




## STANDBY GENERATOR FOR COMBINED SERVICES BUILDING AND WEATHER OFFICE

CLIENT: ENVIRONMENT CANADA  
ELECTRICAL ENGINEER: DORWARD ENGINEERING LTD

### DRAWING INDEX

DIVISION 26 - ELECTRICAL  
E1 - SITE PLAN  
E2 - GENERATOR AND DISTRIBUTION DETAILS

ISSUED FOR TENDER  
DATE: 22-09-2016  
PROJECT#: 15069

 Environment Canada  
Real Property Management  
Division, Technical Services

Environnement Canada  
Division de la Gestion  
des Biens Immobiliers,  
Services Techniques

 DORWARD  
ENGINEERING  
SERVICES LTD.

CONSULTING ELECTRICAL ENGINEERS

UNIT 402 - 309 STRICKLAND ST.  
WHITEHORSE, YUKON  
CANADA Y1A 2J9

Phone: (867) 968-8888  
Fax: (867) 933-4551  
Email: dorward@ieee.org

**ELECTRICAL LEGEND**

	CEILING MOUNTED FIXTURE A12 PANEL & CIRCUIT NUMBER "1" SWITCH NUMBER
	WALL MOUNTED FIXTURE
	RECESSED FIXTURE
	FLUORESCENT FIXTURE CEILING OR SUSPENDED MOUNT
	FLUORESCENT FIXTURE TRIM & CEILING
	PHOTO ELECTRIC CELL
	JUNCTION BOX
	SINGLE GANG SWITCH "3" THREE WAY
	LOW VOLTAGE SWITCH "4" KEYED
	DIMMER SWITCH
	LIGHT CONTROL MOTION SENSOR c/w RELAY AS REQUIRED
	SINGLE OUTLET RECEPTACLE
	DUPLEX RECEPTACLE CH - COUNTER HEIGHT
	DUPLEX RECEPTACLE GF1 - GROUND FAULT INTERRUPT
	SPLIT DUPLEX RECEPTACLE WP - WEATHER PROOF
	COMPUTER DUPLEX RECEPTACLE SCATED SPOT HEAD
	SPECIAL PURPOSE OUTLET OR RECEPTACLE
	CLOCK OUTLET ONLY
	CLOCK & OUTLET
	PACK POLE
	BASEBOARD HEATER
	HEAT TRACE LINE
	TEL/DATA OUTLET
	TELEVISION OUTLET
	EXIT LIGHT UNIT WALL MOUNTED
	EXIT LIGHT UNIT CEILING MOUNTED
	EMERGENCY LIGHTING BATTERY PACK c/w TWO SPOT HEADS
	EMERGENCY LIGHTING REMOTE HEAD c/w TWO LAMPS
	SIRE MINI SOUNDERS c/w SILENCE BUTTON
	FIRE ALARM HORN
	FIRE ALARM BELL
	FIRE ALARM STROBE
	FIRE ALARM BELL/STROBE COMBINATION
	FIRE ALARM STATION & ZONE
	HEAT DETECTOR & ZONE
	SMOKE DETECTOR AND ZONE "D" DUCT
	INDEPENDENT SMOKE DETECTOR - 110V SMOKE & CARBON MONOXIDE
	END OF LINE DEVICE
	MAGNETIC DOOR HOLDER
	HORN (SECURITY)
	360 DEGREE MOTION DETECTOR
	120 DEGREE MOTION DETECTOR
	DOOR SWITCH
	CARD ACCESS DEVICE
	MAGNETIC MOTOR STARTER
	COMBINATION MOTOR STARTER
	MANUAL MOTOR STARTER
	ELECTRICAL FUSED DISCONNECT
	ELECTRICAL UNFUSED DISCONNECT
	THERMOSTAT
	ELECTRIC MOTOR
	ELECTRICAL FUSED DISCONNECT 40A FUSE 100A SWITCH
	ELECTRICAL PANEL RECESSED
	CONDUIT RUN WITH THREE WIRES IN OR ON WALL OR CEILING
	CONDUIT RUN IN OR UNDER FLOOR
	WEATHER PROOF SERVICE HEAD

- PROPOSED SEQUENCE OF INSTALLATION**
- COMPLETE ON-SITE CABLE LOCATIONS AT PROPOSED GENERATOR LOCATION, TRENCHING ROUTES AND CRANE LIFTING POSITION.
  - RE-ROUTE AND TRENCH EXISTING INSTRUMENTATION FEEDERS AND DATA CABLES AS REQUIRED FOR NEW PAD.
  - COMPLETE NEW TRENCHING TO COMBINED SERVICES BUILDING FROM PROPOSED GENERATOR LOCATION, AND AT EXISTING WEATHER OFFICE FEEDER LINE.
  - INSTALL ENGINEERED GENERATOR PAD, ENCASED CONDUIT STUBS, AND PULL PITS. PROVIDE ENGINEERED DRAWINGS AS PER SPECIFICATIONS.
  - INSTALL GENERATOR AND ENCLOSURE, COMPLETE TESTING AS REQUIRED BY THE SPECIFICATIONS.
  - INSTALL NEW CONDUIT AND FEEDERS TO DISTRIBUTION POINTS IN THE ENVIRONMENT CANADA BUILDING.
  - FINAL CONNECTION - WEATHER OFFICE BUILDING MUST EXPERIENCE A LOSS OF POWER BETWEEN THE HOURS OF 8:30 AM AND 2 PM LOCAL TIME. PROVIDE ON-SITE POWER GENERATION IF DOWN TIME IS LONGER THAN MAXIMUM ALLOWABLE. ALL SHUTDOWNS MUST HAVE PRIOR WRITTEN APPROVAL OF THE OWNER AND ENGINEER.
    - DISCONNECT UTILITY FEED TO THE WEATHER OFFICE. COORDINATE WITH THE UTILITIES.
    - CUT WEATHER OFFICE FEEDERS, PULL UTILITY CONNECTION TO GENERATOR DISTRIBUTION, COMPLETE INSTALLATION OF FEEDERS AND NEW PULL PIT.
      - CONTRACTOR MAY USE NEW GENERATOR AS MAIN POWER SUPPLY DURING REMAINING OF UTILITY INSTALLATION.
    - DISCONNECT UTILITY FEED TO THE COMBINED SERVICES BUILDING, COORDINATE WITH THE UTILITIES.
    - CONNECT NEW FEEDERS IN COMBINED SERVICES BUILDING AND AT GENERATOR DISTRIBUTION CENTRE.
    - PULL NEW MAIN FEEDERS FROM MAIN DISCONNECT TO UTILITY CONNECTION, USE EXISTING CONDUIT WHERE POSSIBLE, PROVIDE PULL PITS AS REQUIRED.
    - CONNECT TO UTILITY AND ENERGIZE MAIN UTILITY SERVICE.

