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ARCHITECTURAL WOODWORK

1. PART GENERAL

1.1. GENERAL REQUIREMENTS

- 1.1.1. Conform to Division 01, General Requirements.

1.2. DESCRIPTION

1.2.1. Work Included:

- a. Provide all architectural woodwork requiring shop fabrication c/w hardware.
- a. Provide Solid Surfaces for installation by Others.

1.2.2. Related Work Specified Elsewhere:

- a. Installation of this work: Section 06 20 00

1.3. QUALITY ASSURANCE

- 1.3.1. Quality Standards for Architectural Woodwork by the Architectural Woodwork Manufacturers Association of Canada (AWMAC), Premium Grade.

- 1.3.2. Manufacture and install Architectural Woodwork to the specified AWMAC Architectural Woodwork Standards manual, Latest Edition.

1.4. SUBMITTALS

- 1.4.1. Shop Drawings: Submit shop drawings for review.

1.4.2. Samples:

- a. Submit samples of range of clear finishes available for selection by Architect.
- b. Submit samples 1 bd. ft. in size of each type of finish on each type of wood to be used;
- c. Submit samples of all joinery, if requested;
- d. Submit triplicate samples of plastic laminate and solid surface.
- e. Submit triplicate samples of wood species and stains.
- f. Submit samples of hardware.

1.4.3. Reference Data:

Provide finish materials catalogue cuts and maintenance instructions including warnings on wrong maintenance practices for insertion in Operating Manuals and Reference Data specified in Section 01 33 00, Submittals.

ARCHITECTURAL WOODWORK

1.5. WARRANTY

- 1.5.1. Provide a warranty against defects attributable to labour, material and workmanship for a period of three (3) years from date of Substantial Performance, or a three (3) year maintenance bond for the full value of the Work.

2. PART PRODUCTS

2.1. MATERIALS

2.1.1. Materials:

- a. Medium Density Fiberboard: Industrial Grade Medium Density Fibreboard (MDF) with a formaldehyde free binder to ANSI A201.2-1994 density 740 Kg/m³, product class MD: paint grade, good/solid grade. 19mm thickness unless noted otherwise on drawings.
- b. Plywood: Douglas Fir, G1S, sanded, waterproof, 19mm thick unless noted - FSC Certified Wood.
- c. Veneer Plywood: Walnut and Oak faced, A grade flat cut, thickness as noted and/or required for curving- FSC Certified Wood.
- d. Solid Wood: Walnut and Oak - FSC Certified Wood.
- e. Plastic Laminate: Conforming to CAN3-A172-M, Standard Grade, 2mm thick except 1.25mm thick post forming grade where required, 0.50mm thick backing sheet, sanded one side by same manufacturer, colour and finish choice by Architect from Arborite, Formica, Nevamar or Wilsonart complete range. Premium finish (speckled, crystal or quarry etc.) at countertops.
 1. See Drawings for colour selection.
- f. Thermofused Melamine: Certified EPP (Environmentally Preferred Product) by CPP (Composite Panel Association) and to NEMA LD-3-95 Grade VGL consists of a decorative paper impregnated and saturated with melamine resin, thermally fused under heat and pressure to MDF substrate. Overlay bonded to both faces to prevent warping.
- g. Solid Surface: Corian. Noted as '**SS1**' on Drawings for series and colour selection.
- h. Door and Drawer Edges: 3mm vinyl, to match adjacent laminate or melamine colour/pattern, 3mm solid hardwood for wood doors and drawers.
- i. Nails, screws and fasteners: To CSA B111, galvanized for exterior work, plain finish elsewhere.

2.1.2. Cabinet Hardware:

- a. Heavy Duty Hinges: Self closing, concealed European style 170° open, all metal plated parts with six - way adjustability by Blum, Hettic or Grass.
- b. Pulls: Brushed Aluminum, 100mm D-style pull.
- c. Drawer Slides: Heavy duty ball bearing carrier, fully extendable, heavy duty.

ARCHITECTURAL WOODWORK

- d. Pilaster Strips and shelf Brackets: Brushed metal, recessed.
- e. Locks: Cam style, keyed same for all Work.

2.1.3. Adhesives: Waterproof resin type except for plastic laminate which shall be recommended by plastic laminate manufacturer, all conforming to CSA 0112 Series – M and in conformance with The South Coast Rule #1168 VOC limits for adhesives (www.aqmd.gov).

2.2. FABRICATION

2.2.1. Provide backing sheet on all plastic laminate work. Plastic laminate surfaces shall be free of core ghosting. Adjacent sheets of plastic laminate on finished work shall be matched in colour with seam inconspicuous. Do not use more than one sheet when a sheet size is available that will cover required area. Precision camber outside corners between finished surfaces.

2.2.2. Make all joints tight, flush, level and plumb.

2.2.3. No exposed fasteners on exterior surfaces of melamine panels in finished (installed) condition. Assemble melamine millwork using doweled/wafered-and-glued construction unless otherwise specified.

2.2.4. Make provisions for electrical, gas and water services and outlets and provide concealment of service lines in the work except where service connections must be exposed.

2.2.5. Seal edges of cut-outs in countertops with two coats of varnish.

2.2.6. Install hardware. Install all pulls horizontally or as shown otherwise on Drawings.

2.2.7. Ship all work fully assembled as far as practicable. Otherwise fabricate for site assembly and provide Section 06 20 00 with instructions to assemble on Site.

2.2.8. Protect all work with wrappings of cardboard or heavy kraft paper as is necessary to protect shipped work.

2.2.9. Replace, rework and/or refinish Work that does not meet specified AWMAC AWS Standards Latest Edition, at no additional cost to the Owner, and to the approval of AWMAC's independent Inspector.

3. PART EXECUTION

3.1. INSTALLATION

3.1.1. Install Work to AWMAC Standards.

END OF SECTION

JOINT SEALANTS

1. PART GENERAL

1.1. GENERAL REQUIREMENTS

1.1.1. Conform to Division 01, General Requirements.

1.2. DESCRIPTION

1.2.1. Work Included:

Provide sealants and joint fillers for the Work.

1.2.2. Related Work Specified Elsewhere:

Provide the following work in conformance with this Section:

- | | |
|--|------------------|
| b. Bedding of thresholds: | Section 06 20 00 |
| c. Fire stopping and smoke seals: | Section 07 84 00 |
| d. Glazing: | Section 08 80 50 |
| e. Sealing of gypsum board partitions: | Section 09 21 16 |
| f. Mechanical Sealing: | Mech Divisions |
| g. Electrical Sealing: | Elec Divisions |

1.3. QUALITY ASSURANCE

1.3.1. Qualifications of Products: All products shall be packaged in conformance with the specified standards with every package bearing a label stating the standard to which the product conforms.

1.3.2. Qualifications of Subcontractor: Possess a copy of and be familiar with all standards specified. Have a minimum of 5 years' experience in the work specified.

1.4. SUBMITTALS

1.4.1. Samples: Submit samples of full colour range of all exposed products for colour choice by Architect.

1.4.2. Maintenance and Reference Data: Submit to Section 01 33 00 as specified therein.

JOINT SEALANTS

1.5. JOB CONDITIONS

- 1.5.1. Other Sections providing joints between elements to be sealed by or in conformance with this Section shall conform to the limits of movement of the specified sealant by the careful determination of acceptable lengths of element to be joined (spacing of joints) and establishment of sufficiently wide joints to accommodate anticipated movement in the finished Work.
- 1.5.2. Install sealants at temperatures above 4.4 ° C.
- 1.5.3. Inspection: Inspect work of other Sections upon which work of this Section depends and verify that conditions are suitable for this work to proceed

1.6. WARRANTY

- 1.6.1. Warrant sealant work for a total of Two Years.

2. PART PRODUCTS

2.1. MATERIALS

- 2.1.1. Primer: As recommended by sealant manufacturer for type of surface being primed and conditions of service.
- 2.1.2. Joint Filler and Back-up:
Circular cross-section unless shown as slab or sheet, min. 25% wider than joint, semi-rigid: closed cell polyethylene or polyurethane product, Ethafoam by Dow Chemical of Canada Limited, or product of Herecules Inc., Delaware, U.S.A., rubber tubing or non-migrating plasticized vinyl having a shore 'A' hardness of 20 and tensile strength of 130 - 200 kPA, compatible with sealant and as recommended by sealant manufacturer.
- 2.1.3. Joint Filler Gasket: QuietJoint by Sika Emseal with mass-loaded fire-resistant foam core coated with commercial-grade silicone.
- 2.1.4. Bond Breaker: As recommended for use by sealant manufacturer.
- 2.1.5. Vent Tubes: Rigid clear extruded plastic, min. 6mm ID and 9mm OD.
- 2.1.6. Sealant Colours:
Colours of exposed sealants as chosen by the Architect from manufacturer's complete range.
- 2.1.7. Sealant Types:
 - a. Type 1: Sealing Compound, One Component, Acrylic Base, Solvent Curing conforming to CGSB 19-GP-5M.
 - b. Type 2: Air barrier and sealant quality conforming to Thermal Insulation, Urethane, Spray in Place, CGSB 51-GP-23M.

JOINT SEALANTS

- c. Type 3: Latex Sealing Compound, One Component, acrylic latex conforming to Can/CSGB 19-GP-17M and ASTM C834, Type OP Grade -18degC;
- d. Type 4: Sealing Compound, One Component, Acrylic Emulsion Base conforming to CAN/CSGB 19.17-M.
- e. Type 5: Sealing Compound, One Component, Silicone Base, Solvent Curing conforming to CGSB-19.18-M87; Dow Corning 795 (790 at concrete) or G.E. Silicones Silpruf.
- f. Type 6: Non-curing, non-skinning, non-oxidizing, non-bleeding Sealing and Bedding Compound for Acoustical Purposes and/or metal building sealant for concealed joints conforming to CGSB 19-GP-21M;
- g. Type 7: Sealing Compound, Mildew Resistant, for Tubs and Tile conforming to CGSB 19-GP-22M; Dow Corning 786 or G.E. Silicones Sanitary 1700.
- h. Type 8: Sealing Compound, Multicomponent, Chemical Curing conforming to CAN2-19.24-M80.
- i. Type 9: Tacky preformed tape of 100% solids butyl polyisobutylene base, cross- sectional size as required or as specified;
- j. Type 10: Tacky preformed tape of 100% solids vulcanized-rubber base or macro- polyisobutylene base with solid rubber bead centered in tape, cross-sectional size as required or as specified;
- k. Type 11: Preformed wedge or gasket in shape designed for specific installation condition of appropriate shore 'A' hardness of dense neoprene, EPDM or Santoprene PVC by Monsanto Canada Inc.
- l. Type 12: Expanding preformed foam sealer fabricated of open cell, high density polyurethane foam impregnated throughout with polymer modified asphalt, performance temperature range -40°C to 85°C (95°C short term), excellent resistance to UV, mildew, and aging, non-bleeding, 144 to 160 kg/m³ density, acceptable product: Emseal by Emseal Joint Systems Ltd.;

3. PART EXECUTION

3.1. PREPARATION

- 3.1.1. Check compatibility of proposed sealants with materials to be in contact with sealant and ensure durable seal is provided.
- 3.1.2. Clean joints and surfaces and ensure that they are dry and free of dust, loose mortar, oil, grease and other foreign material. Clean ferrous metals of rust, mill scale and foreign materials by wire brushing, grinding or sanding.
- 3.1.3. Provide bond breaker between sealant and other materials spanning joint where backup rod cannot be provided because of depth.
- 3.1.4. Where surfaces adjacent to joints are likely to become coated with sealant during applications, mask them prior to priming and caulking.

JOINT SEALANTS

- 3.1.5. Seal joints in surfaces to be painted before surfaces are painted. Where surfaces to be caulked are prime-painted in shop before caulking, check to make sure prime paint is compatible with primer and sealant. If they are incompatible, inform Architect and change primer and sealant to compatible types approved by Architect.

3.2. APPLICATION

- 3.2.1. Apply sealant using hand-operated guns fitted with suitable nozzles and equipment approved by sealant manufacturer. Apply in strict accordance with manufacturer's directions and recommendations.
- 3.2.2. Apply sealant under pressure in such a manner as to assure good adhesion to sides of joints and to completely fill all voids in the joint.
- 3.2.3. Form surface of sealant smooth, concave, free from ridges, wrinkles, sags, air pockets and embedded foreign matter.
- 3.2.4. Upon completion, remove masking and sealant smears and droppings from adjacent and other surfaces.
- 3.2.5. Install preformed expanding foam sealants in compressed state of width to provide final compression in service necessary to provide required acoustic-, air-, moisture-, or water- proof seal as per manufacturers recommendations and as specified in List following.

3.3. LIST OF TYPES AND USES OF SEALANTS

3.3.1.. Interior Joints:

- a. Not for glazing, not on exterior walls, not on interior of exterior window, door or screen frames, not in shower or washroom areas, not specifically for acoustic isolation: Type 3 or 8; paintable.
- b. Perimeter of mirrors, washroom accessories to wall and other dissimilar materials: Type 4.

