

1.1 GENERAL CONDITIONS

1. SUPPLY ALL LABOUR, EQUIPMENT, AND MATERIALS NECESSARY TO INSTALL, COMPLETE AND OPERATIONAL, THE ELECTRICAL SYSTEMS DESCRIBED HEREIN AND SHOWN ON THE DRAWINGS. THE REQUIREMENTS OF THIS SECTION ARE IN ADDITION TO THOSE CONTAINED IN THE GENERAL CONDITIONS AND OTHER PORTIONS OF THE CONTRACT DOCUMENTS.

1.2 DRAWINGS & SPECIFICATIONS

1. IT IS THE INTENT OF THESE DRAWINGS AND SPECIFICATIONS TO PROVIDE FOR AN ELECTRICAL INSTALLATION COMPLETE AND IN OPERATING CONDITION. THE RESPONSIBILITY FOR SUPPLYING AND INSTALLING ALL MATERIAL NECESSARY TO ACCOMPLISH THIS, EXCEPT WHERE SPECIFICALLY NOTED THAT SUCH WORK OR MATERIALS IS NOT INCLUDED, SHALL BE PART OF THIS SECTION.

2. DRAWINGS ARE SCHEMATIC; EXACT LOCATIONS, DISTANCES, LEVELS AND OTHER DIMENSIONS SHALL BE GOVERNED BY THE BUILDING AS CONSTRUCTED. SUBMIT ALL PLANS REQUIRED BY THE INSPECTION AUTHORITY FOR APPROVAL. FURNISH INSPECTION CERTIFICATES, PRIOR TO FINAL PAYMENT, TO SHOW INSTALLED WORK CONFORMS TO SPECIFICATION AND REGULATIONS. PAY ALL FEES AND PERMIT COSTS.

1.3 LOCAL RULES AND COSTS

1. THE COMPLETE INSTALLATION SHALL BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE CANADIAN ELECTRICAL CODE AND THE BY-LAWS OF THE PROVINCE AND MUNICIPAL ELECTRICAL ENERGY INSPECTION DEPARTMENT WHOSE AUTHORITY COVERS THE AREA IN WHICH THE WORK IS BEING DONE.

2. OBTAIN AND PAY FOR ALL PERMITS AND LICENSES REQUIRED TO EXECUTE THE WORK.

1.4 EQUIVALENT PRODUCTS

1. EQUIVALENT PRODUCTS MAY BE SUBSTITUTED ONLY AFTER REVIEW AND APPROVAL BY THE ENGINEER.

2. SUBMITTAL OF REQUEST FOR EQUIVALENT PRODUCTS MUST BE SENT THROUGH THE PRIME CONSULTANT AND BE IN AN APPROPRIATE FORMAT ILLUSTRATING THE EXACT NATURE OF THE REQUESTED PRODUCT. UPON APPROVAL, THE CONTRACTOR IS OBLIGATED TO ENSURE THE APPEARANCE AND PERFORMANCE OF THE EQUIVALENT PRODUCTS MEETS OR EXCEEDS THAT OF THE ORIGINALLY SPECIFIED PRODUCT AND THE ORIGINAL DESIGN INTENT INDICATED ON PLANS.

1.5 CO-ORDINATION OF WORK

1. CO-ORDINATE WITH OTHER TRADES ON THE LOCATION OF EQUIPMENT SUPPLIED BY OTHERS PRIOR TO THE INSTALLATION OF CONDUIT, OUTLETS, ETC. WHERE ELECTRICAL EQUIPMENT IS BEING BUILT-IN, SUPPLY THE EQUIPMENT OR NECESSARY DIMENSION TO THE OTHER TRADES.

2. ARRANGE FOR AND COORDINATE ROUGH-IN AND FINAL INSPECTIONS WITH INSPECTION AUTHORITIES, ENGINEER.

3. INSTALL EQUIPMENT, AND APPARATUS REQUIRING MAINTENANCE, ADJUSTMENT OR EVENTUAL REPLACEMENT WITH ADEQUATE CLEARANCES AND ACCESSIBILITY FOR SAME.