- NOTE TO THE CONTRACTOR**
- CONTRACTOR TO DEVELOP A WORK PLAN WHICH OUTLINES STEP-BY-STEP THE IMPLEMENTATION OF THE WORK.
  - WORK PLAN TO INCLUDE SKETCHES OF WORK STAGES.
  - WORK PLAN TO INCLUDE UTILITY COORDINATION AND SHUTDOWN TIMING.
  - WORK PLAN IS TO BE SUBMITTED TO THE ENGINEER FOR REVIEW AND COMMENT PRIOR TO START OF WORK.
  - CONTRACTOR TO ALLOW FOR SIT DOWN MEETING WITH THE OWNER AND ENGINEER TO DISCUSS THE APPROVED WORK PLAN.
  - EXCAVATION EQUIPMENT TO MAINTAIN MINIMUM 2 METER CLEARANCE FROM WEATHER EQUIPMENT.

- SITE KEY NOTES:**
- PROPOSED TRENCHING ROUTE. PATCH AND REPAIR ASPHALT DRIVEWAY.
  - APPROXIMATE LOCATION OF EXISTING ATCO POWER POLE AND 3-PHASE TRANSFORMERS.
  - PROPOSED LOCATION OF GENERATOR ENCLOSURE.
  - WEATHER OFFICE BUILDING ELECTRICAL ROOM AND SERVICE ENTRANCE LOCATION.
  - COMBINED SERVICE BUILDING ELECTRICAL CLOSET AND SERVICE ENTRANCE LOCATION.
  - WEATHER PROOF PULL BOX MOUNTED ON THE EXTERIOR WALL.
  - APPROXIMATE LOCATION OF EXISTING WEATHER OFFICE UNDERGROUND POWER AND TEL/DATA UTILITY FEEDER.
  - APPROXIMATE LOCATION OF COMBINED SERVICE BUILDING PANEL C.
  - APPROXIMATE LOCATION OF EXISTING INSTRUMENT CABLES AND CONDUIT. CONTRACTOR TO RELOCATE AND RETRENCH THE FEEDERS TO CEC STANDARDS.
  - COMPLETE CABLE LOCATION OF ALL EXISTING CABLES, CONDUITS AND PIPES IN THE AREAS OF NEW CONSTRUCTION AND ROUTING.
  - REUSE EXISTING FEEDER.