3.3.2. Building Envelope Joints:

- a. Joints in Sheet Metal Air/Vapour Barrier: Sealant Type 6;
- b. Lap Joints in Plastic Sheet Vapour Barrier: Sealant Type 6;
- c. Securement Joints in Plastic Sheet Air/Vapour Barrier: Sealant Type 3;
- d. Joints in Air Barrier Sheathing Insulation and Joints Between Air/Vapour Barrier or Insulation Wythe and Frames of Windows, Doors or Equipment: Sealant Type 2
- e. Control Joints in Masonry: Type 4.
- f. Interior and Exterior Window, Door and Screen Frames: Sealant Type 4.
- g. Thresholds in Exterior and Vestibule Doors: Type 8, or 13 (watertight);

JOINT SEALANTS

- h. Roof: As supplied by roofing membrane manufacturer. Check compatibility of all sealants in contact with roof membrane or roof sealants;
 - i. Joints in Exterior and Interior Pavements:
Sealant Type 8, with a toughness when cured which resists damage due to mischief and traffic. Sealant Type 8 pourable in floor slab and floor finish expansion and crack control joints.
- 3.3.5. Joints in Shower Rooms and Washrooms: Sealant Type 7.
- 3.3.6. Sealing Partitions for Acoustical Isolation: Sealant Type 6.
- 3.3.7. Joint Filler Gasket: Provide at Fridge Room penetrations. See Drawings

END OF SECTION

WOOD DOORS

1. PART GENERAL

1.1. GENERAL REQUIREMENTS

- 1.1.1. Conform to Division 01, General Requirements.

1.2. DESCRIPTION

1.2.1. Work Included:

Supply plastic laminate faced wood doors.

1.2.2. Related Work Specified Elsewhere:

- | | |
|---|------------------|
| a. Installation of wood doors and hardware: | Section 06 20 00 |
| b. Supply of hardware: | Section 08 70 00 |
| c. Glazing of wood doors: | Section 08 80 00 |
| d. Supply of door grilles: | Division 24 |

1.3. QUALITY ASSURANCE

- 1.3.1. Requirements of Regulatory Agencies: Conform to the latest editions of the following:

- a. CSA 0132.2-Series 90, General Requirements for Wood Flush Doors.
- b. Architectural Woodwork Manufacturers Association of Canada "Quality Standards for Architectural Woodwork" (AWMAC).

1.4. SUBMITTALS

- 1.4.1. Shop Drawings: Submit Shop Drawings.

1.5. PRODUCT DELIVERY, STORAGE AND HANDLING

- 1.5.1. Do not deliver doors to Site until Work of wet trades is complete and moisture readings of surfaces in proposed storage area are less than 18%.
- 1.5.2. Store doors flat on level surface in dry, well ventilated area inside building.
- 1.5.3. Cover top of pile with waterproof covering, but allow air circulation at sides.

1.6. WARRANTY

- 1.6.1. Warrant the Work of this Section against defect for a total of Three Years.

WOOD DOORS

- 1.6.2. Make good defects during warranty period by replacing defective doors in finish to match adjacent similar doors or of original door finish. Defects shall include, but not be limited to bubbling, delamination of faces or edges, warp, twist bow exceeding 6mm, and telegraphing of core. "Replace" as used herein includes installing hardware, finishing, hanging and fitting.

2. PART PRODUCTS

2.1. MATERIALS

- 2.1.1. Conform to CSA 0132.2 for materials, except as specified otherwise herein.

2.1.2. Core Materials for Solid Core Doors:

Solid Eastern White Pine or Western Red Cedar conforming to CAN3-0188.1- M, Grade R.

- 2.1.3. Adhesive: CSA 0112 Series M, Type III.

2.1.4. Finish:

- a. Plastic Laminate faced doors: Conforming to CAN3-A172-M, Standard Grade, 2mm thick, 0.50mm thick backing sheet, sanded one side by same manufacturer, colour and finish choice by Architect from Arborite, Formica, Nevamar or Wilsonart complete range.

2.1.5. Fire-rated Assemblies:

- a. Fabricate assemblies required to have a fire-resistance rating to requirements of testing and labelling agency.
- b. Supply assemblies required to have a fire-resistance rating complete with appropriate label of testing and labelling agency affixed in a visible but unobtrusive location.

- 2.1.6. Glass: See Door and Frame Schedule

2.2. FABRICATION AND MANUFACTURE

2.2.1. General:

- a. Conform to CSA 0132.2 for solid core flush doors, except as specified otherwise herein.
- b. Size doors for 2mm clearance of heads and jambs and 10mm at sills.
- c. Prep rated doors for (but not limited to) heavyweight hinges (minimum 4 per leaf greater than 915mm wide and / or 2300mm high), continuous hinges, concealed vertical rod and mortise lock case exit devices, cylindrical locksets, and concealed overhead stops.

2.2.2. Flush Doors:

WOOD DOORS

- a. Core: Laminated wood framed or unframed core construction comprising narrow kiln dried wood strips not less than 40mm wide, grain running vertically and joints well staggered, electronically glue bonded;
- b. Edges: 19mm minimum thickness one piece full length Maple with plastic laminate faced jambs and painted head and underside edge.
- c. Sealing: Factory seal all door edges with one coat of stain sealer to closely match plastic laminate colour.
- d. Cutouts: Prepare doors in factory for any openings required. Fit loose stops and tack in place.

3. PART EXECUTION

3.1. INSTALLATION

- 3.1.1. Supply wood doors to Section 06 20 00, Finish Carpentry, for installation.

END OF SECTION

ACCESS DOORS AND FRAMES

1. PART GENERAL

1.1. GENERAL REQUIREMENTS

- 1.1.1. Conform to Division 1, General Requirements.

1.2. DESCRIPTION

1.2.1. Work Included:

Provide fire resistive rated and non-rated access door and frame units.

1.2.2. Related Sections:

- | | |
|---------------------------------------|------------------|
| a. Openings in concrete: | Section 03 30 00 |
| b. Openings in masonry: | Section 04 20 00 |
| c. Openings in drywall partitions: | Section 09 20 15 |
| d. Painting: | Section 09 90 00 |
| e. Mechanical Divisions: | Division 21 |
| f. Electrical Divisions: | Division 26 |

1.3. REFERENCES

- 1.3.1. ASTM A653/A653M-11 - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- 1.3.2. ASTM E119-05a - Standard Test Methods for Fire Tests of Building Construction and Materials.
- 1.3.3. CAN/CSA-A440-00/A440.1-00 (R2005) - User Selection Guide to CSA Standard A440-00, Windows.
- 1.3.4. CAN/ULC S101-04 - Standard Methods of Fire Endurance Tests of Building Construction and Materials.
- 1.3.5. ITS - Intertek Testing Services - Certification Listings.
- 1.3.6. NFPA 251-2006 - Standard Methods of Tests of Fire Resistance of Building Construction and Material.
- 1.3.7. NFPA 252-2003 - Standard Methods of Fire Tests of Door Assemblies.
- 1.3.8. NFPA 288-2001 - Standard Method of Fire Tests of Floor Fire Door Assemblies Installed Horizontally in Fire Resistance Rated Floor Systems.
- 1.3.9. UBC 7-2-94 - Uniform Building Code Standard.
- 1.3.10. UL - Fire Resistance Directory.

ACCESS DOORS AND FRAMES

1.3.11. UL 10B-1997 - Standard for Fire Tests of Door Assemblies.

1.4. PERFORMANCE REQUIREMENTS

1.4.1. Gasketed Access Doors:

- a. Air infiltration rating: A-3 at 75 Pa (1.57 psf), A-3 at 300 Pa (6.27 psf), to CSA A440.
- b. Air exfiltration rating: A-3 at 75 Pa (1.57 psf), A-2 at 300 Pa (6.27 psf), to CSA A440.
- c. Water tightness rating: [B-1] [B-4] using the screwdriver cylinder cam latch, to CSA A440.
- d. STC Rating: Acoustically enhanced 12mm gypsum board for 49 – 68 STC rating bauco-plus II series by Bauco..

1.4.2. Loading: Fabricate floor access assemblies to support live load of 700 kg/sq m (150 lb/sq ft) with deflection not to exceed 1/180 of span.

1.4.3. Fire Hazard Classification: To CAN/ULC S114, ASTM E136, CAN/ULC S102, ASTM E84, or UL723.

- a. Flame Spread 0, Fuel Contribution 0, Smoke Developed 0.
- b. Draw frame profile details at scale not less than 1:5.

1.5. SUBMITTALS

1.5.1. Shop Drawings: Indicate exact position of all access door units.

1.5.2. Product Data: Provide sizes, types, finishes, hardware, scheduled locations, and details of adjoining work.

1.5.3. Samples: Submit one (1) access unit of each type specified, 300x300 mm in size illustrating frame configuration and anchors – if requested by Architect.

1.6. QUALITY ASSURANCE

1.6.1. Perform Work in accordance with ULC Design requirements.

1.6.2. Provide fire rated products with Intertek/Warnock Hersey labels

2. PART PRODUCTS

2.1. EXAMPLE MANUFACTURERS and SUPPLIERS

2.1.1. Manufacturers: Acudor, Bauco (for acoustic enhanced access doors such as fridge room wall openings), Cendrex, Elmdor, MIFAB, Van-Met, William Brothers or equal.

ACCESS DOORS AND FRAMES

- 2.1.2. Suppliers: Access Doors Canada, Bauco www.accesspanelsolutions.com, Best Access Doors Canada, Maxam Metal Products Ltd.

2.2. MATERIALS

- 2.2.1. Sheet Steel: ASTM A653/A653M, galvanized coated steel, 2 mm (14 ga), ZF120 (A40) zinc coating designation, with off-white prime finish.
- 2.2.2. Stainless Steel: Type [304] [316], [No. 4 polished] [No. 2b mill] finish.
- 2.2.3. Gasketing: Urethane composition maximum compression set two percent (2%) at 23 degrees C (73 degrees F).
- 2.2.4. Insulation: Fiberglass, RSI-0.74 per 25 mm (R-4.2 per inch).

2.3. FABRICATION

- 2.3.1. Panel Fabrication: Single or double thickness steel sheet as required, with non-combustible insulation filler, gasketed.
- 2.3.2. Panel: Galvanized steel, 1.3 mm (18 gauge), 1.6 mm (16 gauge), and 1.9 mm (14 gauge).
- 2.3.3. Liner Panel: 1.3 mm (18 gauge).
- 2.3.4. Frame: Galvanized steel, minimum 1.3 and/or 1.6mm (16/18 gauge) thick.
- 2.3.5. Hinge: Continuous, concealed rod piano hinge, allowing door panel to open 175 degrees.
- 2.3.6. Flanges:
- a. Exterior: 19 mm (3/4 inch), 22 mm (7/8 inch), 32 mm (1-1/4 inch), 38 mm (1-1/2 inch), 50 mm (2 inch) wide at perimeter as required.
 - b. Gypsum: Gypsum bead, Galvanized steel.
 - c. Plaster: Metal lath, Galvanized steel.
 - d. Concealed: Galvanized steel.
- 2.3.7. Latching/Locking Devices:
- a. Cam Latch: 5 mm (3/16 inch) or 6 mm (1/4 inch) allen key operator.
 - b. Key operated cylinder cam lock with two (2) keys, keyed alike.
 - c. Handle: Non-locking, two position.
 - d. Preparation to accept a 29 mm (1.125 inch) mortise cylinder with 29 mm (1.125 inch) satin chrome 626 finish mortise cylinder, keyway X01 Schlage "C", keyed alike (KA43758) and factory installed.
- 2.3.8. Steel Finish: Galvanized coated finish with applied grey primer.
- 2.3.9. Weld, fill, and grind joints to ensure flush and square unit.

ACCESS DOORS AND FRAMES

3. PART EXECUTION

3.1. EXAMINATION

- 3.1.1. Verify that rough openings for door and frame are correctly sized and located.

3.2. INSTALLATION

- 3.2.1. Install units in accordance with manufacturer's instructions.
- 3.2.2. Install acoustic enhanced access doors at Fridge Room penetrations with 100 x 250mm clear opening – See drawings.
- 3.2.3. Install frames plumb and level in opening. Secure rigidly in place.
- 3.2.4. Position unit to provide convenient access to concealed work requiring access.

END OF SECTION

GLASS and GLAZING

PART 1 GENERAL

1.1. GENERAL REQUIREMENTS

1. Conform to Division 01, General Requirements.

1.2. SECTION INCLUDES

1. Glass and glazing for sections referencing this section for Products and installation.
2. Window Film.

1.3. RELATED SECTIONS

1. Section 07 90 00 - Joint Sealants: Sealant and back-up material.
2. Section 08 11 00 - Hollow Metal Doors: Glazed doors.
3. Section 08 21 00 - Wood Doors: Glazed doors.
4. Section 08 42 30 - Interior Aluminum Sliding Doors.

