SECTION 092116

GYPSUM BOARD SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Interior steel framing members to receive gypsum board, including components for walls and partitions, and for suspended and furred gypsum board ceilings.

B. Gypsum board materials.

C. Taped and sanded joint treatment.

1.02 RELATED SECTIONS

A. Section 061000 - Rough Carpentry.

B. Section 072100 - Building Insulation.

C. Section 081113 - Hollow Metal Doors and Frames.

D. Section 099123 – Painting.

1.03 REFERENCES

A. ASTM C36 - Gypsum Wallboard.

B. ASTM C79 - Gypsum Sheathing Board.

C. ASTM C442 - Gypsum Backing Board and Core Board.


E. ASTM C514 - Nails for the Application of Gypsum Wallboard.

F. ASTM C557 - Adhesive for Fastening Gypsum Wallboard to Wood Framing.

G. ASTM C630 - Water Resistant Gypsum Backing Board.

H. ASTM C645 - Non-Load (Axial) Bearing Steel Studs, Runners (Track), and Rigid Furring Channels for Screw Application of Gypsum Board.


J. ASTM C754 - Installation of Framing Members to Receive Screw Attached Gypsum Wallboard, Backing Board, or Water Resistant Backing Board.

K. ASTM C840 - Application and Finishing of Gypsum Board.

L. ASTM C931 - Exterior Gypsum Soffit Board.
M. ASTM C1002 - Steel Drill Screws for the Application of Gypsum Board.


P. GA-201 - Gypsum Board for Walls and Ceilings.

Q. GA-216 - Recommended Specifications for the Application and Finishing of Gypsum Board.


1.04 SUBMITTALS

A. Submit under provisions of Section 013000.

B. Shop Drawings: Indicate special details associated with fireproofing, acoustical seals.

C. Product Data: Provide data on metal framing, gypsum board, joint tape, and trim accessories.

D. Samples: Submit two samples of gypsum board, 12x12 inches in size illustrating finish color and texture.

1.05 QUALITY ASSURANCE

A. Perform Work in accordance with ASTM C840, GA-201, GA-216 and GA-600.

B. Maintain one copy of each document on site.

1.06 QUALIFICATIONS

A. Applicator: Company specializing in performing the Work of this Section with minimum 10 years documented experience.

1.07 REGULATORY REQUIREMENTS

A. Conform to applicable codes and referenced standards for fire rated assemblies as follows:

1. Fire Rated Partitions: Listed assembly by UL.

2. Fire Rated Ceiling and Soffits: Listed assembly by UL.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. USG Corporation (Chicago, IL).

B. Georgia Pacific Corporation (Atlanta, GA).

C. National Gypsum Company (Charlotte, NC).

D. Substitutions: Under provisions of Section 016000.
2.02 INTERIOR FRAMING MATERIALS

A. Studs and Tracks: ASTM C645; GA-216 and GA-600; galvanized sheet steel, C shape, with knurled faces, of gauges listed below:

1. Interior, non-load-bearing, full-height: 20 gauge, maximum permissible length.
2. Interior, non-load-bearing, non-full-height: 22 gauge, 12’ length typical.


C. Fasteners: ASTM C514, ASTM C1002, GA-216.

D. Anchorage to Substrate: Tie wire, screws and other metal supports, of type and size to suit application; to rigidly secure materials in place.


2.03 STEEL FRAMING COMPONENTS FOR SUSPENDED AND FURRED CEILINGS

A. General: Provide components complying with ASTM C 754 for conditions indicated.

B. Seismic Restraint Requirements: Provide all ceiling restraint systems required by governing Codes for the Seismic Design Category of the Project. Refer to Structural Drawings.

C. Wire Ties: ASTM A 641, Class 1 zinc coating, soft temper, 16 gage, 0.062” diameter.

D. Channels: Cold-rolled steel, 0.0598” minimum thickness of base (uncoated) metal and 7/16” wide flanges, and as follows:

E. Carrying Channels: 1-1/2” deep, 475 lb/1000 feet, unless otherwise indicated.

F. Furring Channels: 3/4” deep, 300 lb/1000 feet, unless otherwise indicated.

G. Finish: Rust-inhibitive paint, unless otherwise indicated.

H. Finish: ASTM A 653, G 60 hot-dip galvanized coating for framing for exterior soffits and where indicated.

I. Steel Studs for Furring Channels: ASTM C 645, with flange edges of studs bent back 90 degrees and doubled over to form 3/16” wide minimum lip (return), and complying with the following requirements for minimum thickness of base (uncoated) metal and for depth:

1. Thickness: 25 gage, 0.0179”, unless otherwise indicated.
2. Depth: 1-5/8”, unless otherwise indicated.

J. Steel Rigid Furring Channels: ASTM C 645, G 40 zinc coating per ASTM A 525, hat-shaped, 25 gage [0.0179"], 7/8” deep, unless indicated otherwise.
K. Grid Suspension System for Interior Ceilings: ASTM C 645, manufacturer's standard direct-hung, heavy duty grid suspension system composed of main tees and cross-furring members that interlock to form a modular supporting network, complete with channel wall molding, furring shoes, clips and other system framing accessories required for conditions indicated.

1. Subject to compliance with requirements, provide one of the following products:
   a. Drywall Furring System; Armstrong World Industries, Inc.
   b. 630 Fire Front System; Chicago Metallic Corp.,
   c. Donn Rigid X System; USG Interiors Inc.

3. Conventional steel framing of suspended gypsum board ceilings is acceptable at Contractor's option or as required by ceiling profile or installation conditions. Provide studs, channels, and furring channels as specified herein and in sizes and spacing to support ceiling board.

