

ADDENDUM 03

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NOTICE: Amend the Drawings and/or Project Manual to the above referenced project as follows:

PROJECT MANUAL

- | | |
|------------|--|
| ITEM NO. 1 | SECTION 075113 – BUILT-UP ASPHALT ROOFING |
| | A. Delete section in its entirety. |
| ITEM NO. 2 | SECTION 075113.11 – BUILT-UP ASPHALT ROOFING, HOT-APPLIED |
| | A. Add section in its entirety. |
| ITEM NO. 3 | SECTION 084113 – ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS |
| | A. Replace section in its entirety. |
| ITEM NO. 4 | SECTION 123216 – MANUFACTURED PLASTIC-LAMINATE CLAD CASEWORK |
| | A. Replace section in its entirety. |
| ITEM NO. 5 | SECTION 123623.13 – PLASTIC-LAMINATE CLAD COUNTERTOPS |
| | A. Replace section in its entirety. |
| ITEM NO. 6 | SECTION 123661.16 – SOLID SURFACING COUNTERTOPS AND SILLS |
| | A. Replace section in its entirety. |
| ITEM NO. 7 | SECTION 123661.19 – QUARTZ AGGLOMERATE COUNTERTOPS |
| | A. Replace section in its entirety. |

ATTACHMENTS

SECTION 075113 – BUILT-UP ASPHALT ROOFING
SECTION 075113.11 – BUILT-UP ASPHALT ROOFING, HOT-APPLIED
SECTION 084113 – ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS
SECTION 123216 – MANUFACTURED PLASTIC-LAMINATE CLAD CASEWORK
SECTION 123623.13 – PLASTIC-LAMINATE CLAD COUNTERTOPS
SECTION 123661.16 – SOLID SURFACING COUNTERTOPS AND SILLS
SECTION 123661.19 – QUARTZ AGGLOMERATE COUNTERTOPS

END OF ADDENDUM 03

SECTION 07 51 13.11 - BUILT-UP ASPHALT ROOFING, HOT-APPLIED

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Roof Types 1: Hot-applied built-up asphalt roofing system on plywood sheathing, including but not limited to:
 - a. Metal deck
 - b. Mechanically attached 5/8" reinforced gyp board.
 - c. Adhered vapor barrier of 1 ply G2 Base sheet and one ply type VI glass felt in hot asphalt.
 - d. Adhered R-20 of roof insulation with adhered cover board.
 - e. Four ply roof membrane and elastomeric base flashings.
 - f. Cold applied surfacing adhesive with aggregate surfacing.

B. Related Sections:

1. Section 05 31 00 "Steel Decking" for steel roof deck.
2. Section 06 10 53 "Miscellaneous Rough Carpentry" for wood nailers, curbs, and blocking, and for wood-based, structural-use roof deck panels.
3. Section 07 62 00 – "Sheet Metal Flashing and Trim" for custom metal roof penetration flashings, flashings, and counterflashings.
4. Section 07 72 00 "Roof Accessories" for roof hatches, curbs, and other roof-mounted accessories.
5. Section 07 92 00 "Joint Sealants" for joint sealants, joint fillers, and joint preparation.
6. Division 22 "Plumbing" sections for roof drains.

1.3 DEFINITIONS

- A. Roofing Terminology: See ASTM D1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to built-up roofing.

1.3 MOCK-UP

- B. Provide roof membrane and related materials for integrated exterior mock-up specified in Section 01 40 00 - Quality Requirements.
- C. Locate where directed.
- D. Mock-up may not remain as part of the Work.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- E. Shop Drawings: For built-up roofing. Include plans, elevations, sections, details, and attachments to other work. Provide roof plan showing orientation and types of roof deck, orientation of membrane roofing, and fastening spacings and patterns for mechanically fastened components.
 - 1. Base flashings and built-up terminations.
 - a. Indicate details meet requirements of NRCA and FMG required by this Section.
 - 2. Tapered insulation, including slopes.
 - 3. Crickets, saddles, and tapered edge strips, including slopes.
 - 4. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.
- F. Samples for Verification: For the following products:
 - 1. Sheet roofing materials, of color specified for exposed material.
 - 2. Roof insulation.
 - 3. 1 lb. of aggregate surfacing material in gradation and color indicated.
 - 4. Walkway materials.
 - 5. Six insulation fasteners of each type, length, and finish.
- G. Qualification Data: For Installer, Manufacturer, and Roofing Inspector.
 - 1. Include letter from Manufacturer written for this Project indicating approval of Installer to install Manufacture's warranted roof system specified.
- H. Contractor's Product Certificate: Submit notarized certificate, indicating products intended for Work of this Section, including product names and numbers and manufacturers' names, with statement indicating that products to be provided meet the requirements of the Contract Documents.
- I. Manufacturer Certificates: Signed by roofing manufacturer certifying that built-up roofing complies with requirements specified in "Performance Requirements" Article.
 - 1. Submit evidence of compliance with performance requirements.
 - 2. Indicate that proposed system components are compatible.

- J. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for components of built-up roofing.
- K. Warranties: Unexecuted sample copies of special warranties.
- L. Field Quality Control Reports: Daily reports of Roofing Inspector. Include weather conditions, description of work performed, tests performed, defective work observed, and corrective actions taken to correct defective work.
- M. Maintenance Data: To include in maintenance manuals.
- N. Warranties: Executed copies of warranties.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and certified by manufacturer, including a full-time on-site supervisor with a minimum of five years' experience installing similar work, able to communicate verbally with Contractor, Architect, and employees, and qualified by the manufacturer to furnish warranty of type specified.
- B. Manufacturer Qualifications: Approved manufacturer with UL listed roofing systems comparable to those specified for this Project, with minimum five years' experience in manufacture of comparable products in successful use in similar applications, and able to furnish warranty with provisions matching specified requirements.
 - 1. Approval of Comparable Products: Submit the following in accordance with project substitution requirements, within time allowed for substitution review:
 - a. Product data, including certified independent test data indicating compliance with requirements.
 - b. Samples of each component.
 - c. Sample submittal from similar project.
 - d. Project specific installation instructions noting installation procedures, application rates, cure times, and installation details at perimeter edges, penetration flashing and drains.
 - e. Project references: Minimum of five installations of specified products not less than five years old, with Owner and Architect contact information.
 - f. Sample warranty.
 - 2. Substitutions following award of contract are not allowed except as stipulated in Section 01 60 00 - Product Requirements.
 - 3. Approved manufacturers must meet separate requirements of Submittals Article.
- C. Roofing Inspector Qualifications: A technical representative of manufacturer, not engaged in the sale of products, and experienced in the installation and maintenance of the specified roofing system, qualified to perform roofing observation and inspection specified in Field Quality Control Article to determine Installer's compliance with the requirements of this Project, and approved by the manufacturer to issue warranty certification. The Roofing Inspector shall be one of the following:
 - 1. An authorized full-time technical employee of the manufacturer.

- D. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products.
- E. Preinstallation Roofing Conference: Conduct conference at Project site.
 - 1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
 - 2. Review drawings and specifications.
 - 3. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
 - 4. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 5. Examine substrate conditions and finishes for compliance with requirements, including flatness and fastening.
 - 6. Review structural loading limitations of roof deck during and after roofing.
 - 7. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing.
 - 8. Review governing regulations and requirements for insurance and certificates if applicable.
 - 9. Review temporary protection requirements for roofing during and after installation.
 - 10. Review roof observation and repair procedures after roofing installation.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing manufacturer. Protect stored liquid material from direct sunlight.
 - 1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.6 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing to be installed according to manufacturer's written instructions and warranty requirements.
- B. Daily Protection: Coordinate installation of roofing so insulation and other components of roofing system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.

1.7 WARRANTY

- A. Warranty, General: Warranties specified shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
- B. Manufacturer's Warranty: Manufacturer's standard or customized form in which manufacturer agrees to repair or replace components of built-up roofing that fail in materials or workmanship within specified warranty period. Failure includes roof leaks.
 - 1. Manufacturer's warranty includes roofing membrane, base flashings, fasteners, roofing membrane accessories and other components of roofing system specified in this Section.
 - 2. Warranty Period: 20 years from date of Substantial Completion.
- C. Installer's Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering the Work of this Section and related Sections indicated above, including all components of built-up roofing such as built-up roofing membrane, base flashing, roof insulation, fasteners, cover boards, substrate boards, vapor retarders, roof pavers, and walkway products, for the following warranty period:
 - 1. Warranty Period: Two years from date of Substantial Completion.
- D. Extended Roof System Warranty: Warranties specified in this Section include the following components and systems specified in other sections supplied by the roofing system Manufacturer, and installed by the roofing system Installer:
 - 1. Sheet metal flashing and trim, including roof penetration flashings.
 - 2. Manufactured copings, roof edge, counterflashings, and reglets.
 - 3. Roof curbs, hatches, and penetration flashings.
 - 4. Roof and parapet expansion joint assemblies.
 - 5. Metal roof, wall, and soffit panels and trim.
- E. Manufacturer Inspection and Preventive Maintenance Requirement: By manufacturer's technical representative, to report maintenance responsibilities to Owner necessary for preservation of Owner's warranty rights. The cost of manufacturer's inspections and preventive maintenance is included in the Contract Sum. Inspections to occur in Years 2, 5, 10 and 15 following completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturer/Product: The roof system specified in this Section is based upon products of Tremco, Inc., Beachwood, OH, (800) 562-2728, www.tremcoroofing.com that are named in other Part 2 articles. Provide specified products.
- B. Source Limitations: Obtain components for roofing system from same manufacturer as membrane roofing or manufacturer approved by membrane roofing manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. General Performance: Roofing shall withstand exposure to weather without failure or leaks due to defective manufacture or installation.
 - 1. Accelerated Weathering: Roofing system shall withstand 2000 hours of exposure when tested according to ASTM G152, ASTM G154, or ASTM G155.
 - 2. Impact Resistance: Roofing system shall resist impact damage when tested according to ASTM D3746 or ASTM D4272.
- B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by built-up roofing manufacturer based on testing and field experience.
- C. Roofing System Design: Provide roofing system that is identical to systems that have been successfully tested by a qualified testing and inspecting agency in accordance with ANSI/FM 4474, UL 580, or UL 1897, and to resist uplift pressures.
 - 1. All Zones (Corner, Perimeter, and Field-of-Roof) Uplift Pressures: As indicated on Drawings.
- D. SPRI Wind Design Standard: Manufacture and install roof edge flashings tested according to SPRI ES-1 and capable of resisting the following design pressures:
 - 1. Design Pressure: As indicated on Drawings.
- E. Flashings and Fastening: Comply with requirements of Section 07 62 00 - Sheet Metal Flashing and Trim. Provide base flashings, perimeter flashings, detail flashings and component materials and installation techniques that comply with requirements and recommendations of the following:
 - 1. FM Global 1-49: Loss Prevention Data Sheet for Perimeter Flashings.
 - 2. FM Global 1-29: Loss Prevention Data Sheet for Above Deck Roof Components.
 - 3. NRCA Roofing Manual (Sixth Edition) for construction details and recommendations.
 - 4. SMACNA Architectural Sheet Metal Manual (Seventh Edition) for construction details.
- F. Exterior Fire-Test Exposure: ASTM E108, Class A; for application and roof slopes indicated, as determined by testing identical membrane roofing materials by a qualified testing agency. Materials shall be identified with appropriate markings of applicable testing agency.

