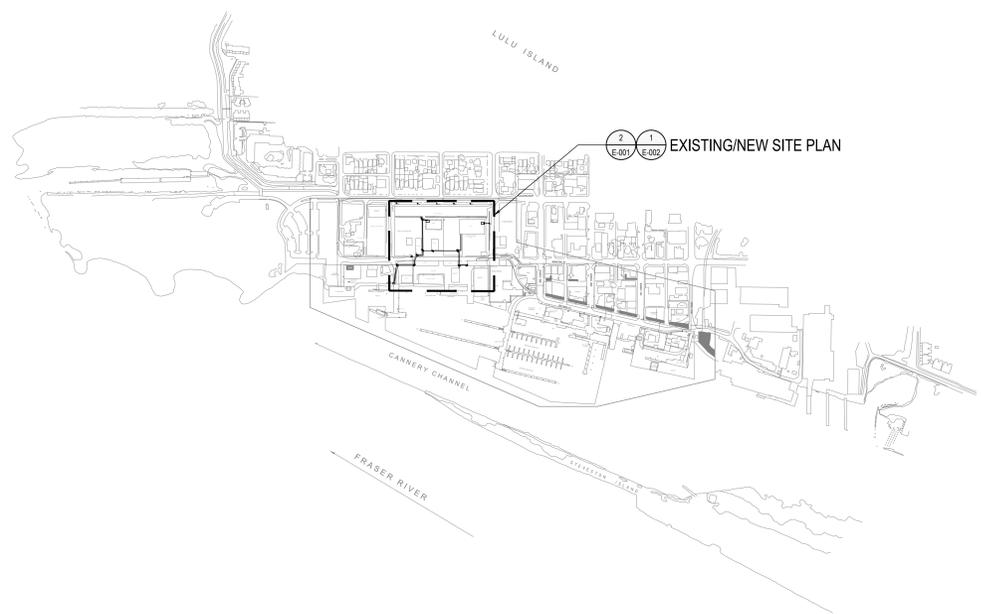


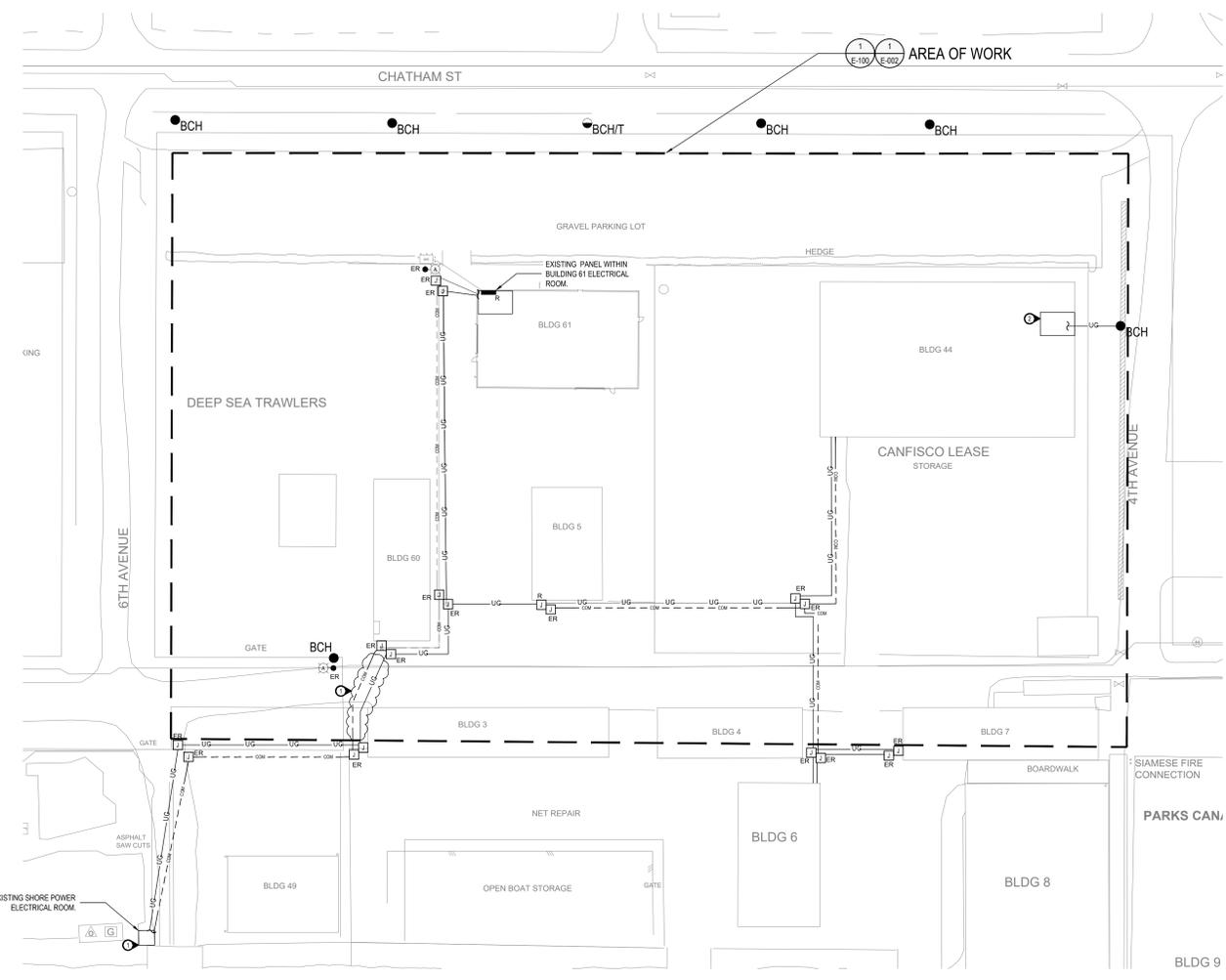
DRAWING LIST	
E-001	EXISTING SITE PLAN, LEGEND, AND DRAWING LIST
E-002	NEW ELECTRICAL SITE PLAN, AND DETAILS
E-003	DUCTBANK DETAILS AND CABLE SCHEDULES
E-004	DUCTBANK, CABLE SCHEDULES, AND ELECTRICAL DETAILS
E-005	ELECTRICAL PULLBOX DETAILS
E-006	ELECTRICAL DETAILS, MDC-GULF
E-007	ELECTRICAL DETAILS, BCH TRANSFORMER
E-100	ELECTRICAL SINGLE LINE DIAGRAM

**GENERAL NOTES:**

- EXISTING INFORMATION WITHIN THESE DRAWINGS IS BASED ON INFORMATION PROVIDED BY OTHERS, EXTRACTED FROM HISTORICAL RECORDS, AND SITE OBSERVATION. EXISTING INFORMATION IS PROVIDED TO FACILITATE THE CONTRACTOR IN PROVIDING A FAIR AND ACCURATE TENDER BID BY PROVIDING A GREATER UNDERSTANDING OF THE SCOPE OF WORK. BY NO MEANS SHALL THE CONTRACTOR RELY SOLELY ON THE EXISTING INFORMATION PROVIDED TO DETERMINE A COMPLETE AND FULLY ACCURATE SCOPE OF WORK. AS NOT ALL ELECTRICAL EQUIPMENT OR DEVICES THAT REQUIRE TO BE RELOCATED, REMOVED OR REPLACED MAY BE NOTED, CONTRACTOR SHALL PERFORM A SITE VISIT TO DETERMINE THE EXACT SCOPE OF WORK PRIOR TO PROVIDING THEIR TENDER BID.
- THIS CONTRACTOR IS TO SUPPLY AND INSTALL ALL NECESSARY TEMPORARY LIGHTING AND POWER DURING CONSTRUCTION.
- INSTALLATION SHALL COMPLY WITH DEPARTMENT OF FISHERIES AND OCEANS CANADA STANDARDS FOR LABELING, COLOUR CODING OF RACEWAYS AND BOXES, ETC.



1 KEY PLAN  
SCALE: N.T.S.



2 EXISTING SITE PLAN  
SCALE: 1:500

**DRAWING KEYNOTES:**

- FIELD VERIFY EXISTING ELECTRICAL CONNECTIONS FROM SHORE POWER ELECTRICAL ROOM TO BUILDING #1. DISCONNECT FEEDERS AND REMOVE EXISTING CONDUCTORS. CAP AND SEAL CONDUITS AFTER REMOVING THE CONDUCTORS. NOTIFY THE DEPARTMENTAL REPRESENTATIVE OF ANY CHANGES.
- CONTRACTOR TO FIELD VERIFY BUILDING #4 ELECTRICAL ROOM PRIOR TO WORK. DISCONNECT EXISTING BCH METER AND HAND OVER TO BC HYDRO. COORDINATE WITH BC HYDRO PRIOR TO WORK.

**DUCT LEGEND**

- UG — UG — UG — EXISTING UNDERGROUND DUCTBANK
- UG — UG — UG — NEW UNDERGROUND DUCT BANK
- COM — COM — COM — EXISTING COMMUNICATION DUCT BANK
- COM — COM — COM — NEW COMMUNICATION DUCT BANK

**SITE SYMBOL SCHEDULE**

BCH	BC HYDRO UTILITY POLE
CTELUS	TELUS POLE
PP	PRIVATE POWER POLE
CHT	BC HYDRO TELUS POLE
UT	UTILITY TRANSFORMER ON CONCRETE PAD
CE	CONCRETE ENCASED TRENCH
CB	CONCRETE PULL BOX
CP	CONCRETE PULL PIT
EB	EXTERIOR CONCRETE BOLLARD
FB	PULL BOX (FIBRE GLASS, PVC, ETC.)
UM	OVERHEAD UTILITY SERVICE MAST
VS	ONE LINE VOLTAGE TOGGLE SWITCH MOUNTED 4' or (1.2M) ABOVE FINISHED FLOOR LEVEL, UNLESS OTHERWISE NOTED
ST	STUBOUT FOR CONDUIT, OR ISOLATED END FOR SHARE CABLE OR CONTROL WIRING
QR	QUADRUPLE RECEPTACLE CONNECTION
WS	WALL MOUNTED OCCUPANCY SENSOR
SP	SINGLE SURFACE MOUNTED PANELBOARD
JB	JUNCTION BOX
SL	STRIP SURFACE MOUNTED LUMINAIRE
EBH	ELECTRIC BASEBOARD HEATER

