DESIGN NOTES

D1. ALL CONSTRUCTION AND TESTING PROCEDURES TO BE IN STRICT COMPLIANCE WITH:
  a. CSA Z662-19 FOR A CLASS 3 LOCATION
    - DESIGN FACTOR, F = 0.8
    - LOCATION FACTOR (ROAD CROSSING), L = 0.7
    - TEMPERATURE FACTOR, T = 1.0
    - JOINT FACTOR, J = 1.0
  b. FORTISBC TRANSMISSION PRESSURE PIPELINE STANDARDS

D2. MAXIMUM OPERATING PRESSURE: 4.020 kPa (583 psi)

D3. HOOP STRESS AT MOP 49.73% OF SMYS

D4. SITE SURVEY TO BE COMPLETED. COORDINATES ARE APPROXIMATE AND ARE TO BE CONFIRMED ON SITE AND UPDATED IN RECORD DRAWINGS. TOTAL CASING INSTALLATION LENGTH TO BE VERIFIED.

D5. CURRENT BCER PROJECT: TBD: SEGMENT: TBD

D6. ALL DIMENSIONS ARE IN MILLIMETRES EXCEPT AS SHOWN.

D7. CASING TO CONFORM WITH CRL 1716 CASINGS, AND STANDARD DRAWINGS 99000-M-000-169-R1, AND 99000-M-000-170-R1.

D8. LINK SEALS INSULATOR / SPACERS, CASING SEALS TO CONFORM TO 99000-M-000-170-R1.

D9. REPAIR SLEEVE TO CONFORM WITH CRL 1718 INSTALLING IP AND TP WELDED SLEEVES, AND STANDARD DRAWING 99000-M-171-R5.

D10. EXISTING GIRTH WELDS EXPOSED IN EXCAVATION (WELD# 28610, 28620, 28630, 28770, 28780, 28790, & 28820) TO BE 100% RT PER CRL 1287. INSPECTION OF WELDS. CONSIDER UT, IF RT IS NOT VIABLE DUE TO PROXIMITY TO OCCUPANTS.

CONSTRUCTION NOTES

C1. ALL CONSTRUCTION MUST BE CONTAINED WITHIN FORTISBC SRW.

C2. ALL CONSTRUCTION TO BE IN ACCORDANCE WITH APPROVED FORTISBC ENVIRONMENTAL BEST MANAGEMENT PRACTICES OR SITE SPECIFIC ENVIRONMENTAL PROTECTION PLAN AS REQUIRED BY REGULATIONS.

C3. 48 HOURS NOTICE TO BE PROVIDED PRIOR TO CONSTRUCTION START PER THE REQUIREMENTS OF THE BC ENERGY REGULATOR.

C4. ALL EXCESS SPOIL TO BE DISPOSED OF AS PER REGULATORY REQUIREMENTS.

C5. CATHODIC PROTECTION DISCONNECTION REQUIREMENTS TO BE CONFIRMED BY OPERATIONS PRIOR TO ANY WORK TAKING PLACE.

C6. REINSTATING / REPAIRING OF CP TEST POINTS AS PER DRAWING 99000-E-030-103.

C7. CONTRACTOR TO CONFIRM ALL DIMENSIONS AND LAYOUT INFORMATION ON SITE. ALL DISCREPANCIES SHALL BE REFERRED TO THE ENGINEER BEFORE BEGINNING CONSTRUCTION.

C8. CONTRACTOR TO LOCATE AND CONFIRM ALL FOREIGN UTILITIES PRIOR TO CONSTRUCTION. LOCATIONS OF FOREIGN UTILITIES INCLUDING GAS PIPELINES AND OVERHEAD CROSSINGS ON DRAWINGS ARE APPROXIMATE ONLY.
  a. MINIMUM CLEARANCE TO FOREIGN UTILITIES PER FORTISBC CRL #1637 FOREIGN UTILITY CROSSING CLEARANCE:
    i. VERTICAL: 300mm
    ii. HORIZONTAL: 1m

C9. EXCAVATION AND SITE RESTORATION TO BE DONE IN COMPLIANCE WITH FORTISBC CRL:
  a. 1397 EXCAVATING
  b. 1728 EMBEDMENT SOIL AND BACKFILL AT VEHICLE AND RAILWAY CROSSINGS
  c. 1783 EXCAVATING SAFETY

C10. BACKFILL AND BACKFILL PROCEDURES TO CONFORM WITH FORTISBC CRL 1727 BACKFILL COMPACTION AND QUALITY CONTROL:
  a. COMPACTION TESTING IS REQUIRED WHEN BACKFILLING IN ALL ROAD WAYS
  b. BACKFILL AND PAVING IN BC MOTI HIGHWAY PROPERTY TO CONFORM WITH BC MOTI REQUIREMENTS

C11. COAL TAR COATED PIPE SHALL BE DISPOSED & HANDLED IN ACCORDANCE TO FORTISBC CRL 1320 HAZARDOUS WASTE TRANSPORT AND 1120 COAL TAR WRAP REMOVAL PROCEDURE.

C12. PIPELINE MARKER POSTS (FORTISBC PART NUMBER 462-0497 AND 462-0491) TO BE INSTALLED IN ACCORDANCE WITH FORTISBC CRL 1069 IMP: PIPELINE IDENTIFICATION (SEE DWG # 90000-P-000-1000, LATEST REVISION).

C13. PIPELINE SHALL REMAIN FULLY SUPPORTED DURING EXCAVATION. PIPE TO WRAPPED WITH A LAYER OF NEOPRENE UNDER PIPE SUPPORT.

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W1. ALL WELDER QUALIFICATIONS SHALL CONFORM TO FORTISBC CRL 1297 WELDER QUALIFICATIONS.

W2. ALL WELDING SHALL COMPLY WITH THE REQUIREMENTS OF FORTISBC CRL 1261 WELDING PROGRAM, CRL 1292 WELDING PROCEDURES, CRL 1644 WELDING ON LIVE LINES.

