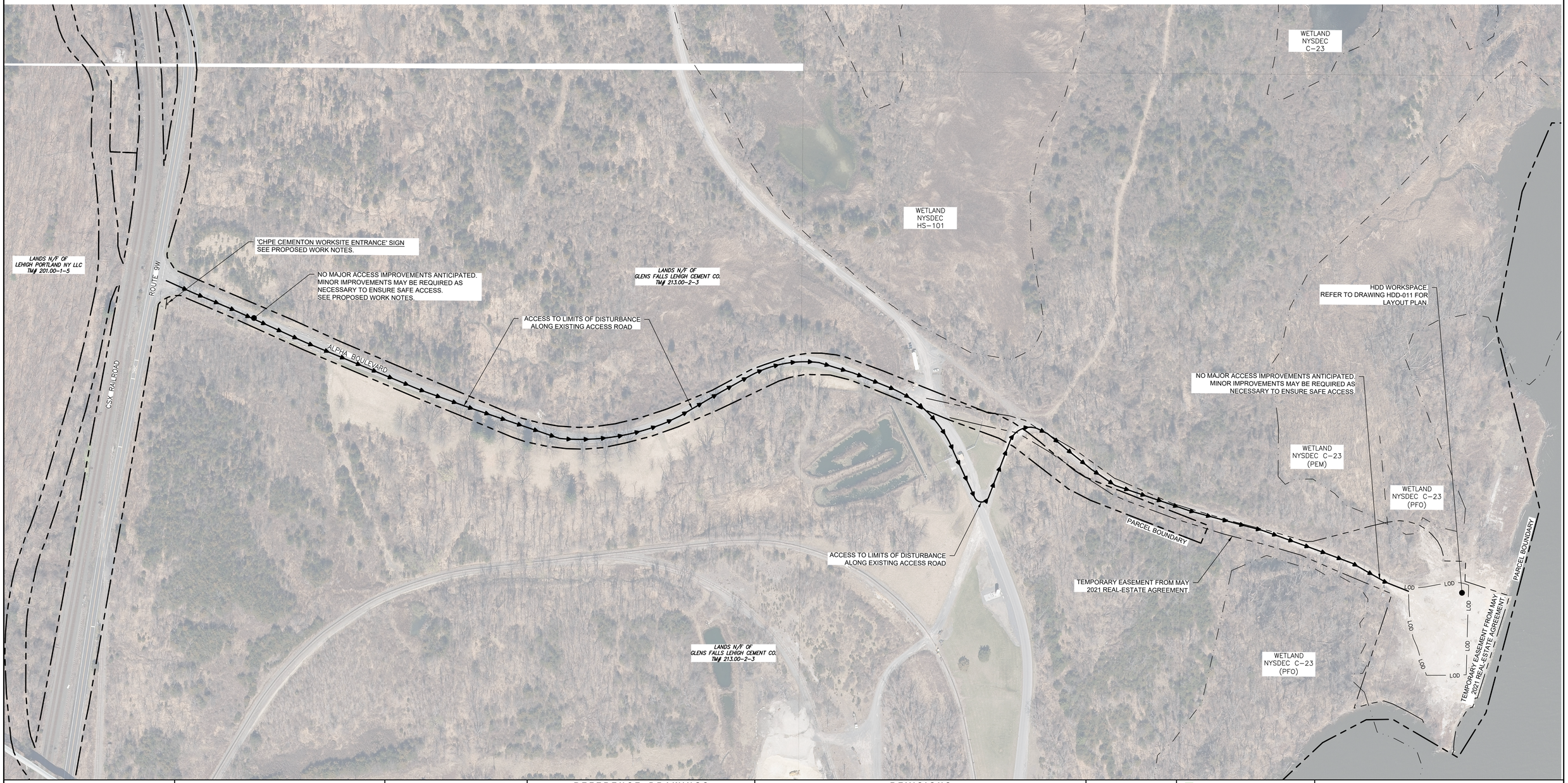
PROPOSED WORK NOTES:

1. THE EXISTING ACCESS ROAD IS ANTICIPATED TO SUPPORT HDD CONSTRUCTION OPERATIONS IN IT'S CURRENT CONDITION. MINOR ACCESS SURFACE IMPROVEMENTS AND INSTALLATION OF ADDITIONAL EROSION CONTROLS WILL BE IMPLEMENTED AS NECESSARY TO PREVENT SEDIMENT-LADEN RUNOFF FROM FLOWING OUTSIDE OF THE LIMITS OF DISTURBANCE.
2. TEMPORARY 'CONSTRUCTION TRAFFIC AHEAD' WARNING SIGNS WILL BE INSTALLED 100-FEET FROM THE EXISTING ACCESS VIA ALPHA BOULEVARD TO GLENS FALL LEHIGH CEMENT CO PROPERTY ON BOTH ROUTE 9W APPROACHES. FINAL SIGN TEXT AND LOCATIONS TO BE APPROVED BY THE OWNER AND COORDINATED WITH THE GREENE COUNTY HIGHWAY DEPARTMENT.

REFERENCE NOTES:

1. AERIAL PHOTOGRAPHY OBTAINED FROM THE NEW YORK GIS CLEARINGHOUSE, STATEWIDE DIGITAL ORTHOIMAGERY PROGRAM, DATED SEPTEMBER 2017.
2. PARCEL DATA OBTAINED FROM NEW YORK GIS CLEARINGHOUSE, DIGITAL MAPS DATABASE, NYS STATEWIDE 2021 PARCEL LAYER, PUBLISHED OCTOBER 2022.
3. WETLANDS DELINEATED IN THE FIELD BY CHA AND SUPPLEMENTED WITH NYSDEC FRESHWATER WETLANDS GIS DATA.



REFERENCE DRAWINGS	
DWG. NO.	TITLE

REVISIONS					
NO.	DESCRIPTION	DATE	DRAWN	CHK	APPR

STATE OF NEW YORK
KEVIN CHARLES SOUBIRAN
LICENSED PROFESSIONAL ENGINEER
091543
11-29-22

DRAWING APPROVALS	
DRAWN	DATE
MMO	11/1/2022
CHECKED	DATE
GJR	11/7/2022
ENGINEER	DATE
KCB	11/29/2022

TRC FIRM REGISTRATION NO: NY 0010187

SCALE PLAN: 0 120'

CEMENTON HDD
ACCESS ROAD PLAN

SCALE	PROJECT NO.	DRAWING NO.	SHT.NO.
1"=120'	496182	HDD-010	12

PROPOSED WORK NOTES:

1. ALL HDD CONSTRUCTION OPERATIONS AND PARKING WILL BE CONTAINED WITHIN THE LIMITS OF DISTURBANCE. TREE CLEARING, VEGETATION REMOVAL AND SIGNIFICANT LAND GRADING IS NOT ANTICIPATED. ALL DISTURBED AREAS SHALL BE RESTORED AFTER CONSTRUCTION.

REFERENCE NOTES:

1. BASE PLAN REFERENCES A ROW, UTILITY & WETLAND SURVEY PREPARED IN THE FIELD BY CONTROL POINT ASSOCIATES, INC.

REFERENCE DRAWINGS	
DWG. NO.	TITLE

REVISIONS					
NO.	DESCRIPTION	DATE	DRAWN	CHK	APPR

STATE OF NEW YORK — KEVIN CHARLES BOURDEAU — LICENSED PROFESSIONAL ENGINEER — 093943

11-29-22

DRAWING APPROVALS	
DRAWN	DATE
MMO	11/1/2022
CHECKED	DATE
GJR	11/7/2022
ENGINEER	DATE
KCB	11/29/2022

TRC — FIRM REGISTRATION NO. NY 0010187

SCALE PLAN: 0 20'

CEMENTON HDD
LAYOUT PLAN

SCALE	PROJECT NO.	DRAWING NO.	SHT.NO.
1"=20'	496182	HDD-011	13

REFERENCE NOTES:

1. BASE PLAN REFERENCES A ROW, UTILITY & WETLAND SURVEY PREPARED IN THE FIELD BY CONTROL POINT ASSOCIATES, INC.
2. HDD EQUIPMENT LAYOUT PROVIDED BY HUXTED TRENCHLESS IN AUGUST 2022.

