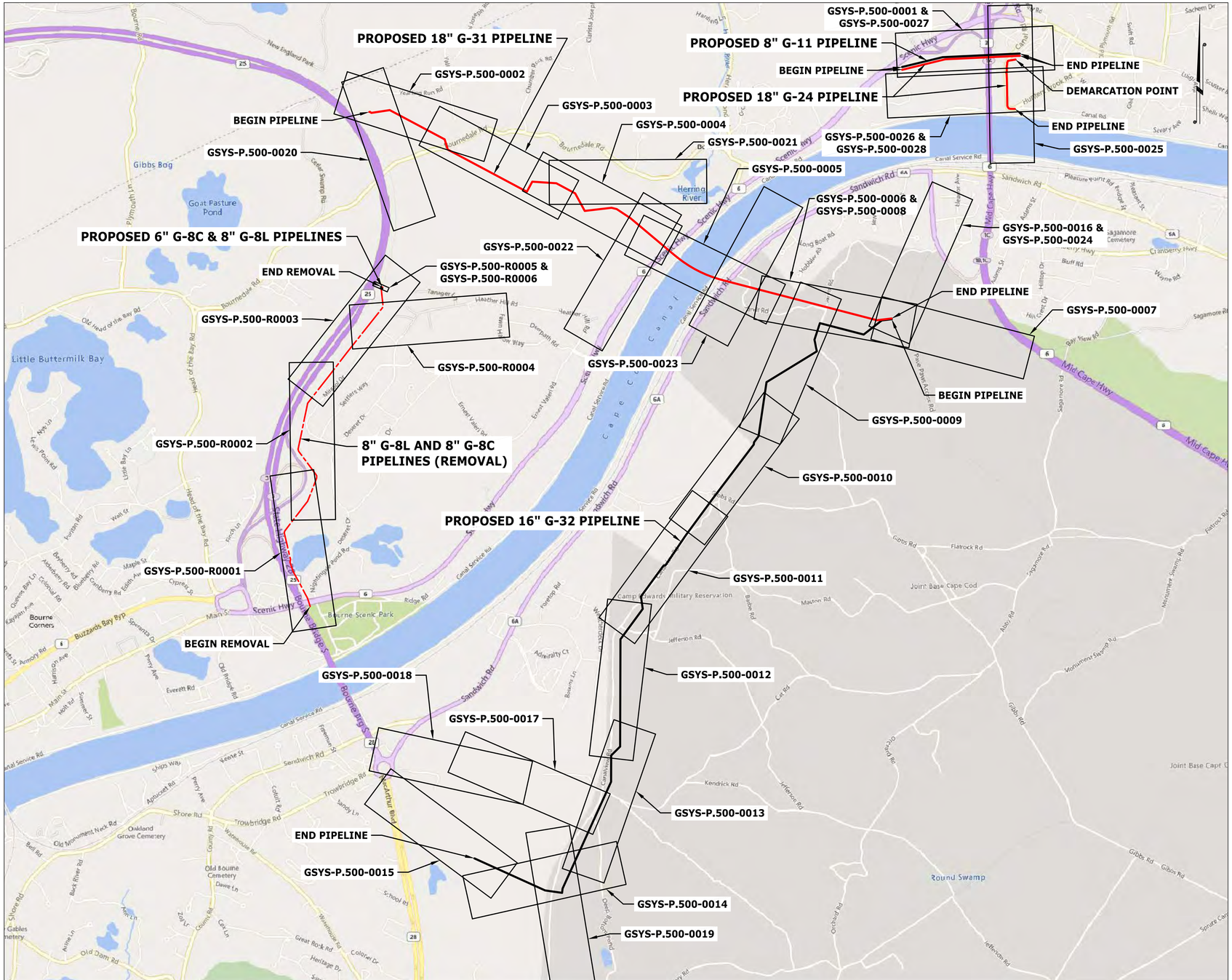
ATTACHMENT 2

Alignment Sheets, Typical Construction Examples, and HDD Profile

ENBRIDGE
CAPE COD CANAL PIPELINE RELOCATION PROJECT
PROPOSED 8" G-11, 18" G-24, 18" G-31, 16" G-32 PIPELINES, AND REMOVAL OF 8" G-8C & 8" G-8L PIPELINES



COVER SHEET / INDEX SHEET DRAWING		
DRAWING NUMBER	**DRAWING TITLE**	**REVISION**
GSYS-P.500-0029	COVER & INDEX SHEET	G
ALIGNMENT SHEET DRAWINGS - PROPOSED 18" G-24 PIPELINE		
DRAWING NUMBER	**DRAWING TITLE**	**REVISION**
GSYS-P.500-0001	ALIGNMENT SHEET - PROPOSED 18" G-24 PIPELINE	F
GSYS-P.500-0025	ALIGNMENT SHEET - PROPOSED 18" G-24 PIPELINE	D
GSYS-P.500-0026	ALIGNMENT SHEET - PROPOSED 18" G-24 PIPELINE	D
ALIGNMENT SHEET DRAWINGS - PROPOSED 18" G-31 PIPELINE		
DRAWING NUMBER	**DRAWING TITLE**	**REVISION**
GSYS-P.500-0002	ALIGNMENT SHEET - PROPOSED 18" G-31 PIPELINE	F
GSYS-P.500-0003	ALIGNMENT SHEET - PROPOSED 18" G-31 PIPELINE	F
GSYS-P.500-0004	ALIGNMENT SHEET - PROPOSED 18" G-31 PIPELINE	F
GSYS-P.500-0005	ALIGNMENT SHEET - PROPOSED 18" G-31 PIPELINE	F
GSYS-P.500-0006	ALIGNMENT SHEET - PROPOSED 18" G-31 PIPELINE	F
GSYS-P.500-0007	ALIGNMENT SHEET - PROPOSED 18" G-31 PIPELINE	F
GSYS-P.500-0020	ALIGNMENT SHEET - PROPOSED 18" G-31 PIPELINE	D
GSYS-P.500-0021	ALIGNMENT SHEET - PROPOSED 18" G-31 PIPELINE	D
GSYS-P.500-0022	ALIGNMENT SHEET - PROPOSED 18" G-31 PIPELINE	D
GSYS-P.500-0023	ALIGNMENT SHEET - PROPOSED 18" G-31 PIPELINE	D
GSYS-P.500-0024	ALIGNMENT SHEET - PROPOSED 18" G-31 PIPELINE	D
ALIGNMENT SHEET DRAWINGS - PROPOSED 16" G-32 PIPELINE		
DRAWING NUMBER	**DRAWING TITLE**	**REVISION**
GSYS-P.500-0008	ALIGNMENT SHEET - PROPOSED 16" G-32 PIPELINE	F
GSYS-P.500-0009	ALIGNMENT SHEET - PROPOSED 16" G-32 PIPELINE	F
GSYS-P.500-0010	ALIGNMENT SHEET - PROPOSED 16" G-32 PIPELINE	F
GSYS-P.500-0011	ALIGNMENT SHEET - PROPOSED 16" G-32 PIPELINE	E
GSYS-P.500-0012	ALIGNMENT SHEET - PROPOSED 16" G-32 PIPELINE	E
GSYS-P.500-0013	ALIGNMENT SHEET - PROPOSED 16" G-32 PIPELINE	F
GSYS-P.500-0014	ALIGNMENT SHEET - PROPOSED 16" G-32 PIPELINE	E
GSYS-P.500-0015	ALIGNMENT SHEET - PROPOSED 16" G-32 PIPELINE	F
GSYS-P.500-0016	ALIGNMENT SHEET - PROPOSED 16" G-32 PIPELINE	E
GSYS-P.500-0017	ALIGNMENT SHEET - PROPOSED 16" G-32 PIPELINE	G
GSYS-P.500-0018	ALIGNMENT SHEET - PROPOSED 16" G-32 PIPELINE	G
GSYS-P.500-0019	ALIGNMENT SHEET - PROPOSED 16" G-32 PIPELINE	E
ALIGNMENT SHEET DRAWINGS - PROPOSED 8" G-11 PIPELINE		
DRAWING NUMBER	**DRAWING TITLE**	**REVISION**
GSYS-P.500-0027	ALIGNMENT SHEET - PROPOSED 8" G-11 PIPELINE	D
GSYS-P.500-0028	ALIGNMENT SHEET - PROPOSED 8" G-11 PIPELINE	D
ALIGNMENT SHEET DRAWINGS - REMOVAL OF 8" G-8C AND 8" G-8L PIPELINES		
DRAWING NUMBER	**DRAWING TITLE**	**REVISION**
GSYS-P.500-R0001	ALIGNMENT SHEET - REMOVAL OF 8" G-8C AND 8" G-8L PIPELINES	G
GSYS-P.500-R0002	ALIGNMENT SHEET - REMOVAL OF 8" G-8C AND 8" G-8L PIPELINES	F
GSYS-P.500-R0003	ALIGNMENT SHEET - REMOVAL OF 8" G-8C AND 8" G-8L PIPELINES	D
GSYS-P.500-R0004	ALIGNMENT SHEET - REMOVAL OF 8" G-8C AND 8" G-8L PIPELINES	D
GSYS-P.500-R0005	ALIGNMENT SHEET - PROPOSED 6" G-8C PIPELINE	C
GSYS-P.500-R0006	ALIGNMENT SHEET - PROPOSED 8" G-8L PIPELINE	C
CONSTRUCTION TYPICAL DRAWINGS		
DRAWING NUMBER	**DRAWING TITLE**	**REVISION**
GSYS-M.223-0001	CONSTRUCTION TYPICAL	D
GSYS-M.223-0002	CONSTRUCTION TYPICAL	D
GSYS-M.223-0003	CONSTRUCTION TYPICAL	C
GSYS-M.223-0004	CONSTRUCTION TYPICAL	C
GSYS-M.223-0005	CONSTRUCTION TYPICAL	C
GSYS-M.223-0006	CONSTRUCTION TYPICAL	C
GSYS-M.223-0007	CONSTRUCTION TYPICAL	C
GSYS-M.223-0008	CONSTRUCTION TYPICAL	C
GSYS-M.223-0009	CONSTRUCTION TYPICAL	C

COMMONWEALTH OF MASSACHUSETTS
CLAY H. WILLIS
STRUCTURAL
NO. 49138
PROFESSIONAL ENGINEER
06/23/26

REV	DATE	DSN	CK	DESCRIPTION
G	03/25/26	TL	JL	RE-ISSUED FOR BID
F	03/20/26	TL	JL	RE-ISSUED FOR BID
E	01/29/26	TL	JL	RE-ISSUED FOR BID
D	08/21/25	TL	JL	ISSUED FOR BID
C	07/07/25	TL	JL	ISSUED FOR REVIEW (90% DESIGN)
B	05/06/25	LBJ	JL	RE-ISSUED FOR REVIEW (60% DESIGN)

wood.
WOOD GROUP USA, INC.

DRAWN BY:	TL	04/04/25
DESIGN CHECKER:	JL	04/04/25
DESIGN ENGINEER:	PA	04/08/25
PROJECT MANAGER:	EL	04/08/25
TITLE	INITIALS	DATE

ENBRIDGE - CAPE COD CANAL PIPELINE RELOCATION PROJECT
PROPOSED 8" G-11, 18" G-24, 18" G-31, 16" G-32 PIPELINES
AND REMOVAL OF 8" G-8C & 8" G-8L PIPELINES
TITLE: COVER & INDEX SHEET

LOC.: BARNSTABLE COUNTY, MASSACHUSETTS

YEAR: 2026 | W.O.: AFE 30002835 | SCALE: N/A | DWG.: GSYS-P.500-0029 | REV.: G

ENBRIDGE
Algonquin Gas Transmission
915 N. Eldridge Parkway, Houston, TX 77079-2703 (713) 627-5400

M:\259271\MAPPING\DRAWINGS\91-ALIGNMENT\RE-ISSUED FOR BID 2\GSYS-P.500-0029

RIGHT-OF-WAY

TRACT NUMBERS

0+00									22+85
G-11-MA-BA-010	G-11-MA-BA-010A	G-11-MA-BA-011	G-11-MA-BA-012	G-11-MA-BA-013.RD HWY 6 (SAGAMORE BRIDGE S)	G-11-MA-BA-014	G-24-MA-BA-001.5.RD CANAL ST	G-11-MA-BA-015.MS		
26 FT.	352 FT.	857 FT.	240FT.	522 FT.	80 FT.	74 FT.	134 FT.		
0+26	3+78	12+35	14+75		19+97	20+77	21+51		

SURVEY DATA

SURVEY COMPANY:
FIELD BOOK:
PAGES:

0+00 BEGIN PIPELINE									22+85
0+42 TREE LINE 0+46 TREE LINE 0+63 TREE LINE	8+51 P.I. <11°02'05" RT. 8+51 HDD EXIT	13+66 WATERLINE	14+76 FENCE	15+22 TELEPHONE LINE 16+16 GUARDRAIL 16+17 EDGE OF PAVEMENT	19+35 DRAINAGE LINE 19+61 DRAINAGE LINE 19+68 EDGE OF PAVEMENT 19+76 EDGE OF PAVEMENT	20+84 TELEPHONE LINE 20+98 WATERLINE	21+39 EDGE OF PAVEMENT	22+85 HDD ENTRY	

CLASS LOCATION

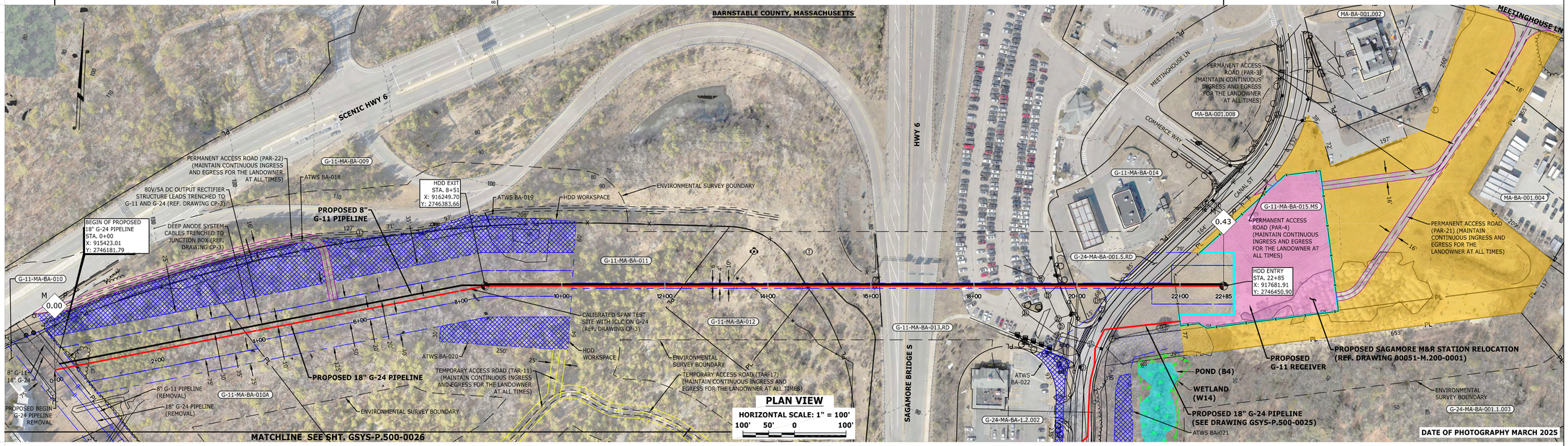
0+00	CLASS 2	15+00	CLASS 3	22+85

PIPE MATERIAL

0+00	18" O.D. X 0.375" W.T., API 5L, X-52, 16-20 MILS FBE 851 FT.	8+51	18" O.D. X 0.500" W.T., API-5L, X-52, 16-20 MILS FBE + 24 MILS ARO 1434 FT. (HDD)	22+85

ALIGNMENT LEGEND

- PIPELINE MILEPOST
- PROPOSED G-24 PIPELINE
- PROPOSED G-11 PIPELINE
- 18" G-24 & 8" G-11 PIPELINES (TO BE REMOVED)
- CONSTRUCTION LIMIT
- WAREYARD / STAGING AREA
- EXISTING PERMANENT ROW
- PROPOSED PERMANENT ROW
- ADDITIONAL TEMPORARY WORKSPACE
- PROPOSED METERING & REGULATING STATION (M&R) SITE / PIG TRAP SITE
- FACILITIES TEMPORARY WORKSPACE
- FACILITIES PERMANENT WORKSPACE
- PROPOSED GRAVEL AREA
- DELINEATED WETLAND BOUNDARY
- DELINEATED WATERBODY BANK
- DELINEATED WATERBODY CENTERLINE
- PERMANENT ACCESS ROAD
- TEMPORARY ACCESS ROAD
- PROPERTY LINE
- MAJOR CONTOUR
- MUNICIPALITY LINE
- ENVIRONMENTAL SURVEY BOUNDARY
- FENCE
- EXISTING AGT PIPELINE
- FOREIGN PIPELINE
- POWERLINE
- WATER PIPELINE
- RAILROAD TRACK
- OVERHEAD WIRE
- TELEPHONE LINE
- UTILITY LINES
- SANITARY SEWER
- TEE TAP
- BLOW OFF VALVE
- MAINLINE VALVE (MLV)
- POINT OF INTERSECTION
- BORE ENTRY/EXIT
- TRANSMISSION TOWER
- LIGHT POLE
- UTILITY POLE
- FIRE HYDRANT
- WELL (GAS)
- WELL (WATER)
- WELL (OIL)
- WELL (UNKNOWN)



ENVIRONMENTAL DATA

E & S TYPICALS

E&S TYPICALS WILL BE USED AS A PLAN AND WILL HAVE FURTHER INPUT FROM ENVIRONMENTAL INSPECTOR.

PROFILE

HORIZONTAL SCALE: 1" = 100'
100' 50' 0 100'

VERTICAL SCALE: 1" = 100'
100' 50' 0 100'

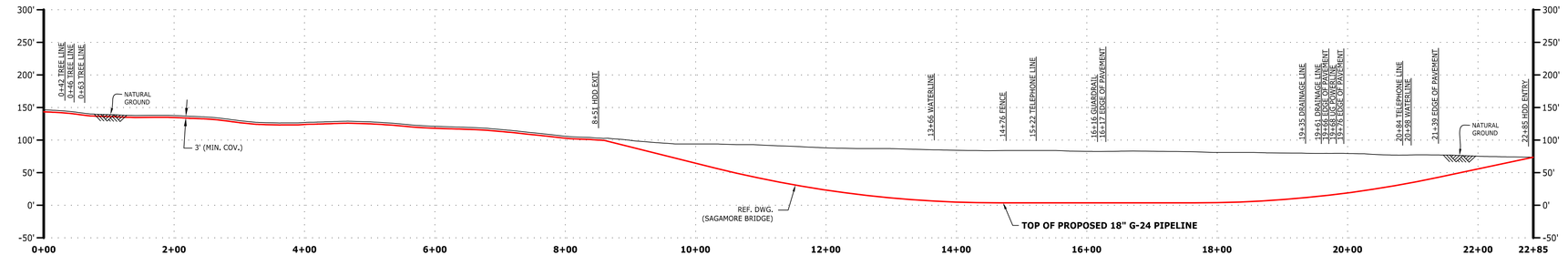
THE LOCATION OF TRENCH PLUGS AND SLOPE BREAKERS ARE INTENDED TO BE USED AS A GUIDELINE ONLY. EXACT LOCATION TO BE DETERMINED IN THE FIELD.

SLOPE BREAKERS
TRENCH PLUG

PERMANENT SLOPE BREAKER & TRENCH PLUG SPACING

% SLOPE	SLOPE BREAKER SPACING (FT)	% SLOPE	TRENCH PLUG SPACING (FT)
5-15%	300 FT	<5%	NO STRUCTURE
15-30%	200 FT	5-15%	300 FT
>30%	100 FT	15-30%	200 FT
		>30%	100 FT

IN AG FIELDS AND RESIDENTIAL AREAS WHERE SLOPE BREAKERS ARE NOT TYPICALLY REQUIRED, INSTALL PERMANENT TRENCH PLUGS AT THE SAME SPACING AS IF PERMANENT SLOPE BREAKERS WERE REQUIRED. (FERC PLAN)



LAND USE CLASSIFICATION

CC CULTIVATED CROPS	DF DECIDUOUS FOREST	D/OS DEVELOPED OPEN SPACE	
EF EVERGREEN FOREST	S/SSHRUB SCRUB	D/LI DEVELOPED LOW INTENSITY	
H/P HAY PASTURE	MF MIXED FOREST	D/MI DEVELOPED MEDIUM INTENSITY	

SEGMENTABLE ELBOW	QTY
90 DEG, 5D, 18" OD, 0.375" WT, CS, x52, FBE COATING SYSTEM 2B	1
45 DEG, 5D, 18" OD, 0.375" WT, CS, x52, FBE COATING SYSTEM 2B	2

STAMP/SEAL

COMMONWEALTH OF MASSACHUSETTS CLAY H. WILLIS STRUCTURAL NO. 49136 REGISTERED PROFESSIONAL ENGINEER
10/23/26

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF:
BID REVIEW
IT IS NOT TO BE USED FOR: CONSTRUCTION, RECORDATION, CONVEYANCE, SALES, OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT

UNDER THE AUTHORITY OF:
PE NAME: CLAY WILLIS
PE STATE: MASSACHUSETTS
PE NUMBER 49136

SOILS

LAND USE

% SLOPE	5-15%	<5%	5-15%	<5%	5-15%	<5%	5-15%	<5%	5-15%	<5%	5-15%	<5%	5-15%	<5%	5-15%	<5%	5-15%	<5%

DWG. NO.	REFERENCE DWG.	REV	DATE	DSN	CK	DESCRIPTION
		F	01/29/26	TL	JL	RE-ISSUED FOR BID
		E	08/21/25	TL	JL	ISSUED FOR BID
SAGAMORE BRIDGE OVERBEND	OVERBEND PLAN AND PROFILE - SAGAMORE BRIDGE HDD	D	07/07/25	TL	JL	ISSUED FOR REVIEW (90% DESIGN)
CP-3	CATHODIC PROTECTION DESIGN	C	04/08/25	TL	RAL	ISSUED FOR REVIEW (60% DESIGN)
00051-M.200-0001	SAGAMORE M&R STATION - LOCATION MAP AND PLOT PLAN	B	02/26/24	LBJ	JL	ISSUED FOR REVIEW
SAGAMORE BRIDGE	SAGAMORE BRIDGE HORIZONTAL DIRECTIONAL DRILL	A	11/16/23	LBJ	JL	ISSUED FOR REVIEW

wood. WOOD GROUP USA, INC.

TITLE	INITIALS	DATE
DRAWN BY:	LBJ	02/19/24
DESIGN CHECKER:	TS	02/20/24
DESIGN ENGINEER:	PA	02/20/24
PROJECT MANAGER:	EL	02/20/24

ENBRIDGE
CAPE COD CANAL PIPELINE RELOCATION PROJECT
PROPOSED 18" G-24 PIPELINE
TITLE: ALIGNMENT SHEET

LOC.: BARNSTABLE COUNTY, MASSACHUSETTS

YEAR: 2026 | W.O.: AFE 30002835 | SCALE: 1" = 100' | DWG.: GSYS-P.500-0001 | REV.: F

Algonquin Gas Transmission
915 N. Eldridge Parkway, Houston, TX 77079-2703 (713) 627-5400

M:\259271\MAPPING\DRAWINGS\91-ALIGNMENT\RE-ISSUED FOR BID\259271-G_24

RIGHT-OF-WAY

TRACT NUMBERS

22+85			34+84
G-11-MA-BA-015.MS	G-24-MA-BA-001.5.RD CANAL ST	G-24-MA-BA-001.5.RD CANAL ST	
123 FT. 24+08	1000 FT.	34+08 76 FT.	

SURVEY DATA

SURVEY COMPANY:
FIELD BOOK:
PAGES:

22+85		34+84
24+15 GUARDRAIL 24+16 EDGE OF PAVEMENT 24+33 P.I. <58°04'07" LT. 24+69 DRAINAGE LINE 25+07 P.I. <37°25'07" LT. 25+04 P.I. <11°55'08" RT. 25+33 P.I. <05°55'43" LT. 25+49 P.I. <05°16'35" LT. 25+98 UTILITY LINE 26+44 P.I. <44°48'14" RT. 26+48 DRAINAGE LINE 26+58 P.I. <45°00'00" LT. 26+78 P.I. <45°00'00" LT. 26+83 P.I. <45°06'58" RT. 27+46 OH POWERLINE 27+81 DRAINAGE LINE 27+83 DRAINAGE LINE 27+92 P.I. <90°00'00" RT. 28+08 DRAINAGE LINE 28+35 UTILITY LINE 29+07 UTILITY LINE 29+15 UTILITY LINE 29+48 UTILITY LINE 30+49 DRAINAGE LINE 30+80 UTILITY LINE 32+33 OH POWERLINE 33+00 UTILITY LINE 33+14 P.I. <26°38' LT. 33+41 P.I. <26°14'24" LT. 33+51 OH POWERLINE 33+72 TELEPHONE LINE 33+79 DRAINAGE LINE 33+91 P.I. <44°45'29" LT. 34+30 TELEPHONE LINE 34+72 WATERLINE	34+84 END PIPELINE

CLASS LOCATION

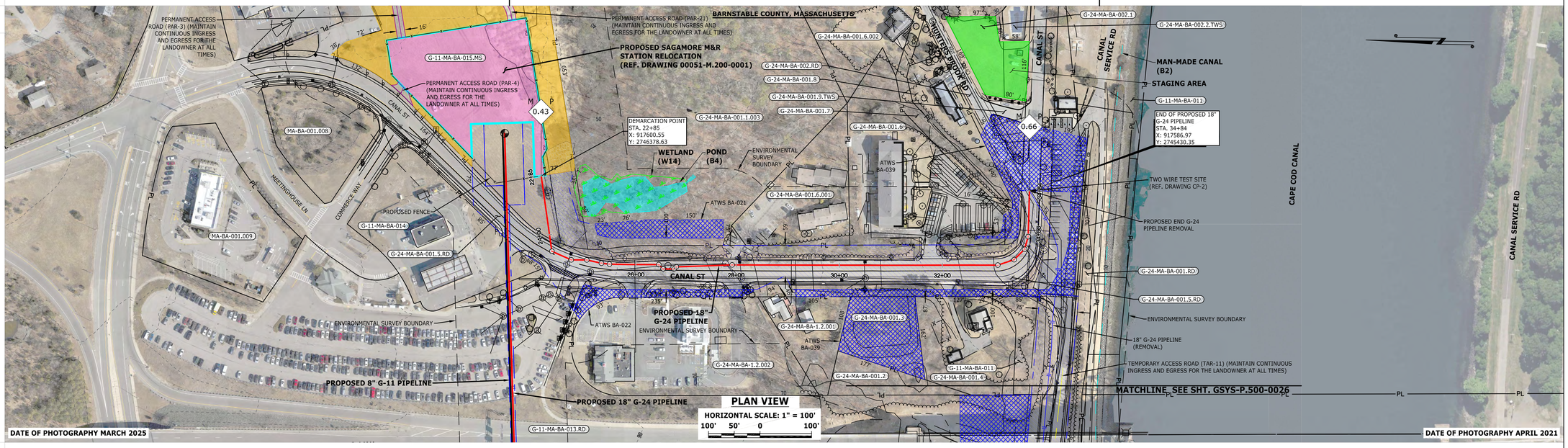
22+85		34+84
	CLASS 3	

PIPE MATERIAL

22+85		34+84
	18" O.D. X 0.375" W.T., API 5L, X-52, 16-20 MILS FBE 1199 FT.	

ALIGNMENT LEGEND

- PIPELINE MILEPOST
- PROPOSED G-24 PIPELINE
- PROPOSED G-11 PIPELINE
- 18" G-24 & 8" G-11 PIPELINES (TO BE REMOVED)
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- WAREYARD / STAGING AREA
- EXISTING PERMANENT ROW
- PROPOSED PERMANENT ROW
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- FACILITIES PERMANENT WORKSPACE
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- DELINEATED WATERBODY BANK
- DELINEATED WATERBODY CENTERLINE
- PERMANENT ACCESS ROAD
- TEMPORARY ACCESS ROAD
- PROPERTY LINE
- MAJOR CONTOUR
- MUNICIPALITY LINE
- ENVIRONMENTAL SURVEY BOUNDARY
- FENCE
- EXISTING AGT PIPELINE
- FOREIGN PIPELINE
- POWERLINE
- WATER PIPELINE
- RAILROAD TRACK
- OVERHEAD WIRE
- TELEPHONE LINE
- UTILITY LINES
- SANITARY SEWER
- TEE TAP
- BLOW OFF VALVE
- MAINLINE VALVE (MLV)
- POINT OF INTERSECTION
- BORE ENTRY/EXIT
- TRANSMISSION TOWER
- LIGHT POLE
- UTILITY POLE
- FIRE HYDRANT
- WELL (GAS)
- WELL (WATER)
- WELL (OIL)
- WELL (UNKNOWN)



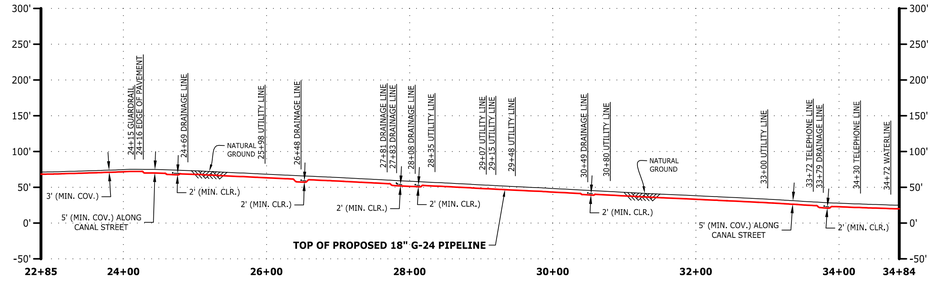
ENVIRONMENTAL DATA

E & S TYPICALS

E&S TYPICALS WILL BE USED AS A PLAN AND WILL HAVE FURTHER INPUT FROM ENVIRONMENTAL INSPECTOR.

PROFILE

HORIZONTAL SCALE: 1" = 100'
100' 50' 0 100'
VERTICAL SCALE: 1" = 100'
100' 50' 0 100'



THE LOCATION OF TRENCH PLUGS AND SLOPE BREAKERS ARE INTENDED TO BE USED AS A GUIDELINE ONLY. EXACT LOCATION TO BE DETERMINED IN THE FIELD.

SLOPE BREAKERS
TRENCH PLUG

PERMANENT SLOPE BREAKER & TRENCH PLUG SPACING

% SLOPE	SLOPE BREAKER SPACING (FT)	% SLOPE	TRENCH PLUG SPACING (FT)
5-15%	300 FT	<5%	NO STRUCTURE
15-30%	200 FT	5-15%	300 FT
>30%	100 FT	15-30%	200 FT
		>30%	100 FT

IN AG FIELDS AND RESIDENTIAL AREAS WHERE SLOPE BREAKERS ARE NOT TYPICALLY REQUIRED, INSTALL PERMANENT TRENCH PLUGS AT THE SAME SPACING AS IF PERMANENT SLOPE BREAKERS WERE REQUIRED. (FERC PLAN)

LAND USE CLASSIFICATION

CC CULTIVATED CROPS	DF DECIDUOUS FOREST	D/OS DEVELOPED OPEN SPACE	
EF EVERGREEN FOREST	S/S SHRUB SCRUB	D/LI DEVELOPED LOW INTENSITY	
H/P HAY PASTURE	MF MIXED FOREST	D/MI DEVELOPED MEDIUM INTENSITY	

SEGMENTABLE ELBOW	QTY
90 DEG, SD, 18" OD, 0.375" WT, CS, x52, FBE COATING SYSTEM 2B	1
45 DEG, SD, 18" OD, 0.375" WT, CS, x52, FBE COATING SYSTEM 2B	6

STAMP/SEAL

COMMONWEALTH OF MASSACHUSETTS CLAY H. WILLIS STRUCTURAL NO. 49136 REGISTERED PROFESSIONAL ENGINEER
5/6/25

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF:
BID REVIEW
IT IS NOT TO BE USED FOR: CONSTRUCTION, RECORDATION, CONVEYANCE, SALES, OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT

UNDER THE AUTHORITY OF:
PE NAME: CLAY WILLIS
PE STATE: MASSACHUSETTS
PE NUMBER 49136

SOILS																
LAND USE																
% SLOPE			5-15%		<5%		5-15%	<5%	5-15%	<5%	5-15%		<5%	5-15%		<5%

DWG. NO.	REFERENCE DWG.	REV	DATE	DSN	CK	DESCRIPTION
		D	01/29/26	TL	JL	RE-ISSUED FOR BID
		C	08/21/25	TL	JL	ISSUED FOR BID
CP-2	CATHODIC PROTECTION DESIGN	B	07/07/25	TL	JL	ISSUED FOR REVIEW (90% DESIGN)
00051-M.200-0001	SAGAMORE M&R STATION - LOCATION MAP AND PLOT PLAN	A	04/08/25	TL	RAL	ISSUED FOR REVIEW (60% DESIGN)

wood. WOOD GROUP USA, INC.

TITLE	INITIALS	DATE
DRAWN BY:	TL	03/31/25
DESIGN CHECKER:	JL	04/01/25
DESIGN ENGINEER:	PA	04/08/25
PROJECT MANAGER:	EL	04/08/25

ENBRIDGE
CAPE COD CANAL PIPELINE RELOCATION PROJECT
PROPOSED 18" G-24 PIPELINE
TITLE: ALIGNMENT SHEET

ENBRIDGE

Algonquin Gas Transmission
915 N. Eldridge Parkway, Houston, TX 77079-2703 (713) 627-5400

YEAR: 2026 | W.O.: AFE 30002835 | SCALE: 1" = 100' | DWG.: GSYS-P.500-0025 | REV.: D

M:\259271\MAPPING\DRAWINGS\91-ALIGNMENT\RE-ISSUED FOR BID\259271-G_24

RIGHT-OF-WAY

TRACT NUMBERS

SURVEY DATA

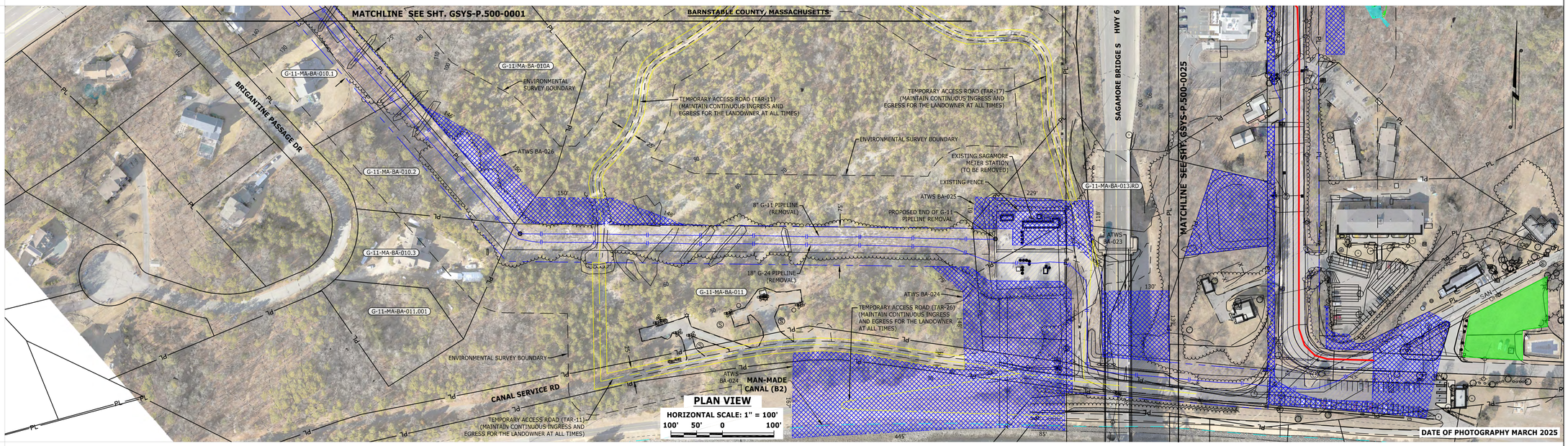
SURVEY COMPANY:
FIELD BOOK:
PAGES:

CLASS LOCATION

PIPE MATERIAL

ALIGNMENT LEGEND

- PIPELINE MILEPOST
- PROPOSED G-24 PIPELINE
- PROPOSED G-11 PIPELINE
- 18" G-24 & 8" G-11 PIPELINES (TO BE REMOVED)
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- FACILITIES TEMPORARY WORKSPACE
- FACILITIES PERMANENT WORKSPACE
- PROPOSED GRAVEL AREA
- DELINEATED WETLAND BOUNDARY
- DELINEATED WATERBODY BANK
- DELINEATED WATERBODY CENTERLINE
- PERMANENT ACCESS ROAD
- TEMPORARY ACCESS ROAD
- PROPERTY LINE
- MAJOR CONTOUR
- MUNICIPALITY LINE
- ENVIRONMENTAL SURVEY BOUNDARY
- FENCE
- EXISTING AGT PIPELINE
- FOREIGN PIPELINE
- POWERLINE
- WATER PIPELINE
- RAILROAD TRACK
- OVERHEAD WIRE
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- MAINLINE VALVE (MLV)
- POINT OF INTERSECTION
- BORE ENTRY/EXIT
- TRANSMISSION TOWER
- LIGHT POLE
- UTILITY POLE
- FIRE HYDRANT
- WELL (GAS)
- WELL (WATER)
- WELL (OIL)
- WELL (UNKNOWN)



ENVIRONMENTAL DATA

E & S TYPICALS

E&S TYPICALS WILL BE USED AS A PLAN AND WILL HAVE FURTHER INPUT FROM ENVIRONMENTAL INSPECTOR.

PROFILE

HORIZONTAL SCALE: 1" = 100'
100' 50' 0 100'
VERTICAL SCALE: 1" = 100'
100' 50' 0 100'

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SLOPE BREAKERS
TRENCH PLUG

PERMANENT SLOPE BREAKER & TRENCH PLUG SPACING

% SLOPE	SLOPE BREAKER SPACING (FT)	% SLOPE	TRENCH PLUG SPACING (FT)
5-15%	300 FT	<5%	NO STRUCTURE
15-30%	200 FT	5-15%	300 FT
>30%	100 FT	15-30%	200 FT
		>30%	100 FT

IN AG FIELDS AND RESIDENTIAL AREAS WHERE SLOPE BREAKERS ARE NOT TYPICALLY REQUIRED, INSTALL PERMANENT TRENCH PLUGS AT THE SAME SPACING AS IF PERMANENT SLOPE BREAKERS WERE REQUIRED. (FERC PLAN)

LAND USE CLASSIFICATION

CC CULTIVATED CROPS DF DECIDUOUS FOREST D/OS DEVELOPED OPEN SPACE
EF EVERGREEN FOREST S/S SHRUB SCRUB D/LI DEVELOPED LOW INTENSITY
H/P HAY PASTURE MF MIXED FOREST D/MI DEVELOPED MEDIUM INTENSITY

SOILS

LAND USE

% SLOPE

STAMP/SEAL

COMMONWEALTH OF MASSACHUSETTS
CLAY H. WILLIS
STRUCTURAL
NO. 49136
REGISTERED PROFESSIONAL ENGINEER
01/23/26

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BID REVIEW
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UNDER THE AUTHORITY OF:
PE NAME: CLAY WILLIS
PE STATE: MASSACHUSETTS
PE NUMBER 49136

DWG. NO.	REFERENCE DWG.	REV	DATE	DSN	CK	DESCRIPTION
		D	01/29/26	TL	JL	RE-ISSUED FOR BID
		C	08/21/25	TL	JL	ISSUED FOR BID
		B	07/07/25	TL	JL	ISSUED FOR REVIEW (90% DESIGN)
		A	04/08/25	TL	RAL	ISSUED FOR REVIEW (60% DESIGN)

wood.
WOOD GROUP USA, INC.

TITLE	INITIALS	DATE
DRAWN BY:	TL	03/31/25
DESIGN CHECKER:	JL	04/01/25
DESIGN ENGINEER:	PA	04/08/25
PROJECT MANAGER:	EL	04/08/25

ENBRIDGE
CAPE COD CANAL PIPELINE RELOCATION PROJECT
PROPOSED 18" G-24 PIPELINE
TITLE: ALIGNMENT SHEET
LOC.: BARNSTABLE COUNTY, MASSACHUSETTS
YEAR: 2026 | W.O.: AFE 30002835 | SCALE: 1" = 100' | DWG.: GSYS-P.500-0026 | REV.: D

ENBRIDGE
Algonquin Gas Transmission
915 N. Eldridge Parkway, Houston, TX 77079-2703 (713) 627-5400

M:\259271\MAPPING\DRAWINGS\91-ALIGNMENT\RE-ISSUED FOR BID\259271-G_24

RIGHT-OF-WAY

TRACT NUMBERS

0+00		17+00
G-31-MA-BA-001.004	G-31-MA-BA-001	
36 FT.	1664 FT.	
0+36		

SURVEY DATA

SURVEY COMPANY:
FIELD BOOK:
PAGES:

0+00 BEGIN PIPELINE		17+00
0+11 P.I. <44°59'57" RT.	15+98 P.I. <45°00'00" RT.	
0+39 TREE LINE 0+44 P.I. <45°01'28" LT.	16+62 OH POWERLINE 16+72 EDGE OF GRAVEL 16+76 PERMANENT ACCESS ROAD (PAR-12)	
1+31 WALL	16+81 OH POWERLINE 16+91 EDGE OF GRAVEL	
1+92 OH POWERLINE 2+05 OH POWERLINE 2+34 OH POWERLINE 2+34 EDGE OF GRAVEL 2+41 PERMANENT ACCESS ROAD (PAR-12) 2+51 EDGE OF GRAVEL 2+79 OH POWERLINE 3+02 OH POWERLINE	16+92 ROSE ENTRY	
3+24 OH POWERLINE		
4+03 P.I. <28°41'33" RT. 4+28 8" AGT PIPELINE (UNKNOWN COVER, FIELD VERIFY) 4+55 18" AGT PIPELINE (UNKNOWN COVER, FIELD VERIFY)		

CLASS LOCATION

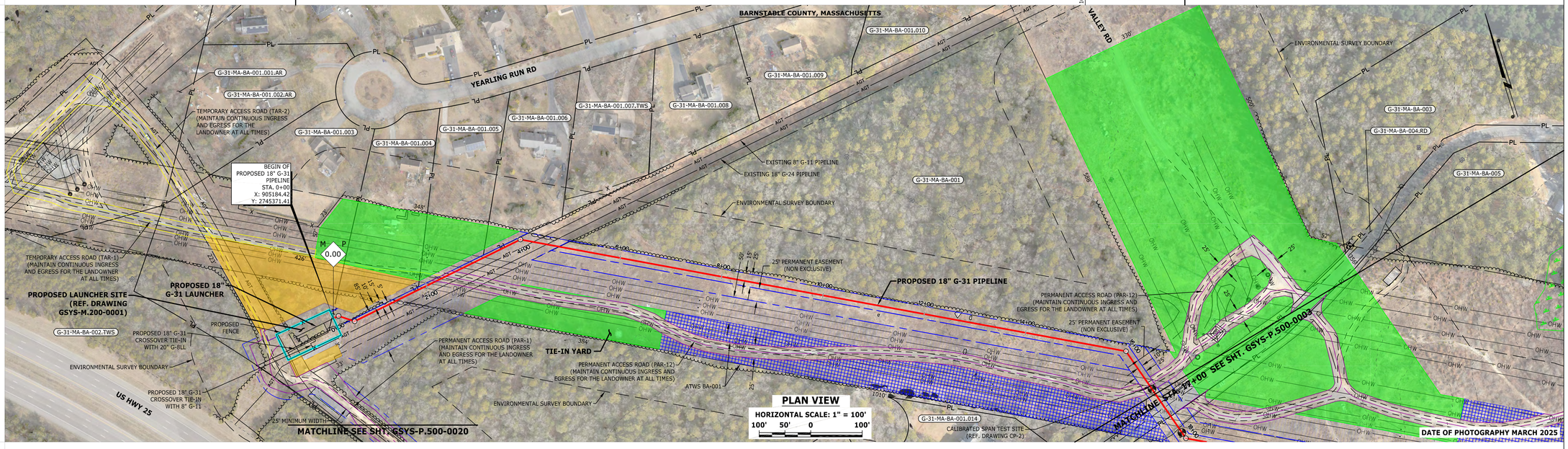
0+00	CLASS 2	17+00

PIPE MATERIAL

0+00		16+87		17+00
18" O.D. X 0.375" W.T., API 5L, X-52, 16-20 MILS FBE			18" O.D. X 0.500" W.T., API 5L, X-52, 16-20 MILS FBE + 24 MILS ARO	
1687 FT.			13 FT. (BORE)	

ALIGNMENT LEGEND

- PIPELINE MILEPOST
- PROPOSED G-31 PIPELINE
- PROPOSED G-32 PIPELINE
- CONSTRUCTION LIMIT
- WAREYARD / STAGING AREA
- EXISTING PERMANENT ROW
- PROPOSED PERMANENT ROW
- ADDITIONAL TEMPORARY WORKSPACE
- PROPOSED METERING & REGULATING STATION (M&R) SITE / PIG TRAP SITE
- FACILITIES TEMPORARY WORKSPACE
- FACILITIES PERMANENT WORKSPACE
- PROPOSED GRAVEL AREA
- DELINEATED WETLAND BOUNDARY
- DELINEATED WATERBODY BANK
- DELINEATED WATERBODY CENTERLINE
- PERMANENT ACCESS ROAD
- TEMPORARY ACCESS ROAD
- PROPERTY LINE
- MAJOR CONTOUR
- MUNICIPALITY LINE
- ENVIRONMENTAL SURVEY BOUNDARY
- FENCE
- EXISTING AGT PIPELINE
- FOREIGN PIPELINE
- POWERLINE
- WATER PIPELINE
- RAILROAD TRACK
- OVERHEAD WIRE
- TELEPHONE LINE
- UTILITY LINES
- SANITARY SEWER
- TEE TAP
- BLOW OFF VALVE
- MAINLINE VALVE (MLV)
- POINT OF INTERSECTION
- BORE ENTRY/EXIT
- TRANSMISSION TOWER
- LIGHT POLE
- UTILITY POLE
- FIRE HYDRANT
- WELL (GAS)
- WELL (WATER)
- WELL (OIL)
- WELL (UNKNOWN)



PLAN VIEW

HORIZONTAL SCALE: 1" = 100'

100' 50' 0 100'

ENVIRONMENTAL DATA

E & S TYPICALS

E&S TYPICALS WILL BE USED AS A PLAN AND WILL HAVE FURTHER INPUT FROM ENVIRONMENTAL INSPECTOR.