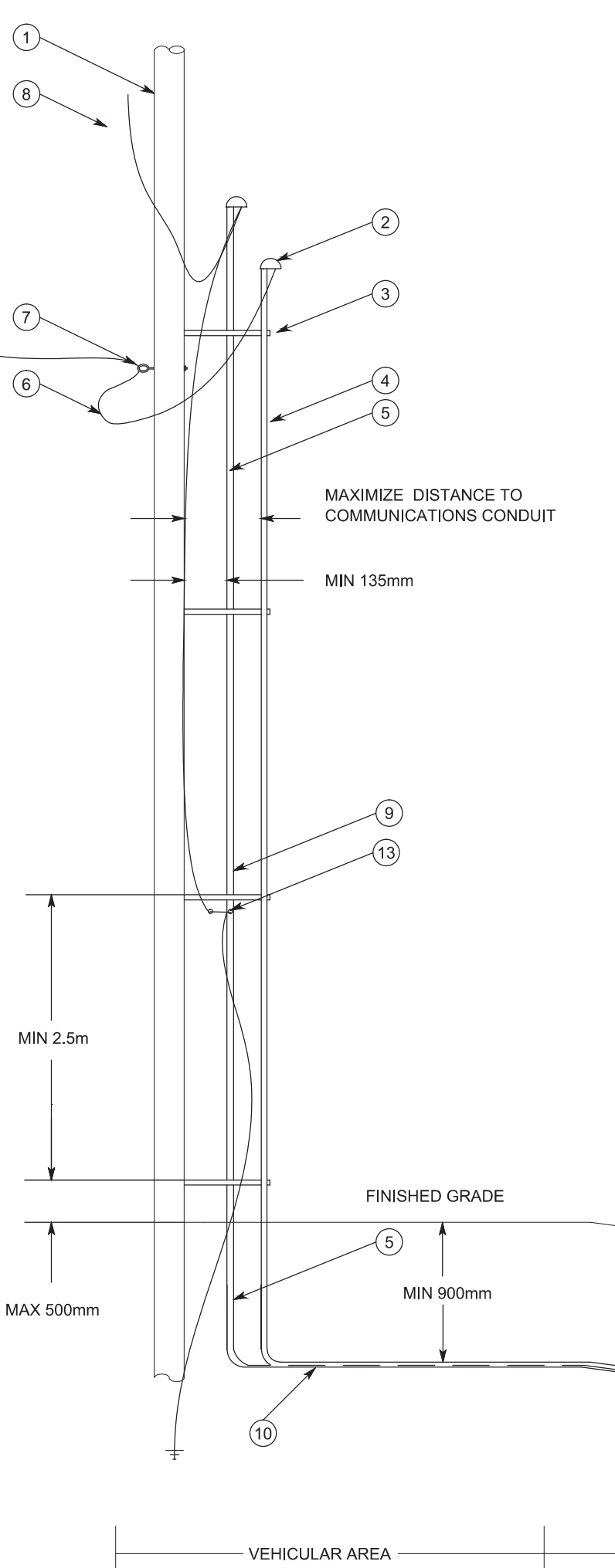
**6 COMBINED SERVICES METER**  
E1



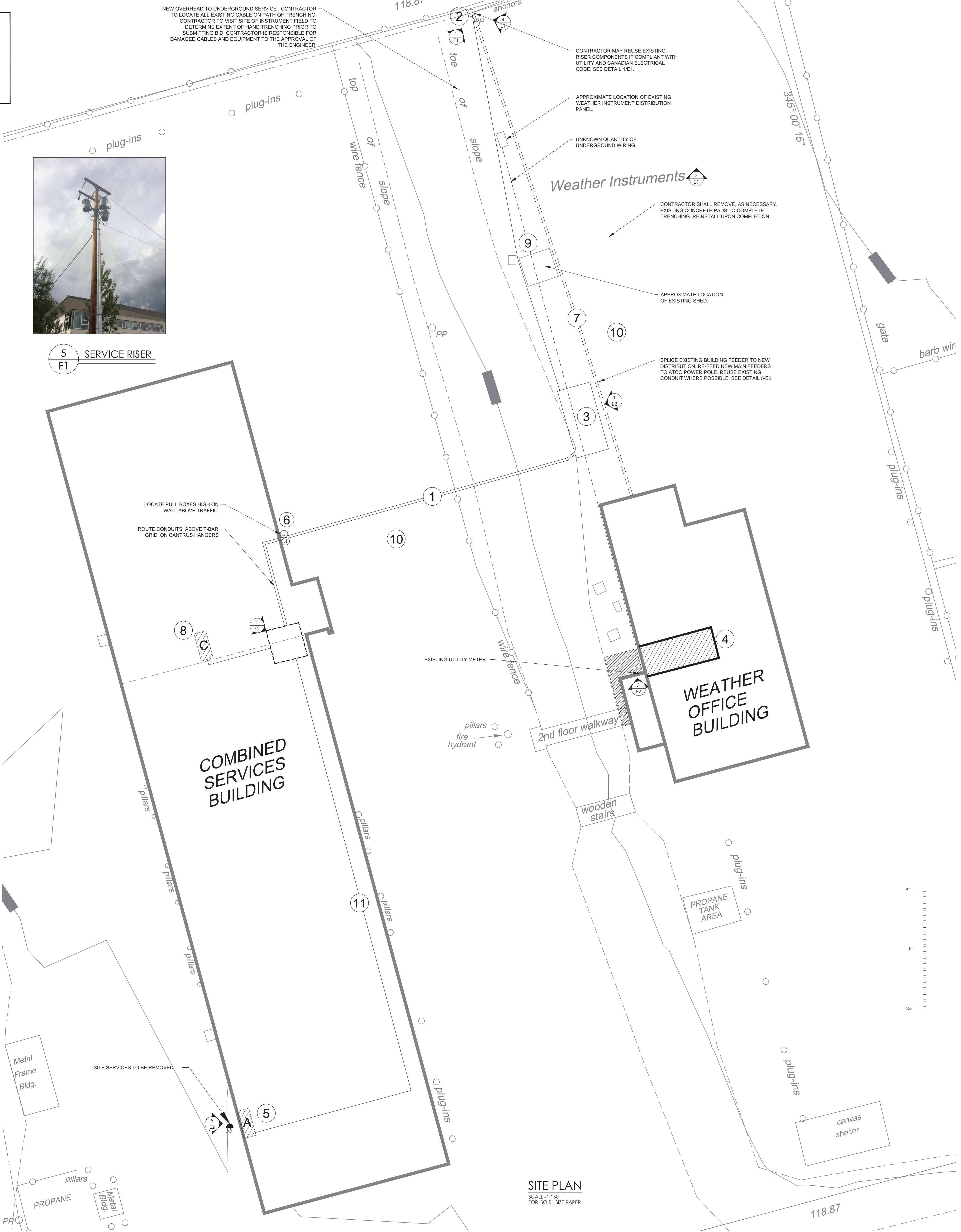
**2 WEATHER OFFICE METER**  
E1



**3 WEATHER INSTRUMENTS**  
E1



- LEGEND:**
- THIS DRAWING SHOWS THE ENGINEERS MINIMUM REQUIREMENTS ONLY. CONTRACTOR TO OBTAIN INSTALLATION LOCATION REQUIREMENTS & UTILITY APPROVAL. PRIOR TO ORDER OF MATERIALS. IN THE EVENT OF A CONFLICT BETWEEN THIS DETAIL AND UTILITY REQUIREMENTS, A RULING SHALL BE OBTAINED BY THE ENGINEER.
- YECL POLE, COORDINATE WITH YECL FOR EXACT LOCATION.
  - TYPICAL WEATHER HEAD, PROVIDED BY DIV 26.
  - TYPICAL STANDOFF BRACKET, QUANTITY TO SUIT POLE HEIGHT, TO YECL APPROVAL; PROVIDED BY DIV 26.
  - 4" RIGID PVC TELEPHONE RISER, TELEPHONE AND ELECTRICAL RISERS TO BE LOCATED ON OPPOSITE SIDES OF STANDOFF BRACKET, PROVIDED BY DIV 26.
  - 2 1/2" RIGID STEEL ELECTRICAL SERVICE RISER (MINIMUM 2m LENGTH FROM RIGID STEEL 90). PROVIDE RIGID STEEL TO RIGID PVC ADAPTERS AS REQUIRED. QUANTITY AS REQUIRED.
  - TELEPHONE SERVICE ENTRANCE CABLE; PROVIDED BY NVTEL.
  - TELEPHONE ATTACHMENT KNOB, TO THE APPROVAL OF NVTEL; PROVIDED BY DIV 26.
  - ELECTRICAL SERVICE CONDUCTORS DIP LENGTH AS REQUIRED BY YECL; CONDUCTOR LENGTH TO YECL CONNECTION POINT PROVIDED BY DIVISION 26.
  - 2 1/2" RIGID PVC ELECTRICAL SERVICE RISER, PROVIDE RIGID STEEL TO RIGID PVC ADAPTERS AS REQUIRED. IN NON-TRAFFIC AREAS, RIGID PVC RISERS ARE PERMITTED WITH THE ENGINEER'S WRITTEN APPROVAL.
  - 2 1/2" RIGID PVC SERVICE CONDUITS UNDERGROUND IN TRENCH; SEE TYPICAL TRENCHING DETAIL.
  - 4" RIGID STEEL CONDUIT FOR TELEPHONE SERVICE ENTRANCE FROM OUTSIDE EXTENT OF BUILDING BACKFILL, COMPLETE THROUGH TO TELEPHONE BACKBOARD (INCLUDES RISER AND 90 DEGREE SWEEP).
  - RIGID PVC 90 DEGREE BEND AND RISER FOR ELECTRICAL SERVICE.
  - SERVICE CONDUIT BOND CONDUCTOR CONNECTION TO RIGID STEEL RISER (ALL RIGID STEEL RISERS TO BE BONDED).
  - WARNING TAPE: SEE TRENCHING DETAIL.



**NOTES**

DRAWINGS ARE DIAGRAMMATIC AND ARE INTENDED TO INDICATE THE GENERAL SCOPE AND ARRANGEMENT OF WORK. DO NOT SCALE THE DRAWINGS. CONTRACTOR IS RESPONSIBLE FOR COORDINATING THEIR WORK WITH ALL TRADES.

THE ELECTRICAL CONTRACTOR IS ENCOURAGED TO CAREFULLY EXAMINE THE SITE AND ASCERTAIN ALL CONDITIONS THAT SHALL AFFECT HIS CONTRACT. NO EXTRAS WILL BE ALLOWED FOR WORK RESULTING FROM CONDITIONS THAT WOULD HAVE BEEN EVIDENT UPON A THOROUGH EXAMINATION OF SITE.

**NOT FOR CONSTRUCTION**



Permit to Practice  
Signature: [Signature]  
Date: Oct 13 2016  
Permit Number: PF001  
Association of Professional Engineers of Yukon

REV. #	TITLE	DATE
1	ISSUED FOR 90% REVIEW	2015-06-15
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**DORWARD ENGINEERING SERVICES LTD.**  
CONSULTING ELECTRICAL ENGINEERS

UNIT 402 - 309 STRICKLAND ST. Phone: (867) 668-6888  
WHITEHORSE, YUKON Fax: (867) 633-4561  
CANADA Y1A 2J9 Email: dward@eesa.org

