

LEGEND

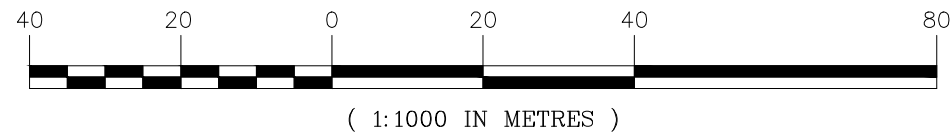
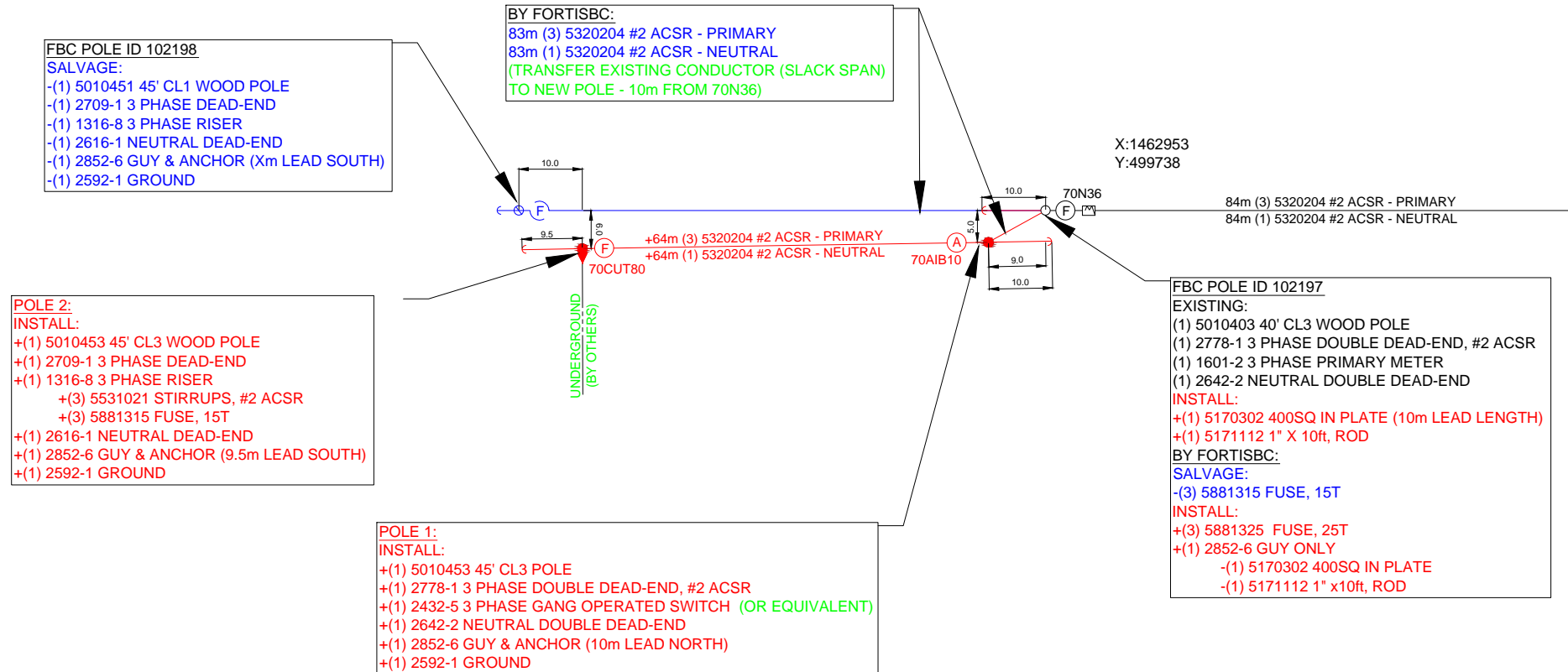
- (A) AIR BREAK
- SOLID DISCONNECT
- (F) FUSED SWITCH, OVERHEAD
- (R) RECLOSER
- (S) SECTIONALIZER
- ⊗ REGULATOR
- ⊕ BY-PASS SWITCH
- ⊖ CAPACITOR
- POLE
- ANCHOR GUY
- ⊥ PUSHBRACE
- ▷ RISER
- ELECTRIC STATION
- CIRCUIT BREAKER
- (G) GENERATOR
- △ TRANSFORMER - INSCRIBED NUMBER DENOTES PHASES
- △ STEP TRANSFORMER
- ⊓ PRIMARY METER
- ⊓ SINGLE UNIT METER
- ⊓ MULTI UNIT METER
- MH MANHOLE
- MAT
- PAD
- OVERHEAD
- - - UNDERGROUND PRIMARY, SINGLE PHASE
- · - · - UNDERGROUND PRIMARY, TWO PHASE
- · - · - UNDERGROUND PRIMARY, THREE PHASE
- - - UNDERGROUND SECONDARY

COLOR SCHEME:

- RED = INSTALL
- BLUE = SALVAGE
- BLACK = EXISTING



WHITE LAKE ROAD



CIRCUIT ID: KAL 1

NOTES:

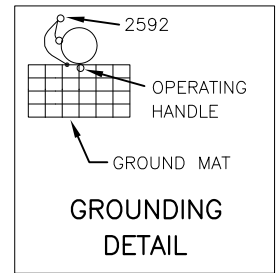
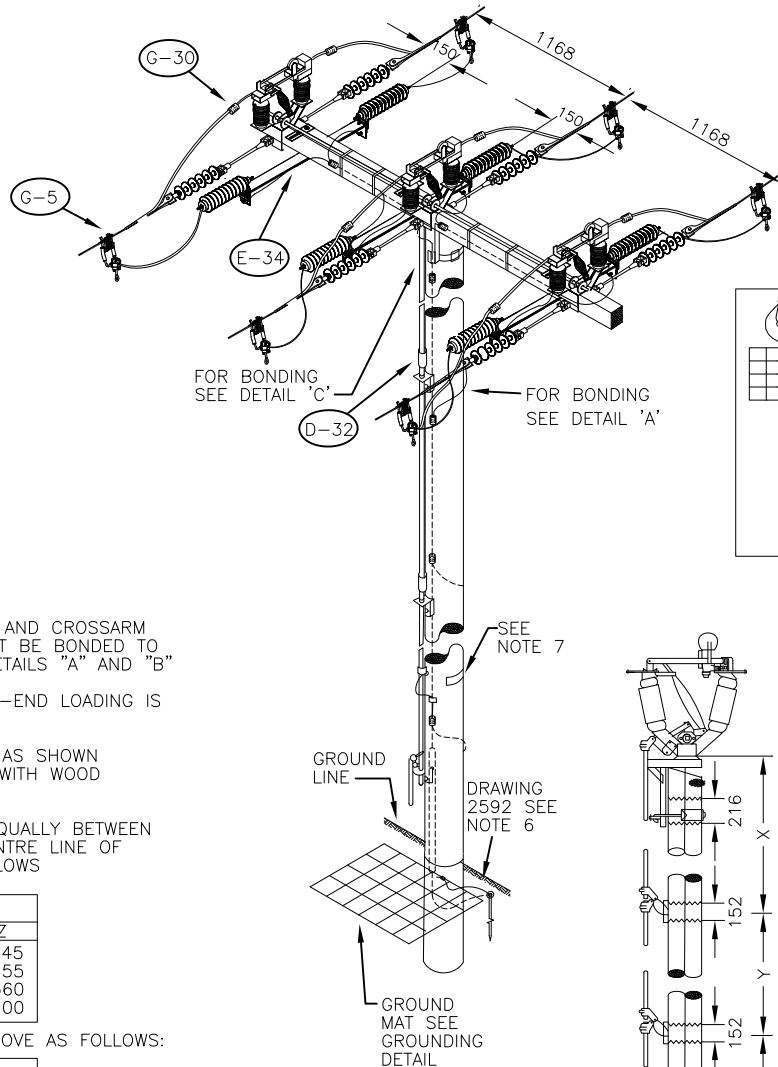
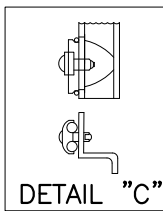
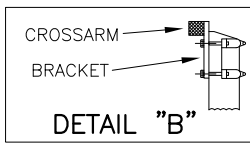
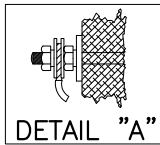
DESIGN ASSUMPTIONS - UNLESS OTHERWISE NOTED
 SITE CONDITIONS MEET CSA 'MEDIUM B'
 MINIMUM GRADE 2 CONSTRUCTION
 SOIL STRENGTH ASSUMED TO BE CLASS 5

DESIGN CRITERIA
 DESIGN TO BE IN ACCORDANCE WITH
 FORTISBC DISTRIBUTION DESIGN CRITERIA DC-001

AS-BUILT INFO
 MARK UP AS-BUILT INFO IN RED AS SPECIFIED IN
 DG-001 DISTRIBUTION PROJECTS COMMISSIONING PROCESS

UNDERGROUND CONSTRUCTION
 UNDERGROUND WORKS TO BE COMPLETED AS SPECIFIED IN
 SPECIFICATION FOR INSTALLATION OF UNDERGROUND
 CONDUIT SYSTEMS

#	DATE	DESCRIPTION	FULL NAME	SIGNATURE	FULL NAME	SIGNATURE	DATE	APPROVALS		DESIGN CONTRACTOR LOGO	P.ENG STAMP & DATE	FORTIS BC	STATUS			
								DESIGNED BY	CHECKED BY				DESIGN LEAD	SUPERVISOR (IF REQ'D)	APPROVED FOR CONSTRUCTION	SCALE
2	17FEB2015	ADDED LEADER TO EXISTING CONDUCTOR	BEN LEE		JESSE SPRING					 Suite 4 - 1414 Hunter Court Kelowna, BC V1X 6E6 Phone: (250) 763-0401 www.primaryeng.com			APPROVED FOR CONSTRUCTION			
1	13FEB2015	ISSUED FOR CONSTRUCTION	BEN LEE		JESSE SPRING				TITLE FOR FORTISBC RESEARCH FACILITY ON WHITE LAKE RD, KALEDEN DB-07361				LABOUR	65167764	2556843	1:1000
0	09FEB2015	ISSUED FOR REVIEW	BEN LEE		JESSE SPRING								ENGINEERING	65167764		
										MATERIAL	65167764	DRAWING NUMBER	70-65167764-F1	REVISION		
										SALVAGE	65167764			2		



NOTES:

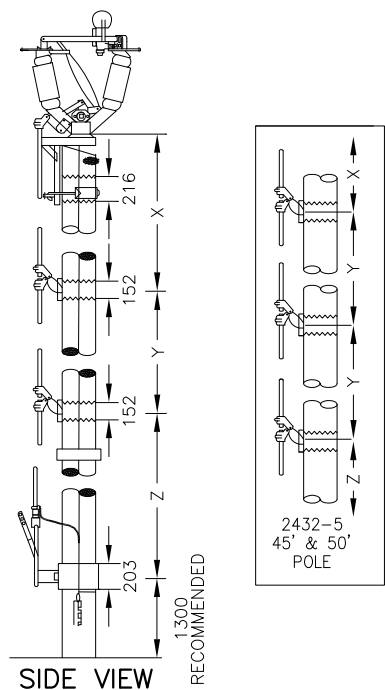
- 1) ALL ROD GUIDE BRACKETS AND CROSSARM MOUNTING BRACKETS MUST BE BONDED TO GROUND AS SHOWN IN DETAILS "A" AND "B"
- 2) MAXIMUM ALLOWABLE DEAD-END LOADING IS 8.8kN PER PHASE
- 3) TOP OF POLE TO BE CUT AS SHOWN (DETAIL B) AND TREATED WITH WOOD PRESERVATIVE
- 4) DISTRIBUTE ROD GUIDES EQUALLY BETWEEN BASE OF SWITCH AND CENTRE LINE OF HANDLE BRACKET AS FOLLOWS

POLE SIZE	DIMENSION		
	X	Y	Z
35'	2445	2445	2445
40'	2955	2955	2955
45'	2560	2560	2560
50'	2900	2900	2900

CUT PIPE LENGTHS FOR ABOVE AS FOLLOWS:

POLE SIZE	DIMENSION		
	X	Y	Z
35'	2445	2420	2180
40'	2955	2930	2990
45'	2560	2535	2290
50'	2900	2875	2635

- 5) GRADIENT CONTROL MAT MUST BE COVERED WITH 150mm OF GRAVEL.
- 6) FOR GROUNDING, ORDER STRUCTURE 2592.
- 7) MOUNT SWITCH NUMBER BOARD ON ROAD SIDE, 3.0 m ABOVE GROUND LINE.
- 8) ALL METAL HARDWARE SEPARATED BY LESS THAN 100 mm SHOULD BE BONDED TOGETHER WITH #10 STEEL WIRE.
- 9) UNLESS OTHERWISE INDICATED, -ALL DIMENSIONS ARE IN MILLIMETERS 13° -ALL HOLES ARE DRILLED TO 16



6																													
5	APR/10	AJR	AJR	UPDATED GROUNDING DWG #		AK	APR/10																						
4	NOV/06	CPA	BM	UPDATED TITLEBLOCK AND DRAWING		IF	APR/07																						
3	NOV/93	SC		CHG'D BRACKET TYPE/MOUNTING LIGHTNING ARRESTOR																									
2	FEB/93	SC		CHG'D AIRBREAKS TO VERTICAL POSITION - ADDED NOTE 8																									
1																													
REV	DATE	BY	CHECKED	DESCRIPTION	APP.	DATE											DRAWING No.	REV.											
							FORTISBC										2432	5											
										DRAWN BY										AIRBREAK - VERTICAL BREAK									
										CHECKED BY										25/34.5kV 1200 AMP									
										APPROVED BY										C/W 1200 AMP. LOAD BREAKS									
																				1.25									

Fortis		Bill of Material		2011/05/18
Structure # 2432		1200 AMP AIRBREAK		
Item #	UI	-4	-5	Description
5132614		6	6	BOLT, MACHINE, GALV, 3/4" X 14",
5132618		2	4	BOLT, MACHINE, GALV, 3/4" X 18",
5138401		1	1	BOLT, LAG, GALVANIZED, 1/2" X 4",
5141106		3	4	NUT, UNFIN SQ, GLV 3/4
5142106		6	8	WASHER, ROUND, 13/16" HOLE, 2" RIM
5142206		8	10	WASHER, SQ, 3 X 3 X 1/4, 13/16 HOLE
5142603		12	14	WASHER, SPRING LOCK, DOUBLE 3/4
5160303		20	20	STAPLE, 1/2"X2", H/P GLV. 'U' TYPE
5310205	M	15	15	WIRE, CU STR, 500MCM, BARE, SOFT DRAWN,
5311105	M	22	22	CONDUCTOR, CU STR, #4 POLY, 600V, RW90,
5390601	M	2	2	WIRE, CU TINNED, BRAIDED STRAP, #2, 1" W
5530131		6	6	CONNECTOR, COMPRESSION, AL, H-TYPE
5530138		3	3	CONNECTOR, COMPRESSION, AL, H-TYPE
5530323		2	2	CONNECTOR, SPLIT BOLT, #2 SOLID
5530502		6	6	CLAMP, HOT LINE, 336.4 MCM : #6 ACSR
5530601		1	1	CLAMP, U-BOLT, COPPER, 1 1/4"
5530650		1	1	CLAMP, GRD, #4 SOL-#2/0 STR, CU TO BAR
5531023		6	6	CLAMP, STIRRUP, 2/0-477 ACSR
5531447		6	6	CONN, W-TYPE, 477 - 477 OR 556 - 336,
5571202		1	1	GROUND MAT, 1200MM X 1800MM
5571654		6	6	CLAMP, CLEVIS D.E, 3/0 - 556.5 ACSR,
5720402		6	6	INSULATOR, POLYMER, D.E, CLEVIS END,
5790600		6	6	LINK, EXTENSION, FIBRE GLASS
5810114		6	6	ARRESTER, 21kV, DIST, 10kA, POLYMER HOUSING
5822025		1		SWITCH, A.B., 1200A, INT STYLE
5822026			1	SWITCH, A.B., 1200A, INT STYLE
5890436		3	3	BRACKET, L/A, FOR S&C AIRBREAK SW. STRUCT.

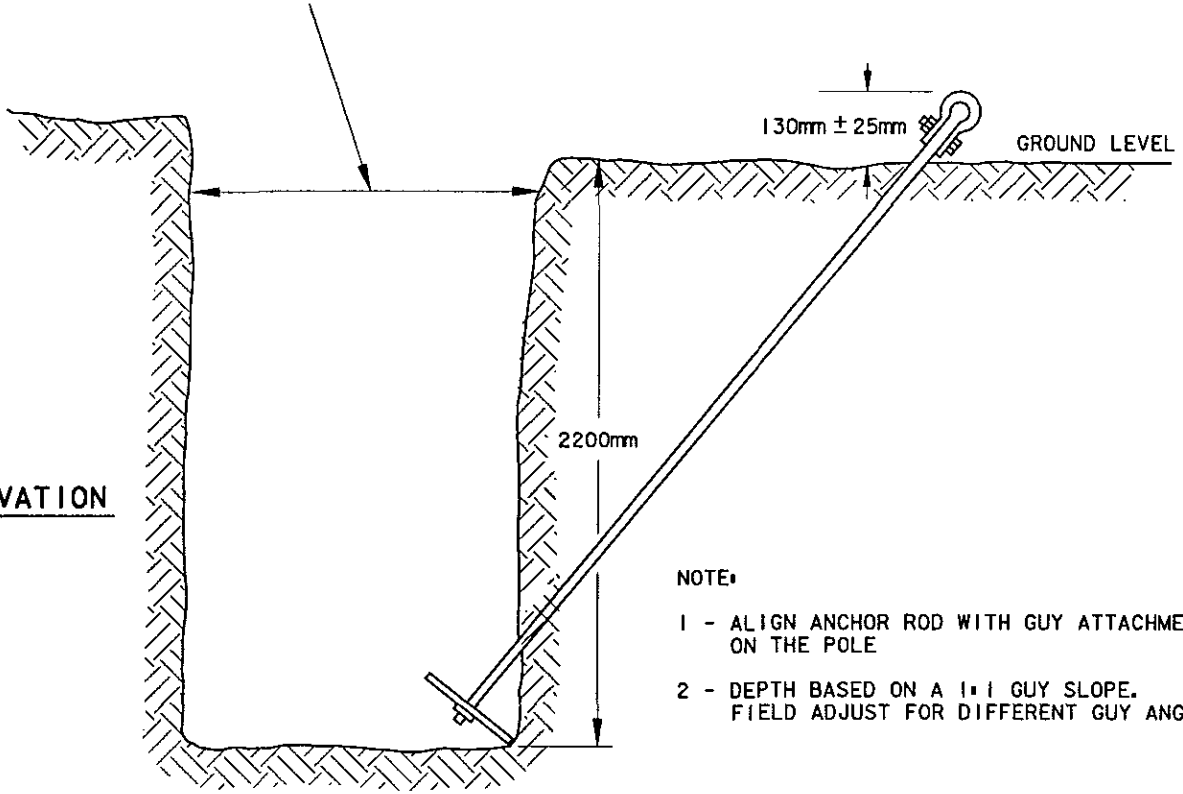
REMARKS :

1. 2432-4 is for 35' and 40' poles.
2. 2432-5 is for 45' and 50' poles.

c:\standa\1\c6.dgn Sep. 04, 2002 16:07:30

BORE HOLE VERTICALLY WITH MACHINE-BORING EQUIPMENT OR DIG BY HAND.
 BACKFILL HOLE & TRENCH WITH WELL TAMPED NATIVE SOIL OR GRAVEL, MOUNDED TO
 ACCOMMODATE SETTLING AND TO PREVENT WATER FROM COLLECTING

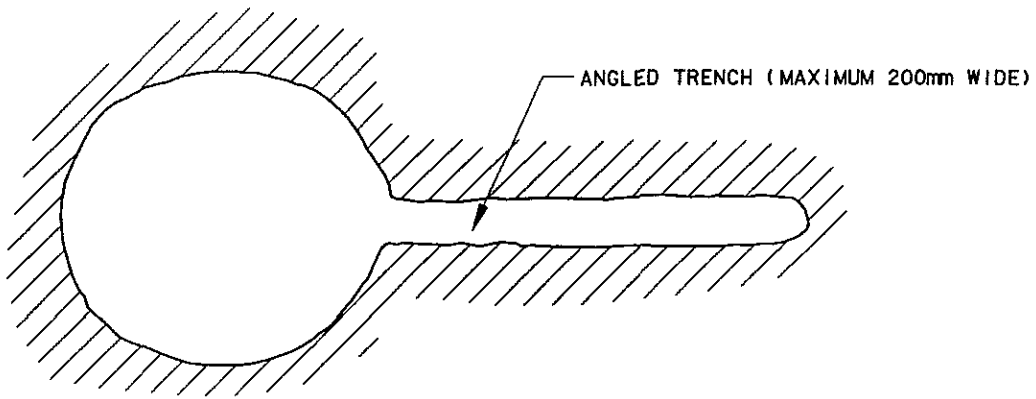
ELEVATION



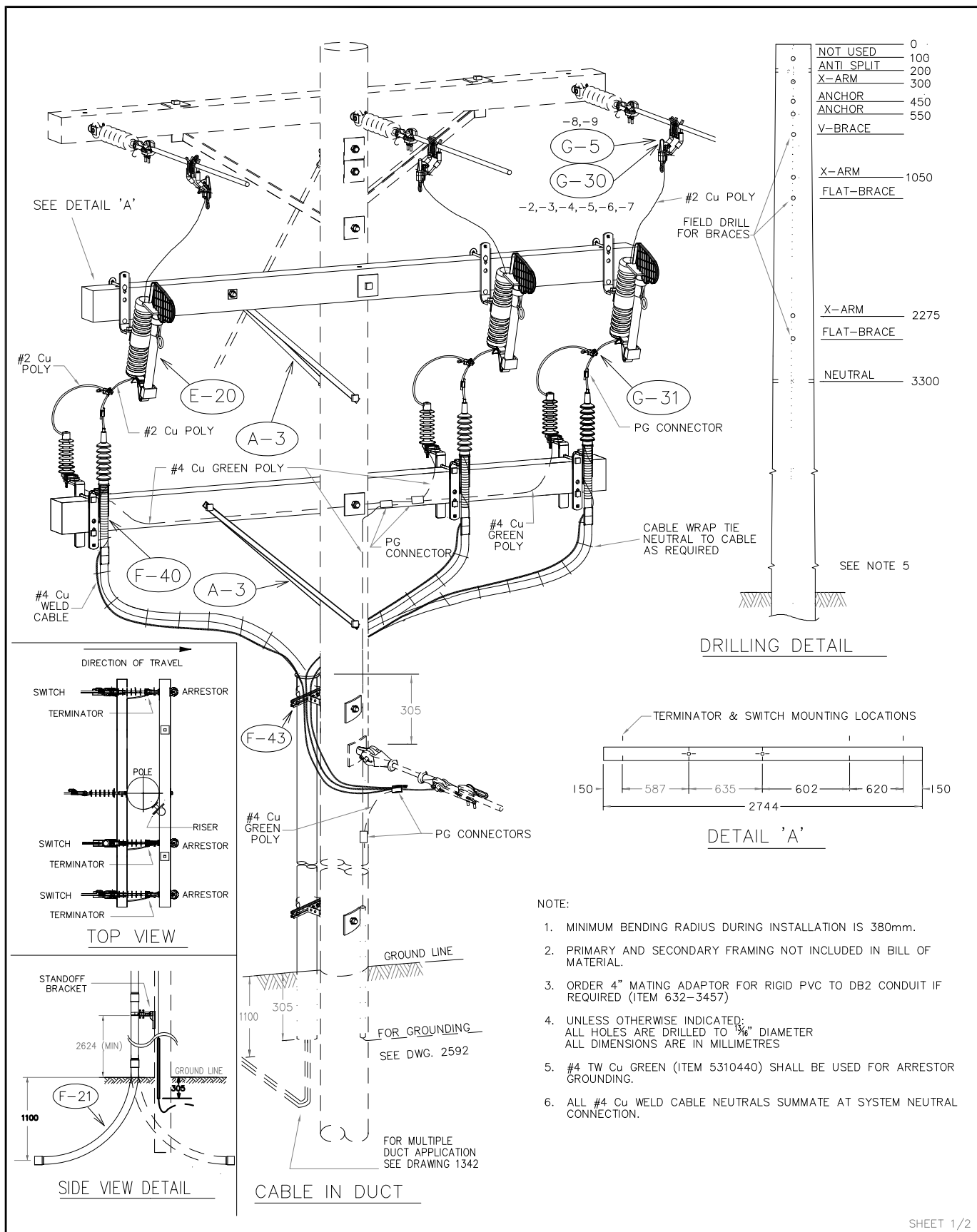
NOTE:

- 1 - ALIGN ANCHOR ROD WITH GUY ATTACHMENT POINT ON THE POLE
- 2 - DEPTH BASED ON A 1:1 GUY SLOPE. FIELD ADJUST FOR DIFFERENT GUY ANGLES

PLAN

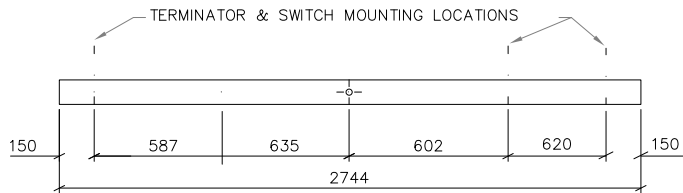


Revision Date		Description		PLATE ANCHOR DETAIL	
Checked					
Approved					
Original - Design / Checked	Original - Approved	Date Created	NOT TO SCALE	Aquila Networks Canada	Drawing Number Sheet
<i>ES.</i>	<i>J.C.</i>	02-08-27			C-6 1/1

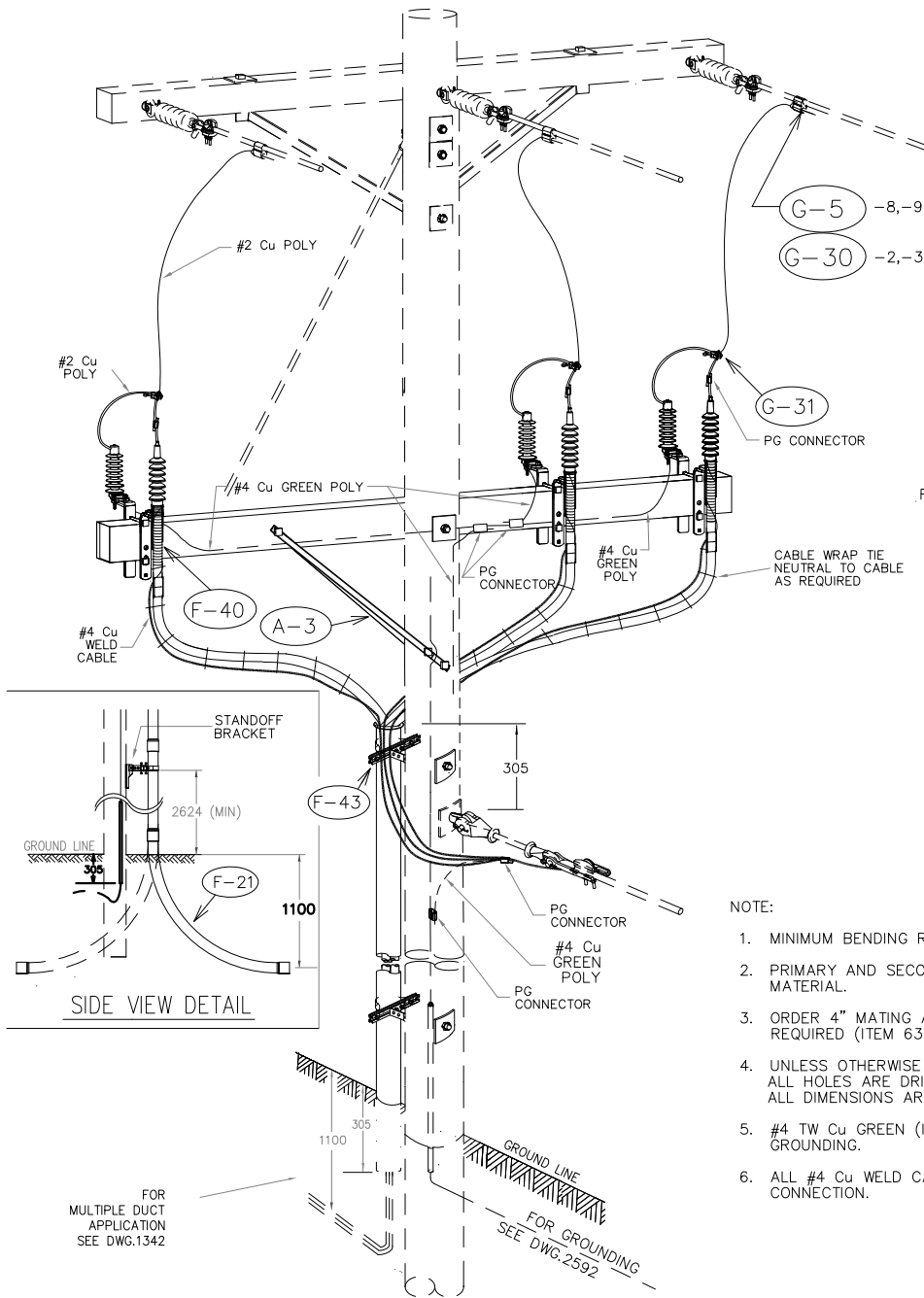
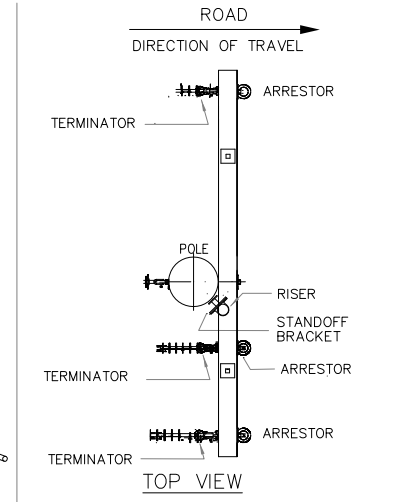


SHEET 1/2

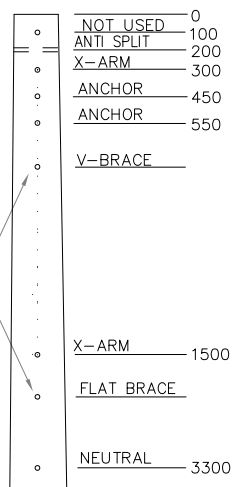
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6							NS			MAR'04	THREE PHASE RISER POLE FOR #1AL AND #2CU CABLE	
5												
4												
3	NOV/10	BN	NG	UPDATED DRILLING PATTERN	DCW	NOV/10			72	MAR'04		
2	NOV/08	S.W.	NG	ADDED LABELS & REVISED NOTES	BMB	DEC/08						
1	MAR/08	DT	NG	CHANGE STIRRUPS FOR HOT TAPS	BMB	MAR/08						
											DRAWING No.	REV.
											1316	3



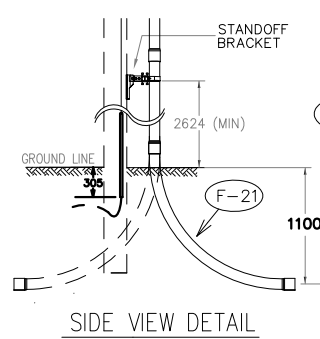
DETAIL 'A'



G-5 -8,-9
G-30 -2,-3,-4,-5,-6,-7



DRILLING DETAIL



SIDE VIEW DETAIL

NOTE:

1. MINIMUM BENDING RADIUS DURING INSTALLATION IS 380mm.
2. PRIMARY AND SECONDARY FRAMING NOT INCLUDED IN BILL OF MATERIAL.
3. ORDER 4" MATING ADAPTOR FOR RIGID PVC TO DB2 CONDUIT IF REQUIRED (ITEM 632-3457)
4. UNLESS OTHERWISE INDICATED: ALL HOLES ARE DRILLED TO 1/8" DIAMETER ALL DIMENSIONS ARE IN MILLIMETRES
5. #4 TW Cu GREEN (ITEM 5310440) SHALL BE USED FOR ARRESTOR GROUNDING.
6. ALL #4 Cu WELD CABLE NEUTRALS SUMMATE AT SYSTEM NEUTRAL CONNECTION.

FOR MULTIPLE DUCT APPLICATION SEE DWG.1342

FOR GROUNDING SEE DWG.2592

7																				
6																				
5																				
4	NOV/10	BN	NG	UPDATED DRILLING PATTERN	DCW	NOV/10														
3	NOV/08	S.W.	NG	REVISED NOTES, LABELS & EXTENDED L-BRACKET	BMB	DEC/08														
2	FEB/08	DT	NG	CHANGE OWNERSHIP, CHANGE STIRRUP BY HOT TAP	BMB	FEB/08														
REV	DATE	BY	CHECKED	DESCRIPTION	APP.	DATE														
														DRAWN BY	NS	SEP'02	THREE PHASE RISER POLE FOR #1AL AND #2CU CABLE			
														CHECKED BY						
														APPROVED BY	TC	SEP'02				
														FORTISBC		DRAWING No.		REV.		
																1316		4		

Fortis		Bill of Material				2011/06/13
Structure # 1316		3 PHASE RISERPOLE #1 AL AND #2 CU CABLE				
Item #	UI	-2	-3	-4	-5	Description
4910304		1	1	1	1	SIGN, ALUMINUM, DANGER, 16 X 9 CM
4945010		1	1	1	1	TAG, ALMETEK, 3", LETTER A
4945011		1	1	1	1	TAG, ALMETEK, 3", LETTER B
4945012		1	1	1	1	TAG, ALMETEK, 3", LETTER C
4947059		1	1	1	1	TAG, HOLDER, APPROX. 16" LONG, ALUMINUM
5020207		2	2	1	1	CROSSARM, WOOD, SAWN OR GLULAM WOOD
5110252		4	4	2	2	BRACE, FLAT, 34" LONG
5132606		2	2	1	1	BOLT, MACHINE, GALV, 3/4" X 6"
5132612		2	2	2	2	BOLT, MACHINE, GALV, 3/4" X 12"
5132614		2	2	2	2	BOLT, MACHINE, GALV, 3/4" X 14"
5132616		2	2	1	1	BOLT, MACHINE, GALV, 3/4" X 16"
5138401		8	8	6	6	BOLT, LAG, GALVANIZED, 1/2" X 4",
5142206		4	4	2	2	WASHER, SQ, 3 X 3 X 1/4, 13/16 HOLE
5142304		6	6	5	5	WASHER, CURVED, 4X4X3/8, 13/16 HOLE.
5142603		8	8	7	7	WASHER, SPRING LOCK, DOUBLE 3/4
5150231		3	3	3	3	BRACKET, CABLE SUPPORT, DIA. .75"- 2.0"
5310440	M	6	6	6	6	WIRE, CU, 4 AWG, 7STR, 600V, TWU GREEN,
5311106	M	8	8	9	9	CONDUCTOR, CU STR, #2 POLY, 600V, RW90,
5390602	M	5	5	5	5	CABLE, #4, MULTI STR. BOND.
5530130		6	6	6	6	CONNECTOR, COMPRESSION, AL, H-TYPE
5530502		6	6	3	3	CLAMP, HOT LINE, 336.4 MCM : #6 ACSR
5590502		15	15	15	15	TIE, CABLE WRAP, BLACK, 7"
5740105		3		3		TERMINATION KIT, 15/25KV, #2 CU
5740112			3		3	TERMINATION KIT, 25KV, #1 ALUM SOL,
5780305		1	1	1	1	TAPE, VINYL, 3/4" x 66' CSA APPROVED
5780311		1	1	1	1	TAPE, LINERLESS RUBBER SPLICING, 1"X15'
5790415		3	3	3	3	PROTECTOR, WILDLIFE, L.A. BRACKET
5810112			3		3	ARRESTER, LIGHTNING, 18KV
5810122		3		3		ARRESTER, LIGHTNING, 10 KV. DIST. CLASS
5821046		3	3			SWITCH, SOLID BLADE, POLYMER, 300A, 15/27YKV
5890417		9	9	6	6	BRACKET, CROSSARM MOUNTING L.A. & CUTOUT
5890450		4	4	4	4	BRACKET, ALUMINUM, STANDOFF
5890455		4	4	4	4	BRACKET, T SLOT, 4 WAY, 12 INCHES LONG
6311110		4	4	4	4	STRAP, KIT, GALV, FOR 4",
6323051		5	5	5	5	PIPE, RIGID PVC, 10' 4" 4.026" ID
6323454		1	1	1	1	END BELLS, FOR 4" RIGID PVC, GREY,

Fortis		Bill of Material				2011/06/13
Structure # 1316		3-PH RISERPOLE FOR #1 AL & #2 CU CABLE				
Item #	UI	-6	-7	-8	-9	Description
4910304		1	1	1	1	SIGN, ALUMINUM, DANGER, 16 X 9 CM
4945010		1	1	1	1	TAG, ALMETEK, 3", LETTER A
4945011		1	1	1	1	TAG, ALMETEK, 3", LETTER B
4945012		1	1	1	1	TAG, ALMETEK, 3", LETTER C
4947059		1	1	1	1	TAG, HOLDER, APPROX. 16" LONG, ALUMINUM
5020207		2	2	2	2	CROSSARM, WOOD, SAWN OR GLULAM WOOD
5110252		4	4	4	4	BRACE, FLAT, 34" LONG
5132606		2	2	2	2	BOLT, MACHINE, GALV, 3/4" X 6"
5132612		2	2	2	2	BOLT, MACHINE, GALV, 3/4" X 12"
5132614		2	2	2	2	BOLT, MACHINE, GALV, 3/4" X 14"
5132616		2	2	2	2	BOLT, MACHINE, GALV, 3/4" X 16"
5138401		8	8	8	8	BOLT, LAG, GALVANIZED, 1/2" X 4",
5142206		4	4	4	4	WASHER, SQ, 3 X 3 X 1/4, 13/16 HOLE
5142304		6	6	6	6	WASHER, CURVED, 4X4X3/8, 13/16 HOLE.
5142603		8	8	8	8	WASHER, SPRING LOCK, DOUBLE 3/4
5150231		3	3	3	3	BRACKET, CABLE SUPPORT, DIA. .75"- 2.0"
5310440	M	6	6	6	6	WIRE, CU, 4 AWG, 7STR, 600V, TWU GREEN,
5311106	M	8	8	8	8	CONDUCTOR, CU STR, #2 POLY, 600V, RW90,
5390602	M	5	5	5	5	CABLE, #4, MULTI STR. BOND.
5530130		6	6	6	6	CONNECTOR, COMPRESSION, AL, H-TYPE
5530502		6	6	6	6	CLAMP, HOT LINE, 336.4 MCM : #6 ACSR
5590502		15	15	15	15	TIE, CABLE WRAP, BLACK, 7"
5740105		3		3		TERMINATION KIT, 15/25KV, #2 CU
5740112			3		3	TERMINATION KIT, 25KV, #1 ALUM SOL,
5780305		1	1	1	1	TAPE, VINYL, 3/4" x 66' CSA APPROVED
5780311		1	1	1	1	TAPE, LINERLESS RUBBER SPLICING, 1"X15'
5790415		3	3	3	3	PROTECTOR, WILDLIFE, L.A. BRACKET
5810112			3		3	ARRESTER, LIGHTNING, 18KV
5810122		3		3		ARRESTER, LIGHTNING, 10 KV. DIST. CLASS
5821045				3	3	SWITCH, LOADBREAK, POLYMER, 100A, 15/27Y KV
5821049		3	3			SWITCH, 15/26Y KV, 200 AMP, 125 KV BIL
5890417		9	9	9	9	BRACKET, CROSSARM MOUNTING L.A. & CUTOUT
5890450		4	4	4	4	BRACKET, ALUMINUM, STANDOFF
5890455		4	4	4	4	BRACKET, T SLOT, 4 WAY, 12 INCHES LONG
6311110		4	4	4	4	STRAP, KIT, GALV, FOR 4",
6323051		5	5	5	5	PIPE, RIGID PVC, 10' 4" 4.026" ID
6323454		1	1	1	1	END BELLS, FOR 4" RIGID PVC, GREY,

REMARKS:

1) Intended uses:

1316-2 15 KV #2 Cu Loadbreak cutouts, 300 A solid blade, wedge type line connectors. Designer to select correct wedge type connectors from chart below.

1316-3 25 KV #1 Al Loadbreak cutouts, 300 A solid blade, wedge type line connectors. Designer to select correct wedge type connectors from chart below.

1316-4 15 KV #2 Cu no switches, wedge type line connectors. Designer to select correct wedge type connectors from chart below.

1316-5 25 KV #1 Al No switches, wedge type line connectors. Designer to select correct wedge type connectors from chart below.

1316-6 15 KV #2 Cu Loadbreak cutouts, 200 A. Use only when fuse size exceeds 100 A, wedge type line connectors. Designer to select correct wedge type connectors from chart below.

1316-7 25 KV #1 Al Loadbreak cutouts, 200 A. Use only when fuse size exceeds 100 A, wedge type line connectors. Designer to select correct wedge type connectors from chart below.

1316-8 15 KV #2 Cu Loadbreak cutouts, 100 A, stirrup line connectors. Designers to select correct stirrups from chart below. Hot line clamps are included in the BOM.

1316-9 25 KV #1 Al Loadbreak cutouts, 100 A, stirrup line connectors. Designers to select correct stirrups from chart below. Hot line clamps are included in the BOM.

2) Designer to select correct stirrup or wedge type connector from chart below. Hot line clamps are included in the BOM

Wedge connectors for structures -2,-3,-4, -5, -6, -7

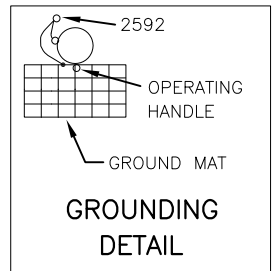
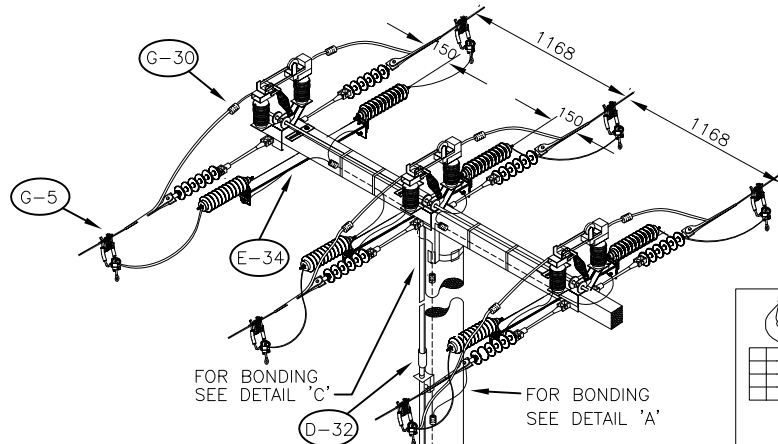
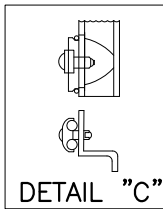
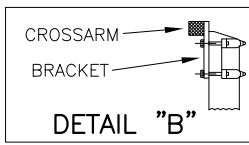
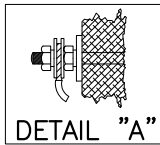
Select the appropriate connectors and shells for application.

LINE CONDUCTOR	WEDGE CONNECTOR ITEM #	SHELL ITEM #
#2 HADDOCK	5531406	5531590 RED
3/0 PIGEON	5531414	5531591 BLUE
477 PELICAN	5531440	5531592 YELLOW

Stirrups for structures -8, -9

LINE CONDUCTOR	STIRRUP ITEM #
#6 - 2/0 Cu	5531025
#2 HADDOCK	5531021
3/0 PIGEON / 477 PELICAN	5531023

INTENTIONALLY LEFT BLANK



NOTES:

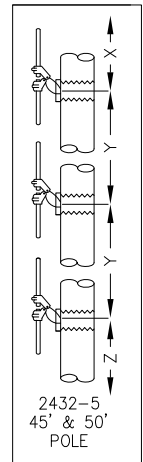
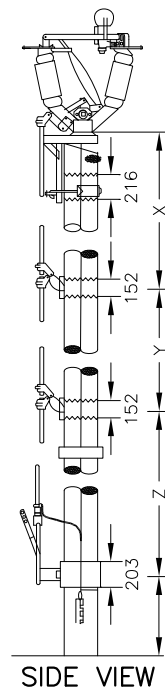
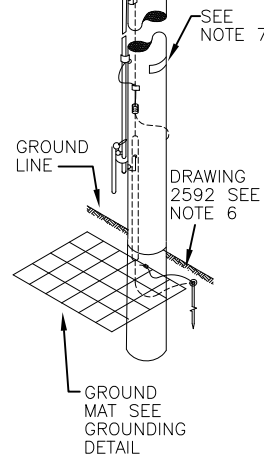
- 1) ALL ROD GUIDE BRACKETS AND CROSSARM MOUNTING BRACKETS MUST BE BONDED TO GROUND AS SHOWN IN DETAILS "A" AND "B"
- 2) MAXIMUM ALLOWABLE DEAD-END LOADING IS 8.8kN PER PHASE
- 3) TOP OF POLE TO BE CUT AS SHOWN (DETAIL B) AND TREATED WITH WOOD PRESERVATIVE
- 4) DISTRIBUTE ROD GUIDES EQUALLY BETWEEN BASE OF SWITCH AND CENTRE LINE OF HANDLE BRACKET AS FOLLOWS

POLE SIZE	DIMENSION		
	X	Y	Z
35'	2445	2445	2445
40'	2955	2955	2955
45'	2560	2560	2560
50'	2900	2900	2900

CUT PIPE LENGTHS FOR ABOVE AS FOLLOWS:

POLE SIZE	DIMENSION		
	X	Y	Z
35'	2445	2420	2180
40'	2955	2930	2990
45'	2560	2535	2290
50'	2900	2875	2635

- 5) GRADIENT CONTROL MAT MUST BE COVERED WITH 150mm OF GRAVEL.
- 6) FOR GROUNDING, ORDER STRUCTURE 2592.
- 7) MOUNT SWITCH NUMBER BOARD ON ROAD SIDE, 3.0 m ABOVE GROUND LINE.
- 8) ALL METAL HARDWARE SEPARATED BY LESS THAN 100 mm SHOULD BE BONDED TOGETHER WITH #10 STEEL WIRE.
- 9) UNLESS OTHERWISE INDICATED, -ALL DIMENSIONS ARE IN MILLIMETERS 13° -ALL HOLES ARE DRILLED TO 16



