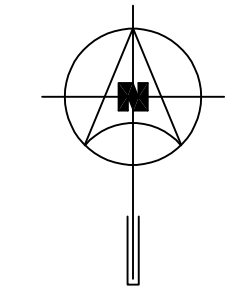
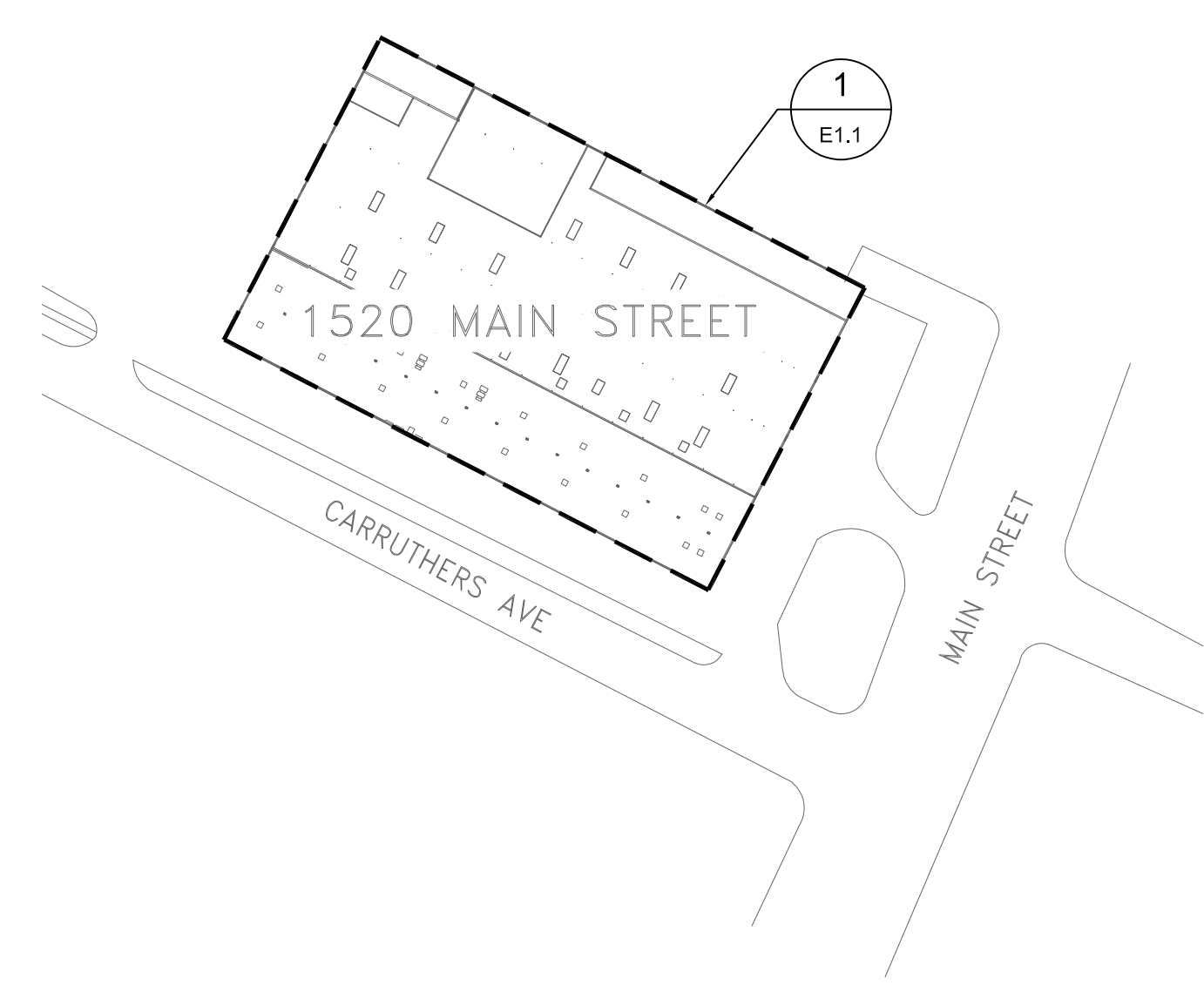


**DRAWING LIST**

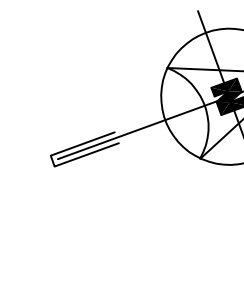
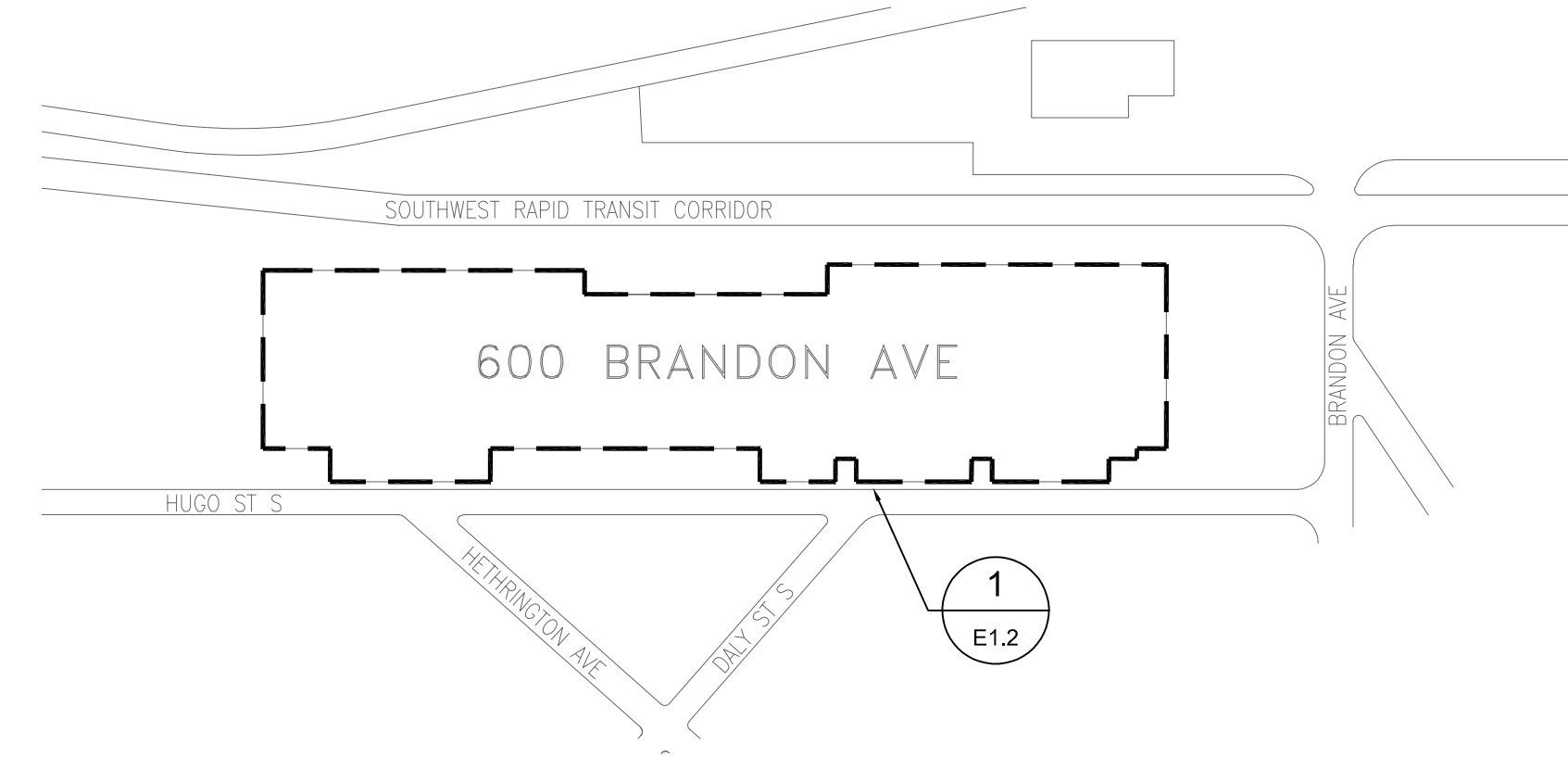
- E0.1 DRAWING LIST, SYMBOL LEGEND, ELECTRICAL SPECIFICATION AND KEY PLANS
- E1.1 NORTH GARAGE ROOF PLAN - ELECTRICAL - NEW CONSTRUCTION
- E1.2 BRANDON GARAGE ROOF PLAN - ELECTRICAL - NEW CONSTRUCTION
- E1.3 FORT ROUGE GARAGE BUILDING B MAIN FLOOR AND ROOF PLAN - ELECTRICAL - NEW CONSTRUCTION
- E1.4 FORT ROUGE GARAGE - BUILDING A MAIN FLOOR AND ROOF PLAN - ELECTRICAL - NEW CONSTRUCTION

SYMBOL LEGEND	
	GFI DUPLEX RECEPTACLE 20A T' SLOT 5-20R
	SURFACE MOUNTED PANEL
	WEATHER PROOF

\* PLEASE NOTE \*  
 ALL EQUIPMENT SHOWN "FADED BACK" IS EXISTING TO REMAIN UNLESS OTHERWISE NOTED.  
 ALL EQUIPMENT SHOWN "BOLD" IS NEW CONSTRUCTION.



**1 NORTH GARAGE - KEY PLAN**  
 SCALE: NTS



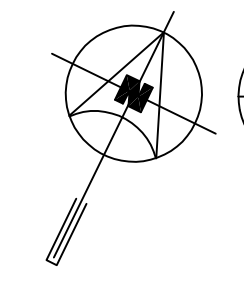
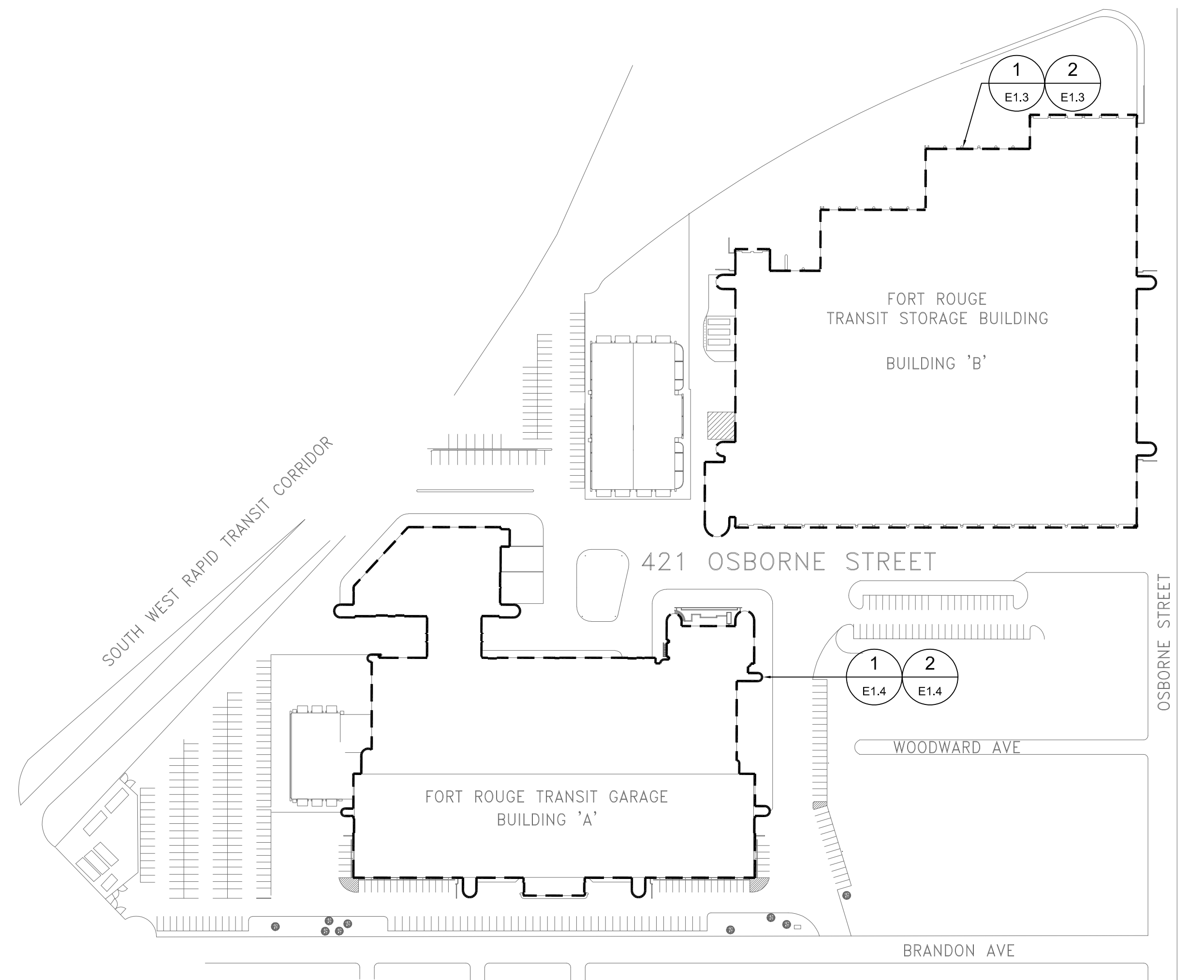
**2 BRANDON GARAGE - KEY PLAN**  
 SCALE: 1/64" = 1'-0"

**ELECTRICAL SPECIFICATION**

**ELECTRICAL GENERAL PROVISIONS**

1. GENERAL
  1. PROVIDE ALL MATERIALS, LABOUR, PLANT AND EQUIPMENT NECESSARY TO MAKE A COMPLETE INSTALLATION AS DESCRIBED AND SHOWN. THIS INSTALLATION SHALL BE LEFT COMPLETE AND READY FOR OPERATION.
  2. THE ENTIRE INSTALLATION SHALL BE GUARANTEED FOR ONE YEAR FROM DATE OF FINAL ACCEPTANCE BY THE CONTRACT ADMINISTRATOR. REPLACE AT NO ADDITIONAL COST ANY WORK OR MATERIAL WHICH MAY FAIL OR PROVE DEFECTIVE DURING THE GUARANTEE PERIOD.
  3. THE INSTALLATION SHALL CONFORM IN EVERY RESPECT TO THE RULES AND REGULATIONS OF THE LATEST EDITION OF THE CANADIAN ELECTRICAL CODE AND ALL LOCAL CODES. ALL WORK SHALL BE UNIFORM AND HIGH QUALITY. ALL EQUIPMENT SUPPLIED UNDER THIS CONTRACT SHALL BE NEW AND BUILT IN ACCORDANCE WITH NEMA, ANSI/IEEE STANDARDS. SHALL BE CSA CERTIFIED OR CERTIFIED BY AN EQUIVALENT RECOGNIZED CERTIFYING AGENCY TO MEET CANADIAN STANDARDS AND LOCALLY APPROVED. ELECTRICAL EQUIPMENT CONSISTING OF INDIVIDUAL CERTIFIED COMPONENTS MUST ALSO HAVE A CSA OR EQUIVALENT CERTIFICATION FOR THE ENTIRE ASSEMBLY. PROVIDE INSPECTION CERTIFICATE UPON COMPLETION OF THE WORK.
  4. CAREFULLY EXAMINE ALL PLANS AND SPECIFICATIONS PERTAINING TO THIS CONTRACT AND VISIT SITE TO DETERMINE ALL FACTORS AFFECTING COSTS AND INCLUDE SAME IN TENDER. NOTIFY CONTRACT ADMINISTRATOR OF DISCREPANCIES OR CONFLICTS WITH ANY REGULATION BEFORE SUBMITTING PRICE. FAILING SUCH NOTIFICATION THIS CONTRACTOR SHALL MEET ALL SUCH REQUIREMENTS WITHOUT EXTRA COST TO THE CITY.
  5. OBTAIN ALL NECESSARY PERMITS, PAY ALL NECESSARY FEES, GIVE ALL NECESSARY NOTICES AND OBTAIN APPROVAL OF THE ELECTRICAL AUTHORITIES HAVING JURISDICTION.
2. SHOP DRAWINGS
  1. SUBMIT ELECTRONIC COPIES OF SHOP DRAWINGS FOR ALL EQUIPMENT.
  2. FOR SHOP DRAWINGS SUBMITTED ELECTRONICALLY, INCLUDE PROJECT NAME IN SUBJECT LINE OF E-MAIL TO CONTRACTADMIN@SMSENG.COM.
  3. EQUIPMENT PROPOSED SHALL MEET THE SAME STANDARDS OF PERFORMANCE, QUALITY AND WORKMANSHIP AS THAT SPECIFIED.
  4. SHOP DRAWINGS TO BE REVIEWED AND STAMPED BY THE TRADE AND GENERAL CONTRACTOR.
  5. ALLOW 10 BUSINESS DAYS FOR THE REVIEW AND PROCESSING OF SHOP DRAWINGS.
3. REQUEST FOR INTERPRETATION (RFI)
  1. FOR RFIS SUBMITTED ELECTRONICALLY, INCLUDE PROJECT NAME AND RFI NUMBER IN SUBJECT LINE OF E-MAIL. SEND RFIS TO CONTRACTADMIN@SMSENG.COM.
  2. CONTENT OF THE RFI INCLUDE A DETAILED DESCRIPTION OF THE ITEM NEEDING INTERPRETATION AND PROPOSED SOLUTION.
  3. ALLOW 10 BUSINESS DAYS FOR THE REVIEW AND PROCESSING OF RFIS.
4. RECORD DRAWINGS
  1. PROVIDE "AS-BUILT" DRAWINGS IN PDF.
5. OPERATION AND MAINTENANCE MANUALS
  1. PROVIDE DATA FOR INCORPORATION INTO MAINTENANCE MANUAL. MANUAL SHALL INCLUDE INSTRUCTIONS FOR ALL EQUIPMENT SUPPLIED. COPY OF REVIEWED SHOP DRAWINGS AND TECHNICAL DATA SUCH AS PARTS LISTS, OPERATING INSTRUCTIONS, MAINTENANCE INSTRUCTIONS, ETC. THREE (3) HARD COVER COPIES OF MAINTENANCE MANUALS ARE TO BE SUBMITTED.
6. WORK IN EXISTING BUILDING
  1. CO-ORDINATION
    1. THE BUILDING SHALL REMAIN OPEN AND IN NORMAL OPERATION DURING THE CONSTRUCTION PERIOD.
    2. WHERE EXISTING SERVICES SUCH AS ELECTRICAL POWER, FIRE ALARM SYSTEM, SOUND SYSTEM, ETC. ARE REQUIRED TO BE DISRUPTED AND/OR SHUT DOWN, CO-ORDINATE THE SHUTDOWNS WITH THE CITY AND CARRY OUT THE WORK AT A TIME AND IN A MANNER ACCEPTABLE TO THEM. CAREFULLY SCHEDULE ALL DISRUPTION AND/OR SHUT-DOWNS AND ENSURE THAT THE DURATION OF SAME IS KEPT TO THE ABSOLUTE MINIMUM. SUBMIT FOR APPROVAL A WRITTEN, CONCISE SCHEDULE OF EACH DISRUPTION AT LEAST 120 HOURS IN ADVANCE OF PERFORMING WORK AND OBTAIN WRITTEN CONSENT FROM THE CITY PRIOR TO IMPLEMENTING.
    3. SHOULD ANY TEMPORARY CONNECTIONS BE REQUIRED TO MAINTAIN SERVICES DURING WORK IN THE EXISTING BUILDING, SUPPLY AND INSTALL ALL NECESSARY MATERIAL AND EQUIPMENT AND PROVIDE ALL LABOUR AT NO EXTRA COST. SHOULD ANY EXISTING SYSTEM BE DAMAGED, MAKE FULL REPAIRS WITHOUT EXTRA COST, AND TO THE SATISFACTION OF THE CITY AND CONTRACT ADMINISTRATOR.
    4. IF EXISTING EQUIPMENT SHOWN ON DRAWINGS IS DEFECTIVE IT SHOULD BE BROUGHT TO THE CONTRACT ADMINISTRATOR AND THE CITY'S ATTENTION PRIOR TO WORK COMPLETION.
  2. INSTALLATION
    1. INSTALL BOXES, CONDUIT AND WIRING THROUGH EXISTING AREAS AS REQUIRED FOR THE NEW INSTALLATION.
    2. PATCH AND REPAIR WALLS AND CEILINGS IN EXISTING AREAS THAT HAVE BEEN DAMAGED OR CUT OPEN DUE TO THE NEW ELECTRICAL INSTALLATION.
    3. WHERE NEW CABLES OR CONDUITS HAVE BEEN INSTALLED THROUGH EXISTING FIRE RATED WALLS, SEAL OPENING AROUND CABLES AND CONDUIT TO MAINTAIN FIRE RATINGS.
    4. ALL EXISTING EQUIPMENT REUSED SHALL BE MADE GOOD AND GUARANTEED.
7. ELECTRICAL MATERIALS AND INSTALLATION
  1. WIRING METHOD
    1. FOR GENERAL PURPOSE WIRING: RW90 CONDUCTORS IN EMT CONDUIT.
    2. FOR OUTDOOR WIRING USE TECK TYPE CONDUCTORS OR RW90 CONDUCTORS IN LIQUID TIGHT CONDUIT (NOT LONGER THAN 1.5M).
    3. RUN ALL CONDUIT AND CABLE CONCEALED, PARALLEL AND PERPENDICULAR TO BUILDING LINES, STAPLED AND/OR CLIPPED IN A NEAT WORKMANLIKE MANNER.
    4. ALL CONDUCTORS SHALL BE COPPER. MINIMUM CONDUCTOR SIZE SHALL BE #12 AWG EXCEPT AS NOTED.
  2. GROUNDING AND BONDING
    1. THE ENTIRE INSTALLATION SHALL BE GROUNDED/BONDED IN CONFORMANCE TO THE LATEST EDITION OF THE CANADIAN ELECTRICAL CODE.
    2. ALL CONDUIT TO HAVE A SEPARATE INSULATED BONDING CONDUCTOR.
  3. BOXES
    1. INDOOR OUTLET, JUNCTION AND SWITCH BOXES SHALL BE GALVANIZED STEEL AND SIZED ACCORDING TO THE ELECTRICAL CODE AND TO SUIT EACH APPLICATION.
    2. OUTDOOR DEVICE AND JUNCTION BOXES SHALL BE TYPE PSFD WITH GASKET FITTED COVER.
  4. WIRING DEVICES
    1. PROVIDE WIRING DEVICES FOR ALL OUTLETS AS REQUIRED AND INDICATED. COLOUR AND MOUNTING TO MATCH EXISTING.
      1. NEMA 5-15R 15A 125VAC RECEPTACLES SHALL BE U-GROUND PARALLEL SLOT SIDE.
8. WIRING IDENTIFICATION
  1. IDENTIFY WIRING WITH PERMANENT INDELIBLE IDENTIFYING MARKINGS ON BOTH ENDS OF PHASE CONDUCTORS OF FEEDERS (COLOURED PLASTIC TAPES) AND BRANCH CIRCUIT WIRING (NUMBERED WIRE MARKERS). CONDUCTOR MARKER IDENTIFICATION SHALL CORRESPOND WITH PANEL OR TERMINAL BOARD DIRECTORY INFORMATION.
  2. MAINTAIN PHASE SEQUENCE AND COLOUR CODING THROUGHOUT.
  3. COLOUR CODING TO CSA C22.1.
  4. INSULATED GROUNDING CONDUCTORS SHALL HAVE A GREEN FINISH AND SHALL BE USED ONLY AS A GROUNDING CONDUCTOR.
9. CONDUIT AND CABLE IDENTIFICATION
  1. CONFIRM IDENTIFICATION METHOD WITH THE CITY AND CONTRACT ADMINISTRATOR PRIOR TO START OF WORK.
  2. IDENTIFY CONDUIT AND CABLES AS FOLLOWS:
    1. AT ENTRY TO AND EXIT FROM EQUIPMENT, WITHIN 300MM FROM EQUIPMENT, INCLUDING PULL BOXES AND JUNCTION BOXES.
    2. AT PENETRATIONS THROUGH WALLS, CEILINGS, FLOORS, AT EACH SIDE, WITHIN 300MM FROM PENETRATION.
    3. AT EVERY 10M ALONG RUN.
    4. LABEL INDOOR AND OUTDOOR INSTALLATION.
    5. PROVIDE SELF ADHESIVE VINYL LABELS, UV RESISTANT, WITH THE FOLLOWING WORDING AS APPLICABLE:
      1. FOR NORMAL POWER: "NORMAL POWER, 120/208V", OR WITH AN APPROPRIATE VOLTAGE.
      2. LABEL SIZES PER THE FOLLOWING TABLE:
 

