVATION SEQUENCING.
3. BMP DESIGN IS SUBJECT TO CHANGE BASED ON ADDITIONAL DATA ANALYSIS AND ENGINEERING EVALUATION, AS WELL AS CHANGES IN POTENTIAL WATER SURFACE ELEVATIONS RESULTING FROM UPSTREAM CONDITIONS CURRENTLY UNDER CONSIDERATION, BUT IS SHOWN AS A CANTILEVERED PILE COFFERDAM WITH A TOP OF PILE HEIGHT OF +9' NAVD88 AND IS COMPOSED OF A PAZ66/AZ38-700N PIPE-Z SYSTEM WITH A PILE TIP DEPTH OF -80' NAVD88 AND A HZ 1080M A HZ-M WALL WITH A PILE TIP DEPTH OF -100' NAVD88.
4. PILES SHOWN ON DRAWINGS DO NOT MEET MAXIMUM DEFLECTION CRITERIA TYPICALLY USED FOR PILE WALLS. SECTIONS ARE SHOWN THAT MEET STABILITY AND STRENGTH REQUIREMENTS ONLY. MEETING DEFLECTION CRITERIA WILL LEAD TO EITHER MUCH LARGER PILE SECTIONS OR DIFFERENT WALL TYPE CONCEPTS OR A DIFFERENT DESIGN APPROACH.
5. BASED ON THE PILE DRIVING ANALYSIS PERFORMED, IT IS UNCERTAIN THAT PILES WILL BE ABLE TO BE DRIVEN COMPLETELY AND PRACTICAL REFUSAL OF THE PILES IS POSSIBLE PRIOR TO REACHING REQUIRED PILE TIP DEPTH.
6. HARD PILE DRIVING CONDITIONS COULD LEAD TO LATERAL MOVEMENT OF THE PILES CREATING ALIGNMENT ISSUES.
7. HARD DRIVING CONDITIONS WILL CAUSE VIBRATIONS THROUGH SOIL CAUSING SOIL PARTICLE ACCELERATION. THESE ACCELERATIONS MAY CAUSE SLOPE INSTABILITY. PREDICTION OF DESIGN MAGNITUDE OF SOIL ACCELERATION IS HIGHLY VARIABLE DUE TO VARIABILITY OF SOIL CONDITIONS, TRANSFER OF FORCES FROM PILE TO SOIL, AND AMOUNT OF PILE DRIVING ENERGY REQUIRED DURING ANY PHASE OF DRIVING.
8. CONSIDERATION OF ADDITIONAL DESIGN SECTIONS ALONG EACH LENGTH OF CELL WALL COULD RESULT IN LARGER PILE SECTIONS, INABILITY TO DRIVE PILES TO REQUIRED DEPTH DUE TO DIFFICULT DRIVING CONDITIONS, AND/OR REFUSAL PRIOR TO REQUIRED TIP DEPTH.
9. SCHEDULE AND CONSTRUCTABILITY WILL BE IMPACTED BY THE PREDICTED LARGE PILE SIZES AND DEPTHS AND MAY BE ADDITIONALLY AFFECTED OR DEEMED IMPRACTICAL BY DIFFICULT DRIVING CONDITIONS AND GEOTECHNICAL UNCERTAINTIES.

PRELIMINARY
NOT FOR CONSTRUCTION

ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 5-28-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 010
GHD TEXAS FIRM REGISTRATION NO. 276

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

LEGEND

- TCRA CAP PERIMETER
- 620 EXISTING CONTOUR INTERVAL
- FENCELINE
- SHORELINE
- TOP OF BANK
- TOE OF SLOPE
- O/H OVERHEAD ELECTRICAL
- GUARDRAIL
- PIPELINE
- SJSB002 BORING LOCATION
- MW MONITORING WELL
- P.P. POWER POLE
- L.P. LIGHT POLE
- WELL WELL
- AREA WITH MATERIAL >30 ng/kg TEQ
- ASPHALT
- CONCRETE
- GRAVEL
- PAZ66/AZ38-700N PILE
- HZ 1080M A PILE

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

Client
SAN JACINTO RIVER WASTE PITS

Project
NORTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	SC	05/28/2020
1	30% CLIENT REVIEW	MW	SC	05/15/2020

Drawn	MW	Designer	RH
Drafting Check	BP	Design Check	LL
Project Coordinator	CM	Date	May 28, 2020
This document shall not be used for construction unless signed and sealed for construction.		Scale	1" = 30'

Original Size
Arch D

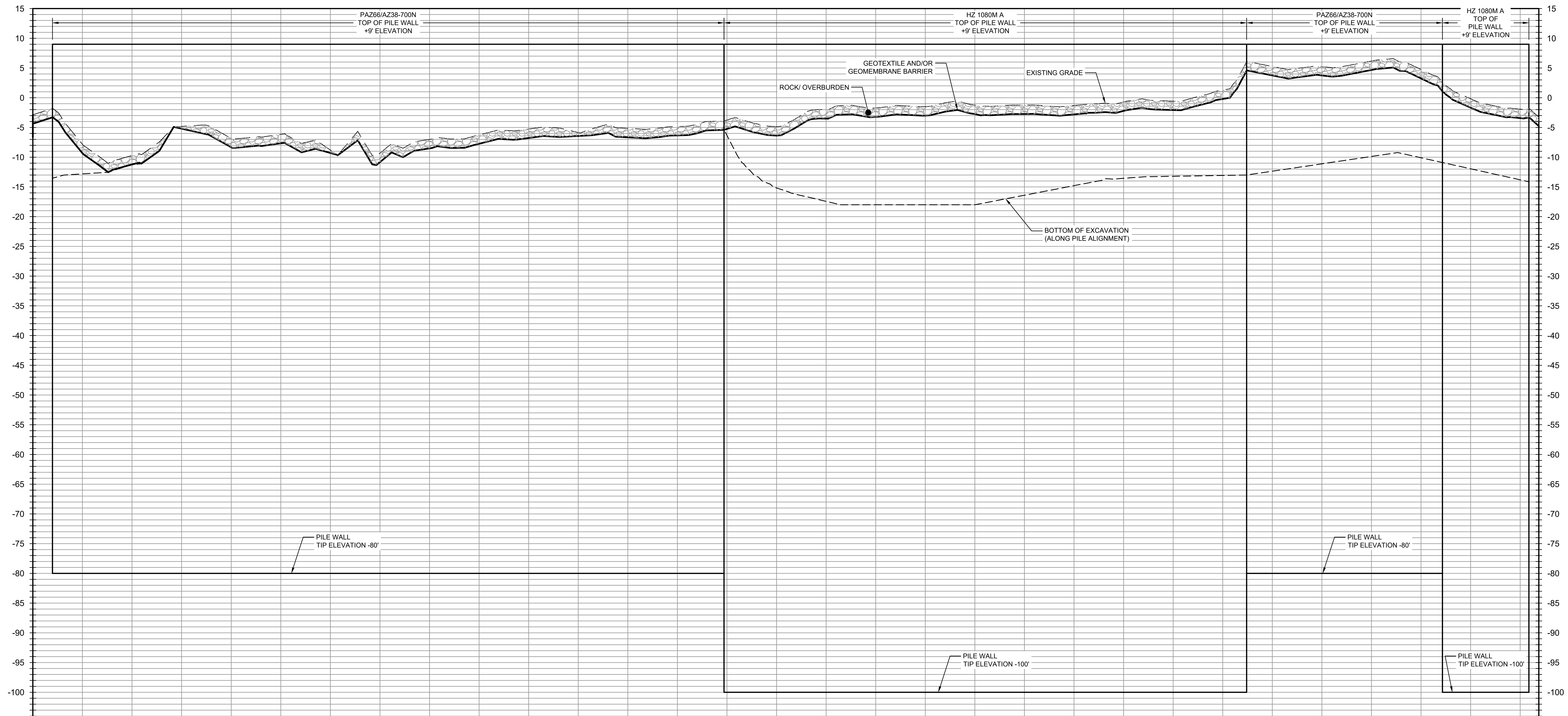
Bar is one inch on original size drawing
0 1"

Project No. 11187072

Title
PILE LAYOUT PLAN CELL 2

Sheet No.
C-15

Sheet - of -



STA	EXIST. ELEV.
0+50	-7.83
1+00	-9.72
1+50	-4.82
2+00	-6.83
2+50	-6.15
3+00	-8.79
3+50	-9.32
4+00	-7.02
4+50	-6.24
5+00	-5.26
5+50	-5.84
6+00	-5.15
6+50	-4.84
7+00	-3.74
7+50	-4.87
8+00	-2.00
8+50	-1.71
9+00	-1.50
9+50	-1.23
10+00	-1.24
10+50	-1.30
11+00	-0.71
11+50	-0.57
12+00	1.30
12+50	5.26
13+00	5.25
13+50	6.18
14+00	4.75
14+50	-0.16
15+00	-1.92

PROFILE

HORIZ: 1" = 60'
VERT: 1' = 10'

NOTES:

1. BOTTOM OF EXCAVATION IS SUBJECT TO CHANGE.
2. CELL NUMBERS FOR IDENTIFICATION ONLY AND DO NOT REPRESENT ORDER OF EXCAVATION SEQUENCING.
3. BMP DESIGN IS SUBJECT TO CHANGE BASED ON ADDITIONAL DATA ANALYSIS AND ENGINEERING EVALUATION, AS WELL AS CHANGES IN POTENTIAL WATER SURFACE ELEVATIONS RESULTING FROM UPSTREAM CONDITIONS CURRENTLY UNDER CONSIDERATION, BUT IS SHOWN AS A CANTILEVERED PILE COFFERDAM WITH A TOP OF PILE HEIGHT OF +9' NAVD88 AND IS COMPOSED OF A PAZ66/AZ38-700N PIPE-Z SYSTEM WITH A PILE TIP DEPTH OF -80' NAVD88 AND A HZ 1080M A HZ-M WALL WITH A PILE TIP DEPTH OF -100' NAVD88.
4. PILES SHOWN ON DRAWINGS DO NOT MEET MAXIMUM DEFLECTION CRITERIA TYPICALLY USED FOR PILE WALLS. SECTIONS ARE SHOWN THAT MEET STABILITY AND STRENGTH REQUIREMENTS ONLY. MEETING DEFLECTION CRITERIA WILL LEAD TO EITHER MUCH LARGER PILE SECTIONS OR DIFFERENT WALL TYPE CONCEPTS OR A DIFFERENT DESIGN APPROACH.
5. BASED ON THE PILE DRIVING ANALYSIS PERFORMED, IT IS UNCERTAIN THAT PILES WILL BE ABLE TO BE DRIVEN COMPLETELY AND PRACTICAL REFUSAL OF THE PILES IS POSSIBLE PRIOR TO REACHING REQUIRED PILE TIP DEPTH.
6. HARD PILE DRIVING CONDITIONS COULD LEAD TO LATERAL MOVEMENT OF THE PILES CREATING ALIGNMENT ISSUES.
7. HARD DRIVING CONDITIONS WILL CAUSE VIBRATIONS THROUGH SOIL CAUSING SOIL PARTICLE ACCELERATION. THESE ACCELERATIONS MAY CAUSE SLOPE INSTABILITY. PREDICTION OF DESIGN MAGNITUDE OF SOIL ACCELERATION IS HIGHLY VARIABLE DUE TO VARIABILITY OF SOIL CONDITIONS, TRANSFER OF FORCES FROM PILE TO SOIL, AND AMOUNT OF PILE DRIVING ENERGY REQUIRED DURING ANY PHASE OF DRIVING.
8. CONSIDERATION OF ADDITIONAL DESIGN SECTIONS ALONG EACH LENGTH OF CELL WALL COULD RESULT IN LARGER PILE SECTIONS, INABILITY TO DRIVE PILES TO REQUIRED DEPTH DUE TO DIFFICULT DRIVING CONDITIONS, AND/OR REFUSAL PRIOR TO REQUIRED TIP DEPTH.
9. SCHEDULE AND CONSTRUCTABILITY WILL BE IMPACTED BY THE PREDICTED LARGE PILE SIZES AND DEPTHS AND MAY BE ADDITIONALLY AFFECTED OR DEEMED IMPRACTICAL BY DIFFICULT DRIVING CONDITIONS AND GEOTECHNICAL UNCERTAINTIES.

PRELIMINARY
NOT FOR CONSTRUCTION
ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 5-28-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 010
GHD TEXAS FIRM REGISTRATION NO. 276

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

Client
SAN JACINTO RIVER WASTE PITS

Project
NORTHERN IMPOUNDMENT
PRELIMINARY 30% REMEDIAL DESIGN
HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	SC	05/28/2020
1	30% CLIENT REVIEW	MW	SC	05/15/2020

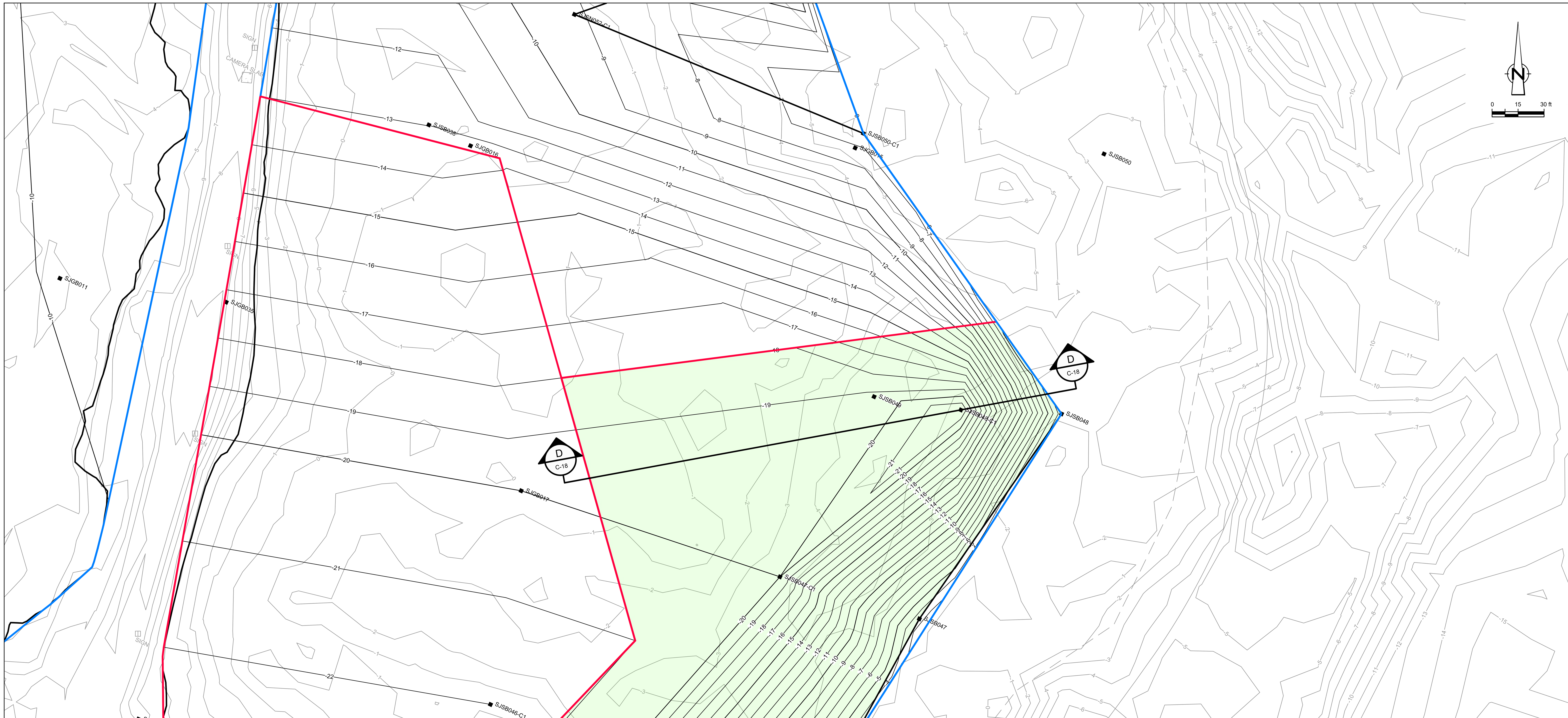
Drawn	MW	Designer	RH
Drafting Check	BP	Design Check	LL
Project Coordinator	CM	Date	May 28, 2020
This document shall not be used for construction unless signed and sealed for construction.		Scale	AS SHOWN
Original Size	Arch D	Bar is one inch on original size drawing 0 1"	

Project No.

Title
PILE PROFILE CELL 2

Sheet No.
C-16

Sheet - of -



NOTES:

1. FINAL EXCAVATION CONTOURS ARE SUBJECT TO CHANGE.
2. CELL NUMBERS FOR IDENTIFICATION ONLY AND DO NOT REPRESENT ORDER OF EXCAVATION SEQUENCING.
3. BMP DESIGN IS SUBJECT TO CHANGE BASED ON ADDITIONAL DATA ANALYSIS AND ENGINEERING EVALUATION, AS WELL AS CHANGES IN POTENTIAL WATER SURFACE ELEVATIONS RESULTING FROM UPSTREAM CONDITIONS CURRENTLY UNDER CONSIDERATION, BUT IS SHOWN AS A CANTILEVERED PILE COFFERDAM WITH A TOP OF PILE HEIGHT OF +9' NAVD88 AND IS COMPOSED OF A PAZ66/AZ38-700N PIPE-Z SYSTEM WITH A PILE TIP DEPTH OF -80' NAVD88 AND A HZ 1080M A HZ-M WALL WITH A PILE TIP DEPTH OF -100' NAVD88.
4. PILES SHOWN ON DRAWINGS DO NOT MEET MAXIMUM DEFLECTION CRITERIA TYPICALLY USED FOR PILE WALLS. SECTIONS ARE SHOWN THAT MEET STABILITY AND STRENGTH REQUIREMENTS ONLY. MEETING DEFLECTION CRITERIA WILL LEAD TO EITHER MUCH LARGER PILE SECTIONS OR DIFFERENT WALL TYPE CONCEPTS OR A DIFFERENT DESIGN APPROACH.
5. BASED ON THE PILE DRIVING ANALYSIS PERFORMED, IT IS UNCERTAIN THAT PILES WILL BE ABLE TO BE DRIVEN COMPLETELY AND PRACTICAL REFUSAL OF THE PILES IS POSSIBLE PRIOR TO REACHING REQUIRED PILE TIP DEPTH.
6. HARD PILE DRIVING CONDITIONS COULD LEAD TO LATERAL MOVEMENT OF THE PILES CREATING ALIGNMENT ISSUES.
7. HARD DRIVING CONDITIONS WILL CAUSE VIBRATIONS THROUGH SOIL CAUSING SOIL PARTICLE ACCELERATION. THESE ACCELERATIONS MAY CAUSE SLOPE INSTABILITY. PREDICTION OF DESIGN MAGNITUDE OF SOIL ACCELERATION IS HIGHLY VARIABLE DUE TO VARIABILITY OF SOIL CONDITIONS, TRANSFER OF FORCES FROM PILE TO SOIL, AND AMOUNT OF PILE DRIVING ENERGY REQUIRED DURING ANY PHASE OF DRIVING.
8. CONSIDERATION OF ADDITIONAL DESIGN SECTIONS ALONG EACH LENGTH OF CELL WALL COULD RESULT IN LARGER PILE SECTIONS, INABILITY TO DRIVE PILES TO REQUIRED DEPTH DUE TO DIFFICULT DRIVING CONDITIONS, AND/OR REFUSAL PRIOR TO REQUIRED TIP DEPTH.
9. SCHEDULE AND CONSTRUCTABILITY WILL BE IMPACTED BY THE PREDICTED LARGE PILE SIZES AND DEPTHS AND MAY BE ADDITIONALLY AFFECTED OR DEEMED IMPRACTICAL BY DIFFICULT DRIVING CONDITIONS AND GEOTECHNICAL UNCERTAINTIES.

PRELIMINARY
NOT FOR CONSTRUCTION

ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 5-28-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 010
GHD TEXAS FIRM REGISTRATION NO. 276

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

LEGEND

	TCRA CAP PERIMETER
620	EXISTING CONTOUR INTERVAL
X	FENCELINE
	SHORELINE
	TOP OF BANK
	TOE OF SLOPE
O/H	OVERHEAD ELECTRICAL
	GUARDRAIL
	PIPELINE
SJSB002	BORING LOCATION
MW	MONITORING WELL
P.P.	POWER POLE
L.P.	LIGHT POLE
WELL	WELL
	AREA WITH MATERIAL >30 ng/kg TEQ
	ASPHALT
	CONCRETE
	GRAVEL
	PAZ66/AZ38-700N PILE
	HZ 1080M A PILE

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

Client
SAN JACINTO RIVER WASTE PITS

Project
NORTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	RH	05/28/2020
1	30% CLIENT REVIEW	MW	RH	05/15/2020

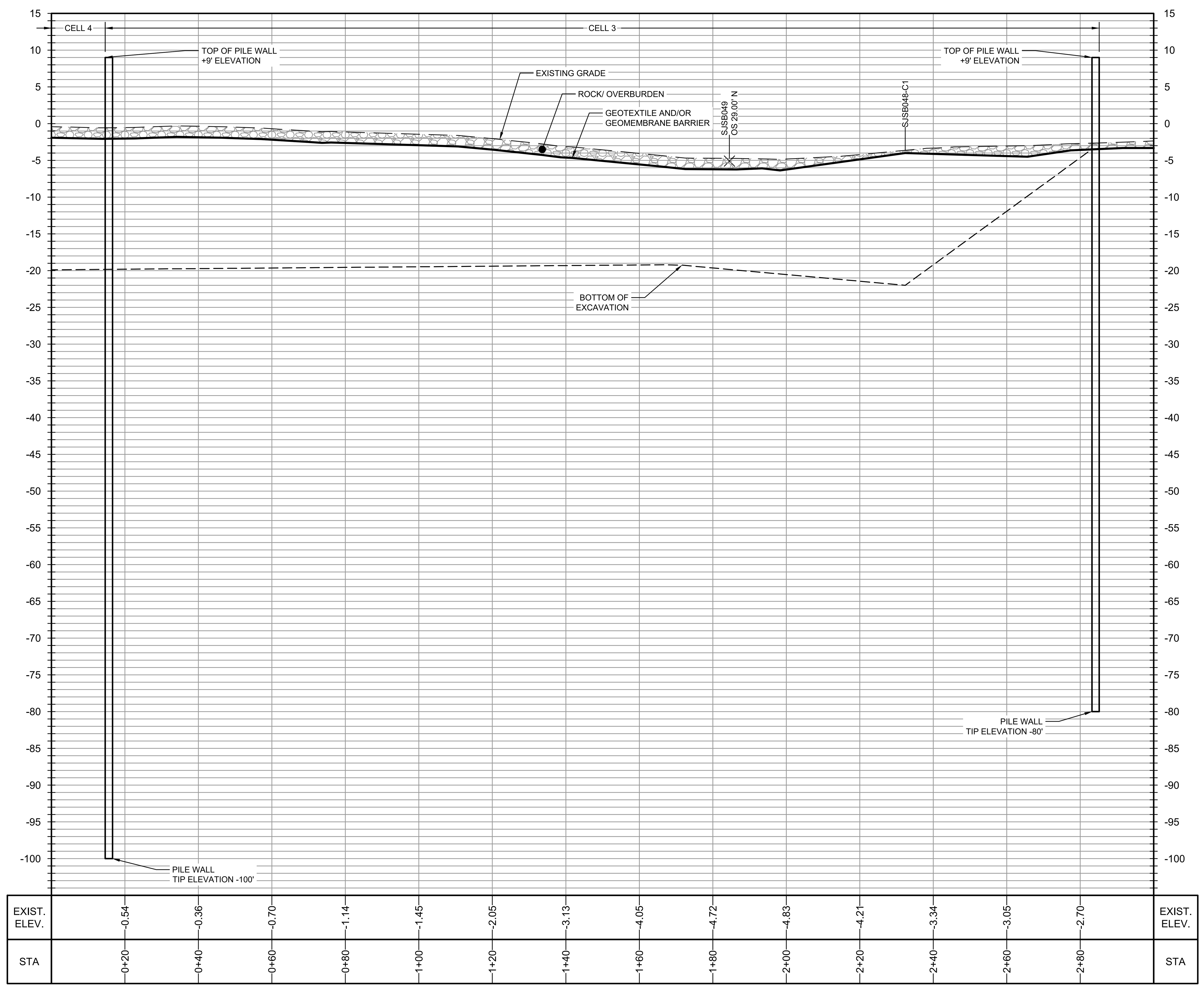
Drawn MW	Designer RH
Drafting Check BP	Design Check LL
Project Coordinator CM	Date May 28, 2020
This document shall not be used for construction unless signed and sealed for construction.	Scale 1" = 30'
Original Size Arch D	Bar is one inch on original size drawing 0 1"

Project No. 11187072

Title
EXCAVATION PLAN CELL 3

Sheet No.
C-17

Sheet - of -



SECTION D C-17
HORIZ: 1"=20'
VERT: 1"=10'

NOTES:

1. BOTTOM OF EXCAVATION IS SUBJECT TO CHANGE.
2. CELL NUMBERS FOR IDENTIFICATION ONLY AND DO NOT REPRESENT ORDER OF EXCAVATION SEQUENCING.
3. BMP DESIGN IS SUBJECT TO CHANGE BASED ON ADDITIONAL DATA ANALYSIS AND ENGINEERING EVALUATION, AS WELL AS CHANGES IN POTENTIAL WATER SURFACE ELEVATIONS RESULTING FROM UPSTREAM CONDITIONS CURRENTLY UNDER CONSIDERATION, BUT IS SHOWN AS A CANTILEVERED PILE COFFERDAM WITH A TOP OF PILE HEIGHT OF +9' NAVD88 AND IS COMPOSED OF A PAZ66/AZ38-700N PIPE-Z SYSTEM WITH A PILE TIP DEPTH OF -80' NAVD88 AND A HZ 1080M A HZ-M WALL WITH A PILE TIP DEPTH OF -100' NAVD88.
4. PILES SHOWN ON DRAWINGS DO NOT MEET MAXIMUM DEFLECTION CRITERIA TYPICALLY USED FOR PILE WALLS. SECTIONS ARE SHOWN THAT MEET STABILITY AND STRENGTH REQUIREMENTS ONLY. MEETING DEFLECTION CRITERIA WILL LEAD TO EITHER MUCH LARGER PILE SECTIONS OR DIFFERENT WALL TYPE CONCEPTS OR A DIFFERENT DESIGN APPROACH.
5. BASED ON THE PILE DRIVING ANALYSIS PERFORMED, IT IS UNCERTAIN THAT PILES WILL BE ABLE TO BE DRIVEN COMPLETELY AND PRACTICAL REFUSAL OF THE PILES IS POSSIBLE PRIOR TO REACHING REQUIRED PILE TIP DEPTH.
6. HARD PILE DRIVING CONDITIONS COULD LEAD TO LATERAL MOVEMENT OF THE PILES CREATING ALIGNMENT ISSUES.
7. HARD DRIVING CONDITIONS WILL CAUSE VIBRATIONS THROUGH SOIL CAUSING SOIL PARTICLE ACCELERATION. THESE ACCELERATIONS MAY CAUSE SLOPE INSTABILITY. PREDICTION OF DESIGN MAGNITUDE OF SOIL ACCELERATION IS HIGHLY VARIABLE DUE TO VARIABILITY OF SOIL CONDITIONS, TRANSFER OF FORCES FROM PILE TO SOIL, AND AMOUNT OF PILE DRIVING ENERGY REQUIRED DURING ANY PHASE OF DRIVING.
8. CONSIDERATION OF ADDITIONAL DESIGN SECTIONS ALONG EACH LENGTH OF CELL WALL COULD RESULT IN LARGER PILE SECTIONS, INABILITY TO DRIVE PILES TO REQUIRED DEPTH DUE TO DIFFICULT DRIVING CONDITIONS, AND/OR REFUSAL PRIOR TO REQUIRED TIP DEPTH.
9. SCHEDULE AND CONSTRUCTABILITY WILL BE IMPACTED BY THE PREDICTED LARGE PILE SIZES AND DEPTHS AND MAY BE ADDITIONALLY AFFECTED OR DEEMED IMPRACTICAL BY DIFFICULT DRIVING CONDITIONS AND GEOTECHNICAL UNCERTAINTIES.