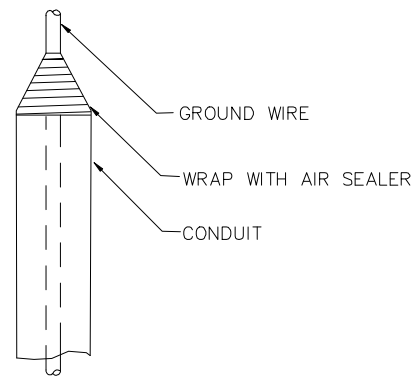
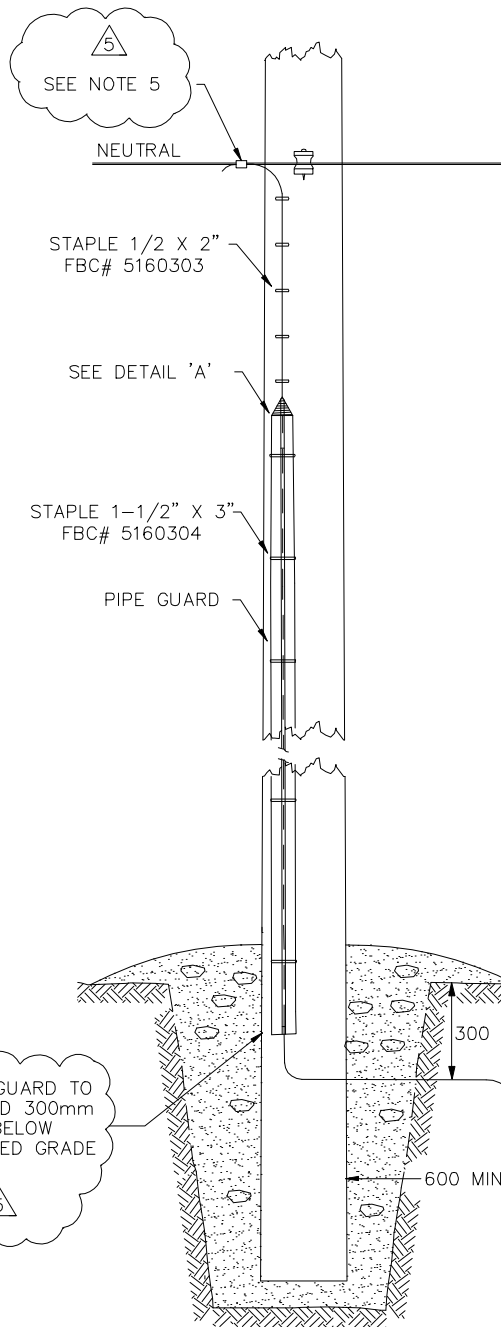
6																			
5	APR/10	AJR	AJR	UPDATED GROUNDING DWG #		AK	APR/10												
4	NOV/06	CPA	BM	UPDATED TITLEBLOCK AND DRAWING		IF	APR/07												
3	NOV/93	SC		CHG'D BRACKET TYPE/MOUNTING LIGHTNING ARRESTOR															
2	FEB/93	SC		CHG'D AIRBREAKS TO VERTICAL POSITION - ADDED NOTE 8															
1																			
REV	DATE	BY	CHECKED	DESCRIPTION	APP.	DATE											DRAWING No.	REV.	
							FORTISBC										2432	5	

AIRBREAK - VERTICAL BREAK
25/34.5kV 1200 AMP
C/W 1200 AMP. LOAD BREAKS 1.25

Fortis		Bill of Material		2011/05/18
Structure # 2432		1200 AMP AIRBREAK		
Item #	UI	-4	-5	Description
5132614		6	6	BOLT, MACHINE, GALV, 3/4" X 14",
5132618		2	4	BOLT, MACHINE, GALV, 3/4" X 18",
5138401		1	1	BOLT, LAG, GALVANIZED, 1/2" X 4",
5141106		3	4	NUT, UNFIN SQ, GLV 3/4
5142106		6	8	WASHER, ROUND, 13/16" HOLE, 2" RIM
5142206		8	10	WASHER, SQ, 3 X 3 X 1/4, 13/16 HOLE
5142603		12	14	WASHER, SPRING LOCK, DOUBLE 3/4
5160303		20	20	STAPLE, 1/2"X2", H/P GLV. 'U' TYPE
5310205	M	15	15	WIRE, CU STR, 500MCM, BARE, SOFT DRAWN,
5311105	M	22	22	CONDUCTOR, CU STR, #4 POLY, 600V, RW90,
5390601	M	2	2	WIRE, CU TINNED, BRAIDED STRAP, #2, 1" W
5530131		6	6	CONNECTOR, COMPRESSION, AL, H-TYPE
5530138		3	3	CONNECTOR, COMPRESSION, AL, H-TYPE
5530323		2	2	CONNECTOR, SPLIT BOLT, #2 SOLID
5530502		6	6	CLAMP, HOT LINE, 336.4 MCM : #6 ACSR
5530601		1	1	CLAMP, U-BOLT, COPPER, 1 1/4"
5530650		1	1	CLAMP, GRD, #4 SOL-#2/0 STR, CU TO BAR
5531023		6	6	CLAMP, STIRRUP, 2/0-477 ACSR
5531447		6	6	CONN, W-TYPE, 477 - 477 OR 556 - 336,
5571202		1	1	GROUND MAT, 1200MM X 1800MM
5571654		6	6	CLAMP, CLEVIS D.E, 3/0 - 556.5 ACSR,
5720402		6	6	INSULATOR, POLYMER, D.E, CLEVIS END,
5790600		6	6	LINK, EXTENSION, FIBRE GLASS
5810114		6	6	ARRESTER, 21kV, DIST, 10kA, POLYMER HOUSING
5822025		1		SWITCH, A.B., 1200A, INT STYLE
5822026			1	SWITCH, A.B., 1200A, INT STYLE
5890436		3	3	BRACKET, L/A, FOR S&C AIRBREAK SW. STRUCT.

REMARKS :

1. 2432-4 is for 35' and 40' poles.
2. 2432-5 is for 45' and 50' poles.




DETAIL "A"

NOTE:

- 1 - THE MULTI-GROUNDED NEUTRAL SYSTEM MUST BE GROUNDED EVERY THIRD POLE, NOT INCLUDING GROUNDS FOR EQUIPMENT AND INDIVIDUAL SERVICES.
- 2 - GROUND RODS MUST BE INSTALLED MINIMUM 600MM AWAY FROM THE POLE IN UNDISTURBED SOIL.
- 3 - UNLESS OTHERWISE INDICATED, ALL DIMENSIONS ARE IN MILLIMETERS.
- 4 - GROUND CONDUCTOR MUST BE INSTALLED AS ONE CONTINUOUS RUN BETWEEN THE NEUTRAL CONDUCTOR AND GROUND ROD.
- 5 - WHEN COPPER NEUTRAL EXISTS, THE GALVANIZED GROUNDING CONDUCTOR SHALL BE INSTALLED ABOVE THE COPPER CONDUCTOR IN THE CONNECTOR. (with a triangle containing the number 5)
- 6 - GALVANIZED GROUND CONDUCTOR SHALL BE USED FROM GROUND ROD TO NEUTRAL ONLY.

NOT TO SCALE

REV	DATE	BY	CHECKED	DESCRIPTION	APP.	DATE
6						
5	SEPT/11	BJM	NG	CHANGED MIN PIPE GUARD DEPTH AND UPDATED NOTES	DCW	SEPT/11
4	JUL/10	ST	NG	UPDATED BOM (STAPLES & DANGER SIGN)	AK	JUL/10
3	JUN/09	BD	BD	GENERAL REVISION	AK	JUL/09
2	DEC 07	JC	HB	NEW FORTISBC BORDER, REVISED NOTE 2	BMB	JAN/08
1	MAR 07		NS	ADDED ROD FOR 2592-0 AND REVISED NOTE	FC	MAR 07

DRAWN BY			SUBSTATION, EQUIP, & GROUNDING STR GROUNDING OF MULTI-GROUNDED NEUTRAL SYSTEM SHEET 1 OF 1	
CHECKED BY	NS	MAY 02		
APPROVED BY	FC	MAY 02		
			DRAWING No.	REV.
			2592	5

Fortis		Bill of Material			2011/09/23
Structure # 2592		GROUNDING OF MULTI-GRD NEUTRAL SYSTEM			
Item #	UI	-1	-2	-3	Description
4910302			1		SIGN, "DANGER BURIED CABLE"
4910304		1		1	SIGN, ALUMINUM, DANGER, 16 X 9 CM
5160303		5	5	5	STAPLE, 1/2"X2", H/P GLV. 'U' TYPE
5160304		5		5	STAPLE, 1:1/2 X 3 ,
5310440	M		20		WIRE, CU, 4 AWG, 7STR, 600V, TWU GREEN,
5310500	M	20		20	CONDUCTOR, COMPOSITE GND 19 STRAND
5530130			1		CONNECTOR, COMPRESSION, AL, H-TYPE
5530203		1			CONNECTOR, MINIWEDGE, 1/0 TO 2 AWG
5530206				1	CONNECTOR, MINIWEDGE, 3/0 TO 2 AWG
5530645			2		CONNECTOR, GRD ROD, MAX 3/4"ROD
5531591		1		1	CARTRIDGE,SHELL,BLUE
5531615		1		1	CONNECTOR, AMPACT CU, 3/4 ROD TO 2 AWG
5571308		1		1	ROD, GROUND, COPPERBONDED, PLAIN 3/4"ROD
5571320			4		ROD, GRD, SECTIONAL, 3/4 X 6' TAPERED
5571325			2		COUPLING, SECT. GRD RODS
5590303		2	2	2	SEALER, AIR FOR CONNECTORS
6310507			5		STRAP,GALV, 2 HOLE, FOR 3/4"RIGID CONDUIT
6320106		1	1	1	PIPE, GROUND GUARD, 10', 3/4" DIA SERIES

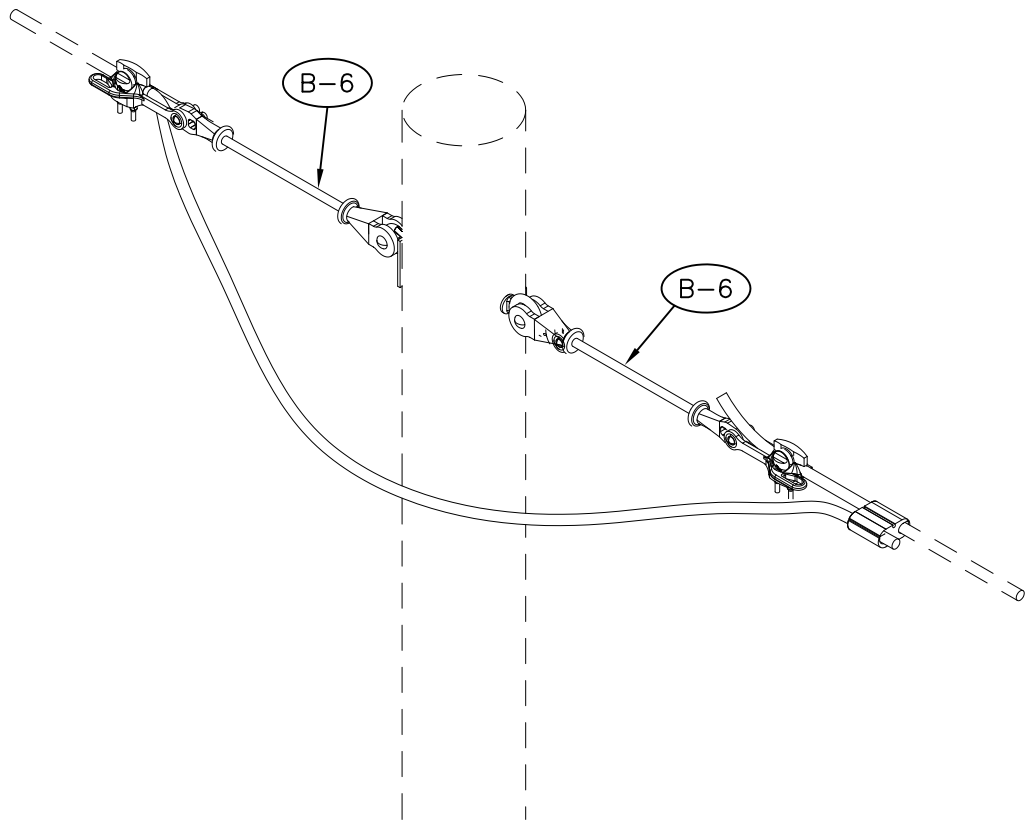
Neutral Conductor Size		Pole Ground Conductor	Manuf. #	FBC #
#8 Cu Solid	TO	19 STRAND GALVANIZED STEEL GND CONDUCTOR (5310500)	AMP / 83630-3	5530200
#6 Cu Solid			AMP / 83592-7	5530201
#4 AAC			AMP / 83592-6	5530202
#4 Cu Stranded (5310440)			AMP / 83592-6	5530202
#2 AAC (5321402)			AMP / 83592-2	5530203
#2 Haddock ACSR (5320204)			AMP / 83592-2	5530203
#2/0 Quail ACSR (5310108)			AMP / 83631-7	5530205
#3/0 Pigeon ACSR (5320110)			AMP / 83631-4	5530206
266 Partridge ACSR (5320114)			AMP / 602046-3 BURNDY / WCB23 HOMAC / PT-26604	5531423
477 Cosmos AAC (5320123)			AMP / 602031-8 BURNDY / WCY57	5531440
477 Pelican ACSR (5320121)			AMP / 602031-8 BURNDY / WCY57	5531440

Remarks:

- 1) Designer to select a connector for the neutral conductor connection from the table above.
- 2) 2592-1 is for neutral conductor size #2.
- 3) 2592-3 is for neutral conductor size #3/0.
- 4) 2592-2 should not be used. Structure is Obsolete.

Structure # 2616 SECONDARY DEAD END RACK

Item #	UI	-1	-3	-4	-5	Description
5110301		1				RACK, SECONDARY, 1 WIRE, UNIT MOUNT
5110303			1			RACK, SECONDARY, 3 WIRE, 8
5110304				1		RACK, SECONDARY, 4 WIRE, 8
5110305					1	RACK, SECONDARY, 5 WIRE, 8
5132612		1				BOLT, MACHINE, GALV, 3/4" X 12",
5132614			2	3	4	BOLT, MACHINE, GALV, 3/4" X 14",
5142206		1	2	3	4	WASHER, SQ, 3 X 3 X 1/4, 13/16 HOLE
5142603		1	2	3	4	WASHER, SPRING LOCK, DOUBLE 3/4



NOTES:

- 1 - MAXIMUM TENSION PER PHASE - 11.5kN
- 2 - UNLESS OTHERWISE INDICATED
 - ALL DIMENSIONS ARE IN MILLIMETRES
 - ALL HOLES ARE DRILLED TO 13/16" DIAMETER
- 3 - STAPLE EVERY 610mm (2')

6								DRAWN BY			NEUTRAL DOUBLE DEAD-END		
5							CHECKED BY	F.C.	NOV/03				
4													
3							APPROVED BY	H.N.	NOV/03				
2	MAY/10	ST	NG	REMOVED CLEVIS AND BOLT		AK	AUG/10	FORTISBC				DRAWING No.	REV.
1	AUG/07	SW		REDRAWN, ADDED CONNECTOR TO DRAWING.								2642	2
REV	DATE	BY	CHECKED	DESCRIPTION		APP.	DATE						

Fortis		B i l l o f M a t e r i a l		2010/06/17
Structure # 2642		NEUTRAL ATTACHMENT, DOUBLE DEAD-END		
Item #	UI	-2	-3	Description
5135612		1	1	BOLT, SHOULDER EYE, 3/4 X 12"
5141306		1	1	NUT, EYE, 3/4
5142206		1	1	WASHER, SQ, 3 X 3 X 1/4, 13/16 HOLE
5142603		1	1	WASHER, SPRING LOCK, DOUBLE 3/4
5571652		2		CLAMP,CLEVIS D.E, #6 - 2/0 ACSR,
5571653			2	CLAMP,CLEVIS D.E, #4 - 336.4 ACSR,
5790600		2	2	LINK, EXTENSION, FIBRE GLASS

Fortis		Bill of Material			2010/12/07
Structure # 2709		25 KV THREE PHASE PRIMARY DEADEND ST			
Item #	UI	-1	-2	-3	Description
5020304		1	2	2	CROSSARM, WOOD, SAWN OR GLULAM WOOD
5110269		1	1	1	BRACE, V, 60"
5132608		2	2	2	BOLT, MACHINE, GALV, 3/4" X 8",
5132612		2	2	2	BOLT, MACHINE, GALV, 3/4" X 12",
5132614		1	1	1	BOLT, MACHINE, GALV, 3/4" X 14",
5133628			2	2	BOLT, D.A. 3/4"X 28"
5135608		2			BOLT, SHOULDER EYE, 3/4 X 8"
5135620		1			BOLT, SHOULDER EYE, 3/4 X 20"
5135622			1	1	BOLT, SHOULDER EYE, 3/4 X22"
5141306		1	2	2	NUT, EYE, 3/4
5142106			4		WASHER, ROUND, 13/16" HOLE, 2" RIM
5142206		11	15	15	WASHER, SQ, 3 X 3 X 1/4, 13/16 HOLE
5142603		7	9	9	WASHER, SPRING LOCK, DOUBLE 3/4
5571652		3			CLAMP,CLEVIS D.E, #6 - 2/0 ACSR,
5571654			3	3	CLAMP, CLEVIS D.E, 3/0 - 556.5 ACSR,
5720402		3	3	3	INSULATOR, POLYMER, D.E, CLEVIS END,

REMARKS;

1) Intended uses:

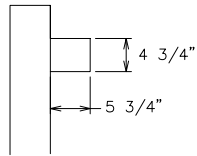
- 2709-1 is for #2 ACSR
- 2709-2 is for 3/0 ACSR
- 2709-3 is for 477 ACSR

2) For grounding use s2592

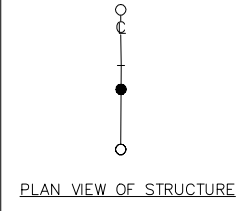
3) For neutral use s2610

4) For use in Bird (Osprey) nesting area, use assembly H-31 and include the following materials:

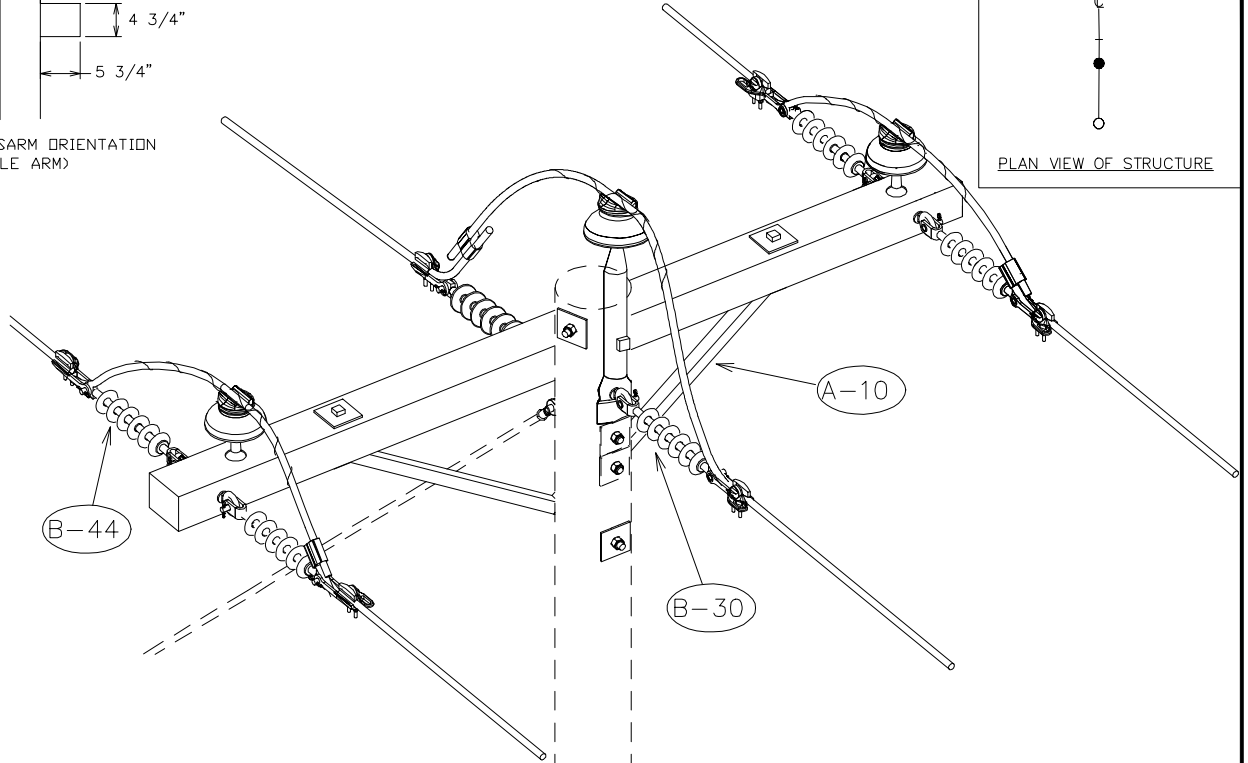
- FBC Item # QTY
- 5161003 1
- 5790417 1



CROSSARM ORIENTATION
(SINGLE ARM)

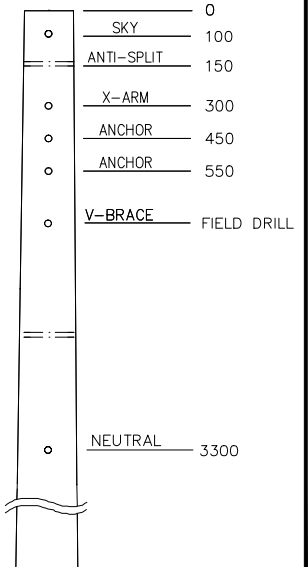


PLAN VIEW OF STRUCTURE



1. ALL HOLES ARE DRILLED 13/16" DIAMETER UNLESS OTHERWISE INDICATED
2. HARDWARE WITHIN 100MM MUST BE BONDED TOGETHER
3. UNLESS OTHERWISE INDICATED ALL DIMENSIONS ARE IN MILLIMETERS
4. FOR NEUTRAL USE 2642

