

LEGEND	
SYMBOL	DESCRIPTION
	CIRCUIT BREAKER, MOULDED CASE WITH THERMAL & MAGNETIC TRIPS
	NEMA SIZE 1 STARTER WITH THERMAL OVERLOAD TRIP
	CURRENT TRANSFORMER
	CAPACITOR
	CONTROL POWER TRANSFORMER (CPT)
	FUSE
	FUSIBLE DISCONNECT SWITCH
	NON-FUSIBLE DISCONNECT SWITCH
	DRY-TYPE POWER TRANSFORMER (INDOOR)
	OIL-FILLED POWER TRANSFORMER (OUTDOOR)
	FAULT INDICATOR WITH FIBRE CABLE ON EACH PHASE
	PRIMARY DUCTBANK, UNDERGROUND CONCRETE ENCASED
	SECONDARY DUCTBANK, UNDERGROUND CONCRETE ENCASED
	LIGHTING DUCT, UNDERGROUND DIRECT BURIED
	COMMUNICATION UNDERGROUND DUCTS
	PROPOSED ENBRIDGE GAS HEADER
	PROPOSED ENBRIDGE GAS FEED
	3-PHASE PAD MOUNTED TRANSFORMER C/W VAULT AND GROUND GRID
	3-PHASE PAD MOUNTED TRANSFORMER C/W LARGER VAULT AND GROUND GRID
	POWER PEDESTAL AND VAULT
	ROGERS GRADE LEVEL BOX
	BELL GRADE LEVEL BOX (BULK-7 SERIES 30"Wx48"Lx36"D)
	LIGHT AND POLE (L# DENOTES LIGHT TYPE)
	LIGHT BOLLARD
	PULLBOX (914mm X 914mm)
	HANDHOLE (810mm DIAMETER)
	ELECTRIC VEHICLE CHARGING STATION WITH PEDESTAL AND CONCRETE BASE
	BOLLARD FOR TRANSFORMER WITH YELLOW HDPE COVER AND RED STRIPE

STANDARD ABBREVIATIONS – ELECTRICAL	
ABBREVIATION	DESCRIPTION
A	AMPERES (CONTINUOUS)
AC	ALTERNATING CURRENT
ASYM	ASYMMETRICAL
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
AWG	AMERICAN WIRE GAUGE
BU	BATTERY UNIT (EMERGENCY)
°C	DEGREE CELSIUS
C	CONDUCTOR
CCT	CIRCUIT
CL	CENTERLINE
C/W	COMPLETE WITH
CPT	CONTROL POWER TRANSFORMER
CSA	CANADIAN STANDARDS ASSOCIATION
CT	CURRENT TRANSFORMER
Cu	COPPER
DC	DIRECT CURRENT
DISC	DISCONNECT
DPDT	DOUBLE POLE DOUBLE THROW
DPST	DOUBLE POLE SINGLE THROW
EEMAC	ELECTRICAL AND ELECTRONIC MANUFACTURERS ASSOCIATION OF CANADA
EP	EXPLOSION PROOF (SUITABLE FOR CLASS I, ZONE 1)
ETM	ELAPSED TIME METER
ESA	ELECTRICAL SAFETY AUTHORITY
GFI	GROUND FAULT INTERRUPTER
GND	GROUND
HOA	HAND-OFF-AUTOMATIC
HP	HORSEPOWER
Hz	HERTZ
IEEE	INSTITUTE OF ELECTRICAL & ELECTRONIC ENGINEERS
INST	INSTANTANEOUS
I/O	INPUT/OUTPUT
ISB	INTRINSIC SAFETY BARRIER
JB	JUNCTION BOX
kAIC	KILO-AMP INTERRUPTING CAPACITY
kVA	KILOVOLTAMPERE
kW	KILOWATT
kWh	KILOWATT HOUR
LOR	LOCAL-OFF-REMOTE
LUC	LOCAL UTILITY COMPANY (INPOWER)
MAN	MANUAL
MCC	MOTOR CONTROL CENTRE
MH	MANHOLE
mm	MILLIMETER
MOT	MOTOR
N	NEUTRAL
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
N/A	NON AUTOMATIC
N.O.	NORMALLY OPEN
N.C.	NORMALLY CLOSED
NP	NAMEPLATE
NTS	NOT TO SCALE
OESC	ONTARIO ELECTRICAL SAFETY CODE
O/H	OVERHEAD
O/L	OVERLOAD
ON-OFF	ON-OFF
PB	PUSHBUTTON
PDC	POWER DISTRIBUTION CENTRE
PH. OR Ø	PHASE OR DIAMETER
PLC	PROGRAMMABLE LOGIC CONTROLLER
REM	REMOTE
RGS	RIGID GALVANIZED STEEL
SN	SOLID NEUTRAL
SPDT	SINGLE POLE DOUBLE THROW
SPMDD	STANDARD PROCTOR MAXIMUM DRY DENSITY
SPST	SINGLE POLE SINGLE THROW
SS	STAINLESS STEEL (316)
SW	SWITCH
SYM	SYMMETRICAL
TDC	TIME DELAY ON CLOSING
TDDO	TIME DELAY ON DROP-OUT (OR OFF TIMER)
TDO	TIME DELAY ON OPENING
TDPU	TIME DELAY ON PICK-UP
TYP.	TYPICAL
U/G	UNDERGROUND
VA	VOLT-AMPERE
VFD	VARIABLE FREQUENCY DRIVE
WH	WEATHERHEAD
WP	WEATHERPROOF

GENERAL SYMBOLS	
	DETAIL SYMBOL: X = DETAIL NUMBER YZ = DRAWING NUMBER
	SYMBOL INDICATES MODIFICATION OR NEW WORK NOTE (# DENOTES NOTE NUMBER)

DRAWING LIST – ELECTRICAL	
E1.0	ELECTRICAL LEGEND
E1.1	ELECTRICAL POWER SITE PLAN
E2.1	ELECTRICAL LIGHTING AND EV CHARGERS SITE PLAN
E2.2	PHOTOMETRIC LIGHTING SITE PLAN
E2.3	LIGHTING DETAILS SHEET No.1
E2.4	LIGHTING DETAILS SHEET No.2
E3.1	COMMUNICATION SITE PLAN
E3.2	COMMUNICATION DETAILS
E4.1	TYPICAL DUCT BANK DETAILS
E4.2	DUCTBANK AND SWITCHBOARD ELEVATION DETAILS
E4.3	3 PHASE TRANSFORMER SPECIFICATIONS
E4.4	USF AND VAULT DETAILS
E5.1	SINGLE LINE DIAGRAM
E5.2	ELECTRICAL POWER PEDESTAL PP-D DETAILS
E5.3	TYPICAL EV CHARGER PEDESTAL DETAILS
E5.4	ELECTRICAL POWER PEDESTAL PP-B DETAILS
E5.5	ELECTRICAL POWER PEDESTAL PP-E & MISCELLANEOUS DETAILS

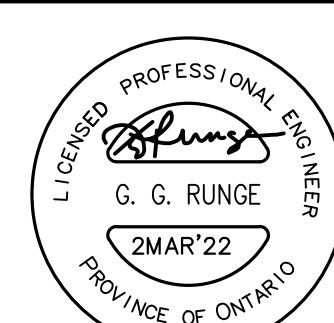


KEY PLAN – NTS  
BARRIE ONTARIO

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4.	FOURTH SUBMISSION TO CITY OF BARRIE	2022 MAR 2	GGR

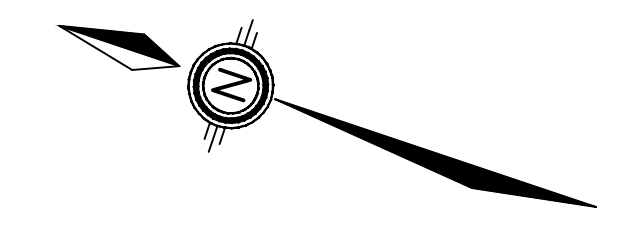
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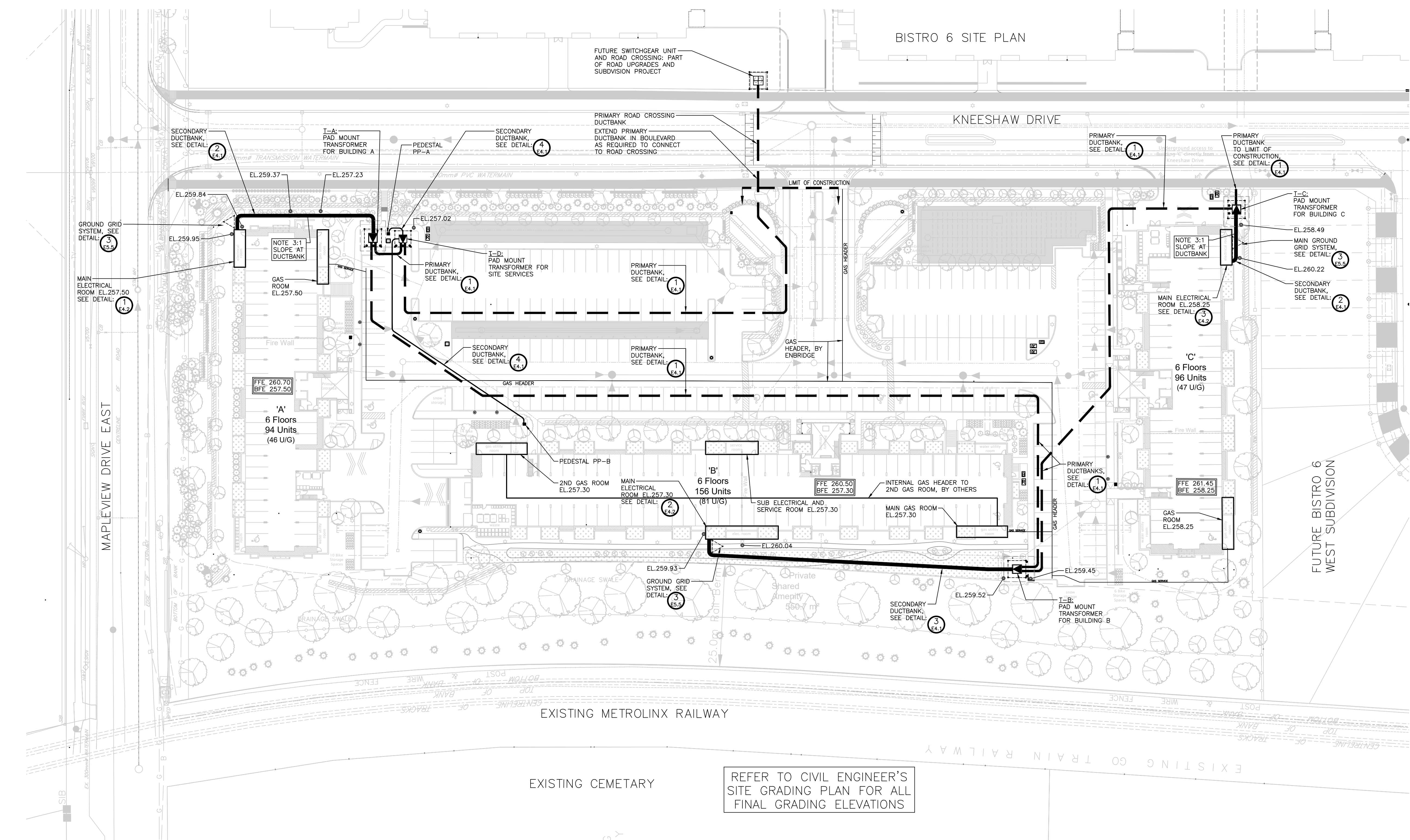
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BISTRO 6 WEST  
CITY OF BARRIE

ELECTRICAL LEGEND

		Runge Engineering A Division of Tatham Eng'g Limited 115 Sandford Fleming Drive Collingwood, ON, L9Y 5A6 (705) 445-2565 www.tathameng.com	
DESIGN	GGR	SCALE: AS SHOWN	DATE: JANUARY, 2021
DRAWN	JS	PROJECT	DWG. NO
CHECKED	GGR	20137P	E1.0



BISTRO 6 SITE PLAN



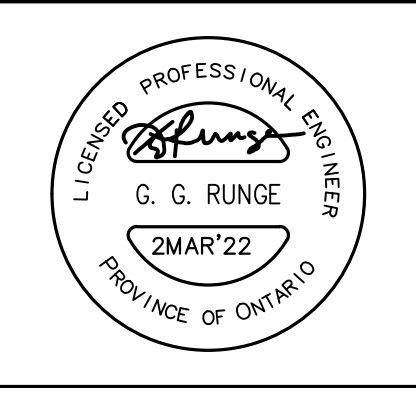
1 ELECTRICAL SITE PLAN - POWER LAYOUT

E1.1 - SCALE 1:500  
 - PROVIDE LARGE UTILITY "SWEEP" FITTINGS FOR ALL DUCT BENDS

NOT FOR CONSTRUCTION

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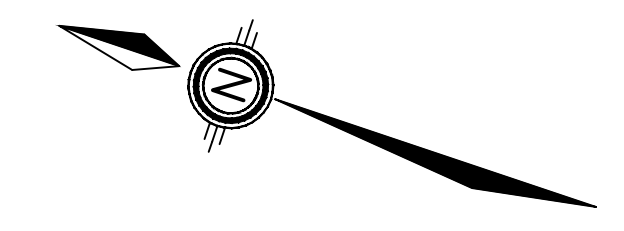
PRATT HANSEN GROUP INC.  
 BISTRO 6 WEST  
 CITY OF BARRIE

ELECTRICAL POWER  
 SITE PLAN

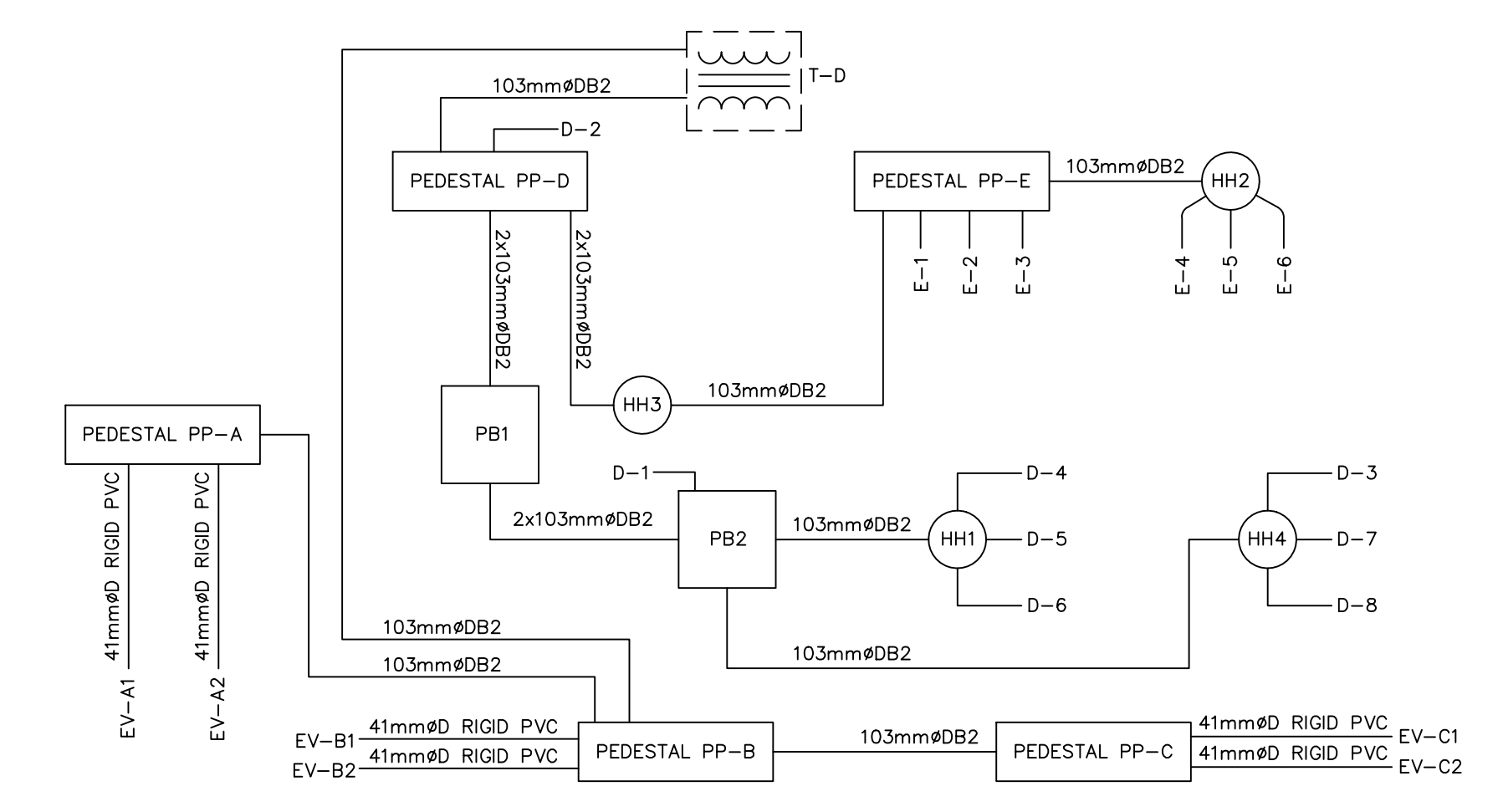
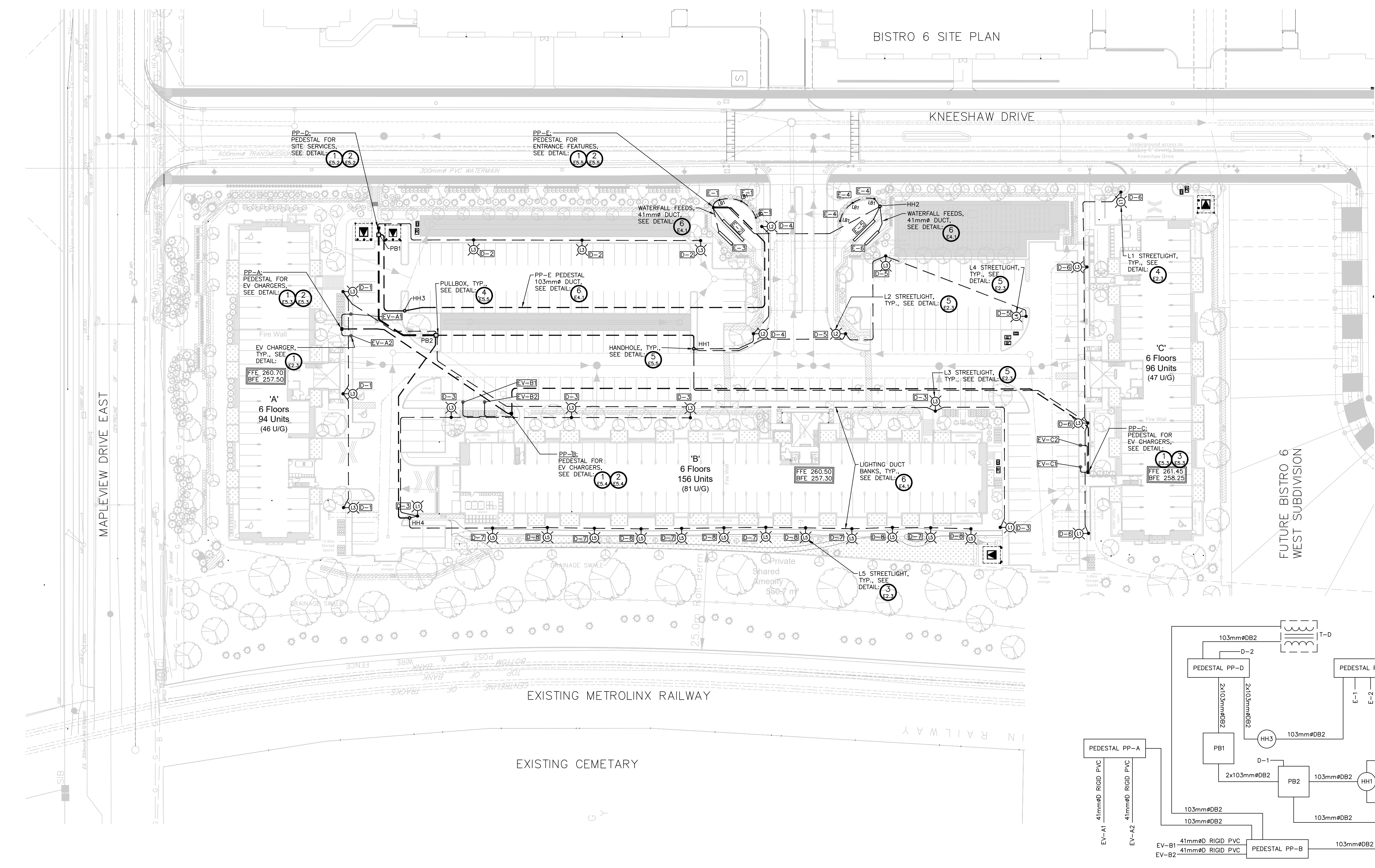
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BISTRO 6 SITE PLAN



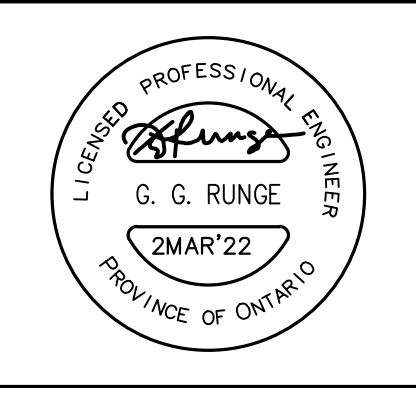
1 ELECTRICAL SITE PLAN - LIGHTING LAYOUT  
SCALE 1:500

2 ELECTRICAL SITE PLAN - LIGHTING AND EV CHARGER RISER DIAGRAM  
- NTS  
- 5.3mm RIGID PVC CONDUIT UNLESS OTHERWISE NOTED  
- FOR SINGLE LINE DIAGRAMS (POWER FEEDS) SEE DWGS E5.1 TO E5.4

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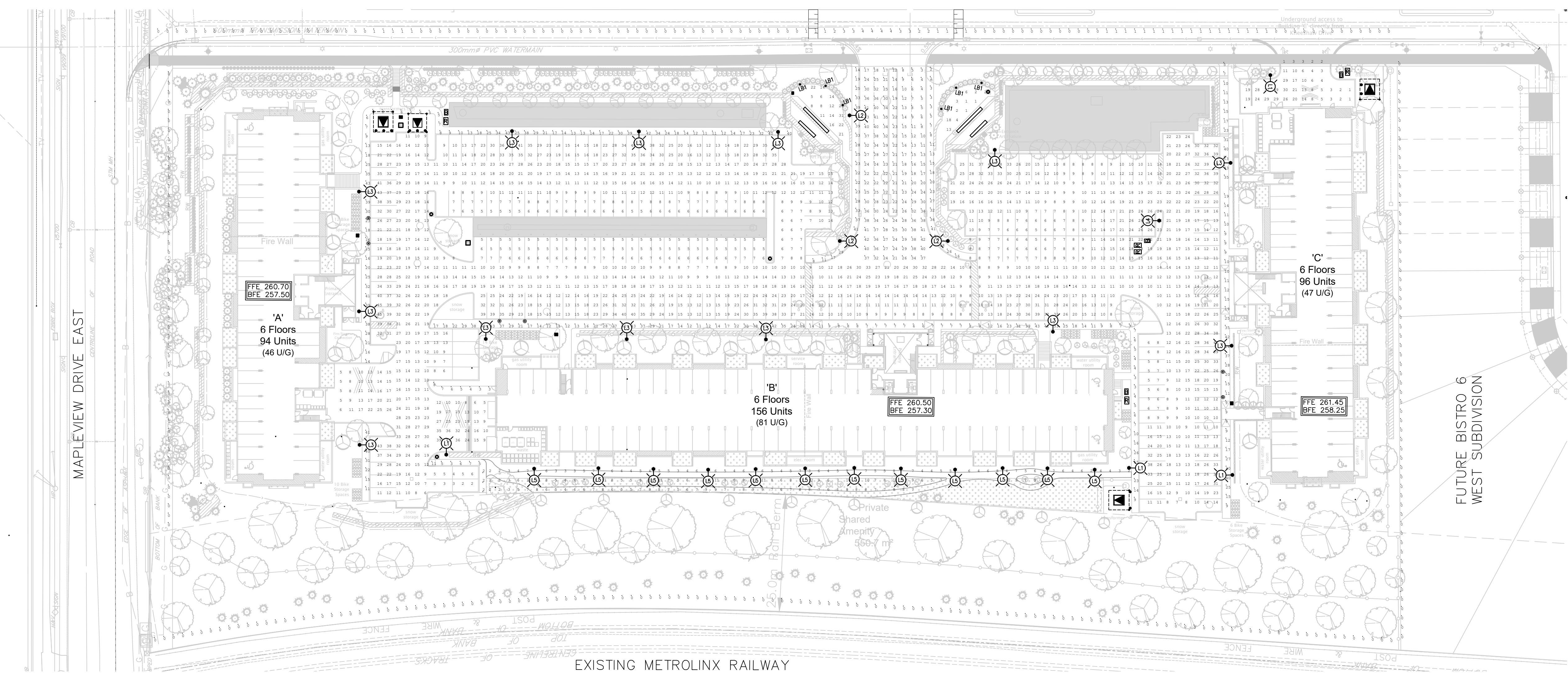
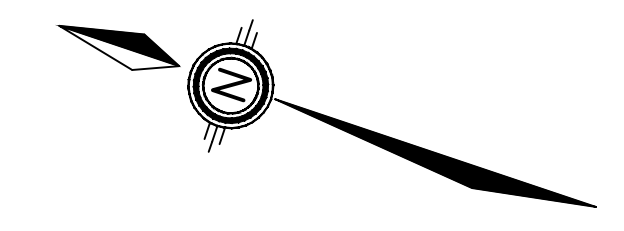
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PRATT HANSEN GROUP INC.  
BISTRO 6 WEST  
CITY OF BARRIE  
ELECTRICAL LIGHTING  
AND EV CHARGERS  
SITE PLAN

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CHECKED	GGR	20137P	E2.1	



**1 ELECTRICAL SITE PLAN – PHOTOMETRIC LAYOUT**  
E2.2 – SCALE 1:500

Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
01 Parking Area 1	Illuminance	Lux	15.6	45	5	3.1	9.0
03 Kneeshaw Entrance Bldg C	Illuminance	Lux	12.7	39	1	12.7	39.0
03 Main Entrance	Illuminance	Lux	24.2	43	3	8.1	14.3
03 Internal Entrance 1	Illuminance	Lux	13.1	26	5	2.6	5.2
03 Internal Entrance 2	Illuminance	Lux	18.9	43	5	3.8	8.6
04 Bldg B Rear Fitness	Illuminance	Lux	6.5	12	2	3.2	6.0
04 Walkway 1	Illuminance	Lux	20.5	47	2	10.3	23.5
04 Walkway 2	Illuminance	Lux	17.8	43	3	5.9	14.3
04 Walkway 3	Illuminance	Lux	28.0	42	8	3.5	5.3
04 Walkway 4	Illuminance	Lux	17.8	42	2	8.9	21.0
04 Walkway 5	Illuminance	Lux	18.7	43	5	3.7	8.6
04 Walkway 6	Illuminance	Lux	24.3	41	2	12.1	20.5
04 Walkway 7	Illuminance	Lux	5.7	11	3	1.9	3.7
04 Walkway 8	Illuminance	Lux	5.1	8	3	1.7	2.7
05 Entrance Feature Left	Illuminance	Lux	15.0	31	5	3.0	6.2
05 Entrance Feature Right	Illuminance	Lux	7.1	25	1	7.1	25.0
09 Light Spill Kneeshaw	Illuminance	Lux	0.5	4	0	N.A.	N.A.
09 Light Spill North	Illuminance	Lux	0.0	0	0	N.A.	N.A.
09 Light Spill South	Illuminance	Lux	0.0	0	0	N.A.	N.A.
09 Light Spill West	Illuminance	Lux	0.0	0	0	N.A.	N.A.

