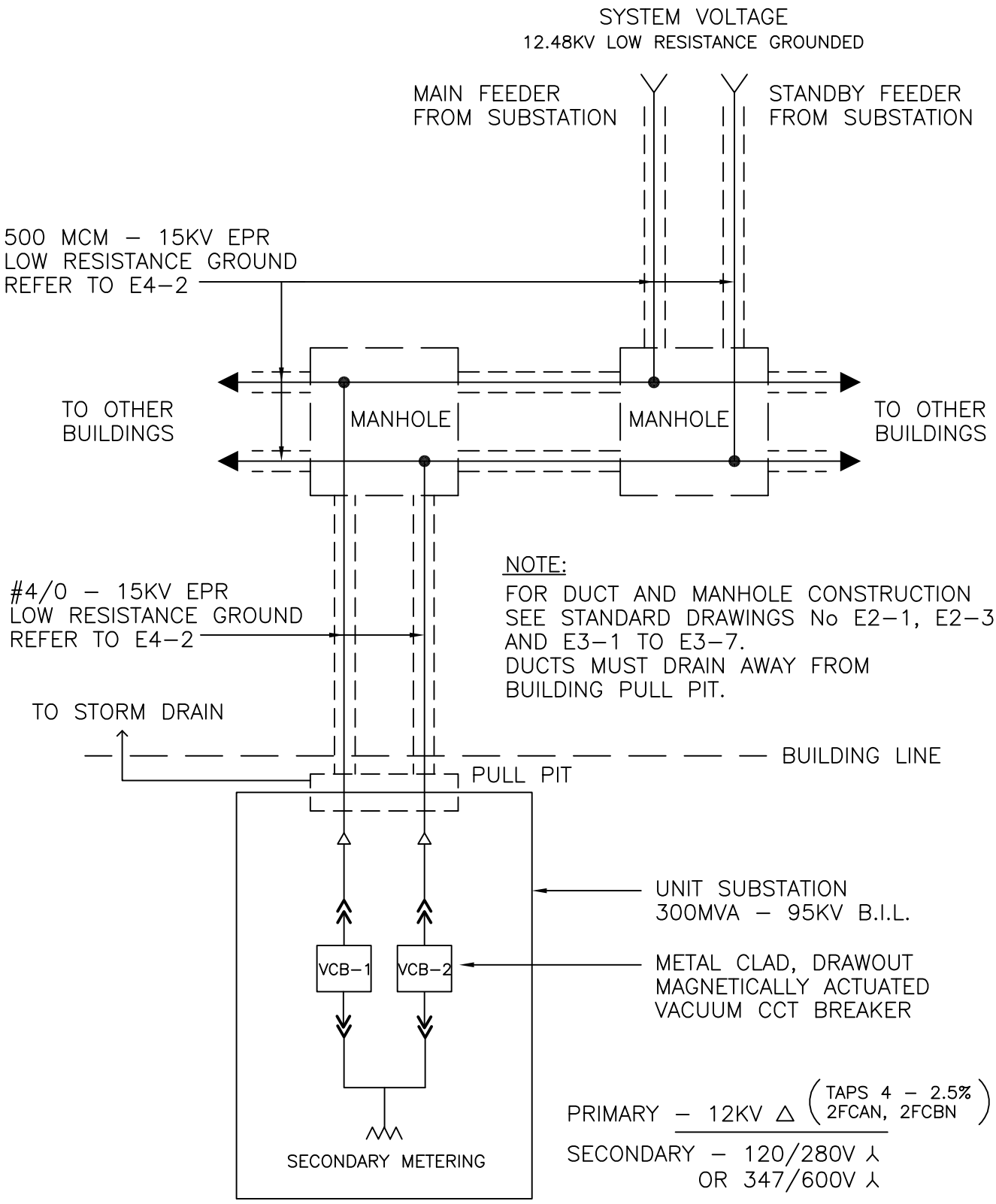
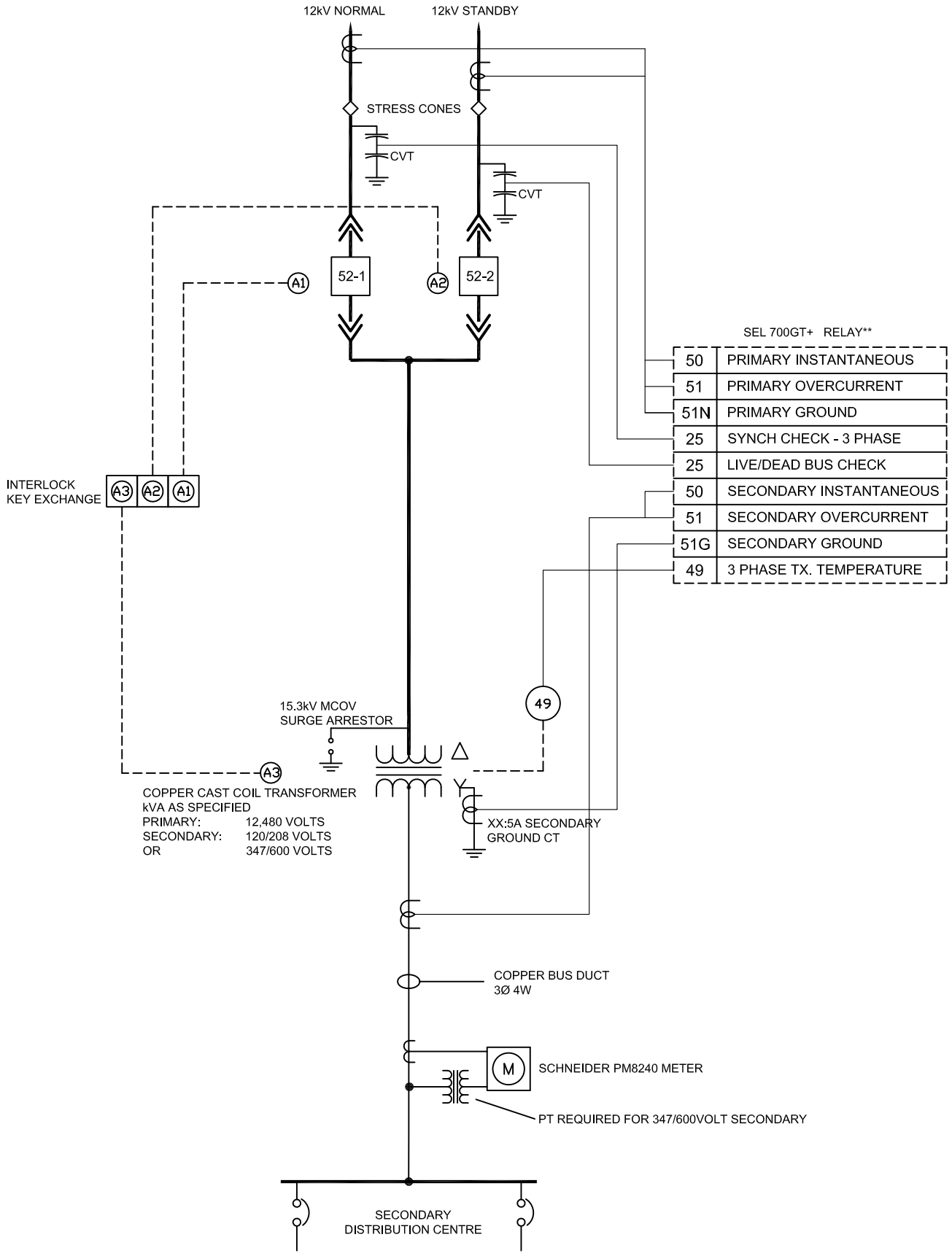


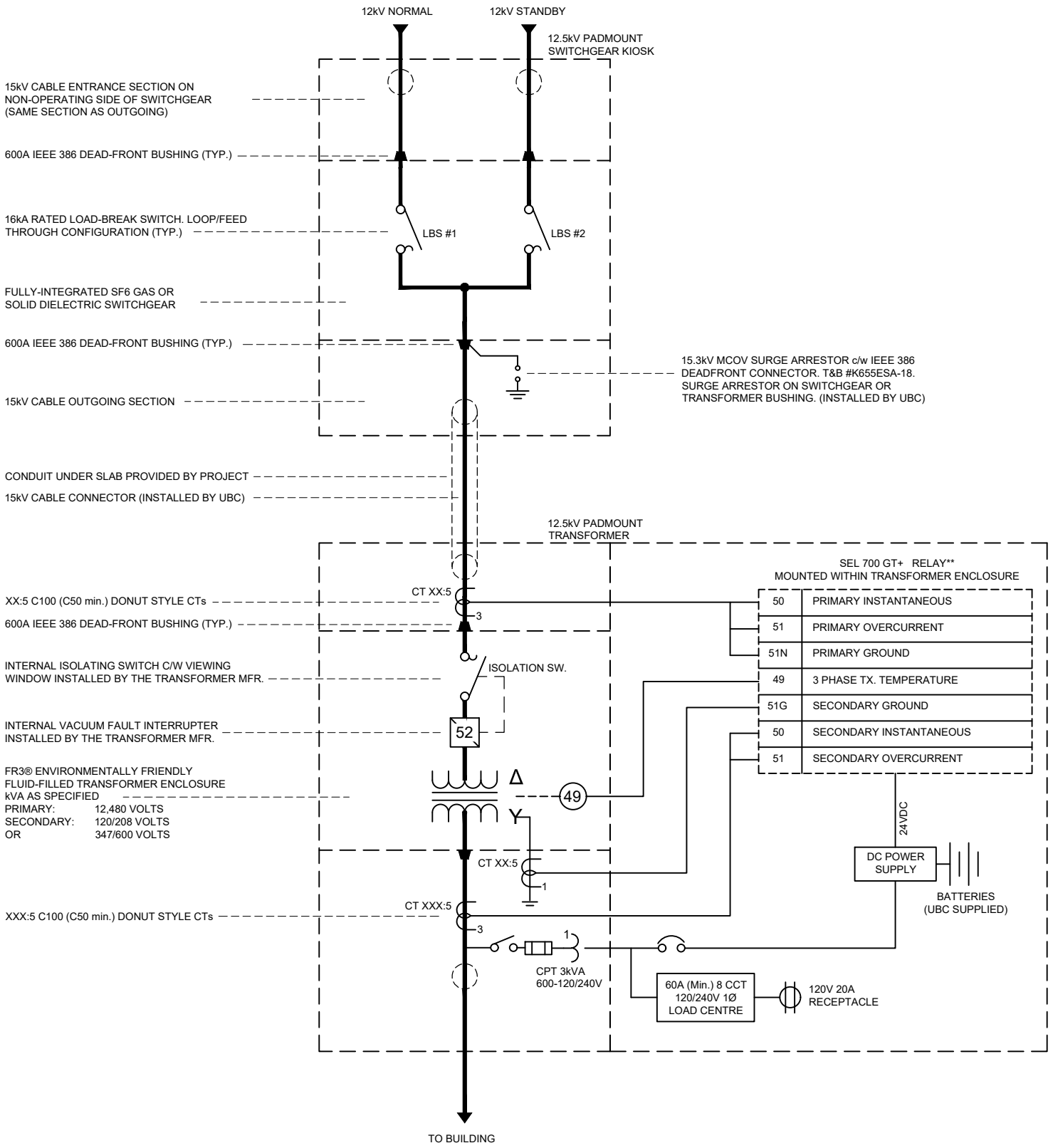
UBC UTILITIES UNIVERSITY OF BRITISH COLUMBIA	REVISION: 2 DATE: 19/02/13 DRAWN: ATR APPROVED: RH	SINGLE LINE DIAGRAM DISTRIBUTION SYSTEMS 12KV DUAL RADIAL FEEDERS TYPICAL BUILDING SUPPLY	STANDARD No **E1-1**



** The following part numbers are for 24 or 48 VDC applications:

SEL-700GT+ Part Number: 0700GT2B3B2X75860600 Key: 1777

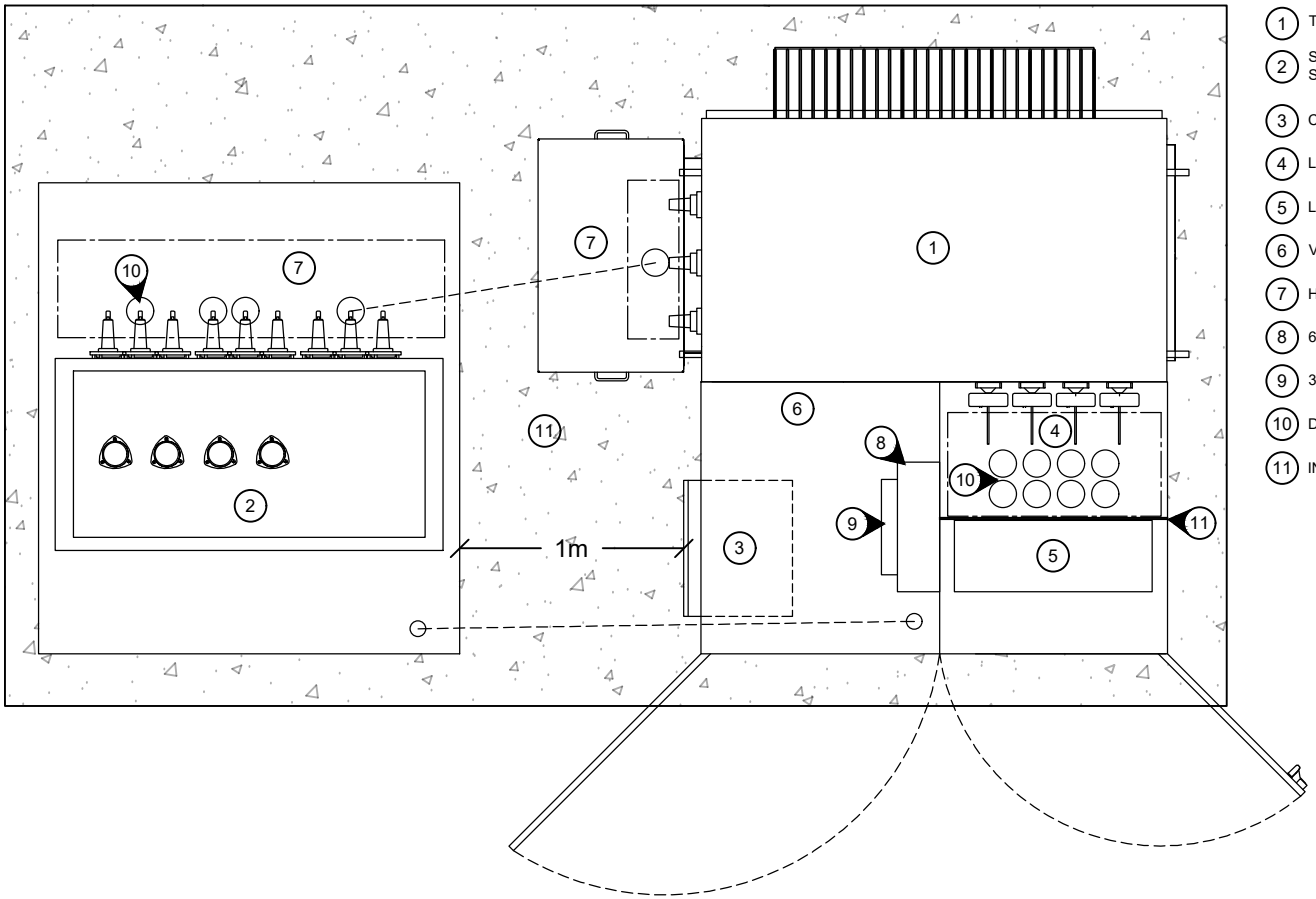
UBC UTILITIES UNIVERSITY OF BRITISH COLUMBIA	REVISION: 3 DATE: 18/02/17 DRAWN: RH APPROVED: RH	ELECTRICAL UNIT SUBSTATION ONE LINE DIAGRAM	STANDARD No **E1-2**



** The following part numbers are for 24 or 48 VDC applications:

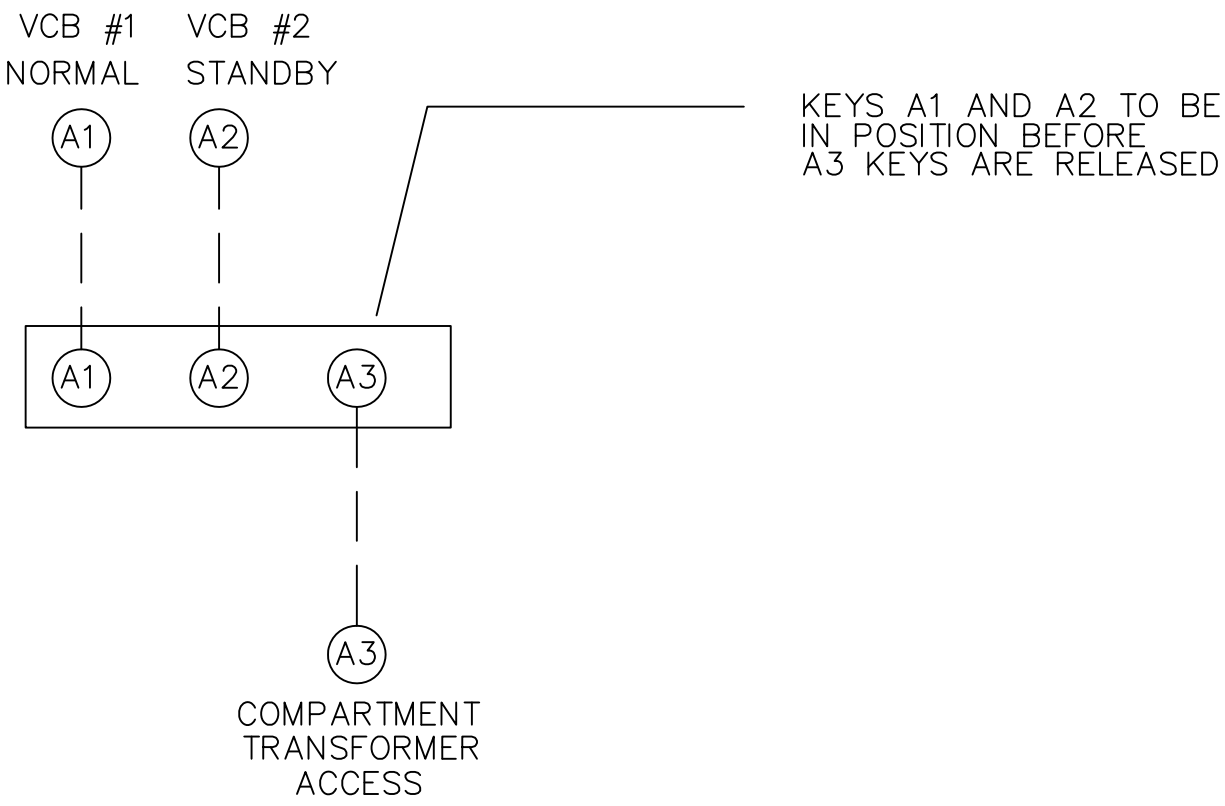
SEL-700GT+ Part Number: 0700GT2B3B2X75860600 Key: 1777

UBC UTILITIES UNIVERSITY OF BRITISH COLUMBIA	REVISION: 1 DATE: 23/08/21 DRAWN: CCC APPROVED: RNH	ELECTRICAL OUTDOOR UNIT SUBSTATION ONE LINE DIAGRAM	STANDARD No. **E1-2b**



1. TRANSFORMER C/W INTERGRATED VFI
2. SOLID DIELECTRIC or GAS INSULATED SWITCHGEAR C/W ENCLOSURE
3. CONTROL CABINET
4. LOW-VOLTAGE BUSHING SECTION
5. LOW-VOLTAGE DISTRIBUTION (IF REQUIRED)
6. VFI OPERATING SECTION
7. HIGH-VOLTAGE BUSHING SECTION
8. 60A 120/240 8cct LOADCENTRE
9. 3kVA 600-120/240 CONTROL TRANSFORMER
10. DBII OR RPVC CONDUIT IN WELL (TYP.)
11. INSULATING BARRIER IF NO DISTRIBUTION INSTALLED