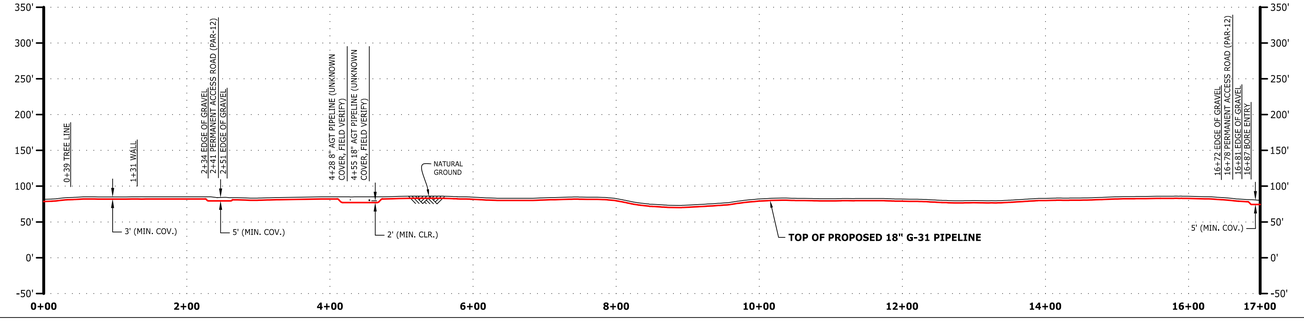
PROFILE

HORIZONTAL SCALE: 1" = 100'

100' 50' 0 100'

VERTICAL SCALE: 1" = 100'

100' 50' 0 100'



THE LOCATION OF TRENCH PLUGS AND SLOPE BREAKERS ARE INTENDED TO BE USED AS A GUIDELINE ONLY. EXACT LOCATION TO BE DETERMINED IN THE FIELD.

SLOPE BREAKERS
TRENCH PLUG

PERMANENT SLOPE BREAKER & TRENCH PLUG SPACING

% SLOPE	SLOPE BREAKER SPACING (FT)	% SLOPE	TRENCH PLUG SPACING (FT)
5-15%	300 FT	<5%	NO STRUCTURE
15-30%	200 FT	5-15%	300 FT
>30%	100 FT	15-30%	200 FT
		>30%	100 FT

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LAND USE CLASSIFICATION

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EF EVERGREEN FOREST S/S/SHRUB SCRUB D/LI DEVELOPED LOW INTENSITY
H/P HAY PASTURE MF MIXED FOREST D/MI DEVELOPED MEDIUM INTENSITY

SEGMENTABLE ELBOW	QTY
90 DEG, SD, 18" OD, 0.375" WT, CS, x52, FBE COATING SYSTEM 2B	0
45 DEG, SD, 18" OD, 0.375" WT, CS, x52, FBE COATING SYSTEM 2B	8

SOILS																			
LAND USE																			
% SLOPE	5-15%		<5%				5-15%	<5%	5-15%	<5%	5-15%	15-30%	5-15%	<5%	5-15%		<5%	5-15%	<5%

STAMP/SEAL

CLAY H. WILLIS STRUCTURAL NO. 49136 REGISTERED PROFESSIONAL ENGINEER
06/23/26

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PE NUMBER 49136

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		E	08/21/25	TL	JL	ISSUED FOR BID
		D	07/07/25	TL	JL	ISSUED FOR REVIEW (90% DESIGN)
GSYS-C.300-0002	ACCESS ROAD PLAN AND PROFILE	C	04/08/25	TL	RAL	ISSUED FOR REVIEW (60% DESIGN)
CP-2	CATHODIC PROTECTION DESIGN	B	02/26/24	LBJ	JL	ISSUED FOR REVIEW
GSYS-M.200-0001	SITE PLAN - G-31 LAUNCHER TRAP	A	11/16/23	LBJ	JL	ISSUED FOR REVIEW

wood.
WOOD GROUP USA, INC.

	INITIALS	DATE
DRAWN BY:	LBJ	02/26/24
DESIGN CHECKER:	JL	02/26/24
DESIGN ENGINEER:	PA	02/26/24
PROJECT MANAGER:	EL	02/26/24

ENBRIDGE

CAPE COD CANAL PIPELINE RELOCATION PROJECT
PROPOSED 18" G-31 PIPELINE
TITLE: ALIGNMENT SHEET

LOC.: BARNSTABLE COUNTY, MASSACHUSETTS

YEAR: 2026 W.O.: AFE 30002835 SCALE: 1" = 100'

Algonquin Gas Transmission
915 N. Eldridge Parkway, Houston, TX 77079-2703 (713) 627-5400

DWG.: GSYS-P.500-0002 REV.: F

M:\259271\MAPPING\DRAWINGS\ALIGNMENT\RE-ISSUED FOR BID\259271-C_01

RIGHT-OF-WAY

TRACT NUMBERS

17+00	G-31-MA-BA-001	17+18	G-31-MA-BA-004.RD BOURNEDALE RD	17+51	G-31-MA-BA-005	29+56	G-31-MA-BA-007	34+05	G-31-MA-BA-008	35+13	G-31-MA-BA-007	41+00
	18 FT.		33 FT.		1205 FT.		449 FT.		208 FT.		487 FT.	

SURVEY DATA

SURVEY COMPANY:
FIELD BOOK:
PAGES:

17+00
17+10 OH POWERLINE
17+18 CHAINLINK WOOD
17+18 EDGE OF GRAVEL
17+21 CL BOURNEDALE RD
17+43 OH POWERLINE
17+43 OH POWERLINE
17+79 GUARDRAIL - WOOD
17+79 GUARDRAIL
17+89 BORE EXIT
18+11 P.I. <45°00'00" LT.

35+26 P.I. <90°00'00" LT.
35+43 OH POWERLINE
35+60 OH POWERLINE
35+60 OH POWERLINE
35+88 TEMPORARY ACCESS ROAD (TAR-4)
35+88 EDGE OF GRAVEL
36+01 OH POWERLINE
36+11 OH POWERLINE
36+71 OH POWERLINE
36+94 OH POWERLINE
37+45 P.I. <65°38'53" RT.
37+74 OH POWERLINE
38+13 OH POWERLINE
38+56 EDGE OF GRAVEL
38+69 PERMANENT ACCESS ROAD (PAR-20)
38+82 EDGE OF GRAVEL
39+39 OH POWERLINE
40+10 OH POWERLINE
40+63 OH POWERLINE

41+00

CLASS LOCATION

17+00 — CLASS 2 — 20+80 — CLASS 1 — 41+00

PIPE MATERIAL

17+00 — 18" O.D. X 0.500" W.T., API 5L, X-52, 16-20 MILS FBE + 24 MILS ARO — 17+89

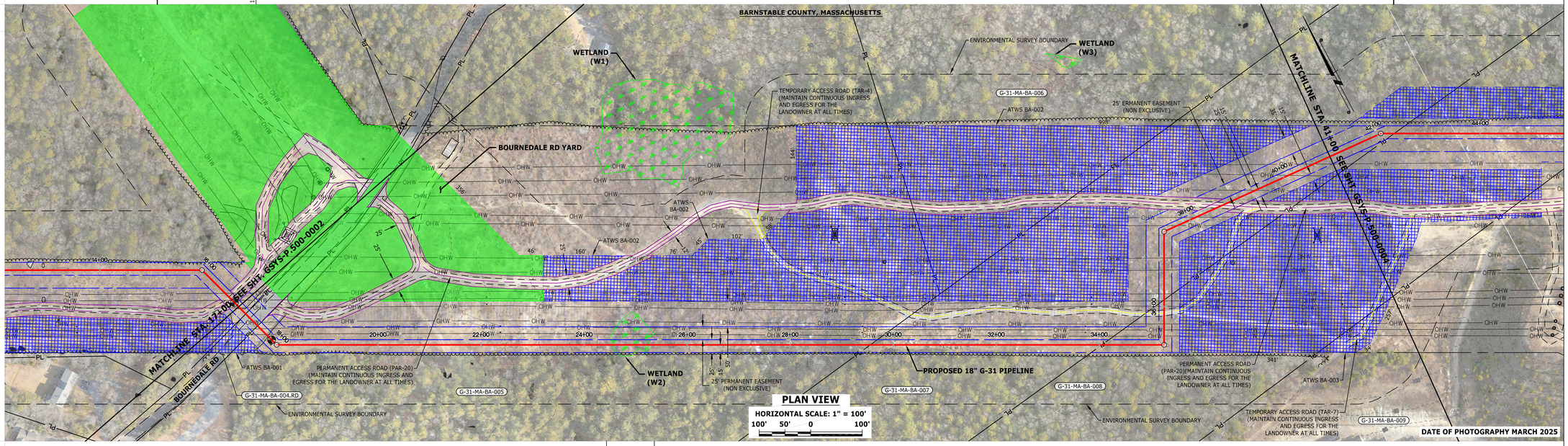
89 FT. (BORE)

18" O.D. X 0.375" W.T., API 5L, X-52, 16-20 MILS FBE — 41+00

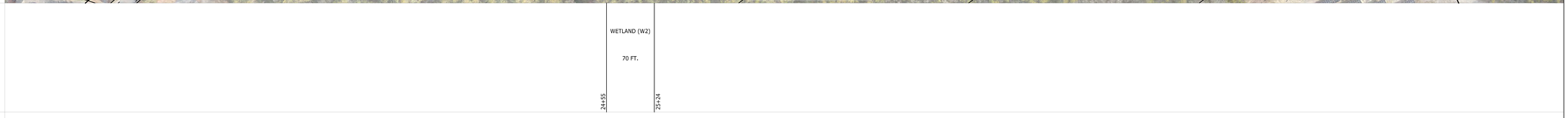
2311 FT.

ALIGNMENT LEGEND

- PIPELINE MILEPOST
- PROPOSED G-31 PIPELINE
- PROPOSED G-32 PIPELINE
- CONSTRUCTION LIMIT
- WAREYARD / STAGING AREA
- EXISTING PERMANENT ROW
- PROPOSED PERMANENT ROW
- ADDITIONAL TEMPORARY WORKSPACE
- PROPOSED METERING & REGULATING STATION (M&R) SITE / PIG TRAP SITE
- FACILITIES TEMPORARY WORKSPACE
- FACILITIES PERMANENT WORKSPACE
- PROPOSED GRAVEL AREA
- DELINEATED WETLAND BOUNDARY
- DELINEATED WATERBODY BANK
- DELINEATED WATERBODY CENTERLINE
- PERMANENT ACCESS ROAD
- TEMPORARY ACCESS ROAD
- PROPERTY LINE — PL
- MAJOR CONTOUR — -100'-
- MUNICIPALITY LINE
- ENVIRONMENTAL SURVEY BOUNDARY
- FENCE — X —
- EXISTING AGT PIPELINE — AGT —
- FOREIGN PIPELINE — F —
- POWERLINE — P —
- WATER PIPELINE — W —
- RAILROAD TRACK — T —
- OVERHEAD WIRE — OHW —
- TELEPHONE LINE — C —
- UTILITY LINES
- SANITARY SEWER — SAN —
- TEE TAP
- BLOW OFF VALVE
- MAINLINE VALVE (MLV)
- POINT OF INTERSECTION
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- TRANSMISSION TOWER
- LIGHT POLE
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- FIRE HYDRANT
- WELL (GAS)
- WELL (WATER)
- WELL (OIL)
- WELL (UNKNOWN)



ENVIRONMENTAL DATA



E & S TYPICALS

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PROFILE

HORIZONTAL SCALE: 1" = 100'
100' 50' 0 100'
VERTICAL SCALE: 1" = 100'
100' 50' 0 100'

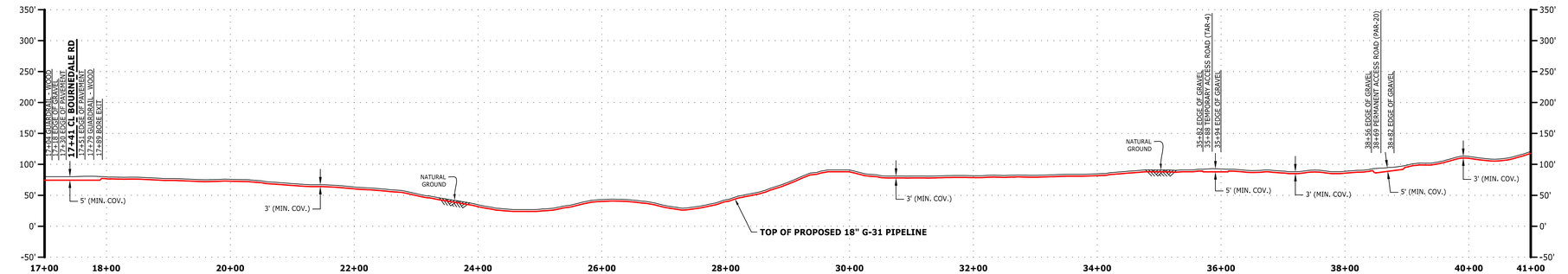
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SLOPE BREAKERS ○
TRENCH PLUG ▲

PERMANENT SLOPE BREAKER & TRENCH PLUG SPACING

% SLOPE	SLOPE BREAKER SPACING (FT)	% SLOPE	TRENCH PLUG SPACING (FT)
5-15%	300 FT	<5%	NO STRUCTURE
15-30%	200 FT	5-15%	300 FT
>30%	100 FT	15-30%	200 FT
		>30%	100 FT

IN AG FIELDS AND RESIDENTIAL AREAS WHERE SLOPE BREAKERS ARE NOT TYPICALLY REQUIRED, INSTALL PERMANENT TRENCH PLUGS AT THE SAME SPACING AS IF PERMANENT SLOPE BREAKERS WERE REQUIRED. (FERC PLAN)



LAND USE CLASSIFICATION

CC CULTIVATED CROPS DF DECIDUOUS FOREST D/OS DEVELOPED OPEN SPACE
EF EVERGREEN FOREST S/SSHRUB SCRUB D/LI DEVELOPED LOW INTENSITY
H/P HAY PASTURE MF MIXED FOREST D/MI DEVELOPED MEDIUM INTENSITY

SEGMENTABLE ELBOW	QTY
90 DEG, SD, 18" OD, 0.375" WT, CS, x52, FBE COATING SYSTEM 2B	2
45 DEG, SD, 18" OD, 0.375" WT, CS, x52, FBE COATING SYSTEM 2B	3

SOILS																													
LAND USE																													
% SLOPE	<5%	5-15%	<5%	5-15%	15-30%	5-15%	<5%	5-15%	15-30%	<5%	5-15%	15-30%	>30%	<5%	15-30%	5-15%	15-30%	5-15%	<5%	5-15%	15-30%	5-15%	15-30%						

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PE STATE: MASSACHUSETTS
PE NUMBER: 49136

COMMONWEALTH OF MASSACHUSETTS — CLAY H. WILLIS — STRUCTURAL — NO. 49136 — REGISTERED PROFESSIONAL ENGINEER — 01/23/26

DWG. NO.	REFERENCE DWG.	REV	DATE	DSN	CK	DESCRIPTION
		F	01/29/26	TL	JL	RE-ISSUED FOR BID
		E	08/21/25	TL	JL	ISSUED FOR BID
		D	07/07/25	TL	JL	ISSUED FOR REVIEW (90% DESIGN)
		C	04/08/25	TL	RAL	ISSUED FOR REVIEW (60% DESIGN)
		B	02/26/24	LBJ	JL	ISSUED FOR REVIEW
		A	11/16/23	LBJ	JL	ISSUED FOR REVIEW

wood. WOOD GROUP USA, INC.

DRAWN BY:	LBJ	02/26/24	ENBRIDGE
DESIGN CHECKER:	JL	02/26/24	CAPE COD CANAL PIPELINE RELOCATION PROJECT
DESIGN ENGINEER:	PA	02/26/24	PROPOSED 18" G-31 PIPELINE
PROJECT MANAGER:	EL	02/26/24	TITLE: ALIGNMENT SHEET
TITLE	INITIALS	DATE	LOC.: BARNSTABLE COUNTY, MASSACHUSETTS

ENBRIDGE

Algonquin Gas Transmission
915 N. Eldridge Parkway, Houston, TX 77079-2703 (713) 627-5400

YEAR: 2026 | W.O.: AFE 30002835 | SCALE: 1" = 100' | DWG.: GSYS-P.500-0003 | REV.: F

M:\29271\MAPPING\DRAWINGS\P1-ALIGNMENT\RE-ISSUED FOR BID\29271-G-31

RIGHT-OF-WAY

TRACT NUMBERS

41+00	G-31-MA-BA-007 133 FT. (42+33)	G-31-MA-BA-008 409 FT. (46+42)	G-31-MA-BA-009 1858 FT.	65+00

SURVEY DATA

SURVEY COMPANY:
FIELD BOOK:
PAGES:

41+00

- 42+07 P.I. <24°21'07" RT.
- 46+20 P.I. <33°22'54" RT.
- 46+79 EDGE OF GRAVEL
- 46+85 TEMPORARY ACCESS ROAD (TAR-3)
- 46+92 EDGE OF GRAVEL
- 47+52 EDGE OF GRAVEL
- 47+60 EDGE OF GRAVEL
- 47+93 OH POWERLINE
- 48+79 OH POWERLINE
- 49+33 OH POWERLINE
- 50+04 P.I. <68°09'05" LT.
- 50+38 OH POWERLINE
- 50+59 OH POWERLINE
- 50+99 EDGE OF GRAVEL
- 51+04 OH POWERLINE
- 51+05 EDGE OF GRAVEL
- 55+22 P.I. <20°32'07" RT.
- 56+25 P.I. <19°44'30" RT.
- 56+96 EDGE OF GRAVEL
- 57+29 PERMANENT ACCESS ROAD (PAR-10)
- 57+53 EDGE OF GRAVEL
- 59+44 P.I. <06°23'22" RT.
- 59+44 HDD ENTRY
- 64+56 EDGE OF PAVEMENT
- 64+68 PERMANENT ACCESS ROAD (PAR-10)
- 64+79 EDGE OF PAVEMENT

65+00

CLASS LOCATION

41+00 CLASS 1 65+00

PIPE MATERIAL

41+00

18" O.D. X 0.375" W.T., API 5L, X-52, 16-20 MILS FBE
1844 FT.

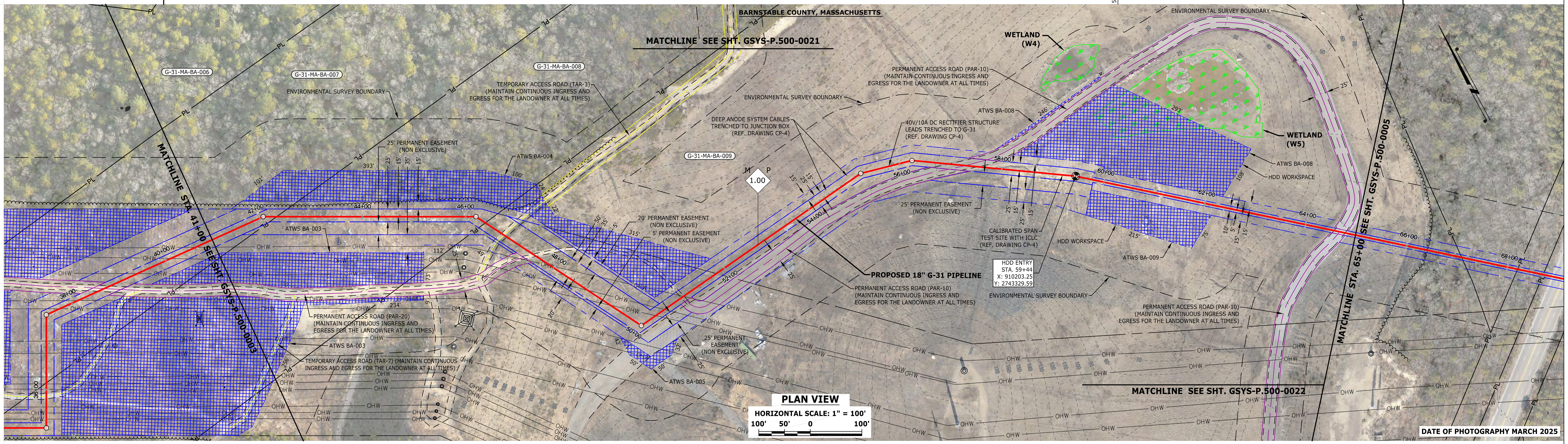
59+44

18" O.D. X 0.500" W.T., API-5L, X-52, 16-20 MILS FBE + 24 MILS ARO
556 FT.
(HDD)

65+00

ALIGNMENT LEGEND

- PIPELINE MILEPOST
- PROPOSED G-31 PIPELINE
- PROPOSED G-32 PIPELINE
- CONSTRUCTION LIMIT
- WAREYARD / STAGING AREA
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- DELINEATED WATERBODY BANK
- DELINEATED WATERBODY CENTERLINE
- PERMANENT ACCESS ROAD
- TEMPORARY ACCESS ROAD
- PROPERTY LINE — PL
- MAJOR CONTOUR — 100'
- MUNICIPALITY LINE
- ENVIRONMENTAL SURVEY BOUNDARY
- FENCE — X
- EXISTING AGT PIPELINE — AGT
- FOREIGN PIPELINE — ||
- POWERLINE — P
- WATER PIPELINE — W
- RAILROAD TRACK
- OVERHEAD WIRE — OHW
- TELEPHONE LINE — C
- UTILITY LINES
- SANITARY SEWER — SAN
- TEE TAP
- BLOW OFF VALVE
- MAINLINE VALVE (MLV)
- POINT OF INTERSECTION
- BORE ENTRY/EXIT
- TRANSMISSION TOWER
- LIGHT POLE
- UTILITY POLE
- FIRE HYDRANT
- WELL (GAS) — GV
- WELL (WATER) — WV
- WELL (OIL) — OIL
- WELL (UNKNOWN) — UNK



ENVIRONMENTAL DATA

E & S TYPICALS

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PROFILE

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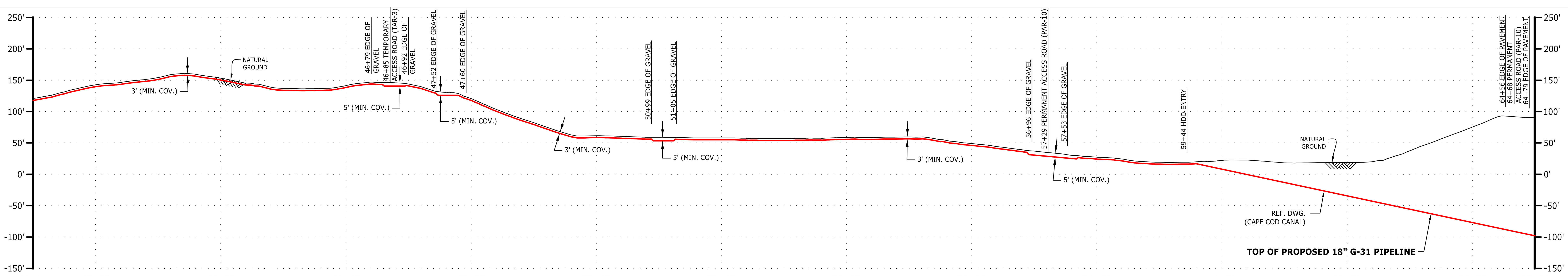
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TRENCH PLUG ▲

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% SLOPE	SLOPE BREAKER SPACING (FT)	% SLOPE	TRENCH PLUG SPACING (FT)
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EF EVERGREEN FOREST	S/S SHRUB SCRUB	D/LI DEVELOPED LOW INTENSITY
H/P HAY PASTURE	MF MIXED FOREST	D/MI DEVELOPED MEDIUM INTENSITY

SOILS

LAND USE

% SLOPE: 15-30% | 5-15% | 15-30% | >30% | 5-15% | 15-30% | 5-15% | 15-30% | >30% | <5% | 5-15% | <5% | 5-15% | 15-30% | >30% | 15-30% | 5-15% | 15-30% | 5-15% | <5% | 5-15% | <5% | >30% | 5-15%

SEGMENTABLE ELBOW	QTY
90 DEG, 5D, 18" OD, 0.375" WT, CS, x52, FBE COATING SYSTEM 2B	1
45 DEG, 5D, 18" OD, 0.375" WT, CS, x52, FBE COATING SYSTEM 2B	2

STAMP/SEAL

COMMONWEALTH OF MASSACHUSETTS — CLAY H. WILLIS — STRUCTURAL — NO. 49136 — REGISTERED PROFESSIONAL ENGINEER
06/23/26

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PE NUMBER 49136

DWG. NO.	REFERENCE DWG.
CP-4	CATHODIC PROTECTION DESIGN
CAPE COD CANAL	CAPE COD CANAL HORIZONTAL DIRECTIONAL DRILL

REV	DATE	DSN	CK	DESCRIPTION
F	01/29/26	TL	JL	RE-ISSUED FOR BID
E	08/21/25	TL	JL	ISSUED FOR BID
D	07/07/25	TL	JL	ISSUED FOR REVIEW (90% DESIGN)
C	04/08/25	TL	RAL	ISSUED FOR REVIEW (60% DESIGN)
B	02/26/24	LBJ	JL	ISSUED FOR REVIEW
A	11/16/23	LBJ	JL	ISSUED FOR REVIEW

wood.
WOOD GROUP USA, INC.

TITLE	INITIALS	DATE
DRAWN BY:	LBJ	02/26/24
DESIGN CHECKER:	JL	02/26/24
DESIGN ENGINEER:	PA	02/26/24
PROJECT MANAGER:	EL	02/26/24

ENBRIDGE
CAPE COD CANAL PIPELINE RELOCATION PROJECT
PROPOSED 18" G-31 PIPELINE
TITLE: ALIGNMENT SHEET

LOC.: BARNSTABLE COUNTY, MASSACHUSETTS

YEAR: 2026 | W.O.: AFE 30002835 | SCALE: 1" = 100' | DWG.: GSYS-P.500-0004 | REV.: F

ENBRIDGE
Algonquin Gas Transmission
915 N. Eldridge Parkway, Houston, TX 77079-2703 (713) 627-5400

M:\259271\MAPPING\DRAWINGS\91-ALIGNMENT\RE-ISSUED FOR BID\259271-G-31

RIGHT-OF-WAY

TRACT NUMBERS

65+00	G-31-MA-BA-009	G-31-MA-BA-012	G-31-MA-BA-013.RD	G-31-MA-BA-013.RD	G-31-MA-BA-014	G-31-MA-BA-016.WC	G-31-MA-BA-018	G-31-MA-BA-018	G-31-MA-BA-021	G-31-MA-BA-022.01.RD	G-31-MA-BA-021	G-31-MA-BA-023	89+00
	209 FT.	111 FT.	51 FT.	81 FT.	330 FT.	598 FT.	46 FT.	96 FT.	150 FT.	18 FT.	77 FT.	633 FT.	
	67+09	68+20	68+71	69+52	72+82	78+80	79+26	80+22	81+72	81+90	82+67		

SURVEY DATA

SURVEY COMPANY:
FIELD BOOK:
PAGES:

65+00

66+38 TREE LINE

69+07 CL SENIC HWY 6

70+70 P.C. <12°42'10" LT.

71+17 TREE LINE
71+17 TOP OF SLOPE
71+32 OH POWERLINE
71+33 TOE OF SLOPE
71+36 EDGE OF PAVEMENT
71+42 CL CANAL SERVICE RD
71+49 EDGE OF PAVEMENT
71+53 TOP OF SLOPE
71+64 HIGH TIDE LINE
71+66 RIP-RAP
71+77 EDGE OF WATER
71+78 MEAN HIGH WATER
71+94 MEAN LOW WATER

73+10 LIMITS OF FEDERAL CHANNEL

73+56 OH POWERLINE

77+98 LIMITS OF FEDERAL CHANNEL

78+91 MEAN LOW WATER
79+10 EDGE OF WATER
79+12 MEAN HIGH WATER
79+23 HIGH TIDE LINE
79+24 RIP-RAP
79+37 TOP OF SLOPE
79+42 EDGE OF PAVEMENT
79+57 EDGE OF PAVEMENT
79+60 TOE OF SLOPE
79+76 TREE LINE

80+26 OH POWERLINE
80+47 TREE LINE
80+54 TOE OF SLOPE
80+62 CL MASS COASTAL RAILROAD
80+74 TOE OF SLOPE
80+79 TREE LINE
80+90 P.T. <12°42'10" LT.
81+18 TREE LINE

81+88 TREE LINE
81+93 GUARDRAIL
81+98 EDGE OF PAVEMENT

82+35 EDGE OF PAVEMENT
82+44 OH POWERLINE
82+47 TOE OF SLOPE
82+50 TREE LINE

86+06 EDGE OF PAVEMENT
86+13 PERMANENT ACCESS ROAD (PAR-13)
86+19 EDGE OF PAVEMENT

89+00

CLASS LOCATION

65+00 CLASS 1 86+80 CLASS 1 89+00

PIPE MATERIAL

65+00

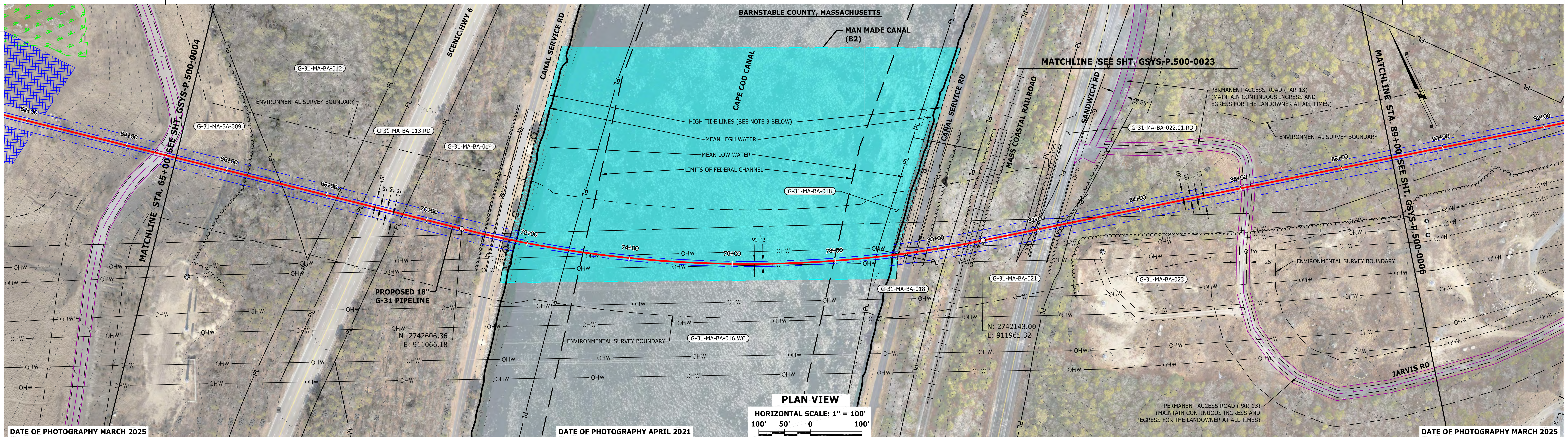
18" O.D. X 0.500" W.T., API-5L, X-52, 16-20 MILS FBE + 24 MILS ARO

2400 FT.
(HDD)

89+00

ALIGNMENT LEGEND

- PIPELINE MILEPOST
- PROPOSED G-31 PIPELINE
- PROPOSED G-32 PIPELINE
- CONSTRUCTION LIMIT
- WAREYARD / STAGING AREA
- EXISTING PERMANENT ROW
- PROPOSED PERMANENT ROW
- ADDITIONAL TEMPORARY WORKSPACE
- PROPOSED METERING & REGULATING STATION (M&R) SITE / PIG TRAP SITE
- FACILITIES TEMPORARY WORKSPACE
- FACILITIES PERMANENT WORKSPACE
- PROPOSED GRAVEL AREA
- DELINEATED WETLAND BOUNDARY
- DELINEATED WATERBODY BANK
- DELINEATED WATERBODY CENTERLINE
- PERMANENT ACCESS ROAD
- TEMPORARY ACCESS ROAD
- PROPERTY LINE —PL—
- MAJOR CONTOUR - - -100'- - -
- MUNICIPALITY LINE
- ENVIRONMENTAL SURVEY BOUNDARY
- FENCE —X—
- EXISTING AGT PIPELINE —AGT—
- FOREIGN PIPELINE —||—
- POWERLINE —P—
- WATER PIPELINE —W—
- RAILROAD TRACK —|—
- OVERHEAD WIRE —OHW—
- TELEPHONE LINE — —C— —
- UTILITY LINES
- SANITARY SEWER —SAN—
- TEE TAP
- BLOW OFF VALVE
- MAINLINE VALVE (MLV)
- POINT OF INTERSECTION
- BORE ENTRY/EXIT
- TRANSMISSION TOWER
- LIGHT POLE
- UTILITY POLE
- FIRE HYDRANT
- WELL (GAS)
- WELL (WATER)
- WELL (OIL)
- WELL (UNKNOWN)



ENVIRONMENTAL DATA

CAPE COD CANAL (B2)

759 FT.

71+64 — 79+23

E & S TYPICALS

E&S TYPICALS WILL BE USED AS A PLAN AND WILL HAVE FURTHER INPUT FROM ENVIRONMENTAL INSPECTOR.

PROFILE

HORIZONTAL SCALE: 1" = 100'
100' 50' 0 100'

VERTICAL SCALE: 1" = 100'
100' 50' 0 100'

THE LOCATION OF TRENCH PLUGS AND SLOPE BREAKERS ARE INTENDED TO BE USED AS A GUIDELINE ONLY. EXACT LOCATION TO BE DETERMINED IN THE FIELD.

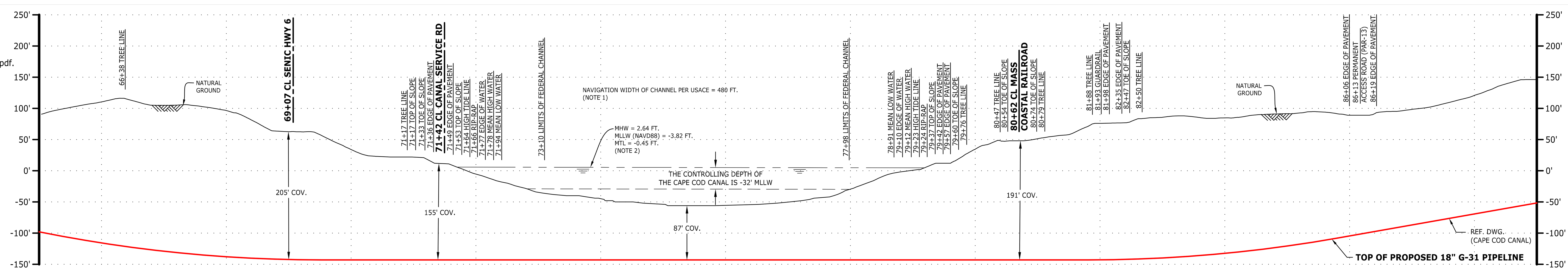
SLOPE BREAKERS ○
TRENCH PLUG ▲

PERMANENT SLOPE BREAKER & TRENCH PLUG SPACING

% SLOPE	SLOPE BREAKER SPACING (FT)	% SLOPE	TRENCH PLUG SPACING (FT)
5-15%	300 FT	<5%	NO STRUCTURE
15-30%	200 FT	5-15%	300 FT
>30%	100 FT	15-30%	200 FT
		>30%	100 FT

IN AG FIELDS AND RESIDENTIAL AREAS WHERE SLOPE BREAKERS ARE NOT TYPICALLY REQUIRED, INSTALL PERMANENT TRENCH PLUGS AT THE SAME SPACING AS IF PERMANENT SLOPE BREAKERS WERE REQUIRED. (FERC PLAN)

NOTES:
1. USACE SOURCE - https://www.nae.usace.army.mil/Portals/74/docs/Recreation/CCC/Brochures/Canal_Overview_Trifold.pdf.
2. NOAA SOURCE - TIDAL STATION DATUM FOR 8447191, BOURNEDALE, CAPE COD CANAL (STA. 200), MA.
3. THE HIGH TIDE LINE JURISDICTIONAL DELINEATIONS CONDUCTED BY SWCA ENVIRONMENTAL CONSULTANTS.



LAND USE CLASSIFICATION

CC	CULTIVATED CROPS	DF	DECIDUOUS FOREST	D/OS	DEVELOPED OPEN SPACE
EF	EVERGREEN FOREST	S/S	SHRUB SCRUB	D/LI	DEVELOPED LOW INTENSITY
H/P	HAY PASTURE	MF	MIXED FOREST	D/MI	DEVELOPED MEDIUM INTENSITY

SEGMENTABLE ELBOW	QTY
90 DEG, 5D, 18" OD, 0.375" WT, CS, x52, FBE COATING SYSTEM 2B	0
45 DEG, 5D, 18" OD, 0.375" WT, CS, x52, FBE COATING SYSTEM 2B	0

SOILS

LAND USE

% SLOPE: 5-15% | >30% | 5-15% | 15-30% | >30% | 5-15% | >30% | <5% | >30% | 15-30% | >30% | 15-30% | <5% | 15-30% | 5-15% | <5% | 5-15% | >30% | <5% | >30% | <5% | >30% | <5% | 15-30% | >30% | <5% | 15-30% | 5-15% | <5% | 15-30% | >30% | <5%

STAMP/SEAL

COMMONWEALTH OF MASSACHUSETTS
CLAY H. WILLIS
STRUCTURAL
NO. 49136
REGISTERED PROFESSIONAL ENGINEER
06/23/26

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CONSTRUCTION, RECORDATION, CONVEYANCE, SALES, OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT

UNDER THE AUTHORITY OF:
PE NAME: CLAY WILLIS
PE STATE: MASSACHUSETTS
PE NUMBER 49136

DWG. NO.	REFERENCE DWG.	REV	DATE	DSN	CK	DESCRIPTION
		F	01/29/26	TL	JL	RE-ISSUED FOR BID
		E	08/21/25	TL	JL	ISSUED FOR BID
		D	07/07/25	TL	JL	ISSUED FOR REVIEW (90% DESIGN)
		C	04/08/25	TL	RAL	ISSUED FOR REVIEW (60% DESIGN)
		B	02/26/24	LBJ	JL	ISSUED FOR REVIEW
CAPE COD CANAL	CAPE COD CANAL HORIZONTAL DIRECTIONAL DRILL	A	11/16/23	LBJ	JL	ISSUED FOR REVIEW

wood.
WOOD GROUP USA, INC.

TITLE	INITIALS	DATE
DRAWN BY:	LBJ	02/26/24
DESIGN CHECKER:	JL	02/26/24
DESIGN ENGINEER:	PA	02/26/24
PROJECT MANAGER:	EL	02/26/24

TITLE: ENBRIDGE
CAPE COD CANAL PIPELINE RELOCATION PROJECT
PROPOSED 18" G-31 PIPELINE
ALIGNMENT SHEET

LOC.: BARNSTABLE COUNTY, MASSACHUSETTS

YEAR: 2026 | W.O.: AFE 30002835 | SCALE: 1" = 100' | DWG.: GSYS-P.500-0005 | REV.: F

ENBRIDGE
Algonquin Gas Transmission
915 N. Eldridge Parkway, Houston, TX 77079-2703 (713) 627-5400

M:\259271\MAPPING\DRAWINGS\91-ALIGNMENT\RE-ISSUED FOR BID\259271-G-31

RIGHT-OF-WAY

TRACT NUMBERS

Station	Tract	Length
89+00 – 97+17	G-31-MA-BA-023	817 FT.
97+17 – 114+45	G-31-MA-BA-025	1728 FT.

SURVEY DATA

SURVEY COMPANY:
FIELD BOOK:
PAGES:

89+00

98+17 OH POWERLINE
98+70 HDD EXIT
98+84 TOE OF SLOPE
99+04 TOP OF SLOPE
101+19 TOP OF SLOPE
101+38 TOE OF SLOPE
103+53 TOE OF SLOPE
111+60 P.I. <21°19'06" LT.
112+12 TREE LINE

114+45 END PIPELINE

CLASS LOCATION

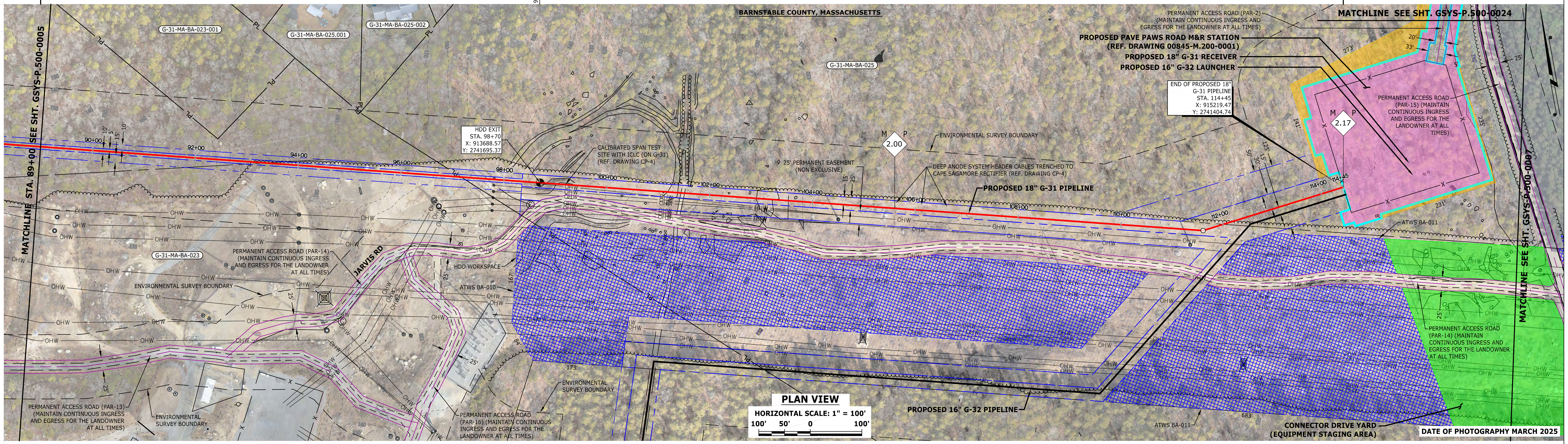
89+00 — CLASS 1 — 114+45

PIPE MATERIAL

Station	Material	Length
89+00 – 98+70	18" O.D. X 0.500" W.T., API-5L, X-52, 16-20 MILS FBE + 24 MILS ARO	970 FT. (HDD)
98+70 – 114+45	18" O.D. X 0.375" W.T., API 5L, X-52, 16-20 MILS FBE	1575 FT.