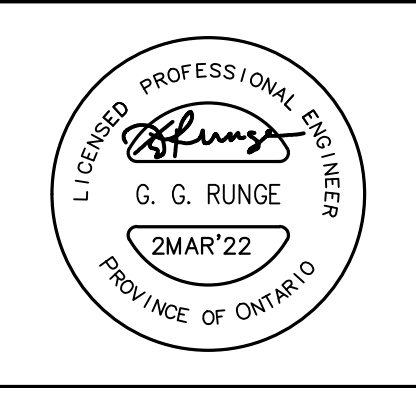
Luminaire Schedule						
Label	Qty	Arr.	Arr. Watts	Lum. Lumens	LLF	Description
L1	4	SINGLE	40	4612	0.950	HD-SL-S-40W-IV-HSS
L2	3	SINGLE	80	11077	0.950	HD-SL-S-80W-III+P-HSS
L3	13	SINGLE	100	11530	0.950	HD-SL-S-100W-IV-HSS
L4	1	SINGLE	100	14185	0.950	HD-SL-S-100W-V
L5	12	SINGLE	40	4612	0.150	HD-SL-S-40W-IV-HSS
LB1	6	SINGLE	17.6	1746	0.100	B805-CAC-18WLED-3K-120V-IES2-RAL9011

**2 PHOTOMETRIC CALCULATIONS**  
E2.2 – NTS



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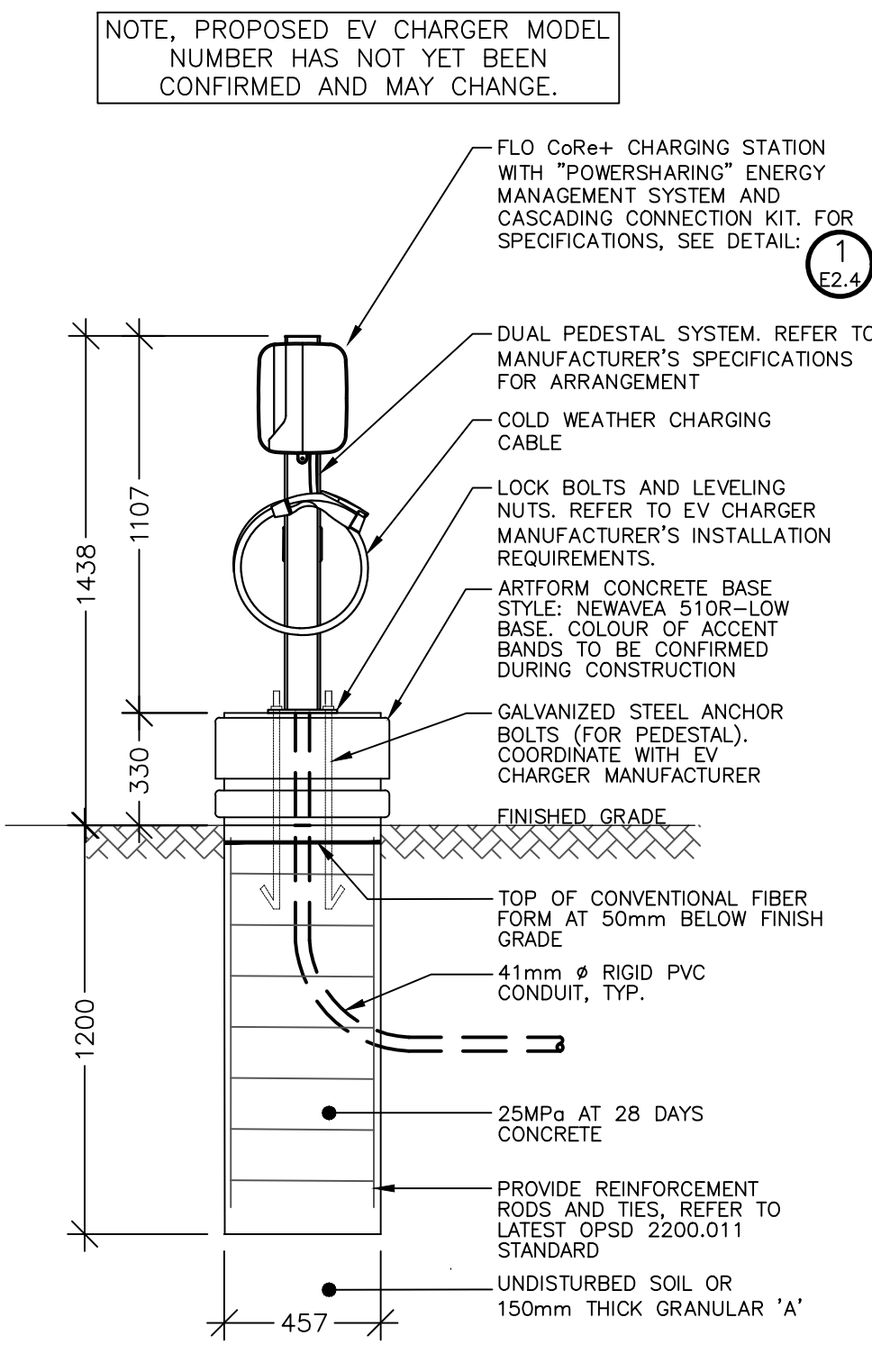


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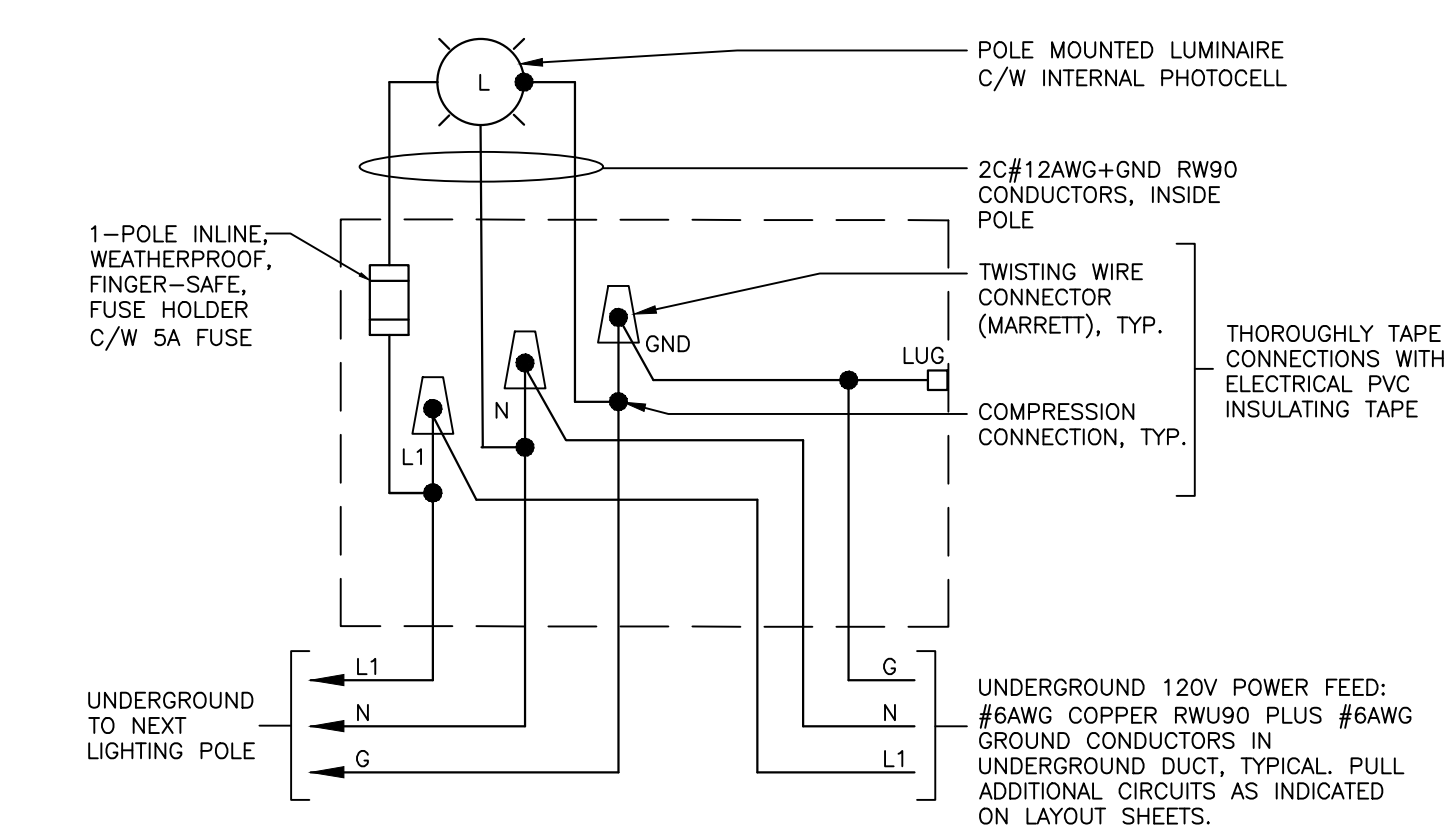
PHOTOMETRIC LIGHTING  
 SITE PLAN

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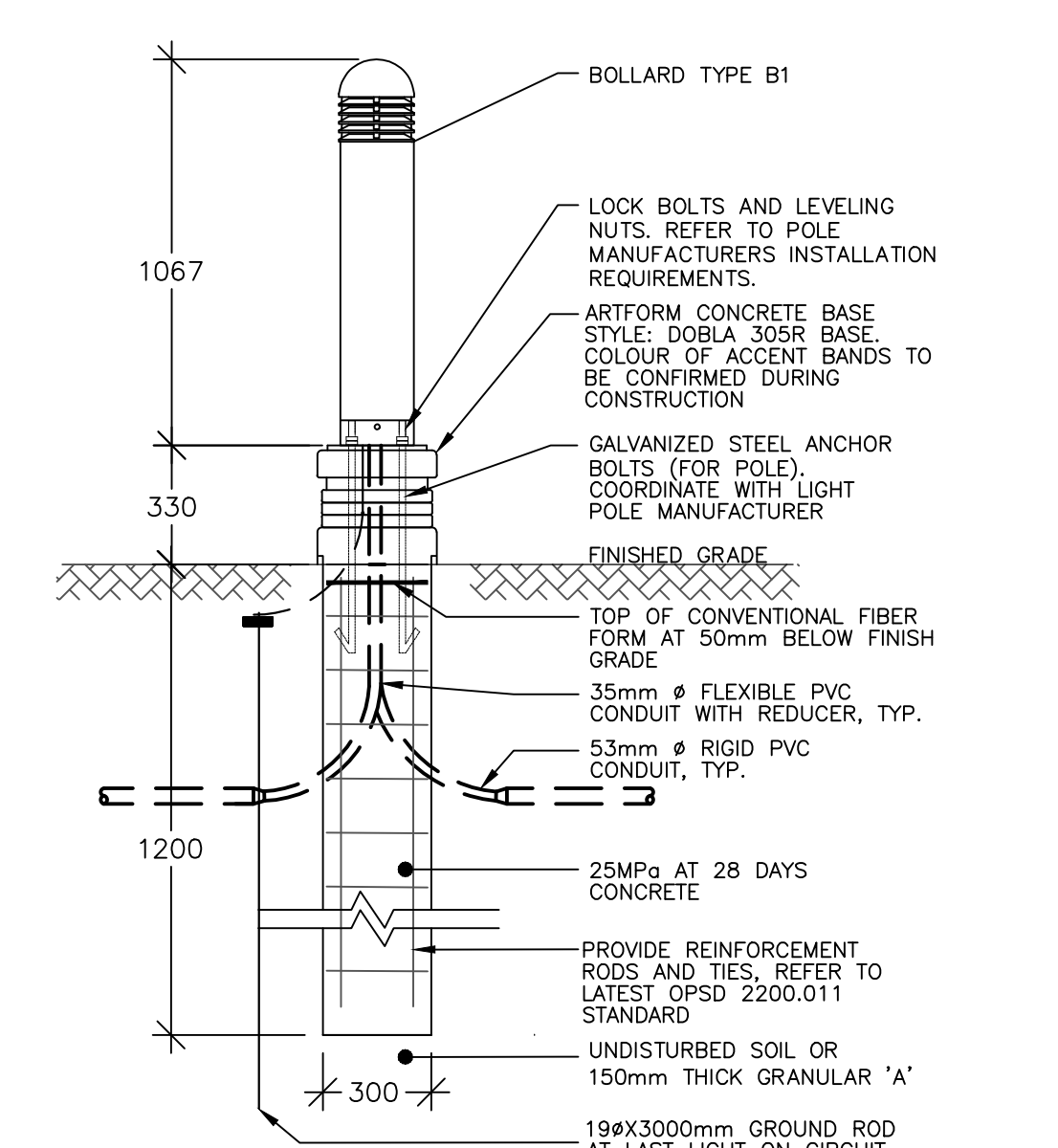
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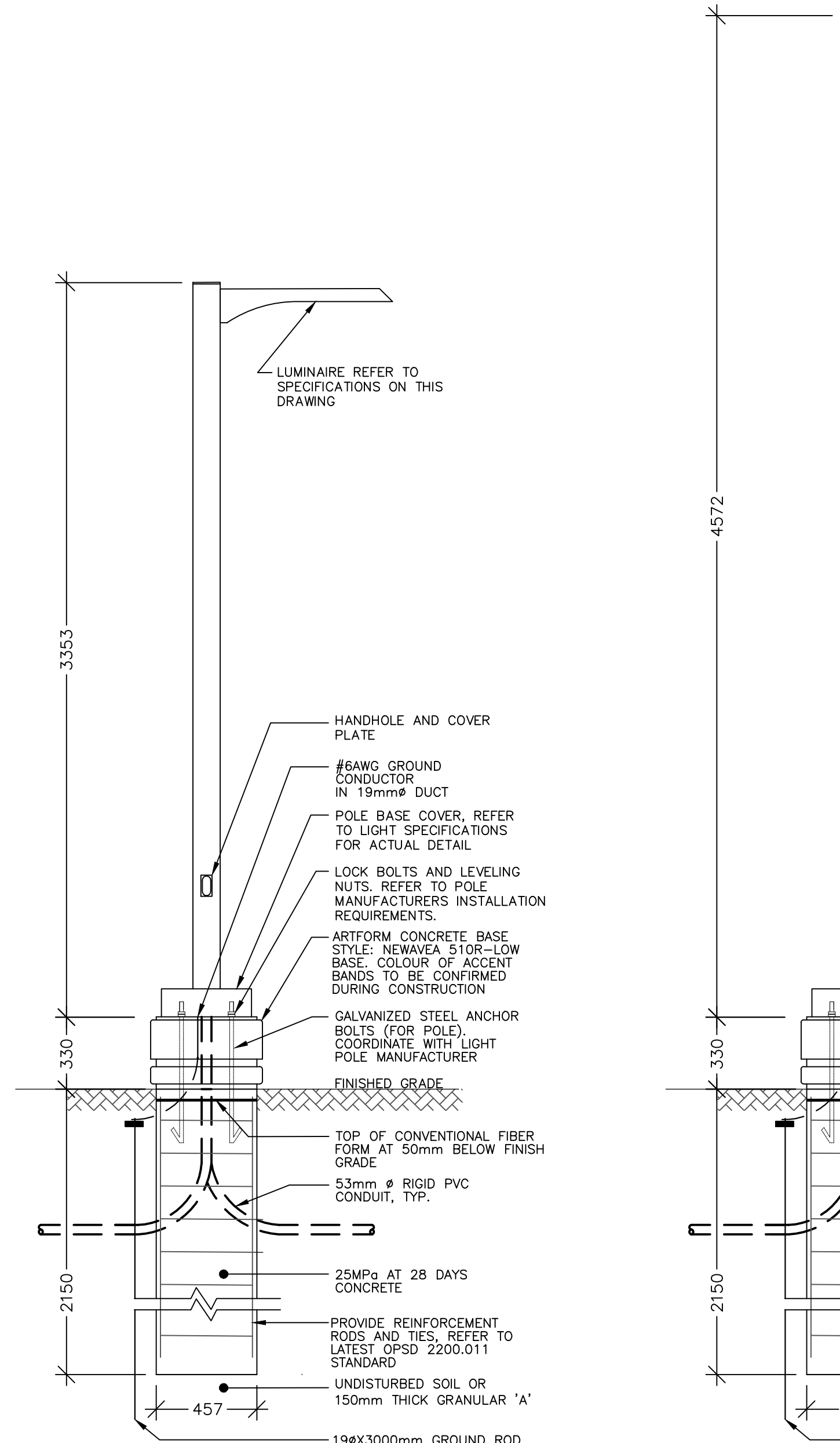
**1**  
E2.3  
**TYPICAL EV CHARGER INSTALLATION DETAIL**  
• NTS - DIMENSIONS SHOW IN MILLIMETRES.



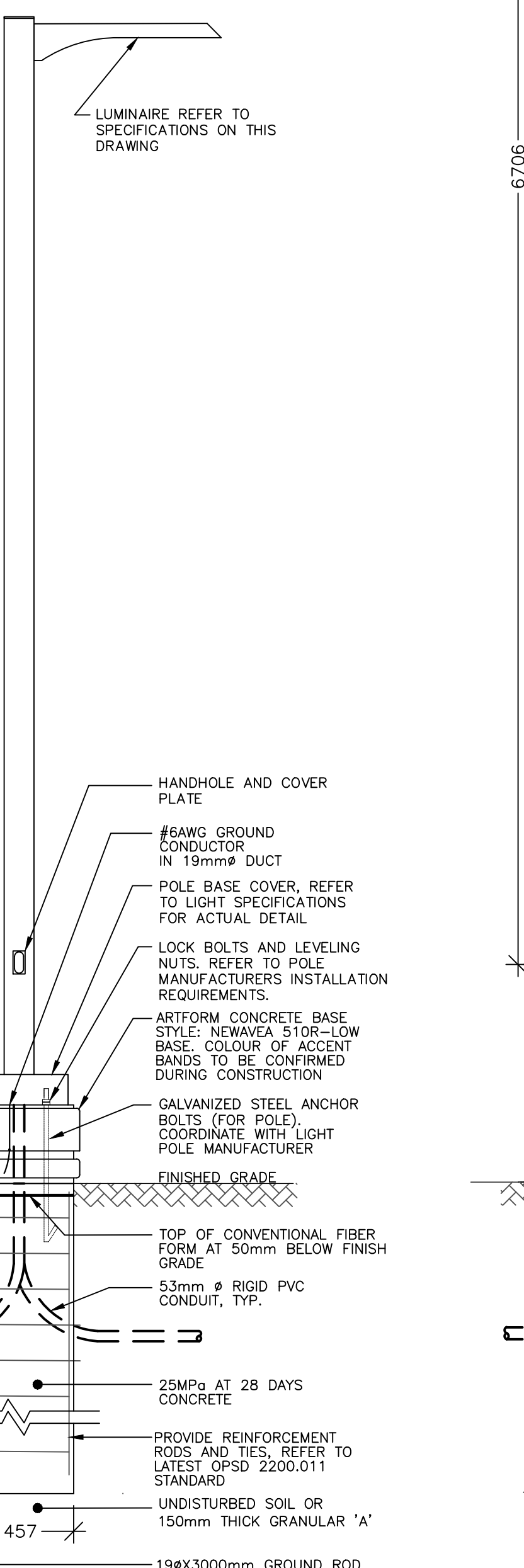
**7**  
E2.3  
**TYP. WIRING DETAIL FOR SITE LIGHTING LIGHTS**  
- NTS



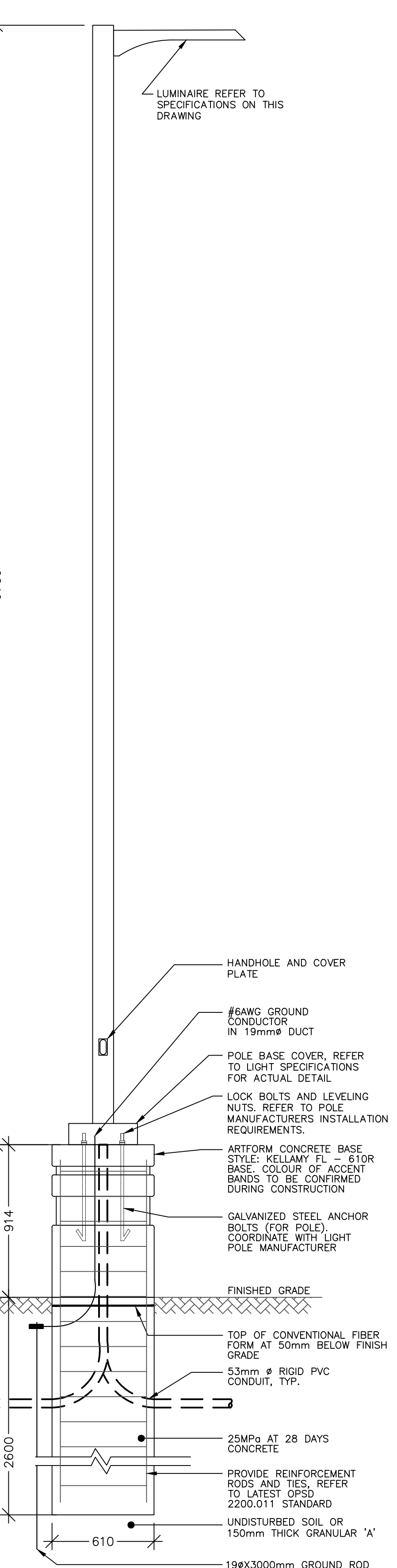
**2**  
E2.3  
**LIGHT BOLLARD TYPICAL INSTALLATION DETAIL**  
- NTS  
- FOR INSTALLATION DETAILS REFER TO OPSD 2200.041



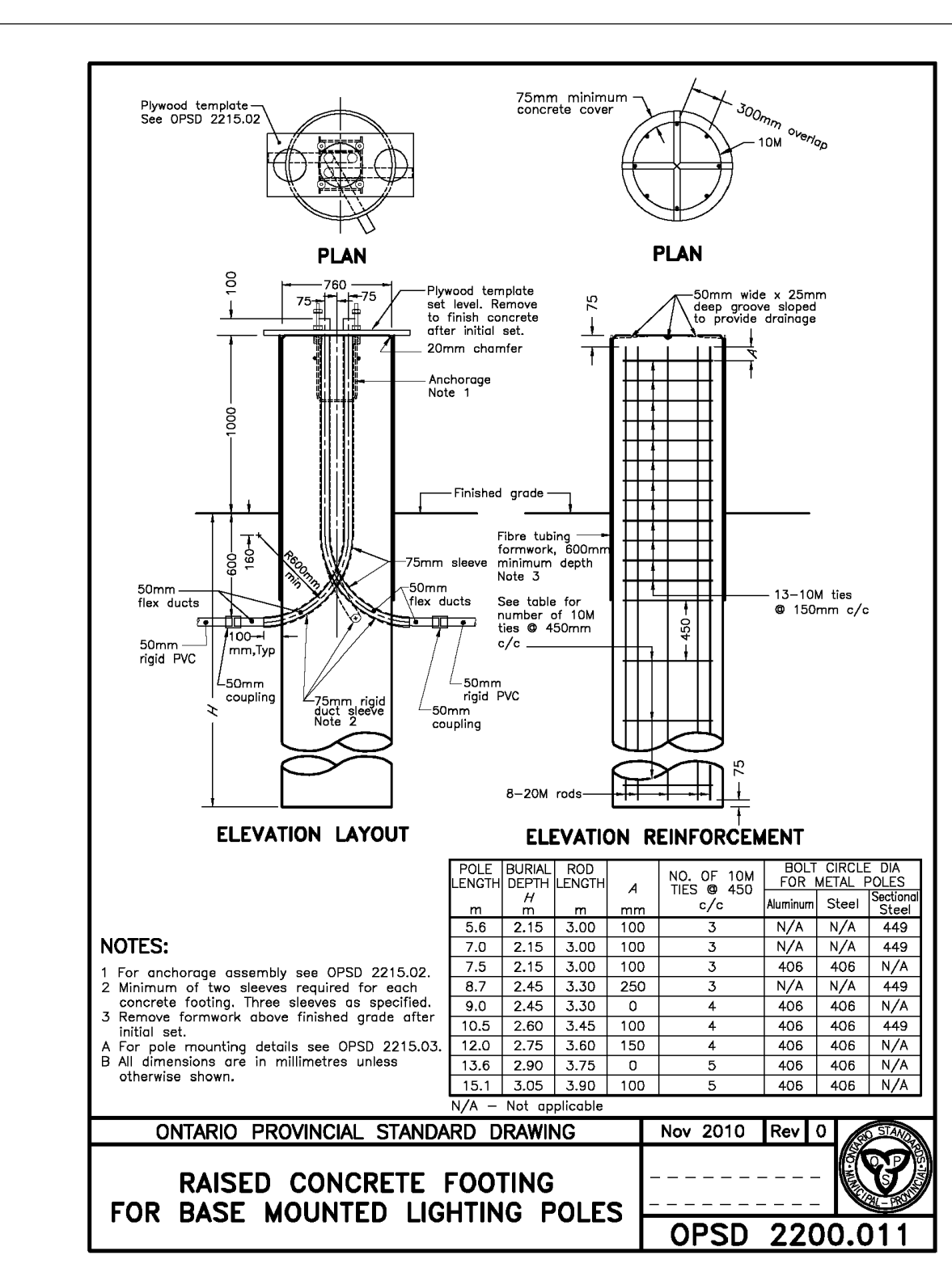
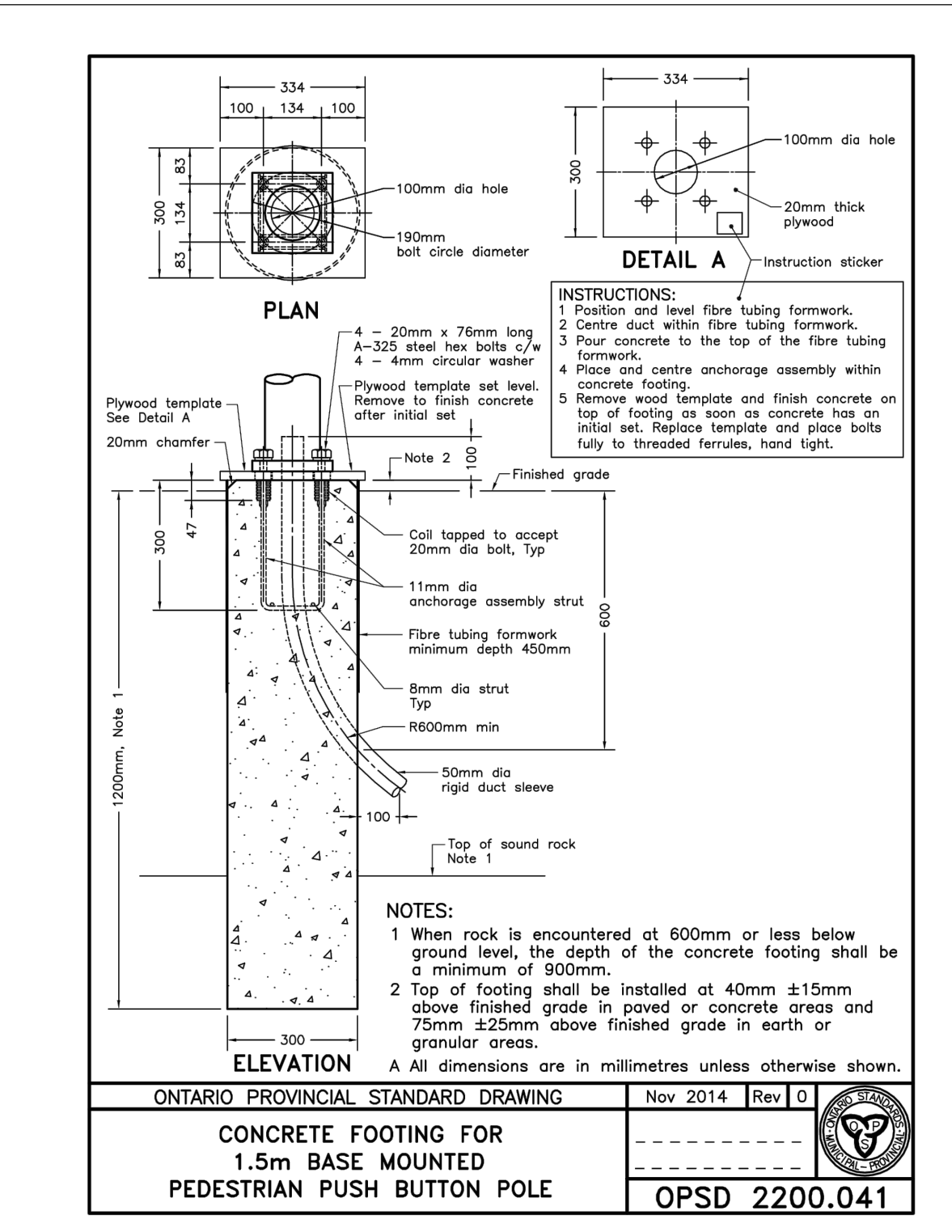
**3**  
E2.3  
**TYPICAL LUMINAIRE INSTALLATION DETAIL: L5**  
- NTS - DIMENSIONS SHOW IN MILLIMETRES.



