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. Installation of all plumbing, service and electrical fixtures attached to casework or countertop (excluding piping and wiring within fume hoods).

2. 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 9001:2015 – Quality Management
International Standards Organization (ISO)

C. ADA (ATBCB ADAAG) Americans with Disabilities Act Accessibility Guidelines
Americans with Disabilities Act (ADA)

1.4 SUBMITTALS

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). **[Delete if colors have already been selected].**

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 follow 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 shall be in electronic format.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications:

1. The following list of information will be provided 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 tabletop finish and performance that have been conducted within the last two years.

B. Mock-Ups: **[Delete section if project size doesn't require a mock-up]**

1. 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 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 always be used 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. 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.

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

PART 2 – PRODUCTS

2.1 MANUFACTURER

A. Acceptable Manufacturers:

1. Mott Manufacturing Ltd.as distributed by **New England Lab**® (NEL).
    i. Boston Corporate Offices - 1 Arrow Drive Woburn, MA 01801
        1. (888) 635-2080
    ii. Baltimore Office - 2707 N. Rolling Road Suite 110 Baltimore, MD 21244
        1. (410) 944-7060
    iii. North Carolina Office - 2175 Presidential Drive Suite 130 Durham, NC 27703
        1. (919) 469-8054
    iv. For pricing - info@newenglandlab.com
    v. For product questions – Rand Weyler - rand@newenglandlab.com

2. Other manufacturers that comply with the minimum thicknesses of material and similar construction appearance and quality as specified and shown in drawings.

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. Basic Materials

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

2. Galvanized Sheet Steel:
   Commercial quality galvanized sheet steel to ASTM 653, Designation Z275.

3. Stainless Steel:
   Sheet: ASTM A240, type 304 or 316 alloy. Unless otherwise indicated, AISI No. 4 brushed Finish

B. 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: 6mm (1/4").

C. Sealant:
One component, RTV silicone sealant. Color to suit application.

D. 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. 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, removable back panels, shelves, drawer bodies, drawer dividers, bin bodies, and pull-out shelves.

B. Cabinet Hardware:

1. Pulls: Provide handles for drawers and hinged doors as 100mm (4”) wide in aluminum with satin finish.

[OR]

2. Pulls: Provide handles for drawers and hinged doors as 100mm (4”) wide in stainless wire material with brushed finish.

[OR]

3. Pulls: Provide handles for drawers and hinged doors as 100mm (4”) wide in black nylon.

[OR]

4. Pulls: Provide handles for drawers and hinged doors as 100mm (4”) wide in aluminum wire material with brushed finish.

[OR]

5. Pulls: Provide handles for drawers and hinged doors as 100mm (4”) wide with chrome finish.

[OR]

6. Pulls: Provide black PVC flush handles for drawers and hinged doors 100mm (4”) wide.

[OR]

7. Pulls: Provide aluminum flush handles for drawers and hinged doors 100mm (4”) wide.

[OR]

8. Pulls: Provide ABS flush handles for drawers and hinged doors 125mm (5”) wide. Color of the handle shall be black **[OR]** gray **[OR]** white **[OR]** beige.

[OR]

9. Pulls: Provide full width aluminum flush handles for drawers and hinged doors. The width of the drawer handle shall match the width of the drawer front. The handle length on the door shall be horizontal [OR] vertical and match the width [OR] height of the door front.

10. Door Hinges: Provide five knuckle-type barrel door hinges of 1.9mm (14 Ga) steel screwed through the door front body and threaded into 1.9mm (14 Ga.) material. Cabinet body side of hinge shall be fastened with two counter sunk #8-32 zinc plated machine screws & captive serrated tooth washer nuts. Standard hinge finish shall be bright chrome.

[OR]

11. Door Hinges: Provide five knuckle-type barrel door hinges of 1.9mm (14 Ga) steel screwed through the door front body and threaded into 1.9mm (14 Ga.) material. Cabinet body side of hinge shall be fastened with two counter sunk #8-32 zinc plated machine screws & captive serrated tooth washer nuts. Hinge finish shall be dull exposed stainless.

[OR]

12. Door Hinges: Provide five knuckle-type barrel door hinges of 1.9mm (14 Ga) steel screwed through the door front body and threaded into 1.9mm (14 Ga.) material. Cabinet body side of hinge shall be fastened with two counter sunk #8-32 zinc plated machine screws & captive serrated tooth washer nuts. Hinge finish shall be painted black enamel.

