

Owner

City of Winnipeg
185 King Street, Winnipeg, Manitoba
R3B 1J1
(204) 794-4418

No.	Date	Revision Notes
0	2018/07/27	Issued for Construction

10399



MCW / AGE
Consulting Professional Engineers
210-1821 Wellington Avenue
Winnipeg, Manitoba, R3B 0S4
Phone - (204) 778-7900 Fax - (204) 778-1119
E-Mail: mcw_age@mcw.com



Certificate of Authorization
MCW/AGE Consulting
Professional Engineers
No. 589

THIS IS A PART OF A DOCUMENT THAT HAS BEEN ELECTRONICALLY AUTHENTICATED BY THE TECHNOLOGY AUTHORITY OF THE PROVINCE OF MANITOBA.



This drawing must not be scaled. The contractor shall verify all dimensions and other data on site prior to commencement of work. Discrepancies, errors, and omissions are to be reported to the Architect prior to proceeding with the Work.

Drawings and specifications as instruments of service are the property of the Architect; the copyright in the same being reserved to him. No reproduction or revision to these drawings may be made without the permission of the Architect, and when made, must bear his name. All prints to be returned to the Architect upon request.

Project

Crescent Drive Park Pavilion

Drawing

MECHANICAL
SPECIFICATION

Drawn By: KL, Scale: As Noted, As Noted
Reviewed By: CD, Drawing No.: M3.1

Date: July 2018, Project No., Revision No.

1. GENERAL REQUIREMENTS 22 00 06

- Comply with all requirements of Contract Administrator's Specification.
- This Section applies to and is part of all sections of Division 22 and 26. Every Section of these Specifications applies equally to all Sections.
- Total Bid Price to include price to include all necessary equipment, parts, labour and plant to complete the Work shown on the Drawings and described in the Specifications and to ensure complete and operational mechanical systems.
- Drawings are diagrammatic and approximately to scale. Do not scale them. For exact dimensions refer to dimensioned Drawings.
- Drawings and Specifications establish scope of Work only and are not detailed installation instructions. Follow manufacturer's recommendations and adhere to all applicable Codes, Standards, Regulations and Bylaws, hereafter referred to as Codes.
- Connect to equipment specified in other sections, installed by other Contractors or the City.
- The Contract Administrator shall have the final say in matters of interpretation.
- Use only new Materials under this Contract unless otherwise noted. New Materials shall be free of Asbestos Containing Materials (ACM).
- Apply for and pay for all required permits, licenses, inspections and fees. Indicate building and mechanical permit numbers on all progress draws. Where no permit was applied for indicate same on progress draw.
- In the event of conflict between contract documents and Codes, the more stringent requirement shall be adhered to at no additional cost.
- All Work shall be executed with good workmanship, and be guaranteed for one year from Substantial performance.
- Only skilled and qualified licensed tradesmen shall perform the Work. Tradesmen to provide proof of registered status as requested.
- Install mechanical systems in a workmanlike manner, neat in appearance and to function properly to the satisfaction of the Contract Administrator.
- Supply access doors, provide rated doors to match fire rating, at all service points for mechanical equipment. Indicate on "as-built drawings" the location of all access doors.
- The Mechanical Subcontractor is responsible to carefully examine conditions at the intended place of Work. Verify all services, connection points, and all access openings to permit installation of new equipment.
- Mechanical Subcontractor shall submit shop drawings for review by the Contract Administrator prior to commencing Work. Shop drawings shall be specific to the equipment and materials for this project. Changes to location and arrangement shall be reviewed prior to installation. Review of shop drawings by the Contract Administrator is for the sole purpose of ascertaining conformance to design intent. The Mechanical Subcontractor retains responsibility for all aspects of installation, performance and coordination.

