LEGEND - SINGLE LINE & SCHEMATIC DIAGRAMS

NOT ALL SYMBOLS MAY APPEAR ON DRAWINGS

SYMBOL	DESCRIPTION
	H.V. CABLE STRESS CONE TERMINATION CABLE SIDE
	INCOMING UTILITY CONNECTION
kA	ULTIMATE AVAILABLE FAULT LEVEL (RMS SYM)
kA	PRESENT AVAILABLE FAULT LEVEL (RMS SYM)
kA	SHORT CIRCUIT RATING OF EQUIPMENT
	LV CIRCUIT BREAKER (MOLDED CASE)
	LV CIRCUIT BREAKER (DRAWOUT)
	INSULATED CASE CIRCUIT BREAKER ELECTRICALLY OPERATED FOR REMOTE OR LOCAL (MANUAL) TRIP AND CLOSE
BREAKER AUX CONTACTS BREAKER KEY INTERLOCK (# INDICATES KEY MATCH) BREAKER DESIGNATION e.g. 52-71 or 4SS2-71 TRIP 500A PROTECTION (OPERATIVE CIRCUIT) BREAKER TRIP UNIT RATING (NOTE 2)	
	DRAWOUT CELL
52	HV CIRCUIT BREAKER (DRAWOUT) LETTER DESIGNATIONS IF USED: OCB: OIL CIRCUIT BREAKER SF6: SF6 VAC: VACUUM R: RECLOSER
	LIGHTNING ARRESTOR/SURGE ARRESTOR
	POWER DISCONNECT SWITCH
	LOAD BREAK SWITCH
	FUSED CUTOUT (POLE MOUNTED)
	FUSED SWITCH
ES	EARTHING/SAFETY GROUNDING SWITCH
LI	LIVE LINE INDICATOR
ATS 1000A	AUTOMATIC TRANSFER SWITCH
MTS	MANUAL TRANSFER SWITCH
	CONTROL FUSE
V	INDICATING INSTRUMENT: V = VOLTMETER A = AMMETER Hz = FREQUENCY METER kW = KILOWATT METER SS = SYNCHROSCOPE
VS	VS = VOLT METER SWITCH AS = AMMETER SWITCH
PA / Hz	TRANSDUCER
	CONVERTER
	INVERTER
RV	REDUCED VOLTAGE STARTER
	VARIABLE FREQUENCY DRIVE
kWd	INTEGRATING/RECORDING/MAX. DEMAND INSTRUMENT: kWd = KILOWATT DEMAND METRE kVAR = KILOVOLT AMPERE RECTIVE METRE ET = ELAPSED TIME (OR HOUR METRE) Ad = AMMETER DEMAND METRE
M1	DIGITAL METERING SYSTEM POWER METER TYPE 1
M2	DIGITAL METERING SYSTEM POWER METER TYPE 2
M2-R	DIGITAL METERING SYSTEM REVENUE CERTIFIED METER
	UTILITY POWER METER
	SLIP RING
	CAPACITOR
20	AC MOTOR (20 DESIGNATES HP)
M	AC MOTOR (GENERAL)
M	DC MOTOR (GENERAL)
G	AC GENERATOR SET
G	DC GENERATOR (OR EXCITER)
	CONTACTOR MAIN CONTACTS
	VACUUM CONTACTOR

SYMBOL	DESCRIPTION
	HAND-OFF-AUTO 3 POSITION, 2 POLE, SHOWN IN 'HAND' POSITION
LOC REM	TWO POSITION SELECTOR SWITCH SHOWN IN 'LOCAL' POSITION
	KEYSWITCH
	SPEED SWITCH
	EMERGENCY STOP
	PUSHBUTTON - NORMALLY CLOSED MOMENTARY
	PUSHBUTTON - NORMALLY OPEN MOMENTARY
	N.O. DELAYED CLOSING AFTER ENERGIZATION OF ACTUATING COIL
	N.C. DELAYED CLOSING AFTER ENERGIZATION OF ACTUATING COIL
	N.O. DELAYED CLOSING AFTER DE-ENERGIZATION OF ACTUATING COIL
	N.C. DELAYED CLOSING AFTER DE-ENERGIZATION OF ACTUATING COIL
	LEVEL SWITCH - CLOSES ON FALLING LEVEL
	LEVEL SWITCH - CLOSES ON RISING LEVEL
	LEVEL SWITCH - OPENS ON RISING LEVEL
	TEMPERATURE SWITCH - CLOSES ON RISING TEMPERATURE
	TEMPERATURE SWITCH - OPENS ON RISING TEMPERATURE
	PRESSURE SWITCH - CLOSES ON RISING PRESSURE
	PRESSURE SWITCH - OPENS ON RISING PRESSURE
	FLOW SWITCH - CLOSES ON INCREASING MATERIAL FLOW
	FLOW SWITCH - OPENS ON INCREASING MATERIAL FLOW
	LIMIT SWITCH - NORMALLY OPEN
	LIMIT SWITCH - NORMALLY CLOSED
	LIMIT SWITCH - NORMALLY CLOSED HELD OPEN
	LIMIT SWITCH NORMALLY OPEN HELD CLOSED
	LIMIT SWITCH MAINTAINED NORMALLY OPEN
	LIMIT SWITCH MAINTAINED NORMALLY CLOSED
	FOOT SWITCH - DEPRESS TO CLOSE
	FOOT SWITCH - DEPRESS TO OPEN
R2	RELAY COIL WITH INHIBIT
R1	RELAY COIL OR CONTACTOR COIL
	N.O. CONTACT - OPEN WHEN RELAY DE-ENERGIZED
	N.C. CONTACT - CLOSED WHEN RELAY DE-ENERGIZED
a	DEVICE/AUXILARY CONTACT (N.O. or a)
b	DEVICE/AUXILARY CONTACT (N.C. or b)
	FORM-C CONTROL CONTACT
	N.O. CONTACT (ALTERNATE) OR DISCONNECT SWITCH
	N.C. CONTACT (ALTERNATE)
RTD	RESISTANCE TEMPERATURE DETECTOR
	RESISTOR (GENERAL)
NGR	NEUTRAL GROUNDING RESISTOR
	SHUNT
	RESISTOR (ALTERNATE SYMBOL)
	HEATER
	COIL/SERIES MAGNETIC OVERLOAD DEVICE/SOLENOID
G	INDICATOR LIGHT
	PLUG CONNECTOR (CONTROL CCTS); STAB CONNECTOR OR DRAWOUT CONTACTS (PWR CCTS)
MFP	MULTI FUNCTION PROTECTION RELAY
	THERMAL OVERLOAD DEVICE
	VT TEST SWITCH
	CT SHORTING TYPE TEST SWITCH

SYMBOL	DESCRIPTION
PANEL A	PANEL A
	FLOAT SWITCH
	ULTRASONIC HEAD
	RADIO ANTENNA
	METAL OXIDE VARISTOR
	RECTIFIER
	THYRISTOR GENERAL
	BATTERY
	GROUND
	1 CONDUCTOR
	1 CONDUCTOR + NEUTRAL
	1 NEUTRAL
	2 CONDUCTORS
	2 CONDUCTORS + NEUTRAL
	3 CONDUCTORS
	3 CONDUCTORS + NEUTRAL
	PORTABLE CABLE WITH SEPARABLE CONNECTORS
	EYS SEAL
	STUB-OUT FOR CONDUIT; OR INSULATED END FOR SPARE CABLE OR CONTROL WIRING
	TRANSFORMER
	AUTO TRANSFORMER
	REACTOR
	REACTOR (ALTERNATE SYMBOL)
	FIELD WINDING
	POTENTIAL TRANSFORMER
	CURRENT TRANSFORMER
	ZERO SEQUENCE CURRENT TRANSFORMER
	TEST LINK/SWITCH/BLOCK (1-LINE DIAGRAM)
	TEST LINK (WIRING DIAGRAM)
	600V BUSDUCT
	MECHANICAL INTERLOCK
	ELECTRICAL AND/OR MECHANICAL INTERLOCK
6T12.5MS-7BKR OR 62A-7	CABLE LABELS

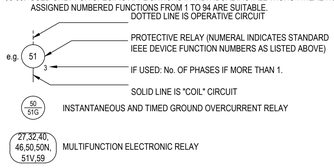
PANEL FRONT DEVICES

	ILLUMINATED PUSHBUTTON (GREEN)
	PILOT LIGHT (RED)
SP	NON-ILLUMINATED PUSHBUTTON (STOP)
	MUSHROOM HEAD PUSHBUTTON
	2-POSITION SELECTOR SWITCH
	3-POSITION SELECTOR SWITCH
	POTENTIOMETER
	CUT-OUT WITH CLOSING BUTTON

ANSI/IEEE STANDARD ELECTRICAL POWER SYSTEM DEVICE FUNCTION NUMBERS (NOTE 1):

1. MASTER ELEMENT
2. TIME-DELAY STARTING OR CLOSING RELAY
3. CHECKING OR INTERLOCKING RELAY
4. MASTER CONTACTOR
5. STOPPING DEVICE
6. STARTING CIRCUIT BREAKER
7. ANODE CIRCUIT BREAKER
8. CONTROL POWER DISCONNECTING DEVICE
9. REVERSING DEVICE
10. UNIT SEQUENCE SWITCH
11. RESERVED FOR FUTURE APPLICATION
12. OVERSPEED DEVICE
13. SYNCHRONOUS-SPEED DEVICE
14. UNDERSPEED DEVICE
15. SPEED OR FREQUENCY MATCHING DEVICE
16. RESERVED FOR FUTURE APPLICATION
17. SHUNTING OR DISCHARGE SWITCH
18. ACCELERATING OR DECELERATING DEVICE
19. STARTING-TO-RUNNING TRANSITION CONTACTOR
20. ELECTRICALLY OPERATED VALVE
21. DISTANCE RELAY
22. EQUALIZER CIRCUIT BREAKER
23. TEMPERATURE CONTROL DEVICE
24. RESERVED FOR FUTURE APPLICATION
25. SYNCHRONIZING OR SYNCHRONISM-CHECK DEVICE
26. APPARATUS THERMAL DEVICE
27. UNDERVOLTAGE RELAY
28. FLAME DETECTOR
29. ISOLATING CONTACTOR
30. ANNUNCIATOR RELAY
31. SEPARATE EXCITATION DEVICE
32. DIRECTIONAL POWER RELAY
33. POSITION SWITCH
34. MASTER SEQUENCE DEVICE
35. BRUSH-OPERATING OR SLIP-RING SHORT-CIRCUITING DEVICE
36. POLARITY OR POLARIZING VOLTAGE DEVICE
37. UNDERCURRENT OR UNDERPOWER RELAY
38. BEARING PROTECTIVE DEVICE
39. MECHANICAL CONDITION MONITOR
40. FIELD RELAY
41. FIELD CIRCUIT BREAKER
42. RUNNING CIRCUIT BREAKER
43. MANUAL TRANSFER OR SELECTOR DEVICE
44. UNIT SEQUENCE STARTING RELAY
45. ATMOSPHERIC CONDITION MONITOR
46. REVERSE-PHASE OR PHASE-BALANCE CURRENT RELAY
47. PHASE-SEQUENCE VOLTAGE RELAY
48. INCOMPLETE SEQUENCE RELAY
49. MACHINE OR TRANSFORMER THERMAL RELAY
50. INSTANTANEOUS OVERCURRENT OR RATE-OF-RISE RELAY
51. AC TIME OVERCURRENT RELAY
52. AC CIRCUIT BREAKER
52a: BREAKER AUXILIARY SWITCH, OPEN WHEN THE BREAKER IS OPEN
52b: BREAKER AUXILIARY SWITCH, CLOSED WHEN THE BREAKER IS OPEN
53. EXCITER OR DC GENERATOR RELAY
54. RESERVED FOR FUTURE APPLICATION
55. POWER FACTOR RELAY
56. FIELD APPLICATION RELAY
57. SHORT-CIRCUITING OR GROUNDING DEVICE
58. RECTIFICATION FAILURE RELAY
59. OVERVOLTAGE RELAY
60. VOLTAGE OR CURRENT BALANCE RELAY
61. RESERVED FOR FUTURE APPLICATION
62. TIME-DELAY STOPPING OR OPENING RELAY
63. PRESSURE SWITCH
64. GROUND DETECTOR RELAY
65. GOVERNOR
66. NOTCHING OR JOGGING DEVICE
67. AC DIRECTIONAL OVERCURRENT RELAY
68. BLOCKING RELAY
69. PERMISSIVE CONTROL DEVICE
70. RHEOSTAT
71. LEVEL SWITCH
72. DC CIRCUIT BREAKER
73. LOAD-RESISTOR CONTACTOR
74. ALARM RELAY
75. POSITION CHANGING MECHANISM
76. DC OVERCURRENT RELAY
77. PULSE TRANSMITTER
78. PHASE-ANGLE MEASURING OR OUT-OF-STEP PROTECTIVE RELAY
79. AC RECLOSING RELAY
80. FLOW SWITCH
81. FREQUENCY RELAY
82. DC RECLOSING RELAY
83. AUTOMATIC SELECTIVE CONTROL OR TRANSFER RELAY
84. OPERATING MECHANISM
85. CARRIER OR PILOT-WIRE RECEIVER RELAY
86. LOCKOUT RELAY
87. DIFFERENTIAL PROTECTIVE RELAY
88. AUXILIARY MOTOR OR MOTOR GENERATOR
89. LINE SWITCH
90. REGULATING DEVICE
91. VOLTAGE DIRECTIONAL RELAY
92. VOLTAGE AND POWER DIRECTIONAL RELAY
93. FIELD-CHANGING CONTACTOR
94. TRIPPING OR TRIP-FREE RELAY

95-99. USED ONLY FOR SPECIFIC APPLICATIONS IN INDIVIDUAL INSTALLATIONS WHERE NONE OF THE ASSIGNED NUMBERED FUNCTIONS FROM 1 TO 94 ARE SUITABLE.



NOTES:

1. FOR DETAILED DESCRIPTION OF DEVICE AND SUFFIX LETTERS TO BE USED WITH FUNCTION NUMBERS, SEE ANSI/IEEE C37.2.
2. UNLESS NOTED OTHERWISE, 1-LINE DIAGRAMS INDICATE ONLY BREAKER TRIP RATINGS. FOR BREAKER FRAME SIZES, SEE SWITCHGEAR FRONT ARRANGEMENT DRAWINGS. WHERE BOTH FRAME SIZE AND TRIP RATING ARE SHOWN ON 1-LINE DIAGRAMS, THEY ARE INDICATED AS (e.g. 600AF, 500AT)

LEGEND - LAYOUT DRAWINGS

NOT ALL SYMBOLS MAY APPEAR ON DRAWINGS. SOME SYMBOLS MAY ALSO APPEAR ON SINGLE LINE AND SCHEMATIC DRAWINGS

SYMBOL	DESCRIPTION
LIGHTING:	
	LUMINAIRE
	SUSPENDED LUMINAIRE
	CEILING MOUNTED LUMINAIRE
	WALL MOUNTED LUMINAIRE
	LUMINAIRE ON EMERGENCY/24hr CIRCUIT
	BOLLARD/POST TOP LUMINAIRE
	POLE MOUNTED LUMINAIRES
	DIRECTIONAL LUMINAIRE
a bc $ ##	SINGLE POLE TOGGLE SWITCH, GANGED AS SHOWN. LETTERS, WHERE SHOWN, DENOTE SWITCHING
$3	SINGLE POLE TOGGLE SWITCH MODIFIERS AS FOLLOWS: 2 - TWO POLE 3 - THREE WAY 4 - FOUR WAY WP - WEATHER PROOF XP - EXPLOSION PROOF P - C/W PILOT LIGHT K - KEY OPERATED D - DOOR OPERATED M - MOTOR STARTER MC - MOMENTARY CONTACT, 3-POSITION
$	LOW VOLTAGE SWITCH
D	DIMMER SWITCH
3	3 WAY DIMMER SWITCH
	PHOTO ELECTRIC CELL
EMERGENCY LIGHTING:	
	EXIT SIGN C/W ARROWS AS SHOWN
90C	EMERGENCY LIGHT BATTERY UNIT, WATTAGE AS SHOWN
	REMOTE EMERGENCY HEADS
GROUNDING:	
	GROUND ROD
	GROUND ROD IN ACCESSIBLE BOX
	END-TO-END GROUND CONNECTION POINT
	X-CONNECTION (GROUNDING)
	T-CONNECTION (GROUNDING)
	GROUNDING PLATE (CAST FLUSH IN CONCRETE)
	WELDED OR EXOTHERMIC END CONNECTION (GROUNDING)
	GROUNDING END CONNECTION WITH CABLE LUG, CLAMP CONNECTOR OR OTHER MECHANICAL CONNECTOR BOLTED TO EQUIPMENT
POWER:	
	MOTOR STARTER
	MAGNETIC MOTOR STARTER
	NON-FUSED DISCONNECT SWITCH
F	FUSED DISCONNECT SWITCH
	COMBINATION MAGNETIC STARTER/DISCONNECT SWITCH
	INDOOR SERVICE POLE
	MOTOR CONNECTION
	SURFACE MOUNTED POWER PANEL
	RECESSED/FLUSH MOUNTED POWER PANEL
A	PANEL DESIGNATION
AB	DISTRIBUTION PANEL DESIGNATION
SECURITY:	
	MOTION SENSOR
	CLOSE CIRCUIT TELEVISION CAMERA
	DOOR CONTACT
ES	ELECTRIC STRIKE
	CARD READER
REQ	REQUEST-TO-EXIT SENSOR

SYMBOL	DESCRIPTION
COMMUNICATIONS:	
	TELEPHONE OUTLET
	DATA OUTLET
	COMBINATION DATA/TEL OUTLET C/W 2 DATA & 1 TEL UNLESS OTHERWISE INDICATED
	INTERCOM
	MICROPHONE OUTLET
	CEILING MOUNTED HORN
	WALL MOUNTED HORN
	DUAL COMPARTMENT RACEWAY C/W OUTLETS AS INDICATED
S	CEILING MOUNTED FIRE ALARM/PAGING SPEAKER
S	WALL MOUNTED FIRE ALARM/PAGING SPEAKER
	CLOCK C/W MASTER CLOCK WIRING AND 120V RECEPTACLE
	SURFACE MOUNTED COMMUNICATIONS PANEL
	RECESSED/FLUSH MOUNTED COMMUNICATIONS PANEL
RECEPTACLES AND OUTLETS:	
	DUPLEX RECEPTACLE
	5-20R (15/20A) DUPLEX RECEPTACLE
	4-PLEX RECEPTACLE
	SINGLE RECEPTACLE
	GROUND FAULT INTERRUPTER RECEPTACLE
J	CEILING MOUNTED JUNCTION BOX
J	WALL MOUNTED JUNCTION BOX
	MECHANICAL EQUIPMENT CONNECTION
	SPECIAL PURPOSE RECEPTACLE
	SPECIAL PURPOSE OUTLET
MD	MOTORIZED DAMPER
FIRE ALARM:	
F	FIRE ALARM PULL STATION
	FIRE ALARM BELL
	FIRE ALARM STROBE
	COMBINATION HEAT/SMOKE DETECTOR
	FIRE ALARM ZONE ISOLATION MODULE
SITE PLAN:	
	EQUIPMENT CONNECTION AS NOTED ON DRAWING
H	HIGH VOLTAGE UNDERGROUND CHAMBER OR BOX
L	LOW VOLTAGE UNDERGROUND CHAMBER OR BOX
C	COMMUNICATIONS UNDERGROUND CHAMBER OR BOX
RSC	RIGID STEEL CONDUIT

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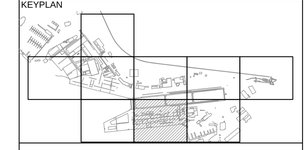
KEYPLAN



Revision/ Revision	Description/Description	Date/Date
5	ISSUED FOR TENDER	15/01/28
4	ISSUED FOR 99% DESIGN REVIEW	16/01/06
3	ISSUED FOR 66% DESIGN REVIEW	15/11/25
2	ISSUED FOR 33% DESIGN REVIEW	15/10/28
1	ISSUED FOR DESIGN DEVELOPMENT	15/09/11
0		

Client/client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD
VICTORIA, BC, V9A 2P1

Project title/Titre du projet
825 ADMIRALS ROAD VICTORIA BC
ESQUIMALT GRAVING DOCK
ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

Designed by/Concept par
I. BARNES

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Preetipal Paul

Drawing title/Titre du dessin

ELECTRICAL SYMBOL LEGEND

Project No./No. du projet	Sheet/Feuille	Revision no./ Le Révision no.
R.062548.2	5001	5

Plot Date: February 5, 2016 3:36 PM — Plotted by: Jacob Bieling
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PWGSC – B1 – 1000X707

ABBREVIATIONS

NOT ALL ABBREVIATIONS MAY APPEAR ON DRAWINGS

AIR CIRCUIT BREAKER	ACB
AIR NATURAL/AIR FORCED TRANSFORMER COOLING	ANAN/ANAF
ALARM	ALM
ALTERNATING CURRENT	AC
APPROXIMATELY	APPROX
ARRESTER	ARSR
AUTOMATIC	(*A), AUTO
AUXILIARY	*AUX
BOILER	BLR
BRAKE	BK
BREAKER	(*BKR) BRKR
BC HYDRO	BCH
BY-PASS	BYP
CABINET	CAB
CABLE LIST	*CL
CAPACITOR	CAP
CIRCUIT	(*CCT), CKT
CIRCUIT BREAKER	CB
CLOSED CIRCUIT TELEVISION	CCTV
COMMUNICATION(S)	COMM
COMPLETE WITH	*C/W
CONSOLE	(*CNSL), CSL
CONTACTOR	*C
CONTROL	(*CTL), CONT
CURRENT TRANSFORMER	CT
DECREASE	DECR
DIAMETER	DIA
DIGITAL METERING SYSTEM	*DMS
DIRECT CURRENT	DC
DIRECT DIGITAL CONTROL	DDC
DISCONNECT	DISC
DISCONNECT SWITCH	DS
DISTRIBUTION	*DIST
DIGITAL TRIP UNIT	DTU
DRAWING	DWG
EACH	*EA
EARTHING SWITCH	ES
ELECTRICAL EQUIPMENT LIST	*EEL
ELECTRICAL MASTER DRAWING(S)	*EMD
ELECTRICAL STANDARD DRAWING(S)	*ESD
ELECTRICALLY OPERATED VALVE (e.g. SOLENOID VALVE)	EV
EMERGENCY	*EM
ENGINE STARTER	*EST
EXCITER	EXC
EXISTING	EXST
FEEDER	FDR
FIELD	FLD
FIRE ALARM	*FA
FLOAT SWITCH	*FLS
FLOW SWITCH	*FS
FLUORESCENT	*FL
FOOT CANDLE	(*FC), ft•c
FORWARD	(*FOR), FWD
FULL LOAD AMPS	*FLA
FUSE	FU
FUSED SWITCH	FS
GALVANIZED	GALV
GAS INSULATED SWITCH	GIS
GENERATOR	(*G), GEN
GROUND	GRD
GROUND FAULT MONITORING SYSTEM	*GFM
HAND	*H
HARDWARE	HDW
HARMONIC FILTER BANK	*HFB
HIGH VOLTAGE	*HV
HORIZONTAL	*HORZ
INCANDESCENT	INCAND
INCREASE	INCR
INDICATOR, INDICATING	*INDT
INDUCTION (MOTOR)	*IND
INFORMATION	INFO
INTERLOCK	INTLK
KEY INTERLOCK	K
LIGHT	LT
LIGHTING	LTG
LIMIT SWITCH	ZS
LOCAL	(LCL), *LOC
LOCK-OUT ATTACHMENT	*L/O
LOW VOLTAGE	*LV
MAIN SUBSTATION	MS
MANHOLE	MH
MANUAL	*MAN
MANUFACTURER	MFR
MATERIAL	MATL
MAXIMUM	MAX
MEDIUM	MED
MINIMUM	MIN
MISCELLANEOUS	MISC
MOTOR	(*M), MOT
MOTOR CONTROL CENTRE	*MCC
MOTOR FIELD RHEOSTAT	*MFR
MOUNTED	MTD
MOUNTING	MTG
MUNROE HEAD	MH
NETWORK	NET
NEUTRAL GROUND RESISTOR	NGR
NORTH SUBSTATION (FUTURE)	NS
NORTH LANDING WHARF SUBSTATION (EXISTING)	NLWS
NOT APPLICABLE	*N/A
OFF	*O
OIL CIRCUIT BREAKER	OCB
ON	*I
ORIGINAL EQUIPMENT MANUFACTURER	OEM
OVERLOAD	*O/L
PADMOUNT	*PDMT
PANEL	PNL
PHASE	(*Ø), PH
PHOTOELECTRIC CONTROL	*PEC
PILOT LIGHT/PILOT LAMP	(PL), *P/L
POINT OF COMMON COUPLING	*PCC
POLARITY	PLRT
POTENTIAL TRANSFORMER	PT
POWER	*PWR
POWER FACTOR CORRECTION CONTROLLER	*PFCC
PRESSURE SWITCH	*PS
PRIMARY	PRI
PROGRAMMABLE LOGIC CONTROLLER	PLC
PUMPHOUSE	PH
PUMPHOUSE SUBSTATION	PHS
PUSH BUTTON	PB
PURPLE	PPL
RECEPTACLE	(RCPT), *REC
RELAY	(RLY), *R
REMOTE	(RMT), *REM
REMOTE INPUT DEVICE	RID
REVERSE	(*R), *REV
RIGID POLYVINYL CHLORIDE	RPVC
RIGID STEEL CONDUIT	RSC
ROOM	RM
SCHEMATIC	SCHEM
SECONDARY	SEC
SERVICE ENTRANCE SUBSTATION	SES
SELECTOR	SEL
SHEET	SH
SOFT START	*SS
SOLONOID VALVE	*EV
SOUTH SIDE SUBSTATION (EXISTING)	SS
SOUTH SIDE SUBSTATION REPLACEMENT (FUTURE)	SSR
SPECIFICATION	SPEC
SPEED SWITCH	*SPS
STANDARD	STD
START	(*S), *ST
STARTER	*STR
STOP	(*SP), *STOP
SUPPLIED WITH EQUIPMENT	*SWE
SWITCH	SW
SWITCHBOARD	SWBD
SWITCHGEAR	SWGR
SYNCHRONOUS/SYNCHRONIZING	*SYNCH
TEST SWITCH	TSW
TEMPERATURE	TEMP
TEMRINAL BLOCK	*TB
TEST TERMINAL	(*TT), *TST
THERMOSTAT	(*T), *STAT
TRANSFORMER	XFMR
TRANSMITTER	XMTR
TYPICAL	TYP
UP	(*U), UP
VERTICAL	VERT
WEATHERPROOF	*WP
WINDING	WDG
WORKERS' COMPENSATION BOARD	WCB
ZERO SEQUENCE CT	*ZSCT

COLOURS

BLACK	BLK
BLUE	BLU
BROWN	BRN
GREY	*GRY
GREEN	(*G), GRN
ORANGE	(*OR), ORN
RED	(*R), RED
YELLOW	(*Y), YEL
WHITE	(*W), WHT
SLATE	SLT

NOTES:

1. UNLESS OTHERWISE NOTED, ABBREVIATIONS ARE IN ACCORDANCE WITH CSA Z85-1983
2. ABBREVIATIONS IN BRACKETS ARE ALTERNATE CHOICES.
3. ASTERISK (*) INDICATES ABBREVIATIONS NOT COVERED BY OR CONTRARY TO CSA Z85-1983.
4. SINGLE LETTER ALTERNATE CHOICES ARE PRIMARILY MEANT FOR USE ON SINGLE LINE, SCHEMATIC AND WIRING DIAGRAMS AS PART OF THE DEVICE SYMBOL.

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Pacific Region
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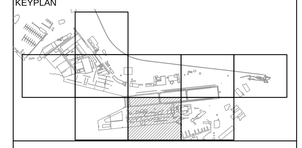
KEYPLAN



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Jamie LeBlanc

PWGSC, Regional Manager, Architectural and Engineering Services/ Gestionnaire régionale, Services d'architectural et de génie, TPSGC
Preetipal Paul

Drawing title/Titre du dessin

ELECTRICAL ABBREVIATIONS

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R.062548.2	5002	5

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EMD DRAWING CROSS-REFERENCE	
EMD	CONTRACT DRAWING SHEET
E2	5900
E3	5901
E4	5902
E5	5903
E6	5905

ELECTRICAL EQUIPMENT TABLE

EQUIPMENT GROUP	EQUIPMENT DESIGNATION	EQUIPMENT NAME/LOCATION	DRAWING	COMMENTS
25/12.5kV SWITCHBOARD	25/12SES	SERVICE ENTRANCE SUBSTATION	2000	Refers to SES project for electrical details for noted drawings.
	25/12PHS	PUMPHOUSE SUBSTATION	3000	Refers to SES project for electrical details for noted drawings.
	25/12SSSR	SOUTH SUBSTATION REPLACEMENT	5010	Refers to SSSR project for electrical details for noted drawings.
12.5kV SWITCHBOARD	12.5MS	MAIN 12.5 kV SWITCHBOARD	EMD E2	
	12.5SS	SOUTHSIDE UNIT-SUBSTATION H.V. SECTION	EMD E5	
	12.5NL	NORTH LANDING WHARF UNIT-SUBSTATION H.V. SECTION	EMD E4	
2.4kV SWITCHBOARD	2.4MS	MAIN SUBSTATION	EMD E2	
	2.4PH	PUMPHOUSE	EMD E3	
	2.4PHS	PUMPHOUSE SUBSTATION	3000	Refers to SSSR project for electrical details for noted drawings.
	2.4SS	SOUTHSIDE SUBSTATION	EMD E5	
	2.4SC	SOUTH COMPRESSOR ROOM	EMD E5	
	2.4kV	SOUTH SUBSTATION REPLACEMENT	5010	Refers to SES project for electrical details for noted drawings.
347/600V SWITCHBOARDS	6MS	MAIN SUBSTATION	EMD E2	
	6PH	PUMPHOUSE	EMD E3	
	6SC	SOUTH COMPRESSOR ROOM	EMD E5	
	6SES-1	SERVICE ENTRANCE SUBSTATION	2002	Refers to SES project for electrical details for noted drawings.
	6PHS-1	PUMPHOUSE SUBSTATION	3002	Refers to SES project for electrical details for noted drawings.
	6SSSR-1	SOUTH SUBSTATION REPLACEMENT	5011	Refers to SSSR project for electrical details for noted drawings.
347/600V PANELBOARDS	6A	BIO BLAST BUILDING	EMD E2	
	6PHS-B	PUMPHOUSE MACHINE SHOP	3002	Was 6B. Refers to SES project for electrical details for noted drawings.
	6C	KEEL BLOCK	EMD E2	(Was at Carpenters Shop)
	6D	PARKING LOT 'A' KIOSK	9012	Refers to SES project for electrical details for noted drawings.
	6Z	PENINSULA WASTE WATER SERVICES	EMD E2	
	6PHS-2	PUMPHOUSE SUBSTATION	3002	Refers to SES project for electrical details for noted drawings.
277/480V SWITCHBOARDS	4MS	MAIN SUBSTATION	EMD E2	
	4SS1	SOUTHSIDE UNIT-SUBSTATION L.V. SECTION	EMD E5	
	4SS2	SOUTHSIDE SUBSTATION	EMD E5	
	4NL	NORTH LANDING WHARF UNIT-SUBSTATION L.V. SECTION	EMD E4	
	4SSSR-1	SOUTH SUBSTATION REPLACEMENT	5011	Refers to SSSR project for electrical details for noted drawings.
	4SSSR-2	SOUTH SUBSTATION REPLACEMENT	5011	Refers to SSSR project for electrical details for noted drawings.
480V HARMONIC FILTER BANKS	4MS-HFB	MAIN SUBSTATION HARMONIC FILTER ABNK	EMD E2	
	4SS1-HFB	SOUTHSIDE SUBSTATION HARMONIC FILTER BANK	EMD E5	
	4SSSR-HFB	SOUTHSIDE SUBSTATION REPLACEMENT HARMONIC FILTER BANK	XXX	Refers to SSSR project for electrical details for noted drawings.
	4NL-HFB	NORTH LANDING WHARF HARMONIC FILTER BANK	EMD E4	
480V PANELBOARDS	4A	ELECTRICAL SHOP	EMD E2	(was Bio Blast Building)
	4B	K BUILDING	EMD E5	
	4C	BUTLER BUILDING	EMD E5	
120/208V SWITCHBOARDS	2MS	MAIN SUBSTATION 120/208V SWITCHBOARD	EMD E2	
	2PH	PUMPHOUSE 120/208V SWITCHBOARD	EMD E3	
	2NL1	NORTH LANDING WHARF 120/208V SWITCHBOARD	EMD E4	
	2NL2	NORTH LANDING WHARF 120/208V DISTRIBUTION PANEL	EMD E4	
	2SS1	SOUTHSIDE UNIT-SUBSTATION L.V. SECTION	EMD E5	
	2SS2	SOUTHSIDE SUBSTATION 120/208V SWITCHBOARD	EMD E5	
	2SSSR	SOUTHSIDE SUBSTATION REPLACEMENT	5010	Refers to SES project for electrical details for noted drawings.
120/208V PANELBOARDS	2A	ELECTRICAL SHOP	EMD E2	(was Bio Blast Building)
	2B	PWGS OFFICE BUILDING	EMD E2	Obtain as-built panel schedule
	2C	WASHROOM BUILDING	EMD E2	
	2E	BC FERRIES TRAILER MINI POWER CENTER	9012	Refers to SES project for electrical details for noted drawings.
	2F	UPPER PARKING ELECTRICAL SHED	EMD E3	
	2FA	UPPER PARKING TRAILER	EMD E3	
	2G	GARAGE	EMD E3	
	2H	PARKING LOT 'A' WASHROOM MINI POWER CENTER	9012	Refers to SES project for electrical details for noted drawings.
	2PHS-A	PUMPHOUSE SUBSTATION	3002	Refers to SES project for electrical details for noted drawings.
	2PHS-C	PUMPHOUSE 120/208V POWER PANEL	3002	Refers to SES project for electrical details for noted drawings.
	2PHS-A-B	PUMPHOUSE MACHINE SHOP	3002	FORMERLY 2K
	2PHS-A-H	PUMPHOUSE HEATING PANEL	3002	Refers to SES project for electrical details for noted drawings.
	2J	PARKING LOT 'A' KIOSK SERVICE PANEL	9012	Refers to SES project for electrical details for noted drawings.
	2M	BACK GATE GUARD HOUSE	EMD E4	
	2N	NORTH LANDING WHARF SUBSTATION	EMD E4	
	2O	KEEL BLOCK BUILDING	EMD E2	naming contrary to note 11
	2OA	KEEL BLOCK BUILDING	EMD E2	naming contrary to note 4 and 4.1
	2P	CARPENTER SHOP IN KEEL BUILDING	EMD E2	
	2Q	PROJECTS OFFICE LOWER TRAILER	?	
	2R	PROJECTS OFFICE UPPER TRAILER	?	
	---	NOTE 4.2		
	2T	COMPRESSOR No.4 ROOM	EMD E5	
	2U	K BUILDING	EMD E5	
	2V	BUTLER BUILDING	EMD E5	
	2VA	BUTLER BUILDING	EMD E5	
347/600V STANDBY PANELS	6PHS-SP-A	PUMPHOUSE	3002	FORMERLY PANEL 6SA
	6SB	SOUTHSIDE SUBSTATION	EMD E6	
	6SC	SOUTHSIDE GENERATOR G2 CONTROL PANEL	EMD E6	
	6SD	SOUTHSIDE GENERATOR G2 ATS PANEL	EMD E6	
	6SH	HIGH MAST LIGHTING PANEL	EMD E6	
	6SP1	NORTHSIDE GENERATOR G1 ATS & STANDBY POWER DISTRIBUTION PANEL No.1	EMD E6	
	6SP2	NORTHSIDE GENERATOR G1 STANDBY POWER DISTRIBUTION PANEL No. 2	EMD E6	
	6SES-SP-1	SERVICE ENTRANCE SUBSTATION	2002	Refers to SES project for electrical details for noted drawings.
	6PHS-SP-1	PUMPHOUSE SUBSTATION	3002	Refers to SES project for electrical details for noted drawings.
	6SSSR-SP-1	SOUTH SUBSTATION REPLACEMENT 347/600V PANEL	5011	Refers to SSSR project for electrical details for noted drawings.
480V STANDBY PANELS	4SA	SOUTHSIDE SUBSTATION	EMD E6	
	4SSSR-SP1-1	SOUTH SUBSTATION REPLACEMENT	5011	Refers to SSSR project for electrical details for noted drawings.
120/208V STANDBY PANELS	2SA	MAIN SUBSTATION	EMD E6	
	2SB	PUMPHOUSE	EMD E6	
	2SD	NORTH GENERATOR ROOM	EMD E6	
	2SE	NLW SUBSTATION 120/208V STANDBY PANEL	EMD E6	
	2SJ	DEMARC BUILDING PANEL	2002	Was 2J. Refers to SES project for electrical details for noted drawings.
	2SK	SOUTHSIDE SUBSTATION	EMD E6	Was 2S
	2SL	SOUTH GENERATOR BUILDING	EMD E6	
	2SM	SOUTH MACHINE SHOP	EMD E6	
	2SN	SOUTH FIRST AID OFFICE	EMD E6	
	2SP	PUMPHOUSE BOTTOM FLOOR STANDBY POWER		Was 2L
	2SQ	PUMPHOUSE 2nd FLOOR PANEL	EMD E6	Was 2M
	2SR	NEW GUARD HOUSE PANEL	2002	Refers to SES project for electrical details for noted drawings.
	2SS	COMMISSIONAIRES KIOSK PANEL	2002	Refers to SES project for electrical details for noted drawings.
	2ST	UPPER WALL PANEL	2002	Refers to SES project for electrical details for noted drawings.
	2SES-SP-1	SERVICE ENTRANCE SUBSTATION 120/208V PANEL	2002	Refers to SES project for electrical details for noted drawings.
	2PHS-SP-A	PUMPHOUSE SUBSTATION 120/208V PANEL	3002	Refers to SES project for electrical details for noted drawings.
	2SSSR-SP-1	SOUTHSIDE SUBSTATION REPLACEMENT 120/208V PANL	5011	Refers to SSSR project for electrical details for noted drawings.
DISCONNECT SWITCHES	4MS-19DS	DOCK OUTLET #3 - EAST DS	EMD E2	Shown as sample only.
	T12.5MS-2DS	SHIP-SHORE TRANSFORMER SECONDARY DISCONNECT SWITCH	EMD E2	Integral with grounding switch T12.5MS-2GS
FUSED DISCONNECT SWITCHES	6SA-20FS	MAIN GATE GUARDHOUSE TRANSFORMER PRIMARY FU. SW.	EMD E6	Shown as sample only. See 1-Line diagrams for switches that are named
MOTOR CONTROL CENTERS	4PH-MCC	CAPSTAN MCC	3002	Refers to SES project for electrical details for noted drawings.
	2.4PHS-MCC1	PUMPHOUSE SUBSTATION	3000	Refers to SES project for electrical details for noted drawings.
	2.4PHS-MCC2	PUMPHOUSE SUBSTATION	3000	Refers to SES project for electrical details for noted drawings.
CRANE SWITCHBOARDS				Refer to manufacturers' drawings for equipment numbering conventions.
UPS	2SES-UPS	SERVICE ENTRACE SUBSTATION UPS	2002	Refers to SES project for electrical details for noted drawings.
	2PHS-UPS	PUMPHOUSE SUBSTATION UPS	3002	Refers to SES project for electrical details for noted drawings.
	2SSSR-UPS	SOUTHSIDE SUBSTATION REPLACEMENT UPS	5110	Refers to SSSR project for electrical details for noted drawings.
2.4kV MOTOR STARTER	2.4PH-SS	COMPRESSOR #1 MOTOR SOFT START/PUMPHOUSE	EMD E3	Refer to manufacturer's drawings and manuals for details
	2.4PHS-MCC1	PUMPHOUSE SUBSTATION MCC1	3000	Refers to SES project for electrical details for noted drawings.
	2.4PHS-MCC2	PUMPHOUSE SUBSTATION MCC2	3000	Refers to SES project for electrical details for noted drawings.

NOTES (POWER SYSTEM COMPONENTS NUMBERING CONVENTION):

1. IN GENERAL, POWER SYSTEM COMPONENTS ARE NUMBERED IN A WAY TO FACILITATE IDENTIFYING THE POWER SOURCE WHICH SUPPLIES THEM, STARTING WITH VOLTAGE, AND FOLLOWED BY ONE OR MORE LOCATION, FUNCTION, OR ALPHANUMERIC DESIGNATORS AS FOLLOWS:
   - 1.1 VOLTAGE DESIGNATORS: 12.5:12,500 V; 6:347/600 V; 4:277/480V; 2:120/208V
   - 1.2 LOCATION DESIGNATORS: MS: MAIN SUBSTATION; NL: NORTH LANDING WHARF; PH: PUMPHOUSE; SC: SOUTH COMPRESSOR ROOM; SS: SOUTHSIDE SUBSTATION; MH - MUNROE HEAD
   - 1.3 FUNCTIONAL DESIGNATORS: DS: DISCONNECT SWITCH (NOT PART OF A SWITCHBOARD OR MCC); FS: FUSED DISCONNECT SWITCH (SIMILAR TO DS); MCC: MOTOR CONTROL CENTER; HFB: HARMONIC FILTER BANK; S: STANDBY POWER SYSTEM; SS; SOFT START.
2. IN GENERAL, SWITCHBOARDS ARE NUMBERED WITH A VOLTAGE DESIGNATOR, FOLLOWED BY A LOCATION DESIGNATOR.
   - 2.1 WHERE THERE IS MORE THAN ONE SWITCHBOARD OF THE SAME VOLTAGE IN THE SAME AREA, THEY ARE DIFFERENTIATED BY CONSECUTIVE NUMERIC DESIGNATORS, SUCH AS 4SS1 AND 4SS2.
   - 2.2 SWITCHBOARD SECTIONS ARE NUMBERED IN CONSECUTIVE ORDER WITH INCOMING SECTION BEING SECTION #1.
3. MOTOR CONTROL CENTERS ARE NUMBERED SIMILAR TO SWITCHBOARDS, FOLLOWED BY "-MCC"
4. IN GENERAL, PANELBOARDS ARE NUMBERED WITH A VOLTAGE DESIGNATOR, FOLLOWED BY A CONSECUTIVE ALPHABETICAL DESIGNATOR (e.g. 2A, 2B, ETC.). ALPHABETICAL DESIGNATOR "S" IS NOT USED IN ORDER TO AVOID CONFUSION WITH STANDBY PANELS AS DESCRIBED BELOW.
   - 4.1 SUB-PANELS ARE NAMED AFTER THE PARENT PANELBOARD, FOLLOWED BY A SECOND ALPHABETICAL DESIGNATOR STARTING WITH "A" AND CONTINUING CONSECUTIVELY FOR EACH SUB-PANEL (e.g. SUB-PANEL 2VA IS FED FROM PANEL 2V).
   - 4.2 FOR STANDBY SYSTEM PANELBOARDS, THE ALPHABETICAL DESIGNATOR IS "S", FOLLOWED BY A SECOND ALPHABETICAL DESIGNATOR STARTING WITH "A" AND CONTINUING CONSECUTIVELY. EXCEPTIONS EXIST FOR THE FOLLOWING STANDBY PANELBOARDS: PANEL "6SP1" IS CURRENTLY LABELED WITH AN ENGRAVED NAMEPLATE PER EXISTING DRAWINGS, AND THE ADJOINING PANEL IS DESIGNATED "6SP2" TO MAINTAIN SIMILARITY.
5. BREAKERS ARE NUMBERED AS FOLLOWS:
   - 5.1 IN GENERAL, BREAKERS ARE NUMBERED TO MATCH THE ORIGINAL SWITCHBOARD MANUFACTURER'S DESIGNATION (e.g. BREAKER 4SS1-2 IS NAMED AFTER 52-2).
   - 5.2 IN LARGE SWITCHBOARDS, EACH SWITCHBOARD SECTION IS ASSIGNED A BLOCK OF BREAKER NUMBERS, BASED ON THE BEST ESTIMATE OF POSSIBLE NUMBER OF BREAKERS WHICH MIGHT BE INSTALLED IN THAT SECTION.
   - 5.3 IN PANELBOARDS, EACH BREAKER IS NUMBERED AFTER THE CIRCUIT NUMBER. FOR 2- OR 3-POLE BREAKERS, THE LOWER CIRCUIT NUMBER DETERMINES THE BREAKER NUMBER (e.g. BREAKER NUMBER FOR CIRCUIT 26/28/30 IN PANEL 2SK IS "2SK-26")
6. FIELD-MOUNTED DISCONNECT SWITCHES ARE NUMBERED AFTER THE EQUIPMENT WHICH POWERS THEM, BUT WITH SUFFIX "DS" (e.g. 4MS-19DS).
7. FIELD-MOUNTED FUSED DISCONNECT SWITCHES ARE NUMBERED SIMILAR TO DISCONNECT SWITCHES, BUT WITH SUFFIX "FS" (e.g. 6SA-20FS). STAND ALONE FUSES ARE DESIGNATED SIMILARLY, BUT WITH SUFFIX "FU".
8. FIELD-MOUNTED BREAKERS ARE NUMBERED SIMILAR TO DISCONNECT SWITCHES, BUT WITH SUFFIX "BKR" (e.g. 6SA-13BKR).
9. TRANSFORMERS ARE NUMBERED AFTER THE EQUIPMENT WHICH POWERS THEM, BUT WITH A "T" PREFIX (e.g. T12.5MS-2). SOME OF THE EXISTING TRANSFORMERS ARE NUMBERED ACCORDING TO SEVERAL DIFFERENT CONVENTIONS. THE TRANSFORMER TABLE ON THIS DRAWING INCLUDES A COLUMN SHOWING THE OBSOLETE DESIGNATIONS FOR REFERENCE.
   - 9.1 TRANSFORMER NEUTRAL GROUNDING RESISTORS ARE NAMED AFTER THE TRANSFORMER, BUT WITH SUFFIX "NGR".
10. IN GENERAL, POWER CABLES ARE LABELLED AFTER THE EQUIPMENT TO WHICH THEY ARE CONNECTED AT THEIR SOURCE END (e.g. CABLE 6SP1-2 IS CONNECTED TO BREAKER 2 IN PANEL 6SP1; CABLE 2PH2-7 IS CONNECTED TO 3 POLE BREAKER OCCUPYING CIRCUIT POSITIONS 7/9/11 IN PANEL '2PH2').
    - 10.1 PARALLEL CABLES ARE DESIGNATED WITH SUFFIX -1, -2, ETC.
    - 10.2 CABLES CONNECTED IN SERIES IN SAME CIRCUIT ARE DESIGNATED WITH SUFFIX -A, -B, ETC. (e.g. "-A" CABLE FROM PANELBOARD TO A FIELD JUNCTION BOX, "-B" CABLE, SUCH AS A FLEXIBLE CABLE, FROM JUNCTION BOX TO MOTOR).
    - 10.3 EXCEPT WHERE INDICATED OTHERWISE, TRANSFORMER SECONDARY CABLES ARE LABELLED STARTING WITH SECONDARY VOLTAGE DESIGNATOR, FOLLOWED BY THE TRANSFORMER DESIGNATION (e.g. 2 T6SA-1).
    - 10.4 IN ORDER TO MAKE CABLE NUMBERING SYSTEM WORK, DO NOT CHANGE BREAKER NUMBERS ARBITRARILY. DO NOT RE-USE OLD NUMBERS OF DELETED BREAKERS. ASSIGN NEW BREAKER NUMBERS WHICH HAVE NOT PREVIOUSLY BEEN USED.
11. WHEN USING CONSECUTIVE ALPHABETICAL DESIGNATORS (e.g. 2A, 2B etc.) DO NOT USE "O" OR "I" TO AVOID CONFUSION WITH "ZERO" AND "ONE".

TRANSFORMER TABLE

DESIGNATION	OBSOLETE NO.	SIZE	VOLTAGE	TYPE	INSULATION CLASS	IMPEDANCE	SERIAL #	MANUFACTURER	DRAWING NO.	COMMENTS/LOCATION
T25/12SSSR-1		-	25/12.5kV/2.4GV, 3Ø, DELTA/WYE	ANAF					5010	SOUTH SIDE SUBSTATION REPLACEMENT
T25/12SSSR-2		-	25/12.5kV/347/600V, 3Ø, DELTA/WYE	ANAF					5010	SOUTH SIDE SUBSTATION REPLACEMENT
T25/12SSSR-3		-	25/12.5kV/480V, 3Ø, DELTA/WYE	ANAF					5010	SOUTH SIDE SUBSTATION REPLACEMENT
T25/12SSSR-4		-	25/12.5kV/120/208V, 3Ø, DELTA/WYE	ANAF					5010	SOUTH SIDE SUBSTATION REPLACEMENT
T25/12SSSR-5		-	25/12.5kV/550V REGULATED	ANAF					5010	SOUTH SIDE SUBSTATION REPLACEMENT
T25/12SES-1		750kVA	25/12.5kV/.600V, 3Ø, DELTA/WYE	ANN		5.0%			2000	SERVICE ENTRANCE SUBSTATION
T25/12PHS-1		5MVA	25/12.5kV/.1386/2400V, 3Ø, DELTA/WYE	ANN		6.5%			3000	PUMPHOUSE SUBSTATION
T25/12PHS-2		750kVA	25/12.5kV/.600V, 3Ø, DELTA/WYE	ANN		5.0%			3000	PUMPHOUSE SUBSTATION
T12.5MS-2	-	5MVA	12.47-12.47/11/6.6kV						EMD E2	
T12.5MS-4	T04	5MVA	12.5kV/2.3kV, 3ø, Delta/Wye	ONAN		6.37%	57843.01	F.P.E.	EMD E2	MS Transformer Yard
T12.5MS-6	T01	450kVA	1.25/12.5kV/.120/208V, 3ø, Delta/Wye	ANN	150SYS		57851	F.P.E.	EMD E2	MS Mezzanine
T12.5MS-7	T03	750kVA	12.5kV/.347/600V, 3ø, Delta/Wye	ANN	150SYS	6.0%	57850	F.P.E.	EMD E2	MS Mezzanine
T12.5MS-8	T02	1500kVA	12.5kV/.277/408V, 3ø, Delta/Wye	ANN	150SYS	6.3%	57849	F.P.E.	EMD E2	MS Mezzanine
T12.5NL	T17	1500/1725/12.5kVA	12.5kV/.277/480V, 3ø, Delta/Wye	ANN	185SYS	5.94%	58391.01		EMD E4	NL
T12.5SS-1	T21	2MVA	12.5kV/.277/480V, 3ø, Delta/Wye			6.05	Cat #32730-1	F.P.E.	EMD E5	SS Unit-Sub
T2.4MS-21FS	T05	1MVA	2400-277/480V, 3ø, Delta/Wye	ANN		5.7%/5.93%@170°	80TSA441	Westinghouse	EMD E2	150T Crane
T2.4MS-21FU	-	300kVA	2400-480V Delta/Delta	ANN		3%			EMD E2	150T Crane
T2.4MS-22	T06	600kVA	2.3kV:480V, 3ø			5.15%			EMD E2	50T Crane
T2.4PH-12	-	15kVA	2400-480V, 3Ø	ANN	220° C	5.0%	Cat.#19350	Rex Manufacturing	EMD E3	Pumphouse
T2.4SC-1	T24	1MVA	2.3kV:600V, 3ø						EMD E5	SC
T2.4SS-2	T23	500kVA	25/12.5kV:600V, 3Ø, DELTA/WYE			5.5%			EMD E5	30T Crane
T6A-7	T10	112.5kVA	600-120/208V, 3ø, Delta/Wye			3.1%			EMD E2	Electrical Shop
T6A-8	T11	75kVA	600-480V, 3ø, Auto Transformer			1.0%			EMD E2	Electrical Shop
T6G		30kVA	600-120/208V, 3ø						EMD E3	Pumphouse Garage
T6MS9-FS-1		150kVA	600-120/208V, 3ø	ANN	200° C	4.5%	Cat. #BA150JM	Rex Manufacturing	EMD E2	Vic Ship Operations Building
T6PH-7	T14	118kVA	600-277/480V, 3ø						EMD E3	
T6PH-15	T13	112.5kVA	600-120/208V, 3ø			6.66%@170°			EMD E3	Upper Pkg. Elect. Shd.
T6PHS-1		500kVA	600V-2.4kV, DELTA/WYE	ANN		5.0%			3000	PUMPHOUSE SUBSTATION
T6PHS-2		112.5kVA	600V-2.4kV, DELTA/WYE	ANN					3002	PUMPHOUSE SUBSTATION
T6PHS-3		112.5kVA	600V-2.4kV, DELTA/WYE	ANN					3002	PUMPHOUSE SUBSTATION
T6PHS-4		5kVA	600V-2.4kV, DELTA/WYE	ANN					3002	PUMPHOUSE SUBSTATION
T6PHS-5		45kVA	600V-2.4kV, DELTA/WYE	ANN					3002	PUMPHOUSE SUBSTATION
T6PHS-37		112.5kVA	600V-2.4kV, DELTA/WYE	ANN					3002	PUMPHOUSE SUBSTATION
T6SA-1	T25B								EMD E6	Pumphouse
T6SA-13BKR		15kVA	600-120/208V, 3ø						EMD E6	NL
T6SA-20FS	T16	15kVA	600-120/240V, 1ø, Delta/Wye			6.18%			EMD E6	Main Gate Guardhouse
T6SB-13BKR		30kVA	600-120/208V,3ø						EMD E6	South Machine Shop
T6SB-20		112.5kVA	600-277/480V, 3ø						EMD E6	SS
T6SB-7		30kVA	600-120/208V,3ø						EMD E6	SS
T6SES-2		75kVA	600-120/208V,3ø	ANN					2002	PARKING LOT 'A'
T6SES-3		45kVA	600-120/208V,3ø	ANN					2002	SERVICE ENTRANCE SUBSTATION
T6SES-4		21kVA	600-120/208V,3ø	ANN					2002	DEMARC BUILDING
T6SES-5		45kVA	600-120/208V,3ø	ANN					2002	NEW GUARD HOUSE
T6SES-6		15kVA	600-120/208V,3ø	ANN					2002	DEMARC BUILDING
T6SES-7		15kVA	600-120/208V,3ø	ANN					2002	UPPER WALL PANEL
T6SES-8		21kVA	600-120/208V,3ø	ANN					2002	PARKING LOT 'A'
T6SES-9		15kVA	600-120/208V,3ø	ANN					2002	PARKING LOT 'A'
T6SES-10		2kVA	600-120/208V,3ø	ANN					2002	PARKING LOT 'A'
T6SES-11		<1kVA	600-120/208V,1ø	ANN					2002	SERVICE ENTRANCE SUBSTATION
T6SP1-2	T25A	30kVA	600-208V,3ø, Delta/Wye	ANN					EMD E6	N. Generator Room
T6SP2-1	-	500kVA	600-2400V,3ø, Delta/Wye	ANN					EMD E6	N. Generator Room
T6SP2-2	T08	300kVA	600-277/480V, 3ø, Delta/Wye	ANN,K		5.5%	Cat. #123363	Hammond	EMD E6	N. Generator Room
T6SP2-4	T09	150kVA	600-120/208V, 3ø, Delta/Wye	ANN,K		4.8%	Cat. #K1509K	Hammond	EMD E6	N. Generator Room
T4B-7	-	10kVA	480-120/240V, 1ø			3.84%			EMD E5	K-Building
T4C-7FS	T26	25/12.5kVA	480-120/208V, 3x1ø			2.9%			EMD E5	Butler Bldg.
T4NL-7	T19	75kVA	480-120/208V, 3ø, Delta/Wye	DE		3.77%	T.55610	F.P.E.	EMD E4	NL
T4NL-8BKR	T18	15kVA	480-120/240V, 1ø, Delta/Wye	F				Hammond	EMD E4	Back Gate Guardhouse
T4NL-9	T20	150kVA	480-120/208V, 3ø, Delta/Wye	TW		3.4%	9885-11-95	Marcus	EMD E4	NL
T4SS1-3	T22	225/12.5kVA	480-120/208V, 3ø, Delta/Wye				Cat #32730-1	F.P.E.	EMD E5	SS Unit-Sub
T4SS2-30	-	450kVA	480-347/600V	ANN					EMD E5	Standby Power
(To Come)	T12	50kVA	600-120/208V, 1ø, Delta/Wye	ANN		4.06%		Westinghouse		Was in old Carpenter Shop (surplus?)
TPH-FS-2	T15	15kVA	600-120/208V, 3ø, Delta/Wye			4.41%				Garage (surplus?)
	T07	300kVA	600-2.3kV, 3ø, Delta/Wye	K			Cat. #123362	Hammond		Surplus
-		150kVA								SS Tower Crane

DATA SUPPLIED BY PWGSC FOR EQUIPMENT NOT IN SCOPE OF CONTRACT HAS NOT BEEN VERIFIED AND MAY NOT REFLECT ACTUAL INSTALLED ITEMS

REFERENCE DRAWING ONLY
ORIGINAL DRAWING No. EMD E1

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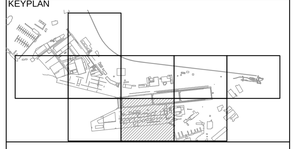


Revision/ Révision	Description/Description	Date/Date
5	ISSUED FOR TENDER	15/01/28
4	ISSUED FOR 99% DESIGN REVIEW	16/01/06
3	ISSUED FOR 66% DESIGN REVIEW	15/11/25
2	ISSUED FOR 33% DESIGN REVIEW	15/10/28
1	ISSUED FOR DESIGN DEVELOPMENT	15/09/11
0		

Client/client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet

825 ADMIRALS ROAD VICTORIA BC ESQUIMALT GRAVING DOCK ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

Designed by/Concept par
I. BARNES

Drawn by/Dessine par
J. BIELING / S. SEYMOUR

PWGSC Project Manager/Administrateur de Projets TPSGC
Jamie LeBlanc

PWGSC, Regional Manager, Architectural and Engineering Services/ Gestionnaire régionale, Services d'architectural et de génie, TPSGC
Preetipal Paul

Drawing title/Titre du dessin

ELECTRICAL EQUIPMENT NUMBERING SYSTEM

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.062548.2	5003	5

Plot Date: January 28, 2016 11:35 AM Plotted by: Jacob Bieling
File Name: H:\PROJECTS\2015\11-15-166\DWGS\DWG\5003 ES2 NO SYS.DWG

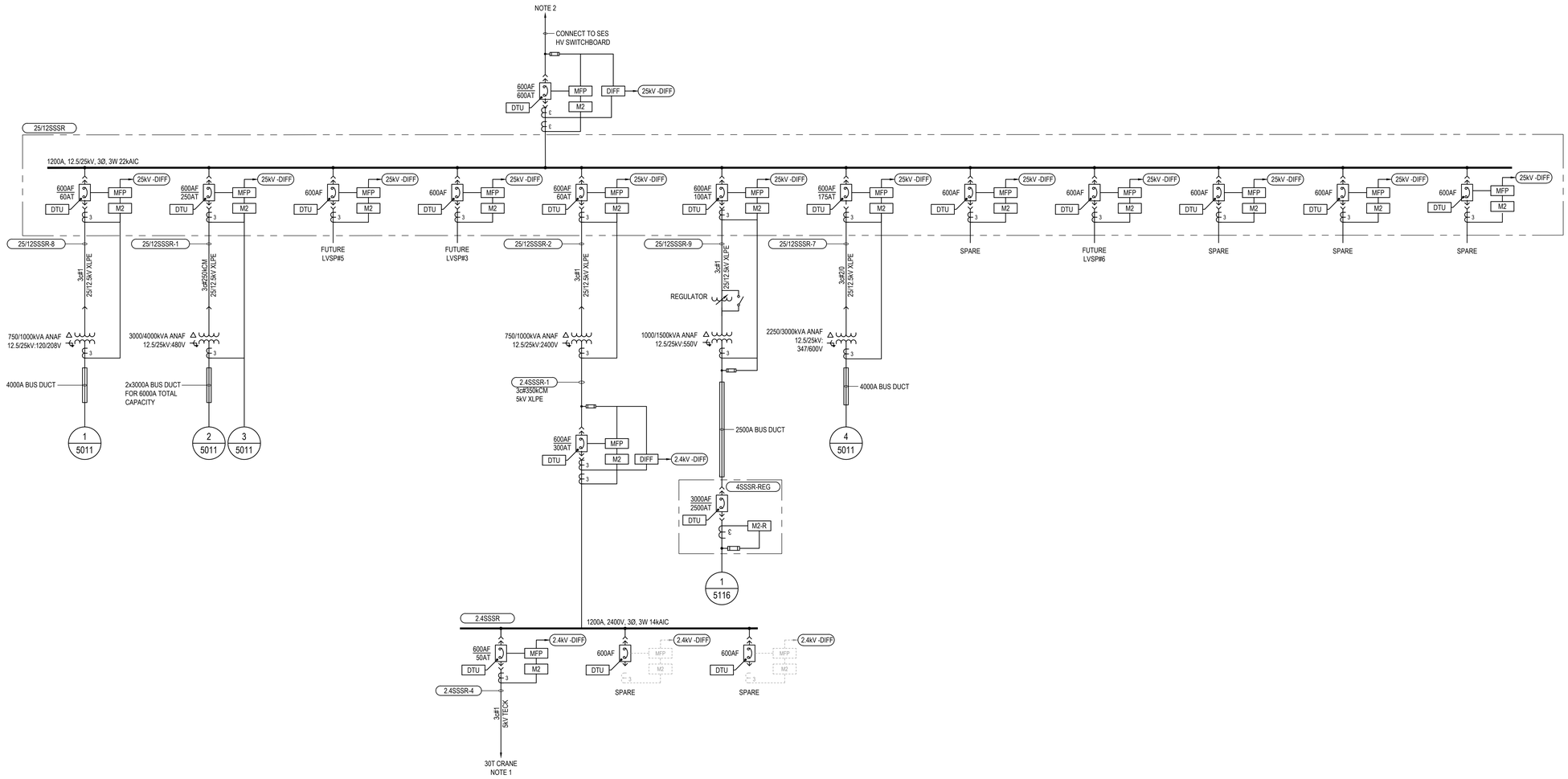
PWGSC – B1 – 1000X707

GENERAL NOTES:

1. 25/12.5kV, 2.4kV SWITCHBOARDS ARE TO BE EQUIPPED WITH OPTICAL FIBRE ARC FLASH SENSORS CONNECTED TO THE SWITCHBOARD UPSTREAM BREAKER, TO BE CONFIGURED TO TRIGGER AN EMERGENCY TRIP OF THE BOARD MAIN FEEDER BREAKER IF AN ARC FLASH EVENT OCCURS.
2. ALL EQUIPMENT TO BE MANUFACTURED TO 25kV STANDARDS AND RATING. INTIAL CONNECTION IS AT 12.5kV. PROVIDE ALL REQUIRED FUSING, WIRING, JUMPERS, ETC. FOR BOTH VOLTAGE CONDITIONS.

NOTES:

1. EXISTING LOAD TO BE RECONNECTED/TRANSFERED FROM EXISTING SSS.
2. CABLING TO SES SWITCHBOARD. SUPPLIED, INSTALLED, CONNECTED AND TERMINATED BY OTHERS. COORDINATE CONNECTION TESTING AND INSTALLED WITH THIS CONTRACTOR VIA DEPARTMENTAL REPRESENTATIVE.