4. INCLUDE, IN THE WORK, ALL REQUIREMENTS SHOWN ON THE SHOP DRAWINGS OR MANUFACTURERS' INSTALLATION INSTRUCTIONS.

5. REPLACE WORK UNSATISFACTORY TO THE CONTRACT ADMINISTRATOR WITHOUT EXTRA COST.

1.6 MATERIALS

1. ALL MATERIALS SUPPLIED SHALL BE NEW (OR AS NOTED) AND OF THE QUALITY INDICATED IN THE SPECIFICATIONS AND SHALL CONFORM TO THE STANDARDS OF THE C.S.A. AND THE U.L.C. AND APPROVED BY THESE AGENCIES WHERE APPLICABLE.

2. IN THE EVENT THAT A MATERIAL SPECIFIED DOES INDICATE C.S.A./U.L.C. OR EQUAL APPROVAL, CONTRACTOR IS TO OBTAIN THE APPROVAL OF THE LOCAL INSPECTION AUTHORITY, PAY ALL CHARGES LEVIED BY THE INSPECTION AUTHORITY AND MAKE ANY MODIFICATIONS REQUIRED, AT NO ADDITIONAL EXPENSE TO THE OWNER.

1.9 AS BUILT DRAWINGS

1. KEEP A RECORD SET OF DRAWINGS ON THE SITE AT ALL TIMES RECORDING ANY CHANGES THAT MAY OCCUR. SUBMIT THESE DRAWINGS TO THE CONTRACT ADMINISTRATOR UPON COMPLETION OF THE WORK. AS-BUILTS SHALL INCLUDE TAGGING CIRCUITS AND EQUIPMENT.

1.10 PANELS AND EQUIPMENT

1. PROVIDE ACCURATE TYPED WRITTEN DIRECTORIES FOR ALL EQUIPMENT.

2. EQUIPMENT TO BE BY SQUARE D, SIEMENS, OR CUTLER HAMMER. ENSURE ALL EQUIPMENT IS RATED AND SUPPLIED TO COORDINATE WITH ALL POSSIBLE FAULT CONDITIONS PRESENT AT SITE.

3. PROVIDE ADDITIONAL BREAKERS AS NECESSARY. INCLUDE ALL HARDWARE, FILLERS, ETC.

4. 250 VOLT PANELBOARDS: COPPER BUS AND BREAKERS RATED FOR SYMMETRICAL INTERRUPTING CAPACITY AS INDICATED. SERVICE ENTRANCE TYPE AS REQUIRED.

5. PANELBOARDS: MAINS, NUMBER OF CIRCUITS, AND NUMBER AND SIZE OF BRANCH CIRCUIT BREAKERS AS INDICATED.

6. MAINS SUITABLE FOR BOLT ON BREAKERS.

7. FINISH TRIM AND DOOR BAKED GREY

8. MOUNT PANELBOARDS AT 5'-6" TO TOP.

9. CONNECT NEUTRAL CONDUCTORS TO COMMON NEUTRAL BUS WITH RESPECTIVE CIRCUIT(S) IDENTIFIED.

10. BREAKER MINIMUM INTERRUPTING RATING (SYMMETRICAL RMS VALUES) SHALL BE NOT LESS THAN 22KAIC

1.11 GROUNDING SYSTEM

1. GROUNDING SYSTEM SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF CANADIAN ELECTRICAL CODE. ENSURE GROUND RESISTANCE IS SUITABLE FOR GRID LOCATION.

2. PROVIDE GROUNDING TO ALL RACEWAYS, AND EQUIPMENT TO C.E.C.

3. WIRE CONNECTORS: TWIST-ON, BOLT-ON PRESSURE TYPE FOR #10 AND SMALLER. HYPRESS COMPRESSION TYPE FOR #8 AND LARGER.

4. INSTALL SEPARATE "GREEN" GROUND CONDUCTOR IN SAME CONDUIT WITH CIRCUIT (POWER WIRING) CONDUCTORS. BOND SECURELY TO GROUND SCREW IN EACH OUTLET, JUNCTION, PULL BOX, AND EQUIPMENT ENCLOSURE GROUND CONDUCTOR EQUAL IN AMPACITY TO SIZE OF CIRCUIT AMPACITY OR IN ACCORDANCE WITH CODE FOR EQUIPMENT GROUNDING.

1.14 WIRING METHODS

1. ALL WIRING SHALL BE COPPER, RW-90 IN EMT OR TECK-90 UNLESS INDICATED OTHERWISE. RIGID PVC TO BE USED IN WET AREAS.

2. CIRCUIT WIRING TO BE MINIMUM #12 AWG RW90 UNLESS OTHERWISE INDICATED. WHERE WIRE SIZE IS NOT SHOWN, AMPACITY MUST MATCH OR EXCEED THAT OF PROTECTIVE DEVICE AND ANY ALLOWANCE FOR VOLTAGE DROP IS TO BE APPLIED. CABLE TO BE UPSIZED AS NECESSARY.

3. CONDUIT AND WIRING SHALL BE GROUPED WHERE POSSIBLE AND CLIPPED IN A WORKMANLIKE MANNER.

4. ALL DIMMING DEVICES, COMPUTER AND COPIER RECEPTACLE CIRCUITS MUST BE CONNECTED WITH A SEPARATE NEUTRAL FOR EACH CIRCUIT.

5. AC-90 CABLE MAY BE USED WHEN RUN DIRECTLY TO A DEVICE OR FIXTURE FROM A JUNCTION BOX ATTACHED TO A CONDUIT SYSTEM. CABLE LENGTH NOT TO EXCEED 10FT.

6. UNDERGROUND WIRING IS TO BE PVC RIGID CONDUIT C/W EXPANSION JOINTS OR TECK 90 CABLE.

7. USE ARMoured CABLE FOR CONNECTION TO VIBRATING EQUIPMENT.

1.15 INSTALLATION

1. INSTALL WIRING CONTINUOUSLY WITHIN RACEWAYS. SPLICES WILL BE PERMITTED ONLY AT OUTLETS AND JUNCTION BOXES. ADEQUATE CABLE SHALL BE PROVIDED TO PERMIT PROPER CONNECTION OF ALL EQUIPMENT.

2. ALL WIRING TO RUN CONCEALED IN CEILING, WALLS OR UNDER FLOORS WHEREVER POSSIBLE. ANY EXPOSED CONDUITS OR CABLES SHALL BE RUN PARALLEL TO OR AT RIGHT ANGLES TO BUILDING LINES AND IN A NEAT MANNER.

3. INSTALL PULL BOXES AS REQUIRED BY THE CANADIAN ELECTRICAL CODE. PULL BOXES SHALL BE LOCATED IN INCONSPICUOUS SPACES. PROVIDE RATED ACCESS DOORS AS REQUIRED.

4. PROVIDE ALL MOUNTING BRACKETS, STRAPS AND SUPPORTS TO SECURE ELECTRICAL DEVICES IN ACCORDANCE TO SPECIFICATIONS AND C.E.C REQUIREMENTS.

5. RUN CONDUIT UNDER SLAB TO AVOID IN FLOOR HEATING PIPING, WATER PIPING, ETC.. COORDINATE WITH G.C. PROVIDE PROPER COMPACTION OF GRANULAR MATERIAL AS REQUIRED.

1.22 TESTING

1. THE ELECTRICAL INSTALLATION SHALL BE COMPLETELY TESTED DEMONSTRATING THE EQUIPMENT AND SYSTEMS INSTALLED PERFORM IN THE MANNER INTENDED

1.23 CUTTING AND PATCHING

1. ARRANGE AND PAY FOR ALL CUTTING AND PATCHING AS REQUIRED FOR THE ELECTRICAL INSTALLATION.

2. PROVIDE & INSTALL APPROPRIATE ULC LISTED FIRE STOP SYSTEMS AT ALL FIREWALL &/OR FLOOR PENETRATIONS. ACCEPTABLE MANUFACTURES: HILTI, DOW CORNING, FIRE-STOP SYSTEMS (ELASTA-SEAL) OR G.E. SILICONE.

1.24 DISTRIBUTION

1. GENERAL ARRANGEMENT AND SIZE OF COMPONENTS SHALL BE AS SHOWN ON THE DRAWINGS. SERVICE ENTRANCE RATED WHERE REQUIRED. COORDINATE ALL METERING AND FINAL EQUIPMENT LOCATIONS WITH MANITOBA HYDRO.

2. ALL DISTRIBUTION EQUIPMENT IS TO BE COMPLETE WITH LOCKING DOOR AND SPARE KEYS. DISTRIBUTION BREAKERS TO BE BOLTED ON. HALF SIZE BREAKERS ARE NOT ALLOWED. COORDINATE ALL TRIP SETTINGS WITH THE EQUIPMENT MANUFACTURER AND SET ACCORDINGLY.

3. ALL EQUIPMENT IS TO INCLUDE ALL NECESSARY HARDWARE MOUNTING ACCESSORIES.

4. ALL EQUIPMENT IS TO BE LABELED WITH EQUIPMENT NAME AND ELECTRICAL RATING. PROVIDE ARC FLASH INFORMATION WHERE REQUIRED.

5. CONTRACTOR IS TO PROVIDE A SHORT CIRCUIT AND COORDINATION STUDY FOR THE ELECTRICAL DISTRIBUTION SYSTEM. NEW AND EXISTING BOTH TO BE INCLUDED.

6. ACCEPTABLE MANUFACTURERS: SQUARE-D, EATON AND SIEMENS.

1.28 SITE REVIEW

1. CONTACT THE CONTRACT ADMINISTRATOR FOR SITE REVIEW AT THE FOLLOWING STAGES OF CONSTRUCTION:

- ROUGH-IN OF WALLS AND FEEDERS
- SUBSTANTIAL PERFORMANCE
- COMPLETION OF DEFICIENCIES (IF REQUIRED)

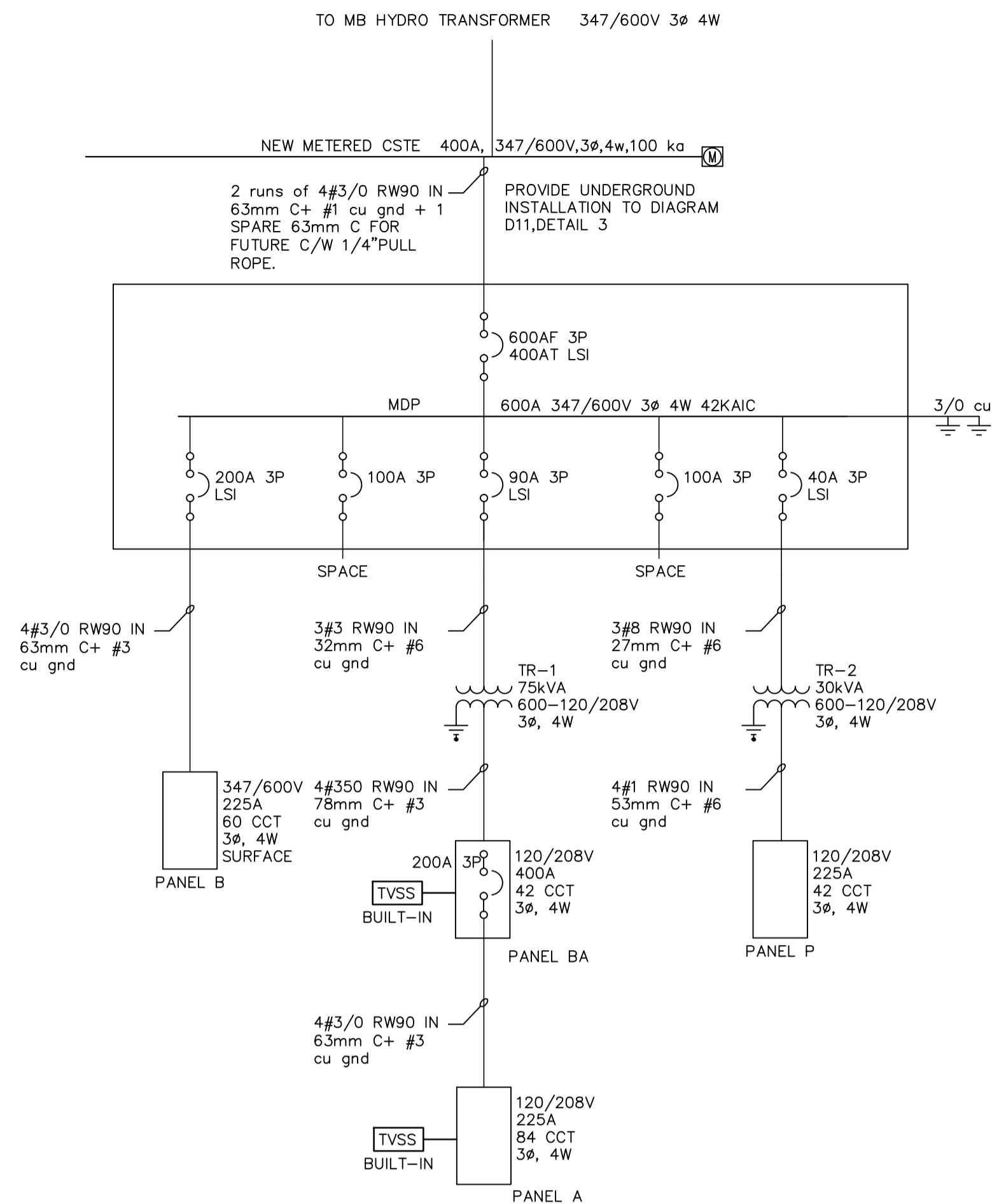
NOTE: ALL REVIEWS ARE AT THE DISCRETION OF THE ENGINEER.

