

**ANNEX "A"**

DEPARTMENT OF NATIONAL DEFENCE SPECIFICATIONS

MINOR MAINTENANCE AND ALTERATIONS

DETACHMENT DUNDURN

DUNDURN, SASKATCHEWAN

DEC 13-1301

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## Section 01005

## GENERAL INSTRUCTIONS

1. General
  1. The overall scope of work of this contract is to supply labour, material and supervision to perform minor maintenance and alterations to buildings, and building systems and surrounding areas of Detachment Dundurn, Dundurn Saskatchewan, HMCS Unicorn, Hugh Cairns Armoury and 737 Squadron Saskatoon Saskatchewan.
  
2. Scope of Work
  1. Work includes, but is not necessarily confined to: services of carpenter, plasterers, drywall applicators, block layers, cement finishers, electricians, plumber/gas fitters, painters, and trade apprentices to carry out maintenance and minor alteration type work at areas indicated in one (1) above.
    - A. It is to be noted that the above may include, but is not necessarily limited to the following:
      1. Repair of buildings and facilities including doors, windows, block and brick work, flooring, plaster and drywall, painting, acoustic tile, base trim, etc., interior and exterior.
      2. Repair to concrete curbs, walkways, barricades, fences and temporary installations.
      3. Construction and/or alterations of the interior of buildings and structures such as the construction of partitions and installation of doors, windows, ceilings and flooring products, etc.
      4. Repair, renovations to existing electrical systems.
      5. Repairs, renovations to existing plumbing systems.
    - B. Supply of materials required for the performance of work included in (1) above will be provided by the Offeror.
      1. Services: Services shall be provided on an as and when required basis, and shall be available on 7 calendar days.
      2. Hours of Work: Work shall be carried out between 0800 hrs and 16:30 hrs, Monday to Friday.
      3. Tradesmen: Tradesmen provided on this Standing Offer must be fully qualified in their respective trade, and with proven experience at the journeyman level, and must hold provincial trade papers.
      4. Trade Helpers: Trades helpers must have proven experience in the respective trade.
      5. Transportation: Transportation, on and off site, shall be provided for by the Offeror for his employees and their tools and equipment and materials required for the performance of

work under any resulting contract/call-up.

6. Tools and Equipment: The supply of all tools and equipment required for the satisfactory performance of work under any call-up shall be responsibility of the Offeror.

3. Documents Required
  1. Maintain at job site one copy each of the following:
    1. Contract drawings
    2. Specification
    3. Addenda
    4. Reviewed shop drawings
    5. Change orders
    6. Other modifications to contract
    7. Copy of approved work schedule
    8. Manufacturers' installation and application instructions
    9. Standards under Reference Standards.
4. Product Supplied by Engineer
  1. Offeror's duties when pertinent:
    1. Order in quantities and at times compatible with construction schedule and site storage capacity.
    2. Unload and handle at site
    3. Promptly inspect delivered products and give written report to Engineer on condition of all items received.
    4. Pay demurrage charges.
    5. Install, connect and finish products as specified.
5. Work Schedule
  1. Provide within 10 working days after Standing Offer call up, schedule showing anticipated progress stages and final completion of work within time period required by Call-up documents.
  2. Interim reviews of work progress based on work schedule will be conducted as decided by Engineer and schedule updated by Offeror in conjunction with and to approval of Engineer.
6. Contractor's Use of Site
  1. Use of Site: Exclusive and complete for execution of work except as follows:
    1. Movement around the site shall be subject to any restrictions imposed by Detachment Commander or Engineer.
    2. Do not unreasonably encumber site with materials or equipment.
    3. Move stored products or equipment, which interfere with operations of Engineer or other contractors.