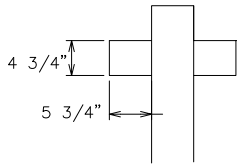
CONDUCTOR	MAX SPAN (M)
HADDOCK	140



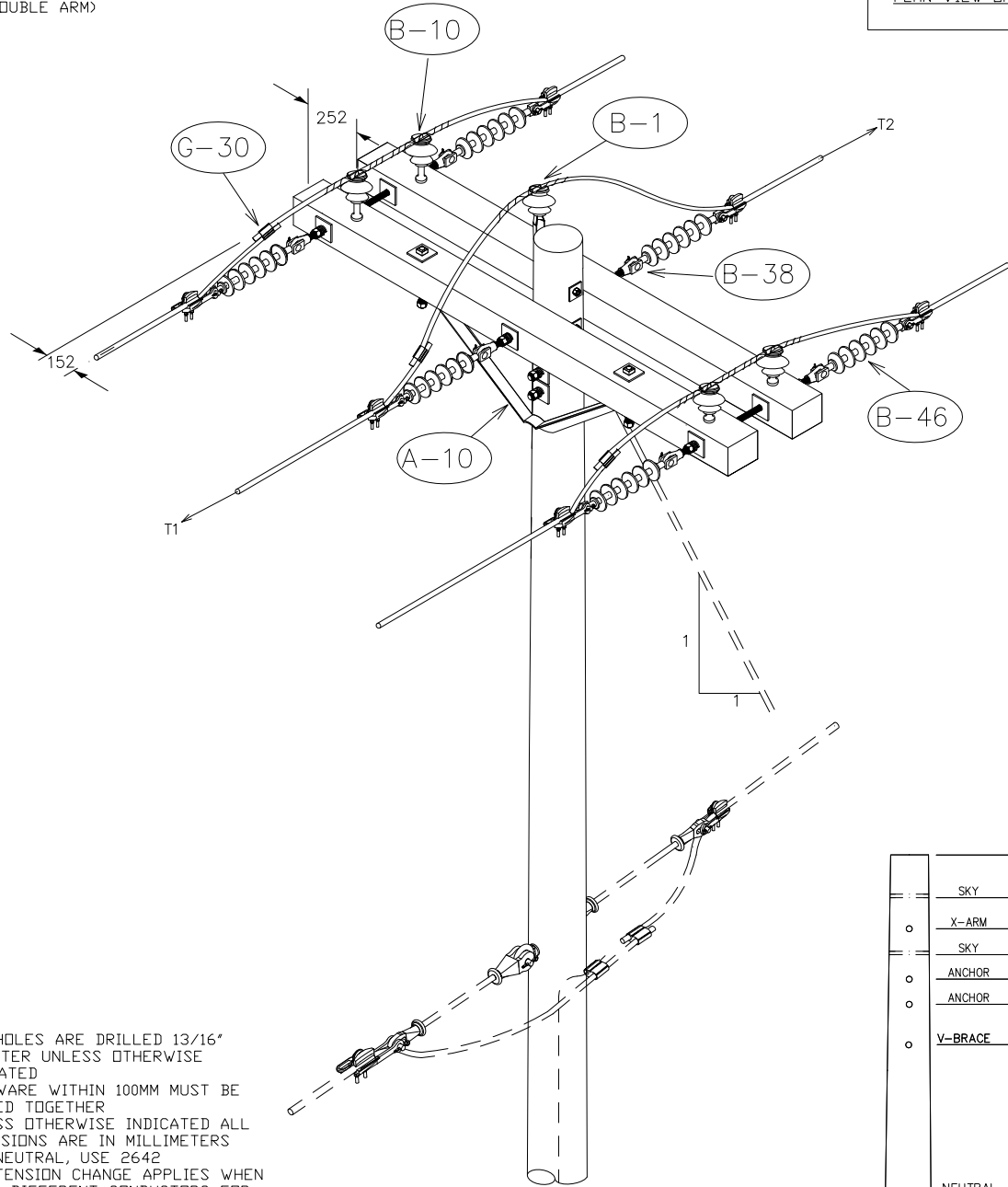
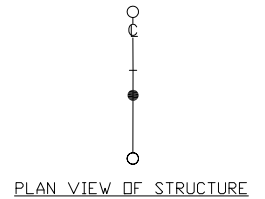
DRILLING DETAIL

NOTE: MAX SPANS BASED ON CSA MED B LOADINGS, FLAT TERRAIN

6						DRAWN BY	JH	JUL/08	TWO WAY DEADEND STRUCTURE
5						CHECKED BY			
4						APPROVED BY			
3									SHEET 1 OF 2
2	NOV/10	BN	NG	UPDATED DRILLING PATTERN	DCW	DEC/10			DRAWING No.
1	JUN/10	ST	NG	UPDATED DRILLING DETAIL	AK	AUG/10			2778
REV	DATE	BY	CHECKED	DESCRIPTION	APP.	DATE			REV.
									2



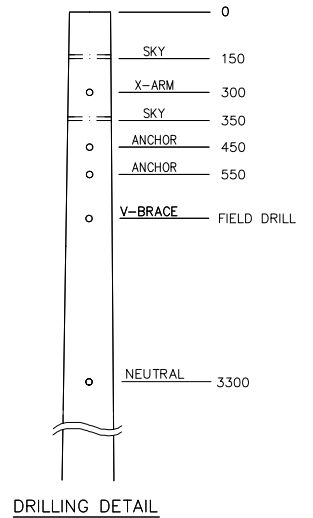
CROSSARM ORIENTATION
(DOUBLE ARM)



1. ALL HOLES ARE DRILLED 13/16" DIAMETER UNLESS OTHERWISE INDICATED
2. HARDWARE WITHIN 100MM MUST BE BONDED TOGETHER
3. UNLESS OTHERWISE INDICATED ALL DIMENSIONS ARE IN MILLIMETERS
4. FOR NEUTRAL, USE 2642
5. MAX TENSION CHANGE APPLIES WHEN USING DIFFERENT CONDUCTORS FOR AHEAD & BACK SPANS

CONDUCTOR	MAX SPAN (M)	MAX TENSION CHANGE (T1-T2) (N)
PELICAN	100	18086
PIGEON	140	11511

NOTE: MAX SPANS BASED ON CSA MED B LOADING, FLAT TERRAIN



REV	DATE	BY	CHECKED	DESCRIPTION	APP.	DATE	DRAWING No.	REV.
6							DRAWN BY JH JUL/08 TWO WAY DEADEND STRUCTURE CHECKED BY SHEET 2 OF 2 APPROVED BY	
5								
4								
3								
2	NOV/10	BN	NG	UPDATED DRILLING PATTERN	DCW	DEC/10	DRAWING No. 2778	REV. 2
1	JUN/10	ST	NG	UPDATED DRILLING DETAIL	AK	AUG/10		
							FORTISBC	

Fortis		Bill of Material			2010/12/09
Structure # 2778		25 KV THREE PHASE VERTICAL DOUB DEADEND			
Item #	UI	-1	-2	-3	Description
5020304		1	2	2	CROSSARM, WOOD, SAWN OR GLULAM WOOD
5110102		2	6	4	PIN, 6" TOP, 3/4 X 6.5" SHK, 1" PIN
5110135		1		1	PIN, POLE TOP, 24", 1" THREAD
5110269		1	1	1	BRACE, V, 60"
5132608		2	4	4	BOLT, MACHINE, GALV, 3/4" X 8",
5132612		2	2	4	BOLT, MACHINE, GALV, 3/4" X 12",
5132614		2	2	2	BOLT, MACHINE, GALV, 3/4" X 14",
5133628			3	3	BOLT, D.A. 3/4"X 28"
5135608		2			BOLT, SHOULDER EYE, 3/4 X 8"
5135616		1			BOLT, SHOULDER EYE, 3/4 X 16"
5141306		3	6	6	NUT, EYE, 3/4
5142106		1	1	1	WASHER, ROUND, 13/16" HOLE, 2" RIM
5142206		13	19	19	WASHER, SQ, 3 X 3 X 1/4, 13/16 HOLE
5142603		10	15	15	WASHER, SPRING LOCK, DOUBLE 3/4
5530131		3			CONNECTOR, COMPRESSION, AL, H-TYPE
5530136			3		CONNECTOR, COMPRESSION, AL, H-TYPE
5531447				3	CONN, W-TYPE, 477 - 477 OR 556 - 336,
5561306	SE	3			TIES, PRFD, DIST, BARE #2 SPARROW,
5561314	SE		1		TIES, PRFD, DIST, BARE 3/0 PIGEON,
5561389				1	TIES, PRFD. DIST. COND. BARE 477 PELICAN
5561395				2	DOUBLE TIE PRFD. DIST. BARE 477 PELICAN
5561396			2		DOUBLE TIE PRFD. DIST. BARE 3/0 PIGEON
5571652		6			CLAMP, CLEVIS D.E, #6 - 2/0 ACSR,
5571653			6		CLAMP, CLEVIS D.E, #4 - 336.4 ACSR,
5571654				6	CLAMP, CLEVIS D.E, 3/0 - 556.5 ACSR,
5710404		3	6	6	INSULATOR, 14.4/25kV, PIN TYPE, ANSI 55-5
5720402		6	6	6	INSULATOR, POLYMER, D.E, CLEVIS END,

REMARKS:

1) Intended Uses:

2778-1 is for #2 Haddock, see sheet 1 of 2.

2778-2 is for 3/0 ASCR.

2778-3 is for 477 ASCR.

2) For neutral use s2642.

3) For grounding use s2592.

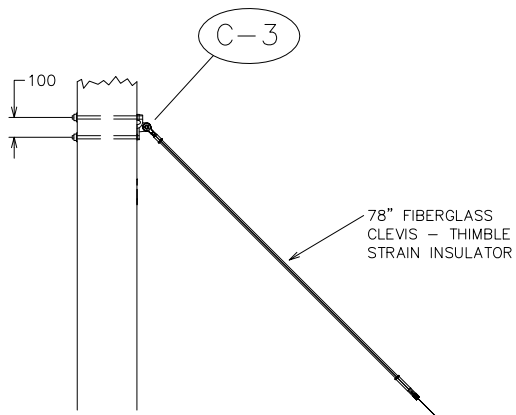
4) Guying and anchor materials are not included.

5) For use in Bird (Osprey) nesting area, use assembly H-31 and include the following materials:

FBC Item # QTY

5161003 1

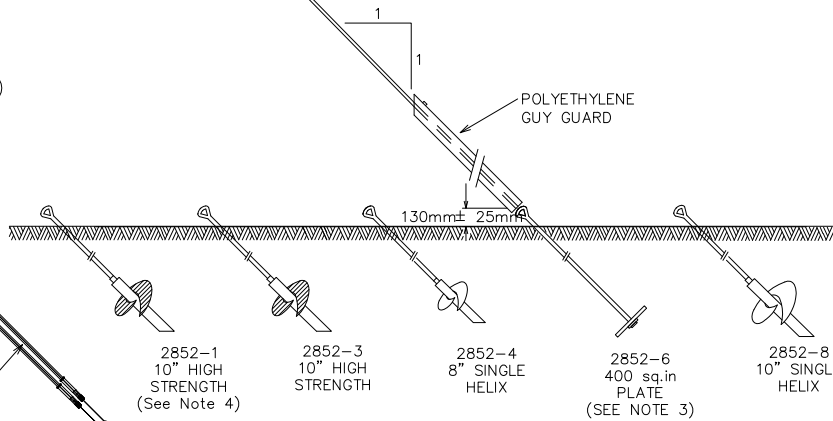
5790417 1



NOTE:

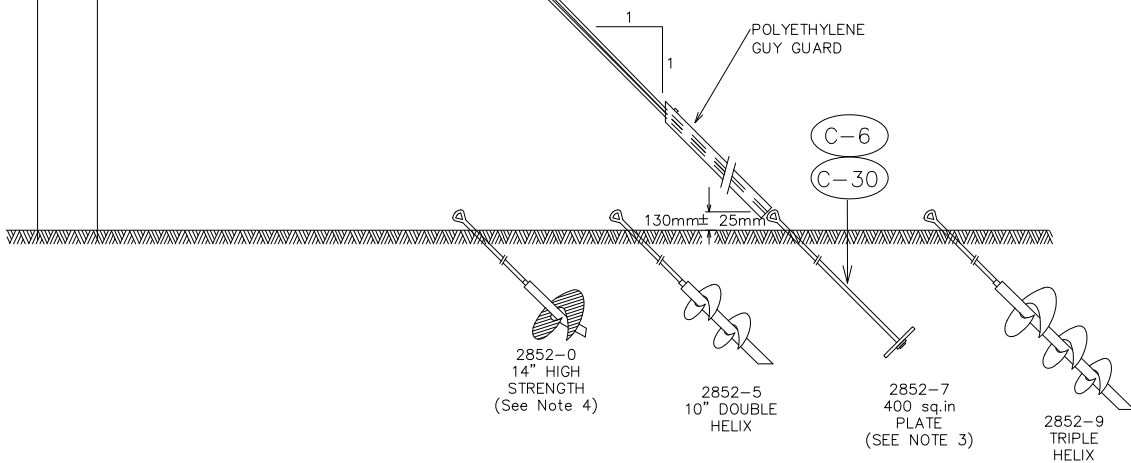
- 1 - LOCATION OF GUY ATTACHMENT AT POLE SHOWN ON PRIMARY AND SECONDARY STRUCTURE DRAWINGS
- 2 - ITEMS 517-1106 (EXTENSION ROD) AND 517-1152 (COUPLINGS) CAN BE USED WITH THE 10" SINGLE HELIX ANCHOR (517-0506)
- 3 - IN AREAS WITH LOW SOIL CLASS IT MAY BE NECESSARY TO IMBED THE CROSS-PLATE ANCHOR OF STRUCTURE 2852-6 OR -7 IN CONCRETE (SEE ASSEMBLY DRAWING C-30) WHICH WILL INCREASE THE HOLDING STRENGTH TO 160 kN IN CLASS 7 SOIL
- 4 - USE STRUCTURES 2852-0, 2852-1 AND 2852-3 IN SOIL CLASS 2, 3, AND 4 ONLY. REFER TO DRAWING 2800 FOR STRUCTURE HOLDING STRENGTH
- 5 - FOR 3 PHASE SERVICES, RISER POLES AND VERTICAL ANGLES WHERE THE PHASE SPACING HAS BEEN INCREASED, ADD A 12 INCH STRAIN INSULATOR (ITEM 579-0605).
ORDER 2 ADDITIONAL PREFORMED GRIPS
SEE STRUCTURE 2800 FOR MOUNTING DETAIL OF THE 12 INCH STRAIN INSULATOR
- 6 - WHEN INSTALLING TWO OPPOSING SIDE GUYS (BALANCED DOWNHAUL GUY AND ANCHOR FOR SOFT SOIL), INSTALL THE GUY ATTACHMENT 150mm FROM THE LOWEST ATTACHMENT ON THE POLE.

GUY WIRE GRIP



78" FIBERGLASS
CLEVIS - THIMBLE
STRAIN INSULATOR

GUY WIRE GRIP



2852-0
14" HIGH
STRENGTH
(See Note 4)

2852-5
10" DOUBLE
HELIX

2852-7
400 sq.in
PLATE
(SEE NOTE 3)

2852-9
TRIPLE
HELIX

6							
5							
4							
3							
2	NOV/10	BN	NG	CHANGED ASSEMBLY TO GUY TEE, CHANGED OWNERSHIP	DCW	DEC/10	
1	FEB/04		HN	ADDED NOTE 6 BALANCED GUY ANCHOR FOR SOFT SOIL	YE	FEB/04	
REV	DATE	BY	CHECKED	DESCRIPTION	APP.	DATE	

DRAWN BY	RS	OCT/02
CHECKED BY		
APPROVED BY	FC	OCT/02

SINGLE DOWNHAUL GUY AND ANCHOR WITH EXTENDED GUY STRAIN INSULATORS		DRAWING No.	REV.
		2852	2

FORTISBC

Structure # 2852 SINGLE DOWNHAUL GUY & ANCHOR

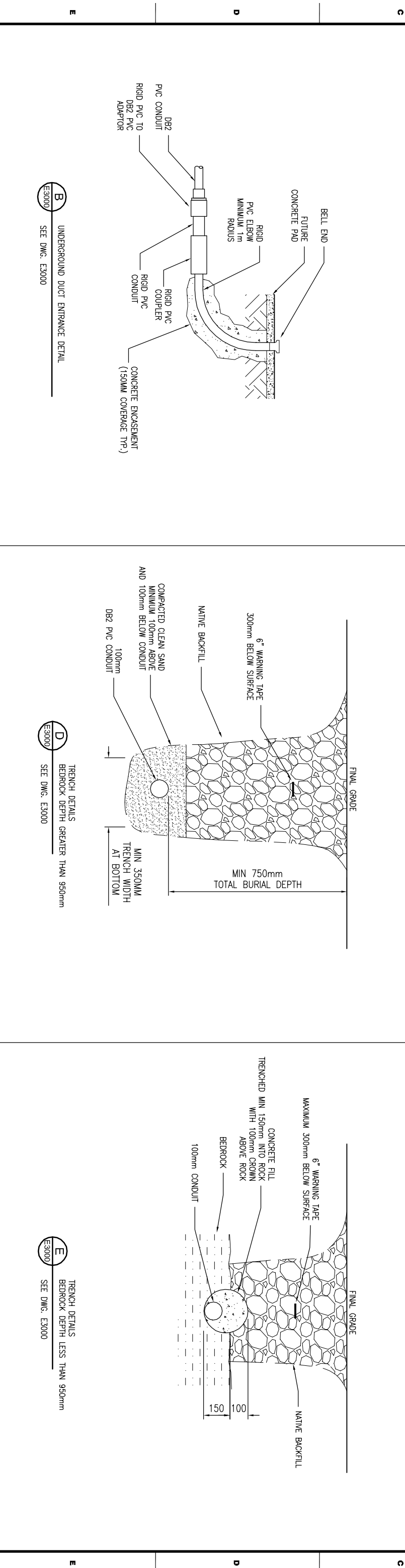
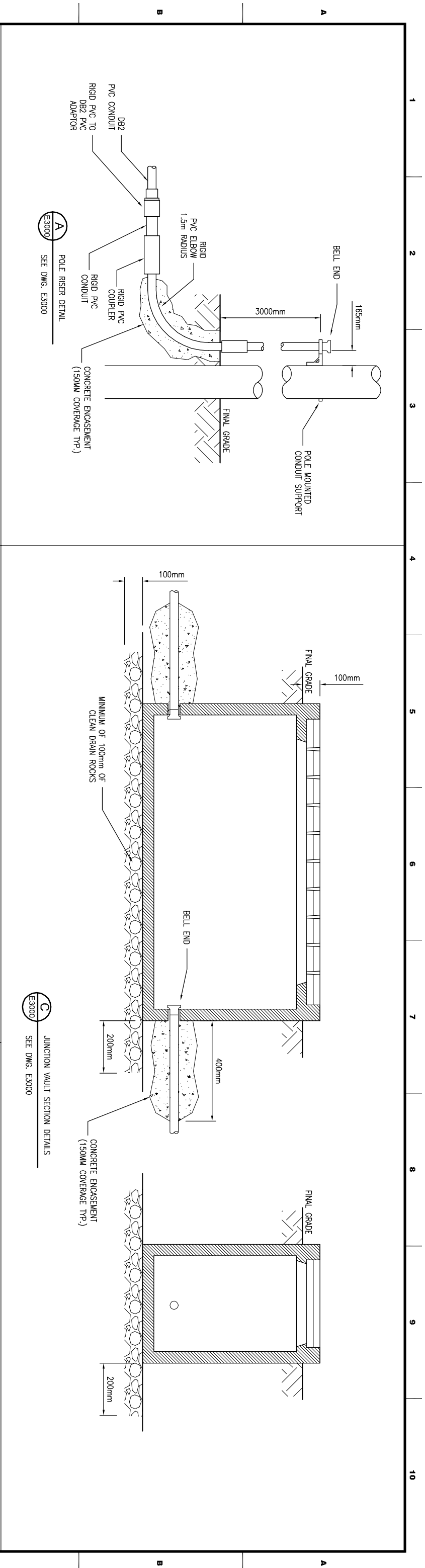
Item #	UI	-3	-6	-7	-8	-9	Description
5132612		2	2	2	2	2	BOLT, MACHINE, GALV, 3/4" X 12",
5142206		2	2		2		WASHER, SQ, 3 X 3 X 1/4, 13/16 HOLE
5142304				2			WASHER, CURVED, 4X4X3/8, 13/16 HOLE.
5142603		2	2	2	2	2	WASHER, SPRING LOCK, DOUBLE 3/4
5170302			1	1			ANCHOR, XPLATE, 400 SQ IN
5170511					1		ANCHOR, SCREW, 10" SGL HELIX ONLY
5170513		1					ANCHOR, 10" SINGLE HELIX, 10,000 FT. LBS
5170515						1	ANCHOR, TRIPLE HELIX, 1.5" Sq., 10", 12", 14"
5171106		1			1		ROD, EXT FOR PISA, 1" X 7'
5171109						1	ROD, EXT FOR 517-0515 1.5" x 1.5" x 7'
5171112			1	1			ROD, ANCHOR, 1"x10ft. FORGED TRIPLE EYE
5171206		1			1		NUT, TWIN EYE, GLV, FOR 3/4" OR 1" ROD
5171208						1	NUT, TRIPLEEYE, ACHR TERMINATOR
5172605		1	1		1		HOOK, GUY, COMBINATION
5172606				1		1	GUYING TEE, DOUBLE
5173052		1	1	1	1	1	GUARD, GUY, 7', ORANGE, POLYETHEYLENE
5380107	M	16	16	32	16	32	WIRE, GUY 7/16, 7 WIRE STEEL STRAND
5560107		2	2	4	2	4	GRIP, PRFD DE, FOR 7/16" GUY, 40" GREEN,
5790609		1	1	2	1	2	GUY STRAIN INSULATOR, 78" LONG

Project: Research Facility on White Lake Road, Kaleden DB-07361

Material	Description	Qty	Notes
4910302	SIGN, "DANGER BURIED CABLE"	2	
4910304	SIGN, ALUMINUM, DANGER, 16 X 9 CM	1	
4945010	TAG, ALMETEK, 3", LETTER A	1	
4945011	TAG, ALMETEK, 3", LETTER B	1	
4945012	TAG, ALMETEK, 3", LETTER C	1	
4947059	TAG, HOLDER, APPROX. 16" LONG, ALUMINUM	1	
5010453	POLE, WOOD, 45 FOOT, CLASS 3	2	
5020207	CROSSARM, WOOD, SAWN OR GLULAM WOOD	2	
5020304	CROSSARM, WOOD, SAWN OR GLULAM WOOD	2	
5110102	PIN, 6" TOP, 3/4 X 6.5" SHK, 1" PIN	2	
5110135	PIN, POLE TOP, 24", 1" THREAD	1	
5110252	BRACE, FLAT, 34" LONG	4	
5110269	BRACE, V, 60"	2	
5110301	RACK, SECONDARY, 1 WIRE, UNIT MOUNT	1	
5132606	BOLT, MACHINE, GALV, 3/4" X 6"	2	
5132608	BOLT, MACHINE, GALV, 3/4" X 8",	4	
5132612	BOLT, MACHINE, GALV, 3/4" X 12"	11	
5132614	BOLT, MACHINE, GALV, 3/4" X 14"	11	
5132616	BOLT, MACHINE, GALV, 3/4" X 16"	2	
5132618	BOLT, MACHINE, GALV, 3/4" X 18",	4	
5135608	BOLT, SHOULDER EYE, 3/4 X 8"	4	
5135612	BOLT, SHOULDER EYE, 3/4 X 12"	1	
5135616	BOLT, SHOULDER EYE, 3/4 X 16"	1	
5135620	BOLT, SHOULDER EYE, 3/4 X 20"	1	
5138401	BOLT, LAG, GALVANIZED, 1/2" X 4"	9	
5141106	NUT, UNFIN SQ, GLV 3/4	4	
5141306	NUT, EYE, 3/4	5	
5142106	WASHER, ROUND, 13/16" HOLE, 2" RIM	9	
5142206	WASHER, SQ, 3 X 3 X 1/4, 13/16 HOLE	44	
5142304	WASHER, CURVED, 4X4X3/8, 13/16 HOLE	6	
5142603	WASHER, SPRING LOCK, DOUBLE 3/4	45	
5150231	BRACKET, CABLE SUPPORT, DIA. .75"- 2.0"	3	
5160303	STAPLE, 1/2"X2", H/P GLV. 'U' TYPE	30	
5170302	ANCHOR, XPLATE, 400 SQ IN	3	
5171112	ROD, ANCHOR, 1"x10ft. FORGED TRIPLE EYE	3	
5172605	HOOK, GUY, COMBINATION	2	
5173052	GUARD, GUY, 7', ORANGE, POLYETHEYLENE	2	
5310205	WIRE, CU STR, 500MCM, BARE, SOFT DRAWN	15	
5310440	WIRE, 4 AWG, 7STR, 600V, TWU GREEN,	46	
5311105	CONDUCTOR,CU STR, #4 POLY,600V,RW90,	22	
5311106	CONDUCTOR,CU STR, #2 POLY,600V,RW90	8	
5320204	CONDUCTOR, ACSR, #2 SB HADDOCK	280	
5380107	WIRE, GUY 7/16, 7 WIRE STEEL STRAND	32	
5390602	CAROLPRENE 4GA WELDING CABLE 600 VOLT	5	
5530130	CONNECTOR, COMPRESSION, AL, H-TYPE	8	
5530131	CONNECTOR, COMPRESSION, AL, H-TYPE	9	
5530138	CONNECTOR, COMP PG	3	
5530502	CLAMP, HOT LINE, 336.4 MCM : #6 ACSR	12	
5531021	CLAMP, STIRRUP, 6-2/0 ACSR	3	
5531447	CONN, W-TYPE, 477 - 477 OR 556 - 336,	6	
5531591	CARTRIDGE,SHELL,BLUE	2	
5531615	CONNECTOR, AMPACT CU, 3/4 ROD TO 2 AWG	2	
5560107	GRIP,PRFD DE, FOR 7/16"GUY, 40" GREEN,	4	