**4**  
E2.3  
**TYPICAL LUMINAIRE INSTALLATION DETAIL: L1**  
- NTS - DIMENSIONS SHOW IN MILLIMETRES.



**5**  
E2.3  
**TYPICAL LUMINAIRE INSTALLATION DETAIL: L2, L3, L4**  
- NTS - DIMENSIONS SHOW IN MILLIMETRES.



**6**  
E2.3  
**OPSD STANDARD**  
- NTS



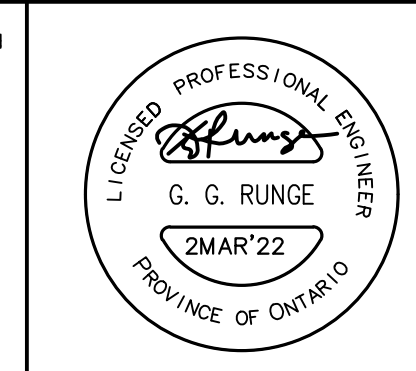
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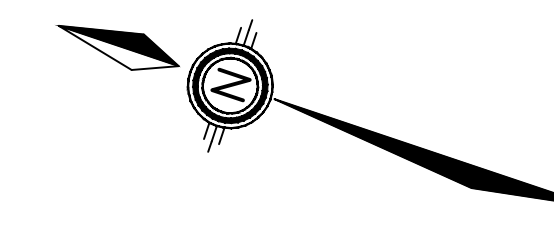
LIGHTING DETAILS  
SHEET No.1

**RUNGE ENGINEERING**

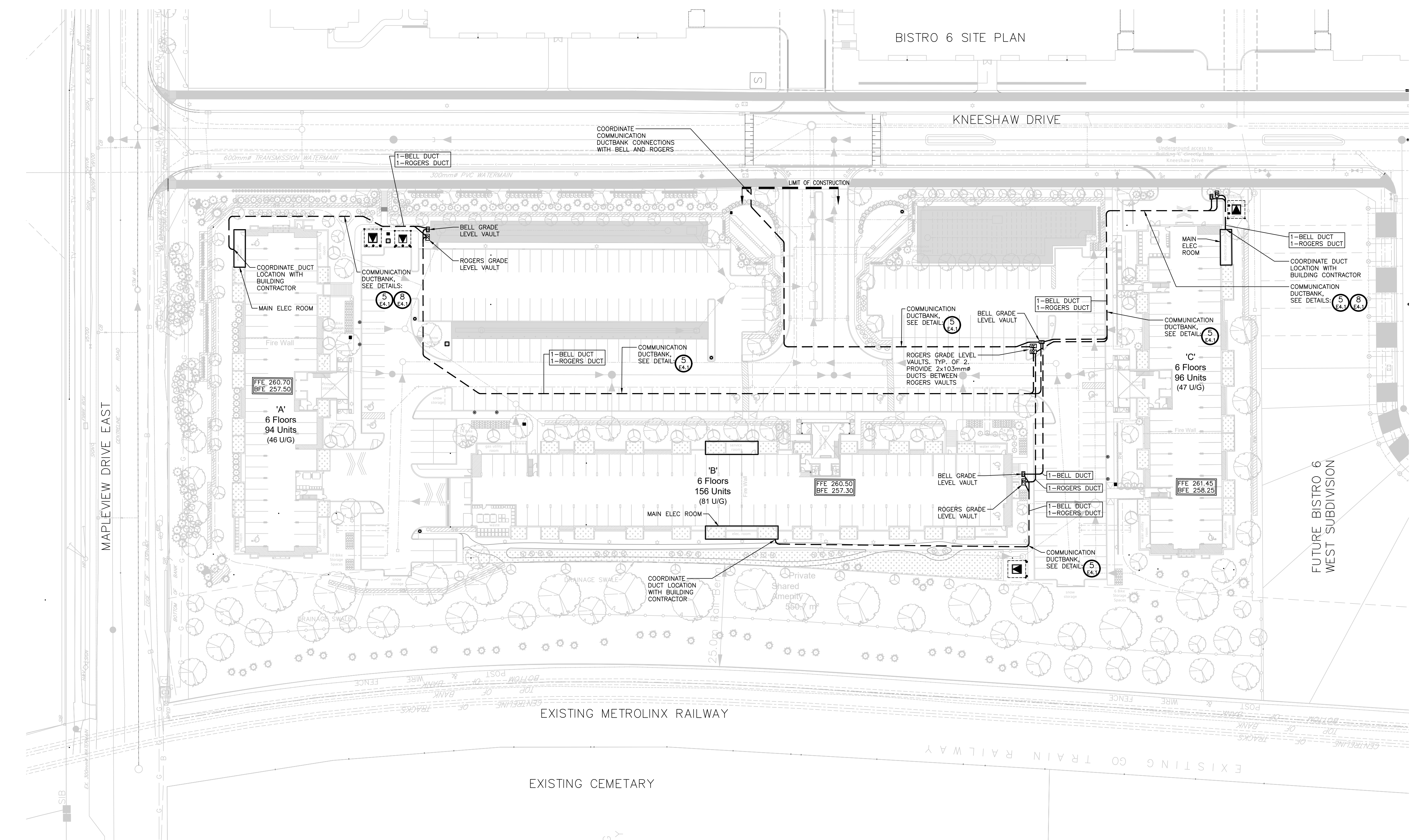
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BISTRO 6 SITE PLAN



**1 ELECTRICAL SITE PLAN – COMMUNICATION LAYOUT**  
E3.1 – SCALE 1:500

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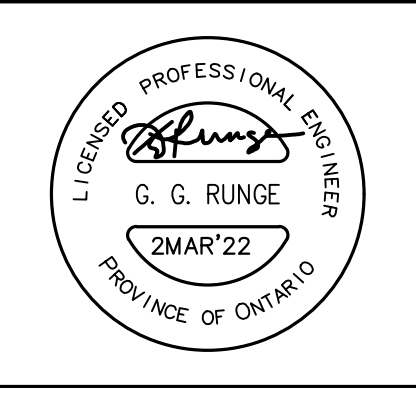
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PRATT HANSEN GROUP INC.  
BISTRO 6 WEST  
CITY OF BARRIE

COMMUNICATION  
SITE PLAN

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**OLDCASTLE ENCLOSURE SOLUTIONS  
VAULT INSTALLATION GUIDE**

**Overview**

Connect offers a full line up of vaults from Oldcastle Enclosure Solutions. With a product offering ranging from HDPE plastic pedestrian rated units to concrete deliberate traffic rated units, there is a vault designed for your application. All units are produced and tested within North America, ensuring that the units meet both environmental and testing requirements.

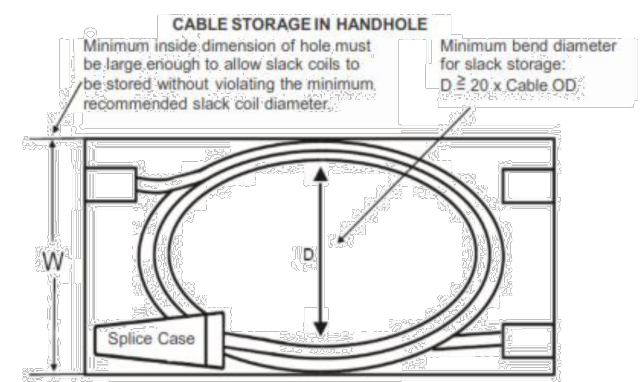
Always follow company mandated health and safety guidelines when installing vaults/handholes and working in or around vaults/handholes such as, but not limited to:

- ✓ Wear proper safety footwear as required
- ✓ Wear proper eye protection as required
- ✓ Wear protective headwear as required
- ✓ Wear leather gloves with protector cuffs whenever practical
- ✓ Use heavy lifting techniques as required

This guide cannot anticipate all situations that could develop in the field. Rather, it represents information applicable to common installation conditions.

The vaults described in this guide are designed to be used with buried cable plant - to ensure proper bending radius is allowed:

- Cable slack storage should be no greater than 40% of the Enclosure Height.
- The standard storage length of OSP Fiber cable is 50' to 100'.
- Cable manufacturers should be consulted for specific product limits.



**OLDCASTLE ENCLOSURE SOLUTIONS  
VAULT INSTALLATION GUIDE**

**Installation – Plastic Vaults**

This guide cannot anticipate all situations that could develop in the field. Rather, it represents information applicable to common installation conditions.

**PROCEDURE WARNING:**  
Buried Telecommunications Cables. Call before digging.

**Site preparation**  
Follow local guidelines and job requirements.

**Excavation and preparation of enclosure hole.**  
Remove material to provide 1-2" of clearance all around the enclosure and 6" - 8" in additional depth allowing for bedding and rodent barrier, with mechanical excavator or hand dig as appropriate.

Place 3/4" crushed stone at the base of the excavated hole and confirm excavation floor is level. Do not use "river rock" or "round stone" as desired compaction and equivalent resistance to lateral loading will not be met. The rock should be free of soil and organic material.

**Removing enclosure from delivery vehicle and pallet.**  
Remove shipping band from enclosure if applicable.

Use proper hook to remove lid from the enclosure Base.

Using proper lifting techniques secure and remove box from truck.

**Enclosure placement into prepared hole.**

Set Vault into the center of the excavated hole on top of the bedding material and adjust height to grade. If applicable, ensure that the vault is parallel with sidewalk or curb.

Place 3/4" crushed stone around the sides.

Install the lid on the vault and position the enclosure to the proper grade level as specified per the job requirement. If necessary, remove lid, make the necessary elevation adjustments and recheck the elevation.

Remove the lid and mark the vault for duct entry locations. A standard hole saw and/or drill motor may be used. Provide adequate clearance for ovality in ducts. Small clearance between duct and vault may be sealed with expanding polyurethane foam as required.

Reinstall the lid to vault prior to uniformly backfilling on all four sides. Nut, bolt threads, and cover seat should always be free of dirt and debris before tightening down the bolt.

Remove stones larger than 3" and larger and compact backfill per engineering specifications. Proper tamping tools such as a mechanical tamping device or hand operated device should be used. (Fig 9) A hand shovel or backhoe should never be used for tamping as damage may occur. Remove excess backfill material from the site as applicable.

**NOTE: Backfill material can vary based on product and installation location. It is customary in landscape installations where vehicles are prevented from traffic in or around a vault to use the spoils removed from excavation for backfill.**



**OLDCASTLE ENCLOSURE SOLUTIONS  
VAULT INSTALLATION GUIDE**

**Installation – Polymer Concrete Vaults**

This guide cannot anticipate all situations that could develop in the field. Rather, it represents information applicable to common installation conditions.

**PROCEDURE WARNING:**  
Buried Telecommunications Cables. Call before digging.

**Site preparation**  
Follow local guidelines and job requirements.

**Excavation and preparation of enclosure hole.**  
Remove material to provide 1-2" of clearance all around the enclosure and 6" - 8" in additional depth allowing for bedding and rodent barrier, with mechanical excavator or hand dig as appropriate.

Place 3/4" crushed stone at the base of the excavated hole and confirm excavation floor is level. Do not use "river rock" or "round stone" as desired compaction and equivalent resistance to lateral loading will not be met. The rock should be free of soil and organic material.

**Removing enclosure from delivery vehicle and pallet.**  
Remove shipping band from enclosure if applicable.

Use proper lifting eye tool (T-Handle J-Hook) to remove lid from the enclosure base (Fig 3).

Using proper lifting techniques secure and remove box from truck.

**Enclosure placement into prepared hole.**

Set Vault into the center of the excavated hole on top of the bedding material and adjust height to grade. If applicable, ensure that the vault is parallel with sidewalk or curb. Place 3/4" crushed stone around the sides.

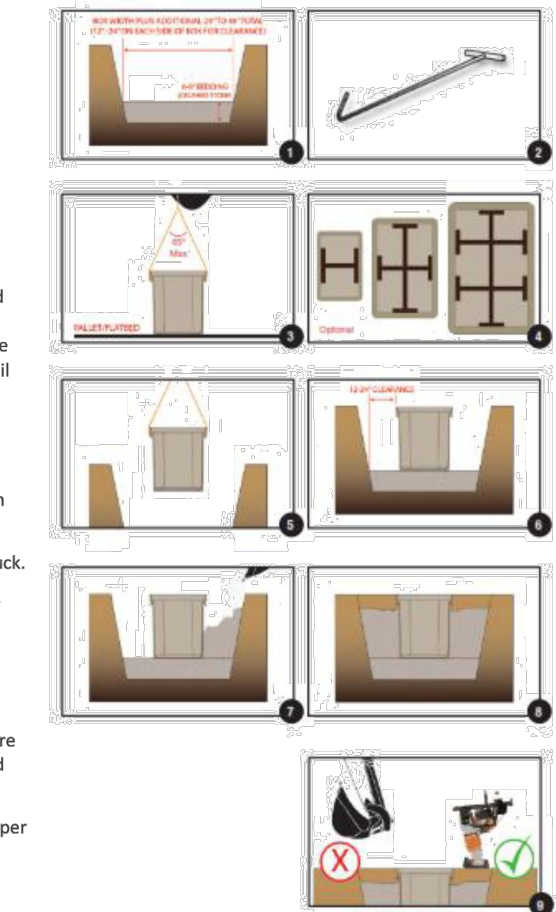
Install the lid on the vault and position the enclosure to the proper grade level as specified per the job requirement. If necessary, remove lid, make the necessary elevation adjustments and recheck the elevation.

Remove the lid and mark the vault for duct entry locations. A standard hole saw and/or drill motor may be used. Provide adequate clearance for ovality in ducts. Small clearance between duct and vault may be sealed with expanding polyurethane foam as required.

Reinstall the lid to vault prior to uniformly backfilling on all four sides. Nut, bolt threads, and cover seat should always be free of dirt and debris before tightening down the bolt.

Remove stones larger than 3" and larger and compact backfill per engineering specifications. Proper tamping tools such as a mechanical tamping device or hand operated device should be used. (Fig 9) A hand shovel or backhoe should never be used for tamping as damage may occur. Remove excess backfill material from the site as applicable.

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**1 ROGERS EQUIPMENT**  
E3.2 -NTS

**ORDERING GUIDE**

**Shutter Box Series  
Grade Level Box SGLB 3048, 36" Depth  
Unsurpassed "I-Beam" Strength**

The SGLB 3048 is the latest addition to Channell's Shutter Box Series family of grade level boxes. Leading the way with the SGLB 1730 and SGLB 2436, Channell has proven and set new high performance standards in the industry for subsurface thermoplastic enclosures.

The SGLB 3048 features a straight sidewall "I-Beam" construction combined with a high rib design that will greatly enhance the cover's load bearing qualities. Unlike tapered box designs, Channell's strength is accomplished with a straight sidewall design that supports the cover's load across the entire vertical sidewall. Sidewall deflection is neutralized.

Meets and is qualified to Telcordia GR-902-CORE specifications. Complies with the applicable elements of ANSI ASCTE 77 2002, for greenbelt placement.



SGLB 3048 shown with bolt-down thermoplastic cover

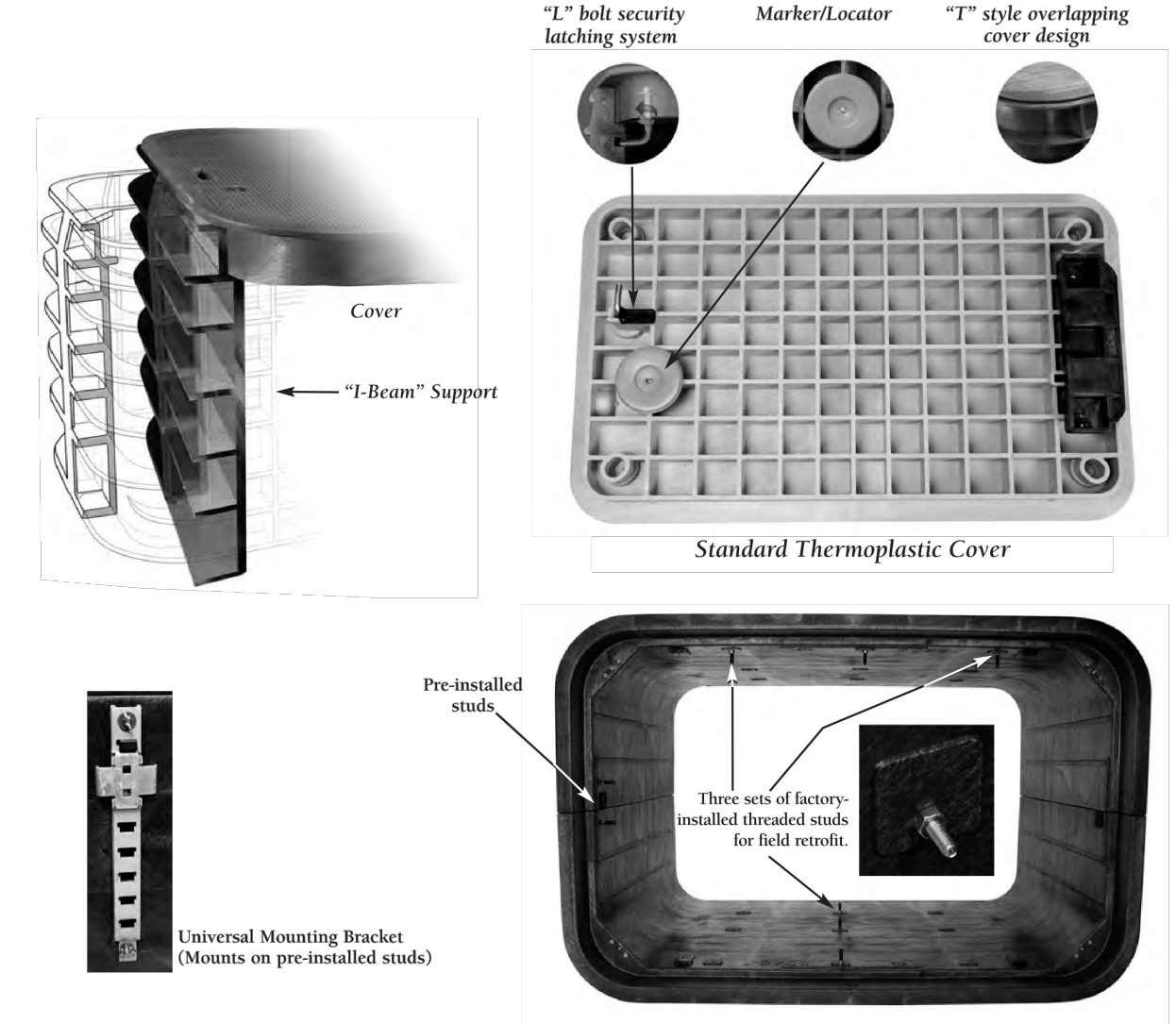
with the addition of a strength member molded into the sidewall. These features allow the SGLB 3048 to be used in various applications, including greenbelt.

Channell's factory installed stud system allows a full range of options including the installation of a galvanized rack system, horizontal brackets and a two-position swing arm bracket. All of these options can be pre-installed at our factory or installed in the field after vault installation. The SGLB 3048 can easily store 650 Ft. (200 meters) of 0.5" diameter fiber cable, in addition to the industry's largest fiber splice cases.

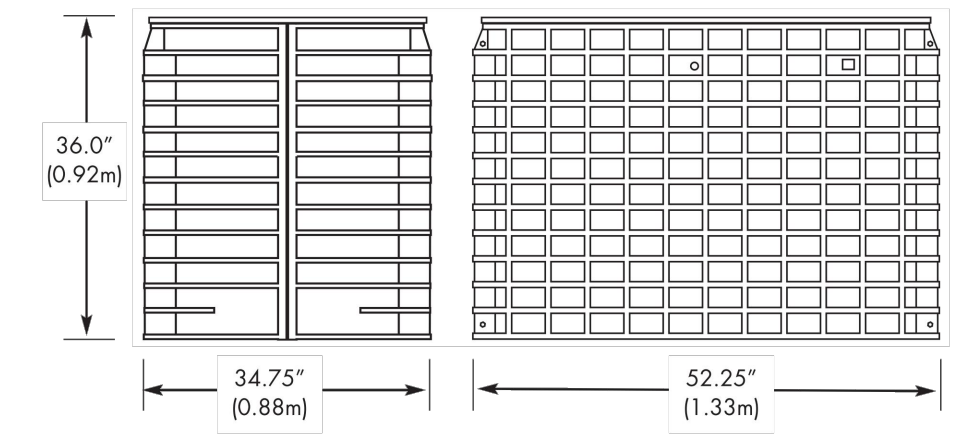
**Features**

- Straight sidewall "I-beam" design permits higher vertical load-bearing capacity
- Tall cross-ribbed sidewall design eliminates sidewall deflection in extreme soil conditions securing box placement during final grade
- High quality HDPE body with cross-ribbed design and additional molded-in strength member carries load evenly across sidewall
- Solid, single piece thermoplastic covers with a variety of logo markings
- Universal "L" bolt security system (available only on thermoplastic covers) eliminates the worry of the loss of cover bolts
- Unique "T" style overlapping cover design improves appearance and reduces soil migration into box
- Four winterized drop access points are standard with all SGLB 3048 units
- Cable locator/marker device can be added in a protected recessed area on the underside of the cover

The straight sidewall design of the "Shutter Box" Series grade level boxes allows the load-bearing surface to be fully supported by the "I-Beam" strength of the full sidewall. HDPE wall-design of the box body distributes the cover load over the strongest section of the box wall. Additionally, the sidewall high rib design greatly reduces or totally eliminates sidewall deflection.



**Specifications**



SGLB 3048 36 with storage for 650 ft. (200 meters) of 0.5" diameter fiber optic cable

**Ordering Information**

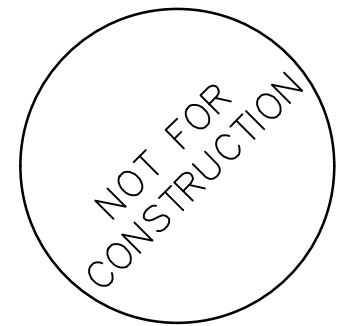
Description	SGLB	3048	36	1	XXX	X	AXX
Cover Size	3048 - 30" x 48"						
Body Depth	36 - 36"						
Cover Color	1 - Green						
Cover Identification*	NOTE: Additional colors available						
	B - Broadband						
	N - Blank						
	T - Telecommunications						
	*NOTE: Customized cover identification marking available						
Cover Type	1 - Solid Thermoplastic						
Cover Security	1 - "L" bolt (Available only on thermoplastic covers)						
	2 - Bolt-Down						
	3 - Penix Bolt						
Racking	0 - None (Equipped with eight mounting studs for mounting brackets and racks)						
	1 - Step Racks (Three 15" racks)						
	2 - Swing-arm with Butterfly Mounting Plate						
	3 - Step Racks and Swing-arm						
	4 - Sidewall Mounting Plate						
	6 - Step Racks (3) with Universal Mounting Bracket						
Accessory Options	AD4 - Marker/Locator						

Example: SGLB3048361111A04  
Shutter Box Series SGLB 3048, 36" depth, green cover, Telecommunications cover identification, "L" bolt security, step racks installed in body, marker/locator disk (installed on cover)



USA: Channell Commercial Corporation, Temecula, CA • Tel. 800.423.1863 • Fax. 951.296.2322  
CANADA: Channell Canada, Inc. • Tel. 905.565.1700 • Fax. 905.565.8080  
EUROPE, MIDDLE EAST, AFRICA: Channell Int. London, UK • Tel. 44.1689.871922 • Fax. 44.1689.833428  
AUSTRALIA, ASIA, PACIFIC RIM: Channell Pty. Ltd., Sydney, Australia • Tel. 61.2.8884.4111 • Fax. 61.2.8814.8841  
WORLDWIDE HEADQUARTERS: Channell Commercial Corporation • Tel. 951.719.2600 • 26540 Yee Road • P.O. Box 9022 • Temecula, CA 92591-9022 USA  
All specifications subject to change without notice.  
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**2 BELL EQUIPMENT**  
E3.2 -NTS