ALIGNMENT LEGEND

PIPELINE MILEPOST
PROPOSED G-31 PIPELINE
PROPOSED G-32 PIPELINE
CONSTRUCTION LIMIT
WAREYARD / STAGING AREA
EXISTING PERMANENT ROW
PROPOSED PERMANENT ROW
ADDITIONAL TEMPORARY WORKSPACE
PROPOSED METERING & REGULATING STATION (M&R) SITE / PIG TRAP SITE
FACILITIES TEMPORARY WORKSPACE
FACILITIES PERMANENT WORKSPACE
PROPOSED GRAVEL AREA
DELINEATED WETLAND BOUNDARY
DELINEATED WATERBODY BANK
DELINEATED WATERBODY CENTERLINE
PERMANENT ACCESS ROAD
TEMPORARY ACCESS ROAD
PROPERTY LINE — PL
MAJOR CONTOUR — 100'
MUNICIPALITY LINE
ENVIRONMENTAL SURVEY BOUNDARY
FENCE — X
EXISTING AGT PIPELINE — AGT
FOREIGN PIPELINE
POWERLINE — P
WATER PIPELINE — W
RAILROAD TRACK
OVERHEAD WIRE — OHW
TELEPHONE LINE — C
UTILITY LINES
SANITARY SEWER — SAN
TEE TAP
BLOW OFF VALVE
MAINLINE VALVE (MLV)
POINT OF INTERSECTION
BORE ENTRY/EXIT
TRANSMISSION TOWER
LIGHT POLE
UTILITY POLE
FIRE HYDRANT
WELL (GAS) — GV
WELL (WATER) — WV
WELL (OIL) — OIL
WELL (UNKNOWN) — UNK



ENVIRONMENTAL DATA

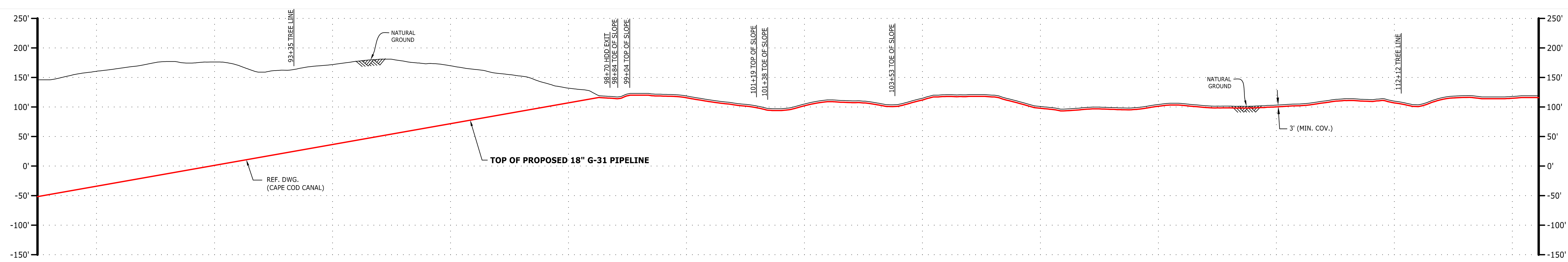
E & S TYPICALS

E&S TYPICALS WILL BE USED AS A PLAN AND WILL HAVE FURTHER INPUT FROM ENVIRONMENTAL INSPECTOR.

PROFILE

HORIZONTAL SCALE: 1" = 100'

VERTICAL SCALE: 1" = 100'



THE LOCATION OF TRENCH PLUGS AND SLOPE BREAKERS ARE INTENDED TO BE USED AS A GUIDELINE ONLY. EXACT LOCATION TO BE DETERMINED IN THE FIELD.

SLOPE BREAKERS ○
TRENCH PLUG ▲

PERMANENT SLOPE BREAKER & TRENCH PLUG SPACING

% SLOPE	SLOPE BREAKER SPACING (FT)	% SLOPE	TRENCH PLUG SPACING (FT)
5-15%	300 FT	<5%	NO STRUCTURE
15-30%	200 FT	5-15%	300 FT
>30%	100 FT	15-30%	200 FT
		>30%	100 FT

IN AG FIELDS AND RESIDENTIAL AREAS WHERE SLOPE BREAKERS ARE NOT TYPICALLY REQUIRED, INSTALL PERMANENT TRENCH PLUGS AT THE SAME SPACING AS IF PERMANENT SLOPE BREAKERS WERE REQUIRED. (FERC PLAN)

LAND USE CLASSIFICATION

CC	CULTIVATED CROPS	DF	DECIDUOUS FOREST	D/OS	DEVELOPED OPEN SPACE
EF	EVERGREEN FOREST	S/S	SHRUB SCRUB	D/LI	DEVELOPED LOW INTENSITY
H/P	HAY PASTURE	MF	MIXED FOREST	D/MI	DEVELOPED MEDIUM INTENSITY

SOILS

LAND USE

% SLOPE: <5% | 15-30% | 5-15% | <5% | 15-30% | >30% | 5-15% | 15-30% | 5-15% | 15-30% | >30% | 15-30% | 5-15% | <5% | 5-15% | 15-30% | 5-15% | 15-30% | 5-15% | 15-30% | <5% | 15-30% | 5-15% | 15-30% | 5-15% | 15-30% | 5-15% | 15-30% | >30% | 5-15% | <5% | 5-15% | <5%

SEGMENTABLE ELBOW	QTY
90 DEG, 5D, 18" OD, 0.375" WT, CS, x52, FBE COATING SYSTEM 2B	0
45 DEG, 5D, 18" OD, 0.375" WT, CS, x52, FBE COATING SYSTEM 2B	1

STAMP/SEAL

COMMONWEALTH OF MASSACHUSETTS — CLAY H. WILLIS — STRUCTURAL — NO. 49136 — REGISTERED PROFESSIONAL ENGINEER — 06/23/26

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF:
BID REVIEW
IT IS NOT TO BE USED FOR: CONSTRUCTION, RECORDATION, CONVEYANCE, SALES, OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT
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PE NAME: CLAY WILLIS
PE STATE: MASSACHUSETTS
PE NUMBER 49136

DWG. NO.	REFERENCE DWG.	REV	DATE	DSN	CK	DESCRIPTION
		F	01/29/26	TL	JL	RE-ISSUED FOR BID
		E	08/21/25	TL	JL	ISSUED FOR BID
		D	07/07/25	TL	JL	ISSUED FOR REVIEW (90% DESIGN)
CP-4	CATHODIC PROTECTION DESIGN	C	04/08/25	TL	RAL	ISSUED FOR REVIEW (60% DESIGN)
00845-M.200-0001	PAVE PAWS ROAD STATION - LOCATION MAP AND PLOT PLAN	B	02/26/24	LBJ	JL	ISSUED FOR REVIEW
CAPE COD CANAL	CAPE COD CANAL HORIZONTAL DIRECTIONAL DRILL	A	11/16/23	LBJ	JL	ISSUED FOR REVIEW

wood. WOOD GROUP USA, INC.

TITLE	INITIALS	DATE
DRAWN BY:	LBJ	02/26/24
DESIGN CHECKER:	JL	02/26/24
DESIGN ENGINEER:	PA	02/26/24
PROJECT MANAGER:	EL	02/26/24

ENBRIDGE
CAPE COD CANAL PIPELINE RELOCATION PROJECT
TITLE: PROPOSED 18" G-31 PIPELINE
ALIGNMENT SHEET

LOC.: BARNSTABLE COUNTY, MASSACHUSETTS

YEAR: 2026 | W.O.: AFE 30002835 | SCALE: 1" = 100' | DWG.: GSYS-P.500-0006 | REV.: F

ENBRIDGE
Algonquin Gas Transmission
915 N. Eldridge Parkway, Houston, TX 77079-2703 (713) 627-5400

M:\259271\MAPPING\DRAWINGS\91-ALIGNMENT\RE-ISSUED FOR BID\259271-G-31

RIGHT-OF-WAY

TRACT NUMBERS

SURVEY DATA

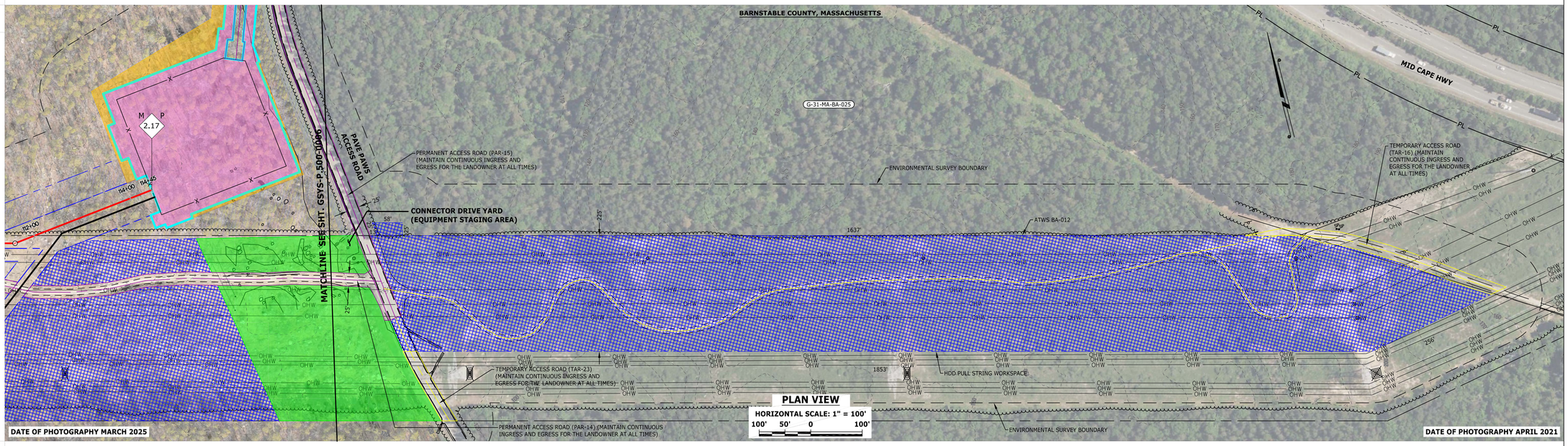
SURVEY COMPANY:
FIELD BOOK:
PAGES:

CLASS LOCATION

PIPE MATERIAL

ALIGNMENT LEGEND

- PIPELINE MILEPOST
- PROPOSED G-31 PIPELINE
- PROPOSED G-32 PIPELINE
- CONSTRUCTION LIMIT
- WAREYARD / STAGING AREA
- EXISTING PERMANENT ROW
- PROPOSED PERMANENT ROW
- ADDITIONAL TEMPORARY WORKSPACE
- PROPOSED METERING & REGULATING STATION (M&R) SITE / PIG TRAP SITE
- FACILITIES TEMPORARY WORKSPACE
- FACILITIES PERMANENT WORKSPACE
- PROPOSED GRAVEL AREA
- DELINEATED WETLAND BOUNDARY
- DELINEATED WATERBODY BANK
- DELINEATED WATERBODY CENTERLINE
- PERMANENT ACCESS ROAD
- TEMPORARY ACCESS ROAD
- PROPERTY LINE — PL —
- MAJOR CONTOUR — -100'- —
- MUNICIPALITY LINE
- ENVIRONMENTAL SURVEY BOUNDARY
- FENCE — X —
- EXISTING AGT PIPELINE — AGT —
- FOREIGN PIPELINE — F —
- POWERLINE — P —
- WATER PIPELINE — W —
- RAILROAD TRACK
- OVERHEAD WIRE — OHW —
- TELEPHONE LINE — C —
- UTILITY LINES
- SANITARY SEWER — SAN —
- TEE TAP
- BLOW OFF VALVE
- MAINLINE VALVE (MLV)
- POINT OF INTERSECTION
- BORE ENTRY/EXIT
- TRANSMISSION TOWER
- LIGHT POLE
- UTILITY POLE
- FIRE HYDRANT
- WELL (GAS)
- WELL (WATER)
- WELL (OIL)
- WELL (UNKNOWN)



ENVIRONMENTAL DATA

E & S TYPICALS

E&S TYPICALS WILL BE USED AS A PLAN AND WILL HAVE FURTHER INPUT FROM ENVIRONMENTAL INSPECTOR.

PROFILE

HORIZONTAL SCALE: 1" = 100'
100' 50' 0 100'
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100' 50' 0 100'

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SLOPE BREAKERS ○
TRENCH PLUG ▲

PERMANENT SLOPE BREAKER & TRENCH PLUG SPACING

% SLOPE	SLOPE BREAKER SPACING (FT)	% SLOPE	TRENCH PLUG SPACING (FT)
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IN AG FIELDS AND RESIDENTIAL AREAS WHERE SLOPE BREAKERS ARE NOT TYPICALLY REQUIRED, INSTALL PERMANENT TRENCH PLUGS AT THE SAME SPACING AS IF PERMANENT SLOPE BREAKERS WERE REQUIRED. (FERC PLAN)

LAND USE CLASSIFICATION

CC CULTIVATED CROPS | DF DECIDUOUS FOREST | D/OS DEVELOPED OPEN SPACE
EF EVERGREEN FOREST | S/S SHRUB SCRUB | D/LI DEVELOPED LOW INTENSITY
H/P HAY PASTURE | MF MIXED FOREST | D/MI DEVELOPED MEDIUM INTENSITY

SOILS

LAND USE

% SLOPE

STAMP/SEAL

CLAY T. WILLIS — STRUCTURAL — NO. 49136 — COMMONWEALTH OF MASSACHUSETTS — REGISTERED PROFESSIONAL ENGINEER
10/23/26

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		B	02/26/24	LBJ	JL	ISSUED FOR REVIEW
		A	11/16/23	LBJ	JL	ISSUED FOR REVIEW

wood. WOOD GROUP USA, INC.

DRAWN BY:	LBJ	02/26/24
DESIGN CHECKER:	JL	02/26/24
DESIGN ENGINEER:	PA	02/26/24
PROJECT MANAGER:	EL	02/26/24

ENBRIDGE
CAPE COD CANAL PIPELINE RELOCATION PROJECT
PROPOSED 18" G-31 PIPELINE
TITLE: ALIGNMENT SHEET

ENBRIDGE

LOC.: BARNSTABLE COUNTY, MASSACHUSETTS

Algonquin Gas Transmission
915 N. Eldridge Parkway, Houston, TX 77079-2703 (713) 627-5400

TITLE	INITIALS	DATE	YEAR:	W.O.:	SCALE:	DWG.:	REV.:
			2026	AFE 30002835	1" = 100'	GSYS-P.500-0007	F

M:\25927\MAPPING\DRAWINGS\M-ALIGNMENT\RE-ISSUED FOR BID\25927-G_31

RIGHT-OF-WAY

TRACT NUMBERS

SURVEY DATA

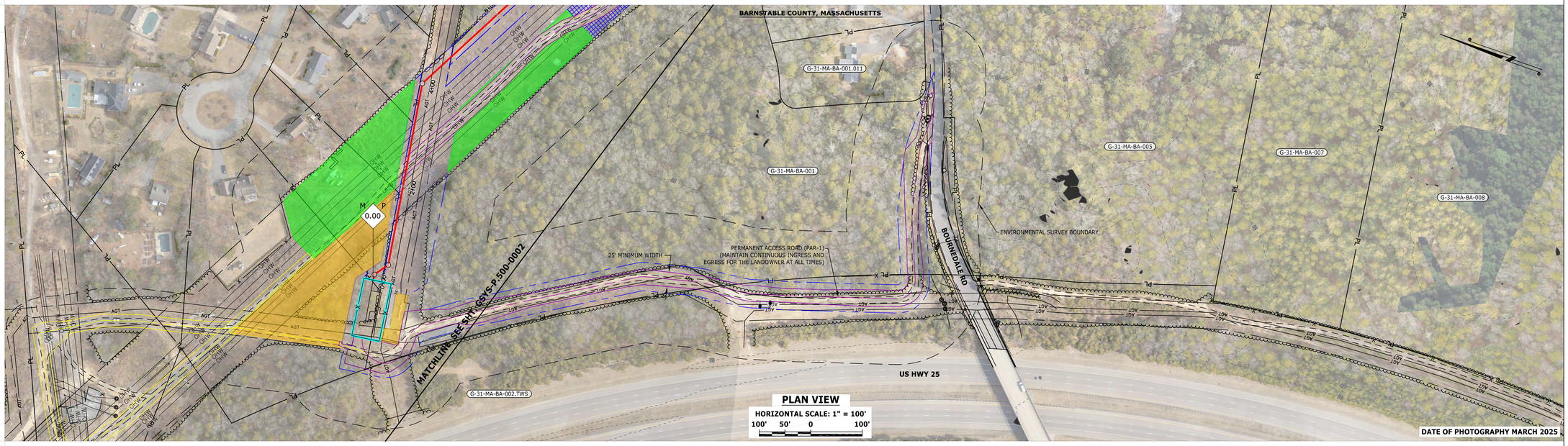
SURVEY COMPANY:
FIELD BOOK:
PAGES:

CLASS LOCATION

PIPE MATERIAL

ALIGNMENT LEGEND

- PIPELINE MILEPOST
- PROPOSED G-31 PIPELINE
- PROPOSED G-32 PIPELINE
- CONSTRUCTION LIMIT
- WAREYARD / STAGING AREA
- EXISTING PERMANENT ROW
- PROPOSED PERMANENT ROW
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- PROPOSED METERING & REGULATING STATION (M&R) SITE / PIG TRAP SITE
- FACILITIES TEMPORARY WORKSPACE
- FACILITIES PERMANENT WORKSPACE
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- DELINEATED WATERBODY BANK
- DELINEATED WATERBODY CENTERLINE
- PERMANENT ACCESS ROAD
- TEMPORARY ACCESS ROAD
- PROPERTY LINE
- MAJOR CONTOUR
- MUNICIPALITY LINE
- ENVIRONMENTAL SURVEY BOUNDARY
- FENCE
- EXISTING AGT PIPELINE
- FOREIGN PIPELINE
- POWERLINE
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- SANITARY SEWER
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- FIRE HYDRANT
- WELL (GAS)
- WELL (WATER)
- WELL (OIL)
- WELL (UNKNOWN)



ENVIRONMENTAL DATA

E & S TYPICALS

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PROFILE

HORIZONTAL SCALE: 1" = 100'
100' 50' 0 100'

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SLOPE BREAKERS ○
TRENCH PLUG ▲

PERMANENT SLOPE BREAKER & TRENCH PLUG SPACING

% SLOPE	SLOPE BREAKER SPACING (FT)	% SLOPE	TRENCH PLUG SPACING (FT)
5-15%	300 FT	<5%	NO STRUCTURE
15-30%	200 FT	5-15%	300 FT
>30%	100 FT	15-30%	200 FT
		>30%	100 FT

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CC CULTIVATED CROPS DF DECIDUOUS FOREST D/OS DEVELOPED OPEN SPACE
EF EVERGREEN FOREST S/S SHRUB SCRUB D/LI DEVELOPED LOW INTENSITY
H/P HAY PASTURE MF MIXED FOREST D/MI DEVELOPED MEDIUM INTENSITY

SOILS

LAND USE

% SLOPE

STAMP/SEAL

CLAY H. WILLIS STRUCTURAL No. 49136 REGISTERED PROFESSIONAL ENGINEER
5/23/26

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PE NAME: CLAY WILLIS
PE STATE: MASSACHUSETTS
PE NUMBER: 49136

DWG. NO.	REFERENCE DWG.	REV	DATE	DSN	CK	DESCRIPTION
		D	01/29/26	TL	JL	RE-ISSUED FOR BID
		C	08/21/25	TL	JL	ISSUED FOR BID
		B	07/07/25	TL	JL	ISSUED FOR REVIEW (90% DESIGN)
GSYS-C.300-0002	ACCESS ROAD PLAN AND PROFILE	A	04/08/25	TL	RAL	ISSUED FOR REVIEW (60% DESIGN)

wood. WOOD GROUP USA, INC.

TITLE	INITIALS	DATE
DRAWN BY:	TL	04/01/25
DESIGN CHECKER:	JL	04/02/25
DESIGN ENGINEER:	PA	04/08/25
PROJECT MANAGER:	EL	04/08/25

ENBRIDGE
CAPE COD CANAL PIPELINE RELOCATION PROJECT
PROPOSED 18" G-31 PIPELINE
TITLE: ALIGNMENT SHEET

LOC.: BARNSTABLE COUNTY, MASSACHUSETTS

YEAR: 2026 | W.O.: AFE 30002835 | SCALE: 1" = 100'

DWG.: GSYS-P.500-0020 | REV.: D

ENBRIDGE
Algonquin Gas Transmission
915 N. Eldridge Parkway, Houston, TX 77079-2703 (713) 627-5400

M:\259271\MAPPING\DRAWINGS\P-ALIGNMENT\RE-ISSUED FOR BID\259271-G-31

RIGHT-OF-WAY

TRACT NUMBERS

SURVEY DATA

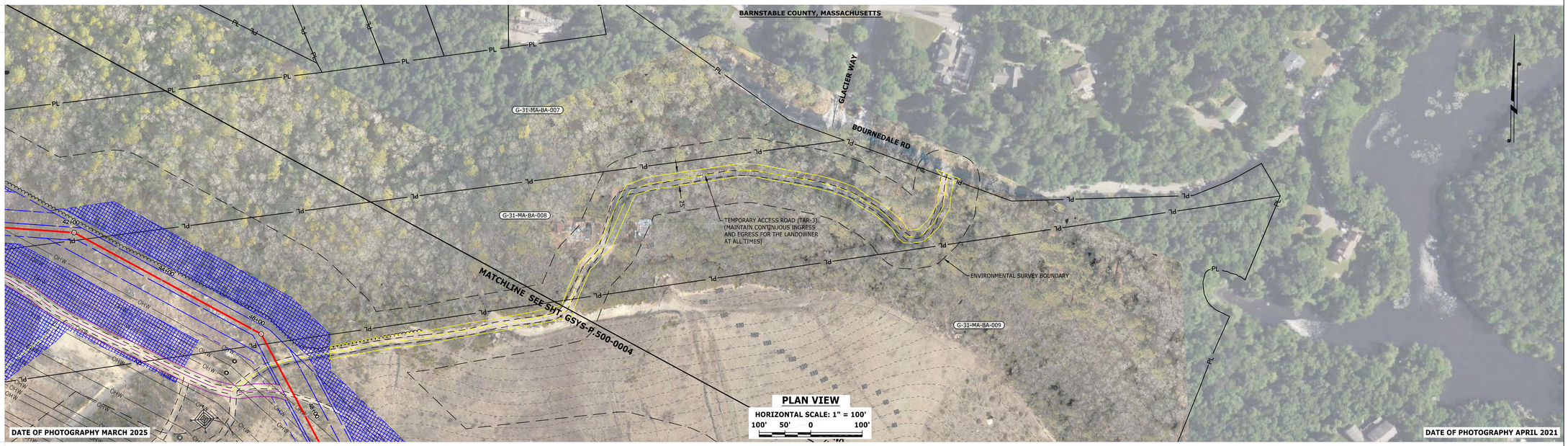
SURVEY COMPANY:
FIELD BOOK:
PAGES:

CLASS LOCATION

PIPE MATERIAL

ALIGNMENT LEGEND

- PIPELINE MILEPOST
- PROPOSED G-31 PIPELINE
- PROPOSED G-32 PIPELINE
- CONSTRUCTION LIMIT
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- PROPOSED PERMANENT ROW
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- DELINEATED WATERBODY BANK
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- PROPERTY LINE — PL —
- MAJOR CONTOUR — -100'- —
- MUNICIPALITY LINE
- ENVIRONMENTAL SURVEY BOUNDARY
- FENCE — X —
- EXISTING AGT PIPELINE — AGT —
- FOREIGN PIPELINE — II —
- POWERLINE — P —
- WATER PIPELINE — W —
- RAILROAD TRACK — T —
- OVERHEAD WIRE — OHW —
- TELEPHONE LINE — C —
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D/LI	DEVELOPED LOW INTENSITY		
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SOILS
LAND USE
% SLOPE

STAMP/SEAL

COMMONWEALTH OF MASSACHUSETTS — CLAY C. WILLIS — 52,671 — PROFESSIONAL ENGINEER — 05/22/26

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wood. WOOD GROUP USA, INC.

TITLE	INITIALS	DATE
DRAWN BY:	TL	04/01/25
DESIGN CHECKER:	JL	04/02/25
DESIGN ENGINEER:	PA	04/08/25
PROJECT MANAGER:	EL	04/08/25

ENBRIDGE
CAPE COD CANAL PIPELINE RELOCATION PROJECT
PROPOSED 18" G-31 PIPELINE
TITLE: ALIGNMENT SHEET
LOC.: BARNSTABLE COUNTY, MASSACHUSETTS

YEAR: 2026 | W.O.: AFE 30002835 | SCALE: 1" = 100' | DWG.: GSYS-P.500-0021 | REV.: D

ENBRIDGE
Algonquin Gas Transmission
915 N. Eldridge Parkway, Houston, TX 77079-2703 (713) 627-5400

M:\25\27\1\MAPPING\DRAWINGS\01-ALIGNMENT\RE-ISSUED FOR BID\25271-G_31

RIGHT-OF-WAY

TRACT NUMBERS

SURVEY DATA

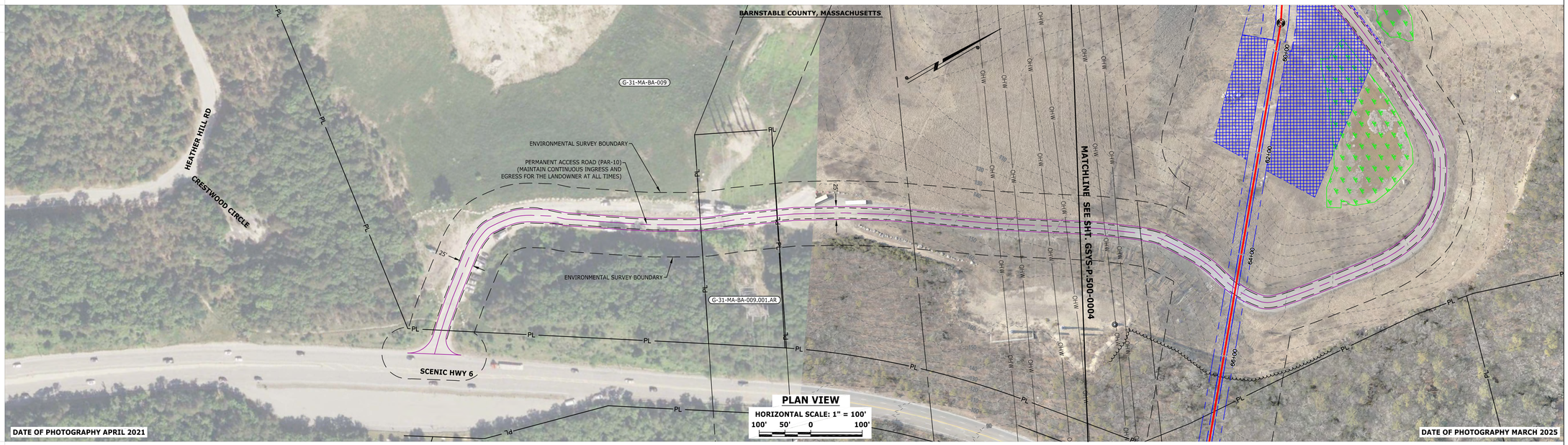
SURVEY COMPANY:
FIELD BOOK:
PAGES:

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PLAN VIEW

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SOILS

LAND USE

% SLOPE

STAMP/SEAL

COMMONWEALTH OF MASSACHUSETTS — CLAY H. WILLIS — NO. 49136 — REGISTERED PROFESSIONAL ENGINEER — STRUCTURAL
10/23/26

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wood. WOOD GROUP USA, INC.

TITLE	INITIALS	DATE
DRAWN BY:	TL	04/01/25
DESIGN CHECKER:	JL	04/02/25
DESIGN ENGINEER:	PA	04/08/25
PROJECT MANAGER:	EL	04/08/25

ENBRIDGE
CAPE COD CANAL PIPELINE RELOCATION PROJECT
PROPOSED 18" G-31 PIPELINE
TITLE: ALIGNMENT SHEET

LOC.: BARNSTABLE COUNTY, MASSACHUSETTS

YEAR: 2026 | W.O.: AFE 30002835 | SCALE: 1" = 100' | DWG.: GSYS-P.500-0022 | REV.: D

ENBRIDGE

Algonquin Gas Transmission
915 N. Eldridge Parkway, Houston, TX 77079-2703 (713) 627-5400

M:\25927\TWAPPING\DRAWINGS\P-ALIGNMENT\ISSUED FOR BID\25927-P_S1

RIGHT-OF-WAY

TRACT NUMBERS

SURVEY DATA

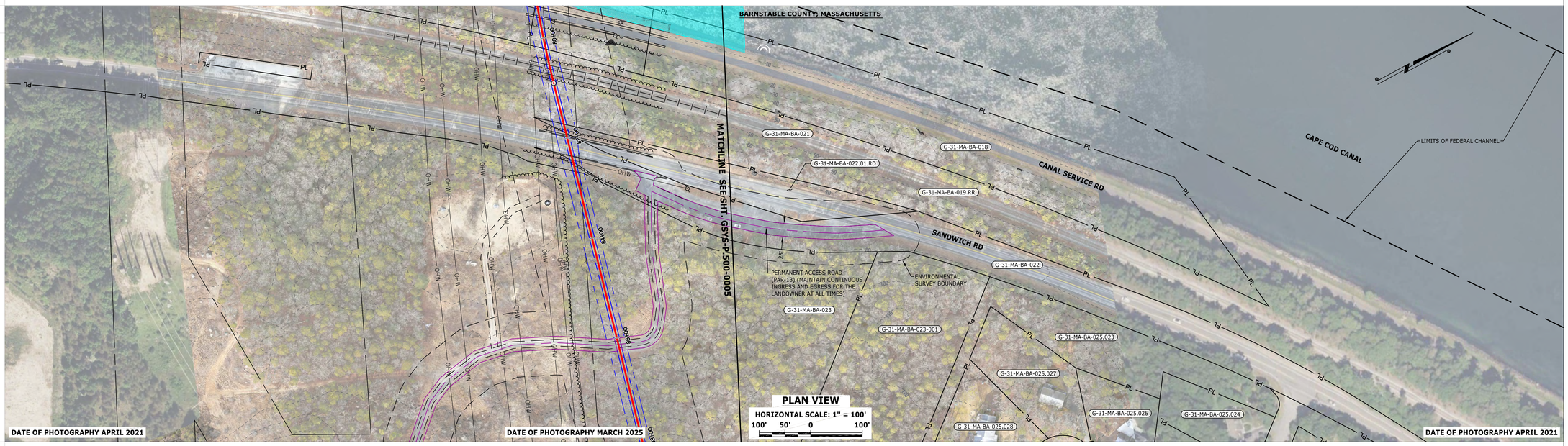
SURVEY COMPANY:
FIELD BOOK:
PAGES:

CLASS LOCATION

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LAND USE

% SLOPE

STAMP/SEAL

COMMONWEALTH OF MASSACHUSETTS — CLAY H. WILLIS — STRUCTURAL — NO. 49136 — REGISTERED PROFESSIONAL ENGINEER — 04/23/26

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LOC.: BARNSTABLE COUNTY, MASSACHUSETTS
YEAR: 2026 W.O.: AFE 30002835 SCALE: 1" = 100'
DWG.: GSYS-P.500-0023 REV.: D

ENBRIDGE
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915 N. Eldridge Parkway, Houston, TX 77079-2703 (713) 627-5400

M:\259271\MAPPING\DRAWINGS\P-ALIGNMENT\RE-ISSUED FOR BID\259271-G_31

RIGHT-OF-WAY

TRACT NUMBERS

SURVEY DATA

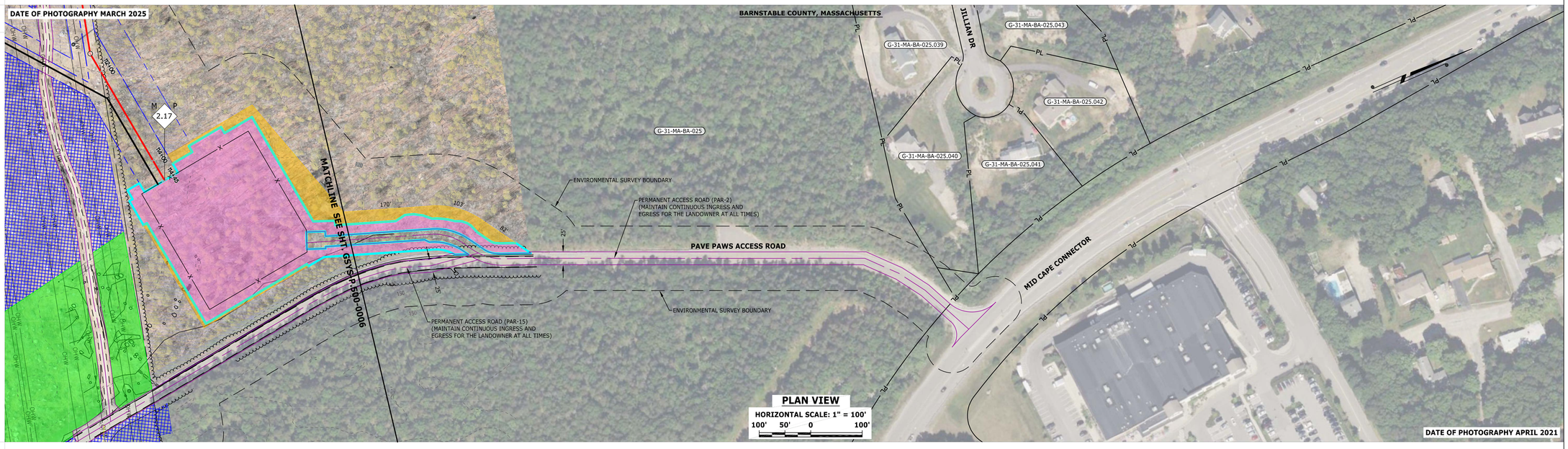
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LAND USE

% SLOPE

STAMP/SEAL

COMMONWEALTH OF MASSACHUSETTS — CLAY H. WILLIS — STRUCTURAL — NO. 49136 — REGISTERED PROFESSIONAL ENGINEER — 04/23/26

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915 N. Eldridge Parkway, Houston, TX 77079-2703 (713) 627-5400

DWG.: GSYS-P.500-0024 | REV.: D

M:\239271\MAPPING\DRAWINGS\P1-ALIGNMENT\RE-ISSUED FOR BID\239271-G_01

RIGHT-OF-WAY

TRACT NUMBERS

G-32-MA-BA-001 — 113 FT. — 12+87 — G-32-MA-BA-001.001 — 1287 FT.

SURVEY DATA

SURVEY COMPANY:
FIELD BOOK:
PAGES:

14+00: 11+96 TREE LINE; 11+27 TREE LINE

7+91 TREE LINE; 7+15 TREE LINE; 6+33 P.I. <52°30'00" RT.; 6+19 TREE LINE; 5+83 OH POWERLINE; 5+26 OH POWERLINE; 5+05 OH POWERLINE; 5+14 OH POWERLINE; 5+04 OH POWERLINE; 4+90 OH POWERLINE; 3+95 OH POWERLINE; 3+68 OH POWERLINE; 3+36 EDGE OF GRAVEL; 3+30 OH POWERLINE; 3+30 PERMANENT ACCESS ROAD (PAR-14); 3+23 EDGE OF GRAVEL; 2+64 OH POWERLINE; 2+45 OH POWERLINE; 1+93 P.I. <31°10'54" LT.; 1+92 TREE LINE

0+00 BEGIN PIPELINE

CLASS LOCATION

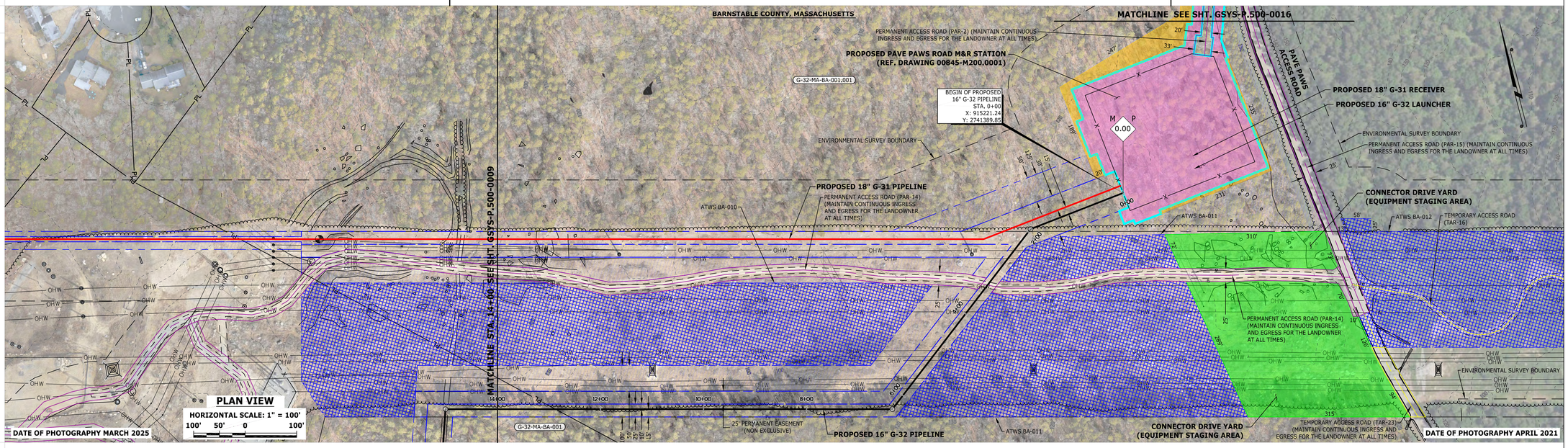
14+00 — CLASS 1 — 0+00

PIPE MATERIAL

14+00 — 16" O.D. X 0.375" W.T., API 5L, X-52, 16-20 MILS FBE — 1400 FT. — 0+00

ALIGNMENT LEGEND

- PIPELINE MILEPOST
- PROPOSED G-31 PIPELINE
- PROPOSED G-32 PIPELINE
- CONSTRUCTION LIMIT
- WAREYARD / STAGING AREA
- EXISTING PERMANENT ROW
- PROPOSED PERMANENT ROW
- ADDITIONAL TEMPORARY WORKSPACE
- PROPOSED METERING & REGULATING STATION (M&R) SITE / PIG TRAP SITE
- FACILITIES TEMPORARY WORKSPACE
- FACILITIES PERMANENT WORKSPACE
- PROPOSED GRAVEL AREA
- DELINEATED WETLAND BOUNDAY
- DELINEATED WATERBODY BANK
- DELINEATED WATERBODY CENTERLINE
- PERMANENT ACCESS ROAD
- TEMPORARY ACCESS ROAD
- PROPERTY LINE (PL)
- MAJOR CONTOUR (-100'-)
- MUNICIPALITY LINE
- ENVIRONMENTAL SURVEY BOUNDARY
- FENCE (X)
- EXISTING AGT PIPELINE (AGT)
- FOREIGN PIPELINE (F)
- POWERLINE (P)
- WATER PIPELINE (W)
- RAILROAD TRACK (T)
- OVERHEAD WIRE (OHW)
- TELEPHONE LINE (C)
- UTILITY LINES
- SANITARY SEWER (SAN)
- TEE TAP
- BLOW OFF VALVE
- MAINLINE VALVE (MLV)
- POINT OF INTERSECTION
- BORE ENTRY/EXIT
- TRANSMISSION TOWER
- LIGHT POLE
- UTILITY POLE
- FIRE HYDRANT
- WELL (GAS)
- WELL (WATER)
- WELL (OIL)
- WELL (UNKNOWN)



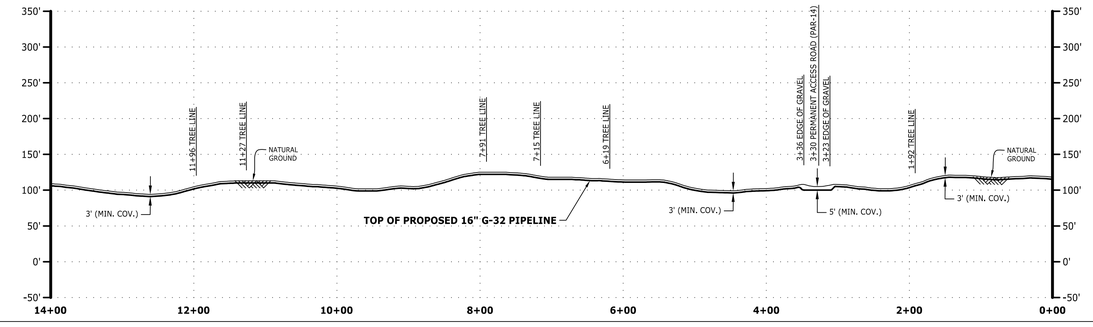
ENVIRONMENTAL DATA

E & S TYPICALS

E&S TYPICALS WILL BE USED AS A PLAN AND WILL HAVE FURTHER INPUT FROM ENVIRONMENTAL INSPECTOR.

PROFILE

HORIZONTAL SCALE: 1" = 100'
100' 50' 0 100'
VERTICAL SCALE: 1" = 100'
100' 50' 0 100'



THE LOCATION OF TRENCH PLUGS AND SLOPE BREAKERS ARE INTENDED TO BE USED AS A GUIDELINE ONLY. EXACT LOCATION TO BE DETERMINED IN THE FIELD.

SLOPE BREAKERS
TRENCH PLUG

PERMANENT SLOPE BREAKER & TRENCH PLUG SPACING

% SLOPE	SLOPE BREAKER SPACING (FT)	% SLOPE	TRENCH PLUG SPACING (FT)
5-15%	300 FT	<5%	NO STRUCTURE
15-30%	200 FT	5-15%	300 FT
>30%	100 FT	15-30%	200 FT
		>30%	100 FT

IN AG FIELDS AND RESIDENTIAL AREAS WHERE SLOPE BREAKERS ARE NOT TYPICALLY REQUIRED, INSTALL PERMANENT TRENCH PLUGS AT THE SAME SPACING AS IF PERMANENT SLOPE BREAKERS WERE REQUIRED. (FERC PLAN)

LAND USE CLASSIFICATION

CC CULTIVATED CROPS · DF DECIDUOUS FOREST D/OS DEVELOPED OPEN SPACE
EF EVERGREEN FOREST S/S SHRUB SCRUB · D/LI DEVELOPED LOW INTENSITY
H/P HAY PASTURE · MF MIXED FOREST D/MI DEVELOPED MEDIUM INTENSITY

SEGMENTABLE ELBOW	QTY
90 DEG, SD, 16" OD, 0.375" WT, CS, x52, FBE COATING SYSTEM 2B	1
45 DEG, SD, 16" OD, 0.375" WT, CS, x52, FBE COATING SYSTEM 2B	0

SOILS																					
LAND USE																					
% SLOPE	15-30%	>30%	15-30%	5-15%	15-30%	5-15%	<5%	5-15%	<5%	15-30%	>30%	<5%	15-30%	<5%	5-15%	15-30%	5-15%	15-30%		5-15%	

STAMP/SEAL

COMMONWEALTH OF MASSACHUSETTS — CLAY H. WILLIS — STRUCTURAL — NO. 49136 — REGISTERED PROFESSIONAL ENGINEER — 02/26/26

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BID REVIEW
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UNDER THE AUTHORITY OF:
PE NAME: CLAY WILLIS
PE STATE: MASSACHUSETTS
PE NUMBER 49136

DWG. NO.	REFERENCE DWG.	REV	DATE	DSN	CK	DESCRIPTION
		F	01/29/26	TL	JL	RE-ISSUED FOR BID
		E	08/21/25	TL	JL	ISSUED FOR BID
		D	07/07/25	TL	RAL	ISSUED FOR REVIEW (90% DESIGN)
		C	04/08/25	TL	RAL	ISSUED FOR REVIEW (60% DESIGN)
		B	02/26/24	LBJ	JL	ISSUED FOR REVIEW
00845-M.200-0001	PAVE PAWS ROAD M&R STATION - LOCATION MAP AND PLOT PLAN	A	11/16/23	LBJ	JL	ISSUED FOR REVIEW

wood. WOOD GROUP USA, INC.

