

ELECTRICAL SPECIFICATION

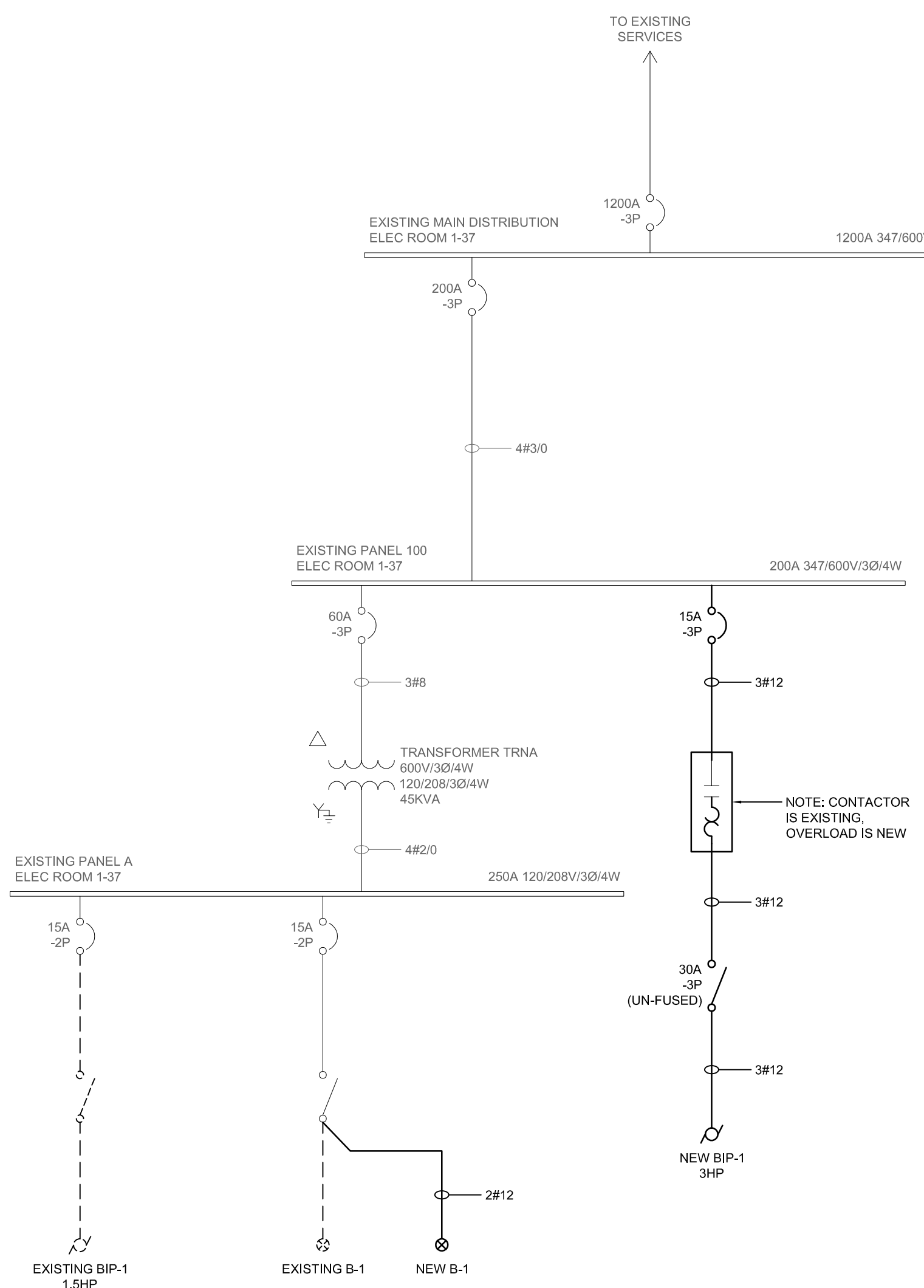
ELECTRICAL SYMBOL LEGEND	
	BOILER
	DISCONNECT
	MOTOR
	SURFACE MOUNTED PANEL
	EMERGENCY POWER OFF BUTTON
	SWITCH

* PLEASE NOTE *

ALL EQUIPMENT SHOWN "FADED BACK" IS EXISTING TO REMAIN UNLESS OTHERWISE NOTED.