L. Hangers: Comply with requirements of ASTM C 754. Suspension shall be by wire, rods or flat hangers as detailed or as required by conditions.

2.04 GYPSUM BOARD MATERIALS

A. Standard Gypsum Board: ASTM C36; 5/8" inch thick, maximum permissible length; ends square cut, tapered edges.

B. Moisture Resistant Gypsum Board:

1. Untiled Areas: Sheetrock Brand Mold Tough Gypsum Panels as manufactured by USG Corporation or Architect approved equal prior to Bid, fire resistive type where required, 5/8 inch thick, maximum permissible length; ends square cut, tapered edges, full height of all walls where specified.

2. Tiled Areas: DensArmor Plus Paperless Interior Panel as manufactured by Georgia Pacific Corporation or Architect approved equal prior to Bid, 5/8" thick, maximum permissible length; ends square cut, tapered edges.

3. Install Fiberock Brand Aqua-Tough Gypsum Interior Panels as manufactured by USG Corporation (Chicago, IL), where both impact resistant gypsum board and moisture resistant gypsum board are specified at the same location.

C. Impact Resistant Gypsum Board: National Gypsum Company (Charlotte, NC) Hi-Impact Brand XP Wallboard or Architect approved equal prior to Bid, 5/8" thick, maximum permissible length; ends square cut, tapered edges.

D. Fire Rated Gypsum Board: ASTM C36; fire resistive type, UL rated; 5/8 inch thick, maximum permissible length; ends square cut, tapered edges.

E. Exterior Sheathing: Georgia-Pacific Corporation Dens-Glass Gold Gypsum Sheathing or Architect approved equal prior to Bid. 1/2 inch thick for vertical applications, 5/8 inch thick for horizontal applications, maximum permissible length; ends square cut, tapered edges.

   1. Glass-Fiber Sheathing Tape and Sealant for Exterior Sheathing: Self-adhering, glass fiber tape, minimum 2 inches wide, 10 by 10 or 10 by 20 threads per inch, of type recommended by sheathing and tape manufacturers for use with sealant system of type recommended by sheathing and tape manufacturers.
a. Tape Products:
   (1) FibaTape as manufactured by Saint-Gobain Technical Fabrics, Inc. (Granville, NY).
   (2) Quik-Tape as manufactured by Quik-Tape, Inc. (Buford, GA).

b. Sealant Products:
   (1) Pecora AC20+Silicone Acrylic Latex Sealant as manufactured by Pecora Corporation (Harleysville, PA).
   (2) Tremco Dymonic as manufactured by Tremco Incorporated (Ashland, OH).

c. Required Secondary Weather Barrier Performance:
   (1) ASTM E 283-84, CFM Air Infiltration.
   (2) ASTM E 331-86, Water Penetration.

F. Exterior Soffit Board: USG Corporation Sheetrock Brand Exterior Ceiling Board or Architect approved prior to Bid. 5/8 inch thick for vertical and horizontal applications, maximum permissible length, ends square cut, tapered edges.

G. Exterior Parapet Sheathing Board: Provide at backside of all parapet walls. Per ASTM C-1177; Georgia-Pacific Corporation Dens-Deck Prime Roof/Sheathing Board or Architect approved equal prior to Bid. 1/2” thick for vertical applications, maximum permissible length; ends square cut, tapered edges.

2.05 ACCESSORIES

A. Acoustical Sealant: USG Corporation SHEETROCK Brand Acoustical Sealant or approved equal.

B. Laminating Adhesive for Multiple Layers: Special adhesive or joint compound specifically recommended for laminating multiple layers of gypsum wall board.

C. Laminating Adhesive for Direct Application: Special adhesive or joint compound specifically recommended for adhering gypsum wall board to solid substrates.

D. Corner Bead: DUR-A-BEAD as manufactured by USG Corporation or Architect approved equal. All corner bead shall be securely screwed in place.

E. Edge Trim: SHEETROCK No. 200 Series as manufactured by USG Corporation or Architect approved equal.

F. Joint Materials: Untiled Areas: Sheetrock Brand Joint Tape, Sheetrock Brand Setting-Type Joint Compound (Durabond) as manufactured by USG Corporation.

G. Fasteners: ASTM C1002, Type S and W.


I. Stainless steel ‘J’ Bead: Exterior Soffit Board “F” Vented Reveal Molding: DRMF-50-V-75 as manufactured by Fry Reglet Corporation (Alhambra, CA) or Architect approved equal.
PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify site conditions under provisions of Section 010390.
   B. Verify that site conditions are ready to receive Work and opening dimensions are as indicated on Shop Drawings.

3.02 METAL STUD INSTALLATION
   A. Install studs in accordance with manufacturer's instructions.
   B. Metal Stud Spacing: 16 inches on center maximum.
   C. Refer to Drawings for locations where partitions stud framing extends through the ceiling to the structure above. Maintain clearance under structural building members to avoid deflection transfer to studs. Provide extended leg ceiling runners.
   D. Blocking: Screw wood blocking to studs. Install blocking for support of plumbing fixtures, toilet partitions, wall cabinets, toilet accessories, hardware, etc.

3.03 WALL FURRING INSTALLATION
   A. Erect wall furring for direct attachment to concrete block or concrete.
   B. Erect furring channels vertically; space maximum 16 inches on center, not more than 4 inches from floor and ceiling lines. Secure in place on alternate channel flanges at maximum 24 inches on center.
   C. Install thermal and acoustical insulation in conjunction with Section 072100 in accordance with manufacturer's instructions.
   D. Erect free-standing metal stud framing tight to concrete and concrete masonry walls, attached by adjustable furring brackets in accordance with manufacturer's instructions.