W3. WELDING SHALL COMPLY WITH WELD PROCEDURES SMAW-185-ASME FOR LONGITUDINAL SEAM WELD, AND SMAW-162-CSA FOR CIRCUMFERENTIAL FILLET WELD.

W4. ALL WELDS SHALL BE NON-DESTRUCTIVELY INSPECTED TO FORTISBC CRL 1287 INSPECTION OF WELDS:
  a. ALL LONGITUDINAL WELDS TO BE 100% RADIOGRAPHICALLY INSPECTED
  b. ALL LIVE LINE WELDS TO BE 100% MAGNETIC PARTICLE INSPECTED, INSPECTED AFTER COMPLETION
  c. ALL FILLET WELDS TO BE 100% MAGNETIC PARTICLE INSPECTED AT LEAST 48 HOURS AFTER WELDING
  d. WELD ID SHEET TO BE COMPLETED FOR AS-BUILT DRAWINGS
  e. ALL MATERIALS SHALL HAVE THEIR HEAT NUMBERS RECORDED WHERE INSTALLED

MATERIAL NOTE

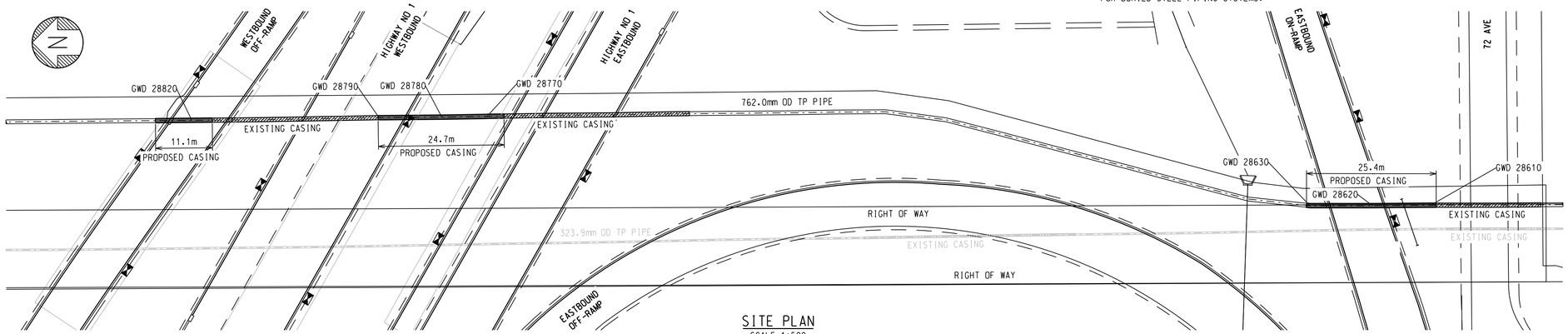
M1. STEEL PIPE SPECIFICATION PER CSA Z245.1 AND FORTISBC CRLS:
  a. 1425 SPECIFYING STEEL PIPE UP TO 323 mm OD.
  b. 1428 TRANSPORTING STEEL PIPE.
  c. 1787 STORAGE AND HANDLING OF STEEL PIPE AND FITTINGS.
  d. 1964 MATERIAL SPECIFICATION FOR TP AND IP STEEL PIPE.

M2. FIELD APPLIED COATINGS FOR CARRIER PIPE:
  a. 100% SOLIDS LIQUID EPOXY APPLIED IN COMPLIANCE WITH FORTISBC CRL #1454 APPLYING 100 PERCENT SOLID LIQUID EPOXY COATINGS.
  b. NON-SHIELDING WRAPPING TAPE SHALL BE USED IN ACCORDANCE WITH FORTISBC CRL #1440 APPLYING NON-SHIELDING WRAPPING TAPE.

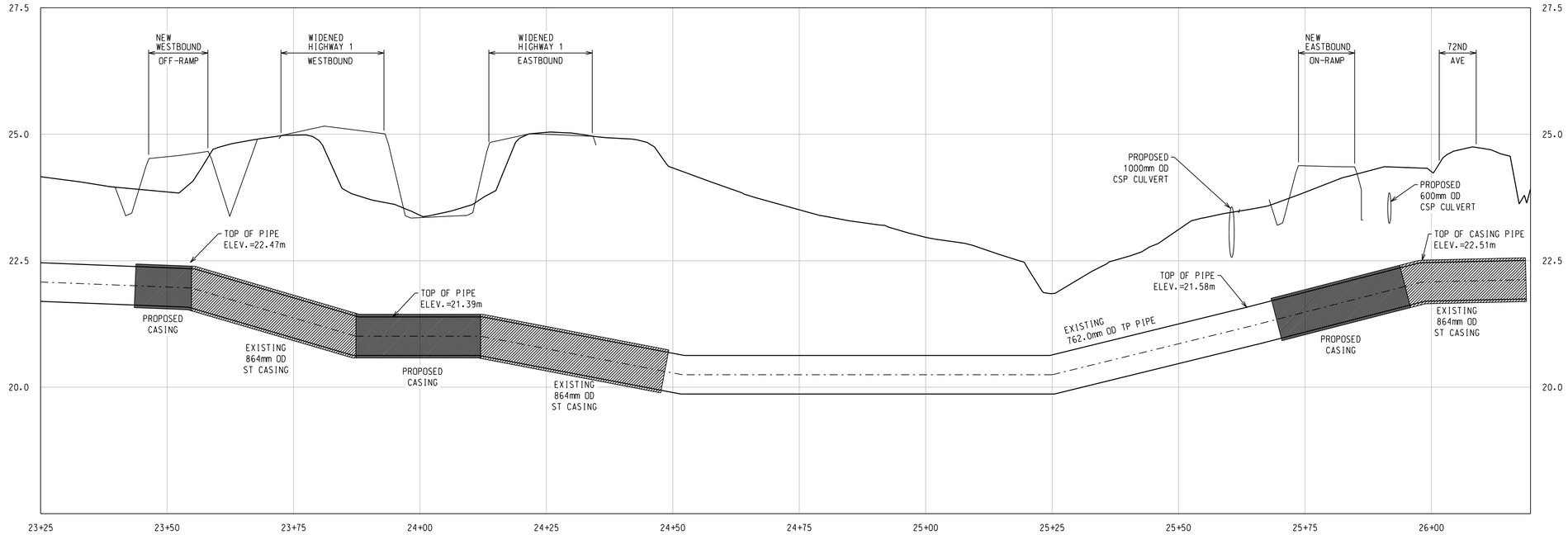
M3. SURFACE PREPARATIONS SHALL COMPLY WITH FORTISBC CRL #1451 SURFACE PREPARATION FOR PROTECTIVE COATINGS ON STEEL CARRIER PIPING SYSTEMS.