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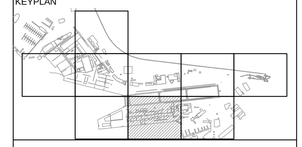

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Client/client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet

825 ADMIRALS ROAD VICTORIA BC ESQUIMALT GRAVING DOCK ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

Designed by/Concept par
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Drawn by/Dessine par
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Jamie LeBlanc

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Preetipal Paul

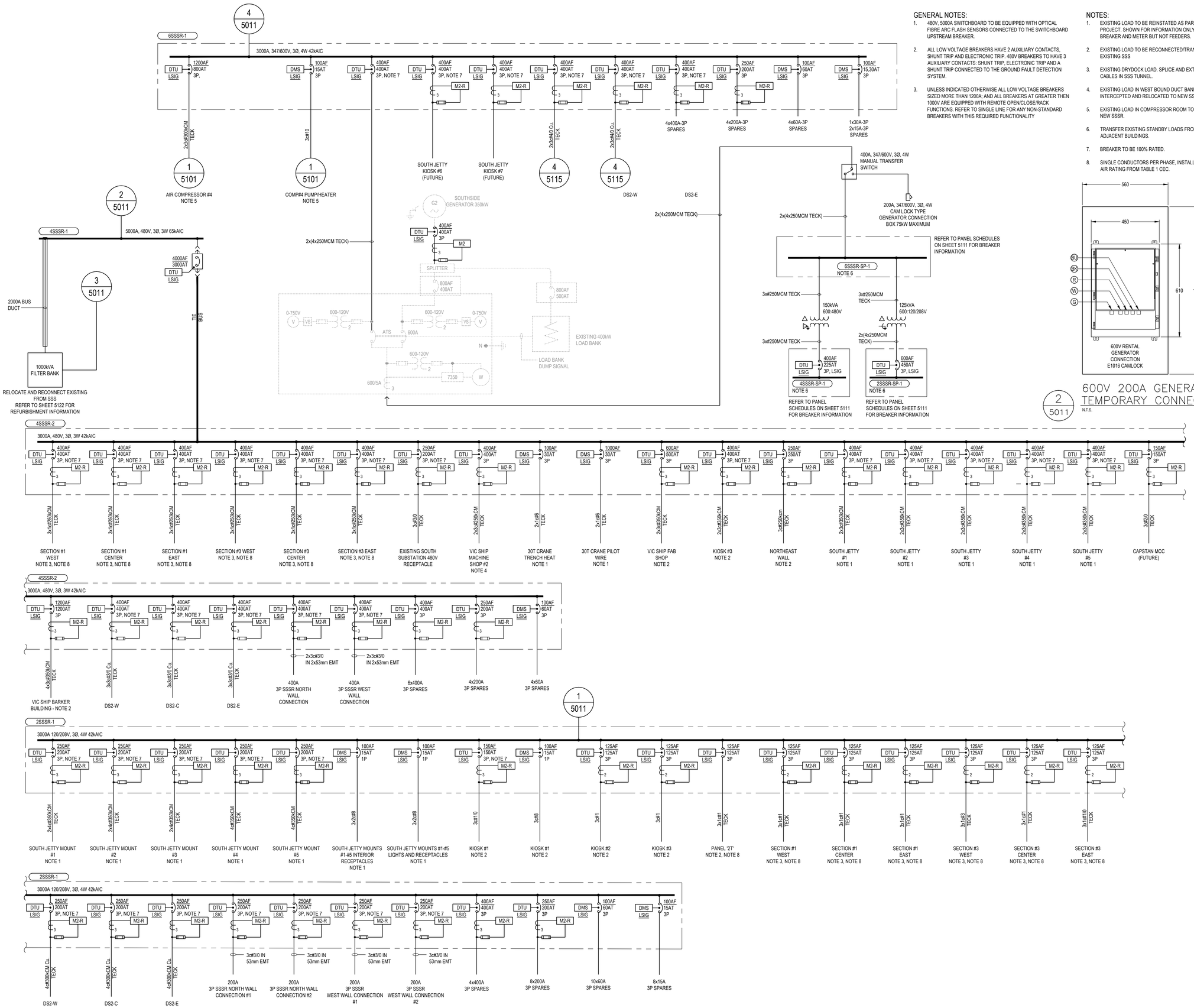
Drawing title/Titre du dessin

SINGLE LINE DIAGRAM HIGH VOLTAGE DISTRIBUTION

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.062548.2	**5010**	**5**

Plot Date: January 28, 2016 11:35 AM Plotted by: Jacob Bieling
File Name: n:\PROJECTS\2015\11-15-166\DWGS\DWG 5010 SSR SNGLE-LINE HV.DWG

PWGSC – B1 – 1000X707



GENERAL NOTES:

1. 480V, 5000A SWITCHBOARD TO BE EQUIPPED WITH OPTICAL FIBRE ARC FLASH SENSORS CONNECTED TO THE SWITCHBOARD UPSTREAM BREAKER.
2. ALL LOW VOLTAGE BREAKERS HAVE 2 AUXILIARY CONTACTS, SHUNT TRIP AND ELECTRONIC TRIP. 480V BREAKERS TO HAVE 3 AUXILIARY CONTACTS: SHUNT TRIP, ELECTRONIC TRIP AND A SHUNT TRIP CONNECTED TO THE GROUND FAULT DETECTION SYSTEM.
3. UNLESS INDICATED OTHERWISE ALL LOW VOLTAGE BREAKERS SIZED MORE THAN 1200A; AND ALL BREAKERS AT GREATER THEN 1000V ARE EQUIPPED WITH REMOTE OPEN/CLOSE/RACK FUNCTIONS. REFER TO SINGLE LINE FOR ANY NON-STANDARD BREAKERS WITH THIS REQUIRED FUNCTIONALITY

NOTES:

1. EXISTING LOAD TO BE REINSTATED AS PART OF SOUTH JETTY PROJECT. SHOWN FOR INFORMATION ONLY. PROVIDE BREAKER AND METER BUT NOT FEEDERS.
2. EXISTING LOAD TO BE RECONNECTED/TRANSFERED FROM EXISTING SSS
3. EXISTING DRYDOCK LOAD. SPLICE AND EXTEND EXISTING MI CABLES IN SSS TUNNEL.
4. EXISTING LOAD IN WEST BOUND DUCT BANK TO BE INTERCEPTED AND RELOCATED TO NEW SSSR.
5. EXISTING LOAD IN COMPRESSOR ROOM TO BE FED FROM NEW SSSR.
6. TRANSFER EXISTING STANDBY LOADS FROM SSS AND ADJACENT BUILDINGS.
7. BREAKER TO BE 100% RATED.
8. SINGLE CONDUCTORS PER PHASE, INSTALLED TO MEET FREE AIR RATING FROM TABLE 1 CEC.

2 5011

600V 200A GENERATOR TEMPORARY CONNECTION

N.T.S.

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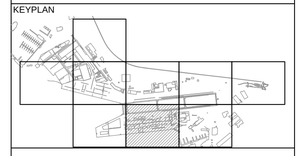

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Client/client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet

825 ADMIRALS ROAD VICTORIA BC ESQUIMALT GRAVING DOCK ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

Designed by/Concept par
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Drawn by/Dessine par
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Jamie LeBlanc

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Preetipal Paul

Drawing title/Titre du dessin

SINGLE LINE DIAGRAM LOW VOLTAGE DISTRIBUTION

Project No./No. du projet	Sheet/Feuille	Revision no./ Lo Révision no.
R.062548.2	5011	5

Plot Date: February 5, 2016 2:54 PM Plotted by: Jacob Bieling
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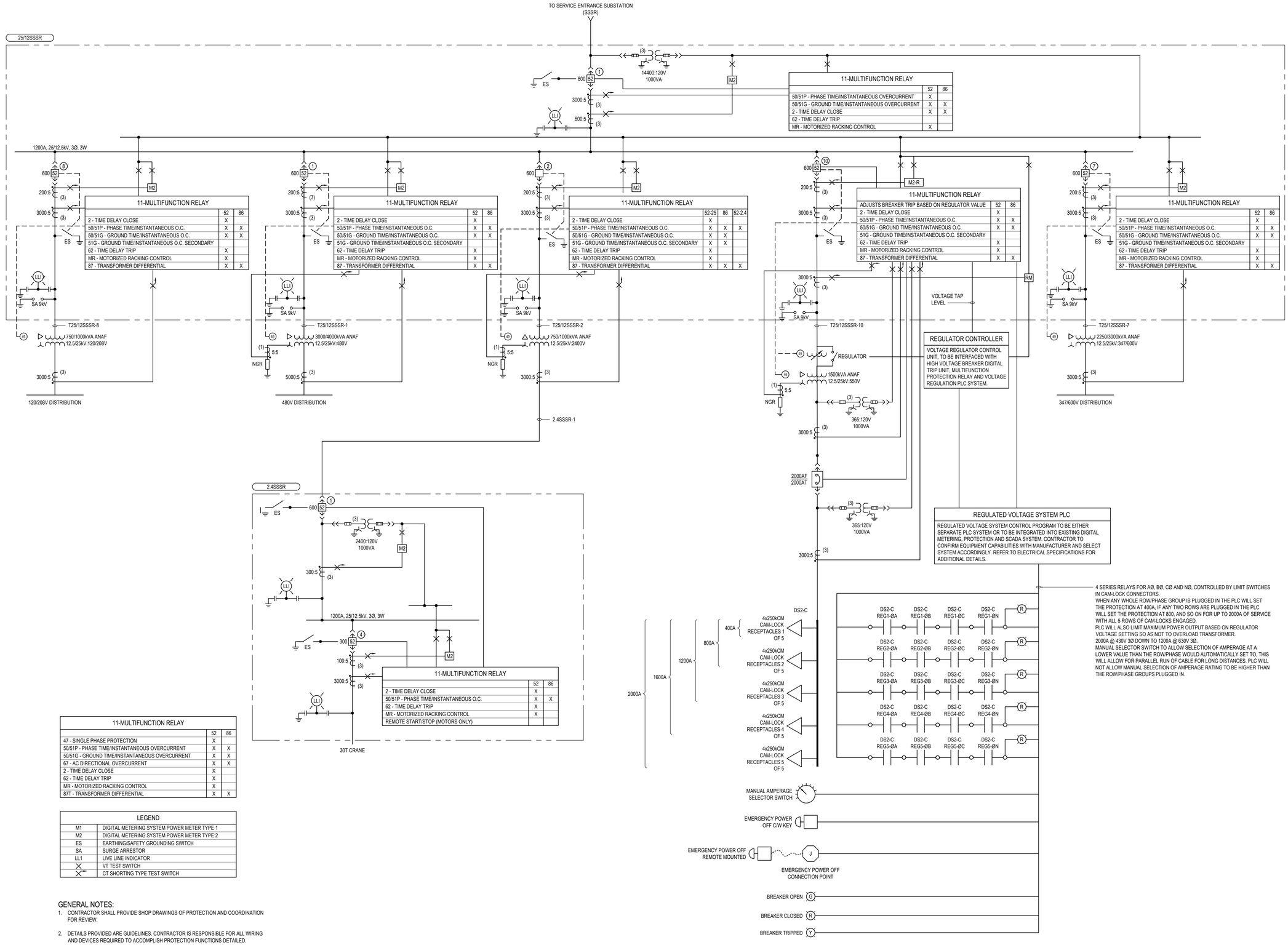

11-MULTIFUNCTION RELAY		
	52	86
47 - SINGLE PHASE PROTECTION	X	
50/51P - PHASE TIME/INSTANTANEOUS OVERCURRENT	X	X
50/51G - GROUND TIME/INSTANTANEOUS OVERCURRENT	X	X
67 - AC DIRECTIONAL OVERCURRENT	X	X
2 - TIME DELAY CLOSE	X	
62 - TIME DELAY TRIP	X	
MR - MOTORIZED RACKING CONTROL	X	
87T - TRANSFORMER DIFFERENTIAL	X	X

LEGEND	
M1	DIGITAL METERING SYSTEM POWER METER TYPE 1
M2	DIGITAL METERING SYSTEM POWER METER TYPE 2
ES	EARTHING/SAFETY GROUNDING SWITCH
SA	SURGE ARRESTOR
LL1	LIVE LINE INDICATOR
	VT TEST SWITCH
	CT SHORTING TYPE TEST SWITCH

GENERAL NOTES:

1. CONTRACTOR SHALL PROVIDE SHOP DRAWINGS OF PROTECTION AND COORDINATION FOR REVIEW.
2. DETAILS PROVIDED ARE GUIDELINES. CONTRACTOR IS RESPONSIBLE FOR ALL WIRING AND DEVICES REQUIRED TO ACCOMPLISH PROTECTION FUNCTIONS DETAILED.
3. SEE SHEET 5010 FOR SINGLE LINE DIAGRAM.
4. ALL 25/12SSSR POTENTIAL TRANSFORMERS SHALL BE RATED FOR 25/12.5kV (14.4kV L-N), AND MULTI RATIO WINDINGS FOR OPERATION AND 25/12.5kV AND 12.5kV. ALL 25/12SSSR CURRENT TRANSFORMERS SHALL BE 25/12.5kV CLASS AND HAVE RATIOS FOR OPERATION AT 25/12.5kV AND 12.5kV.
5. ALL INSTRUMENT TRANSFORMERS MUST MEET REQUIREMENTS OF CSA-C60044.

Plot Date: January 28, 2016 11:35 AM Plotted by: Jacob Bieling
File Name: m:\PROJECTS\2013\11-15-1845\DWG\SWG\5012 SSR HV PROTECTION.DWG

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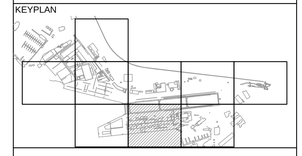

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0		

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ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet

825 ADMIRALS ROAD VICTORIA BC ESQUIMALT GRAVING DOCK ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

Designed by/Concept par
I. BARNES

Drawn by/Dessine par
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Jamie LeBlanc

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Preetipal Paul

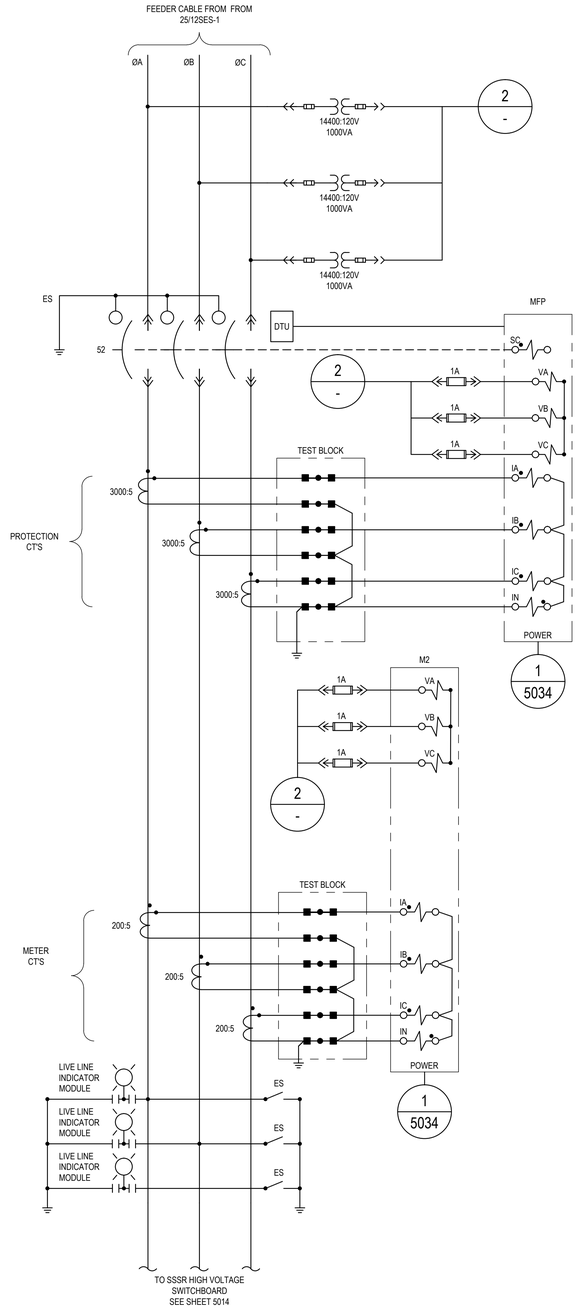
Drawing title/Titre du dessin

HIGH VOLTAGE PROTECTION DIAGRAM

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.062548.2	5012	5

GENERAL NOTES:

1. CONTRACTOR SHALL PROVIDE SHOP DRAWINGS OF PROTECTION AND COORDINATION FOR REVIEW.
2. DETAILS PROVIDED ARE GUIDELINES. CONTRACTOR IS RESPONSIBLE FOR ALL WIRING AND DEVICES REQUIRED TO ACCOMPLISH PROTECTION FUNCTIONS DETAILED.
3. SEE SHEET 5010 FOR SINGLE LINE DIAGRAM.
4. ALL 25/12SSSR POTENTIAL TRANSFORMERS SHALL BE RATED FOR 25/12.5kV (14.4kV L-N), AND MULTI RATIO WINDINGS FOR OPERATION AND 25/12.5kV AND 12.5kV. ALL 25/12SSSR CURRENT TRANSFORMERS SHALL BE 25/12.5kV CLASS AND HAVE RATIOS FOR OPERATION AT 25/12.5kV AND 12.5kV.
5. ALL INSTRUMENT TRANSFORMERS MUST MEET REQUIREMENTS OF CSA-C60044.



1/5013 25/12.5kV MAIN BREAKER THREE LINE DIAGRAM
N.T.S.

Plot Date: January 28, 2016 11:35 AM Plotted by: Jacob Bieling
File Name: N:\PROJECTS\2013\11-15-168\DWGS\DWG\5013 SSR 25kV MAIN BREAKER SLD.DWG

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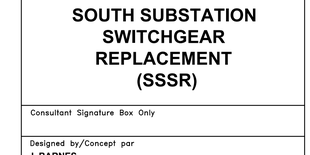

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1	ISSUED FOR DESIGN DEVELOPMENT	15/09/11
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ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet

825 ADMIRALS ROAD VICTORIA BC ESQUIMALT GRAVING DOCK ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

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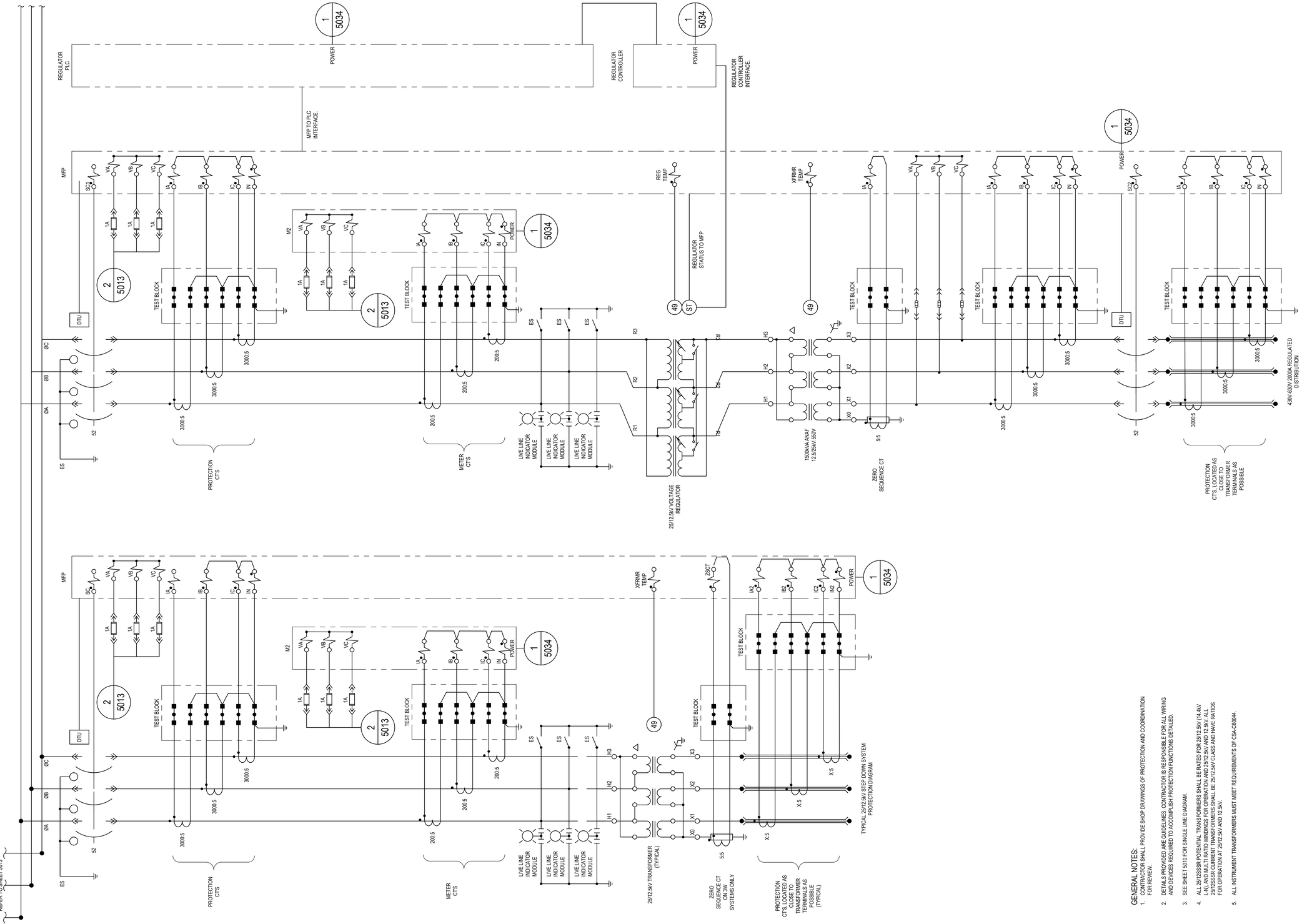
Preetipal Paul

Drawing title/Titre du dessin

25/12.5kV MAIN BREAKER THREE LINE DIAGRAM

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.062548.2	**5013**	**5**



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5. ALL INSTRUMENT TRANSFORMERS MUST MEET REQUIREMENTS OF CSA-C60044.

1 / 5014 — 25/12.5kV DISTRIBUTION TYPICAL THREE LINE DIAGRAMS
N.T.S.

Plot Date: January 28, 2016 11:36 AM — Plotted by: Jacob Bieling
File Name: N:\PROJECTS\2015\1-15-168\Live\CDWG\5014 SSR 25kV TYPICAL SLD.DWG

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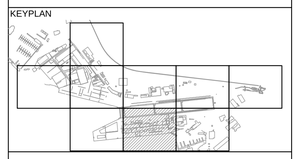

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Client/client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet

825 ADMIRALS ROAD VICTORIA BC
ESQUIMALT GRAVING DOCK
ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

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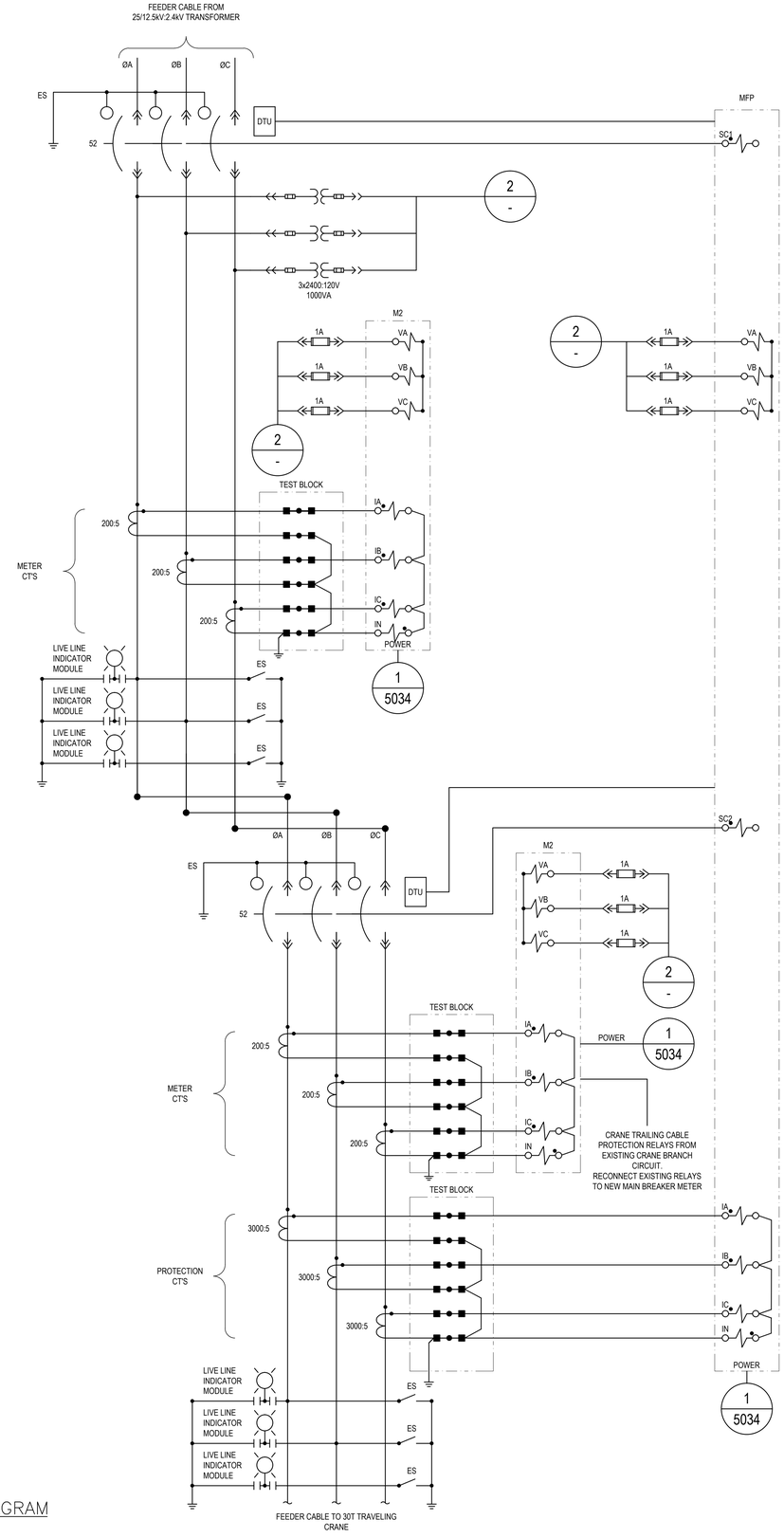
Preetipal Paul

Drawing title/Titre du dessin

25/12.5kV DISTRIBUTION TYPICAL THREE LINE DIAGRAMS

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.062548.2	**5014**	**5**



1 / 5015 2.4kV THREE LINE DIAGRAM
N.T.S.

Plot Date: February 5, 2016 2:51 PM
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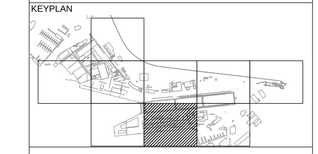

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SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

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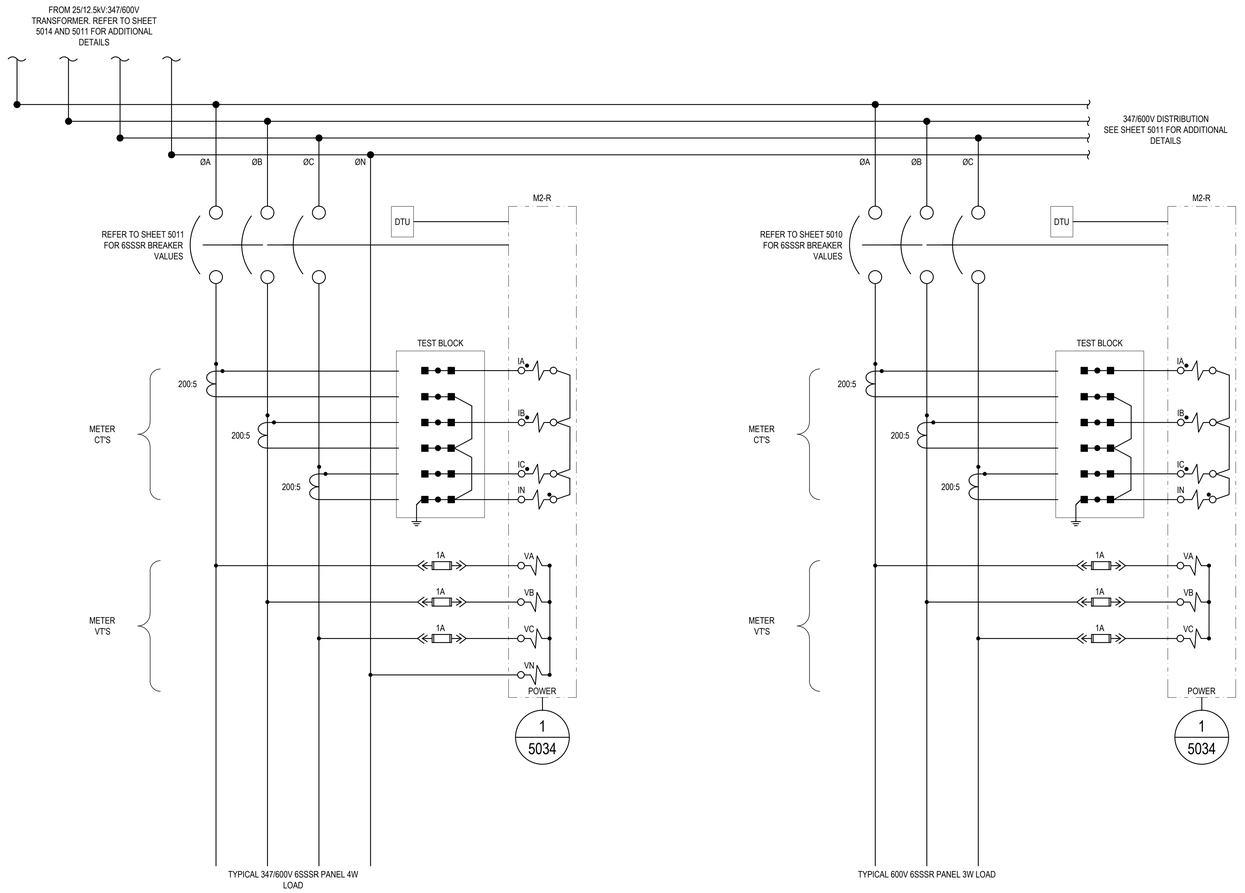
Preetipal Paul

Drawing title/Titre du dessin

2.4kV THREE LINE DIAGRAM

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.062548.2	5015	5



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5016

SOUTH SIDE SUBSTATION REPLACEMENT
600V TYPICAL THREE LINE DIAGRAMS

N.T.S.

Plot Date: January 28, 2016 11:36 AM Plotted by: Jacob Bieling
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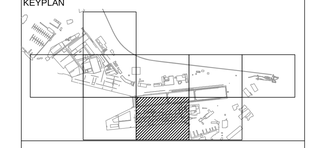

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Project title/Titre du projet

825 ADMIRALS ROAD VICTORIA BC ESQUIMALT GRAVING DOCK ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

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PWGSC Project Manager/Administrateur de Projets TPSGC
Jamie LeBlanc

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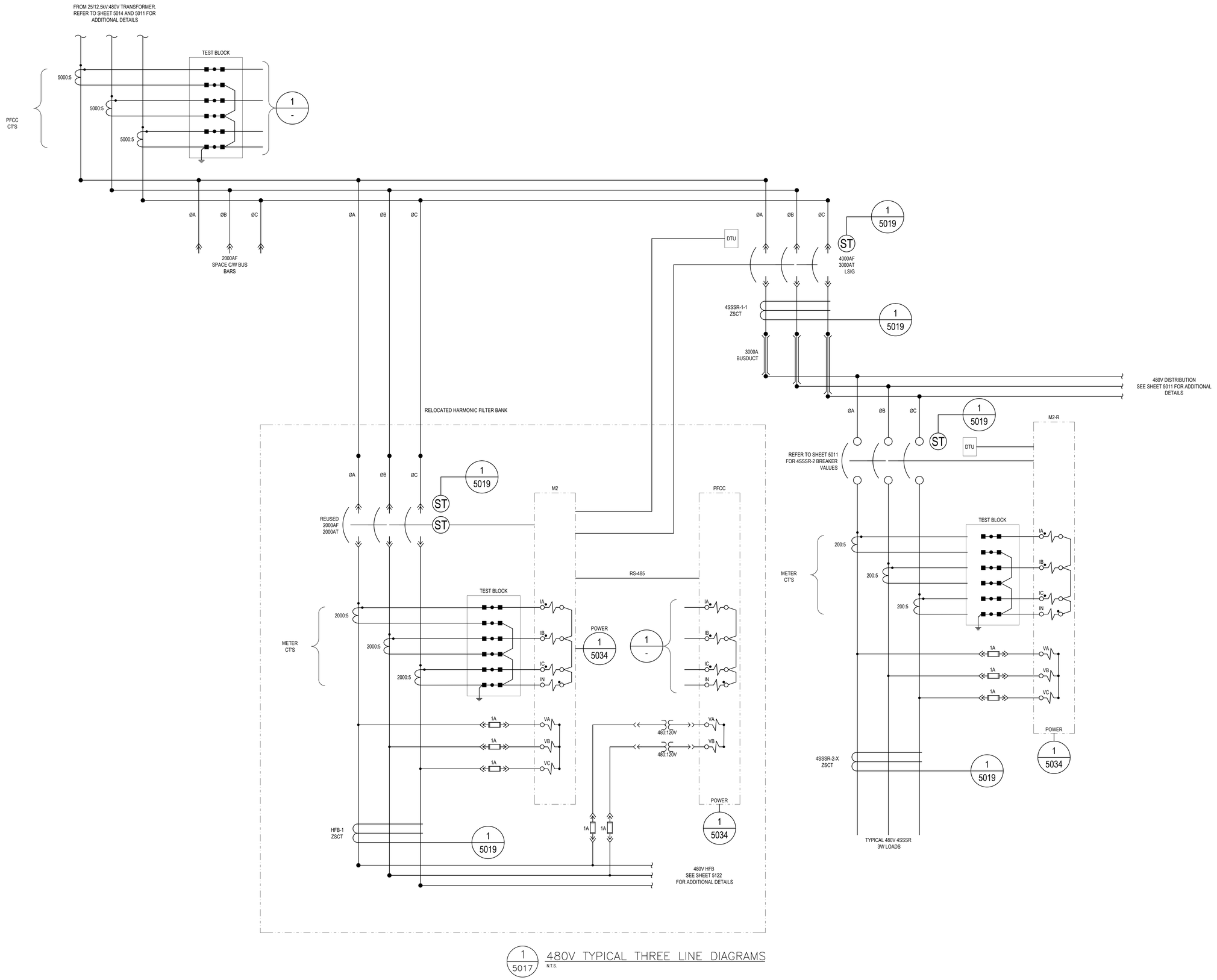
Preetipal Paul

Drawing title/Titre du dessin

600V TYPICAL THREE LINE DIAGRAMS

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.062548.2	5016	5



1/5017 480V TYPICAL THREE LINE DIAGRAMS
N.T.S.

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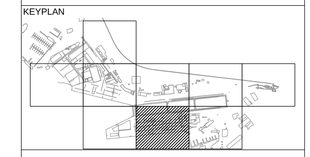

Revision/ Revision	Description/Description	Date/Date
5	ISSUED FOR TENDER	15/01/28
4	ISSUED FOR 99% DESIGN REVIEW	16/01/06
3	ISSUED FOR 66% DESIGN REVIEW	15/11/25
2	ISSUED FOR 33% DESIGN REVIEW	15/10/28
1	ISSUED FOR DESIGN DEVELOPMENT	15/09/11
0		

Client/client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD
VICTORIA, BC, V9A 2P1

Project title/Titre du projet
825 ADMIRALS ROAD VICTORIA BC
ESQUIMALT GRAVING DOCK
ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

Designed by/Concept par
I. BARNES

Drawn by/Dessine par
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Jamie LeBlanc

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Preetipal Paul

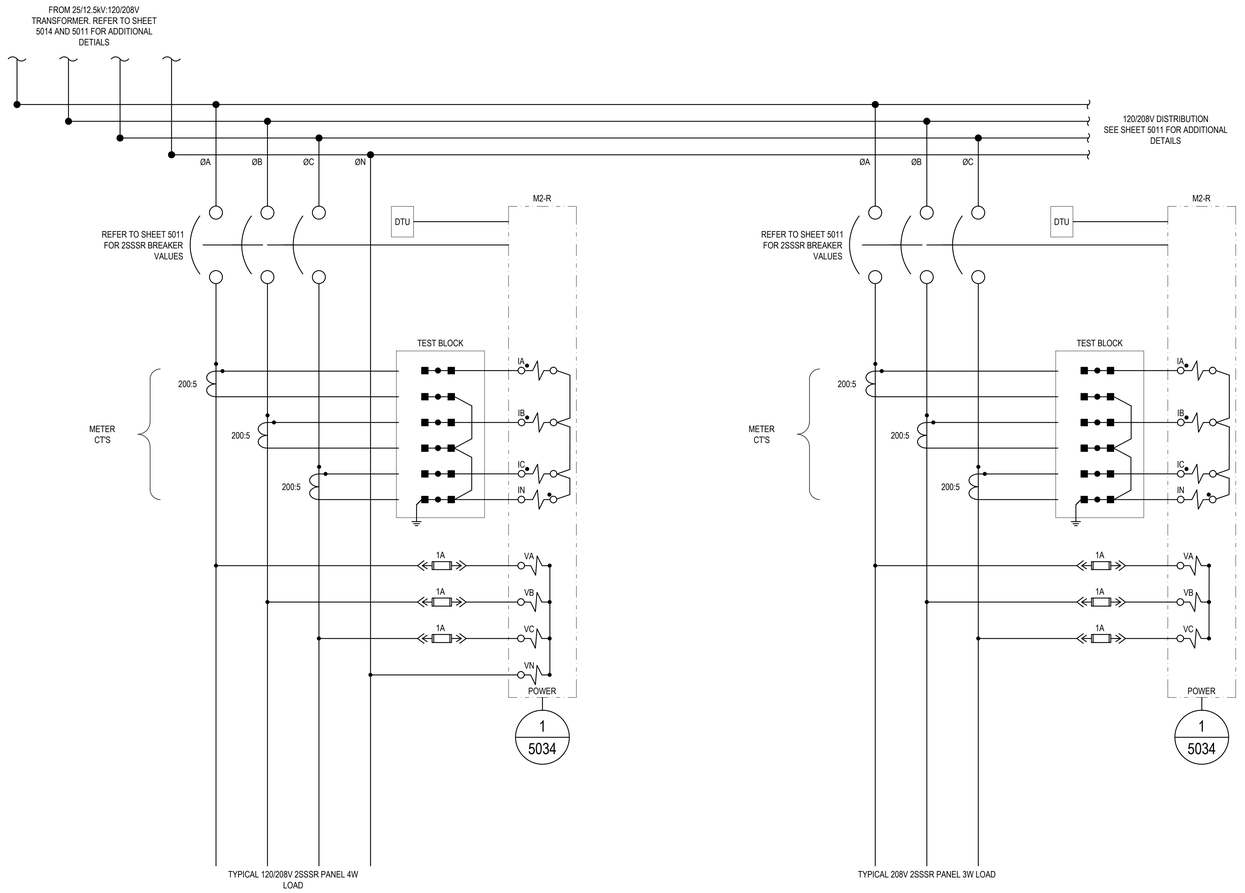
Drawing title/Titre du dessin

480V TYPICAL THREE LINE DIAGRAMS

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.062548.2	**5017**	**2**

Plot Date: January 28, 2016 11:36 AM Plotted by: Jacob Bieling
File Name: N:\PWGSC075\001\1-15-1168\DWGS\DWG\5017 SSR 480V TLD.DWG

PWGSC – B1 – 1000X707



1 / 5018 SOUTH SIDE SUBSTATION REPLACEMENT
120/208V TYPICAL THREE LINE DIAGRAM
N.T.S.

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Region de Pacifique

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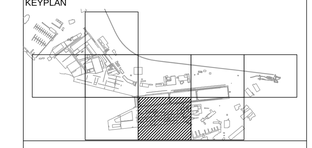
KEYPLAN



Revision/ Revision	Description/Description	Date/Date
5	ISSUED FOR TENDER	15/01/28
4	ISSUED FOR 99% DESIGN REVIEW	16/01/06
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2	ISSUED FOR 33% DESIGN REVIEW	15/10/28
1	ISSUED FOR DESIGN DEVELOPMENT	15/09/11
0		

Client/client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet

825 ADMIRALS ROAD VICTORIA BC ESQUIMALT GRAVING DOCK ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

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I. BARNES

Drawn by/Dessine par
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PWGSC Project Manager/Administrateur de Projets TPSGC
Jamie LeBlanc

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Preetipal Paul

Drawing title/Titre du dessin

120/208V TYPICAL THREE LINE DIAGRAM

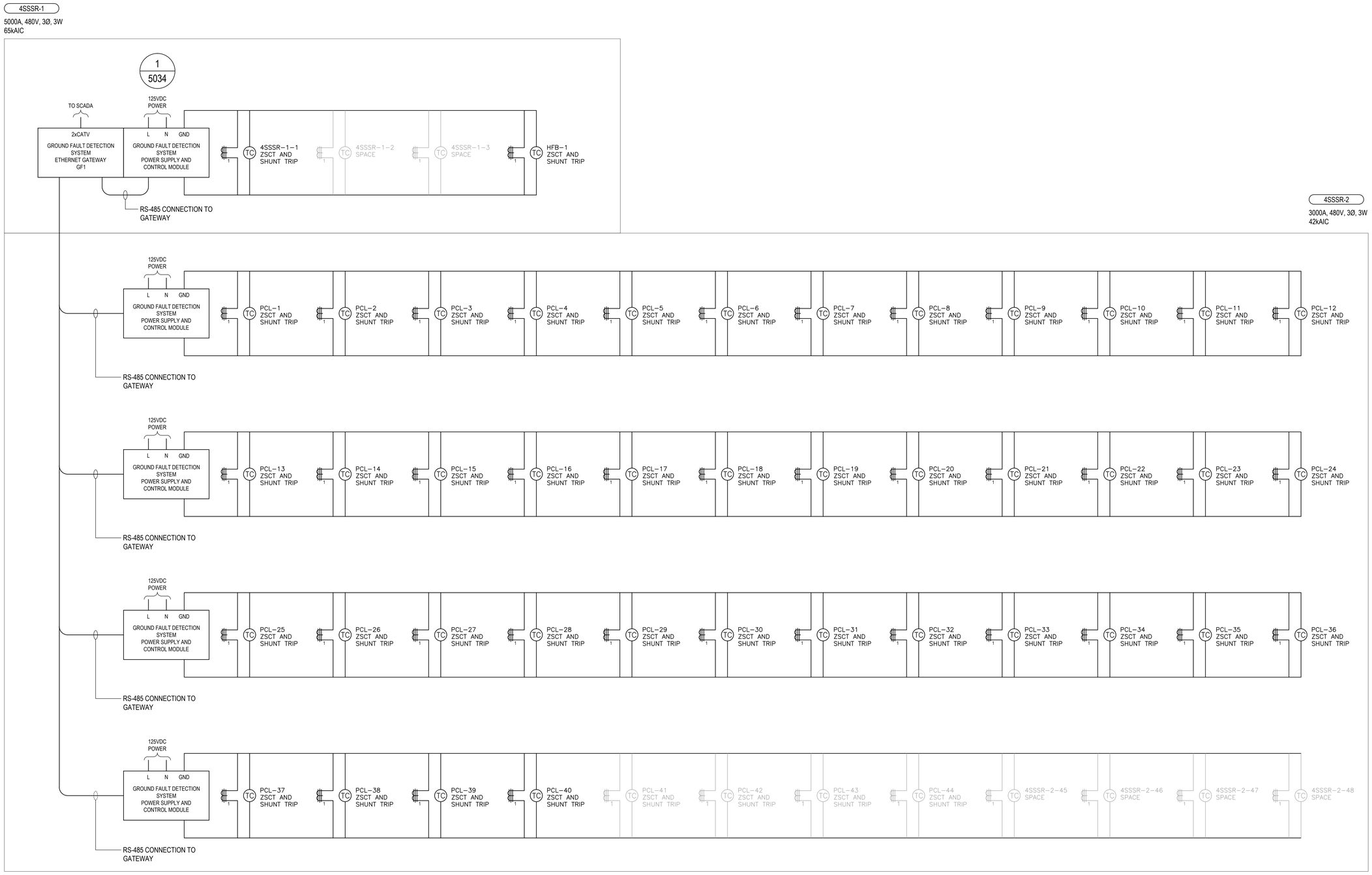
Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.062548.2	5018	5

Plot Date: January 28, 2016 11:36 AM Plotted by: Jacob Bieling
File Name: H:\PROJECTS\2013\11-15-165\Dwgs\Dgns\5018 SSW 208V TLD.dwg

PWGSC – B1 – 1000X707

GENERAL NOTES:

1. GROUND FAULT DETECTION SYSTEM TO BE EQUIPPED WITH CUSTOMIZABLE HIERARCHY LIST. ALLOWING LOADS WITH GREATER PRIORY TO OPERATE WITH A SINGLE PHASE TO GROUND FAULT AND TO TRIP LOADS OF A LOWER PRIORITY WHICH DEVELOP A SIMILAR FAULT.
2. GROUND FAULT SYSTEM TO EXPORT DATA TO THE SCADA SYSTEM, ALLOWING HMI TO DISPLAY ALL BREAKER STATUSES, AND HISTORICAL AND REAL TIME SYSTEM DATA. THIS DATA IS FOR STORAGE AND VIEWING PURPOSES ONLY.



1
5019

SOUTH SIDE SUBSTATION REPLACEMENT
120/208V TYPICAL THREE LINE DIAGRAM
N.T.S.

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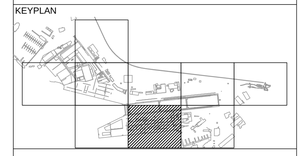
KEYPLAN



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3	ISSUED FOR 66% DESIGN REVIEW	15/11/25
2	ISSUED FOR 33% DESIGN REVIEW	15/10/28
1	ISSUED FOR DESIGN DEVELOPMENT	15/09/11
0		

Client/client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet

825 ADMIRALS ROAD VICTORIA BC ESQUIMALT GRAVING DOCK ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

Designed by/Concept par
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Preetipal Paul

Drawing title/Titre du dessin

120/208V TYPICAL THREE LINE DIAGRAM

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.062548.2	5019	5

Plot Date: January 28, 2016 11:36 AM Plotted by: Jacob Bieling
File Name: n:\PROJECTS\2015\11-15-1185\DWGS\Dwgs\5019 SSR 480V 3P SYSTEM.DWG

PWGSC – B1 – 1000X707

GENERAL NOTES:

1. BREAKER LOCATIONS ARE ILLUSTRATIVE ONLY. FINAL BREAKER LOCATIONS TO BE DETERMINED BY CONTRACTOR BASED ON SITE CONDITIONS AND MANUFACTURER SWITCHBOARD CONSTRUCTION TECHNIQUES.

2. ALL CIRCUIT BREAKERS TO HAVE ELECTRONIC TRIP UNITS COMPLETE WITH LSIG ELEMENT AND POWER/HARMONIC/ENEGERY METERING.

KEYNOTES:

(1) 1200AF/800AT BREAKER C/W LSIG DIGITAL DIGITAL TRIP UNIT. 42kAIC MINIMUM INTERRUPT RATING @ 600V

(2) 400AF/400AT BREAKER C/W LSIG DIGITAL DIGITAL TRIP UNIT. 42kAIC MINIMUM INTERRUPT RATING RATING @ 600V, EQUIPPED WITH LOAD SIDE REVENUE METERING CT'S FOR CUSTOMER BILLING.

(3) 250AF/200AT BREAKER C/W LSIG DIGITAL DIGITAL TRIP UNIT. 42kAIC MINIMUM INTERRUPT RATING RATING @ 600V, EQUIPPED WITH LOAD SIDE REVENUE METERING CT'S FOR CUSTOMER BILLING.

(4) 100AF/60AT BREAKER C/W LSIG DIGITAL DIGITAL TRIP UNIT. 42kAIC MINIMUM INTERRUPT RATING RATING @ 600V.

(5) 100AF/30AT BREAKER C/W LSIG DIGITAL DIGITAL TRIP UNIT. 42kAIC MINIMUM INTERRUPT RATING RATING @ 600V.

(6) 100AF/15AT BREAKER C/W LSIG DIGITAL DIGITAL TRIP UNIT. 42kAIC MINIMUM INTERRUPT RATING RATING @ 600V.

(7) HIGH DENSITY REVENUE METERING CABINET.

(8) 600V 3Ø, 4W 4000A BUS DUCT, 42kAIC WITHSTAND.

(9) SWITCHBOARD CELL, 600V 3Ø, 4W 3000A BUSSING, 42kAIC WITHSTAND, C/W INDICATED BREAKERS. ALL LOAD SIDE FEEDERS ARE BOTTOM ENTRY. BUSSING TO BE TIN PLATED COPPER.

(10) BOTTOM/TOP ENTRY ZONES

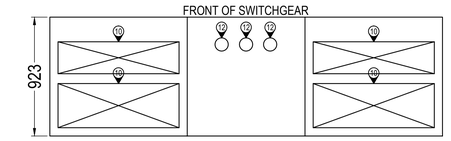
(11) TOP ENTRY BUS DUCT

(12) COMMUNICATION CONDUITS VIA FLOOR PENETRATION SLEEVES

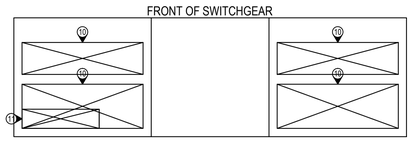
(13) 400AF/400AT BREAKER C/W LSIG DIGITAL DIGITAL TRIP UNIT. 42kAIC MINIMUM INTERRUPT RATING RATING @ 600V.

(14) EMPTY BREAKER LOCATIONS. PROVIDE COVERS, BUSBARS TO EXTEND FULL HEIGHT OF CELL.

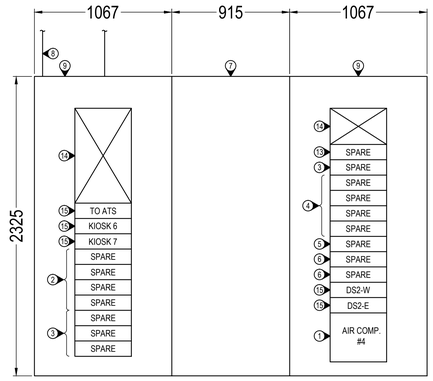
(15) 400AF/400AT, 100% RATED BREAKER C/W LSIG DIGITAL DIGITAL TRIP UNIT. 42kAIC MINIMUM INTERRUPT RATING RATING @ 600V, EQUIPPED WITH LOAD SIDE REVENUE METERING CT'S FOR CUSTOMER BILLING



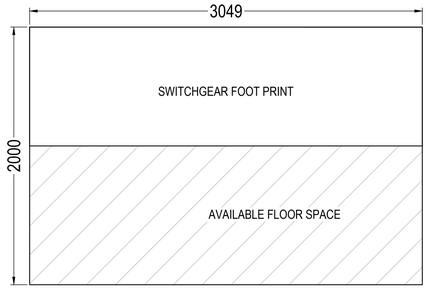
2 / 5030 600V SWITCHBOARD FLOOR PENETRATIONS
SCALE 1:20



3 / 5030 600V SWITCHBOARD PLAN VIEW
SCALE 1:20



1 / 5030 600V SWITCHBOARD FRONT ELEVATION
SCALE 1:20



4 / 5030 600V SWITCHBOARD FOOTPRINT
SCALE 1:20

0 500 1000 1500 2000mm
1:25

Public Works and Government Services Canada
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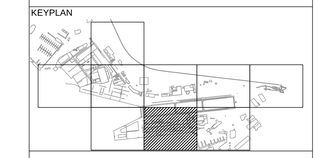
KEYPLAN



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2	ISSUED FOR 33% DESIGN REVIEW	15/10/28
1	ISSUED FOR DESIGN DEVELOPMENT	15/09/11
0		

Client/client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet
825 ADMIRALS ROAD VICTORIA BC
ESQUIMALT GRAVING DOCK
ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

Designed by/Concept par
I. BARNES

Drawn by/Dessine par
J. BIELING / S. SEYMOUR

PWGSC Project Manager/Administrateur de Projets TPSGC
Jamie LeBlanc

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Preetipal Paul

Drawing title/Titre du dessin

600V SWITCHBOARD DETAILS

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.062548.2	5030	5

Plot Date: February 5, 2016 2:51 PM Plotted by: Jacob Bieling
File Name: N:\PROJECTS\2015\12_Esquimalt\Drawings\5030_600V SWITCHBOARD 600V.DWG

PWGSC – B1 – 1000X707

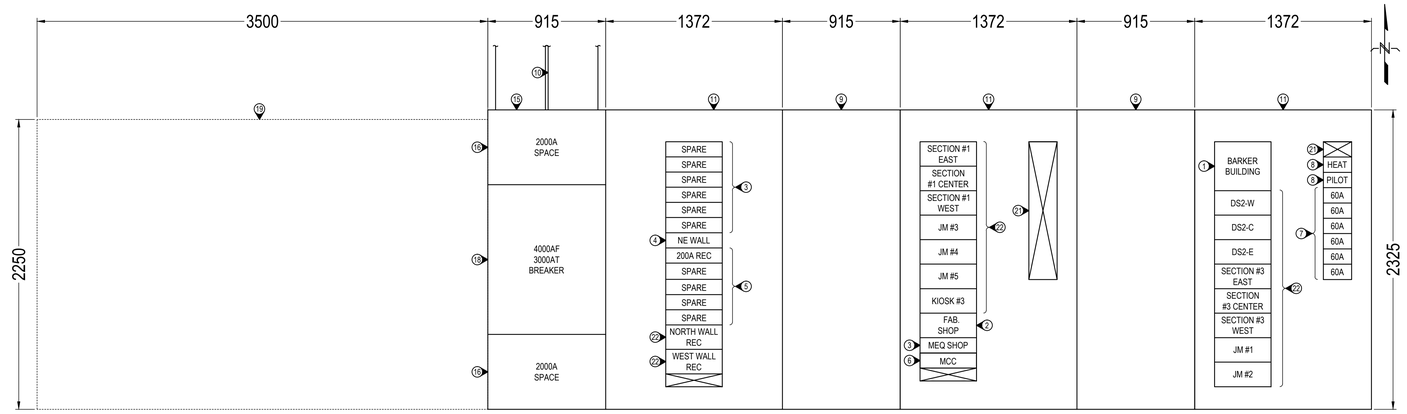
GENERAL NOTES:

1. BREAKER LOCATIONS ARE ILLUSTRATIVE ONLY. FINAL BREAKER LOCATIONS TO BE DETERMINED BY CONTRACTOR BASED ON SITE CONDITIONS AND MANUFACTURER SWITCHBOARD CONSTRUCTION TECHNIQUES.

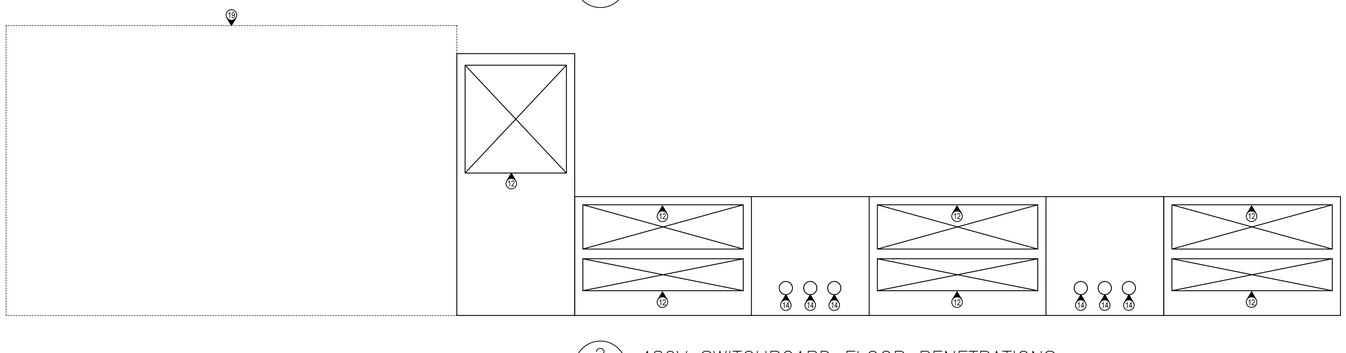
2. ALL CIRCUIT BREAKERS TO HAVE ELECTRONIC TRIP UNITS COMPLETE WITH LSIG ELEMENT AND POWER/HARMONIC/ENEGERY METERING.

KEYNOTES:

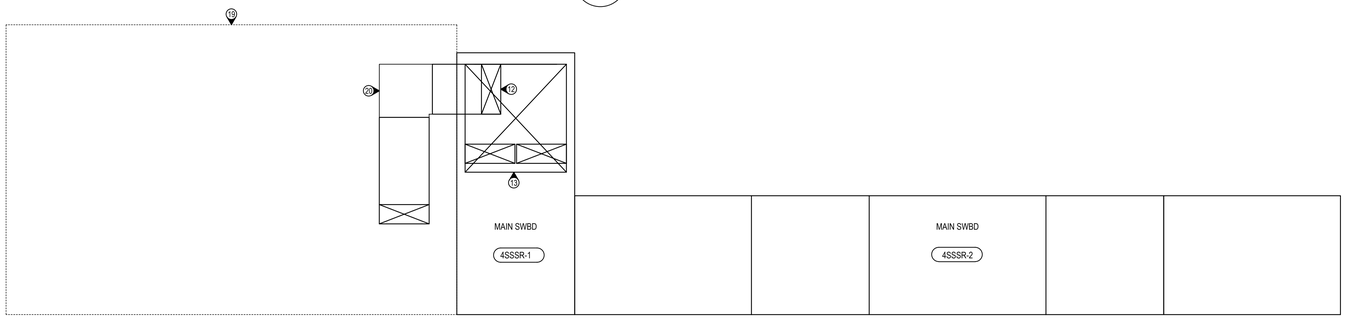
1. 1200AF/1200AT BREAKER C/W LSIG DIGITAL DIGITAL TRIP UNIT. 65kAIC MINIMUM INTERRUPT RATING @ 480V, EQUIPPED WITH LOAD SIDE REVENUE METERING CT'S FOR CUSTOMER BILLING.
2. 600AF/500AT BREAKER C/W LSIG DIGITAL DIGITAL TRIP UNIT. 65kAIC MINIMUM INTERRUPT RATING RATING @ 480V, EQUIPPED WITH LOAD SIDE REVENUE METERING CT'S FOR CUSTOMER BILLING.
3. 400AF/400AT BREAKER C/W LSIG DIGITAL DIGITAL TRIP UNIT. 65kAIC MINIMUM INTERRUPT RATING RATING @ 480V, EQUIPPED WITH LOAD SIDE REVENUE METERING CT'S FOR CUSTOMER BILLING.
4. 250AF/250AT BREAKER C/W LSIG DIGITAL DIGITAL TRIP UNIT. 65kAIC MINIMUM INTERRUPT RATING RATING @ 480V, EQUIPPED WITH LOAD SIDE REVENUE METERING CT'S FOR CUSTOMER BILLING.
5. 250AF/200AT BREAKER C/W LSIG DIGITAL DIGITAL TRIP UNIT. 65kAIC MINIMUM INTERRUPT RATING RATING @ 480V, EQUIPPED WITH LOAD SIDE REVENUE METERING CT'S FOR CUSTOMER BILLING.
6. 250AF/150AT BREAKER C/W LSIG DIGITAL DIGITAL TRIP UNIT. 65kAIC MINIMUM INTERRUPT RATING RATING @ 480V, EQUIPPED WITH LOAD SIDE REVENUE METERING CT'S FOR CUSTOMER BILLING.
7. 100AF/60AT BREAKER C/W LSIG DIGITAL DIGITAL TRIP UNIT. 65kAIC MINIMUM INTERRUPT RATING RATING @ 480V.
8. 100AF/30AT BREAKER C/W LSIG DIGITAL DIGITAL TRIP UNIT. 65kAIC MINIMUM INTERRUPT RATING RATING @ 480V.
9. HIGH DENSITY REVENUE METERING CABINET.
10. 480V 3Ø, 3W 2x3000A PARALLEL BUS DUCT, 65 kAIC WITHSTAND.
11. SWITCHBOARD CELL, 480V 3Ø, 3W 3000A BUSSING, 65 kAIC WITHSTAND, C/W INDICATED BREAKERS. ALL LOAD SIDE FEEDERS ARE BOTTOM ENTRY. BUSSING TO BE TIN PLATED COPPER.
12. BOTTOM/TOP ENTRY ZONES
13. TOP ENTRY BUS DUCT
14. COMMUNICATION CONDUITS VIA FLOOR PENETRATION SLEEVES
15. DRAW OUT CIRCUIT BREAKER SWITCHBOARD CELL, 480V 3Ø 5000A BUSSING, 65 kAIC WITHSTAND, C/W INDICATED BREAKERS. ALL LOAD SIDE FEEDERS ARE BOTTOM ENTRY AND SIDE ENTRY. BUSSING TO BE TIN PLATED COPPER.
16. 2000AF BREAKER SPACE, BUS BARS INSTALLED BEHIND.
17. NOT USED
18. 4000AF/3000AT BREAKER C/W LSIG DIGITAL DIGITAL TRIP UNIT. 65kAIC MINIMUM INTERRUPT RATING RATING @ 480V.
19. EXISTING 1000kVA 480V HARMONIC FILTER BANK TO BE RELOCATED FROM EXISTING SSS TO NEW SSSR BUILDING.
20. 480V 3Ø 2000A BUS DUCT, 65 kAIC WITHSTAND.
21. EMPTY BREAKER LOCATIONS. PROVIDE COVERS, BUSBARS TO EXTEND FULL HEIGHT OF CELL.
22. 400AF/400AT, 100% RATED BREAKER C/W LSIG DIGITAL DIGITAL TRIP UNIT. 65kAIC MINIMUM INTERRUPT RATING RATING @ 480V, EQUIPPED WITH LOAD SIDE REVENUE METERING CT'S FOR CUSTOMER BILLING.



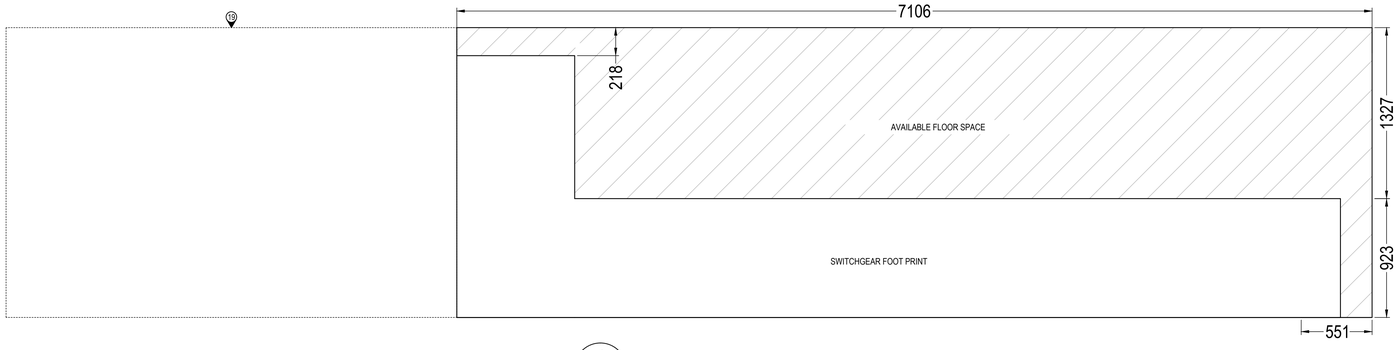
1 / 5031 480V SWITCHBOARD FRONT ELEVATION
SCALE 1:20



2 / 5031 480V SWITCHBOARD FLOOR PENETRATIONS
SCALE 1:20



3 / 5031 480V SWITCHBOARD PLAN VIEW
SCALE 1:20



4 / 5031 480V SWITCHBOARD FOOTPRINT
SCALE 1:20

0 500 1000 1500 2000mm
1:25

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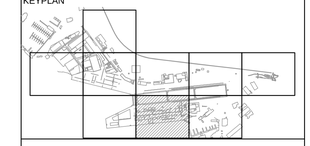

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2	ISSUED FOR 33% DESIGN REVIEW	15/10/28
1	ISSUED FOR DESIGN DEVELOPMENT	15/09/11
0		

Client/client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet

825 ADMIRALS ROAD VICTORIA BC
ESQUIMALT GRAVING DOCK
ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

Designed by/Concept par
I. BARNES

Drawn by/Dessine par
J. BIELING / S. SEYMOUR

PWGSC Project Manager/Administrateur de Projets TPSGC
Jamie LeBlanc

PWGSC, Regional Manager, Architectural and Engineering Services/ Gestionnaire régionale, Services d'architectural et de génie, TPSGC
Preetipal Paul

Drawing title/Titre du dessin

480V SWITCHBOARD DETAILS

Project No./No. du projet	Sheet/Feuille	Revision no./ Le Révision no.
R.062548.2	5031	5

Plot Date: February 5, 2018 2:25 PM
File Name: N:\Projects\2017\17-1371\DWG\DWG\5031 SSMP DETAIL 480V.DWG
Plotted by: Jacob Bieling

PWGSC – B1 – 1000X707

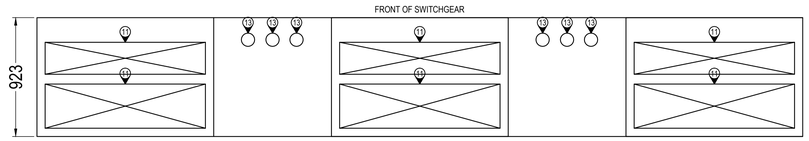
GENERAL NOTES:

1. BREAKER LOCATIONS ARE ILLUSTRATIVE ONLY. FINAL BREAKER LOCATIONS TO BE DETERMINED BY CONTRACTOR BASED ON SITE CONDITIONS AND MANUFACTURER SWITCHBOARD CONSTRUCTION TECHNIQUES.

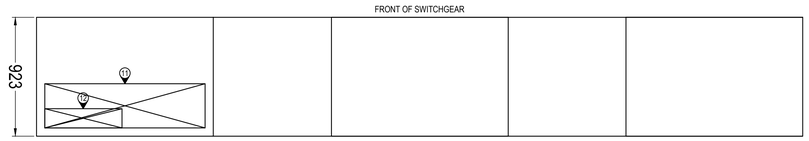
2. ALL CIRCUIT BREAKERS TO HAVE ELECTRONIC TRIP UNITS COMPLETE WITH LSIG ELEMENT AND POWER/HARMONIC/ENEGERY METERING.