**SINGLE LINE DIAGRAM SYMBOL SCHEDULE**

LV CB	LV CIRCUIT BREAKER
LV CB	LV CIRCUIT BREAKER WITH STAB CONTACTS (SHOWOUT CONTACTS)
WCB	WIRING CIRCUIT BREAKER (DISCONNECT) LETTER DESIGNATIONS: F USED FOR 120V CIRCUIT BREAKER, SFE 2P, SMC 120V/240V, R, RELOCATOR
DIS	DISCONNECT SWITCH
LBS	LOAD BREAK SWITCH
FO	FUSED OUTPUT (POLE MOUNTED)
FS	FUSED SWITCH
F	FUSE
FC	FORM C CONTROL CONTACT
N.C.	N.O. CONTACT (ALTERNATE)
N.C.	N.C. CONTACT (ALTERNATE)
TS	TRANSFER SWITCH
C	CAPACITOR
GND	GROUND
UM	UTILITY POWER METER
CP	CONNECTION POINT
AS	AC GENERATOR SET
DY	DY GROUND 1-Y GROUND
TR	TRANSFORMER
PM	PAD MOUNT TRANSFORMER
PA	PANEL #1
PH	RESISTOR HEAT
DC	DRAWOUT CELL
LA	LIGHTNING ARRESTOR
HT	H.V. CABLE STRESS CONE TERMINATION
CS	CABLE SIDE
IC	INCOMING UTILITY CONNECTION / POT HEAD
FW	FIELD WINDING
PT	POTENTIAL TRANSFORMER
CT	CURRENT TRANSFORMER
ZS	ZERO SEQUENCE CURRENT TRANSFORMER
TL	TEST LINK (SHOW/SHIELD) (1-LINE DIAGRAM)
DO	DOTTED LINE IS OPERATIVE CIRCUIT
PS	PROTECTIVE RELAY (NUMERAL INDICATES STANDARD IEEE DEVICE FUNCTION NUMBERS AS LISTED ABOVE). IF USED: No. OF PHASES IF MORE THAN 1. SOLID LINE IS "TOLL" CIRCUIT
GR	INSTANTANEOUS AND TIME-Delayed GROUND AND NEUTRAL OVERCURRENT RELAY
BR	BREAKER DESIGNATION: #1 32.71, #2 452.71, #3 452.71
CK	PROTECTIVE RELAY (NUMERAL INDICATES STANDARD IEEE DEVICE FUNCTION NUMBERS AS LISTED ABOVE)
IL	INTERLOCK
PK	PROTECTION (OPERATIVE CIRCUIT)
MT	MATCH
TR	BREAKER TRIP UNIT RATING (W/ITE 3)

**ABBREVIATIONS**

AHU	Authority Having Jurisdiction
XXF	CB Frame Rating (amps)
XXT	CB Trip Setting (amps)
BCH	B.C. Hydro
CB	Circuit Breaker or Breaker
CT	Current Transformer
CCT	Circuit
CEC	Canadian Electrical Code
DFO	Department of Fisheries & Oceans
MDP	Main Distribution Panel
MDC	Main Distribution Cabinet
DMS	Digital Metering System
NIC	Not in Contract
P	Phase
PH	Phase
RC	Receptacle Cabinet (c/w RCP & receptacle outlets)
RCP	RCP Panel
SCH	Small Craft Harbour
SEE	Service Entrance Enclosure
TRC	Transformer Receptacle Cabinet (c/w TRCP, TRF and RCP)
TRF	Transformer
WP	Weatherproof Outlet
2P	Two pole CB (1 phase use)
3P	Three pole CB (3 phase use)
ER	Existing to Remain
RE	Existing to be Relocated
R	Existing to be Removed

2021-07-09

03 2021/07/09 ISSUED FOR TENDER

02 2021/06/11 ISSUED FOR 100% CLIENT REVIEW

01 2021/03/13 ISSUED FOR 50% CLIENT REVIEW

ISS DATE DESCRIPTION

**FISHERIES AND OCEANS CANADA**  
SMALL CRAFT HARBOURS

**wsp**

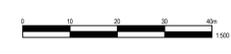
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SCH STEVESTON HARBOUR  
ELECTRICAL INDEPENDENT POWER SOURCE

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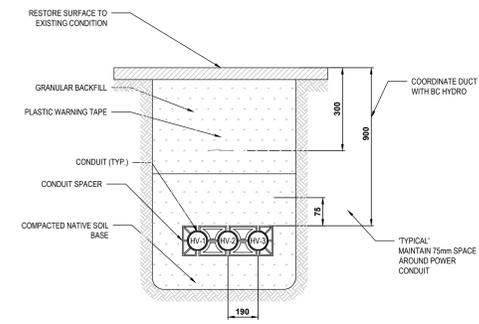
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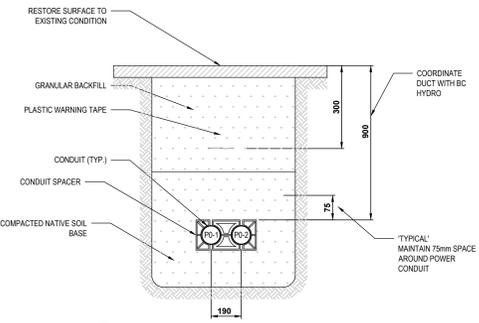
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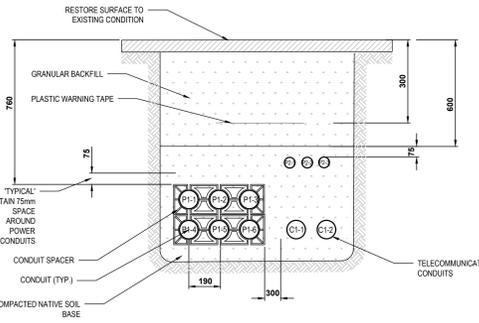




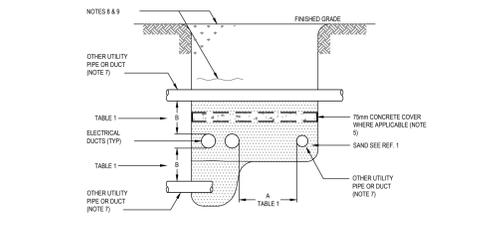
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SCALE: N.T.S.



**B DUCTBANK 'B' CROSS SECTION**  
SCALE: N.T.S.



**C DUCTBANK 'C' CROSS SECTION**  
SCALE: N.T.S.



**D DUCTBANK 'D' CROSS SECTION**  
SCALE: N.T.S.

**TABLE 1 - CLEARANCES (mm)** SEE NOTE 4

TYPE OF UTILITY PIPE OR DUCT	PER B.C. HYDRO (CSA 54) (NOTE 2)	MIN. PER CEC PART 4 CAN/C22.1MO.7 (NOTE 3)	SEE NOTE 4	
COLUMN NO.	1	2	3	4
DIMENSION	A	B	A	B
TELEPHONE OR CABLEVISION	300	150	300	NOTE 11
STREET LIGHTING FROM BCHA DUCTS	900 (NOTE 4)	300	300	150
GAZ MANS, STORM SEWERS, SANITARY SEWERS, WATER, CABLE LINES, FUEL OIL, JET FUEL LINES	900 (NOTE 4)	300	300 MIN. 900 PREFERRED	300

**1 TYPICAL DUCTBANK CLEARANCES**  
SCALE: N.T.S.

**CONDUIT AND CABLE SCHEDULE (BCH POLE TO BC HYDRO TRANSFORMER) - NEW DUCTBANK**

CUT SECTION	CONDUIT ROUTE	TYPE	VOLTAGE	SIZE (mm)	CONDUIT ID	CONDUCTORS	COMMENTS
A	FROM: BC HYDRO UTILITY POLE TO: BC HYDRO TRANSFORMER	HV	25kV	78	HV-1	BY BC HYDRO	BC HYDRO TRANSFORMER PRIMARY DUCT - COORDINATE DUCTBANK WITH BC HYDRO.
					HV-2	BY BC HYDRO	BC HYDRO TRANSFORMER PRIMARY DUCT - COORDINATE DUCTBANK WITH BC HYDRO.
					HV-3	BY BC HYDRO	BC HYDRO TRANSFORMER PRIMARY DUCT - COORDINATE DUCTBANK WITH BC HYDRO.

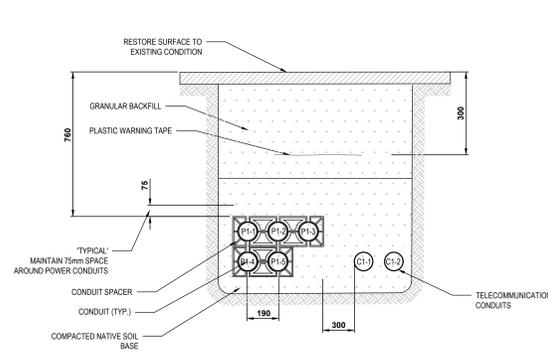
**CONDUIT AND CABLE SCHEDULE (FROM BC HYDRO TRANSFORMER TO MAIN DISTRIBUTION CABINET MDC-GULF) - NEW DUCTBANK**

CUT SECTION	CONDUIT ROUTE	TYPE	VOLTAGE	SIZE (mm)	CONDUIT ID	CONDUCTORS	COMMENTS
B	FROM: BC HYDRO TRANSFORMER TO: MDC-GULF	LV	600/347V	103	P0-1	BY BC HYDRO	BC HYDRO TRANSFORMER SECONDARY DUCT - COORDINATE DUCTBANK WITH BC HYDRO.
					P0-2	BY BC HYDRO	BC HYDRO TRANSFORMER SECONDARY DUCT - COORDINATE DUCTBANK WITH BC HYDRO.