UBC ENERGY & WATER UNIVERSITY OF BRITISH COLUMBIA	REVISION: 0 DATE: 26/08/21 DRAWN: CCC APPROVED: RNH	OUTDOOR SUBSTATION GENERAL LAYOUT	STANDARD No **E1-2c**

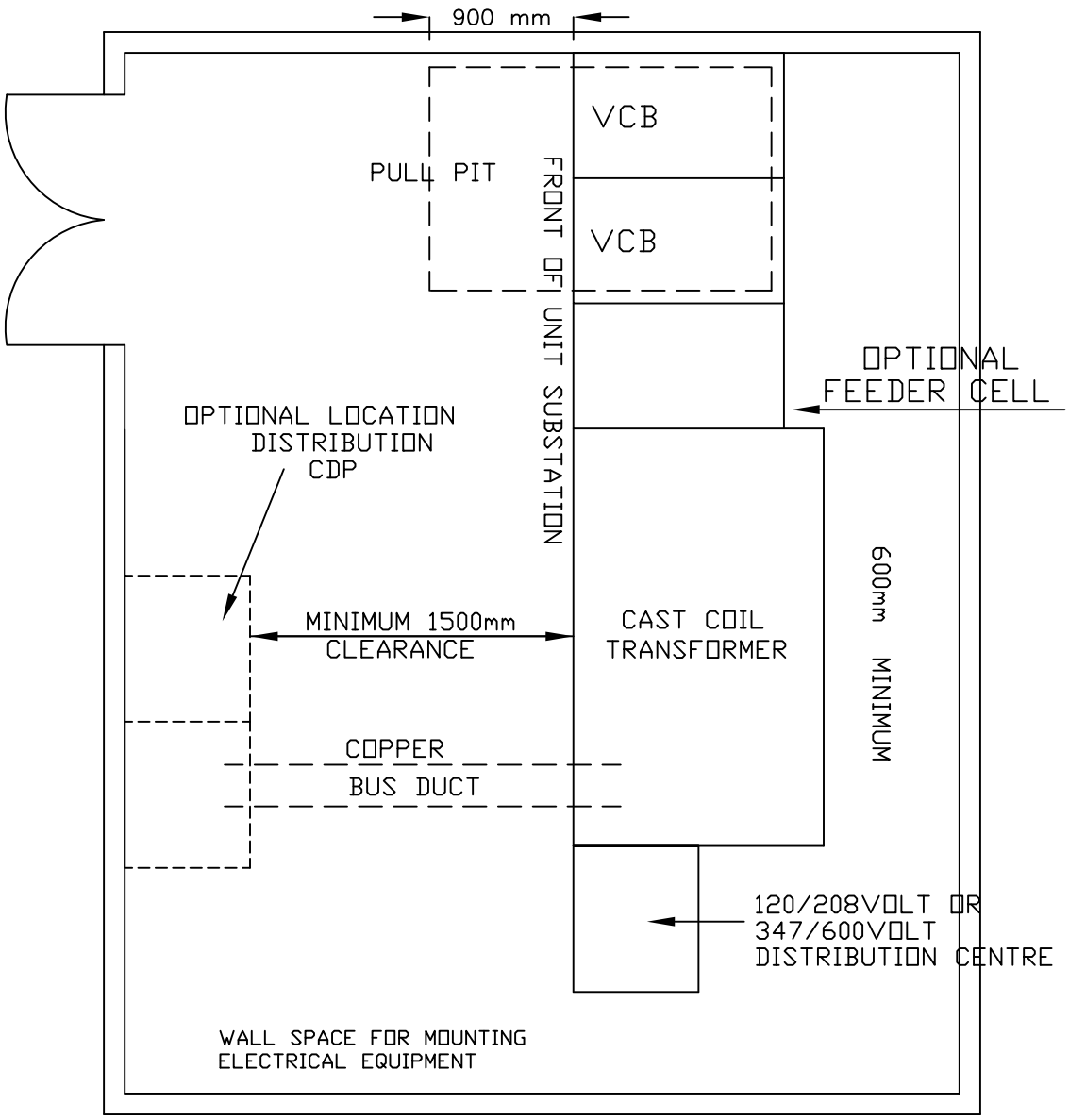


NOTES

1. ACCESS TO ALL HIGH VOLTAGE EQUIPMENT IS TO BE INTERLOCKED USING KEY A3 AS DESCRIBED BELOW.

2. A1 KEY IS RELEASED WHEN LBS #1 IS IN OPEN POSITION
   A2 KEY IS RELEASED WHEN LBS #2 IS IN OPEN POSITION
   A3 KEYS ARE RELEASED WHEN KEYS A1 & A2 ARE INSERTED INTO KEY EXCHANGE
   WHEN AN A3 KEY IS REMOVED, KEYS A1 & A2 REMAIN CAPTIVE

UBC UTILITIES UNIVERSITY OF BRITISH COLUMBIA	REVISION: 2 DATE: 18/02/13 DRAWN: ATR APPROVED: RH	ELECTRICAL UNIT SUBSTATION KEY INTERLOCKS	STANDARD No **E1-3**



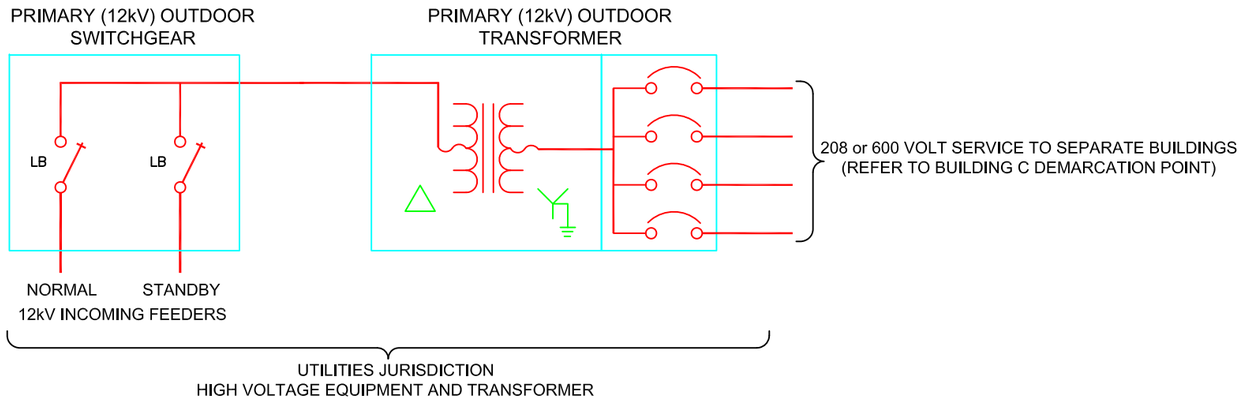
* MINIMUM CEILING HEIGHT 10'

TYPICAL DIMENSIONS	W	D	H
VCB	36" (915mm)	60" (915mm)	90" (2300mm)
TRANSFORMER-500kVA	88" (2250mm)	66" (1700mm)	72" (1850mm)
TRANSFORMER-750kVA	96" (2450mm)	66" (1700mm)	90" (2300mm)
TRANSFORMER-1000kVA	96" (2450mm)	66" (1700mm)	90" (2300mm)
TRANSFORMER-1500kVA	96" (2450mm)	66" (1700mm)	90" (2300mm)

* LAYOUT BASED ON NO REAR ACCESS TO EQUIPMENT

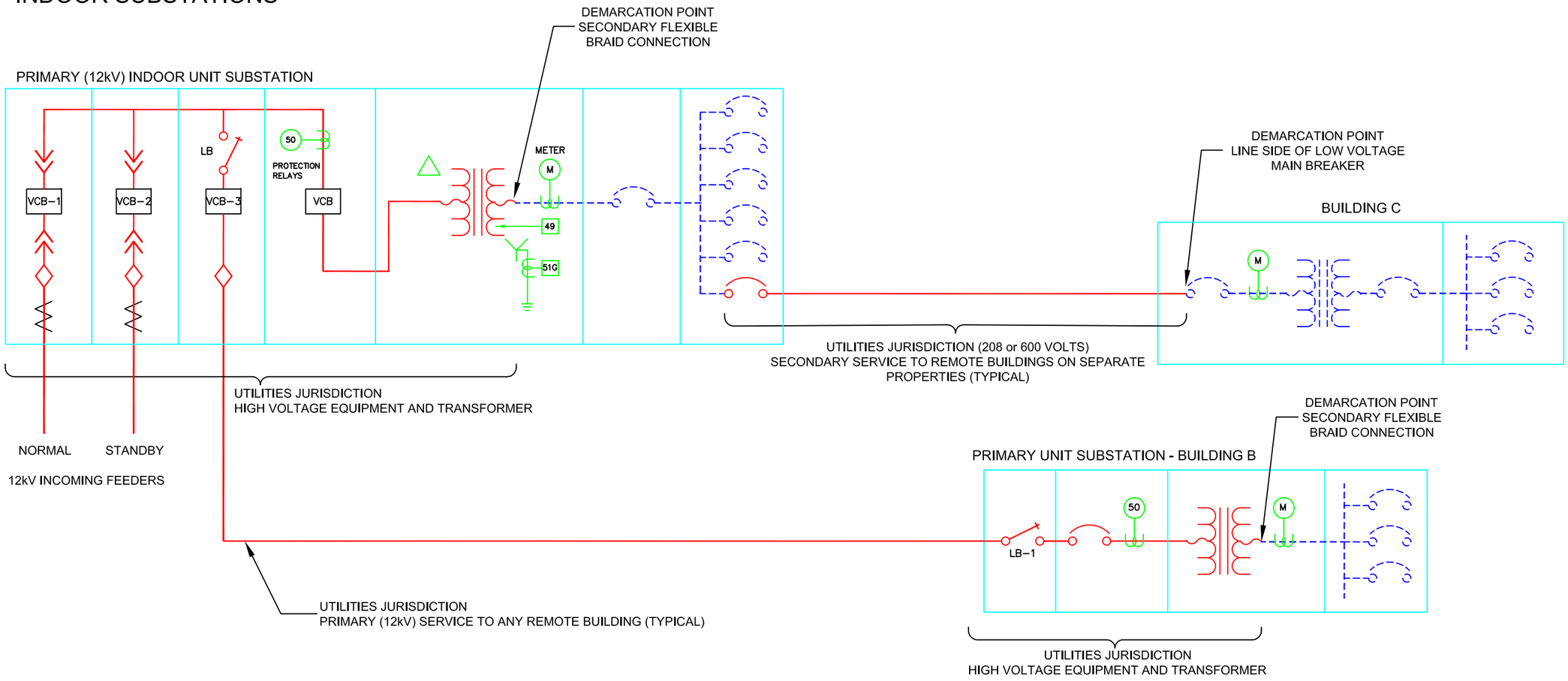
UBC UTILITIES UNIVERSITY OF BRITISH COLUMBIA	REVISION: 2 DATE: 18/02/13 DRAWN: ATR APPROVED: RH	TYPICAL ELECTRICAL ROOM LAYOUT	STANDARD No **E1-4**

OUTDOOR SUBSTATIONS



1. **UTILITIES OPERATING JURISDICTION**
   - ALL HIGH VOLTAGE EQUIPMENT & TRANSFORMERS INDOORS AND OUTDOORS.
   - ALL OUTDOOR LOW VOLTAGE TRANSFORMERS SUPPLYING SEPARATE BUILDINGS.
   - ALL HIGH VOLTAGE PROTECTION EQUIPMENT & METERING DEVICES.
   - ALL SERVICES TO REMOTE BUILDINGS (NOT ON SAME PROPERTY).
2. **BUILDING OPERATIONS or UBC HOUSING OPERATING JURISDICTION**
   - MAIN SECONDARY POWER DISTRIBUTION CENTRE.
   - ALL PANELS AND SERVICES WITHIN THE BUILDING.
3. **DEMARCATION POINT**
   - SECONDARY FLEXIBLE BRAID CONNECTION.
   - SECONDARY BREAKER OR DISCONNECT LINE SIDE.

INDOOR SUBSTATIONS



THIS DRAWING IS INTENDED TO SHOW EQUIPMENT OPERATIONS AND CONTROL JURISDICTION. IT DOES NOT NECESSARILY INDICATE EQUIPMENT OWNERSHIP

LEGEND

RED SOLID LINES INDICATES UTILITIES JURISDICTION (POWER)

GREEN SOLID LINES INDICATES UTILITIES JURISDICTION (PROTECTION & METERING)

BLUE DASHED LINES INDICATES BUILDING OPERATIONS JURISDICTION (SECONDARY FEEDS W/I BLDGS)

CYAN SOLID LINES INDICATES SUBSTATION CELL ARRANGEMENT

50 PROTECTIVE RELAYS

51G PROTECTIVE RELAYS

M REVENUE METER

LOAD BREAK SWITCH

CIRCUIT BREAKER

FLEXIBLE BRAID LINK

NO.	DATE	REVISIONS	BY
4	18/02/26	DEMARCATION UPDATE	RNH
3	17/04/08	DRAWING MODS	RNH
2	23/11/99	APPROVED AS SHOWN	RD
1	18/11/99	ISSUED FOR REVIEW	RD

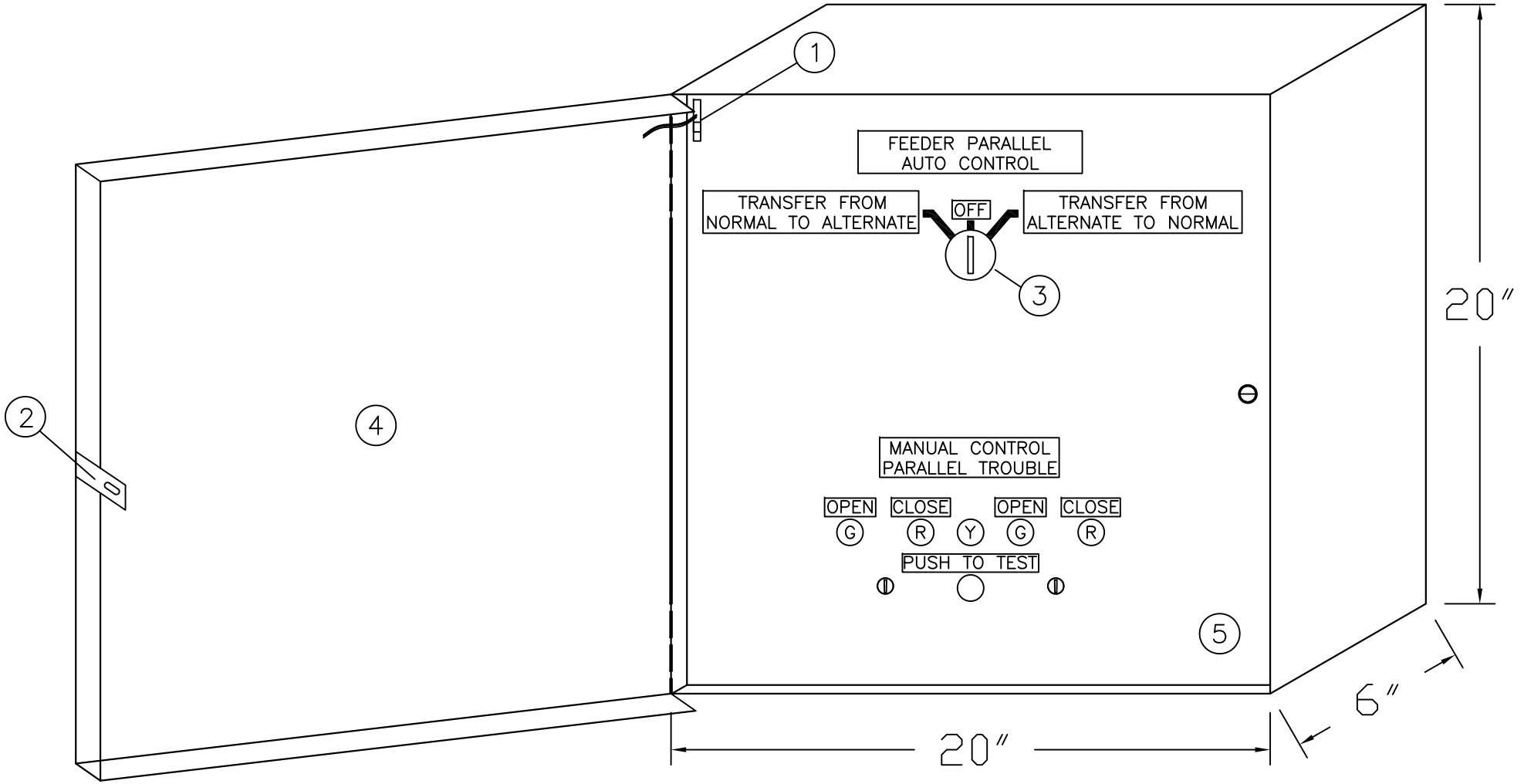
UBC UTILITIES
THE UNIVERSITY OF BRITISH COLUMBIA

BUILDING/FACILITY
ELECTRICAL UTILITY SERVICES

PROJECT TITLE
ELECTRICAL JURISDICTION UTILITIES, PLANT OPERATIONS & UBC HOUSING

DRAWING TITLE
JURISDICATIONAL BLOCK DIAGRAM

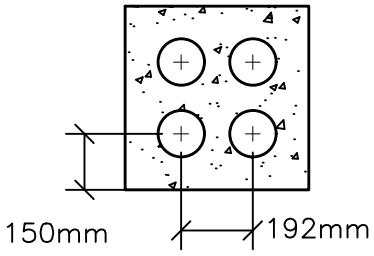
SCALE NTS	DATE 11/12/02
DRAWN RD	STANDARD No. E1-5
REVIEWED KH	
CAD FILENAME E1-5.DWG	
UBC PROJECT NO.	
UBC DRAWING NO. SK-JURISDICTION-ELECTRICAL	REV. 3



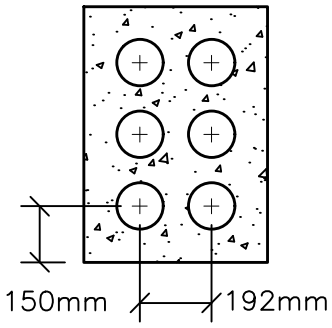
NOTES:

1. DOOR SWITCH - INDICATING LIGHTS OFF WHEN DOOR CLOSED
2. PADLOCK HASP
3. FEEDER SELECTOR SWITCH
4. EXTERIOR DOOR FOR SECURE LIMITED ACCESS
5. INTERIOR DOOR FOR ACCESS TO INTERNAL PARTS & WIRING

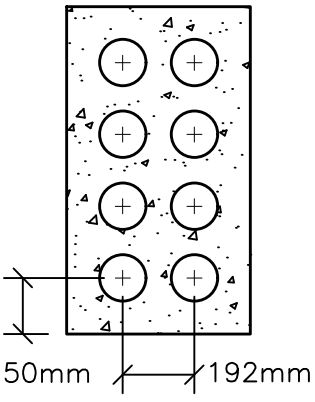
UBC UTILITIES UNIVERSITY OF BRITISH COLUMBIA	REVISION: 0 DATE: 21/02/13 DRAWN: RNH APPROVED: RNH	UNIT SUBSTATION FEEDER TRANSFER CONTROL BOX	STANDARD No **E1-6**