2.3 SHEET MATERIALS -

- A. Vapor Barrier
 - 1. Base Sheet:
 - a. ASTM D 4601 Type II nonperforated asphalt-impregnated and coated glass-fiber sheet, dusted with fine mineral surfacing on both sides.
 - 1) BURmastic Glass Ply-28 lb. by Tremco, or other approved by owner.
 - 2) Breaking Strength, minimum, ASTM D 146: Machine direction, 90 lbf/in (15.7 kN/m); Cross machine direction, 70 lbf/in (12.2 kN/m).
 - 3) Pliability, 1/2 inch (12.7 mm) radius bend, ASTM D 146: No failures.
 - 4) Weight, ASTM D 228: 28 lb/100 sq. ft. (1.37 kg/m²).

2. Ply Sheet:
 - a. ASTM D 2178 Type VI premium asphalt-impregnated glass-fiber ply sheet.
 - 1) THERM glass Premium Type VI by Tremco, or other approved by owner.
 - 2) Net Dry Mass, ASTM D 146: 8 lb/100 sq. ft. (390 g/sq. m).
 - 3) Breaking Strength, minimum, ASTM D 146: Machine direction, 70 lbf/in (12 kN/m); cross machine direction, 60 lbf/in (10 kN/m).
- B. Base Plies:
 1. Non-woven, heat resistant, polyester ply sheet, with the following properties:
 - a. Polytherm. by Tremco, or other approved by owner.
 - b. Breaking Load at 77 deg. F (25 deg. C), minimum, ASTM D 4830: machine direction, 150 lbf (667 N); cross-machine direction, 130 lbf (578 N).
 - c. Trapezoid Tearing Strength, minimum, ASTM D 4830: machine direction, 60 lbf (267 N); cross-machine direction, 60 lbf (267 N).
 - d. Elongation at 77 deg. F (25 deg. C), minimum, ASTM D 4830: machine direction, 30 percent; cross-machine direction, 30 percent.
 - e. Thickness, minimum, ASTM D 1777: 0.035 inch (0.9 mm).
- C. Ply Sheets:
 1. ASTM D 2178 Type VI premium asphalt-impregnated glass-fiber ply sheet.
 - a. THERM glass Premium Type VI by Tremco, or other approved by owner.
 - b. Net Dry Mass, ASTM D 146: 8 lb/100 sq. ft. (390 g/sq. m).
 - c. Breaking Strength, minimum, ASTM D 146: Machine direction, 70 lbf/in (12 kN/m); cross machine direction, 60 lbf/in (10 kN/m).
- D. Base Flashing Backer Sheet:
 1. Non-woven, heat resistant, polyester ply sheet, with the following properties:
 - a. Polytherm. by Tremco, or other approved by owner.
 - b. Breaking Load at 77 deg. F (25 deg. C), minimum, ASTM D 4830: machine direction, 150 lbf (667 N); cross-machine direction, 130 lbf (578 N).
 - c. Trapezoid Tearing Strength, minimum, ASTM D 4830: machine direction, 60 lbf (267 N); cross-machine direction, 60 lbf (267 N).
 - d. Elongation at 77 deg. F (25 deg. C), minimum, ASTM D 4830: machine direction, 30 percent; cross-machine direction, 30 percent.
 - e. Thickness, minimum, ASTM D 1777: 0.035 inch (0.9 mm).
- E. Base Flashing Sheet:
 1. Thermoset elastomeric flashing sheet, polyester-reinforced with EPDM and SBR elastomers.
 - a. TRA Elastomeric Sheeting by Tremco, or other approved by Owner.
 - b. Breaking Strength, minimum, ASTM D751: Machine direction 350 lbf (1550 N); Cross machine direction 300 lbf (1330 N).
 - c. Tear Strength, minimum, ASTM D751: Machine direction 77 lbf (342 N); Cross machine direction 77 lbf (342 N).
 - d. Elongation at Failure, minimum, ASTM D 751: 30 percent.

- e. Low Temperature Flexibility, minimum, ASTM D2136: -40 deg. F (-40 deg. C).
- f. Thickness, minimum, ASTM D751: 0.045 inch (1.1 mm).
- g. Color: Black.

F. Detailing Fabric:

- 1. Woven Glass Fiber Mesh, Vinyl-Coated: Tremco, BURmesh.
 - a. BURmesh by Tremco, or other approved by Owner.

2.4 ADHESIVE MATERIALS

A. General: Adhesive and sealant materials recommended by roofing manufacturer for intended use and compatible with built-up roofing.

B. Ply Sheet Adhesive:

- 1. ASTM D312 Type IV hot-melt asphalt in heat melt container.
 - a. Basis of Design Product: Field's Melt-Pak, Type IV.
 - b. Softening Point, min/max, ASTM D36: 215225 deg. F (102107 deg. C).
 - c. Ductility at 77 deg. F, minimum, ASTM D113: 2.5 cm.
 - d. Penetration at 77 deg. F (25 deg. C), min/max, ASTM D5: 1530 dmm.

C. Insulation and Cover Board Adhesive:

- 1. ASTM D312 Type IV hot-melt asphalt in heat melt container.
 - a. Basis of Design Product: Field's Melt-Pak, Type IV.
 - b. Softening Point, min/max, ASTM D36: 215225 deg. F (102107 deg. C).
 - c. Ductility at 77 deg. F, minimum, ASTM D113: 2.5 cm.
 - d. Penetration at 77 deg. F (25 deg. C), min/max, ASTM D5: 1530 dmm

D. Base Flashing Sheet Adhesive:

- 1. Cold-applied one-part butyl-based elastomer adhesive for flashing membranes.
 - a. Sheeting Bond by Tremco, or other approved by Owner.
 - b. VOC, maximum, ASTM D3960: <250 g/L.
 - c. Adhesion in peel, ASTM D1876: 3 lbf/in (0.5 N/mm).
 - d. Lap shear adhesion, ASTM D3960: 18 psi (124 kPa).

E. Asphalt Roofing Cement: ASTM D4586, asbestos free, of consistency required by roofing manufacturer for application.

F. Mastic Sealant: Polyisobutylene, plain or modified bitumen, nonhardening, nonmigrating, nonskinning, and nondrying.

2.5 HOT-APPLIED ADHESIVE MATERIALS

A. ASTM D312 Type IV hot-melt asphalt in heat melt container.

- 1. Basis of Design Product: Field's Melt-Pak, Type IV.
- 2. Softening Point, min/max, ASTM D36: 215225 deg. F (102107 deg. C).

3. Ductility at 77 deg. F, minimum, ASTM D113: 2.5 cm.
4. Penetration at 77 deg. F (25 deg. C), min/max, ASTM D5: 1530 dmm.

2.6 AUXILIARY BUILT-UP ROOFING MATERIALS

- A. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening built-up roofing components to substrate, tested by manufacturer for required pullout strength, and acceptable to roofing manufacturer.
- B. Liquid-type auxiliary materials shall comply with VOC limits of authorities having jurisdiction.
- C. Asphalt Primer:
 1. Asphalt primer, ASTM D41, low-VOC.
 - a. TREMprime LV by Tremco, or other approved by Owner.
 - b. Volatile Organic Compounds, maximum, ASTM D3960: 350 g/L.
 - c. Flash Point, minimum, ASTM D3278: 100 deg. F (38 deg. C).
- D. Metal Flashing Sheet: Metal flashing sheet is specified in Section 07 62 00 - Metal Flashing and Trim.
- E. Miscellaneous Accessories: Provide miscellaneous accessories recommended by built-up roofing manufacturer.

2.7 ROOF SUBSTRATE BOARD

- A. Glass-mat-faced gypsum panel, primed, ASTM C 1177/C 1177M
 1. Basis of design product: Tremco/GP Gypsum DensDeck Prime
 2. Thickness: 5/8 inch.

2.8 ROOF INSULATION MATERIALS

- A. Roofing Insulation, General: Preformed roof insulation boards manufactured or approved by roofing manufacturer, selected from manufacturer's standard sizes suitable for application, of thicknesses indicated.
- B. Roof Insulation:
 1. Polyisocyanurate board insulation, ASTM C1289 Type II Class 1 CFC- and HCFC- free, with recycled content glass-fiber mat facer on both major surfaces. CCMC listed.
 - a. Trisotech by Tremco, or other approved by Owner.
 - b. Compressive Strength, ASTM C1621: Grade 2: 20 psi (138 kPa).
 - c. Thickness: Provide boards in equal thickness layers, no more than 2.5" thick per layer, to achieve a thermal resistance value of R-20.
 - d. Conditioned Thermal Resistance at 75 deg. F (24 deg. C): 14.4 at 2.5 inches (50.8 mm) thick.
- C. Tapered Insulation: Provide factory-tapered insulation boards fabricated to create finished slopes of 1/4 inch per 12 inches on roof, unless otherwise indicated.

