The following changes in the tender documents are effective immediately. This addendum will form part of the contract documents.

DRAWINGS

.1 Drawing E-000-RB – Key plan and symbol legend

1. Revise general project notes 5, 7, and 8.
2. Add general project note 12.

.2 Drawing E-001-RB – Outdoor enclosure TR6

1. Clarify that communications conduit is to be concrete encased.

.3 Drawing E-002-RB – Neighbourhoods 'A', 'B', 'C', 'E', 'F'

1. Revise reference note on grounding detail as noted

.4 Drawing E-004-RB – Waste Water Treatment Plant

1. Add detail 6 for grounding details as noted.

.5 Drawing E-100-RB – Main Power House (BLDG. 115) Single Line and Electrical Details

1. Add outline to single line diagram indicating items to be packaged in outdoor unit substation, US-1.
2. Add detail 6 for grounding details as noted.

.6 Drawing E-103-RB – Building 103 Partial Site and Floor Plan

1. Revise reference to E-107 to be E-104 as noted.

.7 Drawing E-104-RB – Building 103 Single Line and Electrical Details

1. Revise grounding details as noted and add detail 6 for additional grounding requirements.

.8 Drawing E-106-RB – Building 105 Single Line and Electrical Details

1. Revise grounding details as noted and add detail 6 for additional grounding requirements.

.9 Drawing E-200-RA – Electrical Details

1. Add H/E-200 for typical details on concrete encased underground duct banks.

.10 Drawing E-201-RB – Electrical Details

1. Clarify definition for traffic loading as noted.

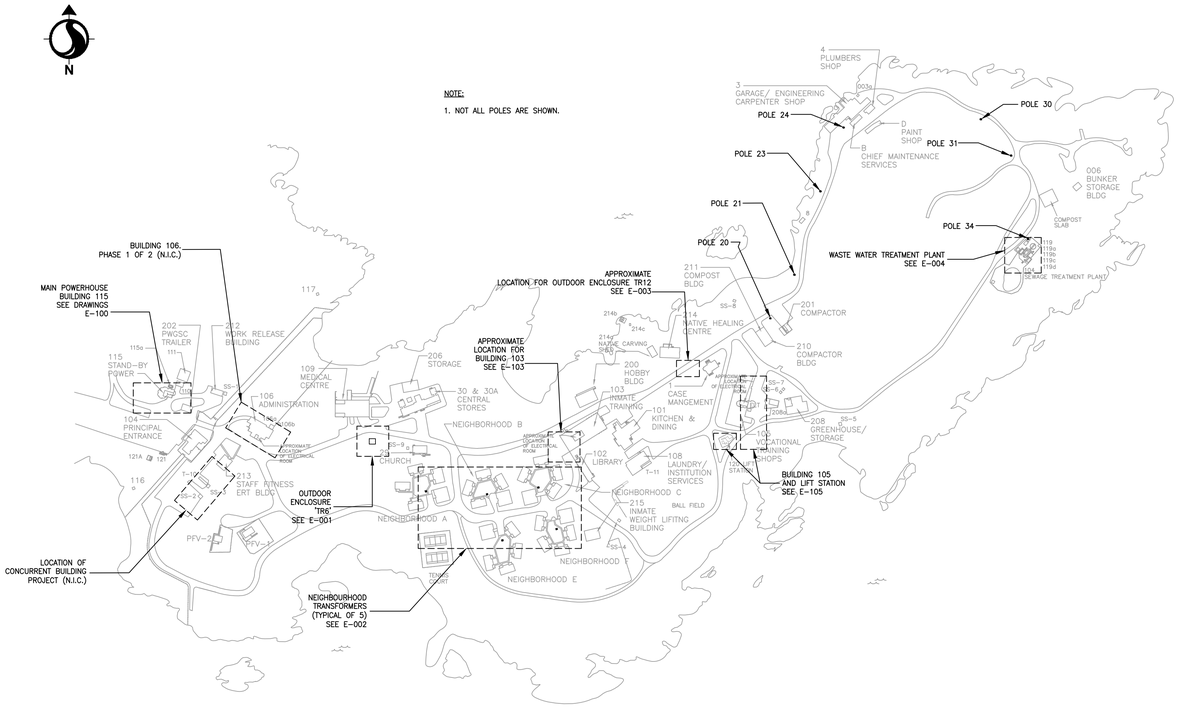
SPECIFICATIONS

.1 Specification Section 26 05 27 - Grounding Primary – Addendum #E-2

1. Add requirement to perform soil resistivity tests to each location where grounding is required and provide step and touch potential, and expected ground potential rise calculations as noted.

.2 Add new specification Section 31 23 16.26 – Rock Removal – Addendum #E-2

END OF ADDENDUM No. 2



1 SITE KEY PLAN
1:3000

DRAWING LIST	
E-000	KEY PLAN AND SYMBOL LEGEND
E-001	OUTDOOR ENCLOSURE TR6
E-002	NEIGHBOURHOODS 'A', 'B', 'C', 'E', 'F'
E-003	OUTDOOR ENCLOSURE TR12
E-004	WASTE WATER TREATMENT PLANT
E-100	MAIN POWER HOUSE (BLDG. 115) SINGLE LINE AND ELECTRICAL DETAILS
E-101	MAIN POWER HOUSE (BLDG. 115) DECONSTRUCTION PLAN
E-102	MAIN POWER HOUSE (BLDG. 115) FLOOR PLAN
E-103	BUILDING 103 – PARTIAL SITE AND FLOOR PLANS
E-104	BUILDING 103 – SINGLE LINE AND ELECTRICAL DETAILS
E-105	BUILDING 105 – PARTIAL SITE AND FLOOR PLANS
E-106	BUILDING 105 – SINGLE LINE AND ELECTRICAL DETAILS
E-200	ELECTRICAL DETAILS
E-201	ELECTRICAL DETAILS
E-202	UPDATED PARTIAL SITE PLAN: HIGH VOLTAGE FEEDER REPLACEMENT
E-203	MAIN POWER HOUSE (BLDG. 115) PHASING NOTES
E-204	BUILDING 103 PHASING NOTES
E-205	BUILDING 105 PHASING NOTES
E-206	WASTE WATER TREATMENT PLANT PHASING NOTES
E-400	EXISTING SITE SINGLE LINE DIAGRAM
E-401	SITE SINGLE LINE DIAGRAM – NEW (1 OF 2)
E-402	SITE SINGLE LINE DIAGRAM – NEW (2 OF 2)

GENERAL PROJECT NOTES:

1. PROVIDE COORDINATED OVERCURRENT PROTECTIVE DEVICES THAT MITIGATE ARC FLASH INCIDENT ENERGY LEVELS BELOW 8 CAL/CM2.
2. PROVIDE NON–DESTRUCTION CABLE TESTING USING VERY LOW FREQUENCY METHOD FOR ALL PRIMARY FEEDERS. PROVIDE TEST RESULTS TO DEPARTMENTAL REPRESENTATIVE.
3. PRIOR TO EXCAVATING, USE GROUND PENETRATING RADAR TO IDENTIFY ALL UNDERGROUND SERVICES THAT WILL BE AFFECTED BY THE WORK AND PROVIDE DIMENSIONED LAYOUT TO DEPARTMENTAL REPRESENTATIVE. CAREFULLY EXPOSE SERVICES BY HAND WHERE APPROPRIATE.
4. WHERE UNDERGROUND SERVICES ARE ENCOUNTERED DURING EXCAVATION FOR DUCTS, PRECAUTIONS ARE TO BE TAKEN TO MAINTAIN THESE SERVICES – PIPES, CABLES, ETC. – AND IF BROKEN DURING THE PROCESS, ARE TO BE REPAIRED UNDER THIS CONTRACTOR'S SCOPE OF WORK, TO THE SATISFACTION OF THE DEPARTMENTAL REPRESENTATIVE.
5. CONTRACTOR SHALL FIELD VERIFY, TO ASSESS THE EXTENT OF ARCHITECTURAL WORK REQUIRED FOR THE ELECTRICAL SCOPE BEFORE PROCEEDING WITH THE WORK. CONTRACTOR SHALL MAKE GOOD AS NEW TO MATCH EXISTING, ANY WALLS/FLOORS/FOUNDATIONS AND MISCELLANEOUS BUILDILNG ENVELOPE PENETRATIONS, INCLUDING INSULATION, BARRIER MEMBRANE SYSTEMS, ETC. THAT WERE AFFECTED TO CARRY OUT THE SCOPE OF THE PROJECT. (B)
6. NO INSTALLED DUCTS IN TRENCHES TO BE LEFT OPEN OVERNIGHT. ALL OPEN TRENCHES IN ROADS SHALL BE COVERED WITH STEEL PLATES.
7. RESTORE ALL LANDSCAPING IN AFFECTED AREAS TO MATCH ORIGINAL LANDSCAPE CONDITIONS.
8. ALL NEW CIRCUIT BREAKERS, 200A OR GREATER, TO BE LSI ELECTRONIC TRIP CIRCUIT BREAKERS. (B)
9. THE TRANSFER SWITCH (WHETHER NOTED AS OPEN TRANSITION OR CLOSED TRANSITION) THAT IS TO BE PROVIDED WILL INITIALLY BE CONNECTED IN AN OPEN TRANSITION. HOWEVER, IT WILL ULTIMATELY BE CONFIGURED AS A CLOSED TRANSITION TRANSFER SWITCH. THE CONTRACTOR IS TO PROVIDE ADDITIONAL MOBILIZATION, MODIFICATION, AND COMMISSIONING SERVICES TO TRANSITION THE TRANSFER SWITCH FROM OPEN TO CLOSED TRANSITION.
10. SHUTDOWN FOR BUILDINGS TO BE PERFORMED ON SUNDAYS.
11. PROVIDE TREE PROTECTION FENCES LARGE ENOUGH TO EXTEND TO THE DRIP LINE OF TREES IN CLOSE PROXIMITY TO SITE WORK.
12. ALLOW FOR UP TO TWO VISITS PER DAY TO REFUEL GENERATORS. (B)

SCHEMATIC SYMBOLS	
	DRAW OUT LOW VOLTAGE CIRCUIT BREAKER
	LOW VOLTAGE CIRCUIT BREAKER
	HIGH VOLTAGE CIRCUIT BREAKER
	DRAW OUT HIGH VOLTAGE CIRCUIT BREAKER
	LOAD BREAK SWITCH
	DISCONNECT SWITCH
	FUSE
	TRANSFORMER
	AUTOTRANSFORMER
	CURRENT TRANSFORMERS (# INDICATES NUMBER OF CTs IN GROUP)
	ZERO SEQUENCE CURRENT TRANSFORMER
	POTENTIAL TRANSFORMERS (# INDICATES NUMBER OF PTs IN GROUP)
	TRANSFER SWITCH
	FOUR POSITION, T–BLADE SWITCH
M	MOTOR OPERATOR FOR LOAD BREAK SWITCH
ST	SHUNT TRIP
R	RELAY CONTACT
	AUTOMATIC TRANSFER SWITCH C/W SINGLE ISOLATION/BYPASS
	AUTOMATIC TRANSFER SWITCH C/W DUAL ISOLATION/BYPASS
	NORMALLY OPEN CONTACT
	NORMALLY CLOSED CONTACT
G	GENERATOR
M	REVENUE METER
DMS	DIGITAL INFORMATION METER
△	DELTA CONNECTION
Y	WYE CONNECTION
⏚	GROUND CONNECTION
	HIGH VOLTAGE STRESS RELIEF CONE
	POTHEAD
	CAPACITOR
	SURGE PROTECTIVE DEVICE
	LIGHTNING ARRESTOR
PANEL PN2A 42CC1 PN1 N2A	PANELBOARD
	PUSH PULL SWITCH
	MANHOLE
	GROUND BUS
O	OHMMETER
K	KEY SWITCH/KEY INTERLOCK
V	VOLTMETER
	CONNECTION
	MAGNETIC MOTOR STARTER
	MANUAL MOTOR STARTER
	MOTOR OVERLOAD
	BREAK LINE
	CONTINUATION BREAK
#	CABLE FAULT INDICATOR (# INDICATES TYPE, REFER TO DRAWING NOTES)
	DEAD BREAK SEPARABLE INSULATED CONNECTORS

POWER PLAN SYMBOLS	
	COMBINATION DISCONNECT AND MAGNETIC MOTOR STARTER
	DISCONNECT SWITCH
	FUSED DISCONNECT SWITCH
	MAGNETIC MOTOR STARTER
	CONDUIT STUB
	CONDUIT UP
	CONDUIT DOWN

GENERAL SYMBOLS	
#	NOTE REFERENCE
## ####	EQUIPMENT REFERENCE
#	REVISION NUMBER
##	WIRING HOME RUN

ABBREVIATIONS	
EX	EXISTING DEVICE TO REMAIN
RE	REMOVE EXISTING DEVICE
RP	REPLACE EXISTING DEVICE WITH NEW DEVICE
RL	RELOCATE EXISTING DEVICE
ER	EXISTING DEVICE IN RELOCATED POSITION
TYP	TYPICAL
WP	WEATHERPROOF