M4. ALL PROTECTIVE COATINGS SHALL COMPLY WITH FORTISBC CRL #1434 PAINTING ABOVE-GRADE PIPING AND STATION FACILITIES OR WITH FORTISBC CRL #1436 PROTECTIVE COATINGS FOR BURIED STEEL PIPING SYSTEMS.

M5. ALL BELOW GROUND FITTINGS, PIPE AND WELD JOINTS, INCLUDING THE BELOW TO ABOVE GROUND TRANSITION AREA, TO BE ABRASIVE BLASTED TO SSPC-SP10/NACE No. 2 AND COMPLETED WITH SPECIFIED COATINGS AS PER FORTISBC CRL #1436 PROTECTIVE COATINGS FOR BURIED STEEL PIPING SYSTEMS.



SITE PLAN
SCALE 1:500



762mm OD PROFILE
HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:50

0 5 10 15 20m
SCALE 1:500

RIGHT OF WAY (ROW) AND WELD LOCATIONS (UTM ZONE 10 NAD 83)

DESCRIPTION	NORTHING (m)	EASTING (m)	ELEVATION (m)
EXISTING CASING START (72 AVE E)	5442376.684	530691.591	22.26
EXISTING CASING END (72 AVE E)	5442397.195	530691.825	22.59
PROPOSED CASING START (72 E)	5442397.195	530691.825	22.59
GWD 28610	5442398.331	530691.854	22.60
GWD 28620	5442409.682	530692.000	22.45
GWD 28630	5442421.910	530692.150	22.00
PROPOSED CASING END (72 E)	5442422.608	530692.288	21.95
EXISTING CASING START (HWY E)	5442543.259	530712.254	21.57
EXISTING CASING END (HWY E)	5442579.650	530712.408	21.39
PROPOSED CASING START (HWY E)	5442579.650	530712.408	21.39
GWD 28770	5442582.940	530712.421	21.40
GWD 28780	5442591.840	530712.427	21.38
GWD 28790	5442604.120	530712.500	21.42
PROPOSED CASING END (HWY E)	5442604.317	530712.477	21.39
EXISTING CASING START (HWY W)	5442604.317	530712.477	21.39
EXISTING CASING END (HWY W)	5442636.838	530712.539	22.47
PROPOSED CASING START (HWY W)	5442636.838	530712.539	22.47
GWD 28820	5442640.837	530712.603	22.00
PROPOSED CASING END (HWY W)	5442647.973	530712.660	22.042

MATERIALS LIST

ITEM	QTY.	DESCRIPTION	REF. DWG.
1	78.0m	864mm O.D. 12.7mm W.T. GR. 359 MPa	99000-M-000-169

WELD INTEGRITY EXAMINATION

INSPECTION COMPANY: _____

TECHNICIAN: (1) _____ (2) _____ (3) _____

WELD #	NDI	TECH.	INSP. DATE	WELD #	NDI	TECH.	INSP. DATE
RADIOGRAPHIC TESTING				MAGNETIC PARTICLE TESTS			

RT: RADIOGRAPHIC TESTING
MT: MAGNETIC PARTICLE TESTING

REFERENCE DRAWINGS:

42004-P-600-1008-R0 HIGHWAY NO. 1 - TRANS CANADA HWY SPLIT CASING 864mm OD x 6m FABRICATION DRAWING

42005-P-600-1000-R0 HIGHWAY NO. 1 - TRANS CANADA HWY 323.9mm OD TRANSMISSION PIPELINE ROAD CROSSING CASING EXTENSION PLAN AND PROFILE

ISSUED FOR CONSTRUCTION
2023-07-27

ENGINEERING SERVICES	R0	ISSUED FOR CONSTRUCTION	J.FULTON	S.AUJLA	EC	2023-07-27
BY	No.	REVISION	DRAWN	DESIGNED	CHECKED	DATE(YYYY-MM-DD)
			PREVIOUS DR. NO.-			SCALE- 1:500

FORTIS BC™

FortisBC Energy INC.
1001924
PERMIT TO PRACTICE No.

Digitally signed by Eric You-Suk Cho
2023-07-27

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
B. C. MIERAU
55585
27 July 2023
ENGINEER SEAL

HUNTINGDON NICHOL 762 TP PIPELINE

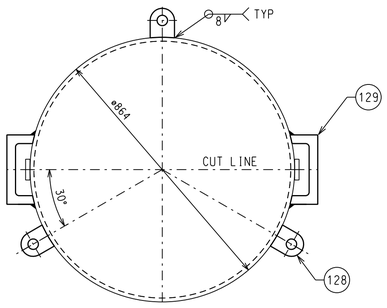
HIGHWAY 1 - TRANS CANADA HWY
762.0mm OD TRANSMISSION PIPELINE
ROAD CROSSING CASING EXTENSION
PLAN AND PROFILE

