

Design and Construction Standards

Volume 7

Underground Power Distribution Systems

Dec 8, 2010

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1. GENERAL REQUIREMENTS

1.1 Intent of these standards

The intent of these standards is to assist the developer with the design and installation of underground power distribution in an approved, consistent manner which conforms to the current City of Edmonton Design and Construction Standards, EPCOR Distribution and Transmission Inc.'s (EDTI) Construction Standards, Alberta Electrical Utility Code, CSA C22.3 – 7 Underground Systems and all other current applicable technical and safety standards. It is understood that these standards are subject to change and so, it is the developer's responsibility to work closely with EDTI and the City of Edmonton to ensure the most current standard is followed. In addition to the above mentioned requirements, in some cases EDTI will exceed these minimum standards.

The work defined in volume 7 relates to work to be done through a service agreement between the City of Edmonton and the developer of the subdivision. However, work being done on behalf of EDTI under arrangement with a developer or through a contractual arrangement between a contractor and EDTI will have similar expectations and so this book can be used for that purpose also.

1.2 Definitions

5-party trenching (also known as 4-party trenching): Where shallow utilities (power, street lighting, Telus, Shaw) in the same trench include natural gas. This is not a typical installation in the City of Edmonton.

Alberta Electrical Utility Safety Association Guide Code of Practice for Working in the Vicinity of Electrical Equipment (AEUSA): A document created by the AEUSA as a guideline for workers to follow while working near power facilities.

Base Plans: Plans showing a minimum of proposed roads and property lines. More detailed base plans would include lot lines complete with lot numbers and block lines complete with block numbers.

Certified Journeyman Electrician or certified lineman: A contractor who is a journeyman lineman or certified electrician with 5 years related high voltage termination experience. Qualifications of the Certified Journeyman Electrician or certified lineman are to be sent to the EDTI Land Servicing Supervisor prior to commencement of work and periodically at the discretion of the EDTI Land Servicing Supervisor.

City: The Corporation of the City of Edmonton, the City of Edmonton's Planning and Development office or land which is in the City of Edmonton's control (i.e. City Boulevard).

Consultant: The professional engineer responsible for the design of the underground power distribution on behalf of the developer. From a design point of view, the consultant represents the developer.

Contractor: The Company hired by the developer to install the underground power distribution, complete terminations or performs high voltage testing of cables, equipment or performing resistance tests. The developer is responsible for all workmanship and so where the word contractor is mentioned in this standard, it shall be understood that the developer is ultimately responsible.

Developer: The owner of the land being developed under an approved City of Edmonton service agreement. The developer is responsible for all workmanship and work practices on-site. Where the word contractor is used in this standard, it is understood that the developer is ultimately responsible.

EDTI: EPCOR Distribution and Transmission Inc., the power distribution supply authority within the City of Edmonton referred to as EDTI.

EDTI Land Servicing: The group of EDTI technologists who review the subdivision process, review drawings, approve drawings, review test reports, issue inspection and energization work orders and as-built the completed installation. In some cases, references to EDTI Land Servicing should be replaced by the name of the EDTI project manager or representative responsible for the specific project.

EDTI Land Servicing Inspector Foreman: The foreman representing the EDTI Land Servicing Inspectors and who schedules their work. He is also the contact for making arrangements for inspections for trenching, pushing, working over energized primary, cabling and base construction. This includes Underground Residential, Underground Industrial and contract work for EDTI. Phone 780-412-4553

EDTI Land Servicing Inspector: The EDTI Inspector trained to inspect underground power distribution installations including trenching, pushing, working over energized primary, cabling and base construction.



EDTI Representative: The professional engineer, engineering technologist, EDTI tradesman, EDTI Land Servicing Inspector, or other person who has been authorized by EDTI to represent EDTI on specific matters. Contact EDTI Land Servicing for a list of contacts.

EDTI Land Servicing Manager: The EDTI manager for the EDTI Land Servicing group and is the main contact for drawings, contact names and phone numbers. Phone 780-412-3858.

EDTI Standard: The EDTI document or announcement clarifying an accepted practice of construction (i.e. City of Edmonton Design and Construction Standards Volume 7, EDTI Standards, EDTI Construction Drawings, EDTI Specifications and also includes written announcements made using letters, emails or meetings held by EDTI representatives).

EDTI System Plan: A plan showing the routing of feeder cable, distribution cable and phasing. This plan includes existing cabling and proposed future cabling.

EDTI Underground Construction Drawing: The EDTI construction drawing which has not been approved as a standard but has been created to assist with the clarification of this document or until a standard replaces it. The drawing title will indicate that it is an Underground Construction Drawing.

EDTI Underground Distribution Standard: The EDTI construction standard which has been approved and signed by an EDTI registered professional engineer or technologist. The drawing title will indicate that it is an Underground Distribution Standard. The title may also include Underground Distribution Construction Standard or Underground Distribution Engineering Standard.

EDTI Underground Trades Foreman: The EDTI foreman who will coordinate the inspection of terminations, testing of cables, equipment and energization of the area. Phone 780-412-4456.

EDTI Underground Tradesperson: The EDTI qualified tradesperson trained to work on energized EDTI equipment and inspect terminations on distribution equipment.

Engineering Set of Drawings: The engineered drawings designed and produced by the developer's consultant or by an authority for the purpose of construction of all facilities on the lands contained within the service agreement.

Hydro Excavating (Hydrovac): The method of exposing utilities using water pressure and suction (commonly known as hydrovac) rather than mechanical excavation to reduce the damage to power cable and must use an oscillating head.

Looped Primary: An EDTI system plan typically includes at least two sets of primary cables installed into an area which can provide for more than one power source thereby allowing options for feeding equipment from more than one source.

Oscillating Head: The nozzle attachment used on the end of the hydro excavating wand must be such that it is not stationary and moves freely so that the jet is constantly in motion to reduce damage to power cable.

Pad Number: An EDTI supplied number shown on the approved power plan and displayed on the outside of the switching cubicle or transformer.

Power Plan: The power distribution drawing which is intended to be approved by the City of Edmonton and by EDTI. If the plan has been red-lined then it should refer to the date that the original approved power plan has been signed off (approval date).

Red-line: If an approved power plan has been changed, it will have the date that the red-line change was completed in the legend and will also indicate the date that the original approved power plan was signed off (approval date). When discussing plans by telephone, it is necessary to refer to the date in the legend so that the most current plan is referenced.

Schematic: The power distribution drawing is accompanied by a schematic showing the actual electrical connections to the equipment and is intended to be approved by the City of Edmonton and by EDTI. If the plan has been red-lined then it should refer to the date that the original approved power plan has been signed off (approval date).

Service Agreement: A drawing indicating the subdivision name, stage, lots and defines the boundary of construction submitted to the City of Edmonton.

Soil Bags: Soil bags refer to woven bags manufactured specifically for soil or sand and used for covering cable. The size of bag is to be larger than what can normally be lifted manually.

Tree Retardant:

Underground Industrial Development: (UID) Those areas which are zoned Industrial or commercial and have been indicated by EDTI to be built using underground power facilities. In some cases, there will be residential zoning included.



Underground Residential Development: (URD) Those areas which are a mixture of residential and commercial lots that will contain underground power facilities and are to be designed, and built by the developer usually contained within service agreement.

Vented Bushings: A 25 kV primary bushing which has vented slots (all new installations must have vented bushings and "blue tags" to identify that they are vented bushings).

2. DESIGN, APPROVALS, CCC, AND FAC

2.1 Responsibility of the Developer

- 2.1.1 EDTI power distribution consists of looped primary systems which provide switching options, reliability and reduced outage times to customers.
- 2.1.2 It is the developer's responsibility to obtain an EDTI system plan prior to the design stage. This may include submission of updated base plans by the developer to EDTI Land Servicing for the purpose of preparing an overall EDTI system plan. In some cases, temporary facilities must be installed due to staging of construction at the developer's expense.
- 2.1.3 The Power Plan and Schematic are to be included in a submission within the City of Edmonton's drawing approval process. These drawings will be part of the Engineering Set of Drawings submitted by the developer to EDTI's Land Servicing Manager.
- 2.1.4 EDTI distribution system typically consists of a 3-phase 15 kV or a 25 kV system. It is the Consultant's responsibility to find out what system is available in the area they are designing for.

2.2 Underground Industrial Development – Design (U.I.D.)

- 2.2.1 The developer is responsible for the design, supply and installation of power facilities similar to the URD process.
- 2.2.2 It is the developer's responsibility to obtain specific cable, cubicle and voltage requirements, from EDTI Land Servicing prior to designing the power distribution.
- 2.2.3 All other design aspects are typically the same as Underground Residential Development.

2.3 Underground Residential Development – Design (U.R.D.)

- 2.3.1 These areas may contain 1-phase and 3-phase switching cubicles (15 kV or 25 kV), 1-phase transformers (8.3 kV (for the 15 kV system or 14.4 kV (for the 25 kV system) to 120/240 volt), distribution primary cables (typically 15 kV or 25 kV), and feeder cables (typically 15 kV or 25 kV). All new underground equipment is dead-front, where switching is done by EDTI using 200 amp load-break elbows or by ganged switches.
- 2.3.2 Transformers and switching cubicles require 4 x 5/8" copper clad electrodes and an interconnected grid using 19 strand #4/0 bare copper ground conductors complete with an additional two 19 strand #4/0 bare copper ground conductors (tails) terminating to the ground bus or ground plate on the electrical equipment (see EDTI base standards for ground details). These grounding conductors are continuous without splicing.
- 2.3.3 1-phase transformers will be 37 kVA complete with bayonet fusing.
- 2.3.4 There is one approved base size for 37 kVA transformers in 15 kV or 25 kV areas (see EDTI standard 6600071527001)
- 2.3.5 Transformers are of the feed-thru types which have two 200 amp elbow terminations and labelled "LA" and "LC" (see EDTI standard 6600071527005 and 6600072527005).
- 2.3.6 The secondary bushings of transformers must have a solid aluminium bus bar terminal block complete with allen key set screws capable of terminating #4 - #350 MCM. An additional 2 set screws are for streetlighting or communications services and capable of terminating #4 - #3/0 (see EDTI 6600071527005, 6600072527005).

2.4 Underground Residential Development – Primary Cable

- 2.4.1 Primary cable requirements for distribution in Underground Residential Development will be 1/C # 1/0 AL XLPE Concentric Neutral Direct Buried cable with Tree Retardant (see EDTI cable specifications 6300051556002, 6300052582001, 6300070082002, 6600051545002 and 6600052545001)
- 2.4.2 In some cases, there are additional requirements for feeder cables. These cables may be larger than #1/0 primary cable. It is the consultant's responsibility to find out what feeder cables may be required by EDTI.
- 2.4.3 It may be necessary to splice primary where cable reel lengths or number of crossings dictate that it is more practical to provide a splice. All primary cable will be spliced by an EDTI tradesman. Where known splices will be planned in advance by the consultant, indicate on the power plan "to be spliced by EDTI". The location of any additional splices required during construction is at the discretion of the EDTI Land Servicing Inspector and must meet their approval.

- 2.4.4 Where multiple runs of primary are required in the same trench, there may be a need to de-rate the cable due to a mutual heating effect. Consult with EDTI Land Servicing for more details. If de-rating of the cable is not an option then separate trench alignment details are to be shown on the power plan to eliminate this mutual heating effect.

2.5 Underground Residential Development – Secondary Cable

- 2.5.1 Each residential service will be designed for a minimum 100 amps, 120/240 volt, 3-wire service. Services larger than 200 amps will need special consideration. Contact EDTI Land Servicing for more details.
- 2.5.2 It is the developer's responsibility to consider the size of lot, size of house and therefore the need for a service size larger than 100 amps.
- 2.5.3 Each residential service shall require an additional 30 m coil left on private property. The entire length of secondary for a residential service shall be installed without a splice.
- 2.5.4 Service coils are to be installed in service boxes past the gas easement if one exists (see other instructions for side lots).
- 2.5.5 Where side lots require servicing along the longer property line and there is no gas easement, service boxes (power service coils) are to be left straddling the property line to allow for excavation of basements without damaging the power service coils.
- 2.5.6 Where side lots require servicing along the longer property line and there is a gas easement, service boxes (power service coils) are to be "A" services (1.5 m) from the rear property line or serviced from the front property line.
- 2.5.7 The service entry points will be 1.5 m ("A" service), 3.0 m ("B" service) or 4.5 m, ("C" service) from the lot line and must be installed parallel to the lot lines. Service entry points which are not designated as "A", "B" or "C" will be dimensioned on the power plan. Note the importance of front and rear lot pins staked to allow the installer to parallel the property line.
- 2.5.8 Secondary residential service cable is a minimum of 2/C #1/0 Al XLPE CN 600 volt direct buried type USEB cable. (See EDTI specifications 66.00.05.08.22.005)
- 2.5.9 Voltage drop calculations are the responsibility of the Consultant and must be submitted upon request. (Refer to Can-3-C235-83 or newer preferred Voltage Levels for AC Systems 0 – 50000V)
- 2.5.10 Cable sizes must be shown on the plan in the legend or by some other method acceptable to EDTI Land Servicing.

2.6 Maximum Number Of Services From A 1-Phase, 37 Kva Transformer

Consult with EDTI Land Servicing for other arrangements. In addition to these residential services, two additional services for communications equipment or street lighting are acceptable.

Size of Service	kVA based on Service Size	Minimum Cable Size	Number of Services	Allowable cable length (meters) from transformer to the SEP at the property line*
100 amp, 120/240 volt	3	#1/0	12	70
150 amp, 120/240 volt	3.6	#2/0	10	48
200 amp, 120/240 volt	6	#4/0	6	60
Combination of the above service sizes			**	

* Based on minimum cable size.

** Add up the total kVA of the services. The number of services that can be terminated cannot exceed 37 kVA

2.7 Power Layout Requirements – 1st Submission

2.7.1 The power layout plan is to include all power distribution facilities inside the service agreement boundaries and outside of the service agreement boundaries where identified by EDTI. The following will be shown on the power layout or other drawing in the 1st submission:

- Name of subdivision.
- Stage number of subdivision.
- Drawing number.
- Scale.
- Seal of the professional engineer responsible for the design.
- Revision block.
- Date of the drawing.
- Lot lines and labels.
- Block lines and labels.
- Roads and labels including quadrant designation in the City of Edmonton (i.e. S.W.).
- References to existing stage numbers.
- Primary cable
- Secondary cable.
- Service entry point designation (i.e. A, B or C service).
- Legend indicating the symbology and their definitions.
- Gas layout.
- Gas crossings dimensioned to property lines.
- Gas easement.
- Other easement boundaries.
- Crossing dimensioned to property lines.
- Pad mounted equipment.
- Other above ground non-power equipment facilities.
- Details – hydrants
- Details – cross sections
- Power crossings (to be installed as per EDTI standards 6300070037002 and 6300070037001).
- Pipeline right of way crossings to be identified.
- Power easements identified.
- Size and number of ducts for service entry points identified and dimensioned from property line.
- Contactors for street lighting are to be identified and secondary shown back to the transformer.
- Communications power supplies are to be identified and secondary shown back to the transformer.
- Where stages end or join to other stages, a note box indicating how the cables are to be left (capped and buried, capped covered by a base, looped, splices required, etc.).
- A note box indicating the number and size of ducts to be capped for future, where ducts are stubbed to the next stage.
- If communications ducts are planned to be installed under EDTI equipment on easements on private property, a note must be added to the power plan indicating that a trough or ducts are to be installed and the alignment of that utility's facilities on the detail (this will assist EDTI inspectors observing the work in the field and avoid confusion).

- Where non EDTI equipment is placed within 3.0 m from the edge of EDTI equipment, the ground grid of the EDTI equipment must be bonded using two tails to the ground of the non EDTI equipment. See details on the power plan of how the bonding is to be achieved. The detail must show the clearance between the edge of the EDTI equipment and the non EDTI equipment. The non EDTI equipment cannot be installed within 1.0 m of the EDTI ground grid.
- Where non EDTI systems are to be bonded to the EDTI system every 300 m, details must be shown on the power plan of where the connection is to be made and how the non EDTI systems are to be bonded.

2.8 Minimum Intended Design Clearances from EDTI Power Facility to Other Utilities, Street Furniture or Landscaping

EDTI Facility	Utility, Furniture or Landscaping	Clearance	Notes
	Roadways (Volume 2)		
Transformer	Corner cut	6.0 m	
1-phase or 3-phase cubicle	Corner cut	30 m	
Transformer	Bus Stop Pad	3.0 m	Minimum 3.0 m of clearance in front of doors required for hot stick operation
1-ph cubicle or 3-ph cubicle	Bus Stop Pad	3.0 m	Minimum 3.0 m of clearance in front of doors required for hot stick operation
1-phase switching cubicle or transformer	Road Crossing	2.5 m	To closest duct in crossing
3-phase switching cubicle	Road Crossing	3.0 m	To closest duct in crossing
	Drainage (Volume 3)		
Main Power Trench	Drainage/Sanitary Main	3.0 m	
Main Power Trench	Catch Basin	3.0 m	Or concrete encased 1.5 m either side of catch basin if less than 3.0 m
Main Power Trench	Manhole, vault, other larger drainage structure	3.0 m	Or concrete encased 1.5 m either side if less than 3.0 m
Transformer or Cubicle	Catch Basin	3.0 m	
Transformer or Cubicle	Manhole	3.0 m	
	Water (Volume 4)		
Main Power Trench	Mains	3 m	Parallel
Main Power Trench	Hydrant	3 m	OR See EDTI Standard For Trenching Around Hydrants for reduced clearances
Primary or Secondary Cables	Service Valve	300 mm	Minimum distance when trenching past a service valve in the blvd. (i.e. curb cock, cc)
Power Service to lot	Service	1.8 m	Parallel to water service

Pad Mounted Equipment	Mains	3 m	
Pad Mounted Equipment	Hydrant	3 m	Minimum 3 m of clearance in front of doors required for hot stick operation
	Landscaping (Volume 5)		
Main Power Trench	Trees	1 m	
Switching Cubicle	Trees, shrubs	3 m	All sides
Transformer	Trees, shrubs	2m on sides and back from base	Minimum 3 m of clearance in front of doors required for hot stick operation
Power Crossings	Trees	1 m	
Power Crossings	Landscaped Road Island		See notes below *
Pad Mounted Equipment	Landscaped Road Island		See notes below *
	Street Lighting (Volume 6) – Common Trench		
Primary or Secondary cables	Street Light Davit Poles or Contactor	300 mm	See standard for trenching around street light pole bases
Power Crossing	Street Light Davit Poles or Contactor	1.5 m	To the closest power crossing duct
Pad Mounted Equipment	Main Street Light Trench	Common Trench	See base standards and trough standards
	I.P. Natural Gas line in Separate Trench		
Main Power Trench	Main	1.0 m	Parallel ***
Power Crossing	Main	1.0 m	Parallel
Power Crossing	Main or Service	300 mm	Without mechanical separation****
	Communications (Common Trench)		
Pad Mounted Equipment	Main Communications Trench	Common Trench	See base standards and trough standards
Pad Mounted Equipment	Communications Pedestals	3 m	** Minimum 3 m from case of transformer or switching cubicle to case of pedestal.
Primary or Secondary Cables	Communication Vault	300 mm	Minimum clearance between edge of communication vault and edge of primary or secondary.

These are preferred minimum horizontal clearances. Consult with EDTI Land Servicing for discussion of the possibility of any deviation to these approved clearances due to specific circumstances.

Clearances are from centre to centre of furniture, trench or duct unless otherwise noted.

* See the City of Edmonton Design and Construction Standards Volume 5 – Landscaping 5.13...shallow utilities shall not be placed in Landscaped Road Islands. Written permission for power crossings or pad mounted equipment in Landscaped Road Islands is the responsibility of the developer. Ducts must be continuous and cannot have trees within 1.0 m of the duct. Other plantings such as small shrubs or flowers would be allowed over top of the crossing.

** If communications pedestals are placed with 3.0 m from the edge of case to edge of pad mounted power equipment, the two pieces of equipment will be bonded. A detail drawing is required.

*** If it is mutually agreed that gas is in the same trench as power (5 party trenching), then clearances and trench cross sections will be determined during the design stage.

**** Where mutually agreed, an approved method of mechanical separation could be used to reduce the crossing from 300 mm (i.e. 5 Party Trenching, using a sleeve, fastened to the I.P. gas line, as mechanical separation and 100 mm of sand between the sleeve and the power cable.).

2.9 Road Crossings

- 2.9.1 Up to 3 primary cables can be installed in one duct. The primary cables chosen to share the same duct must originate from the same set of switches (i.e. primary from an A1 switch could only be installed with primary from A1, A2 or A3 but not mixed with cable crossings from B1, B2 or B3). It is intended that primary cable be pulled through the duct as one pull where possible. Consideration will be given where cables are of different lengths.
- 2.9.2 Crossings at pad mounted equipment in City Boulevard (not on an easement) cannot be centre of the equipment.
- 2.9.3 Crossings near 1-phase switching cubicles and 1-phase transformers in the City Boulevard (not on an easement) must be a minimum of 2.5 meters from the centre of base.
- 2.9.4 Crossings near 3-phase switching cubicles and 3-phase transformers in the City Boulevard (not on an easement) must be a minimum of 3.0 meters from the centre of base.
- 2.9.5 Where switching cubicles are installed in boulevards or on easements, the crossing ducts are continuous from the fused switch of any switching cubicle to the property line of the lot it is intended to service. The number of bends and length of duct must be considered so that recommended pulling tension of future cable is not exceeded.
- 2.9.6 For service stubs, where switching cubicles are installed in boulevards or on easements, the road crossing ducts are continuous from the fused switch of any switching cubicle to the property line of the lot it is intended to service.
- 2.9.7 Crossings should always be aligned so that the power duct crosses the road at right angles (90 degrees), wherever possible.
- 2.9.8 Where more than one service cable is to be installed at a crossing the minimum duct size is 4 inch.

2.10 Service Stubs from Switching Cubicles

- 2.10.1 There will be a bend installed for every compartment (i.e. 1 bend for "A", 1 bend for "B", etc.)
- 2.10.2 The ducts from each fused compartment to the property line that it is intended to service, will be continuous without breaks and capped at the property line.
- 2.10.3 Where gas easements exist, the service ducts are to be extended past the gas easement and capped.
- 2.10.4 Locations of service ducts are to be staked with yellow stakes to identify their location. The stakes must be a 2" X 4" minimum and 1.5 m in length, 450 mm above final grade.

2.11 Cross Sections and Alignments

- 2.11.1 Approved City of Edmonton Design and Construction Standards Volume 2 - Roadway cross sections are to be included and the alignment of power cable indicated. In some circumstances there may be more than one alignment in the same section of roadway (i.e. because gas may be in an easement in one area but then jogs into the blvd. in another area). The "alternate" alignments are to be included.
- 2.11.2 Cross Sections are to show the alignment of the transformer if the transformer is not centred on the centre of trench.
- 2.11.3 Alignment of cables at corner cuts will be 1.25 m from the corner cut unless otherwise detailed on the power plan.
- 2.11.4 Where any alignments are not obvious or do not parallel a property line, a dimensioned cross section detailing the alignment is required (i.e. where a trench parallels a curb or path rather than paralleling a property line).

2.12 Pipeline Crossings and Pipeline Proximity Agreements

- 2.12.1 Pipeline crossing and pipeline proximity agreements are to be secured by the consultant on behalf of EDTI and a copy sent to EDTI Land Servicing. The developer must bare the costs of securing the agreement.
- 2.12.2 Where EDTI Distribution Standards conflict with the pipeline company's requirements, the pipeline company's requirements shall prevail. EDTI must be consulted of any deviation to the EDTI Distribution Standard in advance to construction.
- 2.12.3 Pipeline crossings shall be sized as per EDTI Distribution Standards 6300070037001 and 6300070037002 and must have end bell collars permanently installed at each end of the open duct.
- 2.12.4 Pipeline crossings shall extend at least 1.0 m past either side of the right of way.

2.13 Railway Crossings

- 2.13.1 Railway crossing agreements are to be secured by the consultant on behalf of EDTI and a copy sent to EDTI Land Servicing. The developer must bare the costs of securing the agreement.
- 2.13.2 Where EDTI Distribution Standards conflict with the railway company's requirements, the railway company's requirements shall prevail. EDTI must be consulted of any deviation to the EDTI Distribution Standard in advance to construction.
- 2.13.3 For details on railway crossings, steel casing pipe, compaction (exceeds City of Edmonton compaction standards), depths of steel casing pipe, follow the National Transportation Act, General Order No E-11, Regulations Respecting Standards for Wire Crossings and Proximities, the Transportation Canada, TC E-10, Standards Respecting Pipeline Crossings Under Railways and CSA C22.3 No 7.
- 2.13.4 A profile and cross section are to be included with the engineering set of drawings. The size and type of steel casing pipe (i.e. 150 mm threaded galvanized rigid steel conduit with threaded rigid steel couplings welded on the outside or some other suitable method) must be identified on the cross section. Cable cannot be pulled into a steel casing pipe unless it has smooth surface (i.e. EDTI approved galvanized rigid steel threaded pipe and couplings or a pvc sleeve (duct) inside of steel casing pipe and the void filled to keep the sleeve from moving when cable is pulled in).
- 2.13.5 The profile plan must show top of rails, ditches, depths of proposed steel casing pipe at various points (i.e. top of rail, bottom of ditch), length of steel casing pipe and how far from edge of rails the casing pipe will extend. This plan must be signed by a professional engineer.
- 2.13.6 If a cable duct is installed inside of the steel casing pipe it must be sized as per EDTI Distribution Standards 6300070037001 and 6300070037002 and must have end bell collars permanently installed at each end of the open duct. The cable duct must extend at least 1.0 m past the end of the steel casing pipe and the void between the ducts and the steel encasing pipe must be sealed at each end with an EDTI approved sealant (i.e. EDTI approved sealing material to resist movement of the cable duct and assist with reducing thermal resistivity)

2.14 Transportation Utility Corridor (T.U.C.) Crossings

- 2.14.1 An application for Ministerial Consent to carry out construction and right of entry to the T.U.C. must be obtained from by the consultant on behalf of EDTI and a copy sent to EDTI Land Servicing. The developer must bare the costs of securing the agreement.
- 2.14.2 The Ministerial Consent document must be on site during construction and made available to the EDTI Land Servicing Inspector upon request.
- 2.14.3 EDTI Land Servicing must be consulted of any deviation to the EDTI Distribution Standard in advance to construction.
- 2.14.4 The crossing must be in duct and shall be sized as per EDTI Distribution Standards 6300070037001 and 6300070037002 and must have end bell collars permanently installed at each end of the open duct.
- 2.14.5 An as-built must be provided as per the Ministerial Consent's document.

2.15 Other Crossings or Proximity agreements (EDTI or other utilities)

- 2.15.1 Crossing agreements and proximity agreements are to be secured by the consultant on behalf of EDTI and copies sent to EDTI Land Servicing. The developer must bare the costs of securing any agreements. Note that some utility companies have master agreements in place with EDTI and so a copy of these existing agreements is not necessary.

- 2.15.2 EDTI must be consulted of any deviation to the EDTI Distribution Standard in advance to construction.
- 2.15.3 The crossing must be in duct and shall be sized as per EDTI Distribution Standards 6300070037001 and 6300070037002 and must have end bell collars permanently installed at each end of the open duct.
- 2.15.4 If the purpose of the crossing is a means of extending EDTI power cable from a main power trench on City property across another utility's right of way (the crossing) to EDTI padmounted equipment in an easement, the duct shall be continuous. The EDTI easement will overlap the area of the other utility (i.e. a portion of the easement will be shared by EDTI and gas) or there will be a specific crossing agreement in lieu of an EDTI easement for the crossing (i.e. crossing a railway).
- 2.15.5 Where an easement has been obtained for the benefit of EDTI, no other utility may build facilities within that easement without prior written permission from EDTI (i.e. the contractor cannot use an EDTI easement to conveniently extend a drainage connection or communications duct to private property).

2.16 Schematic Requirements

- 2.16.1 The following will be shown on the schematic 1st submission:
 - 2.16.2 Stage boundaries labelled on the schematic (a dotted line signifying the transition from one stage to the next).
 - 2.16.3 Connection points from previous stages (i.e. from "LC" of P16353 or from A1 of S3245).
 - 2.16.4 Transformers with the "LA" and "LC" to be shown (note that "LA" of the transformer is located on the left hand side of the transformer and the "LC" on the right (cable connections and schematics are to reference this connection so that cable connects to the corresponding "LA" or "LC" without having lines cross each other on the power plan).
 - 2.16.5 Where cable is looped, a loop is to be shown in the schematic and the location of the looped noted.
 - 2.16.6 Cubicles are to be shown and size of service ducts shown.
 - 2.16.7 Phasing to be shown on 3-phase cubicles (i.e. A1, A2, A3, B1, B2, B3).
 - 2.16.8 Proposed temporary looping to be shown with a dotted line and noted as a temporary connection.
- 2.16.9 The following will be shown on the schematic final submission:
 - In addition to other subsequent submissions, the final submission will include pad numbers.

2.17 Drawing Approval process

- 2.17.1 The following will be shown on the Mylar submission:
 - 2.17.2 The final drawing (power plan and schematic) as well as the final engineering set (if more changes have been made) are to be submitted together with a sign off sheet.
 - 2.17.3 A sign off box on the Mylar will include an area for the EDTI Engineer or representative's signature and an area for the City of Edmonton to sign off.
 - 2.17.4 Mylar submissions are made on high quality Mylar for permanent record. These Mylar submissions will be signed by EDTI Land Servicing and returned to the Consultant.

2.18 Construction Completion Certificates (C.C.C.)/Final Acceptance Certificates (F.A.C.):

- 2.18.1 Upon completion of construction, an approved City of Edmonton, three part Construction Completion Certificate may be submitted by the developer. If EDTI accepts the work completed, then the certificate will be signed and returned to the City of Edmonton. The City of Edmonton will return one copy signed by the City of Edmonton to EDTI for a permanent record.
- 2.18.2 The C.C.C. will have a maintenance period of 1 year. During that time the developer will be responsible for any deficiencies as a result of the construction.
- 2.18.3 After completion of the one year maintenance period, an approved City of Edmonton, three part final Acceptance Certificate may be submitted by the developer. If there are no outstanding maintenance issues, then EDTI will sign the form and return to the City of Edmonton. The City of Edmonton will return one copy signed by the City of Edmonton to EDTI for a permanent record.



2.19 Construction Cost Letter

- 2.19.1 EDTI requires a letter from the developer outlining the cost of the installation of transformers, cubicles, cable and other related material. This letter is used by EDTI for accounting purposes and represents the power facility assets installed by the developer on behalf of EDTI.

2.20 Applying for Underground Residential Development (URD) lot rebates, Underground Industrial Development (UID) rebates and Feeder Rebates.

- 2.20.1 Typically, the developer is eligible for rebates once the facilities are installed and ready for energization (i.e. after the cable test reports and as-builts have been received by EDTI Land Servicing).
- 2.20.2 It is the developer's responsibility to apply for these rebates in writing by submitting the request for payment to EDTI Land Servicing.

2.21 Damage to facilities

- 2.21.1 3rd party damage after energization by EDTI will not be the responsibility of the developer. EDTI will pursue the 3rd party for repayment of any damages.
- 2.21.2 Any damage occurring prior to EDTI energizing the area will be the responsibility of the developer to correct. Retesting of cables and equipment may be required.

3. TRENCHING, CABLING AND INSTALLATION OF BASES

3.1 GENERAL REQUIREMENTS

- 3.1.1 The following section outlines the installation of ducts, cable, bases and ground grids. The responsibility to ensure that the installation is completed using EDTI acceptable practices and to EDTI approved Distribution Standards or Construction Drawings extends to both the contractor and developer. Where the words EDTI Distribution Standards or EDTI acceptable practices are mentioned, it will be understood to include EDTI Distribution Standard drawings, EDTI Construction drawings, EDTI approved material, EDTI policy or procedures, or by way of clarification by means of emails, letters or meetings. It is therefore up to the contractor to seek out these EDTI Distribution Standards or EDTI acceptable practices.
- 3.1.2 Refer to other sections for clearances, EDTI Distribution Standard drawings, EDTI Construction Drawings and procedures.
- 3.1.3 EDTI expects that the Alberta Electrical Utility Code and CSA C22.3 No. 7 are followed and where EDTI Distribution Standards exceed these minimum standards, EDTI Distribution Standards shall be followed. From time to time, these standards are updated and so it is the contractor's responsibility to use updated standards and practices or to seek out updates from EDTI.
- 3.1.4 All work is to be inspected by and built to the satisfaction of the EDTI Inspector and EDTI Land Servicing.
- 3.1.5 Contact the EDTI Land Servicing Inspector Foreman at 780-412-4553 48 hours in advance of requiring an EDTI Land Servicing Inspector on-site. Two EDTI approved engineering sets of drawings must be supplied to EDTI Land Servicing complete with 6 copies of the power plan and schematic prior to making arrangements with the EDTI Land Servicing Inspector Foreman. This will allow time for the plans to be distributed and an EDTI work order to be created for the inspection of crossings, cabling, padmounted bases, ground, service boxes and coils and backfilling.
- 3.1.6 The contractor must contact the EDTI Land Servicing Inspector Foreman 24 hours in advance, of any break in construction.
- 3.1.7 The contractor must contact the EDTI Land Servicing Inspector Foreman 24 hours in advance, to notify of a restart of construction.
- 3.1.8 It is the responsibility of the developer/contractor to secure suppliers of EDTI approved transformers, switching cubicles, cable, elbows, bases and any other material required to complete the project. EDTI does not supply material.
- 3.1.9 It is the contractor's responsibility to seek out approvals, prior to construction, for any deviation to power plans. The normal process would be to inform the EDTI Land Servicing Inspector and to discuss a solution with the consultant. It is the consultant's responsibility to discuss the proposed deviation to the power plan with EDTI land Servicing and if necessary to supply a red-lined drawing indicating the new alignments, crossings or relocation of padmounted equipment. The EDTI Land Servicing Inspector may request that no construction proceed without either written permission from EDTI Land Servicing for the deviation or by way of an approved red-lined power plan.
- 3.1.10 In this document, where sand is referenced for shading or cover cable, it shall consist of the following:
- All sand shall be provided by the Developer and shall be free of clay, rocks and organic materials.
 - 100% passing through a 25 mm sieve.
 - 95% passing through a 5 mm sieve.
 - A maximum allowable 10% passing through a 80 micro meter sieve.
 - The moisture content shall not exceed 25% and the plasticity index shall not exceed 6%.
 - Typically the sand will have a blonde colour to it.
 - The EDTI Land Servicing Inspector can determine if the sample can be used.
- 3.1.11 All bends referred to in this document must be rigid PVC bends unless otherwise specified and approved by EDTI Land Servicing. No other types of bends are acceptable.

3.2 Safety

- 3.2.1 If a service agreement exists between the Developer and the City of Edmonton and the contractor is hired by the developer, the construction site is not under EDTI's control. It is the responsibility of the developer to ensure that the contractor completes a hazard assessment of the work site and take effective measures to control the hazards identified as per the Alberta Occupational Health and Safety Act, Regulation, and Code. All workers who may be affected by the hazards must be familiar with the necessary health and safety measures or procedures and that safe-work practices are to be followed. These measures or procedures extend to EDTI workers who may be asked to be present on the work site.
- 3.2.2 If a contract exists between the contractor and EDTI, responsibility for safety is outlined in the contract and will include EDTI safety procedures and policies as well as the Alberta Occupational Health and Safety Act, Regulation, and Code. It is the responsibility of the contractor to ensure that a hazard assessment of the work site be completed and take effective measures to control the hazards identified. All workers who may be affected by the hazards must be familiar with the necessary health and safety measures or procedures and that safe-work practices are to be followed. These measures may be included as part of the contract and indicate that the contractor follow EDTI Safe Work Practices.

3.3 Grades, Staking, Surveying and As-built

- 3.3.1 All staking and surveying shall be the responsibility of the developer and shall be completed by a registered land surveyor.
- 3.3.2 Where curbs are not installed, final grade must be staked (final grade for the trench) at regular intervals parallel and offset to the power trench alignments so that the stakes are not damaged during the trenching process.
- 3.3.3 Where curbs are not installed, final grade must be staked for padmounted equipment.
- 3.3.4 Where curbs are not installed, final grade must be staked for service entry points.
- 3.3.5 Where the slope of grade exceeds 2% from curb or is significantly different in the area being worked compared to the height of the curbs (i.e. due to berming), final grades must be staked for that area which is not at the same height as adjacent curbs.
- 3.3.6 The contractor shall ensure that the working grades are within +125 mm or – 250 mm of final grade and that the final grade is staked prior to construction. The area must have a consistent grade and have 4.0 m of working surface. Additional working surface area will be required around padmounted equipment. If the site does not meet these limits, the EDTI Land Servicing Inspector may not allow the trenching, cabling or building of bases.
- 3.3.7 All alignments, crossings, bases, service entry points, property lines, future face of curbs (where no curbs exist) are to be marked out with stakes prior to construction.
- 3.3.8 Consult cross section plans for staking of trenches along roadways.
- 3.3.9 Where EDTI Inspectors have identified additional staking or re-staking for grade, property lines, crossings, service entry points, bases, trench alignments, curbs or for any other reason the contractor is to provide additional staking using the developer's registered land surveyor.
- 3.3.10 Where lot lines are not at 90 degrees to the front property lines, rear property pins are to be staked. The reason for this is to allow for the installation of service coils into the property at 90 degrees to shared property lines.
- 3.3.11 Upon completion of the installation of equipment, a marked up as-built is to be prepared by the contractor in the presence of the EDTI Inspector and each will sign their own as-built for future use. This copy of the as-built must be submitted to the consultant in preparation of a permanent record as-built to be submitted to EDTI Land Servicing by the consultant. It is in the contractor's best interest to complete this part of the process in a timely fashion to ensure energization of the area can be completed. Alignments, crossings, location of equipment and service entry points are to be noted on the drawing with any changes to proposed locations.
- 3.3.12 The staking of trenches at corner cuts will be 1.25 m parallel to corner cuts unless otherwise noted on the power plan.
- 3.3.13 Red-lined drawings or written approvals for deviation to approved power plan alignments, crossings or padmounted equipment must be made available to the EDTI Land Servicing Inspector upon request. The EDTI Land Servicing Inspector will ask that a justification form be completed and signed by the contractor for changes and must be approved by EDTI Land Servicing before construction begins.

3.4 Trenching, Ducts, Troughs and Backfilling of Trenches

- 3.4.1 All bends referred to in this document must be rigid PVC bends unless otherwise specified and approved by EDTI Land Servicing. No other types of bends are acceptable.
- 3.4.2 The minimum width of a power trench is to be 300 mm (12 inches).
- 3.4.3 The maximum depth of a power cable is to be 1.5 m to the bottom of the cable (bottom of trench) from final grade.
- 3.4.4 The minimum cover over a power cable is 1.1 m to the top of cable or power duct from final grade.
- 3.4.5 The depth of trench must be consistent. If in the opinion of the EDTI Land Servicing Inspector, that the trench depth is not consistent or is too shallow or too deep, corrective measures must be taken which can include sanding (where the trench is too deep) or retrenching if too shallow. If cable has already been laid in the trench, it must be removed, before the trench is repaired and then laid again after receiving permission from the EDTI Land Servicing Inspector.
- 3.4.6 If trenches are left open for more than 72 hours, or if the walls have collapsed, or if other material has entered the trench (i.e. lumps, snow, water), the EDTI Land Servicing Inspector may request that corrective measures be taken which can include cleaning the trench or backfilling, compacting and retrenching.
- 3.4.7 The EDTI Land Servicing Inspector must be contacted and give permission prior to any cabling or backfilling of trenches. If in the opinion of the EDTI Land Servicing Inspector, the trench has been backfilled without the Inspector's approval, corrective measures must be taken which can include exposing the cable, excavating the backfill over the cable, removing the cable, backfilling, re-compaction, retrenching and re-installing the cable.
- 3.4.8 In some cases where multiple runs of primary are in the same alignment, wider trenches or an additional trench or trenches may be required (i.e. 1.0 m separation, centre to centre of trench). See EDTI Distribution Standard drawings in regards to Random and Fixed separation of primary.
- 3.4.9 See other sections for clearances of power facilities to other utilities.
- 3.4.10 Where these clearances cannot be met then a 4 sided trough with concrete or ducts with concrete 1.5 m past either side of the other utility or obstruction must be installed. The trough or ducts are to be installed between the obstruction and private property wherever possible (i.e. between the hydrant and property line). Note that where ducts are installed, primary can only share ducts with other primary and secondary can only share ducts with other secondary and cannot be combined in the same duct as communications.
- 3.4.11 Where there are Communications pedestals with concrete bases to be installed over power trenches, the primary/secondary trenches must be troughed (4 sided troughs) under the base to allow for future maintenance of the cable without disturbance to the concrete base. In some cases a combination of ducts and troughs can be used. Note that where ducts are installed, primary can only share ducts with other primary and secondary can only share ducts with other secondary and cannot be combined in the same duct as communications.
- 3.4.12 Backfill material can be the material excavated from the trench by a mechanical trencher, if in the opinion of the EDTI Land Servicing Inspector, that the material is suitable (i.e. spoil pile from the trencher). Soil having high thermal resistivity containing large amounts of organics, peat, black loam, sod, clay that has hardened, stones, straw, snow or frozen material will not be acceptable. All backfill material will be subject to the approval of the EDTI Land Servicing Inspector. Sand or clean backfill material must be substituted for unsuitable backfill.
- 3.4.13 Where clay is used as the backfill material, the moisture content of the clay cannot exceed the plastic limit, or more than 15%, when being placed in the trench.
- 3.4.14 Backfill shall be placed in uniform lifts not exceeding 300 mm and compacted to the City of Edmonton Design and Construction Standards Volume 2 – Roadways, which outlines the requirements for compaction.

3.5 Road Crossings

- 3.5.1 All power road crossings are to have an end bell collars installed permanently at both ends of the crossing. End bell collars should be installed after the main trench is excavated but prior to pulling in cable so that they are not damaged by a trencher or other equipment. In crossings where it is impossible to install the end bell collars, corrective measures must be taken such as installing a new crossing or installing split collars and leaving the split collars installed (do not remove them).
- 3.5.2 All power road crossings are to be at 1.3 m to the top of the duct wherever possible. The minimum acceptable depth is 1.1 m to the top of the duct and the maximum allowable depth is 1.5 m to the bottom of the duct from final grade (similar to trench depths). Wherever possible, the preferred crossing depth of 1.3 m to the top of the duct is to be followed. Where crossings have been installed shallower or deeper than the allowable depth, corrective

measures must be taken which can include abandoning the crossing and installing a new crossing at the allowable depth.

- 3.5.3 The top of the shallowest duct in a shared crossing is 1.1 m regardless of whether it is power or another utility in the same crossing as power. Therefore, consideration must be given to the number of crossing ducts and the width of a crossing to allow for multiple ducts while maintaining the minimum and maximum depths of crossings.
- 3.5.4 Where cables exit crossings, the area must be covered with a minimum of 300 mm of sand.
- 3.5.5 All cable pulled through crossings must be pulled using acceptable industry practices using equipment designed for that purpose and with lubricant manufactured for use with the cable being pulled. EDTI can provide a list of EDTI acceptable lubricants for this purpose.
- 3.5.6 The contractor must take care while preparing for a cable pull to avoid damage from kinking, rough handling, dragging cable over rough surfaces, driving over cable, walking on cable, or exceeding bending radius of the cable (i.e. bending radius-generally 8 times the cable diameter or manufacturer specs).
- 3.5.7 Up to 3 primary cables can be installed in one duct. The primary cables chosen to share the same duct must originate from the same set of switches (i.e. primary from an A1 switch could only be installed with primary from A2 or A3 and not with primary from B1, B2, B3 or any other switches). It is intended that primary cable be pulled through the duct as one pull where possible. Consideration will be given where cables are of different lengths.
- 3.5.8 In some cases, primary from the same switch may double back on itself (loops) in the same duct.
- 3.5.9 Road crossings near street light bases must be a minimum of 1.5 m from the base to the centre of the closest power duct.
- 3.5.10 Crossings at pad mounted equipment in City Boulevard (not on an easement) cannot be centre of the equipment.
- 3.5.11 Crossings near 1-phase switching cubicles and transformers in the City Boulevard (not on an easement) must be a minimum of 2.5 m from the centre of base.
- 3.5.12 Crossings near 3-phase switching cubicles and transformers in the City Boulevard (not on an easement) must be a minimum of 3.0 m from the centre of base.
- 3.5.13 Where switching cubicles are installed in boulevards or on easements, the crossing ducts are continuous from the fused switch of any switching cubicle to the property line of the lot it is intended to service. The number of bends and length of duct must be considered so that recommended pulling tension of future cable is not exceeded.
- 3.5.14 Crossings shall be sized as per EDTI Distribution Standards 6300070037001 and 6300070037002.
- 3.5.15 Where multiple runs of primary are required, road crossing horizontal clearances from each run of primary may be required (i.e. 1 m separation centre to centre of each crossing). See the power plan for details on alignments of multiple runs of primary.
- 3.5.16 It is understood that the electrical contractor must extend gas crossings after the power cabling has been completed. Where a gas crossing is extended and crosses a power alignment, care must be taken so that it crosses the main power trench with 300 mm vertical separation using sand to separate the two facilities. Where it is impractical to achieve a 300 mm vertical separation using sand, then smooth mechanical separation, such as a four sided trough must be installed.
- 3.5.17 Crossings should always be aligned so that the power duct crosses the road at right angles (90 degrees), wherever possible.

3.6 Pipeline Crossings and Pipeline Proximity Agreements

- 3.6.1 Pipeline crossing and pipeline proximity agreements are to be secured by the consultant on behalf of EDTI and a copy sent to EDTI Land Servicing.
- 3.6.2 Pipeline crossing and pipeline proximity agreements must be signed by the pipeline company's representative prior to construction.
- 3.6.3 Signed pipeline crossing agreements and pipeline proximity agreements must be on-site during construction and made available to the EDTI Land Servicing Inspector upon request.
- 3.6.4 It is the contractor's responsibility to ensure that the pipeline company is contacted, is on-site and the work is completed to the pipeline company's satisfaction as well as to EDTI Distribution Standards. Where EDTI Distribution Standards conflict with the pipeline company's requirements, the pipeline company's requirements

shall prevail. EDTI must be consulted of any deviation to the EDTI Distribution Standard in advance to construction.

- 3.6.5 Pipeline crossings shall be sized as per EDTI Distribution Standards 6300070037001 and 6300070037002 and must have end bell collars permanently installed at each end of the open duct.
- 3.6.6 Pipeline crossings shall extend at least 1.0 m past either side of the right of way.
- 3.6.7 Where the crossing intersects the pipeline, a minimum of 300 mm separation from the edge of one facility to the edge of the other facility is to be maintained using sand or some other suitable method acceptable to the pipeline company for the separation of the two facilities.
- 3.6.8 The crossing will be either above or below the pipeline depending on depths and the pipeline inspector's requirements.

3.7 Railway Crossings

- 3.7.1 Railway crossing agreements are to be secured by the consultant on behalf of EDTI and a copy sent to EDTI Land Servicing.
- 3.7.2 Railway crossing agreements must be signed by the railway company's representative prior to construction.
- 3.7.3 Signed railway crossing agreements must be on site during construction and made available to the EDTI Land Servicing Inspector upon request.
- 3.7.4 It is the contractor's responsibility to ensure that the railway company has been contacted at least 72 hours in advance, is on-site and the crossing is completed to the railway company's satisfaction as well as to EDTI Distribution Standards. Where EDTI Distribution Standards conflict with the railway company's requirements, the railway company's requirements shall prevail. EDTI must be consulted of any deviation to the EDTI Distribution Standard in advance to construction.
- 3.7.5 For details on railway crossings, steel casing pipe, compaction (exceeds City of Edmonton compaction standards), depths of steel casing pipe, follow the National Transportation Act, General Order No E-11, Regulations Respecting Standards for Wire Crossings and Proximities, the Transportation Canada, TC E-10, Standards Respecting Pipeline Crossings Under Railways and CSA C22.3 No 7.
- 3.7.6 Where non metallic duct is proposed, an engineering study must be completed as per CSA C22.3 No. 7.
- 3.7.7 A profile and cross section are to be included with the engineering set of drawings. The size and type of steel casing pipe (i.e. 150 mm threaded galvanized rigid steel conduit with threaded rigid steel couplings welded on the outside or some other suitable method) must be identified on the cross section. Cable cannot be pulled into a steel casing pipe unless it has smooth surface (i.e. EDTI approved galvanized rigid steel threaded pipe and couplings or a PVC sleeve (duct) inside of steel casing pipe and the void filled to keep the sleeve from moving when cable is pulled in).
- 3.7.8 The profile plan must show top of rails, ditches, depths of proposed steel casing pipe at various points (i.e. top of rail, bottom of ditch), length of steel casing pipe and how far from edge of rails the casing pipe will extend. This plan must be signed by a professional engineer.
- 3.7.9 If a cable duct is installed inside of the steel casing pipe it must be sized as per EDTI Distribution Standards 6300070037001 and 6300070037002 and must have end bell collars permanently installed at each end of the open duct. The cable duct must extend at least 1.0 m past the end of the steel casing pipe and the void between the ducts and the steel encasing pipe must be sealed at each end with an EDTI approved sealant (i.e. EDTI approved sealing material to resist movement of the cable duct and assist with reducing thermal resistivity)

3.8 Transportation Utility Corridor (T.U.C.) Crossings

- 3.8.1 An application for Ministerial Consent to carry out construction and right of entry to the T.U.C. must be obtained from by the consultant on behalf of EDTI and a copy sent to EDTI Land Servicing.
- 3.8.2 The Ministerial Consent document must be on site during construction and made available to the EDTI Land Servicing Inspector upon request.
- 3.8.3 It is the contractor's responsibility to ensure that the crossing is completed as per the Ministerial Consent's instructions. EDTI Land Servicing must be consulted of any deviation to the EDTI Distribution Standard in advance to construction.
- 3.8.4 An as-built must be provided as per the Ministerial Consent's document.