Project: Research Facility on White Lake Road, Kaleden DB-07361


5561306	TIES, PREFORMED, DISTRIBUTION #2	3	
5571202	GROUND MAT, 1200MM X 1800MM	1	
5571308	ROD, GROUND, COPPERBONDED, PLAIN 3/4"ROD	2	
5571652	CLAMP,CLEVIS D.E, #6 - 2/0 ACSR,	11	
5590303	SEALER, AIR FOR CONNECTORS	4	
5590502	TIE, CABLE WRAP, BLACK	15	
5710404	INSULATOR, 14.4/25kV,PIN TYPE, ANSI 55-5	3	
5720402	INSULATOR, POLYMER, D.E, CLEVIS END,	15	
5740105	TERMINATION KIT, 15/25KV, #2 CU	3	
5780305	TAPE, VINYL, 3/4" x 66' CSA APPROVED	1	
5780311	TAPE, LINERLESS SPLICING, 1 X 30	1	
5790415	PROTECTOR, WILDLIFE, L.A. BRACKET	3	
5790600	LINK, EXTENSION, FIBER GLASS	8	
5790609	GUY STRAIN INSULATOR, 78" LONG	2	
5810122	ARRESTER, LIGHTNING, 10 KV. DIST. CLASS	3	
5821045	SWITCH,LOADBREAK,SOLID BLADE,27KV,100A	3	
5881315	FUSE LINK, 15 AMP., FITALL, TYPE T	3	
5890417	BRACKET,CROSSARM MOUNTING L.A. & CUTOUT	9	
5890436	BRACKET,L/A,FOR S&C AIRBREAK SW. STRUCT.	3	
5890450	BRACKET, ALUMINUM, STANDOFF	4	
5890455	BRACKET, T SLOT, 4 WAY,12 INCHES LONG	4	
6310507	STRAP,GALV, 2 HOLE,FOR 3/4"RIGID CONDUIT	10	
6311110	STRAP, KIT, GALV, FOR 4",	4	
6320106	PIPE, GROUND GUARD, 8', 3/4" DIA SERIES	2	
6323051	PIPE, RIGID PVC, 10' 4" 4.026" ID	5	
6323454	END BELLS, FOR 4" RIGID PVC, GREY,	1	
5390601	WIRE, CU TINNED, BRAIDED STRAP, #2, 1" W	2	
5530323	CONNECTOR, SPLIT BOLT, #2 SOLID	2	
5530601	CLAMP, U-BOLT, COPPER, 1 1/4"	1	
5530650	CLAMP, GRD, #4 SOL-#2/0 STR, CU TO BAR	1	
5531023	CLAMP, STIRRUP, 2/0-477 ACSR	6	
5771654	CLAMP, CLEVIS D.E, 3/0 - 556.5 ACSR,	6	
5810114	ARRESTER, 21kV, DIST, 10kA, POLYMER HOUSING	6	
5822026	SWITCH, A.B., 1200A INT STYLE	1	(S&C 147423 900A OR EQUIVALENT ARE ACCEPTABLE FOR THIS APPLICATION)



- NOTES:
1. INSTALLATION TO COMPLY WITH ALL REQUIREMENTS OF CEC C22.1-15.
 2. GROUT SHALL BE USED TO ENSURE ADEQUATE SEAL BETWEEN DUCT & BOX.
 3. BELL ENDS TO BE FLUSH WITH BOX.
 4. LID TO BE 100mm ABOVE FINAL GRADE.

REV.	DESCRIPTION	DRAWN	CHECKED	DESIGNED	DATE
A	ISSUED FOR REVIEW	RJH	CS	RD	29AUG14

CLIENT:



NATIONAL RESEARCH COUNCIL CANADA
DOMINION ROAD ASTROPHYSICAL OBSERVATORY

DESIGN BY:



#105 - 78 Industrial Ave., W. Pentlicon BC, V2A6M2
www.strutherstech.com

PROJECT TITLE: **DRAO - 15kV CABLE CONDUIT**

TITLE: **ELECTRICAL CONDUIT SECTION DETAILS**

SCALE: N/A

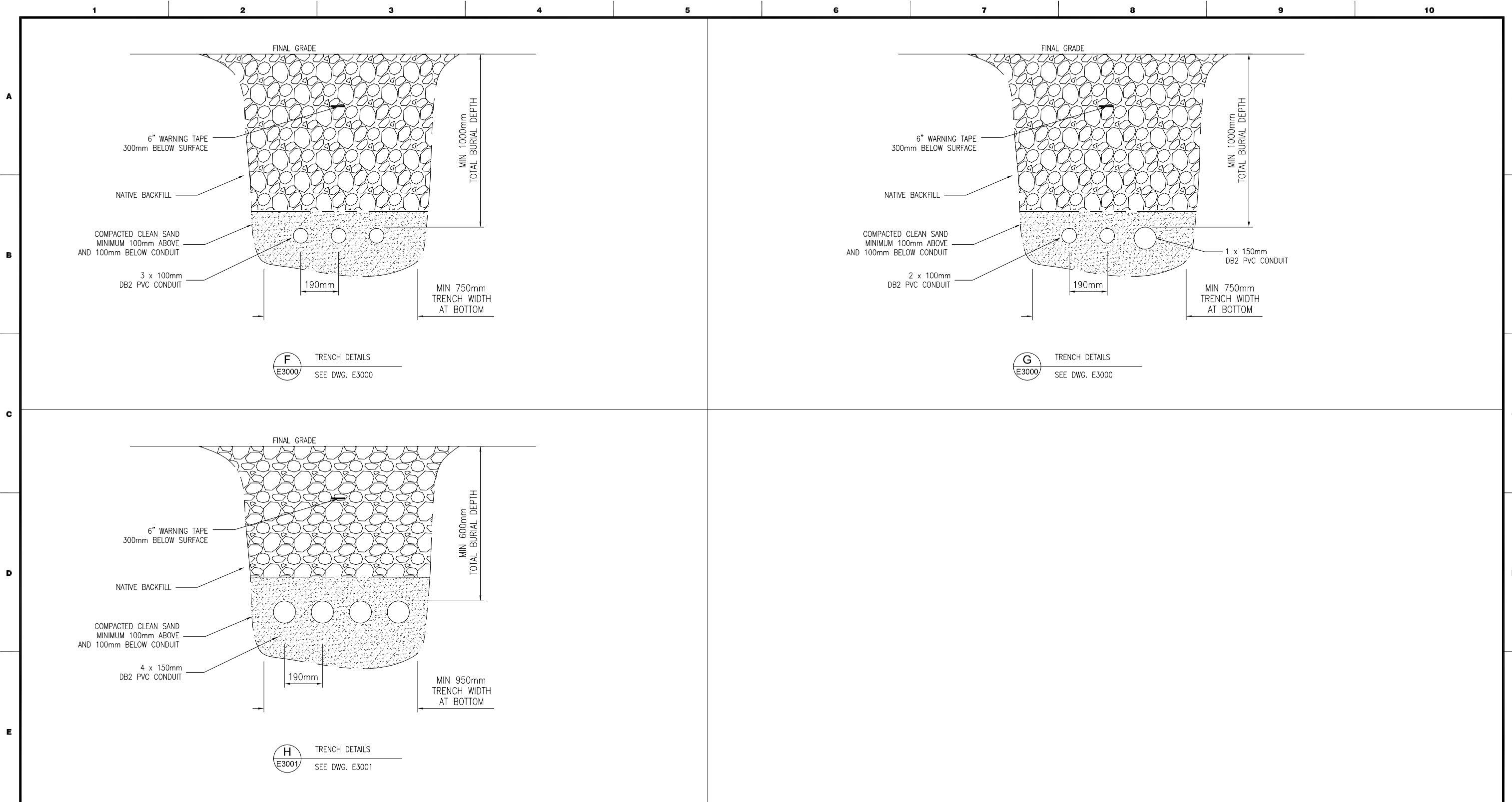
PROJECT DWG. NO.: **E3100**

JOB NO.:

SHT.: **1**

REV.: **A**

SIZE: ANS I B 11 x 17 INCH



F TRENCH DETAILS
E3000 SEE DWG. E3000

G TRENCH DETAILS
E3000 SEE DWG. E3000

H TRENCH DETAILS
E3001 SEE DWG. E3001

- NOTES:
1. GROUT SHALL BE USED TO ENSURE ADEQUATE SEAL BETWEEN DUCT & BOX.
 2. BELL ENDS TO BE FLUSH WITH BOX.
 3. LID TO BE 100mm ABOVE FINAL GRADE.

REV.	DESCRIPTION	DRAWN	CHECKED	DESIGNED	DATE
D	ADDED "H" DETAIL	HSG	RD	RD	29APR15
C	ADDED 100mm CONDUIT	HSG	RD	RD	27MAR15
B	ADDED 150mm CONDUIT	RJH	RD	RD	29SEPT14
A	ISSUED FOR REVIEW	RJH	CS	RD	17SEPT14
REVISIONS					

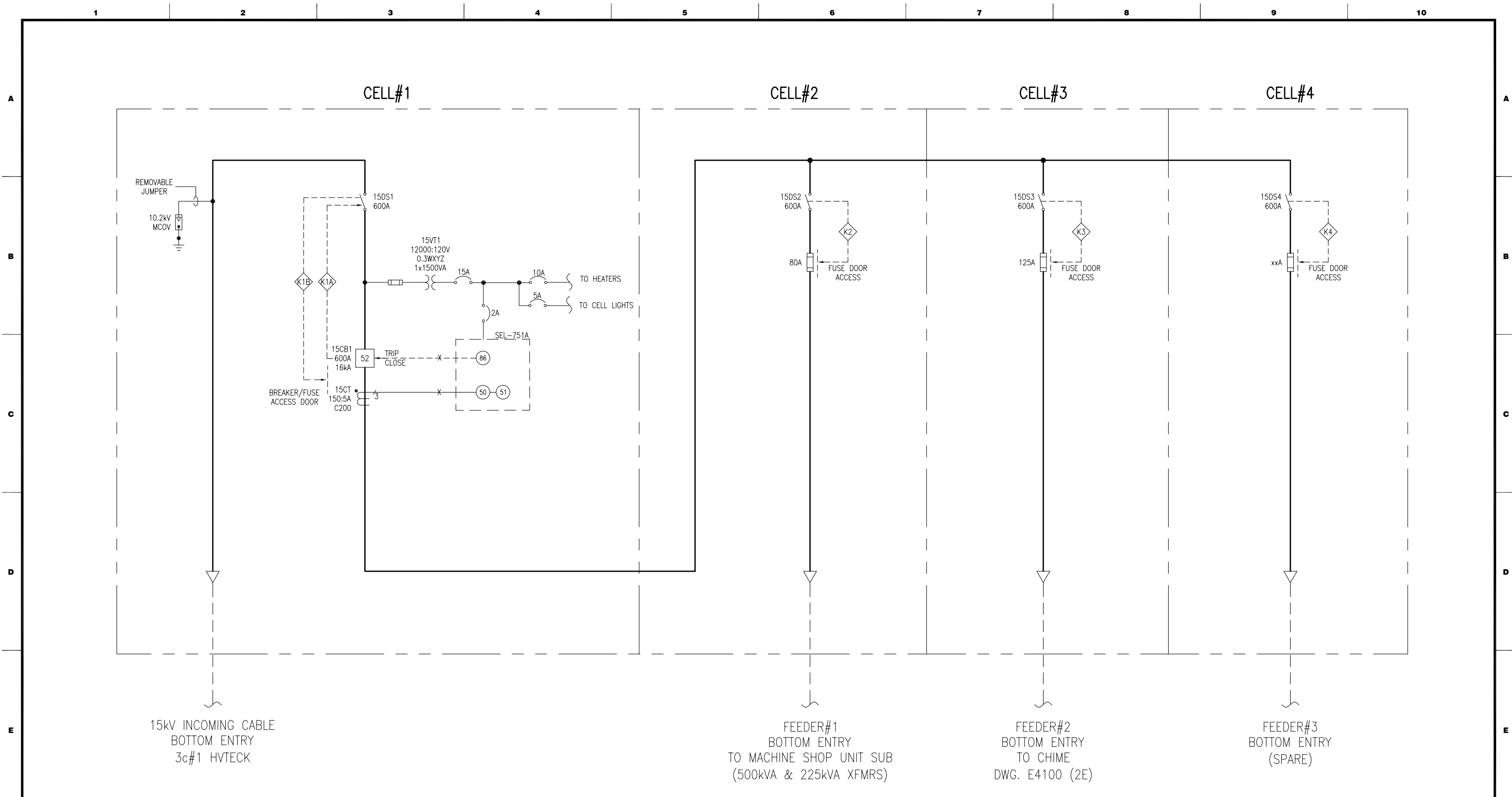
CLIENT:



DESIGN BY:



PROJECT TITLE: DRAO - 15kV CABLE CONDUIT			
TITLE: ELECTRICAL CONDUIT SECTION DETAILS			
SCALE: N/A	JOB NO.:		
PROJECT	DWG.No. E3101	SHT. 1	REV. D



NOTES:

REV.	DESCRIPTION	DRAWN	CHECKED	DESIGNED	DATE
B	ISSUED FOR TENDER	RJH	RD	RD	17MAR15
A	PRELIMINARY	SAN	RD	RD	29JAN15
REVISIONS					

CLIENT:



NATIONAL RESEARCH COUNCIL CANADA
DOMINION ROAD ASTROPHYSICAL OBSERVATORY

DESIGN BY:



#105 - 78 Industrial Ave. W Penticton BC. V2A6M2
www.struthers-tech.com

PROJECT TITLE:

DRAO OBSERVATORY

TITLE:

**15kV OUTDOOR SWITCHGEAR
ELECTRICAL
SINGLE LINE DIAGRAM**

SCALE: N/A

JOB NO.:

PROJECT

DWG.No.

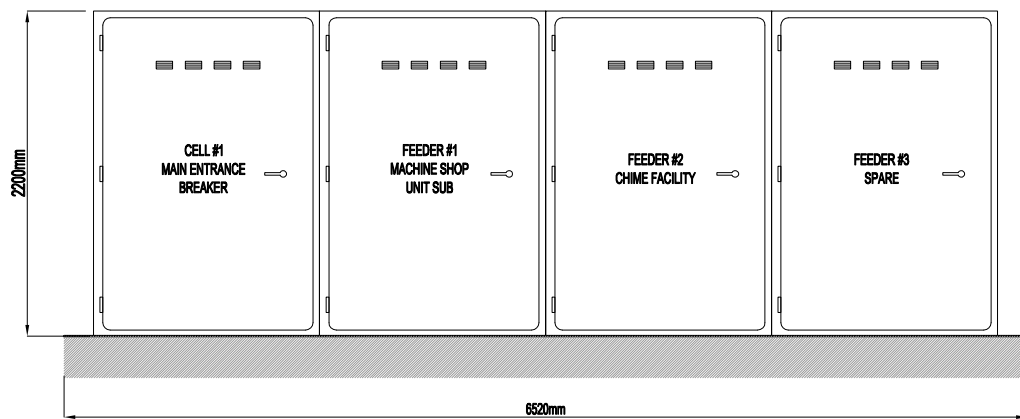
E-4000

SHT.

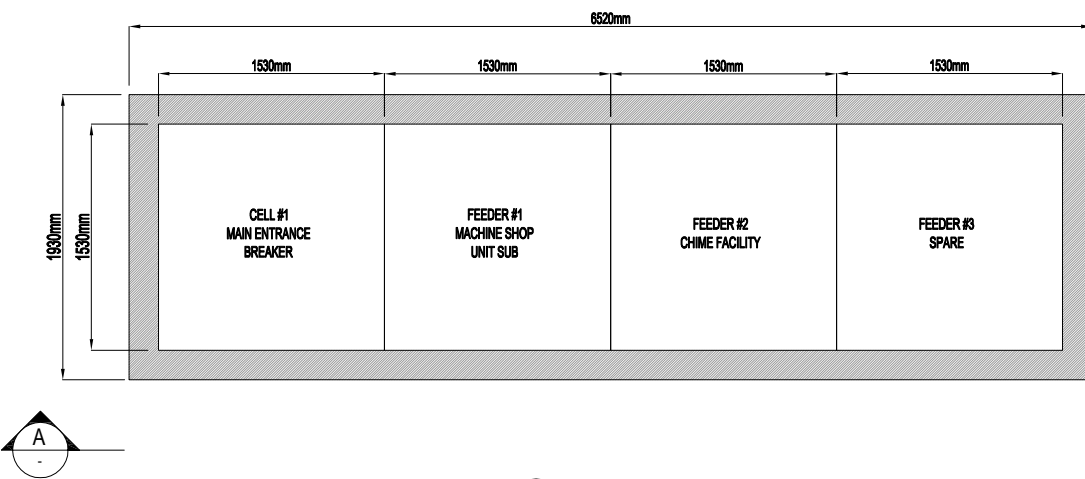
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REV.

B



A
-
ELEVATION VIEW



B
-
PLAN VIEW

TENDER
NOT FOR CONSTRUCTION

NOTES:
1. INSTALLATION TO COMPLY WITH ALL REQUIREMENTS OF CEC C22.1-15.

REV.	DESCRIPTION	DRAWN	CHECKED	DESIGNED	DATE
A	ISSUED FOR TENDER	RJH	RD	RD	18MAR15
REVISIONS					

CLIENT:



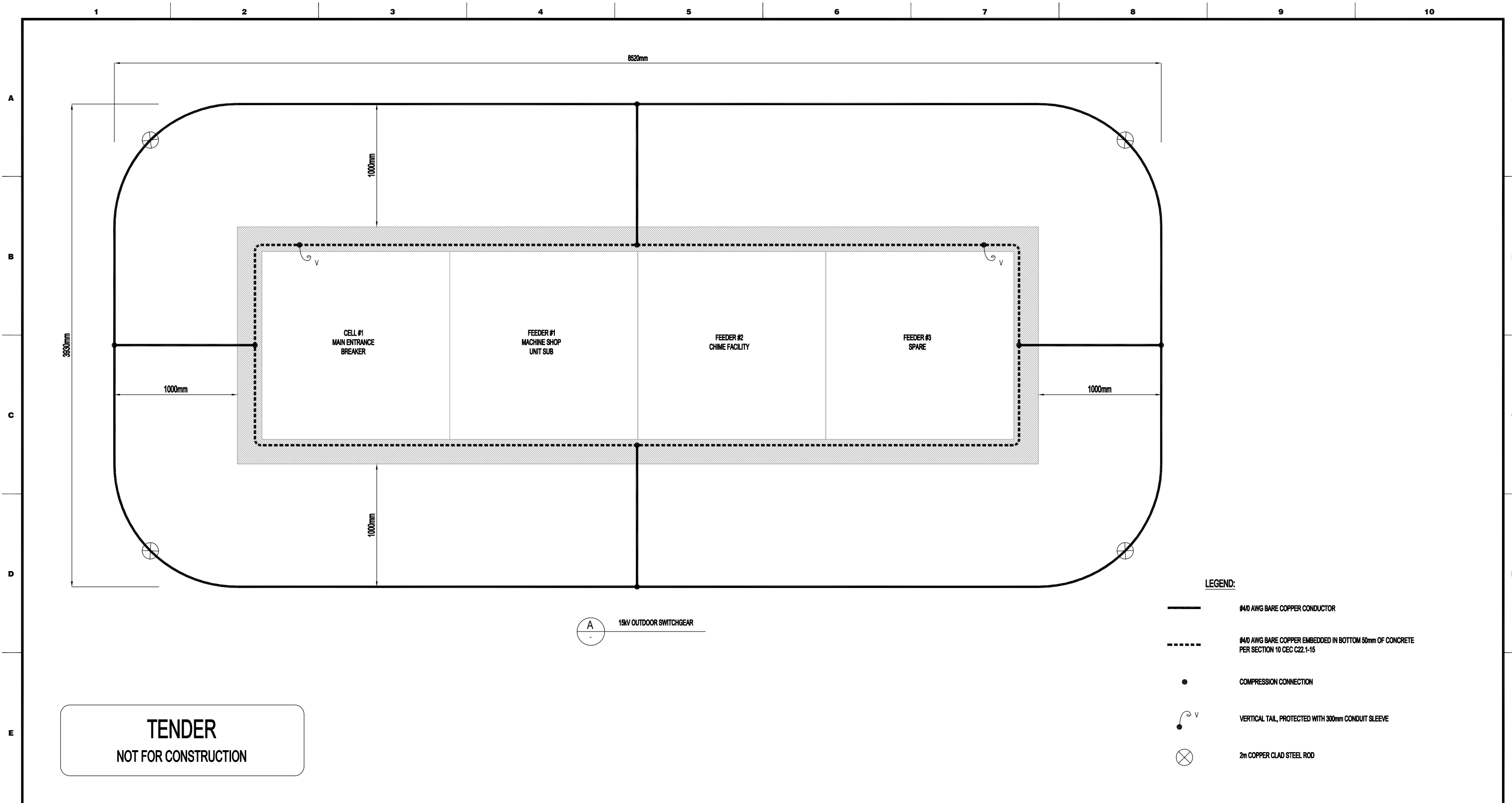
NATIONAL RESEARCH COUNCIL CANADA
DOMINION ROAD ASTROPHYSICAL OBSERVATORY

DESIGN BY:



#105 - 78 Industrial Ave. W Penticton BC. V2A6M2
www.struthers-tech.com

PROJECT TITLE: DRAO OBSERVATORY			
TITLE: 15kV OUTDOOR SWITCHGEAR ELECTRICAL EQUIPMENT LAYOUT			
SCALE: 1:50	JOB NO.:		
PROJECT	DWG.No. E4050	SHT. 1	REV. A



TENDER
 NOT FOR CONSTRUCTION

- LEGEND:**
- #4/0 AWG BARE COPPER CONDUCTOR
 - #4/0 AWG BARE COPPER EMBEDDED IN BOTTOM 50mm OF CONCRETE PER SECTION 10 CEC C22.1-15
 - COMPRESSION CONNECTION
 - VERTICAL TAIL, PROTECTED WITH 300mm CONDUIT SLEEVE
 - 2m COPPER CLAD STEEL ROD

NOTES:
 1. INSTALLATION TO COMPLY WITH ALL REQUIREMENTS OF CEC C22.1-15.
 2. PERIMETER GROUNDING LOOP TO BE BURIED 0.5m BELOW FINISHD GRADE.