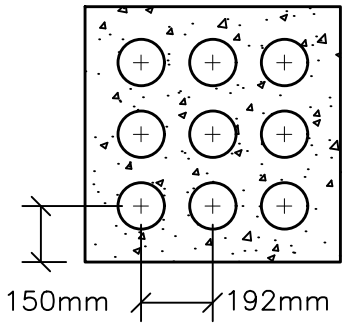
4 DUCT BANK



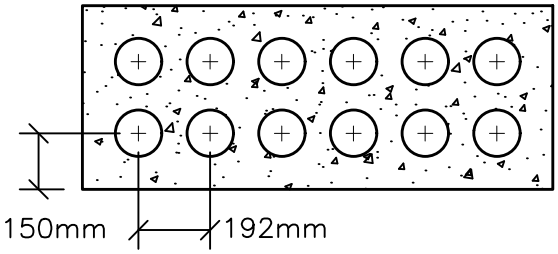
6 DUCT VERTICAL
OR HORIZONTAL



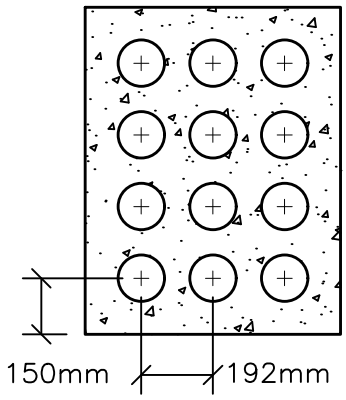
8 DUCT VERTICAL
OR HORIZONTAL



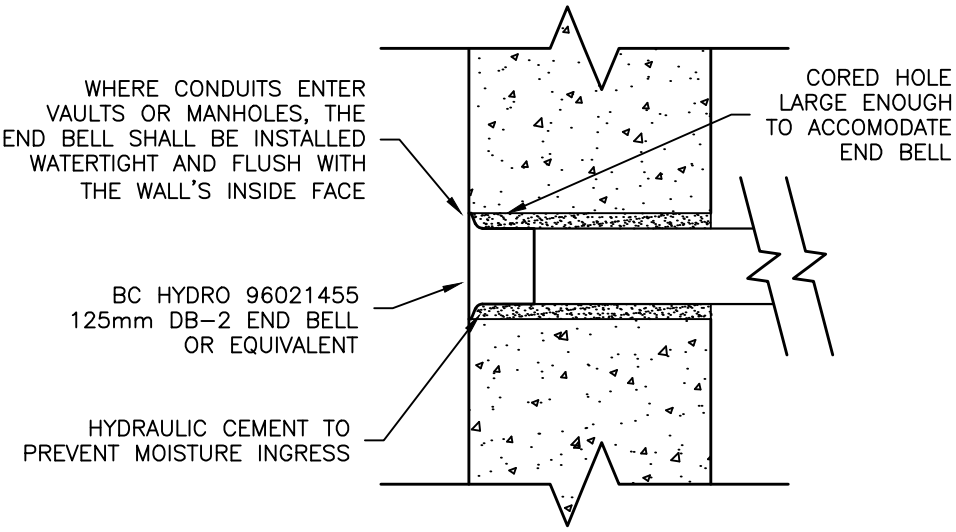
9 DUCT BANK



12 DUCT HORIZONTAL



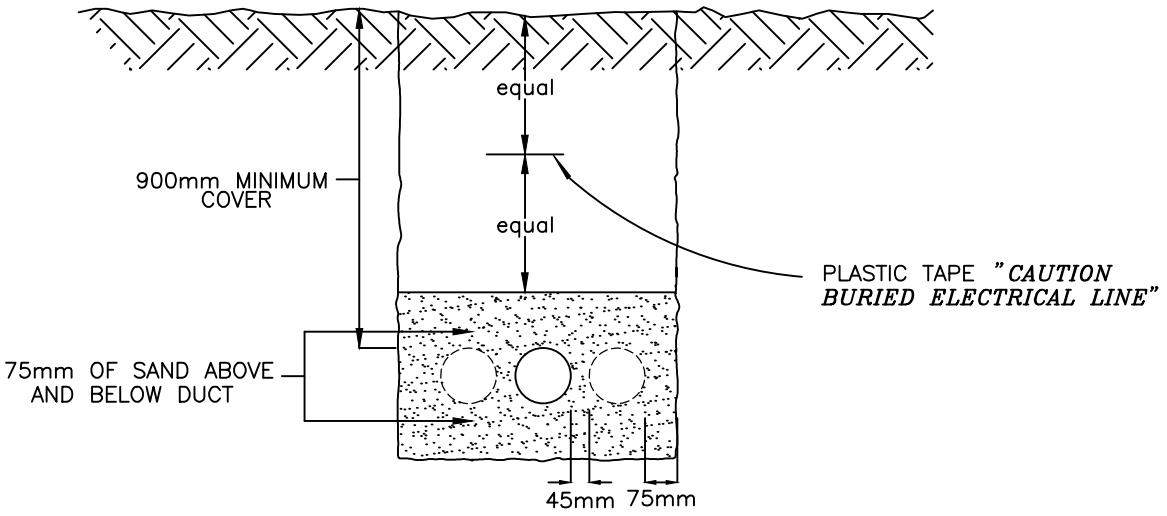
12 DUCT BANK



MANHOLE DUCT ENTRY

1. All duct sizes shall be 125mm DB-2
2. Concrete-encased 125mm duct banks shall be assembled using prefabricated duct spacers IPEX 5W20-2, or approved equivalent.
3. The installation shall comply with spacer manufacturer recommendations.
4. Ducts shall be secured to avoid flatation during the pouring of concrete and to provide uniform concrete cover around the conduits.
5. 100mm ducts used by permission only.
6. All ducts shall drain away from building pull pit.

UBC UTILITIES UNIVERSITY OF BRITISH COLUMBIA	REVISION: 3 DATE: 28/07/21 DRAWN: CCC APPROVED: RNH	STANDARD CONCRETE-ENCASED ELECTRICAL DUCTBANK	STANDARD No **E2-1**

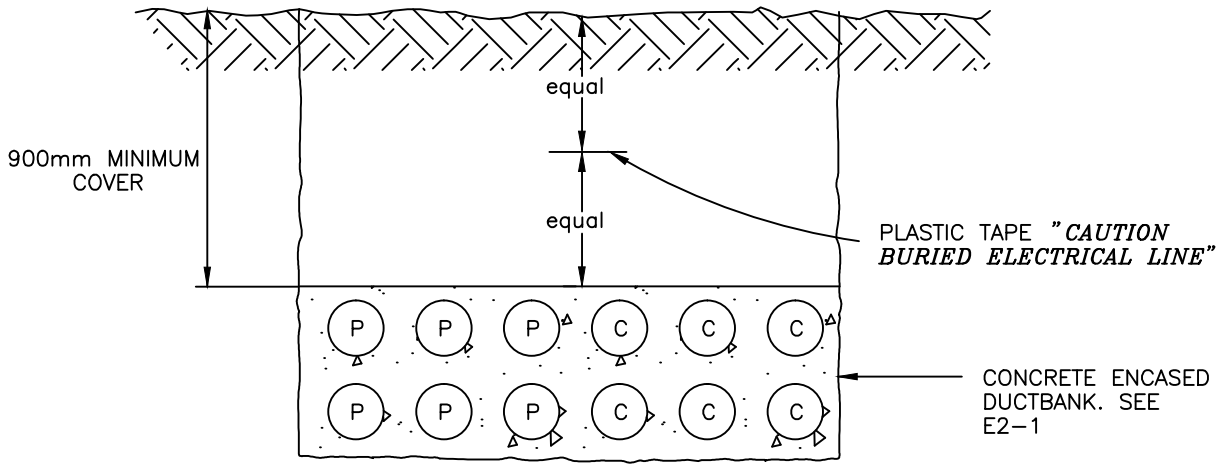


TYPICAL TRENCH DETAIL
FOR DIRECTLY BURIED ELECTRICAL CONDUIT

Notes:

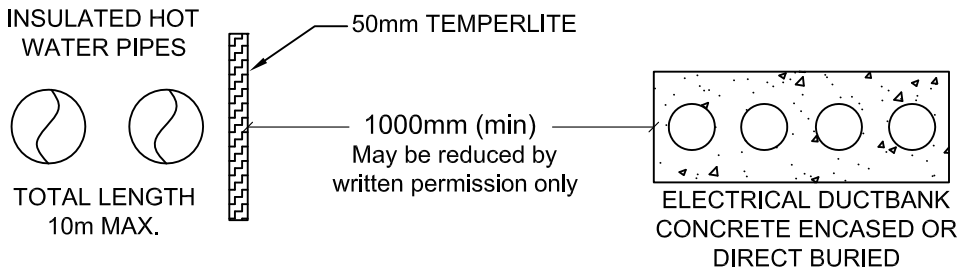
- All power conduits shall be Rigid PVC conduit.
- All conduits used for building services shall be minimum 100mm diam.

UBC UTILITIES UNIVERSITY OF BRITISH COLUMBIA	REVISION: 1 DATE: 11/12/02 DRAWN: RNH APPROVED: KH	STANDARD ELECTRICAL SERVICE CONDUIT DIRECTLY BURIED	STANDARD No **E2-2**

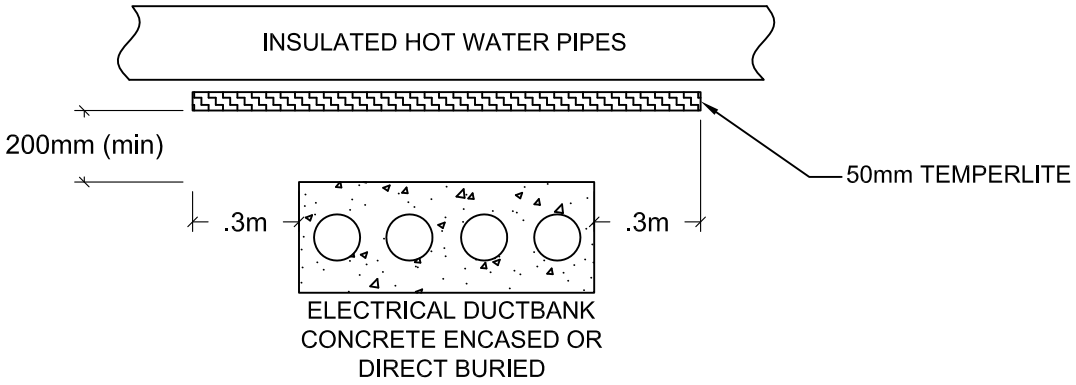


TYPICAL TRENCH DETAIL
FOR CONCRETE ENCASED DUCTBANK

UBC UTILITIES UNIVERSITY OF BRITISH COLUMBIA	REVISION: 1 DATE: 11/12/02 DRAWN: RNH APPROVED: KH	STANDARD ELECTRICAL DUCTBANK CONCRETE ENCASED	STANDARD No **E2-3**



INSULATED HOT WATER PIPES PARALLEL TO DUCTBANKS

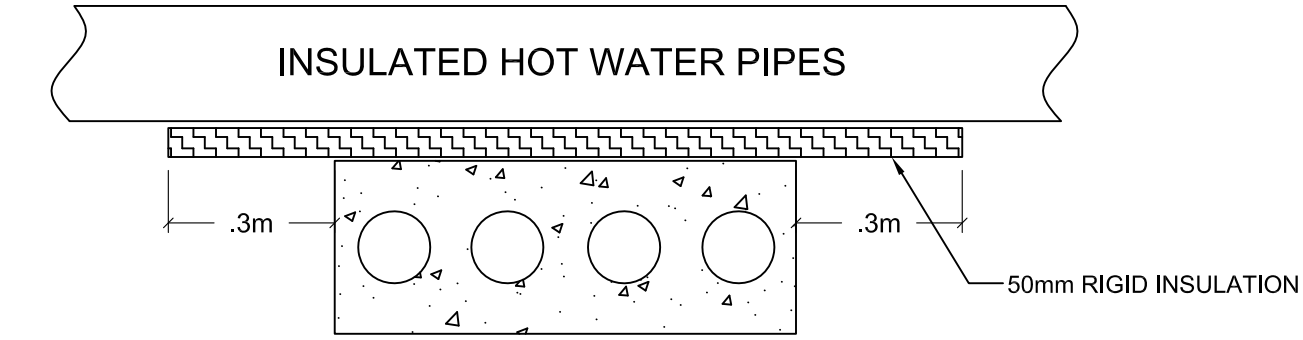


INSULATED HOT WATER PIPES CROSSING DUCTBANKS

NOTES:

1. ALL MEASUREMENTS ARE BASED ON THE HOT WATER PIPING SYSTEM BEING FULLY AND CONTINUOUSLY INSULATED.
2. IN ALL CASES, ELECTRICAL DUCTBANK SHALL NOT RUN PARALLEL TO HOT WATER PIPING FOR LONGER THAN 10m.
3. IN ALL CASES, ELECTRICAL DUCTBANK SHALL NOT RUN DIRECTLY ABOVE HOT WATER PIPING EXCEPT AT CROSSINGS.
4. DRITHERM AND TEMPERLITE PRODUCT AVAILABLE FROM:
   - BURNABY INSULATION SUPPLIES
     5970 BERESFORD ST.
     BURNABY, BC
     604-430-6981

UBC UTILITIES UNIVERSITY OF BRITISH COLUMBIA	REVISION: 1 DATE: 05/07/12 DRAWN: RNH APPROVED:	ELECTRICAL DUCTBANK CLEARANCES TO DES HOT WATER LINES	STANDARD No **E2-4a**

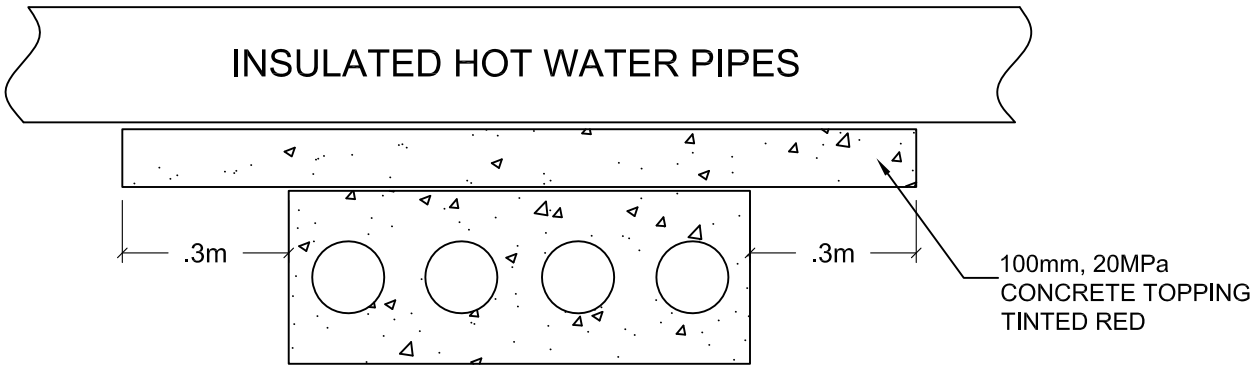


ELECTRICAL DUCTS
** 600 VOLTS OR LESS**
(contact UBC Utilities to confirm)

INSULATED HOT WATER PIPES CROSSING DUCTBANKS

NOTES:
1. ALL MEASUREMENTS ARE BASED ON THE HOT WATER PIPING SYSTEM BEING FULLY AND CONTINUOUSLY INSULATED.
2. IN ALL CASES, ELECTRICAL DUCTBANK SHALL NOT RUN PARALLEL TO HOT WATER PIPING FOR LONGER THAN 10m.
3. IN ALL CASES, ELECTRICAL DUCTBANK SHALL NOT RUN DIRECTLY ABOVE HOT WATER PIPING EXCEPT AT CROSSINGS.
4. DRITHERM AND TEMPERLITE PRODUCT AVAILABLE FROM:
   - BURNABY INSULATION SUPPLIES
     5970 BERESFORD ST.
     BURNABY, BC
     604-430-6981

UBC UTILITIES UNIVERSITY OF BRITISH COLUMBIA	REVISION: 1 DATE: 05/07/12 DRAWN: RNH APPROVED:	ELECTRICAL DUCTBANK CLEARANCES TO DES HOT WATER LINES ONLY FOR 600 VOLTS OR LESS	STANDARD No **E2-4b**



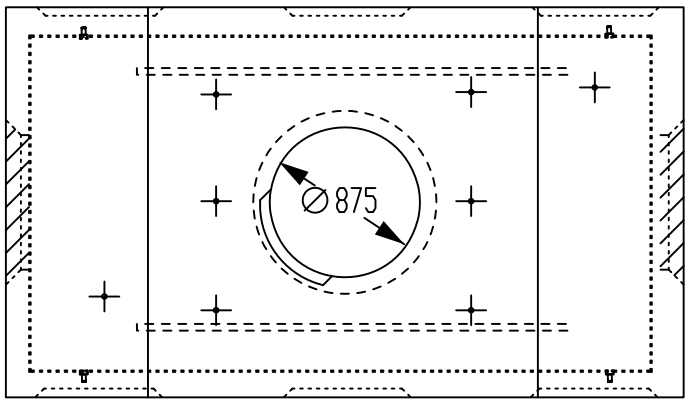
ELECTRICAL DUCTS
** 12,000 VOLTS OR LESS**
(site specific directive by UBC Utilities)

INSULATED HOT WATER PIPES CROSSING DUCTBANKS

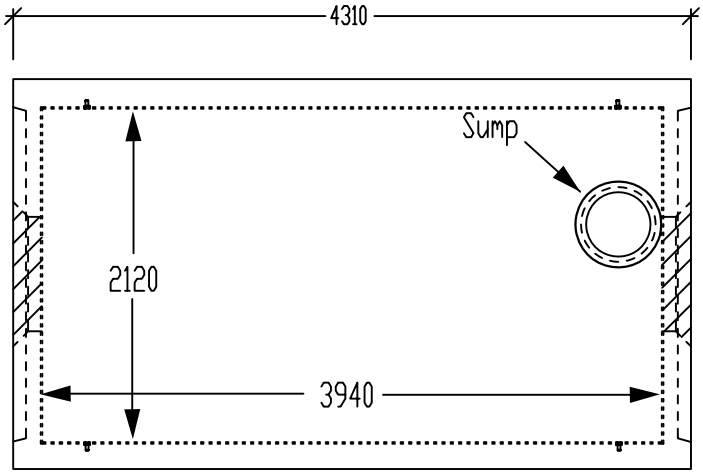
NOTES:
1. ALL MEASUREMENTS ARE BASED ON THE HOT WATER PIPING SYSTEM BEING FULLY AND CONTINUOUSLY INSULATED.
2. IN ALL CASES, ELECTRICAL DUCTBANK SHALL NOT RUN PARALLEL TO HOT WATER PIPING FOR LONGER THAN 10m.
3. IN ALL CASES, ELECTRICAL DUCTBANK SHALL NOT RUN DIRECTLY ABOVE HOT WATER PIPING EXCEPT AT CROSSINGS.
4. DRITHERM AND TEMPERLITE PRODUCT AVAILABLE FROM:
   - BURNABY INSULATION SUPPLIES
     5970 BERESFORD ST.
     BURNABY, BC
     604-430-6981

UBC UTILITIES UNIVERSITY OF BRITISH COLUMBIA	REVISION: 1 DATE: 05/07/12 DRAWN: RNH APPROVED:	ELECTRICAL DUCTBANK CLEARANCES TO DES HOT WATER LINES ONLY FOR 12,000 VOLTS OR LESS	STANDARD No **E2-4c**

