

SECTION 12 35 53.13
(FORMERLY 12345)

METAL LABORATORY CASEWORK

PART 1 – GENERAL

Summary: The subsequent specifications are designed to describe to the provider of the laboratory casework system the standards and expectations that the owner and architect allow for a quality and functional installation of the laboratory casework.

1.1 SECTION INCLUDES

- A. Modular Casework
- B. Mobile Modular Casework
- C. Mobile Workstations
- D. Stainless Steel Casework
- E. Overhead Service Carriers
- F. Shelving
- G. Electrical Fixtures

1.2 RELATED SECTIONS

- A. Division 09 Section 65 13, "Resilient Base and Accessories"
- B. Division 11 Section 53 00, "Laboratory Equipment"
- C. Division 12 Section 31 00, "Manufactured Metal Casework"
- D. Division 12 Section 32 00, "Manufactured Wood Casework"
- E. Division 12 Section 36 00, "Countertops"
- F. Division 13 Section 21 00, "Controlled Environment Rooms"
- G. Division 22 Section 40 00, "Plumbing Fixtures"
- H. Related Work To Be Performed By Others:
 - 1. Final installation of all plumbing, service and electrical fixtures attached to casework or countertop (excluding piping and wiring within fume hoods).

2. Final connection to service lines of all plumbing, service and electrical fixtures attached to laboratory casework or furniture.

1.3 REFERENCES

- A. SEFA 8: Laboratory Furniture – Casework, Shelving and Tables Guidelines
Science Equipment and Furniture Association (SEFA)
- B. ISO 9001:2000 – Quality Management
International Standards Organization (ISO)
- C. ADA (ATBCB ADAAG) Americans with Disabilities Act Accessibility Guidelines
Americans with Disabilities Act (ADA)

1.4 SUBMITTALS

Refer to Section 01 33 00, "Submittal Procedures," for requirements, procedures, etc.

A. Product Data:

Drawings shall include data and details for construction of the laboratory casework as well as information regarding the name, quantity, type and construction of materials (such as hardware, gauges, etc), that will be used to complete the project.

B. Shop Drawings:

1. The laboratory casework manufacturer shall furnish shop drawings illustrating the layout and placement of all laboratory casework and fume hoods as well as any products included in this section.
2. Indicate the type and location of all service fittings and associated supply connections.
3. Preparation instructions and recommendations.
4. Storage and handling requirements and recommendations.
5. Installation methods.

C. Selection Samples:

Submit the following:

1. One (1) 24" (600mm) wide, full-height base cabinet: Construction to consist of one (1) drawer, one (1) door, one (1) cupboard with adjustable half/full depth shelf and related hardware (pulls, hinges, drawer slides, etc.), complete with finish.
2. One 36" (900mm) wide x 36" (900mm) high wall cabinet: Construction to consist of two adjustable shelves as well as related hardware and doors, complete with finish.
3. One complete set of color chips representing the manufacturer's full range of available colors. Minimum sample size 2 inches by 3 inches (50mm x 76mm).

4. One Countertop backsplash and finished edge.

D. Quality Assurance/Control

1. Design Data/Test Reports: Manufacturer shall submit test data and design criteria which are in compliance with the project specifications.
2. Certificates: All certifications required in the specifications shall be submitted with the original submittal package under separate cover. Certificates must be provided with the signature of a qualified individual of the supplier.
3. Manufacturers' Instructions: Provide manufacturer's instructions for installation and maintenance of all products provided and installed within this section. Instructions will be in bound form, tabbed and organized by section number.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications:

1. The following list of information will be provide to the Architect at least ten (10) days prior to the bid opening:
2. List of manufacturing facilities;
3. A list of ten (10) installations of comparable stature completed within the past 5 years;
4. Construction details depicting the materials, sizes and methods of construction;
5. Independent laboratory test reports that include information on cabinet, fume hood and table top finish and performance that have been conducted within the last two years.

B. Mock-Ups

1. Area mockups shall be as indicated on the shop drawings. Post bid mockup areas must be priced for disassembly and reassembly and used within the project.
2. Do not proceed with remaining work until installation is approved by Architect.
 - a) Install base cabinet with specified hardware.
 - b) Install wall cabinet with specified hardware.
 - c) Install workstation

1.6 DELIVERY, STORAGE AND HANDLING

A. Packaging, Shipping, Handling and Unloading

1. Packaging: Products shall have packaging adequate enough to protect finished surfaces from soiling or damage during shipping, delivery and installation.
2. Delivery: Casework delivery shall only take place after painting, utility rough-ins and related activities are completed that could otherwise damage, soil or deteriorate casework in installation areas.