LEGEND	
P	PRIMARY U/G LINE - NEW TO REMAIN
P	PRIMARY U/G LINE - EXISTING
P	PRIMARY U/G LINE - TO BE REMOVED
S	SECONDARY U/G LINE - NEW TO REMAIN
S	SECONDARY U/G LINE - EXISTING
S S	SECONDARY U/G LINE - TO BE REMOVED
COM	COMMUNICATION U/G LINE - EXISTING

Public Works and Government Services Canada
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REAL PROPERTY SERVICES
Pacific Region
SERVICES IMMOBILIERS
Région de Pacifique

Revision/ Revision	Description/Description	Date/Date
B	ISSUED FOR ADDENDUM #E-2	06/22/16
A	ISSUED FOR ADDENDUM #E-1	06/17/16
0	ISSUED FOR TENDER	04/20/16

Client/client

CORRECTIONAL SERVICE CANADA

Project title/Titre du projet

METCHOSIN, BC

WILLIAM HEAD INSTITUTION ELECTRICAL HIGH VOLTAGE UPGRADE (PHASE 2 OF 2)

Consultant Signature Box Only

Designed by/Concept par
PN

Drawn by/Dessine par
PN

PWGSC Project Manager/Administrateur de Projets TPSGC
P. Truong

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

Drawing title/Titre du dessin
KEY PLAN AND SYMBOL LEGEND

Project No./No. du projet	Sheet/ Feuille	Revision no./ La Révision no.
R.069376.001	E-000 1 OF 22	

PWGSC – B1 – 1000X707

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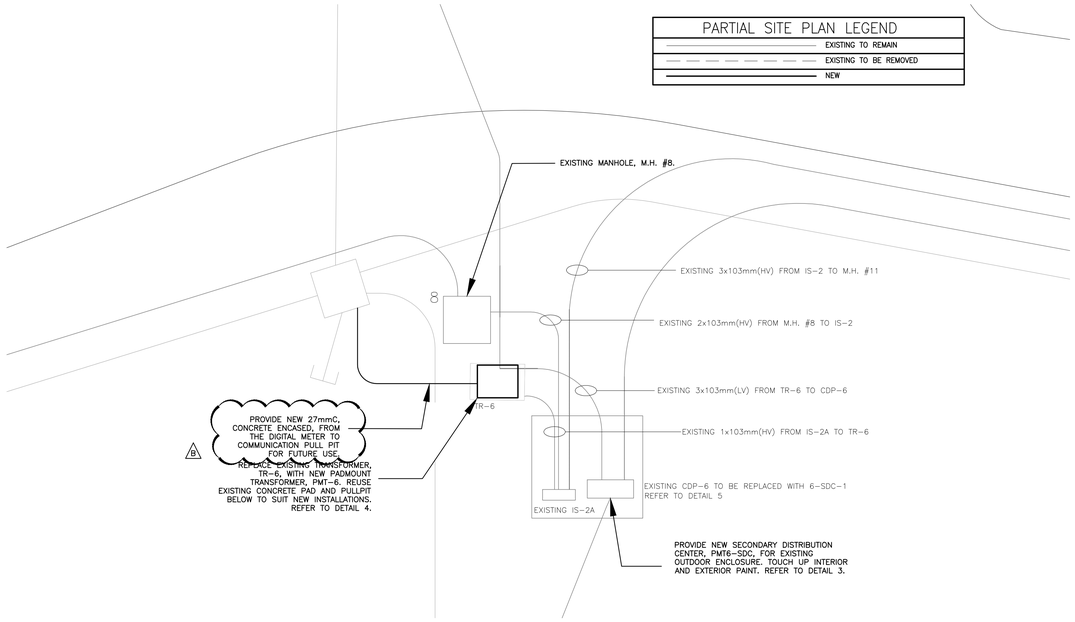


1 / 000 PARTIAL SITE PLAN
1:100

SUGGESTED PHASING NOTES:

1. ARRANGE POWER SHUTDOWN TO CDP-6. PROVIDE TEMPORARY GENERATOR TO POWER MEDICAL CENTER BUILDING 109. INTERRUPT POWER TO TRANSFORMER 6, TR6.
2. REMOVE EXISTING TRANSFORMER 6, TR 6, AND INSTALL A NEW PAD MOUNT TRANSFORMER, PMT-6, IN THE SAME LOCATION.
3. REMOVE CDP-6 AND REPLACE WITH NEW SECONDARY DISTRIBUTION CENTER, PMT6-SDC.
4. UTILIZE EXISTING CONDUITS AND REPLACE EXISTING SECONDARY CONDUCTORS WITH NEW SECONDARY CONDUCTORS FROM NEW PADMOUNT TRANSFORMER, PMT-6, TO NEW SECONDARY DISTRIBUTION CENTER, PMT6-SDC.
5. CUT OVER AND TIE ALL EXISTING LOADS ONE BY ONE FED BY THE TEMPORARY GENERATOR TO THE NEW SECONDARY DISTRIBUTION CENTER, PMT6-SDC. REPLACE EXISTING CONDUCTORS. CONFIRM IF SIZE OF EXISTING CONDUCTORS MEETS THE CURRENT ELECTRICAL CODE REQUIREMENTS. PROVIDE CONFIRMATION TO DEPARTMENTAL REPRESENTATIVE PRIOR TO REPLACING. CONDUCTORS TO BE TURNED OVER TO CSC.
6. REMOVE EXISTING DISTRIBUTION EQUIPMENT NOT REQUIRED FOR LAYOUT.
7. REMOVE TEMPORARY GENERATORS AND COMPLETE ELECTRICAL INSTALLATION.

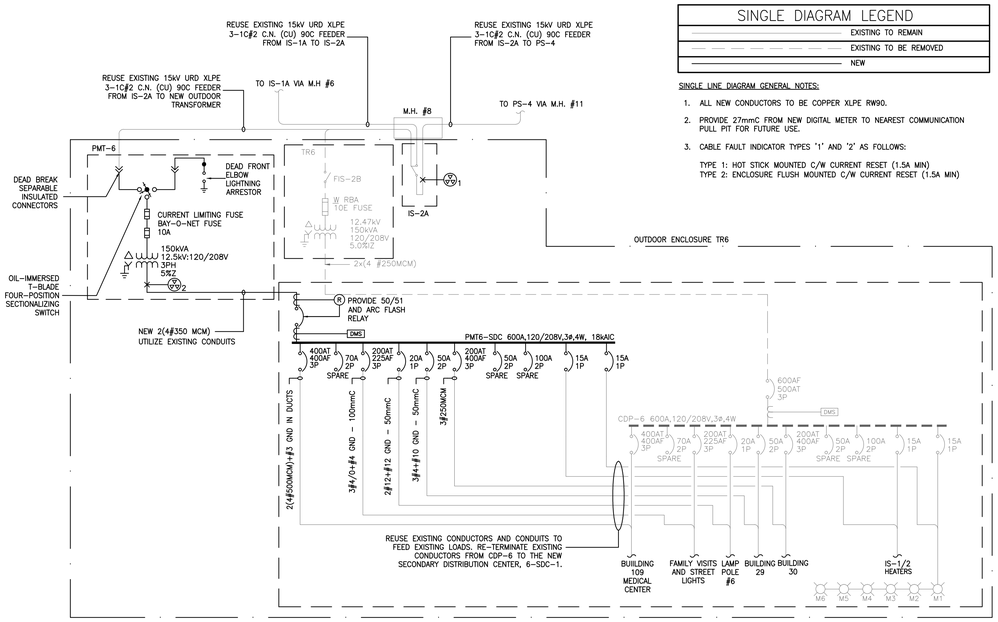
TEMPORARY GENERATOR NOTES:

1. PROVIDE THE FOLLOWING WITH TEMPORARY PRIME POWER RATED GENERATORS FOR BACK-UP:

   1.1 BUILDING 109, MEDICAL CENTER – 150kW, 120/208V, 3Ø

   SUPPLY ALL DIESEL FUEL REQUIRED TO RUN GENERATORS AT FULL LOAD WHILE TRANSFORMER 6, TR6, AND CDP-6 IS BEING REPLACED. TIME PERIOD TO EXTEND UNTIL NEW PADMOUNT TRANSFORMER, PMT-6, AND SECONDARY DISTRIBUTION CENTER, 6-SDC-1, IS COMMISSIONED AND SUPPLYING POWER TO MEDICAL CENTER BUILDING 109.
2. GENERATORS TO BE SKID-MOUNTED AND COMPLETE WITH CRITICAL GRADE MUFFLE AND SOUND ATTENUATED, WEATHERPROOF ENCLOSURES.
3. SAFETY MEANS, PROTECTION AND LOCKOUT TO BE PROVIDED TO PREVENT UNDESIRABLE REVERSE FEED. PROVIDE WARNING LABELS AT ALL CONNECTION POINTS AND AS WELL AS EMERGENCY PLAN & CONTACTS.

5 / – EXISTING CDP-6
N.T.S.



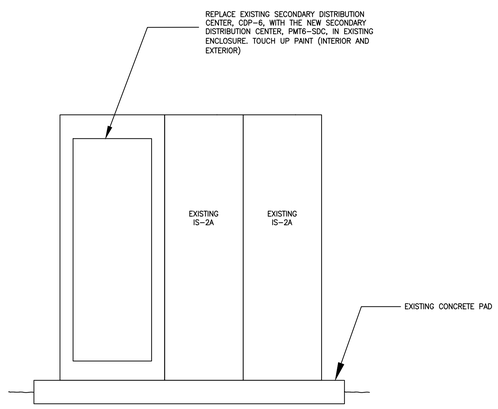
SINGLE DIAGRAM LEGEND
EXISTING TO REMAIN
EXISTING TO BE REMOVED
NEW

SINGLE LINE DIAGRAM GENERAL NOTES:

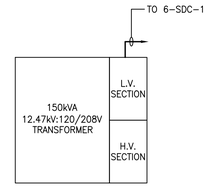
1. ALL NEW CONDUCTORS TO BE COPPER XLPE RW90.
2. PROVIDE 27mmC FROM NEW DIGITAL METER TO NEAREST COMMUNICATION PULL PIT FOR FUTURE USE.
3. CABLE FAULT INDICATOR TYPES '1' AND '2' AS FOLLOWS:

   TYPE 1: HOT STICK MOUNTED C/W CURRENT RESET (1.5A MIN)
   TYPE 2: ENCLOSURE FLUSH MOUNTED C/W CURRENT RESET (1.5A MIN)

2 / – PARTIAL SINGLE LINE DIAGRAM
N.T.S.



3 / – OUTDOOR ENCLOSURE IS-2A & 6-SDC-1 ELEVATION DETAIL
N.T.S.



4 / – PMT-6 – PADMOUNT TRANSFORMER PLAN VIEW
N.T.S.

Public Works and Government Services Canada
Travaux publics et Services gouvernementaux Canada
REAL PROPERTY SERVICES
Pacific Region
SERVICES IMMOBILIERS
Région de Pacifique

Revision/ Revision	Description/Description	Date/Date
B	ISSUED FOR ADDENDUM #E-2	06/21/16
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0	ISSUED FOR TENDER	04/20/16

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CORRECTIONAL SERVICE CANADA

Project title/Titre du projet

METCHOSIN, BC

WILLIAM HEAD INSTITUTION ELECTRICAL HIGH VOLTAGE UPGRADE (PHASE 2 OF 2)

Consultant Signature Box Only

Designed by/Concept par
PN

Drawn by/Dessine par
PN

PWGSC Project Manager/Administrateur de Projets TPSGC
P. Truong

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

Drawing title/Titre du dessin
OUTDOOR ENCLOSURE TR6

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.069376.001	E-001 2 OF 22	

PWGSC – B1 – 1000X707

0 10 20 30 40 50 60 70 80 90 100mm

1 — 000 — PARTIAL SITE PLAN
1:500

PARTIAL SITE PLAN LEGEND	
P	PRIMARY U/G LINE – NEW
P	PRIMARY U/G LINE – EXISTING TO REMAIN
P	PRIMARY U/G LINE – TO BE REMOVED
S	SECONDARY U/G LINE – NEW
S	SECONDARY U/G LINE – EXISTING TO REMAIN
S	SECONDARY U/G LINE – TO BE REMOVED
COM	COMMUNICATION U/G LINE – EXISTING

GENERAL NOTES:

1. REFER TO DRAWING E-202 TO LOCATE PRIMARY CONDUCTORS BEING REMOVED OR INSTALLED.

SUGGESTED PHASING NOTES:

1. ARRANGE POWER SHUT DOWN TO THE NEIGHBOURHOOD TRANSFORMER. PROVIDE TEMPORARY GENERATOR TO POWER THE EXISTING NEIGHBOURHOOD. INTERRUPT POWER TO NEIGHBOURHOOD TRANSFORMER.
2. REMOVE EXISTING CONCRETE PAD AND NEIGHBOURHOOD TRANSFORMER.
3. INSTALL NEW CONCRETE PAD TO FIT THE NEW PADMOUNT TRANSFORMER C/W A STEEL PAD LOCKABLE ACCESS HATCH TO MATCH THE EXISTING COMMUNICATION PULL PIT.
4. INSTALL NEW PADMOUNT TRANSFORMER FOR THE NEIGHBOURHOOD C/W A SECONDARY VOLTAGE SWITCHBOARD.
5. REPLACE EXISTING PRIMARY CONDUCTORS FROM THE PRIMARY SWITCHES TO THE PADMOUNT TRANSFORMER.
6. CUT OVER AND ONE BY ONE PROVIDE NEW SECONDARY FEEDERS TO TIE EXISTING LOADS TO THE NEW SECONDARY VOLTAGE SWITCHBOARD. UTILIZE EXISTING DUCTS.
7. REPEAT PROCESS 1 TO 6 FOR OTHER NEIGHBOURHOOD TRANSFORMERS (5 IN TOTAL)
8. REPLACE EXISTING PRIMARY CONDUCTORS BETWEEN PS-4 TO PS-3, PS-3 TO PS-2 AND PS-2 TO PS-1. REFER TO DRAWING E-202 FOR LOCATIONS OF CONDUCTORS.