PRELIMINARY
NOT FOR CONSTRUCTION
ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 5-28-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 010
GHD TEXAS FIRM REGISTRATION NO. 276

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

Client
SAN JACINTO RIVER WASTE PITS

Project
NORTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	RH	05/28/2020
1	30% CLIENT REVIEW	MW	RH	05/15/2020

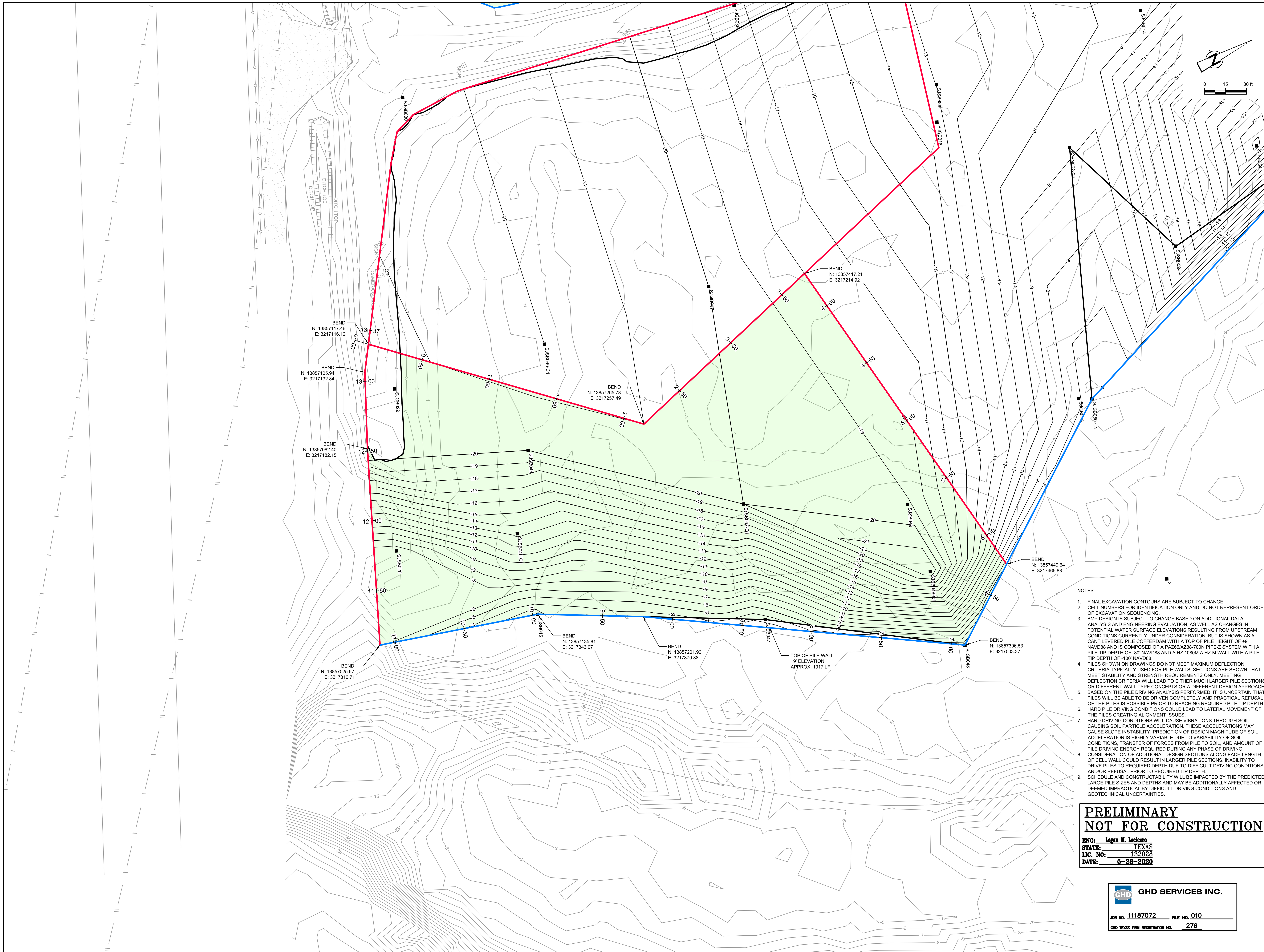
Drawn	MW	Designer	RH
Drafting Check	BP	Design Check	LL
Project Coordinator	CM	Date	May 28, 2020
This document shall not be used for construction unless signed and sealed for construction.		Scale	AS SHOWN
Original Size	Arch D	Bar is one inch on original size drawing 0 1"	

Project No. 11187072

Title
EXCAVATION SECTION CELL 3

Sheet No.
C-18

Sheet - of -



NOTES:

1. FINAL EXCAVATION CONTOURS ARE SUBJECT TO CHANGE.
2. CELL NUMBERS FOR IDENTIFICATION ONLY AND DO NOT REPRESENT ORDER OF EXCAVATION SEQUENCING.
3. BMP DESIGN IS SUBJECT TO CHANGE BASED ON ADDITIONAL DATA ANALYSIS AND ENGINEERING EVALUATION, AS WELL AS CHANGES IN POTENTIAL WATER SURFACE ELEVATIONS RESULTING FROM UPSTREAM CONDITIONS CURRENTLY UNDER CONSIDERATION, BUT IS SHOWN AS A CANTILEVERED PILE COFFERDAM WITH A TOP OF PILE HEIGHT OF +9' NAVD88 AND IS COMPOSED OF A PAZ66/AZ38-700N PIPE-Z SYSTEM WITH A PILE TIP DEPTH OF -80' NAVD88 AND A HZ 1080M A HZ-M WALL WITH A PILE TIP DEPTH OF -100' NAVD88.
4. PILES SHOWN ON DRAWINGS DO NOT MEET MAXIMUM DEFLECTION CRITERIA TYPICALLY USED FOR PILE WALLS. SECTIONS ARE SHOWN THAT MEET STABILITY AND STRENGTH REQUIREMENTS ONLY. MEETING DEFLECTION CRITERIA WILL LEAD TO EITHER MUCH LARGER PILE SECTIONS OR DIFFERENT WALL TYPE CONCEPTS OR A DIFFERENT DESIGN APPROACH.
5. BASED ON THE PILE DRIVING ANALYSIS PERFORMED, IT IS UNCERTAIN THAT PILES WILL BE ABLE TO BE DRIVEN COMPLETELY AND PRACTICAL REFUSAL OF THE PILES IS POSSIBLE PRIOR TO REACHING REQUIRED PILE TIP DEPTH.
6. HARD PILE DRIVING CONDITIONS COULD LEAD TO LATERAL MOVEMENT OF THE PILES CREATING ALIGNMENT ISSUES.
7. HARD DRIVING CONDITIONS WILL CAUSE VIBRATIONS THROUGH SOIL CAUSING SOIL PARTICLE ACCELERATION. THESE ACCELERATIONS MAY CAUSE SLOPE INSTABILITY. PREDICTION OF DESIGN MAGNITUDE OF SOIL ACCELERATION IS HIGHLY VARIABLE DUE TO VARIABILITY OF SOIL CONDITIONS, TRANSFER OF FORCES FROM PILE TO SOIL, AND AMOUNT OF PILE DRIVING ENERGY REQUIRED DURING ANY PHASE OF DRIVING.
8. CONSIDERATION OF ADDITIONAL DESIGN SECTIONS ALONG EACH LENGTH OF CELL WALL COULD RESULT IN LARGER PILE SECTIONS, INABILITY TO DRIVE PILES TO REQUIRED DEPTH DUE TO DIFFICULT DRIVING CONDITIONS, AND/OR REFUSAL PRIOR TO REQUIRED TIP DEPTH.
9. SCHEDULE AND CONSTRUCTABILITY WILL BE IMPACTED BY THE PREDICTED LARGE PILE SIZES AND DEPTHS AND MAY BE ADDITIONALLY AFFECTED OR DEEMED IMPRACTICAL BY DIFFICULT DRIVING CONDITIONS AND GEOTECHNICAL UNCERTAINTIES.

PRELIMINARY
NOT FOR CONSTRUCTION

ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 5-28-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 010
GHD TEXAS FIRM REGISTRATION NO. 276

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 **F** 225 952 2978 **W** www.ghd.com

LEGEND

	TCRA CAP PERIMETER
620	EXISTING CONTOUR INTERVAL
X	FENCELINE
	SHORELINE
	TOP OF BANK
	TOE OF SLOPE
O/H	OVERHEAD ELECTRICAL
	GUARDRAIL
\\	PIPELINE
SJSB002	BORING LOCATION
MW	MONITORING WELL
P.P.	POWER POLE
L.P.	LIGHT POLE
WELL	WELL
	AREA WITH MATERIAL >30 ng/kg TEQ
	ASPHALT
	CONCRETE
	GRAVEL
	PAZ66/AZ38-700N PILE
	HZ 1080M A PILE

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

Client
SAN JACINTO RIVER WASTE PITS

Project
NORTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	SC	05/28/2020
1	30% CLIENT REVIEW	MW	SC	05/15/2020

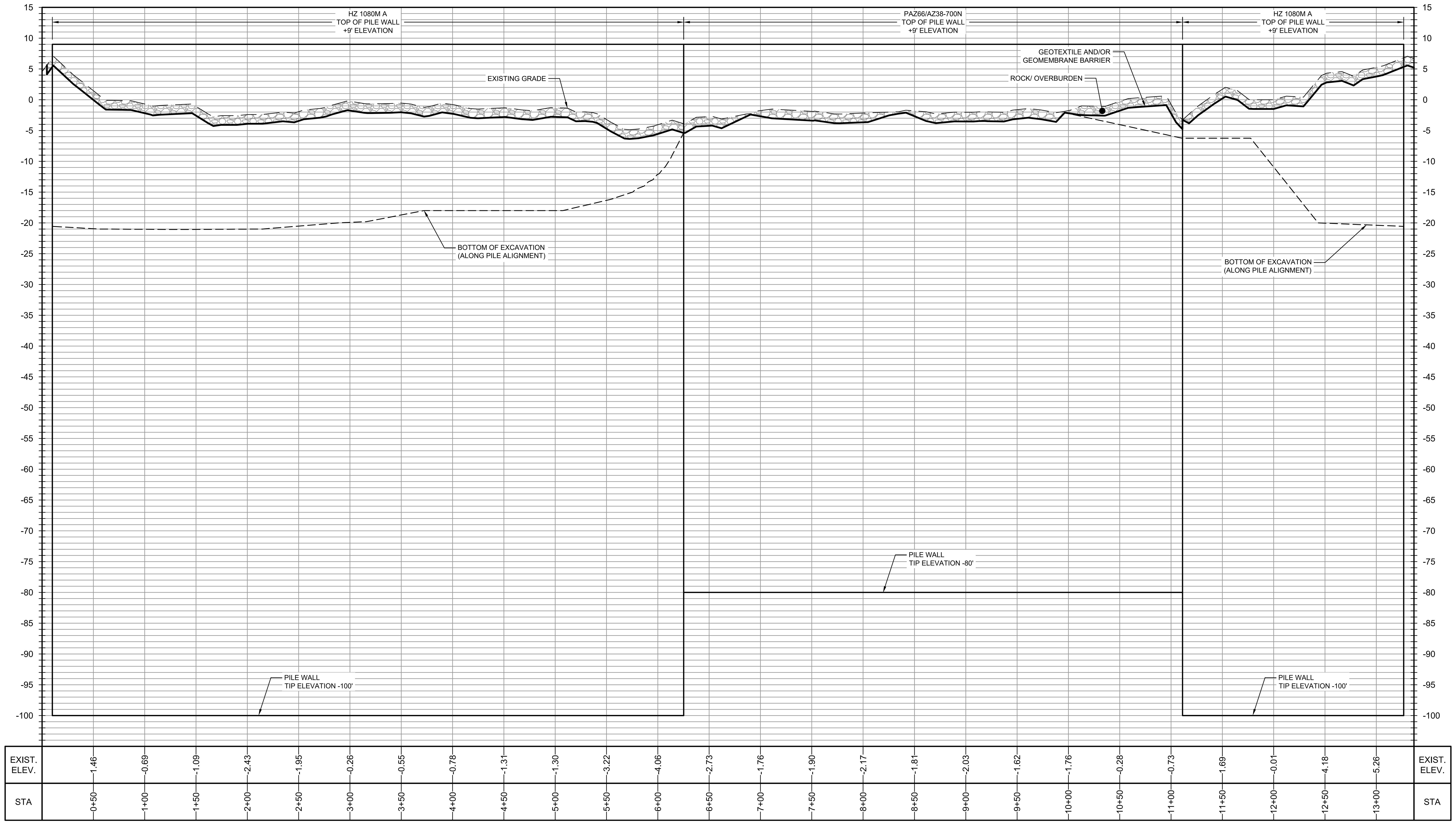
Drawn	MW	Designer	RH
Drafting Check	BP	Design Check	LL
Project Coordinator	CM	Date	May 28, 2020
This document shall not be used for construction unless signed and sealed for construction.		Scale	1" = 30'
Original Size	Arch D	Bar is one inch on original size drawing 0 1"	

Project No. 11187072

Title
PILE LAYOUT PLAN CELL 3

Sheet No.
C-19

Sheet - of -



PROFILE

HORIZ: 1" = 60'
VERT: 1" = 10'

NOTES:

1. BOTTOM OF EXCAVATION IS SUBJECT TO CHANGE.
2. CELL NUMBERS FOR IDENTIFICATION ONLY AND DO NOT REPRESENT ORDER OF EXCAVATION SEQUENCING.
3. BMP DESIGN IS SUBJECT TO CHANGE BASED ON ADDITIONAL DATA ANALYSIS AND ENGINEERING EVALUATION, AS WELL AS CHANGES IN POTENTIAL WATER SURFACE ELEVATIONS RESULTING FROM UPSTREAM CONDITIONS CURRENTLY UNDER CONSIDERATION, BUT IS SHOWN AS A CANTILEVERED PILE COFFERDAM WITH A TOP OF PILE HEIGHT OF +9' NAVD88 AND IS COMPOSED OF A PAZ66/AZ38-700N PIPE-Z SYSTEM WITH A PILE TIP DEPTH OF -80' NAVD88 AND A HZ 1080M A HZ-M WALL WITH A PILE TIP DEPTH OF -100' NAVD88.
4. PILES SHOWN ON DRAWINGS DO NOT MEET MAXIMUM DEFLECTION CRITERIA TYPICALLY USED FOR PILE WALLS. SECTIONS ARE SHOWN THAT MEET STABILITY AND STRENGTH REQUIREMENTS ONLY. MEETING DEFLECTION CRITERIA WILL LEAD TO EITHER MUCH LARGER PILE SECTIONS OR DIFFERENT WALL TYPE CONCEPTS OR A DIFFERENT DESIGN APPROACH.
5. BASED ON THE PILE DRIVING ANALYSIS PERFORMED, IT IS UNCERTAIN THAT PILES WILL BE ABLE TO BE DRIVEN COMPLETELY AND PRACTICAL REFUSAL OF THE PILES IS POSSIBLE PRIOR TO REACHING REQUIRED PILE TIP DEPTH.
6. HARD PILE DRIVING CONDITIONS COULD LEAD TO LATERAL MOVEMENT OF THE PILES CREATING ALIGNMENT ISSUES.
7. HARD DRIVING CONDITIONS WILL CAUSE VIBRATIONS THROUGH SOIL CAUSING SOIL PARTICLE ACCELERATION. THESE ACCELERATIONS MAY CAUSE SLOPE INSTABILITY. PREDICTION OF DESIGN MAGNITUDE OF SOIL ACCELERATION IS HIGHLY VARIABLE DUE TO VARIABILITY OF SOIL CONDITIONS, TRANSFER OF FORCES FROM PILE TO SOIL, AND AMOUNT OF PILE DRIVING ENERGY REQUIRED DURING ANY PHASE OF DRIVING.
8. CONSIDERATION OF ADDITIONAL DESIGN SECTIONS ALONG EACH LENGTH OF CELL WALL COULD RESULT IN LARGER PILE SECTIONS, INABILITY TO DRIVE PILES TO REQUIRED DEPTH DUE TO DIFFICULT DRIVING CONDITIONS, AND/OR REFUSAL PRIOR TO REQUIRED TIP DEPTH.
9. SCHEDULE AND CONSTRUCTABILITY WILL BE IMPACTED BY THE PREDICTED LARGE PILE SIZES AND DEPTHS AND MAY BE ADDITIONALLY AFFECTED OR DEEMED IMPRACTICAL BY DIFFICULT DRIVING CONDITIONS AND GEOTECHNICAL UNCERTAINTIES.

PRELIMINARY
NOT FOR CONSTRUCTION

ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 5-28-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 010
GHD TEXAS FIRM REGISTRATION NO. 276

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

Client
SAN JACINTO RIVER WASTE PITS

Project
NORTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	SC	05/28/2020
1	30% CLIENT REVIEW	MW	SC	05/15/2020

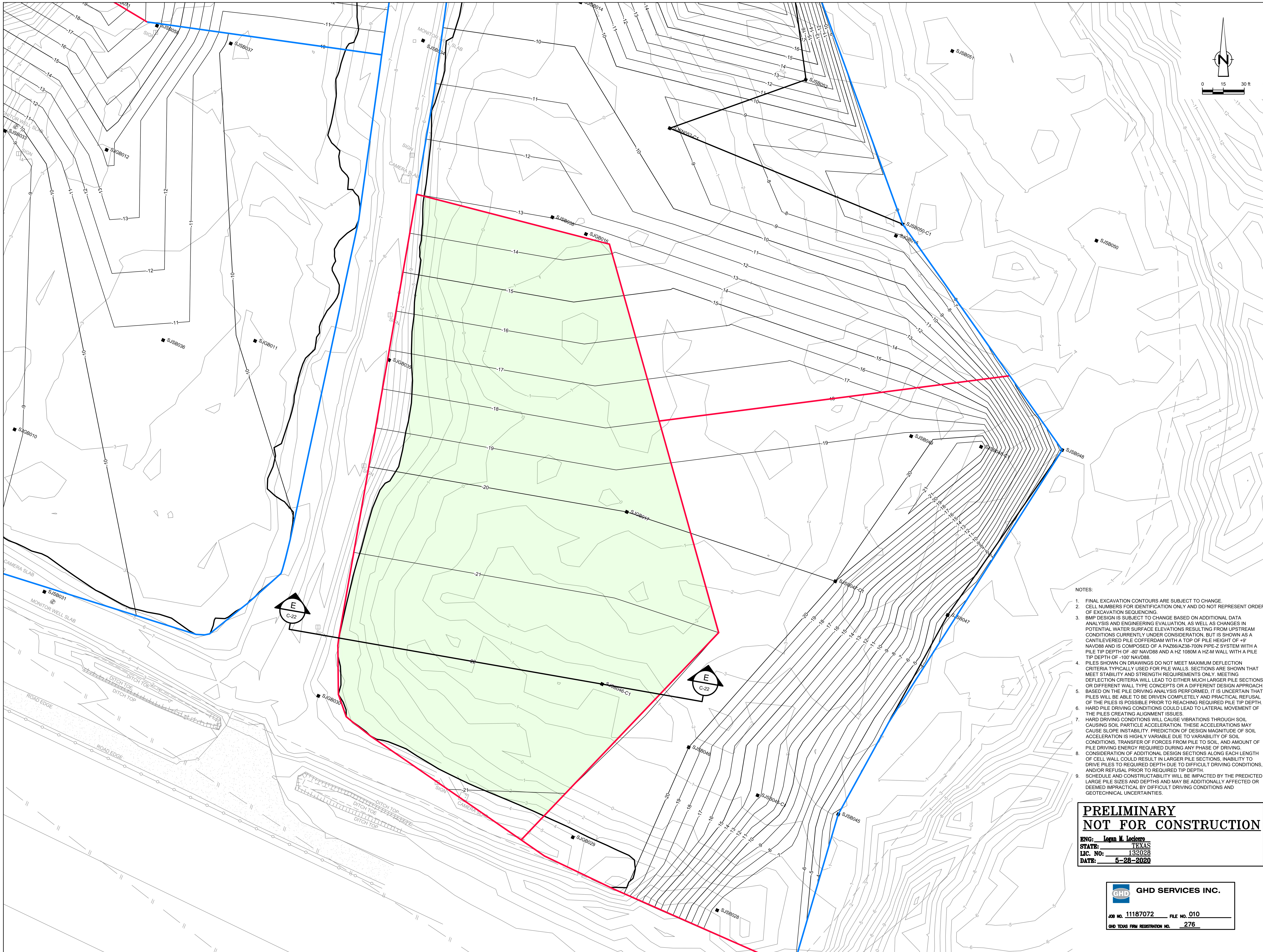
Drawn MW	Designer RH
Drafting Check BP	Design Check LL
Project Coordinator CM	Date May 28, 2020
This document shall not be used for construction unless signed and sealed for construction.	Scale AS SHOWN
Original Size Arch D	Bar is one inch on original size drawing 0 1"

Project No. 11187072

Title
PILE PROFILE CELL 3

Sheet No.
C-20

Sheet - of -



GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

Reuse of Documents

LEGEND

- TCRA CAP PERIMETER
- 620 EXISTING CONTOUR INTERVAL
- X FENCELINE
- SHORELINE
- TOP OF BANK
- TOE OF SLOPE
- O/H OVERHEAD ELECTRICAL
- GUARDRAIL
- PIPELINE
- SJSB002 BORING LOCATION
- MW MONITORING WELL
- P.P. POWER POLE
- L.P. LIGHT POLE
- WELL WELL
- AREA WITH MATERIAL >30 ng/kg TEQ
- ASPHALT
- CONCRETE
- GRAVEL
- PAZ66/AZ38-700N PILE
- HZ 1080M A PILE

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

NOTES:

1. FINAL EXCAVATION CONTOURS ARE SUBJECT TO CHANGE.
2. CELL NUMBERS FOR IDENTIFICATION ONLY AND DO NOT REPRESENT ORDER OF EXCAVATION SEQUENCING.
3. BMP DESIGN IS SUBJECT TO CHANGE BASED ON ADDITIONAL DATA ANALYSIS AND ENGINEERING EVALUATION, AS WELL AS CHANGES IN POTENTIAL WATER SURFACE ELEVATIONS RESULTING FROM UPSTREAM CONDITIONS CURRENTLY UNDER CONSIDERATION, BUT IS SHOWN AS A CANTILEVERED PILE COFFERDAM WITH A TOP OF PILE HEIGHT OF +9' NAVD88 AND IS COMPOSED OF A PAZ66/AZ38-700N PIPE-Z SYSTEM WITH A PILE TIP DEPTH OF -80' NAVD88 AND A HZ 1080M A HZ-M WALL WITH A PILE TIP DEPTH OF -100' NAVD88.
4. PILES SHOWN ON DRAWINGS DO NOT MEET MAXIMUM DEFLECTION CRITERIA TYPICALLY USED FOR PILE WALLS. SECTIONS ARE SHOWN THAT MEET STABILITY AND STRENGTH REQUIREMENTS ONLY. MEETING DEFLECTION CRITERIA WILL LEAD TO EITHER MUCH LARGER PILE SECTIONS OR DIFFERENT WALL TYPE CONCEPTS OR A DIFFERENT DESIGN APPROACH.
5. BASED ON THE PILE DRIVING ANALYSIS PERFORMED, IT IS UNCERTAIN THAT PILES WILL BE ABLE TO BE DRIVEN COMPLETELY AND PRACTICAL REFUSAL OF THE PILES IS POSSIBLE PRIOR TO REACHING REQUIRED PILE TIP DEPTH.
6. HARD PILE DRIVING CONDITIONS COULD LEAD TO LATERAL MOVEMENT OF THE PILES CREATING ALIGNMENT ISSUES.
7. HARD DRIVING CONDITIONS WILL CAUSE VIBRATIONS THROUGH SOIL CAUSING SOIL PARTICLE ACCELERATION. THESE ACCELERATIONS MAY CAUSE SLOPE INSTABILITY. PREDICTION OF DESIGN MAGNITUDE OF SOIL ACCELERATION IS HIGHLY VARIABLE DUE TO VARIABILITY OF SOIL CONDITIONS, TRANSFER OF FORCES FROM PILE TO SOIL, AND AMOUNT OF PILE DRIVING ENERGY REQUIRED DURING ANY PHASE OF DRIVING.
8. CONSIDERATION OF ADDITIONAL DESIGN SECTIONS ALONG EACH LENGTH OF CELL WALL COULD RESULT IN LARGER PILE SECTIONS, INABILITY TO DRIVE PILES TO REQUIRED DEPTH DUE TO DIFFICULT DRIVING CONDITIONS, AND/OR REFUSAL PRIOR TO REQUIRED TIP DEPTH.
9. SCHEDULE AND CONSTRUCTABILITY WILL BE IMPACTED BY THE PREDICTED LARGE PILE SIZES AND DEPTHS AND MAY BE ADDITIONALLY AFFECTED OR DEEMED IMPRACTICAL BY DIFFICULT DRIVING CONDITIONS AND GEOTECHNICAL UNCERTAINTIES.