3. Handling: Care, such as the use of proper moving equipment, experienced movers, etc., shall be used at all times to avoid damaging the casework. Until installation takes place, any wrapping, insulation or other method of protection applied to products from the factory will be left in place to avoid accidental damage.

B. Acceptance at Site:

Casework will not be delivered or installed until the conditions specified under Part 3, Installation section of this document have been met.

C. Storage:

Casework shall be stored in the area of installation. If, prior to installation, it is necessary for casework to be temporarily stored in an area other than the installation area, the environmental conditions shall meet the environmental requirements specified under the Project Site Conditions article of this section.

D. Waste Management and Disposal:

The supplier of the laboratory casework is responsible for removing any waste or refuse resulting from the installation of, or work pertaining to laboratory casework; thereby leaving the project site clean and free of debris. Trash container(s) to be provided by others.

1.7 PROJECT SITE CONDITIONS

- A. Building must be enclosed (windows and doors sealed and weather-tight);
- B. An operational HVAC system that maintains temperature and humidity at occupancy levels must be in place;
- C. Adjacent and related work shall be complete;
- D. Ceiling, overhead ductwork and lighting must be installed;
- E. Site must be free of any further construction such as “wet work”;
- F. Required backing and reinforcements must be installed accurately and the project must be ready for casework installation.

1.8 WARRANTY

- A. Furnish a written warranty that work performed under this section shall remain free from defects as to materials and workmanship for a period of two (2) years from date of shipment. Defects in materials and workmanship that may develop within this time are to be replaced without cost or expense to the Owner.

Defects include, but are not limited to:

1. Ruptured, cracked, or stained coating
2. Discoloration or lack of finish integrity
3. Cracking or peeling of finish

4. Slippage, shift, or failure of attachment to wall, floor, or ceiling
 5. Weld or structural failure
 6. Warping or unloaded deflection of components
 7. Failure of hardware
- B. 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.

PART 2 – PRODUCTS

2.1 MANUFACTURER

A. Acceptable Manufacturer:

Mott Manufacturing Ltd.; 452 Hardy Rd. Brantford, ON, Canada N3T 5L8. Tel: (519) 752-7825. Fax: (519) 752-2895. Email: inquire@mott.ca, www.mott.ca.

B. Substitutions:

Must meet all specification requirements and have prior approval.

C. Requests for substitutions:

All requests will be considered in accordance with provisions of Section 01 60 00.

2.2 CASEWORK MATERIALS

A. Sheet Steel:

Mild steel, cold rolled furniture grade to requirements of ASTM A1008/A1008M, Grade C or higher, with smooth surfaces to furniture quality.

B. Galvanized Sheet Steel:

Commercial quality galvanized sheet steel to ASTM 653, Designation Z275.

C. Stainless Steel:

1. Sheet: ASTM A240, type 304 or 316 alloy.
2. Finish: Unless otherwise indicated, AISI No. 4 brushed Finish

D. Glass:

Clear float, 6mm and 3mm thick, conforming to CAN2 12.3-M76, glazing quality. Laminated glass: CAN/CGSB-12.1-M90, Type 1 with clear PVB interlayer. Total nominal thickness of laminated glass: 6 mm.

E. Sealant:

One component, RTV silicone sealant. Color to suit application.

F. Resilient Base and Adhesive:

Top set coved, 3mm (1/8") thick, 150mm (6") high and 100mm (4") high as indicated for base units, including pre-molded stops and external corners or color selected by Consultant from full range. Adhesive for rubber base shall be trowelled on giving 100% coverage. Use an adhesive compatible with both surfaces, as recommended by the base manufacturer.

2.3 CASEWORK CONSTRUCTION

A. Materials and Thickness:

Use the following minimum steel thicknesses for furniture manufacturing:

1. 3mm (11 Ga) leveling bolt gusset plates.
2. 1.9mm (14 Ga) drawer slides and side suspension channels.
3. 1.5mm (16 Ga) for tubular rails, legs for tables, gusset plates, cabinet top and intermediate horizontal rails.
4. 1.2mm (18 Ga) for door and drawer fronts, cabinet floor, cabinet sides, vertical front members, cabinet toe kick, service cover panels, table and kneehole frames, front rails, gable legs and dust caps, false panels, furring and filler panels.
5. 0.9mm (20 Ga) for drawer backs, door backs, vertical closure channel, removable back panels, shelves, drawer bodies, drawer dividers, bin bodies, and pull-out shelves.