17. Shop Drawing Procedures are as follows:

- General:
 - Submittal routing shall be established at the beginning of each project.
 - Generally, submittals shall be forwarded as follows: Subcontractor to Contractor/Contractor to Contract Administrator.
 - A transmittal listing each item of equipment shall accompany each submission.
 - Contractor and Mechanical or Electrical Subcontractor must review, approve and stamp submittals prior to sending to Contract Administrator for review. Submittals without Contractor stamps will not be reviewed.
 - Equipment must be labeled appropriately. Each item of equipment must bear the identifier used on the drawings, i.e. EF-1, RTU-3, etc.
 - Data sheets must clearly indicate model and options being utilized. All information that does not apply must be crossed off.
 - Where products have applied for and received equal approvals, proof of this shall be submitted with Shop Drawings.
 - Electronic Submissions (pdf only):
 - Send electronic Shop Drawing submittals to wpg.shopdrawings@mcw.com only, please do not copy staff members directly.
 - Hard Copy Submissions:
 - A minimum of four (4) hard copies must be provided.
18. Mechanical Subcontractor shall maintain accurate "as-built" Drawings on site and shall present for review at each Site review. Submit these record Drawings in AutoCAD 2010 or newer format for review at the completion of the project. Note that changes to floor plans must be included. The Contract Administrator will not perform final inspections nor certify for occupancy until the "as-built" Drawings have been received, reviewed and accepted. After acceptance of "as-built" Drawings by the Contract Administrator, provide one (1) complete set on CD-ROM and three (3) sets of prints.
19. **Engineering Site Reviews:** Contractor's Work shall be periodically reviewed by the Contract Administrator for determining general quality of installation. Guidance will be offered as to interpretation of contract documents and to assist in performing the mechanical installation. Inspections, reviews and directives issued in no way relieve the Contractor, his agents, employees or subtrades from contractual obligations, conformance to codes or safe and recognized practices.
20. Operating and Maintenance Manuals: At the completion of work submit three (3) hard covered loose leaf binders showing all major components divided by trade sections. Manuals shall be complete with all instructions for operation, maintenance and replacement parts as required. Include performance curves, detailed drawings, part lists, supplier information and any other pertinent data. Include copies of reviewed Shop Drawings, Contract Administrator contact information, Contractor and Sub-contractor information. Include copies of valve tag lists, all inspection certificates, and balancing reports. The Contract Administrator will not perform final inspections nor certify for occupancy until the O&M Manuals are received, reviewed and approved.
 - Provide manufacturers start-up reports and letters of certification that the following equipment and systems are started, commissioned and working correctly:
 - Controls
 - Air moving equipment
 - Heat recovery ventilators
 - Plumbing fixtures, mixing valves and brass.
 - Water Treatment
21. Provide one (1) set of special tools required to service equipment as recommended by manufacturer. Provide a receipt signed by the City's representative for each tool in each copy of the O&M Manual.
22. Provide one (1) set of spare filters for each filter bank.

- Prior to requesting any Substantial Performance site review, all aspects of the mechanical systems shall be complete and operational. Testing and balancing shall be complete along with valve and equipment identification, equipment startups.
 - Each of the Contractors shall instruct the City of Winnipeg Staff on the operation, maintenance, and adjustment of equipment and/or system that they have installed or set. Provide sign off sheets for training indicating who was trained and number of hours of training.
 - Use of Equipment before occupancy by the City:
 - The Contractor may operate equipment for testing and balancing only. The use of equipment for any other purpose must be approved by the City in writing prior to use. Approval must indicate who is paying for utilities used.
 - Any equipment that is placed in use for any reason prior to the beginning of the guarantee period shall be cleaned and provide with whatever maintenance and repair is required so that its condition is equal to that of new equipment, or it shall be replaced, at no cost to the City.
 - Prior to final inspection or certification provide the following:
 - Fire damper certification
 - Copies of manufacturer's startup or certification reports
 - TAB reports.
 - Training sign off sheets.
 - Receipts or transmittals indicating the City has received all special tools and spare sets of filters.
 - Mechanical subcontractor is to review and approve all requests for information (RFI's) from Contract Administrator and Contractor is to review and approve all mechanical RFI's prior to submittal to ensure information is not already included in contract documents or cannot be reasonably inferred from contract documents.
 - Contractor is to review and approve all mechanical change pricing and credits prior to submitting to Contract Administrator, approval to state that the Contractor believes the pricing is fair and reasonable.
 - Mechanical change pricing will only be reviewed if it includes a complete breakdown of items of material, labour hours, labour rates and markups. This review period will start when the information indicated above is received.
 - Mechanical progress claims will only be reviewed if they provide a complete breakdown by trade and sub trade and list all major equipment complete with costs.
2. **ACCEPTABLE MANUFACTURERS 22 00 10**
- Standard of Material & Equipment:
- Where a Manufacturer's name is mentioned, it is for the purpose of setting a standard of quality, performance, capacity, appearance and serviceability. Manufacturers shown below are pre-approved if their products are equal in performance to the specified ones, and the products can be used in the preparation of the Bid. Where no approved manufacturer's are provided, provide the exact make specified. Requests for approval must be submitted to the Contract Administrator not less than two full Working Days prior to the issuance of the last addendum and must be approved in writing by the Contract Administrator in an addendum, no exceptions. Approval does not absolve the supplier and Contractor of the obligation to meet all clauses of this Specification. Where approved products have different power requirements, controls, weights, dimensions, or features, it is the responsibility of the bidder to include all costs associated with this in their bid.

Description:

1. Plumbing and Drainage Approved List

Equipment	Acceptable Manufacturers
Hangers and Supports	Crane, Grinnell, Myatt
Drainage Specialties	Ancon, Smith, Zurn, Mifab, Watts
Shock Absorbers	Ancon, Smith, Zurn, PPP, Watts
Gauges and Thermometers (swivel)	Dresser, Terice, Weiss, Dwyer
Wall Hydrants	Ancon, Zurn, Smith, Mifab, Watts
Plumbing Fixtures	Kohler, American Standard, Toto, Crane, Sloan
Plumbing Brass	Kohler, Delta Commercial, Chicago Faucets, Zurn, Moen, Toto, Sloan
Flush Valves	Sloan, Delta Commercial, Crane, Kohler, Toto
Thermostatic Mixing Valves	Powers, Leonard
Mop Sinks	American Standard, Fiat, Stern Williams
Toilet Seats	Olsonite, Beneke, Centoco
Domestic Hot Water Heaters	RHEEM, State, A.O. Smith, Bradford White

2. Ventilation Approved List

Equipment	Acceptable Manufacturers
Damper Hardware, Fan Connectors	Duro-Dyne, Elgin
Fire Dampers	NCA, Ruskin, Nailor Industries
Static Pressure Monitors	Dwyer, Terice
Filters	A.A.F., Farr, Cambridge, Flanders
Inline Centrifugal Fans	Greenheck, Penn, Loren Cook, Delhi
Diffusers, Registers and Grilles	Titus, Price, Nailor Industries, Tuttle and Bailey
Backdraft Dampers	Tamco, Ruskin, Price, Westvent, Nailor Industries
Acoustic Duct Insulation	Owens Corning, J-M, Knaf, Ultralite
Flexible Ductwork	Thermoflex, Wire-mould, Flex Master
Electric Duct Heaters	Thermolec, PM Wright

Equipment	Acceptable Manufacturers
Heat Recovery Ventilators	Lifebreath, VenMar, Renevairs, Vanee

3. Controls Approved List

Equipment	Acceptable Manufacturers
Control Dampers	Ruskin, Ventex, Tamco, Greenheck, Westvent
Damper Motors	Honeywell, Belimo, TAC I/A, Johnson Controls

3. PIPING and FITTINGS 22 00 20

- Provide isolation valves at all fixtures, appliances and equipment.
- Provide check stops at all mixing valves.
- Allow for thermal expansion on all piping systems conveying hot or cold vapour or liquid.
- Provide point of use thermostatic mixing valves set to 43°C (110°F) for lavatories where indicated.
- Tag all major zone and shut off valves with 38mm (1½") diameter brass tags. Index and list valves, insert list in each O&M Manual also frame and mount copy of list in a conspicuous area of the mechanical Room.
- Identify all equipment with black lamacoid tags 100mm x 25mm (4" x 1") with white lettering. Mechanically affix tags to equipment. Equipment names and number to match those listed on contract documents.
- Identify all piping with stenciled lettering and directional arrows at intervals no greater than 6m (20') and at every change in direction. Labeling and identification to either the City's standard or the CSA standard. Confirm system with the City prior to Bid.
- Wherever pipes of dissimilar metals are joined the piping systems shall be protected and isolated by use of dielectric unions or brass valves.
- Provide and install union or flange connections at all equipment and devices to allow for ease of service or future replacement.
- Piping Systems:
 - Sanitary Drainage - Above Ground: Cast iron and copper. PVC DWV as permitted by the 2010 NPC.
 - Domestic Hot & Cold Water: Type L copper with wrought copper fittings and lead free solder; CPVC Dr11 Pipe and fittings as permitted by the 2010 NPC. PEX as permitted by the 2010 NPC. Soft copper Type K, PVC or HDPE to approval of authorities having jurisdiction
 - Building Water Services: PVC DWV as permitted by the 2010 NPC. PVC Sewer Pipe as permitted by the 2010 NPC.
 - Sanitary Drainage - Buried: PVC DWV as permitted by the 2010 NPC. PVC Sewer Pipe as permitted by the 2010 NPC.
- Valves:
 - Isolate all serviceable equipment, using ball and butterfly valves where possible.
 - All valves shall have a minimum certified rating of 150 psi.
 - All drain valves shall be complete with cap and chain.

- Install ¼ turn ball valves prior to all pressure gauge devices.
 - PVC ball valves, double backing with union ends, solvent weld, pressure rated at 230 psi (1580kPa) at 79°F (23°C).
12. Hangers and Supports:
- All hangers shall be of same material as piping system, or shall be isolated from the pipe.
 - Provide adjustable clevis hangers equal to pipe size and of same material as piping system.
 - Provide oversized hangers on all cold water piping conveying liquid less than 21°C (70°F).
 - Use only factory made inserts, coach screw rods, c-clamps, beam clamps and expansion shields rated for the intended load.
 - "Caddy" clip or tension clip rod supports are not allowed on this project.
 - Duct hangers shall be rod or strap 2 gauges heavier than duct.
13. Provide and install sleeves of suitable Material where piping and duct systems pass through any and all separations.
14. Supply and install thermostats and gauges at all major pieces of equipment and where indicated on the drawings. (Note PSN-B Snubbers required at all gauges.) Mount all gauges and thermostats vertically and place so that ease of reading is ensured. Pressure and temperature ranges shall be suitable for the application.
15. Primer paint all miscellaneous metal supports channels and angle iron prior to installation.
16. Pipe all water discharge from relief valves and equipment drains to nearest floor drain or suitable receptacle. Confirm locations with Contract Administrator prior to installation.
17. Install all valves, strainers, equipment, specialties, filters and the like to permit ease of operation and full access.
18. Acceptable joining systems include mechanical joints (sanitary) soldering, silver soldering, threaded joints, welding, grooved Victaulic (black) and grooved copper Victaulic. NOTE: Tee drilling and Press-fit systems are not acceptable on this project.
19. Test all systems to 1½ times working pressure for a minimum of two hours. All tests shall be recorded and independently witnessed. Submit recorded data for Contract Administrator's review prior to substantial completion and include in O&M Manuals.
20. Metal to PVC thread connections shall be stainless steel reinforced SCH 80, PVC female adaptors.
4. **INSULATION 22 07 10**
- Definitions:
 - The word "exposed" where used in this Section means any Work, which is not concealed in wall, shaft, or ceiling cavities or spaces. Work in mechanical rooms, utility spaces, behind doors in closets or cupboards or under counters is considered exposed.
 - Flexible Duct Insulation (FDI):
 - R-24 flexible blanket with foil jacket, pin at 400mm on centre and tape all joints with aluminum tape.
 - Pre-molded Pipe Insulation (PPI):
 - Provide ULC listed sectional fiberglass pipe insulation in compliance with ASTM C335-84 in pre-molded sections 900mm (36") long, split and ready for application with a minimum Thermal Conductivity of 0.033 W/m deg C at 24°C (75°F) mean temperature and be capable of use on service from -40°C to 260°C (-40°F to 500°F) and with factory applied