PRELIMINARY
NOT FOR CONSTRUCTION

ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 5-28-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 010
GHD TEXAS FIRM REGISTRATION NO. 276

Client

SAN JACINTO RIVER WASTE PITS

Project

NORTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	RH	05/28/2020
1	30% CLIENT REVIEW	MW	RH	05/15/2020

Drawn	MW	Designer	RH
Drafting Check	BP	Design Check	LL
Project Coordinator	CM	Date	May 28, 2020
This document shall not be used for construction unless signed and sealed for construction.		Scale	1" = 30'
Original Size	Arch D	Bar is one inch on original size drawing 0 1"	

Project No. 11187072

Title

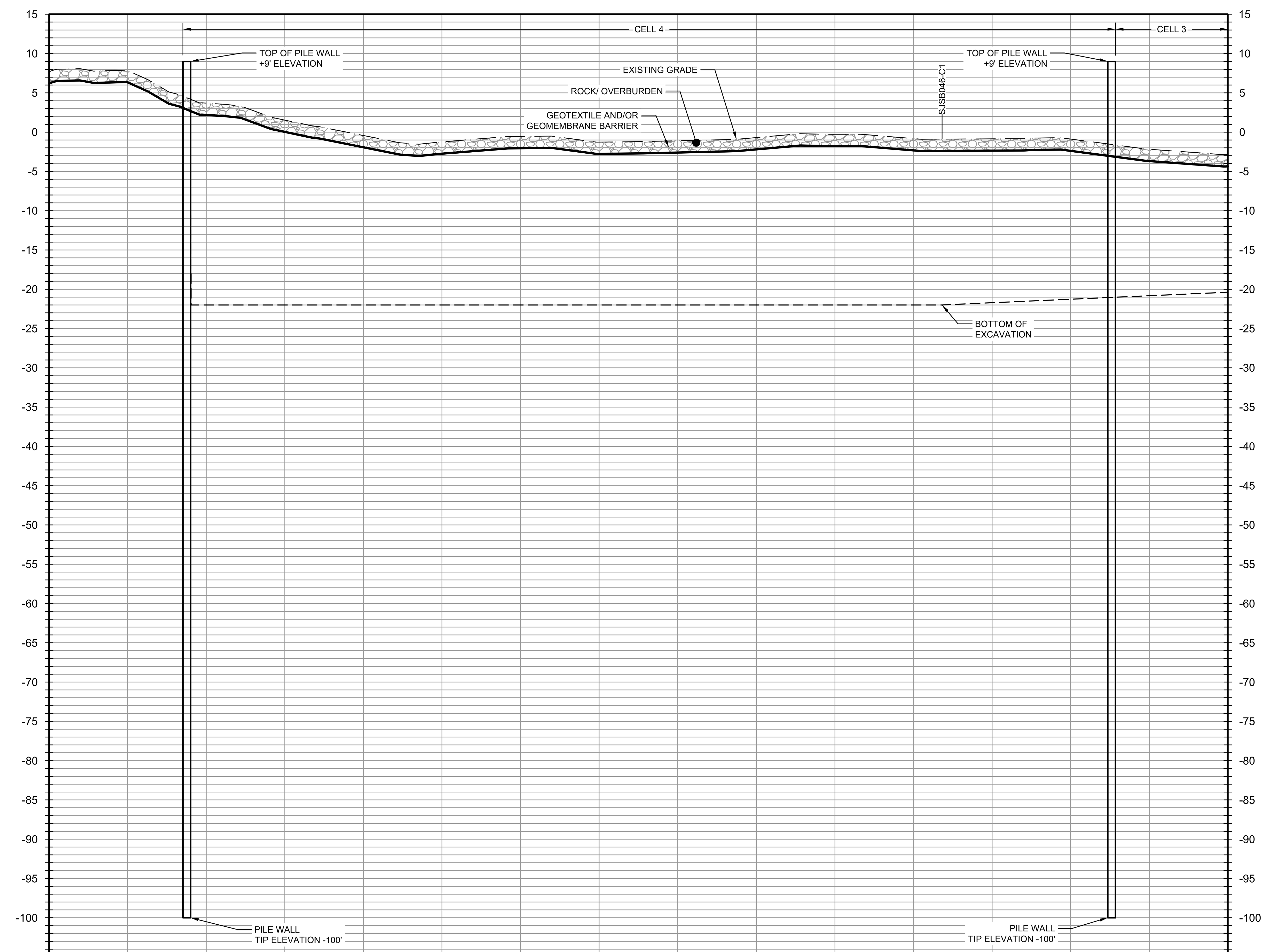
EXCAVATION PLAN CELL 4

Sheet No.

C-21

Sheet - of -

Plot Date: 28 May 2020 - 7:52 AM Plotted By: Matt Wolfer Filename: N:\US\Baton Rouge\Legacy\BAT\Shared\Project Work Area\11180000s\11187072 - San Jacinto River Waste Pits Superfund Site - Remedial Design\Design\CAD\Sheets\11187072-00(010)\11187072-00(010)CI\11187072-00(010)CI-WA011.dwg



EXIST. ELEV.	7.84	3.69	1.53	-0.43	-1.25	-0.55	-1.27	-1.10	-0.70	-0.28	-0.83	-0.86	-0.88	-2.18
STA	0+20	0+40	0+60	0+80	1+00	1+20	1+40	1+60	1+80	2+00	2+20	2+40	2+60	2+80

SECTION E
C-21
HORIZ: 1"=20'
VERT: 1"=10'

NOTES:

1. BOTTOM OF EXCAVATION IS SUBJECT TO CHANGE.
2. CELL NUMBERS FOR IDENTIFICATION ONLY AND DO NOT REPRESENT ORDER OF EXCAVATION SEQUENCING.
3. BMP DESIGN IS SUBJECT TO CHANGE BASED ON ADDITIONAL DATA ANALYSIS AND ENGINEERING EVALUATION, AS WELL AS CHANGES IN POTENTIAL WATER SURFACE ELEVATIONS RESULTING FROM UPSTREAM CONDITIONS CURRENTLY UNDER CONSIDERATION, BUT IS SHOWN AS A CANTILEVERED PILE COFFERDAM WITH A TOP OF PILE HEIGHT OF +9' NAVD88 AND IS COMPOSED OF A PAZ66/AZ38-700N PIPE-Z SYSTEM WITH A PILE TIP DEPTH OF -80' NAVD88 AND A HZ 1080M A HZ-M WALL WITH A PILE TIP DEPTH OF -100' NAVD88.
4. PILES SHOWN ON DRAWINGS DO NOT MEET MAXIMUM DEFLECTION CRITERIA TYPICALLY USED FOR PILE WALLS. SECTIONS ARE SHOWN THAT MEET STABILITY AND STRENGTH REQUIREMENTS ONLY. MEETING DEFLECTION CRITERIA WILL LEAD TO EITHER MUCH LARGER PILE SECTIONS OR DIFFERENT WALL TYPE CONCEPTS OR A DIFFERENT DESIGN APPROACH.
5. BASED ON THE PILE DRIVING ANALYSIS PERFORMED, IT IS UNCERTAIN THAT PILES WILL BE ABLE TO BE DRIVEN COMPLETELY AND PRACTICAL REFUSAL OF THE PILES IS POSSIBLE PRIOR TO REACHING REQUIRED PILE TIP DEPTH.
6. HARD PILE DRIVING CONDITIONS COULD LEAD TO LATERAL MOVEMENT OF THE PILES CREATING ALIGNMENT ISSUES.
7. HARD DRIVING CONDITIONS WILL CAUSE VIBRATIONS THROUGH SOIL CAUSING SOIL PARTICLE ACCELERATION. THESE ACCELERATIONS MAY CAUSE SLOPE INSTABILITY. PREDICTION OF DESIGN MAGNITUDE OF SOIL ACCELERATION IS HIGHLY VARIABLE DUE TO VARIABILITY OF SOIL CONDITIONS, TRANSFER OF FORCES FROM PILE TO SOIL, AND AMOUNT OF PILE DRIVING ENERGY REQUIRED DURING ANY PHASE OF DRIVING.
8. CONSIDERATION OF ADDITIONAL DESIGN SECTIONS ALONG EACH LENGTH OF CELL WALL COULD RESULT IN LARGER PILE SECTIONS, INABILITY TO DRIVE PILES TO REQUIRED DEPTH DUE TO DIFFICULT DRIVING CONDITIONS, AND/OR REFUSAL PRIOR TO REQUIRED TIP DEPTH.
9. SCHEDULE AND CONSTRUCTABILITY WILL BE IMPACTED BY THE PREDICTED LARGE PILE SIZES AND DEPTHS AND MAY BE ADDITIONALLY AFFECTED OR DEEMED IMPRACTICAL BY DIFFICULT DRIVING CONDITIONS AND GEOTECHNICAL UNCERTAINTIES.

PRELIMINARY
NOT FOR CONSTRUCTION
ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 5-28-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 010
GHD TEXAS FIRM REGISTRATION NO. 276

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

Client
SAN JACINTO RIVER WASTE PITS

Project
NORTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	RH	05/28/2020
1	30% CLIENT REVIEW	MW	RH	05/15/2020

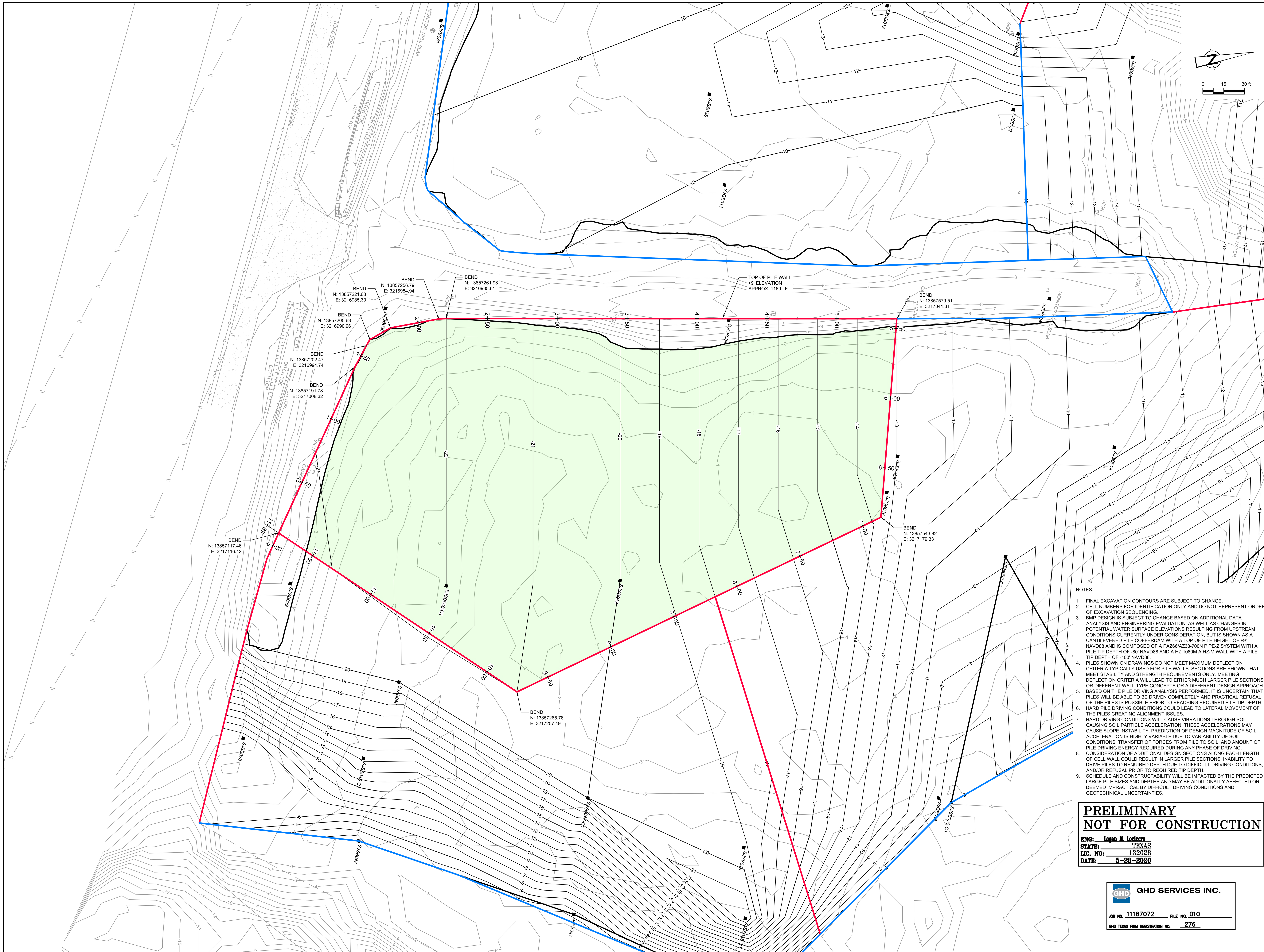
Drawn	MW	Designer	RH
Drafting Check	BP	Design Check	LL
Project Coordinator	CM	Date	May 28, 2020
This document shall not be used for construction unless signed and sealed for construction.		Scale	AS SHOWN
Original Size	Arch D	Bar is one inch on original size drawing 0 1"	

Project No. 11187072

Title
EXCAVATION SECTION CELL 4

Sheet No.
C-22

Sheet - of -



GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

Reuse of Documents
This document and the ideas and designs incorporated herein, as an instrument of professional service, is the property of GHD and shall not be reused in whole or in part for any other project without GHD's written authorization. © 2020 GHD

LEGEND
- TCRA CAP PERIMETER
- EXISTING CONTOUR INTERVAL (620)
- FENCELINE
- SHORELINE
- TOP OF BANK
- TOE OF SLOPE
- OVERHEAD ELECTRICAL (OH)
- GUARDRAIL
- PIPELINE
- SJSB002 BORING LOCATION
- MW MONITORING WELL
- P.P. POWER POLE
- L.P. LIGHT POLE
- WELL WELL
- AREA WITH MATERIAL >30 ng/kg TEQ
- ASPHALT
- CONCRETE
- GRAVEL
- PAZ66/AZ38-700N PILE
- HZ 1080M A PILE

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

NOTES:

1. FINAL EXCAVATION CONTOURS ARE SUBJECT TO CHANGE.
2. CELL NUMBERS FOR IDENTIFICATION ONLY AND DO NOT REPRESENT ORDER OF EXCAVATION SEQUENCING.
3. BMP DESIGN IS SUBJECT TO CHANGE BASED ON ADDITIONAL DATA ANALYSIS AND ENGINEERING EVALUATION, AS WELL AS CHANGES IN POTENTIAL WATER SURFACE ELEVATIONS RESULTING FROM UPSTREAM CONDITIONS CURRENTLY UNDER CONSIDERATION, BUT IS SHOWN AS A CANTILEVERED PILE COFFERDAM WITH A TOP OF PILE HEIGHT OF +9' NAVD88 AND IS COMPOSED OF A PAZ66/AZ38-700N PIPE-Z SYSTEM WITH A PILE TIP DEPTH OF -80' NAVD88 AND A HZ 1080M A HZ-M WALL WITH A PILE TIP DEPTH OF -100' NAVD88.
4. PILES SHOWN ON DRAWINGS DO NOT MEET MAXIMUM DEFLECTION CRITERIA TYPICALLY USED FOR PILE WALLS. SECTIONS ARE SHOWN THAT MEET STABILITY AND STRENGTH REQUIREMENTS ONLY. MEETING DEFLECTION CRITERIA WILL LEAD TO EITHER MUCH LARGER PILE SECTIONS OR DIFFERENT WALL TYPE CONCEPTS OR A DIFFERENT DESIGN APPROACH.
5. BASED ON THE PILE DRIVING ANALYSIS PERFORMED, IT IS UNCERTAIN THAT PILES WILL BE ABLE TO BE DRIVEN COMPLETELY AND PRACTICAL REFUSAL OF THE PILES IS POSSIBLE PRIOR TO REACHING REQUIRED PILE TIP DEPTH.
6. HARD PILE DRIVING CONDITIONS COULD LEAD TO LATERAL MOVEMENT OF THE PILES CREATING ALIGNMENT ISSUES.
7. HARD DRIVING CONDITIONS WILL CAUSE VIBRATIONS THROUGH SOIL CAUSING SOIL PARTICLE ACCELERATION. THESE ACCELERATIONS MAY CAUSE SLOPE INSTABILITY. PREDICTION OF DESIGN MAGNITUDE OF SOIL ACCELERATION IS HIGHLY VARIABLE DUE TO VARIABILITY OF SOIL CONDITIONS, TRANSFER OF FORCES FROM PILE TO SOIL, AND AMOUNT OF PILE DRIVING ENERGY REQUIRED DURING ANY PHASE OF DRIVING.
8. CONSIDERATION OF ADDITIONAL DESIGN SECTIONS ALONG EACH LENGTH OF CELL WALL COULD RESULT IN LARGER PILE SECTIONS, INABILITY TO DRIVE PILES TO REQUIRED DEPTH DUE TO DIFFICULT DRIVING CONDITIONS, AND/OR REFUSAL PRIOR TO REQUIRED TIP DEPTH.
9. SCHEDULE AND CONSTRUCTABILITY WILL BE IMPACTED BY THE PREDICTED LARGE PILE SIZES AND DEPTHS AND MAY BE ADDITIONALLY AFFECTED OR DEEMED IMPRACTICAL BY DIFFICULT DRIVING CONDITIONS AND GEOTECHNICAL UNCERTAINTIES.

PRELIMINARY
NOT FOR CONSTRUCTION
ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 5-28-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 010
GHD TEXAS FIRM REGISTRATION NO. 276

Client
SAN JACINTO RIVER WASTE PITS

Project
NORTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	SC	05/28/2020
1	30% CLIENT REVIEW	MW	SC	05/15/2020

Drawn	MW	Designer	RH
Drafting Check	BP	Design Check	LL
Project Coordinator	CM	Date	May 28, 2020
This document shall not be used for construction unless signed and sealed for construction.		Scale	1" = 30'
Original Size	Arch D	Bar is one inch on original size drawing	0 1"

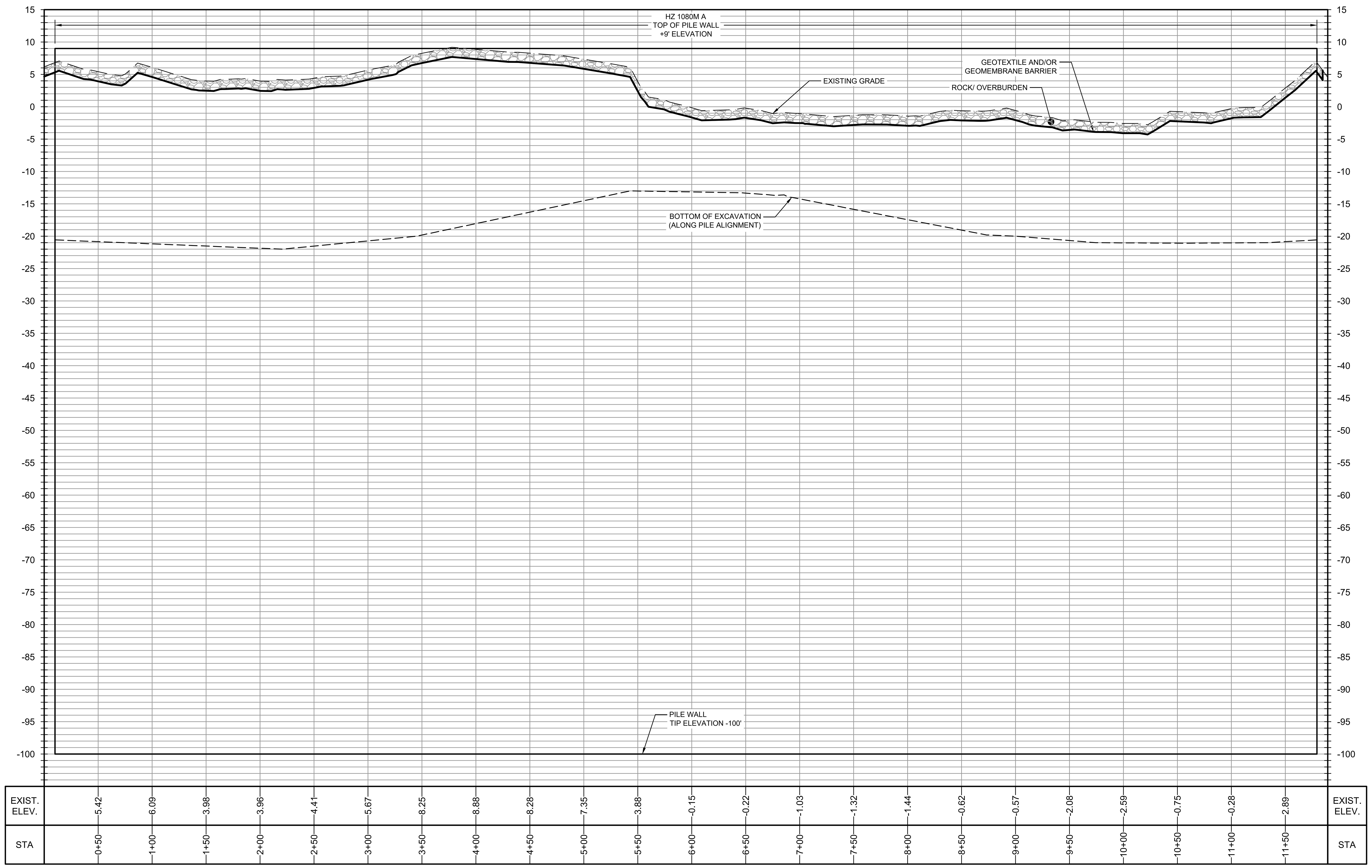
Project No. 11187072

Title
PILE LAYOUT PLAN CELL 4

Sheet No.
C-23

Sheet - of -

Plot Date: 28 May 2020 - 8:13 AM Plotted By: Matt Wolfer Filename: N:\US\Baton Rouge\Legacy\BAT\Shared\Project Work Area\11180000\11187072 - San Jacinto River Waste Pits Superfund Site - Remedial Design\Design\CAD\Sheets\11187072-00(010)\11187072-00(010)CI\11187072-00(010)CI-WA018.dwg



PROFILE

HORIZ: 1" = 60'
VERT: 1" = 10'

NOTES:

1. BOTTOM OF EXCAVATION IS SUBJECT TO CHANGE.
2. CELL NUMBERS FOR IDENTIFICATION ONLY AND DO NOT REPRESENT ORDER OF EXCAVATION SEQUENCING.
3. BMP DESIGN IS SUBJECT TO CHANGE BASED ON ADDITIONAL DATA ANALYSIS AND ENGINEERING EVALUATION, AS WELL AS CHANGES IN POTENTIAL WATER SURFACE ELEVATIONS RESULTING FROM UPSTREAM CONDITIONS CURRENTLY UNDER CONSIDERATION, BUT IS SHOWN AS A CANTILEVERED PILE COFFERDAM WITH A TOP OF PILE HEIGHT OF +9' NAVD88 AND IS COMPOSED OF A PAZ66/AZ38-700N PIPE-Z SYSTEM WITH A PILE TIP DEPTH OF -80' NAVD88 AND A HZ 1080M A HZ-M WALL WITH A PILE TIP DEPTH OF -100' NAVD88.
4. PILES SHOWN ON DRAWINGS DO NOT MEET MAXIMUM DEFLECTION CRITERIA TYPICALLY USED FOR PILE WALLS. SECTIONS ARE SHOWN THAT MEET STABILITY AND STRENGTH REQUIREMENTS ONLY. MEETING DEFLECTION CRITERIA WILL LEAD TO EITHER MUCH LARGER PILE SECTIONS OR DIFFERENT WALL TYPE CONCEPTS OR A DIFFERENT DESIGN APPROACH.
5. BASED ON THE PILE DRIVING ANALYSIS PERFORMED, IT IS UNCERTAIN THAT PILES WILL BE ABLE TO BE DRIVEN COMPLETELY AND PRACTICAL REFUSAL OF THE PILES IS POSSIBLE PRIOR TO REACHING REQUIRED PILE TIP DEPTH.
6. HARD PILE DRIVING CONDITIONS COULD LEAD TO LATERAL MOVEMENT OF THE PILES CREATING ALIGNMENT ISSUES.
7. HARD DRIVING CONDITIONS WILL CAUSE VIBRATIONS THROUGH SOIL CAUSING SOIL PARTICLE ACCELERATION. THESE ACCELERATIONS MAY CAUSE SLOPE INSTABILITY. PREDICTION OF DESIGN MAGNITUDE OF SOIL ACCELERATION IS HIGHLY VARIABLE DUE TO VARIABILITY OF SOIL CONDITIONS, TRANSFER OF FORCES FROM PILE TO SOIL, AND AMOUNT OF PILE DRIVING ENERGY REQUIRED DURING ANY PHASE OF DRIVING.
8. CONSIDERATION OF ADDITIONAL DESIGN SECTIONS ALONG EACH LENGTH OF CELL WALL COULD RESULT IN LARGER PILE SECTIONS, INABILITY TO DRIVE PILES TO REQUIRED DEPTH DUE TO DIFFICULT DRIVING CONDITIONS, AND/OR REFUSAL PRIOR TO REQUIRED TIP DEPTH.
9. SCHEDULE AND CONSTRUCTABILITY WILL BE IMPACTED BY THE PREDICTED LARGE PILE SIZES AND DEPTHS AND MAY BE ADDITIONALLY AFFECTED OR DEEMED IMPRACTICAL BY DIFFICULT DRIVING CONDITIONS AND GEOTECHNICAL UNCERTAINTIES.