B. Cabinet Frame:

1. Provide one-piece die-formed cabinet bottom construction with return side flanges turned down. Spot weld flanges to cabinet sides. Provide sink cabinets with galvanized bottom painted to match cabinet.
2. Cabinet bottoms shall be turned down at front to form 32mm (1-1/4") "U" channel to accept toe kick and turn down 133mm (5-1/4") at back with 16mm (5/8") return to form the back lower member of cabinet base. Provide punched 19mm (3/4") dia. corner holes for access to levelers and to accept PVC press plugs. It shall be possible to access levelers from above cabinet without removing drawers or drawer supports.
3. Provide additional vertical 75mm (3") "HAT" shaped channels, spot-welded to or formed with the rear vertical corner. Channel shall be provided with pre-punched holes to receive shelf clips, and slotted holes to receive drawer suspension tracks. Cabinets 762mm (30") wide and larger shall be provided with intermediate 117mm (4-5/8") "HAT" channels to brace cabinet and accept shelf clips and drawer tracks
4. Where applicable, the front corner posts shall be pre-punched and slotted to accept drawer suspension systems and suspension pull-out shelves. Front vertical posts shall form inboard flush front construction for doors and drawers acting as the cabinet main member side gable tying the cabinet bottom and horizontal member together to form a rigid case. Front post rear closure channels shall be "J" shaped 9mm (11/32") x 33mm (1-5/16") x 49mm (1-15/16"). Provide channel with pre-punched holes to receive shelf clips.
5. Doors and drawers shall overlay top intermediates and floor horizontal members.

6. Top horizontal front framing member shall form a “J” shaped section 75mm (3”) wide, 10mm (3/8”) return by 25mm (1”) deep with 16mm (5/8”) return.
7. Intermediate horizontal framing members shall form a “U” 32mm (1-1/4”) high with a 25mm (1”) return on top and 16mm (5/8”) return on bottom.
8. Top rear horizontal framing member shall be 50mm (2”) x 32mm (1-1/4”) angle section welded to back corner lapped post and side gables with welded corner gusset plates acting as cabinet bracing and counter top material fixing member.
9. Enclose cabinetry toe space shall be 75mm (3”) deep x 100mm (4”) high and shall act as a total enclosure to bottom of cabinet. Toe space section shall key up into “U” shaped front floor member and act as reinforcement. Toe space, front floor of cabinet and corner post sections shall be spot welded together forming one structural member.
10. The toe space members, side gable returns, and back lower member shall form all welded structural corner to accept leveller gussets and 10mm (3/8”) levelling bolts.
11. Cabinet construction shall be electro spot-welded to form a strong well-fitted, one-piece unit.
12. Exposed horizontal structural cabinet members between doors and drawers shall be unacceptable.

C. Cabinet Hardware:

1. Pulls: Provide handles for drawers and hinged doors in 100mm (4”) satin finish aluminium.
2. Door Hinges: Provide five knuckle-type barrel door hinges of 1.9mm (14 Ga) steel screwed into door and fastened to cabinet side stile with two counter sunk #8-32 zinc plated machine screws & captive serrated tooth washer nuts. Standard hinge finish shall be bright chrome.
3. Locks:
 - a) Removable core, 5 disc tumbler with 229 key changes on a single cut key complete with master key.
 - b) [Optional when required] removable core, 5 disc tumbler with a double cut key containing over 1800 key changes and complete with master key.

D. Base Cabinet Components:

1. Provide removable back panels for cupboard base cabinets. Provide partial back panels 229mm (9”) in height to accommodate plumbing at sink units. When requested, provide back panels and security panels on cabinets requiring locks.
2. Shelving edges; turned down on all four sides 25mm (1”), and returned under on front and back 25mm (1”). Shelves 914mm (36”) and longer shall be provided with “HAT’ channel reinforcement at front edge.
3. Doors:
 - a) Fabricate doors of two telescoping metal panels, 19mm (3/4”) thick, painted internally with a sound-deadening material extending continuously full-width, and top to bottom.