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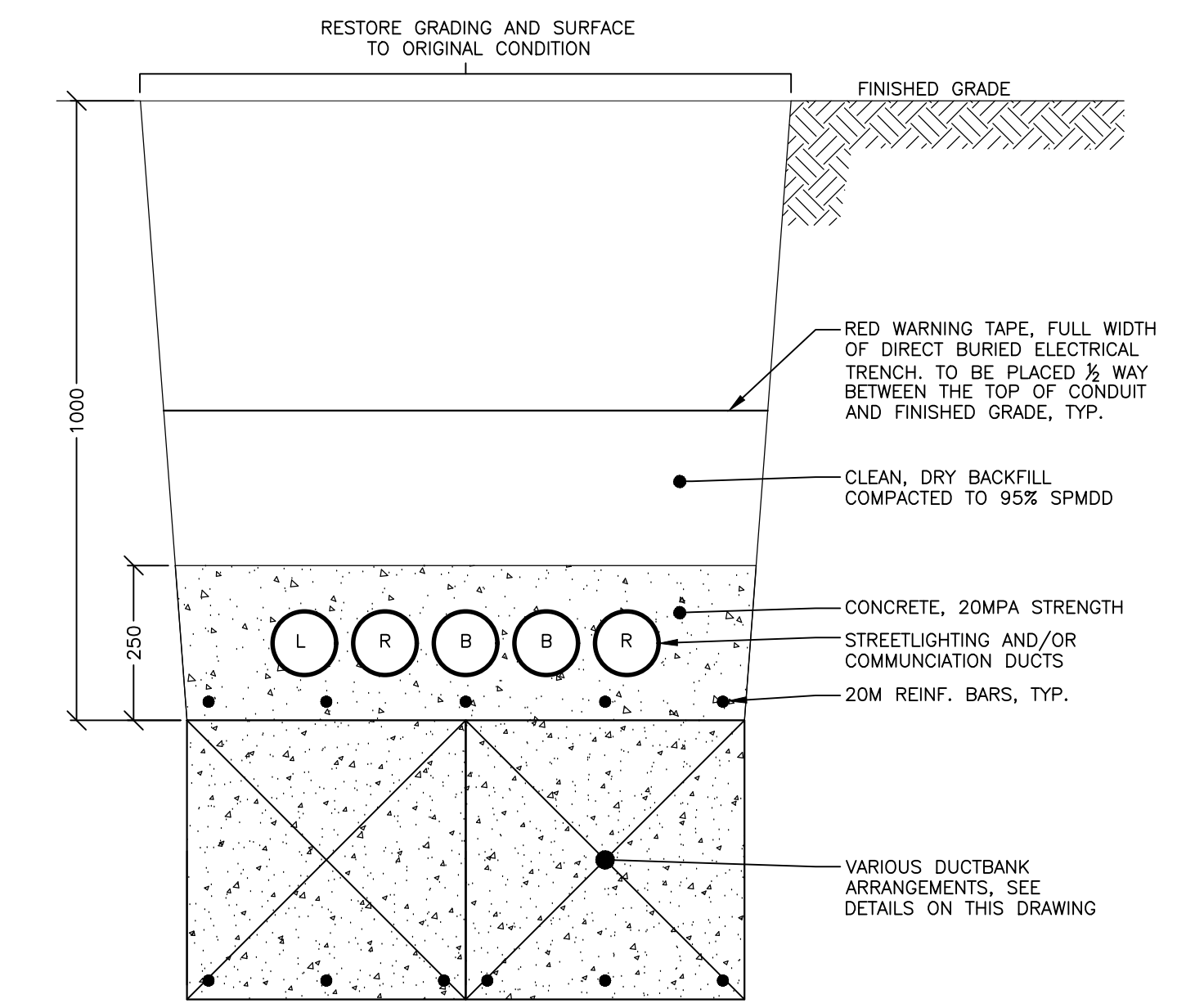
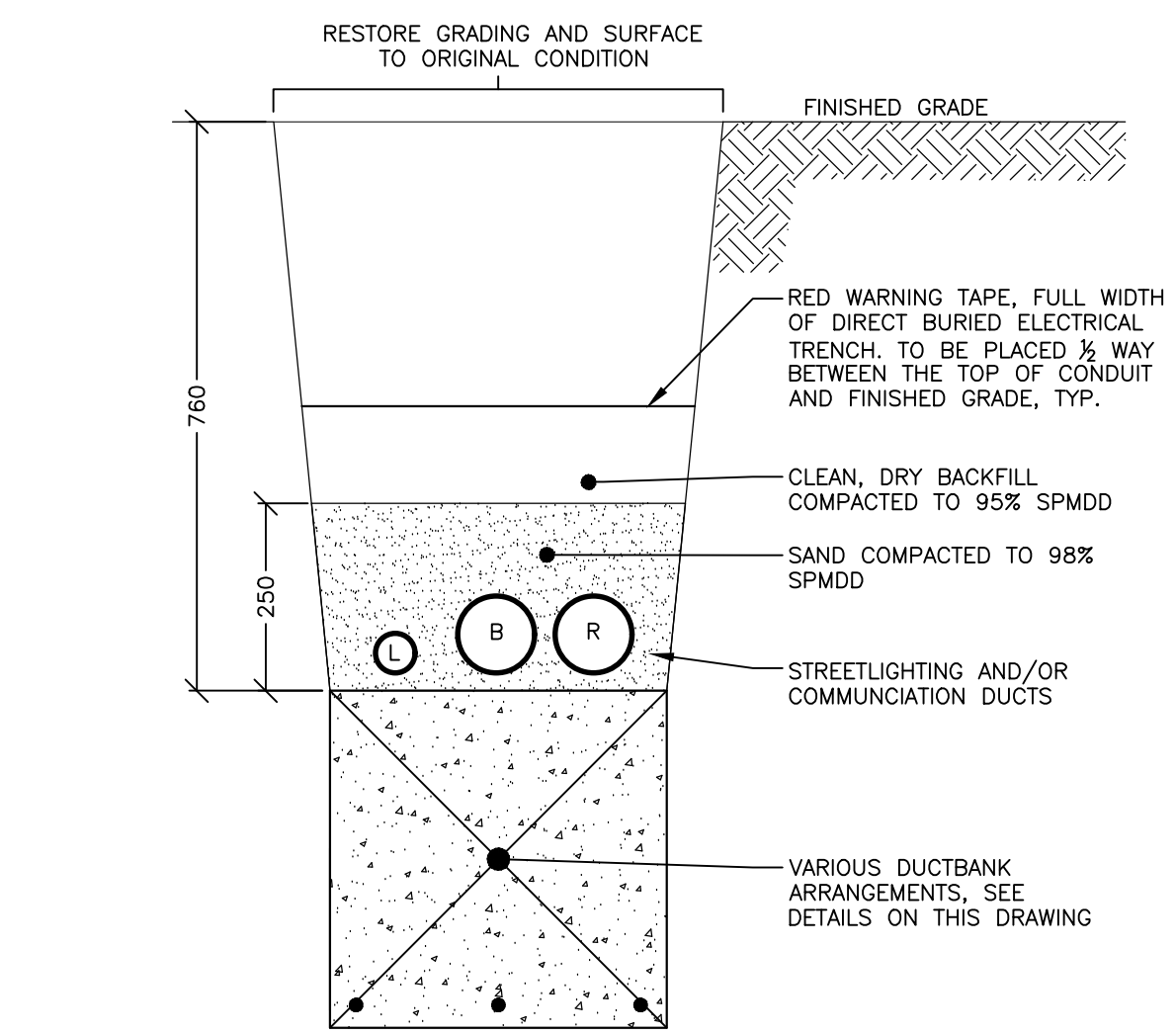
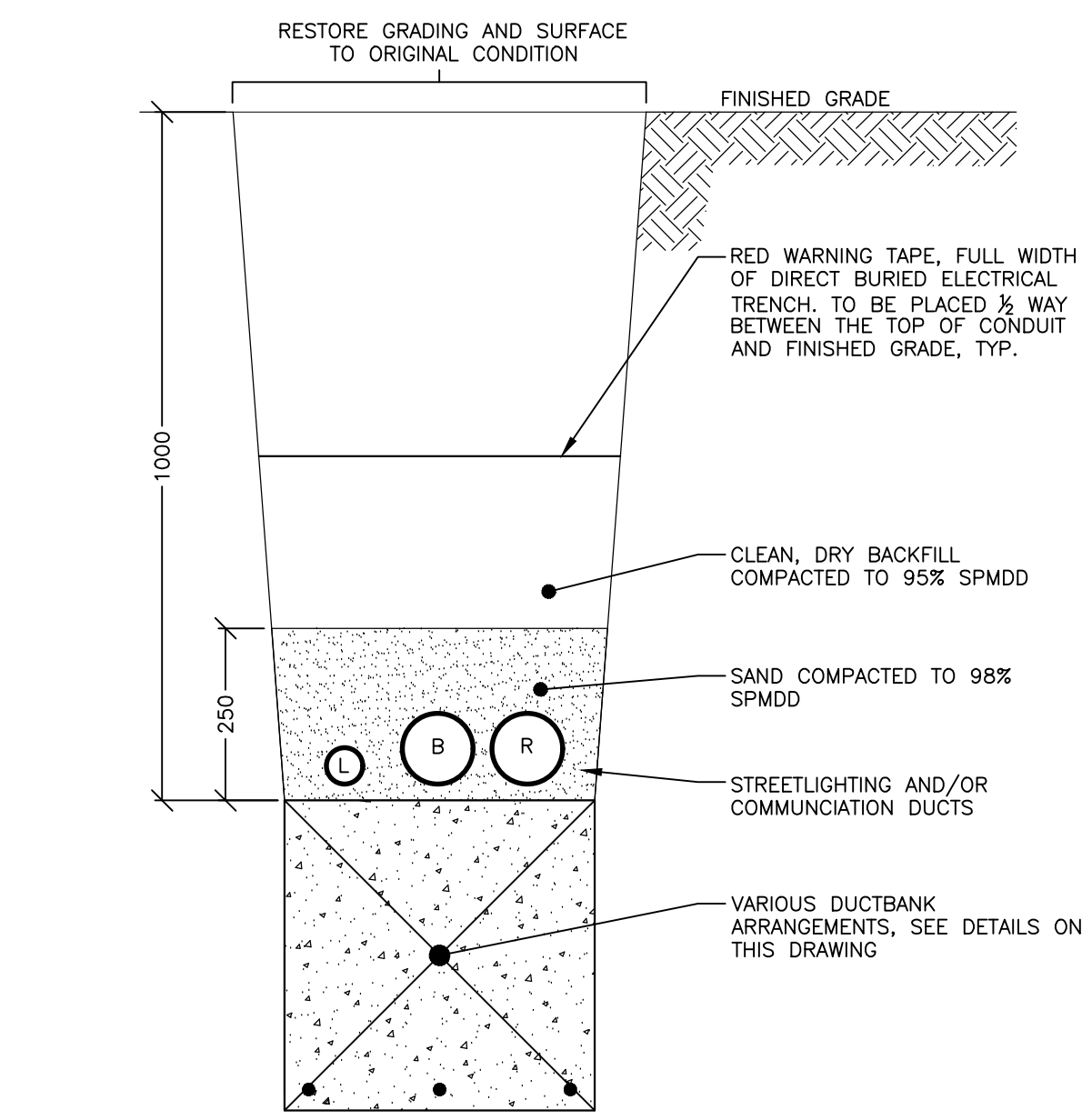
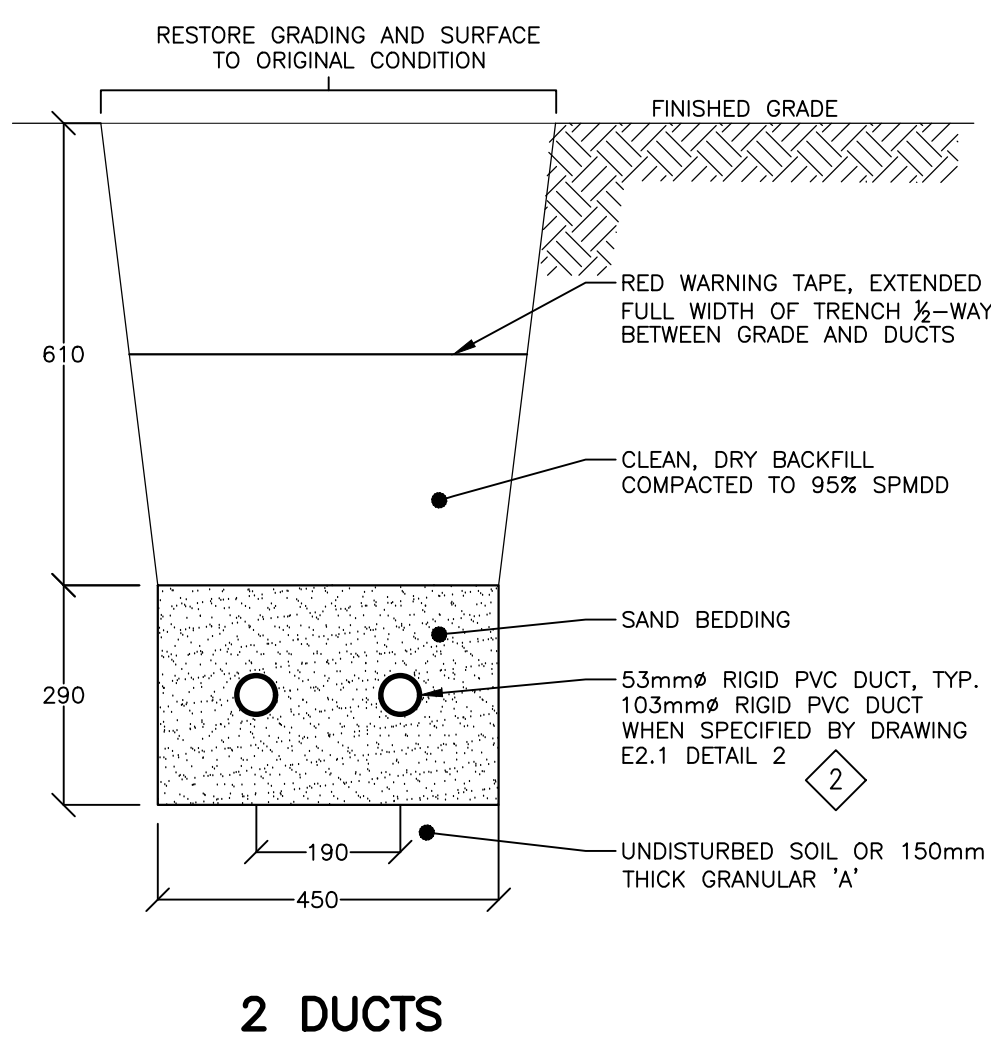
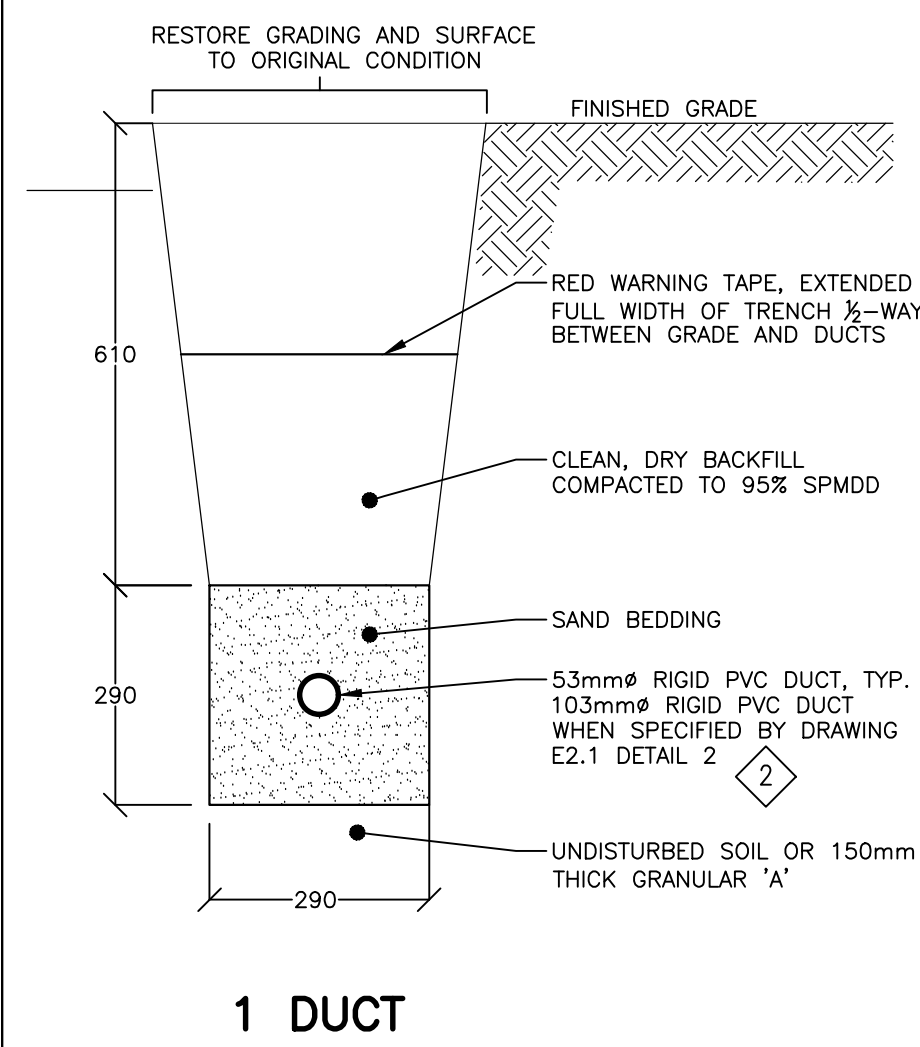


**PRATT HANSEN GROUP INC.**  
BISTRO 6 WEST CITY OF BARRIE  
  
COMMUNICATION DETAILS



DESIGN	GGR	SCALE: AS SHOWN	DATE	JANUARY, 2021
DRAWN	JS	PROJECT	DWG. NO	
CHECKED	GGR	20137P	E3.2	

- NOTES**
- 1 DUCTBANK NOTES:
    - DIMENSIONS SHOWN IN mm.
    - ALL DUCTS ARE 103mmØ TYPE PVC DB2, UNLESS OTHERWISE NOTED.
    - PROVIDE 915mm "LONG SWEEP BENDS" FOR ALL BENDS: 90°, 45°, AND 22.5° BENDS.
    - PROVIDE FISH ROPE IN EACH SPARE DUCT.
    - INSTALL SPACERS EVERY 1524mm TO ASSEMBLE CONCRETE ENCASED DUCTBANKS, OFFSET OR STAGGER SPACERS.
    - GLUE ALL PVC JOINTS.
    - PROVIDE END-BELLS WHEN FINISHING DUCTS IN CHAMBER OR WALLS.
    - B = BELL DUCTS, R = ROGERS' DUCTS
    - L = LIGHTING, S = SPARE
  - 2 PROVIDE 103mmØ STREET LIGHTING DUCT BETWEEN HANDHOLES AND POWER PEDESTALS AS INDICATED ON DETAIL 2/E2.1

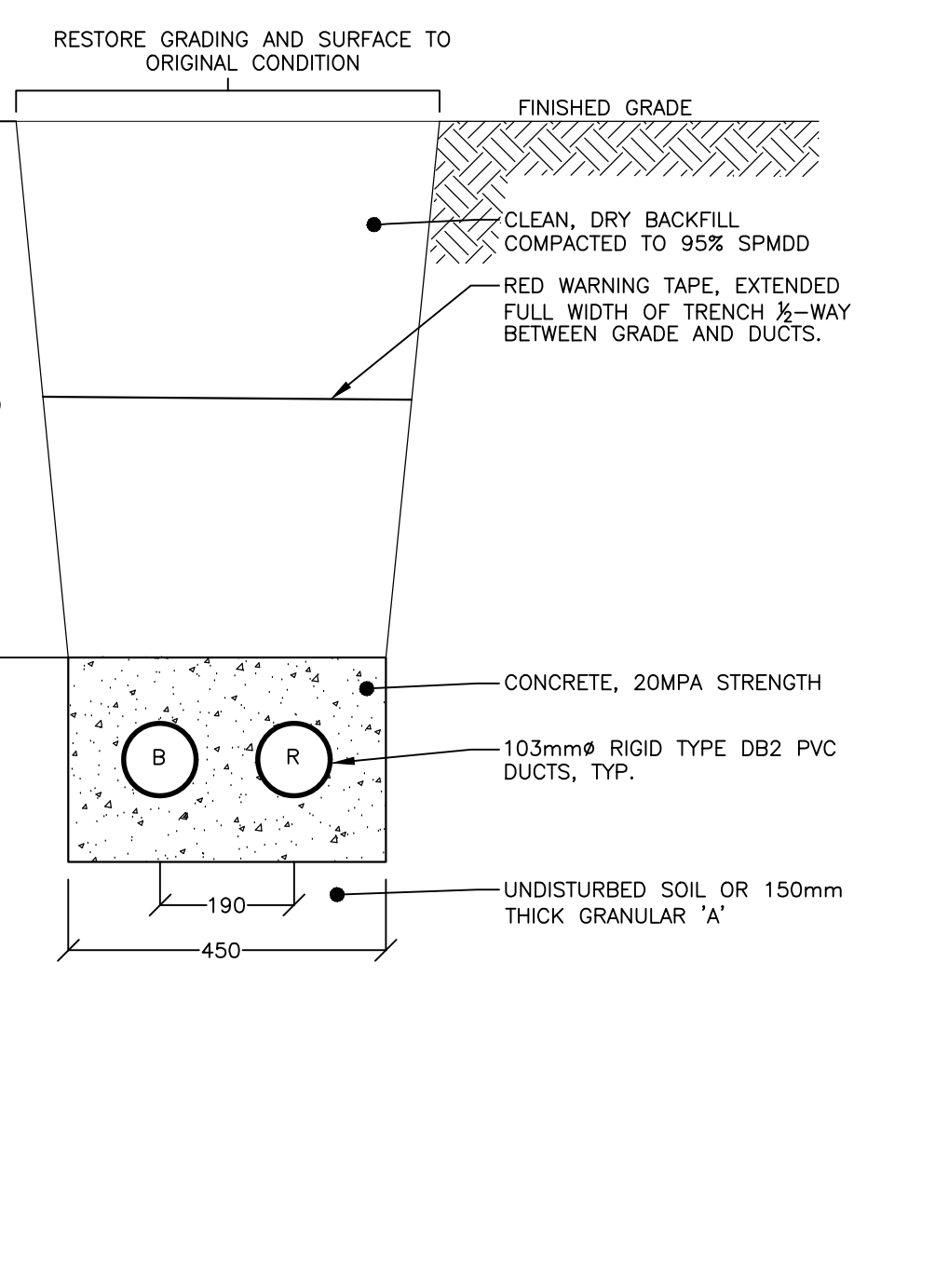
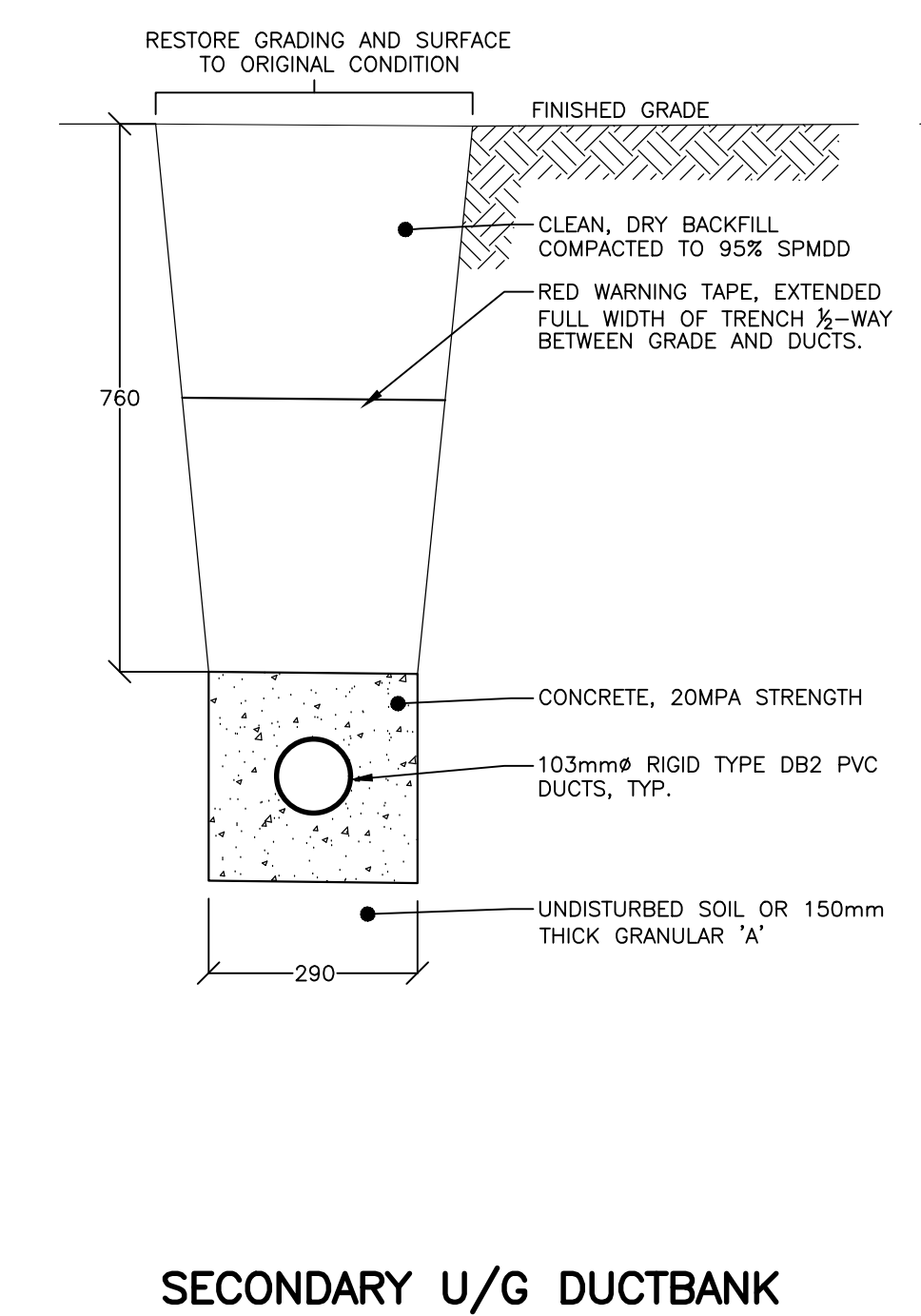
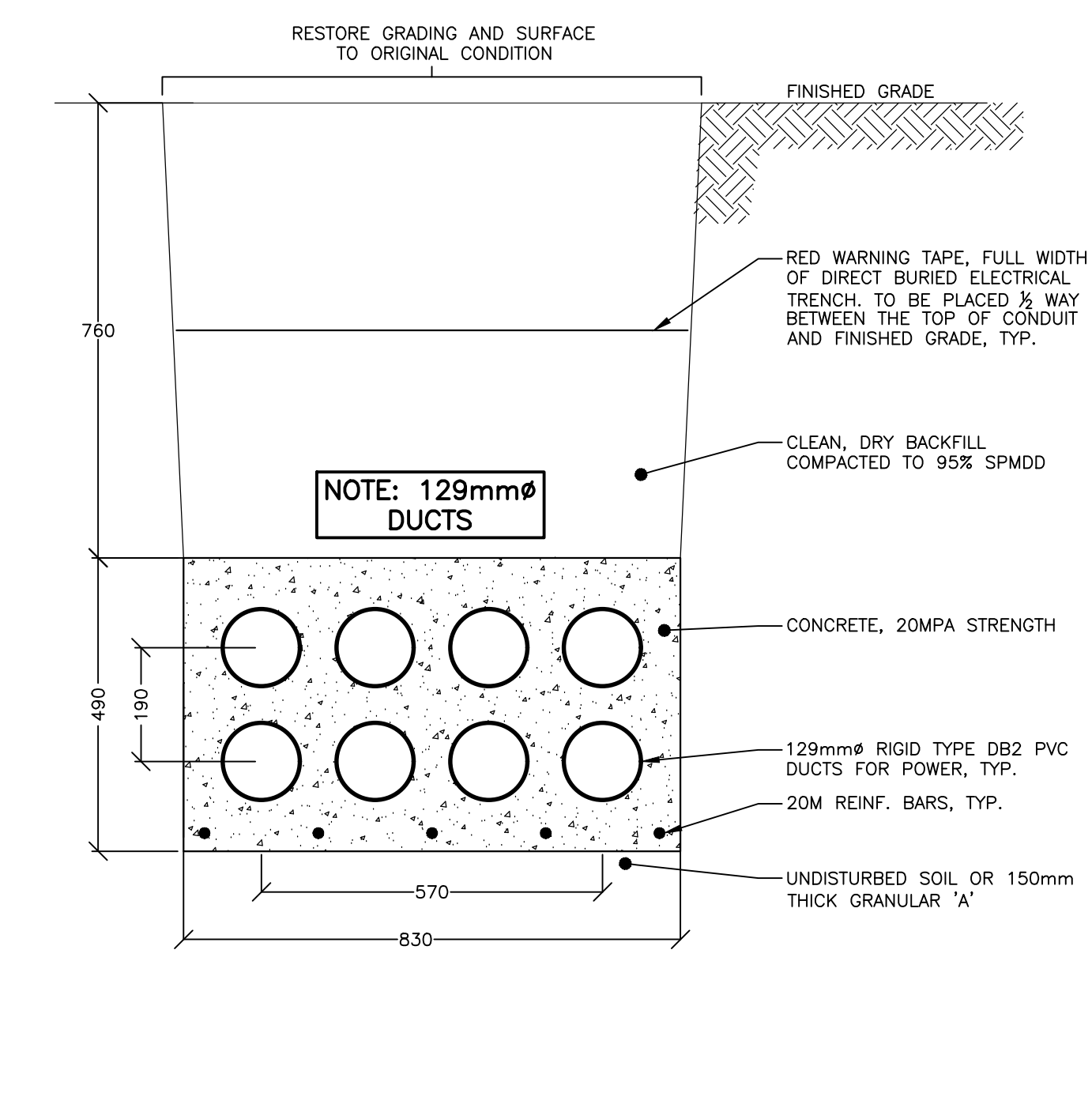
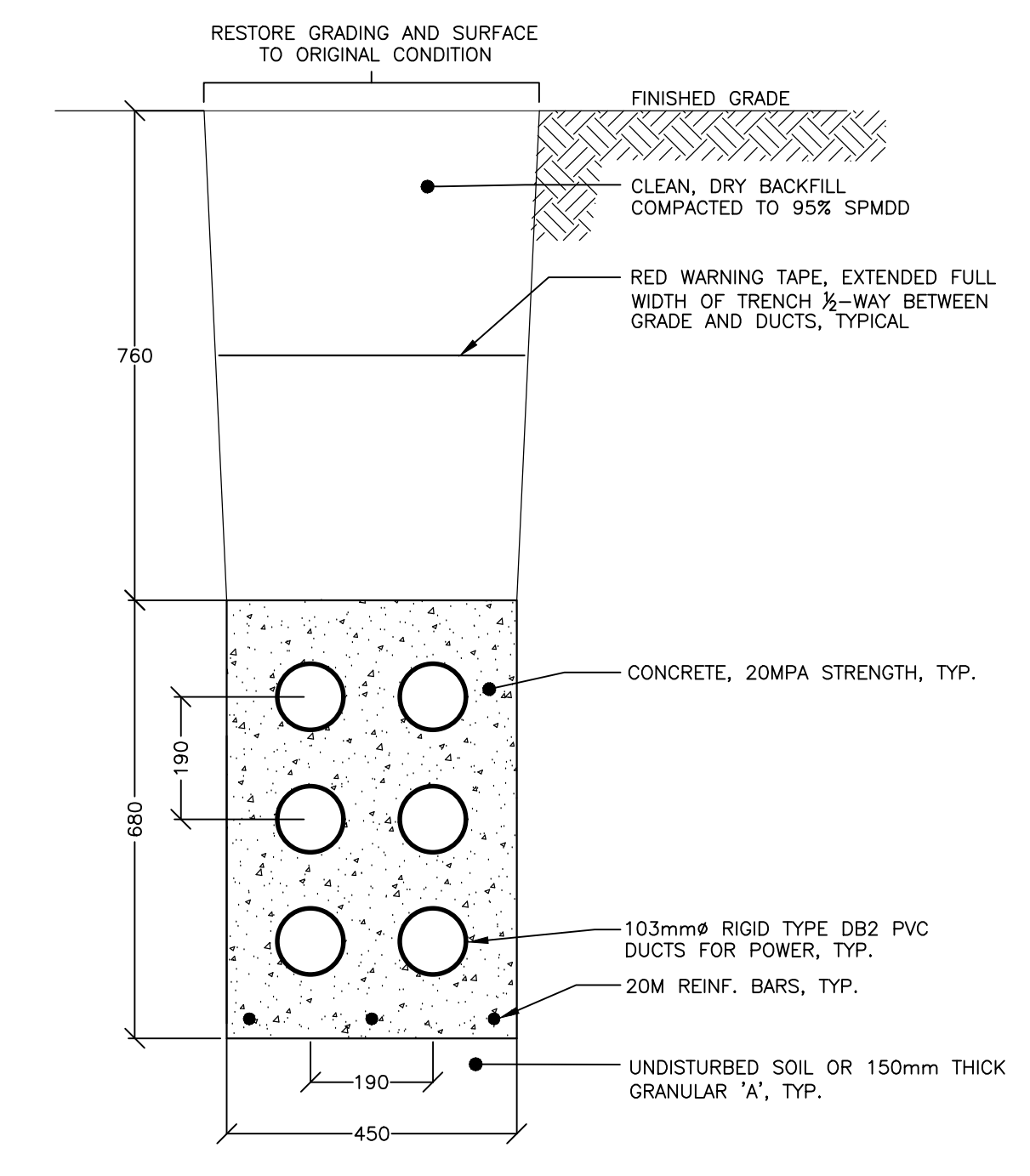
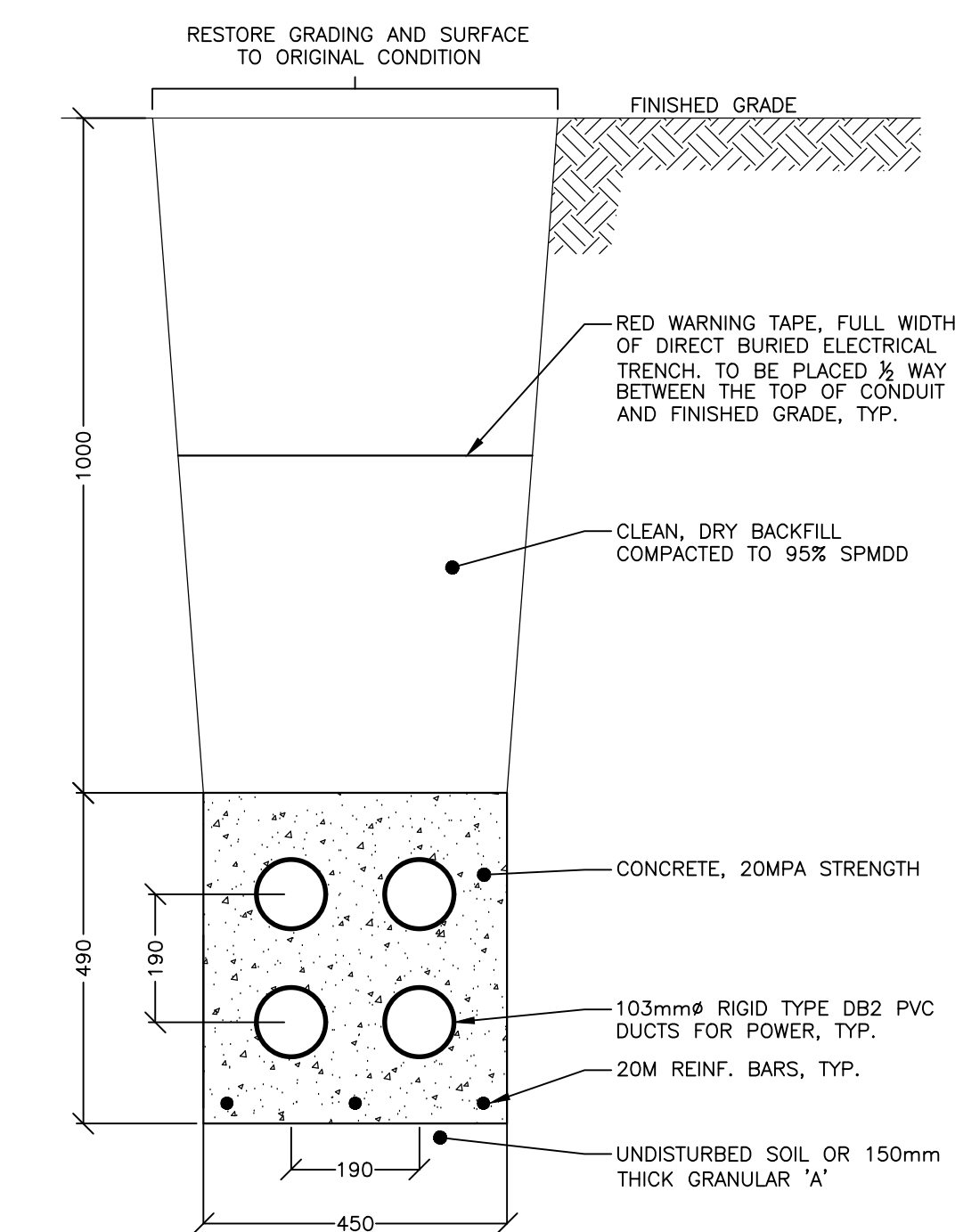