PRELIMINARY
NOT FOR CONSTRUCTION

ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 5-28-2020

GHD SERVICES INC.

JOB NO. 11187072 FILE NO. 010
GHD TEXAS FIRM REGISTRATION NO. 276

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 **F** 225 952 2978 **W** www.ghd.com

Client
SAN JACINTO RIVER WASTE PITS

Project
NORTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	SC	05/28/2020
1	30% CLIENT REVIEW	MW	SC	05/15/2020

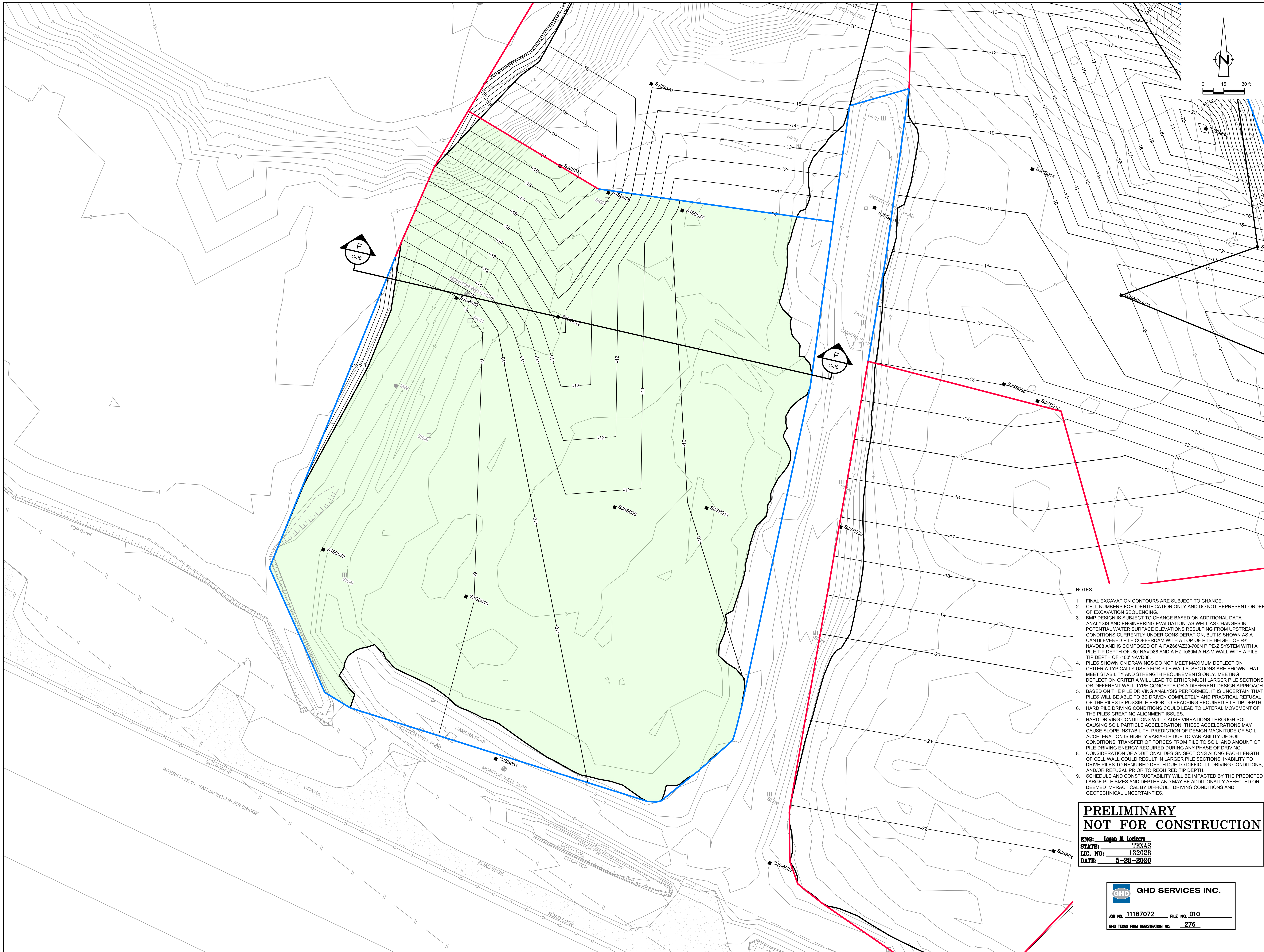
Drawn	MW	Designer	RH
Drafting Check	BP	Design Check	LL
Project Coordinator	CM	Date	May 28, 2020
This document shall not be used for construction unless signed and sealed for construction.		Scale	AS SHOWN
Original Size	Arch D	Bar is one inch on original size drawing 0 1"	

Project No. 11187072

Title
PILE PROFILE CELL 4

Sheet No.
C-24

Sheet - of -



NOTES:

1. FINAL EXCAVATION CONTOURS ARE SUBJECT TO CHANGE.
2. CELL NUMBERS FOR IDENTIFICATION ONLY AND DO NOT REPRESENT ORDER OF EXCAVATION SEQUENCING.
3. BMP DESIGN IS SUBJECT TO CHANGE BASED ON ADDITIONAL DATA ANALYSIS AND ENGINEERING EVALUATION, AS WELL AS CHANGES IN POTENTIAL WATER SURFACE ELEVATIONS RESULTING FROM UPSTREAM CONDITIONS CURRENTLY UNDER CONSIDERATION, BUT IS SHOWN AS A CANTILEVERED PILE COFFERDAM WITH A TOP OF PILE HEIGHT OF +9' NAVD88 AND IS COMPOSED OF A PAZ66/AZ38-700N PIPE-Z SYSTEM WITH A PILE TIP DEPTH OF -80' NAVD88 AND A HZ 1080M A HZ-M WALL WITH A PILE TIP DEPTH OF -100' NAVD88.
4. PILES SHOWN ON DRAWINGS DO NOT MEET MAXIMUM DEFLECTION CRITERIA TYPICALLY USED FOR PILE WALLS. SECTIONS ARE SHOWN THAT MEET STABILITY AND STRENGTH REQUIREMENTS ONLY. MEETING DEFLECTION CRITERIA WILL LEAD TO EITHER MUCH LARGER PILE SECTIONS OR DIFFERENT WALL TYPE CONCEPTS OR A DIFFERENT DESIGN APPROACH.
5. BASED ON THE PILE DRIVING ANALYSIS PERFORMED, IT IS UNCERTAIN THAT PILES WILL BE ABLE TO BE DRIVEN COMPLETELY AND PRACTICAL REFUSAL OF THE PILES IS POSSIBLE PRIOR TO REACHING REQUIRED PILE TIP DEPTH.
6. HARD PILE DRIVING CONDITIONS COULD LEAD TO LATERAL MOVEMENT OF THE PILES CREATING ALIGNMENT ISSUES.
7. HARD DRIVING CONDITIONS WILL CAUSE VIBRATIONS THROUGH SOIL CAUSING SOIL PARTICLE ACCELERATION. THESE ACCELERATIONS MAY CAUSE SLOPE INSTABILITY. PREDICTION OF DESIGN MAGNITUDE OF SOIL ACCELERATION IS HIGHLY VARIABLE DUE TO VARIABILITY OF SOIL CONDITIONS, TRANSFER OF FORCES FROM PILE TO SOIL, AND AMOUNT OF PILE DRIVING ENERGY REQUIRED DURING ANY PHASE OF DRIVING.
8. CONSIDERATION OF ADDITIONAL DESIGN SECTIONS ALONG EACH LENGTH OF CELL WALL COULD RESULT IN LARGER PILE SECTIONS, INABILITY TO DRIVE PILES TO REQUIRED DEPTH DUE TO DIFFICULT DRIVING CONDITIONS, AND/OR REFUSAL PRIOR TO REQUIRED TIP DEPTH.
9. SCHEDULE AND CONSTRUCTABILITY WILL BE IMPACTED BY THE PREDICTED LARGE PILE SIZES AND DEPTHS AND MAY BE ADDITIONALLY AFFECTED OR DEEMED IMPRACTICAL BY DIFFICULT DRIVING CONDITIONS AND GEOTECHNICAL UNCERTAINTIES.

PRELIMINARY
NOT FOR CONSTRUCTION

ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 5-28-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 010
GHD TEXAS FIRM REGISTRATION NO. 276

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

LEGEND

— — —	TCRA CAP PERIMETER
620	EXISTING CONTOUR INTERVAL
X	FENCELINE
	SHORELINE
	TOP OF BANK
	TOE OF SLOPE
O/H	OVERHEAD ELECTRICAL
	GUARDRAIL
\\	PIPELINE
■ SJSB002	BORING LOCATION
● MW	MONITORING WELL
● P.P.	POWER POLE
● L.P.	LIGHT POLE
○ WELL	WELL
	AREA WITH MATERIAL >30 ng/kg TEQ
	ASPHALT
	CONCRETE
	GRAVEL
	PAZ66/AZ38-700N PILE
	HZ 1080M A PILE

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

Client
SAN JACINTO RIVER WASTE PITS

Project
NORTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	RH	05/28/2020
1	30% CLIENT REVIEW	MW	RH	05/15/2020

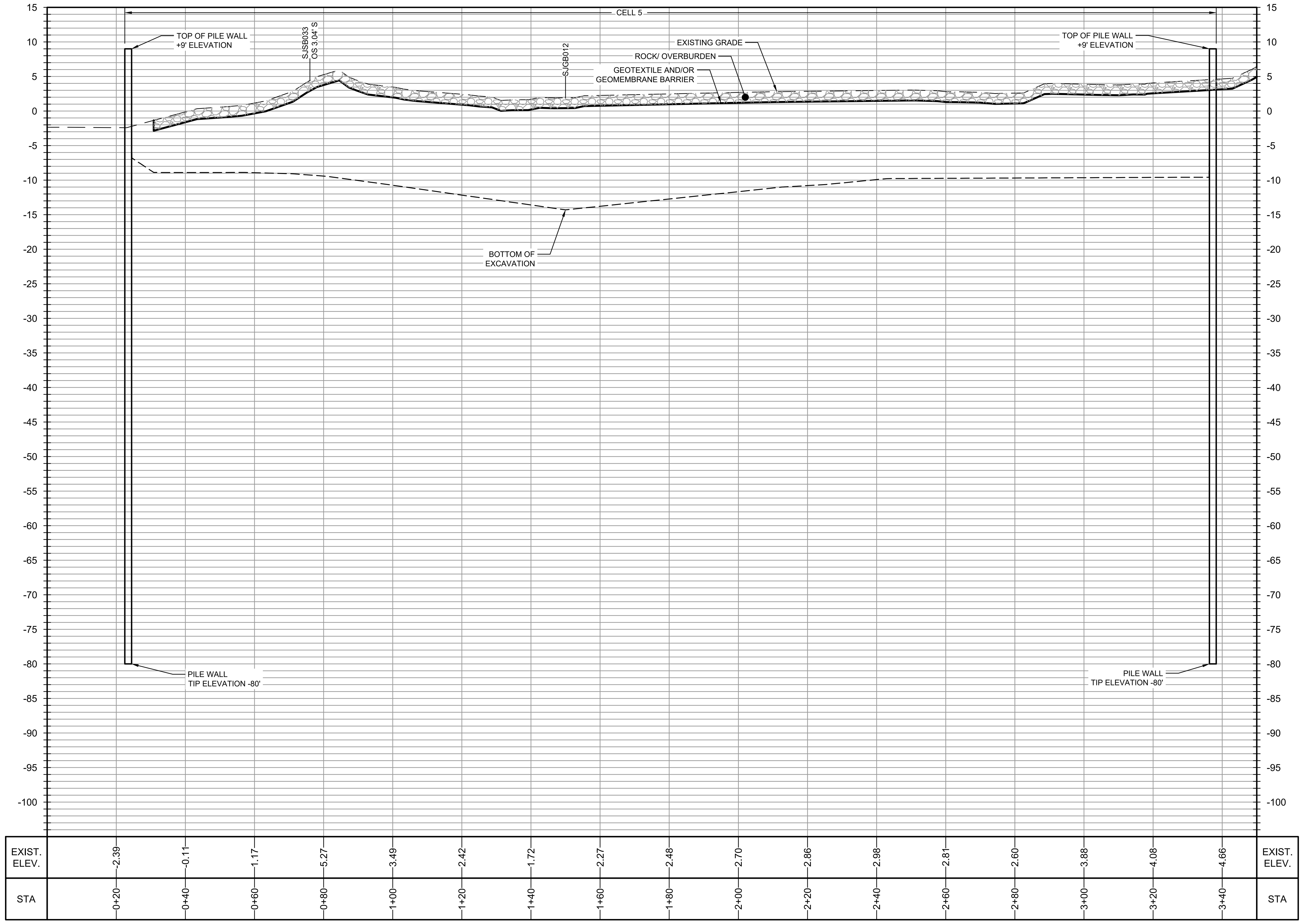
Drawn	MW	Designer	RH
Drafting Check	BP	Design Check	LL
Project Coordinator	CM	Date	May 28, 2020
This document shall not be used for construction unless signed and sealed for construction.		Scale	1" = 30'
Original Size	Arch D	Bar is one inch on original size drawing	0 1"

Project No. 11187072

Title
EXCAVATION PLAN CELL 5

Sheet No.
C-25

Sheet - of -



SECTION F
C-25
HORIZ: 1"=20'
VERT: 1"=10'

NOTES:

1. BOTTOM OF EXCAVATION IS SUBJECT TO CHANGE.
2. CELL NUMBERS FOR IDENTIFICATION ONLY AND DO NOT REPRESENT ORDER OF EXCAVATION SEQUENCING.
3. BMP DESIGN IS SUBJECT TO CHANGE BASED ON ADDITIONAL DATA ANALYSIS AND ENGINEERING EVALUATION, AS WELL AS CHANGES IN POTENTIAL WATER SURFACE ELEVATIONS RESULTING FROM UPSTREAM CONDITIONS CURRENTLY UNDER CONSIDERATION, BUT IS SHOWN AS A CANTILEVERED PILE COFFERDAM WITH A TOP OF PILE HEIGHT OF +9' NAVD88 AND IS COMPOSED OF A PAZ66/AZ38-700N PIPE-Z SYSTEM WITH A PILE TIP DEPTH OF -80' NAVD88 AND A HZ 1080M A HZ-M WALL WITH A PILE TIP DEPTH OF -100' NAVD88.
4. PILES SHOWN ON DRAWINGS DO NOT MEET MAXIMUM DEFLECTION CRITERIA TYPICALLY USED FOR PILE WALLS. SECTIONS ARE SHOWN THAT MEET STABILITY AND STRENGTH REQUIREMENTS ONLY. MEETING DEFLECTION CRITERIA WILL LEAD TO EITHER MUCH LARGER PILE SECTIONS OR DIFFERENT WALL TYPE CONCEPTS OR A DIFFERENT DESIGN APPROACH.
5. BASED ON THE PILE DRIVING ANALYSIS PERFORMED, IT IS UNCERTAIN THAT PILES WILL BE ABLE TO BE DRIVEN COMPLETELY AND PRACTICAL REFUSAL OF THE PILES IS POSSIBLE PRIOR TO REACHING REQUIRED PILE TIP DEPTH.
6. HARD PILE DRIVING CONDITIONS COULD LEAD TO LATERAL MOVEMENT OF THE PILES CREATING ALIGNMENT ISSUES.
7. HARD DRIVING CONDITIONS WILL CAUSE VIBRATIONS THROUGH SOIL CAUSING SOIL PARTICLE ACCELERATION. THESE ACCELERATIONS MAY CAUSE SLOPE INSTABILITY. PREDICTION OF DESIGN MAGNITUDE OF SOIL ACCELERATION IS HIGHLY VARIABLE DUE TO VARIABILITY OF SOIL CONDITIONS, TRANSFER OF FORCES FROM PILE TO SOIL, AND AMOUNT OF PILE DRIVING ENERGY REQUIRED DURING ANY PHASE OF DRIVING.
8. CONSIDERATION OF ADDITIONAL DESIGN SECTIONS ALONG EACH LENGTH OF CELL WALL COULD RESULT IN LARGER PILE SECTIONS, INABILITY TO DRIVE PILES TO REQUIRED DEPTH DUE TO DIFFICULT DRIVING CONDITIONS, AND/OR REFUSAL PRIOR TO REQUIRED TIP DEPTH.
9. SCHEDULE AND CONSTRUCTABILITY WILL BE IMPACTED BY THE PREDICTED LARGE PILE SIZES AND DEPTHS AND MAY BE ADDITIONALLY AFFECTED OR DEEMED IMPRACTICAL BY DIFFICULT DRIVING CONDITIONS AND GEOTECHNICAL UNCERTAINTIES.

PRELIMINARY
NOT FOR CONSTRUCTION
ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 5-28-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 010
GHD TEXAS FIRM REGISTRATION NO. 276

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

Client
SAN JACINTO RIVER WASTE PITS

Project
NORTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	RH	05/28/2020
1	30% CLIENT REVIEW	MW	RH	05/15/2020

Drawn	MW	Designer	RH
Drafting Check	BP	Design Check	LL
Project Coordinator	CM	Date	May 28, 2020
This document shall not be used for construction unless signed and sealed for construction.		Scale	AS SHOWN
Original Size	Arch D	Bar is one inch on original size drawing 0 1"	

Project No. 11187072

Title
EXCAVATION SECTION CELL 5

Sheet No.
C-26

Sheet - of -

NOTES:

1. FINAL EXCAVATION CONTOURS ARE SUBJECT TO CHANGE.
2. CELL NUMBERS FOR IDENTIFICATION ONLY AND DO NOT REPRESENT ORDER OF EXCAVATION SEQUENCING.
3. BMP DESIGN IS SUBJECT TO CHANGE BASED ON ADDITIONAL DATA ANALYSIS AND ENGINEERING EVALUATION, AS WELL AS CHANGES IN POTENTIAL WATER SURFACE ELEVATIONS RESULTING FROM UPSTREAM CONDITIONS CURRENTLY UNDER CONSIDERATION, BUT IS SHOWN AS A CANTILEVERED PILE COFFERDAM WITH A TOP OF PILE HEIGHT OF +9' NAVD88 AND IS COMPOSED OF A PAZ66/AZ38-700N PIPE-Z SYSTEM WITH A PILE TIP DEPTH OF -80' NAVD88 AND A HZ 1080M A HZ-M WALL WITH A PILE TIP DEPTH OF -100' NAVD88.
4. PILES SHOWN ON DRAWINGS DO NOT MEET MAXIMUM DEFLECTION CRITERIA TYPICALLY USED FOR PILE WALLS. SECTIONS ARE SHOWN THAT MEET STABILITY AND STRENGTH REQUIREMENTS ONLY. MEETING DEFLECTION CRITERIA WILL LEAD TO EITHER MUCH LARGER PILE SECTIONS OR DIFFERENT WALL TYPE CONCEPTS OR A DIFFERENT DESIGN APPROACH.
5. BASED ON THE PILE DRIVING ANALYSIS PERFORMED, IT IS UNCERTAIN THAT PILES WILL BE ABLE TO BE DRIVEN COMPLETELY AND PRACTICAL REFUSAL OF THE PILES IS POSSIBLE PRIOR TO REACHING REQUIRED PILE TIP DEPTH.
6. HARD PILE DRIVING CONDITIONS COULD LEAD TO LATERAL MOVEMENT OF THE PILES CREATING ALIGNMENT ISSUES.
7. HARD DRIVING CONDITIONS WILL CAUSE VIBRATIONS THROUGH SOIL CAUSING SOIL PARTICLE ACCELERATION. THESE ACCELERATIONS MAY CAUSE SLOPE INSTABILITY. PREDICTION OF DESIGN MAGNITUDE OF SOIL ACCELERATION IS HIGHLY VARIABLE DUE TO VARIABILITY OF SOIL CONDITIONS, TRANSFER OF FORCES FROM PILE TO SOIL, AND AMOUNT OF PILE DRIVING ENERGY REQUIRED DURING ANY PHASE OF DRIVING.
8. CONSIDERATION OF ADDITIONAL DESIGN SECTIONS ALONG EACH LENGTH OF CELL WALL COULD RESULT IN LARGER PILE SECTIONS, INABILITY TO DRIVE PILES TO REQUIRED DEPTH DUE TO DIFFICULT DRIVING CONDITIONS, AND/OR REFUSAL PRIOR TO REQUIRED TIP DEPTH.
9. SCHEDULE AND CONSTRUCTABILITY WILL BE IMPACTED BY THE PREDICTED LARGE PILE SIZES AND DEPTHS AND MAY BE ADDITIONALLY AFFECTED OR DEEMED IMPRACTICAL BY DIFFICULT DRIVING CONDITIONS AND GEOTECHNICAL UNCERTAINTIES.