SURVEY BOUNDARY

TEMPORARY EASEMENT FROM MAY 2021 REAL-ESTATE AGREEMENT

LIMITS OF DISTURBANCE
0.79± AC

100-FOOT ADJACENT AREA

F-150 SUPERCAB 4X4

F-150 SUPERCAB 4X4

F-150 SUPERCAB 4X4

F-150 SUPERCAB 4X4

F-150 SUPERCAB 4X4

F-150 SUPERCAB 4X4

F-150 SUPERCAB 4X4

F-150 SUPERCAB 4X4

Hoe

Mud Pallets

Mud Pump

Cuttings

Cuttings

Cleaning System

Frac Tank

Frac Tank

Control Cab

HDD ENTRY CONDUIT (1)

PERMITTED DEVIATION ZONE

PERMITTED DEVIATION ZONE

12-IN HDPE CONDUIT (1)

12-IN HDPE CONDUIT (2)

16'

20'

31'

Drill Rig

HDD ENTRY CONDUIT (2)

Pipe Trailer

Crane

Tool Trailer

Office Trailer

Crew Trailer

EXISTING SHRUB LINE

LOD

SF

REFERENCE DRAWINGS	
DWG. NO.	TITLE

REVISIONS					
NO.	DESCRIPTION	DATE	DRAWN	CHK	APPR

DRAWING APPROVALS	
DRAWN	DATE
MMO	11/1/2022
CHECKED	DATE
GJR	11/7/2022
ENGINEER	DATE
KCB	11/29/2022

STATE OF NEW YORK
KEVIN CHARLES BOARDMAN
093543
LICENSED PROFESSIONAL ENGINEER
11-29-22

TRC FIRM REGISTRATION NO: NY 0010187

SCALE PLAN: 0 10'

CEMENTON HDD
EQUIPMENT LAYOUT PLAN

SCALE	PROJECT NO.	DRAWING NO.	SHT.NO.
1"=10'	496182	HDD-012	14

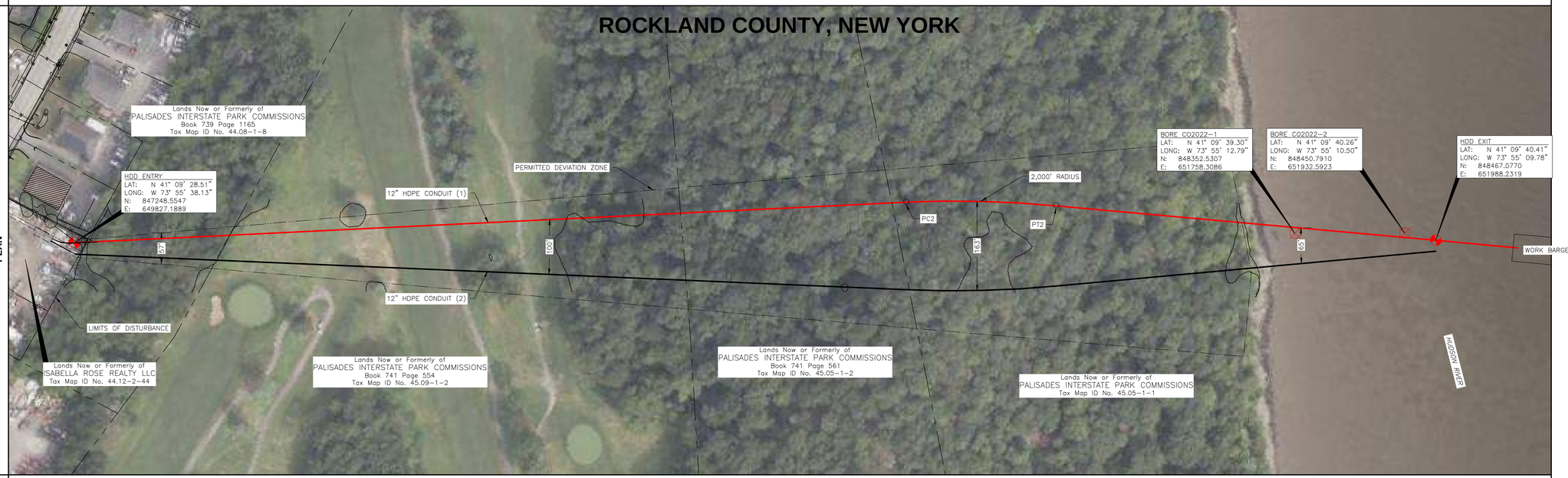
USER_DWGNAME

PIPE STATIONING

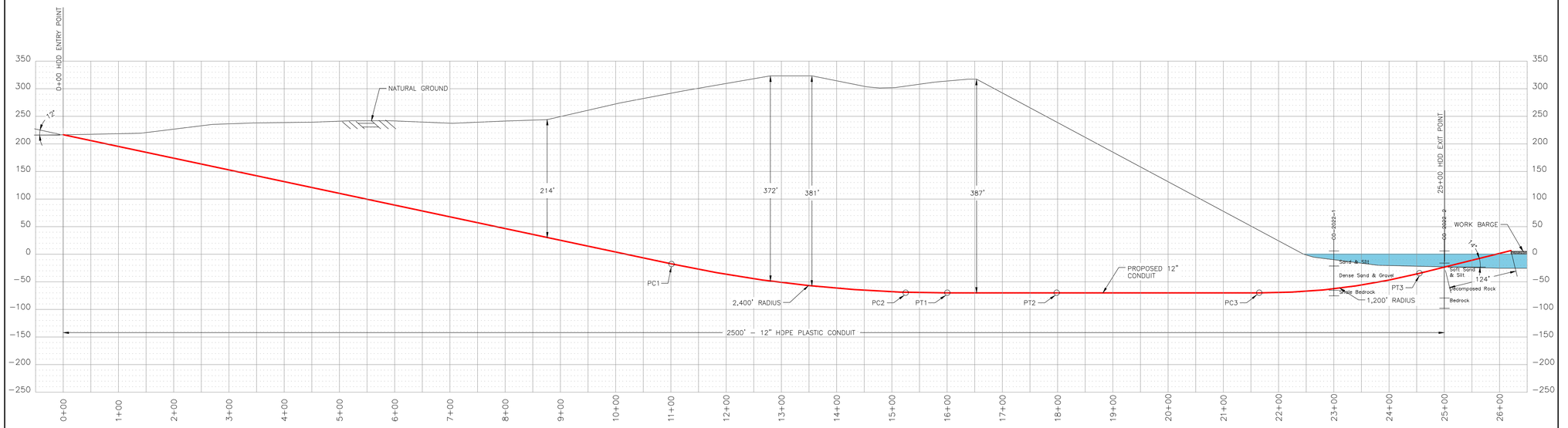
0+00 HDD ENTRY POINT | 1+00 | 2+00 | 3+00 | 4+00 | 5+00 | 6+00 | 7+00 | 8+00 | 9+00 | 10+00 | 11+00 | 12+00 | 13+00 | 14+00 | 15+00 | 16+00 | 17+00 | 18+00 | 19+00 | 20+00 | 21+00 | 22+00 | 23+00 | 24+00 | 25+00 HDD EXIT POINT

PLAN

ROCKLAND COUNTY, NEW YORK



PROFILE



HORIZONTAL DIRECTIONAL DRILL DATA

DESCRIPTION	STA.	ELEV.
ENTRY ANGLE @ 12°	0+00	216.4'
POINT OF CURVATURE (PC1) (2,400 FT. RADIUS)	11+01	−17.6'
POINT OF HORIZ. CURVATURE (PC2) (2,000 FT. RADIUS)	15+25	−68.8'
POINT OF TANGENCY (PT1)	16+00	−70.0'
POINT OF TANGENCY (PT2)	17+98	−70.0'
POINT OF CURVATURE (PC3) (1,200 FT. RADIUS)	21+64	−70.0'
POINT OF TANGENCY (PT3)	24+54	−34.6'
EXIT ANGLE @ 14°	25+00	−20.0'

HORIZONTAL DIRECTIONAL DRILL PARAMETERS

1.) PIPE: 12.75" O.D. x 1.417" W.T. — HDPE DR9 IPS
DESIGN FACTOR: 0.63

2.) LENGTH OF CROSSING: 2,500' HORIZONTAL DISTANCE

3.) TYPE OF PIPE JOINT: BUTT FUSION
LENGTH OF PIPE: 2,535 L.F.

4.) ESTIMATED PULL FORCE: 40,504 LBS.
ALLOWABLE PULL FORCE: 53,428 LBS.