4. Obtain and pay for use of additional storage or work areas needed for operations.
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7. Codes and Standards
    1. Perform work in accordance with National Building Code of Canada (NBC) and any other code of provincial or local application provided that in any case of conflict or discrepancy, more stringent requirements shall apply.
    2. Meet or exceed requirements of specified standards, codes and referenced documents.
    3. All jobs must be completed, performed and finished in a workmanlike manner. Work and materials of an incidental nature, necessary by implication to produce the finished job as specified, shall be supplied even when not listed or described in detail.
  8. Permits and Fees
    1. Submit to the proper Site Authority the necessary number of drawings and specifications for examination and approval prior to the commencement of work.
    2. Pay all associated fees.
  9. Setting Out of Work
    1. Assume full responsibility for, and execute complete layout of work to locations, lines and elevations indicated.
    2. Provide devices needed to lay out and construct work.
    3. Supply such devices as straight edges and templates required to facilitate Engineer's inspection of work.
  10. Location of Fixtures
    1. Location of fixtures and outlets indicated or specified are to be considered as approximate.
    2. Locate fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.
    3. Inform Engineer of impending installation and obtain his approval for actual location.
  11. Concealment
    1. Conceal pipes, ducts and wiring in floor, wall and ceiling construction of finished areas except where indicated otherwise.

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|----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 12. Cutting, Fitting and Patching                                    | <ol style="list-style-type: none"><li>1. Execute cutting, fitting and patching required to make work fit together properly.</li><li>2. Where new work connects with existing and where existing work is altered, cut, patch and make good to match existing work.</li><li>3. Obtain Engineer's approval before cutting, boring or sleeving load bearing members.</li><li>4. Make cuts with clean, true, smooth edges. Make patches inconspicuous in final assembly.</li><li>5. Fit work alright to pipes, sleeves, ducts and conduits.</li></ol> |
| 13. Alterations, Additions Additions of Repairs to Existing Building | <ol style="list-style-type: none"><li>1. Execute work with least possible interference or disturbance to occupants, public and normal use of premises. Arrange with Engineer to facilitate execution of work.</li><li>2. Where security has been reduced by work of Call-up, provide temporary means to maintain security.</li></ol>                                                                                                                                                                                                             |
| 14. Additional Drawings                                              | <ol style="list-style-type: none"><li>1. Engineer may furnish additional drawings to assist proper execution of work. These drawings will be issued for clarification only. Such drawings shall have same meaning and intent as if they were included with plans referred to in Call-up documents.</li></ol>                                                                                                                                                                                                                                     |
| 15. Definition of Engineer                                           | <ol style="list-style-type: none"><li>1. Throughout this contract the term "Engineer" shall refer to the Wing Construction Engineering Officer (WCEO) or such officer/inspector as he may designate in writing.</li></ol>                                                                                                                                                                                                                                                                                                                        |
| 16. Design Authority                                                 | <ol style="list-style-type: none"><li>1. The design authority shall be the DCEO</li></ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 17. Guarantees and Warranties                                        | <ol style="list-style-type: none"><li>1. Products and execution of work shall be guaranteed in writing, against defects of material and workmanship for one full year after date of acceptance.</li><li>2. Under this guarantee the Offeror shall carry out or shall arrange to have carried out, within the period of guarantee, repair to all such defects not caused by abnormal conditions or improper use and may resulting damage to equipment or building repair at no cost to the owner.</li></ol>                                       |

## 18. Protection

1. Comply with Canadian Code for Construction Safety.
2. Protect finished work against damage until takeover.
3. Provide protection against spread of dust and dirt beyond work areas.
4. Protect users of site and general public from all hazards.

1. General
  1. Submit to Engineer, for review, shop drawings, product data and samples specified.
  2. Until submission is reviewed, work involving relevant product may not proceed.
2. Shop Drawings
  1. Drawings to be originals prepared by Offeror/Contractor, Subcontractor, Supplier or Distributor, which illustrates the appropriate portion of work; showing fabrication, layout, setting or erection details as specified in appropriate sections.
  2. Identify details by reference to sheet and detail numbers shown on Contract Drawings.
  3. Maximum sheet size 960 x 1120 mm. Reproduction for submission: opaque diazo prints.
3. Product Data
  1. Manufacturer's standard schematic drawings, catalogue sheets, diagrams schedules, performance charts, illustrations and other standard descriptive data will be accepted in lieu of shop drawings.
  2. Above will only be accepted if they conform to the following:
    1. Delete Information which is not applicable to project
    2. Supplement standard information to provide additional information applicable to project.
    3. Show dimensions and clearances required.
    4. Show performance characteristics and capacities
    5. Show wiring diagrams (when requested) & controls
4. Coordination of Submissions
  1. Review shop drawings, product data and samples prior to submission.
  2. Verify:
    1. Field Measurements
    2. Field construction criteria
    3. Catalogue numbers and similar data.

3. Coordinate each submission with requirements of work and contract documents. Individual shop drawings will not be reviewed until all related drawings are available.
4. Offeror's responsibility for errors and omissions in submission is not relieved by Engineer's review of submittals.
5. Offeror's responsibility for deviations in submission from requirements of contract documents is not relieved by Engineer's review of submissions, unless the Engineer gives written acceptance of specified deviations.
6. Notify the Engineer, in writing, at time of submission of deviations from requirements of Contract/Call-up documents.
7. After Engineer's review, distribute copies.

#### 5. Submission Requirements

1. Schedule submissions at least 10 days before the dates of review when the submissions will be needed.
2. Accompany submissions with transmittal letter, in duplicate, containing:
  1. Data
  2. Project title and number
  3. Offeror's name and address
  4. Number of each shop drawing, product data and sample submitted.
  5. Other pertinent data.
3. Submission shall include:
  1. Date and revision dates
  2. Project title and number
  3. Name of:
    - a. Offeror/Contractor
    - b. Subcontractor
    - c. Supplier
    - d. Manufacturer
    - e. Separate detailer when pertinent.
  4. Identification of product or material
  5. Relation to adjacent structure or materials
  6. Field dimensions, clearly identified as such
  7. Specification section number

8. Applicable standards such as CSA or CGSB numbers
9. Offeror's stamp, initialed or signed, certifying review of submission, verification of field measurements and compliance with Contract/Call-up documents.

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|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Sanitary Facilities             | 1. Existing sanitary facilities may be used on approval of the Engineer.                                                                                                                                                                                      |
|                                    | 2. These areas and premises are to be kept in a clean and sanitary condition                                                                                                                                                                                  |
| 2. Parking                         | 1. Parking space will be made available on site. Maintain and administer this space as directed.                                                                                                                                                              |
| 3. Power and Water supply          | 1. DND can provide, free of charge, temporary electric power and water for construction purposes, as defined necessary by the Engineer.                                                                                                                       |
|                                    | 2. Connect to existing power supply in accordance with Canadian Electrical Code                                                                                                                                                                               |
|                                    | 3. Supply of temporary services by DND is subject to DND requirements and may be discontinued by DND site representative at any time without notice, without acceptance of any liability for damage or delay caused by such withdrawal of temporary services. |
| 4. Scaffolding                     | 1. Construct and maintain scaffolding in rigid, secure and safe manner.                                                                                                                                                                                       |
|                                    | 2. Erect scaffolding independent of walls. Remove promptly when no liner required                                                                                                                                                                             |
| 5. Removal of Temporary Facilities | 1. Remove temporary facilities from site when directed by the Engineer.                                                                                                                                                                                       |
| 6. Access                          | 1. Provide and maintain adequate access to project site.                                                                                                                                                                                                      |

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|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Construction Safety Measures         | 1. Observe and enforce construction safety measures required by National Building Code (1990) Part 8, Provincial Government, Workmen's Compensation Board and municipal statutes and authorities. |
|                                         | 2. In event of conflict between any provisions of the above authorities, the most stringent provisions govern.                                                                                    |
| 2. Fire Safety Requirements             | 1. Comply with requirements of FCC No. 301 Standard for Construction Operations, June 1982, issued by Fire Commissioner of Canada (FC)                                                            |
|                                         | 2. This standard may be viewed at the Regional Engineer's Office                                                                                                                                  |
|                                         | 3. Comply with requirement of Fire Orders and Precautions for Civilian Contractors as issued by the Base Fire Chief.                                                                              |
| 3. Explosive Actuated Fastening Devices | 1. Do not employ power guns using explosives, except with permission of the Engineer, and comply with requirements of CSA Z-166 (Safety Code for Explosive Actuated Tools).                       |

National Defence  
Detachment Dundurn, SK  
Job No: DCE 13-1301

ENVIRONMENTAL PROTECTION

Section 01575

1. Fires
  2. Disposal of Wastes
1. Fires and burning of rubbish on site is not permitted.
  1. Burying rubbish and waste materials on site it not permitted.
  2. Disposal of waste and volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers is prohibited.
  3. All construction waste and debris to be removed off of DND property.

1. General
  1. Use new material & equipment unless otherwise specified.
  2. Provide material and equipment of specified design and quality, performing to published ratings and for which replacement parts are readily available.
  3. Use products of one manufacturer for material & equipment of same type or classification unless otherwise specified.
  
2. Manufacturers Instructions
  1. Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation methods.
  2. Notify the Engineer, in writing, of any conflict between these specifications and the manufacturer's instructions. The Engineer will designate which document is to be followed.
  
3. Fastenings - General
  1. Provide metal fastenings and accessories in same texture, colour and finish as base metal in which they occur. Prevent electrolytic action between dissimilar metals. Use non-corrosive fasteners, anchors and spacers for securing exterior work.
  2. Space anchors within limits of load bearing or shear capacity and ensure that they provide positive permanent anchorage. Wood plugs not acceptable.
  3. Keep exposed fastenings to minimum, space evenly and lay out neatly.
  4. Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable
  5. Obtain the Engineer's approval before using explosive actuated fastening devices. If approval is obtained comply with CSA Z166-1985.

4. Fastenings - Equipment
  1. Use fastenings of standard commercial sized and patterns with material sizes and patterns with material and finish suitable for service.
  2. Use heavy hexagon heads, semi-finished unless otherwise specified. Use No. 304 stainless steel for exterior areas.
  3. Bolts may not project more than one diameter beyond nuts.
  4. Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibration occur and resilient washers with stainless steel.
5. Delivery
  1. Deliver, store and maintain packaged material and equipment and manufacturer's seals and labels intact.
  2. Prevent damage, adulteration and spoiling of materials and equipment, during delivery, handling and storage. Immediately remove rejected material and equipment from site.
  3. Store material and equipment in accordance with suppliers instructions.
  4. Touch-up damaged factory finished surfaces to the Engineer's satisfaction. Use primer or enamel to match original. Do not paint over plates.
6. Conformance
  1. When material or equipment is specified by standard or performance specifications, upon request of the Engineer, obtain from the manufacturer an independent testing laboratory report, stating that material or equipment meets or exceeds specified requirements.

1. General
  1. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.
  2. Store volatile waste in covered metal containers, and remove from premises at end of each working day.
  3. Prevent accumulation of waste which creates hazardous conditions.
  4. Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.
2. Materials
  1. Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
3. Cleaning during Construction
  1. Maintain the work, including roof and building systems, at least on a daily basis free from accumulations of waste material and debris.
  2. Provide on-site containers for collection of waste materials and debris.
  3. Remove waste materials and debris from site.
4. Final Cleaning
  1. In preparation for acceptance of the project on an interim or final certification of completion perform final cleaning.
  2. Remove grease, dust, dirt, stains, labels, fingerprints and other foreign materials from interior and exterior finished surfaces including glass and other polished surfaces.
  3. Remove debris and surplus materials from accessible concealed spaces.
  4. The Offeror shall leave the system clean, neat and ready for use.
  5. All construction waste and debris shall be removed and disposed of off DND property.

1. Maintenance

1. **The following is required on call-ups where designated:**  
On completion of project submit to the Engineer, 3 copies of Operations Data and Maintenance Manual in English made up as follows:
  1. Bind data in vinyl hard covered, 3 ring loose leaf binder for 215 x 280 mm size paper.
  2. Enclose title sheet, labelled "Operation Data and Maintenance Manual", project name, date and list of contents.
  3. Organize contents into applicable sections of work to parallel project specification breakdown. Mark each section by labelled tabs protected with celluloid covers fastened to hard paper dividing sheets.
  
2. Include the following information plus data specified:
  1. Description, operation and maintenance instructions for equipment and systems, including a complete list of equipment and a parts list. Indicate nameplate information such as make, size, capacity and serial number.
  2. Names, addresses and phone numbers of sub-contractors and suppliers.
  3. Guarantees, warranties and bonds showing:
    1. Name and address of projects
    2. Guarantee commencement date (date of final Certificate of Completion).
    3. Duration of guarantee
    4. Clear indication of what is being guaranteed and what remedial action will be taken under guarantee.
    5. Signature and seal of Contractor
    6. Additional material used in project listed under various sections showing name of manufacturer and source of supply.
  
  4. Neatly typed lists and notes. Use clear drawings, diagrams of manufacturer's literature.

5. Include one complete set of final shop drawings (bond separately) indicating corrections and changes made during fabrication and installation.

National Defence  
Detachment Dundurn, SK  
Job No: DCE 13-1301

STRUCTURAL GENERAL

Section 01741

1. General
  1. Perform work in accordance with the National Building Code of Canada (NBC) and any other Code of Provincial or Municipal application.
  2. All jobs must be completed, performed and finished in a workmanlike manner. Work and materials of an incidental nature, necessary by implication to produce the finished job as specified, shall be supplied even when not listed or described in detail.
2. Materials
  1. All materials to be new, unless otherwise specified by the Engineer. Specific materials to be designated at time of implication.
3. Qualifications
  1. All work to be performed by Journeyman level tradesmen, working on a 1:1 Journeyman to Apprentice ratio.

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|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Codes and Standards                     | <ol style="list-style-type: none"><li>1. Do complete plumbing to the National Plumbing Code Operations Data and Maintenance manual in English.</li><li>2. Do sheet metal to ASHRAE standards.</li><li>3. Comply with CSA standards and other referenced organizations.</li></ol>                                                                                                                                                                                                                                                                                                                                                                                                      |
| 2. Equipment Requirements and Installation | <ol style="list-style-type: none"><li>1. Permit equipment maintenance and disassembly by use of unions or flanges to minimize disturbance to connecting piping and duct systems and without interference from building structure or other equipment.</li><li>2. Provide accessible means for lubricating equipment including permanent lubricated bearings.</li><li>3. Mount base mounted equipment on chamfered edge housekeeping pads a minimum of 100 mm high and 50 mm larger than equipment dimensions all around.</li><li>4. Pipe drain lines to drains.</li><li>5. Line-up equipment, rectangular cleanouts and similar items with building walls wherever possible.</li></ol> |
| 3. Responsibility for Trial Usage          | <ol style="list-style-type: none"><li>1. Obtain written permission from the Engineer to start and test permanent equipment and systems prior to acceptance by the Engineer.</li><li>2. The Engineer may use equipment and systems for test purposes prior to acceptance. Supply labour, material and instruments required for testing.</li></ol>                                                                                                                                                                                                                                                                                                                                      |
| 4. Pipe Hanger and Supports                | <ol style="list-style-type: none"><li>1. Fabricate hangers, supports and sway braces in accordance with ANSI B31.1-1983.</li></ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 5. Sleeves                                 | <ol style="list-style-type: none"><li>1. Provide sleeves: at point where pipes pass through</li></ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

masonry or concrete.

6. Escutcheons and Plates
  1. Provide on pipes passing through finished walls, partitions, floors and ceilings.
7. General
  1. Plumbing fixtures shall be product of one manufacturer and of same colour in any one washroom or location.
  2. Plumbing fittings shall be product of one manufacturer.
8. Dielectric Couplings
  1. Provide wherever pipes of dissimilar metals are joined
  2. Provide insulating unions for pipe sizes NPS 2 and under flanges for pipe sizes over NPS 2.
  3. Cast brass adapters may be used where approved by the Engineer.
  4. Provide felt or rubber gaskets to prevent dissimilar metals contact.
9. Tests
  1. Give 24 hours notice of date when tests will be made.
  2. Do not insulate or conceal work until tested and approved. Follow construction schedule and arrange for tests.
  3. Conduct tests in the presence of the Engineer.
  4. Bear costs including retesting and making good.
  5. Pipe pressure:
    1. Hydraulically test piping systems at 1 1/2 times system operating pressure or minimum 860 kPa, whichever is greater.
    2. Maintain test pressure without loss for 4h unless otherwise specified.
    3. Test natural gas systems to requirements of authorities having jurisdiction,
      1. Test drainage, waste and vent piping to code.