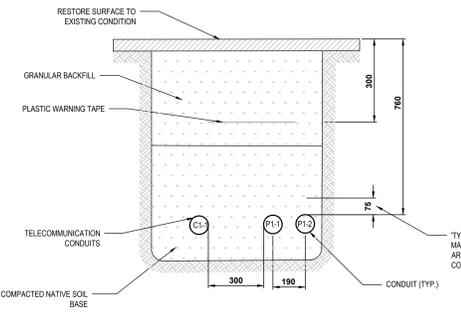
**CONDUIT AND CABLE SCHEDULE (FROM MDC-GULF TO NEW PULL-BOXES) - NEW DUCTBANK**

CUT SECTION	CONDUIT ROUTE	TYPE	VOLTAGE	SIZE (mm)	CONDUIT ID	CONDUCTORS	COMMENTS
C	FROM: MDC-GULF KIOSK TO: PULLBOX 'P1'	LV	347/600V	103	P1-1	REFER TO SLD	POWER TO BUILDING 61
					P1-2	REFER TO SLD	POWER TO BUILDING 61
					P1-3	REFER TO SLD	POWER TO BUILDING 60
					P1-4	REFER TO SLD	POWER TO BUILDING 5
					P1-5	EMPTY C/W PULLCORD	POWER TO FUTURE BUILDING
					P1-6	REFER TO SLD	POWER TO BUILDING 44 VIA NEW JUNCTION-BOX
		COMMS	NA	103	P2-1	REFER TO SLD	FUTURE EV CHARGING
					P2-2	REFER TO SLD	FUTURE EV CHARGING
					P2-3	REFER TO SLD	FUTURE BOLLARD AND PARKING LOT LIGHTING
					C1-1	EMPTY C/W PULLCORD	CONDUIT - FUTURE TELECOMMUNICATIONS
					C1-2	EMPTY C/W PULLCORD	CONDUIT - FUTURE TELECOMMUNICATIONS
					C1-3	EMPTY C/W PULLCORD	CONDUIT - FUTURE TELECOMMUNICATIONS

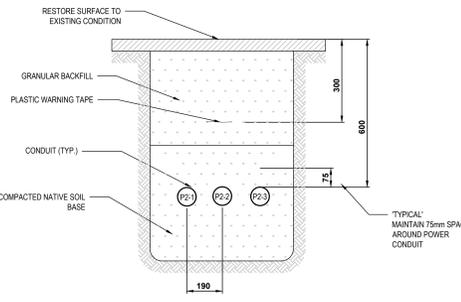
- TYPICAL DUCTBANK CLEARANCES NOTES:**
- THIS DRAWING IS BASED ON B.C. HYDRO STANDARD E54-1M 01, REV. 2, DATED AUG 2018 AND CSA STANDARD CAN/C22.1MO.7 (NOTE 3). PRIOR TO PROCEEDING WITH THE WORK, CONFIRM THAT THE FOREGOING STANDARDS ARE CURRENT AND VALID FOR THE APPLICATION. COMPLY WITH ADDITIONAL REQUIREMENTS OF CAN/C22.1MO.7 FOR CABLES OPERATING AT VOLTAGES UP TO 25kV.
  - FIGURES IN COLUMNS 1 AND 2 ARE APPLICABLE FOR PRIMARY AND SECONDARY B.C. HYDRO DUCTS ON PUBLIC PROPERTY. FIGURES IN COLUMNS 3 AND 4 ARE APPLICABLE FOR ALL ELECTRICAL DUCTS LOCATED ON PRIVATE PROPERTY.
  - WHEN PRIMARY B.C. HYDRO DUCTS ARE BEING INSTALLED ON PRIVATE PROPERTY, OBTAIN WRITTEN APPROVAL FROM B.C. HYDRO THAT CLEARANCES OF COLUMNS 3 AND 4 ARE ACCEPTABLE. IN THE ABSENCE OF SUCH AN APPROVAL, CLEARANCES OF COLUMNS 1 AND 2 SHALL BE APPLICABLE.
  - CLEARANCE MAY BE REDUCED TO 300mm (ABSOLUTE MINIMUM) BY OBTAINING WRITTEN APPROVAL FROM B.C. HYDRO.
  - UNLESS CONCRETE ENCASUREMENT IS SPECIFIED, INSTALL CONCRETE PAVEMENT SLAB ALONG THE ELECTRICAL DUCT ROUTE IN ACCORDANCE WITH REF. 1 FOR THE FOLLOWING APPLICATIONS: B.C. HYDRO PRIMARY AND SECONDARY SERVICE DUCTS, REGARDLESS OF VOLTAGE. DUCTS CONTAINING CABLES OPERATING AT SYSTEM VOLTAGES ABOVE 600V.
  - WHERE CLEARANCES OF TABLE 1 CANNOT BE OBTAINED DUE TO SITE CONDITIONS, USE REDUCED CLEARANCES OF DRAWING REF. 4, BY CONCRETE ENCASING THE AFFECTED PORTIONS OF DUCTS.
  - FOR CLEARANCES OF DUCTS TO STEAM PIPES, SEE REF. 5.
  - FOR INSTALLATION DETAILS OF DIRECT BURIED DUCTS IN GENERAL, SEE REF. 3.
  - FOR INSTALLATION DETAILS OF DIRECT BURIED DUCTS RUNNING UNDER SLAB OR UNDER PAVED SURFACES, SEE REF. 2.
  - FOR RAILWAY CROSSINGS, SEE CSA STANDARD CAN/C22.1MO.7.
  - FOR SYSTEM VOLTAGES ABOVE 600V, PROVIDE 300mm OF CLEARANCE AT TOP AND BOTTOM. THE TOP CLEARANCE MAY BE REDUCED TO 150mm WHEN CONCRETE PAVEMENT SLAB ARE USED.



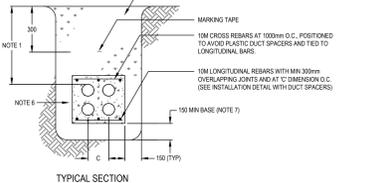
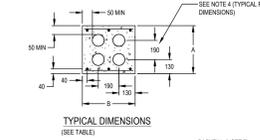
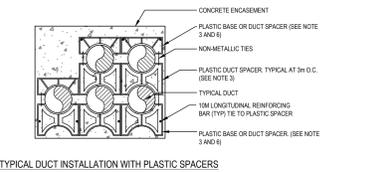
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**E DUCTBANK 'E' CROSS SECTION**  
SCALE: N.T.S.



**F DUCTBANK 'F' CROSS SECTION**  
SCALE: N.T.S.



**2 TYPICAL CONCRETE ENCASED DUCT CONSTRUCTION DETAIL**  
SCALE: N.T.S.

**CONDUIT AND CABLE SCHEDULE (FROM NEW PULL-BOXES TO BUILDINGS) - NEW DUCTBANK**

CUT SECTION	CONDUIT ROUTE	TYPE	VOLTAGE	SIZE (mm)	CONDUIT ID	CONDUCTORS	COMMENTS
D	FROM: PULLBOX 'P1' TO: EXISTING JUNCTION BOX	LV	347/600V	103	P1-1	REFER TO SLD	POWER TO BUILDING 61
					P1-2	REFER TO SLD	POWER TO BUILDING 61
					P1-3	REFER TO SLD	POWER TO BUILDING 60
					P1-4	REFER TO SLD	POWER TO BUILDING 5
					P1-5	EMPTY C/W PULLCORD	POWER TO FUTURE BUILDING
D	FROM: PULLBOX 'C1' TO: EXISTING JUNCTION BOX	COMMS	NA	103	C1-1	EMPTY C/W PULLCORD	CONDUIT - FUTURE TELECOMMUNICATIONS
					C1-2	EMPTY C/W PULLCORD	CONDUIT - FUTURE TELECOMMUNICATIONS

**CONDUIT AND CABLE SCHEDULE (BUILDING 61) - EXISTING TO BE MODIFIED**

CUT SECTION	CONDUIT ROUTE	TYPE	VOLTAGE	SIZE (mm)	CONDUIT ID	CONDUCTORS	COMMENTS
E	FROM: PULLBOX 'P1' VIA EXISTING JUNCTION BOX TO: BUILDING 61	LV	347/600V	103	P1-1	REFER TO SLD	POWER TO BUILDING 61 - EXISTING CONDUIT.
					P1-2	REFER TO SLD	POWER TO BUILDING 61 - NEW CONDUIT.
					C1-1	EMPTY C/W PULLCORD	CONDUIT - FUTURE TELECOMMUNICATIONS - NEW.

**CONDUIT AND CABLE SCHEDULE (FROM PULLBOX 'P1' TO PARKING LOT LIGHTING JUNCTION BOX) - NEW DUCTBANK**

CUT SECTION	CONDUIT ROUTE	TYPE	VOLTAGE	SIZE (mm)	CONDUIT ID	CONDUCTORS	COMMENTS
F	FROM: PULLBOX 'P1' TO: PARKING LOT LIGHTING JUNCTION BOX	LV	120/208V	35	P2-1	REFER TO SLD	FUTURE EV CHARGING
					P2-2	REFER TO SLD	FUTURE EV CHARGING
					P2-3	REFER TO SLD	FUTURE BOLLARD AND PARKING LOT LIGHTING

**DUCT BANK CONFIGURATION**

DUCT BANK CONFIGURATION	DUCT QUANTITY	DIMENSIONS (NOTE 3)		COMMENTS
		A	B	
	4	450	450	
	6	450	640	NOTE 5
	6	450	640	NOTE 5
	9	640	640	NOTE 5
	12	640	830	NOTE 5

- TYPICAL CONCRETE ENCASED DUCT CONSTRUCTION DETAIL NOTES:**
- UNLESS INDICATED OTHERWISE, ALL OUTDOOR DUCT RUNS CONTAINING CABLES OPERATING AT SYSTEM VOLTAGES ABOVE 600V SHALL BE AT MINIMUM DEPTH OF 1000mm AND SHALL BE CONCRETE ENCASED.
  - FOR OTHER DUCT RUNS REQUIRING CONCRETE ENCASUREMENT, IN ADDITION TO THOSE DESCRIBED IN NOTE 1, REFER TO SPECIFIC PROJECT DOCUMENTATION.
  - ALL DUCT BANK DIMENSIONS ARE TYPICAL FOR 100mm DIAMETER DUCTS. FOR OTHER DUCT SIZES AND TYPES ADJUST DIMENSIONS AND SELECT PLASTIC SPACERS TO OBTAIN A MIN OF 100mm SEPARATION, OR AS INDICATED OTHERWISE AND 50mm CONCRETE COVER, WHERE REFERRED TO IN THIS DRAWING. INCREASE CONCRETE COVER IN ACCORDANCE WITH RECHA STANDARDS.
  - GRADUALLY INCREASE VERTICAL SEPARATION FROM 40mm TO 150mm AT END OF DUCT RUN BEFORE ENTERING CONCRETE BOXES, ROOMS, PULLITTS OR TRENCHES, STARTING 8M FROM THE OUTSIDE FACE OF CONCRETE WALL.
  - DUCTBANKS MAY BE ORIENTED HORIZONTALLY AS SHOWN OR VERTICALLY WHERE INDICATED ON SPECIFIC PROJECT DRAWINGS.
  - SELECT TOP AND BOTTOM PLASTIC SPACERS TO ACCURATELY POSITION THE REBARS IN ACCORDANCE WITH THE TYPICAL DIMENSIONS DETAIL ON THIS DRAWING.
  - FOR GENERAL DESIGN GUIDELINES, DUCT TYPES, COMPACTON AND FILL, SEE REF. 1.