TITLE	INITIALS	DATE
DRAWN BY:	LBJ	02/26/24
DESIGN CHECKER:	JL	02/26/24
DESIGN ENGINEER:	PA	02/26/24
PROJECT MANAGER:	EL	02/26/24

ENBRIDGE
CAPE COD CANAL PIPELINE RELOCATION PROJECT
PROPOSED 16" G-32 PIPELINE
TITLE: ALIGNMENT SHEET
LOC.: BARNSTABLE COUNTY, MASSACHUSETTS

YEAR: 2026 | W.O.: AFE 30002835 | SCALE: 1" = 100' | DWG.: GSYS-P.500-0008 | REV.: F

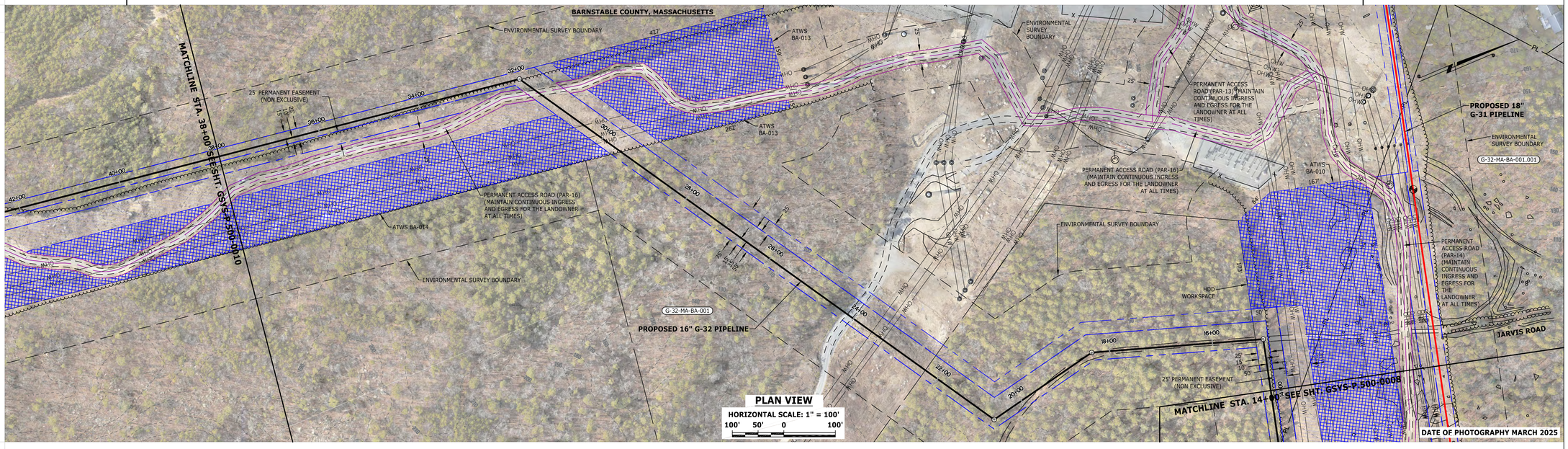
ENBRIDGE
Algonquin Gas Transmission
915 N. Eldridge Parkway, Houston, TX 77079-2703 (713) 627-5400

M:\259271\MAPPING\DRAWINGS\ALIGNMENT\ALIGNMENT.dwg - ISSUED FOR BID\259271-G_32

RIGHT-OF-WAY TRACT NUMBERS	38+00	G-32-MA-BA-001 2400 FT.	14+00
SURVEY DATA SURVEY COMPANY: FIELD BOOK: PAGES:	38+00	31+88 P.I. <50°04'10" LT. 31+92 TREE LINE 31+62 EDGE OF GRAVEL 31+52 PERMANENT ACCESS ROAD (PAR-16) 31+44 EDGE OF GRAVEL 30+44 OH POWERLINE 30+11 OH POWERLINE 29+91 OH POWERLINE 29+60 TREE LINE 24+15 EDGE OF GRAVEL 24+03 EDGE OF GRAVEL 23+56 OH POWERLINE 23+39 OH POWERLINE 23+30 OH POWERLINE 20+65 P.I. <70°05'39" RT. 18+35 P.I. <30°00'00" LT. 15+01 P.I. <86°07'27" LT.	14+00
CLASS LOCATION	38+00	CLASS 1	14+00
PIPE MATERIAL	38+00	16" O.D. X 0.375" W.T., API 5L, X-52, 16-20 MILS FBE 2400 FT.	14+00

ALIGNMENT LEGEND

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- PROPOSED G-31 PIPELINE
- PROPOSED G-32 PIPELINE
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- TEMPORARY ACCESS ROAD
- PROPERTY LINE — PL —
- MAJOR CONTOUR - -100'- -
- MUNICIPALITY LINE
- ENVIRONMENTAL SURVEY BOUNDARY
- FENCE — X —
- EXISTING AGT PIPELINE — AGT —
- FOREIGN PIPELINE — F —
- POWERLINE — P —
- WATER PIPELINE — W —
- RAILROAD TRACK
- OVERHEAD WIRE — OHW —
- TELEPHONE LINE — C —
- UTILITY LINES
- SANITARY SEWER — SAN —
- TEE TAP
- BLOW OFF VALVE
- MAINLINE VALVE (MLV)
- POINT OF INTERSECTION
- BORE ENTRY/EXIT
- TRANSMISSION TOWER
- LIGHT POLE
- UTILITY POLE
- FIRE HYDRANT
- WELL (GAS)
- WELL (WATER)
- WELL (OIL)
- WELL (UNKNOWN)



ENVIRONMENTAL DATA

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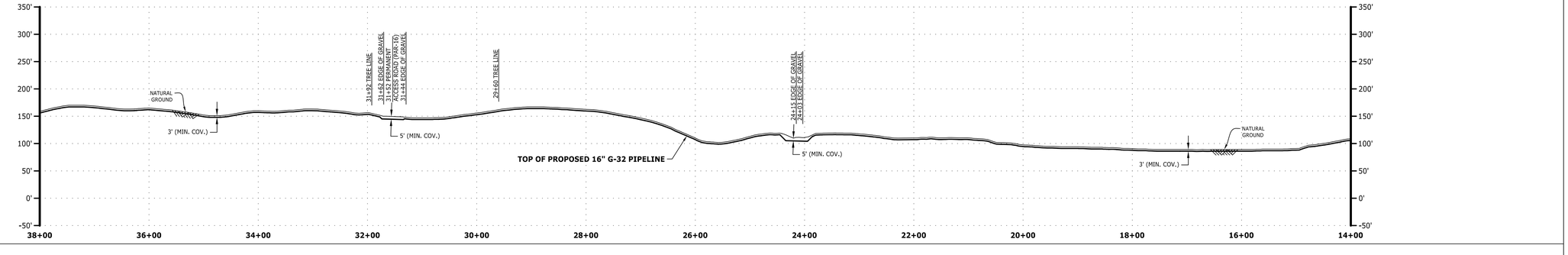
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SLOPE BREAKERS ○
TRENCH PLUG ▲

PERMANENT SLOPE BREAKER & TRENCH PLUG SPACING

% SLOPE	SLOPE BREAKER SPACING (FT)	% SLOPE	TRENCH PLUG SPACING (FT)
5-15%	300 FT	<5%	NO STRUCTURE
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LAND USE CLASSIFICATION

CC CULTIVATED CROPS	DF DECIDUOUS FOREST	D/OS DEVELOPED OPEN SPACE	**SOILS**																								
EF EVERGREEN FOREST	S/S SHRUB SCRUB	D/LI DEVELOPED LOW INTENSITY	**LAND USE**																								
H/P HAY PASTURE	MF MIXED FOREST	D/MI DEVELOPED MEDIUM INTENSITY	**% SLOPE**	15-30%	<5%	5-15%	15-30%	5-15%	15-30%	5-15%	15-30%	>30%	<5%	15-30%	5-15%	<5%	5-15%	15-30%	>30%	15-30%	>30%	15-30%	>30%	<5%	15-30%		

SEGMENTABLE ELBOW	QTY
90 DEG, SD, 16" OD, 0.375" WT, CS, x52, FBE COATING SYSTEM 2B	3
45 DEG, SD, 16" OD, 0.375" WT, CS, x52, FBE COATING SYSTEM 2B	0

STAMP/SEAL

CLAY H. WILLIS — COMMONWEALTH OF MASSACHUSETTS — NO. 49138 — REGISTERED PROFESSIONAL ENGINEER — 04/23/26

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UNDER THE AUTHORITY OF:
PE NAME: CLAY WILLIS
PE STATE: MASSACHUSETTS
PE NUMBER: 49138

DWG. NO.	REFERENCE DWG.	REV	DATE	DSN	CK	DESCRIPTION
		F	01/29/26	TL	JL	RE-ISSUED FOR BID
		E	08/21/25	TL	JL	ISSUED FOR BID
		D	07/07/25	TL	RAL	ISSUED FOR REVIEW (90% DESIGN)
		C	04/08/25	TL	RAL	ISSUED FOR REVIEW (60% DESIGN)
		B	02/26/24	LBJ	JL	ISSUED FOR REVIEW
		A	11/16/23	LBJ	JL	ISSUED FOR REVIEW

WOOD GROUP USA, INC.

DRAWN BY:	LBJ	02/26/24
DESIGN CHECKER:	JL	02/26/24
DESIGN ENGINEER:	PA	02/26/24
PROJECT MANAGER:	EL	02/26/24
TITLE	INITIALS	DATE

ENBRIDGE
CAPE COD CANAL PIPELINE RELOCATION PROJECT
PROPOSED 16" G-32 PIPELINE
TITLE: ALIGNMENT SHEET
LOC.: BARNSTABLE COUNTY, MASSACHUSETTS
YEAR: 2026 | W.O.: AFE 30002835 | SCALE: 1" = 100'
DWG.: GSYS-P.500-0009 | REV.: F

ENBRIDGE
Algonquin Gas Transmission
915 N. Eldridge Parkway, Houston, TX 77079-2703 (713) 627-5400

M:\239271\MAPPING\DRAWINGS\PI-ALIGNMENTS\RELEASED FOR BID\239271-G-32

RIGHT-OF-WAY

TRACT NUMBERS

62+00	G-32-MA-BA-001 / 2400 FT.	38+00

SURVEY DATA

SURVEY COMPANY:
FIELD BOOK:
PAGES:

62+00 — 50+19 TREE LINE; 49+56 EDGE OF GRAVEL; 48+53 EDGE OF GRAVEL; 47+89 TREE LINE; 46+64 TREE LINE; 45+16 TREE LINE; 44+36 P.I. <29°38'01" RT.; 43+93 P.I. <28°39'04" LT.; 43+54 SANITARY SEWER (UNKNOWN COVER, FIELD VERIFY) 43+36 TREE LINE; 42+48 P.I. <27°44'48" RT.; 42+16 TREE LINE — 38+00

CLASS LOCATION

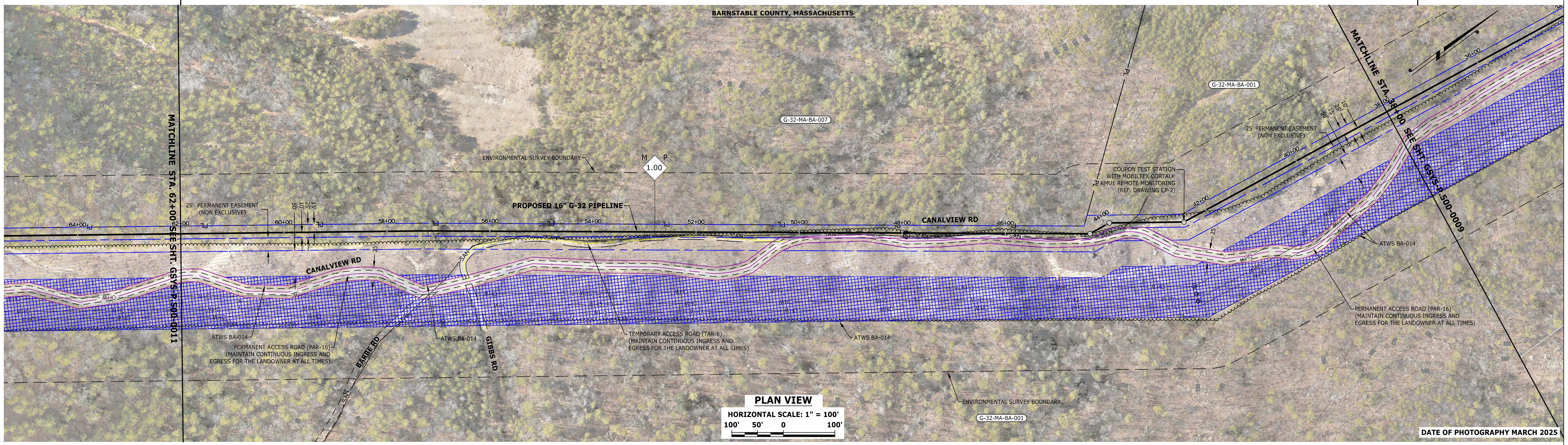
62+00 — CLASS 1 — 38+00

PIPE MATERIAL

62+00 — 16" O.D. X 0.375" W.T., API 5L, X-52, 16-20 MILS FBE — 2400 FT. — 38+00

ALIGNMENT LEGEND

- PIPELINE MILEPOST
- PROPOSED G-31 PIPELINE
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- DELINEATED WETLAND BOUNDARY
- DELINEATED WATERBODY BANK
- DELINEATED WATERBODY CENTERLINE
- PERMANENT ACCESS ROAD
- TEMPORARY ACCESS ROAD
- PROPERTY LINE — PL
- MAJOR CONTOUR — 100'
- MUNICIPALITY LINE
- ENVIRONMENTAL SURVEY BOUNDARY
- FENCE — X
- EXISTING AGT PIPELINE — AGT
- FOREIGN PIPELINE — ||
- POWERLINE — P
- WATER PIPELINE — W
- RAILROAD TRACK — |
- OVERHEAD WIRE — OHW
- TELEPHONE LINE — C
- UTILITY LINES
- SANITARY SEWER — SAN
- TEE TAP
- BLOW OFF VALVE
- MAINLINE VALVE (MLV)
- POINT OF INTERSECTION
- BORE ENTRY/EXIT
- TRANSMISSION TOWER
- LIGHT POLE
- UTILITY POLE
- FIRE HYDRANT
- WELL (GAS) — GV
- WELL (WATER) — WV
- WELL (OIL) — OIL
- WELL (UNKNOWN) — UNK



ENVIRONMENTAL DATA

E & S TYPICALS

E&S TYPICALS WILL BE USED AS A PLAN AND WILL HAVE FURTHER INPUT FROM ENVIRONMENTAL INSPECTOR.

PROFILE

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100' 50' 0 100'
VERTICAL SCALE: 1" = 100'
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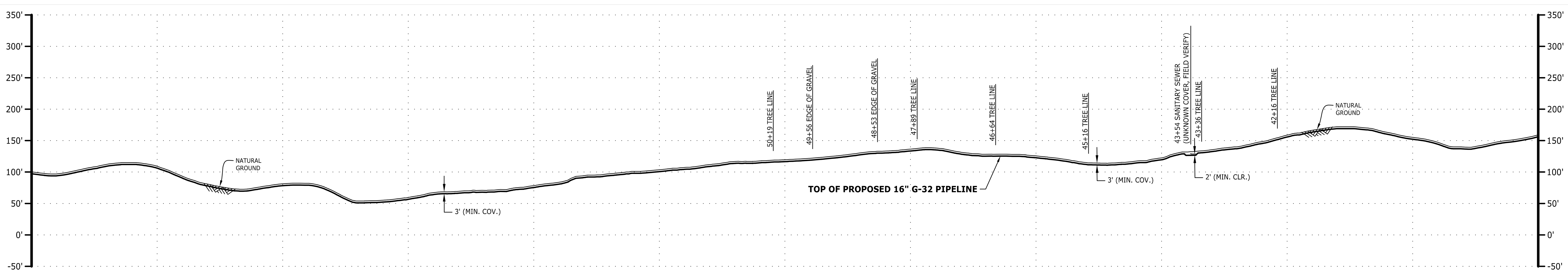
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SLOPE BREAKERS ○
TRENCH PLUG ▲

PERMANENT SLOPE BREAKER & TRENCH PLUG SPACING

% SLOPE	SLOPE BREAKER SPACING (FT)	% SLOPE	TRENCH PLUG SPACING (FT)
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LAND USE CLASSIFICATION

CC	CULTIVATED CROPS	DF	DECIDUOUS FOREST	D/OS	DEVELOPED OPEN SPACE
EF	EVERGREEN FOREST	S/S	SHRUB SCRUB	D/LI	DEVELOPED LOW INTENSITY
H/P	HAY PASTURE	MF	MIXED FOREST	D/MI	DEVELOPED MEDIUM INTENSITY

SOILS

LAND USE

% SLOPE: 5-15% | 15-30% | <5% | 15-30% | >30% | 15-30% | 5-15% | >30% | 15-30% | >30% | 5-15% | 15-30% | 5-15% | 15-30% | 5-15% | 15-30% | >30% | 15-30% | <5% | 5-15% | 15-30% | >30% | 15-30% | 5-15% | 15-30%

SEGMENTABLE ELBOW	QTY
90 DEG, 5D, 16" OD, 0.375" WT, CS, x52, FBE COATING SYSTEM 2B	0
45 DEG, 5D, 16" OD, 0.375" WT, CS, x52, FBE COATING SYSTEM 2B	0

STAMP/SEAL

COMMONWEALTH OF MASSACHUSETTS
CLAY H. WILLIS
STRUCTURAL
NO. 49136
REGISTERED PROFESSIONAL ENGINEER
06/23/26

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UNDER THE AUTHORITY OF:
PE NAME: CLAY WILLIS
PE STATE: MASSACHUSETTS
PE NUMBER 49136

DWG. NO.	REFERENCE DWG.
CP-2	CATHODIC PROTECTION DESIGN

REV	DATE	DSN	CK	DESCRIPTION
F	01/29/26	TL	JL	RE-ISSUED FOR BID
E	08/21/25	TL	JL	ISSUED FOR BID
D	07/07/25	TL	RAL	ISSUED FOR REVIEW (90% DESIGN)
C	04/08/25	TL	RAL	ISSUED FOR REVIEW (60% DESIGN)
B	02/26/24	LBJ	JL	ISSUED FOR REVIEW
A	11/16/23	LBJ	JL	ISSUED FOR REVIEW

wood.
WOOD GROUP USA, INC.

TITLE	INITIALS	DATE
DRAWN BY:	LBJ	02/26/24
DESIGN CHECKER:	JL	02/26/24
DESIGN ENGINEER:	PA	02/26/24
PROJECT MANAGER:	EL	02/26/24

TITLE: ENBRIDGE
CAPE COD CANAL PIPELINE RELOCATION PROJECT
PROPOSED 16" G-32 PIPELINE
ALIGNMENT SHEET

LOC.: BARNSTABLE COUNTY, MASSACHUSETTS

YEAR: 2026 | W.O.: AFE 30002835 | SCALE: 1" = 100' | DWG.: GSYS-P.500-0010 | REV.: F

ENBRIDGE

Algonquin Gas Transmission
915 N. Eldridge Parkway, Houston, TX 77079-2703 (713) 627-5400

M:\259271\MAPPING\DRAWINGS\91-ALIGNMENT\RE-ISSUED FOR BID\259271-G-32

RIGHT-OF-WAY

TRACT NUMBERS

G-32-MA-BA-001

2400 FT.

SURVEY DATA

SURVEY COMPANY:
FIELD BOOK:
PAGES:

83+24 P.I. <45°00'00" RT.
83+14 OH POWERLINE
82+93 OH POWERLINE
82+57 OH POWERLINE
81+41 EDGE OF GRAVEL
81+32 PERMANENT ACCESS ROAD (PAR-16)
81+13 EDGE OF GRAVEL
81+13 TREE LINE
80+83 P.I. <45°00'00" LT.
73+58 P.I. <41°29'39" LT.
73+11 P.I. <43°36'18" RT.

CLASS LOCATION

86+00 CLASS 2 83+50 CLASS 1 62+00

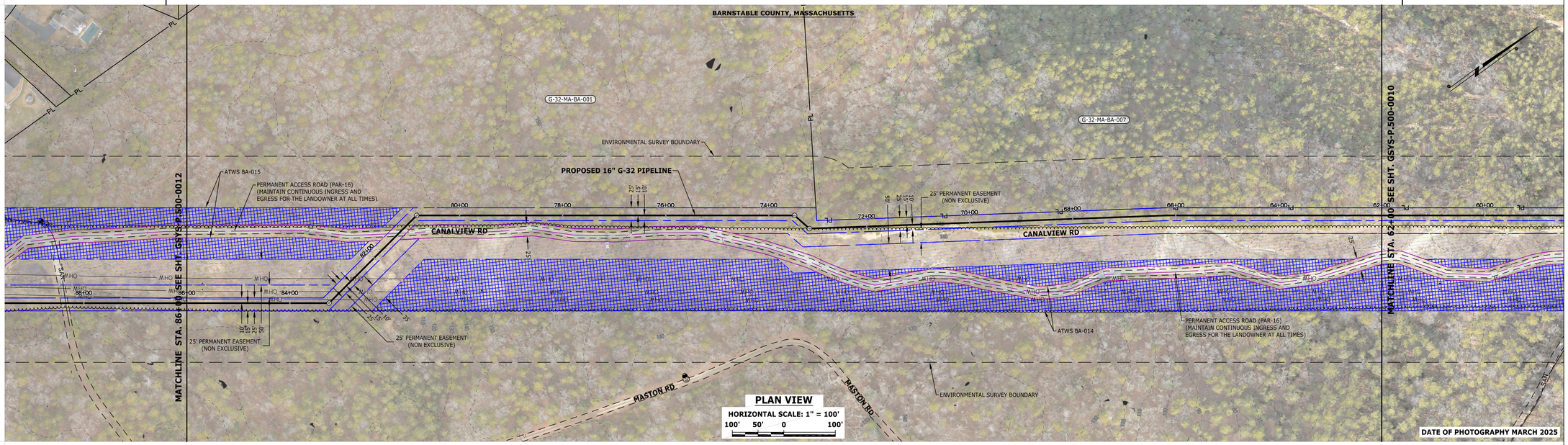
PIPE MATERIAL

16" O.D. X 0.375" W.T., API 5L, X-52, 16-20 MILS FBE

2400 FT.

ALIGNMENT LEGEND

- PIPELINE MILEPOST
- PROPOSED G-31 PIPELINE
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- WELL (OIL)
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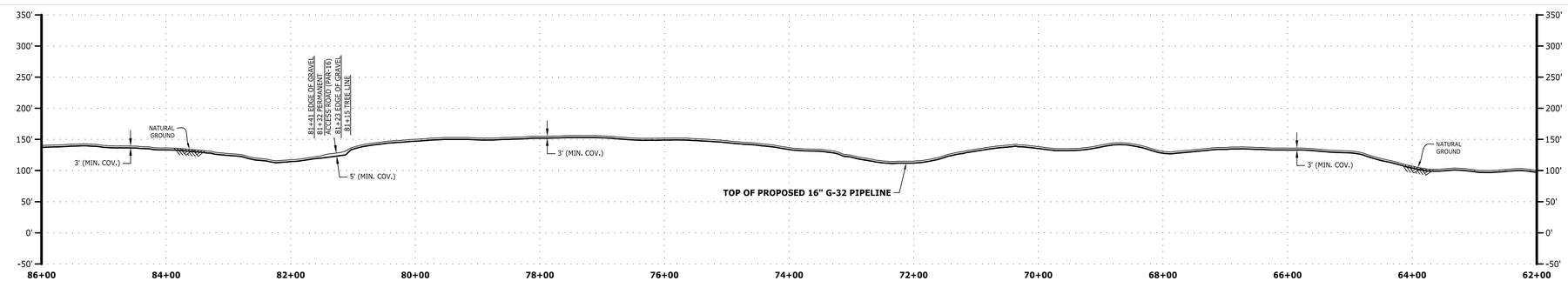
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TRENCH PLUG ▲

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H/P HAY PASTURE MF MIXED FOREST D/MI DEVELOPED MEDIUM INTENSITY

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SOILS																										
LAND USE																										
% SLOPE	5-15%	15-30%	5-15%	15-30%	5-15%		<5%		5-15%	15-30%	5-15%	>30%	5-15%	>30%	15-30%	>30%	5-15%	15-30%	>30%	15-30%	5-15%	15-30%	>30%	15-30%	5-15%	

STAMP/SEAL

CLAY H. WILLIS STRUCTURAL — COMMONWEALTH OF MASSACHUSETTS — NO. 49136 — REGISTERED PROFESSIONAL ENGINEER — 02/23/26

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UNDER THE AUTHORITY OF:
PE NAME: CLAY WILLIS
PE STATE: MASSACHUSETTS
PE NUMBER: 49136

DWG. NO.	REFERENCE DWG.	REV	DATE	DSN	CK	DESCRIPTION
		E	01/29/26	TL	JL	RE-ISSUED FOR BID
		D	08/21/25	TL	JL	ISSUED FOR BID
		C	07/07/25	TL	RAL	ISSUED FOR REVIEW (90% DESIGN)
		B	04/08/25	TL	RAL	ISSUED FOR REVIEW (60% DESIGN)
		A	02/26/24	LBJ	JL	ISSUED FOR REVIEW

wood. WOOD GROUP USA, INC.

TITLE	INITIALS	DATE
DRAWN BY:	LBJ	02/26/24
DESIGN CHECKER:	JL	02/26/24
DESIGN ENGINEER:	PA	02/26/24
PROJECT MANAGER:	EL	02/26/24

ENBRIDGE
CAPE COD CANAL PIPELINE RELOCATION PROJECT
PROPOSED 16" G-32 PIPELINE
TITLE: ALIGNMENT SHEET

LOC.: BARNSTABLE COUNTY, MASSACHUSETTS
YEAR: 2026 | W.O.: AFE 30002835 | SCALE: 1" = 100' | DWG.: GSYS-P.500-0011 | REV.: E

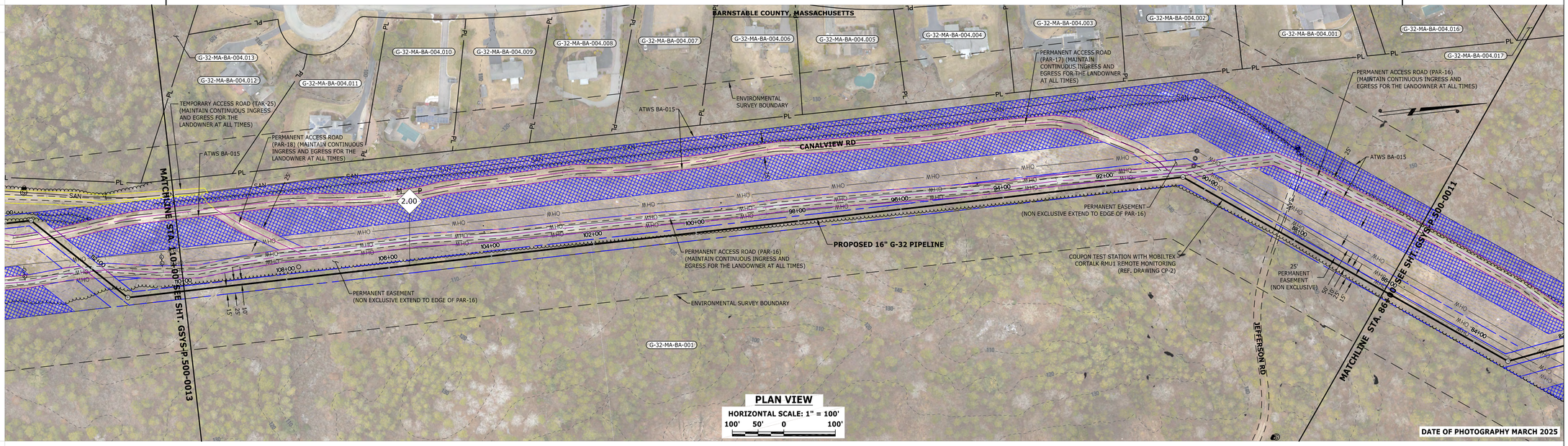
Algonquin Gas Transmission
915 N. Eldridge Parkway, Houston, TX 77079-2703 (713) 627-5400

M:\2392\1\MAPPING\DRAWINGS\P-ALIGNMENT\RE-ISSUED FOR BID\2392_1_22

RIGHT-OF-WAY TRACT NUMBERS	110+00	G-32-MA-BA-001 2400 FT.		86+00
SURVEY DATA SURVEY COMPANY: FIELD BOOK: PAGES:	110+00	99+88 TREE LINE	90+49 P.I. = 26°04'26" LT.	88+44 EDGE OF GRAVEL 88+37 CL JEFFERSON RD 88+35 SANITARY SEWER (UNKNOWN DEPTH - FIELD VERIFY) 88+30 EDGE OF GRAVEL	86+00
CLASS LOCATION	110+00	CLASS 2			86+00
PIPE MATERIAL	110+00	16" O.D. X 0.375" W.T., API 5L, X-52, 16-20 MILS FBE 2400 FT.			86+00

ALIGNMENT LEGEND

- PIPELINE MILEPOST
- PROPOSED G-31 PIPELINE
- PROPOSED G-32 PIPELINE
- CONSTRUCTION LIMIT
- WAREYARD / STAGING AREA
- EXISTING PERMANENT ROW
- PROPOSED PERMANENT ROW
- ADDITIONAL TEMPORARY WORKSPACE
- PROPOSED METERING & REGULATING STATION (M&R) SITE / PIG TRAP SITE
- FACILITIES TEMPORARY WORKSPACE
- FACILITIES PERMANENT WORKSPACE
- PROPOSED GRAVEL AREA
- DELINEATED WETLAND BOUNDARY
- DELINEATED WATERBODY BANK
- DELINEATED WATERBODY CENTERLINE
- PERMANENT ACCESS ROAD
- TEMPORARY ACCESS ROAD
- PROPERTY LINE — PL —
- MAJOR CONTOUR - -100'- -
- MUNICIPALITY LINE
- ENVIRONMENTAL SURVEY BOUNDARY
- FENCE — X —
- EXISTING AGT PIPELINE — AGT —
- FOREIGN PIPELINE — F —
- POWERLINE — P —
- WATER PIPELINE — W —
- RAILROAD TRACK — T —
- OVERHEAD WIRE — OHW —
- TELEPHONE LINE — C —
- UTILITY LINES
- SANITARY SEWER — SAN —
- TEE TAP
- BLOW OFF VALVE
- MAINLINE VALVE (MLV)
- POINT OF INTERSECTION
- BORE ENTRY/EXIT
- TRANSMISSION TOWER
- LIGHT POLE
- UTILITY POLE
- FIRE HYDRANT
- WELL (GAS)
- WELL (WATER)
- WELL (OIL)
- WELL (UNKNOWN)



PLAN VIEW
HORIZONTAL SCALE: 1" = 100'
100' 50' 0 100'

ENVIRONMENTAL DATA

E & S TYPICALS

E&S TYPICALS WILL BE USED AS A PLAN AND WILL HAVE FURTHER INPUT FROM ENVIRONMENTAL INSPECTOR.

PROFILE

HORIZONTAL SCALE: 1" = 100'
100' 50' 0 100'
VERTICAL SCALE: 1" = 100'
100' 50' 0 100'

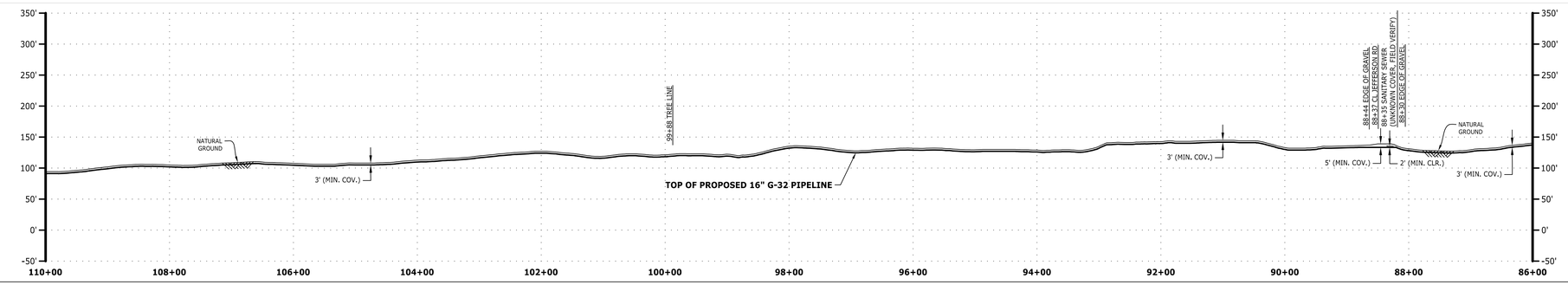
THE LOCATION OF TRENCH PLUGS AND SLOPE BREAKERS ARE INTENDED TO BE USED AS A GUIDELINE ONLY. EXACT LOCATION TO BE DETERMINED IN THE FIELD.

SLOPE BREAKERS ○
TRENCH PLUG ▲

PERMANENT SLOPE BREAKER & TRENCH PLUG SPACING

% SLOPE	SLOPE BREAKER SPACING (FT)	% SLOPE	TRENCH PLUG SPACING (FT)
5-15%	300 FT	<5%	NO STRUCTURE
15-30%	200 FT	5-15%	300 FT
>30%	100 FT	15-30%	200 FT
		>30%	100 FT

IN AG FIELDS AND RESIDENTIAL AREAS WHERE SLOPE BREAKERS ARE NOT TYPICALLY REQUIRED, INSTALL PERMANENT TRENCH PLUGS AT THE SAME SPACING AS IF PERMANENT SLOPE BREAKERS WERE REQUIRED. (FERC PLAN)



LAND USE CLASSIFICATION

CC CULTIVATED CROPS | DF DECIDUOUS FOREST | D/OS DEVELOPED OPEN SPACE
EF EVERGREEN FOREST | S/S SHRUB SCRUB | D/LI DEVELOPED LOW INTENSITY
H/P HAY PASTURE | MF MIXED FOREST | D/MI DEVELOPED MEDIUM INTENSITY

SEGMENTABLE ELBOW	QTY
90 DEG, SD, 16" OD, 0.375" WT, CS, x52, FBE COATING SYSTEM 2B	0
45 DEG, SD, 16" OD, 0.375" WT, CS, x52, FBE COATING SYSTEM 2B	0

SOILS																															
LAND USE																															
% SLOPE	<5%	5-15%	15-30%		5-15%		<5%		5-15%			<5%		5-15%	15-30%		5-15%		15-30%	>30%		15-30%	5-15%	<5%	5-15%	>30%	15-30%	<5%	5-15%	<5%	>30%		<5%	5-15%	>30%	15-30%	5-15%

STAMP/SEAL

COMMONWEALTH OF MASSACHUSETTS
CLAY C. WILLIS
STRUCTURAL
NO. 49136
REGISTERED PROFESSIONAL ENGINEER
02/23/26

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PE STATE: MASSACHUSETTS
PE NUMBER 49136

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		D	08/21/25	TL	JL	ISSUED FOR BID
		C	07/07/25	TL	RAL	ISSUED FOR REVIEW (90% DESIGN)
		B	04/08/25	TL	RAL	ISSUED FOR REVIEW (60% DESIGN)
CP-2	CATHODIC PROTECTION DESIGN	A	02/26/24	LBJ	JL	ISSUED FOR REVIEW

wood.
WOOD GROUP USA, INC.

DRAWN BY:	LBJ	02/26/24
DESIGN CHECKER:	JL	02/26/24
DESIGN ENGINEER:	PA	02/26/24
PROJECT MANAGER:	EL	02/26/24
TITLE	INITIALS	DATE

ENBRIDGE
CAPE COD CANAL PIPELINE RELOCATION PROJECT
PROPOSED 16" G-32 PIPELINE
TITLE: ALIGNMENT SHEET

ENBRIDGE

Algonquin Gas Transmission
915 N. Eldridge Parkway, Houston, TX 77079-2703 (713) 627-5400

YEAR: 2026 | W.O.: AFE 30002835 | SCALE: 1" = 100' | DWG.: GSYS-P.500-0012 | REV.: E

M:\25\25271\MAPPING\DRAWINGS\ALIGNMENT\ALIGNMENT_ISSUED FOR BID\25271-G-32

RIGHT-OF-WAY

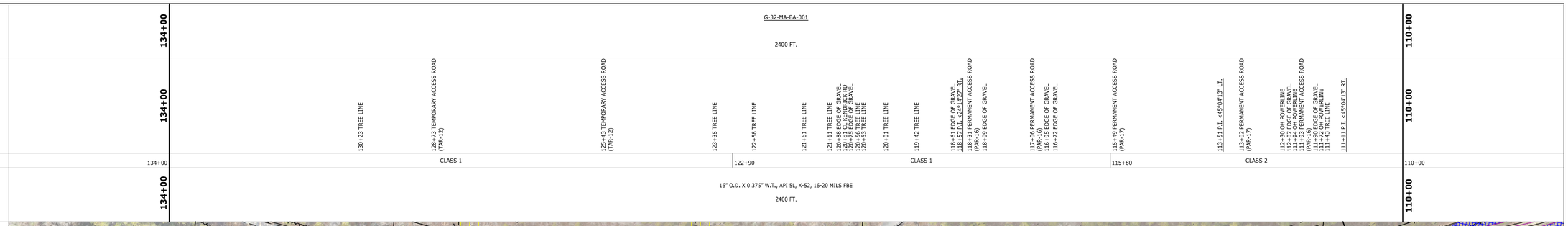
TRACT NUMBERS

SURVEY DATA

SURVEY COMPANY:
FIELD BOOK:
PAGES:

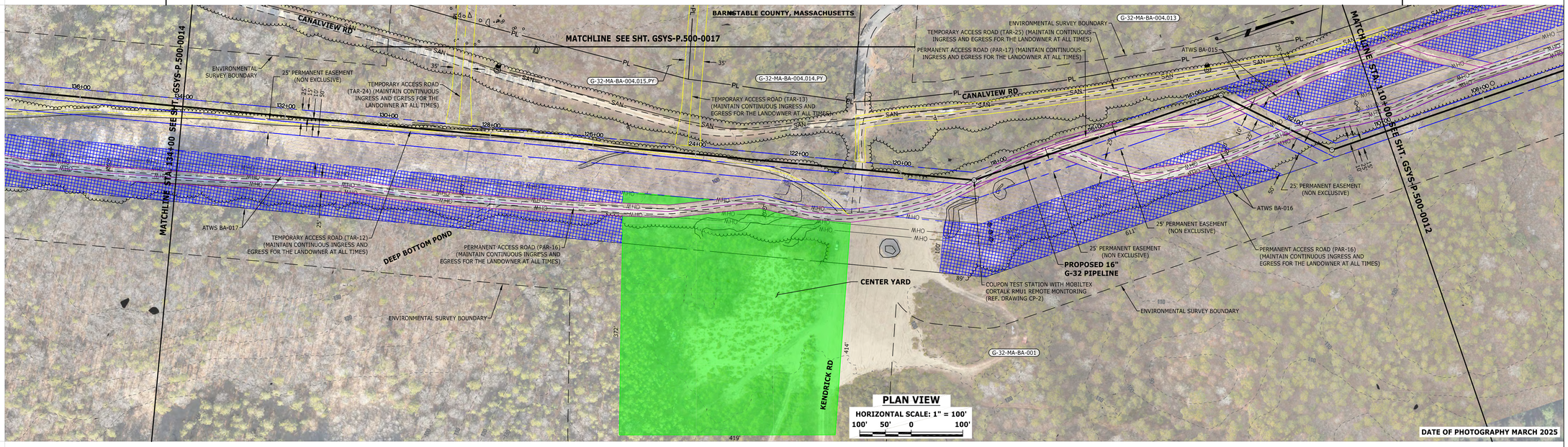
CLASS LOCATION

PIPE MATERIAL



ALIGNMENT LEGEND

- PIPELINE MILEPOST
- PROPOSED G-31 PIPELINE
- PROPOSED G-32 PIPELINE
- CONSTRUCTION LIMIT
- WAREYARD / STAGING AREA
- EXISTING PERMANENT ROW
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- PERMANENT ACCESS ROAD
- TEMPORARY ACCESS ROAD
- PROPERTY LINE — PL —
- MAJOR CONTOUR - -100'- -
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- FENCE — X —
- EXISTING AGT PIPELINE — AGT —
- FOREIGN PIPELINE — F —
- POWERLINE — P —
- WATER PIPELINE — W —
- RAILROAD TRACK — | —
- OVERHEAD WIRE — OHW —
- TELEPHONE LINE — C —
- UTILITY LINES
- SANITARY SEWER — SAN —
- TEE TAP
- BLOW OFF VALVE
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- WELL (UNKNOWN)



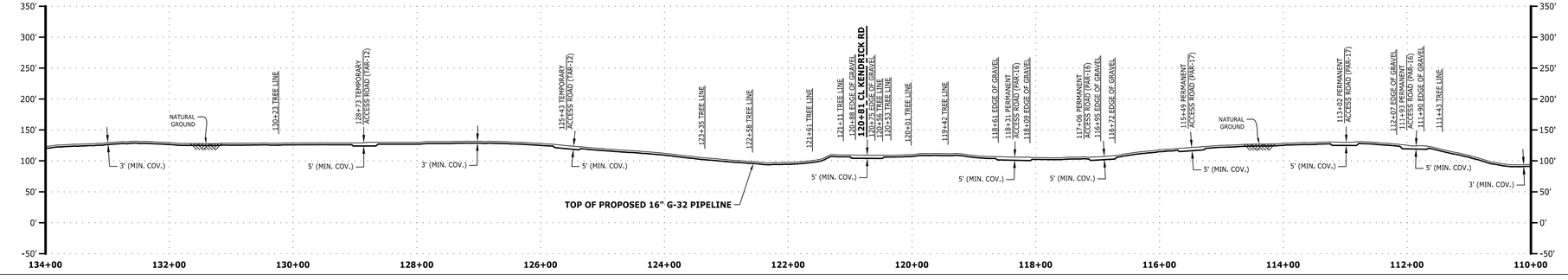
ENVIRONMENTAL DATA

E & S TYPICALS

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PROFILE

HORIZONTAL SCALE: 1" = 100'
100' 50' 0 100'
VERTICAL SCALE: 1" = 100'
100' 50' 0 100'



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SLOPE BREAKERS ○
TRENCH PLUG ▲

PERMANENT SLOPE BREAKER & TRENCH PLUG SPACING

% SLOPE	SLOPE BREAKER SPACING (FT)	% SLOPE	TRENCH PLUG SPACING (FT)
5-15%	300 FT	<5%	NO STRUCTURE
15-30%	200 FT	5-15%	300 FT
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EF EVERGREEN FOREST S/S SHRUB SCRUB D/LI DEVELOPED LOW INTENSITY
H/P HAY PASTURE MF MIXED FOREST D/MI DEVELOPED MEDIUM INTENSITY

SEGMENTABLE ELBOW	QTY
90 DEG, SD, 16" OD, 0.375" WT, CS, x52, FBE COATING SYSTEM 2B	0
45 DEG, SD, 16" OD, 0.375" WT, CS, x52, FBE COATING SYSTEM 2B	2

	>30%	15-30%	>30%	15-30%	5-15%	<5%	5-15%	15-30%	<5%	15-30%	5-15%	15-30%	5-15%	<5%	15-30%	<5%	5-15%	15-30%	5-15%	15-30%	>30%	15-30%	<5%
SOILS																							
LAND USE																							
% SLOPE																							

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PE STATE: MASSACHUSETTS
PE NUMBER 49136

CLAY H. WILLIS — COMMONWEALTH OF MASSACHUSETTS — NO. 49136 — REGISTERED PROFESSIONAL ENGINEER — 02/23/26

DWG. NO.	REFERENCE DWG.	REV	DATE	DSN	CK	DESCRIPTION
		F	03/20/26	TL	JL	RE-ISSUED FOR BID
		E	01/29/26	TL	JL	RE-ISSUED FOR BID
		D	08/21/25	TL	JL	ISSUED FOR BID
		C	07/07/25	TL	RAL	ISSUED FOR REVIEW (90% DESIGN)
		B	04/08/25	TL	RAL	ISSUED FOR REVIEW (60% DESIGN)
		A	02/26/24	LBJ	JL	ISSUED FOR REVIEW

wood. WOOD GROUP USA, INC.