6 E4.1 - NTS 1 2  
**TYP. SITE LIGHTING DUCTBANK**

7 E4.1 - NTS 1  
**COMMUNICATION & LIGHTING COMMON TRENCH WITH PRIMARY DUCTBANK**

8 E4.1 - NTS 1  
**COMMUNICATION & LIGHTING COMMON TRENCH WITH SECONDARY DUCTBANK**

9 E4.1 - NTS 1 2  
**TYPICAL COMMUNICATION & LIGHTING COMMON TRENCH WITH PRIMARY DUCTBANKS (2) ROAD CROSSING**



1 E4.1 - NTS 1  
**PRIMARY FEEDER DUCTBANK**

2 E4.1 - NTS 1  
**SECONDARY U/G DUCTBANK (6/PHASE)**

3 E4.1 - NTS 1  
**SECONDARY U/G DUCTBANK (8/PHASE)**

4 E4.1 - NTS 1  
**SECONDARY U/G DUCTBANK (1/PHASE)**

5 E4.1 - NTS 1  
**COMMUNICATION U/G DUCTBANK- 1Hx2W**

NOT FOR CONSTRUCTION

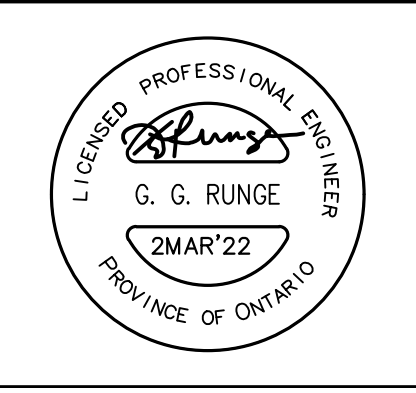
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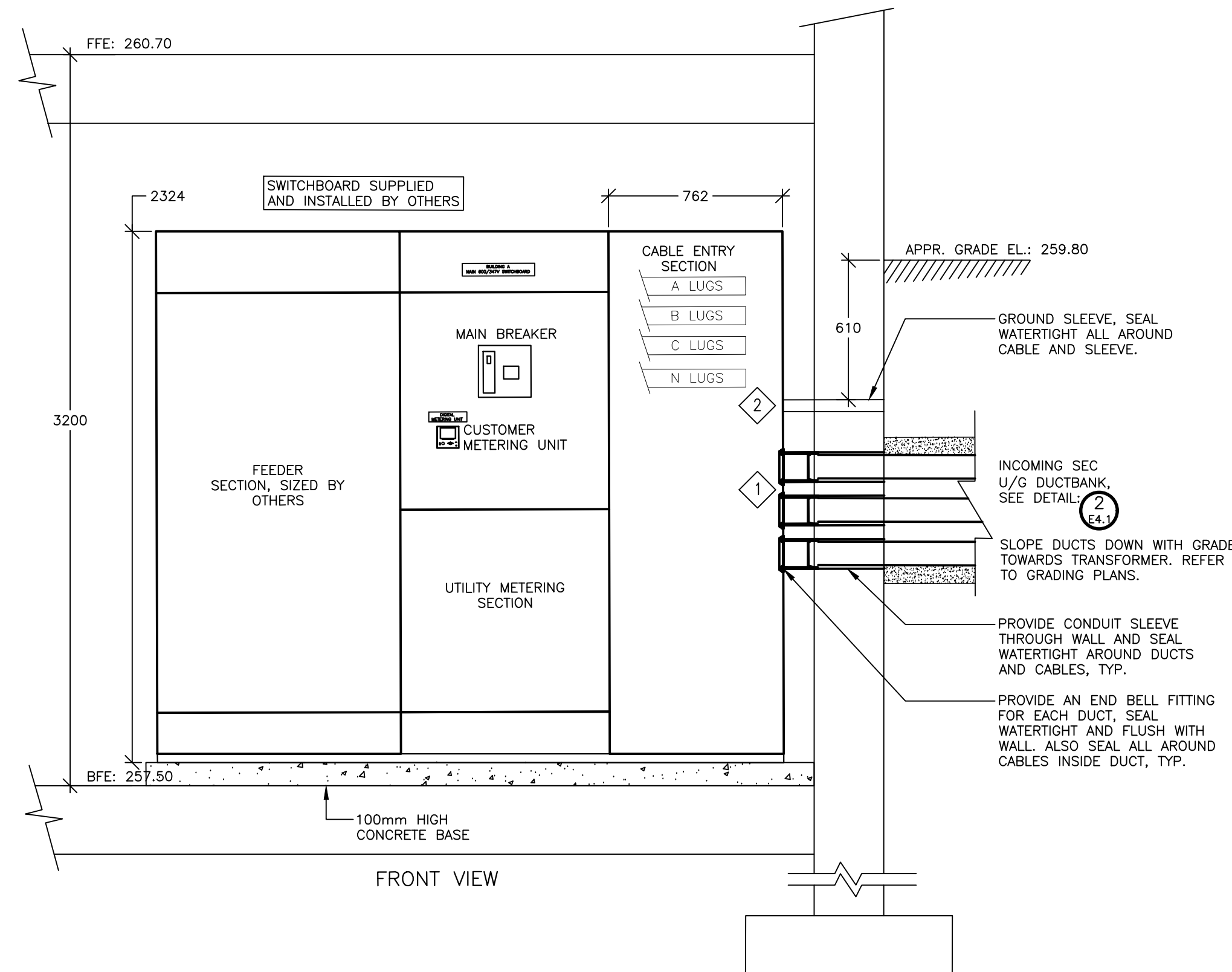
PRATT HANSEN GROUP INC.  
BISTRO 6 WEST  
CITY OF BARRIE

TYPICAL DUCT BANKS DETAILS

**RUNGE ENGINEERING**

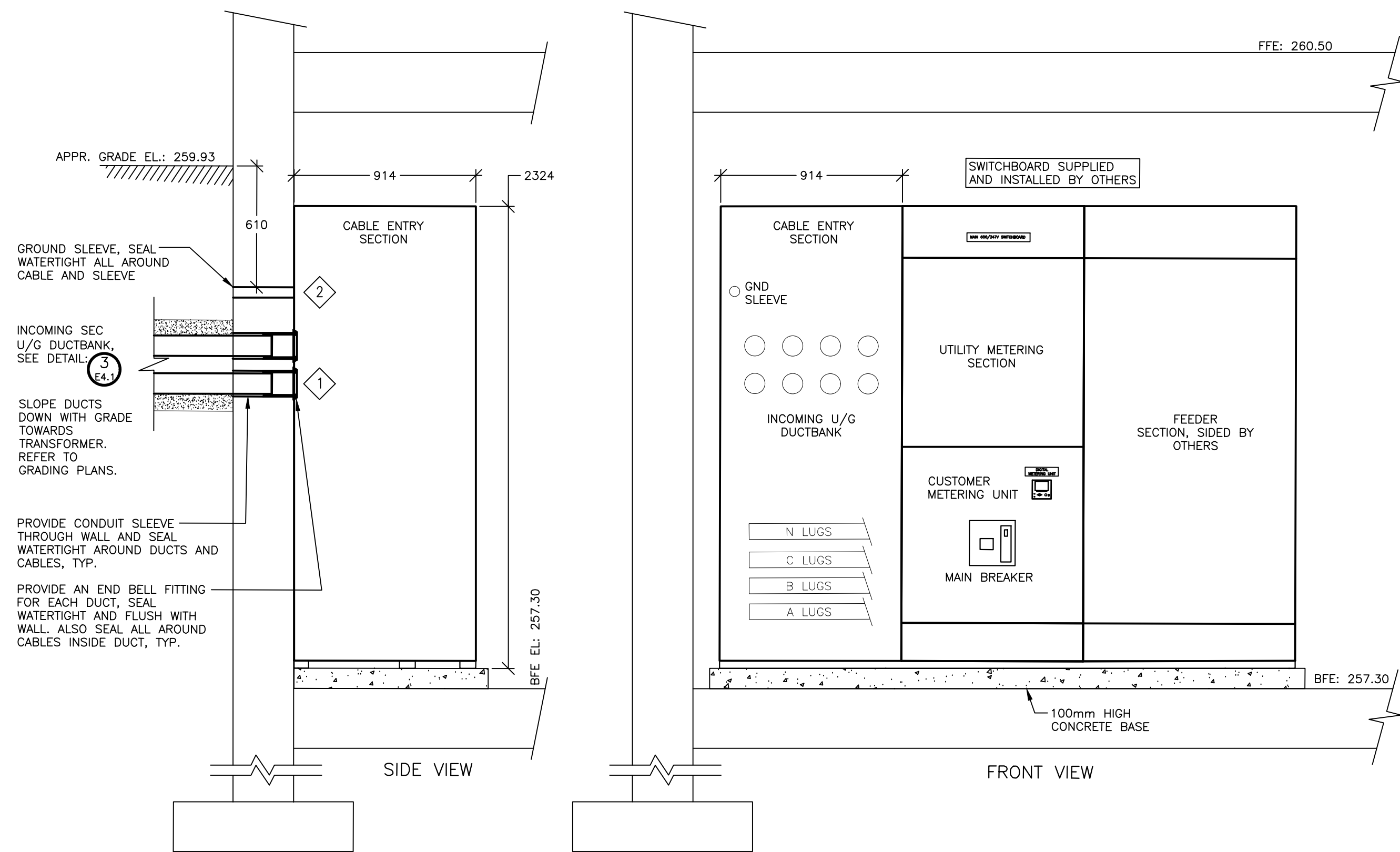
Runge Engineering  
A Division of Tatham Eng'g Limited  
115 Sandford Fleming Drive  
Collingwood, ON, L9Y 5A6  
(705) 445-2565  
www.tathameng.com

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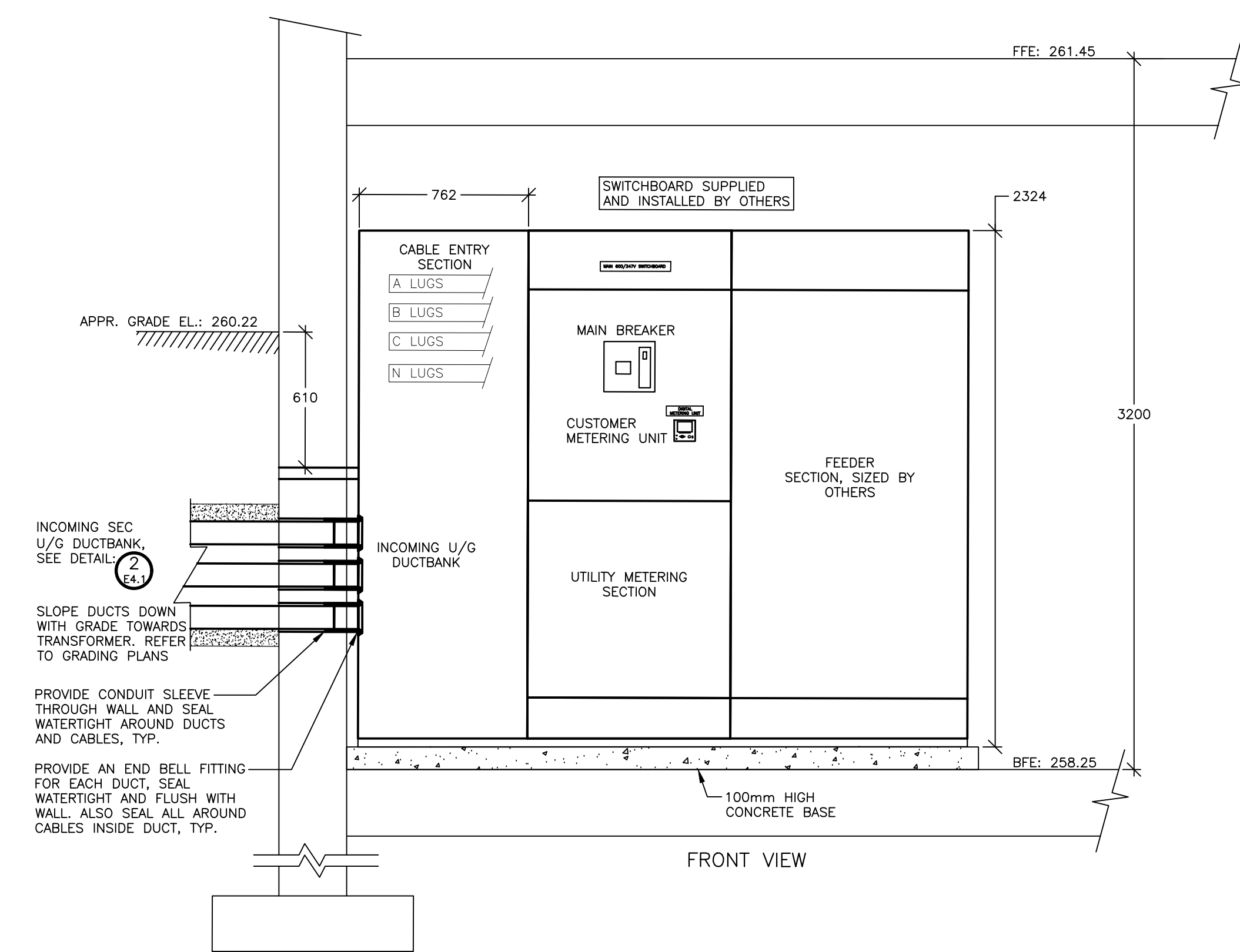


- NOTES**
- 1 CORE DRILL HOLES THRU CONCRETE WALL, COORDINATE DUCT OPENINGS WITH BUILDING CONTRACTOR
  - 2 GROUND SLEEVE, SEAL WATERTIGHT ALL AROUND CABLE AND SLEEVE
  - 3 COORDINATE UNDERGROUND DUCTS TO SWITCHBOARD WITH BUILDING CONTRACTOR.

1 MAIN 600V SWITCHBOARD IN BUILDING A (SERVICE ENTRANCE RATED)  
E4.2 - NTS



2 MAIN 600V SWITCHBOARD IN BUILDING B (SERVICE ENTRANCE RATED)  
E4.2 - NTS

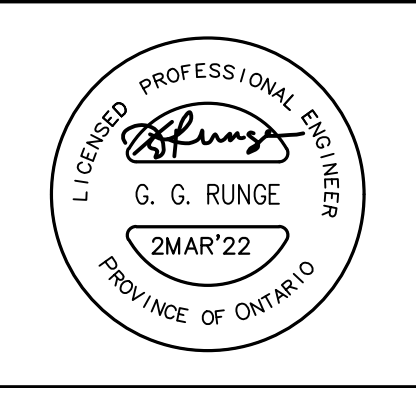


3 MAIN 600V SWITCHBOARD IN BUILDING C (SERVICE ENTRANCE RATED)  
E4.2 - NTS

NOT FOR CONSTRUCTION

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PRATT HANSEN GROUP INC.  
BISTRO 6 WEST  
CITY OF BARRIE

DUCTBANK AND SWITCHBOARD  
ELEVATION DETAILS

**RUNGE ENGINEERING**

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Collingwood, ON, L9Y 5A6  
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INNISFIL HYDRO IHS01-013  
**THREE PHASE, TRANSFORMERS** Revised on: November 21, 2006

**1. GENERAL REQUIREMENTS**

1.1 All transformers are to be new (not rebuilt) and be of the standard 3 phase distribution type transformer, complete with oil, suitable for customer installations.

1.2 All transformers to be standard profile, three phase padmount design with dead front HV (high Voltage) compartment with a maximum profile height of 1200mm in accordance with CSA Standard C227.3 Figure 1.

1.3 To be constructed in accordance with the latest edition of CSA Standard C227.4-M91 and as subreference to the following:

- .1 CSA Standard CSA-C2-M91, Single Phase and Three Phase Distribution Transformers, types ONAN;
- .2 Hydro One Specification M-104M-79, Electrical Insulating Oil;
- .3 ASTM D1816, Test Method for Dielectric Oil;
- .4 ANSI C57.12.28-1988, Pad mounted Equipment Enclosure Integrity;
- .5 CSA Standard W47.1-1992, Certification of Companies for Fusion Welding of Steel Structures;
- .6 CSA Standard W59-1989, Welded Steel Construction (Metal Arc Welding);
- .7 CSA Standard Z299.3-1985, Quality Assurance Program Category 3;
- .8 EEMAC Standard L16-1-1990, Distribution Transformer Warning Labels;
- .9 ISO Standard 9000-1987, Quality Systems - Model for Quality Assurance in Final Inspection and Test;
- .10 ANSI C57.12.25-1990, Requirements for Padmounted, Compartmental-type, Self Cooled Three Phase transformers;
- .11 CEA Specification DTWG-03 (12/93), Low Profile, Three-Phase, dead front Padmounted Distribution Transformer.

1.4 The transformers shall operate without causing interference to radio and television reception or telephone communication circuits higher than limits set forth in CSA Standards C22.4 No.103.

1.5 Transformer approvals are to be submitted with guaranteed no-load and load losses and typical outline drawings complete with details of primary termination equipment.

1.6 Refer to section IHS01-009 'Primary Termination Equipment'.

**2. PRIMARY SYSTEM VOLTAGE**

2.1 Innisfil Hydro has two (2) system voltages, 4.8/8.32KV and 16/27.6KV, grounded system.

2.2 High Voltage insulation class shall be 28KV.

2.3 The Basic Impulse level (BIL) at rated high Voltage shall be as per CSA C227.3 clause 4.3.1 of Table 1 with a minimum of 125KV BIL.

2.4 Where system Voltage is 16/27.6KV units shall be rated at 27.6KV.

2.5 Where system Voltage is 4.8/8.32KV units shall be designed to use 16KV bushing inserts.

Underground Electrical Plant Installation Page 1

INNISFIL HYDRO IHS01-013  
**THREE PHASE, TRANSFORMERS** Revised on: November 21, 2006

**3. SECONDARY SYSTEM VOLTAGE**

3.1 Output secondary Voltages:

- 1 120/208 Volt, 4 wire grounded.
- 2 347/600 Volt, 4 wire grounded.

3.2 Secondary Voltage insulation class shall be 1.2KV.

**4. PRIMARY VOLTAGE TAPS**

4.1 Four 2-1/2% high Voltage taps, two above and two below the nominal voltage. Tap switches to be located inside the enclosure and accessible with cables in position and permanently marked.

4.2 Tap positions to be the following percentage of high Voltage windings:

Tap Position	1	2	3	4	5
Percentage	105.0	102.5	100.0	97.5	95.0

4.3 Initial setting of the tap switch shall be factory set on position 3 at 100% of designated high Voltage 27.6KV.

4.4 Taps are to be rated for 200% of the current rating of the tapped winding.

4.5 The tap switch for OFF - CIRCUIT operation shall be externally operated and located in the cable entrance compartment. Switch handle (operator) shall be positioned such that it is clearly visible and accessible with all cables in place.

4.6 Tap positions must be clearly labeled in the HV / LV compartment such that they are not obstructed in any way, cannot be removed. Adhesive taping is not acceptable.

**5. RATED CHARACTERISTICS**

5.1 Standard Sizes

- .1 75KVA, 60 HZ
- .2 150KVA, 60 HZ
- .3 225KVA, 60 HZ
- .4 300KVA, 60 HZ
- .5 500KVA, 60 HZ

5.2 Cooling: ONAN.

5.3 Polarity: Additive.

5.4 Temperature rise test shall be measured by resistance method. The maximum temperature rise of the windings at rated KVA and Voltage shall be 65° C above ambient. Highest ambient air temperature to be considered 40° C.

5.5 The transformer impedance shall be limited to an absolute minimum of 3.5% for all transformers 75KVA and above.

Underground Electrical Plant Installation Page 2

INNISFIL HYDRO IHS01-013  
**THREE PHASE, TRANSFORMERS** Revised on: November 21, 2006

5.6 Transformers shall be constructed to withstand the mechanical and thermal stresses induced by the short circuit currents in accordance with CSA Standard C2 Table 6.

5.7 The transformer shall be grounded in the following manner:

- 1 Transformer core shall be electrically connected (grounded) to the tank.
- 2 Two grounding bosses complete with 2 - 9.5mm holes at each location, shall be provided on the transformer tank, one on HV side and one in the LV side.
- 3 Cover of switching compartment shall be bonded with extra flexible braid equivalent to # 2/0 AWG copper.
- 4 Ground spade terminals shall be provided in accordance with CSA C227.3 item 6.4 except that they shall have two holes spaced 44.5mm apart.
- 5 Grounding bracket shall be provided.
- 6 The grounding assembly shall consist of a rigid copper bus, with minimum dimensions of 40mm wide by 6mm thick, bolted to and joining the two ground spade terminals and mounted 75mm from the face of the tank. There shall be a minimum of 6 - 15mm evenly spaced holes on the bus.

5.8 The transformer oil shall meet all of the Hydro One specifications for Electrical Insulating oil, M-104M-79 or latest revision and be non-paraffinic dielectric strength greater than 40KV where tested in accordance with ASTM D1816 using 2 mm electrode spacing.

**6. TRANSFORMER LOSSES**

6.1 Maximum acceptable transformer operating dollar losses are to be calculated using the following Formula:  $PV = 7.4N + 3.9L$

6.2 Where maximum acceptable transformer losses are:

Rating KVA	Voltage KV	No Load Losses Watts	Full Load Losses Watts
220	210	645	645
210	210	560	560
350	350	1,220	1,220
350	350	1,100	1,100
550	550	1,600	1,600
550	550	1,450	1,450
600	600	1,800	1,800
600	600	1,650	1,650
1,200	1,200	3,100	2,800
1,100	1,100	3,000	2,800

**7. HOUSING AND ACCESS**

7.1 Transformer tank and switching compartment shall be tamperproof and weatherproof with all accessible openings fitted with a provision for padlocking and a recessed well for the pentahed bolt complete with cup washer locking device.

7.2 Cover to HV and LV compartments to open to 180 degrees maximum.

7.3 Shall be equipped with lifting provisions designed with a safety factor of 5 in accordance with ANSI C56 12.25.1990.

Underground Electrical Plant Installation Page 3

INNISFIL HYDRO IHS01-013  
**THREE PHASE, TRANSFORMERS** Revised on: November 21, 2006

7.4 The cover's front sill shall be made removable from the transformer tank and shall be complete with one tamperproof emergency access hole 65mm in diameter.

7.5 The cable entrance compartment shall be as per ANSI C57.12.25.1990 with centre hasp 90mm above the bottom of the sill.

7.6 Transformer shall be equipped with an automatic pressure relief valve to CSA Standard C227.3 item 5.1.6.

7.7 Transformer tank, sill and cover shall be blasted both inside and out or chemically treated to remove all surfaces of rust then coated with two coats of an approved high quality primer with a final dry thickness of 1.5mils. A minimum of two coats shall be applied to exterior and interior surfaces of the assembly. The exterior finish shall conform to EEMAC Standard Y1-2, Equipment Green for Outdoor Electrical Equipment and ANSI C57.12.25-1988 except salt spray test shall be for 1500 hours. Minimum paint thickness shall be 3mils for exterior surfaces and 2.5mils for interior surfaces.

7.9 The surface and finishes shall be resistant to peeling and chipping due to temperature variation induced by the transformer or deterioration under all normal operating conditions.

7.10 The transformer base shall be coated with a bituminous material to prevent the tank bottom from corroding.

7.11 The inside cover of HV / LV compartments to be coated with an anti-condensation "no - drip" compound.

7.12 Transformer base shall have a resilient closed cell gasket on the bottom flange to protect the finish from being scratched during installation and resist the alkalinity of the concrete base.

7.13 All welding shall conform to the latest approved edition of CSA Standard W59.

7.14 Provide external cooling fins where required.

**8. LOW VOLTAGE BUSHINGS**

8.1 Low Voltage bushings shall be one piece integral of the welded type and be equipped with either plated aluminum or plated copper bars with 4 - 14.4mm diameter holes in a line spaced 41.3mm apart. Bushings to be in the vertical plane to provide convenient primary switching and secondary cable connections.

8.2 All secondary cables shall be terminated with compression lugs suitable to the size and type of cable.

8.3 Low Voltage bushings shall be designated X1, X2, X3 and X0.

**9. BUSHING TERMINALS**

9.1 The transformer high Voltage coil shall be terminated with three (radial) and six (loop) internally connected, universal style ESNA flower pot bushing wells bolted in place and in accordance with CSA Standard C227.3-M91 item 6 and Figure 3 and Figure 4. Bushings shall be tilted upwards at 12.5 degrees +/- 2.5 degrees on loop units and horizontal on radial units.

Underground Electrical Plant Installation Page 4

INNISFIL HYDRO IHS01-013  
**THREE PHASE, TRANSFORMERS** Revised on: November 21, 2006

9.2 Shall meet the dimensional requirements of ANSI / IEEE Standard 386.

9.3 Primary Bushing wells shall be designated as follows:

- .1 Radial Units H1, H2, and H3.
- .2 Loop Units H1A, H1B, H1C, H2A, H2B and H2C.

9.4 A high Voltage parking stands for each elbow shall be provided between high Voltage bushings H1A - H1B and H1B - H1C.

9.5 Shall accept either the ESNA 160-FT or 160-SOP accessories for feed through or open point applications.

9.6 Acceptable manufacturer to be as per Approved Products Schedule. Refer to section IHS01-002.

**10. DEAD END CAPS**

10.1 All high Voltage bushing terminals shall be capped at factory and shipped to site.

10.2 Refer to drawings for quantity and location of units. All units that are provided with inserts to have the factory installed dead end caps turned over to Innisfil Hydro for spares.

10.3 Load break dead end caps rated at 200amp, 28KV complete with stand off plug rated at 200amp, 28KV.

Refer to section IHS01-009 for "Primary Termination Equipment".

**11. LOAD BREAK SWITCH**

11.1 Primary Voltage internal load break switch shall be a three phase, two position for radial feed, four position for loop feed, rated at 300amp, 28KV.

11.2 Load break switch acceptable manufacturer to be as per Approved Products Schedule. Refer to section IHS01-002.

**12. FUSING**

12.1 Primary protection shall consist of an expulsion type bayonet high Voltage Dual Heat Sensing fuses with internal weak (isolation) link.

12.2 Fuse link sizes to be confirmed by Innisfil Hydro. Asymmetrical rating as directed by Innisfil Hydro.

Underground Electrical Plant Installation Page 5

INNISFIL HYDRO IHS01-013  
**THREE PHASE, TRANSFORMERS** Revised on: November 21, 2006

12.3 Standard Fuse Sizes

KVA	8.32KV / 27.6KV
75	8.0A 3.0A
150	15.0A 5.0A
225	25.0A 8.0A
300	50.0A 15.0A
500	50.0A 15.0A

12.4 Primary fusing acceptable manufacturer to be as per Approved Products Schedule. Refer to section IHS01-002.

12.5 Provide to spare fuses in a fuse clip mounted inside HV / LV compartment of each transformer.

**13. MARKINGS**

13.1 No advertising "Decals" to be applied to exterior of units.

13.2 The numerical value only of the KVA and primary Voltage shall be stenciled in white on the top right hand corner of front cover with 50mm high white indelible lettering spaced 25mm apart.

13.3 Directly below the Voltage and KVA the transformers shall be identified with a number as directed by Innisfil Hydro. Number shall be stenciled in white on the top right hand corner of front cover. As-built drawings should show same identification.

13.4 CSA Standard C2-1976 Nameplate information shall be complete with type of winding materials and installed within the HV / LV compartment.

13.5 On each opening compartment of the transformer there shall be a legible / permanent warning sign stating "DANGER - HIGH VOLTAGE". "Zap the Safety Bird" affixed at the centre of the door.

13.6 The transformer shall have the following components inside the HV / LV compartment identified by 15-25mm high stenciled lettering:

- 1. High Voltage terminal designations
- 2. Low Voltage terminal designations
- 3. DV - Dual Voltage switch
- 4. TC - Tap change
- 5. Voltage markings of Voltage selector switch positions
- 6. Tap position of the tap changer
- 7. Open and closed position of the load break switch

**14. MANUFACTURERS**

14.1 Three phase padmount transformers acceptable manufacturer to be as per Approved Products Schedule. Refer to section IHS01-002.

Underground Electrical Plant Installation Page 6

INNISFIL HYDRO IHS01-013  
**THREE PHASE, TRANSFORMERS** Revised on: November 21, 2006

**15. INSTALLATION**

15.1 Transformers will be pretested at factory and shipped to site complete with oil.



15.2 Transformers are to be shipped to site on pallets or crates which are of greater dimensions than the transformer. Transformers are to be secured to the pallets / crates by bolting the base down or with non-metallic straps.

15.3 Transformers will be positioned on bases and grounded in accordance with Innisfil Hydro Standard Detail IHS01-016. Covers to be accessible from road side.