ISS	DATE	DESCRIPTION
03	2021/07/09	ISSUED FOR TENDER
02	2021/06/11	ISSUED FOR 100% CLIENT REVIEW
01	2021/03/13	ISSUED FOR 50% CLIENT REVIEW

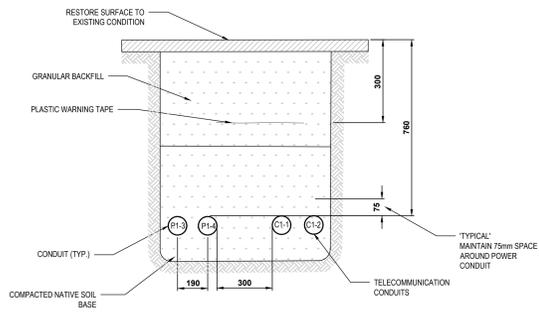
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SMALL CRAFT HARBOURS



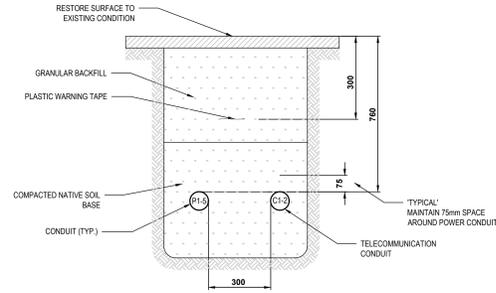
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**ELECTRICAL INDEPENDENT POWER SOURCE**

Drawing No./No. de dessin: DUCTBANK DETAILS AND CABLE SCHEDULES  
191-16093-06 E-003 01

CONDUIT AND CABLE SCHEDULE (TO BUILDINGS 60 AND 5) - EXISTING TO BE MODIFIED							
CUT SECTION	CONDUIT ROUTE	TYPE	VOLTAGE	SIZE (mm)	CONDUIT ID	CONDUCTORS	COMMENTS
G	FROM PULLBOX 'P1' VIA EXISTING JUNCTION BOX TO BUILDING 60 & 5	LV	347/600V	103	P1-3	REFER TO SLD	POWER TO BUILDING 60 - EXISTING CONDUIT, PROVIDE CONDUCTOR.
					P1-4	REFER TO SLD	POWER TO BUILDING 5 - EXISTING CONDUIT, PROVIDE CONDUCTOR.
	FROM PULLBOX 'C1' VIA EXISTING JUNCTION BOX TO BUILDING 60 & 5	COMMS	NA	103	C1-1	EMPTY CW PULLCORD	CONDUIT - FUTURE TELECOMMUNICATIONS TO BUILDING 60
					C1-2	EMPTY CW PULLCORD	CONDUIT - FUTURE TELECOMMUNICATIONS TO BUILDING 5



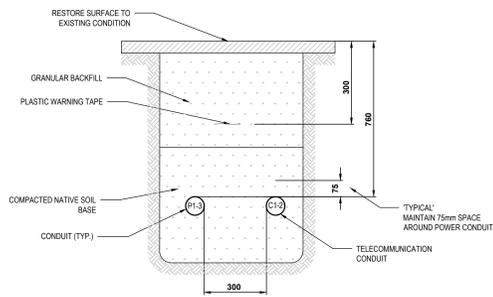
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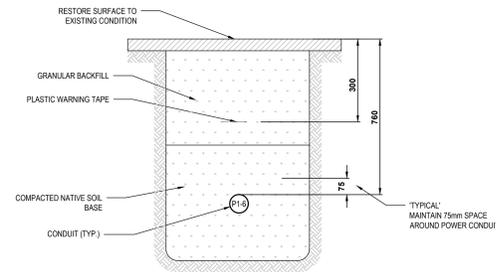
K DUCTBANK 'K' CROSS SECTION  
SCALE: N.T.S.

CONDUIT AND CABLE SCHEDULE (FUTURE BUILDING J) - NEW DUCTBANK							
CUT SECTION	CONDUIT ROUTE	TYPE	VOLTAGE	SIZE (mm)	CONDUIT ID	CONDUCTORS	COMMENTS
K	FROM PULLBOX 'P1' VIA EXISTING JUNCTION BOX TO FUTURE BUILDING STUB-OUT	LV	347/600V	103	P1-5	EMPTY CW PULLCORD	POWER TO FUTURE BUILDING - STUB-OUT
					C1-2	EMPTY CW PULLCORD	CONDUIT - FUTURE TELECOMMUNICATIONS TO FUTURE BUILDING

CONDUIT AND CABLE SCHEDULE (BUILDING 60) - EXISTING TO BE MODIFIED							
CUT SECTION	CONDUIT ROUTE	TYPE	VOLTAGE	SIZE (mm)	CONDUIT ID	CONDUCTORS	COMMENTS
H	FROM PULLBOX 'P1' VIA EXISTING JUNCTION BOX TO BUILDING 60	LV	347/600V	103	P1-3	REFER TO SLD	POWER TO BUILDING 60 - EXISTING CONDUIT, PROVIDE CONDUCTOR.
					C1-1	EMPTY CW PULLCORD	CONDUIT - FUTURE TELECOMMUNICATIONS TO BUILDING 60



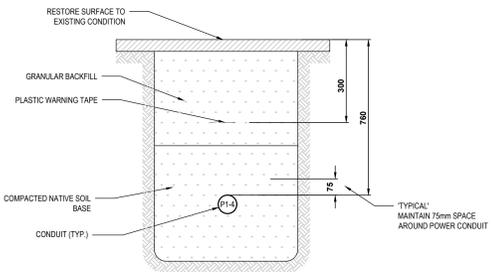
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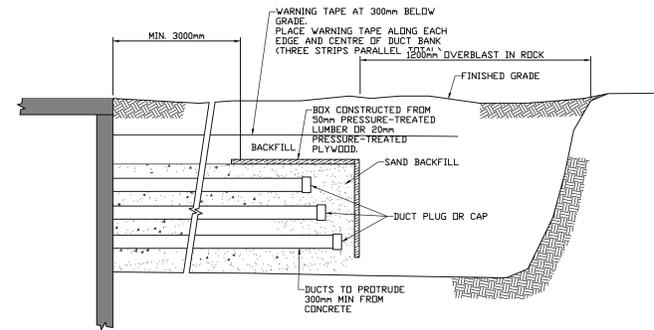
L DUCTBANK 'L' CROSS SECTION  
SCALE: N.T.S.

CONDUIT AND CABLE SCHEDULE (BUILDING 44) - NEW DUCTBANK							
CUT SECTION	CONDUIT ROUTE	TYPE	VOLTAGE	SIZE (mm)	CONDUIT ID	CONDUCTORS	COMMENTS
L	FROM PULLBOX 'P1' VIA NEW JUNCTION BOX TO BUILDING 44	LV	347/600V	103	P1-6	REFER TO SLD	POWER TO BUILDING 44

CONDUIT AND CABLE SCHEDULE (BUILDING 5) - EXISTING TO BE MODIFIED							
CUT SECTION	CONDUIT ROUTE	TYPE	VOLTAGE	SIZE (mm)	CONDUIT ID	CONDUCTORS	COMMENTS
I	FROM PULLBOX 'P1' VIA EXISTING JUNCTION BOX TO BUILDING 5	LV	347/600V	103	P1-4	REFER TO SLD	POWER TO BUILDING 5 - EXISTING CONDUIT, PROVIDE CONDUCTOR.

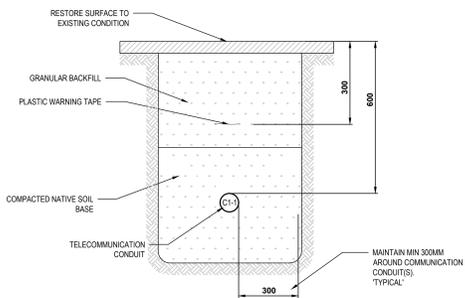


I DUCTBANK 'I' CROSS SECTION  
SCALE: N.T.S.

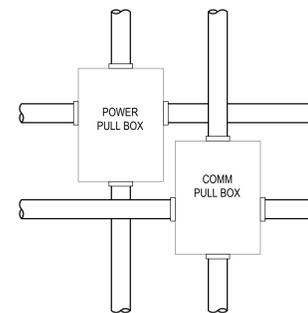


1 TYPICAL STUB-OFF DETAIL  
SCALE: N.T.S.

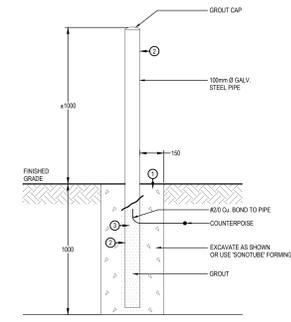
CONDUIT AND CABLE SCHEDULE (FROM TELUS SERVICE POLE TO MDC-GULF) - NEW DUCTBANK							
CUT SECTION	CONDUIT ROUTE	TYPE	VOLTAGE	SIZE (mm)	CONDUIT ID	CONDUCTORS	COMMENTS
J	FROM TELUS SERVICE POLE TO MDC-GULF	COMMS	NA	103	C1-1	EMPTY CW PULLCORD	CONDUIT - MAIN TELECOMMUNICATION TO MDC-GULF



J DIRECT BURIED 'J' CROSS SECTION  
SCALE: N.T.S.



2 GENERAL ARRANGEMENT OF POWER AND COMM PULLBOXES - 'TYPICAL'  
SCALE: N.T.S.



**BOLLARD INSTALLATION DETAIL**  
N.T.S.

**BOLLARD NOTES:**

- STEEL PIPE SHALL BE FILLED WITH GROUT AND FORM A CAP TO SHED WATER.
- SEE PAD FABRICATION AND INSTALLATION DETAIL THIS SHEET FOR BACKFILL AND COMPACTION DETAILS.
- STANCHIONS SHALL BE PLACED SO AS NOT TO OBSTRUCT ANY DOORS NOR RESTRICT THE OPERATION OF THE UNIT.