PRELIMINARY
NOT FOR CONSTRUCTION

ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 5-28-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 010
GHD TEXAS FIRM REGISTRATION NO. 276

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

LEGEND

- TCRA CAP PERIMETER
- 620 EXISTING CONTOUR INTERVAL
- FENCELINE
- SHORELINE
- TOP OF BANK
- TOE OF SLOPE
- O/H OVERHEAD ELECTRICAL
- GUARDRAIL
- PIPELINE
- SJSB002 BORING LOCATION
- MW MONITORING WELL
- P.P. POWER POLE
- L.P. LIGHT POLE
- WELL WELL
- AREA WITH MATERIAL >30 ng/kg TEQ
- ASPHALT
- CONCRETE
- GRAVEL
- PAZ66/AZ38-700N PILE
- HZ 1080M A PILE

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

Client
SAN JACINTO RIVER WASTE PITS

Project
NORTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	SC	05/28/2020
1	30% CLIENT REVIEW	MW	SC	05/15/2020

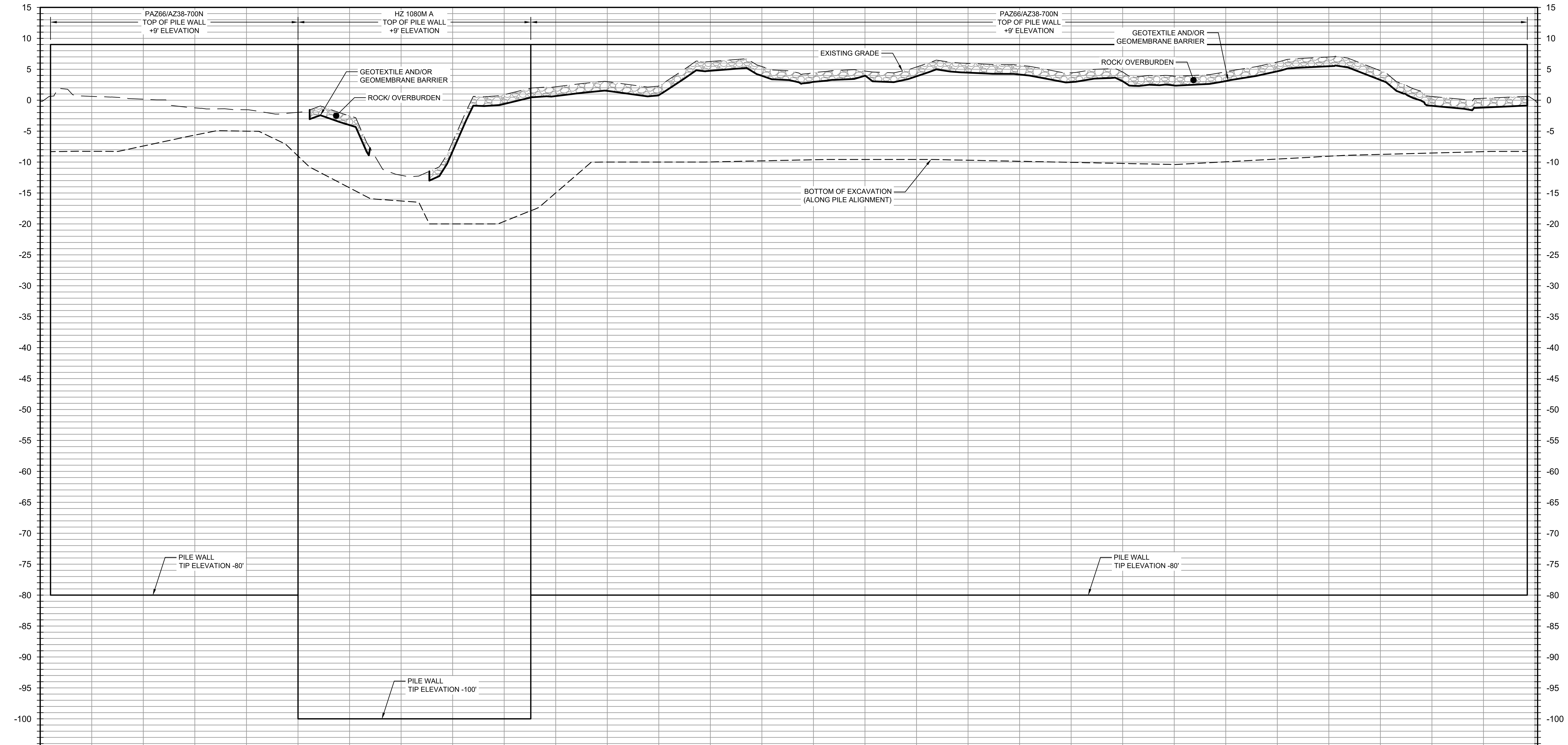
Drawn	MW	Designer	RH
Drafting Check	BP	Design Check	LL
Project Coordinator	CM	Date	May 28, 2020
This document shall not be used for construction unless signed and sealed for construction.		Scale	1" = 30'
Original Size	Arch D	Bar is one inch on original size drawing	0 1"

Project No. 11187072

Title
PILE LAYOUT PLAN CELL 5

Sheet No.
C-27

Sheet - of -



STA	EXIST. ELEV.
0+50	0.61
1+00	0.15
1+50	1.25
2+00	1.55
2+50	1.96
3+00	2.53
3+50	12.14
4+00	6.75
4+50	0.89
5+00	2.16
5+50	3.00
6+00	2.31
6+50	6.25
7+00	5.44
7+50	4.45
8+00	4.70
8+50	5.36
9+00	5.94
9+50	5.64
10+00	4.42
10+50	4.56
11+00	3.88
11+50	4.58
12+00	6.17
12+50	6.98
13+00	4.76
13+50	0.59
14+00	0.31
14+50	0.04

PROFILE

HORIZ: 1" = 60'
VERT: 1' = 10'

NOTES:

1. BOTTOM OF EXCAVATION IS SUBJECT TO CHANGE.
2. CELL NUMBERS FOR IDENTIFICATION ONLY AND DO NOT REPRESENT ORDER OF EXCAVATION SEQUENCING.
3. BMP DESIGN IS SUBJECT TO CHANGE BASED ON ADDITIONAL DATA ANALYSIS AND ENGINEERING EVALUATION, AS WELL AS CHANGES IN POTENTIAL WATER SURFACE ELEVATIONS RESULTING FROM UPSTREAM CONDITIONS CURRENTLY UNDER CONSIDERATION, BUT IS SHOWN AS A CANTILEVERED PILE COFFERDAM WITH A TOP OF PILE HEIGHT OF +9' NAVD88 AND IS COMPOSED OF A PAZ66/AZ38-700N PIPE-Z SYSTEM WITH A PILE TIP DEPTH OF -80' NAVD88 AND A HZ 1080M A HZ-M WALL WITH A PILE TIP DEPTH OF -100' NAVD88.
4. PILES SHOWN ON DRAWINGS DO NOT MEET MAXIMUM DEFLECTION CRITERIA TYPICALLY USED FOR PILE WALLS. SECTIONS ARE SHOWN THAT MEET STABILITY AND STRENGTH REQUIREMENTS ONLY. MEETING DEFLECTION CRITERIA WILL LEAD TO EITHER MUCH LARGER PILE SECTIONS OR DIFFERENT WALL TYPE CONCEPTS OR A DIFFERENT DESIGN APPROACH.
5. BASED ON THE PILE DRIVING ANALYSIS PERFORMED, IT IS UNCERTAIN THAT PILES WILL BE ABLE TO BE DRIVEN COMPLETELY AND PRACTICAL REFUSAL OF THE PILES IS POSSIBLE PRIOR TO REACHING REQUIRED PILE TIP DEPTH.
6. HARD PILE DRIVING CONDITIONS COULD LEAD TO LATERAL MOVEMENT OF THE PILES CREATING ALIGNMENT ISSUES.
7. HARD DRIVING CONDITIONS WILL CAUSE VIBRATIONS THROUGH SOIL CAUSING SOIL PARTICLE ACCELERATION. THESE ACCELERATIONS MAY CAUSE SLOPE INSTABILITY. PREDICTION OF DESIGN MAGNITUDE OF SOIL ACCELERATION IS HIGHLY VARIABLE DUE TO VARIABILITY OF SOIL CONDITIONS, TRANSFER OF FORCES FROM PILE TO SOIL, AND AMOUNT OF PILE DRIVING ENERGY REQUIRED DURING ANY PHASE OF DRIVING.
8. CONSIDERATION OF ADDITIONAL DESIGN SECTIONS ALONG EACH LENGTH OF CELL WALL COULD RESULT IN LARGER PILE SECTIONS, INABILITY TO DRIVE PILES TO REQUIRED DEPTH DUE TO DIFFICULT DRIVING CONDITIONS, AND/OR REFUSAL PRIOR TO REQUIRED TIP DEPTH.
9. SCHEDULE AND CONSTRUCTABILITY WILL BE IMPACTED BY THE PREDICTED LARGE PILE SIZES AND DEPTHS AND MAY BE ADDITIONALLY AFFECTED OR DEEMED IMPRACTICAL BY DIFFICULT DRIVING CONDITIONS AND GEOTECHNICAL UNCERTAINTIES.

PRELIMINARY
NOT FOR CONSTRUCTION
ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 5-28-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 010
GHD TEXAS FIRM REGISTRATION NO. 276

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

Client
SAN JACINTO RIVER WASTE PITS

Project
NORTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	SC	05/28/2020
1	30% CLIENT REVIEW	MW	SC	05/15/2020

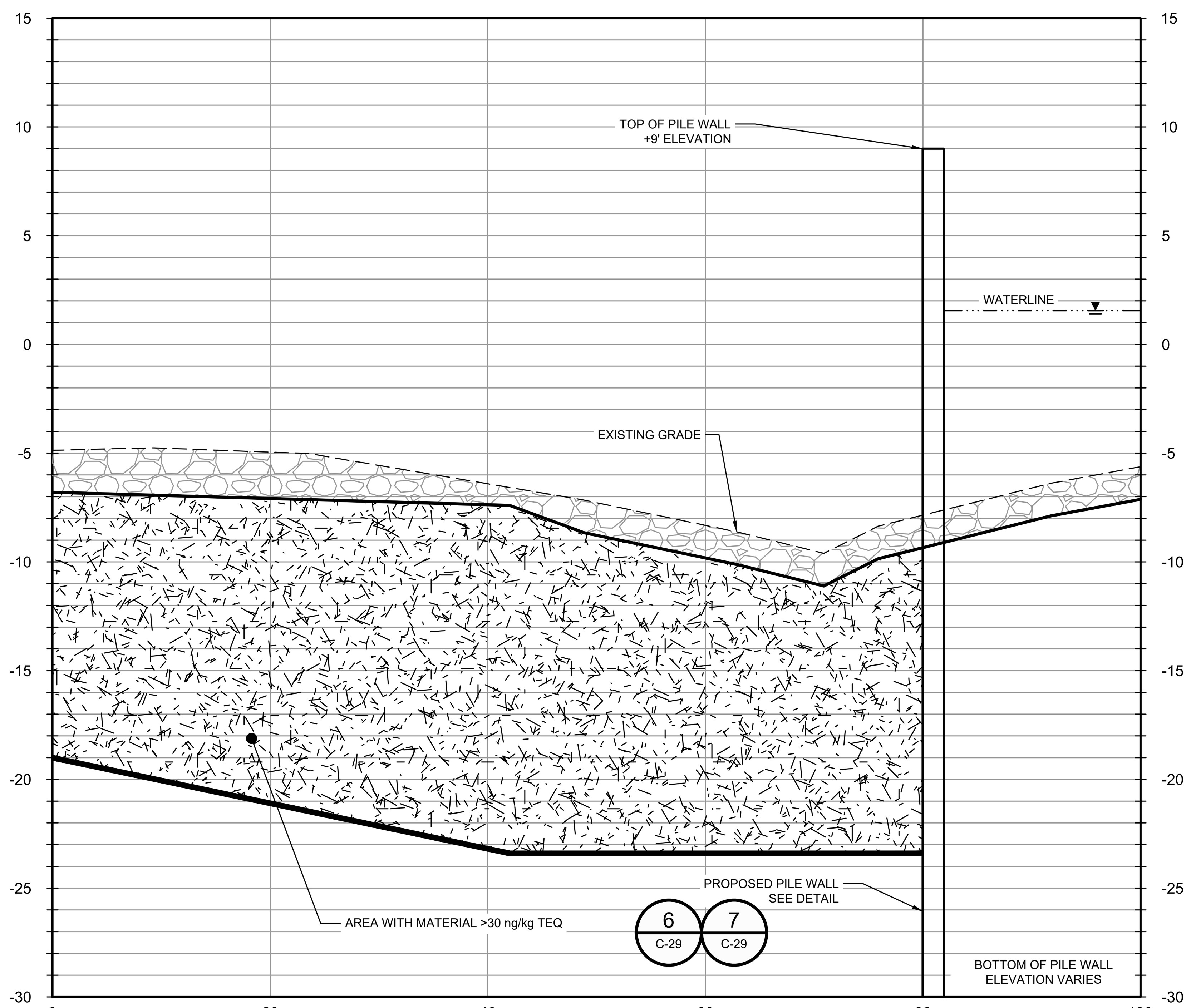
Drawn	MW	Designer	RH
Drafting Check	BP	Design Check	LL
Project Coordinator	CM	Date	May 28, 2020
This document shall not be used for construction unless signed and sealed for construction.		Scale	AS SHOWN
Original Size	Arch D	Bar is one inch on original size drawing 0 1"	

Project No. 11187072

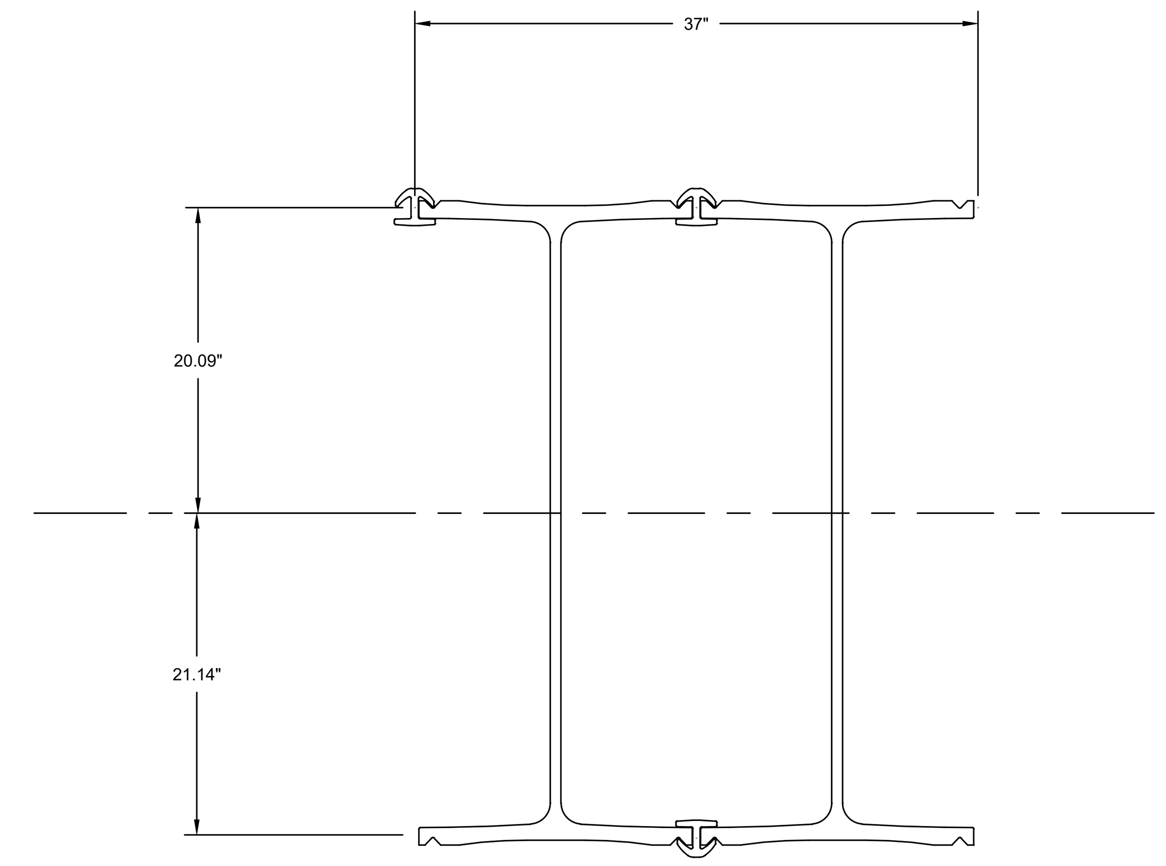
Title
PILE PROFILE CELL 5

Sheet No.
C-28

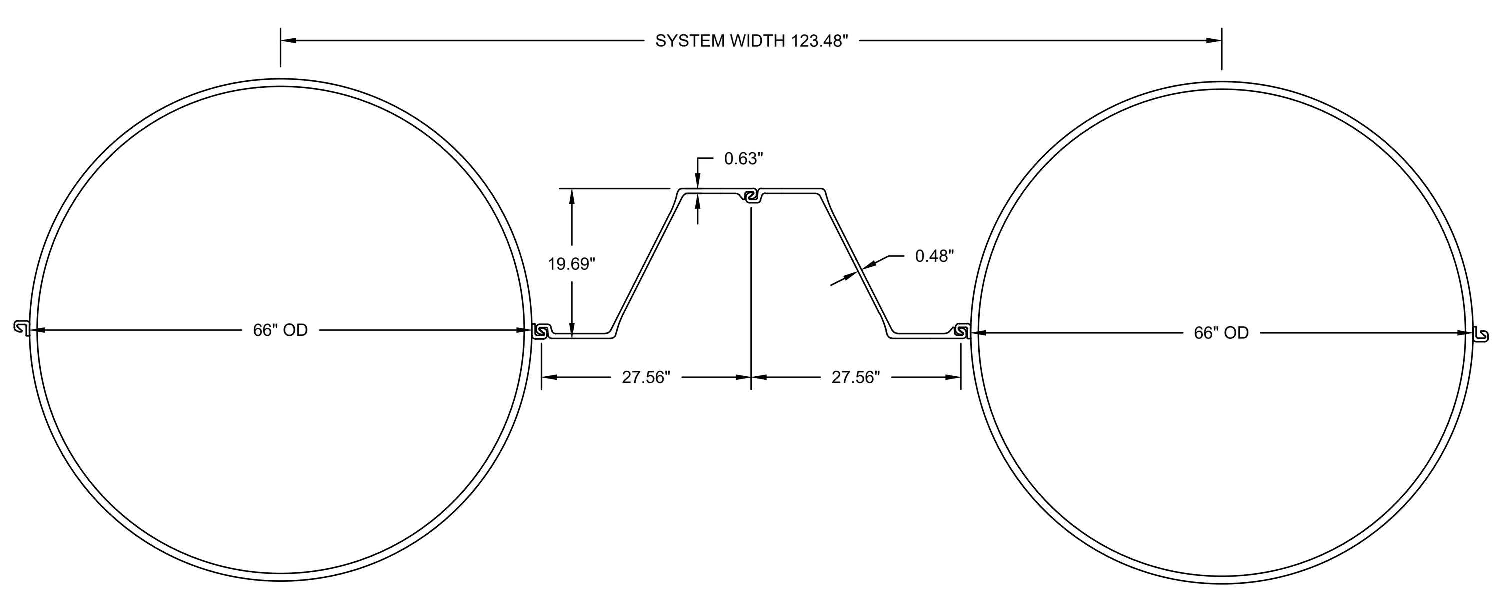
Sheet - of -



SECTION G TYPICAL PILE
N.T.S.



DETAIL 6 HZ 1080M A PILE WALL
N.T.S. C-29



DETAIL 7 PAZ66/AZ38-700N PILE WALL
N.T.S. C-29

NOTES:

1. BOTTOM OF EXCAVATION IS SUBJECT TO CHANGE.
2. BMP DESIGN IS SUBJECT TO CHANGE BASED ON ADDITIONAL DATA ANALYSIS AND ENGINEERING EVALUATION, AS WELL AS CHANGES IN POTENTIAL WATER SURFACE ELEVATIONS RESULTING FROM UPSTREAM CONDITIONS CURRENTLY UNDER CONSIDERATION, BUT IS SHOWN AS A CANTILEVERED PILE COFFERDAM WITH A TOP OF PILE HEIGHT OF +9' NAVD88 AND IS COMPOSED OF A PAZ66/AZ38-700N PIPE-Z SYSTEM WITH A PILE TIP DEPTH OF -80' NAVD88 AND A HZ 1080M A HZ-M WALL WITH A PILE TIP DEPTH OF -100' NAVD88.
3. PILES SHOWN ON DRAWINGS DO NOT MEET MAXIMUM DEFLECTION CRITERIA TYPICALLY USED FOR PILE WALLS. SECTIONS ARE SHOWN THAT MEET STABILITY AND STRENGTH REQUIREMENTS ONLY. MEETING DEFLECTION CRITERIA WILL LEAD TO EITHER MUCH LARGER PILE SECTIONS OR DIFFERENT WALL TYPE CONCEPTS OR A DIFFERENT DESIGN APPROACH.
4. BASED ON THE PILE DRIVING ANALYSIS PERFORMED, IT IS UNCERTAIN THAT PILES WILL BE ABLE TO BE DRIVEN COMPLETELY AND PRACTICAL REFUSAL OF THE PILES IS POSSIBLE PRIOR TO REACHING REQUIRED PILE TIP DEPTH.
5. HARD PILE DRIVING CONDITIONS COULD LEAD TO LATERAL MOVEMENT OF THE PILES CREATING ALIGNMENT ISSUES.
6. HARD DRIVING CONDITIONS WILL CAUSE VIBRATIONS THROUGH SOIL CAUSING SOIL PARTICLE ACCELERATION. THESE ACCELERATIONS MAY CAUSE SLOPE INSTABILITY. PREDICTION OF DESIGN MAGNITUDE OF SOIL ACCELERATION IS HIGHLY VARIABLE DUE TO VARIABILITY OF SOIL CONDITIONS, TRANSFER OF FORCES FROM PILE TO SOIL, AND AMOUNT OF PILE DRIVING ENERGY REQUIRED DURING ANY PHASE OF DRIVING.
7. CONSIDERATION OF ADDITIONAL DESIGN SECTIONS ALONG EACH LENGTH OF CELL WALL COULD RESULT IN LARGER PILE SECTIONS, INABILITY TO DRIVE PILES TO REQUIRED DEPTH DUE TO DIFFICULT DRIVING CONDITIONS, AND/OR REFUSAL PRIOR TO REQUIRED TIP DEPTH.
8. SCHEDULE AND CONSTRUCTABILITY WILL BE IMPACTED BY THE PREDICTED LARGE PILE SIZES AND DEPTHS AND MAY BE ADDITIONALLY AFFECTED OR DEEMED IMPRACTICAL BY DIFFICULT DRIVING CONDITIONS AND GEOTECHNICAL UNCERTAINTIES.