DRAWING NUMBER 42004-P-600-1007-R0

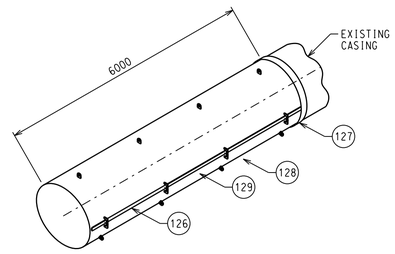
NPS 34 / 864mm OD

BILL OF MATERIALS

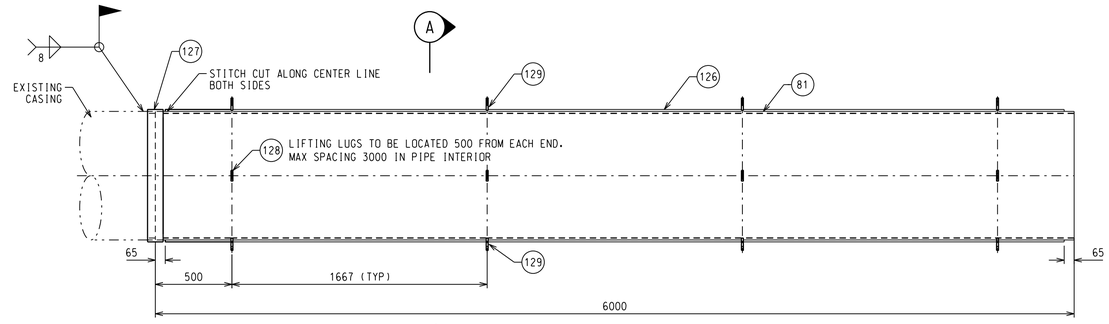
ITEM NO.	QUANITY #	count	NOMINAL SIZE (mm OD)	RATING / WT	CONN	MATERIAL	PART NAME	NOTES	FBC PART NO.
81	6	m	NPS 34 / 864mm	12.7mm	BE	CSA Z245.1 GR 359 CAT I	PIPE	BARE PIPE TO BE INSTALLED AS SPLIT CASING ON HUN NIC 762. PURCHASE DRL	
126	12	m	60mm (WIDTH)	12.7mm		CSA G40.21 300W	SPLIT CASING, GUIDE BAR (LONGITUDINAL JOINT)	STEEL BAR (2" WIDE, 1/2" THICK) MANUFACTURE GUIDE BAR FROM STEEL PLATE	
127	1	ea	100mm (WIDTH)	9.5mm		CSA G40.21 300W	SPLIT CASING, WELD BAND (CIRCUMFERENTIAL JOINT)	STEEL BAR (4" WIDE, 3/8" THICK) FIELD INSTALL, SHIP MANUFACTURED PARTS WITH SPLIT CASING	
128	12	ea		12.7mm		CSA G40.21 300W	LIFTING LUG	MANUFACTURE LIFTING LUGS FROM STEEL PLATE	
129	8	ea		12.7mm		CSA G40.21 300W	DOG	MANUFACTURE DOGS FROM STEEL PLATE	



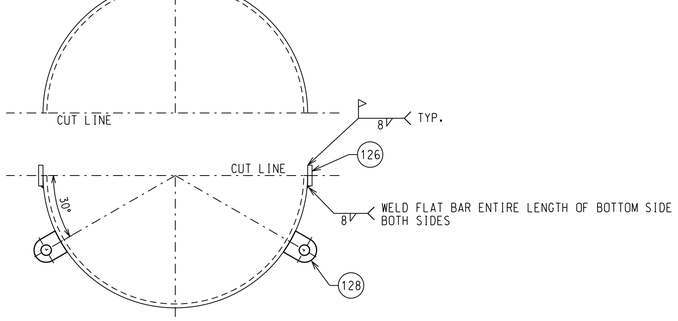
A END SECTION - PREPARED FOR CUT
SCALE 1:10



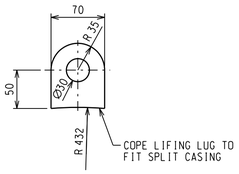
ISOMETRIC VIEW
SCALE: NTS
QTY: 12



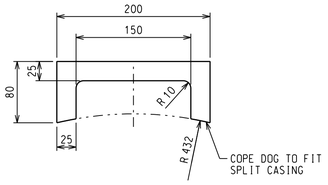
864mm OD X 6m - TOP VIEW
SCALE 1:20



A END SECTION - CUT COMPLETE
SCALE 1:10



128 LIFTING LUG - ITEM
SCALE 1:4



129 DOG - ITEM
SCALE 1:4

NOTES:

- DIMENSIONS IN mm UNLESS OTHERWISE NOTED.
- FABRICATION DRAWING IS FOR FABRICATION OF SPLIT CASING NOT INSTALLATION OF SPLIT CASING. REFER TO FORTISBC DWG 99000-M-000-170 'TYPICAL SPLIT CASING NEW OR EXTENSION' FOR INSTALLATION DETAILS.
- FABRICATION OF SPLIT CASING FROM PIPE. REFER TO CONSTRUCTION DRAWING FOR SPLIT CASING LENGTH. (42004-P-600-1007). TO SHIP TWELVE (x12) INDIVIDUAL SPLIT CASING ASSEMBLY TO SITE (6m)

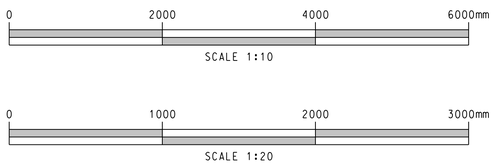
FABRICATION NOTES:

1. CUT AND ARRANGE PIPE LENGTHS TO REQUIRED SPLIT CASING DIMENSIONS.
   a. 6m PIPE.
   b. IDENTIFY EACH SPLIT CASING. MARK BOTH HALVES OF SPLIT CASINGS BY IDENTIFYING THE MATCHING ENDS SO THEY CAN BE ASSEMBLED ON SITE MATCHING ORIGINAL POSITION.
2. MARK FABRICATION REQUIREMENTS
   a. CUT LINE DOWN BOTH SIDES OF PIPE (END SECTION - PREPARED FOR CUT - 'A')
   b. CENTERLINE OF DOG LOCATIONS
   c. LIFTING LUG LOCATIONS
3. INSTALL LIFTING LUGS AND DOGS
4. COMPLETE STITCH CUT ALONG CUT LINE ON BOTH SIDES OF PIPE (300mm CUT, 75mm UNCUT) LEAVING ADDITIONAL 300mm UNCUT CENTERED AT DOG LOCATION.
5. SEPARATE PIPE INTO TWO HALVES (DOGS WILL HOLD PIPE TOGETHER)
   a. CUT REMAINING 75mm STITCHES BETWEEN DOG LOCATIONS
   b. CUT REMAINING 300mm LOCATIONS UNDERNEATH DOG LOCATIONS
6. CUT LONGITUDINAL FLAT BAR TO REQUIRED LENGTHS (PART 126). PLACE LONGITUDINAL FLAT BAR THROUGH DOGS. STOP 65mm FROM ENDS OF SPLIT CASING.
7. WELD LONGITUDINAL FLAT BAR TO BOTTOM HALF OF SPLIT CASING. WEDGE THE FLAT BAR TO SECURE IN CENTER OF CUT. TACK BOTH SIDES. COMPLETE WELD. COMPLETE FOR BOTH SIDES. (NOTE FIELD CREW WILL JOINT SPLIT CASING HALVES ON SITE BY WELDING THE TOP OF THE LONGITUDINAL BAR TO THE TOP OF THE SPLIT CASING.)
8. REMOVE DOGS IN A CONTROLLED MANNER TO CONTROL RELEASE OF POTENTIAL TENSION IN PIPE (I.E. CHAINS OR STRAPS AT EACH DOG LOCATION)
9. SEPARATE SPLIT CASING HALVES. GRIND AND CUT SLAG FROM CUT EDGES TO SIMPLIFY FIELD INSTALLATION.
10. ALL WELDING TO CSA W59.
11. MPI LIFTING LUGS ONLY. NO OTHER NDI REQUIRED.
12. VISUAL INSPECTION ON ALL WELDS TO CSA W59.
13. CASING VENT TO BE INSTALLED ON SITE PER STANDARD DRAWING 99000-M-000-169.

REFERENCE DRAWINGS:

99000-M-000-169	TYPICAL CASING DESIGN
99000-M-000-170	TYPICAL SPLIT CASING NEW OR EXTENSION
42004-P-600-1007	CASING EXTENSION PLAN AND PROFILE

ISSUED FOR CONSTRUCTION
2023-07-27



ENGINEERING SERVICES	R0	ISSUED FOR CONSTRUCTION	J.FULTON	S.AUJLA	EC	2023-07-27
BY	No.	REVISION	DRAWN	DESIGNED	CHECKED	DATE(YYYY-MM-DD)
			PREVIOUS DR. NO.-			SCALE- AS SHOWN

FORTIS BC™

FortisBC Energy INC.
1001924
PERMIT TO PRACTICE No.

Digitally signed by Eric You-Suk Cho
2023-07-27

PROFESSIONAL ENGINEER
B. C. MIERAU
55585
ENGINEER
27 July 2023

ENGINEER SEAL

HUNTINGDON NICHOL 762 TP PIPELINE

HIGHWAY NO. 1 - TRANS CANADA HWY
SPLIT CASING 864mm OD x 6m
FABRICATION DRAWING

DRAWING NUMBER 42004-P-600-1008-R0

DESIGN NOTES

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    - DESIGN FACTOR, F = 0.8
    - LOCATION FACTOR (ROAD CROSSING), L = 0.7
    - TEMPERATURE FACTOR, T = 1.0
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  b. FORTISBC TRANSMISSION PRESSURE PIPELINE STANDARDS
D2. MAXIMUM OPERATING PRESSURE: 4,020 kPa (583 psi)
D3. HOOP STRESS AT MOP 35.08% OF SMYS
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C13. PIPELINE SHALL REMAIN FULLY SUPPORTED DURING EXCAVATION. PIPE TO WRAPPED WITH A LAYER OF NEOPRENE UNDER PIPE SUPPORT.

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  d. WELD ID SHEET TO BE COMPLETED FOR AS-BUILT DRAWINGS
  e. ALL MATERIALS SHALL HAVE THEIR HEAT NUMBERS RECORDED WHERE INSTALLED

