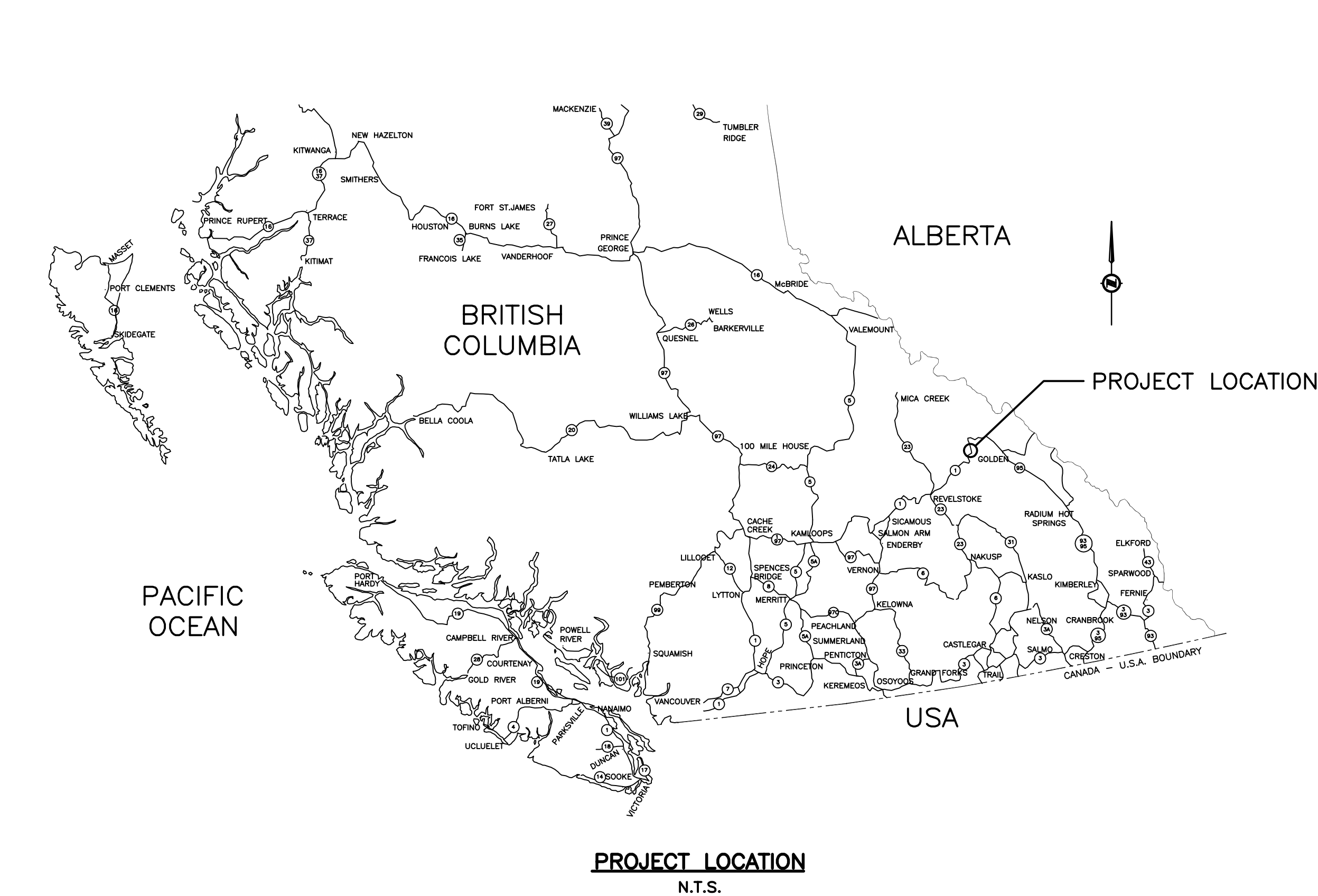
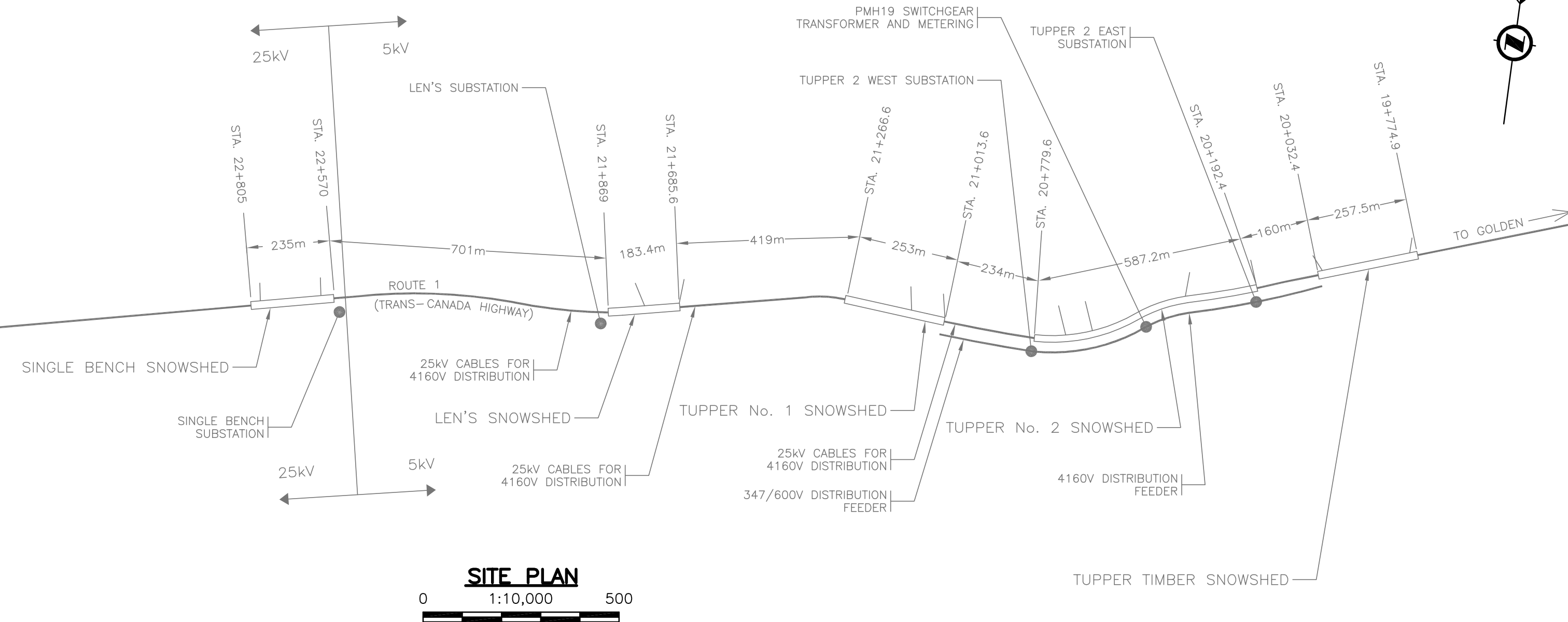
