

PART 1 – GENERAL

1.1 GENERAL INSTRUCTIONS

Read and be governed by the conditions of the *Contract Documents*, including sections of Division 1.

1.2 SECTION INCLUDES

- .1 1.1 General Instructions
- .2 1.2 Section Includes
- .3 1.3 Summary
- .4 2.1 Materials
- .5 3.1 Workmanship
- .6 3.2 General Erection Tolerances

1.3 SUMMARY

- .1 Section includes:
 - 1. Solid core doors with wood veneer.

1.4 SUBMITTALS

- .1 Submit required submittals in accordance with Section 01 33 00.
 - 1. Product data sheets:
 - 2. Submit manufacturer's Product data sheets for Products proposed for use in the work of this section.
 - 3. Shop drawings:
 - 1. Indicate door location using numbering system per door schedule, size, and hand of each door, elevation of each door type; undercuts, bevelling, construction type core and edge construction not covered in product data; and special blocking requirements.
 - 2. Indicate dimensions and locations of factory machining criteria for hardware, extent of hardware blocking.
 - 3. Indicate dimensions and locations of cut-outs including trim for openings.
 - 4. Indicate door face finish requirements including veneer matching.
 - 5. Indicate doors to be factory finished and finish requirements.
 - 4. Verification samples:
 - .1 Submit 3 sets of samples minimum 300 mm (12") x 300 mm (12") of veneers showing full range of grain variation, finish and patterns proposed for wood specified.
 - 1. Submit samples as many times as required until approved by *Consultant*. First submission to include one set of samples per *Consultant* request plus one set lighter in tone and one set darker in tone.

5. Submit cut-away sample of each type of door, to show stile and rail construction, core, cross banding, door face finish and edges.
6. Submit solid lumber frames for light openings, minimum 150 mm (6") long, for each material, type and finish required Section includes:

1.5 QUALITY ASSURANCE

.1 Qualifications:

1. Manufacturer shall be a member in good standing of the Architectural Woodwork Institute or the Architectural Woodwork Manufacturers Association of Canada or the Woodwork Institute.

.2 Quality standard:

1. Work shall be in accordance with the North American Architectural Woodwork Standards 3.1, Premium Grade.

1.6 DELIVERY, STORAGE, AND HANDLING

- .1 Door numbers shall be marked with door numbers used on shop drawings in the top hinge cavity created by the machining for hinges.
- .2 Identify doors with labels. Package with resilient packaging.
- .3 Store doors flat at the *Place of the Work* in piles with bottom face on bottom of pile. Protect from moisture by placing water resistant material under skids supporting piles. Cover top of piles and provide air at sides of piles.
- .4 Deliver the wood doors only after the building is closed and dry and HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period. Do not receive the doors in a damp area. Do not drag the doors on the ground, floor or across one another.

PART 2 – PRODUCTS

2.1 MANUFACTURER

.1 The following manufacturers are approved for work of this section:

1. Lambton Doors.
2. Masonite Architectural.
3. VT Industries.
4. Requests for substitution will be considered in accordance with Section 01 25 00.

2.2 GENERAL

- .1 Single-source manufacturing and fabrication responsibility: Engage a qualified Manufacturer to assume undivided responsibility for wood doors and frames specified in this section, including fabrication and finishing.

2.3 2.3 FABRICATION - DOOR CONSTRUCTION

- .1 Performance duty level:
 - .1 Doors shall meet the requirements of ANSI/WDMA I.S. 1A-13 for Extra Heavy Duty Performance Level unless otherwise indicated or scheduled.
- .2 Solid particleboard core, veneer faced, non fire rated and 20 minute fire rated wood door construction to Architectural Woodwork Standards Manual, Section 9 and as follows:
 - .1 Type PC-5, particle board core to ANSI A208.1-2009 LD-2 (minimum 529 kg/m³ (33 lbs/ft³) density).
- .3 Bonding:
 - .1 Bond stiles and rails to core; abrasive sand core assembly to achieve uniform thickness prior to lamination of door faces.
- .4 Panel edge types:
 - .1 Wood veneer faced doors for transparent finish:
 - .1 For vertical edges (stiles) and exposed horizontal edges (rails). (Exposed horizontal edges are those edges that can be viewed from floors above.):
 - .1 Edge Type A: Minimum 11 mm (7/16") thick solid hardwood, species to match face veneer, and referenced quality standard.
 - .2 Inset solid wood edging shall have consistent moisture content as panel core material, be glued securely, and calibrated with panel core thickness prior to being laminated with wood veneer on both sides.
 - .3 Non rated or 20 minute fire rated doors: Solid hardwood edge to be laminated to minimum 25.4 mm (1") structural composite lumber backer.
 - .5 For unexposed horizontal edges (rails):
 - .1 Non rated or 20 minute fire rated doors: Minimum 25 mm (1") structural composite lumber.
- .6 Blocking:
 - .1 *Provide* hardware blocking for doors as follows:
 - .1 Non-rated or 20 minute fire rated doors: Structural composite lumber for hardware blocking.
- .7 Thickness:
 - .1 45 mm (1-3/4") minimum unless otherwise indicated or scheduled.