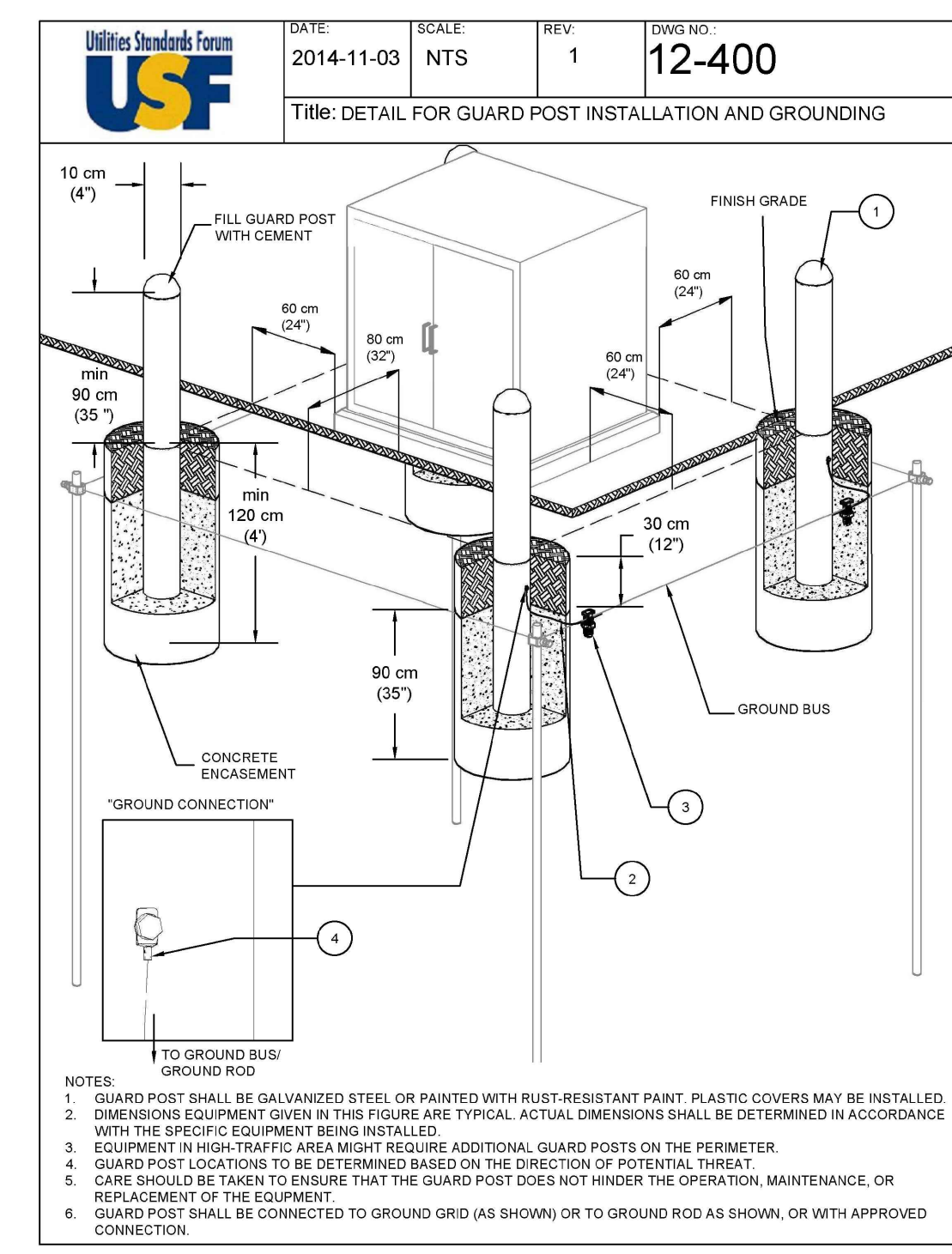
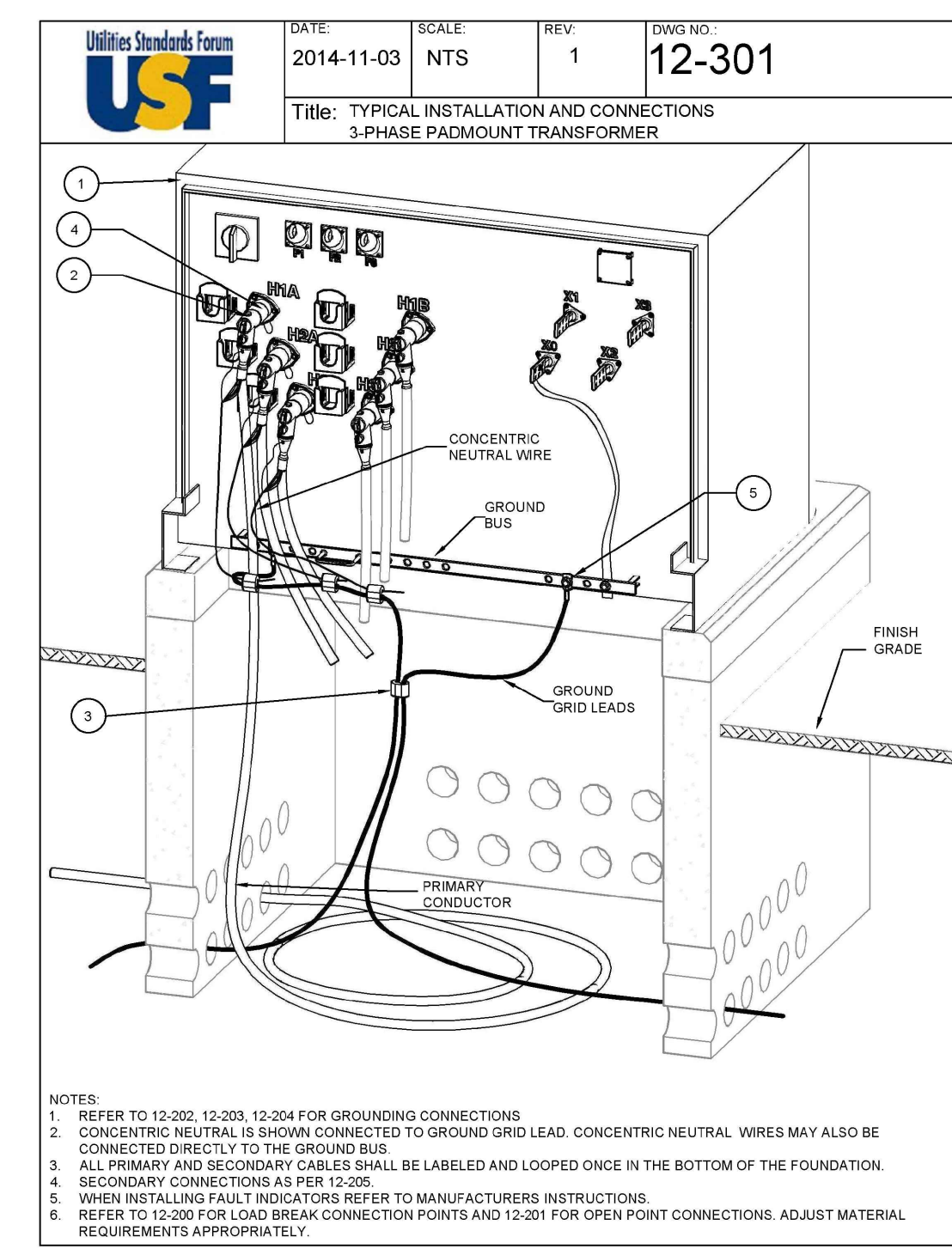
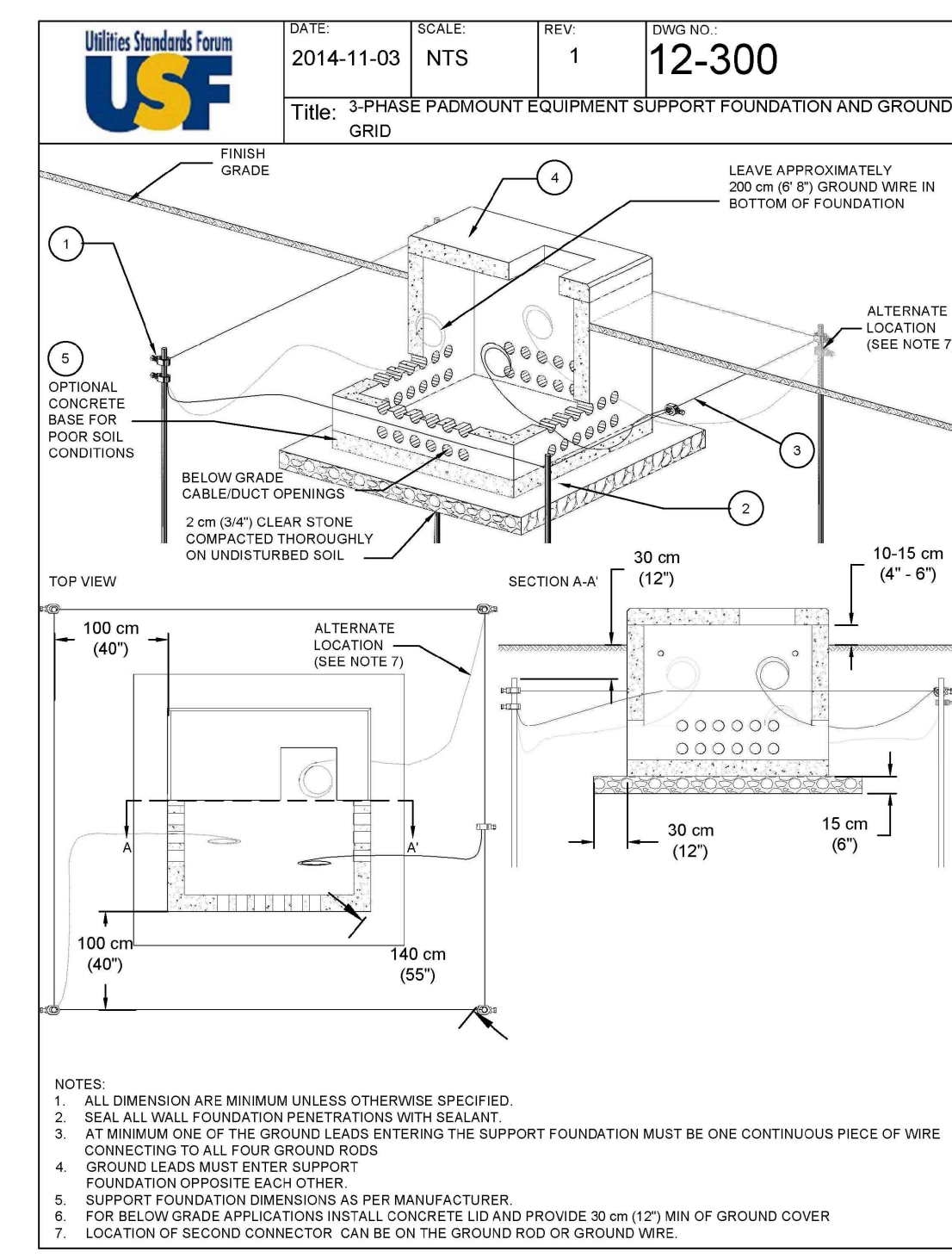
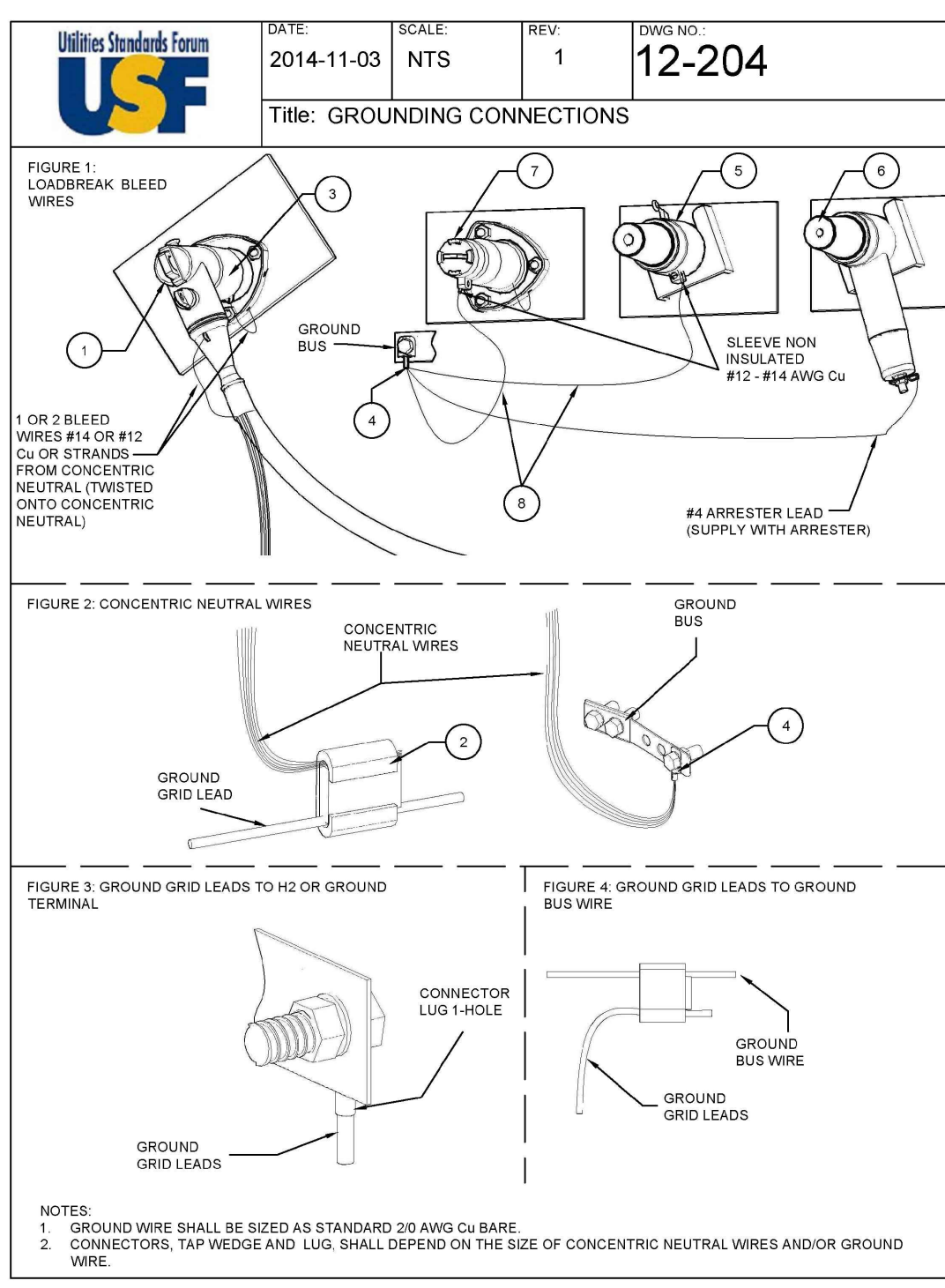
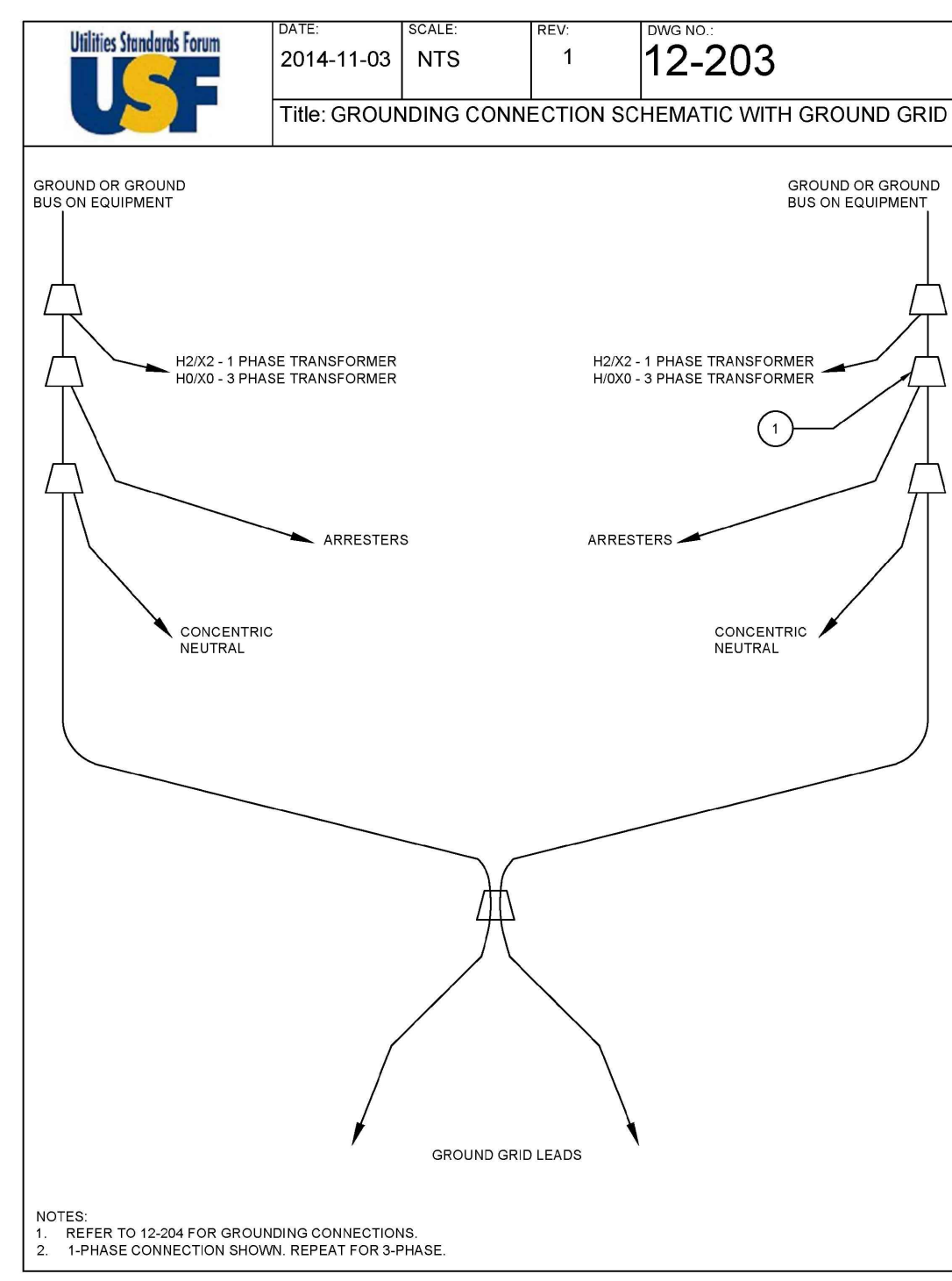
15.4 All damaged components or transformers are to be replaced at contractor's / owner's / developer's expense.

15.5 Install blastwalls and / or guard post as directed by Innisfil Hydro and in accordance with details IHS01-017 and / or IHS01-018.

Underground Electrical Plant Installation Page 7

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					DESIGN GGR	SCALE: AS SHOWN	DATE JANUARY, 2021
					DRAWN JS	PROJECT	DWG. NO
					CHECKED GGR	20137P	E4.3
					<b>3 PHASE TRANSFORMER SPECIFICATIONS</b>		

NO.	REVISIONS	DATE	INITIAL



MATERIAL LIST 12-203

Part #	Qty	Description	Part Number
1	as req'd	Connector	U01144, U05284, U05289

MATERIAL LIST 12-204

Part #	Qty	Description	Part Number
1	as req'd	Elbow, Load Break	U05511
2	as req'd	Connector, Wedge Type	Refer to Chart 13-01
3	as req'd	Bushing Insert	U06350
4	as req'd	Connector, Lug	U05610
5	as req'd	Parking Stand	U10800
6	as req'd	Parking Stand Arrester	U05185-U05187
7	as req'd	Insulating Cap	U05473, U05300
8	as req'd	Bleed Wire	U11150

MATERIAL LIST 12-300

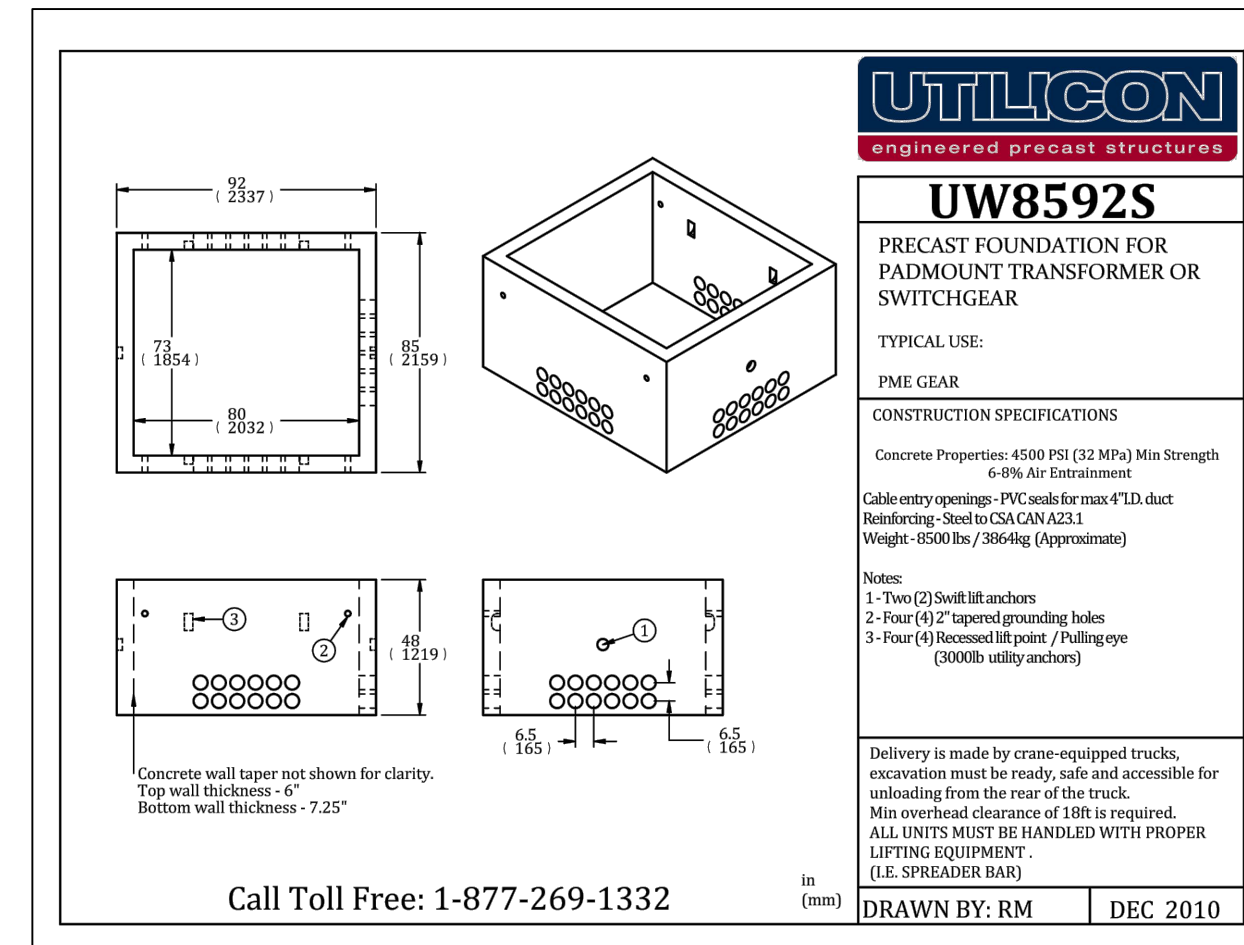
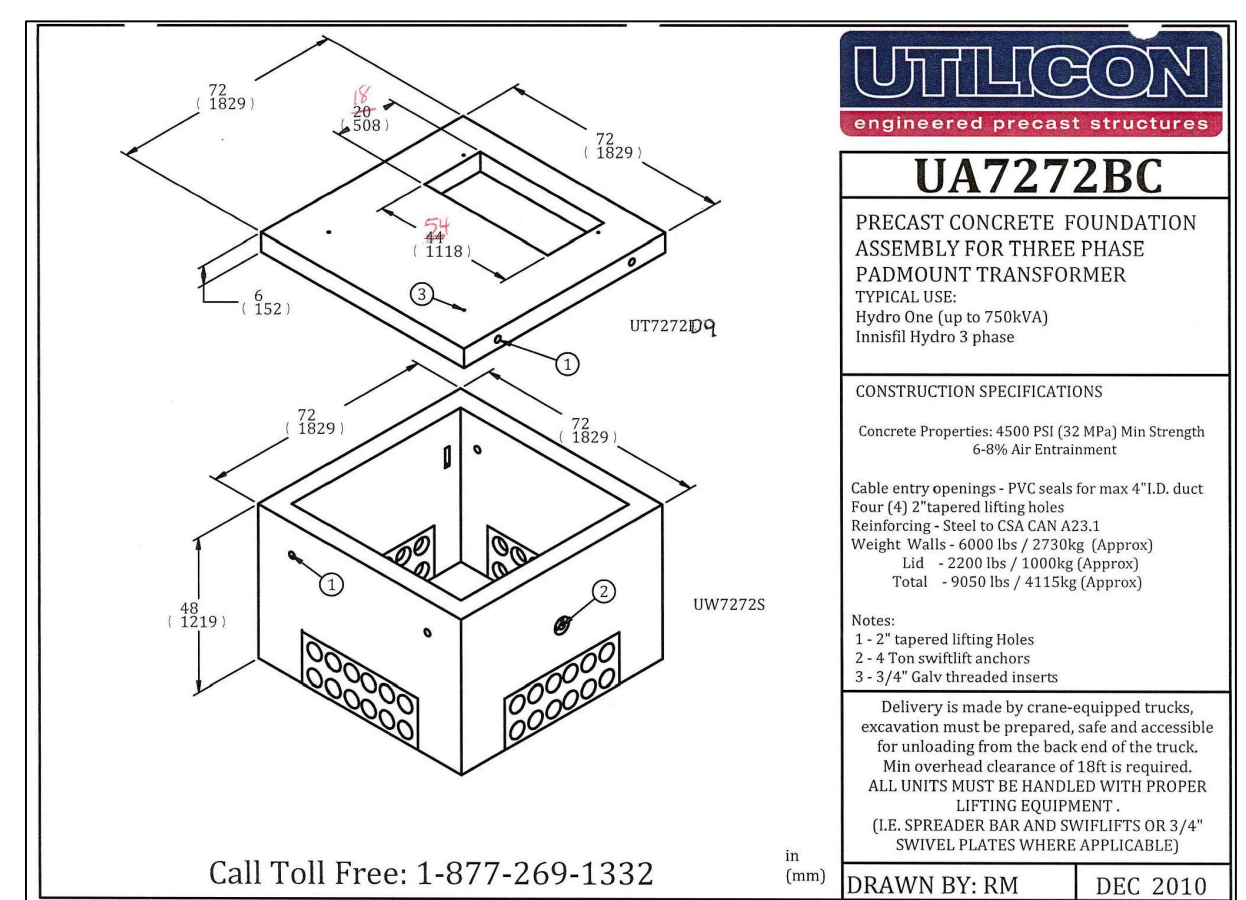
Part #	Qty	Description	Part Number
1	6	Connector, Ground Rod	U01144, U06024, U06340
2	4	Ground Rod	U05812, U00484, U06001
3	as req'd	Ground Wire 20 AWG Cu	U10650
4	1	Foundation	U11200
5	Optional	Concrete Base	U06953

MATERIAL LIST 12-301

Part #	Qty	Description	Part Number
1	1	Transformer, 3-Phase Padmount	U10900
2	as req'd	Elbow, Load Break	U05511
3	as req'd	Connector	U01144, U05284, U05289
4	as req'd	Bushing Insert	U06350
5	as req'd	Connector, Lug	U05610
Optional	as req'd	Feed Thru Insert	U05476-U05478
Optional	as req'd	Bushing Arrester	U10750
Optional	as req'd	Parking Stand	U10800
Optional	as req'd	Feed Thru Parking Stand	U05467
Optional	as req'd	Parking Stand Arrester	U05185-U05187
Optional	as req'd	Elbow Arrester	U11800
Optional	as req'd	Fault Indicators	U05465

MATERIAL LIST 12-400

Part #	Qty	Description	Part Number
1	as req'd	Guard Post	U11100
2	as req'd	Ground Wire 20 AWG Cu	U10650
3	as req'd	Connector	U05585
4	as req'd	Connector, Lug	U05610



1 TRANSFORMER VAULT - UP TO 500kVA  
E4.6

2 TRANSFORMER VAULT - 750kVA TO 1500kVA  
E4.6

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BISTRO 6 WEST  
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USF AND VAULT DETAILS

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Runge Engineering  
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Collingwood, ON, L9Y 5A6  
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**POWER CABLE SCHEDULE**

PC01	3-1C#2/OAWG, AL, 28kV 100%, TR-XLPE, LLDP, 100% CONCENTRIC NEUTRAL IN CONCRETE ENCASED DUCTBANK (4-103mmØ RIGID PVC DB2)
PC02	4C#25OAWG RW90 Cu, IN U/G DUCTBANK (OESC DIAGRAM D11, DETAIL #1)
PC03	4C#1AWG RW90 Cu, IN U/G DUCTBANK (OESC DIAGRAM D11, DETAIL #1)
PC04	4C#2/OAWG + #6AWG GND RW90 Cu, IN U/G DUCTBANK
PC05	4C#250MCM + #4AWG GND RW90 Cu, IN U/G DUCTBANK
PC06	3C#6AWG + #8AWG GND RW90 Cu, IN 41mmØ U/G RPVC DUCT
PC07	3C#2/OAWG + #6AWG GND RW90 Cu, IN U/G DUCTBANK
2000A	18C#750MCM + 6C#750MCM NEUTRALS (6/PHASE, 4-WIRE), Cu, RW90, IN U/G DUCTBANK (OESC DIAGRAM D11, DETAIL 6)
3000A	24C#1000MCM + 8C#1000MCM NEUTRALS (8/PHASE, 4-WIRE), Cu, RW90, IN U/G DUCTBANK (OESC DIAGRAM D11, DETAIL 8)