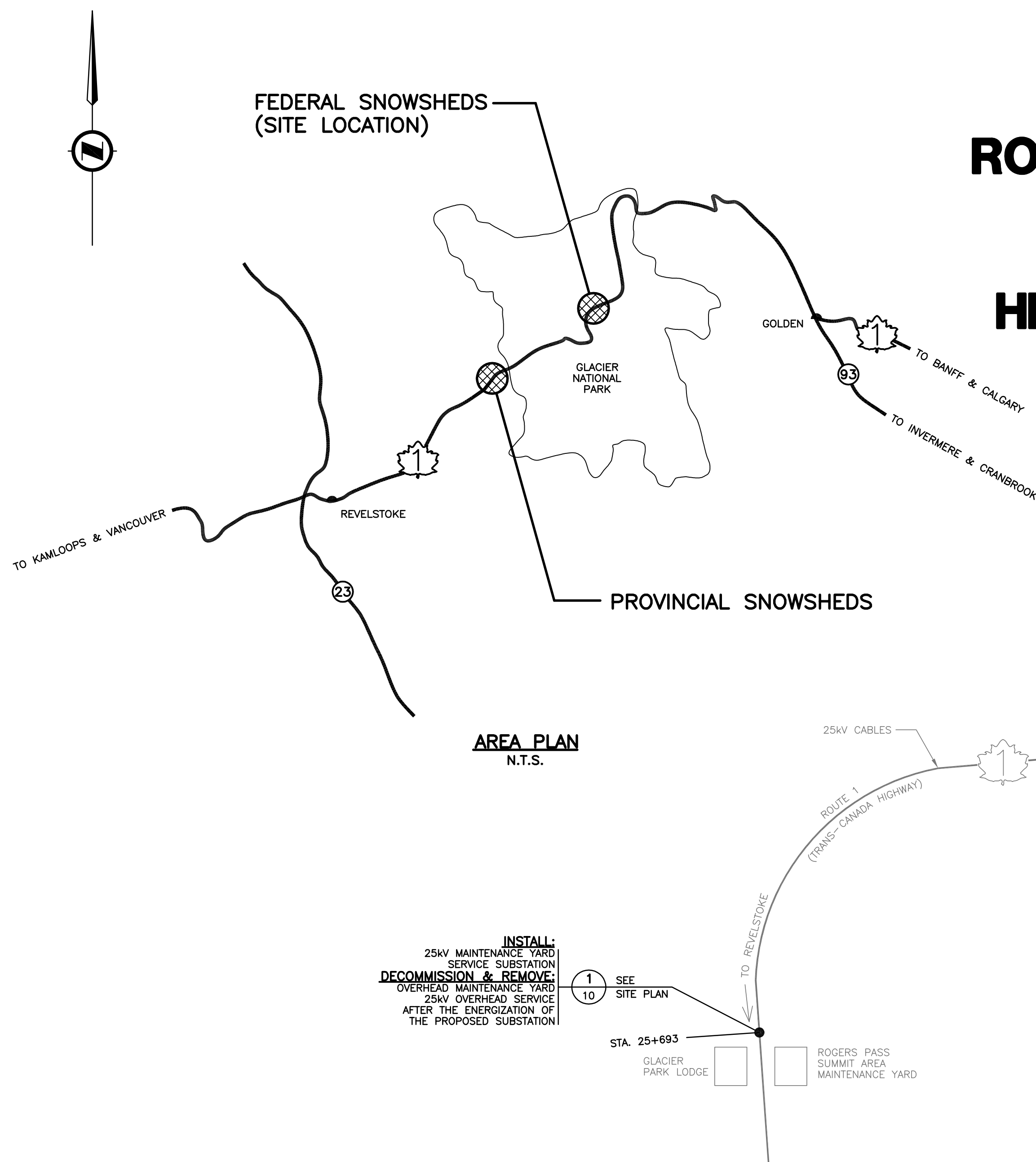


