NOTES:

CONSTRUCTION

1. IT IS RECOMMENDED THAT THE BORING CONTRACTOR INDEPENDENTLY EVALUATE THE FEASIBILITY OF BORING THE CROSSING WITH DUE CONSIDERATION GIVEN TO THE SUITABILITY OF THEIR EQUIPMENT AND PROPOSED CONSTRUCTION PROCEDURES. SPECIFIC BORING METHOD AND EQUIPMENT SELECTION IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR WITH APPROVAL FROM THE COMPANY.
2. THE CONTRACTOR MUST SUBMIT A BORING EXECUTION PLAN FOR COMPANY APPROVAL (PRIOR TO START OF DRILLING OPERATIONS) THAT MEETS THESE MINIMUM REQUIREMENTS. THE EXECUTION PLAN SHALL BE ADHERED TO AND DEVIATION FROM THIS PLAN SHALL ONLY BE EXECUTED ONCE COMPANY APPROVED.
3. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SPECIFIED. ALL DIMENSIONS ARE TO THE CENTRELINE OF BOREHOLE UNLESS OTHERWISE SPECIFIED.
4. ALL LENGTHS ARE ROUNDED TO THE NEAREST METRE AND ALL ANGLES ARE ROUNDED TO THE NEAREST DEGREE UNLESS OTHERWISE SPECIFIED.
5. ALL BORE LENGTHS ARE ROUNDED TO THE NEAREST METRE UNLESS OTHERWISE SPECIFIED.
6. THE INSTALLED PIPE AND EXISTING UTILITIES BEING CROSSED SHALL HAVE A MINIMUM SEPARATION OF 2m.
7. CONTRACTOR SHALL ENSURE THE BORE IS COMPLETED SUCH THAT BOREHOLE COLLAPSE AND SETTLEMENT IS MINIMIZED.
8. ALL EXISTING UTILITY DEPTHS ARE ASSUMED AND SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO THE START OF INSTALLATION. THE CONTRACTOR SHALL ENSURE ANY UTILITIES IN THE AREA ARE PROTECTED AND NOT DAMAGED DUE TO ANY CONSTRUCTION ACTIVITIES. VERIFICATION SHALL BE IN ACCORDANCE WITH COMPANY SPECIFICATIONS AND GROUND DISTURBANCE PROCEDURES.
9. ALL EXCAVATIONS ARE APPROXIMATE IN DIMENSION. THE CONTRACTOR SHALL ASSESS THE SITE CONDITIONS AND EXCAVATE APPROPRIATELY ADHERING TO OH&S GUIDELINES.
10. RIG MATTING AND GRAVEL BASE MAY BE REQUIRED WITHIN ENTRY PIT TO STABILIZE EQUIPMENT DURING INSTALLATION.
11. CASING SHALL BE SUPPLIED BY THE CONTRACTOR.
12. CONTRACTOR SHALL COMPLETE THE INSTALLATION IN ACCORDANCE WITH THE SUPPLIED PIPELINE CONSTRUCTION SPECIFICATIONS.
13. ALTERNATE METHODS OF COMPLETING THE CROSSING MUST BE APPROVED IN ADVANCE BY THE OWNER.
14. ENTRY AND EXIT PITS MUST BE COMPACTED FOLLOWING INSTALLATION TO PREVENT SETTLEMENT.
15. CONTRACTOR TO PROVIDE A DETAILED EXECUTION PLAN FOR APPROVAL BY THE OWNER IN ADVANCE OF THE CONSTRUCTION.
16. THIS BORE SHALL BE COMPLETED UTILIZING A BORE MACHINE AND MAINTAINED WITH A STEERING TOLERANCE OF +-10cm FROM THE DESIGN DRAWING ALIGNMENT.

ENVIRONMENTAL

17. NO REFUELING OF PUMPS OR EQUIPMENT WITHIN 100M OF THE WATER BODY SHALL BE COMPLETED.
18. EMERGENCY RESPONSE SPILL KITS MUST BE ON-SITE AND AVAILABLE FOR USE FOR THE DURATION OF THE PROJECT.
19. ANY NEARBY WATERCOURSE MUST BE MONITORED FOR IMMEDIATE EFFECTS OF THE WORKS ON THE AQUATIC ENVIRONMENT IN ACCORDANCE WITH THE BRITISH COLUMBIA GOVERNMENT'S CODE OF PRACTICE.
20. THE CONTRACTOR SHALL ENSURE THAT THE FOLLOWING DOCUMENTATION IS ON-SITE AND READILY AVAILABLE AT ALL TIMES (AT A MINIMUM):
    a. BRITISH COLUMBIA ENERGY REGULATOR (BCER) NOTIFICATION;
    b. EMERGENCY RESPONSE PROCEDURE (ERP);
    c. ENVIRONMENTAL PROTECTION PLAN (EPP);
    d. SDS FOR ALL ON-SITE MATERIAL;
    e. BRITISH COLUMBIA ENERGY REGULATOR (BCER) PERMITS;
    f. APPLICABLE LAND USE AGREEMENTS.