REV.	DESCRIPTION	DRAWN	CHECKED	DESIGNED	DATE
A	ISSUED FOR TENDER	RJH	RD	RD	18MAR15
REVISIONS					

CLIENT:

NATIONAL RESEARCH COUNCIL CANADA
 DOMINION ROAD ASTROPHYSICAL OBSERVATORY

DESIGN BY:

#105 - 78 Industrial Ave. W Penticon BC. V2A6M2
 www.struthers-tech.com

PROJECT TITLE: DRAO OBSERVATORY			
TITLE: 15kV OUTDOOR SWITCHGEAR ELECTRICAL GROUNDING LAYOUT			
SCALE: 1:30	JOB NO.:		
PROJECT	DWG.No.	SHT.	REV.
E4051		1	A

1 2 3 4 5 6 7 8 9 10

A




B

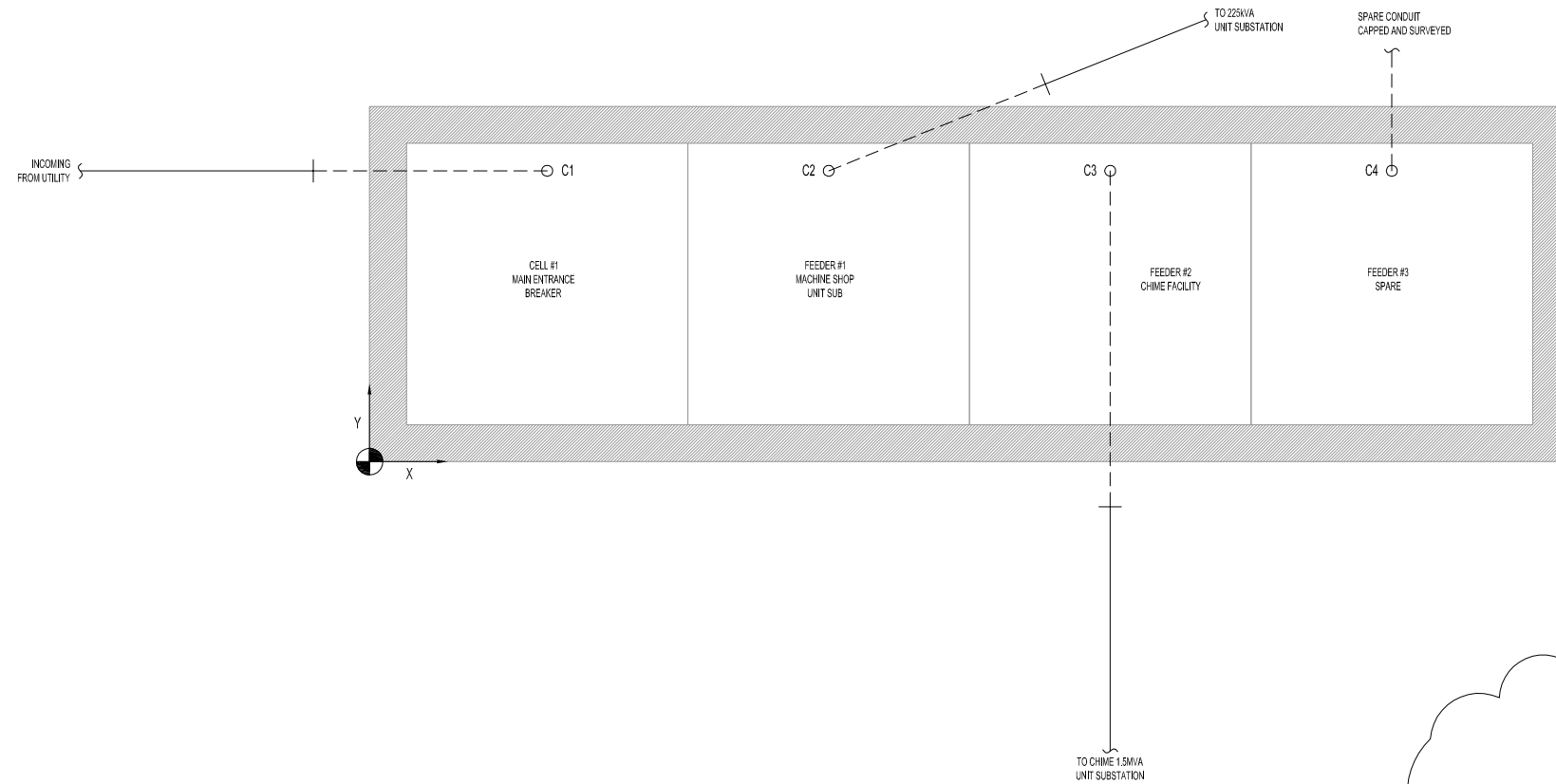
C

D

E

LEGEND

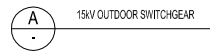
-  COORDINATE ORIGIN POINT
-  CONDUIT INSTALLED IN 2014
-  CONDUIT TO BE INSTALLED IN 2015



TENDER
NOT FOR CONSTRUCTION

HOLD

	COORDINATES			
	MIN. DEPTH (mm)	SIZE (mm)	"X" (mm)	"Y" (mm)
C1	-	-	965	1580
C2	-	-	2495	1580
C3	-	-	4025	1580
C4	-	-	5555	1580



NOTES:
1. INSTALLATION TO COMPLY WITH ALL REQUIREMENTS OF CEC C22.1-15.

REV.	DESCRIPTION	DRAWN	CHECKED	DESIGNED	DATE
B	CONDUIT LAYOUT MODIFIED	HSG	RD	RD	30APR15
A	ISSUED FOR TENDER	RJH	RD	RD	18MAR15

REVISIONS

CLIENT:



NATIONAL RESEARCH COUNCIL CANADA
DOMINION ROAD ASTROPHYSICAL OBSERVATORY

DESIGN BY:



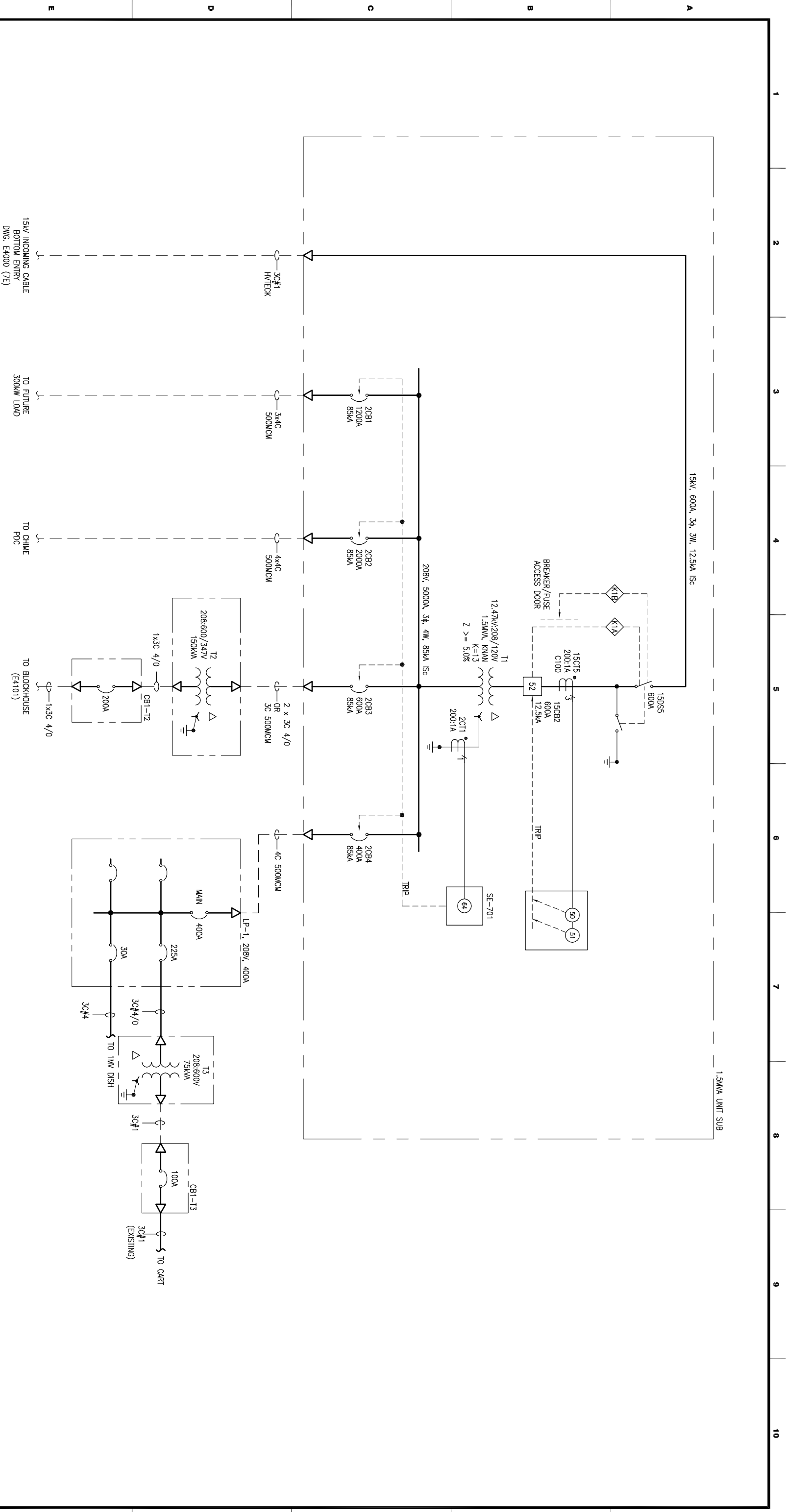
#105 - 78 Industrial Ave. W Penticton BC, V2A6M2
www.strutherstech.com

PROJECT TITLE: **DRAO OBSERVATORY**

TITLE: **15kV OUTDOOR SWITCHGEAR ELECTRICAL CONDUIT LAYOUT**

SCALE: 1:30	JOB NO.:	SHT. 1	REV. B
PROJECT	DWG.No. E4052		

1 2 3 4 5 6 7 8 9 10



- NOTES:
1. INSTALLATION TO COMPLY WITH ALL REQUIREMENTS OF CEC C22-1-15.
 2. ALL CABLES TO BE TECK90, CU, 90°C, UNLESS OTHERWISE SPECIFIED.

REV.	DESCRIPTION	DRAWN	CHECKED	DESIGNED	DATE
A	PRELIMINARY	SAN	RD	RD	3FEB15
B	REVISED DESIGN	RJH	RD	RD	17MAR15
C	ISSUED FOR TENDER	RJH	CS	RD	18MAR15
D	REVISED CABLE SIZE	HSG	RD	RD	28APR15

REVISIONS					
REV.	DESCRIPTION	DRAWN	CHECKED	DESIGNED	DATE

CLIENT:



NATIONAL RESEARCH COUNCIL CANADA
DOMINION ROAD ASTROPHYSICAL OBSERVATORY

DESIGN BY:



#105 - 78 Industrial Ave, W Penikese BC, V2A6N2
www.strutherstech.com

PROJECT TITLE:

DRAO OBSERVATORY
CHIME SITE
ELECTRICAL
SINGLE LINE DIAGRAM

TITLE:

SCALE: N/A
PROJECT DWG. No. **E4100**
JOB NO.:

SCALE: N/A

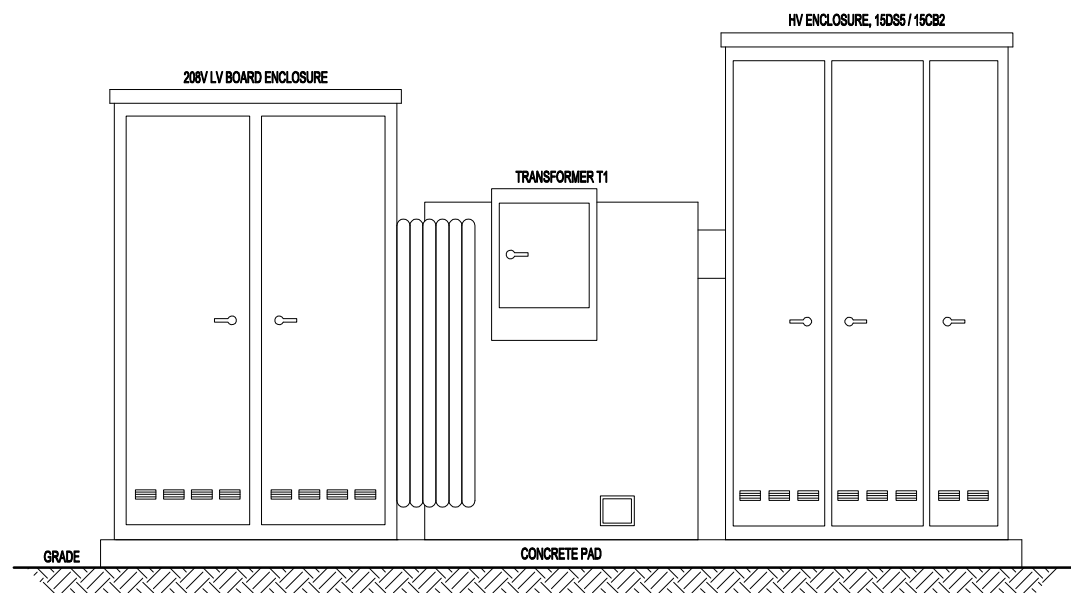
DWG. No.

E4100

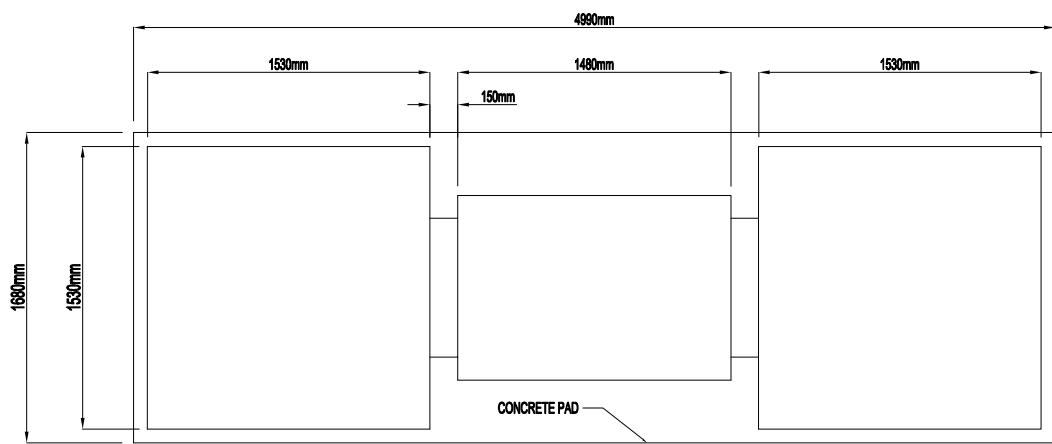
SHT. **1**

REV. **D**

SIZE: ANSI_B 11 x 17 INCH



A
-
ELEVATION VIEW



A
-
PLAN VIEW

B
-
PLAN VIEW

TENDER
NOT FOR CONSTRUCTION

NOTES:
1. INSTALLATION TO COMPLY WITH ALL REQUIREMENTS OF CEC C22.1-15.

REV.	DESCRIPTION	DRAWN	CHECKED	DESIGNED	DATE
A	ISSUED FOR TENDER	RJH	RD	RD	18MAR15
REVISIONS					

CLIENT:



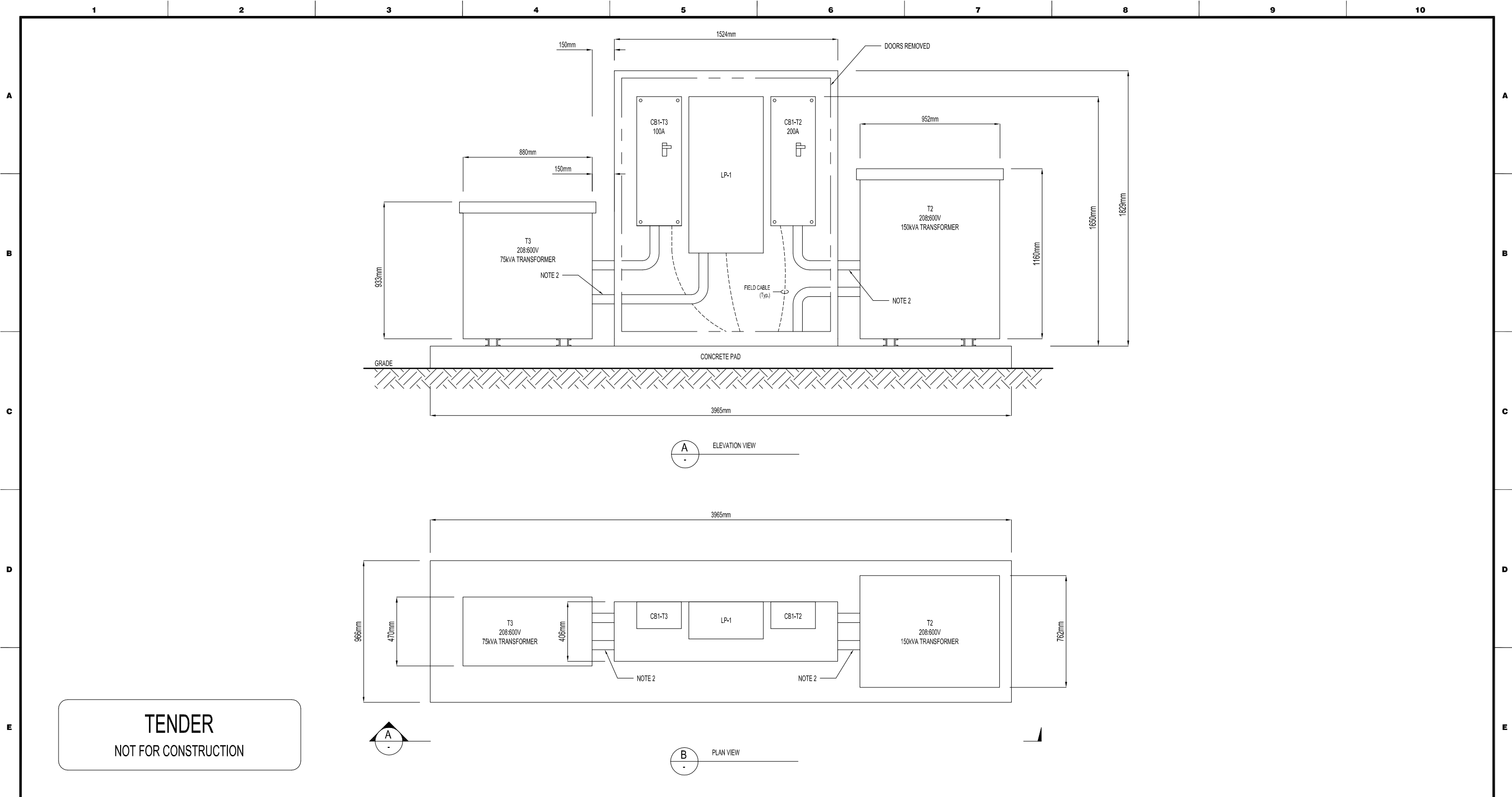
NATIONAL RESEARCH COUNCIL CANADA
DOMINION ROAD ASTROPHYSICAL OBSERVATORY

DESIGN BY:



#105 - 78 Industrial Ave. W Penticton BC. V2A6M2
www.struthers-tech.com

PROJECT TITLE: DRAO OBSERVATORY			
TITLE: CHIME SITE ELECTRICAL UNIT SUBSTATION LAYOUT			
SCALE: 1:40	JOB NO.:		
PROJECT	DWG.No. E4150	SHT. 1	REV. A



NOTES:
 1. INSTALLATION TO COMPLY WITH ALL REQUIREMENTS OF CEC C22.1-15.
 2. GALVANIZED RIGID CONDUIT.

REV.	DESCRIPTION	DRAWN	CHECKED	DESIGNED	DATE
B	ADDED CONDUIT	HSG	RD	RD	28APR15
A	ISSUED FOR TENDER	RJH	RD	RD	18MAR15
REVISIONS					

CLIENT:



NATIONAL RESEARCH COUNCIL CANADA
 DOMINION ROAD ASTROPHYSICAL OBSERVATORY

DESIGN BY:



#105 - 78 Industrial Ave. W Penticton BC. V2A6M2
 www.struthers-tech.com






PROJECT TITLE: **DRAO OBSERVATORY**

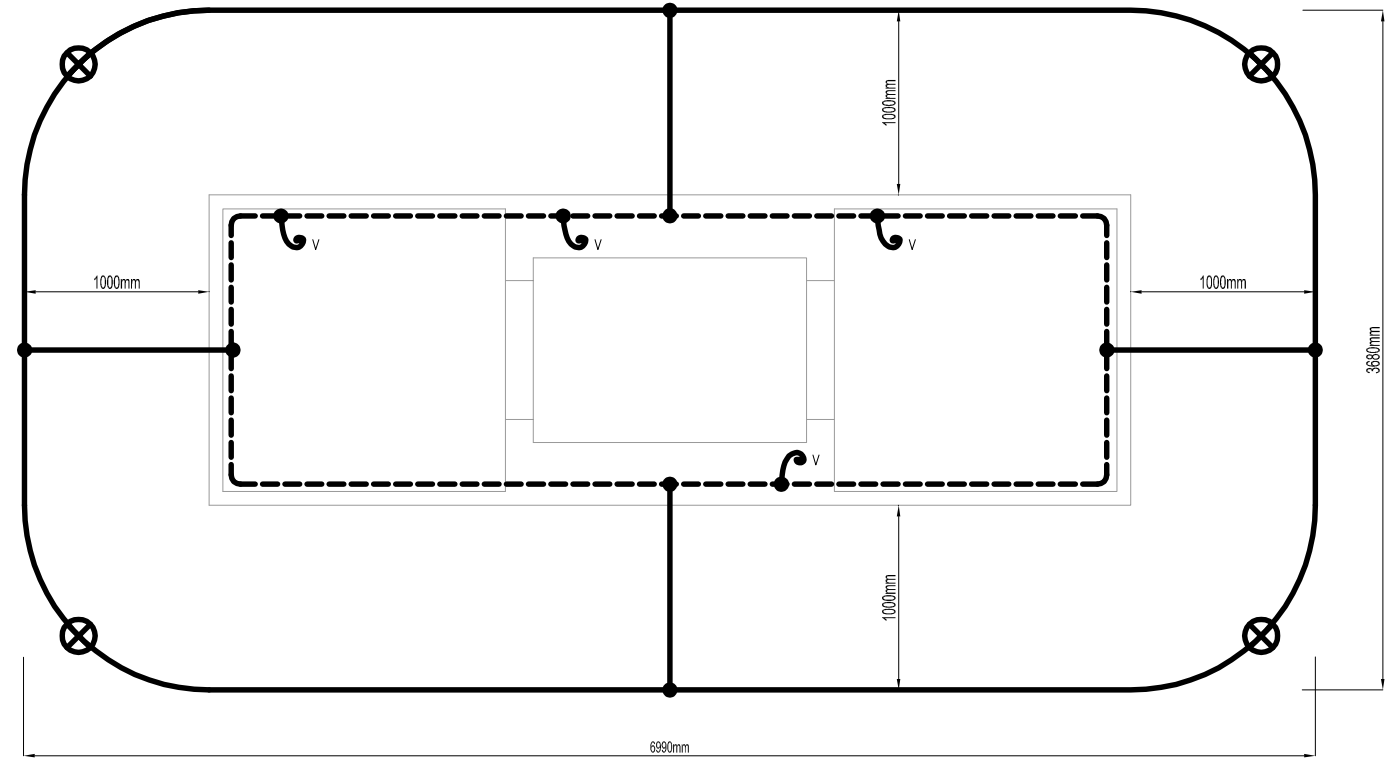
TITLE: **CHIME SITE ELECTRICAL LV EQUIPMENT LAYOUT**

SCALE: 1:25 JOB NO.: SHT. **1** REV. **B**

PROJECT: **E4151**

TENDER
NOT FOR CONSTRUCTION

- LEGEND:**
-  #4/0 AWG BARE COPPER CONDUCTOR
 -  #4/0 AWG BARE COPPER EMBEDDED IN BOTTOM 50mm OF CONCRETE PER SECTION 10 CEC C22.1-15
 -  COMPRESSION CONNECTION
 -  VERTICAL TAIL, PROTECTED WITH 300mm CONDUIT SLEEVE
 -  2m COPPER CLAD STEEL ROD



A
15kV UNIT SUBSTATION

NOTES:
1. INSTALLATION TO COMPLY WITH ALL REQUIREMENTS OF CEC C22.1-15.
2. PERIMETER GROUNDING LOOP TO BE BURIED 0.5m BELOW FINISHED GRADE.