PARKS CANADA  
GLACIER NATIONAL PARK

ROUTE 1 (TRANS-CANADA HIGHWAY) THROUGH ROGERS PASS  
ROGERS PASS SNOWSHED LIGHTING  
HIGH AND LOW VOLTAGE DISTRIBUTION SYSTEMS - YEAR 2  
MAINTENANCE YARD SERVICE SUBSTATION  
PROJECT No. 201422



DRAWING INDEX

DRAWING No.	REV.	DESCRIPTION
1	-	COVER SHEET, INDEX & SITE PLAN
2	-	SYMBOL, LEGEND & ABBREVIATIONS
3	-	GENERAL NOTES
4	-	DETAILS - EXISTING POWER DISTRIBUTION SYSTEM
10	-	PLAN - STA. 26+025 TO STA. 24+611
11	-	PLAN - STA. 24+611 TO STA. 23+024
12	-	PLAN - STA. 23+024 TO STA. 21+600
13	-	PLAN - STA. 21+600 TO STA. 20+094
14	-	PLAN - STA. 20+094 TO STA. 19+406
15	-	SECTIONS - TYPICAL TRENCH
16	-	SINGLE LINE DIAGRAM - EXISTING SYSTEM - HIGH VOLTAGE
17	-	SINGLE LINE DIAGRAM - PROPOSED SYSTEM - HIGH VOLTAGE
18	-	BLOCK DIAGRAM - LIGHTING CONTROL SYSTEM
19	-	25KV SERVICE LAYOUT - MAINTENANCE YARD
20	-	SWITCHGEAR LAYOUT - MAINTENANCE YARD
21	-	SWITCHGEAR GROUNDING - MAINTENANCE YARD
30	-	SWITCHGEAR LAYOUT - SINGLE BENCH
31	-	SWITCHGEAR GROUNDING - SINGLE BENCH
32	-	UNDERGROUND LAYOUT - SINGLE BENCH
33	-	ABOVE GROUND LAYOUT - SINGLE BENCH
36	-	SINGLE LINE DIAGRAM - LOW VOLTAGE - SINGLE BENCH
40	-	SWITCHGEAR LAYOUT - LEN'S
41	-	SWITCHGEAR GROUNDING - LEN'S
42	-	UNDERGROUND LAYOUT - LEN'S
43	-	ABOVE GROUND LAYOUT - LEN'S
46	-	SINGLE LINE DIAGRAM - LOW VOLTAGE - LEN'S
50	-	SWITCHGEAR LAYOUT - TUPPER 2 WEST
51	-	SWITCHGEAR GROUNDING - TUPPER 2 WEST
52	-	UNDERGROUND LAYOUT - TUPPER 2 WEST
53	-	ABOVE GROUND LAYOUT - TUPPER 2 WEST
56	-	SINGLE LINE DIAGRAM - LOW VOLTAGE - TUPPER 2 WEST
60	-	SWITCHGEAR LAYOUT - TUPPER 2 EAST
61	-	SWITCHGEAR GROUNDING - TUPPER 2 EAST
62	-	UNDERGROUND LAYOUT - TUPPER 2 EAST
63	-	ABOVE GROUND LAYOUT - TUPPER 2 EAST
66	-	SINGLE LINE DIAGRAM - LOW VOLTAGE - TUPPER 2 EAST