3.9 Other Crossings or Proximity agreements (EDTI or other utilities)

- 3.9.1 Crossing agreements and proximity agreements are to be secured by the consultant on behalf of EDTI and copies sent to EDTI Land Servicing. Note that some utility companies have master agreements in place with EDTI and that these copies are not necessary.
- 3.9.2 Crossing agreements and proximity agreements must be signed prior to construction.
- 3.9.3 Signed crossing agreements or proximity agreements must be on site during construction and made available to the EDTI Land Servicing Inspector upon request (unless a master agreement is already in place).
- 3.9.4 It is the contractor's responsibility to ensure that the crossing is completed to the satisfaction of the utility company's inspector as well as to EDTI Distribution Standards. EDTI must be consulted of any deviation to the EDTI Distribution Standard in advance to construction.
- 3.9.5 Where the crossing intersects the other utility a minimum vertical separation of 300 mm from edge of one facility to the edge of the other facility is to be maintained using sand or some other suitable method.
- 3.9.6 The crossing will be either above or below the other utility depending on depths and instructions from the other utility.
- 3.9.7 The crossing shall be sized as per EDTI Distribution Standards 6300070037001 and 6300070037002 and must have end bell collars permanently installed at each end of the open duct.
- 3.9.8 If the purpose of the crossing is a means of extending EDTI power cable from a main power trench on City property across another utility's right of way (the crossing) to EDTI padmounted equipment in an easement, the duct shall be continuous. The EDTI easement will overlap the area of the other utility (i.e. a portion of the easement will be shared by EDTI and gas) or there will be a specific crossing agreement in lieu of an EDTI easement for the crossing (i.e. crossing a railway).
- 3.9.9 Where an easement has been obtained for the benefit of EDTI, no other utility may build facilities within that easement without prior written permission from EDTI (i.e. the contractor cannot use an EDTI easement to conveniently extend a drainage connection or communications duct to private property).

3.10 Cabling General Requirements

- 3.10.1 Where other facilities such as street lighting, communications or CATV cable or conduit is placed, care must be taken so that the facilities are neatly placed and if necessary, wider trenches used to allow access to the power facilities for future repairs.
- 3.10.2 Facilities in a trench are to be neatly placed. Where the width of a trench allows for utilities to be neatly separated, power facilities are to be pushed to the curb side of the trench wherever possible.
- 3.10.3 Where cable will be placed above ducts, all ducts must be shaded with a minimum of 100 mm of sand or with trenched material if a mechanical trencher was used, if the material is acceptable to the EDTI Land Servicing Inspector. Backhoed material will not be an acceptable material for shading ducts.
- 3.10.4 Where a trench has been backhoed, cables must be shaded with 300 mm of sand. Backhoed material cannot be placed over cable.
- 3.10.5 Backfill material over cable can be the material trenched using a mechanical trencher, if in the opinion of the EDTI Land Servicing Inspector, that the backfill material is suitable. Soil having high thermal resistivity containing large amounts of organics, peat, black loam, sod, clay that has hardened, stones, straw, snow or frozen material will not be acceptable. All backfill material will be subject to the approval of the EDTI Land Servicing Inspector. Sand or clean backfill material must be substituted for unsuitable backfill.
- 3.10.6 There is additional cable required to be left in bases of pad mounted equipment. Therefore, before cutting the cable, layout 5.0 m of additional primary and secondary in transformers, 6.0 m of additional primary in 1-phase cubicles and 10 m of additional primary for 3-phase cubicles, measured from the centre of where the base will be installed. This will ensure that there is enough cable to be trimmed by others for terminations prior to energization.
- 3.10.7 Secondary Cable ends must have heat shrink caps installed (see EDTI Distribution Standard drawings).
- 3.10.8 Primary Cable ends must be wrapped with elastomeric tape (i.e. Greenline) to prevent the migration of moisture in the cable prior to testing. Elastomeric tape must be wrapped in a spiral shape overlapping one half of each previous wrap at a time and then covered with black low voltage vinyl tape. A minimum of 2 layers of half lapped

tape is to be applied. Immediately after testing, primary cable ends must have heat shrink caps installed (see EDTI Distribution Standard drawings).

- 3.10.9 Where stages of construction end, it is necessary to protect the primary or secondary from damage or tampering. For other acceptable work practices or updated work practices or procedures, refer to the EDTI Land Servicing Inspector. Temporary Transformer Bases, Boarding and shading or use of Soil Bags are three acceptable methods of securing primary or secondary.
- 3.10.10 The preferred method of protecting capped or coiled cable for future extension is by installing temporary transformer bases (see other sections for details on this).
- 3.10.11 An alternative method of protecting cable for future extension is to coil cable horizontally, and sand with 300 mm of sand covered with a minimum of 2" X 8" pressure treated planking butted together without voids, covered with an additional 300 mm of sand and then backfilled to grade.
- 3.10.12 Capped cables that are boarded and sanded are to be staked with four yellow stakes marking the location and the circumference of the coiled cable. The yellow stakes must be 2" X 4" by a minimum of 1.5 m in length and 450 mm above final grade.

3.11 Protecting Cables using Temporary Transformer Bases

- 3.11.1 The preferred method of protecting cable is by using temporary transformer bases.
- 3.11.2 Both capped and looped primary or secondary must be trained into the base compartment.
- 3.11.3 The ducts and cables for communications and street lighting will be extended beyond the base (no trough required) and the length to be extended will be up to the EDTI Land Servicing Inspector's discretion.
- 3.11.4 Temporary base installation heights and orientation are the same as permanent bases.
- 3.11.5 Primary and or secondary is to be brought into the base through the sand. Consideration must be given to the combination, number and type of cable expected to be inserted into the base. Should there be too many cables, then the contractor must resort to the method of boarding and shading.
- 3.11.6 The minimum requirements for a lid on a temporary transformer base will be ¼" steel drilled for four bolt holes (not plywood).
- 3.11.7 The bolts are intended to be EDTI pentahead type bolts and a cupped washer combination (regular hex sided bolts will be allowed until pentaheads are available).
- 3.11.8 Only EDTI Land Servicing Inspectors or EDTI tradesman may have access to the temporary base once an area is energized (i.e. hot loops).
- 3.11.9 If it is necessary to insert any cables into the base after an area is energized, it will be done so or by direct supervision of an EDTI Land Servicing Inspector or an EDTI Underground tradesperson.
- 3.11.10 The locations of temporary transformer bases are to be marked on the as-built by the contractor.

3.12 Protecting Cables Using Boarding and Shading

- 3.12.1 A method of protecting cable is boarding and shading. Cable must be sanded with 300 mm of sand covered with a minimum of 2" X 8" pressure treated planking butted together without voids, covered with an additional 300 mm of sand and then backfilled to grade. See other sections for alternative methods of securing primary or secondary cable.
- 3.12.2 Capped cables that are boarded and sanded are to be staked with four yellow stakes marking the location and the circumference of the coiled cable. The yellow stakes must be 2" X 4" by a minimum of 1.5 m in length and 450 mm above final grade.

3.13 Protecting Cables Using Soil Bags

- 3.13.1 Soil bags refer to woven bags manufactured specifically for soil or sand and used for covering cable. The size of bag is to be larger than what can normally be lifted manually.
- 3.13.2 These bags break down in ultraviolet light and therefore cannot be expected to hold together while removing them from the site if left for a long period of time.
- 3.13.3 The bags can be placed directly on the cable.

- 3.13.4 All cable must be completely covered and cannot be left exposed.

3.14 Secondary Services to Lots

- 3.14.1 Secondary residential service cable is a minimum of 2/C #1/0 Al XLPE CN 600 volt direct buried type USEB cable. (See EDTI specifications 66.00.05.08.22.005).
- 3.14.2 Follow the power plan for size of secondary services for each residential lot. Where the size of cable is larger than the minimum, the size will be indicated on the power plan using the legend or some other method acceptable to EDTI Land Servicing.
- 3.14.3 Each residential service shall require an additional 30 m coil left on private property. The entire length of secondary for a residential service shall be installed without a splice and cable end must have heat shrink caps installed (see EDTI Distribution Standard Drawing).
- 3.14.4 Service coils are to be installed in service boxes (see EDTI Distribution Standard Drawing for box construction) past the gas easement if one exists (see other instructions for side lots).
- 3.14.5 Where side lots require servicing along the longer property line and there is no gas easement, service boxes (power service coils) are to be left straddling the property line to allow for excavation of basements without damaging the power service coils.
- 3.14.6 Where side lots require servicing along the longer property line and there is a gas easement, service boxes (power service coils) are to be "A" services (1.5 m) from the rear property line or serviced from the front property line.
- 3.14.7 The service entry points will be 1.5 m ("A" service), 3.0 m ("B" service) or 4.5 m, ("C" service) from the lot line and must be installed parallel to the lot lines. Service entry points which are not designated as "A", "B" or "C" will be dimensioned on the power plan. Note the importance of front and rear lot pins staked to allow the installer to parallel the property line.
- 3.14.8 Secondary left in transformers must have the lot numbers clearly marked using permanent black ink on white phasing tape or cable marking stickers or some other permanent method and must be marked on both sides of the cable. If two cables in a transformer have the same lot number then the block number will need to be identified in addition to lot numbers.
- 3.14.9 5.0 m of additional secondary is required in transformers, measured from the centre of where the base will be installed. This will ensure that there is enough cable to be trimmed by others for terminations prior to energization.

3.15 Transformers

- 3.15.1 Excavation for bases should be a stepped excavation so that the native backfill is not disturbed under the ground grid area. This will help prevent the bending of rods and deformation of the ground grid during the backfilling/compaction process (i.e. the area where the ground grid and rods are installed, should not be dug as deep as what will be required for the base excavation). See EDTI Distribution Standard Drawings for a detail of stepped excavations.
- 3.15.2 Where base excavations are not a stepped excavation, special care must be taken to ensure that the area around the base and the ground rods are backfilled with a maximum of 300 mm lifts of sand or backfill and compacted without damage to the ground rods, ground grid or #4/0 copper ground conductors (tails).
- 3.15.3 The bottom of the excavation where the base will be installed requires 300 mm of compacted road crush (20 mm crushed gravel).
- 3.15.4 A minimum of four 2" X 10 " pressure treated lumber must be installed under bases to assist with the levelling of the base before placing the base and to increase the distribution of the weight of the base.
- 3.15.5 The height of the top of concrete base shall be installed at between 150 mm - 200 mm above finished grade.
- 3.15.6 The City Design and Construction Standards Volume 2 – Roadways, outline the requirements for compaction. The contractor must meet these requirements for compacting around or under a base.
- 3.15.7 Where a 4-sided trough is to be located under a base, the trough will need to extend 300 mm beyond the outside of the ground grid. All troughs are a minimum of 2-2"X8" and 2-2"X10" pressure treated lumber (see EDTI Underground Standard Drawings for more details).

- 3.15.8 Additional primary or secondary left in transformers must be 5.0 m longer than measured from the centre of the transformer (i.e. 5.0 m additional cable for future trimming by the termination contractor).
- 3.15.9 Where the secondary enters the left mouse hole, lay the secondary on the bottom of the base training the secondary in a clockwise rotation (0.75 of a complete turn around the inside wall of the base) and trim at 1.0 m (minimum) above the top of the base. Ensure the secondary tails are towards the right wall of the base.
- 3.15.10 Where the secondary enters the right mouse hole, lay the secondary on the bottom of the base training the secondary in a clockwise rotation (1.25 of a complete turn around the inside wall of the base) and trim at 1.0 m (minimum) above the top of the base. Ensure the secondary tails are towards the right wall of the base.
- 3.15.11 Where the primary enters the right or left mouse hole, lay the primary on the bottom of the base on top of the secondary coils, training the primary in a counter clockwise rotation (at least one turn) and trim at 2.0 m (minimum) above the top of the base plus enough extra to allow the neutral conductor to be connected to the ground bus without splicing.
- 3.15.12 2 X #4/0 bare copper grounding conductors (tails) from the ground grid must be brought into the transformer below the concrete base between the pressure treated lumber or through a mouse hole. See EDTI Distribution Standard Drawings.
- 3.15.13 If there are bends in the transformer for future servicing or extension of primary, they must have end bell collars permanently installed at both ends of the bend.

3.16 Switching Cubicles

- 3.16.1 Excavation for bases should be a stepped excavation so that the native backfill is not disturbed under the ground grid area. This will help prevent the bending of rods and deformation of the ground grid during the backfilling/compaction process (i.e. the area where the ground grid and rods are installed, should not be dug as deep as what will be required for the base excavation). See EDTI Distribution Standard Drawings for detail of this.
- 3.16.2 Where base excavations are not a stepped excavation, special care must be taken to ensure that the area around the base and the ground rods are backfilled with a maximum of 300 mm lifts of sand or backfill and compacted without damage to the ground rods, ground grid or #4/0 copper ground conductors (tails).
- 3.16.3 A minimum of 2" X 10" pressure treated lumber must be installed under bases to assist with the levelling of the base before placing the base and to allow for some spreading of the weight of the base.
- 3.16.4 The height of the top of concrete base shall be installed at between 250 mm - 300 mm above finished grade.
- 3.16.5 The City of Edmonton Design and Construction Standards Volume 2 – Roadways, outlines the requirements for compaction. The contractor must meet these requirements for compacting around or under a base.
- 3.16.6 Where a 4 sided trough is to be located under a base, the trough will need to extend 300 mm beyond the outside of the ground grid. All troughs are a minimum of 2-2"X8" and 2-2"X10" pressure treated lumber (see EDTI Underground Standard Drawings for more details).
- 3.16.7 All bends entering the base requires permanent end bell collars on the end of the bends inside of the switching cubicle (do not cut these off or remove them).
- 3.16.8 All spare bends are to be covered (taped or covered by some other suitable method) to prevent material falling into the bends.
- 3.16.9 There must be a bend installed for every compartment of a switching cubicle (i.e. 1 bend for "A", 1 bend for "B", etc.)
- 3.16.10 Each bend which is not capped specifically for a customer's service stub must have an end bell collar permanently installed on the open end outside of the switching cubicle (i.e. both ends of the bend must have end bell collars).
- 3.16.11 The ducts from each fused compartment to the property line that it is intended to service will be continuous without breaks and capped at the property line.
- 3.16.12 Where gas easements exist, the service ducts are to be extended past the gas easement and capped.
- 3.16.13 Service ducts are to be staked to identify their location with a yellow stake. That stake must be a 2 X 4" minimum of 1.5 m in length, 450 mm above final grade.

- 3.16.14 Ducts from cubicles in an easement must be continuous from the switching cubicle to the main power trench and have end bell collars installed at each end.

3.17 Grounding and Bonding

- 3.17.1 Ground grids are required around all padmounted equipment and consist of four copper clad ground rods interconnected by #4/0 bare copper grounding conductor and an additional 2 X #4/0 bare copper grounding conductor tails connected to the ground bus of the equipment. See other sections as well as EDTI Distribution drawings for details.
- 3.17.2 All electrical connections (for the ground grid) are to be cleaned before making the connection (i.e. free of mud, grease, oil).
- 3.17.3 Where non EDTI equipment is placed within 3.0 m from the edge of EDTI equipment, the ground grid of the EDTI equipment must be bonded using two tails to the ground of the non EDTI equipment. See details on the power plan of how the bonding is to be achieved. The detail must show the clearance between the edge of the EDTI equipment and the non EDTI equipment. The non EDTI equipment cannot be installed within 1.0 m of the EDTI ground grid.
- 3.17.4 Where non EDTI systems are to be bonded to the EDTI system every 300 m, see the power plan for details of where the connection is to be made and how the non EDTI systems are to be bonded.

3.18 Exposing Existing Power Facilities

- 3.18.1 It is understood that some work may be required over energized primary or secondary. This may involve crossing or over trenching of energized primary and secondary. Mechanical excavation is allowed up to 1.0 m from the energized facilities. Therefore, the facilities must be located first using hydro excavating or hand digging methods prior to determining where the mechanical excavation limits end.
- 3.18.2 Refer to the Alberta Electrical Utility Safety Association Guide Code of Practice for Working in the Vicinity of Electrical Equipment.
- 3.18.3 The EDTI Land Servicing Foreman must be contacted 48 hours prior to this work. EDTI Land Servicing Inspectors are not expected to advise contractors on the location of Power facilities.
- 3.18.4 Alberta One-Call must be contacted and a current and valid Alberta One-Call ticket c/w locate document must be on-site.
- 3.18.5 All existing power facilities are to be assumed energized. Therefore, follow hydro excavating procedures over energized primary or secondary.

3.19 Hydro Excavating Procedure (Hydrovac) over Primary or Secondary

- 3.19.1 Follow updated EDTI hydro excavating standards (i.e. water temperature and water pressure limits, neoprene oscillating head, equal-potential bonding). The hydro excavating operator must be familiar with this specific standard prior to commencement of work to avoid damage to the cable or exposing themselves to an electrical hazard. A copy of the updated standard must be on-site and made available to an EDTI Land Servicing Inspector or EDTI Underground Tradesman upon request. Contact EDTI Land Servicing or the prime contractor for updated standards.
- 3.19.2 EDTI will allow a contractor to over trench up to 5.0 m of energized facilities by hand or hydro excavating. Follow Alberta-One-Call procedures prior to commencement of work.
- 3.19.3 All exposed energized cable cannot be left unattended. If the excavation is narrow or small, the primary must be covered with soil bags or some other suitable temporary method of securing the primary cable. Contact the EDTI Underground Trades Foreman for more details.
- 3.19.4 Under no circumstances can energized primary be moved or handled in anyway unless under direct supervision of an EDTI Underground Tradesperson or EDTI Land Servicing Inspector.

3.20 Energized Primary

- 3.20.1 Where energized primary is left uncovered, site security personnel must be retained to ensure public safety. Energized primary cannot be left open and unattended.
- 3.20.2 Where it is impractical to have site security for long periods of time then the boarding and shading, temporary transformer base or soil bag method must be utilized to secure energized primary.

3.21 Splice Pits

- 3.21.1 The contractor must contact the Underground Trades Foreman to coordinate primary splicing, sanding and backfilling of splice pits.
- 3.21.2 Splice pits must be 3.0 m long (parallel to the trench) and 2.0 m wide and 150 mm deeper than the cable trench.
- 3.21.3 Where water has entered the splice pit, the contractor may be asked to clean out prior to the arrival of EDTI crews.
- 3.21.4 Where splice pits have been excavated over energized primary, cable cannot be left unattended. Therefore the cable must be covered in an acceptable method. The covering will be removed by the contractor in coordination with the EDTI Underground Trades Foreman.
- 3.21.5 Once splicing is completed by the EDTI Underground Tradesman, the contractor must immediately cover the splices with 300 mm sand at least 1.0 m beyond the area where the splices are located and then backfilled and compacted to the City of Edmonton Design and Construction Standards Volume 2 - Roadways.
- 3.21.6 It may be necessary to splice primary where cable reel lengths or number of crossings dictates that it is more practical to provide a splice. The location of any additional splices required during construction is at the discretion of the EDTI Land Servicing Inspector and must meet their approval.
- 3.21.7 All primary cable will be spliced by EDTI tradesman. Where known splices are planned in advance by the consultant, they must be indicated on the power plan with the words "to be spliced by EDTI".
- 3.21.8 All splices must be as-built by the contractor.

3.22 Removing Temporary Transformer Bases

- 3.22.1 Where temporary transformer bases have been used to cover capped or coils of primary or secondary in previous stages of development, care must be taken when removing these facilities. It is understood that some work may require the removal of these bases to prepare a site for splicing.
- 3.22.2 Mechanical excavation is allowed up to 1.0 m from these temporary bases or from the cable entering the temporary base. Therefore, when working within 1.0 m of the facilities the area must be hydro excavated or hand dug.
- 3.22.3 The EDTI Land Servicing Inspector must be contacted 48 hours prior to the removal of temporary bases. EDTI Land Servicing Inspectors are not expected to advise contractors on the location of Power facilities.
- 3.22.4 Alberta One-Call must be contacted to advise contractors on the location of existing power facilities and the completed Alberta One-Call document must be on-site prior to construction.
- 3.22.5 All work proposed near existing power facilities are to be treated as though the existing power facilities are energized. Therefore, follow the hydro excavating procedures.

4. TERMINATIONS / TERMINATION INSPECTIONS / CABLE, EQUIPMENT AND GROUND GRID TEST REPORTS

4.1 Safety

- 4.1.1 If a service agreement exists between the Developer and the City of Edmonton and the contractor is hired by the developer, the construction site is not under EDTI's control. It is the responsibility of the developer to ensure that the contractor completes a hazard assessment of the work site and take effective measures to control the hazards identified as per the Alberta Occupational Health and Safety Act, Regulation, and Code. All workers who may be affected by the hazards must be familiar with the necessary health and safety measures or procedures and that safe-work practices are to be followed. These measures or procedures extend to EDTI workers who may be asked to be present on the work site.
- 4.1.2 1.2.2 If a contract exists between the contractor and EDTI, responsibility for safety is outlined in the contract and will include EDTI safety procedures and policies as well as the Alberta Occupational Health and Safety Act, Regulation, and Code. It is the responsibility of the contractor to ensure that a hazard assessment of the work site be completed and take effective measures to control the hazards identified. All workers who may be affected by the hazards must be familiar with the necessary health and safety measures or procedures and that safe-work practices are to be followed. These measures may be included as part of the contract and indicate that the contractor follow EDTI Safe Work Practices.

4.2 Prior to Terminations or Testing of Pad mounted Equipment

- 4.2.1 Contact the EDTI Underground Trades Foreman at 780-412-4456, 48 hours in advance to make arrangements for inspection of the terminations on power equipment (i.e. elbow terminations in cubicles and transformers and secondary terminations). In most cases, an EDTI Underground Tradesperson will be assigned to witness the terminations while in progress.
- 4.2.2 Once terminations are completed, contact the EDTI Underground Trades Foreman at 780-412-4456, 48 hours in advance to make arrangements for witnessing the testing of cable, equipment and ground grids. Testing is not to be performed unless the EDTI Underground Tradesperson has approved the terminations.
- 4.2.3 EDTI Underground Trades inspections typically require one full working day to complete. Therefore time is required after notifying the EDTI Underground Trades Foreman to allow the EDTI Underground Tradesperson to complete a detailed inspection prior to testing taking place. Contact the EDTI Underground Trades Foreman in regards to timelines of inspections and any changes to EDTI inspection procedures or policies.

4.3 General Requirements for Pad mounted Equipment and Primary Terminations

- 4.3.1 All terminations must be witnessed by the EDTI Underground Tradesperson unless prior approval has been received from the EDTI Underground Tradesperson to proceed without direct EDTI supervision.
- 4.3.2 It is the responsibility of the developer/contractor to secure suppliers of EDTI approved transformers, switching cubicles, cable, elbows, bases and any other material required to complete the project.
- 4.3.3 All electrical connections must be completed by a certified journeyman electrician, certified power lineman, certified power systems electrician or apprentice working under the direct supervision of the certified journeyman electrician, certified power lineman or certified power systems electrician using EDTI approved elbows, EDTI approved termination kits and EDTI approved hardware. Qualifications and certification produced by the above referenced trades people must be recognized in the Province of Alberta as qualified or certified to work in the Province of Alberta and be experienced in the field of high voltage electrical terminations.
- 4.3.4 The name of the tradesperson who will be completing the terminations, certification, qualifications and high voltage electrical termination experience must be on file with EDTI. Therefore, upon request, this information must be forwarded to EDTI Land Servicing or to the EDTI Underground Trades Foreman.
- 4.3.5 All primary cables in 3-phase switching cubicles require EDTI approved Fault Indicators and fibre optics installed on them.
- 4.3.6 The "B" elbow of 1-phase switching cubicles requires an EDTI approved Fault Indicator and fibre optic.
- 4.3.7 The "LC" elbow of transformers requires an EDTI approved Fault Indicator.
- 4.3.8 It is the contractor's responsibility to use the EDTI approved type of fault indicator for each switching cubicle application.

- 4.3.9 All fibre optic connections in cubicles are to be made to fault indicators on the primary cable and where no primary cable exists, the fibre optic cable is to be neatly coiled. Fibre optic is to be tied to the cable using cable ties and when the fibre optic reaches a point below the bottom of the top lip of the cubicle base, the fibre optic is to be trained towards the wire protector on the switching cubicle. The reason for this is to keep the fibre optic away from the area where the fuse doors are to be swung open.
- 4.3.10 EDTI approved permanent cable identification tags must be installed. The location of this tag is above the fault indicator and if there is no fault indicator required then above the neutral and secured with a cable tie (do not bundle the bleed wire with the cable tie). If the elbow required does not allow for the identification tag to be installed above the fault indicator then the tag must be installed as close as practicable to the fault indicator.
- 4.3.11 Where there are 25 kV connections and vented bushings, blue tags (skate tags) are to be installed. These blue tags are to be attached to the EDTI approved permanent cable identification tag using the same cable tie (do not bundle the bleed wire with the cable tie).
- 4.3.12 An EDTI approved Insulated Cap with a Ground Lead must be installed onto each 200 amp bushing with no primary termination and onto a reducing tap plug on elbows larger than 200 amps (both 15kV and 25 kV). The factory lead is to be terminated to the ground bus using EDTI approved hardware (i.e. amp lug sized for the ground lead and size of ground bus bolt c/w EDTI conical washer and EDTI approved flat washer). The excess ground lead is wrapped around the cap by turning the cap until the slack is taken up.
- 4.3.13 All Insulated Caps with Ground leads installed on the window op reducing tap plug of the 400 amp or 600 amp terminations are 25 kV and are identical regardless of the voltage of the cubicle. The window op reducing tap plug is lubricated with a light film of silicone grease and the insulated cap pushed on to the plug. Depending on the supplier, the Insulated Cap with Ground Lead may come as part of the termination kit. The factory lead is to be terminated to the ground bus using EDTI approved hardware (i.e. amp lug sized for the ground lead and size of ground bus bolt c/w EDTI conical washer and EDTI approved flat washer).
- 4.3.14 All Insulated Caps with Ground leads installed onto each 200 amp bushing are rated specifically for 15 kV or 25 kV depending on the voltage class of the cubicle. The bushing is lubricated with a light film of silicone grease and the insulated cap is pushed on. The factory lead is to be terminated to the ground bus using EDTI approved hardware (i.e. amp lug sized for the ground lead and size of ground bus bolt c/w EDTI conical washer and EDTI approved flat washer).
- 4.3.15 An Insulated Cap with Ground lead is required on all transformer bushings where there is no primary cable (i.e. on the last transformer in a subdivision intended to connect to a future subdivision with an empty duct...no primary). This cap is rated for the application, either 15 kV or 25 kV. The bushing is lubricated with a light film of silicone grease and the insulated cap is pushed on. The factory lead is to be terminated to the ground bus using EDTI approved hardware (i.e. amp lug sized for the ground lead and size of ground bus bolt c/w EDTI conical washer and EDTI approved flat washer).
- 4.3.16 All Dead break Insulated Caps with Test Points are installed directly to the 400 amp (25 kV) or 600 amp (15 kV) bushing (hand tightened) where there is no primary cable termination required. A minimum #14 AWG copper lead is to be installed on the Dead break Insulated Cap and terminated to the ground bus using EDTI approved hardware (i.e. amp lug sized for the ground lead and size of ground bus bolt c/w EDTI conical washer and EDTI approved flat washer).
- 4.3.17 On the installation of a 200 amp elbow, there is no provision for a separate Insulated Cap as the elbow itself performs this function. Therefore, where primary cable is terminated using 200 amp elbows, this is the only instance where the insulated cap is not required.
- 4.3.18 All neutral conductors of primary and secondary cable are to be connected to the ground bus using EDTI approved hardware following EDTI Underground Distribution Standards.
- 4.3.19 The equipment ground of pad mounted equipment must be connected as per EDTI Underground Distribution Standards using four copper clad ground rods interconnected using #4/0 copper grounding conductor and two #4/0 bare copper grounding conductor tails terminated to the ground bus of the equipment with EDTI approved hardware.
- 4.3.20 All electrical connections to the ground bus should be cleaned using steel wool or some other approved method to allow for a better electrical connection.

4.4 Shaping, Termination and Identifying Cables in Transformers

- 4.4.1 Any reference to shaping in this section is while standing facing the front of the transformer.
- 4.4.2 Where the #4/0 copper ground conductors (tails) enters the transformer base, one full coil around the base of both tails is required for termination to the ground bus to separate bolts but in close proximity to each other. The reason that they are in close proximity is to allow for a clip-on ground resistance test on both tails at the same time.
- 4.4.3 Where the secondary enters the left mouse hole, lay the secondary on the bottom of the base training the secondary in a clockwise rotation (0.75 of a complete turn around the inside wall of the base) and trim at 1.0 m (minimum) above the top of the base. Ensure the secondary tails are towards the right wall of the base.
- 4.4.4 Where the secondary enters the right mouse hole, lay the secondary on the bottom of the base training the secondary in a clockwise rotation (1.25 of a complete turn around the inside wall of the base) and trim at 1.0 m (minimum) above the top of the base. Ensure the secondary tails are towards the right wall of the base.
- 4.4.5 Where the primary enters the right or left mouse hole, lay the primary on the bottom of the base on top of the secondary coils, training the primary in a counter clockwise rotation (at least one turn) and trim at 2.0 m (minimum) above the top of the base plus enough extra to allow the neutral conductor to be connected to the ground bus without splicing.
- 4.4.6 Primary cable has limits on its bending radius depending on the size, type of cable and manufacture's specs. In general, EDTI approved primary cable cannot be shaped or stressed (by bending it) into a radius less than 8 times the diameter of the cable.
- 4.4.7 Primary cable loops shall be trained on top of secondary cable loops to allow adequate movement for switching operations.
- 4.4.8 EDTI approved Fault Indicators are to be installed on the "LC" primary cable. The location of the fault indicator is to be located above the neutral. The cable identification tag is to be located above the Fault Indicator.
- 4.4.9 All secondary neutrals are to be terminated with the correct sized lug (see EDTI transformer standard for correct lug sizes), shaped neatly and with EDTI approved hardware.
- 4.4.10 After secondary cable neutrals have been shaped and secured, the jacket that has been stripped back from the cable must line up with the bottom of the top lip of the base.
- 4.4.11 After trimming the secondary, the lot and block number must be identified on the secondary cable attached to the X1 (lower) secondary terminal block using permanent black ink on an opaque plastic tube slipped over the insulation of the secondary.
- 4.4.12 The secondary cables are to be installed in the terminal block and have shrink caps installed (note that the insulation is not to be stripped off) and the set screw on the secondary terminal block is to be loosely secured (so that the secondary/cable tie will not fall through the secondary terminal block). Larger cables are to be secured to the secondary terminal block using cable ties (note that the insulation is not to be stripped off) and a short length of shrink tubing is to be installed to cover the end of the cable. See the transformer EDTI Underground Distribution Standard for a detail on this.
- 4.4.13 There must be a ground strap bonding the XO terminal and the tank of the transformer to the ground bus. Therefore the contractor must ensure that this connection exists, is in good condition and is secure.
- 4.4.14 All lifting bolts from transformers must be removed.
- 4.4.15 Four approved tie down plates are to be supplied and installed to secure all transformers to the precast base.

4.5 Shaping and Terminations in 3-Phase Switching Cubicles

- 4.5.1 One full coil of the #4/0 copper ground conductors (tails) are shaped between the "A2" and "A3" bushings of 200 amp, 3-phase cubicles to approximately 150 mm above the height of the ground bails. The tails are shaped at 90 degrees and continue towards the ground bails and will be terminated to separate connectors. One connector will be located on the right side of the "A2" ground bail (stirrup). The other connector will be on the left side of the "A3" ground bail. Note that both connectors must be mounted on the vertical portion of the ground bails so that they do not interfere with the connection of working grounds. The tails will not be trained through the cable guides so that they will not interfere with switching operations of the primary. The connector must be an EDTI approved connector sized for the 5/8" ground bails and the #4/0 copper ground conductors similar to the connectors used in the buried portion of the ground grid. The tails will be shaped and secured together with cable ties to allow easy access for a ground grid resistance check on both tails at the same time.
- 4.5.2 One full coil of the #4/0 copper ground conductors (tails) are shaped between the "A2" and "A3" bushings of 400 or 600 amp, 3-phase cubicles to approximately 150 mm above the height of the ground bus. The tails are shaped at 90 degrees and continue towards the ground bus and will be terminated using bolts and EDTI approved lugs (one bolt for each connection). Both tails are trained together using cable ties so that resistance checks can easily be done on both tails at the same time.
- 4.5.3 From the "A" duct, loop primary in a clockwise direction (one complete loop) and trim at 2.0 m (minimum) above the base plus enough extra to allow the neutral conductor to be connected to the ground bus (400 amp/600 amp) or ground plate (200 amps) without splicing.
- 4.5.4 From the "B" duct, loop primary in a counter clockwise direction (one complete loop) and trim at 2.0 m above the base plus enough extra to allow the neutral conductor to be connected to the ground bus (400 amp/600 amp) or ground plate (200 amps) without splicing.
- 4.5.5 If there is cable in the "C" duct, loop primary in a clockwise direction (one complete loop) and trim at 2.0 m (minimum) above the base plus enough extra to allow the neutral conductor to be connected to the ground bus (400 amp/600 amp) or ground plate (200 amps) without splicing.
- 4.5.6 If there is cable in the "D" duct, loop primary in a counter clockwise direction (one complete loop) and trim at 2.0 m above the base plus enough extra to allow the neutral conductor to be connected to the ground bus (400 amp/600 amp) or ground plate (200 amps) without splicing.
- 4.5.7 Cables are to be shaped to ensure that they do not cover up other ducts.
- 4.5.8 All bends entering the base require permanent end bell collars on the end of the bends inside of the switching cubicle (do not cut these off or remove them).
- 4.5.9 All spare bends are to be covered (end bells taped or covered by some other suitable method) to prevent material falling into the bends.
- 4.5.10 Primary cable has limits on its bending radius depending on the size, type of cable and manufacture's specs. In general, EDTI approved primary cable cannot be shaped or stressed (by bending it) into a radius less than 8 times the diameter of the cable.
- 4.5.11 Fuse holders are to be installed in the fusing compartments and fuse doors in the closed position.
- 4.5.12 All lifting eyes on switching cubicles are to be turned down.
- 4.5.13 Four EDTI approved tie down plates are to be supplied and installed to secure all switching cubicles to the precast base.
- 4.5.14 Where primary cable exceeds 500 MCM, follow other EDTI standards for shaping and cable support.
- 4.5.15 Fibre optic indicators on three phase cubicles must face the nearest road (where the "B" compartment would be on the left hand side of the cubicle while facing the cubicle from the road).

4.6 Shaping and Terminations in 1-Phase Switching Cubicles

- 4.6.1 One full coil of the #4/0 copper ground conductors (tails) are shaped between the "A" and "B" bushings of 1-phase cubicles to approximately 150 mm above the height of the ground bails. The tails are shaped at 90 degrees and continue towards the ground bails and will be terminated to separate connectors. One connector will be located on the right side of the "A" ground bail (stirrup). The other connector will be on the left side of the "B" ground bail. Note that both connectors must be mounted on the vertical portion of the ground bails so that they do not interfere with the connection of working grounds. The tails will not be trained through the cable guides so that they will not interfere with switching operations of the primary. The connector must be an EDTI approved connector sized for the 5/8" ground bails and the tails similar to the connectors used in the buried portion of the ground grid. The tails will be shaped and secured together with cable ties to allow easy access for a ground grid resistance check on both tails at the same time.
- 4.6.2 From the "A" and "B", loop primary (one complete loop) in counter clockwise direction and trim at 2.0 m (minimum) above the base plus enough extra to allow the neutral conductor to be connected to the ground plate without splicing.
- 4.6.3 If there is a "C" and "D" primary then loop primary (one complete loop) in clockwise direction and trim at 2.0 m (minimum) above the base plus enough extra to allow the neutral conductor to be connected to the ground plate without splicing.
- 4.6.4 All bends entering the base requires permanent end bell collars on the end of the bends inside of the switching cubicle (do not cut these off or remove them).
- 4.6.5 All spare bends are to be covered (end bells taped or covered by some other suitable method) to prevent material falling into the bends.
- 4.6.6 Cables are to be shaped to ensure that they do not cover up other ducts.
- 4.6.7 Primary cable has limits on its bending radius depending on the size, type of cable and manufacture's specs. In general, EDTI approved primary cable cannot be shaped or stressed (by bending it) into a radius less than 8 times the diameter of the cable.
- 4.6.8 All lifting eyes on switching cubicles are to be turned down.
- 4.6.9 Four approved tie down plates are to be supplied and installed to secure all switching cubicles to the precast base.
- 4.6.10 The 1-phase cubicles must be oriented with the road so that the fibre optic indicator is on the right hand side of the cubicle when standing facing the cubicle from the road.

4.7 Ground Grid Testing and Witnessing

- 4.7.1 All ground grid tests are to be witnessed by the EDTI Underground Tradesperson. There will be three levels of testing.
- 4.7.2 All ground grids must be tested to ensure continuity and cannot exceed 6.0 ohms.
- 4.7.3 If the ground grid does not meet EDTI Underground Distribution Standards or exceeds 6.0 ohms then repairs or corrections must be made. These corrections may include:
- Cleaning connections, replacing damaged rods, copper ground conductors or driving additional rods to maintain 6.0 ohms or less.
 - Any repairs or replacing of rods, ground conductor or connections are subject to re-inspection, re-testing and witnessing by the EDTI Underground Tradesperson.
- 4.7.4 A "Three Point Test" or a "Clip-on resistance" method of testing is required.
- 4.7.5 Three Point Test:
- Use instrument with two remote ground rods and the third lead attached to the ground grid.
 - Details of the test procedure available upon request.
 - This test is typically required where there is only one device to be added to EDTI's distribution system.
- 4.7.6 Or a Clip-on Method may be used:
- Use of approved clip-on apparatus.

- In transformers and switching cubicles, clip-on both #4/0 copper ground conductors (tails) simultaneously and take the resistance reading.
- Details of the test procedure are available upon request.
- This test is typically required where there is more than one device to be added to EDTI's distribution system and is interconnected.

4.7.7 Ground grid test reports must include the following data:

- Subdivision Name and Stage number as shown on the approved power plan
- Voltage Rating of equipment
- Pad Number of the equipment being tested
- Manufacturer & Description of the type of equipment
- Equipment rating

4.8 Primary Cable Testing Requirements and Witnessing

- 4.8.1 EDTI is considering adopting Very Low Frequency (VLF) testing as the approved acceptance test to replace DC high-potential testing of cable and cubicles in the future. To determine which practice is currently accepted, contact EDTI Land Servicing or the EDTI Underground Trades Foreman for more details.
- 4.8.2 Primary XLPE cables are to be tested and tests are to be witnessed by the EDTI Underground Tradesperson. Existing primary XLPE cables older than 2 years old should not be incorporated in a DC high-potential test. Refer to the EDTI Underground Trades Foreman for cables other than primary XLPE. Any sections of cables or elbows that fail this withstand test shall be removed and replaced with new material or repaired to the satisfaction of the EDTI Underground Tradesperson. The contractor shall ensure that all DC high-potential tests are carried out in accordance to the rules and regulations, as described in the current Alberta Electrical Utility Code, EDTI Standard for testing cable and any other applicable standard or safety code.
- 4.8.3 The contractor performing the tests is responsible for carrying out safe work practices and to ensure the safety of the general public, EDTI Underground Tradesperson and colleagues and safety of the contractor performing the test.
- 4.8.4 The contractor is responsible for continuity checks to ensure that the cable routing follows the approved schematic. The cable route is to be recorded on the test reports and will include the typical "LA", "LC" transformer bushing designation or switch compartment letter and phase c/w the pad number as a reference. Cables intended to be capped in pits or bases are to be identified by their location on the test reports and cross referenced to the approved schematic.

4.9 General Cable Test Requirements

- 4.9.1 EDTI is considering adopting Very Low Frequency (VLF) testing as the approved acceptance test to replace DC high-potential testing of cable and cubicles in the future. To determine which practice is currently accepted, contact EDTI Land Servicing or the EDTI Underground Trades Foreman for more details.
- 4.9.2 Elbows on cables to be tested are to be parked on a double parking stand where feed-thru connections on transformers are or to bypass cubicles to ensure the interconnection of the cables prior to testing.
- 4.9.3 Temporary stress cones, taping or temporary boots, to prevent corona may be necessary on cable ends.
- 4.9.4 Stepped voltage increases should take between 10-60 seconds and should be maintained such that the leakage current does not spike.
- 4.9.5 Current magnitude is to be measured once the maximum test voltage is achieved and at 5 minute intervals and maintained for 15 minutes.
- 4.9.6 Discharging of the cable after completion of the test must be done in such a manner as to reduce the damage to the cable (using a resistance of 10 k-ohms / k-volt to be discharged). The cable may only be quickly discharged after it has been reduced slowly to 40% of the maximum test voltage.
- 4.9.7 Refer to the EDTI Guide for the Testing of High Voltage Underground Cables using D.C. for Basic Impulse Levels and a table indicating the Test Voltage / System Voltage Rating.
- 4.9.8 15 kV cable shall be tested to a maximum of 37.5 kV.

4.9.9 25 kV cable shall be tested to a maximum of 52.5 kV.

4.10 Equipment Testing Requirements and Witnessing

4.10.1 Transformers shall be tested by the manufacturer according to the approved standard Can/CSA-C2.1-06 (February 2007) or newer. At EDTI's discretion, EDTI may request a copy of the test report, certified by the manufacturer, acknowledging that all routine tests have been performed. It is the contractor's responsibility to provide copies of these test reports.

4.10.2 EDTI reserves the right to request copies of manufacturer's test reports and specifications for any transformers or switching cubicles purchased where EDTI does not already have this information on hand. The reason for this is to ensure that the equipment meets EDTI specifications and is identical to existing equipment in EDTI's distribution system and meets current EDTI standards. Any equipment, which does not meet these requirements, may need to be replaced and is at the discretion of EDTI Land Servicing, the EDTI Underground Tradesperson or EDTI Underground Trades Foreman.

4.10.3 Depending on the supplier of transformers, EDTI may request copies of the test reports from the factory (the contractor must supply these reports prior to energization of these transformers or EDTI may request a field test of the transformers).

4.10.4 All equipment tests are to be witnessed by the EDTI Underground Tradesperson.

4.10.5 Switching cubicle or transformer test reports must include the following data:

- Subdivision Name and Stage number as shown on the approved power plan
- Current Temperature the day of the test
- Current Humidity the day of the test
- Maximum Test Voltage
- Duration of Test in minutes
- Voltage Rating of equipment
- Pad Number of the equipment being tested
- Manufacturer & Description of the type of equipment
- Equipment Rating
- Contact Resistance Test (for cubicles only)

4.10.6 EDTI is considering adopting Very Low Frequency (VLF) testing as the approved acceptance test to replace D.C. switching cubicles in the future. To determine which practice is currently accepted, contact EDTI Land Servicing or the EDTI Underground Trades Foreman for more details.

4.10.7 A high-voltage DC test shall be undertaken on each switching cubicle. Raise the voltage in 5 kV increments, holding for 1 minute until the test voltage is reached recording leakage currents. The maximum leakage current allowed is 100 micro-amps. Cubicles failing this test must be repaired or replaced and retested.

- 15 kV equipment shall be tested to a maximum of 37.5 kV.
- 25 kV equipment shall be tested to a maximum of 52.5 kV.

4.10.8 A resistance test shall be undertaken on each switching cubicle and will include switches and bus in the test in such a way that all of the bus and all of the switches are tested. Cubicles failing the resistance test must be cleaned, repaired or replaced and retested.

- 200 amp switches/bus shall have a resistance of 2100 micro-ohms or less tested from corner to corner (i.e. A1 to C1 and from B1 to D1).
- 400/600 amp switches/bus shall have a resistance of 1600 micro-ohms or less tested from corner to corner (i.e. A1 to C1 and from B1 to D1).
- 1-phase cubicles shall be tested from the centre of the bus (through the rear door) to all points and shall have a resistance of 400 micro-ohms or less.

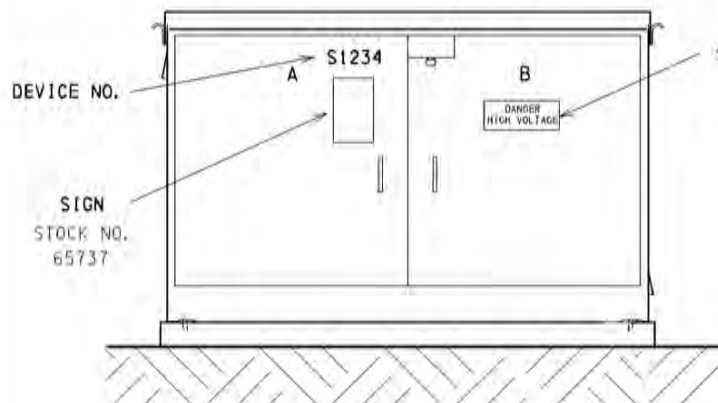


4.11 Upon Completion of Testing

- 4.11.1 Immediately after testing, 400/600 amp window op reducing tap plugs must be torqued to 55 ft-lbs to secure the 400/600 amp elbows and all connections made ready for energization. An EDTI Underground Tradesperson will install parking stands where terminations are to be disconnected or install ground elbows on 400/600 amp terminations (i.e. primary cables are capped outside of the cubicle waiting for future development and cannot be energized).
- 4.11.2 Immediately after testing, all 200 amp elbows must be solidly seated on the appropriate bushing.
- 4.11.3 Cable test reports, cubicle test reports, transformer test reports (if required), and ground grid resistance reports are to be submitted to EDTI Land Servicing after being witnessed and signed off by the EDTI Underground Tradesperson.

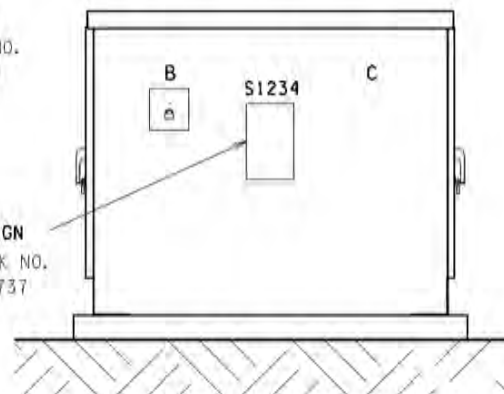
Immediately after testing, heat shrink cable caps are to be installed on the ends of all primary cable (see EDTI Distribution Standard drawing for heat shrink caps).

600 AMP SWITCHING CUBICLE (LIVE OR DEAD FRONT)

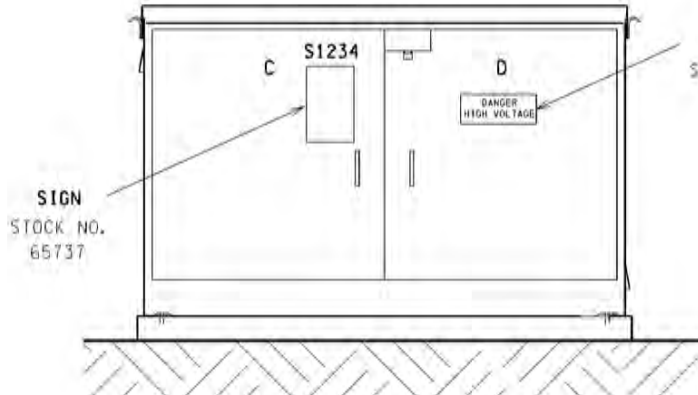


FRONT VIEW

SIGN
STOCK NO.
13824

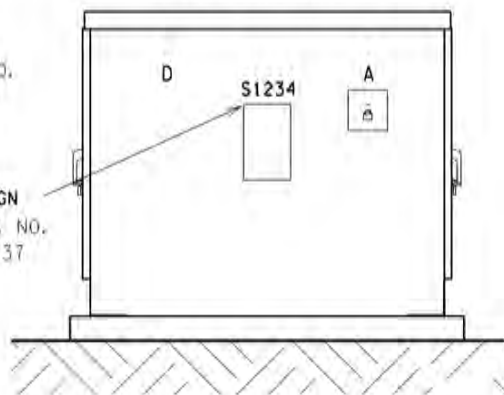


RIGHT SIDE VIEW



REAR VIEW

SIGN
STOCK NO.
13824



LEFT SIDE VIEW

NOTE:

DEPARTMENT NUMBERS TO BE PLACED AS HIGH AS POSSIBLE INSIDE THE FRONT RIGHT DOOR AND INSIDE THE BACK RIGHT DOOR OF THE CUBICLE.