## 10. Qualifications

6. Prior to tests, isolate all equipment or other parts which are not designed to withstand test pressures.
1. All work to be done by a certified Journeyperson plumber and tinsmith.

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|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Codes and Standards     | 1. Do complete installation in accordance with CSA C22.1-1994 except where specified otherwise.<br>2. Comply with CSA Certification Standards and Electrical Bulletins in force at time of tender submission.<br>3. Do overhead and underground systems in accordance with CSA C22.3 No. 1-M1994 except where specified otherwise.                                     |
| 2. Voltage Ratings         | 1. Operating voltages; to CAN3-C235-83<br>2. Motors, electric heating, control and distribution devices and equipment to operate satisfactorily at 60 Hz within normal operating limits established by above standard. Equipment to operate in extreme operating conditions established in above standard without damage to equipment.                                 |
| 3. Materials and Equipment | 1. Equipment and material to be CSA certified and manufactured to standard quoted.<br>2. Where there is no alternative to supply equipment which is not CSA certified, obtain special approval from Inspection Department.                                                                                                                                             |
| 4. Wiring Identification   | 1. Identify wiring with permanent indelible identifying markings, either numbered or coloured plastic tapes, on both ends of phase conductors of feeders and branch circuit wiring.<br>2. Maintain phase sequence and colour coding throughout.<br>3. Colour code: to CSA C22.1-1994.<br>4. Use colour coded wires in communication cables, matched throughout system. |
| 5. Wiring Terminations     | 1. Lugs, terminals, screws used for termination of wiring to be suitable for either copper or aluminum conductors.                                                                                                                                                                                                                                                     |

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|-----------------------------------|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 6. Manufacturers and CSA Labels   | 1. | Visible & legible after equipment is installed, C22.1-1994                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 7. Mounting Heights               | 1. | Mounting height of equipment is from finished floor to centerline of equipment unless specified or indicated otherwise.                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                   | 2. | Install electrical equipment at the following heights unless indicated otherwise: <ol style="list-style-type: none"> <li>1. Local switches: 1400 mm</li> <li>2. Wall receptacles:             <ol style="list-style-type: none"> <li>1. General: 300 mm.</li> <li>2. Above top of continuous baseboard heater: 200 mm</li> <li>3. Above top of counters or splash-back: 175 mm</li> <li>4. In mechanical rooms: 1400 mm</li> <li>5. Fire alarm stations: 1.5 m</li> <li>6. Fire alarm bells: 2.1 m</li> <li>7. Clocks: 2.1 m</li> <li>8. Door bell push buttons: 1.5 m.</li> </ol> </li> </ol> |
| 8. Protection                     | 1. | Protect exposed live equipment during construction for personnel safety.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                   | 2. | Shield and mark live parts "LIVE 120 VOLTS" or with appropriate voltage in English and French.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 9. Load Balance                   | 1. | Measure phase current to panel board with normal loads operating. Adjust branch circuit connections as required to obtain best balance of current between phases.                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 10. Fireproofing                  | 1. | Where cables or conduits pass through floors and fire rated walls pack space between wiring and sleeve full with insulation and seal with caulking compound conforming to CGSB BAN2-19.13-M82.                                                                                                                                                                                                                                                                                                                                                                                                 |
| 11. Insulation Resistance Testing | 1. | Megger circuits, feeders and equipment up to 350 V with a 500 V instrument.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                   | 2. | Megger 350-600 V circuits, feeders and equipment with a 1000 V instrument.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                   | 3. | Check resistance to ground before energizing.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 12. Wires and Conduit             | 1. | All wiring shall be enclosed in EMT (Electrical Metallic Tubing) and shall be sized as per CSA C22.1-1990 with                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

600 V insulation of chemically cross-linked thermosetting polyethylene material rated RW90.