- D. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.
- E. Insulation Cover Board:
 - 1. ASTM C 208, Type II, Grade 2, Cellulosic-fiber and water-resistant binders, coated on six sides and chemically treated for deterioration.
 - a. Basis of design product: Blue Ridge Structodek HD.
 - b. Thickness: ½ inch.
- F. Insulation Cant Strips: ASTM C208, Type II, Grade 1, cellulosic-fiber insulation board.
- G. Tapered Edge Strips: ASTM C208, Type II, Grade 1, cellulosic-fiber insulation board.

2.9 SURFACING

- A. Base Flashing: Reflective Aluminum Roof Coating: ASTM D2824 Type III metallic-pigmented, fibrated asphalt-based roof coating, Energy Star qualified and CRRC listed.
 - 1. Alumanation 301 by Tremco, or other approved by Owner.
 - 2. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 400 g/L.
 - 3. Reflectance, minimum, ASTM D1549: 65 percent.
 - 4. Solids, percent by volume: 46.
- B. ROOF MMEMBRANE SURFACING ADHESIVE
 - 1. Slopes less than 2" in 12": Cold-applied aggregate adhesive and surfacer, water-based, low-VOC, formulated for compatibility with asphalt and coal tar roofing membranes and flashings.
 - a. ECOLastic by Tremco, or other approved by Owner.
 - b. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 30 g/L.
 - 2. Slopes greater than 2" in 12": Cold-applied restoration coating, neoprene rubber-modified asphalt emulsion, water-based, low-VOC.
 - a. Basis of design product: Tremco, TremLastic S.
 - b. Volatile Organic Compounds (VOC), maximum, ASTM D3960: 5 g/L.
- C. Aggregate Surfacing: Clean, washed crushed stone.
 - 1. Size: 1/4" - #10.

2.10 WALKWAYS

- A. Walkway Product:
 - 1. Walkway pads, ceramic-granule-surfaced reinforced asphaltic composition slip-resisting pads, manufactured as a traffic pad for foot traffic, 1/2 inch (13 mm) thick minimum.
 - a. Trem-Tred by Tremco or other approved by Owner.
 - b. Flexural Strength at max. load, minimum, ASTM C203: 210 psi (1.5 kPa).
 - c. Granule adhesion (weight loss), maximum, ASTM D4977: 1.1 gram.

- d. Impact Resistance at 77 deg. F (25 deg. C), ASTM D3746: No Damage to Roof.
- e. Pad Size: 36 by 48 inch (914 by 1220 mm).

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with the following requirements and other conditions affecting performance of roofing system:
 - 1. Verify that roof openings and penetrations are in place and curbs are set and braced and that roof drain bodies are securely clamped in place.
 - 2. Verify that, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation. wood cants
 - 3. Wood Roof Deck: Verify that wood deck is securely fastened with no projecting fasteners and with no adjacent units in excess of 1/16 inch (1.6 mm) out of plane relative to adjoining deck.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing manufacturer's written instructions. Remove sharp projections.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

3.3 INSTALLATION, GENERAL

- A. Install roofing system in accordance with manufacturer's recommendations.
- B. Install roofing membrane, base flashings, and component materials in compliance with requirements in FMG 4470 as part of a membrane roofing system as listed in FMG's "Approval Guide" for fire/windstorm classification indicated. Comply with recommendations in FMG Loss Prevention Data Sheet 1-49.
- C. Install block for back nailing plies for roof slopes greater than 2" in 12" spaced to manufacturers recommendations

3.4 SUBSTRATE BOARD INSTALLATION

- A. Install substrate boards with long joints in continuous straight lines, with end joints staggered minimum 24" from adjacent rows.
 - 1. At Steel decks, install substrate boards and right angles to flutes of deck.
 - a. Locate end joints over crests of steel deck.
 - 2. Abut board tightly together.
 - 3. Cut boards to fit tight at walls and curbs and t fit tight at intersection roof slopes.

4. Fasten boards at 16 fasteners per board in field of roof. Increase fastener rate to 24 fasteners per board at perimeters and to 32 fasteners per board at corners.

3.5 VAPOR-RETARDER INSTALLATION

- A. Provide 1 ply of G2 glass base sheet adhered in type VI hot asphalt to substrate board.
 1. Extend base sheet up walls 8".
 2. Extend base sheet up and over wood nailers.
- B. Provide one ply of type VI glass ply sheet adhered in type VI hot asphalt.
 1. Extend base sheet up walls 8".
 2. Extend base sheet up and over wood nailers.

3.6 INSULATION INSTALLATION

- A. Comply with built-up roofing manufacturer's written instructions for installing roof insulation.
- B. Adhere all layers of insulation to completed vapor barrier.
 1. Offset joints of insulation below a minimum of 12 inches (150 mm) in each direction.
 2. Firmly butt cover boards together just prior to setting in adhesive.
 3. Set insulation boards in full application of hot asphalt, firmly pressing and maintaining cover in place.
 - a. Weight down boards as necessary to ensure complete adhesion until adhesive cools.
- C. Install tapered insulation under area of roofing to conform to slopes indicated.
- D. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch (6 mm) with insulation.
 1. Cut and fit insulation within 1/4 inch (6 mm) of nailers, projections, and penetrations.
- E. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 inches (68 mm) or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 12 inches in each direction.
 1. Install insulation at minimum thickness of 1-1/2 inches.
 2. Install insulation at average overall thickness of minimum: sufficient to achieve R-20 thermal resistance.
- F. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.
- G. Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces.
- H. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 12 inches (150 mm) in

each direction. Loosely butt cover boards together. Tape joints if required by roofing manufacturer.

1. Set cover board in full application of hot asphalt, firmly pressing and maintaining cover in place.
 - a. Weight down boards as necessary to ensure complete adhesion until adhesive cools.
- I. Cant Strips: Adhere preformed 45-degree cant strips at junctures of built-up roofing with vertical surfaces or angle changes greater than 45 degrees.

3.7 HOT-APPLIED BUILT-UP ROOFING INSTALLATION, GENERAL

- A. Install roofing membrane according to roofing manufacturer's written instructions and applicable recommendations of ARMA/NRCA's "Quality Control Guidelines for the Application of Built-up Roofing" and as follows:
 1. Roof System
 - a. Number of Polyester Ply Sheets: Two (2)
 - 1) Adhering Method: Hot Applied.
 - b. Number of Fiberglass Ply Sheets: Two (2)
 - 1) Adhering Method: Hot Applied.
 - c. Surfacing Type: A (aggregate in Cold Adhesive).
 - B. Start installation of built-up roofing in presence of manufacturer's technical personnel.
 - C. Cooperate with testing agencies and personnel engaged or required to perform services for installing roofing.
 - D. Coordinate installation of roofing system so insulation and other components of the roofing membrane system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.
 1. Provide tie-offs at end of each day's work configured as recommended by NRCA Roofing Manual Appendix: Quality Control Guidelines - Insulation to protect new roofing.
 2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing.
 3. Remove temporary plugs from roof drains at end of each day.
 4. Remove and discard temporary seals before beginning work on adjoining roofing.
 - E. Substrate-Joint Penetrations: Prevent roofing asphalt and adhesives from penetrating substrate joints, entering building, or damaging built-up roofing components or adjacent building construction.
 - F. Hot Roofing Asphalt Heating: Heat asphalt to its equiviscous temperature, measured at the mop cart or mechanical spreader immediately before application. Circulate asphalt during heating.

Do not raise asphalt temperature above equiviscous temperature range more than one hour before time of application. Do not exceed asphalt manufacturer's recommended temperature limits during asphalt heating. Do not heat asphalt within 25 deg F of flash point. Discard asphalt maintained at a temperature exceeding finished blowing temperature for more than four hours.

1. Apply hot roofing asphalt within plus or minus 25 deg F of equiviscous temperature and adhere components to asphalt heated to not less than 425 deg F.

3.8 ROOFING MEMBRANE INSTALLATION

A. Install two plies of polyester base ply sheets starting at low point of roofing. Align ply sheets without stretching. Shingle side laps of ply sheets uniformly to achieve required number of plies throughout thickness of roofing membrane. Shingle in direction to shed water. Extend ply sheets over and terminate beyond cants.

1. Embed each ply sheet in in uniform mopping of hot asphalt applied at rate required by roofing manufacturer, to form a uniform membrane without ply sheets touching.
2. Broom lies into adhesive while at EVT to ensure complete saturation of ply sheet.
3. Back nail plies as recommended by roofing manufacturer.

B. Install two plies of fiberglass ply sheets starting at low point of roofing. Align ply sheets without stretching. Shingle side laps of ply sheets uniformly to achieve required number of plies throughout thickness of roofing membrane. Shingle in direction to shed water. Extend ply sheets over and terminate beyond cants.

1. Embed each ply sheet in in uniform mopping of hot asphalt applied at rate required by roofing manufacturer, to form a uniform membrane without ply sheets touching.
2. Broom lies into adhesive while at EVT to ensure complete saturation of ply sheet.
3. Back nail plies as recommended by roofing manufacturer.

3.9 FLASHING AND STRIPPING INSTALLATION

A. Install one ply of polyester backer sheet cant strips and other sloping and vertical surfaces, at roof edges, and at penetrations through roof, and secure to substrates according to built-up roofing manufacturer's written instructions and as follows

1. Embed each ply sheet in in uniform mopping of hot asphalt applied at rate required by roofing manufacturer, to form a uniform membrane without ply sheets touching.

B. Install base flashing over cant strips and other sloping and vertical surfaces, at roof edges, and at penetrations through roof, and secure to substrates according to built-up roofing manufacturer's written instructions and as follows:

1. Extend base flashing up walls or parapets a minimum of 12 inches (300 mm) above built-up roofing and 6 inches (150 mm) onto field of built-up roofing.
2. Prime substrates with asphalt primer if required by built-up roofing manufacturer.
3. Flashing Sheet Application: Adhere flashing sheet to substrate in cold-applied adhesive. Apply cold-applied flashing sheet adhesive to back of flashing sheet if recommended by

roofing manufacturer. Mechanically fasten top of base flashing securely at terminations and perimeter of roofing.