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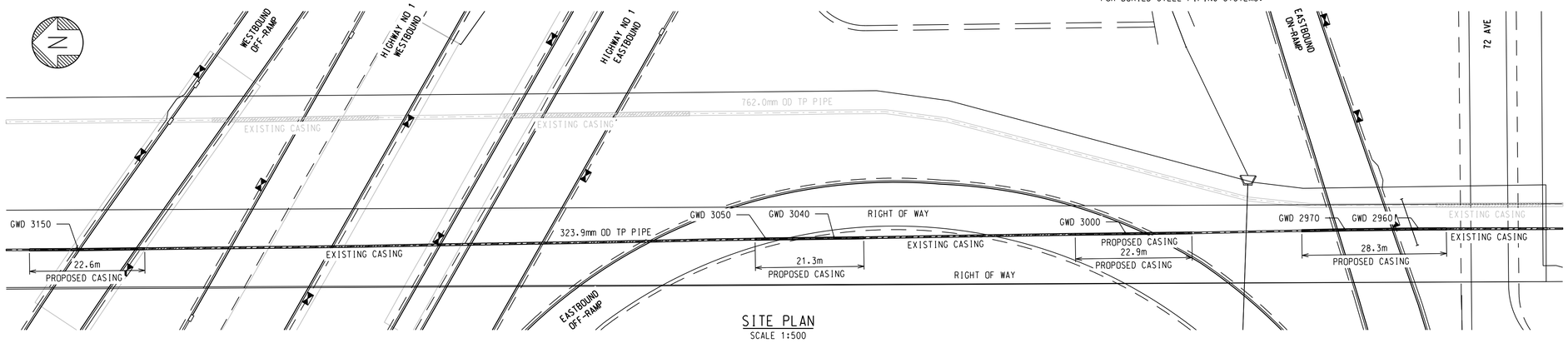
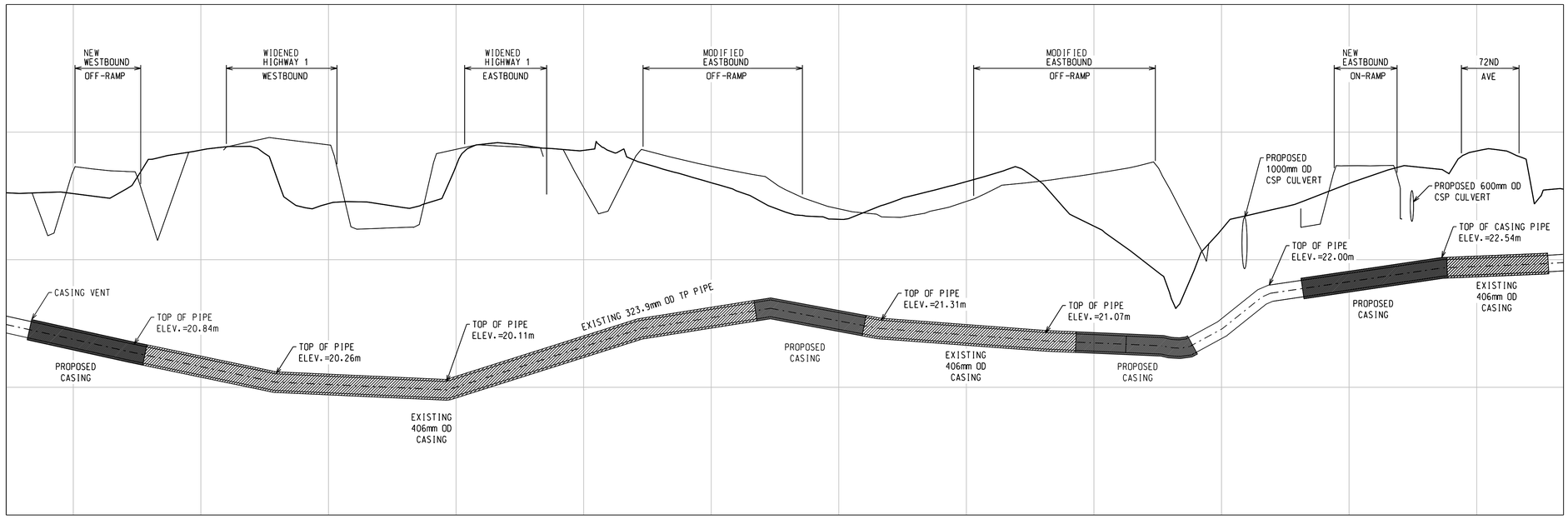
  b. 1428 TRANSPORTING STEEL PIPE.
  c. 1787 STORAGE AND HANDLING OF STEEL PIPE AND FITTINGS.
  d. 1964 MATERIAL SPECIFICATION FOR TP AND IP STEEL PIPE.
M2. FIELD APPLIED COATINGS FOR CARRIER PIPE:
  a. 100% SOLIDS LIQUID EPOXY APPLIED IN COMPLIANCE WITH FORTISBC CRL #1454 APPLYING 100 PERCENT SOLID LIQUID EPOXY COATINGS.
  b. NON-SHIELDING WRAPPING TAPE SHALL BE USED IN ACCORDANCE WITH FORTISBC CRL #1440 APPLYING NON-SHIELDING WRAPPING TAPE.
M3. SURFACE PREPARATIONS SHALL COMPLY WITH FORTISBC CRL #1451 SURFACE PREPARATION FOR PROTECTIVE COATINGS ON STEEL CARRIER PIPING SYSTEMS.
M4. ALL PROTECTIVE COATINGS SHALL COMPLY WITH FORTISBC CRL #1434 PAINTING ABOVE-GRADE PIPING AND STATION FACILITIES OR WITH FORTISBC CRL #1436 PROTECTIVE COATINGS FOR BURIED STEEL PIPING SYSTEMS.
M5. ALL BELOW GROUND FITTINGS, PIPE AND WELD JOINTS, INCLUDING THE BELOW TO ABOVE GROUND TRANSITION AREA, TO BE ABRASIVE BLASTED TO SSPC-SP10/NACE No. 2 AND COMPLETED WITH SPECIFIED COATINGS AS PER FORTISBC CRL #1436 PROTECTIVE COATINGS FOR BURIED STEEL PIPING SYSTEMS.



SITE PLAN
SCALE 1:500



323mm O.D. PROFILE
HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:50

0 5 10 15 20m
SCALE 1:500

RIGHT OF WAY (ROW) AND WELD LOCATIONS (UTM ZONE 10 NAD 83)

DESCRIPTION	NORTHING (m)	EASTING (m)	ELEVATION (m)
START OF EXISTING CASING 72 AVE	5442375.442	530688.4418	22.4481
END OF EXISTING CASING 72 AVE	5442395.255	530688.6796	22.6856
START OF PROPOSED CASING	5442395.255	530688.6796	22.6856
GWD 2960	5442400.761	530688.7431	22.8677
GWD 2970	5442415.193	530688.8148	22.6681
END OF PROPOSED CASING	5442423.616	530687.2970	NEEDS VERIFICATION
START OF PROPOSED CASING	5442445.140	530688.6821	-
GWD 3000	5442458.191	530688.7246	20.9825
END OF PROPOSED CASING	5442468.026	530688.7903	21.0864
START OF EXISTING CASING	5442468.026	530688.7903	21.0864
END OF EXISTING CASING	5442509.531	530688.8381	21.5210
START OF PROPSED CASING	5442509.531	530688.8381	21.5210
GWD 3040	5442515.328	530688.8497	21.6345
GWD 3050	5442528.794	530688.9315	20.9639
END OF PROPOSED CASING	5442530.818	530688.9462	20.8586
START OF EXISTING CASING	5442530.818	530688.9462	20.8586
END OF EXISTING CASING	5442650.492	530689.1603	20.9505
START OF PROPOSED CASING	5442650.492	530689.1603	20.9505
GWD 3150	5442663.596	530689.1929	22.0554
GWD 3160	5442677.942	530689.3305	22.2705
END OF PROPOSED CASING	5442673.100	530687.742	NEEDS VERIFICATION

