

CAMPUS SITE PLAN

N.T.S.

ELECTRICAL LEGEND - SINGLE LINE	
SYMBOL	DESCRIPTION
[Symbol]	MOTOR-OPERATED SWITCH
[Symbol]	SOLENOID-OPERATED SWITCH
[Symbol]	CIRCUIT SWITCH WITH INTEGRATED MOTOR OPERATED DISCONNECT SWITCH
[Symbol]	LOAD BREAK SWITCH
[Symbol]	FUSED CUTOUT
[Symbol]	FUSE
[Symbol]	MV CIRCUIT BREAKER, DRAW-OUT TYPE
[Symbol]	GROUNDING STUD
[Symbol]	SURGE SUPPRESSION DEVICE
[Symbol]	LIGHTNING ARRESTOR
[Symbol]	MEDIUM VOLTAGE SNUBBER
[Symbol]	POTHEAD
[Symbol]	STRESS CONE
[Symbol]	POWER TRANSFORMER DELTA / SOLIDLY GROUND WYE
[Symbol]	ZIG-ZAG OR GROUNDING TRANSFORMER OR WINDING
[Symbol]	SCOTT-T WINDING
[Symbol]	POWER TRANSFORMER
[Symbol]	POWER TRANSFORMER WITH AUTOMATIC TAP CHANGER
[Symbol]	POWER TRANSFORMER WITH DOUBLE SECONDARY WINDINGS

ELECTRICAL LEGEND - SINGLE LINE (CONT.)	
SYMBOL	DESCRIPTION
[Symbol]	LINE OPENERS OR REMOVABLE LOOPS
[Symbol]	LV CIRCUIT BREAKER, DRAW-OUT
[Symbol]	LV CIRCUIT BREAKER, FIXED MOUNT
[Symbol]	RESISTOR
[Symbol]	GROUND
[Symbol]	POTENTIAL TRANSFORMER FUSED FIXED TYPE
[Symbol]	POTENTIAL TRANSFORMER FUSED DRAW-OUT TYPE
[Symbol]	CURRENT TRANSFORMER
[Symbol]	ZERO SEQUENCE CURRENT TRANSFORMER
[Symbol]	SOLID STATE RELAY- LONG TIME, SHORT TIME, INSTANTANEOUS AND GROUND TRIP UNIT
[Symbol]	PHASE OVERCURRENT RELAY
[Symbol]	RESIDUAL GROUND FAULT RELAY
[Symbol]	SOURCE GROUND FAULT RELAY
[Symbol]	VOLTAGE METER SWITCH
[Symbol]	AMPERAGE METER SWITCH
[Symbol]	SHORTING BLOCK
[Symbol]	AMPERAGE METER
[Symbol]	VOLTAGE METER
[Symbol]	DIGITAL METERING SYSTEM
[Symbol]	KILOWATT-HOUR METER

ELECTRICAL LEGEND - SINGLE LINE (CONT.)	
SYMBOL	DESCRIPTION
[Symbol]	KIRK INTERLOCK, LOCKED OPEN WITH KEY REMOVED.
[Symbol]	KIRK INTERLOCK, LOCKED CLOSED WITH KEY HELD.
[Symbol]	NEON VOLTAGE INDICATOR
[Symbol]	AIR CIRCUIT BREAKER
[Symbol]	CABLE
[Symbol]	FEEDER CABLE
[Symbol]	FUSE
[Symbol]	GANG OPERATED SWITCH
[Symbol]	LIGHTNING ARRESTOR
[Symbol]	LOOP FEEDER CABLE
[Symbol]	LOAD BREAK SWITCH
[Symbol]	NORMALLY CLOSED
[Symbol]	NORMALLY OPEN
[Symbol]	PAPER INSULATED, LEAD COVERED
[Symbol]	POTENTIAL TRANSFORMER
[Symbol]	SWITCH
[Symbol]	CROSS LINK POLYETHYLENE

ELECTRICAL LEGEND	
SYMBOL	DESCRIPTION
[Symbol]	DUCT BANK # DENOTES DUCT NUMBER. SEE DUCT TABLE FOR DETAILS SHADED DUCT DENOTES SPARE DUCT
[Symbol]	FENCE
[Symbol]	HYDRO POLE
[Symbol]	GUY WIRE
[Symbol]	GROUND ROD
[Symbol]	GROUND ROD WITH INSPECTION PORT
[Symbol]	DUPLEX 5-15R RECEPTACLE C/W INTEGRAL GFCI PROTECTION
[Symbol]	WALL MOUNTED LUMINAIRE

DRAWING LIST	
DWG#	DRAWING NAME
E01	CAMPUS PLAN, PROJECT AREAS, AND LEGEND
E02	SINGLE LINE DIAGRAM - DEMOLITION
E03	SINGLE LINE DIAGRAM - NEW CONSTRUCTION
E04	BUILDING LAYOUT - DEMOLITION AND NEW CONSTRUCTION
E05	SITE LAYOUT
E06	ELECTRICAL DETAILS #1
E07	ELECTRICAL DETAILS #2

- GENERAL NOTES:**
- EXCEPT AS NOTED OTHERWISE ALL EXISTING EQUIPMENT TO REMAIN IS SHOWN IN THIN SOLID LINES.
 - EXCEPT AS NOTED OTHERWISE ALL EQUIPMENT TO BE DEMOLISHED IS SHOWN IN THICK DASHED LINES.
 - EXCEPT AS NOTED OTHERWISE ALL NEW EQUIPMENT IS SHOWN IN THICK SOLID LINES.
- PROJECT SPECIFIC NOTES:**
- CONTRACTOR MUST COMPLETE SERVICE LOCATES IN ALL AREAS WHERE EXCAVATION IS BEING COMPLETED, PRIOR TO COMMENCING EXCAVATION.
 - CONTRACTOR IS RESPONSIBLE FOR CONFIRMING PHASING AND ROTATION MATCHES EXISTING SYSTEM CONFIGURATION PRIOR TO ENERGIZATION ANY NEW FEEDER CABLES OR NEW EQUIPMENT AND SHALL SUBMIT DOCUMENTATION STATING EXISTING PHASE ROTATION PRIOR TO DE-ENERGIZATION OF ANY FEEDER.
 - ALL WORK REQUIRING EQUIPMENT SHUTDOWNS MUST BE COORDINATED WITH THE NRC, AND COMPLETED DURING OVERTIME HOURS. SHUTDOWNS ARE NOT TO EXCEED 36 HOURS IN DURATION AND MUST BE COMPLETED 8 HOURS IN ADVANCE OF THE SITES REGULAR WORKING HOURS, WHICH ARE MONDAY TO FRIDAY 6AM TO 10PM.
- DESCRIPTION OF WORK:**
- REPLACE EXISTING PDX PANELBOARD WITH A NEW 1200A SERVICE ENTRANCE RATED PANELBOARD SUPPLIED FROM A NEW 1000KVA PADMOUNTED TRANSFORMER.
 - CONTRACTOR TO SUPPLY AND INSTALL ALL LOW VOLTAGE CABLES, PRIMARY DUCT BANK, SECONDARY DUCT BANK, CABLE TRAY, METERING BASE, 1200A SWITCHBOARD, POLE LATERAL AND ALL CIVIL WORKS ASSOCIATED WITH NEW 1000KVA TRANSFORMER.
 - HYDRO OTTAWA TO SUPPLY AND INSTALL NEW HYDRO POLE, 27.6KV OVERHEAD LINE, ASSOCIATED SWITCHES, LIGHTNING ARRESTORS, FUSES AND MEDIUM VOLTAGE CABLES.
 - HYDRO OTTAWA TO SUPPLY AND INSTALL NEW 1000KVA PADMOUNTED TRANSFORMER WHICH WILL SUPPLY NORMAL POWER TO BUILDING U-89B.
 - UPON COMPLETION OF PROJECT, BUILDING U-89B'S NORMAL POWER DISTRIBUTION WILL BE SUPPLIED BY THE NEW 1000KVA TRANSFORMER.

F	16.04.20	RE-ISSUED FOR TENDER	R.Mc.
E	16.03.30	ISSUED FOR TENDER	R.Mc.
D	16.03.23	ISSUED FOR HYDRO OTTAWA REVIEW	R.Mc.

No.	Date	Revision	By: Par:	
Date Printed				Date imprimée
● Verify all dimensions and site conditions and be responsible for same				
● Vérifier toutes les dimensions et l'état des lieux et en assumer la responsabilité				

A	A Detail no. No. du détail	A
B	B Location drawing no. sur dessin no.	B C
C	C Drawing no. dessin no.	

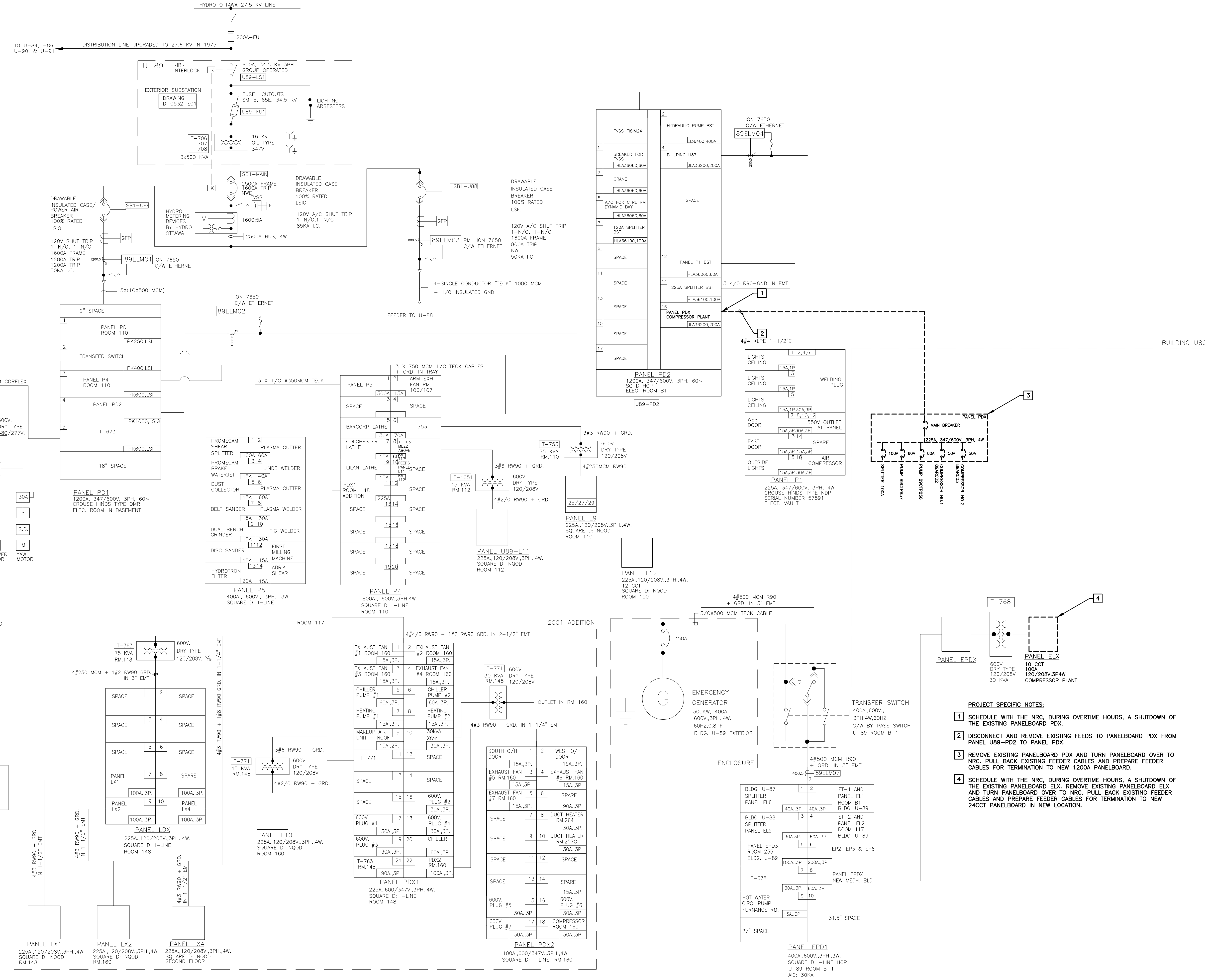
project **BUILDING U89B UTILITY SUPPLY UPGRADE** project
UPLANDS CAMPUS

drawing **ELECTRICAL CAMPUS PLAN, PROJECT AREA, AND LEGEND** dessin

designed	conçu	date	date	4056-E01
RMCCALLUM		16.01.06		
drawn	dessiné	scale	échelle	
RMCCALLUM		AS SHOWN		
checked	vérifié	sheet	feuille	
D.VAN GAAL		1 of/ de 7		
approved	approuvé	W.O.no.	D.T.no.	
D.VAN GAAL		A1-005791		
		Stantec No: 163302049		
dwg.no.			dessin no.	
4056-E01				

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PROJECT SPECIFIC NOTES:

- SCHEDULE WITH THE NRC, DURING OVERTIME HOURS, A SHUTDOWN OF THE EXISTING PANELBOARD PDX.
- DISCONNECT AND REMOVE EXISTING FEEDS TO PANELBOARD PDX FROM PANEL U89-PD2 TO PANEL PDX.
- REMOVE EXISTING PANELBOARD PDX AND TURN PANELBOARD OVER TO NRC. PULL BACK EXISTING FEEDER CABLES AND PREPARE FEEDER CABLES FOR TERMINATION TO NEW 1200A PANELBOARD.
- SCHEDULE WITH THE NRC, DURING OVERTIME HOURS, A SHUTDOWN OF THE EXISTING PANELBOARD ELX. REMOVE EXISTING PANELBOARD ELX AND TURN PANELBOARD OVER TO NRC. PULL BACK EXISTING FEEDER CABLES AND PREPARE FEEDER CABLES FOR TERMINATION TO NEW 24CCT PANELBOARD IN NEW LOCATION.