PRELIMINARY
NOT FOR CONSTRUCTION
ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 5-28-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 010
GHD TEXAS FIRM REGISTRATION NO. 276

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

Client
SAN JACINTO RIVER WASTE PITS

Project
NORTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	SC	05/28/2020
1	30% CLIENT REVIEW	MW	SC	05/15/2020

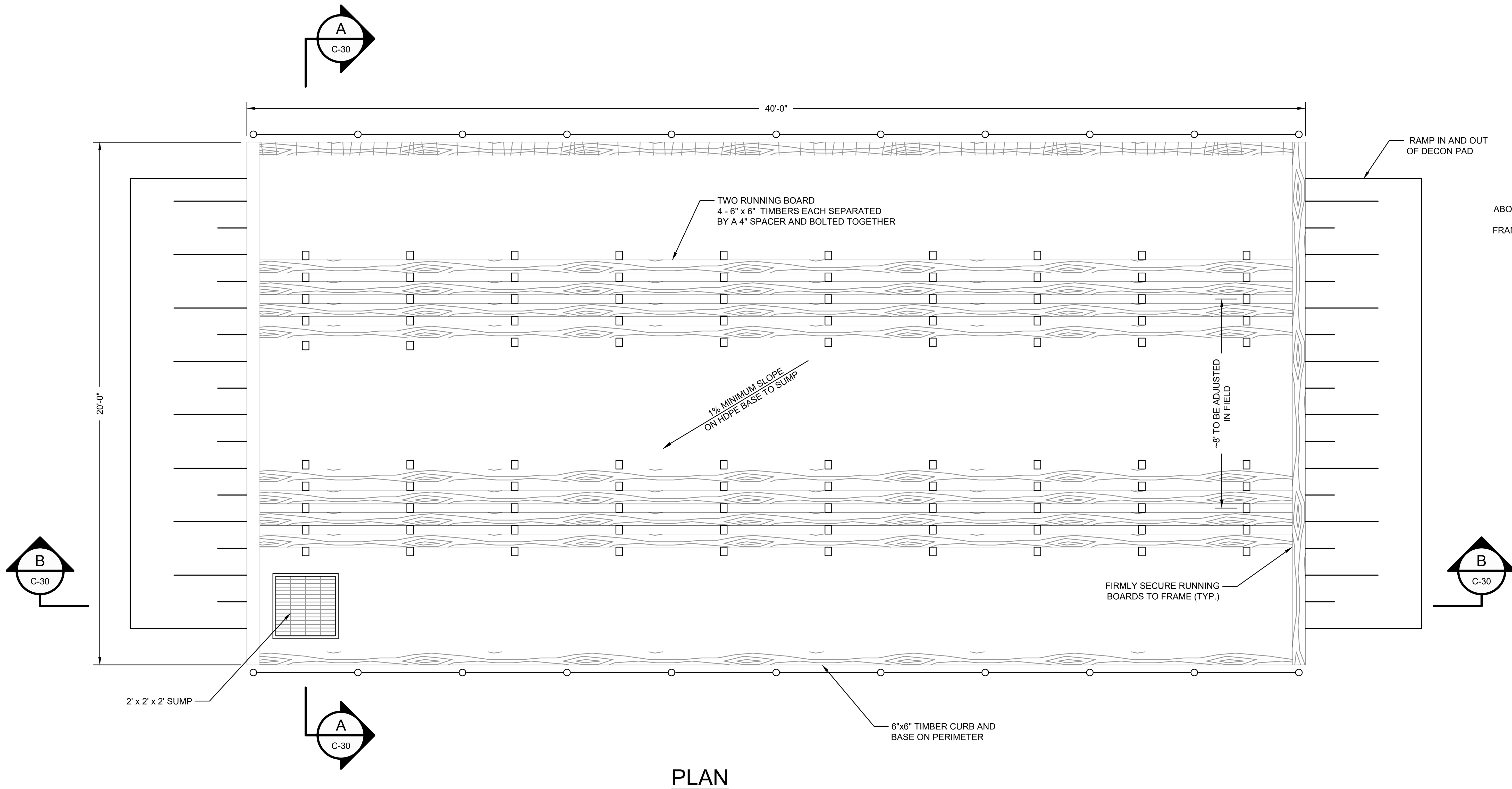
Drawn	MW	Designer	RH
Drafting Check	BP	Design Check	LL
Project Coordinator	CM	Date	May 28, 2020
This document shall not be used for construction unless signed and sealed for construction.		Scale	N.T.S.
Original Size	Arch D	Bar is one inch on original size drawing 0 1"	

Project No. 11187072

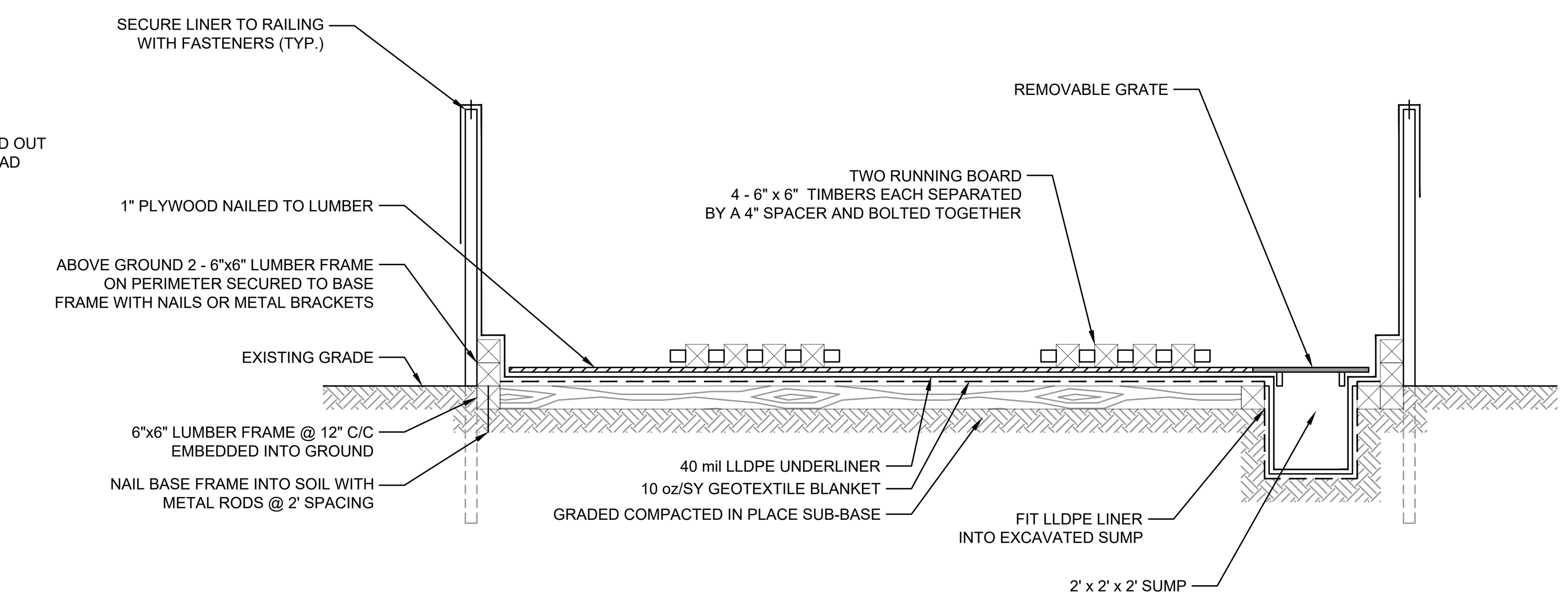
Title
PILE DETAILS

Sheet No.
C-29

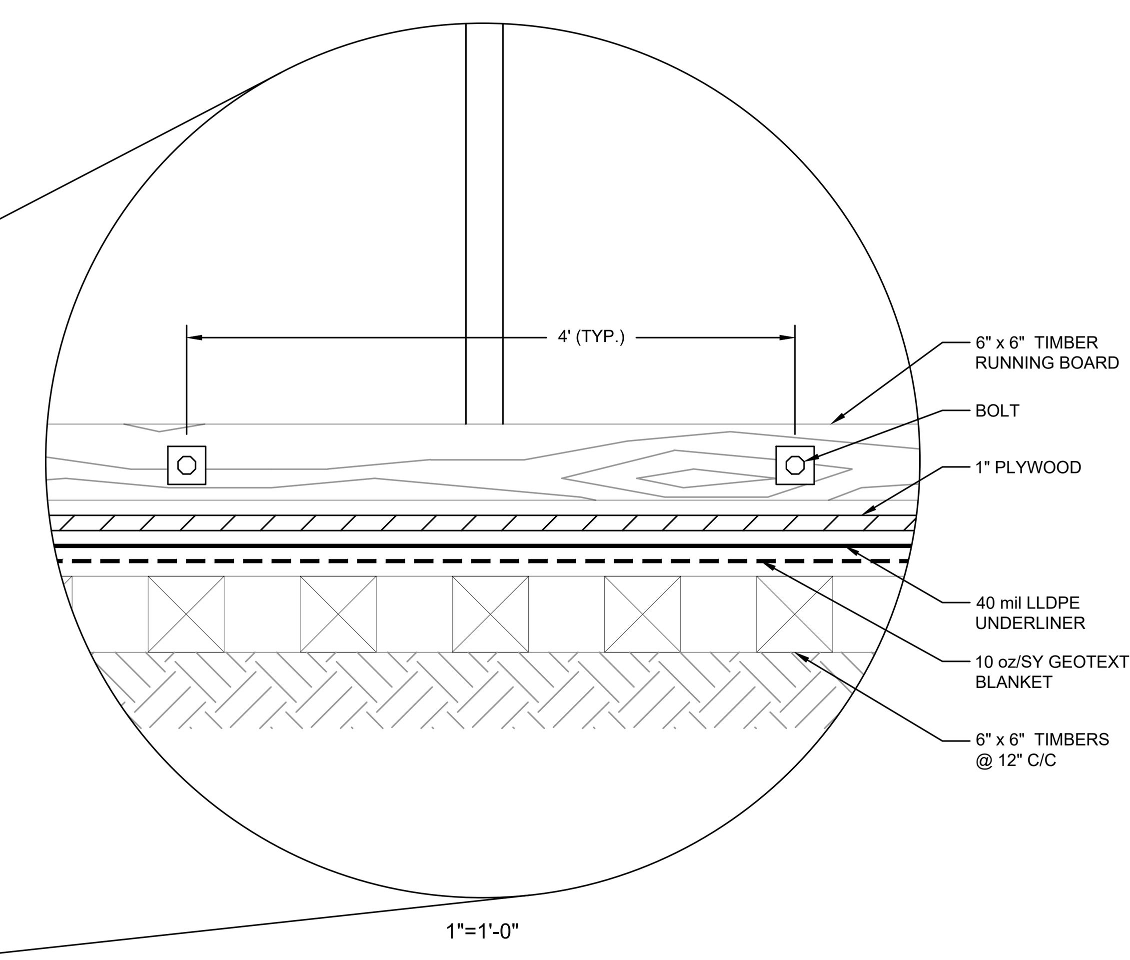
Sheet - of -

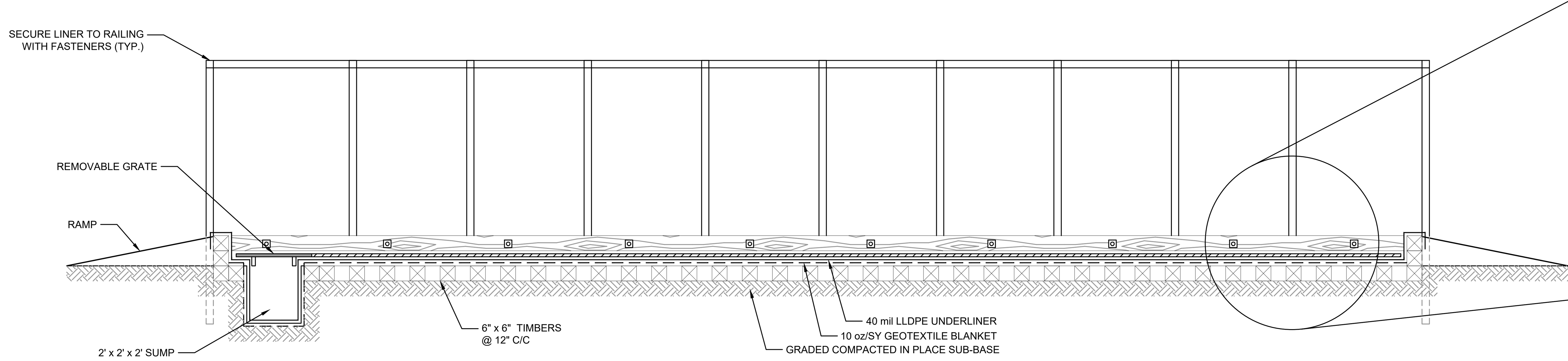


PLAN
1"=3'-0"



SECTION A
1"=3'-0"
C-30





SECTION B
1"=3'-0"
C-30

DETAIL 8 TEMPORARY EQUIPMENT DECONTAMINATION PAD
1"=3'-0"
C-03

PRELIMINARY
NOT FOR CONSTRUCTION
ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 5-28-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 010
GHD TEXAS FIRM REGISTRATION NO. 276

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

Client
SAN JACINTO RIVER WASTE PITS

Project
NORTHERN IMPOUNDMENT
PRELIMINARY 30% REMEDIAL DESIGN
HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	RH	05/28/2020
1	30% CLIENT REVIEW	MW	RH	05/15/2020

Drawn	MW	Designer	RH
Drafting Check	BP	Design Check	LL
Project Coordinator	CM	Date	May 28, 2020
This document shall not be used for construction unless signed and sealed for construction.		Scale	AS SHOWN

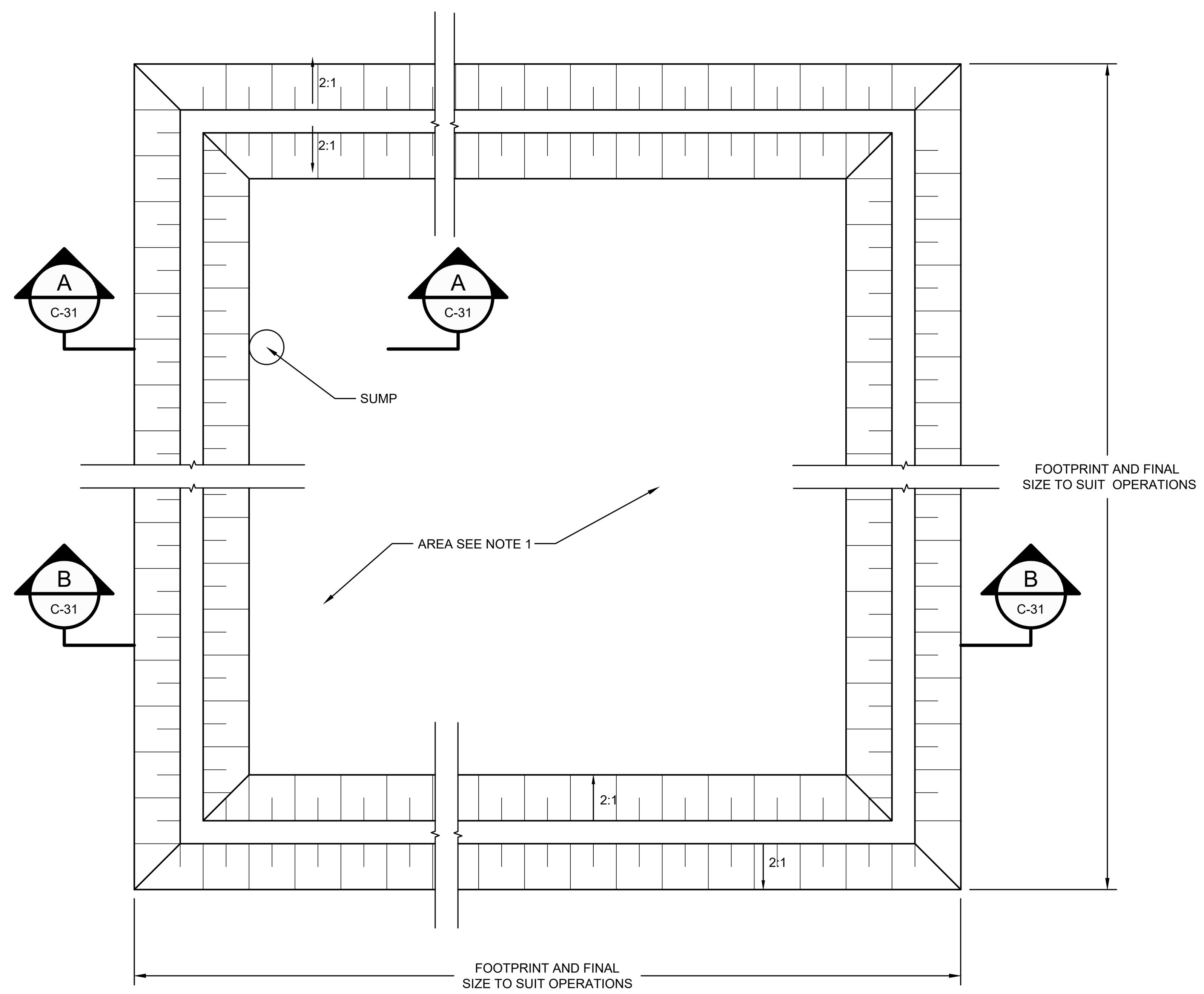
Original Size
Arch D
Bar is one inch on original size drawing
0 1"

Project No. 11187072

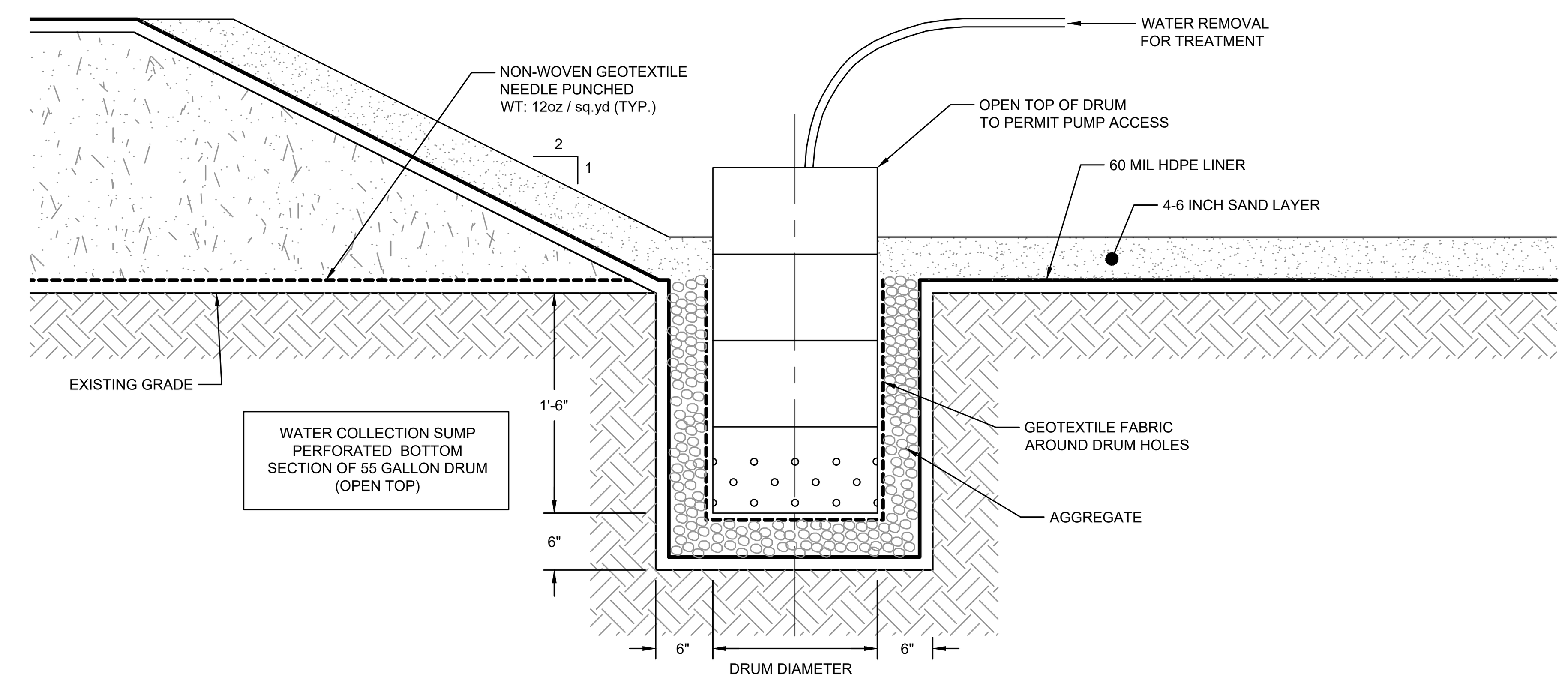
Title
TYPICAL DETAILS
1 OF 3

Sheet No.
C-30

Sheet - of -



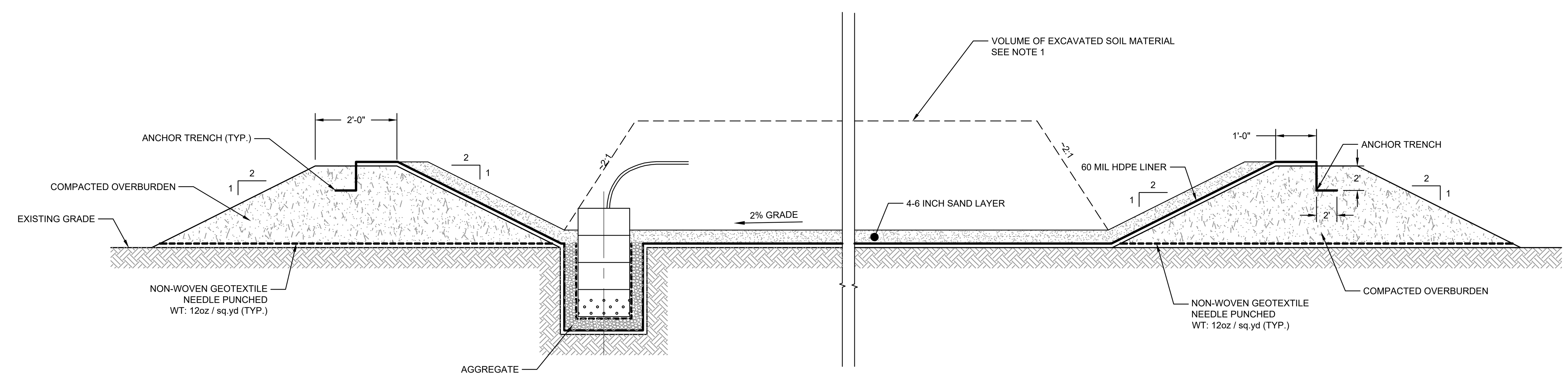
PLAN
N.T.S.



SECTION A SUMP
N.T.S. C-31

NOTES:

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



SECTION B
N.T.S. C-31

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

PRELIMINARY
NOT FOR CONSTRUCTION
ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 5-28-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 010
GHD TEXAS FIRM REGISTRATION NO. 276

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

Client
SAN JACINTO RIVER
WASTE PITS

Project
NORTHERN IMPOUNDMENT
PRELIMINARY 30% REMEDIAL DESIGN
HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	RH	05/28/2020
1	30% CLIENT REVIEW	MW	RH	05/15/2020

Drawn	MW	Designer	RH
Drafting Check	BP	Design Check	LL
Project Coordinator	CM	Date	May 28, 2020
This document shall not be used for construction unless signed and sealed for construction.		Scale	N.T.S.
Original Size	Arch D	Bar is one inch on original size drawing 0 1"	

Project No. 11187072

Title
TYPICAL DETAILS
2 OF 3

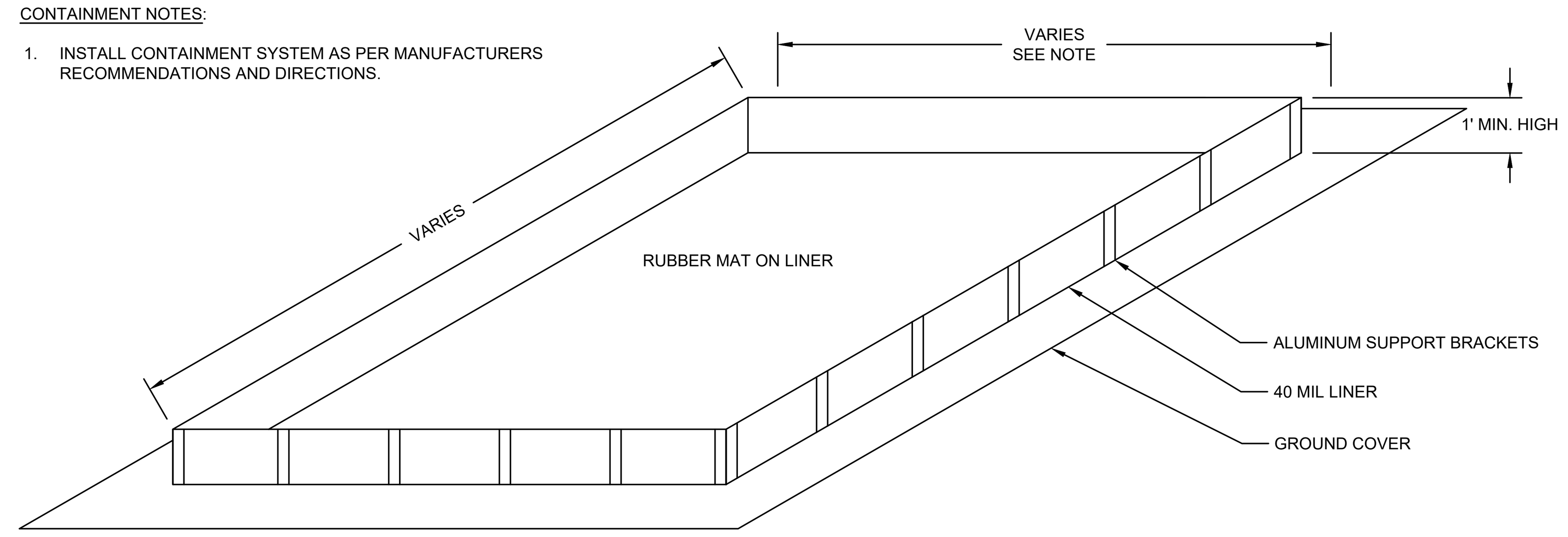
Sheet No.
C-31

Sheet - of -

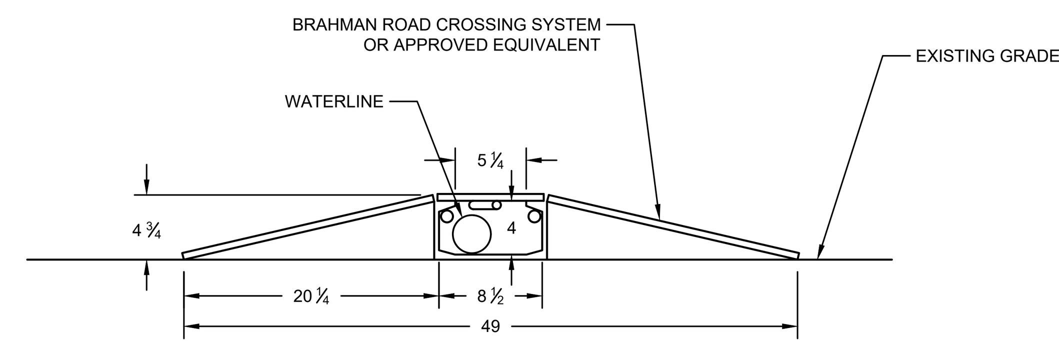
Plot Date: 28 May 2020 - 8:34 AM Plotted By: Matt Wolfer Filename: N:\US\Baton Rouge\Legacy\BAT\Shared\Project Work Area\11180000s\11187072 - San Jacinto River Waste Pits Superfund Site - Remedial Design\Design\CAD\Sheets\11187072-00(010)\11187072-00(010)CI\11187072-00(010)CI-WA022.dwg

CONTAINMENT NOTES:

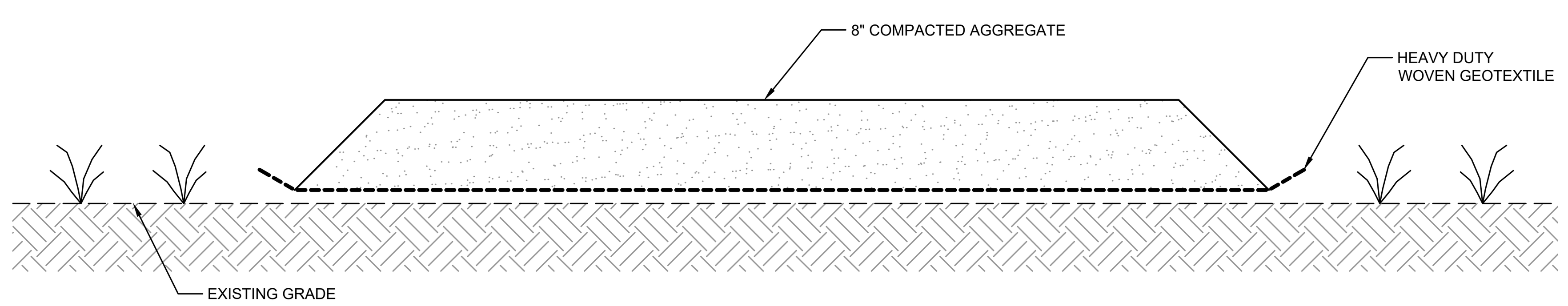
1. INSTALL CONTAINMENT SYSTEM AS PER MANUFACTURERS RECOMMENDATIONS AND DIRECTIONS.



