



Prince William County

PUBLIC SCHOOLS

Providing A World-Class Education

ADDENDUM

ADDENDUM # 2

DATE: April 17, 2009

REFERENCE: Invitation for Bid: S-BB-9607
IFB Issue Date: April 8, 2009
Title & Location: Godwin Middle School Renewal,
State Project #75-64E,
14800 Darbydale Ave., Woodbridge, VA 22193
Architect/Engineer: Architecture, Inc.
Sealed Bid Due Date: May 7, 2009 @ 3:00 p.m.

THE FOLLOWING CHANGES, ADDITIONS, DELETIONS AND CLARIFICATIONS ARE HEREBY MADE PART OF THE BIDDING REQUIREMENTS AND CONTRACT DOCUMENTS FOR THE ABOVE REFERENCED PROJECT AND SHALL BE TAKEN INTO ACCOUNT IN THE PREPARATION OF ALL BIDS AND THE EXECUTION OF ALL WORK. BIDDERS SHALL ACKNOWLEDGE RECEIPT OF THIS ADDENDUM IN THE APPROPRIATE SPACE ON THE BID FORM.

- A. Specifications:
1. Section 02831: Delete in it's entirety.
 2. Section 08311: Add entire section. See attached specification.
 3. Section 09500: Add entire section. See attached specification.
 4. Section 12346: Replace entire section. See attached specification.
- B. Drawings:
1. Sheet A0.1:
 - A. Add Demolition Keyed Notes: "72. Removal of corridor ceilings shall be by Owner's Abatement Contractor. The General Contractor shall remove any remaining framing, support wires, etc. The General Contractor shall re-support all existing conduits, wiring, ductwork, piping, etc. as required to comply with all applicable codes and specifications for new systems."
 2. Sheet D1.1:
 - A. Add Demolition Keyed Note #72 to: A Corridor (800), A Corridor (824) and The Corridor (900).
 3. Sheet D1.2:
 - A. Add Demolition Keyed Note #72 to: B Corridor (700), B Corridor (708) and The Corridor (900).

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4. Sheet D1.3:
 - A. Add Demolition Keyed Note #72 to: C Corridor (100), D Corridor (200) and e Corridor (300).

5. Sheet D1.4:
 - A. Add Demolition Keyed Note #72 to: F Corridor (400) and G Corridor (500).

6. Sheet A1.6: See attached sheet.
 - A. Add roof penetrations, detail 8/5.1, for exhaust goosenecks from Family and Consumer Science (505).
 - B. Add roof penetration, detail 8/5.1, for PRV-19 from Family and Consumer Science (505).
 - C. Add roof penetration, detail 3/1.6, for cooling unit piping from Systems (215).
 - D. Add roof mounting, detail 4/1.6, for condensing unit to server unit in Systems (215).
 - E. Add RTU-A and roof penetration, detail 8/5.1, for RTU-A, serving Front Office Addition (933, 934, 935 and 936).
 - F. Add roof penetration, detail 8/5.1, for exhaust gooseneck from Toilet (936).
 - G. Add roof penetration, detail 8/5.1, for exhaust gooseneck from Family and Consumer Science (406).
 - H. Add roof penetration, detail 8/5.1, for PRV-17 from Art (502).
 - I. Add roof penetration, detail 8/5.1, for PRV-18 from Art (504).
 - J. Add roof penetration, detail 8/5.1, for PRV-15 from 8th Science (401).
 - K. Add roof penetration, detail 8/5.1, for PRV-16 from 8th Science (403).
 - L. Add Detail 3, Typical Pipe Penetration Detail.
 - M. Add Detail 4, Equipment Mounting Detail.

7. Sheet A8.3:
 - A. Elevations 1 and 2: Remove the 1' high tack boards show on each side of the main marker board.

8. Sheet ED1.5:
 - A. Revise AHU 6,7 and 9 to be existing to remain.

9. Sheet E1.1: See attached sheet.
 - A. Identified emergency lighting circuit numbers for clarifications.

10. Sheet E1.2: See attached sheet.
 - A. Identified emergency lighting circuit numbers for clarifications.

11. Sheet E1.3: See attached sheet.
 - A. Identified emergency lighting circuit numbers for clarifications.

12. Sheet E2.1: See attached sheet.
 - A. Identified circuit numbers for clarifications.

13. Sheet E2.2: See attached sheet.
 - A. Added keyed note #16.

14. Sheet E2.3: See attached sheet.
 - A. Identified circuit numbers for clarifications.
 - B. Add keyed note 12.
 - C. Add hand dryer circuits.

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15. Sheet E2.4: See attached sheet.
 - A. Identified circuit numbers for clarifications.
 - B. Add keyed note 25.
 - C. Add hand dryer circuits.
 16. Sheet E2.5: See attached sheet.
 - A. Identified circuit numbers for clarifications.
 17. Sheet E2.6: See attached sheet.
 - A. Revised kitchen plan note 14 to read panel - LP.
 18. Sheet E6.1: See attached sheet.
 - A. Revised ground wire sizes.
 19. Sheet E6.2: See attached sheet.
 - A. Revised power riser diagram and keyed notes.
 20. Sheet E6.3: See attached sheet.
 - A. Revised main switchboard schedule and add note 6.
 21. Sheet E7.1: See attached sheet.
 - A. Revised panels schedule loads.
 22. Sheet E7.2: See attached sheet.
 - A. Completed the panel schedules.
 - B. Add additional panel schedules.
 23. Sheet E7.3: See attached sheet.
 - A. Add panel schedules.
 24. Sheet M1.3:
 - A. Revised PRV-12 and connected ductwork are to be existing to remain.
 - B. Special Ed. Classroom 109: Provide 10" x 3 1/4" duct from the hood through exterior wall and terminate into a brick vent with mesh screen.
 25. Sheet M1.4:
 - A. Kiln / Storage 510: Delete thermostat and connection to PRV-19. Interlock PRV-19 with kiln circuit to energize fan whenever the kiln is activated. Provide a time delay relay to activate the fan running for 30 minutes after the kiln is deactivated.
- C. Clarifications:
1. On sheet PH1.1, the intent for the areas that are not numbered is to have this work completed in the time frame between 6/19/10 and 8/15/10.
 2. Erosion and Sediment control measures will be required around the front office addition and around the rear electrical room door and walk, as required to comply with all state and county requirements.
 3. During time span of this project, there will be separate projects taking place in the facility. Coordination with the Contractors on these separate projects will be required. These other projects will include Mechanical System Upgrade, Locker Replacement and Asbestos

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Abatement.

4. Where resilient tile flooring is removed by the Asbestos Abatement Contractor, the slab will be ready for patching and installation of new tile at the completion of the abatement work.
 5. An allowance has been established for interior signs. See specifications section 01010.
 6. The Owner, Architect and Engineers shall strive for a submittal review time of less than 2 weeks. This will vary with the complexity of the submittal.
 7. All items indicated in the schedules on sheet A0.2 shall be provided and installed by the General Contractor.
 8. Items which are to be removed and re-installed, shall be stored either in the existing school or in Owner provided on site storage units, as directed by the Owner.
 9. Disregard any references to LEED submittals. This is not a LEED certified project.
 10. The facility is available for review by the contractors during school hours, or by appointment with the Owner. All persons visiting the school or school grounds must report to the security desk or main office to register and receive a visitor's pass.
 11. The generator, called for in General New Work Note #16 on sheet A0.1, is for general construction activities. The Contractor shall determine the size of generator which is needed. The generator is for use when the power is shut off.
 12. The specification for the new floor finish of the stage is contained in specification section 09900.
 13. Corner guards are not required on this project.
 14. Pre the requirements of specification section 10100, provide music staffs on the following boards:
 - Strings 903, 6'MB by door 903
 - Music 904, 6' MB by door 904
 - Band 905, 6' MB by door 908
- No grids are to be provided in the math rooms.
15. Mechanical demolition shown in these documents is the responsibility of this General Contractor. Not the contractors involved in the HVAC Renewal Project.
 16. The corridor ceilings do not require temporary acoustic ceiling tile. They can remain exposed until the scheduled completion date of that phase.
 17. See attached area plan for staging area.
 18. Elevations 1 and 2 on sheet A8.3 are for classroom wiring information only.
 19. The 8th Grade Classrooms (601 through 608) in area "D" have electrical work.
 20. The Science Labs are in Phase 17.

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21. Urinal screens are not required.

End of Addendum # 2

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SECTION 08311 - ACCESS DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Access doors and frames.
 - 2. Fire-rated access doors and frames.
- B. See Division 8 Section "Door Hardware" for mortise or rim cylinder locks and master keying.

1.2 SUBMITTALS

- A. Product Data: For each type of access door indicated.
- B. Coordination Drawings: Drawn to scale and coordinating access door and frame installation with ceiling support, ceiling-mounted items, and concealed Work above ceiling.
- C. Schedule: Door and frame schedule, including types, general locations, sizes, construction details, latching or locking provisions, and other data pertinent to installation.

1.3 QUALITY ASSURANCE

- A. Fire-Rated Access Doors and Frames: Units complying with NFPA 80 and that are labeled and listed by UL, ITS, or another testing and inspecting agency acceptable to authorities having jurisdiction per test method indicated.
 - 1. Vertical Access Doors: NFPA 252 or UL 10B.
 - 2. Horizontal Access Doors and Frames: ASTM E 119 or UL 263].
- B. Size and Location Verification: Determine specific locations and sizes for access doors needed to gain access to concealed equipment, and indicate on schedule.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
 - 1. Hot-Dip Galvanized Steel: Coat to comply with ASTM A 123/A 123M for steel and iron products and ASTM A 153/A 153M for steel and iron hardware.
- B. Steel Sheet:
 - 1. Hot-Rolled: ASTM A 569/A 569M, Commercial Steel (CS), Type B; free of scale, pitting, and surface defects; pickled and oiled.

2. Cold-Rolled: ASTM A 366/A 366M, Commercial Steel (CS), or ASTM A 620/A 620M, Drawing Steel (DS), Type B; stretcher-leveled standard of flatness.
 - a. Electrolytic zinc-coated steel sheet, complying with ASTM A 591/A 591M, Class C coating, may be substituted at fabricator's option.
- C. Drywall Beads: Edge trim formed from 0.0299-inch zinc-coated steel sheet formed to receive joint compound and in size to suit thickness of gypsum panels indicated.
- D. Paint:
 1. Shop Primer for Ferrous Metal: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with performance requirements in FS TT-P-664; selected for good resistance to normal atmospheric corrosion, compatibility with finish paint systems indicated, and capability to provide sound foundation for field-applied topcoats despite prolonged exposure.
 2. Shop Primer for Metallic-Coated Steel: Organic zinc-rich primer complying with SSPC-Paint 20 and compatible with topcoat.

2.2 ACCESS DOORS AND FRAMES

- A. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include the following:
 1. Jensen Industries.
 2. J. L. Industries, Inc.
 3. Larsen's Manufacturing Company.
 4. Milcor Limited Partnership.
- B. Insulated, Fire-Rated Access Doors and Frames with Exposed Trim:
 1. Material: Prime-painted steel sheet.
 2. Surface Type: Masonry and gypsum board.
 3. Locations: Walls and ceilings.
 4. Fire-Resistance Rating: 1 hour.
 5. Temperature-Rise Rating: 250 deg F at the end of 30 minutes.
 6. Door: Flush panel with core of mineral-fiber insulation enclosed in sheet metal; minimum thickness of 0.036 inch.
 7. Frame: Minimum 0.060-inch- thick sheet metal with 1-inch- wide, surface-mounted trim.
 8. Hinges: Concealed pin type.
 9. Automatic Closer: Spring type.
 10. Latch: Self-latching bolt operated by key with interior release.
 11. Lock: Key-operated cylinder lock.
- C. Flush Access Doors and Frames with Exposed Trim:
 1. Material: Prime-painted steel sheet.
 2. Surface Type: Masonry and gypsum board.
 3. Locations: Walls and ceilings.
 4. Door: Minimum 0.060-inch- thick sheet metal, set flush with exposed face flange of frame.
 5. Frame: Minimum 0.060-inch- thick sheet metal with 1-inch- wide, surface-mounted trim.
 6. Hinges: Spring-loaded concealed pin type.

7. Lock: Key-operated cylinder lock.

2.3 FABRICATION

- A. Latching Mechanisms: Furnish number required to hold doors in flush, smooth plane when closed.

1. For cylinder lock, furnish two keys per lock and key all locks alike.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Advise installers of other work about specific requirements relating to access door and floor door installation, including sizes of openings to receive access door and frame, as well as locations of supports, inserts, and anchoring devices.
- B. Install access doors flush with adjacent finish surfaces or recessed to receive finish material.
- C. Adjust doors and hardware after installation for proper operation.

END OF SECTION 08311

SECTION 09500**ACOUSTICAL WALL PANELS****PART 1 - GENERAL**

1.01 RELATED DOCUMENTS

- A. Drawings and General Provisions of Contract, including General Conditions and other Division 1 Specification Sections, apply to the Work of this Section.

1.02 DESCRIPTION OF WORK

- A. The work under this section shall include all labor, materials and services required, including but not limited to proper adhesives, insulation, etc., sufficient to produce a complete installation in accordance with project requirements.

1.03 RELATED WORK

- A. Section 06100, Rough Carpentry (fire retardant treated interior wood furring)
- B. Section 06400, Architectural Woodwork (trim)
- C. Section 09900, Painting

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Store panels in a secure, dry location, away from contact with floors or walls, in manufacturer's original packaging, with all identification labels intact. Protect from construction damage and abuse.

PART 2 - PRODUCTS

2.01 ACOUSTICAL WALL PANELS

- A. Panels shall consist of wood fibers and a hydraulic cement binder formed under controlled conditions of heat and pressure. Weight of panels: 1.63 PSF minimum for 1" thickness.
- B. The panels shall be Class A/Class 1 for flame spread and smoke development requirements as classified by Underwriters Laboratories, Inc., guide No. BVRT (Structural Cement-Fiber Units).
- B. Panels shall be 2'-8" wide X 1" thick and shall have beveled long edges. The panels shall have minimum noise reduction coefficient of .80 (utilizing the C-20 mounting system).
- C. Finish: "Natural" for painting in the field. Minimum light reflectance for natural finish: .60.

2.02 Approved Manufacturers

- A. Tectum, Inc., Newark, Ohio ("Tectum" Wall Panels) (www.tectum.com).
- B. Martin Acoustical Products, Division of Martin Fireproofing Georgia, Inc., Elberton, GA ("AcoustiPlank" Acoustical Wall Panels).

2.03 INSULATION

- A. Fiberglass sound attenuation insulation shall be placed directly under acoustical wall panels, and between furring strips. Owens Corning "703 Insulation" or comparable products of other manufacturers, capable of being compressed to the required thickness, shall be acceptable.

PART 3 - EXECUTION**3.01 PREPARATION**

- A. Inspect wall surfaces scheduled to receive wall panel mounting. Notify Architect and Owner's Representative of any conditions that would adversely affect installation. Do not proceed until such conditions are corrected.

3.02 INSTALLATION

- A. Mechanically fastened wood fire retardant treated furring (1" x 3") shall be provided for permanent panel support under work of Section 06100. Mounting assembly shall comply with manufacturer's wall mounting detail C-20.
- B. Continuous 3/8" diameter beads of contact adhesive shall be applied between furring and acoustical panels.
- C. Panels shall be screwed to furring panels.
- D. Install sound attenuation fiberglass insulation directly beneath acoustical panels, temporarily held in place with adhesive until panels are installed.
- E. Panels shall be painted as specified under the work of Section 09900, using spray application (roller application shall not be allowed). Color shall be as selected by Architect.

3.03 CLEAN UP

- A. Remove all excess materials, trash, and debris from the work area and dispose of legally.

END OF SECTION

SECTION 12346 - WOOD LABORATORY CASEWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes **Science classroom, Prep. room and Work and Family Studies Casework, which includes** the following:
 - 1. Wood laboratory casework.
 - 2. Utility-space closure panels between base cabinets and at exposed ends of utility spaces.
 - 3. Epoxy countertops (Science and Prep. Rooms)
 - 4. Laboratory sinks.
 - 5. Plastic laminate countertops (Work and Family Studies)
 - 6. Accessories.
 - 7. Water and electrical service fittings.
- B. Related Sections include the following:
 - 1. Division 6 Section "Rough Carpentry" for wood blocking to anchor laboratory casework.
 - 2. Division 12 Section "Plastic Laminate Casework" for other casework and counter tops.
 - 3. Divisions 15 and 16 Sections for installing service fittings specified in this Section.
 - 4. Divisions 15 and 16 Sections for connecting service utilities at indicated point.

1.3 DEFINITIONS

- A. Exposed Portions of Casework: Surfaces visible when doors and drawers are closed, including bottoms of cabinets more than 48 inches above floor, and visible surfaces in open cabinets or behind glass doors.
 - 1. Ends of cabinets indicated to be installed directly against and completely concealed by walls or other cabinets after installation shall not be considered exposed.
- B. Semi-exposed Portions of Casework: Surfaces behind opaque doors, such as interiors of cabinets, shelves, dividers, interiors and sides of drawers, and interior faces of doors.
- C. Concealed portions of casework include sleepers, web frames, dust panels, and other surfaces not usually visible after installation.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For wood laboratory casework. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Indicate locations of blocking and reinforcements required for installing laboratory casework.
 - 2. Indicate locations and types of fittings, and associated service supply connection required.

3. Include details of exposed conduits, if required, for service fittings.
 4. Indicate locations of and clearances from adjacent walls, doors, windows, other building components, and other laboratory equipment.
 5. Include coordinated dimensions for laboratory equipment specified in other Sections.
- C. Samples for Initial Selection: For factory-applied finishes.
- D. Samples for Verification: For each type of finish, including countertop material, in manufacturer's standard sizes.
- E. Qualification Data: For testing agency.
- F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating compliance of laboratory casework finishes and countertops with requirements specified for chemical and physical resistance.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative of institutional casework manufacturer for installation and maintenance of units required for this Project.
- B. Manufacturer: Minimum of 5 years experience in providing manufactured casework systems for similar types of projects, produce evidence of financial stability, bonding capacity, and adequate facilities and personnel required to perform on this project.
1. Approved manufacturer of casework holds an AWI Premium Certification in all levels of AWI Quality Standard sections.
- C. Source Limitations: Obtain laboratory casework, including countertops, sinks, service fittings, and accessories, through one source from a single manufacturer.
- D. Product Standard: Comply with SEFA 8, "Laboratory Furniture--Casework, Shelving and Tables--Recommended Practices."
- E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect finished surfaces during handling and installation with protective covering of polyethylene film or other suitable material.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install wood laboratory casework until building is enclosed, wet work and utility roughing-in are complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

1.8 COORDINATION

- A. Coordinate installation of wood laboratory casework with installation of other laboratory equipment.

1.9 EXTRA MATERIALS

- A. Furnish complete touchup kit for each type and color of wood laboratory casework provided. Include scratch fillers, stains, finishes, and other materials necessary to perform permanent repairs to damaged laboratory casework finish.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Wood Laboratory Casework:
 - a. Leonard Peterson & Company, Inc. (Schedule is based on Leonard Peterson numbers)
 - b. Collegedale Casework, L.L.C.
 - c. Fisher Hamilton L.L.C.
 - d. Kewaunee Scientific Corporation; Laboratory Division.
 - e. Sheldon Laboratory Systems.
 2. Epoxy Countertops, Sinks, and Troughs:
 - a. Durcon Company, Inc. (The).
 - b. Epoxyn Products.
 - c. Laboratory Tops, Inc.
 - d. Prime Industries, Inc.

2.2 CABINET MATERIALS

- A. General:
1. Maximum Lumber Moisture Content: 7 percent for hardwood; 12 percent for softwood.
 2. Hardwood Plywood: HPVA HP-1, either veneer or lumber core, unless otherwise noted.
 3. Edgbanding for Wood-Veneered Construction: Minimum 1/8-inch- thick, solid wood of same species as face veneer.
- B. Exposed Materials:
1. General: Provide materials that are selected and arranged for compatible grain and color.
 2. Wood Species and Veneer Cut: Red oak, plain sliced/sawn.
 3. Stain Colors and Finishes: As selected by Architect from manufacturer's full range.
 4. Solid Wood: Clear hardwood lumber.
 5. Plywood: Hardwood plywood; Grade A exposed faces at least 1/50 inch thick, Grade J crossbands, and backs of same species as faces.
- C. Semi-exposed Materials:
1. Solid Wood: Sound hardwood lumber, selected to eliminate appearance defects, of any species similar in color and grain to exposed solid wood.
 2. Plywood: Hardwood plywood of any species similar in color and grain to exposed plywood. Grade B or C faces, Grade J crossbands, and backs of same species as faces. Semi-exposed backs of plywood with exposed faces shall be same species as faces.
- D. Concealed Materials:

1. Solid Wood: Any hardwood or softwood species, with no defects affecting strength or utility.
2. Plywood: Hardwood plywood. Concealed backs of plywood with exposed or semi-exposed faces shall be same species as faces.
3. Particleboard: ANSI A208.1, Grade M-2.
4. Medium-Density Fiberboard: ANSI A208.2, Grade MD.
5. Hardboard: AHA A135.4, Class 1 tempered.

2.3 CABINET FABRICATION

- A. Cabinet Design: Lipped overlay with radiused edges.
- B. Construction: Provide wood-faced laboratory casework of the following minimum construction:
 1. Bottoms and Ends of Cabinets: 3/4-inch- thick plywood.
 2. Base Cabinet Top Frames: 3/4-by-2-inch solid wood with mortise and tenon or doweled connections, glued and pinned or screwed.
 3. Base Cabinet Intermediate Frames: 3/4-by-2-inch solid wood with mortise and tenon or doweled connections, glued and pinned or screwed. Provide four-sided frame in all cases, and added center rail for cabinet widths exceeding 24-inches.
 - a. In lieu of intermediate frames, casework manufacturer may provide face and rear rail supported security panels (see below) and full-extension slides specified.
 4. Backs of Cabinets: 3/4-inch- thick plywood where exposed.
 5. Drawer Fronts: 3/4-inch- thick plywood or solid hardwood.
 6. Drawer Boxes: Conform to AWI Section 400B-T-5 and 400B-T-7 for Premium Grade.
 7. Security panels, 1/4-inch thick tempered hardboard fully grooved into cabinet frames. Security panels provided between all drawers or drawers and cupboards having locks which are keyed differently.
 8. Doors 48 Inches or Less in Height: 3/4 inch thick, with veneer plywood or particleboard cores, solid hardwood stiles and rails, and hardwood face veneers and crossbands.
- C. Base Molding: ASTM F 1861, Type TS or TP rubber , black, 4 inches in height. Provide on fronts and exposed sides of floor-mounted laboratory casework. "A" style, straight with no toe.

2.4 WOOD FINISH

- A. Quality Standard: Comply with AWI Section 1500, Premium Grade.
- B. General: Finish architectural woodwork at fabrication shop as specified in this Section. Defer only final touchup, cleaning, and polishing until after installation.
- C. Chemical-Resistant Finish: Apply laboratory casework manufacturer's standard chemical-resistant, transparent finish consisting of sealer and catalyzed topcoat(s). Sand and wipe clean between coats. Topcoat(s) may be omitted on concealed surfaces.

2.5 CABINET HARDWARE

- A. General: Provide laboratory casework manufacturer's standard satin-finish, commercial-quality, heavy-duty hardware complying with requirements indicated for each type.

- B. Hinges: Stainless-steel, 5-knuckle hinges complying with BHMA A156.9, Grade 1, with antifriction bearings and rounded tips. Provide 2 for doors 48 inches or less in height.
- C. Pulls: Solid aluminum, stainless steel, or chrome-plated brass; fastened from back with two screws.
- D. Door Catches: Nylon-roller spring catch or dual, self-aligning, permanent magnet catch.
- E. Drawer Slide: Conform to AWI Section 400B-T-7 for Premium Grade.
- F. Locks: Cam type, brass with chrome-plated finish; complying with BHMA A156.11, Type E07281.
 - 1. Provide minimum of two keys per lock and two master keys.
 - 2. Provide on all drawers and doors except sink fronts.
 - 3. Provide keying and masterkeying as directed by Owner.
- G. Adjustable Shelf Supports: Powder-coated steel shelf rests complying with BHMA A156.9, Type B04013. (Plastic supports not acceptable.)

2.6 COUNTERTOPS AND SINKS

- A. Countertops, General: Provide units with smooth surfaces in uniform plane free of defects. Make exposed edges and corners straight and uniformly beveled. Provide front and end overhang of 1 inch, with continuous drip groove on underside 1/2 inch from edge.
- B. Sinks, General: Provide sizes indicated or laboratory casework manufacturer's closest standard size of equal or greater volume, as approved by Architect.
 - 1. Outlets: Provide with strainers and tailpieces, NPS 1-1/2, unless otherwise indicated.
- C. Epoxy Countertops and Sinks: Factory molded modified epoxy-resin formulation with smooth, non-specular finish.
 - 1. Physical Properties:
 - a. Flexural Strength: Not less than 10,000 psi.
 - b. Modulus of Elasticity: Not less than 2,000,000 psi.
 - c. Hardness (Rockwell M): Not less than 100.
 - d. Water Absorption (24 Hours): Not more than 0.02 percent.
 - e. Heat Distortion Point: Not less than 260 deg F.
 - 2. Chemical Resistance: Epoxy-resin material has the following ratings when tested with indicated reagents according to NEMA LD 3, Test Procedure 3.4.5:
 - a. No Effect: Acetic acid (98 percent), acetone, ammonium hydroxide (28 percent), benzene, carbon tetrachloride, dimethyl formamide, ethyl acetate, ethyl alcohol, ethyl ether, methyl alcohol, nitric acid (70 percent), phenol, sulfuric acid (60 percent), and toluene.
 - b. Slight Effect: Chromic acid (60 percent) and sodium hydroxide (50 percent).
 - 3. Color: Black.
 - 4. Countertop Fabrication: Fabricate with factory cutouts for sinks and with butt joints assembled with epoxy adhesive and prefitted, concealed metal splines.
 - a. Countertop Configuration: Flat, 1-inch thick, with beveled or rounded edge and corners, and with drip groove and integral coved backsplash.
 - b. Countertop Construction: Uniform throughout full thickness.

5. Sink Fabrication: Molded in 1 piece with smooth surfaces, coved corners, and bottom sloped to outlet; 1/2-inch minimum thickness.
 - a. Provide with polypropylene strainers and tailpieces.
 - b. Provide integral sinks in epoxy countertops, bonded to countertops with invisible joint line.

2.7 WATER SERVICE FITTINGS

- A. Service Fittings: Provide units that comply with SEFA 7, "Laboratory and Hospital Fixtures--Recommended Practices." Provide fittings complete with washers, locknuts, nipples, and other installation accessories. Include wall and deck flanges, escutcheons, handle extension rods, and similar items.
 1. Provide units that comply with recommendations in SEFA 7, Section 11, "Vandal-Resistant Faucets and Fixtures."
- B. Materials: Fabricated from cast or forged red brass, unless otherwise indicated.
- C. Finish: Chromium plated except where corrosion-resistant finish is indicated.
 1. Provide corrosion-resistant finish in laboratory casework manufacturer's standard metallic brown, aluminum, or other color as approved by Architect.
- D. Water Valves and Faucets: Provide units complying with ASME A112.18.1, with renewable seats, designed for working pressure up to 80 psig.
 1. Provide water fixtures with adjustable volume control (Water Saver BNV200AC or equal).
 - a. Adjusted flow rates required are specified in Division 15 "Plumbing."
 2. Vacuum Breakers: Provide ASSE 1035 vacuum breakers on water fittings with serrated outlets.
 3. Aerators: Provide aerators on water fittings that do not have serrated outlets.
 4. Self-Closing Valves: Provide self-closing valves where indicated.
- E. Handles: Provide three- or four-arm, forged-brass handles for valves, unless otherwise indicated.
- F. Service-Outlet Identification: Provide color-coded plastic discs with embossed identification, secured to each service-fitting handle to be tamper resistant.

2.8 ELECTRICAL SERVICE FITTINGS

- A. Service Fittings, General: Furnish units complete with metal housings, receptacles, terminals, switches, pilot lights, device plates, accessories, and gaskets required for mounting on laboratory casework.
- B. Receptacles: Comply with NEMA WD 1, NEMA WD 6, FS W-C-596, and UL 498. Duplex type, Configuration 5 20R.
 1. Receptacle Grade: General grade, unless otherwise indicated.
 2. GFCI Receptacles: Comply with UL 943, General grade.
- C. Recessed-Type Fittings: Provide with galvanized steel boxes.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances, location of reinforcements, and other conditions affecting performance of wood laboratory casework.
 - 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF CABINETS

- A. Install level, plumb, and true; shim as required, using concealed shims. Where laboratory casework abuts other finished work, apply filler strips and scribe for accurate fit, with fasteners concealed where practical.
- B. Base Cabinets: Adjust top rails and subtops within 1/16 inch of a single plane. Fasten cabinets to utility-space framing, partition framing, wood blocking, or reinforcements in partitions with fasteners spaced not more than 24 inches o.c. Fasten adjacent cabinets together with joints flush, tight, and uniform. Align similar adjoining doors and drawers to a tolerance of 1/16 inch.
 - 1. Where base cabinets are installed away from walls, fasten to floor at toe space at not more than 24 inches o.c. and at sides of cabinets with not less than 2 fasteners per side.
- C. Install hardware uniformly and precisely. Set hinges snug and flat in mortises.
- D. Adjust laboratory casework and hardware so doors and drawers align and operate smoothly without warp or bind and contact points meet accurately. Lubricate operating hardware as recommended by manufacturer.

3.3 INSTALLATION OF COUNTERTOPS

- A. Abut top and edge surfaces in one true plane with flush hairline joints and with internal supports placed to prevent deflection. Locate joints only where shown on Shop Drawings.
- B. Field Jointing: Where possible, make in the same manner as shop jointing using dowels, splines, adhesives, and fasteners recommended by manufacturer. Prepare edges to be joined in shop.
 - 1. Use concealed clamping devices for field joints in plastic-laminate countertops. Locate clamping devices within 6 inches of front and back edges and at intervals not exceeding 24 inches. Tighten according to manufacturer's written instructions to exert a uniform heavy pressure at joints.
- C. Fastening:
 - 1. Secure countertops, except for epoxy countertops, to cabinets with Z-type fasteners or equivalent, using two or more fasteners at each cabinet front, end, and back.
 - 2. Secure epoxy countertops to cabinets with epoxy cement, applied at each corner and along perimeter edges at not more than 48 inches o.c.
 - 3. Where necessary to penetrate countertops with fasteners, countersink heads approximately 1/8 inch and plug hole flush with material equal to countertop in chemical resistance, hardness, and appearance.
- D. Provide required holes and cutouts for service fittings.

- E. Seal unfinished edges and cutouts in plastic-laminate countertops with heavy coat of polyurethane varnish.
- F. Provide scribe moldings for closures at junctures of countertop, curb, and splash, with walls as recommended by manufacturer for materials involved. Match materials and finish to adjacent laboratory casework. Use chemical-resistant, permanently elastic sealing compound where recommended by manufacturer.
- G. Carefully dress joints smooth, remove surface scratches, and clean entire surface.

3.4 INSTALLATION OF SINKS

- A. Underside Installation of Epoxy Sinks: Use laboratory casework manufacturer's recommended adjustable support system for table- and cabinet-type installations. Set top edge of sink unit in sink and countertop manufacturers' recommended chemical-resistant sealing compound or adhesive and firmly secure to produce a tight and fully leak-proof joint. Adjust sink and securely support to prevent movement. Remove excess sealant while still wet and finish joint for neat appearance.

3.5 INSTALLATION OF ACCESSORIES

- A. Install accessories according to Shop Drawings and manufacturer's written instructions.
- B. Install shelf standards plumb and at heights to align shelf brackets for level shelves. Install shelving level and straight, closely fitted to other work where indicated.

3.6 INSTALLATION OF SERVICE FITTINGS

- A. Comply with requirements in Divisions 15 and 16 Sections for installing water service fittings, piping, electrical devices, and wiring.
- B. Install fittings according to Shop Drawings and manufacturer's written instructions. Set bases and flanges of sink- and countertop-mounted fittings in sealant recommended by manufacturer of sink or countertop material. Securely anchor fittings, piping, and conduit to laboratory casework, unless otherwise indicated.

3.7 CLEANING AND PROTECTING

- A. Clean finished surfaces, touch up as required, and remove or refinish damaged or soiled areas to match original factory finish, as approved by Architect.
- B. Protect countertop surfaces during construction with 6-mil plastic or other suitable water-resistant covering. Tape to underside of countertop at minimum of 48 inches o.c.

END OF SECTION