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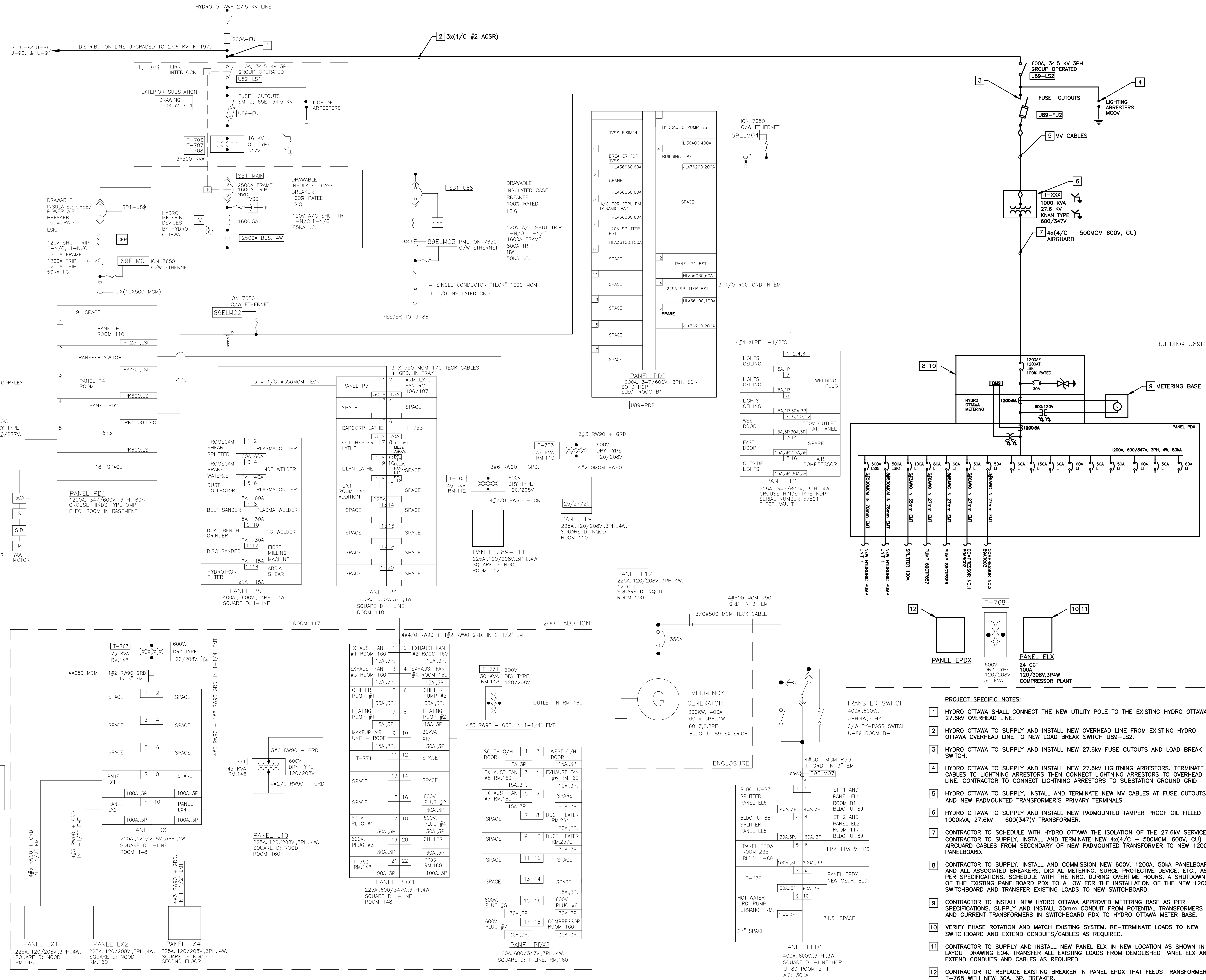
A C	A Detail no. No. du détail	A B C
	B Location drawing no. sur dessin no.	
	C Drawing no. dessin no.	

project
BUILDING U89B
UTILITY SUPPLY
UPGRADE
UPLANDS CAMPUS

drawing		dessin	
ELECTRICAL SINGLE LINE DIAGRAM DEMOLITION			
designed RMCCALLUM	conçu RMCCALLUM	date 16.01.06	échéelle AS SHOWN
drawn RMCCALLUM	dessiné RMCCALLUM	sheet 2	feuille 7
checked D.VAN GAAL	vérifié D.VAN GAAL	W.O.no. A1-005791	D.T.no. -
approved D.VAN GAAL	approuvé D.VAN GAAL	Stantec No: 163302049	
dwg.no. 4056-E02		dessin no. 4056-E02	

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 2016/04/20 11:14 PM By: McCallum, Rory

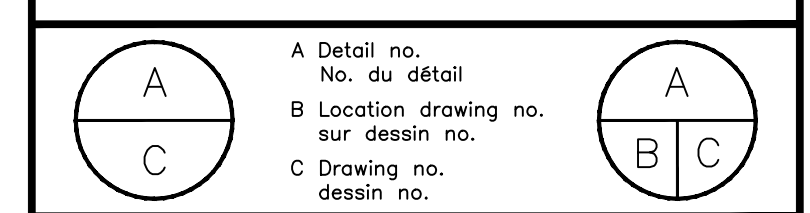
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- PROJECT SPECIFIC NOTES:**
- HYDRO OTTAWA SHALL CONNECT THE NEW UTILITY POLE TO THE EXISTING HYDRO OTTAWA 27.6KV OVERHEAD LINE.
 - HYDRO OTTAWA TO SUPPLY AND INSTALL NEW OVERHEAD LINE FROM EXISTING HYDRO OTTAWA OVERHEAD LINE TO NEW LOAD BREAK SWITCH U89-LS2.
 - HYDRO OTTAWA TO SUPPLY AND INSTALL NEW 27.6KV FUSE CUTOUPS AND LOAD BREAK SWITCH.
 - HYDRO OTTAWA TO SUPPLY AND INSTALL NEW 27.6KV LIGHTNING ARRESTORS. TERMINATE CABLES TO LIGHTNING ARRESTORS THEN CONNECT LIGHTNING ARRESTORS TO OVERHEAD LINE. CONTRACTOR TO CONNECT LIGHTNING ARRESTORS TO SUBSTATION GROUND GRID.
 - HYDRO OTTAWA TO SUPPLY, INSTALL AND TERMINATE NEW MV CABLES AT FUSE CUTOUPS AND NEW PADMOUNTED TRANSFORMER'S PRIMARY TERMINALS.
 - HYDRO OTTAWA TO SUPPLY AND INSTALL NEW PADMOUNTED TAMPER PROOF OIL FILLED 1000KVA, 27.6KV - 600(347)V TRANSFORMER.
 - CONTRACTOR TO SCHEDULE WITH HYDRO OTTAWA THE ISOLATION OF THE 27.6KV SERVICE. CONTRACTOR TO SUPPLY, INSTALL AND TERMINATE NEW 4x(4/C - 500MCM, 600V, CU) AIRGUARD CABLES FROM SECONDARY OF NEW PADMOUNTED TRANSFORMER TO NEW 1200A PANELBOARD.
 - CONTRACTOR TO SUPPLY, INSTALL AND COMMISSION NEW 600V, 1200A, 50KA PANELBOARD AND ALL ASSOCIATED BREAKERS, DIGITAL METERING, SURGE PROTECTIVE DEVICE, ETC. AS PER SPECIFICATIONS. SCHEDULE WITH THE NRC, DURING OVERTIME HOURS, A SHUTDOWN OF THE EXISTING PANELBOARD PDX TO ALLOW FOR THE INSTALLATION OF THE NEW 1200A SWITCHBOARD AND TRANSFER EXISTING LOADS TO NEW SWITCHBOARD.
 - CONTRACTOR TO INSTALL NEW HYDRO OTTAWA APPROVED METERING BASE AS PER SPECIFICATIONS. SUPPLY AND INSTALL 30mm CONDUIT FROM POTENTIAL TRANSFORMERS AND CURRENT TRANSFORMERS IN SWITCHBOARD PDX TO HYDRO OTTAWA METER BASE.
 - VERIFY PHASE ROTATION AND MATCH EXISTING SYSTEM. RE-TERMINATE LOADS TO NEW SWITCHBOARD AND EXTEND CONDUITS/CABLES AS REQUIRED.
 - CONTRACTOR TO SUPPLY AND INSTALL NEW PANEL ELX IN NEW LOCATION AS SHOWN IN LAYOUT DRAWING E04. TRANSFER ALL EXISTING LOADS FROM DEMOLISHED PANEL ELX AND EXTEND CONDUITS AND CABLES AS REQUIRED.
 - CONTRACTOR TO REPLACE EXISTING BREAKER IN PANEL EPDX THAT FEEDS TRANSFORMER T-768 WITH NEW 30A, 3P, BREAKER.

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No.	Date	Revision	By: Par.

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project **BUILDING U89B UTILITY SUPPLY UPGRADE** projet
 UPLANDS CAMPUS
 drawing **ELECTRICAL SINGLE LINE DIAGRAM NEW CONSTRUCTION** dessin

designed	conçu	date	date
RMCCALLUM		16.01.06	
drawn	dessiné	scale	échelle
RMCCALLUM		AS SHOWN	
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approved	approuvé	W.O.no.	D.T.no.
D.VAN GAAL		A1-005791	
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4056-E03			

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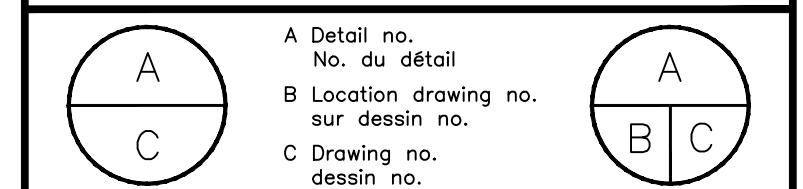
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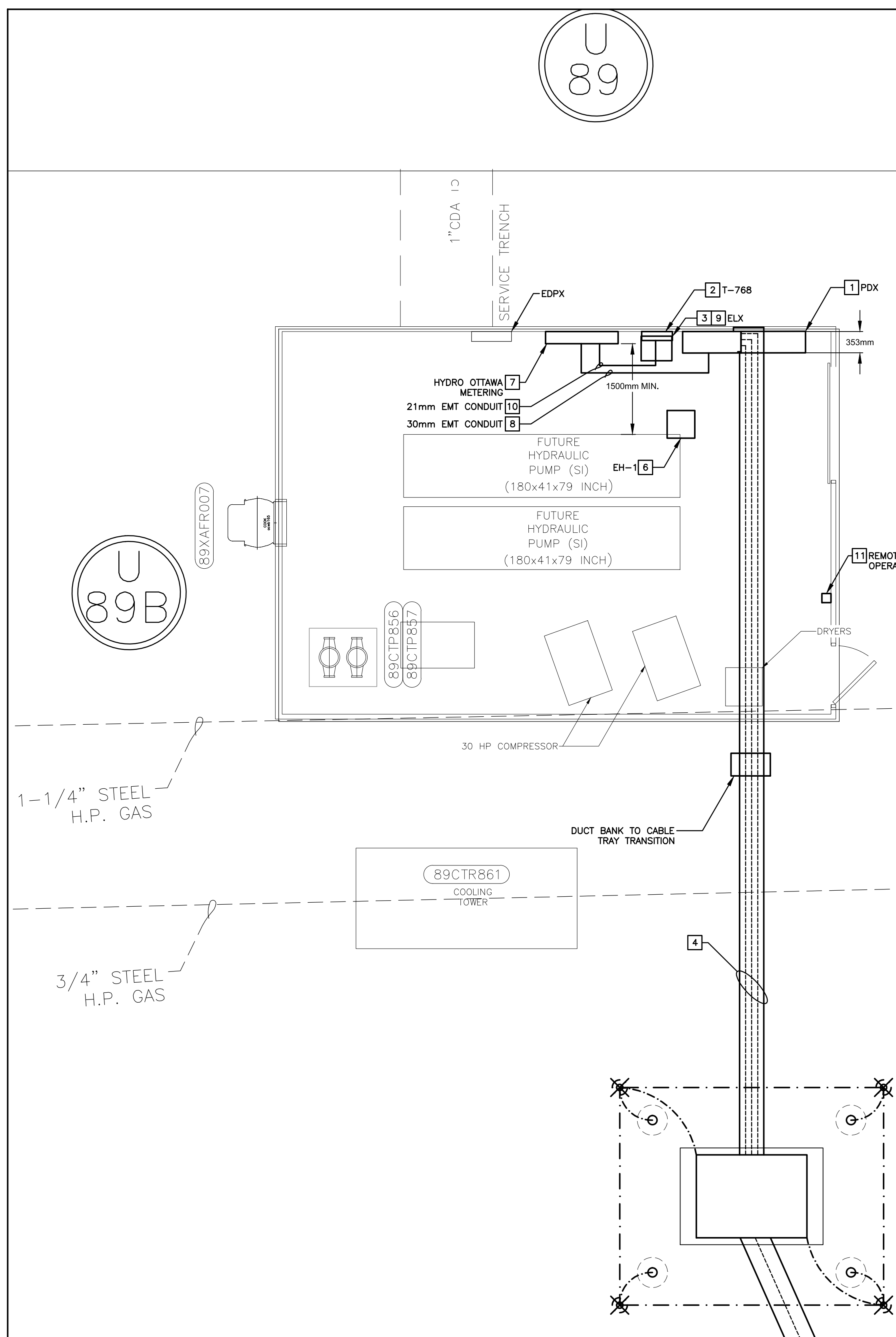


project: **BUILDING U89B
UTILITY SUPPLY
UPGRADE**
UPLANDS CAMPUS

drawing: **ELECTRICAL - BUILDING
LAYOUT - DEMOLITION
AND NEW CONSTRUCTION**

designed RMCCALLUM	conçu RMCCALLUM	date 16.01.06	date
drawn RMCCALLUM	dessiné RMCCALLUM	scale AS SHOWN	échelle
checked D.VAN GAAL	vérifié D.VAN GAAL	sheet 4	of/de 7
approved D.VAN GAAL	approuvé D.VAN GAAL	W.O.no. A1-005791	D.T.no. Stantec No: 163302049
dwg.no. 4056-E04		dessin no.	