KEYNOTES:

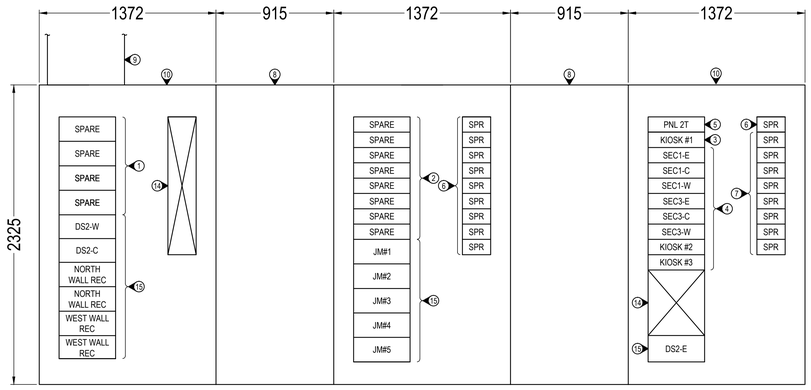
1. 400AF/400AT BREAKER C/W LSIG DIGITAL DIGITAL TRIP UNIT. 42kAIC MINIMUM INTERRUPT RATING @ 240V, EQUIPPED WITH LOAD SIDE REVENUE METERING CT'S FOR CUSTOMER BILLING.
2. 250AF/200AT BREAKER C/W LSIG DIGITAL DIGITAL TRIP UNIT. 42kAIC MINIMUM INTERRUPT RATING RATING @ 240V, EQUIPPED WITH LOAD SIDE REVENUE METERING CT'S FOR CUSTOMER BILLING.
3. 250AF/150AT BREAKER C/W LSIG DIGITAL DIGITAL TRIP UNIT. 42kAIC MINIMUM INTERRUPT RATING RATING @ 240V, EQUIPPED WITH LOAD SIDE REVENUE METERING CT'S FOR CUSTOMER BILLING.
4. 250AF/125AT BREAKER C/W LSIG DIGITAL DIGITAL TRIP UNIT. 42kAIC MINIMUM INTERRUPT RATING RATING @ 240V, EQUIPPED WITH LOAD SIDE REVENUE METERING CT'S FOR CUSTOMER BILLING.
5. 250AF/125AT BREAKER C/W LSIG DIGITAL DIGITAL TRIP UNIT. 42kAIC MINIMUM INTERRUPT RATING RATING @ 240V.
6. 100AF/60AT BREAKER C/W LSI DIGITAL DIGITAL TRIP UNIT. 42kAIC MINIMUM INTERRUPT RATING RATING @ 240V.
7. 100AF/15AT BREAKER C/W LSI DIGITAL DIGITAL TRIP UNIT. 42kAIC MINIMUM INTERRUPT RATING RATING @ 240V.
8. HIGH DENSITY REVENUE METERING CABINET.
9. 120/240V 3Ø 4000A BUS DUCT, 42 kAIC WITHSTAND.
10. SWITCHBOARD CELL, 120/240V 3Ø 3000A BUSSING, 42 kAIC WITHSTAND, C/W INDICATED BREAKERS. ALL LOAD SIDE FEEDERS ARE BOTTOM ENTRY. BUSSING TO BE TIN PLATED COPPER.
11. BOTTOM/TOP ENTRY ZONES
12. TOP ENTRY BUS DUCT
13. COMMUNICATION CONDUITS VIA FLOOR PENETRATION SLEEVES
14. EMPTY BREAKER LOCATIONS. PROVIDE COVERS, BUSBARS TO EXTEND FULL HEIGHT OF CELL.
15. 250AF/200AT, 100% RATED BREAKER C/W LSIG DIGITAL DIGITAL TRIP UNIT. 42kAIC MINIMUM INTERRUPT RATING RATING @ 240V, EQUIPPED WITH LOAD SIDE REVENUE METERING CT'S FOR CUSTOMER BILLING.



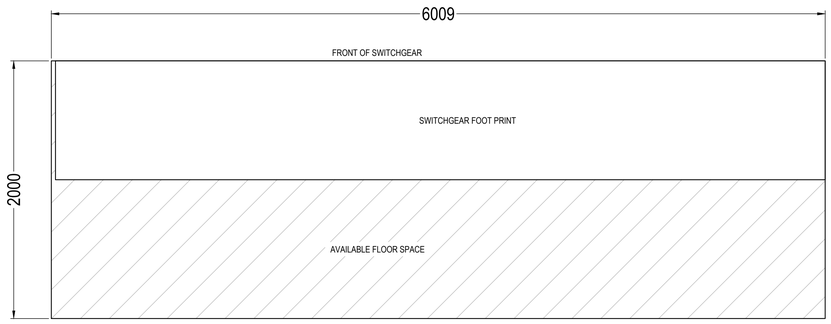
2 / 5032 — 120/208V SWITCHBOARD FLOOR PENETRATIONS
SCALE 1:20



3 / 5032 — 120/208V SWITCHBOARD PLAN VIEW
SCALE 1:20



1 / 5032 — 120/208V SWITCHBOARD FRONT ELEVATION
SCALE 1:20



4 / 5032 — 120/208V SWITCHBOARD FOOTPRINT
SCALE 1:20

0 500 1000 1500 2000mm
1:25

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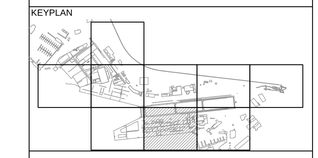

Revision/ Revision	Description/Description	Date/Date
5	ISSUED FOR TENDER	15/01/28
4	ISSUED FOR 99% DESIGN REVIEW	16/01/06
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2	ISSUED FOR 33% DESIGN REVIEW	15/10/28
1	ISSUED FOR DESIGN DEVELOPMENT	15/09/11
0		

Client/client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet
825 ADMIRALS ROAD VICTORIA BC ESQUIMALT GRAVING DOCK ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

Designed by/Concept par
I. BARNES

Drawn by/Dessine par
J. BIELING / S. SEYMOUR

PWGSC Project Manager/Administrateur de Projets TPSGC
Jamie LeBlanc

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Preetipal Paul

Drawing title/Titre du dessin

120/208V SWITCHBOARD DETAILS

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.062548.2	5032	5

Plot Date: February 5, 2016 2:37 PM — Plotted by: Jacob Bieling
File Name: N:\PROJECTS\2015\1_Full Set\Drawings\5032_120_208V.dwg

PWGSC – B1 – 1000X707

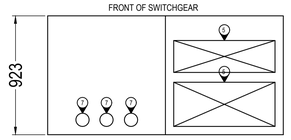
GENERAL NOTES:

1. ALL CIRCUIT BREAKERS TO HAVE ELECTRONIC TRIP UNITS COMPLETE WITH LSIG ELEMENT AND POWER/HARMONIC/ENEGERY METERING.

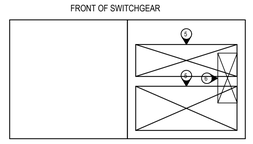
KEYNOTES:

1. 3000AF/2500AT. BREAKER, RATED AT 630V C/W LSIG DIGITAL DIGITAL TRIP UNIT. 42kAIC MINIMUM INTERRUPT RATING @ 630V.
2. HIGH DENSITY REVENUE METERING CABINET.
3. 630V 3Ø 2500A BUS DUCT, 42kAIC WITHSTAND.
4. SWITCHBOARD CELL, 630V 3Ø 2500A BUSSING, 42kAIC WITHSTAND, C/W INDICATED BREAKERS. ALL LOAD SIDE FEEDERS ARE BOTTOM ENTRY. BUSSING TO BE TIN PLATED COPPER.
5. BOTTOM/TOP ENTRY ZONES
6. TOP ENTRY BUS DUCT
7. COMMUNICATION CONDUITS VIA FLOOR PENETRATION SLEEVES

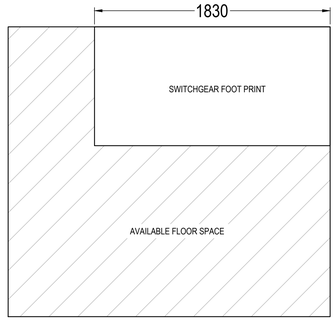
1 / 5033 430-630V REGULATED SWITCHBOARD FRONT ELEVATION
SCALE 1:20



2 / 5033 430-630V REGULATED SWITCHBOARD FLOOR PENETRATIONS
SCALE 1:20



3 / 5033 430-630V REGULATED SWITCHBOARD PLAN VIEW
SCALE 1:20



4 / 5033 430-630V REGULATED SWITCHBOARD FOOTPRINT
SCALE 1:20

0 500 1000 1500 2000mm
1:25

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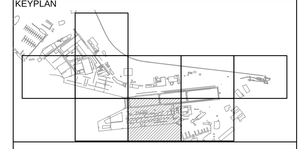

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1	ISSUED FOR DESIGN DEVELOPMENT	15/09/11
0		

Client/client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet

825 ADMIRALS ROAD VICTORIA BC
ESQUIMALT GRAVING DOCK
ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

Designed by/Concept par
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Drawn by/Dessine par
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PWGSC Project Manager/Administrateur de Projets TPSGC
Jamie LeBlanc

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Preetipal Paul

Drawing title/Titre du dessin

430-630V REGULATED SWITCHBOARD DETAILS

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.062548.2	5033	5

Plot Date: January 28, 2016 11:36 AM Plotted by: Jacob Bieling
File Name: K:\PROJECTS\2015\1-15-168\Lanes\Dwg\5033 SSR EQPart 430-630V.dwg

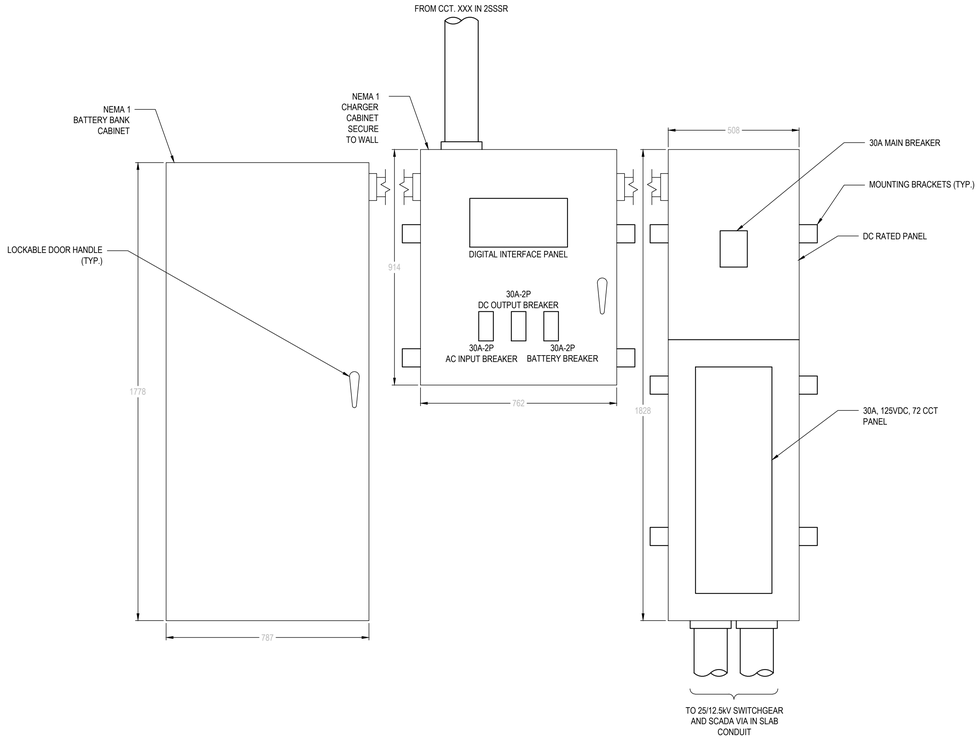
PWGSC – B1 – 1000X707

SOUTH SIDE SUBSTATION REPLACEMENT BATTERY BANK PANEL

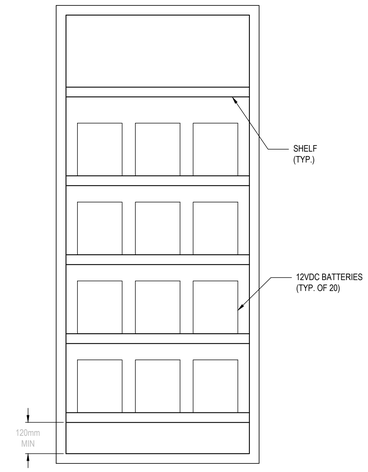
Voltage:	-	125VDC, 2W
Location:	-	SOUTH SIDE SUBSTATION REPLACEMENT
Circuits:	-	72
Bus Size:	-	100A
Main Breaker:	-	30A

Description	Bkr	P	Cir	Cir	Bkr	P	Description
25/12SSSR Cell 1 - Upper	15	2	1	2	15	2	25/12SSSR Cell 1 - Lower
			3	4			
25/12SSSR Cell 2 - Upper	15	2	5	6	15	2	25/12SSSR Cell 2 - Lower
			7	8			
25/12SSSR Cell 3 - Upper	15	2	9	10	15	2	25/12SSSR Cell 3 - Lower
			11	12			
25/12SSSR Cell 4 - Upper	15	2	13	14	15	2	25/12SSSR Cell 4 - Lower
			15	16			
25/12SSSR Cell 5 - Upper	15	2	17	18	15	2	25/12SSSR Cell 5 - Lower
			19	20			
25/12SSSR Cell 6 - Upper	15	2	21	22	15	2	25/12SSSR Cell 6 - Lower
			23	24			
25/12SSSR Cell 7 - Upper	15	2	25	26	15	2	25/12SSSR Cell 7 - Lower
			27	28			
24SSSR Cell 1 - Upper	15	2	29	30	15	2	24SSSR Cell 1 - Lower
			31	32			
24SSSR Cell 2 - Upper	15	2	33	34	15	2	24SSSR Cell 2 - Lower
			35	36			
4SSSR-1 Cell 1 - Upper	15	2	37	38	15	2	4SSSR-1 Cell 1 - Lower
			39	40			
4SSSR-1 Cell 2 - Middle	15	2	41	42	15	2	6SSSR-1 SCADA METER POWER
			43	44			
4SSSR-2 SCADA METER POWER	15	2	45	46	15	2	2SSSR-1 SCADA METER POWER
			47	48			
5SSSR-REG SCADA METER POWER	15	2	49	50	15	2	SSSR SCADA PANEL
			51	52			
SSSR 480V GROUND FAULT SYSTEM	15	2	53	54	15	2	BATTERY CHARGER CABINET
			55	56			
	15	2	57	58	15	2	
			59	60			
	15	2	61	62	15	2	
			63	64			
	15	2	65	66	15	2	
			67	68			
	15	2	69	70	15	2	
			71	72			

1 / 5013 1 / 5014 1 / 5015 1 / 5016 1 / 5017 SOUTH SIDE SUBSTATION REPLACEMENT BATTERY BANK CHARGER PANEL SCHEDULE
N.T.S.



2 / 5034 SOUTH SIDE SUBSTATION REPLACEMENT DC PANEL, BATTERY BANK AND CHARGER CABINET ELEVATION
N.T.S.



3 / 5034 SOUTH SIDE SUBSTATION REPLACEMENT BATTERY BANK (DOOR NOT SHOWN)
N.T.S.

GENERAL NOTES:

1. ENCLOSURE DIMENSIONS ARE APPROXIMATE ONLY. FINAL ENCLOSURE SIZES TO BE PROVIDED IN SHOP DRAWINGS.
2. BATTERY CHARGER TO PROVIDE A MINIMUM OF 8 HOURS BACK-UP WITH SUFFICIENT CAPACITY TO TRIP ALL BREAKERS CONCURRENTLY.
3. DC DEVICES IN SWITCHGEAR SHALL BE WIRED FROM TERMINAL BLOCKS TO ENSURE DC TRIP CIRCUIT CANNOT BE COMPROMISED BY A METER OR OTHER DEVICE FAULT.
4. PROVIDE DEDICATED CIRCUIT BREAKERS FOR UPPER AND LOWER PORTIONS OF EACH SWITCHGEAR CELL AS INDICATED. SPARE BREAKERS SHALL BE PROVIDED PER PANEL SCHEDULE.
5. CONTRACTOR SHALL SUBMIT COMPLETE PANEL SCHEDULE INDICATING BREAKER ID'S.

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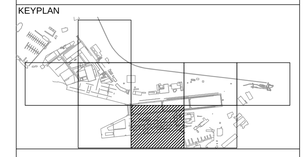

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0		

Client/client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet

825 ADMIRALS ROAD VICTORIA BC ESQUIMALT GRAVING DOCK ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

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Preetipal Paul

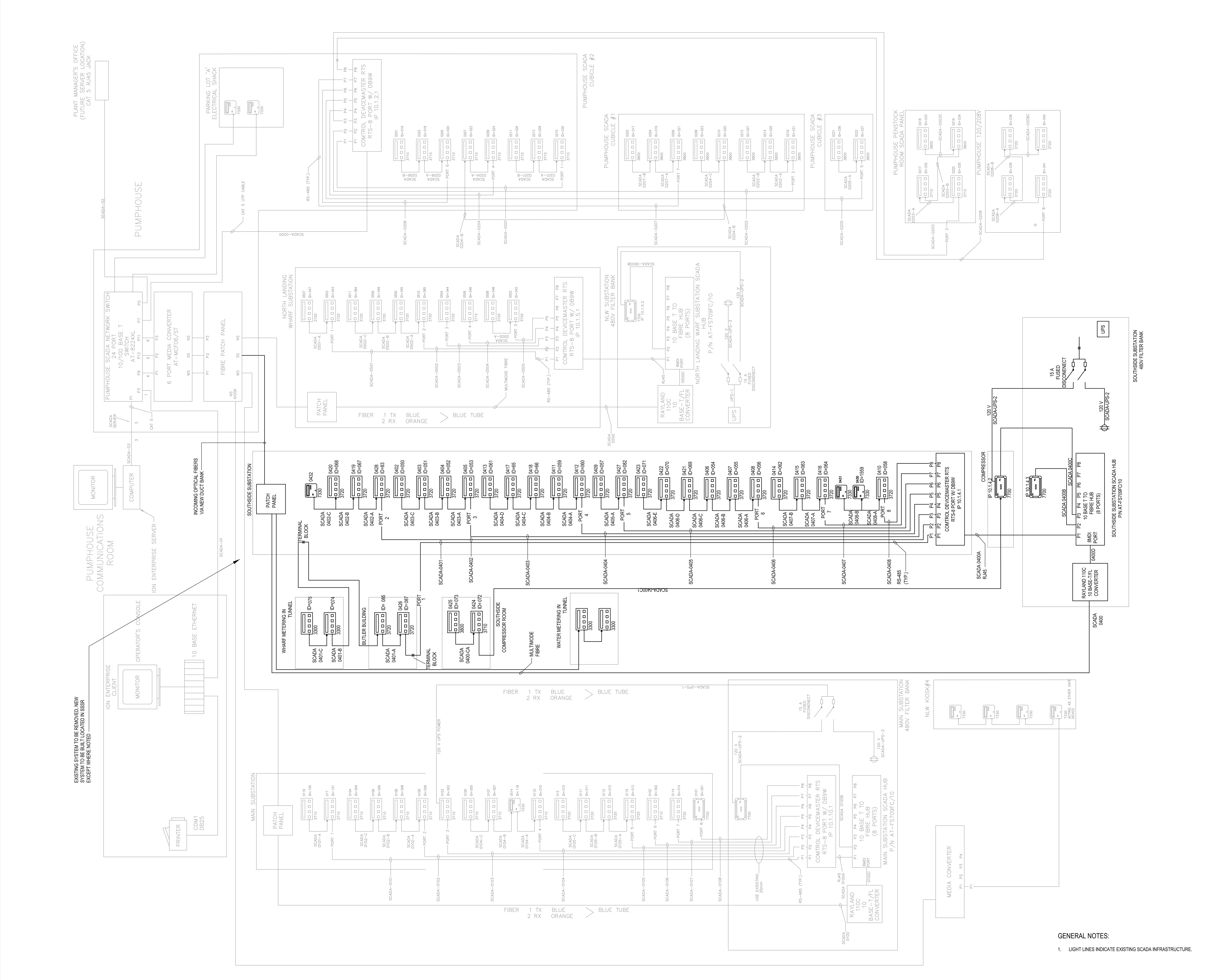
Drawing title/Titre du dessin

BATTERY BANK AND CHARGER DETAILS

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.062548.2	5034	5

Plot Date: January 28, 2016 11:36 AM Plotted by: Jacob Bieling
File Name: H:\PROJECTS\2015\11-15-166\DWG\DWG\5034 SSR BATTERY BANK CHARGER DETAILS.DWG

PWGSC – B1 – 1000X707



GENERAL NOTES:

1. LIGHT LINES INDICATE EXISTING SCADA INFRASTRUCTURE.

Plot Date: January 28, 2016 11:36 AM Plotted by: Jacob Bieling
File Name: H:\PROJECTS\2015\1-15-168\DWGS\DWG\5050 SCADA SITE RISER.DWG

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Client/client

ESQUIMALT GRAVING DOCK

**825 ADMIRALS ROAD
VICTORIA, BC, V9A 2P1**

Project title/Titre du projet
**825 ADMIRALS ROAD VICTORIA BC
ESQUIMALT GRAVING DOCK
ELECTRICAL SAFETY UPGRADE**

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

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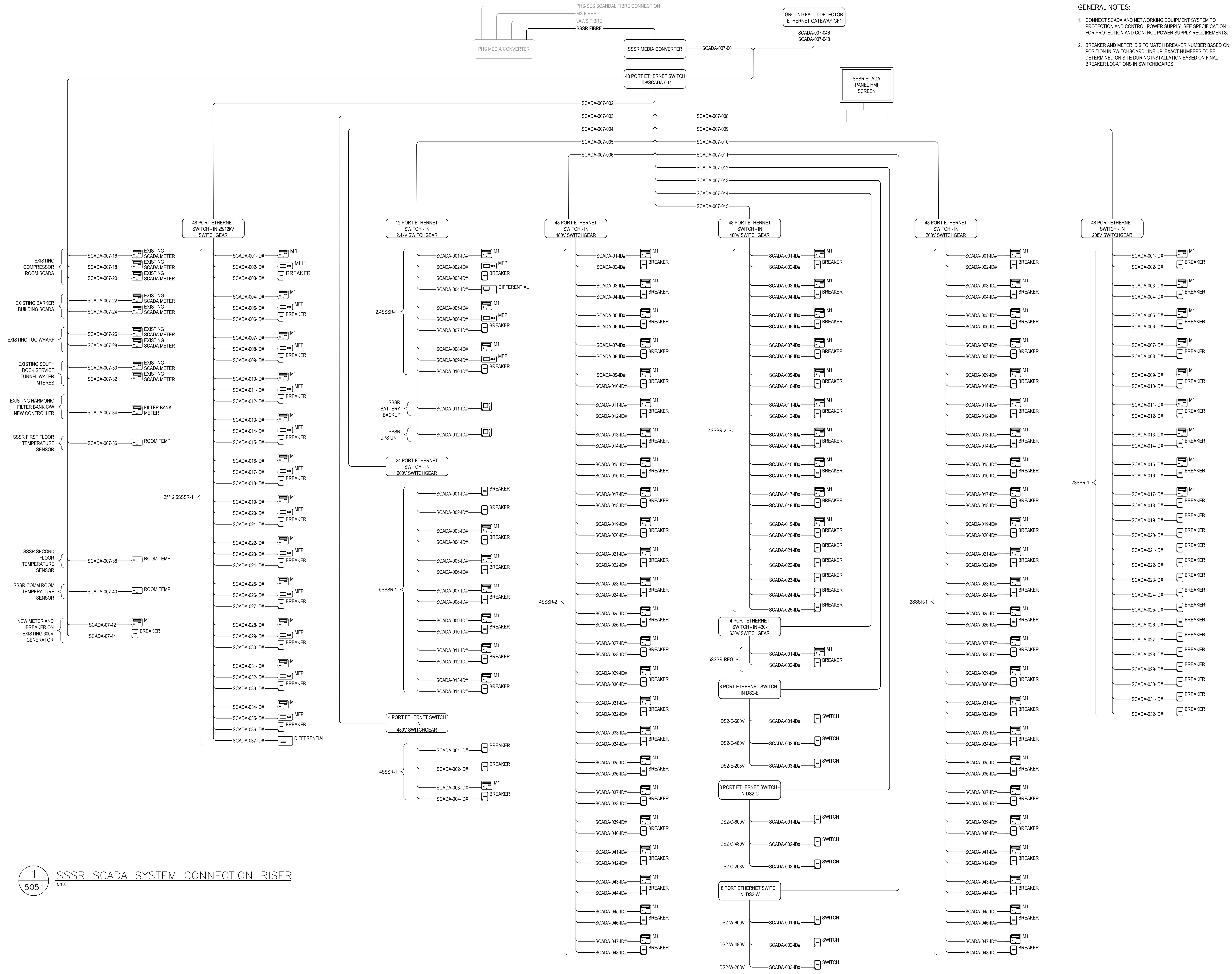
Preetipal Paul

Drawing title/Titre du dessin

EGD SITE SCADA SYSTEM RISER DIAGRAM

Project No./No. du projet	Sheet/Feuille	Revision no./La Révision no.
R.062548.2	5050	5



1 / 5051 SSSR SCADA SYSTEM CONNECTION RISER
N.T.S.

GENERAL NOTES:

1. CONNECT SCADA AND NETWORKING EQUIPMENT SYSTEM TO PROTECTION AND CONTROL POWER SUPPLY. SEE SPECIFICATION FOR PROTECTION AND CONTROL POWER SUPPLY REQUIREMENTS.
2. BREAKER AND METER ID'S TO MATCH BREAKER NUMBER BASED ON POSITION IN SWITCHBOARD LINE UP. EXACT NUMBERS TO BE DETERMINED ON SITE DURING INSTALLATION BASED ON FINAL BREAKER LOCATIONS IN SWITCHBOARDS.

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ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD
VICTORIA, BC, V9A 2P1

Project title/Titre du projet
825 ADMIRALS ROAD VICTORIA BC
ESQUIMALT GRAVING DOCK
ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

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Preetipal Paul

Drawing title/Titre du dessin

SSSR SCADA SYSTEM CONNECTION RISER

Project No./No. du projet	Sheet/Feuille	Revision no./La Révision no.
R.062548.2	5051	5

Plot Date: January 28, 2016 11:36 AM Plotted by: Jacob Bieling
File Name: H:\PROJECTS\2015\1-15-166\DWG\DWG\5051 SSR SCADA RISER.DWG

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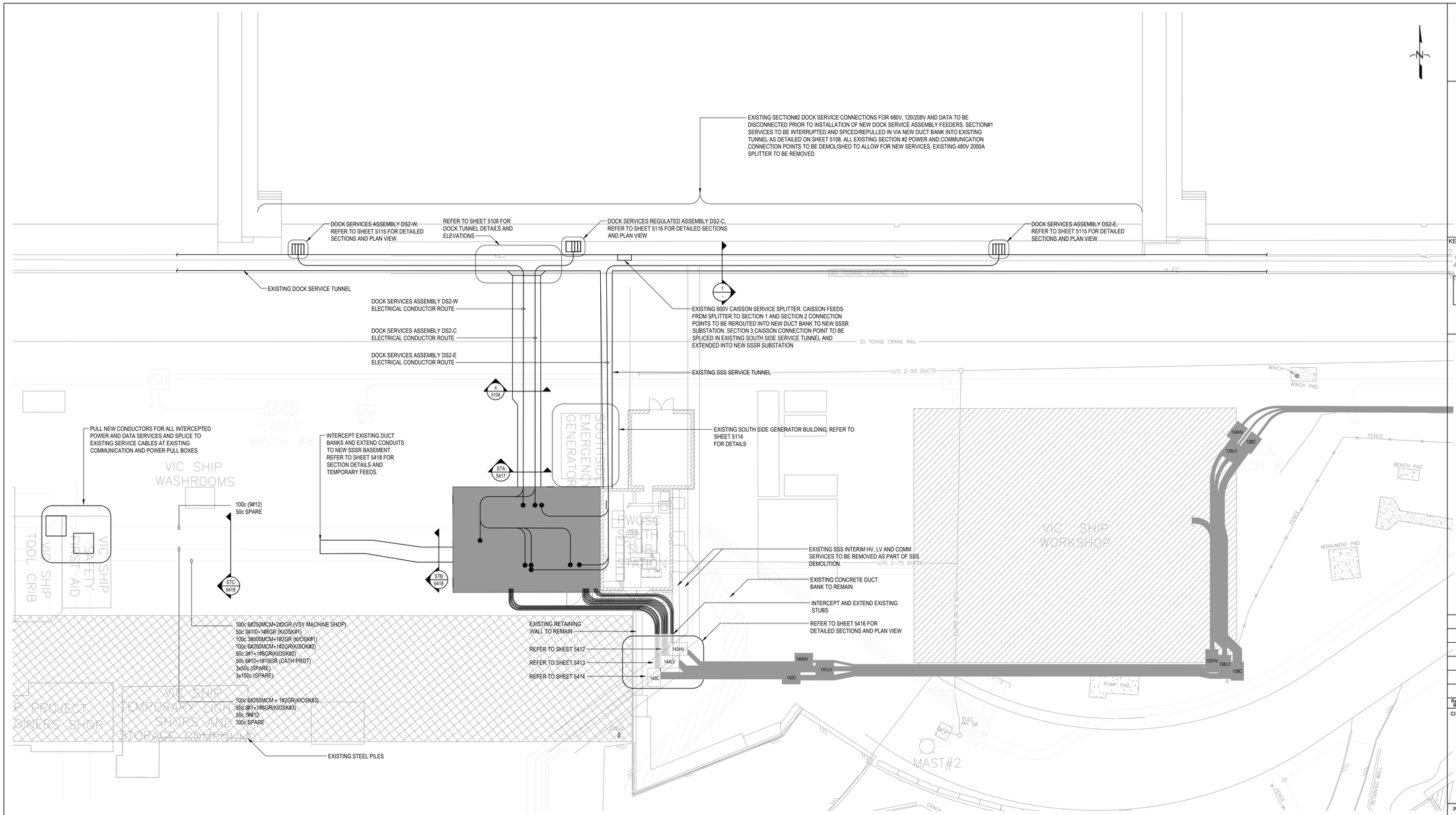
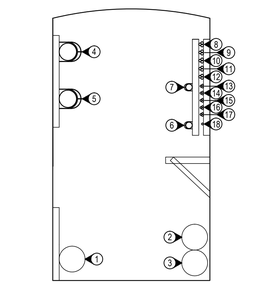
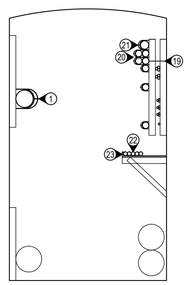




1 / 5100 SERVICE TUNNEL EXISTING SERVICES
SCALE 1:20



2 / 5100 SERVICE TUNNEL WITH NEW DS-2E
SCALE 1:20

KEY NOTES:

1. EXISTING COMPRESSOR AIR LINE TO REMAIN.
2. EXISTING POTABLE WATER LINE TO REMAIN
3. EXISTING SERVER LINE TO REMAIN.
4. EXISTING 12.5kV SSS TECK FEEDER TO BE DISMOUNTED AND REROUTED FOR TEMPORARY SSS REEFED. TO BE REMOVED FROM TUNNELS AND DISPOSED OF AS PART OF SSS DEMOLITION.
5. 2.4SS2 TECK 5KV TO 30T CRANE TO BE REPLACED WITH NEW FROM 2.4SSSR SWITCHBOARD
6. 3c#2/0 TECK 1000V 6SB2 CAISSON POWER TO SECTION #3 TO BE REPLACED WITH NEW CABLE FROM EXISTING SPLICE BOX
7. EXISTING TECK CABLE TO REMAIN.
8. 3c#250MCM MI CABLE (3x1c#250kCM TECK SPLICE) 4SS2-10 500A 480V #2 CENTER TO BE DEMOLISHED AND REMOVED FROM TUNNEL
9. 3c#250MCM MI CABLE (3x1c#250kCM TECK SPLICE) 4SS2-9 500A 480V #2 SOUTHEAST TO BE DEMOLISHED AND REMOVED FROM TUNNEL
10. 3c#250MCM MI CABLE (3x1c#250kCM TECK SPLICE) 4SS2-14 500A 480V #2 SOUTHWEST TO BE DEMOLISHED AND REMOVED FROM TUNNEL
11. 3c#250MCM MI (3x1c#250kCM TECK SPLICE) CABLE 4SS2-13 500A 480V #3 CENTER
12. 3c#250MCM MI (3x1c#250kCM TECK SPLICE) CABLE 4SS2-12 500A 480V #3 SOUTHEAST
13. 3c#3 MI (3c#1 TECK SPLICE) CABLE 2SS2-5 125A 120/208V #2 SOUTH CENTER TO BE DEMOLISHED AND REMOVED FROM TUNNEL
14. 3c#3 MI (3c#1 TECK SPLICE) CABLE 2SS2-4 125A 120/208V #2 SOUTHEAST TO BE DEMOLISHED AND REMOVED FROM TUNNEL
15. 3c#3 MI (3c#1 TECK SPLICE) CABLE 2SS2-9 125A 120/208V #3 SOUTHWEST
16. 3c#1 MI (3c#2/0 TECK SPLICE) CABLE 2SS2-8 125A 120/208V #3 CENTER
17. 3c#1/0 MI (3c#3/0 TECK SPLICE) CABLE 2SS2-7 125A 120/208V #3 SOUTHEAST
18. 3c#10 (3c#6 TECK SPLICE) MI CABLE 25K 32, 34 ROPE LIGHT AND SOUTHEAST DOCK STAIRS
19. NEW DS2-E 480V, 400A SERVICE 3x3c#3/0 TECK CABLES MOUNTED TO EXISTING SERVICE TUNNEL WALLS. RUN CONDUIT FROM NEW 4SSSR-2 SWITCHBOARD TO NEW DS2-E DOCK SERVICE ASSEMBLY IN EXISTING SERVICE TUNNELS.
20. NEW DS2-E 600V, 400A SERVICE 2x3c#4/0 TECK CABLES MOUNTED TO EXISTING SERVICE TUNNEL WALLS. RUN CONDUIT FROM NEW 4SSSR-2 SWITCHBOARD TO NEW DS2-E DOCK SERVICE ASSEMBLY IN EXISTING SERVICE TUNNELS.
21. NEW DS2-E 120/208, 200A SERVICE 4c#350kCM TECK CABLES MOUNTED TO EXISTING SERVICE TUNNEL WALLS. RUN CONDUIT FROM NEW 4SSSR-2 SWITCHBOARD TO NEW DS2-E DOCK SERVICE ASSEMBLY IN EXISTING SERVICE TUNNELS.
22. NEW DS2-E TELECOM SERVICES:

TEL	-12PR#22
DATA	-4xCAT5e
FIBRE	-FUTURE (PROVIDE SPACE)
F/A	-2x2c#12
EMERGENCY	-2X2C#12

29. NEW 300mm CABLE TRAY MOUNTED TO EXISTING STEEL BRACKETS

0 400 800 1200 1600mm — 1:20
0 2 4 6 8m — 1:100

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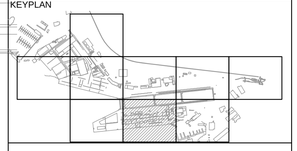
KEYPLAN



Revision/ Révision	Description/Description	Date/Date
5	ISSUED FOR TENDER	15/01/28
4	ISSUED FOR 99% DESIGN REVIEW	16/01/06
3	ISSUED FOR 66% DESIGN REVIEW	15/11/25
2	ISSUED FOR 33% DESIGN REVIEW	15/10/28
1	ISSUED FOR DESIGN DEVELOPMENT	15/09/11
0		

Client/ client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet

825 ADMIRALS ROAD VICTORIA BC ESQUIMALT GRAVING DOCK ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

Designed by/Concept par
I. BARNES

Drawn by/Dessine par
J. BIELING / S. SEYMOUR

PWGSC Project Manager/Administrateur de Projets TPSGC
Jamie LeBlanc

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Preetipal Paul

Drawing title/Titre du dessin

SSSR ELECTRICAL SITE PLAN

Project No./No. du projet	Sheet/ Feuille	Revision no./ La Révision no.
R.062548.2	5100	5

Plot Date: January 28, 2016 11:36 AM — Plotted by: Jacob Bieling
File Name: H:\PROJECTS\2013\L\13-166\Dwgs\Dwfx\5100_SSR_SITE.dwg

PWGSC – B1 – 1000X707

GENERAL PHASING NOTES AND PROPOSED SEQUENCE OF WORK:

1. ALL OUTAGES ARE TO BE OF MINIMAL DISRUPTION TO THE DOCK OPERATIONS AND ARE TO BE DONE DURING OFF HOURS WHENEVER POSSIBLE.

2. WHEN TRANSITIONING FROM THE SSS TO THE SSSR, ALL REQUIRED SUPPORTING WORKS OR INFRASTRUCTURE MUST BE COMPLETED, TESTED AND OPERATIONAL IN ADVANCE OF THE SWITCHOVER.

3. AS CONSTRUCTION PROGRESS POWER SHALL NOT BE INTERRUPTED TO EXISTING OPERATIONS.

SEQUENCE OF WORK:

1. AT THE ONSET OF CONSTRUCTION, THE SSS WILL BE POWERED BY THE EXISTING TECK CABLE FEEDER IN THE TUNNEL FROM THE MAIN SUBSTATION. AT SOME POINT IN TIME PRIOR TO THE SSSR BEING COMPLETED, THE SES MAY BE OPERATIONAL AND THE NEW FEED AS PROVIDED BY THE SSES PROJECT WILL HAVE BEEN INSTALLED.

3. CIVIL WORKS ON THE SSSR FOOTPRINT WILL EXPOSE EXISTING POWER FEEDERS RUNNING TO THE WEST. THESE ARE TO BE PROTECTED UNTIL AN ACCEPTABLE CABLE DIVERSION IS INSTALLED AND BYPASSES THE ACTIVE CONSTRUCTION SITE. THE EXISTING CONDUCTORS ARE TO BE PROTECTED FOR REUSE INTO THE NEW SSSR WHERE PRACTICAL.

4. NEW DUCTS SHALL BE EXTENDED FROM THE SOUTH EAST FROM MANHOLES INSTALLED AS PART OF THE SSES PROJECT. THIS WILL INCLUDE HV, LV AND COMMUNICATIONS DUCTS TO SERVICE THE SSSR AS WELL AS TO SUPPORT NEW AND EXISTING LOADS SUCH AS THE SOUTH JETTY KIOSKS. THIS WILL REQUIRE PARTIAL DEMOLITION OF THE WEST SIDE OF THE EXISTING STAIRS IN THE SSS.

5. EXISTING CABLE TRAY AND CABLES FROM THE GENERATOR BUILDING TO BE REROUTED TO CLEAR THE ACTIVE CONSTRUCTION SITE. THESE WILL BE COMPLETELY REROUTED OR REMOVED BY COMPLETION OF THE SSSR.

6. ONCE SSSR IS OPERATIONALLY READY, A TEMPORARY FEEDER WILL BE USED TO BACK FEED TO THE SSS AND THE PERMANENT FEEDER FROM SES WILL BE CONNECTED. AT THIS POINT, BOTH SSS AND SSSR WILL BE OPERATIONAL TO ALLOW FOR CONTROLLED TRANSITION OF EXISTING LOADS AND EVENTUAL REMOVAL OF ALL ELECTRICAL EQUIPMENT FROM THE SSS. THIS WOULD INCLUDE COMMUNICATIONS CABLING FROM SSS OR POSSIBLY SES FOR SCADA AND CONTROLS.

7. ONCE THE SSSR IS ENERGIZED, EXISTING 2500V CRANE CABLING WILL BE RUN FROM THE EXISTING TERMINAL BOX AT THE TRAILING CABLE CONNECTION TO THE SSSR 2400V SWITCHGEAR.

8. THE EXISTING GENERATOR WILL REMAIN IN PLACE ALONG WITH EXISTING LOAD BANK AND TRANSFER EQUIPMENT. A GENERATOR BREAKER WILL BE ADDED TO REDUCE EXISTING ARC FLASH HAZARD LEVELS IN THIS ROOM AT THIS TIME. THE 600V FROM THE TRANSFER SWITCH WILL BE RE DIRECTED TO NEW STANDBY DISTRIBUTION AND TRANSFORMATION IN THE SSSR PROVIDING 120/208V, 480V AND 600V STANDBY POWER. EXISTING STANDBY POWER PANELS AT 480V AND 600V WILL BE REMOVED FROM THE SSS ALONG WITH THEIR TRANSFORMERS. PANEL 2SL IN THE GENERATOR ROOM WILL REMAIN AND BE FED FROM THE NEW SSSR DISTRIBUTION. PANEL 2SK IN THE SSS WILL REMAIN AND BE REFED FROM THE STANDBY DISTRIBUTION IN THE SSSR.

9. THE EXISTING 600V COMPRESSOR, DRIER AND ACCESSORIES IN THIS ROOM WILL BE REFED DIRECTLY FROM THE SSSR USING TECK CABLE OR CONDUITS. EXISTING PANEL 2T IS TO BE REFED FROM THE NEW DISTRIBUTION AND RETAINED. THE EXISTING 2400V-600V SUBSTATION TO BE BE REMOVED. THE EXISTING 2400V CABLE IN THE TUNNEL FROM THE PUMPHOUSE TO BE BE REMOVED.

10. EXISTING 120/208V, 480V AND 600V DRYDOCK LOADS WILL BE SPLICED AT THE TUNNEL NEAR THE NORTH EAST CORNER OF THE SSSR AND IN THE NEW DOCK SERVICE TUNNEL DUCT BANK AND EXTENDED INTO THE NEW DISTRIBUTION USING TECK CABLE. ALL TRANSITS THROUGH THE TUNNEL/SSSR WALL TO BE WATERPROOF.

11. EXISTING SOUTH JETTY KIOSK LOADS REMOVED DURING DEMOLITION WILL HAVE PROVISIONS FOR REINSTATEMENT VIA DUCT STUBS INSTALLED IN SSES PROJECT.

12. ALL EXISTING COMMUNICATIONS CABLING TO KIOSKS OR BUILDINGS WILL BE REROUTED, SPLICED OR REPLACED TO CONNECT AT THE NEW COMMUNICATIONS ROOM IN THE SSSR.

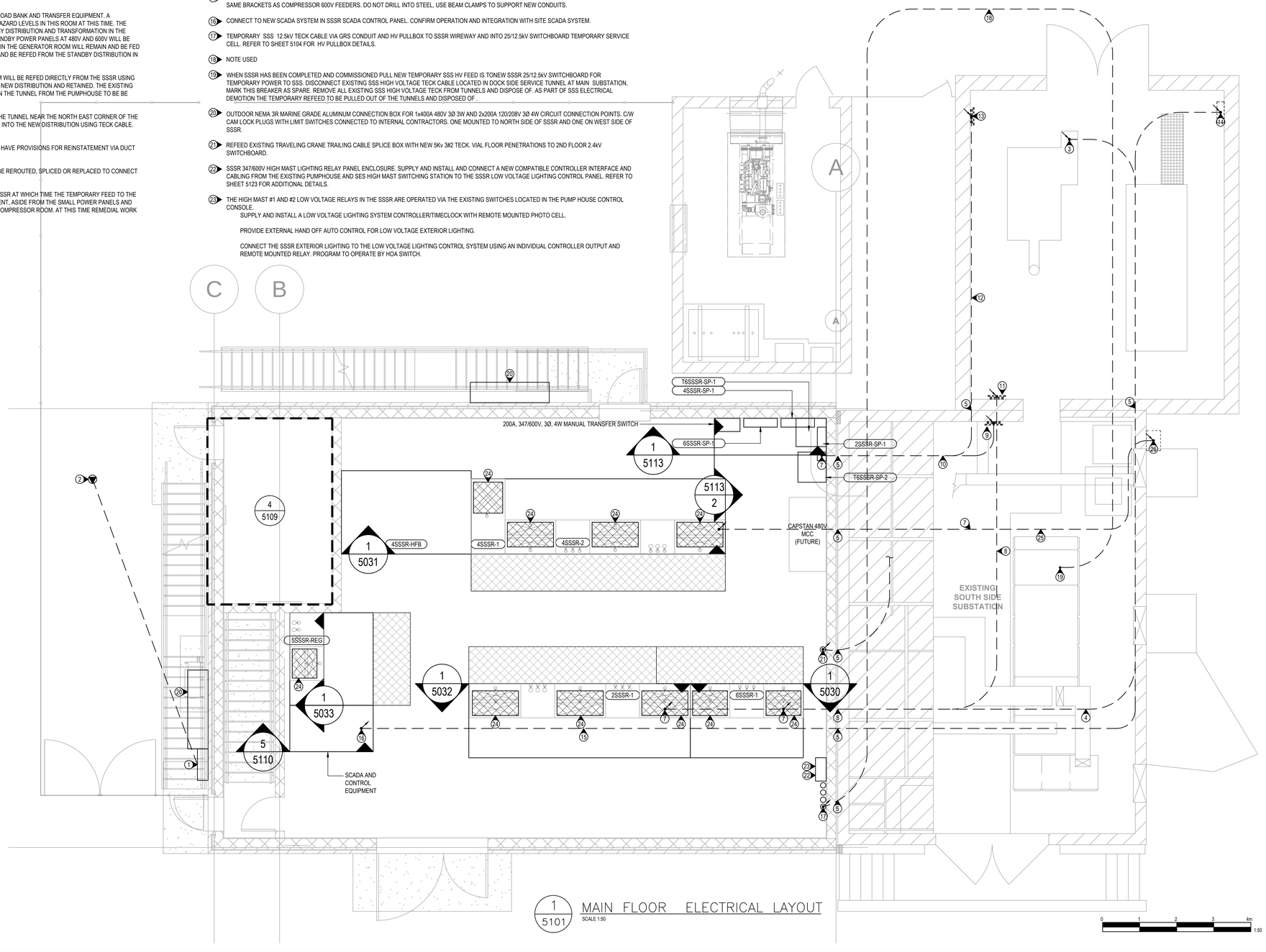
13. AT THIS POINT ALL LV LOADS SHOULD HAVE BEEN TRANSITIONED TO THE SSSR AT WHICH TIME THE TEMPORARY FEED TO THE SSSR WILL BE OPENED AND REMOVED. ALL EXISTING ELECTRICAL EQUIPMENT, ASIDE FROM THE SMALL POWER PANELS AND FIRE ALARM EQUIPMENT, WILL HAVE BEEN REMOVED FROM THE SSS AND COMPRESSOR ROOM. AT THIS TIME REMEDIAL WORK TO THE TUNNEL GRATES, HATCH AND ACCESS TO BE BE MADE.

KEY NOTES:

1. NEW LIFT STATION CONTROL PANEL. TO BE CONNECTED TO SCADA AND 6SSSR-SP1 VIA CONDUITS CONCEALED WITHIN NEW SSSR BUILDING
2. LIFT STATION LOCATION. REFER TO SHEET 5501
3. CONNECT NEW FEED FROM 6SSSR-1 TO EXISTING COMPRESSOR STARTER. CONFIRM STARTER TERMINAL LUG SIZE AND PROVIDE SUITABLE ADAPTOR LUGS AS REQUIRED TO CONNECT NEW FEEDERS. CONNECT NEW FEED FROM 6SSSR-1 TO EXISTING COMPRESSOR AIR DRYER UNIT.
4. 2x3c300kCM IN 2x103mm EMT CONDUIT AND 3c#10 IN 1x53mm EMT CONDUIT. MOUNT CONDUITS NEAR ROOF OF EXISTING SOUTH SIDE SUBSTATION JUST BELOW EXISTING STRUCTURAL STEEL BEAMS. DO NOT DRILL INTO STEEL, USE BEAM CLAMPS TO SUPPORT NEW CONDUITS.
5. CORE THROUGH EXISTING/NEW WALL AND INSTALL CONDUITS AS INDICATED. SEAL AND FIRE STOP EDGES OF WALL PENETRATION AS PER NFC REQUIREMENTS.
6. RUN CONDUITS INTO PULL BOX, THEN UP EXISTING SSS WALL TO CEILING HEIGHT.
7. CONNECT CIRCUITS INTO INDICATED SWITCHBOARD OR PANEL BOARD. REFER TO SINGLE LINE DIAGRAM AND PANEL BOARD SCHEDULES FOR CIRCUIT INFORMATION.
8. 4c#3 IN 1x53mm EMT CONDUIT TO SSSR-SSS WALL PENETRATION, THEN RUNNING IN NEW CABLE TRAY TO 2SSSR-1 SWITCHBOARD.
9. RECONNECT EXISTING SOUTH SIDE SUBSTATION PANEL 120/208V 1Ø, 100A 2SK
10. 4c#6 IN 1x35mm EMT CONDUIT MOUNTED TO WALLS OF OF EXISTING SUBSTATION AND COMPRESSOR ROOM.
11. RECONNECT EXISTING 120/208V 3Ø, 100A COMPRESSOR ROOM PANEL 2T
12. 3c#8 IN 1x21mm EMT CONDUIT MOUNTED TO WALLS OF OF EXISTING SUBSTATION AND COMPRESSOR ROOM.
13. RECONNECT EXISTING 120/240V 1Ø, 100A COMPRESSOR ROOM CONTROL POWER PANEL
14. RECONNECT EXISTING COMPRESSOR ROOM SCADA METER DATA CONNECT ION TO NEW SSSR SCADA CONTROL PANEL.
15. 1x53mm EMT CONDUIT. MOUNT CONDUIT NEAR ROOF OF EXISTING SOUTH SIDE SUBSTATION JUST BELOW EXISTING STRUCTURAL STEEL BEAMS FROM SAME BRACKETS AS COMPRESSOR 600V FEEDERS. DO NOT DRILL INTO STEEL, USE BEAM CLAMPS TO SUPPORT NEW CONDUITS.
16. CONNECT TO NEW SCADA SYSTEM IN SSSR SCADA CONTROL PANEL. CONFIRM OPERATION AND INTEGRATION WITH SITE SCADA SYSTEM.
17. TEMPORARY SSS 12.5kV TECK CABLE VIA GRS CONDUIT AND HV PULLBOX TO SSSR WIREWAY AND INTO 25/12.5kV SWITCHBOARD TEMPORARY SERVICE CELL. REFER TO SHEET 5104 FOR HV PULLBOX DETAILS.
18. NOTE USED
19. WHEN SSSR HAS BEEN COMPLETED AND COMMISSIONED PULL NEW TEMPORARY SSS HV FEED IS TONEW SSSR 25/12.5kV SWITCHBOARD FOR TEMPORARY POWER TO SSS. DISCONNECT EXISTING SSS HIGH VOLTAGE TECK CABLE LOCATED IN DOCK SIDE SERVICE TUNNEL AT MAIN SUBSTATION, MARK THIS BREAKER AS SPARE. REMOVE ALL EXISTING SSS HIGH VOLTAGE TECK FROM TUNNELS AND DISPOSE OF. AS PART OF SSS ELECTRICAL DEMOTION THE TEMPORARY REFEED TO BE PULLED OUT OF THE TUNNELS AND DISPOSED OF .
20. OUTDOOR NEMA 3R MARINE GRADE ALUMINUM CONNECTION BOX FOR 1x400A 480V 3Ø 3W AND 2x200A 120/208V 3Ø 4W CIRCUIT CONNECTION POINTS. C/W CAM LOCK PLUGS WITH LIMIT SWITCHES CONNECTED TO INTERNAL CONTRACTORS. ONE MOUNTED TO NORTH SIDE OF SSSR AND ONE ON WEST SIDE OF SSSR.
21. REFEED EXISTING TRAVELING CRANE TRAILING CABLE SPLICE BOX WITH NEW 5Kv 3#2 TECK. VIAL FLOOR PENETRATIONS TO 2ND FLOOR 2.4kV SWITCHBOARD.
22. SSSR 347/600V HIGH MAST LIGHTING RELAY PANEL ENCLOSURE. SUPPLY AND INSTALL AND CONNECT A NEW COMPATIBLE CONTROLLER INTERFACE AND CABLING FROM THE EXISTING PUMPHOUSE AND SES HIGH MAST SWITCHING STATION TO THE SSSR LOW VOLTAGE LIGHTING CONTROL PANEL. REFER TO SHEET 5123 FOR ADDITIONAL DETAILS.
23. THE HIGH MAST #1 AND #2 LOW VOLTAGE RELAYS IN THE SSSR ARE OPERATED VIA THE EXISTING SWITCHES LOCATED IN THE PUMP HOUSE CONTROL CONSOLE.
    SUPPLY AND INSTALL A LOW VOLTAGE LIGHTING SYSTEM CONTROLLER/TIMECLOCK WITH REMOTE MOUNTED PHOTO CELL.

    PROVIDE EXTERNAL HAND OFF AUTO CONTROL FOR LOW VOLTAGE EXTERIOR LIGHTING.

    CONNECT THE SSSR EXTERIOR LIGHTING TO THE LOW VOLTAGE LIGHTING CONTROL SYSTEM USING AN INDIVIDUAL CONTROLLER OUTPUT AND REMOTE MOUNTED RELAY. PROGRAM TO OPERATE BY HOA SWITCH.
24. ALL SWITCHBOARD FLOOR PENETRATION WINDOWS TO BE BOXED OUT DURING FOUNDATION CONSTRUCTION, NOT PRE-CAST OR CORED SLEEVES. CO-ORDINATE PENETRATION POINTS WITH SWITCHBOARD BOTTOM ENTRY LOCATIONS, SWITCHBOARD BREAKER LOCATIONS AND REBAR PLACEMENT. CONDUCTORS IN FLOOR PENETRATION WINDOWS TO BE NEATLY ARRANGE AND SECURELY FASTENED TO CHANNEL IRON BARS INSTALLED INSIDE WINDOW. TRANSMISSION BETWEEN PENETRATION WINDOWS AND SWITCHBOARD BOTTOMS TO BE COVERED BY ALUMINUM PLATE. PLATE MUST BE OF NON-FERROUS MATERIAL TO PREVENT INDUCED CURRENTS FROM SINGLE WIRE CONDUCTORS, MUST BE CONDUCTIVE MATERIAL TO ALLOW RETURN PATH FOR PROPER OPERATION OF OVER-CURRENT PROTECTIVE DEVICES.
25. 1x53mm EMT CONDUIT FROM EXISTING SSS CABLE PIT TO EXISTING 480V, 200A 3Ø 3W CONNECTION BOX. MOUNT CONDUITS NEAR ROOF OF EXISTING SOUTH SIDE SUBSTATION JUST BELOW EXISTING STRUCTURAL STEEL BEAMS. DO NOT DRILL INTO STEEL, USE BEAM CLAMPS TO SUPPORT NEW CONDUITS.
26. RECONNECT EXISTING OUTDOOR 480V SERVICE CONNECTION BOX USING NEW CONDUCTORS PULLED IN NEW EMT CONDUIT.



1 / 5101 MAIN FLOOR ELECTRICAL LAYOUT
SCALE 1:50

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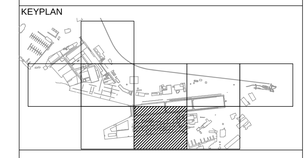

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Client/client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet
825 ADMIRALS ROAD VICTORIA BC
ESQUIMALT GRAVING DOCK
ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

Designed by/Concept par
I. BARNES

Drawn by/Dessine par
J. BIELING / S. SEYMOUR

PWGSC Project Manager/Administrateur de Projets TPSGC
Jamie LeBlanc

PWGSC, Regional Manager, Architectural and Engineering Services/ Gestionnaire régionale, Services d'architectural et de génie, TPSGC
Preetipal Paul

Drawing title/Titre du dessin

MAIN FLOOR ELECTRICAL EQUIPMENT

Project No./No. du projet	Sheet/ Feuille	Revision no./ Le Révision no.
R.062548.2	5101	5

Plot Date: February 5, 2018 2:39 PM
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Plotted by: Jacob Bieling

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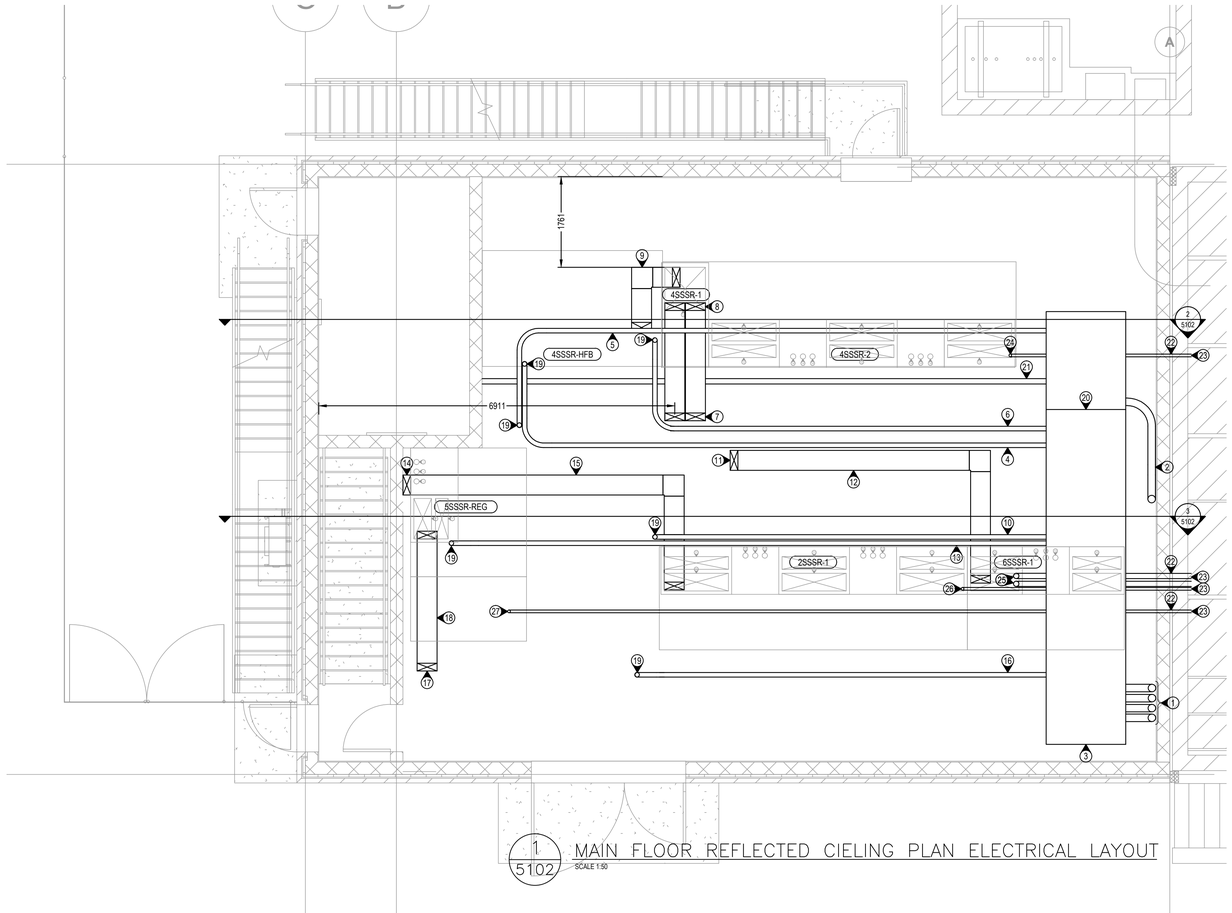

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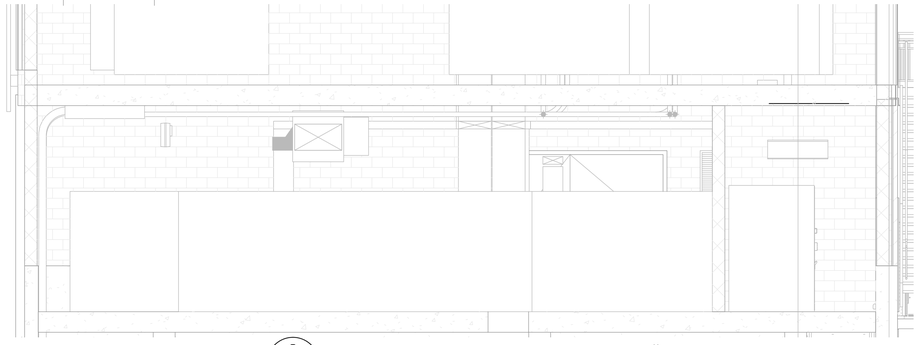

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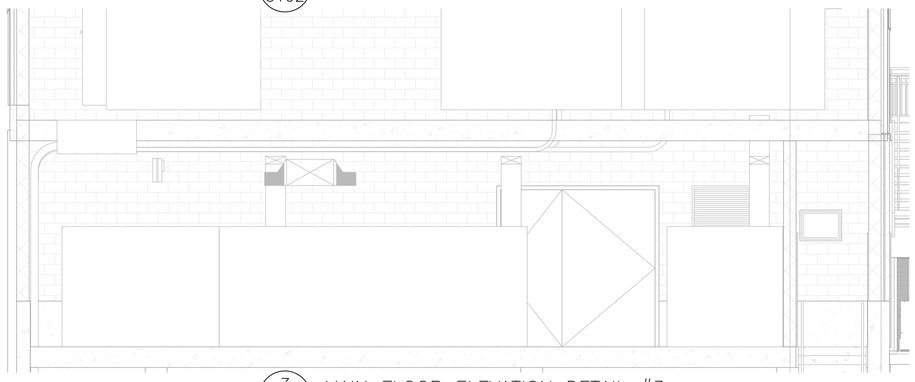

3 / 5102 MAIN FLOOR ELEVATION DETAIL #3
SCALE 1:50

GENERAL NOTES

1. NOTE

KEY NOTES:

1. 4x129mm HV CONDUIT-GRS FROM BASEMENT PULL BOX
2. 1x103mm 2.4kV CONDUIT-GRS FROM BASEMENT
3. 650x1550x8300mm HIGH VOLTAGE WIRE WAY BELOW 25/12.5kV AND 2.4kV SWITCHGEAR.
4. 1x103mm GRS CONDUIT FROM HIGH VOLTAGE WIREWAY TO 25/12.5:2.4kV TRANSFORMER
5. 1x103mm GRS CONDUIT FROM 25/12.5:2.4kV TRANSFORM TO 2.4kV SECTION OF HIGH VOLTAGE WIREWAY.
6. 1x103mm GRS CONDUIT FROM HIGH VOLTAGE WIREWAY TO 25/12.5:480V TRANSFORMER
7. 2x3000A BUS DUCT FLOOR PENETRATION TO FIRST FLOOR
8. 2x3000A BUS DUCT FROM FLOOR PENETRATION TO TOP OF SWITCHBOARD 4SSSR-1
9. 2000A BUS DUCT FROM SWITCHBOARD 4SSSR-1 TO RELOCATED HARMONIC FILTER BANK
10. 1x103mm GRS CONDUIT FROM HIGH VOLTAGE WIREWAY TO 25/12.5:600V TRANSFORMER
11. 4000A BUS DUCT FLOOR PENETRATION TO FIRST FLOOR
12. 4000A BUS DUCT FROM FLOOR PENETRATION TO TOP OF SWITCHBOARD 6SSSR-1
13. 1x103mm GRS CONDUIT FROM HIGH VOLTAGE WIREWAY TO 25/12.5:120/208V TRANSFORMER
14. 4000A BUS DUCT FLOOR PENETRATION TO FIRST FLOOR
15. 4000A BUS DUCT FROM FLOOR PENETRATION TO TOP OF SWITCHBOARD 2SSSR-1
16. 1X103mm GRS CONDUIT FROM HIGH VOLTAGE WIREWAY TO VOLTAGE REGULATOR
17. 2500A BUS DUCT FLOOR PENETRATION TO FIRST FLOOR
18. 2500A BUS DUCT FROM FLOOR PENETRATION TO TOP OF SWITCHBOARD 5SSSR-REG
19. 103mm SLAB PENETRATIONS FROM FIRST TO SECOND FLOOR. PENETRATION TO BE COORDINATED WITH TRANSFORMER PRIMARY TERMINAL LOCATIONS.
20. WIREWAY SEPARATION BETWEEN 25/12.5kV AND 2.4kV SECTIONS.
21. 1x103mm EMT CONDUIT BETWEEN NEW HIGH VOLTAGE SWITCHBOARDS AND NEW SSSR TELECOM ROOM FOR COMMUNICATION WIRING.
22. CORE THROUGH EXISTING/NEW WALL AND INSTALL CONDUITS AS INDICATED. SEAL AND FIRE STOP EDGES OF WALL PENETRATION AS PER NFC REQUIREMENTS.
23. REFER TO SHEET 5101 FOR CONDUIT ROUTING. INSTALL PULL BOXES AS REQUIRED FOR CABLE PULLS AND ACCESS POINTS. REFER TO SHEET 5101 FOR ADDITIONAL MOUNTING REQUIREMENTS.
24. 3c#3/0 CABLES TO SWITCHBOARD 4SSSR-2, EXISTING SOUTH SIDE SUBSTATION 480V 200A RECEPTACLE. VIA 1x53mm EMT.
25. 2x3c300kCM CABLES TO SWITCHBOARD 6SSSR-1, EXISTING 600V COMPRESSOR MOTOR VIA 2x103mm EMT.
26. 4#3 CABLES TO SWITCHBOARD 2SSSR-1, EXISTING 120/208V PANEL '2T' VIA 1x53mm EMT.
27. 1x53mm EMT CONDUIT FROM SSSR SCADA PANEL, EXISTING COMPRESSOR ROOM SCADA METERS.