3.04 SHAFT WALL INSTALLATION
   A. General: Install gypsum board shaft-wall assemblies to comply with requirements of fire-resistance-rated assemblies indicated, manufacturer's written installation instructions, and the following:
      1. ASTM C 754 for installing steel framing except comply with framing spacing indicated.
   B. Do not bridge architectural or building expansion joints with shaft-wall assemblies; frame both sides of expansion joints with furring and other support.
   C. Isolate perimeter of gypsum panels from building structure to prevent cracking of panels, while maintaining continuity of fire-rated construction.
   D. Firestop Tracks: Where indicated, install to maintain continuity of fire-resistance-rated assembly indicated.
   E. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect, while maintaining fire-resistance rating of gypsum board shaft-wall assemblies.
F. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.

3.05 ACOUSTICAL ACCESSORIES INSTALLATION

A. Place acoustical insulation in partitions tight within spaces, around cut openings, behind and around electrical and mechanical items within or behind partitions, and tight to items passing through partitions.

B. Install acoustical sealant within partitions in accordance with manufacturer's instructions.

C. Install acoustical sealant at gypsum board perimeter at:

1. Metal Framing: Two beads.
2. Face Layer.
3. Caulk all penetrations of partitions by conduit, pipe, duct work, rough-in boxes, etc.

3.06 GYPSUM BOARD INSTALLATION

A. Install gypsum board in accordance with GA-201, GA-216 and GA-600 and manufacturer's instructions.

B. Erect single layer gypsum board vertically, with ends and edges occurring over firm bearing.

C. Erect single layer fire rated gypsum board vertically, with edges and ends occurring over firm bearing.

D. Use screws when fastening gypsum board to metal furring or framing.

E. Use screws when fastening gypsum board to wood furring or framing.

F. Double Layer Applications: Use gypsum board for first layer, placed perpendicular to framing or furring members. Use fire rated gypsum backing board for fire rated partitions.

G. Double Layer Applications: Secure second layer to first with fasteners.

H. Place second layer perpendicular to first layer. Offset joints of second layer from joints of first layer.

I. Treat cut edges and holes in moisture resistant gypsum board with sealant.

J. Place control joints consistent with lines of building spaces as directed and in accordance with manufacturer’s recommendations.

K. Place corner beads at external corners. Use longest practical length. Place edge trim where gypsum board abuts dissimilar materials.

L. Apply gypsum board to curved walls in accordance with GA-216.

3.07 JOINT TREATMENT

A. Provide gypsum wallboard finish levels in accordance with ASTM-C840 and GA-214, minimally complying as follows:
1. Unless otherwise indicated, provide Level 1 Finish on fully concealed surfaces, including:
   a. First ply of two layer gypsum wallboard systems.
   b. Surfaces above finished ceilings.
   c. Surfaces inside plenums, chases or cavities.

2. Provide Level 2 Finish on backing boards to receive mortar-set tile.

3. Unless otherwise indicated, provide Level 4 Finish on exposed surfaces to receive no further finish, or to receive lusterless coatings, including:
   a. Flat paint.
   b. Eggshell paint.

4. Provide Level 5 Finish on exposed surfaces to receive lustrous coatings, including:
   a. Semigloss or gloss paint.
   b. High build glazed or epoxy coatings.

5. In addition, provide Level 4 Finish on other surfaces so indicated or implied on Drawings.

B. Securely attach continuous corner beads to external corners in accordance with manufacturer's directions.

C. Where wallboard abuts dissimilar surfaces securely attach continuous trim beads in accordance with manufacturer's directions.

   1. Where bead abuts exterior metal window frames or other metal components, separate from other material by use of foam tape.
   2. Install accessories.

D. Apply joint treatment compound full height of partition in accordance with manufacturer's directions.

E. Fill joints, screw heads and internal corners with compound.

F. Have surfaces with gypsum wallboard finish Level 4 or 5 primed by painter.

G. After painter has applied primer to wallboard surfaces, repair and refinish defective areas.

H. If wallboard is damaged, or surfaces are roughened, repair, or remove and replace, to satisfaction of the Owner, at no additional cost to the Owner.

3.08 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

END OF SECTION
PART 1  GENERAL

1.01  SECTION INCLUDES

A. Fixed modular laminate clad casework and components.

B. Custom laminate clad casework and components.

C. Plastic laminate clad and solid surface countertops.

1.02  RELATED WORK

A. Section 061000 - Rough Carpentry: Blocking in walls where required.

B. Section 064100 - Architectural Woodwork: Millwork and trim.

C. Section 096500 - Resilient Base.

D. Divisions 20 through 28 - Mechanical and Electrical: Sinks and service fixtures, service and waste lines and all connections, vents, electrical service fixtures, hoods and ducting within or adjacent to casework or otherwise required.

1.03  DEFINITIONS

A. Identification of casework components and related products by surface visibility.

1.  Open Interiors: Any open storage unit without solid door or drawer fronts and units with full glass insert doors and/or acrylic doors.

2.  Closed Interiors: Any closed storage unit behind solid door or drawer fronts, sliding solid doors.

3.  Exposed Ends: Any storage unit exterior side surface that is visible after installation.

4.  Other Exposed Surfaces: Faces of doors and drawers when closed, and tops of cabinets less than 72 inches above furnished floor.

5.  Semi-Exposed Surfaces: Interior surfaces which are visible, bottoms of wall cabinets and tops of cabinets 72 inches or more above finished floor.