ALL EQUIPMENT SHOWN "DASHED" IS EXISTING TO BE DEMOLISHED.

ALL EQUIPMENT SHOWN "SOLID" ARE NEW TO BE PROVIDED UNLESS OTHERWISE NOTED.



1 PARTIAL SINGLE LINE DIAGRAM
SCALE: NTS

MOTOR SCHEDULE

MOTOR No.	NAME	LOCATION	HP. (KW)	VOLTS	STARTER & ACC.					CIRCUIT	STARTER LOCATION	FEEDER	REMARKS
					MAN	MAG	PL	HOA	VFD				
BP-1	BOILER INJECTION PUMP	MECH ROOM 1-35	3	600V/3ø			✓		✓		FED FROM PANEL 100	REFER TO SLD	REPLACE EXISTING 1PH OVERLOAD FOR 3PH OVERLOAD. REFER TO E102.

ELECTRICAL GENERAL PROVISIONS

- GENERAL
 - 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.
 - THE ENTIRE INSTALLATION SHALL BE GUARANTEED FOR ONE YEAR FROM DATE OF FINAL ACCEPTANCE BY THE CITY. REPLACE AT NO ADDITIONAL COST ANY WORK OR MATERIAL WHICH MAY FAIL OR PROVE DEFECTIVE DURING THE GUARANTEE PERIOD.
 - 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.
 - CAREFULLY EXAMINE ALL PLANS AND SPECIFICATIONS PERTAINING TO THIS CONTRACT AND VISIT SITE TO DETERMINE ALL FACTORS AFFECTING COSTS AND INCLUDE SAME IN THE BID OPPORTUNITY. 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.
 - OBTAIN ALL NECESSARY PERMITS, PAY ALL NECESSARY FEES, GIVE ALL NECESSARY NOTICES AND OBTAIN APPROVAL OF THE ELECTRICAL AUTHORITIES HAVING JURISDICTION.
 - SHOP DRAWINGS
 - SUBMIT ELECTRONIC COPIES OF SHOP DRAWINGS FOR ALL EQUIPMENT.
 - FOR SHOP DRAWINGS SUBMITTED ELECTRONICALLY, INCLUDE PROJECT NAME IN SUBJECT LINE OF E-MAIL TO CONTRACTADMIN@SMS.ENG.CM
 - EQUIPMENT PROPOSED SHALL MEET THE SAME STANDARDS OF PERFORMANCE, QUALITY AND WORKMANSHIP AS THAT SPECIFIED.
 - SHOP DRAWINGS TO BE REVIEWED AND STAMPED BY THE TRADE AND GENERAL CONTRACTOR.
 - SHOP DRAWINGS MUST BE SUBMITTED TO THE CONTRACT ADMINISTRATOR FOR REVIEW IN SUFFICIENT TIME TO ENABLE CONTRACT ADMINISTRATOR TO RETAIN THEM FOR REVIEWING FOR AT LEAST TEN (10) WORKING DAYS.
 - REQUEST FOR INTERPRETATION (RFI)
 - FOR RFIS SUBMITTED ELECTRONICALLY, INCLUDE PROJECT NAME AND RFI NUMBER IN SUBJECT LINE OF E-MAIL. SEND RFIS TO CONTRACTADMIN@SMS.ENG.CM
 - CONTENT OF THE RFI INCLUDE A DETAILED DESCRIPTION OF THE ITEM NEEDING INTERPRETATION AND PROPOSED SOLUTION.
 - CONTRACT ADMINISTRATOR WILL REVIEW EACH RFI, DETERMINE ACTION REQUIRED, AND RESPOND ALLOW TEN (10) WORKING DAYS FOR CONTRACT ADMINISTRATOR'S RESPONSE FOR EACH RFI. RFIS RECEIVED BY CONTRACT ADMINISTRATOR AFTER 1:00 P.M. WILL BE CONSIDERED AS RECEIVED THE FOLLOWING WORKING DAY.
 - RECORD DRAWINGS
 - PROVIDE "AS-BUILT" DRAWINGS IN PDF AND AUTOCAD FORMAT COPIED TO USB STICK.
 - PRODUCE AS-BUILT DRAWINGS IN AUTOCAD FORMAT DESCRIBING THE ENTIRE ELECTRICAL AS-BUILT CONDITION. DRAWING SHALL INDICATE, BUT SHALL NOT BE LIMITED TO:
 - RECORD ALL CIRCUIT NUMBERS AND THE HORIZONTAL AND VERTICAL ROUTING OF ALL ELECTRICAL CABLES AND CONDUITS INSTALLED UNDER THIS CONTRACT. THIS INCLUDES THE ENTIRE ELECTRICAL DISTRIBUTION, AND ALL OTHER DIVISIONS ELECTRICAL SYSTEMS, AND LIGHTING.
 - EACH DISCIPLINE SHALL BE RECORDED ON SEPARATE RECORD DRAWING SETS. DO NOT "CROWD" DRAWINGS WITH AS-BUILT RECORD INFORMATION. USE ADDITIONAL DRAWING PRINTS AS REQUIRED. IN ADDITION TO THE PLAN RECORD DRAWINGS, PROVIDE SUPPLEMENTAL RISER SCHEMATICS FOR CLARITY.
 - RECORD THE LOCATION OF THE FOLLOWING: ALL POWER DISTRIBUTION EQUIPMENT, CABLES SPLICES, PULL BOXES, JUNCTION BOXES, ACCESS FITTINGS, POWER SUPPLIES AND SYSTEM CONTROL EQUIPMENT, ANNUNCIATORS, TERMINAL CABINETS, ETC.
 - RECORD LOCATIONS OF OTHER DISCIPLINES EQUIPMENT SUPPLIED BY ELECTRIC POWER.
 - OPERATION AND MAINTENANCE MANUALS
 - 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.
 - REMOVALS
 - REMOVE ALL UNNECESSARY EXISTING ELECTRICAL EQUIPMENT, WIRING AND FIXTURES IN THOSE PORTIONS OF THE EXISTING BUILDING WHICH ARE BEING REMODELED OR DEMOLISHED. THE EQUIPMENT MAY BE REUSED ON THIS PROJECT IF, IN THE OPINION OF THE CONTRACT ADMINISTRATOR, SUCH EQUIPMENT IS IN SATISFACTORY CONDITION AND MEETS THE STANDARDS ESTABLISHED. THE CITY MAY SELECT FROM THE MATERIALS AND/OR EQUIPMENT REMAINING WHICH HE WISHES TO RETAIN AND THE REMAINDER SHALL BE REMOVED FROM THE SITE.
 - ANY ELECTRICAL EQUIPMENT IN REMODELED SECTIONS OR IN STRUCTURES REMOVED OR ALTERED, ADJACENT TO NEW WORK, NECESSARY FOR THE OPERATION OF THE EXISTING BUILDING, SHALL BE RELOCATED AS NECESSARY.
 - ALL EXISTING EQUIPMENT REUSED SHALL BE MADE GOOD AND GUARANTEED.
 - POWER INTERRUPTIONS SHALL BE KEPT TO A MINIMUM AND SHALL BE A TIME SUITABLE TO THE BUILDING OCCUPANTS.
 - WORK IN EXISTING BUILDING
 - COORDINATION
 - THE BUILDING SHALL REMAIN OPEN AND IN NORMAL OPERATION DURING THE CONSTRUCTION PERIOD.
 - WHERE EXISTING SERVICES SUCH AS ELECTRICAL POWER, FIRE ALARM SYSTEM, SOUND SYSTEM, ETC. ARE REQUIRED TO BE INTERRUPTED AND/OR SHUT DOWN, COORDINATE 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 THE CITY'S WRITTEN CONSENT PRIOR TO IMPLEMENTING.
 - 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.
 - 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.
 - INSTALLATION
 - INSTALL BOXES, CONDUIT AND WIRING THROUGH EXISTING AREAS AS REQUIRED FOR THE NEW INSTALLATION.
 - ADD MODULES, SWITCHES, ETC. IN EXISTING CONTROL PANELS, AS REQUIRED, TO EXTEND EXISTING SYSTEMS TO NEW OR RENOVATED AREAS.
 - PATCH AND REPAIR WALLS AND CEILINGS IN EXISTING AREAS THAT HAVE BEEN DAMAGED OR CUT OPEN DUE TO THE NEW ELECTRICAL INSTALLATION.