13. Door Catches: Provide nylon roller friction catches, mounted on horizontal top or intermediate members pull side of doors. Catch body and strike shall be zinc plated steel except on acid cabinets wherein door catches and strikes must be made of nylon or another polymer.

[OR]

14. Door Catches: Provide positive action door pin and receiving cam. Pin shall be located near the hinge side of the door and receiving cam mechanism concealed within cabinet rail. Cam action shall prevent rebound of door opening until the door is purposely pulled open by users.

Catch body and strike shall be zinc plated steel with nylon except on acid cabinets wherein door catches and strikes must be roller friction catches made of nylon or another polymer.

15. Drawer Slides: Provide full-extension drawer slides rated for 45kg (100lbs). Slides are to be hooked and/or fastened on to drawer body and cabinet body. Rivetted or welded drawer slides are not acceptable. Exposed fasteners on the inside of the drawer body used to fasten drawer slides on are not acceptable.

[OR]

16. Drawer Slides: Provide full-extension drawer slides rated for 90kg (200lbs). Slides are to be hooked and/or fastened on to drawer body and cabinet body. Rivetted or welded drawer slides are not acceptable. Exposed fasteners on the inside of the drawer body used to fasten drawer slides on are not acceptable.

[OR]

17. Drawer Slides: Provide full-extension drawer slides with soft close feature rated for 45kg (100lbs). Soft close feature shall pull drawer to be fully closed from a minimum of 25mm (1") of being closed and prevent drawer from rebounding open. Slides are to be hooked and/or fastened on to drawer body and cabinet body. Rivetted or welded drawer slides are not acceptable. Exposed fasteners on the inside of the drawer body used to fasten drawer slides on are not acceptable.

[OR]

18. Drawer Slides: Provide full-extension drawer slides with soft close feature rated for 90kg (200lbs). Soft close feature shall pull drawer to be fully closed from a minimum of 25mm (1") of being closed and prevent drawer from rebounding open. Slides are to be hooked and/or fastened on to drawer body and cabinet body. Rivetted or welded drawer slides are not acceptable. Exposed fasteners on the inside of the drawer body used to fasten drawer slides on are not acceptable.

[OR]

19. Drawer Slides: Provide full-extension drawer slides rated for 45kg (100lbs) on small and medium height drawers. Provide full-extension drawer slides rated for 90kg (200lbs) on drawers 30" or wider or file type drawers. Slides are to be hooked and/or fastened on to drawer body and cabinet body. Rivetted or welded drawer slides are not acceptable. Exposed fasteners on the inside of the drawer body used to fasten drawer slides on are not acceptable.

[OR]

20. Drawer Slides: Provide full-extension drawer slides with soft close feature rated for 45kg (100lbs) on small and medium height drawers. Provide full-extension drawer slides with soft close feature rated for 90kg (200lbs) on drawers 30" or wider or file type drawers. Soft close feature shall pull drawer to be fully closed from a minimum of 25mm (1") of being closed and prevent drawer from rebounding open. Slides are to be hooked and/or fastened on to drawer body and cabinet body. Rivetted or welded drawer slides are not acceptable. Exposed fasteners on the inside of the drawer body used to fasten drawer slides on are not acceptable.

[OPTIONAL]

21. Locks: Removable core, 5 disc tumbler with 229 key changes on a single cut key complete with master key. Any double doors with locks shall one receive 1 lock on the right side door, and a nickel plated elbow catch and strike on the inside of the left door.

[OR]

22. Locks: Removable core, 5 pin tumbler with 750 key changes with master key groupings available as well as grand master keying available. Any double doors with locks shall one receive 1 lock on the right side door, and a nickel plated elbow catch and strike on the inside of the left door.

C. 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 powdercoated 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 slides. 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 slides.

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. Door and drawer fronts are inset into the cabinet body so that their faces are flush with the cabinet's vertical posts. Provide "Inset" style cabinets.

6. Top horizontal front framing member shall form a **"J"** shaped section 50mm (2") wide, 16mm (5/8") return by 25mm (1") high with 16mm (5/8") return.

7. Intermediate horizontal framing members shall form a "U" 22mm (7/8") high with a 16mm (5/8") return on top and bottom.

8. Top rear horizontal framing member shall be 57mm (2-1/4") wide x 35mm (1-3/8") high welded to back corner lapped post and side gables.

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") levelers.

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.

