

MECHANICAL SPECIFICATION

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- 1.0 General
 - .1 Visit jobsite during tender. Drawings indicate approximate location of existing mechanical equipment and services. Verify exact locations of existing mechanical equipment and services and allow for necessary relocating of noted services (or reconnection to existing services) to suit new construction.
 - .2 All work shall conform to Manitoba Building Code and local authorities. Apply for, obtain and pay for all necessary permits.
 - .3 Coordinate installation with all related trades and drawings. Verify all dimensions and locations of existing building services, piping, conduit, equipment, interior fittings, and furnishing prior to proceeding with work.
 - .4 Submit shop drawings for all equipment to Contract Administrator.
 - .5 Provide one year guarantee for all equipment.
 - .6 All necessary cutting and patching shall be performed by competent Contractor to satisfaction of the Contract Administrator.
 - .7 Refer to Instructions to Bidders for requirements regarding project phasing, working hours, shut-down procedures, access, etc.
 - .8 Prior to drilling holes and/or openings in existing structure, contractor shall to locate and mark all structural reinforcing steel located in area where cutting or drilling is proposed. At no time shall reinforcing steel be cut without prior written approval from the Contract Administrator. No holes or openings will be permitted within area of structural drop panels located at columns.
 - .9 All interior space power hammering, drilling and other noisy work shall be performed between hours of 6:00 p.m. and 8:00 a.m.
 - .10 Tender quotations shall be based on the use of specified equipment, unless acceptance for the use of equal manufacturers is obtained from the engineer prior to submission of tenders. Alternate manufacturers may be quoted as an increase or decrease amount to the tender price, without prior acceptance of the Contract Administrator.
 - .11 Furnish to the Contract Administrator three (3) complete sets of manufacturer's operating and maintenance instructions for all equipment requiring maintenance. Review instructions with The City of Winnipeg's representative to ensure a thorough understanding of the equipment and its operation.
 - .12 Provide a mark-up of the contract drawings for record "As-Built" drawings, revised as required to show any changes from that originally shown.
 - .13 Provide as-built drawing in Autocad format, complete with disk paid for by Mechanical Contractor.
 - .14 All piping to be installed straight, parallel to the building walls.
 - .15 Where pipes or ducts go through an exterior roof or wall, they should be boxed-in, flashed and waterproofed. Allow for expansion and contraction of pipe.
 - .16 Pipe hangers shall be Grinnell Fig. 65 for steel pipe and Fig. CT65 for copper pipe, all with Fig. 140 threaded rod attached to Fig. 117 expansion case set in holes drilled in concrete, or attached to Fig. 225 or 227 clamp attached to joists or beams.
 - .17 Provide firestopping for all openings in fire separations for passage of pipes, ducts, etc. to maintain integrity of fire separations as per manufacturer's published recommendations.
 - .18 Installation of work shall be coordinated with all Contractors and shall be scheduled so as not to endanger or disturb the users of the building. Shutdown of existing building systems shall be coordinated with the Contract Administrator.
 - .19 Contractor shall review all equipment requiring electrical hook-up with Electrical Contractor and electrical drawings prior to ordering equipment. Ensure proper electrical characteristics are determined for all affected and related work.
 - .20 Prior to installation of the ceiling, notify the Contract Administrator and arrange for a final review of the work. For undertaking this review, the following shall be completed:
 - .1 All systems to be fully operational, as-built drawings supplied and Operating and Maintenance Manuals submitted. Two (2) days notification (in writing) is required to be given to the Contract Administrator prior to reviews being undertaken.
 - .2 All deficiencies shall be completed within two (2) weeks of an agreed period of time after final review and a letter shall be submitted to the Contract Administrator within that time advising of such.
 - .21 Where mechanical services are concealed within walls, floors or ceilings 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 mechanical services at no cost to the Contractor.
- 2.0 Insulation
 - .1 Insulate sump pump discharge piping 3 m back from wall penetration with 1" Fibreglas 5 1/2 lb. density piping insulation with ASJ as per manf. recommendations. Seal all breaks, joints with ASJ tape.
 - .2 All cold piping insulation shall be c/w with vapour barrier.
 - .3 Insulation covered with white P.V.C. insulation cover.
- 3.0 Plumbing
 - .1 Provide labour, material, equipment and services necessary for and incidental to supply and installation of systems shown on drawings. Generally this shall include:
 - .1 Weeping Tile Sump Pump Systems
 - .2 Drainage Systems
 - .1 Provide complete systems of drainage and venting to serve all fixtures, equipment, etc. as noted on drawings and in accordance with local codes.

- 2 Cleanouts:
 - .1 Install cleanouts at all changes of direction, at intervals of not over fifty feet (50) in horizontal runs, at all points where obstructions might be formed and at all points required by plumbing regulations or shown on drawings.
- .3 Sump Pump Discharge Piping
 - .1 Pipe and fittings shall conform to standards listed in applicable Building Code (latest revision).
 - .2 Pipe - Type 'L' Third Party Certified hard copper tube.
 - .3 Fittings - Wrot or cast solder joint.
- .4 Ball Valves
 - .1 Toyo Fig. 5049A.
- .5 Cleanouts
 - .1 Cleanouts in copper drainage tube shall be brass screwed plugs with raised head.
- .6 Joining
 - .1 Make all joints in accordance with manufacturer's recommendations.
 - .2 Brace fittings necessary to prevent joints from coming apart under pressure.
 - .3 Make joints with solder containing no lead. Solder material shall be Silverbrite 100 or equal consisting of combination of tin, copper and silver.
- .7 Cleaning and Flushing
 - .1 On completion, flush out piping system to remove any foreign material in piping.
- .8 Testing
 - .1 Pressure test all piping systems as follows:
 - .1 Plumbing System - in accordance with local regulations.
- .9 Hangers
 - .1 Water - Grinnell CT65 plated clevis.
 - .2 Drainage - Grinnell 260 clevis.
 - .3 Install hangers 6 ft. on centre for pipes up to 1", 8 ft. on centre for pipes 1 1/4" and larger.
- .10 Equipment
 - .1 Sump Pumps P-1/P-2 (Typical of P-3/P-4, P-5/P-6)
 - .1 Duplex Monarch submersible sump pumps, Model WS30M, 45 USgpm @ 20 fhd, 1/3 hp, 1750 rpm.
 - .2 Pumps shall be mounted on concrete pad in sump pit, strainer at bottom of sump, ball valve and check valve in discharge of each pump, and common type 'L' copper discharge line to exterior as shown.
 - .3 Provide float control panel for each pair of sump pumps consisting of the following:
 - .1 2 only main disconnect switches, c/w door interlocked handle.
 - .2 Automatic switch over mechanism between 2 power sources.
 - .3 'Power On' and 'Run' and 'High Level Alarm' pilot lights.
 - .4 Electric alternating relay.
 - .5 High level alarm c/w silencer.
 - .6 High level alarm relay for connection to remote panel.
 - .7 Nema 4 enclosure
 - .8 One steel bracket to support float switch in suitable position.
 - .9 Three (3) "PIL" Mercury switches enclosed in a PVC housing c/w suitable length of electrical cable.
 - .2 Float switches shall be installed by Section 15400 and wired by Div. 16 to operate two pump motors of a duplex pump installation as follows:
 - .1 Automatically alternate the first pump to start on each successive operation.
 - .2 Automatically start second pump should first pump fail, or to provide additional capacity when load becomes too great for the first pump.
 - .3 Automatically provide high level alarm should the liquid level rise above the predetermined level setting. Wiring of float switch to remote annunciation by Div. 16.
 - .6 Provide one central alarm panel to annunciate high level alarms. Panel to include one buzzer with silence button, and one trouble light for each sump pump pair. Panel to be located at the main floor front desk as directed on site.

ELECTRICAL SPECIFICATION

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SECTION 16010 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 City of Winnipeg. 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 EEMAC standards and shall be CSA and locally approved. 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 of Winnipeg.
 - .5 Obtain all necessary permits, pay all necessary fees, give all necessary notices and obtain approval of the electrical authorities having jurisdiction.
 - .6 Be responsible for any damage caused to the City of Winnipeg or other contractors due to improperly carrying out this work. Included would be all costs including labour and materials for the replacement of any damaged equipment.
- 2 Shop Drawings
 - .1 Submit six (6) copies of shop drawings for all equipment.
 - .2 Equipment proposed shall meet the same standards of performance, quality and workmanship as that specified.
- 3 As-builts
 - .1 Provide two copies of "as-built" drawings.
 - .2 Provide as-built drawing in Autocad format, complete with disk paid for by Electrical contractor.
- 4 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.
- 5 Removals
 - .1 Remove all unnecessary existing electrical equipment, wiring and fixtures in those portions of the existing building which are being remodelled 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 of Winnipeg may select from the materials and/or equipment remaining which he wishes to retain and the remainder shall be removed from the site.
 - .2 Any electrical equipment in remodelled sections or in structures removed or altered, adjacent to new work, necessary for the operation of the existing building, shall be relocated as necessary.
 - .3 All existing equipment reused shall be made good and guaranteed.
 - .4 Power interruptions shall be kept to a minimum and shall be a time suitable to the building occupant(s).
- 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 of Winnipeg 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 City of Winnipeg's written consent 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 of Winnipeg and Contract Administrator.
 - .4 If existing equipment shown on drawings is defective it should be brought to the Contract Administrator and City of Winnipeg's attention prior to work completion.
 - .2 Installation
 - .1 Install boxes, conduit and wiring through existing areas as required for the new installation.
 - .2 Add modules, switches, etc. in existing control panels, as required, to extend existing systems to new or renovated areas.
 - .3 Patch and repair walls and ceilings in existing areas that have been damaged or cut open due to the new electrical installation.
 - .4 Where new cables or conduits have been installed through existing fire rated walls, seal opening around cables and conduit to maintain fire rating. In an approved manner.
 - .3 All existing equipment reused shall be made good and guaranteed.
 - .4 Power interruptions shall be kept to a minimum and shall be a time suitable to the building occupant(s).

SECTION 16100 ELECTRICAL MATERIALS AND INSTALLATION

- 1 Wiring Method
 - .1 For general purpose wiring: RW90 conductors in EMT conduit.
 - .2 For connection to motors and miscellaneous mechanical equipment use lightweight flexible conduit.
 - .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
 - .1 The entire installation shall be grounded in conformance to the latest edition of the Canadian Electrical Code.
 - .2 All conduit to have a separate insulated ground conductor.
- 3 Boxes
 - .1 Outlet, junction and switch boxes shall be galvanized steel and sized according to the electrical code and to suit each application.
 - .2 Provide moulded box vapour barrier: factory moulded polyethylene box for use with recessed electric boxes in exterior walls.
- 4 Power Distribution System
 - .1 Multi-pole breakers shall be of one piece construction with common trip.
 - .2 Provide breakers in panelboards as indicated on the drawing.
 - .3 All new breakers shall match panel voltage unless indicated otherwise. Circuit breakers shall be thermal magnetic type. Breaker manufacturer to match existing.
 - .4 Nameplate for each panelboard 20 x 90mm engraved as indicated.
 - .5 Complete circuit directory with typewritten legend showing location and load of each circuit.
 - .6 Wiring in panelboards shall be neat and set in as if faced. All neutral conductors shall be identified in the panel with their associated circuit numbers by means of Brady Markers.
 - .7 Interrupting capacity of new breakers in existing panels shall match existing.
- 5 Mechanical Equipment Connections
 - .1 Refer to mechanical drawings for the exact location of motor control devices, and other mechanical equipment requiring an electrical connection.
 - .2 Obtain full information from Div. 15, regarding wiring, controls, overload heaters, equipment ratings and overcurrent protection. Notify the Div. 15 subcontractor, at once, if any information provided is incorrect or unsatisfactory.
 - .3 Co-ordinate control wiring requirements with Div. 15 and provide all control wiring and connections as required to make the control systems operate as specified.
- 6 Conduits and Cable
 - .1 Drawings do not indicate all conduit and cable runs. Those indicated are in diagrammatic form only.
 - .2 Minimum conduit size shall be 3/4" unless indicated otherwise.
 - .3 All conduits shall have a separate insulated green ground conductor.
- 7 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 "ELLS" where 90° bends are required for 25mm and larger conduits.
 - .5 Steel set screw connectors and couplings. Insulated throat liners on connectors.
- 8 Disconnect Switches
 - .1 Fusible and non-fusible disconnect switch in CSA enclosure.
 - .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 Install disconnect switches as indicated on drawings.
 - .7 Weatherproof where required.
- 9 Manual Motor Starters
 - .1 Manual motor starters with components as follows:
 - .1 Switching mechanical quickmake and break.
 - .2 Overload heaters, manual reset, trip indicating handle.
 - .2 Accessories:
 - .1 Toggle switch labelled.
 - .2 Indicating light: type and color to match existing starters.

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

APEGM
 Certificate of Authorization
 SMS Engineering Ltd.
 No. 166 Expiry: April 30, 2009

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Drawing Title
MECHANICAL & ELECTRICAL SPECIFICATION

Sheet No.
ME-2

Design	Drawn	Checked	Scale	Date	File
HW/TS	RR	HW/TS	AS NOTED	07/17/2008	08-111-01