ITEM	QUANTITY	MATERIAL LIST DESCRIPTION
1	AS REQD	CONCRETE
2	8	100mm NOMINAL DIAMETER GALVANIZED STEEL PIPE
3	8m <sup>3</sup>	GROUT

3 CONCRETE BOLLARD DETAIL  
SCALE: N.T.S.

ISSUED FOR TENDER

ISSUED FOR 100% CLIENT REVIEW

ISSUED FOR 50% CLIENT REVIEW

ISS DATE DESCRIPTION

**FISHERIES AND OCEANS CANADA**  
SMALL CRAFT HARBOURS

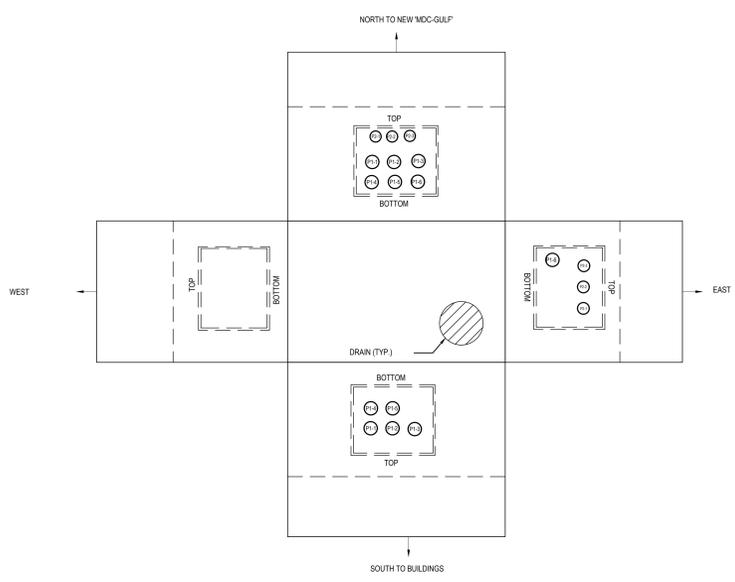
**wsp**

Project No./No. de projet: 3300 CHATHAM, RICHMOND, B.C. SCH STEVESTON HARBOUR  
**ELECTRICAL INDEPENDENT POWER SOURCE**

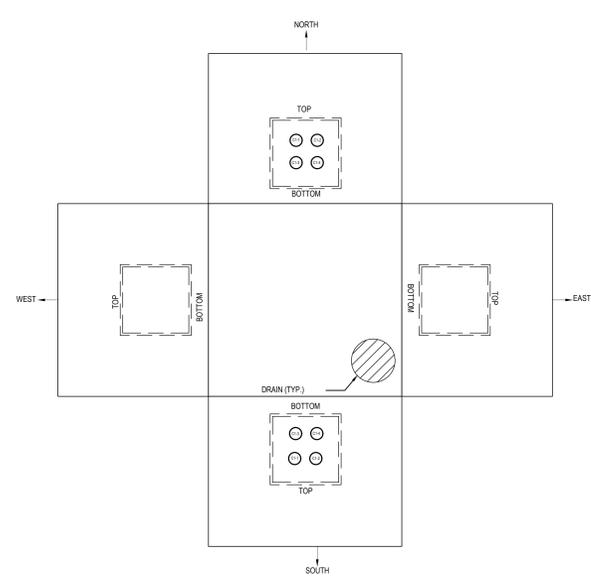
Drawing No./No. de dessin: DUCTBANK, CABLE SCHEDULES, AND ELECTRICAL DETAILS

Project No./No. de projet: 191-16093-06  
Sheet/Feuille: E-004  
Revision/Revisão: 01

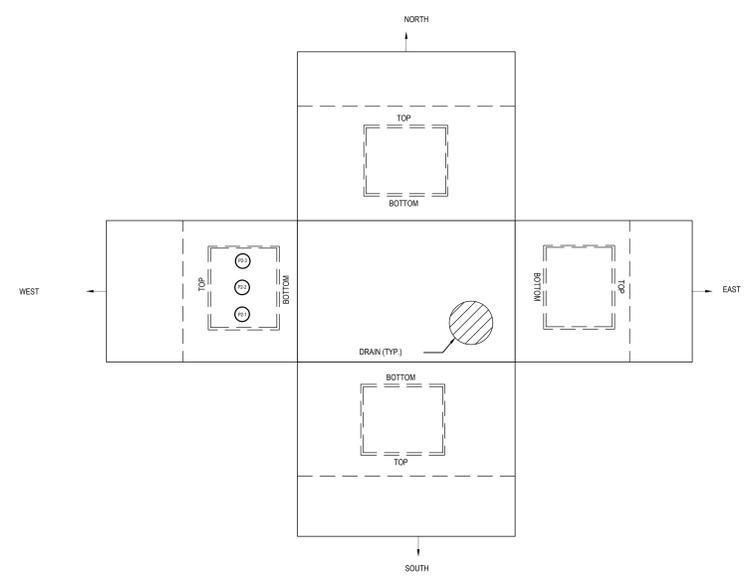
- GENERAL NOTES:**
1. ALL LOW VOLTAGE VAULTS WITH TOP ACCESS
  2. VAULT TOP AND ACCESS LID TO BE H-20 FULL TRAFFIC RATED.
  3. KNOCKOUT LOCATIONS ARE APPROXIMATE. CONFIRM WITH SHOP DRAWINGS FOR LOCATION AND POSITION OF KNOCKOUTS.
  4. ALL VAULT COVERS SHALL HAVE ASSIGNED NUMBER WELDED ONTO LID
  5. ALL VAULTS SHALL HAVE ENGRAVED LAMACOD CONDUIT DIRECTORIES. REFER TO PROJECT SPECIFICATIONS.
  6. INSTALL MANHOLE TO DEPTH INDICATED ON CIVIL DRAWINGS.
  7. PROVIDE BUOYANCY COLLAR ON VAULTS WHERE NOTED.
  8. BUILD MANHOLE NECK TO REQUIRED HEIGHT USING PRECAST CONCRETE RISER RINGS. USE ONE LAYER OF MORTAR BETWEEN RINGS. BOND THE MANHOLE COVER FRAME TO THE MANHOLE GROUNDING CONDUCTOR. PARSE THE INSIDE OF THE NECK AND ENGRAVE THE MANHOLE NUMBER NEAR THE UPPER END OF THE NECK.
  9. MAKE DUCT ENTRANCES AS SHOWN ON DRAWINGS.
  10. BACKFILL THE EXCAVATION AND COMPACT THE BACKFILL MATERIAL.
  11. MANHOLES SHALL BE RATED FOR H-20 LIVE LOADING.
  12. CONTRACTOR TO FIELD VERIFY THE EXISTING PULL BOXES AND MODIFY THE CONDUIT CONNECTIONS AS PER DRAWINGS E-102, E-005.



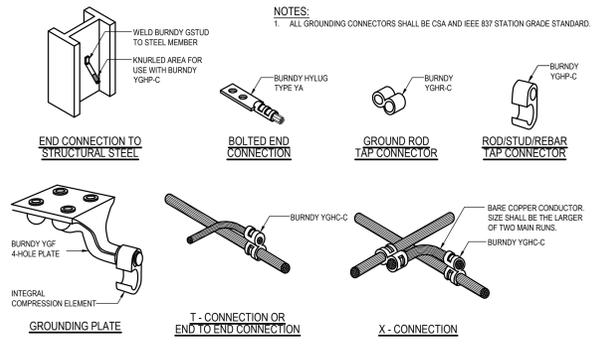
1 PULLBOX 'P1'  
SCALE: N.T.S.



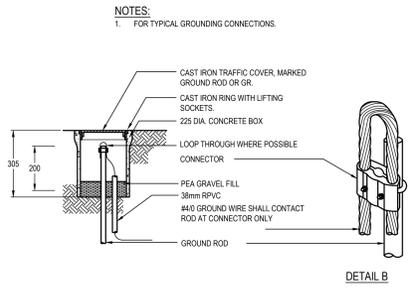
2 TYPICAL COMMUNICATIONS PULLBOX (C1)  
SCALE: N.T.S.



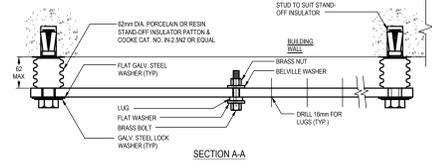
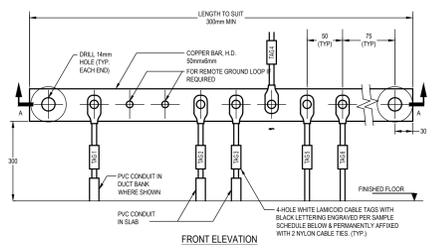
3 PULLBOX 'P2'  
SCALE: N.T.S.



4 WIRING DETAILS CRIMP-ON CONNECTIONS  
SCALE: N.T.S.



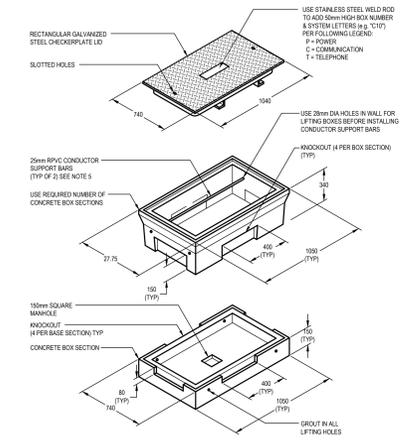
5 GROUNDING ROD INSPECTION WELL  
SCALE: N.T.S.