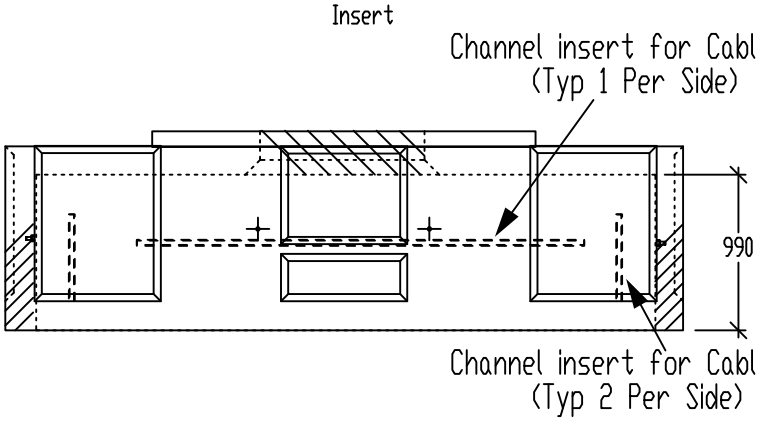
4212 BCH C1 Thru Manhole Chamber

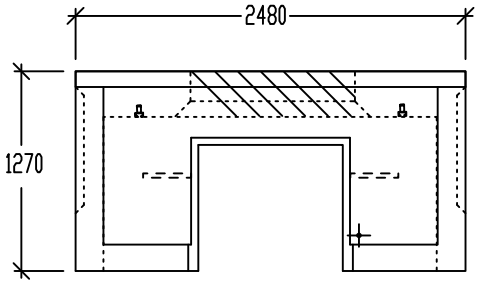


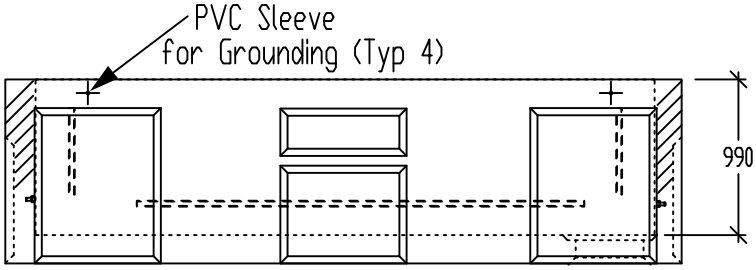
Plan View - Top



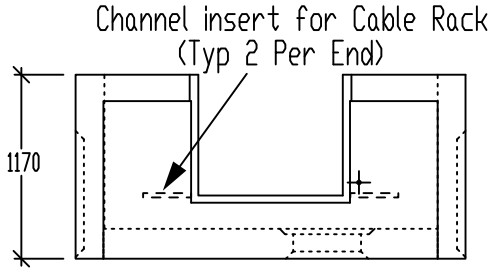
Plan View - Bottom







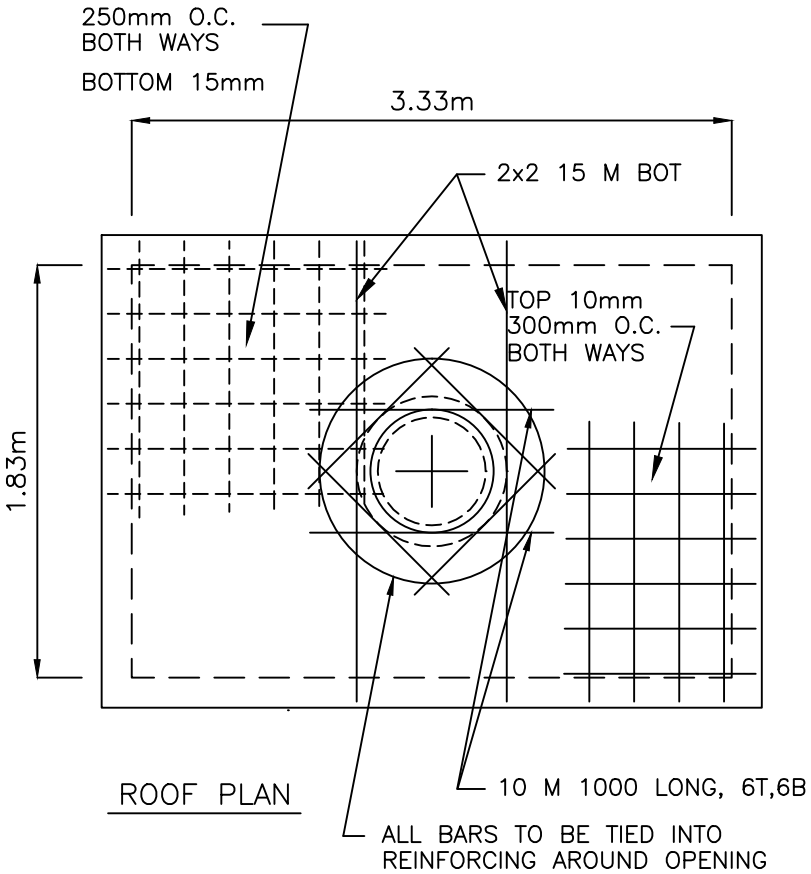
Side View



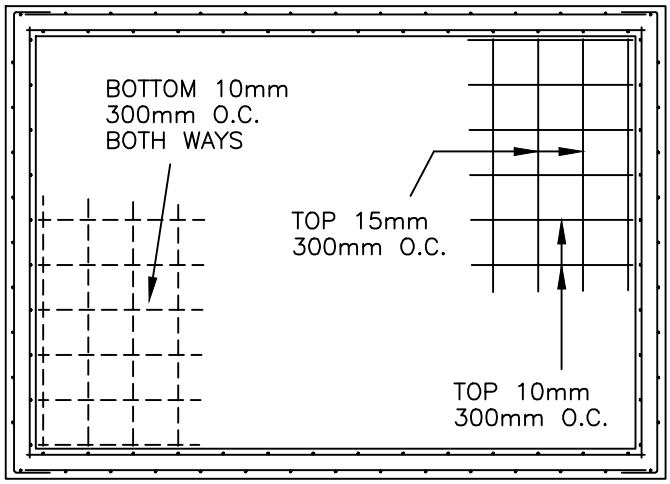
End View

General Notes:
- Product Manufactured in accordance with CSA A23.4
- Lifting loops cast in.
- Designed for Roadway Use - H-20 Traffic Loading.
- Interior to be painted white to 150mm from floor
- Exterior to be coated with black damp proofing

UBC UTILITIES UNIVERSITY OF BRITISH COLUMBIA	REVISION: 1 DATE: 02/26/13 DRAWN: ATR APPROVED: RH	STANDARD ELECTRICAL PRECAST MANHOLE	STANDARD No **E3-1**

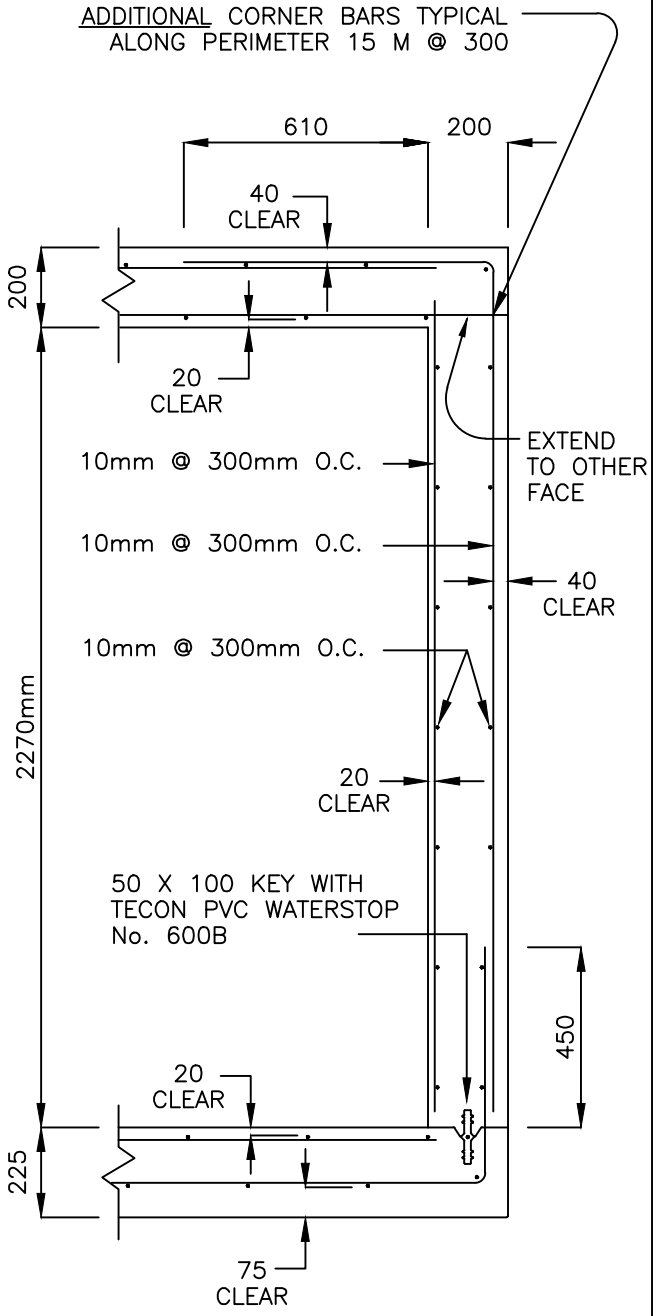


ROOF PLAN



FLOOR PLAN

NTS



TYPICAL WALL SECTION

NTS

NOTES:

1. CEMENT TO CSA CAN3–A5, TYPE 10 NORM
2. CONCRETE TO MEET CSA–A23.1–94 EXPOSURE C–1 CONCRETE 35MPA AT 28 DAYS
3. REINFORCING STEEL TO CSA–G30.18, 400MPA
4. DESIGN STRUCTURE FOR CS–600 LOADING
5. PROVIDE 19X450 EYEBOLTS FOR PULLING, SLACAN 9970, CAST INTO EACH INSTALLED DUCT BANK. POSITION EYE BASE AT INSIDE EDGE OF MANHOLE.
6. ALL DIMENSIONS IN MILLIMETERS (mm)
7. REFER TO A.E. CONCRETE CHAMBER 331822 FOR TYPICAL MANHOLE DIMENSIONS
8. CONTRACTOR TO CAST BELL ENDS FOR DUCT ENTRY INTO MANHOLE AS REQUIRED, DO NOT DAMAGE REINFORCING STEEL

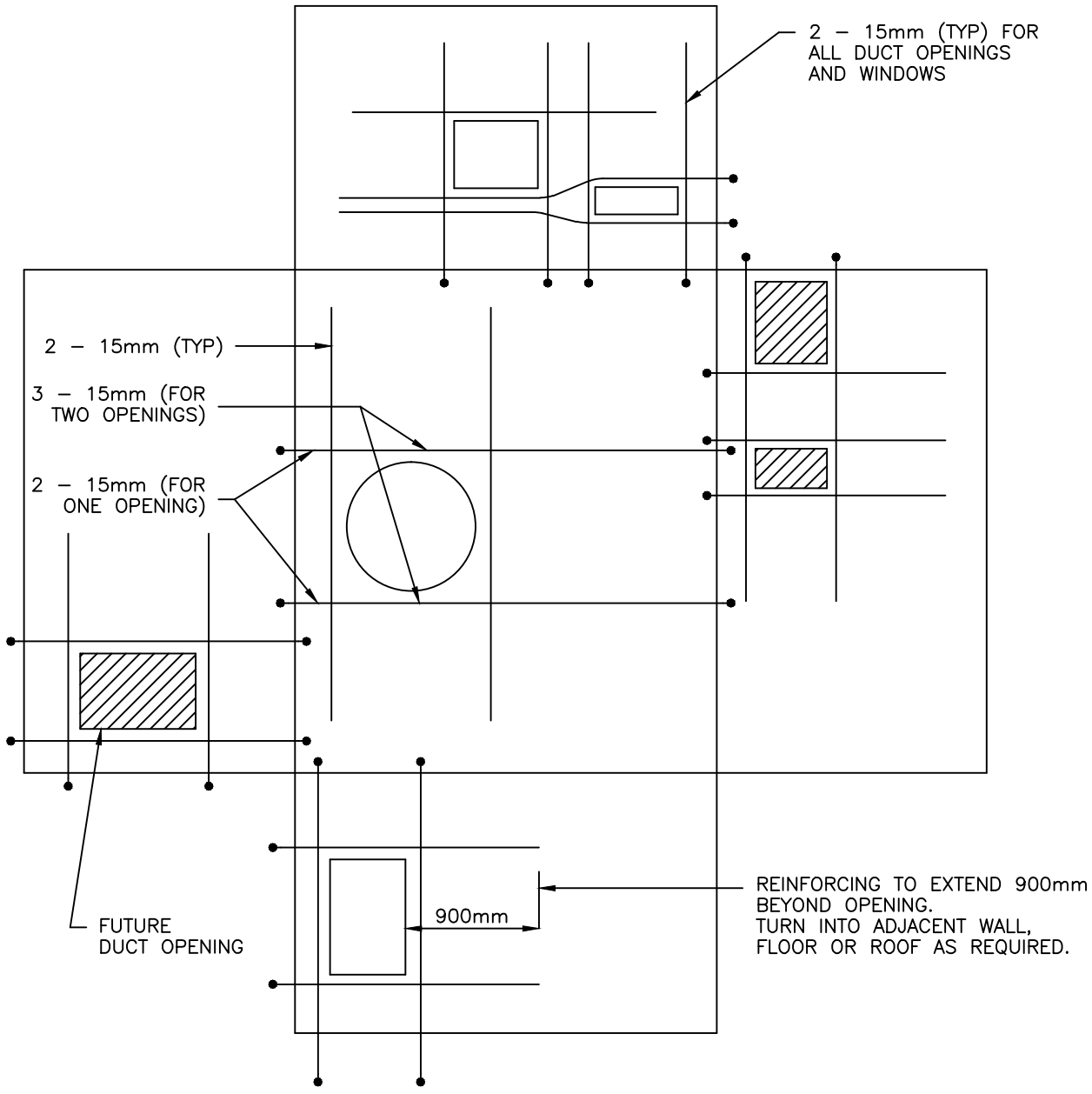
AT ANY WINDOW OR DUCT ENTRY LOCATION

1. PROVIDE 2–15 M E.F. EACH SIDE OF WALL OPENING, VERTICALLY FROM TOP TO BOTTOM.
2. WINDOW SHOULD BE A MIN OF 400 FROM CORNER
3. CORNERS OF WINDOW, IF SAW CUT IN FIELD, MUST BE CORED.
4. WINDOW KNOCKOUTS NOT TO BE PROVIDED. CORE INDIVIDUAL HOLES FOR EACH DUCT TO SUIT DUCT BANK ENTRY LOCATION.

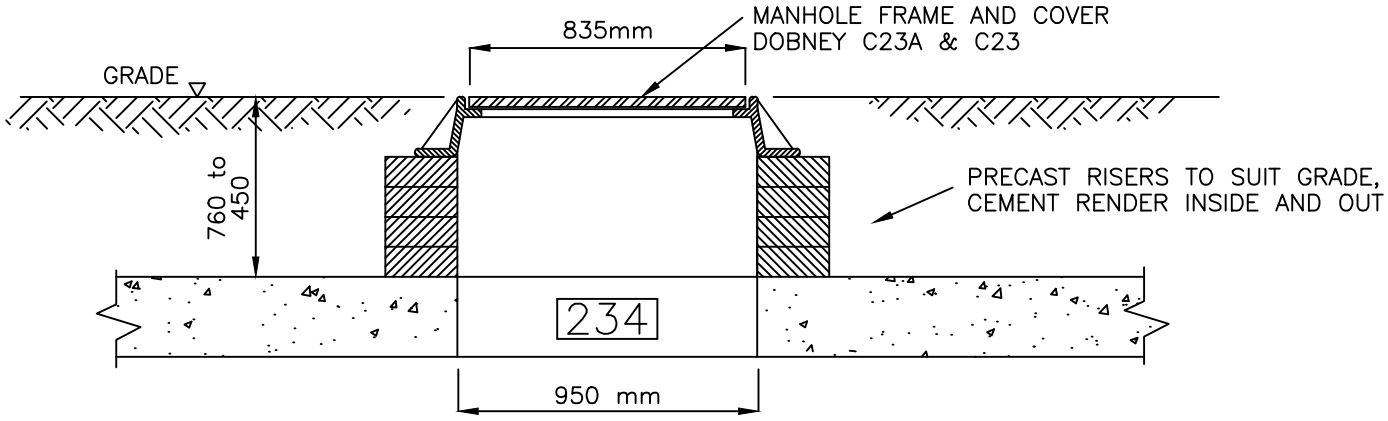
UBC UTILITIES UNIVERSITY OF BRITISH COLUMBIA	REVISION: 1 DATE: 11/12/02 DRAWN: RNH APPROVED: KH	STANDARD ELECTRICAL MANHOLE POUR IN PLACE	STANDARD No **E3-2**

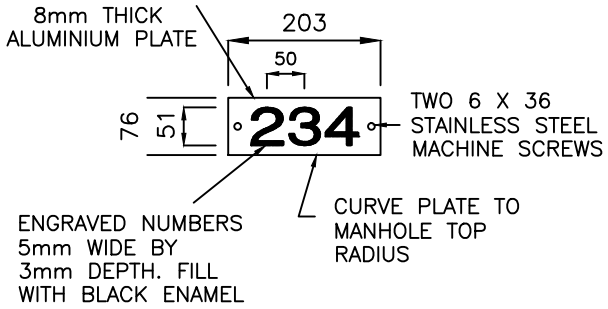
REINFORCING SHOWN IS IN ADDITION TO THAT SHOWN ON STANDARD DRAWING No. E3–2

REINFORCING IS TYPICAL FOR OPENINGS IN WALLS AND ROOF.