REPAINTING CHECKLIST

☐ DEVICE NUMBERS

IMPORTANT - THE DEVICE NUMBER SEQUENCE MUST BE MAINTAINED

WRITE THE NUMBER ON THE CONCRETE BASE OR CURB FACING THE STREET PRIOR TO GRINDING.

WRITE THE NUMBER ON THE WORKSHEET.

WHEN REAPPLYING THE NUMBER TO THE CUBICLE, PLACE NUMBER FACING THE STREET FOR EASY CUBICLE IDENTIFICATION.

☐ LOCKS/PENTAHEADS

COVER WITH PLASTIC PRIOR TO PRIMING/PAINTING. WHEN PAINT IS DRY REMOVE PLASTIC.

☐ SIGNS

UPDATE IF NECESSARY, LEAVING ADEQUATE ROOM FOR DEVICE NUMBERS.

☐ PAINT

MATCH COLOR OF EXISTING UNIT.



UNDERGROUND
DISTRIBUTION
STANDARDS

APPROVED BY STANDARDS
COMMITTEE: 07-05-31

DRAFTED BY:

DESIGNED BY:
T. SHMYR

APPROVED BY:
T. SHMYR

APPROVED BY:
D. ARNOLD

SIGNAGE & REPAINTING REQUIREMENTS

SCALE: N. T. S.

DATE REVISED: 07-04-18

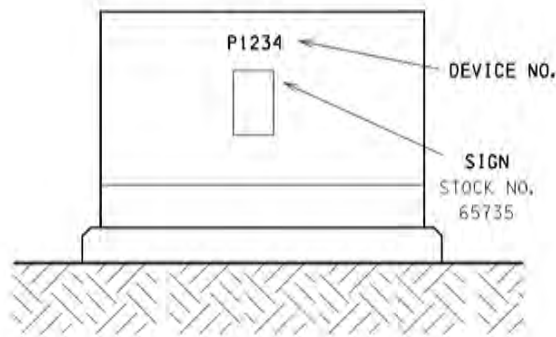
STANDARD NO.

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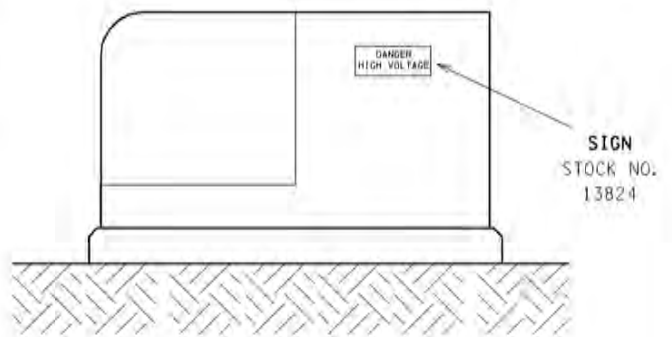
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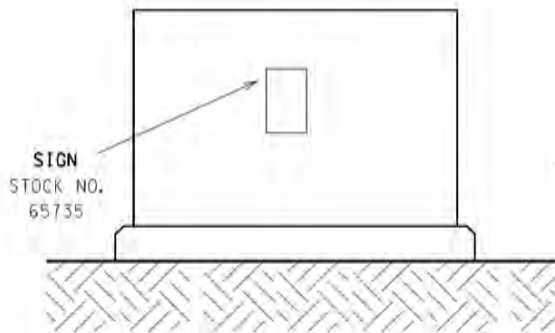
SINGLE PHASE TRANSFORMER



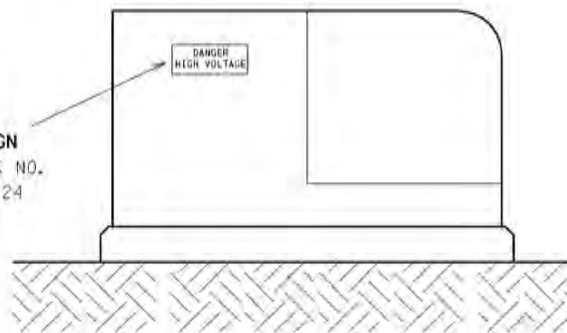
FRONT VIEW



RIGHT SIDE VIEW



REAR VIEW



LEFT SIDE VIEW

NOTE:

DEPARTMENT NUMBERS TO BE PLACED INSIDE THE LID AT THE BOTTOM.

REPAINTING CHECKLIST

☐ DEVICE NUMBERS

IMPORTANT - THE DEVICE NUMBER SEQUENCE MUST BE MAINTAINED

WRITE THE NUMBER ON THE CONCRETE BASE OR CURB FACING THE STREET PRIOR TO GRINDING.

WRITE THE NUMBER ON THE WORKSHEET.

WHEN REAPPLYING THE NUMBER TO THE TRANSFORMER, PLACE NUMBER FACING THE STREET FOR EASY TRANSFORMER IDENTIFICATION.

☐ LOCKS/PENTAHEADS

COVER WITH PLASTIC PRIOR TO PRIMING/PAINTING. WHEN PAINT IS DRY REMOVE PLASTIC.

☐ SIGNS

UPDATE IF NECESSARY, LEAVING ADEQUATE ROOM FOR DEVICE NUMBERS.

☐ PAINT

MATCH COLOR OF EXISTING UNIT.



UNDERGROUND
DISTRIBUTION
STANDARDS

APPROVED BY STANDARDS
COMMITTEE: 07-05-31

DRAFTED BY:

DESIGNED BY:
T. SHMYR

APPROVED BY:
T. SHMYR

APPROVED BY:
D. ARNOLD

SIGNAGE & REPAINTING REQUIREMENTS

SCALE: N. T. S.

DATE REVISED: 07-04-18

STANDARD NO.

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PAGE NO.

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XLPE PRIMARY CABLE - 15 KV

STOCK #	SIZE	CONDUCTOR ALLOY	NEUTRAL TYPE	STRAND CONFIG.	NEUTRAL RATING (%)	TYPICAL REEL LENGTH	SPECIFICATION #	SINGLE CABLE WEIGHT (LBS/FT)	NOMINAL OUTER JACKET DIA. (IN./MM)	DESCRIPTION/APPLICATION
050323	#2	AL	JCN	COMPRESSED	100	1000m	6600051545002	0.618	1.07/25.7	USED FOR TRANSFORMER CONNECTION, METERING AND TRANSPORTATION SERVICES
046339	1/0	AL	JCN	COMPRESSED	100	1000m	6600051545002	0.654	1.14/27.4	STANDARD URD CABLE
045207	350MCM	AL	JCN	COMPRESSED	33	565m	6600051545002	1.144	1.47/36.5	STANDARD URD CABLE
032501	500MCM	Cu	JCN	COMPACT	33		6300051556002	2.629	1.66/42.2	PILC FEEDER CABLE REPLACEMENT (TRIPLEXED)
010194	750MCM	Cu	JCN	COMPACT	33	280m	6300051556002	3.325	1.87/47.5	FEEDER CABLE FOR WESTEND S/S ONLY (TRIPLEXED)
007449	750MCM	Cu	JCN	COMPACT	11	320m	6300051556002	3.283	1.65/41.8	PILC CABLE REPLACEMENT - (LC SHIELD, TRIPLEXED)
085692	1250MCM	AL	JCN	COMPRESSED						EMERGENCY STOCK - EL SMITH WTP "UNEL SHAF" CABLE

XLPE PRIMARY CABLE - 25 KV

STOCK #	SIZE	CONDUCTOR ALLOY	NEUTRAL TYPE	STRAND CONFIG.	NEUTRAL RATING (%)	TYPICAL REEL LENGTH	SPECIFICATION #	SINGLE CABLE WEIGHT (LBS./FT)	NOMINAL CABLE OUTER JACKET DIA. (In./mm)	DESCRIPTION/APPLICATION
069921	#1	AL	JCN	COMPRESSED	100	1000m	6600052545001	0.725	1.27/32.0	NOT USED FOR NEW INSTALLATIONS
004934	1/0	AL	JCN	COMPRESSED	100	1000m	6600052545001	0.782	1.31/31.5	STANDARD URD CABLE - RED JACKET
004936	350MCM	AL	JCN	COMPRESSED	33		6600052545001			NOT USED FOR NEW INSTALLATIONS
069903	500MCM	AL	JCN	COMPACT	33	470m	6600052545001	1.592	1.73/44.0	STANDARD URD CABLE (TRI-PLEXED)

XLPE PRIMARY CABLE - 28 KV

STOCK #	SIZE	CONDUCTOR ALLOY	NEUTRAL TYPE	STRAND CONFIG.	NEUTRAL RATING (%)	TYPICAL REEL LENGTH	SINGLE CABLE WEIGHT (lb/ft)	NOMINAL CABLE OUTER DIAMETER (in./mm)	DESCRIPTION/APPLICATION
C10190	153MCM	Cu	JCN	COMPACT	33	230m	6300052582001	2.19/55.6	CABLE IN USE AT WESTFNG S/S

A	REVIEWED BY STANDARDS COMMIT.	RT	031016	DA
No.	DETAILS	BY	DATE	APPRO
REVISIONS				

UNDERGROUND DISTRIBUTION CONSTRUCTION STANDARDS



UNDERGROUND PRIMARY CABLE - XLPE

Drawn By RINGO ISANG	Checked By GARY EGGEN	Approved By
Scale M. T. S.	Standard No.	Page No.
Date 04-02-04	63 00 C/ 00 82 001	1/1

PRIMARY & SECONDARY CABLES USED IN UNDERGROUND CONSTRUCTION

600 VOLT - SECONDARY CABLE

STOCK #	SIZE	CONDUCTOR ALLOW	NEUTRAL TYPE	STRAND CONF'G.	NEUTRAL RATING (%)	TYPICAL REEL LENGTH	SPECIFICATION #	SINGLE CABLE WEIGHT (lb/ft)	NOMINAL OUTER JACKET DIMENSION (mm)	DESCRIPTION/APPLICATION
036216	#4	AL	JCN	COMPRESSED	70	900m	6600C50822005	0.277	14.3 X 22.2 (mm)	LSEB90 - STANDARD STRENGTH-FITTING CABLE
022532	#2	AL	JCN	COMPRESSED	70	900m	6600C50822005	0.427	16.3 X 25.6 (mm)	LSEB90 - STANDARD RESIDENTIAL SERVICE CABLE
051879	2/0	AL	JCN	COMPRESSED	70	700m	6600C50822005	0.655	19.6 X 32.2 (mm)	LSEB90 - RESIDENTIAL SERVICE CABLE
086898	1/0	AL	JCN	COMPRESSED	70	750m	6600C50822005	0.520	18.5 X 30.0 (mm)	LSEB90 - RESIDENTIAL SERVICE CABLE
041293	4/0	AL	JCN	COMPRESSED	100	500m	6600C50822005	1.083	23.6 X 38.8 (mm)	LSEB90 - RESIDENTIAL SERVICE CABLE
086902	4/0	AL	JCN	COMPRESSED	70	500m	6600C50822005	0.991	22.8 X 37.8 (mm)	LSEB90 - RESIDENTIAL SERVICE CABLE

CABLE STOCKED BUT NO LONGER PURCHASED

STOCK #	SIZE	CONDUCTOR ALLOW	NEUTRAL TYPE	STRAND CONF'G.	NEUTRAL RATING (%)	TYPICAL REEL LENGTH	SPECIFICATION #	SINGLE CABLE WEIGHT (lb/ft)	NOMINAL OUTER JACKET DIMENSION (mm)	DESCRIPTION/APPLICATION
029709	#14					312m				3 CONDUCTOR - SJTW

UNDERGROUND DISTRIBUTION CONSTRUCTION STANDARDS

UNDERGROUND SECONDARY CABLE - XLPE



Drawn By RING TSANG	Checked By GARY EGGEN	Approved By
Scale N.T.S.	Standard No. 63 00 07 00 82 002	Page No. 1/1
Date 04-02-04		

No. DETAILS BY DATE APPD

REVISIONS

A REVIEWED BY STANDARDS COMMIT. RT 03:016 DA

TRXLPE PRIMARY CABLE- 15kV

CABLE SIZE	CONDUCTOR TYPE	NEUTRAL	TRIPLEXED	NO. OF CABLES	NOMINAL OUTER JACKET DIA. mm in	ROAD CROSSING		LATERALS			
						MIN. DUCT SIZE mm in		MIN. EXISTING DUCT SIZE mm in		NEW INSTALLATION DUCT SIZE mm in	
2	AL	JCN	NO	1-1/C	25.7 1.07	100	4	50	2	100	4
				3-1/C		100	4	100	4	100	4
1/0	AL	JCN	NO	1-1/C	27.4 1.14	100	4	50	2	100	4
				2-1/C		100	4	100	4	100	4
				3-1/C		100	4	100	4	100	4
350	AL	JCN	NO	3-1/C	36.5 1.4	125	5	100	4	125	5
				3-1/C		125	5	100	4	125	5
500	Cu	JCN	YES	3-1/C	42.2 1.66	125	5	100	4	150	6
750	Cu	JCN	YES	3-1/C	47.5 1.87	125	5	125	5	150	6
		LC	YES	3-1/C	41.8 1.65	125	5	100	4	150	6

TRXLPE PRIMARY CABLE- 25kV

CABLE SIZE	CONDUCTOR TYPE	NEUTRAL	TRIPLEXED	NO. OF CABLES	NOMINAL OUTER JACKET DIA. mm in	ROAD CROSSING		LATERALS			
						MIN. DUCT SIZE mm in		MIN. EXISTING DUCT SIZE mm in		NEW INSTALLATION DUCT SIZE mm in	
1/0	AL	JCN	NO	1-1/C	31.5 1.31	100	4	100	4	100	4
				2-1/C		100	4	100	4	100	4
				3-1/C		125	5	125	5	125	5
500	AL	JCN	NO	3-1/C	44.0 1.73	150	6	125	5	150	6
750	Cu	JCN	NO	3-1/C		150	6	150	6	150	6

TRXLPE PRIMARY CABLE- 28kV

CABLE SIZE	CONDUCTOR TYPE	NEUTRAL	TRIPLEXED	NO. OF CABLES	NOMINAL OUTER JACKET DIA. mm in	ROAD CROSSING		LATERALS			
						MIN. DUCT SIZE mm in		MIN. EXISTING DUCT SIZE mm in		NEW INSTALLATION DUCT SIZE mm in	
750	Cu	JCN	NO	3-1/C	55.6 2.19	150	6	150	6	150	6

NOTE:

- APPROVED ROAD CROSSING DUCT FOR HORIZONTAL DIRECTIONAL DRILLING
 - IPEX [COMPANY] - TERRACON [PRODUCT]
 - CARLON [COMPANY] - BORE-GARD [PRODUCT]
- APPROVED LATERAL DUCT ON DISTRIBUTION POLE
 - IPEX [COMPANY] - SUPER DUCT (TYPE DB2) [PRODUCT]
 - SECTION OF RISER PIPE ABOVE ADAPTER/COUPLING
 - ADAPTER/COUPLING
 - FRE COMPOSITES [COMPANY] - RISERWAY [PRODUCT]
 - 3m (10FT) SECTION OF RISER PIPE BELOW ADAPTER/COUPLING
 - THE RISER BEND

3. RISER BEND DIAMETER TO BE THE SAME AS THE ROAD CROSSING DUCT DIAMETER FOR NEW INSTALLATIONS.
ALL DIMENSIONS ARE IN MILLIMETERS (INCHES) UNLESS OTHERWISE INDICATED



APPROVED BY STANDARDS COMMITTEE: 07-01-25

DRAFTED BY: P. L. MANN

DESIGNED BY: KEVIN SORENSON

APPROVED BY: T. SHMYR

APPROVED BY: C. M. RECTO

DUCT SIZE FOR PRIMARY ROAD CROSSINGS & LATERALS

SCALE: N. T. S.

DATE REVISED: 10-12-22

STANDARD NO.

63 00 07 00 37 001

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XLPE SECONDARY CABLE- FOR URD PURPOSES

CABLE SIZE	CONDUCTOR TYPE	NEUTRAL	NO. OF CABLES	OVERALL DIMENSIONS		ROAD CROSSING & LATERALS	
				mm	in	MIN. DUCT SIZE	
4	AL	JCN	1-2/C	14.9 × 22.8	0.59 × 0.90	100	4
			2-2/C			100	4
			3-2/C			100	4
			4-2/C			100	4
2	AL	JCN	1-2/C	16.3 × 25.6	0.64 × 1.01	100	4
			2-2/C			100	4
			3-2/C			100	4
			4-2/C			100	4
1/0	AL	JCN	1-2/C	18.5 × 30.0	0.73 × 1.18	100	4
			2-2/C			100	4
			3-2/C			100	4
			4-2/C			125	5
2/0	AL	JCN	1-2/C	19.6 × 32.2	0.77 × 1.27	100	4
			2-2/C			100	4
			3-2/C			100	4
			4-2/C			125	5
4/0	AL	JCN	1-2/C	22.8 × 37.8	0.90 × 1.49	100	4
			2-2/C			100	4
			3-2/C			125	5
			1-7/C	62	2.44	100	4
	CU NETWORK CABLE		4-1/C	36.5	1.43	100	4

NOTE:

- APPROVED ROAD CROSSING DUCT FOR HORIZONTAL DIRECTIONAL DRILLING
 - IPEX [COMPANY] - TERRACON [PRODUCT]
 - CARLON [COMPANY] - BORE-GARD [PRODUCT]
- APPROVED LATERAL DUCT ON DISTRIBUTION POLE
 - IPEX [COMPANY] - SUPER DUCT (TYPE DB2) [PRODUCT]
 - SECTION OF RISER PIPE ABOVE ADAPTER/COUPLING
 - ADAPTER/COUPLING
 - FRE COMPOSITES [COMPANY] - RISERWAY [PRODUCT]
 - 3m (10FT) SECTION OF RISER PIPE BELOW ADAPTER/COUPLING
 - THE RISER BEND
- RISER BEND DIAMETER TO BE THE SAME AS THE ROAD CROSSING DUCT DIAMETER FOR NEW INSTALLATIONS.

ALL DIMENSIONS ARE IN MILLIMETERS (INCHES) UNLESS OTHERWISE INDICATED



APPROVED BY STANDARDS COMMITTEE: 06-11-30

DRAFTED BY: P. I. MANN

DESIGNED BY: KEVIN SORENSON

APPROVED BY: T. SHMYR

APPROVED BY: D. ARNOLD

DUCT SIZE FOR SECONDARY ROAD CROSSINGS & LATERALS

SCALE: N.T.S.

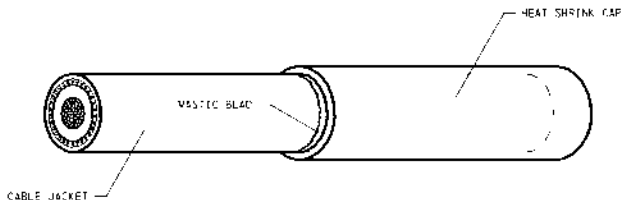
STANDARD NO.

DATE REVISED: 10-12-01

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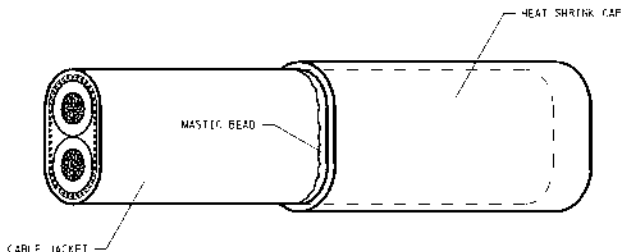
PAGE NO.

1 / 1



SINGLE CONDUCTOR CABLE

NOTE: MASTIC HEAD IS AN INTERNAL PART OF THE CAP




USER90 SECONDARY CABLE

INSTALLATION PROCEDURE

1. CLEAN END OF CABLE AND SLIDE APPLICABLE END CAP INTO PLACE
2. BEGIN HEATING CAP FROM THE CLOSED END TO ASSURE UNIFORM SHRINKAGE.
3. DISCONTINUE HEATING WHEN CAP HAS SHRUNK ENOUGH THAT IT ASSUMES CABLE SHAPE AND SEALANT FLOWS OUT.

REFER TO NOTES AND CHARTS
PAGE 2 FOR MANUFACTURERS,
TYPES, SIZES, REQUIRED ETC.

				UNDERGROUND DISTRIBUTION CONSTRUCTION STANDARDS			
					SEALING OF X, L, P, E, CONCENTRIC NEUTRAL AND USEB90 (SECONDARY) CABLE ENDS		
					Origin By K. M. C.	Checked By D. APHOLD	Approved By L. GARDNER
					Scale: N. F. S.	Standard No. 66 30 07 00 48 1/5	Page No. 1/2
					Date: 08-10-19		
NO. _____ DETAILS _____ REVISIONS _____				BY _____ DATE _____ APPD _____			

RAYCHEM HEAT SHRINK CABLE END CAPS CATALOGUE NUMBERS

CONCENTRIC NEUTRAL PRIMARY CABLE

CABLE SIZE	600V	15kV	25kV
#2	-	ESC-3/4	-
#1	-	ESC-3/4	ESC-4/4
1/0	-	ESC-3/4	ESC-4/4
350MCM	-	ESC-4/4	-
500MCM	-	-	ESC-5/4
750MCM	-	ESC-5/4	ESC-5/4

USEB 90 SECONDARY CABLE

CABLE SIZE	600V	15kV	25kV
#4	ESC-3/4	-	-
#2	ESC-3/4	-	-
1/0	ESC-4/4	-	-
2/0	ESC-4/4	-	-
4/0	ESC-4/4	-	-
350 MCM	ESC-5/4	-	-

NOTE :

THE USE OF ELECTRICAL TAPE IS NOT
ACCEPTABLE FOR SEALING CABLES

3V HEAT SHRINK CABLE END CAPS CATALOGUE NUMBERS

CONCENTRIC NEUTRAL PRIMARY CABLE

CABLE SIZE	600V	STOCK #	15kV	STOCK #	25kV	STOCK #
#2	-	-	SKE-15/40	8929	-	-
#1	-	-	SKE-15/40	8929	SKE-25/63	9135
1/0	-	-	SKE-15/40	8929	SKE-25/63	9135
350MCM	-	-	SKE-25/63	9135	-	-
500MCM	-	-	-	-	SKE-30/76	85296
750MCM	-	-	SKE-30/76	85296	SKE-30/76	85296

USEB 90 SECONDARY CABLE

CABLE SIZE	600V	STOCK #	15kV	STOCK #	25kV	STOCK #
#4	SKE-15/40	8929	-	-	-	-
#2	SKE-15/40	8929	-	-	-	-
1/0	SKE-25/63	9135	-	-	-	-
2/0	SKE-25/63	9135	-	-	-	-
4/0	SKE-25/63	9135	-	-	-	-
350 MCM	ESC-5/4	85296	-	-	-	-

UNDERGROUND DISTRIBUTION CONSTRUCTION STANDARDS



SEALING OF
X.L.P.E. CONCENTRIC NEUTRAL
AND USEB90 (SECONDARY)
CABLE ENDS

Drawn By K. W. C.	Checked By D. ARNOLD	Approved By J. BARBER
Scale: N.T.S.	Standard No.	Page No.
Date: 89-10-19	66 30 07 80 48 1/5	2/2

REVIEWED BY STANDARDS COMMITTEE RT 02-02-21 DA

NO. DETAILS BY DATE APPD

REVISIONS

MAKE A SQUARE CUT ON
CABLE JACKET AT THE
REQUIRED LOCATION FOR
THE CABLE SPLICE OR
TERMINATION

APPLY A MINIMUM OF 1
HALF LAPPED LAYERS OF
SCOTCHFIL PUTTY FROM
END OF JACKET TO 50mm
DOWN CABLE JACKET

1
SCOTCHFIL PUTTY

BEND BACK CONCENTRIC
NEUTRAL STRANDS OVER
SCOTCHFIL PUTTY & TIE
DOWN 10mm BELOW EDGE
OF PUTTY

COPPER WIRE SHOULD BE USED FOR THE TIE DOWN OR ALTERNATIVELY A STAINLESS STEEL HOSE CLAMP SIZED TO SUIT THE CABLE

STARTING 25mm ABOVE
NEUTRAL STRANDS WRAP
CABLE WITH SCOTCHFIL
PUTTY MOVING DOWN UNTIL
THE UNDERNEATH LAYER
OF PUTTY IS COVERED

FORCE PUTTY BETWEEN
STRANDS UNTIL IT FORMS
A HOMOGENEOUS MASS WITH
THE LOWER LAYER OF PUTTY

A MINIMUM OF 1 HALF
LAPPED LAYERS OF PUTTY
SHOULD BE APPLIED TO
ENSURE THE COMPLETE
ENCAPSULATION & SEALING
OF THE NEUTRAL WIRES

STARTING 25mm ABOVE THE
TOP OF SCOTCHFIL APPLY
SHRINK SLEEVE DOWN TO THE
LOWER NEUTRAL WIRE TIE

- TIE WIRES

- NEUTRAL WIRES

- CABLE JACKET

SECTION VIEW OF COMPLETED WATER STOP

-	REVIEWED BY OPERATIONS	--	26-11-91	BR
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A	REVISED	RT	99-11-12	DA
No.	DETAILS	BY	DATE	APPD
REVISIONS				

UNDERGROUND DISTRIBUTION CONSTRUCTION STANDARDS



XLPE CABLE NEUTRAL WIRE WATER STOP FOR TERMINATIONS

Drawn By
K W C

Checked By
D. ARNO

Approved By
L. BARKER

Scale N.T.S.

Standard No.	Standard Description	Standard Reference
1	Standard 1: The student will be able to identify the components of a system.	1.1
2	Standard 2: The student will be able to describe the function of a system.	2.1
3	Standard 3: The student will be able to analyze the performance of a system.	3.1
4	Standard 4: The student will be able to design a system.	4.1
5	Standard 5: The student will be able to implement a system.	5.1
6	Standard 6: The student will be able to evaluate a system.	6.1
7	Standard 7: The student will be able to maintain a system.	7.1
8	Standard 8: The student will be able to troubleshoot a system.	8.1
9	Standard 9: The student will be able to upgrade a system.	9.1
10	Standard 10: The student will be able to replace a system.	10.1

Page No.

Date 91-08-12

66 00 07 00 84 015

1/2

RAYCHEM HEAT SHRINK CABLE END CAPS CATALOGUE NUMBERS

CONCENTRIC NEUTRAL PRIMARY CABLE

CABLE SIZE	600V	15kV	25kV
#2	-	ESC-3/4	-
#1	-	ESC-3/4	ESC-4/4
1/0	-	ESC-3/4	ESC-4/4
350MCM	-	ESC-4/4	-
500MCM	-	-	ESC-5/4
750MCM	-	ESC-5/4	ESC-5/4

USEB 90 SECONDARY CABLE

CABLE SIZE	600V	15kV	25kV
#4	ESC-3/4	-	-
#2	ESC-3/4	-	-
1/0	ESC-4/4	-	-
2/0	ESC-4/4	-	-
4/0	ESC-4/4	-	-
350 MCM	ESC-5/4	-	-

NOTE :

THE USE OF ELECTRICAL TAPE IS NOT
ACCEPTABLE FOR SEALING CABLES

3V HEAT SHRINK CABLE END CAPS CATALOGUE NUMBERS

CONCENTRIC NEUTRAL PRIMARY CABLE

CABLE SIZE	600V	STOCK #	15kV	STOCK #	25kV	STOCK #
#2	-	-	SKE-15/40	8929	-	-
#1	-	-	SKE-15/40	8929	SKE-25/63	9135
1/0	-	-	SKE-15/40	8929	SKE-25/63	9135
350MCM	-	-	SKE-25/63	9135	-	-
500MCM	-	-	-	-	SKE-30/76	85296
750MCM	-	-	SKE-30/76	85296	SKE-30/76	85296

USEB 90 SECONDARY CABLE

CABLE SIZE	600V	STOCK #	15kV	STOCK #	25kV	STOCK #
#4	SKE-15/40	8929	-	-	-	-
#2	SKE-15/40	8929	-	-	-	-
1/0	SKE-25/63	9135	-	-	-	-
2/0	SKE-25/63	9135	-	-	-	-
4/0	SKE-25/63	9135	-	-	-	-
350 MCM	ESC-5/4	85296	-	-	-	-

UNDERGROUND DISTRIBUTION CONSTRUCTION STANDARDS



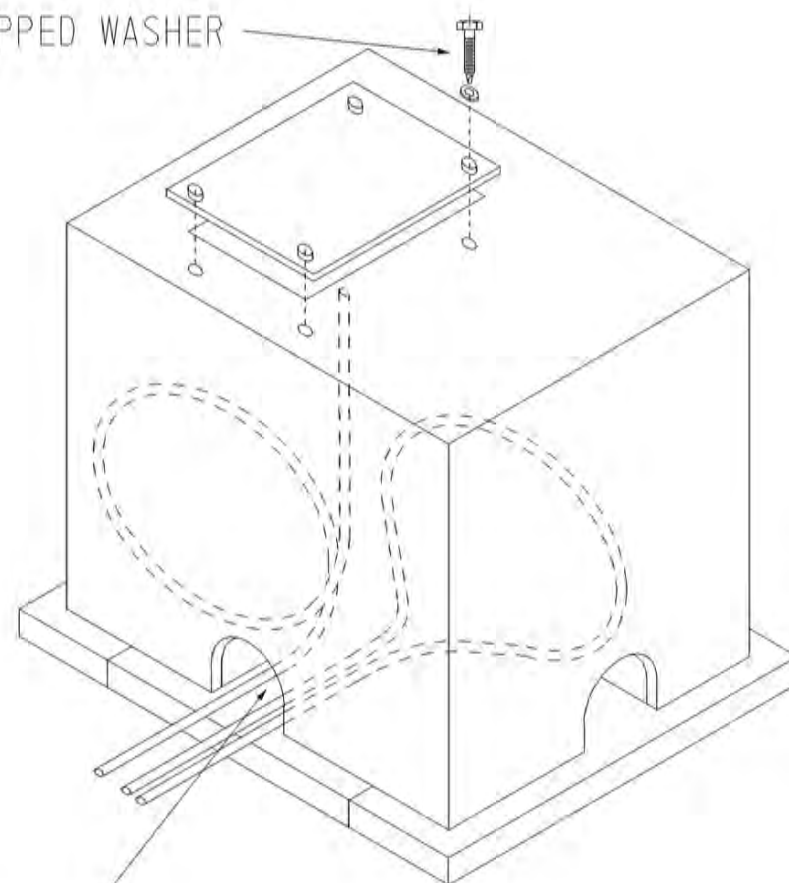
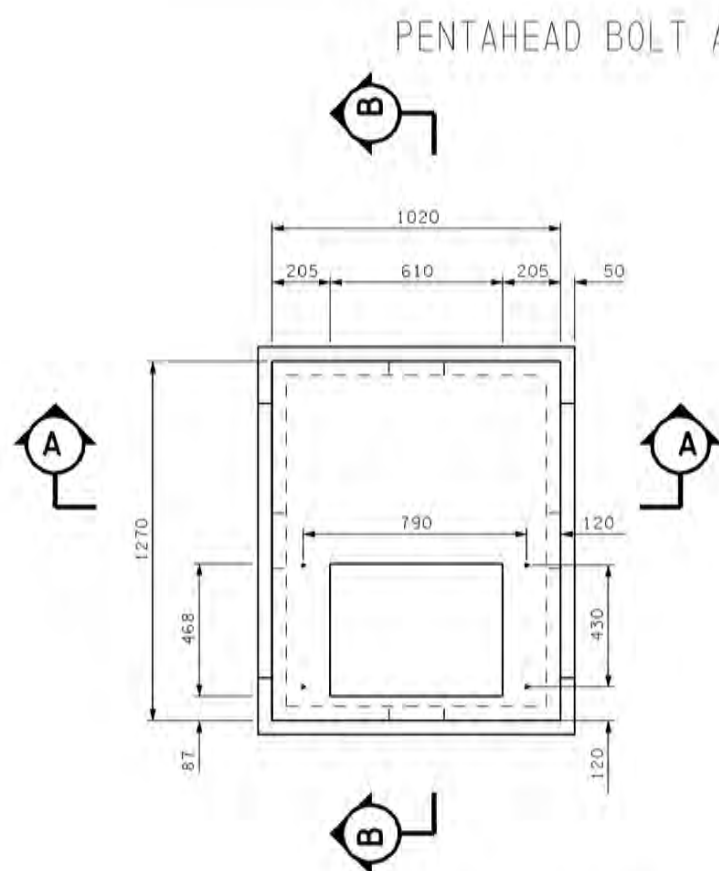
SEALING OF
X.L.P.E. CONCENTRIC NEUTRAL
AND USEB90 (SECONDARY)
CABLE ENDS

Drawn By K. W. C.	Checked By D. ARNOLD	Approved By J. BARBER
Scale: N.T.S.	Standard No.	Page No.
Date: 89-10-19	66 30 07 80 48 1/5	2/2

REVIEWED BY STANDARDS COMMITTEE RT 02-02-21 DA

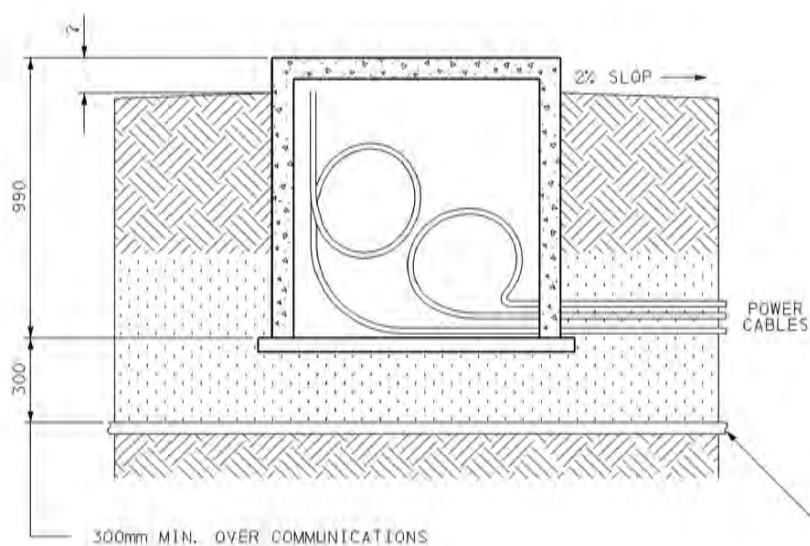
NO. DETAILS BY DATE APPD

REVISIONS

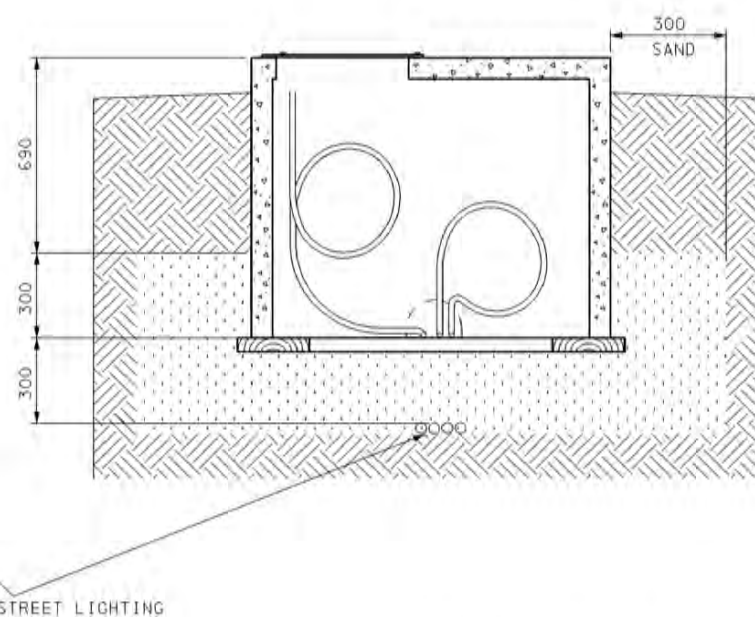


CABLES TO BE INSTALLED
THROUGH THE "MOUSE HOLE"
ABOVE THE TREATED WOOD.

ISOMETRIC VIEW



SECTION A-A



SECTION B-B

UNDERGROUND DISTRIBUTION ENGINEERING DRAWING




INSTALLATION OF PRECAST CONCRETE BASE OVER SPLICE PITS

Drawn By ML	Checked By BA0	Approved By
Scale N. T. S.	Standard No.	Page No. /
Date 06-02-01		

No.	DETAILS	BY	DATE	APPD
A	PROPOSED STANDARD	MEL	07/06/06	
REVISIONS				

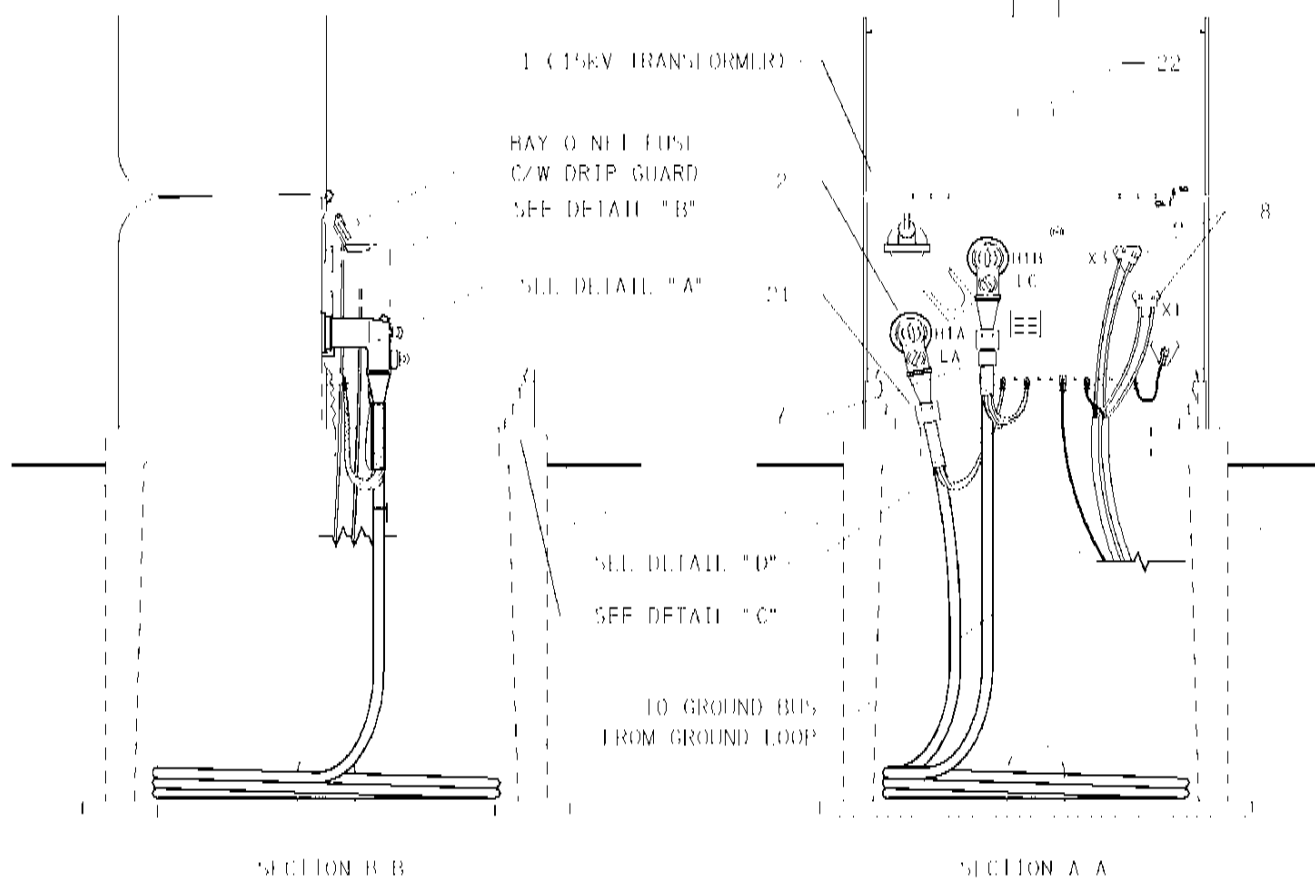
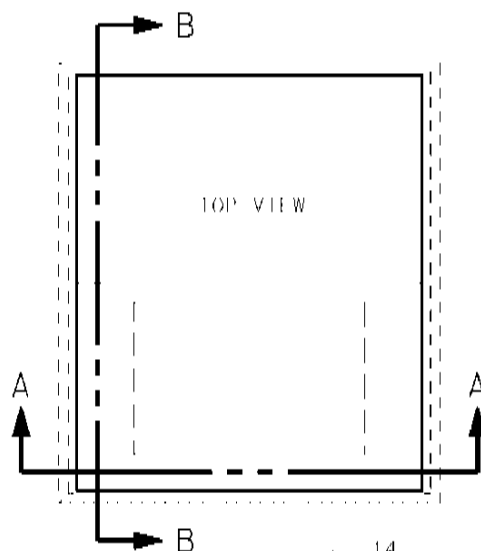
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ITEM	DESCRIPTION	PART/STOCK #	QTY.
1	BASE, PRECAST WIND PAD TRANSFORMER	062891	1
2	RODS, GROUND 5/8IN. x 10FT. COPPER CLAD	073937	4
3	PIPE DUCT DB2 4 INCH X 20 FT	053283	2
4	WIRE, 4/0 BARE 19W (SEE NOTE PAGE 1)	045655	A/R
5	LUMBER SPRUCE WINDPAD PWF (OPTIONAL) (50mm x 250mm x 1500mm / 2 IN X 10 IN X 5 FT)	042392	4
6	CONNECTOR - GROUND - 3/4 IN ROD - 250 CAB SINGLE WIRE CONNECTOR DOUBLE WIRE CONNECTOR	031914 009136	2 2
7	TELEPHONE TROUGH - PRESSURE TREATED WOOD INCLUDES: 2 X (50mm x 200mm x 3620mm / 2 IN X 8 IN X 12 FT) 1 X (50mm x 250mm x 3620mm / 2 IN X 10 IN X 12 FT)	045846	1
8	SAND (UNIT = CU. M)	014462	A/R
9	20mm CRUSHED GRAVEL	015523	A/R
10	BEND RIGID PVC 90° (4 IN X 24 IN RADIUS)	044327	4


					UNDERGROUND DISTRIBUTION CONSTRUCTION STANDARDS				
G	REVISED MAT'L & STOCK No.	RT	05-04-23	GE	<div>  <div> <div>INSTALLATION OF PRECAST CONCRETE BASE FOR SINGLE PHASE TRANSFORMERS</div> <div> <div>Drawn By K. W. C.</div> <div>Checked By C. CLARKE</div> <div>Approved By L. BARKER</div> </div> </div> </div>				
F	REVIEWED BY STANDARDS COMMITTEE	RT	02-02-27	DA					
E	1993 UPDATE AS PER C. CLARKE	KC	93-02-11	JS					
D	1991 UPDATE AS PER C. CLARKE	KC	91-01-24	JS					
C	ADDED NOTE FOR TROUGH CONST.	KC	89-08-31	CC					
B	REMOVED ONE GROUND WIRE	KC	87-01-07	CC					
A	ADDED NOTES	KC	86-12-16	CC					
No.	DETAILS	BY	DATE	APP'D	Scale N.T.S.	Standard No.	Page No.		
REVISIONS					Date 86-06-06	66 00 07 15 27 001	2/2		

NO 11 2

ALL CABLES ARE TO HAVE A MINIMUM OF 4 METERS OF EXTRA LENGTH COILED IN BASE.
THE SERVICE CABLE CONCENTRIC NEUTRAL WIRES FROM THREE SERVICE CABLES (2 FOR 4/0 SERVICE CABLES) ARE TO BE WOUND TOGETHER AND TERMINATED TO ONE COMPRESSION GROUND LUG.
REFER TO TABLE 1 (PAGE 4) FOR DETAILS.



FOR INSTALLATION PURPOSES ONLY REFER TO SPECIFICATION DRAWINGS FOR ALL OTHER APPLICATIONS

					UNDERGROUND DISTRIBUTION CONSTRUCTION STANDARDS					
						INSTALLATION OF SINGLE PHASE 15KV 'MSB' TYPE TRANSFORMER ON EXISTING PAD (SERVICES DIRECTLY FROM TRANSFORMER)				
2.	PAGE 5 REVISED	RI	02/04/04	DA		Drawn By N. SLOAN ARCHER	Checked By C. CLARKE	Approved By C. CLARKE		
1.	REVIEWED BY STANDARDS COMM.	RI	00/07/19	DA		Scale - N. E. S.	Standard of No.		Page No.	
No.	DETAILS	BY	DATE	APP'D		Date - 99-12-30	(5) 00 07 15 24 005		1/6	
DIVISIONS										

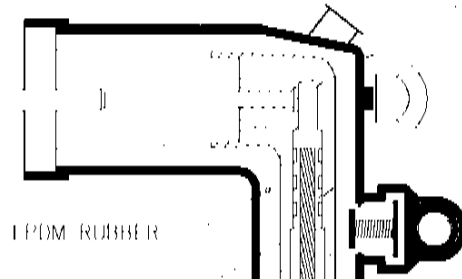
MOULDED CONDUCTIVE SHIELD

BELLVILLE WASHER

PULLING EYE

WIRE CONNECTOR

SNAP CAP / PROTECTED TEST POINT



EPDM RUBBER

SEMI CONDUCTIVE RUBBER

CONCENTRIC NEUTRAL STRAND
CONNECTION TO GROUND EYE

XPE INSULATION

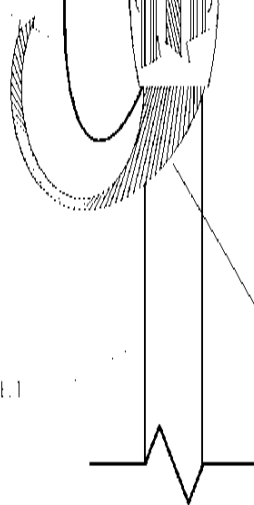
ALUMINUM CONDUCTOR

PHASE ID TAG

SEMI CONDUCTOR INSULATION SHIELD

WATER STOP AS PER 66 00 07 00 84 015
OR MANUFACTURER'S WATER SEAL (COLD SHRINK)

FAULT INDICATOR (ON I.C. ONLY)



TIGHTLY WRAPPED CONCENTRIC NEUTRAL
FOR CONNECTION TO GROUND BUS

OUTSIDE JACKET

NOTE :

DRAWING IS FOR TAPING INSTRUCTIONS ONLY. INSTALLATION AS PER MANUFACTURER'S INSTRUCTIONS.

UNDERGROUND DISTRIBUTION CONSTRUCTION STANDARDS



INSTALLATION OF SINGLE PHASE
15kV 'MSB' TYPE TRANSFORMER
ON EXISTING PAD
(SERVICES DIRECTLY FROM TRANSFORMER)

Drawn By S. STOLARCHUK	Checked By C. CLARKE	Approved By C. CLARKE
Scale: N.T.S.	Standard No. 66 00 07 15 24 005	Page No. 2/6
Date: 99 12 30		

No.	DETAILS	BY	DATE	APP'D
2.	PAGE 5 REVISED	RI	02/04/04	DA
1.	REVIEWED BY STANDARDS COMM.	RI	00/07/19	DA
REVISIONS				

IMPORTANT NOTES

DIMENSIONS PROVIDED BY THE MANUFACTURER AND SUPPLIED WITH EACH ELBOW TERMINATOR ARE TO BE FOLLOWED IN REMOVING INSULATION, INSTALLING THE CONDUCTOR CONTACT, ETC.,


THE STEPS COVERING THE INSTALLATION INSTRUCTIONS FOR THE ELBOW AND RELATED PARTS, THAT ARE PROVIDED BY THE MANUFACTURER, ARE TO BE FOLLOWED IN THE SEQUENCE AS OUTLINED.

