
USACE / NAVFAC / AFCEA / NASA UFGS-12 36 00 (May 2009)

Preparing Activity: NASA Superseding
UFGS-12 36 00 (January 2008)

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UML dated January 2011

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SECTION 12 36 00

COUNTERTOPS 05/09

NOTE: This guide specification covers the requirements for countertops.

Edit this guide specification for project specific requirements by adding, deleting, or revising text. For bracketed items, choose applicable items(s) or insert appropriate information.

Remove information and requirements not required in respective project, whether or not brackets are present.

Comments, suggestions and recommended changes for this guide specification are welcome and should be submitted as a Criteria Change Request (CCR).

PART 1 GENERAL

1.1 REFERENCES

NOTE: This paragraph is used to list the publications cited in the text of the guide specification. The publications are referred to in the text by basic designation only and listed in this paragraph by organization, designation, date, and title.

Use the Reference Wizard's Check Reference feature when you add a RID outside of the Section's Reference Article to automatically place the reference in the Reference Article. Also use the Reference Wizard's Check Reference feature to update the issue dates.

References not used in the text will automatically be deleted from this section of the project specification when you choose to reconcile references in the publish print process.

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI A161.2 (1998) Decorative Laminate Countertops, Performance Standards for Fabricated High Pressure

ASME INTERNATIONAL (ASME)

ASME B18.6.1 (1981; R 2008) Wood Screws (Inch Series)

ASTM INTERNATIONAL (ASTM)

ASTM A 1008/A 1008M (2010) Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardened

ASTM A 167 (1999; R 2009) Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip

ASTM A 325 (2010) Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength

ASTM A 325M (2009) Standard Specification for Structural Bolts, Steel, Heat Treated, 830 MPa Minimum Tensile Strength (Metric)

ASTM D 13 (2002) Standard Specification for Spirits of Turpentine

ASTM D 2583 (2007) Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor

ASTM D 4689 (1999; R 2005) Standard Specification for Adhesive, Casein-Type

ASTM D 4690 (1999; R 2005) Standard Specification for Urea Formaldehyde Resin Adhesives

ASTM D 570 (1998; R 2010e1) Standard Test Method for Water Absorption of Plastics

ASTM D 638 (2010) Standard Test Method for Tensile Properties of Plastics

ASTM E 84 (2010b) Standard Test Method for Surface Burning Characteristics of Building Materials

ASTM F 594 (2009) Standard Specification for

	Stainless Steel Nuts
ASTM F 836M	(2002) Standard Specification for Style 1 Stainless Steel Metric Nuts
COMPOSITE PANEL ASSOCIATION (CPA)	
CPA A208.1	(2009) Medium Density Fiberboard (MDF) For Interior Applications
INTERNATIONAL ASSOCIATION OF PLUMBING AND MECHANICAL OFFICIALS (IAPMO)	
IAPMO Z124.3	(2005) Plastic Lavatories
INTERNATIONAL CODE COUNCIL (ICC)	
ICC IPC	(2009) International Plumbing Code
KITCHEN CABINET MANUFACTURERS ASSOCIATION (KCMA)	
KCMA A161.1	(2000) Performance & Construction Standards for Kitchen and Vanity Cabinets
NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)	
ANSI/NEMA LD 3	(2005) Standard for High-Pressure Decorative Laminates
SCIENTIFIC EQUIPMENT AND FURNITURE ASSOCIATION (SEFA)	
SEFA 7	(1996) Recommended Practice for Laboratory and Hospital Service Fittings
U.S. GENERAL SERVICES ADMINISTRATION (GSA)	
FS FF-B-588	(Rev E; Notice 1) Bolt, Toggle: and Expansion Sleeve, Screw
FS FF-S-325	(Int Amd 3) Shield, Expansion; Nail, Expansion; and Nail, Drive Screw (Devices, Anchoring, Masonry)
FS MM-L-736	(Rev D) Lumber; Hardwood
FS MM-L-751	(Rev H) Lumber; Softwood
FS TT-C-490	(Rev E) Cleaning Methods for Ferrous Surfaces and Pretreatments for Organic Coatings
FS TT-C-520	(Rev B; Notice 1) Coating Compound, Bituminous, Solvent Type, Underbody (for Motor Vehicles)
FS TT-E-491	(Rev C; Notice 1) Enamel; Gloss, Synthetic (for Metal and Wood Furniture)
FS TT-F-336	(Rev E; Notice 2) Filler, Wood, Paste

FS TT-V-121

(Rev H; Notice 1) Varnish, Spar,
Water-Resisting

FS WW-P-541

(Rev E; Am 1) Plumbing Fixtures

1.2 SUBMITTALS

NOTE: Review Submittal Description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list to reflect only the submittals required for the project. Submittals should be kept to the minimum required for adequate quality control.

A "G" following a submittal item indicates that the submittal requires Government approval. Some submittals are already marked with a "G". Only delete an existing "G" if the submittal item is not complex and can be reviewed through the Contractor's Quality Control system. Only add a "G" if the submittal is sufficiently important or complex in context of the project.

For submittals requiring Government approval on Army projects, a code of up to three characters within the submittal tags may be used following the "G" designation to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for Architect-Engineer; "DO" for District Office (Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes following the "G" typically are not used for Navy, Air Force, and NASA projects.

Choose the first bracketed item for Navy, Air Force and NASA projects, or choose the second bracketed item for Army projects.

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are [for Contractor Quality Control approval.] [for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government.] Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Submit fabrication drawings for [Countertop] [and] [Backsplash] Fabrication, specified in this section.

Submit Installation Drawings for [Countertop] [and] [Backsplash]

SD-03 Product Data

Submit Manufacturer's catalog data for the following items:

Corrosion-Resistant Steel
Plywood
Hardwood
Granite
Marble
Synthetic resin
Stainless steel
Tile
FRP
Adhesives
Filler Material
Particle Board
Turpentine
Varnish
Fasteners
Steel Sinks
Service Fixtures
Accessories and Hardware
Softwoods
Plastic Laminate

SD-04 Samples

Include samples for the following:

Countertop and Backsplash, one each, 100 millimeter 4 inches in width, submitted as one unit or as separate items.

Accessories and Hardware, one each.

Submit Manufacturer's Standard Color Charts in accordance with paragraph entitled, "General," of this section.

SD-07 Certificates

Submit certificates for the following items showing conformance with the referenced standards contained in this section.

Corrosion-Resistant Steel
Plywood
Hardwood
Adhesives
Filler Material
Particle Board
Turpentine
Varnish
Fasteners
Steel Sinks
Service Fixtures
Accessories and Hardware

SD-08 Manufacturer's Instructions

Submit Manufacturer's Instructions for in accordance with paragraph entitled, "General," of this section.

1.3 DELIVERY, STORAGE, AND HANDLING

Deliver, store, and handle countertops [and backsplash] in a manner that will prevent damage and disfigurement.

Provide temporary skids under units weighing more than [_____] kilogram pounds.

1.4 DESIGN

Provide factory fabricated, prefinished [wood] [marble] [steel] [_____] countertops in the manufacturer's standard sizes and finishes of the type, design, and configuration indicated. Construct countertops as specified and meet the requirements of **KCMA A161.1**. Accomplish fastenings to permit removal and replacement of individual units without affecting the remainder of the installation. Provide counters with watertight sink rim when indicated. Include removable drawers equipped with position stops to avoid accidental complete withdrawals.

PART 2 PRODUCTS

2.1 GENERAL

Submit **Manufacturer's Standard Color Charts** for countertops showing the manufacturer's recommended color and finish selections.

Submit **Manufacturer's Instructions** for countertops including special provisions required to install equipment components and system packages. Include all special notices detailing impedances, hazards and safety precautions.

Provide the manufacturer's standard type countertops or as indicated on the drawings. Accomplish fastenings to permit removal and replacement of individual countertops without affecting the remainder of the installation.

2.2 MATERIALS

[Provide **Corrosion-Resistant Steel** conforming to **ASTM A 1008/A 1008M** and **ASTM A 167**, Type [302] [304] [316] Finish 4.]

[Provide [Douglas-fir] [_____] **Plywood** conforming to **ICC IPC**, exterior type, fully waterproof bond.]

Use thermosetting urea-resin Type II **Adhesives** for application of plastic laminate conforming to **ASTM D 4690** as recommended by the manufacturer of the laminate. Use adhesive for wood members conforming to **ASTM D 4689**.

Use **Filler Material** conforming to **FS TT-F-336**.

[Provide **Hardwood** conforming to **FS MM-L-736**, standard hardwood lumber, S2S, and hardwood plywood conforming to **ICC IPC**.]

[Provide **Particle Board** conforming to **CPA A208.1**, Type 1, Grade M or medium density.]

NOTE: Review ANSI/NEMA LD 3 and insert style, type,
grade, class, and finish as required.

Provide Plastic Laminate conforming to ANSI/NEMA LD 3, Style [____], Type [____], Grade [____], Class [____], Finish [____].

Provide Softwoods conforming to FS MM-L-751, factory and shop grade.

Provide Turpentine conforming to ASTM D 13.

Provide Varnish conforming to FS TT-V-121.

Provide fasteners conforming to the following:

Screws: ASME B18.6.1, Group, Type and Class as applicable

Anchoring Devices: FS FF-S-325, Group, Type, and Class as applicable

Toggle bolts: FS FF-B-588, Type I, Class A, Style 2

Nuts: ASTM F 594, corrosion-resistant steel

Bolts: ASTM A 325, heavy, hexagon head bolts corrosion-resistant steel

Nuts: ASTM F 836M, corrosion-resistant steel

Bolts: ASTM A 325M, heavy, hexagon head bolts corrosion-resistant steel

NOTE: Specify sink for inset-type installation in
Section 22 00 00 PLUMBING, GENERAL PURPOSE.

Corrosion-resistant Steel Sinks:

[1.3 millimeter 18-gage corrosion-resistant steel, integral with corrosion-resistant steel countertop]

[1.3 millimeter 18-gage corrosion-resistant steel, nonintegral, self-rimming]

Drain holes in center of bowl

Underside coated with 3 millimeter 1/8-inch thick sound deadener

Die-form, seamless, raised edges at front and ends

Cove corners to 13 millimeter 1/2-inch radius

Equip with strainers and tail pieces

Sound deadening: conform to FS TT-C-520.

Provide Service Fixtures conforming to the following requirements:

Fixtures: In accordance with the water conservation policy as stated in the Standard Plumbing Codes, Appendix J.

Faucets: Splashback mounted, cast brass, chrome plated, FS WW-P-541

Faucets: Deck mounted, cast brass, chrome plated, FS WW-P-541

Gas, air, and vacuum, distilled water, steam, and de-ionized water cocks: Cast brass, chrome plated, ground key type

Drains, strainers, and taps: Brass, chrome plated, FS WW-P-541

Index buttons: Plastic, color codes in accordance with SEFA 7

Special items: Nipples and locknuts with each fixture will be as directed.

NOTE: Delete any of the following types that are not applicable.

Type I, zinc phosphate

Type II, iron phosphate

Type III, organic-paint, varnish, lacquer

- [Metal pretreatment coatings: FS TT-C-490, Type I]
- [Metal pretreatment coatings: FS TT-C-490, Type II]
- [Metal pretreatment coatings: FS TT-C-490, Type III]
- [Enamel: FS TT-E-491, Class 2]

2.3 COUNTERTOP AND BACKSPLASH FABRICATION

Construct countertops and backsplash of [plywood] [wood] [particle board] [Granite] [Marble] [Synthetic resin] [Stainless steel] [Tile] [FRP] [_____] covered with a [shop-applied plastic laminate] [corrosion-resistant steel] [an integral corrosion-resistant steel top without backing] [according to ANSI A161.2].

- [Use a water-resistant type plywood, Grade B-D Douglas fir plywood, with a minimum thickness of 20 millimeter 3/4 inch. [Provide [plywood] [hardwood] [Granite] [Marble] [Synthetic resin] [Stainless steel] [Tile] [FRP] [_____] backsplash 20 millimeter 3/4-inch thick by the height indicated[, according to ANSI A161.2].]]

- [Specify particle board with a minimum thickness of 20 millimeter 3/4 inch. Build up edges and opening around sink rim with hardwood strips. Provide backsplash of similar construction, a minimum of [20 millimeter 3/4-inch] [_____] thick by the height indicated.]

Provide steel no lighter than 0.85 millimeter 22-gage corrosion-resistant steel for backed construction and not lighter than 1.3 millimeter 18-gage corrosion-resistant steel for integral construction. Reinforce steel tops on edges and around sink-rim opening. Provide counters of one-piece construction; where corrosion-resistant sink bowls are provided, weld and polish smooth all joints. Make joints between sink, countertop, and backsplash watertight. Provide backsplash of the same material as countertop and form with square edges, and height as indicated.

Provide continuous sheet laminate of the longest length practicable and of

the design and color selected. Provide joints in the surface sheeting that are tight and flush, and held to a practical minimum number.

Edging and trim:

For plastic-laminate-covered countertops and backsplash, provide edging and trim consisting of:

Strips of laminate cut and fitted to exposed edges with contact adhesive

Corrosion-resistant steel molding applied to exposed edges and at the intersection of the top and backsplash with a concealed fastening system

For corrosion-resistant steel countertops and backsplash, form the edging and trim as an integral part of the top.

Provide sink rims which are the standard products of a manufacturer regularly producing this type of equipment, fabricated from corrosion-resistant steel of the size necessary to receive the sinks.

NOTE: Select the appropriate statement from the following paragraph for the type of chopping block desired.

[Include chopping block of the size and in the location indicated on the drawings, [portable type, of solid edge-grain clear [maple] [____], minimum 20 millimeter 3/4-inch thick, sized to fit on a suitable rack for storage] [stationery type or built-up, edge-grain clear [maple] [____], minimum 40 millimeter 1-1/2-inches thick, installed in a countertop]]

2.3.1 High-Pressure Laminated Plastic Clad Countertops

Construct clad countertop and backsplash of [20 mm 3/4 inch thick plywood] [or] [20 mm 3/4 inch thick, 20 kg 44 pound density particle board core], [post formed cove type] [or] [fully formed type]. [Provide single unit cove type unit with self-edging and plastic laminate coved at the juncture of the countertop and backsplash.] [Provide fully formed type or square edge unit with shaped edges using wood nose molding at counter edge, including a separate backsplash not less than 90 mm 3-1/2 inch high.] Provide edging and trim that consists of plastic laminate cut and fitted to all exposed edges. Supply end splashes constructed of 20 mm 3/4 inch plywood or 20 mm 3/4 inch thick, 20 kg 44 pound density particle board core. Provide continuous sheets of longest lengths practicable. Make all joints in surface sheeting tight and flush. When the countertop and backsplash are two separate units, use GP50 plastic laminate. When the countertop and backsplash are one unit, use PF42 plastic laminate. Provide plastic laminate conforming to the requirements of ANSI/NEMA LD 3, with contact type plastic laminate adhesive applied to both surfaces. For fully formed and cove type countertops, the post-forming plastic laminate can not be bent to a radius smaller than the limit recommended by the plastic manufacturer.

2.3.2 Solid Polymer Countertops

Construct countertop and backsplash [with integral [sink] [and] [lavatory]]

[of sheet material for sink/lavatory cutout]; as shown, with [12.7] [19] [_____] mm [1/2] [3/4] [_____] inch material thickness, cast, and filled nonporous solid surfacing composed of acrylic polymer, mineral fillers, and pigments. Repair superficial damage, a depth of no more than 0.25 mm 0.010 inch, by sanding or polishing. Use material conforming to the following performance requirements:

- a. Tensile Strength; 18.3 N/mm² 4100 psi, when tested in accordance with ASTM D 638.
- b. Hardness; Barcol Impressor 50 when tested in accordance with ASTM D 2583.
- c. Flammability; rated Class I with a flame spread of 25 maximum and a smoke developed of 100 maximum when tested in accordance with ASTM E 84.
- d. Boiling water resistance; no effect when tested in accordance with ANSI/NEMA LD 3.
- e. High temperature; no effect when tested in accordance with ANSI/NEMA LD 3.
- f. Liquid absorption; 0.06 percent maximum (24 hours) when tested in accordance with ASTM D 570.
- g. Sanitation; National Sanitation Foundation approval for food contact in accordance with Standard 51 and approval for food area applications.
- h. Impact resistance; no failure for ball drop when tested in accordance with ANSI/NEMA LD 3.

2.3.3 Solid Polyester Resin Cultured Marble Countertops

Construct countertop and backsplash [with integral [sink] [and] [lavatory]] [of sheet material for sink/lavatory cutout]; as shown. Use material of [12.7] [19] [_____] mm [1/2] [3/4] [_____] inch thickness minimum, cast, and filled nonporous solid surfacing composed of polyester resin crushed marble, glass frit, mineral fillers and pigments. Material is to comply with IAPMO Z124.3 and the following performance requirement; Flammability: Class I, flame spread of 25 maximum, smoke developed of 100 maximum when tested in accordance with ASTM E 84.

2.4 SURFACING

2.4.1 Laminated Plastic Surfacing

Laminate plastic sheeting to faces and exposed edges of particle board at 138 kilopascal and 85 degrees C 20 pounds per square inch and 185 degrees F.

Apply backing sheet to concealed faces.

2.4.2 Corrosion-Resistant Steel Surfacing

Form counters and work surfaces of 1.6 millimeter 16-gage sheets with exposed edges returned.

Use hat-shaped channels, 1.6 millimeter 16-gage, for reinforcement, spaced 760 millimeter 30 inches on center.

Equip surfaces with wood strips under edges for fastening to cabinets.

Cove internal corners to 15 millimeter 1/2-inch radius.

Coat underside with 3 millimeter 1/8-inch thick sound deadener.

Electrically weld all joints, grind smooth, and polish to match adjacent finish.

[2.4.3 Wood Countertop Finish

Provide factory applied [stained wood] [clear coated natural finish] [or] [HPDL] finish [as indicated] on all internal and external surfaces.

[2.4.3.1 Stained Wood Finish

NOTE: Manufacturers use a variety of wood species in the production of kitchen cabinets. To specify a single species would be cost prohibitive and/or restrict competition. When indicating finishes, such as "light oak," "medium walnut," etc., a wood species should be included in the finish designation for use as a guide to the wood grain character and appearance.

[As selected from manufacturer's standard finishes] [As indicated].
Internal surfaces need to receive at least one coat of finish material.

] [2.4.3.2 HPDL Finish

Pattern and color: [As selected from manufacturer's standard finishes] [As indicated].

] [2.5 ACCESSORIES AND HARDWARE

2.5.1 Mounting Adhesives

Provide structural-grade silicone or epoxy adhesives of type recommended by manufacturer for application and conditions of use.

Provide spacers, if required, of type recommended by adhesive manufacturer.

2.5.2 Stone Adhesive

Provide epoxy or polyester adhesive of type recommend by manufacturer for application and conditions of use.

If adhesive will be visible in finished work, tint adhesive to match surfacing.

2.5.3 Joint Sealants

Use clear silicone sealant of type recommended by manufacturer for application and conditions of use.

Provide anti-bacterial type in [[toilet] [and] [bath] rooms,] [food preparation areas,] [and] [_____].

2.5.4 Solvent

Use a product recommended by adhesive manufacturer to clean surface of quartz surfacing to assure adhesion of adhesives [and sealants].

2.5.5 Cleaning Agents

Use non-abrasive, soft-scrub type kitchen cleaners.

2.6 COLOR, TEXTURE, AND PATTERN

NOTE: Coordinate editing of color reference sentence(s) with the Government. Generally, Section 09 06 90 COLOR SCHEDULE or drawing is used when the project is designed by an Architect or Interior designer. Select color from manufacturers standard colors or identified as a manufacturers color in this specification only when the project is very simple and has minimal finishes.

When the Government directs that color be located in the drawings add a note that states: "Where color is shown as being specific to one manufacturer, an equivalent color by another manufacturer may be submitted for approval. Manufacturers and materials specified are not intended to limit the selection of equal colors from other manufacturers. The word "color" as used herein includes surface color and pattern."

Prior to specifying a custom color finish, research to determine if additional cost and lead time is feasible. Note there is often a minimum order requirement; this requirement will also affect future orders.

When a manufacturer's name, stock number, pattern, and color is used, be certain that the product conforms to this specification, as edited.

Select color [in accordance with Section 09 06 90 COLOR SCHEDULE.] [as indicated on the drawings.] [from manufacturers standard colors.] [[_____.] Color listed is not intended to limit the selection of equal colors from other manufacturers.]

PART 3 EXECUTION

3.1 INSTALLATION

NOTE: Installation of sinks must be per the requirements of Section 22 00 00 PLUMBING, GENERAL PURPOSE.

Inspect material for defects prior to installation. Ensure materials throughout bear labels with the same batch number. Visually inspect

materials used for adjacent pieces to assure acceptable color match. Inspect in lighting conditions similar to those on the project. Repair or replace damaged materials in a satisfactory manner.

Install countertops plumb with cabinetry level to within 1 millimeter in 3000 millimeter 1/16 inch in 10 feet. Level base cabinets by adjusting leveling screws. Scribe and fit scribe strips to irregularities of adjacent surfaces. Gap openings exceeding 0.63 millimeter 0.025 inch are not acceptable.

Secure countertops to cabinetry and wall construction using [6 millimeter 1/4-inch diameter masonry anchors] [____], spaced [760 millimeter 30 inches] [____] maximum on center.

Submit installation drawings for countertops. Drawings must include location of cabinets, details of cabinets related and dimensional positions, and locations for roughing in plumbing, including sinks, faucets, strainers and cocks.

3.1.1 Preliminary Installation and Adjustment

Install materials in accordance to manufacturer's recommendations. Lift and place to avoid breakage.

Position materials to verify that materials are correctly sized and prepared. Make necessary adjustments.

If jobsite cutting, grinding, or polishing is required, use water-cooled tools. Protect jobsite and surfaces against dust and water. Perform work away from installation site if possible.

[Gypsum drywall back walls [which are not [fire][or][acoustically] rated] may be routed up to half the thickness of the drywall to allow countertop to fit.]

[Shim countertop drainage [adjacent to sinks][and][where drainage is required], slightly to insure positive drainage.]

3.1.2 Permanent Installation

After verifying fit, remove quartz surfacing from position, clean substrates of dust and contamination, and clean quartz surfacing back side and joints with solvent.

Apply sufficient quantity of mounting adhesive in accordance with adhesive manufacturer's recommendations to provide permanent, secure installation.

Spacing of mounting adhesive will not exceed:

Horizontal Surfaces: [____] mm [____] inch on center

Vertical Surfaces: [____] mm [____] inch on center; provide temporary shims until adhesive cures.

[Fasteners] [Grout] [Hardware]: [____]

Install surfacing plumb, level, and square and flat to within 1.6 mm in 3 meters 1/6 inch in 10 feet.

3.1.3 Joints

Joints between adjacent pieces of quartz surfacing:

Joints must be flush, tight fitting, level, and neat.

Securely join with stone adhesive. Fill joints level with quartz surfacing.

Clamp or brace quartz surfacing in position until adhesive sets.

Joints [between backsplashes and countertops] [and] [around
[tub] [and] [shower] enclosures]: Seal joints with silicone sealer.

3.2 CLEANING

On completion of cabinet installation, touch up marred or abraded finished surfaces. Remove crating and packing materials from premises. Wipe down surfaces to remove fingerprints and markings and leave in clean condition.

3.3 INSPECTION

Examine casework grounds and supports for adequate anchorage, foreign material, moisture, and unevenness that could prevent quality casework installation.

Ensure that electrical and plumbing rough-ins for casework are complete. Do not proceed with installation until defects are corrected.

-- End of Section --