- C. Seal top termination of base flashing with a strip of glass-fiber fabric set in asphalt roofing cement.
- D. Install stripping, according to roofing manufacturer's written instructions, where metal flanges and edgings are set on built-up roofing.
 - 1. Flashing-Sheet Stripping: Install flashing-sheet stripping in a continuous coating of cold-applied flashing sheet adhesive, and extend onto roofing membrane.
- E. Roof Drains: Set 30-by-30-inch (760-by-760-mm) 4#, primed, lead sheet flashing in bed of asphalt roofing cement on completed built-up roofing. Cover primed lead flashing with one ply of roofing ply sheet set in cold adhesive. Extend a minimum of 6 inches (150 mm) beyond edge of lead flashing onto field of built-up roofing. Clamp built-up roofing, metal flashing, and stripping into roof-drain clamping ring.
 - 1. Install flashing sheet stripping according to roofing manufacturer's written instructions, to seal ply to roof.

3.10 SURFACING AND COATING INSTALLATION

- A. Reflective Aluminum Coating: Apply coating to base flashings according to manufacturer's written instructions, by spray, roller, or other suitable application method to provide a dry film thickness of not less than 20 mils (0.5 mm).
- B. Aggregate Surfacing: Promptly after installing plies, provide seal-coat or asphalt
 - 1. Flood roof surface with cold-applied surfacing adhesive appropriate to slope, applied at rate of 5 gal/ 100 sq ft. Cast the following average weight of aggregate into wet adhesive in a uniform course:
 - 2. Aggregate Weight: 250 lb./100 sq. ft. (20 kg/sq. m).

3.11 WALKWAY INSTALLATION

- A. Walkway Pads: Install walkway pads using units of size indicated or, if not indicated, of manufacturer's standard size according to walkway pad manufacturer's written instructions.
 - 1. Sweep away loose aggregate surfacing.
 - 2. Set walkway pads in 5 spots of mastic to adhere to roof surface.
- B. Set walk pads at all HVAC access Doors, Ladder Landing and roof access doors and hatches.
- C. Install walk path as shown on project drawings.

3.12 FIELD QUALITY CONTROL

- A. Roofing Inspector: Contractor shall engage a qualified roofing inspector for a minimum of full-time days on site to perform roof tests and inspections and to prepare start up, interim, and final reports. Roofing Inspector's quality assurance inspections shall comply with criteria established in ARMA/NRCA's "Quality Control Guidelines for the Application of Built-up Roofing."

- B. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation at commencement and upon completion.
 - 1. Notify Architect and Owner 48 hours in advance of date and time of inspection.
- C. Repair or remove and replace components of built-up roofing where test results or inspections indicate that they do not comply with specified requirements.
 - 1. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.13 PROTECTING AND CLEANING

- A. Protect built-up roofing from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.
- B. Correct deficiencies in or remove built-up roofing that does not comply with requirements, repair substrates, and repair or reinstall roofing to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

3.14 ROOFING INSTALLER'S WARRANTY

- A. WHEREAS _____ of _____, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:
 - 1. Owner:
 - 2. Address:
 - 3. Building Name/Type:
 - 4. Address:
 - 5. Area of Work:
 - 6. Acceptance Date:
 - 7. Warranty Period:
 - 8. Expiration Date:
- B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,
- C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.
- D. This Warranty is made subject to the following terms and conditions:
 - 1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:

- a. lightning;
 - b. peak gust wind speed exceeding 74 mph (120 k/hr);
 - c. fire;
 - d. failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
 - e. faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
 - f. vapor condensation on bottom of roofing; and
 - g. activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.
2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
 3. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.
 4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.
 5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.
 6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.
 7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

E. IN WITNESS THEREOF, this instrument has been duly executed by:

1. Authorized Signature:
2. Name:
3. Date:

END OF SECTION

SECTION 08 41 13 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Exterior, thermally-improved storefront framing.
 - 2. Interior, non-thermally-improved storefront framing.
 - 3. Window wall framing.
 - 4. Operable vents.
 - 5. Sunshades.
 - 6. Manual-swing entrance doors.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For aluminum-framed entrances and storefronts. Include plans, elevations, sections, full-size details, and attachments to other work.
 - 1. Show connection to and continuity with adjacent thermal, weather, air, and vapor barriers.
 - 2. Include point-to-point wiring diagrams.
- C. Samples: For each type of exposed finish required.
- D. Entrance Door Hardware Schedule: Prepared by or under supervision of supplier, detailing fabrication and assembly of entrance door hardware, as well as procedures and diagrams.
- E. Delegated-Design Submittal: For aluminum-framed entrances and storefronts indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- F. Product test reports.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance data.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.7 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of aluminum-framed entrances and storefronts that do not comply with requirements or that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Five (5) years from date of Substantial Completion.
- B. Special Finish Warranty: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Warranty Period: Twenty (20) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 40 00 "Quality Requirements," to design aluminum-framed entrances and storefronts.
- B. General Performance: Comply with performance requirements specified, as determined by testing of aluminum-framed entrances and storefronts representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.
 - 1. Aluminum-framed entrances and storefronts shall withstand movements of supporting structure, including, but not limited to, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
 - 2. Failure also includes the following:
 - a. Thermal stresses transferring to building structure.
 - b. Glass breakage.
 - c. Noise or vibration created by wind and thermal and structural movements.
 - d. Loosening or weakening of fasteners, attachments, and other components.
 - e. Failure of operating units.
- C. Structural Loads:
 - 1. Wind Loads: As indicated on Drawings.
 - 2. Other Design Loads: As indicated on Drawings.
- D. Deflection of Framing Members: At design wind pressure, as follows:
 - 1. Deflection Normal to Wall Plane: Limited to 1/175 of clear span for spans of up to 13 feet 6 inches (4.1 m) and to 1/240 of clear span plus 1/4 inch (6.35 mm) for spans greater than 13 feet 6 inches (4.1 m) or an amount that restricts edge deflection of individual glazing lites to 3/4 inch (19.1 mm), whichever is less.
 - 2. Deflection Parallel to Glazing Plane: Limited to amount not exceeding that which reduces glazing bite to less than 75 percent of design dimension and that which reduces edge clearance between framing members and glazing or other fixed components to less than 1/8 inch (3.2 mm).
 - a. Operable Units: Provide a minimum 1/16-inch (1.6-mm) clearance between framing members and operable units.

3. Cantilever Deflection: Where framing members overhang an anchor point, as follows:
 - a. Perpendicular to Plane of Wall: No greater than 1/240 of clear span plus 1/4 inch (6.35 mm) for spans greater than 11 feet 8-1/4 inches (3.6 m) or 1/175 times span, for spans of less than 11 feet 8-1/4 inches (3.6 m).
- E. Structural: Test according to ASTM E 330/E 330M as follows:
 1. When tested at positive and negative wind-load design pressures, storefront assemblies, including entrance doors, do not evidence deflection exceeding specified limits.
 2. When tested at 150 percent of positive and negative wind-load design pressures, storefront assemblies, including entrance doors and anchorage, do not evidence material failures, structural distress, or permanent deformation of main framing members exceeding 0.2 percent of span.
 3. Test Durations: As required by design wind velocity, but not less than 10 seconds.
- F. Air Infiltration: Test according to ASTM E 283 for infiltration as follows:
 1. Fixed Framing and Glass Area:
 - a. Maximum air leakage of 0.06 cfm/sq. ft. (0.30 L/s per sq. m) at a static-air-pressure differential of 6.24 lbf/sq. ft. (300 Pa).
 2. Entrance Doors:
 - a. Single Doors: Maximum air leakage of 0.5 cfm/sq. ft. (2.54 L/s per sq. m) at a static-air-pressure differential of 1.57 lbf/sq. ft. (75 Pa).
- G. Water Penetration under Static Pressure: Test according to ASTM E 331 as follows:
 1. No evidence of water penetration through fixed glazing and framing areas, including entrance doors, when tested according to a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft. (300 Pa).
- H. Energy Performance: Certify and label energy performance according to NFRC as follows:
 1. Thermal Transmittance (U-factor): Fixed glazing and framing areas as a system shall have U-factor of not more than 0.45 Btu/sq. ft. x h x deg F (2.55 W/sq. m x K) as determined according to NFRC 100.
 2. Solar Heat Gain Coefficient (SHGC): Fixed glazing and framing areas as a system shall have SHGC of no greater than 0.35 as determined according to NFRC 200.
 3. Condensation Resistance Factor (CRF): Fixed glazing and framing areas as a system shall have an NFRC-certified condensation resistance rating of no less than 55 as determined according to NFRC 500.
- I. Windborne-Debris Impact Resistance: Pass missile-impact and cyclic-pressure tests according to ASTM E 1996 for Wind Zone3.
 1. Large-Missile Test: For glazed openings located within 30 feet (9.1 m) of grade.
 2. Small-Missile Test: For glazed openings located more than 30 feet (9.1 m) above grade.
- J. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes.
 1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.2 STOREFRONT SYSTEMS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Arcadia, Inc; www.arcadiainc.com.
 2. EFCO Corporation; www.efco.com.
 3. Kawneer North America; an Alcoa company; www.kawneer.com.
 4. Oldcastle Building Envelope; www.obe.com.
 5. U.S. Aluminum; a brand of C.R. Laurence; www.crlaurence.com.
- B. Framing Members: Manufacturer's extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.
1. Basis-of-Design Framing System: ~~System 960, 1 3/4 inch Thermal Clip Storefront System by EFCO; www.efcocorp.com~~ Trifab 451/451T Framing System by Kawneer; www.kawneer.com.
 2. Exterior Framing Construction: Thermally-broken.
 3. Glazing System: Retained mechanically, dry-glazed with pre-set gaskets on four sides.
 4. Finish: Clear anodic finish or color anodic finish as selected by Architect.
 5. Fabrication Method: Field-fabricated stick system.
 6. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
 7. Steel Reinforcement: As required by manufacturer to meet structural performance requirements.
- C. Venting Window: Casement style window, without screens, and with limiting opening hardware.
- D. Sunshades: Manufacturer's standard horizontal sunshade supported from window wall framing.
- E. Backer Plates: Manufacturer's standard, continuous backer plates for framing members, if not integral, where framing abuts adjacent construction.
- F. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.