REFERENCE DRAWINGS

DWG. NO.	TITLE

REVISIONS

NO.	DESCRIPTION	DATE	DRAWN	CHK	APPR

DRAWING APPROVALS

DRAWN	DATE
AWF	09/14/22
CHECKED	DATE
GJR	11/29/22
ENGINEER	DATE
KCB	11/29/22

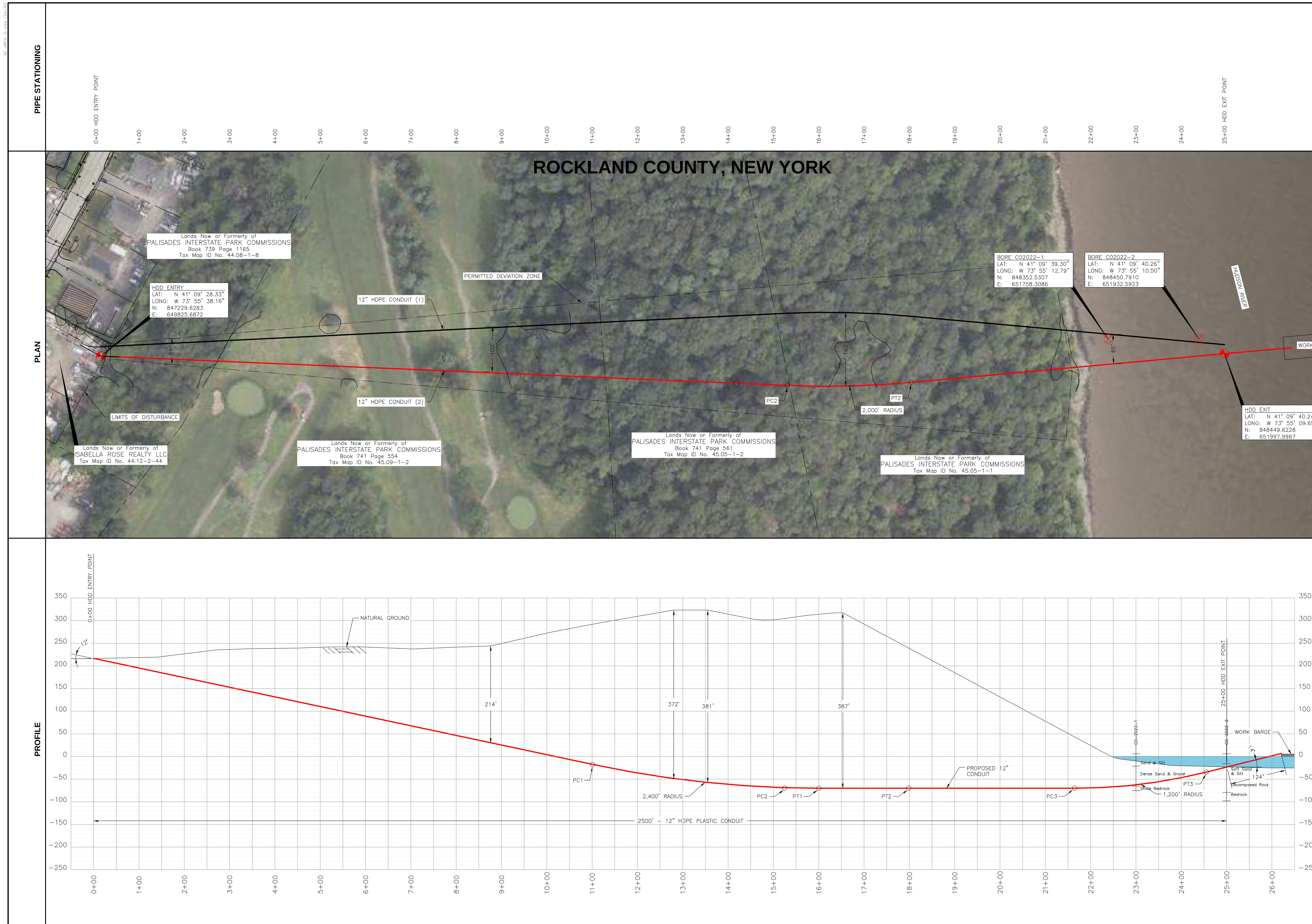
TRC FIRM REGISTRATION NO.: NY 0010187

SCALE PLAN: 0 100'
SCALE PROFILE H: 0 100'
SCALE PROFILE V: 0 100'

STATE OF NEW YORK — KEVIN CHARLES BOOMHOWER — 091543 — LICENSED PROFESSIONAL ENGINEER
11-29-22

CONGERS HDD 1
PLAN AND PROFILE

SCALE	PROJECT NO.	DRAWING NO.	SHT. NO.
1"=100'	496182	HDD-013	15



PIPE STATIONING
PLAN
PROFILE
ROCKLAND COUNTY, NEW YORK
0+00 HDD ENTRY POINT
25+00 HDD EXIT POINT
Lands Now or Formerly of PALISADES INTERSTATE PARK COMMISSIONS Book 739 Page 1165 Tax Map ID No. 44.08-1-8
HDD ENTRY LAT: N 41° 09' 28.33" LONG: W 73° 55' 38.16" N: 847229.6283 E: 649825.6872
PERMITTED DEVIATION ZONE
12" HDPE CONDUIT (1)
12" HDPE CONDUIT (2)
LIMITS OF DISTURBANCE
Lands Now or Formerly of ISABELLA ROSE REALTY LLC Tax Map ID No. 44.12-2-44
Lands Now or Formerly of PALISADES INTERSTATE PARK COMMISSIONS Book 741 Page 554 Tax Map ID No. 45.09-1-2
Lands Now or Formerly of PALISADES INTERSTATE PARK COMMISSIONS Book 741 Page 561 Tax Map ID No. 45.05-1-2
Lands Now or Formerly of PALISADES INTERSTATE PARK COMMISSIONS Tax Map ID No. 45.05-1-1
BORE C02022-1 LAT: N 41° 09' 39.30" LONG: W 73° 55' 12.79" N: 848352.5307 E: 651758.3086
BORE C02022-2 LAT: N 41° 09' 40.26" LONG: W 73° 55' 10.50" N: 848450.7910 E: 651932.5923
HUDSON RIVER
WORK BARGE
HDD EXIT LAT: N 41° 09' 40.24" LONG: W 73° 55' 09.65" N: 848449.6228 E: 651997.9967
PC2
PT2
2,000' RADIUS
NATURAL GROUND
214'
372'
381'
387'
PC1
2,400' RADIUS
PT1
PC3
1,200' RADIUS
PT3
PROPOSED 12" CONDUIT
Sand & Silt
Dense Sand & Gravel
Shale Bedrock
Soft Sand & Silt
Decomposed Rock
Bedrock
124'
2500' – 12" HDPE PLASTIC CONDUIT

HORIZONTAL DIRECTIONAL DRILL DATA		
DESCRIPTION	STA.	ELEV.
ENTRY ANGLE @ 12°	0+00	216.4'
POINT OF CURVATURE (PC1) (2,400 FT. RADIUS)	11+01	−17.6'
POINT OF HORIZ. CURVATURE (PC2) (2,000 FT. RADIUS)	15+25	−68.8'
POINT OF TANGENCY (PT1)	16+00	−70.0'
POINT OF TANGENCY (PT2)	17+98	−70.0'
POINT OF CURVATURE (PC3) (1,200 FT. RADIUS)	21+64	−70.0'
POINT OF TANGENCY (PT3)	24+54	−34.6'
EXIT ANGLE @ 14°	25+00	−20.0'

HORIZONTAL DIRECTIONAL DRILL PARAMETERS

1.) PIPE: 12.75" O.D. x 1.417" W.T. — HDPE DR9 IPS
DESIGN FACTOR: 0.63

2.) LENGTH OF CROSSING: 2,500' HORIZONTAL DISTANCE

3.) TYPE OF PIPE JOINT: BUTT FUSION
LENGTH OF PIPE: 2,535 L.F.

4.) ESTIMATED PULL FORCE: 40,504 LBS.
ALLOWABLE PULL FORCE: 53,428 LBS.

REFERENCE DRAWINGS

DWG. NO.	TITLE

REVISIONS

NO.	DESCRIPTION	DATE	DRAWN	CHK	APPR

DRAWING APPROVALS

DRAWN	DATE
AWF	09/14/22
CHECKED	DATE
GJR	11/29/22
ENGINEER	DATE
KCB	11/29/22

TRC FIRM REGISTRATION NO.: NY 0010187

SCALE PLAN: 0 100'
SCALE PROFILE H: 0 100'
SCALE PROFILE V: 0 100'

STATE OF NEW YORK · CHARLES BODENHAMER · LICENSED PROFESSIONAL ENGINEER · 093543
11-29-22

CONGERS HDD 2
PLAN AND PROFILE

SCALE	PROJECT NO.	DRAWING NO.	SHT. NO.
1"=100'	496182	HDD−014	16

PROPOSED WORK NOTES:

1. ALL HDD CONSTRUCTION OPERATIONS, LAYDOWN, AND PARKING WILL BE CONTAINED WITHIN THE LIMITS OF DISTURBANCE. TREE CLEARING AND SIGNIFICANT LAND GRADING IS NOT ANTICIPATED. VEGETATION REMOVAL IS ANTICIPATED TO BE LIMITED TO PRUNING OF LIMBS AND TRIMMING OF UNDERGROWTH ALONG THE PERIMETER OF THE HDD WORKSPACE, NO HERBICIDE USE IS PERMITTED. ALL DISTURBED AREAS SHALL BE RESTORED AND RE-VEGETATED AFTER CONSTRUCTION.
2. THE EXISTING ACCESS TO THE PROPERTY SHALL SUPPORT HDD CONSTRUCTION OPERATIONS AND PREVENT SEDIMENT-LADEN RUNOFF TO FLOW OUTSIDE OF THE LIMITS OF DISTURBANCE. THE EXTENT OF THE TEMPORARY CONSTRUCTION AREA WILL BE COORDINATED WITH THE LAND OWNER, ISABELLA ROSE REALTY LLC.
3. TEMPORARY 'CONSTRUCTION TRAFFIC AHEAD' WARNING SIGNS WILL BE INSTALLED IN THE SHOULDER OF ROUTE 9W 100-FEET FROM THE EXISTING ACCESS TO ISABELLA ROSE REALTY PROPERTY ON BOTH STATE ROUTE 9W APPROACHES. FINAL SIGN TEXT AND LOCATIONS TO BE APPROVED BY THE OWNER, ISABELLA ROSE REALTY LLC, AND COORDINATED WITH THE STATE OF NEW YORK.