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1:50

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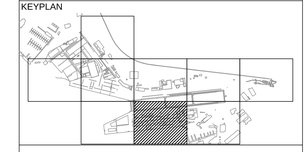

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ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet

825 ADMIRALS ROAD VICTORIA BC ESQUIMALT GRAVING DOCK ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

Designed by/Concept par
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Drawn by/Dessine par
J. BIELING / S. SEYMOUR

PWGSC Project Manager/Administrateur de Projets TPSGC
Jamie LeBlanc

PWGSC, Regional Manager, Architectural and Engineering Services/ Gestionnaire régionale, Services d'architectural et de génie, TPSGC
Preetipal Paul

Drawing title/Titre du dessin

MAIN FLOOR REFLECTED CEILING PLAN

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.062548.2	5102	5

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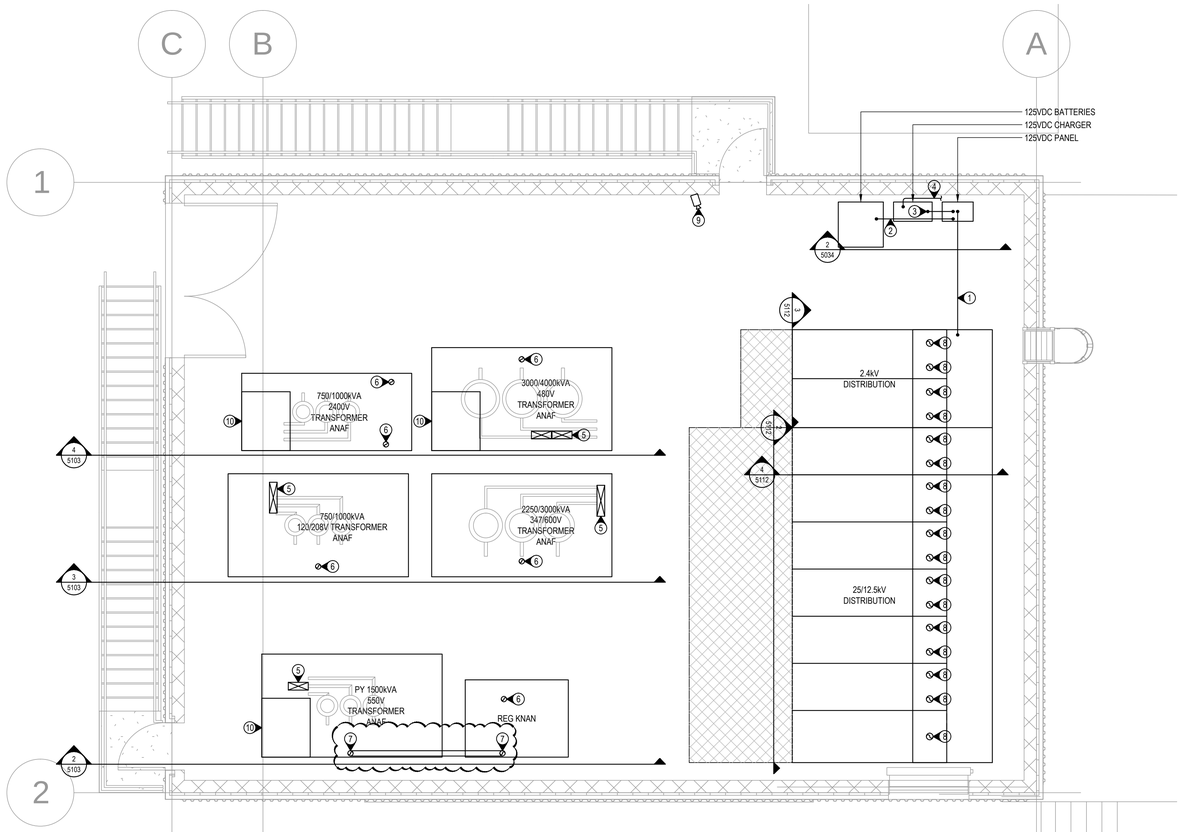
KEY NOTES:

1. 2x27mm C. IN SLAB BETWEEN 125VDC PANEL AND HIGH VOLTAGE SWITCHGEAR.
2. 1x53mm C. IN SLAB BETWEEN DC CHARGER AND DC BATTERY BANK.
3. 1x53mm C. IN SLAB BETWEEN DC CHARGER AND 125VDC PANEL 2SSSR-SP-1
4. 1x53mm C. CONCEALED IN WALL BETWEEN DC CHARGER AND PANEL
5. BUS DUCT FLOOR PENETRATION, COORDINATE WITH TRANSFORMER SECONDARY TERMINAL LOCATIONS
6. CONDUIT FLOOR PENETRATION, COORDINATE WITH TRANSFORMER PRIMARY AND HIGH VOLTAGE SWITCH GEAR CELL LOCATIONS.
7. 1x103mm C. BETWEEN REGULATOR SECONDARY AND TRANSFORMER PRIMARY TERMINALS.
8. 1x129mm SLEEVE BETWEEN SWITCHGEAR CELLS AND HIGH VOLTAGE WIREWAY. COORDINATE SLEEVE LOCATION WITH MANUFACTURER'S SHOP DRAWINGS TO DETERMINE REQUIRED LOCATION.
9. CCTV CAMERA TO MONITOR HIGH VOLTAGE GEAR DURING REMOTE OPERATION.
10. TRANSFORMER NEUTRAL GROUNDING RESISTORS. 1016x1143x940mm (HxWxD)



1 5103 SECOND FLOOR ELECTRICAL LAYOUT
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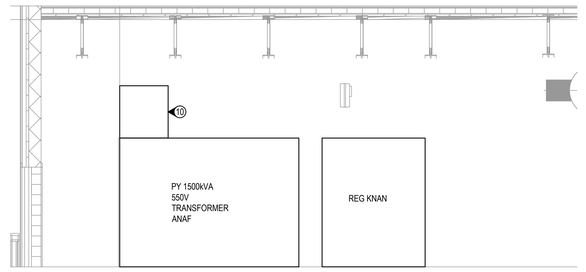

2 5103 SECOND FLOOR PARTIAL ELEVATION DETAIL 1 OF 3
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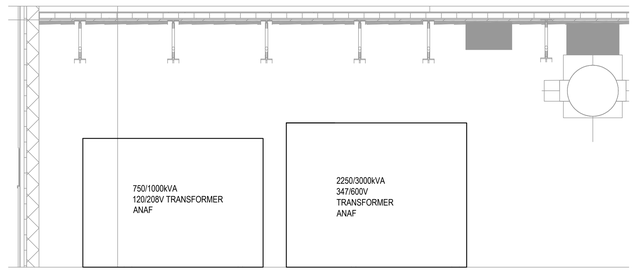

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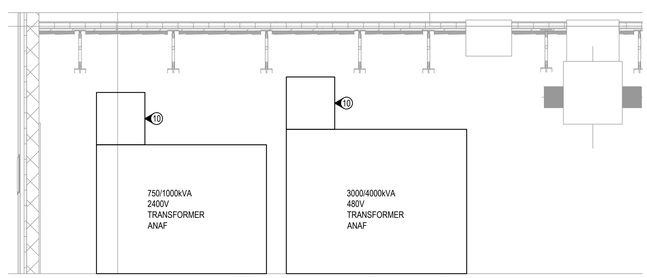

4 5103 SECOND FLOOR PARTIAL ELEVATION DETAIL 3 OF 3
SCALE 1:50

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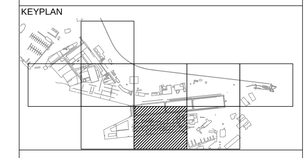

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2	ISSUED FOR 33% DESIGN REVIEW	15/10/28
1	ISSUED FOR DESIGN DEVELOPMENT	15/09/11
0		

Client/client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet
825 ADMIRALS ROAD VICTORIA BC
ESQUIMALT GRAVING DOCK
ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

Designed by/Concept par
I. BARNES

Drawn by/Dessine par
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PWGSC Project Manager/Administrateur de Projets TPSGC
Jamie LeBlanc

PWGSC, Regional Manager, Architectural and Engineering Services/ Gestionnaire régionale, Services d'architectural et de génie, TPSGC
Preetipal Paul

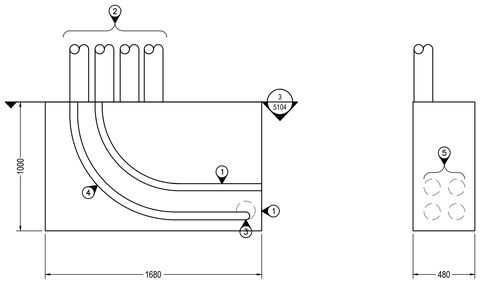
Drawing title/Titre du dessin

SECOND FLOOR ELECTRICAL EQUIPMENT LAYOUT

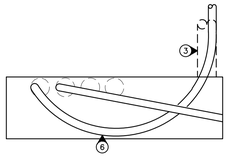
Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.062548.2	5103	5

Plot Date: February 5, 2016 2:53 PM
File Name: N:\PROJECTS\2015\15_R-SAFUP\DWG\SWG\5103_SSR_SECOND LEVELING
Plotted by: Jacob Bieling

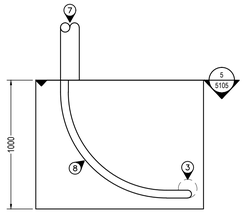
PWGSC – B1 – 1000X707



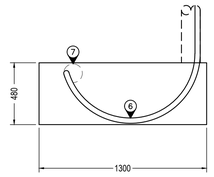
2 / 5104 — 25/12.5kV PULLBOX ELEVATIONS
SCALE 1:20



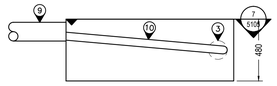
3 / 5104 — 25/12.5kV PULLBOX PLAN VIEW
SCALE 1:20



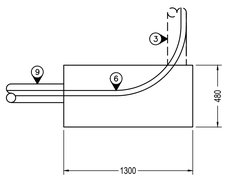
4 / 5104 — 2.4kV PULLBOX ELEVATIONS
SCALE 1:20



5 / 5104 — 2.4kV PULLBOX PLAN VIEW
SCALE 1:20



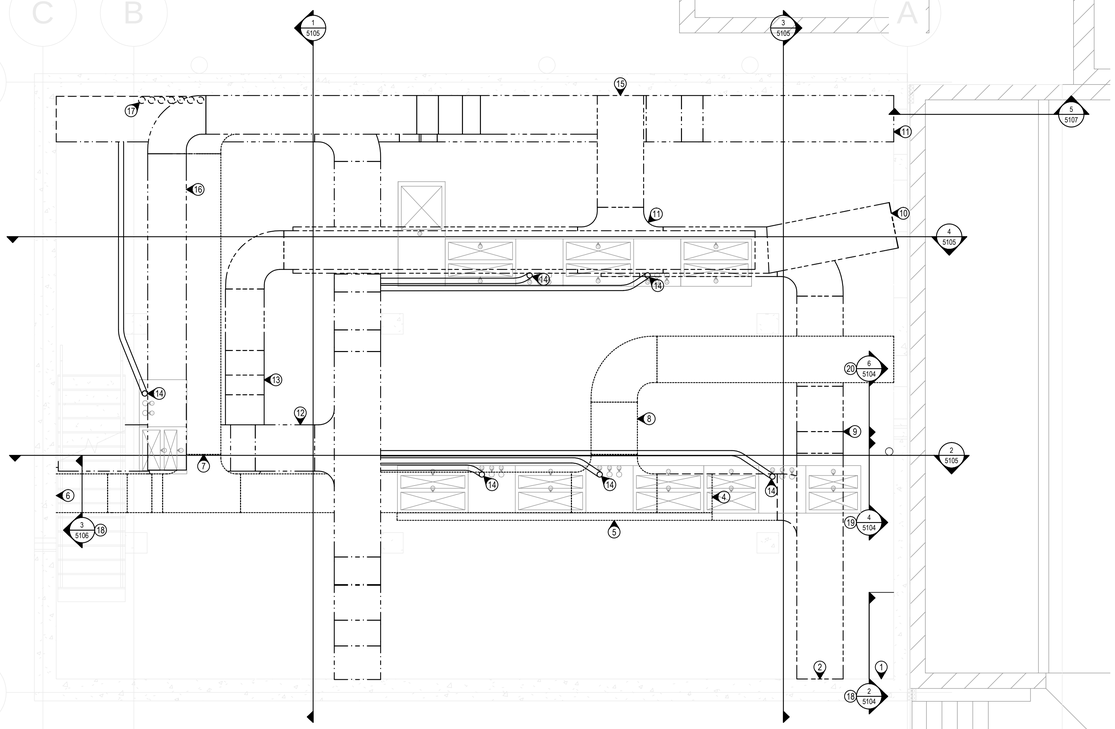
6 / 5104 — 600V PULL BOX ELEVATIONS
SCALE 1:20



7 / 5104 — 600V PULL BOX PLAN VIEW
SCALE 1:20

KEYNOTES DETAIL 2/5104 TO 7/5104:

1. NEW SSSR HIGH VOLTAGE SERVICE. 3c#250kCM XLPE.
2. 4x129mm C. TO SECOND FLOOR HIGH VOLTAGE WIREWAY 25kV SECTION, REFER TO SHEET 5102 FOR ADDITONAL DETAILS.
3. 1x129mm C. TO EXISTING SOUTH SIDE SUB SERVICE TUNNEL.
4. 3c#1, 12.5kV TECK REROUTED FROM SERVICE TUNNEL, TEMPORARY SSS BACKFEED.
5. 4x129mm C. DUCT BANK - SEE SHEET 5106 AND 5416 FOR ADDITIONAL DETAIL.
6. ENSURE BOX AND CONDUITS ARE LOCATED TO MEET 12x O.D BENDING RADIUS OF 12kV, 5kV OR 600V TECK CABLE.
7. 1x129mm C. TO SECOND FLOOR HIGH VOLTAGE WIREWAY, 2,4kV SECTION.
8. 3c#2 5kV TECK CABLE TO TRAVELING CRANE TRAILING CABLE SPLICE BOX. REFER TO SHEET 5107 FOR ADDITIONAL DETAILS.
9. 1x129mm C. TO 6SSSR-SP-1
10. 3c#2/0 600V TECK CABLE TO CAISSON #2, AND CAISSON #3 SPLICE BOX IN SERVICE TUNNEL. REFER TO SHEET 5107 FOR ADDITIONAL INFORMATION



1 / 5104 — CABLE PIT ELECTRICAL DETAILS
SCALE 1:50

NOTES DETAIL 1/5104:

1. CABLE TRAY LOCATIONS ARE PRELIMINARY, CONTRACTOR TO CONFIRM LAYOUT WITH MANUFACTURERS SWITCHGEAR AND SHOP DRAWINGS AND MAKE ADJUSTMENTS ACCORDINGLY. ENSURE ALL CLEARANCES AND ACCESS SPACING IS MAINTAINED. CABLE TRAY ADJUSTMENTS TO BE MADE TO MATCH EQUIPMENT AT NO ADDITIONAL COST TO THE OWNER.

KEYNOTES DETAIL 1/5104:

1. SSSR SOUTH WALL HIGH VOLTAGE CONDUIT ENTRY, REFER TO ELEVATION FOR EXACT LOCATION.
2. SSSR SOUTH WALL LOW VOLTAGE CONDUIT ENTRY, CABLE TRAYS FOR 120/208V, 480V AND 600V SWITCHBOARD. TRAYS TO BUTT UP AS CLOSE AS POSSIBLE TO WALL. CO-ORDINATE EXACT CABLE ARRANGEMENTS AND LAYOUT WITH CONDUCTOR BENDING AND SPACING REQUIREMENTS.
3. SSSR SOUTH WALL COMMUNICATION CONDUIT ENTRY. TRAYS TO BUTT UP AS CLOSE AS POSSIBLE TO WALL. CO-ORDINATE EXACT CABLE ARRANGEMENTS AND LAYOUT WITH CONDUCTOR BENDING AND SPACING REQUIREMENTS.
4. TRANSITION FROM 600V TO 120/208 CABLE TRAY
5. 120/208V CABLE TRAYS OVER EACH OTHER, ENSURE TRAYS ARE NEATLY SUSPENDED AND ARRANGED TO ALLOW FOR LEVEL TRANSITIONS AND ENTRY IN SWITCHBOARDS. REFER TO SHEET 5105 TO CABLE TRAY ELEVATION DETAILS.
6. SSSR WEST WALL LOW VOLTAGE CONDUIT ENTRY, CABLE TRAYS FOR 120/208V AND 480V SWITCHBOARD. TRAYS TO BUTT UP AS CLOSE AS POSSIBLE TO WALL. CO-ORDINATE EXACT CABLE ARRANGEMENTS AND LAYOUT WITH CONDUCTOR BENDING AND SPACING. TRAYS MUST PASS UNDER ACCESS STAIRWAY. CO-ORDINATE TRAY ELEVATIONS WITH STAIRCASE TO ALLOW FOR ACCESS SPACING.
7. SSSR NORTH WALL LOW VOLTAGE CABLE TRAYS TO MERGE WITH WEST WALL TRAYS
8. SSSR EAST WALL 120/208V WINDOWS IN NEW FOUNDATION TO HOLES CORED IN EXISTING SSS SUBSTATION TUNNEL WALL. TRAYS TO BUTT UP AS CLOSE AS POSSIBLE TO WALL. CO-ORDINATE EXACT CABLE ARRANGEMENTS AND LAYOUT WITH CONDUCTOR BENDING AND SPACING.
9. SSSR SOUTH WALL 480V TRAY TO RUN BELOW 4SSSR-2 SWITCHBOARD.
10. SSSR EAST WALL 480V WINDOWS IN NEW FOUNDATION TO HOLES CORED IN EXISTING SSS SUBSTATION TUNNEL WALL. TRAYS TO BUTT UP AS CLOSE AS POSSIBLE TO WALL. CO-ORDINATE EXACT CABLE ARRANGEMENTS AND LAYOUT WITH CONDUCTOR BENDING AND SPACING.
11. SSSR NORTH WALL 480V TRAY TO MERGE WITH TRAYS UNDER 4SSSR-2 SWITCHBOARD.
12. SSSR WEST WALL COMMUNICATION TRAY TO MERGE WITH SOUTH WALL COMMUNICATION TRAYS.
13. SSSR WEST WALL 480V TRAY TO MERGE WITH TRAYS UNDER 4SSSR-2.
14. 1x103mm EMT CONDUITS FROM SWITCHBOARD METERING AND CONTROL CABINETS. TO RUN TO NEARBY COMMUNICATIONS CABLE TRAYS AS SHOWN FOR DATA WIRING. CO-ORDINATE CONDUIT ROUTE WITH CABLE TRAY TO ALLOW FOR REQUIRED SPACING AND ACCESS.
15. SSSR NORTH WALL LOW VOLTAGE AND COMMUNICATION CONDUIT ENTRY. LOW VOLTAGE TRAYS TO BUTT UP AS CLOSE AS POSSIBLE TO WALL. CO-ORDINATE EXACT CABLE ARRANGEMENTS AND LAYOUT WITH CONDUCTOR BENDING AND SPACING. COMMUNICATION CABLES TO PASS DIRECTION INTO COMMUNICATION CABLE TRAY WHICH RUNS THE LENGTH OF THE NORTH WALL.
16. 430-630V CABLE TRAY FROM NORTH WALL CONDUIT PENETRATION TO BASE OF 5SSSR-REG SWITCHBOARD.
17. CO-ORDINATE CABLE TRAY LOCATION AND LAYOUT WITH FLOOR PENETRATIONS INTO SSSR COMMUNICATIONS ROOM. ALL CABLE TO BE ARRANGED NEATLY FOR PASS-THROUGH INTO UPPER FLOOR.
18. SSSR 25/12.5kV PULL BOX, REFER TO ELEVATION DETAILS FOR ADDITIONAL INFORMATION
19. SSSR 2.4kV PULL BOX, REFER TO ELEVATION DETAILS FOR ADDITIONAL INFORMATION
20. SSSR 600V PULL BOX, REFER TO ELEVATION DETAILS FOR ADDITIONAL INFORMATION, CO-ORDINATE CONDUIT ROUTE WITH COMMUNICATIONS TRAY ALONG NORTH WALL TO ALLOW ENTRY IN 6SSSR-SP-1 SWITCHBOARD.

0 400 800 1200 1600mm — 1:20
0 1 2 3 4m — 1:50

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REAL PROPERTY SERVICES
Pacific Region
SERVICES IMMOBILIERS
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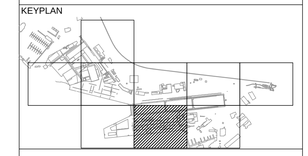
KEYPLAN



5	ISSUED FOR TENDER	15/01/28
4	ISSUED FOR 99% DESIGN REVIEW	16/01/06
3	ISSUED FOR 66% DESIGN REVIEW	15/11/25
2	ISSUED FOR 33% DESIGN REVIEW	15/10/28
1	ISSUED FOR DESIGN DEVELOPMENT	15/09/11
0		
Revision/ Revision	Description/Description	Date/Date

Client/client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet
825 ADMIRALS ROAD VICTORIA BC ESQUIMALT GRAVING DOCK ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

Designed by/Concept par
I. BARNES

Drawn by/Dessine par
J. BIELING / S. SEYMOUR

PWGSC Project Manager/Administrateur de Projets TPSGC
Jamie LeBlanc

PWGSC, Regional Manager, Architectural and Engineering Services/ Gestionnaire régionale, Services d'architectural et de génie, TPSGC
Preetipal Paul

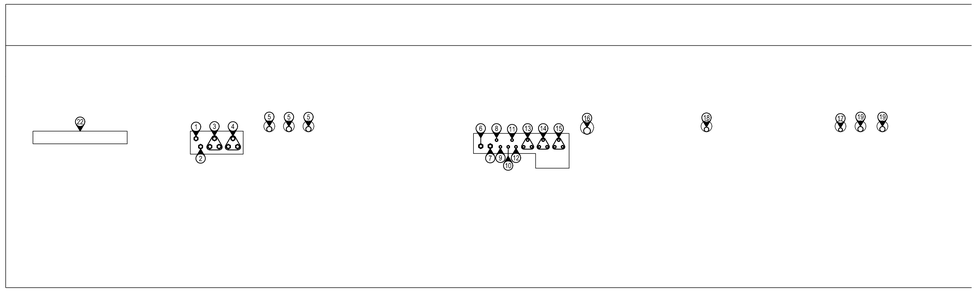
Drawing title/Titre du dessin

CABLE PIT

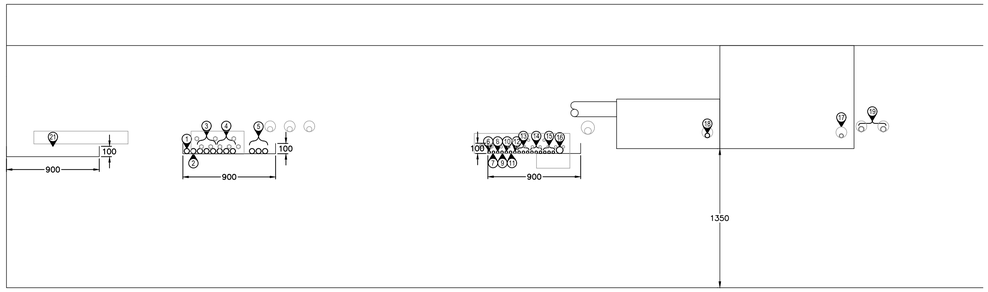
Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.062548.2	5104	5

Plot Date: February 5, 2016 2:52 PM — Plotted by: Jacob Bieling
File Name: K:\PROJECTS\2015\15-1451_DND\DWG\5104 CRIT BRANCH LEVELING

PWGSC – B1 – 1000X707



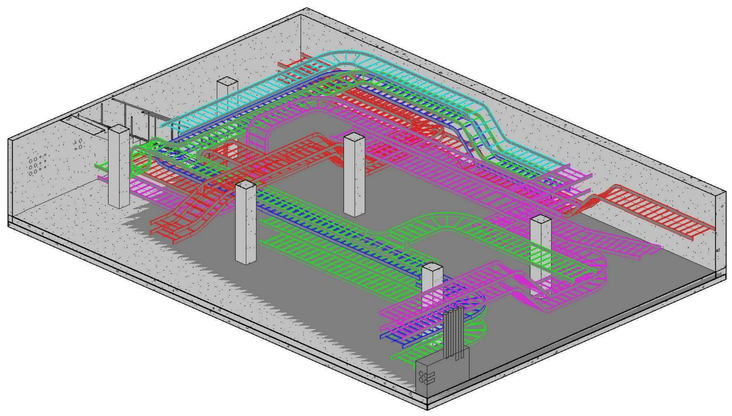
5 / 5105 BASEMENT WALL ELEVATION – EAST WALL
SCALE 1:20



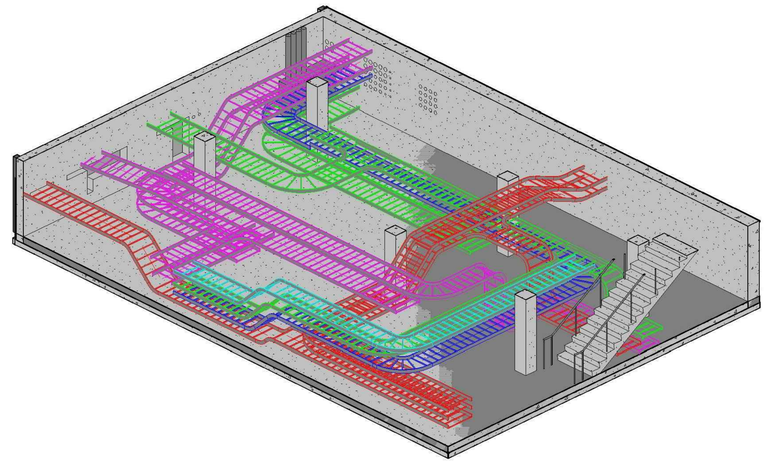
6 / 5105 BASEMENT CABLE TRAY ENDS – EAST WALL
SCALE 1:20

KEY NOTES DETAIL 5/5105 AND 6/5105:

1. 3c#8 TECK CABLE TO SWITCHBOARD 4SSSR-2, 30 T CRANE TRENCH HEAT
2. 2c#8 TECK CABLE TO SWITCHBOARD 4SSSR-2, 30T CRANE PILOT WIRE
3. 3x1c#250kCM TECK CABLES TO SWITCHBOARD 4SSSR-2, 400A 480V #3 CENTER
4. 3x1c#250kCM TECK CABLES TO SWITCHBOARD 4SSSR-2, 400A 480V #3 SOUTHEAST
5. 3x3c#3/0 TECK CABLES TO SWITCHBOARD 4SSSR-2, NEW DS2-E 480V, 400A SERVICE
6. 2c#10 TECK CABLE TO SWITCHBOARD 2SSSR-SP-1 , TUNNEL LIGHTS B
7. 3c#12 TECK CABLE TO SWITCHBOARD 2SSSR-SP-1M, PUMP REC. 25K 41 BLUE ALARM LIGHT
8. 4c#8 TECK CABLE TO SWITCHBOARD 2SSSR-SP-1, FUEL STATION GAS AND DIESEL SE DOCK
9. 2c#8 TECK CABLE TO SWITCHBOARD 2SSSR-SP-1, CABLE WINCH & BLUE ALARM LIGHTS
10. 3c#8 TECK CABLE TO SWITCHBOARD 2SSSR-SP-1, ROPE LOCKER
11. 3c#8 TECK CABLE TO SWITCHBOARD 2SSSR-SP-1, ROPE LIGHT AND SOUTHEAST DOCK STAIRS
12. 2c#8 TECK CABLE TO SWITCHBOARD 2SSSR-SP-1, TUNNEL LIGHTS AND EM BATTERY UNITS
13. 3c#2 TECK CABLE TO SWITCHBOARD 2SSSR-1, 125A 120/208V #3 SOUTHWEST
14. 3c#1/0, TECK CABLE TO SWITCHBOARD 2SSSR-1, 125A 120/208V #3 CENTER
15. 3c#3/0 TECK CABLE TO SWITCHBOARD 2SSSR-1, 125A 120/208V #3 SOUTHEAST
16. 4c#350kCM TECK CABLES TO SWITCHBOARD 2SSSR-1, NEW DS2-E 120/208 200A SERVICE
17. 3c#2 5kV TECK CABLE TO SWITCHBOARD 2.4SSSR-1, TO 30T CRANE
18. 3c#2/0 TECK CABLE TO SWITCHBOARD 6SSSR-SP-1, CAISSON POWER
19. 2x3c#4/0 TECK CABLES TO SWITCHBOARD 6SSSR-1, NEW DS2-E 600V 400A SERVICE



1 / 5105 CABLE TRAY FRONT RIGHT VIEW
NOT TO SCALE



2 / 5105 CABLE TRAY BACK LEFT VIEW
NOT TO SCALE

0 400 800 1200 1600mm 1:20
0 1 2 3 4m 1:50

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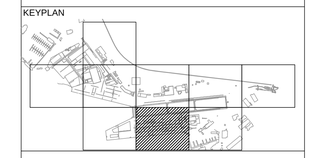
KEYPLAN



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5	ISSUED FOR TENDER	15/01/28
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SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

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PWGSC, Regional Manager, Architectural and Engineering Services/ Gestionnaire régionale, Services d'architectural et de génie, TPSGC
Preetipal Paul

Drawing title/Titre du dessin

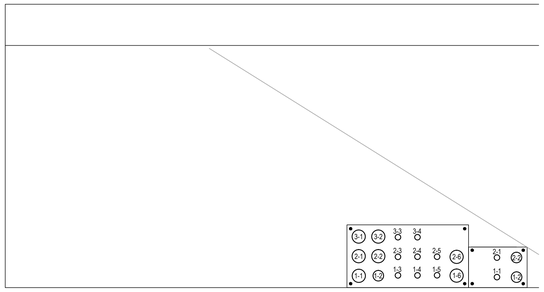
CABLE PIT TRAY AND WALL ELEVATIONS

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.062548.2	5105	5

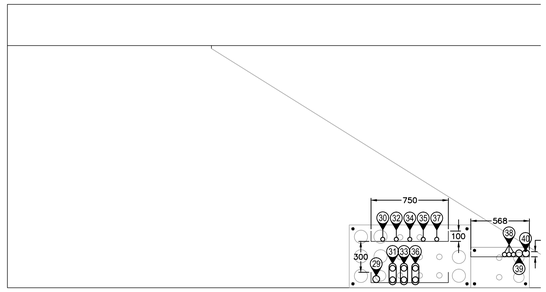
Plot Date: February 5, 2016 2:38 PM Plotted by: Jacob Bieling
File Name: N:\PROJECTS\2015\L-15-AR\DWG\DWG\5105_CSP_BASEMENT TRAY ELEVATIONS.DWG

PWGSC – B1 – 1000X707

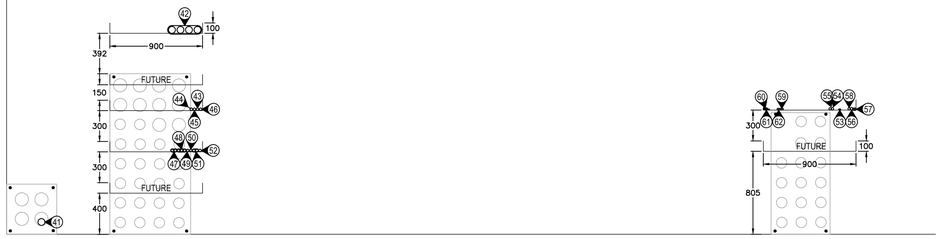
1 / 5106 BASEMENT WALL ELEVATION – SOUTH WALL
SCALE 1:25



3 / 5106 BASEMENT WALL ELEVATION – WEST WALL
SCALE 1:25



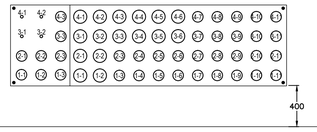
4 / 5106 BASEMENT CABLE TRAY ENDS – WEST WALL
SCALE 1:25



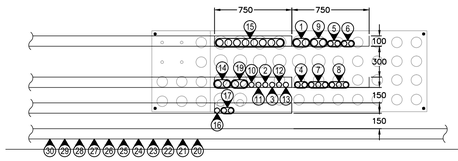
2 / 5106 BASEMENT CABLE TRAY ENDS – SOUTH WALL
SCALE 1:25

CONDUIT AND CABLE SCHEDULE

CONDUIT ROUTE	CONDUIT ID	SIZE (mm)	TYPE	SYSTEM NOMINAL VOLTAGE	CONDUCTORS	COMMENTS	
143HV - SSSR HV SECTION	1-1	129	HV	12.5/25/12.5kV	EMPTY	FUTURE	
	1-2	129	HV	12.5/25/12.5kV	3x1C#250KCM	FEEDER TO SSSR FROM SES	41
	2-1	129	HV	12.5/25/12.5kV	EMPTY	FUTURE	
	2-2	129	HV	12.5/25/12.5kV	EMPTY	FUTURE	
LV - SSS LV SECTION	1-1	103	LV	480V	4c#350kCM RW90	B-1 FEEDER	42
	1-2	103	LV	480V	4c#350kCM RW90	B-1 FEEDER	42
	1-3	103	LV	600V	EMPTY	FUTURE DOCK RECEPTACLES #1, FUTURE DOCK RECEPTACLES #2	
	1-4	103	LV	600V	4c#6, 3x#2 TECK, 2x(3c#10 TECK)	HIGH MAST LIGHTING #2, LIFT STATION #11 POWER, SUMP #1 PANEL, SUMP #2 PANEL	43 44 45 46
	2-1	103	LV	480V	4c#350kCM RW90	B-1 FEEDER	42
	2-2	103	LV	480V	4c#350kCM RW90	B-1 FEEDER	42
	2-3	103	LV	600V	EMPTY	FUTURE DOCK RECEPTACLES #3, FUTURE DOCK RECEPTACLES #4	
	2-4	103	LV	600V	EMPTY	FUTURE TUG WHARF POWER	
	3-1	103	LV	600V	EMPTY	FUTURE	
	3-2	103	LV	600V	EMPTY	FUTURE	
	3-3	103	LV	600V	EMPTY	FUTURE	
	3-4	103	LV	600V	EMPTY	FUTURE	
	4-1	103	LV	600V	EMPTY	FUTURE	
	4-2	103	LV	120/208V	EMPTY	JM#5 120V (FUTURE)	
	4-3	103	LV	120/208V	2x3c#10, 3x3c#12	TUG WHARF CABLES (EXISTING)	47 48
	4-4	103	LV	600V	EMPTY	FUTURE	
	5-1	103	LV	600V	EMPTY	FUTURE	
	5-2	103	LV	120/208V	3c#2, 2c#12	120/208V OUTDOOR PANEL, NAV. LIGHTS (EXISTING)	49 50
	5-3	103	LV	120/208V	2x3c#12, 2c#12	TUG WHARF CABLES (EXISTING)	51 52
	5-4	103	LV	600V	EMPTY	FUTURE	
	6-1	103	LV	120/208V	EMPTY	KCB CONDUIT #70,71,72 (FUTURE)	
	6-2	103	LV	480V	EMPTY	KCB CONDUIT #77, 123, 126 (FUTURE)	
	6-3	129	LV	480V	EMPTY	JM#4 480V (FUTURE)	
	6-4	129	LV	480V	EMPTY	JM#4 480V (FUTURE)	
	7-1	129	LV	480V	EMPTY	JM#3 480V (FUTURE)	
	7-2	129	LV	480V	EMPTY	JM#3 480V (FUTURE)	
	7-3	129	LV	480V	EMPTY	JM#4 120/208V (FUTURE)	
	7-4	129	LV	480V	EMPTY	JM#5 120/208V (FUTURE)	
	8-1	129	LV	480V	EMPTY	JM#3 120/208V (FUTURE)	
	8-2	129	LV	480V	EMPTY	JM#3 120/208V (FUTURE)	
	8-3	129	LV	480V	EMPTY	JM#5 480V (FUTURE)	
	8-4	129	LV	480V	EMPTY	JM#5 480V (FUTURE)	
145C-SSSR COMM. ROOM	1-1	103	COMM	N/A	2xCoax	SHAW CABLE	53
	1-2	103	COMM	N/A	4c#12TECK, 8c#12 TECK	LIFT STATION #11 SCADA ALARM, SUMP #1 & SUMP #2 WATER SCADA ALARM	54 55
	1-3	103	COMM	N/A	1x48 50/125um SMM, 2x48 9/125um SSM	FIBRE LINK - SES TO SSSR INTERCONNECT	56 57
	2-1	103	COMM	N/A	100PR#24 GEL FILLED	TELEPHONE CABLE - SES TO SSSR INTERCONNECT	58
	2-2	103	COMM	N/A	EMPTY	JM#5 TEL & JETTY TEL (FUTURE)	
	2-3	103	COMM	N/A	2x12 9/125um SSM	FIBRE - F/A AND G/A SYSTEMS	59
	3-1	103	COMM	N/A	4x2c#12, 6x2c#12	TUG WHARF & JETTY F/A HORN (EXISTING) TUG WHARF & JETTY F/A (EXISTING+FUTURE)	60 61
	3-2	103	COMM	N/A	EMPTY	JM#5 SCADA (FUTURE)	
	3-3	103	COMM	N/A	1x12 9/125um SSM	FIBRE - CCTV SYSTEM	62
	4-1	103	COMM	N/A	TBD	TBD	
	4-2	103	COMM	N/A	TBD	TBD	
	4-3	103	COMM	N/A	EMPTY	FUTURE - FIBRE ONLY	
	5-1	103	COMM	N/A	EMPTY	JETTY CCTV (FUTURE)	
	5-2	103	COMM	N/A	EMPTY	FUTURE	
	6-1	103	COMM	N/A	EMPTY	FUTURE	
	6-2	103	COMM	N/A	EMPTY	FUTURE	



5 / 5106 BASEMENT WALL ELEVATION – NORTH WALL
SCALE 1:25



6 / 5106 BASEMENT CABLE TRAY ENDS – NORTH WALL
SCALE 1:25

CONDUIT AND CABLE SCHEDULE

CONDUIT ROUTE	CONDUIT ID	SIZE (mm)	TYPE	SYSTEM NOMINAL VOLTAGE	NEW CONDUCTORS	EXISTING CONDUCTORS	COMMENTS	
SSSR-SERVICE TUNNEL LV	1-1	129	LV	208V	REUSE EXISTING	4c#350kCM TECK	JM1 - 120/208V CIRCUIT	1
	1-2	129	LV	208V	REUSE EXISTING	4c#350kCM TECK	JM1 - 120/208V CIRCUIT	1
	1-3	103	LV	208V	3c#2/0 TECK	3c#1 MI CABLE	EXISTING DOCK SERVICES #1 CENTER	2
	1-4	103	LV	208V	3c#8 TECK	3c#10 MI CABLE	SOUTH WEST DOCK STAIR ROPELIGHT	3
	1-5	103	LV	120/208V	4c#350kCM	NEW SERVICE	120/208V, 400A DS2-W	4
	1-6	103	LV	480V	3c#4/0 TECK	3c#250kCM MI CABLE	EXISTING DOCK SERVICES #1 SOUTH WEST 1 OF 2	5
	1-7	103	LV	480V	3c#4/0 TECK	3c#250kCM MI CABLE	EXISTING DOCK SERVICES #1 CENTER 1 OF 2	6
	1-8	103	LV	480V	3c#4/0 TECK	3c#250kCM MI CABLE	EXISTING DOCK SERVICES #1 SOUTH EAST 1 OF 2	7
	1-9	103	LV	480V	3c#3/0	NEW SERVICE	480V, 400A DS2-W	7
	1-10	103	LV	480V	3c#3/0	NEW SERVICE	480V, 400A DS2-C	8
	1-11	103	LV	480V	3c#3/0	NEW SERVICE	480V, 400A DS2-C	8
	2-1	129	LV	208V	REUSE EXISTING	4c#350kCM TECK	JM2 - 120/208V CIRCUIT	9
	2-2	129	LV	208V	REUSE EXISTING	4c#350kCM TECK	JM2 - 120/208V CIRCUIT	9
	2-3	103	LV	208V	3c#2/0 TECK	3c#1 MI CABLE	EXISTING DOCK SERVICES #1 SOUTH EAST	10
	2-4	103	LV	208V	3c#3/0 TECK	3c#1/0 MI CABLE	EXISTING DOCK SERVICES #1 SOUTH WEST	11
	2-5	103	LV	120/208V	4c#350kCM	NEW SERVICE	120/208V, 400A DS2-C	4
	2-6	103	LV	480V	3c#4/0 TECK	3c#250kCM MI CABLE	EXISTING DOCK SERVICES #1 SOUTH WEST 2 OF 2	5
	2-7	103	LV	480V	3c#4/0 TECK	3c#250kCM MI CABLE	EXISTING DOCK SERVICES #1 CENTER 2 OF 2	6
	2-8	103	LV	480V	3c#4/0 TECK	3c#250kCM MI CABLE	EXISTING DOCK SERVICES #1 SOUTH EAST 2 OF 2	7
	2-9	129	LV	480V	3c#3/0	NEW SERVICE	480V, 400A DS2-W	12
	2-10	103	LV	480V	3c#3/0	NEW SERVICE	480V, 400A DS2-W	8
	2-11	129	LV	480V	3c#3/0	NEW SERVICE	480V, 400A DS2-C	13
	3-1	129	LV	430-630V	3c#500kCM TECK	NEW SERVICE	2000A REGULATED DOCK SERVICE, DS2-C	14
	3-2	129	LV	430-630V	3c#500kCM TECK	NEW SERVICE	2000A REGULATED DOCK SERVICE, DS2-C	14
	3-3	129	LV	430-630V	3c#500kCM TECK	NEW SERVICE	2000A REGULATED DOCK SERVICE, DS2-C	
	3-4	129	LV	430-630V	3c#500kCM TECK	NEW SERVICE	2000A REGULATED DOCK SERVICE, DS2-C	15
	3-5	129	LV	408V	REUSE EXISTING	3c#350kCM TECK	JM1 - 480V CIRCUIT	
	3-6	129	LV	408V	REUSE EXISTING	3c#350kCM TECK	JM1 - 480V CIRCUIT	
	3-7	103	LV	600V	REUSE EXISTING	3c#2/0 TECK	600V CAISSON CONNECTION	16
	3-8	103	LV	600V	3c#4/0	NEW SERVICE	600V, 400A DS2-W	17
	3-9	103	LV	600V	3c#4/0	NEW SERVICE	600V, 400A DS2-W	17
	3-10	103	LV	600V	FUTURE	NEW SERVICE	FUTURE HIGH MAST #1	18
	3-11	103	LV	N/A	FUTURE	NEW SERVICE	SPARE	18
	4-1	129	LV	430-630V	3c#500kCM TECK	NEW SERVICE	2000A REGULATED DOCK SERVICE, DS2-C	19
	4-2	129	LV	430-630V	3c#500kCM TECK	NEW SERVICE	2000A REGULATED DOCK SERVICE, DS2-C	19
	4-3	129	LV	430-630V	3c#500kCM TECK	NEW SERVICE	2000A REGULATED DOCK SERVICE, DS2-C	
	4-4	129	LV	430-630V	3c#500kCM TECK	NEW SERVICE	2000A REGULATED DOCK SERVICE, DS2-C	15
	4-5	129	LV	408V	REUSE EXISTING	3c#350kCM TECK	JM2 - 480V CIRCUIT	
	4-6	129	LV	408V	REUSE EXISTING	3c#350kCM TECK	JM2 - 480V CIRCUIT	
	4-7	103	LV	N/A	FUTURE	NEW SERVICE	SPARE	
	4-8	103	LV	N/A	FUTURE	NEW SERVICE	SPARE	
	4-9	103	LV	N/A	FUTURE	NEW SERVICE	SPARE	18
	4-10	103	LV	N/A	FUTURE	NEW SERVICE	SPARE	
	4-11	103	LV	N/A	FUTURE	NEW SERVICE	SPARE	
SSSR-SERVICE TUNNEL COMM.	1-1	103	COMM	N/A	4xCAT5e	NEW SERVICE	DS2-W DATA SERVICES	20
	1-2	103	COMM	N/A	16PR#22	NEW SERVICE	DS2-W COMM SERVICES	21
	1-3	103	COMM	N/A	FUTURE	NEW SERVICE	DS2-W FIBRE SERVICES	22
	2-1	103	COMM	N/A	4xCAT5e	NEW SERVICE	DS2-C DATA SERVICES	23
	2-2	103	COMM	N/A	16PR#22	NEW SERVICE	DS2-C COMM SERVICES	24
	2-3	103	COMM	N/A	FUTURE	NEW SERVICE	DS2-C FIBRE SERVICES	25
	3-1	27	COMM	N/A	2x2c#12	NEW SERVICE	DS2-W F/A SERVICES	26
	3-2	27	COMM	N/A	2x2c#12	NEW SERVICE	DS2-W EMERGENCY SERVICES	27
	3-3	103	COMM	N/A	SPARE	NEW SERVICE	FUTURE (FIBRE ONLY)	28
	4-1	27	COMM	N/A	2x2c#12	NEW SERVICE	DS2-C F/A SERVICES	29
	4-2	27	COMM	N/A	2x2c#12	NEW SERVICE	DS2-C EMERGENCY SERVICES	30
	4-3	103	COMM	N/A	SPARE	NEW SERVICE	FUTURE (FIBRE ONLY)	28

0 500 1000 1500 2000mm
1:25

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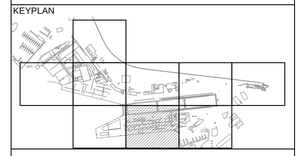
KEYPLAN



Revision/ Revision	Description/Description	Date/Date
5	ISSUED FOR TENDER	15/01/28
4	ISSUED FOR 99% DESIGN REVIEW	16/01/06
3	ISSUED FOR 66% DESIGN REVIEW	15/11/25
2	ISSUED FOR 33% DESIGN REVIEW	15/10/28
1	ISSUED FOR DESIGN DEVELOPMENT	15/09/11
0		

Client/client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet
825 ADMIRALS ROAD VICTORIA BC
ESQUIMALT GRAVING DOCK
ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

Designed by/Concept par
I. BARNES

Drawn by/Dessine par
J. BIELING / S. SEYMOUR

PWGSC Project Manager/Administrateur de Projets TPSGC
Jamie LeBlanc

PWGSC, Regional Manager, Architectural and Engineering Services/ Gestionnaire régionale, Services d'architectural et de génie, TPSGC
Preetipal Paul

Drawing title/Titre du dessin

CABLE PIT WALL PENETRATION ELEVATIONS

Project No./No. du projet	Sheet/Feuille	Revision no./ Le Révision no.
R.062548.2	5106	5

Plot Date: February 5, 2016 2:37 PM
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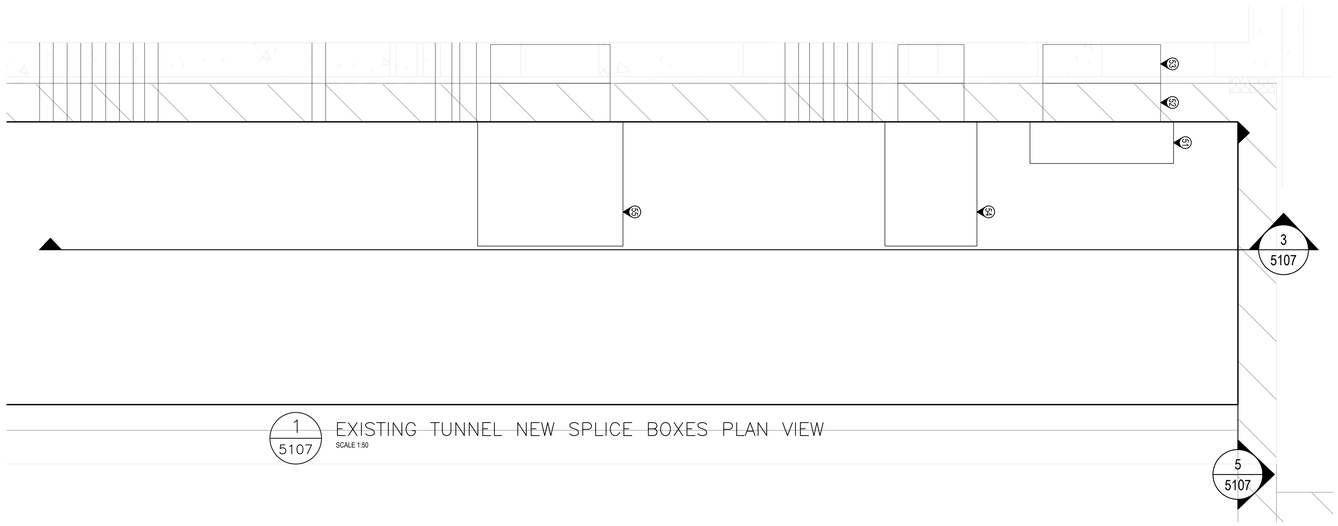
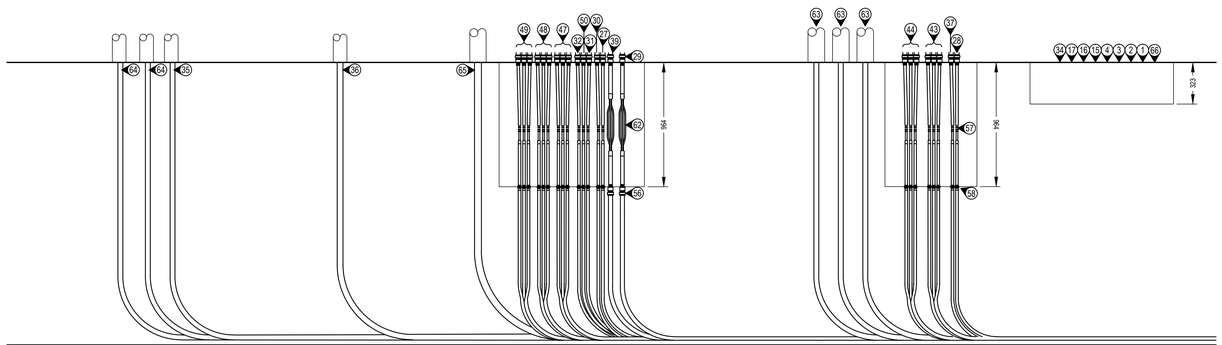
Plotted by: Jacob Bieling

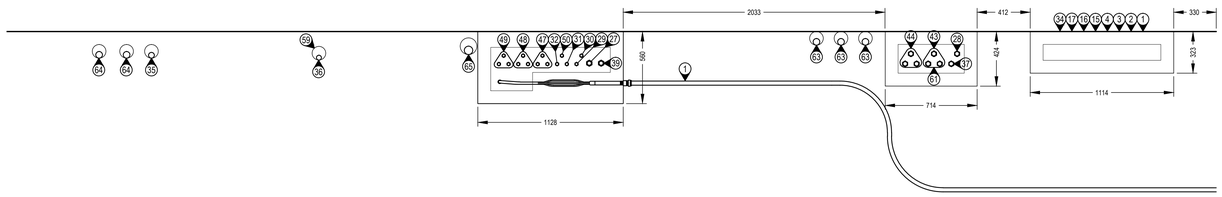
PWGSC – B1 – 1000X707



1 5107 EXISTING TUNNEL NEW SPLICE BOXES PLAN VIEW
SCALE 1:50



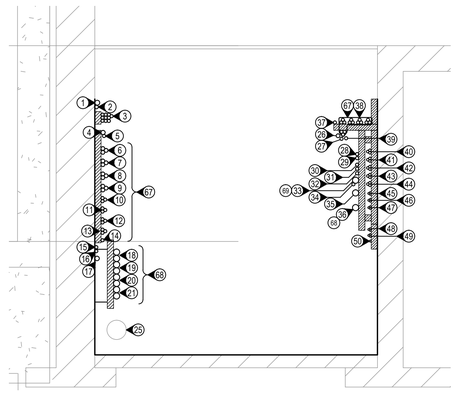
2 5107 EXISTING TUNNEL NEW SPLICE BOXES PLAN VIEW WITH CONDUCTORS
SCALE 1:20



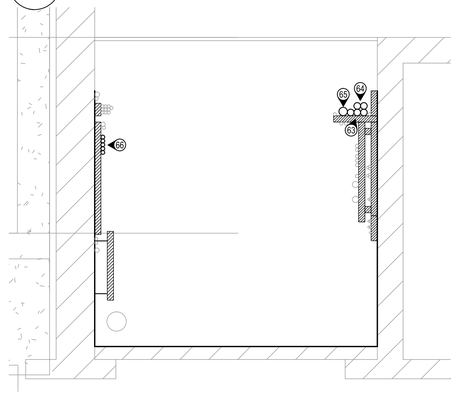
3 5107 EXISTING TUNNEL NEW SPLICE BOX ELEVATIONS
SCALE 1:20

KEY NOTES

1. 3c#8 TECK TUNNEL LIGHTING C-D 25K 8,10
2. 2PR #18 INSTRUMENT CABLE
3. 9x12PR #22 TEL TO DRYDOCK SECTIONS + 1EA 12X62.5 FIBER
4. 1x100PR TELEPHONE TO PB 67 VIA PIPE #20 "SS-USL"
5. 1xFIBER OPTIC CABLE TO PB 67 VIA PIPE #19
6. 3c#250MCM MI CABLE 4SS2-11 #2 SOUTHWEST
7. 3c#250MCM MI CABLE 4SS2-5 #1 SOUTHEAST
8. 3c#250MCM MI CABLE 4SS2-6 #1 CENTER
9. 3c#250MCM MI CABLE 4SS2-7 #1 SOUTHWEST
10. 3c#3 MI CABLE 2SS2-6 #2 SOUTHWEST
11. 3c#3 MI CABLE 2SS2-1 #1 SOUTHEAST
12. 3c#1 MI CABLE 2SS2-2 #1 CENTER
13. 3c#1/0 MI CABLE 2SS2-3 #1 SOUTHWEST
14. 3c#10 MI CABLE 25K 33,35 SOUTHWEST DOCK STAIR ROPELIGHT
15. 12mm FA DATA
16. 12mm SCADA SYSTEM DATA 3C 16SH.
17. 25mm EMT WITH 1-2C16 SHIELDED BELDEN
18. 2x4SS2-71 -JM1 3c#350MCM
19. 2x2SS2-61 -JM1 4c#350MCM
20. 2x4SS2-72 -JM2 3c#350MCM
21. 2x2SS2-62 -JM2 4c#350MCM
22. NOT USED
23. NOT USED
24. NOT USED
25. 150mm Ø AIRLINE
26. 4c#14 TECK 2000A BREAKER REMOTE TRIP/CLOSE FROM 2000A SPLITTER
27. 4c#8 25K-29 & 31 FUEL STATION GAS AND DIESEL SE DOCK
28. 3c#10 MI CABLE 30 T CRANE TRENCH HEAT 4SS2-21
29. 2c#10 MI CABLE 25K 12 TUNNEL LIGHTS B
30. 2c#10 MI CABLE 25K 17 CABLE WINCH & BLUE ALARM LIGHTS
31. 3c#10 MI 25K 19-21 ROPE LOCKER
32. 2c#10 MI CABLE 25K 14 TUNNEL LIGHTS AND EM BATTERY UNITS
33. 2.4kV MS 5KV CARE CRANE SWBD. FEEDER, TO BE REMOVED
34. 2c#12 TECK 25K 43 SCADA WATER METER SOUTH TUNNEL
35. 2.4SS2 TECK 5KV TO 30T CRANE TO BE REPLACED WITH NEW FROM 2.4SSSR SWITCHBOARD
36. 3c#2/0 TECK 1000V 6SB2 CAISSON POWER TO BE REPLACED WITH NEW FROM 6SSSR-SP-1
37. 2c PYROTENAX 30T CRANE PILOT WIRE
38. 2000A DRYDOCK 480V SPLITTER 4SSS 2-27 5x3c#250MCM MI
39. 3c#12 TECK 25K 39 PUMP REC. 25K 41 BLUE ALARM LIGHT
40. 3c#250MCM MI CABLE (3x1c#250kCM TECK SPLICE) 4SS2-10 500A 480V #2 CENTER
41. 3c#250MCM MI CABLE (3x1c#250kCM TECK SPLICE) 4SS2-9 500A 480V #2 SOUTHEAST
42. 3c#250MCM MI CABLE (3x1c#250kCM TECK SPLICE) 4SS2-14 500A 480V #2 SOUTHWEST
43. 3c#250MCM MI (3x1c#250kCM TECK SPLICE) CABLE 4SS2-13 500A 480V #3 CENTER
44. 3c#250MCM MI (3x1c#250kCM TECK SPLICE) CABLE 4SS2-12 500A 480V #3 SOUTHEAST
45. 3c#3 MI (3c#1 TECK SPLICE) CABLE 2SS2-5 125A 120/208V #2 SOUTH CENTER
46. 3c#3 MI (3c#1 TECK SPLICE) CABLE 2SS2-4 125A 120/208V #2 SOUTHEAST
47. 3c#3 MI (3c#1 TECK SPLICE) CABLE 2SS2-9 125A 120/208V #3 SOUTHWEST



4 5107 EXISTING TUNNEL CABLE SECTION
SCALE 1:20



5 5107 REVISED TUNNEL CABLE SECTION
SCALE 1:20

48. 3c#1 MI (3c#2/0 TECK SPLICE) CABLE 2SS2-8 125A 120/208V #3 CENTER
49. 3c#1/0 MI (3c#3/0 TECK SPLICE) CABLE 2SS2-7 125A 120/208V #3 SOUTHEAST
50. 3c#10 (3c#6 TECK SPLICE) MI CABLE 25K 32, 34 ROPE LIGHT AND SOUTHEAST DOCK STAIRS
51. CSA TYPE 3R MARINE GRADE ALUMINUM SPLICE BOX, TO BE MINIMUM DIMENSIONS SHOWN ON DRAWING. MOUNTED TO WALL OF EXISTING SERVICE TUNNEL TO BE SIDE ENTRY.
52. WALL PENETRATIONS TO BE CORED BETWEEN EXISTING SERVICE TUNNEL WALL AND FOUNDATION WINDOWS IN SSSR BUILDING. REFER TO SHEET 5106 FOR WINDOW ELEVATION DETAILS. (TYPICAL)
53. WALL PENETRATIONS TO BE A FORMED WINDOW IN CONCRETE FOUNDATION OF SSSR. (TYPICAL)
54. CSA TYPE 3R MARINE GRADE ALUMINUM SPLICE FOR, TO BE MINIMUM DIMENSIONS SHOWN ON DRAWING. MOUNTED TO WALL OF EXISTING SERVICE TUNNEL TO BE BOTTOM ENTRY.
55. CSA TYPE 3R MARINE GRADE ALUMINUM SPLICE FOR, TO BE MINIMUM DIMENSIONS SHOWN ON DRAWING. MOUNTED TO CEILING OF EXISTING SERVICE TUNNEL TO BE BOTTOM ENTRY.
56. TECK CABLE ARMORED WATERTIGHT GLAND CONNECTOR. FOR ENTRY OF TECK CABLES IN SERVICES BOXES, (TYPICAL FOR ALL TECK CABLES).
57. MINERAL INSULATED CABLE TO TECK CABLE SPLICE, FOLLOW MANUFACTURER'S RECOMMENDED GUIDELINES FOR CUTTING COPPER OUTER SHEATH, FORMING MINERAL INSULATION AND SPLICING INTERNAL CONDUCTORS. SPLICE COVER TO BE INSULATED HEAT SHRINK AND MUST BE WATERTIGHT. (TYPICAL FOR ALL MI-TECK SPLICES)
58. MINERAL INSULATED CABLE ARMORED WATERTIGHT CONNECTOR. FOR ENTRY OF MI CABLES INTO SERVICES BOXES, (TYPICAL FOR ALL MI CABLES).
59. FIRESTOP AND VAPOR SEAL CONDUITS AS REQUIRED.
60. NOT USED
61. SEPARATE MINERAL INSULATED CABLE PRIOR TO ENTRY INTO SERVICE BOX TO ALLOW WORKING ROOM AROUND WATER TIGHT CONNECTOR. (TYPICAL FOR ALL MI CABLES)
62. TECK TO TECK SPLICE, AS PER MANUFACTURER'S RECOMMENDED METHOD. TO BE HEAT SHRUNK AND WATERTIGHT SPLICE.
63. NEW DS2-E 480V, 400A SERVICE 3x3c#3/0 TECK CABLES MOUNTED TO EXISTING SERVICE TUNNEL WALLS. RUN CONDUIT FROM NEW 4SSSR-2 SWITCHBOARD TO NEW DS2-E DOCK SERVICE ASSEMBLY IN EXISTING SERVICE TUNNELS.
64. NEW DS2-E 600V, 400A SERVICE 2x3c#4/0 TECK CABLES MOUNTED TO EXISTING SERVICE TUNNEL WALLS. RUN CONDUIT FROM NEW 4SSSR-2 SWITCHBOARD TO NEW DS2-E DOCK SERVICE ASSEMBLY IN EXISTING SERVICE TUNNELS.
65. NEW DS2-E 120/208, 200A SERVICE 4c#350kCM TECK CABLES MOUNTED TO EXISTING SERVICE TUNNEL WALLS. RUN CONDUIT FROM NEW 4SSSR-2 SWITCHBOARD TO NEW DS2-E DOCK SERVICE ASSEMBLY IN EXISTING SERVICE TUNNELS.
66. NEW DS2-E TELECOM SERVICES
    TEL -16PR#22
    DATA -4xCAT5e
    FIBRE -FUTURE (PROVIDE SPACE)
    F/A -2x2c#12
    EMERGENCY -2X2C#12
67. EXISTING SERVICE CABLES TO BE DISCONNECT AND DEMOLISHED FROM BASE OF SSS SWITCHBOARD TO DOCK TUNNEL SERVICE BOXES OR TO SPLICE POINT INTO NEW DUCT BANK. REFER TO SHEET 5108 FOR DOCK TUNNEL SPLICE DETAILS.
68. EXISTING TECK CABLES TO BE MEGGER TESTED FOR RELIABILITY, DISMOUNTED FROM WALL AND PULLED VIA NEW DUCT BANK AND CABLE TRAYS AND RECONNECTED TO APPROPRIATE SWITCHBOARDS IN NEW SSSR SUBSTATION. REFER TO SHEET 5108 FOR DOCK TUNNEL TECK RELOCATION DETAILS.
69. EXISTING 24kV TECK FROM MAIN SUB-STATION TO SSS TO BE DEMOLISHED. REMOVE FROM ALL TUNNELS AND MAIN SUB-BREAKER RENAME AS SPARE.

0 400 800 1200 1600mm
1:20

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REAL PROPERTY SERVICES
Pacific Region
SERVICES IMMOBILIERS
Region de Pacifique

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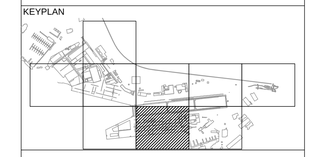
KEYPLAN



Revision/ Revision	Description/Description	Date/Date
5	ISSUED FOR TENDER	15/01/28
4	ISSUED FOR 99% DESIGN REVIEW	16/01/06
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1	ISSUED FOR DESIGN DEVELOPMENT	15/09/11
0		

Client/client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet
825 ADMIRALS ROAD VICTORIA BC
ESQUIMALT GRAVING DOCK
ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

Designed by/Concept par
I. BARNES

Drawn by/Dessine par
J. BIELING / S. SEYMOUR

PWGSC Project Manager/Administrateur de Projets TPSGC
Jamie LeBlanc

PWGSC, Regional Manager, Architectural and Engineering Services/ Gestionnaire régionale, Services d'architectural et de génie, TPSGC
Preetipal Paul

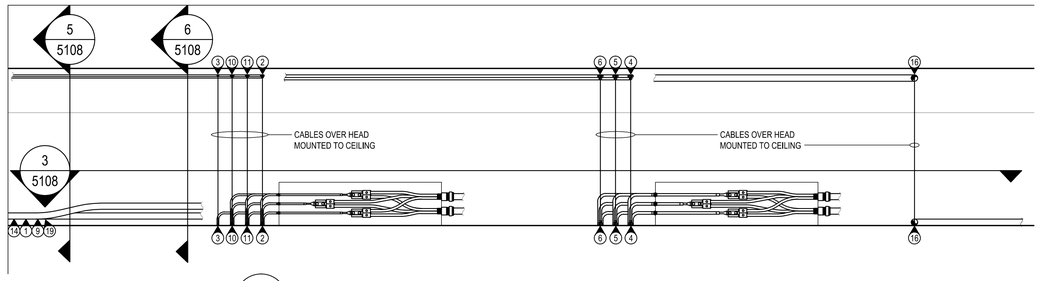
Drawing title/Titre du dessin

EXISTING TUNNEL CABLE SPLICING AND PULL BOX DETAILS

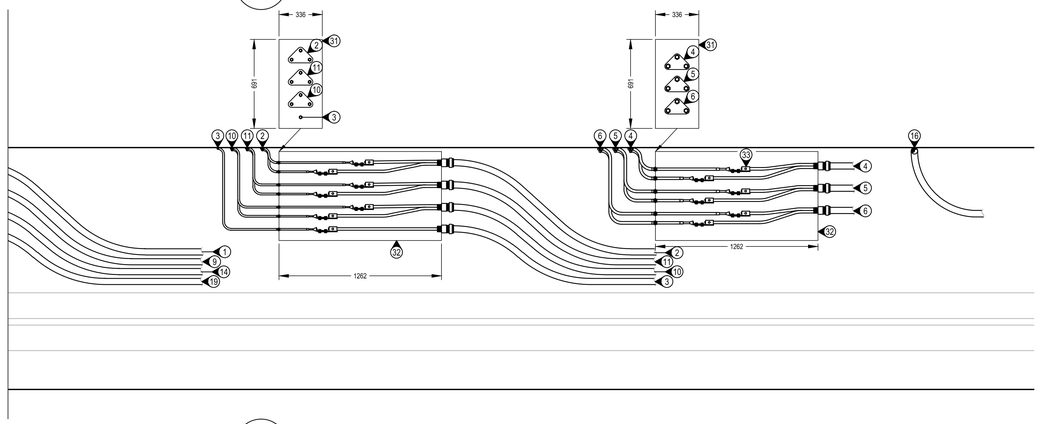
Project No./No. du projet	Sheet/ Feuille	Revision no./ La Révision no.
R.062548.2	5107	5

Plot Date: February 5, 2016 2:38 PM
File Name: N:\PROJECTS\2015\15-LAP-LWL\WORKING\15107-SSSR-SSS TUNNEL_SPLICES.DWG
Plotted by: Jacob Bieling

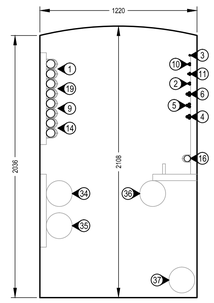
PWGSC – B1 – 1000X707



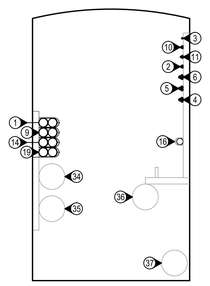
1 5108 SERVICE TUNNEL SPLICE BOX PLAN VIEW
SCALE 1:20



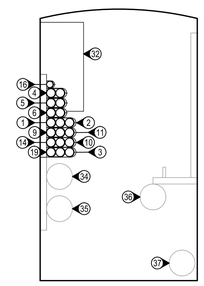
2 5108 SERVICE TUNNEL SPLICE BOX ELEVATION VIEW
SCALE 1:20



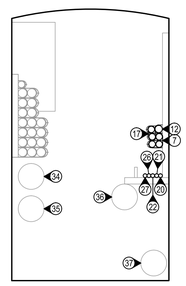
5 5108 SERVICE TUNNEL EXISTING SERVICES
SCALE 1:20



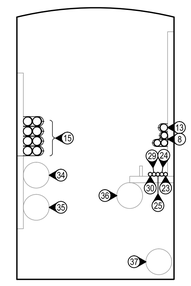
6 5108 SERVICE TUNNEL TECK REMOUNTING
SCALE 1:20



7 5108 SERVICE TUNNEL AFTER SPLICE BOXES
SCALE 1:20



8 5108 SERVICE TUNNEL WITH NEW DS-2W
SCALE 1:20



9 5108 SERVICE TUNNEL WITH NEW DS-2C
SCALE 1:20

KEY NOTES:

(31) SPLICE BOX M1 CABLE END ENTRY DETAIL, ENSURE ADEQUATE WORKING SPACE AROUND MI CABLE WATERTIGHT CONNECT.

(32) 1220mmx700mmx340mm TYPE 3R MARINE GRADE ALUMINUM WALL MOUNTED SPLICE BOX, TO BE FRONT AND BOTTOM ACCESSIBLE VIA REMOVABLE PANELS AND C/W DRAINAGE HOLE IN BOTTOM OF BOX.

(33) MI TO TECK CABLE SPLICE. FOLLOW MANUFACTURES RECOMMENDED GUIDELINES. SPLICE COVER TO BE HEAT SHRINK WATER TIGHT RUBBER.

(34) EXISTING COOLING WATER FEEDLINE TO REMAIN.

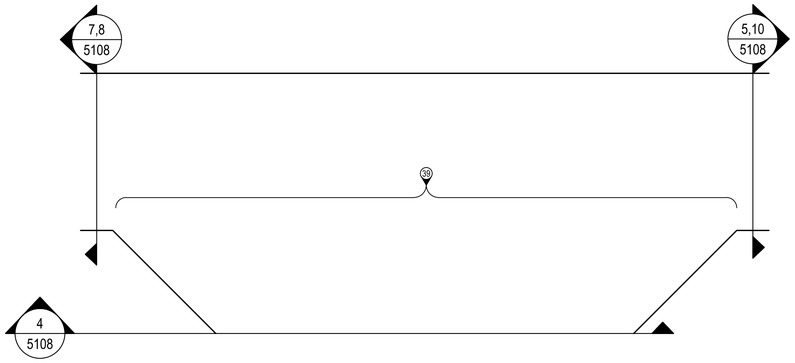
(35) EXISTING COMPRESSOR AIR LINE TO REMAIN.

(36) EXISTING POTABLE WATER LINE TO REMAIN

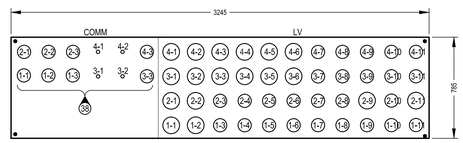
(37) EXISTING SEWER LINE TO REMAIN.

(38) DUCT BANK CONDUIT ORIENTATION CHANGES BETWEEN SSSR AND ENTRY INTO SERVICE TUNNEL. THIS WILL REQUIRE ROTATION OF COMMUNICATION CONDUITS DURING INSTALLATION OF DUCT BANK.

(39) PROVIDE CABLE SUPPORT, SPACERS, AND ASSOCIATED HARDWARE TO ALLOW FOR NEAT, EASY TO MAINTAIN ENTRY INTO DUCT BANK FROM EXISTING TUNNEL. PROVIDE CHANNEL STEEL SUPPORT STRUCTURE TO ALLOW FOR CABLE CO-ORDINATION AND CROSSING. CARE MUST BE TAKEN TO COMPLY WITH CABLE BENDING RADIUS AND SUPPORT DISTANCE REQUIREMENTS.



3 5108 SERVICE TUNNEL DUCT BANK ENTRY
SCALE 1:20



4 5108 SERVICE TUNNEL DUCT BANK ELEVATION
SCALE 1:20

CONDUIT AND CABLE SCHEDULE

CONDUIT ROUTE	CONDUIT ID	SIZE (mm)	TYPE	SYSTEM NOMINAL VOLTAGE	NEW CONDUCTORS	EXISTING CONDUCTORS	COMMENTS	
SSSR-SERVICE TUNNEL LV	1-1	129	LV	208V	REUSE EXISTING	4c#350kCM TECK	JM1 - 120/208V CIRCUIT	14
	1-2	129	LV	208V	REUSE EXISTING	4c#350kCM TECK	JM1 - 120/208V CIRCUIT	14
	1-3	103	LV	208V	3c#2/0 TECK	3c#1 MI CABLE	EXISTING DOCK SERVICES #1 CENTER	2
	1-4	103	LV	208V	3c#8 TECK	3c#10 MI CABLE	SOUTH WEST DOCK STAIR ROPELIGHT	3
	1-5	103	LV	120/208V	4c#350kCM	NEW SERVICE	120/208V, 400A DS2-W	12
	1-6	103	LV	480V	3c#4/0 TECK	3c#250kCM MI CABLE	EXISTING DOCK SERVICES #1 SOUTH WEST 1 OF 2	4
	1-7	103	LV	480V	3c#4/0 TECK	3c#250kCM MI CABLE	EXISTING DOCK SERVICES #1 CENTER 1 OF 2	5
	1-8	103	LV	480V	3c#4/0 TECK	3c#250kCM MI CABLE	EXISTING DOCK SERVICES #1 SOUTH EAST 1 OF 2	6
	1-9	103	LV	480V	3c#3/0	NEW SERVICE	480V, 400A DS2-W	7
	1-10	103	LV	480V	3c#3/0	NEW SERVICE	480V, 400A DS2-C	8
	1-11	103	LV	480V	3c#3/0	NEW SERVICE	480V, 400A DS2-C	8
	2-1	129	LV	208V	REUSE EXISTING	4c#350kCM TECK	JM2 - 120/208V CIRCUIT	19
	2-2	129	LV	208V	REUSE EXISTING	4c#350kCM TECK	JM2 - 120/208V CIRCUIT	19
	2-3	103	LV	208V	3c#2/0 TECK	3c#1 MI CABLE	EXISTING DOCK SERVICES #1 SOUTH EAST	10
	2-4	103	LV	208V	3c#3/0 TECK	3c#1/0 MI CABLE	EXISTING DOCK SERVICES #1 SOUTH WEST	11
	2-5	103	LV	120/208V	4c#350kCM	NEW SERVICE	120/208V, 400A DS2-C	13
	2-6	103	LV	480V	3c#4/0 TECK	3c#250kCM MI CABLE	EXISTING DOCK SERVICES #1 SOUTH WEST 2 OF 2	4
	2-7	103	LV	480V	3c#4/0 TECK	3c#250kCM MI CABLE	EXISTING DOCK SERVICES #1 CENTER 2 OF 2	5
	2-8	103	LV	480V	3c#4/0 TECK	3c#250kCM MI CABLE	EXISTING DOCK SERVICES #1 SOUTH EAST 2 OF 2	6
	2-9	129	LV	480V	3c#3/0	NEW SERVICE	480V, 400A DS2-W	7
	2-10	103	LV	480V	3c#3/0	NEW SERVICE	480V, 400A DS2-W	7
	2-11	129	LV	480V	3c#3/0	NEW SERVICE	480V, 400A DS2-C	8
	3-1	129	LV	430-630V	3c#500kCM TECK	NEW SERVICE	2000A REGULATED DOCK SERVICE, DS2-C	15
	3-2	129	LV	430-630V	3c#500kCM TECK	NEW SERVICE	2000A REGULATED DOCK SERVICE, DS2-C	
	3-3	129	LV	430-630V	3c#500kCM TECK	NEW SERVICE	2000A REGULATED DOCK SERVICE, DS2-C	
	3-4	129	LV	430-630V	3c#500kCM TECK	NEW SERVICE	2000A REGULATED DOCK SERVICE, DS2-C	
	3-5	129	LV	408V	REUSE EXISTING	3c#350kCM TECK	JM1 - 480V CIRCUIT	1
	3-6	129	LV	408V	REUSE EXISTING	3c#350kCM TECK	JM1 - 480V CIRCUIT	1
	3-7	103	LV	600V	REUSE EXISTING	3c#2/0 TECK	600V CAISSON CONNECTION	16
	3-8	103	LV	600V	3c#4/0	NEW SERVICE	600V, 400A DS2-W	17
	3-9	103	LV	600V	3c#4/0	NEW SERVICE	600V, 400A DS2-W	17
	3-10	103	LV	600V	FUTURE	NEW SERVICE	FUTURE HIGH MAST #1	18
	3-11	103	LV	N/A	FUTURE	NEW SERVICE	SPARE	18
	4-1	129	LV	430-630V	3c#500kCM TECK	NEW SERVICE	2000A REGULATED DOCK SERVICE, DS2-C	
	4-2	129	LV	430-630V	3c#500kCM TECK	NEW SERVICE	2000A REGULATED DOCK SERVICE, DS2-C	15
	4-3	129	LV	430-630V	3c#500kCM TECK	NEW SERVICE	2000A REGULATED DOCK SERVICE, DS2-C	
	4-4	129	LV	430-630V	3c#500kCM TECK	NEW SERVICE	2000A REGULATED DOCK SERVICE, DS2-C	
	4-5	129	LV	408V	REUSE EXISTING	3c#350kCM TECK	JM2 - 480V CIRCUIT	9
	4-6	129	LV	408V	REUSE EXISTING	3c#350kCM TECK	JM2 - 480V CIRCUIT	9
	4-7	103	LV	N/A	FUTURE	NEW SERVICE	SPARE	
	4-8	103	LV	N/A	FUTURE	NEW SERVICE	SPARE	
	4-9	103	LV	N/A	FUTURE	NEW SERVICE	SPARE	18
	4-10	103	LV	N/A	FUTURE	NEW SERVICE	SPARE	
	4-11	103	LV	N/A	FUTURE	NEW SERVICE	SPARE	
SSSR-SERVICE TUNNEL COMM.	1-1	103	COMM	N/A	4xCAT5e	NEW SERVICE	DS2-W DATA SERVICES	20
	1-2	103	COMM	N/A	16PR#22	NEW SERVICE	DS2-W COMM SERVICES	21
	1-3	103	COMM	N/A	FUTURE	NEW SERVICE	DS2-W FIBRE SERVICES	22
	2-1	103	COMM	N/A	4xCAT5e	NEW SERVICE	DS2-C DATA SERVICES	23
	2-2	103	COMM	N/A	16PR#22	NEW SERVICE	DS2-C COMM SERVICES	24
	2-3	103	COMM	N/A	FUTURE	NEW SERVICE	DS2-C FIBRE SERVICES	25
	3-1	27	COMM	N/A	2x2c#12	NEW SERVICE	DS2-W F/A SERVICES	26
	3-2	27	COMM	N/A	2x2c#12	NEW SERVICE	DS2-W EMERGENCY SERVICES	27
	3-3	103	COMM	N/A	SPARE	NEW SERVICE	FUTURE (FIBRE ONLY)	28
	4-1	27	COMM	N/A	2x2c#12	NEW SERVICE	DS2-C F/A SERVICES	29
	4-2	27	COMM	N/A	2x2c#12	NEW SERVICE	DS2-C EMERGENCY SERVICES	30
	4-3	103	COMM	N/A	SPARE	NEW SERVICE	FUTURE (FIBRE ONLY)	28

0 400 800 1200 1600mm
1:20

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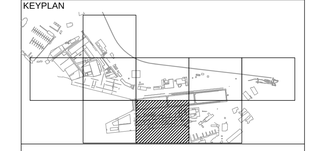

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3	ISSUED FOR 66% DESIGN REVIEW	15/11/25
2	ISSUED FOR 33% DESIGN REVIEW	15/10/28
1	ISSUED FOR DESIGN DEVELOPMENT	15/09/11
0		
Revision/ Revision	Description/Description	Date/Date

Client/client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet
825 ADMIRALS ROAD VICTORIA BC ESQUIMALT GRAVING DOCK ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

Designed by/Concept par
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Drawn by/Dessine par
J. BIELING / S. SEYMOUR

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Jamie LeBlanc

PWGSC, Regional Manager, Architectural and Engineering Services/ Gestionnaire régionale, Services d'architectural et de génie, TPSGC
Preetipal Paul

Drawing title/Titre du dessin

DOCK SERVICE TUNNEL CABLE AND CONDUIT WORK

Project No./No. du projet	Sheet/Feuille	Revision no./ Le Révision no.
R.062548.2	5108	5

Plot Date: February 5, 2016 2:54 PM
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Plotted by: Jacob Bieling

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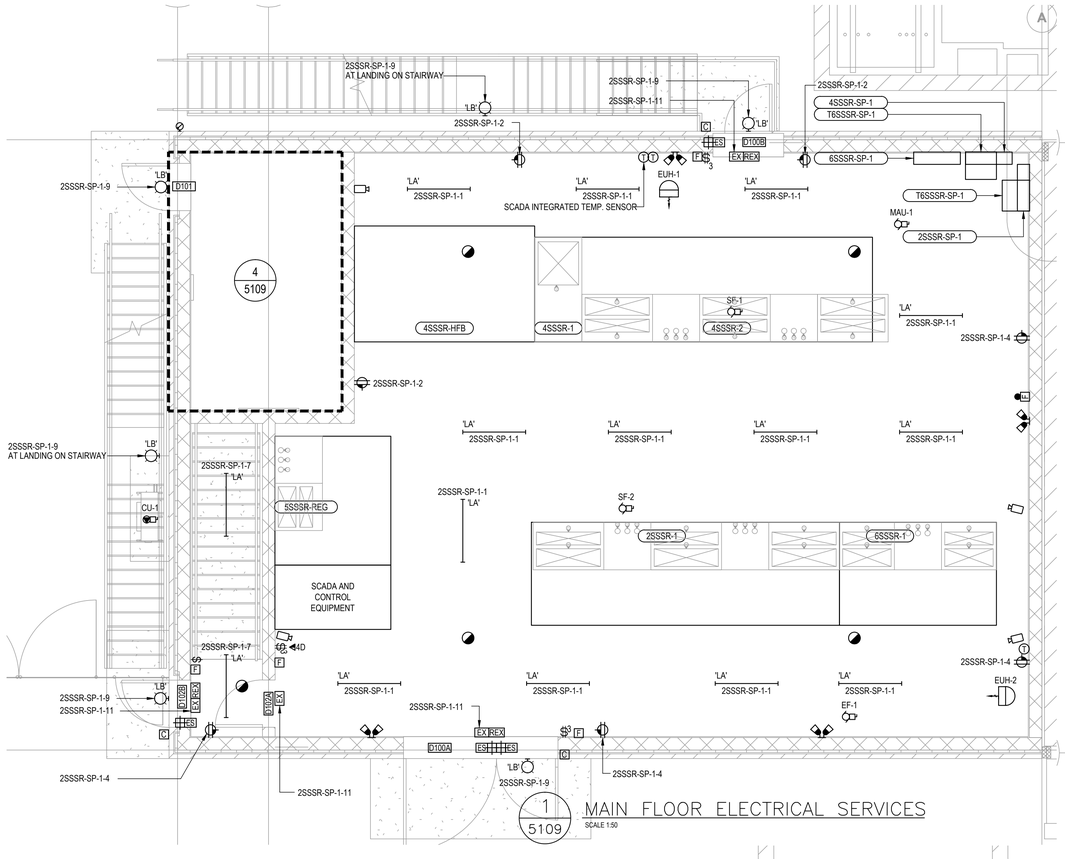

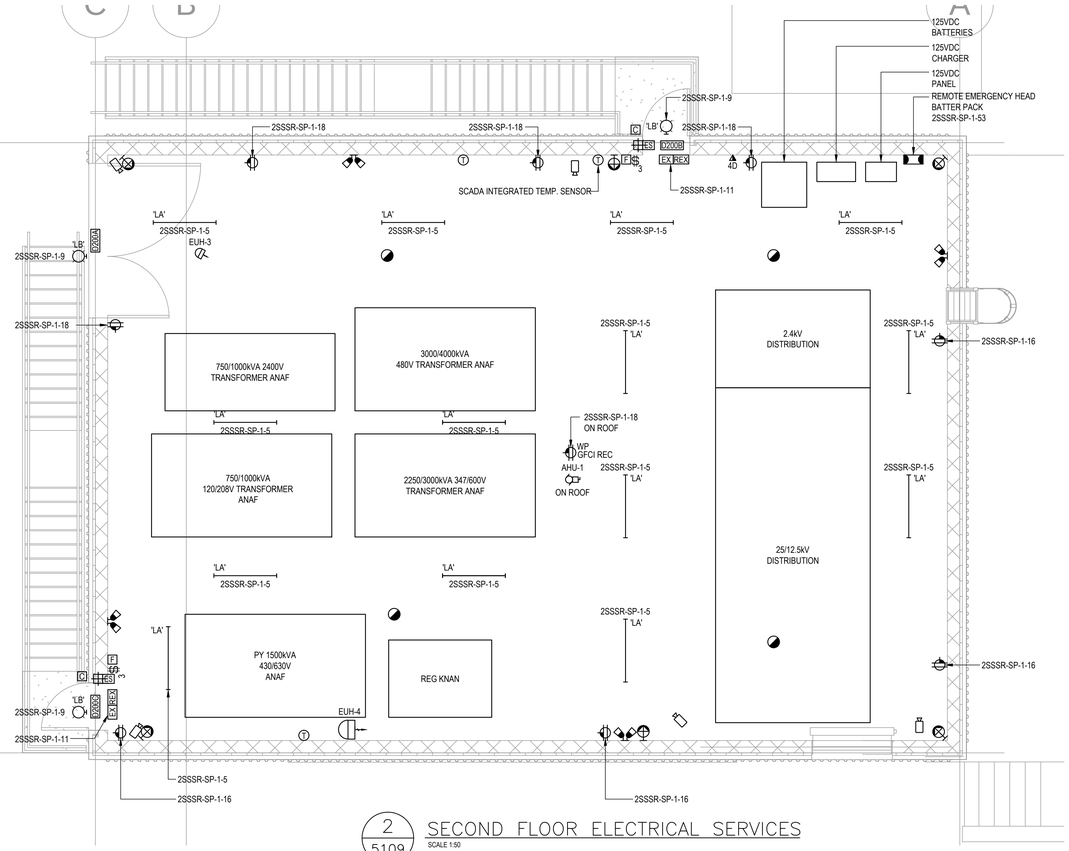

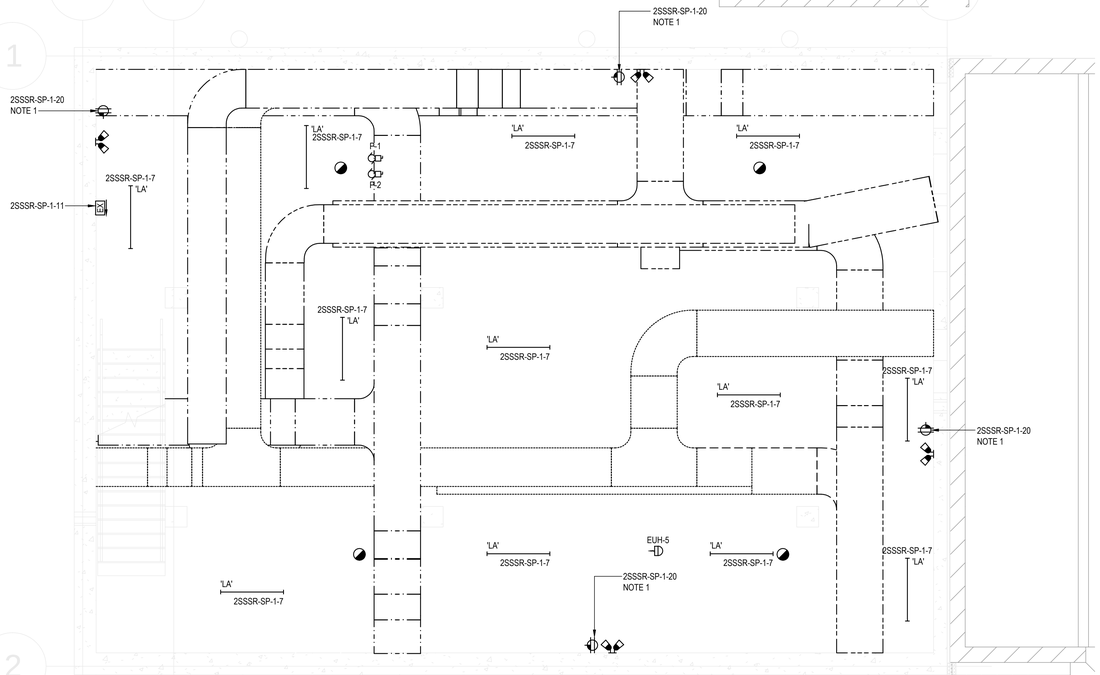

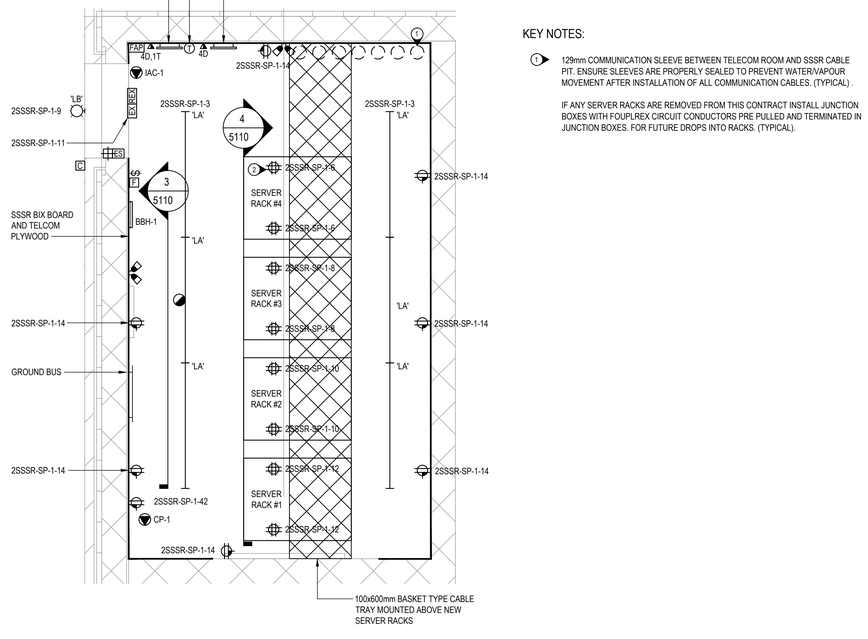

GENERAL PHASING NOTES

1. MOUNT RECEPTACLE 600mm A.F.F.

KEY NOTES:

1. 129mm COMMUNICATION SLEEVE BETWEEN TELECOM ROOM AND SSSR CABLE PIT. ENSURE SLEEVES ARE PROPERLY SEALED TO PREVENT WATER/VAPOUR MOVEMENT AFTER INSTALLATION OF ALL COMMUNICATION CABLES. (TYPICAL) .

   IF ANY SERVER RACKS ARE REMOVED FROM THIS CONTRACT INSTALL JUNCTION BOXES WITH FOUPLREX CIRCUIT CONDUCTORS PRE PULLED AND TERMINATED IN JUNCTION BOXES. FOR FUTURE DROPS INTO RACKS. (TYPICAL).

0 500 1000 1500 2000mm — 1:25
0 1 2 3 4m — 1:50

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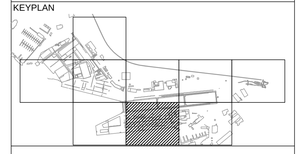

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1	ISSUED FOR DESIGN DEVELOPMENT	15/09/11
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Client/client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet

825 ADMIRALS ROAD VICTORIA BC
ESQUIMALT GRAVING DOCK
ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

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Preetipal Paul

Drawing title/Titre du dessin

SSSR
ELECTRICAL SERVICES

Project No./No. du projet	Sheet/Feuille	Revision no./ Le Révision no.
R.062548.2	**5109**	**5**

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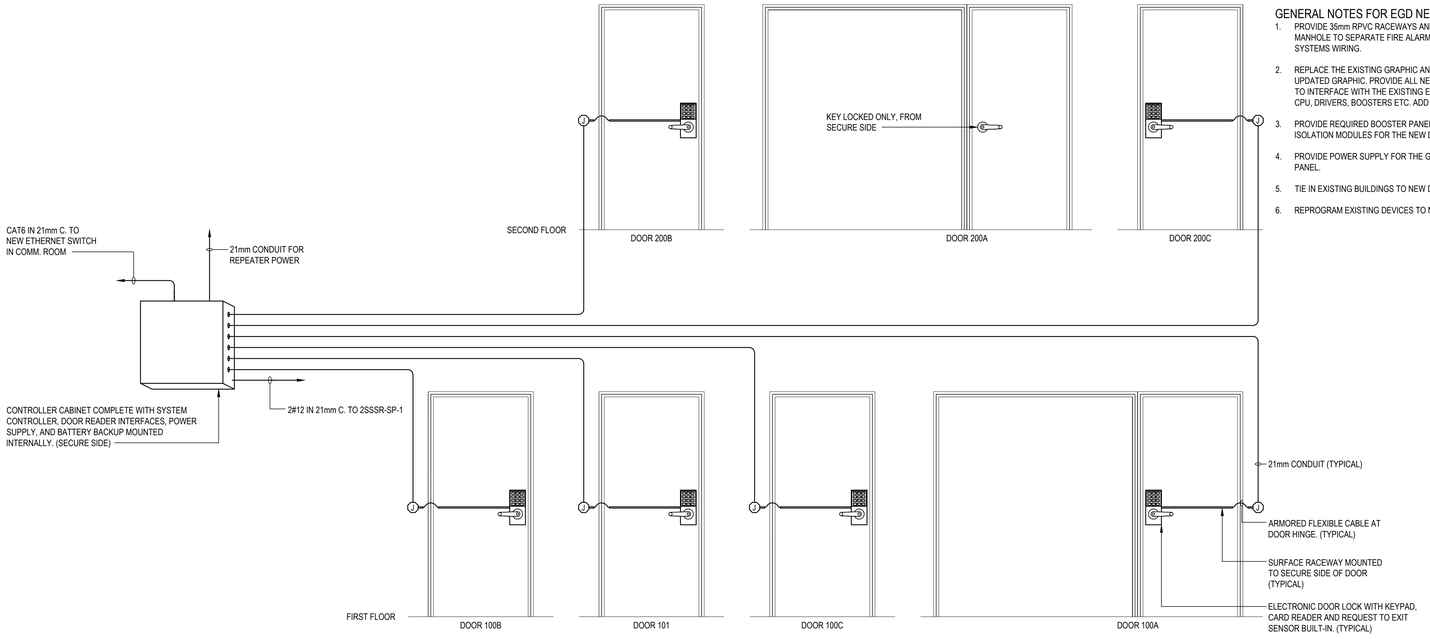
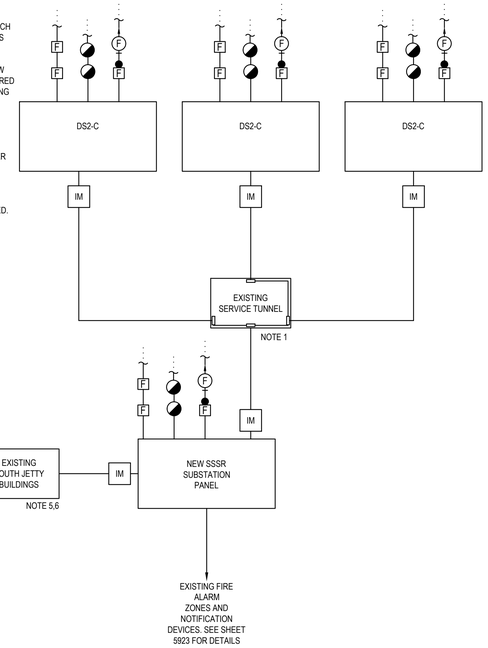


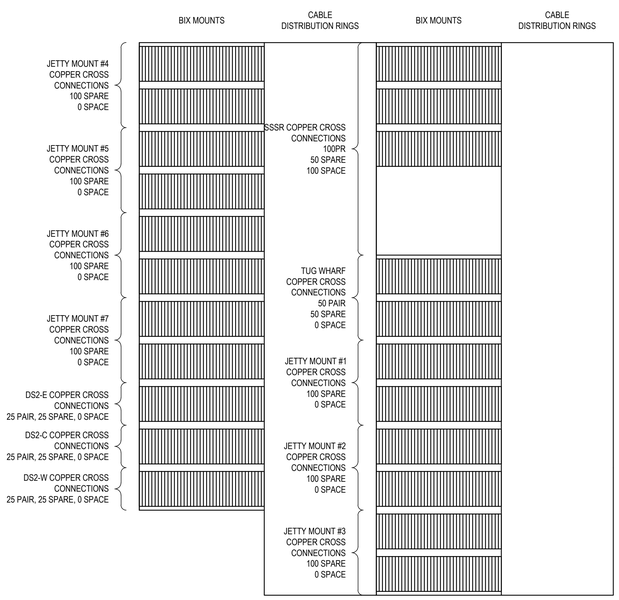
1 / 5110 SSSR ACCESS CONTROL SYSTEM
NTS

GENERAL NOTES FOR EGD NEW FIRE ALARM SYSTEM:

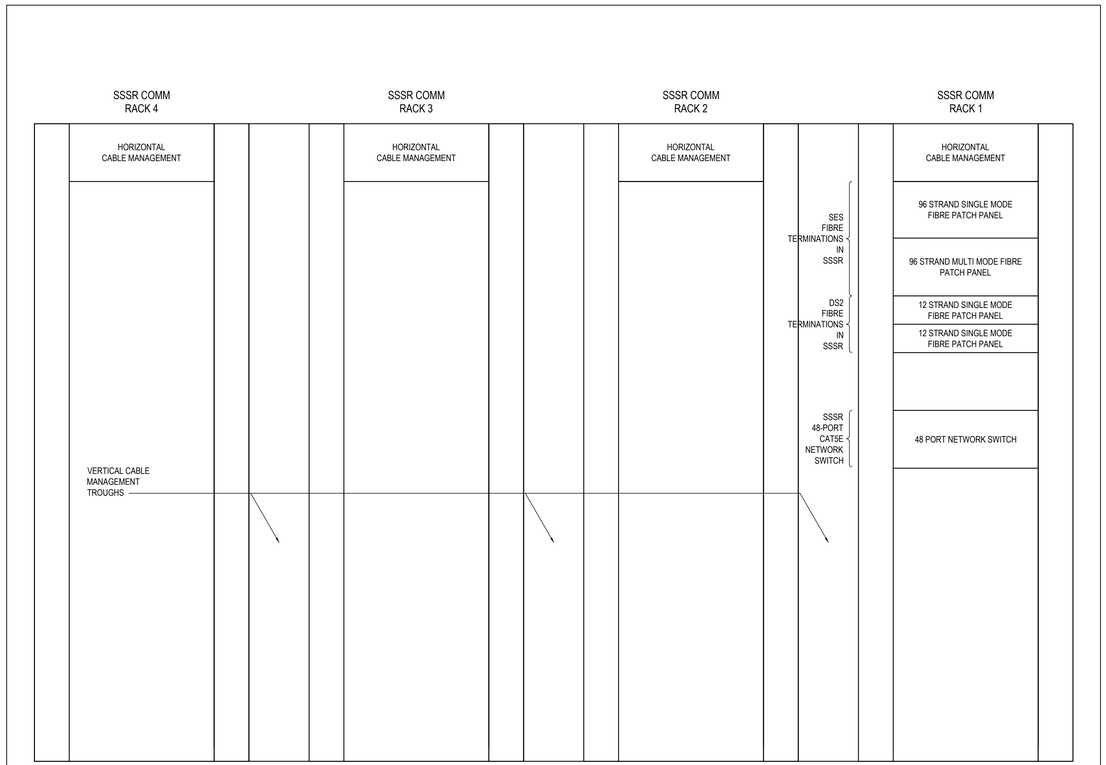
1. PROVIDE 35mm RPVC RACEWAYS AND 250x250x150RPVC PULL BOXES IN EACH MANHOLE TO SEPARATE FIRE ALARM SYSTEM WIRING FROM OTHER COMMS SYSTEMS WIRING.
2. REPLACE THE EXISTING GRAPHIC ANNUNCIATOR AT MAIN GATE WITH A NEW UPDATED GRAPHIC. PROVIDE ALL NEW DRIVERS AND COMPONENTS REQUIRED TO INTERFACE WITH THE EXISTING EDWARDS EST 3 PANEL. RE-USE EXISTING CPU, DRIVERS, BOOSTERS ETC. ADD ADDITIONAL LEDs AS REQUIRED.
3. PROVIDE REQUIRED BOOSTER PANELS FOR NOTIFICATION DEVICES AND ISOLATION MODULES FOR THE NEW DATA LOOP.
4. PROVIDE POWER SUPPLY FOR THE GRAPHIC ANNUNCIATOR FROM BOOSTER PANEL.
5. TIE IN EXISTING BUILDINGS TO NEW DATA LOOP.
6. REPROGRAM EXISTING DEVICES TO NEW ADDRESSABLE LOOP AS REQUIRED.



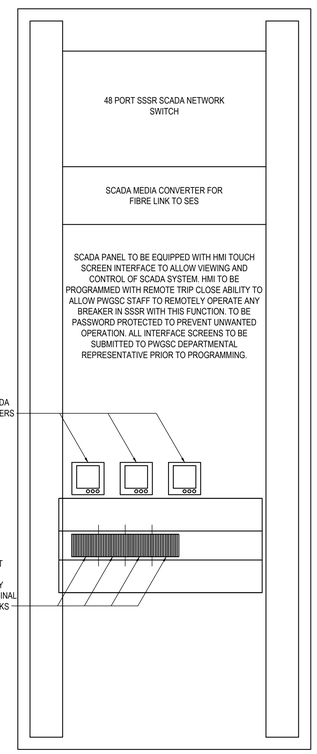
2 / 5110 SSSR NEW FIRE ALARM SYSTEM
NTS



3 / 5110 SSSR BIX BOARD ELEVATION
NTS



4 / 5110 SSSR DATA RACK ELEVATION
NTS



5 / 5110 SSSR SCADA PANEL ELEVATION
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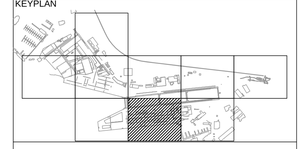

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1	ISSUED FOR DESIGN DEVELOPMENT	15/09/11
0		

Client/client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet
825 ADMIRALS ROAD VICTORIA BC
ESQUIMALT GRAVING DOCK
ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

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Preetipal Paul

Drawing title/Titre du dessin

SECURITY, COMMUNICATIONS AND SCADA SYSTEM DETAILS

Project No./No. du projet	Sheet/Feuille	Revision no./ Le Révision no.
R.062548.2	5110	5

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SOUTH SIDE SUBSTATION REPLACEMENT MECHANICAL EQUIPMENT SCHEDULE

#	DESCRIPTION	EQUIPMENT LOCATION	LOAD			VOLTS	PHASE	UNIT			STARTER			DISC.			CONTROL					SUPPLY PANEL		BREAKER		WIRE & CONDUIT			TOTAL AMPS	NOTE
			MCA	KW	HP			SUPPLY	MOUNT	CONNECT	SUPPLY	MOUNT	CONNECT	TYPE	SUPPLY	MOUNT	CONNECT	SUPPLY	MOUNT	CONNECT	TYPE	FIRE ALARM	PANEL #	PANEL LOCATION	AMPS	P	CCT NO'S	WIRE SIZE	NO.	CONDUIT SIZE (mm)		
IAC-1	INDOOR EVAPORATOR	SSSR COMM. ROOM	-	-	FRAC	208	1	M	M	E	M	M	M	-	E	E	E	M	M	M	INT	-	2SSSR-SP-1	SSSR MAIN FLOOR	40	1	1,3	8	4	21	-	1,5
CU-1	CONDENSING UNIT	SSSR WEST EXTEROIR	-	-	-	208	1	M	M	E	M	M	M	-	E	E	E	M	M	M	INT	-	2SSSR-SP-1	SSSR MAIN FLOOR								
CP-1	CONDENSATE PUMP	SSSR COMM. ROOM	-	-	FRAC	120	1	M	M	E	M	M	M	-	E	E	E	M	M	M	INT	-	2SSSR-SP-1	SSSR MAIN FLOOR	15	1	42	12	3	21	2.2	2
SF-1	SUPPLY FAN	SSSR MAIN FLOOR	-	-	5	600	3	M	M	E	M	M	M	MOT	E	E	E	M	M	M	INT	-	6SSSR-SP-1	SSSR MAIN FLOOR	15	3	22,24,26	12	12	21	6.1	-
SF-2	SUPPLY FAN	SSSR MAIN FLOOR	-	-	FRAC	120	1	M	M	E	M	M	M	HOA	E	E	E	M	M	M	INT	-	2SSSR-SP-1	SSSR MAIN FLOOR	15	1	44	10	3	21	2.2	4
AHU-1	AIR HANDLING UNIT	SSSR ROOF	-	-	25	600	3	M	M	E	M	M	M	VFD	E	E	E	M	M	M	INT	-	6SSSR-SP-1	SSSR MAIN FLOOR	70	3	28,30,32	4	4	35	35	2,3
EHU-1	ELECTRIC UNIT HEATER	SSSR MAIN FLOOR	-	5.0	-	600	1	M	M	E	M	M	M	TSTAT	E	E	E	M	M	M	INT	-	6SSSR-SP-1	SSSR MAIN FLOOR	30	3	34,36,38	10	3	21	8.3	-
EHU-2	ELECTRIC UNIT HEATER	SSSR MAIN FLOOR	-	5.0	-	600	1	M	M	E	M	M	M	TSTAT	E	E	E	M	M	M	INT	-	6SSSR-SP-1	SSSR MAIN FLOOR	30	3	40,42,44	10	3	21	8.3	-
EHU-3	ELECTRIC UNIT HEATER	SSSR SECOND FLOOR	-	5.0	-	600	1	M	M	E	M	M	M	TSTAT	E	E	E	M	M	M	INT	-	6SSSR-SP-1	SSSR MAIN FLOOR	30	3	46,48,50	10	3	21	8.3	-
EHU-4	ELECTRIC UNIT HEATER	SSSR SECOND FLOOR	-	5.0	-	600	1	M	M	E	M	M	M	TSTAT	E	E	E	M	M	M	INT	-	6SSSR-SP-1	SSSR MAIN FLOOR	30	3	52,54,56	10	3	21	8.3	-
BBH-1	BASEBOARD HEATER	SSSR COMM. ROOM	-	1	-	120	1	M	M	E	M	M	M	TSTAT	E	E	E	M	M	M	INT	-	2SSSR-SP-1	SSSR MAIN FLOOR	15	1	25	12	3	21	8.3	5
CTRL-1	CONTROL PANEL	SSSR COMM. ROOM	-	-	-	120	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2SSSR-SP-1	SSSR MAIN FLOOR	15	1	27	12	3	21	2.2	2
TP	ELEC TRAP PRIMER	SSSR CABLE PIT	-	-	FRAC	120	1	M	M	E	M	M	M	TIMER	E	E	E	M	M	M	INT		2SSSR-SP-1	SSSR MAIN FLOOR	15	1	29	12	3	21	2.2	-
P-1	SUMP PUMP	SSSR CABLE PIT	-	-	.5	208	3	M	M	E	M	M	M	FLOW	E	E	E	M	M	M	INT	-	2SSSR-SP-1	SSSR MAIN FLOOR	15	3	39,41,43	10	4	21	2.4	-
P-2	SUMP PUMP	SSSR CABLE PIT	-	-	.5	208	3	M	M	E	M	M	M	FLOW	E	E	E	M	M	M	INT	-	2SSSR-SP-1	SSSR MAIN FLOOR	15	3	45,47,49	10	4	21	2.4	-
MAU-1	MAKE UP AIR UNIT	SSSR MAIN FLOOR	-	20	-	600	3	M	M	E	E	E	E	VFD	E	E	E	M	M	M	INT	-	6SSSR-SP-1	SSSR MAIN FLOOR	25	3	31,33,35	10	4	21	19.3	-

E DENOTES BY ELECTRICAL CONTRACTOR
T = THERMOSTAT
HOA = MAGNETIC STARTER WITH HAND-OFF-AUTO SELECTOR
SW = H.P. RATED SWITCH
DDC = DIRECT DIGITAL CONTROL
INT = DEVICE IS INTEGRAL TO EQUIPMENT SUPPLIED BY MECHNICAL CONTRACTOR
FLOW = FLOW SWITCH
MOT = MOTION DETECTOR

NOTES
1. DIVISION 26 TO PROVIDE WEATHERPROOF DISCONNECT SWITCH AND SINGLE POINT POWER CONNECT AT OUTDOOR UNIT. PROVIDE LINE VOLTAGE POWER WIRING BETWEEN INDOOR AND OUTDOOR UNITS.
2. DIVISION 26 TO PROVIDE DEDICATED ELECTRICAL RECEPTACLE ADJACENT TO DEVICE.
3. PROVIDE SEPARATE 120V CCT FOR CONTROLS
4. MOTION SENSOR CONTROLLED
5. INTERLOCK TO PREVENT SIMULTANEOUS OPERATION

CONFIRM ALL BREAKER SIZES WITH MECHANICAL SHOP DRAWINGS AND REVISE BREAKER SIZES AS NEEDED AT NO ADDITIONAL COST.

PANELBOARD SCHEDULE

JOB NO./NAME : EGD SOUTH SUBSTATION SWITCHGEAR REPLACEMENT
PANEL : 2SSSR-SP-1
SYSTEM : 120/208V 3Ø 4W
TYPE : CDP
LOCATION : SOUTH SIDE SUBSTATION REPLACEMENT
MOUNTING : SURFACE
NO. CIRCUITS : 60
BUS SIZE : 600A
SYM. FAULT RATING : 22kAIC

DESCRIPTION	BRK	POLE	CCT	CCT	POLE	BRK	DESCRIPTION
SSSR MAIN FLOOR LTS	15	1	01	02	1	20	SSSR MAIN FLOOR REC.
SSSR COMM ROOM LTS	15	1	03	04	1	20	SSSR MAIN FLOOR REC.
SSSR 2ND FLOOR LTS	15	1	05	06	1	20	SSSR COMM. REC. #1
SSSR CABLE PIT LTS	15	1	07	08	1	20	SSSR COMM. REC. #2
SSSR OUTDOOR LTS	15	1	09	10	1	20	SSSR COMM. REC. #3
SSSR EXIT LTS	15	1	11	12	1	20	SSSR COMM. REC. #4
SSSR LOCKS/OPEN	15	1	13	14	1	20	SSSR COMM. REC. #5
SSSR MOTOR DAMPERS	20	1	15	16	1	20	SSSR 2ND FL. REC.
SW DRYDOK STAIRS	15	1	17	18	1	20	SSSR 2ND FL. REC.
SE DRYDOK STAIRS	15	1	19	20	1	20	SSSR CABLE PIT REC.
IAC-1/CU-1	40	2	21	22	3	40	TUG #1
			23	24			
BBH-1	15	1	25	26			
MEQ. CONTROL PANEL	15	1	27	28	3	40	TUG #2
SPARE	15	1	29	30			
TP	15	1	31	32			
AHU-1 CONTROLS	15	1	33	34	2	20	TUG REC.
SECURITY ALARM PANEL	15	1	35	36			
FIRE ALARM PANEL	15	1	37	38	2	15	TUG REC.
P-1	15	3	39	40			
			41	42	1	15	CTRL-1
			43	44	1	15	SF-2
P-2	15	3	45	46	2	70	PANEL '2SL'
			47	48			
			49	50	3	100	PANEL '2K'
SSSR DDC SYSTEM	30	1	51	52			
SSSR BATTERY PACK	15	1	53	54			
SPARE	15	1	55	56	3	150	PANEL '2SM'
SPARE	15	1	57	58			
SPARE	15	1	59	60			

PANELBOARD SCHEDULE

JOB NO./NAME : EGD SOUTH SUBSTATION SWITCHGEAR REPLACEMENT
PANEL : 6SSSR-SP-1
SYSTEM : 480Y 3Ø 3W
TYPE : CDP
LOCATION : SOUTH SIDE SUBSTATION REPLACEMENT
MOUNTING : SURFACE
NO. CIRCUITS : 60
BUS SIZE : 400A
SYM. FAULT RATING : 22kAIC

DESCRIPTION	BRK	POLE	CCT	CCT	POLE	BRK	DESCRIPTION
SEWAGE PUMP	100	3	01	02	3	20	SPARE
			03	04			
			05	06			
SPARE	15	3	07	08	3	20	SPARE
			09	10			
			11	12			
SPARE	15	3	13	14	3	20	SPARE
			15	16			
			17	18			
SPARE	15	3	19	20	3	20	SPARE
			21	22			
			23	24			
SPARE	15	3	25	26	3	20	SPARE
			27	28			
			29	30			
SPARE	15	3	31	32	3	20	SPARE
			33	34			
			35	36			
			37	38			
			39	40			
			41	42			
			43	44			
			45	46			
			47	48			
			49	50			
			51	52			
			53	54			
			55	56			
			57	58			
			59	60			

PANELBOARD SCHEDULE

JOB NO./NAME : EGD SOUTH SUBSTATION SWITCHGEAR REPLACEMENT
PANEL : 6SSSR-SP-1
SYSTEM : 347/600V 3Ø 4W
TYPE : CDP
LOCATION : SOUTH SIDE SUBSTATION REPLACEMENT
MOUNTING : SURFACE
NO. CIRCUITS : 60
BUS SIZE : 400A
SYM. FAULT RATING : 22kAIC

DESCRIPTION	BRK	POLE	CCT	CCT	POLE	BRK	DESCRIPTION
4SSSR-SP-1 XFMR	200	3	01	02	3	150	2SSSR-SP-1 XFMR
			03	04			
			05	06			
CAISSONS 2, 3	175	3	07	08	1	15	JETTY EAST CAT. PRO.
			09	10	1	15	JETTY WEST CAT. PRO.
			11	12	3	100	SSSR HIGH MAST LIGHTING CONTROLLER
CAISSON 1	175	3	13	14			
			15	16			
			17	18	2	30	125VDC STATION
LIFT STATION C.P.	15	3	19	20			
			21	22	3	15	SF-1
			23	24			
LIFT STATION C.P.	15	3	25	26			
			27	28	3	70	AHU-1
			29	30			
MAU-1	25	3	31	32			
			33	34	3	15	EUH-1
			35	36			
SPARE	15	3	37	38			
			39	40	3	15	EUH-2
			41	42			
SPARE	15	3	43	44			
			45	46	3	15	EUH-3
			47	48			
SPARE	20	3	49	50			
			51	52	3	15	EUH-4
			53	54			
SPARE	20	3	55	56			
			57	58	1	15	SPARE
			59	60	1	15	SPARE

LUMINAIRE SCHEDULE
(ALL NEW FIXTURES TO BE 120V/240V)

TYPE	EXAMPLE REPLACEMENT FIXTURE PICTURES	REPLACEMENT FIXTURE PERFORMANCE REQUIREMENTS
LA		3000 LUMEN, 3500K, 80CRI LED SUSPENDED 4' STRIP LIGHT C/W DIFFUSER LENS. L70 AT MINIMUM 100,0000 HOURS.
LB		4500 LUMEN, 3500K, 70CRI LED DIE CAST ALUMINUM IP66 BUILDING MOUNTED FIXTURE WITH IES TYPE III DISTRIBUTION. CORROSION RESISTANT HOUSING WITH MOLDED ACRYLIC LENS. L80 AT MINIMUM 100,0000 HOURS. SUITABLE FOR OPERATION AT -20°C. DARK SKY RATED
LC		3000 LUMEN, 3500K, 80CRI LED KIOSK MOUNTED 4' STRIP LIGHT C/W DIFFUSER LENS. L70 AT MINIMUM 100,0000 HOURS.
LD		1500 LUMEN, 3500K, 80CRI LED KIOSK MOUNTED 2' STRIP LIGHT C/W DIFFUSER LENS. L70 AT MINIMUM 100,0000 HOURS.
LE		1200 LUMEN/METER, 3000K, 70CRI IP 66 RATED STRIP LIGHT FOR DOCK SERVICE ASSEMBLIES. L70 AT MINIMUM 100,0000 HOURS.

ALL FIXTURES TO HAVE MINIMUM 10 YEAR WARRANATY

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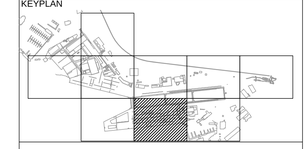

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3	ISSUED FOR 66% DESIGN REVIEW	15/11/25
2	ISSUED FOR 33% DESIGN REVIEW	15/10/28
1	ISSUED FOR DESIGN DEVELOPMENT	15/09/11
0		

Client/client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet
825 ADMIRALS ROAD VICTORIA BC ESQUIMALT GRAVING DOCK ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

Designed by/Concept par
I. BARNES

Drawn by/Dessine par
J. BIELING / S. SEYMOUR

PWGSC Project Manager/Administrateur de Projets TPSGC
Jamie LeBlanc

PWGSC, Regional Manager, Architectural and Engineering Services/ Gestionnaire régionale, Services d'architectural et de génie, TPSGC
Preetipal Paul

Drawing title/Titre du dessin

EQUIPMENT, LUMINAIRE AND PANEL SCHEDULES

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.062548.2	5111	5

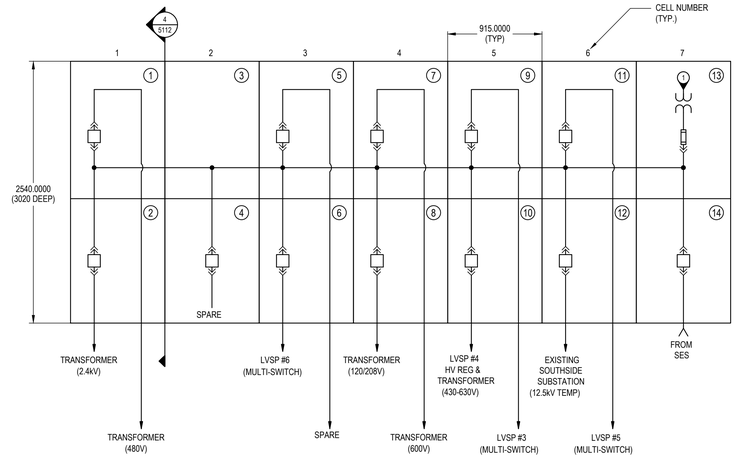
Plot Date: February 5, 2016 1:53 PM Plotted by: Jacob Bieling
File Name: N:\PROJECTS\R.062548.2 - ESQUIMALT GRAVING DOCK\11 - DESIGN\ELECTRICAL\DWG\5111 - EQUIPMENT, LUMINAIRE AND PANEL SCHEDULES.DWG

PWGSC – B1 – 1000X707

SSSR SWITCHGEAR SCHEDULE

VOLTAGE		CELL NO.		EQ.	DESCRIPTION OF USE	RELAY	METER	NAMEPLATE	
RATED	USED							ENGRAVING	SIZE
25KV	12.5KV	1	TOP	VCB	3000/4000kVA TRANSFORMER (480V)	MFP	DMS 2		250mmX 70mm
			BOT	VCB	750/1000kVA TRANSFORMER (2.4kV)	MFP	DMS 2		
		2	TOP	-	SPACE				
			BOT	VCB	SPARE				
		3	TOP	VCB	SPARE				
			BOT	VCB	LVSP #6: (MULTI-SWITCH)		DMS 2		
		4	TOP	VCB	2250/3000kVA TRANSFORMER (600V)	MFP	DMS 2		
			BOT	VCB	750/1000kVA TRANSFORMER (120/208V)	MFP	DMS 2		
		5	TOP	VCB	LVSP #3: (MULTI-SWITCH)		DMS 2		
			BOT	VCB	LVSP #4: HV REG & 1000/1500kVA XFMR (450-630V SHIP POWER)	MFP	DMS 2		
		6	TOP	VCB	LVSP #5: (MULTI-SWITCH)		DMS 2		
			BOT	VCB	EXISTING SOUTHSIDE SUB (TEMP 12.5KV)	MFP			
		7	TOP	VT	BUS VOLTAGE				
				CT	BUS LOAD				
			BOT	VCB	FROM SES	MFP	DMS 2		
5KV	2.4KV	1	TOP	VT	FUSED VTS				
			BOT	CT	BUS LOAD	MFP	DMS 2		
				VCB	FROM 750/1000kVA TRANSFORMER (2.4kV)				
		2	TOP	VCB	SPARE				
			BOT	VCB	30 T CRANE	MFP	DMS 2		

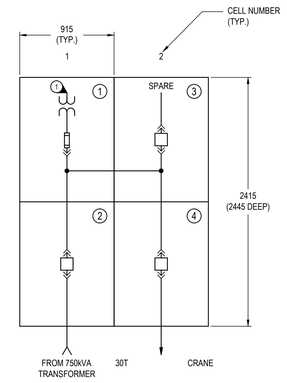
1 / 5112 SWITCHGEAR SCHEDULE
N.T.S.



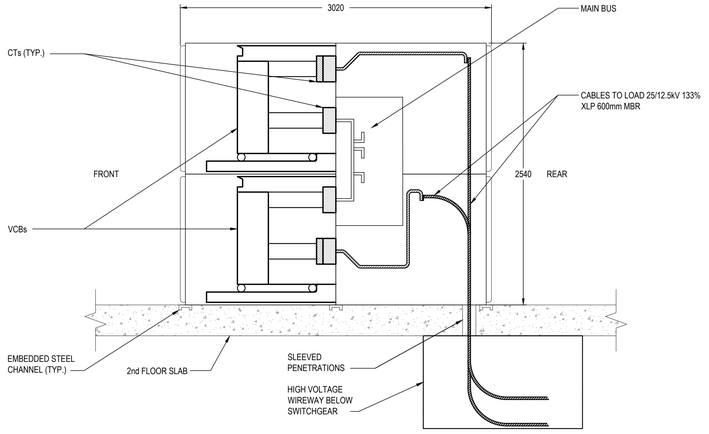
2 / 5112 25/12.5kV METAL CLAD SWITCHGEAR ELEVATION
SCALE 1:25

GENERAL NOTES:
1. REFER TO DRAWING 5010 FOR SINGLE LINE DIAGRAM.

KEYNOTES:
(1) POTENTIAL TRANSFORMER PRIMARY TO MATCH AVAILABLE VOLTAGE. SECONDARY VOLTAGE (120VAC) IS COMMON TO ALL METERING IN RESPECTIVE CELLS



3 / 5112 5kV METAL CLAD SWITCHGEAR ELEVATION
SCALE 1:25



4 / 5112 CUT SECTION ELEVATION
SCALE 1:25

0 500 1000 1500 2000mm
1:25

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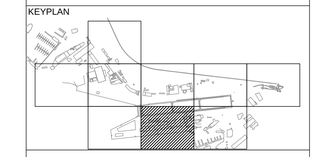

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2	ISSUED FOR 33% DESIGN REVIEW	15/10/28
1	ISSUED FOR DESIGN DEVELOPMENT	15/09/11
0		

Client/client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet
825 ADMIRALS ROAD VICTORIA BC
ESQUIMALT GRAVING DOCK
ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

Designed by/Concept par
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Jamie LeBlanc

PWGSC, Regional Manager, Architectural and Engineering Services/ Gestionnaire régionale, Services d'architectural et de génie, TPSGC
Preetipal Paul

Drawing title/Titre du dessin

HIGH VOLTAGE SWITCHGEAR DETAILS AND ELEVATIONS

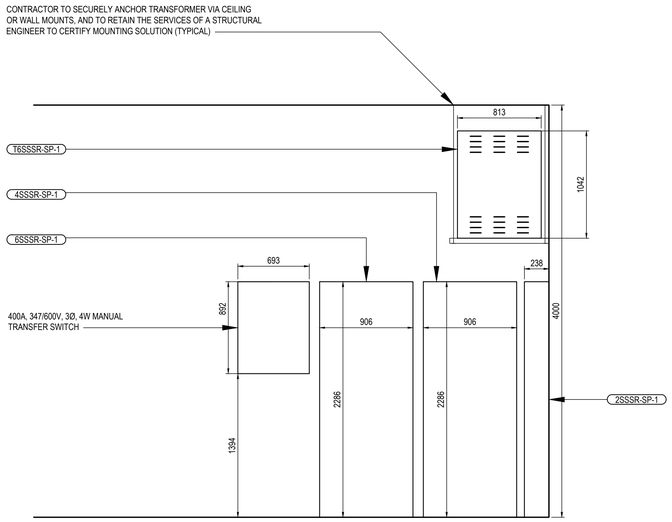
Project No./No. du projet	Sheet/Feuille	Revision no./ Le Révision no.
R.062548.2	5112	5

Plot Date: February 5, 2016 2:53 PM
File Name: K:\PROJECTS\2015\15-1491\DWG\SWGR\15-1491_SWGR_ELEVATIONS_AND_SECTIONS.DWG
Plotted by: Jacob Bibby

PWGSC – B1 – 1000X707

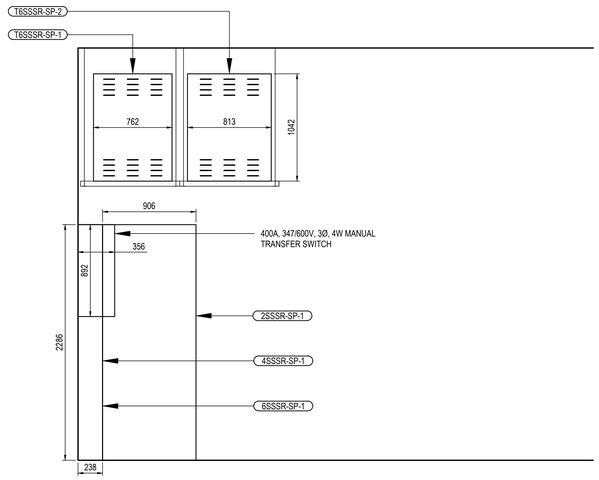
GENERAL NOTES:

1. REFER TO DRAWING 5011 FOR SINGLE LINE DIAGRAM.
2. DIMENSIONS ARE PRELIMINARY AND FOR ILLUSTRATIVE PURPOSES ONLY. CONFIRM ALL DIMENSIONS WITH MANUFACTURER SHOP DRAWINGS AND CONFIRM SPACE AND SEPARATION DISTANCES AND CORRECT AS REQUIRED AT NO ADDITIONAL COST.



1 / 5113 SSSR STANDBY POWER PANELS ELEVATION 1

1:25



2 / 5113 SSSR STANDBY POWER PANELS ELEVATION 2

1:25

0 500 1000 1500 2000mm

1:25

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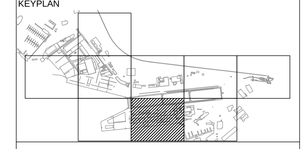

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Client/client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet

825 ADMIRALS ROAD VICTORIA BC
ESQUIMALT GRAVING DOCK
ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

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Jamie LeBlanc

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Preetipal Paul

Drawing title/Titre du dessin

LOW VOLTAGE STANDBY POWER PANELS DETAILS AND ELEVATIONS

Project No./No. du projet	Sheet/Feuille	Revision no./ Le Révision no.
R.062548.2	5113	5

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File Name: N:\PROJECTS\2013\X\-13-1165\DWGS\DWG\5113 SSR LV EQUIPT ELEVATIONS AND SECTIONS.DWG

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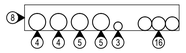
GENERAL PHASING NOTES AND PROPOSED SEQUENCE OF WORK

1. ALL OUTAGES ARE TO BE OF MINIMAL DISRUPTION TO THE DOCK OPERATIONS AND ARE TO BE DONE DURING OFF HOURS WHENEVER POSSIBLE.
2. WHEN TRANSITIONING FROM THE SSS TO THE SSSR, ALL REQUIRED SUPPORTING WORKS OR INFRASTRUCTURE MUST BE COMPLETED, TESTED AND OPERATIONAL IN ADVANCE OF THE SWITCHOVER.
3. AS CONSTRUCTION PROGRESS POWER SHALL NOT BE INTERRUPTED TO EXISTING OPERATIONS.

KEY NOTES:

1. EXISTING 350kW 600V 3Ø GENERATOR. DURING CONSTRUCTION OF NEW SSSR BUILDING THIS EXISTING STRUCTURE WILL REQUIRE FOUNDATION WORK, DEFUEL AND TEMPORARILY DECOMMISSION AND DISCONNECT EXISTING 350kW GENERATOR. PROVIDE TEMPORARY 50kW PORTABLE GENERATOR CONNECTED TO EXISTING AUTOMATIC TRANSFER SWITCH AND GENERATOR AUTO-START CONTACTOR. PROVIDE TEMPORARY BREAKER FOR GENERATOR PROTECTION AND CO-ORIDNATION. AFTER FOUNDATION WORK IS COMPLETE REFUEL, RECONNECT AND RECOMISSION EXISTING GENERATOR.
2. EXISTING PANEL '2SL', TO BE RECONNECTED TO NEW SSSR BUILDING.
3. NEW 4c#6 TECK IN NEW 53mm EMT CONDUIT FROM NEW CABLE TRAY TO EXISTING PANEL '2SL'
4. NEW 2x350kCM TECK FROM NEW CABLE TRAY TO EXISTING AUTOMATIC TRANSFER SWITCH, STANDBY POWER FROM GENERATOR TO 6SSSR-SP-1
5. NEW 2x350kCM TECK FROM NEW CABLE TRAY TO EXISTING AUTOMATIC TRANSFER SWITCH, NORMAL POWER FEED FROM PANEL 6SSSR.
6. EXISTING 600V, 600A 3Ø 4W TRANSFER SWITCH TO REMAIN. CONNECT NEW FEEDERS TO EXISTING TERMINAL LUGS AND TEST TRANSFER SWITCH AND GENERATOR OPERATION.
7. CREATE WINDOW IN EXISTING GENERATOR BUILDING BRICK WORK TO ALLOW FOR INSTALLATION OF NEW ANGLED LADDER TYPE CABLE TRAY. REFER TO CUT SECTION 2/5114 FOR CABLE AND CONDUIT LAYOUT IN CABLE TRAY. ENSURE WINDOW PENETRATION IS FILLED AND SEALED AFTER INSTALLATION OF CONDUITS AND CABLES.
8. NEW 600x100mm OUTDOOR RATED LATTER TYPE CABLE TRAY RUN BETWEEN EXISTING GENERATOR BUILDING AND NEW SSSR BUILDING. COORDINATE PENETRATION WITH NEW BUILDING TO ALLOW FOR ALL CONDUIT BENDING RADII AND TO AVOID NEW WALL MOUNTED EQUIPMENT, TRAY TO BE SUITABLE GROUNDED AND BONDED.
9. NEW CABLE TRAY WINDOW IN NEW SSSR BUILDING BRICK WORK TO ALLOW FOR INSTALLATION OF NEW ANGLED LADDER TYPE CABLE TRAY. REFER TO CUT SECTION 2/5114 FOR CABLE AND CONDUIT LAYOUT IN CABLE TRAY. ENSURE WINDOW PENETRATION IS FILLED AND SEALED AFTER INSTALLATION OF CONDUITS AND CABLES.
10. NEW 2x350kCM TECK FROM NEW CABLE TRAY TO NEW 600V MANUAL TRANSFER SWITCH. (SEE KEY NOTE 4 FOR OTHER END OF CONNECTION)
11. NEW 4c#6 TECK IN NEW 53mm EMT CONDUIT FROM NEW CABLE TRAY TO NEW PANEL 2SSSR-SP-1, FROM EXISTING PANEL '2SL' (SEE KEY NOTE 3 FOR OTHER END OF CONNECTION)
12. NOT USED
13. 2x4c#250kCM TECK IN NEW 2x129mm EMT CONDUIT MOUNTED TO CEILING. TO RUN IN FRONT OF HIGH VOLTAGE CABLE WIREWAY.
14. 2x4C#250KCM TECK TO ENTER NEW 6SSSR-1 SWITCHBOARD VIA SWITCHBOARD TOP ENTRY COMPARTMENT, COORDINATE OVERHEAD ENTRY DETAILS WITH SWITCHBOARD MANUFACTURER'S SHOP DRAWINGS.
15. EXISTING CABLE TRAY FROM EXISTING SSS BUILDING TO BE DECOMMISSIONED AND REMOVED. SEAL EXISTING WALL PENETRATIONS WITH CONCRETE GROUT.
16. 3x53mm EMT CONDUITS MOUNTED IN CABLE TRAY STUBBING OFF INSIDE SSSR AND GENERATOR BUILDINGS. TWO BE FIRE STOPPED AND LEFT EMPTY FOR FUTURE COMMUNICATION CABLES, 1 FOR NEW GENERATOR SCADA AND DIGITAL BREAKER CAT5E TO NEW SCADA CONTROL PANEL
17. 200A, 600V CAM-LOCK TEMPORARY GENERATOR CONNECTION BOX. REFER TO 2/5011 FOR ADDITIONAL INFORMATION. ENCLOSURE TO BE OF MARINE GRADE ALUMINUM AND OF CSA 3R RATED CONSTRUCTION.
18. 4c#3/0 Cu. AWG CABLE IN 53mm EMT CONDUIT CONCEALED WITHIN BUILDING FABRIC.
19. TEMPORARY GENERATOR CONNECTION TO NEW MANUAL TRANSFER SWITCH.
20. INSTALL NEW MAIN BREAKER ON GENERATOR, ATTACHED TO ALTERNATOR WITH MINIMUM LEAD LENGTHS POSSIBLE. PERFORM ARC FAULT ANALYSIS AND SELECT BREAKER TO ACHIEVE APPROPRIATE ARC FAULT CO-ORDINATION WITH DOWNSTREAM DEVICES. INSTALL M2 TYPE PROTECTION METER AT SAME LOCATION. REUSE EXISTING FEEDERS BETWEEN GENERATOR AND TRANSFER SWITCH.
21. 2xCAT5E IN 1x27mm CONDUIT CONCEALED IN NEW BUILDING WALL. FROM NEW SCADA SYSTEM PANEL TO JUNCTION BOX CONNECTING TO 1x53mm CABLE TRAY CONDUIT.



2 / 5114 SSSR–GENERATOR BUILDING CABLE TRAY
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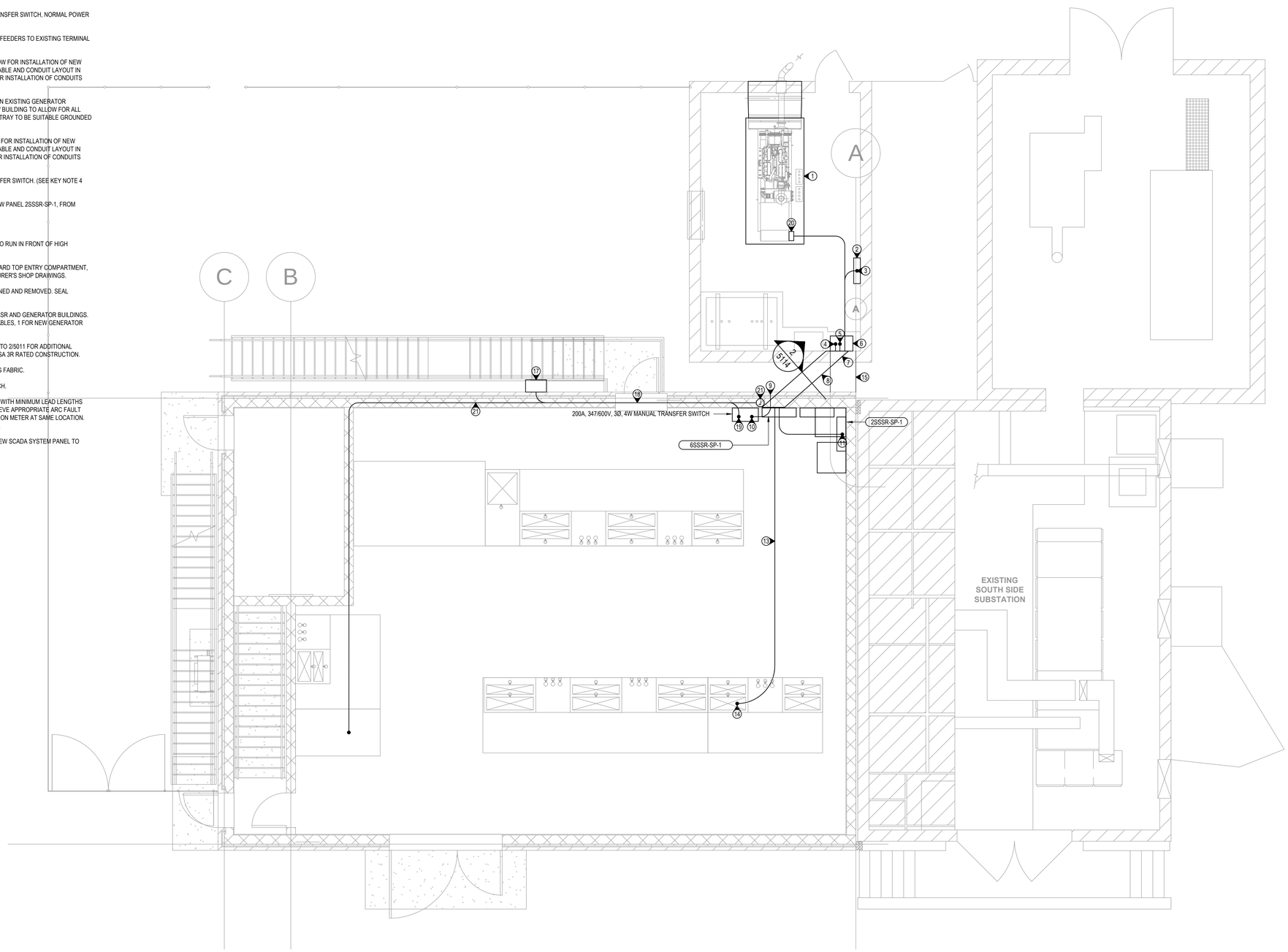

1 / 5114 MAIN FLOOR GENERATOR CONNECTION
SCALE 1:50

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Plot Date: January 28, 2016 11:38 AM Plotted by: Jacob Bieling
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PWGSC – B1 – 1000X707

Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Pacific Region
SERVICES IMMOBILIERS
Region de Pacifique

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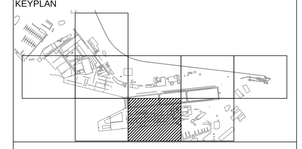
KEYPLAN



Revision/ Revision	Description/Description	Date/Date
5	ISSUED FOR TENDER	15/01/28
4	ISSUED FOR 99% DESIGN REVIEW	16/01/06
3	ISSUED FOR 66% DESIGN REVIEW	15/11/25
2	ISSUED FOR 33% DESIGN REVIEW	15/10/28
1	ISSUED FOR DESIGN DEVELOPMENT	15/09/11
0		

Client/client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet

825 ADMIRALS ROAD VICTORIA BC
ESQUIMALT GRAVING DOCK
ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

Designed by/Concept par
I. BARNES

Drawn by/Dessine par
J. BIELING / S. SEYMOUR

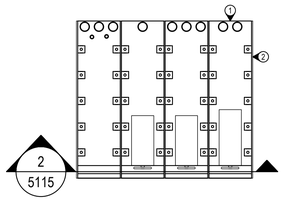
PWGSC Project Manager/Administrateur de Projets TPSGC
Jamie LeBlanc

PWGSC, Regional Manager, Architectural and Engineering Services/ Gestionnaire régionale, Services d'architectural et de génie, TPSGC
Preetipal Paul

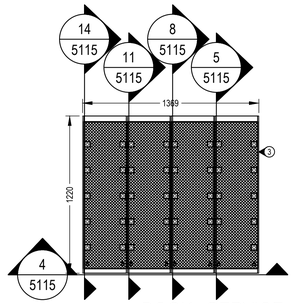
Drawing title/Titre du dessin

GENERATOR RECONNECTION

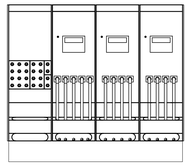
Project No./No. du projet	Sheet/Feuille	Revision no./ Le Révision no.
R.062548.2	5114	5



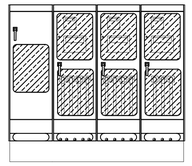
1 5115 DOCK SERVICE ASSEMBLY COVER OFF PLAN
SCALE 1:20



2 5115 DOCK SERVICE ASSEMBLY EXTERIOR PLAN
SCALE 1:20



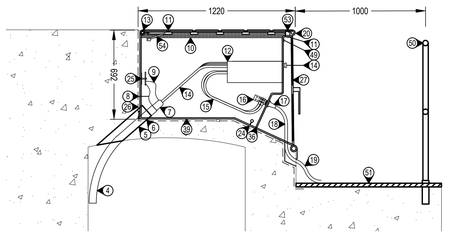
3 5115 DOCK SERVICE ASSEMBLY COVER OFF ELEVATION
SCALE 1:20



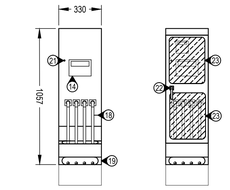
4 5115 DOCK SERVICE ASSEMBLY EXTERIOR ELEVATION
SCALE 1:20

KEYNOTES

1. DOCK SERVICE ASSEMBLY, TO BE MADE OF WELDED STAINLESS STEEL AND OF NEMA 4X RATED CONSTRUCTION, MINIMUM 12.5mm THICK STEEL FOR OUTER COMPARTMENT WALLS. EACH CELL TO BE A SEPARATE ELECTRICAL ZONE ALLOWING WORK ON ONE CELL WHILE THE REMAINDER ARE ENERGIZED, ALL CROSS CELL WIRING TO BE IN CONDUIT.
2. 12.5mm STAINLESS STEEL CELL SEPARATION WALL. ASSEMBLIES TO BE CONSTRUCTED WITH SEPARATION WALLS BETWEEN EACH CELL AND BETWEEN CELLS AND DOCK WALLS. TO BE USED TO MOUNT HINGES ON ALL CELL ACCESS DOORS. TO BE USED TO MOUNT SAFETY HARNESS ATTACHMENT POINTS. CONTRACTOR TO RETAIN THE SERVICES OF A STRUCTURAL ENGINEER TO DESIGN SAFETY ATTACHMENT POINTS AND SUBMITTED STAMPED SHOP DRAWINGS OF FINAL DESIGN FOR APPROVAL PRIOR TO MANUFACTURING.
3. STAINLESS STEEL ACCESS HATCH. TO HAVE CHECKER PLATE TOP COVER SURFACE TO REDUCE SLIP CHANCE. TO BE SEALED AND GASKETED TO PREVENT LIQUID OR SOLIDS FROM ENTERING CELL COMPARTMENT. TO BE REMOVABLE BY MEANS OF SCREWS LOCATED AT PERIMETER OF PLATE. CHECKER PLATE TO BE PAINTED WIT NON-SLIP MATERIAL.
4. TECK CONDUCTORS FOR ELECTRICAL SERVICE. REFER TO SINGLE LINE DIAGRAM AND SHEET 5108 FOR ADDITIONAL DETAILS (TYPICAL)
5. 103mm RIGID STEEL CONDUIT BETWEEN TUNNEL AND BOTTOM OF DOCK SERVICE CELL, CORE HOLE FROM CELL SIDE INTO SERVICE TUNNEL AND INSTALL CONDUIT, ENSURE CONDUIT IS COMPLETE WITH BELL END AND SMOOTH FINISHED TO PREVENT ABRASION TO CONDUCTORS (TYPICAL).
6. CONDUITS TO ENTER CELL ANGLED TO ALLOW FOR EASY BENDING OF STRIPPED TECK CABLE. ENSURE EDGES OF PENETRATION AS SEALED WITH WATERPROOF POLYURETHANE CAULKING (TYPICAL).
7. REMOVE TECK CONDUCTOR EXTERIOR RUBBER SHEATH AND INTERLOCKING ARMOR
8. BOND TECK CABLE ARMOR TO CELL GROUND BAR.
9. BOND TECK CABLE CONCENTRIC COPPER BOND WIRES TO CELL GROUND BAR.
10. ASSEMBLY INSULATION AND VAPOR BARRIER. TO BE OF NON-CONDUCTIVE MATERIALS.
11. HEXAGONAL LAG-BOLT. USED TO SECURE ASSEMBLY LID. LID TO BE COMPLETELY SEALED AND GASKETED. LAG BOLT TO ENTER INTO KIOSK INTO BLANK FASTENING POCKET TO REDUCE WATER INGRESS. (TYPICAL)
12. TERMINATE TECK CONDUCTOR TO MOLDED CASE SWITCH TERMINAL LUGS USING 2-HOLE COMPRESSION STYLE TERMINAL CONNECTORS. HEAT SHRINK TERMINATION USING MANUFACTURER'S RECOMMENDED METHODS.
13. SERVICE ASSEMBLY LID HINGE. MODIFY EXISTING CONCRETE AS REQUIRED TO ENSURE 110° OPENING ANGLE IS POSSIBLE. HINGE TO BE OF RUGGED AND DURABLE CONSTRUCTION.
14. 400A, 600V 3P MOLDED CASE SWITCH, 100% RATED. 65 KAIC INTERRUPT CAPABILITY C/W MANUAL OPEN/CLOSE TURN HANDLE AND INTERLOCKED WITH CAM-LOCK CONNECTORS TO PREVENT OPERATION UNTIL CONNECTION IS MADE.
15. 2x3c#3/0 Cu CONDUCTORS FROM MOLDED CASE SWITCH TERMINAL LUGS TO TERMINAL LUGS ON CAM-LOCK PLUG. CONDUCTORS TO TERMINATE ON MOLDED CASE SWITCH AND CAM-LOCK LUGS USING 2-HOLE COMPRESSION STYLE TERMINAL CONNECTORS. HEAT SHRINK TERMINATIONS USING MANUFACTURER'S RECOMMENDED METHODS.
16. CAM-LOCK TERMINAL LUGS, TO BE TIN PLATED COPPER AND RATED FOR 400A LOADS @ 100% RATING.
17. 400A, 600V RATED CAM-LOCK STYLE RECEPTACLES, SINGLE POLE PER PHASE 250kCM. C/W DOUBLE THROW MICRO SWITCH FOR SAFETY INTERLOCKING OF MOLDED CASE SWITCH. RECEPTACLES FOR ØA, ØB, ØC, ØG WIRE CONNECTIONS, ØG RECEPTACLES TO BE REVERSED FROM POWER PHASES AND USE MALE CONNECTIONS ON EQUIPMENT FACE.
18. DOCK SERVICE "DLO" OR SIMILAR STYLE CABLES BY OTHERS FOR CONNECTION TO SERVICE CELL.
19. REMOVE EXISTING CONCRETE IN DOCK WALL AND INSTALL STAINLESS STEEL CABLE TROUGH TO ALLOW CABLES TO CONNECT TO CAM-LOCK RECEPTACLES WITH ACCESS DOOR CLOSED. ENSURE MINIMUM BENDING RADIUS IS POSSIBLE TO ACHIEVE FOR CABLES GOING TO ANY RECEPTACLE.
20. 25mm STRUCTURAL STEEL RIGID BAR INSTALLED IN ASSEMBLY TO ALLOW ASSEMBLY TO WITHSTAND COMPRESSION FORCES FROM THERMAL EXPANSION OF EXISTING CONCRETE DOCK.
21. STATUS LIGHT, PUSH TO TEST, DUAL COLOR (RED CLOSED, GREEN OPEN)
22. DOOR HANDLE, C/W LOCK.
23. REINFORCED SAFETY GLASS VIEWING WINDOW, SEALED AND GASKETED.
24. 100W STRIP HEATER C/W INTEGRATED THERMOSTAT IN EACH CELL.
25. CELL GROUND BUS BAR MOUNTED NEAR BACK OF CELL. TO BE OF TIN PLATED COPPER CONSTRUCTION MOUNTED ON INSULATED STANDOFFS.
26. TO INSTALL CELL CONTRACTOR WILL BE REQUIRED TO REMOVE EXISTING GRANITE DOCK EDGE PROTECTION STONES AND CHISEL AWAY EXISTING CONCRETE TO CREATE A VOID OF SUFFICIENT SIZE TO ALLOW ASSEMBLIES TO BE INSTALLED FLUSH WITH FACE AND TOP OF DOCK WALL. DRILL INTO DOCK AND ATTACH ASSEMBLY USING CONCRETE DOWELS AND FILL SPACES WITH CONCRETE GROUT. CARE IS TO BE TAKEN TO AVOID DAMAGING ADJACENT GRANITE STONES OR PENETRATING INTO SERVICE TUNNEL. TYPICAL OF ALL ASSEMBLIES
27. 400A, 480V 3P MOLDED CASE SWITCH, 100% RATED. 65 KA/C INTERRUPT CAPABILITY C/W MANUAL OPEN/CLOSE TURN HANDLE AND INTERLOCKED WITH CAM-LOCK CONNECTORS TO PREVENT OPERATION UNTIL CONNECTION IS MADE.
28. 2x3c#3/0 Cu CONDUCTORS FROM MOLDED CASE SWITCH TERMINAL LUGS TO TERMINAL LUGS ON CAM-LOCK PLUG. CONDUCTORS TO TERMINATE ON MOLDED CASE SWITCH AND CAM-LOCK LUGS USING 2-HOLE COMPRESSION STYLE TERMINAL CONNECTORS. HEAT SHRINK TERMINATIONS USING MANUFACTURER'S RECOMMENDED METHODS.
29. 400A, 480V RATED CAM-LOCK STYLE RECEPTACLES, SINGLE POLE PER PHASE 250kCM. C/W DOUBLE THROW MICRO SWITCH FOR SAFETY INTERLOCKING OF MOLDED CASE SWITCH. RECEPTACLES FOR ØA, ØB, ØC, ØG WIRE CONNECTIONS, ØG RECEPTACLES TO BE REVERSED FROM POWER PHASES AND USE MALE CONNECTIONS ON EQUIPMENT FACE.
30. 400A, 480V RATED CAM-LOCK STYLE RECEPTACLES FOR GROUNDING CONNECTION, TO BE CONNECTED TO CELL GROUND BUS VIA #3Cu. CONDUCTOR.
31. 200A, 208V 3P MOLDED CASE SWITCH, 100% RATED. 65 KAIC INTERRUPT CAPABILITY C/W MANUAL OPEN/CLOSE TURN HANDLE AND INTERLOCKED WITH CAM-LOCK CONNECTORS TO PREVENT OPERATION UNTIL CONNECTION IS MADE.
32. 3x#3/0 Cu CONDUCTORS FROM MOLDED CASE SWITCH TERMINAL LUGS TO TERMINAL LUGS ON CAM-LOCK PLUG. CONDUCTORS TO TERMINATE ON MOLDED CASE SWITCH AND CAM-LOCK LUGS USING 2-HOLE COMPRESSION STYLE TERMINAL CONNECTORS. HEAT SHRINK TERMINATIONS USING MANUFACTURER'S RECOMMENDED METHODS.
33. 200A, 240V RATED CAM-LOCK STYLE RECEPTACLES, SINGLE POLE PER PHASE 250kCM. C/W DOUBLE THROW MICRO SWITCH FOR SAFETY INTERLOCKING OF MOLDED CASE SWITCH. RECEPTACLES FOR ØA, ØB, ØC, ØN, ØG WIRE CONNECTIONS, ØN, ØG RECEPTACLES TO BE REVERSED FROM POWER PHASES AND USE MALE CONNECTIONS ON EQUIPMENT FACE.
34. 200A, 240 RATED CAM-LOCK STYLE RECEPTACLES FOR GROUNDING CONNECTION, TO BE CONNECTED TO CELL GROUND BUS VIA #2Cu. CONDUCTOR.
35. CONDUITS TO ENTER CELL ANGLED TO ALLOW FOR EASY BENDING OF TELECOM CABLES.
36. INSTALL DRAIN HOLE TO ALLOW WATER OR CONDENSATION TO DRAIN FROM SERVICE ASSEMBLY INTO CABLE ENTRY TOUGH.
37. ALLOW 1m NEATLY SPOOLED SLACK IN ALL TELECOM AND ALARM CABLES FOR SPLICING.
38. WEATHERPROOF CAT5 AND CAT3 TELECOM RECEPTACLES C/W SCREW ON CAPS
39. KIOSK FLOOR TO HAVE 0.5° SLOPE TO PREVENT ANY WATER FROM POOLING
40. 16xCAT3 WEATHERPROOF TELEPHONE RECEPTACLES, TO MATCH EXISTING STYLE ON SITE.
41. 4xCAT5 WEATHERPROOF CAT5 ETHER NET RECEPTACLES.
42. 2xCAT3 WEATHERPROOF FIRE ALARM CONNECTION RECEPTACLES. C/W DUMMY WIRED TO END OF LINE RESISTOR.
43. 2xCAT3 WEATHERPROOF EMERGENCY ALARM CONNECTION RECEPTACLES. C/W DUMMY WIRED TO END OF LINE RESISTOR.
44. 1x103mm RIGID STEEL TELECOM CONDUIT FOR 12PR #22 TELECOM WIRES
45. 1x103mm RIGID STEEL DATA CONDUIT FOR 6xCAT5 ARMORED TECK CABLE
46. 1x103mm RIGID STEEL CONDUIT FOR FUTURE FIBER OPTICS
47. 1x27mm RIGID STEEL CONDUIT FOR FIRE ALARM SYSTEM
48. 1x27mm RIGID STEEL CONDUIT FOR EMERGENCY ALARM
49. LED STRIP MOUNTED INSIDE ASSEMBLY DOOR C/W SWITCH FOR DOOR OPEN DETECTION. TYPE 'LE' FIXTURE, REFER TO SHEET 5111 FOR ADDITIONAL INFORMATION.
50. REMOVABLE SAFETY RAILING, TYPICAL OF ALL ASSEMBLIES REFER TO DETAILS 8/5116 AND 9/5116 FOR ADDITIONAL INFORMATION.
51. FIBERGLASS NO-SLIP DECKING MATERIAL. REFER TO DETAIL 9/5116 FOR ADDITIONAL INFORMATION.
52. 1x29mm RIGID STEEL CONDUIT FOR 120/208V CIRCUIT
53. LIFTING KEY SLOTS. TWO PER ASSEMBLY. PROVIDE TWO LIFTING KEYS TO PWGSC SITE STAFF FOR EACH DOCKSIDE ASSEMBLY (6) AT END OF PROJECT.
54. DOOR OPEN LIMIT ARM. INSTALLED TO PREVENT ASSEMBLY COVER OPENING MORE THAN 110°. C/W LOCK POINT TO PREVENT WING FROM CLOSING THE LID.
55. RETAIN SERVICES OF A STRUCTURAL ENGINEER TO CERTIFY STRENGTH AND INTEGRITY OF SYSTEM. MUST BE APPROVED PRIOR TO MANUFACTURING.



5 5115 600V DOCK SERVICES CELL SECTION CUT
SCALE 1:20



6 5115 600V DOCK SERVICES CELL ELEVATION VIEW
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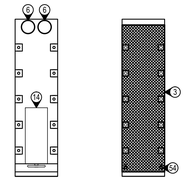

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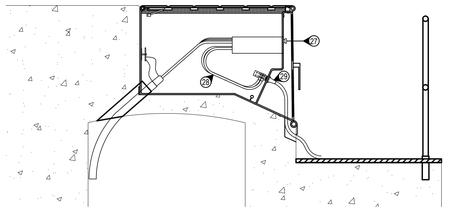

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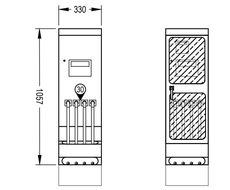

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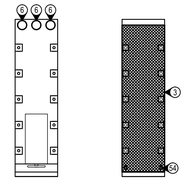

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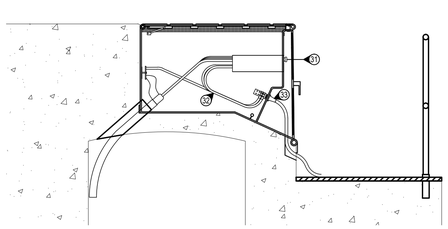

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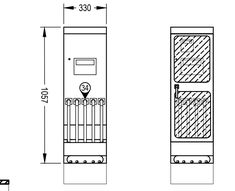

12 5115 120/208V DOCK SERVICES CELL ELEVATION VIEW
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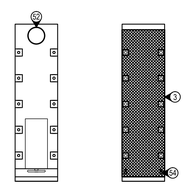
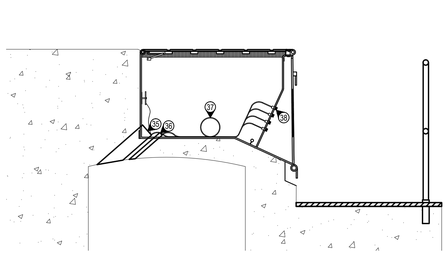


13 5115 120/208V DOCK SERVICES CELL PLAN VIEW
SCALE 1:20



14 5115 TELECOM DOCK SERVICES CELL SECTION CUT
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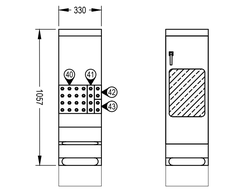

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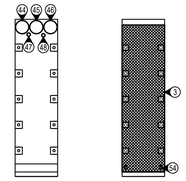

16 5115 TELECOM DOCK SERVICES CELL PLAN VIEW
SCALE 1:20

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1:25

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Pacific Region
SERVICES IMMOBILIERS
Region de Pacifique

AES
CALGARY | VANCOUVER | VICTORIA
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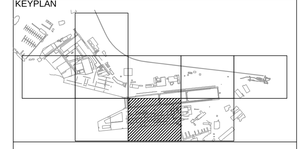
KEYPLAN



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0		

Client/client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet
825 ADMIRALS ROAD VICTORIA BC ESQUIMALT GRAVING DOCK ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

Designed by/Concept par
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Drawn by/Dessine par
J. BIELING / S. SEYMOUR

PWGSC Project Manager/Administrateur de Projets TPSGC
Jamie LeBlanc

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Preetipal Paul

Drawing title/Titre du dessin

DOCK SERVICE ASSEMBLIES 1 OF 2 (DS2-E, DS2-W)

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.062548.2	5115	5

Plot Date: January 28, 2016 11:38 AM Plotted by: Jacob Bieling
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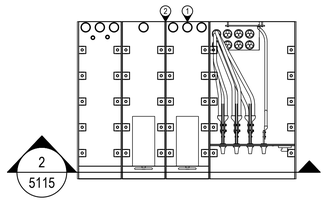
PWGSC – B1 – 1000X707



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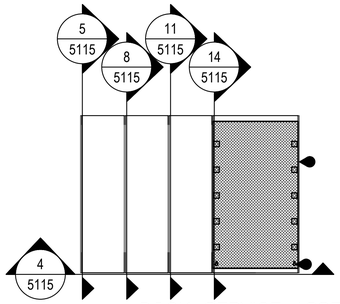
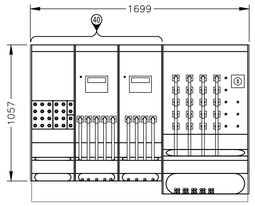
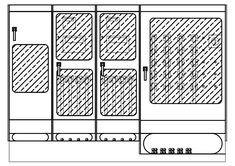
SCALE 1:20



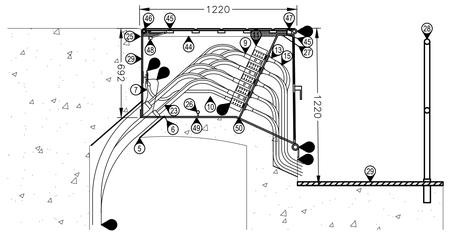
2 5116 DOCK SERVICE ASSEMBLY EXTERIOR PLAN
SCALE 1:20



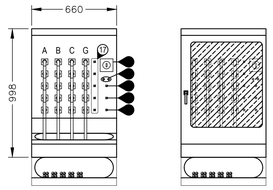
3 5116 DOCK SERVICE ASSEMBLY COVER OFF ELEVATION
SCALE 1:20



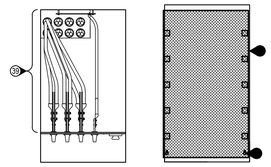
4 5116 DOCK SERVICE ASSEMBLY EXTERIOR ELEVATION
SCALE 1:20



5 5116 430–630V DOCK SERVICES CELL SECTION CUT
SCALE 1:20



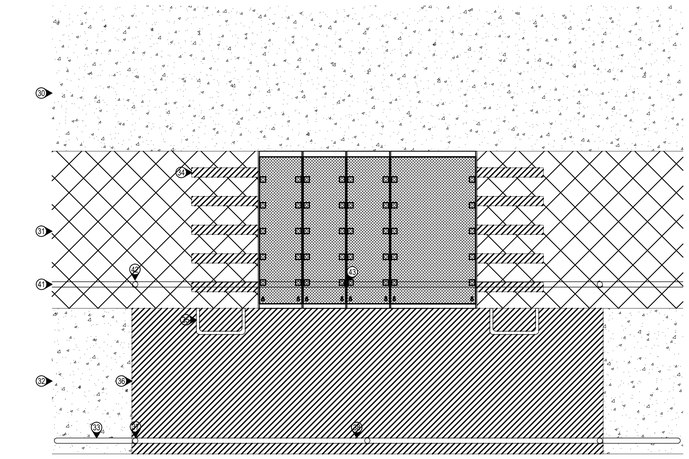
6 5116 430–630V DOCK SERVICES CELL ELEVATION VIEW
SCALE 1:20



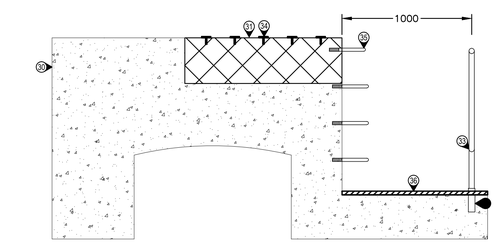
7 5116 430–630V DOCK SERVICES CELL PLAN VIEW
SCALE 1:20

KEYNOTES

1. DOCK REGULATED SERVICE ASSEMBLY, TO BE MADE OF WELDED STAINLESS STEEL AND OF NEMA 4X RATED CONSTRUCTION, MINIMUM 12.5mm THICK STEEL FOR OUTER COMPARTMENT WALLS. EACH CELL TO BE A SEPARATE ELECTRICAL ZONE ALLOWING WORK ON ONE CELL WHILE THE REMAINDER ARE ENERGIZED, ALL CROSS CELL WIRING TO BE IN CONDUIT.
2. 12.5mm STAINLESS STEEL CELL SEPARATION WALL. ASSEMBLIES TO BE CONSTRUCTED WITH SEPARATION WALLS BETWEEN EACH CELL AND BETWEEN CELLS AND DOCK WALLS. TO BE USED TO MOUNT HINGES ON ALL CELL ACCESS DOORS. TO BE USED TO MOUNT SAFETY HARNESS ATTACHMENT POINTS. CONTRACTOR TO RETAIN THE SERVICES OF A STRUCTURAL ENGINEER TO DESIGN SAFETY ATTACHMENT POINTS AND SUBMIT STAMPED SHOP DRAWINGS OF FINAL DESIGN FOR APPROVAL PRIOR TO MANUFACTURING.
3. STAINLESS STEEL ACCESS HATCH. TO HAVE CHECKER PLATE TOP COVER SURFACE TO REDUCE SLIP CHANCE. TO BE SEALED AND GASKETED TO PREVENT LIQUID OR SOLIDS FROM ENTERING CELL COMPARTMENT. TO BE REMOVABLE BY MEANS OF SCREWS LOCATED AT PERIMETER OF PLATE. CHECKER PLATE TO BE PAINTED WIT NON-SLIP MATERIAL.
4. 8x3c#500kCM Cu. TECK CONDUCTORS FOR 430-630V 2000A REGULATED SERVICE. REFER TO SINGLE LINE DIAGRAM AND SHEET 5108 FOR ADDITIONAL DETAILS.
5. RIGID STEEL CABLE COMPARTMENT BETWEEN TUNNEL AND BOTTOM OF DOCK SERVICE CELL, CORE HOLE FROM CELL SIDE INTO SERVICE TUNNEL AND INSTALL COMPARTMENT, ENSURE COMPARTMENT EDGES ARE SMOOTH FINISHED TO PREVENT ABRASION TO CONDUCTORS.
6. CONDUITS TO ENTER CELL ANGLED TO ALLOW FOR EASY BENDING OF STRIPPED TECK CABLE. ENSURE EDGES OF PENETRATION ARE SEALED WITH WATERPROOF POLYURETHANE CAULKING.
7. BOND TECK CABLE ARMOR TO CELL GROUND BAR.
8. BOND TECK CABLE CONCENTRIC COPPER BOND WIRES TO CELL GROUND BAR.
9. TERMINATE TECK CONDUCTOR TO CAM-LOCK CONNECTOR TERMINAL LUGS USING 2-HOLE COMPRESSION STYLE TERMINAL CONNECTORS. HEAT SHRINK TERMINATION USING MANUFACTURER'S RECOMMENDED METHODS.
10. 1c#250KCM Cu. GROUND CONDUCTOR DAISY CHAINED BETWEEN GROUNDING CAM-LOCK RECEPTACLES AND TO CELL GROUND BUS.
11. 2x1000A TIN PLATED COPPER BUS BARS MOUNTED TO CAM-LOCK RECEPTACLE TERMINAL BUS.
12. CAM-LOCK TERMINAL LUGS, TO BE TIN PLATED COPPER AND RATED FOR 400A LOADS.
13. 400A @ 100%, 630V RATED CAM-LOCK STYLE RECEPTACLES, SINGLE POLE PER PHASE 250kCM. C/W DOUBLE THROW MICRO SWITCH FOR SAFETY INTERLOCKING OF MOLDED CASE SWITCH. RECEPTACLES FOR ØA, ØB, ØC, ØG WIRE CONNECTIONS, ØG RECEPTACLES TO BE REVERSED FROM POWER PHASES AND USE MALE CONNECTIONS ON EQUIPMENT FACE.
14. 25mm STRUCTURAL STAINLESS STEEL PIPE WELDED IN TOP AND BOTTOM OF ASSEMBLY FACE TO PROVIDE RIGID STRUCTURE.
15. DOCK SERVICE "DLO" OR SIMILAR STYLE CABLES BY OTHERS FOR CONNECTION TO SERVICE CELL.
16. REMOVE EXISTING CONCRETE IN DOCK WALL AND INSTALL STAINLESS STEEL CABLE TROUGH TO ALLOW CABLES TO CONNECT TO CAM-LOCK RECEPTACLES WITH ACCESS DOOR CLOSED. ENSURE MINIMUM BENDING RADIUS IS POSSIBLE TO ACHIEVE FOR CABLES GOING TO ANY RECEPTACLE.
17. PILOT LIGHT, PUSH TO TEST, INDICATES ALL CAM-LOCK RECEPTACLES FOR A, B , C AND GROUND PHASES ARE CONNECTED FOR ONE 400A CONNECTION. REFER TO REGULATED VOLTAGE SYSTEM CONTROL LOGIC DIAGRAMS FOR ADDITIONAL DETAILS
18. MUSHROOM HEAD EMERGENCY POWER OFF BUTTON C/W KEY DISENGAGE.
19. CONNECTION POINTS FOR REMOTE MOUNTED EMERGENCY POWER OFF, TRIP ON OPEN SIGNAL C/W SHORTING CAP
20. PILOT LIGHT, PUSH TO TEST, RED - POWER ON
21. PILOT LIGHT, PUSH TO TEST, GREEN - POWER OFF
22. PILOT LIGHT, PUSH TO TEST, AMBER - BREAKER TRIPPED DUE TO FAULT CONDITION
23. REMOVE TECK CONDUCTOR EXTERIOR RUBBER SHEATH AND INTERLOCKING ARMOR
24. CELL GROUND BUS BAR MOUNTED NEAR BACK OF CELL. TO BE OF TIN PLATED COPPER CONSTRUCTION MOUNTED ON INSULATED STANDOFFS.
25. TO INSTALL CELL CONTRACTOR WILL BE REQUIRED TO REMOVED EXISTING GRANITE DOCK EDGE PROTECTION STONES AND CHISEL AWAY EXISTING CONCRETE TO CREATE A VOID OF SUFFICIENT SIZE TO ALLOW ASSEMBLIES TO BE INSTALLED FLUSH WITH FACE AND TOP OF DOCK WALL. DRILL INTO DOCK AND ATTACH ASSEMBLY USING CONCRETE DOWELS AND FILL SPACES WITH CONCRETE GROUT. CARE IS TO BE TAKEN TO AVOID DAMAGING ADJACENT GRANITE STONES OR PENETRATING INTO SERVICE TUNNEL.
26. 100W STRIP HEATER C/W INTEGRATED THERMOSTAT.
27. LED STRIP MOUNTED INSIDE ASSEMBLY DOOR C/W SWITCH FOR DOOR OPEN DETECTION. TYPE 'LE' FIXTURE, REFER TO SHEET 5111 FOR ADDITIONAL INFORMATION.
28. REMOVABLE SAFETY RAILING, TYPICAL OF ALL ASSEMBLIES REFER TO DETAIL 8/5116 FOR ADDITIONAL INFORMATION.
29. NO-SLIP DECKING MATERIAL. REFER TO DETAIL 8/5116 FOR ADDITIONAL INFORMATION.
30. EXISTING DOCK CONCRETE AND ASPHALT SURFACE TO REMAIN,
31. EXISTING DOCK GRANITE EDGE PROTECTION STONES TO REMAIN.
32. EXISTING DOCK LEDGE WALKWAY, TO BE MODIFIED WITH NO-SLIP DECKING MATERIAL IN FRONT OF NEW SERVICE ASSEMBLIES.
33. NEW SAFETY HANDRAIL TO SLOP DOWN NEAR ENDS TO REDUCE RISK OF SNAGGING ROPES AND POWER CABLES. CONFIRM EXACT SLOPE ANGLE AND FINAL HANDRAIL DIMENSIONS WITH ENGINEER AND PWGSC SITE REPRESENTATIVE PRIOR TO MANUFACTURE.
34. NO-SLIP PLATES INSTALLED ON EXISTING GRANITE PROTECTION STONES. CORE INTO STONES AND ANCHOR NO-SLIP PLATES, PLATES TO BE MOUNTED SUCH THAT THEY CAN BE EASILY REPLACED AS NEEDED.
35. STAINLESS STEEL LADDER RUNGS INSTALLED IN EXISTING CONCRETE WALL AND IN GRANITE PROTECTION STONES. CORE INTO CONCRETE OR GRANITE MINIMUM 80mm AND SECURELY ANCHOR RUNGS.
36. NO-SLIP DECKING MATERIAL TO BE INSTALLED ON EXISTING DRYDOCK LEDGE.
37. REMOVABLE HANDRAILS TO BE INSTALLED IN METAL POST HOLES COMPLETE WITH STAINLESS STEEL LOCKING PIN SECURED TO POST HOLES WITH STAINLESS STEEL CHAIN. TO BE INSTALLED INTO EXISTING DOCK LEDGE CONCRETE.
38. REMOVABLE STAINLESS STEEL SAFETY RAILING. TO BE DESIGNED TO WORKSAFE BC REQUIREMENTS, TO BE MINIMUM 1000mm FROM FACE OF NEW SERVICE ASSEMBLY AS PER CEC REQUIREMENTS FOR WORKING SPACE AROUND ELECTRICAL EQUIPMENT.
39. TECK TO CAM LOCK BUSSING CONNECTION DETAIL, SINGLE PAIR OF CABLES SHOWN FOR CLARITY.
40. REFER TO SHEET 5115 FOR 480V, 120V AND COMMUNICATION SERVICE ASSEMBLY DETAILS.
41. EXISTING DOCK RAILING TO BE REMOVED AND REINSTALLED AFTER INSTALLATION OF DOCK SERVICE ASSEMBLIES.
42. EXISTING DOCK TRAILING POST HOLES. CO-ORIDNATE WITH EXISTING LOCATIONS TO ALLOW FOR REUSE OF EXISTING RAILINGS.
43. IF A POST HOLE IS REQUIRED IN THE CENTRAL SPAN OVER THE NEW SERVICE ASSEMBLY ENSURE IT IS INSTALLED ON THE CELL SEPARATION WALLS.
44. ASSEMBLY INSULATION AND VAPOR BARRIER. TO BE OF NON-CONDUCTIVE MATERIALS.
45. HEXAGONAL LAG-BOLT. USED TO SECURE ASSEMBLY LID. LID TO BE COMPLETELY SEALED AND GASKETED. LAG BOLT TO ENTER INTO KIOSK INTO BLANK FASTENING POCKET TO REDUCE WATER INGRESS. (TYPICAL)
46. SERVICE ASSEMBLY LID HINGE. MODIFY EXISTING CONCRETE AS REQUIRED TO ENSURE 110° OPENING ANGLE IS POSSIBLE. HINGE TO BE OF RUGGED AND DURABLE CONSTRUCTION.
47. LIFTING KEY SLOTS. TWO PER ASSEMBLY. PROVIDE TWO LIFTING KEYS TO PWGSC SITE STAFF FOR EACH DOCKSIDE ASSEMBLY (6) AT END OF PROJECT.
48. DOOR OPEN LIMIT ARM. INSTALLED TO PREVENT ASSEMBLY COVER OPENING MORE THAN 110°. C/W LOCK POINT TO PREVENT WING FROM CLOSING THE LID.
49. INSTALL DRAIN HOLE TO ALLOW WATER OR CONDENSATION TO DRAIN FROM SERVICE ASSEMBLY INTO CABLE ENTRY TOUGH.
50. KIOSK FLOOR TO HAVE 0.5° SLOPE TO PREVENT ANY WATER FROM POOLING
51. 25mm STRUCTURAL STEEL RIGID BAR INSTALLED IN ASSEMBLY TO ALLOW ASSEMBLY TO WITHSTAND COMPRESSION FORCES FROM THERMAL EXPANSION OF EXISTING CONCRETE DOCK.
52. RETAIN SERVICES OF A STRUCTURAL ENGINEER TO CERTIFY STRENGTH AND INTEGRITY OF SYSTEM. MUST BE APPROVED PRIOR TO MANUFACTURING.



8 5116 DOCK SERVICES SAFETY SYSTEMS PLAN VIEW (REGULATED SERVICE SHOWN)
SCALE 1:20



9 5116 DOCK SERVICES SAFETY SYSTEMS SECTION VIEW
SCALE 1:20

0 500 1000 1500 2000mm
1:25

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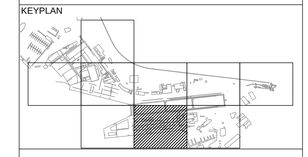


5	ISSUED FOR TENDER	15/01/28
4	ISSUED FOR 99% DESIGN REVIEW	16/01/06
3	ISSUED FOR 66% DESIGN REVIEW	15/11/25
2	ISSUED FOR 33% DESIGN REVIEW	15/10/28
1	ISSUED FOR DESIGN DEVELOPMENT	15/09/11
0		
Revision/ Revision	Description/Description	Date/Date

Client/client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet

825 ADMIRALS ROAD VICTORIA BC ESQUIMALT GRAVING DOCK ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

Designed by/Concept par
I. BARNES

Drawn by/Dessine par
J. BIELING / S. SEYMOUR

PWGSC Project Manager/Administrateur de Projets TPSGC
Jamie LeBlanc

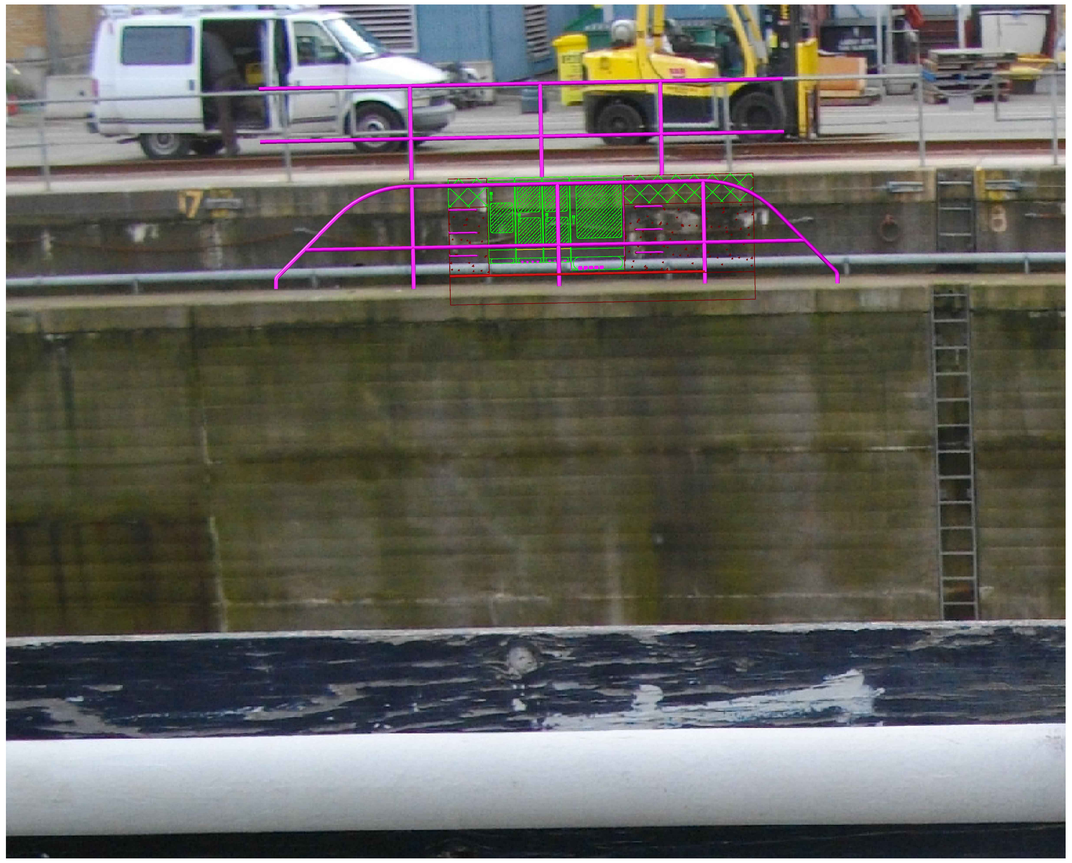
PWGSC, Regional Manager, Architectural and Engineering Services/ Gestionnaire régionale, Services d'architectural et de génie, TPSGC
Preetipal Paul

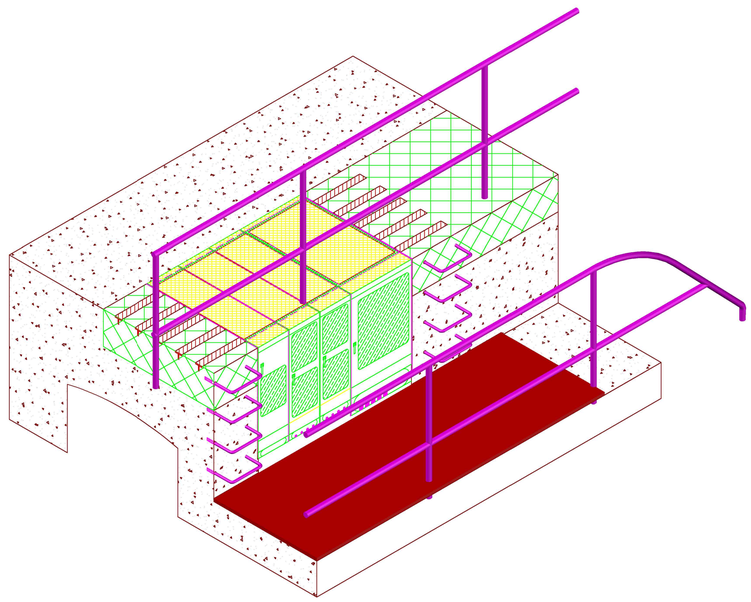
Drawing title/Titre du dessin

DOCK SERVICE ASSEMBLIES 2 OF 2 (DS2-C)

Project No./No. du projet	Sheet/Feuille	Revision no./ Le Révision no.
R.062548.2	5116	5

Plot Date: February 5, 2016 2:53 PM Plotted by: Jacob Bieling
File Name: N:\PROJECTS\2015\15-TSP-SWI\DWG\DWG\15-SWI-REGULATED DOCK SERVICE ASSEMBLIES.dwg





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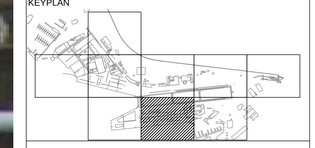

Revision/ Revision	Description/Description	Date/Date
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4	ISSUED FOR 99% DESIGN REVIEW	16/01/06
3	ISSUED FOR 66% DESIGN REVIEW	15/11/25
2	ISSUED FOR 33% DESIGN REVIEW	15/10/28
1	ISSUED FOR DESIGN DEVELOPMENT	15/09/11
0		

Client/client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD
VICTORIA, BC, V9A 2P1

Project title/Titre du projet

825 ADMIRALS ROAD VICTORIA BC
ESQUIMALT GRAVING DOCK
ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

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Jamie LeBlanc

PWGSC, Regional Manager, Architectural and Engineering Services/ Gestionnaire régionale, Services d'architectural et de génie, TPSGC
Preetipal Paul

Drawing title/Titre du dessin

DOCK SERVICE ASSEMBLIES 3D MODEL

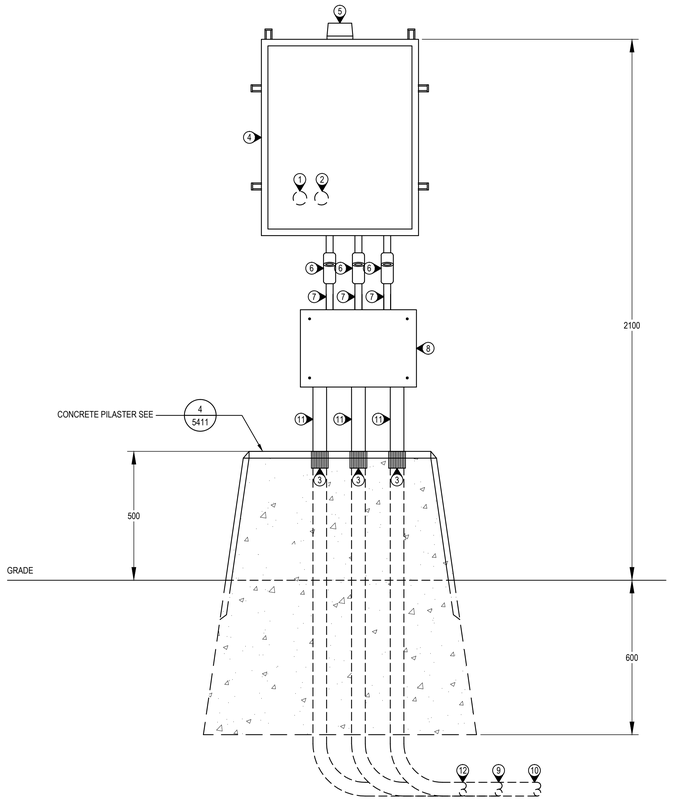
Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.062548.2	5117	5

Plot Date: January 28, 2016 11:38 AM
File Name: H:\PROJECTS\2015\1-1-15-166\DWG\SSWG\5117 DOCK SERVICE BOXES 3D MODEL.DWG
Plotted by: Jacob Bieling

PWGSC – B1 – 1000X707

KEYNOTES:

1. 1x53mm CONDUIT FROM SSSR VIA WALL PENETRATION TO NEW LIFT STATION CONTROL PANEL FOR 600V POWER CIRCUIT.
2. 1x53mm CONDUIT FROM SSSR VIA WALL PENETRATION TO NEW LIFT STATION CONTROL PANEL FOR CONTROL CIRCUITS.
3. SUPPLY AND INSTALL RPVC TO GRS CONDUIT ADAPTER COUPLINGS.
4. SUPPLY AND INSTALL NEMA 4X RATED SUMP PUMP CONTROL PANEL, MOUNTED TO NEW SSSR BUILDING ON GROUT LINES OF BLOCKS ONLY. SUPPLY AND INSTALL POWER WIRING, WIRE ALL CONTROLS AND ALARMS. COMMISSION AND TEST PUMP OPERATION TO THE SATISFACTION OF EGD SITE REPRESENTATIVE.
5. PANEL TO BE EQUIPPED WITH HIGH WATER LEVEL ALARM STROBE LIGHT.
6. 27mm EYS SEAL
7. 27mm GRS CONDUIT
8. SUPPLY AND INSTALL 300mm X 300mm X 150mm NEMA 4X RATED TERMINAL AND CONNECTION BOX.
9. SUPPLY AND INSTALL 1x53mm RPVC CONDUIT TO SUMP CHAMBER FOR LIFT STATION PUMP POWER, SEE SHEET 5101 FOR CONDUIT ROUTE.
10. SUPPLY AND INSTALL 1x53mm RPVC CONDUIT TO SUMP CHAMBER FOR LIFT STATION FLOAT CONTACTS, SEE SHEET 5101 FOR CONDUIT ROUTE
11. 53mm GRS CONDUIT.
12. 53mm RPVC CONDUIT TO NEW LIFT STATION WET WELL FOR FUTURE



1 / 5120 LIFT STATION CONTROL PANEL ELEVATION DETAIL
SCALE 1:10

0 100 200 300 400 500 600 1:10

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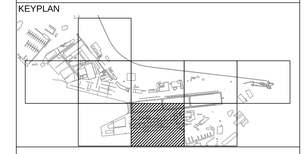

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0		

Client/client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet
825 ADMIRALS ROAD VICTORIA BC ESQUIMALT GRAVING DOCK ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

Designed by/Concept par
I. BARNES

Drawn by/Dessine par
J. BIELING / S. SEYMOUR

PWGSC Project Manager/Administrateur de Projets TPSGC
Jamie LeBlanc

PWGSC, Regional Manager, Architectural and Engineering Services/ Gestionnaire régionale, Services d'architectural et de génie, TPSGC
Preetipal Paul

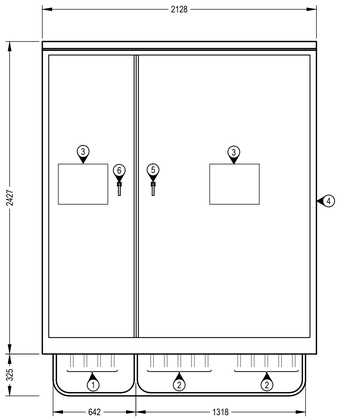
Drawing title/Titre du dessin

LIFT STATION CONTROL PANEL

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.062548.2	5120	5

Plot Date: January 28, 2016 11:38 AM Plotted by: Jacob Bieling
File Name: H:\PROJECTS\2015\1-1-15-166\DWG\DRWG\5120 SSR LS PANEL.DWG

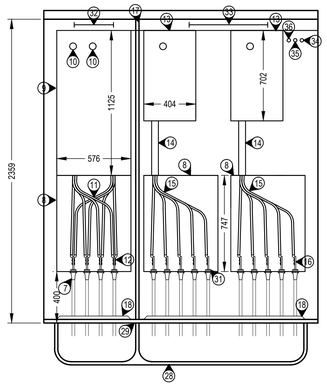
PWGSC – B1 – 1000X707



1 5121

SSSR 480, 120/208V BUILDING MOUNTED SERVICE ASSEMBLY EXTERIOR ELEVATION

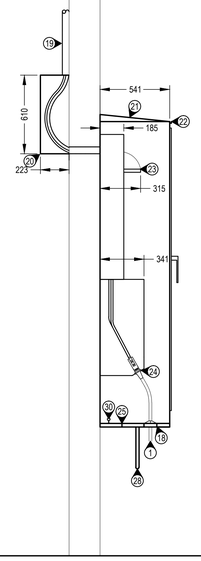
SCALE 1:20



2 5121

SSSR 480, 120/208V BUILDING MOUNTED SERVICE ASSEMBLY INTERIOR ELEVATION

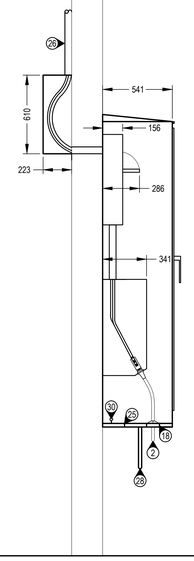
SCALE 1:20



3 5121

SSSR 480V BUILDING MOUNTED SERVICE ASSEMBLY INTERIOR ELEVATION

SCALE 1:20



4 5121

SSSR 120/208V BUILDING MOUNTED SERVICE ASSEMBLY INTERIOR ELEVATION

SCALE 1:20

KEYNOTES:

1. A Ø, B Ø, C Ø, and Ground cables. Rated 480V, 400A. DOCK SERVICE "DLO" OR SIMILAR STYLE CABLES BY OTHERS FOR CONNECTION TO SERVICE.
2. A Ø, B Ø, C Ø, N Ø, and Ground cables. Rated 120/208V, 200A. DOCK SERVICE "DLO" OR SIMILAR STYLE CABLES BY OTHERS FOR CONNECTION TO SERVICE.
3. OUTDOOR WEATHERPROOF ELECTRICAL HAZARD SIGN, C/W ARC FLASH INFORMATION LABEL. CONFIRM EXACT WORDING AND DIMENSIONS WITH PUBLIC WORKS DEPARTMENTAL REPRESENTATIVE.
4. NEMA 3R RATED MARINE GRADE ALUMINUM ENCLOSURE MOUNTED TO EXTERIOR OF NEW SOUTH SIDE SUBSTATION. REFER TO DRAWING DETAILS FOR ENCLOSURE DIMENSIONS. CONFIRM DIMENSIONS WITH MANUFACTURER EQUIPMENT SIZES AND ADJUST AS NEEDED AT NO ADDITIONAL COST. DOORS TO BE COMPLETELY GASKETED AND CAPABLE OF 180 DEGREES OF SWING TO ALLOW FOR ACCESS.
5. 120/208V COMPARTMENT ACCESS HANDLE C/W LOCKABLE HASP.
6. 480V COMPARTMENT ACCESS HANDEL C/W LOCKABLE HASP.
7. 400A, 480V RATED CAM-LOCK STYLE RECEPTACLES, SINGLE POLE PER PHASE 250kCM. C/W DOUBLE THROW MICRO SWITCH FOR SAFETY INTERLOCKING OF BREAKER (TYPICAL FOR 480V CELL). MICRO SWITCHES WIRES IN SERIES TO TRIGGER BREAKER TRIP IF ANY CAM-LOCK PLUG IS PULLED FROM IT'S SOCKET WHILE SYSTEM WHILE BREAKER IS CLOSED.
8. NEMA 12 CAM-LOCK SPLICE BOX SHOWING INTERNAL WIRING. REFER TO DRAWINGS FOR MINIMUM DIMENSIONS. ENSURE MINIMUM BENDING RADIUS AND WORKING SPACE IS ALLOWED INSIDE SPLICE BOX. CONFIRM DIMENSIONS WITH MANUFACTURER EQUIPMENT SIZES AND ADJUST AS NEEDED AT NO ADDITIONAL COST.
9. 400A, 480V RATED NON-FUSED DISCONNECT SWITCH IN NEMA 12 ENCLOSURE. C/W KEY INTERLOCK TO PREVENT OPENING OF SWITCH WHILE UPSTREAM BREAKER IS CLOSED.
10. 53mm CONDUIT WALL SLEEVES BETWEEN INTERIOR JUNCTION BOX AND OUTDOOR SERVICE ASSEMBLY. EDGES TO BE SEALED WITH WATERTIGHT CAULKING TO PREVENT LEAKS AND INTERIOR TO BE SEALED AFTER CONDUCTORS ARE INSTALLED TO PREVENT VAPOUR MIGRATION.
11. 2x3c#3/0 Conductors from 480V, 400A DISCONNECT SWITCH SECONDARY TERMINALS TO CAM-LOCK TERMINALS.
12. 1#3/0 Conductors CONNECTED TO CAM-LOCK TERMINALS VIAL IRREVERSIBLE COMPRESSION STYLE LUG PER 2 PHASE (TYPICAL).
13. 200A, 120/208V RATED NON-FUSED DISCONNECT SWITCH IN NEMA 12 ENCLOSURE. C/W KEY INTERLOCK TO PREVENT OPENING OF SWITCH WHILE UPSTREAM BREAKER IS CLOSED.
14. 53mm EMT CONDUIT BETWEEN DISCONNECT SWITCH AND CAM-LOCK SPLICE BOX.
15. 3c#3/0 Conductors from 120/208V, 200A DISCONNECT SWITCH SECONDARY TERMINALS TO CAM-LOCK TERMINALS.
16. 1#3/0 Conductor CONNECTED TO CAM-LOCK TERMINALS VIAL IRREVERSIBLE COMPRESSION STYLE LUG, ONE PER PHASE (TYPICAL).
17. 480V AND 120/208V SECTION DIVIDER WALL BETWEEN BOTH SERVICE COMPARTMENTS. EACH COMPARTMENT TO BE TREATED AS SEPARATE CELL TO ALLOW FOR WORK/MAINTENANCE ON ONE CELL WHILE OTHER IS ENERGIZED.
18. EPDM TYPE RUBBER GASKET SEAL INSTALLED IN BOTTOM OF EACH CELL. TO BE STIFF TO PREVENT INTRUSION OF WATER/WEATHER AND DEBRIS BUT ALLOW CABLE TO BE PULLED THROUGH AND CONNECTED TO CAM-LOCK PLUGS.
19. 2x53mm EMT CONDUIT FROM INTERIOR JUNCTION BOX TO 480V SWITCHBOARD. REFER TO 5101 FOR CONDUIT ROUTE.
20. CONDUIT JUNCTION BOX
21. ANGLED ROOF TO PREVENT WATER POOLING.
22. DRIP GUARD AT EDGE OF ROOF.
23. FUSED DISCONNECT SWITCH HANDLE, ENSURE CLEARANCE IS MAINTAINED TO ALLOW EASY OPERATION.
24. ANGLE CAM-LOCK PLUGS AT 30° TO ALLOW FOR EASE OF CONNECTION.
25. WATER DRAIN HOLE AT BOTTOM OF WALL MOUNTED SERVICE ASSEMBLY.
26. 1x53mm EMT CONDUIT FROM INTERIOR JUNCTION BOX TO 120/208V SWITCHBOARD. REFER TO 5101 FOR CONDUIT ROUTE.
27. NOT USED
28. 1" WELDED ALUMINUM PIPE MOUNTED BELOW NEW BUILDING MOUNTED SERVICE ASSEMBLY. MOUNT BEHIND RUBBER GASKET SEAL TO ALLOW CABLES TO BE TIED OFF TO PREVENT ACCIDENTAL/NUISANCE DISCONNECTION.
29. PIPE SUPPORT STRUT ANCHORED TO CELL SEPARATION WALL.
30. 250W STRIP HEATER WITH THERMOSTAT.
31. 200A, 120/208V RATED CAM-LOCK STYLE RECEPTACLES, SINGLE POLE PER PHASE 250kCM. C/W DOUBLE THROW MICRO SWITCH FOR SAFETY INTERLOCKING OF BREAKER. (TYPICAL FOR 120/208V CELL). MICRO SWITCHES WIRES IN SERIES TO TRIGGER BREAKER TRIP IF ANY CAM-LOCK PLUG IS PULLED FROM IT'S SOCKET WHILE SYSTEM WHILE BREAKER IS CLOSED. SEPARATE TRIP FOR EACH DISCONNECT.
32. 2' TYPE 'LD' LED STRIP LIGHT, C/W LIMIT SWITCH FOR AUTOMATIC ON WHEN DOOR IS OPENED, REFER TO SHEET 5111 FOR ADDITIONAL DETAILS
33. 4' TYPE 'LC' LED STRIP LIGHT, C/W LIMIT SWITCH FOR AUTOMATIC ON WHEN DOOR IS OPENED, REFER TO SHEET 5111 FOR ADDITIONAL DETAILS
34. 1x27mm CONDUIT FROM BUILDING MOUNTED SERVICE ASSEMBLY TO 120/208V SWITCHBOARD FOR REMOTE TRIPPING OF 120/208V SERVICE BREAKERS.
35. 1x27mm CONDUIT FROM BUILDING MOUNTED SERVICE ASSEMBLY TO 120/208V SWITCHBOARD FOR HEATING AND LIGHTING CIRCUIT.
36. 1x27mm CONDUIT FROM BUILDING MOUNTED SERVICE ASSEMBLY TO 480V SWITCHBOARD FOR REMOTE TRIPPING OF 480V SERVICE BREAKER.

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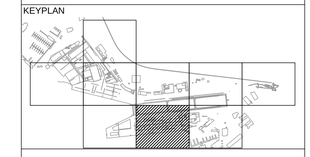

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Client/client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet

825 ADMIRALS ROAD VICTORIA BC ESQUIMALT GRAVING DOCK ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

Designed by/Concept par
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Preetipal Paul

Drawing title/Titre du dessin

LIFT STATION CONTROL PANEL

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.062548.2	5121	5

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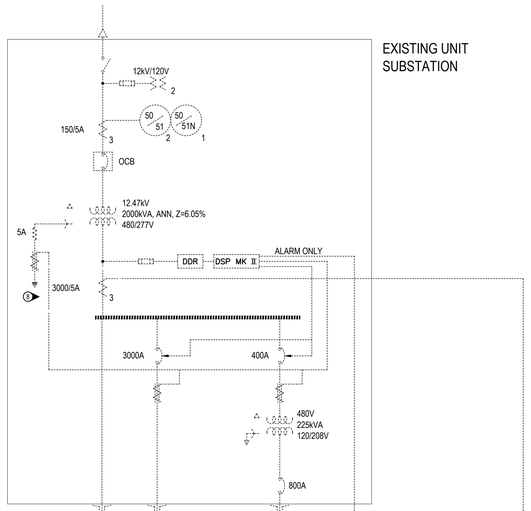
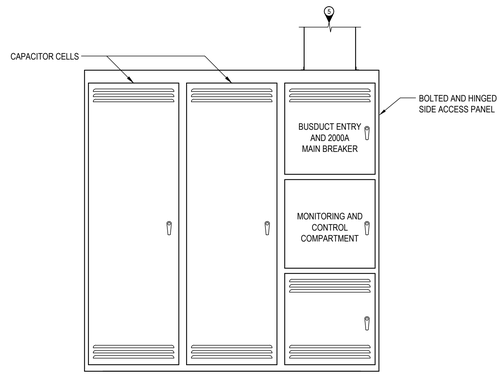
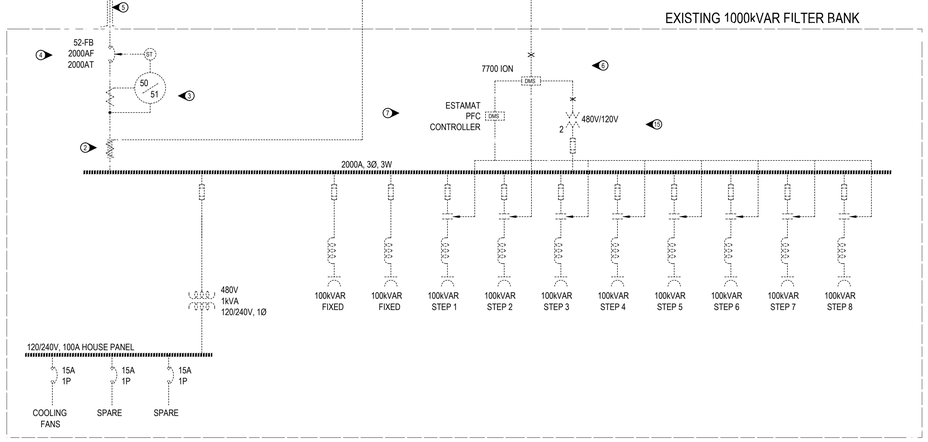
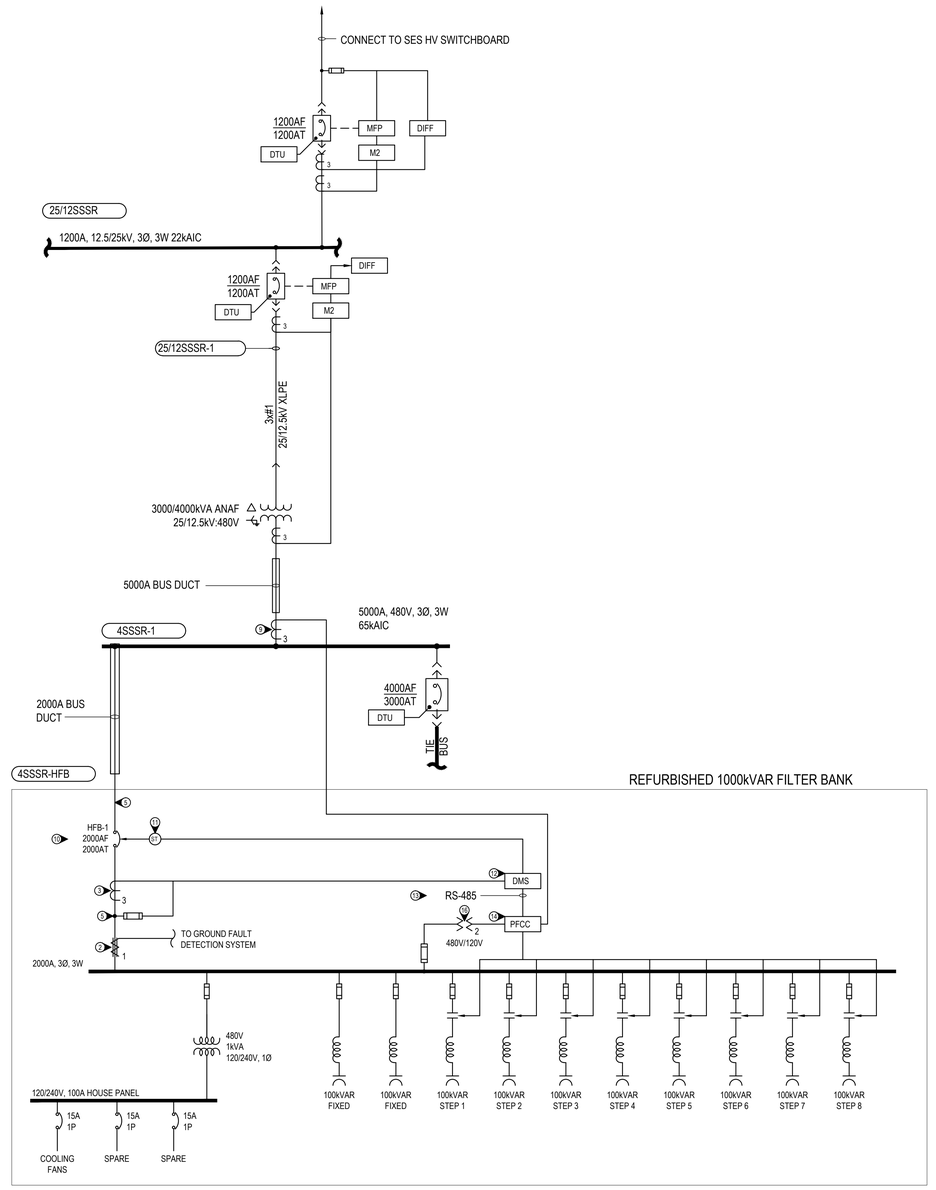




2 / 5122 480V HARMONIC FILTER BANK EXTERIOR ELEVATION
NTS



1 / 5122 EXISTING SSS 480V HARMONIC FILTER BANK PARTIAL SINGLE LINE DIAGRAM
SCALE 1:20



3 / 5122 REFURBISHED SSSR 480V HARMONIC FILTER BANK PARTIAL SINGLE LINE DIAGRAM
SCALE 1:20

KEYNOTES:

1. EXTENT OF EXISTING HARMONIC FILTER BANK. SYSTEM TO BE RELOCATED TO NEW SUBSTATION BUILDING, REFURBISHED AND RE-COMMISSIONED.
2. EXISTING ZSCT GROUND FAULT PROTECTION SYSTEM SENSORS, TO BE REMOVED AND REPLACED WITH NEW DURING REFURBISHMENT. CO-ORDINATE NEW EQUIPMENT WITH BUS AMPERAGE RATING AS WELL AS PHYSICAL DIMENSIONS OF BUS BARS AND CONDUCTORS.
3. EXISTING PROTECTION CT'S AND 50/51 PROTECTION RELAY TO BE REMOVED AND REPLACED DURING REFURBISHMENT. CO-ORDINATE NEW EQUIPMENT WITH BUS AMPERAGE RATING AS WELL AS PHYSICAL DIMENSIONS OF BUS BARS AND CONDUCTORS.
4. EXISTING MERLIN GERIN 2000A BREAKER TO REMAIN. EXISTING SHUNT TRIP TO BE RE-USED WITH NEW PROTECTION DEVICES. RE-COMMISSIONED AND CONFIRM CORRECT OPERATION AS PART OF FILTER BANK REFURBISHMENT.
5. DISCONNECT EXISTING BUS DUCT AS PART OF HARMONIC FILTER BANK RELOCATION. ENSURE TERMINALS ARE SPACES AND ORIENT AS REQUIRED TO CONNECT TO NEW BUS DUCT IN SSSR.
6. EXISTING ION 7700 PROTECTION AND CONTROL METER. TO BE REPLACED WITH NEW DMS STYLE METER FOR PROTECTION AND REPORTING TO SCADA SYSTEM.
7. EXISTING ESTAMATE POWER FACTOR CORRECTION SYSTEM CONTROLLER TO BE REPLACED WITH NEW POWER FACTOR CORRECTION CONTROLLER (PFCC).
8. EXISTING CT'S TO BE DISPOSED OF AS PART OF SSS DEMOLITION.
9. NEW CT'S LOCATED IN 4SSSR-1 SWITCHBOARD FOR PFCC INPUT.
10. EXISTING BREAKER TO BE RECONNECTED TO NEW 2000A BUS DUCT.
11. EXISTING BREAKER SHUNT TRIP TO BE CONNECTED TO NEW DMS PROTECTION METER.
12. NEW DMS PROTECTION AND MONITORING METER. TO BE USED FOR DIGITAL METERING AND PROTECTION ON 2000A MAIN BREAKER TO ALLOW FOR CO-ORDINATION AND EQUIPMENT PROTECTION. TO COMMUNICATE WITH NEW PFCC SYSTEM AND REPORT BACK TO SCADA WITH THE FOLLOWING DATA (VOLTAGE, AMPERES, kVA, kVAR, PFCC STATUS AND ALARMS, CAPACITOR STEPS.
13. PFCC AND DMS TO BE CAPABLE OF COMMUNICATION VIA RS-485. SYSTEM IS TO COMMUNICATE BETWEEN THESE TWO DEVICES VIA DIGITAL MEANS.
14. POWER FACTOR CORRECTION CONTROLLER. SELECTED TO REPLACE EXISTING ESTAMATE SYSTEM. TO BE CAPABLE OF DIGITAL COMMUNICATION WITH DMS AND SCADA SYSTEM. REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION.
15. PROVIDE NEW PT 120:480V FOR DMS PROTECTION METER INPUTS.
16. REUSE EXISTING 120:480V PT FOR PFCC INPUT.

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825 ADMIRALS ROAD
VICTORIA, BC, V9A 2P1

Project title/Titre du projet
825 ADMIRALS ROAD VICTORIA BC
ESQUIMALT GRAVING DOCK
ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

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HARMONIC FILTER BANK EXISTING AND REVISED SINGLE LINE DIAGRAM

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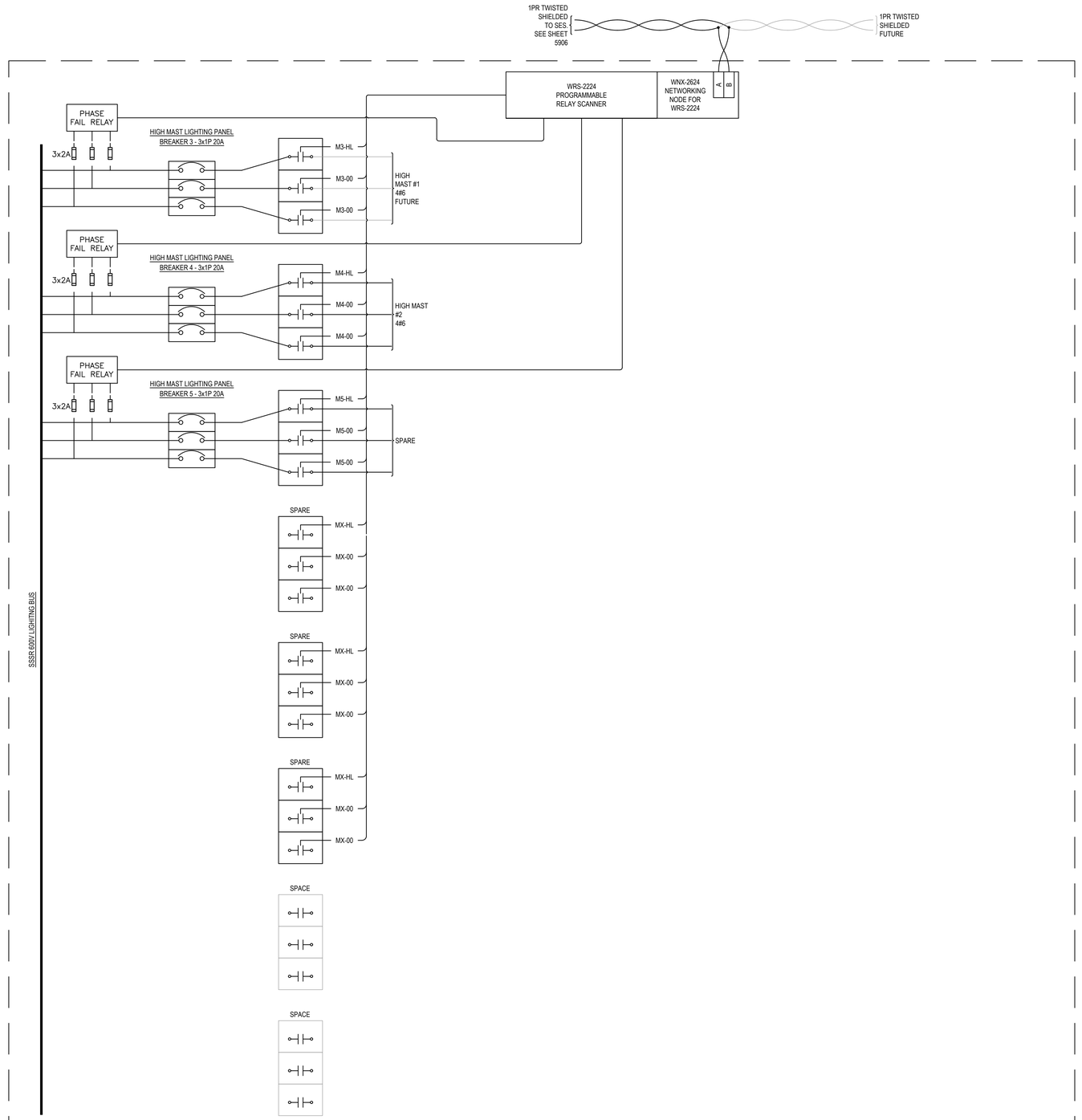

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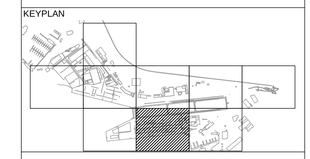

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ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet

825 ADMIRALS ROAD VICTORIA BC ESQUIMALT GRAVING DOCK ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

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Drawing title/Titre du dessin

SOUTH SIDE SUBSTATION REPLACEMENT HIGH MAST LIGHTING CONTROLLER WIRING DIAGRAM

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.062548.2	5123	5

GENERAL NOTES

1. ALL LV LOADS HAVE BEEN TRANSITIONED TO THE SSSR AT WHICH TIME THE TEMPORARY FEED TO THE SSSR WILL BE DISCONNECTED AND REMOVED. ALL EXISTING ELECTRICAL DISTRIBUTION EQUIPMENT , ASIDE FROM THE SMALL POWER PANELS AND FIRE ALARM EQUIPMENT, TO BE REMOVED FROM THE SSS AND COMPRESSOR ROOM.

KEY NOTES:

(1) EXISTING PANEL '2SL' TO BE REFED FROM NEW ELECTRICAL DISTRIBUTION 2SSSR-SP-1, REFER TO SHEET 5108 FOR ADDITIONAL DETAILS.

(2) EXISTING CABLES TO BE DISCONNECTED FROM SOUTH SIDE SUBSTATION SERVICES AND REMOVED, EXISTING CABLE TRAY TO BE DISMOUNTED AND REMOVED. REFER TO SHEET 5108 FOR ADDITIONAL DETAILS. DURING CONSTRUCTION PROVIDE TEMPORARY CONNECTION BETWEEN EXISTING STANDBY POWER PANEL AND EXISTING TRANSFER SWITCH TO ALLOW FOR UNINTERRUPTED OPERATION.

(3) EXISTING WALL MOUNTED SPLITTER BOX AND INTERNAL ELECTRICAL DISCONNECT AND CONNECTION BOX TO BE REMOVED.

(4) EXISTING WALL MOUNTED OUTDOOR LIGHT TO BE REMOVED

(5) EXISTING WALL MOUNTED SIREN TO BE REMOVED.

(6) EXISTING CCTV CAMERA CONTROL BOX AND FIBRE PATCH PANELS TO BE REMOVED AFTER TRANSFER AND COMMISSIONING OF COMMUNICATION SYSTEM IN NEW SSSR IS COMPLETE.

(7) NOT USED

(8) SCADA CONTROL AND SIGNALING DUCT WORK TO BE REMOVED AFTER TRANSFER AND COMMISSIONING OF NEW SSSR SCADA SYSTEM IS COMPLETE.

(9) EXISTING SCADA CONTROL PANELS TO BE REMOVED AFTER TRANSFER AND COMMISSIONING OF NEW SSSR SCADA SYSTEM IS COMPLETE. ANY SERVICES CONNECTED TO MEASUREMENT INSTRUMENTS OUTSIDE EXISTING SOUTH SIDE SUBSTATION TO BE TRANSFERRED TO NEW METERS LOCATED IN NEW SSSR SCADA PANEL.

(10) SOUTH SIDE OVERHEAD TECK CABLES AND CABLE TRAYS
- REMOVE ALL CONDUITS, CABLES, RACKS AND HARDWARE RELATED AFTER EXISTING CONDUCTORS ARE DISCONNECTED.
- PATCH ALL WALL ANCHOR POINTS AND PAINT TO MATCH EXISTING WALL COLOUR.
- SEAL ALL WALL PENETRATIONS, REMOVE ALL WALL PENETRATION SLEEVES, CONDUITS, AND JOINTS AND SEAL WITH WATERPROOF GROUT. SMOOTH AND PAINT TO MATCH EXISTING.

(11) SOUTH SIDE SUBSTATION 347/600V SWITCHBOARD 6SB DISTRIBUTION:
- TRANSFER ALL REMAINING LOADS IN THIS SWITCHBOARD TO NEW PANEL 6SSSR-SP.
- INSTALL CONTINUOUS NEW HOME RUNS WHERE SPECIFIED.
- DISCONNECT THE CELL AND REMOVE ENTIRELY WHEN ALL CIRCUITS HAVE BEEN TRANSFERRED.
- REPAIR AND PATCH ALL FLOOR/WALL PENETRATION AT EACH SWITCHGEAR CELL.
- REMOVE ALL REDUNDANT CONDUITS, CABLES, RACKS AND HARDWARE RELATED TO THE DISTRIBUTION.

(12) SOUTH SIDE SUBSTATION 2.4kV SWITCHBOARD 2.4SS DISTRIBUTION:
- TRANSFER ALL TRAVELING CRANE LOAD IN THIS PANEL TO 2.4kV DISTRIBUTION IN NEW SSSR SECOND FLOOR
- INSTALL CONTINUOUS NEW HOME RUNS WHERE SPECIFIED.
- DISCONNECT THE CELLS AND REMOVE THEM ENTIRELY WHEN ALL CIRCUITS HAVE BEEN TRANSFERRED.
- REPAIR AND PATCH ALL FLOOR/WALL PENETRATION AT EACH SWITCHGEAR CELL.
- REMOVE ALL REDUNDANT CONDUITS, CABLES, RACKS AND HARDWARE RELATED TO THE DISTRIBUTION.

(13) SOUTH SIDE SUBSTATION 480V SWITCHBOARD 4SS2 DISTRIBUTION:
- TRANSFER ALL REMAINING LOADS IN THIS PANEL TO NEW 4SSSR-2 SWITCHBOARD.
- INSTALL CONTINUOUS NEW HOME RUNS WHERE SPECIFIED.
- DISCONNECT THE CELLS AND REMOVE THEM ENTIRELY WHEN ALL CIRCUITS HAVE BEEN TRANSFERRED.
- REPAIR AND PATCH ALL FLOOR/WALL PENETRATION AT EACH SWITCHGEAR CELL.
- REMOVE ALL REDUNDANT CONDUITS, CABLES, RACKS AND HARDWARE RELATED TO THE DISTRIBUTION.

(14) SOUTH SIDE SUBSTATION 120/208V SWITCHBOARD 2SS2 DISTRIBUTION:
- TRANSFER ALL REMAINING LOADS IN THIS PANEL TO NEW 2SSSR-1 SWITCHBOARD.
- INSTALL CONTINUOUS NEW HOME RUNS WHERE SPECIFIED.
- DISCONNECT THE CELLS AND REMOVE THEM ENTIRELY WHEN ALL CIRCUITS HAVE BEEN TRANSFERRED.
- REPAIR AND PATCH ALL FLOOR/WALL PENETRATION AT EACH SWITCHGEAR CELL.
- REMOVE ALL REDUNDANT CONDUITS, CABLES, RACKS AND HARDWARE RELATED TO THE DISTRIBUTION.

(15) NOT USED

(16) EXISTING OVERHEAD FEEDER BUS DUCTS TO BE DISCONNECTED AND REMOVED AFTER ALL LOADS ARE TRANSFERRED AND CONNECTED PANELS/DEVICES ARE DECOMMISSIONED.

(17) EXISTING 480V 1000kVAR HARMONIC FILTER BANK TO BE RELOCATED INTO NEW SSSR SUBSTATION AND RECOMISSIONED. REFER TO SHEET 5101 AND SHEET 5031 FOR EQUIPMENT LOCATION INFORMATION AND SHEET XXXX FOR EQUIPMENT RECOMMISSIONING INFORMATION.

(18) SOUTH SIDE SUBSTATION 480V SWITCHBOARD 4SS1 DISTRIBUTION:
- EXISTING 480V, 3000A MAIN BREAKER AND BUS DUCT CONNECTION CELLS TO BE DISCONNECTED AND REMOVED
- EXISTING 480V, 400A MAIN BREAKER, 225/12.5kVA 480-120/208V STEP DOWN TRANSFORMER AND 800A 120/208V SECONDARY BREAKER AND BUS DUCT CONNECTION CELLS TO BE REMOVED.

(19) SOUTH SIDE SUBSTATION T12.5SS-1 12.5kV:480V 2000kVA STEP DOWN TRANSFORMER
- DISCONNECT THE CELL AND REMOVE ENTIRELY WHEN ALL CIRCUITS HAVE BEEN TRANSFERRED.
- REPAIR AND PATCH ALL FLOOR/WALL PENETRATION AT EACH SWITCHGEAR CELL.
- REMOVE ALL REDUNDANT CONDUITS, CABLES, RACKS AND HARDWARE RELATED TO THE DISTRIBUTION.

(20) SOUTH SIDE SUBSTATION 12.5kV MAIN BREAKER AND DISCONNECT SWITCH CELLS
- DISCONNECT THE CELL AND REMOVE ENTIRELY WHEN ALL CIRCUITS HAVE BEEN TRANSFERRED.
- REPAIR AND PATCH ALL FLOOR/WALL PENETRATION AT EACH SWITCHGEAR CELL.
- REMOVE ALL REDUNDANT CONDUITS, CABLES, RACKS AND HARDWARE RELATED TO THE DISTRIBUTION.
- DISCONNECT AND REMOVE TEMPORARY FEED FROM SSSR. REFER TO SHEET 5101 FOR TEMPORARY FEED DETAILS.

(21) SOUTH SIDE SUBSTATION 480-600V TRANSFORMER T4SS2
- DISCONNECT THE TRANSFORMER AND REMOVE ENTIRELY WHEN ALL LOADS HAVE BEEN TRANSFERRED.
- REPAIR AND PATCH ALL FLOOR/WALL PENETRATION AT EACH SWITCHGEAR CELL.
- REMOVE ALL REDUNDANT CONDUITS, CABLES, RACKS AND HARDWARE RELATED TO THE INSTALLATION.

(22) SOUTH SIDE SUBSTATION 600V-120 TRANSFORMER T6SB-2
- DISCONNECT THE TRANSFORMER AND REMOVE ENTIRELY WHEN ALL LOADS HAVE BEEN TRANSFERRED.
- REPAIR AND PATCH ALL FLOOR/WALL PENETRATION AT EACH SWITCHGEAR CELL.
- REMOVE ALL REDUNDANT CONDUITS, CABLES, RACKS AND HARDWARE RELATED TO THE INSTALLATION.

(23) SOUTH SIDE SUBSTATION 600V-480 TRANSFORMER T4SB-2
- DISCONNECT THE TRANSFORMER AND REMOVE ENTIRELY WHEN ALL LOADS HAVE BEEN TRANSFERRED.
- REPAIR AND PATCH ALL FLOOR/WALL PENETRATION AT EACH SWITCHGEAR CELL.
- REMOVE ALL REDUNDANT CONDUITS, CABLES, RACKS AND HARDWARE RELATED TO THE INSTALLATION.

(24) SOUTH SIDE SUBSTATION 208V PANEL '2SK' DISTRIBUTION:
- EXISTING NON BUILDING LOADS TO BE TRANSFERRED TO NEW 208V PANEL IN SSSR 2SSSR-1
- REPAIR AND PATCH ALL FLOOR/WALL PENETRATIONS AT PANEL.
- REMOVE ALL REDUNDANT CONDUITS, CABLES, RACKS AND HARDWARE RELATED TO THE DISTRIBUTION.
- EXISTING PANEL AND BREAKERS TO BE RETAINED. MARK ALL UNUSED BREAKERS AS SPARES.

(25) SOUTH SIDE SUBSTATION 480V PANEL '4SA' DISTRIBUTION:
- EXISTING LOADS TO BE TRANSFERRED TO NEW 480V STANDBY PANEL IN SSSR 4SSSR-SP
- REPAIR AND PATCH ALL FLOOR/WALL PENETRATIONS AT PANEL.
- REMOVE ALL REDUNDANT CONDUITS, CABLES, RACKS AND HARDWARE RELATED TO THE DISTRIBUTION, PANEL TO BE DISMOUNTED AND DISPOSED OF.

(26) EXISTING 480V, 200A DISCONNECT TO BE REMOVED AND ALL WALL PENETRATIONS AND ANCHOR POINTS PATCHED, SEALED AND REPAIRED.

(27) EXISTING 480V POWER FEED FROM SOUTH SIDE SUBSTATION TO VICTORIA SHIPYARDS BARKER BUILDING. AFTER TRANSFER OF BARKER BUILDING FEEDS TO NEW 4SSSR-2 SWITCHBOARD AND RECONNECTION OF BARKER BUILDING VIA EXISTING DUCT BANK EXISTING TECK FEEDERS ARE TO BE REMOVED, WALL PENETRATIONS TO BE SEALED AND PAINTED TO MATCH EXISTING WALL COLOUR. CONDUIT STUBS TO BE CAPPED FOR FUTURE USE.

(28) EXISTING COMMUNICATIONS AND FIRE ALARM SERVICES FROM SOUTH SIDE SUBSTATION TO VICTORIA SHIPYARDS BARKER BUILDING. AFTER TRANSFER OF BARKER BUILDING SERVICES TO NEW SOUTH SIDE SUBSTATION TELECOM VIA EXISTING DUCT BANK; EXISTING CONDUCTORS, LB'S AND PULL BOXES ARE TO BE REMOVED, WALL PENETRATIONS TO BE SEALED AND PAINTED TO MATCH EXISTING WALL COLOUR. CONDUIT STUBS TO BE CUT DOWN TO 100mm ABOVE CONCRETE PILASTER AND CAPPED FOR FUTURE USE.

(29) EXISTING COMMUNICATIONS, SCADA, FIRE ALARM AND POWER CONNECTIONS FROM SOUTH SIDE SUBSTATION TO EXISTING PULL BOXES NEAR HIGH MAST LIGHTING. EXISTING SERVICES TO BE RECONNECTED VIA EXISTING DUCT BANK TO NEW SSSR, AND ALL CONDUITS CUT BACK TO 100mm ABOVE PILASTER AND CAPPED AS SPARE. WALL PENETRATIONS TO BE SEALED AND PAINTED TO MATCH EXISTING WALL COLOUR.

(30) EXISTING JETTY MOUNT SERVICE TO BE REMOVED. EXISTING TECK CABLES TO BE REMOVED FROM CONDUITS AND DISPOSED OF. EXISTING COMMUNICATIONS CABLES TO BE REMOVED FROM CONDUITS AND DISPOSED OF. ALL DIRECT BURIED CABLES TO BE DISCONNECTED AND MADE SAFE. ALL CONDUITS TO BE CUT DOWN TO 100mm ABOVE PILASTER AND CAPPED AS SPARE. WALL PENETRATIONS TO BE SEALED AND PAINTED TO MATCH EXISTING WALL COLOUR. EXISTING EXTERIOR AND INTERIOR WALL MOUNTED CABLE TRAY TO BE REMOVED.

(31) EXISTING SOUTH SIDE SUBSTATION INTERIM HIGH VOLTAGE, LOW VOLTAGE AND COMMUNICATIONS SERVICE. AFTER TRANSFER TO LOADS THESE SERVICES ARE TO BE DISCONNECTED. HIGH VOLTAGE FEED FROM SSSR TO BE PULLED OUT OF DUCT BANK AND DISPOSED OF, LOW VOLTAGE TO BE TRANSFERRED TO APPROPRIATE SSSR SWITCHBOARDS.
ALL CONDUITS TO BE CUT DOWN TO 100mm ABOVE PILASTER AND CAPPED AS SPARE. WALL PENETRATIONS TO BE SEALED AND PAINTED TO MATCH EXISTING WALL COLOUR. EXISTING EXTERIOR AND INTERIOR WALL MOUNTED CABLE TRAY TO BE REMOVED.

(32) EXISTING SOUTH SIDE SUBSTATION ACCESS STAIRWAY TO BE REMOVED DURING SSSR CONSTRUCTION PHASE AND REINSTATED BEFORE FINAL HAND OVER TO PUBLIC WORKS. REFER TO ARCHITECTURAL AND CIVIL SHEETS FOR ADDITIONAL INFORMATION.

(33) EXISTING WALL MOUNTED TUNNEL LIGHTS TO BE REMOVED AND RELOCATED TO OPPOSITE SIDE OF TUNNEL WALL AFTER NEW SSSR SPLICE BOXES AND LOAD TRANSFER IS COMPLETE.

(34) EXISTING JUNCTION BOX TO BE REMOVED

(35) EXISTING SERVICE METER TO BE REMOVED.

(36) EXISTING ROPE LIGHTS SPLICE BOX TO BE REMOVED AFTER RECONNECTION OF ROPE LIGHTS VIA TUNNEL SPLICES.

(37) EXISTING DISCONNECT SWITCH TO BE REMOVED, SERVICE TO BE RECONNECTED FROM NEW SSSR 480V SWITCHBOARD

(38) COMPRESSOR ROOM 600V SWITCHBOARD 6SC
- DISCONNECT THE TRANSFORMER AND REMOVE ENTIRELY WHEN ALL LOADS HAVE BEEN TRANSFERRED.
- REPAIR AND PATCH ALL FLOOR/WALL PENETRATION AT EACH SWITCHGEAR CELL.
- REMOVE ALL REDUNDANT CONDUITS, CABLES, RACKS AND HARDWARE RELATED TO THE INSTALLATION, PANEL TO BE DISMOUNTED AND DISPOSED OF.

(39) COMPRESSOR ROOM T2.4-SC 2.4kV:600V 1000kVA STEP DOWN TRANSFORMER
- DISCONNECT THE CELL AND REMOVE ENTIRELY WHEN ALL CIRCUITS HAVE BEEN TRANSFERRED.
- REPAIR AND PATCH ALL FLOOR/WALL PENETRATION AT EACH SWITCHGEAR CELL.
- REMOVE ALL REDUNDANT CONDUITS, CABLES, RACKS AND HARDWARE RELATED TO THE DISTRIBUTION.

(40) COMPRESSOR ROOM 2.4kV MAIN BREAKER AND DISCONNECT SWITCH CELLS
- DISCONNECT THE CELL AND REMOVE ENTIRELY WHEN ALL CIRCUITS HAVE BEEN TRANSFERRED.
- REPAIR AND PATCH ALL FLOOR/WALL PENETRATION AT EACH SWITCHGEAR CELL.
- REMOVE ALL REDUNDANT CONDUITS, CABLES, RACKS AND HARDWARE RELATED TO THE DISTRIBUTION.

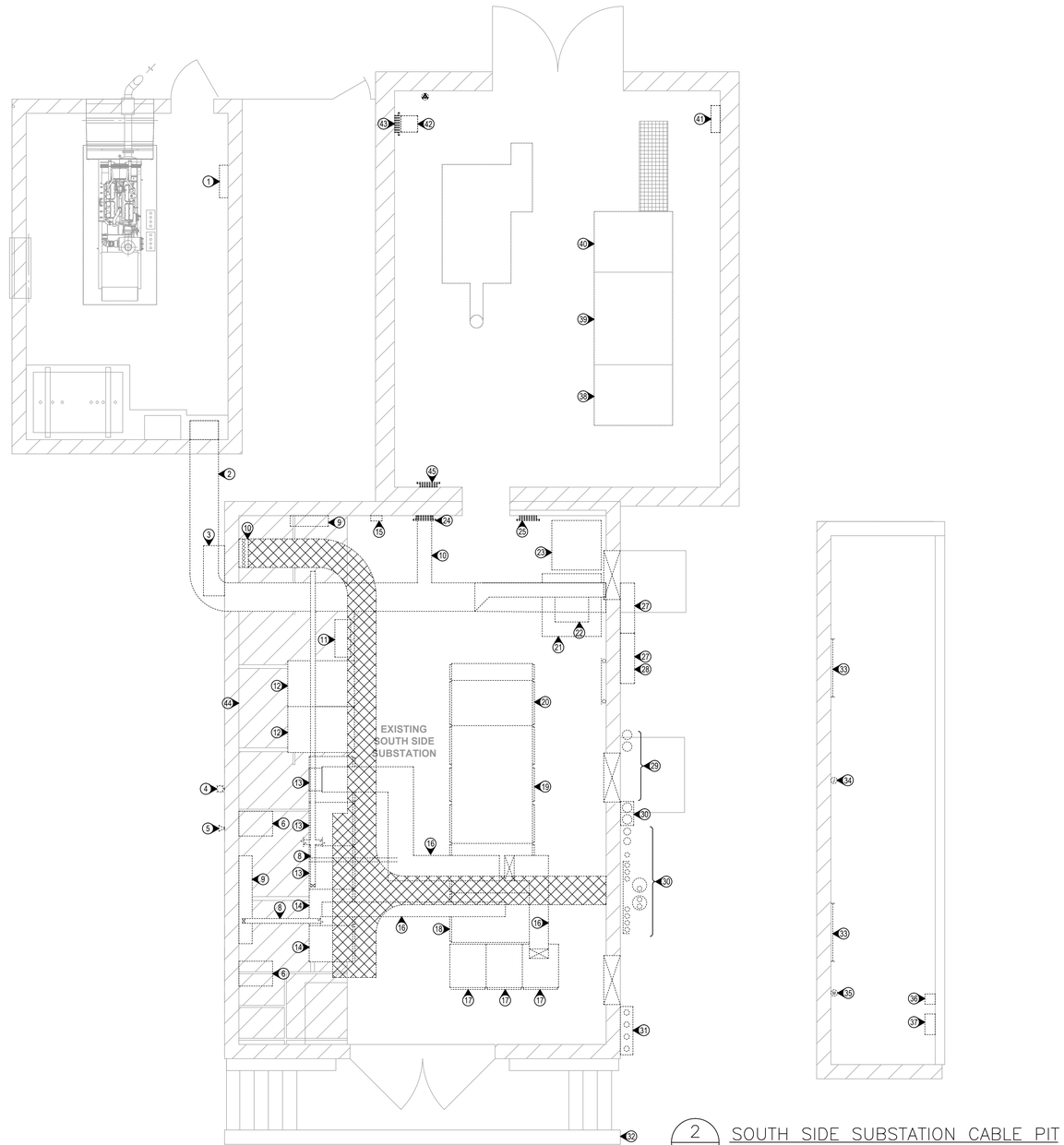
(41) COMPRESSOR ROOM SCADA PANEL COMMUNICATION FEEDS TO BE TRANSFERRED TO NEW SSSR SCADA PANEL.

(42) EXISTING COMPRESSOR ROOM 10kVA 600-120/240V TRANSFORMER TO BE REMOVED

(43) EXISTING 120/240V COMPRESSOR ROOM CONTROL POWER PANEL TO BE REFED FROM 2SSSR-SP-1

(44) NEW SERVICE TUNNEL COVER PLATES TO BE SUPPLIED TO REPLACE EXISTING. REFER TO ARCHITECTURAL DETAILS FOR ADDITIONAL INFORMATION.

(45) EXISTING COMPRESSOR ROOM 120/208V 3Ø 4W 100A PANEL '2T' TO REMAIN.



1 / 5130 SOUTH SIDE SUBSTATION MAIN FLOOR
SCALE 1:50

2 / 5130 SOUTH SIDE SUBSTATION CABLE PIT
SCALE 1:50

0 1 2 3 4m
1:50

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5	ISSUED FOR TENDER	15/01/28
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2	ISSUED FOR 33% DESIGN REVIEW	15/10/28
1	ISSUED FOR DESIGN DEVELOPMENT	15/09/11
0		

Client/client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet
825 ADMIRALS ROAD VICTORIA BC ESQUIMALT GRAVING DOCK ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

Designed by/Concept par
I. BARNES

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PWGSC, Regional Manager, Architectural and Engineering Services/ Gestionnaire régionale, Services d'architectural et de génie, TPSGC
Preetipal Paul

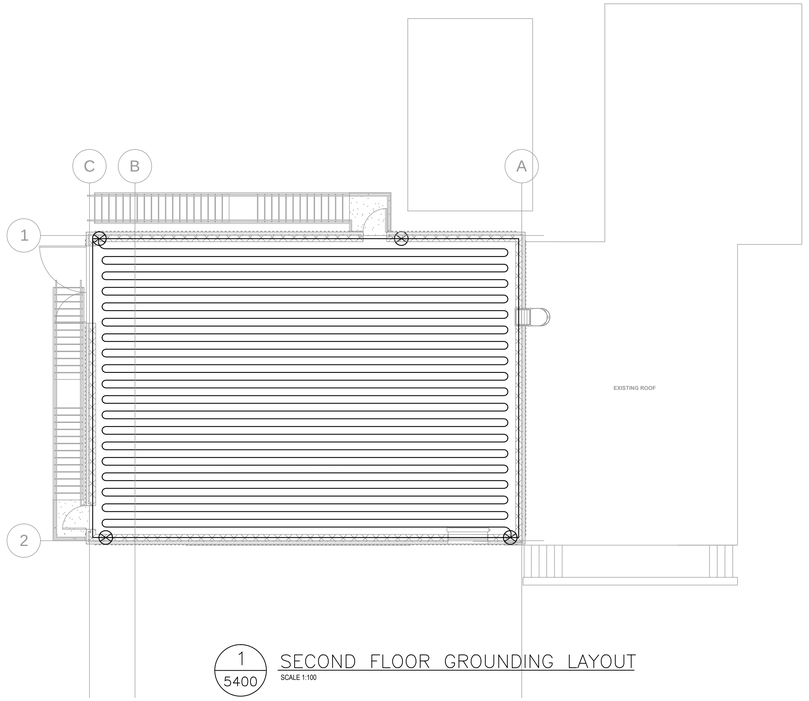
Drawing title/Titre du dessin

EXISTING SOUTH SIDE SUBSTATION DEMOLITION AND REMEDIATION WORK

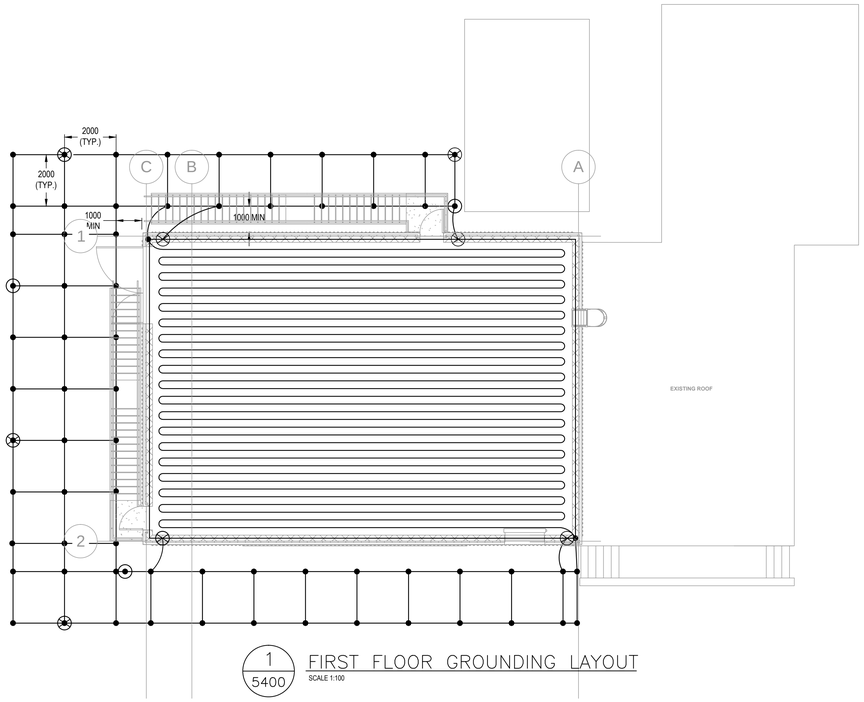
Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.062548.2	5130	5

Plot Date: February 5, 2016 2:54 PM — Plotted by: Jacob Bieling
File Name: N:\PROJECTS\2015\1_1-5\R.062548.2\REVIT\R062548.2-5130_DEMOLITION.DWG

PWGSC – B1 – 1000X707



1/5400 SECOND FLOOR GROUNDING LAYOUT
SCALE 1:100



1/5400 FIRST FLOOR GROUNDING LAYOUT
SCALE 1:100

LEGEND	
⊙	GROUND ROD WITH ACCESS
⊠	GROUND ROD WITHOUT ACCESS
⊗	GROUND ROD CONDUCTOR RISER TO 2ND FLOOR
•	COMPRESSION CONNECTOR
———	#4/0 GROUND CONDUCTOR
———	#2/0 GROUND CONDUCTOR

GENERAL NOTES:

1. GROUNDING SYSTEM SHALL BE INSTALLED PER CANADIAN ELECTRICAL CODE.
2. BUILDING UFER GROUND CONDUCTOR CONNECTED TO GROUND GRID.
3. STEP AND TOUCH GRID SHOWN IS ON UPPER FLOOR LEVEL
4. FLOOR SHOWN IS SECOND FLOOR, GROUND CONDUCTORS TO RUN DOWN TO FIRST FLOOR GROUND LEVEL IN RISERS BEFORE ENTERING GROUND GRID AT INDICATED LOCATIONS.

0 2 4 6 8m
1:100

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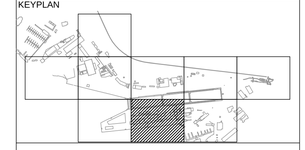

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Client/client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet

825 ADMIRALS ROAD VICTORIA BC
ESQUIMALT GRAVING DOCK
ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

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Preetipal Paul

Drawing title/Titre du dessin

SECOND FLOOR GROUNDING LAYOUT

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.062548.2	5400	5

Plot Date: January 28, 2016 11:39 AM Plotted by: Jacob Bieling
File Name: N:\PROJECTS\2015\1-15-168\DWGS\DWG SSR GROUNDING.DWG

PWGSC – B1 – 1000X707

LEGEND	
⊙	INTERCEPTING CONDUCTOR WITH DOWN CONDUCTOR CONNECTION
⊡	DOWN CONDUCTOR CONNECTION TO GROUND ROD, THERMIT TYPE CONNECTION
✕	AIR TERMINAL
•	INTERCEPTING CONDUCTOR CONNECTION TO METALLIC DEVICE ON ROOF

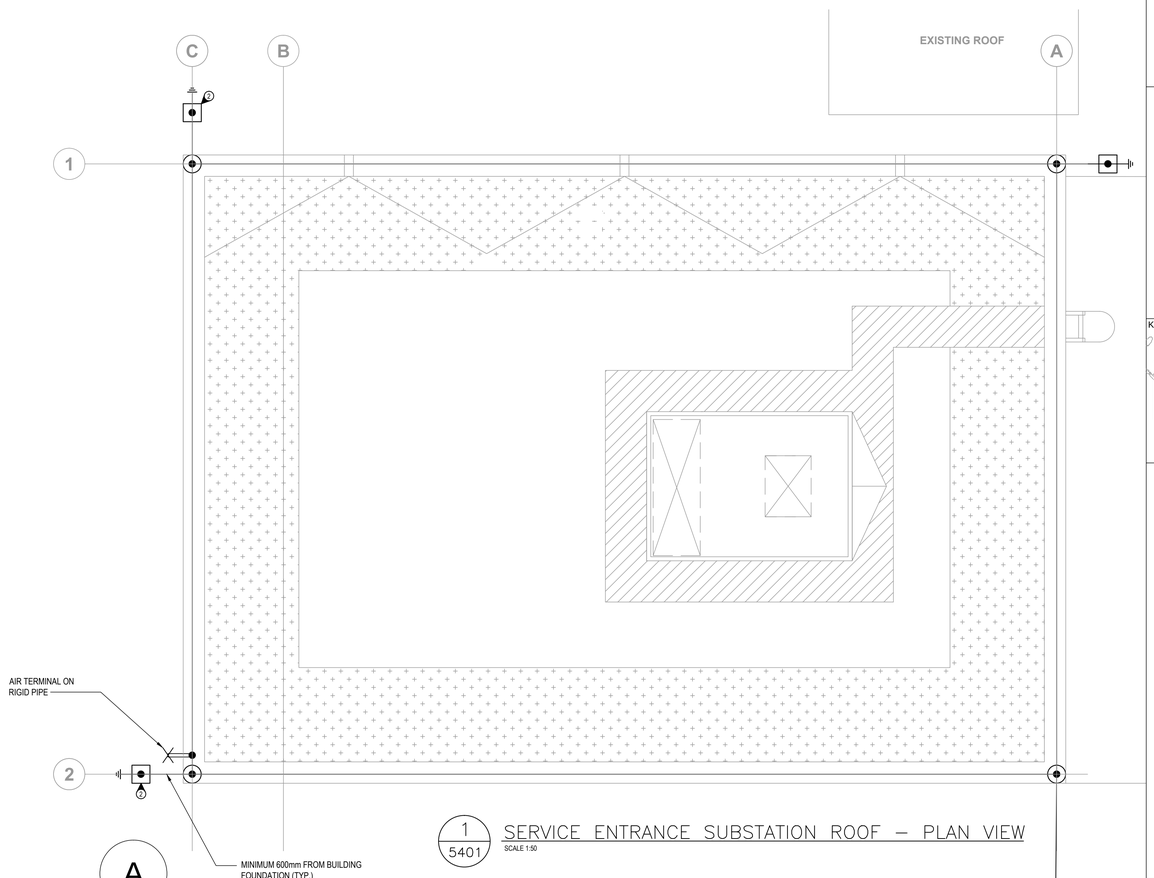
GENERAL NOTES:

1. LIGHTNING PROTECTION SYSTEM SHALL COMPLY WITH OR EXCEED REQUIREMENTS OF CAN/CSA-B72-M87 INSTALLATION CODE FOR LIGHTNING PROTECTION SYSTEMS FOR CLASS 1 INSTALLATION.
2. ALL LIGHTNING PROTECTION EQUIPMENT SHALL BE RATED MINIMUM CLASS 1 MATERIAL.
3. AS PER CAN/CSA-B72-M87 REQUIREMENT, CONTRACTOR SHALL TEST THAT LIGHTNING PROTECTION SYSTEM PROVIDES A RESISTANCE TO GROUND OF LESS THAN 50 OHMS WHEN MEASURED AT ANY POINT BETWEEN INTERCEPTING SYSTEM AND THE GROUND SYSTEM. IF NECESSARY, AUXILIARY GROUND ELECTRODES SHALL BE ADDED TO OBTAIN THIS VALUE.
4. INTERCEPTING CONDUCTORS AND DOWN CONDUCTORS SHALL BE BARE STRANDED COPPER MINIMUM #2 AWG
5. GROUND ROD, COPPER OR COPPER-CLAD STEEL TYPE MINIMUM 19mm DIAMETER x 3048mm LONG. CONNECTION TO DOWN CONDUCTORS SHALL BE MINIMUM 150mm BELOW GRADE. GROUND RODS TO BE INSTALLED IN GROUND ROD INSPECTION WELL BOX MINIMUM 300x300x450mm SIZE.
6. EACH GROUND ROD OF LIGHTNING PROTECTION SYSTEM SHALL BE CONNECTED TO THE GROUND GRID SYSTEM VIA THERMIT TYPE CONNECTION.
7. ALL CONDUCTIVE MATERIALS ON ROOF SHALL BE CONNECTED TO INTERCEPTING CONDUCTOR.
8. ALL PARAPET PENETRATIONS SHALL BE SEALED WITH SUITABLE CAULKING.
9. AIR TERMINALS SHALL BE SOLID ROD 9.5MM IN DIAMETER COPPER AND SHALL EXTEND NOT LESS THAN 50MM ABOVE HIGHEST PART OF ROOF. COORDINATE AIR TERMINAL INSTALLATION ON MECHANICAL UNIT WITH DIV 25 CONTRACTOR AND EQUIPMENT SUPPLIER.
10. DOWN CONDUCTORS SHALL BE ROUTED SUCH THAT THEY ARE NOT DIRECTLY BEHIND ANY ELECTRICAL EQUIPMENT MOUNTED ON THE INTERIOR WALL. A MINIMUM HORIZONTAL DISTANCE OF 300mm MUST BE MAINTAINED FROM ANY INTERIOR WALL MOUNTED ELECTRICAL EQUIPMENT.
11. CO-ORDINATE ANY REQUIRED SUPPORT OR GYE WIRES WITH ARCHITECTURAL AND STRUCTURAL DISCIPLINES.

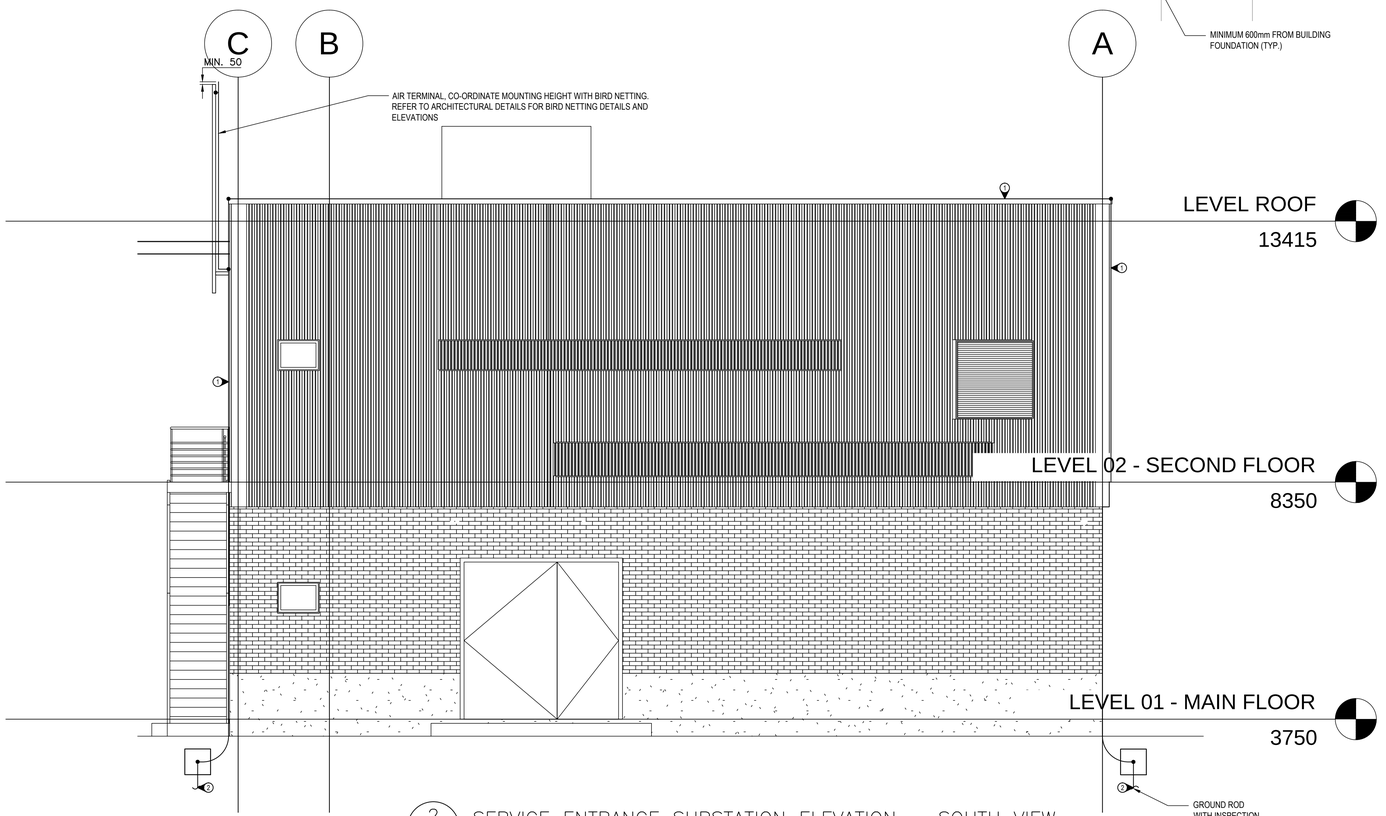
KEYNOTES:

③ INTERCEPTING CONDUCTORS AND DOWN CONDUCTORS SHALL BE BARE STRANDED COPPER MINIMUM No.2 AWG.

④ LIGHTNING GROUND RODS REQUIRED IN ADDITION TO GROUND GRID RODS. SEE SHEET 5400 FOR GROUND GRID DETAILS.



1/5401 SERVICE ENTRANCE SUBSTATION ROOF – PLAN VIEW
SCALE 1:50



2/5401 SERVICE ENTRANCE SUBSTATION ELEVATION – SOUTH VIEW
SCALE 1:100

0 1 2 3 4m
1:50

Plot Date: January 28, 2016 11:39 AM Plotted by: Jacob Bieling
File Name: H:\PROJECTS\2015\1-15-185\DWG\DWG\A01 SSR LIGHTNING PROTECTION.DWG

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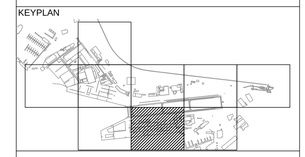
KEYPLAN



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2	ISSUED FOR 33% DESIGN REVIEW	15/10/28
1	ISSUED FOR DESIGN DEVELOPMENT	15/09/11
0		

Client/client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet

825 ADMIRALS ROAD VICTORIA BC
ESQUIMALT GRAVING DOCK
ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

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Preetipal Paul

Drawing title/Titre du dessin

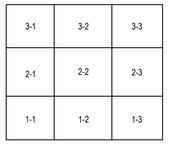
LIGHTNING PROTECTION

Project No./No. du projet	Sheet/Feuille	Revision no./ Le Révision no.
R.062548.2	**5401**	**5**

EGD DUCTBANK CONDUIT NAMING CONVENTION

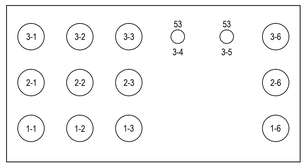
1. CONDUIT CUT SECTIONS ARE TAKEN LOOKING WEST DOWN THE SITE AND LOOKING OUT FROM EACH MANHOLE FACE OR BUILDING.

2. CONDUITS ARE NAMED ACCORDING TO THE VERTICAL AND HORIZONTAL ROW AT WHICH THEY LEAVE A MANHOLE OR BUILDING.

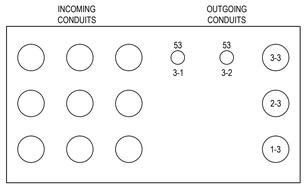


3. CONDUITS ARE NAMED FROM MANHOLE OR BUILDING IT IS COMING FROM TO THE MANHOLE OR BUILDING IT IS GOING TO. CONDUITS ARE NAMED FOR THE LOWEST NUMBERED MANHOLE TO THE NEXT BOX. SO A CONDUIT RUNNING FROM 102LV TO 105LV WOULD BE NAMED IN MANHOLE 102LV NOT 105 LV. IF CONDUIT 2-3 FROM ABOVE IS GOING FROM MANHOLES 102LV TO 105LV THEN THIS CONDUIT WOULD BE NAMED 102LV-105LV:1-1.

4. IF A SPACE EXISTS IN ONE OF THE CONDUIT ROWS OR COLUMNS IT IS SKIPPED AND ITS IDENTIFIER IS NOT USED. FOR EXAMPLE THE FOLLOWING CONDUITS ARE IDENTIFIED AS SHOWN:



5. CONDUITS ENTERING A MANHOLE VIA THE SAME FACE AS CONDUITS EXITING A MANHOLE OR BUILDING ARE IGNORED FOR THE PURPOSES OF CREATING THE EXITING CONDUIT'S MATRIX.



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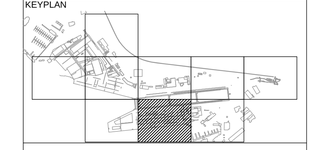

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2	ISSUED FOR 33% DESIGN REVIEW	15/10/28
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Client/client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet

825 ADMIRALS ROAD VICTORIA BC
ESQUIMALT GRAVING DOCK
ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

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Preetipal Paul

Drawing title/Titre du dessin

EGD DUCT BANK CONDUIT NAMING CONVENTION

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.062548.2	5410	5

Plot Date: January 28, 2016 11:39 AM Plotted by: Jacob Bieling
File Name: N:\PROJECTS\2015\1-15-168\DWGS\DWG\5410 CONDUIT NAMING CONVENTION.DWG

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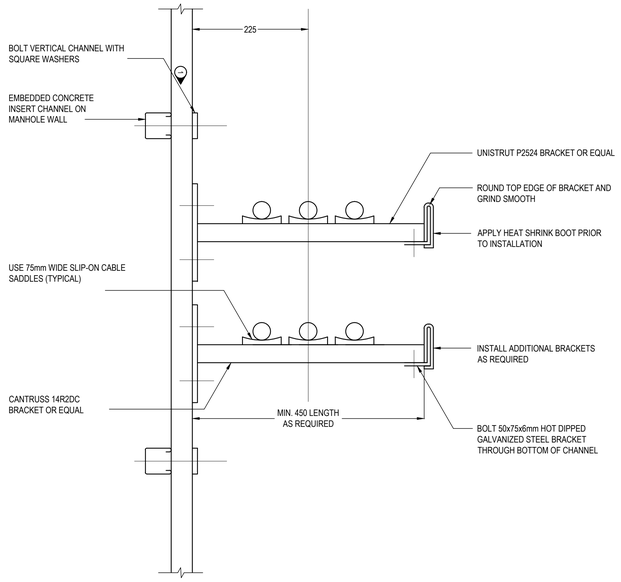
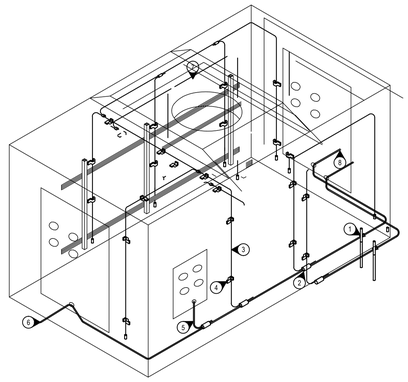


KEYNOTES:

1. CONTRACTOR TO SUPPLY 3 SETS OF 2 RACKS PER HV MANHOLE. CONTRACTOR TO INSTALL SUPPORT CANTRUSS IN LV AND COMM MANHOLES TO ALLOW INSTALLATION OF RACKS IN FUTURE.

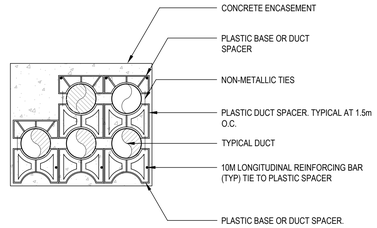
1 / 5411 TYPICAL 27kV CABLE SUPPORT IN HV MANHOLES
SCALE 1:5



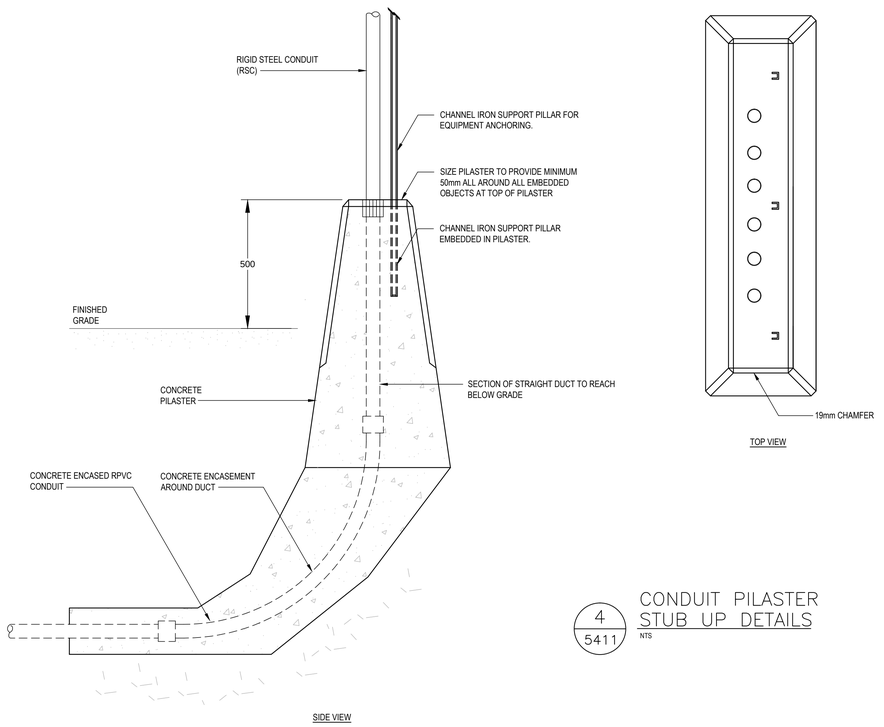
KEYNOTES:

1. INSTALL ONE GROUND ROD IN EACH MANHOLE AT SUMP END OF BASE. CONNECT TO #4/0 GROUND.
2. COMPRESSION TAP CONNECTOR
3. #2/0 BONDING CONDUCTOR FOR EACH SUPPORT STRUT LOCATION ON MANHOLE WALLS.
4. GALVANIZED CABLE STRAP
5. #4/0 AWG GREEN INSULATED GROUND FOR EACH BRANCH DUCT BANK.
6. #4/0 AWG GREEN INSULATED GROUND TO MAIN SUBSTATION.
7. FOR LID FRAME GROUNDING SEE REFERENCE 1.
8. TO NEXT MANHOLE WHERE APPLICABLE.

2 / 5411 HV MANHOLE GROUNDING DETAILS
N.T.S.



3 / 5411 DUCT INSTALLATION WITH PLASTIC SPACERS
N.T.S.



4 / 5411 CONDUIT PILASTER STUB UP DETAILS
NTS

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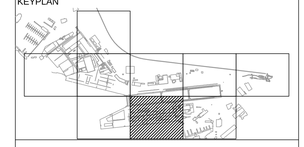

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Client/client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet
825 ADMIRALS ROAD VICTORIA BC
ESQUIMALT GRAVING DOCK
ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

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Preetipal Paul

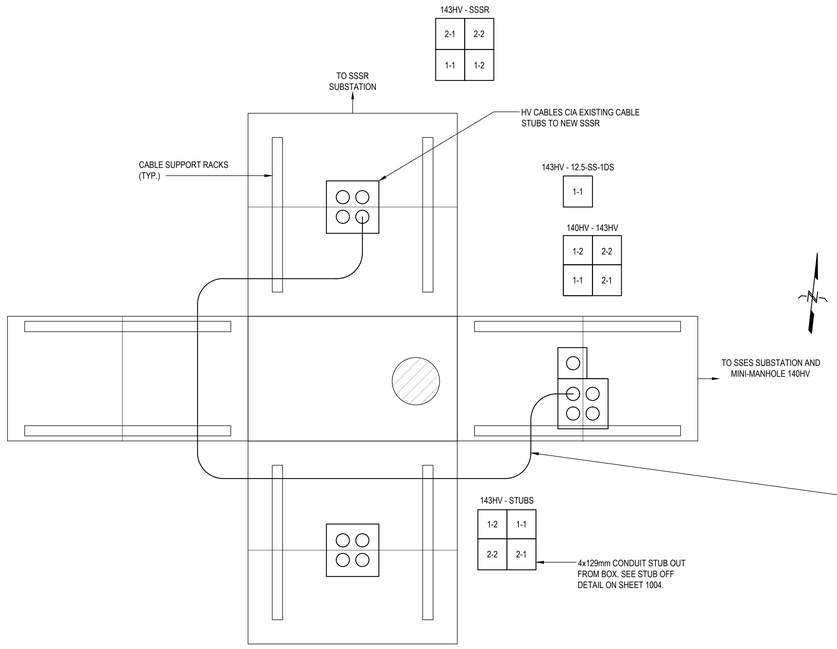
Drawing title/Titre du dessin

MINI MANHOLE DETAILS, GROUNDING AND MISCELLANEOUS DETAILS

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.062548.2	5411	5

Plot Date: January 28, 2016 11:39 AM
File Name: R:\PROJECTS\2015\1-15-168\DWGS\DWG\5411 SSSR MH DETAIL AND GROUNDING.DWG
Plotted by: Jacob Bieling

PWGSC – B1 – 1000X707



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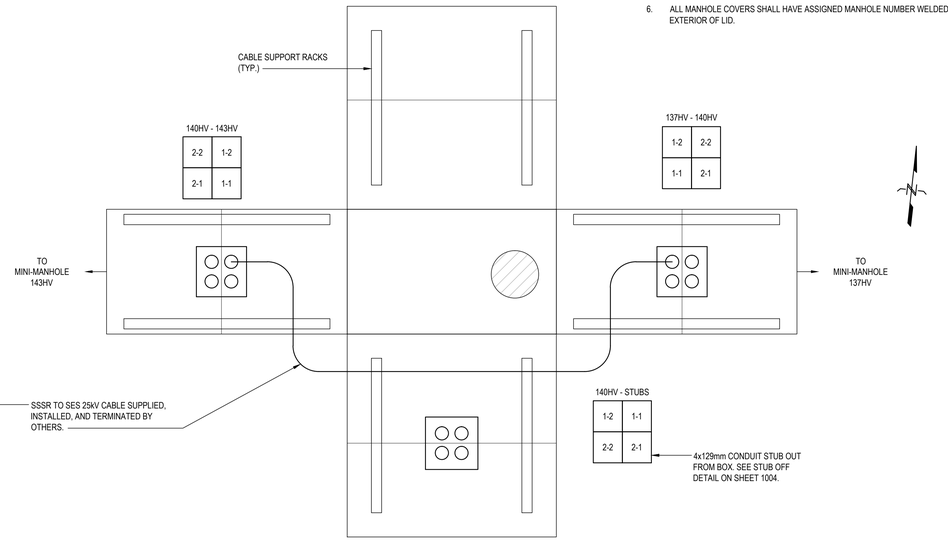
5412

MINI–MANHOLE (143HV)

SCALE 1:25



2
5412

MINI–MANHOLE (140HV)

SCALE 1:25

GENERAL NOTES:

1. SEE SHEET 5411 FOR MANHOLE DIMENSIONS AND CONSTRUCTION DETAILS.
2. SEE SHEET 5411 FOR CONDUIT SPACER DETAILS.
3. SEE SHEET 5411 FOR HIGH VOLTAGE MANHOLE GROUNDING DETAILS.
4. IDENTIFY ALL FEEDER CABLES WITH COLOURED TAGS HAVING 4 SLOTTED TIE HOLES AND SECURED WITH TWO PLASTIC TAG TIES.
5. ALL MANHOLES SHALL BE EQUIPPED WITH CONDUIT DIRECTORIES. EACH WALL OF THE MANHOLE WITH CONDUIT ENTRY SHALL HAVE A DIRECTORY. SEE SPECIFICATION FOR DIRECTORY DETAILS.
6. ALL MANHOLE COVERS SHALL HAVE ASSIGNED MANHOLE NUMBER WELDED ONTO EXTERIOR OF LID.

0 500 1000 1500 2000mm
1:25

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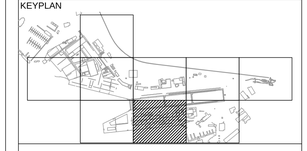
KEYPLAN



Revision/ Revision	Description/Description	Date/Date
5	ISSUED FOR TENDER	15/01/28
4	ISSUED FOR 99% DESIGN REVIEW	16/01/06
3	ISSUED FOR 66% DESIGN REVIEW	15/11/25
2	ISSUED FOR 33% DESIGN REVIEW	15/10/28
1	ISSUED FOR DESIGN DEVELOPMENT	15/09/11
0		

Client/client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet

825 ADMIRALS ROAD VICTORIA BC
ESQUIMALT GRAVING DOCK
ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

Designed by/Concept par
I. BARNES

Drawn by/Dessine par
J. BIELING / S. SEYMOUR

PWGSC Project Manager/Administrateur de Projets TPSGC
Jamie LeBlanc

PWGSC, Regional Manager, Architectural and Engineering Services/ Gestionnaire régionale, Services d'architectural et de génie, TPSGC
Preetipal Paul

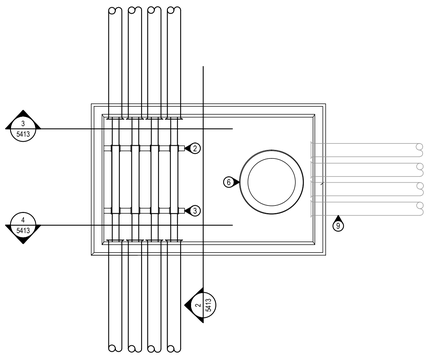
Drawing title/Titre du dessin

EXISTING HIGH VOLTAGE MANHOLE DETAILS

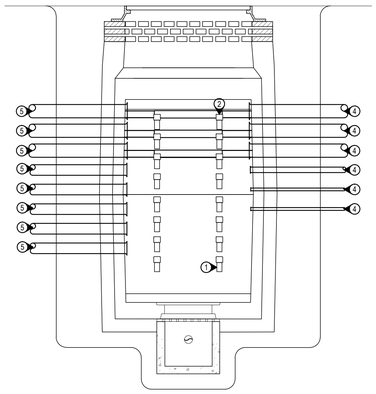
Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.062548.2	5412	5

Plot Date: January 28, 2016 11:39 AM Plotted by: Jacob Bieling
File Name: K:\PROJECTS\2015\1-15-168\DWGS\DWG\5412 HIGH SCHALLS.DWG

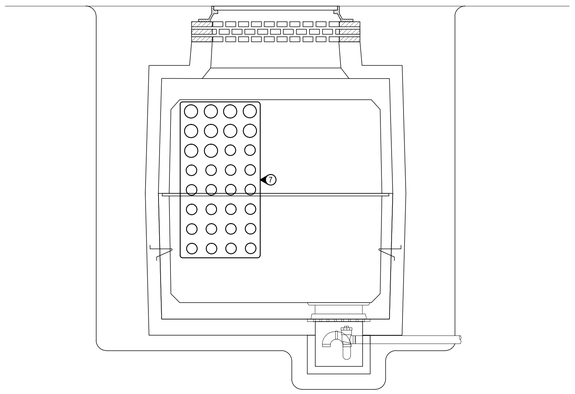
PWGSC – B1 – 1000X707



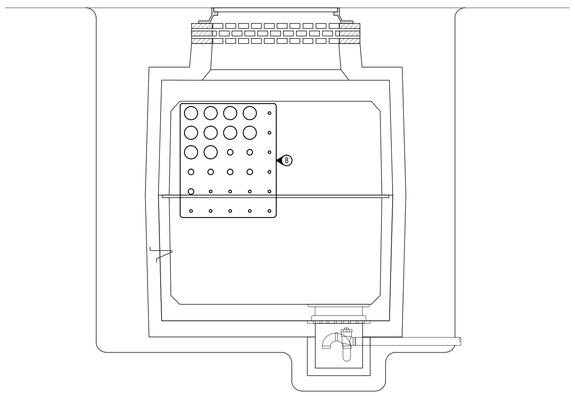
1 / 5413 MINI–MANHOLE (144LV)
SCALE 1:25



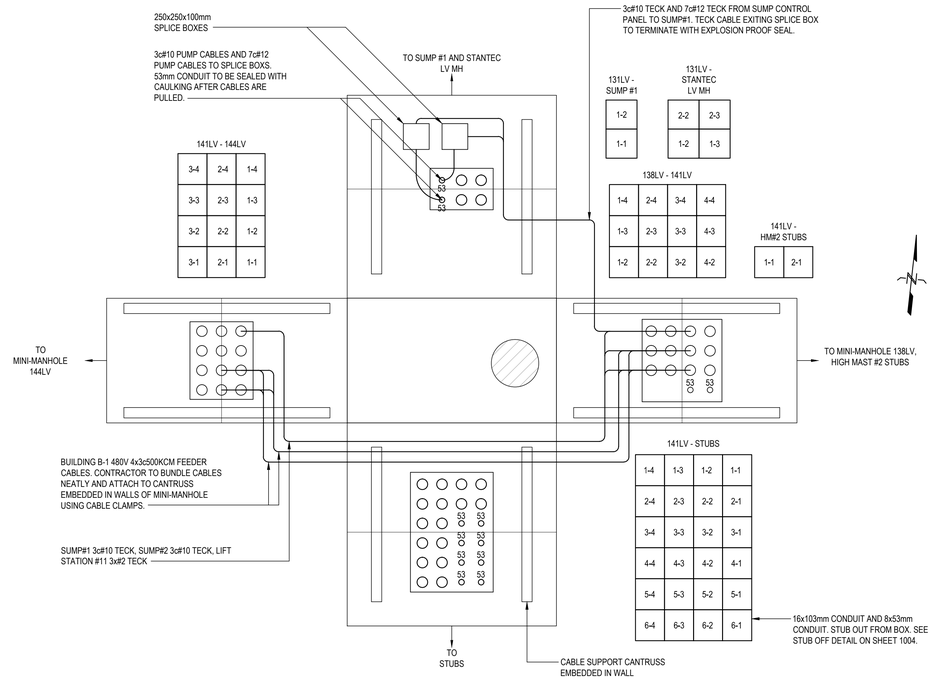
2 / 5413 MINI–MANHOLE (144LV)
SCALE 1:25



3 / 5413 MINI–MANHOLE (144LV)
SCALE 1:25



4 / 5413 MINI–MANHOLE (144LV)
SCALE 1:25



5 / 5413 MINI–MANHOLE (141LV)
SCALE 1:25

KEYNOTES:

1. 1000mm LONG, CABLE SUPPORT HOOKS MOUNTED TO STEEL SUPPORT CHANNELS TO BE HOT DIP GALVANIZED CONSTRUCTION AND SUITABLE FOR MOUNTING INSULATED PORCELAIN SUPPORT PADS. HOOKS TO BE MOUNTED SUCH THAT THE 3c AND 4c 350kCM CABLES PASS THROUGH THE MANHOLE IN A STRAIGHT RUN AND CAN BE SPLICED ON THE SUPPORTS.
2. PORCELAIN CABLE RACK INSULATOR PADS, SIZED TO SUPPORT 4c#350kCM TECK CABLE SPLICES.
3. NOT USED
4. NOT USED
5. CONDUITS FROM MANHOLE TO NEW SSSR BASEMENT.
6. SUMP PIT
7. CONDUIT PENETRATIONS IN MANHOLE WALL. REFER TO SECTION SSSR/5416 FOR ADDITIONAL DETAILS.
8. CONDUIT PENETRATIONS IN MANHOLE WALL. REFER TO SECTION SJ/5416 FOR ADDITIONAL DETAILS.
9. CONDUITS FROM EXISTING DUCT. REFER TO SECTION SS/5415 FOR ADDITIONAL DETAILS.

GENERAL NOTES:

1. SEE SHEET 5411 FOR MANHOLE DIMENSIONS AND CONSTRUCTION DETAILS.
2. SEE SHEET 5411 FOR CONDUIT SPACER DETAILS.
3. SEE SHEET 5411 FOR HIGH VOLTAGE MANHOLE GROUNDING DETAILS.
4. IDENTIFY ALL FEEDER CABLES WITH COLOURED TAGS HAVING 4 SLOTTED TIE HOLES AND SECURED WITH TWO PLASTIC TAG TIES.
5. ALL MANHOLES SHALL BE EQUIPPED WITH CONDUIT DIRECTORIES. EACH WALL OF THE MANHOLE WITH CONDUIT ENTRY SHALL HAVE A DIRECTORY. SEE SPECIFICATION FOR DIRECTORY DETAILS.
6. ALL MANHOLE COVERS SHALL HAVE ASSIGNED MANHOLE NUMBER WELDED ONTO EXTERIOR OF LID.

0 500 1000 1500 2000mm
1:25

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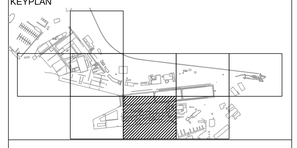

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1	ISSUED FOR DESIGN DEVELOPMENT	15/09/11
0		

Client/client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet

825 ADMIRALS ROAD VICTORIA BC ESQUIMALT GRAVING DOCK ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

Designed by/Concept par
I. BARNES

Drawn by/Dessine par
J. BIELING / S. SEYMOUR

PWGSC Project Manager/Administrateur de Projets TPSGC
Jamie LeBlanc

PWGSC, Regional Manager, Architectural and Engineering Services/ Gestionnaire régionale, Services d'architectural et de génie, TPSGC
Preetipal Paul

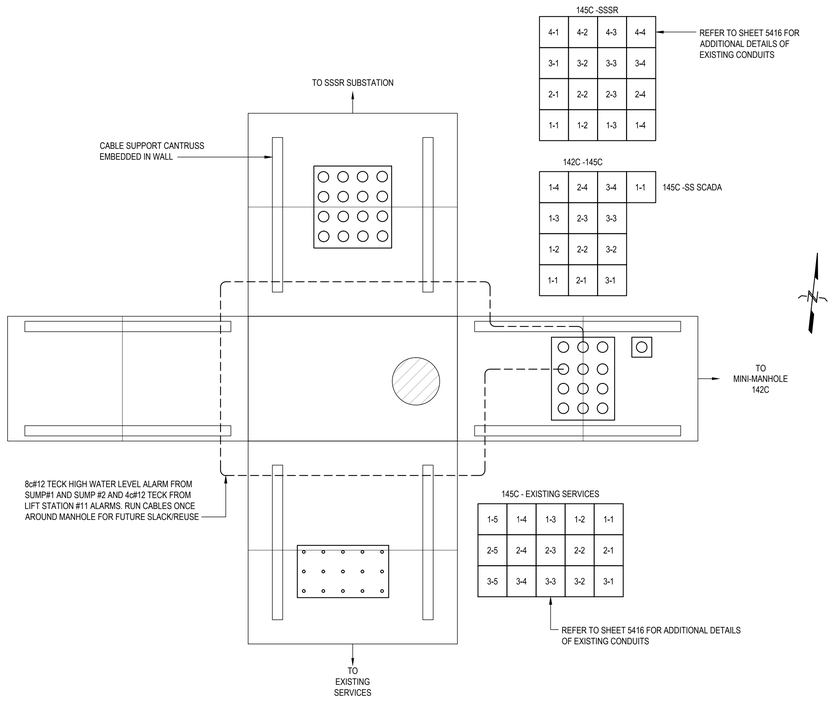
Drawing title/Titre du dessin

EXISTING LOW VOLTAGE MANHOLE DETAILS

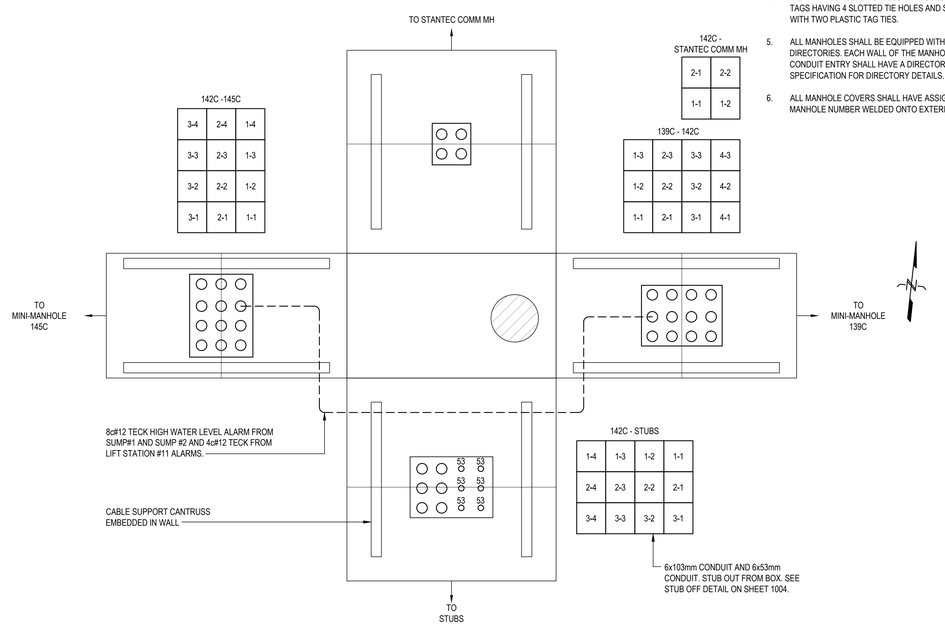
Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.062548.2	5413	5

Plot Date: January 28, 2016 11:39 AM Plotted by: Jacob Bieling
File Name: K:\PROJECTS\2015\11-15-1165\DWGS\DWGS\5413 LVMH DETAILS.DWG

PWGSC – B1 – 1000X707



1 / 5414 MINI–MANHOLE (145C)
SCALE 1:25



2 / 5414 MINI–MANHOLE (142C)
SCALE 1:25

GENERAL NOTES:

1. SEE SHEET 5411 FOR MANHOLE DIMENSIONS AND CONSTRUCTION DETAILS.
2. SEE SHEET 5411 FOR CONDUIT SPACER DETAILS.
3. SEE SHEET 5411 FOR HIGH VOLTAGE MANHOLE GROUNDING DETAILS.
4. IDENTIFY ALL FEEDER CABLES WITH COLOURED TAGS HAVING 4 SLOTTED TIE HOLES AND SECURED WITH TWO PLASTIC TAG TIES.
5. ALL MANHOLES SHALL BE EQUIPPED WITH CONDUIT DIRECTORIES. EACH WALL OF THE MANHOLE WITH CONDUIT ENTRY SHALL HAVE A DIRECTORY. SEE SPECIFICATION FOR DIRECTORY DETAILS.
6. ALL MANHOLE COVERS SHALL HAVE ASSIGNED MANHOLE NUMBER WELDED ONTO EXTERIOR OF LID.

0 500 1000 1500 2000mm
1:25

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3	ISSUED FOR 66% DESIGN REVIEW	15/11/25
2	ISSUED FOR 33% DESIGN REVIEW	15/10/28
1	ISSUED FOR DESIGN DEVELOPMENT	15/09/11
0		

Client/client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet

825 ADMIRALS ROAD VICTORIA BC
ESQUIMALT GRAVING DOCK
ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

Designed by/Concept par
I. BARNES

Drawn by/Dessine par
J. BIELING / S. SEYMOUR

PWGSC Project Manager/Administrateur de Projets TPSGC
Jamie LeBlanc

PWGSC, Regional Manager, Architectural and Engineering Services/ Gestionnaire régionale, Services d'architectural et de génie, TPSGC
Preetipal Paul

Drawing title/Titre du dessin

EXISTING COMMUNICATIONS MANHOLE DETAILS

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.062548.2	5414	5

Plot Date: January 28, 2016 11:39 AM Plotted by: Jacob Bieling
File Name: H:\PROJECTS\2015\1-15-168\DWGS\DWG\5414 GEN DETAILS.DWG

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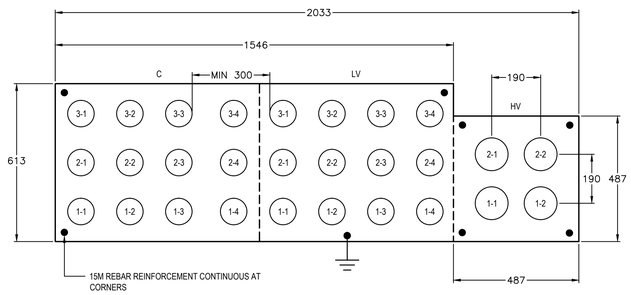

SS 5415 DUCT SECTION DETAIL

SCALE 1:10

CONDUIT AND CABLE SCHEDULE

CUT SECTION	CONDUIT ROUTE	CONDUIT ID	SIZE (mm)	TYPE	SYSTEM NOMINAL VOLTAGE	CONDUCTORS	COMMENTS
SS	140HV - 143HV	1-1	129	HV	12.5/25/12.5kV	EMPTY	FUTURE
		1-2	129	HV	12.5/25/12.5kV	3x1C#250KCM	FEEDER TO EXISTING SOUTH SUBSTATION
		2-1	129	HV	12.5/25/12.5kV	EMPTY	FUTURE
		2-2	129	HV	12.5/25/12.5kV	EMPTY	FUTURE
	141LV - 144LV	1-1	103	LV	600V	4c#350kCM RW90	B-1 FEEDER
		1-2	103	LV	600V	4c#350kCM RW90	B-1 FEEDER
		1-3	103	LV	600V	EMPTY	FUTURE DOCK RECEPTACLES #1, FUTURE DOCK RECEPTACLES #2
		1-4	103	LV	600V	4c#6, 3x#2 TECK, 2x(3c#10 TECK)	HIGH MAST LIGHTING #2, LIFT STATION #11 POWER, SUMP #1 PANEL, SUMP #2 PANEL
		2-1	103	LV	600V	4c#350kCM RW90	B-1 FEEDER
		2-2	103	LV	600V	4c#350kCM RW90	B-1 FEEDER
		2-3	103	LV	600V	EMPTY	FUTURE DOCK RECEPTACLES #3, FUTURE DOCK RECEPTACLES #4
		2-4	103	LV	600V	EMPTY	FUTURE
		3-1	103	LV	600V	EMPTY	FUTURE
		3-2	103	LV	600V	EMPTY	FUTURE
		3-3	103	LV	600V	EMPTY	FUTURE
		3-4	103	LV	600V	EMPTY	FUTURE
	142C-145C	1-1	103	COMM	EMPTY	2xCoax	SHAW CABLE
		1-2	103	COMM	N/A	4c#12TECK, 8c#12 TECK	LIFT STATION #11 SCADA ALARM, SUMP #1 & SUMP #2 WATER SCADA ALARM
		1-3	103	COMM	EMPTY	1x48 50/125um SMM, 2x48 9/125um SSM	FIBRE LINK - SES TO SSSR INTERCONNECT
		1-4	103	COMM	EMPTY	2x12 9/125um SSM	FIBRE - F/A AND G/A SYSTEMS
		2-1	103	COMM	EMPTY	100PR#24 GEL FILLED	TELEPHONE CABLE - SES TO SSSR INTERCONNECT
		2-2	103	COMM	EMPTY	EMPTY	FUTURE
		2-3	103	COMM	EMPTY	EMPTY	FUTURE
		2-4	103	COMM	EMPTY	1x12 9/125um SSM	FIBRE - CCTV SYSTEM
		3-1	103	COMM	EMPTY	EMPTY	FUTURE FIRE & EMERGENCY ALARM
		3-2	103	COMM	EMPTY	EMPTY	FUTURE
		3-3	103	COMM	EMPTY	EMPTY	FUTURE
		3-4	103	COMM	EMPTY	EMPTY	FUTURE - FIBRE ONLY

GENERAL NOTES:

1. ALL HV CONDUITS ON THIS SHEET ARE 129mm. ALL OTHER CONDUITS ON THIS SHEET ARE 103mm UNLESS NOTED OTHERWISE.
2. ALL CONCRETE ENCASED CONDUITS ARE SCHEDULE 40 RIGID PVC CONDUITS.
3. REINFORCE DUCT BANKS WITH 15M BARS RUN CONTINUOUSLY IN ALL 4 CORNERS OF THE DUCT BANK.
4. INSTALL ONE CONTINUOUS 4/0 INSULATED COPPER GROUND CONDUCTORS IN THE BOTTOM OF EVERY DUCT BANK. TIE IN GROUNDS AT EVERY MANHOLE AND DISTRIBUTION CENTER TO PROVIDE ELECTRICAL CONTINUITY SITE WIDE.
5. PROVIDE ADDITIONAL GROUNDS WHERE DUCT BANKS FAN OUT INTO SEPARATE MANHOLES.
6. BOND ALL METAL RACKING LOCATIONS IN EVERY MANHOLE.
7. USE UNDERGROUND DUCT SPACERS WITH 190mmx190mm DUCT CENTER TO CENTER MEASUREMENT EXCEPT WHERE NOTED.
8. ALL CONDUITS MUST BE ENCASED IN A MINIMUM OF 50mm OF CONCRETE.
9. MAINTAIN 300mm SEPARATION BETWEEN COMMUNICATIONS CONDUITS AND POWER CONDUITS. FIBRE OPTIC CONDUITS MAY BE INSTALLED WITHIN THE 300mm SEPARATION.
10. ALL DUCTBANKS SHALL BE INSTALLED IN ACCORDANCE WITH CANADIAN ELECTRICAL CODE.
11. REFER TO SITE PLANS FOR SPACING BETWEEN DUCTBANKS.

0 200 400 600 800mm

1:10

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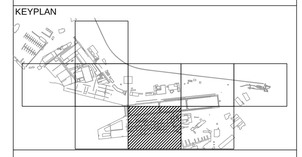
KEYPLAN



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2	ISSUED FOR 33% DESIGN REVIEW	15/10/28
1	ISSUED FOR DESIGN DEVELOPMENT	15/09/11
0		

Client/client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet

825 ADMIRALS ROAD VICTORIA BC ESQUIMALT GRAVING DOCK ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

Designed by/Concept par
I. BARNES

Drawn by/Dessine par
J. BIELING / S. SEYMOUR

PWGSC Project Manager/Administrateur de Projets TPSGC
Jamie LeBlanc

PWGSC, Regional Manager, Architectural and Engineering Services/ Gestionnaire régionale, Services d'architectural et de génie, TPSGC
Preetipal Paul

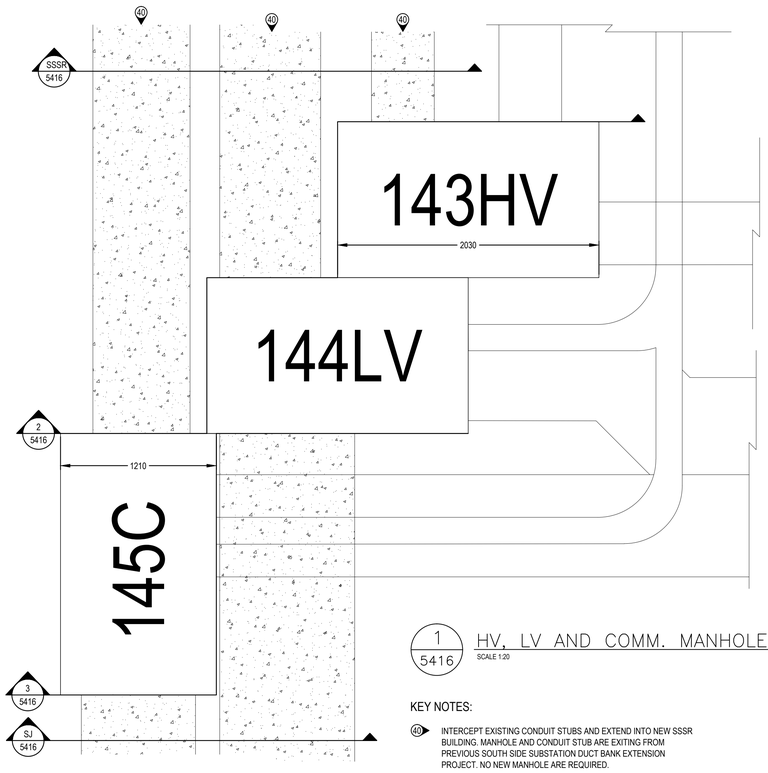
Drawing title/Titre du dessin

NEW DUCT BANK CROSS SECTION DETAILS 1 OF 4

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.062548.2	5415	5

Plot Date: January 28, 2016 11:39 AM Plotted by: Jacob Bieling
File Name: H:\PROJECTS\2015\1-15-1185\DWGS\DWG\5415 SSR DUCT SECT 1 OF 5.DWG

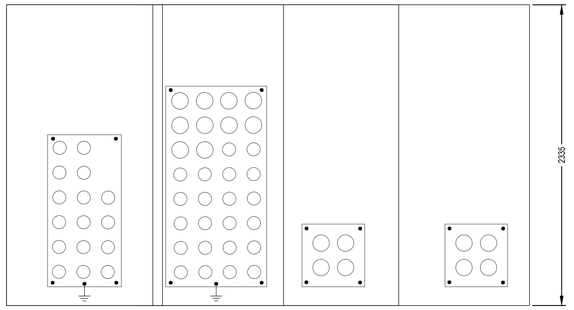
PWGSC – B1 – 1000X707



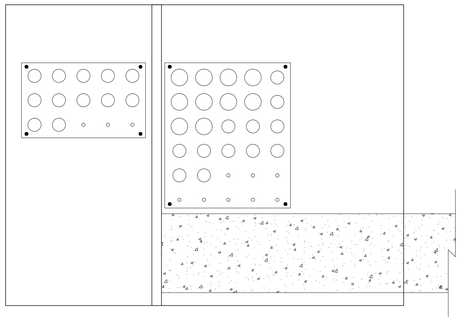
1 5416 HV, LV AND COMM. MANHOLE PLAN VIEW
SCALE 1:20

KEY NOTES:

40 INTERCEPT EXISTING CONDUIT STUBS AND EXTEND INTO NEW SSSR BUILDING. MANHOLE AND CONDUIT STUB ARE EXITING FROM PREVIOUS SOUTH SIDE SUBSTATION DUCT BANK EXTENSION PROJECT. NO NEW MANHOLE ARE REQUIRED.



2 5416 HV, LV AND COMM. MANHOLE PENETRATION ELEVATION
SCALE 1:20



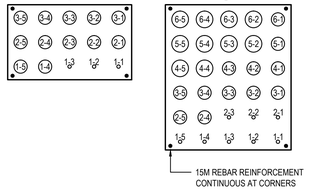
3 5416 LV AND COMM. MANHOLE PENETRATION ELEVATION
SCALE 1:20

GENERAL NOTES:

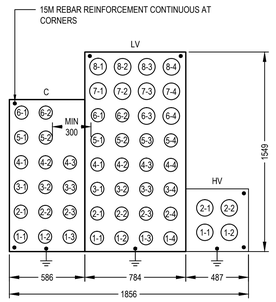
1. ALL CONCRETE ENCASED CONDUITS ARE SCHEDULE 40 RIGID PVC CONDUITS.
2. REINFORCE DUCT BANKS WITH 15M BARS RUN CONTINUOUSLY IN ALL 4 CORNERS OF THE DUCT BANK.
3. INSTALL ONE CONTINUOUS 4/0 INSULATED COPPER GROUND CONDUCTORS IN THE BOTTOM OF EVERY DUCT BANK. TIE IN GROUNDS AT EVERY MANHOLE AND DISTRIBUTION CENTER TO PROVIDE ELECTRICAL CONTINUITY SITE WIDE.
4. PROVIDE ADDITIONAL GROUNDS WHERE DUCT BANKS FAN OUT INTO SEPARATE MANHOLES.
5. BOND ALL METAL RACKING LOCATIONS IN EVERY MANHOLE.
6. USE UNDERGROUND DUCT SPACERS WITH 190mmx190mm DUCT CENTER TO CENTER MEASUREMENT EXCEPT WHERE NOTED.
7. ALL CONDUITS MUST BE ENCASED IN A MINIMUM OF 50mm OF CONCRETE.
8. MAINTAIN 300mm SEPARATION BETWEEN COMMUNICATIONS CONDUITS AND POWER CONDUITS. FIBRE OPTIC CONDUITS MAY BE INSTALLED WITHIN THE 300mm SEPARATION.
9. ALL DUCTBANKS SHALL BE INSTALLED IN ACCORDANCE WITH CANADIAN ELECTRICAL CODE.
10. REFER TO SITE PLANS FOR SPACING BETWEEN DUCTBANKS.

CONDUIT AND CABLE SCHEDULE

CUT SECTION	CONDUIT ROUTE	CONDUIT ID	SIZE (mm)	TYPE	SYSTEM NOMINAL VOLTAGE	CONDUCTORS	COMMENTS
SSSR	143HV - SSSR HV SECTION	1-1	129	HV	12.5/25/12.5kV	EMPTY	FUTURE
		1-2	129	HV	12.5/25/12.5kV	3x1C#250KCM	FEEDER TO SSSR FROM SES
		2-1	129	HV	12.5/25/12.5kV	EMPTY	FUTURE
		2-2	129	HV	12.5/25/12.5kV	EMPTY	FUTURE
	LV - SSS LV SECTION	1-1	103	LV	480V	4c#350kCM RW90	B-1 FEEDER
		1-2	103	LV	480V	4c#350kCM RW90	B-1 FEEDER
		1-3	103	LV	600V	EMPTY	FUTURE DOCK RECEPTACLES #1, FUTURE DOCK RECEPTACLES #2
		1-4	103	LV	600V	4c#6, 3x#2 TECK, 2x(3c#10 TECK)	HIGH MAST LIGHTING #2, LIFT STATION #11 POWER, SUMP #1 PANEL, SUMP #2 PANEL
		2-1	103	LV	480V	4c#350kCM RW90	B-1 FEEDER
		2-2	103	LV	480V	4c#350kCM RW90	B-1 FEEDER
		2-3	103	LV	600V	EMPTY	FUTURE DOCK RECEPTACLES #3, FUTURE DOCK RECEPTACLES #4
		2-4	103	LV	600V	EMPTY	FUTURE TUG WHARF POWER
		3-1	103	LV	600V	EMPTY	FUTURE
		3-2	103	LV	600V	EMPTY	FUTURE
		3-3	103	LV	600V	EMPTY	FUTURE
		3-4	103	LV	600V	EMPTY	FUTURE
		4-1	103	LV	600V	EMPTY	FUTURE
		4-2	103	LV	120/208V	EMPTY	JM#5 120V (FUTURE)
		4-3	103	LV	120/208V	2x3c#10, 3x3c#12	TUG WHARF CABLES (EXISTING)
		4-4	103	LV	600V	EMPTY	FUTURE
		5-1	103	LV	600V	EMPTY	FUTURE
		5-2	103	LV	120/208V	3c#2, 2c#12	120/208V OUTDOOR PANEL, NAV. LIGHTS (EXISTING)
		5-3	103	LV	120/208V	2x3c#12, 2c#12	TUG WHARF CABLES (EXISTING)
		5-4	103	LV	600V	EMPTY	FUTURE
		6-1	103	LV	120/208V	EMPTY	KCB CONDUIT #70,71,72 (FUTURE)
		6-2	103	LV	480V	EMPTY	KCB CONDUIT #77, 123, 126 (FUTURE)
		6-3	129	LV	480V	EMPTY	JM#4 480V (FUTURE)
		6-4	129	LV	480V	EMPTY	JM#4 480V (FUTURE)
		7-1	129	LV	480V	EMPTY	JM#3 480V (FUTURE)
		7-2	129	LV	480V	EMPTY	JM#3 480V (FUTURE)
		7-3	129	LV	480V	EMPTY	JM#4 120/208V (FUTURE)
		7-4	129	LV	480V	EMPTY	JM#5 120/208V (FUTURE)
		8-1	129	LV	480V	EMPTY	JM#3 120/208V (FUTURE)
		8-2	129	LV	480V	EMPTY	JM#3 120/208V (FUTURE)
		8-3	129	LV	480V	EMPTY	JM#5 480V (FUTURE)
		8-4	129	LV	480V	EMPTY	JM#5 480V (FUTURE)
	145C-SSSR COMM. ROOM	1-1	103	COMM	N/A	2xCoax	SHAW CABLE
		1-2	103	COMM	N/A	4c#12TECK, 8c#12 TECK	LIFT STATION #11 SCADA ALARM, SUMP #1 & SUMP #2 WATER SCADA ALARM
		1-3	103	COMM	N/A	1x48 50/125um SMM, 2x48 9/125um SSM	FIBRE LINK - SES TO SSSR INTERCONNECT
		2-1	103	COMM	N/A	100PR#24 GEL FILLED	TELEPHONE CABLE - SES TO SSSR INTERCONNECT
		2-2	103	COMM	N/A	EMPTY	JM#5 TEL & JETTY TEL (FUTURE)
		2-3	103	COMM	N/A	2x12 9/125um SSM	FIBRE - F/A AND G/A SYSTEMS
		3-1	103	COMM	N/A	4x2c#12, 6x2c#12	TUG WHARF & JETTY F/A HORN (EXISTING) TUG WHARF & JETTY F/A (EXISTING+FUTURE)
		3-2	103	COMM	N/A	EMPTY	JM#5 SCADA (FUTURE)
		3-3	103	COMM	N/A	1x12 9/125um SSM	FIBRE - CCTV SYSTEM
		4-1	103	COMM	N/A	TBD	TBD
		4-2	103	COMM	N/A	TBD	TBD
		4-3	103	COMM	N/A	EMPTY	FUTURE - FIBRE ONLY
		5-1	103	COMM	N/A	EMPTY	JETTY CCTV (FUTURE)
		5-2	103	COMM	N/A	EMPTY	FUTURE
		6-1	103	COMM	N/A	EMPTY	FUTURE
		6-2	103	COMM	N/A	EMPTY	FUTURE



SJ 5416 DUCT SECTION DETAILS
SCALE 1:20



SSSR 5416 DUCT SECTION DETAILS
SCALE 1:20

CONDUIT AND CABLE SCHEDULE

CUT SECTION	CONDUIT ROUTE	CONDUIT ID	SIZE (mm)	TYPE	SYSTEM NOMINAL VOLTAGE	CONDUCTORS	COMMENTS
3/5416	EXISTING SERVICES - 144LV	1-1	27	LV	120/208V	3c#10	TUG WHARF CABLES (EXISTING)
		1-2	27	LV	120/208V	3c#10	TUG WHARF CABLES (EXISTING)
		1-3	27	LV	120/208V	3c#12	TUG WHARF CABLES (EXISTING)
		1-4	27	LV	120/208V	3c#12	TUG WHARF CABLES (EXISTING)
		1-5	27	LV	120/208V	3c#12	TUG WHARF CABLES (EXISTING)
		2-1	27	LV	120/208V	3c#12	TUG WHARF CABLES (EXISTING)
		2-2	27	LV	120/208V	3c#12	TUG WHARF CABLES (EXISTING)
		2-3	27	LV	120/208V	2c#12	TUG WHARF CABLES (EXISTING)
		2-4	53	LV	120/208V	3c#2	120/208V OUTDOOR PANEL (EXISTING)
		2-5	53	LV	480V	EMPTY	KCB CONDUIT #77 (FUTURE)
		3-1	27	LV	120/208V	EMPTY	JM#5 120V (FUTURE)
		3-2	53	LV	120/208V	EMPTY	JM#5 120V (FUTURE)
		3-3	53	LV	120/208V	EMPTY	KCB CONDUIT #70 (FUTURE)
		3-4	53	LV	120/208V	EMPTY	KCB CONDUIT #71 (FUTURE)
		3-5	53	LV	120/208V	EMPTY	KCB CONDUIT #72 (FUTURE)
		4-1	27	LV	120/208V	EMPTY	JM#5 120V (FUTURE)
		4-2	53	LV	480V	EMPTY	KCB CONDUIT #123 (FUTURE)
		4-3	53	LV	480V	EMPTY	KCB CONDUIT #126 (FUTURE)
		4-4	129	LV	480V	EMPTY	JM#3 480V (FUTURE)
		4-5	129	LV	480V	EMPTY	JM#3 480V (FUTURE)
		5-1	27	LV	120/208V	EMPTY	JM#5 120V (FUTURE)
		5-2	129	LV	480V	EMPTY	JM#4 480V (FUTURE)
		5-3	129	LV	480V	EMPTY	JM#4 480V (FUTURE)
		5-4	129	LV	120/208V	EMPTY	JM#3 120/208V (FUTURE)
		5-5	129	LV	120/208V	EMPTY	JM#3 120/208V (FUTURE)
		6-1	27	LV	120/208V	2c#12	NAV. LIGHTINS (EXISTING)
		6-2	129	LV	480V	EMPTY	JM#5 480V (FUTURE)
		6-3	129	LV	480V	EMPTY	JM#5 480V (FUTURE)
		6-4	129	LV	120/208V	EMPTY	JM#4 120/208V (FUTURE)
		6-5	129	LV	120/208V	EMPTY	JM#5 120/208V (FUTURE)
	EXISTING SERVICES - 145C	1-1	27	COMM	N/A	2c#12	TUG WHARF F/A HORN (EXISTING)
		1-2	27	COMM	N/A	2c#12	TUG WHARF F/A HORN (EXISTING)
		1-3	27	COMM	N/A	2c#14	TUG WHARF F/A (EXISTING)
		1-4	27	COMM	N/A	EMPTY	JETTY MOUNTS F/A (FUTURE)
		1-5	27	COMM	N/A	EMPTY	JM#5 TEL (FUTURE)
		2-1	27	COMM	N/A	EMPTY	JM#5 SCADA (FUTURE)
		2-2	27	COMM	N/A	EMPTY	JETTY TEL (FUTURE)
		2-3	27	COMM	N/A	EMPTY	JETTY TEL (FUTURE)
		2-4	27	COMM	N/A	EMPTY	JETTY TEL (FUTURE)
		2-5	27	COMM	N/A	EMPTY	JETTY TEL (FUTURE)
		3-1	27	COMM	N/A	EMPTY	JETTY CCTV (FUTURE)
		3-2	27	COMM	N/A	EMPTY	JETTY CCTV (FUTURE)
		3-3	27	COMM	N/A	EMPTY	JETTY F/A HORN (FUTURE)
		3-4	27	COMM	N/A	EMPTY	JETTY F/A HORN (FUTURE)
		3-5	27	COMM	N/A	EMPTY	JETTY F/A (FUTURE)

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PWGSC – B1 – 1000X707

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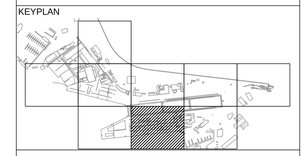


Revision/ Revision	Description/Description	Date/Date
5	ISSUED FOR TENDER	15/01/28
4	ISSUED FOR 99% DESIGN REVIEW	16/01/06
3	ISSUED FOR 66% DESIGN REVIEW	15/11/25
2	ISSUED FOR 33% DESIGN REVIEW	15/10/28
1	ISSUED FOR DESIGN DEVELOPMENT	15/09/11
0		

Client/client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet
825 ADMIRALS ROAD VICTORIA BC
ESQUIMALT GRAVING DOCK
ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

Designed by/Concept par
I. BARNES

Drawn by/Dessine par
J. BIELING / S. SEYMOUR

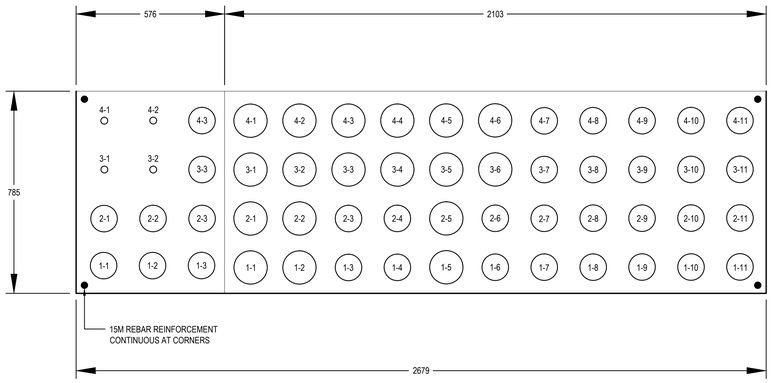
PWGSC Project Manager/Administrateur de Projets TPSGC
Jamie LeBlanc

PWGSC, Regional Manager, Architectural and Engineering Services/ Gestionnaire régionale, Services d'architectural et de génie, TPSGC
Preetipal Paul

Drawing title/Titre du dessin

NEW DUCT BANK CROSS SECTION DETAILS 2 OF 4

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.062548.2	5416	5



STA 5417 DUCT SECTION DETAILS

SCALE 1:10

CONDUIT AND CABLE SCHEDULE

CUT SECTION	CONDUIT ROUTE	CONDUIT ID	SIZE (mm)	TYPE	SYSTEM NOMINAL VOLTAGE	NEW CONDUCTORS	EXISTING CONDUCTORS	COMMENTS
STA	SSSR-SERVICE TUNNEL LV	1-1	129	LV	208V	REUSE EXISTING	4c#350kCM TECK	JM1 - 120/208V CIRCUIT
		1-2	129	LV	208V	REUSE EXISTING	4c#350kCM TECK	JM1 - 120/208V CIRCUIT
		1-3	103	LV	208V	3c#2/0 TECK	3c#1 MI CABLE	EXISTING DOCK SERVICES #1 CENTER
		1-4	103	LV	208V	3c#8 TECK	3c#10 MI CABLE	SOUTH WEST DOCK STAIR ROPELIGHT
		1-5	103	LV	120/208V	4c#350kCM	NEW SERVICE	120/208V, 400A DS2-W
		1-6	103	LV	480V	3c#4/0 TECK	3c#250kCM MI CABLE	EXISTING DOCK SERVICES #1 SOUTH WEST 1 OF 2
		1-7	103	LV	480V	3c#4/0 TECK	3c#250kCM MI CABLE	EXISTING DOCK SERVICES #1 CENTER 1 OF 2
		1-8	103	LV	480V	3c#4/0 TECK	3c#250kCM MI CABLE	EXISTING DOCK SERVICES #1 SOUTH EAST 1 OF 2
		1-9	103	LV	480V	3c#3/0	NEW SERVICE	480V, 400A DS2-W
		1-10	103	LV	480V	3c#3/0	NEW SERVICE	480V, 400A DS2-C
		1-11	103	LV	480V	3c#3/0	NEW SERVICE	480V, 400A DS2-C
		2-1	129	LV	208V	REUSE EXISTING	4c#350kCM TECK	JM2 - 120/208V CIRCUIT
		2-2	129	LV	208V	REUSE EXISTING	4c#350kCM TECK	JM2 - 120/208V CIRCUIT
		2-3	103	LV	208V	3c#2/0 TECK	3c#1 MI CABLE	EXISTING DOCK SERVICES #1 SOUTH EAST
		2-4	103	LV	208V	3c#3/0 TECK	3c#1/0 MI CABLE	EXISTING DOCK SERVICES #1 SOUTH WEST
		2-5	103	LV	120/208V	4c#350kCM	NEW SERVICE	120/208V, 400A DS2-C
		2-6	103	LV	480V	3c#4/0 TECK	3c#250kCM MI CABLE	EXISTING DOCK SERVICES #1 SOUTH WEST 2 OF 2
		2-7	103	LV	480V	3c#4/0 TECK	3c#250kCM MI CABLE	EXISTING DOCK SERVICES #1 CENTER 2 OF 2
		2-8	103	LV	480V	3c#4/0 TECK	3c#250kCM MI CABLE	EXISTING DOCK SERVICES #1 SOUTH EAST 2 OF 2
		2-9	129	LV	480V	3c#3/0	NEW SERVICE	480V, 400A DS2-W
		2-10	103	LV	480V	3c#3/0	NEW SERVICE	480V, 400A DS2-W
		2-11	129	LV	480V	3c#3/0	NEW SERVICE	480V, 400A DS2-C
		3-1	129	LV	430-630V	3c#500kCM TECK	NEW SERVICE	2000A REGULATED DOCK SERVICE, DS2-C
		3-2	129	LV	430-630V	3c#500kCM TECK	NEW SERVICE	2000A REGULATED DOCK SERVICE, DS2-C
		3-3	129	LV	430-630V	3c#500kCM TECK	NEW SERVICE	2000A REGULATED DOCK SERVICE, DS2-C
		3-4	129	LV	430-630V	3c#500kCM TECK	NEW SERVICE	2000A REGULATED DOCK SERVICE, DS2-C
		3-5	129	LV	408V	REUSE EXISTING	3c#350kCM TECK	JM1 - 480V CIRCUIT
		3-6	129	LV	408V	REUSE EXISTING	3c#350kCM TECK	JM1 - 480V CIRCUIT
		3-7	103	LV	600V	REUSE EXISTING	3c#2/0 TECK	600V CAISSON CONNECTION
		3-8	103	LV	600V	3c#4/0	NEW SERVICE	600V, 400A DS2-W
		3-9	103	LV	600V	3c#4/0	NEW SERVICE	600V, 400A DS2-W
		3-10	103	LV	600V	FUTURE	NEW SERVICE	FUTURE HIGH MAST #1
		3-11	103	LV	N/A	FUTURE	NEW SERVICE	SPARE
		4-1	129	LV	430-630V	3c#500kCM TECK	NEW SERVICE	2000A REGULATED DOCK SERVICE, DS2-C
		4-2	129	LV	430-630V	3c#500kCM TECK	NEW SERVICE	2000A REGULATED DOCK SERVICE, DS2-C
		4-3	129	LV	430-630V	3c#500kCM TECK	NEW SERVICE	2000A REGULATED DOCK SERVICE, DS2-C
		4-4	129	LV	430-630V	3c#500kCM TECK	NEW SERVICE	2000A REGULATED DOCK SERVICE, DS2-C
		4-5	129	LV	408V	REUSE EXISTING	3c#350kCM TECK	JM2 - 480V CIRCUIT
		4-6	129	LV	408V	REUSE EXISTING	3c#350kCM TECK	JM2 - 480V CIRCUIT
		4-7	103	LV	N/A	FUTURE	NEW SERVICE	SPARE
		4-8	103	LV	N/A	FUTURE	NEW SERVICE	SPARE
		4-9	103	LV	N/A	FUTURE	NEW SERVICE	SPARE
		4-10	103	LV	N/A	FUTURE	NEW SERVICE	SPARE
		4-11	103	LV	N/A	FUTURE	NEW SERVICE	SPARE
	SSSR-SERVICE TUNNEL COMM.	1-1	103	COMM	N/A	4xCAT5e	NEW SERVICE	DS2-W DATA SERVICES
		1-2	103	COMM	N/A	16PR#22	NEW SERVICE	DS2-W COMM SERVICES
		1-3	103	COMM	N/A	FUTURE	NEW SERVICE	DS2-W FIBRE SERVICES
		2-1	103	COMM	N/A	4xCAT5e	NEW SERVICE	DS2-C DATA SERVICES
		2-2	103	COMM	N/A	16PR#22	NEW SERVICE	DS2-C COMM SERVICES
		2-3	103	COMM	N/A	FUTURE	NEW SERVICE	DS2-C FIBRE SERVICES
		3-1	27	COMM	N/A	2x2c#12	NEW SERVICE	DS2-W F/A SERVICES
		3-2	27	COMM	N/A	2x2c#12	NEW SERVICE	DS2-W EMERGENCY SERVICES
		3-3	103	COMM	N/A	SPARE	NEW SERVICE	FUTURE (FIBRE ONLY)
		4-1	27	COMM	N/A	2x2c#12	NEW SERVICE	DS2-C F/A SERVICES
		4-2	27	COMM	N/A	2x2c#12	NEW SERVICE	DS2-C EMERGENCY SERVICES
		4-3	103	COMM	N/A	SPARE	NEW SERVICE	FUTURE (FIBRE ONLY)

GENERAL NOTES:

1. ALL CONCRETE ENCASED CONDUITS ARE SCHEDULE 40 RIGID PVC CONDUITS.
2. REINFORCE DUCT BANKS WITH 15M BARS RUN CONTINUOUSLY IN ALL 4 CORNERS OF THE DUCT BANK.
3. INSTALL ONE CONTINUOUS 4/0 INSULATED COPPER GROUND CONDUCTORS IN THE BOTTOM OF EVERY DUCT BANK. TIE IN GROUNDS AT EVERY MANHOLE AND DISTRIBUTION CENTER TO PROVIDE ELECTRICAL CONTINUITY SITE WIDE.
4. PROVIDE ADDITIONAL GROUNDS WHERE DUCT BANKS FAN OUT INTO SEPARATE MANHOLES.
5. BOND ALL METAL RACKING LOCATIONS IN EVERY MANHOLE.
6. USE UNDERGROUND DUCT SPACERS WITH 190mmx190mm DUCT CENTER TO CENTER MEASUREMENT EXCEPT WHERE NOTED.
7. ALL CONDUITS MUST BE ENCASED IN A MINIMUM OF 50mm OF CONCRETE.
8. MAINTAIN 300mm SEPARATION BETWEEN COMMUNICATIONS CONDUITS AND POWER CONDUITS. FIBRE OPTIC CONDUITS MAY BE INSTALLED WITHIN THE 300mm SEPARATION.
9. ALL DUCTBANKS SHALL BE INSTALLED IN ACCORDANCE WITH CANADIAN ELECTRICAL CODE.
10. REFER TO SITE PLANS FOR SPACING BETWEEN DUCTBANKS.

0 200 400 600 800mm

1:10

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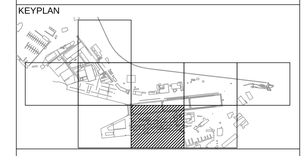
KEYPLAN



Revision/ Revision	Description/Description	Date/Date
5	ISSUED FOR TENDER	15/01/28
4	ISSUED FOR 99% DESIGN REVIEW	16/01/06
3	ISSUED FOR 66% DESIGN REVIEW	15/11/25
2	ISSUED FOR 33% DESIGN REVIEW	15/10/28
1	ISSUED FOR DESIGN DEVELOPMENT	15/09/11
0		

Client/client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet

825 ADMIRALS ROAD VICTORIA BC ESQUIMALT GRAVING DOCK ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

Designed by/Concept par
I. BARNES

Drawn by/Dessine par
J. BIELING / S. SEYMOUR

PWGSC Project Manager/Administrateur de Projets TPSGC
Jamie LeBlanc

PWGSC, Regional Manager, Architectural and Engineering Services/ Gestionnaire régionale, Services d'architectural et de génie, TPSGC
Preetipal Paul

Drawing title/Titre du dessin

NEW DUCT BANK CROSS SECTION DETAILS 3 OF 4

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.062548.2	5417	5

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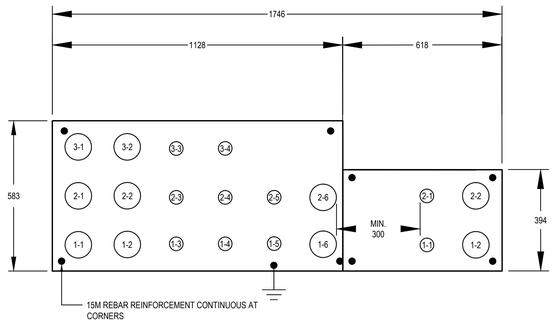
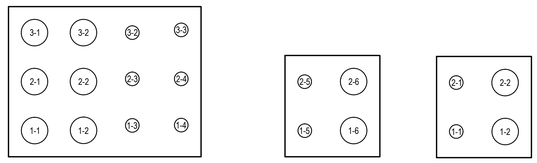


STB 5418 DUCT SECTION DETAILS
SCALE 1:25

CONDUIT AND CABLE SCHEDULE

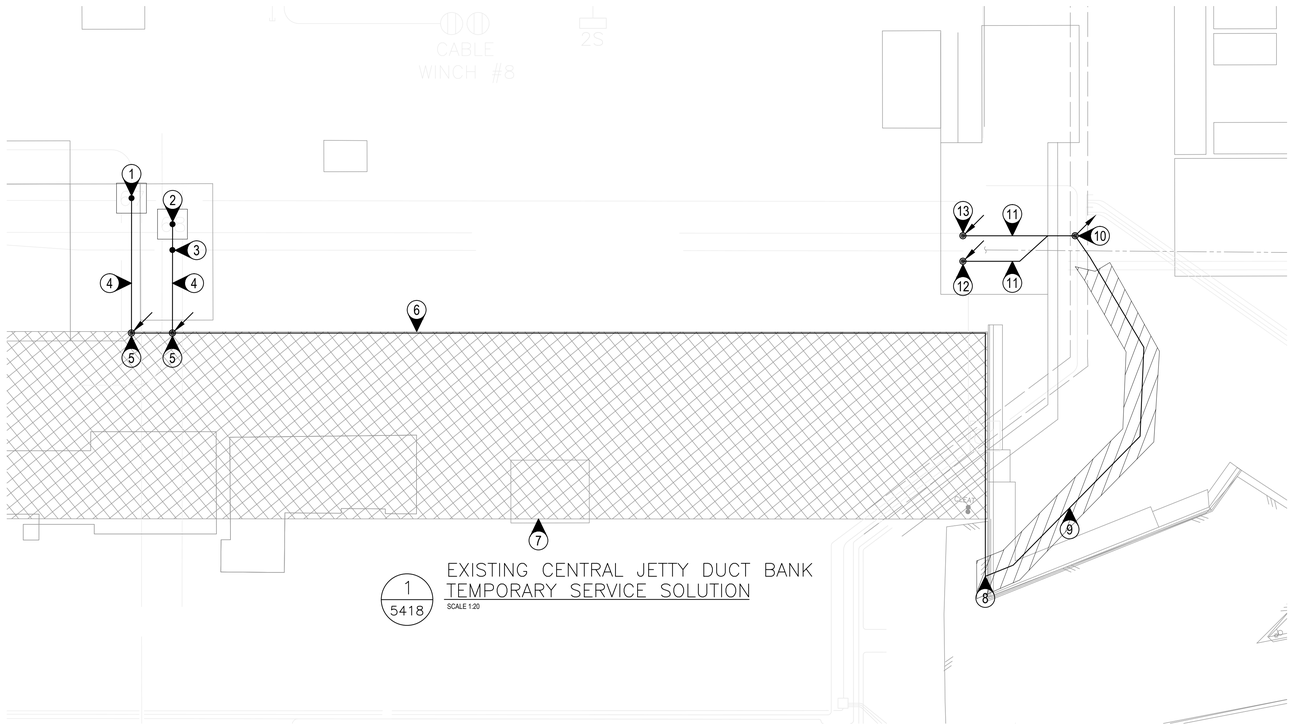
CUT SECTION	CONDUIT ROUTE	CONDUIT ID	SIZE (mm)	TYPE	SYSTEM NOMINAL VOLTAGE	CONDUCTORS	COMMENTS
STB	EXISTING DUCT BANK LV - SSSR SERVICE PIT	1-1	103	LV	480V	3c#500kCM) TECK + 1#2 GR	480V, KIOSK #1
		1-2	103	LV	600V	EMPTY	SPARE
		1-3	53	LV	208V	3c#1 TECK + 1#8 GR	120/208V, KIOSK #1
		1-4	53	LV	600V	EMPTY	SPARE
		2-1	103	LV	480V	2x(3c#250kCM) TECK + 1#2 GR	480V, KIOSK #2
		2-2	103	LV	600V	EMPTY	SPARE
		2-3	53	LV	208V	3c#1 TECK + 1#8 GR	120/208V, KIOSK #2
		2-4	53	LV	600V	EMPTY	SPARE
		3-1	103	LV	480V	2x(3c#250kCM) TECK + 2#12 GR	480V, VSY MACHINE SHIP
		3-2	103	LV	600V	EMPTY	SPARE
		3-3	53	LV	120/208V	6c#10 + 1#10 GND	CATHODIC PROTECTION
		3-4	53	LV	600V	EMPTY	SPARE
		1-5	53	LV	120/208V	7c#12	UNKNOW SERVICE
		1-6	103	LV	480V	2x(3c#250kCM) TECK + 1#2 GR	480V, KIOSK #3
		2-5	53	LV	208V	3c#1 TECK + 1#8 GR	120/208V, KIOSK #3
		2-6	103	LV	600V	EMPTY	SPARE
	EXISTING DUCT BANK COMM - SSSR SERVICE PIT	1-1	53	COMM	N/A	EMPTY	SPARE
		1-2	53	COMM	N/A	9c#12	VICTORIA SHIPYARDS FIRE ALARM SYSTEM
		2-1	103	COMM	N/A	50PR#22	TELECOMM
		2-2	103	COMM	N/A	12PR#22M 1 FIBRE, 1 F/A	TELECOMM



STC 5418 EXISTING DUCT SECTION DETAILS
SCALE 1:25

CONDUIT AND CABLE SCHEDULE

CUT SECTION	CONDUIT ROUTE	CONDUIT ID	SIZE (mm)	TYPE	SYSTEM NOMINAL VOLTAGE	CONDUCTORS	COMMENTS
STB	EXISTING DUCT BANK LV - SSSR SERVICE PIT	1-1	103	LV	480V	3c#500kCM) TECK + 1#2 GR	480V, KIOSK #1
		1-2	103	LV	600V	EMPTY	SPARE
		1-3	53	LV	208V	3c#1 TECK + 1#8 GR	120/208V, KIOSK #1
		1-4	53	LV	600V	EMPTY	SPARE
		2-1	103	LV	480V	2x(3c#250kCM) TECK + 1#2 GR	480V, KIOSK #2
		2-2	103	LV	600V	EMPTY	SPARE
		2-3	53	LV	208V	3c#1 TECK + 1#8 GR	120/208V, KIOSK #2
		2-4	53	LV	600V	EMPTY	SPARE
		3-1	103	LV	480V	2x(3c#250kCM) TECK + 2#12 GR	480V, VSY MACHINE SHIP
		3-2	103	LV	600V	EMPTY	SPARE
		3-3	53	LV	120/208V	6c#10 + 1#10 GND	CATHODIC PROTECTION
		3-4	53	LV	600V	EMPTY	SPARE
		1-5	53	LV	120/208V	7c#12	UNKNOW SERVICE
		1-6	103	LV	480V	2x(3c#250kCM) TECK + 1#2 GR	480V, KIOSK #3
		2-5	53	LV	208V	3c#1 TECK + 1#8 GR	120/208V, KIOSK #3
		2-6	103	LV	600V	EMPTY	SPARE
	EXISTING DUCT BANK COMM - SSSR SERVICE PIT	1-1	53	COMM	N/A	EMPTY	SPARE
		1-2	53	COMM	N/A	9c#12	VICTORIA SHIPYARDS FIRE ALARM SYSTEM
		2-1	103	COMM	N/A	50PR#22	TELECOMM
		2-2	103	COMM	N/A	12PR#22M 1 FIBRE, 1 F/A	TELECOMM



1 5418 EXISTING CENTRAL JETTY DUCT BANK TEMPORARY SERVICE SOLUTION
SCALE 1:20

KEYNOTES:

1. INTERCEPT, SPLICE AND EXTEND EXISTING COMMUNICATION, FIRE ALARM AND CCTV CIRCUITS FROM EXISTING COMMUNICATIONS MANHOLE AND EXTEND TO EXISTING SSS BUILDING ALONG ROUTE SHOWN. REFER TO STC/5418 FOR EXISTING COMMUNICATIONS CONDUCTORS.
2. INTERCEPT, SPLICE AND EXTEND EXISTING POWER CIRCUITS FROM EXISTING LV MANHOLE AND EXTEND TO EXISTING SSS SWITCHBOARDS, RECONNECT TO EXISTING FEEDER BREAKERS. REFER TO STC/5418 FOR EXISTING LV CONDUCTORS.
3. INTERCEPT, SPLICE AND EXTEND EXISTING POWER CIRCUITS FROM EXISTING LV DUCT BANK AND EXTEND TO EXISTING SSS SWITCHBOARDS, RECONNECT TO EXISTING FEEDER BREAKERS. REFER TO STC/5418 FOR EXISTING LV CONDUCTORS.
4. CONDUCTORS WILL BE REQUIRES TO CROSS ACTIVE ROAD, ENSURE SUITABLE CROSSING COVERING IS PROVIDED TO PREVENT DAMAGE TO CABLES DURING CONSTRUCTION.
5. MOUNT TEMPORARY CONDUCTORS TO EXISTING SOUTH JETTY RETAINING WALL, ENSURE THEY ARE MOUNTED ABOVE MAXIMUM HIGH TIDE LEVELS. ENSURE PASS THROUGHS FROM ABOVE JETTY DECK PLANE TO BELOW JETTY ARE SEALED TO PREVENT LIQUIDS FROM BYPASSING EGD WATER TREATMENT SYSTEMS.
6. RUN TEMPORARY CONDUCTORS ALONG EXISTING SOUTH JETTY RETAINING WALL, ENSURING ADEQUATE SUPPORT SPACING.
7. SHADED AREA INDICATES EXTENT OF EXISTING STEEL PILING, THIS ZONE BUTTS UP TO RETAINING WALL AND IS OPEN TO THE OCEAN BELOW, ALLOWING ACCESS TO RETAINING WALL FOR CONDUCTOR MOUNTINGS. THIS IS A CONFINED SPACE AND WILL REQUIRE CO-ORDINATION WITH TIDAL LEVELS TO ACCESS WORK AREAS.
8. REUSE EXISTING JETTY MOUNT SERVICE DUCT BANK, PULL NEW TEMPORARY CONDUCTORS IN DUCT BANK TO EXISTING SSS BUILDING
9. EXISTING JETTY MOUNT SERVICE DUCT BANK ROUTE.
10. ENTRE SSS BUILDING USING EXISTING WALL MOUNTED CABLE TRAY AND WALL PENETRATIONS AND SEAL EDGES OF PENETRATIONS WITH WATERPROOF POLYURETHANE CAULKING.
11. RUN CONDUCTORS TO REQUIRED TERMINATION POINTS USING EXISTING OVERHEAD CABLE TRAY.
12. TERMINATE COMMUNICATIONS CONDUCTORS IN SSS COMMUNICATION PANELS, TEST AND CONFIRM SYSTEM OPERATION.
13. TERMINAL LV CONDUCTORS IN SSS LV SWITCHBOARD. TEST AND CONFIRM SYSTEM OPERATION.

GENERAL NOTES:

1. ALL CONCRETE ENCASED CONDUITS ARE SCHEDULE 40 RIGID PVC CONDUITS.
2. REINFORCE DUCT BANKS WITH 15M BARS RUN CONTINUOUSLY IN ALL 4 CORNERS OF THE DUCT BANK.
3. INSTALL ONE CONTINUOUS 4/0 INSULATED COPPER GROUND CONDUCTORS IN THE BOTTOM OF EVERY DUCT BANK. TIE IN GROUNDS AT EVERY MANHOLE AND DISTRIBUTION CENTER TO PROVIDE ELECTRICAL CONTINUITY SITE WIDE.
4. PROVIDE ADDITIONAL GROUNDS WHERE DUCT BANKS FAN OUT INTO SEPARATE MANHOLES.
5. BOND ALL METAL RACKING LOCATIONS IN EVERY MANHOLE.
6. USE UNDERGROUND DUCT SPACERS WITH 190mmx190mm DUCT CENTER TO CENTER MEASUREMENT EXCEPT WHERE NOTED.
7. ALL CONDUITS MUST BE ENCASED IN A MINIMUM OF 50mm OF CONCRETE.
8. MAINTAIN 300mm SEPARATION BETWEEN COMMUNICATIONS CONDUITS AND POWER CONDUITS. FIBRE OPTIC CONDUITS MAY BE INSTALLED WITHIN THE 300mm SEPARATION.
9. ALL DUCTBANKS SHALL BE INSTALLED IN ACCORDANCE WITH CANADIAN ELECTRICAL CODE.
10. REFER TO SITE PLANS FOR SPACING BETWEEN DUCTBANKS.

0 200 400 600 800mm
1:10

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Pacific Region
SERVICES IMMOBILIERS
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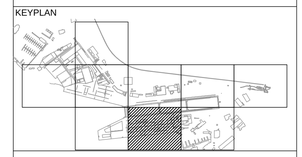
KEYPLAN



Revision/ Revision	Description/Description	Date/Date
5	ISSUED FOR TENDER	15/01/28
4	ISSUED FOR 99% DESIGN REVIEW	16/01/06
3	ISSUED FOR 66% DESIGN REVIEW	15/11/25
2	ISSUED FOR 33% DESIGN REVIEW	15/10/28
1	ISSUED FOR DESIGN DEVELOPMENT	15/09/11
0		

Client/client

ESQUIMALT GRAVING DOCK

825 ADMIRALS ROAD VICTORIA, BC, V9A 2P1

Project title/Titre du projet
825 ADMIRALS ROAD VICTORIA BC ESQUIMALT GRAVING DOCK ELECTRICAL SAFETY UPGRADE

SOUTH SUBSTATION SWITCHGEAR REPLACEMENT (SSSR)

Consultant Signature Box Only

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Drawn by/Dessine par
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Preetipal Paul

Drawing title/Titre du dessin

NEW DUCT BANK CROSS SECTION DETAILS 4 OF 4 AND TEMPORARY SERVICE

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.062548.2	5418	5

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