drawing no. **4056-E04**

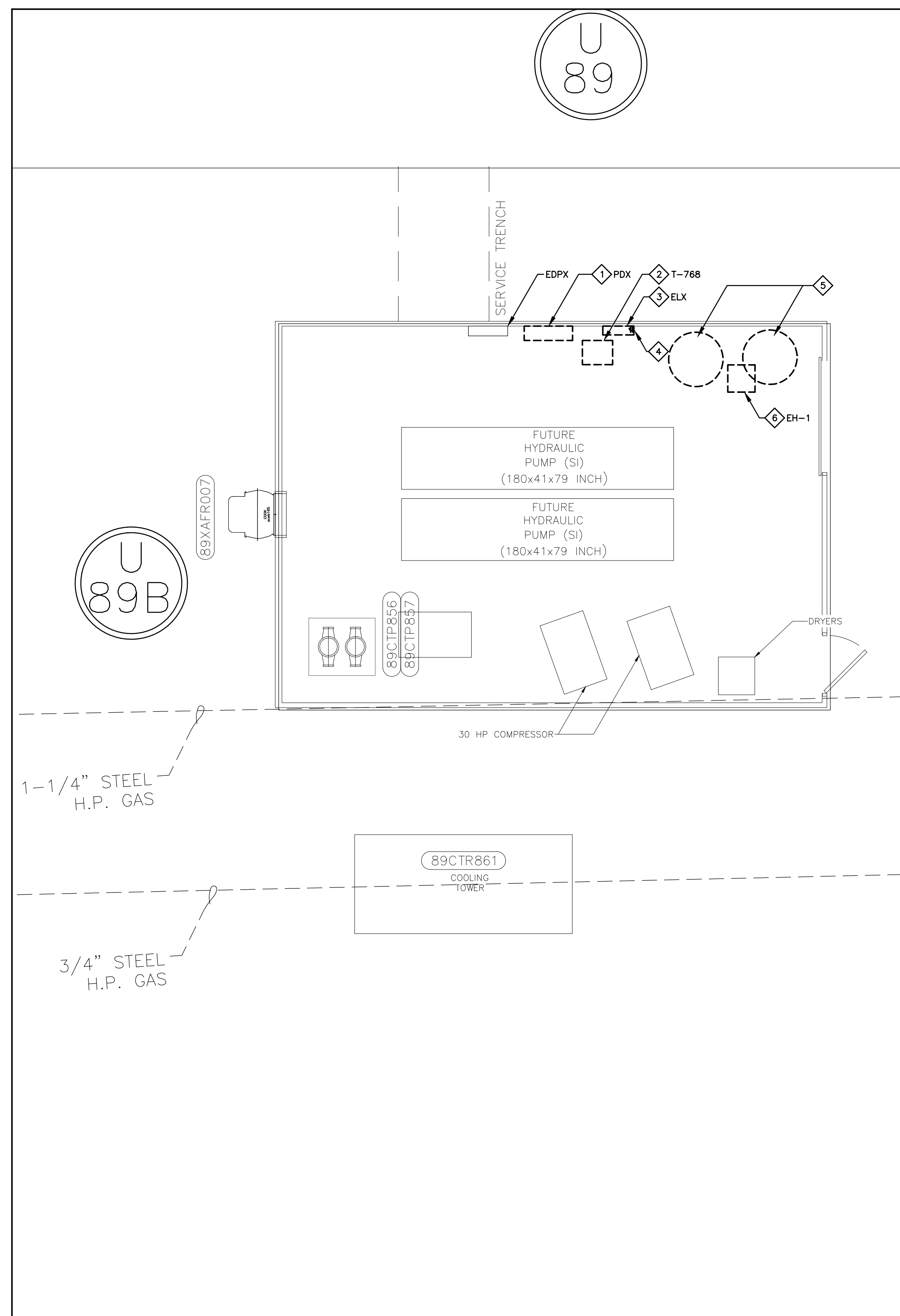


BUILDING U-89B LAYOUT - NEW CONSTRUCTION

1:50

NEW CONSTRUCTION DRAWING NOTES:

- SUPPLY, INSTALL AND COMMISSION NEW 600V, 1200A, 50KA PANELBOARD AND ALL ASSOCIATED BREAKERS, DIGITAL METERING, SURGE PROTECTIVE DEVICE, ETC., AS PER SPECIFICATIONS. SUPPLY AND INSTALL NEW CONDUITS TO EXISTING CONDUITS PREVIOUSLY CONNECTED TO PANELBOARD PDX. SUPPLY AND INSTALL NEW FEEDERS FROM PANELBOARD TO EXISTING LOADS. CONTRACTOR TO CONSTRUCT HOUSEKEEPING PAD ON WHICH NEW SWITCHBOARD IS TO BE PLACED.
- SUSPEND FROM CEILING TRANSFORMER T-768 AS INDICATED. EXTEND EXISTING FEEDER CONDUITS AND CABLES AS REQUIRED.
- INSTALL NEW PANELBOARD ELX AS INDICATED. SUPPLY AND INSTALL NEW CABLES AND CONDUITS ASSOCIATED WITH PANELBOARD TO TRANSFORMER T-768 AND EXISTING LOADS.
- SUPPLY AND INSTALL NEW DUCT BANKS, CABLES TRAY AND SECONDARY FEEDERS CABLES FROM TRANSFORMER SECONDARY TO NEW SWITCHBOARD.
- NOT USED.
- RELOCATE EH-1 AS INDICATED. EXTEND CABLES AND CONDUIT AS REQUIRED FROM PANELBOARD EDPX.
- SUPPLY, INSTALL AND COMMISSION HYDRO OTTAWA APPROVED METERING BASE, METERING ENCLOSURE AND RECEPTACLE AS PER HYDRO OTTAWA DRAWINGS MCS0066 AND HYDRO OTTAWA GCS0008 SPECIFICATION.
- SUPPLY AND INSTALL 30mm EMT CONDUIT FROM METERING CELL OF 1200A SWITCHBOARD TO HYDRO OTTAWA METERING BASE FOR POTENTIAL TRANSFORMERS AND CURRENT TRANSFORMERS WIRING.
- SUPPLY AND INSTALL NEW 24 CCT, 100A PANEL. SUPPLY AND INSTALL NEW DEDICATED HYDRO OTTAWA 15A BREAKER IN PANEL ELX C/W PROVISION TO BE PADLOCKED IN THE "ON" POSITION WHILE STILL ALLOWING FOR TRIP-FREE OPERATION.
- SUPPLY AND INSTALL NEW 21mm CONDUIT AND 2/C #12AWG + GND, RW90, CU CABLE FROM PANEL ELX TO METERING BASE'S 120V, 15A OUTLET.
- SUPPLY AND INSTALL NEW REMOTE OPERATOR CONTROL PANEL TO REMOTELY OPEN AND CLOSE NEW MAIN BREAKER.

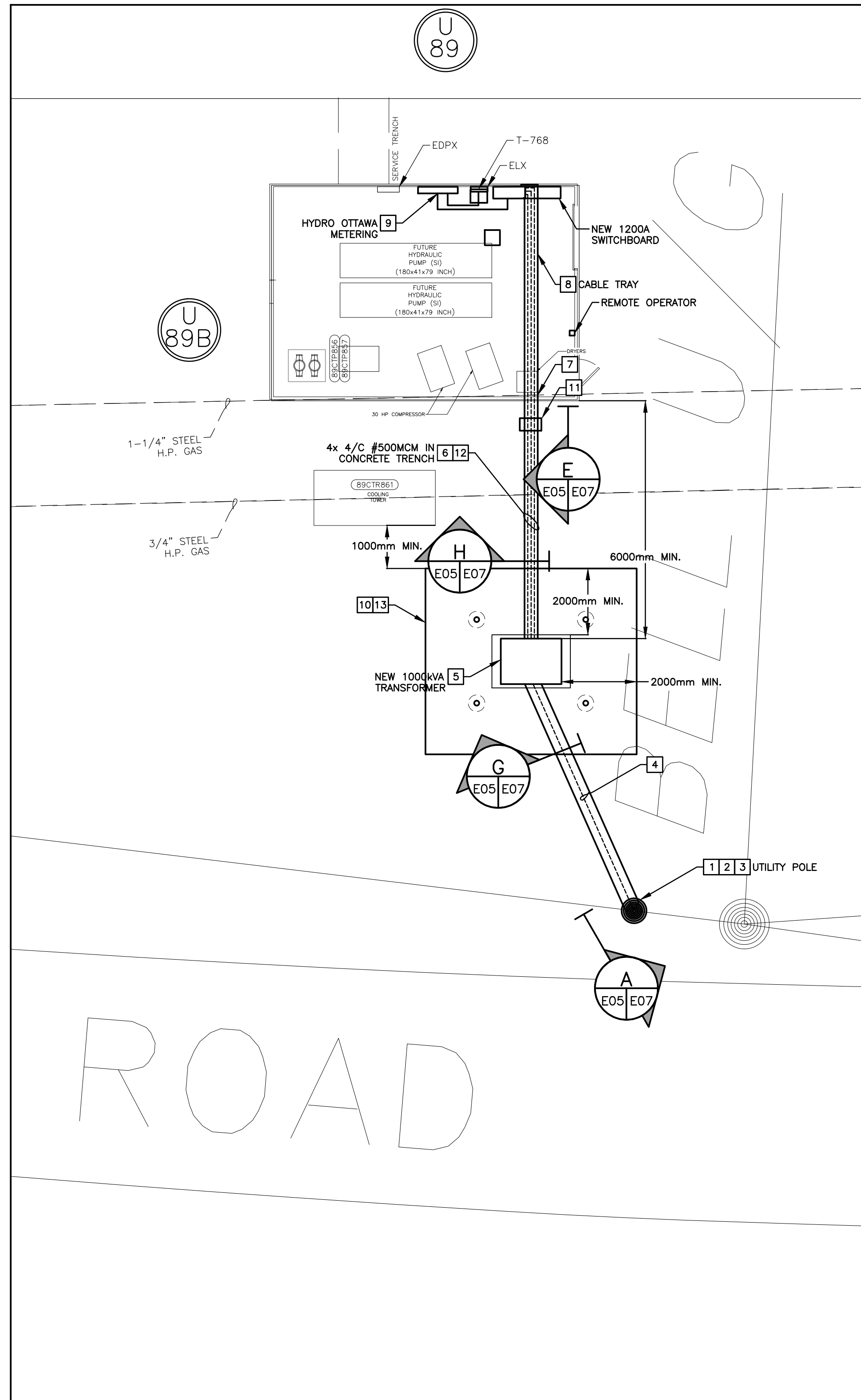


BUILDING U-89B LAYOUT - DEMOLITION

1:50

DEMOLITION DRAWING NOTES:

- REMOVE EXISTING PANELBOARD PDX AND TURN PANELBOARD OVER TO NRC. PULL BACK EXISTING FEEDER CABLES AS REQUIRED AND PREPARE EXISTING CONDUITS TO ALLOW FOR TERMINATION TO NEW 1200A SWITCHBOARD.
- DISCONNECT AND REMOVE PRIMARY AND SECONDARY CABLES AND CONDUITS FROM TRANSFORMER T-768 AND PREPARE TRANSFORMER FOR RELOCATION.
- REMOVE EXISTING PANELBOARD PDX AND TURN PANELBOARD OVER TO NRC. PULL BACK EXISTING FEEDER CABLES AS REQUIRED AND PREPARE EXISTING CONDUITS TO ALLOW FOR TERMINATION TO NEW PANELBOARD IN NEW LOCATION.
- DISCONNECT AND REMOVE ELECTRICAL OUTLET.
- DISCONNECT AND REMOVE COMPRESSED AIR TANKS AND AIR LINES. TURN COMPRESSED AIR TANKS AND AIR LINES OVER TO NRC. NRC WILL RE-INSTALL THE COMPRESSED AIR TANKS IN ANOTHER BUILDING ON SITE.
- DISCONNECT AND REMOVE EH-1 AND PREPARE UNIT FOR RELOCATION.