MATERIALS LIST

ITEM	QTY.	DESCRIPTION	REF. DWG.
1	-	323mm x 6.40mm W.T. API 5L Gr. 290	
2	96.0m	406.4mm x 6.40mm W.T. API 5L, Gr. 310	99000-M-000-169

WELD INTEGRITY EXAMINATION

INSPECTION COMPANY: _____
TECHNICIAN: (1) _____ (2) _____ (3) _____

WELD #	NDI	TECH.	INSP. DATE	WELD #	NDI	TECH.	INSP. DATE
RADIOGRAPHIC TESTING				MAGNETIC PARTICLE TESTS			

RT: RADIOGRAPHIC TESTING
MT: MAGNETIC PARTICLE TESTING

REFERENCE DRAWINGS:

42005-P-600-1001-R0 HIGHWAY NO.1 - TRANS CANADA HWY SPLIT CASING 406.4mm OD x 6m FABRICATION DRAWING

42004-P-600-1007-R0 HIGHWAY NO.1 - TRANS CANADA HWY 762mm OD TRANSMISSION PIPELINE ROAD CROSSING CASING EXTENSION PLAN AND PROFILE.

ISSUED FOR CONSTRUCTION
2023-07-27

ENGINEERING SERVICES	R0	ISSUED FOR CONSTRUCTION	J.FULTON	S.AUJLA	EC	2023-07-27
BY	No.	REVISION	DRAWN	DESIGNED	CHECKED	DATE(YYYY-MM-DD)
			PREVIOUS DR. NO.-			SCALE- 1:500

FORTIS BC™

FortisBC Energy INC.
1001924
PERMIT TO PRACTICE No.

Digitally signed by Eric You-Suk Cho
2023-07-27

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
B.C. MIERAU
55585
27 July 2023
ENGINEER SEAL

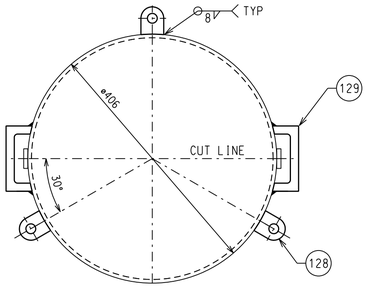
LIVINGSTON COQUITLAM 323 TP PIPELINE

HIGHWAY NO. 1 - TRANS CANADA HWY 323.9mm OD TRANSMISSION PIPELINE ROAD CROSSING CASING EXTENSION PLAN AND PROFILE

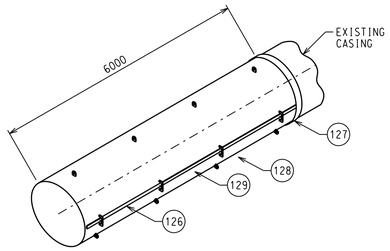
DRAWING NUMBER 42005-P-600-1000-R0

NPS 16 / 406mm OD — BILL OF MATERIALS

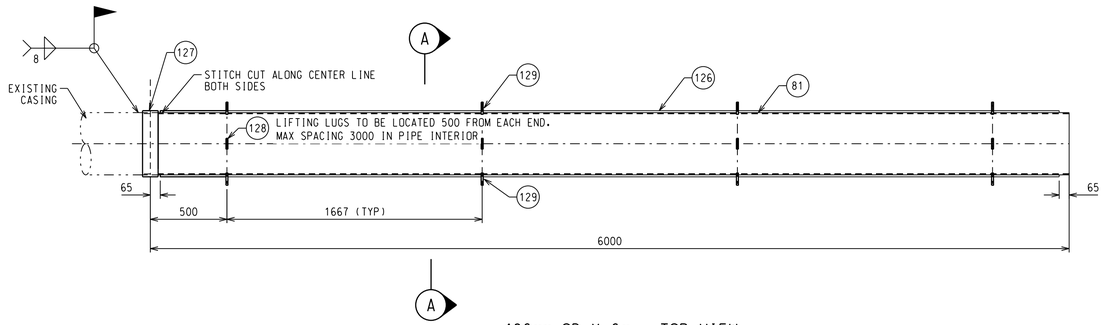
ITEM NO.	QUANITY #	count	NOMINAL SIZE (mm OD)	RATING / WT	CONN	MATERIAL	PART NAME	NOTES	FBC PART NO.
81	6	m	NPS 16 / 406mm	6.4mm	BE	ASTM A252 Gr.3	PIPE	BARE PIPE TO BE INSTALLED AS SPLIT CASING ON LIV COC 323. PURCHASE DRL	
126	12	m	60mm (WIDTH)	12.7mm		CSA G40.21 300W	SPLIT CASING, GUIDE BAR (LONGITUDINAL JOINT)	STEEL BAR (2" WIDE, 1/2" THICK) MANUFACTURE GUIDE BAR FROM STEEL PLATE	
127	1	ea	100mm (WIDTH)	9.5mm		CSA G40.21 300W	SPLIT CASING, WELD BAND (CIRCUMFERENTIAL JOINT)	STEEL BAR (4" WIDE, 3/8" THICK) FIELD INSTALL, SHIP MANUFACTURED PARTS WITH SPLIT CASING	
128	12	ea		12.7mm		CSA G40.21 300W	LIFTING LUG	MANUFACTURE LIFTING LUGS FROM STEEL PLATE	
129	8	ea		12.7mm		CSA G40.21 300W	DOG	MANUFACTURE DOGS FROM STEEL PLATE	