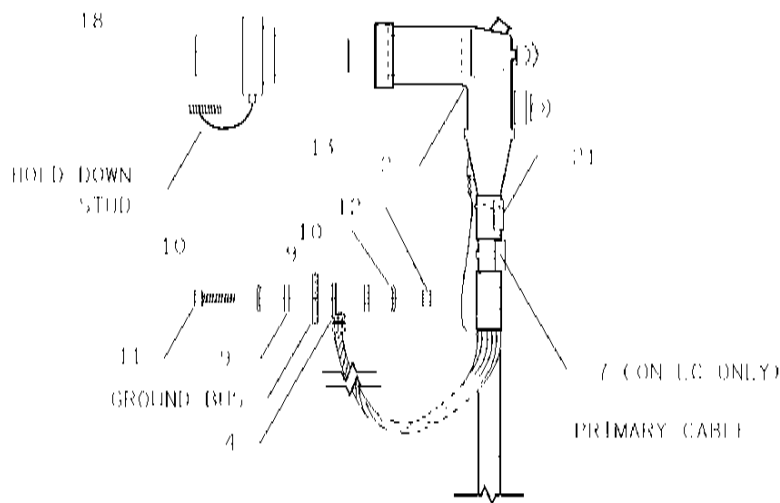
DURING INSTALLATION, THE MALE CONTACT PIN IS NOT TO BE HANDLED WITH THE BARE HANDS BUT SHALL BE HANDLED ONLY BY WORKMEN WEARING CLEAN COTTON GLOVES. THE PIN IS TO BE ABSOLUTELY FREE OF ANY LUBRICANT AND IS TO BE INSTALLED BY UTILIZING THE PROBE INSERTION TOOL. THE FINAL TORQUE IS TO BE BY FACTORY SUPPLIED WRENCH.

ONE STRAND OF A CONCENTRIC NEUTRAL WIRE IS TO BE UTILIZED TO GROUND THE GROUNDING EYE. THE REMAINING CONCENTRIC NEUTRAL WIRES ARE TO BE TIGHTLY TWISTED TOGETHER AND CONNECTED TO THE GROUND BUS OF THE TRANSFORMER.

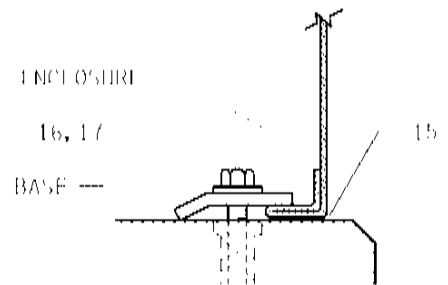
SILICON GREASE SHALL BE APPLIED AND THE ELBOW CONNECTOR PLACED ON THE BUSHING PRESSING THE ELBOW STRAIGHT ONTO THE BUSHING WITH SUFFICIENT FORCE TO ENSURE THAT THE TOP OF THE BUSHING IS FIRMLY LOCKED INTO PLACE IN THE BOTTOM OF THE ELBOW. A VISUAL CHECK SHOULD BE CARRIED OUT TO ENSURE THAT THE SKIRT OF THE ELBOW IS COMPLETELY OVER THE SEMI CONDUCTING PORTION OF THE BUSHING.

THE CONDUCTOR CONNECTORS AND THE ELBOW PINS MUST NOT BE INTERCHANGED AND FITTED INTO ELBOWS UNLESS THEY ARE FROM THE SAME MANUFACTURER.

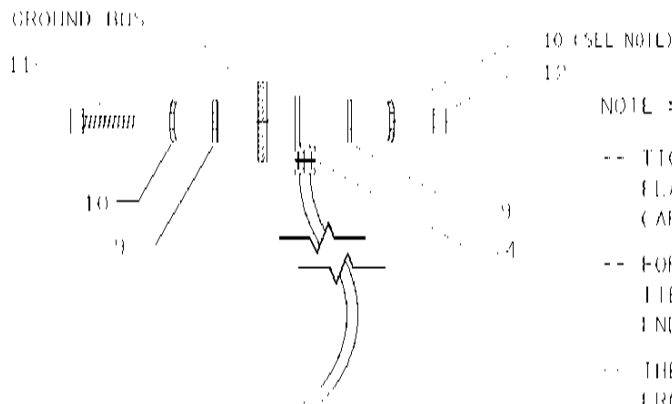
					UNDERGROUND DISTRIBUTION CONSTRUCTION STANDARDS						
						INSTALLATION OF SINGLE PHASE 15KV 'MSB' TYPE TRANSFORMER ON EXISTING PAD (SERVICES DIRECTLY FROM TRANSFORMER)					
2. PAGE 5 REVISED						RI	02/04/04	DA	Drawn By M. STOLARCHUK	Checked By C. CLARKE	Approved By C. CLARKE
1. REVIEWED BY STANDARDS COMM.						RI	00/07/19	DA	Scale: N.T.S.	Standard No.	
No. DETAILS						BY	DATE	APP'D	Date: 99-12-30	65-00-07-15-24-0015	
REVISIONS										Page No. 5/6	



DETAIL A (LOAD BREAK ELBOW)



DETAIL C (ANCHORING DETAIL)
TYPICAL 4 CORNERS



DETAIL "D"

NOTE :

- TIGHTEN NUT UNTIL WASHER BECOMES FLAT THEN BACK OFF SLIGHTLY (APPROXIMATELY 50 FT LBS TORQUE)
- FOR RADIAL FEED USE 1 EACH OF ITEMS 2, 3 & 7 AND 1 DEAD END PLUG STOCK No. 031795
- THE SERVICE CABLE CONCENTRIC NEUTRAL WIRES FROM THREE SERVICE CABLES (2 FOR 4/0 SERVICE CABLES) ARE TO BE WOUND TOGETHER AND TERMINATED TO ONE COMPRESSION GROUND LUG.

TABLE 1

SERVICE CABLE OR WIRE SIZE	APPROX. NEUTRAL SIZE	NEUTRAL COMPRESSION LUG	S/N
3-#2 USE-B	3-#6	AMPT CONN #2	000172
3-#1/0 USE-B	3-#4	AMPT CONN 2/0	038489
3-#2/0 USE-B	3-#3	AMPT CONN 4/0	044950
2-#4/0 USE-B	2-#1	AMPT CONN 4/0	044950
1-#4/0 BARE CU	-	OTRUGCU 1/0 5/0-4/0	024945
1-1/0 #2 15KV	#4	AMPT CONN #4	053081
1-1/0 1/0 15KV	#2	AMPT CONN #2	000172

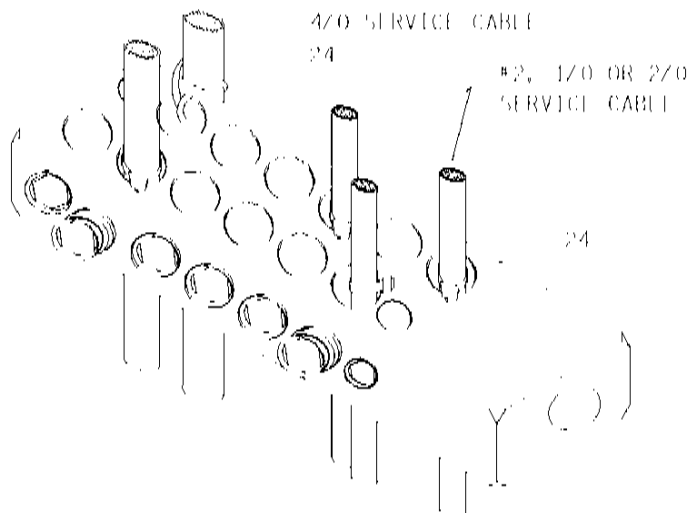
UNDERGROUND DISTRIBUTION CONSTRUCTION STANDARDS



INSTALLATION OF SINGLE PHASE 15KV 'MSB' TYPE TRANSFORMER ON EXISTING PAD (SERVICES DIRECTLY FROM TRANSFORMER)

2.	PAGE 5 REVISED	RI	02/04/04	DA
1.	REVIEWED BY STANDARDS COMM.	RI	00/07/19	DA
No.	DETAILS	BY	DATE	APPD
REVISIONS				

Drawn By S. STOLARCHUK	Checked By C. CLARKE	Approved By C. CLARKE
Scale: N.T.S.	Standard No. 65-00-07-15-24-005	Page No. 4/6
Date: 99-12-30		



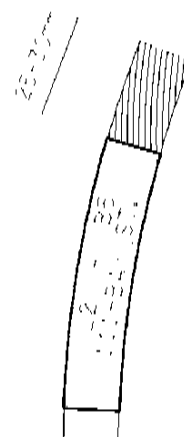
DETAIL "B"

PRIOR TO SERVICE ENERGIZATION

- URD SERVICING CONTRACTOR TO INSTALL TEMPORARY SERVICE CABLE IDENTIFICATION AS PER THE CITY OF EDMONTON DESIGN AND CONSTRUCTION STANDARDS MANUAL, CHAPTER 7, CLAUSE 4.6.3.11. CLEAR PLASTIC TUBING WITH LEGAL DESCRIPTION IN BLACK PERMANENT INK ON X3 CONDUCTOR.

SERVICE CABLE #2, 1/0 & 2/0 ARE TO BE TRAINED INTO THEIR ASSIGNED HOLES. THE WRAP TO BE INSTALLED AS PER DETAIL. TIGHTEN SET SCREW ONLY TIGHT ENOUGH TO PREVENT CABLE FROM SLIPPING OUT.

4/0 SERVICE CABLES TO BE WRAPPED TO OUTSIDE OF TERMINAL BLOCK AS PER DETAIL B.



WHITE PRE-PRINTED
SELF-ADHESIVE LABEL
LETTERS/NUMBERS MIN.
5mm HIGH

CLEAR HEAT
SHRINK TUBING

DETAIL "F"

LABELLING REQUIREMENTS AFTER ENERGIZATION
(TO BE INSTALLED BY SERVICE ENERGIZER)

NOTE:

- PERMANENT LABEL GOES ON X3 CONDUCTOR ONLY
- ADDRESS TO BE INSTALLED AT SERVICE ENERGIZATION TIME.
- THE PERMANENT LABEL IS TO BE THE STREET ADDRESS.

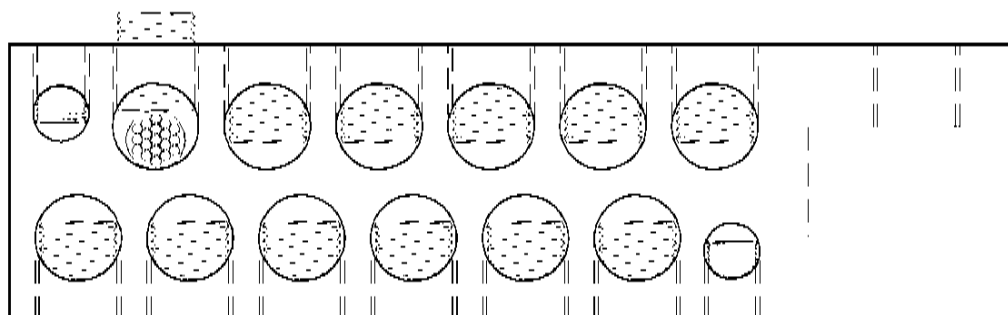
TORQUING INSTRUCTIONS:

CONNECTOR SIZE:

- #4 3/0 (SMALL HOLE)
- 4 350 (LARGE HOLE)

RECOMMENDED TORQUE:

- 15 - 20 ft. lb
- 23 - 38 ft. lb




DETAIL "E" (SECONDARY TERMINAL BLOCK)


SEE 66000403/7001

NOTE:

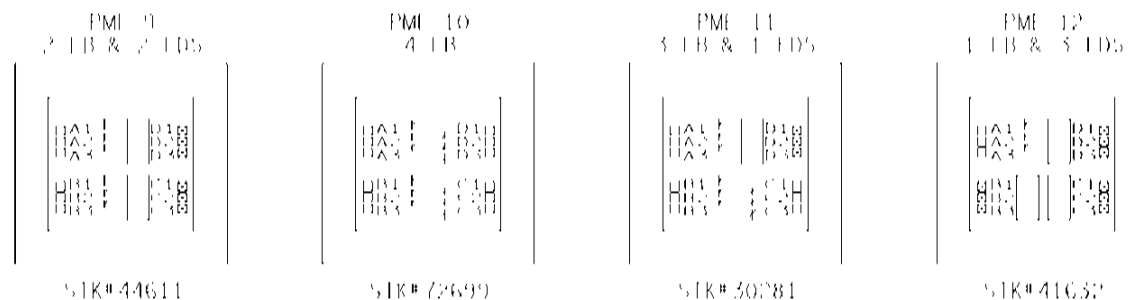
- THE ALLEN WRENCH MUST BE PROPERLY SET IN THE SET SCREW OR DAMAGE WILL BE CAUSED TO THE SET SCREW WHICH WILL "FREEZE" IT IN THE BODY OF THE CONNECTOR.
- THE SET SCREW SHOULD BE TORQUED. AFTER A FEW SECONDS THE SET SCREW SHOULD BE RETIGHTENED.
- ENSURE THAT THE "ORIENTATION" OF THE TERMINAL BLOCK IS SET, SO THAT THE SET SCREWS CAN BE READILY ACCESSED WHEN CABLES ARE INSTALLED.

UNDERGROUND DISTRIBUTION CONSTRUCTION STANDARDS				
INSTALLATION OF SINGLE PHASE 15kV 'MSB' TYPE TRANSFORMER ON EXISTING PAD (SERVICES DIRECTLY FROM TRANSFORMER)				
2. REVISED DETAIL B	RI	02/04/04	DA	
	RI	00/07/19	DA	
1. REVIEWED BY STANDARDS COMM.				
No.	DETAILS	BY	DATE	APP'D
REVISIONS				
Drawn By		Checked By		Approved By
S. STOLARCHUK		C. CLARKE		C. CLARKE
Scale: N.T.S.		Standard No.		Page No.
Date: 99.12.30		66-00-07-15-24-001		5/6

ITEM	DESCRIPTION	PART/STOCK #	QTY.
1	TRANSFORMER / AS REQUIRED		1
2	ELBOW TERMINATOR 251R 15kV	035565	A/R
2	ELBOW TERMINATOR 1-0 15kV	035566	A/R
4	AMP T CONN #4I 35471	053081	A/R
4	AMP T CONN #2I 35184	000172	A/R
4	DISJUG CR 1-C 3-0-4 0	024945	1
4	AMP T CONN #2-OL 36923 3/8	038489	A/R
4	AMP T CONN #4-OL 36934 3/8	038950	A/R
7	FAULT INDICATOR 1-0 / 350MCM	051247	1
8	SECONDARY TERMINAL BLOCK	057318	2
9	WASHERS BRASS FLAT 3/8IN.	022988	A/R
10	WASHERS BLUEVILLE 3/8IN.	058191	A/R
11	BOLTS COPPER 3/8 x 3/4	024533	A/R
11	BOLTS COPPER 3/8 x 1	024534	A/R
11	BOLTS COPPER 3/8 x 1 1/4	024535	A/R
12	NUTS EVERDUR COPPER 3/8IN.	044711	A/R
13	BARE COPPER WIRE	FROM CABLE	A/R
14	PADLOCK AMERICAN	024921	1
15	SLABANT BLDG. DOW CORNING	NON STOCK	A/R
16	BOLTS STEEL CAP 3/8 x 1 1/4 PLATED (UNIT - EACH)	002814	4
17	PLATE FLAT 1/4 x 2 x 6 IN. HOT DIP GALVANIZED	073145	4
18	BUSHING INSERT 15kV 200A WITH TRANSFORMER	024592	2
19	TAPE 3/4IN. #13 SCOTCH T511.	025116	A/R
21	LAMICOID WHITE RED BKG (UNIT - EACH)		2
22	STICK ON DECALE 249 A (UNIT - EACH)	050997	1
23	HEAT SHRINK	062428	1
24	TELE WRAPS	025145	A/R

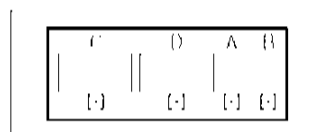
					UNDERGROUND DISTRIBUTION CONSTRUCTION STANDARDS				
					<div><div></div><div>INSTALLATION OF SINGLE PHASE 15KV 'MSB' TYPE TRANSFORMER ON EXISTING PAD (SERVICES DIRECTLY FROM TRANSFORMER)</div></div>				
2. PAGE 5 REVISED			RI	02/04/04	DA	Drawn By		Checked By	Approved By
1. REVIEWED BY STANDARDS COMM.			RI	00/07/19	DA	S. STOLARCHUK		C. CLARKE	C. CLARKE
No.	DETAILS		BY	DATE	APP'D	Scale - N.T.S.		Standard of No.	
REVISIONS						Date - 99-12-30		65-00-07-15-27-0015	
								Page No.	
								6/6	

DEADFRONT 15KV 600A 4-WAY SWITCHING CUBICLES



1. INSTALLATION CONSTRUCTION STANDARD 65000/1523007.
2. EACH CUBICLE USES A PRECAST BASE STOCK No. 62472 (2.00m W X 1.795m D X 0.865m H).
3. BASE CONSTRUCTION INSTALLATION STANDARD IS 65000/1523006.

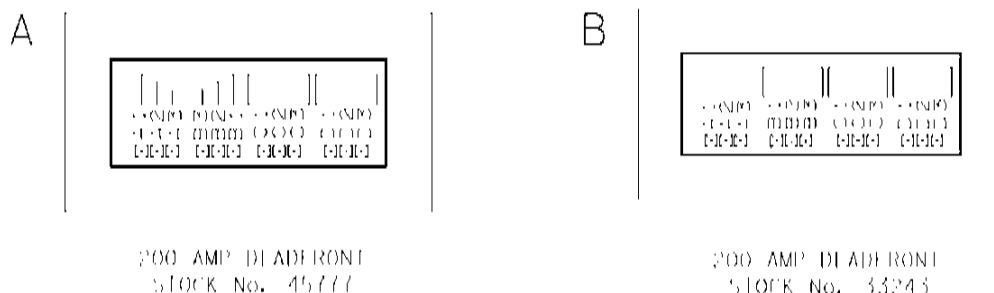
DEADFRONT 15KV 200A SINGLE PHASE 4-WAY



200 AMP DEADFRONT
STOCK No. 44215

1. INSTALLATION CONSTRUCTION STANDARD 66000/1523007.
2. PRECAST BASE IS STOCK No. 61415 (1.50m W X 1.08m D X 0.914m H).
3. BASE CONSTRUCTION INSTALLATION STANDARD IS 66000/1523008.

DEADFRONT 15KV 200A THREE PHASE 4-WAY



1. INSTALLATION CONSTRUCTION STANDARD IS 66000/1523009.
2. PRECAST BASE FOR CUBICLE "A" STOCK No. 64315 (2.03m W X 1.593m D X 0.915m H).
PRECAST BASE FOR CUBICLE "B" STOCK No. 62472 (2.00m W X 1.795m D X 0.865m H).
3. INSTALLATION CONSTRUCTION STANDARD FOR BASE FOR CUBICLE "A" IS 66000/1523010.
4. INSTALLATION CONSTRUCTION STANDARD FOR BASE FOR CUBICLE "B" IS 65000/1523006.

NOTE THAT THE FAULT RATING OF THIS CUBICLE IS LIMITED BY THE RATING OF THE 200A FCBOW
200A CONTINUOUS, 10KA SYMMETRICAL, 10 CYCLES.

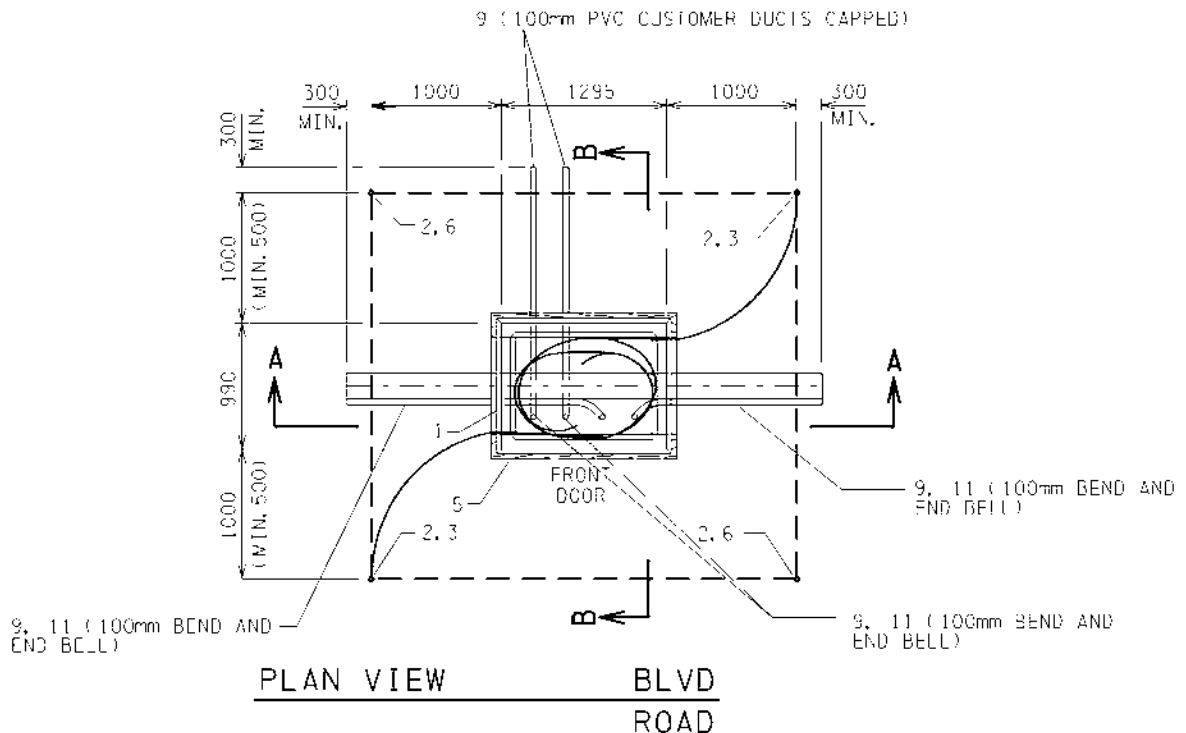
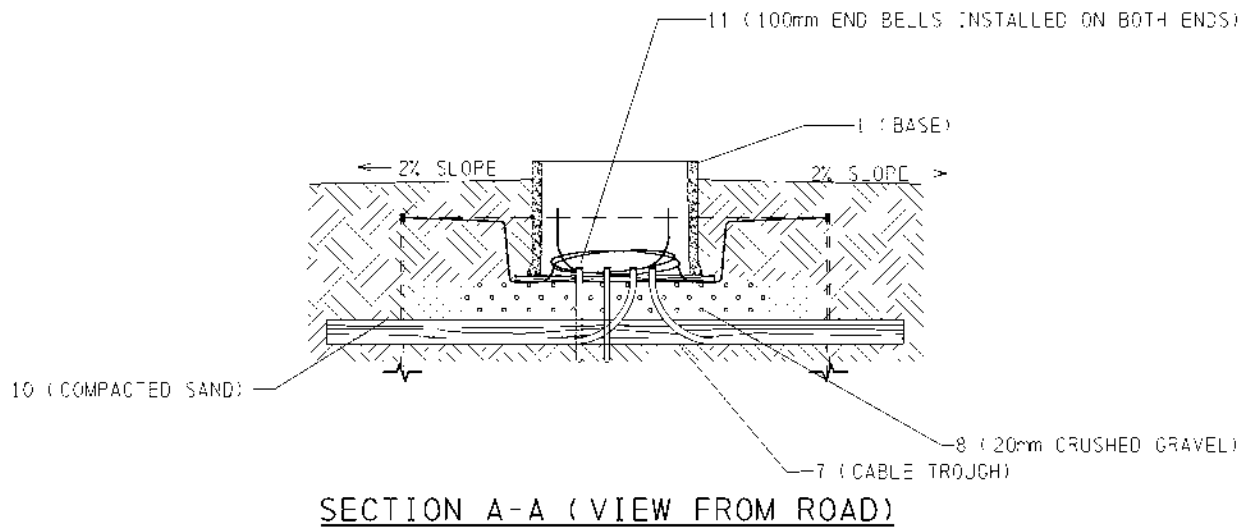
UNDERGROUND DISTRIBUTION CONSTRUCTION STANDARDS

SUMMARY OF 15kv DEAD FRONT SWITCHING CUBICLE INSTALLATION INFORMATION



Drawn By RINCO TSANG	Checked By D. ARNOLD	Approved By JOHN BYRON
Scale: N.T.S.	Standard No. 66-00-07-15-23-012	Page No. 1/1
Date: 04-09-02		

No.	DETAILS	BY	DATE	APD
B	MINOR DIMENSION REVISED	RI	04-12-16	GI
A	REVIEWED BY STANDARD COMMITTEE	RI	04-09-24	DA
REVISIONS				



ALL DIMENSIONS GIVEN IN MILLIMETERS

UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING



INSTALLATION OF PRECAST
CONCRETE BASE FOR 4-WAY
SINGLE PHASE 200 AMP DEAD FRONT
15kV SWITCHING CUBICLE

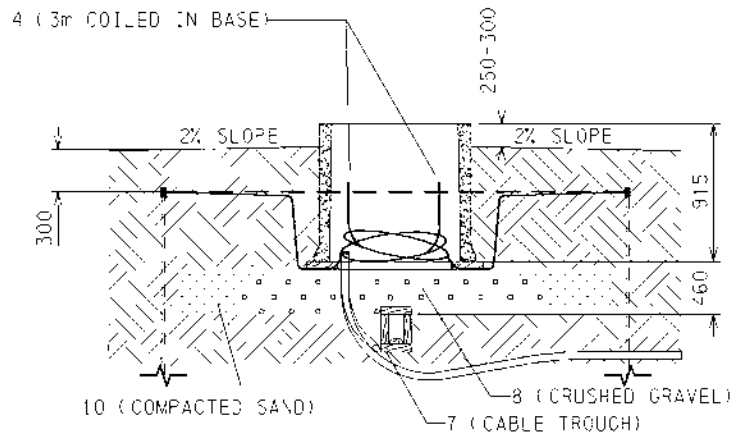
(STOCK No. 61415)

Drawn By BAO	Checked By DXT	Approved By
Scale A.T.S.	Drawing No. U-756-007	Page No. 1/4
Date 06-11-21		

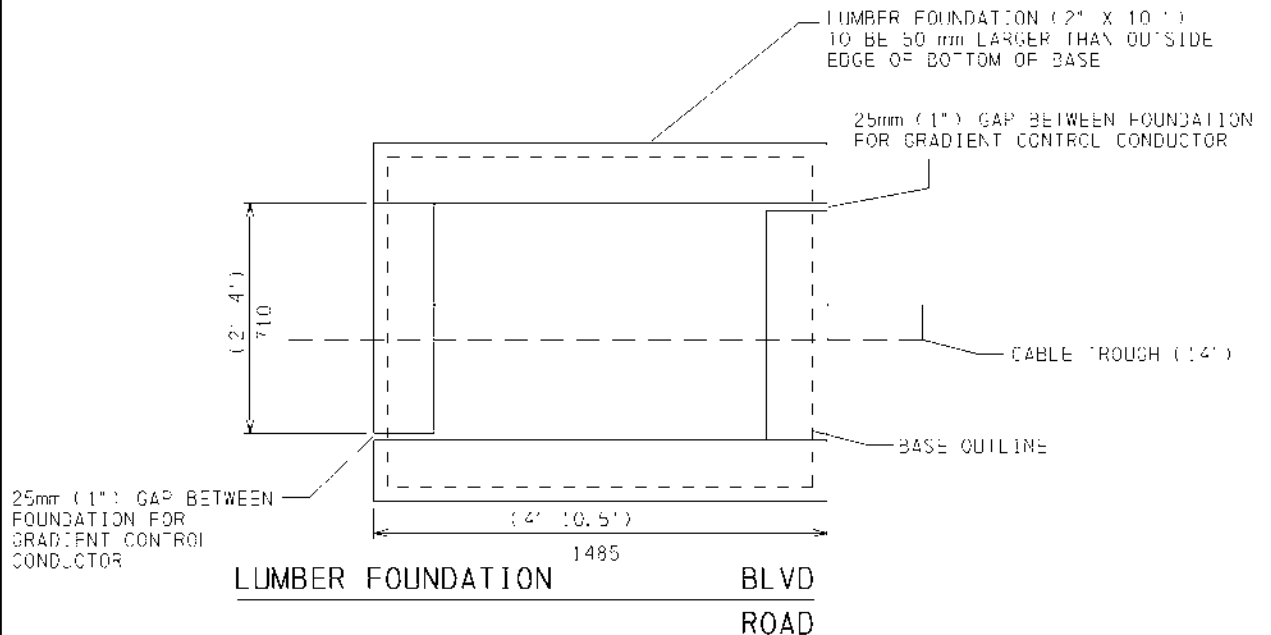
No.	DETAILS	BY	DATE	APPD
1	CREATED FOR VOLUME 7	BAO	06-11-21	
REVISIONS				

20110525 08:26 baa

ROAD
BLVD



SECTION B-B (FROM PAGE 1)
VIEW ALONG TRENCH ALIGNMENT



ALL DIMENSIONS GIVEN IN MILLIMETERS (IMPERIAL IN BRACKETS)

UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING



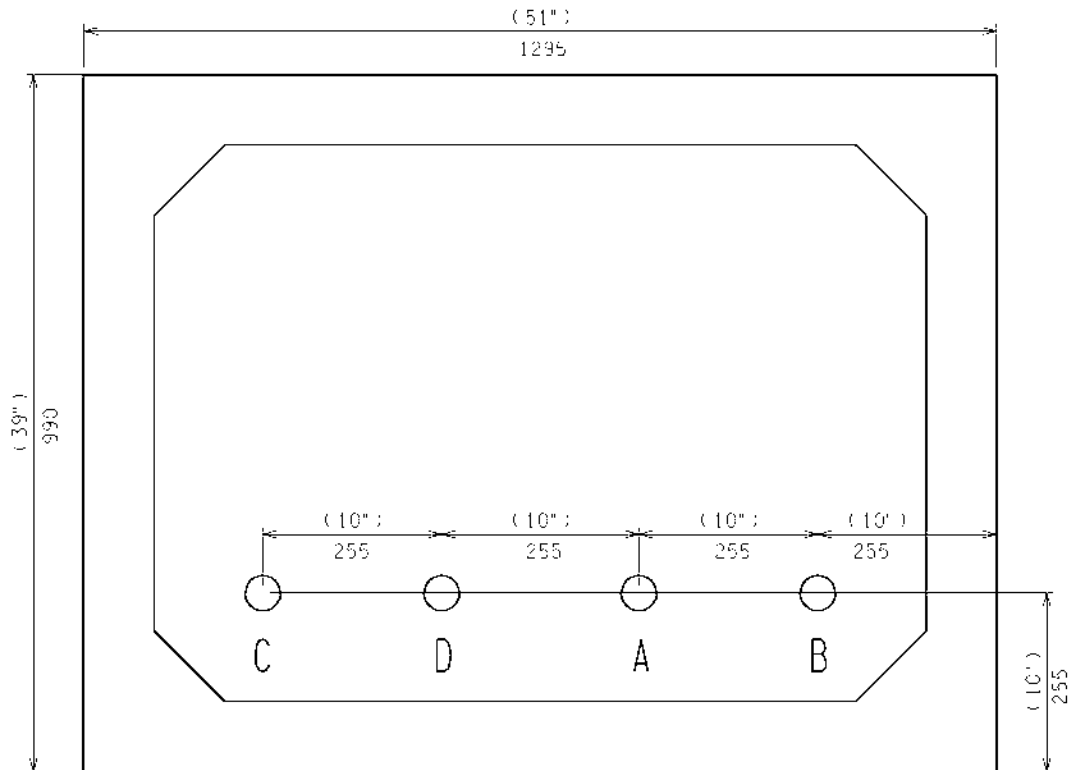
INSTALLATION OF PRECAST
CONCRETE BASE FOR 4-WAY
SINGLE PHASE 200 AMP DEAD FRONT
15kV SWITCHING CUBICLE

(STOCK No. 61415)

Drawn By BAC	Checked By DXT	Approved By
Scale A.T.S.	Drawing No. U-756-007	Page No. 2/4
Date 06-11-21		

No.	DETAILS	BY	DATE	APPD
2	UPDATED DEPTH	BAC	08-10-06	
1	CREATED FOR VOLUME 7	BAC	06-11-21	
REVISIONS				

20110525 08:26 bac



FRONT DOOR

PLAN VIEW

BLVD
ROAD

NOTES :

- ALL DUCTS ARE 100 mm (4 INCH) RIGID PVC - 24 INCH RADIUS BENDS C/W END BELLS.
- THE DUCTS MUST BE POINTING DIRECTLY UPWARDS WITH THE TOP OF THE END BELL 150 mm (6 INCHES) ABOVE THE 2" X 10" PRESSURE TREATED FOUNDATION (WITHOUT TRIMMING THE BENDS).
- PRIOR TO PLACING THE BASE AND INSTALLING THE END BELLS, DUCTS SHOULD BE CAPPED (I.E. DUCT TAPE) TO KEEP LOOSE MATERIAL FROM ENTERING THE DUCTS.
- DUCTS C/W WITH END BELLS ARE TO REMAIN CAPPED IF CABLE IS NOT PULLED INTO THEM.
- TYPICAL DETAILS SHOWN ONLY. DUCTING MAY VARY DEPENDING UPON APPLICATION IN FIELD (LENGTH, DIRECTION, NUMBER OF CUSTOMER DUCTS)
- PRIMARY CABLES ARE TO BE INSTALLED THROUGH DUCTS ONLY.
- GROUND GRID AND GROUND RODS TO BE 300mm BELOW FINAL GRADE (NOT ROUGH GRADE).
- AMOUNT OF GROUNDING CONDUCTOR REQUIRED INCLUDES COILS INSIDE OF BASE. TRIMMING WILL BE REQUIRED WHEN TERMINATING.
- ALL BASE DIMENSIONS ARE TO THE OUTSIDE TOP OF BASE.

ALL DIMENSIONS GIVEN IN MILLIMETERS (IMPERIAL IN BRACKETS)

UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING



INSTALLATION OF PRECAST
CONCRETE BASE FOR 4-WAY
SINGLE PHASE 200 AMP DEAD FRONT
15kV SWITCHING CUBICLE

(STOCK No. 61415)

Drawn By

BAC

Checked By

DXT

Approved By

Scale A.T.S.

Date 06-11-21

Drawing No.

U-756-007

Page No.


3/4

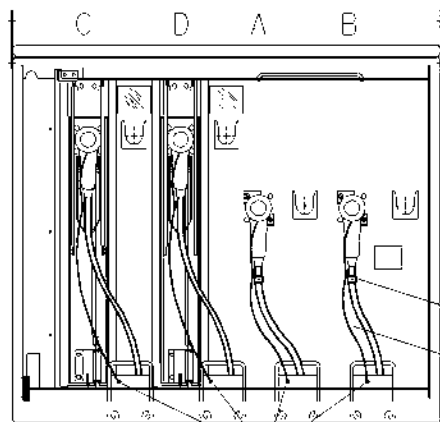
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No.	DETAILS	BY	DATE	APPD
REVISIONS				

20110527 08:39 ba0

ITEM	DESCRIPTION	PART/STOCK #	QTY.
1	BASE, PRECAST SW/CU 4 WAY, 1 PHASE, 200 AMP, 15 kV	61415	1
2	RODS, GROUND 5/8" x 10FT. COPPER CLAD	73937	4
3	CONNECTOR, GRD 5/8" ROD - 250 DOUBLE WIRE	9136	2
4	WIRE, BARE COPPER 4/0 STRANDED 19W	45655	30
5	LUMBER SPRUCE PRESSURE TREATED (2"X10")	42392	2
6	CONNECTOR, GROUND ROD 5/8"N.(4/0)	31914	2
7	TROUGH (PRESSURE TREATED WOOD 2' X10") - SEE DWG. NO. U-756-003	27272	2
8	20mm CRUSHED GRAVEL	15588	3
9	BEND RIGID PVC 100mm (4 ") 24R 90D	44327	4
10	SAND (UNIT = CU.m)	14433	3
11	100 mm FND FILL	20574	A/R

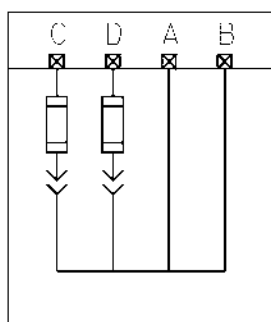
20110525 08:28 ba0

				UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING					
									
				INSTALLATION OF PRECAST CONCRETE BASE FOR 4-WAY SINGLE PHASE 200 AMP DEAD FRONT 15kV SWITCHING CUBICLE (STOCK No. 61415)					
1		CREATED FOR VOLUME 7	BA0	06-11-21	Drawn By BA0		Checked By DXT	Approved By	
No.	DETAILS		BY	DATE	APPD	Scale A, T, S. Date 06-11-21		Drawing No. U-756-007	Page No. 4 / 4
REVISIONS									

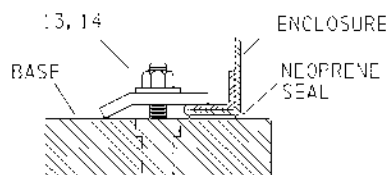


NEUTRALS TERMINATED TO
WORKING GROUND PLATE
(SEE PAGE 2, DETAIL "A")

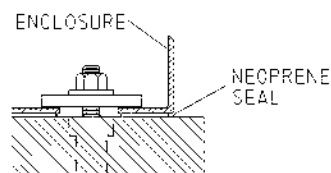
FUSE COMPARTMENT



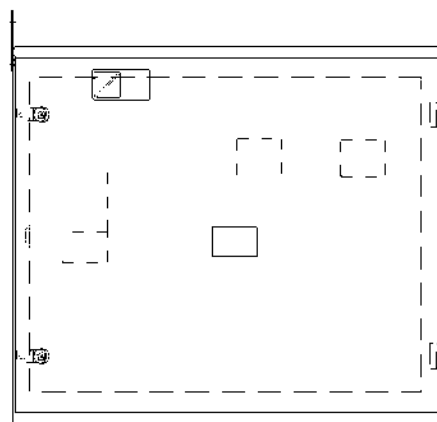
CONNECTION DIAGRAM



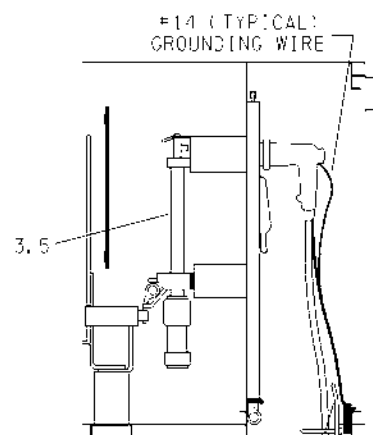
ANCHORING DETAIL
(TYPICAL FRONT)



ANCHORING DETAIL
(TYPICAL REAR)

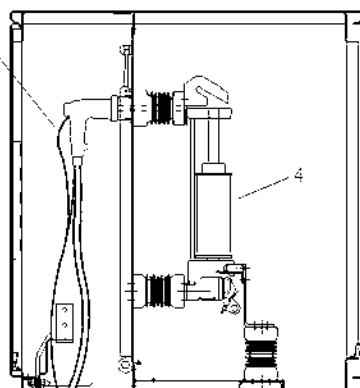


CUBICLE FRONT VIEW



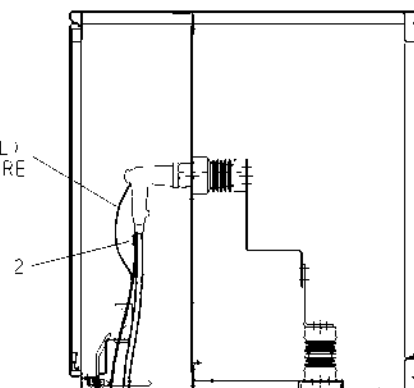
GROUND BAIL DETAIL "A"
"E" FUSE HOLDER (OPTIONAL)

#14 (TYPICAL)
GROUNDING WIRE



"NX" FUSE FITTED

#14 (TYPICAL)
GROUNDING WIRE



ELBOW CONNECTED CIRCUIT

UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING

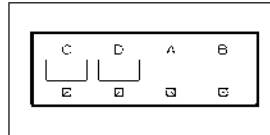


INSTALLATION OF
4-WAY SINGLE PHASE DEADFRONT
15kV 200 AMP SWITCHING CUBICLE

Drawn By BAO	Checked By DXT	Approved By
Scale N.T.S.	Drawing No. U-756-008	Page No. 1/3
Date 06-11-21		

1	CREATED FOR VOLUME 7	BAO	06-11-21	
Rev.	DETAILS	BY	DATE	APPD
REVISIONS				

20110525 08:27 bao

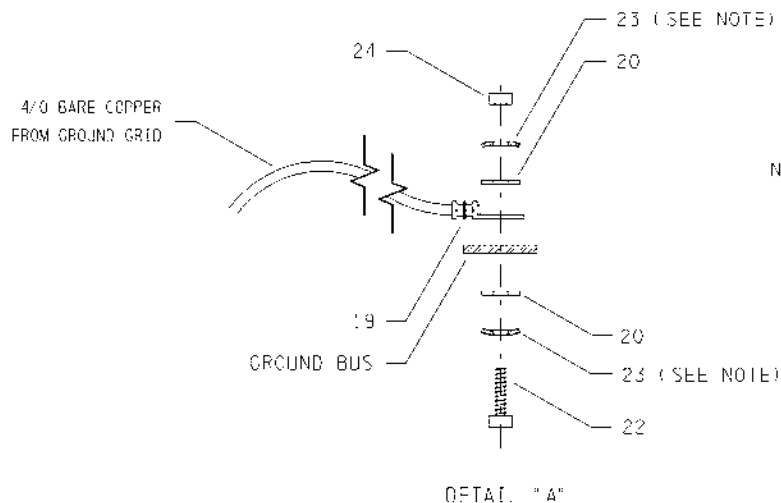


200 AMP DEADFRONT
 STK No. 044215
 BASE STK No. 61415


SCHEMATICS FOR VARIOUS ARRANGEMENTS

NOTES :

- PRIMARY CABLES TO HAVE A MINIMUM OF 5 METERS OF EXTRA LENGTH COILED IN BASE PRIOR TO TERMINATING.




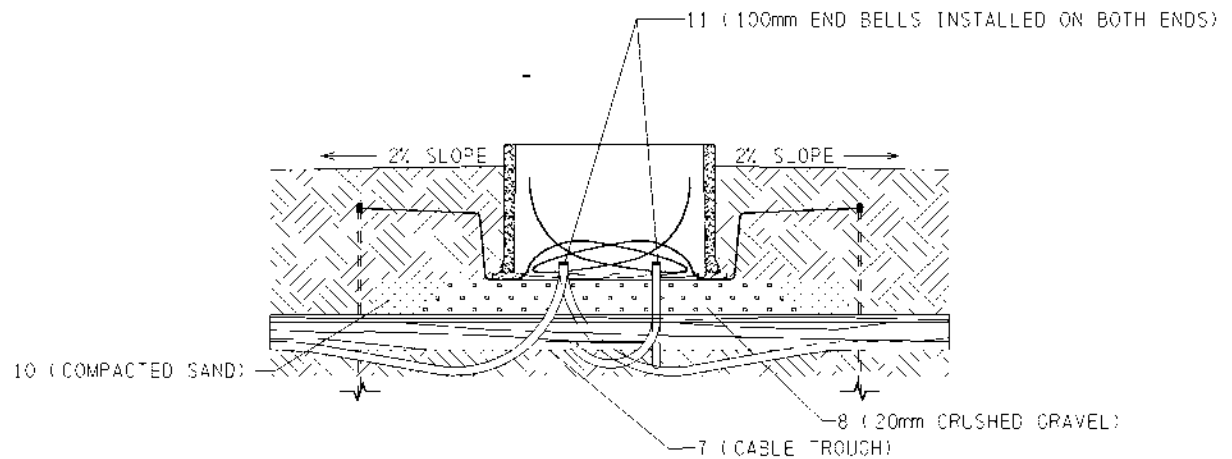
20110525 08:28 baa

UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING					INSTALLATION OF 4-WAY SINGLE PHASE DEADFRONT 15KV 200 AMP SWITCHING CUBICLE		
					Drawn By BAO	Checked By DXT	Approved By
					Scale N.T.S.	Drawing No. U-756-008	Page No. 2/3
					Date 06-11-21		
					REVISIONS		
No.	DETAILS	BY	DATE	APPD			
1	CREATED FOR VOLUME 7	BAO	06-11-21				

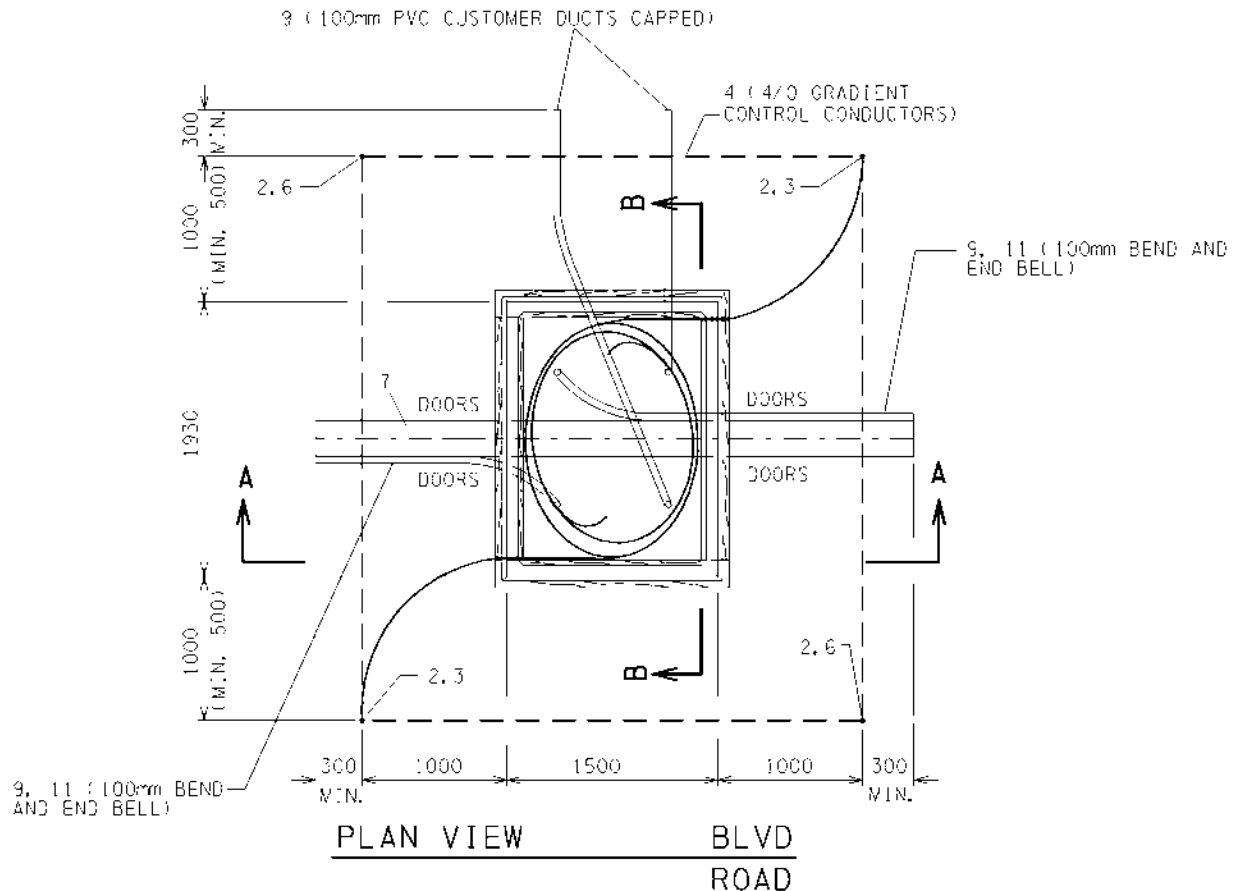
ITEM	DESCRIPTION	PART/STOCK #	QTY.
1	CUBICLE 4 WAY 200 AMP DEADFRONT	044215	1
2	FAULT INDICATOR	051247	2
3	F FUSE BY FPCR		
4	FUSE CLIP HOLDER	054440	A/R
5	E-TYPE FUSE HOLDER CONVERSION KIT	022345	A/R
6	PADLOCK AMERICAN	024921	2
7	ELBOW TERMINATOR #2 15KV	035565	A/R
7	ELBOW TERMINATOR 1/0 15KV	035566	A/R
13	BOLTS STEEL CAP 5/8 X 1 PLATED	002814	4
14	PLATE FLAT 6 X 2 X 1/4" THICK BY 3/4" HOLE	073145	
16	STICK ON DECAL U-249-A	024746	1
17	AMP T CONN #2 35185 1/2 HOLE	024443	A/R
17	AMP T CONN #4/0 36934 1/2 HOLE	038828	A/R
18	LAMACOID LABEL		A/R
19	4/0 COPPER SEC. LUG	038436	A/R
20	WASHERS BRASS FLAT 3/8	022988	A/R
22	BOLTS COPPER 3/8 BY 1 1/2	024536	A/R
23	BELLEVILLE WASHER 3/8	056191	A/R
24	NUTS - EVERDUR COPPER 3/8	044711	A/R
25	INSULATING CAP WITH GROUND (FOR UNUSED FUSED BUSHINGS)	031795	A/R

20110525 08:28 baa

				UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING				
				 <div style="display: inline-block; vertical-align: middle; text-align: center;"> INSTALLATION OF 4-WAY SINGLE PHASE DEADFRONT 15kv 200 AMP SWITCHING CUBICLE </div>				
2	ADDED INSULATING CAP	BAO	08-10-06	<div style="display: flex; justify-content: space-between;"> <div> Drawn By BAO </div> <div> Checked By DXT </div> <div> Approved By </div> </div>				
1	CREATED FOR VOLUME 7	BAO	06-11-21					
No.	DETAILS	BY	DATE			APPD		
REVISIONS					Scale A.T.S. Date 06-11-21		Drawing No. U-756-008 Page No. 3 / 3	



SECTION A-A (VIEW FROM ROAD)



ALL DIMENSIONS GIVEN IN MILLIMETERS

UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING



INSTALLATION OF
PRECAST CONCRETE BASE FOR
4-WAY 3 PHASE 200 AMP DEAD FRONT
"TYPE A" 15kV SWITCHING CUBICLE
(STOCK No. 64315)

Drawn By BAO	Checked By DXT	Approved By
Scale A.T.S.	Drawing No. U-756-009	Page No. 1/4
Date 06-11-21		

1	CREATED FOR VOLUME 1	BAO	06-11-21	
No.	DETAILS	BY	DATE	APPD
REVISIONS				

20110525 08:52 bao



SECTION B-B (FROM PAGE 1)

BLVD
ROAD

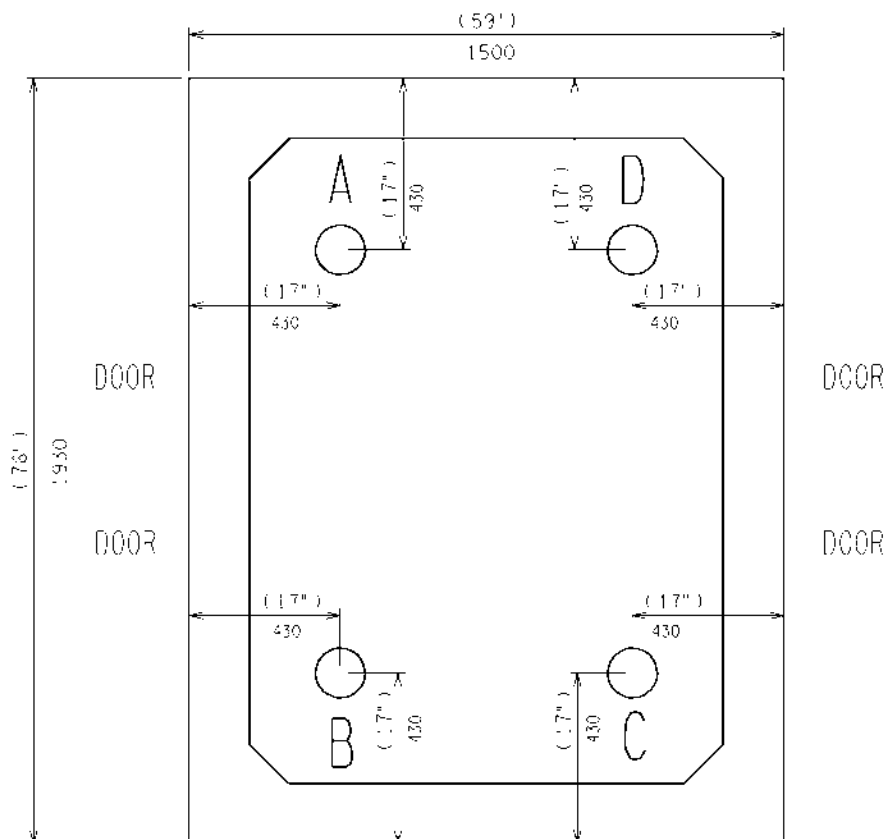
UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING

EPCOR

Scale A.T.S.	Drawing No.	Page No.
Date 06-11-21	U-756-009	2/4

2	UPDATED DEPTH	BAO	08-10-06	
1	CREATED FOR VOLUME 7	BAO	06-11-21	
No.	DETAILS	BY	DATE	APPR
REVISIONS				

20110525 08:53 b40



PLAN VIEW

BLVD

ROAD

NOTES :

- ALL DUCTS ARE 100 mm (4 INCH) RIGID PVC - 24 INCH RADIUS BENDS C/W END BELLS.
- THE DUCTS MUST BE POINTING DIRECTLY UPWARDS WITH THE TOP OF THE THE END BELL 150 mm (6 INCHES) ABOVE THE 2' X 10" PRESSURE TREATED FOUNDATION (WITHOUT TRIMMING THE BENDS).
- PRIOR TO PLACING THE BASE AND INSTALLING THE END BELLS, DUCTS SHOULD BE CAPPED (i.e. DUCT TAPE) TO KEEP LOOSE MATERIAL FROM ENTERING THE DUCTS.
- DUCTS C/W END BELLS ARE TO REMAIN CAPPED IF CABLE IS NOT PULLED INTO THEM.
- TYPICAL DETAILS SHOWN ONLY. DUCTING MAY VARY DEPENDING UPON APPLICATION IN FIELD (LENGTH, DIRECTION AND NUMBER OF CUSTOMER DUCTS)
- PRIMARY CABLES ARE TO BE INSTALLED THROUGH DUCTS ONLY.
- GROUND GRID AND GROUND RODS TO BE 300mm BELOW FINAL GRADE (NOT ROUGH GRADE).
- AMOUNT OF GROUNDING CONDUCTOR TO BE COILED IN THE BASE IS MEASURED FROM WHERE THE GROUNDING CONDUCTOR ENTERS THE BASE.
- ALL BASE DIMENSIONS ARE TO THE OUTSIDE TOP OF BASE.