2. PROVIDE FIVE (5) WORKING DAYS NOTICE FOR ALL REVIEWS.

1.29 SUBSTANTIAL PERFORMANCE

1. BEFORE REQUESTING A SUBSTANTIAL PERFORMANCE REVIEW, THE FOLLOWING ARE AMONG ITEMS THAT MUST BE COMPLETE:

- ANY DEVICES NOT INSTALLED MUST HAVE THE WIRING MADE SAFE AND TERMINATED IN AN OUTLET BOX COMPLETE WITH COVER.
- ALL ELECTRICAL EQUIPMENT MUST HAVE COVERS AND/OR DOORS INSTALLED COMPLETE.
- ALL PANELS AND EQUIPMENT ARE TO BE INSTALLED AND ENERGIZED WITH ALL TRIP SETTINGS PROPERLY ADJUSTED.
- PROVIDE CERTIFICATE OF ACCEPTANCE FROM ELECTRICAL INSPECTION DEPARTMENT

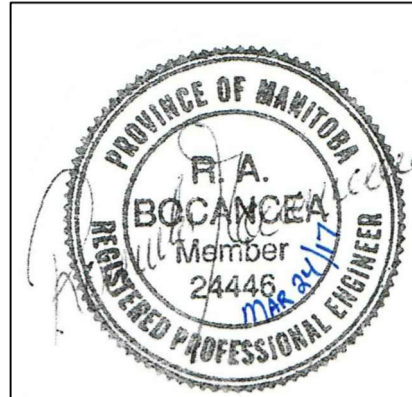


DRAWING NOTES:

1.	ALL ELECTRICAL DISTRIBUTION EQUIPMENT IS TO BE BONDED TO GROUND WITH A DEDICATED GROUNDING CABLE DIRECT TO THE MAIN GROUND. SIZE TO CEC
2.	ALL PENETRATIONS THROUGH RATED AREAS ARE TO BE SEALED WITH A ULC LISTED FIRE STOP SYSTEM.
3.	PROVIDE CO-ORDINATED TRIPS AND SETTINGS FOR ALL BREAKERS.
4.	PANELS AND TRANSFORMERS TO HAVE COPPER BUS AND WINDINGS.
5.	TVSS TO BE BUILT-IN, MIN 160KA SURGEOLOGIC BY SQUARE D OR APPROVED EQUAL.
6.	



NOTES:



1	ISSUED FOR CONSTRUCTION	KO	2017 03.24
0	ISSUED FOR UTILITY COORDINATION	KO	2017 02.28

No.	REVISION/DESCRIPTION	BY	DATE

DRAWN	KO	CHECKED	RB	DESIGNED	KO	APPROVED
DATE	2017.02.23	USER APPROVAL				

THE CITY OF WINNIPEG
PLANNING, PROPERTY AND DEVELOPMENT DEPARTMENT
MUNICIPAL ACCOMMODATIONS DIVISION
3-65 GARRY STREET, R3C 4K4

PROJECT
BRADY ROAD LANDFILL
ADMINISTRATION BUILDING DEVELOPMENT FOR BRADY LANDFILL
1777 BRADY ROAD

SHEET TITLE
ELECTRICAL SINGLE LINE AND SPECIFICATION

SCALE	PROJECT No:	SHEET No:
AS SHOWN	2015-037	ES2