2.3 ENTRANCE DOOR SYSTEMS

- A. Entrance Doors: Manufacturer's standard glazed entrance doors for manual-swing or automatic operation.
1. Door Construction: 2- to 2-1/4-inch (50.8- to 57.2-mm) overall thickness, with minimum 0.125-inch- (3.2-mm-) thick, extruded-aluminum tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deeply penetrated, and fillet welded or that incorporate concealed tie rods.
 - a. Thermal Construction: High-performance plastic connectors separate aluminum members exposed to the exterior from members exposed to the interior.
 2. Door Design: Wide stile; 5-inch (127-mm) nominal width.
 3. Glazing Stops and Gaskets: Square, snap-on, extruded-aluminum stops and preformed gaskets.
 - a. Provide nonremovable glazing stops on outside of door.

2.4 ENTRANCE DOOR HARDWARE

- A. Entrance Door Hardware: Hardware not specified in this Section is specified in Section 08 71 00 "Door Hardware."
- B. General: Provide entrance door hardware and entrance door hardware sets indicated in door and frame schedule for each entrance door, to comply with requirements in this Section.
 - 1. Entrance Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and named manufacturers' products.
 - 2. Sequence of Operation: Provide electrified door hardware function, sequence of operation, and interface with other building control systems indicated.
 - 3. Opening-Force Requirements:
 - a. Egress Doors: Not more than 15 lbf (67 N) to release the latch and not more than 30 lbf (133 N) to set the door in motion and not more than 15 lbf (67 N) to open the door to its minimum required width.
- C. Designations: Requirements for design, grade, function, finish, quantity, size, and other distinctive qualities of each type of entrance door hardware are indicated in "Entrance Door Hardware Sets" Article. Products are identified by using entrance door hardware designations as follows:
 - 1. Named Manufacturers' Products: Manufacturer and product designation are listed for each door hardware type required for the purpose of establishing minimum requirements. Manufacturers' names are abbreviated in "Entrance Door Hardware Sets" Article.
 - 2. References to BHMA Standards: Provide products complying with these standards and requirements for description, quality, and function.
- D. Cylinders: As specified in Section 08 71 00 "Door Hardware."
- E. Continuous-Gear Hinges: BHMA A156.26.
- F. Operating Trim: BHMA A156.6.
- G. Concealed Overhead Holders and Stops: BHMA A156.8, Grade 1.
- H. Weather Stripping: Manufacturer's standard replaceable components.
 - 1. Compression Type: Made of ASTM D 2000 molded neoprene or ASTM D 2287 molded PVC.
- I. Weather Sweeps: Manufacturer's standard exterior-door bottom sweep with concealed fasteners on mounting strip.
- J. Thresholds: BHMA A156.21 raised thresholds beveled with a slope of not more than 1:2, with maximum height of 1/2 inch (12.7 mm).

2.5 GLAZING

- A. Glazing: Comply with Section 08 80 00 "Glazing."
- B. Glazing Gaskets: Manufacturer's standard sealed-corner pressure-glazing system of black, resilient elastomeric glazing gaskets, setting blocks, and shims or spacers.
- C. Glazing Sealants: As recommended by manufacturer.

2.6 MATERIALS

- A. Sheet and Plate: ASTM B 209 (ASTM B 209M).
- B. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221 (ASTM B 221M).
- C. Extruded Structural Pipe and Tubes: ASTM B 429/B 429M.

- D. Structural Profiles: ASTM B 308/B 308M.
- E. Steel Reinforcement:
 - 1. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.
 - 2. Cold-Rolled Sheet and Strip: ASTM A 1008/A 1008M.
 - 3. Hot-Rolled Sheet and Strip: ASTM A 1011/A 1011M.
 - 4. Primer: Manufacturer's standard zinc-rich, corrosion-resistant primer complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM and prepare surfaces according to applicable SSPC standard.

2.7 FABRICATION

- A. Form or extrude aluminum shapes before finishing.
- B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
- C. Fabricate components that, when assembled, have the following characteristics:
 - 1. Profiles that are sharp, straight, and free of defects or deformations.
 - 2. Accurately fitted joints with ends coped or mitered.
 - 3. Physical and thermal isolation of glazing from framing members.
 - 4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
 - 5. Provisions for field replacement of glazing from interior.
 - 6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- D. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.
- E. Entrance Door Frames: Reinforce as required to support loads imposed by door operation and for installing entrance door hardware.
- F. Entrance Doors: Reinforce doors as required for installing entrance door hardware.
- G. Entrance Door Hardware Installation: Factory install entrance door hardware to the greatest extent possible. Cut, drill, and tap for factory-installed entrance door hardware before applying finishes.
- H. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.8 ALUMINUM FINISHES

- A. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General:
 - 1. Comply with manufacturer's written instructions.
 - 2. Do not install damaged components.

3. Fit joints to produce hairline joints free of burrs and distortion.
 4. Rigidly secure nonmovement joints.
 5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
 6. Seal perimeter and other joints watertight unless otherwise indicated.
- B. Metal Protection:
1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with materials recommended by manufacturer for this purpose or by installing nonconductive spacers.
 2. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.
- C. Set continuous sill members and flashing in full sealant bed, as specified in Section 07 92 00 "Joint Sealants," to produce weathertight installation.
- D. Install components plumb and true in alignment with established lines and grades.
- E. Install operable units level and plumb, securely anchored, and without distortion. Adjust weather-stripping contact and hardware movement to produce proper operation.
- F. Install glazing as specified in Section 08 80 00 "Glazing."
- G. Entrance Doors: Install doors to produce smooth operation and tight fit at contact points.
1. Exterior Doors: Install to produce weathertight enclosure and tight fit at weather stripping.
 2. Field-Installed Entrance Door Hardware: Install surface-mounted entrance door hardware according to entrance door hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.
- 3.2 FIELD QUALITY CONTROL
- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Field Quality-Control Testing: Perform the following test on mockup.
1. Water-Spray Test: Before installation of interior finishes has begun, areas designated by Architect shall be tested according to AAMA 501.2 and shall not evidence water penetration.
 - a. Perform a minimum of three tests in areas as directed by Architect.
 2. Air Infiltration: ASTM E 783 at 1.5 times the rate specified for laboratory testing in "Performance Requirements" Article but not more than 0.09 cfm/sq. ft. (0.45 L/s per sq. m) at a static-air-pressure differential of 1.57 lbf/sq. ft. (75 Pa).
 - a. Perform a minimum of three tests in areas as directed by Architect.
 3. Water Penetration: ASTM E 1105 at a minimum uniform and cyclic static-air-pressure differential of 0.67 times the static-air-pressure differential specified for laboratory testing in "Performance Requirements" Article, but not less than 6.24 lbf/sq. ft. (300 Pa) and shall not evidence water penetration.
- C. Aluminum-framed entrances and storefronts will be considered defective if they do not pass tests and inspections.
- D. Prepare test and inspection reports.

END OF SECTION 08 41 13

SECTION 12 32 16 - MANUFACTURED PLASTIC-LAMINATE-CLAD CASEWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes plastic-laminate-clad cabinets.
- B. Related Requirements:
 - 1. Section 06 10 53 "Miscellaneous Rough Carpentry" for wood blocking for anchoring casework.
 - 2. Section 09 22 16 "Non-Structural Metal Framing" for reinforcements in metal-framed partitions for anchoring casework.
 - 3. Section 09 65 13 "Resilient Base and Accessories" for resilient base applied to plastic-laminate-clad casework.
 - 4. Section 12 36 23.13 "Plastic-Laminate-Clad Countertops."

1.3 DEFINITIONS

- A. WI – Woodwork Institute; <http://woodworkinstitute.com>; 916-372-9943.
- B. NAAWS - Definitions in the "North American Architectural Woodwork Standards" (NAAWS), latest edition, apply to the Work of this Section. 3.1 or latest edition, jointly published by the the Woodwork Institute (WI) and the Architectural Woodwork Manufacturers Association of Canada (AWMAC)
 - 1. For free downloads in PDF format, www.naaws-committee.com.
- C. CCP – Certified Compliance Program. <https://woodworkinstitute.com/services/certified-compliance-program/>.

1.4 COORDINATION

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that casework can be supported and installed as indicated.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For plastic-laminate-clad casework.
 - 1. Comply with requirements for Submittals Section 1 NAAWS.
 - 2. Include plans, elevations, sections, and attachments to other work including blocking and reinforcements required for installation.
 - 3. Indicate types and sizes of casework.
 - 4. Indicate manufacturer's catalog numbers for casework.
 - 5. Show fabrication details, including types and locations of hardware.