91780 ALASKA HIGHWAY  
91782 ALASKA HIGHWAY  
WHITEHORSE, YUKON

STANDBY GENERATOR FOR COMBINED SERVICES BUILDING AND WEATHER OFFICE

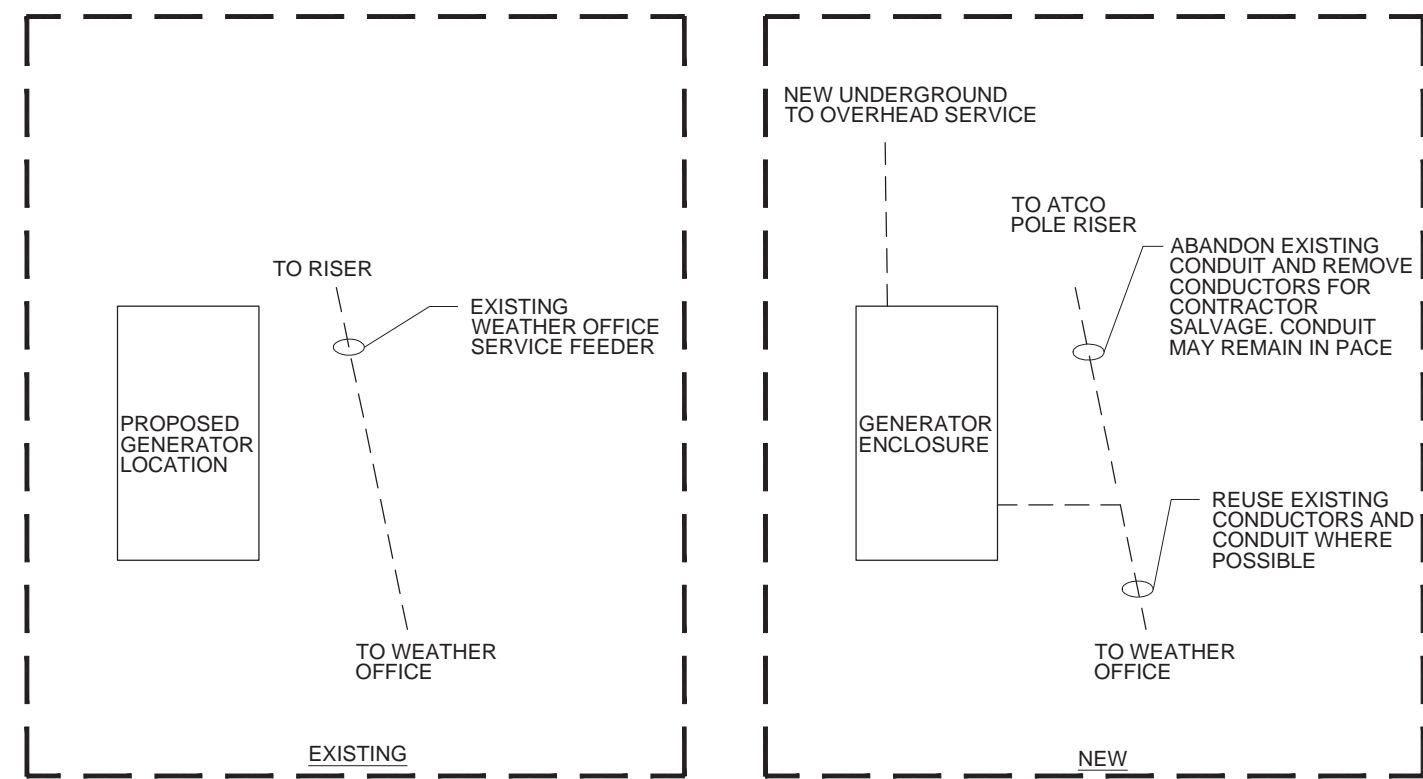
**SITE PLAN**

MS	DESIGNED BY	RD	CHECKED BY
AS SHOWN	SCALE	15069	PROJECT #
			<b>E1/2</b>

NOTES

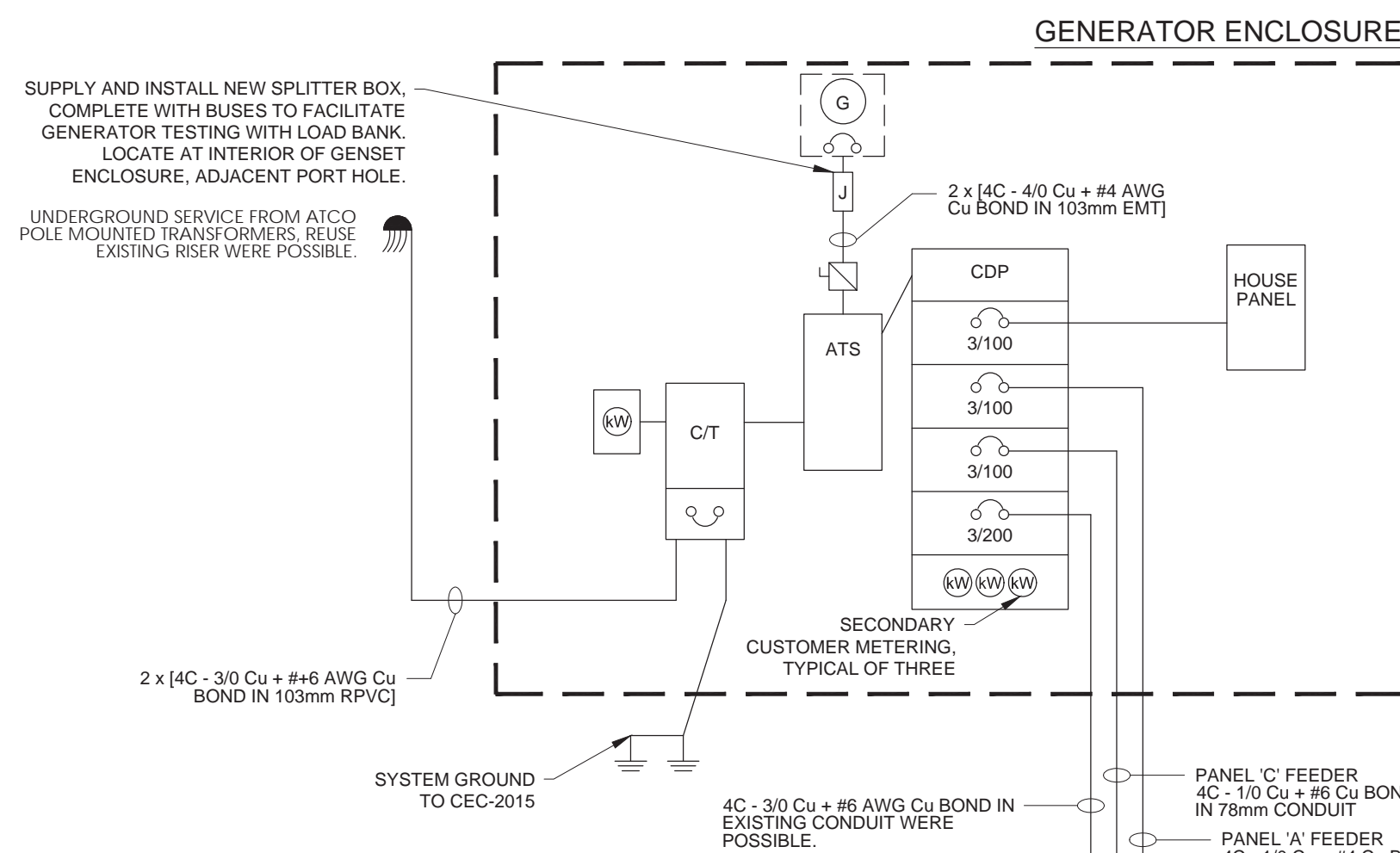
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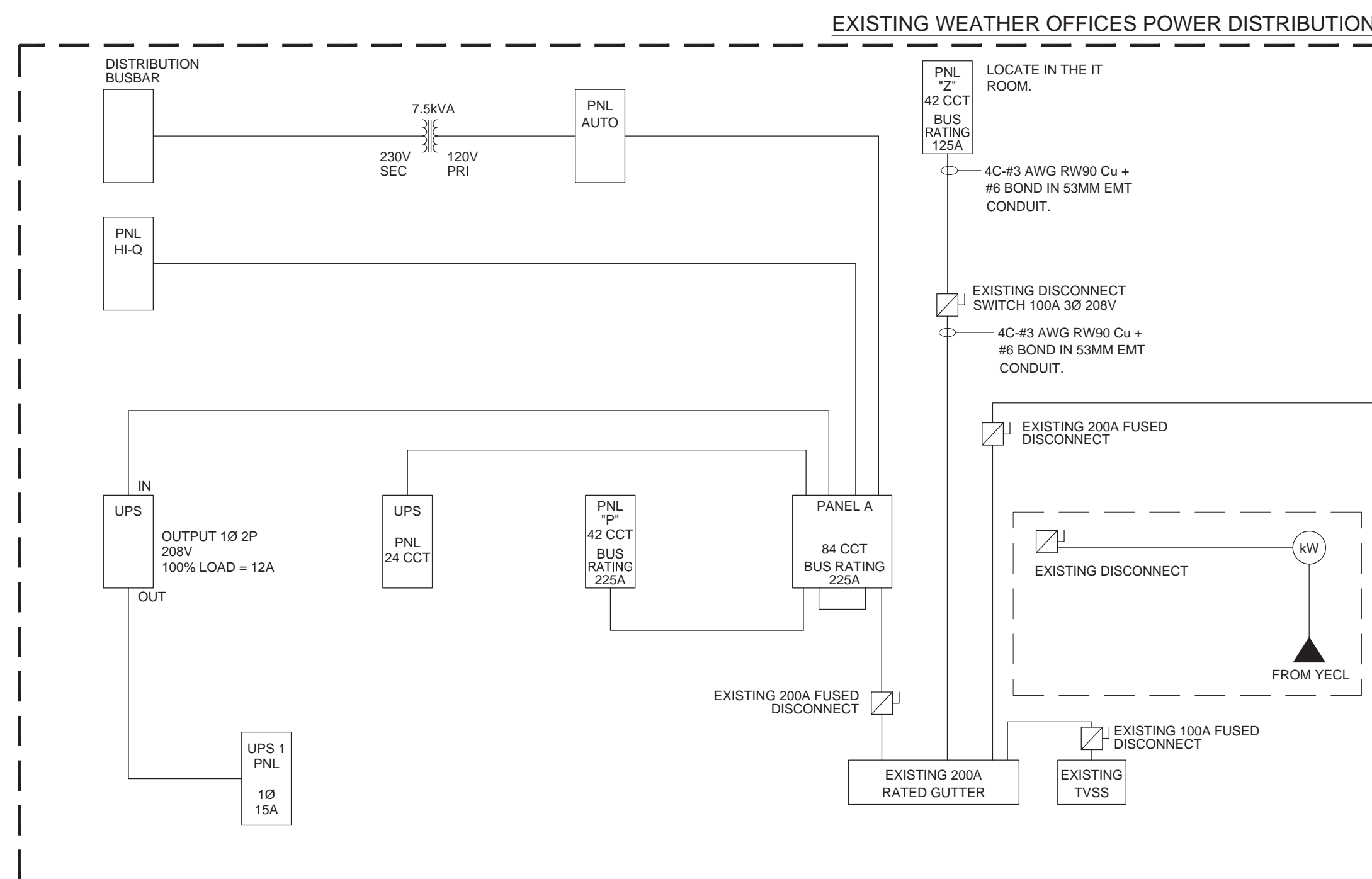