REFERENCE NOTES:

1. BASE PLAN REFERENCES A ROW, UTILITY & WETLAND SURVEY PREPARED IN THE FIELD BY CONTROL POINT ASSOCIATES, INC.
2. BASE PLAN HAS BEEN SUPPLEMENTED WITH INFORMATION PROVIDED BY CALDWELL MARINE INC AND NEW YORK GIS CLEARING HOUSE.

REFERENCE DRAWINGS		REVISIONS					
DWG. NO.	TITLE	NO.	DESCRIPTION	DATE	DRAWN	CHK	APPR

DRAWING APPROVALS	
DRAWN	DATE
MMO	11/1/2022
CHECKED	DATE
GJR	11/7/2022
ENGINEER	DATE
KCB	11/29/2022

TRC — FIRM REGISTRATION NO. NY 0010187

SCALE PLAN: 0 20'

CONGERS HDD
LAYOUT PLAN

SCALE	PROJECT NO.	DRAWING NO.	SHT.NO.
1"=20'	496182	HDD-015	17

[Seal: STATE OF NEW YORK, LICENSED PROFESSIONAL ENGINEER, 093943]
11-29-22

REFERENCE NOTES:

1. BASE PLAN REFERENCES A ROW, UTILITY & WETLAND SURVEY PREPARED IN THE FIELD BY CONTROL POINT ASSOCIATES, INC.
2. HDD EQUIPMENT LAYOUT PROVIDED BY HUXTED TRENCHLESS IN OCTOBER 2022.

REFERENCE DRAWINGS	
DWG. NO.	TITLE

REVISIONS					
NO.	DESCRIPTION	DATE	DRAWN	CHK	APPR

DRAWING APPROVALS	
DRAWN	DATE
MMO	11/1/2022
CHECKED	DATE
GJR	11/7/2022
ENGINEER	DATE
KCB	11/29/2022

TRC — FIRM REGISTRATION NO. NY 0010187

SCALE PLAN: 0 — 10'

CONGERS HDD
EQUIPMENT LAYOUT PLAN

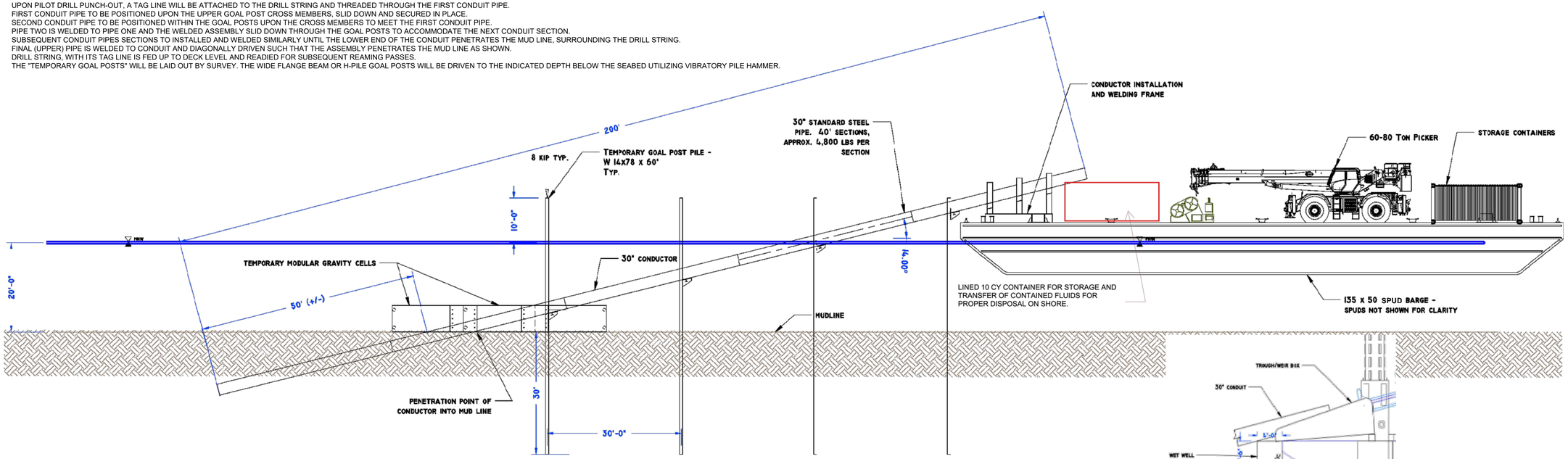
SCALE	PROJECT NO.	DRAWING NO.	SHT.NO.
1"=10'	496182	HDD-016	18

STATE OF NEW YORK — KEVIN CHARLES BODENMANN — LICENSED PROFESSIONAL ENGINEER — 093543

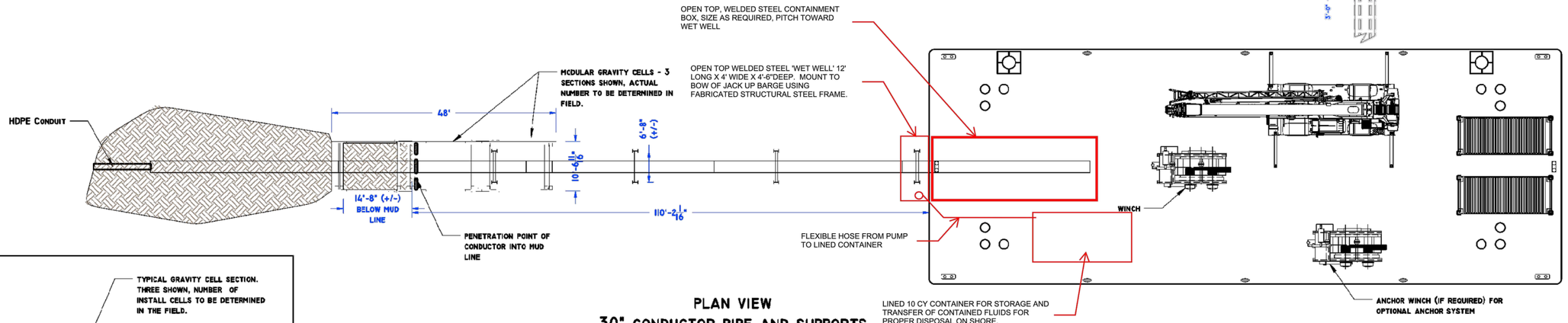
11-29-22

INSTALLATION NOTES:

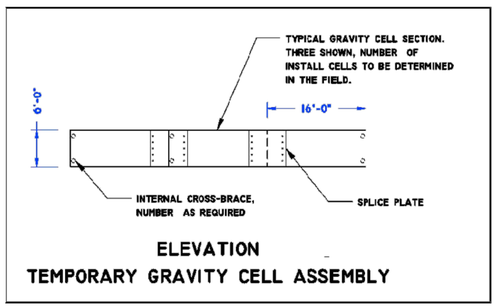
1. GRAVITY CELL TO BE PLACED AT MUD LINE TO ENCOMPASS PILOT HOLE PUNCH-OUT LOCATION.
2. PILOT HOLE TO BE DRILLED FROM SHORE TO IN-RIVER PUNCH-OUT LOCATION.
3. PIN PILES TO BE DRIVEN SIMULTANEOUS TO PILOT HOLE DRILLING OPERATION.
4. CONDUIT CROSS SUPPORTS TO BE INSTALLED AT EACH PILE BENT AT CORRECT ELEVATIONS TO ENSURE 14-DEGREE VERTICAL ANGLE.
5. UPON PILOT DRILL PUNCH-OUT, A TAG LINE WILL BE ATTACHED TO THE DRILL STRING AND THREADED THROUGH THE FIRST CONDUIT PIPE.
6. FIRST CONDUIT PIPE TO BE POSITIONED UPON THE UPPER GOAL POST CROSS MEMBERS, SLID DOWN AND SECURED IN PLACE.
7. SECOND CONDUIT PIPE TO BE POSITIONED WITHIN THE GOAL POSTS UPON THE CROSS MEMBERS TO MEET THE FIRST CONDUIT PIPE.
8. PIPE TWO IS WELDED TO PIPE ONE AND THE WELDED ASSEMBLY SLID DOWN THROUGH THE GOAL POSTS TO ACCOMMODATE THE NEXT CONDUIT SECTION.
9. SUBSEQUENT CONDUIT PIPES SECTIONS TO INSTALLED AND WELDED SIMILARLY UNTIL THE LOWER END OF THE CONDUIT PENETRATES THE MUD LINE, SURROUNDING THE DRILL STRING.
10. FINAL (UPPER) PIPE IS WELDED TO CONDUIT AND DIAGONALLY DRIVEN SUCH THAT THE ASSEMBLY PENETRATES THE MUD LINE AS SHOWN.
11. DRILL STRING, WITH ITS TAG LINE IS FED UP TO DECK LEVEL AND READIED FOR SUBSEQUENT REAMING PASSES.
12. THE "TEMPORARY GOAL POSTS" WILL BE LAID OUT BY SURVEY. THE WIDE FLANGE BEAM OR H-PILE GOAL POSTS WILL BE DRIVEN TO THE INDICATED DEPTH BELOW THE SEABED UTILIZING VIBRATORY PILE HAMMER.