INCHES	MM	INCHES	MM	INCHES	MM
0.75 - 1.25	19 - 32	4	100	0.5	13
1.5 - 2	38 - 51	4	100	0.75	19
2.5 - 4	64 - 102	6	150	1.25	32
  3. PROVIDE LARGER LABEL TO SUIT WORDING AS REQUIRED.
  4. LABEL COLOURS
    1. BLACK LETTERS ON ORANGE BACKGROUND. WORDING SHALL BE UPPERCASE.
  5. LABELS INSTALLED OUTDOORS SHALL BE RATED FOR OUTDOOR APPLICATIONS.
  6. LABELS SHALL BE MANUFACTURED IN ACCORDANCE TO ANSI Z535.4 PRODUCT SAFETY SIGNS AND LABELS.
  7. APPROVED MANUFACTURERS
    1. GTS SIGN DESIGN
    2. AGCENT STRIPING AND LETTERING COMPANY
10. CONDUITS, FASTENINGS AND FITTINGS
  1. ONE HOLE STEEL STRAPS TO SECURE SURFACE CONDUITS 50MM AND SMALLER.
  2. FITTINGS FOR RACEWAYS: TO CSA C22.2 NO. 18
  3. FITTINGS MANUFACTURED FOR USE WITH CONDUIT SPECIFIED COATING SAME AS CONDUIT.
  4. FACTORY "ELBOW" WHERE 90° BENDS ARE REQUIRED FOR 25MM AND LARGER CONDUITS.
  5. STEEL SET SCREW CONNECTORS AND COUPLINGS, INSULATED THROAT LINERS ON CONNECTORS.
11. DISCONNECT SWITCHES
  1. HEAVY DUTY, FUSIBLE AND NON-FUSIBLE DISCONNECT SWITCH IN METAL ENCLOSURE, CSA RATED.
  2. PROVISION FOR PADLOCKING "ON-OFF" SWITCH POSITION BY THREE LOCKS.
  3. MECHANICAL INTERLOCKED DOOR TO PREVENT OPENING WHEN HANDLE IS IN "ON" POSITION.
  4. QUICK-MAKE, QUICK-BREAK ACTION.
  5. "ON-OFF" SWITCH POSITION INDICATION ON SWITCH ENCLOSURE COVER.
  6. DISCONNECTS USED FOR SERVICE ENTRANCES SHALL BE APPROVED SERVICE ENTRANCE SWITCHES.
  7. DISCONNECTS FOR TWO SPEED MOTORS TO BE SIX POLE. REFER TO MOTOR SCHEDULE AND DRAWINGS FOR TWO SPEED MOTORS AND PROVIDE A SIX POLE DISCONNECT SWITCH FOR EACH TWO SPEED MOTOR.
  8. INSTALL DISCONNECT SWITCHES AS INDICATED ON DRAWINGS.
  9. WEATHERPROOF WHERE REQUIRED, MINIMUM NEMA4 RATING.
12. EQUIPMENT IDENTIFICATION
  1. IDENTIFY ELECTRICAL EQUIPMENT WITH NAMEPLATES AND LABELS AS FOLLOWS:
    1. NAMEPLATES: LAMACOD 3MM THICK PLASTIC ENGRAVING SHEET, BLACK FACE WITH WHITE CORE (BLACK WITH WHITE LETTERS) FOR NORMAL POWER AND LAMACOD 3MM THICK PLASTIC ENGRAVING SHEET, RED FACE WITH WHITE CORE (RED WITH WHITE LETTERS) FOR EMERGENCY POWER. LETTERING ACCURATELY ALIGNED AND ENGRAVED INTO CORE MECHANICALLY ATTACHED WITH SELF TAPPING SCREWS. LETTERS TO BE MINIMUM 5MM HIGH.
    2. WORDING ON NAMEPLATES AND LABELS TO BE APPROVED BY CONTRACT ADMINISTRATOR PRIOR TO MANUFACTURE.
    3. ALLOW FOR MINIMUM OF TWENTY-FIVE (25) LETTERS PER NAMEPLATE AND LABEL.
  2. NAMEPLATES FOR TERMINAL CABINETS, STARTERS AND CONTACTORS: INDICATE EQUIPMENT BEING CONTROLLED AND VOLTAGE.
13. ELECTRICAL REQUIREMENTS FOR ROOF MOUNTED HOIST
  1. SYSTEM TO BE APPROVED FOR USE IN CANADA (CERTIFIED BY CSA, ULC, ETC.).
  2. WIRING AND COMPONENTS (MOTOR, POWER CORD, CONTROL PANEL, PENDANT, ETC.) TO BE WEATHERPROOF (SUITABLE FOR WET LOCATIONS) AND RATED FOR USE AT -40 DEGREES CELSIUS TO +40 DEGREES CELSIUS.
  3. POWER CORD TO BE 20' LONG, PLUG TO BE 5-20R.
  4. POWER CORD AND PENDANT CABLE TO REMAIN FLEXIBLE AT LOW TEMPERATURE AND RATED FOR DIRECT SUNLIGHT EXPOSURE.
  5. MOTOR TO BE TOTALLY ENCLOSED FAN COOLED (TEFC) TYPE.
  6. PENDANT AND CONTROL PANEL TO BE NEMA 4 RATED.



**3 FORT ROUGE GARAGE - KEY PLAN**  
 SCALE: NTS

The General Contractor shall check & verify all dimensions and report any errors or omissions to the designers.

No.	Date	Issue/Revision	By
A	2019-05-06	ISSUED FOR CONSTRUCTION	MZ

**ENGINEERS GEOSCIENTISTS MANITOBA**  
 Certificate of Authorization  
**SMS Engineering Ltd.**  
 No. 166

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**Crosier Kilgour & Partners Ltd.**  
 CONSULTING STRUCTURAL ENGINEERS

Project

**WINNIPEG TRANSIT ROOF FALL ARREST MEASURES**

VARIOUS SITES  
 WINNIPEG, MANITOBA

Sheet Title

**DRAWING LIST, SYMBOL LEGEND, ELECTRICAL SPECIFICATION AND KEY PLANS**

File	Date
2018-0794	2019-05-01

Design	Drawn
MZ	WPD

Revision	Sheet No.
A	E0.1