TITLE	INITIALS	DATE
DRAWN BY:	LBJ	02/26/24
DESIGN CHECKER:	JL	02/26/24
DESIGN ENGINEER:	PA	02/26/24
PROJECT MANAGER:	EL	02/26/24

ENBRIDGE
CAPE COD CANAL PIPELINE RELOCATION PROJECT
PROPOSED 16" G-32 PIPELINE
TITLE: ALIGNMENT SHEET
LOC.: BARNSTABLE COUNTY, MASSACHUSETTS
YEAR: 2026 W.O.: AFE 30002835 SCALE: 1" = 100'
DWG.: GSYS-P.500-0013 REV.: F

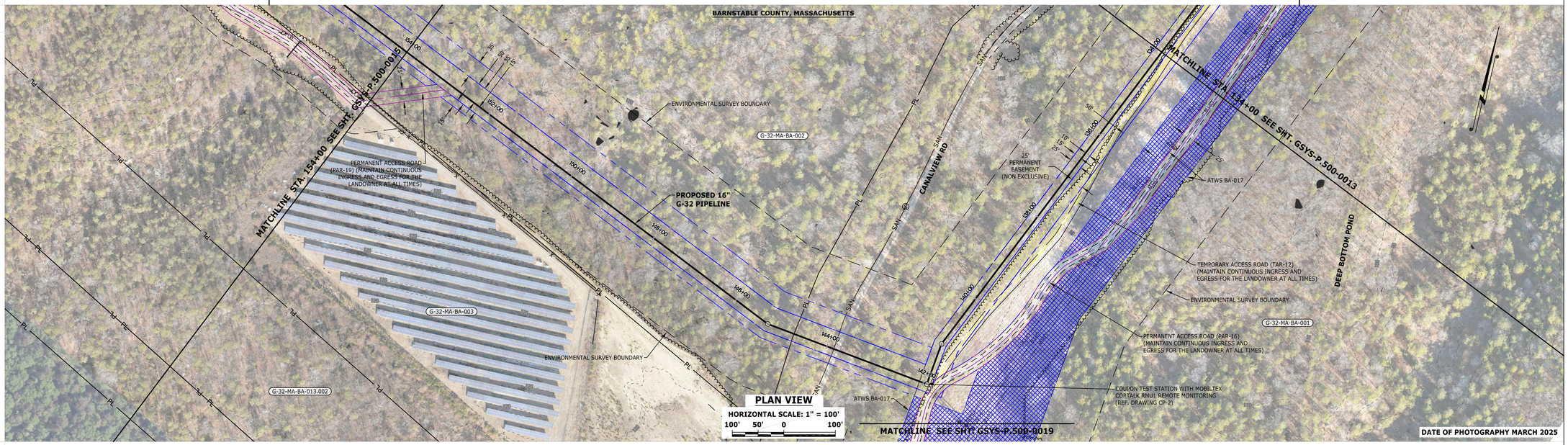
ENBRIDGE
Algonquin Gas Transmission
915 N. Eldridge Parkway, Houston, TX 77079-2703 (713) 627-5400

M:\259271\MAPPING\DRAWINGS\ALIGNMENT\RE-ISSUED FOR BID\V2\0073-G_S2

RIGHT-OF-WAY	154+00	G-32-MA-BA-002		144+68	G-32-MA-BA-001	134+00
TRACT NUMBERS		932 FT.			1068 FT.	
SURVEY DATA	154+00	145+23 P.I. <168°14'57" RT.	143+86 SANITARY SEWER (UNKNOWN COVER, FIELD VERIFY) 143+81 CL CANAL VIEW RD	141+93 P.I. <90°42'03" RT.	141+10 P.I. <17°02'35" LT.	134+00
SURVEY COMPANY:						
FIELD BOOK:						
PAGES:						
CLASS LOCATION	154+00	CLASS 1				134+00
PIPE MATERIAL	154+00	16" O.D. X 0.375" W.T., API 5L, X-52, 16-20 MILS FBE				134+00
		2000 FT.				

ALIGNMENT LEGEND

- PIPELINE MILEPOST
- PROPOSED G-31 PIPELINE
- PROPOSED G-32 PIPELINE
- CONSTRUCTION LIMIT
- WAREYARD / STAGING AREA
- EXISTING PERMANENT ROW
- PROPOSED PERMANENT ROW
- ADDITIONAL TEMPORARY WORKSPACE
- PROPOSED METERING & REGULATING STATION (M&R) SITE / PIG TRAP SITE
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- DELINEATED WATERBODY BANK
- DELINEATED WATERBODY CENTERLINE
- PERMANENT ACCESS ROAD
- TEMPORARY ACCESS ROAD
- PROPERTY LINE — PL —
- MAJOR CONTOUR - -100'- -
- MUNICIPALITY LINE
- ENVIRONMENTAL SURVEY BOUNDARY
- FENCE — X —
- EXISTING AGT PIPELINE — AGT —
- FOREIGN PIPELINE — II —
- POWERLINE — P —
- WATER PIPELINE — W —
- RAILROAD TRACK — | —
- OVERHEAD WIRE — OHW —
- TELEPHONE LINE — C — —
- UTILITY LINES
- SANITARY SEWER — SAN —
- TEE TAP
- BLOW OFF VALVE
- MAINLINE VALVE (MLV)
- POINT OF INTERSECTION
- BORE ENTRY/EXIT
- TRANSMISSION TOWER
- LIGHT POLE
- UTILITY POLE
- FIRE HYDRANT
- WELL (GAS)
- WELL (WATER)
- WELL (OIL)
- WELL (UNKNOWN)



ENVIRONMENTAL DATA

E & S TYPICALS

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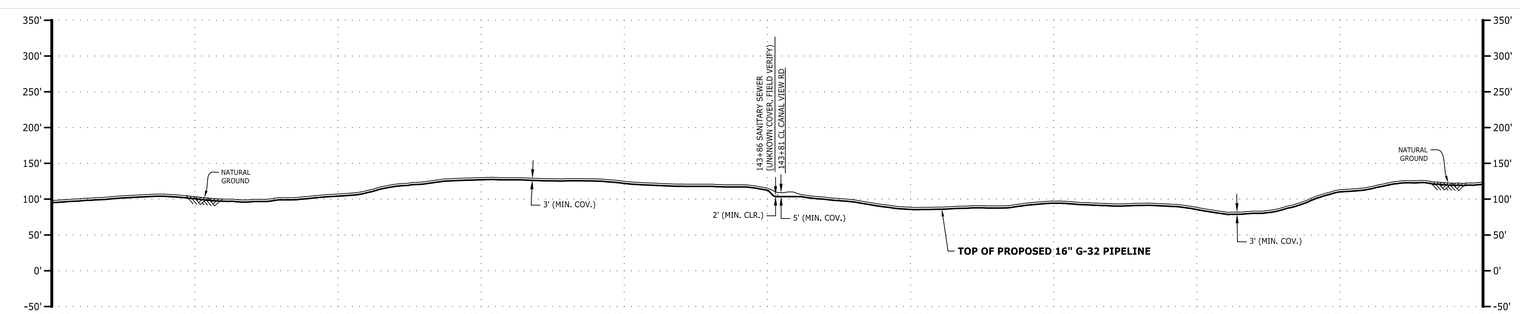
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SLOPE BREAKERS
TRENCH PLUG

PERMANENT SLOPE BREAKER & TRENCH PLUG SPACING

% SLOPE	SLOPE BREAKER SPACING (FT)	% SLOPE	TRENCH PLUG SPACING (FT)
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H/P HAY PASTURE MF MIXED FOREST D/MI DEVELOPED MEDIUM INTENSITY

SEGMENTABLE ELBOW	QTY
90 DEG, 5D, 16" OD, 0.375" WT, CS, x52, FBE COATING SYSTEM 2B	1
45 DEG, 5D, 16" OD, 0.375" WT, CS, x52, FBE COATING SYSTEM 2B	0

SOILS																								
LAND USE																								
% SLOPE	15-30%	<5%	5-15%	15-30%	5-15%	<5%	5-15%	<5%	5-15%	<5%	5-15%	15-30%	5-15%	15-30%	>30%	5-15%	15-30%	>30%						

STAMP/SEAL

COMMONWEALTH OF MASSACHUSETTS — CLAY H. WILLIS — STRUCTURAL — NO. 49136 — REGISTERED PROFESSIONAL ENGINEER
05/23/26

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wood. WOOD GROUP USA, INC.

TITLE	INITIALS	DATE
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DESIGN CHECKER:	JL	02/26/24
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YEAR: 2026 | W.O.: AFE 30002835 | SCALE: 1" = 100'

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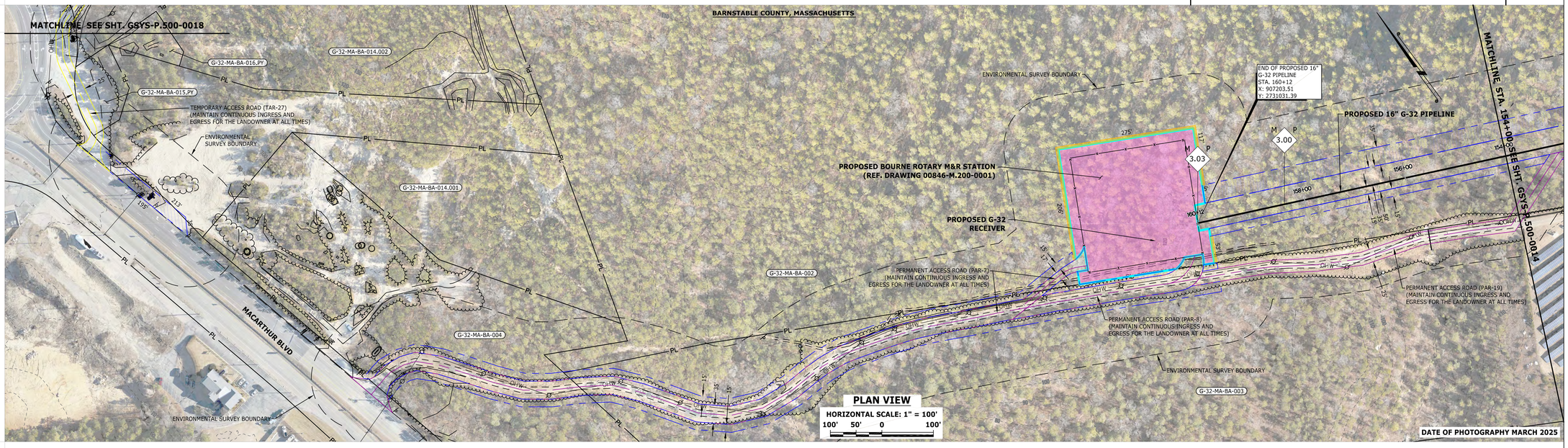
DWG.: GSYS-P.500-0014 | REV.: E

M:\2792\TYMAPPING\DRAWINGS\ALIGNMENT\RE-ISSUED FOR BID\2792TYM_G-32

RIGHT-OF-WAY		160+12	154+00
TRACT NUMBERS	G-32-MA-BA-002 612 FT.		
SURVEY DATA		160+12 END PIPELINE	154+00
SURVEY COMPANY: FIELD BOOK: PAGES:			
CLASS LOCATION	CLASS 1	160+12	154+00
PIPE MATERIAL	16" O.D. X 0.375" W.T., API 5L, X-52, 16-20 MILS FBE 612 FT.	160+12	154+00

ALIGNMENT LEGEND

- PIPELINE MILEPOST
- PROPOSED G-31 PIPELINE
- PROPOSED G-32 PIPELINE
- CONSTRUCTION LIMIT
- WAREYARD / STAGING AREA
- EXISTING PERMANENT ROW
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- MAJOR CONTOUR
- MUNICIPALITY LINE
- ENVIRONMENTAL SURVEY BOUNDARY
- FENCE
- EXISTING AGT PIPELINE
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100' 50' 0 100'

VERTICAL SCALE: 1" = 100'
100' 50' 0 100'

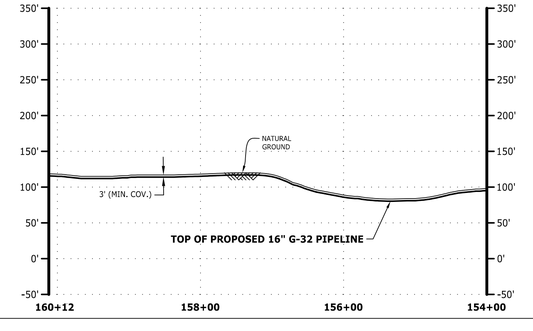
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SLOPE BREAKERS
TRENCH PLUG

PERMANENT SLOPE BREAKER & TRENCH PLUG SPACING

% SLOPE	SLOPE BREAKER SPACING (FT)	% SLOPE	TRENCH PLUG SPACING (FT)
5-15%	300 FT	<5%	NO STRUCTURE
15-30%	200 FT	5-15%	300 FT
>30%	100 FT	15-30%	200 FT
		>30%	100 FT

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LAND USE CLASSIFICATION

SOILS	
LAND USE	
% SLOPE	

CC CULTIVATED CROPS DF DECIDUOUS FOREST D/OS DEVELOPED OPEN SPACE
EF EVERGREEN FOREST S/S SHRUB SCRUB D/LI DEVELOPED LOW INTENSITY
H/P HAY PASTURE MF MIXED FOREST D/MI DEVELOPED MEDIUM INTENSITY

SEGMENTABLE ELBOW	QTY
90 DEG, SD, 16" OD, 0.375" WT, CS, x52, FBE COATING SYSTEM 2B	0
45 DEG, SD, 16" OD, 0.375" WT, CS, x52, FBE COATING SYSTEM 2B	0

% SLOPE	5-15%	<5%	5-15%	<5%	>30%	15-30%	<5%	15-30%

STAMP/SEAL

COMMONWEALTH OF MASSACHUSETTS
CLAY H. WILLIS
STRUCTURAL
NO. 49136
REGISTERED PROFESSIONAL ENGINEER
02/23/26

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		B	04/08/25	TL	RAL	ISSUED FOR REVIEW (60% DESIGN)
00846-M.200-0001	BOURNE ROTARY M&R STATION - LOCATION MAP AND PLOT PLAN	A	02/26/24	LBJ	JL	ISSUED FOR REVIEW

wood.
WOOD GROUP USA, INC.

TITLE	INITIALS	DATE
DRAWN BY:	LBJ	02/26/24
DESIGN CHECKER:	JL	02/26/24
DESIGN ENGINEER:	PA	02/26/24
PROJECT MANAGER:	EL	02/26/24

ENBRIDGE
CAPE COD CANAL PIPELINE RELOCATION PROJECT
PROPOSED 16" G-32 PIPELINE
TITLE: ALIGNMENT SHEET
LOC.: BARNSTABLE COUNTY, MASSACHUSETTS
YEAR: 2026 W.O.: AFE 30002835 SCALE: 1" = 100'

ENBRIDGE
Algonquin Gas Transmission
915 N. Eldridge Parkway, Houston, TX 77079-2703 (713) 627-5400

DWG.: GSYS-P.500-0015 REV.: F

M:\259271\MAPPING\DRAWINGS\01-ALIGNMENT\RE-ISSUED FOR BID\259271-G-32

RIGHT-OF-WAY

TRACT NUMBERS

SURVEY DATA

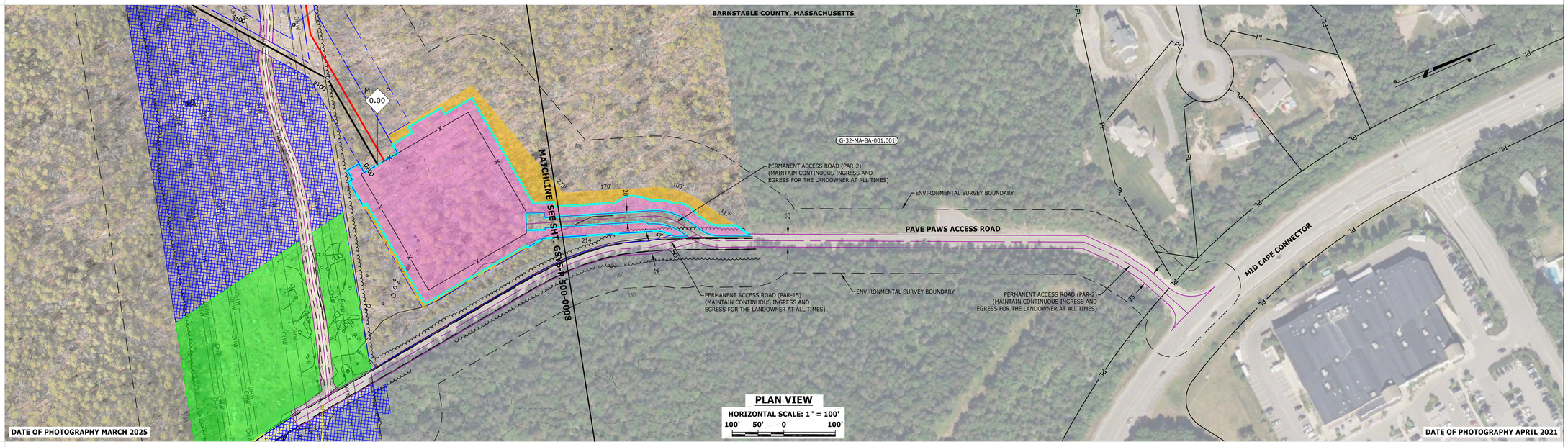
SURVEY COMPANY:
FIELD BOOK:
PAGES:

CLASS LOCATION

PIPE MATERIAL

ALIGNMENT LEGEND

- PIPELINE MILEPOST
- PROPOSED G-31 PIPELINE
- PROPOSED G-32 PIPELINE
- CONSTRUCTION LIMIT
- WAREYARD / STAGING AREA
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- DELINEATED WATERBODY BANK
- DELINEATED WATERBODY CENTERLINE
- PERMANENT ACCESS ROAD
- TEMPORARY ACCESS ROAD
- PROPERTY LINE — PL —
- MAJOR CONTOUR — -100'-
- MUNICIPALITY LINE
- ENVIRONMENTAL SURVEY BOUNDARY
- FENCE — X —
- EXISTING AGT PIPELINE — AGT —
- FOREIGN PIPELINE — II —
- POWERLINE — P —
- WATER PIPELINE — W —
- RAILROAD TRACK — I —
- OVERHEAD WIRE — OHW —
- TELEPHONE LINE — C —
- UTILITY LINES
- SANITARY SEWER — SAN —
- TEE TAP
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PLAN VIEW

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D/OS	DEVELOPED OPEN SPACE		
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SOILS

LAND USE

% SLOPE

STAMP/SEAL

CLAY H. WILLIS STRUCTURAL NO. 49136 REGISTERED PROFESSIONAL ENGINEER STATE OF MASSACHUSETTS

10/23/26

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WOOD GROUP USA, INC.

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YEAR: 2026 | W.O.: AFE 30002835 | SCALE: 1" = 100'

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915 N. Eldridge Parkway, Houston, TX 77079-2703 (713) 627-5400

DWG.: GSYS-P.500-0016 | REV.: E

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RIGHT-OF-WAY

TRACT NUMBERS

SURVEY DATA

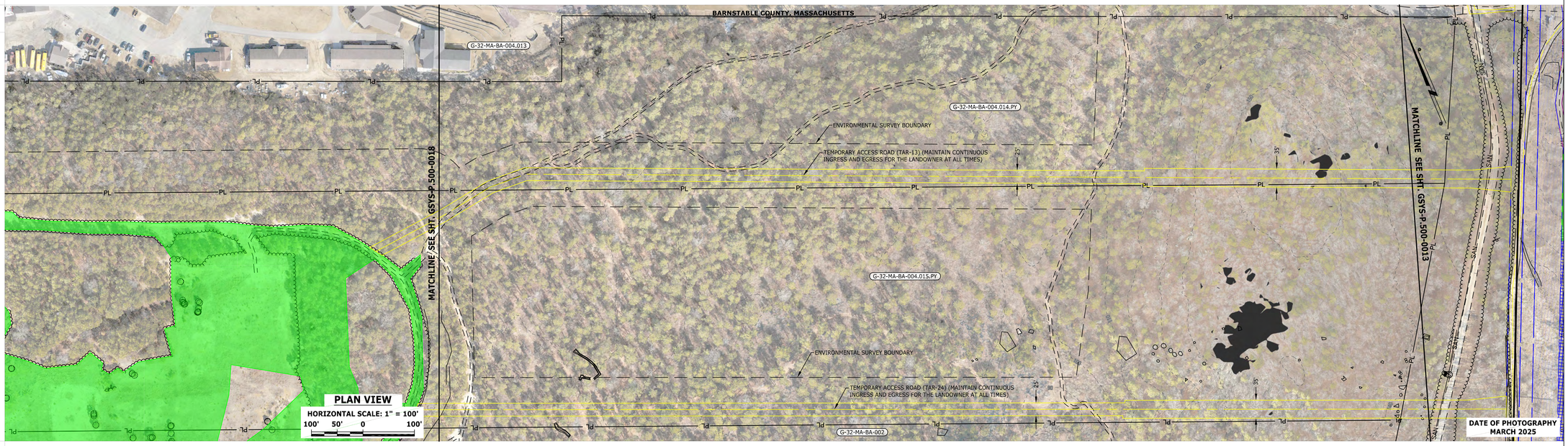
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SOILS

LAND USE

% SLOPE

STAMP/SEAL

COMMONWEALTH OF MASSACHUSETTS — CLAY E. WILLIS — NO. 49136 — REGISTERED PROFESSIONAL ENGINEER — 02/23/26

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wood. WOOD GROUP USA, INC.

TITLE	INITIALS	DATE
DRAWN BY:	LBJ	02/26/24
DESIGN CHECKER:	JL	02/26/24
DESIGN ENGINEER:	PA	02/26/24
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ENBRIDGE
CAPE COD CANAL PIPELINE RELOCATION PROJECT
PROPOSED 16" G-32 PIPELINE
TITLE: ALIGNMENT SHEET
LOC.: BARNSTABLE COUNTY, MASSACHUSETTS

ENBRIDGE
Algonquin Gas Transmission
915 N. Eldridge Parkway, Houston, TX 77079-2703 (713) 627-5400

YEAR: 2026 | W.O.: AFE 30002835 | SCALE: 1" = 100' | DWG.: GSYS-P.500-0017 | REV.: G

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RIGHT-OF-WAY

TRACT NUMBERS

SURVEY DATA

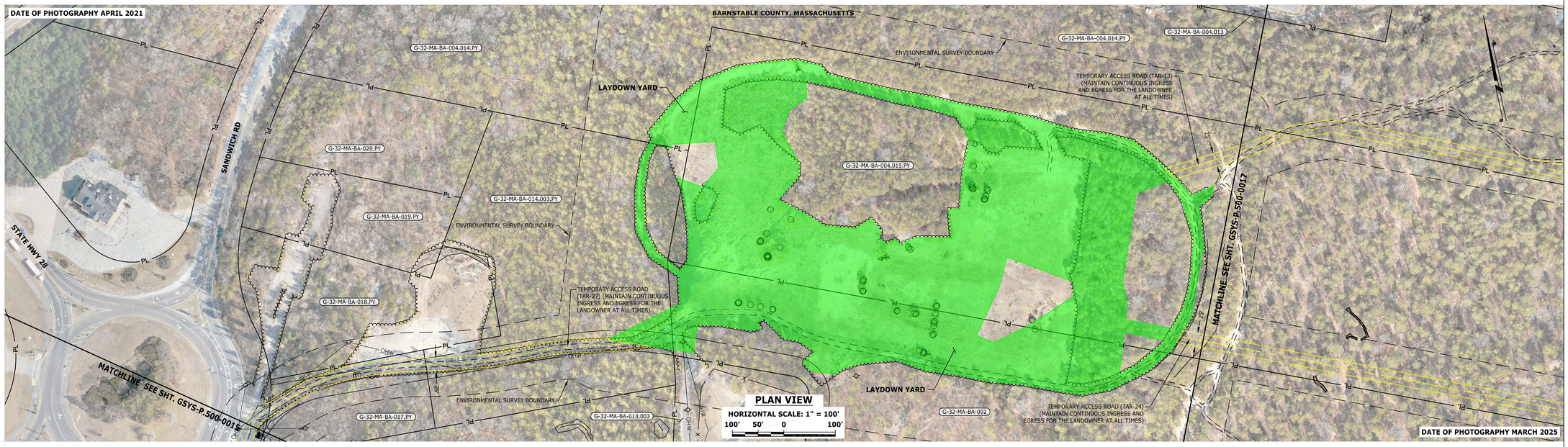
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LAND USE

% SLOPE

STAMP/SEAL

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wood. WOOD GROUP USA, INC.

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YEAR: 2026 | W.O.: AFE 30002835 | SCALE: 1" = 100'

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DWG.: GSYS-P.500-0018 | REV.: G

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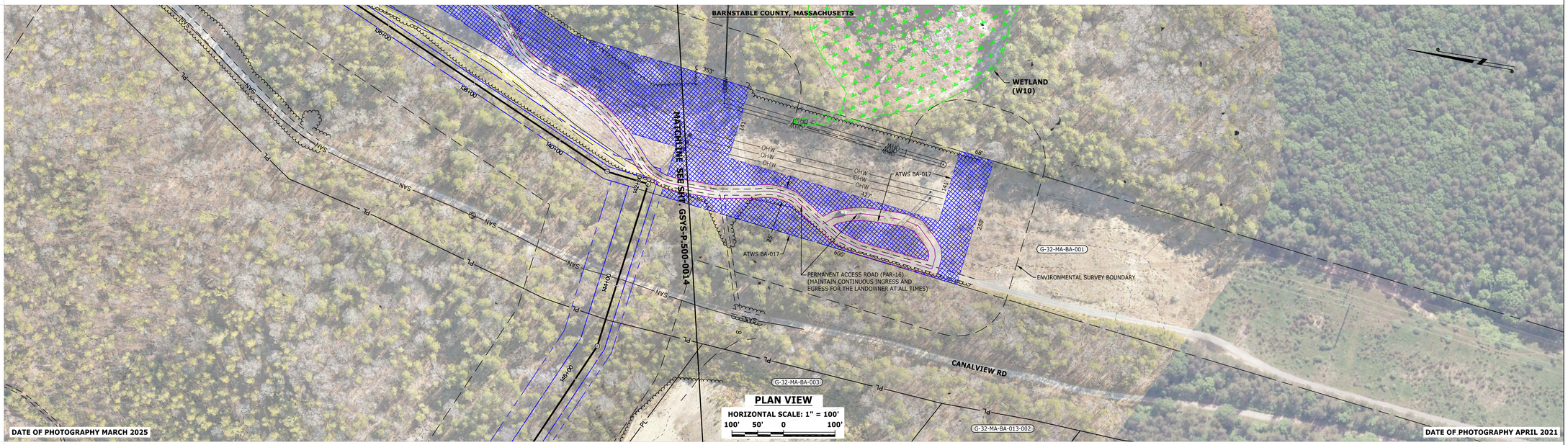
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RIGHT-OF-WAY

TRACT NUMBERS

0+00	G-11-MA-BA-010		G-11-MA-BA-010A		G-11-MA-BA-011		G-11-MA-BA-012		G-11-MA-BA-013.RD HWY 6 (SAGAMORE BRIDGE S)		G-11-MA-BA-014	G-24-MA-BA-001.5.RD CANAL ST		G-11-MA-BA-015.MS	22+74
	9 FT.	0+09	352 FT.	2+61	864 FT.	12+25	238 FT.	14+63	522 FT.	19+85	83 FT.	20+68	74 FT.	21+42	132 FT.

SURVEY DATA

SURVEY COMPANY:
FIELD BOOK:
PAGES:

0+00 BEGIN PIPELINE														22+74 END PIPELINE
0+27 TREE LINE 0+32 TREE LINE 0+54 TREE LINE		7+90 P.I. <11°02'03" RT.	8+40 HDD EXIT		13+53 WATERLINE	14+64 FENCE	15+12 TELEPHONE LINE	16+05 GUARDRAIL 16+06 EDGE OF PAVEMENT		19+24 DRAINAGE LINE	19+55 EDGE OF PAVEMENT 19+56 UG POWERLINE 19+65 EDGE OF PAVEMENT	20+75 TELEPHONE LINE 20+88 WATERLINE	21+30 EDGE OF PAVEMENT	22+74 HDD ENTRY	

CLASS LOCATION

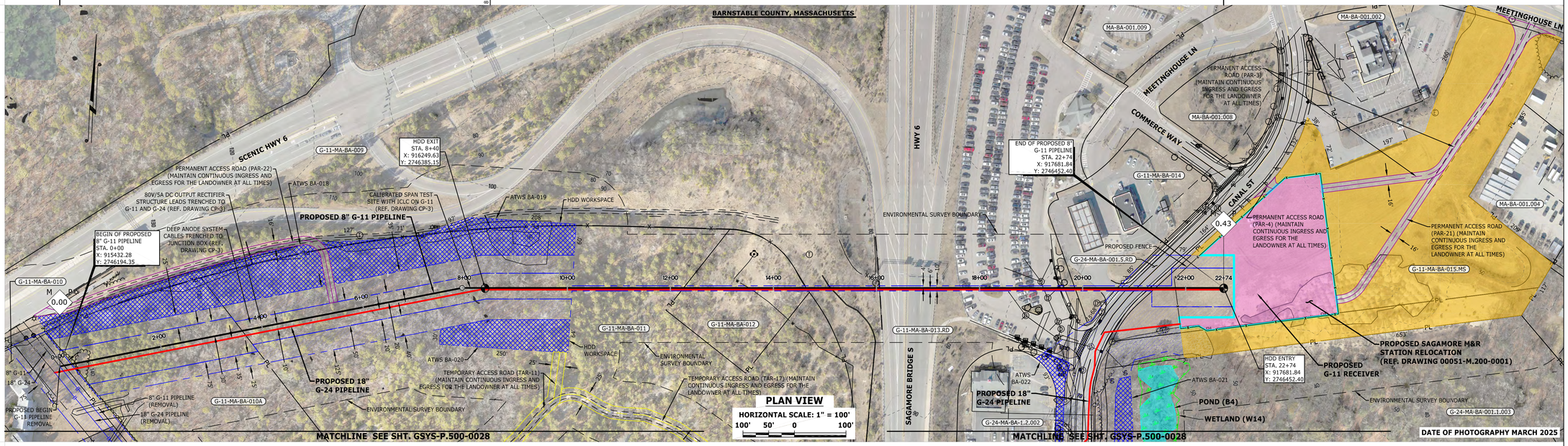
0+00	CLASS 2	14+90	CLASS 3	22+74

PIPE MATERIAL

0+00	8.625" O.D. X 0.322" W.T., API 5L, Gr. B, 16-20 MILS FBE 840 FT.	8+40	8.625" O.D. X 0.500" W.T., API 5L, Gr. B, 16-20 MILS FBE + 24 MILS ARO 1434 FT. (HDD)	22+74

ALIGNMENT LEGEND

- PIPELINE MILEPOST
- PROPOSED G-24 PIPELINE
- PROPOSED G-11 PIPELINE
- 18" G-24 & 8" G-11 PIPELINES (TO BE REMOVED)
- CONSTRUCTION LIMIT
- WAREYARD / STAGING AREA
- EXISTING PERMANENT ROW
- PROPOSED PERMANENT ROW
- ADDITIONAL TEMPORARY WORKSPACE
- PROPOSED METERING & REGULATING STATION (M&R) SITE / PIG TRAP SITE
- FACILITIES TEMPORARY WORKSPACE
- FACILITIES PERMANENT WORKSPACE
- PROPOSED GRAVEL AREA
- DELINEATED WETLAND BOUNDARY
- DELINEATED WATERBODY BANK
- DELINEATED WATERBODY CENTERLINE
- PERMANENT ACCESS ROAD
- TEMPORARY ACCESS ROAD
- PROPERTY LINE
- MAJOR CONTOUR
- MUNICIPALITY LINE
- ENVIRONMENTAL SURVEY BOUNDARY
- FENCE
- EXISTING AGT PIPELINE
- FOREIGN PIPELINE
- POWERLINE
- WATER PIPELINE
- RAILROAD TRACK
- OVERHEAD WIRE
- TELEPHONE LINE
- UTILITY LINES
- SANITARY SEWER
- TEE TAP
- BLOW OFF VALVE
- MAINLINE VALVE (MLV)
- POINT OF INTERSECTION
- BORE ENTRY/EXIT
- TRANSMISSION TOWER
- LIGHT POLE
- UTILITY POLE
- FIRE HYDRANT
- WELL (GAS)
- WELL (WATER)
- WELL (OIL)
- WELL (UNKNOWN)



PLAN VIEW
HORIZONTAL SCALE: 1" = 100'
100' 50' 0 100'

ENVIRONMENTAL DATA

E & S TYPICALS

E&S TYPICALS WILL BE USED AS A PLAN AND WILL HAVE FURTHER INPUT FROM ENVIRONMENTAL INSPECTOR.

PROFILE

HORIZONTAL SCALE: 1" = 100'
100' 50' 0 100'

VERTICAL SCALE: 1" = 100'
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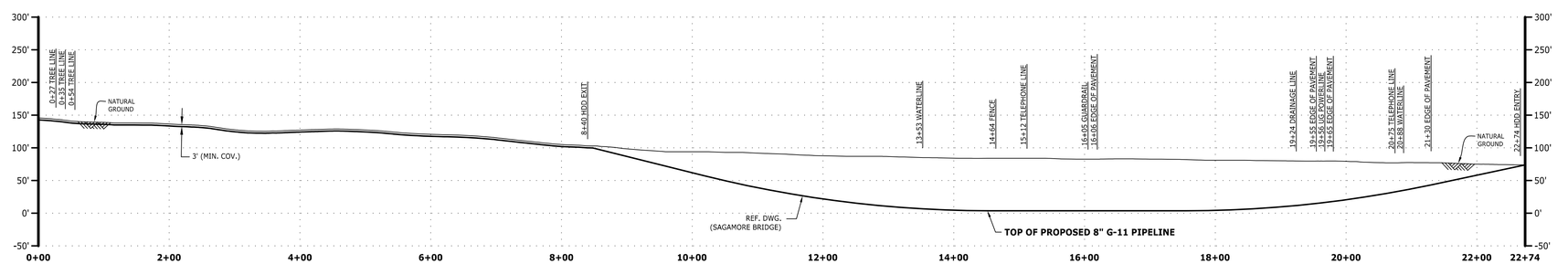
THE LOCATION OF TRENCH PLUGS AND SLOPE BREAKERS ARE INTENDED TO BE USED AS A GUIDELINE ONLY. EXACT LOCATION TO BE DETERMINED IN THE FIELD.

SLOPE BREAKERS
TRENCH PLUG

PERMANENT SLOPE BREAKER & TRENCH PLUG SPACING

% SLOPE	SLOPE BREAKER SPACING (FT)	% SLOPE	TRENCH PLUG SPACING (FT)
5-15%	300 FT	<5%	NO STRUCTURE
15-30%	200 FT	5-15%	300 FT
>30%	100 FT	15-30%	200 FT
		>30%	100 FT

IN AG FIELDS AND RESIDENTIAL AREAS WHERE SLOPE BREAKERS ARE NOT TYPICALLY REQUIRED, INSTALL PERMANENT TRENCH PLUGS AT THE SAME SPACING AS IF PERMANENT SLOPE BREAKERS WERE REQUIRED. (FERC PLAN)



LAND USE CLASSIFICATION

CC CULTIVATED CROPS DF DECIDUOUS FOREST D/OS DEVELOPED OPEN SPACE
EF EVERGREEN FOREST S/S SHRUB SCRUB D/LI DEVELOPED LOW INTENSITY
H/P HAY PASTURE MF MIXED FOREST D/MI DEVELOPED MEDIUM INTENSITY

SEGMENTABLE ELBOW	QTY
90 DEG, SD, 8.625" OD, 0.322" WT, CS, x52, FBE COATING SYSTEM 2B	1
45 DEG, SD, 8.625" OD, 0.322" WT, CS, x52, FBE COATING SYSTEM 2B	2

SOILS															
LAND USE															
% SLOPE	5-15%	<5%	5-15%	15-30%	5-15%	<5%	5-15%	<5%	5-15%		<5%	5-15%	<5%	5-15%	<5%	5-15%	<5%

STAMP/SEAL

CLAY H. WILLIS — STRUCTURAL — NO. 49136 — COMMONWEALTH OF MASSACHUSETTS — REGISTERED PROFESSIONAL ENGINEER
5/23/26

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UNDER THE AUTHORITY OF:
PE NAME: CLAY WILLIS
PE STATE: MASSACHUSETTS
PE NUMBER 49136

DWG. NO.	REFERENCE DWG.	REV	DATE	DSN	CK	DESCRIPTION
SAGAMORE BRIDGE OVERBEND	OVERBEND PLAN AND PROFILE - SAGAMORE BRIDGE HDD	D	01/29/26	TL	JL	RE-ISSUED FOR BID
CP-3	CATHODIC PROTECTION DESIGN	C	08/21/25	TL	JL	ISSUED FOR BID
00051-M.200-0001	SAGAMORE M&R STATION - LOCATION MAP AND PLOT PLAN	B	07/07/25	TL	JL	ISSUED FOR REVIEW (90% DESIGN)
SAGAMORE BRIDGE (REV. P9)	SAGAMORE BRIDGE HORIZONTAL DIRECTIONAL DRILL	A	04/08/25	TL	RAL	ISSUED FOR REVIEW (60% DESIGN)

wood. WOOD GROUP USA, INC.

DRAWN BY:	TL	03/31/25	ENBRIDGE CAPE COD CANAL PIPELINE RELOCATION PROJECT PROPOSED 8" G-11 PIPELINE
DESIGN CHECKER:	JL	04/01/25	
DESIGN ENGINEER:	PA	04/08/25	TITLE: ALIGNMENT SHEET
PROJECT MANAGER:	EL	04/08/25	LOC.: BARNSTABLE COUNTY, MASSACHUSETTS

ENBRIDGE
Algonquin Gas Transmission
915 N. Eldridge Parkway, Houston, TX 77079-2703 (713) 627-5400

TITLE	INITIALS	DATE	YEAR:	W.O.:	SCALE:	DWG.:	REV.:
			2026	AFE 30002835	1" = 100'	GSYS-P.500-0027	D

M:\259271\MAPPING\DRAWINGS\91-ALIGNMENT\RE-ISSUED FOR BID\259271-G_11

RIGHT-OF-WAY

TRACT NUMBERS

SURVEY DATA

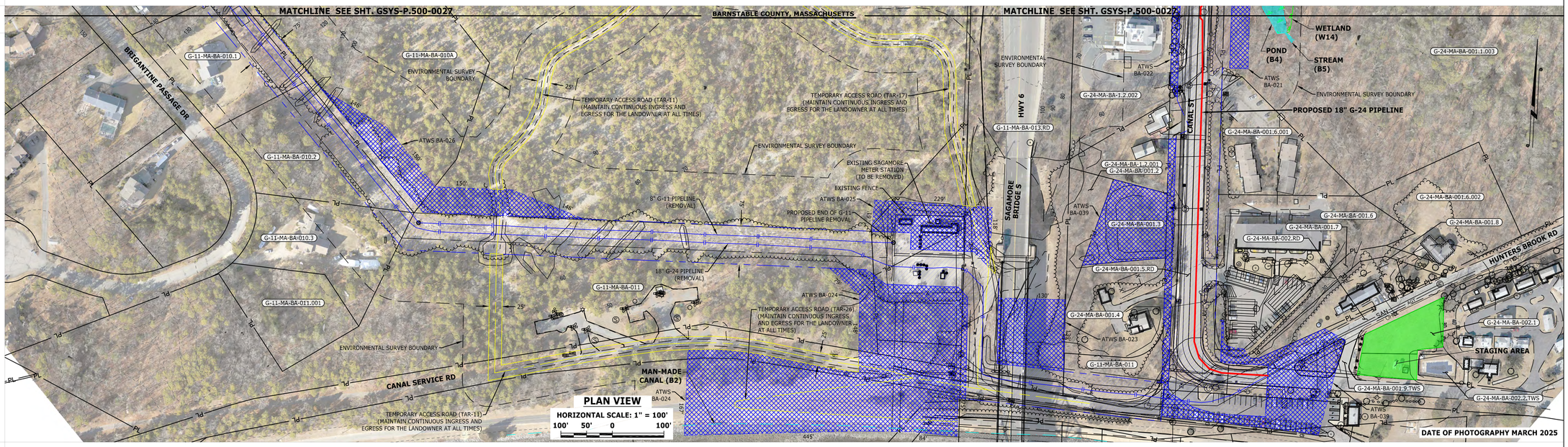
SURVEY COMPANY:
FIELD BOOK:
PAGES:

CLASS LOCATION

PIPE MATERIAL

ALIGNMENT LEGEND

- PIPELINE MILEPOST
- PROPOSED G-24 PIPELINE
- PROPOSED G-11 PIPELINE
- 18" G-24 & 8" G-11 PIPELINES (TO BE REMOVED)
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PROFILE

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TRENCH PLUG ▲

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EF EVERGREEN FOREST S/S SHRUB SCRUB D/LI DEVELOPED LOW INTENSITY
H/P HAY PASTURE MF MIXED FOREST D/MI DEVELOPED MEDIUM INTENSITY

SOILS

LAND USE

% SLOPE

STAMP/SEAL

COMMONWEALTH OF MASSACHUSETTS
CLAY H. WILLIS
STRUCTURAL
NO. 49136
REGISTERED PROFESSIONAL ENGINEER
5/23/26

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UNDER THE AUTHORITY OF:
PE NAME: CLAY WILLIS
PE STATE: MASSACHUSETTS
PE NUMBER 49136

DWG. NO.	REFERENCE DWG.	REV	DATE	DSN	CK	DESCRIPTION
		D	01/29/26	TL	JL	RE-ISSUED FOR BID
		C	08/21/25	TL	JL	ISSUED FOR BID
		B	07/07/25	TL	JL	ISSUED FOR REVIEW (90% DESIGN)
		A	04/08/25	TL	RAL	ISSUED FOR REVIEW (60% DESIGN)

wood.
WOOD GROUP USA, INC.

TITLE	INITIALS	DATE
DRAWN BY:	TL	03/31/25
DESIGN CHECKER:	JL	04/01/25
DESIGN ENGINEER:	PA	04/08/25
PROJECT MANAGER:	EL	04/08/25

ENBRIDGE
CAPE COD CANAL PIPELINE RELOCATION PROJECT
PROPOSED 8" G-11 PIPELINE
TITLE: ALIGNMENT SHEET
LOC.: BARNSTABLE COUNTY, MASSACHUSETTS
YEAR: 2026 | W.O.: AFE 30002835 | SCALE: 1" = 100' | DWG.: GSYS-P.500-0028 | REV.: D

ENBRIDGE
Algonquin Gas Transmission
915 N. Eldridge Parkway, Houston, TX 77079-2703 (713) 627-5400

M:\259271\MAPPING\DRAWINGS\91-ALIGNMENT\RE-ISSUED FOR BID\259271-G_11

RIGHT-OF-WAY

TRACT NUMBERS

1360+76	G-8-MA-BA-135.MS	1360+31	G-8-MA-BA-134.RD	1359+42	G-8-MA-BA-130	1337+00
	45 FT.		89 FT.		2242 FT.	