PROFILE
30" CONDUCTOR PIPE AND SUPPORTS



PLAN VIEW
30" CONDUCTOR PIPE AND SUPPORTS



ELEVATION
TEMPORARY GRAVITY CELL ASSEMBLY

NOTE:

CONDUCTOR PIPE/GOAL POST/GRAVITY CELL INSTALLATION INFORMATION SHOWN HEREIN PROVIDED BY CALDWELL MARINE IN NOVEMBER 2022

REFERENCE DRAWINGS	
DWG. NO.	TITLE
HDD-002	PUTNAM STATION 12" HDPE CONDUIT (1)
HDD-003	PUTNAM STATION 12" HDPE CONDUIT (2)
HDD-008	CEMENTON 12" HDPE CONDUIT (1)
HDD-009	CEMENTON 12" HDPE CONDUIT (2)

REVISIONS					
NO.	DESCRIPTION	DATE	DRAWN	CHK	APPR

DRAWING APPROVALS	
DRAWN	DATE
AWF	06/28/22
CHECKED	DATE
GJR	11/29/22
ENGINEER	DATE
KCB	11/29/22

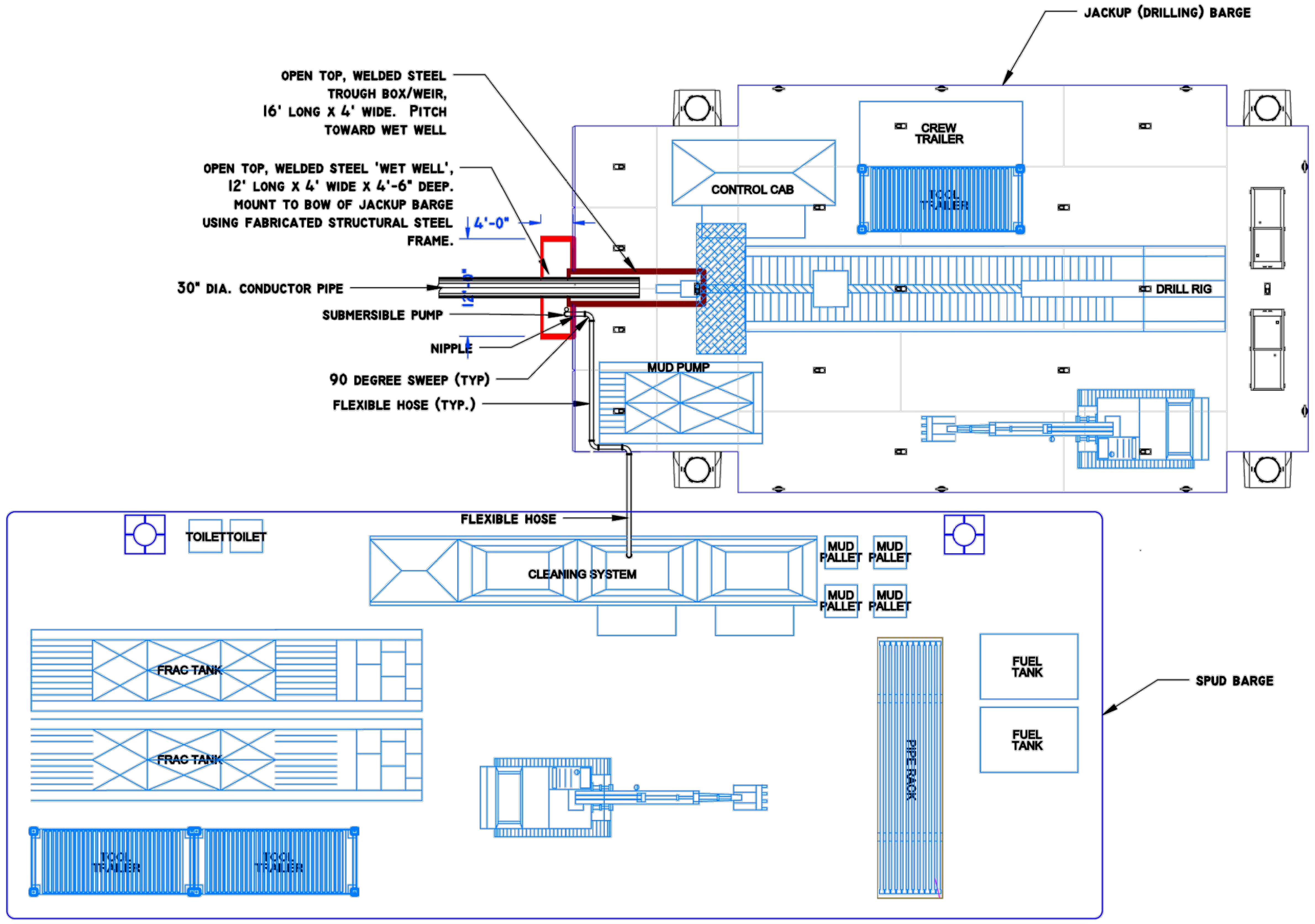
TRC FIRM REGISTRATION NO. NY 0010187

SCALE PLAN: 0 N.T.S.
SCALE PROFILE H: 0 N.T.S.
SCALE PROFILE V: 0 N.T.S.

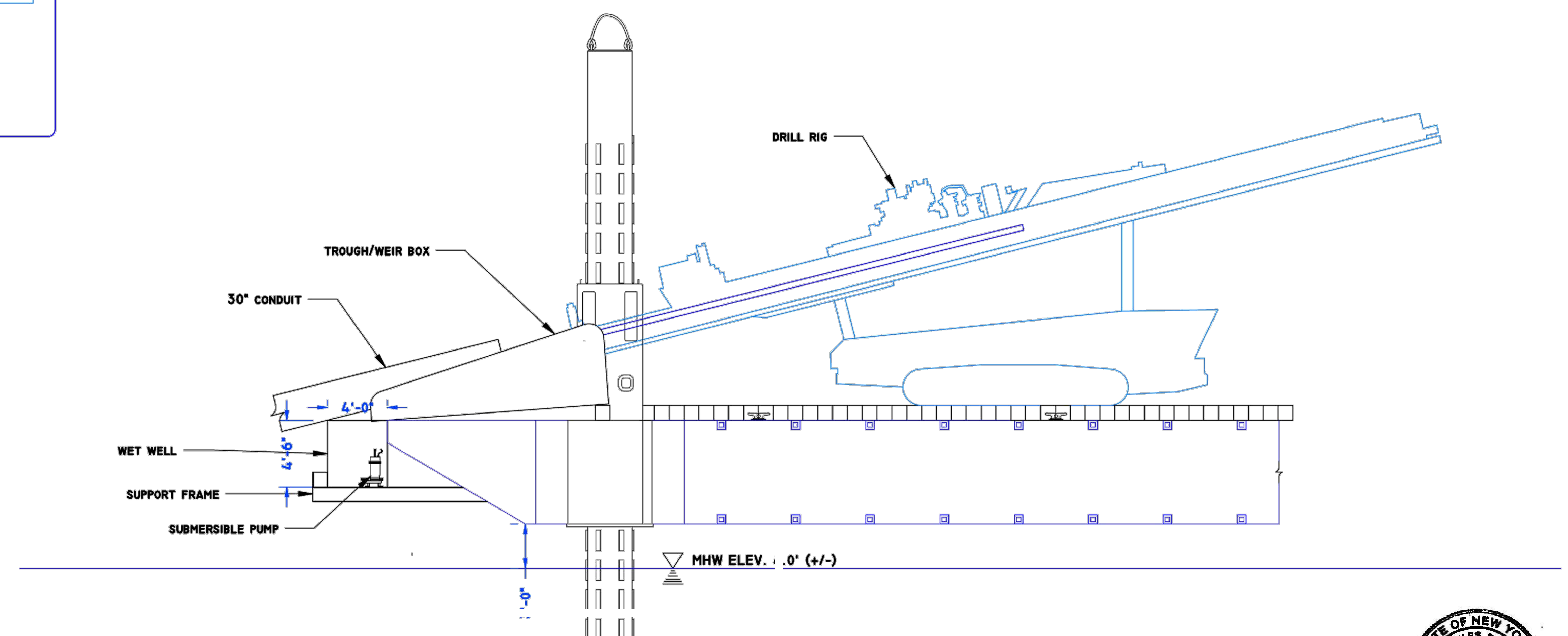
PUTNAM STATION & CEMENTON CONDUCTOR PIPE/GOAL POST/ GRAVITY CELL INSTALLATION

SCALE	PROJECT NO.	DRAWING NO.	SHT. NO.
N.T.S.	496182	HDD-017	19

USER_DWGNAME



PLAN VIEW
DRILL FLUID COLLECTION SYSTEM
INSTALLED ON JACKUP DRILL BARGE



ELEVATION - DRILL FLUID COLLECTOR SYSTEM
(PIPING AND HOSES NOT SHOWN)
N.T.S.

