

## **1. GENERAL**

### **1.1 WORK INCLUDED**

- .1 The general conditions and instructions to bidders set forth in the general contract specifications and all addenda thereto shall apply to, and govern all portions of the electrical work.
- .2 Points not specifically mentioned shall be in strict accordance with the Canadian Electrical Code (C22.1-2002) and regulations of the electrical inspection department from which the permit was obtained. The latest revisions and/or amendments to this code, with applicable date restrictions, shall also govern work on this contract.
- .3 It is the intent that these drawings and specifications provide for an electrical installation complete and in operating condition. The Contractor shall be responsible for supplying and installing all material necessary to accomplish this, except where specifically noted that such work or material is not included.
- .4 Where the words “furnish”, “provide”, or “install” appear in this division, or a manufacturer is indicated with item or catalog number listed, it is the contractor’s responsibility to furnish and install the item complete and operating for the purpose of function intended, unless noted otherwise.

### **1.2 CODES, PERMITS AND INSPECTIONS**

- .1 The installation shall comply with the requirements of the current edition of the Canadian Electrical Code and the regulations of the Electrical Inspection Department having jurisdiction.
- .2 The electrical trade shall obtain all electrical permits required and, after completion of the work, shall furnish to the Architect a Certificate of Final Inspection and approval from the Inspection Department. Electrical trade shall obtain all permits at the beginning of the work.
- .3 The Electrical Contractor shall submit two (2) sets of drawings to the Electrical Inspection Department and shall include all costs for prints, surveys, etc. in this Electrical Tender.

### **1.3 STANDARD OF MATERIAL AND WORKMANSHIP**

- .1 All materials supplied by the Contractor shall be new and of the quality specified. All such material shall conform to the standards of the Canadian Standards Association and shall bear the necessary CSA label. For any material not CSA approved, this Contractor shall obtain the approval of the local Inspection Authority and shall bear all inspection charges levied and any modification costs required.

- .2 All phases of the electrical installation shall be executed in a satisfactory, workmanlike manner and shall present a neat, mechanical appearance when completed. Work not deemed satisfactory to the Engineer shall be corrected at the Contractor's expense.
- .3 The Contractor shall keep on the job during its progress, a competent Foreman and necessary qualified tradesmen, all satisfactory to the Engineer. The Foreman shall represent the Contractor in his absence, and all directions given to the Foreman shall be held as being given to the Contractor. The Contractor shall give efficient supervision to the work, using his best skill and attention.

#### **1.4 SETTING OUT OF THE WORK**

- .1 The Electrical Trade shall be responsible for correcting all work completed contrary to the intent of the drawings and specifications and shall bear all costs for same. Where the intent of the drawings and specifications is not clear, the Contractor shall obtain a clarification from the Engineer before proceeding with the work.
- .2 The Electrical Trade shall give the work his personal supervision, lay out his own work, do all necessary levelling and measuring or employ a competent Engineer to do so. Figures, full-size drawings and details shall take precedence over scale measurements.
- .3 Where any equipment supplied by the Electrical Trade must be built-in with work of other Contractor, the Electrical Contractor shall be responsible for the supplying of the equipment to be built-in or measurements to allow necessary openings to be left so as not to hold up the work.
- .4 The Electrical Trade, in setting out of his work, shall make reference to Architectural, Structural and Mechanical drawings and specifications. He shall consult with the respective Trades in setting out locations for cable runs, panel assemblies, etc., so that conflicts are avoided and symmetrical even spacing is maintained.
- .5 Before submitting Tender, carefully examine the site of the proposed work so as to ascertain all existing conditions affecting the work. No extras will be allowed for work necessitated by conditions ordinarily evident on the site.

#### **1.5 EXCAVATION, BACKFILLING, ETC.**

- .1 The Electrical Contractor shall be responsible for all trenching pertaining to his work and shall arrange and pay for this trenching.
- .2 Bottoms of trenches, etc. for cables shall be levelled with a 100 mm sand bed.

## **1.6 SUBSTITUTION**

- .1 No substitution will be allowed unless written acceptance has been obtained from the Engineer prior to Tender closing.

## **1.7 SHOP DRAWINGS**

- .1 Submit sets of manufacturer's detailed shop drawings (Four (4) sets), specifications, data sheets, catalog cuts, etc., for equipment including but not limited to: panel boards, service equipment, safety switches or as may be considered necessary by the Engineer.

## **1.8 RECORD DRAWINGS**

- .1 The Engineer will furnish one set of blueprints to be used to record work as actually installed.