ALL DIMENSIONS GIVEN IN MILLIMETERS (INCHES IN BRACKETS)

UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING



INSTALLATION OF
PRECAST CONCRETE BASE FOR
4-WAY 3 PHASE 200 AMP DEAD FRONT
"TYPE A" 15kV SWITCHING CUBICLE
(STOCK No. 64315)


Drawn By BAC	Checked By DXT	Approved By
Scale A.T.S.	Drawing No. U-756-009	Page No. 3/4
Date 06-11-21		

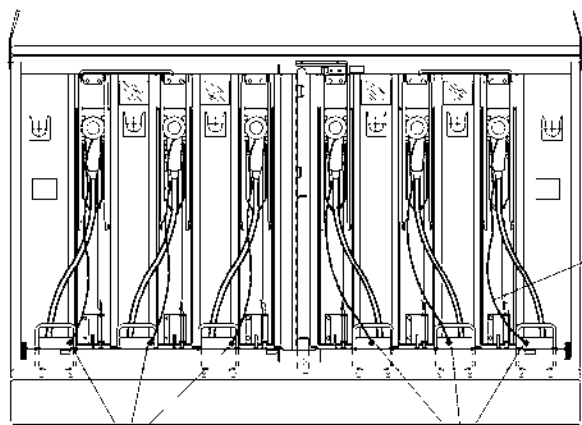
No.	DETAILS	BY	DATE	APPD
1	CREATED FOR VOLUME 7	BAC	06-11-21	
REVISIONS				

20110525 08:54 bac

ITEM	DESCRIPTION	PART/STOCK #	QTY.
1	BASE, PRECAST SW/CU 4 WAY, 3 PHASE, 200 AMP, 15KV	64315	1
2	RODS, GROUND 5/8IN. x 10FT. COPPER CLAD	73937	4
3	CONNECTOR, GRD 3/4 ROD - 250 DOUB. F WIRE	9136	2
4	WIRE, 4/0 STRANDED BARE COPPER 19W	45655	35
5	LUMBER SPRUCE PRESSURE TREATED (2"X10")	42392	4
6	CONNECTOR, GROUND ROD 5/8IN. (4/0)	31914	2
7	TROUGH (PRESSURE TREATED WOOD 2' X10') - SEE DWG. NO. U-756-003	27272	2
8	20mm CRUSHED GRAVEL	15523	3
9	BEND RIGID PVC 100mm (4") 24R 90D	44327	4
10	SAND (UNIT = C.J.m)	17762	3
11	100 mm FND FILL	70574	A/R

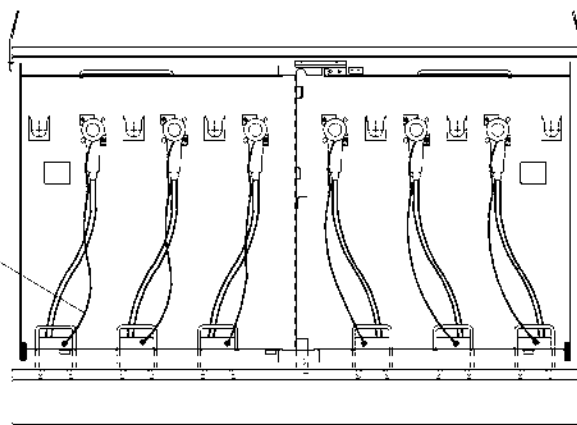
20110525 09:09 ba0

				UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING							
											
				INSTALLATION OF PRECAST CONCRETE BASE FOR 4-WAY 3 PHASE 200 AMP DEAD FRONT "TYPE A" 15KV SWITCHING CUBICLE (STOCK No. 64315)							
1		CREATED FOR VOLUME 7		BA0		06-11-21		Drawn By BA0	Checked By DXT	Approved By	
No.	DETAILS			BY	DATE	APPD	Scale A.T.S. Date 06-11-21		Drawing No. U-756-009		Page No. 4 / 4
REVISIONS											

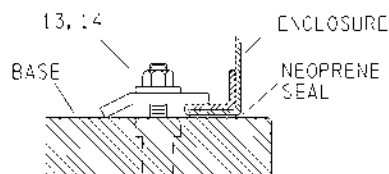


NEUTRALS TERMINATED TO
WORKING GROUND PLATE
(SEE PAGE 2, DETAIL 'A')

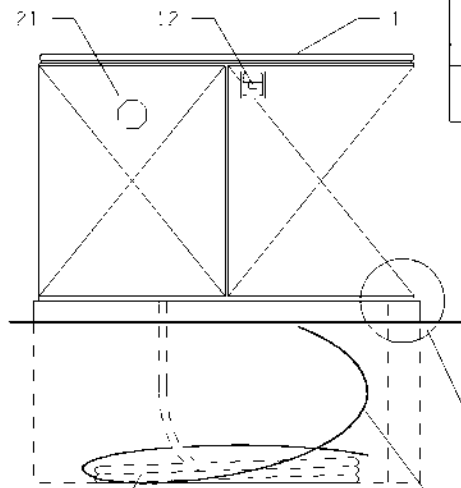
FUSE COMPARTMENT



FEED THROUGH COMPARTMENT



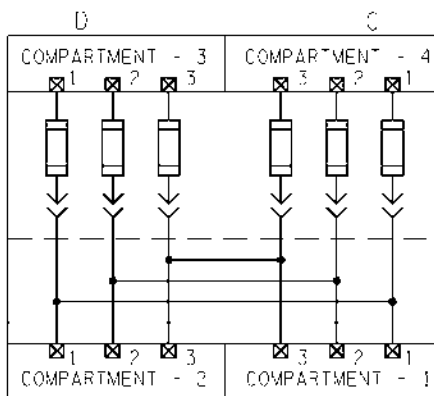
ANCHORING DETAIL
(TYPICAL FRONT)



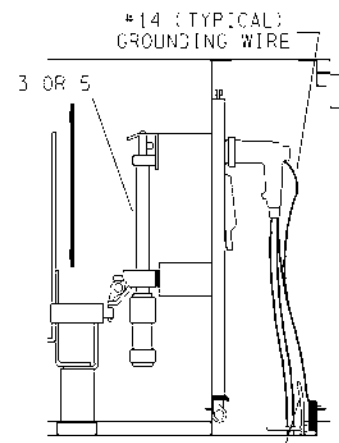
SEE
NOTE
PAGE 2

REFER TO DETAIL "A"
(PAGE 2) FOR GROUND GRID
CONNECTION TO GROUND BUS

ELEVATION VIEW



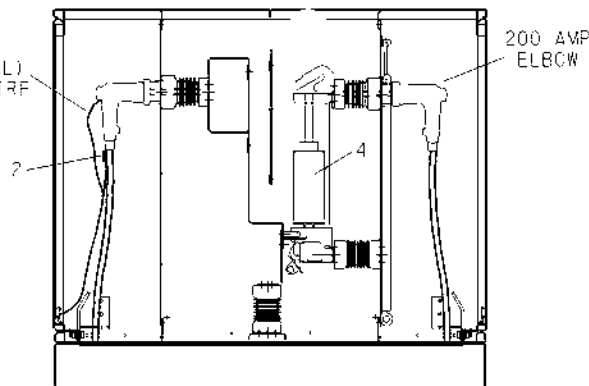
CONNECTION DIAGRAM



GROUND BAIL DETAIL 'A'

"E" FUSE HOLDER (OPTIONAL)

#14 (TYPICAL)
GROUNDING WIRE



"NX" FUSE FITTED

UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING

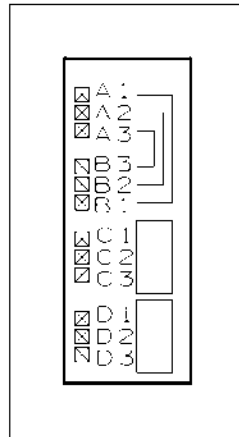
EPCOR

INSTALLATION OF
4-WAY 3 PHASE 200 AMP DEADFRONT
15KV SWITCHING CUBICLE

Drawn By B40	Checked By DXT	Approved By
Scale N.T.S.	Standard No. U-756-010	Page No. 1 / 3
Date 06-11-21		

NO.	DETAILS	BY	DATE	APPD
A	CREATED FOR VOLUME 7	B40	06-11-21	
REVISIONS				

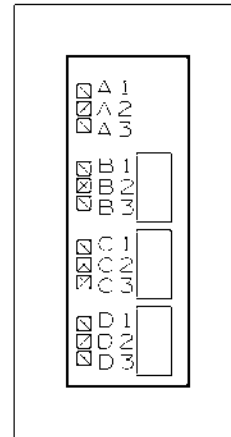
20110525 09:13 b40



200 AMP DEADFRONT TYPE A

STK No. 45777

BASE STK No. 64315



200 AMP DEADFRONT TYPE B

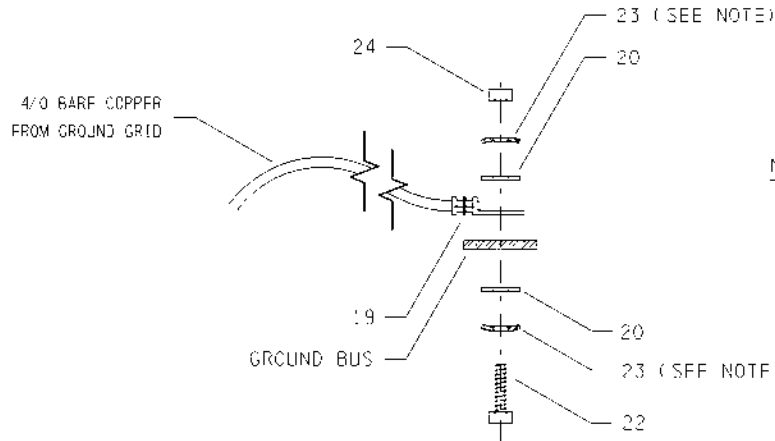
STK No. 33243

BASE STK No. 62472

SCHEMATICS FOR VARIOUS ARRANGEMENTS

NOTES :

- ALL CABLES TO HAVE A MINIMUM OF 4 METERS OF EXTRA LENGTH COILED IN BASE.
- DIMENSIONS FOR ALL 3 PHASE S & C SWITCHING CUBICLES ARE INDEPENDENT OF COMPARTMENT CONTEXTS. PHYSICAL LOCATION OF SWITCHES AND FUSES ARE AS PER SCHEMATICS.
- FIBERS ARE TO BE TERMINATED IN ACCORDANCE WITH STANDARD DRAWING 6600071582001.
- FUSE AS PER CONSTRUCTION STANDARDS 6000071550100, 6000071550200, 6000071550300.




NOTE :

TIGHTEN NUT UNTIL WASHER BECOMES FLAT THEN BACK OFF SLIGHTLY (APPROXIMATELY 50 ft lbs TORQUE)


DETAIL "A"

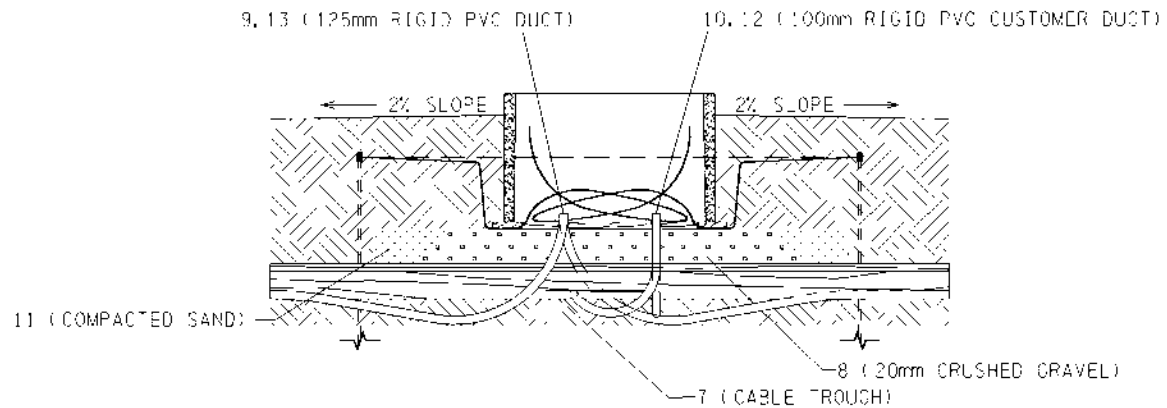
20110525 09:14 ba0

UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING					INSTALLATION OF 4-WAY 3 PHASE 200 AMP DEADFRONT 15kV SWITCHING CUBICLE		
<div style="text-align: center;">  </div>					Drawn By BA0	Checked By DXT	Approved By
					Scale N.T.S.	Standard No. U-756-010	Page No. 2 / 3
					Date 06-11-21		
					REVISIONS		
No.	DETAILS	BY	DATE	APPD			
A	CREATED FOR VOLUME 7	BA0	06-11-21				

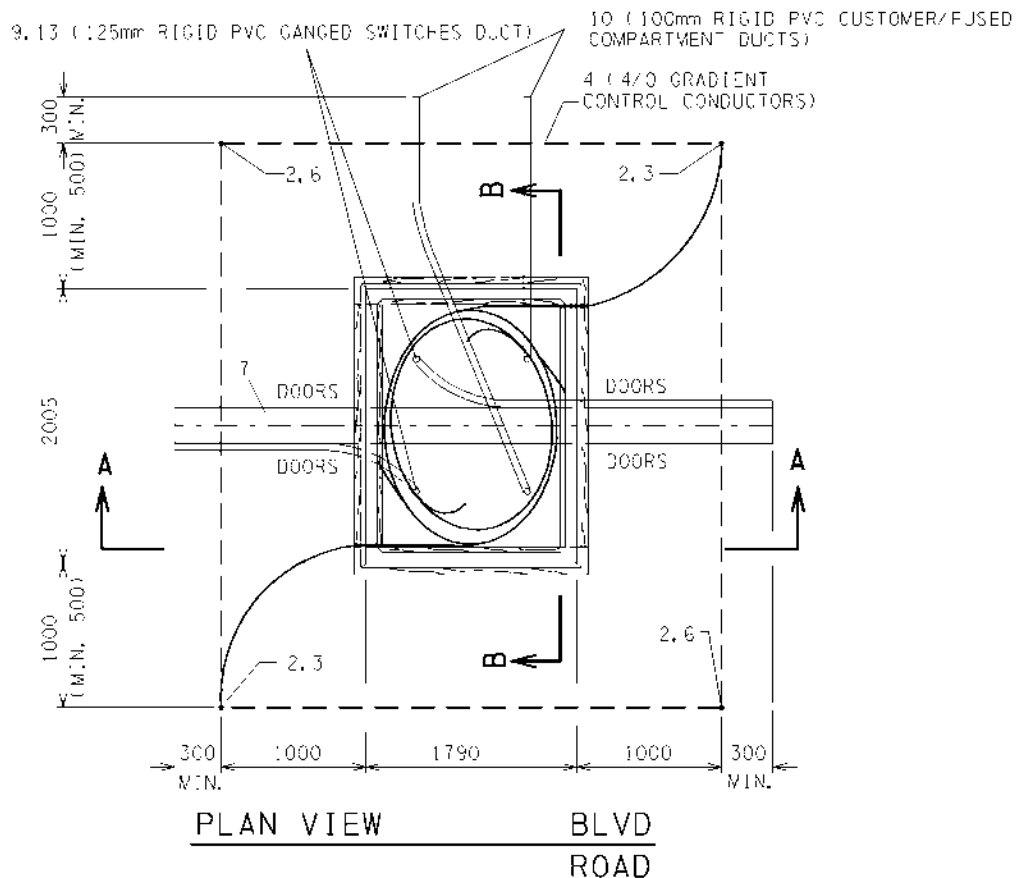
ITEM	DESCRIPTION	PART/STOCK #	QTY.
1	CUBICLE 4 WAY 3 PHASE DEADFRONT	45777	A/R
1	CUBICLE 4-WAY 3 PHASE DEADFRONT	33243	A/R
2	FAULT INDICATOR 1-0	51247	2
4	NX FUSE CARTRIDGE, FUSE AS PER FUSING CHART		
5	E-FUSE HOLDER, FUSE AS PER FUSING CHART		
6	ELBOW TERMINATOR #2 15KV	035565	A/R
6	ELBOW TERMINATOR 1/0 15KV	35566	A/R
7	4/0 COPPER SEC. ILLG	38436	2
8	WASHERS BRASS FLAT 3-8	22988	A/R
9	WASHERS BELLEVILLE 3-8 INCH	58188	A/R
11	NUTS EVERDUR COPPER 3-8 IN	44711	A/R
12	PADLOCK AMERICAN	24921	2
13	BOLTS STEEL CAP 5-8 x 1 PLATE (UNIT = EACH)	2814	4
14	PLATE FLAT 3-16 x 2 x 5 IN HOT DIP GALVANIZED (UNIT = EACH)	73145	A/R
20	LAMICOID WHITE RED BKG		A/R
21	STICK-ON DECAL U-249-A (UNIT = EACH)		A/R
25	INSULATING CAP WITH GROUND (FOR UNUSED FUSED BUSHINGS)	031795	A/R

20110525 09:15 baa


				UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING					
									
				INSTALLATION OF 4-WAY 3 PHASE 200 AMP DEADFRONT 15KV SWITCHING CUBICLE					
2	ADDED INSULATING CAP	BAO	08-10-06	Drawn By BAO		Checked By DXT		Approved By	
1	CREATED FOR VOLUME 7	BAO	06-11-21	Scale N. T. S.		Standard No.			Page No.
No.	DETAILS	BY	DATE	APPD	Date 06-11-21		U-756-010		3/3
REVISIONS									



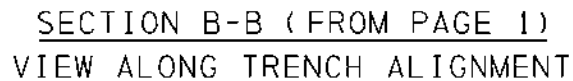
SECTION A-A (VIEW FROM ROAD)




ALL DIMENSIONS GIVEN IN MILLIMETERS

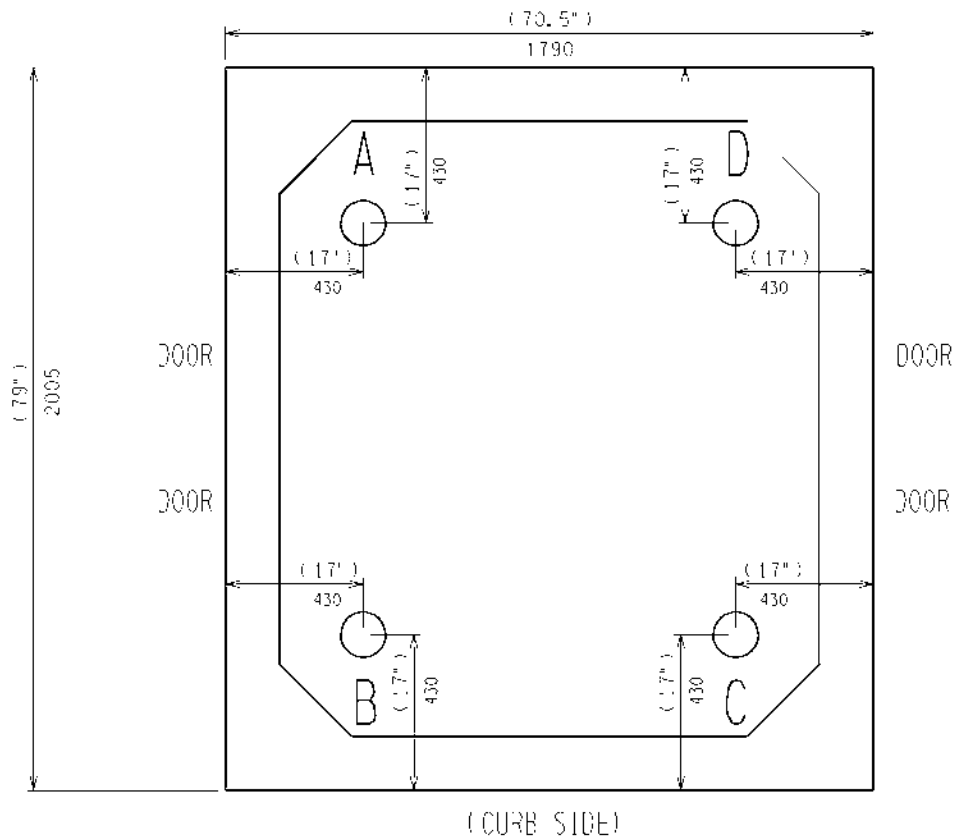
REVIEWED BY OPERATIONS				BR	UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING					
						INSTALLATION OF PRECAST CONCRETE BASE FOR 4-WAY 3 PHASE 600 AMP DEAD FRONT OR "TYPE B" 3-PH 15kV CUBICLE (STOCK No. 62472)				
						Drawn By BAO	Checked By DXT	Approved By		
1	CREATED FOR VOLUME 7	BAO	06-11-21			Scale A.T.S.	Drawing No. U-756-011		Page No. 1/4	
No.	DETAILS	BY	DATE	APPD		Date 06-11-21				
REVISIONS										

20110525 09:22 bao



REVIEWED BY OPERATIONS				BR	UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING				
						INSTALLATION OF PRECAST CONCRETE BASE FOR 4-WAY 3 PHASE 600 AMP DEAD FRONT OR "TYPE B" 3-PH 15kV CUBICLE (STOCK No. 62472)			
2	UPDATED DEPTH	BAQ	08-10-06			Drawn By BAQ	Checked By DXT	Approved By	
1	CREATED FOR VOLUME 7	BAQ	06-11-21			Scale A.T.S.	Drawing No. U-756-011	Page No. 2 / 4	
No.	DETAILS	BY	DATE	APPD		Date 06-11-21			
REVISIONS									

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PLAN VIEW BLVD
ROAD

NOTES :


- GANGED SWITCHES ARE 125 mm (5 INCH) RIGID PVC 36 INCH RADIUS BENDS C/W END BELLS.
- CUSTOMER DUCTS/FUSED COMPARTMENTS ARE 100 mm (4 INCH) RIGID PVC - 24 INCH RADIUS BENDS C/W END BELLS.
- THE DUCTS MUST BE POINTING DIRECTLY UPWARDS WITH THE TOP OF THE TIE END BELL 150 mm (6 INCHES) ABOVE THE 2" X 10" PRESSURE TREATED FOUNDATION (WITHOUT TRIMMING THE BENDS).
- PRIOR TO PLACING THE BASE AND INSTALLING THE END BELLS, DUCTS SHOULD BE CAPPED (I.e. DUCT TAPE) TO KEEP LOOSE MATERIAL FROM ENTERING THE DUCTS.
- DUCTS C/W END BELLS ARE TO REMAIN CAPPED IF CABLE IS NOT PULLED INTO THEM.
- TYPICAL DETAILS SHOWN ONLY. DUCTING MAY VARY DEPENDING UPON APPLICATION IN FIELD (LENGTH, DIRECTION AND NUMBER OF CUSTOMER DUCTS)
- PRIMARY CABLES ARE TO BE INSTALLED THROUGH DUCTS ONLY.
- GROUND GRID AND GROUND RODS TO BE 300mm BELOW FINAL GRADE (NOT ROUGH GRADE).
- AMOUNT OF GROUNDING CONDUCTOR TO BE COILED IN THE BASE IS MEASURED FROM WHERE THE GROUNDING CONDUCTOR ENTERS THE BASE.
- ALL BASE DIMENSIONS ARE TO THE OUTSIDE TOP OF BASE.

ALL DIMENSIONS GIVEN IN MILLIMETERS (INCHES IN BRACKETS)

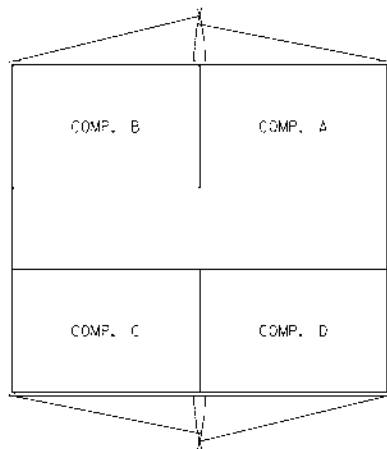
REVIEWED BY OPERATIONS			B7	UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING			
					INSTALLATION OF PRECAST CONCRETE BASE FOR 4-WAY 3 PHASE 600 AMP DEAD FRONT OR "TYPE B" 3-PH 15kV CUBICLE (STOCK No. 62472)		
					Drawn By BAO	Checked By DXT	Approved By
1	CREATED FOR VOLUME 7	BAO	06-11-21		Scale A.T.S.	Drawing No. U-756-011	Page No. 3/4
No.	DETAILS	BY	DATE		Date 03-10-21		
REVISIONS							

20110525 09:25 bao

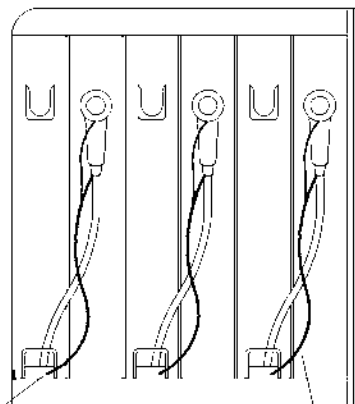
ITEM	DESCRIPTION	PART/STOCK #	QTY.
1	BASE, PRECAST SW/CU 4 WAY 3 PHASE 600 AMP 15KV	62472	1
2	RODS, GROUND 5/8IN. x 10FT. COPPER CLAD	73937	4
3	CONNECTOR, GRD 3/4 ROD - 250 DOUB. F WIRE	9136	2
4	WIRE, BARE COPPER 4/0 STRANDED 19W	45655	35
5	LUMBER SPRUCE PRESSURE TREATED (2"X10")	42392	4
6	CONNECTOR, GROUND ROD 5/8IN. (4/0)	31914	2
7	TROUGH (PRESSURE TREATED WOOD 2"X10") - SEE DWG. NO. U-756-003	27272	2
8	20mm CRUSHED GRAVEL	15588	3
9	BEND PVC 125mm (5 IN) 36R 90D (IN'S & OUT'S/GANGED SWITCHES)	61674	AR
10	BEND PVC 100mm (4 IN) 36R 90D (CUSTOMER DUCTS/FUSED COMPARTMENTS)	44327	AR
11	SAND (UNIT = CU.m)	14433	3
12	100 mm END BELL	20574	A/R
13	125 mm END BELL	20731	A/R

REVIEWED BY OPERATIONS			BR	UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING			
					INSTALLATION OF PRECAST CONCRETE BASE FOR 4-WAY 3 PHASE 600 AMP DEAD FRONT OR "TYPE B" 3-PH 15kV CUBICLE <small>(STOCK No. 62472)</small>		
					Drawn By BAO	Checked By KMII	Approved By
1	CREATED FOR VOLUME 7	BAO	06-11-21		Scale A.T.S.	Drawing No. U-756-011	Page No. 4/4
No.	DETAILS	BY	DATE		Date 03-10-21		
REVISIONS							

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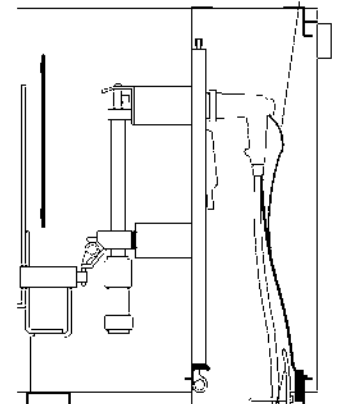


TOP VIEW



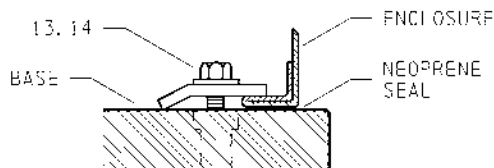
NEUTRALS TERMINATED TO WORKING GROUND PLATE (SEE PAGE 2, DETAIL "A")

NEUTRAL

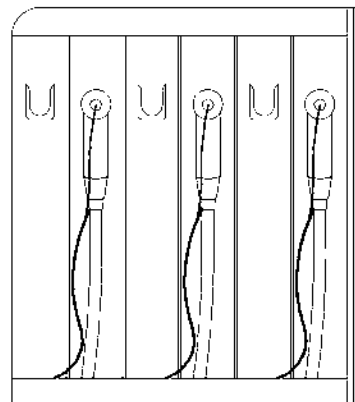


GROUND RAIL DETAIL "A"

FUSING COMPARTMENT

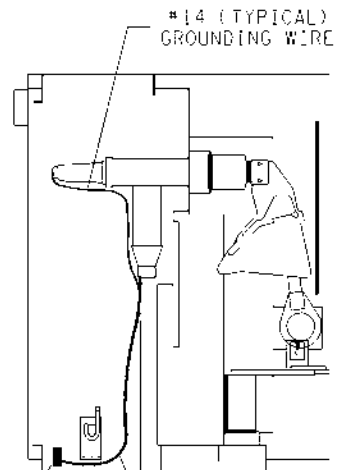


ANCHORING DETAIL (TYPICAL 4 CORNERS)

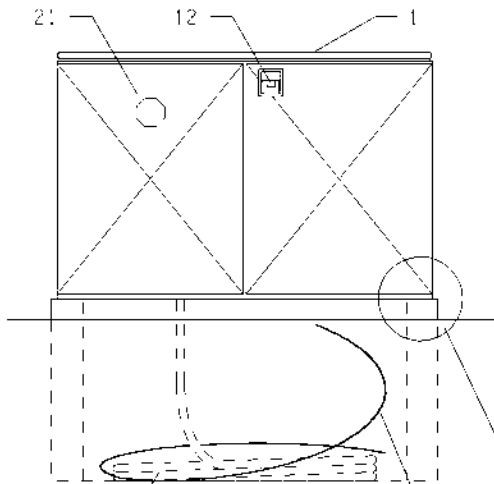


GROUND BUS DETAIL "A"

SWITCHING COMPARTMENT



NEUTRAL



ELEVATION VIEW

SEE ANCHORING DETAIL

SEE NOTE PAGE 2

REFER TO DETAIL "A" (PAGE 2) FOR GROUND GRID CONNECTION TO GROUND BUS

FOR INSTALLATION PURPOSES ONLY -- REFER TO SPECIFICATION DRAWINGS FOR ALL OTHER APPLICATIONS

UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING

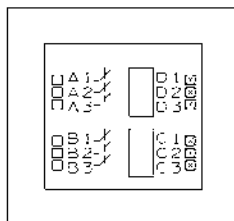
EPCOR

INSTALLATION OF S & C
4-WAY 3 PHASE 600 AMP DEADFRONT
15KV SWITCHING CUBICLE
(GENERAL ARRANGEMENTS)

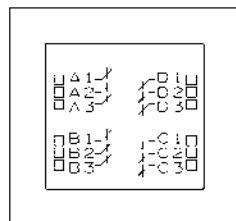
Drawn By BAO	Checked By DXT	Approved By
Scale N.T.S.	Drawing No. U-756-012	Page No. 1/5
Date 06-11-21		

No.	DETAILS	BY	DATE	APPD
1	CREATED FOR VOLUME 7	BAO	06-11-21	
REVISIONS				

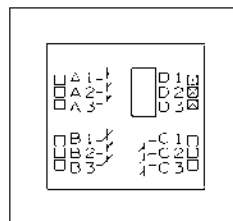
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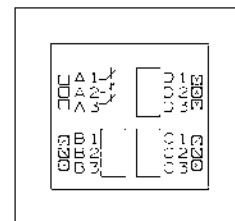
PME 9
STK No. 44611



PME 10
STK No. 72699



PME 11
STK No. 30281



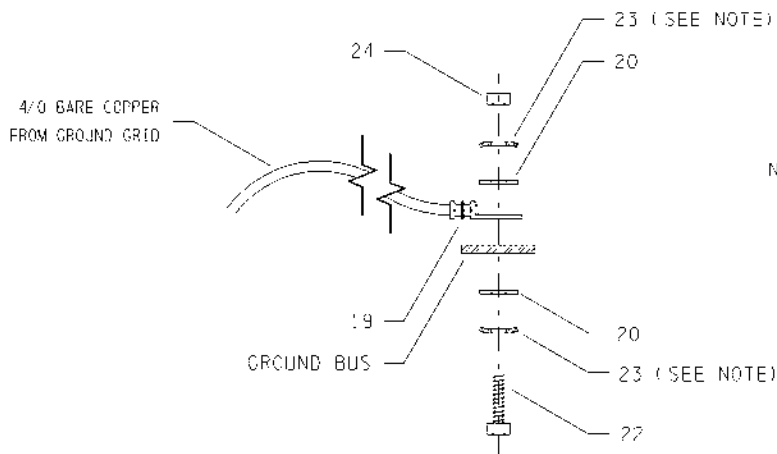
PME 12
STK No. 41632

BASE STK No. 62472

SCHEMATICS FOR VARIOUS ARRANGEMENTS

NOTES :

- ALL CABLES TO HAVE A MINIMUM OF 4 METERS OF EXTRA LENGTH COILED IN BASE
- FOR FUSING GUIDE REFER TO STANDARDS DRAWING 6000071550300
- DIMENSIONS FOR ALL 3 PHASE S & C SWITCHING CUBICLES ARE INDEPENDENT OF COMPARTMENT CONTENTS
- PHYSICAL LOCATION OF SWITCHES AND FUSES ARE AS PER SCHEMATICS




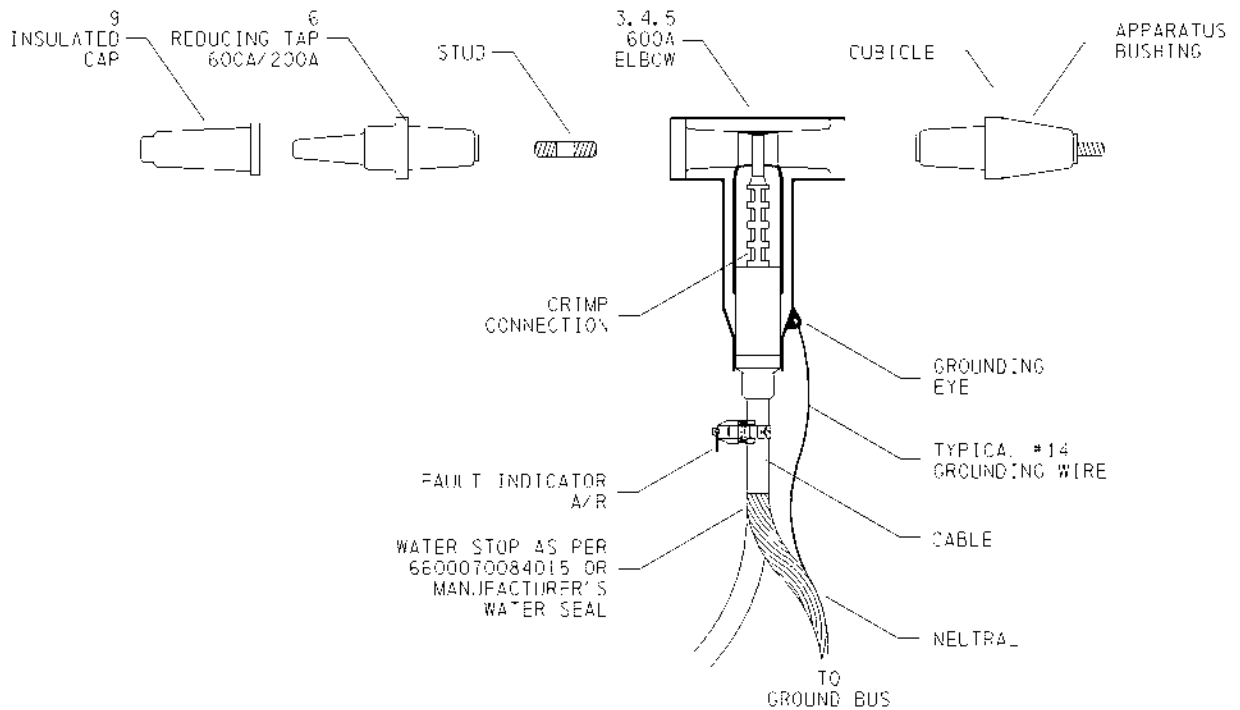
NOTE :

TIGHTEN NUT UNTIL WASHER BECOMES FLAT THEN BACK OFF SLIGHTLY (APPROXIMATELY 50 ft lbs TORQUE)

DETAIL 'A'

20110525 09:29 baa


					UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING				
						INSTALLATION OF S & C 4-WAY 3 PHASE 600 AMP DEADFRONT 15KV SWITCHING CUBICLE (GENERAL ARRANGEMENTS)			
						Drawn By BAO	Checked By DXT	Approved By	
						Scale A.T.S.	Drawing No. U-756-012		Page No. 2/5
						Date 06-11-21			
1	CREATED FOR VOLUME 7	BAO	06-11-21						
No.	DETAILS	BY	DATE	APPD					
REVISIONS									



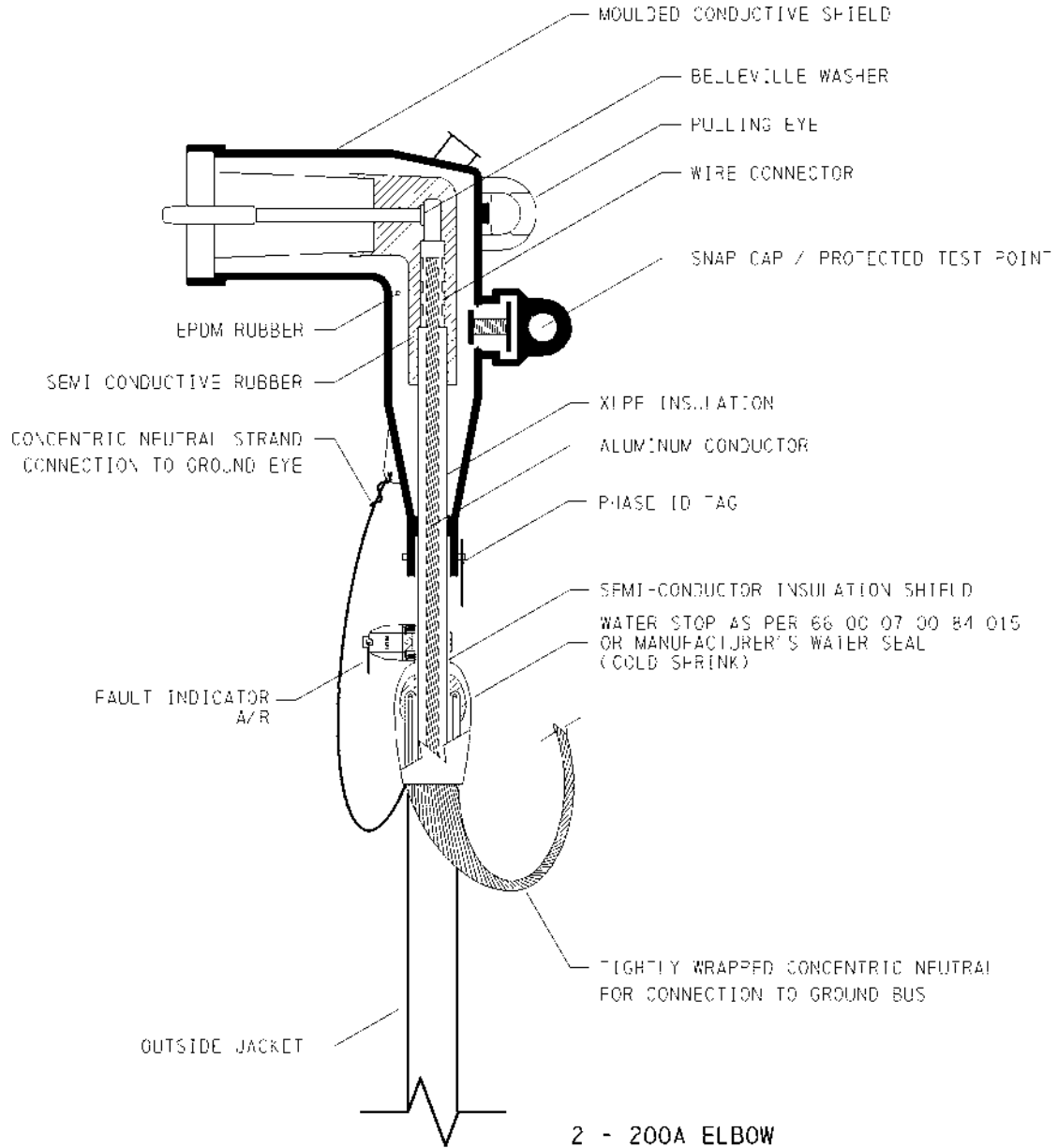
SWITCH COMPARTMENT CABLE TERMINATION

600A ELBOW TO BE INSTALLED AS PER THE MANUFACTURERS INSTRUCTIONS

20110525 09:29 baa

					UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING				
						INSTALLATION OF S & C 4-WAY 3 PHASE 600 AMP DEADFRONT 15KV SWITCHING CUBICLE (GENERAL ARRANGEMENTS)			
						Drawn By BAO	Checked By DXT	Approved By	
						Scale N.T.S.	Drawing No. U-756-012		Page No. 3/5
						Date 06-11-21			
						REVISIONS			
1	CREATED FOR VOLUME 7	BAO	06-11-21						
No.	DETAILS	BY	DATE	APPD					


TYPICAL FUSING COMPARTMENT TERMINATION



NOTE :


DRAWING IS FOR TAPING INSTRUCTIONS ONLY. INSTALLATION AS PER MANUFACTURER'S INSTRUCTIONS
ALL DIMENSIONS GIVEN IN MILLIMETERS

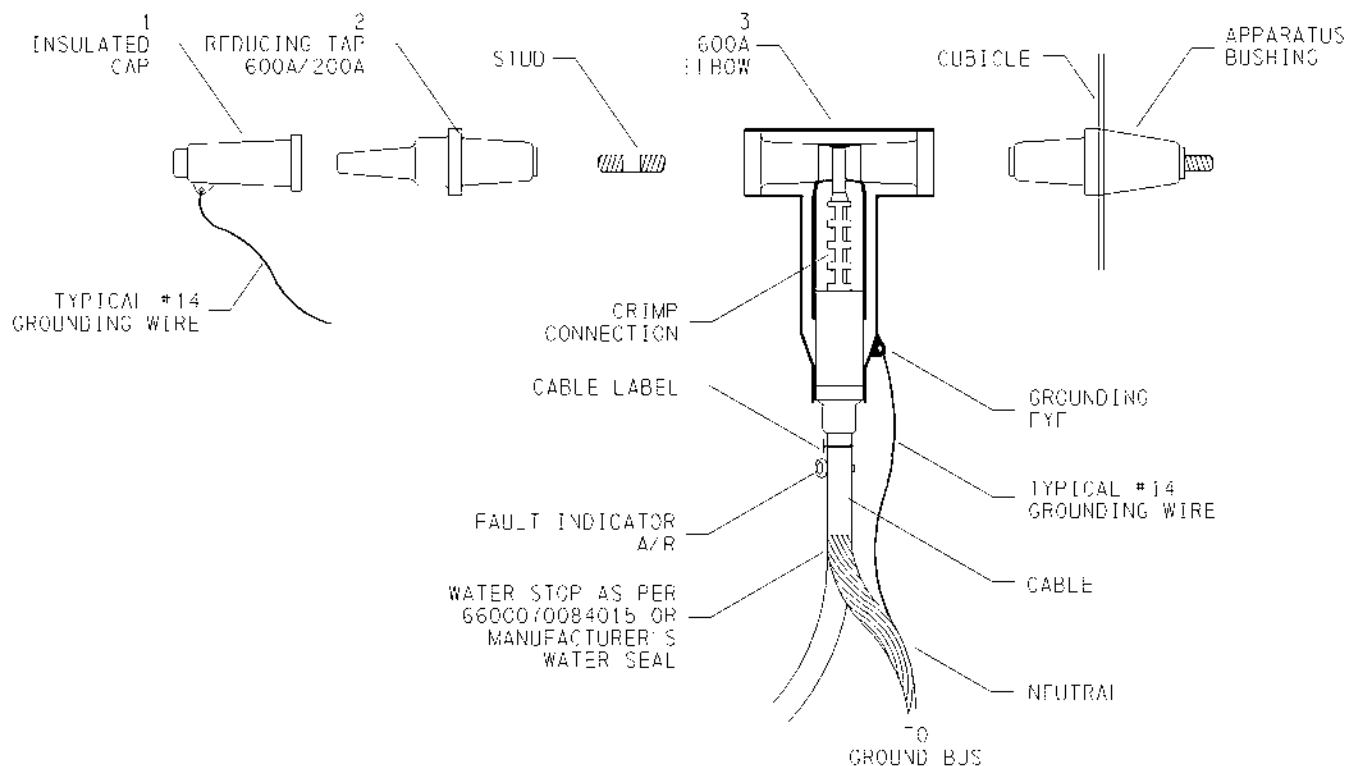
20110525 09:41 baa

UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING					INSTALLATION OF S & C 4-WAY 3 PHASE 600 AMP DEADFRONT 15KV SWITCHING CUBICLE (GENERAL ARRANGEMENTS)		
<div style="text-align: center;">  </div>					Drawn By	Checked By	Approved By
					BAO	DXT	
					Scale A.T.S.	Drawing No.	Page No.
					Date 06-11-21	U-756-012	4/5
No.	DETAILS	BY	DATE	APPD			
REVISIONS							