SURVEY DATA

SURVEY COMPANY:
FIELD BOOK:
PAGES:

1360+76 BEGINNING OF REMOVAL	1360+08 SCENIC HWY 6 (NE BOUND)	1359+76 SCENIC HWY 6 (SW BOUND)	1359+44 FENCE LINE	1358+93 P.I. <086°51'04" RT.	1353+26 P.I. <110°21'45" LT.	1351+36 P.I. <30°39'34" LT.	1350+85 P.I. <26°45'09" RT.	1346+17 OH POWERLINE	1346+11 OH POWERLINE	1346+05 OH POWERLINE	1345+54 P.I. <29°10'22" LT.	1345+24 P.I. <20°20'46" LT.	1338+04 P.I. <165°10'16" RT.	1337+00

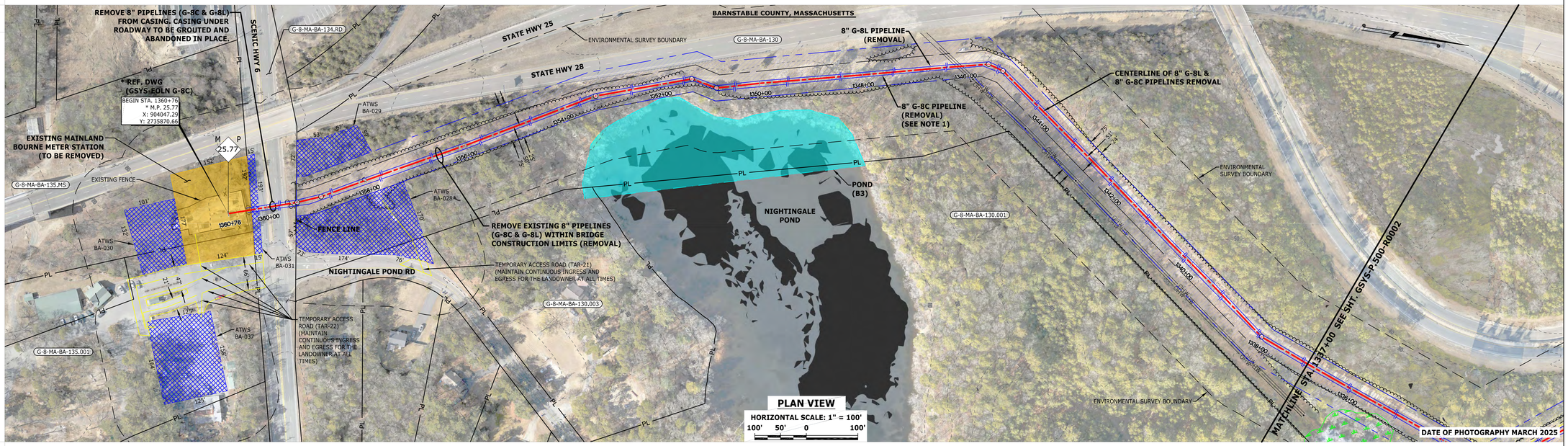
CLASS LOCATION

1360+76	CLASS 3	1347+33	CLASS 2	1337+00

PIPE MATERIAL

ALIGNMENT LEGEND

- PIPELINE MILEPOST (M / P)
- CENTERLINE OF G-8C & G-8L REMOVAL
- 8" G-8C & 8" G-8L PIPELINES (TO BE REMOVED)
- PROPOSED G-8C PIPELINE
- PROPOSED G-8L PIPELINE
- CONSTRUCTION LIMIT
- WAREYARD / STAGING AREA
- EXISTING PERMANENT ROW
- PROPOSED PERMANENT ROW
- ADDITIONAL TEMPORARY WORKSPACE
- PROPOSED METERING & REGULATING STATION (M&R) SITE
- FACILITIES TEMPORARY WORKSPACE
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- PROPOSED GRAVEL AREA
- DELINEATED WETLAND BOUNDARY
- DELINEATED WATERBODY BANK
- DELINEATED WATERBODY CENTERLINE
- PERMANENT ACCESS ROAD
- TEMPORARY ACCESS ROAD
- PROPERTY LINE (PL)
- MAJOR CONTOUR (-100-)
- MUNICIPALITY LINE
- ENVIRONMENTAL SURVEY BOUNDARY
- FENCE (X)
- EXISTING AGT PIPELINE (AGT)
- FOREIGN PIPELINE (I)
- POWERLINE (P)
- WATER PIPELINE (W)
- RAILROAD TRACK (I)
- OVERHEAD WIRE (OHW)
- TELEPHONE LINE (C)
- UTILITY LINES
- SANITARY SEWER (SAN)
- TEE TAP
- BLOW OFF VALVE
- MAINLINE VALVE (MLV)
- POINT OF INTERSECTION
- BORE ENTRY/EXIT
- TRANSMISSION TOWER
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ENVIRONMENTAL DATA

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PROFILE

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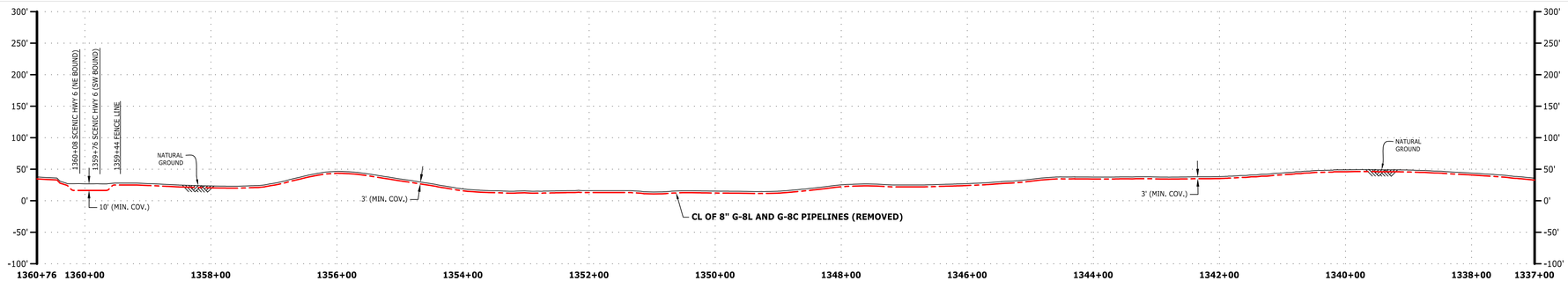
SLOPE BREAKERS ○
TRENCH PLUG ▲

PERMANENT SLOPE BREAKER & TRENCH PLUG SPACING

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NOTE:
1. G-8C REMOVAL INCLUDES VARIOUS PIPE SIZES BETWEEN 8.625" O.D. AND 6.625" O.D.



LAND USE CLASSIFICATION

CC CULTIVATED CROPS DF DECIDUOUS FOREST D/OS DEVELOPED OPEN SPACE
EF EVERGREEN FOREST S/S SHRUB SCRUB D/LI DEVELOPED LOW INTENSITY
H/P HAY PASTURE MF MIXED FOREST D/MI DEVELOPED MEDIUM INTENSITY

SOILS
LAND USE
% SLOPE

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UNDER THE AUTHORITY OF:
PE NAME: CLAY WILLIS
PE STATE: MASSACHUSETTS
PE NUMBER: 49136

CLAY H. WILLIS — COMMONWEALTH OF MASSACHUSETTS — NO. 49136 — REGISTERED PROFESSIONAL ENGINEER — STRUCTURAL — 01/23/26

DWG. NO.	REFERENCE DWG.	REV	DATE	DSN	CK	DESCRIPTION
		G	01/29/26	TL	JL	RE-ISSUED FOR BID
		F	08/21/25	TL	JL	ISSUED FOR BID
		E	07/07/25	TL	JL	ISSUED FOR REVIEW (90% DESIGN)
		D	05/06/25	LBJ	JL	RE-ISSUED FOR REVIEW (60% DESIGN)
		C	04/08/25	TL	RAL	ISSUED FOR REVIEW (60% DESIGN)
GSYS-EOLN G-8C	OPERATIONS ALIGNMENT SHEET	B	02/26/24	TCS	JL	ISSUED FOR REVIEW

WOOD GROUP USA, INC.

TITLE	INITIALS	DATE
DRAWN BY:	LBJ	02/08/24
DESIGN CHECKER:	JL	02/09/24
DESIGN ENGINEER:	PA	02/09/24
PROJECT MANAGER:	EL	02/09/24

ENBRIDGE
CAPE COD CANAL PIPELINE RELOCATION PROJECT
REMOVAL OF 8" G-8C & 8" G-8L PIPELINES
TITLE: ALIGNMENT SHEET

LOC.: BARNSTABLE COUNTY, MASSACHUSETTS

YEAR: 2026 | W.O.: AFE 30002835 | SCALE: 1" = 100' | DWG.: GSYS-P.500-R0001 | REV.: G

Algonquin Gas Transmission
915 N. Eldridge Parkway, Houston, TX 77079-2703 (713) 627-5400

M:\259271\MAPPING\DRAWINGS\01-ALIGNMENT\RE-ISSUED FOR BID\GSYS-P.500-R0001

RIGHT-OF-WAY

TRACT NUMBERS

1337+00	G-8-MA-BA-130	1325+75	G-8-MA-BA-129	1320+38	G-8-MA-BA-129.20	1317+51	UNKNOWN	1315+68	G-8-MA-BA-129.18	1314+64	G-8-MA-BA-129.17	1313+37	G-8-MA-BA-129.16	1313+00
	1125 FT.		537 FT.		287 FT.		183 FT.		104 FT.		127 FT.		37 FT.	

SURVEY DATA

SURVEY COMPANY:
FIELD BOOK:
PAGES:

1337+00	1333+21 P.I. <19°27'46" RT. 1333+01 TEMPORARY ACCESS ROAD (TAR-20)	1332+78 P.I. <32°02'49" RT. 1332+45 P.I. <05°22'14" RT.	1330+13 TEMPORARY ACCESS ROAD (TAR-20) 1330+02 TEMPORARY ACCESS ROAD (TAR-20)	1327+78 TEMPORARY ACCESS ROAD (TAR-20)	1326+94 P.I. <22°03'57" LT. 1326+53 P.I. <26°24'01" LT. 1326+31 TEMPORARY ACCESS ROAD (TAR-20)	1320+56 TEMPORARY ACCESS ROAD (TAR-20)	1317+49 P.I. <26°17'28" LT. 1317+07 OH POWERLINE	1313+00

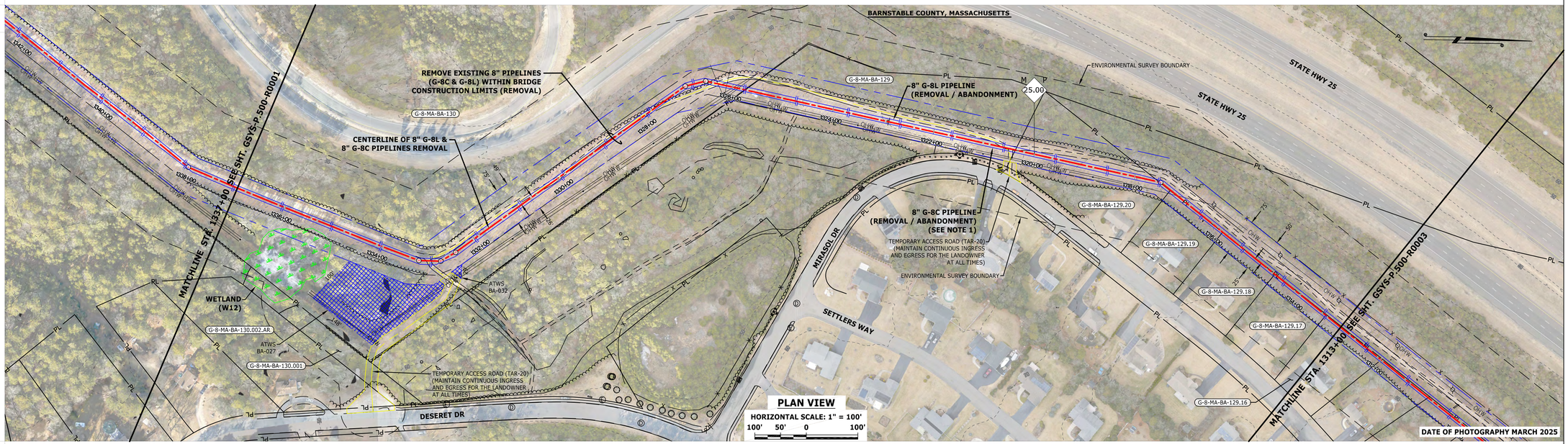
CLASS LOCATION

1337+00	CLASS 2	1334+66	CLASS 3	1313+00

PIPE MATERIAL

ALIGNMENT LEGEND

- PIPELINE MILEPOST
- CENTERLINE OF G-8C & G-8L REMOVAL
- 8" G-8C & 8" G-8L PIPELINES (TO BE REMOVED)
- PROPOSED G-8C PIPELINE
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- WAREYARD / STAGING AREA
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ENVIRONMENTAL DATA

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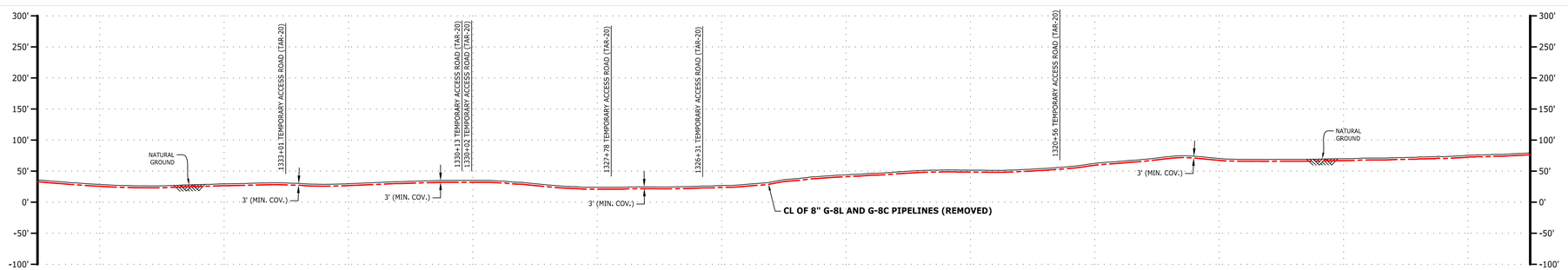
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CC CULTIVATED CROPS	DF DECIDUOUS FOREST	D/OS DEVELOPED OPEN SPACE	
EF EVERGREEN FOREST	S/S SHRUB SCRUB	D/LI DEVELOPED LOW INTENSITY	
H/P HAY PASTURE	MF MIXED FOREST	D/MI DEVELOPED MEDIUM INTENSITY	

SOILS
LAND USE
% SLOPE



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CONSTRUCTION, RECORDATION, CONVEYANCE, SALES, OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT

UNDER THE AUTHORITY OF:
PE NAME: CLAY WILLIS
PE STATE: MASSACHUSETTS
PE NUMBER: 49136

DWG. NO.	REFERENCE DWG.	REV	DATE	DSN	CK	DESCRIPTION
		F	01/29/26	TL	JL	RE-ISSUED FOR BID
		E	08/21/25	TL	JL	ISSUED FOR BID
		D	07/07/25	TL	JL	ISSUED FOR REVIEW (90% DESIGN)
		C	05/06/25	LBJ	JL	RE-ISSUED FOR REVIEW (60% DESIGN)
		B	04/08/25	TL	RAL	ISSUED FOR REVIEW (60% DESIGN)
		A	02/26/24	TCS	JL	ISSUED FOR REVIEW

wood.
WOOD GROUP USA, INC.

TITLE	INITIALS	DATE
DRAWN BY:	LBJ	02/08/24
DESIGN CHECKER:	JL	02/09/24
DESIGN ENGINEER:	PA	02/09/24
PROJECT MANAGER:	EL	02/09/24

ENBRIDGE
CAPE COD CANAL PIPELINE RELOCATION PROJECT
REMOVAL OF 8" G-8C & 8" G-8L PIPELINES
TITLE: ALIGNMENT SHEET

LOC.: BARNSTABLE COUNTY, MASSACHUSETTS

YEAR: 2026 | W.O.: AFE 30002835 | SCALE: 1" = 100' | DWG.: GSYS-P.500-R0002 | REV.: F

Algonquin Gas Transmission
915 N. Eldridge Parkway, Houston, TX 77079-2703 (713) 627-5400

M:\259271\MAPPING\DRAWINGS\91-ALIGNMENT\RE-ISSUED FOR BID\GSYS-P.500-R0001

RIGHT-OF-WAY

TRACT NUMBERS

1313+00	G-8-MA-BA-129.16	G-8-MA-BA-129.15	G-8-MA-BA-129.14	G-8-MA-BA-129.13	G-8-MA-BA-129.12	G-8-MA-BA-129.11	G-8-MA-BA-129.10	G-8-MA-BA-129.09	G-8-MA-BA-129.08	G-8-MA-BA-129.07	G-8-MA-BA-129.06	G-8-MA-BA-129.05	G-8-MA-BA-129.04	G-8-MA-BA-129.03	G-8-MA-BA-129.02	G-8-MA-BA-129.01	G-8-MA-BA-128.MS	UNKNOWN	1290+08
	101 FT.	117 FT.	98 FT.	86 FT.	82 FT.	89 FT.	86 FT.	99 FT.	99 FT.	110 FT.	124 FT.	125 FT.	125 FT.	144 FT.	224 FT.	51 FT.	470 FT.	62 FT.	
	1311+99	1310+82	1309+84	1308+98	1308+16	1307+27	1306+41	1305+42	1304+43	1303+33	1302+09	1300+84	1299+59	1298+15	1295+91	1295+40		1290+70	

SURVEY DATA

SURVEY COMPANY:
FIELD BOOK:
PAGES:

1313+00																	1293+99 P.I. <44°41'01" RT.		1290+23 P.I. <29°17'49" LT.	1290+08 END OF REMOVAL

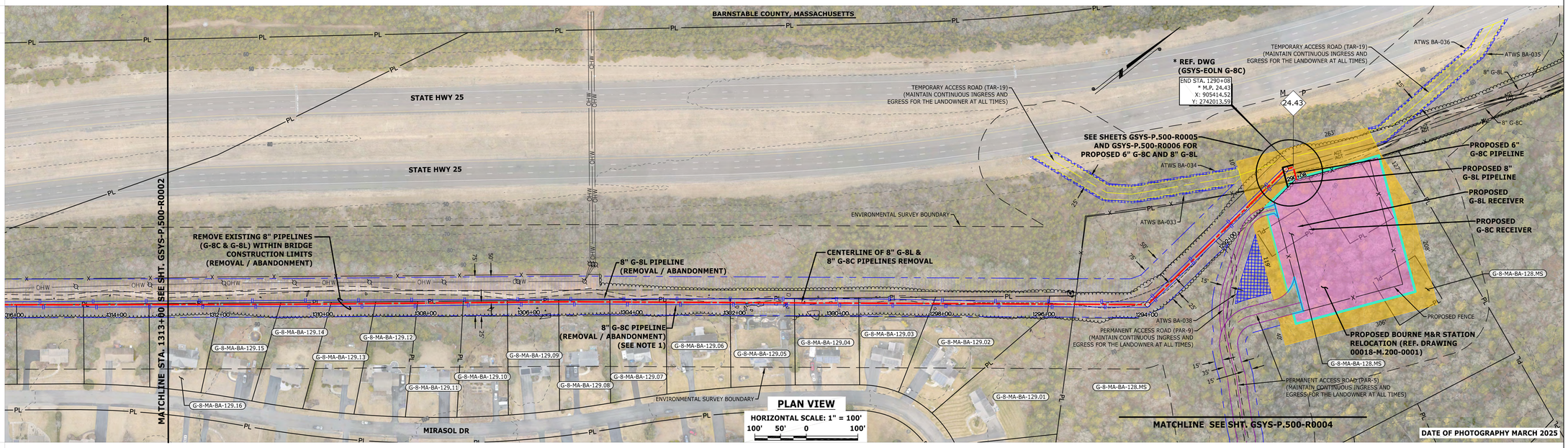
CLASS LOCATION

1313+00	CLASS 3	1292+93	CLASS 1	1290+08

PIPE MATERIAL

ALIGNMENT LEGEND

- PIPELINE MILEPOST
- CENTERLINE OF G-8C & G-8L REMOVAL
- 8" G-8C & 8" G-8L PIPELINES (TO BE REMOVED)
- PROPOSED G-8C PIPELINE
- PROPOSED G-8L PIPELINE
- CONSTRUCTION LIMIT
- WAREYARD / STAGING AREA
- EXISTING PERMANENT ROW
- PROPOSED PERMANENT ROW
- ADDITIONAL TEMPORARY WORKSPACE
- PROPOSED METERING & REGULATING STATION (M&R) SITE
- FACILITIES TEMPORARY WORKSPACE
- FACILITIES PERMANENT WORKSPACE
- PROPOSED GRAVEL AREA
- DELINEATED WETLAND BOUNDARY
- DELINEATED WATERBODY BANK
- DELINEATED WATERBODY CENTERLINE
- PERMANENT ACCESS ROAD
- TEMPORARY ACCESS ROAD
- PROPERTY LINE
- MAJOR CONTOUR
- MUNICIPALITY LINE
- ENVIRONMENTAL SURVEY BOUNDARY
- FENCE
- EXISTING AGT PIPELINE
- FOREIGN PIPELINE
- POWERLINE
- WATER PIPELINE
- RAILROAD TRACK
- OVERHEAD WIRE
- TELEPHONE LINE
- UTILITY LINES
- SANITARY SEWER
- TEE TAP
- BLOW OFF VALVE
- MAINLINE VALVE (MLV)
- POINT OF INTERSECTION
- BORE ENTRY/EXIT
- TRANSMISSION TOWER
- LIGHT POLE
- UTILITY POLE
- FIRE HYDRANT
- WELL (GAS)
- WELL (WATER)
- WELL (OIL)
- WELL (UNKNOWN)



ENVIRONMENTAL DATA

E & S TYPICALS

E&S TYPICALS WILL BE USED AS A PLAN AND WILL HAVE FURTHER INPUT FROM ENVIRONMENTAL INSPECTOR.

PROFILE

HORIZONTAL SCALE: 1" = 100'
100' 50' 0 100'
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100' 50' 0 100'

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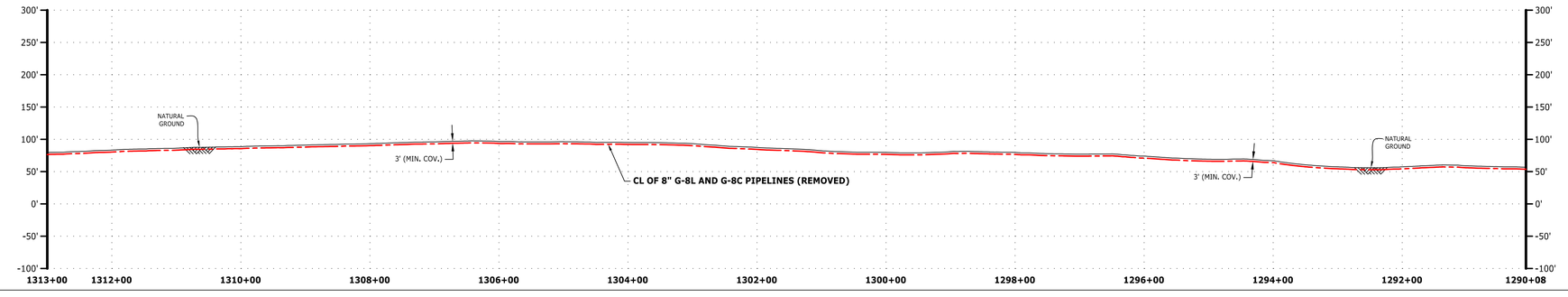
SLOPE BREAKERS ○
TRENCH PLUG ▲

PERMANENT SLOPE BREAKER & TRENCH PLUG SPACING

% SLOPE	SLOPE BREAKER SPACING (FT)	% SLOPE	TRENCH PLUG SPACING (FT)
5-15%	300 FT	<5%	NO STRUCTURE
15-30%	200 FT	5-15%	300 FT
>30%	100 FT	15-30%	200 FT
		>30%	100 FT

IN AG FIELDS AND RESIDENTIAL AREAS WHERE SLOPE BREAKERS ARE NOT TYPICALLY REQUIRED, INSTALL PERMANENT TRENCH PLUGS AT THE SAME SPACING AS IF PERMANENT SLOPE BREAKERS WERE REQUIRED. (FERC PLAN)

NOTE:
1. G-8C REMOVAL INCLUDES VARIOUS PIPE SIZES BETWEEN 8.625" O.D. AND 6.625" O.D.



LAND USE CLASSIFICATION

CC CULTIVATED CROPS	DF DECIDUOUS FOREST	D/OS DEVELOPED OPEN SPACE	
EF EVERGREEN FOREST	S/S SHRUB SCRUB	D/LI DEVELOPED LOW INTENSITY	
H/P HAY PASTURE	MF MIXED FOREST	D/MI DEVELOPED MEDIUM INTENSITY	

SOILS
LAND USE
% SLOPE

M:\259271\MAPPING\DRAWINGS\91-ALIGNMENT\RE-ISSUED FOR BID\GSYS-P.500-R0001

CLAY H. WILLIS — COMMONWEALTH OF MASSACHUSETTS — NO. 49136 — REGISTERED PROFESSIONAL ENGINEER — STRUCTURAL — 04/23/26

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PE STATE: MASSACHUSETTS
PE NUMBER 49136

DWG. NO.	REFERENCE DWG.	REV	DATE	DSN	CK	DESCRIPTION
		D	01/29/26	TL	JL	RE-ISSUED FOR BID
		C	08/21/25	TL	JL	ISSUED FOR BID
00018-M.200-0001	BOURNE M&R STATION - LOCATION MAP AND PLOT PLAN	B	07/07/25	TL	JL	ISSUED FOR REVIEW (90% DESIGN)
GSYS-EOLN G-8C	OPERATIONS ALIGNMENT SHEET	A	04/08/25	TL	RAL	ISSUED FOR REVIEW (60% DESIGN)

wood. WOOD GROUP USA, INC.

DRAWN BY:	TL	04/02/25
DESIGN CHECKER:	JL	04/03/25
DESIGN ENGINEER:	PA	04/08/25
PROJECT MANAGER:	EL	04/08/25
TITLE	INITIALS	DATE

ENBRIDGE
CAPE COD CANAL PIPELINE RELOCATION PROJECT
REMOVAL OF 8" G-8C & 8" G-8L PIPELINES
TITLE: ALIGNMENT SHEET
LOC.: BARNSTABLE COUNTY, MASSACHUSETTS
YEAR: 2026 | W.O.: AFE 30002835 | SCALE: 1" = 100'

ENBRIDGE
Algonquin Gas Transmission
915 N. Eldridge Parkway, Houston, TX 77079-2703 (713) 627-5400

DWG.: GSYS-P.500-R0003 | REV.: D

RIGHT-OF-WAY

TRACT NUMBERS

SURVEY DATA

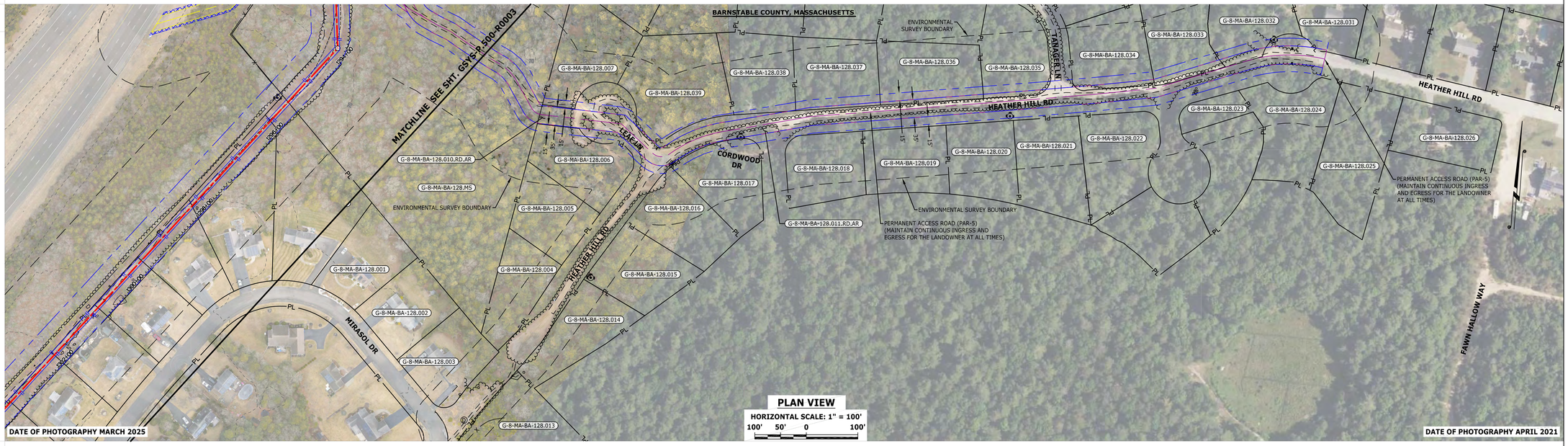
SURVEY COMPANY:
FIELD BOOK:
PAGES:

CLASS LOCATION

PIPE MATERIAL

ALIGNMENT LEGEND

- PIPELINE MILEPOST
- CENTERLINE OF G-8C & G-8L REMOVAL
- 8" G-8C & 8" G-8L PIPELINES (TO BE REMOVED)
- PROPOSED G-8C PIPELINE
- PROPOSED G-8L PIPELINE
- CONSTRUCTION LIMIT
- WAREYARD / STAGING AREA
- EXISTING PERMANENT ROW
- PROPOSED PERMANENT ROW
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- PROPOSED METERING & REGULATING STATION (M&R) SITE
- FACILITIES TEMPORARY WORKSPACE
- FACILITIES PERMANENT WORKSPACE
- PROPOSED GRAVEL AREA
- DELINEATED WETLAND BOUNDARY
- DELINEATED WATERBODY BANK
- DELINEATED WATERBODY CENTERLINE
- PERMANENT ACCESS ROAD
- TEMPORARY ACCESS ROAD
- PROPERTY LINE — PL
- MAJOR CONTOUR — -100'-
- MUNICIPALITY LINE
- ENVIRONMENTAL SURVEY BOUNDARY
- FENCE — X
- EXISTING AGT PIPELINE — AGT
- FOREIGN PIPELINE — I
- POWERLINE — P
- WATER PIPELINE — W
- RAILROAD TRACK — I
- OVERHEAD WIRE — OHW
- TELEPHONE LINE — C
- UTILITY LINES
- SANITARY SEWER — SAN
- TEE TAP
- BLOW OFF VALVE
- MAINLINE VALVE (MLV)
- POINT OF INTERSECTION
- BORE ENTRY/EXIT
- TRANSMISSION TOWER
- LIGHT POLE
- UTILITY POLE
- FIRE HYDRANT
- WELL (GAS)
- WELL (WATER)
- WELL (OIL)
- WELL (UNKNOWN)



PLAN VIEW

HORIZONTAL SCALE: 1" = 100'

100' 50' 0 100'

ENVIRONMENTAL DATA

E & S TYPICALS

E&S TYPICALS WILL BE USED AS A PLAN AND WILL HAVE FURTHER INPUT FROM ENVIRONMENTAL INSPECTOR.

PROFILE

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100' 50' 0 100'

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SLOPE BREAKERS ○
TRENCH PLUG ▲

PERMANENT SLOPE BREAKER & TRENCH PLUG SPACING

% SLOPE	SLOPE BREAKER SPACING (FT)	% SLOPE	TRENCH PLUG SPACING (FT)
5-15%	300 FT	<5%	NO STRUCTURE
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LAND USE CLASSIFICATION

CC CULTIVATED CROPS	DF DECIDUOUS FOREST	D/OS DEVELOPED OPEN SPACE	
EF EVERGREEN FOREST	S/S SHRUB SCRUB	D/LI DEVELOPED LOW INTENSITY	
H/P HAY PASTURE	MF MIXED FOREST	D/MI DEVELOPED MEDIUM INTENSITY	

SOILS

LAND USE

% SLOPE

M:\259271\MAPPING\DRAWINGS\01-ALIGNMENT\RE-ISSUED FOR BID\GSYS-P.500-R0001

COMMONWEALTH OF MASSACHUSETTS — CLAY H. WILLIS — STRUCTURAL — NO. 49136 — REGISTERED PROFESSIONAL ENGINEER — 01/23/26

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UNDER THE AUTHORITY OF:
PE NAME: CLAY WILLIS
PE STATE: MASSACHUSETTS
PE NUMBER: 49136

DWG. NO.	REFERENCE DWG.	REV	DATE	DSN	CK	DESCRIPTION
		D	01/29/26	TL	JL	RE-ISSUED FOR BID
		C	08/21/25	TL	JL	ISSUED FOR BID
		B	07/07/25	TL	JL	ISSUED FOR REVIEW (90% DESIGN)
		A	04/08/25	TL	RAL	ISSUED FOR REVIEW (60% DESIGN)

wood. WOOD GROUP USA, INC.

TITLE	INITIALS	DATE
DRAWN BY:	TL	04/02/25
DESIGN CHECKER:	JL	04/03/25
DESIGN ENGINEER:	PA	04/08/25
PROJECT MANAGER:	EL	04/08/25

ENBRIDGE
CAPE COD CANAL PIPELINE RELOCATION PROJECT
REMOVAL OF 8" G-8C & 8" G-8L PIPELINES
TITLE: ALIGNMENT SHEET

LOC.: BARNSTABLE COUNTY, MASSACHUSETTS

YEAR: 2026 | W.O.: AFE 30002835 | SCALE: 1" = 100'

ENBRIDGE

Algonquin Gas Transmission
915 N. Eldridge Parkway, Houston, TX 77079-2703 (713) 627-5400

DWG.: GSYS-P.500-R0004 | REV.: D

RIGHT-OF-WAY

TRACT NUMBERS

SURVEY DATA

SURVEY COMPANY:
FIELD BOOK:
PAGES:

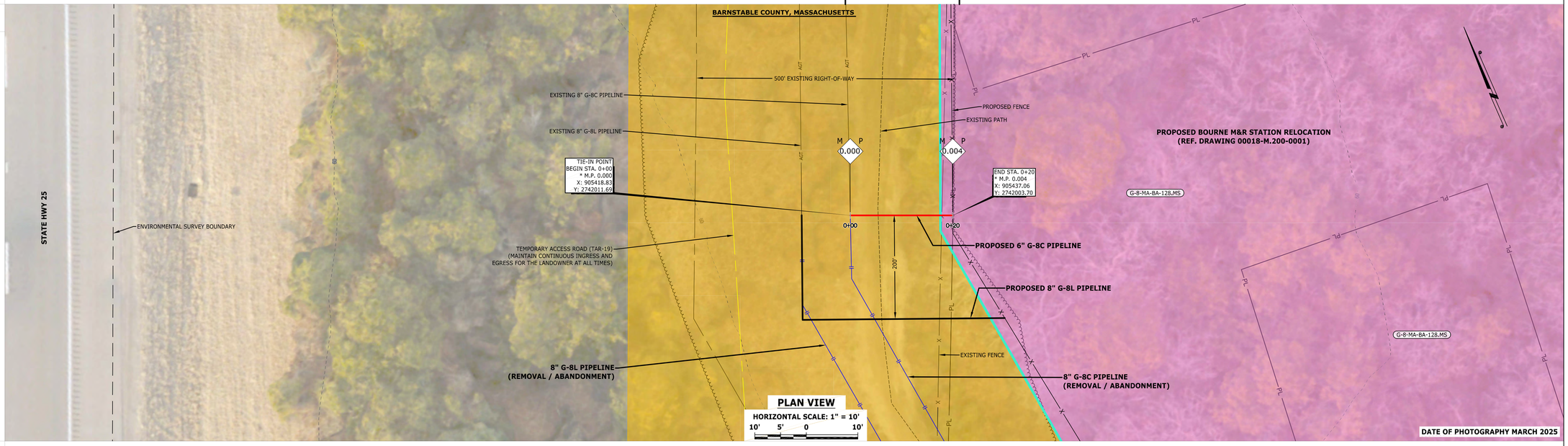
CLASS LOCATION

PIPE MATERIAL

	0+00		0+20
RIGHT-OF-WAY		UNKNOWN 20 FT.	
SURVEY DATA	0+00 BEGIN PIPELINE 0+00 PIPELINE TIE-IN	0+18 EXISTING FENCE 0+20 FACILITY FENCE	0+20 END PIPELINE
CLASS LOCATION	0+00	CLASS 1	0+20
PIPE MATERIAL	0+00	6.625" O.D. X 0.277" W.T., API 5L, Gr. B, 16-20 MILS FBE 20 FT.	0+20

ALIGNMENT LEGEND

- PIPELINE MILEPOST
- CENTERLINE OF G-8C & G-8L REMOVAL
- 8" G-8C & 8" G-8L PIPELINES (TO BE REMOVED)
- PROPOSED G-8C PIPELINE
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- DELINEATED WATERBODY BANK
- DELINEATED WATERBODY CENTERLINE
- PERMANENT ACCESS ROAD
- TEMPORARY ACCESS ROAD
- PROPERTY LINE — PL —
- MAJOR CONTOUR — 100' —
- MUNICIPALITY LINE
- ENVIRONMENTAL SURVEY BOUNDARY
- FENCE — X —
- EXISTING AGT PIPELINE — AGT —
- FOREIGN PIPELINE
- POWERLINE — P —
- WATER PIPELINE — W —
- RAILROAD TRACK
- OVERHEAD WIRE — OHW —
- TELEPHONE LINE — C —
- UTILITY LINES
- SANITARY SEWER — SAN —
- TEE TAP
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- FIRE HYDRANT
- WELL (GAS)
- WELL (WATER)
- WELL (OIL)
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ENVIRONMENTAL DATA

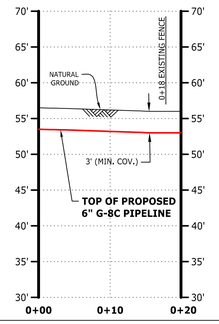
E & S TYPICALS

E&S TYPICALS WILL BE USED AS A PLAN AND WILL HAVE FURTHER INPUT FROM ENVIRONMENTAL INSPECTOR.

PROFILE

HORIZONTAL SCALE: 1" = 10'
10' 5' 0 10'

VERTICAL SCALE: 1" = 10'
10' 5' 0 10'



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SLOPE BREAKERS ○
TRENCH PLUG ▲

PERMANENT SLOPE BREAKER & TRENCH PLUG SPACING

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LAND USE CLASSIFICATION

CC CULTIVATED CROPS DF DECIDUOUS FOREST D/OS DEVELOPED OPEN SPACE
EF EVERGREEN FOREST S/S SHRUB SCRUB D/LI DEVELOPED LOW INTENSITY
H/P HAY PASTURE MF MIXED FOREST D/MI DEVELOPED MEDIUM INTENSITY

SEGMENTABLE ELBOW	QTY
90 DEG, SD, 6.625" OD, 0.277" WT, CS, x52, FBE COATING SYSTEM 2B	1

SOILS		
LAND USE		
% SLOPE	5-15%	<5%

CLAY H. WILLIS — STRUCTURAL — NO. 49136 — COMMONWEALTH OF MASSACHUSETTS — PROFESSIONAL ENGINEER — 05/23/26

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		C	01/29/26	TL	JL	RE-ISSUED FOR BID
		B	08/21/25	TL	JL	ISSUED FOR BID
00018-M.200-0001	BOURNE M&R STATION - LOCATION MAP AND PLOT PLAN	A	07/07/25	TL	JL	ISSUED FOR REVIEW (90% DESIGN)

wood. WOOD GROUP USA, INC.

TITLE	INITIALS	DATE
DRAWN BY:	TL	06/04/25
DESIGN CHECKER:	JL	06/05/25
DESIGN ENGINEER:	PA	07/07/25
PROJECT MANAGER:	EL	07/07/25

ENBRIDGE
CAPE COD CANAL PIPELINE RELOCATION PROJECT
PROPOSED 6" G-8C PIPELINE
TITLE: ALIGNMENT SHEET

LOC.: BARNSTABLE COUNTY, MASSACHUSETTS

YEAR: 2026 | W.O.: AFE 30002835 | SCALE: 1" = 10'

Algonquin Gas Transmission
915 N. Eldridge Parkway, Houston, TX 77079-2703 (713) 627-5400

DWG.: GSYS-P.500-R0005 | REV.: C

M:\259271\MAPPING\DRAWINGS\91-ALIGNMENT\RE-ISSUED FOR BID\GSYS-P.500-R0001

RIGHT-OF-WAY

TRACT NUMBERS

SURVEY DATA

SURVEY COMPANY:
FIELD BOOK:
PAGES:

CLASS LOCATION

CLASS 1

PIPE MATERIAL

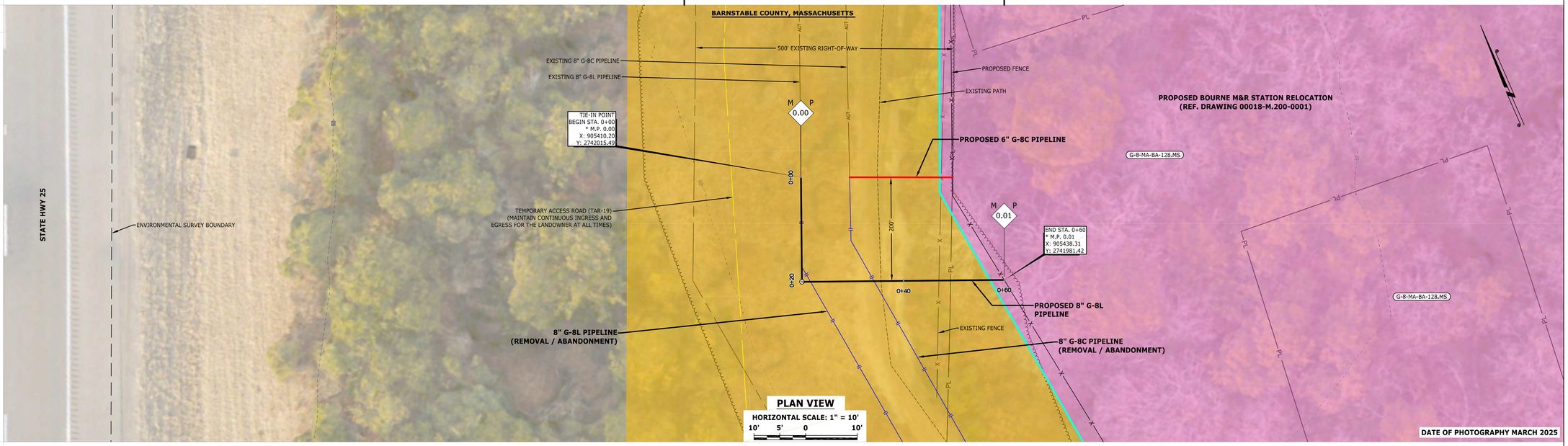
8.625" O.D. X 0.322" W.T., API 5L, Gr. B, 16-20 MILS FBE

60 FT.

0+00		0+49	0+60
	UNKNOWN	G-8-MA-BA-128.MS	
	49 FT.	11 FT.	
0+00 BEGIN PIPELINE 0+00 PIPELINE TIE-IN	0+20 P.I. <90°00'00" LT.	0+47 EXISTING FENCE	0+60 FACILITY FENCE 0+60 END PIPELINE
0+00			0+60
0+00			0+60

ALIGNMENT LEGEND

- PIPELINE MILEPOST
- CENTERLINE OF G-8C & G-8L REMOVAL
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- DELINEATED WATERBODY BANK
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- PERMANENT ACCESS ROAD
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- PROPERTY LINE — PL —
- MAJOR CONTOUR — -100'- —
- MUNICIPALITY LINE
- ENVIRONMENTAL SURVEY BOUNDARY
- FENCE — X —
- EXISTING AGT PIPELINE — AGT —
- FOREIGN PIPELINE — I —
- POWERLINE — P —
- WATER PIPELINE — W —
- RAILROAD TRACK
- OVERHEAD WIRE — OHW —
- TELEPHONE LINE — C —
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- SANITARY SEWER — SAN —
- TEE TAP
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PLAN VIEW

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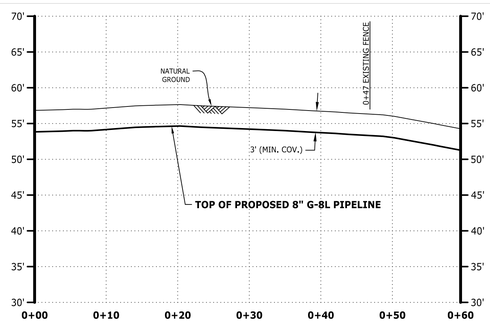
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TRENCH PLUG ▲

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>30%	100 FT	15-30%	200 FT
		>30%	100 FT

IN AG FIELDS AND RESIDENTIAL AREAS WHERE SLOPE BREAKERS ARE NOT TYPICALLY REQUIRED, INSTALL PERMANENT TRENCH PLUGS AT THE SAME SPACING AS IF PERMANENT SLOPE BREAKERS WERE REQUIRED. (FERC PLAN)

LAND USE CLASSIFICATION

CC	CULTIVATED CROPS	DF	DECIDUOUS FOREST
D/OS	DEVELOPED OPEN SPACE		
EF	EVERGREEN FOREST	S/S	SHRUB SCRUB
D/LI	DEVELOPED LOW INTENSITY		
H/P	HAY PASTURE	MF	MIXED FOREST
D/MI	DEVELOPED MEDIUM INTENSITY		

SEGMENTABLE ELBOW	QTY
90 DEG, SD, 8.625" OD, 0.322" WT, CS, x52, FBE COATING SYSTEM 2B	1
45 DEG, SD, 8.625" OD, 0.322" WT, CS, x52, FBE COATING SYSTEM 2B	0

SOILS	
LAND USE	
% SLOPE	5-15%

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF:
BID REVIEW
IT IS NOT TO BE USED FOR:
CONSTRUCTION, RECORDATION, CONVEYANCE, SALES, OR AS THE BASIS FOR THE ISSUANCE OF A PERMIT

UNDER THE AUTHORITY OF:
PE NAME: CLAY WILLIS
PE STATE: MASSACHUSETTS
PE NUMBER 49136

COMMONWEALTH OF MASSACHUSETTS — CLAY H. WILLIS — No. 49136 — REGISTERED PROFESSIONAL ENGINEER — 06/23/26

DWG. NO.	REFERENCE DWG.	REV	DATE	DSN	CK	DESCRIPTION
		C	01/29/26	TL	JL	RE-ISSUED FOR BID
		B	08/21/25	TL	JL	ISSUED FOR BID
00018-M.200-0001	BOURNE M&R STATION - LOCATION MAP AND PLOT PLAN	A	07/07/25	TL	JL	ISSUED FOR REVIEW (90% DESIGN)

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WOOD GROUP USA, INC.