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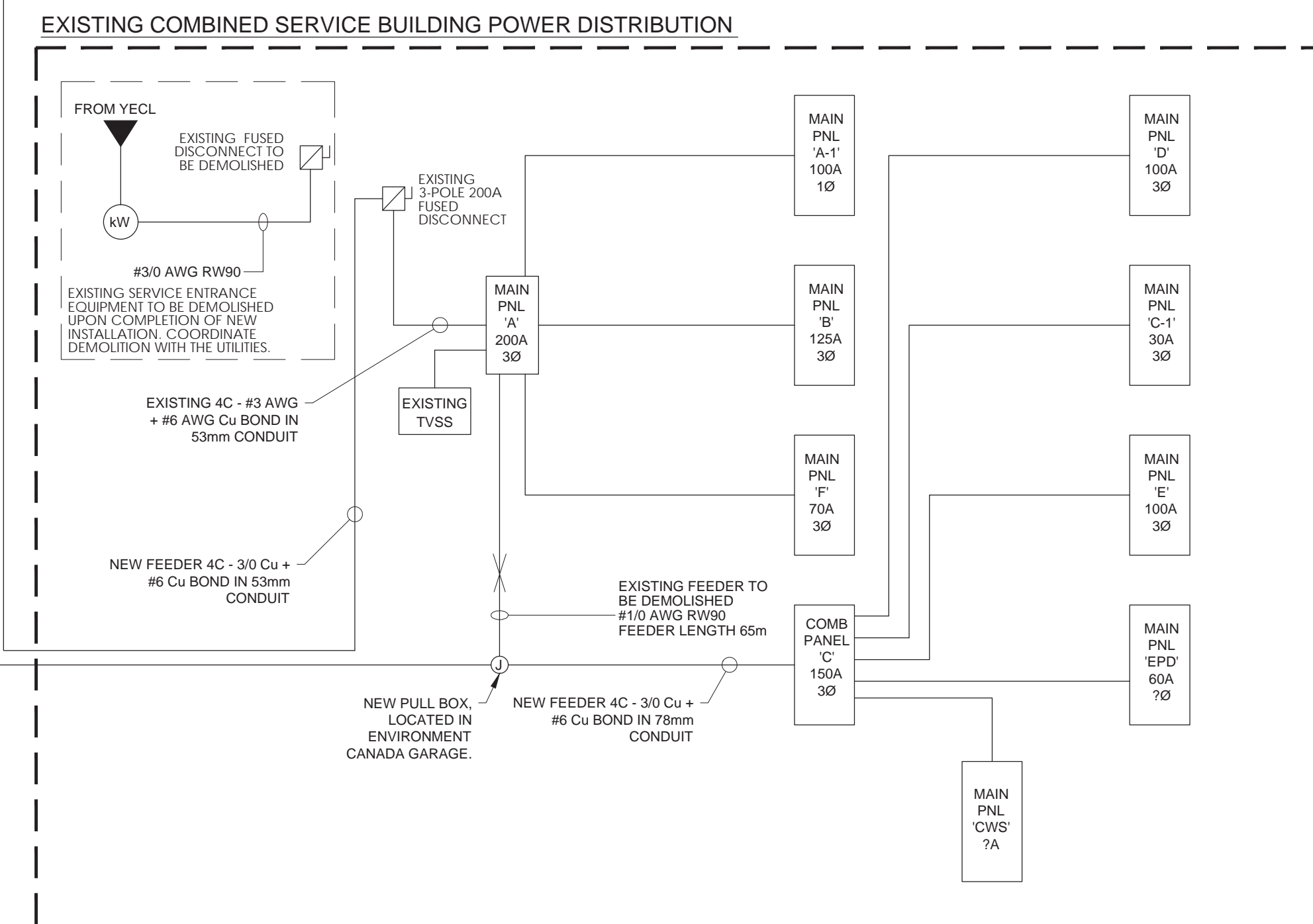
- CONTRACTOR TO PULL BACK WEATHER OFFICE SERVICE FEEDER CONDUCTORS FROM UTILITY RISER, FEED TO NEW GENERATOR ENCLOSURE DISTRIBUTION WITHOUT SPICE. PULL PRT PERMITTED WITH ENGINEER APPROVAL.
- REUSE EXISTING CONDUCTORS AND CONDUIT WHERE POSSIBLE.
- REFER TO DETAIL 2/E2 FOR CONDUCTOR AND CONDUIT SIZES.