Reinforce hinged side of door adequately with hinge machine screws to prevent sagging. Secure recessed hinges to cabinet posts with machine screws and concealed self-locking nuts. Provide nylon roller friction catches, mounted on horizontal top or intermediate members pull side of doors. Provide each hinged door with two rubber bumpers.

- b) Doors, drawers, tracks and back panels shall be replaceable in the field without requiring special tools.
- c) All standard double door cabinets shall be designed without center stiles to maximize access to the cabinet.

4. Drawers:

- a) Fabricate drawer fronts of two telescoping metal panels painted internally, and totally filled with sound-deadening material to eliminate possible drumming effect. The exterior drawer front shall have a channel formation on the top edge with fully finished return edges telescoping together to form fully sounded-deadened drawer front. Removable outside panel with lip to fit over inside panel on top edge, and to lock into position at bottom with rivets to form a rigid, one-piece 19mm (3/4") thick drawer front.
- b) Conventional drawer track systems shall be designed to eliminate metal surface-to-surface contact and reduce side play, while incorporating a self-closing action for 150mm (6") of drawer travel. Made up of custom manufactured components. Each drawer track assembly shall incorporate two nylon rimmed, plated steel ball bearing rollers.
- c) Provide drawer operation on full extension drawer slides, load capacity 45kg (100 pounds).
- d) Drawer body shall consist of one piece construction including the bottom, two sides, back and inner front flanged end which shall be welded to the interior drawer front head. Drawer bodies shall have a reinforcing bend on top edges.
- e) Provide built-in stops to prevent inadvertent removal of drawers, with allowance for drawer to be removed by lifting front of drawers and pulling out.
- f) Provide drawer pulls in central location of drawer face. Two handles shall be provided on units 762mm (30") and larger.

5. Mobile Cabinets:

- a) Mobile cabinets shall be the same construction as fixed base cabinets with the following modifications:
- b) Toe kick space shall be eliminated
 - i) Cabinet underside shall be reinforced with 14 gauge steel channels to provide caster mounting points.
 - ii) A counterweight shall be provided to prevent the cabinet from tipping when one drawer is opened. Counterweight not required for cabinets without drawers.
 - iii) Drawers shall be rated at 50 lbs maximum.
 - iv) Four casters shall be provided with a load rating of 165 lbs each.

6. Tables:

- a) Fabricate tables from metal skirting panels formed into 95mm (3-3/4") channel sections, and welded into a rigid frame construction. Notch corners and reinforce to receive 50mm (2") square metal tubular legs bolted securely in place. Provide leg with 10mm (3/8") leveling devices and slip-on type black PVC shoes.
- b) Construct mobile tables the same as standard laboratory tables, except for the table legs which shall be designed to receive swivel casters.
- c) Caster tires shall be made of non-marring type urethane tires in gray color.
- d) Table Bracing: Table bracing members shall consist of 25mm (1") x 50mm (2") removable tube members, installed between legs according to two table bracing configurations. Removable bracing shall be mechanically fixed to concealed "U" shaped mounting tabs that are integral with each leg. Where called for, provide table braces welded to legs as a fixed rigid bracing system.
- e) Table Drawers: Where called for, drawers located in table aprons shall be supplied in a maximum width of 381mm (15") with two drawers supplied in tables 1219mm (48") and wider. Drawer suspension shall be with 25mm (1") nylon ball bearing rollers and self closing action, and custom manufactured 1.5mm (16 Ga) suspension system.

7. Leg Sets:

- a) Leg sets shall consist of two 50mm (2") square metal tubular legs complete with steel bolt levellers and slip on PVC shoes.
- b) Legs, when secured together, shall be provided with 25mm (1") x 50mm (2") steel rail centred 135mm (5.3") up from bottom of leg.
- c) Top of legs, both standing and sitting heights, shall have a 1.9mm (14 Ga) triangular mounting plate welded in position for securing to underside of countertop.

8. Apron Drawer Assembly:

- a) Apron drawer assembly shall be fabricated from metal channel shaped skirting panels of modular widths the same as standard base cabinets. Rails 95mm (3-3/4") high channel ends shall be turned to fit into end mounting brackets. Drawer suspension framing shall be mechanically fixed to channels, welded integrally with front and back channel sections formed into a rigid one-piece frame.
- b) Where called for, drawers located in table aprons shall be supplied in a maximum width of 381mm (15") with two drawers supplied in tables 1219mm (48") and wider. Drawer suspension shall be with 25mm (1") nylon ball bearing rollers and self-closing action, custom manufactured 1.5mm (16 Ga) suspension system.