6. Indicate locations of and clearances from adjacent walls, doors, windows, other building components, and equipment.
 - C. Keying Schedule: Include schematic keying diagram, and index each key set to unique designations that are coordinated with the Contract Documents.
 - D. Samples: For casework and hardware finishes.
 - E. Samples for Initial Selection: For casework and hardware finishes.
- 1.6 INFORMATIONAL SUBMITTALS
- A. Qualification Data: For Installer.
 - B. Sample Warranty: For special warranty.
- 1.7 QUALIFICATIONS
- A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.
 1. Woodwork manufacturers and installers do not need to be members of WI nor an Accredited Millwork Company (AMC) for their work product to be inspected and certified in compliance with the NAAWS. It is the achievement of compliance with the standards *on each project* and not prior membership that is of paramount necessity.
 2. The woodwork manufacturer must have at least one project in the past 5 years where the value of the woodwork was within 20 percent of the cost of woodwork for this project.
 - B. Installer Qualifications: An authorized representative who is trained and approved by manufacturer. Firm (woodwork manufacturer) with no less than 5 years of production experience similar to a specific project, whose qualifications indicate the ability to comply with the requirements of this Section.
 - C. Single source responsibility: A single manufacturer shall provide and install the work of described in this Section.
- 1.8 QUALITY ASSURANCE
- A. Before delivery to the job site, provide a Woodwork Institute Certified Compliance Certificate indicating the countertops being supplied and certifying that they fully meet the requirements of the grade or grades specified.
 - B. Provide a Woodwork Institute Certified Compliance Label on each plastic laminate countertop, each solid-surface countertop, and each wood countertop.
 - C. At completion of installation, provide a Woodwork Institute Certified Compliance Certificate indicating the products installed and certifying that the installation of these products fully meets the requirements of the grade or grades specified.
- 1.9 ALL FEES CHARGED BY THE WOODWORK INSTITUTE FOR ITS CERTIFIED COMPLIANCE PROGRAM ARE THE RESPONSIBILITY OF THE MILLWORK MANUFACTURER AND/OR INSTALLER AND SHALL BE INCLUDED IN THEIR BID AS A LINE ITEM IN THE SCOPE OF WORK TO BE LATER BILLED TO THE PROJECT OWNER.DELIVERY, STORAGE, AND HANDLING
- A. Comply with requirements of the NAAWS Section 2 Care and Storage.

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

1.10 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install casework until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature and relative humidity at levels planned for building occupants during remainder of construction period. Maintain temperature and relative humidity during remainder of construction period in range recommended for Project location by the "*North American Architectural Woodwork Standards.*"
- B. Established Dimensions: Where casework is indicated to fit to other construction, establish dimensions for areas where casework is to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.
- C. Field Measurements: Where casework is indicated to fit to existing construction, verify dimensions of existing construction by field measurements before fabrication and indicate measurements on Shop Drawings. Provide fillers and scribes to allow for trimming and fitting.
- D. Locate concealed framing, blocking, and reinforcements that support casework by field measurements before enclosing them, and indicate measurements on Shop Drawings.

1.11 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of casework that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Delamination of components or other failures of glue bond.
 - b. Warping of components.
 - c. Failure of operating hardware.
 - 2. Warranty Period: Five (5) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Artek Group; www.artek-group.com.
 - 2. JS Parrott & Company; www.jsperrrott.com.
 - 3. Legends Custom Woodworking; www.legendcustomwoodworking.com.
 - 4. Uncommon Cabinetry; www.uncommoncabinetry.com.
 - 5. Fremont Millwork; www.fremontmillwork.com.
 - 6. Cascade Cabinets and Countertops; 541-727-7877.
 - 7. US Custom Millwork (Market Contractors); www.uscmw.com.
 - 8. Advanced Custom Cabinets, 208-772-2377.
- B. Source Limitations: Obtain plastic-laminate-clad casework from single source from single manufacturer.

2.2 CASEWORK, GENERAL

- A. Quality Standard: Unless otherwise indicated, comply with the "North American Architectural Woodwork Standards" Section 10 Casework for grades of casework indicated for construction, finishes, installation, and other requirements.
 - 1. Grade: Custom.
 - 2. Provide inspections of casework fabrication and installation together with labels and certificates from WI's certification program indicating that casework complies with requirements of grades specified.
- B. Product Designations: Drawings indicate sizes, configurations, and finish materials of manufactured plastic-laminate-clad casework by referencing designated manufacturer's catalog numbers. Other manufacturers' casework of similar sizes and door and drawer configurations, of same finish materials, and complying with the Specifications may be considered. See Section 01 60 00 "Product Requirements."
- C. Product Designations: Drawings indicate configurations of manufactured plastic-laminate-clad casework by referencing designations of Casework Design Series numbering system in Appendix A of the "North American Architectural Woodwork Standards."

2.3 PLASTIC-LAMINATED-FACED CABINETS

- A. Design:
 - 1. Flush overlay.
- B. Exposed Materials:
 - 1. Plastic-Laminate Grade: HGS.
 - 2. Edgebanding: PVC
 - 3. Plastic Laminate: Grade VGS unless otherwise indicated. Provide plastic laminate for semiexposed surfaces unless otherwise indicated.
 - a. Provide plastic laminate of same grade as exposed surfaces for interior faces of cabinets and wall cabinets that have no doors or drawers and other locations where opposite side of component is exposed.
- C. Semi-exposed Materials:
 - 1. Thermoset Decorative Panels: Provide thermoset decorative panels for semi-exposed surfaces unless otherwise indicated.
 - 2. Hardboard: Use only for cabinet backs where exterior side of back is not exposed.
 - 3. Unless otherwise indicated, provide specified edge-banding on all semiexposed edges.
- D. Concealed Materials:
 - 1. Solid Wood: With no defects affecting strength or utility.
 - 2. Plywood: Hardwood plywood.
 - 3. Plastic Laminate: Grade BKL.
 - 4. Particleboard.
 - 5. MDF.
 - 6. Hardboard.

2.4 MATERIALS

- A. Maximum Moisture Content for Lumber: 7 percent for hardwood and 12 percent for softwood.
- B. Hardwood Plywood: HPVA HP-1, particleboard core except where veneer core is indicated.
- C. Softwood Plywood: DOC PS 1.
- D. Particleboard: ANSI A208.1, Grade M-2.
- E. MDF: Medium-density fiberboard, ANSI A208.2,.
- F. Hardboard: ANSI A135.4, Class 1 tempered.
- G. Plastic Laminate: High-pressure decorative laminate complying with NEMA LD 3.
- H. PVC Edgebanding for Plastic Laminate: Rigid PVC extrusions, through color with satin finish, 0.12 inch (3 mm) thick at doors and drawer fronts, 0.04 inch (1 mm) thick elsewhere.
- I. Thermoset Decorative Panels: Particleboard or MDF finished with thermally fused, melamine-impregnated decorative paper.
 - 1. Edgebanding for Thermoset Decorative Panels: PVC or polyester edgebanding matching thermoset decorative panels.

2.5 DESIGN, COLOR, AND FINISH

- A. Thermoset Decorative Panel Colors, Patterns, and Finishes: As selected by Architect from casework manufacturer's full range.
- B. Plastic-Laminate Colors, Patterns, and Finishes: As indicated by manufacturer's designations.
 - 1. Manufacturer: Wilsonart, LLC.; www.wilsonart.com.
 - a. PL-1: Color no. 4878-38 "Pewter Mesh."
 - b. PL-3: Color no. 4879-38 "Steel Mesh."
 - c. PL-4: Color no. 4991-38 "Pressed Linen."
 - d. PL-7: Color no. 4880-38 "Carbon Mesh."
 - 2. Manufacturer: Nevamar, div. of Panolam Industries International, Inc.; www.panolam.com.
 - a. PL-2: Color no. VA7002 "Cool Chic."
 - 1) Finish: ARP (T-).
 - b. PL-10: Color no. S6054 "Wrought Iron."
 - 1) Finish: ARP (T-).
 - 3. Manufacturer: Pionite, div. of Panolam Industries International, Inc.; www.panolam.com.
 - a. PL-5: Color no. WF181 "Ice Fishin."
 - 1) Finish: Textured/Suede (SD).
 - b. PL-8: Color no. AG601 "Pearl of the Orient."
 - 1) Finish: Textured/Suede (SD).
 - 4. Manufacturer: Formica.
 - a. PL-6: Color no. M3091 "Crystal White Magnetic Markerboard."
 - 1) Finish: Gloss (90).
 - b. PL-9: As selected by Architect to match School Color.

1) Finish: AbsoluteMatte (AN).

c. PL-9A: Color no. M4702 "Non-Decor Magnetic Board."

1) Finish: Naturel (00).

C. PVC Edgebanding Color: To match Laminate.

2.6 FABRICATION

A. Plastic-Laminate-Clad Cabinet Construction: As required by NAAWS, Section 10 Casework, but not less than the following:

1. Bottoms and Ends of Cabinets, and Tops of Wall Cabinets and Tall Cabinets: 3/4-inch (19-mm) particleboard or MDF core melamine panels.
2. Shelves: 3/4-inch- (19-mm-) thick particleboard for 30" length or less. Follow the NAAWS guidelines for required material composition and allowable length for 50 lbs/sf capacity institutional requirements.
3. Backs of Casework: 1/2-inch- (13-mm-) thick particleboard or MDF where exposed, 1/4-inch- (6.4-mm-) thick hardboard dadoed into sides, bottoms, and tops where not exposed.
4. Drawer Fronts: 3/4-inch (19-mm) particleboard or MDF panels.
5. Drawer Sides and Backs: 1/2-inch- (13-mm-) thick solid-wood or veneer-core hardwood plywood, with glued dovetail or multiple-dowel joints.
6. Drawer Bottoms: 1/4-inch- (6.4-mm-) thick hardwood veneer core plywood glued and dadoed into front, back, and sides of drawers. Use 1/2-inch (13-mm) material for drawers more than 24 inches (600 mm) wide.
7. Doors: 3/4 inch (19 mm) thick, with particleboard or MDF cores.

B. Filler Strips: Provide as needed to close spaces between casework and walls, ceilings, and equipment. Fabricate from same material and with same finish as casework.

2.7 CASEWORK HARDWARE AND ACCESSORIES

A. Hardware, General: Unless otherwise indicated, provide manufacturer's standard satin-finish, commercial-quality, heavy-duty hardware.

1. Use threaded metal or plastic inserts with machine screws for fastening to particleboard except where hardware is through-bolted from back side.

B. Frameless Concealed Hinges (European Type): BHMA A156.9, Type B01602, self-closing. Provide two hinges for doors less than 40 inches (1220 mm) high, and provide three hinges for doors more than 40 inches (1220 mm) high.

1. Degrees of Opening: 135 degrees.

C. Wire Pulls: Solid chrome-plated brass wire pulls, fastened from back with two screws.

1. Provide two pulls for drawers more than 24 inches (600 mm) wide.

D. Door Catches: Zinc-plated, nylon-roller spring catch. Provide two catches on doors more than 48 inches (1220 mm) high.