ITEM	DESCRIPTION	PART/STOCK #	QTY.
1	CUBICLE 4 WAY 2 600A 2 200A 15kv PME 9	44611	A/R
1	CUBICLE 4-WAY 4-600A 15kv PME-10	72699	A/R
1	CUBICLE 4-WAY 3-600A - 1-600A 15 KV PME-11	30281	A/R
1	CUBICLE 4-WAY 1-600A - 3-200A 15kv PME-12	41632	A/R
2	ELBOW #2 15 KV 200A	35565	A/R
2	ELBOW 1/0 15 KV 200A	35566	A/R
3	ELBOW 350MCM 15kv 600A	34543	A/R
4	ELBOW 500MCM 15 KV 600A	33353	A/R
5	ELBOW 750MCM 15kv 600A	48455	A/R
6	REDUCING TAP W/FL 600 TO 200A	48450	A/R
7	FAULT INDICATOR	51247	A/R
8	FUSE S/C REFILL SM4 200A	30862	A/R
9	INSULATED CAP	69918	A/R
12	PADLOCK AMERICAN	24921	4
13	BOLTS STEEL CAP 5/8 X 1 PLATED	2614	4
14	PLATE FLAT 6 X 2 X 1/4 THICK BY 3/4" HOLE GALVANIZED	73145	4
15	LAMICOID LABEL		A/R
16	STICK ON DECAL U-249-A		1
17	AMP T CONN #2 35185 1/2 HOLE	24443	A/R
18	AMP T CONN 4-0 1/2 36934	38628	A/R
19	4/0 COPPER SEC. LLG	38436	1
20	WASHERS BRASS FLAT 3/8	22968	A/R
21	STICK ON DECAL U 249 A	24746	1
22	BOLTS COPPER 3/8 BY 1 1/2	24536	A/R
23	BELLEVILLE WASHER 3/8	58188	A/R
24	NUTS - EVERDUR COPPER 3/8	44711	A/R
25	INSULATING CAP WITH GROUND (FOR UNUSED FUSED BUSHINGS)	031795	A/R

20110525 09:41 baa


				UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING					
									
				INSTALLATION OF S & C 4-WAY 3 PHASE 600 AMP DEADFRONT 15KV SWITCHING CUBICLE (GENERAL ARRANGEMENTS)					
2	ADDED INSULATING CAP	BAO	08-10-06	Drawn By BAO		Checked By DXT		Approved By	
1	CREATED FOR VOLUME 7	BAO	06-11-21	Scale A.T.S.		Drawing No. U-756-012		Page No. 5/5	
No.	DETAILS	BY	DATE	APPD	Date 06-11-21				
REVISIONS									

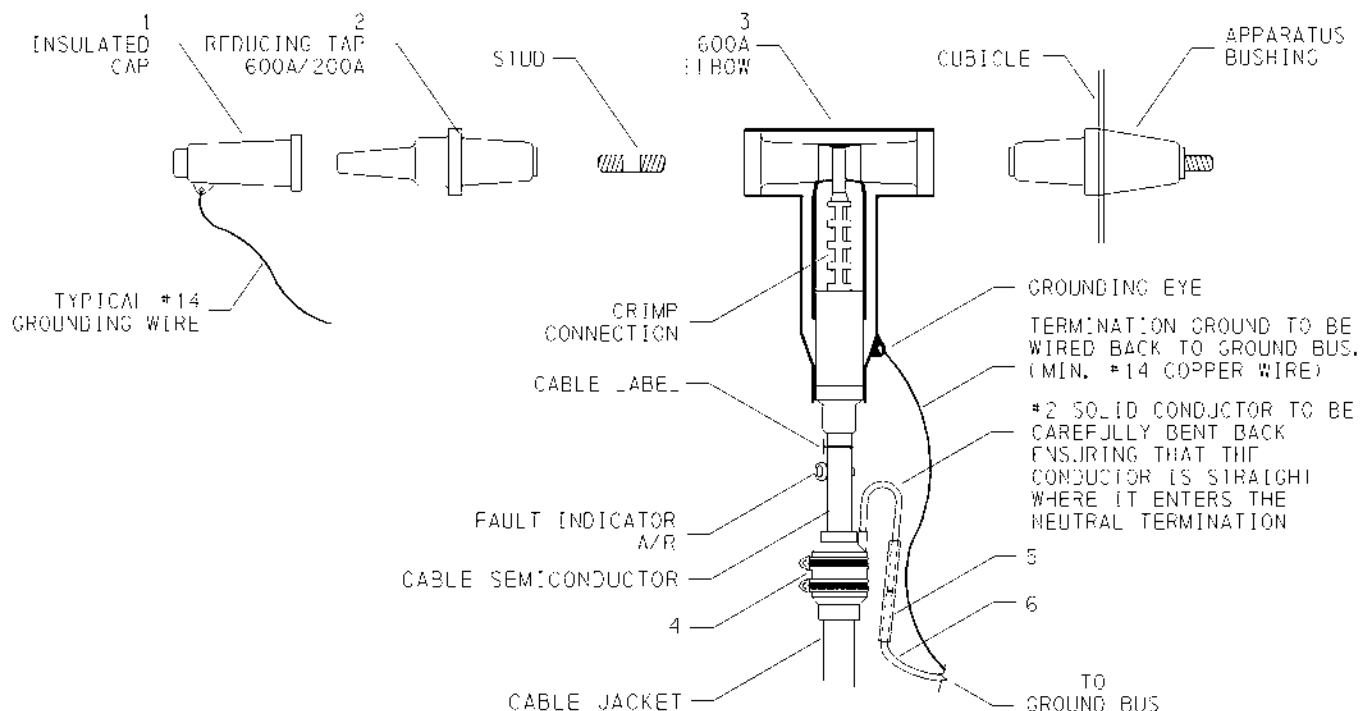


TYPICAL 600A ELBOW CABLE TERMINATION

SEE SHEET 2 FOR LC SHIELD TERMINATION
(750VCM LC SHIELD CABLE ONLY)

600A ELBOW TO BE INSTALLED AS PER THE MANUFACTURERS INSTRUCTIONS

				UNDERGROUND DISTRIBUTION CONSTRUCTION STANDARDS							
					TERMINATION OF 15KV TRXLPE CABLES USING 600A ELBOWS						
					Drawn By RINGO TSANG		Checked By DAVID ARNOLD		Approved By DAVID ARNOLD		
A	REVIEWED BY STANDARDS COMMITTEE		RT		02-02-27		DA				
No.	DETAILS		RY		DATE		APPD				
REVISIONS											
				Date		02-01-08		Standard No. 65 00 07 15 23 007		Page No. 1/3	




LC SHIELD TERMINATION

NOTE:


1. CABLE NEUTRAL AND TERMINATION GROUND TO BE CONNECTED TO THE GROUND BUSS.
2. LC SHIELD TERMINATION TO BE INSTALLED AS PER MANUFACTURERS INSTRUCTIONS.

ALL DIMENSIONS GIVEN IN MILLIMETERS

UNDERGROUND DISTRIBUTION CONSTRUCTION STANDARDS			
			
		TERMINATION OF 15KV TRXLPE CABLES USING 600A ELBOWS	
		Drawn By RINCO TSANG	Checked By DAVID ARNOLD
		Approved By DAVID ARNOLD	
REVISIONS		Scale N.T.S.	Standard No.
No.	DETAILS	BY	DATE
		DATE	02-01-08
		Page No.	2/3

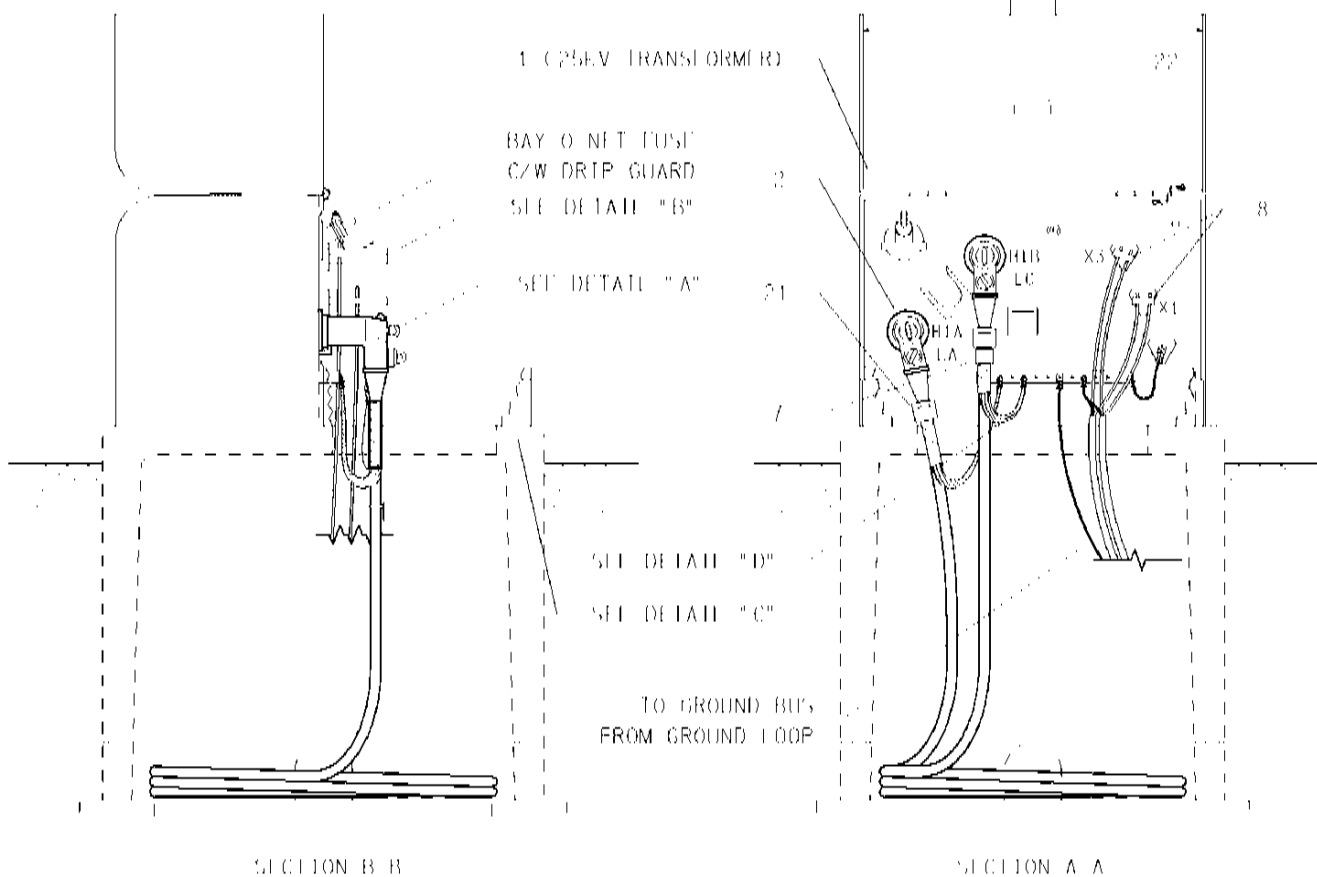
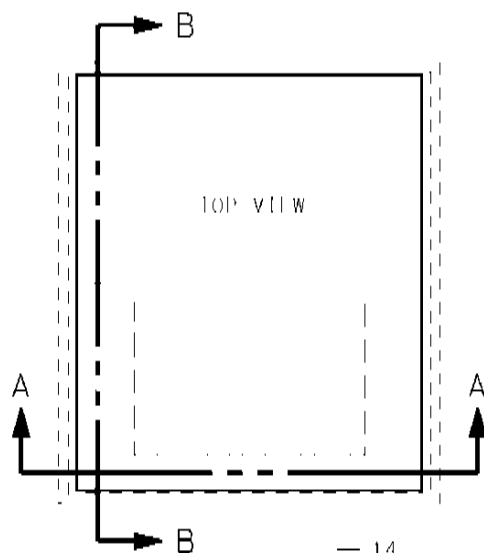
ITEM	DESCRIPTION	PART/STOCK #	QTY.
1	INSULATED CAP	069918	A/R
2	REDUCING TAP 600A TO 200A	048450	A/R
3	750MCM CU 15KV LC SHIELD CABLE OR 33% CN CABLE		
	ELASTIMOLD 600A ELBOW	048455	A/R
	RICHARDS 600A ELBOW	054788	A/R
	KIT (INCLUDES ITEMS 1, 2 AND 3)	010231	A/R
3	500MCM CU 15KV 33% CN CABLE		
	ELASTIMOLD 600A ELBOW	033353	A/R
	RICHARDS 600A ELBOW	055132	A/R
	KIT (INCLUDES ITEMS 1, 2 AND 3)	010233	A/R
3	500MCM AL 25KV (USED AT 15KV) 33% CN CABLE		
	ELASTIMOLD 600A ELBOW	018694	A/R
	RICHARDS 600A ELBOW	496605	A/R
	KIT (INCLUDES ITEMS 1, 2 AND 3)	010232	A/R
3	350MCM AL 25KV 33% CN CABLE		
	ELASTIMOLD 600A ELBOW	051814	A/R
	KIT (INCLUDES ITEMS 1, 2 AND 3)	NCNE	A/R
3	350MCM AL 15KV 33% CN CABLE		
	ELASTIMOLD 600A ELBOW	034543	A/R
	KIT (INCLUDES ITEMS 1, 2 AND 3)	010230	A/R
4	LC SHIELD TERMINATION FOR 750MCM LC SHIELD CABLE	048457	A/R
5	SLEEVE #2 TO #2	025053	A/R
6	NEUTRAL WIRE	037658	A/R
<p>NOTE THAT THE KITS LISTED BELOW WILL EVENTUALLY REPLACE THE COMPONENTS ABOVE</p> <p><u>KITS</u> - INCLUDES ELBOW BODY, REDUCING TAP AND INSULATING CAP</p> <p>750 MCM CU 15KV LC SHIELD CABLE OR 33% NEUTRAL CABLE 010231 A/R</p> <p>500 MCM CU 15KV 33% NEUTRAL CABLE 010233 A/R</p> <p>500 MCM AL 15KV 33% NEUTRAL CABLE 010232 A/R</p> <p>350 MCM AL 15KV 33% NEUTRAL CABLE 010230 A/R</p>			

NOTE : SPECIFY QUANTITY BASED ON NUMBER OF TERMINATIONS (PHASES) TO BE INSTALLED


				UNDERGROUND DISTRIBUTION CONSTRUCTION STANDARDS				
					TERMINATION OF 15KV TRXLPE CABLES USING 600A ELBOWS			
					Drawn By	Checked By	Approved By	
					RINGO TSANG	DAVID ARNOLD	DAVID ARNOLD	
					Scale N.T.S.	Standard No.		Page No.
					Date 02-01-08	65 00 07 15 23 001		3/3
A	REVIEWED BY STANDARDS COMMITTEE	RT	02-02-27	DA				
No.	DETAILS	BY	DATE	APPD				
REVISIONS								

NOTE :

ALL CABLES ARE TO HAVE A MINIMUM OF 4 METERS OF EXTRA LENGTH COILED IN BAY.
THE SERVICE CABLE CONCENTRIC NEUTRAL WIRES FROM THREE SERVICE CABLES (2 FOR 4/0 SERVICE CABLES) ARE TO BE WOUND TOGETHER AND TERMINATED TO ONE COMPRESSION GROUND LUG.
REFER TO TABLE 1 (PAGE 4) FOR DETAILS.



FOR INSTALLATION PURPOSES ONLY REFER TO SPECIFICATION DRAWINGS FOR ALL OTHER APPLICATIONS

					UNDERGROUND DISTRIBUTION CONSTRUCTION STANDARDS			
					INSTALLATION OF SINGLE PHASE 25kV 'MNB' TYPE TRANSFORMER ON EXISTING PAD (SERVICES DIRECTLY FROM TRANSFORMER)			
								
2. PAGE 5 REVISED					RT	02/04/04	DA	Drawn By S. STOLARCHUK
1. REVIEWED BY STANDARD'S COMM.					RT	00/07/19	DA	Checked By C. CLARKE
No. DETAILS					BY	DATE	APPD	Approved By C. CLARKE
REVISIONS					Scale: N.T.S. Date: 99-12-30			
					Standard No. 66-00-07-25-27-005			
					Page No. 1/6			

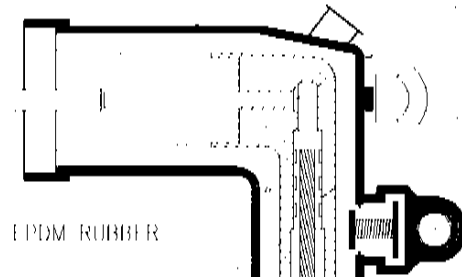
MOULDED CONDUCTIVE SHIELD

BELLEVILLE WASHER

PULLING EYE

WIRE CONNECTOR

SNAP CAP / PROTECTED TEST POINT



EPDM RUBBER

SEMI CONDUCTIVE RUBBER

CONCENTRIC NEUTRAL STRAND
CONNECTION TO GROUND EYE

XLPF INSULATION

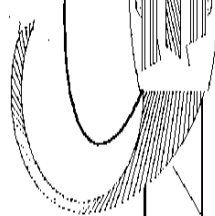
ALUMINUM CONDUCTOR

PHASE ID TAG

SEMI CONDUCTOR INSULATION SHIELD

WATER STOP AS PER 66 00 07 00 84 015
OR MANUFACTURER'S WATER SEAL (COLD SHRINK)

FAULT INDICATOR (ON LC ONLY)



TIGHTLY WRAPPED CONCENTRIC NEUTRAL
FOR CONNECTION TO GROUND BUS

OUTSIDE JACKET

NOTE :

DRAWING IS FOR TAPING INSTRUCTIONS ONLY. INSTALLATION AS PER MANUFACTURER'S INSTRUCTIONS

UNDERGROUND DISTRIBUTION CONSTRUCTION STANDARDS




INSTALLATION OF SINGLE PHASE
25kV 'MNB' TYPE TRANSFORMER
ON EXISTING PAD
(SERVICES DIRECTLY FROM TRANSFORMER)

Drawn By S. STOLARCHUK	Checked By C. CLARKE	Approved By C. CLARKE
Scale: N.T.S.	Standard No. 66 00 07 25 27 005	Page No. 2/6
Date: 99 12 30		

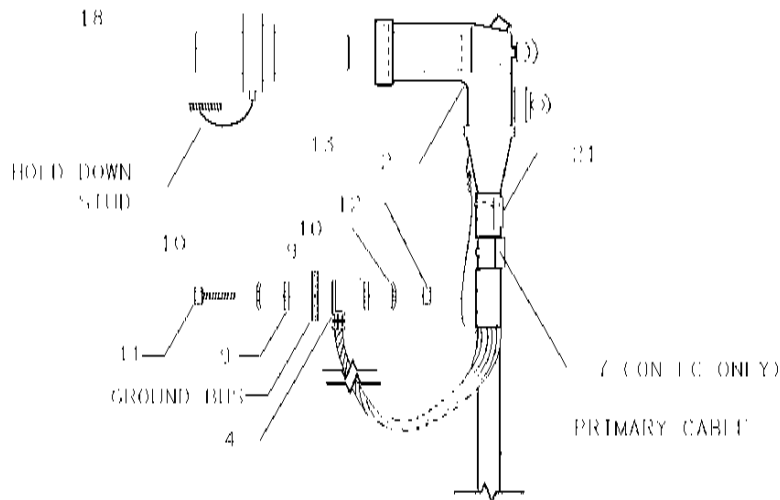
No.	DETAILS	BY	DATE	APPD
2.	PAGE 5 REVISED	RT	02/04/04	DA
1.	REVIEWED BY STANDARD'S COMM.	RT	00/07/19	DA
REVISIONS				

[illegible]

THE CONDUCTOR CONNECTORS AND THE ELBOW PINS MUST NOT BE INTERCHANGED AND FITTED INTO ELBOWS UNLESS THEY ARE FROM THE SAME MANUFACTURER.

					UNDERGROUND DISTRIBUTION CONSTRUCTION STANDARDS			
						INSTALLATION OF SINGLE PHASE 25kV 'MNB' TYPE TRANSFORMER ON EXISTING PAD (SERVICES DIRECTLY FROM TRANSFORMER)		
2.	PAGE 5 REVISED	RT	02/04/04	DA		Drawn By	Checked By	Approved By
1.	REVIEWED BY STANDARD'S COMM.	RT	00/07/19	DA		S. SLO ARCHIB	C. CLARKE	C. CLARKE
No.	DETAILS	BY	DATE	APPD		Scale: N.T.S.	Standard No.	Page No.
REVISIONS					Date: 99-12-30	Std: 00-07-25 27-005	3/6	

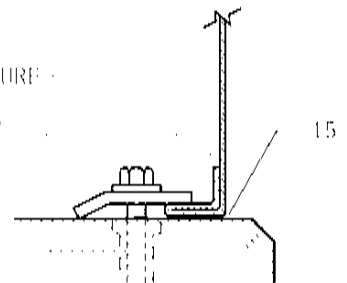
18

**DETAIL A (LOAD BREAK ELBOW)**

ENCLOSURE

16, 17

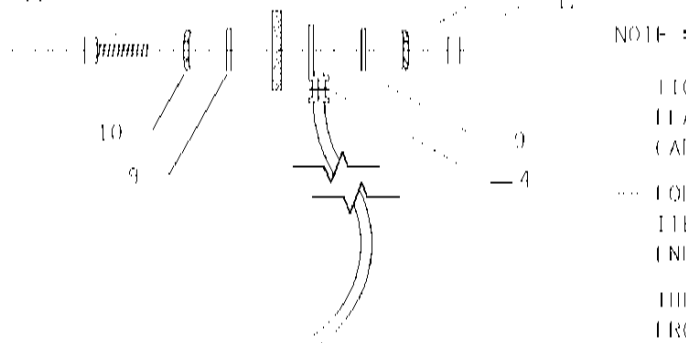
BASE

**DETAIL C (ANCHORING DETAIL)**

TYPICAL 4 CORNERS

GROUND BIPS —

11



NOTE :

TIGHTEN NUT UNTIL WASHER BECOMES
FLAT THEN BACK OFF SLIGHTLY
(APPROXIMATELY 50 +/- lbs TORQUE)

FOR RADIAL FEED USE 1 EACH OF
ITEMS 2, 3 & 7 AND 1 DEAD
END PLUG STOCK No. 031795

THE SERVICE CABLE CONCENTRIC NEUTRAL WIRES
FROM THREE SERVICE CABLES (2 FOR 4/0 SERVICE
CABLES) ARE TO BE WOUND TOGETHER AND
TERMINATED TO ONE COMPRESSION GROUND LUG.

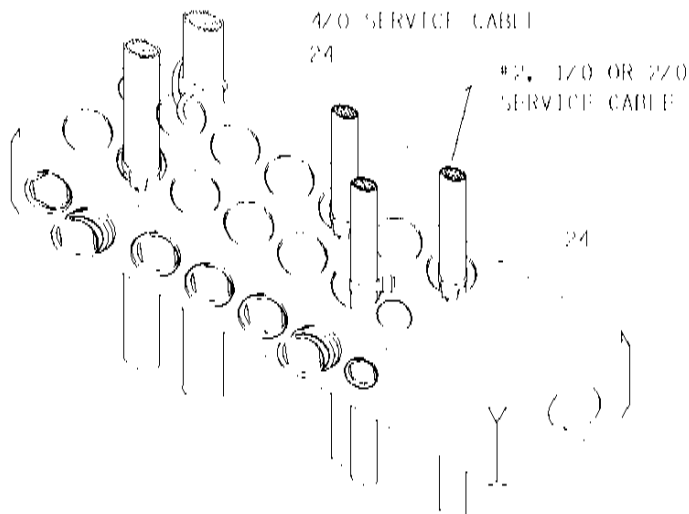
DETAIL "D"**TABLE 1**

SERVICE CABLE OR WIRE SIZE	APPROX. NEUTRAL SIZE	NEUTRAL COMPRESSION LUG	S/N
3 #2 USEB	3 #6	AMPT CONN #2	000172
3 #1/0 USEB	3 #4	AMPT CONN 2/0	038480
3 #2/0 USEB	3 #3	AMPT CONN 4/0	044950
2 #4/0 USEB	2 #1	AMPT CONN 4/0	044950
1 #4/0 BARE CU	-	DIK LUGCH 1/C 5/0-4/0	034945
1 1/C #2 15KV	#4	AMPT CONN #4	053081
1 1/C 1/0 15KV	#2	AMPT CONN #2	000172

UNDERGROUND DISTRIBUTION CONSTRUCTION STANDARDS
**INSTALLATION OF SINGLE PHASE
25kV 'MNB' TYPE TRANSFORMER
ON EXISTING PAD
(SERVICES DIRECTLY FROM TRANSFORMER)**

2.	PAGE 5 REVISED	RT	02/04/04	DA
1.	REVIEWED BY STANDARDS COMM.	RT	00/07/19	DA
No.	DETAILS	BY	DATE	APPD
REVISIONS				

Drawn By S. STOLARCHUK	Checked By C. CLARKE	Approved By C. CLARKE
Scale: N. 1" = 5'	Standard No. 66-00-07-25-27-005	Page No. 4/6
Date: 99-12-30		



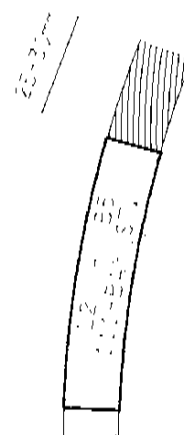
DETAIL "B"

PRIOR TO SERVICE ENERGIZATION

URD SERVICING CONTRACTOR TO INSTALL TEMPORARY SERVICE CABLE IDENTIFICATION AS PER THE CITY OF EDMONTON DESIGN AND CONSTRUCTION STANDARDS MANUAL, CHAPTER 7, CLAUSE 4.6.3.11. CLEAR PLASTIC TUBING WITH LEGAL DESCRIPTION IN BLACK PERMANENT INK ON X3 CONDUCTOR.

SERVICE CABLE #2, 1/0 & 2/0 ARE TO BE TRAINED INTO THEIR ASSIGNED HOLE. FIL WRAP TO BE INSTALLED AS PER DETAIL. TIGHTEN SET SCREW ONLY TIGHT ENOUGH TO PREVENT CABLE FROM SLIPPING OUT.

4/0 SERVICE CABLES TO BE WRAPPED TO OUTSIDE OF TERMINAL BLOCK AS PER DETAIL B.



WHITE PREPRINTED
SELF-ADHESIVE LABEL
LETTERS/NUMBERS MIN.
5mm HIGH

CLEAR HEAT
SHRINK TUBING

DETAIL "F"

LABELLING REQUIREMENTS AFTER ENERGIZATION
(TO BE INSTALLED BY SERVICE ENERGIZER)

NOTE:

1. PERMANENT LABEL GOES ON X3 CONDUCTOR ONLY
2. ADDRESS TO BE INSTALLED AT SERVICE ENERGIZATION TIME.
3. THE PERMANENT LABEL IS TO BE THE STREET ADDRESS.

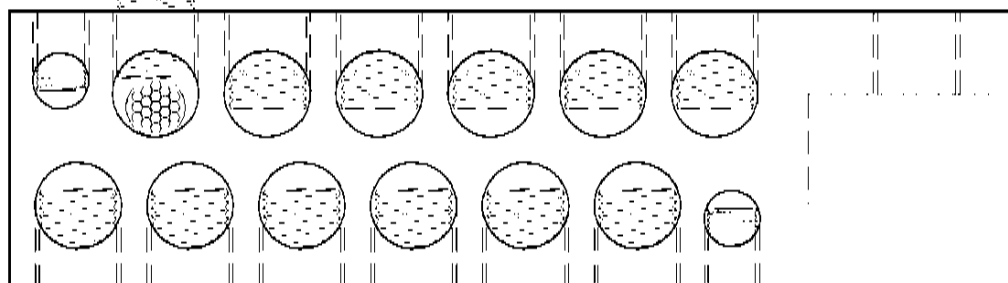
TORQUING INSTRUCTIONS:

CONNECTOR SIZE

- #4 3/0 (SMALL HOLE)
- 4 350 (LARGE HOLE)

RECOMMENDED TORQUE

- 15 20 ft. lb
- 23 38 ft. lb



DETAIL "E" (SECONDARY TERMINAL BLOCK)

SEE 660004052/001


NOTE:

- a) THE ALLEN WRENCH MUST BE PROPERLY SET IN THE SET SCREW OR DAMAGE WILL BE CAUSED TO THE SET SCREW WHICH WILL "FREEZE" IT IN THE BODY OF THE CONNECTOR.
- b) THE SET SCREW SHOULD BE TORQUED. AFTER A FEW SECONDS THE SET SCREW SHOULD BE RETIGHTENED.
- c) ENSURE THAT THE "ORIENTATION" OF THE TERMINAL BLOCK IS SET, SO THAT THE SET SCREWS CAN BE READILY ACCESSED WHEN CABLES ARE INSTALLED.

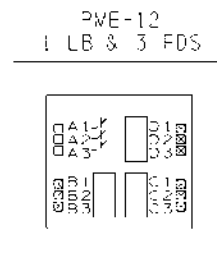
				UNDERGROUND DISTRIBUTION CONSTRUCTION STANDARDS			
				INSTALLATION OF SINGLE PHASE 25kV 'MNB' TYPE TRANSFORMER ON EXISTING PAD (SERVICES DIRECTLY FROM TRANSFORMER)			
				EPCOR			
2.	REVISED DETAIL B	RT	02/04/04	DA	Drawn By	Checked By	Approved By
1.	REVIEWED BY STANDARDS COMM.	RT	00/07/19	DA	S. STOLARCHUK	C. CLARKE	C. CLARKE
No.	DETAILS	BY	DATE	APPD	Scale	Standard No.	Page No.
REVISIONS					Date	66-00-07-25-27-005	5/6

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ITEM	DESCRIPTION	PARTS/STOCK #	QTY.
1	TRANSFORMER / AS REQUIRED		1
2	ELBOW TERMINATOR 1/0 25KV	68056	A/R
4	AMP 1 CONN #4L 33471	053081	A/R
4	AMP 1 CONN #2L 35184	000162	A/R
4	ORING CU 1 C 3 0 4 0	024945	1
4	AMP 1 CONN #2-01 36923 3/8	038489	A/R
4	AMP 1 CONN #4 01 36934 3/8	038950	A/R
7	FAULT INDICATOR 1 0 / 350MM	051247	1
8	SECONDARY TERMINAL BLOCK	057318	2
9	WASHERS BRASS FLAT 3/8IN.	022988	A/R
10	WASHERS BELLEVILLE 3/8IN.	058191	A/R
11	BOLTS COPPER 3/8 x 3/4	024533	A/R
11	BOLTS COPPER 3/8 x 1	024534	A/R
11	BOLTS COPPER 3/8 x 1 1/4	024535	A/R
12	NUTS EVERDUR COPPER 3/8IN.	044711	A/R
13	BARE COPPER WIRE	FROM CABLE	A/R
14	PADLOCK AMERICAN	024921	1
15	SEALANT BDOG. DOW CORNING	NON STOCK	A/R
16	BOLTS STEEL CAP 5/8 x 1-1/4 PLATED (UNIT EACH)	002814	4
17	PLATE FLAT 1/4 x 2 x 6 IN. HOT DIP GALVANIZED	073145	4
18	BUSHING INSERT 15KV 200A WITH TRANSFORMER	024592	2
19	TAPE 3/4IN. #13 SCOTCH 151L	025116	A/R
21	LAMICOID WHITE RED BKG (UNIT EACH)		2
22	STICK-ON DECAL U-249-A (UNIT EACH)	050997	1
23	HEAT SHRINK	062428	1
24	TIE WRAPS	025145	A/R

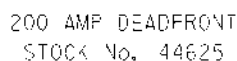
				UNDERGROUND DISTRIBUTION CONSTRUCTION STANDARDS			
				<div>  <div> INSTALLATION OF SINGLE PHASE 25kV 'MNB' TYPE TRANSFORMER ON EXISTING PAD (SERVICES DIRECTLY FROM TRANSFORMER) </div> </div>			
2.	PAGE 5 REVISED	RT	02/04/04	DA	Drawn By	Checked By	Approved By
1.	REVIEWED BY STANDARD'S COMM.	RT	00/07/19	DA	S. STORARCHUK	C. CLARKE	C. CLARKE
No.	DETAILS	BY	DATE	APPD	Scale: N. 1" = 5'	Standard No.	Page No.
REVISIONS					Date: 99-12-30	66-00-07-25-27-005	6/6

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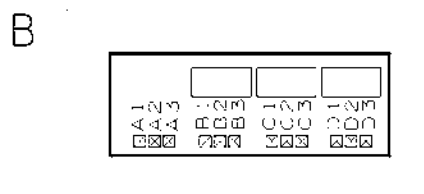
STK# 47628

- DEADFRONT 25KV 200A SINGLE PHASE 4-WAY



1. INSTALLATION CONSTRUCTION STANDARD 6600072523006.
2. PRECAST BASE IS STOCK No. 56200 (1.55m W X 1.155m D X 0.865m H).
3. BASE CONSTRUCTION INSTALLATION STANDARD IS 6600072523005.


DEADFRONT 25KV 200A THREE PHASE 4-WAY

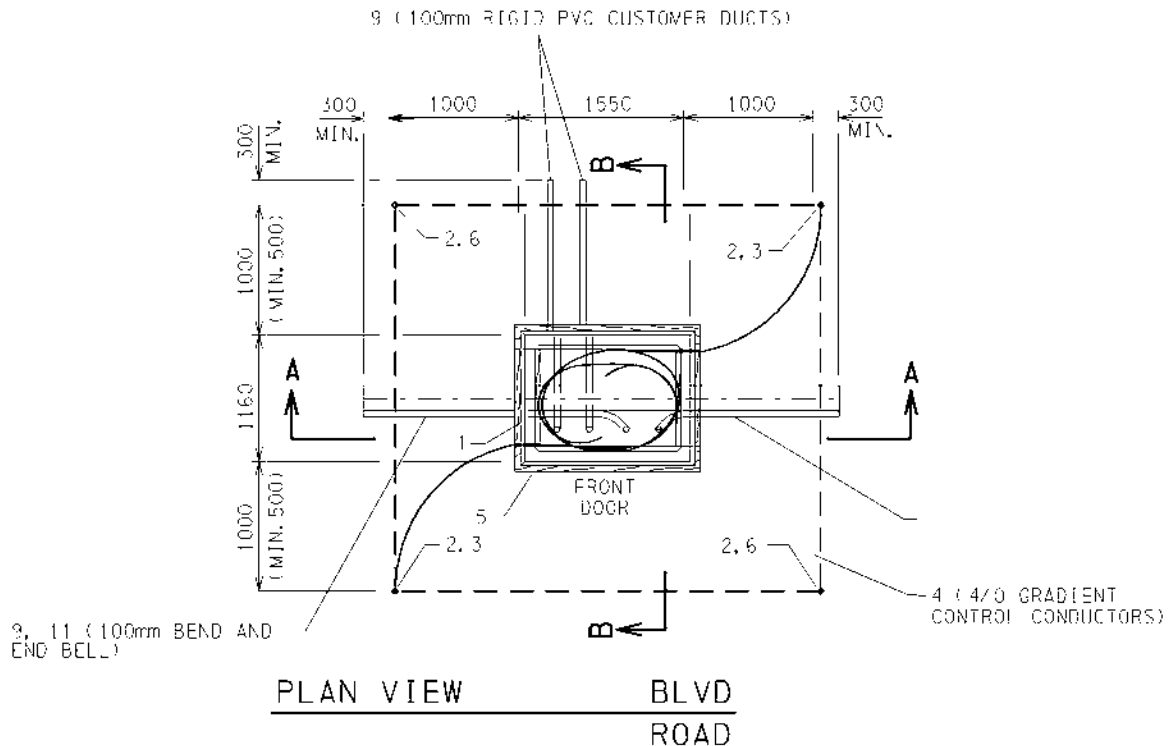
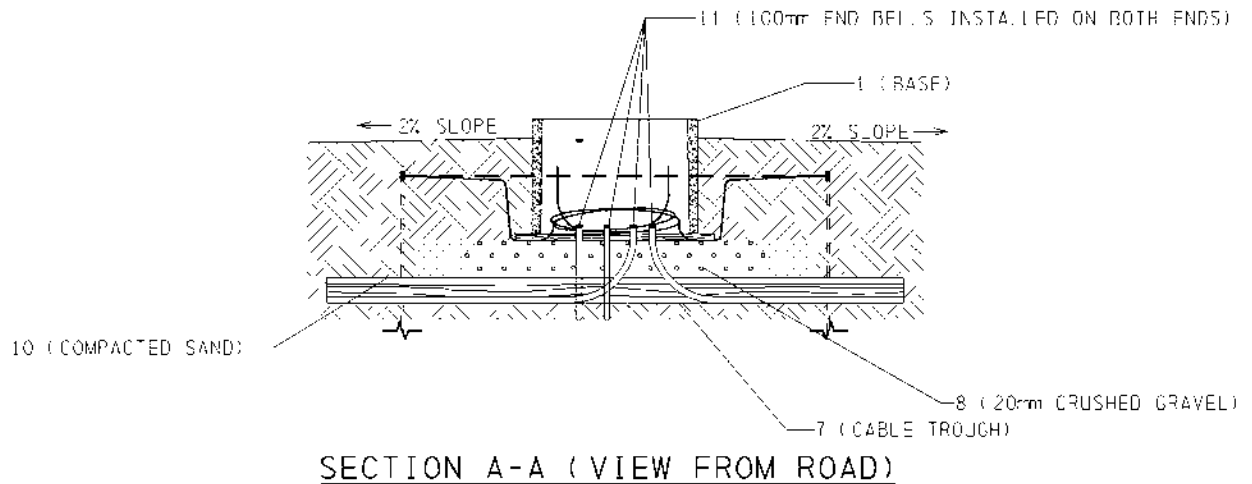


200 AMP DEADFRONT
STOCK No. 6840 (OLD STYLE)

1. INSTALLATION CONSTRUCTION STANDARD IS 6600072523008.
2. PRECAST BASE FOR CUBICLE 'A' STOCK No. 44600 (2.21m W X 1.90m D X 0.865m H).
 PRECAST BASE FOR CUBICLE "B" STOCK No. 48743 (2.125m W X 2.185m D X 0.990m H).
3. INSTALLATION CONSTRUCTION STANDARD FOR BASE FOR CUBICLE 'A' IS 6600072523007.
4. INSTALLATION CONSTRUCTION STANDARD FOR BASE FOR CUBICLE 'B' IS 6500072523006.

NOTE THAT THE FAULT RATING OF T-15 CUBICLE IS LIMITED BY THE RATING OF THE 200A ELBOW - 200A CONTINUOUS, 10KA SYMMETRICAL, 10 CYCLES.

					UNDERGROUND DISTRIBUTION CONSTRUCTION STANDARDS				
						SUMMARY OF 25kV DEAD FRONT SWITCHING CUBICLE INSTALLATION INFORMATION			
						Drawn By RINGO TSANG	Checked By GARY EGGEN	Approved By D. ARNOLD	
A	REVIEWED BY STANDARD COMMITTEE	RT	04-12-16	CF		Scale N.T.S.	Standard No.		Page No.
No.	DETAILS	BY	DATE	APPD		Date 04-12-15	66 00 07 25 23 009		1/1
REVISIONS									



ALL DIMENSIONS GIVEN IN MILLIMETERS

UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING



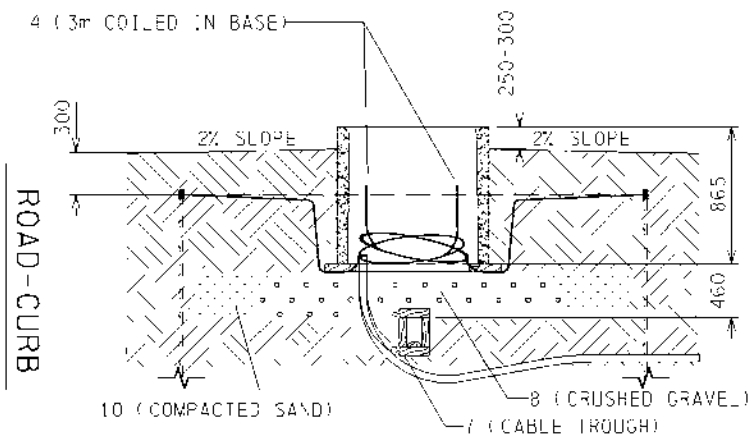
INSTALLATION OF
PRECAST CONCRETE BASE FOR
4-WAY SINGLE PHASE 200 AMP DEAD FRONT
25kV SWITCHING CUBICLE
(STOCK No. 56200)

Drawn By BAO	Checked By DXT	Approved By
Scale A.T.S.	Drawing No. U-756-013	Page No. 1/4
Date 06-11-21		

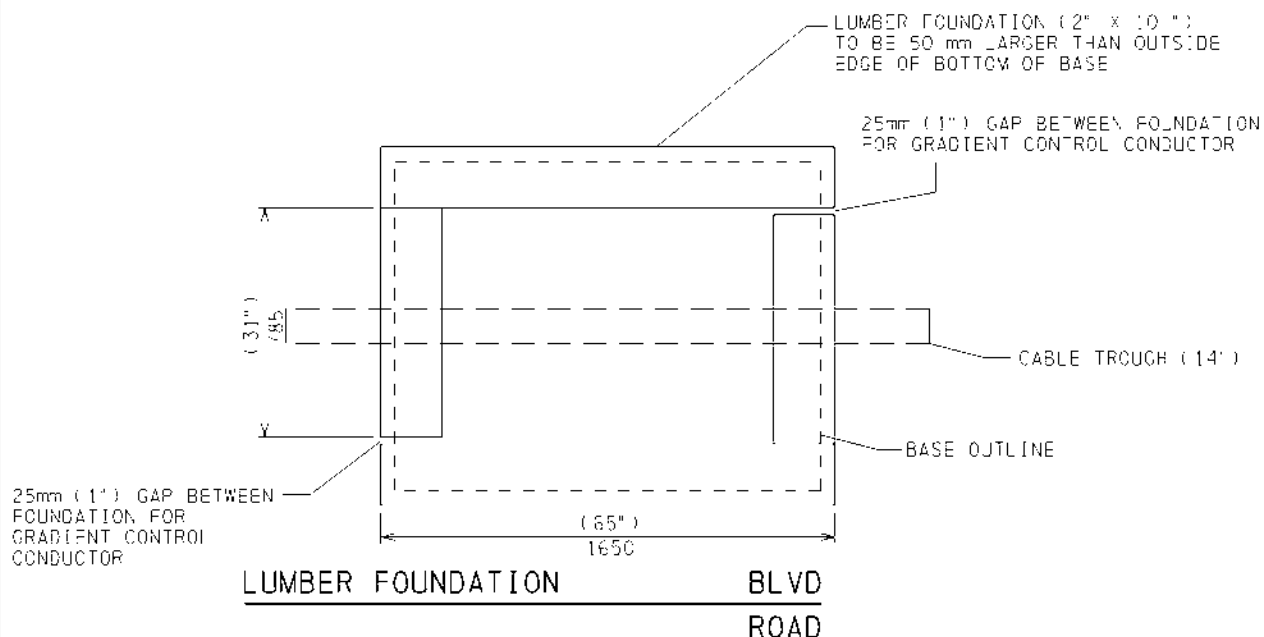
No.	DETAILS	BY	DATE	APPD
1	CREATED FOR VOLUME 7	BAO	06-11-21	
REVISIONS				

20110525 09:30 baa

ROAD
BLVD



SECTION B-B (FROM PAGE 1)
VIEW ALONG TRENCH ALIGNMENT



ALL DIMENSIONS GIVEN IN MILLIMETERS

UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING



INSTALLATION OF
PRECAST CONCRETE BASE FOR
4-WAY SINGLE PHASE 200 AMP DEAD FRONT
25KV SWITCHING CUBICLE
(STOCK No. 56200)


Drawn By BAO	Checked By DXT	Approved By
Scale N.T.S.	Drawing No. U-756-013	Page No. 2 / 4
Date 06-11-21		

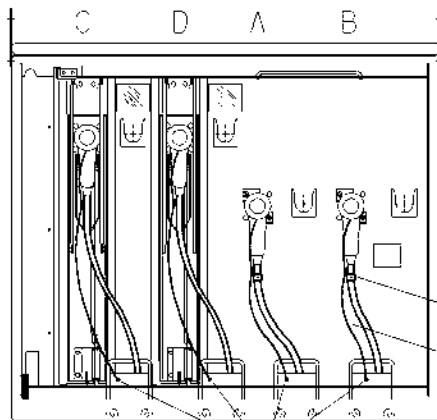
No.	DETAILS	BY	DATE	APPD
2	UPDATED DEPTH	BAO	08-10-06	
1	CREATED FOR VOLUME 7	BAO	06-11-21	
REVISIONS				

20110525 09:32 bao

ITEM	DESCRIPTION	PART/STOCK #	QTY.
1	BASE, PRECAST SW/CU 4 WAY, 1 PHASE, 200 AMP, 25 kV	56200	1
2	RODS, GROUND 5/8" x 10FT. COPPER CLAD	73937	4
3	CONNECTOR, GRD 5/8" ROD - 250 DOUBLE WIRE	9136	2
4	WIRE, BARE COPPER 4/0 STRANDED 19W	45655	30
5	LUMBER SPRUCE PRESSURE TREATED (2" x 10")	42392	2
6	CONNECTOR, GROUND ROD 5/8"N. (4/0)	31914	2
7	TROUGH (PRESSURE TREATED WOOD 2' X 10') - SEE DWG. NO. U-756-003	27272	2
8	20mm CRUSHED GRAVEL	15588	3
9	BEND RIGID PVC 100mm (4") 24R 90D	44327	4
10	SAND (UNIT = CU.m)	14433	3
11	100 mm FND FILL	20574	A/R

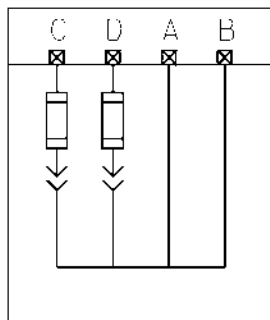
20110525 09:40 ba0

					UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING				
						INSTALLATION OF PRECAST CONCRETE BASE FOR 4-WAY SINGLE PHASE 200 AMP DEAD FRONT 25kV SWITCHING CUBICLE (STOCK No. 56200)			
2	ADDED INSULATING CAP	BA0	08-10-06			Drawn By BA0	Checked By DXT	Approved By	
1	CREATED FOR VOLUME 7	BA0	06-11-21						
No.	DETAILS	BY	DATE	APPD					
REVISIONS									
					Scale N.T.S.	Drawing No. U-756-013		Page No. 4/4	

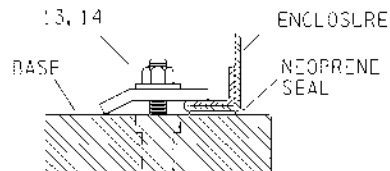


NEUTRALS TERMINATED TO
WORKING GROUND PLATE
(SEE PAGE 2, DETAIL 'A')

