SECTION 08 71 00

FINISH HARDWARE

PART 1: GENERAL

1.01 RELATED DOCUMENTS

A. Drawings, Details of Construction and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to work specified in this section.

1.02 SUMMARY

A. This Section includes the furnishing of butt hinges and the furnishing and installing of all finish hardware material specified herein, listed in the hardware schedule, or required by the Drawings.

B. Cylinders for:

C. Items of hardware include:

1. Finish hardware

2. Thresholds and weatherstrip

1.03 RELATED WORK SPECIFIED ELSEWHERE

A. Section 08 10 00 - Hollow Metal Doors and Frames.

B. Section 08 14 00 - Wood Doors.

1.04 REFERENCES

A. Builders' Hardware Manufacturers Assoc., Inc. (BHMA), 60 E. 42nd St., New York, NY 10017.

1. Recommended locations for builders' hardware.

B. American National Standards Institute, Inc. (ANSI), 1430 Broadway, New York, NY 10018.

1. A115.2 - Specifications for standard steel door and frame preparations for bored cylindrical locks for 1-3/8" and 1-3/4" doors.

C. National Fire Protection Association, Inc. (NFPA), Battery March Park, Quincy, MA 02269.

1. NFPA 80 - Standard for fire doors and windows.

2. NFPA 101 - Code for safety to life from fire in buildings and structures.

D. Underwriters Laboratories, Inc. (UL), 333 Pfingsten Road, Northbrook, IL 60062.

1. Building Materials Directory.

E. Builders' Hardware Manufacturers Assoc., Inc. (BHMA), 60 E. 42nd Street, New York, NY 10017.

1. Recommended locations for builders' hardware.

F. Building Codes: International Building Code, Adopted Edition.

1. Include State amendments modifying model codes in jurisdiction where project is constructed.

1.05 QUALITY ASSURANCE

A. Except where specified in the hardware schedule, furnish products of only one manufacturer for each type of hardware.

B. Supplier: Company specializing in the builders' hardware industry.

C. Provide hardware for fire-rated openings conforming to UBC Standard 7-2.

D. Provide hardware for fire-rated openings conforming in compliance with NFPA 80 1995 Edition.

1.06 REGULATORY REQUIREMENTS

A. Furnish hardware listed by UL testing agency for all rated openings in conformance with requirements for the class of opening scheduled.

B. Rating requirements have precedence over this specification where conflict exists.

C. Furnish and install hardware that is in compliance with American with Disabilities Act of 1990 (ADA) technical standards, and current State Building Code.

1.07 SUBMITTALS

A. Submit in accordance with Section 01 33 00.

1. Schedules

a. Immediately after award of the hardware contract, submit a detailed, vertical type hardware schedule and cut sheets for each type of hardware for approval. On existing buildings field verify existing swings and functions prior to submitting schedule.

b. Itemize hardware in the sequence and format established by this specification.

1. List and describe each opening separately; include door number, room designations, degree of swing, and hand.

2. List related details; include dimensions, door and frame material, and other conditions affecting hardware.

3. List all hardware items; include manufacturer's name, quantity, product name, catalog number, size, finish, attachments, and related details where applicable.

c. Submit manufactures cut sheets on each type of hardware proposed.

d. Resubmit the corrected schedule when required.

e. Determine keying requirements by meeting with the Owner coordinated through the Architect, and submit a detailed keying schedule for review; resubmit the corrected schedule when required.

3. Samples: Submit samples of hardware items as may be required by the Architect; identify each sample and indicate the location of subsequent installation in the project.

4. Templates: Furnish a copy of the approved hardware schedule and all pertinent templates or template information to each fabricator of material factory-prepared for the installation of hardware.

5. Include documentation for UL 10C or other approved testing agency stating hardware has passed UBC Standard 7-2.

1.08 DELIVERY, STORAGE AND HANDLING

A. Deliver hardware to the job site in the manufacturer's original containers that have been marked to correspond with the approved hardware schedule for installation location.

B. Store hardware in dry surroundings and protect against loss and damage.

PART 2: PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS/MATERIALS

A. Hinges

1. Butt hinge manufacturers and respective catalog numbers:

	IVES	Hager	Stanley	McKinney	Bommer
a.	5PB1	1279	F179	T2714	5000
b.	5BB1	BB1279	FBB179	TB2714	BB5000
c.	5BB1 630	BB1191	FBB191	TB2314	BB5002
d.	5BB1HW	BB1168	FBB168	T4B3786	BB5004
e.	5BB1HW630	BB1199	FBB199	T4B3386	BB5006

2. When hinges are specified on the hardware schedule, furnish:

   a. Interior openings through 36 inches wide and 60 inches high without a door closer: Two (2) standard-weight, plain bearing hinges #1279 per leaf.

   b. Interior openings through 36 inches wide and 90 inches high without a door closer: Three (3) standard-weight, plain bearing hinges #1279 per leaf.

   c. Interior openings through 36 inches wide and 60 inches high with a door closer: Two (2) standard-weight, ball bearing hinges #BB1279 per leaf.

   d. Interior openings through 36 inches wide and 90 inches high with a door closer: Three (3) standard-weight, ball bearing hinges #BB1279 per leaf.

   e. Interior openings over 36 inches in width and/or 90 inches in height: One (1) continuous hinge per leaf.

   f. Exterior hollow metal or stainless steel openings: One (1) continuous hinge per leaf.

   g. Exterior aluminum openings through 36 inch wide and 90 inches high: Four (4) heavyweight ball bearing hinges #BB1199xNRP per leaf.

   h. Exterior aluminum openings over 36 inches wide in width and/or 90 inches in height: One (1) continuous hinge per leaf.

B. Locks

1. Manufacturers and respective catalog numbers:

Corbin-Russwin
M ML2000 LWA

2. Furnish lock types and functions specified in the hardware schedule, with the following provisions:

a. Strikes:

1) Lip length sufficient to protect trim, frame or inactive leaf.

3. Lever handles must be cast brass, bronze or stainless steel construction and conform to ASNI A117.1.

C. Cylinders: Corbin-Russwin

D. Pulls, Push Plates/Bars, Flush cup pulls

1. Manufacturers and respective catalog numbers:

	Hem	Hagar	Hiawatha	Burns	Rockwood
a.	Pull	10Q 18"	518B-18"	26C-18"	118
b.	Push Plate (flush doors	30s 8x16	200K	57	70F
c.	Push Plate (6" stile doors)	30s 4x16	200F	54	70C
d.	Pushbar	130s	1081LBP	422	47
e.	Flush Cup Pulls	27p	-	-	BF97

E. Coordinators

1. Manufacturers and respective catalog numbers:

Ives	Door Control	Hager
COR	600	297D

2. Furnish a COR series coordinator for labeled pairs of doors equipped with automatic flush bolts or vertical rod-mortise lock fire exit device combinations with astragals.

3. Furnish filler bars for total opening width, closer mounting brackets, carry bars, and special preparation for top latches where applicable.

F. Closers

1. Manufacturers and respective catalog numbers:

LCN	Sargent	Norton	Yale
4011/4111 Series	351P10	7500 Series	4400 Series

2. Where closers are listed in the hardware schedule, furnish 4011/4111, 351P10, PR7500, PR4400 series unless other functions/series are specified in the hardware groups.

3. Furnish complete with all mounting brackets, drop plates and special shoes as may be required by the door and frame conditions.

4. Determine closer size in accordance with manufacturer's recommendations for application on the room side of corridor doors, stair side of stair doors, and interior side of exterior doors.

G. Kick Plates: Where kick plates are specified in the hardware schedule, furnish 16 gauge, .050" plates, with the following dimensions:

1. Width: 2" less than door width.

2. Height: 8" (unless noted different on door schedule.)

H. Overhead Stops

1. Manufacturers and respective catalog numbers:

	Glynn-Johnson	Rixson-Firemark
a.	GJ450	10
b.	GJ90	9
c.	GJ100	1

2. Furnish a GJ90 series overhead stop for all doors equipped with regular arm surface type closers that swing more than 140 degrees before striking a wall and for all doors that open against equipment, casework, sidelights, or other objects that would make wall bumpers inappropriate.

3. Furnish a GJ90 or GJ100 series overhead holder where listed in the Hardware Schedule.

4. Furnish sex bolt attachments for mineral core door applications, unless solid wood blocking is provided in the door for attachment.

I. Floor and Wall Stops and Holders

1. Manufacturers and respective catalog numbers:

		Ives	Hager	Burns
a.	Wall bumper	WS407CVX	232W	570
b.	Wall stop	WS11X	255W	530
c.	Holder	WS20X	254W	
d.	Floor stop	FS435/FS436	241F/246B	510/525
e.	Wall holder	WS40	326W	533
f.	Exterior Floor Stop	FS9		

2. Furnish a WS407CVX series wall stop, as applicable, for each door leaf except where wall bumber WS11X, floor stops FS435/FS436, holders WS20X, wall holder WS40 or overhead stops/holders are specified in the hardware schedule.

3. Where wall stops are not applicable, furnish overhead stops as previously specified within this section of the specification.

J. Thresholds, Weatherstrips and Jamb Gaskets

1. Manufacturers and respective catalog numbers:

		Reese	Pemko	National Guard
a.	Saddle threshold	S205A	171A	425E
b.	Half saddle threshold	S245A	229A	325 Alum
c.	Bumper seal threshold	S483AV	2005AV	896 Alum (Vinyl)
d.	Weatherstrip	755A	2891APK	700NA

e.	Astragral weatherstrip	804	Pair 309	185
f.	Sweep	964C	18061CP	B606A
g.	Head and Jamb Gasket	797	S88	5050
h.	Drip	R201	346	16
i.	Jamb sound seal	F499	350CSR	1038
j.	Auto door bottom	F521	430CPKL	420

2. Where specified in the hardware groups, furnish the above products unless otherwise details in groups.

3. Furnish 5050 head/jamb gaskets and NGP 9605 edge stile astragals for pairs, at all fire labeled doors whether listed in group or not. *Reese and Pemko equivalents approved based on passing UL 10C, UBC test Standard 7-2.

4. Coordinate with door manufacturer the intumescent fire and smoke material for fire rated openings as required by door and frame manufacturer to comply with UL 10C, UBC test 7-2.

5. When "threshold" appears within a hardware group provide the following:

   a. At aluminum entrances on new buildings provide a half saddle threshold.
   b. At aluminum entrances on existing buildings provide a saddle threshold.
   c. At interior door ways provide a saddle threshold.
   d. At exterior doorways from occupied rooms and HM or FRP exit only doors provide a bumper seal threshold.
   e. At exterior HM or FRP doors to receiving areas, loading docks and boiler rooms provide a saddle threshold.

K. Lock Protectors

1. Manufacturers and respective catalog numbers.

Ives
LG1-LG14

2.03 ACCESSORIES AND ATTACHMENTS

A. Furnish all necessary hardware accessories such as wood or machine screws, bolts, nuts, anchors, toggle bolts, and other fasteners, each of the type, size, material and finish for its intended purpose and each according to the material to which the hardware is being applied.

2.04 FINISH AND BASE METALS

A. Finish and Base Metal:

Butt Hinges-Interior	US26D on steel
Locks	US26D on brass or bronze
Closers	Sprayed AL on cast iron or aluminum
Protective Plates	US32D on stainless Steel
Overhead Stops	US26D on brass, bronze, or steel
Wall Stops	US26D on brass, bronze, or steel
Miscellaneous	US26D on brass or bronze

2.06 KEYING

A. Change key and masterkey all lock cylinders as directed by the Architect.

B. Furnish two change keys for each lock, six masterkeys for each masterkey set, and two removable core control keys.

C. Stamp keys with file key number and "Do Not Copy."

D. Ship masterkeys and control keys to the Owner via registered mail.

PART 3: EXECUTION

3.01 INSTALLATION

A. Install hardware in accordance with manufacturer's recommendations / instructions, and the adopted Building Code.

B. Install hardware on UL labeled openings in accordance with manufacturer's requirements, so as to maintain the label.

C. Install hardware mountable weatherstipping continuous throughout opening prior to installation of other hardware.

D. Mortise and cut to close tolerance and conceal evidence of cutting in the finished work.

E. Remove, cover or protect hardware after fitting until paint or other finish is applied; permanently install hardware after finishing operations are complete.

F. Install closers on the room side of corridor doors, stair side of stairways, and interior side of exterior doors.

G. Mounting heights:

1. Install hardware at mounting heights conforming to the recommended mounting locations of the Builders' Hardware Manufacturing Association, and the adopted Building Code.

2. Install wall stops WS11X, wall holders WS20X, and magnetic holders to strike near top of doors, but not more than 78" from the finished floor line; install wall stops WS407CVX to engage knobs, levers or pulls.

H. Install pulls at 40" to top of pull and push bars at 36" above finished floor. Off set pull on exterior door rails to allow access to cylinders.

I. Deliver to the Owner one complete set of installation and adjustment instructions, and tools as furnished with the hardware.

J. Before hardware installation, general contractor/construction manager shall coordinate a hardware installation seminar to be conducted on the rough-in of electrical boxes for hardware and the installation of hardware, specifically of locksets, closers/accessibility closers, exit devices, hardware, mountable weatherstrip and overhead stops. Manufacturer's representative of the above products to present seminar. Seminar to be held at the job site and attended by installers of hardware (including low voltage hardware) for aluminum, hollow metal and wood doors. Training to include use of installation manuals, hardware schedule, templates and physical product samples. The architect needs to be informed of the meeting and contractor is to distribute meeting minutes on issues raised at seminar.

K. Install per door and/or frame manufacturer's supplemental "S" label instructions on fire rated openings.

3.02 ADJUSTING AND CLEANING

A. At final completion, adjust and test all hardware for function, performance, building code compliance and leave in good operating condition. Panic Hardware device manufacturer's representative to inspect panic hardware installation and provide a report to contractor and architect on items that need correction.

B. Clean all hardware to restore the original finish.

3.03 PROTECTION

A. Protect the finished installation until acceptance of the project.

B. Provide final adjustment or cleaning where necessary.

3.04 DEMONSTRATION

A. Engage a factory-authorized service representative(s) to train Owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes. At a minimum, provide the following training:

1.	Miscellaneous hardware	1 hour
2.	Exit devices	2 hours
3.	Locks	1 hour
4.	Closers	1 hour
5.	Electromagnetic locks	2 hours
6.	Accessibility closers	2 hours

Refer to Section 01 79 00 Demonstration and Training.

3.05 HARDWARE SETS

Hardware Group 1 (Corridor Doors)

3EA	HINGE	5BB1 4.5X4.5	652 IVE
1 EA	CLASROOM LOCK	L9070BD	626 SCH
1 EA	CYLINDER CORE	CORBIN RUSWIN	D2 KEYWAY COORD W/ DIST. TO MATCH KEY TYPE
1 EA	SURFACE CLOSER	4011	689 LCN
1 EA	KICKPLATE	8400 10"X2" LDW B4E	630 IVE
1EA	WALLSTOP	WS33	626 IVE
1 SET	SEALS	2525B	BRN NGP

END OF SECTION 08 71 00

SECTION 08 80 00

GLAZING

PART 1: GENERAL

1.01 RELATED DOCUMENTS

A. Drawings, Details of Construction and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to work specified in this section.

1.02 SUMMARY

A. Section includes:

1. Interior Glazing
   a. Clear glass in wood doors.

2. Exterior Insulated Glazing
   a. Safety glass in locations identified in Part 3.
   b. Clear glass in windows.

B. Related work specified in other sections:

1. Steel doors and frames - Section 08 10 00.
2. Wood doors - Section 08 14 00.

1.03 QUALITY ASSURANCE

A. Reference Specification: Glazing Manual by Flat Glass Marketing Association.

B. Materials: Conform in all respects to the "Safety Standard for Architectural Glazing Materials" (16CFR 1201) issued by the Consumer Product Safety Commission and Chapter 24 of the Uniform Building Code.

C. Insulating glass units to be CBA rated with the Insulating Glass Certification Council (IGCC) in accordance with ASTM Specifications E-773 and E-774.

1.04 SUBMITTALS

A. Submit per Section 01 33 00.

1. Manufacturer's recommended installation instructions.

2. Samples for each type glass specified.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Package, handle, deliver and store at the job site in a manner that will avoid damage. Reject scratched glass.

1.06 WARRANTY

A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer's standard form in which coated-glass manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.

1. Warranty Period: 10 years from date of Substantial Completion.

B. Manufacturer's Special Warranty on Insulating Glass: Manufacturer's standard form in which insulating-glass manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.

1. Warranty Period: 10 years from date of Substantial Completion.

C. Submit per Section 01 78 23.

PART 2: PRODUCTS

2.01 MANUFACTURERS/FABRICATORS

A. Glass Manufacturers and/or Coating Manufacturers: PPG Industries, www.ppgglazing.com; Guardian Industries, www.sunguardglass.com; Old Castle Building Products, www.oldcastlebe.com; Pilkington North America, Inc., www.pilkington.com; Visteon Corporation, www.visteon.com; Viracon, www.viracon.com.

B. Safety Glass Manufacturers: SAFTI First, www.safti.com. Comparable products as manufactured by Technical Glass Products, www.fireglass.com are acceptable.

C. Interlayer Manufacturers: Solutia/Saflex, www.saflex.com or equal.

D. Glass Product Fabricators: As certified by glass manufacturers and/or coating manufacturers.

2.02 INTERIOR GLAZING

A. Clear:

1. Clear Float Glass, ¼" thick.

B. Fire Rated:

1. Products by Technical Glass Products (FireLite, NT, Premium Grade) are acceptable.

2.03 ACCESSORIES

A. Glazing Sealant: Two-part silicone similar to Dow Corning 982 Insulating Glass Sealant. Glazer is responsible to verify compatibility to primary seal material.

B. Setting Blocks: 70-90 Shore "A" durometer, sized to accommodate size of glass used, compatible with glazing sealant.

C. Spacers: Warm edge spacer, compatible with sealant used. Maximum "U" value at glass edge: 0.399.

D. Primer - Sealers, Cleaners: As recommended by glass manufacturer.

PART 3: EXECUTION

3.01 INSPECTION

A. Check that glazing channels are free of burrs, irregularities, and debris.

B. Check that glass is free of edge damage or face imperfections.

C. Do not proceed with installation until conditions are satisfactory.

3.02 PREPARATION

A. Field Measurements:

1. Measure size of frame to receive glass.
2. Compute actual glass size, allowing for edge clearances.

B. Preparation of Surfaces:

1. Remove protective coatings from surfaces to be glazed.
2. Clean glass and glazing surfaces, to remove dust, oil and contaminants. Wipe dry.

3.03 INSTALLATION

A. Install glass in accordance with glass manufacturer's current printed instructions.

B. Install sliding glass doors in accordance with manufacturer's instructions and as shown on Drawings.

3.04 CLEANING

A. Remove excess glazing compound from installed glass.

B. Remove labels from glass surface as soon as installed.

C. Wash and polish both faces of glass.

D. Remove debris from work site.

3.05 PROTECTION OF COMPLETED WORK

A. Attach crossed streamers away from glass face.

B. Do not apply markers to glass surface.

C. Replace damaged glass.

END OF SECTION 08 80 00

SECTION 09 21 16

GYPSUM BOARD

PART 1: GENERAL

1.01 RELATED DOCUMENTS

A. Drawings, Details of Construction and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to work specified in this section.

1.02 SUMMARY

A. Section includes:

1. Non load bearing interior metal stud framing for drywall.
2. Gypsum wallboard and joint system.
3. Sound batt insulation and acoustic sealant at gypsum board.
4. Shaft wall framing and board.

B. Related work specified in other sections:

1. Insulation - Section 07 21 00.

1.03 SUBMITTALS

A. Submit in accordance with Section 01 33 00.

1. UL listings for gypsum board partitions for proposed products.
2. UL listings for shaft wall assemblies proposed.
3. Samples of abuse-resistant gypsum board.

1.04 QUALITY ASSURANCE

A. Referenced Specifications: Current Gypsum Associates publications (www.gypsum.org).

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Delivery and Handling

1. Deliver materials to the project site with manufacturer's labels intact and legible.
2. Handle materials with care to prevent damage.
3. Deliver fire-rated materials bearing testing agency label and required fire classification numbers.
4. The plastic packaging used to wrap gypsum panel products for shipment is intended to provide temporary protection from moisture exposure during transit only and is not intended to provide protection during storage after delivery. Such plastic packaging shall be removed immediately upon receipt of the shipment.
    a. Failure to remove protective plastic shipping covers can result in condensation which can lead to damage, including mold.

B. Storage

1. Store materials inside under cover, stack flat, properly supported on a level surface, all in same direction, off of floor. Gypsum panel products to be fully protected from weather, direct sunlight exposure and condensation.

2. Avoid overloading floor system

3. Store adhesives in dry area; provide protection against freezing at all times.

4. Steel framing and related accessories shall be stored and handled in accordance with AISI's "Code of Standard Practice".

1.06 JOB CONDITIONS

A. Environmental Conditions

1. Do not install gypsum board products at temperatures below 40°F for mechanical installation and 50°F for adhesive installation, unless approved by manufacturer.

2. Measure temperature and humidity on a daily basis during taping operations. Re-application of taping compound shall not occur sooner than shown on the table in Gypsum Association Brochure GA-236.

3. Temperature: During cold weather, in areas receiving wallboard installation, maintain temperature range between 55°0 F to 90° F for 48 hours before, and during gypsum board and joint treatment application. Maintain specified temperature range until joint treatment is completely dry.

4. Ventilation

   a. Provide ventilation during and following adhesives and joint treatment applications.

   b. Use temporary air circulators in enclosed areas lacking natural ventilation.

   c. Under slow drying conditions, allow additional drying time between coats of joint treatment.

   d. Protect installed materials from drafts during hot, dry weather.

B. Protect adjacent surfaces against damage and stains.

1.07 JOB COORDINATION

A. Coordinate Work with installation of metal framing and electrical work.

B. Coordinate framing and blocking for wall mounted accessories with Section 06 10 53.

PART 2: PRODUCTS

2.01 PANELS, GENERAL

A. Size: Provide in maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

B. General: Complying with ASTM C 1396/C 1396M, as applicable to type of gypsum board indicated and whichever is more stringent.

2.02 GYPSUM BOARD

A. Standard

1. Panel Physical Characteristics.

   a. Core: Regular
   b. Surface Paper: 100% recycled content paper on front, back and long edges.
   c. Long Edges: Tapered; square edge acceptable at areas with Level 1 finish.
   d. Thickness: As noted on drawings.
   e. Panel shall comply with requirements of ASTM C 1396 Standard Specification for Gypsum Board.

B. Fire-Resistance Rated.

1. Type X, Panel Physical Characteristics

   a. Core: Fire-resistant rated gypsum core.
   b. Surface Paper: 100% recycled content paper on front, back and long edges.
   c. Long Edges: Tapered; square edge acceptable at areas with Level 1 finish.
   d. Thickness: 5/8"
   e. Panel shall comply with Type X requirements of ASTM C 1396 Standard Specification for Gypsum Board.

2. Type C, Panel Physical Characteristics

   a. Core: Fire-resistant rated gypsum core.
   b. Surface Paper: 100% recycled content paper on front, back and long edges.
   c. Long Edges: Tapered; square edge acceptable at areas with Level 1 finish.
   d. Thickness: 1/2"
   e. Panel shall comply with Type C requirements of ASTM C 1396 Standard Specification for Gypsum Board.

C. Abuse-Resistant

1. Panel Physical Characteristics

   a. Core: Fire resistance rated gypsum core, with additives to enhance, surface indentation resistance and impact resistance.
   b. Surface Paper: 95% recycled content moisture/mold/mildew resistance paper on front, back and long edge.
   c. Long Edges: Tapered; square edge acceptable at areas with Level 1 finish.
   d. Thickness: 5/8"
   e. Panel shall comply with the following requirements:
      1) Type X: ASTM C 1396, C 1629.
      2) Surface Abrasion, ASTM D 4977, abraded depth maximum: Less than 0.290 inches.
      3) Surface indentation, ASTM D 5420, indentation maximum less than 0.200 inches.
      4) Prog. Drop Soft Body Impact, ASTM E 695, ft-lbs to failure: between 100 and 200.
      5) Single Drop Soft Body Impact, ASTM E 695, ft-lbs to failure: between 200 and 475.
   f. Mold/Mildew Resistance: 10 when tested in accordance with ASTM D3273.

D. Shaft Wall

1. Panel Physical Characteristics

   a. Core: Type X, gypsum core, with additives to enhance fire-resistance, moisture and mold resistance.
   b. Facing: Water-resistant glass mat on front, back and long edges.
   c. Long Edges: Double beveled.
   d. Overall Thickness: 1"
   e. Shall comply with ASTM C 1396 and ASTM C 1658.
   f. Mold/Mildew Resistance: 10 when tested in accordance with ASTM D 3273.

2. Finishing Panels: Conform to fire-resistance rated gypsum board previously specified in this section.

3. Framing: C-T (or other standard shapes proprietary to manufacturer) studs, runners and accessories as required to meet UL tests.

   a. Complying with ASTM C 645.
   b. Depth: 2 ½", 4" or 6" as required by span or as noted on drawings.
   c. Gauge: As required to fulfill performance criteria with a minimum base metal thickness of 25 gauge (20 gauge at jamb and lintels).

4. Fire-Resistance Rating: As noted on code plans.

E. Metal Framing:

1. Protective Coating: ASTM C 645/C, 645M G40 (Z120) or equivalent corrosion resistance.

   a. Metal studs and runners.
      1) Metal Thickness
         a) 20 gauge or ProSTEEL 20 gauge equivalent.
         b) 25 gauge or ProSTEEL 25 gauge equivalent.
      2) Size: 1 5/8", 2 ½", 3 5/8", 4" or 6" deep as noted on drawings.

   b. Deflection Track: Steel sheet top runner manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.

   c. Fire Stop Track: Top runner designed to allow partition head to move while maintaining integrity of assembly fire-resistance rating. Thickness not less than indicated for studs, and of width to accommodate depth of studs.

   d. Hat-Shaped, Rigid Furring Channels
      1) Base Metal Thickness: 0.0179 inch.
      2) Depth: 7/8" or 1 ½" as noted on drawings.

   e. Resilient Furring Channels: ½" deep, steel members designed to reduce sound transmission.

   f. Z-Shaped Furring: With slotted or non-slotted web, face flange of 1 ¼", wall attachment flange of 7/8", minimum bare metal thickness of 0.0179 inch and depth required to fit insulation thickness.

   g. Radius Framing: Steel sheet runner for non-structural curves, bends, variable radii and arches. Design to provide higher strength capacity than conventional lighter gauge material by using a work-hardened steel base strip.
      1) Base Metal Thickness and Size: Match studs.

   h. Flat Strap and Backing Plate Sheet: For blocking or bracing.

1) Base Metal Thickness: 20 gauge.
2) Width: 6 inch.

i. Fasteners for Metal Framing: Provide fasteners of type, material, size, corrosion resistance, holding power and other properties required to fasten steel framing and furring member securely to substrates involved; comply with recommendations of gypsum board manufacturers for application indicated.

j. Ceiling Suspension Systems. Use one of the following systems:
1) Metal studs with depth required to handle span.
2) 1 ½" cold rolled steel channels, 8 gauge annealed hanger wire and furring channels.
3) Direct-hung system composed of 8 gauge hanger wire, main beams and interlocking cross furring members as manufactured by:
a) Armstrong World Industries, "Furring Systems/Drywall".
b) Chicago Metallic Corp. "Drywall Furring 640/Drywall Furring 660".
c) USG Interiors, Inc. "Drywall Suspension Systems".

F. Accessories:

1. Trim: ASTM C 1047.

a. Material: Galvanized or aluminum-coated steel sheet, rolled zinc.
b. Shapes:
1) Cornerbead.
2) L-C Bead: J-shaped; exposed long flange receives joint compound.
3) L-Bead: L-shaped: exposed long flange receives joint compound.
4) Off-angle or splayed cornerbead.
5) V-shaped Control Joint protected with plastic tape.

2. Acoustical sealant conforming to ASTM C 919.

3. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.

a. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.
b. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.

4. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.

a. Use adhesives that have a VOC content of 50 g/L or less when calculated according to 40 CFR, 59, Subpart D (EPA Method 24).

5. Sound Batt Insulation and Rigid Wall Insulation: Conform to requirements of Section 07 21 00.

6. Joint Treatment Materials:

a. General: Comply with ASTM C 475/C 475M.
b. Joint Tape:
1) Interior Gypsum Wallboard: 2 1/16" wide paper reinforcing tape.
2) Glass-Mat Gypsum Wallboard: 2" wide self adhering fiberglass tape.
3) Tile Backing Panels: As recommended by panel manufacturer.
c. Joint Compound for Interior Gypsum Wallboard: Drying type pre-mixed vinyl base compound and/or drying type pre-mixed vinyl base topping compound.
d. Joint compound for glass-mat gypsum wallboard: As recommended by wallboard manufacturer.

PART 3: EXECUTION

3.01 EXAMINATION

A. Examine substrates to which gypsum board construction attaches or abuts, installed hollow metal frames, cast-in anchors and structural framing with installer present for compliance with requirements for installation tolerances and other conditions affecting performance of gypsum board assemblies specified in this section.

1. Do not proceed with installation until satisfactory conditions have been corrected.

3.02 INSTALLATION OF STEEL FRAMING, GENERAL

A. Steel framing installation standard: Comply with ASTM C 754.

B. Metal Stud Schedule

1. Use 25 gauge metal studs or equivalent on partitions up to 12'-0" high and soffits.
2. Use 20 gauge or equivalent metal studs on:
   a. Metal stud partitions over 12'-0" high.
   b. Metal stud ceilings.
   c. For partitions of nay height covered with abuse or high impact resistant gypsum board.
   d. Double studs at each door and borrowed light jamb and head.

C. Install supplementary framing, blocking and bracing at terminations in work and for support of fixtures, equipment services, heavy trim, grab bars, toilet accessories, door bumpers, furnishings and similar construction to comply with details indicated and with recommendations of gypsum board manufacturer.

D. Isolate steel framing from building structure to prevent transfer of loading imposed by structural movement, at location indicated below to comply with details shown on drawings.

1. Where suspended ceiling assemblies abut building structure horizontally at ceiling perimeters or penetrations of ceiling.

2. Where partitions and wall framing abut overhead structure.
   a. Provide slip or cushioned type joints to attain lateral support and avoid axial loading.

E. Do not bridge building expansion and control joints with steel framing or furring members, independently frame both sides of joints with framing or furring members or as indicated.

3.03 INSTALLATION OF STEEL FRAMING FOR CEILINGS AND SOFFITS

A. Suspend ceiling hangers from building structural members and as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum not part of supporting structural or ceiling suspension system.

   a. Splay hangers only where required to miss obstruction s and offset resulting horizontal forces by bracing, counter splaying or other equally effective means.

2. Where widths of ducts and other construction within ceiling plenum produce hanger spacing that interfere with the location of hangers at spacing required to support standard suspension system members, install supplemental suspension system members and hangers in form of trapezes or equivalent devices.

   a. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.

3. Secure wire hangers to structure, by looping or wire tying, directly to supporting structure, including intermediate framing members. Attach to inserts, eye screws, or other devices appropriate for structure to which hangers are attached as well as for type of hanger involved in manner that will not cause deterioration or failure, due to age, corrosion or elevated temperatures.

4. Do not attach hangers to metal roof deck or metal deck tabs.

5. Do not connect or suspend steel framing from ducts, pipes or conduits.

B. Keep hangers and braces 2 inches clear of ducts, pipes and conduits.

C. Wire-tie or clip furring members to main runners and to other structural supports.

D. Grid Suspension Systems: Attach perimeter wall track or angle where grid suspension system abuts vertical surfaces. Mechanically join main beam and cross furring members to each other and butt cut to fit wall track.

3.04 INSTALLATION OF STEEL FRAMING FOR WALLS AND PARTITIONS

A. Install runners (tracks) at floors, ceilings and structural walls and columns where gypsum board stud system abuts other construction.

1. Use proprietary tracks for non-rated and fire rated walls and partitions.
2. Install studs full height for all partitions unless noted otherwise.
3. Where studs are installed directly against masonry or concrete walls, set studs in acoustical sealant.

B. Installation Tolerances: Install each steel framing and furring member so that fastening surface does not vary more than 1/8" from plane of faces of adjacent framing.

C. Extend partition framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at or just above suspended ceilings. Continue framing over frames for doors and openings and frame around ducts penetrating partitions above ceiling to provide support for gypsum board.

1. Cut studs ½ inch short of full height to provide perimeter relief.
2. For STC-rated or fire-resistance rated partitions that extend full height, install framing around structural members, as required to support gypsum board closures needed to make partitions continuous from floor to underside of structure above.
3. Install bridging/spacing bar.

D. Brace partition framing, not extending full height to structure above, with studs same size and thickness as partition framing. Provide bracing at:

1. 6'-0" o.c. intervals along length of partitions.
2. Not less than 6'-0" from partition ends and corners.
3. Door and window openings.

E. Terminate partition framing at suspended ceiling where indicated.

F. Install metal studs and furring in sizes and at spacings indicated.

1. Single and Multi Layer Construction: Space studs 16 inches o.c., unless otherwise indicated.

G. Install metal studs with flanges in same direction and leading edge or end of gypsum board panel can be attached to open (unsupported) edges of stud flanges first.

H. Frame door openings to comply with details indicated, with GA-219 and with applicable published recommendations of gypsum board manufacturer. Attach vertical studs at jambs with screws either directly to frames or to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.

I. Frame openings other than door openings to comply with details indicated, or if none indicated, in same manner as required for door openings; and install framing below sills of openings to match framing required above door heads.

1. Extend vertical jamb studs through suspended ceilings and attach to underside of floor or roof structure above.

3.05 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:

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. Install supplementary framing in gypsum board shaft-wall assemblies around openings and as required for blocking, bracing, and support of gravity and pullout loads of fixtures, equipment services, heavy trim, furnishings, and similar items that cannot be supported directly by shaft-wall assembly framing.

1. At elevator hoistway entrance door frames, provide jamb struts on each side of door frame.
2. Where handrails directly attach to gypsum board shaft-wall assemblies, provide galvanized steel reinforcing strip with 0.0312 inch minimum thickness of base (uncoated) metal, accurately positioned and secure behind at least 1 gypsum board face-layer panel.

D. Integrate stair hanger rods with gypsum board shaft-wall assemblies by locating cavity of assemblies where required to enclose rods.

E. At penetrations in shaft wall, maintain fire-resistance rating of shaft-wall assembly by installing supplementary steel framing around perimeter of penetration and fire protection behind boxes containing wiring devices, elevator call buttons, elevator floor indicators, and similar items.

F. Isolate perimeter of gypsum panels from building structure to prevent cracking of panels, while maintaining continuity of fire-rated construction.

3.06 APPLICATION OF GYPSUM BOARD

A. Install the following gypsum board types as follows:

1. Regular type: All non-rated areas unless noted differently below.
2. Type X or C: As required to meet fire-resistant rated assemblies.
3. Mold and Moisture Resistant: All gypsum board on the interior face of an insulated stud exterior wall. (Note: Gypsum Board on furred masonry walls can be regular type.)
4. Abuse-resistant and high impact resistant: As noted on drawings and/or wall types.

B. Gypsum Board Application and Finishing Standards: Comply with ASTM C 480 and GA-216.

C. Install sound attenuation insulation blankets where indicated, prior to gypsum board, unless readily installed after board has been installed on one side.

D. Single-Layer Application: Install gypsum wallboard as follows:

1. Locate exposed end-butt joints as far from center of walls and ceilings as possible, and stagger not less than 24 inches in alternate courses of board.

2. On partitions/walls apply gypsum board vertically (parallel to framing), unless otherwise indicated or required by fire resistance rated assembly, and provide sheet lengths which will minimize end joints.
   a. On partitions/walls 8'-1" or less in height, apply gypsum board horizontally (perpendicular to framing); use maximum length sheets possible to minimize end joints.
   b. At stairwells and other high walls, install gypsum board horizontal, unless otherwise indicated or required for fire resistance rating.
   c. On Z-furring, apply gypsum panels vertically (parallel to framing). Locate edge joints over furring member.

E. Double-Layer Application: Install gypsum backing board for base layer and exposed gypsum board for face layer.

1. On ceilings apply base layer prior to application of base layer on walls/partitions; apply face layer in same sequence. Offset joints between layers minimum one stud space. Apply base layers at right angles to supports, unless otherwise indicated.

2. On partitions/walls apply base layer and face layer vertically (parallel to framing) with joints of base layer over supports and face layer joints offset minimum one stud space with base layer joints.

F. Install exposed gypsum board with face side out. Do not install imperfect, damaged or damp boards. Butt boards together for light at edges and ends with not more than 1/16 inch open space between boards. Do not force into place.

G. Locate both edge or end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints.

1. Position boards so like edges abut, tapered edges against tapered edges and mill-cut or field-cut ends against mill-cut or field-cut ends.
2. Do not place tapered edges against cut edges or ends.
3. Gypsum panel product joints shall be located so that no joint will align with the edge of an opening unless control joints are to be installed at these locations.
4. Joints on opposite sides of a partition shall not occur on the same stud.
5. In single layer gypsum panel products systems, end joints parallel to and on the same side of framing members shall be staggered between alternate courses of gypsum panel products and from joints on the opposite side of the framing members.
6. In multi-layer gypsum panel product systems, end joints parallel to and on the same side of framing members shall be staggered between alternate courses of gypsum panel products.
7. Base layer end joints parallel to and on one side of framing shall be staggered from base layer end joints on the opposite side of the framing members.
8. Install ceiling boards across framing in manner to minimize end-butt joints, and avoid end joints in central area of each ceiling. Stagger end joints at least 24 inches.

H. Spot grout hollow metal door frames for solid core wood doors, hollow metal doors and doors over 32 inches wide except where full grout is shown. Apply spot grout at each jamb anchor clip just before inserting board into frame.

I. Form control joints and expansion joints at locations indicated or as recommended, with space between edges of boards, prepared to receive trim accessories.

1. Where a control joints occurs in an acoustical or fire-rated system, blocking shall be provide behind the control joint by using a backing material such as 5/8" type X gypsum panel product, or other tested equivalent.

J. Cover both faces of metal stud partition framing with gypsum board in concealed spaces (above ceiling, etc.), except in chase walls which are braced internally.

1. Except where concealed application is indicated or required for sound, fire, air or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq.ft. area, and may be limited to not less than 75 percent of full coverage.
2. Fit gypsum board around ducts, pipes and conduits.

K. Isolate perimeters of non-load-bearing drywall partitions at structural abutments. Provide ¼ to ½ inch space to accept trim edge.

L. Where STC-rated gypsum board assemblies are indicated or drawings indicate acoustical sealant, seal construction at perimeters, behind control and expansion joints, openings, and other penetrations with a continuous bead of acoustical sealant. Include a bead of sealant at both faces of partitions.

1. Comply with ASTM C 919 and manufacturer's recommendations for location of edge trim and closing off sound flanking paths around or through gypsum board assemblies, including partitions extending above ceilings.
2. Where resilient furring channels are used over steel framing, the screws used to attach the gypsum panel product to the furring channels shall not contact the framing.

M. Gypsum panel products applied to walls shall be applied with the bottom edge spaced a minimum of 1/8 inch and maximum of ¼ inch above the floor.

N. Laminating to Substrate: Where gypsum panels are indicated as directly adhered to a substrate (other than studs, joists, furring members, or base layer of gypsum board), comply with gypsum board manufacturer's written recommendations and temporarily brace or fasten gypsum panels until fastening adhesive has set.

O. Wall Tile Substrates: For substrates scheduled to receive ceramic or porcelain tile, comply with the following:

1. Install gypsum tile backer board panels to comply with manufacturer's installation instructions at locations scheduled to receive wall tile. Install with ¼" open space where panels abut other construction.

3.06 METHODS OF GYPSUM BOARD FASTENING

A. Fastener lengths shall be at least 1 1/8" long for ½" gypsum panels and 1 ¼" long for 5/8" gypsum panels used for metal framing.

B. Screws shall be spaced not more than 12 in. o.c. for ceilings and 16 in. o.c. for walls where the framing members are 16 in. o.c. Screws shall be spaced not more than 12 in. o.c. for both ceilings and walls where framing members are 24 in. o.c.

C. Fasteners at gypsum panel product edges or ends shall be located not less than 3/8" from the edge or end. Fasteners at edges or ends in a perpendicular application shall be located not more than 1 in. from the edge or end. Perimeter attachment into partition top and bottom plates is neither required nor recommended except where fire ratings, structural performance requirements, or other special conditions require such attachment.

D. While diving fasteners, gypsum panel products shall be held in firm contact with framing members or underlaying support. Application of fasteners shall proceed from the center or field of the gypsum panel product toward the ends and edges, or shall begin along one edge and proceed toward the other edge.

E. To provide a more flat surface at joints, attach gypsum board to steel studs so leading edge or end of each board is attached to open (unsupported) edge of stud flanges first.

F. Attach gypsum board to supplementary framing and blocking provided for additional support at openings and cutouts.

G. Screws shall be driven so that screw heads are slightly below the gypsum panel product surface without breaking the face paper, fracturing the core, or stripping the framing member around the screw shank.

H. Double-Layer Fastening Methods: Apply base layer of gypsum board and face layer to base layer as follows:

1. Fasten base layer with screws and face layer with adhesive and supplementary fasteners, except where otherwise required for fire-resistance rated assemblies.

3.07 INSTALLATION OF DRYWALL TRIM ACCESSORIES

A. General: Where feasible, use same fasteners to anchor trim accessory flanges as required to fasten gypsum board to supports. Otherwise, fasten flanges to comply with manufacturer's recommendations.

B. Install corner beads at external corners.

C. Install metal edge trim whenever edge of gypsum board would otherwise be exposed or semi-exposed. Provide type with face flange to receive joint compound except where "U" bead (semi-finishing type) is indicated.

1. Install "J" bead where drywall construction is tightly butted to other construction and back flange can be attached to framing or supporting substrate.
2. Install "L" bead where edge trim can only be installed after gypsum board is installed.

D. Install control joints at locations as follows:

1. At ceilings, 50'-0" o.c. each way maximum and/or where shown on drawings. At corners and at tee intersections of soffits that change directions.
2. At walls, 30'-0" o.c. maximum, and/or where shown on drawings.
3. Full height door frames shall be considered equivalent to a control joint.

3.08 FINISHING OF GYPSUM WALL BOARD

A. General: Apply joint treatment at gypsum board joints (both directions); flanges of corner bead, edge trim and control joints; penetrations; fastener heads, surface defects and elsewhere as required to prepare work for decoration.

B. Prefill open joints using setting-type joint compound.

C. Apply joint tape at joints between gypsum boards, except where trim accessories are indicated.

D. Glass-Mat Water Resistant Backer Board: Comply with glass mat backer board manufacturer's recommendations.

E. Water or additive shall not be added to joint compound unless recommended by manufacturer. See quality assurance for application temperature and drying times.

F. Levels of Gypsum Board Finishing per Gypsum Association GA-214 and as note herein:

1. Level 1/Fire Taping: All joints and interior angles shall have tape set in joint compound. Surface shall be free of excess joint compound. Tool marks and ridges are acceptable. Tape and fasteners need not be covered.

a. For use in plenum areas above ceilings, gypsum board not scheduled for paint or wallcovering, gypsum board concealed from view in the finished work, except as noted in level 2.

2. Level 2: All joints and interior angles shall have tape embedded in joint compound and wiped with a joint knife leaving a thin coating of joint compound over all joints and interior angles. Fastener heads and accessories shall be covered with a coat of joint compound. Surface shall be free of excess joint compound. Tool marks and ridges are acceptable. Joint compound applied over the body of the tape at the time of tape embedment shall be considered a separate coat of joint compound and shall satisfy the conditions of this level.

    a. For use on areas that are a substrate for tile or wood paneling.

3. Level 3: All joints and interior angles shall have tape embedded in joint compound and one additional coat of joint compound applied over all joints and interior angles. Fastener heads and accessories shall be covered with two separate coats of joint compound. All joint compound shall be smooth and free to tool marks and ridges.

    a. For use on surfaces of mechanical and electrical spaces scheduled to receive paint.

4. Level 4: All joints and interior angles shall have tape embedded in joint compound and two separate coats of joint compound applied over all flat joints and one separate coat of joint compound applied over interior angles. Fastener heads and accessories shall be covered with three separate coats of joint compound. All joint compound shall be smooth and free of tool marks and ridges. When necessary, sand between coats and following final coat to provide smooth surface ready for decoration.

    a. For use on all walls scheduled for paint or wallcovering except those areas noted under Level 3 and 5.

5. Level 5: All joints and interior angles shall have tape embedded in joint compound and two separate coats for joint compound applied over all flat joints and one separate coat of joint compound applied over interior angles. Fastener heads and accessories shall be covered with three separate coats of joint compound. A thin skim coat of joint compound trowel applied, or a material manufactured especially for this purpose and applied in accordance with manufacturer's recommendations, shall be applied to the entire surface. The surface shall be smooth and free of tool marks and ridges. When necessary, sand between coats and following final coat to provide smooth surface ready for decoration.

    a. For use on all ceilings; walls and/or soffits under skylights and clerestories, and as noted on drawings. Note: when Level 5 finish is used, it shall extend to nearest inside or outside corner.

3.09 FINISHING ADJUSTMENT

A. Screw Pop

1. Repair nail pop by driving new screw approximately 1-1/2 inches away and reseat screw.

2. When face paper is punctured drive new screw approximately 1-1/2 inches from defective fastening and remove defective fastening.

3. Fill damaged surface with compound in coats specified by required finish level.

B. Ridging

1. Sand ridges to reinforcing tape without cutting through tape.

2. Fill concave areas on both sides of ridge with topping compound.

3. After fill is dry, blend in topping compound over repaired area.

C. Fill cracks with compound and finish smooth and flush.

3.10 CLEANING AND PROTECTION

A. Promptly remove any residual joint compound from adjacent surfaces.

B. Protect installed products from damage from weather, condensation, construction, and other causes during remainder of the construction period.

C. Remove and replace panels that are wet, moisture damaged, or mold damaged.

1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 09 21 16

SECTION 09 51 00

ACOUSTICAL CEILINGS

PART 1: GENERAL

1.01 RELATED DOCUMENTS

A. Drawings, Details of Construction and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to work specified in this section.

1.02 SUMMARY

A. Section includes:

1. Lay-in acoustic ceilings.

B. Related work specified in other sections:

1. Mechanical penetration of ceilings - Divisions 21-25.

2. Electrical penetration of ceilings - Divisions 26-28.

1.03 SUBMITTALS

A. Submit Shop Drawings indicating installation layouts in accordance with Section 01 33 00.

B. Submit samples of all acoustical and suspension materials to Architect for approval.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original, unopened, protective packaging, with manufacturer's labels indicating brand name, pattern, size, thickness and fire rating as applicable, legible and intact.

B. Store materials in original protective packaging to prevent soiling, physical damage or wetting.

C. Store cartons open at each end to stabilize moisture content and temperature.

D. Do not begin installation until sufficient materials to complete a room are received.

1.06 ENVIRONMENTAL REQUIREMENTS

A. Complete installation of dampening materials before beginning work.

B. Maintain humidity of 65% - 75% in area where acoustical materials are to be installed, 25 hours before, during, and after installation.

C. Maintain a uniform temperature in the range of 55 F. to 70 F. prior to, during, and after installation of materials.

PART 2: PRODUCTS

2.01 ACOUSTICAL MATERIALS

A. Products specified are as follows:

1. Armstrong, www.armstrong.com
2. USG, www.usg.com
3. National Gypsum, www.nationalgypsum.com
4. Tectum, Inc., www.tectum.com

B. ACT 1: Square edge, 5/8" thick, sag and abuse resistant, anti-microbial, low VOC, lay-in tile. Provide 24" x 24" or 24" x 48" tile as shown on drawings.

1. Minimum NRC: 0.50
2. Minimum CAC: 30
3. Minimum LR: 0.86
4. Minimum Recycled Content: 33%
5. Armstrong "Tundra Humigard" #301 or #302.
6. USG "Touchstone ClimaPlus" #5893 or #5894

C. Furnish extra materials equal to 1% of each type of acoustical material supplied. Provide materials in new, unopened cartons labeled as to contents.

2.02 SUSPENSION SYSTEMS

A. Systems specified are by Chicago Metallic. Equivalent systems by USG or Armstrong are acceptable.

B. Suspension System for Non-Rated Lay-In Panels (except locations listed below): 200 Intermediate Duty Snap-Grid System, standard white finish.

C. Systems for use in kitchens, kitchen serving areas, toilets and locker rooms to be 1830 intermediate duty hot dipped galvanized capped with white aluminum capping.

D. Perimeter treatment components for all systems to be 0.020 inch thick hot dipped galvanized steel, 15/16" wide x ¾" high. Edges to be hemmed. Finished identical to main runners and cross tees.

PART 3: EXECUTION

3.01 CONDITION OF SURFACES

A. Examine surfaces scheduled to receive suspended or directly attached acoustical units for unevenness, irregularities, and dampness that would affect quality and execution of work.

B. Mark access provisions as to size and location before beginning installation.

3.02 REQUIREMENTS FOR ALL MECHANICAL SUSPENSION SYSTEMS

A. Grid layout in each space, area located symmetrically in room, space. Coordinate work with other trades so that lighting fixtures, grilles, other ceiling fixtures work to grid layout.

B. Do not use universal splices or other types whose use would obstruct passage of recessed lighting fixtures through grid openings, or make untenable their reposition upon flanges of beams.

C. Support suspension system from structure above, not from ductwork, equipment or piping.

D. Space hangers not more than 6" from ends, not more than 4'-0" o.c. Between ends of main runners, provide extra hangers as required to support other work resting in or on ceiling.

E. Provide additional tee supports, hangers and cut tiles to support and fit to all sides of light fixtures, linear diffusers and other ceiling penetrations. Coordinate with mechanical and electrical drawings.

3.03 ACOUSTICAL MATERIALS

A. Install ceiling panels and tiles using clean gloves, to avoid soiling materials.

B. Install lay-in panels snugly against support system without damaging panels.

C. Field rabbit edges of panels where field-cut to match shadow-line profile.

D. Adjust any sags or twists which develop in the ceiling systems and replace any part which is damaged or faulty.

E. Clean exposed surfaces of acoustical ceilings, including trim, edge moldings and suspension members; comply with manufacturer's instructions for cleaning and touch up of minor finish damage. Remove and replace work which cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

F. Replace any damaged tile just prior to substantial completion.

END OF SECTION 09 51 00

SECTION 09 65 00

RESILIENT FLOORING

PART 1: GENERAL

1.01 RELATED DOCUMENTS

A. Drawings, Details of Construction and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to work specified in this section.

1.02 SUMMARY

A. Section includes:

1. Vinyl composition tile.
2. Vinyl base and accessories.
3. Vinyl base at freestanding island casework.
4. Removal of concrete curing compound.

B. Related work specified in other sections:

1. Concrete Substrates – Section 03 30 00
2. Wood Substrates – Section 06 10 53.

1.03 SUBMITTALS

A. Submit per Section 01 78 23.

1. Submit full line of color samples for materials to be furnished for Architect's review and selection.
2. Provide manufacturer's recommended maintenance data and instructions prior to completion of work.

B. Specified warranties from manufacturer. Submit per Section 01 78 23.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver materials to project site in manufacturer's original, unopened containers with labels indicating brand names, colors and patterns, and quality designations legible and intact.

B. Do not open containers or remove markings until materials are inspected and accepted.

C. Store and protect accepted materials in accordance with manufacturer's directions and recommendations.

D. Unless otherwise directed, store materials in original containers at not less than 70° F. for not less than 24 hours immediately before installation.

1.05 ENVIRONMENTAL REQUIREMENTS

A. Maintain temperature in space to receive tile between 70° F. and 90° F. for not less than 48 hours before and 48 hours after installation.

B. Maintain minimum temperature of 65° F. thereafter.

PART 2: PRODUCTS

2.01 APPROVED MANUFACTURERS

A. Manufacturers listed in this specification are approved under the following conditions:

1. A manufacturer listed in both the specification and the Material Finish/Color Schedule, on Architectural Drawings is not required to submit a pre-bid approval.
2. Manufacturers listed in this specification, but not in the Material Finish/Color Schedule, on Architectural Drawings shall submit color samples for pre-bid approval by addendum. Refer to Section 01 25 00.
3. When no colors are listed in the Material Finish/Color Schedule, on Architectural Drawings, any manufacturer listed in this specification are not required to submit a pre-bid approval.

2.02 VINYL COMPOSITION TILE

A. Manufacturer: Products specified are by Tarkett. Equivalent products by Armstrong and Mannington are acceptable.

B. Tile: 12" x 12" x 1/8".

C. Color/Texture: See Material Finish/Color Schedule, on Architectural Drawings.

D. Patterns as shown on drawings.

2.03 VINYL BASE

A. Manufacturer: Products by Mercer are specified. VPI, Armstrong, Johnsonite, Roppe, Tarkett are acceptable.

B. Base: 1/8" thick x 4" high, solid vinyl. Straight base at carpet, coved base at other surfaces.

2.04 ACCESSORIES

A. Adhesives, Other Application Material: As recommended specifically by flooring manufacturer.

B. Subfloor Filler: Hydraulic/Portland cement based material designed for providing thin solid surface for leveling and for minor ramping of subsurface to adjacent floor finishes.

1. Use material capable of being applied and feathered out to adjacent floor without spalling.

C. Non-slip strips: 3M Company.

D. Sealant for non-slip flooring: Altro "Gunseal".

2.05 EXTRA STOCK

A. Furnish 1% of each type/color of flooring, trim used in this project to Owner as maintenance stock.

PART 3: EXECUTION

3.01 PREPARATION

A. Surfaces to receive resilient finishes: Dry, clean, smooth. Fill defects or grind smooth as required. Sand subfloors to remove mortar, paint, other surface irregularities.

B. Buff out the concrete curing compound with a scouring pad on a buffer or other recommended procedure prior to installing adhesives for flooring.

C. Correct adverse conditions of any type before starting any flooring installation.

D. Where filling, patching, leveling is required of thickness exceeding 1/8" apply latex type underlayment in two or more applications. Apply compound in accordance with Manufacturer's printed instructions. Achieve a substrate that is flat to within 1/8" in 10'.

1. On remodeling projects, assume 33% of area will require filling, patching or leveling.

E. Beginning of installation means installer has accepted substrate as acceptable.

F. Install flooring only after finishing operation has been completed and permanent heating system is in operation. Moisture content of concrete slabs, building air temperature and relative humidity must be within limits recommended by flooring manufacturer.

G. Terminate resilient flooring at centerline of door openings where adjacent floor finish is dissimilar.

3.02 VINYL COMPOSITION TILE

A. Place tile units with adhesive cement in strict compliance with the manufacturer's recommendations. Butt tile units tightly to vertical surfaces, thresholds, nosings and edgings. Scribe as necessary around obstructions and to produce neat points, laid tight, even and in straight, parallel lines. Extend tile units into toe spaces, door reveals, and into closet and similar openings.

B. Maintain reference markers, holes, or openings that are in place or plainly marked for future cutting by repeating on the finished tile marked in the subfloor. Use chalk or other non-permanent marking device.

C. Lay tile from center marks established with principal walls discounting minor offsets so that tile at opposite edges of the room are of equal width. Adjust as necessary to avoid use of cut widths less than 3" at room perimeters.

D. Match tiles for color and pattern by using tile from cartons in the same sequence as manufactured and packaged. Broken, cracked, chipped or deformed tile are not acceptable.

C. Tightly cement tile to sub-floor without open cracks, voids, ridging and puckering at joints, telegraphing of adhesive spreader marks through tile, or other surface imperfections.

3.03 ACCESSORIES

A. Place resilient reducer strips tightly butted to resilient flooring and secure with adhesive. Provide edging strips or cap strips at all unprotected edges of flooring.

B. Apply coved base at resilient floors and straight base at carpeted floors.

C. Install non-slip strips on ramps, vestibules 6" o.c.

3.04 CLEANING, WAXING AND PROTECTION

A. VCT

1. Remove excess adhesive from floor, base, and wall surfaces without causing damage to surfaces due to cleaning operations, and repair damage to adjacent materials caused by resilient tile installation using methods recommended by adjacent material manufacturers.

2. Just prior to substantial completion, strip factory applied wax from floor tile with cleaner (do not flood floor), and apply two (2) coats of sealer and three (3) coats of wax.

3.05 DEMONSTRATION

A. Engage factory-authorized representatives to train Owner's maintenance personnel on proper waxing and cleaning procedures for each floor product. Refer to Section 01 79 00 Demonstration and Training.

END OF SECTION 09 65 00

SECTION 09 91 00

PAINTING

PART 1: GENERAL

1.01 RELATED DOCUMENTS

A. Drawings, Details of Construction and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to work specified in this section.

1.02 SUMMARY

A. Section includes:

1. Field finish all materials scheduled and/or specified for paint, trim, stain or seal. Including but not limited to:

    a. Concrete block
    b. Gypsum Board
    c. Rated partition identification.

B. Related work specified in other sections:

1. Colored sealants – Section 07 92 00

2. Finishing of wood casework, paneling, etc. Div. 6.

1.03 SUBMITTALS

A. Provide three (3) copies of a schedule detailing each substrate in the same order as the schedules used in Part 2 of this section. Include the following:

1. The specific products to be used for each coat.

2. Documentation that the manufacturer has reviewed and approved each painting system.

3. Data pages for all products listed, highlight the following:

    a. Type of resin.
    b. Dry Film Thickness.
    c. Volume Solids.
    d. Units of Sheen.
    e. VOC content and chemical components.
    f. Other performance or descriptive data required by Part 2 of this section.
    g. If this information is not on the data page provide the information in a letter of certification from the manufacturer. Attach the letter to the appropriate data page.

B. Submit three (3) drawdowns of each product and color combination. Drawdowns shall be applied using a 4 mil WFT drawdown bar on Leneta form WD plain white coated cards size 3-7/8" x 6".

1. Label each card with the following:

    a. Job name.
    b. Date.
    c. Product name.

d. Product number.
e. Color number as stated in the material finish/color schedule.
f. Name, address, and phone number of the supplying facility.
g. Surface material product is to be applied onto.

C. Do not deliver material to site until having received written approval of submitted information and samples.

D. Complete sample area on project as selected by Architect on each type surface and with each type of paint system specified. Do not proceed further with application until receiving acceptance of each sample area by Architect. Accepted areas will serve as standard of quality for entire project.

1.04 EXAMINATION OF DOCUMENTS

A. Examine the specifications for the work of other trade contractors and to become familiar with their work. All surfaces that are left unfinished by the requirements of other specifications to be finished by this section.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Store materials not is use, in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg. F.

1. Maintain containers in clean condition, free for foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.06 PROJECT CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 degrees F.

B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 degrees F above the dew point; or to damp or wet surfaces.

C. Do not apply coatings during cold, rainy or frosty weather.

D. Do not apply to surfaces, which are exposed to hot sun.

1.07 QUALITY ASSURANCE

A. MPI Standards:

1. Products: Complying with MPI standards indicated and listed in "MPI Approved Products List."

2. Preparation and Workmanship: Comply with requirements in "MPI Architectural Painting Specification Manual" for products and paint systems indicated.

3. Previously Painted Surface Preparation and Workmanship: Comply with requirements in "MPI Maintenance and Repainting Manual" for products and paint system indicated.

PART 2: PRODUCTS

2.01 PAINTING SYSTEMS

A. Painting systems for normal applications are specified using the products of Sherwin-Williams Co. (S-W), Akzo Nobel Paints [Glidden Professional: (GP); DEVOE COATINGS: (DC); (Sika)] and Pittsburgh Paints (PPG) and Benjamin Moore & Co.: Benjamin Moore (BM); Coronado; Corotech; Insl-x; Lenmar to establish standards of quality, except as noted.

1. Other manufacturers can submit for approval through the pre-bid process defined in Section 01 25 00 Substitutions and Product options.

    a. For approval, submit data sheets for each paint type with volume solids and VOC's highlighted to indicate they meet or exceed products specified in Part 2.

B. Use the materials of the same manufacturer for each system.

C. VOC Content of Field-Applied Interior Paints and Coatings: Provide products that comply with the following limits for VOC content, exclusive of colorants added to a tint base, when calculated according to 40 CFR 59, Subpart D (EPA Method 24); these requirements do not apply to paints and coatings that are applied in a fabrication or finishing shop:

1. Flat Paints, Coatings, and Primers VOC content of not more than 50 g/L.
2. Non-flat Paints, Coatings and Primers: VOC content of not more than 150 g/L.
3. Anti-Corrosive and Anti-Rust Paints Applied to Ferrous Metals: VOC not more than 250 g/L.
4. Floor Coatings: VOC not more than 100 g/L.
5. Shellacs, Clear: VOC not more than 730 g/L.
6. Shellacs, Pigmented: VOC not more than 550 g/L.

D. For color selection see Material Finish/Color Schedule, on Architectural Drawings.

2.02 PRIMERS (INTERIOR AND EXTERIOR)

A. 100% Acrylic Interior Primer:

1. Shall be certifiable for use on gypsum drywall or wood, and paint.
2. Minimum Volume Solids: 35%.
3. Maximum VOC: 150 g/L
    a. S-W Multi Purpose Latex Primer / Seal B51W8020
    b. GP Gripper Interior/Exterior Primer Sealer 3210-1200.
    c. PPG Seal Grip Int/Ext. Acrylic Universal Primer/Sealer, 17-921.
    d. BM Fresh Start High Hiding All Purpose Primer N046.

B. Rust-inhibitive Waterborne Acrylic Primer:

1. Minimum Volume Solids: 37%.
2. Maximum VOC: 250 g/L
    a. S-W DTM Acrylic Primer/Finish B66W1.
    b. DC Devflex 4020PF Direct to Metal Primer and Flat Finish.
    c. PPG Pitt-Tech Int/Ext Primer DTM, 90-712.
    d. BM Corotech Waterborne DTM Metal Primer/Finish V110.

2.03 BLOCKFILLERS (INTERIOR AND EXTERIOR)

A. Vinyl Acrylic Blockfiller:

1. Minimum Volume Solids: 44%.
2. Maximum VOC: 150 g/L
   a. S-W PrepRite Block Filler B25W25.
   b. GP Concrete Coatings Block Filler Interior/Exterior Primer 3010-1200.
   c. PPG Speedhide Int/Ext Masonry Block Filler, 6-7.
   d. BM Corotech Acrylic Block Filler V114.

2.04 EXTERIOR FINISH PAINTS

A. 100% Acrylic Exterior Satin Coating:
1. Minimum Volume Solids: 29%.
2. Maximum VOC: 150 g/L
3. Sheen: 10-20 units at 60 degrees.
   a. S-W A-100 Exterior Latex Satin A82 series.
   b. GP Ultra-Hide 150 Exterior Satin Paint 2412V series.
   c. PPG Sun-Proof Exterior 100% Acrylic Satin Finish, 76-45.
   d. BM Ultra Spec Exterior Satin N448.

2.05 STAINS, VARNISHES AND WATER REPELLENTS (INTERIOR AND EXTERIOR)

A. Wiping Stain:

1. Maximum VOC: 545 g/L
   a. S-W Wood Classics Interior Oil Stain A49 Series.
   b. GP Woodpride Interior Oil Wood Finishing Stain 1700.
   c. PPG Olympic Interior oil stain, 44500.
   d. BM Lenmar Alkyd Wiping Stain 1AS.1200.

B. Waterborne Polyurethane Satin Varnish

1. Minimum Volume Solids: 22%
2. Maximum VOC: 309 g/L
3. Sheen: 20-35 units at 60 degrees.
   a. S-W wood classics waterborne polyurethane varnish, satin.
   b. GP Wood Pride Interior Water Based Satin Varnish 1802-0000.
   c. PPG REZ Interior Acrylic Polyurethane Satin Finish, 77-49.
   d. BM Benwood Stays clear Polyurethane Satin N423.

2.06 INTERIOR FINISH PAINTS

A. Vinyl Acrylic Interior Eggshell Finish:

1. Minimum Volume Soilds: 35%.
2. Maximum VOC: 0 g/L
   a. S-W ProMar 200 0 VOC Interior Latex Eg-Shel, B20-2600 Series.
   b. GP No VOC Interior Eggshell, 1411.
   c. PPG Pure Performance Interior Eggshell Latex, 9-300 Series.
   d. CM Ultra Spec 500 Interior Eggshell 538.

B. Vinyl Acrylic Interior Flat Finish:

1. Minimum Volume Solids: 32%.
2. Maximum VOC: 0 g/L
3. Sheen: 0-8 units at 85 degrees.
   a. S-W ProMar 200 0 VOC Interior Latex, B30-2600 Series.
   e. GP No VOC Interior Flat 150, 1209
   b. PPG Pure Performance Interior Flat Latex, 9-100 Series.
   c. BM Ultra Spec 500 Interior Flat 536.

C. 100%, Modified Acrylic, Interior Semi-Gloss Coating:

1. Minimum Volume Solids: 33%.
2. Maximum VOC: 150 g/L
   a. S-W Pro Industrial Pre-Catalyzed Epoxy.
   b. DC Devflex 4216HP Water-Borne Acrylic or
      GP Lifemaster Oil Interior/Exterior Semi-Gloss Paint 1506.
   c. PPG PITT-GLAZE WB1 Interior Semi-Gloss Pre-Catalyzed Water-Borne Acrylic Epoxy.
   d. BM Corotech WB Pre-Cat Epoxy Coating Semi-Gloss V341.

D. Two-component, Semi-Gloss Waterbased Catalyzed Epoxy:

1. Minimum Volume Solids: 29% (catalyzed).
2. Maximum VOC: 150 g/L
3. Sheen 20-50 units at 60 degrees.
   a. S-W Water Based Catalyzed Epoxy B70 Series/B60V25.
   b. DC Tru-Glaze-WB 4426 Waterborne Epoxy Semi Gloss Coating.
   c. PPG Pitt-Glaze WB. Epoxy Semi-Gloss, Series 16-551.
   d. BM Corotech Waterborne Amine Epoxy Gloss V440.

2.07 EXTRA STOCK

A. Provide left over paint with Owner for touch-up purposes. At completion of project, provide one complete set of drawdowns in each maintenance manual with a schedule noting the locations each paint color was used. Refer to Section 01 78 39.

PART 3: EXECUTION

3.01 PREPARATION OF SURFACES

A. General

1. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates indicated.

2. Do not start work until preparation specified in surface Section is completed.

3. Ensure surfaces are dry and adequately protected from dampness.

4. Thoroughly clean surfaces free of loose, rough and foreign substances which will affect adhesion or appearance of applied coats.

5. Remove mildew and neutralize surface.

6. Remove plates, machined surfaces, and similar items already in place that are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface applied protection before surface preparation and painting.

    a. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
    b. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.

7. Complete repainting or refinishing will be required if coats are applied over improperly prepared surfaces.

B. Wood

1. Hand sandpaper to smooth surface. Sand direction of grain, taking care not to mar character of details and sharp edges. Remove sanding dust.

2. After first coat is dry, thoroughly coat, with shellac (suitably reduced with alcohol for flowing consistency) or known sealer, knots, pitch pockets and resinous sapwood areas.

3. After first coat is dry, fill nail holes, cracks and defects with colored putty tinted to match stain or paint.

4. Previously painted surfaces must be free of dirt, mildew, loose paint, etc. Excessive chalking or dirt must be removed by washing with water. Hard glossy surfaces are to be lightly sanded or dulled with deglosser/cleaner. Openings permitting entrance of water should be caulked prior to painting. Surfaces in poor condition must be prepared for repainting by removing loose paint and blisters by scraping, sanding or burning. Paint in these areas is to be removed at least 12 inches beyond the failing area. Prime before applying finish coats.

C. Gypsum Board:

1. Fill minor irregularities with patching material and sand to smooth level surfaces taking care not to raise nap of paper.

2. Previously painted gypsum wallboards must be completely dry, smooth-sanded, clean and free of dust, dirt, powdery residue, grease, oil, wax or any other contaminants such as flaking or peeling paint before paint application is started. Treat or remove all contaminants and correct defects. Dull glossy old paint by light sanding or with a commercial deglosser/cleaner to assure maximum adhesion of the new coating. Patch holes and cracks with a latex patching compound, sand smooth and spot prime with the paint or enamel to be used as the final coat.

D. Plaster

1. Fill cracks, holes or imperfections with patching plaster and smooth off to match adjoining surfaces. Do not sandpaper.

2. In case of high alkali or lime conditions, neutralize with solution recommended by paint manufacturer.

3. Do not paint until moisture content of surface is 12% or below, except as may be required by paint manufacturer.

4. Previously painted plaster surfaces must be dry, clean, and free of dust, dirt, powder residue, grease, oil, wax or any other contaminants; free of flaking, crumbling or chalking conditions before paint application is started. Contaminants must be treated or removed. Defects corrected as necessary. Dull glossy old paints by light sanding or with deglosser/cleaner to assure maximum adhesion of the new coating. Remove any loose, chipped, peeling or blistered old paint by scraping and smooth sanding. If highly porous old paint needs reconditioning before receiving the new application, prime the entire surface with undercoater oil primer. Patch holes and cracks with latex patching compound per manufacturer's instructions after removing plaster as far back as necessary to reach firm areas. Spot prime patched areas with sealer-primer.

E. Masonry

1. Do not paint until moisture content of surface is 15% or below except as may be required by paint manufacturer.

2. After prime coat is dry, fill remaining small holes, cracks and other defects with Swedish putty made by mixing dry spackle with prime paint.

3. Previously painted masonry surfaces must be dry, clean and free of dust, dirt and any other contaminants. Hard glossy surfaces are to be lightly sanded or dulled with deglosser/cleaner. Surfaces in poor condition must be prepared for repainting by removing loose paint and blisters by scraping, sanding or burning. Paint in these areas are to be removed at least 12 inches beyond the failing area. Patch all holes left after removal of nails, screws, and anchors. Prime before applying finish coats.

3.02 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of work.

B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Concrete: 12 percent
1. Masonry: 12 percent
2. Wood: 15 percent
3. Gypsum Board: 12 percent
4. Plaster: 12 percent

C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.

D. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.

1. Beginning coating application constitutes Contractor's acceptance of substrates and conditions.

E. Conditions

1. Do no work when surface, coating product, air temperature, humidity or dewpoint does not meet requirements of PROJECT CONDITIONS in Part 1 of this specification.

2. Do no interior work until building is properly enclosed.

3. Do work under adequate illumination and dust-free conditions.

3.03 APPLICATION

A. Methods: Paint may be applied by brush, roller or spray methods except where particular method will produce unsatisfactory results. Where spray method is used on concrete block, follow with roller to work paint into voids.

B. Materials: Do not open containers until required for use. Stir materials thoroughly and keep at uniform consistency during application.

C. Coats

1. Number specified is minimum. Provide sufficient number of coats to provide even, consistent, opaque coverage of substrate.

2. Touch up suction spots between coats.

3. Refinish surfaces affected by refitting work.

4. Tint prime and under coats of paint approximately 1/2 to 3/4 depth of final color.

5. Touch up suction and "hot" spots in plaster and concrete after application or first coat and before second coat.

6. Do not apply next coat until previous is thoroughly dry.

7. Provide final coat which is solid and even in color; free from runs, laps, sags, brush marks, air bubbles and excessive roller stipple and worked into crevices, joint and similar areas.

8. Do not paint sealant / sealant joints.

3.04 SCHEDULE OF EXTERIOR WORK

A. General: Do not paint brick, stucco, precast concrete, prefinished aluminum, sealant (unless scheduled to receive paint).

1. New Work: Paint or finish all other new, unfinished, primed and factory painted surfaces, including all rooftop mechanical equipment, screen louvers, wall louvers (not factory-finished), miscellaneous metals, steel lintels and prefinished metal copings (color to match brick) occurring in brick as detailed.

2. Existing Work: Prepare and paint all surfaces as noted on the drawings.

B. Concrete, Stucco, Concrete Masonry Units, Fluted Block and Restored Masonry (except soffits):

1. 1st Coat: 100% Acrylic Exterior Masonry Primer.
   a. Minimum DFT: 8 mils.
2. 2nd and 3rd Coat: 100% Acrylic Exterior Satin Coating.
   a. Minimum DFT: 1.1 mils per coat.

C. Zinc-coated Metal – Flashing, Decking, and Exposed Mechanical Including Rooftop Mechanical:

1. Touch-up: Rust-inhibitive Waterborne Acrylic Primer.
   a. DFT: 2.5-5.0 mils.
2. 2nd and 3rd Coat: 100% Acrylic Exterior Satin Coating.
   a. Minimum DFT: 1.3 mils per coat.

D. Zinc-coated Metal – Doors, Frames and Handrails:

1. Touch-up: Rust-inhibitive Waterborne Acrylic Primer.
   a. DFT: 2.5-5.0 mils.
2. 2nd and 3rd Coat: Non-blocking, 100% Acrylic Exterior Gloss Coating.
   a. Minimum DFT: 1.3 mils per coat.

E. Wood – Semi Transparent Stain-Siding, Soffits, Fascia, Trim:
   1. 1st Coat and 2nd Coat: Mildew Resistant Waterborne Exterior Semi-Transparent Stain
      a. Coverage:
         1) Rough/porous: 100-200 SF/gal
         1) Smooth: 350 SF/gal

3.05 SCHEDULE OF INTERIOR WORK

A. General

1. Paint complete all surfaces noted with a "PT" on Room Finish Schedule.

   a. New Work: In rooms with surfaces not scheduled for paint on Room Finish Schedule, paint hollow metal doors and frames, metal stairs and railings as occur.

   b. Existing Areas:

      1) Remodeling work: In rooms with surfaces not scheduled for paint on Room Finish Schedule, paint hollow metal doors and frames, metal stairs and railings as occur.

      2) In unscheduled areas where patching has occurred, paint all walls corner to corner and floor to ceiling. Match adjacent wall color. Paint both sides of doors and frames at locations where replacement or modifications have been made.

2. Provide specified finish on exposed surfaces including, but not limited to the following:

   a. Prime coated mechanical units, piping, pipe covering, sprinkler piping, interior duct surfaces visible behind grilles, tanks without factory finish, radiation covers, cabinet unit heaters, exposed ductwork, louvers and grilles.

   b. Electrical panel box covers and surface raceways (over factory finish), conduits and boxes and all factory primed electrical equipment. (Except in maintenance, service and electrical rooms).

   c. Hollow metal doors and frames, steel stairs, ladders and railings, catwalks and safety mesh grilles, access panels, prime painted hardware, painted astragals and vision lite kits on doors, coiling grilles and doors (unless factory finished), metal supports for counters and exposed miscellaneous metals.

3. Do not paint sealant.

4. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.

5. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.

6. Partition Identification

   a. Place identification on all partitions indicated on Code Drawings as having a required fire or smoke rating.

   b. Identification shall be as follows:

      1) Rating (i.e. 2 HR Fire Wall; Smoketight; 2 HR Fire Barrier): Same as indicated on Code Drawing Legend.
      2) Location: 10 feet on center, both sides of partitions, above ceiling line.
         a) Place above panels in hard ceilings.

3) Style of Lettering: 2 inches high, Helvetica style, painted with aid of stencils.
4) Color: Red.

B. Concrete Masonry Units and Restored Masonry (not scheduled for epoxy):

1. 1st Coat: Vinyl Acrylic Blockfiller.
   (1st Coat Option due to schedule constraints: 100% Acrylic Exterior Masonry Primer).
   a. Minimum DFT: 8.0 mils (75-125 sq. ft./gal).
2. 2nd and 3rd Coat: Vinyl Acrylic Interior Eggshell Finish.
   a. Minimum DFT: 1.5 per coat.

C. Gypsum Drywall – Wall (not scheduled for epoxy):

1. 1st Coat: 100% Acrylic Interior Primer.
   a. Minimum DFT: 1.5 mils.
2. 2nd and 3rd Coat: Vinyl Acrylic Interior Eggshell Finish.
   a. Minimum DFT: 1.5 per coat.

D. Gypsum Drywall – Ceilings (not scheduled for epoxy):

1. 1st Coat: 100% Acrylic Interior Primer.
   a. Minimum DFT: 1.5 mils.
2. 2nd and 3rd Coat: Vinyl Acrylic Interior Flat Finish.
   a. Minimum DFT: 1.4 per coat.

E. Plaster – Walls (not scheduled for epoxy):

1. 1st Coat: 100% Acrylic, Interior Alkali Resistant Primer.
   a. Minimum DFT: 3.0 mils.
2. 2nd and 3rd Coat: Vinyl Acrylic Interior Eggshell Finish.
   a. Minimum DFT: 1.5 per coat

F. Wood – Transparent Finish:

1. 1st Coat: Wiping Stain.
   a. Spreading Rate: As needed to match architect's sample.
2. 2nd and 3rd Coat: Waterborne Polyurethane Satin Varnish.
   a. Minimum DFT: 0.8-1.1 mils per coat.

G. Zinc-coated Metal:

1. Touch-up: Rust-inhibitive Waterborne Acrylic Primer
   a. DFT: 2.0-5.0 mils.
2. 2nd and 3rd Coat: 100% Modified Acrylic Interior Semi-Gloss Coating.
   a. Minimum DFT: 1.3 mils per coat.

H. Concrete, Cement Plaster, and Gypsum or Veneer Plaster - Walls (scheduled to receive epoxy except showers):

1. 1st Coat: 100% Acrylic, Interior Alkali Resistant Primer.
   a. Minimum DFT: 3.0 mils.
2. 2nd and 3rd Coat: Two-component, Semi-Gloss Waterbased Catalyzed Epoxy.
   a. DFT: 2.0-3.0 mils per coat.

3.06 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.07 FIELD QUALITY CONTROL

A. Testing and Painting Application: Owner reserves the right to test DFT of painted surfaces.

1. If testing discovers that DFT of installed paint does not meet specification, the Contract or will pay for initial and final testing and recoat surfaces until testing agency confirms specification is met.

END OF SECTION 09 91 00

SECTION 12 35 53

WOOD LABORATORY CASEWORK

PART 1: GENERAL

1.01 RELATED DOCUMENTS

A. Drawings, Details of Construction and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to work specified in this section.

1.02 DESCRIPTION OF WORK

A. Section includes:

1. Pre-manufactured wood casework units with epoxy resin tops, integral epoxy sinks with acid resistant traps/drain outlet, and receptacles.

2. Service fittings and accessory equipment.

3. Re-installation requirements for existing salvaged laboratory casework, including associated existing epoxy resin tops, sinks, and fixtures.

B. Related work specified in other sections:

1. Division 6 – Rough carpentry/blocking within walls, plastic laminate casework.

2. Division 9 – Base molding on casework.

3. Division 22 –Furnishing and installation of domestic water supply and waste plumbing fixtures, piping and final connections.

4. Division 22 - Installation of epoxy resin sinks supplied by Section 12 35 53.

5. Division 22 - Furnishing and installation of compressed air piping, gas piping, fixtures and final connections.

6. Divisions 26-28 - Furnishing and installation of electrical and low voltage devices, conduit, wiring, and final connections to fixed casework.

1.03 CASEWORK DESIGN

A. Door and drawer design:

1. Flush/full overlay construction.

B. Standard grain pattern on end panels is vertical:

C. Grain pattern on cabinet fronts to be combination grain: (drawer fronts horizontal, door fronts vertical).

D. Cabinet end panels exposed to view after installation must be a "finished end" panel. All end panels not exposed to view after installation will be clad as listed under "unexposed" plywood.

E. Flush Interiors: Set cupboard bottom flush with front end facers. Surface mounted bottoms and offsets caused by front face frames which interfere with ease of cleaning are not acceptable.

F. Joinery: 32mm doweled system of mortise and tenon joinery glued, clamped and screwed.

1.04 SUBMITTALS

A. Submit in accordance with Section 01 33 00.

1. Shop Drawings: Provide large scale plans and elevations of individual and battery casework units, cross sections, rough-in and anchor placements, tolerances and clearances. Indicate relation of units to surrounding walls, windows, doors and other building components.

2. Product Data: Submit manufacturer's catalog for reference. Provide overall cabinet dimensions, configurations, construction details, joint details, attachment details, and roughing in details as required.

3. Submit coordination drawings showing plumbing and electrical rough-ins and all pertinent finish hardware, etc., in ample time for mechanical and electrical contractor to layout their work.

4. Letter from manufacturer certifying the installer.

1.05 QUALITY ASSURANCE

A. Manufacturer's qualifications: Modern plant with proper tools, dies, fixtures and skilled workmen to produce high quality laboratory casework and equipment, and shall meet the following minimum requirements:

1. Minimum of ten years experience in manufacture of wood laboratory casework.

2. Ten installations of equal or larger size.

B. Installers qualifications: Factory certified by the manufacturer.

C. Manufacturer to provide load test results certified by an independent testing laboratory for drawers, suspension slides and unit shelving.

D. Submit independent test report certifying that the casework finish and resin tops comply with specified chemical and physical resistance requirements.

1.06 DELIVERY, STORAGE AND HANDLING

A. Schedule delivery of casework and equipment so that spaces are sufficiently complete that material can be installed immediately following delivery.

B. Protect finished surfaces from soiling or damage during handling and installation.

C. Protect work surfaces throughout the construction period with corrugated cardboard covering and top and securing taped to edges.

1.07 PROJECT CONDITIONS

A. Do not deliver or install equipment until following conditions are met:

1. Ceiling, overhead ductwork and lighting are installed.

2. All painting is complete.

3. Wood casework and related materials require the interior building temperature not to exceed 80 degrees (F) to avoid undue drying of materials subsequently causing structural fatigue and damage. Additionally, frequent and/or excessive changes in temperature and/or humidity levels during the course of the material installation, or once materials are installed, must be avoided to prevent damage to equipment.

4. Under no conditions should moisture levels exceed 60% relative humidity in order to avoid undue stress or splitting of wood materials.

1.08 MAINTENANCE INSTRUCTIONS

A. Provide a technically qualified representative to thoroughly instruct the Owner's personnel in correct procedures of operating and maintaining all equipment and/or materials installed under this Section. Refer to Section 01 79 00 for requirements.

1.09 GUARANTEE

A. Provide manufacturer's written guarantee covering all materials and workmanship of equipment provided in this contract for one (1) year from date of final acceptance. Any defective materials of faulty workmanship occurring within that time shall be replaced or corrected promptly without charge upon notification by the Owner or its designed representative.

PART 2 PRODUCTS

2.01 MANUFACTURER

A. Design, materials, construction and finish of casework specified is the minimum acceptable standard of quality for wood laboratory casework. The basis of this specification is Diversified Woodcrafts, Inc. product. Equivalent products by Keewaunee, Advanced Lab Concepts, CampbellRhea Casework, Fisher Hamilton Inc., Collegedale Casework, LLC are acceptable given the size of tables and equipment match the intent of the drawings.

2.02 CASEWORK MATERIALS

A. Provide pre-manufactured Octagon Workstations. Basis-of-design is 1516K 54" Octagon Workstation with pedestal base. Manufacturer's shall provide products with the following construction features, options, and characteristics.

1. Unit shall be constructed of solid oak, oak and hardwood veneers using dowel construction

2. Octagon shaped unit shall have a pedestal base with chemical resistant finish and removable panels at the pedestal for access (54" solid epoxy top, which is 1" thick).

    a. Uniform mixture throughout their full thickness.
    b. Non-glaring.
    c. 1" thick, with 1/8" drip grooves provided on the underside at all exposed edges.
    d. Exposed edges shall be a 1/8" bevel or a 3/16" radius at front top edge and at vertical corners.

3. Aprons shall be 4-1/2"H x 13/16"D and hold 4 drawers and 4 GFI protected AC duplex electrical receptacles.

    a. Drawers shall be dovetailed and glued on all four sides, have 3/4" oak veneer core fronts with 1/8" edge banding and 1/2" plywood box, wire pulls and locks.
    b. Glides for drawers shall be 100# epoxy coated steel dynamic glides with nylon bearings.

4. Epoxy resin sink (16"W x 16"D x 7"H) with strainer, stopper and chemical resistant trap.
5. Two multi-service fixtures including split service for compressed air and gas, and having cold water and hot water valves for user adjustment of water temperature and volume.
6. Four each rod sockets.

7. Overall dimensions shall be 54"W x 54"D x 36"H. Provide one unit as noted to comply with ADA requirements.

2.03 MISCELLANEOUS ACCESSORIES

A. Burette Rods: Burette rods shall be anodized aluminum, 3/4" diameter, 24" long, and furnished with a tapered adapter to fit rod socket.

B. Rod Sockets: Rod sockets shall be die cast aluminum, tapered to receive 3/4" diameter upright rods, and shall be secured to top of means of heavy aluminum nut and lock washer.

C. Metal Crossbars and Greenlaw Arms: Metal crossbars and arms shall be 3/4" diameter anodized aluminum with both ends rounded, and provided with aluminum clamps for holding at any position on upright rods.

D. Goggle Cabinets: 24½" w x 9½" deep x 32" h painted steel storage cabinet to hold 30 pairs of goggles.

1. Germicidal UV light with automatic timer to sanitize goggles.

2. Safety interlock switch on doors.

3. 7 three wire core rated for 115v, 60Hz, single phase 75 watts.

4. Finish: White.

PART 3 EXECUTION

3.01 INSTALLATION

A. New and existing salvaged casework installation:

1. Assemble pre-manufactured units per manufacturer's instructions.

2. Set casework components plumb, square, and straight with no distortion and securely anchored to building structure. Shim as required using concealed shims.

3. Fasten continuous cabinets together with joints flush, tight and uniform, and with alignment of adjacent units within 1/16" tolerance.

4. Secure wall cabinets to solid supporting material, not to plaster, lath or gypsum board. Blocking in wall by rough carpentry.

5. Abut top edge surfaces in one true plane. Provide flush joints not to exceed 1/8" between top units.

B. New and existing salvaged work surface installation:

1. Where required due to field conditions, scribe to abutting surfaces.

2. Secure joints in the field, where practicable, in the same manner as in factory, with dowels, adhesive of fasteners recommended by manufacturer.

3. Secure work surfaces to casework and equipment components with material and procedures recommended by the manufacturer.

C. New and existing salvaged sink installation: Sinks shall be set in chemical resistant sealing compound and secured and supported per manufacturer's recommendation. (Installed by Div. 22 where indicated.)

D. Accessory installation: Install accessories and fittings in accordance with manufacturer's recommendation. Turn screws to seat flat; do not drive.

3.02 ADJUSTING

A. Repair or remove and replace defective work, as directed by Architect upon completion of installation.

B. Adjust doors, drawers, hardware, fixtures and other moving or operating parts to function smoothly.

3.03 CLEANING

A. Clean shop finished casework, touch up as required.

B. Clean materials as recommended by manufacturer.

3.04 PROTECTION OF FINISHED WORK

A. Provide necessary protective measures to prevent damage of casework and equipment from exposure to other construction activity.

B. Advise contractor/construction manager of procedures and precautions for protection of material, installed laboratory casework and fixtures from damage by work of other trades.

END OF SECTION 12 35 53