REFERENCE DRAWINGS

DRAWING No.
G2001R6-1 TO G2001R6-7
G2002R1-1 TO G2002R1-21
A.C. DANDY AS BUILTS ESK#9 TO ESK#22

DRAWINGS NOT INCLUDED IN THE CURRENT PACKAGE

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No.	Date	Description	Drawn by Dessiné par	Approved Approuvé
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Revision / Revision				
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Consultant's Stamp Sceau de l'expert-conseil		Eng. Stamp Sceau de l'ingénieur		
Client/client				
Parks Canada Agency Western and Northern Region L'Agence Parcs Canada Ouest et Nord Région				
Consultant's Name Nom de l'expert-conseil				
PBX ENGINEERING Ltd. Suite 200 - 2612 Bridge St. Victoria BC, V8T 4S9 Tel 250.388.7222 Suite 300 - 131 Water St. Vancouver BC, V6B 4M3 Tel 604.408.7222 www.pbxeng.com				
Project title/Titre du projet				
ROGERS PASS SNOWSHED LIGHTING				
TRANS CANADA HIGHWAY THROUGH ROGERS PASS				
GLACIER NATIONAL PARK				
Drawing title/Titre du dessin				
HIGH AND LOW VOLTAGE DISTRIBUTION SYSTEMS				
COVER SHEET, INDEX & SITE PLAN				
Surveyed by/Arpenté par	Drawn by/Dessiné par	Date		
	PBX	2014-01-17		
Designed by/Concept par	Reviewed by/Revisé par	Scale/Echelle		
AC	PB	AS NOTED		
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PARK RESPONSIBLE OFFICER/AGENT RESPONSABLE		Date	A & E SERVICES/GÉNIE ET ARCHITECTURE	
Project No./No du projet		Asset No./N° du bien	Sheet No./N° de la feuille	
201422			1	
Drawing Reference No./No de référence du dessin		G2002R1		







**GENERAL REQUIREMENTS:**

- LAWS, RULES, ORDINANCES AND INSPECTION:**

- SITE INSPECTION:**

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**RESPONSIBILITY:**

- ### 3. GUARANTEE:

- EQUIPMENT GROUNDING:

- SEISMIC RESTRAINTS:**

- 1. LABELING:**

- ## 2. COORDINATION:

- ### 3. TESTING:

PRE-TESTING DOCUMENTATION:

- ## 2.0 POST-TESTING DOCUMENTATION:

- ### 3.0 TEST PROCEDURES:

26. BEFORE ENERGIZING ANY PORTION OF THE ELECTRICAL SYSTEMS, MEGGER TESTS SHALL BE PERFORMED ON ALL FEEDERS AND BRANCH CIRCUITS AND HI-POT TEST SHALL BE PERFORMED ON ALL HIGH VOLTAGE FEEDERS. EXERCISE CARE NOT MEGGERING LOW VOLTAGE CABLES (SIGNALS, VIDEO, ETC.) TEST REPORTS SHALL BE PROVIDED TO ENGINEER FOR REVIEW. HI-POT OLDER HIGH VOLTAGE CABLES IN COMPLIANCE WITH NETA TESTING STANDARDS.

28. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ARRANGING ALL INSPECTIONS AND TESTS REQUIRED BY MUNICIPAL OR OTHER AUTHORITIES HAVING JURISDICTION OVER THE WORK AND FOR OBTAINING ALL NECESSARY PERMITS. COPIES OF ALL INSPECTION AND TEST RESULTS UNDERTAKEN BY THE REPRESENTATIVES OF SUCH AUTHORITIES SHALL BE PASSED TO THE ENGINEER.

#### 4.0 CORRECTIONS:

1. ALL FAULTS AND DEFECTS IN ANY ELECTRICAL EQUIPMENT AND SYSTEMS COMPLETED UNDER THE CONTRACT, SHALL BE CORRECTED WITHOUT ADDED EXPENSE TO THE OWNER AND PRIOR TO SUBSTANTIAL PERFORMANCE.

## 5.0 EXISTING FIBRE OPTIC CABLE:

1. THE EXISTING FIBRE OPTIC CABLE IS FOR FUTURE USE. CONTRACTOR SHALL EXPOSE, PROTECT AND MARK THE LOCATION OF THE EXISTING FIBRE OPTIC CABLE IN THE CONSTRUCTION ZONES.