SAMPLE CABLE TAG ENGRAVING SCHEDULE

TAG NO.	ENGRAVING TEXT
1	INCOMING SERVICE GROUND
2	INCOMING SERVICE SWITCHGEAR GROUND BUS LOOP
3	INCOMING SERVICE SWITCHGEAR GROUND BUS LOOP
4	ROOM PERIMETER GROUND
5	STATION GROUND ELECTRODE (GROUND ROD LOOP)
6	STATION GROUND ELECTRODE (GROUND ROD LOOP)

6 GROUND BUS BAR DETAIL  
SCALE: N.T.S.



7 TYPICAL PULLBOX DETAIL  
SCALE: N.T.S.



ISS	DATE	DESCRIPTION
03	2021/07/09	ISSUED FOR TENDER
02	2021/06/11	ISSUED FOR 100% CLIENT REVIEW
01	2021/03/13	ISSUED FOR 50% CLIENT REVIEW

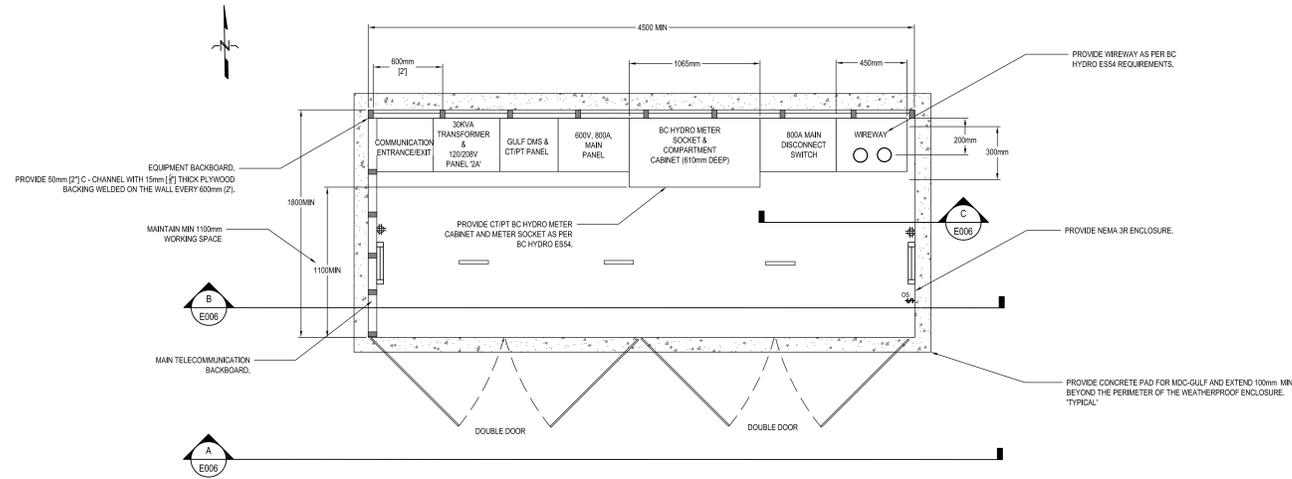
FISHERIES AND OCEANS CANADA  
SMALL CRAFT HARBOURS



Project No./No. de projet  
3300 CHATHAM, RICHMOND, B.C.  
SCH STEVESTON HARBOUR  
ELECTRICAL INDEPENDENT  
POWER SOURCE

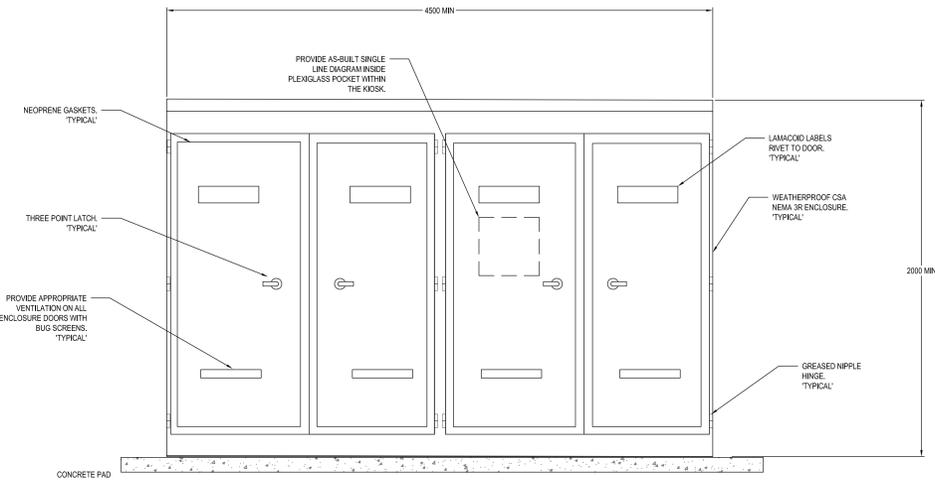
Drawing No./No. de dessin  
ELECTRICAL PULLBOX DETAILS

Project No./No. de projet: 191-16093-06  
Sheet/Feuille: E-005  
Revision/Revisão: 01

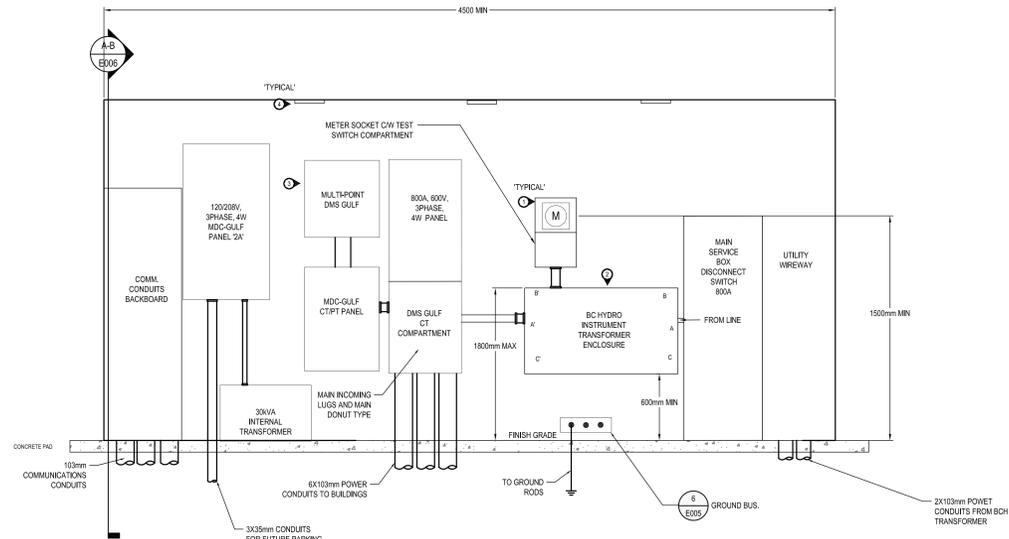


**EQUIPMENT LAYOUT - NON-WALK IN 'MDC-GULF'**  
SCALE: NTS

- GENERAL NOTES:**
- CONTRACTOR TO FIELD VERIFY THE LOCATION OF THE MDC-GULF AS PER DRAWING E-002 PRIOR TO WORK. COORDINATE EXACT LOCATION OF THE MDC-GULF WITH BC HYDRO TO MEET ALL ESS4 REQUIREMENTS. NOTIFY THE DEPARTMENTAL REPRESENTATIVE WITH ANY CHANGES.
  - ALL LOCATION AND DIMENSIONS SHOWN ON THIS DRAWING ARE MINIMUM REQUIREMENTS FOR THE MDC-GULF. CONTRACTOR SHALL FOLLOW THE BC HYDRO ESS4 STANDARDS AND REQUIREMENTS, AND MAKE APPROPRIATE ADJUSTMENTS TO THE MDC-GULF. COORDINATE ANY CHANGES WITH THE DEPARTMENTAL REPRESENTATIVE PRIOR TO PURCHASE AND INSTALLATION AS PER THE ELECTRICAL SPECIFICATIONS.
  - CONTRACTOR TO SIZE FINAL HEIGHT AND WIDTH OF KIOSK TO APPROPRIATELY HOUSE INDICATED EQUIPMENT.
  - ALL ENCLOSURES TO BE WEATHERPROOF TYPE NEMA 3R, UNLESS OTHERWISE SPECIFIED.
  - PROVIDE MDC INTERNAL EQUIPMENT AS PER SINGLE LINE DIAGRAM AND ELECTRICAL SPECIFICATIONS. NOTIFY THE DEPARTMENTAL REPRESENTATIVE OF ANY CHANGES.
  - COMMUNICATION CONDUITS LOCATION ARE NOT SHOWN ON THIS DRAWING. FIELD VERIFY THE BEST COMMUNICATION ROUTE PRIOR TO WORK, AND PROVIDE ALL UNDERGROUND COMMUNICATION CONNECTIONS AS PER DRAWING E-002 AND CABLE SCHEDULES.
  - PROVIDE ARC-FLASH STUDY REPORT OF THE MDC-GULF TO THE DEPARTMENTAL REPRESENTATIVE FOR APPROVAL PRIOR TO SERVICE ENERGIZATION.
  - CABLES CLIPS FOR THE BC HYDRO SERVICE CABLES SHALL BE CSA TYPE, 600V CLASS, SEPARATELY MOUNTED FOR THE SUPPORT OF INDIVIDUAL SERVICE CABLES.

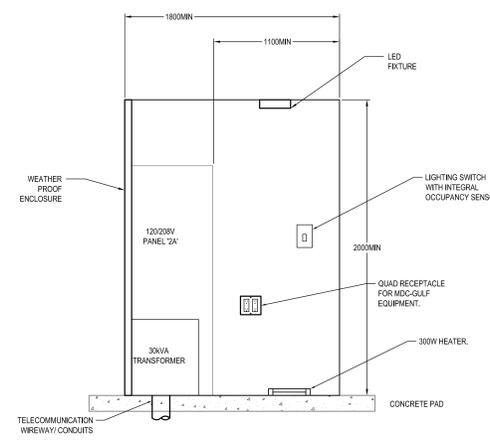


**A - FRONT ELEVATION DOORS CLOSED**  
SCALE: NTS

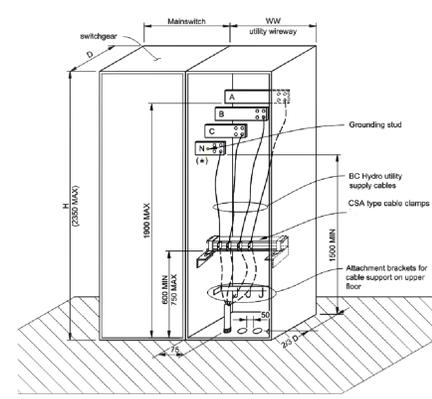


**B - FRONT ELEVATION DOORS REMOVED**  
SCALE: NTS

- DRAWING KEYNOTES:**
- BC HYDRO TO PROVIDE ONE (1) BCH METER, THREE (3) CTS, AND THREE (3) P.T.S. CONTRACTOR TO COORDINATE BCH METERING SYSTEM PRIOR TO INSTALLATION. PROVIDE ALL ENCLOSURES, CONNECTIONS, AND MISCELLANEOUS AS PER BENCHES REQUIREMENTS FOR A FULLY FUNCTIONAL SYSTEM.
  - THE INSTRUMENT TRANSFORMER ENCLOSURE SHALL BE INSTALLED IN HORIZONTAL POSITION WITH LINE ENTERING AND LOAD EXISTING FROM A TO A', B TO B', C TO C', B TO C', C TO B', A TO B', A TO C', B TO A', OR C TO A'.
  - PROVIDE A FULLY FUNCTIONAL DIGITAL METERING SYSTEM (DMS) WITH CT/PT PANEL FOR MDC-GULF.
  - PROVIDE THREE (3) 1W, 1000-1000 LUMENS LED FIXTURES VAPOUR WRAP WITHIN THE MDC-GULF. PROVIDE A SWITCH AND SENSORS.