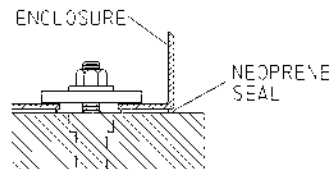
FUSE COMPARTMENT



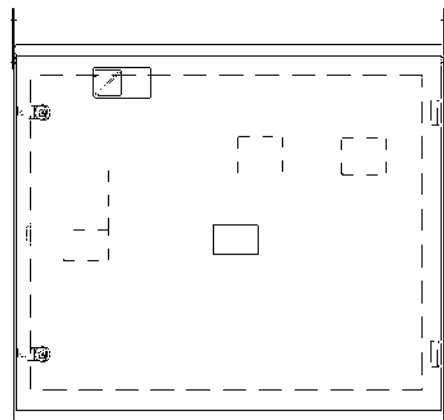
CONNECTION DIAGRAM



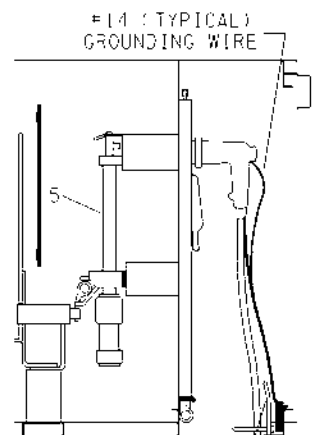
ANCHORING DETAIL
(TYPICAL FRONT)



ANCHORING DETAIL
(TYPICAL REAR)

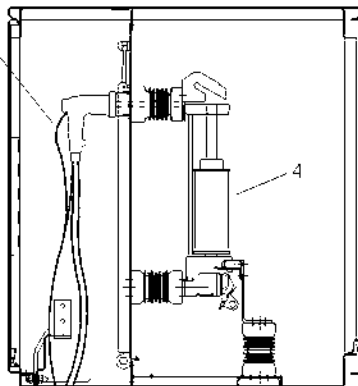


CUBICLE FRONT VIEW



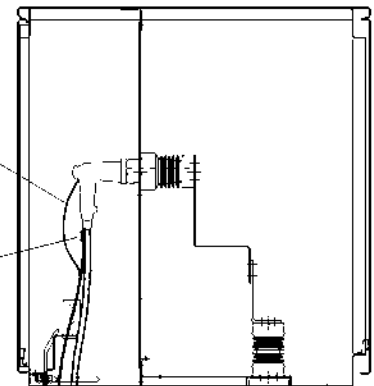
GROUND BAIL DETAIL "A"
"E" FUSE HOLDER (OPTIONAL)

#14 (TYPICAL)
GROUNDING WIRE



"NX" FUSE FITTED

#14 (TYPICAL)
GROUNDING WIRE



ELBOW CONNECTED CIRCUIT

UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING

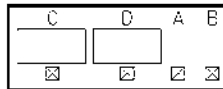
EPCOR

INSTALLATION OF
4-WAY SINGLE PHASE DEADFRONT
25kV 200 AMP SWITCHING CUBICLE

Drawn By BAO	Checked By DXT	Approved By
Scale N.T.S.	Drawing No. U-756-014	Page No. 1 / 3
Date 06-11-21		

1	CREATED FOR VOLUME 7	BAO	06-11-21	
No.	DETAILS	BY	DATE	APPD
REVISIONS				

20110525 09:32 bao

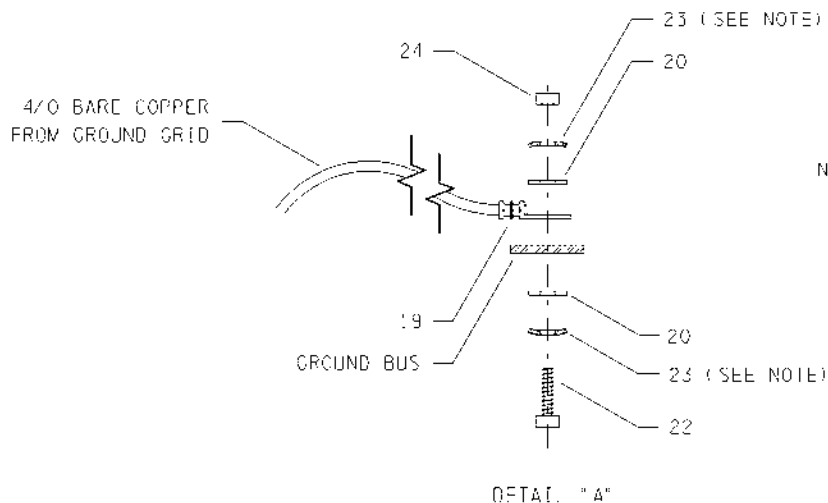


200 AMP DEADFRONT
 STK No. 44625
 BASE STK No. 56200

SCHEMATICS FOR VARIOUS ARRANGEMENTS


NOTES :

- ALL CABLES TO HAVE A MINIMUM OF 4 METERS OF EXTRA LENGTH COILED IN BASE
- PHYSICAL LOCATION OF SWITCHES AND FUSES ARE AS PER SCHEMATICS
- ELBOWS ARE TO BE TERMINATED IN ACCORDANCE WITH STANDARD DRAWING 66000/2582001
- FUSE AS PER CONSTRUCTION STANDARD 6000072550100



DETAIL "A"


20110525 09:41 ba0

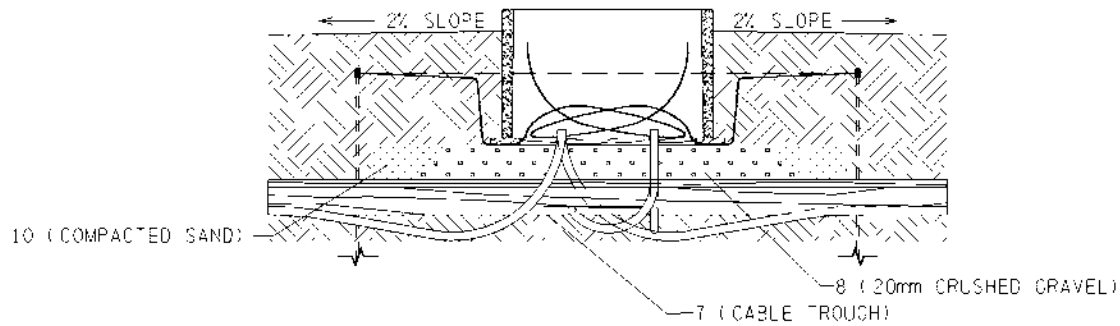
					UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING				
						INSTALLATION OF 4-WAY SINGLE PHASE DEADFRONT 25kV 200 AMP SWITCHING CUBICLE			
						Drawn By BA0	Checked By DXT	Approved By	
						Scale N.T.S.	Drawing No. U-756-014		Page No. 2 / 3
						Date 06-11-21			
A	CREATED FOR VOLUME 7		BA0	06-11-21					
No.	DETAILS		BY	DATE	APPD				
REVISIONS									



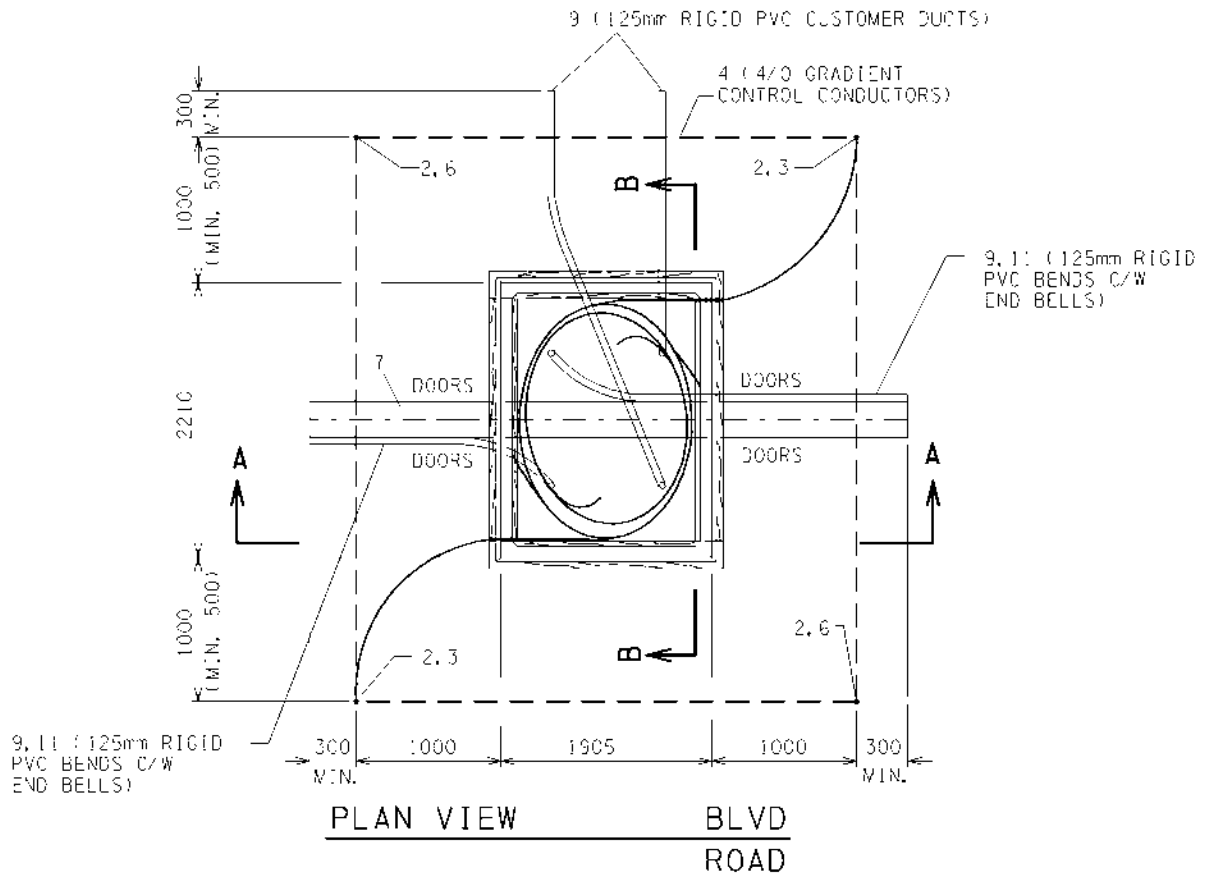
ITEM	DESCRIPTION	PART/STOCK #	QTY.
1	CUBICLE 4 WAY 200 AMP DEADFRONT	44625	A/R
2	FAULT INDICATOR	51247	A/R
4	NX FUSE AS PER FUSING CHART		
5	E-TYPE FUSE HOLDER FUSE INSERT AS PER FUSING CHART		
6	PADLOCK AMERICAN	24921	4
8	ELBOW TERMINATOR 1/0 25KV	68056	A/R
13	BOLTS STEEL CAP 5/8 X 1 PLATED	2814	4
14	PLATE FLAT 6 X 2 X 1/4" THICK BY 3/4" HOLE	73145	
16	STICK ON DECAL U-249-A	24746	1
17	AMP T CONN #2 35185 1/2 HOLE	24443	A/R
18	AMP T CONN 4-0 1/2 36534	38828	A/R
19	4/0 SEC LUG, LONG SHANK	24894	A/R
20	WASHERS BRASS FLAT 3/8	22988	A/R
22	BOLTS COPPER 3/8 BY 1 1/2	24536	A/R
23	BELLEVILLE WASHER 3/8	58188	A/R
24	NUTS - EVERDUR COPPER 3/8	44711	A/R
25	INSULATING CAP WITH GROUND (FOR UNUSED FUSED BUSHINGS)	069318	A/R

20110525 09:42 ba0

				UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING					
									
				INSTALLATION OF 4-WAY SINGLE PHASE DEADFRONT 25kv 200 AMP SWITCHING CUBICLE					
2	ADDED INSULATING CAP	BA0	08-10-06	Drawn By BA0		Checked By DXT		Approved By	
1	CREATED FOR VOLUME 7	BA0	06-11-21	Scale A.T.S.		Drawing No. U-756-014		Page No. 3/3	
No.	DETAILS	BY	DATE	APPD	Date 06-11-21				
REVISIONS									



SECTION A-A (VIEW FROM ROAD)



ALL DIMENSIONS GIVEN IN MILLIMETERS

UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING



**INSTALLATION OF
PRECAST CONCRETE BASE FOR
4-WAY 3 PHASE 200 AMP DEAD FRONT
"TYPE A" 3-PH 25kV CUBICLE**
(STOCK No. 44600)

Drawn By BAO	Checked By DXT	Approved By
Scale A.T.S.	Drawing No. U-756-015	Page No. 1/4
Date 06-11-21		

1	CREATED FOR VOLUME 7	BAO	06-11-21	
No.	DETAILS	BY	DATE	APPD
REVISIONS				

20110525 09:32 bao



SECTION B-B (FROM PAGE 1)

BLVD
ROAD

UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING

(STOCK NO. 44600):

EPCOR

Scale A.T.S.	Drawing No.	Page No.
Date 06-11-11	U-756-015	2/4

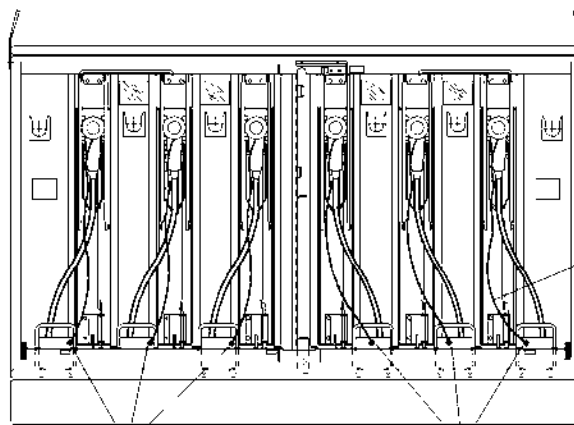
2	UPDATED DEPTH	BAO	08-10-06	
1	CREATED FOR VOLUME 7	BAO	06-11-21	
No.	DETAILS	BY	DATE	APPR
REVISIONS				

20110525 09:33 ba0

ITEM	DESCRIPTION	PART/STOCK #	QTY.
1	BASE, PRECAST SW/CU 4 WAY, 3 PHASE, 200 AMP, 25KV	44600	1
2	RODS, GROUND 5/8IN. x 10FT. COPPER CLAD	73937	4
3	CONNECTOR, GRD 3/4 ROD - 250 DOUB. F WIRE	9136	2
4	WIRE, 4/0 STRANDED BARE COPPER 19W	45655	35
5	LUMBER SPRUCE PRESSURE TREATED (2"X10")	42392	4
6	CONNECTOR, GROUND ROD 5/8IN. (4/0)	31914	2
7	TROUGH (PRESSURE TREATED WOOD 2"X10") - SEE DWG. NO. U-756-003	27272	2
8	20mm CRUSHED GRAVEL	15523	3
9	BEND RIGID PVC 125mm (5") 36R 90D	61674	4
10	SAND (UNIT = CU.m)	17762	3
11	125 mm FND BELL	20731	A/R

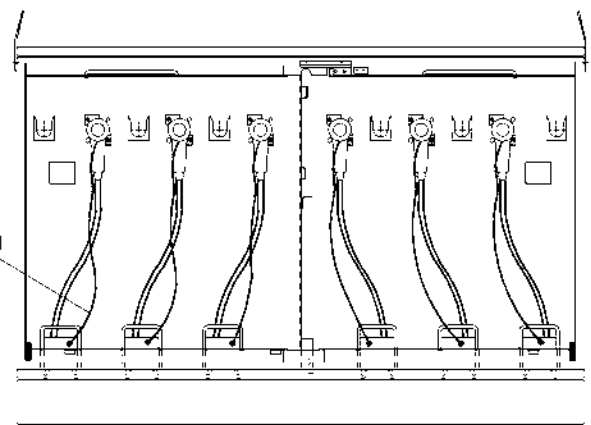
20110525 09:37 ba0

				UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING				
				<div style="display: flex; align-items: center; justify-content: center;"> <div style="text-align: center;"> INSTALLATION OF PRECAST CONCRETE BASE FOR 4-WAY 3 PHASE 200 AMP DEAD FRONT "TYPE A" 3-PH 25kV CUBICLE <small>(STOCK No. 44600)</small> </div> </div>				
1		CREATED FOR VOLUME 7	BA0	06-11-21	Drawn By BA0		Checked By DXT	Approved By
No.	DETAILS		BY	DATE	APPD	Scale A.T.S.	Drawing No. U-756-015	Page No. 4 / 4
REVISIONS								

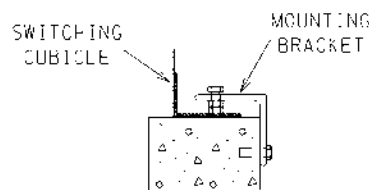


NEUTRALS TERMINATED TO
WORKING GROUND PLATE
(SEE PAGE 2, DETAIL "A")

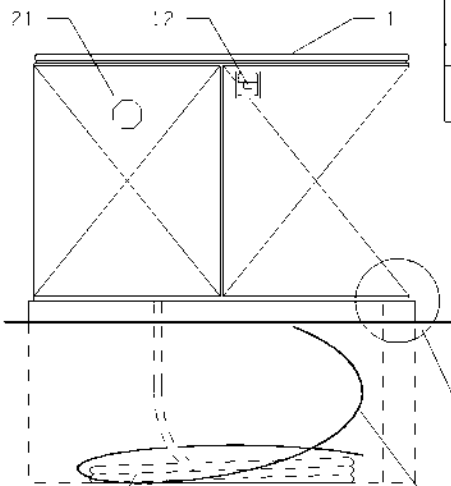
FUSE COMPARTMENT



FEED THROUGH COMPARTMENT



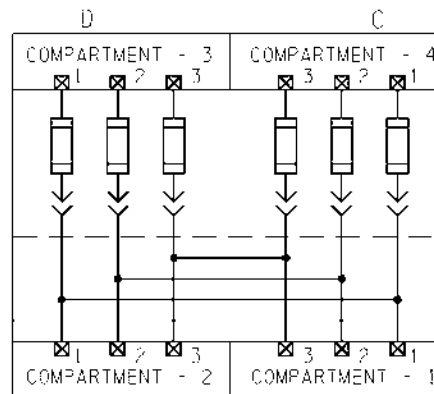
ANCHORING DETAIL
(TYPICAL FRONT)



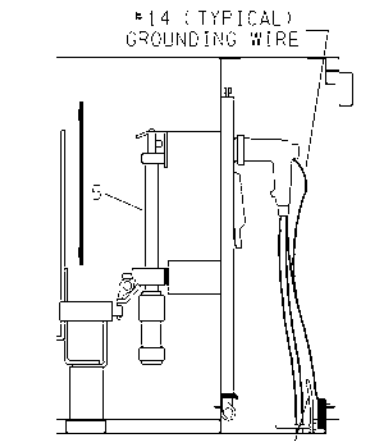
SEE NOTE
PAGE 2

REFER TO DETAIL "A"
(PAGE 2) FOR GROUND GRID
CONNECTION TO GROUND BUS

ELEVATION VIEW

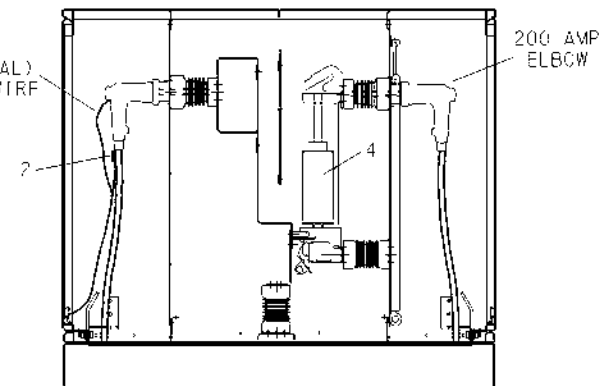


CONNECTION DIAGRAM



GROUND BAIL DETAIL "A"

"E" FUSE HOLDER (OPTIONAL)



"X" FUSE FITTED

UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING

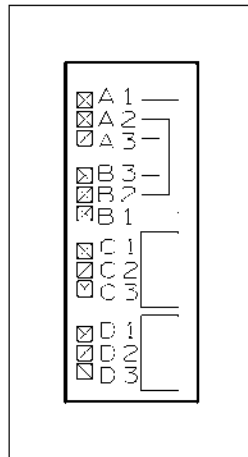


INSTALLATION OF
4-WAY 3 PHASE 200 AMP DEAD FRONT
25KV SWITCHING CUBICLE

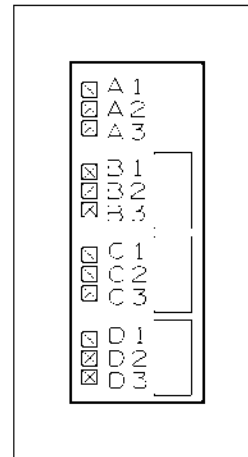
Drawn By BAO	Checked By DXT	Approved By
Scale N.T.S.	Drawing No. U-756-016	Page No. 1 / 3
Date 06-11-21		

CREATED FOR VOLUME 7	BAO	06-11-21	
No.	DETAILS	BY	DATE APPD
REVISIONS			

20110525 09:37 bao



200 AMP DEADFRONT TYPE A
STK No. 66372
BASE STK No. 44600

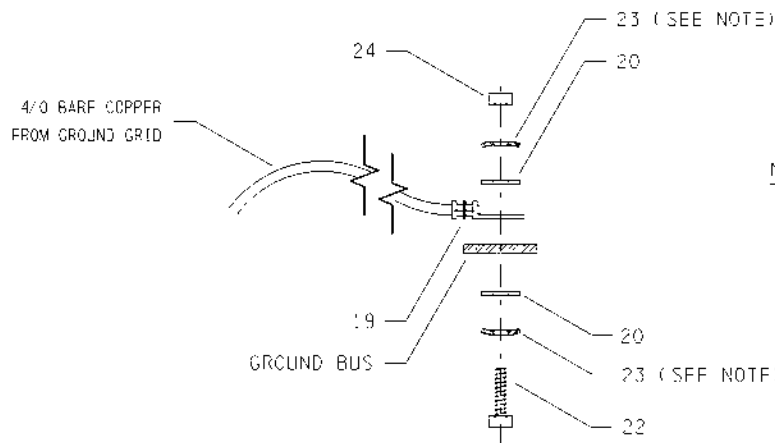


200 AMP DEADFRONT TYPE B
STK No. 6840
BASE STK No. 48743

SCHEMATICS FOR VARIOUS ARRANGEMENTS

NOTES :

- ALL CABLES TO HAVE A MINIMUM OF 4 METERS OF EXTRA LENGTH COILED IN BASE.
- PHYSICAL LOCATION OF SWITCHES AND FUSES ARE AS PER SCHEMATICS.
- ELBOWS ARE TO BE TERMINATED IN ACCORDANCE WITH STANDARD DRAWING 6600072582001.
- FUSE AS PER CONSTRUCTION STANDARDS 6000072550100, AND 6600072550300




NOTE :

TIGHTEN NUT UNTIL
WASHER BECOMES FLAT
THEN BACK OFF SLIGHTLY
(APPROXIMATELY
50 ft lbs TORQUE)


DETAIL "A"

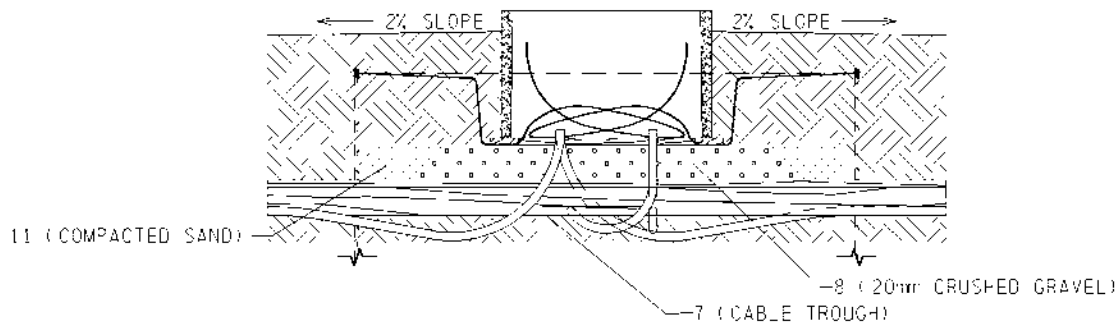
20110525 09:42 baa

					UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING				
						INSTALLATION OF 4-WAY 3 PHASE 200 AMP DEAD FRONT 25kV SWITCHING CUBICLE			
						Drawn By BAO	Checked By DXT	Approved By	
A	CREATED FOR VOLUME 7	BAO	06-11-21			Scale A.T.S.	Drawing No. U-756-016	Page No. 2 / 3	
No.	DETAILS	BY	DATE	APPD		Date 06-11-21			
REVISIONS									

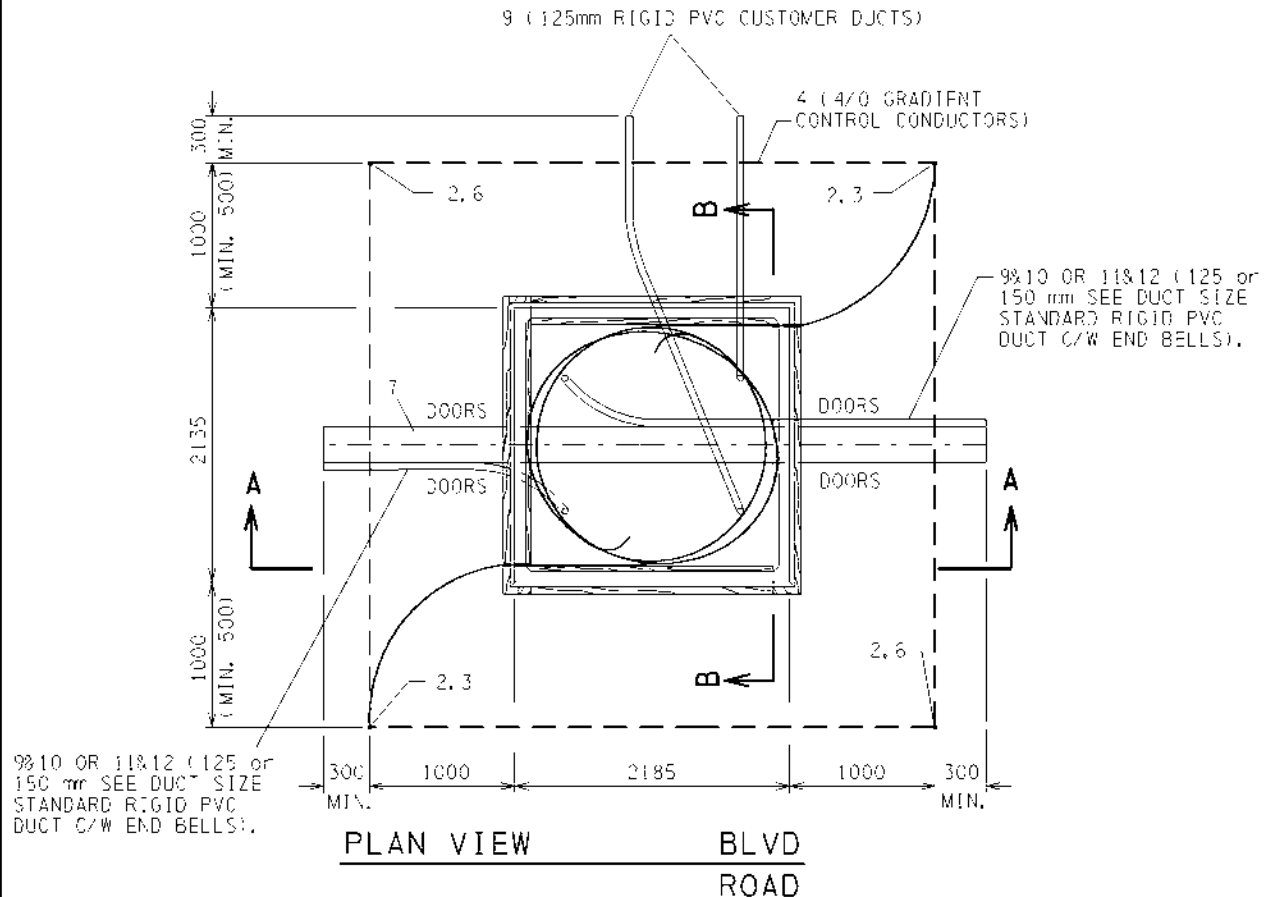
ITEM	DESCRIPTION	PART/STOCK #	QTY.
1	CUBICLE 4 WAY 3 PHASE DEADFRONT 200AMP	66372	1
1	CUBICLE 4-WAY 3 PHASE DEADFRONT 200AMP	6640	1
2	FAULT INDICATOR 1-0	51247	2
4	NX FUSE CARTRIDGE, FUSE AS PER FUSING CHART		
5	E-FUSE HOLDER, FUSE AS PER FUSING CHART	22725	
6	ELBOW TERMINATOR 1/0 25KV	68056	A/R
7	4/0 COPPER SEC. LUG	38436	2
8	WASHERS BRASS FLAT 3-8	22988	A/R
9	WASHERS BELLEVILLE 3-8 INCH	58188	A/R
11	NUTS EVERDUR COPPER 3-8 IN	44711	A/R
12	PADLOCK AMERICAN	24921	2
20	LAMICOID WHITE RED BKG		A/R
21	STICK-ON DECA. U-249-A (UNIT = EACH)		A/R
25	INSULATING CAP WITH GROUND (FOR UNUSED FUSED BUSHINGS)	069918	A/R

20110525 09:42 baa

				UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING					
									
				INSTALLATION OF 4-WAY 3 PHASE 200 AMP DEAD FRONT 25KV SWITCHING CUBICLE					
2	ADDED INSULATING CAP	BAO	08-10-06	Drawn By BAO		Checked By DXT		Approved By	
1	CREATED FOR VOLUME 7	BAO	06-11-21	Scale A.T.S.		Drawing No. U-756-016		Page No. 3 / 3	
No.	DETAILS	BY	DATE	APPD	Date 06-11-21				
REVISIONS									



SECTION A-A (VIEW FROM ROAD)



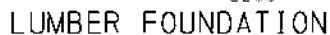
ALL DIMENSIONS GIVEN IN MILLIMETERS

REVIEWED BY OPERATIONS				B7				UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING					
								EPCOR					
								INSTALLATION OF PRECAST CONCRETE BASE FOR 4-WAY 3 PHASE 400 AMP DEAD FRONT OR "TYPE B" 3-PH, 25 kV CUBICLE (STOCK No. 48743)					
1 CREATED FOR VOLUME 7				BAO 06-11-21				Drawn By BAO		Checked By DXT		Approved By	
No. DETAILS				BY DATE APPD				Scale A.T.S.		Drawing No.		Page No.	
REVISIONS								Date 06-11-21		U-756-017		1/4	

20110525 09:43 baa



SECTION B-B (FROM PAGE 1)



BLVD

ROAD

ALL DIMENSIONS GIVEN IN MILLIMETERS (INCHES IN BRACKETS)

UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING

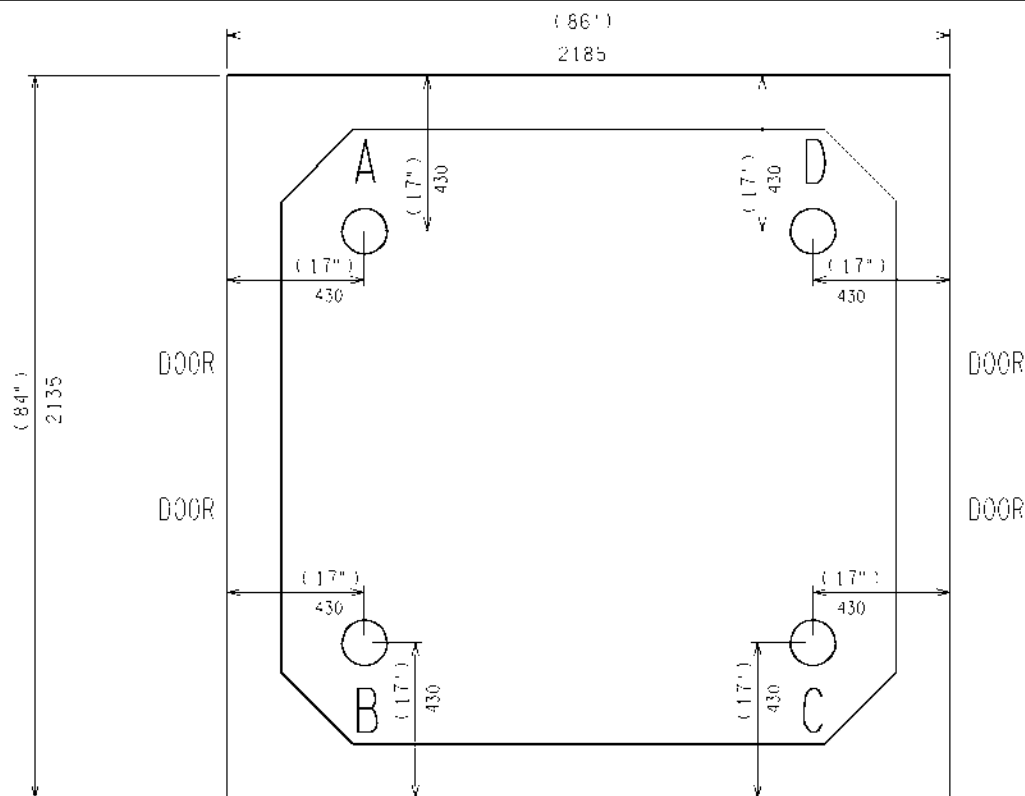


INSTALLATION OF
PRECAST CONCRETE BASE FOR
4-WAY 3 PHASE 400 AMP DEAD FRONT
OR "TYPE B" 3-PH, 25 KV CUBICLE
(Stock No. 48743)

Drawn By BAQ	Checked By DXT	Approved By
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Scale	A.T.S.	Drawing No.	Page No.
Date	06-11-11	U-756-017	2/4

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PLAN VIEW BLVD
ROAD

NOTES :


- GANGED SWITCHES CAN BE 125 (5 INCH) OR 150 mm (6 INCH) 36 INCH RADIUS BENDS DEPENDING ON CABLE SIZE.
- THE DUCTS MUST BE POINTING DIRECTLY UPWARDS WITH THE TOP OF THE THE END BELL 150 mm (6 INCHES) ABOVE THE 2" X 10' PRESSURE TREATED FOUNDATION (WITHOUT TRIMMING THE BENDS).
- PRIOR TO PLACING THE BASE AND INSTALLING THE END BELLS, DUCTS SHOULD BE CAPPED (i.e. DUCT TAPE) TO KEEP LOOSE MATERIAL FROM ENTERING THE DUCTS.
- DUCTS C/W END BELLS ARE TO REMAIN CAPPED IF CABLE IS NOT PULLED INTO THEM.
- UNUSED DUCTS (CUSTOMER DUCTS) MUST BE CAPPED, TAPED AND STAKED.
- TYPICAL DETAILS SHOWN ONLY. DUCTING MAY VARY DEPENDING UPON APPLICATION IN FIELD (LENGTH, DIRECTION AND NUMBER OF CUSTOMER DUCTS)
- PRIMARY CABLES ARE TO BE INSTALLED THROUGH DUCTS ONLY.
- GROUND GRID AND GROUND RODS TO BE 300mm BELOW FINAL GRADE (NOT ROUGH GRADE).
- AMOUNT OF GROUNDING CONDUCTOR TO BE COILED IN THE BASE IS MEASURED FROM WHERE THE GROUNDING CONDUCTOR ENTERS THE BASE.
- ALL BASE DIMENSIONS ARE TO THE OUTSIDE TOP OF BASE.

ALL DIMENSIONS GIVEN IN MILLIMETERS (INCHES IN BRACKETS)

REVIEWED BY OPERATIONS		B7		UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING					
									
1 CREATED FOR VOLUME 7		BAO 06-11-21		INSTALLATION OF PRECAST CONCRETE BASE FOR 4-WAY 3 PHASE 400 AMP DEAD FRONT OR "TYPE B" 3-PH, 25 kV CUBICLE (STOCK No. 48743)					
No. DETAILS		BY DATE APPD		Drawn By BAO		Checked By DXT		Approved By	
				Scale A.T.S.		Drawing No. U-756-017		Page No. 3/4	
				Date 06-11-21					
REVISIONS									

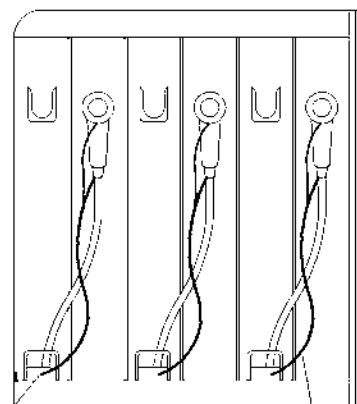
20110525 09:38 bao

ITEM	DESCRIPTION	PART/STOCK #	QTY.
1	BASE, PRECAST SW/CU 4 WAY 3 PHASE 400 AMP 25KV	048743	1
2	RODS, GROUND 5/8IN. x 10FT. COPPER CLAD	73937	4
3	CONNECTOR, GRD 3/4 ROD - 250 DOUB. F WIRE	9136	2
4	WIRE, 4/0 STRANDED BARE COPPER 19W	45655	35
5	LUMBER SPRUCE PRESSURE TREATED (2"X10")	42392	4
6	CONNECTOR, GROUND ROD 5/8IN. (4/0)	31914	2
7	TROUGH (PRESSURE TREATED WOOD 2"X10") - SEE DWG. NO. U-756-003	27272	2
8	20mm CRUSHED GRAVEL	15523	3
9	BEND RIGID PVC 125mm (5') 36R 90D	61674	AR
10	BEND RIGID PVC 150mm (6') 36R 90D	26475	AR
11	SAND (UNIT = CU.m)	17762	3
12	125 mm END BELL	20731	A/R
13	150 mm END BELL	20889	A/R

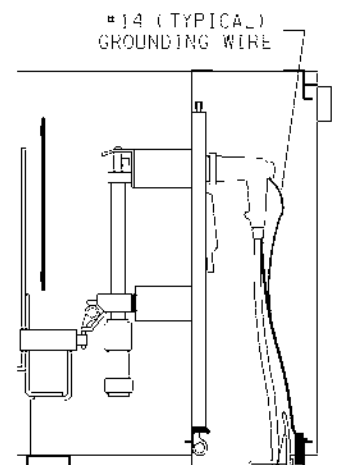
REVIEWED BY OPERATIONS			BR	UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING			
					INSTALLATION OF PRECAST CONCRETE BASE FOR 4-WAY 3 PHASE 400 AMP DEAD FRONT OR "TYPE B" 3-PH, 25 kV CUBICLE (STOCK No. 48743)		
					Drawn By BAO	Checked By DXT	Approved By
1	CREATED FOR VOLUME 7	BAO	06-11-21		Scale A.T.S.	Drawing No. U-756-017	Page No. 4/4
No.	DETAILS	BY	DATE		Date 06-11-21		
REVISIONS							

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TOP VIEW



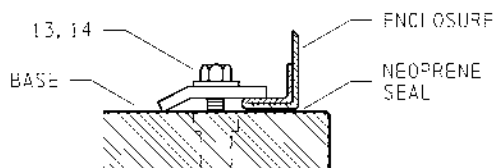
NEUTRALS TERMINATED TO
WORKING GROUND PLATE
(SEE PAGE 2, DETAIL "A")



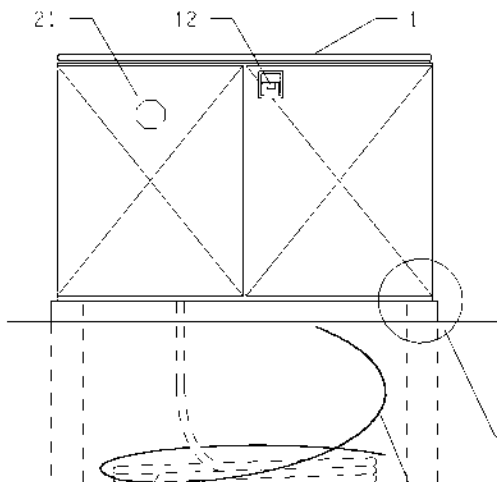
NEUTRAL

GROUND BAIL
DETAIL 'A'

FUSING COMPARTMENT



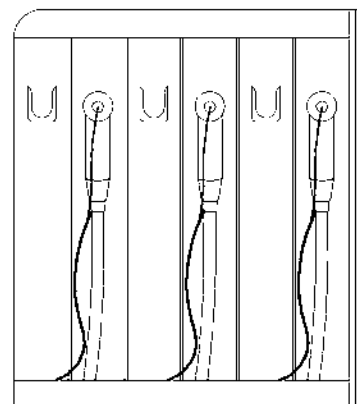
ANCHORING DETAIL
(TYPICAL 4 CORNERS)



SEE NOTE
PAGE 2

— SEE
ANCHORING DETAIL

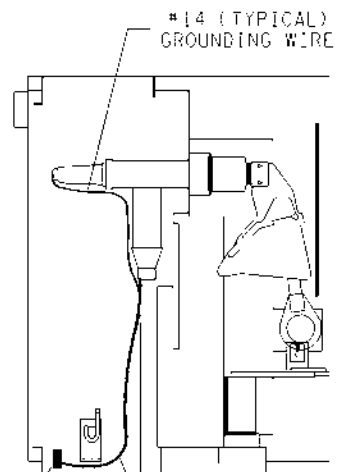
REFER TO DETAIL "A"
- (PAGE 2) FOR GROUND GRID
CONNECTION TO GROUND BUS



GROUND BU
DETAIL "A"


- NEUTRAL

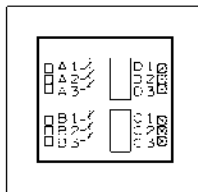
SWITCHING COMPARTMENT



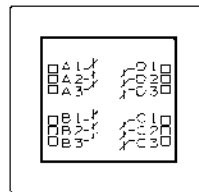
#14 (TYPICAL)
GROUNDING WIRE

FOR INSTALLATION PURPOSES ONLY -- REFER TO SPECIFICATION DRAWINGS FOR ALL OTHER APPLICATIONS

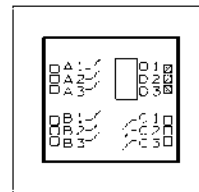
					UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING				
						INSTALLATION OF S & C 4-WAY 3 PHASE 400 AMP DEADFRONT 25KV SWITCHING CUBICLE (GENERAL ARRANGEMENTS)			
						Drawn By BAC	Checked By DXT	Approved By	
1	CREATED FOR VOLUME 7	BAO	06-11-21			Scale N.T.S.	Drawing No.		Page No.
No.	DETAILS	BY	DATE	APPD		Date 06-11-21	U-757-018		1/5
REVISIONS									



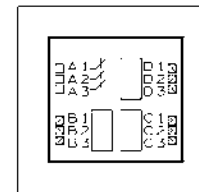
PME 9
STK No. 4943



PME 10
STK No. 51223



PME 11
STK No. 13252



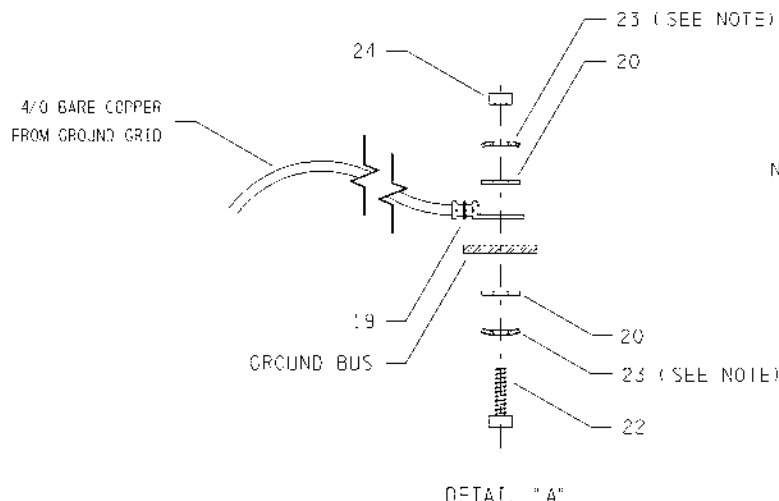
PME 12
STK No. 47628

BASE STK No. 48743

SCHEMATICS FOR VARIOUS ARRANGEMENTS

NOTES :

- ALL CABLES TO HAVE A MINIMUM OF 4 METERS OF EXTRA LENGTH COILED IN BASE
- FOR FUSING GUIDE REFER TO STANDARDS DRAWING 60000/2550300
- PHYSICAL LOCATION OF SWITCHES AND FUSES ARE AS PER SCHEMATICS



UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING



INSTALLATION OF S & C
4-WAY 3 PHASE 400 AMP DEADFRONT
25kV SWITCHING CUBICLE
(GENERAL ARRANGEMENTS)

Drawn By BAC	Checked By DXT	Approved By
Scale N.T.S.	Drawing No. U-757-018	Page No. 2/5
Date 06-11-21		

No.	DETAILS	BY	DATE	APPD
1	CREATED FOR VOLUME 7	BAO	06-11-21	
REVISIONS				

20110525 09:47 bac



UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING

EPCOR

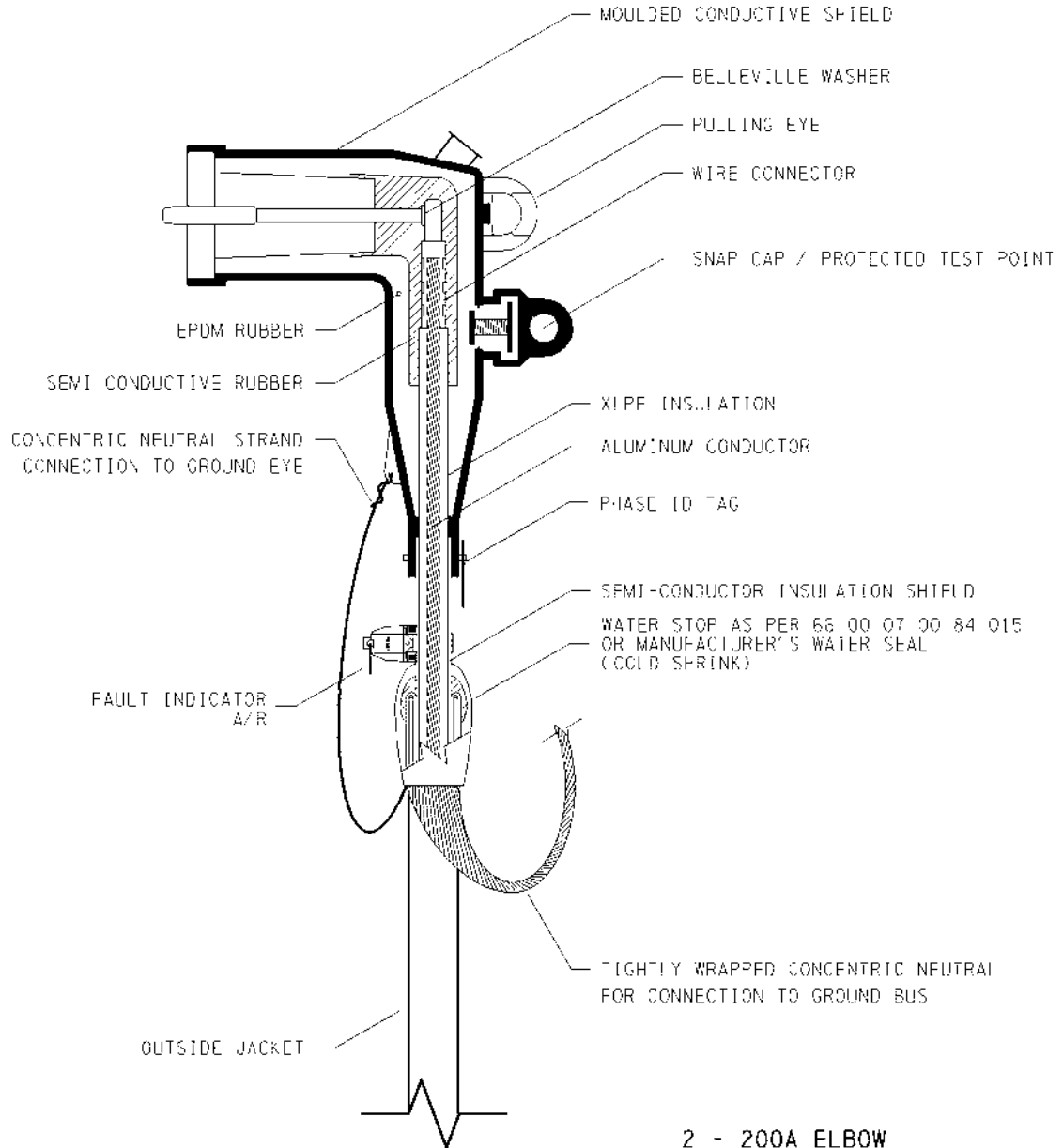
3/5

REVISIONS

No.	DETAILS	BY	DATE	APPD
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REVISIONS

TYPICAL FUSING COMPARTMENT TERMINATION




2 - 200A ELBOW

NOTE :


DRAWING IS FOR TAPING INSTRUCTIONS ONLY. INSTALLATION AS PER MANUFACTURER'S INSTRUCTIONS
ALL DIMENSIONS GIVEN IN MILLIMETERS

20110525 09:39 ba0

UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING				
<div>  <div> INSTALLATION OF S & C 4-WAY 3 PHASE 400 AMP DEADFRONT 25KV SWITCHING CUBICLE (GENERAL ARRANGEMENTS) </div> </div>				
Drawn By BA0		Checked By DXT		Approved By
Scale N.T.S.		Drawing No. U-757-018		Page No. 4/5
Date 06-11-21				
No.	DETAILS	BY	DATE	APPD
REVISIONS				

ITEM	DESCRIPTION	PART/STOCK #	QTY.
1	CUBICLE 4 WAY 2 600A 2 200A 25KV PME 9	4943	A/R
1	CUBICLE 4-WAY 4-600A 25KV PME-10	51223	A/R
1	CUBICLE 4-WAY 3-600A - 1-600A 25 KV PME-11	13252	A/R
1	CUBICLE 4-WAY 1-600A - 3-200A 25KV PME-12	47628	A/R
2	LOAD BREAK ELBOW 1/0 25 KV 200A	68056	A/R
2	LOAD BREAK ELBOW #1 25 KV 200A	69922	A/R
4	DEAD BREAK ELBOW 500MCM 25 KV 600A	18694	A/R
4	DEAD BREAK ELBOW 350MCM 25 KV 600A	51814	A/R
6	REDUCING TAP 600 TO 200A	48450	A/R
7	FAULT INDICATOR	51247	A/R
8	FUSE S/C REFILL SM4 200A	30862	A/R
9	INSULATING CAP WITH GROUND LEAD	69918	A/R
12	PADLOCK AMERICAN	24921	4
13	BOLTS STEEL CAP 5/8 X 1 PLATED	2614	4
14	PLATE FLAT 6 X 2 X 1/4 THICK BY 3/4" HOLE GALVANIZED	73145	4
15	LAMICOID LABEL		A/R
16	STICK ON DECAL U-249-A		1
17	AMP T CONN #2 35185 1/2 HOLE	24443	A/R
18	AMP T CONN 4-0 1/2 36934	38828	A/R
19	4/0 COPPER SEC. LLG	38436	A/R
20	WASHERS BRASS FLAT 3/8	22988	A/R
21	STICK ON DECAL U 249 A	24746	1
22	BOLTS COPPER 3/8 BY 1 1/2	24536	A/R
23	BELLEVILLE WASHER 3/8	58188	A/R
24	NUTS - EVERDUR COPPER 3/8	44711	A/R

20110525 09:47 baq

				UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING					
									
				INSTALLATION OF S & C 4-WAY 3 PHASE 400 AMP DEADFRONT 25KV SWITCHING CUBICLE (GENERAL ARRANGEMENTS)					
2	ADDED INSULATING CAP	BAQ	08-10-06	Drawn By BAQ		Checked By DXT		Approved By	
1	CREATED FOR VOLUME 7	BAQ	06-11-21	Scale A.T.S.		Drawing No. U-757-018		Page No. 5/5	
No.	DETAILS	BY	DATE	APPD	Date 06-11-21				
REVISIONS									



UNDERGROUND
DISTRIBUTION
STANDARDS

APPROVED BY STANDARDS
COMMITTEE: 07-06-28

DRAFTED BY:
P. L. MANN

DESIGNED BY:
JOHN W. SCOTT

APPROVED BY:
T. SIMYR

APPROVED BY:
D. ARNOLD

FAULT INDICATOR INSTALLATION ON SINGLE CONDUCTOR CABLES

SCALE: N. T. S.