E. Drawer Slides: BHMA A156.9, Type B05091.

1. Heavy Duty (Grade 1HD-100 and Grade 1HD-200): Side mounted; full-extension type; zinc-plated, steel ball-bearing slides.

- F. Drawer and Hinged-Door Locks: Mortise type, five-pin tumbler, brass with chrome-plated finish, and complying with BHMA A156.11, Grade 1.
 - 1. Provide a minimum of two keys per lock and six master keys.
 - 2. Provide locks where indicated on casework elevations.
- G. Sliding-Door Hardware Sets: Manufacturer's standard, to suit type and size of sliding-door unit.
- H. Adjustable Shelf Supports: Single-pin metal shelf rests complying with BHMA A156.9, Type B04013.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances, location of framing and reinforcement in-wall blocking, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 CASEWORK INSTALLATION

- A. Grade: Install casework to comply with same quality standard grade as item to be installed.
- B. Install casework level, plumb, and true in line; shim as required using concealed shims. Where casework abuts other finished work, apply filler strips and scribe for accurate fit, with fasteners concealed where practical.
- C. Installation anchors to meet requirements for Seismic installation.
 - 1. Use correct anchors for cabinet installation: #14 x 3" with surface bearing heads.
 - 2. Flush mount screws with Fastcaps are not allowed.
 - 3. For open cabinets (exposed interiors), use flat fastener (with surface bearing head) by Fast Cap including Fast Cap covers matching exposed surfaces.
- D. Base Cabinets: Set cabinets straight, level, and plumb. Adjust subtops within 1/16 inch (1.5 mm) of a single plane. Align similar adjoining doors and drawers to a tolerance of 1/16 inch (1.5 mm). Bolt adjacent cabinets together with joints flush, tight, and uniform.
- E. Wall Cabinets: Hang cabinets straight, level, and plumb. Adjust fronts and bottoms within 1/16 inch (1.5 mm) of a single plane. Fasten cabinets to hanging strips, masonry, framing, wood blocking, or reinforcements in walls and partitions. Align similar adjoining doors to a tolerance of 1/16 inch (1.5 mm).
- F. Fasten casework to adjacent units and to masonry, framing, wood blocking, or reinforcements in walls and partitions to comply with the "North American Architectural Woodwork Standards."
- G. Install hardware uniformly and precisely. Set hinges snug and flat in mortises unless otherwise indicated. Adjust and align hardware so moving parts operate freely and contact points meet accurately. Allow for final adjustment after installation.
- H. Adjust operating hardware so doors and drawers operate smoothly without warp or bind. Lubricate operating hardware as recommended by manufacturer.

3.3 CLEANING

- A. Repair or remove and replace defective work as directed on completion of installation.
- B. Clean finished surfaces, touch up as required, and remove or refinish damaged or soiled areas to match original factory finish, as approved by Architect.

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HILLSBORO SCHOOL DISTRICT
HILLSBORO, OREGON

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ADDENDUM 03

END OF SECTION 12 32 16

SECTION 12 36 23.13 - PLASTIC-LAMINATE-CLAD COUNTERTOPS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes plastic-laminate-clad countertops.

1.3 DEFINITIONS

- A. WI – Woodwork Institute; <http://woodworkinstitute.com>; 916-372-9943.
- B. NAAWS - Definitions in the "North American Architectural Woodwork Standards" (NAAWS), latest edition, apply to the Work of this Section. 3.1 or latest edition, jointly published by the the Woodwork Institute (WI) and the Architectural Woodwork Manufacturers Association of Canada (AWMAC)
 - 1. For free downloads in PDF format, www.naaws-committee.com.
- C. CCP – Certified Compliance Program. <https://woodworkinstitute.com/services/certified-compliance-program/>.

1.4 SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For plastic-laminate-clad countertops.
 - 1. Include plans, sections, details, and attachments to other work. Detail fabrication and installation, including field joints.
 - 2. Show locations and sizes of cutouts and holes for items installed in plastic-laminate-clad countertops.
 - 3. Apply WI Certified Compliance Program (CCP) label to Shop Drawings.
- C. Samples: Plastic laminates in each type, color, pattern, and surface finish required in manufacturer's standard size.
- D. Samples for Initial Selection: For plastic laminates.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For fabricator.
- B. Quality Standard Compliance Certificates:

1.6 QUALIFICATIONS

- A. Fabricator Qualifications: Shop that employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.
 - 1. Woodwork manufacturers and installers do not need to be members of WI nor an Accredited Millwork Company (AMC) for their work product to be inspected and certified in

compliance with the NAAWS. It is the achievement of compliance with the standards *on each project* and not prior membership that is of paramount necessity.

2. The woodwork manufacturer must have at least one project in the past 5 years where the value of the woodwork was within 20 percent of the cost of woodwork for this project.
- B. Installer Qualifications: An authorized representative who is trained and approved by manufacturer. Firm (woodwork manufacturer) with no less than 5 years of production experience similar to a specific project, whose qualifications indicate the ability to comply with the requirements of this Section.
- C. Single source responsibility: A single manufacturer shall provide and install the work of described in this Section.

1.7 QUALITY ASSURANCE

- A. Before delivery to the job site, provide a Woodwork Institute Certified Compliance Certificate indicating the countertops being supplied and certifying that they fully meet the requirements of the grade or grades specified.
- B. Provide a Woodwork Institute Certified Compliance Label on each plastic laminate countertop, each solid-surface countertop, and each wood countertop.
- C. At completion of installation, provide a Woodwork Institute Certified Compliance Certificate indicating the products installed and certifying that the installation of these products fully meets the requirements of the grade or grades specified.
- D. All fees charged by the Woodwork Institute for its Certified Compliance Program (CCP) are the responsibility of the millwork manufacturer and/or installer and shall be included in their bid as a line item in the Scope of Work to be later billed to the project owner.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of the NAAWS Section 2 Care and Storage.
- B. Deliver countertops only after casework and supports on which they will be installed have been completed in installation areas.
- C. Store countertops in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.
- D. Keep surfaces of countertops covered with protective covering during handling and installation.

1.9 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install countertops until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature and relative humidity at levels planned for building occupants during the remainder of the construction period.
- B. Environmental Limitations: Do not deliver or install countertops until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg F (16 and 32 deg C) and relative humidity between 25 and 55 percent during the remainder of the construction period.
- C. Field Measurements: Where countertops are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- D. Established Dimensions: Where countertops are indicated to fit to other construction, establish dimensions for areas where countertops are to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

PART 2 - PRODUCTS

2.1 PLASTIC-LAMINATE-CLAD COUNTERTOPS

- A. Quality Standard: Unless otherwise indicated, comply with the "North American Architectural Woodwork Standards" (NAAWS) for grades of plastic-laminate-clad countertops indicated for construction, finishes, installation, and other requirements.
 - 1. The Contract Documents contain requirements that are more stringent than the referenced quality standard. Comply with requirements of Contract Documents in addition to those of the referenced quality standard.
- B. Grade: Premium.
- C. High-Pressure Decorative Laminate: NEMA LD 3, Grade HGS.
- D. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:
 - 1. Refer to Section 12 32 16 "Manufactured Plastic-Laminate-Clad Casework" for finishes.
- A. Edge Treatment: 3-mm (0.12 inch) PVC edging to match laminate.
 - 1. At outside corner of countertops provide 3/4-inch radius edges.
- B. Core Material: ANSI A208.1 Particleboard or ANSI A208.2 MDF.
- C. Core Material at Sinks: Moisture Resistant (MR) Particleboard or MDF made with water resistant binders or non-telegraphing exterior-grade plywood.
- D. Core Thickness: 3/4-inch (19 mm).
 - 1. Build up countertop thickness to 1-1/2 inches (38 mm) at front, back, and ends with additional layers of core material laminated to top.
- E. Backer Sheet: Provide plastic-laminate backer sheet, NEMA LD 3, Grade BKL, on underside of countertop substrate and backsplashes.

2.2 WOOD MATERIALS

- A. Wood Products: Provide materials that comply with requirements of referenced quality standard unless otherwise indicated.
 - 1. Wood Moisture Content: 5 to 10 percent.
- B. Composite Wood and Agrifiber Products: Provide materials that comply with requirements of referenced quality standard for each type of countertop and quality grade specified unless otherwise indicated.
 - 1. Softwood Plywood: DOC PS 1.

2.3 ACCESSORIES

- A. Wire-Management Grommets: Circular, molded-plastic grommets and matching plastic caps with slot for wire passage, color of grommets to match adjacent surfaces.
- B. Cantilever Bracket Support: Large basic work surface support, provide the following:
 - 1. Basis-of-Design Product: Model No. SWS4 by Doug Mockett and Company, Inc.; www.mockett.com.
 - 2. Color: To be selected by the Architect from manufacturer's full range of colors.

2.4 MISCELLANEOUS MATERIALS

- A. Adhesive for Bonding Plastic Laminate: Unpigmented contact cement.
 - 1. Adhesive for Bonding Edges: Hot-melt adhesive or adhesive specified above for faces.

2.5 FABRICATION

- A. Fabricate in compliance with NAAWS Section 11 Countertops.
- B. Sand fire-retardant-treated wood lightly to remove raised grain on exposed surfaces before fabrication.
- C. Fabricate countertops to dimensions, profiles, and details indicated. Provide front and end overhang of 1 inch (25 mm) over base cabinets. Ease edges to radius indicated for the following:
 - 1. Solid-Wood (Lumber) Members: 1/16 inch (1.5 mm) unless otherwise indicated.
- D. Complete fabrication, including assembly of Type 2 Deck-mounted back splashes with scribe, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
 - 1. Notify Architect seven days in advance of the dates and times countertop fabrication will be complete.
 - 2. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended, and check measurements of assemblies against field measurements before disassembling for shipment.
- E. Shop cut openings to maximum extent possible to receive appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.
 - 1. Seal edges of cutouts by saturating with color tinted varnish.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Before installation, condition countertops to average prevailing humidity conditions in installation areas.
- B. Before installing countertops, examine shop-fabricated work for completion and complete work as required, including removal of packing.

