

1 General**1.1 RELATED SECTIONS**

- .1 Section 01 33 00 – Submittal Procedures.
- .2 Section 01 78 00 – Closeout Submittals.

1.2 REFERENCES

- .1 American Society for Testing and Materials (ASTM)
 - .1 ASTM A 167-99 (2009), Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
 - .2 ASTM A 653/A 653M-15e1, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .3 ASTM B 117-16, Practice for Operating Salt Spray (Fog) Apparatus.
 - .4 ASTM B 456-17, Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.
 - .5 ASTM E 54-80(1996), Test Methods for Chemical Analysis of Special Brasses and Bronzes.
 - .6 ASTM E 478-17, Test Methods for Chemical Analysis of Copper Alloys.
- .2 Canadian Standards Association (CSA)
 - .1 CSA 0121-M1978 (R2003) Douglas Fir Plywood.

1.3 WORK FURNISHED BUT NOT CONNECTED

- .1 Gas, air and vacuum cocks, faucets, tailpieces, strainers, traps, countertop electrical boxes, non-integral sinks and drains. Install in countertops but hook-up by Divisions 22 and 26.

1.4 SAMPLES

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit duplicate samples of:
 - .1 Each countertop material, 300 x 300 mm including external corner.
 - .2 Each standard colour of cabinet finish.

1.5 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Indicate:

- .1 Details of laboratory casework construction and related and dimensional position, with sections.
 - .2 Location of each casework unit.
 - .3 Location for roughing-in of plumbing, including sinks, faucets, strainers and cocks and electrical services.
 - .4 Manufacturer's standard range of cabinet colours.
 - .5 Product data on plastic laminate.
- .3 Include test reports by independent testing laboratories indicating results of furniture finish tests.

2 Products

2.1 MATERIALS

- .1 Galvanized steel sheet: commercial quality to ASTM A 653 with Z275 zinc coating.
- .2 Stainless steel sheet: to ASTM A167, Type 316, with type 4 finish.
- .3 Stainless steel tubing: AISI Type 304, commercial grade, seamless welded, 1.5 mm wall thickness.
- .4 Non-asbestos cement building board composed of Portland cement, marble fillers and reinforcing fibres; flat fully compressed sheet, smooth surface one face, 12 mm thick, light grey.
- .5 Sealants: clear silicone, bacteria resistant.

2.2 COUNTERTOP MATERIALS

- .1 Poured epoxy: apply 100% solid epoxy resin compound at a rate which will produce finished thickness of not less than 25mm thick, with surface ground to dull black, non-reflecting surface which is free of minute pin holes, air bubbles, and pores. Use 0.25mm thick coating for concealed and unfinished surfaces. Epoxy finished surfaces to conform to following minimum requirements:
 - .1 Tensile strength: 20 to 30 MPa.
 - .2 Flexural strength: 700 MPa.
 - .3 Compressive strength: 100 MPa.
 - .4 Impact strength: 4 J.
 - .5 Hardness: 100 Rockwell.
 - .6 Linear shrinkage on curing: 0.4%
 - .7 Water absorption: 0.1%
 - .8 Good flexibility, hard abrasion, impact and thermal shock resistant.
 - .9 Resist immersion in water, heat up to 100 degrees.
 - .10 Resistance against alkaline substances, detergents and coolants.
 - .11 Resistance to acid fumes, acid solutions, greases and oils.
 - .12 Resistance to wide range of corrosive chemicals and solvents.
 - .13 Will not support mould or fungus growth.

2.3 COUNTERTOP FABRICATION

- .1 Fabricate laboratory countertops, splashbacks, reagent shelves as indicated.
- .2 Use specified materials in designated locations as follows:

<u>Code</u>	<u>Materials</u>
TSLE	Solid Epoxy.
- .3 Fabricate countertop sections in as long a length as practicable.
- .4 Cut holes for fittings, accessories, and equipment.
- .5 Round or chamfer exposed edges and corners of cut-outs.
- .6 Finish exposed edges and surfaces in same manner as specified for working surface of countertop material.
- .7 Make allowances around periphery and where fixed objects pass through or project into countertop material to permit normal movement without restriction.
- .8 Joints: field welded or mechanical watertight.