SITE LAYOUT
1:100

- DRAWING NOTES:**
- HYDRO OTTAWA TO SUPPLY AND INSTALL NEW 27.6KV TRANSITION POLE.
 - HYDRO OTTAWA TO SUPPLY AND INSTALL NEW LOAD BREAK, FUSES, LIGHTNING ARRESTORS, AND DROP LEADS.
 - CONTRACTOR TO CONSTRUCT POLE LATERAL AS PER DETAIL F/E07.
 - CONTRACTOR TO CONSTRUCT NEW 1X2 CONCRETE ENCASED DUCT BANK FROM UTILITY POLE TO TRANSFORMER AS PER DETAIL G/E07. HYDRO OTTAWA TO SUPPLY, INSTALL AND TERMINATE NEW MV CABLES TO FUSE CUTOUTS AND TRANSFORMER PRIMARY.
 - HYDRO OTTAWA TO SUPPLY AND INSTALL NEW 1000kVA PADMOUNTED TRANSFORMER. CONTRACTOR TO INSTALL PRE-CAST CONCRETE TRANSFORMER PAD AS PER DETAIL B/E06 AND K/E07.

- CONTRACTOR TO INSTALL AND CONNECT NEW 3X2 CONCRETE ENCASED DUCT BANK FROM 1000kVA TRANSFORMER TO DUCT BANK-CABLE TRAY TRANSITION AS PER DETAIL H/E07.
- WHERE CABLES PENETRATES BUILDING WALL CONTRACTOR TO INSTALL REQUIRED FLASHING INSULATION AND WATER PROOFING TO ENSURE BUILDING IS MAINTAINED WATER TIGHT AS PER DETAIL J/E07.
- CONTRACTOR TO SUPPLY AND INSTALL CABLE TRAY. POSITION CABLE TRAY TO ALLOW TOP ENTRY OF CABLES INTO NEW SWITCHBOARD. IMMEDIATELY AFTER THE WALL PENETRATION SUPPLY AND INSTALL A NEW UNISTRUT STRUCTURE TO SUPPORT CABLE TRAY. CABLE TRAY TO BE SEISMICALLY BRACED AS PER SPECIFICATIONS.
- CONTRACTOR TO SUPPLY AND INSTALL NEW HYDRO OTTAWA METERING BASE TO SPECIFICATION AND DETAIL I/E07 C/W WITH UNISTRUT STAND.
- CONTRACTOR TO SUPPLY AND INSTALL GRANULAR 'A' AND EXTEND 1 METER BEYOND THE GROUND GRID.

- CONTRACTOR TO CONSTRUCT CONCRETE TRANSITION FROM DUCT BANK TO CABLE TRAY AS PER DETAIL E/E07.
- CONTRACTOR TO SUPPLY, INSTALL, AND TERMINATE NEW 4X(3/C - 500MCM 600V, AIRGUARD, CU) AT SECONDARIES OF TRANSFORMERS AND AT 1200A SWITCHBOARD.
- CONTRACTOR TO SUPPLY AND INSTALL OIL CONTAINMENT SYSTEM TO CI AGENT RECOMMENDATIONS.

GENERAL NOTES

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- ALL CODES REFERENCED ARE TO BE THE LATEST VERSION AT THE DATE OF ISSUE.
- DESIGN IS BASED ON THE NATIONAL BUILDING CODE NBC 2015, C22.3 No. 1-10.
- READ THESE DESIGN NOTES IN CONJUNCTION WITH THE CONTRACT SPECIFICATIONS AND ALL OTHER CONTRACT DOCUMENTS.
- OBTAIN ENGINEER'S APPROVAL BEFORE CUTTING, BORING, OR SLEEVING LOAD-BEARING MEMBERS UNLESS NOTED OTHERWISE.
- THE DRAWINGS ARE FOR THE COMPLETED PROJECT. STABILITY OF THE EXISTING STRUCTURE DURING CONSTRUCTION REMAINS THE RESPONSIBILITY OF THE CONTRACTOR.
- REVIEW ALL DRAWINGS AND CHECK DIMENSIONS PRIOR TO IMPLEMENTING THE WORK. REPORT ANY DISCREPANCIES TO THE CONSULTANT FOR CLARIFICATION BEFORE PROCEEDING.
- COORDINATE PLACEMENT AND LOCATION OF ITEMS BY SUBSEQUENT TRADES. RELEVANT TRADES SHALL REVIEW PRIOR TO INSTALLATION.
- OWNER MAY ADJUST SLAB SIZE BASED ON CONTRACTOR SELECTED EQUIPMENT AT NO ADDITIONAL COST TO OWNER.
- NOTIFY THE ENGINEER A MINIMUM OF 24 HOURS PRIOR TO ANY REQUIRED SITE REVIEWS.
- EXISTING STRUCTURE, BEAMS AND/OR SUPPORTS ARE NOT TO BE IMPACTED OR MODIFIED UNLESS NOTED.
- ALL CIVIL WORK MUST BE PERFORMED BY A HYDRO OTTAWA APPROVED CONTRACTOR. HYDRO OTTAWA APPROVED CONTRACTORS AS FOLLOWS:
 - BRADLEY KELLY CONSTRUCTION Ltd.
 - CARLETON ELECTRIC Ltd.
 - JWK UTILITIES & SITE SERVICES Ltd.
 - SEGUIN MORRIS
 - TERAFLEX Ltd.
 - VALLEY UTILITIES Ltd.
 - WESTBORO UTILITIES

EXISTING STRUCTURES

- THE DESIGN IS BASED ON INFORMATION GATHERED FROM THE RECORD DRAWINGS AND FROM LIMITED VISUAL OBSERVATIONS ON SITE.
- VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS ON SITE PRIOR TO IMPLEMENTING AFFECTED WORK.
- NOTIFY THE CONSULTANT OF ANY SITE CONDITIONS THAT DIFFER FROM THE CONTRACT DOCUMENTS OR THE RECORD DRAWINGS.

DESIGN LOADS

- UNLESS NOTED OTHERWISE, THE LOADS NOTED IN TABLES AND ON DRAWINGS ARE UNFACTORED.
- CLIMATIC INFORMATION REFER TO CLIMATIC INFORMATION TABLE BELOW
- SITE INFORMATION REFER TO SITE INFORMATION TABLE BELOW

DELEGATED DESIGN

- PORTIONS OF THE DETAILED DESIGN ARE DELEGATED TO THE CONTRACTOR. RETAIN A PROFESSIONAL ENGINEER REGISTERED IN THE PROVINCE OF ONTARIO TO COMPLETE THE DESIGN.
- SUBMIT SHOP DRAWINGS FOR COMPONENTS REQUIRING DELEGATED DESIGN UNDER THE SEAL AND SIGNATURE OF THE ENGINEER RESPONSIBLE FOR THE DESIGN.
- THE FOLLOWING COMPONENTS REQUIRE DELEGATED DESIGN:
 - CONCRETE MIX DESIGN
 - REBAR DETAILS
- THE ENGINEER RESPONSIBLE FOR THE DESIGN IS ALSO RESPONSIBLE FOR REVIEW OF FABRICATION AND INSTALLATION OF THE COMPONENTS. UPON COMPLETION OF THE WORK, CERTIFY IN WRITING TO THE CONSULTANT THAT SUCH REVIEW HAS BEEN COMPLETED.
- REFER TO SPECIFICATIONS FOR FURTHER REQUIREMENTS.

FOUNDATION AND GEOTECHNICAL NOTES

- BEAR ALL FOOTINGS ON UNDISTURBED SOIL NOTWITHSTANDING THE ELEVATIONS INDICATED ON THE DRAWINGS.
- BRING OVER-EXCAVATION AND CAVITIES IN THE FOOTING BASE UP TO THE REQUIRED LEVELS WITH COMPACTED OPSS GRANULAR 'B' TYPE 2
- REMOVE ALL ORGANIC MATERIAL FROM TEXCAVATION AND DISPOSE OF OFF SITE.
- REMOVE ALL LOOSE OR SATURATED MATERIAL AND GROUNDWATER FROM THE BASE OF FOOTING EXCAVATIONS BY APPROVED METHODS PRIOR TO PLACING FOUNDATIONS.
- PROTECT EXCAVATIONS FOR FOOTINGS FROM RAIN, SNOW, FREEZING TEMPERATURES, STANDING WATER, LOSS OF MOISTURE AND DEGRADATION BY APPROVED METHODS.
- BEARING SURFACES TO BE INSPECTED IN THE FIELD BY A PROFESSIONAL GEOTECHNICAL ENGINEER REGISTERED IN THE PROVINCE OF ONTARIO PRIOR TO PLACING CONCRETE. CONTRACTOR TO PAY FOR GEOTECHNICAL ENGINEER'S INSPECTION COSTS.
- GEOTECHNICAL TESTING AGENCY TO BE APPROVED BY AND RESPONSIBLE TO THE ENGINEER AND PAID FOR BY THE CONTRACTOR. PROVIDE A MINIMUM OF 24 HOURS NOTICE PRIOR TO REQUIRED INSPECTION.
- BACKFILL MATERIAL TO CONSIST OF OPSS GRANULAR 'A' AND BE COMPACTED TO 95% OF STANDARD PROCTOR MAXIMUM DRY DENSITY IN MAXIMUM LIFTS OF 300 mm.
- BACKFILL WALLS BELOW GRADE EVENLY ON BOTH SIDES ENSURING THAT NO PORTION OF THE FILL IS PLACED MORE THAN 600 mm ABOVE ANY OTHER PORTION OF THE FILL DURING BACKFILLING.

CAST-IN-PLACE REINFORCED CONCRETE

- CONCRETE MATERIALS, QUALITY, MIXING, PLACING, FORMWORK AND OTHER CONSTRUCTION PRACTICES TO CONFORM TO CSA-A23.1.
- SUPPLY CONTROLLED CONCRETE IN ACCORDANCE WITH CSA-A23.1 WITH PROPERTIES NOTED IN SPECIFICATION 033000.

- USE TYPE GU CEMENT FOR ALL CONCRETE UNLESS NOTED OTHERWISE.
- NOTIFY CONSULTANT 24 HOURS PRIOR TO CONCRETE POURS TO ALLOW FOR REVIEW OF REINFORCEMENT.
- DO NOT USE ADMIXTURES CONTAINING CALCIUM CHLORIDE.
- FOR FLOOR SLABS, DESIGN THE CONCRETE MIX WITH AGGREGATE GRADING AND WATER TO CEMENTING MATERIALS RATIO TO MINIMIZE SHRINKAGE.
- FIELD AND LABORATORY TESTING OF CONCRETE TO BE COMPLETED BY A THIRD PARTY TESTING AND INSPECTION AGENCY APPROVED BY AND RESPONSIBLE TO THE ENGINEER. TESTING AGENCY SHALL BE CERTIFIED TO CSA-A283 AND TESTING TO BE COMPLETED IN ACCORDANCE WITH CSA-A23.2. TESTING PAID FOR BY CONTRACTOR.

CONCRETE REINFORCEMENT

- REINFORCEMENT STEEL TO CONFORM TO CSA-G30.18 GRADE 400.
- DO NOT WELD REINFORCEMENT UNLESS APPROVED IN WRITING BY THE ENGINEER. REINFORCEMENT TO BE WELDED TO CONFORM TO CSA-G30.18, GRADE 400W. WELDING ONLY PERMITTED BY AN ORGANIZATION CERTIFIED TO CSA-W186.
- NOTIFY THE ENGINEER PRIOR TO CONCRETE PLACEMENT TO ALLOW FOR REVIEW OF REINFORCEMENT.
- SUBMIT SHOP DRAWINGS AND DETAILS FOR ALL REINFORCEMENT FOR REVIEW PRIOR TO FABRICATION.
- CLEAR CONCRETE COVER TO REINFORCEMENT

CAST PERMANENTLY AGAINST EARTH	75mm
REMINDER	60mm
- REINFORCEMENT SPLICES - DO NOT SPLICE REINFORCEMENT.
- EMBEDMENT OF DOWELS ARE DIMENSIONED ON THE DRAWINGS.
- WELDED WIRE MESH TO CONFORM TO ASTM A497/A497M.
- ALL REINFORCEMENT TO BE SUPPORTED AT 900mm MAXIMUM SPACING.

CONCRETE FORMWORK

- DESIGN, FABRICATION, ERECTION, AND OTHER CONSTRUCTION PRACTICES TO CONFORM TO CAN/CSA-S269.3.