9. Front Rails:

- a) Front rail units shall be fabricated from a single metal channel-shaped skirting panel in modular widths the same as standard base cabinets. Channel ends shall be turned to fit into end mounting brackets. Rails are 95mm (3-3/4") high.

10. Gable Legs:

- a) Gable legs shall consist of two telescoping side panels totally enclosed on all four sides and welded to form a strong rigid unit.

- b) Gables shall be 38mm (1-1/2") thick with 75mm x 100mm (3" x 4") toe space and designed to be secured in a concealed fashion to the adjacent knee-hole assembly or to the bench top material.
- c) Gable legs shall be provided with two leveling devices.

11. Acid Storage Cabinets (moulded liner)

- a) Construct in similar manner to standard steel base cabinets with the addition of a molded polyethylene interior liner.
- b) The lining on the back of doors shall be fitted so that it overlays the flange on the front of the molded cabinet liner to protect all metal areas of the cabinet from corrosive vapors.
- c) Acid storage cabinets shall contain one full-width phenolic shelf. It shall be possible to locate shelf in four positions on 75mm (3") increments. Shelf supports shall be integrally molded into cabinet liner.
- d) Provide the door with a decal signifying "ACID" storage. On acid cabinets with two doors, provide one decal signifying "ACID" storage on each door.
- e) Molded liner shall incorporate a 25mm (1") high lip along bottom edge to contain spills.
- f) Provide one threaded connection fusion welded to the rear of the cabinet. Thread shall be 50mm (2") NPT for connection to exhaust source.
- g) Provide an entirely plastic door catch.

12. Tall Acid Storage Cabinets:

- a) Construct in similar manner to standard steel base cabinets with entire interior lined with 5mm (3/16") thick fiber glass reinforced polyester thermo set resin similar to fume hoods.
- b) The lining on the back of doors shall be fitted so that when the door is in a closed position the lining shall fit inside the interior lining of the cabinet.
- c) Acid storage cabinets that are 84" tall shall contain four phenolic full-width adjustable shelves and one middle painted steel fixed shelf. Acid storage cabinets that are 65" tall shall contain two phenolic full-width adjustable shelves and one middle painted steel fixed shelf. Adjustability is offered in one inch increments.
- d) Provide the door with a decal signifying "ACID" storage. On acid cabinets with two doors, provide one decal signifying "ACID" storage on each door.
- e) Exhaust port (4" diameter) shall be provided on the top of cabinets for fume evacuation to ducting.

13. Pump Cabinets (foam insulated)

- h) Construct in similar manner to standard steel base cabinets with the addition of a sound insulating foam interior liner.
- i) 1" Inch thick foam sheet on the back of door(s), roof (on most models), sides and back shall be fitted within a 20 Ga. steel frame lattice to hold it in place. Cutouts in the steel frame lattice and foam shall allow air to flow through door louvers, access to rear receptacle, removable back, and optional fan.
- j) Pump cabinets shall contain one pullout shelf with lips on all four sides 3" high.
- k) Cabinets with false panel shall have a switch to operate the receptacle located on the inside of the cabinet and the optional fan.

14. Bin Cabinets:

- a) Constructed the same as a standard base cabinet, except the door panels shall be hinged at the bottom to permit the door to tilt out from the top. Bin section shall have its own built-in catch, designed to stop and hold the loaded bin at a predetermined opened position.
- b) Bin door shall have one integral bin compartment capable of supporting 45kg (100 pounds) without sagging or binding.
- c) Bin cabinets shall be suitably fastened in place only in fixed bench assemblies to prevent any tipping action when bin sections are loaded and in an open position.
- d) When shown on drawings, removable leak-proof bin liners with two lift out handles shall be designed to fit into bin compartment and fabricated of either type 304, 1.2mm (18 Ga) stainless steel or 1.2mm (18 Ga) galvanized steel.

15. Control Panel Base Cabinets [457mm (18") or 559mm (22") optional depths]:

- a) Constructed the same as standard base cabinets, except blank panels are provided above cupboard doors for the mounting of remote control fittings. Cabinet shall be complete with a removable back panel and an access panel in the false panel cupboard roof.