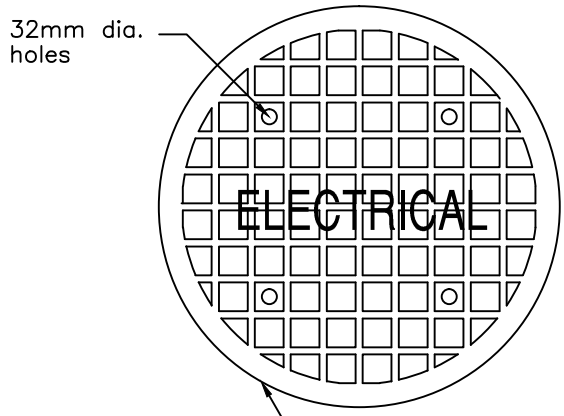
UBC UTILITIES UNIVERSITY OF BRITISH COLUMBIA	REVISION: 1 DATE: 11/12/02 DRAWN: RNH APPROVED: KH	ADDITIONAL REINFORCING FOR POUR IN PLACE ELECTRICAL MANHOLES	STANDARD No **E3-3**

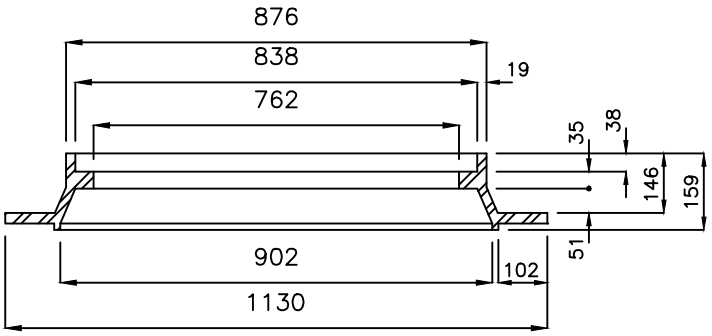




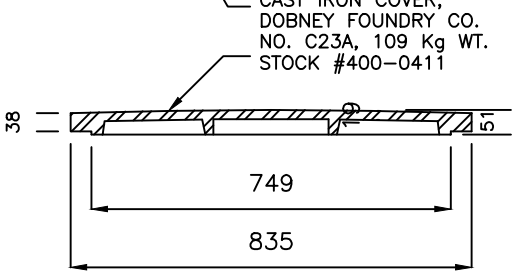
MANHOLE NUMBERING DETAIL

MANHOLE COVER PLAN
Dobney #C23A

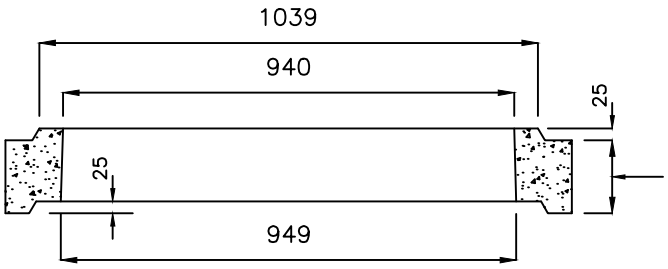




MANHOLE FRAME SECTION
Dobney C23 Frame



MANHOLE COVER SECTION
Dobney #C23A COVER

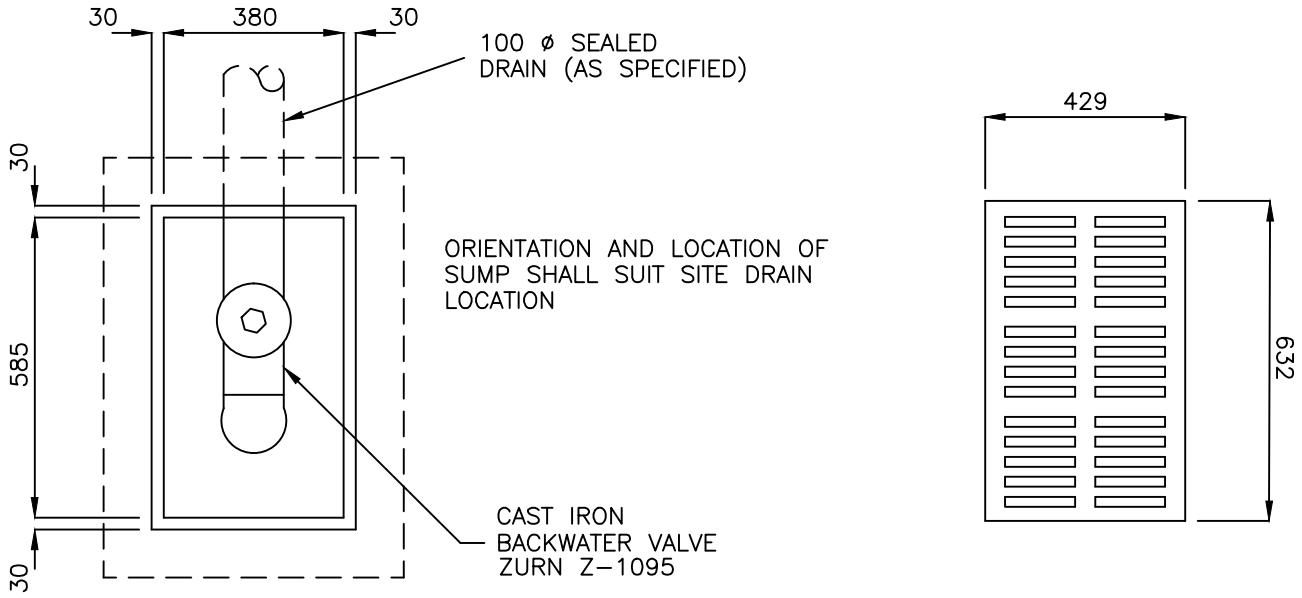


COVER RISER SECTION

NOTES: (FOR PRECAST ITEM)

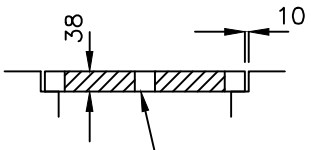
1. MANHOLE MANUFACTURED BY A.E. CONCRETE PRECAST PRODUCTS LTD.
2. CONCRETE TO CSA CAN3-A5, TYPE 10 NORM
3. CONCRETE STRENGTH 35MPA AT 23 DAYS
4. REINFORCING STEEL TO CSA 630-12 GR40
5. DESIGNED FOR HS20 WHEEL LOADING

UBC UTILITIES UNIVERSITY OF BRITISH COLUMBIA	REVISION: 1 DATE: 11/12/02 DRAWN: RNH APPROVED: KH	STANDARD ELECTRICAL MANHOLE COVER & RISER DETAILS	STANDARD No **E3-4**

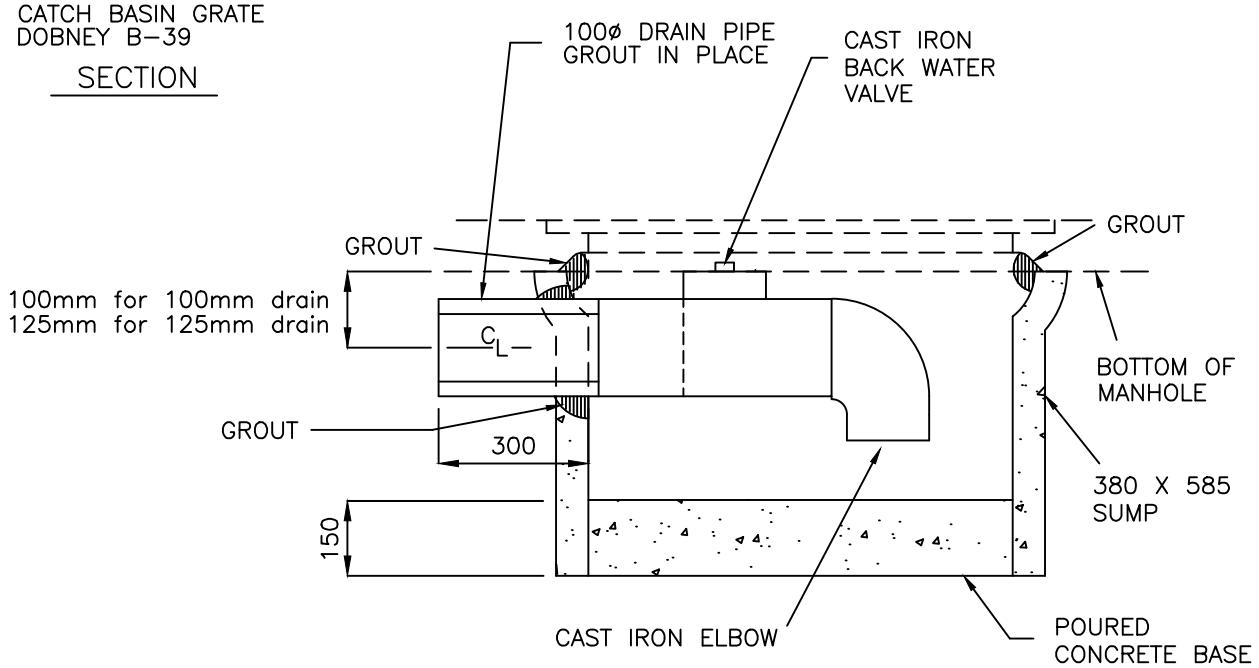


PLAN

PLAN – SUMP COVER
Dobney # B-39

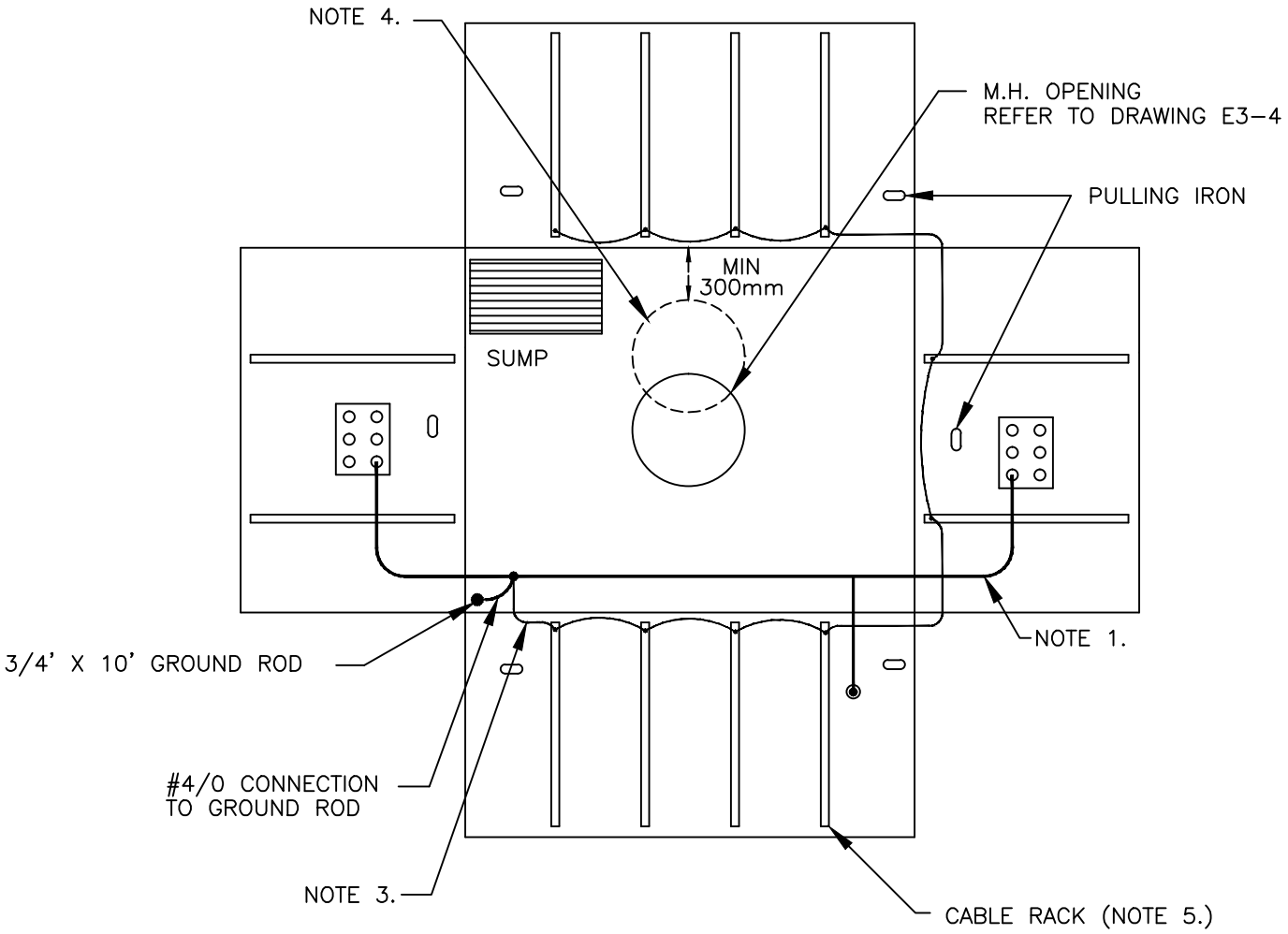


SECTION



DETAILS OF SUMP AND SUMP COVER

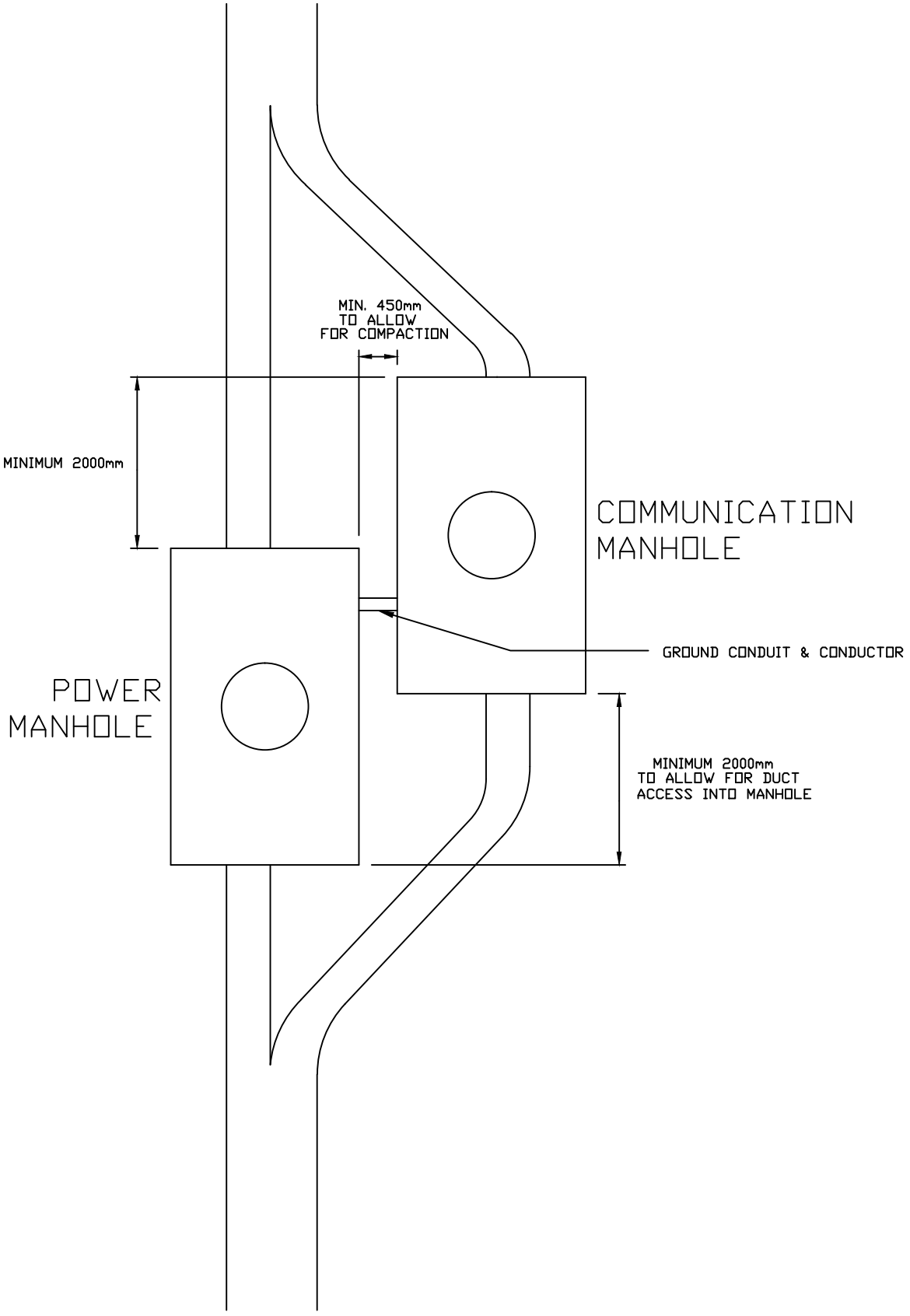
UBC UTILITIES UNIVERSITY OF BRITISH COLUMBIA	REVISION: 1 DATE: 11/12/02 DRAWN: RNH APPROVED: KH	STANDARD ELECTRICAL MANHOLE SUMP DETAIL	STANDARD No **E3-5**



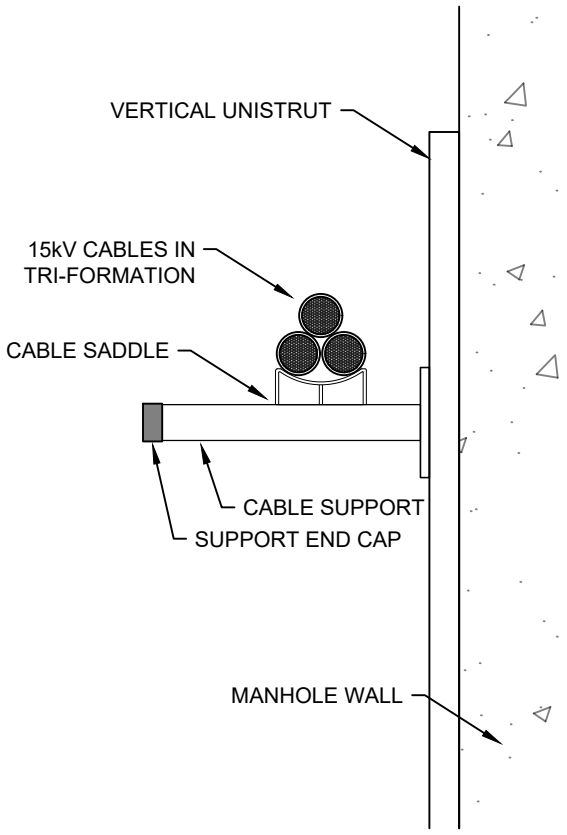
GROUNDING NOTES:

1. SYSTEM GROUND TO BE 500 MCM TW.
2. TAP CONDUCTOR TO GROUND ROD TO BE MIN. #4/0 AWG BARE Cu.
3. BONDING OF ALL NON–CURRENT CARRYING METAL PARTS (CABLE RACKS, SHEATHS, ETC.) TO BE MIN. #2 AWG BARE Cu.
4. MANHOLE OPENING MAY BE OFFSET FROM CENTRE BUT MAINTAIN MINIMUM 300mm DISTANCE BETWEEN OUTSIDE EDGE OF OPENING & INSIDE EDGE OF MANHOLE
5. MOUNT CABLE RACKING AS SHOWN. 4 STRUTS TO BE ON EACH SIDE WALL. 2 STRUTS TO BE ON EACH END WALL. MOUNT 1 BRACKET ON EACH STRUT AT MIDPOINT.