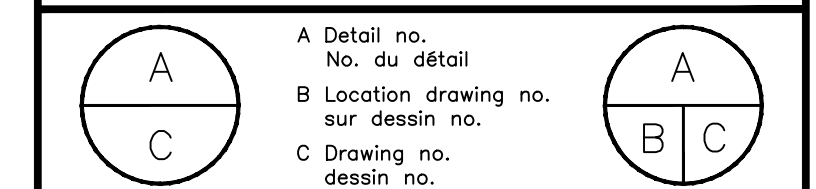
CLIMATIC INFORMATION	
TO BE READ IN CONJUNCTION WITH DESIGN NOTES	
SNOW LOAD (1/50), Ss	2.4 kPa
SNOW LOAD (1/50), Sr	0.4 kPa
ONE DAY RAIN (1/50)	91mm
HOURLY WIND PRESSURE (1/10)	0.32 kPa
HOURLY WIND PRESSURE (1/50)	0.41 kPa
SEISMIC RESPONSE, Sa(0.2)	0.63
SEISMIC RESPONSE, Sa(0.5)	0.31
SEISMIC RESPONSE, Sa(1.0)	0.14
SEISMIC RESPONSE, Sa(2.0)	0.046
SEISMIC RESPONSE, PGA	0.32

SITE INFORMATION	
TO BE READ IN CONJUNCTION WITH DESIGN NOTES	
IMPORTANCE CATEGORY	NORMAL
WIND EXPOSURE TYPE	OPEN TERRIAN
INTERNAL PRESSURE CATEGORY	1
FOUNDATION SITE CLASS	D

F	16.04.20	RE-ISSUED FOR TENDER	R.Mc.
E	16.03.30	ISSUED FOR TENDER	R.Mc.
D	16.03.23	ISSUED FOR HYDRO OTTAWA REVIEW	R.Mc.
No.	Date	Revision	By: Par:

Date Printed: _____ Date imprimée: _____

- Verify all dimensions and site conditions and be responsible for same
- Vérifier toutes les dimensions et l'état des lieux et en assumer la responsabilité



project
BUILDING U89B
UTILITY SUPPLY
UPGRADE
 UPLANDS CAMPUS

drawing
ELECTRICAL
SITE LAYOUT

designed RMCCALLUM	conçu RMCCALLUM	date 16.01.06	date AS SHOWN
drawn D.VAN GAAL	dessiné D.VAN GAAL	scale 5 of 7	échelle feuille
checked D.VAN GAAL	vérifié D.VAN GAAL	sheet A1-005791	W.O.no. D.T.no.
dwg.no. 4056-E05		dessin no.	

- GENERAL NOTES:**
- EXCEPT AS NOTED OTHERWISE ALL EXISTING EQUIPMENT TO REMAIN IS SHOWN IN THIN SOLID LINES.
 - EXCEPT AS NOTED OTHERWISE ALL EQUIPMENT TO BE DEMOLISHED IS SHOWN IN THICK DASHED LINES.
 - EXCEPT AS NOTED OTHERWISE ALL NEW EQUIPMENT IS SHOWN IN THICK SOLID LINES.

DRAWING SPECIFIC NOTES:

TRANSFORMER PAD AND BOLLARDS SHALL BE INSPECTED AND APPROVED BY HYDRO OTTAWA PRIOR TO POURING CONCRETE.

BACKFILL MATERIAL FOR PRIMARY DUCT BANK AND TRANSFORMER BASE SHALL BE INSPECTED AND APPROVED BY HYDRO OTTAWA PRIOR TO USE.

DRAWING NOTES:

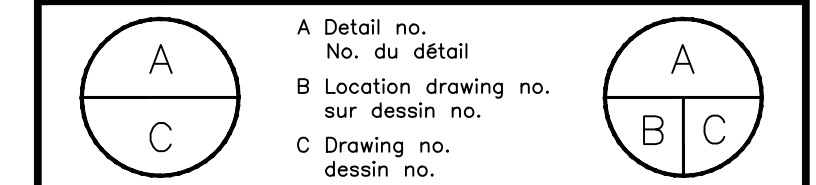
- 35KV SWITCH, LIGHTNING ARRESTORS, POLES, FUSE CUTOUPS AND LOAD BREAK TO BE SUPPLIED AND INSTALLED BY HYDRO OTTAWA.
- HYDRO OTTAWA TO SUPPLY, INSTALL AND TERMINATE PRIMARY MV CABLES TO FUSE CUTOUPS C/W STRESS CONE, CABLE GUARDS AND STRAPS.
- CONTRACTOR TO SUPPLY AND INSTALL GRADIENT CONTROL MAT AND CONTROL MAT MUST BE PLACED IN A MINIMUM OF 150mm OF CRUSHED STONE.
- CONTRACTOR TO SUPPLY AND INSTALL #2/0 AWG BARE COPPER CONDUCTOR AND CONNECT MV SWITCH TO NEW GROUND GRID.
- SUPPLY AND INSTALL GROUND RODS AND GROUND GRID AS INDICATED. GROUND CONDUCTORS MUST BE #2/0 AWG BARE COPPER CONDUCTOR AND GROUND RODS MUST BE 19mm x 3m COPPER CLAD STEEL RODS.
- SUPPLY AND INSTALL BOLLARDS AS PER DETAIL D/E06.
- HOLE FOR THE GROUND WIRE TO BE LABELLED WITH GROUND SYMBOL USING GREEN PAINT. SYMBOL TO MEASURE 150mmX150mm.

N.T.S.

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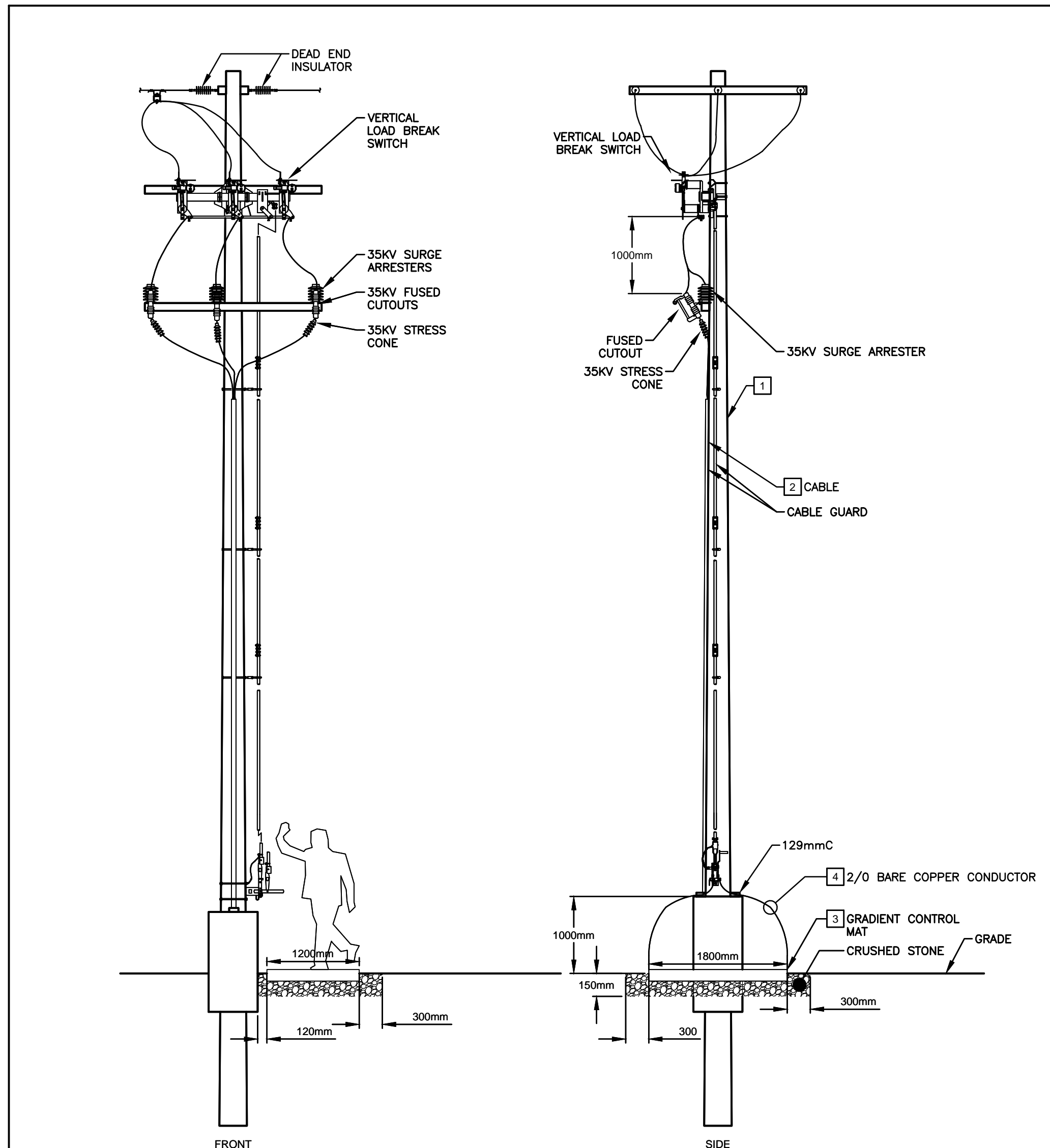


project: **BUILDING U89B UTILITY SUPPLY UPGRADE**
 UPLANDS CAMPUS

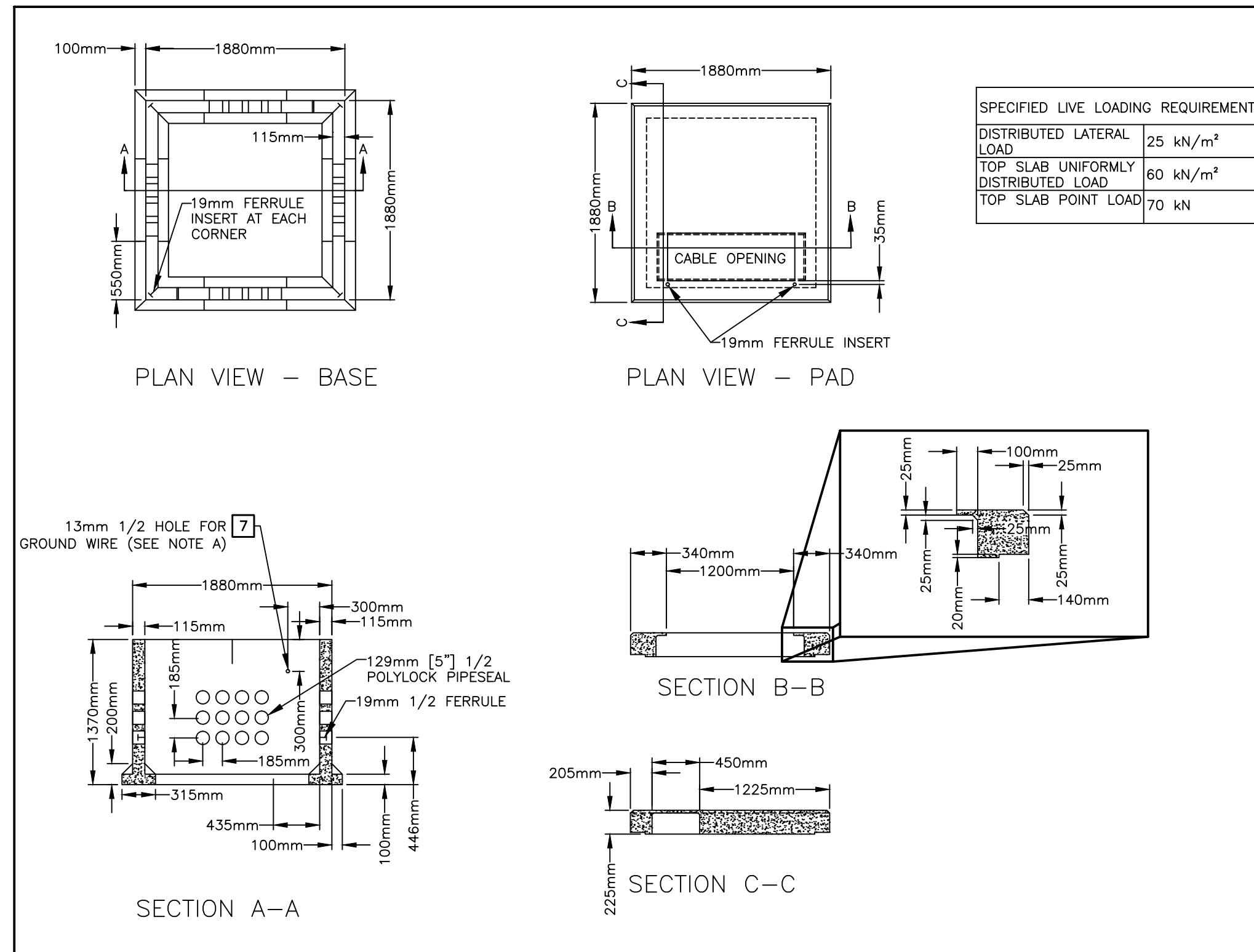
drawing: **ELECTRICAL DETAILS #1**

designed	conçu	date	date
RMCCALLUM		16.01.06	
drawn	dessiné	scale	échelle
RMCCALLUM		AS SHOWN	
checked	vérifié	sheet	feuille
D.VAN GAAL		6 of/de	7
approved	approuvé	W.O.no.	D.T.no.
D.VAN GAAL		A1-005791	
dwg.no.		Stantec No: 163302049	dessin no.