16. File Drawer Cabinets:

- a) Construct file drawer cabinets in similar manner to standard base cabinets, and consisting of one or two double height file drawers for low height or standard height file cases.
- b) Provide each file drawer complete with two file supports and hanger rods.
- c) The file drawer shall be provided with full extension telescoping drawer slides.
- d) Hanger rods are adjustable to accommodate legal or letter size files.

17. Service Cover Panels:

- a) Service cover panels shall be provided, where called for, between base cabinets to enclose the pipe space. Service cover panels shall be designed in two sections. The lower section shall be fixed in place to mount cove base moulding. The upper section shall be fitted between the base cabinets and shall be removable.

18. Filler Panels:

- a) Fabricate front filler panels complete with flanges on both sides and a 75mm x 100mm (3" x 4") toe space along the working face.
- b) Scribe filler panels shall be flanged on one side and flat on the other, to be cut on jobsite to suit wall conditions, and shall fit into double angles secured to the wall. No visible mounting screws permitted.
- c) Corner filler panels shall be a two-piece construction, one fixed panel and the other a variable panel to facilitate room dimensions. Each shall have flanges and an integral 75mm x 100mm (3" x 4") toe space filler to interlock with its counterpart.
- d) End closing filler panels shall be flanged on one side 25mm (1") and secured to back of cabinet. The edge extending to wall shall be flat and fit into a double angle secured to wall. No visible mounting screws permitted.

19. Glassware Drying Base Cabinets - Electric Heat:

- a) Constructed the same as steel base cabinets in general, except the cabinet shall be double walled with a full steel interior liner. The resulting space between cabinet interior and exterior wall shall be insulated with minimum 1" thick compressed fibreglass insulation.
- b) Provide a full-width perforated stainless steel shelf.
- c) Heater controls shall be a thermostatic control equal to Ranco Co. G4-14209 complete with a Style "0" sensitive bulb and neon pilot light. The heater element is available in 120 volt only. Controls shall be limited to 180°F (82°C)
- d) Wiring and connections within the cabinet shall meet local codes and be factory installed and connected, and shall terminate in electrical cord complete with plug. Standard 120v/15A receptacle required on wall behind cabinet.
- e) Cabinet electrical components shall be UL listed, UL recognised or CSA certified.

20. Safety Storage Cabinets; Fume Hood Base Type:

- a) Construct storage cabinets of double wall, welded sheet steel construction with double panel door; overall thickness, 50mm (2"). Provide cabinets with four adjustable levelling devices to compensate for approximately 25mm (1") base building floor differential. Raised door sill 50mm (2") above bottom of the cabinet to form a liquid-tight well. Overlap cabinet frame with hinged doors having continuous piano type hinges with three-point locking mechanism ship lapped at opening stile.
- b) Provide adjustable galvanized sheet steel shelves with four edges turned down 25mm (1") and additionally returned under 16mm (5/8") on all edges. Provide 13mm (1/2") incremental shelf adjustment.
- c) Provide 50mm (2") vents, complete with fire baffle covers on each vent, with 50mm (2") dia. fine metal filter.

- d) Provide overlaid red warning letters on doors as follows: "FLAMMABLE -- KEEP FIRE AWAY".
- e) Construction shall meet requirements of OSHA Standard 1910-106(d)(3), considered as organized storage centres for flammable and combustible liquids. Cabinets shall comply with National Fire Protection Association's flammable and combustible liquids Code #30 and #45, 1996. Provide grounding screw lug in accordance with Codes.
- f) Construct safety storage cabinets sized for under-counter and under fume hood configurations as required by drawings.

21. Safety Storage Cabinets; Fume Hood Base Type (optional UL approved Model):

- a) Construct storage cabinets of double wall, welded sheet steel construction with double panel door; overall thickness, 50mm (2"). Provide cabinets with four adjustable levelling devices to compensate for approximately 25mm (1") base building floor differential. Raised door sill 50mm (2") above bottom of the cabinet to form a liquid-tight well. Overlap cabinet frame with hinged doors having continuous piano type hinges with three-point locking mechanism ship lapped at opening stile. Shiplap shall be provided with braided fibreglass gasket.
- b) Walls, back, side and top of cabinet shall be insulated with two inch (50mm) thick mineral fibre insulation.
- c) Provide adjustable galvanized sheet steel shelves with four edges turned down 25mm (1") and additionally returned under 16mm (5/8") on all edges. Provide 13mm (1/2") incremental shelf adjustment.
- d) Provide 50mm (2") vents, complete with fire baffle covers on each vent, with 50mm (2") dia. fine metal filter.
- e) Provide overlaid red warning letters 50mm (2") high on doors as follows: "FLAMMABLE -- KEEP FIRE AWAY".
- f) Construction shall meet requirements of OSHA Standard 1910-106(d)(3), considered as organized storage centres for flammable and combustible liquids. Cabinets shall comply with National Fire Protection Association's flammable and combustible liquids Code #30 and #45, 1996. Provide grounding screw lug in accordance with Codes.
- g) Construct safety storage cabinets sized for under-counter and under fume hood configurations as required by Drawings.
- h) Cabinet shall be listed and labelled to the UL1275 standard.