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Linear dimensions in millimetres	Dimensions linéaires en millimètres
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Client/client	
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Consultant's Name  
Nom de l'expert-conseil

**PBX**  
**ENGINEERING**

PBX Engineering Ltd.  
Suite 200 - 2612 Bridge St.  
Victoria BC V8T 4S9 Tel 250.388.7222

Suite 300 - 131 Water St.  
Vancouver BC, V6B 4M3 Tel 604.408.7222  
[www.pbxeng.com](http://www.pbxeng.com)

Drawing title/Titre du dessin

Surveyed by/Arpenté par	Drawn by/Dessiné par PBX	Date 2014-01-17
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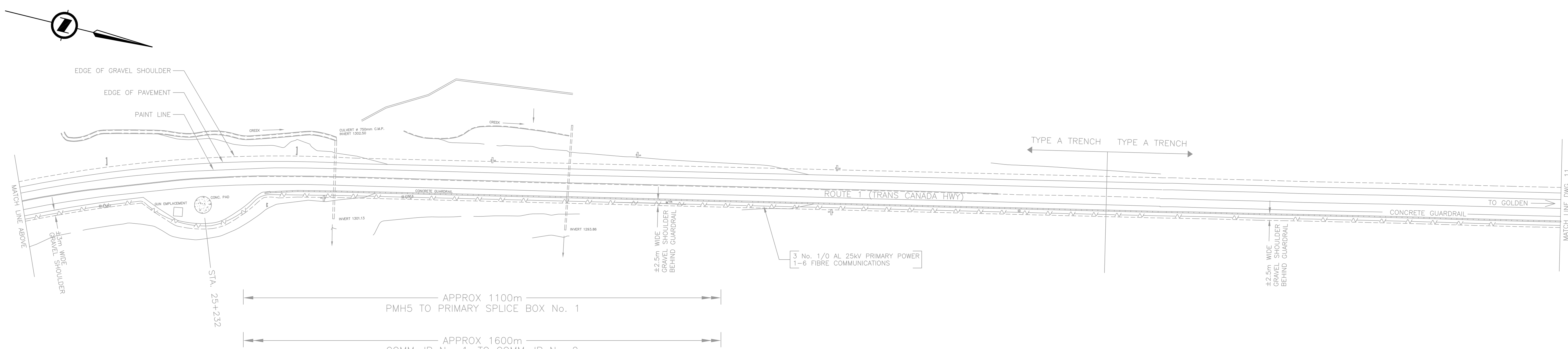
Designed by/Concept par <b>AC</b>	Reviewed by/Revisé par <b>PB</b>	Scale/Echelle <b>AS NOTED</b>
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Client Acceptance/Acceptation du client	Approved by/Approuvé par
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PARK RESPONSIBLE OFFICER/AGENT RESPONSABLE		Date	A & E SERVICES/GÉNIE ET ARCHITECTURE		Date
Project No./No du projet		Asset No./N° du-bien			Sheet No./N° de la feuille
201432					