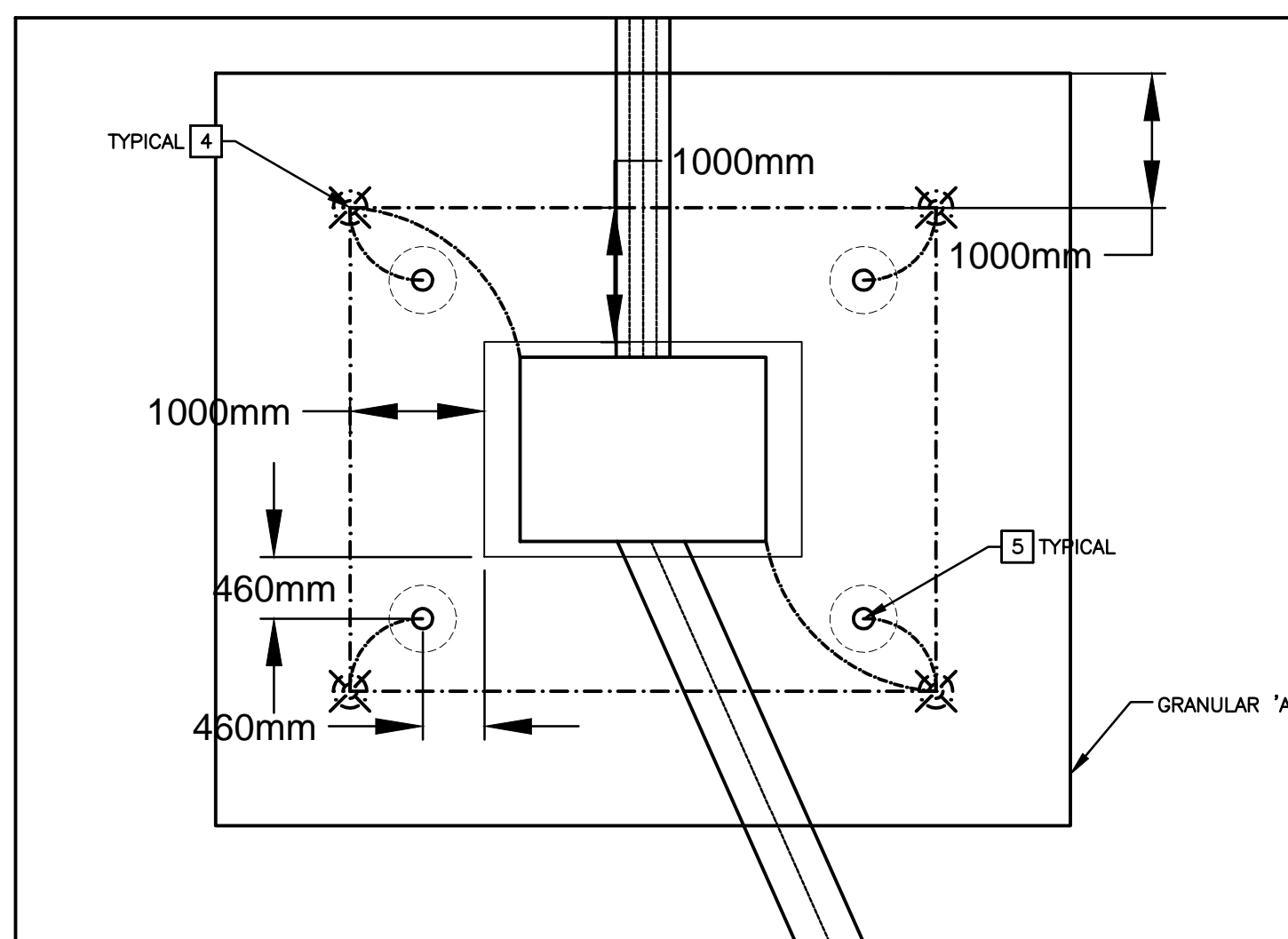
4056-E06



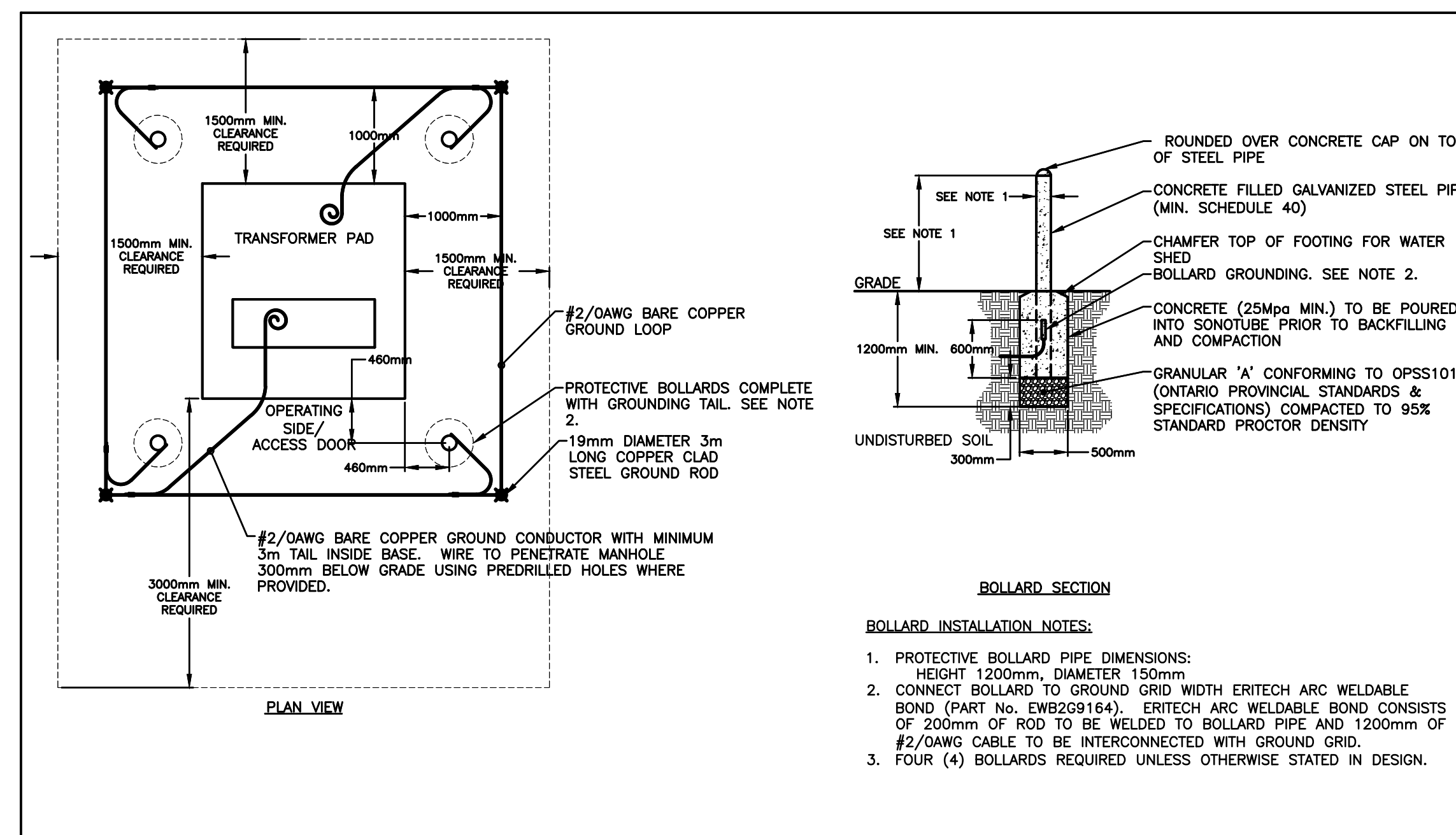
A HYDRO OTTAWA LOAD POLE
 E06 N.T.S.



B TRANSFORMER PAD
 E06 N.T.S.



C TRANSFORMER BOLLARD AND GROUND RODS PLAN
 E06 1:50



D TYPICAL BOLLARD DETAIL
 E06 N.T.S.

- GENERAL NOTES:**
- EXCEPT AS NOTED OTHERWISE ALL EXISTING EQUIPMENT TO REMAIN IS SHOWN IN THIN SOLID LINES.
 - EXCEPT AS NOTED OTHERWISE ALL EQUIPMENT TO BE DEMOLISHED IS SHOWN IN THICK DASHED LINES.
 - EXCEPT AS NOTED OTHERWISE ALL NEW EQUIPMENT IS SHOWN IN THICK SOLID LINES.

DRAWING SPECIFIC NOTES:

FOR HYDRO OTTAWA METER EQUIPMENT, METERING BASE AND INSTALLATION REQUIREMENTS, REFER TO REVENUE METERING SPECIFICATION GCS0008, TABLE 5 AND HYDRO OTTAWA SPECIFICATION GCS008 SECTION 5.1.

PRIMARY DUCT BANK SHALL BE INSPECTED AND APPROVED BY HYDRO OTTAWA PRIOR TO POURING CONCRETE.

BACKFILL MATERIAL FOR PRIMARY DUCT BANK AND TRANSFORMER BASE SHALL BE INSPECTED AND APPROVED BY HYDRO OTTAWA PRIOR TO USE.

- DRAWING NOTES:**
- CONTRACTOR TO PROVIDE AND INSTALL FLASHING TO PROVIDE WEATHER PROOFING TO CABLE TRAY AND CABLE ENTRY.
 - CONTRACT TO SEAL ALL IN USE OUTDOOR CONDUIT WITH WEATHER PROOFING CAULKING TO PREVENT WATER PENETRATION AND CAP CONDUITS NOT IN USE BY MECHANICAL MEANS.
 - GRANULAR "A" CONFORMING TO OPSS1010 COMPACTED 95% STANDARD PROCTOR DENSITY. PERFORMED IN TWO LIFTS OF 150mm EACH AND FREE OF ORGANIC MATERIAL. EXTEND TO 1000mm ON ALL SIDES.
 - CONTRACTOR TO CONSTRUCT FREE STANDING UNISTRUT STAND TO MOUNT HYDRO OTTAWA METERING BASE.

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No.	Date	Revision	By: / Par:

Date Printed: _____ Date imprimée: _____

- Verify all dimensions and site conditions and be responsible for same
- Vérifier toutes les dimensions et l'état des lieux et en assumer la responsabilité

A	A
C	B

A Detail no. / No. du détail
 B Location drawing no. / sur dessin no.
 C Drawing no. / dessin no.