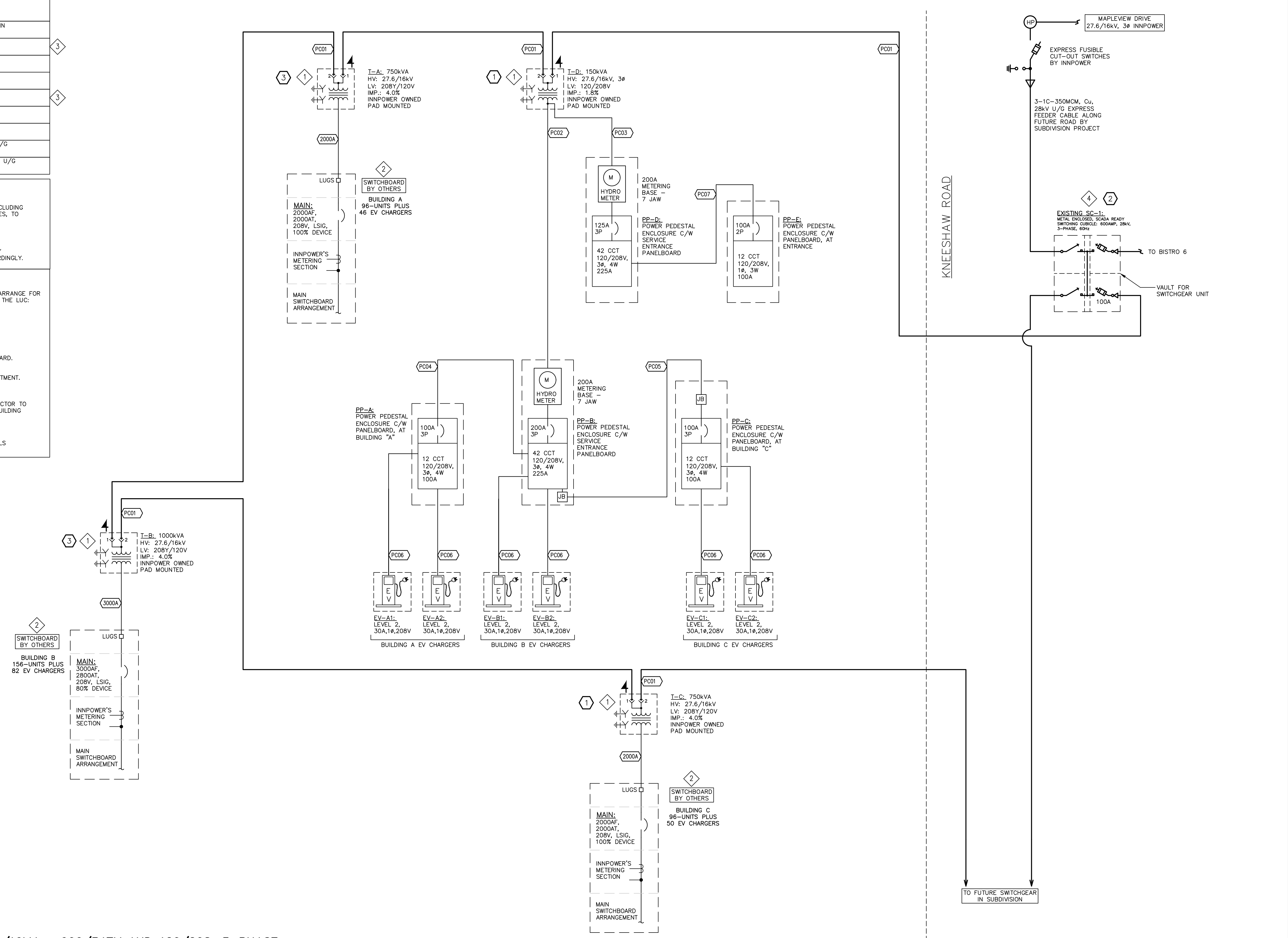
**PHASING NOTES FOR TRANSFORMERS:**

- 1 PROVIDE TRANSFORMER, VAULT AND SECONDARY SERVICE FOR PHASE 1, INCLUDING PRIMARY AND SECONDARY TERMINATIONS. HI-POT TEST ALL PRIMARY CABLES, TO INNPOWER'S STANDARDS.
- 2 PROVIDE NEW SWITCHGEAR FOR PHASE 1, TO INNPOWER'S STANDARDS
- 3 PROVIDE VAULT AND TRANSFORMER ONLY FOR PHASE 1 INCLUDING PRIMARY TERMINATIONS. COMPLETE SECONDARY SERVICE IN SEPARATE PHASE, ACCORDINGLY.

**NOTES:**

- 1 CONTRACTOR TO COORDINATE WORK WITH LUC (INNPOWER) ACCORDINGLY AND ARRANGE FOR NEW SERVICE. THE FOLLOWING EQUIPMENT WILL BE OWNED AND MAINTAINED BY THE LUC:
  - PAD MOUNT TRANSFORMERS, SWITCHGEAR AND JUNCTION BOX.
 SERVICE ENTRANCE WORK PROVIDED BY ELECTRICAL CONTRACTOR INCLUDES:
  - ALL TRANSFORMERS, AND SWITCHGEAR UNIT
  - PRIMARY DUCTBANK TO PROPERTY LINE, AS PER LUC STANDARDS
  - PRIMARY CABLES AND TERMINATIONS
  - SECONDARY SERVICE DUCTBANK, SECONDARY CABLES AND TERMINATION IN TRANSFORMER AND AT BUILDING SWITCHBOARD.
  - SEALING WATER-TIGHT ALL CABLES IN DUCT, INSIDE BUILDING AT SWITCHBOARD.
  - TRANSFORMER VAULT, BOLLARDS AND GROUND GRID TO LUC STANDARDS.
  - COORDINATE WORK WITH LUC REPRESENTATIVE AND BUILDING CONTRACTOR.
  - FAULT INDICATOR WITH FIBRE CABLE ON EACH PHASE INSIDE CABLE COMPARTMENT.
  - PRIMARY CABLE LABEL ON EACH CONDUCTOR, PER INNPOWER'S STANDARDS.
- 2 EACH BUILDING SWITCHBOARD IS SUPPLIED AND INSTALLED BY OTHERS. CONTRACTOR TO COORDINATE SECONDARY DUCTBANK ROUTING AND CABLE CONNECTIONS WITH BUILDING CONTRACTOR. SEAL WATER-TIGHT ALL CABLES IN DUCT, INSIDE BUILDING AT SWITCHBOARD AND AT VAULT END.
- 3 SECONDARY FEEDER CABLES SIZED FOR VOLTAGE DROP TO EV POWER PEDESTALS

ALL TRANSFORMERS WILL BE OWNED AND MAINTAINED BY INNPOWER.  
ALL TRANSFORMER SIZES HAVE "NOT YET" BEEN CONFIRMED AND APPROVED BY INNPOWER.



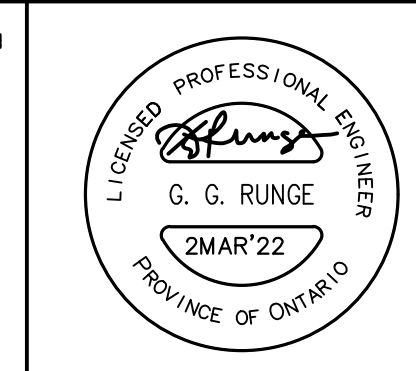
1 PROPOSED SINGLE LINE DIAGRAM: 27.6/16kV – 600/347V AND 120/208, 3-PHASE

E5.1

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4.	FOURTH SUBMISSION TO CITY OF BARRIE	2022 MAR 2	GGR
NO.	REVISIONS	DATE	INITIAL

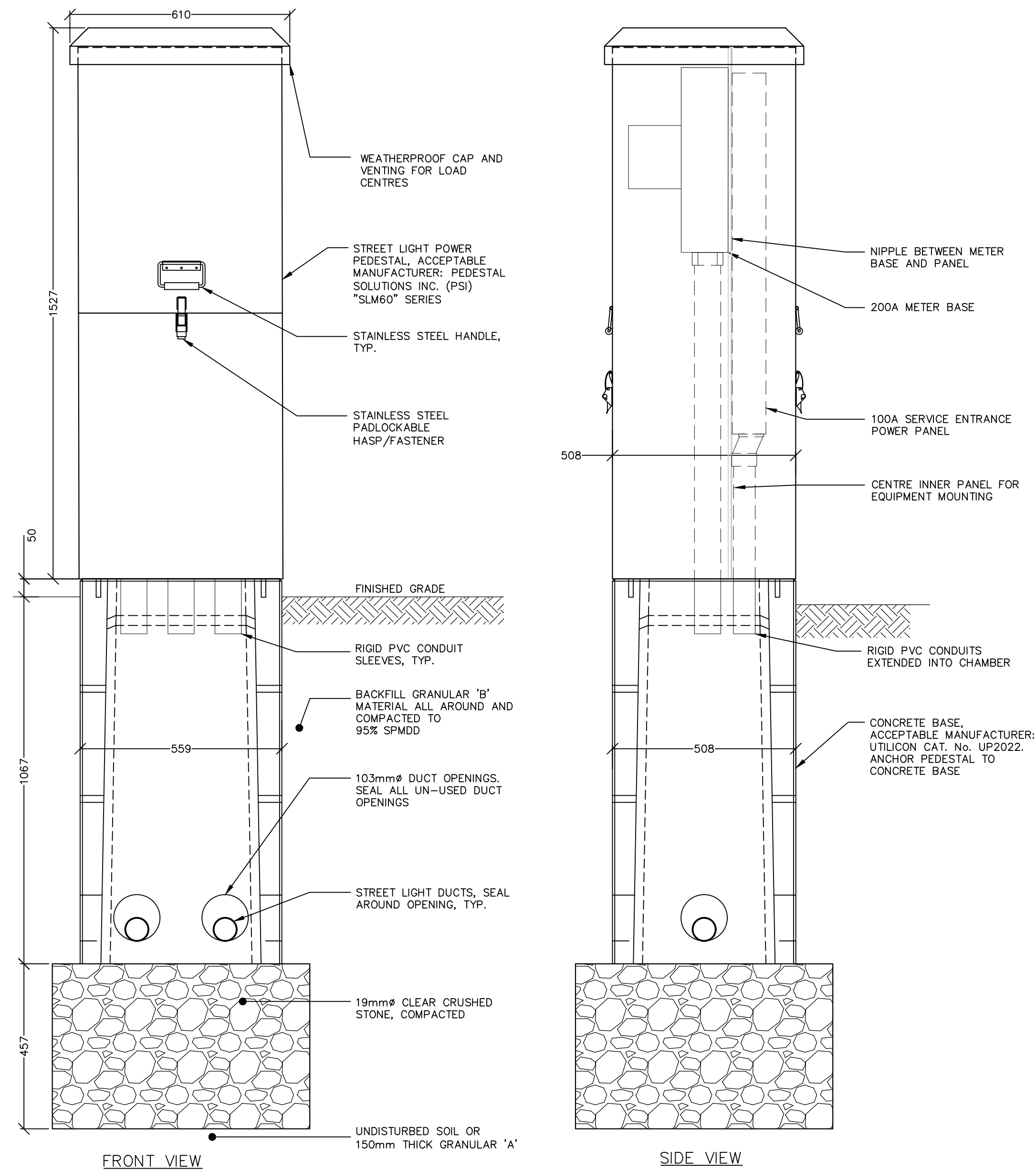
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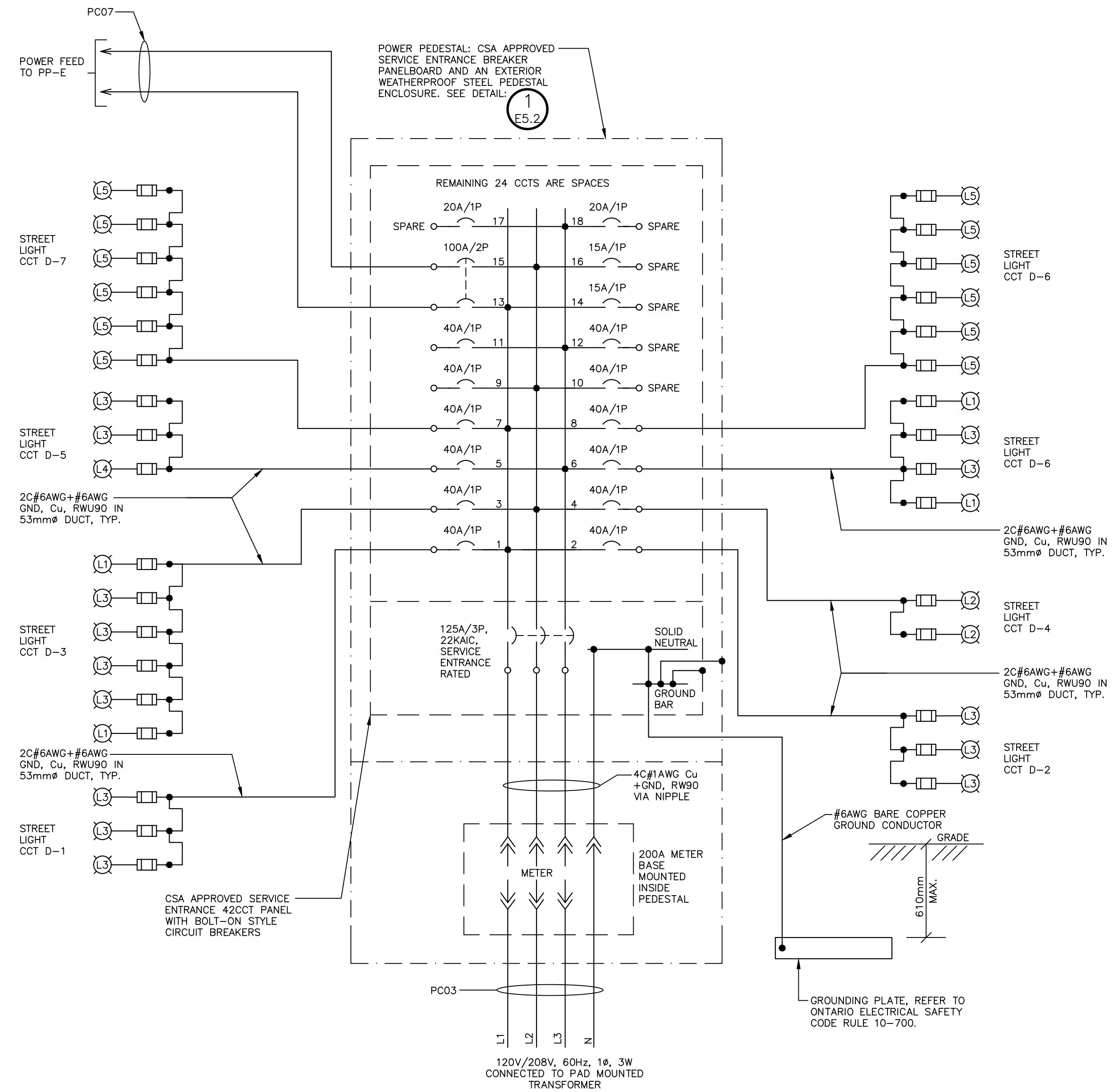
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SINGLE LINE DIAGRAM

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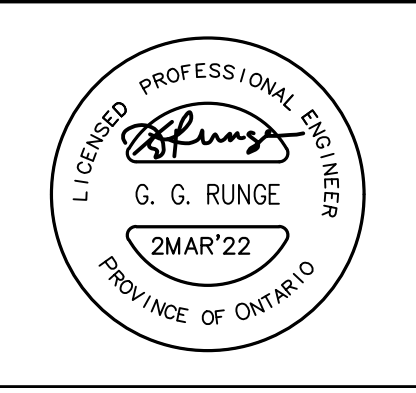
**1** PP-D: METERED 3 $\varnothing$  120/208 POWER PEDESTAL DETAIL  
 - NTS, DIMENSIONS SHOWN IN MILLIMETRES (mm)



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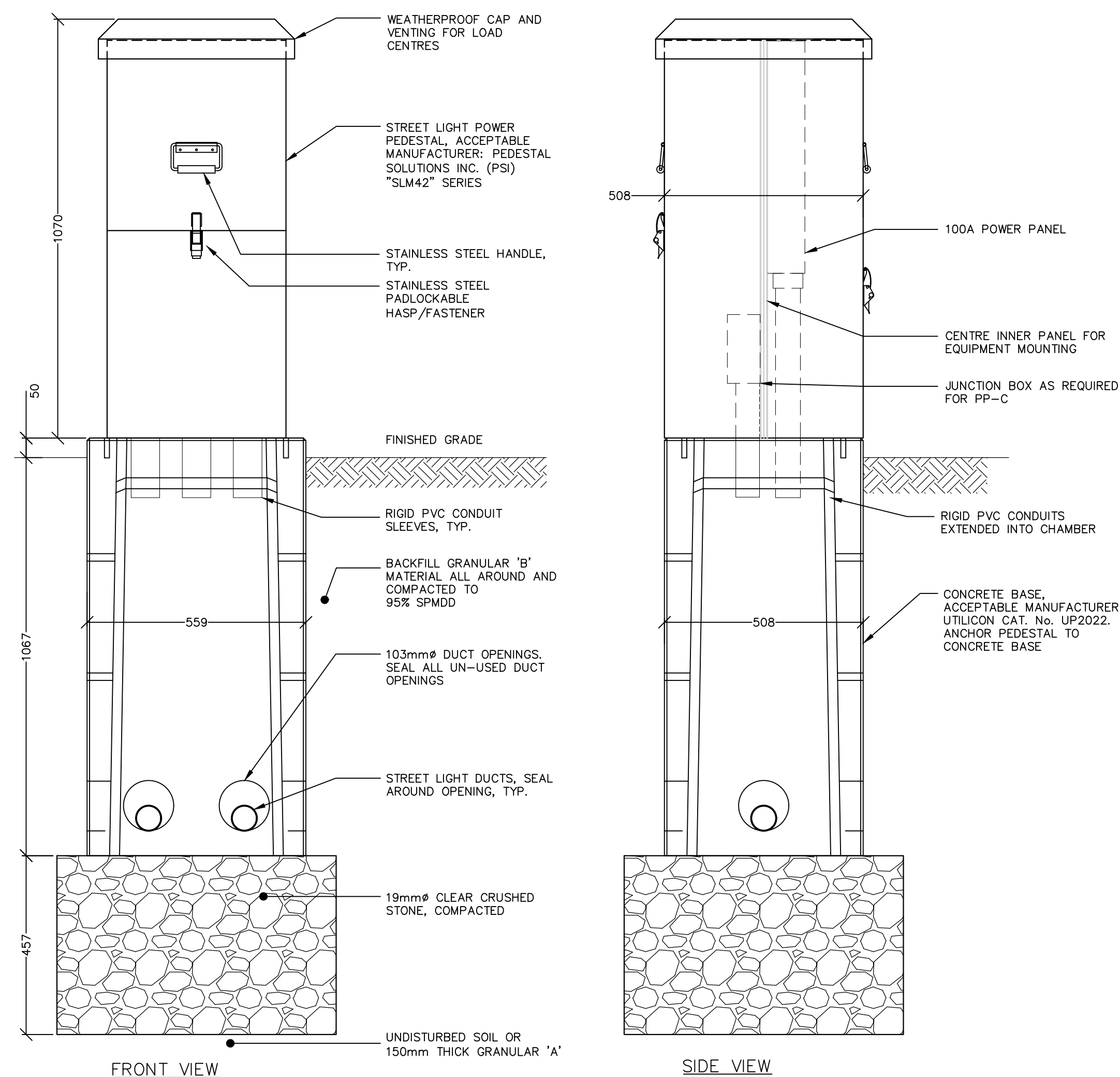


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ELECTRICAL POWER PEDESTAL  
 PP-D DETAILS

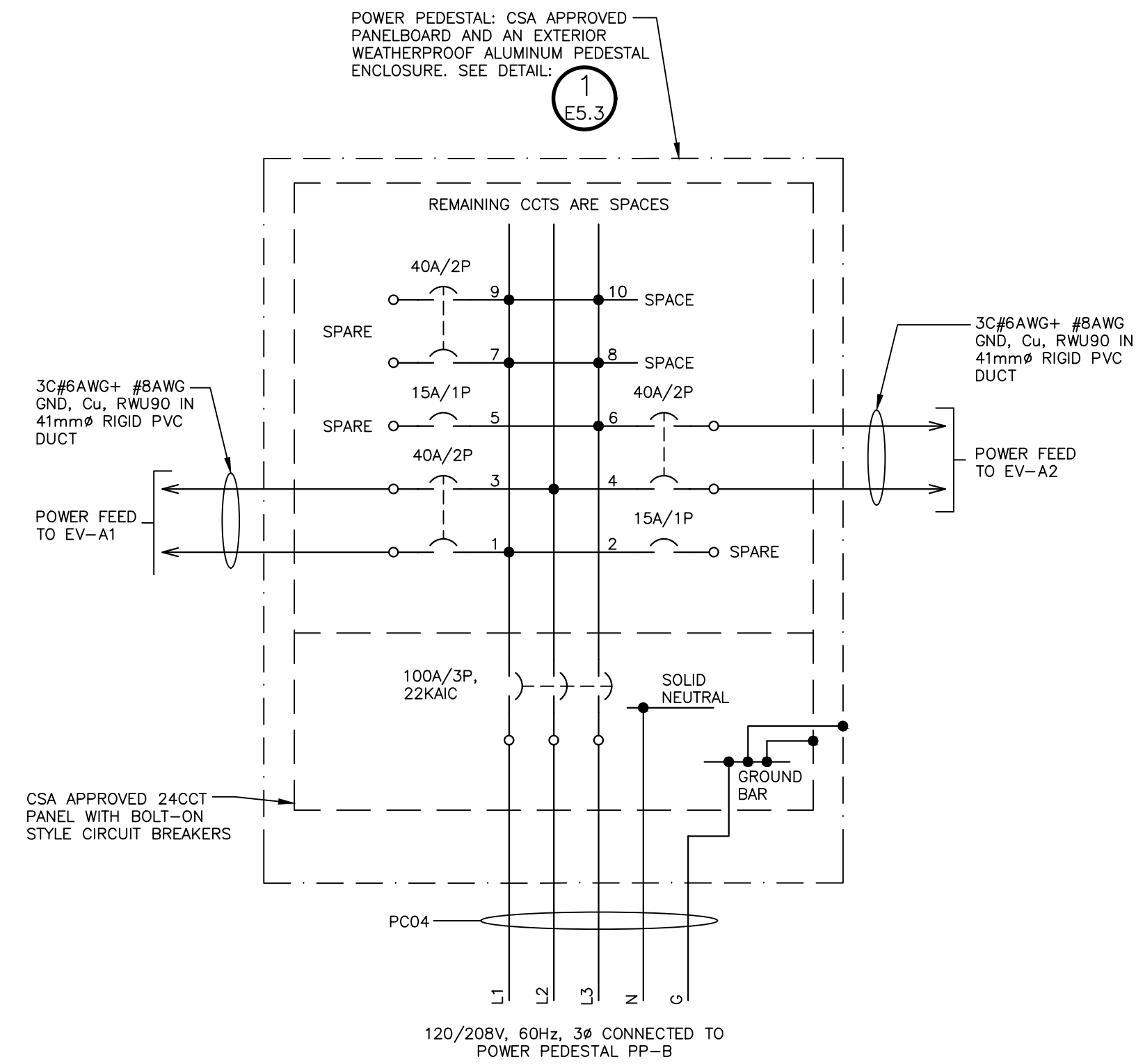
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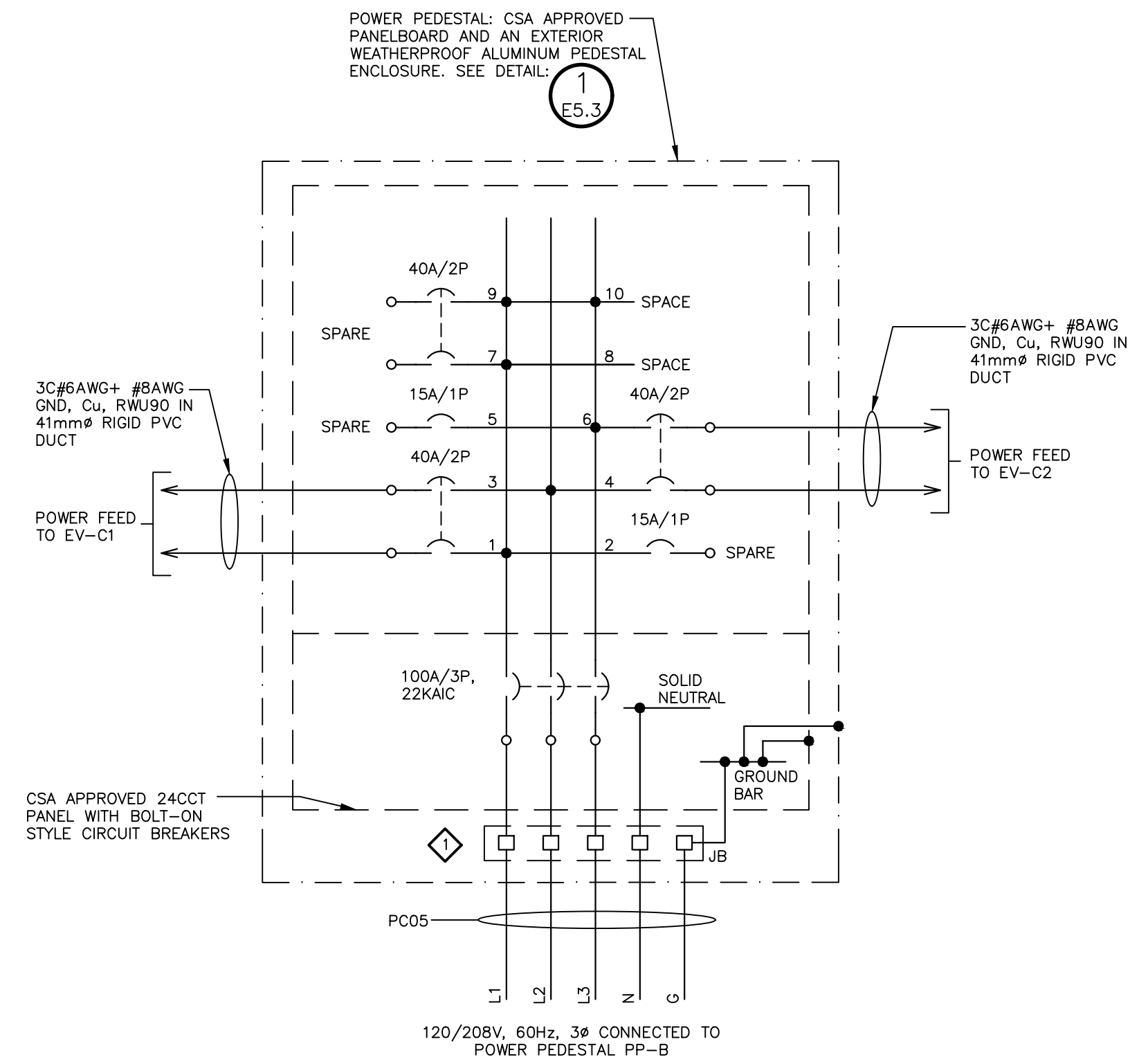
**1 UNMETERED EV CHARGER PEDESTAL DETAIL, TYPICAL.**

E5.3 - NTS, DIMENSIONS SHOWN IN MILLIMETRES (mm)  
- TYPICAL FOR PP-A AND PP-C



**2 "PP-A" UNMETERED EV CHARGER PEDESTAL WIRING DIAGRAM**

E5.3 - NTS, DIMENSIONS SHOWN IN MILLIMETRES (mm). SEE DRAWING E5.1 FOR CABLE PC04 DESCRIPTION.



**3 "PP-C" UNMETERED EV CHARGER PEDESTAL WIRING DIAGRAM**

E5.3 - NTS, DIMENSIONS SHOWN IN MILLIMETRES (mm). SEE DRAWING E5.1 FOR CABLE PC05 DESCRIPTION.  
◇ PROVIDE A JUNCTION BOX WITH POWER DISTRIBUTION BLOCKS AT BOTH END TO TRANSITION CONDUCTORS TO FEEDER BREAKER. LOCATE JUNCTION BOX INSIDE PEDESTAL.