1.4. REFERENCES

1. ANSI Z97.1-04e1 - Safety Glazing Materials Used in Buildings – Safety Performance Specifications and Methods of Test.
2. ASTM C542-05 - Specification for Lock-Strip Gaskets.
3. ASTM C864-05 - Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers.
4. ASTM C920-05 - Elastomeric Joint Sealants.
5. ASTM C1036-01 - Flat Glass.
6. ASTM C1172-03 - Laminated Architectural Flat Glass.
7. ASTM C1048-04 - Heat-Treated Flat Glass - Kind HS, Kind FT Coated and Uncoated Glass.
8. ASTM C1193-05a - Use of Joint Sealants.
9. ASTM C1503-01 - Silvered Flat Glass Mirror.
10. ASTM D412-06a - Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers - Tension.
11. ASTM D1149-99 - Test Method for Rubber Deterioration - Surface Ozone Cracking in a Chamber.
12. ASTM D2240-05 - Test Method for Rubber Property - Durometer Hardness.
13. ASTM E84-07 - Test Method for Surface Burning Characteristics of Building Materials.
14. ASTM E283-04 - Test Method For Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences Across the Specimen.
15. ASTM E330-02 - Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
16. ASTM E773-01 - Test Method for Accelerated Weathering of Sealed Insulating Glass Units.
17. CAN/CGSB 12.1-M90 - Tempered or Laminated Safety Glass.

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18. CAN/CGSB 12.2-M91 - Flat, Clear Sheet Glass.
19. CAN/CGSB 12.3-M91 - Flat, Clear Float Glass.
20. CAN/CGSB 12.4-M91 - Heat Absorbing Glass.
21. CAN/CGSB 12.6-M91 - Transparent (One-Way) Mirrors.
22. CAN/CGSB 12.8-97 - Insulating Glass Units.
23. CAN/CGSB 12.9-M91 - Spandrel Glass.
24. CAN/CGSB 12.10-M76 - Glass, Light and Heat Reflecting.
25. CAN/CGSB 12.11-M90 - Wired Safety Glass.
26. CAN/CGSB 12.12-M90 - Plastic Safety Glazing.
27. CAN/CGSB 12.13-M91 - Patterned Glass.
28. CAN/CGSB 12.20-M89 - Structural Design of Glass for Buildings.
29. CGSB 19-GP-5M - Sealing Compound, One Component, Acrylic Base, Solvent Curing (Incorporating Amendment No. 1)
30. GANA (Glass Association of North America)
31. Glazing Manual (2004).
32. FGMA Sealant Manual.
33. Laminated Glazing Reference Manual (2006).
34. IGMAC (Insulating Glass Manufacturers Association of Canada) - Sealed Insulating Glass: Certification Program.
35. IGMA (Insulating Glass Manufacturers Alliance).
36. LSGA (Laminators Safety Glass Association) Laminated Glass Design Guide 2000.

1.5. PERFORMANCE REQUIREMENTS

1. Provide glass and glazing materials for continuity of building enclosure vapour retarder and air barrier:
 1. To utilize the inner pane of multiple pane sealed units for the continuity of the air barrier and vapour retarder seal.
 2. To maintain a continuous air barrier and vapour retarder throughout the glazed assembly from glass pane to heel bead of glazing sealant.
2. Heat strengthen or temper all glass as required in order to meet the wind loads, failure probability specified or to accommodate thermal stresses and as required to meet building regulations.
3. Temper glass within 457mm of the floor.
4. Design horizontal rails and glazing up to 1100mm above finished floor in accordance with OBC requirements for guards.

1.6. SUBMITTALS

1. Product Data on Glass and Plastic Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.
2. Product Data on Glazing Compounds: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colours.

GLASS and GLAZING

3. Samples: Submit three (3) samples 300mm x 300 mm in size, exemplifying glass, plastic units, colouration and design.
4. Samples: Submit 150mm long bead of glazing sealant, of each colour as selected by the architect.
5. Certificates: Certify that Products meet or exceed specified requirements.
6. Manufacturer's Certificate: Certify that sealed insulated glass, meets or exceeds specified requirements.

1.7. QUALITY ASSURANCE

1. Perform Work in accordance with GANA Glazing Manual, GANA Sealant Manual, GANA Laminated Glazing Reference Manual, IGMA and in accordance with the building code (Latest edition).
2. Maintain one (1) copy on site.

1.8. ENVIRONMENTAL REQUIREMENTS

1. Do not install glazing when ambient temperature is less than 10 degrees C (50 degrees F).
2. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.9. WARRANTY

1. Section 01 78 10: Warranties.
2. Provide a five (5) year warranty to include coverage for sealed glass units from seal failure, interpane dusting or misting, and replacement of same.
3. Provide a five (5) year warranty to include coverage for delamination of laminated glass and replacement of same.

PART 2 PRODUCTS

2.1. MANUFACTURERS - FLAT GLASS MATERIALS

1. Okalux Industries.
2. Other acceptable manufacturers offering functionally and aesthetically equivalent products;
 1. Guardian Glass.
 2. Old Castle Glass.
 3. Trulite Glass.
 4. Solera Glass.
3. Glass Types:
 1. GL1: Float Glass: to CAN/CGSB-12.3-M , clear, 6mm thick;
GL1a: 9mm thick;
GL1b: 12mm thick.

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2. GL2: Tempered glass: to CAN/CGSB-12.1-M ,Category II, Type 2 tempered, Class B, clear, minimum 6mm thick;
GL2a: 9mm thick;
GL2b: 12mm thick.
3. GL3: Wired Glass: to CAN/CGSB-12.11-M, Type 1, Style 3, minimum 6mm thick;
GL3a: 9mm thick;
GL3b: 12mm thick.
4. GL4: Heat Absorbing Glass: to CAN/CGSB-12.4-M, minimum 6mm thick;
GL4a: 9mm thick;
GL4b: 12mm thick.
5. GL5: Silvered Mirror Glass: ASTM C1503, min. 6mm thick float glass "AA" quality, polished plate glass with 2 silvering coats, an electro-plated copper backing, and 1 coat of protective paint, or silvering quality and copper backed to requirements of CAN/CGSB-12.5-M86;
GL5a: 9mm thick;
GL5b: 12mm thick.
6. GL6: Laminated safety Glass: Type 1, Class B, Category II, total 6mm thick, clear float glass. Laminate with minimum 0.060 clear PVB film between panes;
GL6a: 3mm + 6mm with PVB of thicknesses of 0.03;
GL6b: 6mm + 6mm with PVB of thicknesses of 0.09.
7. GL7: Back painted Glass(BPG1): CAN/CGSB 12.9, minimum 6mm thick, float or plate, tempered, with ceramic coating of colour selected by the Consultant;
8. GL8: Fire Rated Ceramic Glass:
 1. Tested in accordance with CAN4-S104-M and CAN4-S106-M.
 2. FireLite Plus : 20 minute to 3 Hours fire rated, impact safety rated glass ceramic by TGP Technical Glass Products - Precision Glass Services Inc.
10. GL9: Heat Absorbing Glass: CAN/CGSB-12.4-M91, minimum 6mm thick.
11. GL10: Leaded Glass: Lead barium type glass with 60 percent heavy metal oxide, including minimum 55percent PbO. Minimum 7mm thick.
12. GL11: Two-way Mirror: Polycarbonate, 6mm thick.
13. Window Film: Opaque White Film, gloss finish, Writerglass by Levey Industries.

GLASS and GLAZING

2.2. MANUFACTURERS - SEALED INSULATING GLASS UNITS

1. Acceptable manufacturers:
 1. Guardian Glass;
 2. Viracon Glass;
 3. Old Castle Glass;
 4. Trulite Industries
 5. AFGD Glass Inc.; www.afgd.com
 6. PPG Canada Inc. www.ppg.com
2. Sealed Insulating Glazing Units: Factory sealed, double glazed units conforming to CAN2-12.8-M.
 1. GL X1: Vision Unit
Outboard glass - 6mm clear tempered glass,
12mm superspacer and argon filled air space,
Inboard glass - 6mm clear tempered glass.
 2. GL X2: Vision Unit
Outboard glass - 6mm clear tempered glass,
18mm superspacer and argon filled air space,
Inboard glass - 6mm clear tempered glass
 3. Warm edge non-metallic polyisobutylene or thermo plastic spacer.
SuperSpacer by Edgetech or I-Spacer by Technoform or equal.
 4. Mitred corners.
 5. Edge Seal Material: grey colour.
 6. Design horizontal rails and glazing up to 1100mm above finished floor in accordance with Code requirements for guards.

2.3. GLAZING COMPOUNDS

1. Silicone Sealant: Dow 790 or approved equal. Colour as selected by Architect.
2. Spectrum Pro-Glaze. Color as selected by Architect.
3. Dow 995. Colour as selected by Architect.

2.4. GLAZING ACCESSORIES

1. Manufacturer as mentioned below for each accessory.
2. Lock Strip Gaskets: ASTM C542, ozone-resistant neoprene compound, with lock-strip (zipper) component that friction-fits into position to retain glass pane/unit, H-shape, or reglet type, tensile strength of 14 MPa (2000 psi) tested to ASTM D412, Durometer hardness of 75 tested to ASTM D2240, sized to accommodate glass thickness.
3. Setting Blocks: 40 to 60; 80 to 90 Shore A durometer hardness tested to ASTM D2240, EPDM neoprene rubber by Good year Industrial Products or approved equal. Length of 25 mm for each square metre of glazing or

GLASS and GLAZING

- minimum 100 mm x width of glazing rabbet space minus 1.5 mm x height to suit glazing method and pane weight and area.
4. Spacer Shims: Neoprene, 40 to 50; 50 & 80 Shore 'A' durometer hardness + - 5 respectively EPDM neoprene rubber by Goodyear Industrial Products. Resistance to sunlight, weathering, oxidization and permanent deformation under load and compatibility with all materials in the glazing system, shall be the prime essential of spacers, shims and setting blocks.
 5. Glazing Tape: "440 Tape" by Tremco Ltd., or approved equal
 6. Glazing Tape: Closed cell polyvinyl chloride foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume of 2 percent, designed for compression of 25 percent to effect an air barrier and vapour retarder seal.
 7. Mirror adhesive: "Mirro-Mastic" by Palmer products Corporation or approved equal.
 8. Stainless Steel 'J' Strip: Type #302, #4 brushed finish, non-magnetic, 16 ga thick.
 9. Glazing Gaskets: Black Neoprene compression gasket of sufficient thickness to suit glazing channel retaining slot to be under 25% compression minimum when installed.
 10. Glazing Clips: Manufacturer's standard type.

PART 3 EXECUTION

3.1. EXAMINATION

1. Verify that openings for glazing are correctly sized and within tolerance.
2. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.

3.2. PREPARATION

1. Clean contact surfaces with solvent and wipe dry.
2. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
3. Prime surfaces scheduled to receive sealant.
4. Install sealant in accordance with manufacturer's written instructions.

3.3. INSTALLATION

1. Install glazing in accordance with material manufacturer's directions.
2. Glaze in temperatures above +5 degree C.
3. Comply with FGMA (Flat glass marketing Assoc.) glazing manual.
4. Orient heat strengthened and tempered glass so that roller marks are horizontal.

3.4. EXTERIOR DRY METHOD (TAPE AND GASKET SPLINE GLAZING)

GLASS and GLAZING

1. Cut glazing tape to length; install on glazing pane. Seal corners by butting tape and sealing junctions with sealant.
2. Place setting blocks at 1/3 points with edge block no more than 150 mm from corners.
3. Rest glazing on setting blocks and push against fixed stop with sufficient pressure to attain full contact.
4. Install removable stops without displacing glazing spline. Exert pressure for full continuous contact.
5. Trim protruding tape edge.

3.5. INSTALLATION - EXTERIOR BUTT GLAZED METHOD (SEALANT ONLY)

1. Temporarily brace glass in position for duration of glazing process. Mask edges of glass at adjoining glass edges and between glass edges and framing members.
2. Temporarily secure a small diameter non-adhering foamed rod on back side of joint.
3. Apply sealant to open side of joint in continuous operation; thoroughly fill the joint without displacing the foam rod. Tool the sealant surface smooth to concave profile.
4. Permit sealant to cure then remove foam backer rod. Apply sealant to opposite side, tool smooth to concave profile.
5. Remove masking tape.

3.6. INSTALLATION - INTERIOR DRY METHOD (TAPE AND TAPE)

1. Cut glazing tape to length and set against permanent stops, projecting 1.6 mm above sight line.
2. Place setting blocks at 1/3 points with edge block no more than 150mm from corners.
3. Rest glazing on setting blocks and push against tape for full contact at perimeter of pane or unit.
4. Place glazing tape on free perimeter of glazing in same manner described above.
5. Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.
6. Knife trim protruding tape.

3.7. INSTALLATION - INTERIOR WET/DRY METHOD (TAPE AND SEALANT)

1. Cut glazing tape to length and install against permanent stops, projecting 1.6 mm above sight line.
2. Place setting blocks at 1/3 points with edge block no more than 150mm from corners.
3. Rest glazing on setting blocks and push against tape to ensure full contact at perimeter of pane or unit.
4. Install removable stops, spacer shims inserted between glazing and applied stops at 600 mm and 6 mm below sight line.

GLASS and GLAZING

5. Fill gaps between pane and applied stop with silicone type sealant to depth equal to bite on glazing, to uniform and level line.
6. Trim protruding tape edge.

3.8. INSTALLATION - PLASTIC FILM

1. Install plastic film with adhesive, applied in accordance with film manufacturer's written instructions.
2. Place without air bubbles, creases or visible distortion.
3. Fit tight to glass perimeter with razor cut edge.

3.9. FIELD QUALITY CONTROL

1. Inspection will monitor quality of glazing.

3.10. MANUFACTURER'S FIELD SERVICES

1. Glass and glazing product manufacturers to provide field surveillance of the installation of their Products.
2. Monitor and report installation procedures & unacceptable conditions.

3.11. CLEANING

1. Remove glazing materials from finish surfaces.
2. Remove labels after Work is complete.
3. Clean glass and adjacent surfaces.

3.12. PROTECTION OF FINISHED WORK

1. After installation, mark pane with an 'X' by using removable plastic tape or paste. Do not mark heat absorbing or reflective glass units.

END OF SECTION

ACOUSTIC CEILING PANELS

1. PART GENERAL

1.1. GENERAL REQUIREMENTS

1.1.1. Conform to Division 01, General Requirements.

1.2. DESCRIPTION

1.2.1. Work Included:

Provide acoustic ceiling panels including mounting and suspension systems.

1.2.2. Related Work Specified Elsewhere:

- a. Suspension hooks Section 06 10 00
- b. Gypsum Board Section 09 20 15

1.3. SUBMITTALS

1.3.1. Shop Drawings: Submit in accordance with Section 01 30 00.

1.3.2. Samples: Submit samples of all patterns and colours available for selection by Architect.

1.3.3. Product Test Report: From qualified testing agency indicating panels comply with requirements.

1.4. QUALITY ASSURANCE

1.4.1. Fire Test Report: Provide acoustic wall panels with Class A Flammability rating and the following surface-burning characteristics as per ASTM E 84:

- a. Flame spread: 25 or less.
- b. Smoke developed: 450 or less.

1.4.2. Fire Test Report: Provide acoustical test report indicating the wall panels meet 0.85 NRC per ASTM C-423

1.5. WARRANTY

Warrant panels and installation for a period of 2 years.

2. PART PRODUCTS

2.1. MATERIALS

2.1.1. Acoustic Ceiling Panels: Noted as Acoustic Panel (CT4) on Drawings - See Room Finish Schedule on Drawings for Series and manufacturer.

2.1.2. Mounting: Mechanically fasten to underside of the interior core of the existing concrete waffle slabs.

ACOUSTIC CEILING PANELS

3. PART EXECUTION

3.1. PRE-FABRICATION

3.1.1. Site measure all panel size locations prior to fabrication.

3.1. FABRICATION

3.1.1. Shop fabricate panels to custom sizes as measured on site.

3.1.2. Reinforce back of ceiling panels to prevent warpage.

3.2. INSTALLATION

3.2.1. Install wall and ceiling panels in accordance with manufacturer's written instructions.

END OF SECTION

RUBBER SHEET FLOORING

1. PART GENERAL

1.1. GENERAL REQUIREMENTS

- 1.1.1. Conform to Division 01, General Requirements.

1.2. DESCRIPTION

1.2.1. Work Included:

Provide rubber sheet flooring, base, sub-floor preparation.

1.3. REFERENCE STANDARDS

- a. ASTM F1859 Rubber Sheet Floor Covering Without Backing.

1.4. SUBMITTALS

1.4.1. Samples:

- a. Submit samples in accordance with Section 01 30 00.
- a. Submit duplicate 200mm x 250mm samples of all flooring materials, in specified colours and patterns.
- a. Submit duplicate 102mm x 102mm samples of prefabricated bases.

1.4.2. Maintenance Materials:

Supply 2% (accent) to 5% (field) extra tiles of each colour in unopened packages for future repairs. Place where directed.

1.4.3. Reference Data:

Submit complete list of Products, colours and patterns used to Operating Manuals and Reference Data specified in Section 01 30 00 as specified therein.

2. PART PRODUCTS

2.1. MATERIALS

- 2.1.1. Rubber Sheet Flooring: Noted as 'RF1, RF2 and RF3' on Drawings, 2mm thick - See Drawings for manufacturer, series and colours.
- 2.1.2. Rubber Base: by flooring Manufacturer. See Finish Schedule on Drawings for basis of design product.
- 2.1.3. Welding Rods: by flooring Manufacturer. Match sheet flooring colour.

RUBBER SHEET FLOORING

- 2.1.4. Tactile Warning Strips: Manufactured by Johnsonite or Allstate or Roppe, colour and series selected by Consultant from complete range, conforming to most recent ISO 23599:2012:
- 2.1.5. Primer: As recommended by adhesive manufacturer.
- 2.1.6. Adhesives: As recommended by manufacturers
- 2.1.7. Levelling underlayment:
Ardex 'Liquid BackerBoard Self-Levelling Underlayment' complete with Ardex 51' primer, Surface Preparation 567 by TEC, or approved equal by Reardon Co. or Mapei, non-shrink compound.
- 2.1.8. Thresholds and Edge Reducer Strips: One piece, PVC by Johnsonite or Allstate or Roppe.
 - a. SLTC-XX-A at 1/4" to 1/8" materials. Slim Line Transition at curved floor transitions
 - b. CTA-XX-A at 1/4" to 1/8" materials. Transition Adaptor
 - c. CTA-XX-HT at 1/4" to 0.08"/2mm. Wheeled Traffic Transition
 - d. CTA-XX-J at 1/4" to floor. Wheeled Traffic Transition
 - e. CTA-XX-N at 1/8" to 1/8" materials. Wheeled Traffic Transition

3. PART EXECUTION

3.1. PREPARATION

- 3.1.1. Prepare sub-floor in accordance with recognized industry standards and established in Manufacturer's installation instructions. Use only preparation materials that are acceptable to the Manufacturer's specification criteria.
 - a. Mechanically remove all substances from sub-floor that would interfere with or be harmful to the installation.
 - b. Remove sub-floor ridges and bumps. Fill cracks, joints, holes, and other defects following written manufacturer's instructions
- 3.1.2. Verify that sub-floor is smooth, level, and flat within specified tolerances of ASTM F710 and other relevant guidelines.
- 3.1.3. Verify that substrate surface is dust-free. Installing parties shall not use petroleum- or wax-based sweeping compounds.
- 3.1.4. Verify that concrete surfaces are ready for installation by following industry standards and the manufacturer's installation guidelines.
- 3.1.5. There will be no exceptions to the provisions stated in the Manufacturer's installation instructions.

RUBBER SHEET FLOORING

3.2. INSTALLATION

3.2.1. Resilient Sheet Flooring Application:

- a. Apply adhesive uniformly with an approved notch tooth spreader at the recommended rate. Do not spread more adhesive than can be covered before initial set takes place.
- b. Lay flooring with seams parallel to building lines and parallel to each other, to produce a minimum number of seams. "Piecing-in" with scrap or leftover material will not be accepted.
- c. Double cut sheet joints and continuously cold weld in rooms indicated on Drawings.
- d. Run patterned sheets parallel to corridor traffic, and parallel to long dimension of rooms. Border widths minimum 1/3 width of full material width.
- e. Terminate flooring at centreline of door in openings where adjacent floor finish or colour is dissimilar.
- f. Roll floor in accordance with manufacturer's recommendations to ensure adhesion and elimination of air pockets.

3.2.3. Base:

- a. Install bases in accordance with manufacturer's recommendations.
- b. Use full length pieces, accumulated short lengths not permitted.
- c. Butt joints and keep flush without gaps.

3.2.4. Thresholds and Edge Reducer Strip:

- a. At edge of dissimilar floor finishes, resilient and other flooring, other than carpet, Provide one piece thresholds and edge reducer strips.
- b. Secure in place with adhesive to manufacturer's recommendations.

3.3. ADJUST AND CLEAN

3.3.1. Clean:

Remove surplus adhesive from face of tiles and base as Work progresses. As soon as possible after adhesive has set thoroughly, clean tile and base surfaces in accordance with manufacturer's directions.

END OF SECTION

PAINTING

1. PART GENERAL

1.1. GENERAL REQUIREMENTS

- 1.1.1. Conform to Division 01, General Requirements.

1.2. DESCRIPTION

1.2.1. Work Included:

- a. Exterior - Apply paint to ferrous (non-galvanized) metal and other surfaces.
- b. Interior - Work shall generally include the following:
 - 1. Paint all surfaces and objects within new and existing rooms, except where specifically indicated or specified otherwise. This includes grilles, pipes, ducts, etc.
 - 2. In areas indicated as unfinished on Room Finish Schedule, painting is still required at doors and frames, elevator doors and trim (if applicable), exposed unprimed structural steel, and other items normally requiring protection.
 - 3. Do not paint acoustical ceilings, architectural woodwork, manufactured casework, chalkboards, their trim, windows and window frames, baked enamel finished metals, toilet partitions, aluminum, copper, plastic laminate, hardware or other surfaces obviously not intended to be painted, unless otherwise specifically stated.

1.2.2. Related Work Specified Elsewhere:

- a. Shop priming is provided on some items by their respective Sections,
- b. Identification and lettering of mechanical Work: Divisions 20 - 25

1.3. QUALITY ASSURANCE

- 1.3.1. Comply with requirements of Ontario Painting Contractors Association (OPCA) Master Painters Institute (MPI) Architectural Specifications Manual, latest edition.
- 1.3.2. Engage a qualified independent inspector, with MPI Level 3 certification and acceptable to the Architect, to verify that Work conforms to Contract Documents. Include cost of inspection in Contract.
- 1.3.2. Job Mock-Up:
 - a. Prepare small sample room for painted finish, giving prime coat to one wall, two coats to second wall, and three coats to third wall. Leave sample room for that purpose until majority of Work is finished. Each coat to be tinted a different colour from previous coat.
 - b. Prepare small one wall mock-up for each individual paint colour as requested by Architect.

PAINTING

1.4. MATERIAL STANDARDS

1.4.1. Conforming to ECP-07-89/ECP-12-89

Interior Latex Type, Flat Paint	CAN/CGSB-1.100-M
Primer-Sealer, Wall, Interior Latex Type	CAN/CGSB-1.119-M
Paint, Exterior, Latex Type, Flat	CGSB 1-GP-138M
Emulsion Type Filler Masonry Block	CAN/CGSB-1.188-M
Interior Semigloss Latex Paint	CAN/CGSB-1.195-M
Primer, Exterior, Latex Type	CGSB 1-GP-203Ma
Stain, Pigmented, Exterior Latex Type	CGSB 1-GP-204M

1.5. SUBMITTALS

1.5.1. List of Materials:

Before ordering materials, submit in writing a complete list of all types and brands of materials to be used for this job and adjacent to each type state surface and/or location of application. Paint list shall bear manufacturer's certification that materials listed are premium quality. Do not order materials or commence Work until list is approved by Architect. On request of Architect, produce invoices from time to time covering all materials on job.

1.5.2. Samples: Provide 300mm x 300mm samples of each coat of each paint colour as selected by the Architect. Work must match approved samples

1.5.3. Reference Data: Provide data to Operating Manuals and Reference Data.

1.5.4. Maintenance Materials:

Provide the Owner with all opened, but not completely used materials in resealed containers, minimum 2 litres of each colour, marked with colour number for maintenance purposes.

1.6. JOB CONDITIONS

1.6.1. Inspection: Inspect all surfaces before commencement of this Work and verify their readiness for this Work.

1.6.2. Scheduling:

Commence interior Work only when building is completely enclosed and sealed, all Sections creating dirt have completed their Work, room doors are installed, heating and ventilation is provided or permanent systems are working and Work areas can be closed to traffic until Work cures.

PAINTING

1.6.3. Environmental Requirements:

Follow manufacturer's recommendations. Do not paint exterior surfaces during cold, windy, rainy or frosty weather when temperature is likely to drop below 10 deg C, when surfaces are damp or exposed to hot sun. Interior temperatures shall be at least 15 deg C, 21 deg C preferable, before commencing interior Work.

1.7. WARRANTY

1.7.1. Provide OPCA 2 year warranty.

2. PART PRODUCTS

2.1. MATERIALS

2.1.1. Standards:

a. Water Based Paint Standard:

1. In accordance with Environmental Choice Program guideline ECP-07-89, water based paint shall be formulated or manufactured free from formaldehyde, halogenated solvents, aromatic hydrocarbons, mercury or mercury compounds, or be tinted with pigments of lead, cadmium, chromium VI and their oxides.
2. Paint must have Flash Point of 61.0 deg C or greater, and not contain Volatile Organic Compounds in excess of 250 grams per litre (g/L).

b. Solvent Base Paint Standard:

1. In accordance with ECP guideline ECP-12-89, solvent based paint shall not be formulated with formaldehyde, halogenated solvents, aromatic hydrocarbons in excess of 10% of weight, mercury or mercury compounds, or be tinted with pigments of lead, cadmium, chromium VI and their oxides.
2. Paint shall have Flash Point of 37.8 deg C or greater, and not contain Volatile Organic Compounds in excess of 380 g/L.

2.1.2. Manufacturer:

The quality of paint shall be equal to the ECO label formulas prepared by Benjamin Moore "Pristine EcoSpec", Canadian Industries Limited EcoLogo, Glidden, Para Paints Eco Logo, Sherwin Williams EcoLogo, or approved similar, and applied in strict accordance with the manufacturer's directions.

2.1.3. Colours:

Refer to room finish legend, and schedule.

PAINTING

3. PART EXECUTION

3.1. PREPARATION

3.1.1. Protection:

- a. Use sufficient drop cloths and protective coverings for full protection of floors and Work not being painted. Clean any components paint spotted or soiled.

3.1.2. Coating Removal:

- a. Apply to manufacturers written instructions. Repeat as required for complete removal of existing paints from glazed blocks and mortar joints.

3.1.3. Surface Preparation:

- a. Surfaces shall be dry, clean, smooth, free from dust, dirt, grease, rust, loose crystals, or extraneous matter. Wire brush metal castings before first coat.
- b. Check non-metallic surfaces with moisture meter, do not proceed if reading is higher than 12-15% without written directions. If substrate is steel, do not apply coatings over moisture or when surface temperature is within 3 degrees Celcius of dew point.
- c. Wash unpainted or shop painted metal free of grease, dirt or oil; remove rust; then prime or spot prime where material is exposed, with rust inhibitive primer. Feather our edges to make touch up paint inconspicuous.
- d. Allow galvanized metal to weather minimum of 26 weeks and Xylene clean or abrade surface with bronze wool prior to coating.
- e. Test masonry surfaces to be painted for alkalinity. Ensure neutral pH before painting.
- f. If concrete to be painted is less than 26 weeks old, etch normal concrete surfaces with muriatic acid solution (1 part commercial 331.45% to 3 parts water). Rinse 2 or 3 times with clean water and bring pH of surface to neutral using Tri-Sodium-Phosphate (TSP) and flush and allow to dry to moisture content of 12-15% or less, read with electronic moisture meter. Confirm that no curing agents have been used on surfaces to be painted.
- g. Inspect millwork to assure surfaces are smooth, free from machine or surface marks and that nailheads have been countersunk. Seal all knots and sapwood where painted.
- h. Ensure shop sealer has been applied to glue-laminated beams.
- i. Inspect gypsum board to ensure joints are completely filled and sanded smooth. Fill small nicks or holes with patching compound and sand smooth. Remove dust prior to painting.
- j. Nail holes, splits or scratches shall be puttied or speckled smooth after prime coat. Where same occurs on transparent finish, putty shall be coloured to match finish.

PAINTING

- k. If woodwork, metal or any other surface to be finished, cannot be put in proper condition for finishing by customary cleaning, sanding, puttying operations, notify Architect in writing, or assume responsibility for and rectify any unsatisfactory finish resulting.
- l. For exposed steel in high humidity areas, prepare steel in accordance with Steel Structures Painting Council Standard SSPC.SP 6 for a Commercial Blast.

3.2. APPLICATION

- 3.2.1. Use same brand of paint for primer, intermediate and finish coats. Use approved sealer for knots and sappy areas under enamels.
- 3.2.2. Permit paint to dry before applying succeeding coats. Touch-up suction spots after application of first coat. Sand lightly between coats with No. 120 sandpaper.
- 3.2.3. Painting coats specified are intended to cover surfaces completely. If materials and colours require additional coats to ensure adequate and uniform coverage, apply further coats until complete satisfactory coverage is achieved. Minimum finish shall be Premium (three coats) as defined by OPCA. Some deep hues or bright colours may require four coats.
- 3.2.4. Areas exhibiting incomplete or unsatisfactory coverage shall have entire plane painted. Patching not acceptable. Paint entire plane of areas which have been cut and patched.
- 3.2.5. Work application:
 - a. By skilled tradespeople in accordance with manufacturer's directions and supervision;
 - b. In dust-free and suitable conditions for production of good results;
 - c. Even, uniform in sheen, colour and texture, free from brush or roller marks, sags, crawls, runs or other defects.
- 3.2.6. Apply materials by brush or roller. Airless spray painting may be permitted in specific areas but Architect must be consulted and approve each area before Work commences. Architect may at any time prohibit use of spray painting for such reasons as carelessness, poor masking or protective measures, drifting paint fog, disturbance to other trades or failure to obtain dense, even opaque finish.
- 3.2.7. Mechanical and Electrical Work:
 - a. Paint all convectors, grilles, conduit, pipes, ducts, panels, switch boxes, access panels, mechanical and electrical equipment which are not prefinished. Remove grilles, covers, access panels for mechanical and electrical systems from installed location and paint separately, if these items are not prefinished.
 - b. Paint Work to match surfaces they are seen against unless directed otherwise.
 - c. Finish interior surface of ventilation ducts where visible through grilles, diffusers, louvres, etc. Apply two coats of flatblack paint to limit of site line.

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- d. Protect gauges, identification plates and similar items from being painted over or paint splattered.

3.3. GENERAL FINISHING:

- 3.3.1. Apply primer coat to unprimed ferrous metal surfaces.
- 3.3.2. Prime woodwork designated for painting immediately upon delivery to site. Prime all surfaces of such woodwork, whether exposed or not, before installation. Back prime woodwork which is to receive transparent finish with 1 coat of transparent finish reduced 25%.
- 3.3.3. Re-seal all cut edges of wood to be painted or finished, if material was cut subsequent to initial sealing. Ensure tops and bottoms of wood doors sealed.

3.4. LIST OF FINISHES:

- a. Exterior Galvanized Steel: Unpainted.
- b. Exterior Steel: Rust inhibitor paint by Tremclad or Rustolium or Devoe.
- c. Interior and Exterior Metal (Ferrous): Exposed Structural and Miscellaneous Steel:
 - 1 coat shop applied, oil Alkyd primer (metal surfaces already primed need only touchup),
 - 1 coat 100% Acrylic emulsion, waterborne, corrosion resistant paint as tie-coat at 1.5 - 2 mils Dry Film Thickness (DFT).
 - 2 coats semi-gloss Acrylic emulsion finish at 1.2 mils/coat DFT. Total 3.9 - 4.4mils DFT.
- d. Interior Galvanized Steel (Hollow Metal Doors, Screens and Deck):
 - 1 coat 100% Acrylic emulsion, waterborne, corrosion resistant primer at 2 mils DFT.
 - 2 coats water reducible Latex house and trim paint at 1.2 mils/coat DFT. Total 4.4mils DFT. Semi-gloss finish at doors and screens/Flat finish at steel deck.
- e. Gypsum Board:
 - 1 coat Latex primer sealer at 1.0mil DFT.
 - 2 coats interior Latex enamel at 1.5mils/coat DFT. Total 4.0mils DFT.
- f. Painted Woodwork:
 - 1 coat undercoater, low-odour, pigmented, interior alkyd primer at 1.5mil DFT. VOC complying. Back paint wood base.
 - 2 coats interior Latex enamel at 1.5mils/coat DFT. Total 4.5mils DFT.
- g. Clear Finish for Wood: Penetrating wood stain by Behr, Minwax or Sikkens or Sansin for glulam and CLT.
 - 1 coat stain.
 - 2 coats water based Urethane gloss varnish at 2.0mils/coat. Total 4.0mils DFT.
- h. Knot and Sapwood Sealer: White shellac.
- i. Concrete Block:

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- 1 coat high-solids, pigmented block filler used full body, VOC complying, 3mils DFT.
- 2 coats vinyl acrylic Latex enamel, VOC complying, 1.5 mils/coat DFT. Total 6mils DFT.
- j. Painted Concrete:
 - 2 coats high-solids purpose made floor paint with non-slip surface.
- k. Insulated and Uninsulated Pipes, Ducts, Conduit, Valves, Fittings and Equipment and Ancillary Items where "Exposed" in Completed Work:
 - 1. Insulated Work: 1 coat Latex primer sealer, 1 mil DFT. 2 coats interior Latex enamel, 1.5mils/coat. Total 4.0mils DFT.
 - 2. Non-insulated Work: 1 coat structural steel primer, 1 mil DFT. 2 coats interior Latex enamel, 1.5mils/coat. Total 4.0mils DFT.
- l. Specific Areas:
 - 1. Existing previously painted walls: including Concrete block, drywall, vinyl faced and Interior Metal (Ferrous) surfaces:
 - a. Prepare existing paint by removing all loose and peeling paint. Prep surfaces to be gloss free and clean of grease and dirt. Sand entire surface using 80 – 100 grit sandpaper followed by a wash of TSP and water and rinsed with clean warm water and allowed to dry.
 - b. Apply:
 - 1 coat Devflex 4020 primer by Devoe or ICI Paints (Canada) Inc. or Sherwin-Williams, backroll to force and fill all pin holes to 3 mils DFT,
 - 2 coats Devflex 4216 to 5mils DFT by Devoe or ICI Paints (Canada) Inc. or Sherwin-Williams.

3.5. FIELD QUALITY CONTROL

- 3.5.1. Submit to OPCA, at least 4 weeks prior to commencement of Work on OPCA forms:
 - a. Request for Assignment of Inspector.
 - b. List of Paint Products.
- 3.5.2. Provide and pay for OPCA inspector to requirements of Chapter 7 of OPCA Manual and submit written reports to Consultant.

END OF SECTION

OPERABLE GLASS PARTITION

1. PART GENERAL

1.1. GENERAL REQUIREMENTS

- 1.1.1. Conform to Division 01, General Requirements.

1.2. DESCRIPTION

1.2.1. Work Included:

- a. Provide operable glass partitions for the Work.

1.2.2. Related Work:

- a. Gypsum Board: Section 09 20 15
b. Structural steel: Section 05 50 00

1.3. REFERENCES

1.3.1. Conform to the following:

- a. ASTM C1048-92 - Glass
b. ASTM E90 – Sound transmission coefficient
c. CAN3-S157-M, Strength Design In Aluminum
d. CSA-W59.2-M, Welded Aluminum Construction
e. CAN3 S16.1-M: For steel reinforcement and support brackets

1.4. SUBMITTALS

1.4.1. Shop Drawings:

- a. Submit Shop Drawings bearing seal of Ontario Registered Professional Structural Engineer responsible for design and fabrication.
b. Indicate reinforcing and support steel sizes and associated design loads.
c. Submit data sheets for Hardware.

1.4.2. Test Report Submission:

- a. Supply a copy of an acoustic test report certifying that the partition was tested with a performance of 44 STC by an independent accredited laboratory. The partition tested must be fully functional, sized at 4267mm X 2743mm (14'0" X 9'0") and meet ASTM-E90 standard. The test results must be like or exceed the specified performance. The acoustical test report must show the weight and the panel construction as well as the acoustical seals tested

OPERABLE GLASS PARTITION

1.5. PRODUCT DELIVERY, STORAGE AND HANDLING

- 1.5.1. Proper storage of partitions before installation and continued protection during and after installation will be the responsibility of the General Contractor.

1.6. WARRANTY

- 1.6.1. Warrant work of this Section against defects and deficiencies for period of 1 year in accordance with General Conditions of the Contract. Warrant track and trolley system against defects and deficiencies for period of 5 years.

2. PART PRODUCTS

2.1. MATERIALS

- 2.1.1. Acceptable Products: Aluminum frames glass panels, manually operated

1. Series G-701 by Corflex.;

- a. Series G-701 by Corflex;
- b. approved equal.

- 2.1.2. Panels: Extruded aluminum frame 60mm (2 3/8") reinforced with concealed corner brackets.

- 2.1.3. Glass: Double sealed glazed tempered glass 51mm (2") thick.

- 2.1.4. Fabrication:

- a. The leading vertical edge of each panel shall incorporate a tongue with two vinyl gaskets to nest into the vertical recess in the edge of the adjoining panel creating a positive, interlocking joint that provides panel stability, ease of panel alignment and sound control.
- b. Horizontal seals must not exceed the panel width to prevent damage while handling.
- c. Top seals shall be continuous contact vinyl sweeps.
- d. Top and bottom horizontal seals shall be continuous contact, multi-layer, vinyl sweep seals.
- e. The top seals maintain contact with the track and the bottom seals maintain contact with the floor or other surface along the path of the movable wall.

- 2.1.5. Suspension System:

- a. Track shall be of clear anodized architectural grade extruded aluminum alloy 6063-T6. Track #36 design shall provide integral support for adjoining ceiling, soffit, or plenum sound barrier. Tracks shall be connected to the structural support by pairs of 10mm (3/8") diameter threaded steel hanger rods. L or T intersections shall be factory assembled and welded.

OPERABLE GLASS PARTITION

- b. Built-in ceiling trim shall be of anodized aluminum finish providing enclosure of plenum sound barrier on both sides of track for maximum sound control. A section of track will be removable to make it possible for a panel to be removed from the track for later maintenance.
- c. Each panel shall be supported by two dual horizontal wheel type trolley assemblies. Only the last or before last panel will have a visible locking device installed in the bottom rail.
- d. Each panel shall be supported by two-wheel counter-rotating horizontal carriers. Wheels to be of precision ground steel ball bearing with heat treated and hardened races encased with molded polymer tires.

2.1.6. Finishes:

- a. Aluminum components: Clear Anodized.
- b. Vinyl and PJC trim: Black, grey or beige as selected by Architect.

2.1.7. Operation:

- a. Top supported panels and manually operated.
- b. Hinged closure panel: Final partition closure to be by a full height hinged closure access panel at one end of the opening that hinges from a fixed two-piece telescopic aluminum jamb.
- c. The hinged panel shall be fitted with a lever type latches or lockset. Foot bolt to activate at the bottom of the panel next to the hinged closure panel.

2.1.8. Acoustical Performance:

- a. Panels to have an acoustic performance of STC 44.

3. PART EXECUTION

3.1. INSTALLATION

- 3.1.1. Provide anchors to be built into structure to the appropriate Sections for setting in.
- 3.1.2. Supply fastenings and anchors required to be built in to Work of other Sections to other Sections as required, and direct their proper installation.
- 3.1.3. Glazing:
 - a. Clean sealing surfaces at perimeter of glass, and sealing surfaces of rebates and stops, before applying any glazing material; use only solvents and cleaning agents recommended by glazing material manufacturer.
 - b. Centre glass in rebate to maintain specified clearances at perimeter on all four sides. Maintain centered position of glass in rebates on both sides of glass. Provide setting blocks as recommended by glass manufacturer as required, 70 to 90 points Shore "A" hardness, under each glass light; locate at quarter points.

OPERABLE GLASS PARTITION

3.1.4. Adjust and Cleaning:

- a. Remove strippable protective coatings before they have thermoset, and leave glass, framing members, and adjacent Work clean and unblemished upon completion of Work.
- b. Adjust all hardware for proper operation.

END OF SECTION

FLEXIBLE LABORATORY FURNITURE SYSTEM

- 1. PART GENERAL
- 1.1. GENERAL REQUIREMENTS
 - 1.1.1. Conform to Division 01, General Requirements.
- 1.2. SECTION INCLUDES
 - 1.2.1. Modular Support Structure and Structural Table Base.
 - 1.2.2. Mobile Base / Wall Cabinets and Shelves.
 - 1.2.3. Fixtures and related Service Connections.
- 1.3. RELATED SECTIONS
 - 1.3.2. Solid Composite Worksurfaces: Section 12 36 53
 - 1.3.4. Plumbing Fixtures: Division 22
 - 1.3.5. Electrical: Division 26
- 1.4. REFERENCES
 - 1.4.1. SEFA 8: Laboratory Furniture – Casework, Shelving and Tables Guidelines
 - 1.4.2. ISO 9001:2015 – Quality Management International Standards Organization (ISO).
- 1.5. SUBMITTALS
 - 1.5.1. Product Data: Drawings to include data and details for construction of the laboratory furniture. Further, provide name, quantity, type and construction of materials (such as hardware, gauges, etc).
 - 1.5.2. Shop Drawings:
 - a. Provide shop drawings showing the layout and placement of all products by this section.
 - b. Show the type and location of all service fittings by this section.
 - c. Preparation instructions and recommendations.
 - d. Storage and handling requirements and recommendations.
 - 1.5.3. Selection Samples: Submit: one complete set of color chips showing the manufacturer's full range of colors. Minimum sample size: 2" x 2-1/2".
 - 1.5.4. Quality Assurance/Control: Design Data/Test Reports: Submit test data and design criteria in compliance with the project specifications.
- 1.6. QUALITY ASSURANCE
 - 1.6.1. Manufacturer Qualifications:
Provide to the Architect at least ten days prior to the bid opening:
 - a. List of manufacturing facilities.
 - b. Construction details depicting the materials, sizes, and methods of construction.
- 1.7. DELIVERY, STORAGE AND HANDLING

FLEXIBLE LABORATORY FURNITURE SYSTEM

- 1.7.1. Packaging, Shipping, Handling and Unloading:
 - a. Products to have packaging adequate to protect finished surfaces from soiling or damage during shipping, delivery, and installation.
 - b. Delivery: Product delivery to take place after painting, utility rough-ins and related activities are completed that could otherwise damage, soil or deteriorate casework in installation areas.
 - c. Handling: Always use proper moving equipment and personnel. Any wrapping or other method of protection to be left in place to avoid damage.
- 1.7.2. Acceptance at Site: Product is not to be delivered or installed until the conditions specified under Part 3, Installation, have been met.
- 1.7.3. Storage: Product to be stored in the area of installation. If it is necessary for product to be temporarily stored in an area other than the installation area, the environmental conditions to meet the environmental requirements specified under the Project Site Conditions article of this section.
- 1.7.4. Waste Management and Disposal: Remove any waste or refuse resulting from the installation of laboratory furniture products. Leave the project site broom clean and free of debris. Trash container(s) to be provided by others.
- 1.8. PROJECT SITE CONDITIONS
 - 1.8.1. Building must be enclosed. Windows and doors sealed and weather-tight.
 - 1.8.2. An operational HVAC system that maintains temperature and humidity at occupancy levels must be in place.
 - 1.8.3. Adjacent and related work to be complete.
 - 1.8.4. Ceiling, overhead ductwork and lighting must be installed.
 - 1.8.5. Site must be free of any further construction such as "wet work".
 - 1.8.6. Required backing and reinforcements must be installed accurately, and the project must be ready for furniture installation.
- 1.9. WARRANTY
 - 1.9.1. Furnish a written warranty that work performed under this section to remain free from defects as to materials and workmanship for a period of two years from date of shipment. Defects in materials and workmanship that develop within this time are to be replaced without cost or expense to the Owner.
 - 1.9.2. Defects include, but are not limited to:
 - a. Ruptured, cracked, or stained coating
 - b. Discoloration or lack of finish integrity
 - c. Cracking or peeling of finish

FLEXIBLE LABORATORY FURNITURE SYSTEM

- d. Slippage, shift, or failure of attachment to wall, floor, or ceiling
- e. Weld or structural failure
- f. Warping or unloaded deflection of components
- g. Failure of hardware

1.9.3. The warranty with respect to products of another manufacturer sold by Mott Manufacturing is limited to the warranty extended by that manufacturer to Mott Manufacturing.

2. PART PRODUCTS

2.1. MANUFACTURER

- 2.1.1. Acceptable Manufacturer:
- a. Mott Manufacturing Ltd.; as represented by MottLAB or equal.
 - b. Other manufacturers that comply with the minimum thicknesses of material and similar construction appearance and quality as specified and shown in drawings.

2.2. MATERIALS

- 2.2.1. Sheet Steel: Mild steel, cold rolled furniture grade to requirements of ASTM A1008/A1008M, Grade C or higher
- 2.2.2. Galvanized Sheet Steel: Commercial quality, to ASTM 653, Designation Z275.
- 2.2.3. Stainless Steel: to ASTM A240, T304 and T316 alloy, #4 brushed finish.

2.3. DESIGN REQUIREMENTS

Basis of design: Mott Manufacturing Altus Table system.

- 2.3.1. Modular system to be made of tubular style framing combined with rectangular formed steel uprights.
- 2.3.2. Allow for custom cabinet size fabrications as noted on Drawings.
- 2.3.3. Tubular Frames / Table Supports to be adjustable height in 1" increments and complete with levelers.
- 2.3.4. Rear frame to be used for carrying services and electrical conduit.
- a. Rear upright supports to be equipped with slots for adjustable shelving and levelers.
 - b. All services supplied with hose and quick disconnect to reach ceiling panel supply.
- 2.3.5. Assembled frame to be self-supporting without needing to be anchored to the building.
- 2.3.6. The modular system must ship complete from the factory with minimal on-site assembly.

FLEXIBLE LABORATORY FURNITURE SYSTEM

- 2.3.7. Altus Tables (**C1c** through **C1d** on Laboratory Architect Drawings) without upright supports are not to have pre-plumbed or pre-wired services in them, however, they are otherwise constructed as described herein.
- 2.4. ALTUS CONSTRUCTION
- 2.4.1. Rear Support Structure:
- a. Nominal rear frame dimensions: Width: 48", 60", 72", Depth: 3", Height: 84"
 - b. Rear Uprights:
 - i. 2" x 3" 14 ga. powder coated cold rolled steel
 - ii. 2" diameter nylon leveling glide 3/8" x 2-1/2" long threaded stem.
 - c. Upper Cross Rail: 16 ga. powder coated cold rolled steel
 - d. Load Capacity: Rear Upright to support up to 3 shelves loaded to a combined maximum of 400lbs. Shelf depths available as 12" or 15" deep.
 - e. Uprights to house services, electrical and data cables:.
 - f. Wire management tray to be under countertop.
 - g. Rear posts have slots punched on 1" increments starting at nominal 59" above the finished floor.
- 2.4.2. Tubular Table Assembly:
- a. Nominal table assembly dimensions: Width: 48", 60", 72", Depth: 23" or 29", Height: Adjustable from 29" – 36" (not including work surface).
 - b. Tubular Table Legs:
 - i. 2" outside square, 14ga. powder coated cold rolled steel.
 - ii. 1-3/4" outside square, 11ga. powder coated cold rolled steel inner telescoping leg.
 - iii. 2" diameter nylon leveling glide 3/8" x 2-1/2" long threaded stem
 - c. Capable of vertical height adjustment in 1" increments.
 - d. Table assembly to be fastened to the rear upright with two (2) hex 3/8" socket head bolts.
 - e. Hanging Rails: Front apron and rear support are to have rails allowing suspended cabinets to hang from.
 - f. Leveling Bolt: Frame to be fitted with a leveling bolt which will allow the legs to be adjusted for proper alignment of work surface height.
 - g. Load Capacity: Table frame to support 1000lbs maximum, width of bench may not exceed 72".
- 2.4.3. Shelves:
- a. Nominal shelf dimensions: Width: 48", 60", 72". Depth: 12" or 15" for shelves. 1" thick.

FLEXIBLE LABORATORY FURNITURE SYSTEM

- b. Shelf requirements:
 - i. Shelves constructed of powder coated cold rolled steel.
 - ii. Shelves to be flush with the face of the rear rectangular posts.
 - iii. Shelf brackets to be constructed powder coated cold rolled steel
 - iv. Bottom and middle shelves to have a rear 1" high retaining lip. Top shelf assemblies do not come with retaining lip.
 - v. Vertical shelf adjustment in 1" increments.

2.4.4. Mobile Base Cabinets:

- a. Design and construction to be as in section 12 35 53.13 Metal Laboratory Casework.
- b. Minimum each and to be locking type. Cabinet height must ensure 2-½" of clearance under the table frame.

2.4.5. Plumbing/Fixtures:

- a. Provide fixtures as shown on drawings.
- b. Rear upright structure to support a maximum of three plumbing fixtures on one side.
- c. Compressed air fixture: dual-90 degree celcon needle valves, ColourTech (white).
- d. Nitrogen air fixture: dual-90 degree celcon needle valves, ColourTech (white).
- e. Vacuum air fixture: dual-90 degree celcon needle valves, ColourTech (white).
- f. Plumbing lines to be polyurethane routed out the top of the upright.
- g. All plumbing to have service hose at the top of the upright with additional 4' of hose length to reach the ceiling supply panel.
- h. Plumbing to be arranged that they services cannot be intermixed.
- i. All service valves and quick disconnects to be keyed and color coded. Only plug and body connects of the same key will couple and allow flow.

2.4.6 Electrical: Each Altus table to have 6 120V Receptacles, 2-20A circuits, factory prewired and complete with a 4' cord and twist lock plug.

2.4.7. Data: Each Altus table to have a factory pre-wired data receptacle (Cat 6A) capable of providing 4 ethernet connections.

2.5. CEILING SERVICE PANELS

2.5.1. General Construction:

- a. Panels shall be compatible with most T-grid acoustical suspended ceiling structures.
- b. Panel shall provide a means to mount and disconnect quick connect service fixtures, electrical and data outlets.
- c. Panel shall accommodate single sided and back-to-back bench configurations.
- d. Panels ship with junction boxes and cover plates.

FLEXIBLE LABORATORY FURNITURE SYSTEM

- e. Provide quick connect fitting, electrical receptacles, and data receptacles as shown on drawings.
- f. Panels shall be 23-³/₄" x 23-³/₄" x 1", 14 gauge cold rolled steel with a powder coated finish. Colour by Architect.

2.6. STEEL FURNITURE FINISH

- 2.6.1. Metal finishes to meet or exceed current SEFA standards.
- 2.6.2. Provide a third-party certificate to showing compliance.
- 2.6.3. Colour selection per Drawings.

3. PART EXECUTION

3.1. INSTALLATION

- 3.1.1. Install casework within system, align and set level with levelling devices, in accordance with shop drawings.
- 3.1.2. At wall locations secure wall cabinets to face of finished walls and partitions, applying self-tapping screws through wall finish material into each concealed stud flange.
- 3.1.3. Install components to provide a secure, neat, and complete installation.

END OF SECTION

SOLID COMPOSITE WORK SURFACES

PART 1. GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Conform to Division 01, General Requirements.

1.2 SECTION INCLUDES

- .2 Solid composite work surfaces.

1.3 RELATED SECTIONS:

- .1 Flexible Laboratory Furniture System: Section 12 35 53
.2 Plumbing Fixtures: Div 24

1.4. REFERENCES

- .1 SEFA 3-2010 Recommended practices for laboratory work surfaces
.2 International Standards:
.1 ASTM D3023 & C1378 – Stain Resistance
.2 ASTM D696 – Thermal Co-efficient of Expansion
.3 ASTM E1428 / JIS Z 2801:2012 (mod) – Bacteria Resistance
.4 EN 438-2:12 – Boiling water absorption
.5 EN 438-2:16 – Standard Test Method for Resistance to Dry Heat
.6 EN 12721 – Standard test method for resistance to wet heat
.7 EN 438-2:17 Dimensional stability in elevated temperature (ASTM D648 – Heat distortion)
.8 EN 438 – 2:21 – Impact resistance
.9 EN 438 -2:25 – Standard Test Method for Resistance to Scratch
.10 EN 438 – 2:27 – Light fastness
.11 EN ISO 178/ASTM 790-08 – Elasticity and flexural strength
.12 EN ISO 1183 – Density
.13 ASTM e-84 – Surface burning / flame spread.
.14 ASTM D785 – Rockwell hardness
.15 ISO 9001 – quality management systems
.16 ISO 14001: 2015 – Environmental management system
.17 ISO 50001:2018 – Energy Management System
.18 ISO 45001:2018 -Occupational health and safety management system

1.5. SUBMITTALS

- .1 Submittals for Review in accordance with Section.
.1 Product data: Manufacturer's data sheets on each product used,

SOLID COMPOSITE WORK SURFACES

including preparation instructions/installation instructions and recommendations; storage & handling requirements.

.2 Samples:

- .1 Selection Samples: for each product specified, submit a complete set of color samples representing manufacturer's full range of standard colors
- .2 Verification samples: Submit four samples 100mm x 150mm representing each color and thickness of material used

.2 Quality Control Submittals: Test Reports – independent/certified test reports showing compliance with specified performance characteristics and physical properties.

1.6. QUALITY ASSURANCE

.1 Manufacturer qualifications:

- .1 Primary product furnished by a single manufacturer with a minimum of 10- years (documented) experience in work of this section.
- .2 Products manufactured in an ISO 9001 certified facility.

1.7. WARRANTY

Provide warranty for an extended period of 10 years. The warranty to include the specified physical and chemical properties. The manufacturers authorized fabricator, product installer and panel manufacturer must sign the warranty documents and submit a copy to the contractor.

PART 2. PRODUCTS

2.1. MANUFACTURER

- .1 Fundermax
- .2 Durcon SPC Chemical Resistance

2.2. MATERIALS

- .1 Basis of Design: Fundermax Max Resistance² with post-consumer recycled content (min 65%), a double sided and double-cured polyurethane acrylic surface finish (Optional: with Color Through Core)
- .2 Basis of Design Product: Subject to compliance with requirements, provide phenolic Max Resistance² with post-consumer recycled content (min 65%), double hardened acrylic coating top and bottom as manufactured by Fundermax GmbH, or a comparable product by one of the following:
 - .1 Fundermax GmbH / Fundermax North America LLC
 - .2 Durcon

SOLID COMPOSITE WORK SURFACES

Typical Counter SS2	Fundermax Max Resistance ² (Option: Colour Through Core)
ESD Counter SS3	Fundermax MAX Compact Interior (in clean room only)
Typical Base - white	Mott Altus Table System (Option: No services/shelves)
ESD Base be - white	Mott Altus Table System (Option: Grounding Lug)
Fundermax's Colour Core to match counter surface colour - Volcano Grey 2181	

- .2 Grommets: Provide 50mm dia grommets by Hafele or approved equal.
 Location to be determined on site

2.3. MATERIAL PROPERTIES

- .1 Work surfaces – shall be constructed of chemical resistant panels that are double sided and color matched top and bottom.
- .2 Thickness – As specified on drawings or by Architect.
- .3 Cabinets – shall be constructed as per the cabinet manufacturer's specification with chemical resistant panels that are double sided with a double cured polyurethane integrated acrylic surface.
- .4 Color: Colored Core to be Selected by Architect: 0085 white with 0085 white core; 0074 pastel grey with 0074 pastel grey core; 0077 charcoal with 0077 charcoal core; 2181 volcano with 2181 volcano core.
- .5 Finish – matte non-glare.
- .6 Chemical resistance
 - .1 Evaluation of chemical resistance based on SEFA 3-2010 Laboratory Work Surfaces standard list of 49 chemicals / concentrations, their required methods of testing (24-hour surface test) and exceed the acceptable results as a means of establishing an acceptable level of performance for all exposed and semi- exposed surfaces.
 - .2 The chemical resistance performance as follows:
 - .1 Rating Scale:
 - Level 0 - No detectable change.
 - Level 1 - Slight change in color or gloss.
 - Level 2 - Slight surface etching or severe staining.
 - Level 3 - Pitting, cratering, swelling, or erosion of coating. Obvious and significant deterioration.

SOLID COMPOSITE WORK SURFACES

CHEMICAL/REAGENT	TEST METHOD	RATING
ACETATE, AMYL	A	0
ACETATE, ETHYL	A	0
ACETIC ACID - 98%	B	0
ACETONE	A	0
ALCOHOL, ETHYL	A	0
ALCOHOL, METHYL	A	0
ALCOHOL, BUTYL	A	0
AMMONIUM HYDROXIDE, 28%	B	0
BENZENE	A	0
CARBON TETRACHLORIDE	A	0
CHLOROFORM	A	1
CHROMIC ACID - 60%	B	0
CRESOL	A	1
DICHLORACETIC ACID	A	2
DICHROMATE ACID 5%	B	1
DIMETHYLFORMAMIDE	A	0
DIOXANE	A	0
ETHYL ETHER	A	0
FORMALDEHYDE, 37%	A	0
FORMIC ACID - 90%	B	1
FURFURAL	A	1
GASOLINE	A	0
HYDROCHLORIC ACID 37%	B	0
HYDROFLUORIC ACID, 48%	B	1
HYDROGEN PEROXIDE, 30%	B	2
IODINE, TINCTURE OF	B	1
METHYL ETHYL KETONE	A	0
METHYLENE CHLORIDE	A	0
MONOCHLOROBENZENE	A	0
NAPHTHALENE	A	0
NITRIC ACID 20%	B	0

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NITRIC ACID 30%	B	0
NITRIC ACID 70%	B	0
PHENOL, 90% (WT)	A	1
PHOSPHORIC ACID 85%	B	0
SILVER NITRATE, SATURATED	B	0
SODIUM HYDROXIDE FLAKE	B	0
SODIUM HYDROXIDE, 10% (WT)	B	0
SODIUM HYDROXIDE, 20% (WT)	B	0
SODIUM HYDROXIDE, 40% (WT)	B	0
SODIUM SULFIDE SATURATED	B	0
SULFURIC ACID, 33%	B	0
SULFURIC ACID, 77%	B	0
SULFURIC ACID, 77% & NITRIC ACID, 70% EQUAL PARTS	B	2
SULFURIC ACID, 96%	B	1
TOLUENE	A	0
TRICHOLOROETHYLENE	A	0
XYLENE	A	0
ZINC CHLORIDE, SATURATED	B	0

.7 Physical Properties:

- .1 Density DIN 52350 / ISO 1183: $\geq 1,35\text{g/cm}^3$ / $\geq 84\text{lbs/ft}^3$.
- .2 Modulus of elasticity EN ISO 178: $\geq 9000\text{MPa}$ / $\geq 1,305,340$ psi.
- .3 Flexural Strength EN ISO 178: ≥ 80 MPa / $\geq 11,603$ psi.
- .4 Tensile Strength EN ISO 527-2: ≥ 60 MPa / $\geq 8,702$ psi.
- .5 Resistance to Scratching EN 438-2 point 25: 4-6 N (6N = 1.35lbf).
- .6 Resistance to Impact EN 438-2 point 21: $\geq 8\text{mm}$ / $\geq 1/3''$.
- .7 Resistance to stress Abrasion EN 438-2 point 10: ≥ 450 U (rotations).
- .8 Dimensional stability measured at elevated temperatures with moisture change EN 438-2, point 17: $\leq 0.10\%$ length : $\leq 0.21\%$ width (CGS).
- .9 Resistance to boiling water EN 438-2, point 12: 0.5% (CGS/CGF) 1.5 (BCS).
- .10 Co-efficiency of thermal expansion DIN 52328: 20×10^{-6} .
- .11 Resistance to dry heat EN 438-2, point 16: 4.

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- .12 Resistance to staining EN 438-2, point 26 (group 1-2): 5 no visible changes, no blisters or cracks.
- .13 Light fastness EN 438-2 point 27: 4 or 5.
- .14 Non porous and non-microporous surface and edges.
- .15 Surface will not support bacteria growth.
- .16 Will not support oxidation of material surface.
- .17 Both sides decorative and chemical resistant.
- .18 Double hardened acrylic surface finish.
- .19 Min thickness of the acrylic finish: $\geq 0,1\text{ mm} / 0.004''$
- .20 Environmental standards: FSC / PEFC certification ; Environmental Product Declaration (EPD) ; Manufacturer recycles waste and cutoffs to produce green electricity.
- .21 Fire Rating:
 - 1. Flame Spread Index: 25
 - 2. Smoke Developed Index: 130

2.4. FABRICATION

- .1 Fabricate panels as per shop drawings: Drip grooves 3mm set back 6mm from face on the underside at all exposed edges unless otherwise noted on Laboratory Furnishings drawings.
- .2 Standard **Edge** treatment:
 - .1 All exposed edges to be sanded to a smooth finish.
 - .2 All edges to be **standard** edge type.
- .3 Curb/Back splash
 - .1 Supplied loose for field installation.
 - .2 Same material as the work surface/countertop.
 - .3 4" high unless otherwise indicated on the drawing.
 - .4 Bonded to the top of the work surface to form a square joint.
- .4 Joints:
 - .1 Tight fitting butt joints (recommended) – adhered with reactive adhesive/resin adhesive or mechanical fasteners positioned to be concealed after installation.
 - .2 Standard butt joints – a 1.5mm seam using a two-part epoxy adhesive/grout.
 - .3 Fix work surface panels with blind fastenings into the back or underside

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of the panel. Use #10, type A sheet metal screws sized to stop at least 3mm short of the finished face. Pre-drill panel with clearance hole in the supporting structure. Or Max Compact panels can be bonded to wood materials using a high-quality PVA glue.

.5 Sink cutouts:

- .1 Drop in – shall be routed to form openings with 10mm minimum depth supporting flanges and such that the rim of the sink, when installed is at the same level as the work surface top. Epoxy sinks shall be set in a bed of two-part epoxy adhesive/grout. Stainless steel and polypropylene sinks shall be set in a bed of silicone sealant.
- .2 Under Mount – routed to form smooth edged openings with the top edge radius. The bottom edge of the sink opening shall be finished smooth with the edge broken to prevent sharpness. Corners of sink cutouts shall be radius not less than 3mm. All undermount sinks shall be supported by brackets blind fixed to the underside of the work surface and/or cabinet.

.6 Allowable tolerances:

- .1 Square: +/- 1.0mm per running foot
- .2 Location of cutouts / drilled openings: +/- 1.0mm of design dimension
- .3 Size of cutouts / drilled openings: +/- 1.0mm.

PART 3. EXECUTION

3.1. EXAMINATION

- .1 Do not begin installation of work surfaces/countertops until cabinets have been installed.
- .2 Confirm that surfaces to receive tops are plumb, level with a maximum deflection of 6mm in 6.0m.

3.2. PREPARATION

- .1 Prepare surface as per methods recommended by manufacturer.

3.3. INSTALLATION

- .1 Install in accordance with approved shop drawings and manufacturer's instructions.
- .2 Adhere to adjacent surfaces in accordance with manufacturer's recommendations.
- .3 Fasten tops to supporting construction with adhesive appropriate for use with adjoining construction and as recommended by the manufacturer.
- .4 Form field joints using manufacturer's recommended adhesive. Joints to be

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inconspicuous and nonporous.

- .5 Install laboratory shelving, pegboards, and reagent racks using fasteners and adhesive appropriate for use with adjoining construction and as recommended by the manufacturer.

- .1 Adhesive options: For installation of materials in permanent location bond joints with a high chemical resistant sealant with color similar to base material.

3.4. PROTECTION

- .1 Following installation, the General Contractor shall ensure the work surfaces/countertops are protected from damage. The tops shall be kept free from paint, plaster, cement scratches or any other destructive forces.

END OF SECTION

MODULAR CLEANROOM

1. PART GENERAL

1.1. GENERAL REQUIREMENTS

- 1.1.1. Conform to Division 01, General Requirements.

1.2. DESCRIPTION

1.2.1. Work Included:

- a. Provide Modular Cleanroom for the Work.

1.2.2. Related Work Specified Elsewhere:

- a. Rubber Sheet Flooring: Section 09 65 15
b. Mechanical: Division 20-25
b. Electrical: Division 26

1.3. REFERENCE STANDARDS

- 1.3.1. ISO 14644-4 Design, Construction and Start Up – Cleanrooms and associated controlled environments
- 1.3.2. NAPRA – Model Standards for Pharmacy Compounding of Non-Hazardous Sterile Preparations - 2016
- 1.3.3. NAPRA – Model Standards for Pharmacy Compounding of Hazardous Sterile Preparations – 2016.
- 1.3.4. 2017 – USP Compounding Compendium General Chapter 797, General Chapter 800.
- 1.3.5. CSA Z317.2-15 – Special requirements for heating, ventilation, and air-conditioning systems in health care facilities.
- 1.3.6. CSA Z317.13-17 – Infection Control during Construction Renovation and Maintenance of Health Care Facilities.

1.4 SYSTEM DESCRIPTION

1.4.1. Cleanroom Modular Wall/Ceiling System Requirements:

- a. Construct cleanroom of modular aluminum honeycomb panels c/w galvanized steel skins, uPVC finish and demountable panels with fine line seams and cold welded finish.
- a. Non-walkable cleanroom ceiling system with Precision T Grid Clear Anodize Aluminum Finish and D-Lite Solid Core Ceiling.

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1.4.2. Performance:

- a. Meet NAPRA model standards, Section 5.3 requirements for construction and performance.
- b. Primary compounding rooms designed as 'Clean-Not-Classified' with a minimum of 10 ACH. Room conditions of 20C, 30%RH – 50%RH.
- c. Design conditions outside of clean room: 23° C dry bulb max. and 18 °C max. wet bulb.
- d. Provide an overall safety factor on loads and equipment selection of 5%.
- e. Lighting levels in the room in accordance with CSA Z317.5.
- f. Power receptacles as noted on drawings imbedded in wall system. No exposed conduits or raceways.
- g. Trim kit to fit room into adjacent architectural finishes

1.4.3. Mechanical Systems:

- a. Base building contractor to provide:
 - 1. Conditioned ventilation/cooling air, and exhaust ductwork to the perimeter of the cleanroom as indicated on the mechanical drawings/specifications.
 - 2. Sprinkler system for cleanroom area. Openings in cleanroom panels by this Section.
- b. This Section responsible for the design and installation of all ductwork, dampers, air valves, exhaust ducting, and pressure control for cleanroom.
- c. Provide terminal HEPA units for supply air to cleanroom.
- d. Provide pressure control monitoring to provide audible and visual indication of alarm conditions.

1.4.4. Electrical Systems:

- a. Provide distribution panel and wiring, receptacles, data, lighting, and controls within cleanroom.

1.5 SUBMITTALS

1.5.1. Provide submittals in accordance with Section 01 33 00.

1.5.2. Shop Drawings:

- a. Include in drawing plan view of room and equipment, elevation view with equipment, electrical power and control drawings and equipment list. Construction/layout, equipment sizes, equipment capacities, air delivery

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systems relative to system load including safety factor and lighting design calculations.

b. HVAC Shop Drawings:

1. *Indicate unit, complete specifications, dimensions, sizes, required clearances, and connection details to base building systems.*
2. *Product data to indicate dimensions, weights, and ratings, characteristics and finish materials.*
3. *Indicate product data on all filtration media and filter performance.*
4. *Indicate electric requirements for power supply wiring including wiring diagrams for interlock and control wiring.*
5. *Indicate all control system components, devices, and assembly complete with schematic wiring diagrams and control sequence descriptions.*
6. Sizing and details of dedicated HVAC and Terminal Fan powered HEPA systems.
7. HVAC and pressure control details.

c. Indicate features of units including but not limited to the following: switches, locks, doors, light fixtures, shelving, services, recorders, utility connection points, signage, and closure trim. Dimension items for both size and location. Shop drawings shall note work provided by others. Coordinate services with mechanical, electrical, and other trade subcontractors.

d. Provide lighting calculations to support the number of fixtures required. Provide output from the IES approved software system indicating luminance calculations to meet the required CSA 317.5 illumination requirements. Provide a reflected ceiling plan that supports the desired luminance level. Provide cut sheet of selected high efficiency LED lighting fixtures.

1.5.3. Samples: Submit one sample of panel finish when requested by Consultant.

1.5.4. Provide operation and maintenance data for incorporation into manual specified in Division 01.

1.5.4. Provide testing plan, from third party testing company, for certification of the cleanroom.

1.6 QUALITY ASSURANCE

1.6.1. Supply, installation and commissioning of the Cleanroom must conform to ISO 14644. All design drawings must be reviewed and approved by on-staff Professional Engineer and must demonstrate local warranty and service support.

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1.7 DELIVERY, HANDLING and STORAGE

- 1.7.1. Deliver, store and handle materials in manner to prevent damage and deterioration. Protect all factory finished panel surfaces subject to damage while in transit and after installation.
- 1.7.2. Do not deliver materials or assemblies to site until installation spaces are ready to receive rooms. Cover and protect panels as required to prevent site damage.

1.8 WARRANTY

- 1.8.1. Provide written warranty stating the product is free from defects in material or workmanship under normal use and service. The warranty to cover the following:
 - a. One-year parts and labour warranty on all components.
 - b. Five-year panel warranty.
- 1.8.2. Warranty to indicate, that one year after acceptance, the cleanroom will, under normal operation.
 - a. Maintain within specified tolerance the selected temperature settings.
 - b. Be free from defects due to faulty materials or workmanship.

2. PART PRODUCTS

2.1. ACCEPTABLE CLEAN ROOM MANUFACTURERS

- 2.1.1. Basis of Design: Labworks International, Woodbridge, ON – 416.977.5477.
- 2.1.2. Equal: Environmental Systems Corp., Barrie ON. 705.797.8877.
- 2.1.3. Equal: Mecart, St. Augustin-de-Desmaures, QC, 418.880.7000.

2.2. MATERIALS and COMPONENTS

2.2.1. Cleanroom Wall System:

- a. Description: Non-load bearing, flush wall system with aluminum honeycomb core, galvanized steel skins and un-plasticized PVC finish on both sides. Wall panels shall snap into aluminum furring clips and be demountable with fine line seams, cold welded except for removable panels. Caulk removable panels.
- b. Materials: Panel size: Maximum 1219mm x 4876mm. Panel thickness – 50mm for studless panel system, 12mm for liner panel. Galvanized steel skin 30ga.

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- c. *Liner Panels: Matching UPVC finish and sealed seams and attached to standard stud wall where noted on drawings.*
- d. *Panel Fabrication: Continuously bonded galvanized steel skins to aluminum honeycomb creating a homogeneous construction panel.*
- e. *Screed system to allow for leveling of wall system. Screed to be recessed to allow for flooring to be coved in place.*
- f. *Panels to incorporate chase-ways as required for services in the clean room.*
- g. *Finish: Snow white uPVC on both sides.*
- h. *Low Level Return Air Chases: Construct low-level return air chases with either raised wall opening or stainless-steel grille. Locate as required for required performance of the room.*

2.2.2. Cleanroom Ceiling System:

- a. *Description: Non-walkable ceiling with T-Bar suspension system with 50mm x 38mm gasketed grid in powder-coated white finish. Demountable panels with fine line seams.*
- b. *Materials: Panel size – maximum 1470mm x 3048mm. Panel thickness 50mm. Galvanized steep skin 30 ga.:*
 - 1. *Mounting Components – Zinc plated steel plates, turnbuckles and fasteners to be zinc plated steel.*
 - 2. *Light / Filter Frames – welded T-bar frame with a powder coat hybrid polyester-epoxy white paint finish, sized to match fixture requirements*
- c. *Panel Fabrication: Continuously bonded galvanized steel skins to aluminum honeycomb creating a homogeneous construction panel.*
- d. *Finish: Snow white uPVC on cleanroom side.*

2.2.3. Coves:

- a. *Description: Snap-in PVC coving with preformed PVC internal and external corners to receive coving allowing for a continuous smooth system.*
- b. *Materials: Cove – white, 50mm radius extruded PVC. Attachment track: Mill finish, extruded aluminum. Preformed corners – injection molded smooth PVC.*
- c. *Cold-weld sealed on all sides.*

2.2.4. Flooring:

- a. *As specified in Section 09 65 16.*

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2.2.5. Cleanroom Windows:

- a. *Description: Double glazed, trim-less, flush window system for installation in wall system.*
- b. *Unit thickness 50mm.*
- c. *Glazing – 2 – 5mm clear tempered panes.*
- d. *Edge Construction: Black powder coated extruded aluminum glazing frame with groove to facilitate the joining and support to the adjacent panel utilizing a plastic spline connector.*
- e. *Glass to be bonded to aluminum glazing frame.*
- f. *Vent glazing frame to interior of window and filled with desiccant*

2.2.6. Aluminum Cleanroom Doors:

- a. *Description: Welded Miter or standard crimp miter, powder coated hybrid polyester-epoxy painted door units with full glaze and specified hardware. (See Door Schedule and Door Spex).*
- b. *Overall Frame and Unit thickness 50mm.*
- c. *Glazing – 2 – 5mm clear tempered pane.*
- d. *Fabrication: Construct door leaf and jamb of an epoxy powder coated aluminum extrusion frame. Supply doors with full glazing c/w standard double gasket.*

2.2.7. Cleanroom HVAC System:

- a. *General: Provide HVAC system from supply, return, and exhaust connection points provided by base building mechanical. Include ducting above the cleanroom including Professional Engineered design, installation, site supervision, commissioning and independent certification by a NEBB accredited testing agency.*
- b. *Mechanical ducting, air-valves, dampers, and controls must be suitable for a cleanroom environment and in accordance with the mechanical specification requirements.*
- c. *Equipped each pressure zone with an electronic pressure monitoring indicator c/w LCD display and BACNET interface to base building BAS for alarming.*

2.2.8. Cleanroom Lighting:

- a. *Basis of Design: Certolux CRIF series cleanroom grade LED luminaire or equivalent.*

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- b. *Provide sufficient fixtures to meet required light levels as required by the CSA Z317-5 Illumination in Healthcare Facilities.*
- c. *Provide CSA approved fixtures.*

2.2.9. Stainless Steel Sink:

- a. *Hospital grade 316 stainless steel wall mounted sink, no overflow.*
- b. *Provide handsfree faucet with no aerator.*
- c. *Shroud complete unit to conceal plumbing connections for view.*

3. PART EXECUTION

3.1. EXAMINATION

- 3.1.1. *Examine and verify areas and work of other trades for conditions that affect the work of this Section.*
- 3.1.2. *Ensure floor is level to accommodate the floor panels.*
- 3.1.3. *Report unsatisfactory conditions to Consultant in writing.*
- 3.1.3. *Do not begin installation until unsatisfactory conditions are corrected.*

3.2. INSTALLATION

- 3.2.1. *Perform installation by Specialty Room Supplier personnel or manufacturer's representative. Supplier shall supply factory trained, on-site supervision at all times when work of this Section is performed.*
- 3.2.2. *Provide appropriate protection apparatus.*
- 3.2.3. *Install in accordance with ISO 14644-4 – Cleanroom design & construction.*
- 3.2.4. *Erect work true-to-line, plumb, square and level with all joints aligned. Fit joints and intersecting members accurately and in true planes adequately fastened.*
- 3.2.5. *Cut or drill holes in panels, as required, to accommodate electrical and mechanical services, runs or connections. Cleanroom panel system to have integral raceways for services into the room.*
- 3.2.6. *Final connections of building utilities to room to be made by HVAC, plumbing, and electrical contractors.*

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3.3. CLEANING AND ADJUSTING

- 3.3.1. *Upon completion of work, clean equipment and apparatus, remove protective coverings and test and adjust operating equipment. Provide a complete cleaning of the room and all associated equipment in preparation for certification testing.*

3.4. TESTING, BALANCING, AND TRAINING

- 3.4.1. *Provide complete air balancing of all systems by an independent AABC certified balancing contractor. Once balancing is complete and in compliance with design intent, certification testing may commence.*
- 3.4.2. *Employ an independent certification company to complete all required ISO certification tests to ensure this room meets all requirements for the ISO ratings as noted.*
- 3.4.3. *Manufacturer to instruct Owner in the complete operation of room, including controls, after completion of room start-up.*
- a. *Provide up to 8 hours of demonstration and instruction in the complete operation and maintenance of the cleanroom.*
 - a. *Provide Operation and Maintenance data indicating sequential operation, start-up and shut-down, and preventative maintenance, with all pertinent control data, schematics, test results, quality control documents and as built drawings.*

END OF SECTION