NOTE:

CONDUCTOR PIPE/GOAL POST/GRAVITY CELL INSTALLATION INFORMATION SHOWN HEREIN PROVIDED BY CALDWELL MARINE IN NOVEMBER 2022

REFERENCE DRAWINGS

DWG. NO.	TITLE
HDD-013	CONGERS HDD 1 PLAN AND PROFILE
HDD-014	CONGERS HDD 2 PLAN AND PROFILE

REVISIONS

NO.	DESCRIPTION	DATE	DRAWN	CHK	APPR

DRAWING APPROVALS

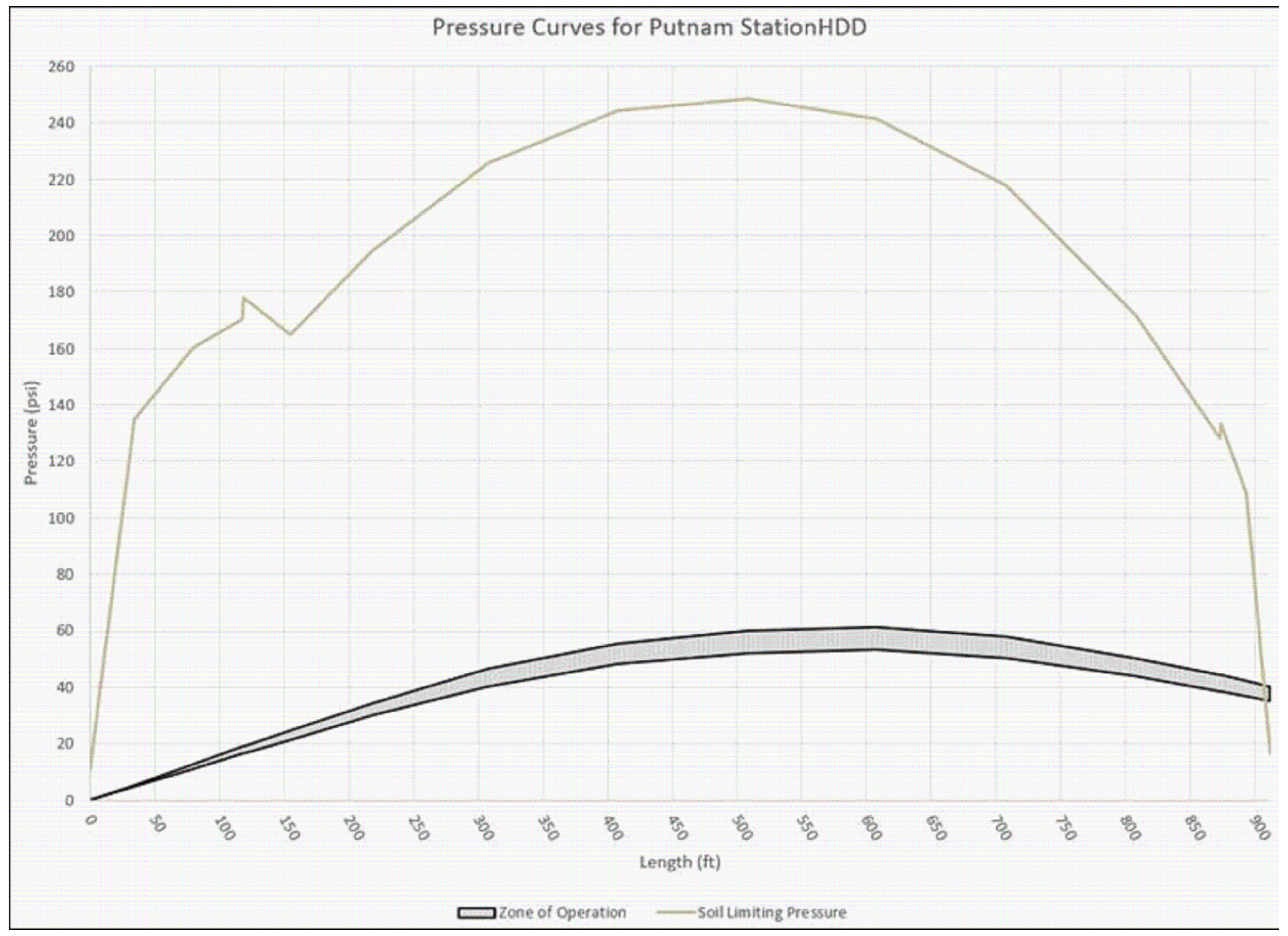
DRAWN	DATE
AWF	06/28/22
CHECKED	DATE
GJR	11/29/22
ENGINEER	DATE
KCB	11/29/22

TRC — FIRM REGISTRATION NO.: NY 0010187

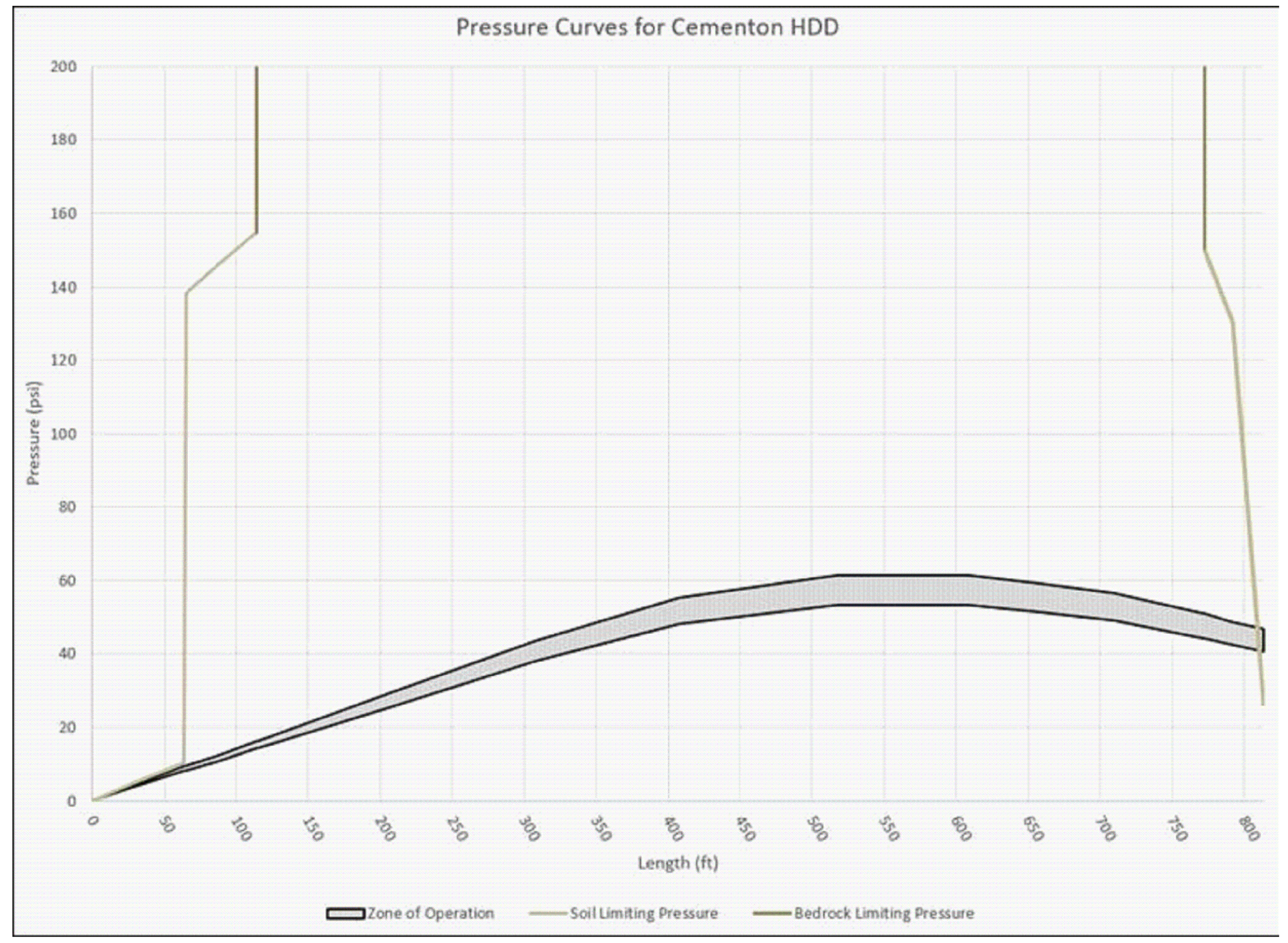
SCALE PLAN: N.T.S.
SCALE PROFILE H: N.T.S.
SCALE PROFILE V: N.T.S.