GENERATOR ENCLOSURE

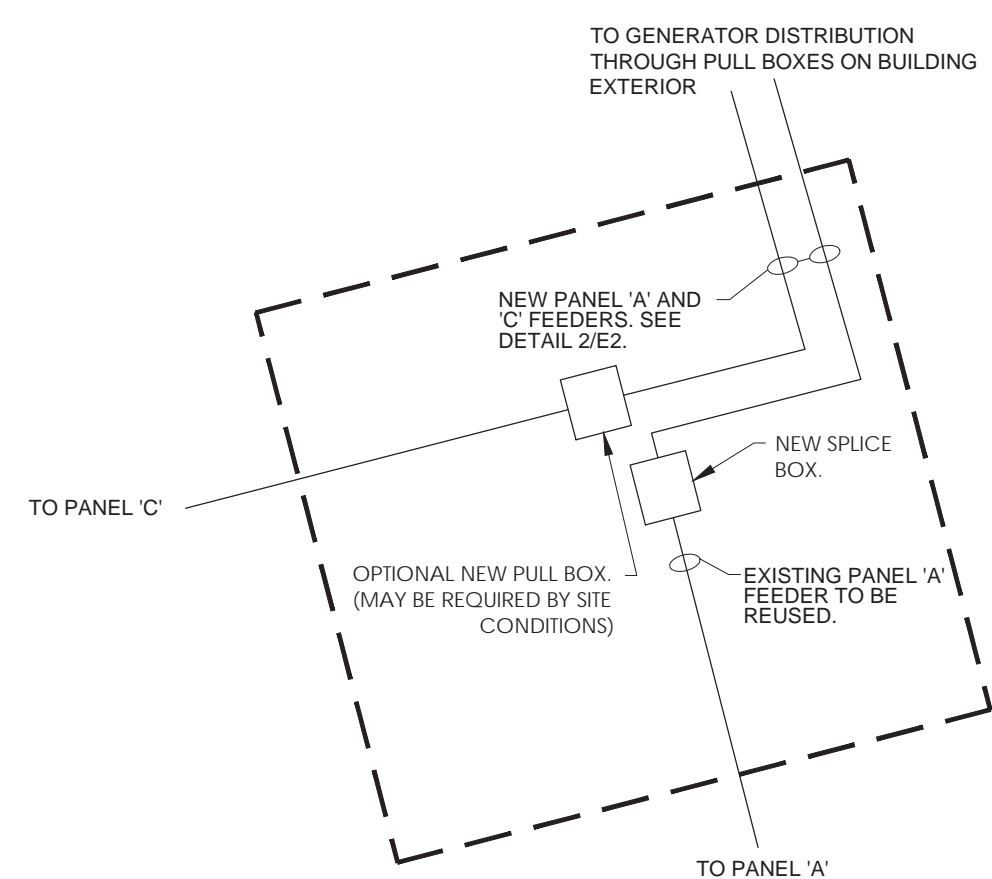


EXISTING WEATHER OFFICES POWER DISTRIBUTION



EXISTING COMBINED SERVICE BUILDING POWER DISTRIBUTION

5 WEATHER OFFICE FEEDER DETAIL  
 SCALE: NTS



NOTES:

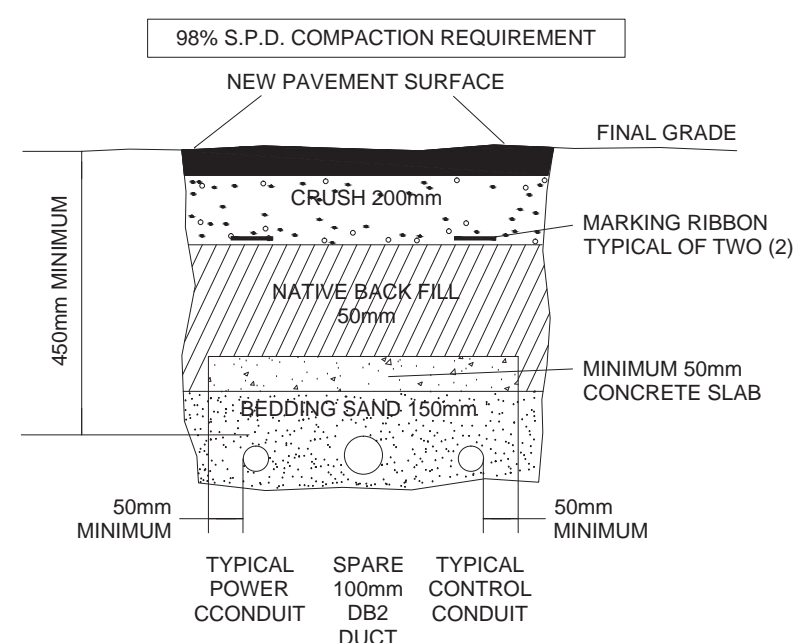
- CONTRACTOR TO PULL BACK PANEL 'C' FEEDER FROM PANEL 'C' TO NEW JUNCTION BOX.
- INSTALL NEW FEEDERS TO PANEL 'C' FROM THE GENERATOR DISTRIBUTION.
- INSTALL NEW FEEDER FOR PANEL 'A' TO LOCATION OF SPICE BOX.
- REUSE EXISTING CONDUCTORS AND CONDUIT WHERE POSSIBLE.
- NEW PANEL 'C' FEEDER TO BE CONTINUOUS WITHOUT SPICE.
- NEW FEEDER FOR PANEL 'A' TO BE CONTINUOUS TO SPICE BOX.
- ALLOW FOR PULL BOX IN BID PRICE TO BE INSTALLED AT THE CONTRACTORS DISCRETION.