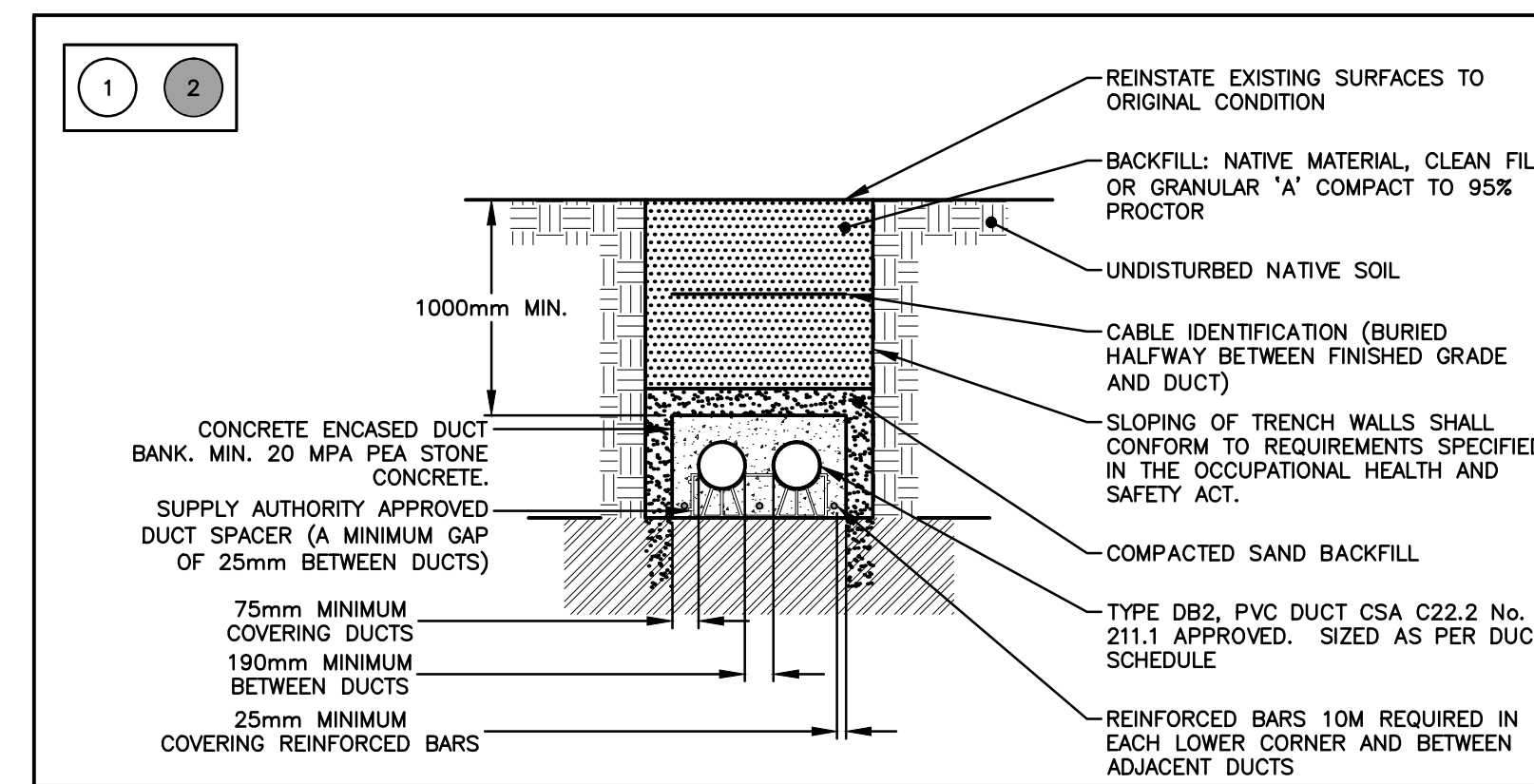
project: _____ projet: _____

**BUILDING U89B
 UTILITY SUPPLY
 UPGRADE
 UPLANDS CAMPUS**

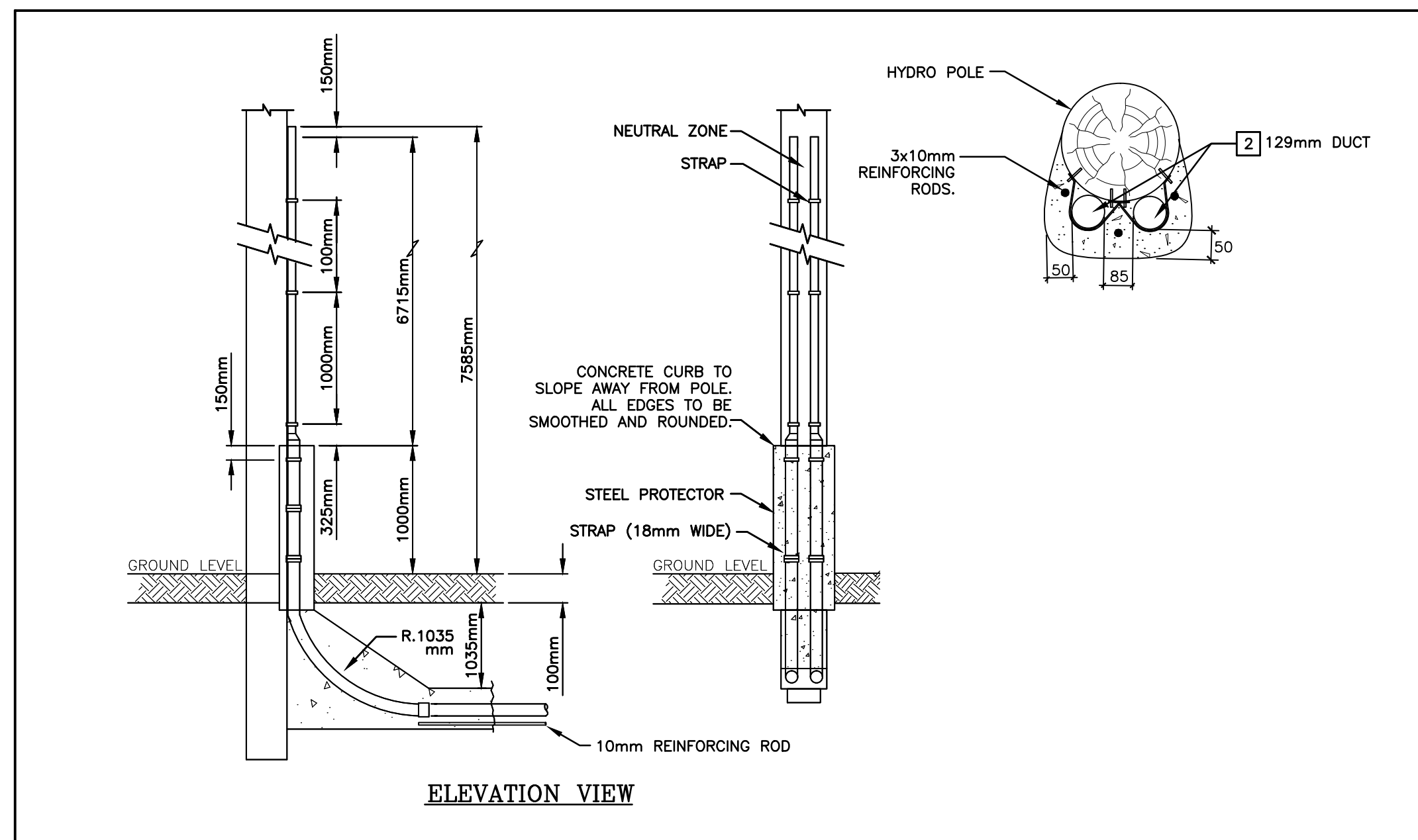
**ELECTRICAL
 DETAILS #2**

designed / conçu	RMCCALLUM	date	16.01.06
drawn / dessiné	RMCCALLUM	scale / échelle	AS SHOWN
checked / vérifié	D.VAN GAAL	sheet / feuille	7 of / de 7
approved / approuvé	D.VAN GAAL	W.O.no. / D.T.no.	A1-005791
dwg.no.	4056-E07	Stantec No:	163302049

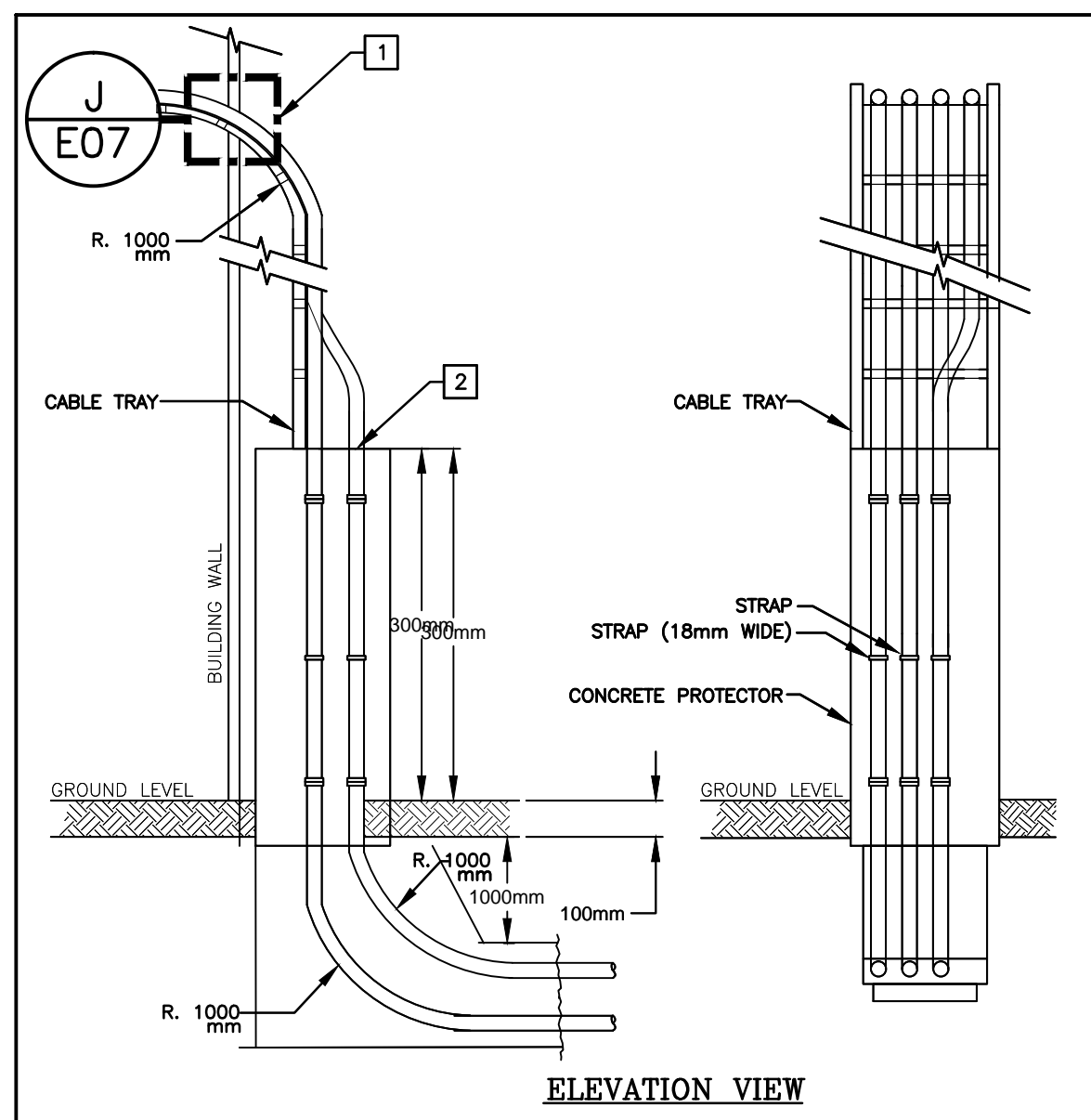
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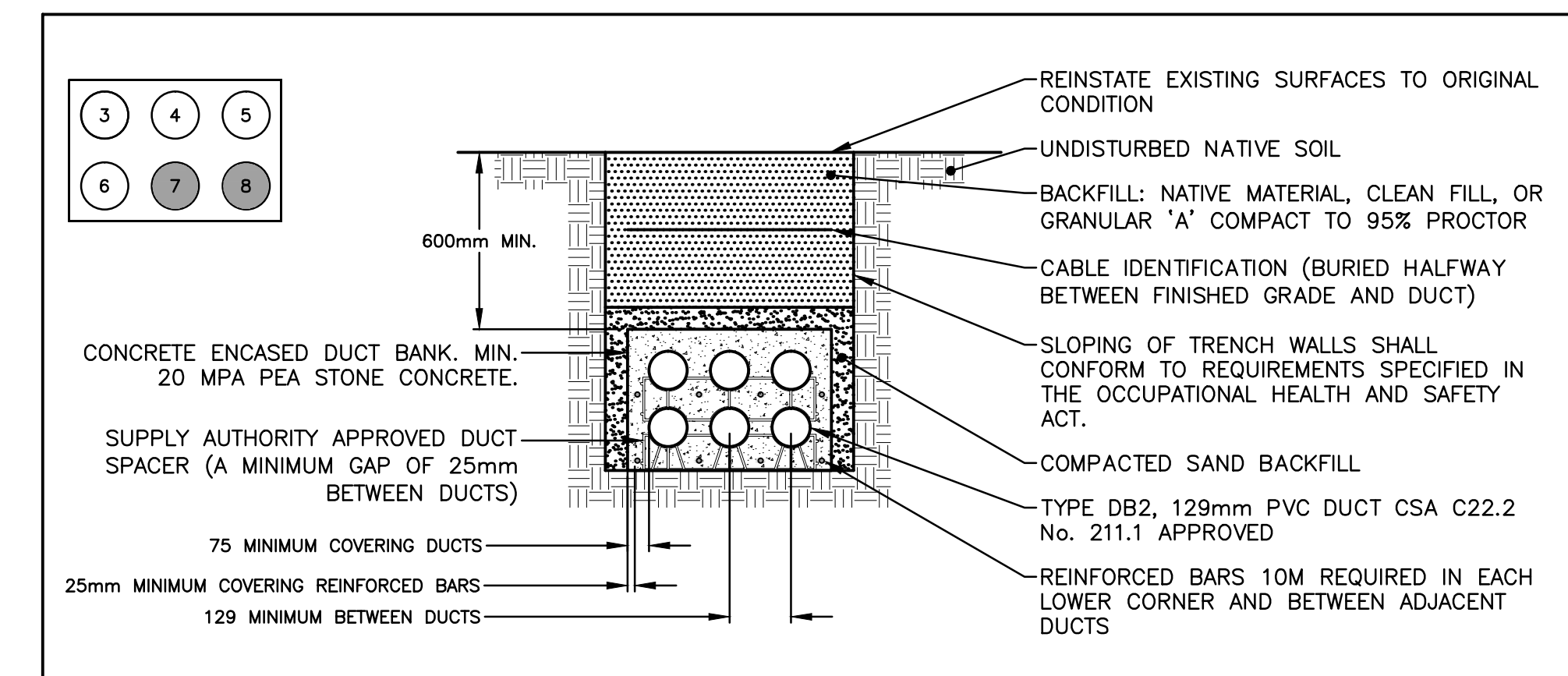
G NEW (2x1) CONCRETE ENCASED DUCT BANK
 E07 N.T.S.