CONGERS
CONDUCTOR PIPE/GOAL POST/ GRAVITY CELL INSTALLATION

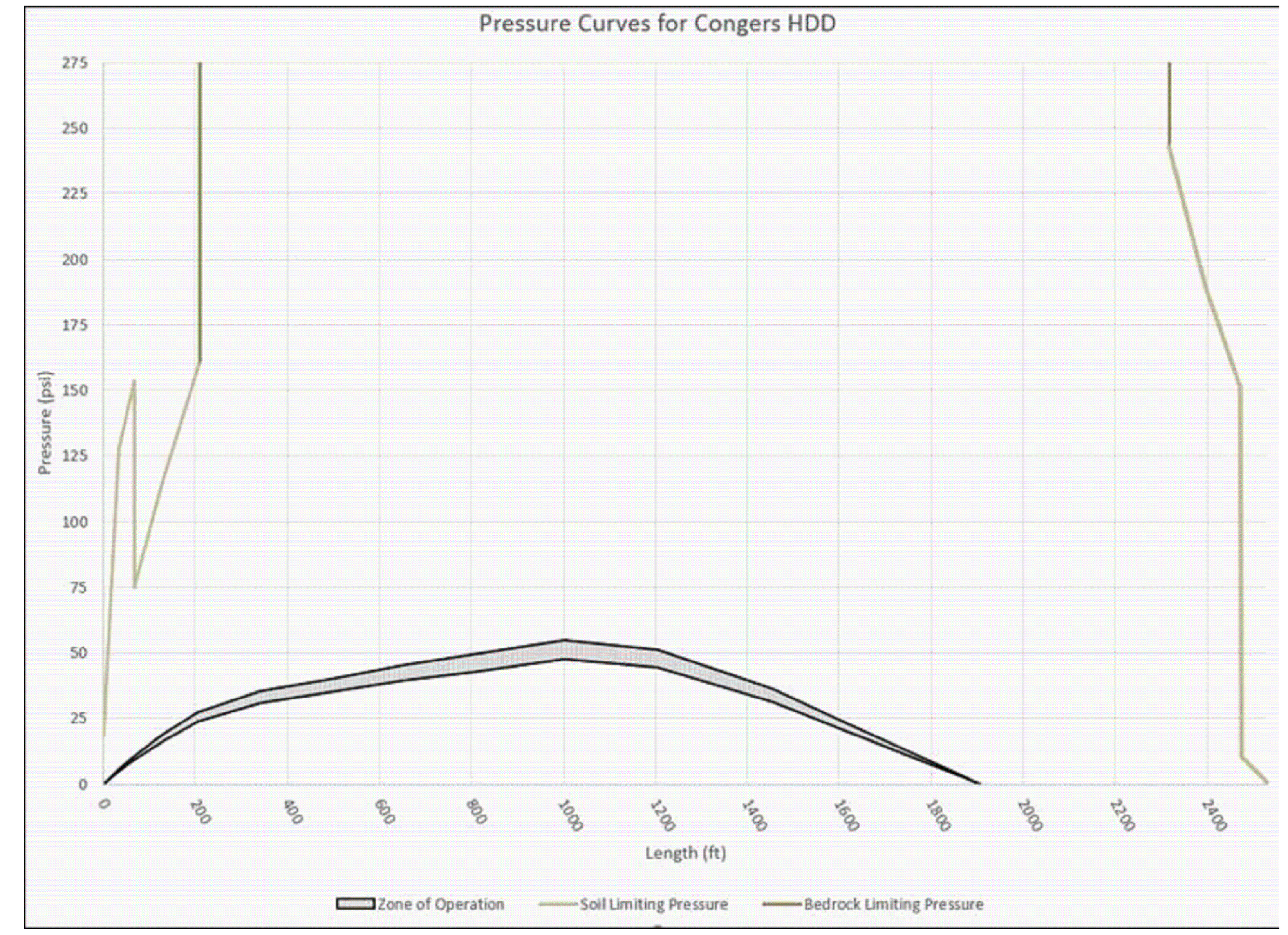
SCALE	PROJECT NO.	DRAWING NO.	SHT. NO.
N.T.S.	496182	HDD-018	20



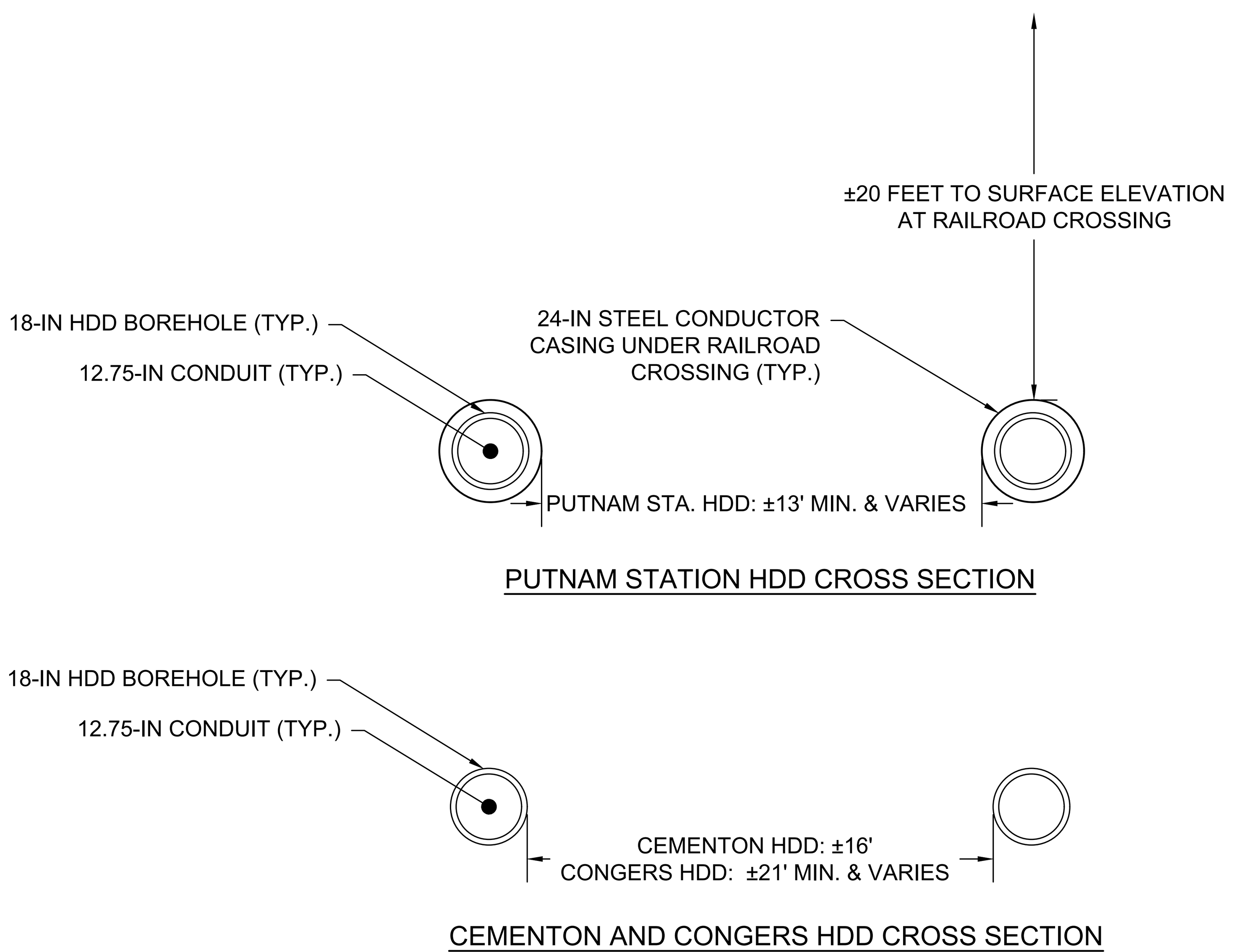
1 / 21 PUTNAM STATION HDD PRESSURE CURVE
SCALE: NTS