 - WHERE NEW CABLES OR CONDUITS HAVE BEEN INSTALLED THROUGH EXISTING FIRE RATED WALLS, SEAL OPENING AROUND CABLES AND CONDUIT TO MAINTAIN FIRE RATING.
 - ALL EXISTING EQUIPMENT REUSED SHALL BE MADE GOOD AND GUARANTEED.
 - POWER INTERRUPTIONS SHALL BE KEPT TO A MINIMUM AND SHALL BE A TIME SUITABLE TO THE BUILDING OCCUPANTS.
 - WHERE SERVICES ARE CONCEALED WITHIN WALLS, FLOORS OR CEILING AND CANNOT BE VISUALLY IDENTIFIED PROVIDE ELECTRONIC SCANNING DEVICES OR OTHER APPROVED MEANS TO LOCATE AND IDENTIFY CONCEALED SERVICES PRIOR TO WORK START. MAKE GOOD ANY DAMAGE TO EXISTING SERVICES AT NO COST TO THE CONTRACT. SCAN FOR AND DO NOT CUT REINFORCING STEEL IN CONCRETE SLABS.
- ELECTRICAL MATERIALS AND INSTALLATION
 - WIRING METHOD
 - FOR GENERAL PURPOSE WIRING- RW90 CONDUCTORS IN EMT CONDUIT. USE AC90 FOR FIXTURE DROPS (MAX 3 METERS LONG) AND IN METAL STUD WALLS.
 - FOR CONNECTION TO MOTORS AND MISCELLANEOUS MECHANICAL EQUIPMENT USE RAIN TIGHT FLEXIBLE METAL CONDUIT.
 - RUN ALL CONDUIT AND CABLE CONCEALED, PARALLEL AND PERPENDICULAR TO BUILDING LINES, STAPLED AND/OR CLIPPED IN A NEAT WORKMANLIKE MANNER.
 - ALL CONDUCTORS SHALL BE COPPER. MINIMUM CONDUCTOR SIZE SHALL BE #12 AWG EXCEPT AS NOTED.
 - CONTROL WIRING
 - PROVIDE WIRING TO EQUIPMENT, INCLUDING BUT NOT LIMITED TO THE FOLLOWING: THERMOSTATS, SENSORS, FLOW SWITCHES, PRESSURE SWITCHES, EMERGENCY SHUTDOWN SWITCHES, HIGH LIMIT SWITCHES, CONTROL PANELS, ALARM PANELS, ETC. FOR GAS FIRED BOILERS.
 - PROVIDE POWER AND CONTROL WIRING FOR FULLY FUNCTIONAL CONTROLLED SYSTEM. CONTROL WIRING SHALL BE INSTALLED IN CONDUIT.
 - GROUNDING AND BONDING
 - THE ENTIRE INSTALLATION SHALL BE GROUNDED/BONDED IN CONFORMANCE TO THE LATEST EDITION OF THE CANADIAN ELECTRICAL CODE.
 - ALL CONDUIT TO HAVE A SEPARATE INSULATED BONDING CONDUCTOR.
 - POWER DISTRIBUTION SYSTEM
 - PROVIDE ALL BREAKERS, CONDUIT, DISCONNECTS, CONDUCTORS AND ACCESSORIES REQUIRED FOR THE ALTERATION OF EXISTING PANELBOARDS AS INDICATED ON THE DRAWING AND IN THIS SPECIFICATION.
 - MULTI-POLE BREAKERS SHALL BE OF ONE PIECE CONSTRUCTION WITH COMMON TRIP.
 - PROVIDE BREAKERS AS INDICATED IN THE PANEL SCHEDULE AND AS INDICATED ON THE DRAWING.
 - ALL NEW BREAKERS SHALL MATCH PANEL VOLTAGE UNLESS INDICATED OTHERWISE.
 - ALL DEVICES MUST BE FULLY RATED. SERIES RATED DEVICES ARE NOT ACCEPTABLE.
 - UPDATE EXISTING PANEL DIRECTORIES, PROVIDE TYPED DIRECTORIES.
- ACCEPTABLE MANUFACTURERS: EATON, SCHNEIDER (FPE), SQUARE D AND SIEMENS.
- WIRING IN PANELBOARDS SHALL BE NEAT AND SET IN AS IF LACED. ALL NEUTRAL CONDUCTORS SHALL BE IDENTIFIED IN THE PANEL WITH THEIR ASSOCIATED CIRCUIT NUMBERS BY MEANS OF BRADY MARKERS.

SHALL BE IN CONFORMANCE WITH CAN/ULC-S524, STANDARD FOR INSTALLATION OF FIRE ALARM SYSTEMS. PROVIDE A COMPLETE VERIFICATION REPORT FOR ZONES AFFECTED IN CONFORMANCE WITH CAN/ULC-S537. A MANITOBA FIRE ALARM TECHNICIAN "M" LICENSE IS REQUIRED TO PERFORM FIRE ALARM VERIFICATIONS.

- EQUIPMENT IDENTIFICATION
 - IDENTIFY ELECTRICAL EQUIPMENT WITH NAMEPLATES AND LABELS AS FOLLOWS:
 - NAMEPLATES: LAMACOID 3mm THICK PLASTIC ENGRAVING SHEET, BLACK FACE WITH WHITE CORE (BLACK WITH WHITE LETTERS) FOR NORMAL POWER AND LAMACOID 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.
 - WORDING ON NAMEPLATES AND LABELS TO BE APPROVED BY CONTRACT ADMINISTRATOR PRIOR TO MANUFACTURE.
 - ALLOW FOR MINIMUM OF TWENTY-FIVE (25) LETTERS PER NAMEPLATE AND LABEL.
 - NAMEPLATES FOR TERMINAL CABINETS, STARTERS AND CONTACTORS; INDICATE EQUIPMENT BEING CONTROLLED AND VOLTAGE.
 - TRANSFORMERS: INDICATE CAPACITY, PRIMARY AND SECONDARY VOLTAGES.
 - ROOM NAMES AND NUMBERS USED SHALL BE ACTUAL ROOM NAMES AND NUMBERS THAT WILL BE USED ON THE PROJECT. COORDINATE AND CONFIRM WITH TRADES INVOLVED.
 - COORDINATE NAMES OF EQUIPMENT AND SYSTEMS WITH MECHANICAL SECTION TO ENSURE THAT IDENTICAL NAMES ARE USED.
 - NAMEPLATES FOR CONTROL DEVICES: INDICATE EQUIPMENT CONTROLLED.
 - ADJACENT TO EACH BREAKER IN CDP TYPE PANELBOARDS, PROVIDE AND MOUNT LAMACOID NAMEPLATES IDENTIFYING THE RESPECTIVE LOAD AND LOCATION.
 - TO MATCH EXISTING WHERE APPLICABLE.

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