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"), returned under on front and back 13mm (1/2") and turned up by 10mm (3/8").

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 door catches as specified in section 2.3.C.3, mounted on horizontal top or intermediate members of cabinet body. Provide each hinged door with two rubber bumpers.

   b) Doors, drawers, sliding door 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 or other mechanical method to form a rigid, one-piece 19mm (3/4") thick drawer front.

   b) Provide drawer operation on full extension drawer slides as specified in section 2.3.C.4.

   c) 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.

d) Provide built-in stops to prevent inadvertent removal of drawers, with allowance for drawer to be removed by way of tabs located on the drawer slides.

e) 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) The back and top shall be provided with welded finished panels. Holes punched into back or top shall not be permitted. Backs or tops with visible fasteners, hook and loop, tape, or adhesive are not acceptable and will be rejected.
      iii) A counterweight shall be provided to prevent the cabinet from tipping when one drawer is opened. Counterweight not required for cabinets without drawers.
      iv) Drawers shall be rated at 23kg (50lbs) maximum.
      v) Provide interlocking drawer slides when more than one drawer is used on any mobile cabinet.
      vi) Four casters shall be provided with a load rating of 74kg (165lbs) each.
      [OR]
      vii) Four casters shall be provided with a load rating of 113kg (250lbs) each.

6. Suspended Cabinets:
   a. Suspended cabinets shall be the same construction as fixed base cabinets with the following modifications:
      i. Provide a system of cold-rolled steel hanger rails attached to the casework frames. Rails on cabinets shall mate with rails on lab bench system. Installation and removal of cabinet from bench to be accomplished without the use of tools. Provide thumb screw to secure rear rail to bench system and prevent accidental removal.
      ii. Toe kick space shall be eliminated. Additionally, holes and caps in the cabinet interior bottom which are meant for levelling shall also be eliminated.
      iii. The back and top shall be provided with welded finished panels. Holes punched into back or top shall not be permitted. Backs or tops with visible fasteners, hook and loop, tape, or adhesive are not acceptable and will be rejected.

6. Tables:

   a. Style Cambridge Bench TOD/TAD Series: H-Leg Dual Bolt-Adjustable Height Workstation:
   b. Construction: All-welded frame construction of 16 gage apron and 2 inch square tubing creating a full perimeter frame capable of supporting an evenly distributed 1,000 pound load across the full 1" thick worksurface.
   c. Legs: 16 gauge, 2 inch square exterior tubing with interior sliding tube, threaded at 2 inch increments for dual bolt height adjustment. Connections into 2" threaded fittings shall allow for

height adjustments on 1" increments. Interior sliding tube shall be enclosed at one end with a threaded insert plate. Threaded insert plate for interchangeable casters and levelers shall be **welded** to the bottom of the table legs.

d. Provide adjustment that allows for 30 to 37 inch table heights while on casters or levelers. Casters and levelers shall be interchangeable without affecting table height adjustment range of 30"-37".
e. Provide Casters: 4 by 1-1/4 inch polyurethane wheels with dual locking mechanism for locking both swivel and wheel. Provide caster with 250 pound load capacity per caster. Provide casters attached to tables where indicated on drawings.
f. Provide 4 adjustable levelers attached where indicated on drawings. Provide non-marring nylon leveling pad on each leveler.
g. Provide holes in rear legs for attachment of shelving uprights.
h. Intermediate Hanging Rail: 16 gage steel for suspended cabinet installation.
i. Lower Cross Members: 16 gage steel tubing
    i. Cross Rail Location: Rear
    ii. 1" x 2" Cross members welded to exterior steel tubing to create an "H" leg.

7. Leg Sets:
    a) Leg sets shall consist of two 50mm (2") square metal tubular legs complete with steel bolt levelers and slip on PVC shoes.

    b) Legs, when secured together, shall be provided with 25mm (1") x 50mm (2") steel rail centered 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. Drawers shall operate on full extension drawer slides as specified in section 2.3.C.4.

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 kneehole assembly or to the bench top material.

c) Gable legs shall be provided with two leveling devices.