2.4 VENEER FACED DOORS FOR TRANSPARENT FINISH

- .1 Species:
 - .1 White Oak as specified in Section 06 40 00.
 - .2 Veneer thickness: Minimum 1.02 mm (0.040") thick after sanding.
 - .3 Veneer cut:

- .1 Plain/Flat.
- .4 Veneer leaf matching:
 - .1 Book.
- .5 Veneer assembly matching:
 - .1 Balance.
- .6 Doors in pairs or sets:
 - .1 For openings with more than one door, including doors with mullions, door faces shall be matched as follows:
 - .1 Pair matched.

2.5 ACCESSORIES

- .1 Wood glass stops: Solid hardwood, species to match face finish, and referenced quality standard.
- .2 Finishing hardware: in accordance with Section 08 71 00.

2.6 FABRICATION

- .1 Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors. Seal edges of doors, edges of cutouts, and mortises after fitting and machining.
 - .1 Clearances: Refer to Part 3 for clearance tolerances.
 - .2 Fit doors for automatic door bottoms.
 - .3 Bevel non-fire-rated doors 3-1/2 degrees (1/8 inch in 2 inches) at lock and hinge edges.
- .2 Fabricate doors with hardware blocking as specified in Part 2 of this Section.
- .3 Factory machine doors for finish hardware that is not surface applied. Do not machine for surface hardware. Locate hardware to comply with Door and Hardware Institute (DHI) "Recommended Locations for Architectural Hardware for Flush Wood Doors (latest edition). Comply with final reviewed hardware schedules, door and frame shop drawings and hardware templates.
- .4 Coordinate with hardware mortises in metal frames to verify dimensions and alignment before factory machining.

2.7 FACTORY FINISHING

- .1 Finish work in factory in accordance with Architectural Woodwork Standards Manual, Section 9 and referenced quality standard.
- .2 Prior to finishing, handling marks or effects of exposure to moisture removed with a thorough final sanding over surfaces of the exposed portions, using appropriate grit sandpaper, and shall be cleaned prior to applying sealer or finish. Sanding shall be completed just prior to stain or finishing application.
- .3 Comply with requirements indicated below for finish system, staining, and sheen.

- .1 Sheen: As selected by Consultant.
- .2 Factory finish with transparent, Post Catalyzed Lacquer in accordance with the North American Architectural Woodwork Standards 3.1, Section 5.
 - .1 Transparent finish: Clear (natural).
- .4 Seal top and bottom door edges.

2.8 SITE FINISHING

- .1 Paint: in accordance with Section 09 91 00.
- .2 Seal top and bottom door edges.

PART 3 – EXECUTION

3.1 EXAMINATION

- .1 *Provide* necessary grounds, bracing and strapping for fitting and adequate for securing of the work.
- .2 Cooperate with work of other sections to ensure fastenings set by others are provided and located, their work is installed to their specifications and that those responsible for back priming are notified in sufficient time for them to schedule work.

3.2 3.2 INSTALLATION – GENERAL

- .1 Execute installation and assembly at the *Place of the Work* using skilled forces under supervision of a competent joinery foreperson.
- .2 Install work plumb, level and straight, and fasten it securely to backing to support itself and anticipated superimposed loads.
- .3 Build into construction as indicated, or specified in other sections of this specification, or both.
- .4 Adequately fasten units and secure in place with concealed fixings wherever possible. Include grounds and furring where required.

3.3 INSTALLATION

- .1 Install wood doors after finishing of walls.
- .2 Align and fit doors in frames with uniform clearances as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors. Machine doors for hardware. Seal edges of doors, edges of cutouts, and mortises after fitting and machining.
 - .1 Clearances: Provide 3.2 mm (1/8") maximum at heads, jambs, and between pairs of doors. Provide 3.2 mm (1/8") maximum from bottom of door to top of decorative floor finish or covering unless otherwise indicated. Where threshold is shown or scheduled, 6.4 mm (1/4") minimum from bottom of door to top of threshold unless otherwise indicated and a maximum of 12.7 mm (1/2").
- .3 Seal top and bottom edges of wood doors are re-sealed if they are cut to fit, in accordance with door manufacturer's warranty requirements.
- .4 Pilot drill screw and bolt holes.