**A-B - SIDE ELEVATION**  
SCALE: NTS



**C - WIREWAY DETAILS**  
SCALE: NTS

**DETAIL NOTES:**

TABLE	DIMENSION (mm)
WW	450
D	300
H	1500

**1 MAIN DISTRIBUTION CABINET - 'MDC-GULF'**  
SCALE: NTS



**FISHERIES AND OCEANS CANADA**  
SMALL CRAFT HARBOURS

**wsp**

Projet titre/Title de projet  
3300 CHATHAM, RICHMOND, B.C.  
SCH STEVESTON HARBOR  
**ELECTRICAL INDEPENDENT POWER SOURCE**

Drawing titre/Title de dessin  
ELECTRICAL DETAILS,  
MDC-GULF

ISS	DATE	DESCRIPTION
03	2021/07/09	ISSUED FOR TENDER
02	2021/06/11	ISSUED FOR 100% CLIENT REVIEW
01	2021/03/13	ISSUED FOR 50% CLIENT REVIEW

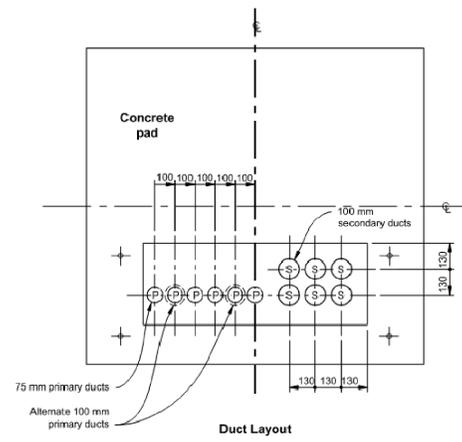
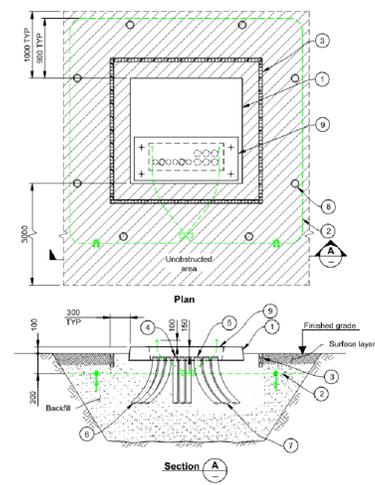
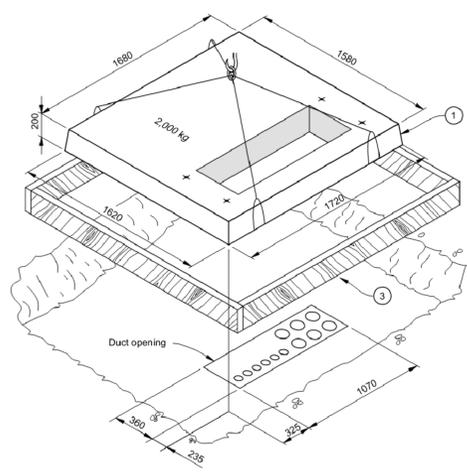
Projet No./No. de  
191-16093-06

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E-006

10/10/2021  
10

**GENERAL NOTES:**

- CONTRACTOR TO COORDINATE THE LOCATION AND ALL DETAILS OF THE TRANSFORMER WITH BC HYDRO. CONCRETE PAD IS PROVIDED BY BC HYDRO. CONTRACTOR TO INSTALL THE CONCRETE PAD AS PER BCH ESS4 STANDARDS AND REQUIREMENTS.
- PROVIDE AND INSTALL GROUNDING FOR THE TRANSFORMER. COORDINATE DETAILS WITH BCH PRIOR TO WORK.
- PROVIDE A COMPLETE ARC FLASH AND FUSE COORDINATION TEST REPORTS TO THE DEPARTMENTAL REPRESENTATIVE AND COORDINATE THE SCHEDULE WITH BCH AND THE DEPARTMENTAL REPRESENTATIVE FOR APPROVAL.



**Notes**

- There shall be no vegetation or pavement around the pad within the containment frame.
- Designer is to specify the orientation of the pad to allow for a safe operating position for crews.
- Designer is to specify transformer protection in accordance with ESS4 U2-02.

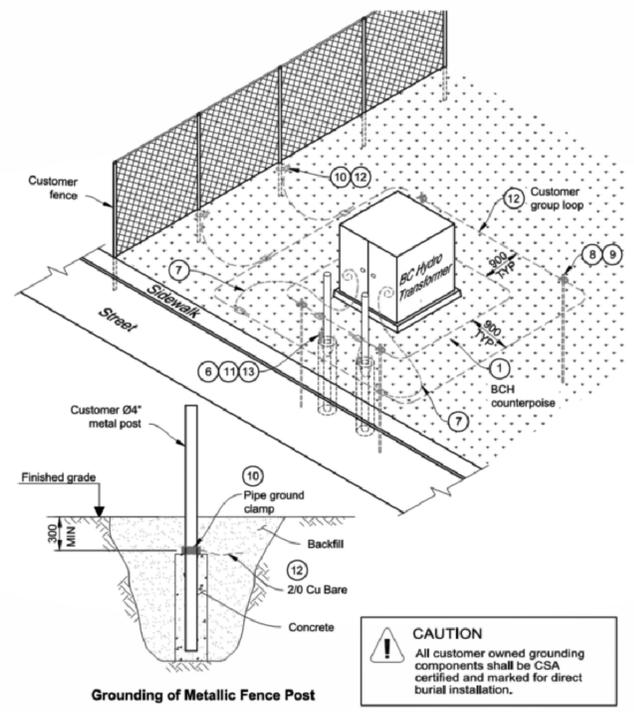
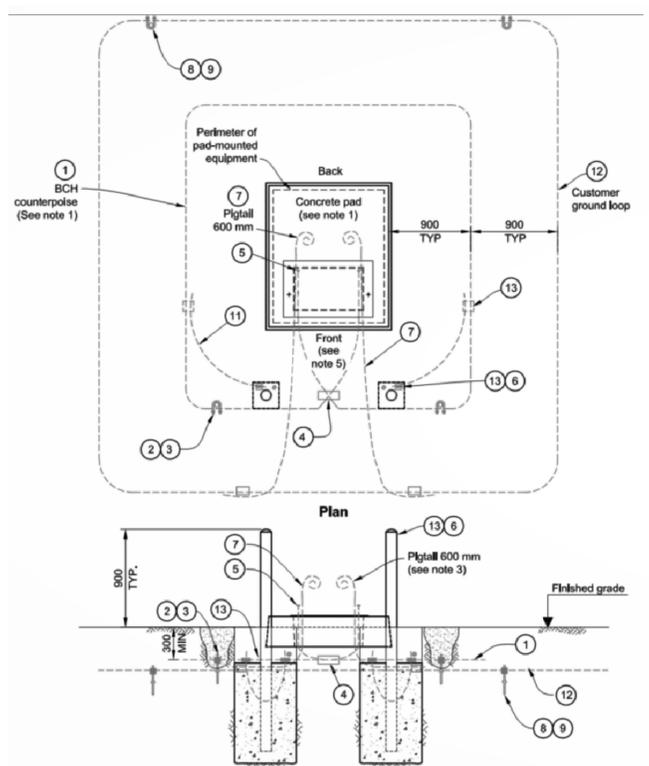
**Bill of Material**

Item	Description	Catalogue ID	Quantity	Supplied By
1	Precast concrete pad	400-0853	1	BC Hydro
2	Grounding kit	412-0015	1	BC Hydro
3	Ground rod	420-1093	2	BC Hydro
4	18 m counterpoise	412-0014	1	BC Hydro
5	Border frame	N/A	As required	Contractor
6	75 mm duct caps	401-0173	As required	Contractor
7	100 mm duct caps	96021451	As required	Contractor
8	75 mm duct, 90° elbow	400-4024	As required	Contractor
9	100 mm duct, 90° elbow	96021350	As required	Contractor
10	Bollards	400-0959	As required	BC Hydro
11	Phywood cover	N/A	1	Contractor

**Reference Standards**

- ESS4 F0-03 Border Containment Frame, Typical Detail
- ESS4 H1-03 Duct Entry at Pads
- ESS4 R1-01 Grounding of Pad-Mounted Equipment in Public Corridors
- ESS4 U2-02 Above-Ground Equipment, Mechanical Protection
- ESS4 U7 Lifting and Handling
- ESS4 W1-01 Excavation and Backfill
- ESS3 F3 Three-Phase Padmount

**1 BC HYDRO TRANSFORMER CONCRETE DETAILS**  
SCALE: NTS



**Notes**

- BC Hydro requires unobstructed access for the maintenance and testing of the counterpoise and BC Hydro ground rods. The customer portion of the grounding must not be connected to the BC Hydro ground rod or counterpoise.
- The customer bare grounding conductors shall be kept 300 mm minimum (900 mm maximum) from the BC Hydro counterpoise. The customer shall leave 600 mm-long pigtails inside the concrete pad window for future termination to the equipment ground bus by a BC Hydro crew.
- The customer shall connect all exposed conductive and metal structures to the customer ground loop, located within 3 metres of the BC Hydro pad-mounted equipment, to eliminate dangerous touch potentials. Protective metal bollards shall be bonded to the BC Hydro counterpoise.
- All concealed grounding and ducting installations shall be inspected by the BC Hydro civil inspector before placing the backfill. The electrical contractor shall complete the attached Installer's Declaration Form for grounding and ducting installations, and submit it to the BC Hydro civil inspector or BC Hydro representative.