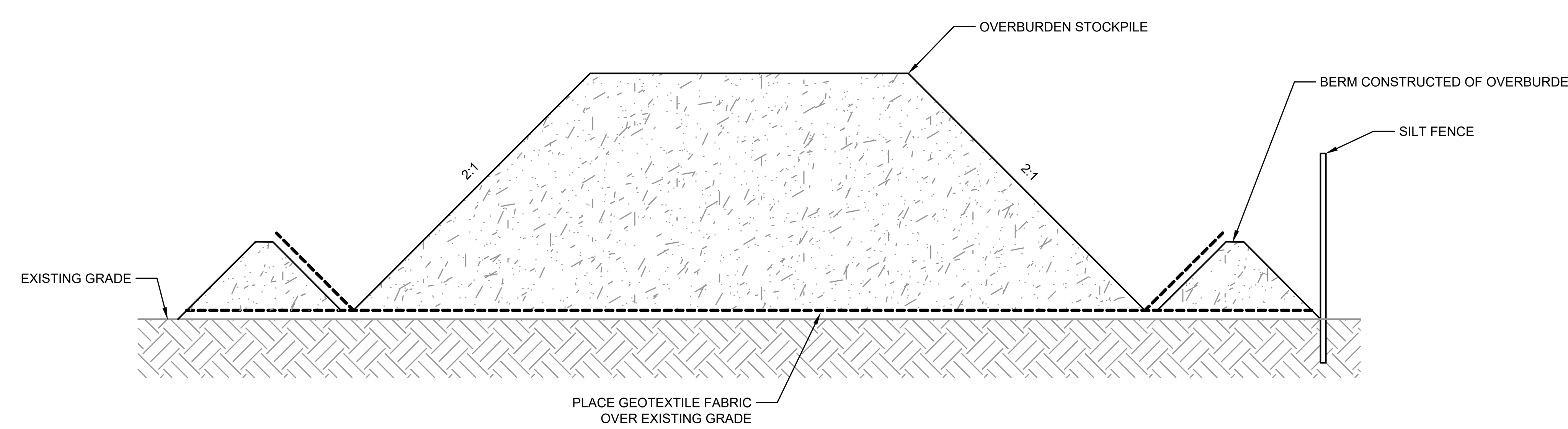
DETAIL 10 WATER STORAGE TANK CONTAINMENT PAD
N.T.S. -



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



DETAIL 12 TEMPORARY GRAVEL ACCESS ROAD
N.T.S. -



DETAIL 13 TEMPORARY OVERBURDEN STOCKPILE
N.T.S. C-03

PRELIMINARY
NOT FOR CONSTRUCTION
ENG: Logan M. Locicero
STATE: TEXAS
LIC. NO: 132028
DATE: 5-28-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 010
GHD TEXAS FIRM REGISTRATION NO. 276

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

Client
SAN JACINTO RIVER WASTE PITS

Project
NORTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	MW	RH	05/28/2020
1	30% CLIENT REVIEW	MW	RH	05/15/2020

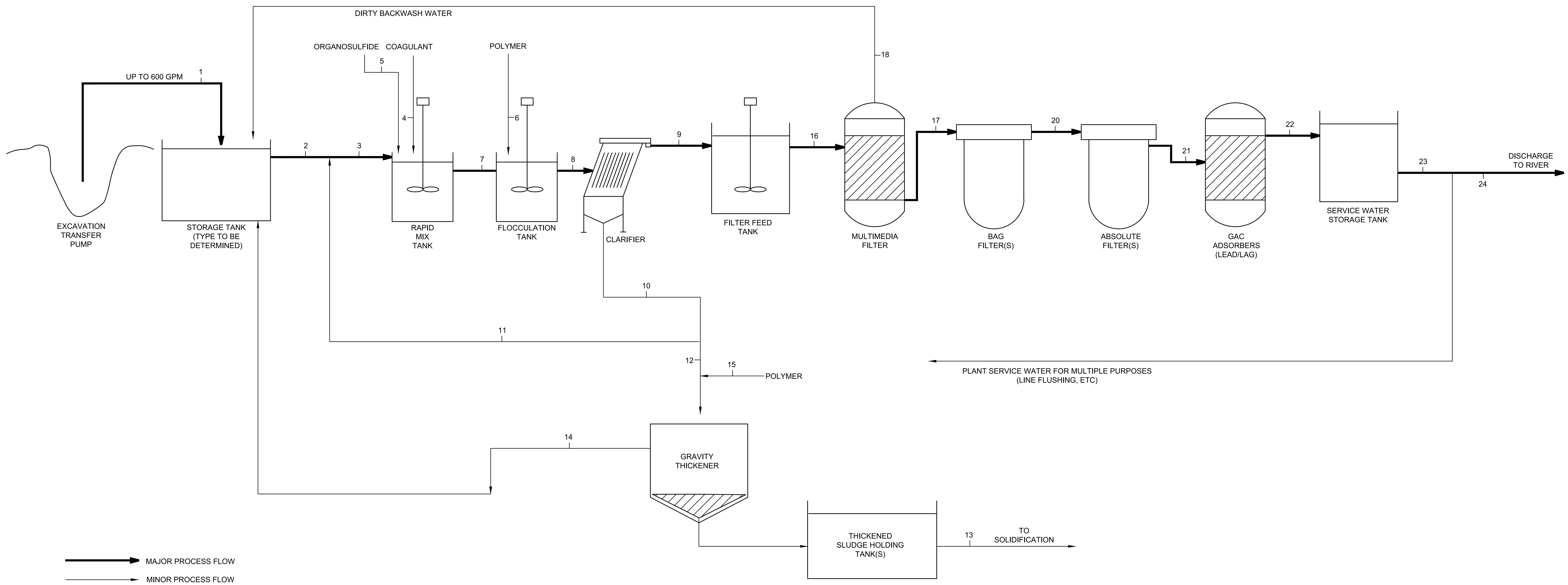
Drawn	MW	Designer	RH
Drafting Check	BP	Design Check	LL
Project Coordinator	CM	Date	May 28, 2020
This document shall not be used for construction unless signed and sealed for construction.		Scale	AS SHOWN
Original Size	Arch D	Bar is one inch on original size drawing 0 1"	

Project No. 11187072

Title
TYPICAL DETAILS 3 OF 3

Sheet No.
C-32

Sheet - of -



WATER TREATMENT PLANT PROCESS STREAMS

Streams		1	2	3	4	5	6	7	8	9	10
	Units	Contact Water	Storage Tank Effluent	Rapid Mix Tank Influent	Coagulant Feed	Organosulfide Feed	Polymer Feed	Flocculation Tank Influent	Flocculation Tank Effluent	Clarifier Effluent	Clarifier Underflow
Volumetric Flow	gpm	600	421	772	0.02	0.03	0.2	773	773	304	468
Total Mass Flow	lb/hr	300,240	210,805	386,519	14	14	107	394,369	386,660	152,351	241,313
Suspended Solids	%	0.41%	0.29%	0.61%	0.50%	0.50%	1.00%	0.61%	0.61%	0.00%	1.00%
Chemical Feed	ppm				50.0	50.0	500.0				
Chem Solids Generation	lb/lb				0.3	0.3	0.01				
Chem Solids Generation	lb/hr				3.2	3.2	1.1				
Mass Flow Liquid	lb/hr	299,024	210,193	384,150	11	11	105	391,951	384,290	152,347	238,900
Mass Flow Solids	lb/hr	1,216	612	2,369	3.2	3.2	1.1	2,418	2,370	4.6	2,413
Specific Gravity		1.0	1.0	1.0	1.3	1.0	1.0	1.0	1.0	1.0	1.0
Density	lb/cf	62.4	62.4	62.4	81.1	62.4	62.4	63.6	62.4	62.4	64.3

Streams	11	12	13	14	15	16	17	18	20	21	22	23	24
	Sludge Recycle	Sludge to Thickener	Sludge to Solidification	Decant to Storage Tank(s)	Polymer Feed	Mulitmedia Filter	Multimedia Filter Effluent	Multimedia Filter Backwash	Absolute Filter Feed	GAC Adsorber Feed	Effluent Storage Tank Feed	Service Water Storage Tank Effluent	Discharge
Volumetric Flow	351	117	17	100	0.059	304	21	21	304	304	304	304	284
Total Mass Flow	180,985	60,328	10,013	50,227	30	152,351	10,458	10,458	152,347	152,347	152,347	152,347	141,888
Suspended Solids	1.00%	1.00%	6.00%	0.01%	1.00%	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%
Chemical Feed					500.0								
Chem Solids Generation					0.01								
Chem Solids Generation					0.0								
Mass Flow Liquid	179,175	59,725	9,412	50,225	29	0	10,458	10,457	152,347	152,347	152,347	152,347	141,888
Mass Flow Solids	1,810	603	601	2.5	0.3	4.6	0.02	1.5	0.6	0.3	0.3	0.3	0.3
Specific Gravity	1.0	1.0	1.2	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Density	64.3	64.3	74.9	62.4	62.4	62.4	62.4	62.4	62.4	62.4	62.4	62.4	62.4

PRELIMINARY
NOT FOR CONSTRUCTION
ENG: Keith Brecheen
STATE: TEXAS
LIC. NO: 130378
DATE: 5-28-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 010
GHD TEXAS FIRM REGISTRATION NO. 276

NOTE:
1. SOME PROCESS FLOWS ARE AVERAGED OVER ESTIMATED TOTAL OPERATING CYCLE. PROCESS FLOW/MASS BALANCE SHOULD NOT BE USED FOR EQUIPMENT SIZING PURPOSES
2. TREATMENT IS 300 GPM PLUS RECYCLE FLOWS.
3. THE TREATMENT SYSTEM DESIGNS ARE PRELIMINARY AND SUBJECT TO CHANGE.

Plot Date: 28 May 2020 - 8:42 AM Plotted By: Bruce Pietz Filename: N:\US\Baton Rouge\Legacy\BAT\Shared\Project Work Area\11180000s\11187072 - San Jacinto River Waste Pits Superfund Site - Remedial Design\Design\CAD\Sheets\11187072-00(010)\11187072-00(010)PR\11187072-00(010)P-WA005.dwg

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

Client
SAN JACINTO RIVER WASTE PITS

Project
NORTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	BP	NF	05/28/2020
1	30% CLIENT REVIEW	BP	NF	05/15/2020

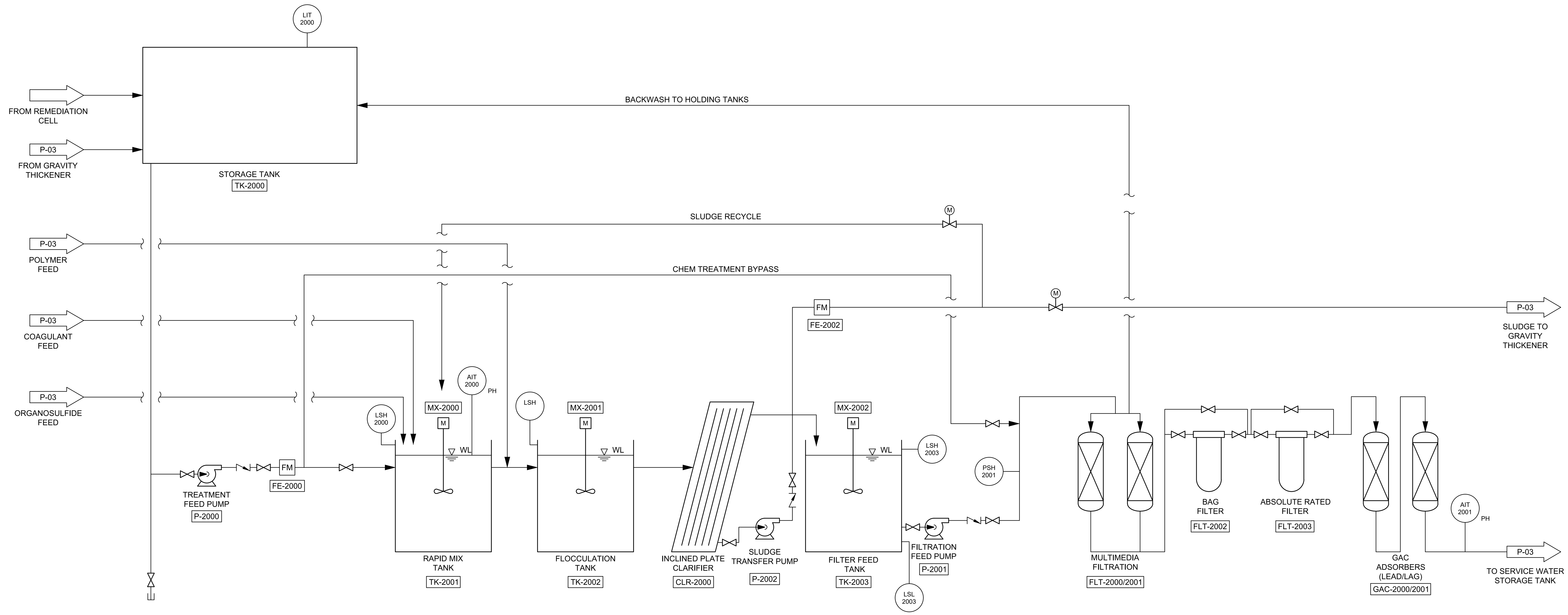
Drawn BP Designer KJ
Drafting Check MW Design Check NF
Project Coordinator CM Date May 28, 2020
This document shall not be used for construction unless signed and sealed for construction. Scale N.T.S.
Original Size Arch D Bar is one inch on original size drawing 0 1"

Project No. 11187072

Title
WATER TREATMENT SYSTEM APPROACH A PROCESS FLOW DIAGRAM/ MASS BALANCE

Sheet No.
P-01

Sheet - of -



NOTE:
1. FOR CLARITY NOT ALL SYSTEM ELEMENTS (E.G. VALVES, PIPE SIZES) HAVE BEEN SHOWN. P&IDs ARE CONCEPTUAL ONLY AND ARE TO BE FINALIZED BY CONTRACTOR.
2. THE TREATMENT SYSTEM DESIGNS ARE PRELIMINARY AND SUBJECT TO CHANGE.

Plot Date: 28 May 2020 - 8:48 AM   Plotted By: Bruce Pietz   Filename: N:\US\Baton Rouge\Legacy\BAT\Shared\Project Work Area\11180000s\11187072 - San Jacinto River Waste Pits Superfund Site - Remedial Design\Design\CAD\Sheets\11187072-00(010)\11187072-00(010)PR\11187072-00(010)P-WA006.dwg

PRELIMINARY
NOT FOR CONSTRUCTION
ENG: Keith Brecheen
STATE: TEXAS
LIC. NO: 130378
DATE: 5-28-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 010
GHD TEXAS FIRM REGISTRATION NO. 276

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

Client
SAN JACINTO RIVER WASTE PITS

Project
NORTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	BP	NF	05/28/2020
1	30% CLIENT REVIEW	BP	NF	05/15/2020

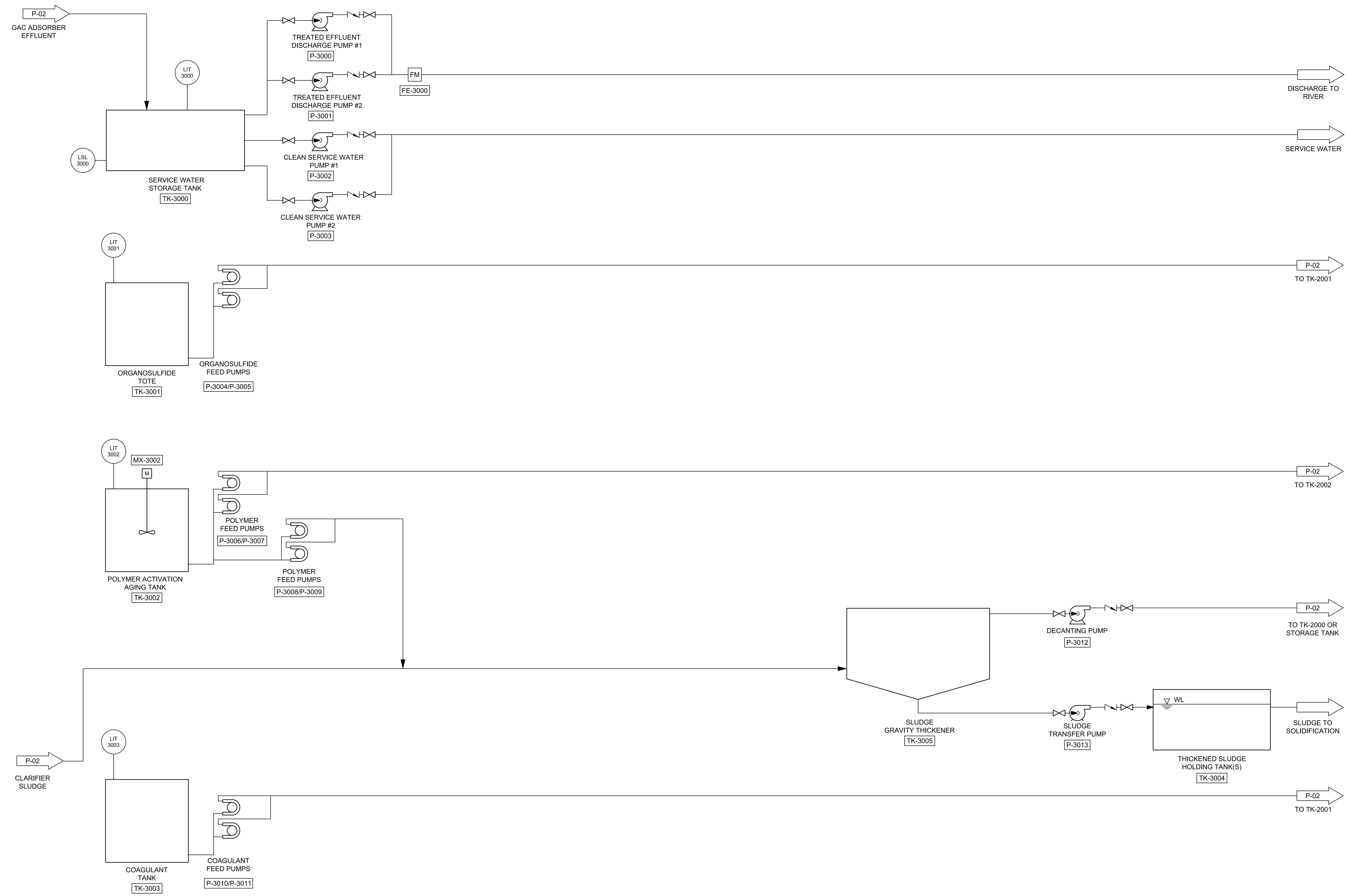
Drawn	BP	Designer	KJ
Drafting Check	MW	Design Check	NF
Project Coordinator	CM	Date	May 28, 2020
This document shall not be used for construction unless signed and sealed for construction.		Scale	N.T.S.
Original Size	Arch D	Bar is one inch on original size drawing 0 1"	

Project No. 11187072

Title
WATER TREATMENT SYSTEM APPROACH A P&ID (1 OF 2)

Sheet No.
P-02

Sheet - of -



PRELIMINARY
NOT FOR CONSTRUCTION
ENG: Keith Brecheen
STATE: TEXAS
LIC. NO: 130378
DATE: 5-28-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 010
GHD TEXAS FIRM REGISTRATION NO. 276

NOTE:
1. FOR CLARITY NOT ALL SYSTEM ELEMENTS (E.G. VALVES, PIPE SIZES) HAVE BEEN SHOWN. P&IDs ARE CONCEPTUAL ONLY AND ARE TO BE FINALIZED BY CONTRACTOR.
2. THE TREATMENT SYSTEM DESIGNS ARE PRELIMINARY AND SUBJECT TO CHANGE.

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

Client
SAN JACINTO RIVER WASTE PITS

Project
NORTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	BP	NF	05/28/2020
1	30% CLIENT REVIEW	BP	NF	05/15/2020

Drawn	BP	Designer	KJ
Drafting Check	MW	Design Check	NF
Project Coordinator	CM	Date	May 28, 2020
This document shall not be used for construction unless signed and sealed for construction.		Scale	N.T.S.
Original Size	Arch D	Bar is one inch on original size drawing 0 1"	

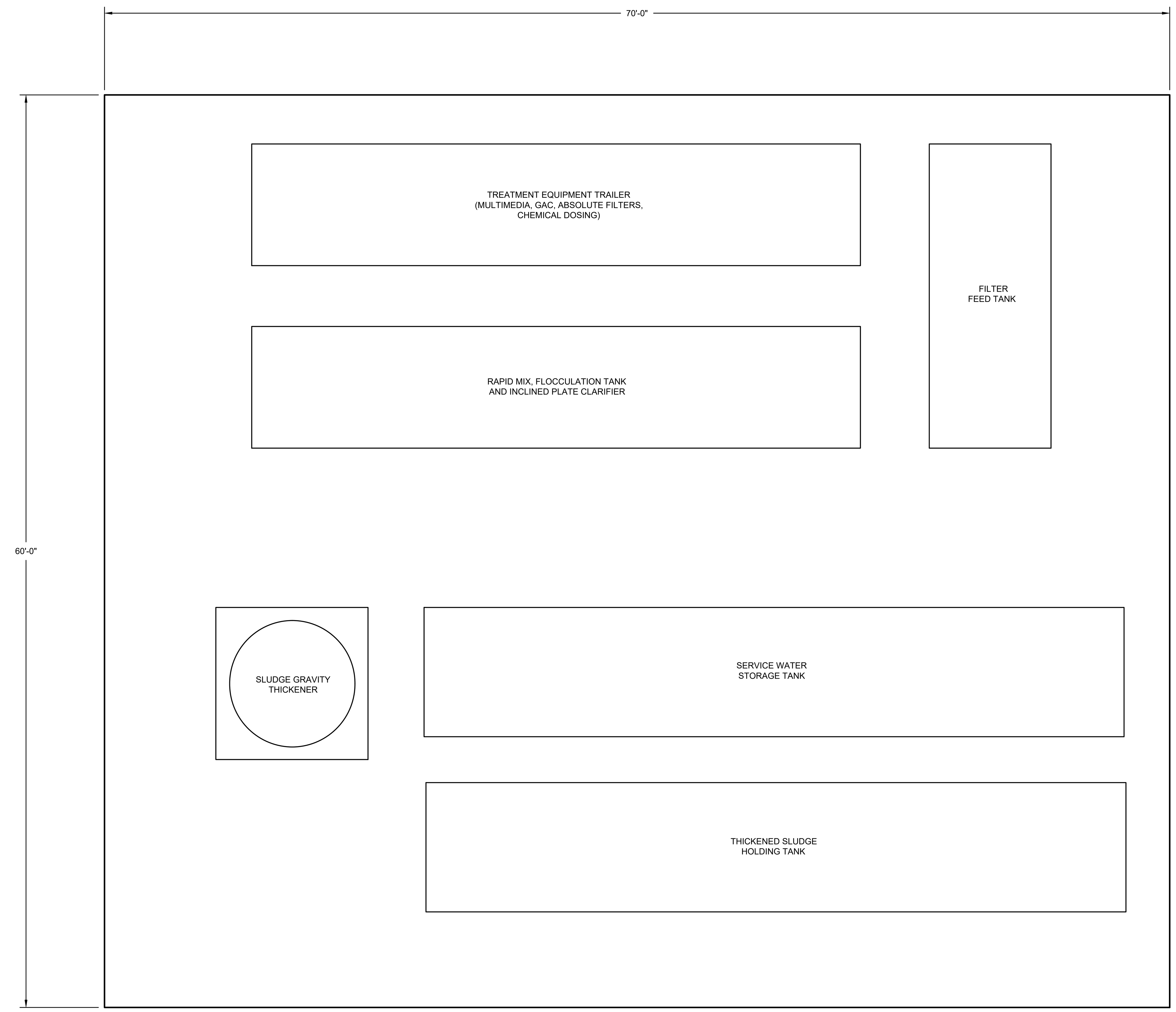
Project No. 11187072

Title
WATER TREATMENT SYSTEM APPROACH A P&ID (2 OF 2)

Sheet No.
P-03

Sheet - of -

Plot Date: 28 May 2020 - 8:51 AM Plotted By: Bruce Pietz Filename: N:\US\Baton Rouge\Legacy\BAT\Shared\Project Work Area\11180000s\11187072 - San Jacinto River Waste Pits Superfund Site - Remedial Design\Design\CAD\Sheets\11187072-00(010)\11187072-00(010)PR\11187072-00(010)P-WA007.dwg



NOTE:
1. AREA REQUIRED IS FOR A TREATMENT FLOW OF 300 GPM.
2. AREA REQUIRED FOR THE STORAGE TANK(S) IN THE FRONT HEAD OF THE TREATMENT SYSTEM ARE NOT SHOWN.
3. LOCATION OF WATER TREATMENT SYSTEM PENDING ACCESS AGREEMENTS.
4. THE TREATMENT SYSTEM DESIGNS ARE PRELIMINARY AND SUBJECT TO CHANGE.