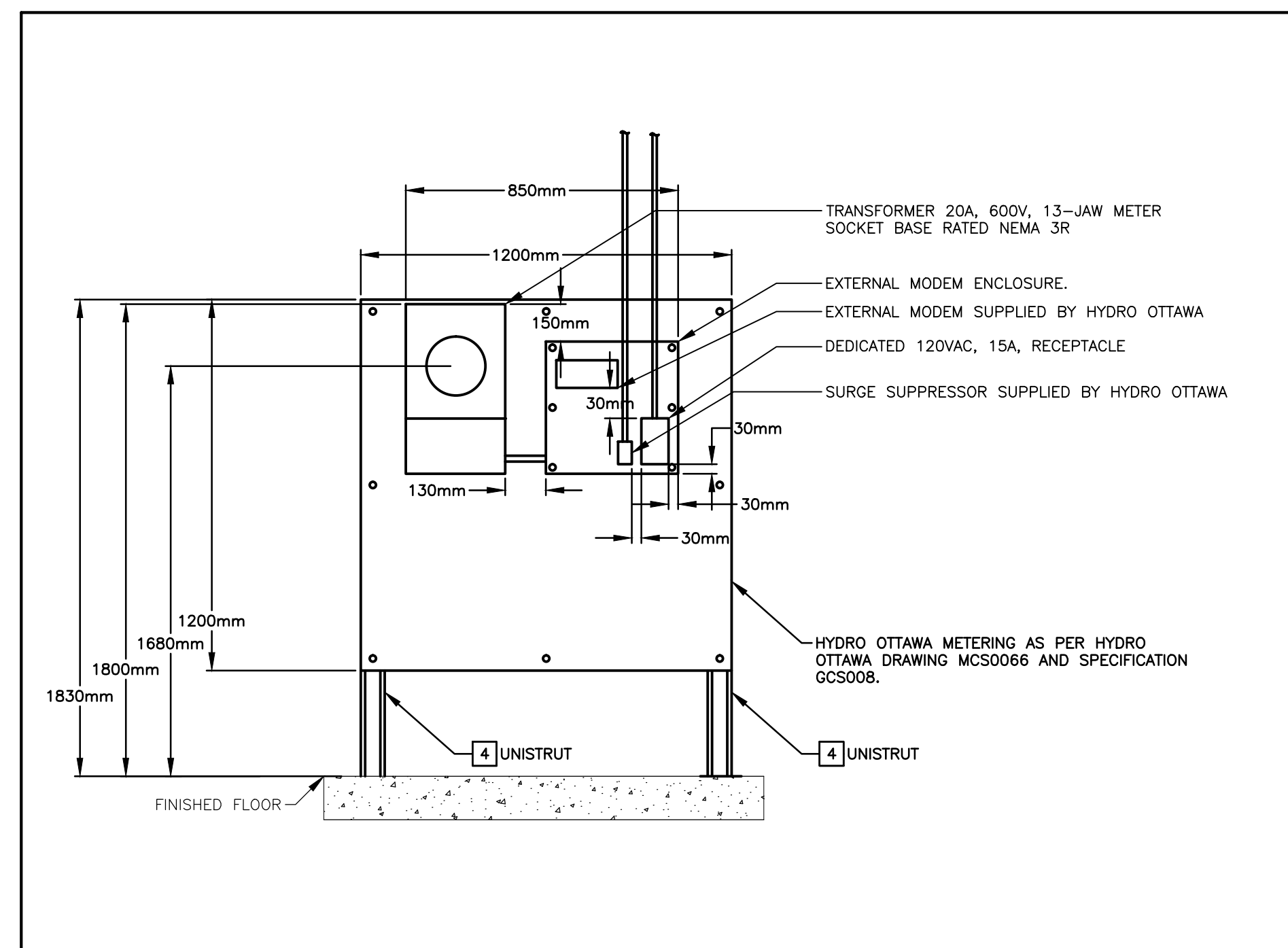
F POLE LATERAL TRANSITION OVERHEAD/UNDERGROUND
 E07 N.T.S.



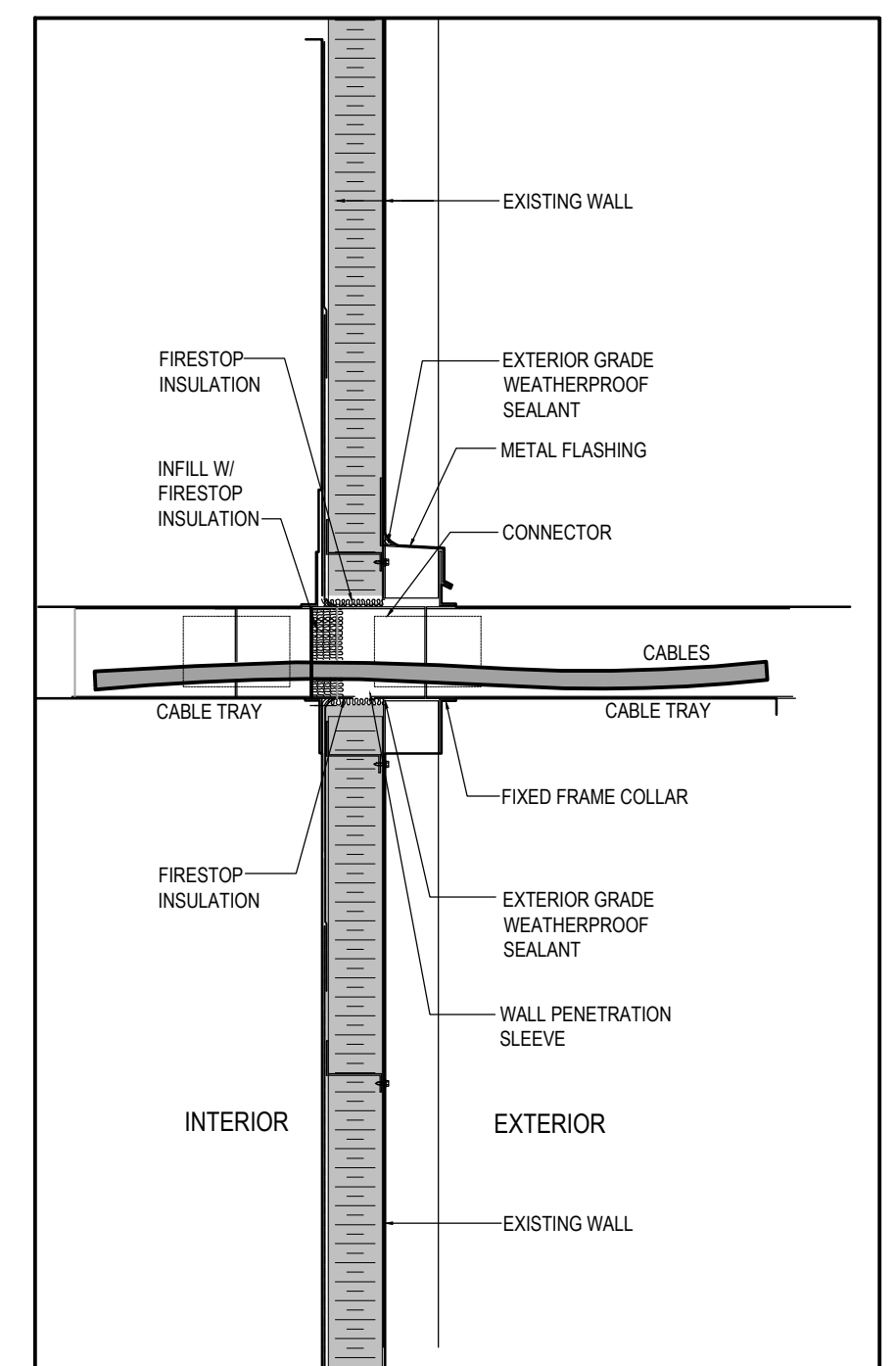
E TRANSITION FROM DUCT BANK TO CABLE TRAY
 E07 N.T.S.



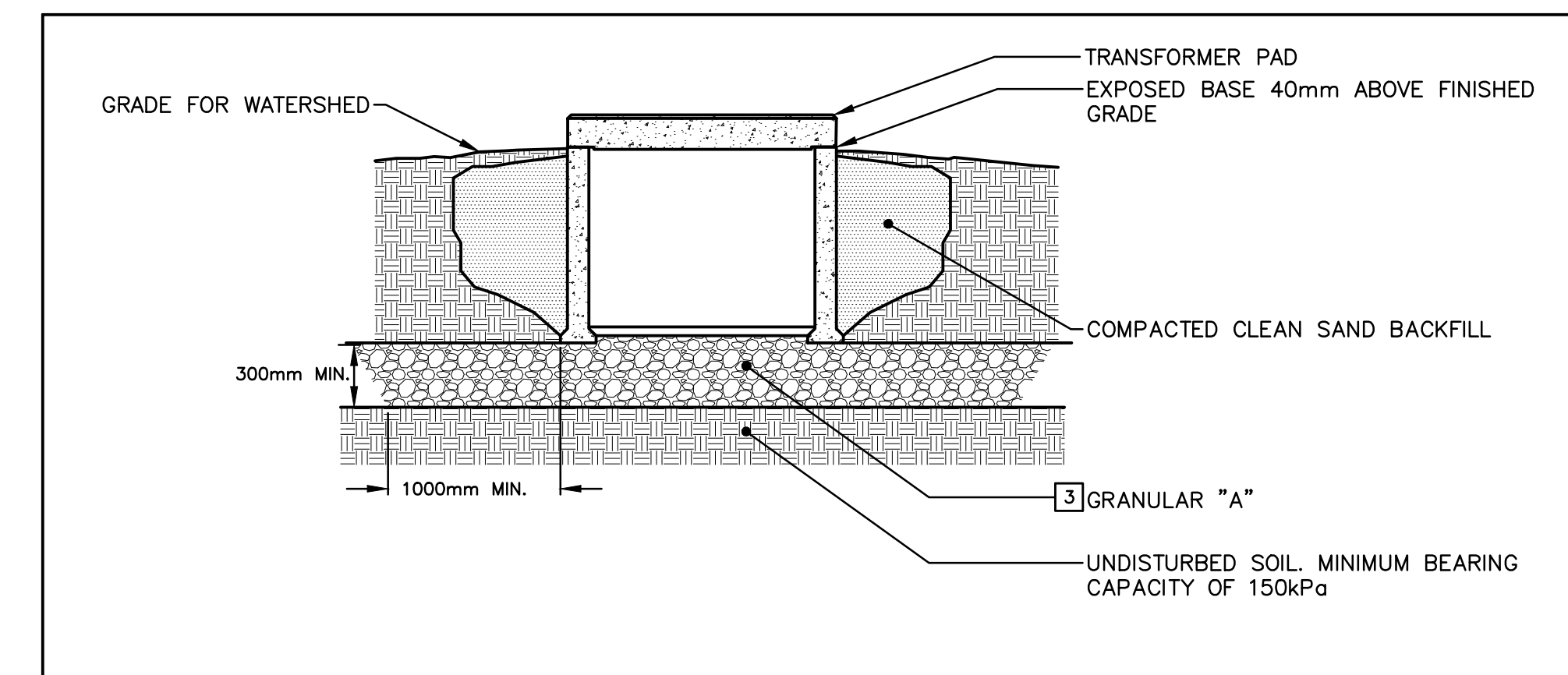
H NEW (3x2) CONCRETE ENCASED DUCT BANK
 E07 N.T.S.



I HYDRO OTTAWA METERING BASE
 E07 N.T.S.



J TYPICAL WALL PENETRATION DETAIL
 E07 N.T.S.



K TRANSFORMER BASE AND PAD
 E07 N.T.S.

DUCT SCHEDULE				
NO.	FROM	TO	DIAM.	CONDUCTOR(S)
1	NEW DIP POLE	NEW 1000kVA TRANSFORMER	129 mm	UB9-LS2 HYDRO PROVIDED CABLE
2	NEW DIP POLE	NEW 1000kVA TRANSFORMER	129 mm	SPARE 8mm POLYPROPYLENE ROPE
3	NEW 1000kVA TRANSFORMER	NEW 1200A SWITCHBOARD	129 mm	FEED TO SWITCHBOARD PDX (4/C-#500MCM, 600V, AIRGUARD, CU)
4	NEW 1000kVA TRANSFORMER	NEW 1200A SWITCHBOARD	129 mm	FEED TO SWITCHBOARD PDX (4/C-#500MCM, 600V, AIRGUARD, CU)
5	NEW 1000kVA TRANSFORMER	NEW 1200A SWITCHBOARD	129 mm	FEED TO SWITCHBOARD PDX (4/C-#500MCM, 600V, AIRGUARD, CU)
6	NEW 1000kVA TRANSFORMER	NEW 1200A SWITCHBOARD	129 mm	FEED TO SWITCHBOARD PDX (4/C-#500MCM, 600V, AIRGUARD, CU)
7	NEW 1000kVA TRANSFORMER	NEW 1200A SWITCHBOARD	129 mm	SPARE 8mm POLYPROPYLENE ROPE
8	NEW 1000kVA TRANSFORMER	NEW 1200A SWITCHBOARD	129 mm	SPARE 8mm POLYPROPYLENE ROPE

LEGEND:

DUCT BANK # DENOTED DUCT NUMBER. SEE DUCT TABLE FOR DETAILS
 SHADED DUCT DENOTES SPARE DUCT