**Bill of Material**

Item	Description	Catalogue ID	Quantity	Supplied By
1	Counterpoise, Ø ¼", galvanized steel	106-2510	As Required	BC Hydro
2	Ground rod, Ø ½" x 8", galvanized steel	420-1093	2	BC Hydro
3	Connector, counterpoise to ground rod, galvanized steel	420-1157	2	BC Hydro
4	Rope clamp, Ø ½", galvanized steel	420-0965	2	BC Hydro
5	Cap, heat shrink, 1.2" x 3"	394-0605	2	BC Hydro
6	Protective bollard, precast, grounded	97002788	2	BC Hydro
7	2/0 AWG Cu insulated 600 V green, stranded	N/A	As Required	Contractor
8	Ground rod, Ø ½" x 8", galvanized steel	N/A	As Required	Contractor
9	Ground rod to 2/0 Cu connector for direct burial, Burndy GUVS821 or equivalent	N/A	As Required	Contractor
10	Pipe grounding clamp 2/0 Cu stranded to 4" dia. pipe, Burndy GD2228 or equivalent	N/A	2	Contractor
11	Theft deterrent wire, ERICO	96006428	12 m	BC Hydro
12	2/0 Cu, bare, stranded, minimum	N/A	As Required	Contractor
13	Connector, ERICO wire to counterpoise or precast grounded bollard stud	420-1158	2 per bollard	BC Hydro

**Reference Standards**

- ESS4 Section F Transformers
- ESS4 R1-01 Grounding of Pad-Mounted Equipment in Public Corridors
- ESS4 U2-01 Concrete Pads, Above Ground Equipment, General Notes
- ESS4 U2-02 Concrete Pads, Above Ground Equipment, Mechanical Protection
- ESS4 R4-01 Grounding in High Corrosion Areas
- ESS3 Z3-01 Grounding Assemblies

**2 BC HYDRO TRANSFORMER GROUNDING AND COUNTERPOISE DETAILS**  
SCALE: NTS

**FISHERIES AND OCEANS CANADA**  
SMALL CRAFT HARBOURS

**wsp**

Projet / Titre de projet  
3300 CHATHAM, RICHMOND, B.C.  
SCH STEVESTON HARBOUR  
**ELECTRICAL INDEPENDENT POWER SOURCE**

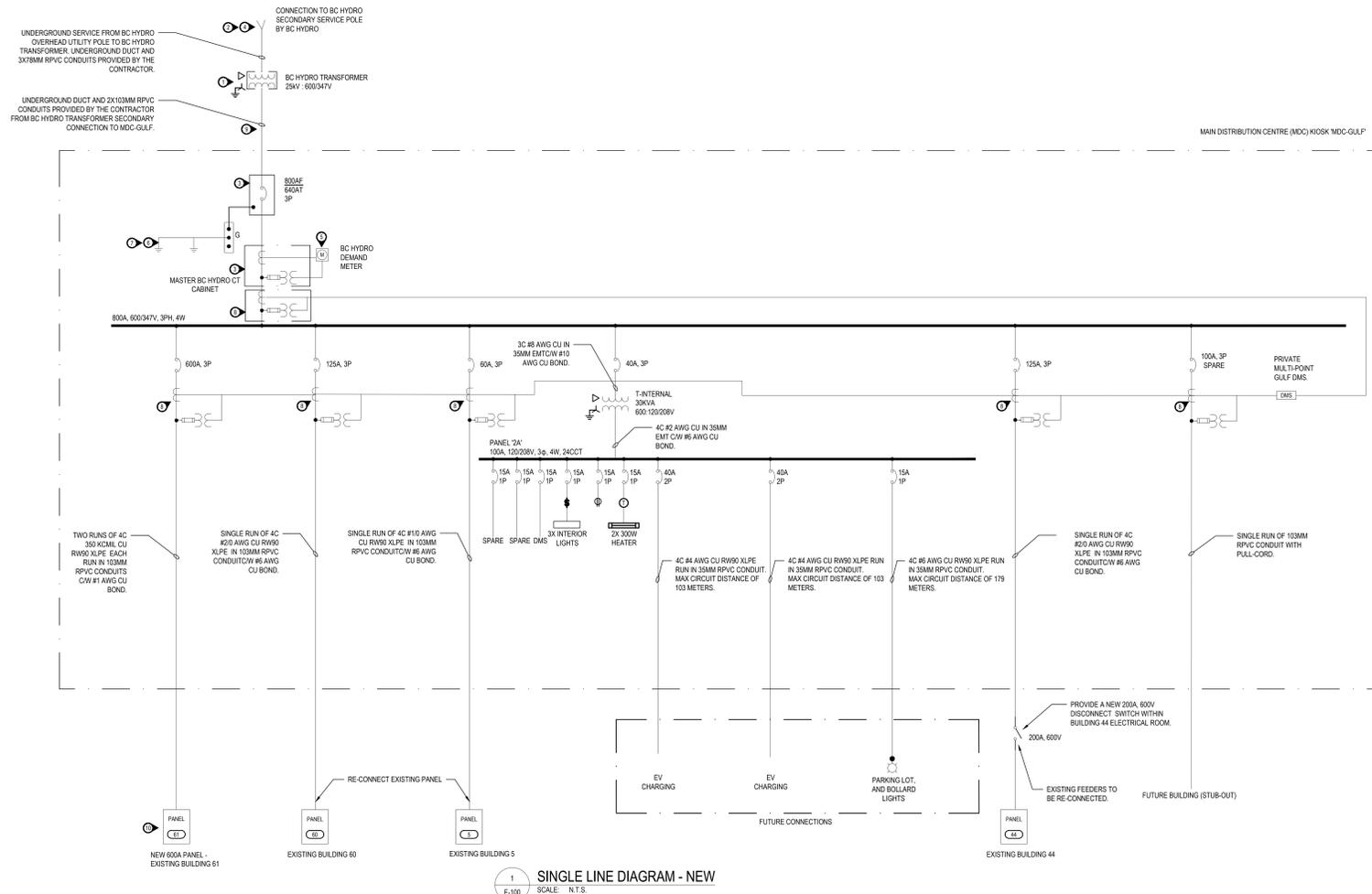
Dessins / Titre de dessin  
ELECTRICAL DETAILS,  
BCH TRANSFORMER

Projet No./No. de  
191-16093-06

Dessin No./No. de  
E-007

Page No./No. de  
01





- SLD - GENERAL NOTES:**
1. ALL BCH WORK IS N.I.C.
  2. PROVIDE THE MEANS TO PURCHASE, DELIVER, INSTALL, CONNECT, COMMISSION, AND PERFORM MISCELLANEOUS REQUIRED WORK FOR A FULLY FUNCTIONING AND SAFE OPERATING SYSTEM.
  3. PROVIDE ALL EQUIPMENT UNLESS NOTED OTHERWISE.
  4. PROVIDE BONDING TO GROUND AND EARTH GROUND TEST, AND FAULT CURRENT TEST RESULTS TO THE DEPARTMENTAL REPRESENTATIVE FOR APPROVAL PRIOR TO ENERGIZATION.
  5. ALL EQUIPMENT RATED, CONNECTED AND OPERATED AS 3 PHASE, 4 WIRE OR 3 PHASE, 3 WIRE UNLESS OTHERWISE NOTED.

- SLD - KEYNOTES:**
- TRANSFORMER CONCRETE PAD PROVIDED BY BC HYDRO. CONTRACTOR SCOPE OF WORK INCLUDES THE INSTALLATION OF THE CONCRETE PAD, ALL GROUNDING, AND BOLLARDS FOR THE TRANSFORMER. COORDINATE INSTALLATIONS WITH BC HYDRO.
  - EXISTING HYDRO POLE CONNECTION. POINT LOCATION TO BE CONFIRMED BY BC HYDRO.
  - MOUNT MAIN BREAKER ENCLOSURE INSIDE MDC-GULF ENCLOSURE AS PER DRAWING E-006.
  - PROVIDE CONDUIT STUB-UP AS REQUIRED TO ROUTE BC HYDRO CABLES FROM BC HYDRO POWER UTILITY POLE TO MAIN DISTRIBUTION CABINET.
  - PROVIDE METER SOCKET WITH TEST SWITCH COMPARTMENT AND METER ENCLOSURE AS PER DRAWING E-006.
  - CONNECT METER SOCKET NEUTRAL TO GROUND ROD.
  - PROVIDE GROUND ROD AND REQUIRED BONDING CONNECTIONS ADJACENT TO MDC.
  - CONNECTION TO PRIVATE GULF DIGITAL METERING SYSTEM (DMS) WITHIN THE MDC-GULF. PROVIDE PT AND CT AS SHOWN WITHIN THE DMS PANEL. PROVIDE DMS MISCELLANEOUS AS NEEDED.
  - COORDINATE TRANSFORMER SECONDARY FINAL CONNECTION TO MDC-GULF WITH BC HYDRO. PROVIDE ALL UNDERGROUND CONDUITS AS PER ESSA BCH REQUIREMENTS WITH PULL-CORDS. NOTIFY THE DEPARTMENTAL REPRESENTATIVE WITH ANY CHANGES.
  - PROVIDE A NEW 600A, 600V, 3PHASE, 4W PANELBOARD WITHIN THE BUILDING 61 ELECTRICAL ROOM. PROVIDE CONNECTIONS AS REQUIRED.

**wsp**

**CEC LOAD CALCULATION**

**Project:** 3300 Chatham Independent Electrical Power Source - 800A BCH Service  
**Project No.:** 191-16093-06

**1. Areas:**

Type of Occupancy	Area in ft <sup>2</sup>	Area in m <sup>2</sup>	Watts per m <sup>2</sup>	Demand Factor	Basic Load in Watts
Industrial & Commercial - Building 61		735	25	100	18,375
Storage Warehouse - Building 44		1,938	5	100	9,690
Storage Warehouse - Building 5		373	5	100	1,865
Storage Warehouse - Building 60		427	5	100	2,135
Industrial & Commercial - Future Building		735	25	100	18,375
<b>Total Basic Load (W)</b>					<b>50,440</b>

**2. Special Loads:**

<b>Electrical Heating:</b>					
First 10kW=	10.00 kW @ 100% demand =				10,000 W
Remaining Demand =	40.00 kW @ 75% demand =				30,000 W
Tenant Equipment Load - Building 61=	500.00 kW @ 75% demand =				375,000 W
Tenant Equipment Load - Building 60=	40.00 kW @ 75% demand =				30,000 W
Tenant Equipment Load - Building 44=	40.00 kW @ 75% demand =				30,000 W
Tenant Equipment Load - Future Building=	75.00 kW @ 75% demand =				56,250 W
<b>Exterior:</b>					
Exterior lighting, security, etc. =	2.00 kW @ 50% demand =				1,000 W
EV Charging =	15.50 kW @ 100% demand =				15,500 W
<b>Total Special Loads</b>					<b>547,750 W</b>

**3. Total of (1) & (2) = 598,190 W**

**4. Phase-to-phase voltage = 600 volts phase= 3 pf= 0.9**

**5. Minimum connected load amp = 640 Amps**

**6. 125% rated overcurrent device size = 800 Amps**

**2 ELECTRICAL LOAD CALCULATION**  
SCALE: N.T.S.

Project No./Title de projet: 3300 CHATHAM, RICHMOND, B.C. SCH STEVESTON HARBOUR  
**ELECTRICAL INDEPENDENT POWER SOURCE**  
 Drawing No./Title de dessin: SINGLE LINE DIAGRAM  
 Project No./Title de projet: 191-16093-06 Sheet/Feuille: E-100 Drawing No.: 01