DATE REVISED: 07-05-30

STANDARD NO.

63 00 07 00 23 005

PAGE NO.

1 / 3

FCI SELECTION GUIDE FOR EPCOR URD AND UID

EPCOR STOCK#	INSTALLATION LOCATION	APPLICATION	MFR. TYPE CODE	MFR. CATALOGUE NO.
51247	ALL LOCATIONS < 350 MCM & ON THE LOAD SIDE OF FUSES EXCEPT WHERE TYPE FCI-222 OR FCI-PM ARE NEEDED	THE FCI MOST SUITABLE FOR USE ON FUSED AND/OR LINE TAPS & LIGHTLY LOADED LINES < 75 AMPS. ①	FCI LT - 1PPZ > ALSO PM TYPE TRIP	29-3028-000 TRIP-RESET AFTER 4 HOURS
58430	OLD LIVE FRONT CUBICLES AND PS TRANSFORMERS	INSTALLATION ON UNSHIELDED SECTIONS OF CABLE (ABOVE STRESS CONE) ②	FCI-222 D/U TYPE TRIP	25-2003-000-400A-4H TRIP-RESET AFTER 4 HOURS
43942	HEAVILY LOADED MAINS (AT 15 KV > 5500 KVA, AT 25 KV > 9000 KVA CONNECT PER PH.) ③	NOT SUITABLE FOR USE IF LOWEST FAULT LEVEL MAY BE < 2200 AMPS ④	FCI-PM ALSO HAS PPZ ANTI-1NRUSH	PM-29-0179-500-2200A-4H TRIP-RESET AFTER 4 HOURS
44019	MODERATELY LOADED MAINS (AT 15 KV 3000 TO 6000 KVA, AT 25 KV 5500 TO 9000 KVA CONNECT PER PH.) ③	NOT SUITABLE FOR USE IF LOWEST FAULT LEVEL MAY BE < 1500 AMPS ④	FCI-PM ALSO HAS PPZ ANTI-1NRUSH	PM-29-0179-500-1500A-4H TRIP-RESET AFTER 4 HOURS
51130	LIGHTLY LOADED MAINS (AT 15 KV < 3000 KVA, AT 25 KV < 5500 KVA CONNECT PER PH.) ③	NOT SUITABLE FOR USE IF LOWEST FAULT LEVEL MAY BE < 1000 AMPS ④	FCI-PM ALSO HAS PPZ ANTI-1NRUSH	PM-29-0179-500-1000A-4H TRIP-RESET AFTER 4 HOURS

LEGEND

< SYMBOL USED TO INDICATE "LESS THAN"

> SYMBOL USED TO INDICATE "GREATER THAN"

≥ SYMBOL USED TO INDICATE "GREATER THAN OR EQUAL TO"

FCI FAULTED CIRCUIT INDICATOR

LT LOAD TRACKER - THE FCI TRIP LEVEL INCREASES WITH INCREASING LOAD.

PPZ PULSE PAUSE ZERO - ON ENERGIZATION INRUSH GREATER THAN THE FCI TRIP LEVEL, THE FCI STARTS TO BLINK AND AFTER ABOUT 30 SECONDS IT STOPS BLINKING (IF CURRENT > 5 AMPS). IF THERE IS NO CURRENT, IT KEEPS BLINKING UNTIL ITS INDICATION TIME RUNS OUT OR IT IS MANUALLY RESET.

PM PROTECTION MATED TRIP CURVE - THE DURATION OF THE CURRENT PULSE REQUIRED TO TRIP THE FCI DECREASES WITH INCREASING CURRENT. THIS MAKES THE FAULT INDICATOR MORE RESISTANT TO FALSE TRIPPING.

D/U DELAYED/UN-DELAYED TRIP CURVE - THE FCI 25-2003-000-400A HAS TWO TRIP LEVELS, 1200 TO 2000 AMPS FOR SHORT DURATION FAULT PULSES AND 400 AMPS FOR LONG DURATION FAULT PULSES.

FOOTNOTES

- ① ON MAIN LINES, 29-3028-000 FCI'S ARE SUBJECT TO FALSE TRIPPING ON GOOD PHASES IF THE FAULT IS RE-ENERGIZED. THE RESET TO THE DEFAULT TRIP LEVEL (100 AMPS) IS TOO FAST.
- ② THE PLASTIC MOUNTING CLIP HAS LESS EFFECT ON THE ELECTRIC FIELD NEAR THE CABLE AND CAUSES LESS CORONA CUTTING THAN A METAL CLIP.
- ③ THE MOST CERTAIN WAY TO SELECT THE MOST RELIABLE FIXED TRIP LEVEL FCI'S FOR INSTALLATION ON A MAIN DISTRIBUTION LINE IS TO BUILD AN ACCURATE MODEL OF THE CIRCUIT IN QUESTION
 - a) CALCULATE THE LOWEST EXPECTED FAULT LEVEL ON EACH LINE SECTION.
 - b) ESTIMATE THE HIGHEST EXPECTED LOADING ON EACH LINE SECTION AND USE THE MOST SUITABLE ENERGIZATION INRUSH VERSUS TIME MULTIPLIER CURVE/EQUATION AVAILABLE TO DETERMINE INRUSH VALUES.
 - c) REPEAT STEPS a) AND b) FOR ALL REASONABLE ALTERNATE CIRCUIT CONFIGURATIONS.
 - d) SELECT FCI'S WITH TRIP LEVELS THAT FIT BETWEEN THE LOWEST EXPECTED FAULT LEVEL AND THE ENERGIZATION INRUSH CURVE.
- ④ THE FCI TRIP LEVEL MUST BE ABOVE THE ENERGIZATION INRUSH AND BELOW THE LOWEST FAULT LEVEL IN THE FCI'S ZONE.

GENERAL

- FCI'S ON MAIN LINES NEAR A SUBSTATION WILL NOT SEE ALL FAULTS AT THE END OF THE CIRCUIT. AN UNDERGROUND FCI INSTALLED NEAR A SUBSTATION WITH A TRIP LEVEL HIGH ENOUGH TO AVOID INRUSH MAY NOT TRIP ON ACTUAL FAULTS THAT OCCUR AT OR NEAR THE ENDS OF THE CIRCUIT. CAREFUL SELECTION OF THE FIXED TRIP LEVEL FCI'S WILL USUALLY WORK.
- FCI'S SHOULD BE INSTALLED SUCH THAT ANY RETURN CURRENT IN THE NEUTRALS DOES NOT CANCEL THE FAULT CURRENT IN THE CONDUCTOR.
- ONLY FCI'S WITH PLASTIC CLIPS (e.g. CAT # 25-2003-000-400A-4H) MAY BE INSTALLED ON UNSHIELDED SECTIONS OF CABLE ABOVE THE STRESS CONES AND THEN ONLY IF THERE IS NO ALTERNATIVE AND THERE IS AT LEAST 4" (100mm) ABOVE THE STRESS CONE.
- FCI TYPE LT- (PPZ) CAT # 29-3028-000 SHOULD NORMALLY BE USED UNLESS ANOTHER TYPE IS REQUIRED OR SPECIFIED. THIS TYPE MUST ONLY BE USED ON SHIELDED SECTIONS OF CABLE DUE TO THE METAL "CT" TYPE CLIP.

DEFINITIONS

TRIP: THE LIGHT THAT INDICATES A FAULT (HIGH CURRENT PULSE) HAS OCCURRED, STARTS TO BLINK & HIGH CURRENT PULSE DETECTION IS DEACTIVATED.

TRIP - RESET: THE LIGHT THAT INDICATES A FAULT HAS OCCURRED, STOPS BLINKING & HIGH CURRENT PULSE DETECTION IS REACTIVATED.

CORONA CUTTING: INSULATION DAMAGE DUE TO PARTIAL DISCHARGE IN AIR (LOCAL DIELECTRIC FAILURE). PARTIAL DISCHARGE IN AIR CREATES OZONE WHICH BURNS ANYTHING THAT WILL BURN.
FCI 29-3028-000 EPCOR STOCK 51247 MUST ONLY BE INSTALLED BELOW THE STRESS CONE ON SHIELDED CABLE TO PREVENT CORONA CUTTING.



APPROVED BY STANDARDS COMMITTEE:	07-06-28
DRAFTED BY:	P. L. MANN
DESIGNED BY:	JOHN W. SCOTT
APPROVED BY:	T. SHMYR
APPROVED BY:	D. ARNOLD

FAULT INDICATOR INSTALLATION ON SINGLE CONDUCTOR CABLES

SCALE: N. T. S.
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29-3028-000
STOCK# 51247



25-2003-000-400A-4H
STOCK# 58430



PM-29-0179-500-1000A-4H
STOCK# 51130



PM-29-0179-500-1500A-4H
STOCK# 44019



PM-29-0179-500-2200A-4H
STOCK# 43942

EPCOR
UNDERGROUND
DISTRIBUTION
STANDARDS

APPROVED BY STANDARDS
COMMITTEE: 07-06-28
DRAFTED BY: P. L. MANN
DESIGNED BY: JOHN W. SCOTT
APPROVED BY: T. SHMYR
APPROVED BY: D. ARNOLD

FAULT INDICATOR INSTALLATION
ON SINGLE CONDUCTOR CABLES

SCALE: N. T. S.
DATE REVISED: 07-05-30

STANDARD NO.
63 00 07 00 21 005

PAGE NO.
3 / 3



EPCOR

TYPICAL SERVICE BOX CONSTRUCTION

Drawn By
BAO

Checked By	DXT
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Approved By

Scale N. T. S.

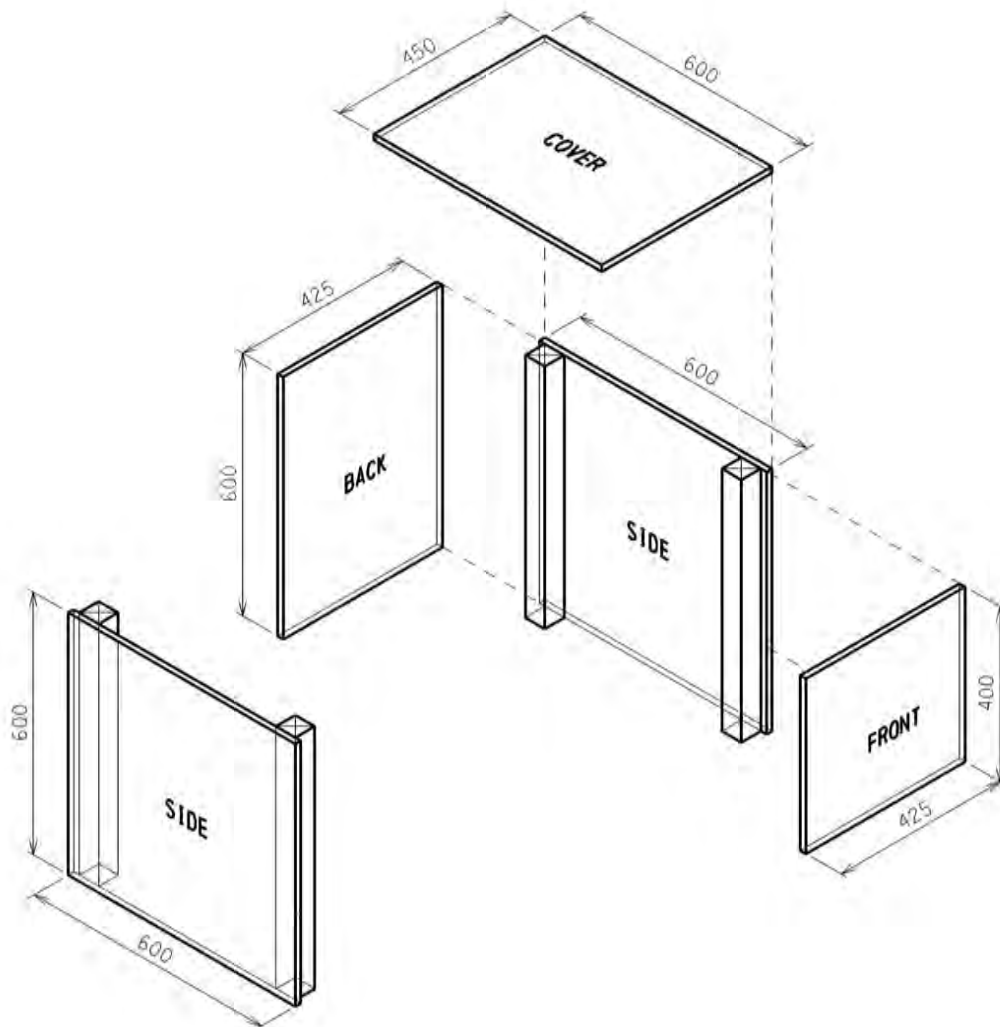
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Date 08-10-09

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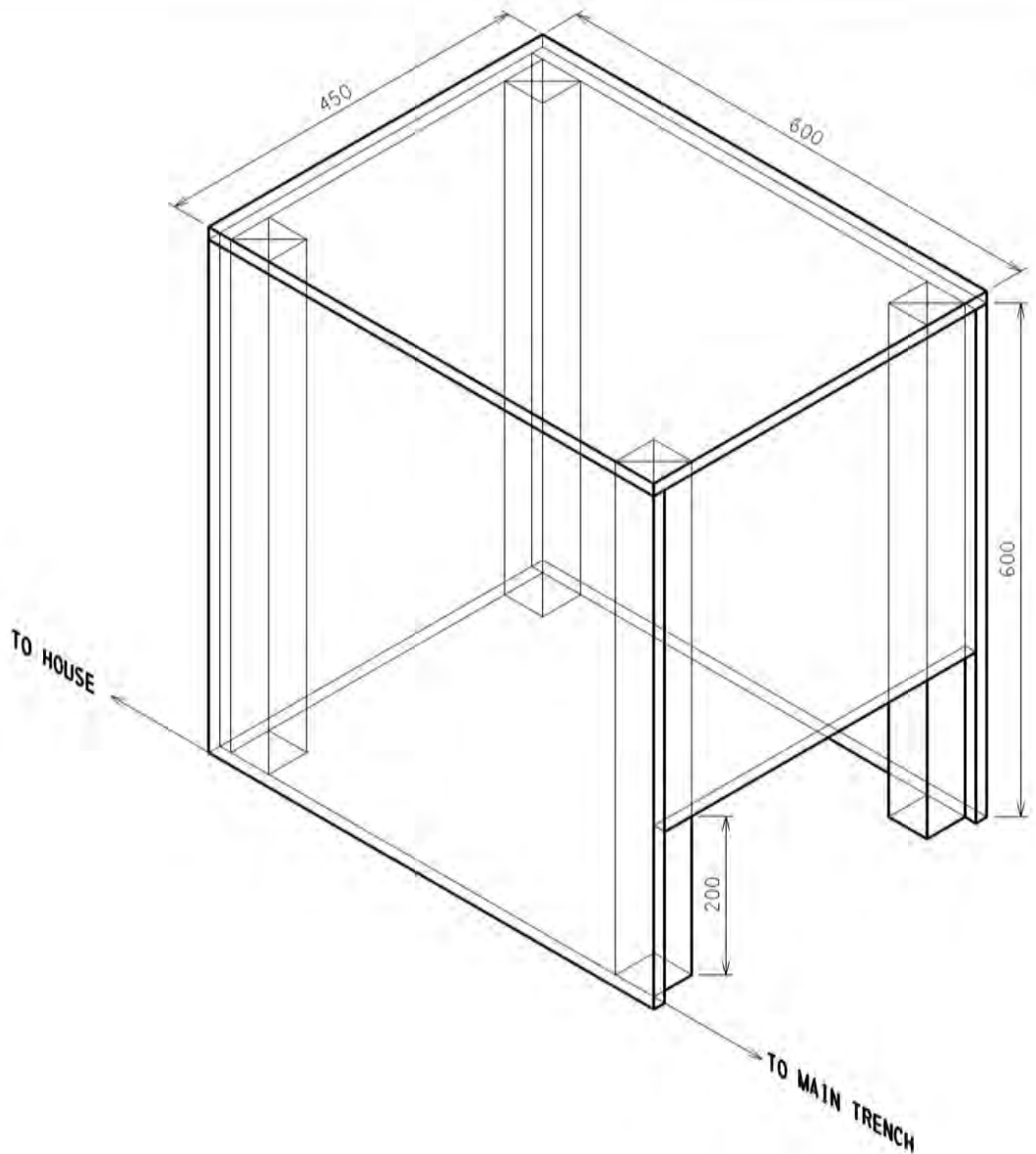
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REVISIONS				

UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING



TYPICAL SERVICE BOX CONSTRUCTION

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Scale N. T. S.	Drawing No. U-756-019	Page No. 2 / 4
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NOTES

USE A MINIMUM 12.5 mm (1/2 inch) SHEET OF PLYWOOD OR ORIENTED STRAND BOARD.

STAPLES, NAILS OR SCREWS CANNOT BE EXPOSED INSIDE OF BOX.

USE 2" X 2" FOR FRAMING (NOT REQUIRED ON THE TOP PANEL)

THE FRAME AND PLYWOOD OR O.S.B. MUST BE CAPABLE OF SUPPORTING 900 mm OF BACKFILL AND SAND AS WELL AS EQUIPMENT (THE TOP PANEL MUST OVERLAP THE OTHER 4 PANELS TO ADD STRENGTH FOR SUPPORTING BACKFILL).

THE BOTTOM OF BOX IS OPEN AS WELL AS A 200 x 450 mm OPENING IN THE FRONT OF THE BOX.

WHERE CABLE IS LARGER THAN 1/0, A SECOND BOX FOR COMMUNICATIONS IS REQUIRED.

A 2" x 4" MARKER PAINTED YELLOW MUST BE BURIED BEHIND THE BOX (450 mm ABOVE GRADE) TO IDENTIFY THE LOCATION OF THE BOX (NOTE THAT IN THE FUTURE, THE ALBERTA ONE-CALL COLOUR RED SHOULD BE USED).

UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING

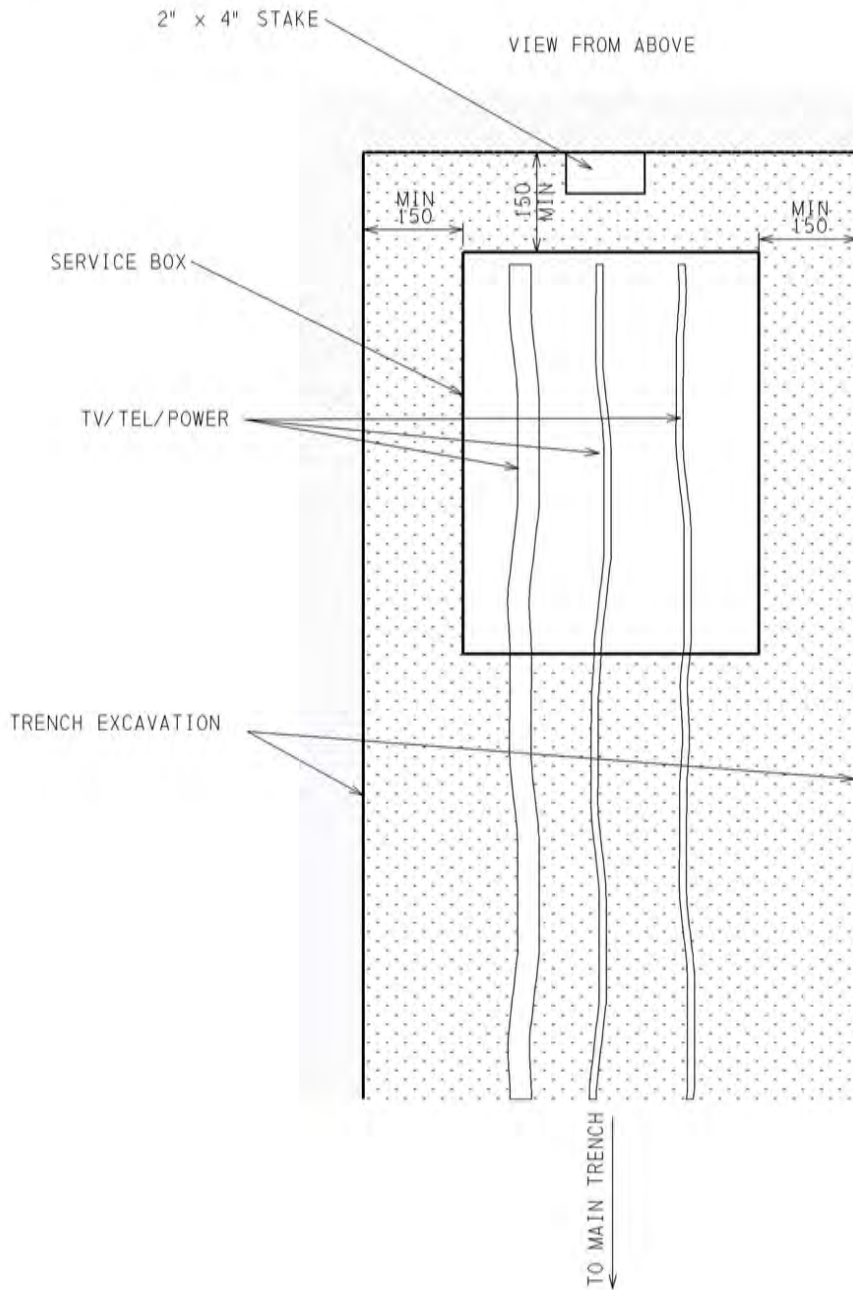
TYPICAL SERVICE BOX CONSTRUCTION



Drawn By BAO	Checked By DXT	Approved By
Scale N.T.S.	Drawing No. U-756-019	Page No. 1/4
Date 08-10-09		

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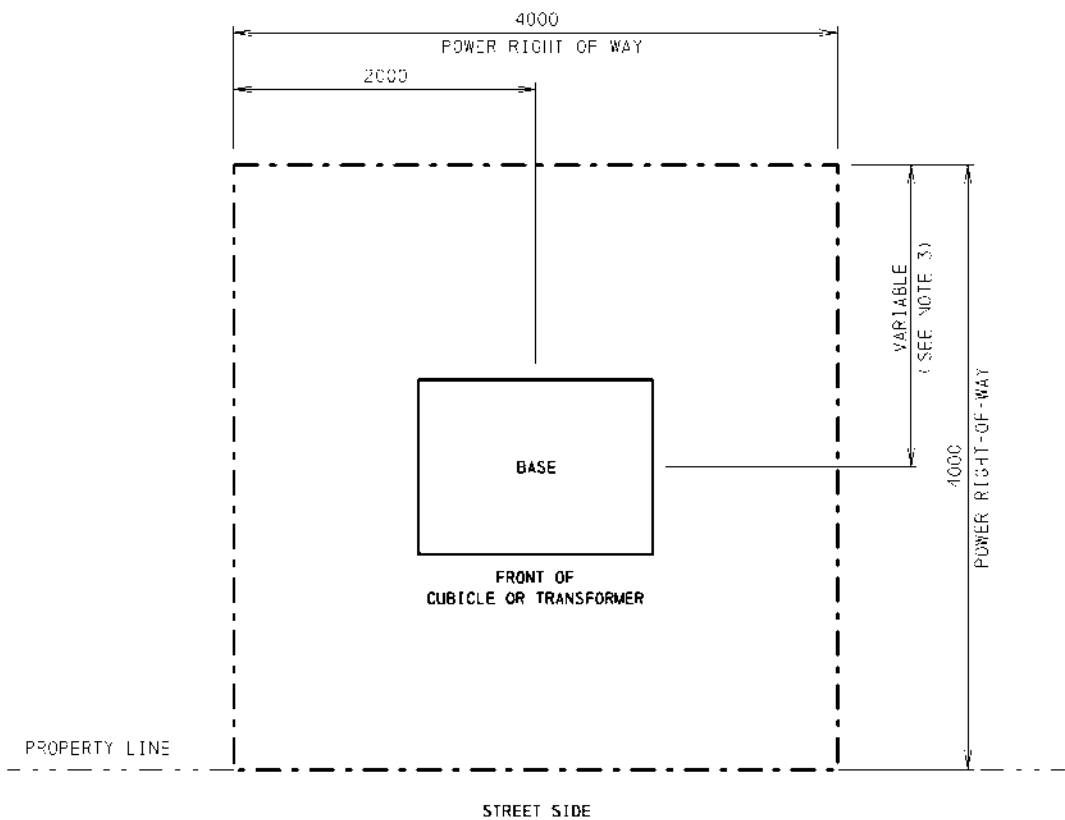
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4.0m X 4.0m RIGHT-OF-WAY REQUIREMENT



NOTE:

- 1. HOTSTICK OPERATIONS REQUIRE 3.0m UNOBSTRUCTED ACCESS.
- 2. FRONT OF CUBICLE OR TRANSFORMER TO FACE STREET.
- 3. REFER TO SWITCHING CUBICLE BASE AND TRANSFORMER BASE INSTALLATION STANDARDS.

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED

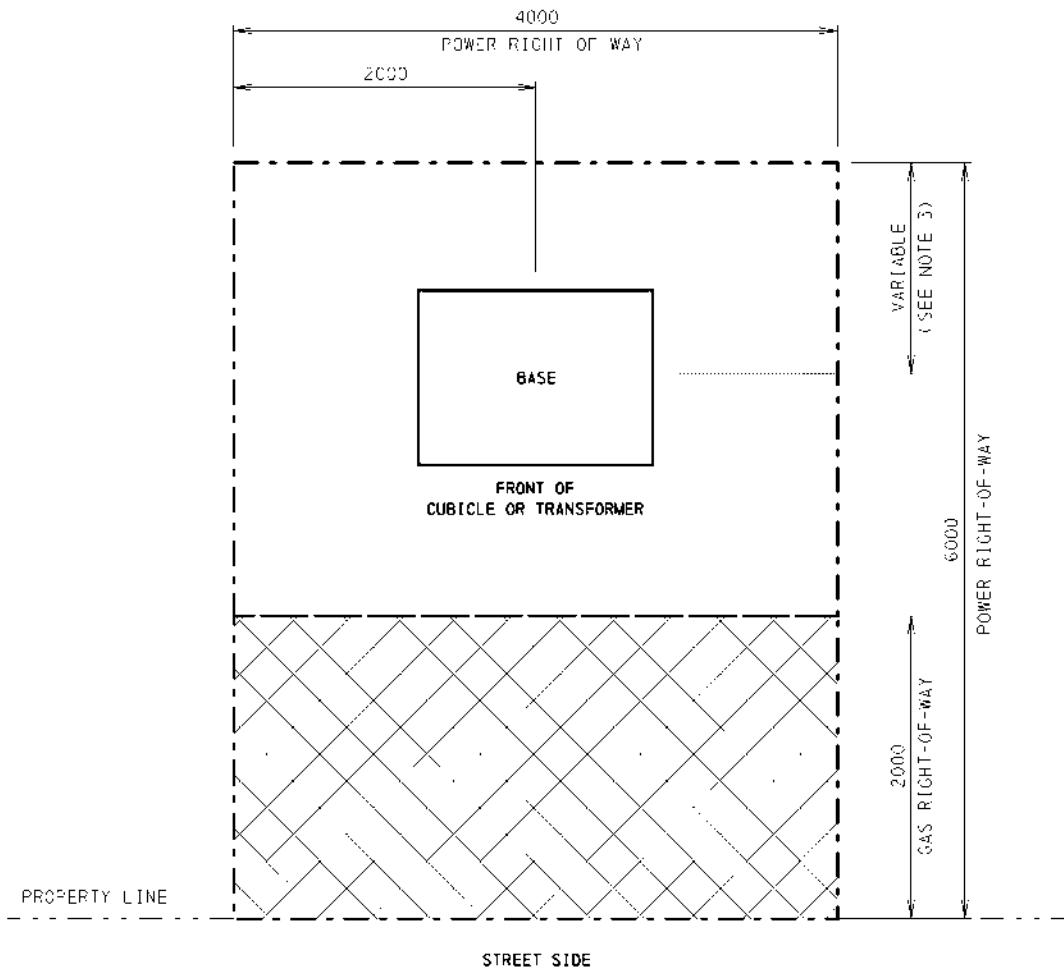
EPCOR

UNDERGROUND
DISTRIBUTION
STANDARDS

APPROVED BY STANDARDS COMMITTEE: 07-06-28
DRAFTED BY: P. J. MANN
DESIGNED BY: B. O'CALLAGHAN
APPROVED BY: T. SHMYR
APPROVED BY: D. ARNOLD

RIGHT-OF-WAY REQUIREMENT FOR SINGLE PHASE SWITCHING CUBICLE, SINGLE PHASE TRANSFORMER OR 3 PHASE TRANSFORMER		
SCALE: N. T. S.	STANDARD NO. 60 00 07 00 12 001	PAGE NO. 1 / 1
DATE REVISED: 07 06 07		

4.0m X 6.0m RIGHT-OF-WAY REQUIREMENT



NOTE:

- 1. HOTSTICK OPERATIONS REQUIRE 3.0m UNOBSTRUCTED ACCESS.
- 2. FRONT OF CUBICLE OR TRANSFORMER TO FACE STREET.
- 3. REFER TO SWITCHING CUBICLE BASE AND TRANSFORMER BASE INSTALLATION STANDARDS.

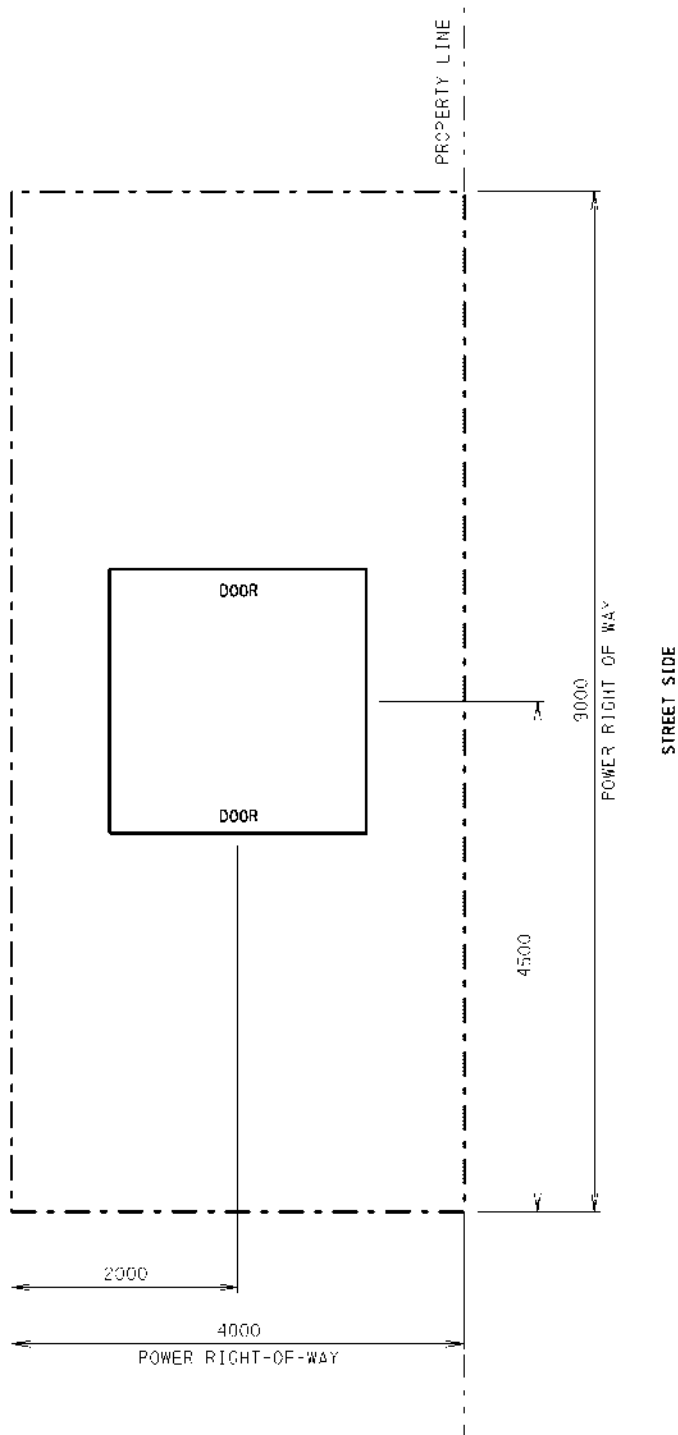
ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED



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APPROVED BY:	T. SHMYR
APPROVED BY:	D. ARNOLD

RIGHT-OF-WAY REQUIREMENT FOR SINGLE PHASE SWITCHING CUBICLE, SINGLE PHASE TRANSFORMER OR 3 PHASE TRANSFORMER WITH 2.0m GAS RIGHT-OF-WAY		
SCALE:	N. T. S.	STANDARD NO.
DATE REVISED:	07 06 07	60 00 07 00 12 002
		PAGE NO. 1 / 1

4.0m X 9.0m RIGHT-OF-WAY REQUIREMENT



NOTE:

1. HOTSTICK OPERATIONS REQUIRE 3.0m UNOBSTRUCTED ACCESS.

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED



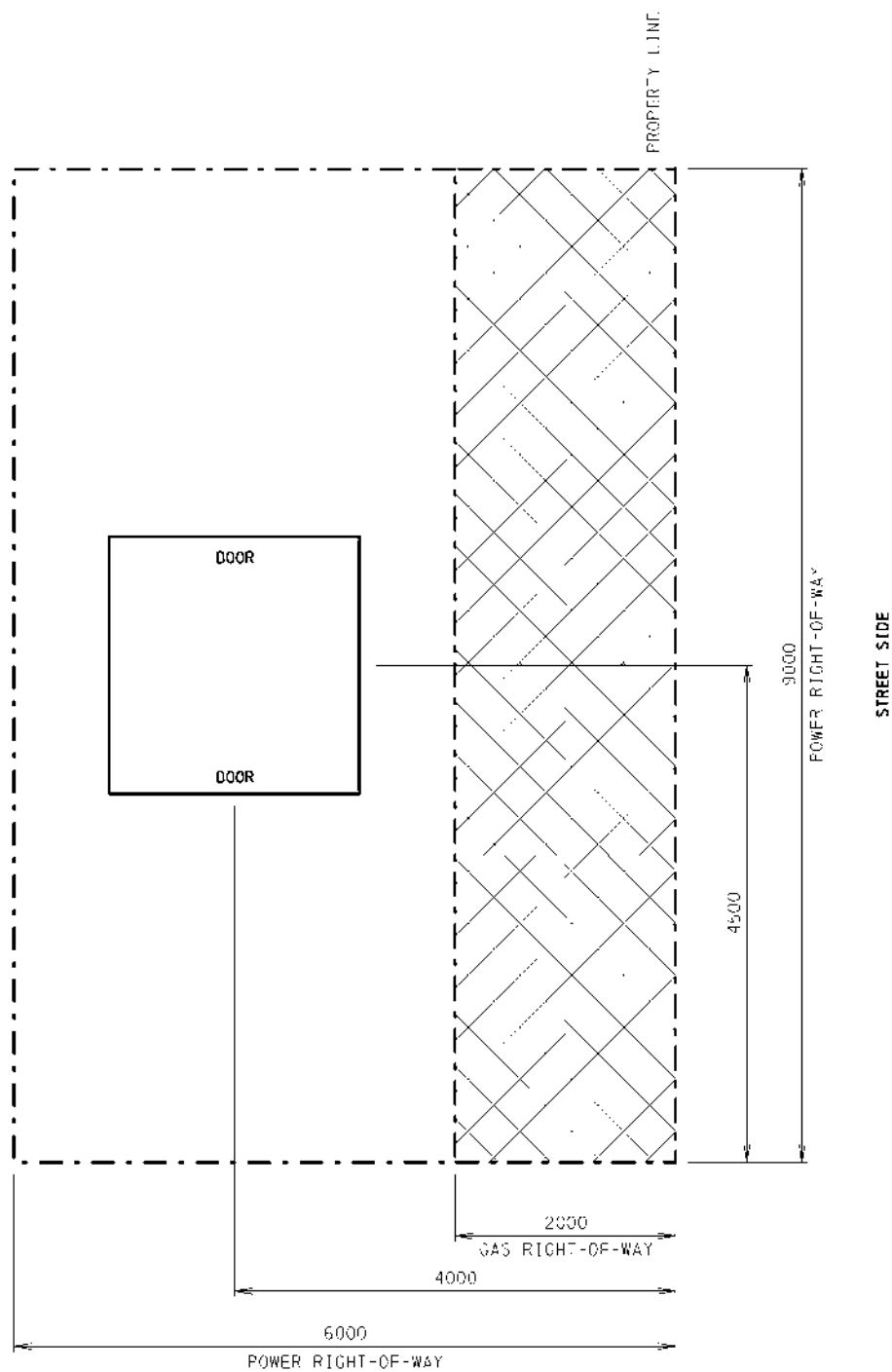
UNDERGROUND
DISTRIBUTION
STANDARDS

APPROVED BY STANDARDS COMMITTEE: 07-06-28
DRAFTED BY: P. J. MANN
DESIGNED BY: B. O'CALLAGHAN
APPROVED BY: T. SHMYR
APPROVED BY: D. ARNOLD

RIGHT-OF-WAY REQUIREMENT
FOR
3 PHASE SWITCHING CUBICLE

SCALE: N. T. S.	STANDARD NO. 60 00 07 00 12 005	PAGE NO. 1 / 1
DATE REVISED: 07 06 11		

6.0m X 9.0m RIGHT-OF-WAY REQUIREMENT

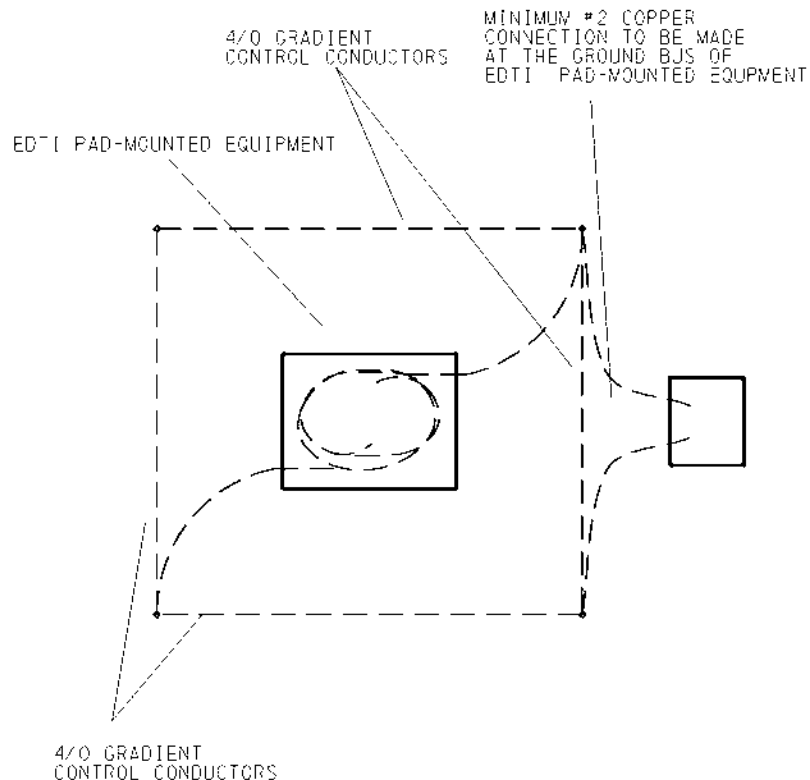


NOTE:
1. HOTSTICK OPERATIONS REQUIRE 3.0m UNOBSTRUCTED ACCESS.
ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE INDICATED



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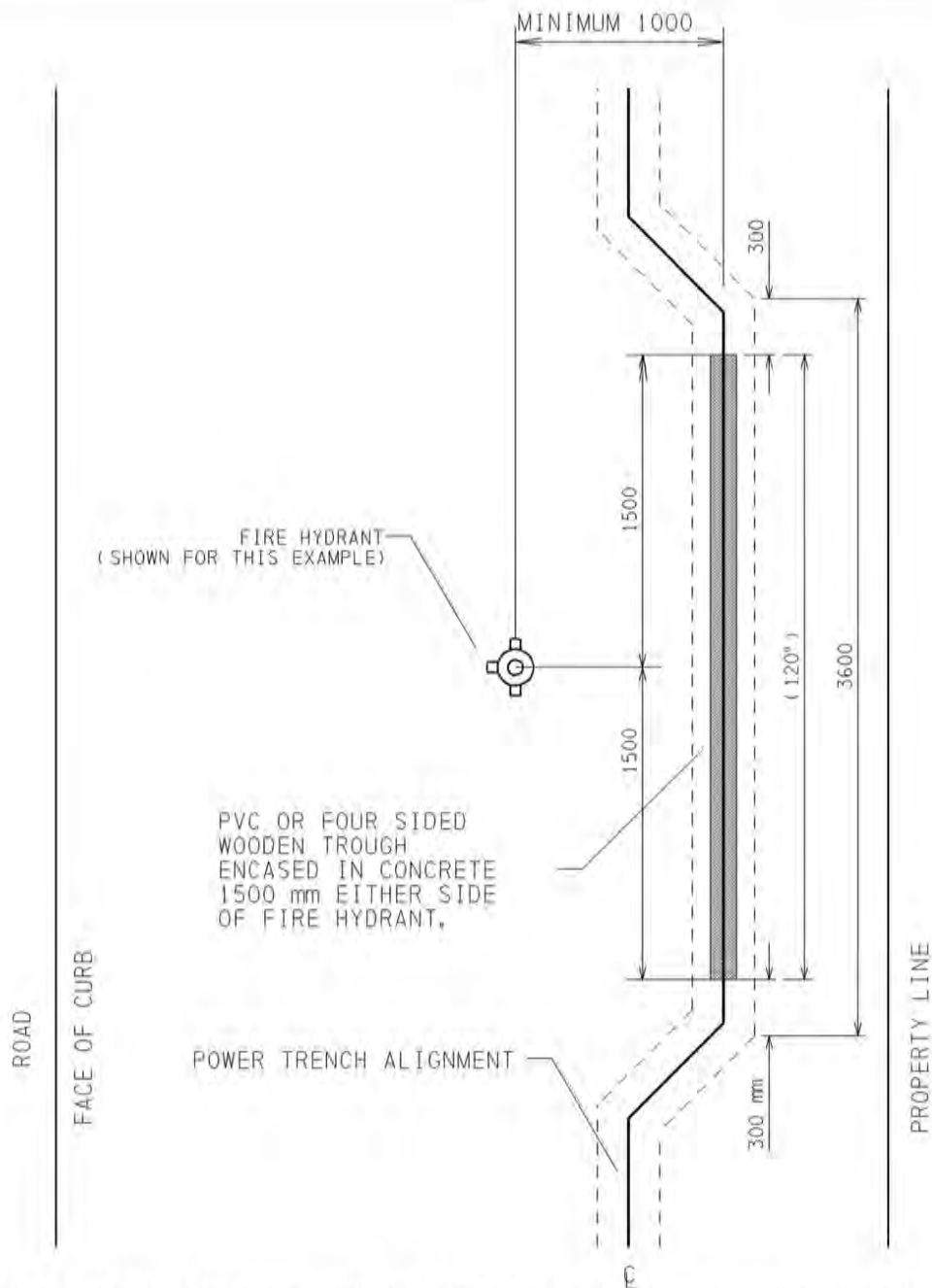
RIGHT-OF-WAY REQUIREMENT FOR 3 PHASE SWITCHING CUBICLE WITH 2.0m GAS RIGHT-OF-WAY		
SCALE: N. T. S.	STANDARD NO. 60 00 07 00 12 006	PAGE NO. 1 / 1
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NOTES:
 SEE THE TRANSFORMER AND CUBICLE BASE DRAWINGS FOR GROUND GRID DETAILS OF EDIT PAD MOUNTED EQUIPMENT.
 #2 COPPER IS THE MINIMUM CALCULATED SIZE OF BONDING CONDUCTOR BASED ON FAULT CALCULATIONS.
 A DETAIL IS REQUIRED SHOWING EQUIPMENT, THEIR DIMENSIONS FROM EACH OTHER AND THE PROPOSED GROUNDING
 CONNECTIONS TO BE SUPPLIED BY THE PARTY REQUESTING THE CONNECTION.
 THE COMMUNICATIONS PEGESTAL MUST BE OUTSIDE OF THE EDIT GROUND GRID.
 THE COMMUNICATIONS PEGESTAL CANNOT BE WITHIN 3 METERS OF THE EDIT PAD-MOUNTED EQUIPMENT DOORS.

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					UNDERGROUND DISTRIBUTION CONSTRUCTION DRAWING					
					BONDING COMMUNICATIONS OR STREET LIGHTING FACILITIES WITHIN 3 METERS OF THE CASE OF POWER DISTRIBUTION FACILITIES (CROSS BONDING)					
					EPCOR					
					Drawn By BAO		Checked By DXT		Approved By	
3 TWO TAILS					BAO		10-12-08			
A CREATED FOR VOLUME 7					BAO		08-06-02			
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NOTE:
THE DESIGNER MUST HAVE PERMISSION FROM THE OTHER UTILITY FOR THE REDUCED CLEARANCE.
IF PVC IS USED, PRIMARY, SECONDARY AND COMMUNICATIONS DUCTS MUST BE SEPERATE AND SIZED FOR THE
SPECIFIC CABLES AND HAVE END BELLS PERMANENTLY INSTALLED AT EACH END OF THE OPEN DUCTS.
THE TROUGH OR DUCTS ARE TO BE INSTALLED ON THE PROPERTY SIDE OF THE HYDRANT, MANHOLES OR C.B. WHERE
POSSIBLE.

ALL DIMENSIONS GIVEN IN MILLIMETERS (INCHES IN BRACKETS)

UNDERGROUND CONSTRUCTION DRAWING



TRENCHING PAST VALVES (NOT cc'S)
CATCH BASINS, MANHOLES OR
HYDRANTS

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