REV.	DESCRIPTION	DRAWN	CHECKED	DESIGNED	DATE
B	LAYOUT CHANGED	HSG	RD	RD	27APR15
A	ISSUED FOR TENDER	RJH	RD	RD	18MAR15
REVISIONS					

CLIENT:



NATIONAL RESEARCH COUNCIL CANADA
DOMINION ROAD ASTROPHYSICAL OBSERVATORY

DESIGN BY:



#105 - 78 Industrial Ave. W Penticton BC. V2A6M2
www.struthers-tech.com

PROJECT TITLE:
DRAO OBSERVATORY

TITLE:
CHIME SITE ELECTRICAL GROUNDING LAYOUT




SCALE: 1:30 JOB NO.:

PROJECT: DWG.No. SHT. REV.

E4152 **1** **B**

TENDER
NOT FOR CONSTRUCTION

LEGEND

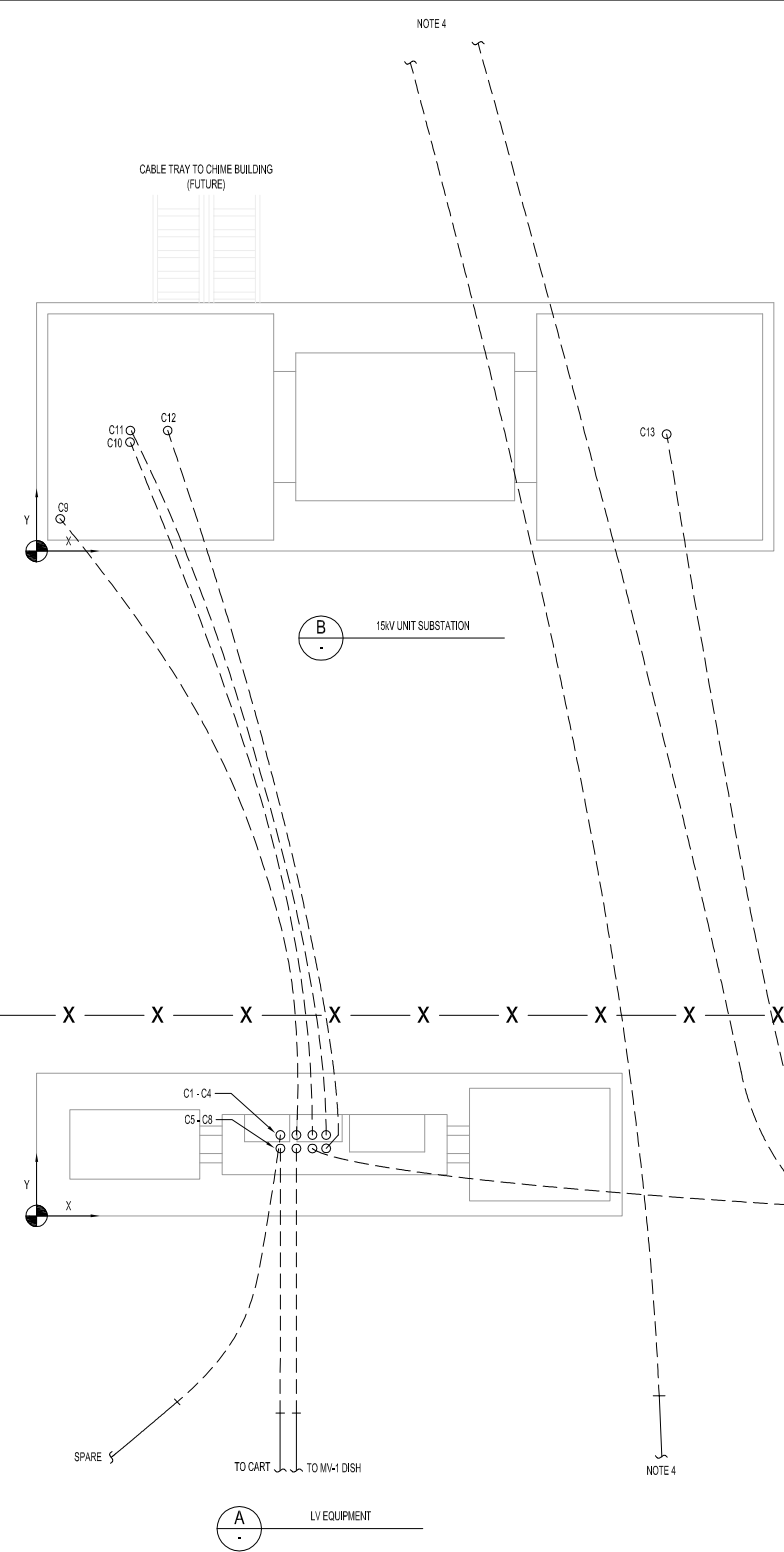
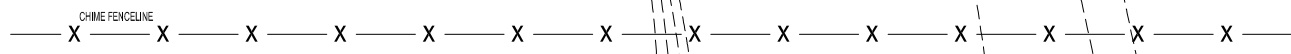
-  COORDINATE ORIGIN POINT
-  CONDUIT INSTALLED IN 2014
-  CONDUIT TO BE INSTALLED IN 2015

HOLD

	COORDINATES		
	SIZE (mm)	X' (mm)	Y' (mm)
C9	150	160	217
C10	150	632	734
C11	150	635	816
C12	150	887	816
C13	100	4263	792

HOLD

	COORDINATES		
	SIZE (mm)	X' (mm)	Y' (mm)
C1	100	1652	548
C2	150	1760	548
C3	150	1868	548
C4	150	1961	548
C5	100	1652	456
C6	100	1760	456
C7	100	1868	456
C8	150	1961	456



NOTES:
 1. INSTALLATION TO COMPLY WITH ALL REQUIREMENTS OF CEC C22.1-15.
 2. ALL CONDUITS ARE 100mm UNLESS OTHERWISE SPECIFIED.
 3. REFER TO DRAWING E-3101 FOR CONDUIT SPACING AND TRENCH DETAILS.
 4. CONTRACTOR TO EXTEND THE EXISTING 100mm & 150mm CONDUITS FOR THE CHIME FACILITY DATA 5m BEYOND UNIT SUBSTATION, SURVEY AND CAP.
 5. SPARE CONDUIT (C5) TO EXTEND 5m BEYOND THE EDGE OF THE CONCRETE, CAPPED AND SURVEYED.

REV.	DESCRIPTION	DRAWN	CHECKED	DESIGNED	DATE
C	REVISED CONDUIT LAYOUT	HSG	RD	RD	30APR15
B	15KV UNIT SUB RELOCATED	HSG	RD	RD	27APR15
A	ISSUED FOR TENDER	RJH	RD	RD	18MAR15

REVISIONS

CLIENT:



NATIONAL RESEARCH COUNCIL CANADA
DOMINION ROAD ASTROPHYSICAL OBSERVATORY

DESIGN BY:



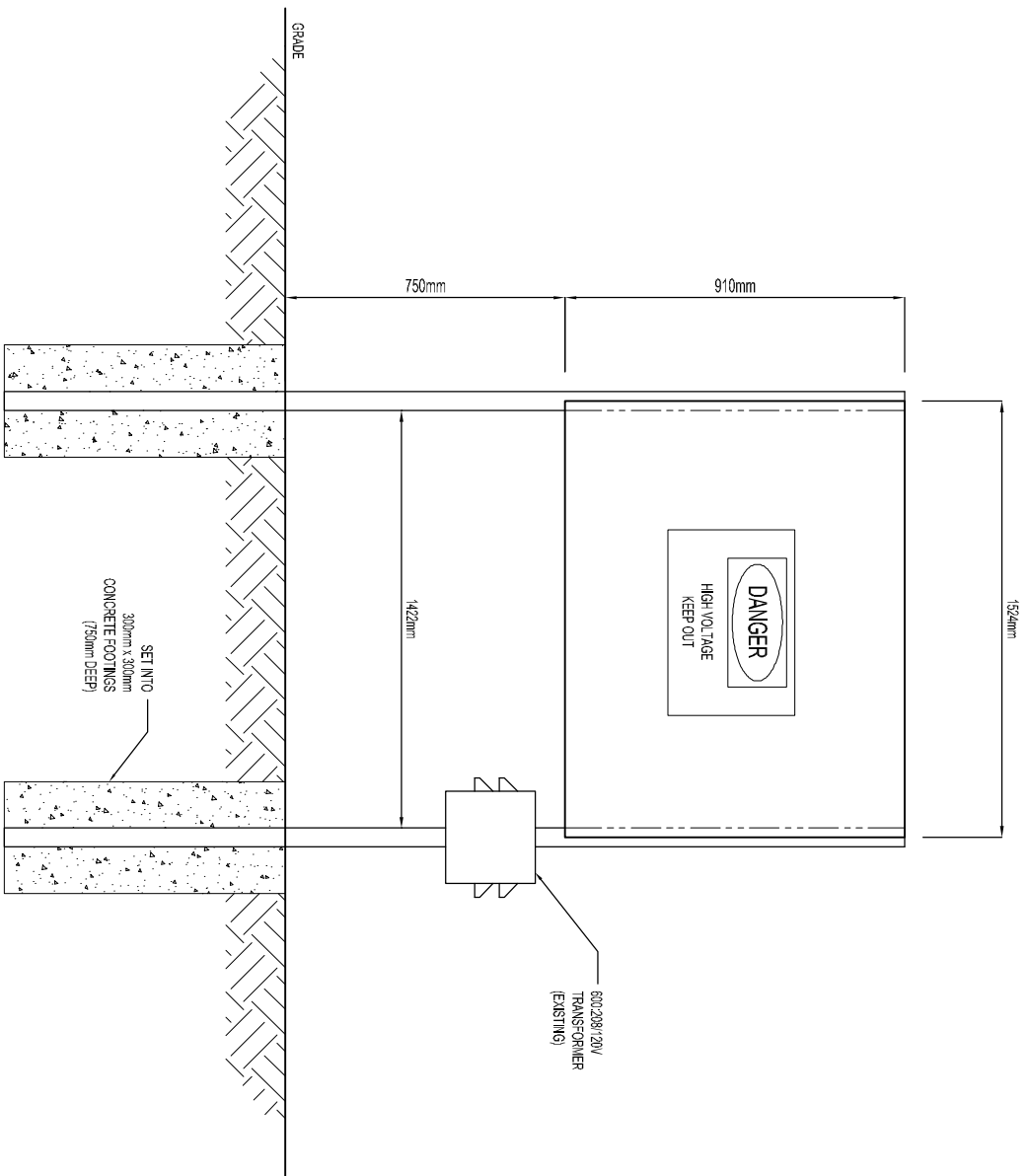
#105 - 78 Industrial Ave. W Penticton BC, V2A6M2
www.struthers-tech.com

PROJECT TITLE: **DRAO OBSERVATORY**

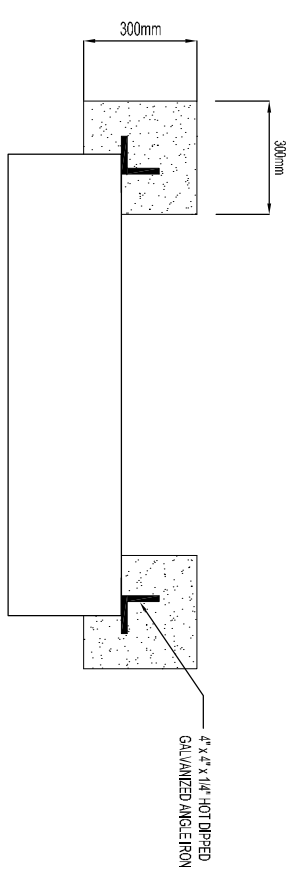
TITLE: **CHIME SITE ELECTRICAL CONDUIT LAYOUT**

SCALE: NTS JOB NO.: **E4153**

PROJECT: **E4153** DWG. No. SHT. **1** REV. **C**



A
ELEVATION VIEW



B
PLAN VIEW

TENDER
NOT FOR CONSTRUCTION

NOTES:
1. INSTALLATION TO COMPLY WITH ALL REQUIREMENTS OF CEC C22-1-15.

REV.	DESCRIPTION	DRAWN	CHECKED	DESIGNED	DATE
A	ISSUED FOR TENDER	RJH	RD	RD	18MAY15

REVISIONS

CLIENT:



NATIONAL RESEARCH COUNCIL CANADA
DOMINION ROAD ASTROPHYSICAL OBSERVATORY

DESIGN BY:



#105 - 78 Industrial Ave., W. Pentlicon BC, V2A6M2
www.strutherstech.com

PROJECT TITLE:

**DRAO OBSERVATORY
CART SITE
ELECTRICAL
DIST. INSTALLATION DETAILS**

TITLE:

SCALE: NTS

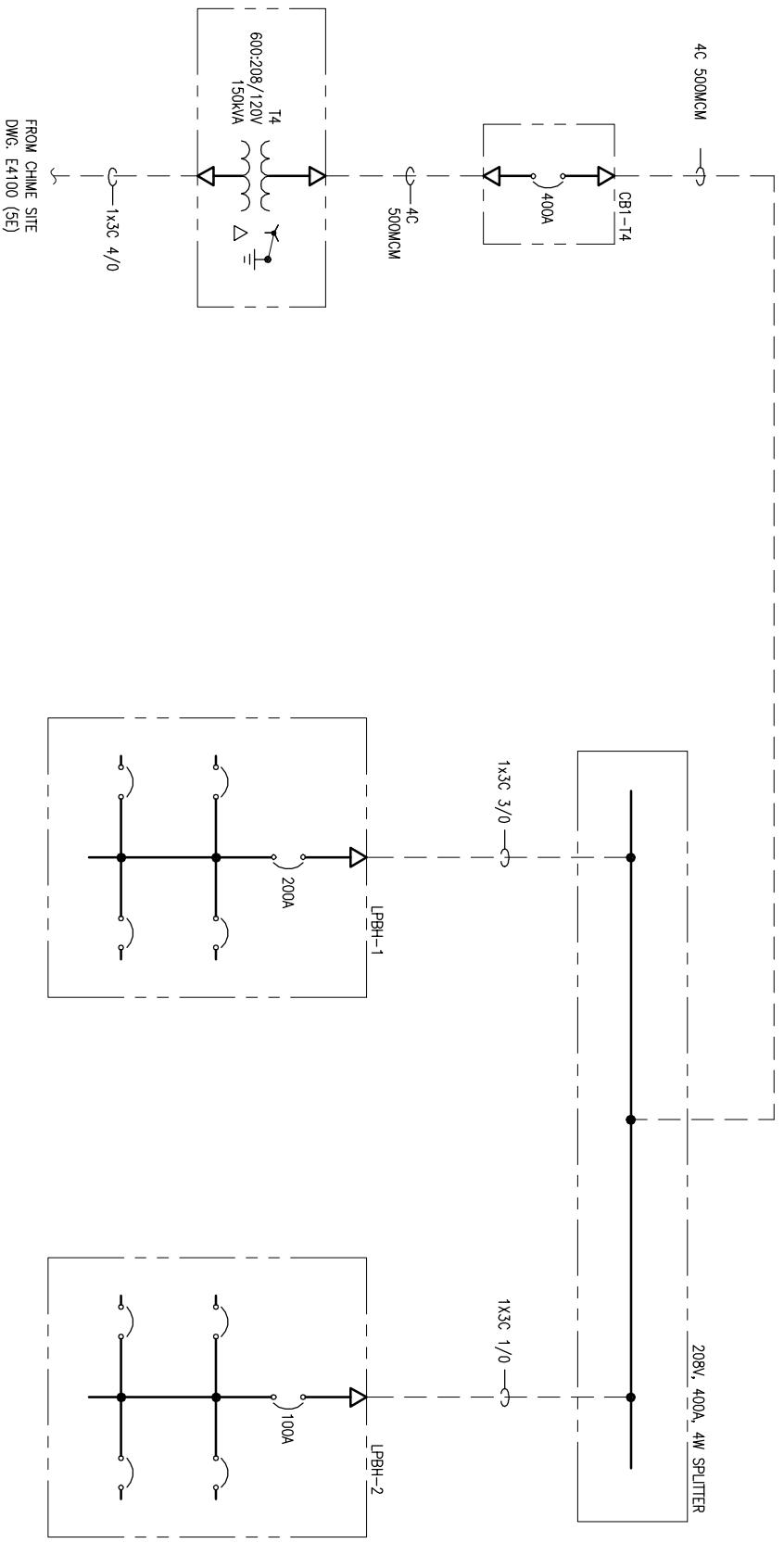
PROJECT DWG NO.

E6000

JOB NO.:

SHT. **1**
REV. **A**

SIZE: ANSI_LB 11 x 17 INCH



NOTES:
 1. INSTALLATION TO COMPLY WITH ALL REQUIREMENTS OF CEC C22.1-15.
 2. ALL CABLES TO BE TECK90, CU, 90°C, UNLESS OTHERWISE SPECIFIED.

REV.	DESCRIPTION	DRAWN	CHECKED	DESIGNED	DATE
A	ISSUED FOR TENDER	RJH	RD	RD	18MARR15
B	REVISED CABLES	HSG	RD	RD	28APR15

REVISIONS



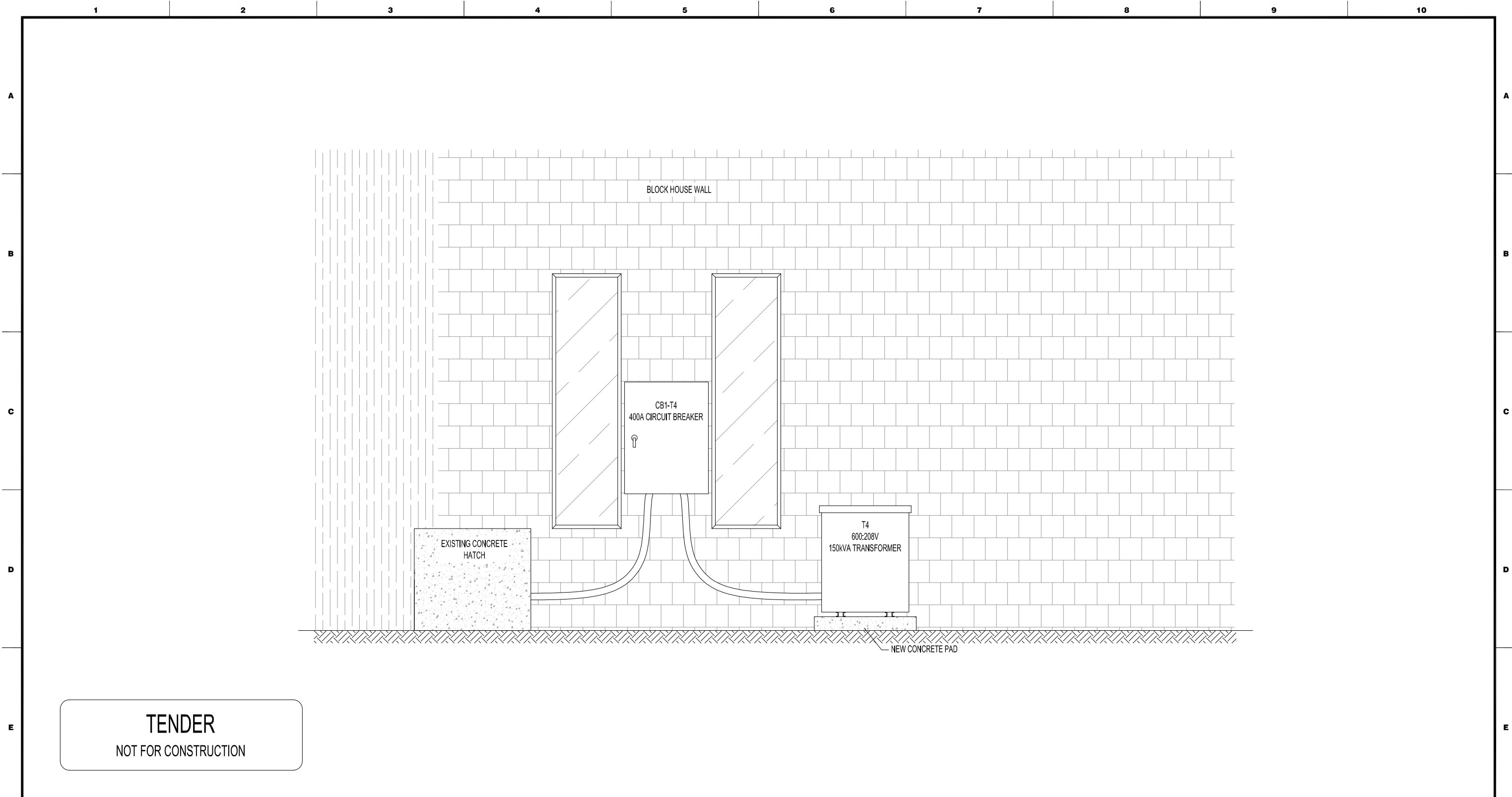
CLIENT:
 NATIONAL RESEARCH COUNCIL CANADA
 DOMINION ROAD ASTROPHYSICAL OBSERVATORY



DESIGN BY:
 #105 - 78 Industrial Ave. W Penikese BC, V2A6N2
 www.strutherstech.com

PROJECT TITLE:
DRAO OBSERVATORY
 TITLE:
BLOCKHOUSE ELECTRICAL SINGLE LINE DIAGRAM

SCALE: N/A	DWG. No.	JOB NO.:	SHT.	REV.
	E4300		1	B



TENDER
 NOT FOR CONSTRUCTION

NOTES:
 1. INSTALLATION TO COMPLY WITH ALL REQUIREMENTS OF CEC C22.1-15.