## **1.9 MAINTENANCE MANUALS**

- .1 Before completion and acceptance of the project, furnish an electrical system Operation and Maintenance Manual in a 3-ring binder. Each system and piece of equipment requiring adjustment or maintenance or whose operation is not readily apparent to unskilled users, or requested by the Owner's representative shall be covered by a separate section in the manual. Three such manuals are required.

## **1.10 TESTING**

- .1 Perform megger tests on all feeders to ensure that the C.E.C. Requirements are met. Take current readings on all feeders and if load unbalance exceeds 15%, reconnect loads to bring within balance. Take voltage readings and, if necessary, adjust the transformer tap settings.

## **1.11 GUARANTEE/WARRANTY**

- .1 The Electrical Trade shall furnish a written Guarantee/Warranty countersigned and guaranteed by the General Contractor, stating:
  - .1 That all work executed under this Contract will be free from defects of workmanship and materials for a period of one (1) year from the date of final acceptance of this work.
  - .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 the Guarantee/Warranty, provided that such failure is not due to improper usage.

- .3 The period of the Guarantee specified shall in no way supplant any other Guarantee of a longer period but shall be binding on work not otherwise covered.

## **2. WORK AND MATERIALS**

### **2.1 SCOPE OF WORK**

- .1 Coordinate main service with NPC and installation of new service feeders, meter base, enclosed circuit breakers and splitters for heat trace servicing. Pay for all utility costs from a power cash allowance of \$10,000 per service drop.
- .2 Supply and install electrical services via underground service cables c/w trenching, backfilling and compacting from power pedestals to Access Vault Heat tracing as indicated on drawings.
- .3 Power panels 'A' and 'B' will be Nema 4 weather proof metal/lockable panels, each containing a 100 Amp 24-circuit panel.
- .4 Power Panel 'A' (Loop #1) will feed five Access Vaults (AV4, AV5, AV7, AV9 and AV28) which will each require connection to heat trace and transition boxes to feed downstream Access Vaults.
- .5 Power Panel 'B' (Loop #2) will feed seven Access Vaults (AV2, AV3, AV23, AV13, AV14, AV16, and AV18) which will each require connection to heat trace and transition boxes to feed downstream Access Vaults.
- .6 Power Panel 'B' (Loop #3) will feed two Access Vaults (AV42 and AV44) which will each require connection to heat trace and transition boxes to feed downstream Access Vaults.
- .7 Provide breakout pricing for Loop #1, Loop #2, and Loop #3 servicing.
- .8 Supply and install exterior 6"x6" PWF treated wooden posts. The 6"x6" PWF treated posts will be 2100 mm (7 ft.) long, of which 900 mm (3 ft.) will be below grade. Paint 6" x 6" posts "Grey". Posts to be painted minimum of 6" below grade.
- .9 The contractor will be responsible for confirming all site dimensions and routes for all under ground cables, cable trenching requirements from the utility poles to the power pedestals and to the individual Access Vaults. The distances and routes indicated on drawings are only to be used as a guide.
- .10 All work will be done in accordance to the current applicable codes governing the work.
- .11 All cable shall be sleeved in PVC conduit where it comes above grade.

## **2.2 BRANCH CIRCUIT WIRING**

- .1 Branch circuit wiring to be copper, 600 volt minimum, Teck 90. Steel Interlocked Armour, XLPE Insulation, Inner PVC Jacket, and outer PVC Jacket.

## **2.3 IDENTIFICATION**

- .1 Label all panels, indicating the voltage, usage and other pertinent information subject to the approval of the Engineer. Labels shall be lamacoid plates, 13mm minimum height, glued and rivetted.

## **2.4 POWER SERVICE AND DISTRIBUTION**

- .1 Provide all conduit, wire, connections, etc., required for service as indicated on the drawings.
- .2 Include in Tender price all charges which may be levied by the servicing utility companies (power) in servicing the project. If charges are not available, qualify the Tender submission using Cash Allowance of \$10,000 per Utility service connection.
- .3 All the requirements of the utility companies shall govern the service installations and such utilities shall be notified at the time work is commenced, with drawings and specifications submitted to same if requested.
- .4 Coordinate the complete service installations with the servicing utility companies before installation commences.

## **2.5 BRANCH CIRCUIT PANELS**

- .1 All Panel boards are to be of the bussing and voltage rating as specified. Panel boards are to be complete with flush type hinges, locking doors and bolt-in breakers.
- .2 Provide typewritten panel directories in all panels.

## **2.6 GROUNDING**

- .1 Provide all necessary grounding as per the latest C.E.C. requirements.

## **2.7 HEAT TRACE**

- .1 Refer to Section 16867.

**END OF SECTION 16010**