PRELIMINARY
NOT FOR CONSTRUCTION
ENG: Keith Brecheen
STATE: TEXAS
LIC. NO: 130378
DATE: 5-28-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 010
GHD TEXAS FIRM REGISTRATION NO. 276

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

Client
SAN JACINTO RIVER
WASTE PITS

Project
NORTHERN IMPOUNDMENT
PRELIMINARY 30% REMEDIAL DESIGN
HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	BP	NF	05/28/2020
1	30% CLIENT REVIEW	MW	NF	05/15/2020

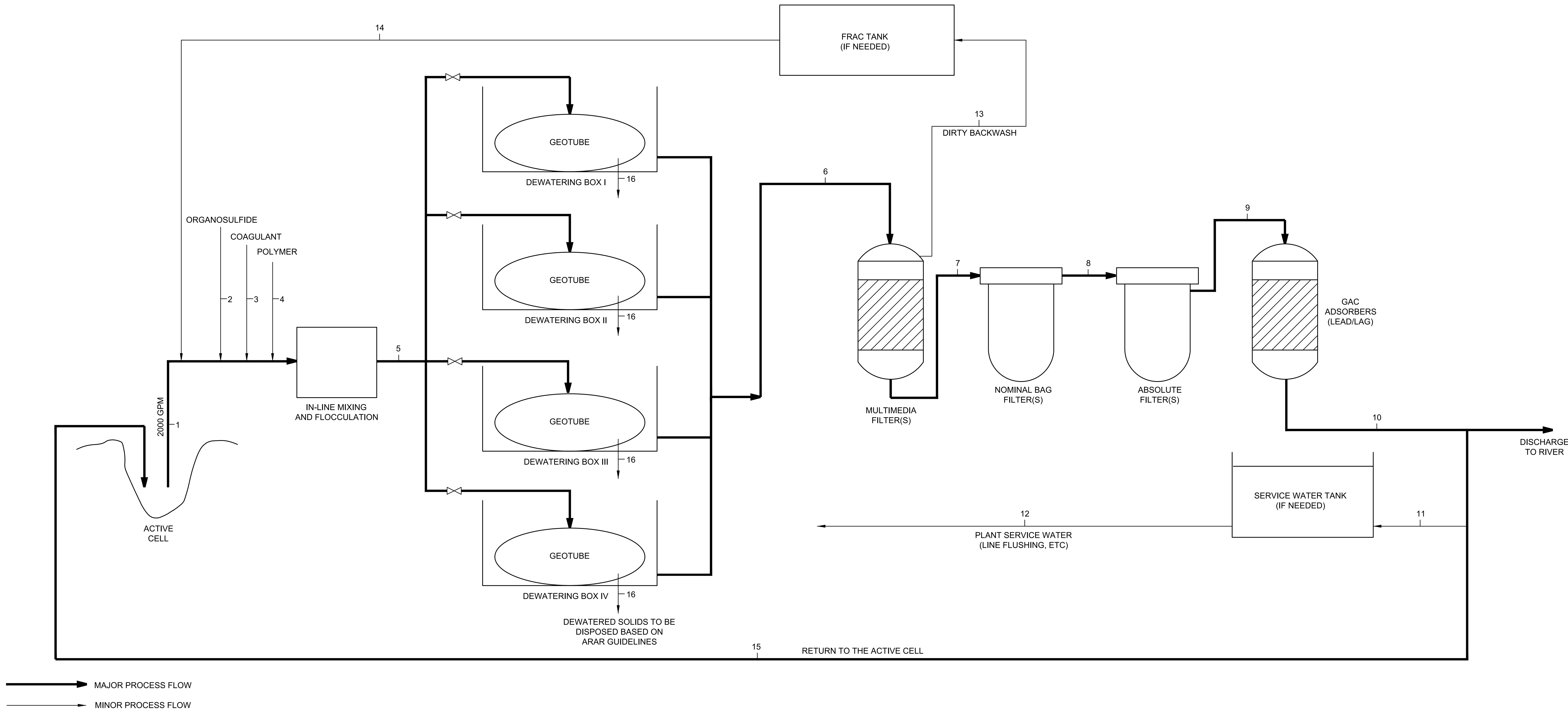
Drawn MW	Designer KJ
Drafting Check BP	Design Check NF
Project Coordinator CM	Date May 28, 2020
This document shall not be used for construction unless signed and sealed for construction.	Scale N.T.S.
Original Size Arch D	Bar is one inch on original size drawing 0 1"

Project No. 11187072

Title
WATER TREATMENT SYSTEM
APPROACH A
PLAN

Sheet No.
P-04

Sheet - of -



WATER TREATMENT PLANT PROCESS STREAMS

Streams		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Units	Contact Water	Organosulfide Feed	Coagulant Feed	Polymer Feed	Geotube(s) Feed	Geotube Effluent	Nominal Bag Filter(s) Feed	Absolute Filter(s) Feed	GAC Adsorber(s) Feed	GAC Adsorber(s) Effluent	Service Water Tank Feed	Plant Service Water Feed	Dirty Backwash to Storage Tank	Dirty Backwash Return	Treated Water Return to the Active Cell	Dewaterd Solids to Solidification
Volumetric Flow	gpm	2,000	0.10	0.08	1.00	2,142	2,097	2,097	2,097	2,097	2,097	140	140	140	140	1,957	35.12
Total Mass Flow	lb/hr	1,000,800	50	50	501	1,072,077	1,049,232	1,049,147	1,049,131	1,049,129	1,049,129	70,056	70,056	70,141	70,141	979,073	22,845
Suspended Solids	%	0.41%	0.00%	0.00%	0.00%	0.44%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.12%	0.12%	0.00%	20.00%
Chemical Feed	ppm		50.0	50.0	500.0												
Chem Solids Generation	lb/lb		0.3	0.3	0.0												
Chem Solids Generation	lb/hr		15.0	15.0	5.0												
Mass Flow Liquid	lb/hr	996,747	50	50	501	1,067,403	1,049,127	1,049,127	1,049,127	1,049,127	1,049,127	70,056	70,056	70,056	70,056	979,071	18,276
Mass Flow Solids	lb/hr	4,053	0	0	0	4,674	105	20	4.0	2.0	2.0	0.1	0.1	85.0	85.0	2.0	4,569
Specific Gravity		1.0	1.0	1.3	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.3
Density	lb/cf	62.4	62.4	81.1	62.4	62.4	62.4	62.4	62.4	62.4	62.4	62.4	62.4	62.4	62.4	62.4	81.1

PRELIMINARY
NOT FOR CONSTRUCTION
ENG: Keith Brecheen
STATE: TEXAS
LIC. NO: 130378
DATE: 5-28-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 010
GHD TEXAS FIRM REGISTRATION NO. 276

NOTE:
1. SOME PROCESS FLOWS ARE AVERAGED OVER ESTIMATED TOTAL OPERATING CYCLE. PROCESS FLOW/MASS BALANCE SHOULD NOT BE USED FOR EQUIPMENT SIZING PURPOSES.
2. FOR CLARITY, THE NUMBER OF GEOTUBES ON THIS DRAWING HAS BEEN REDUCED.
3. THE MAXIMUM OPERATION FLOW OF 2000 GPM HAS BEEN USED IN THE MASS BALANCE TABLE. THE OPERATION FLOW MAY RANGE FROM 250 TO 2000 GPM AND WILL BE PROVIDED BY TWO 1000 GPM TRAINS.
4. CAPTURED SOLIDS INSIDE THE GEOTUBES WILL BE EXCAVATED OUT ONCE IT'S DEWATERED. LINE 16 IN THE PFD IS JUST FOR MASS BALANCE PURPOSES.
5. THE TREATMENT SYSTEM DESIGNS ARE PRELIMINARY AND SUBJECT TO CHANGE.

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

Client
SAN JACINTO RIVER WASTE PITS

Project
NORTHERN IMPOUNDMENT
PRELIMINARY 30% REMEDIAL DESIGN
HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	BP	NF	05/28/2020
1	30% CLIENT REVIEW	BP	NF	05/15/2020

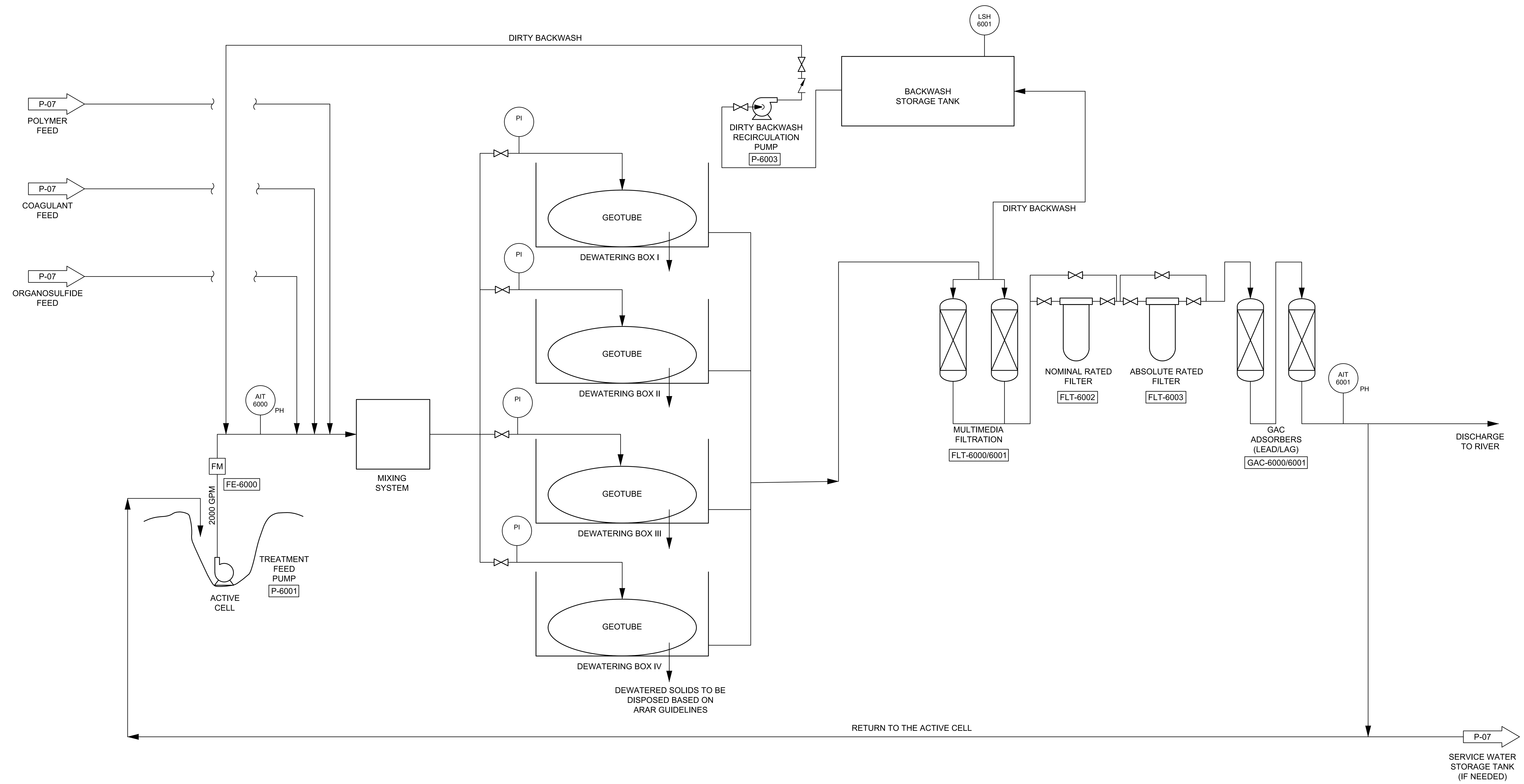
Drawn BP | Designer KJ
Drafting Check MW | Design Check NF
Project Coordinator CM | Date May 28, 2020
This document shall not be used for construction unless signed and sealed for construction. | Scale N.T.S.
Original Size Arch D | Bar is one inch on original size drawing 0 1"

Project No. 11187072

Title
WATER TREATMENT SYSTEM
APPROACH B
PROCESS FLOW DIAGRAM/
MASS BALANCE

Sheet No.
P-05

Sheet - of -



NOTE:
1. FOR CLARITY NOT ALL SYSTEM ELEMENTS (E.G. VALVES, PIPE SIZES) HAVE BEEN SHOWN. P&IDs ARE CONCEPTUAL ONLY AND ARE TO BE FINALIZED BY CONTRACTOR.
2. FOR CLARITY, THE NUMBER OF GEOTUBES ON THIS DRAWING HAS BEEN REDUCED.
3. THE TREATMENT SYSTEM DESIGNS ARE PRELIMINARY AND SUBJECT TO CHANGE.

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

Client
SAN JACINTO RIVER WASTE PITS

Project
NORTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	BP	NF	05/28/2020
1	30% CLIENT REVIEW	BP	NF	05/15/2020

Drawn	BP	Designer	KJ
Drafting Check	MW	Design Check	NF
Project Coordinator	CM	Date	May 28, 2020
This document shall not be used for construction unless signed and sealed for construction.		Scale	N.T.S.
Original Size	Arch D	Bar is one inch on original size drawing 0 1"	

Project No. 11187072

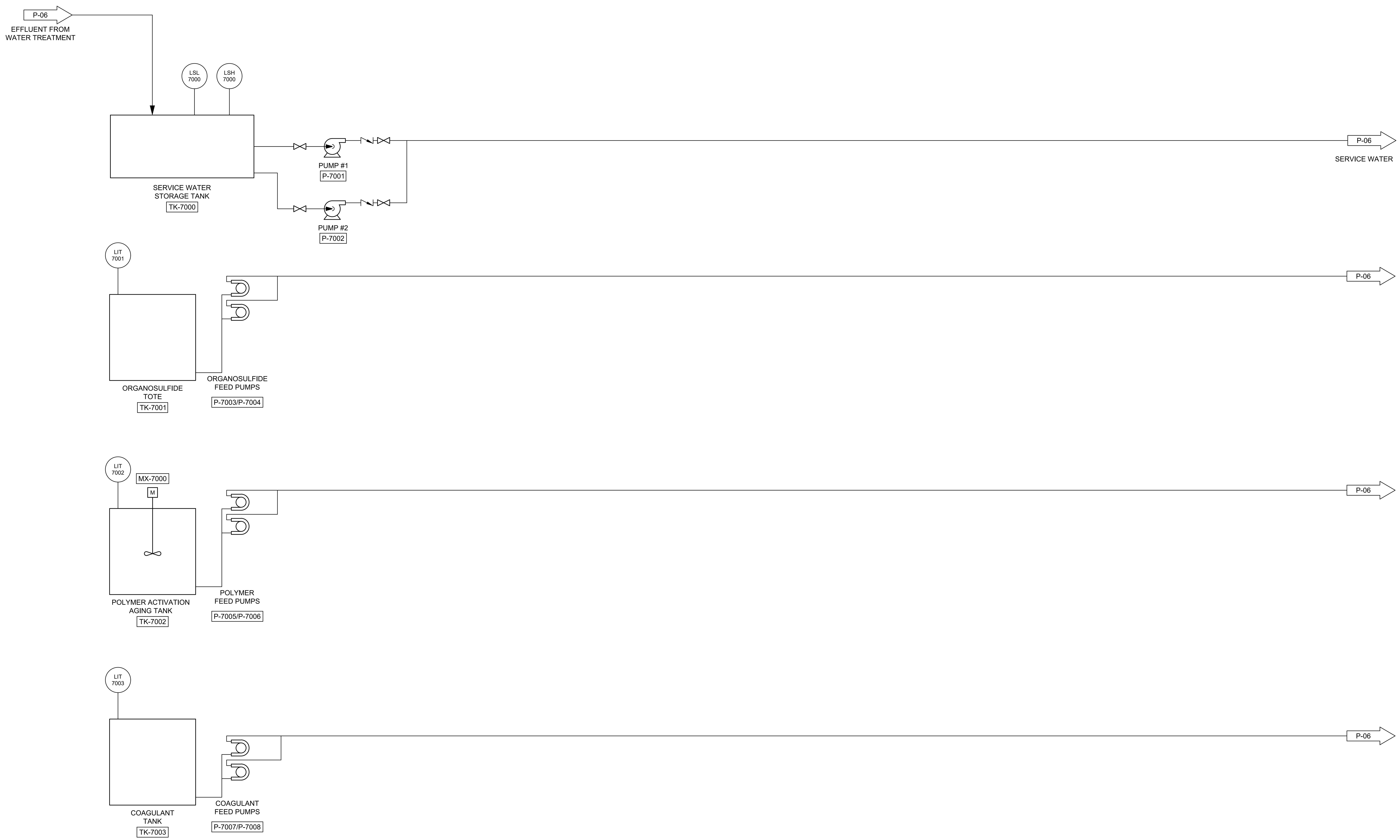
Title
WATER TREATMENT SYSTEM APPROACH B P&ID (1 OF 2)

Sheet No.
P-06

Sheet - of -

PRELIMINARY
NOT FOR CONSTRUCTION
ENG: Keith Brecheen
STATE: TEXAS
LIC. NO: 130378
DATE: 5-28-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 010
GHD TEXAS FIRM REGISTRATION NO. 276



NOTE:
1. FOR CLARITY NOT ALL SYSTEM ELEMENTS (E.G. VALVES, PIPE SIZES) HAVE BEEN SHOWN. P&IDs ARE CONCEPTUAL ONLY AND ARE TO BE FINALIZED BY CONTRACTOR.
2. THE TREATMENT SYSTEM DESIGNS ARE PRELIMINARY AND SUBJECT TO CHANGE.

PRELIMINARY
NOT FOR CONSTRUCTION
ENG: Keith Brecheen
STATE: TEXAS
LIC. NO: 130378
DATE: 5-28-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 010
GHD TEXAS FIRM REGISTRATION NO. 276

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 **F** 225 952 2978 **W** www.ghd.com

Client
SAN JACINTO RIVER WASTE PITS

Project
NORTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	BP	NF	05/28/2020
1	30% CLIENT REVIEW	BP	NF	05/15/2020

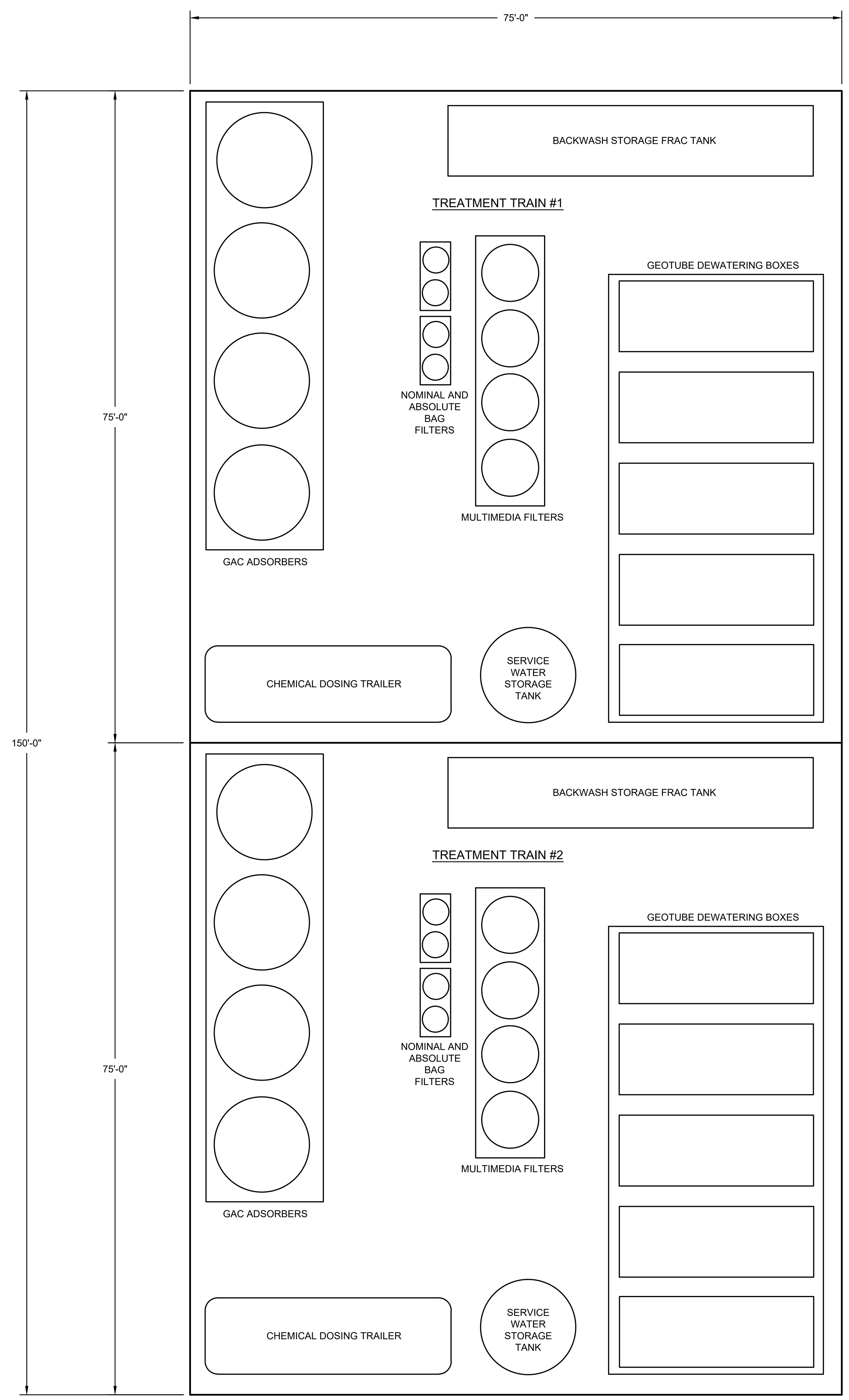
Drawn	BP	Designer	KJ
Drafting Check	MW	Design Check	NF
Project Coordinator	CM	Date	May 28, 2020
This document shall not be used for construction unless signed and sealed for construction.		Scale	N.T.S.
Original Size	Arch D	Bar is one inch on original size drawing 0 1"	

Project No. 11187072

Title
WATER TREATMENT SYSTEM APPROACH B P&ID (2 OF 2)

Sheet No.
P-07

Sheet - of -



NOTE:
1. THE MAXIMUM WATER TREATMENT FLOW IN APPROACH B WILL BE AT 2000 GPM.
   TWO TREATMENT TRAINS WILL OPERATE IN PARALLEL AND THE TOTAL FOOTPRINT WILL BE 75 FEET BY 150 FEET.
2. MAXIMUM TREATMENT FLOW IS 1000 GPM. FOR EACH TREATMENT TRAIN.
3. LOCATION OF WATER TREATMENT SYSTEM PENDING ACCESS AGREEMENTS.
4. THE TREATMENT SYSTEM DESIGNS ARE PRELIMINARY AND SUBJECT TO CHANGE.

PRELIMINARY
NOT FOR CONSTRUCTION

ENG: Keith Brecheen
STATE: TEXAS
LIC. NO: 130378
DATE: 5-28-2020

GHD SERVICES INC.
JOB NO. 11187072 FILE NO. 010
GHD TEXAS FIRM REGISTRATION NO. 276

GHD
5551 Corporate Boulevard Suite 200
Baton Rouge Louisiana USA
T 225 292 9007 F 225 952 2978 W www.ghd.com

Client
SAN JACINTO RIVER WASTE PITS

Project
NORTHERN IMPOUNDMENT PRELIMINARY 30% REMEDIAL DESIGN HARRIS COUNTY, TEXAS

No.	Issue	Drawn	Approved	Date
2	30% EPA REVIEW	BP	NF	05/28/2020
1	30% CLIENT REVIEW	MW	NF	05/15/2020

Drawn MW	Designer KJ
Drafting Check BP	Design Check NF
Project Coordinator CM	Date May 28, 2020
This document shall not be used for construction unless signed and sealed for construction.	Scale N.T.S.
Original Size Arch D	Bar is one inch on original size drawing 0 1"

Project No. 11187072

Title
WATER TREATMENT SYSTEM APPROACH B PLAN

Sheet No.
P-08

Sheet - of -