GEOTECHNICAL

21. A GEOTECHNICAL INVESTIGATION WAS COMPLETED AT THIS SITE BY GEONORTH ENGINEERING LTD. AND CAN BE REFERENCED FROM CCI INC. REPORT NO. 4952-GEO-RPT-0001.
22. SUBSURFACE CONDITIONS ARE BELIEVED TO BE SUITABLE FOR CONSTRUCTION OF THE PROPOSED AUGER BORE CROSSING BASED ON THE DATA AVAILABLE.
23. SOIL STRATIGRAPHY SHOWN IS BASED ON INTERPRETATION OF DATA FROM TWO (2) BOREHOLES, DRILLED BY OTHERS AT THE LOCATIONS SHOWN AND CCI'S UNDERSTANDING OF THE LOCAL GEOLOGY. DUE TO NATURAL VARIATIONS IN SUBSURFACE CONDITIONS AND INHERENT UNCERTAINTIES ASSOCIATED WITH THE INTERPRETATION OF SUBSURFACE DATA, SOME VARIATION IN STRATIGRAPHY ALONG THE LENGTH OF THE BORE SHOULD BE EXPECTED.
24. A DETAILED SETTLEMENT MONITORING PLAN (SMP) WILL BE COMPLETED PRIOR TO CONSTRUCTION OUTLINING THE REQUIRED SETTLEMENT MONITORING PROGRAM DURING INSTALLATION.
25. THE MAXIMUM ALLOWABLE RADIAL OVER-CUT IS 12.7mm (0.5").

CN RAIL REQUIREMENTS

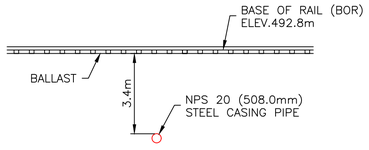
26. INSTALLATION AND MAINTENANCE TO BE IN ACCORDANCE WITH TC E-10 AND THE LATEST EDITION OF APPLICABLE CSA STANDARD CSA Z662.
27. AS A MINIMUM, THE CROSSING SHALL BE CONSTRUCTED AND TESTED IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, PROVINCIAL, MUNICIPAL AND COUNTY REGULATIONS.
28. THIS DRAWING IS BASED ON INFORMATION SUPPLIED BY VARIOUS SOURCES. THE CONTRACTOR SHALL CONFIRM THE ACCURACY OF INFORMATION PRIOR TO CONSTRUCTION.
29. NEAREST SHUT-OFF VALVES LOCATED AT:
    APPROXIMATELY 0.150km TO THE SOUTHWEST AS MEASURED ALONG THE ROW.
    APPROXIMATELY 0.034km TO THE NORTHEAST AS MEASURED ALONG THE ROW.
30. THE MINIMUM DEPTH OF COVER OVER THE ENCASED PIPE SHALL BE:
    a. 1.68m BELOW THE BASE-OF-RAIL AND WITHIN 7m OF CENTER OF THE OUTSIDE RAIL, MEASURED AT RIGHT ANGLES TO THE CENTERLINE OF THE TRACK.
    b. 0.91m BELOW GRADE OR BOTTOM OF DITCH WITHIN ALL PORTIONS OF THE CN RAIL RIGHT-OF-WAY WHERE THE PIPELINE IS NOT UNDER THE TRACK. WARNING SIGNS TO BE INSTALLED NEAR RAILWAY PROPERTY LINES.
31. CN RAILWAY SUBDIVISION/RAILWAY MILEAGE: BULKLEY SUBDIVISION, MILEAGE 0.04.

CASING INFO

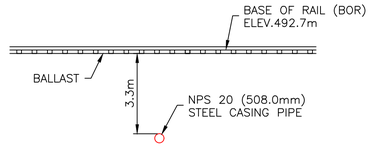
Pipe Name:	CN YARD WATERMAIN REPLACEMENT PROJECT
Pipe Size:	NPS 20 (508.0mm OD)
Wall Thickness:	6.35mm
Inside Diameter:	495.3mm
Material:	STEEL
Specification & Grade:	CSA Z245.1, GRADE 291
Yield Strength:	291 MPa
Contents to be Handled:	DIPS 14 HDPE WATERMAIN
Coating:	DUAL FBE
M.O.P.:	101 kPa
Min. Test Pressure:	N/A
Min. Installation Temperature:	N/A
Max. Operating Temperature:	N/A
Type of Joint:	WELDED CONNECTION
Joint Factor:	1.0
Geotechnical Bore Holes:	YES
Installation Method:	AUGER BORE
Cathodic Protection Method:	N/A
Number of Tracks:	SIX
D/T Ratio:	80.00
Design Loading:	COOPER E-90
Railway Mileage & Subdivision:	MP 0.04, BULKLEY SUBDIVISION
Hoop Strength:	NPS 20, 0.00% SMYS (291MPa)