E. Floor/Wall Cabinet Components:

1. Materials and Thicknesses:

Use the following standard steel thicknesses for this furniture manufacturing:

- a) 1.2mm (18 Ga) leveled prime grade furniture steel for sides, top, back, bottom, false bottom, dust caps and bases on tall storage cabinets.

- b) 3mm (11 Ga) cold rolled steel for levelling device brackets on floor storage cabinets only.
2. Wall Storage Cabinets Sliding Glass Door or Open Type:
- a) Cabinet sides, bottom and top shall be flat panels die-formed "U" shaped flange on front edge and a return flange on back edges. Provide top and bottom panels with 40mm (1-9/16") flanges on both ends with double returns. Reinforce front flanges on both sides and top with a flanged "U" shaped member. Both front side stile reinforcing channels shall contain a vertical row of shelf support clip holes 5mm (3/16") round or square and 13mm (1/2") o.c. Reinforce bottom with "U" channel.
 - b) Design of cabinet shall enable it to be easily converted to a sliding glass door cabinet.
 - c) Wall cabinets shall be provided with an internally painted, flush bottom enclosure interlocking with front floor of cabinet as a telescoping panel with flange at rear and secured through the cabinet back.
 - d) Provide shelves with edges turned down on 4 sides 25mm (1"), and return under on front and back by 25mm (1"). Provide shelf adjustment on 13mm (1/2") increments for full height of cabinet interior. Provide a minimum of four plated shelf clips per shelf. Provide shelves 914mm (36") and longer with 'HAT' channel reinforcement at front edge.
 - e) Provide sliding glass doors in 6mm (1/4") sheet glass with "H" shaped extruded aluminium shoes fixed to and running the full width of the door bottom. Provide vinyl glazing channel fixed into shoe. Provide two removable spring steel and nylon wheel assemblies, one located at each end. The door assembly shall run on an inverted double "Y" shaped extruded aluminium track. Provide each door at top with two PVC guides running in double "U" shaped extruded aluminium track. One finger pull per door shall be ground into glass on side of door next to cabinet frame.
 - f) Install bumpers on vertical reinforcement members of the cabinet frame.
3. Wall Storage Cabinets; Sliding Metal Doors & Framed Glass Doors:
- a) Fabricate cabinet the same as in Para. 2.3.D.2.a. above, with modified front side posts to accept sliding metal doors, generally as specified in Para. 2.3.C.1.
 - b) Doors shall be guided at the bottom with a full width black PVC double "U" channel fixed to floor of cabinet.
 - c) Upper track for sliding metal and framed glass doors shall be galvanized; double-track, "V" grooved, and painted to match furniture. Provide two suspended rollers per door, with special set of brackets for fixing to sliding doors. Nylon rimmed ball bearing rollers as specified for drawer track assemblies.
 - d) 3mm (1/8") glass shall be provided for frame glass doors.
4. Wall Storage Cabinets: Hinged Metal Doors:
- a) Fabricate cabinets as specified in Para. 2.3.D.2.a. with two front side frames modified to minimize dust penetration. Provide intermediate exposed vertical members in a

double "U" shaped channel. The front edges of the top panel shall have a channel formation reinforced with a flanged "U" channel. The exterior bottom panel shall have a channel formation at front and fitted with a flanged interior floor.

b) Hinged metal doors shall be as specified in Para. 2.3.C.3.