3.4 INSTALLATION - FINISHING HARDWARE

- .1 Install finishing hardware in accordance with Section 08 71 00.

3.5 ADJUSTING AND CLEANING

- .1 Adjust doors to swing freely, smoothly and easily, to remain stationary at any point, to close evenly and tightly against stops without binding, and to latch positively when doors are closed with moderate force.
- .2 Adjust hardware so that latches and locks operate smoothly and without binding, and closers act positively with the least possible resistance in use. Lubricate hardware if required by *Supplier's* requirements.
- .3 Ensure that doors equipped with closers operate to close doors firmly against anticipated wind and building air pressure, and to enable doors to be readily opened as suitable for function, location and traffic.
- .4 Clean hardware after installation in accordance with *Supplier's* requirements.

END OF SECTION

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Read and be governed by conditions of the Contract Documents, including sections of Division 01.

1.2 SUMMARY

- .1 Section Includes:
 - .1 Gas Detection System
- .2 Shop Drawings / Product Data
 - .1 Submit shop drawings in accordance with Section 20 05 00 – Mechanical General Provisions.
 - .2 Submit product data sheets for gas detection system. Include wiring diagrams.

PART 2 PRODUCTS

2.1 GAS DETECTORS

- .1 Stand-alone gas detector shall provide continuous monitoring in ambient air and two factory-set alarm levels and outputs for control of fans and dampers. BAS integration is possible by sending analog relay signal to record CO gas concentration.
- .2 The transmitter will be capable of sending signal through two onboard DPDT relay 5 A, 30 VDC or 250 VAC and will be activated at programmable set points.
- .3 LCD display for local gas concentration readings and “one man” calibration.
- .4 Transmitter shall be capable of operating within relative humidity ranges of 5 to 95% non-condensing and temperature ranges of -20°C to 40°C.
- .5 The transmitter shall have a plug-in capability for a field replaceable gas sensor cartridge. The replaceable gas sensor cartridge shall be factory calibrated and certified to the target gas ready for operation without the requirement for onsite calibration.
- .6 Sensor cell shall have a continuous self-test to ensure operation and to provide EOL notification.
- .7 LED indicator lights for power, alarm 1 and alarm 2 levels. For local activation of audible alarms, the transmitter shall have an on-board device able to generate an audible output of 85 dB at 3 m (10 ft).
- .8 Radius of gas sensor coverage shall be at least 15 m (50 ft).
- .9 Ratings and certifications:
 - .1 Conforms to International Electrical Code: IEC No. 61010
 - .2 EMI/RFI complies with EMC Directive 89/336/EEC
 - .3 CSA Certification
- .10 Product equal to Honeywell Analytics E3SA-E3SCO and E3SRMNO2. Acceptable manufacturers:
 - .1 Honeywell Analytics
 - .2 Or equal

PART 3 EXECUTION

3.1 INSTALLATION

- .1 Install to manufacturer's written instructions.

3.2 TESTING

- .1 After installation, schedule test to demonstrate operation of functions described under sequence of operation by manufacturers certified technician. Issue certificate of operational and installation compliance to facility operators.

END OF SECTION

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Read and be governed by conditions of the Contract Documents, including sections of Division 01.

1.2 SUMMARY

- .1 Section Includes
 - .1 Gas Unit Heaters

1.3 SUBMITTALS

- .1 Section 01 33 00 – Submittals.
- .2 Product Data: Provide typical catalogue of information including arrangements.
- .3 Shop Drawings:
 - .1 Indicate cross sections of cabinets, grilles, bracing and reinforcing, and typical elevations.
 - .2 Submit schedules of equipment and enclosures typically indicating length and number of pieces of element and enclosure, corner pieces, end caps, cap strips, access doors, pilaster covers, and comparison of specified heat required to actual heat output provided.
 - .3 Indicate mechanical and electrical service locations and requirements.
 - .4 Heating capacity at voltage provided.

1.4 CLOSEOUT SUBMITTALS

- .1 Operation and Maintenance Data: Include start-up instructions, maintenance instructions, parts lists, controls, and accessories.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- .1 Maintenance and extra material requirements.

1.6 QUALITY ASSURANCE

- .1 Products of This Section: Manufactured to ISO 9000 certification requirements.
- .2 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three (3) years documented experience.
- .3 Installer Qualifications: Company specializing in performing the work of this section with minimum three (3) years documented experience and approved by the manufacturer.

1.7 REGULATORY REQUIREMENTS

- .1 Products Requiring Electrical Connection: Listed and classified by CSA testing firm acceptable to the authority having jurisdiction as suitable for the purpose specified and indicated.