CONTACT

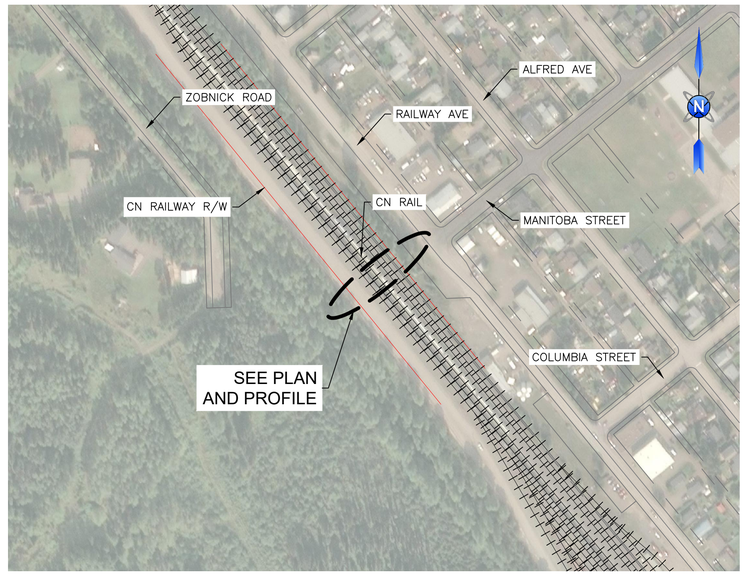
MATTHEW LABRECQUE - Geotechnical Engineer
CCI Inc.
10239 - 178 ST. NW
Edmonton, AB CANADA T5S 1M3
780.292.0443
Matthew.LaBrecque@ccisolutions.ca



CN RAIL ALIGNMENT PROFILE
NTS



CN RAIL ALIGNMENT PROFILE
NTS



LOCATION PLAN
SCALE 1:2,500

REFERENCE DOCUMENT NO.

	DATE
1. Town As-Built Master in UTM	2025-08-05
2. 4952-API 1102 Analysis-02	2026-01-06
3. 4952-STRAIGHT PIPE STRESS-01	2025-12-31

ENGINEER AND PERMIT STAMPS

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
B. S. VAN HELM
39695
2026-01-08

PERMIT TO PRACTICE
CCI Inc.
Signature: ID# 203065
Date: January 8, 2026
PERMIT NUMBER: 1000703
Engineers and Geoscientists BC

PIPELINE SPECIFICATIONS

	NPS 20	DIPS 14
OUTSIDE DIAMETER (OD)(mm)	508.0	356.0
WALL THICKNESS (WT)(mm) / DR	6.35	DR 13.5
GRADE	291	PE4710
PRODUCT	CASING	WATER
MATERIAL	STEEL	HDPE
SPECIFICATIONS	CSA Z245.1	CSA B137.1
INTERNAL COATING	N/A	N/A
OUTER COATING	DUAL FBE	N/A
MAX. OPER. PRESSURE (kPa)	101	738
MIN. TEST PRESSURE (kPa)	N/A	N/A
MAX. INSTALLATION TEMP (°C)	N/A	N/A

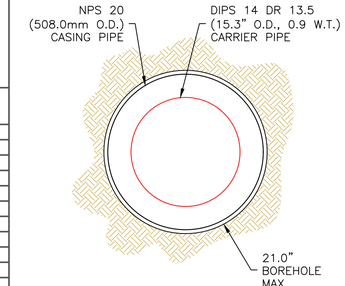
STEERING TOLERANCES

PULL FORCE / RIG SIZE / STRESS

DRAWING STATUS

	DATE	DRN	CHK	DES	GEO	APR	CR
ISSUED FOR PERMIT	2026-01-06	GS	BO	BE	ML	AH	RJ

BOREHOLE CROSS SECTION



Allnorth

CN YARD WATERMAIN REPLACEMENT PROJECT
CN RAILWAY AUGER BORE CROSSING
CONSTRUCTION NOTES AND PIPELINE INFORMATION - NPS 20 CASING
TOWN OF SMITHERS

SCALE	DWG. #	REVISION	SHEET
AS SHOWN	4952-EG-0102	0	2 OF 2

CCI

File Name: S:\Current Jobs\4952-Allnorth Consultants Ltd- CN Yard Watermain Repl\Eng\Drawings\01-CN Rail\VFC\4952-EG-0101-0.dwg Date/Time: 2026-01-08 / 11:56:43 AM Last Saved By: Gary.Sargeant