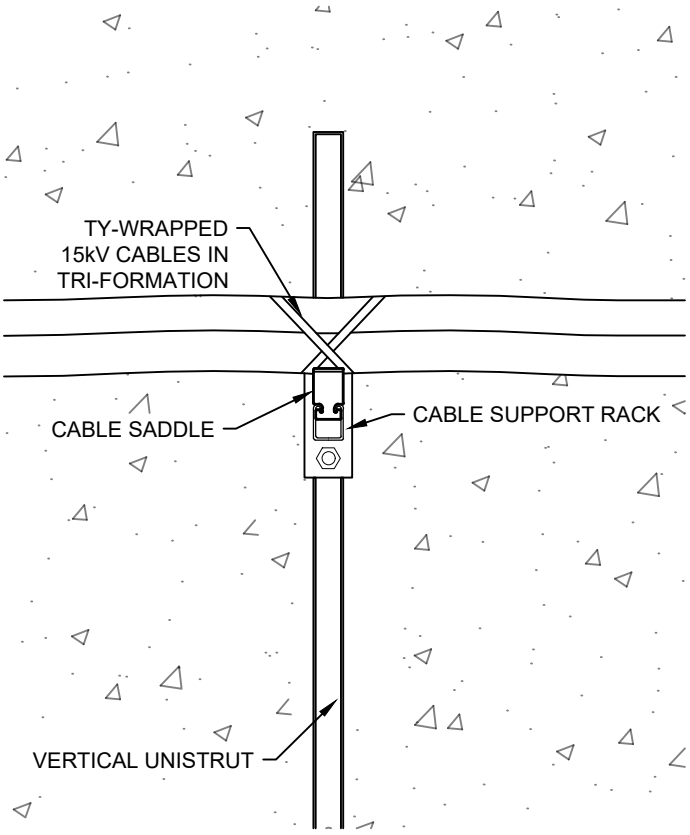
UBC UTILITIES UNIVERSITY OF BRITISH COLUMBIA	REVISION: 1 DATE: 11/12/02 DRAWN: RNH APPROVED: KH	TYPICAL MANHOLE GROUNDING & DETAILS	STANDARD No **E3-6**



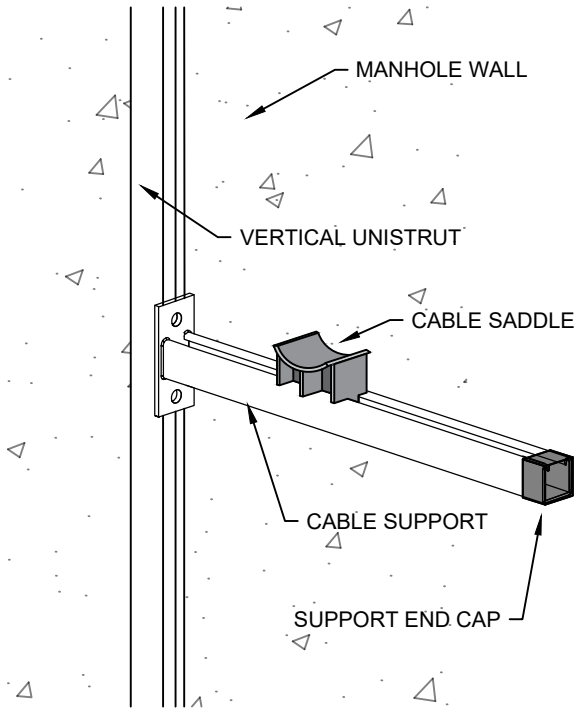
UBC UTILITIES UNIVERSITY OF BRITISH COLUMBIA	REVISION: 1 DATE: 11/12/02 DRAWN: RNH APPROVED: KH	TYPICAL MANHOLE SEPARATIONS	STANDARD No **E3-7**



SIDE ELEVATION



FRONT ELEVATION



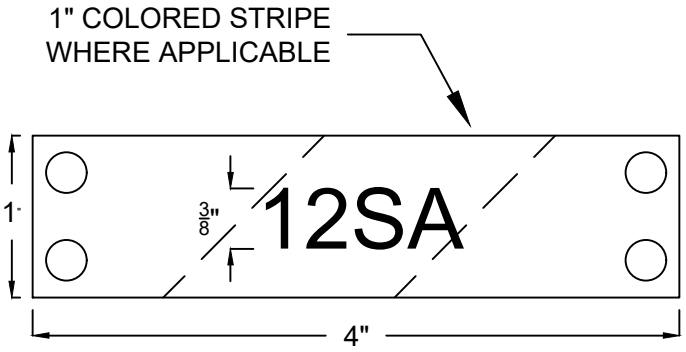
ISOMETRIC VIEW

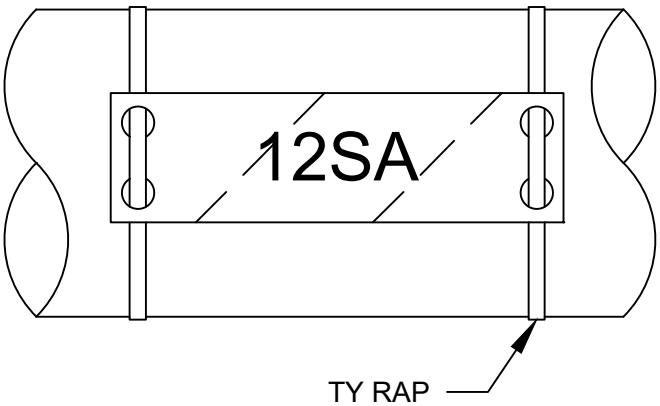
MATERIAL LIST:

1. GALVANIZED VERTICAL UNISTRUT SUPPORT.
2. CABLE SUPPORT BRACKET - UBS CB2916-HG OR APPROVED EQUIVALENT. SHALL BE HOT-DIPPED GALVANIZED.
3. CABLE SADDLE - UNISTRUT P1753 OR APPROVE EQUIVALENT
4. SUPPORT BRACKET END CAP - UNISTRUT P2859 OR APPROVED EQUIVALENT
5. TY-WRAPS - BLACK NYLON, LOCKING. WEATHER AND UV RESISTANT FOR INDOOR/OUTDOOR. MINIMUM TENSILE STRENGTH OF 222 NEWTONS (50lbs). OPERATING TEMP. -60 TO 105°C

UBC UTILITIES UNIVERSITY OF BRITISH COLUMBIA	REVISION: 1 DATE: 24/05/22 DRAWN: CCC APPROVED: RNH	STANDARD MANHOLE CABLE SUPPORT DETAIL	STANDARD No **E3-8**

12kV SYSTEM





NOTES:

1. TAGS ARE LAMACOID WITH THE PRIMARY FEEDER COLOUR AS THE MAIN BACKGROUND. THE SECONDARY COLOUR SHALL BE VINYL TAPE PERMANENTLY AFFIXED. LETTER COLOURS SHALL BE WHITE.

2. THE HOLES SHALL BE ENLARGED TO 1/4"Ø WITH A METAL PUNCH TO ACCEPT A SELF-LOCKING NYLON TY-RAP T+B #TY528MX.

3. COLORS ARE:

   FEEDER 12-S - YELLOW
   FEEDER 12-SA - YELLOW WITH RED STRIPE
   FEEDER 12-SH - YELLOW WITH BLUE STRIPE
   FEEDER 12-SS - YELLOW WITH GREEN STRIPE
   FEEDER 12-SB - YELLOW WITH WHITE STRIPE
   FEEDER 12-F10 - GREEN
   FEEDER 12-F11 - BLUE
   FEEDER 12-F12 - ORANGE
   FEEDER 12-F13 - GREEN WITH BLUE STRIPE
   FEEDER 12-F14 - GREEN WITH RED STRIPE
   FEEDER 12-F20 - RED
   FEEDER 12-F21 - BROWN
   FEEDER 12-F22 - PINK
   FEEDER 12-F23 - RED WITH BLUE STRIPE
   FEEDER 12-F24 - RED WITH YELLOW STRIPE
   FEEDER 12-F25 - RED WITH WHITE STRIPE
   FEEDER 12-F26 - BLUE WITH WHITE STRIPE
   FEEDER 12-F27 - GREEN WITH WHITE STRIPE
   FEEDER 12-F28 - ORANGE WITH WHITE STRIPE
   FEEDER 12F20-SC - RED
   FEEDER 12SS-SC - YELLOW WITH GREEN STRIPE

4. TAG DIMENSIONS AS SHOWN
   TAG: 4" x 1"
   FEEDER NAME: 3/8" WIDE LETTERING

GENERAL NOTES:

1. TAGS WITHIN MANHOLES SHALL BE INSTALLED ON EVERY CABLE AT EACH DUCT ENTRY AND AT ALL SPLICES.

UBC ENERGY & WATER SERVICES UNIVERSITY OF BRITISH COLUMBIA	REVISION: 5 DATE: 09/11/21 DRAWN: CCC APPROVED: RNH	CABLE IDENTIFICATION TAGS 12 kV	STANDARD No **E4-1**

INSTALLATION NOTES:

1. TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS.

2. GROUND COPPER CABLE SHIELD AT OUTGOING CABLE SECTION ONLY (i.e. LOAD SIDE).
   a. ISOLATE CABLE SHIELD AT OUTGOING SIDE AS PER DETAIL.
   b. GROUND KITS TO CONSIST OF EQUIV. #2 GROUNDING BRAID C/W SOLDER STOP.
   c. BRAID TO BE MIN 18" LONG, PLUS CONSTANT FORCE ROLL SPRING CLIP, INSULATING BODY AND MASTIC SEAL STRIPS. KITS TO BE EQUIVALENT TO BC HYDRO STANDARD ES53-Z5-05

3. USE 600 AMP TEE FITTINGS ONLY FOR BOTH 500MCM & 4/0 TAP CONDUCTORS AS PER MATERIAL LIST.

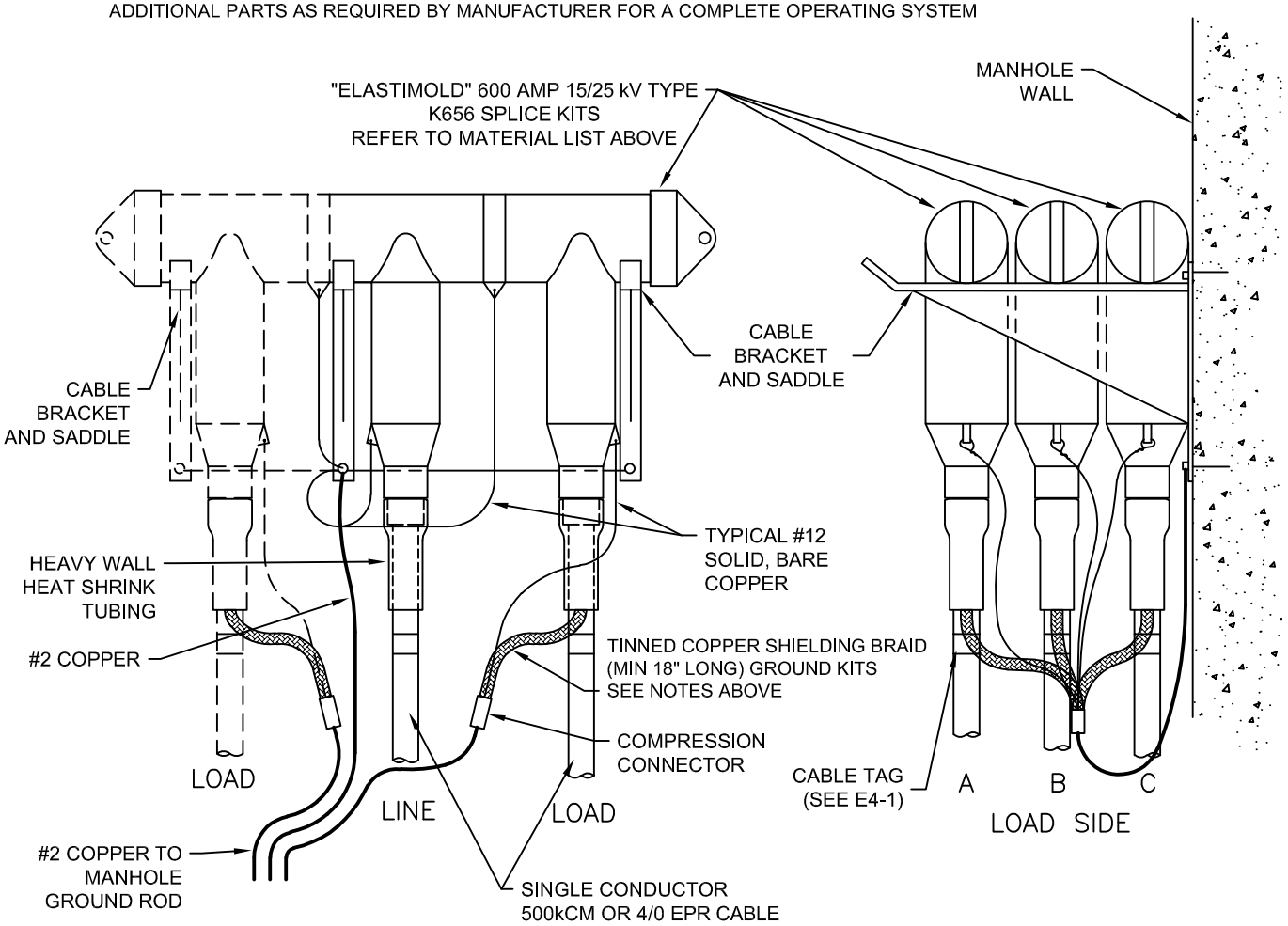
4. ALL INDIVIDUAL COMPONENTS TO BE REVIEWED & APPROVED BY MANUFACTURER & UBC UTILITIES PRIOR TO PURCHASE.

5. CONTACT HALLWOOD AGENCIES LTD (604-451-1401)

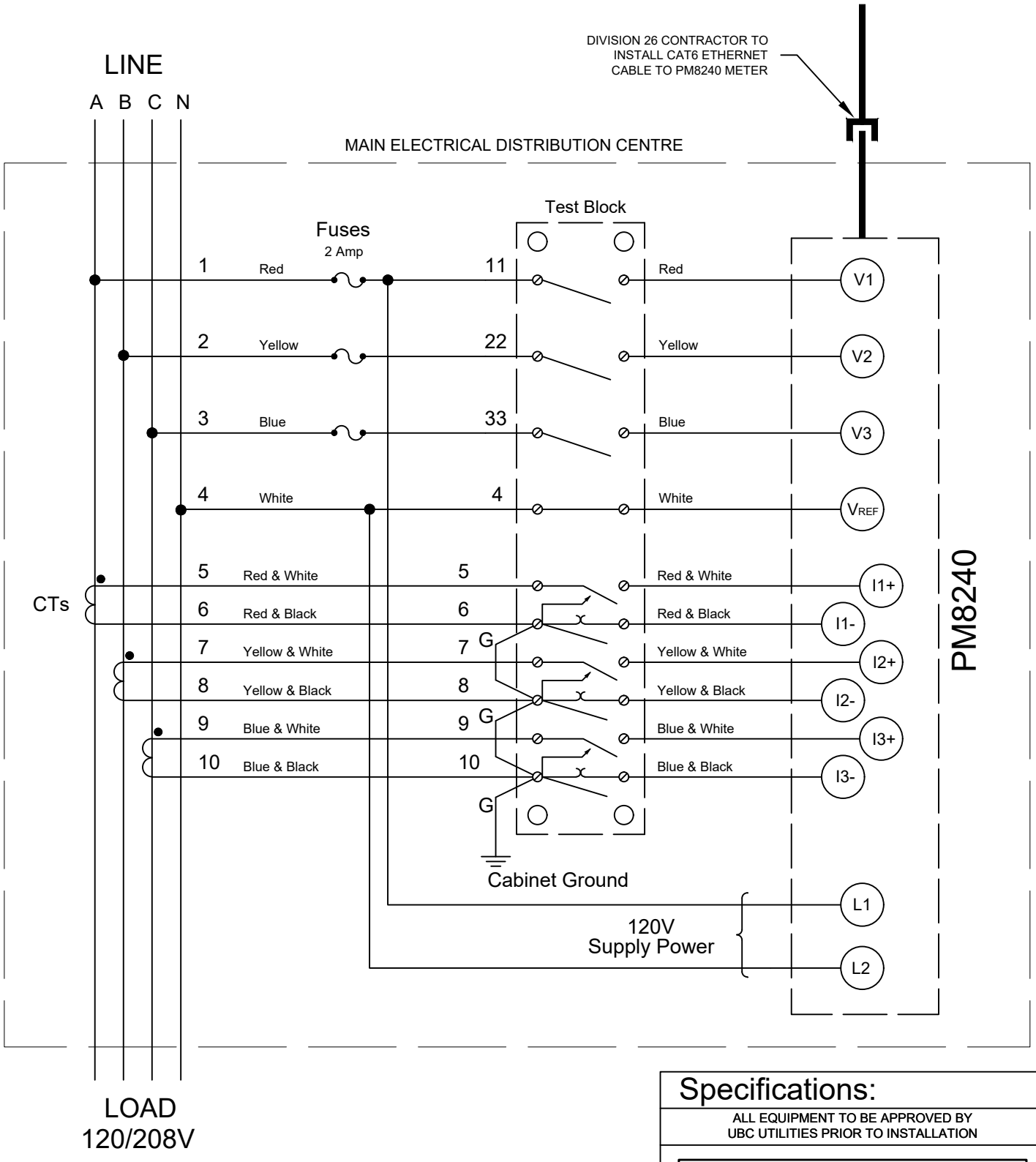
MATERIAL LIST:

1. ELASTIMOLD 600 A SERIES ELBOW HOUSING CAT# K656BLR
2. ELASTIMOLD INSULATING PLUG CAT# K650BIP
3. ELASTIMOLD CONNECTING PLUG CAT# K651CP
4. ELASTIMOLD CABLE ADAPTERS FOR 4/0 CAT# 655CA-H or J (See Elastimold Table W7)
5. ELASTIMOLD CABLE ADAPTERS FOR 500MCM CAT# 655CA-L (See Elastimold Table W7)
6. ELASTIMOLD CABLE LUGS FOR 4/0 CAT# 03700270 (See Elastimold Table X6)
7. ELASTIMOLD CABLE LUGS FOR 500MCM CAT# 03700330 (See Elastimold Table X6)
8. GROUND KITS FOR 500MCM TO BE 3M CAT# 8461 OR RAYCHEM HVS-EG-2
9. GROUND KITS FOR 4/0 TO BE 3M CAT# 8460 OR RAYCHEM HVS-EG-2
10. HEAVY WALL HEAT SHRINK TUBING (8")

CONTRACTOR TO VERIFY COMPLETE PARTS LIST WITH MANUFACTURER PRIOR TO PURCHASE TO ENSURE COMPATIBILITY BETWEEN THE DIFFERENT CABLE MANUFACTURERS & ELASTIMOLD PARTS. OBTAIN ADDITIONAL PARTS AS REQUIRED BY MANUFACTURER FOR A COMPLETE OPERATING SYSTEM



UBC UTILITIES UNIVERSITY OF BRITISH COLUMBIA	REVISION: 2 DATE: 28/08/18 DRAWN: CCC APPROVED: RNH	ELASTIMOLD SPLICE CONNECTION MOUNTING AND SHIELD GROUNDING DETAILS FOR SPLICES BETWEEN 2 (OR MORE) 15 KV 'X'– LINK 500 MCM & 4/0 CABLES	STANDARD No **E4-2**



Specifications:

ALL EQUIPMENT TO BE APPROVED BY UBC UTILITIES PRIOR TO INSTALLATION

Schneider Electric meter:
- METSEPM8240, 120V input, c/w ethernet port
- Programmed with UBC Utilities standard displays

Schneider Electric Digital I/O Module:
- METSEPM89M2600

Test Switch (Equivalent To):
- Superior 10 Pole/30 Amp/600 Volt - CAT# 1082F
- ABB FT-1

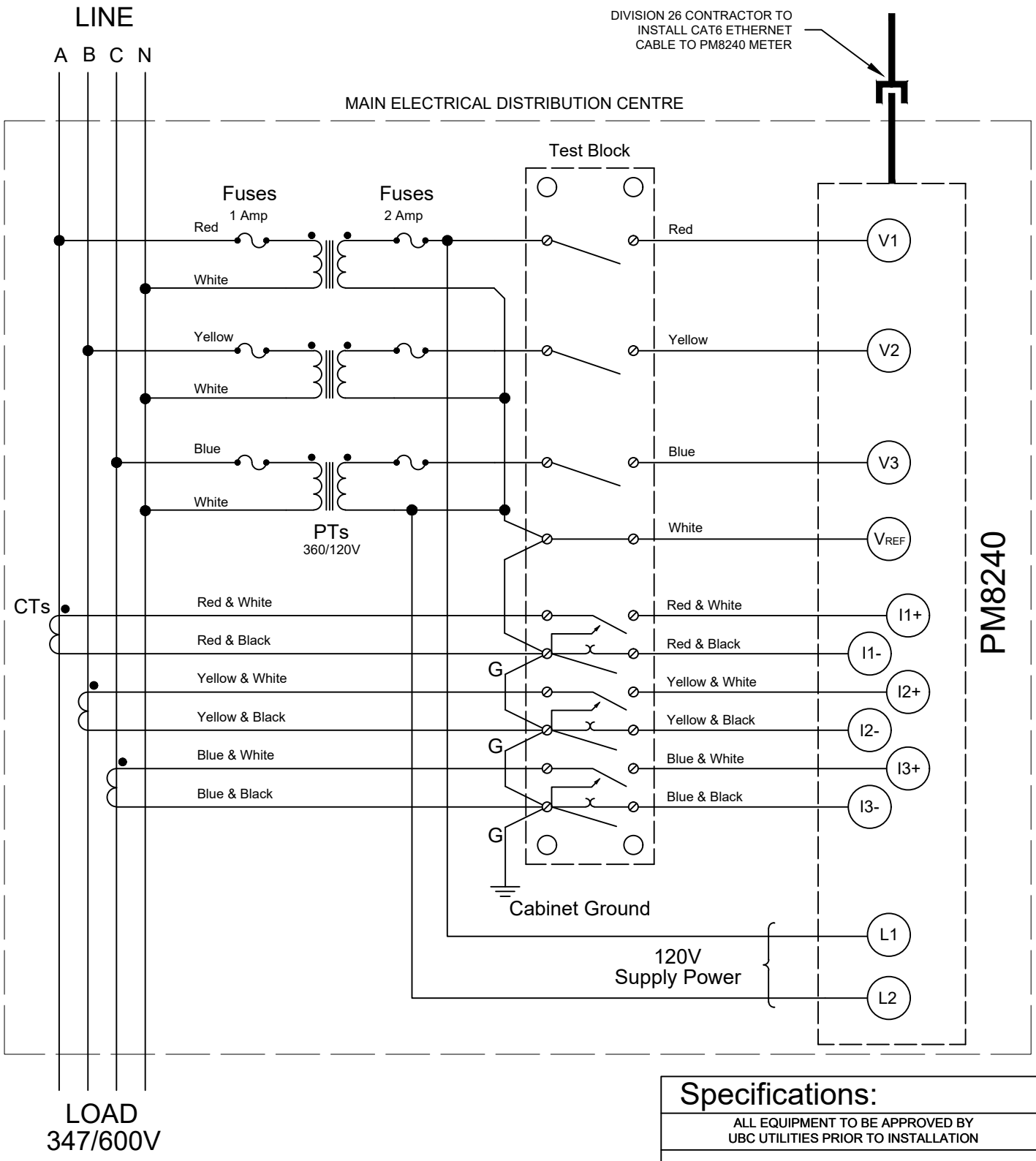
Fuses & Holders: Gould Ultrasafe class CC or equivalent
CTs: Revenue class 0.3B0.9
PTs: Revenue class with 360/120 ratio

Meter Location to be in a separately barriered compartment per UBC Technical Guidelines 26 27 13 2.2.3

Notes:

- Use SIS switchboard wire for all connections.
- All CT wiring to be MIN #12.
- All Potential wiring to be MIN #14.
- Final wiring to be as per manufacturer.
- Provide colour coding or numbering on wiring as shown.
- Ground system at test block only as shown.