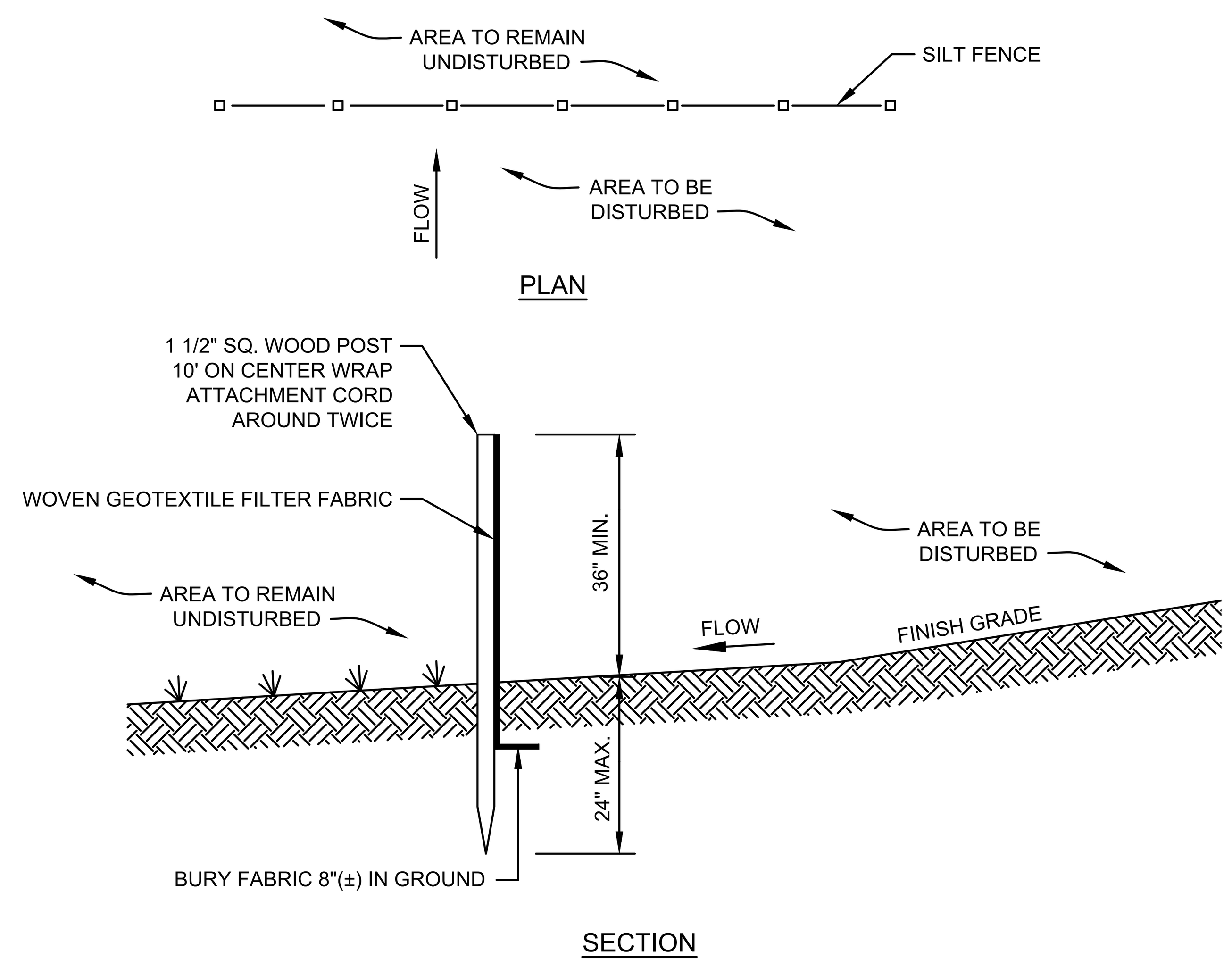
2 / 21 CEMENTON HDD PRESSURE CURVE
SCALE: NTS



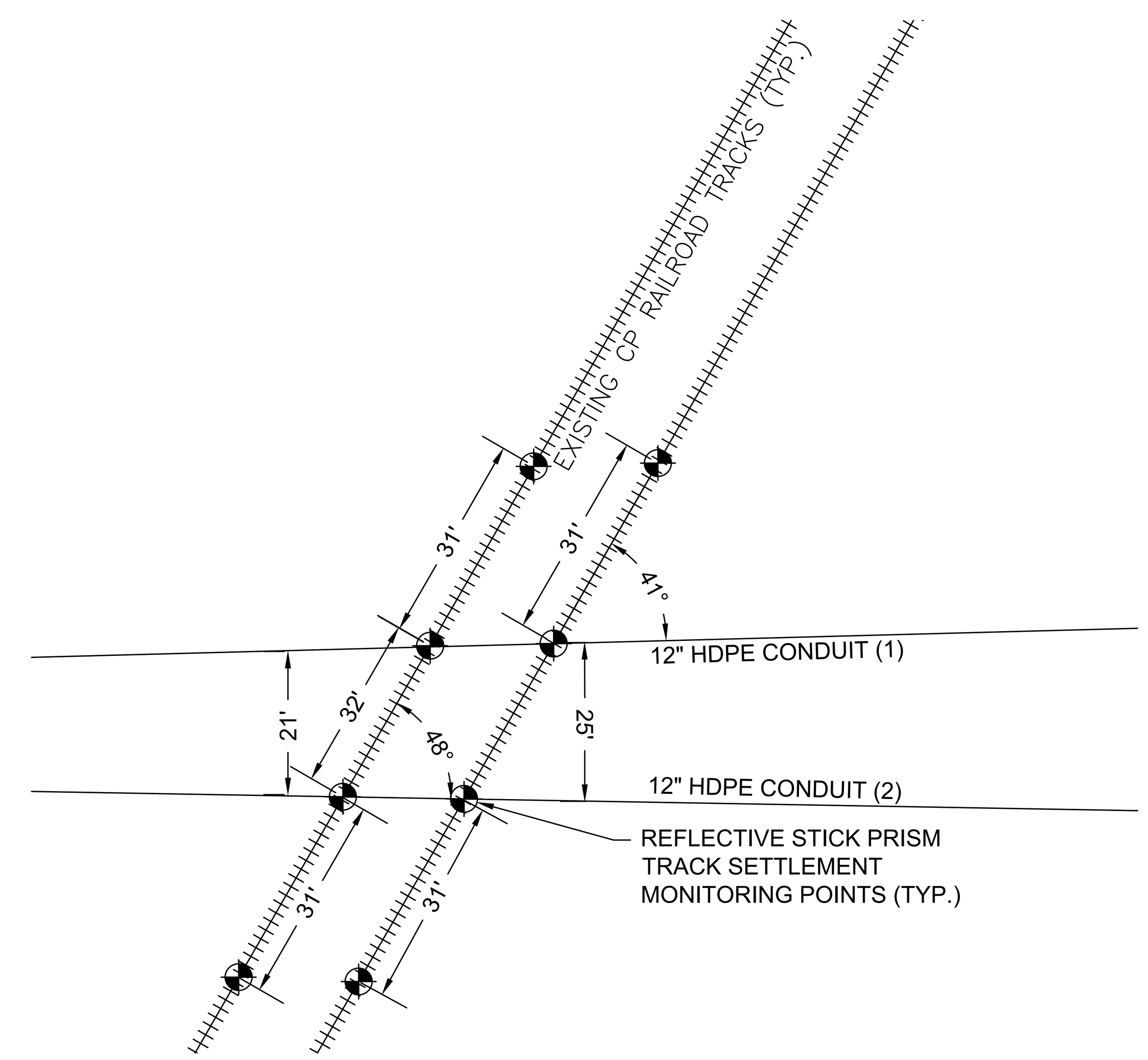
3 / 21 CONGERS HDD PRESSURE CURVE
SCALE: NTS



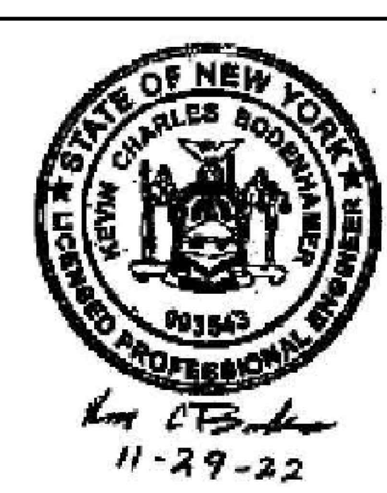
4 / 21 TYPICAL HDD CROSS SECTION
SCALE: NTS



5 / 21 TYPICAL SILT FENCE
SCALE: NTS



6 / 21 PUTNAM STATION HDD RAILROAD CROSSING MONITORING LOCATIONS SCHEMATIC
SCALE: NTS



REFERENCE DRAWINGS	
DWG. NO.	TITLE

REVISIONS					
NO.	DESCRIPTION	DATE	DRAWN	CHK	APPR

DRAWING APPROVALS	
DRAWN	DATE
MMO	11/1/2022
CHECKED	DATE
GJR	11/8/2022
ENGINEER	DATE
KCB	11/29/2022

TRC
NY 0010187

DETAILS

SCALE	PROJECT NO.	DRAWING NO.	SHT.NO.
NTS	496182	HDD–019	21