201422		3
Drawing Reference No./No de référence du dessin <b>G2002R1</b>		





PLAN  
1:1000

1. REFER TO DWG. 16 AND 17 FOR THE EXISTING AND PROPOSED 25KV SERVICE SINGLE LINE DIAGRAMS.

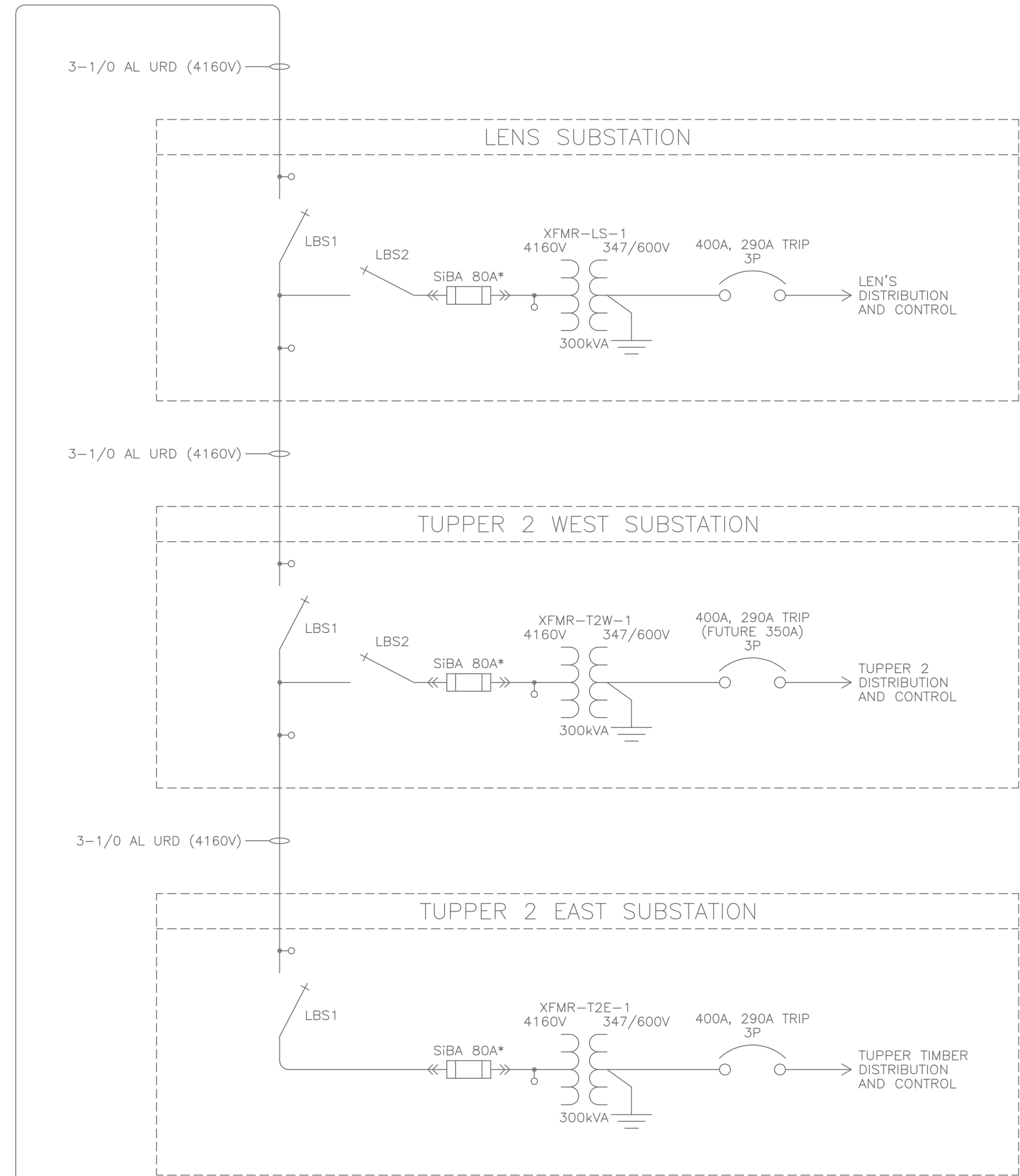
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Drawing title/Titre du dessin					
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PLAN STA. 26+025 TO STA. 24+611					
Surveyed by/Arpenté par	Drawn by/Dessinée par	Date			
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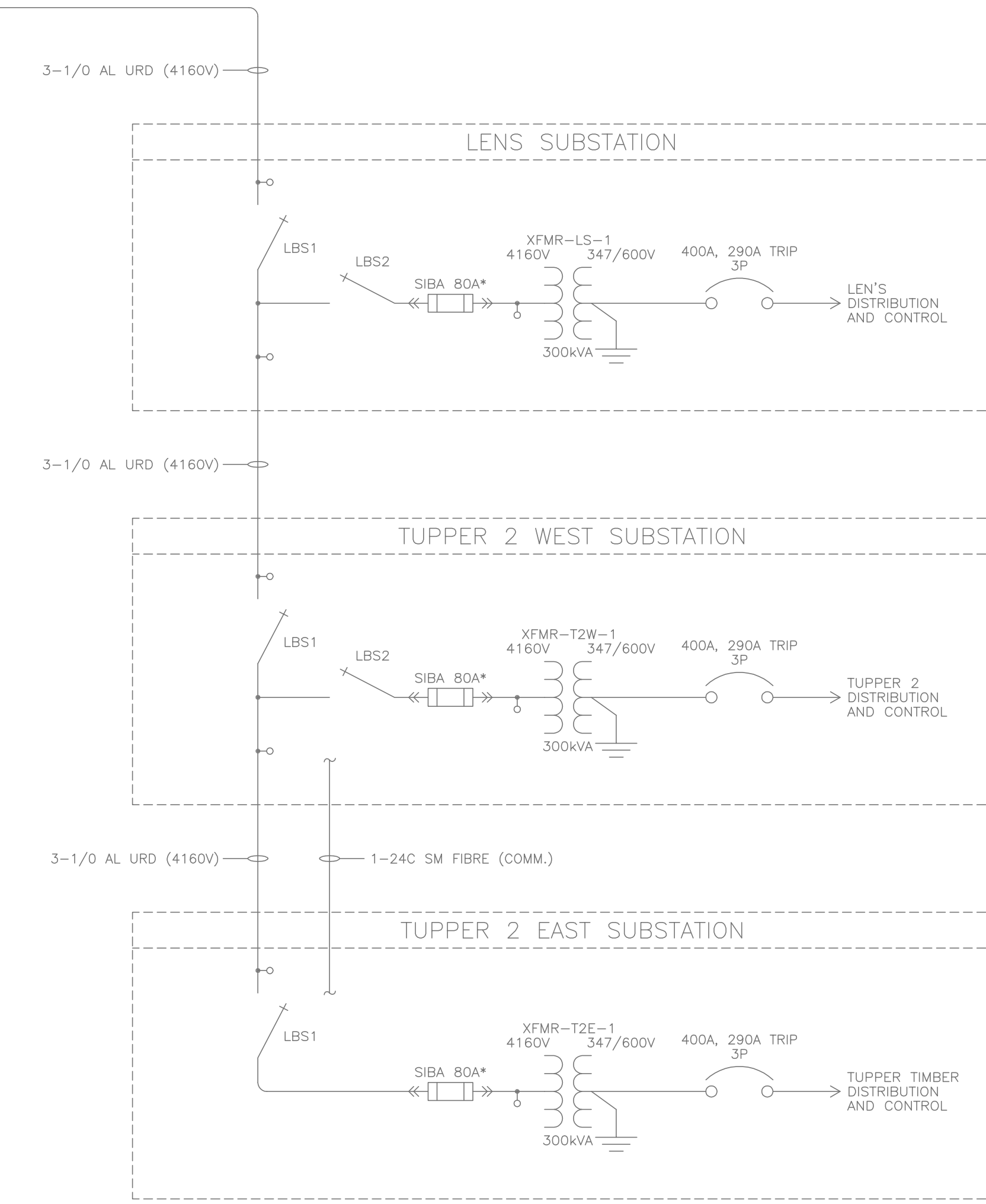