5. Floor Storage Cabinets; Sliding Glass Doors and Open Type:

- a) Fabricate cabinet bottom as specified in Section 2.3.B.1., 2.3.B.2. and 2.3.B.3., with vertical height divided into two equal sections, each with a set of sliding doors and track system. Provide a finished floor full width and depth of interior with return flanges turned down on all four edges in both upper and lower sections and welded in place. Fabricate cabinet floor flush with front flange.
- b) Provide a shelf separating upper and lower sections, with 40mm (1-9/16") flanges on all four sides, fixed and spot welded in place.
- c) Provide built-in toe space 100mm (4") high extending full width of cabinet recessed back 75mm (3") from front face with a 10mm(3/8") diameter steel threaded bolt type levelling device in each corner.
- d) Provide sliding glass doors in 6mm (1/4") sheet glass with "H" shaped extruded aluminium shoes fixed to and running the full width of the door bottom. Provide vinyl glazing channel fixed into shoe. Provide 2 removable spring steel and nylon wheel assemblies, one located at each end. The door assembly shall run on an inverted double "Y" shaped extruded aluminium track. Provide each door at top with two PVC guides running in double "U" shaped extruded aluminium track. One finger pull per door shall be ground into glass on side of door next to cabinet frame.

6. Floor Storage Cabinets - Hinged Metal Doors:

- a) Construct cabinets as per Para. 2.3.B. and 2.3.C., and modified as in Para. 2.3.C.5.a.
- b) Hinged metal doors as per Para. 2.3.C.3.

7. Dust Cap:

- a) Dust caps shall be fabricated from 1.2mm (18 Ga) steel, and shall mount flush with the front edge of the cabinet and extend back at an angle of 30 degrees to a point perpendicular to the rear of the cabinet. Ends shall be finished and flanged so as to allow attachment to the cabinet below.

F. Steel Furniture Finish

1. Paint performance data is available in Appendix 1
2. All steel furniture in this section shall be constructed of stainless steel with a #4 brushed finish. Grain direction shall be horizontal except where cabinet dimensions do not permit.

PART 3 – EXECUTION

3.1 INSTALLERS

A. Installer Qualifications:

1. Installer shall have a minimum of five years continued experience in installation or application of systems similar to those required for this project.
2. Installer shall be authorized by either the distributor or manufacturer. Warranty will be void if unauthorized installer executes the installation.

3.2 EXAMINATION

A. Site Verification of Conditions:

1. Casework will not be delivered or installed until the following conditions have been met:
 - a) Building must be enclosed (windows and doors sealed and weather-tight);
 - b) An operational HVAC system that maintains temperature and humidity at occupancy levels must be in place;
 - c) Ceiling, overhead ductwork and lighting must be installed;
 - d) Site must be free of any further construction such as "wet work."
 - e) Required backing and reinforcements must be installed accurately and the project must be ready for casework installation.

B. NOTE:

In the event that any of the specified requirements for installation are not present at the time of requested delivery, the general contractor or owner must provide the casework manufacturer with a letter of deviation that releases the manufacturer from any responsibility or liability from an damage to the products resulting from the unfavorable building conditions.

3.3 INSTALLATION

A. Casework Installation:

1. Casework shall be set with components plumb, straight and square, securely anchored to building structure with no distortion. Concealed shims shall be used as required.
2. Cabinets in continuous runs shall be fastened together with joints flush, uniform and tight with misalignment of adjacent units not to exceed 1/16 of an inch.
3. Wall casework shall be secured to solid material, not lath, plastic or gypsum board.
4. Top edge surfaces shall be abutted in one true plane. Joints are to be flush and gap shall not exceed 1/8 of an inch between tops.
5. Casework and hardware shall be adjusted and aligned to allow for accurate connection of contact points and efficient operation of doors and drawers without any warping or binding.

B. Countertop Installation:

1. Countertops are to have been fabricated in lengths according to drawings, with ends abutting tightly and sealed with corrosion resistant sealant.
2. Tops will be anchored to base casework in a single true plane with ends abutting at hairline joints with no raised edges at joints.
3. Joints shall be factory prepared having no need for in-field processing of top and edge surfaces.
4. Joints shall be dressed smoothly, surface scratches removed and entire surface cleaned thoroughly.

3.4 CLEANING

- A. Ensure all products are unsoiled and match factory finish. Remove or repair damaged or defective units.
- B. Clean all finished surfaces, including drawers and cabinet shelves, and touch up as necessary.
- C. Counter tops shall be cleaned and free of grease or streaks.

3.5 PROTECTION:

- A. Counter tops and ledges shall be protected with 1/4 inch ribbed cardboard for the remainder of the construction process.
- B. Examine casework for damaged or soiled areas; replace, repair, and touch-up as required.
- C. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION