

Section 01 00 00 – Bid Depository Sections

- Sentence 1.3.1.5, delete word “Systems”.
- Sentence 1.3.1.6, delete word “10 44 20”, and replace with “10 44 16.19”.

Section 01 11 00 – Summary of Work

- Add the following sentence 1.7:

1.7 Contract Documents

- .1 Legends and schedules in the Issued for Tender Drawings take precedence over the Technical Specifications with respect to products and materials identified.

Section 01 56 00 – Temporary Barriers and Enclosures

- Delete sentence 1.4.1 and replace with the following:
 - .1 Erect temporary site enclosures using 38 x 89 mm construction grade lumber framing at 600 mm centres, installed on 89 x 89 mm wood posts at 2400 mm centres or 50 mm dia. steel posts at 2400 mm centres. Posts to be place in post holes filled with concrete to minimum 900 mm depth. Finish temporary site enclosures with 1200 x 2400 x 13 mm exterior grade fir plywood to CSA O121 or chain link fence fabric to Section 32 31 13 – Chain Link Fences and Gates.
- Delete sentence 1.4.2 and replace with the following:
 - .2 Apply plywood panels or chain link fence fabric vertically flush and butt jointed.

Section 03 33 00 – Cast in Place Concrete

- Delete sentence 3.3.1 and replace with the following:
 - .1 Concrete slab tolerances in accordance with CSA-A23.1/A23.2, F-number Method, $F_F = 25$, $F_L = 20$.

Section 03 35 00 – Concrete Floor Treatment

- Section renamed to Concrete Finishing.

Section 04 05 19 – Masonry Anchorage and Reinforcing

- Delete sentence 2.1.3 and replace with the following:
 - .3 Ties:
 - .1 For metal stud or wood stud and masonry construction: to CSA-A370 and CSA-S304, 1.6 mm thick side mounting, stainless steel flat plate, c/w 5.8 mm ø holes for veneer tire wire attachment, 4.76 mm ø veneer ties with polyethylene insulation supports. Total length of flat plate to suit stud width, sheathing, air space and insulation.
 - .2 For cast-in-place concrete and masonry construction: to CSA-A370 and CSA-S304, 1.6 mm thick stainless steel L-Plate, c/w 5.8 mm ø holes for veneer tire wire attachment, 4.76 mm ø veneer ties with polyethylene insulation supports.
 - .3 For concrete block and masonry construction: to CSA-A370 and CSA-S304, 1.6 mm thick stainless steel connector plate, c/w 5.8 mm ø holes for veneer tire wire attachment, 4.76 mm ø veneer ties with polyethylene insulation supports. Total length of connector plate to suit block width, air space and insulation.

Section 07 17 15 – Membrane Waterproofing

- Section to be renumbered to 07 13 26 and renamed Self Adhered Sheet Waterproofing.

Section 07 46 13 – Preformed Metal Siding

- Delete sentence 1.4.1 and replace with the following:
 - .1 Provide a written guarantee, signed and issued in the name of the owner, covering the metal cladding/siding material for 10 (ten) years and workmanship for a period of 2 (years) years from the date of Substantial Completion.

Section 07 52 00 – Modified Bituminous Membrane Roofing

- Add the following sentence 1.7.4:
 - .4 Contractor to verify existing under deck mounted electrical conduits prior to installing mechanically fastened roof assembly.
- Add the following to sentence 2.8.1:

“Ensure fasteners have the following deck penetration:”

- .1 For concrete decks: minimum 25 mm.
- .2 For wood decks: minimum 25 mm.
- .3 For metal decks: minimum 19 mm and maximum 25 mm longer than assembly being secured. Fasteners to engage metal deck top flange. At gymnasium locations, fastener points of all fasteners to be removed.

- Delete to sentence 3.4.1.2 (Option 1) and replace with the following:

- .2 Secure thermal barrier to metal deck using:
 - .1 one (1) fastener per board, located at the centre of the board, fasteners to be FMRC approved. **Or**, apply beads of roofing adhesive to metal deck in accordance with manufacturer’s written instructions. Adhere thermal barrier in adhesive and walk-in thermal barrier to insure maximum contact with adhesive.

- Add the following to sentence 3.4.1.2 (Option 2):

“**or** apply beads of roofing adhesive to metal deck in accordance with manufacturer’s written instructions. Adhere thermal barrier in adhesive and walk-in thermal barrier to insure maximum contact with adhesive.”

- Add the following to sentence 3.4.2.1:

“**or** apply beads of roofing adhesive to air/vapour barrier in accordance with manufacturer’s written instructions. Adhere insulation in adhesive and walk-in insulation boards to insure maximum contact with adhesive.”

- Add the following to sentence 3.4.3.1 (EPS):

“**or** apply beads of roofing adhesive to insulation in accordance with manufacturer’s written instructions. Adhere cover board in adhesive and walk-in cover boards to insure maximum contact with adhesive.”

- Add the following to sentence 3.4.3.4 (EPS):

“**or** apply beads of roofing adhesive to cover board in accordance with manufacturer’s written instructions. Adhere asphalt recover board in adhesive and walk-in asphalt recover boards to insure maximum contact with adhesive.”

- Sentence 3.4.3.5 (EPS), delete words “using FMRC approved fasteners placed”.

- Add the following to sentence 3.4.3.4 (XPS):

“**or** apply beads of roofing adhesive for each layer of asphalt recover board in accordance with manufacturer’s written instructions. Adhere each layer of asphalt

- recover board in adhesive and walk-in asphalt recover boards to insure maximum contact with adhesive.”
- Sentence 3.4.3.5 (XPS), delete words “using FMRC approved fasteners placed”.
 - Add the following to sentence 3.4.3.4 (Polyiso):
“**or** apply beads of roofing adhesive to insulation in accordance with manufacturer’s written instructions. Adhere asphalt recover board in adhesive and walk-in asphalt recover boards to insure maximum contact with adhesive.”
 - Sentence 3.4.3.5 (Polyiso), delete words “using FMRC approved fasteners placed”.
 - Sentence 3.7.2, delete words “Transportation and Works Mechanical Inspector” and replace with “Owner’s Representative”.

Section 08 11 00 – Metal Doors and Frames

- Sentence 1.7.1, delete words “ten (10) years” and replace with “one (1) year”.

Section 08 31 00.01 – Access Doors – Mechanical Systems

- Section renamed to Access Doors.

Section 08 50 00 – Aluminum Windows

- Section to be renumbered to 08 51 13.
- Sentence 2.2.2, delete word “G1” from all sub sentences.
- Sentence 2.2.3.2, delete words “Davis Inlet” and replace with “Natuashish”.
- Sentence 2.2.3.3, delete words “Davis Inlet” and replace with “Natuashish”.

Section 08 50 01 – Vinyl Windows

- Section to be renumbered to 08 53 13.
- Sentence 2.2.2, delete word “G1” from all sub sentences.
- Sentence 2.2.3.2, delete words “Davis Inlet” and replace with “Natuashish”.
- Sentence 2.2.3.3, delete words “Davis Inlet” and replace with “Natuashish”.

Section 08 50 02 – Fiberglass Windows

- Section to be renumbered to 08 54 13.
- Sentence 2.2.2, delete word “G1” from all sub sentences.
- Sentence 2.2.3.2, delete words “Davis Inlet” and replace with “Natuashish”.
- Sentence 2.2.3.3, delete words “Davis Inlet” and replace with “Natuashish”.

Section 08 50 50 – Glazing

- Sentence 1.1.9, delete word “08 50 00” and replace with “08 51 13”.
- Sentence 1.1.10, delete word “08 50 01” and replace with “08 53 13”.
- Sentence 1.1.11, delete word “08 50 02” and replace with “08 54 13”.

Section 09 21 16 – Gypsum Board Assemblies

- Delete sentence 2.1.2 and replace with the following:
 - .2 Moisture and mold resistant board: to ASTM C36/C36M and ASTM C1177/C1177M with glass mat facings, both sides, regular and Type X, thicknesses as indicated on drawings, 1200 mm wide x maximum practical length, ends square cut, long edges tapered.
- Add the following 2.1.3:
 - .3 Glass mat exterior gypsum board sheathing: to ASTM C1177/C1177M regular and Type X, thicknesses as indicated on drawings, 1200 mm wide x maximum practical length, ends and long edges square cut.
- Renumber 2.1.3 to 2.1.4.
- Renumber 2.1.4 to 2.1.5.
- Renumber 2.1.5 to 2.1.6.
- Renumber 2.1.6 to 2.1.7.
- Renumber 2.1.7 to 2.1.8.
- Renumber 2.1.8 to 2.1.9.
- Renumber 2.1.9 to 2.1.10.

- Renumber 2.1.10 to 2.1.11.
- Renumber 2.1.11 to 2.1.12.
- Renumber 2.1.12 to 2.1.13.
- Renumber 2.1.13 to 2.1.14.
- Renumber 2.1.14 to 2.1.15.
- Renumber 2.1.15 to 2.1.16.

Section 09 22 16 – Non-Structural Metal Framing

- Delete sentence 2.1.1, and replace with the following:
 - .1 Non-load bearing channel stud framing: to ASTM C645, roll formed hot dipped galvanized steel sheet, 0.55 mm thickness for stud lengths up to 3500 mm, 0.91 mm thickness for stud lengths greater than 3500 mm, unless indicated otherwise on the drawings, for screw attachment of gypsum board. Knock-out service holes at 460 mm centres.

Section 09 65 22 – Seamless Flooring

- Delete sentence 2.1 and replace with the following:
 - 2.1 Seamless Flooring Type 1:
 - .1 Primer: type recommended by the manufacturer to penetrate the substrate to form a permanent bond between substrate and surfacing matrix.
 - .2 Aggregate: brightly colored quartz silica selected from manufacturers standard range.
 - .3 Troweled Mortar: consisting of epoxy resin, curing agent and finely graded non-silica aggregate.
 - .4 Sealer: two-component, high performance, clear epoxy sealer.
 - .5 Physical Properties:
 - .1 Compressive Strength: ASTM C-519, 69 MPa, (10,000 psi).
 - .2 Tensile Strength: ASTM C-307, 13.8, MPa (2,000 psi)
 - .3 Flexural strengths; ASTM C-580, 29.65 MPa (4,300 psi).
 - .4 Thermal Coefficient of Expansion: 3.5×10^{-5} m/m ° C.
 - .5 Bond Strength: ACI 503R, > 2.8 MPa (400 psi), with 100% concrete failure.

- .6 Abrasion Resistance: ASTM D-4060, 0.1 mg maximum weight loss.
- .7 Moisture Absorption: ASTM C-413, 0.1% maximum.

- Add the following sentence 2.2:

2.2 Seamless Flooring Type 2:

- .1 Primer: two component, low viscosity, methyl methacrylate resin.
- .2 Undercoat: three component, medium viscosity, methyl methacrylate resin.
- .3 Colour flakes: 1.6 mm and 6.3 mm coloured flakes distributed evenly over undercoat layer. Colour as selected from manufactured standard colour range.
- .4 Sealer: two-component, low viscosity, UV resistant, methyl methacrylate sealer.
- .5 Total thickness: nominal 3.0 mm
- .6 Physical Properties:
 - .1 Tensile Strength: ASTM D-638, 40.7, MPa (5,900 psi).
 - .2 Bond Strength: ASTM D-7234, > 2.07 MPa (300 psi), with 100% concrete failure.
 - .3 Abrasion Resistance: ASTM D-4060, C-17, 0.03 mg maximum weight loss, sealed.
 - .4 Flexural strength: ASTM D-790, 13.8 MPa (2,000 psi).
 - .5 Linear Coefficient of Expansion: ASTM C-531, 59.4×10^{-5} mm/mm ° C (33×10^{-6} in/in ° F).
 - .6 Impact Resistance: ASTM D-4226, > 8941 mm/kg (160 in/lb).

Section 09 84 10 – Acoustic Treatment

- Section to be renumbered to 09 80 00.

Section 10 11 00 – Miscellaneous Specialties

- Section to be renumbered to 11 66 33 and renamed Gymnasium Equipment.

Section 10 11 14 – Markerboards

- Section to be renumbered to 10 11 16.

Section 10 11 23 - Tackboards

- Sentence 1.1.7, delete word “10 11 14” and replace with “10 11 16”.

Section 10 22 25 – Interior Space Division Systems

- Section to be renumbered to 12 59 13 and renamed Panel-Hung Component System Furniture.

Section 10 44 20 – Fire Extinguishers and Safety Blankets

- Section to be renumbered to 10 44 16.19.

Section 10 51 16 – Laboratory Fume Hoods

- Section to be renumbered to 11 53 16.

Section 11 10 00 – Domestic Equipment

- Section to be renumbered to 11 31 00 and renamed Residential Appliances.

Section 12 21 20 – Curtains and Drapes

- Section to be renumbered to 12 22 00.

Section 12 21 21 – Stage Curtains

- Section to be renumbered to 11 61 43.
- Delete 1.1.4 and replace with:
.4 Section 12 22 00 - Curtains and Drapes.

Section 12 21 22 – Black Out Blinds

- Section to be renumbered to 12 21 26

Section 14 42 00 – Wheelchair Lifts

- Section to be renumbered 14 42 16 and renamed Vertical Wheelchair Lifts.

Section 14 42 01 – Stair Lift

- Section to be renumbered 14 42 13 and renamed Inclined Wheelchair Lifts.

Section 21 07 16 – Thermal Insulation for Buildings

- Renumber and rename section to Section 22 07 16 – Plumbing Equipment Insulation.

Section 21 07 19 – Thermal Insulation for Piping

- Renumber and rename section to Section 22 07 19 – Plumbing Piping Insulation.
- Delete sentence 1.2.4 and replace with:
 - .4 Section 22 07 16 – Plumbing Equipment Insulation.
- Delete sentence 3.4.1 and replace with:
 - .1 See Section 22 07 16 – Plumbing Equipment Insulation.

Section 21 13 13 – Wet Pipe Sprinkler Systems

- Add the following sentence 1.2.6:
 - .6 Section 28 31 00.01 – Multitplex Fire Alarm System.
- Add the following sentence 1.2.7:
 - .7 Section 33 11 16.01 – Incoming Site Water Utility Distribution Piping.
- Add the following sentence 2.2.3.6:
 - .6 Provide ball or butterfly valves for zone control.
- Add the following sentence 2.2.5:
 - .5 Riser manifold assembly
 - .1 Provide floor control assembly in accordance with NFPA 13 consisting of supervised control valve, pressure gauge, flow switch, sight glass, test valve, drain valve and corrosion resistant orifice equal to smallest sprinkler orifice in the system.
 - .2 Provide as alternative to the above a riser manifold assembly with flow switch, pressure gauge with isolating valve, test/drain valve with orifice and sight glass.

Section 21 13 16 – Dry Pipe Sprinkler Systems

- Delete sentence 1.2.6 and replace with the following:
 - .6 Section 28 31 00.01 – Multitplex Fire Alarm System.
- Add the following sentence 1.2.7:
 - .7 Section 33 11 16.01 – Incoming Site Water Utility Distribution Piping.

- Sentence 2.1.3.2, delete words “OS & Y gate” and replace with “ball valves”.
- Add the following to sentence 2.1.3.3, “or OS & Y gate”.

Section 21 22 00 – Clean Agent Fire Extinguishing Systems

- Add the following sentence 1.2.5.1:
 - .1 NFPA 750, Water Mist Fire Protection System.
- Renumber 1.2.5.1 to 1.2.5.2
- Add the following sentence 2.2:
 - 2.2 Hybrid Nitrogen-Water Fire Suppression System
 - .1 System Description
 - .1 Unless otherwise specified, protection shall be by a high velocity low pressure dual fluid system capable of making water particles less than 10 microns in size, designed, installed and tested in accordance with NFPA 750 performance based design intent. The system shall incorporate separate pressurized streams of nitrogen and water which are combined and discharged as a hybrid inert gas micro mist (HIGMM) into the fire hazard.
 - .2 The combination of the nitrogen gas and water shall be at the emitter, where the nitrogen stream shall be at approximately 170 kPa and the water component shall be at less than 70 kPa.
 - .1 Water shall be introduced into the nitrogen flow downstream of the nitrogen exit orifice to atmosphere.
 - .2 A flow cartridge shall be provided for each emitter to ensure a specific water flow of less than 0.06 L/s per emitter shall be provided independent of the water pressure.
 - .3 A strainer shall be provided upstream of each flow cartridge to ensure no clogging is permitted.
 - .3 The mixture of the two components (hybrid) shall be in a shock front, allowing shear forces to atomize the water, creating the hybrid inert gas micro mist of water droplets less than 20µm in diameter, with the majority being less than 10µm in diameter.
 - .4 This hybrid mixture shall exit the emitter at a high velocity ranging from 6.1 m/s within 450 mm of the emitter to 3.6 m/s 2.4 m from the emitter.

- .5 The application mode shall be able to protect via total flooding or as a local application hazard protection.
 - .1 System shall be activated automatically upon detection of a fire with an additional manual activation (optional), if required.
- .2 Extinguishment Mechanism and Test Methodology
 - .1 The fire extinguishing system's primary mechanism shall be by lowering the flame temperature to the point where combustion cannot continue based on the critical adiabatic flame concept.
 - .2 A secondary mechanism shall be by heat absorption via the fine water particles vaporization from liquid phase to vapor phase.
 - .3 The test protocol acceptance criteria shall be in accordance with that set by Factory Mutual (FMRC) and UL. All pre-engineered system design shall have been tested and approved by an internationally recognized third party fire system testing laboratory (e.g., Factory Mutual & UL).
 - .4 Documented approval agency testing for machined spaces up to 3500 m³ with scalability beyond 3500 m³, shall be required.
 - .5 No ozone depletion potential or Global Warming Characteristic shall be accepted.
- .3 Specification Needs
 - .1 When an engineered system is required or specified, the design shall include the following:
 - .1 Engineered systems shall utilize proven fire test data from a recognized international testing agency (e.g., Factory Mutual) as a minimum for the design basis of the proposed system design.
 - .2 The testing referenced shall be based on the specific hazards, equipment packages and the associated enclosure type.
 - .3 The design of engineered systems must clearly demonstrate function and NFPA 750 performance based design intent based on the referenced test data considering volume and water volume density and extinguishing performance for the design when comparing to the test data.
 - .2 The following items designs shall be submitted to Owner's Representative for approval as a minimum for all the manufacturer's systems:
 - .1 Basis of design including test records showing dimensions of the test rig, emitter layout and test results for each test.
 - .2 System plan and section drawings.

- .3 Pipe/tubing isometric drawings.
 - .4 Detail drawings calling out all fittings and fitting part numbers.
 - .5 Recommended startup and operational spare parts lists.
 - .6 Commissioning and test instructions and forms.
 - .7 Detection type for release circuits.
 - .8 Installation method, i.e. Turn-key house or assemble on site.
- .3 The manufacturer's customer information sheets shall be provided for the hazards and provide detailed drawings to assist in the design and layout of the emitters and submitted to the Owner's Representative. Any further requirements for the system not covered in this specification shall be relayed to the manufacturer's project engineers for their consideration and requisite actions in laying out the proposal.
- .4 Owner's Representative approval is required for all fire suppression systems.
- .4 Overall Installation Requirements
- .1 Clear instruction signs shall be posted outside the system hazard area or adjacent to an unenclosed system to ensure correct operation of the system. Recharge and basic maintenance instructions shall also be posted inside the system cabinet or adjacent to the system. Signs and instructions shall be provided on engraved or etched material in English.
- .5 Emitter Requirements
- .1 System shall not require tight enclosures such as with gaseous alternatives.
 - .2 Designs shall include emitters to ensure proper coverage of the enclosure. Designs incorporating doorway manifold emitters shall not be allowed.
 - .3 All emitters shall be located in the protected space in accordance with the fire suppression system manufacturer's recommendation and the approved pre-engineered system design. Emitter positioning shall ensure the hybrid inert gas micro mist is uninterrupted and does not directly impinge on adjacent enclosure equipment (e.g., monorails) or mounting supports.
 - .4 Emitter covers shall be fitted to all discharge emitters to prevent blockage from corrosion deposits in a marine environment. The emitter covers shall be designed to not interfere with the normal discharge.

- .5 The testing certificate, test protocol including arrangement of emitters and details of test results shall be provided to Owner's Representative.
- .6 Water Supply Requirements
 - .1 Unless approved otherwise, pre-engineered fire suppression system shall provide a connected reserve of fluids equal in volume to the initial discharge supply per NFPA 750 performance based design intent and shall be used for backup. The back-up system for engineered systems shall be equal in volume to the initial discharge supply.
 - .2 An optional turn-key skid, as indicated, shall be designed for weather or freeze protection unless approved otherwise. An automatic HVAC system shall be provided to keep the skid and equipment between 4° C and 40° C. Storage of the nitrogen cylinders outside is acceptable as long as ambient temperature remains above -29° C.
 - .3 Shutoff control valves for all fluid paths shall be monitored for proper operative position.
 - .4 A supply of water shall be confirmed for refilling the water cylinders. Provisions shall be made to simplify the task of periodically draining and refilling water cylinders as required by NFPA 750 performance based design intent. Filters or strainers shall be provided with mesh no larger than 80 percent of the smallest orifice or fluid channel in the system or 100 micrometers (µm), whichever is smaller. A system shall be provided to rapidly verify the water cylinders are full by continual monitoring of facilities to enable rapid level confirmation during periodic maintenance.
 - .5 Water cylinders shall be designed to prevent corrosion. When requested, tanks and cylinders shall be installed on metal or fiberglass grating inside optional cabinets to raise the cylinders above the cabinet floor and avoid corrosion underneath of the cylinders and/or cabinets.
 - .6 Systems shall be designed to be fully drained of all liquid after discharge to ensure that no piping corrosion or freezing occurs due to residual water. Pitching of the water supply lines shall be provided to ensure drainage back to the panels. Alternatively, where required, manual drains may be installed.
- .7 Nitrogen Supply Requirements
 - .1 Cylinders are to be retained in position by metal bands with rubber or synthetic strips fitted to prevent corrosion of the cylinders or metal bands. (Special consideration should be given to Marine applications due to additional motion induced forces.)

- .2 Nitrogen cylinder pressure shall be continually monitored and displayed with a low pressure alarm transmitted to an attended location.
- .3 DOT or ASME approved cylinder tubes shall be provided.
- .4 The nitrogen cylinders, when requested, shall be installed on metal or fiberglass grating inside optional cabinets to raise the cylinders above the cabinet floor and avoid corrosion underneath of the cylinders and/or cabinet.
- .8 General Requirements
 - .1 A signal shall be provided to the fire and gas monitoring system confirming when the hybrid inert gas micro mist has discharged.
 - .2 All tubing, piping, and fittings for the complete system shall be stainless steel, galvanized, or other corrosion resistant materials. Fittings that do not have wetted surfaces may be ductile iron or equivalent.
 - .3 A pressure test of the complete system (discharge pipe, tubing and fittings) shall be carried out in accordance with the requirements of NFPA 750 performance based design intent to ensure the system is free of leaks prior to a final discharge test. A final discharge test is required on every individual system prior to any machine testing or operation to ensure piping and fittings do not come loose due to system shock, that emitters have been positioned correctly with suitable, unobstructed spray patterns.

- Renumber 2.2 to 2.3.
- Renumber 2.3 to 2.4.
- Renumber 2.4 to 2.5.
- Renumber 2.5 to 2.6.
- Renumber 2.6 to 2.7.
- Renumber 2.7 to 2.8.
- Renumber 2.8 to 2.9.
- Renumber 2.9 to 2.10.
- Renumber 2.10 to 2.11.
- Renumber 2.11 to 2.12.

- Renumber 2.12 to 2.13.
- Renumber 2.13 to 2.14.
- Renumber 2.14 to 2.15.
- Renumber 2.15 to 2.16.

Section 22 11 18 – Domestic Water Piping Copper

- Add the following sentence 1.1.8:
.8 Section 22 05 00 – Common Work Results for Plumbing.
- Add the following sentence 1.1.9:
.9 Section 22 07 16 – Plumbing Equipment Insulation.
- Add the following sentence 1.1.10:
.10 Section 22 07 19 – Plumbing Piping Insulation.
- Renumber 1.1.8 to 1.1.11.
- Renumber 1.1.9 to 1.1.12.
- Renumber 1.1.10 to 1.1.13.
- Renumber 1.1.11 to 1.1.14.
- Delete sentence 1.1.12.
- Renumber 1.1.13 to 1.1.15.
- Add the following sentence 1.2.2:
.2 American National Standards Institute/National Sanitation Foundation (ANSI/NSF).
.1 ANSI/NSF 61, Drinking Water System Components.
- Renumber 1.2.2 to 1.2.3.
- Add the following sentence 1.2.3.2:
.2 ASTM A536, Standard Specification for Ductile Iron Castings.

- Renumber 1.2.3.2 to 1.2.3.3.
- Renumber 1.2.3.3 to 1.2.3.4.
- Renumber 1.2.3 to 1.2.4.
- Add the following sentence 1.2.4.2:
 - .2 AWWA C606, Grooved and Shouldered Joints.
- Renumber 1.2.4 to 1.2.5.
- Renumber 1.2.5 to 1.2.6.
- Renumber 1.2.6 to 1.2.7.
- Renumber 1.2.7 to 1.2.8.
- Renumber 1.2.8 to 1.2.9.
- Renumber 1.2.9 to 1.2.10.
- Add the following sentence 1.3.5:
 - .5 Grooved joint couplings and fittings to be indicated on product submittals and to be specifically identified with the applicable style or series designation.
- Delete sentence 2.2.5 and replace with the following:
 - .5 NPS2 and larger: roll grooved to CSA B242. Cast bronze to ANSI/ASME B16.18 or wrought copper ANSI/ASME B16.22.
 - .1 Fittings to be manufactured to copper-tube dimensions. Flaring of tube or fitting ends to accommodate IPS sized couplings is not permitted.
- Add the following sentence 2.2.6:
 - .6 NPS 1 ½ and under: Cast copper, ANSI/ASME B16.18 or wrought copper, ANSI/ASME B16.22; with 301 stainless steel internal components, EPDM seal, and push-to-connect joints.
- Add the following sentence 2.3.4:

.4 Push-to-connect: EPDM gasket, UL classified in accordance with ANSI/NSF 61 for potable water service.

- Renumber 2.3.4 to 2.3.5.
- Renumber 2.3.5 to 2.3.6.
- Add the following to sentence 2.3.6:

“Gasket to be classified in accordance with ANSI/NSF 61 for potable water service. Couplings to be manufactured to copper-tube dimensions. Flaring of tube or fitting ends to accommodate IPS sized couplings is not permitted.”

- Renumber 2.3.6 to 2.3.7.
- Add the following sentence 2.6.3:

.3 NPS 2 and under, push-to-connect, lift-disc type:

.1 To MSS-SP-80, 1380 kPa CWP, bronze body, stainless steel disc, spring, and shaft, suitable for installation in horizontal or vertical lines.

- Renumber 2.6.3 to 2.6.4.
- Add the following sentence 3.1.4:

.4 Grooved joint couplings and fittings to be installed in accordance with the manufacturer’s written installation instructions. Grooved ends to be clean and free from indentations, projections, and roll marks in the area from pipe end to groove. Gaskets to be verified as suitable for the intended service prior to installation. Gaskets to be molded and produced by the coupling manufacturer. The grooved coupling manufacturer’s factory trained representative to provide on-site training for Contractor’s field personnel in the use of grooving tools, application of groove, and installation of grooved joint products. The manufacturer’s representative to periodically visit the jobsite and review installation. Contractor to remove and replace any joints deemed improperly installed.

- Add the following sentence 3.1.5:

.5 Push-to Connect Piping: Prepare copper tube and install in strict accordance with installation instructions. Pipe ends to be cleaned, free from indentations, projections, burrs, and foreign matter. Use a tube preparation tool to clean and make installation mark. Push copper tube into fittings to installation depth mark, per installation instructions. Keep fittings free of dirt and oil.

- Renumber 3.1.4 to 3.1.6.
- Renumber 3.1.5 to 3.1.7.
- Renumber 3.1.6 to 3.1.8

Section 22 11 18.01 – Domestic Water Piping Plastic

- Add the following sentence 1.1.8:
.8 Section 22 05 00 – Common Work Results for Plumbing.
- Add the following sentence 1.1.9:
.9 Section 22 07 16 – Plumbing Equipment Insulation.
- Add the following sentence 1.1.10:
.10 Section 22 07 19 – Plumbing Piping Insulation.
- Renumber 1.1.8 to 1.1.11.
- Renumber 1.1.9 to 1.1.12.
- Renumber 1.1.10 to 1.1.13.
- Renumber 1.1.11 to 1.1.14.
- Delete sentence 1.1.12.
- Renumber 1.1.13 to 1.1.15.

Section 22 13 17 – Drainage Waste and Vent Piping – Cast Iron and Copper

- Section renamed “Drainage Waste and Vent Piping – Cast Iron, Copper and Stainless Steel”.
- Add the following sentence 1.3.1:
.1 American Iron and Steel Institute (AISI).
.1 AISI 304, Stainless Steel.
- Renumber 1.3.1 to 1.3.2.
- Renumber 1.3.2 to 1.3.3.

- Add the following sentence 2.3:
 - 2.3 Stainless Steel Pipe and Fittings
 - .1 Above ground and buried sanitary, storm and vent, NPS 2 to NPS 10, stainless steel, type AISI 304.
 - .1 Mechanical joints:
 - .1 Push-fit socket joint with EPDM sealing ring.

Section 22 13 19 – Drainage Waste and Vent Piping – Corrosion Resistant

- Add the following sentence 1.3.1:
 - .2 American Iron and Steel Institute (AISI)
 - .1 AISI 316L Stainless Steel.
- Renumber 1.3.1 to 1.3.2.
- Renumber 1.3.2 to 1.3.3
- Renumber 1.3.3 to 1.3.4
- Add the following sentence 2.1.5:
 - .5 Above or below ground stainless steel.
 - .1 Pipe material and fittings to be AISI type 316L.
 - .2 Fittings to be push-fit type.
 - .3 Fittings sealing rings to be EPDM except as indicated.
 - .4 Fittings sealing rings for oil and petroleum service to be NBR.
 - .5 Fittings sealing rings for heat resistance and resistance to oil, solvents and strong acids to be FPM.
- Add the following sentence 3.1.5:
 - .5 Install and test to manufacturer’s recommendations.

Section 22 42 01 – Plumbing Specialties and Accessories

- Add the following to sentence 2.1.1.1.1, “Blücher”.
- Add the following to sentence 2.1.1.2.1, “Blücher”.
- Add the following to sentence 2.1.1.3.1, “Blücher”.
- Add the following to sentence 2.1.1.4.1, “Blücher”.

- Delete sentence 2.2.1 and replace with the following:
 - .1 Type 1; Standard coated roof drain with cast iron body 381 mm diameter, with aluminum dome, under-deck clamp to suit roof construction, flashing clamp ring with integral gravel stop.
- Add the following to sentence 2.3.1.1, “Blücher”.
- Sentence 2.4.1, delete word “preventer” and replace with “preventer,”.
- Add the following sentence 2.13.3:
 - .3 Trap guard:
 - .1 All elastomeric normally closed trap guard device utilizes a normally closed seal to prevent evaporation of the trap seal and to protect against sewer gases from backing up into habitable areas. It opens with fluid flow and allows liquid drainage to flow through into the building drain.
- Add the following to sentence 2.21.8, “50 mm above floor, for floors above grade.”

Section 22 42 03 – Commercial Washroom Fixtures

- Add the following sentence 1.3.1:
 - .1 American National Standards Institute (ANSI)
 - .1 ANSI 112-19.2, Ceramic Plumbing Fixtures.
- Add the following sentence 1.3.2:
 - .2 American National Standards Institute/national Sanitation Foundation (ANSI/NSF)
 - .1 ANSI/NSF 61, Drinking Water System Components.
- Renumber 1.3.1 to 1.3.3.
- Renumber 1.3.2 to 1.3.4.
- Add the following to table 2.2.1:

WC-11		X	X			X		
-------	--	---	---	--	--	---	--	--
- Add the following 2.2.13:
 - .13 WC-11: floor mounted penal fixture:

- .1 Penal lavatory/water closet combination: 450 mm wide suicide resistant combination water closet and lavatory. Hemispherical cabinet design to reduce risk of fixture being used as a suicide device. Fixture to have the following features.
 - .1 Fabricated from 2.0 mm Type 304 stainless steel.
 - .2 D-shaped lavatory bowl (381 x 330 x 140 mm deep).
 - .3 Pneumatically operated pushbutton valve.
 - .4 Valve to comply with ANSI/NSF 61, Section 9, lead free requirements.
 - .5 Provide hemispherical penal bubbler and hemispherical penal pushbutton.
 - .6 Water-closet bowl housing to prohibit the attachment of objects.
 - .7 Water-closet to be concealed blowout jet type with elongated bowl complete with self drainage flushing rim.
 - .8 Integral contoured seat with a sanitary high polish finish.
 - .9 Water-closet trap to pass 53 mm diameter ball.
 - .10 Water-closet to conform with ANSI 112-19.2.
 - .11 Cabinet interior shall be sound deadened with fire resistant materials.
 - .12 Fixture to withstand loading of 1360 kg.
 - .13 Fixture to be furnished with necessary fasteners for proper installation.
 - .14 Water-closet to be floor mounted, wall outlet.
 - .15 Unit to be left hand or right hand, as required to suit individual cell orientation.
 - .16 Clean-out w/o-ring connecting metering valve.
 - .17 Hot and cold air controlled metering valve.
 - .18 6 L flush valve.
 - .19 75 mm toilet p-trap.
 - .20 Floor-trol anti-flood system.
 - .21 Wall sleeve with 12 mm diameter steel bars.
 - .22 Metal template.

- Sentence 2.4.6.9, delete word “WFELHHDF” and replace with “HDF-DST”.

Section 22 42 20 – Commercial Showers and Bathtubs

- Sentence 2.2.1.3.23, delete word “T13H913-20” and replace with “T13H913-25”.
- Sentence 2.2.2.3.23, delete word “T13H913-20” and replace with “T13H913-25”.
- Sentence 2.3.2.24, delete word “T13H313-20” and replace with “T13H313-25”.
- Add the following sentence 2.3.4:

- .4 SH-4 Electronic shower, hard wired for central tempered water.
 - .1 Complies with ASME A112.18.1/CSA B125.1.
 - .2 Push button electronic shower system.
 - .3 Field adjustable shower times.
 - .4 Vandal resistant 30° cast flow control wall mount shower head.
 - .5 Flow 7.6 l/min @550 kPa.
 - .6 Vandal resistant recessed mounted 200 x 200 mm box for push button actuator, solenoid valve and driver board, 250 x 250 mm S.S covers.
 - .7 Shower flows when push button actuated.
 - .8 Adjustable maximum continuous run time 10 minutes, factory set at 3 minutes.
 - .9 Acceptable product: Cambridge Brass 860T163.
- Add the following sentence 2.3.5:
 - .5 SH-5 Electronic Shower, hard wired with mixing valve.
 - .1 Complies with ASME A112.18.1/CSA B125.1.
 - .2 Thermostatic mixing valve CSA certified.
 - .3 Push button electronic shower system.
 - .4 Field adjustable shower times.
 - .5 Vandal resistant 30° cast flow control wall mount shower head.
 - .6 Flow 7.6 l/min @550 kPa.
 - .7 Vandal resistant recessed mounted 250 x 250 mm box with push button actuators, solenoid valve, driver board and thermostatic mixing valve with lever mounted in 300 x 300 mm S.S. cover.
 - .8 Shower flows when push button actuated.
 - .9 Adjustable maximum continuous run time 10 minutes, factory set at 3 minutes.
 - .10 Acceptable product: Cambridge Brass 860T168.

Section 22 47 00 – Drinking Fountains and Water Coolers

- Sentence 2.3.1.2, delete words “27EC”, “10EC” and “32EC”, and replace with “27°C”, “10°C” and “32°C” respectively.

Section 23 05 13 – Common Motor Requirements for HVAC Equipment

- Delete sentence 1.1.1.3 and replace with the following:
 - .3 Control wiring and conduit specified in Division 26. Control wiring 50V or less for systems specified in Division 21, 22, 23 and 25 is by Division 25.

Section 23 05 19.01 – Thermometers and Pressure Gauges – Piping Systems

- Add the following to sentence 2.5.2.6, “such as pumps.”

Section 23 05 23.01 – Valves – Bronze

- Add the following sentence 1.3.1.3:
 - .3 ANSI/ASME B16.22, Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.
- Add the following sentence 1.3.2:
 - .2 American Society for Testing and Materials (ASTM)

Renumber 1.3.1.3 to 1.3.2.1.

- Add the following sentence 1.3.2.2:
 - .1 ASTM A536, Specification for Ductile Iron Castings.
- Add the following 1.3.2.3:
 - .1 ASTM B 16, Specification for Free-Cutting Brass Rod Bar and Shapes for Use in Screw Machines.
- Renumber 1.3.1.4 to 1.3.2.4.
- Renumber 1.3.1.5 to 1.3.2.6.
- Renumber 1.3.1.6 to 1.3.2.6.
- Add the following sentence 1.3.2.7:
 - .6 ASTM B584, Specification for Copper Alloy Sand Castings for General Applications.
- Add the following sentence 1.3.3:
 - .3 Canadian Standards Association (CSA)
 - .1 CSA B242, Groove and Solder Type Mechanical Pipe Couplings.
- Renumber 1.3.2 to 1.3.4.
- Add the following sentence 1.4.2.3:

- .3 Grooved joint couplings and fittings to be indicated on product submittals and to be specifically identified with the applicable style or series designation.
- Add the following sentence 1.5.2:
 - .2 All grooved joint couplings, fittings, valves, and specialties to be the products of a single manufacturer. Grooving tools to be of the same manufacturer as the grooved components.
- Add the following sentence 1.7.1.1.6:
 - .6 Grooved couplings: IPS and copper-tube dimensioned, one for every 10 (ten) grooved joints.
- Delete sentence 2.1.3.1.2 and replace with the following:
 - .2 Copper tube systems.
 - .1 Solder ends ANSI/ASME B16.18.
 - .2 Grooved ends to copper tube dimensions and CSA B242.
 - .3 Push-to-connect ends to ANSI/ASME B16.22 and manufacturer's standards.
- Add the following sentence 2.4.7:
 - .7 NPS 2 and under, vertical or horizontal, lift type, 1380 kPa CWP.
 - .1 Disc: 301 stainless steel, center guided.
- Sentence 2.6.1.1, delete words "ASTM B62" and replace with "ASTM B16 or ASTM B62"
- Add the following to sentence 2.6.1.3:

"Push-to-connect, Pressfit ends."
- Sentence 2.6.1.6, delete words "hard chrome solid" and replace with "hard chrome, plated brass solid".
- Sentence 2.6.1.7, delete words "TFE with" and replace with "TFE, EPDM, Nitrile, Fluoroelastomer with".
- Add the following sentence 2.6.1.9:
 - .9 Cap and drain for drain service.
- Add the following sentence 2.7:

- 2.7 Butterfly Valves
 - .1 NPS 2-1/2 through NPS 6.
 - .1 Body: cast bronze per CDA-836 (85-5-5-5).
 - .2 Pressure rating: 2065-kPa CWP.
 - .3 Connections: copper tube dimensioned grooved ends.
 - .4 Disc: ductile iron per ASTM A536 with elastomer coating.
 - .5 Stem: integrally cast with disc.
 - .6 Stem Nuts: nickel plated 416 stainless steel.
 - .7 Operator: gear operator, NPS and over.
- Renumber 2.7 to 2.8.
- Add the following to sentence 2.8.1:

“Victaulic”.
- Add the following sentence 3.1.3:
 - .3 Adjoining tube, couplings, and fittings with grooved joint valves shall be copper-tube dimensioned. Flaring tube or fitting ends to accommodate IPS sized valves is not permitted.
- Renumber 3.1.3 to 3.1.4.
- Add the following sentence 3.1.4.1:
 - .1 Unions are not required in installations using grooved mechanical couplings. The couplings shall serve as unions.

Section 23 05 23.02 – Valves – Cast Iron

- Add the following sentence 1.3.3.1:
 - .1 MSS SP-67, Butterfly Valves.
- Renumber 1.3.3.1 to 1.3.3.2.
- Renumber 1.3.3.2 to 1.3.3.3.
- Renumber 1.3.3.3 to 1.3.3.4.
- Renumber 1.3.3.4 to 1.3.3.5.
- Add the following sentence 2.8.7:

- .7 Grooved end check valves.
 - Add the following sentence 2.9:
 - 2.9 Grooved End Butterfly Valves
 - .1 Butterfly valves: to MSS-SP-67. Application: Isolating cells or section of multiple component equipment (eg. multi-section coils, multi-cell cooling towers).
 - .1 NPS2 and over: Grooved ends.
 - .2 2068 kPa WOG and be both bi-directional and dead end service capable to full rated pressure. Ductile iron body with blow-out proof stainless steel stems and nickel coated ductile iron disc. Seat shall be “EPDM” and have a full 360° continuous contact with the seating surface.
 - .3 Valve Operators: Lever or Gear operator NPS6 and over.
 - Add the following sentence 2.10:
 - 2.10 Acceptable material: Jenkins, Crane, Wath, Newman Hathersley, Milwaukee, Conbraco, Kitz, Red White, M. A. Stewart, Nibco, Victaulic.
 - Add the following 3.1.2:
 - .2 Grooved end valves to be supplied by the same manufacture of the grooved fittings.
 - Add the following 3.1.3:
 - .3 Grooved end valves to be installed in accordance with the manufacturer’s written installation instructions. Grooved ends to be clean and free from indentations and projections. Gaskets to be verified as suitable for the intended service prior to installation. Gaskets to be molded and produced by the coupling manufacturer. The grooved coupling manufacturer’s factory trained representative to provide on-site training for contractor’s field personnel in the use of grooving tools, application of groove, and installation of grooved joint products. The manufacturer’s representative to periodically visit the jobsite and review installation. Contractor to remove and replace any joints deemed improperly installed.

Section 23 07 13 – Thermal Insulation for Ducting

- Section renamed to Duct Insulation.

Section 23 20 12 – Pressure Piping – Plastic

- Add the following sentence 1.1:

1.1 Summary

.1 Section Includes.

- .1 Materials and installation for steel piping, valves and fittings for hydronic systems in building services piping.

- Add the following sentence 1.2:

1.2 Related Sections

- .1 Section 01 33 00 - Submittal Procedures.
.2 Section 01 35 29.06- Health and Safety Requirements.
.3 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
.4 Section 01 78 00 - Closeout Submittals.
.5 Section 21 05 01 - Common Work Results -Mechanical.
.6 Section 23 05 05 - Installation of Pipework.
.7 Section 23 05 17 - Pipe Welding.
.8 Section 23 05 23.01 - Valves - Bronze.
.9 Section 23 05 23.02 - Valves - Cast Iron
.10 Section 23 05 93 - Testing, Adjusting and Balancing for HVAC.
.11 Section 23 08 01 - Performance Verification of Mechanical Piping.
.12 Section 23 08 02 - Cleaning and Start-up of Mechanical Piping Systems.

- Renumber 1.1 to 1.3.
- Renumber 1.2 to 1.4.
- Renumber 1.3 to 1.5.
- Renumber 1.4 to 1.6.

Section 23 21 13.02 – Hydronic Systems: Steel

- Add the following sentence 1.2.6:

- .6 Section 23 05 00 – Common Work Results for Plumbing.

- Renumber 1.2.6 to 1.2.7.
- Renumber 1.2.7 to 1.2.8.
- Renumber 1.2.8 to 1.2.9.
- Renumber 1.2.9 to 1.2.10.

- Renumber 1.2.10 to 1.2.11.
- Add the following sentence 1.2.12:
 - .12 Section 23 07 13 – Duct Insulation.
- Add the following sentence 1.2.13:
 - .13 Section 23 10 16 – HVAC Equipment Insulation.
- Add the following sentence 1.2.14:
 - .14 Section 23 07 19 – HVAC Piping Insulation.
- Renumber 1.2.11 to 1.2.15.
- Renumber 1.2.12 to 1.2.16.
- Add the following sentence 1.4.3:
 - .3 Grooved joint couplings and fittings to be indicated on product submittals and to be specifically identified with the applicable style or series designation.
- Add the following sentence 1.4.4:
 - .4 Grooved products manufacturer to supply on site tools and products for installation training.
- Add the following sentence 1.4.5:
 - .5 All grooved products to be of one manufacturer.
- Add the following sentence 1.4.6:
 - .6 Groove products to have current CRN numbers.
- Add the following sentence 2.2.4:
 - .4 Flexible couplings to CSA B242 to be used where noted on drawings and on elbows utilized on expansion joints.
- Renumber 2.2.4 to 2.2.5.
- Renumber 2.2.5 to 2.2.6.
- Renumber 2.2.6 to 2.2.7.

- Renumber 2.2.7 to 2.2.8.
- Renumber 2.2.8 to 2.2.9.
- Renumber 2.2.9 to 2.2.10.
- Delete 2.2.10 and replace with the following:
 - .10 Roll grooved coupling gaskets: NPS 2 to 8, type EHP, EPDM high performance, -40°C to +120°C for continuous operation, NPS 10 and above type EPDM, -30°C to +110°C for continuous acceptable on hot water, glycol water, chilled water and condenser water.
- Add the following sentence 2.4.5.2.2:
 - .2 Mechanical Rooms and Elsewhere: Globe, with plug disc as specified Section 23 05 23.01 - Valves – Bronze.
- Add the following sentence 2.4.5.2.3:
 - .3 In lieu of standard malleable iron or copper fittings the Contractor may install the following component system:
 - .1 Union port fitting with air vent and pressure/temperature port.
 - .2 Balancing valve, strainer with drain valve, ball valve combination may also be used.

Section 23 21 14 – Hydronic Specialities

- Sentence 2.9.1, delete words “screwed connections” and replace with “screwed or grooved connections”.
- Add the following sentence 2.9.7:
 - .7 Acceptable materials: Watts Regulator Model 77F-DI, Hoffman, Wilkins, Victaulic.
- Add the following sentence 2.10.7:
 - .7 Acceptable materials: ITT Bell and Gossett, Victaulic with EPDM Grade E gaskets, Taco suction diffuser, S.A. Armstrong suction diffuser.
- Add the following sentence 2.11:
 - 2.11 Triple Duty Valve
 - .1 Center-guided non-slam drip tight check valve.

- .2 Positive shut-off valve.
- .3 Calibrated system balance valve.
- .4 Straight pattern as indicated.
- .5 Flanged or Grooved end connections.
- .6 Soft seat design for positive sealing.
- .7 Construction:
 - .1 Body: cast iron with bronze seat.
 - .2 Disc: bronze with EPDM seat insert.
 - .3 Stem: stainless steel.
 - .4 Spring: stainless steel.
 - .5 Packing: Teflon-Graphite (Asbestos-free).
 - .6 Gasket: asbestos-free.
 - .7 Readout valve: brass with EPT insert, check valve and gasket.
- .8 Maximum operating temperature: 121°C.
- .9 Maximum working pressure: 1.2 MPa.
- .10 Valve design shall permit repacking under full system pressure.
- .11 Provide complete with brass readout valves, with integral check feature, to facilitate taking differential pressure readings across the orifice for accurate system balance.
- .12 Provide CV rating at 10% increments. Manufacturer shall supply the CV rating for read-out of flow determination and system pressure drop.
- .13 Capacity: see schedule on drawings for performance criteria and model selections.
- .14 Acceptable manufacturers: ITT Bell and Gossett, Victaulic with butterfly valve, Taco multi-purpose valve, S.A. Armstrong triple duty valves.

Section 23 35 17 – Generator Exhaust Systems

- Delete sentence 1.1.2 and replace with the following:
 - .2 Section 22 07 19 – Plumbing Piping Insulation.

Section 23 37 13 – Diffusers, Registers and Grilles

- Add the following to sentence 2.1.5, “Kruger”.

Section 23 38 13 – Commercial Kitchen Exhaust

- Section renamed Commercial Kitchen Hoods
- Add the following sentence 2.9:
 - 2.9 Capture Jet Hood

- .1 Supply and install kitchen exhaust hood as indicated. The hood to bear the intertek E.T.L. label, comply with standard 710, and be fabricated in accordance with NFPA-96.
- .2 Construction:
 - .1 Kitchen hood inner liner to be constructed from 1.2 mm stainless steel where exposed. Kitchen hood to be supplied complete with outer casing/main body, inner liner, exhaust duct, pressure measurement T.A.B ports.
 - .2 Outer casing panels to be constructed of stainless steel with a brushed satin finish. Each joint to be welded and liquid tight, avoiding harmful dripping of condensation.
 - .3 All exposed welds ground and polished to the original finish of metal. Canopy ends to be double sided wall construction (no single wall hoods permitted).
- .3 Exhaust airflow to be based on convective heat generated by the appliances underneath each hood system. Submittals to include convective heat calculations based on the input power of the appliance served.
- .4 Hood to be designed with capture jet technology to reduce the exhaust airflow rate required, and to improve capture and containment efficiency of hood, while reducing energy consumption. The capture jet air to be introduced through a special discharge panel and shall not exceed 10% of the calculated exhaust airflow. The capture jet discharge velocity to be a minimum of 7.62 m/s. The capture jet to be internally mounted with a speed control. Fire damper or electronic shut down in fire mode not required.
- .5 Airflow through the extractors and capture jet air chamber shall be determined through the integral T.A.B. (Testing and Balancing) ports mounted in the hood. Airflows to be determined by the pressure vs. airflow curves supplied by the manufacturer.
- .6 Hood to be equipped with multi-cyclone stainless steel grease extractors. Filters to be NSF and UL Classified. Grease extraction efficiency to be 93% on particles with a diameter of 5 microns and 98% on particles with a diameter of 15 microns or larger as tested by an independent testing laboratory. Pressure loss over the extractor shall not exceed 128 Pa of water at flow rates approved by UL for heavy load cooking. Sound levels shall not exceed an NC rating of 55.
- .7 Hood lights to be UL listed recessed fluorescent, suitable for grease hoods.
- .8 Control panel: master remote mounted NEMA 3R control panel supplied with hood. Panel to contain speed controller for capture jet fan, main disconnect switch, magnetic starter for supply air fan with overload protection, auxiliary contacts and relays as required to interface with the building DDC system.

- .9 Hood duct connection: as indicated on drawings.
- .10 Dimensions: as indicated in schedules on drawings.
- .11 Acceptable materials: Halton Model KVE, Gaylord, Greenheck.

- Add the following sentence 2.10:

2.10 Dishwasher Fume Hood

- .1 Dishwasher fume hood to be constructed of 1.2 mm Type 300 stainless steel with 0.1016 mm finish at all exposed surfaces. Non-exposed structural assemblies to be fabricated from 1.2 mm galvanized steel.
- .2 All joints and seams to be continuously welded. All exposed welds to be ground polished to original finish of metal. Internal seams to be filled with NSF approved, non-hardening sealer.
- .3 Acceptable material: Vent Master, Greenheck, Gaylord.

- Add the following sentence 2.11:

2.11 Ecology Unit

- .1 Ecology system to be supplied complete with filter module, odour control module, fan module and control panel. All components to be UL/ULC listed.
 - .1 Filter Module:
 - .1 Unit casing to be double wall construction reinforced and braced for maximum rigidity. Inner walls to be 1.5 mm liquid tight welded construction. Outer walls to be minimum 0.92 mm steel. Filter section to be insulated with 36 mm insulation to the requirements of UL/ULC. The unit to be complete with three stages of filtration.
 - .2 First stage to be 102 mm deep pleated UL/ULC filter, rated at 40% ASHRAE 52. The second stage to be a 559 mm deep bag type UL/ULC filter rated at 95% ASHRAE 52. The third stage to be a 305 mm deep UL/ULC Class 1 fire rated absolute filter rated at 95% DOP to 0.3 microns.
 - .3 Provide UL/ULC listed fire damper actuated by fusible link at outlet.
 - .4 Module to be complete with four pressure switches to monitor pre-filter, high efficiency, absolute filter and filter missing.
 - .2 Odour Control Module:
 - .1 Consist of a liquid spray system with timers mounted in the remote control panel to switch on/off and cycle control and provide for infinite.
 - .3 Fan Module:

- .1 Fan housing to be constructed from minimum 1.5 mm cold rolled steel with joints suitably reinforced and braced for rigidity. Fan to have a DWDI backward inclined wheel with A.M.C.A. rating and be mounted on a heavy duty ground and polished steel shaft. Bearings shall be pillow block type with lubrication nipples. Drives to be V-belt with capacity 25% greater than motor horsepower. Fan and motor to be mounted on a common base with spring vibration isolation from fan housing. Hinged access doors to allow easy access to fan and motor.
- .4 Control Panel:
 - .1 Control panel to be constructed from heavy gauge steel, suitable for remote mounting and have front locking screws. Controls to be complete with timers, relays and lamps to indicate system on, condition of pre-filter, bag filter, absolute filter, filter missing, fire and odour reducing operation.
 - .2 Controls and interconnecting field wiring to be 24 V AC.
- .5 Options:
 - .1 Single odour control module.
 - .2 Odour liquid low level alarm.
 - .3 24 hour timer for odour control system.
 - .4 Fifth pressure switch for final monitoring (filter missing).
 - .5 Provide terminal strip and all necessary relays and/or interlocks to remote monitoring of all unit functions via the building's DDC system. Provide ability to remotely start and stop kitchen ventilation system via signal from DDC system. Items to include at terminal strip:
 - .1 System start/stop from DDC.
 - .2 Filter alarm (for each filter).
- .2 provide certificate of approval (air) for exhaust emissions as per Section 9 of the Environmental Protection Act of Canada and all other approvals required by local authorities.
- .3 Accepted Materials: Halton Ecolair, Gaylord, Greenheck.

Section 23 73 10 – Air Handling – Built-up

- Delete sentence 1.1.6 and replace with the following:

- .6 Section 22 07 16 – Plumbing Equipment Insulation

Section 23 81 41 – Water to Air Source Unitary Heat Pumps

- Section to be renumbered 23 81 43.

Section 23 81 42 – Water to Water Source Unitary Heat Pumps

- Section to be renumbered 23 81 46

Section 25 05 60 – EMCS – Field Installation

- Sentence 1.1.9, delete words “Thermal Insulation of Ducting” and replace with “Duct Insulation”.

Section 26 05 01 – Electrical Commissioning

- Section to be renumbered 26 80 00 and renamed Commissioning of Electrical Systems

Section 26 32 03 – Installation of Electric Power Generating Equipment

- Section to be renumbered 26 32 13.03

Section 26 53 00 – Exit Lights

- Section renamed Exist Signs

Section 27 05 14 - Communication Cables - Inside Buildings

- Delete sentence 1.1.5, and replace with the following:

.5 Section 27 20 00 - Data Communications.

Section 27 05 28 - Pathways for Communications Systems

- Delete sentence 1.1.8, and replace with the following:

.8 Section 27 20 00 - Data Communications.

Section 27 10 50 – Data System

- Section to be renumbered 27 20 00 and renamed Data Communications

Section 27 11 19 – Structured Cabling for Communications Systems

- Delete sentence 1.1.6, and replace with the following:

.6 Section 27 20 00 - Data Communications.

Section 33 56 13 – Aboveground Fuel Storage Tanks

- Delete sentence 1.2.5 and replace with the following:

.5 Section 22 07 16 - Plumbing Equipment Insulation.

New Specification Sections

Section 01 35 99 – Dust Control Procedures

Section 23 07 16 – HVAC Equipment Insulation

Section 23 07 19 – HVAC Piping Insulation