\*\* 832 JB AND H.V. CABLES TO SINGLE BENCH WILL BE INSTALLED BY OTHERS AS PART OF THE ROGERS PASS 25KV FEEDER UPGRADES PROJECT.

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P:\1320\_Snowshed Lighting - Glacier National Park\01 - Design\Drawings\ACAD\Primary Powerline Construction\16: 6/03/2015 10:15 AM: CARLOS.MATIAS


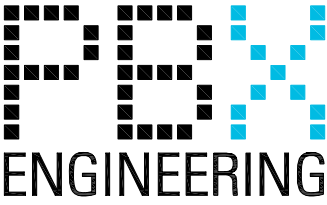


- NOTES:**
- \* TO BE CONFIRMED WITH BERGEVIN ELECTRIC.
  1. 1200VA VACUUM CIRCUIT BREAKER PROVIDED WITH DIGITAL PROTECTION AND 5s/10s PUSH BUTTON CONNECTION DELAY. PROTECTION SHALL INCLUDE 27, 50, 51 AND CONNECTION FOR REMOTE 49 AND 50N RELAYS. VACUUM CB SHALL TRIP AT PHASE LOSS OR LOW VOLTAGE.
  2. PROVIDE SUBSTATION PROTECTION COORDINATION STUDY, ARC FLASH STUDY, SETTINGS AND SYSTEM TESTING AND COMMISSIONING.
  3. SERVICE SECTIONS AND METERING CABINETS TO BE CY-HYDRO STANDARDS.
  4. DIGITAL PROTECTION SHALL PROVIDE POWER, CURRENT AND VOLTAGE INFORMATION (INSTANTANEOUS AND PEAK).
  5. SUBSTATION SHALL BE PROVIDED WITH HEATING/VENTILATION AS REQUIRED (AMBIENT TEMPERATURE AND HUMIDITY). 25mm WALL THERMAL INSULATION SHALL BE INCLUDED AS REQUIRED.
  6. 30KVA TRANSFORMER SHALL INCLUDE OIL CONTAMINANT TRAY.

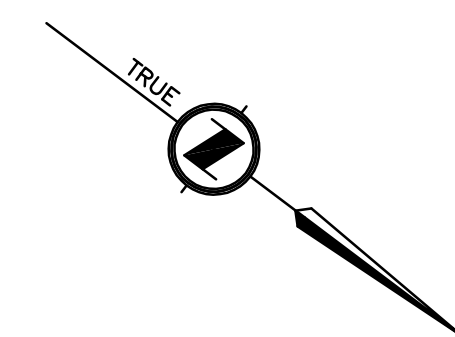
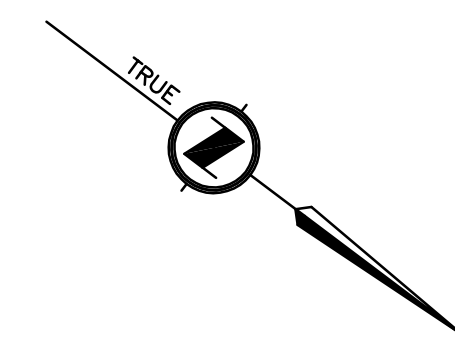
 WORK INCLUDED AS  
PART OF THIS CONTRACT