NOT FOR CONSTRUCTION

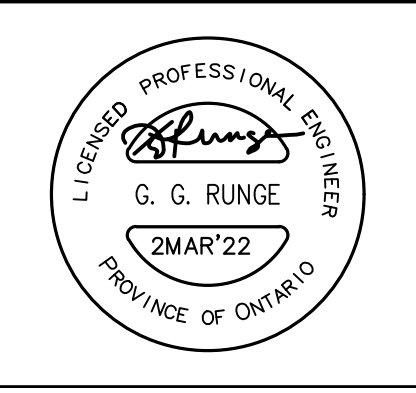
NO.	REVISIONS	DATE	INITIAL
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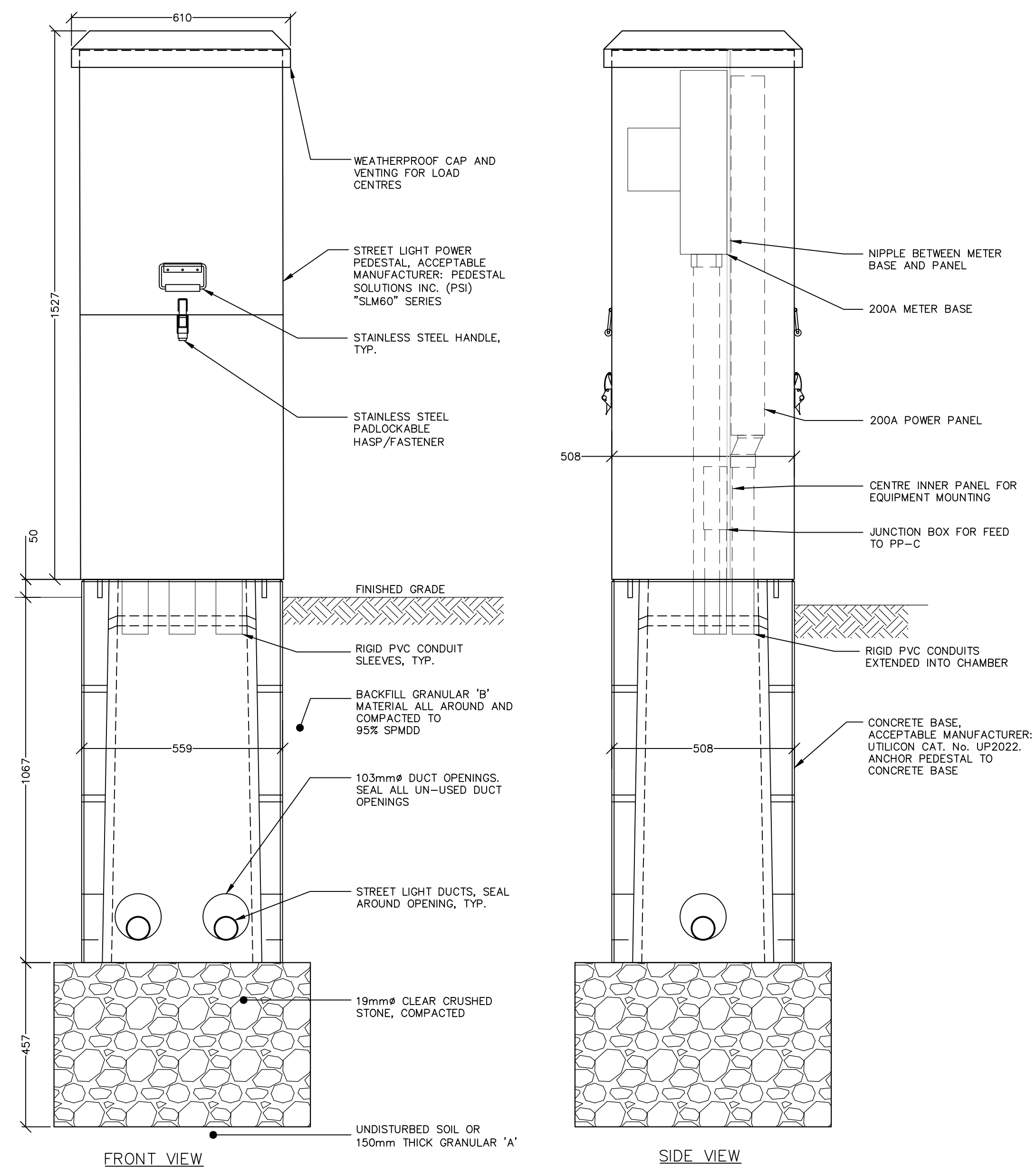
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TYPICAL EV CHARGER PEDESTAL  
DETAILS

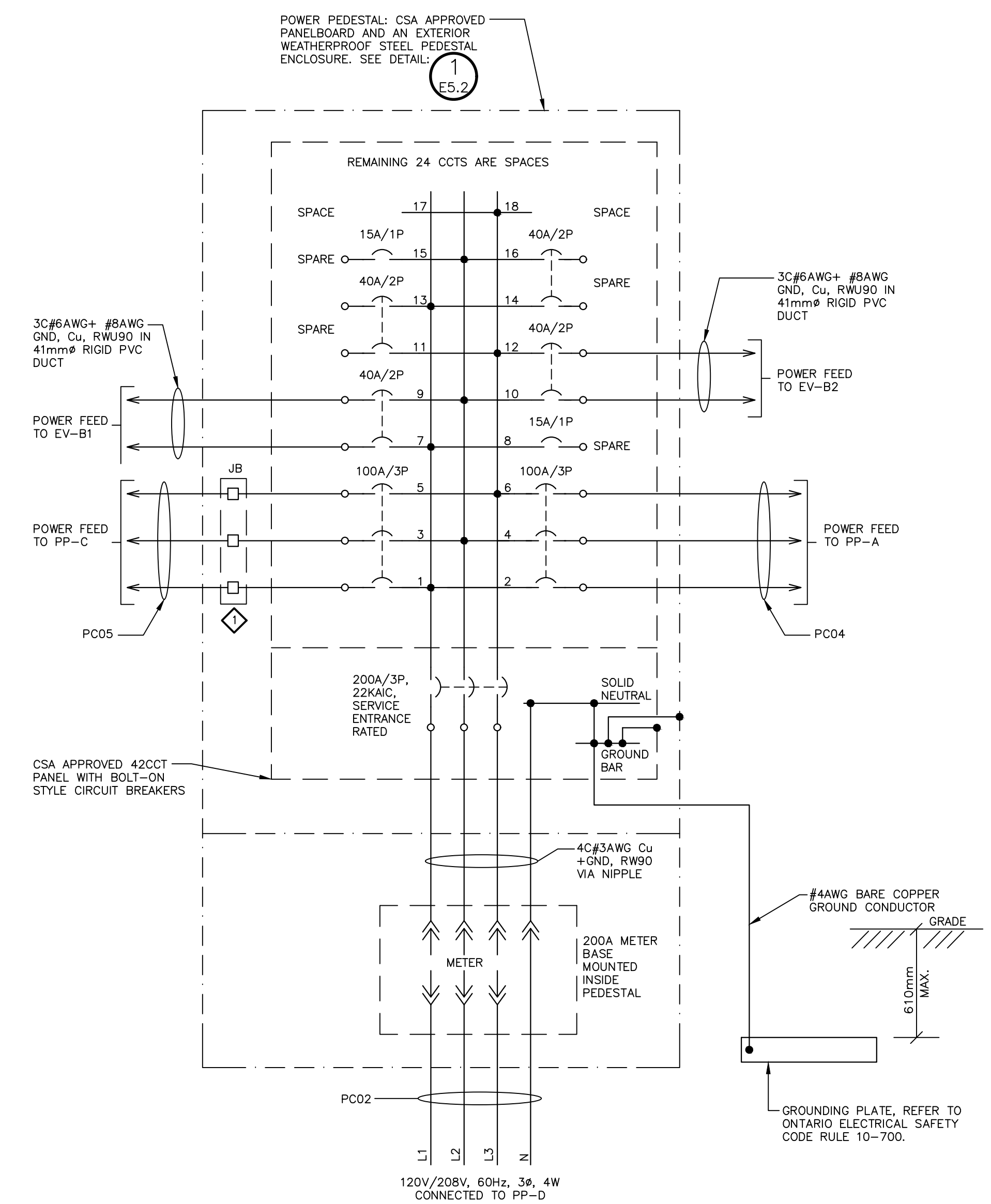
**RUNGE ENGINEERING**

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**1** PP-B: METERED 3 $\varnothing$  120/208 POWER PEDESTAL DETAIL  
 E5.4 - NTS, DIMENSIONS SHOWN IN MILLIMETRES (mm)



**2** "PP-B" POWER PEDESTAL WIRING DIAGRAM  
 E5.4 - NTS, DIMENSIONS SHOWN IN MILLIMETRES (mm). SEE DRAWING E5.1 FOR CABLES PC02, PC04 AND PC05 DESCRIPTION.  
 PROVIDE A JUNCTION BOX WITH POWER DISTRIBUTION BLOCKS AT BOTH ENDS TO TRANSITION CONDUCTORS TO FEEDER. LOCATE JUNCTION BOX INSIDE PEDESTAL.

NOT FOR CONSTRUCTION

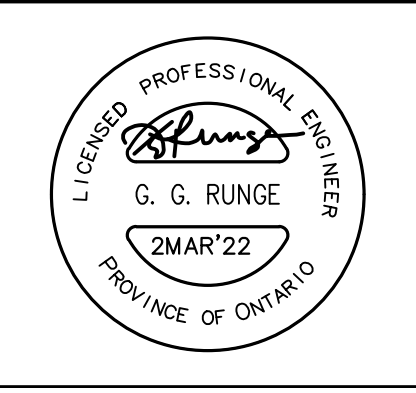
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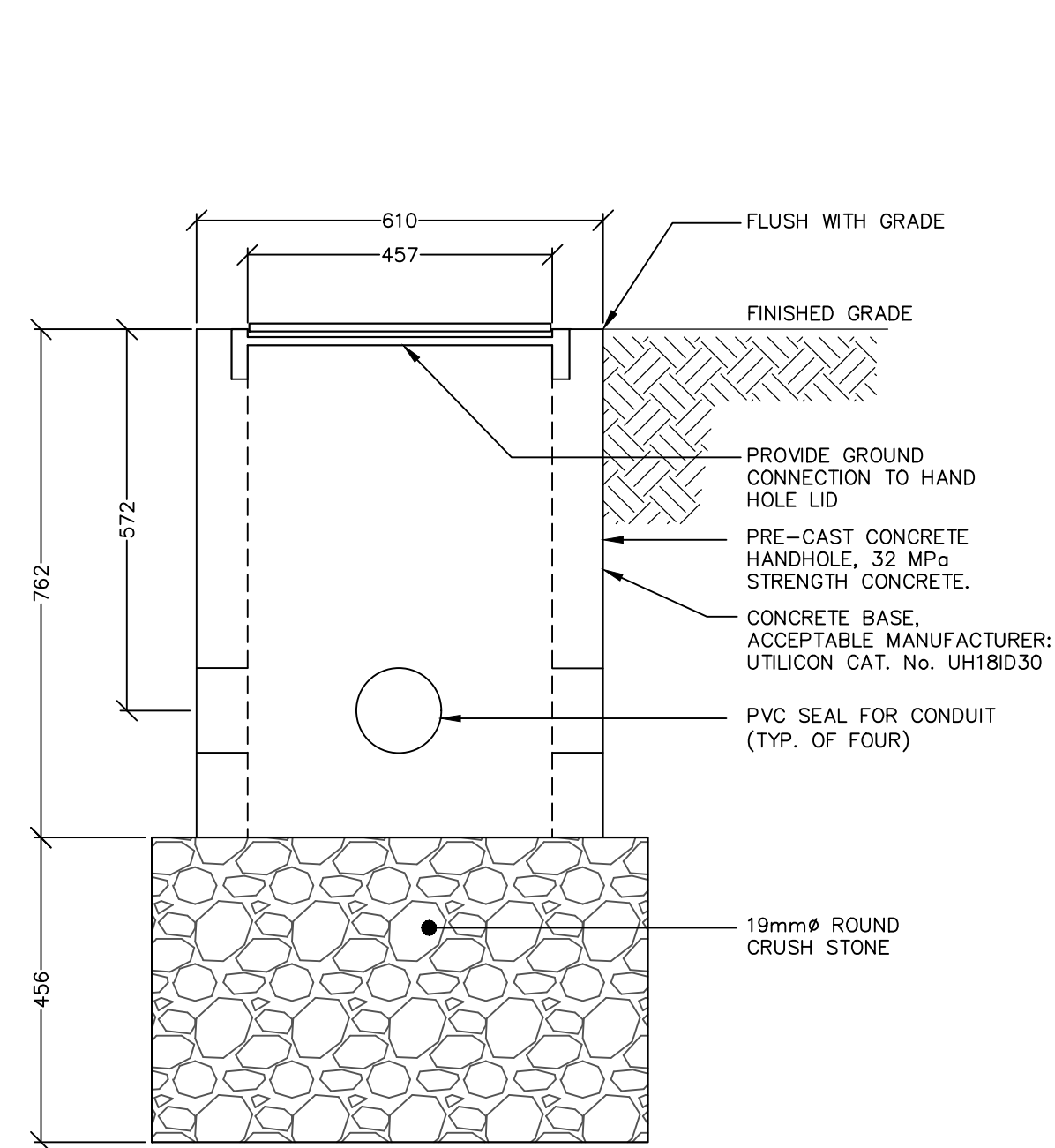
PRATT HANSEN GROUP INC.  
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 CITY OF BARRIE

ELECTRICAL POWER PEDESTAL  
 PP-B DETAILS

**RUNGE ENGINEERING**

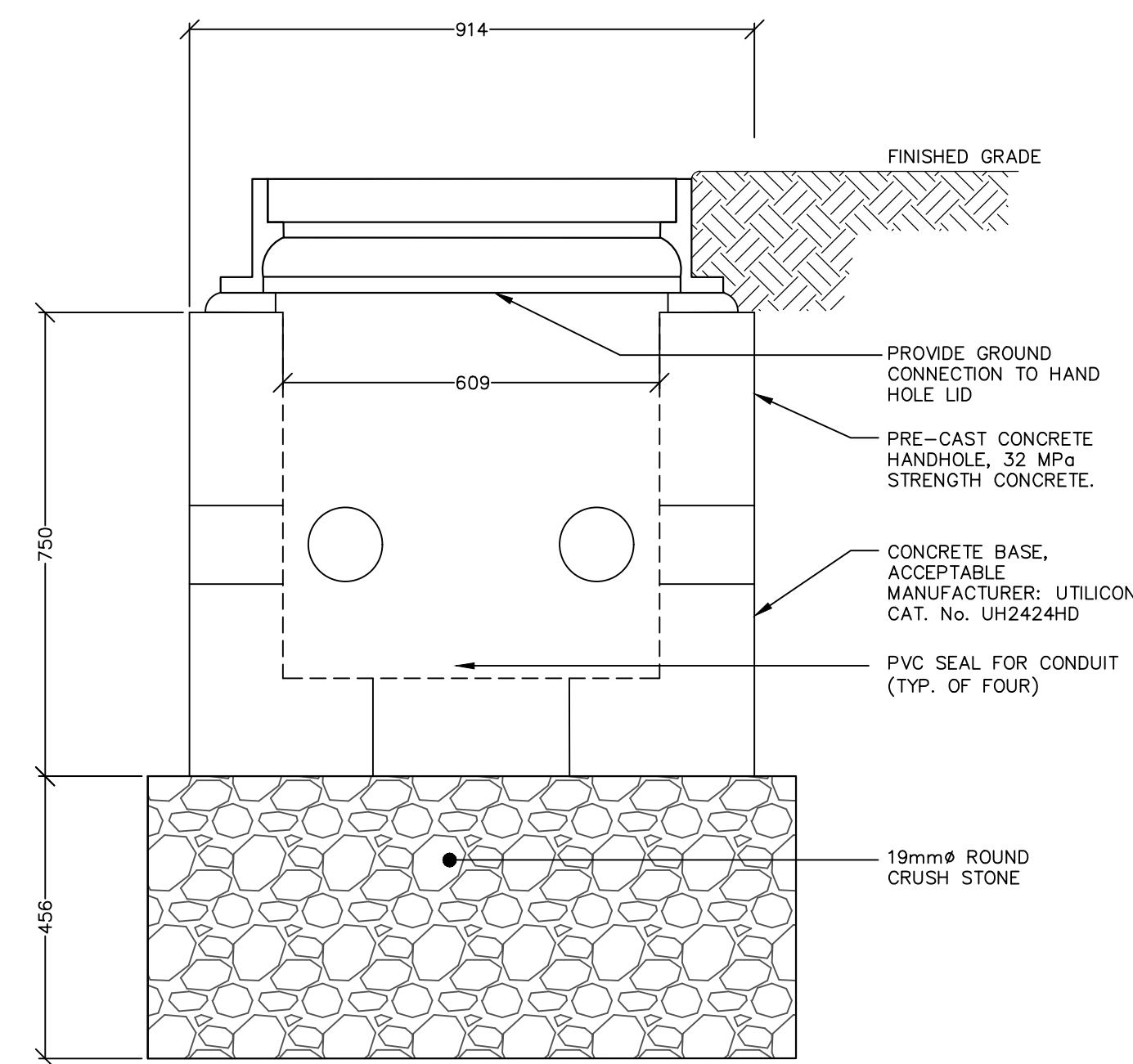
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DESIGN	GGR	SCALE: AS SHOWN	DATE	JANUARY, 2021
DRAWN	JS	PROJECT	DWG. NO	
CHECKED	GGR	20137P	E5.4	



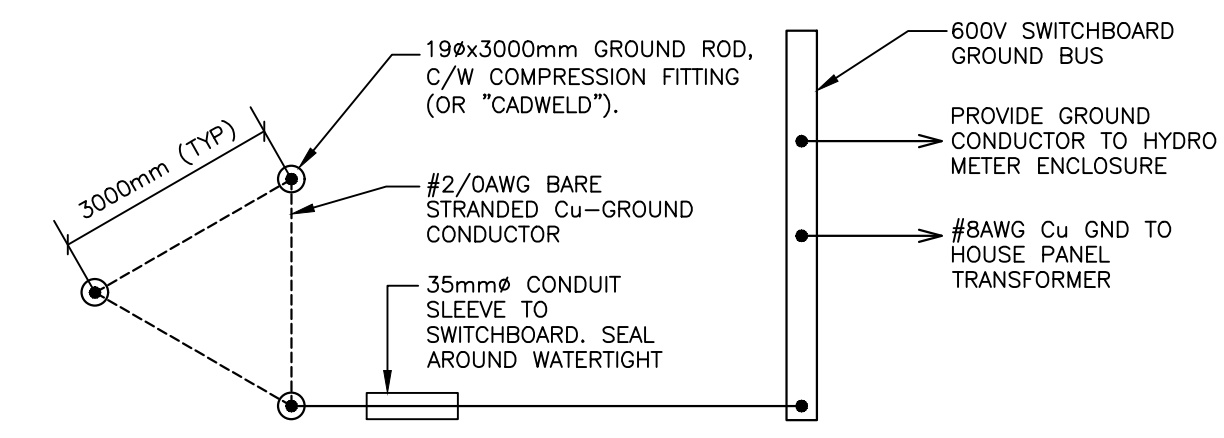
**5 HAND HOLE DETAIL, TYPICAL**

E5.5  
 - NTS, DIMENSIONS SHOWN IN MILLIMETERS (mm)  
 - REFERENCE OPSD 2112.02 AND 2117.02 STANDARDS  
 - TYPICAL DETAIL FOR HANDHOLES HH1 TO HH4



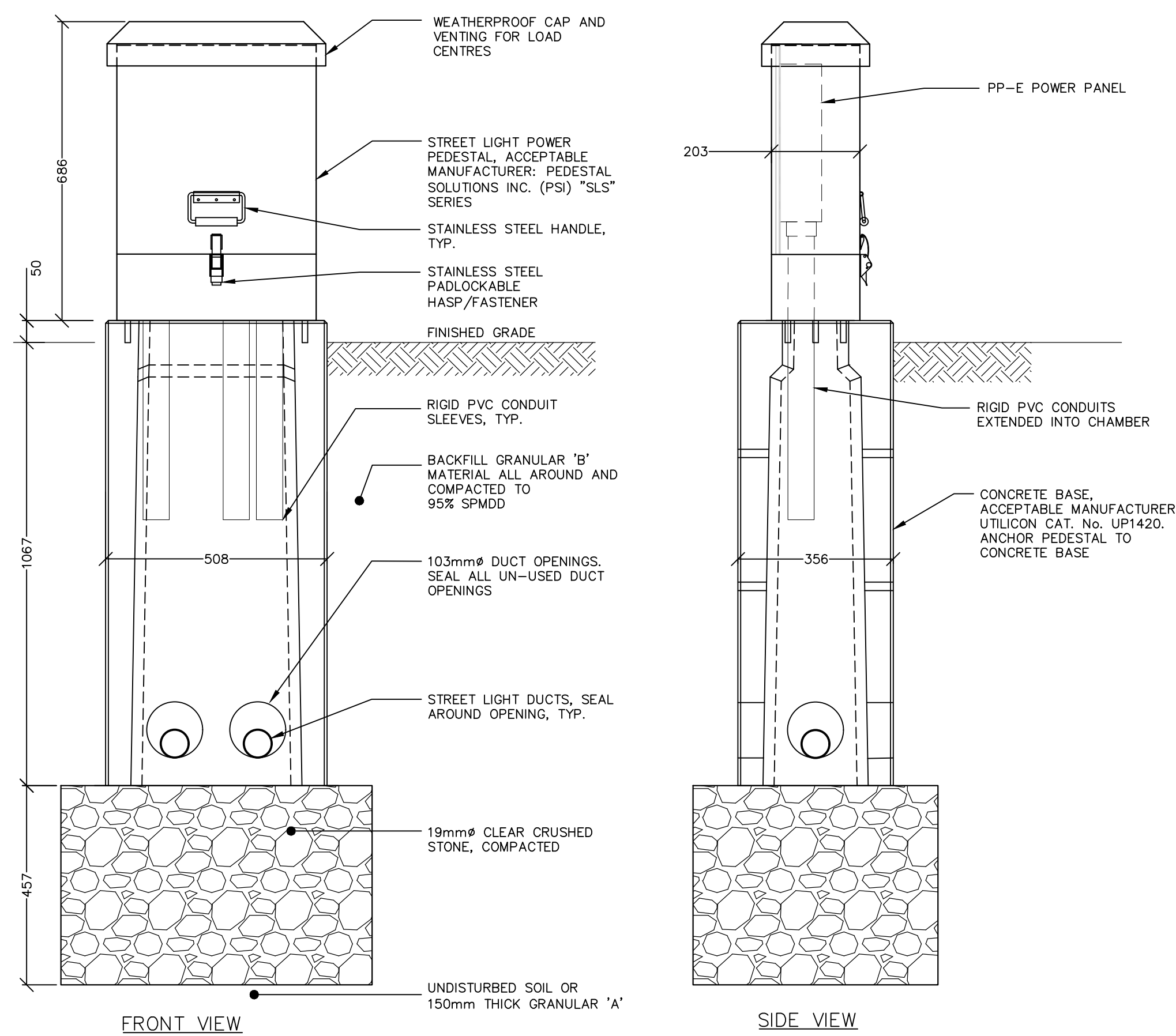
**4 PULL BOX 1 (PB1) DETAIL**

E5.5  
 - NTS, DIMENSIONS SHOWN IN MILLIMETERS (mm)  
 - REFERENCE OPSD 2112.040, OPSD 2117.02, OPSD 401.01 TYPE A STANDARDS  
 - TYPICAL DETAIL FOR PULL BOXES PB1 TO PB2



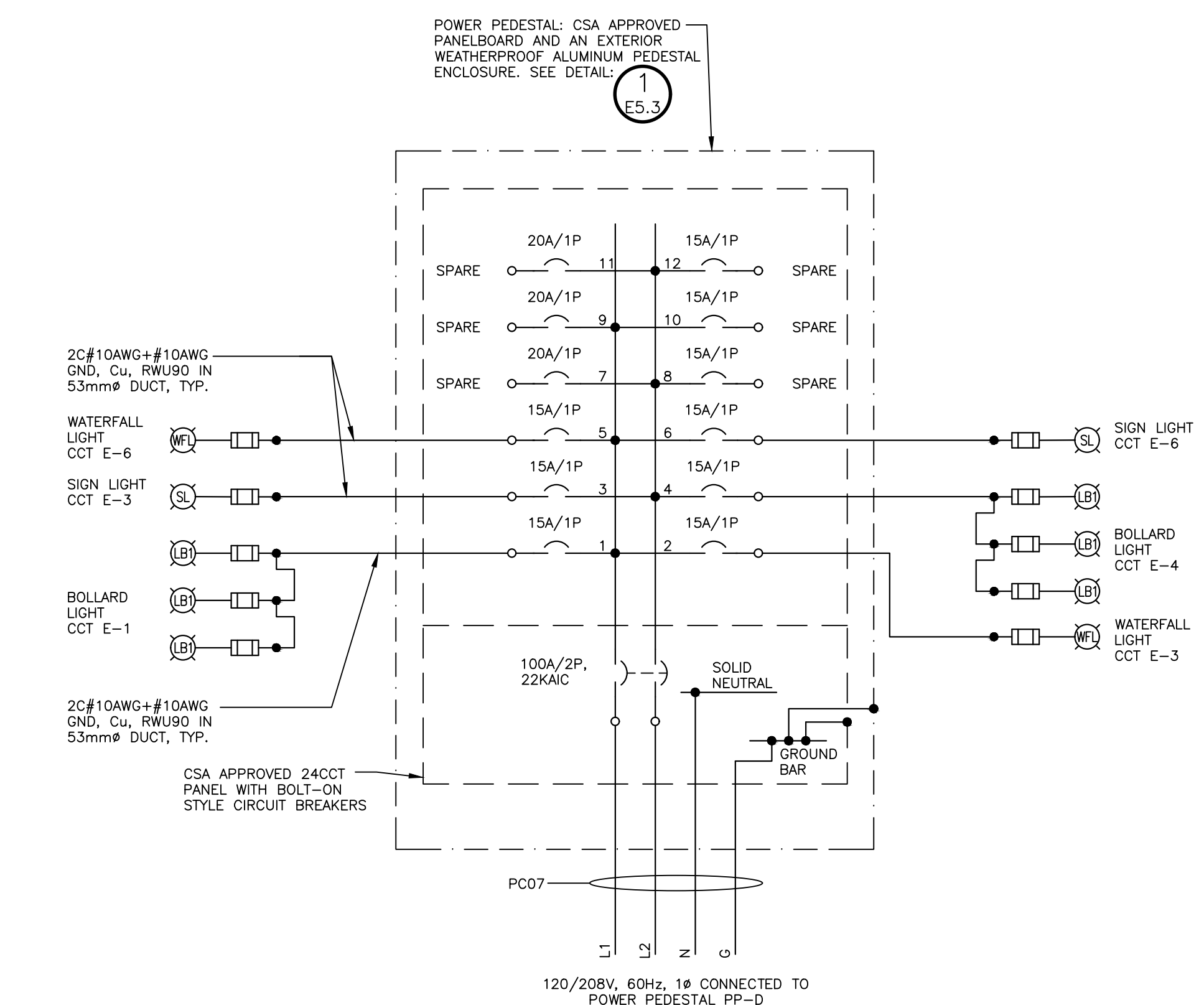
**3 TYP., GROUND GRID DETAIL**

E5.5  
 - NTS, DIMENSIONS SHOWN IN mm  
 - ONLY MAIN ELECTRICAL EQUIPMENT SHOWN  
 - TYPICAL GROUND GRID FOR EACH BUILDING



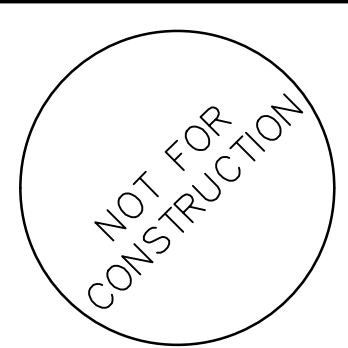
**1 PP-E: UNMETERED 10 120/208 POWER PEDESTAL DETAIL**

E5.5  
 - NTS, DIMENSIONS SHOWN IN MILLIMETRES (mm)



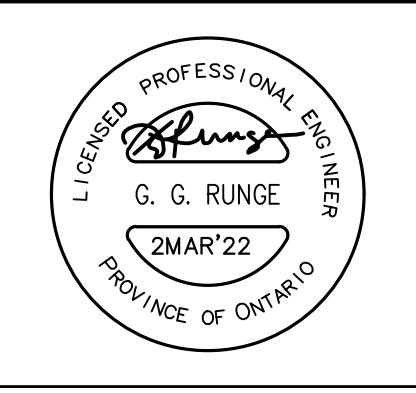
**2 "PP-E" UNMETERED POWER PEDESTAL WIRING DIAGRAM**

E5.5  
 - NTS, DIMENSIONS SHOWN IN MILLIMETRES (mm). SEE DRAWING E5.1 FOR CABLE PC07 DESCRIPTION.



NO.	REVISIONS	DATE	INITIAL
1.	FIRST SUBMISSION TO CITY OF BARRIE	2021 FEB 12	GGR
2.	SECOND SUBMISSION TO CITY OF BARRIE	2021 AUG 31	GGR
3.	THIRD SUBMISSION TO CITY OF BARRIE	2021 DEC 21	GGR
4.	FOURTH SUBMISSION TO CITY OF BARRIE	2022 MAR 2	GGR

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 2. The contractor shall verify all dimensions, levels, and datums on site and report any discrepancies or omissions to this office prior to construction.  
 3. This drawing is to be read and understood in conjunction with all other plans and documents applicable to this project.  
 4. Drawing revision must be noted "Issued For Construction" before any work commences.



PRATT HANSEN GROUP INC.  
 BISTRO 6 WEST  
 CITY OF BARRIE

ELECTRICAL POWER PEDESTAL  
 PP-B & MISCELLANEOUS DETAILS

**RUNGE ENGINEERING**

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DESIGN	GGR	SCALE: AS SHOWN	DATE: JANUARY, 2021
DRAWN	JS	PROJECT	DWG. NO
CHECKED	GGR	20137P	E5.5