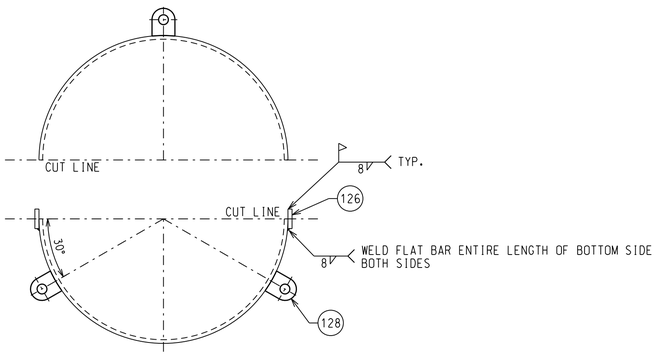
A END SECTION - PREPARED FOR CUT
SCALE 1:10



ISOMETRIC VIEW
SCALE: NTS
QTY: 16



406mm OD X 6m - TOP VIEW
SCALE 1:20



A END SECTION - CUT COMPLETE
SCALE 1:10

NOTES:

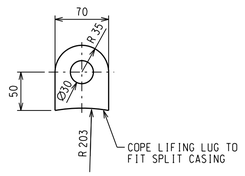
- DIMENSIONS IN mm UNLESS OTHERWISE NOTED.
- FABRICATION DRAWING IS FOR FABRICATION OF SPLIT CASING NOT INSTALLATION OF SPLIT CASING. REFER TO FORTISBC DWG 99000-M-000-170 'TYPICAL SPLIT CASING NEW OR EXTENSION' FOR INSTALLATION DETAILS.
- FABRICATION OF SPLIT CASING FROM PIPE. REFER TO CONSTRUCTION DRAWING FOR SPLIT CASING LENGTH. (42005-P-600-1000). TO SHIP SIXTEEN (x16) INDIVIDUAL SPLIT CASING ASSEMBLY TO SITE (6m)

FABRICATION NOTES:

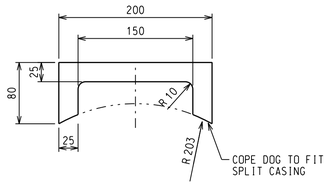
1. CUT AND ARRANGE PIPE LENGTHS TO REQUIRED SPLIT CASING DIMENSIONS.
   a. 6m PIPE.
   b. IDENTIFY EACH SPLIT CASING. MARK BOTH HALVES OF SPLIT CASINGS BY IDENTIFYING THE MATCHING ENDS SO THEY CAN BE ASSEMBLED ON SITE MATCHING ORIGINAL POSITION.
2. MARK FABRICATION REQUIREMENTS
   a. CUT LINE DOWN BOTH SIDES OF PIPE (END SECTION - PREPARED FOR CUT - 'A')
   b. CENTERLINE OF DOG LOCATIONS
   c. LIFTING LUG LOCATIONS
3. INSTALL LIFTING LUGS AND DOGS
4. COMPLETE STITCH CUT ALONG CUT LINE ON BOTH SIDES OF PIPE (300mm CUT, 75mm UNCUT) LEAVING ADDITIONAL 300mm UNCUT CENTERED AT DOG LOCATION.
5. SEPARATE PIPE INTO TWO HALVES (DOGS WILL HOLD PIPE TOGETHER)
   a. CUT REMAINING 75mm STITCHES BETWEEN DOG LOCATIONS
   b. CUT REMAINING 300mm LOCATIONS UNDERNEATH DOG LOCATIONS
6. CUT LONGITUDINAL FLAT BAR TO REQUIRED LENGTHS (PART 126). PLACE LONGITUDINAL FLAT BAR THROUGH DOGS. STOP 65mm FROM ENDS OF SPLIT CASING.
7. WELD LONGITUDINAL FLAT BAR TO BOTTOM HALF OF SPLIT CASING. WEDGE THE FLAT BAR TO SECURE IN CENTER OF CUT. TACK BOTH SIDES. COMPLETE WELD. COMPLETE FOR BOTH SIDES. (NOTE FIELD CREW WILL JOINT SPLIT CASING HALVES ON SITE BY WELDING THE TOP OF THE LONGITUDINAL BAR TO THE TOP OF THE SPLIT CASING.)
8. REMOVE DOGS IN A CONTROLLED MANNER TO CONTROL RELEASE OF POTENTIAL TENSION IN PIPE (I.E. CHAINS OR STRAPS AT EACH DOG LOCATION)
9. SEPARATE SPLIT CASING HALVES. GRIND AND CUT SLAG FROM CUT EDGES TO SIMPLIFY FIELD INSTALLATION.
10. ALL WELDING TO CSA W59.
11. MPI LIFTING LUGS ONLY. NO OTHER NDI REQUIRED.
12. VISUAL INSPECTION ON ALL WELDS TO CSA W59.
13. CASING VENT TO BE INSTALLED ON SITE PER STANDARD DRAWING 99000-M-000-169.

REFERENCE DRAWINGS:

99000-M-000-169	TYPICAL CASING DESIGN
99000-M-000-170	TYPICAL SPLIT CASING NEW OR EXTENSION
42005-P-600-1000	CASING EXTENSION PLAN AND PROFILE



128 LIFTING LUG - ITEM
SCALE 1:4



129 DOG - ITEM
SCALE 1:4

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2023-07-27

SCALE 1:5

SCALE 1:20

ENGINEERING SERVICES	R0	ISSUED FOR CONSTRUCTION	J.FULTON	S.AUJLA	EC	2023-07-27
BY	No.	REVISION	DRAWN	DESIGNED	CHECKED	DATE(YYYY-MM-DD)
			PREVIOUS DR. NO.-			SCALE- AS SHOWN

FORTIS BC™

FortisBC Energy INC. 1001924
PERMIT TO PRACTICE No.

Digitally signed by Eric You-Suk Cho
2023-07-27

PROFESSIONAL ENGINEER — PROVINCE OF B.C. — B.C. MIERAU # 55585 — 27 July 2023
ENGINEER SEAL

LIVINGSTON COQUITLAM 323 TP PIPELINE

HIGHWAY NO. 1 - TRANS CANADA HWY
SPLIT CASING 406.4mm OD x 6m
FABRICATION DRAWING

DRAWING NUMBER 42005-P-600-1001-R0