TITLE	INITIALS	DATE
DRAWN BY:	TL	06/04/25
DESIGN CHECKER:	JL	06/05/25
DESIGN ENGINEER:	PA	07/07/25
PROJECT MANAGER:	EL	07/07/25

ENBRIDGE
CAPE COD CANAL PIPELINE RELOCATION PROJECT
PROPOSED 8" G-8L PIPELINE
TITLE: ALIGNMENT SHEET
LOC.: BARNSTABLE COUNTY, MASSACHUSETTS

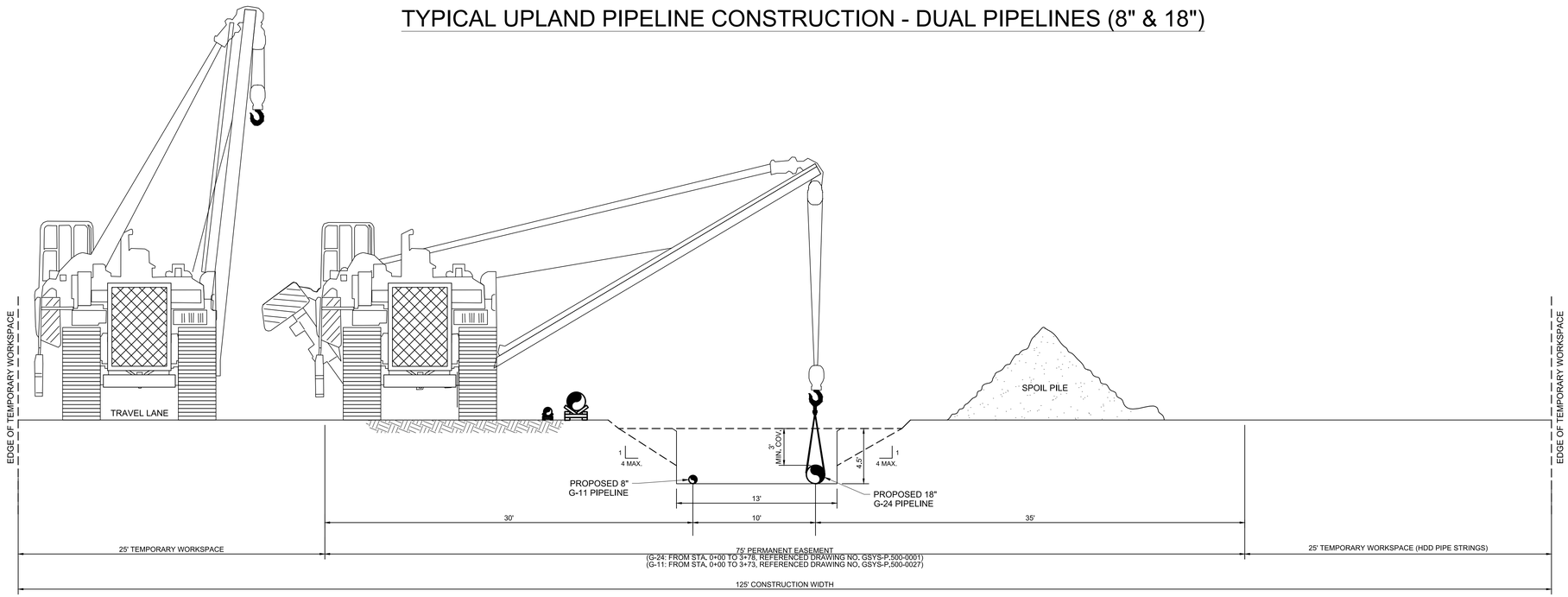
YEAR: 2026 | W.O.: AFE 30002835 | SCALE: 1" = 10' | DWG.: GSYS-P.500-R0006 | REV.: C

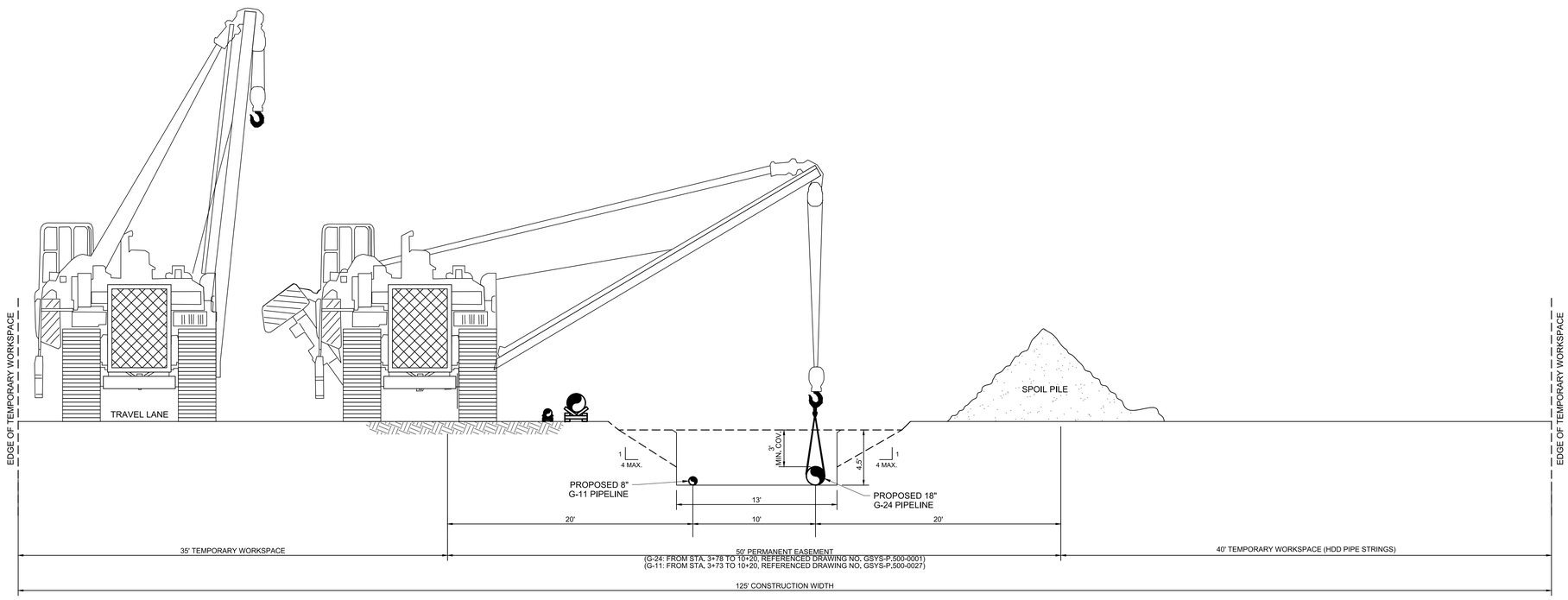
ENBRIDGE
Algonquin Gas Transmission
915 N. Eldridge Parkway, Houston, TX 77079-2703 (713) 627-5400

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Typical Pipeline Construction Methods and HDD Plan & Profile

TYPICAL UPLAND PIPELINE CONSTRUCTION - DUAL PIPELINES (8" & 18")





NOTES:

1. ADDITIONAL TEMPORARY WORKSPACE AND TEMPORARY WORKSPACE COULD BE MODIFIED DEPENDING ON SITE SPECIFIC CONDITIONS INCLUDING DEEPER DEPTH OF COVER, TOP SOIL SEGREGATION (NOT INCLUDED WITHIN CONSTRUCTION PROFILE), MODIFICATION IN SIDE SLOPE OF DITCH, PRESENCE OF PROTECTED RESOURCES.

REV	DATE	DSN	CK	DESCRIPTION
D	01/29/26	TL	JL	RE-ISSUED FOR BID
C	08/21/25	TL	JL	ISSUED FOR BID
B	07/07/25	RAL	LR	ISSUED FOR REVIEW (90% DESIGN)
A	04/08/25	RAL	LR	ISSUED FOR REVIEW (60% DESIGN)

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TITLE	INITIALS	DATE
DRAWN BY:	RAL	04/02/25
DESIGN CHECKER:	JL	04/02/25
DESIGN ENGINEER:	PA	04/08/25
PROJECT MANAGER:	EL	04/08/25

ENBRIDGE
CAPE COD CANAL PIPELINE RELOCATION PROJECT
CONSTRUCTION TYPICAL

TITLE:

LOC.: BARNSTABLE COUNTY, MASSACHUSETTS

YEAR: 2026 | W.O.: AFE 30002835 | SCALE: N.T.S.

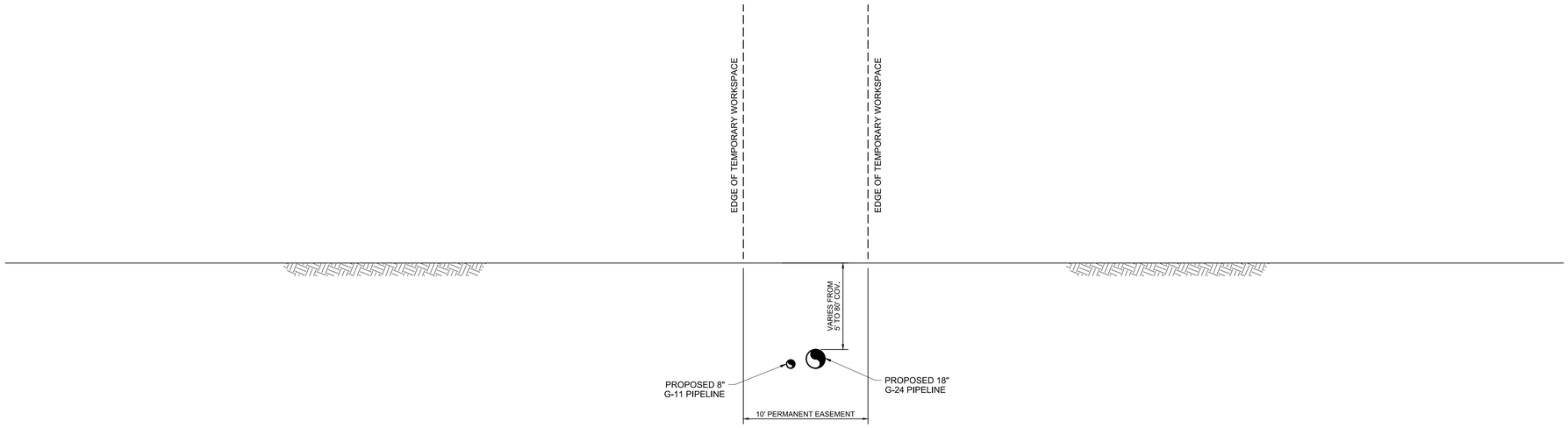
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DWG.: GSYS-M.223-0001 | REV.: D

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TYPICAL CONSTRUCTION - DUAL PIPELINES (8" & 18") HDD



DUAL PIPELINES (8" & 18") - HDD CROSSING

NOTES:

1. CURRENT CONFIGURATION ASSUMES THE DUAL PIPELINES HAVE A MINIMUM OF 6" WALL TO WALL SEPARATION.
2. ADDITIONAL TEMPORARY WORKSPACE AND TEMPORARY WORKSPACE COULD BE MODIFIED DEPENDING ON SITE SPECIFIC CONDITIONS INCLUDING DEEPER DEPTH OF COVER, TOP SOIL SEGREGATION (NOT INCLUDED WITHIN CONSTRUCTION PROFILE), MODIFICATION IN SIDE SLOPE OF DITCH, PRESENCE OF PROTECTED RESOURCES.

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B	07/07/25	RAL	LR	ISSUED FOR REVIEW (90% DESIGN)
A	04/08/25	RAL	LR	ISSUED FOR REVIEW (60% DESIGN)

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TITLE	INITIALS	DATE
DRAWN BY:	RAL	04/02/25
DESIGN CHECKER:	JL	04/02/25
DESIGN ENGINEER:	PA	04/08/25
PROJECT MANAGER:	EL	04/08/25

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CAPE COD CANAL PIPELINE RELOCATION PROJECT
CONSTRUCTION TYPICAL

TITLE:

LOC.: BARNSTABLE COUNTY, MASSACHUSETTS

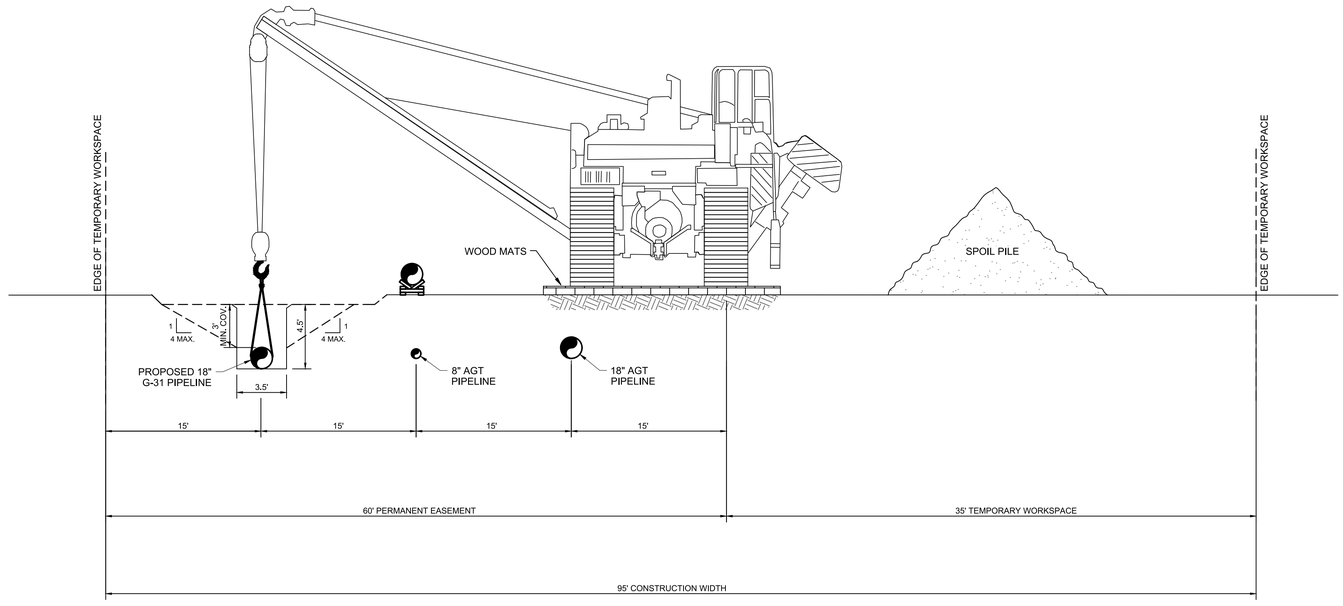
YEAR: 2026 | W.O.: AFE 30002835 | SCALE: N.T.S.

DWG.: GSYS-M.223-0002 | REV.: D

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TYPICAL UPLAND PIPELINE CONSTRUCTION - SINGLE PIPELINE (18")



NOTES:

1. ADDITIONAL TEMPORARY WORKSPACE AND TEMPORARY WORKSPACE COULD BE MODIFIED DEPENDING ON SITE SPECIFIC CONDITIONS INCLUDING DEEPER DEPTH OF COVER, TOP SOIL SEGREGATION (NOT INCLUDED WITHIN CONSTRUCTION PROFILE), MODIFICATION IN SIDE SLOPE OF DITCH, PRESENCE OF PROTECTED RESOURCES.

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A	04/08/25	RAL	LR	ISSUED FOR REVIEW (60% DESIGN)

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TITLE	INITIALS	DATE
DRAWN BY:	RAL	04/02/25
DESIGN CHECKER:	JL	04/02/25
DESIGN ENGINEER:	PA	04/08/25
PROJECT MANAGER:	EL	04/08/25

ENBRIDGE
CAPE COD CANAL PIPELINE RELOCATION PROJECT
CONSTRUCTION TYPICAL

TITLE:

LOC.: BARNSTABLE COUNTY, MASSACHUSETTS

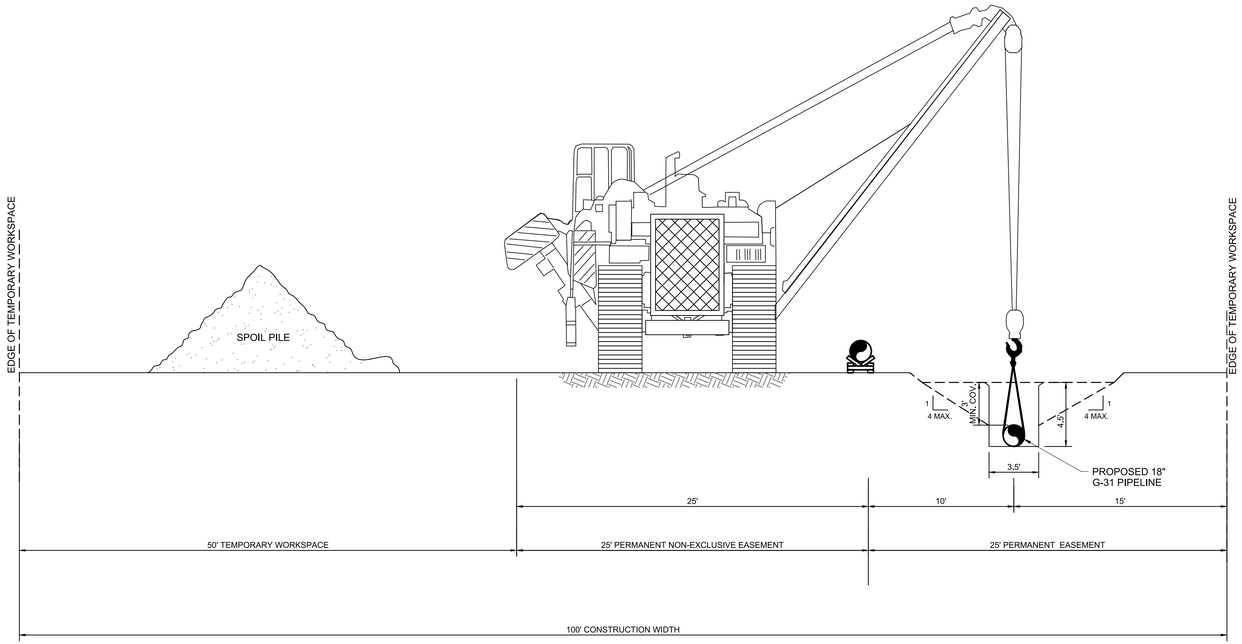
YEAR: 2025 | W.O.: AFE 30002835 | SCALE: N.T.S. | DWG.: GSYS-M.223-0003 | REV.: C

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TYPICAL UPLAND PIPELINE CONSTRUCTION - SINGLE PIPELINE (18")



NOTES:.

1. ADDITIONAL TEMPORARY WORKSPACE AND TEMPORARY WORKSPACE COULD BE MODIFIED DEPENDING ON SITE SPECIFIC CONDITIONS INCLUDING DEEPER DEPTH OF COVER, TOP SOIL SEGREGATION (NOT INCLUDED WITHIN CONSTRUCTION PROFILE), MODIFICATION IN SIDE SLOPE OF DITCH, PRESENCE OF PROTECTED RESOURCES.

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DESIGN ENGINEER:	PA	04/08/25
PROJECT MANAGER:	EL	04/08/25

ENBRIDGE
CAPE COD CANAL PIPELINE RELOCATION PROJECT
CONSTRUCTION TYPICAL

TITLE:

LOC.: BARNSTABLE COUNTY, MASSACHUSETTS

YEAR: 2025 | W.O.: AFE 30002835 | SCALE: N.T.S.

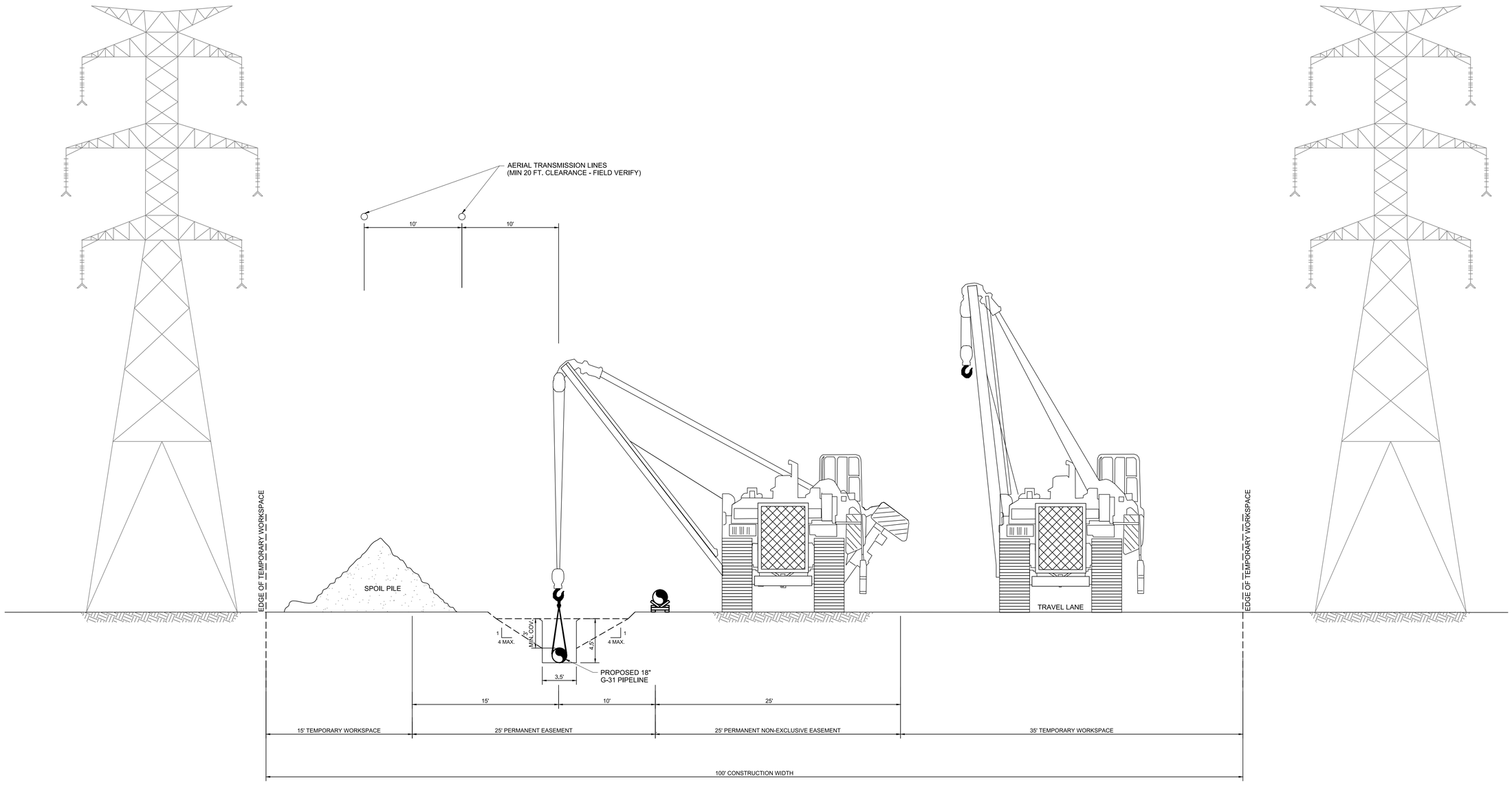
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DWG.: GSYS-M.223-0004 | REV.: C

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TYPICAL UPLAND (PARALLELING POWER LINES) PIPELINE CONSTRUCTION - SINGLE PIPELINE (18")



NOTES:

1. ADDITIONAL TEMPORARY WORKSPACE AND TEMPORARY WORKSPACE COULD BE MODIFIED DEPENDING ON SITE SPECIFIC CONDITIONS INCLUDING DEEPER DEPTH OF COVER, TOP SOIL SEGREGATION (NOT INCLUDED WITHIN CONSTRUCTION PROFILE), MODIFICATION IN SIDE SLOPE OF DITCH, PRESENCE OF PROTECTED RESOURCES.

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A	04/08/25	RAL	LR	ISSUED FOR REVIEW (60% DESIGN)

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DESIGN CHECKER:	JL	04/02/25
DESIGN ENGINEER:	PA	04/08/25
PROJECT MANAGER:	EL	04/08/25

ENBRIDGE
CAPE COD CANAL PIPELINE RELOCATION PROJECT
CONSTRUCTION TYPICAL

TITLE:

LOC.: BARNSTABLE COUNTY, MASSACHUSETTS

YEAR: 2025 | W.O.: AFE 30002835 | SCALE: N.T.S.

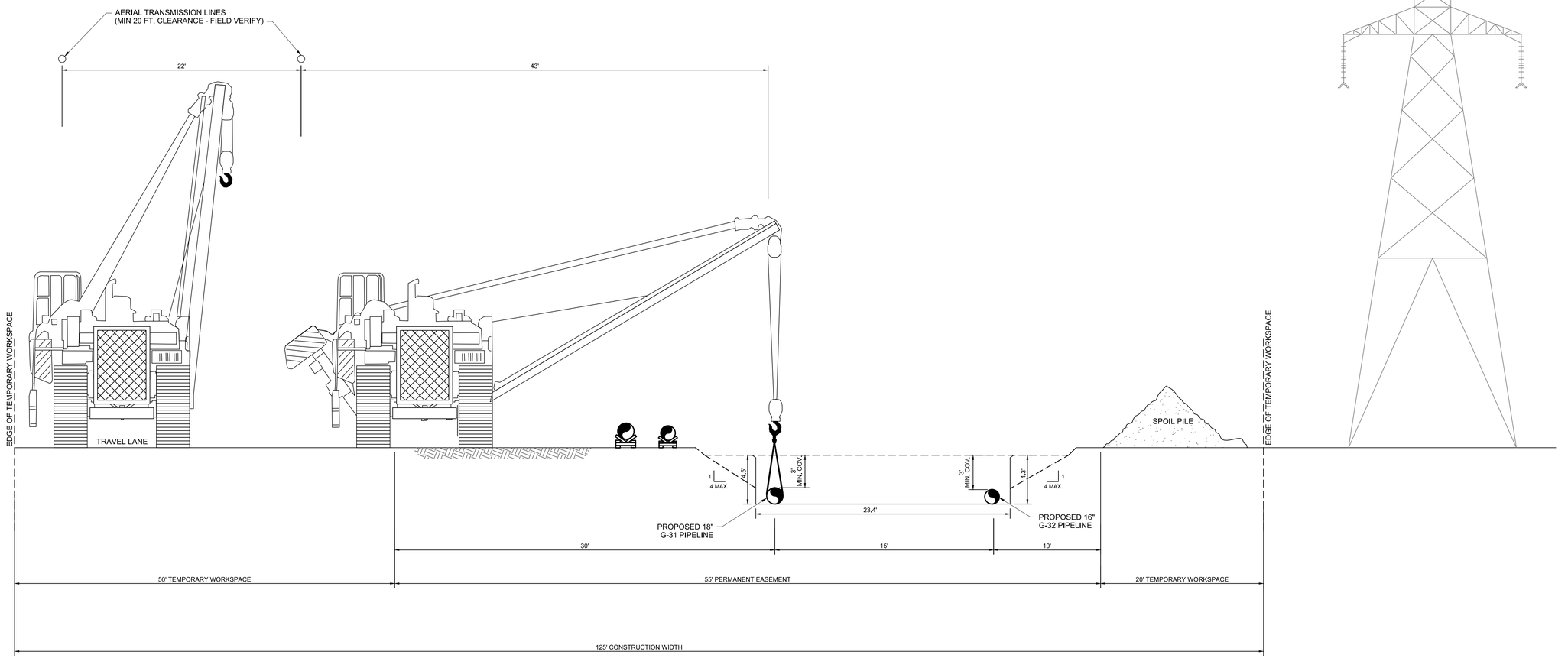
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DWG.: GSYS-M.223-0005 | REV.: C

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TYPICAL UPLAND (PARALLELING POWER LINES) PIPELINE CONSTRUCTION - DUAL PIPELINES (16" & 18")



NOTES:

1. ADDITIONAL TEMPORARY WORKSPACE AND TEMPORARY WORKSPACE COULD BE MODIFIED DEPENDING ON SITE SPECIFIC CONDITIONS INCLUDING DEEPER DEPTH OF COVER, TOP SOIL SEGREGATION (NOT INCLUDED WITHIN CONSTRUCTION PROFILE). MODIFICATION IN SIDE SLOPE OF DITCH, PRESENCE OF PROTECTED RESOURCES.

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A	04/08/25	RAL	LR	ISSUED FOR REVIEW (60% DESIGN)

WOOD GROUP USA, INC.

TITLE	INITIALS	DATE
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DESIGN CHECKER:	JL	04/02/25
DESIGN ENGINEER:	PA	04/08/25
PROJECT MANAGER:	EL	04/08/25

ENBRIDGE
CAPE COD CANAL PIPELINE RELOCATION PROJECT
CONSTRUCTION TYPICAL

TITLE:

LOC.: BARNSTABLE COUNTY, MASSACHUSETTS

YEAR: 2025 | W.O.: AFE 30002835 | SCALE: N.T.S.

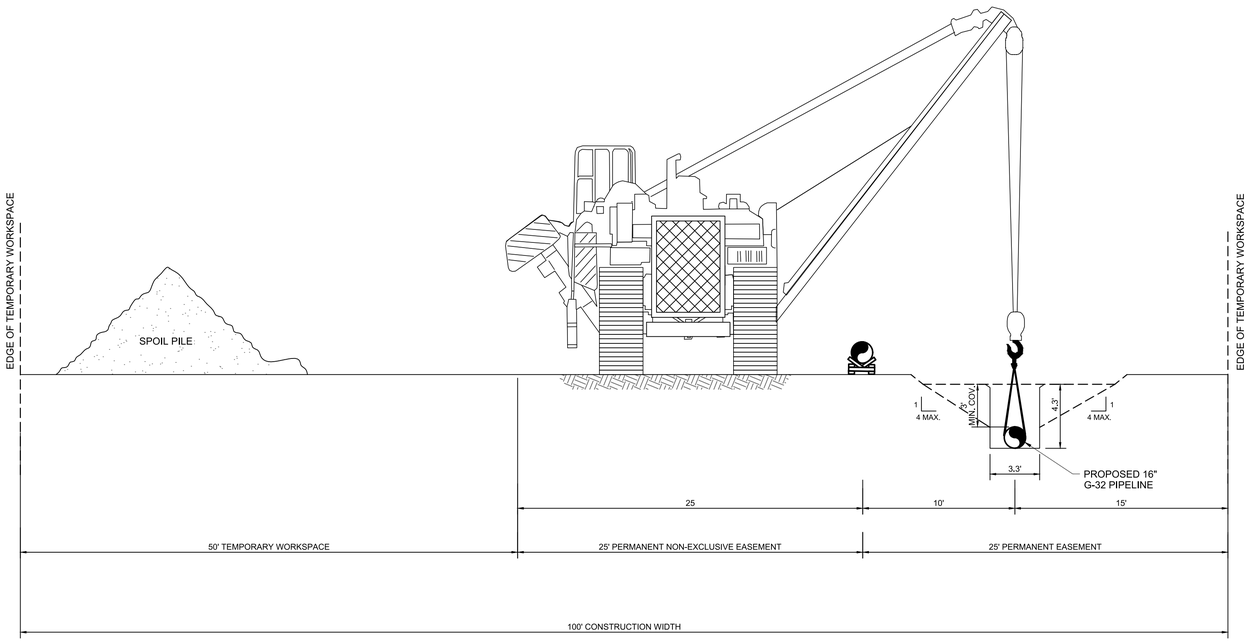
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TYPICAL UPLAND PIPELINE CONSTRUCTION - SINGLE PIPELINE (16")



NOTES:

1. ADDITIONAL TEMPORARY WORKSPACE AND TEMPORARY WORKSPACE COULD BE MODIFIED DEPENDING ON SITE SPECIFIC CONDITIONS INCLUDING DEEPER DEPTH OF COVER, TOP SOIL SEGREGATION (NOT INCLUDED WITHIN CONSTRUCTION PROFILE), MODIFICATION IN SIDE SLOPE OF DITCH, PRESENCE OF PROTECTED RESOURCES.

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B	07/07/25	RAL	LR	ISSUED FOR REVIEW (90% DESIGN)
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WOOD GROUP USA, INC.

TITLE	INITIALS	DATE
DRAWN BY:	RAL	04/02/25
DESIGN CHECKER:	JL	04/02/25
DESIGN ENGINEER:	PA	04/08/25
PROJECT MANAGER:	EL	04/08/25

ENBRIDGE
CAPE COD CANAL PIPELINE RELOCATION PROJECT
CONSTRUCTION TYPICAL

TITLE:

LOC.: BARNSTABLE COUNTY, MASSACHUSETTS

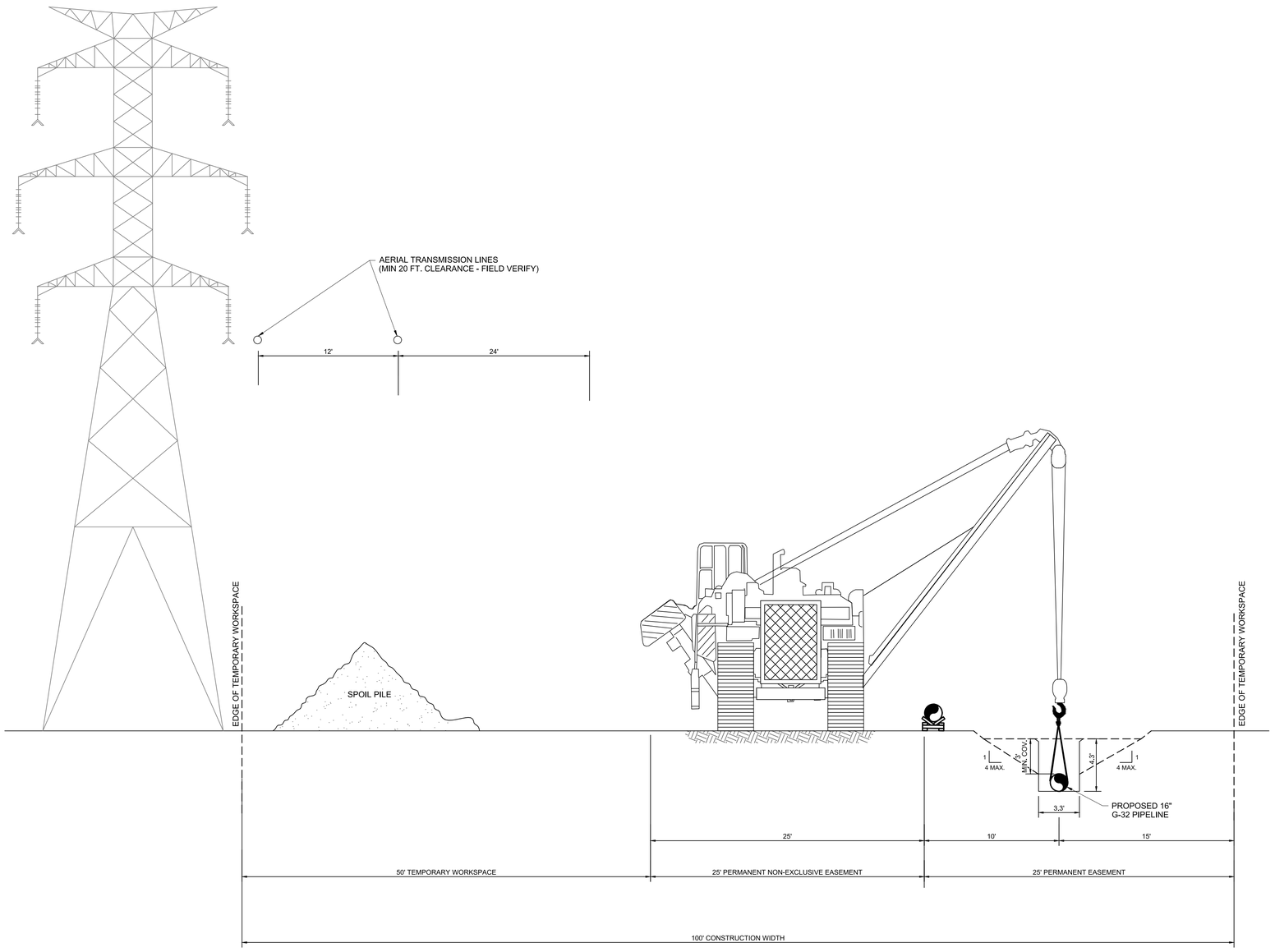
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TYPICAL UPLAND (PARALLELING POWER LINES) PIPELINE CONSTRUCTION WORKSPACE - 16"



NOTES:

1. ADDITIONAL TEMPORARY WORKSPACE AND TEMPORARY WORKSPACE COULD BE MODIFIED DEPENDING ON SITE SPECIFIC CONDITIONS INCLUDING DEEPER DEPTH OF COVER, TOP SOIL SEGREGATION (NOT INCLUDED WITHIN CONSTRUCTION PROFILE), MODIFICATION IN SIDE SLOPE OF DITCH, PRESENCE OF PROTECTED RESOURCES.

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TITLE	INITIALS	DATE
DRAWN BY:	RAL	04/02/25
DESIGN CHECKER:	JL	04/02/25
DESIGN ENGINEER:	PA	04/08/25
PROJECT MANAGER:	EL	04/08/25

ENBRIDGE
CAPE COD CANAL PIPELINE RELOCATION PROJECT
CONSTRUCTION TYPICAL

TITLE:

LOC.: BARNSTABLE COUNTY, MASSACHUSETTS

YEAR: 2025 | W.O.: AFE 30002835 | SCALE: N.T.S.

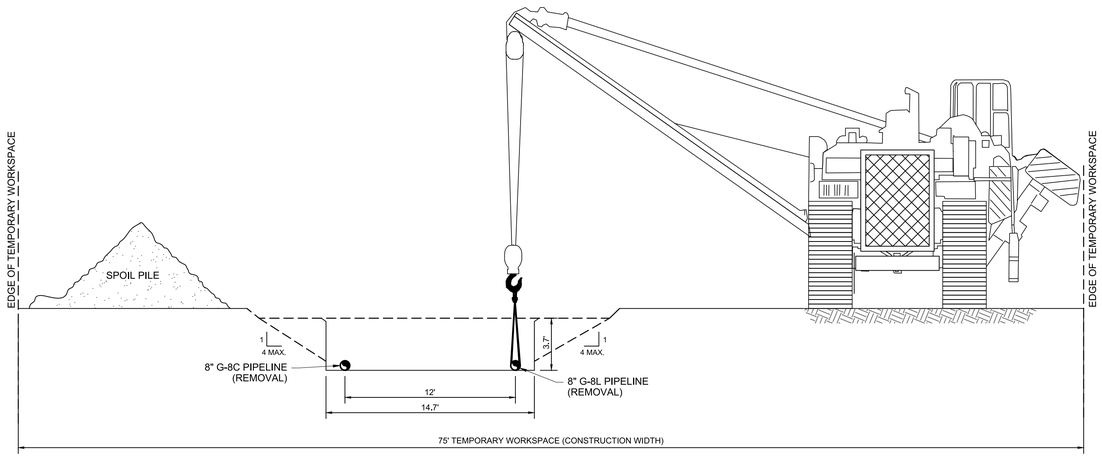
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DWG.: GSYS-M.223-0008 | REV.: C

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TYPICAL UPLAND PIPELINE CONSTRUCTION - DUAL PIPELINES REMOVAL (8")



NOTES:

1. ADDITIONAL TEMPORARY WORKSPACE AND TEMPORARY WORKSPACE COULD BE MODIFIED DEPENDING ON SITE SPECIFIC CONDITIONS INCLUDING DEEPER DEPTH OF COVER, TOP SOIL SEGREGATION (NOT INCLUDED WITHIN CONSTRUCTION PROFILE), MODIFICATION IN SIDE SLOPE OF DITCH, PRESENCE OF PROTECTED RESOURCES.