1.8 DELIVERY, STORAGE, AND PROTECTION

- .1 Transport, handle, store, and protect products.
- .2 Protect coil fins from crushing and bending by leaving in shipping cases until installation, and by storing indoors.
- .3 Protect connections from entry of dirt and debris with pipe caps or plugs.

PART 2 PRODUCTS

2.1 WALL FAN HEATERS

.1 General

- .1 Assembly: CSA listed and labelled.
- .2 Heating Elements: High-quality nickel-chrome resistance wire.
- .3 Cabinet: 20 gauge steel with 18-gauge steel grille.
- .4 Element Hangers: Quiet operating, ball bearing cradle type providing unrestricted longitudinal movement, on enclosure brackets.
- .5 Fan: Quiet helicoidal fan, single or multiple.
- .6 Motor: Totally enclosed, permanently lubricated.
- .7 Thermal protection with automatic reset.
- .8 Control: Remote thermostat with relay for connection to BAS as required by controls sequences.
- .9 Electrical Characteristics:
 - .1 208 volts, single phase, 60 Hz.
 - .2 Disconnect Switch: Factory mount disconnect switch.

.2 Acceptable Manufacturers

- .1 Stelpro;
- .2 Ouellet;
- .3 Reznor.

2.2 ELECTRIC UNIT HEATERS

.1 General

- .1 Assembly: CSA listed and labelled, with terminal control box and cover, splice box, coil, casing, and controls.
- .2 Heating Elements: Exposed helical coil of nickel-chrome resistance wire with refractory ceramic support bushings.
- .3 Cabinet: 20 gauge steel with easily removed front panel with integral air outlet and inlet grilles.
- .4 Element Hangers: Quiet operating, ball bearing cradle type providing unrestricted longitudinal movement, on enclosure brackets.
- .5 Fan: Direct drive propeller type, statically and dynamically balanced, with fan guard.
- .6 Motor: Permanently lubricated, sleeve bearings for horizontal models, ball bearings for vertical models.
- .7 Control: Separate fan speed switch and thermostat, factory wired, with switches built-in behind cover. Provide thermal overload.
- .8 Electrical Characteristics:
 - .1 208 volts, single phase, 60 Hz.
 - .2 Disconnect Switch: Factory mount disconnect switch.

.2 Acceptable Manufacturers

- .1 Stelpro;

- .2 Ouellet;
- .3 Chromalox;
- .4 Reznor;
- .5 Modine.

2.3 GAS-FIRED UNIT HEATERS

.1 General

- .1 Description: Self-contained, packaged, factory assembled, consisting of cabinet, supply fan, heat exchanger, burner, controls, and accessories, piped and wired, and complying with ANSI Z83.8.
 - .1 Fuel Type: Natural gas.
- .2 Supply Fan: Axial Propeller type.
- .3 Heat Exchanger: 409 stainless steel.
- .4 Separated Combustion.
- .5 Electrical: Built-in disconnect switch.
- .6 Controls: Regulated redundant gas valve containing pilot solenoid valve, electric gas valve, pilot filter, pressure regulator, pilot shutoff, and manual shutoff all in one body.
 - .1 Gas Control Valve: Two stage.
 - .2 Interlock Door Switch
 - .3 Ignition System: Electronically controlled electric spark with flame sensor.
 - .4 Vent Flow Verification: Differential pressure switch to verify open vent.
 - .5 High Limit: Thermal switch or fuse to stop burner.
 - .6 Control via the Building Automation System.

PART 3 EXECUTION

3.1 INSTALLATION

- .1 Install to manufacturer's written instructions.
- .2 Install equipment exposed to finished areas after walls and ceiling are finished and painted. Avoid damage.
- .3 Protection: Provide finished cabinet units with protective covers during balance of construction.
- .4 Unit Heaters: Hang from building structure, with pipe hangers anchored to building, not from piping. Mount as high as possible to maintain greatest headroom unless otherwise indicated.
- .5 Install electric heating equipment including devices provided by manufacturer but not factory-mounted. Provide copy of manufacturer's wiring diagram submittal. Install electrical wiring to manufacturer's submittals.
- .6 Install units on vibration isolation and seismic isolation/bracing. Refer to sections 23 05 48 and 23 05 49.
- .7 Provide heating season start-up, cooling season shut-down service, for first year of operation.
- .8 Shut-down system if initial start-up and testing takes place in summer and units are to remain inoperative. Repeat start-up and testing operation at beginning of first heating season.

END OF SECTION

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<p>General Notes:</p> <p>This schedule is intended as a general guideline; contractor shall include for any additional control points required to allow for proper operation & BAS control of the listed equipment and in accordance with Sequences of Operation.</p> <p>Contractor shall verify quantities.</p>	
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