2.4 LABORATORY SERVICE FITTINGS

- .1 Metals: use min 80% red brass alloy for valve bodies. Make handles and turrets of brass forgings. Use solid brass bar stock or specially selected alloys for assembly components and operating parts such as valve stems, renewable seats and needle cones.
- .2 Completely enclose spring mechanisms. Design compression and needle valve stems to operate inside and make them replaceable. Provide needle valves with stainless steel floating needles and removable seats.
- .3 Equip remote controls with universal joints.
- .4 Provide fittings with wall flanges, shanks, lock nuts, couplings, nuts and tailpieces.
- .5 Identify fittings as to type of service with coloured plastic removable type buttons with engraved lettering and following colour coding.

SERVICE	LETTERING		COLOUR CODING
	ENGLISH	FRENCH	
Cold Water	CW	EF	Green
Hot Water	HW	EC	Red
Vacuum	VAC	HER	Yellow
Air	AIR	AIR	Orange
Gas	GAS	GAZ	Yellow - Orange

- .6 Provide chrome finish for service fittings. Corrosion resistant finish to conform to following minimum requirements.
 - .1 Acid resistance: acid applied at rate of 60 drops per minute for 10 minutes on fixture coatings held approx. at angle of 45.
 - .1 Hydrochloric acid: 36.9%

- .2 Nitric acid: 70.6%
- .3 Sulfuric acid: 96.4%
- .4 Acetic acid: 96.4%
- .5 Discolouration and slight bubbling may occur with concentrated sulphuric acid only.
- .2 Resistance to alkali and organic solvents: reagents and solvents applied at rate of 60 drops per minute on fixture coatings held approx. at angle of 45: alkali (50% sodium hydroxide), ethyl alcohol, toluol, xylol, benzol, carbon tetrachloride, phenol and mineral oil.
- .3 Resistance to salt fog spray: samples of fixtures placed in salt fog cabinet for period of 125 hours at temperature of 34 – 36C. Artificial sea water (composite per litre: 11 g $\text{MgC}_{12}\text{H}_2\text{O}$, 1.2 g Na_2SO_4 , and 25 g NaCl). Fixtures tested to ASTM B117 for 1000 hours.
- .4 Resistance to high humidity: samples of fixtures placed in high humidity cabinet maintained at 100% RH and 50 C for period of 125 hours.
- .5 Resistance to acid fumes: samples of fixtures placed in closed cylindrical glass containers approx. 20 L in volume, together with beaker of concentrated hydrochloric acid, nitric acid, and sulphuric acid. Maintain 23° C temperature for period of 150 hours.
- .7 Regular water faucet (gooseneck): 356 mm gooseneck, mixing faucet, deck mounted, brass body, chrome finish, serrated tip, complete with vacuum breaker, hot and cold side mounted taps, single lever control.
- .8 Eyewash: chrome finish, brass body, deck mounted, pull down activated, beside faucet at sinks.
- .9 D.I. water laboratory fill-up –chrome finish , gooseneck, self closing and flow positions, deck mounted.

2.5 LABORATORY SINKS

- .1 Equip laboratory sinks with tailpieces, cross strainer, plug and overflow unless otherwise indicated.
- .2 Provide standing overflow, when in position, 25 mm below flood level of sink. Include perforated over-flow guard with top 12 mm below flood level.
- .3 Locate waste outlets where indicated.
- .4 Stainless steel sinks: deck mounted.
- .5 Sink Schedule;

No.	Room No.	Size	Motion Sensor	Double Sink	Single Sink	Spray	Goose neck	Hot Water	Cold Water	Eye Wash	Single Lever	Material	Remarks
S1 & S5	1008 & 1017	400x350x300deep	no	no	yes	yes	yes	yes	yes	yes	yes	Stainless Steel	Stainless steel side board.
S2,	1011	400x350 deep	No	no	yes	yes	yes	yes	yes	yes	yes	Stainless Steel	
S3	1015	400x350x300deep	No	yes	no	yes	yes	yes	yes	yes	yes	Stainless Steel	Stainless steel side board.
S4	1015a	400x350x300deep	No	no	yes	yes	yes	yes	yes	yes	yes	Stainless Steel	Stainless steel side board.
S6	1024	400x350x300deep	no	no	yes	no	yes	yes	yes	no	yes	Stainless Steel	

2.6 ELECTRICAL FITTINGS

- .1 Electrical outlets: to applicable EEMAC standards and CSA approval.
 - .1 Boxes for flush mounted outlets: of sufficient size, with galvanized finish.
 - .2 Surface mounted pedestal type outlet boxes: epoxy coated finish housing.
 - .3 Receptacles: by Division 26.
 - .4 Cover plates: epoxy coated finish.
- .2 Raceway: 2 compartment (electrical, data) prefinished aluminum, clear anodized finish.

2.7 CABINET HARDWARE

- .1 Pulls: recessed anodized aluminum.
- .2 Hinges: 5 knuckle, chrome 75 mm.
- .3 Drawer: slides 50 K load, 7/8 extension, full extension zinc plated.

2.8 FABRICATION

- .1 Fabricate steel laboratory casework to details.
- .2 Align end panels, top rails, bottoms and vertical posts, at intersections in same plane, without overlap.
- .3 Grind exposed welds flush and smooth, burnish to match adjacent surfaces.
- .4 Provide 2 mm thick metal for tapping strips, gussets, drawer runners and hinge reinforcements.
- .5 Use 1.5 mm thick metal for cabinet top rails, hanging brackets, frame and base.
- .6 Use 1.2 mm thick metal for cabinet door outer pan and slide support, cross rails, cabinet fronts, scribe strips and fillers.

- .7 Use 0.9 mm thick metal for drawer and door inner panels, drawer bodies and back panels to cabinets.

2.9 CABINETS

- .1 Construct cabinet bodies of sheet metal, flanged and returned at exposed gables to receive flush mounted drawer fronts and doors.
- .2 Flange and set back top rails and bottom panels.
- .3 At base cabinets provide 38 mm long galvanized levelling screw for adjusting to floor variations, in gussets and accessible through plugged openings in bottom.
- .4 Provide removable backs, knee space panels on all service chases.

2.10 DOORS

- .1 Fabricate doors of double pan construction, 19 mm thick, telescoped inner pan into outer pan with exposed vertical edge formed into channel shape having returned lip over inner pan, offset to receive lip.
- .2 Use fibrous board or paper waffle sound deadener.
- .3 Provide reinforcement for hardware attachment to inner pan and conceal. Install hardware.
- .4 Bevel inside edge of cut-out in front panel of glass door.
- .5 Set glass in continuous rubber gasket between panels.

2.11 DRAWERS

- .1 Fabricate drawer fronts of double pan construction, 19 mm thick, telescoped inner pan with exposed vertical edge formed into channel shape having return lip over inner pan, offset to receive lip.
- .2 Fill front panels with fibrous board or waffle paper.
- .3 Weld drawer bodies to front through flanges on sides and bottom, and back through flanges at rear.
- .4 Extend flanges outward or downward, top of side and back rolled. Cove corners to 12 mm radius.
- .5 Provide reinforcements for hardware and install finish hardware.

2.12 SHELVES

- .1 Form shelves of prefinished galvanized steel sheet with front and rear edges flanged down 19 mm and hemmed back at 30 deg to underside of shelf.
- .2 Support shelves with chrome shelf clips inserted in slots in front stile and in formed channel in back.
- .3 Notch flanges at sides to match, and engage with embossments on side panels.

2.13 FINISHING

- .1 Grind and polish spot weld marks from exposed surfaces.

- .2 Immerse in hot alkaline to remove grease, oil, dirt and foreign matter.
- .3 Neutralize, wash, and apply metal pre-treatment coating.
- .4 Apply primer, and bake at 175°C, to minimum dry film thickness of 0.02 mm.
- .5 Apply enamel and bake at 212°C to min dry film thickness conforming to following requirements: 2 coats chemical resistant polyester baked enamel.

2.14 ACCESSORIES

- .1 Stainless steel pegboard; Type 304 with No4 finish, wall mounted, 0.91mm thickness, 90mm deep drip trough integral to the pegboard, 125mm long x 9mm diameter white pegs.
- .2 Bench Seat: Epoxy top, painted metal frame.
- .3 Ventilation Grille: Pre-finished metal

3 Execution

3.1 INSTALLATION

- .1 Install laboratory casework plumb with countertops level to 1.5 mm in 3 m.
- .2 Level base cabinets by adjusting levelling screws.
- .3 Fit closure strips and scribe to irregularities of adjacent surfaces, maximum gap opening 0.5 mm.
- .4 Support wall cabinets on continuous galvanized steel hanging brackets by bolting directly to wall.
- .5 Bolt adjoining cabinets together, maximum width of joint 1 mm.
- .6 Apply small bead of sealant at junction of countertop and adjacent wall finish.
- .7 After installation adjust operating hardware.

3.2 CLEANING

- .1 On completion, touch up marred or abraded finished surfaces.
- .2 Wipe down surfaces to remove fingerprints and markings and leave in clean condition.

END OF SECTION