

**ELECTRICAL SPECIFICATION****1. GENERAL**

1.1 REQUIREMENTS, INSTRUCTIONS TO BIDDERS, THIS SPECIFICATION AND ANY ADDENDA HERETO FORM PART OF THE CONTRACT DOCUMENTS AND SHALL BE READ IN CONJUNCTION WITH THEM. WORK TO INCLUDE THE FURNISHING OF AL LABOUR AND MATERIALS UNLESS OTHERWISE SPECIFIED TO COMPLETE AND PUT INTO OPERATING CONDITIONS ALL ELECTRICAL SYSTEMS AS INDICATED ON THE DRAWINGS AND SPECIFIED HEREIN.

1.2 RESPONSIBILITY AS TO WHICH TRADES PROVIDES REQUIRED ARTICLES OR MATERIAL RESTS SOLELY WITH THE GENERAL CONTRACTOR. EXTRAS WILL BE CONSIDERED BASED ON GROUNDS OF DIFFERENCE OF INTERPRETATION OF SPECIFICATIONS AS TO WHICH TRADE INVOLVED SHALL PROVIDE CERTAIN SPECIALTIES OR MATERIALS.

1.3 MUST: THIS WORD, OR THE TERMS 'REQUIRED' OR 'SHALL', MEAN THAT THE DEFINITION IS AN ABSOLUTE REQUIREMENT OF THE SPECIFICATION.

**2. DRAWINGS AND SPECIFICATIONS**

2.1 DRAWINGS AND SPECIFICATIONS ARE COMPLEMENTARY TO EACH OTHER AND WHAT IS CALLED FOR BY ONE IS BINDING AS IF CALLED FOR BY THE OTHER.

2.2 SHOULD ANY DISCREPANCY APPEAR BETWEEN DRAWINGS AND SPECIFICATIONS WHICH LEAVES THE ELECTRICAL SUB-CONTRACTOR IN DOUBT AS TO TRUE INTENT AND MEANING, OBTAIN RULING FROM CONTRACT ADMINISTRATOR BEFORE SUBMITTING BID. IF THIS IS NOT DONE, IT WILL BE ASSUMED THAT THE MOST EXPENSIVE ALTERNATE HAS BEEN BUDGETED.

**3. EXAMINATION OF OTHER DRAWINGS**

3.1 THE CONTRACTOR IS TO CAREFULLY EXAMINE ARCHITECTURAL, STRUCTURAL AND MECHANICAL DRAWINGS AND WORK OF OTHER TRADES AND SATISFY HIMSELF THAT THE WORK UNDER THIS CONTRACT CAN BE SATISFACTORILY EXECUTED WITHOUT CHANGES TO THE BUILDING AS SHOWN ON THE PLANS. SHOULD ANY DIFFICULTY ARISE SHOWING CONFLICT WITH, OR REQUIRING ADDITIONAL WORK BEYOND THE WORK OF THESE DRAWINGS, BRING THIS MATTER TO THE ATTENTION OF THE CONTRACT ADMINISTRATOR BEFORE SUBMITTING BID.

**4. UNIFORMITY OF EQUIPMENT**

4.1 UNLESS OTHERWISE SPECIFIED, UNIFORMITY OF MANUFACTURER TO BE MAINTAINED FOR PARTICULAR ITEM THROUGHOUT THE WORK.

**5. STANDARDS OF MATERIAL AND WORKMANSHIP**

5.1 ALL MATERIALS TO BE NEW AND OF THE QUALITY SPECIFIED AND CONFORM TO THE STANDARDS OF THE CSA. WHERE EQUIPMENT OR MATERIALS ARE SPECIFIED BY TECHNICAL DESCRIPTION ONLY, THEY SHALL BE OF THE BEST COMMERCIAL QUALITY OBTAINABLE FOR THE PURPOSE.

5.2 ALL WORK TO BE EXECUTED IN NEAT AND PROFESSIONAL MANNER BY QUALIFIED TRADESMEN. ELECTRICAL SUB-CONTRACTOR TO KEEP A COMPETANT FOREMAN AND NECESSARY ASSISTANTS ON THE JOBSITE DURING THE PROGRESS OF THE WORK.

5.3 ALL MATERIAL AND INSTALLATION SHALL MATCH BUILDING STANDARD UNLESS IT IS NOTED ON THE DRAWINGS.

**6. RECORD DRAWINGS**

6.1 THE GENERAL CONTRACTOR WILL FURNISH TO THE ELECTRICAL SUB-CONTRACTOR ONE SET OF PRINTS TO BE USED FOR RECORD PURPOSES. ALL REVISIONS MADE ON SITE DURING CONSTRUCTION ARE TO BE ACCURATELY RECORDED.

6.2 ELECTRICAL SUB-CONTRACTOR TO PRODUCE AT HIS OWN EXPENSE A SET OF AUTOCAD DRAWINGS, INCLUDING ALL CHANGES TO THE ORIGINAL BID DRAWINGS COVERED BY ADDENDA, CHANGE ORDERS, FIELD INSTRUCTIONS, JOB CONDITIONS, ETC. AND TURN THESE OVER TO THE CONTRACT ADMINISTRATOR IN ELECTRONIC AND HARD COPY FORM. COMPLETED RECORD DRAWINGS TO BE CLEARLY MARKED "RECORD DRAWINGS".

6.3 SHOW ALL MAJOR JUNCTION BOXES, CORE HOLES, CONDUIT HOME RUNS AND CIRCUIT NUMBERS ON AS-BUILT DRAWINGS.

6.4 PROVIDE THREE COPIES OF MAINTENANCE MANUALS TO INCLUDE ALL NEW ELECTRICAL EQUIPMENT SUCH AS LIGHT FIXTURES, EXIT LIGHTS, BATTERY UNITS, LIGHTING CONTROLS, PANELS, TRANSFORMERS.

6.5 PROVIDE AS-BUILT DRAWINGS AND MANUALS TO BUILDING MANAGEMENT AT TIME OF COMPLETION DRAWINGS AND MANUALS SHALL BE REVIEWED, APPROVED AND STAMPED BY CONTRACTADMINISTRATOR AT COMPLETION.

**7. SHOP DRAWINGS**

7.1 ELECTRICAL SOB-CONTRACTOR TO SUBMIT TO THE CONTRACT ADMINISTRATOR FOR REVIEW, SHOP DRAWINGS OF ELECTRICAL COMPONENTS AS INDICATED.

7.2 ALL DRAWINGS TO BE SUBMITTED IN PORTABLE DIGITAL FILE FORMAT. REVIEWED AND STAMPED COPIES WILL BE RETURNED DIGITALLY TO THE CONTRACTOR.

7.3 CONTRACT ADMINISTRATOR'S REVIEW OF SHOP DRAWINGS TO BE FOR GENERAL DESIGN ONLY AND DOES NOT RELIEVE THE ELECTRICAL SUB-CONTRACTOR OR SUPPLIERS FORM RESPONSIBILITY FOR ERRORS, PROPER FITTING, CONSTRUCTION OF WORK AND FURNISHING OF MATERIALS. REVIEW CANNOT BE CONTRUED AS APPROVING DEPARTURES FROM CONTRACT DOCUMENT REQUIREMENT IF SUCH DEPARTURES ARE SPECIFICALLY NOTED. ELECTRICAL SUB-CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL DIMENSIONS.

**8. GUARANTEE WARRANTY**

8.1 FURNISH A WRITTEN WARRANTY COUNTERSIGNED AND GUARANTEED BY GENERAL CONTRACT TRADE STATING:

8.1.1 THAT ALL WORK EXECUTED UNDER THIS CONTRACT WILL BE FREE FROM DEFECTS OF MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE.

8.1.2 THE ABOVE PARTIES FURTHER AGREE TO, AT THEIR OWN EXPENSE, REPAIR AND REPLACE ALL SUCH DEFECTIVE WORK AND OTHER WORK DAMAGED THEREBY WHICH FAILS OR BECOMES DEFECTIVE DURING THE TERM OF GUARANTEE WARRANTY PROVIDED THAT SUCH FAILURE IS NOT DUE TO IMPROPER USAGE.

8.1.3 PERIOD OF GUARANTEE SPECIFIED TO IN NO WAY SUPPLANT ANY OTHER GUARANTEE OF A LONGER PERIOD BUT BE BINDING ON WORK NOT OTHERWISE COVERED.

**9. SETTING OUT OF THE WORK**

9.1 ELECTRICAL TRADE TO BE RESPONSIBLE FOR CORRECTING ALL WORK COMPLETED CONTRARY TO INTENT OF DRAWINGS AND SPECIFICATIONS AND BEAR ALL COST FOR SAME. WHERE INTENT OF DRAWINGS AND SPECIFICATIONS IS NOT CLEAR, OBTAIN CLARIFICATION BEFORE PROCEEDING WITH WORK.

9.2 ELECTRICAL TRADE TO GIVE WORK THEIR PERSONAL SUPERVISION, LAY OUT THEIR OWN WORK, DO ALL NECESSARY LEVELING AND MEASURING OR EMPLOY A COMPETENT ENGINEER TO DO SO. FIGURES, FULL SIZE AND DETAIL DRAWINGS TO TAKE PRECEDENCE OVER SCALE MEASUREMENTS.

9.3 WHERE ANY EQUIPMENT SUPPLIED BY ELECTRICAL TRADE MUST BE BUILT-IN WITH WORK OF OTHER CONTRACTORS, THIS CONTRACTOR BE RESPONSIBLE FOR SUPPLYING OF EQUIPMENT TO BE BUILT-IN OR MEASUREMENTS TO ALLOW NECESSARY OPENINGS TO BE LEFT SO AS NOT TO HOLD UP WORK.

9.4 ELECTRICAL TRADE TO BE RESPONSIBLE FOR ANY DAMAGE CAUSED TO OWNER OR ANOTHER TRADE BY IMPROPER LOCATION OR CARRYING OUT OF HIS WORK.

9.5 ELECTRICAL TRADE, IN SETTING OUT OF HIS WORK, TO MAKE REFERENCE TO ARCHITECTURAL, STRUCTURAL, AND MECHANICAL DRAWINGS. CONSULT WITH RESPECTIVE TRADES IN SETTING OUT LOCATIONS FOR CONDUIT RUNS, LIGHTING FIXTURES, PANEL ASSEMBLIES, ETC., SO THAT CONFLICTS ARE AVOIDED AND SYMMETRICAL SPACING IS MAINTAINED.

9.6 WHERE RECEPTACLES ARE MOUNTED ABOVE COUNTERS, BENCHES, SPLASHBACKS, ETC., LOCATION AND MOUNTING HEIGHTS TO BE COORDINATED WITH THE BUILT-IN UNITS. REFER TO ARCHITECTURAL PLANS AND DETAILS. WHERE RECEPTACLES OCCUR IN PERIMETER WALLS WHERE HEATING UNITS ARE LOCATED, RECEPTACLE HEIGHT TO BE ADJUSTED TO COORDINATE WITH THE HEATING UNITS.

9.7 CONTRACTOR TO COORDINATE ANY INTERRUPTIONS TO ADJOINING TENANTS IN ORDER TO AVOID ANY INCONVENIENCES TO SAID TENANT. IF NECESSARY, CONTRACTOR TO DO ANY REQUIRED CONNECTIONS ON OFF HOURS.

9.8 SWITCH MOUNTING HEIGHTS TO BE COORDINATED WITH ARCHITECTURAL DETAILS AND TO BE ADJUSTED, IF REQUIRED, TO COORDINATE WITH PANELLING, DADOS, MASONRY COURSE LINES, ETC.

9.9 WHERE OUTLETS OCCUR IN EXTERIOR WALLS, ELECTRICAL TRADE TO ENSURE THAT THERE IS INSULATION BEHIND THE OUTLET BOXES TO PREVENT CONDENSATION THROUGH THE BOXES.

**10. EXAMINATION OF THE SITE**

10.1 PRIOR TO SUBMITTING TENDER, ELECTRICAL TRADE TO CAREFULLY EXAMINE THE SITE AND ASCERTAIN ALL CONDITIONS WHICH MAY AFFECT THEIR TRADE. NO EXTRAS WILL BE ALLOWED FOR WORK RESULTING FROM CONDITIONS THAT WOULD HAVE BEEN EVIDENT UPON A THOROUGH EXAMINATION OF THE SITE.

**11. CLEANUP**

11.1 ELECTRICAL TRADE AND THEIR SUB-TRADES TO MAINTAIN A CLEAN WORK ENVIRONMENT AT ALL TIMES DURING CONSTRUCTION, KEEP SITE FREE OF ALL DEBRIS, BOXES, PACKING, ETC., RESULTING FROM WORK OF THIS TRADE.

11.2 UPON COMPLETION OF WORK, ELECTRICAL INSTALLATION TO BE LEFT IN A CLEAN AND FINISHED CONDITION TO SATISFACTION OF THE CONTRACT ADMINISTRATOR.

**12. ACCESS DOORS**

12.1 ELECTRICAL TRADE TO SUPPLY AND INSTALL ACCESS DOORS REQUIRED FOR PROPER SERVICING OF ALL ELECTRICAL WORK. ACCESS DOORS TO BE COMPLETE WITH NECESSARY FRAMES AND HINGED DOORS HELD CLOSED WITH CAPTIVE STUDS. ACCESS PANEL TO BE OF NOT LESS THAN 14 GAUGE STEEL, PRIME COAT FINISHED AND PAINTED ON THE JOB SITE TO MATCH THE WALL OR CEILING FINISH.

**13. CODES, PERMITS AND INSPECTION**

13.1 INSTALATION TO COMPLY WITH REQUIREMENTS OF MANITOBA BUILDING CODE, CANADIAN ELECTRICAL CODE AND REGULATIONS OF THE MUNICIPAL INSPECTION DEPARTMENT.

13.2 ELECTRICAL TRADE TO OBTAIN ALL PERMITS REQUIRED AND AFTER COMPLETION OF THE WORK, FURNISH TO THE CONTRACT ADMINSTRATOR A CERTIFICATE OF FINAL INSPECTION AND APPROVAL FROM THE ELECTRICAL INSPECTION DEPARTMENT.

**14. MECHANICAL EQUIPMENT**

14.1 UNLESS SPECIFIED OTHERWISE, ELECTRICAL TRADE TO SUPPLY AND INSTALL ALL CONDUIT AND WIRE, FITTINGS AND CONNECTIONS FOR ALL MECHANICAL EQUIPMENT. MOTOR PROTECTION SWITCHES COMPLETE WITH OVERLOAD RELAYS, ETC. TO BE SUPPLIED AND INSTALLED BY ELECTRICAL TRADE. ELECTRICAL TRADE TO CONFIRM WITH MECHANICAL TRADE SIZE, CHARACTERISTICS AND LOCATIONS OF ALL MECHANICAL EQUIPMENT BEFORE INSTALLATION OF CONDUIT, OUTLETS, HEATERS, ETC.

**15. TESTS**

15.1 ALL PORTIONS OF ELECTRICAL WORK TO BE TESTED AND CHECKED FOR SATISFACTORY OPERATION.

15.2 BEFORE ENERGIZING ANY PORTION OF ELECTRICAL SYSTEM, PERFORM MEGGER TESTS ON ALL FEEDERS AND BRANCH CIRCUITS. RESULTS OF SUCH TESTS TO CONFORM TO REQUIREMENTS OF CANADIAN ELECTRICAL CODE AND BE TO SATISFACTION OF AUTHORIZED INSPECTION AGENCY AND THE CONTRACT ADMINISTRATOR.

15.3 UPON COMPLETION AND IMMEDIATELY PRIORTO FINAL INSPECTION AND TURNOVER, CHECK LOAD BALANCE ON ALL FEEDERS AND AT DISTRIBUTION CENTRES, PANELS, ETC. TESTS TO BE CARRIED OUT BY TURNING ALL POSSIBLE LOADS AND CHECKING LOAD CURRENT BALANCE. IF LOAD IMBALANCE EXCEEDS 15%, RECONNECT CIRCUITS TO BALANCE LOAD.

**16. PAINTING AND FINISHES**

16.1 ALL ELECTRICAL FITTINGS, SUPPORTS, HANGAR RODS, PULLBOXES, CHANNEL FRAMES, CONDUIT RACKS, OUTLET BOXES, BRACKETS, CLAMPS, ETC., TO HAVE GALVANIZED FINISH OR PAINT FINISH OVERCORROSION-RESISTANT PRIMER.

16.2 ALL PANELS TO BE FACTORY-FINISHED WITH SPRAY-ON, AIR-DRY ENAMEL. ALL ENAMEL TO BE APPLIED OVER CORROSION-RESISTANT PRIMER. MATTE OR FLAT TYPE FINISH PAINT WILL NOT BE ACCEPTABLE. ALL PANELS OR SIMILAR FACTORY FINISHED UNITS THA ARE SCRATCHED OR MARKED DURING INSTALLATION TO BE TOUCHED UP WITH MATCHING SPRAY-ON AIR-DRY LACQUER AND IF REQUIRED TO PROVIDE SATISFACTORY JOB, TO BE COMPLETELY REFINISHED.

16.3 ALL 120/208 V PANELBOARDS, PULLBOXES, ETC. TO BE FIISHED IN GREY ENAMEL.

16.4 PULLBOXES, JUNCTION BOXES, TERMINAL PANELS, ETC. TO BE FINISHED IN ACCORDANCE WITH EXISTING BUILDING.

**17. CONDUIT**

17.1 ALL WIRE AND CABLE TO BE INSTALLED IN CONDUIT EXCEPT WHERE IS NOTED OTHERWISE ON THE DRAWINGS. BX WIRING MAY BE UTILIZED FOR DROPS FROM JUNCTION BOXES TO OUTLET AND LIGHTS NOT TO EXCEED 30 FT. [9.14M] IN LENGTH.

17.2 CONDUIT TO BE ELECTRIC METALLIC TUBING. UTILIZE RIGID GALVANIZED STEEL CONDUIT FOR ALL EXPOSED RUNS OUTDOOR & UNDERGROUND AND WHERE IN JUDGEMENT BY THE ELECTRICAL INSPECTION AUTHORITY IS SUBJECT TO MECHANICAL DAMAGE.

17.3 SURFACE-MOUNTED CONDUITS TO BE INSTALLED PARALLEL TO STRUCTURAL LINES AND WHERE BENDS OCCUR IN PARALLEL RUNS, THEY SHALL BE CONCENTRIC.

17.4 CONDUITS TO BE INSTALLED FREE OF DENTS AND HAVE ENDS PLUGGED TO PREVENT ENTRANCE OF DUST OR MOISTURE.

17.5 ALL CONDUITS, EXCEPT WHERE OTHERWISE NOTED, TO BE SIZED IN ACCORDANCE WITH CANADIAN ELECTRICAL CODE.

17.6 FLEXIBLE CONDUIT CONNECTIONS TO MOTORS, CONTROLS, ETC. TO BE FLEXIBLE PLASTIC JACKETED, SEAL TIGHT OR APPROVED EQUAL. FLEXIBLE CONDUIT CONNECTIONS ARE REQUIRED TO ALL MOTORS FROM STUB-UP OR JUNCTION BOXES.

17.7 APPROPRIATE AND COORDINATED METAL TYPE FITTINGS TO BE USED WITH CONDUITS.

**18. EXPANSION JOINTS**

18.1. WHERE CONDUITS ARE INSTALLED IN CONCRETE SLABS AND ACROSS STRUCTURAL EXPANSION JOINTS, AN APPROVED EXPANSION FITTING COMPLETE WITH BONDING JUMPER AND CLAMPS SHALL BE INSTALLED. ELECTRICAL TRADE TO USE APPROVED EXPANSION JOINTS.