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PROJECT MANAGER:	EL	04/08/25

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CAPE COD CANAL PIPELINE RELOCATION PROJECT
CONSTRUCTION TYPICAL

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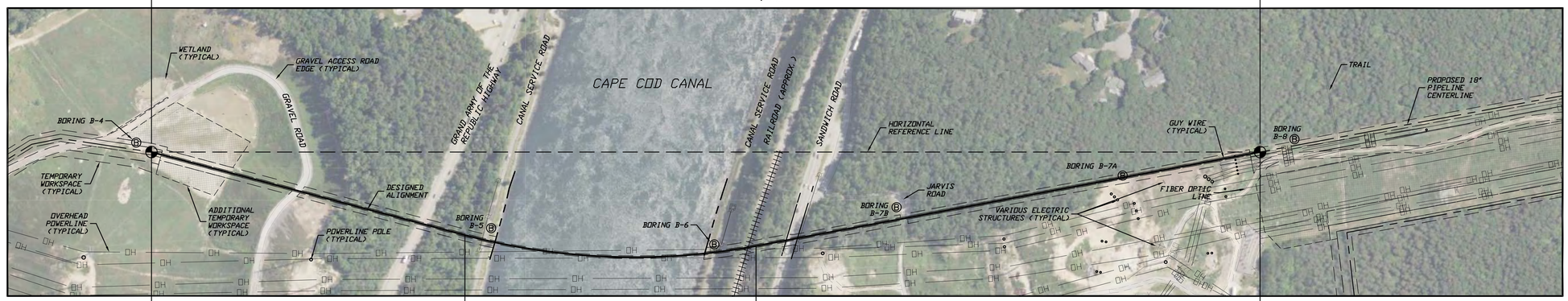
LOC.: BARNSTABLE COUNTY, MASSACHUSETTS

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ENBRIDGE

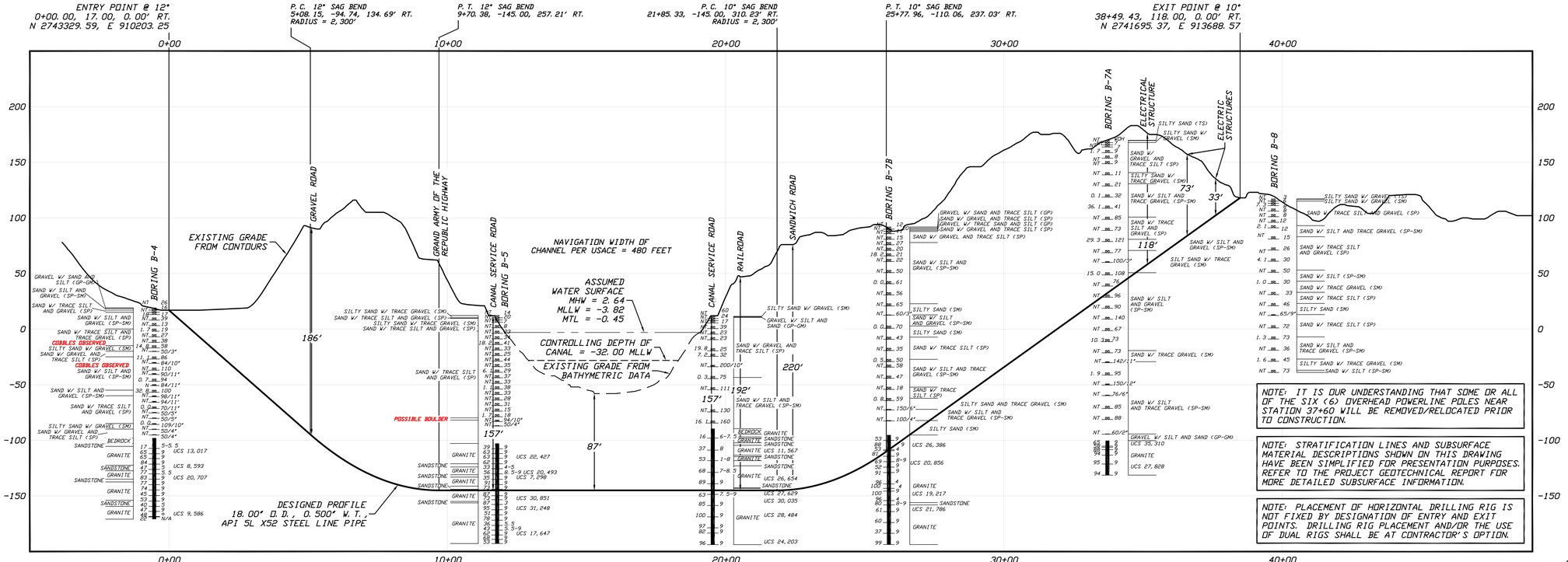
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PLAN

SCALE: 1"=200'



PROFILE

SCALE: 1"=200' HORIZONTAL
1"= 50' VERTICAL

NOTE: IT IS OUR UNDERSTANDING THAT SOME OR ALL OF THE SIX (6) OVERHEAD POWERLINE POLES NEAR STATION 37+60 WILL BE REMOVED/RELOCATED PRIOR TO CONSTRUCTION.

NOTE: STRATIFICATION LINES AND SUBSURFACE MATERIAL DESCRIPTIONS SHOWN ON THIS DRAWING HAVE BEEN SIMPLIFIED FOR PRESENTATION PURPOSES. REFER TO THE PROJECT GEOTECHNICAL REPORT FOR MORE DETAILED SUBSURFACE INFORMATION.

NOTE: PLACEMENT OF HORIZONTAL DRILLING RIG IS NOT FIXED BY DESIGNATION OF ENTRY AND EXIT POINTS. DRILLING RIG PLACEMENT AND/OR THE USE OF DUAL RIGS SHALL BE AT CONTRACTOR'S OPTION.

GENERAL LEGEND

DRILLED PATH ENTRY/EXIT POINT

GEOTECHNICAL LEGEND

(B) BORING LOCATION

SPLIT SPOON SAMPLE

53 X 23 — PENETRATION RESISTANCE IN BLOWS PER FOOT FOR A 140 POUND HAMMER FALLING 30 INCHES
└ PERCENTAGE OF GRAVEL BY WEIGHT FOR SAMPLES CONTAINING GRAVEL

CORE BARREL SAMPLE

UCS 6,250 — UNCONFINED COMPRESSIVE STRENGTH (PSI)
53 6 — MOHS HARDNESS
└ ROCK QUALITY DESIGNATION (PERCENT)

GEOTECHNICAL NOTES

1. GEOTECHNICAL DATA PROVIDED BY GEOENGINEERS USA, P.C., BOSTON, MA. REFER TO THE GEOTECHNICAL DATA REPORT DATED NOVEMBER, 2024 FOR MORE DETAILED SUBSURFACE INFORMATION.
2. THE LETTER "N" TO THE LEFT OF A SAMPLE INDICATES THAT NO GRAVEL WAS OBSERVED IN THE SAMPLE. THE LETTERS "NT" INDICATE THAT GRAVEL WAS OBSERVED BUT NO GRADATION TEST WAS PERFORMED.
3. THE GEOTECHNICAL DATA IS ONLY DESCRIPTIVE OF THE LOCATIONS ACTUALLY SAMPLED. EXTENSION OF THIS DATA OUTSIDE OF THE ORIGINAL BORINGS MAY BE DONE TO CHARACTERIZE THE SOIL CONDITIONS, HOWEVER, COMPANY DOES NOT GUARANTEE THESE CHARACTERIZATIONS TO BE ACCURATE. CONTRACTOR MUST USE HIS OWN EXPERIENCE AND JUDGMENT IN INTERPRETING THIS DATA.

TOPOGRAPHIC SURVEY NOTES

1. TOPOGRAPHIC SURVEY DATA PROVIDED BY ENBRIDGE, CALGARY, CANADA.
2. NORTHINGS AND EASTINGS ARE IN U.S. SURVEY FEET REFERENCED TO MASSACHUSETTS STATE PLANE COORDINATES, MAINLAND ZONE, NAD 83.
3. ELEVATIONS ARE IN FEET REFERENCED TO NAVD 88.

DESIGNED PATH NOTES

1. DESIGNED PATH STATIONING IS IN FEET BY HORIZONTAL MEASUREMENT AND IS REFERENCED TO CONTROL ESTABLISHED FOR THE DRILLED SEGMENT.
2. DESIGNED PATH COORDINATES REFER TO CENTERLINE OF PILOT HOLE AS OPPOSED TO TOP OF INSTALLED PIPE.

PILOT HOLE TOLERANCES

THE PILOT HOLE SHALL BE DRILLED TO THE TOLERANCES LISTED BELOW. HOWEVER, IN ALL CASES, RIGHT-OF-WAY RESTRICTIONS AND CONCERN FOR ADJACENT FACILITIES SHALL TAKE PRECEDENCE OVER THESE TOLERANCES.

1. ENTRY POINT: UP TO 5 FEET FORWARD OR BACK FROM THE DESIGNED ENTRY POINT; UP TO 5 FEET RIGHT OR LEFT OF THE DESIGNED ALIGNMENT
2. EXIT POINT: UP TO 10 FEET SHORT OR 30 FEET LONG RELATIVE TO THE DESIGNED EXIT POINT; UP TO 5 FEET RIGHT OR LEFT OF THE DESIGNED ALIGNMENT
3. ELEVATION: UP TO 2 FEET ABOVE AND 20 FEET BELOW THE DESIGNED PROFILE
4. ALIGNMENT: UP TO 10 FEET RIGHT OR LEFT OF THE DESIGNED ALIGNMENT
5. CURVE RADIUS: NO LESS THAN 1,200 FEET BASED ON A 3-JOINT AVERAGE (ASSUMING RANGE 2 DRILL PIPE)

PROTECTION OF EXISTING FACILITIES

CONTRACTOR SHALL UNDERTAKE THE FOLLOWING STEPS PRIOR TO COMMENCING DRILLING OPERATIONS.

1. CONTACT THE UTILITY LOCATION/NOTIFICATION SERVICE FOR THE CONSTRUCTION AREA.
2. POSITIVELY LOCATE AND STAKE ALL EXISTING UNDERGROUND FACILITIES. ANY FACILITIES LOCATED WITHIN 10 FEET OF THE DESIGNED DRILLED PATH SHALL BE EXPOSED.
3. MODIFY DRILLING PRACTICES AND DOWNHOLE ASSEMBLIES AS NECESSARY TO PREVENT DAMAGE TO EXISTING FACILITIES.

CAPE COD CANAL PIPELINE RELOCATION PROJECT

PLAN AND PROFILE
18-INCH PIPELINE CROSSING OF CAPE COD CANAL BY HORIZONTAL DIRECTIONAL DRILLING

LOCATION: BARNSTABLE COUNTY, MASSACHUSETTS

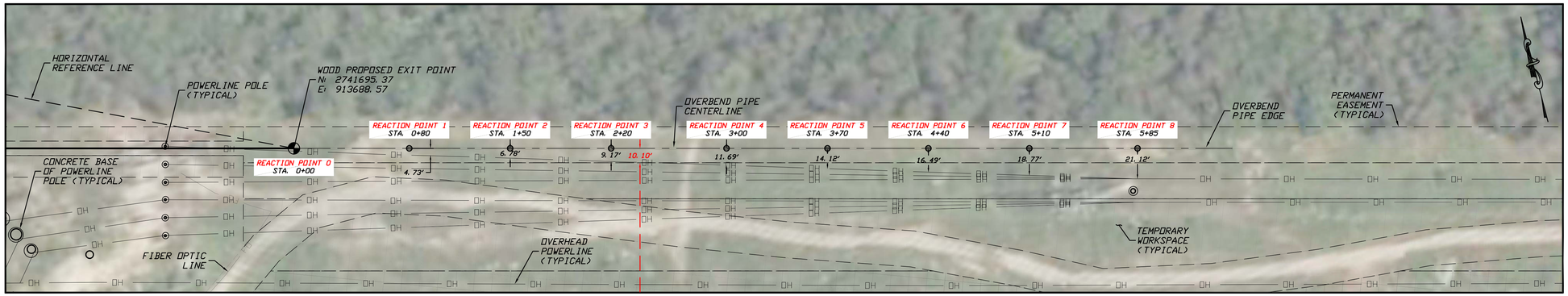
DRAWN	DATE	CHECKED	APPROVED	SCALE	DRAWING LABEL	REVISION
JDH&A	08/01/25	ACM	JMS	SHOWN FOR D-SIZED PLOT	CAPE COD CANAL	1

NO.	DATE	REVISION DESCRIPTION	BY	CHKD	APP.
1	08/20/25	ISSUE FOR BID	RCL	DLB	JMS

J.D. Hair & Associates, Inc.
Consulting Engineers
6100 South Yale Avenue
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Tulsa, Oklahoma 74136

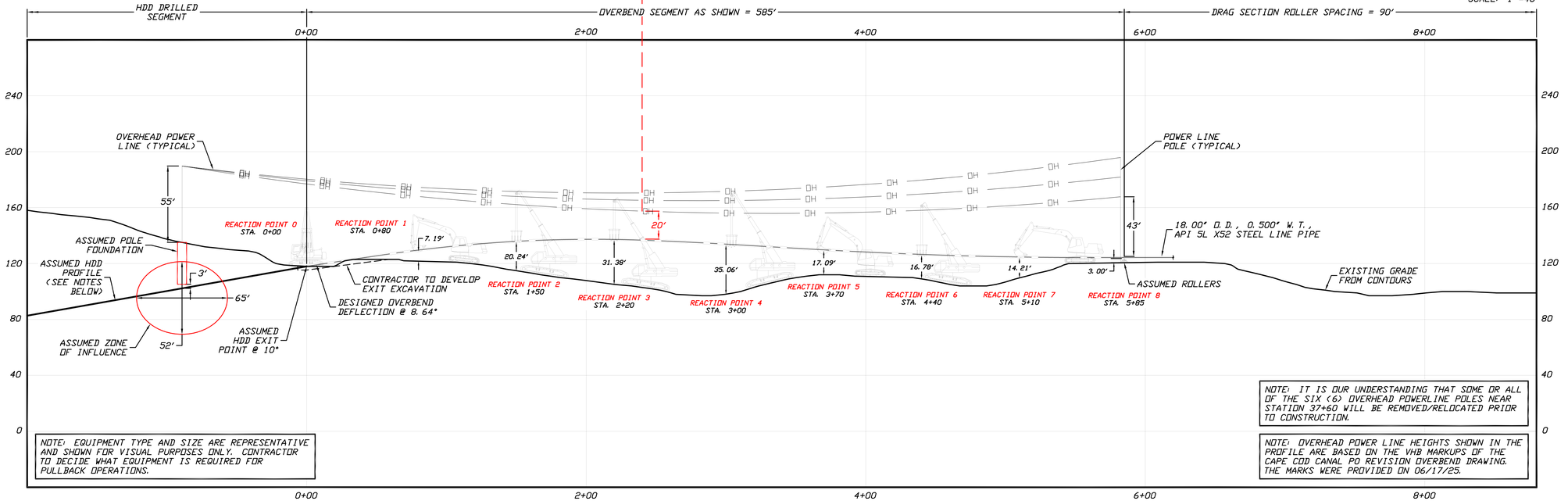
PROJECT NO.
WOOD\2336

SHEET NO.
1



PLAN

SCALE: 1"=40'



GENERAL LEGEND

DESIGNED PATH EXIT POINT

TOPOGRAPHIC SURVEY NOTES

1. TOPOGRAPHIC SURVEY DATA PROVIDED BY ENBRIDGE, CALGARY, CANADA.
2. NORTHINGS AND EASTINGS ARE IN U.S. SURVEY FEET REFERENCED TO MASSACHUSETTS STATE PLANE COORDINATES, MAINLAND ZONE, NAD 83.
3. ELEVATIONS ARE IN FEET REFERENCED TO NAVD 88.

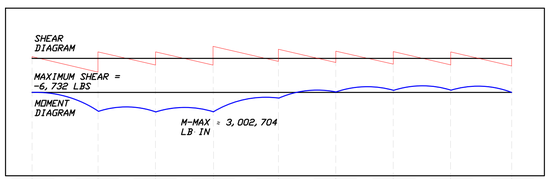
18-INCH STEEL LINE PIPE PROPERTIES

- OUTSIDE DIAMETER = 18.00 INCHES
- NOMINAL WALL THICKNESS = 0.500 INCHES
- UNIT WEIGHT = 93.45 POUNDS/FOOT
- SPECIFIED MINIMUM YIELD STRENGTH (SMYS) = 52,000 PSI

OVERBEND AND PULLBACK CRITERIA

- LENGTH OF SUSPENDED PIPE SEGMENT = ~585 FEET
- WEIGHT OF SUSPENDED PIPE SEGMENT = 54,668 POUNDS
- MAXIMUM LIFT POINT LOAD = 9,933 POUNDS
- FINITE ELEMENT ANALYSIS PEAK STRESS = ~49.3% OF SMYS
- DRAG SECTION ROLLER SPACING AS SHOWN = 90 FEET (BASED ON L/240 DEFLECTION LIMIT)

SUPPORT POINT LOADING ANALYSIS



REACTION POINT 0 | REACTION POINT 1 | REACTION POINT 2 | REACTION POINT 3 | REACTION POINT 4 | REACTION POINT 5 | REACTION POINT 6 | REACTION POINT 7 | REACTION POINT 8

REACTION POINT	STA.	HEIGHT* (FT) RELATIVE TO GRADE	HEIGHT* (FT) RELATIVE TO EXIT	VERT. REACTION FORCE (LBS)***	BENDING** STRESS (PSI)
0 (EXIT)	0+00	0.00	0.00	697	-0
1	0+80	7.19	10.91	9,933	24,756
2	1+50	20.24	17.17	6,669	25,659
3	2+20	31.38	18.52	9,204	25,660
4	3+00	35.06	15.18	5,969	7,635
5	3+70	17.09	11.09	5,679	637
6	4+40	16.79	7.82	6,874	2,698
7	5+10	14.21	5.98	6,393	2,823
8	5+85	3.00**	5.63	3,872	-0

* HEIGHTS ARE REFERENCED TO BOTTOM OF PIPE ** PIPE ON ROLLERS AT GROUND SURFACE *** BASED ON FEA ANALYSIS

OVERBEND NOTES

1. THE OVERBEND GEOMETRY INDICATED ON THIS DRAWING DEMONSTRATES ONE OF MANY POSSIBLE CONFIGURATIONS THAT WOULD BE CONSIDERED ACCEPTABLE WITH REGARD TO ALLOWABLE STRESSES. ON THE BASIS OF MOMENT-CURVATURE AND PURE BENDING, CALCULATED BENDING STRESSES IN THIS CONFIGURATION FALL BELOW 50% OF THE SPECIFIED MINIMUM YIELD STRENGTH OF THE 18-INCH STEEL PIPE. DYNAMIC LOADS INVOLVED WITH POSITIONING, LIFTING, OR HANDLING THE STEEL PIPE DURING PULLBACK HAVE NOT BEEN CONSIDERED IN THIS ANALYSIS. CONTRACTOR RETAINS ULTIMATE RESPONSIBILITY FOR HANDLING THE PULL SECTION SO THAT THE PIPE AND THE CORROSION COATING ARE NOT DAMAGED.
2. CONTRACTOR IS RESPONSIBLE FOR DETERMINING ACTUAL LIFT POINT LOCATIONS, LIFT HEIGHTS, AND LIFTING EQUIPMENT NECESSARY TO ENSURE THAT OPERATIONS ARE CONDUCTED SAFELY AND THE PIPE IS NOT DAMAGED OR OVERSTRESSED.
3. THE OVERBEND GEOMETRY SHOWN IS BASED ON THE PULL SECTION ENTERING THE REAMED HOLE AT THE EXIT POINT LOCATION AND EXIT ANGLE BASED ON AN ASSUMED HDD DESIGN EXIT POINT. NOTE THAT MODIFICATIONS MAY BE REQUIRED BASED ON THE ACTUAL LOCATION AND ANGLE OF THE EXIT POINT AT THE COMPLETION OF REAMING OPERATIONS.
4. THE OVERBEND GEOMETRY TABLE INCLUDED ON THIS DRAWING IS INTENDED TO PROVIDE GUIDANCE WITH REGARD TO POTENTIAL LIFTING HEIGHTS ALONG THE LENGTH OF THE OVERBEND. THE HEIGHTS THAT HAVE BEEN PROVIDED REPRESENT VERTICAL DISTANCES FROM THE GRADE TO THE BOTTOM OF THE PIPE. NOTE THAT LIFT HEIGHTS MAY NEED TO BE MODIFIED BASED ON ACTUAL GRADE ELEVATIONS AT THE TIME OF CONSTRUCTION.

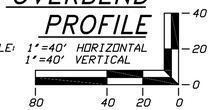
OVERBEND GEOMETRY TABLE

OFFSET (X)	HEIGHT* (Y)	OFFSET (X)	HEIGHT* (Y)
0+00	0.0	4+20	16.28
0+20	2.31**	4+40	16.79
0+40	2.76**	4+60	20.00
0+60	3.24	4+80	20.56
0+80	7.19	5+00	17.31
1+00	9.98	5+20	11.42
1+20	13.35	5+40	5.41
1+40	18.02	5+60	3.32
1+60	22.33	5+80	3.06
1+80	26.16	5+85	3.00***
2+00	28.76	–	–
2+20	31.38	–	–
2+40	33.09	–	–
2+60	35.97	–	–
2+80	37.11	–	–
3+00	35.06	–	–
3+20	29.00	–	–
3+40	22.84	–	–
3+60	18.39	–	–
3+80	16.54	–	–
4+00	16.69	–	–

* HEIGHTS NOTED ARE FROM EXISTING GRADE TO BOTTOM OF PIPE
** HEIGHTS NOTED ARE FROM EXCAVATION TO BOTTOM OF PIPE
*** PIPE ON ROLLERS AT GROUND SURFACE

OVERBEND PROFILE

SCALE: 1"=40' HORIZONTAL
1"=40' VERTICAL



CAPE COD CANAL PIPELINE RELOCATION PROJECT

OVERBEND PLAN AND PROFILE
18-INCH PIPELINE CROSSING OF CAPE COD CANAL
BY HORIZONTAL DIRECTIONAL DRILLING

LOCATION: BARNSTABLE COUNTY, MASSACHUSETTS

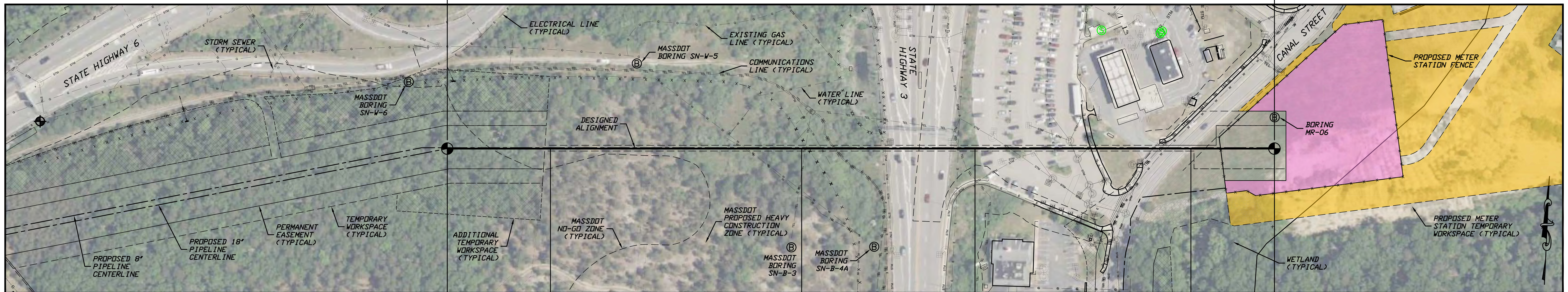
DRAWN	DATE	CHECKED	APPROVED	SCALE	DRAWING LABEL	REVISION
JDH&A	08/01/25	ACM	JMS	SHOWN FOR D-SIZED PLOT	CANAL OVERBEND	0

NO.	DATE	REVISION DESCRIPTION	BY	CHKD	APP.

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Consulting Engineers
6100 South Yale Avenue
Suite 1610
Tulsa, Oklahoma 74136

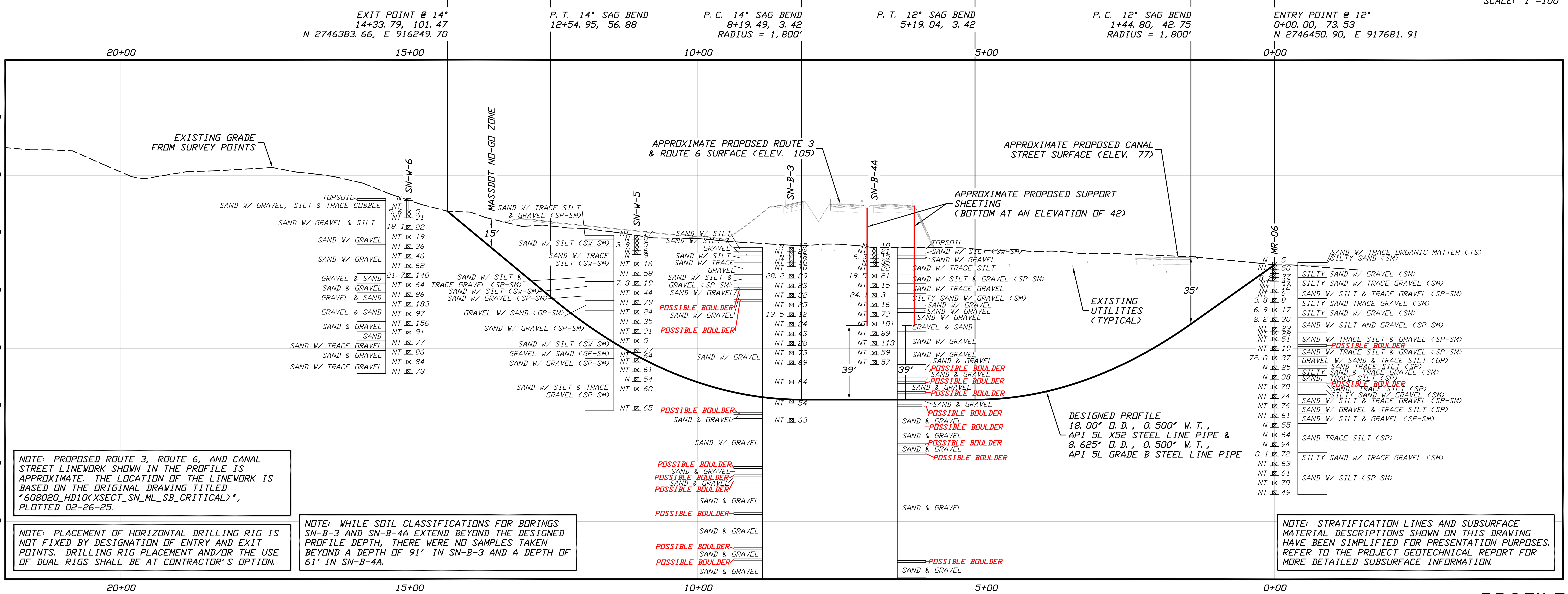
PROJECT NO.
WOOD\2336

SHEET NO.
2



PLAN

SCALE: 1"=100'



PROFILE

SCALE: 1"=100' HORIZONTAL
1"= 30' VERTICAL

200 100 50 0 ; 0 15 30

GENERAL LEGEND

DESIGNED PATH ENTRY/EXIT POINT

GEOTECHNICAL LEGEND

Ⓑ BORING LOCATION

SPLIT SPOON SAMPLE

53 ⊠ 23 — PENETRATION RESISTANCE IN BLOWS PER FOOT FOR A 140 POUND HAMMER FALLING 30 INCHES; PERCENTAGE OF GRAVEL BY WEIGHT FOR SAMPLES CONTAINING GRAVEL

VACUUM EXPLORATION

53 — PERCENTAGE OF GRAVEL BY WEIGHT FOR SAMPLES CONTAINING GRAVEL

GEOTECHNICAL NOTES

1. GEOTECHNICAL DATA PROVIDED BY HNTB CORPORATION, BOSTON, MA, AND GEOENGINEERS USA, P.C., BOSTON, MA. REFER TO THE GEOTECHNICAL DATA REPORTS DATED OCTOBER 2024 AND NOVEMBER 2024 FOR MORE DETAILED SUBSURFACE INFORMATION.
2. THE LETTER "N" TO THE LEFT OF A SAMPLE INDICATES THAT NO GRAVEL WAS OBSERVED IN THE SAMPLE. THE LETTERS "NT" INDICATE THAT GRAVEL WAS OBSERVED BUT NO GRADATION TEST WAS PERFORMED.
3. THE GEOTECHNICAL DATA IS ONLY DESCRIPTIVE OF THE LOCATIONS ACTUALLY SAMPLED. EXTENSION OF THIS DATA OUTSIDE OF THE ORIGINAL BORINGS MAY BE DONE TO CHARACTERIZE THE SOIL CONDITIONS, HOWEVER, COMPANY DOES NOT GUARANTEE THESE CHARACTERIZATIONS TO BE ACCURATE. CONTRACTOR MUST USE HIS OWN EXPERIENCE AND JUDGMENT IN INTERPRETING THIS DATA.

TOPOGRAPHIC SURVEY NOTES

1. TOPOGRAPHIC SURVEY DATA PROVIDED BY ENBRIDGE, CALGARY, CANADA.
2. NORTHINGS AND EASTINGS ARE IN U.S. SURVEY FEET REFERENCED TO MASSACHUSETTS STATE PLANE COORDINATES, MAINLAND ZONE, NAD 83.
3. ELEVATIONS ARE IN FEET REFERENCED TO NAVD 88.

DESIGNED PATH NOTES

1. DESIGNED PATH STATIONING IS IN FEET BY HORIZONTAL MEASUREMENT AND IS REFERENCED TO CONTROL ESTABLISHED FOR THE DESIGNED SEGMENT.
2. DESIGNED PATH COORDINATES REFER TO CENTERLINE OF PILOT HOLE AS OPPOSED TO TOP OF INSTALLED PIPE.

PILOT HOLE TOLERANCES

THE PILOT HOLE SHALL BE DRILLED TO THE TOLERANCES LISTED BELOW. HOWEVER, IN ALL CASES, RIGHT-OF-WAY RESTRICTIONS AND CONCERN FOR ADJACENT FACILITIES SHALL TAKE PRECEDENCE OVER THESE TOLERANCES.

1. ENTRY POINT: UP TO 2 FEET FORWARD OR BACK FROM THE DESIGNED ENTRY POINT; UP TO 2 FEET RIGHT OR LEFT OF THE DESIGNED ALIGNMENT
2. EXIT POINT: UP TO 10 FEET SHORT OR 30 FEET LONG RELATIVE TO THE DESIGNED EXIT POINT; UP TO 5 FEET RIGHT OR LEFT OF THE DESIGNED ALIGNMENT
3. ELEVATION: UP TO 2 FEET ABOVE AND 15 FEET BELOW THE DESIGNED PROFILE
4. ALIGNMENT: UP TO 5 FEET RIGHT OR LEFT OF THE DESIGNED ALIGNMENT
5. CURVE RADIUS: NO LESS THAN 1,200 FEET BASED ON A 3-JOINT AVERAGE (ASSUMING RANGE 2 DRILL PIPE)

PROTECTION OF EXISTING FACILITIES

CONTRACTOR SHALL UNDERTAKE THE FOLLOWING STEPS PRIOR TO COMMENCING DRILLING OPERATIONS.

1. CONTACT THE UTILITY LOCATION/NOTIFICATION SERVICE FOR THE CONSTRUCTION AREA.
2. POSITIVELY LOCATE AND STAKE ALL EXISTING UNDERGROUND FACILITIES. ANY FACILITIES LOCATED WITHIN 10 FEET OF THE DESIGNED DRILLED PATH SHALL BE EXPOSED.
3. MODIFY DRILLING PRACTICES AND DOWNHOLE ASSEMBLIES AS NECESSARY TO PREVENT DAMAGE TO EXISTING FACILITIES.

CAPE COD CANAL PIPELINE RELOCATION PROJECT

PLAN AND PROFILE
18-INCH & 8-INCH BUNDLED PIPELINE CROSSING OF THE SAGAMORE BRIDGE BY HORIZONTAL DIRECTIONAL DRILLING

LOCATION: BARNSTABLE COUNTY, MASSACHUSETTS

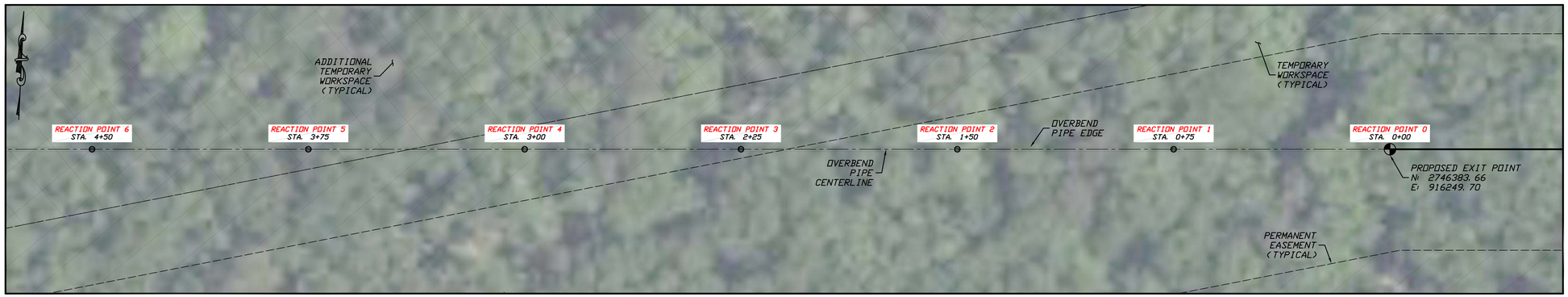
DRAWN	DATE	CHECKED	APPROVED	SCALE	DRAWING LABEL	REVISION
ACM	08/01/25	DLB	JMS	SHOWN FOR D-SIZED PLOT	STATE HWY 3	1

NO.	DATE	REVISION DESCRIPTION	BY	CHK'D	APP.
1	08/20/25	ISSUE FOR BID	RCL	DLB	JMS

J.D.Hair&Associates,Inc.
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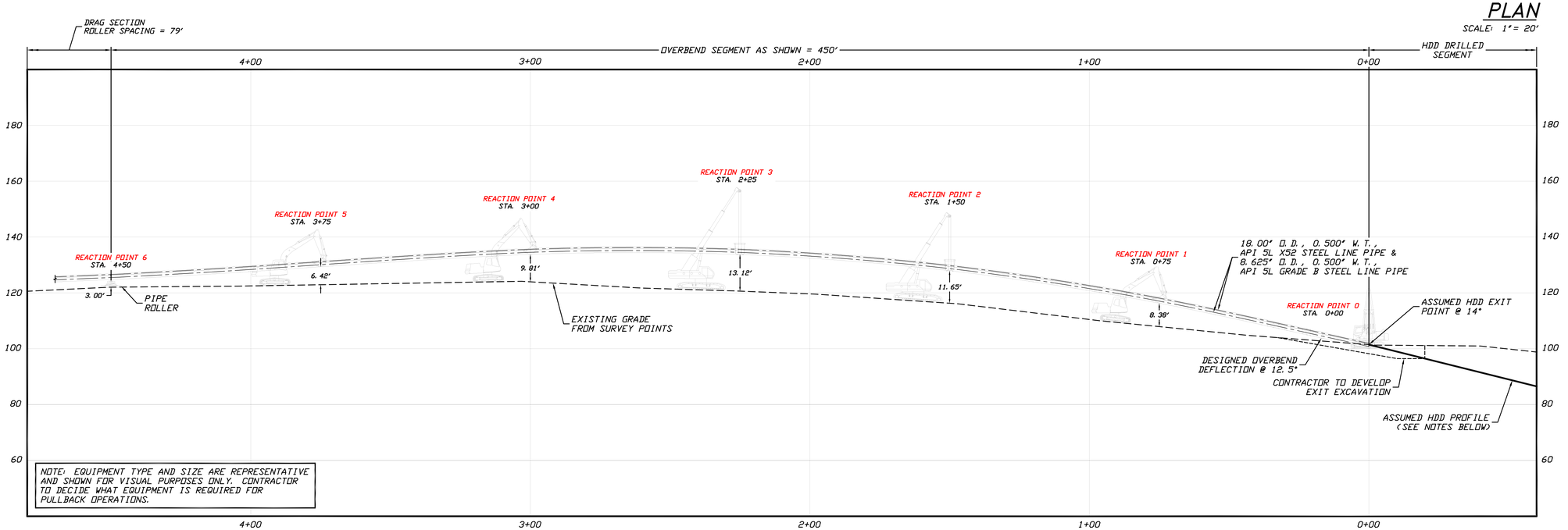
PROJECT NO. WOOD\2336

SHEET NO. 1



PLAN

SCALE: 1" = 20'



NOTE: EQUIPMENT TYPE AND SIZE ARE REPRESENTATIVE AND SHOWN FOR VISUAL PURPOSES ONLY. CONTRACTOR TO DECIDE WHAT EQUIPMENT IS REQUIRED FOR PULLBACK OPERATIONS.

GENERAL LEGEND

DESIGNED PATH EXIT POINT

TOPOGRAPHIC SURVEY NOTES

1. TOPOGRAPHIC SURVEY DATA PROVIDED BY ENBRIDGE, CALGARY, CANADA.
2. NORTHINGS AND EASTINGS ARE IN U.S. SURVEY FEET REFERENCED TO MASSACHUSETTS STATE PLANE COORDINATES, MAINLAND ZONE, NAD 83.
3. ELEVATIONS ARE IN FEET REFERENCED TO NAVD 88.

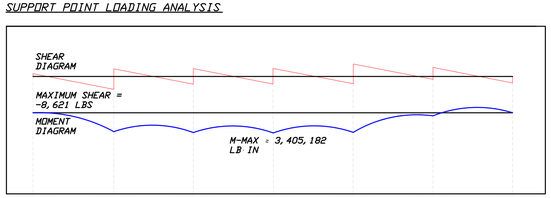
18-INCH AND 8-INCH STEEL LINE PIPE PROPERTIES

- OUTSIDE DIAMETER = 18.00 INCHES AND 8.625 INCHES
- NOMINAL WALL THICKNESS = 0.500 INCHES
- UNIT WEIGHT = 93.45 POUNDS/FOOT (18-INCH) AND 43.39 POUNDS/FOOT (8-INCH)
- SPECIFIED MINIMUM YIELD STRENGTH (SMYS) = 52,000 PSI (18-INCH) AND 35,000 PSI (8-INCH)

OVERBEND AND PULLBACK CRITERIA

- LENGTH OF SUSPENDED PIPE SEGMENT = ~453 FEET
- WEIGHT OF SUSPENDED COMBINED PIPE SEGMENT = 61,989 POUNDS
- MAXIMUM LIFT POINT LOAD = 13,138 POUNDS
- FINITE ELEMENT ANALYSIS PEAK STRESS OF 18-INCH PIPE = 38% OF SMYS
- FINITE ELEMENT ANALYSIS PEAK STRESS OF 8-INCH PIPE = 40% OF SMYS
- DRAG SECTION ROLLER SPACING AS SHOWN = 79 FEET (BASED ON L/240 DEFLECTION LIMIT)

SUPPORT POINT LOADING ANALYSIS



REACTION POINT	STA.	HEIGHT* (FT) RELATIVE TO GRADE	HEIGHT* (FT) RELATIVE TO EXIT	VERT. REACTION FORCE (LBS)***	18-INCH BENDING** STRESS (PSI)	8-INCH BENDING** STRESS (PSI)
0 (EXIT)	0+00	-0.60	-0.60	1,471	0	0
1	0+75	8.38	14.83	13,783	27,614	13,116
2	1+50	11.65	26.48	10,371	28,761	13,864
3	2+25	13.12	38.28	10,442	29,082	13,892
4	3+00	9.81	38.31	13,138	28,007	13,316
5	3+75	6.42	27.88	7,879	4,819	1,978
6	4+50	3.00**	23.89	4,506	0	0

* HEIGHTS ARE REFERENCED TO BOTTOM OF PIPE ** PIPE ON ROLLERS AT GROUND SURFACE *** BASED ON FEA ANALYSIS

OVERBEND NOTES

1. THE OVERBEND GEOMETRY INDICATED ON THIS DRAWING DEMONSTRATES ONE OF MANY POSSIBLE CONFIGURATIONS THAT WOULD BE CONSIDERED ACCEPTABLE WITH REGARD TO ALLOWABLE STRESSES. ON THE BASIS OF MOMENT-CURVATURE AND PURE BENDING, CALCULATED BENDING STRESSES IN THIS CONFIGURATION FALL BELOW 60% OF THE SPECIFIED MINIMUM YIELD STRENGTH (SMYS) OF THE 18-INCH STEEL PIPE AND BELOW 40% OF THE SMYS OF THE 8-INCH STEEL PIPE. DYNAMIC LOADS INVOLVED WITH POSITIONING, LIFTING, OR HANDLING THE STEEL PIPES DURING PULLBACK HAVE NOT BEEN CONSIDERED IN THIS ANALYSIS. CONTRACTOR RETAINS ULTIMATE RESPONSIBILITY FOR HANDLING THE PULL SECTION SO THAT THE PIPES AND THE CORROSION COATING ARE NOT DAMAGED.
2. REACTIONS MUST BE MAINTAINED AT ALL DESIGNATED LIFT POINTS AND CARE MUST BE TAKEN TO MINIMIZE LOAD SHEDDING. MANIPULATION OF THE FRONT AND REAR OF THE STEEL PIPE SHALL BE CONDUCTED IN A MANNER THAT PRESERVES LOAD EQUILIBRIUM AND PREVENTS UNDUE STRESS. EFFORTS SHALL BE TAKEN TO ENSURE THE PIPE IS NOT SUDDENLY UNSUPPORTED UPON ADVANCING BEYOND ANY ONE LIFT POINT/ROLLER/CRADLE.
3. THE OVERBEND GEOMETRY SHOWN IS BASED ON THE BUNDLED PULL SECTION ENTERING THE REAMED HOLE AT APPROXIMATELY THE DESIGNED EXIT POINT LOCATION WITH AN OVERBEND EXIT ANGLE OF 12.5°. NOTE THAT MODIFICATIONS MAY BE REQUIRED BASED ON THE ACTUAL LOCATION AND ANGLE OF THE EXIT POINT AT THE COMPLETION OF REAMING OPERATIONS.
4. THE OVERBEND GEOMETRY TABLE INCLUDED ON THIS DRAWING IS INTENDED TO PROVIDE GUIDANCE WITH REGARD TO POTENTIAL LIFTING HEIGHTS ALONG THE LENGTH OF THE OVERBEND. THE HEIGHTS THAT HAVE BEEN PROVIDED REPRESENT VERTICAL DISTANCES FROM THE GRADE TO THE BOTTOM OF THE 18-INCH PIPE. NOTE THAT LIFT HEIGHTS MAY NEED TO BE MODIFIED BASED ON ACTUAL GRADE ELEVATIONS AT THE TIME OF CONSTRUCTION.

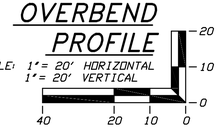
OVERBEND GEOMETRY TABLE

OFFSET (X)	HEIGHT* (Y)	OFFSET (X)	HEIGHT* (Y)
0+00	-0.67	4+20	4.09
0+20	2.74	4+40	3.12
0+40	4.40	4+50	3.00**
0+60	6.83	–	–
0+80	8.84	–	–
1+00	10.31	–	–
1+20	11.08	–	–
1+40	11.48	–	–
1+60	12.07	–	–
1+80	12.58	–	–
2+00	12.79	–	–
2+20	13.11	–	–
2+40	13.08	–	–
2+60	12.69	–	–
2+80	11.46	–	–
3+00	9.81	–	–
3+20	8.98	–	–
3+40	8.13	–	–
3+60	7.18	–	–
3+80	6.16	–	–
4+00	5.14	–	–

* HEIGHTS NOTED ARE FROM EXISTING GRADE TO BOTTOM OF 18" PIPE
** PIPE ON ROLLERS AT GROUND SURFACE

OVERBEND PROFILE

SCALE: 1" = 20' HORIZONTAL
1" = 20' VERTICAL



CAPE COD CANAL PIPELINE RELOCATION PROJECT

OVERBEND PLAN AND PROFILE
18-INCH AND 8-INCH BUNDLED PIPELINE CROSSING OF THE SAGAMORE BRIDGE BY HORIZONTAL DIRECTIONAL DRILLING

LOCATION: BARNSTABLE COUNTY, MASSACHUSETTS

DRAWN	DATE	CHECKED	APPROVED	SCALE	DRAWING LABEL	REVISION
RCL	08/01/25	ACM	JMS	SHOWN FOR D-SIZED PLOT	BRIDGE OVERBEND	0

NO.	DATE	BY	CHKD	APP.

REVISION DESCRIPTION

J.D. Hair & Associates, Inc.
Consulting Engineers
6100 South Yale Avenue
Suite 1610
Tulsa, Oklahoma 74136

PROJECT NO.
WOOD\2336

SHEET NO.
2