1 COMBINED SERVICES BUILDING FEEDER DETAIL  
 SCALE: NTS

2 SINGLE LINE DIAGRAM  
 SCALE: NTS

VEHICLE AREA - TRENCH SPECIFICATION ON ASPHALT/CONCRETE WITH CONCRETE SLAB PROTECTION

NOT TO SCALE

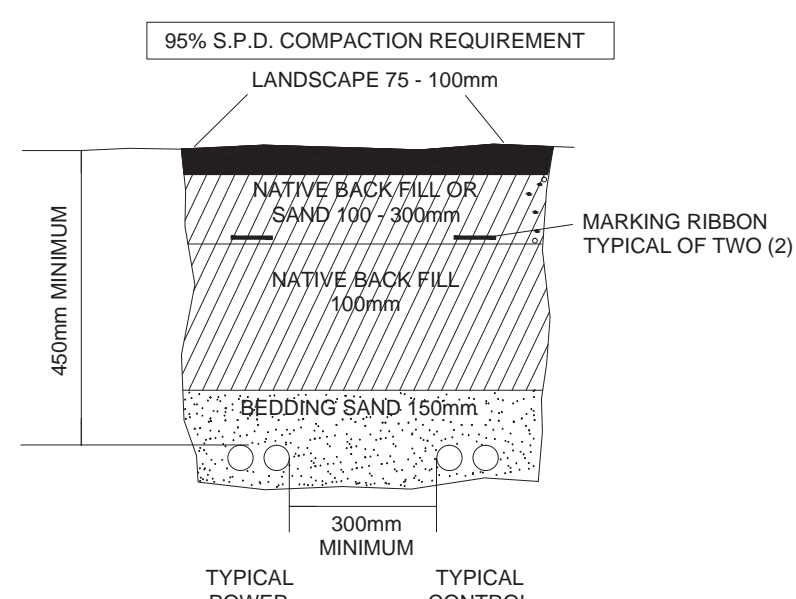


- NOTES:
- MINIMUM DEPTH OF 450mm FROM TOP OF DUCTS TO FINAL GRADE.
  - TRENCHING IN ASPHALT NEW PAVEMENT SURFACE TO BE 75mm COMPACTED DEPTH, ASPHALTIC COLD MIX MATERIAL.
  - TRENCHING IN CONCRETE MATCH EXISTING CONCRETE PAVEMENT THICKNESS, USE OPERATOR CONCRETE BASE DETAIL FOR MIX DESIGN.
  - TRENCHING IN GRAVEL/MOIT ASPHALT COLD MIX REQUIREMENTS, COMPACT 20mm MINUS CRUSH TO FINAL GRADE ELEVATION.
  - CRUSH THICKNESS 300mm AT ROAD CROSSINGS.
  - IF UNSTABLE TO USE NATIVE BACKFILL TO MEET DENSITY REQUIREMENTS SUBSTITUTE WITH BEDDING WITH A MINIMUM 250mm OF 20mm CRUSH.
  - MAXIMUM TRENCH DEPTH DEPENDS ON QUALITY OF DUCTS, DUCT QUANTITY SHOWN ON CONSTRUCTION PRINTS.
  - COMPACTION TO 98% S.P.D.

6 VEHICLE AREA TRENCH DETAIL  
 SCALE: NTS

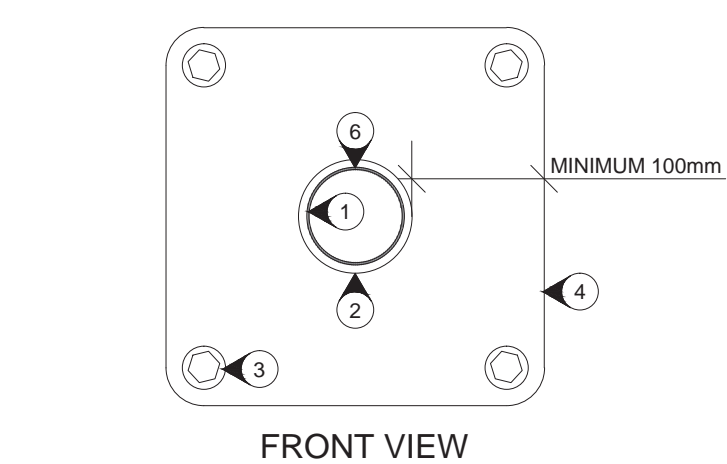
NON-VEHICLE AREA - TRENCH SPECIFICATION ON LANDSCAPE

NOT TO SCALE

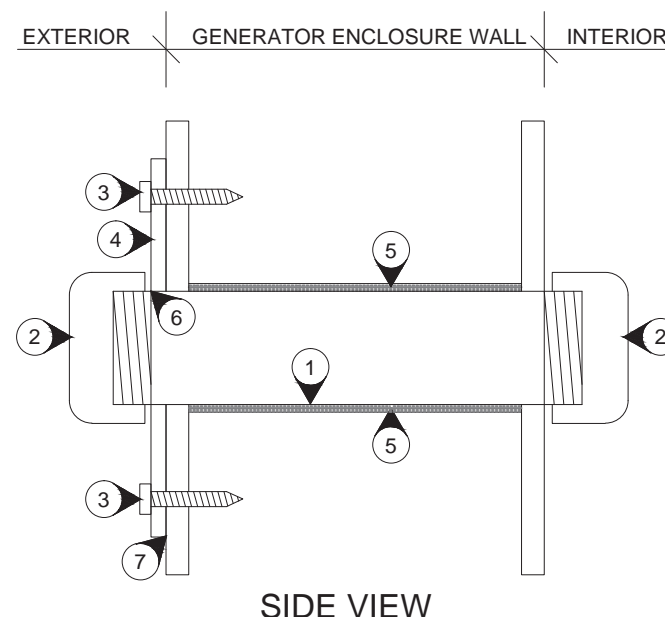


- NOTES:
- MINIMUM DEPTH OF 450mm FROM TOP OF DUCTS TO TOP OF FINAL GRADE.
  - IF UNABLE TO USE NATIVE BACKFILL TO MEET DENSITY REQUIREMENTS SUBSTITUTE WITH BEDDING WITH A MINIMUM 250mm OF 20mm CRUSH.
  - MAXIMUM TRENCH DEPTH DEPENDS ON QUANTITY OF DUCTS, DUCT QUANTITY SHOWN ON CONSTRUCTION PRINTS.
  - COMPACTION TO 98% S.P.D.