REV.	DESCRIPTION	DRAWN	CHECKED	DESIGNED	DATE
A	ISSUED FOR TENDER	HSG	RD	RD	06MAY15
REVISIONS					

CLIENT:



NATIONAL RESEARCH COUNCIL CANADA
 DOMINION ROAD ASTROPHYSICAL OBSERVATORY

DESIGN BY:



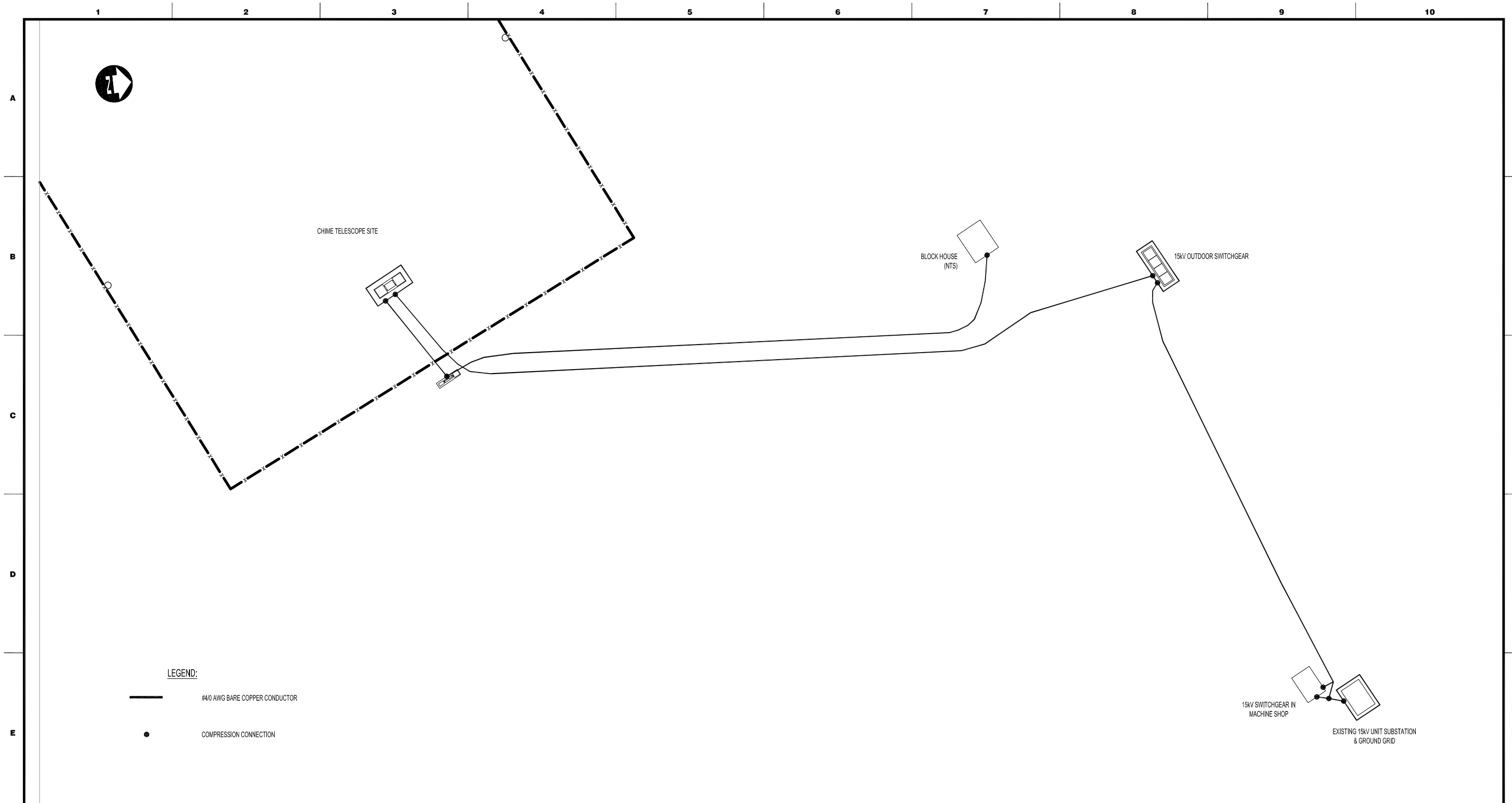
#105 - 78 Industrial Ave. W Penticton BC, V2A6M2
 www.struthers.tech

PROJECT TITLE: **DRAO OBSERVATORY**

TITLE: **BLOCK HOUSE ELECTRICAL LV OUTDOOR EQUIPMENT LAYOUT**

SCALE: NTS JOB NO.:

PROJECT: **E4350** DWG.No. SHT. **1** REV. **A**



NOTES:
 1. GROUNDING AT EACH LOCATION TO BE CONNECTED WITH #4/0 BARE COPPER CONDUCTOR PULLED THROUGH EACH CONDUIT. GROUNDING TO BE CONNECTED TO THE EXISTING GROUND GRID AT THE EXISTING 15KV UNIT SUBSTATION / MACHINE SHOP.
 2. ALL INTERCONNECTING GROUND CONNECTIONS BETWEEN CONDUITS MUST BE INSTALLED SUCH THAT IT IS POSSIBLE TO INSPECT THE INTEGRITY OF THE CONNECTION WITHOUT DE-ENERGIZING THE EQUIPMENT (IE. CONNECTION IS VISIBLE THROUGH THE VIEWING WINDOW OR INSTALLED IN AN INSPECTION WELL)

REV.	DESCRIPTION	DRAWN	CHECKED	DESIGNED	DATE
B	CHANGED LAYOUT	HSG	RD	RD	27APR15
A	ISSUED FOR TENDER	RJH	HG	RD	17MAR15
REVISIONS					

CLIENT:



NATIONAL RESEARCH COUNCIL CANADA
 DOMINION ROAD ASTROPHYSICAL OBSERVATORY

DESIGN BY:



#105 - 78 Industrial Ave. W Penticton BC. V2A6M2
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PROJECT TITLE: **DRAO OBSERVATORY**

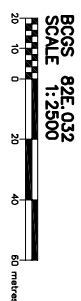
TITLE: **ELECTRICAL SITE GROUNDING LAYOUT**

SCALE: NTS JOB NO.:

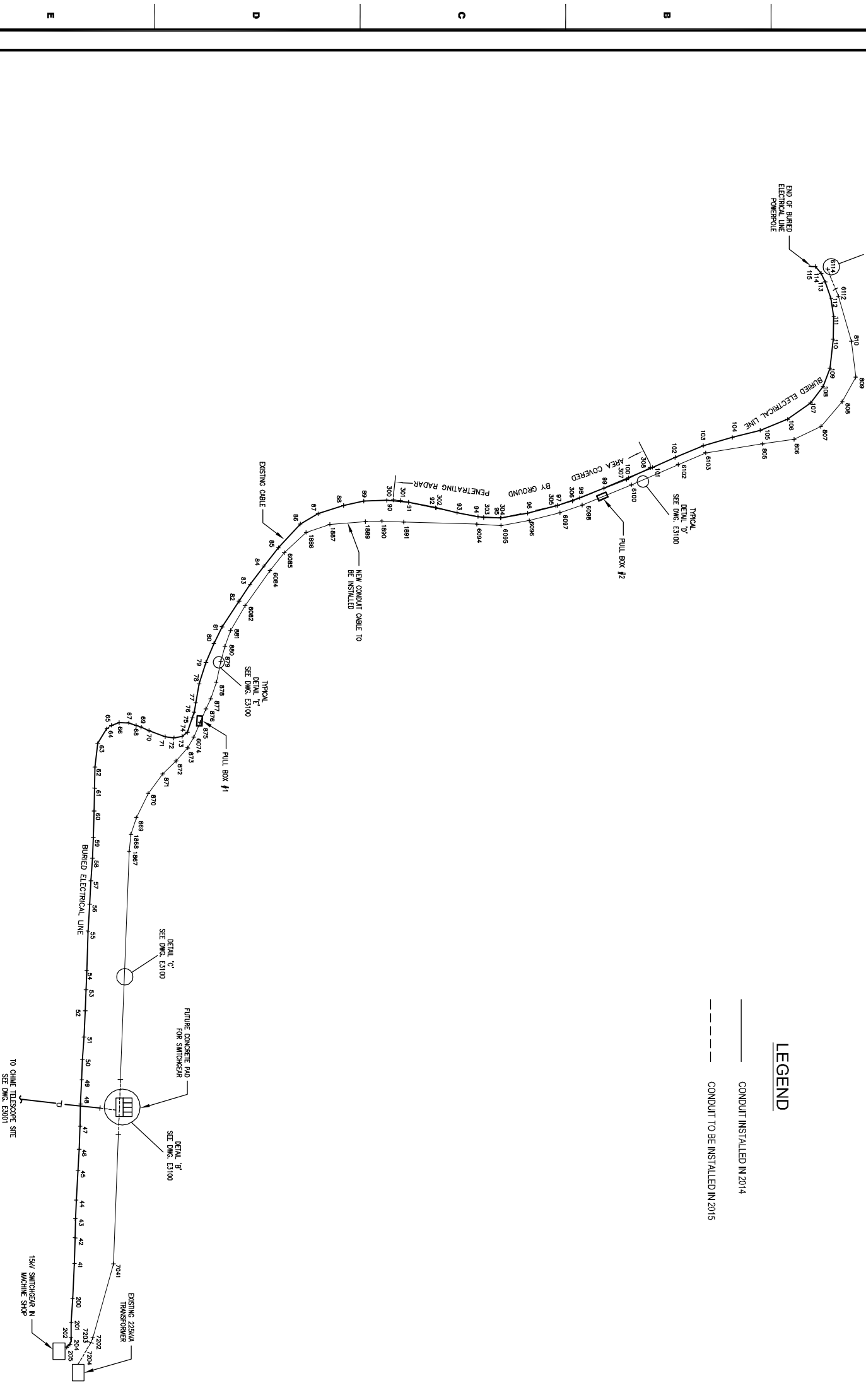
PROJECT: DWG.No. **E5000** SHT. **1** REV. **B**

SKETCH PLAN SHOWING BURIED FACILITIES AT DOMINION RADIO ASTROPHYSICAL OBSERVATORY OKANAGAN FALLS, BC
 CIVIC ADDRESS: 717 WHITE LAKE ROAD, PENTICTON, BC

SHOWING ESTIMATED ELEVATIONS OF "CHINE" SITE



BCOS 82E 032
 SCALE 1:2500



POINTNUMBER	NORTHING	EASTING	ELEVATION	DESCRIPTION
205	5 466 588.46	309 631.32	545.65	PMR LINE-BURIED 4.5ft
204	5 466 590.04	309 629.79	545.70	PMR LINE-BURIED 4.0ft
202	5 466 590.60	309 626.40	545.75	PMR LINE-BURIED 3.5ft
201	5 466 590.77	309 618.23	545.76	PMR LINE-BURIED 3.5ft
200	5 466 591.45	309 603.73	545.79	PMR LINE-BURIED 3.5ft
41	5 466 592.44	309 581.41	545.91	PMR LINE-BURIED 3.0ft
42	5 466 592.61	309 563.92	546.06	PMR LINE-BURIED 3.0ft
43	5 466 592.80	309 543.92	546.17	PMR LINE-BURIED 3.0ft
44	5 466 593.32	309 554.11	546.01	PMR LINE-BURIED 3.0ft
45	5 466 594.29	309 538.48	546.12	PMR LINE-BURIED 3.0ft
46	5 466 594.93	309 527.49	546.17	PMR LINE-BURIED 3.5ft
47	5 466 595.43	309 515.40	546.09	PMR LINE-BURIED 3.5ft
48	5 466 595.64	309 503.74	546.14	PMR LINE-BURIED 3.0ft
49	5 466 596.24	309 491.05	546.20	PMR LINE-BURIED 3.0ft
50	5 466 596.58	309 480.23	546.51	PMR LINE-BURIED 4.0ft
51	5 466 597.48	309 468.66	546.49	PMR LINE-BURIED 3.5ft
52	5 466 598.04	309 454.96	546.73	PMR LINE-BURIED 2.5ft
53	5 466 598.47	309 443.91	546.67	PMR LINE-BURIED 2.5ft
54	5 466 598.85	309 433.78	546.80	PMR LINE-BURIED 2.5ft
55	5 466 599.46	309 413.11	547.16	PMR LINE-BURIED 2.0ft
56	5 466 600.43	309 399.02	547.48	PMR LINE-BURIED 2.0ft
57	5 466 601.07	309 386.76	547.23	PMR LINE-BURIED 3.0ft
58	5 466 601.89	309 374.98	547.06	PMR LINE-BURIED 3.0ft
59	5 466 602.30	309 364.15	546.95	PMR LINE-BURIED 3.0ft
60	5 466 602.73	309 350.10	547.17	PMR LINE-BURIED 3.0ft
61	5 466 603.95	309 329.60	547.26	PMR LINE-BURIED 3.0ft
62	5 466 604.65	309 314.65	547.48	PMR LINE-BURIED 3.0ft
64	5 466 609.37	309 307.03	548.07	PMR LINE-BURIED 3.5ft
65	5 466 611.82	309 305.22	548.43	PMR LINE-BURIED 3.5ft
66	5 466 613.91	309 303.78	548.91	PMR LINE-BURIED 3.0ft
67	5 466 620.88	309 303.92	549.57	PMR LINE-BURIED 3.0ft
68	5 466 624.70	309 305.28	550.14	PMR LINE-BURIED 3.0ft
69	5 466 627.36	309 306.18	550.52	PMR LINE-BURIED 3.0ft
70	5 466 631.54	309 307.98	551.24	PMR LINE-BURIED 2.0ft
71	5 466 639.91	309 311.23	552.64	PMR LINE-BURIED 2.5ft
72	5 466 644.53	309 310.85	553.47	PMR LINE-BURIED 2.5ft
73	5 466 648.78	309 310.95	554.24	PMR LINE-BURIED 3.5ft
74	5 466 651.56	309 308.94	554.68	PMR LINE-BURIED 3.5ft
75	5 466 654.20	309 301.33	555.11	PMR LINE-BURIED 3.5ft
76	5 466 655.14	309 298.28	555.08	PMR LINE-BURIED 2.5ft
77	5 466 655.96	309 293.44	554.91	PMR LINE-BURIED 2.5ft
78	5 466 657.78	309 283.53	554.51	PMR LINE-BURIED 3.0ft
79	5 466 661.32	309 272.28	552.32	PMR LINE-BURIED 3.5ft
80	5 466 663.48	309 262.48	551.94	PMR LINE-BURIED 2.5ft
81	5 466 665.90	309 250.80	550.50	PMR LINE-BURIED 2.0ft
82	5 466 678.65	309 240.00	550.56	PMR LINE-BURIED 2.0ft
83	5 466 694.48	309 231.36	550.16	PMR LINE-BURIED 2.0ft
84	5 466 691.72	309 221.62	550.33	PMR LINE-BURIED 3.0ft
85	5 466 699.31	309 212.05	551.04	PMR LINE-BURIED 3.5ft
86	5 466 710.76	309 199.69	552.53	PMR LINE-BURIED 2.5ft
87	5 466 720.13	309 194.28	553.79	PMR LINE-BURIED 2.5ft
88	5 466 733.49	309 189.91	555.60	PMR LINE-BURIED 2.5ft
89	5 466 744.10	309 187.64	556.49	PMR LINE-BURIED 2.5ft
90	5 466 756.05	309 187.27	556.89	PMR LINE-BURIED 3.0ft
91	5 466 767.49	309 188.30	556.93	PMR LINE-BURIED 3.0ft
92	5 466 781.63	309 191.10	557.32	PMR LINE-BURIED 3.5ft
93	5 466 792.91	309 193.69	558.01	PMR LINE-BURIED 3.5ft
94	5 466 803.85	309 195.78	559.00	PMR LINE-BURIED 2.0ft
95	5 466 815.84	309 196.42	559.94	PMR LINE-BURIED 2.5ft
96	5 466 829.92	309 193.96	559.57	PMR LINE-BURIED 3.0ft
97	5 466 845.66	309 189.95	559.03	PMR LINE-BURIED 2.5ft
98	5 466 857.18	309 185.94	559.10	PMR LINE-BURIED 3.0ft
99	5 466 869.98	309 180.80	558.00	PMR LINE-BURIED 2.5ft
100	5 466 882.74	309 169.94	558.02	PMR LINE-BURIED 2.5ft
101	5 466 896.74	309 164.80	557.60	PMR LINE-BURIED 3.5ft
102	5 466 907.25	309 158.55	557.60	PMR LINE-BURIED 2.5ft
103	5 466 921.96	309 154.55	564.36	PMR LINE-BURIED 2.5ft
104	5 466 937.24	309 154.26	566.97	PMR LINE-BURIED 2.5ft
105	5 466 951.77	309 150.52	567.67	PMR LINE-BURIED 2.0ft
106	5 466 966.19	309 144.75	567.39	PMR LINE-BURIED 2.5ft
107	5 466 978.25	309 136.14	566.68	PMR LINE-BURIED 2.5ft
108	5 466 984.72	309 127.46	565.70	PMR LINE-BURIED 2.5ft
109	5 466 998.31	309 118.00	563.16	PMR LINE-BURIED 2.5ft
110	5 466 990.02	309 102.78	559.50	PMR LINE-BURIED 2.0ft
111	5 466 990.33	309 090.83	557.21	PMR LINE-BURIED 2.5ft
112	5 466 988.87	309 081.27	554.56	PMR LINE-BURIED 2.5ft
113	5 466 985.83	309 072.75	552.26	PMR LINE-BURIED 3.5ft
114	5 466 983.68	309 068.21	551.16	PMR LINE-BURIED 3.0ft
115	5 466 980.69	309 064.64	550.56	PMR LINE-BURIED 2.5ft

- NOTES:
1. CONDUIT SHALL NOT BE INSTALLED BELOW -10°C.
 2. ALL CONDUIT TO BE 100mm PVC TYPE DB2.
 3. ALL CONDUIT TERMINATED IN PULL BOXES TO BE TERMINATED WITH PRE-FORMED END BELTS, GROUNDED IN PLACE.
 4. CONTRACTOR TO INSTALL A 5mm STRANDED PULL STRING. PULL STRING TO HAVE A MINIMUM 11,000 TENSILE STRENGTH.
 5. IN TRENCH, USE ONLY 22.5 AND 45 DEGREE SWEEP BENDS WITH MINIMUM RADIUS OF 36" AND 60" RESPECTIVELY.
 6. NO BACKFILLING OF TRENCH BEFORE ENGINEERING APPROVAL.
 7. ALL CONCRETE TO MEET CSA-A23.1-00.
 8. SURVEY DATA SHOWN FOR INFORMATION ONLY. DATA PROVIDED BY OTHERS.

REV.	DESCRIPTION	DRAWN	CHECKED	DESIGNED	DATE
A	ISSUED FOR REVIEW	RJH	HG	RD	29AUG14
B	REVISED AS PER CUSTOMER COMMENTS	RJH	RD	RD	17SEPT14
C	REVISED PROPOSED ALTERNATE PATH	RJH	RD	RD	08OCT14
D	ADDED LEGEND	RD	RD	RD	30APR15
E	ISSUED FOR TENDER	RD	RD	RD	07MAY15

CLIENT: NATIONAL RESEARCH COUNCIL OF CANADA
 DOMINION ROAD ASTROPHYSICAL OBSERVATORY

DESIGN BY: Strutherstech

#105 - 78 Industrial Ave., W Penticton BC, V2A6M2
 www.strutherstech.com

PROJECT TITLE: DRAO - 15KV CABLE CONDUIT

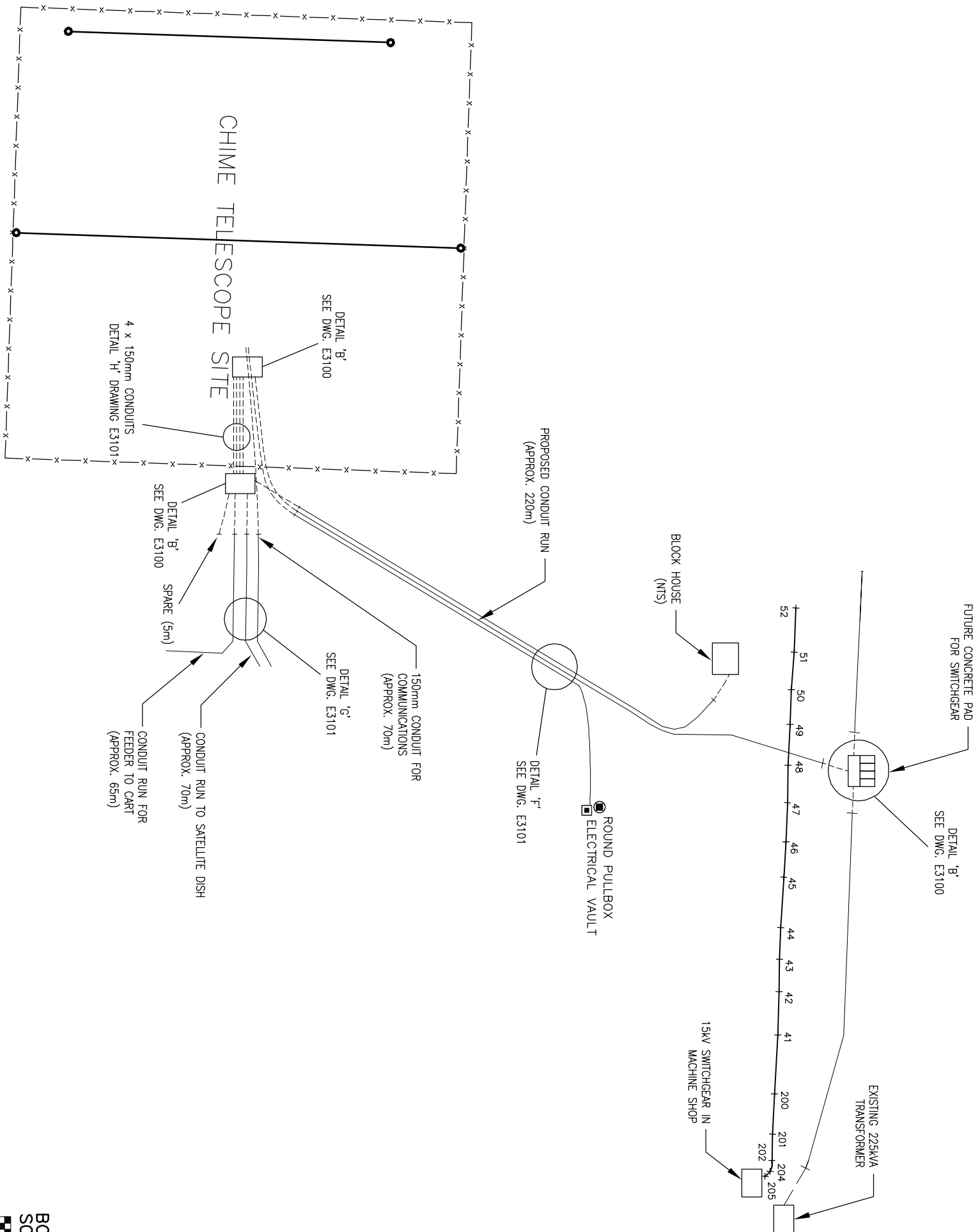
TITLE: ELECTRICAL
 15KV CABLE ROUTING

SCALE: 1:2500

PROJECT DWG NO: E3000

JOB NO: 1

SHT. REV: 1 E



LEGEND

	CONDUIT INSTALLED IN 2014
	CONDUIT TO BE INSTALLED IN 2015

BCGS 82E.0.32
 SCALE 1:1500

- NOTES:
1. CONDUIT SHALL NOT BE INSTALLED BELOW -10°C.
 2. ALL CONDUIT TO BE 100mm, OR 150mm PVC, TYPE DB2.
 3. ALL CONDUIT TERMINATED IN PULL BOXES TO BE TERMINATED WITH PRE-FORMED END BELLS, GROUDED IN PLACE.
 4. CONTRACTOR TO INSTALL A 5mm STRANDED PULL STRING. PULL STRING TO HAVE A MINIMUM 11,000N TENSILE STRENGTH.
 5. IN TRENCH, USE ONLY 22.5 AND 45 DEGREE SWEEP BENDS WITH MINIMUM RADIUS OF 36" AND 60" RESPECTIVELY.
 6. NO BACKFILLING OF TRENCH BEFORE ENGINEERING APPROVAL.
 7. ALL CONCRETE TO MEET CSA-A23.1-00.
 8. SURVEY DATA SHOWN FOR INFORMATION ONLY. DATA PROVIDED BY OTHERS.

REV.	DESCRIPTION	DRAWN	CHECKED	DESIGNED	DATE
H	REVISED DEMARK FOR INSTALLED CONDUIT	RD	RD	RD	07MAY15
G	ISSUED FOR TENDER	HSG	RD	RD	30APR15
F	REVISED 15kV UNIT SUB LOCATION	HSG	RD	RD	24APR15
E	ADDED 100mm CONDUIT	RJH	RD	RD	27MAR15
D	REVISED PROPOSED ALTERNATE PATH	RJH	RD	RD	08OCT14
C	ADDED 150mm CONDUIT	RJH	RD	RD	29SEPT14
B	ADDED CONDUIT FOR CART & SATELLITE	RJH	HG	RD	19SEPT14

CLIENT:

NATIONAL RESEARCH COUNCIL CANADA
 DOMINION ROAD ASTROPHYSICAL OBSERVATORY

DESIGN BY:

Strutherstech
 #105 - 78 Industrial Ave. W. Pentlicon BC, V2A6M2
 www.strutherstech.com

PROJECT TITLE:		DRAO - 15kV CABLE CONDUIT	
TITLE:		ELECTRICAL 15kV CABLE ROUTING CHIME SITE	
SCALE: 1:1500	DWG. NO.:	JOB NO.:	
PROJECT	E3001	SHT.:	1
		REV.:	H