1.04  QUALITY ASSURANCE

A. Manufacturer: Minimum of 5 years experience in providing manufactured casework systems for similar types of projects, produce evidence of financial stability, bonding capacity, and adequate facilities and personnel required to perform on this Project.

B. AWI Certification: The selected manufacturer shall be AWI CERTIFIED.

1.05  SUBMITTALS

A. Submit under provisions of Section 013000.

B. Product Data: Manufacturer’s catalog with specifications and construction details.
C. Shop Drawings: Indicate dimensions, description of materials and finishes, general construction, specific modifications, component connections, anchorage methods, hardware, and installation procedures, plus the following specific requirements.

1. Include Section Drawings of typical and special casework, work surfaces and accessories.
2. Indicate locations of plumbing and electrical service field connection by others.

D. Casework Samples:

1. Base cabinet: Cabinet conforming to specifications, with drawer and door.
2. Wall cabinet: Cabinet conforming to specifications, with door.
3. Cabinet samples shall be complete with specified hardware for doors, drawers and shelves.
4. Component samples: Two sets of samples for each of the following:
   a. Decorative laminate color charts.
   b. PVC edgings.

1.06 PRODUCT HANDLING

A. Deliver completed laminate clad casework, countertops, and related products only after wet operations in building are completed, store in ventilated place, protected from the weather, with relative humidity range of 20 percent to 50 percent.

B. Protect finished surfaces from soiling and damage during handling and installation with a protective covering.

1.07 JOB CONDITIONS

A. Environmental Requirements: Do not install casework until permanent HVAC systems are operating and temperature and humidity have been stabilized for at least 1 week.

1. Manufacturer/Supplier shall advise Contractor of temperature and humidity requirements for architectural casework installation areas.
2. After installation, control temperature and humidity to maintain relative humidity between 25 percent and 55 percent.

B. Conditions: Do not install casework until interior concrete work, masonry, plastering and other wet operations are complete.

1.08 REGULATORY REQUIREMENTS

A. Conform to ANSI A117.1 code for access for the handicapped.

B. Conform to Americans with Disabilities Act (ADA) “Accessibility Guidelines for Buildings and Facilities” for access for the handicapped.

1.09 WARRANTY

A. Lifetime Guarantee and Limited Warranty to the original Owner against defective material and fabrication for as long as they own the product. Warranty shall cover cost replacement and/or repair only, manufacturer will correct defects in material and/or fabrication without charge.
PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Manufacturers:

1. Construction Drawings and specifications are based on manufacturer’s literature from TMI Systems Design Corporation (Dickinson, ND). Product: Fixed modular and custom casework and accessories as indicated in Construction Drawings and as follows:

   a. Base cabinets indicated to be 31” in height shall be manufacturer’s standard 29 1/8” height base cabinets (30 5/8” to top of countertop) with 2” aprons at all kneespace (including pencil drawers and keyboard trays) as required to maintain 27” minimum high knee clearance per ADA requirements.
   b. Base cabinets indicated to be 34” in height shall be manufacturer’s standard 31 5/8” height base cabinets (33 1/8” to top of countertop).
   c. Base cabinets indicated to be 36” in height shall be manufacturer’s standard 35 3/8” height base cabinets (36 7/8” to top of countertop) with 2” aprons at all kneespace (including pencil drawers and keyboard trays).
   d. Wall cabinets indicated to be 15” in height shall be manufacturer’s standard 15 1/4” height wall cabinets.
   e. Wall cabinets indicated to be 30” in height shall be manufacturer’s standard 31 5/8” height wall cabinets.
   f. Full-height cabinets indicated to be 86” in height shall be manufacturer’s standard 84 1/2” height full-height cabinets.

2. Comparable systems meeting all requirements contained within this Section from the following manufacturers shall be acceptable:

   a. LSI Corporation of America, Inc. (Minneapolis, MN).
   b. Stevens Industries (Teutopolis, IL).
   c. PolyVision Corporation (Suwanee, GA).

B. Substitutions:

1. It is the intent of this specification to establish performance and quality criteria consistent with pre-established standards of design and function herein described. Casework systems not meeting these minimum standards will not be accepted.

2. Where specific materials, finish options, construction details, modularity, hardware, and test data are specified herein, the casework storage system will be held in strict compliance. Substitutions will be only considered prior to bid date provided request is submitted to the Architect in writing no later than ten (10) days prior to bid date. Substitution requests shall list any and all deviations from the specified system. Requests later than ten (10) days prior to bid will not be considered. Acceptable substitutions will be identified in future Addenda.

2.02 MATERIALS

A. Core Materials:

1. Particleboard up to 7/8 inch thick: Industrial Grade average 47-pound density particleboard, ANSI A 208.1-1993, M-3.

B. Hardboard: 1/4 inch thick prefinished hardboard, CS-251.

C. Decorative Laminates:
   3. High-pressure decorative laminate HGP (.039), NEMA Test LD 3-1995.
   5. High-pressure backer BKH (.048), (.039), (.028), NEMA Test LD3-1995.

D. Chemical-Resistant decorative laminate, NEMA Test LD 3-1995.

E. Laminate Color Selection: Maximum 1 color per unit face and 5 colors per Project.

F. Edging Materials:
   1. 1mm PVC banding.
   2. 3mm PVC banding, machine profiled to 1/8 inch radius.

G. Glass:
   1. Wall unit full sliding glass doors: 1/4 inch laminated safety glass.
   2. Glass insert doors, hinged or sliding base, wall, or tall cabinets: 1/4 inch laminated safety glass.
   4. Trim glass inserts: Extruded rigid PVC.

2.03 SPECIALTY ITEMS

A. Support Members: Furniture grade, epoxy powder coated steel in color as selected by Architect.
   1. Countertop Support Brackets:
      a. Model EH1818P Extra Heavy-Duty Countertop bracket as manufactured by Richelieu Hardware or Knee Saver Support as manufactured by Iron Shore, Inc. (Ashby, MA).
   2. Undercounter support frames.
   3. Legs.

2.04 CABINET HARDWARE

A. Hinges:
   1. Concealed 125-degree swing, self-closing, clip-on style, Blum No. 77M5580.
      a. Doors up to 34 inches in height have 2 hinges per door.
      b. Doors 35 inches to 62 inches in height have 3 hinges per door.
      c. Doors 63 inches to 80 inches in height have 4 hinges per door.
      d. All doors have rubber bumpers.
B. Pulls:

1. Door and drawer front pulls are Hafele, 124.02.920, anodized silver finish. Pull design shall comply with the Americans with Disability Act (ADA).

C. Drawer Slides:


D. Adjustable Shelf Supports:

1. Injection molded transparent polycarbonate friction fit into cabinet end panels and vertical dividers, adjustable on 32mm centers. Each shelf support has 2 integral support pins, 5mm diameter, to interface pre-drilled holes, and to prevent accidental rotation of support. The support automatically adapts to 3/4 inch or 1 inch thick shelving and provides non-tip feature for shelving. Supports may be field fixed if desired. Structural load to 1200 pounds (300 pounds per support) without failure.

E. Locks:

1. National #M49054, removable core, disc tumbler, cam style lock with strike. Furnish 2 keys. Lock for sliding 3/4 inch doors is a disc type plunger lock, sliding door type with strike. Provide grandmaster/master keying system for all casework locks on Project.
2. Automatic door bolt, Hafele #530-1604, used to secure inactive door on all locked cabinets.

F. Sliding Door Track: Anodized aluminum double channel.

G. Coat Rods: 1 inch diameter, 14-gauge chrome plated steel installed in captive mounting hardware. Provide at all wardrobe units.

H. File Suspension System: 14-gauge steel file suspension rails, epoxy powder coated. File followers, or other split bottom hardware, are not acceptable.

2.05 FABRICATION

A. Fabricate casework, countertops and related products to dimensions, profiles, and details shown.

B. Cabinet Body Construction:

1. Tops and bottoms are glued and doweled to cabinet sides and internal cabinet components such as fixed horizontals, rails and verticals. Minimum 6 dowels each joint for 24 inch deep cabinets and a minimum of 4 dowels each joint for 12 inch deep cabinets.
   a. Tops, bottoms and sides of all cabinets are 3/4 inch thick particleboard core.
2. Cabinet backs: 1/4 inch thick prefinished hardboard. Wall and tall cabinets are provided with a 1 inch x 1-3/4 inch PVC mounting strip used to secure the cabinet to the wall.
   a. Exposed back on fixed or movable cabinets: 3/4 inch particleboard with the exterior surface finished in VGS laminate as selected.

3. Fixed base and tall units have an individual factory-applied base, constructed of 3/4 inch exterior grade plywood. Base is 96mm (nominal 4 inch) high unless otherwise indicated on the Drawings.

4. Base units, except sink base units: Full sub-top. Sink base units are provided with open top, a welded steel/epoxy painted sink rail full width at top front edge concealed behind face rail/doors, a split back removable access panel.

5. Side panels and vertical dividers shall receive adjustable shelf hardware at 32mm line boring centers. Mount door hinges, drawer slides and pull-out shelves in the line boring for consistent alignment.

6. Exposed and semi exposed edges.
   a. Edging: 1mm PVC match edge.

7. Adjustable shelf core: 3/4 inch thick particleboard up to 30 inches wide, 1 inch thick particleboard over 30 inches wide.
   a. All four edges: 3mm PVC.

8. Interior finish, units with open Interiors:
   a. Top, bottom, sides, horizontal and vertical members, and adjustable shelving faces with VGS high-pressure decorative laminate with matching prefinished back.

9. Interior finish, units with closed Interiors:
   a. Top, bottom, sides, horizontal and vertical members, and adjustable shelving faces with thermally fused melamine laminate with matching prefinished back.

10. Exposed ends:
    a. Faced with VGS high-pressure decorative laminate.

11. Wall unit bottom:
    a. Faced with VGS high-pressure decorative laminate.

12. Wall and tall unit tops:
    a. Top surface is faced with VGS high-pressure decorative laminate.

13. Balanced construction of all laminated panels is mandatory. Unfinished core stock surfaces, even on concealed surfaces (excluding edges), not permitted.

C. Drawers:

1. Sides, back and sub front: Minimum 1/2 inch thick particleboard, laminated with thermally fused melamine doweled and glued into sides. Top edge banded with 1mm PVC.
2. Drawer bottom: Minimum 1/2 inch thick particleboard laminated with thermally fused melamine, screwed directly to the bottom edges of drawer box.

3. Paper storage drawers: Minimum 3/4 inch thick particleboard sides, back, and sub front laminated with thermally fused melamine. Minimum 1/2 inch thick particleboard drawer bottoms screwed directly to the bottom edges of the drawer box. Provide PVC angle retaining bar at the rear of the drawer.

D. Door/Drawer Fronts:

1. Core: 3/4 inch thick particleboard.
2. Provide double doors in opening in excess of 24 inches wide.
3. Faces:
   a. Exterior: VGS High-pressure decorative laminate.
   b. Interior: High-pressure cabinet liner CLS.

4. Door/drawer edges: 1mm PVC.
5. Miscellaneous Shelving:
   a. Core material: 3/4 inch or 1 inch particleboard.
   b. Exterior: VGS High-pressure decorative laminate.
   c. Edges: 3mm PVC, external edges and outside corners machine profiled to 1/8 inch radius.

2.06 DECORATIVE LAMINATE COUNTERTOPS

A. All countertops not designated as solid surface in Construction Drawings shall be 1 1/2” thick with square-edge fronts and 4” high backsplashes. Tops shall be constructed of 3/4” particleboard with 3/4” additional front, side, and back build-ups. All countertops are to be laminated with HGS high-pressure decorative laminate with balanced backer sheeting.

2.07 SOLID SURFACE COUNTERTOPS

A. Reference Section 064100 - Architectural Woodwork for specifications for solid surface countertops indicated in Construction Drawings.

A. Epoxy Resin Work Surface:

1. Materials and Fabrication:
   a. General: Material shall be a monolithic modified epoxy resin product and shall consist of a cast resin material formulated to provide a work surface with high chemical resistance characteristics. A combination of epoxy resins and inert materials, oven-cured in molds to obtain maximum chemical resistance then removed from the molds and oven tempered to achieve maximum physical strength and stability. Surfaces shall have a uniform low-sheen surface and the finished material shall be extremely hard and resistant to scratches and abrasion.
   b. Thickness: 1 inch (25mm) thick, unless otherwise noted on drawings. Each corner of top shall not deviate more than plus or minus 1/32 inch (1.5mm) from nominal.
   c. Edge: Exposed edges, except as indicated, shall be furnished with a standard 1/8” chamfered or a 1/4” radius edge as specified.
d. Color: Black or as specified.

e. Warpage: Check work surface for warpage before fabrication. Measure in unrestrained condition. Work surface will be accepted for use if there is no gap exceeding 1/16" (1.5mm) in a 36" (0.9m) span.

f. Fabrication: Provide in longest practical lengths. All joints shall be bonded with highly chemical and corrosion resistant cement having similar properties as the base material. Provide 1/8 inch drip groove on underside of exposed edges set back ½ inch (12mm) from edge at all sink areas and where shown on drawings. All exposed edges to be molded or finished.

g. Size Tolerances: Length, plus or minus 1/8” (3mm); width, plus or minus 1/16” (1.5mm).

h. Squareness: Compare the diagonal corner-to-corner measurements across the width of each work surface. The diagonal measurements must be within 1/16 inch.

i. Penetrations: Location of cutouts and drillings: Plus or minus 1/8” (3mm).
Sizes of cutout and drillings: Plus or minus 1/16” (1.5mm).

j. Backsplash: Materials shall be 1” (25mm) thick. Supply loose for field application in same material as countertops. Curbs as installed shall be 4 inches (102mm) high, unless otherwise indicated on drawings. Curbs will be bonded to the tops at the jobsite. Include top mounted end curb where work surfaces abut walls, fume hoods, and locations detailed on drawings.

2. Material Properties: Provide independent testing laboratory report certifying that the epoxy work surface meets or exceeds the following test criteria:

a. Chemical Resistance:

Test Methods:

Volatile chemicals (organic solvents): A cotton ball, saturated with the test chemical (reagent) is placed in a one-ounce bottle (10 x 75 mm test tube or similar container) with a reservoir of liquid above the ball. The container is inverted on the test material for a period of 24 hours at a standard temperature of 23 degrees plus or minus 2 degrees C. (73 degrees plus or minus 4 degrees F).

Non-Volatile Chemicals: Five drops (1/4 cc) of the test chemical are placed on the test material surface. The chemical is covered with a watch glass (25mm) for a period of no less than 24 hours at a standard temperature of 23 degrees plus or minus 2 degrees C. (73 degrees plus or minus 4 degrees F).

Evaluation Ratings:

After 24-hour exposure, exposed areas are washed with water, then a detergent solution, finally with naphtha, then rinsed with distilled water and dried with a cloth. Change in surface finish and function shall be described by the following (1-5) ratings:

Rating:
1) No Effect: No detectable change in surface material.

2) Excellent: Slight detectable change in color or gloss, but no change to the function or life of the work surface material.

3) Good: Clearly discernible change in color or gloss, function or life.

4) Fair: Objectionable change in appearance due to surface discoloration or etch, possibly resulting in deterioration of function over an extended period.

5) Failure: Pitting, cratering or erosion of work surface material; obvious and significant deterioration.

<table>
<thead>
<tr>
<th>TYPE</th>
<th>Inorganic Acids – Corrosive</th>
<th>Minimum Acceptable Results</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Chromic Acid 40%</td>
<td>4</td>
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<tr>
<td></td>
<td>Hydrochloric Acid 10%</td>
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</table>
Soap Solution 1% 1
Turpentine 1

b. Hardness (ASTM D785):

Test Method: A steel ball under a minor load is applied to the surface of the specimen. This indents slightly and assures good contact. The gauge is then set at zero. The major load is applied for 15 seconds and removed, leaving the minor load still applied. The indentation remaining after 15 seconds is read directly off the dial (Rockwell Hardness “M” Scale).

Minimum acceptable test results: Average value of 100 over five readings.

c. Water Absorption (ASTM D570):

Test Method: Specimens measuring 3” in length by 1” in width by the thickness of the material should be used. At least 3 specimens should be tested. After weighing, specimens should be entirely immersed in distilled water maintained at a temperature of 23 degrees plus or minus 1 degree C. (73.4 degrees plus or minus 1.8 degrees F.) for a period of 24 hours. The samples should then be removed, dried and weighed to the nearest 0.001g. The percentage of increase in weight calculated to the nearest 0.01% should then be calculated.

Minimum Acceptable Test Results: 0.01%

d. Flammability or Rate of Burning (ASTM D635):

Test Method: The specimen is clamped at one end on a ring stand so the longitudinal axis is horizontal and the transverse axis is inclined 45 degrees to horizontal. A piece of 20-mesh Bunsen burner gauze is clamped horizontally 3/8” below the specimen. A Bunsen burner, placed so the flame contacts the end of the specimen, is held 30 seconds and then removed. If the specimen does not ignite, the burner is returned for another 30-second attempt. The burning is measured along the lower edge of the specimen. If the specimen does not ignite, it is classed non-burning by this test. If the specimen continues to burn, it is timed until it stops or a 4” mark is reached. A specimen which burns to the 4” mark is classed as burning by this test and the rate is equal to (180/time) in. per min. If the specimen does not continue burning to the 4” mark, it is classed as self-extinguishing.

Minimum Acceptable Test Results: Self-extinguishing

e. Porcelain Crucible – Test A (Non-Standard Test)

Test Method: a high form porcelain crucible, size D, 15 ml capacity, shall be heated over a Bunsen burner until the crucible bottom attains an incipient red heat. Immediately, the hot crucible shall be transferred to the top surface and allowed to cool to room temperature.

Minimum Acceptable Test Results: Upon removal of the cooled crucible, there shall be no blisters or cracks. Slight dulling or color change is acceptable.

f. Heat Deflection @ 264 psi (ASTM D648)
Test Method: a bar of rectangular cross section is tested as a simple beam with the load applied at its center to give maximum fiber stresses of 455 kPa (66psi). The specimen is immersed under load in a heat-transfer medium provided with a means of raising the temperature at 2 ± 0.2 degrees C/min. The temperature of the medium is measured when the test bar has deflected 0.25mm (0.010 in.). This temperature is recorded as the deflection temperature under flexural load of the test specimen.

Minimum Acceptable Test Results: 191 degrees C (375 degrees F).

g. Flexural Strength and Modulus of Flex (ASTM D790):

Test Method: Test specimens should be prepared from 1” thick production material with a support span 16 times the depth (thickness) of the beam. The original surface of the sample should be unaltered. Recommended sample size is 19.5” x 1.0” x 1.0” (length x width x depth). A minimum of five samples are to be tested. Testing should be carried out to failure of the test sample. Modulus of rupture should be measured as described in the ASTM method.

Minimum Acceptable Test Result: Flexural Strength: 10,000 psi
Modulus of Flex: 2,000,000 psi

1. Materials and Fabrication:

a. General: Material shall be a monolithic modified epoxy resin product and shall consist of a cast resin material formulated to provide a work surface with high chemical resistance characteristics. A combination of epoxy resins and inert materials, oven-cured in molds to obtain maximum chemical resistance then removed from the molds and oven tempered to achieve maximum physical strength and stability. Surfaces shall have a uniform low-sheen surface and the finished material shall be extremely hard and resistant to scratches and abrasion.

b. Thickness: 1 inch (25mm) thick, unless otherwise noted on drawings. Each corner of top shall not deviate more than plus or minus 1/32 inch (1.5mm) from nominal.

c. Edge: Exposed edges, except as indicated, shall be furnished with a standard 1/8” chamfered or a 1/4” radius edge as specified.

d. Color: Black or as specified.

e. Warpage: Check work surface for warpage before fabrication. Measure in unrestrained condition. Work surface will be accepted for use if there is no gap exceeding 1/16” (1.5mm) in a 36” (0.9m) span.

f. Fabrication: Provide in longest practical lengths. All joints shall be bonded with highly chemical and corrosion resistant cement having similar properties as the base material. Provide 1/8 inch drip groove on underside of exposed edges set back ½ inch (12mm) from edge at all sink areas and where shown on drawings. All exposed edges to be molded or finished.

g. Size Tolerances: Length, plus or minus 1/8” (3mm); width, plus or minus 1/16” (1.5mm).

h. Squareness: Compare the diagonal corner-to-corner measurements across the width of each work surface. The diagonal measurements must be within 1/16 inch.
i. Penetrations: Location of cutouts and drillings: Plus or minus 1/8” (3mm).
Sizes of cutout and drillings: Plus or minus 1/16” (1.5mm).

j. Backsplash: Materials shall be 1” (25mm) thick. Supply loose for field application in same material as
countertops. Curbs as installed shall be 4 inches (102mm) high, unless otherwise indicated on
drawings. Curbs will be bonded to the tops at the jobsite. Include top mounted end curb where work
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Test Methods:

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The chemical is covered with a watch glass (25mm) for a period of no less than 24 hours at a
standard temperature of 23 degrees plus or minus 2 degrees C. (73 degrees plus or minus 4 degrees
F).

Evaluation Ratings:

After 24-hour exposure, exposed areas are washed with water, then a detergent solution, finally with
naphtha, then rinsed with distilled water and dried with a cloth. Change in surface finish and function
shall be described by the following (1-5) ratings:

Rating:

1) No Effect: No detectable change in surface material.

2) Excellent: Slight detectable change in color or gloss, but no change to the function or life of the work
surface material.

3) Good: Clearly discernible change in color or gloss, function or life.

4) Fair: Objectionable change in appearance due to surface discoloration or etch, possibly resulting in
deterioration of function over an extended period.

5) Failure: Pitting, cratering or erosion of work surface material; obvious and significant deterioration.

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<td>Turpentine</td>
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b. Hardness (ASTM D785):

Test Method: A steel ball under a minor load is applied to the surface of the specimen. This indents slightly and assures good contact. The gauge is then set at zero. The major load is applied for 15 seconds and removed, leaving the minor load still applied. The indentation remaining after 15 seconds is read directly off the dial (Rockwell Hardness “M” Scale).

Minimum acceptable test results: Average value of 100 over five readings.

c. Water Absorption (ASTM D570):

Test Method: Specimens measuring 3” in length by 1” in width by the thickness of the material should be used. At least 3 specimens should be tested. After weighing, specimens should be entirely immersed in distilled water maintained at a temperature of 23 degrees plus or minus 1 degree C. (73.4 degrees plus or minus 1.8 degrees F.) for a period of 24 hours. The samples should then be removed, dried and weighed to the nearest 0.001g. The percentage of increase in weight calculated to the nearest 0.01% should then be calculated.

Minimum Acceptable Test Results: 0.01%
d. Flammability or Rate of Burning (ASTM D635):

Test Method: The specimen is clamped at one end on a ring stand so the longitudinal axis is horizontal and the transverse axis is inclined 45 degrees to horizontal. A piece of 20-mesh Bunsen burner gauze is clamped horizontally 3/8” below the specimen. A Bunsen burner, placed so the flame contacts the end of the specimen, is held 30 seconds and then removed. If the specimen does not ignite, the burner is returned for another 30-second attempt. The burning is measured along the lower edge of the specimen. If the specimen does not ignite, it is classed non-burning by this test. If the specimen continues to burn, it is timed until it stops or a 4” mark is reached. A specimen which burns to the 4” mark is classed as burning by this test and the rate is equal to (180/time) in. per min. If the specimen does not continue burning to the 4” mark, it is classed as self-extinguishing.

Minimum Acceptable Test Results: Self-extinguishing

e. Porcelain Crucible – Test A (Non-Standard Test)

Test Method: a high form porcelain crucible, size D, 15 ml capacity, shall be heated over a Bunsen burner until the crucible bottom attains an incipient red heat. Immediately, the hot crucible shall be transferred to the top surface and allowed to cool to room temperature.

Minimum Acceptable Test Results: Upon removal of the cooled crucible, there shall be no blisters or cracks. Slight dulling or color change is acceptable.

f. Heat Deflection @ 264 psi (ASTM D648)

Test Method: a bar of rectangular cross section is tested as a simple beam with the load applied at its center to give maximum fiber stresses of 455 kPa (66psi). The specimen is immersed under load in a heat-transfer medium provided with a means of raising the temperature at 2 ± 0.2 degrees C/min. The temperature of the medium is measured when the test bar has deflected 0.25mm (0.010 in.). This temperature is recorded as the deflection temperature under flexural load of the test specimen.

Minimum Acceptable Test Results: 191 degrees C (375 degrees F).

g. Flexural Strength and Modulus of Flex (ASTM D790):

Test Method: Test specimens should be prepared from 1” thick production material with a support span 16 times the depth (thickness) of the beam. The original surface of the sample should be unaltered. Recommended sample size is 19.5” x 1.0” x 1.0” (length x width x depth). A minimum of five samples are to be tested. Testing should be carried out to failure of the test sample. Modulus of rupture should be measured as described in the ASTM method.

Minimum Acceptable Test Result: Flexural Strength: 10,000 psi
Modulus of Flex: 2,000,000 psi

PART 3 EXECUTION

3.01 INSPECTION

A. The casework contractor must examine the job site and the conditions under which the Work under this Section is to be performed, and notify the building Owner in writing of unsatisfactory conditions.
Do not proceed with Work under this Section until satisfactory conditions have been corrected in a manner acceptable to the installer.

3.02 PREPARATION

A. Condition casework to average prevailing humidity conditions in installation areas prior to installing.

3.03 INSTALLATION

A. Erect casework, plumb, level, true and straight with no distortions. Shim as required. Where laminate clad casework abuts other finished work, scribe and cut to accurate fit.

B. Adjust casework and hardware so that doors and drawers operate smoothly without warp or bind.

C. Repair minor damage per plastic laminate manufacturer’s recommendations. Replace other damaged cabinets or materials.

3.04 CLEANING

A. Leave cabinets broom clean inside and out. Wipe off fingerprints, pencil marks, and surface soil etc., in preparation for final cleaning by the building Owner.

B. Remove and dispose of all packing materials and related construction debris.

3.05 COLOR SELECTION

A. Laminate Color Selection:

1. As selected from the full range of Wilsonart®, Nevamar®, Pionite®, and Formica® stock color charts for cabinet faces, exposed ends, open interiors, and countertops and/or as indicated on Interior Design Construction Drawings.

B. Hinge and Pull Color Selection:

1. As selected from stock colors of casework manufacturer and including (matched to Wilsonart®) Frosty White, Light Beige, Dove Grey, Slate Grey, Black and Chrome.

C. Miscellaneous Hardware Color Selection (support brackets, table frames, rail):

1. As selected from stock colors of casework manufacturer and including (matched to Wilsonart®) Frosty White, Light Beige, Dove Grey, Slate Grey and Black.

D. 1mm PVC Edge Banding Color Selection:

1. As selected from solid, patterned and woodgrains matching laminate colors.

E. 3mm PVC Edge Banding Color Selection:

1. As selected from stock colors of casework manufacturer of 3mm PVC and including (matched to Wilsonart®) Frosty White, Light Beige, Dove Grey, Slate Grey, Black.

END OF SECTION