11. Acid Storage Cabinets (molded 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 1" thick 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) Acid cabinets occurring under fume hoods, when shown on drawings, shall be provided with two exhaust ducts. The upper duct shall extend up through the top material into the hood side wall and terminate with entry into the hood chamber at a point above the upper angled baffle. Ducting material shall be 2" diameter O.D. flexible medium-weight blue PVC wall hose construction reinforced with a spring steel wire helix meeting UL 94V-0 (Flame retardant) and supplied separately for installation on-site by the installer. Connections to the hood interior and cabinet interior shall be with 2" CPVC threaded elbow fittings and flange nuts. Zip-tie or clamp hose to barb hose ends on CPVC fittings.

    h) 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 thermoset resin similar to fume hood liners.

    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 [101mm (4") diameter] shall be provided on the top of cabinets for fume evacuation to ducting.

13. Pump Cabinets (foam insulated)
    a) Construct in similar manner to standard steel base cabinets with the addition of a sound insulating foam interior liner.

    b) 1" Inch thick foam sheet on the back of door(s), roof (of false panels cabinets), sides and back shall be fitted within a 20 Ga. steel cage to hold it in place. Cutouts in the steel cage and foam shall allow air to flow through door louvers, access to rear receptacle, removable back, and optional fan.

    c) Pump cabinets shall contain one pullout shelf with lips on all four sides 75mm (3") high.

    d) 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:
    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.

    b) Provide each file drawer complete with two file support hanging bars.

    c) The file drawer shall be provided with full extension drawer slides as specified in section 2.3.C.

    d) File support 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 molding. 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. Safety Storage Cabinets; Fume Hood Base Type (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 fiberglass gasket.

    b) Walls, back, side, and top of cabinet shall be insulated with two inch (50mm) thick mineral fiber 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 locations 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 provided with self-closing doors. If cabinet has double doors, self-closing mechanism shall properly sequence the doors in the correct closing order to accommodate the shiplap.

i) Provide hold-open fusible links on each door. Links shall melt at 165 degrees if the door is chained in the hold open position. Doors shall close in the proper order when both links have melted.

j) 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 all four sides 25mm (1”), returned under on front and back 13mm (1/2”) and turned up by 10mm (3/8”). Adjustable in 25mm (1”) height increments.

e) Provide sliding glass doors in 6mm (1/4”) glass with "H" shaped extruded aluminum 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 aluminum track. Provide each door at top with two PVC guides running in double "U" shaped extruded aluminum track. One finger pull per door shall be ground into glass on side of door next to cabinet frame.

f) Unframed glass shall be 6mm (1/4”) float glass.

[OR]

g) Unframed glass shall be 6mm (1/4”) laminated safety glass.

[OR]

h) Unframed glass shall be 6mm (1/4”) tempered safety glass.

i) 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 section 2.3.C., with modified front side posts to accept sliding metal doors, generally as specified in section 2.3.D.3.

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) Framed glass doors shall secure 3mm (1/8”) float glass.

[OR]

e) Framed glass doors shall secure 6mm (1/4”) laminated safety glass.

[OR]

f) Framed glass doors shall secure 3mm (1/8”) tempered safety glass.

4. Wall Storage Cabinets: Hinged Metal Doors:
   a) Fabricate cabinets as specified in section 2.3.C. 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.D.3.

5. Floor Storage Cabinets; Sliding Glass Doors and Open Type:
   a) Fabricate cabinet bottom as specified in section 2.3.C. 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 sliding glass doors in 6mm (1/4”) glass with "H" shaped extruded aluminum 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 aluminum track. Provide each door at top with two PVC guides running in double "U" shaped extruded aluminum track. One finger pull per door shall be ground into glass on side of door next to cabinet frame.

   d) Unframed glass shall be 6mm (1/4”) float glass.

   [OR]

   e) Unframed glass shall be 6mm (1/4”) laminated safety glass.

   [OR]

   f) Unframed glass shall be 6mm (1/4”) tempered safety glass.

6. Floor Storage Cabinets - Hinged Metal Doors:
   a) Construct cabinets as per section 2.3.C. & 2.3.D.3 and modified as in section 2.3.E.5.a-b.

   b) Hinged metal doors as per Para. 2.3.D.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 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 specification that is modified to be constructed of stainless steel will be made with a #4 brushed finish. Grain direction shall be horizontal except where cabinet dimensions do not permit.

PART 3 – EXECUTION

1.1 INSTALLERS

A. Installer Qualifications:

1. Installer shall have a minimum of five years continued experience in installation or application of systems like 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.

1.2 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 any damage to the products resulting from the unfavorable building conditions.

1.3 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.

1.4 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.

1.5 PROTECTION:

A. Counter tops and ledges shall be protected with 6mm (1/4”) 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