UBC UTILITIES UNIVERSITY OF BRITISH COLUMBIA	REVISION: 4 DATE: 30/11/21 DRAWN: CCC APPROVED: RH	SCHNEIDER ELECTRIC PM8240 METER 120/208V 3-PHASE 4-WIRE SYSTEM 3 ELEMENT WIRING CONNECTION DIAGRAM	STANDARD No **E4-4**



Specifications:

ALL EQUIPMENT TO BE APPROVED BY UBC UTILITIES PRIOR TO INSTALLATION

Schneider Electric meter:
- METSEPM8240, 120V input, c/w ethernet port
- Programmed with UBC Utilities standard displays

Schneider Electric Digital I/O Module:
- METSEPM89M2600

Test Switch (Equivalent To):
- Superior 10 Pole/30 Amp/600 Volt - CAT# 1082F
- ABB FT-1

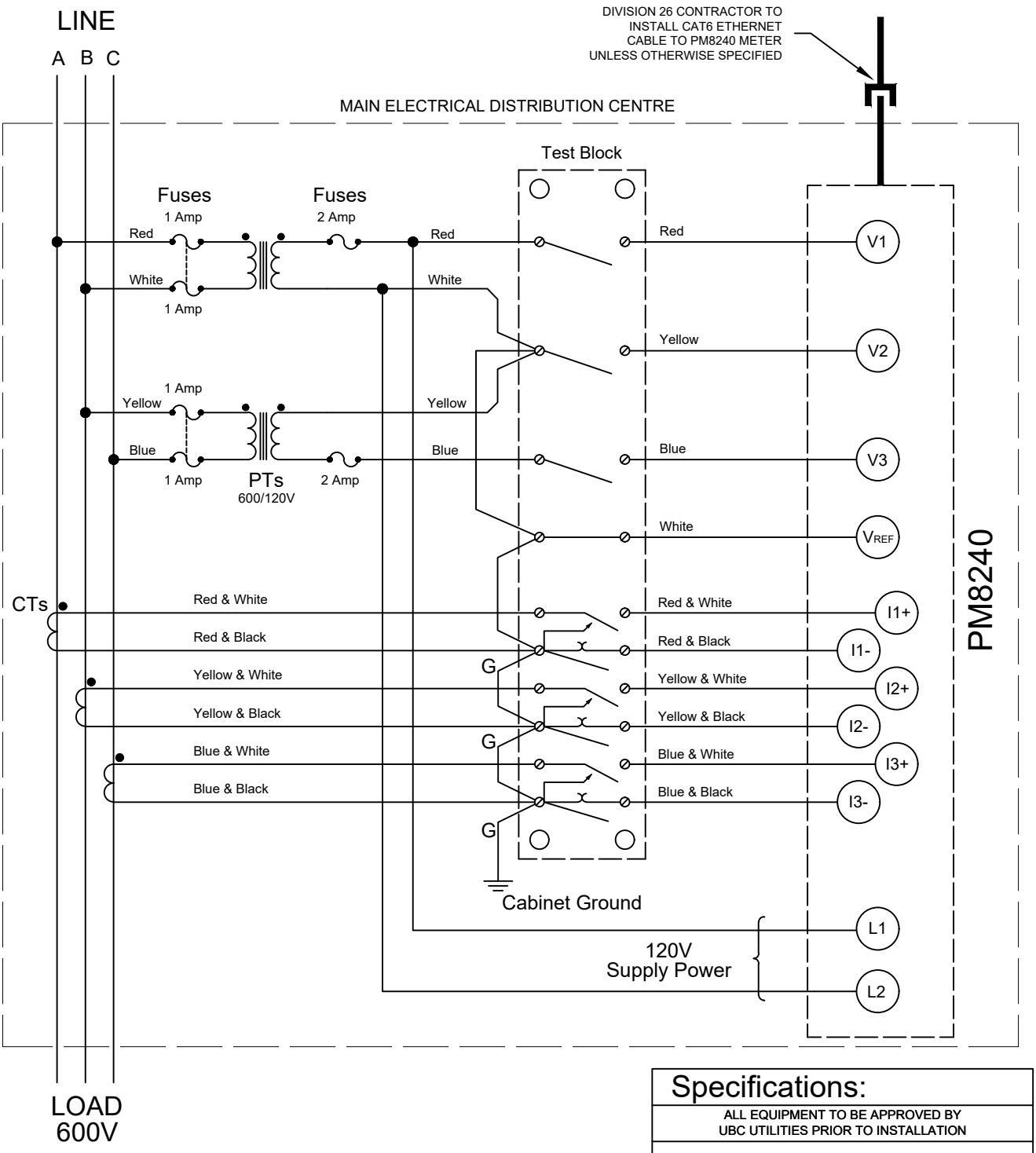
Fuses & Holders: Gould Ultrasafe class CC or equivalent
CTs: Revenue class 0.3B0.9
PTs: Revenue class with 360/120 ratio

Meter Location to be in a separately barriered compartment per UBC Technical Guidelines 26 27 13 2.2.3

Notes:

- Use SIS switchboard wire for all connections.
- All CT wiring to be MIN #12.
- All Potential wiring to be MIN #14.
- Final wiring to be as per manufacturer.
- Provide colour coding or numbering on wiring as shown.
- Ground system at test block only as shown.

UBC UTILITIES UNIVERSITY OF BRITISH COLUMBIA	REVISION: 4 DATE: 30/11/21 DRAWN: CCC APPROVED: RNH	SCHNEIDER ELECTRIC PM8240 METER 347/600V 3-PHASE 4-WIRE SYSTEM 3 ELEMENT WIRING CONNECTION DIAGRAM	STANDARD No **E4-5a**



Specifications:

ALL EQUIPMENT TO BE APPROVED BY UBC UTILITIES PRIOR TO INSTALLATION

Schneider Electric meter:
- METSEPM8240, 120V input, c/w ethernet port
- Programmed with UBC Utilities standard displays

Schneider Electric Digital I/O Module:
- METSEPM89M2600

Test Switch (Equivalent To):
- Superior 10 Pole/30 Amp/600 Volt - CAT# 1082F
- ABB FT-1

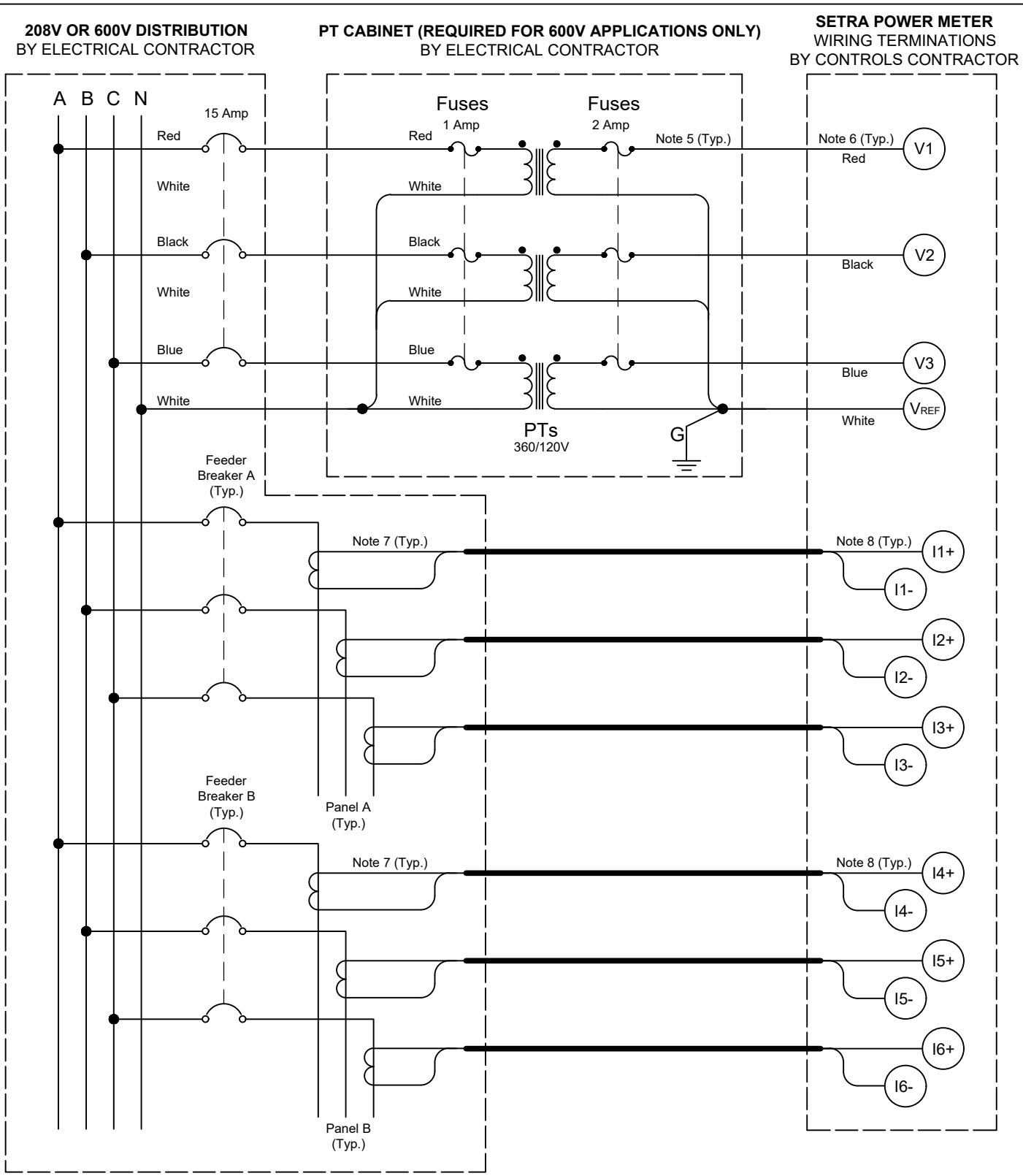
Fuses & Holders: Gould Ultrasafe class CC or equivalent
CT's: Revenue class 0.3B0.9
PT's: Revenue class with 600/120 ratio

Meter Location to be in a separately barriered compartment per UBC Technical Guidelines 26 27 13 2.2.3

Notes:

- Use SIS switchboard wire for all connections.
- All CT wiring to be MIN #12.
- All Potential wiring to be MIN #14.
- Final wiring to be as per manufacturer.
- Provide colour coding or numbering on wiring as shown.
- Ground system at test block only as shown.

UBC UTILITIES UNIVERSITY OF BRITISH COLUMBIA	REVISION: 2 DATE: 30/11/21 DRAWN: CCC APPROVED: RNH	SCHNEIDER ELECTRIC PM8240 METER 600V 3-PHASE 3-WIRE SYSTEM 2 ELEMENT WIRING CONNECTION DIAGRAM	STANDARD No **E4-5b**



Notes:

1. Use SIS switchboard wire for all connections.
2. All Potential wiring to be MIN #14.
3. Final wiring to be as per manufacturer.
4. Provide colour coding or numbering on wiring as shown.
5. PT wiring installed by electrical contractor.
6. Terminations to Setra meter by controls contractor.
7. Rogowski Coils installed by electrical contractor.
8. Terminations to Setra meter by controls contractor. Shorting blocks shall not be used.

Specifications:

ALL EQUIPMENT TO BE APPROVED BY UBC BUILDING OPERATIONS PRIOR TO INSTALLATION

Setra Networked Multi-Load Power Meter:
- Minimum 12 metering loads.
- Model example SMP12EDN

Current Transducers:
- Patrol Flex Rogowski Coil or Equivalent.

Potential Transformers:
- 360/120 ratio.

Fuses:
- 3-Pole, DIN-Rail mounted
- 600V rated, Type CC
- Amp rating as shown in drawing

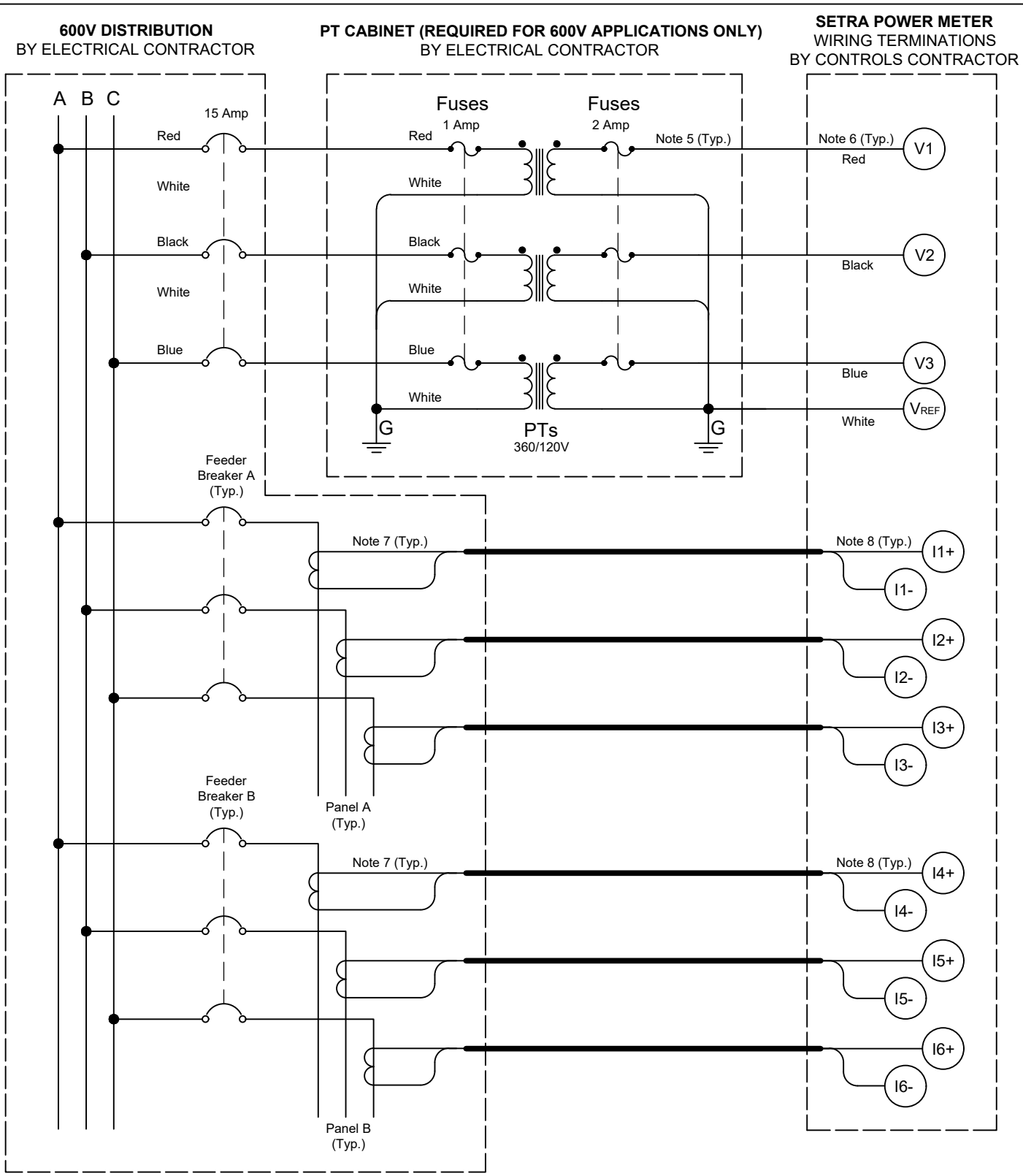
UBC BUILDING OPERATIONS
UNIVERSITY OF BRITISH COLUMBIA

REVISION: 1
DATE: 2023/08/23
DRAWN: CCC
APPROVED:

SETRA NETWORKED MULTI-CIRCUIT POWER METER 208V OR 600V WIRING CONNECTION DIAGRAM - 4-WIRE SYSTEM

STANDARD No.

E4-5c



Notes:

1. Use SIS switchboard wire for all connections.
2. All Potential wiring to be MIN #14.
3. Final wiring to be as per manufacturer.
4. Provide colour coding or numbering on wiring as shown.
5. PT wiring installed by electrical contractor.
6. Terminations to Setra meter by controls contractor.
7. Rogowski Coils installed by electrical contractor.
8. Terminations to Setra meter by controls contractor. Shorting blocks shall not be used.

Specifications:

ALL EQUIPMENT TO BE APPROVED BY UBC BUILDING OPERATIONS PRIOR TO INSTALLATION

Setra Networked Multi-Load Power Meter:
- Minimum 12 metering loads.
- Model example SMP12EDN

Current Transducers:
- Patrol Flex Rogowski Coil or Equivalent.

Potential Transformers:
- 360/120 ratio.

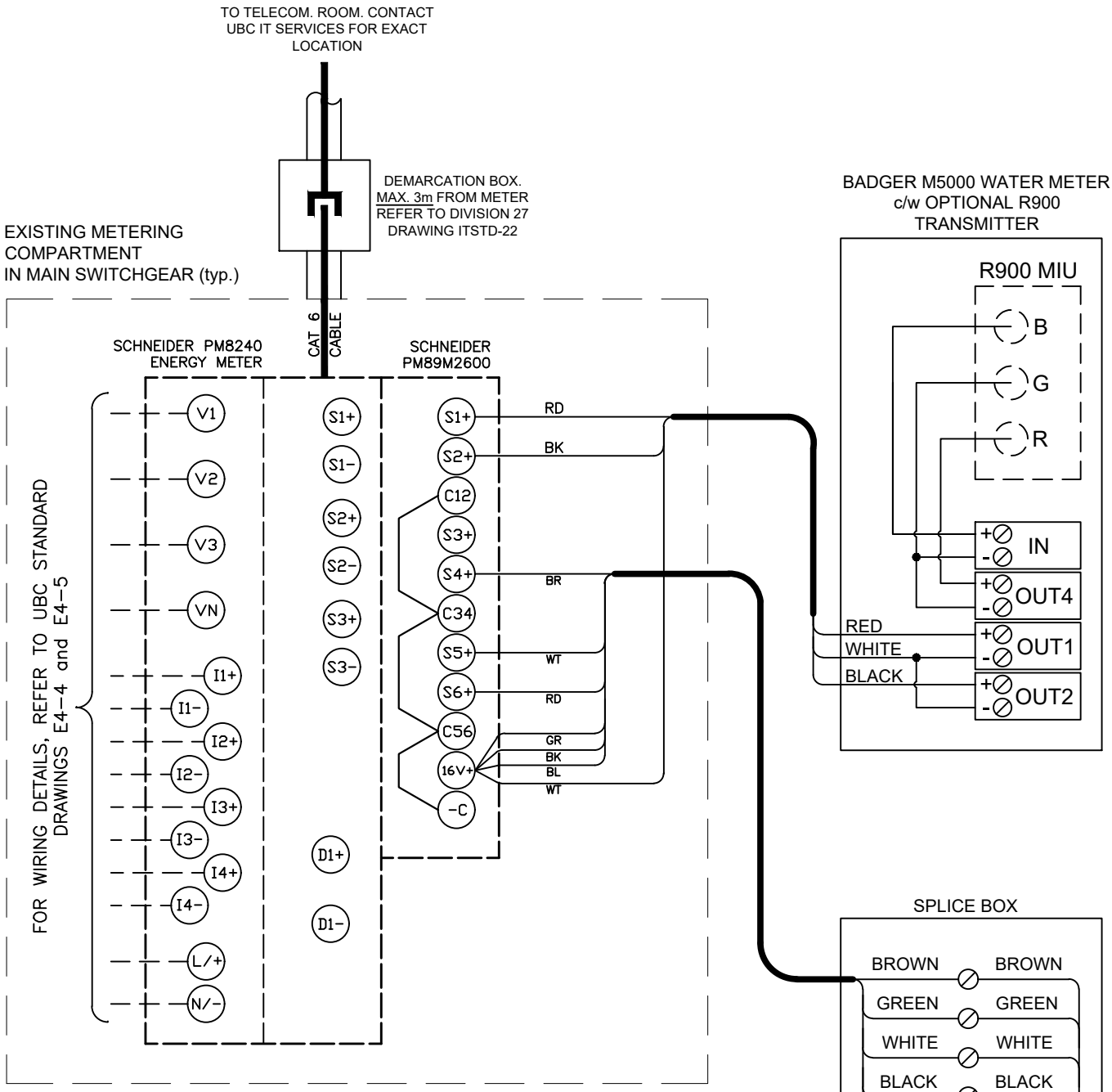
Fuses:
- 3-Pole, DIN-Rail mounted
- 600V rated, Type CC
- Amp rating as shown in drawing

UBC BUILDING OPERATIONS
UNIVERSITY OF BRITISH COLUMBIA

REVISION: 1
DATE: 2023/03/03
DRAWN: CCC
APPROVED:

SETRA NETWORKED
MULTI-CIRCUIT POWER METER 600V WIRING
CONNECTION DIAGRAM 3-WIRE SYSTEM

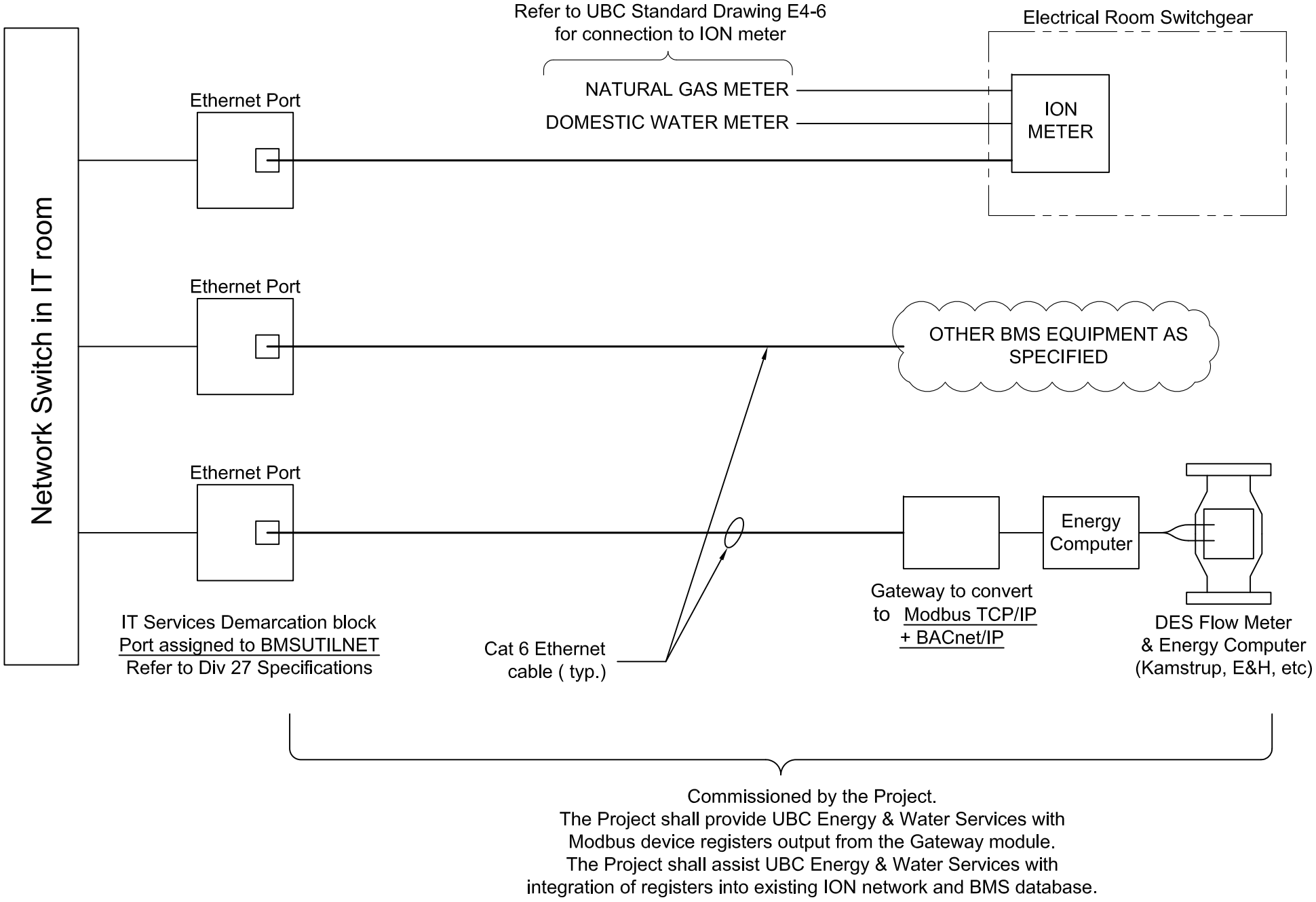
STANDARD No.
E4-5d



NOTES:

- All cables to be run in approved raceway between terminations.
- Water and Gas meter cables shall be minimum #18-6 shielded.
- All shields to be grounded at PM8240 meter end only.
- Programming and commissioning PM8240 meters shall be done by UBC Energy & Water Services.
- All field wiring shall be checked for correct polarity and continuity.
- R900 MIU Transmitter for Water meter used only where PM8240 meter not installed.
- For Water Meter Installation, refer to UBC Standard Drawing 1140-UT-12
- For Gas Meter Installation, refer to UBC Standard Drawing 1100-UT-01

UBC ENERGY & WATER SERVICS UNIVERSITY OF BRITISH COLUMBIA	REVISION: 5 DATE: 19/04/23 DRAWN: CCC APPROVED: RH	Water and Gas Meter Integration into Electrical Metering System Tenant & Core Buildings	STANDARD No **E4-6**



Commissioned by the Project.
The Project shall provide UBC Energy & Water Services with
Modbus device registers output from the Gateway module.
The Project shall assist UBC Energy & Water Services with
integration of registers into existing ION network and BMS database.

UBC UTILITIES UNIVERSITY OF BRITISH COLUMBIA	REVISION: 1 DATE: 01/03/15 DRAWN: RNH APPROVED: RNH	District Energy System Metering ION Network Interface	STANDARD No **E4-6c**

PANEL LABELING

2–E–2–L–1–A

- SUB SEQUENCE A,B,C ETC. USED ONLY FOR SUB–FED PANELS
- SEQUENCE NUMBER NUMBER 1,2,3, ETC
- TYPE
  - L = LIGHTING
  - P = POWER
  - M = MECHANICAL
  - D = DISTRIBUTION
  - T = TENANT
- FLOOR
  - 0 = BASEMENT
  - 1 = LEVEL 1
  - 2 = LEVEL 2
  - 3 = LEVEL 3
- SYSTEM SOURCE
  - N = NORMAL POWER
  - E = EMERGENCY
  - S = STANDBY
- SYSTEM VOLTAGE
  - 6 = 347/600
  - 2 = 120/208

TRANSFORMER LABELING

TX–N–3–S–1

- SEQUENCE NUMBER NUMBER 1,2,3, ETC
- AREA
  - N = NORTH
  - S = SOUTH
- FLOOR
  - 0 = BASEMENT
  - 1 = LEVEL 1
  - 2 = LEVEL 2
  - 3 = LEVEL 3
  - P = PENTHOUSE
- SYSTEM
  - N = NORMAL POWER
  - E = EMERGENCY
  - S = STANDBY

4”

PNL 2E2LI
FED FROM
TX E2NI
ROOM 221

3”

TYPICAL STANDARD
PANEL ID LAMACOID

4”

TX N3SI
FED FROM
PNL 6N2PI
ROOM 221

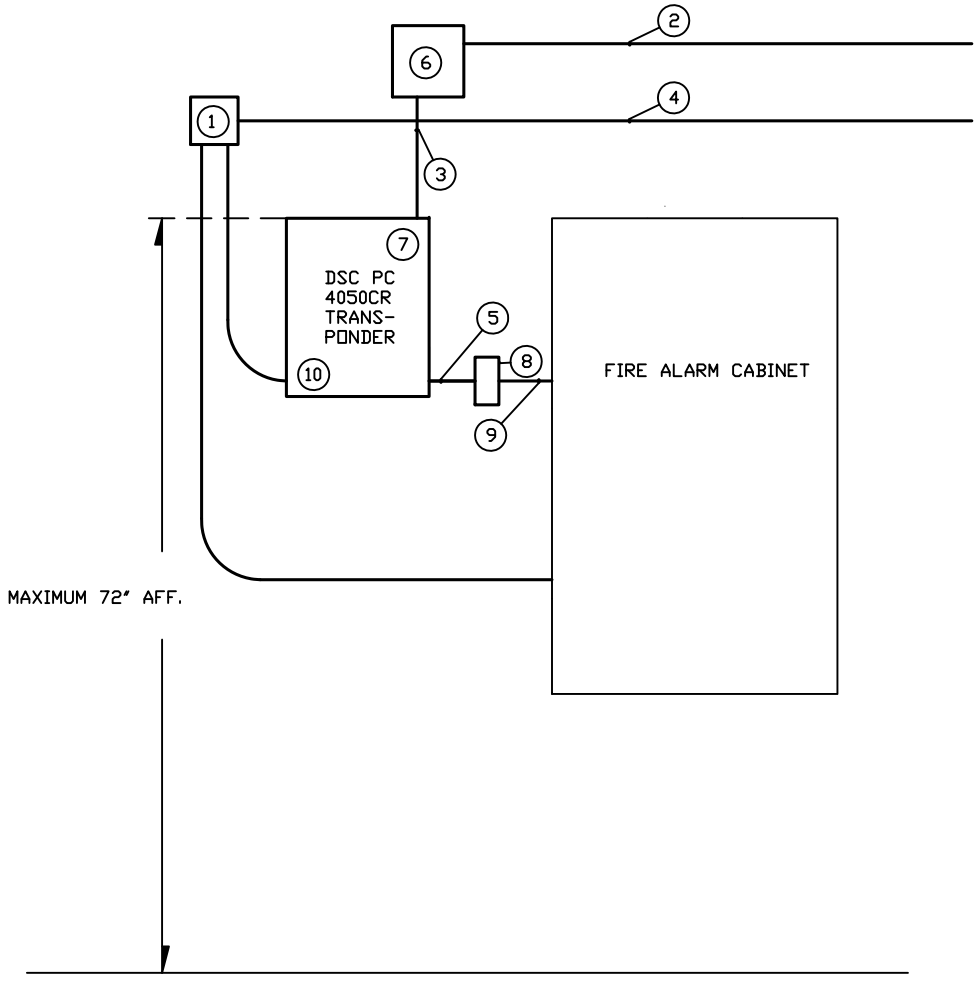
3”

TYPICAL STANDARD
TRANSFORMER ID LAMACOID

STANDARD COLOURS FOR PANEL AND TRANSFORMER LABELING

NORMAL POWER: WHITE LETTERING ON BLACK BACKGROUND
STAND-BY POWER: BLACK LETTERING ON YELLOW BACKGROUND
LIFE SAFETY OR EMERGENCY POWER: WHITE LETTERING ON RED BACKGROUND
UPS POWER: WHITE LETTERING ON BLUE BACKGROUND

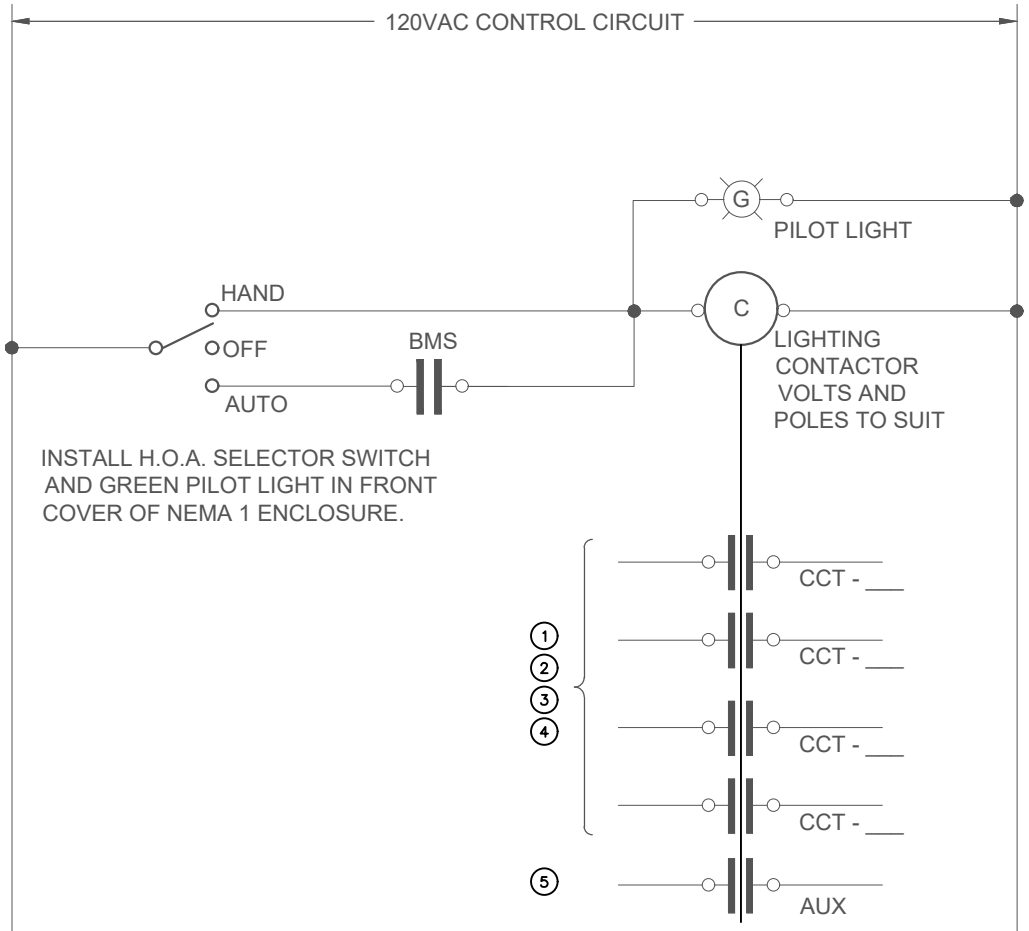
UBC TECHNICAL SERVICES ELECTRICAL UNIVERSITY OF BRITISH COLUMBIA	REVISION: 3 DATE: 08/06/21 DRAWN: JC APPROVED: MD	INTERIOR WIRING SYSTEMS STANDARD TRANSFORMER AND PANEL IDENTIFICATION	STANDARD No **E10-2**



NOTES

1. 4" x 4" DEEP BOX C/W BLANK COVER (POWER).
2. 1" EMT COMMUNICATIONS PATHWAY TO COMMUNICATIONS ROOM. INSTALL AS PER UBC GUIDELINES.
3. 1/2" EMT, ITS DEMARC TO DSC TRANSPONDER FOR NETWORK AND ANALOUGE DIALER WIRING. MAXIMUM LENGTH 36".
4. EMT FROM SAME POWER PANEL AS FIRE ALARM C/W DEDICATED CIRCUIT FOR NEW DSC TRANSPONDER. USE EXISTING EUROPLEX DEDICATED CIRCUIT IF INSTALLED.
5. 1/2" EMT CONDUIT TO NEW 1110 BOX FOR DSC KEYPAD. MINIMUM LENGTH 6", MAXIMUM LENGTH 12".
6. 6" X 6" X 3" SQUARE BOX WITH BLANK COVER FOR COMMUNICATIONS D-MARC.
7. DSC TRANSPONDER CABINET. INSTALL STANDOFFS FOR PC1616 BOARD BEFORE MOUNTING ON WALL. USE 4 MOUNTING HOLES IN CORNERS ONLY. INSTALL AND CONNECT TRANSFORMER. LABEL WITH PANEL AND CIRCUIT BREAKER INFORMATION.
8. 1110 BOX FOR MONITORING KEYPAD.
9. 1/2" EMT, FIRE ALARM CABINET TO 1110 BOX FOR MONITORING KEYPAD. MINIMUM LENGTH 12", MAXIMUM LENGTH 24".
10. ONLY USE 1/2" KNOCK OUTS PROVIDED ON TRANSPONDER BOX OR EQUIPMENT WILL NOT BE CERTIFIABLE.

UBC ELECTRICAL TECHNICAL SERVICES UNIVERSITY OF BRITISH COLUMBIA	REVISION: 1 DATE: 10/02/15 DRAWN: MCD APPROVED: RNH	FIRE ALARM SYSTEM MONITORING EQUIPMENT INSTALLATION	STANDARD No **E11-1**



AREAS SHALL BE DIVIDED INTO THE FOLLOWING:

1. BUILDING MOUNTED EXTERIOR LIGHTING - EXTERIOR FIXTURES LOCATED ON ROOFTOP LOCATIONS ARE EXCLUDED
2. WALKWAY / LANDSCAPE / AREA LIGHTING
3. STREET LIGHTING
4. STREET LIGHTING RECEPTACLES
5. FEEDBACK TO BMS TO BE PROVIDED VIA CONNECTION TO AUXILIARY CONTACTS OR CT'S ON THE CONDUCTORS FEEDING THE LIGHTING CIRCUITS ON THE LOAD SIDE OF THE CONTACTOR.

EACH AREA SHALL CONTAIN ITS OWN SET OF HOA, CONTACTORS, RELAY AND PILOT LIGHT FOR INDEPENDENT CONTROL VIA THE BMS. ALL AREAS SHALL BE CONTAINED WITHIN THE SAME ENCLOSURE WHEN POSSIBLE. SEPARATE ENCLOSURES MAY BE REQUIRED FOR LOADS OPERATING AT DIFFERENT VOLTAGES OR SOURCES (NORMAL/EMERGENCY). ANY OTHER SCENARIO WILL REQUIRE APPROVAL FROM UBC FACILITIES ELECTRICAL.

UBC ETS UNIVERSITY OF BRITISH COLUMBIA	REVISION: 1 DATE: 9/23/22 DRAWN: CM APPROVED: MD	EXTERIOR LIGHTING AND RECEPTACLE CONTROL	STANDARD No E12-1