7 NON-VEHICLE AREA TRENCH DETAIL  
 SCALE: NTS



FRONT VIEW

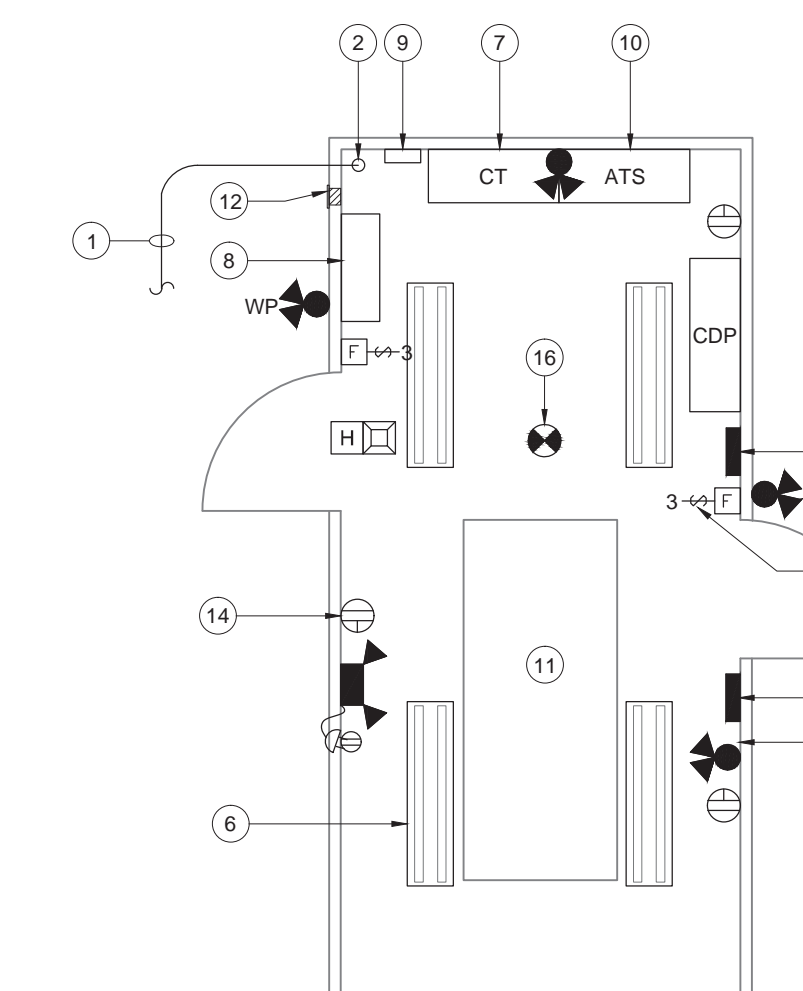


SIDE VIEW

KEY NOTES:

- 4" (103mm) RIGID STEEL CONDUIT c/w REMOVABLE RIGID STYROFOAM PLUG.
- THREADED GALVANIZED STEEL CAP.
- STAINLESS STEEL BOLTS AND WASHERS.
- 1/4" STEEL PLATE, PAINTED TWO COATS OF ZINC PRIMER, AND TWO COATS OF MATCHING GENERATOR ENCLOSURE PAINT.
- EXPANDING FOAM INSULATION c/w FIRE CAULKING.
- WELDED SEAM.
- CAULK TO EXTERIOR WALL.

3 GENERATOR ENCLOSURE CABLE PORT DETAIL  
 SCALE: NTS



GENERATOR ENCLOSURE KEY NOTES:

- CONDUITS IN COMMON TRENCH TO BUILDINGS. REFER TO SINGLE LINE DIAGRAM FOR CONDUIT AND WIRE SIZE: 2 x FEEDER TO COMBINED SERVICES BUILDING, 1 x FEEDER TO WEATHER OFFICES, 1 x 3/4" RPVC FOR SECURITY TO COMBINED SERVICES BUILDING 1 x 3/4" RPVC FIRE ALARM TO COMBINED SERVICES BUILDING 2 x 3/4" RPVC SPARE, ONE TO EACH BUILDING.
- FINAL CONDUIT LOCATIONS SHALL BE COORDINATED WITH FINAL ENCLOSURE LAYOUT.
- COMBINATION PANEL 'G', RATED 100AMP 2-POLE
- EXTERIOR WEATHERPROOF EMERGENCY HEAD, TYPICAL OF TWO (2), POWERED FROM LOCAL BATTERY PACK, STANDARD OF ACCEPTANCE: READY-LITE CADLITE CAD-DC-BK
- BP-G BATTERY PACK FOR MINIMUM TWO HOUR OPERATION, STANDARD OF ACCEPTANCE: READY-LITE LDX12-144-AD-2LD7
- LINEAR LED FIXTURES, TYPICAL OF FOUR (4), COORDINATE FINAL LOCATIONS WITH MECHANICAL TRADE ON SITE.
- UTILITY SERVICE ENTRANCE AND NEW 400 AMP RATED CT CABINET, COORDINATE INSTALLATION WITH UTILITIES.
- NEW 400 AMP RATED THREE PHASE DISCONNECT.
- NEW 400 AMP RATED JUNCTION BOX FOR GENERATOR TESTING, AND METER LOCATION.
- NEW 400 AMP RATED SINGLE-BYPASS ISOLATION AUTOMATIC TRANSFER SWITCH.
- 100KW STANDBY GENERATOR.
- CABLE PORTS FOR LOAD BANK TESTING, REFERENCE DETAIL THIS DRAWING COORDINATE FINAL LOCATION ON SITE WITH THE ENGINEER.
- 3-WAY LIGHT SWITCH, TYPICAL OF TWO (2).
- 20A DEDICATED GFCI RECEPTACLE, TYPICAL OF THREE (3).
- INTERIOR EMERGENCY REMOTE HEAD, TYPICAL OF TWO (2), POWERED FROM LOCAL BATTERY PACK, STANDARD OF ACCEPTANCE: READY-LITE RM-2LD9
- TYPICAL FIXED HEAT DETECTOR TO MATCH EXISTING IN THE WEATHER OFFICE. INSTALL COMPLETE WITH TERMINATION TO THE EXISTING FA PANEL, PROVIDE RUNTROUBLE RELAY FOR THE GENERATORS COMPLETE WITH TERMINATION AND TESTING. CREATE NEW FIRE ALARM ZONE FOR THE GENERATOR ENCLOSURE, VERIFY THE FIRE ALARM NEW/UPDATED ZONES. UPDATE THE FIRE ALARM ZONE MAP ACCORDINGLY.
- LOCAL GENERATOR CONTROL PANEL.

NOTES:

- PROVIDE LAMICOID LABELS
- EMERGENCY LIGHTS TO AUTOMATICALLY ACTUATE UPON FAILURE OF THE POWER SUPPLY TO THE NORMAL LIGHTING IN THE AREA COVERED BY THE EQUIPMENT, SUPPLY RELAYS AS REQUIRED.
- SUPPLY AND INSTALL ONE HEAT DETECTOR, TWO PULL STATIONS AND RUNTROUBLE RELAY FOR THE GENERATOR, COMPLETE WITH TERMINATIONS TO EXISTING FIRE ALARM PANEL IN THE EXISTING BUILDING, COMPLETE INSTALLATION INCLUDING TESTING AND VERIFICATION.
- VERIFY THE NEW FA ZONES AS PER ULC AND AHJ STANDARDS, UPDATE THE PASSIVE MAPS FOR THE EXISTING SYSTEM.
- ENCLOSURE TO HAVE FUEL TANK ENOUGH TO SUPPLY 100KW GENERATOR FOR MINIMUM 24 HOURS AT 100% FULL LOAD.

4 GENERATOR ENCLOSURE DETAIL  
 SCALE: NTS

NOT FOR CONSTRUCTION



Permit to Practice stamp for F. F. DORWARD, dated Oct 13 2016, Permit Number: PP001.

REV. #	TITLE	DATE
1	ISSUED FOR 98% REVIEW	2015-06-15
2	ISSUED FOR TENDER	2016-09-22

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UNIT 402 - 309 STRICKLAND ST. WHITEHORSE, YUKON CANADA Y1A 2J9

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 91782 ALASKA HIGHWAY  
 WHITEHORSE, YUKON

STANDBY GENERATOR FOR COMBINED SERVICES BUILDING AND WEATHER OFFICE

GENERATOR AND DISTRIBUTION DETAILS

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			E2/2