TEMPORARY GENERATOR NOTES (TYP):

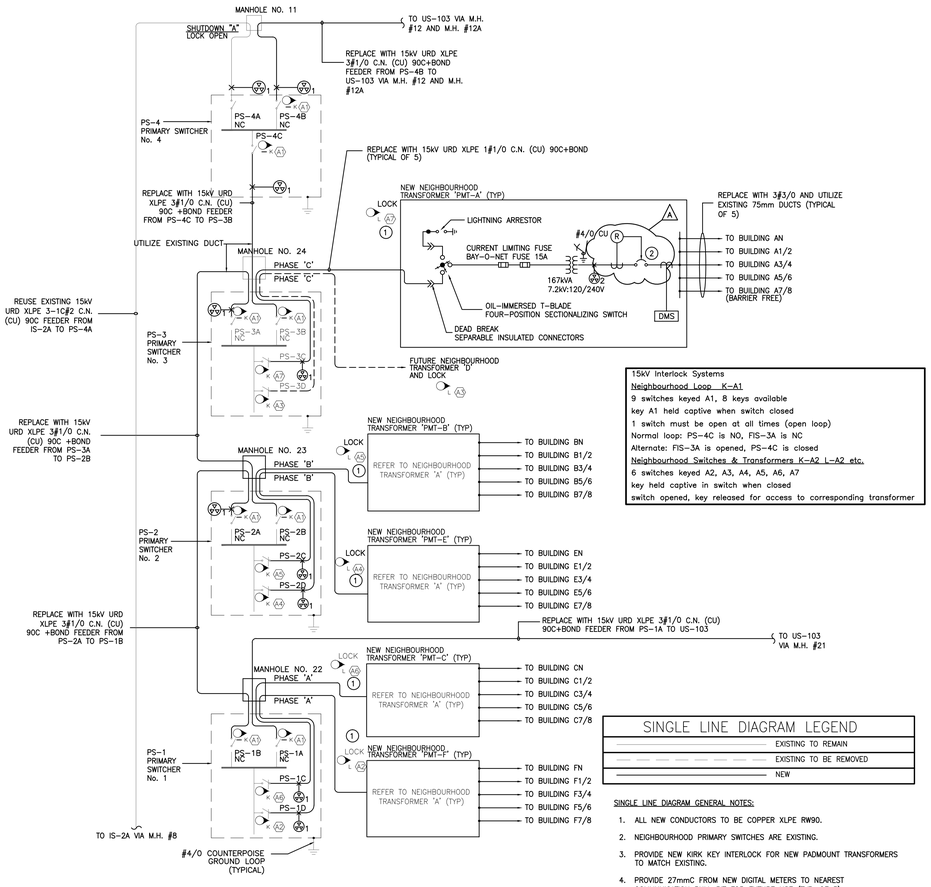
1. PROVIDE THE FOLLOWING WITH TEMPORARY PRIME POWER RATED GENERATORS FOR BACK-UP:

   1.1 NEIGHBOURHOOD A, B, C, E, AND F – 167kW, 120/240V, 1Ø

   SUPPLY ALL DIESEL FUEL REQUIRED TO RUN GENERATORS AT FULL LOAD WHILE EXISTING NEIGHBOURHOOD TRANSFORMER AND CONCRETE PAD IS BEING REPLACED. TIME PERIOD TO EXTEND UNTIL THE NEW PADMOUNT TRANSFORMER AND CONCRETE PAD IS COMMISSIONED AND SUPPLYING POWER TO THEIR RESPECTIVE NEIGHBOURHOODS.
2. GENERATORS TO BE SKID-MOUNTED AND COMPLETE WITH CRITICAL GRADE MUFFLE AND SOUND ATTENUATED, WEATHERPROOF ENCLOSURES.
3. SAFETY MEANS, PROTECTION AND LOCKOUT TO BE PROVIDED TO PREVENT UNDESIRABLE REVERSE FEED. PROVIDE WARNING LABELS AT ALL CONNECTION POINTS AND AS WELL AS EMERGENCY PLAN AND CONTACT.

OUTDOOR PAD MOUNT TRANSFORMER CONCRETE PAD GENERAL NOTES:

1. COPPER TO ROD CONNECTION TO BE THERMITE WELDED.
2. RETAIN A STRUCTURAL ENGINEER (REGISTERED BY APEGBC) TO DESIGN A RE-INFORCED CONCRETE PAD. INCLUDE SEISMIC RESTRAINT ANCHORING.



SINGLE LINE DIAGRAM LEGEND	
	EXISTING TO REMAIN
	EXISTING TO BE REMOVED
	NEW

SINGLE LINE DIAGRAM GENERAL NOTES:

1. ALL NEW CONDUCTORS TO BE COPPER XLPE RW90.
2. NEIGHBOURHOOD PRIMARY SWITCHES ARE EXISTING.
3. PROVIDE NEW KIRK KEY INTERLOCK FOR NEW PADMOUNT TRANSFORMERS TO MATCH EXISTING.
4. PROVIDE 27mmC FROM NEW DIGITAL METERS TO NEAREST COMMUNICATION PULL PIT FOR FUTURE USE (TYP. OF 5).
5. CABLE FAULT INDICATOR TYPES '1' AND '2' AS FOLLOWS:

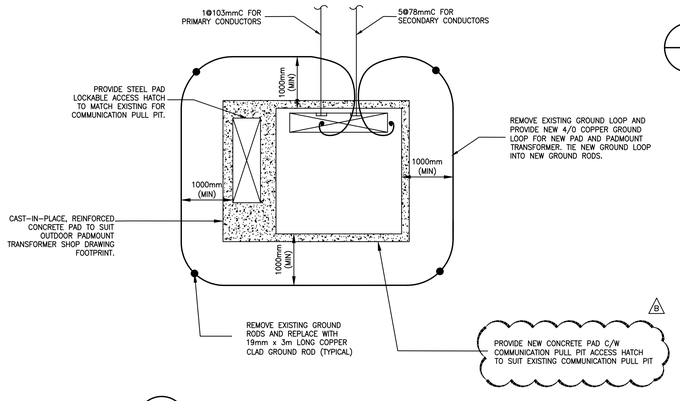
   TYPE 1: HOT STICK MOUNTED C/W CURRENT RESET (1.5A MIN)
   TYPE 2: ENCLOSURE FLUSH MOUNTED C/W CURRENT RESET (1.5A MIN)

SINGLE LINE DIAGRAM KEYNOTES:

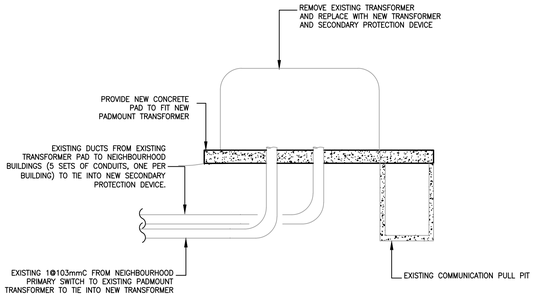
(1) PROVIDE KEY INTERLOCKS TO MATCH EXISTING PRIMARY SWITCH KEY INTERLOCKS.

(2) PROVIDE 50/51 AND ARC FLASH RELAY

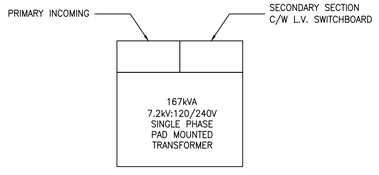
2 — – — PARTIAL SINGLE LINE DIAGRAM
N.T.S.



4 — – — TRANSFORMER CONCRETE PAD LAY-OUT PLAN (TYPICAL)
N.T.S.



3 — – — TRANSFORMER PROFILE DETAIL (TYPICAL)
N.T.S.



5 — – — OUTDOOR PADMOUNT TRANSFORMER PLAN VIEW
N.T.S.

6 — – — EXISTING PADMOUNT TRANSFORMER AND CONCRETE PAD
N.T.S.

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

REAL PROPERTY SERVICES
Pacific Region
SERVICES IMMOBILIERS
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Client/client

CORRECTIONAL SERVICE CANADA

Project title/Titre du projet

METCHOSIN, BC

WILLIAM HEAD INSTITUTION ELECTRICAL HIGH VOLTAGE UPGRADE (PHASE 2 OF 2)

Consultant Signature Box Only

Designed by/Concept par: **PN**

Drawn by/Dessine par: **PN**

PWGSC Project Manager/Administrateur de Projets TPSGC: **P. Truong**

PWGSC, Regional Manager, Architectural and Engineering Services/ Gestionnaire régionale, Services d'architectural et de génie, TPSGC: **P. Paul**

Drawing title/Titre du dessin

NEIGHBOURHOODS 'A', 'B', 'C', 'E', 'F'

Project No./No. du projet: **R.069376.001**

Sheet/Feuille: E-002

3 OF 22

Revision no./ La Révision no.

PWGSC – B1 – 1000X707

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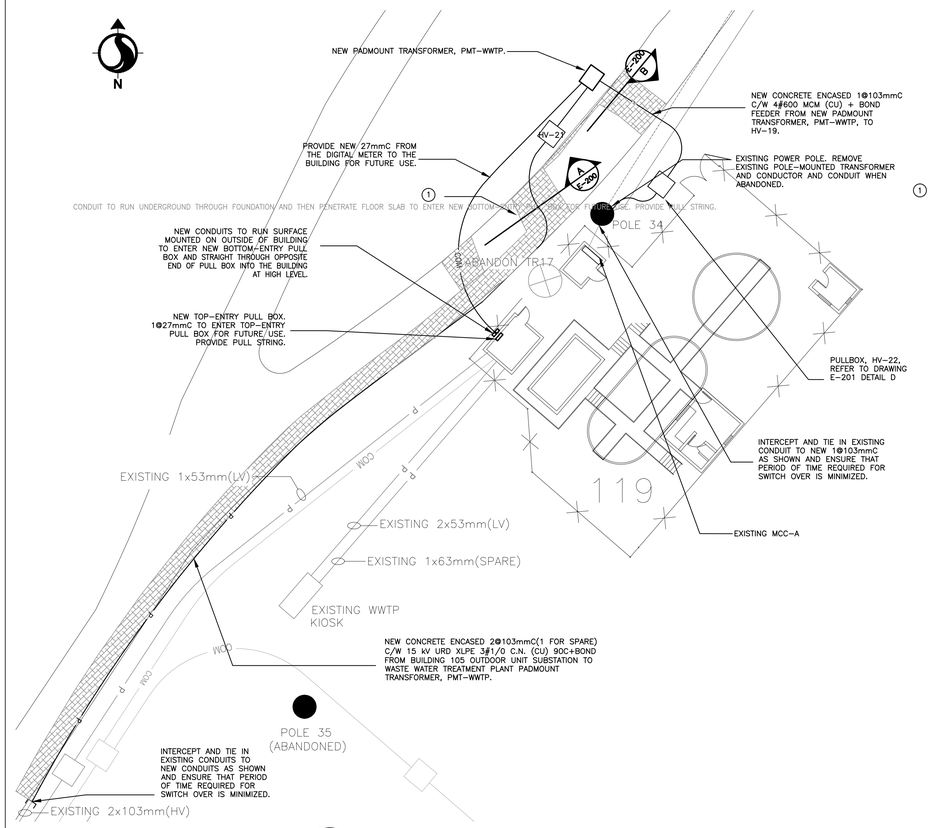


1 PARTIAL SITE PLAN
000 — 1:200

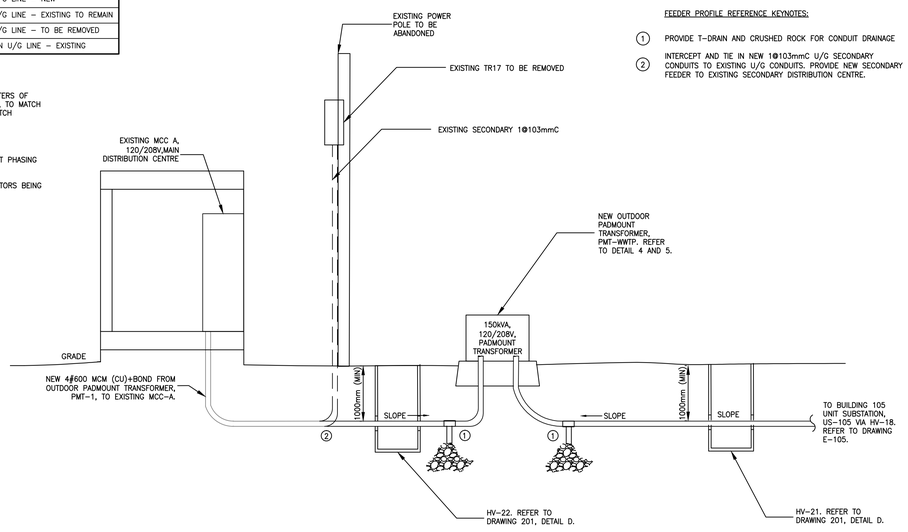
PARTIAL SITE PLAN LEGEND	
7	PRIMARY U/G LINE – NEW
7	PRIMARY U/G LINE – EXISTING TO REMAIN
7	PRIMARY U/G LINE – TO BE REMOVED
1	SECONDARY U/G LINE – NEW
1	SECONDARY U/G LINE – EXISTING TO REMAIN
1	SECONDARY U/G LINE – TO BE REMOVED
COM	COMMUNICATION U/G LINE – EXISTING

WASTE WATER TREEATMENT KEYNOTES:

(1) REMOVE, REPAIR, MAKE GOOD, AND RESTORE 130 SQUARE METERS OF ASPHALT PAVEMENT, INCLUDING BASE AND SUB BASE GRAVELS, TO MATCH OR EXCEED THE EXISTING THICKNESS. FINAL CONDITION TO MATCH QUALITY OF EXISTING CONDITION IN AREA.

GENERAL NOTES:

1. REFER TO DRAWING E-206 FOR WASTE WATER TREATMENT PHASING NOTES.
2. REFER TO DRAWING E-202 TO LOCATE PRIMARY CONDUCTORS BEING REMOVED OR INSTALLED.

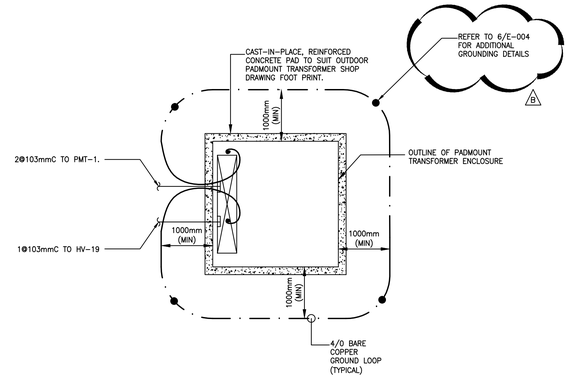


FEEDER PROFILE REFERENCE KEYNOTES:

(1) PROVIDE T-DRAIN AND CRUSHED ROCK FOR CONDUIT DRAINAGE

(2) INTERCEPT AND TIE IN NEW 1@103mmC U/G SECONDARY CONDUITS TO EXISTING U/G CONDUITS. PROVIDE NEW SECONDARY FEEDER TO EXISTING SECONDARY DISTRIBUTION CENTRE.

3 OUTDOOR PADMOUNT TRANSFORMER AND WASTE WATER TREATMENT PLANT FEEDER PROFILE
N.T.S.

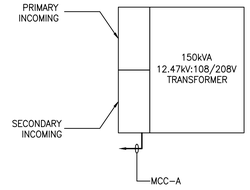


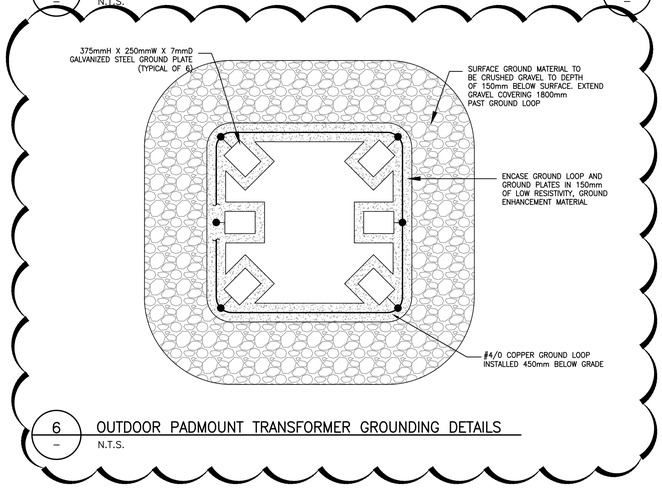
OUTDOOR PAD MOUNT TRANSFORMER CONCRETE PAD GENERAL NOTES:

1. COPPER TO ROD CONNECTION TO BE THERMITE WELDED.
2. RETAIN A STRUCTURAL ENGINEER (REGISTERED BY APEGBC) TO DESIGN A RE-INFORCED CONCRETE PAD. INCLUDE SEISMIC RESTRAINT ANCHORING.

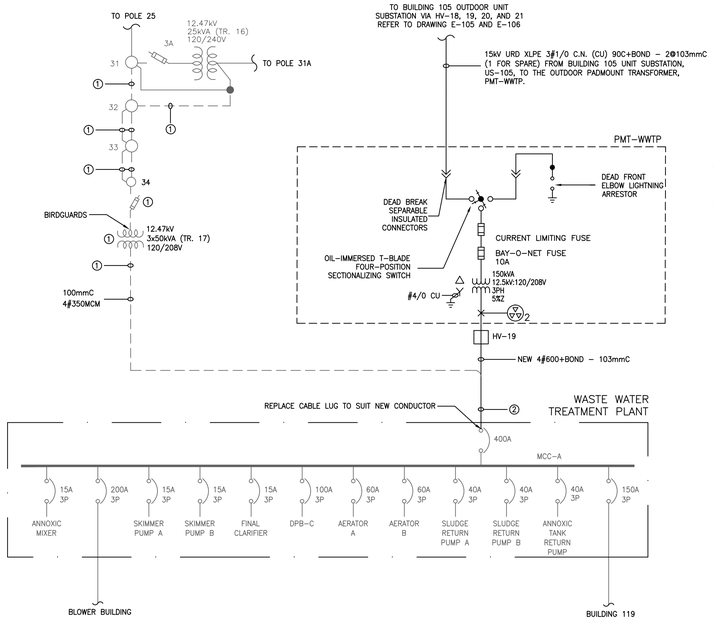
4 OUTDOOR PADMOUNT TRANSFORMER CONCRETE PAD LAY-OUT PLAN
N.T.S.

5 OUTDOOR PADMOUNT TRANSFORMER PLAN VIEW
N.T.S.





6 OUTDOOR PADMOUNT TRANSFORMER GROUNDING DETAILS
N.T.S.



SINGLE LINE DIAGRAM LEGEND	
	EXISTING TO REMAIN
	EXISTING TO BE REMOVED
	NEW

SINGLE LINE DIAGRAM REFERENCE KEYNOTES:

(1) REMOVE EXISTING POLE-MOUNTED TRANSFORMER, EXISTING SECONDARY CONDUCTORS TO WASTE WATER TREATMENT PLANT MCC A MAIN BREAKER, GANG OPERATED SWITCHES, INSULATORS AND HIGH VOLTAGE AERIAL CABLES.

(2) PROVIDE NEW 1@103mmC AND TIE INTO EXISTING 1@103mmC U/G DUCT FED FROM POLE. PROVIDE NEW 4#600 MCM (CU)+BOND AND TERMINATE IN WASTE WATER TREATMENT PLANT MAIN BREAKER (400A)

SINGLE LINE DIAGRAM GENERAL NOTES:

1. ALL NEW CONDUCTORS TO BE COPPER XLPE RW90.
2. PROVIDE 27mmC FROM NEW DIGITAL METER TO NEW BOTTOM-ENTRY PULL BOX AND ENTER INTO BUILDING AT HIGH LEVEL. PROVIDE NEW TOP-ENTRY PULL BOX FOR 27mmC TO ENTER. PROVIDE PULL STRING.
3. CABLE FAULT INDICATOR TYPES '1' AND '2' AS FOLLOWS:

   TYPE 1: HOT STICK MOUNTED C/W CURRENT RESET (1.5A MIN)
   TYPE 2: ENCLOSURE FLUSH MOUNTED C/W CURRENT RESET (1.5A MIN)

2 PARTIAL SINGLE LINE DIAGRAM
N.T.S.

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REAL PROPERTY SERVICES
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Revision/ Revision	Description/Description	Date/Date
B	ISSUED FOR ADDENDUM #E-2	06/21/16
A	ISSUED FOR ADDENDUM #E-1	06/17/16
0	ISSUED FOR TENDER	04/20/16

Client/client

CORRECTIONAL SERVICE CANADA

Project title/Titre du projet

METCHOSIN, BC

WILLIAM HEAD INSTITUTION ELECTRICAL HIGH VOLTAGE UPGRADE (PHASE 2 OF 2)

Consultant Signature Box Only

Designed by/Concept par: **PN**

Drawn by/Dessine par: **PN**

PWGSC Project Manager/Administrateur de Projets TPSGC: **P. Truong**

PWGSC, Regional Manager, Architectural and Engineering Services/ Gestionnaire régionale, Services d'architectural et de génie, TPSGC: **P. Paul**

Drawing title/Titre du dessin

WASTE WATER TREATMENT PLANT

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.069376.001	E-004	
	5 OF 22	

PWGSC – B1 – 1000X707

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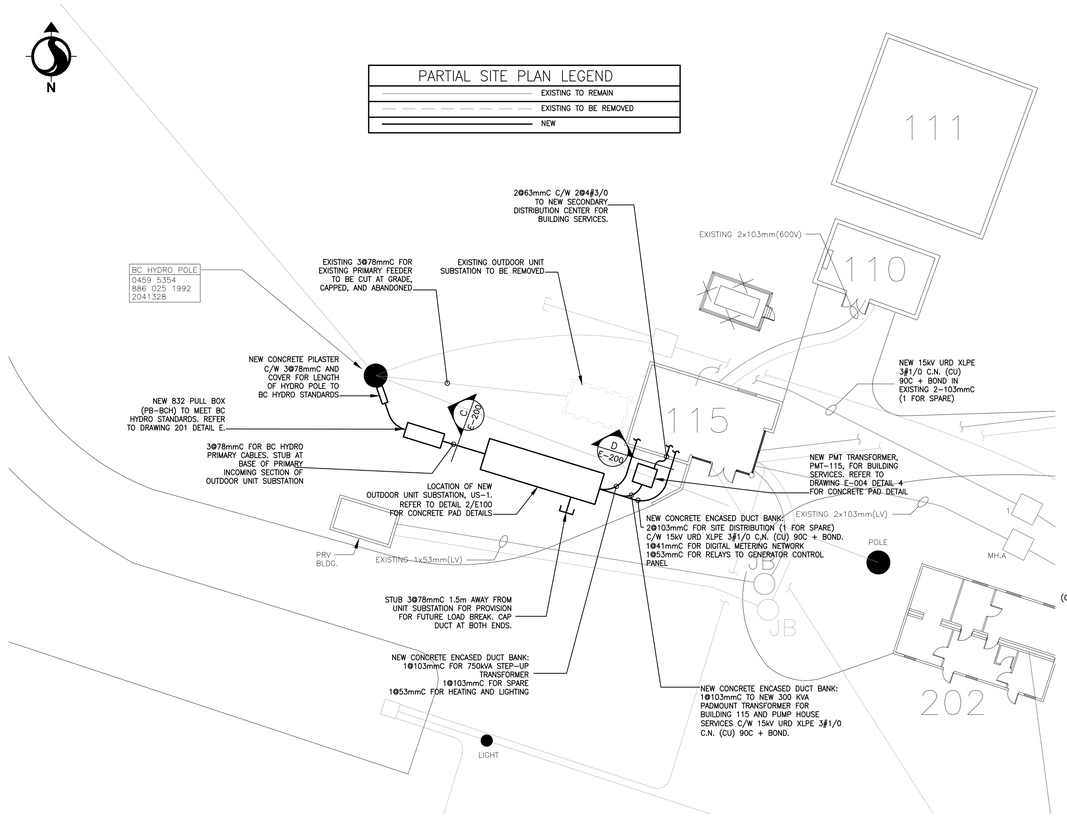
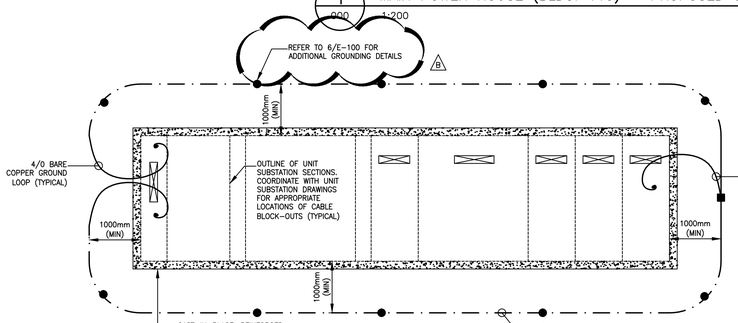


1 MAIN POWER HOUSE (BLDG. 115) – PROPOSED SITE PLAN

000 1:200



2 OUTDOOR UNIT SUBSTATION (US-1) CONCRETE PAD LAYOUT PLAN

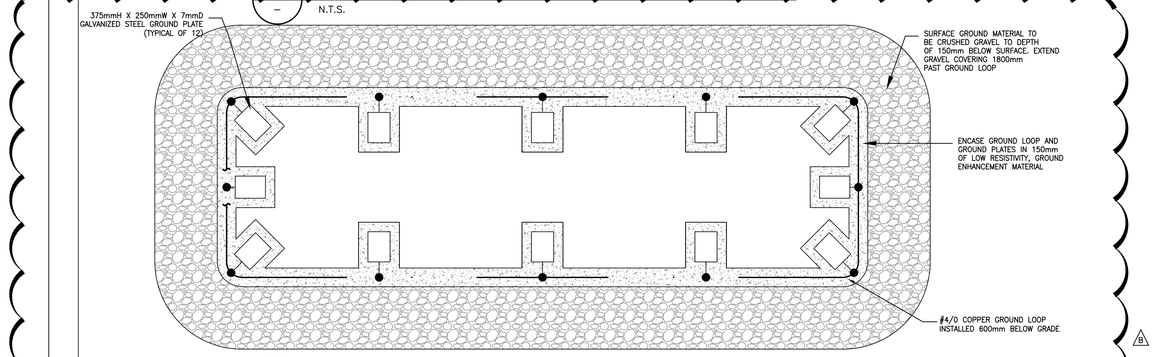
N.T.S.

GENERAL NOTES:

1. REFER TO DRAWING E-203 FOR MAIN POWER HOUSE PHASING NOTES.
2. MAINTAIN 90 DEGREES SEPARATION BETWEEN POWER AND COMMUNICATION WIRING ON JOINT USE B.C. HYDRO POLE.

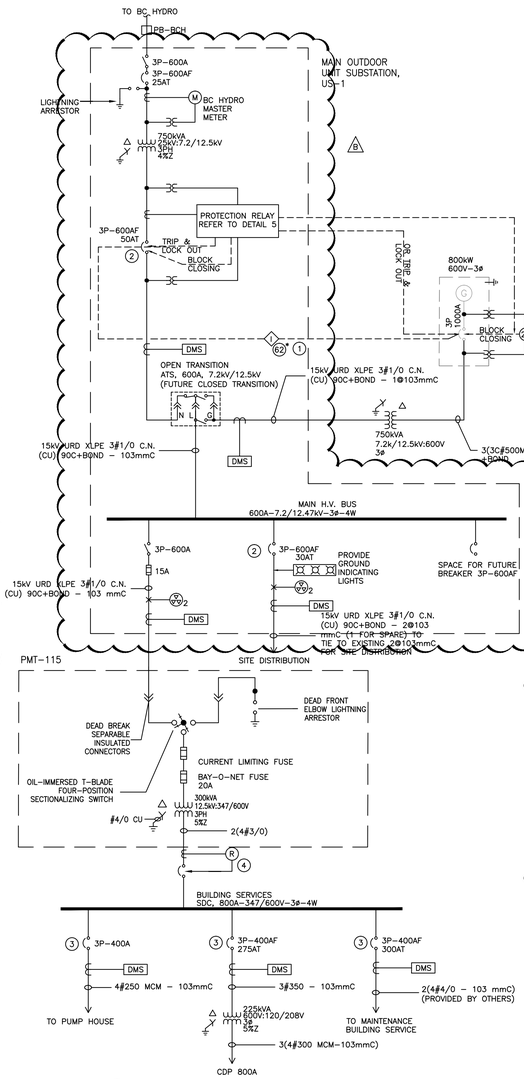
OUTDOOR UNIT SUBSTATION CONCRETE PAD GENERAL NOTES:

1. COPPER TO ROD CONNECTION TO BE THERMITE WELDED.
2. RETAIN A STRUCTURAL ENGINEER (REGISTERED BY APEGBC) TO DESIGN A RE-INFORCED CONCRETE PAD. INCLUDE SEISMIC RESTRAINT ANCHORING.



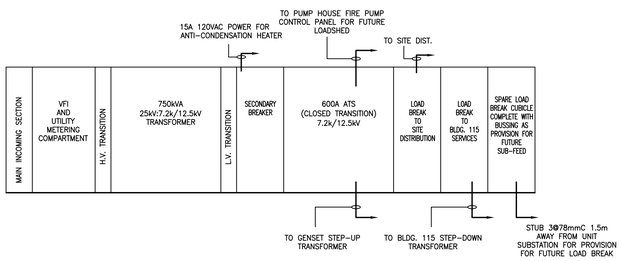
6 OUTDOOR UNIT SUBSTATION (US-1) GROUNDING DETAILS

N.T.S.



4 MAIN POWERHOUSE SINGLE LINE DIAGRAM

N.T.S.



3 OUTDOOR UNIT SUBSTATION (US-1) PLAN VIEW

N.T.S.

SINGLE LINE DIAGRAM LEGEND

EXISTING TO REMAIN
EXISTING TO BE REMOVED
NEW

SITE SINGLE LINE DIAGRAM KEYNOTES:

(1) PROTECTIVE RELAY FUNCTIONS

25 SYNCHRONISM-CHECK
27 UNDERVOLTAGE
32 DIRECTIONAL POWER
59 OVERVOLTAGE
81U UNDERFREQUENCY
810 OVERFREQUENCY
62 TIME DELAY (BACKUP TIMER)

LEGEND

(F)* FUNCTION ACTIVE DURING PARALLEL OPERATION ONLY

(I) ELECTRICAL INTERLOCK

(2) PROVIDE INTERLOCK CAPABILITIES BETWEEN TWO CIRCUIT BREAKERS FOR IMPROVED SYSTEM PROTECTION COORDINATION.

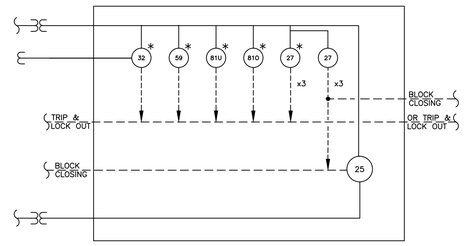
(3) PROVIDE LSI ELECTRONIC TRIP CIRCUIT BREAKER

(4) PROVIDE 50/51 AND ARC FLASH RELAY

SINGLE LINE DIAGRAM GENERAL NOTES:

1. ALL NEW WIRING TO BE XLPE RW90.
2. ALL NEW DIGITAL METERS (DMS) TO CONNECT TO LOCAL PATCH PANEL FOR CONNECTION TO SITE BUILDING MANAGEMENT SYSTEM NETWORK.
3. CABLE FAULT INDICATOR TYPES '1' AND '2' AS FOLLOWS:

   TYPE 1: HOT STICK MOUNTED C/W CURRENT RESET (1.5A MIN)
   TYPE 2: ENCLOSURE FLUSH MOUNTED C/W CURRENT RESET (1.5A MIN)



5 PROTECTION RELAY DETAIL

N.T.S.

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

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Pacific Region
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Client/client

CORRECTIONAL SERVICE CANADA

Project title/Titre du projet

METCHOSIN, BC

WILLIAM HEAD INSTITUTION ELECTRICAL HIGH VOLTAGE UPGRADE (PHASE 2 OF 2)

Consultant Signature Box Only

Designed by/Concept par
PN

Drawn by/Dessine par
PN

PWGSC Project Manager/Administrateur de Projets TPSGC
P. Truong

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

Drawing title/Titre du dessin

MAIN POWER HOUSE (BLDG.115)

SINGLE LINE AND ELECTRICAL DETAILS

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.069376.001	E-100 6 OF 22	

PWGSC – BI – 10000X707

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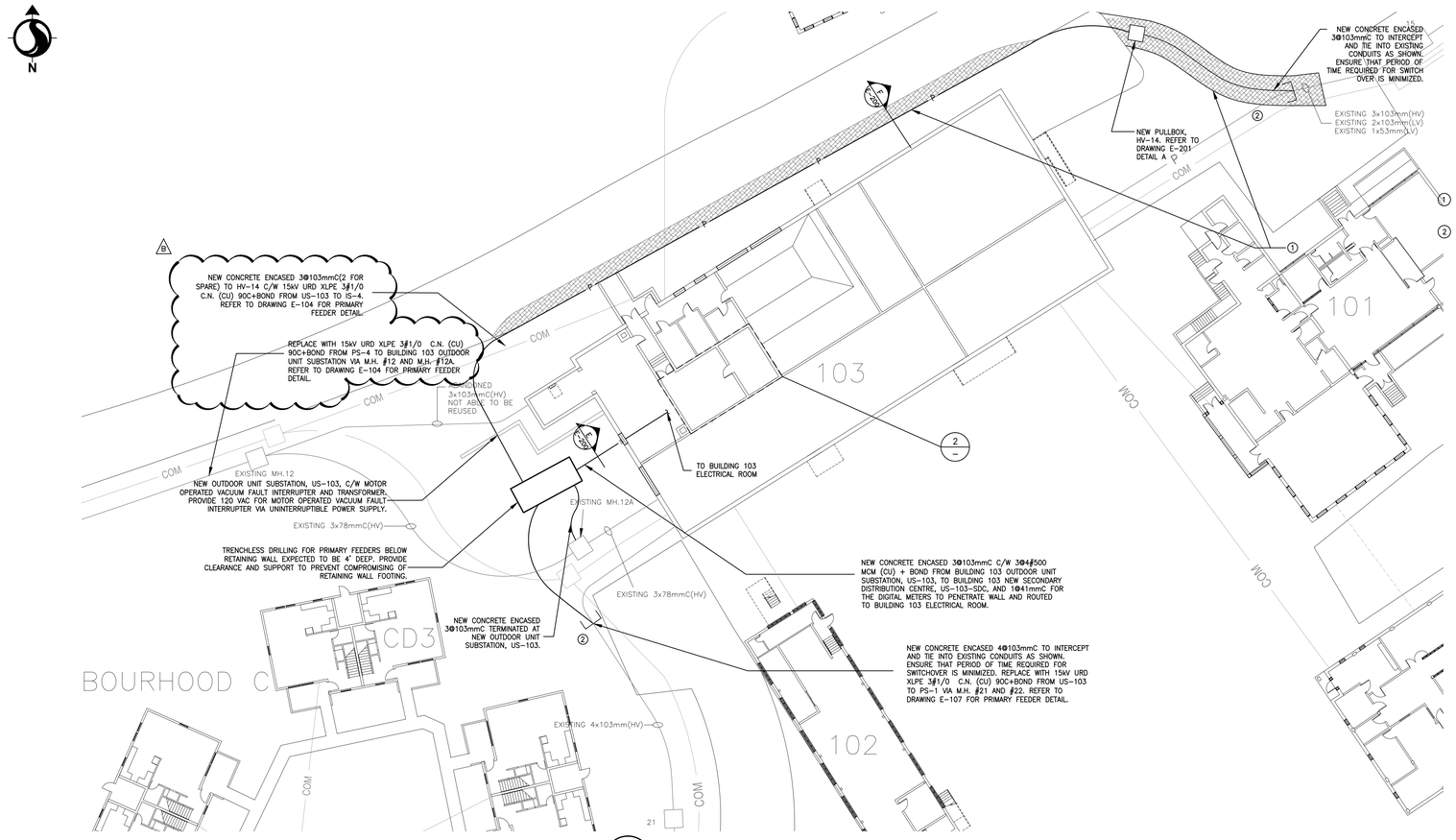

1 / 000 PARTIAL SITE PLAN
1:250

PARTIAL SITE PLAN LEGEND	
P	PRIMARY U/G LINE – NEW
P	PRIMARY U/G LINE – EXISTING TO REMAIN
P	PRIMARY U/G LINE – TO BE REMOVED
S	SECONDARY U/G LINE – NEW
S	SECONDARY U/G LINE – EXISTING TO REMAIN
S	SECONDARY U/G LINE – TO BE REMOVED
COM	COMMUNICATION U/G LINE – EXISTING

SITE PLAN KEYNOTES:

REMOVE, REPAIR, MAKE GOOD, AND RESTORE 165 SQUARE METERS OF ASPHALT PAVEMENT, INCLUDING BASE AND SUB BASE GRAVELS, TO MATCH OR EXCEED THE EXISTING THICKNESS. FINAL CONDITION TO MATCH QUALITY OF EXISTING CONDITION IN AREA.

CAP OFF AND MARK EXISTING CONDUITS BELOW GRADE.

GENERAL NOTES:

1. REFER TO DRAWING E-204 FOR BUILDING 103 PHASING NOTES.
2. REFER TO DRAWING E-202 TO LOCATE PRIMARY CONDUCTORS BEING REMOVED OR INSTALLED.

2 / – EXISTING BUILDING 103 – ELECTRICAL AND COMMUNICATION ROOM DETAIL
1:50

3 / – BUILDING 103 – EXISTING ELECTRICAL ROOM
1:50

EXISTING ELECTRICAL ROOM NOTES:

1. REFER TO DRAWING E-104 FOR ADDITIONAL DETAILS

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Client/client

CORRECTIONAL SERVICE CANADA

Project title/Titre du projet

METCHOSIN, BC

WILLIAM HEAD INSTITUTION ELECTRICAL HIGH VOLTAGE UPGRADE (PHASE 2 OF 2)

Consultant Signature Box Only

Designed by/Concept par
PN

Drawn by/Dessine par
PN

PWGSC Project Manager/Administrateur de Projets TPSGC
P. Truong

PWGSC Regional Manager, Architectural and Engineering Services/ Gestionnaire régional, Services d'architectural et de génie, TPSGC
P. Paul

Drawing title/Titre du dessin

BUILDING 103

PARTIAL SITE AND FLOOR PLANS

Project No./No. du projet	Sheet/ Feuille	Revision no./ La Révision no.
R.069376.001	E-103 9 OF 22	

PWGSC – B1 – 1000X707

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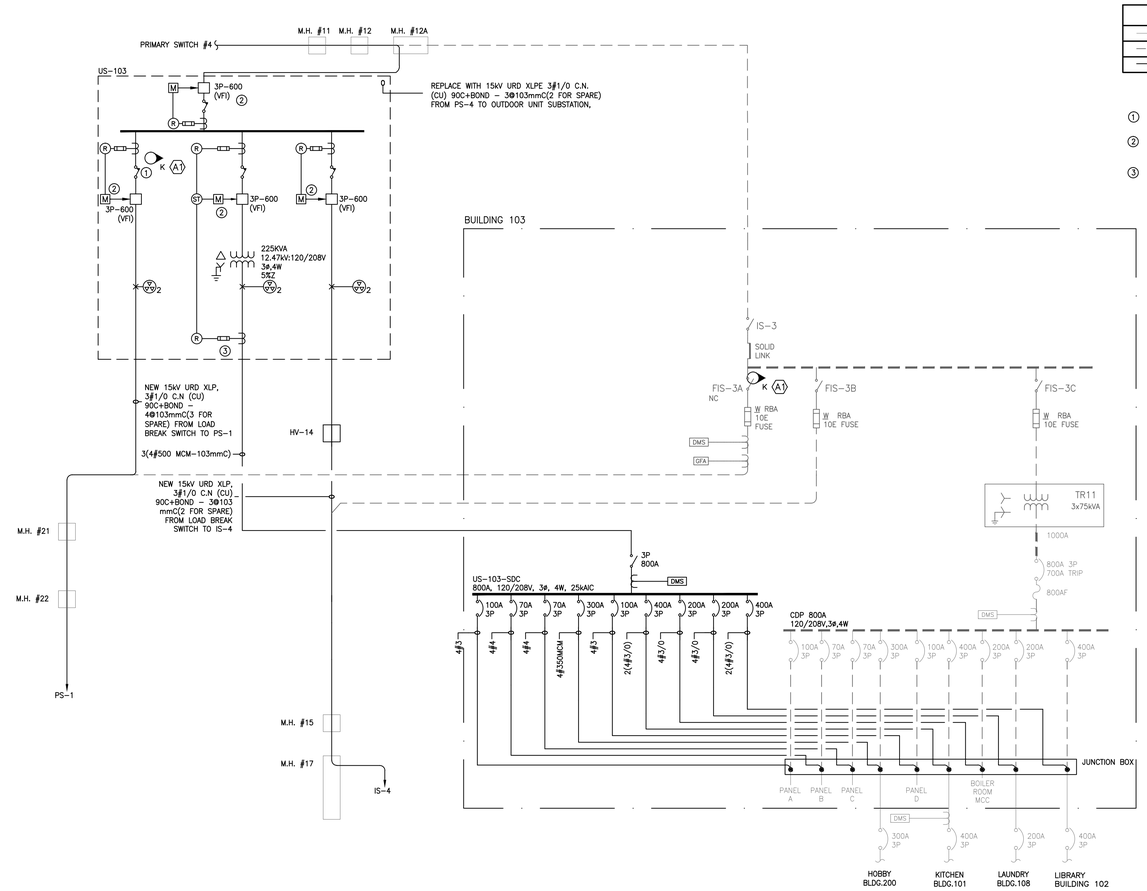


1 PARTIAL SINGLE LINE DIAGRAM
N.T.S.

SINGLE LINE DIAGRAM LEGEND
EXISTING TO REMAIN
EXISTING TO BE REMOVED
NEW

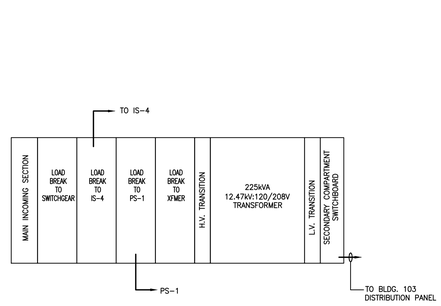
BUILDING 103 SINGLE LINE DIAGRAM KEYNOTES:

1. PROVIDE KIRK-KEY INTERLOCK TO MATCH EXISTING KEY INTERLOCK.
2. PROVIDE PRIMARY CT'S FOR VFI MOTOR OPERATION.
3. PROVIDE CT AND OVERCURRENT PROTECTION RELAY TO SHUNT TRIP THE PRIMARY VFI.

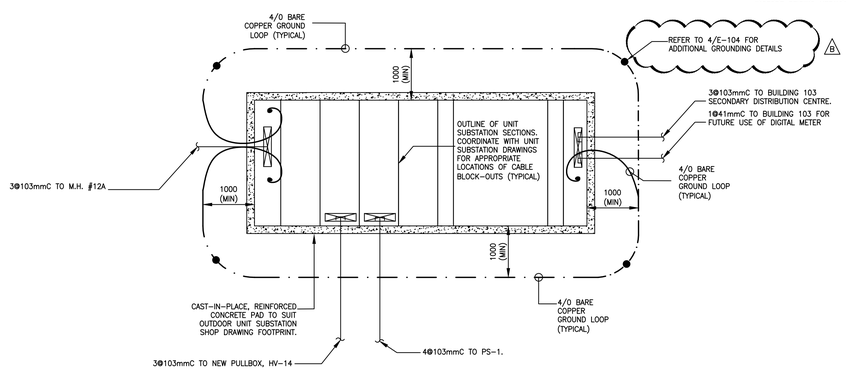
SINGLE LINE DIAGRAM GENERAL NOTES:

1. ALL NEW CONDUCTORS TO BE COPPER XLPE RW90.
2. PROVIDE 1Φ41mmC FROM US-103 TO BUILDING 103 ELECTRICAL ROOM FOR FUTURE USE OF THE DIGITAL METER. CONDUIT TO ENTER PULL BOX. PROVIDE PULL STRING.
3. CABLE FAULT INDICATOR TYPES '1' AND '2' AS FOLLOWS:

   TYPE 1: HOT STICK MOUNTED C/W CURRENT RESET (1.5A MIN)
   TYPE 2: ENCLOSURE FLUSH MOUNTED C/W CURRENT RESET (1.5A MIN)



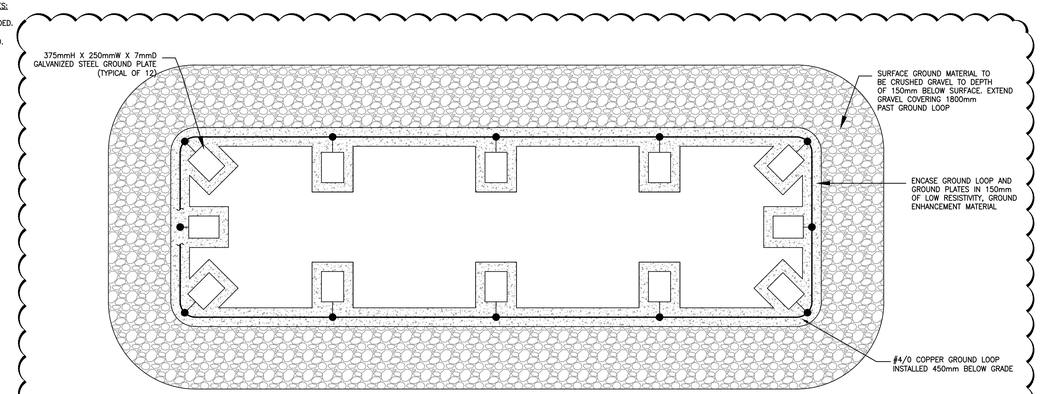
3 OUTDOOR UNIT SUBSTATION (US-103) PLAN VIEW
N.T.S.



2 OUTDOOR UNITSUBSTATION (US-103) CONCRETE PAD LAY-OUT PLAN
N.T.S.

OUTDOOR UNIT SUBSTATION CONCRETE PAD GENERAL NOTES:

1. COPPER TO ROD CONNECTION TO BE THERMITE WELDED.
2. RETAIN A STRUCTURAL ENGINEER (REGISTERED BY APEGBC) TO DESIGN A RE-INFORCED CONCRETE PAD. INCLUDE SEISMIC RESTRAINT ANCHORING.



2 OUTDOOR UNIT SUBSTATION (US-103) GROUNDING DETAILS
N.T.S.

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Client/client

CORRECTIONAL SERVICE CANADA

Project title/Titre du projet

METCHOSIN, BC

WILLIAM HEAD INSTITUTION ELECTRICAL HIGH VOLTAGE UPGRADE (PHASE 2 OF 2)

Consultant Signature Box Only

Designed by/Concept par
PN

Drawn by/Dessine par
PN

PWGSC Project Manager/Administrateur de Projets TPSGC
P. Truong

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

Drawing title/Titre du dessin

BUILDING 103

SINGLE LINE AND ELECTRICAL DETAILS

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.069376.001	E-104 10 OF 22	

PWGSC – B1 – 1000X707

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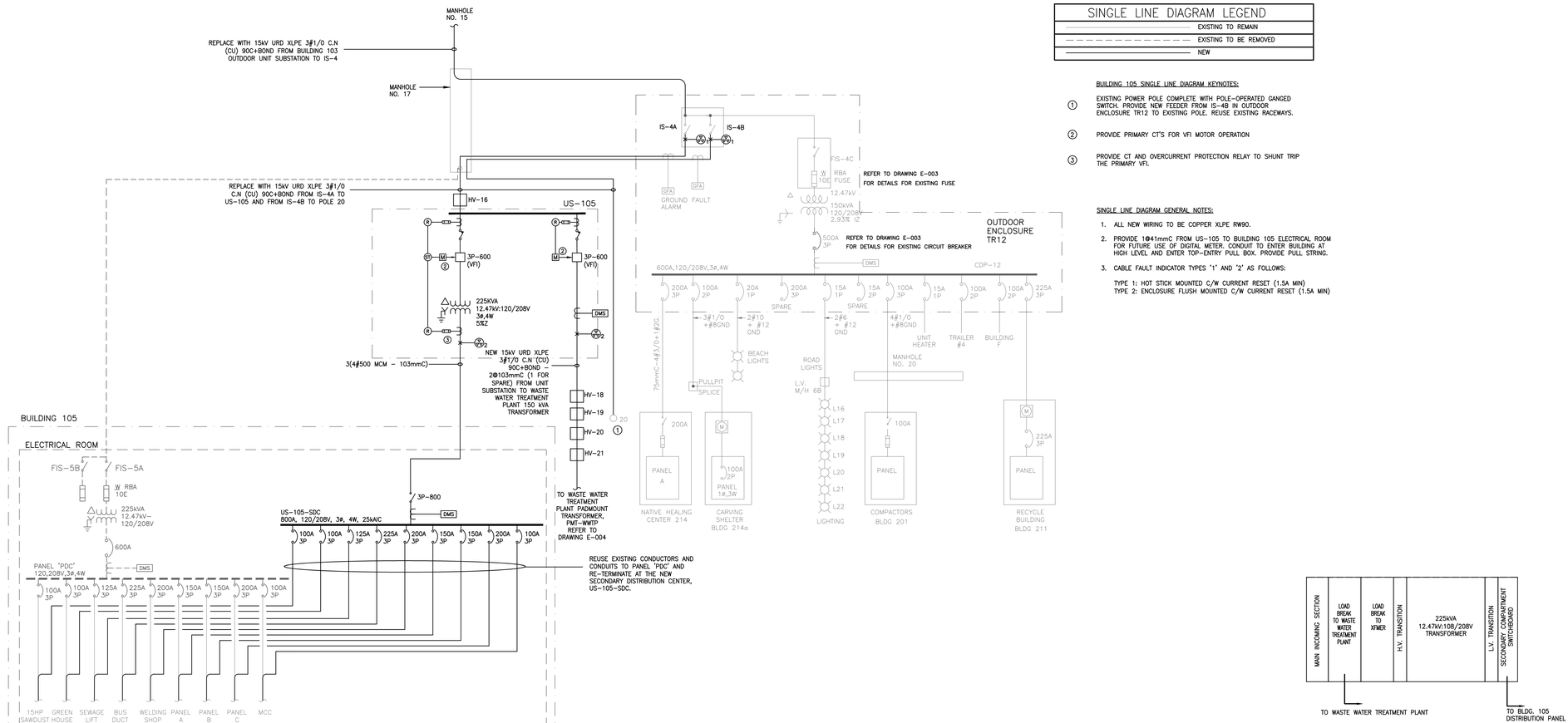


3 — PARTIAL SINGLE LINE DIAGRAM
N.T.S.

SINGLE LINE DIAGRAM LEGEND

- EXISTING TO REMAIN
- EXISTING TO BE REMOVED
- NEW

BUILDING 105 SINGLE LINE DIAGRAM KEYNOTES:

1. EXISTING POWER POLE COMPLETE WITH POLE-OPERATED GANGED SWITCH. PROVIDE NEW FEEDER FROM IS-4B IN OUTDOOR ENCLOSURE TR12 TO EXISTING POLE. REUSE EXISTING RACEWAYS.
2. PROVIDE PRIMARY CT'S FOR VFI MOTOR OPERATION
3. PROVIDE CT AND OVERCURRENT PROTECTION RELAY TO SHUNT TRIP THE PRIMARY VFI.

SINGLE LINE DIAGRAM GENERAL NOTES:

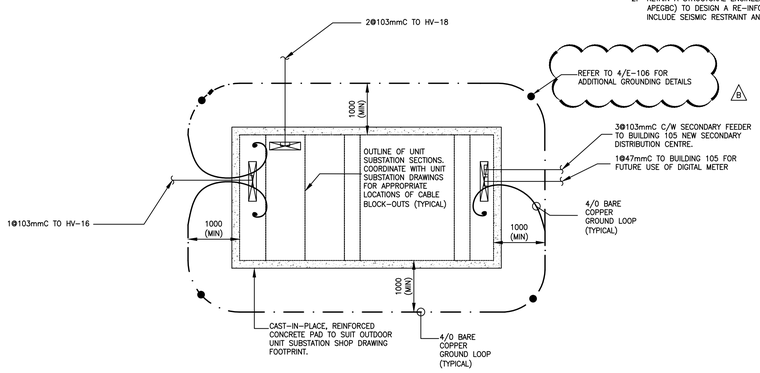
1. ALL NEW WIRING TO BE COPPER XLPE RW90.
2. PROVIDE 1Ø41mmC FROM US-105 TO BUILDING 105 ELECTRICAL ROOM FOR FUTURE USE OF DIGITAL METER. CONDUIT TO ENTER BUILDING AT HIGH LEVEL AND ENTER TOP-ENTRY PULL BOX. PROVIDE PULL STRING.
3. CABLE FAULT INDICATOR TYPES '1' AND '2' AS FOLLOWS:

   TYPE 1: HOT STICK MOUNTED C/W CURRENT RESET (1.5A MIN)
   TYPE 2: ENCLOSURE FLUSH MOUNTED C/W CURRENT RESET (1.5A MIN)

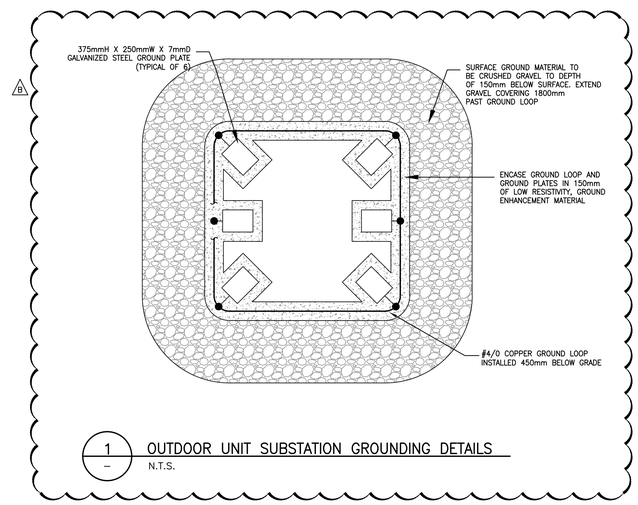
2 — OUTDOOR UNIT SUBSTATION PLAN VIEW
N.T.S.

OUTDOOR UNIT SUBSTATION CONCRETE PAD GENERAL NOTES:

1. COPPER TO ROD CONNECTION TO BE THERMITE WELDED.
2. RETAIN A STRUCTURAL ENGINEER (REGISTERED BY APEGBC) TO DESIGN A RE-INFORCED CONCRETE PAD. INCLUDE SEISMIC RESTRAINT ANCHORING.



1 — OUTDOOR UNIT SUBSTATION CONCRETE PAD LAY-OUT PLAN
N.T.S.



1 — OUTDOOR UNIT SUBSTATION GROUNDING DETAILS
N.T.S.

Revision/ Revision	Description/Description	Date/Date
B	ISSUED FOR ADDENDUM #E-2	06/21/16
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Région de Pacifique

Client/client

CORRECTIONAL SERVICE CANADA

Project title/Titre du projet

METCHOSIN, BC

WILLIAM HEAD INSTITUTION ELECTRICAL HIGH VOLTAGE UPGRADE (PHASE 2 OF 2)

Consultant Signature Box Only

Designed by/Concept par
PN

Drawn by/Dessiné par
PN

PWGSC Project Manager/Administrateur de Projets TPSGC
P. Truong

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

Drawing title/Titre du dessin

BUILDING 105

SINGLE LINE AND ELECTRICAL DETAILS

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.069376.001	E-106 12 OF 22	

PWGSC – B1 – 1000X707

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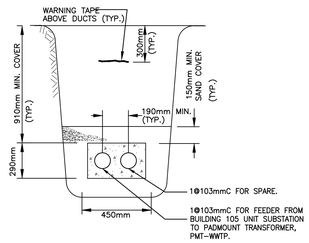
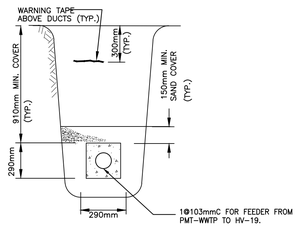


A E-004 TRENCH SECTION DETAIL – 105 UNIT SUBSTATION TO PMT-WWTP
N.T.S.



B E-004 TRENCH SECTION DETAIL – PMT-WWTP TO HV-19
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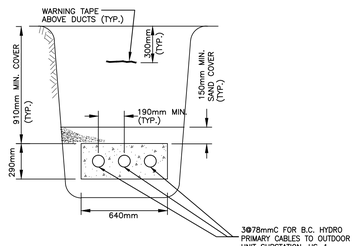
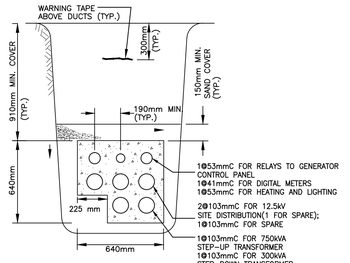
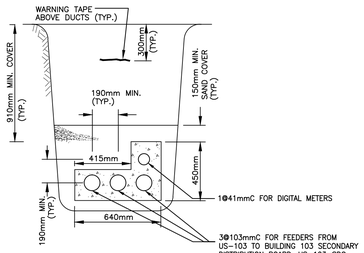


C E-100 TRENCH SECTION DETAIL – B.C. HYDRO SERVICE TO US-1
N.T.S.



D E-100 TRENCH SECTION DETAIL – US-1 TO BUILDING 115
N.T.S.



E E-103 TRENCH SECTION DETAIL – US-103 TO BUILDING 103
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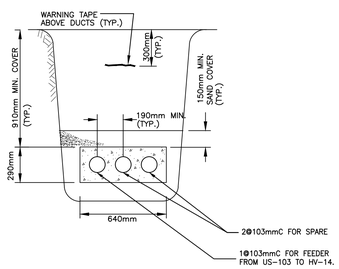
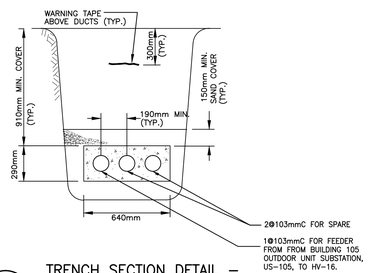
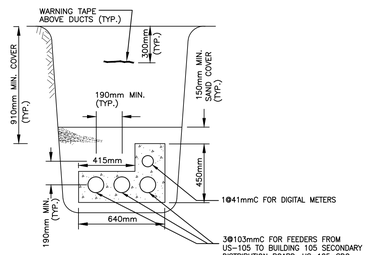


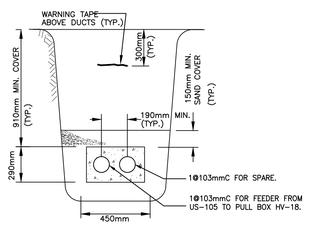
F E-103 TRENCH SECTION DETAIL – US-103 TO HV-14
N.T.S.



G E-105 TRENCH SECTION DETAIL – US-105 TO HV-16
N.T.S.



H E-105 TRENCH SECTION DETAIL – US-105 TO BUILDING 105
N.T.S.



I E-105 TRENCH SECTION DETAIL – US-4 TO HV-18
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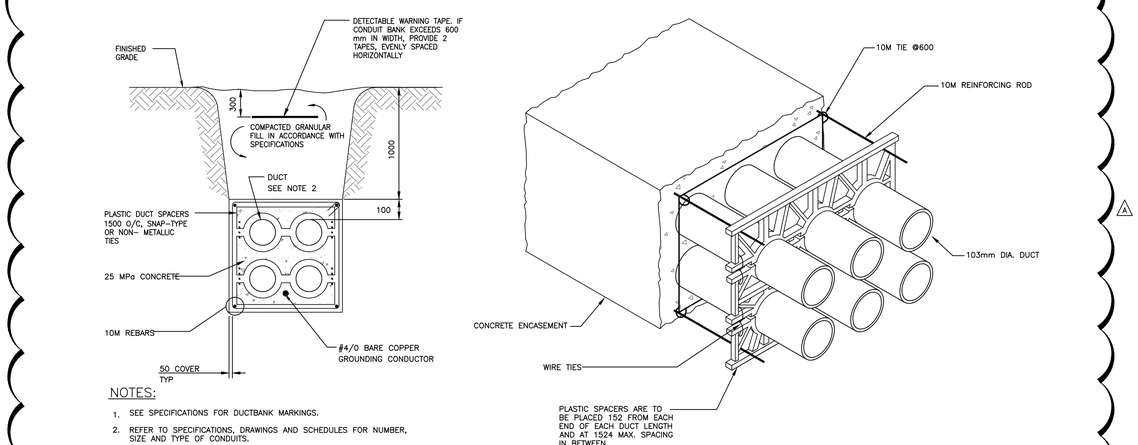


NOTES:

1. SEE SPECIFICATIONS FOR DUCTBANK MARKINGS.
2. REFER TO SPECIFICATIONS, DRAWINGS AND SCHEDULES FOR NUMBER, SIZE AND TYPE OF CONDUITS.
3. ADD RED OCHRE TO TOP LAYER OF CONCRETE.

H – TYPICAL – UNDERGROUND CONCRETE ENCASED DUCT BANK DETAILS
NTS

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

REAL PROPERTY SERVICES
Pacific Region
SERVICES IMMOBILIERS
Région de Pacifique

Revision/ Revision	Description/Description	Date/Date
A	ISSUED FOR ADDENDUM #E-2	06/21/16
0	ISSUED FOR TENDER	04/20/16

Client/client

CORRECTIONAL SERVICE CANADA

Project title/Titre du projet

METCHOSIN, BC

WILLIAM HEAD INSTITUTION ELECTRICAL HIGH VOLTAGE UPGRADE (PHASE 2 OF 2)

Consultant Signature Box Only

Designed by/Concept par
PN

Drawn by/Dessine par
PN

PWGSC Project Manager/Administrateur de Projets TPSGC
P. Truong

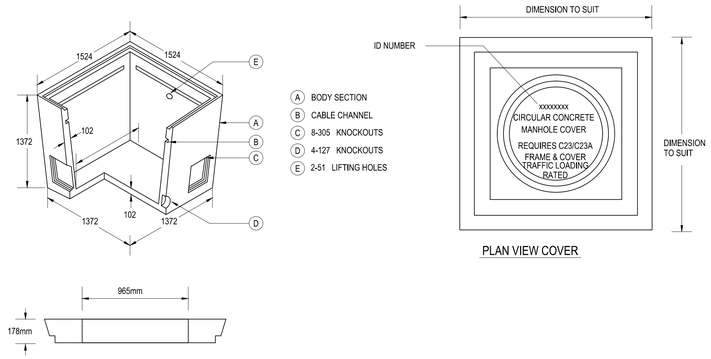
PWGSC, Regional Manager, Architectural and Engineering Services/ Gestionnaire régionale, Services d'architectural et de génie, TPSGC
P. Paul

Drawing title/Titre du dessin
ELECTRICAL DETAILS

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.069376.001	E-200 13 OF 22	

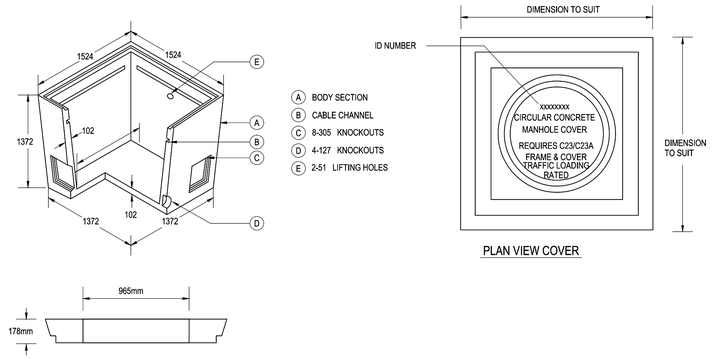
PWGSC – B1 – 1000X707

0 10 20 30 40 50 60 70 80 90 100mm



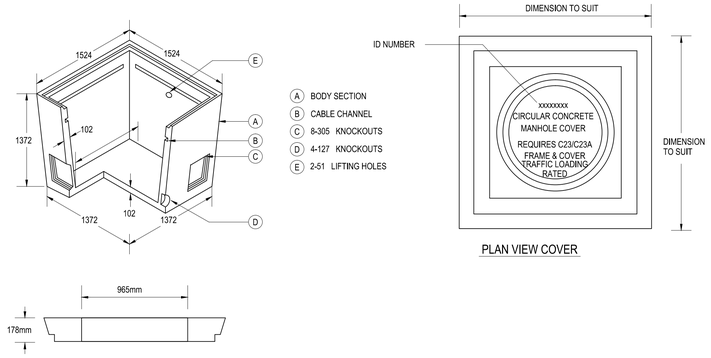
PLAN VIEW COVER

A — UNDERGROUND PULLBOX, HV–14
N.T.S.



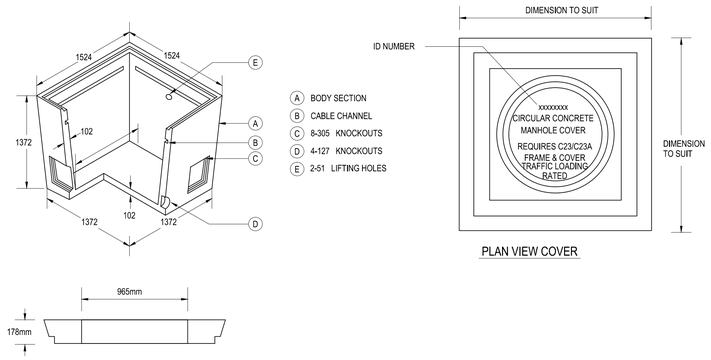
PLAN VIEW COVER

D — UNDERGROUND PULLBOX, HV–19, 20, 21, 22
N.T.S.



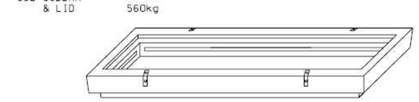
PLAN VIEW COVER

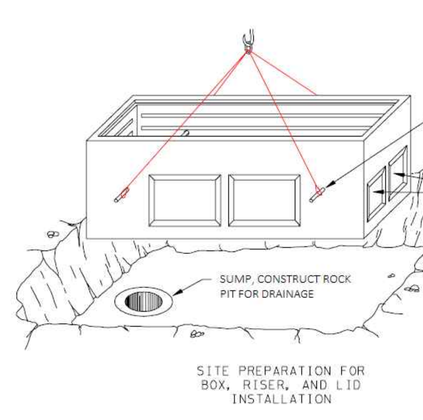
C — UNDERGROUND PULLBOX, HV–18
N.T.S.



PLAN VIEW COVER

B — UNDERGROUND PULLBOX, HV–16
N.T.S.





SITE PREPARATION FOR BOX, RISER, AND LID INSTALLATION

E — 832 JUNCTION BOX – PB–BCH
N.T.S.

GENERAL NOTES:

1. HEAD MARKED "ID" ON TOP OF LIDS.
2. PULLBOX CONSTRUCTION TO BE RATED FOR TRAFFIC LOADING AS PER THE AMERICAN ASSOCIATION FOR STATE AND HIGHWAY TRANSPORTATION OFFICIALS, STANDARD AASHTO M306 SPECIFICATION FOR DRAINAGE, SEWER, UTILITY, AND RELATED CASTINGS.

B

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

REAL PROPERTY SERVICES
Pacific Region
SERVICES IMMOBILIERS
Région de Pacifique

B	ISSUED FOR ADDENDUM #E–2	06/21/16
A	ISSUED FOR ADDENDUM #E–1	06/17/16
0	ISSUED FOR TENDER	04/20/16
Revision/ Révision	Description/Description	Date/Date

Client/client

CORRECTIONAL SERVICE CANADA

Project title/Titre du projet

METCHOSIN, BC

WILLIAM HEAD INSTITUTION ELECTRICAL HIGH VOLTAGE UPGRADE (PHASE 2 OF 2)

Consultant Signature Box Only

Designed by/Concept par
PN

Drawn by/Dessiné par
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PWGSC Project Manager/Administrateur de Projets TPSGC
P. Truong

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

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ELECTRICAL DETAILS

Project No./No. du projet	Sheet/Feuille	Revision no./ La Révision no.
R.069376.001	E-201 14 OF 22	

PWGSC – B1 – 1000X707

0 10 20 30 40 50 60 70 80 90 100mm

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 26 05 00 - Common Work Results for Electrical

.2 Section 26 05 22 - Connectors and Terminations

.3 Section 26 05 28 - Grounding – Secondary

1.2 REFERENCES

.1 American National Standards Institute/Institute of Electrical and Electronics Engineers (ANSI/IEEE)

.1 ANSI/IEEE 837-02, Qualifying Permanent Connections Used in Substation Grounding.

.2 IEEE Std-80-2000, IEEE Guide for Safety in AC Substation Grounding

1.3 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.2 Waste Management and Disposal:

.1 Separate waste materials for recycling in accordance with Section 01 01 50 – General Instructions.

Part 2 Products

2.1 MATERIALS

.1 Rod electrodes: copper, 19 mm diameter by 3m long.

.2 Conductors: bare, stranded, tinned soft annealed copper wire, size No. 4/0 AWG and 2/0 AWG for ground bus, electrode interconnections, metal structures, gradient control mats, transformers, switchgear, motors, ground connections.

.3 Conductors: bare, stranded, tinned soft annealed copper wire, size No. 4 AWG unless otherwise indicated on drawings for grounding cable sheaths, raceways, pipe work, screen guards, switchboards, potential transformers.

.4 Conductors: pvc insulated coloured green, stranded tinned soft annealed copper wire No. 10 AWG for grounding meter and relay cases.

.5 Conductors: No. 3/0 AWG extra flexible (425 strands) copper conductor for connection of switch mechanism operating rod to gradient control mat, fence gates, vault doors.

.6 Bolted removable test links.

.7 Gradient control mat as indicated on drawings.

.8 Accessories: non-corroding, necessary for complete grounding system, type, size material as indicated, including:

.1 Grounding and bonding bushings.

.2 Protective type clamps.

.3 Thermit welded type conductor connectors.

.4 Bonding jumpers, straps.

.5 Pressure wire connectors.

.6 Permanent compression connectors.

.9 Wire connectors and terminations: to Section 26 05 22 - Connectors and Terminations.

Part 3 Execution

3.1 INSTALLATION

.1 Perform soil resistivity measurements for each location where grounding is required to meet IEEE and C.E.C 22.1 requirements for the soil conditions present. Provide step and touch potential, and expected ground potential rise calculations to the Departmental Representative prior to grounding materials being purchased. Provide recommendations and test results to support recommendations and indicate compliance with C.E.C.

.2 Install continuous grounding system including, electrodes, conductors, connectors and accessories as indicated and to requirements of local authority having jurisdiction.

.3 Ground fences to grounding system independent of station ground.

.4 Install connectors and cadweld in accordance with manufacturer's instructions.

.5 Protect exposed grounding conductors during and after construction.

.6 Make buried connections, and connections to electrodes, structural steel work, using copper welding by thermit process.

.7 Use mechanical connectors for grounding connections to equipment provided with lugs.

.8 Use No. 4/0 AWG bare copper cable for main ground bus of substation and No. 2/0 AWG bare copper cable for taps on risers from main ground bus to equipment.

.9 Use tinned copper conductors for aluminum structures.

.10 Do not use bare copper conductors near un-jacketed lead sheath cables.

3.2 ELECTRODE INSTALLATION

.1 Install ground rod electrodes. Make grounding connections to station equipment.

.2 Install ground rod electrodes at transformer and switchgear locations.

.3 Install gradient control mats. Connect mats to station ground electrode and switch mechanism operating rods.

.4 Make special provision for installing electrodes that will give acceptable resistance to ground value, where rock or sand terrain prevails.

3.3 EQUIPMENT GROUNDING

.1 Install grounding connections as indicated to typical station equipment including: metallic water main, line sky wire, neutral, gradient control mats. Non-current carrying parts of: transformers, generators, motors, circuit breakers, reclosers, current transformers, frames of gang-operated switches and fuse cutout bases. Cable sheaths, raceways, pipe work, screen guards, switchboards, potential transformers. Meter and relay cases. Any exposed building metal, within or forming part of station enclosure. Sub-station fences, pothead bodies. Outdoor lighting.

.2 Ground hinged doors to main frame of electrical equipment enclosure with flexible jumper.

.3 Connect metallic piping (water, oil, air, etc.) inside station to main ground bus at several locations, including each service location within station.[Make connections to metallic water pipes outside station to assist in reduction of station ground resistance value].

3.4 NEUTRAL GROUNDING

.1 Connect transformer neutral and distribution neutral together using 1000 V insulated conductor to one side of ground test link, the other side of the test link being connected directly to main station ground. Ensure distribution neutral and neutrals of potential transformers and service banks are bonded directly to transformer neutral and not to main station ground.

.2 Interconnect electrodes and neutrals at each grounding installation.

.3 Connect neutral of station service transformer to main neutral bus with tap of same size as secondary neutral.

.4 Ground transformer tank with continuous conductor from tank ground lug through connector on ground bus to primary neutral. Connect neutral bushing at transformer to primary neutral in same manner.

3.5 CABLE SHEATH GROUNDING

.1 Bond single conductor, metallic sheathed cables together at one end only. Break sheath continuity by inserting insulating sleeves in cables.

.2 Use No. 6 AWG flexible copper wire soldered, not clamped, to cable sheath.

.3 Connect bonded cables to ground with No. 2/0 AWG copper conductor.

3.6 FIELD QUALITY CONTROL

.1 Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical.

.2 Perform earth loop test and resistance tests using method appropriate to site conditions and to approval of the Consultant and local authority having jurisdiction.

.3 Perform test before energizing electrical system.

.4 Provide step-and-touch potential calculations using measured station ground resistance measurements. Make adjustments to grounding system and retest to ensure results meet

the requirements of the Canadian Electrical Code. Submit test result and inspection certificate before energizing electrical system.

END OF SECTION

Part 1 General

1.1 PRICE AND PAYMENT PROCEDURES

.1 The site consists of a mixture of native soil and rock. The extent of buried rock is not known. Rock removal may be required for the installation of underground ductbanks, underground pullboxes, concrete pads and similar infrastructure.

.2 Measurement for Payment will be calculated from cross sections taken in area over excavation and measured in bank cubic metres. Measurement of rock volume will be as measured in situ prior to removal and approved by the Departmental Representative.

.3 Payment will be made on the basis of the Price per Unit Bid for Rock Removal in the Bid and Acceptance Form.

.4 There are a number of possible methods used for rock removal. Provide a single Unit Price to cover all possible methods of rock removal.

1.2 SECURITY

.1 The facility is a Correctional Institution and security is a concern. Follow all institutional security protocols if explosives are required on the site.

1.3 REFERENCES

.1 Definitions:
- .1 Rock: any solid material in excess of 0.25 m^3 and which cannot be removed by means of heavy duty mechanical excavating equipment with 0.95 to 1.15 m^3 bucket. Frozen material not classified as rock.
- .2 PPV: peak particle velocity.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit submittals in accordance with Section 01 01 50 – General Instructions.

.2 Blasting Submittals: submit for approval, written proposal of operations for removal of rock by blasting to Departmental Representative.
- .1 Indicate proposed method of carrying out work, types and quantities of explosives to be used, blast protection measures for items such as flying rock, vibration, dust and noise control. Include details on protective measures, time of blasting and other pertinent details.
- .2 Maintain complete and accurate record of drilling and blasting operations.

.3 Qualification Statements:
- .1 Retain licensed explosives expert to program and supervise blasting work,
- .2 Submit documentation verifying explosives expert's qualifications.

1.5 QUALITY ASSURANCE

.1 Blasting and Vibration Control:

.1 Reduce ground vibrations to avoid damage to structures or remaining rock mass.

Part 2 Products

2.1 MATERIALS

.1 Not used.

Part 3 Execution

3.1 ROCK REMOVAL

.1 Perform excavation in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.

.2 Co-ordinate this Section with Section 01 35 33 - Health and Safety Requirements .

.3 Remove rock to alignments, profiles, and cross sections as required.

.4 Do blasting operations in accordance with local and provincial codes and requirements of authority having jurisdiction.

.5 Use rock removal procedures to produce uniform and stable excavation surfaces. Minimize overbreak, and to avoid damage to adjacent structures.

.6 Cut trenches to widths as indicated.

.7 Remove boulders and fragments which may slide or roll into excavated areas.

.8 Correct unauthorized rock removal at no extra cost, in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.

3.2 CLEANING

.1 Clean in accordance with Section 01 01 50 – General Instructions.

.2 Rock Disposal:
- .1 Dispose of removed rock off site.
- .2 Do not dispose removed rock into landfill. Send material to appropriate quarry as approved by Departmental Representative

.3 Restore all surfaces including but not limited to roadways, sidewalks, landscaping to original condition if damaged.

3.3 PROTECTION

.1 Prevent damage to surroundings and injury to persons. Erect fencing, post guards, sound warnings and display signs when blasting to take place.

END OF SECTION