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Client/client				
<div> Parks Canada Agence Western and Northern Region</div> <div>L'Agence Parcs Canada Ouest et Nord Région</div>				
Consultant's Name Nom de l'expert-conseil				
<div><div>PBX ENGINEERING Ltd. Suite 200 - 2612 Bridge St. Victoria BC, V8T 4S9 Tel 250.388.7222  Suite 300 - 131 Water St. Vancouver BC, V6B 4M3 Tel 604.408.7222 www.pbxing.com</div></div>				
Project title/Titre du projet				
ROGERS PASS SNOWSHED LIGHTING				
TRANS CANADA HIGHWAY THROUGH ROGERS PASS				
GLACIER NATIONAL PARK				
Drawing title/Titre du dessin				
HIGH AND LOW VOLTAGE DISTRIBUTION SYSTEMS				
SINGLE LINE DIAGRAM PROPOSED SYSTEM HIGH VOLTAGE				
Surveyed by/arpenté par	Drawn by/Dessiné par		Date	
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G2002R1				

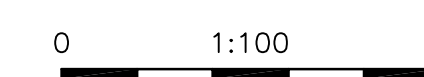


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$$\frac{2}{10}$$

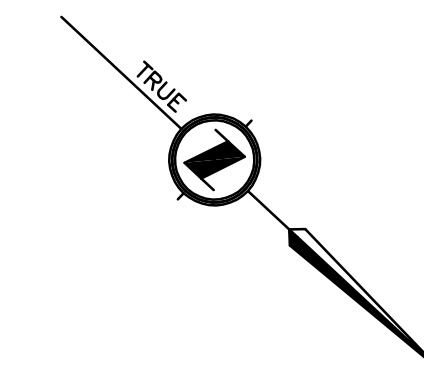
1. COORDINATE THE REMOVAL OF THE REDUNDANT TELUS CABLE WITH TELUS.

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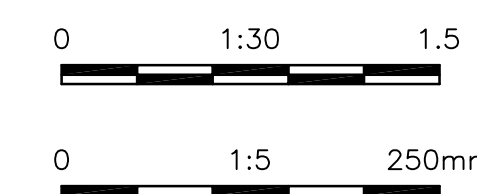
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BC  
OneCall  
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TRANS CANADA HIGHWAY THROUGH ROGERS PASS					
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Drawing title/Titre du dessin					
HIGH AND LOW VOLTAGE DISTRIBUTION SYSTEMS					
SWITCHGEAR LAYOUT MAINTENANCE YARD					
Surveyed by/Arpenté par		Drawn by/Dessiné par		Date	
		PBX		2014-01-17	
Designed by/Concept par		Reviewed by/Revisé par		Scale/Echelle	
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201422				20	
Drawing Reference No./No de référence du dessin					
G2002R1					





SPLIT-BOLT (TYP.)

3/8 COPPER

TO STATION GROUND ELECTRODE

DETAIL 5 FENCE GROUNDING  
N.T.S. -



150mm LAYER OF 21mm  
CRUSHED ROCK (TYP.)

MAINTENANCE YARD SWITCHGEAR GROUNDING  
1:25

1. GROUND GRID CONDUCTORS SHALL BE BURIED 500mm BELOW ROUGH GRADE, OR BELOW THE CONCRETE PAD.
2. GROUNDING SYSTEM TO BE INSTALLED PER THE CANADIAN ELECTRICAL CODE.
3. ALL MATERIALS TO BE SUPPLIED AND INSTALLED BY CONTRACTOR.
4. GROUND THE SUBSTATION IN AT LEAST 10 LOCATIONS AS SHOWN.
5. GROUNDING GRID RESISTANCE SHALL BE MAXIMUM 0.50 (OHM).
6. ALL THE GROUNDING GRID/LOOP/ROD CONNECTIONS SHALL BE COMPRESSION TYPE.
7. PAINT ALL THE VISIBLE BARE GROUND CABLES AND THE FENCE CONNECTION POINTS WITH GALVACON.

REFER TO STRUCTURAL AND CIVIL DRAWINGS  
AND SPECIFICATIONS FOR CONCRETE PAD,  
DIMENSIONS AND DETAILS.

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0 1:25