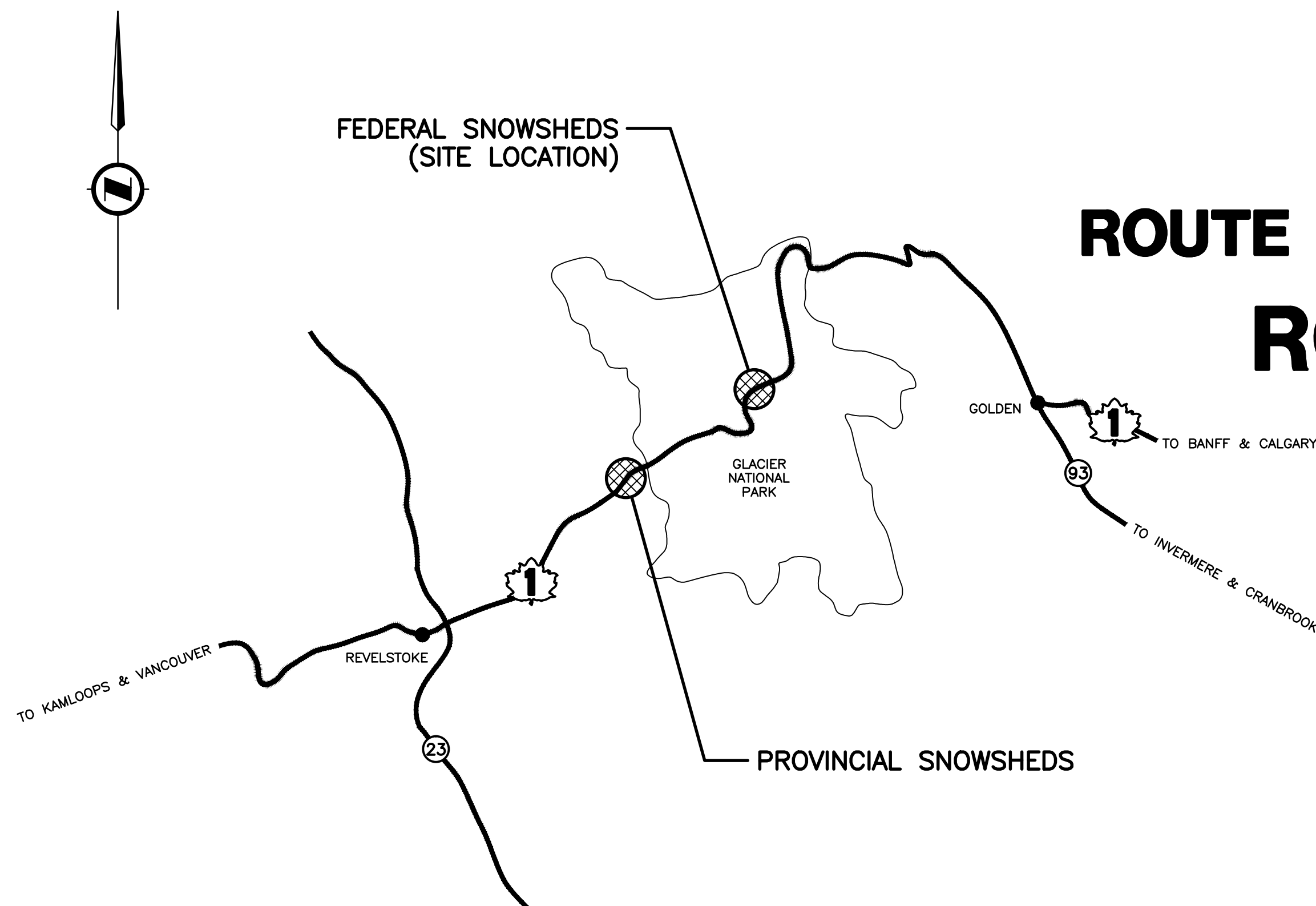


PARKS CANADA
GLACIER NATIONAL PARK

ROUTE 1 (TRANS-CANADA HIGHWAY) THROUGH ROGERS PASS
ROGERS PASS SNOWSHED LIGHTING

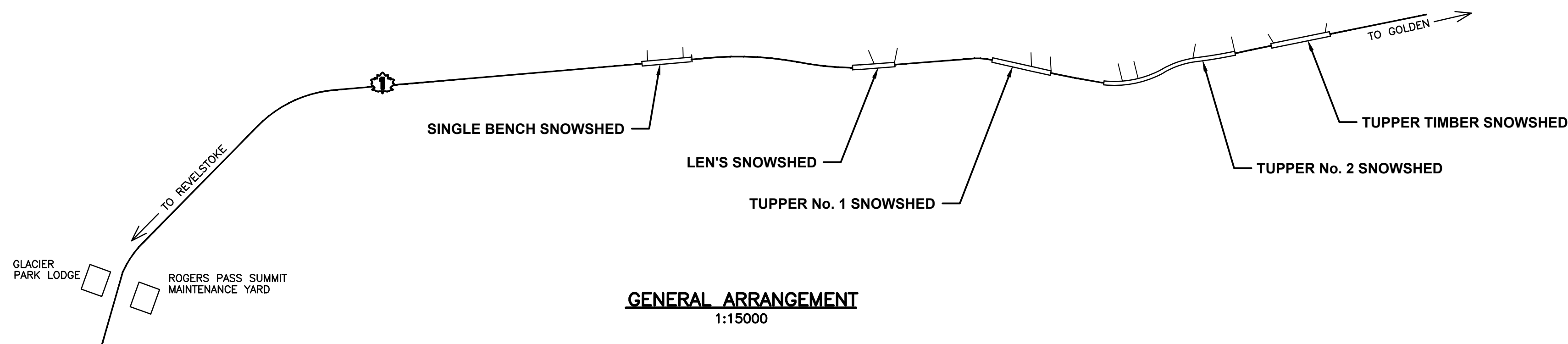
TUPPER TIMBER SNOWSHED LIGHTING

PROJECT 201525

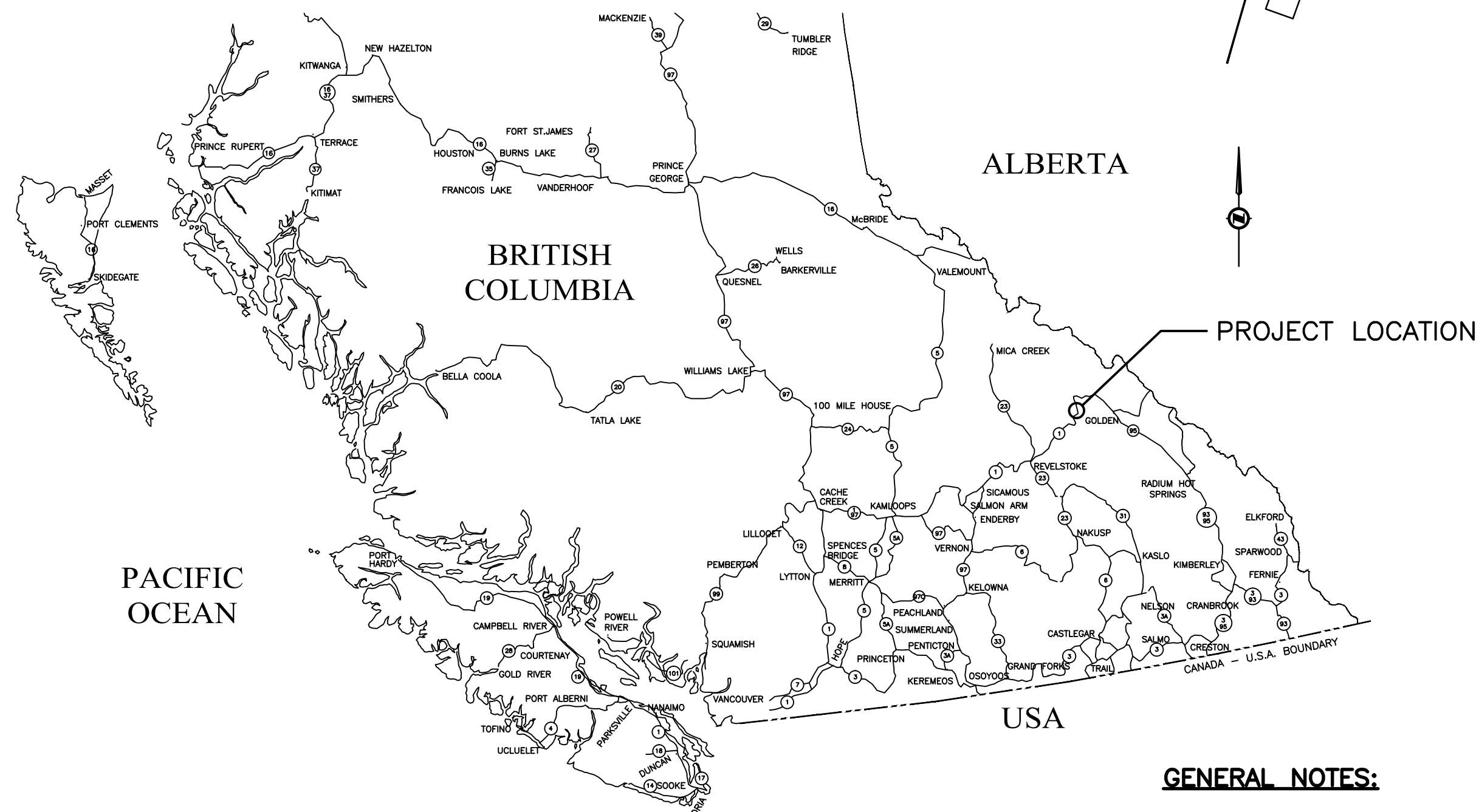


AREA PLAN
N.T.S.

REFER TO HIGH AND LOW VOLTAGE POWER
DISTRIBUTION SYSTEMS DRAWINGS FOR
ALL FIVE SNOW SHEDS



GENERAL ARRANGEMENT
1:15000



PROJECT LOCATION
N.T.S.

LINE TYPE LEGEND	
LINE	DESCRIPTION
— — — — —	120V CONDUIT / CABLE
— · — · —	COMMUNICATIONS CONDUIT / CABLE
— · — — —	600V CONDUIT / CABLE
— · — — —	TECK / CABLE

GENERAL NOTES:

- ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE ELECTRICAL SPECIFICATIONS.
- ELECTRICAL WORK SHALL CONFORM TO LATEST EDITION OF CANADIAN ELECTRICAL CODE AND BULLETINS PUBLISHED BY THE BC SAFETY AUTHORITY.
- WORK SHALL CONFORM TO ALL APPLICABLE REGULATIONS OF THE WORKERS' COMPENSATION BOARD (WCB).
- THE CONTRACTOR SHALL SUPPLY ALL MATERIALS, EQUIPMENT AND LABOUR TO COMPLETE THE WORKS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR TRAFFIC CONTROL FOR ALL WORK INCLUDED IN THIS CONTRACT. ALL TRAFFIC CONTROL SHALL BE IN ACCORDANCE WITH THE CURRENT BC MINISTRY OF TRANSPORTATION AND INFRASTRUCTURE TRAFFIC CONTROL MANUAL FOR WORK ON ROADWAYS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL FEES FOR PERMITS AND INSPECTIONS, AS REQUIRED BY THE BC SAFETY AUTHORITY.
- ALL COMMON CIRCUIT WIRING SHALL BE TAGGED AND TY-RAPPED AS DETAILED IN THE MMOD, SECTION 16550, SUBSECTION 3.13 AND THESE DRAWINGS.
- ALL CONDUCTORS SHALL BE RW90 STRANDED COPPER, UNLESS NOTED OTHERWISE.
- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
- ALL CONCRETE BASES AND JUNCTION BOX SYMBOLS ARE NOT TO SCALE.
- CONTRACTOR SHALL CONFIRM NEW SERVICE LOCATIONS WITH BC HYDRO. CONTACT TYLER KELLY. TEL. 250-832-1235.

- THE CONTRACTOR SHALL OBTAIN PERMISSION FROM THE PARKS CANADA REPRESENTATIVE PRIOR TO TURNING OFF OR REMOVING ANY EXISTING ELECTRICAL EQUIPMENT.
- PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL PROVIDE THE ENGINEER WITH AN ITEMIZED SPREADSHEET OF ALL ITEMS TO BE REMOVED AND RETURNED TO THE PUBLIC WORKS YARD. THE CONTRACTOR SHALL NOT PROCEED WITH THE EQUIPMENT REMOVALS UNTIL CONFIRMED BY A PARKS CANADA REPRESENTATIVE.
- THE CONTRACTOR SHALL ENSURE THERE IS NO INTERRUPTION OF EXISTING NIGHT TIME LIGHTING DURING CONSTRUCTION, UNLESS APPROVED BY THE ENGINEER.
- ENSURE CLEARANCES FROM OVERHEAD UTILITY LINES MEET UTILITY AND WORKSAFE BC REGULATIONS PRIOR TO CONCRETE BASE INSTALLATION. CONTACT PBX ENGINEERING IN THE EVENT OF CONFLICT.
- ALL EXISTING WIRING, CONDUIT AND BASES TO BE REMOVED SHALL BE DISPOSED OFF SITE BY THE CONTRACTOR.
- CONTRACTOR SHALL CONTACT Schröder CANADA DIRECTLY FOR TUNNEL LUMINAIRE PROCUREMENT. CONTACT FRANCIS ST-LAURENT TEL: 514-337-6440 OR CELL: 604-282-7420.
- CONTRACTOR SHALL CONTACT NYX HEMERA DIRECTLY FOR TUNNEL LIGHTING CONTROL SYSTEM PROCUREMENT. CONTACT PIERRE LONGTIN TEL: 418-977-7788 EXT. 101.

LEGEND:

- BC MINISTRY OF TRANSPORTATION 11.0m DAVIT STREETLIGHT POLE, 133W LED 120V LUMINAIRE (PART No. LRL NXT-60M-700MA-120V TYPE 2ES)
C/W FRANGIBLE BASE
- EXISTING BC MINISTRY OF TRANSPORTATION 11.0m DAVIT STREETLIGHT POLE C/W FRANGIBLE BASE
- BC MINISTRY OF TRANSPORTATION 11.0m DAVIT STREETLIGHT POLE C/W FRANGIBLE BASE
- BC MINISTRY OF TRANSPORTATION TYPE 10 JUNCTION BOX
- BC MINISTRY OF TRANSPORTATION ISLAND FLASHER
- MoTI CONCRETE JUNCTION BOX (REFER TO MoTI DRAWINGS SP635-1.3.1&2)

ISSUED FOR TENDER
NOT FOR CONSTRUCTION

No.	Date	Description	Drawn by Dessiné par	Approved Approuvé
—	Sep. 15 2015	ISSUED FOR TENDER	PBX	PB

Revision / Revision	
A	Detail number Sheet number
B	A Numéro de détail B Numéro de la feuille
Linear dimensions in millimetres	
Dimensions linéaires en millimètres	
Consultant's Stamp Sceau de l'expert-conseil	Eng. Stamp Sceau de l'ingénieur

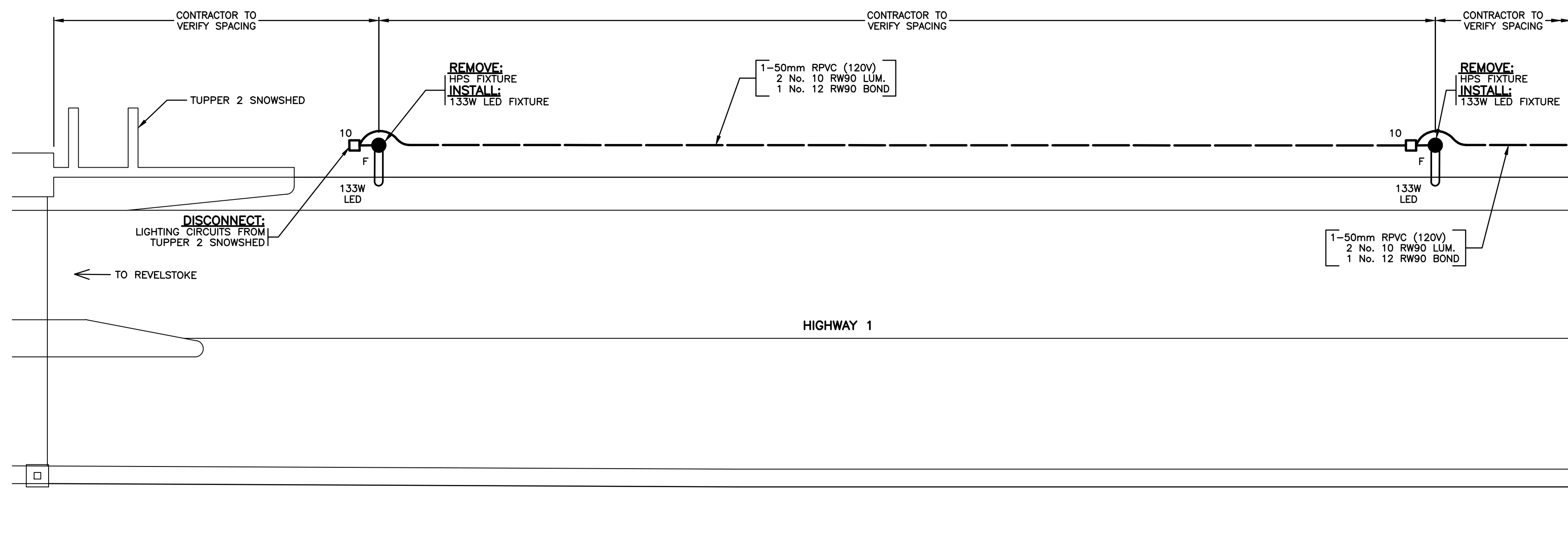
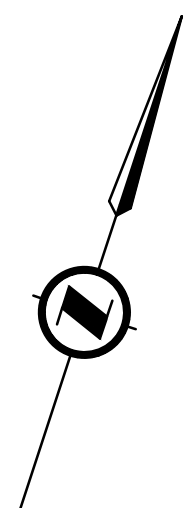
Client/client	Parks Canada Agency Western and Northern Region	L'Agence Parcs Canada Ouest et Nord Région
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Consultant's Name Nom de l'expert-conseil	PBX ENGINEERING Ltd. Suite 200 - 2612 Bridge St. Victoria BC, V8T 4S9 Tel 250.388.7222 www.pbxing.com
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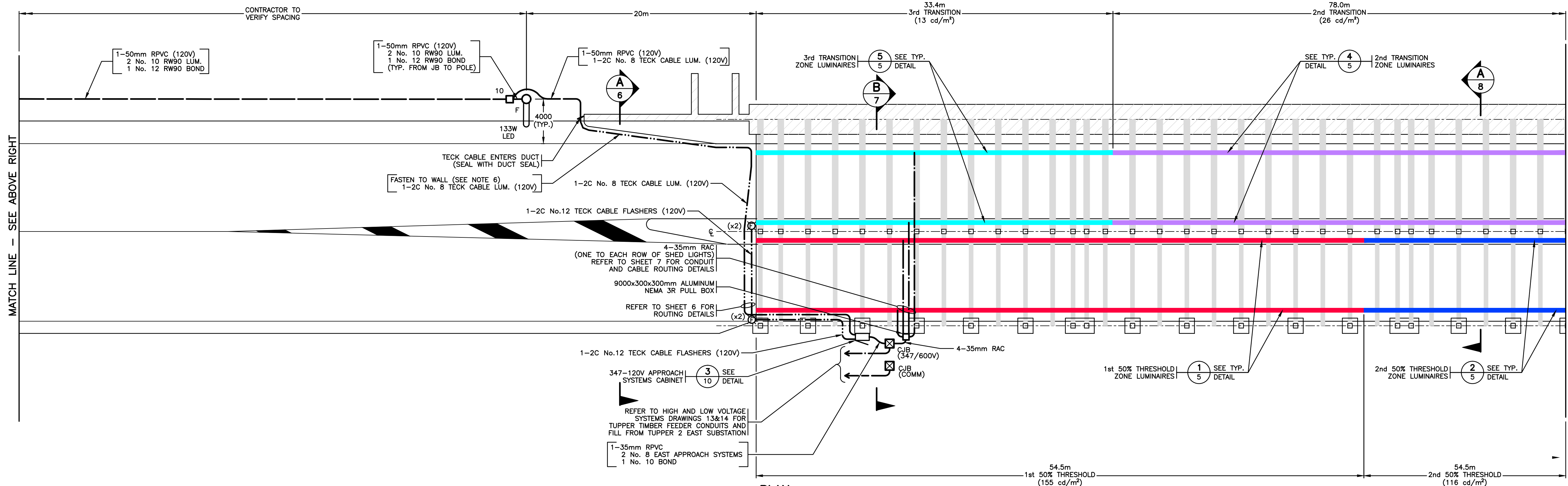
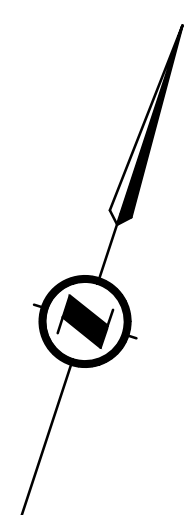
Project title/Titre du projet	ROGERS PASS SNOWSHED LIGHTING TRANS CANADA HIGHWAY THROUGH ROGERS PASS GLACIER NATIONAL PARK
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Drawing title/Titre du dessin	TUPPER TIMBER SNOWSHED LIGHTING COVER SHEET, INDEX & GENERAL ARRANGEMENT
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Surveyed by/Arpenté par	Drawn by/Dessiné par	Date
	PBX	2015-08-31
Designed by/Concept par	Reviewed by/Revisé par	Scale/Echelle
MM	AB	AS NOTED
Client Acceptance/Acceptation du client	Approved by/Approuvé par	
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
201525		1
Drawing Reference No./No de référence du dessin	G2004R1	



PLAN
1:200



PLAN
1:200

CONDUCTOR COLOUR CODE	
ITEM	CONDUCTOR COLOUR
LUMINAIRE CCT. A	RED
LUMINAIRE CCT. B	BLACK
LUMINAIRE CCT. C	BLUE
NEUTRAL	WHITE
GROUND/BOND	GREEN

TUNNEL LENGTH
257.5m

LINETYPE	QUANTITY	LABEL	LUM. SPACING*	DESCRIPTION OF OPERATION		DESCRIPTION	FIXTURE LUMENS	FIXTURE WATTS	LLF	TOTAL WATTS	PHOTOMETRIC FILE NAME
				DAY	NIGHT*						
(RED)	118		1.5m (WB) 1.9m (EB)	ON 100%	SELECT LUMINAIRES ON 10%	FV32-240-XP-G2(R4)S102(ASYM)2X150W-500mA-277 C/W INTEGRAL NYX H DIMMING MODULE	37995	382	0.65	45076	240 LED IES - T31573 - FV32-240-XP-G2(R4)S102(ASYM)2X150W-500mA-277.ies
(BLUE)	80		2.25m (WB) 2.5m (EB)	ON 100%	SELECT LUMINAIRES ON 10%	FV32-240-XP-G2(R4)S102(ASYM)2X150W-500mA-277 C/W INTEGRAL NYX H DIMMING MODULE	37995	382	0.65	30560	240 LED IES - T31573 - FV32-240-XP-G2(R4)S102(ASYM)2X150W-500mA-277.ies
(ORANGE)	56		4.25m (WB) 4.5m (EB)	ON 100%	SELECT LUMINAIRES ON 10%	FV32-240-XP-G2(R4)S102(ASYM)2X150W-500mA-277 C/W INTEGRAL NYX H DIMMING MODULE	37995	382	0.65	21392	240 LED IES - T31573 - FV32-240-XP-G2(R4)S102(ASYM)2X150W-500mA-277.ies
(PURPLE)	56		5.5m (WB) 5.5m (EB)	ON 100%	SELECT LUMINAIRES ON 20%	FV32-120-XP-G2(R4)S096(ASYM)1X150W-500mA-277 C/W INTEGRAL NYX H DIMMING MODULE	17663	181	0.65	10136	120 LED IES - T31715A - FV32-120LED-5102(ASYM)1X150W-500mA-277.ies
(CYAN)	8		12.0m (WB) 11.0m (EB)	ON 100%	SELECT LUMINAIRES ON 20%	FV32-120-XP-G2(R4)S096(ASYM)1X150W-500mA-277 C/W INTEGRAL NYX H DIMMING MODULE	17663	181	0.65	1448	120 LED IES - T31715A - FV32-120LED-5102(ASYM)1X150W-500mA-277.ies
TOTAL	318									108612	

* APPROXIMATE - SEE RISER DIAGRAM ON SHEET 4

NOTES:

- REFER TO TYPICAL LUMINAIRE MOUNTING DETAILS ON SHEET 5 FOR LUMINAIRE SPACING IN EACH ZONE.
- REFER TO RISER DIAGRAM ON SHEET 4 FOR OVERALL LUMINAIRE LAYOUT AND WIRING.
- REFER TO LUMINAIRE TABLE (CURRENT SHEET) FOR DAYTIME AND NIGHTTIME OPERATION.
- REFER TO SITE PLAN ON THIS SHEET AND TABLE ON SHEET 5 FOR DAYTIME AND NIGHTTIME TUNNEL LIGHTING CRITERIA.
- STANDARD OF ACCEPTANCE FOR THE LIGHTING CONTROL CABINET AND RELATED SYSTEM: NYX HEMERA TECHNOLOGIES TUNNEL LIGHTING CONTROL SYSTEM - ENERGY MANAGEMENT. LIGHTING CONTROL SYSTEM SHALL BE SUPPLIED WITH INLINE UPS BACKUP POWER.
- TECK CABLE ON WALL SHALL BE INSTALLED A MINIMUM OF 2.5m ABOVE GRADE.

**ISSUED FOR TENDER
NOT FOR CONSTRUCTION**

**ALL EQUIPMENT IS PROPOSED
UNLESS NOTED OTHERWISE**

0 1:200 10

No.	Date	Description	Drawn by Dessiné par	Approved Approuvé
-	Sep. 15 2015	ISSUED FOR TENDER	PBX	PB

Revision / Revision	
A	B
Detail number Sheet number	A Numéro de détail B Numéro de la feuille
Linear dimensions in millimetres	Dimensions linéaires en millimètres
Consultant's Stamp Sceau de l'expert-conseil	Eng. Stamp Sceau de l'ingénieur

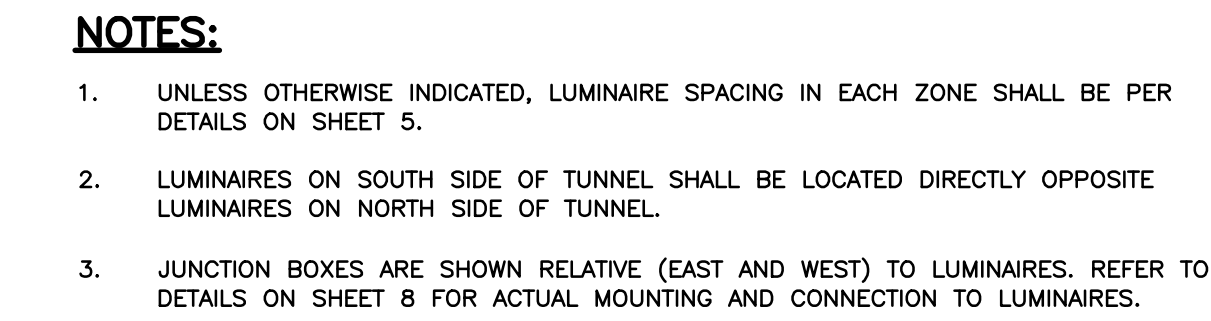
Client/client	Parks Canada Agence Western and Northern Region	L'Agence Parcs Canada Ouest et Nord Région
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Consultant's Name Nom de l'expert-conseil	PBX ENGINEERING Ltd. Suite 200 - 2612 Bridge St. Victoria BC, V8T 4S9 Tel 250.388.7222 www.pbxieng.com
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Project title/Titre du projet	ROGERS PASS SNOWSHED LIGHTING TRANS CANADA HIGHWAY THROUGH ROGERS PASS GLACIER NATIONAL PARK
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Drawing title/Titre du dessin	TUPPER TIMBER SNOWSHED LIGHTING PLAN LUMINAIRE LAYOUT (SHEET 1 OF 2)
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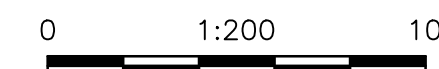
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	PBX	2015-08-31
Designed by/Concept par	Reviewed by/Revisé par	Scale/Echelle
MM	AB	AS NOTED
Client Acceptance/Acceptation du client	Approved by/Approuvé par	
PARK RESPONSIBLE OFFICER/AGENT RESPONSABLE	Date	A & E SERVICES/GÉNIE ET ARCHITECTURE
Project No./No du projet	Asset No./N° du bien	Sheet No./N° de la feuille
201525		2
Drawing Reference No./No de référence du dessin	G2004R1	



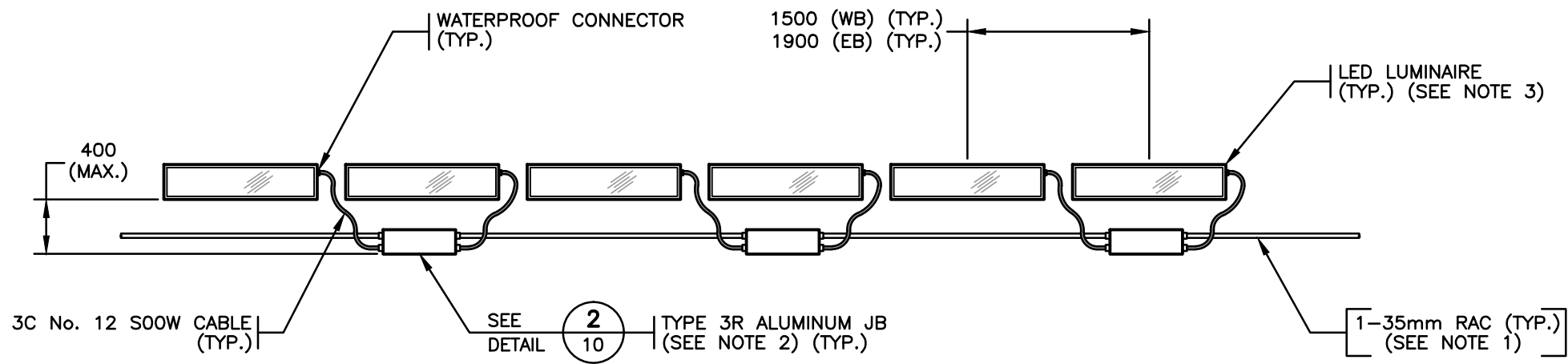
DETAIL 2 TUNNEL LUMINAIRES
1:200 - (EASTBOUND)

LEGEND	
	PHASE A – 382W LUMINAIRE
	PHASE A – 181W LUMINAIRE
	PHASE B – 382W LUMINAIRE
	PHASE B – 181W LUMINAIRE
	PHASE C – 382W LUMINAIRE
	PHASE C – 181W LUMINAIRE
	LUMINAIRE ON AT NIGHT
	JUNCTION BOX (SEE DETAIL 2, SHEET 10)
	1st 50% THRESHOLD (RED)
	2nd 50% THRESHOLD (BLUE)
	1st TRANSITION (ORANGE)
	2nd TRANSITION (PURPLE)
	3rd TRANSITION (CYAN)

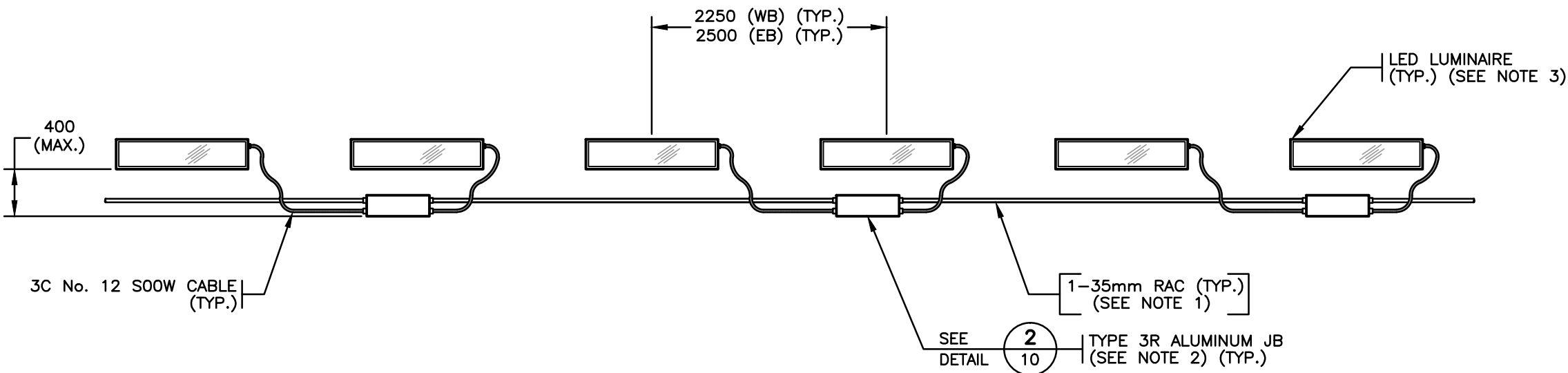
ALL EQUIPMENT IS PROPOSED
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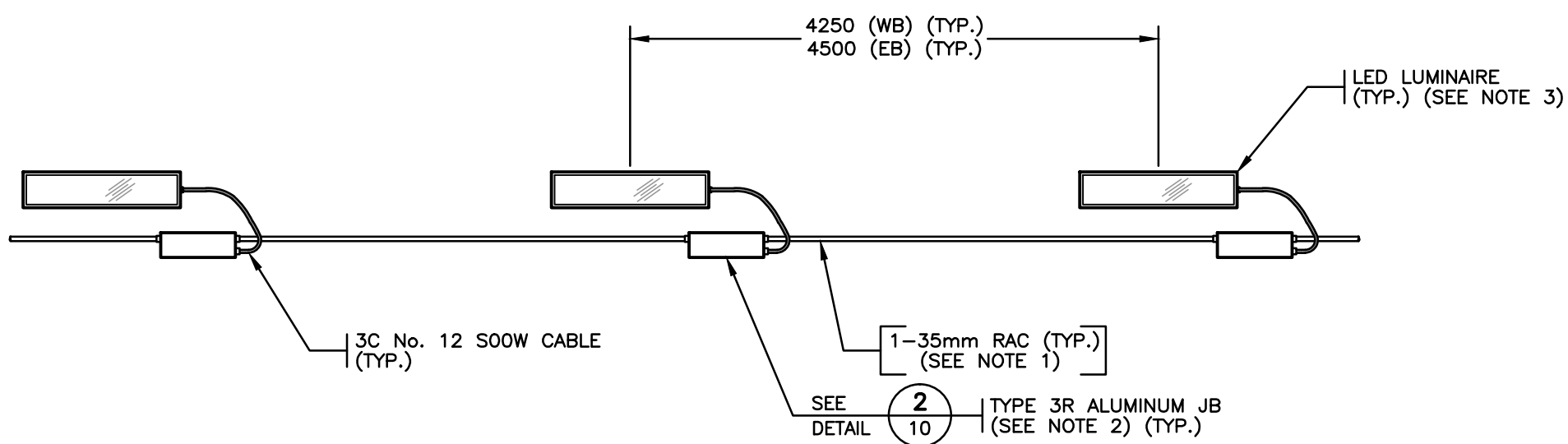
-	Sep. 15 2015	ISSUED FOR TENDER				PBX	PB		
No.	Date	Description				Drawn by Dessiné par	Approved Approuvé		
Revision / Revision									
		Detail number Sheet number		A Numéro de détail B Numéro de la feuille					
Linear dimensions in millimètres				Dimensions linéaires en millimètres					
Consultant's 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 250.386.7222 www.pbxing.com					
Project title/Titre du projet									
ROGERS PASS SNOWSHED LIGHTING									
TRANS CANADA HIGHWAY THROUGH ROGERS PASS									
GLACIER NATIONAL PARK									
Drawing title/Titre du dessin									
TUPPER TIMBER SNOWSHED LIGHTING									
DETAILS TUNNEL LUMINAIRE RISER DIAGRAM									
Surveyed by/Arpenté par		Drawn by/Dessiné par		Date					
		PBX		2015-08-31					
Designed by/Concept par		Reviewed by/Revisé par		Scale/Echelle					
MM		AB		AS NOTED					
Client Acceptance/Acceptation du client				Approved by/Approuvé par					
PART 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			
201525									
Drawing Reference No./N°de référence du dessin									
G2004R1						4			



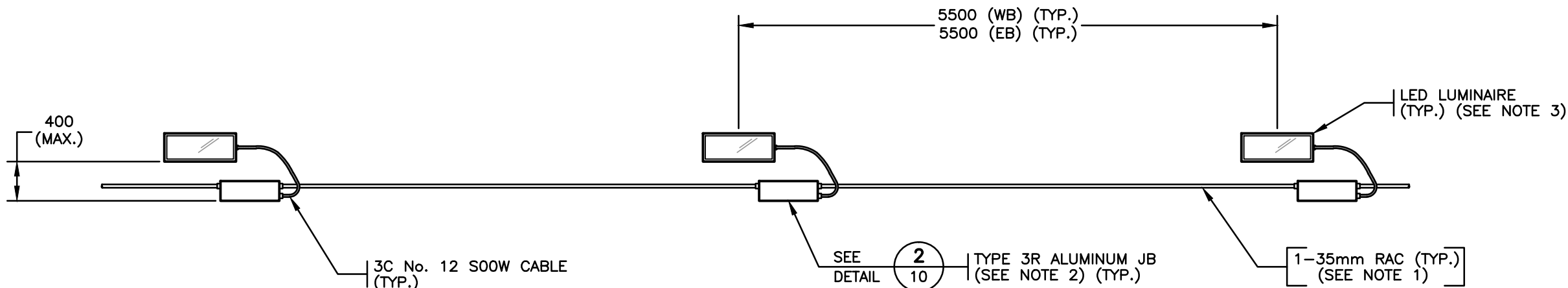
TYP. DETAIL 1:50 1st 50% THRESHOLD ZONE LUMINAIRES (RED) (*SEE NOTE 4)



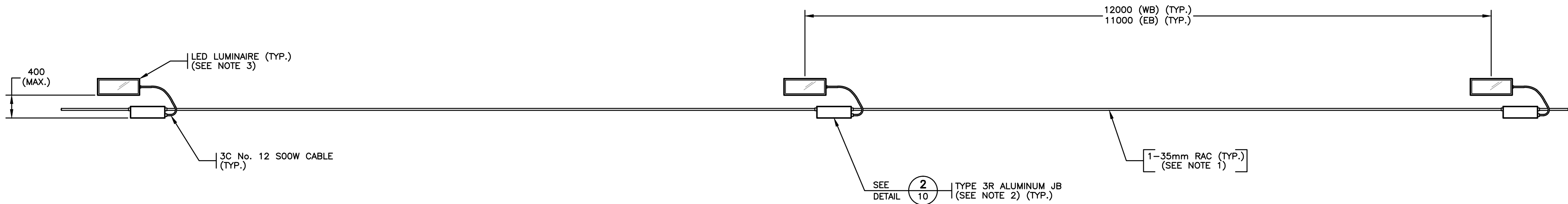
TYP. DETAIL 1:50 2nd 50% THRESHOLD ZONE LUMINAIRES (BLUE) (*SEE NOTE 4)



TYP. DETAIL 1:50 1st TRANSITION ZONE LUMINAIRES (ORANGE) (*SEE NOTE 4)



TYP. DETAIL 1:50 2nd TRANSITION ZONE LUMINAIRES (PURPLE) (*SEE NOTE 4)



TYP. DETAIL 1:50 3rd TRANSITION ZONE LUMINAIRES (CYAN) (*SEE NOTE 4)

ZONE / TOD	THRESHOLD (DAY)		TRANSITION (DAY)			NIGHT
	1ST 50% THRESHOLD	2ND 50% THRESHOLD	1ST TRANSITION	2ND TRANSITION	3RD TRANSITION	
ROADWAY LUMINANCE Lavg, cd/m2	155	116	64	26	13	1.2
WALL LUMINANCE Lw, cd/m2	30		30 down to 2			0.4
UNIFORMITY Lavg : Lmin	2.0 : 1		2.0 : 1			2.01
UNIFORMITY Lmax : Lmin	3.5 : 1		3.5 : 1			3.5 : 1
FLICKER cycles/sec	<5 or >10		<5 or >10			<5 or >10
GLARE L'vmax : Lavg	0.6 : 1		0.6 : 1			0.3 : 1

NOTES:

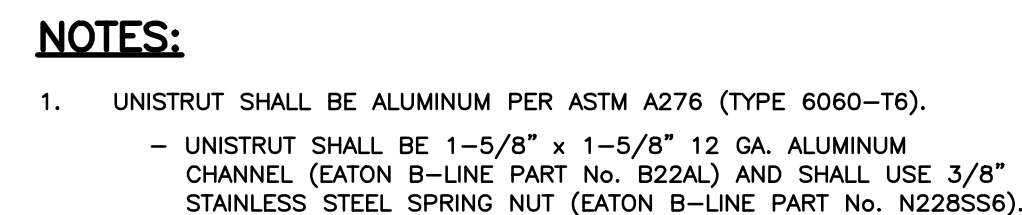
- REFER TO LUMINAIRE RISER DIAGRAM ON DWG. 4 FOR CONDUIT FILL.
- REFER TO LUMINAIRE RISER DIAGRAM ON DWG. 4 FOR JUNCTION BOX LOCATIONS.
- REFER TO LUMINAIRE RISER DIAGRAM ON DWG. 4 FOR LUMINAIRE TYPES AND LOCATIONS.
- JUNCTION BOX PLACEMENT AND S00W CABLE ROUTING IS REPRESENTATIONAL ONLY. REFER TO SECTIONS B, C & D ON DWG. 8 FOR INSTALLATION DETAILS.

0 1:50 2.5

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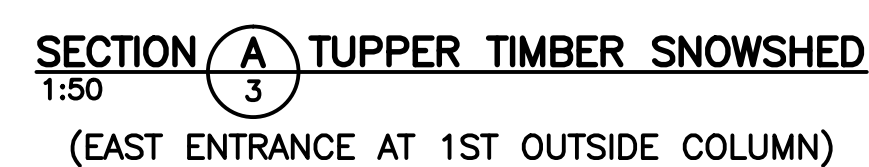
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No.	Date	Description	Drawn by Dessiné par	Approved Approuvé					
—	Sep. 15 2015	ISSUED FOR TENDER	PBX	PB					
Revision / Revision									
A B	Detail number Sheet number	A Numéro de détail B Numéro de la feuille							
Linear dimensions in millimetres		Dimensions linéaires en millimètres							
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									
PBX ENGINEERING Ltd. Suite 200 - 2612 Bridge St. Victoria BC, V8T 4S9 Tel 250.388.7222 www.pbxieng.com									
Project title/Titre du projet									
ROGERS PASS SNOWSHED LIGHTING									
TRANS CANADA HIGHWAY THROUGH ROGERS PASS									
GLACIER NATIONAL PARK									
Drawing title/Titre du dessin									
TUPPER TIMBER SNOWSHED LIGHTING									
DETAILS LUMINAIRE MOUNTING									
Surveyed by/Arpenté par	Drawn by/Dessiné par	Date							
	PBX	2015-08-31							
Designed by/Concept par	Reviewed by/Revisé par	Scale/Echelle							
MM	AB	AS NOTED							
Client Acceptance/Acceptation du client		Approved by/Approuvé par							
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							
201525		5							
Drawing Reference No./No de référence du dessin									
G2004R1									



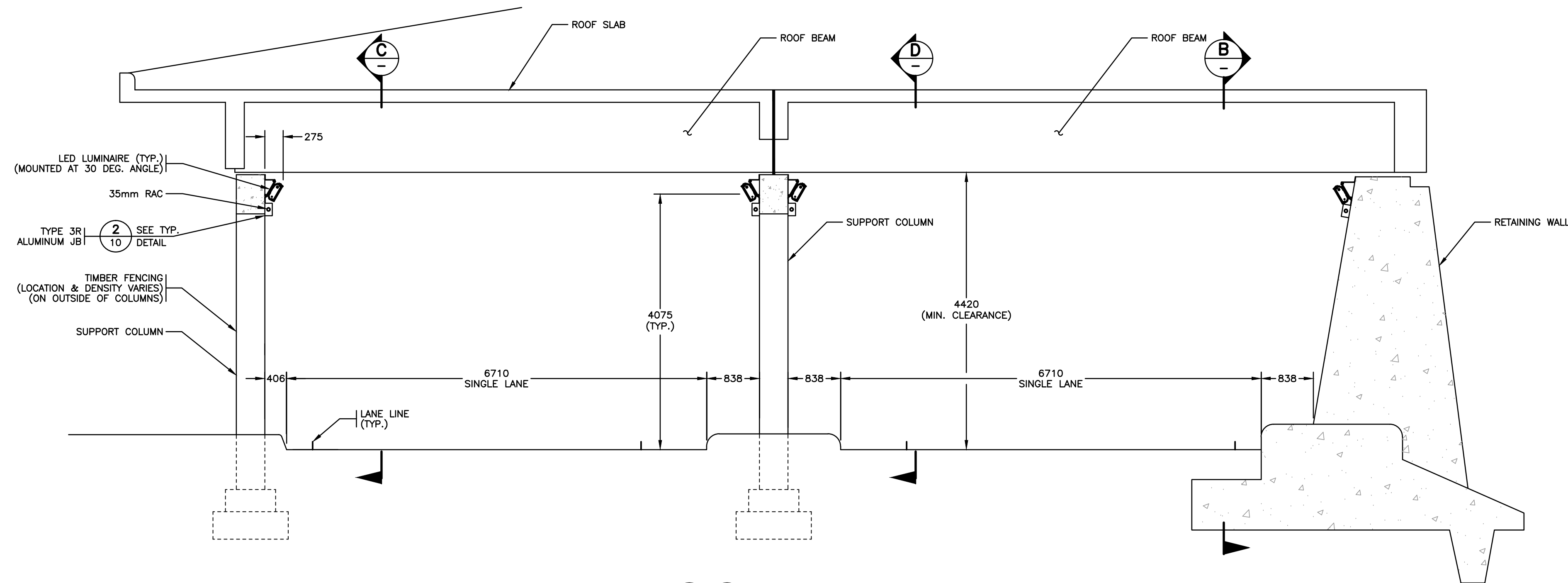
ALL EQUIPMENT IS PROPOSED
UNLESS NOTED OTHERWISE

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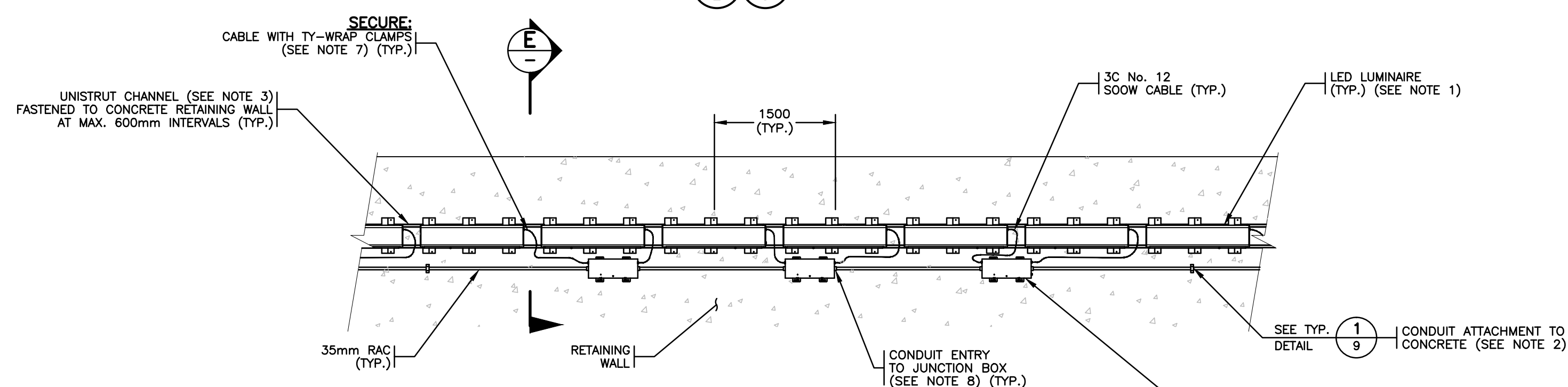


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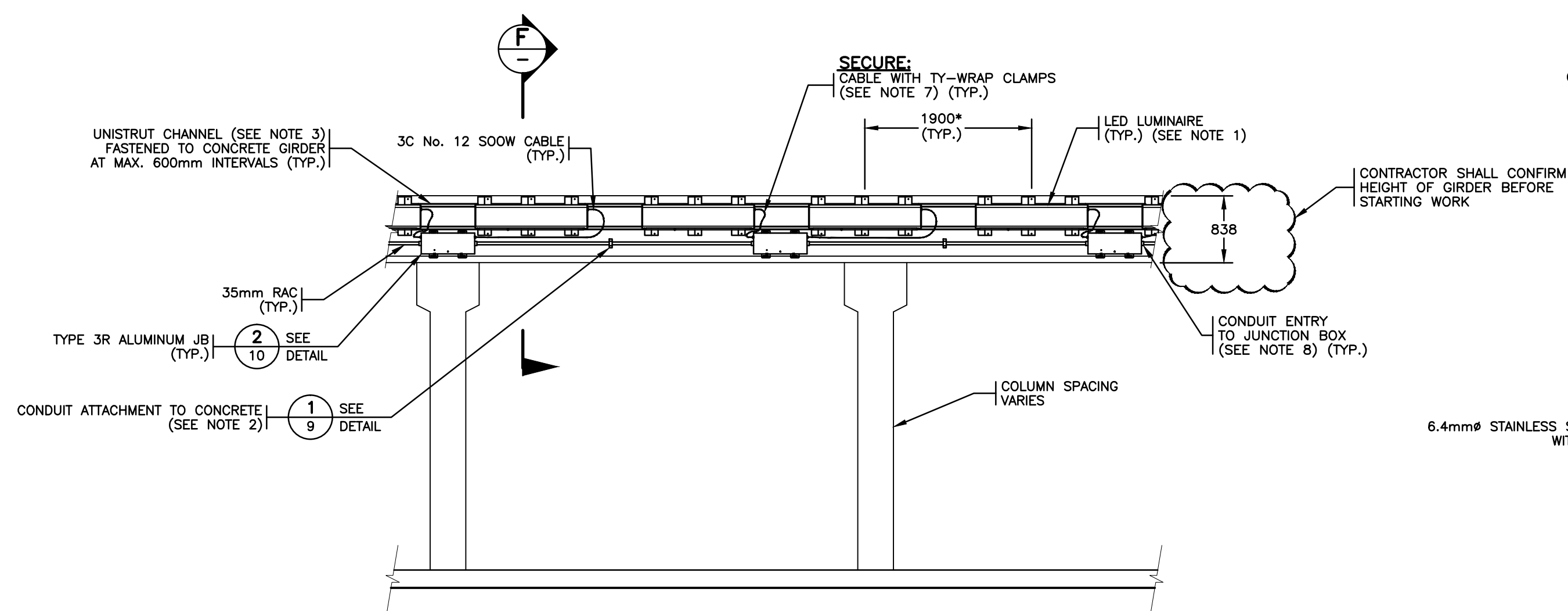
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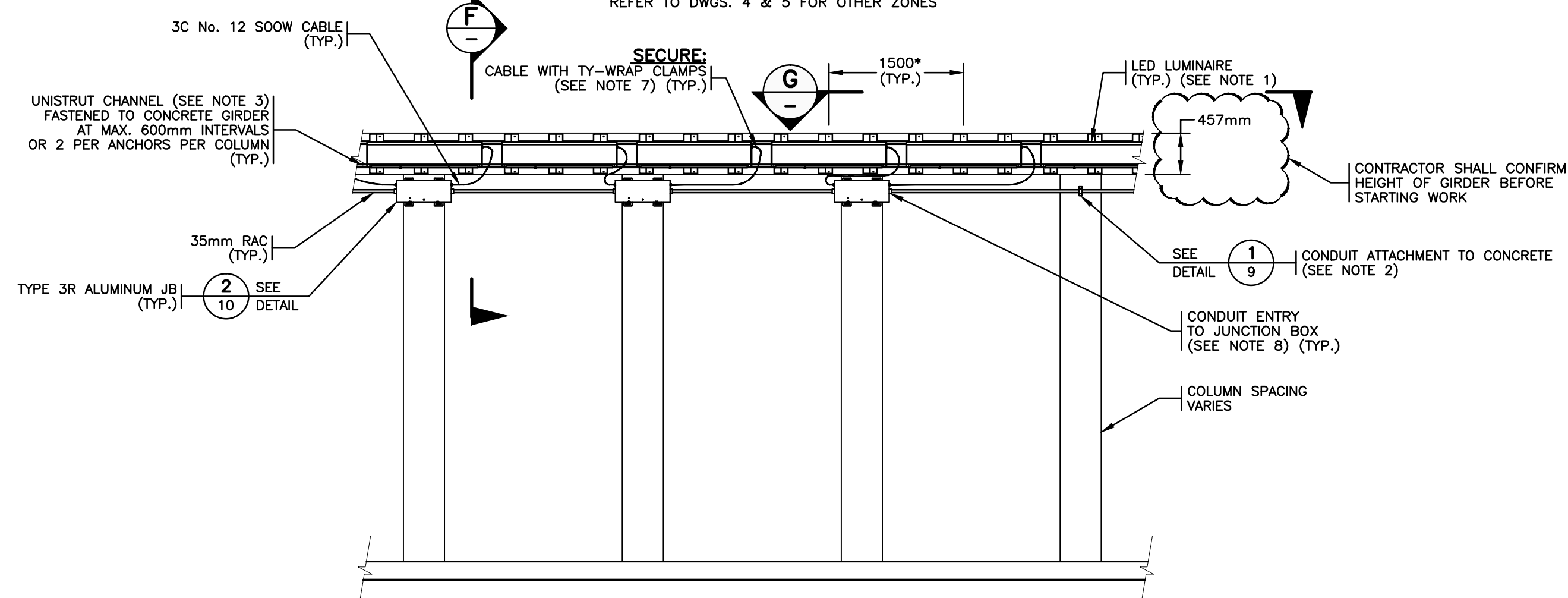
TYPICAL SECTION A-A TUPPER TIMBER SNOWSHED
1:50



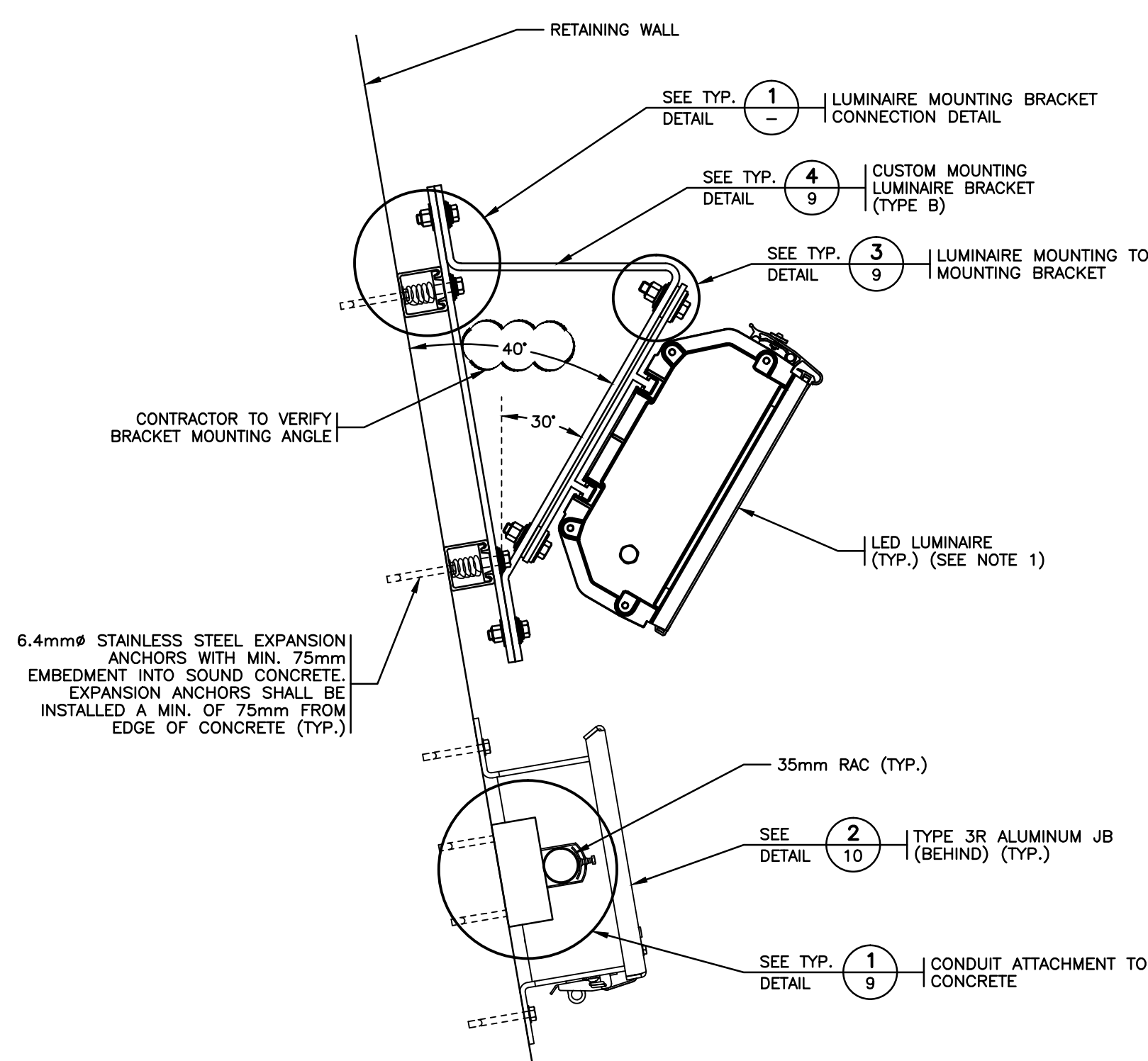
SECTION B-B LUMINAIRE MOUNTING ON RETAINING WALL
1:50



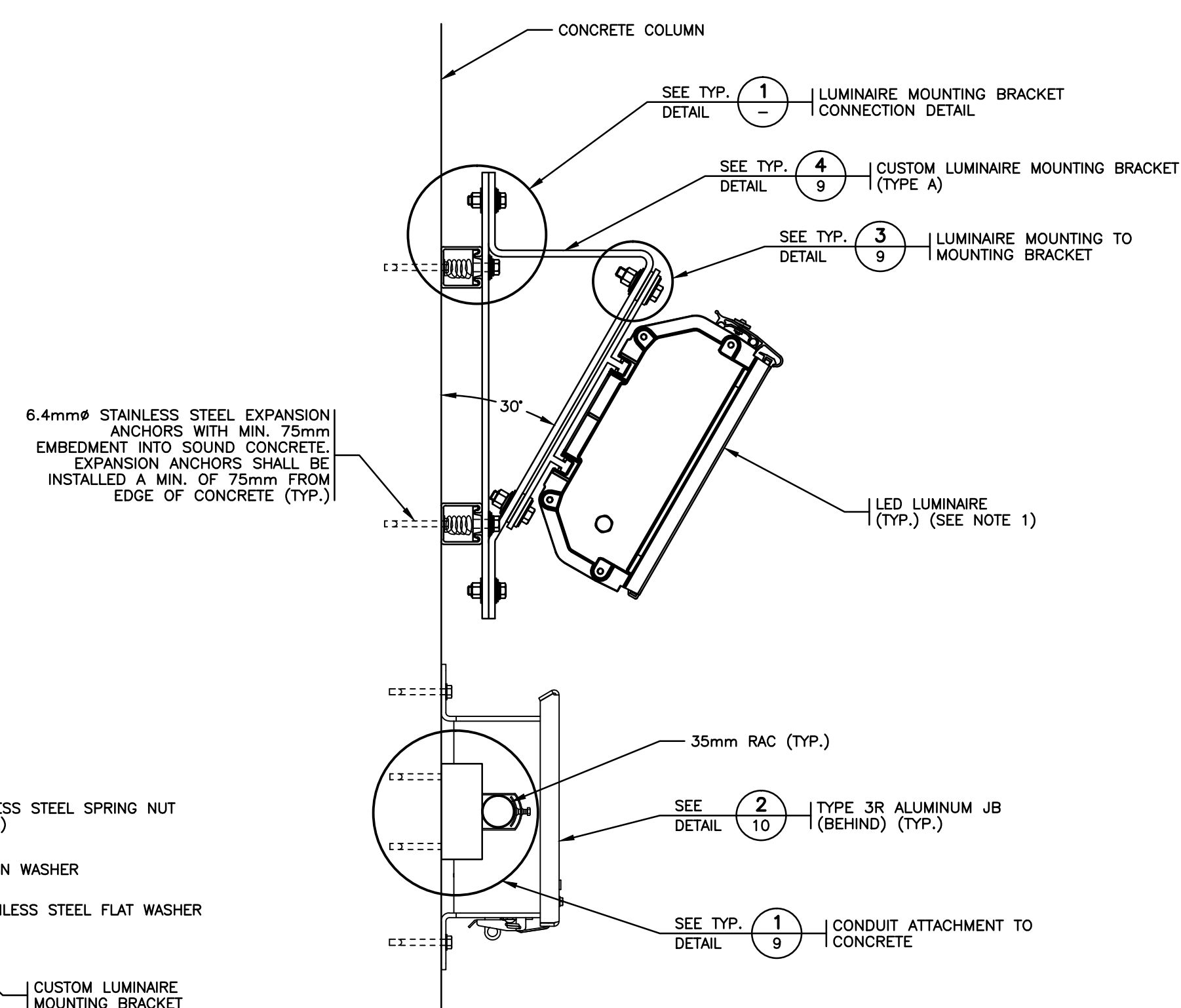
SECTION C-C LUMINAIRE MOUNTING - OUTSIDE COLUMNS
1:50



SECTION D-D LUMINAIRE MOUNTING - CENTRE COLUMNS
1:50

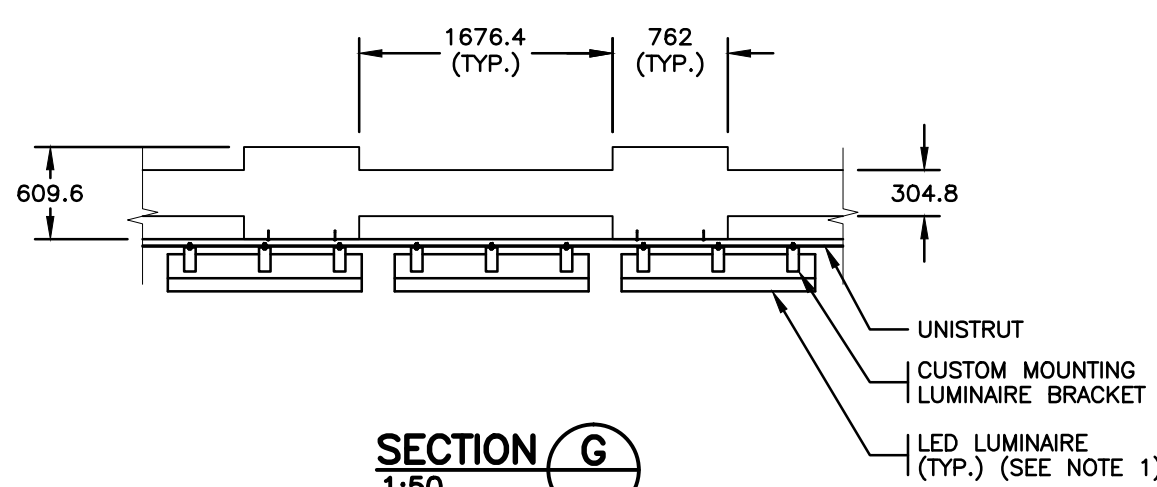


SECTION E-E TYPICAL LUMINAIRE MOUNTING ON RETAINING WALL
1:5



SECTION F-F TYPICAL LUMINAIRE MOUNTING ON EAST HALF COLUMNS
1:5

DETAIL (TYP.) 1 LUMINAIRE MOUNTING BRACKET CONNECTION DETAIL
N.T.S.



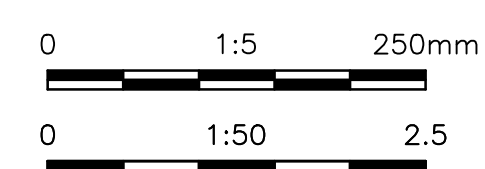
* DIMENSIONS ARE TYPICAL. CONTRACTOR SHALL CONFIRM ALL DIMENSIONS ON SITE.

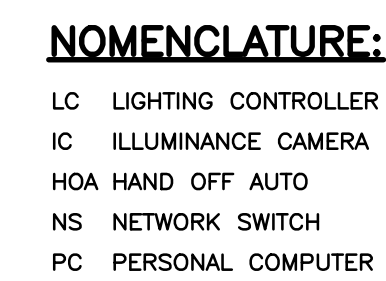
NOTES:

- REFER TO LUMINAIRE RISER DIAGRAM ON DWG. 4 FOR LUMINAIRE TYPES AND EXACT LOCATION.
- RAC CONDUIT SUPPORTS SHALL BE LOCATED NO MORE THAN 2.0m APART.
- UNISTRUT SHALL BE ALUMINUM PER ASTM A276 (TYPE 6060-T6).
- UNISTRUT SHALL BE 1-5/8" x 1-5/8" 12 GA. ALUMINUM CHANNEL (EATON B-LINE PART No. B22AL) AND SHALL USE 3/8" STAINLESS STEEL SPRING NUT (EATON B-LINE PART No. N226S56).
- ALL MOUNTING HARDWARE INCLUDING ANCHORS SHALL BE STAINLESS STEEL.
- ALL CONDUIT SHALL BE RIGID ALUMINUM 6060 ALLOY, T-1 TEMPER TO ANSI C80.5 AND CSA APPROVED.
- ATTACH ALL EQUIPMENT TO CONCRETE USING 6.4mm STAINLESS STEEL EXPANSION ANCHORS WITH MIN. 75mm EMBEDMENT INTO SOUND CONCRETE. COMPLETE WITH STAINLESS STEEL BOLTS AND WASHERS. SEAL AROUND ANCHOR WITH STRUCTURAL GRADE POLYURETHANE CAULKING.
- SOOW CABLES SHALL BE SECURED TO BOTTOM OF UNISTRUT OR CONCRETE AT INTERVALS NO GREATER THAN 300mm. CABLES SHALL BE SECURED WITH TY-WRAP AND ANCHOR BASE. ANCHOR BASE SHALL BE T&B PART No. SM7-002-9-D OR APPROVED ALTERNATE. SCREW SHALL BE SUITABLE #10 STAINLESS STEEL SELF-TAPPING MACHINE SCREW. (USE #10 SS SCREW WITH LEAD EXPANSION ANCHORS FOR CONCRETE LOCATIONS).
- CONDUIT SHALL ENTER JUNCTION BOX AT CENTRE OF JUNCTION BOX WALL THROUGH THREADED CONDUIT HUB. THREADED CONDUIT HUB SHALL BE T&B ALUMINUM CHASE THREADED CONDUIT HUB, PART No. HT4.

**ISSUED FOR TENDER
NOT FOR CONSTRUCTION**

**ALL EQUIPMENT IS PROPOSED
UNLESS NOTED OTHERWISE**





NOTES:

1. MODEM SHALL BE HUAWEI B890 4G LTE SMART HUB.

ALL EQUIPMENT IS PROPOSED
UNLESS NOTED OTHERWISE

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