3.2 INSTALLATION

- A. Grade: Install countertops to comply with same grade as item to be installed unless otherwise noted.
- B. Assemble countertops and complete fabrication at Project site to the extent that it was not completed in the shop.
 - 1. Provide cutouts for appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.
 - 2. Seal edges of cutouts by saturating with color tinted varnish.

- C. 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 so Project-site processing of top and edge surfaces is not required. Locate field joints where shown on Shop Drawings.
 - 1. Secure field joints in countertops with concealed clamping devices located within 6 inches (150 mm) of front and back edges and at intervals not exceeding 24 inches (600 mm). Use Type 1 water resistant PVA glue when clamping joints. Tighten according to manufacturer's written instructions to exert a constant, heavy-clamping pressure at joints.
- D. Scribe and cut countertops to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
- E. Countertop Installation: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.
 - 1. Install countertops level and true in line. Use concealed shims as required to maintain not more than a 1/8-inch-in-96-inches (3-mm-in-2400-mm) variation from a straight, level plane.
 - 2. Secure backsplashes to countertops for Type 2 Deck-mounted application. (Type 1 Wall Mount not accepted in Canada only, not US.)
 - 3. Seal joints between countertop and backsplash, if any, and joints where countertop and backsplash abut walls with mildew-resistant silicone sealant or another permanently elastic sealing compound recommended by countertop material manufacturer.

3.3 ADJUSTING AND CLEANING

- A. Repair damaged and defective countertops, where possible, to eliminate functional and visual defects. Where not possible to repair, replace countertops. Adjust joinery for uniform appearance.
- B. Clean countertops on exposed surfaces.
- C. Protection: Provide Kraft paper or other suitable covering over countertop surfaces, taped to underside of countertop at a minimum of 48 inches (1220 mm) on center. Remove protection at Substantial Completion.

END OF SECTION 12 36 23.13

SECTION 12 36 61.16 - SOLID SURFACING COUNTERTOPS AND SILLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Solid surface material countertops.
 - 2. Solid surface window sills.

1.3 DEFINITIONS

- A. WI – Woodwork Institute; <http://woodworkinstitute.com>; 916-372-9943.
- B. NAAWS - Definitions in the "North American Architectural Woodwork Standards" (NAAWS), latest edition, apply to the Work of this Section. 3.1 or latest edition, jointly published by the the Woodwork Institute (WI) and the Architectural Woodwork Manufacturers Association of Canada (AWMAC)
 - 1. For free downloads in PDF format, www.naaws-committee.com.
- C. CCP – Certified Compliance Program. <https://woodworkinstitute.com/services/certified-compliance-program/>.

1.4 SUBMITTALS

- A. Comply with the NAAWS Section 1 Submittals.
- B. Product Data: For countertop materials.
- C. Shop Drawings: For countertops. Show materials, finishes, profiles, methods of joining, and cutouts for plumbing fixtures.
 - 1. Show locations and details of joints.
 - 2. Show direction of directional pattern, if any.
- D. Samples for Verification: For the following products:
 - 1. Countertop material, 6 inches ((150 mm)) square.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For fabricator.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For solid surface material countertops to include in maintenance manuals. Include Product Data for care products used or recommended by Installer and names, addresses, and telephone numbers of local sources for products.

1.7 QUALITY ASSURANCE

- A. Before delivery to the job site, provide a Woodwork Institute Certified Compliance Certificate indicating the countertops being supplied and certifying that they fully meet the requirements of the grade or grades specified.
- B. Provide a Woodwork Institute Certified Compliance Label on each countertop, each solid-surface countertop.
- C. At completion of installation, provide a Woodwork Institute Certified Compliance Certificate indicating the products installed and certifying that the installation of these products fully meets the requirements of the grade or grades specified.
- D. All fees charged by the Woodwork Institute for its Certified Compliance Program (CCP) are the responsibility of the millwork manufacturer and/or installer and shall be included in their bid as a line item in the Scope of Work to be later billed to the project owner.

1.8 QUALIFICATIONS

- A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate countertops similar to that required for this Project, and whose products have a record of successful in-service performance.
 - 1. Woodwork manufacturers and installers do not need to be members of WI nor an Accredited Millwork Company (AMC) for their work product to be inspected and certified in compliance with the *NAAWS*. It is the achievement of compliance with the standards *on each project* and not prior membership that is of paramount necessity.
 - 2. The woodwork manufacturer must have at least one project in the past 5 years where the value of the woodwork was within 20 percent of the cost of woodwork for this project.
- B. Installer Qualifications: Fabricator of countertops.
 - 1. Installer Qualifications: An authorized representative who is trained and approved by manufacturer. Firm (woodwork manufacturer) with no less than 5 years of production experience similar to a specific project, whose qualifications indicate the ability to comply with the requirements of this Section.
- C. Single source responsibility: A single manufacturer shall provide and install the work of described in this Section.
- D.

1.9 FIELD CONDITIONS

- A. Field Measurements: Verify dimensions of countertops by field measurements after base cabinets are installed but before countertop fabrication is complete.

1.10 COORDINATION

- A. Coordinate locations of utilities that will penetrate countertops.

PART 2 - PRODUCTS

2.1 SOLID SURFACE COUNTERTOP AND WINDOW SILL MATERIALS

- A. Solid Surface Material: Homogeneous-filled plastic resin complying with ICPA SS-1.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Wilsonart LLC; www.wilsonart.com.

2. Colors and Patterns: As indicated by manufacturer's designations.
 - a. SS-1: Model No. 9203CE "Dusk Ice".
 - 1) Location: Countertops as noted and sills in Rooms 102, 103, 104, 105, 106, and 107.
 - b. SS-2: Model No. 9208CS "White Stone".
 - 1) Location: Countertops.
 - c. SS-3: Model No. 9115GS "Zen Gray".
 - 1) Location: Top caps as noted and sill in all other areas.

2.2 COUNTERTOP FABRICATION

- A. Fabricate countertops according to solid surface material manufacturer's written instructions and to the "North American Architectural Woodwork Standards." (NAAWS).
 1. Grade: Custom.
- B. Configuration:
 1. Front: Straight, slightly eased at top.
 2. Backsplash: Straight, slightly eased at corner.
 3. End Splash: Matching backsplash.
- C. Countertops: 1/2-inch- ((12.7-mm-)) thick, solid surface material.
- D. Backsplashes: 1/2-inch- ((12.7-mm-)) thick, solid surface material.
- E. Fabricate tops with shop-applied edges unless otherwise indicated. Comply with solid surface material manufacturer's written instructions for adhesives, sealers, fabrication, and finishing.
 1. Fabricate with loose backsplashes for field assembly.
- F. Joints: Fabricate countertops without joints.
- G. Joints: Fabricate countertops in sections for joining in field.
 1. Joint Locations: Not within 18 inches (450 mm) of a sink and not where a countertop section less than 36 inches (900 mm) long would result, unless unavoidable.
 2. Splined Joints: Accurately cut kerfs in edges at joints for insertion of metal splines to maintain alignment of surfaces at joints. Make width of cuts slightly more than thickness of splines to provide snug fit. Provide at least three splines in each joint.
- H. Cutouts and Holes:
 1. Outlets at Backsplashes:
 - a. Prepare countertops in shop for field cutting openings for electrical outlets in backsplashes. Make cutouts to accurately fit items to be installed an at right angles to finished surfaces.

2.3 COUNTERTOP HARDWARE

- A. Floating Countertop Support: Provide Braxton Bragg Floating Countertop Support L-Brace or as indicated on plans.

2.4 WINDOW SILL FABRICATION

- A. Solid surface material sills.

1. Configuration: Provide sills with the following front style:
 - a. Front: Straight, slightly eased at top.
2. Sills: 1/2-inch- (12.7-mm-) thick, solid surface material.
3. Fabrication: Fabricate tops in one piece with shop-applied edges unless otherwise indicated. Comply with solid-surface-material manufacturer's written instructions for adhesives, sealers, fabrication, and finishing.

2.5 INSTALLATION MATERIALS

- A. Adhesive: Product recommended by solid surface material manufacturer.
- B. Sealant for Countertops and Window Sills: Comply with applicable requirements in Section 07 92 00 "Joint Sealants."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates to receive solid surface material countertops and conditions under which countertops will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of countertops.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install countertops level to a tolerance of 1/8 inch in 8 feet (3 mm in 2.4 m), 1/4 inch (6 mm) maximum. Do not exceed 1/64-inch (0.4-mm) difference between planes of adjacent units.
- B. Carefully dress joints smooth, remove surface scratches, and clean entire surface.
- C. Fasten subtops to cabinets by screwing through subtops into cornerblocks of base cabinets. Shim as needed to align subtops in a level plane.
- D. Secure countertops to subtops with adhesive according to solid surface material manufacturer's written instructions. Align adjacent surfaces and, using adhesive in color to match countertop, form seams to comply with manufacturer's written instructions. Carefully dress joints smooth, remove surface scratches, and clean entire surface.
- E. Bond joints with adhesive and draw tight as countertops are set. Mask areas of countertops adjacent to joints to prevent adhesive smears.
 1. Clamp units to temporary bracing, supports, or each other to ensure that countertops are properly aligned and joints are of specified width.
- F. Install backsplashes and end splashes by adhering to wall and countertops with adhesive. Mask areas of countertops and splashes adjacent to joints to prevent adhesive smears.
- G. Install sills level to a tolerance of 1/8 inch in 8 feet (3 mm in 2.4 m).
 1. Adhere solid surface sills to substrates with adhesive as approved by manufacturer.
- H. Complete cutouts not finished in shop. Mask areas of countertops adjacent to cutouts to prevent damage while cutting. Make cutouts to accurately fit items to be installed, and at right angles to finished surfaces unless beveling is required for clearance. Ease edges slightly to prevent snipping.
 1. Seal edges of cutouts in particleboard subtops by saturating with varnish.
- I. Apply sealant to gaps at walls; comply with Section 07 92 00 "Joint Sealants."

ELEMENTARY SCHOOL NO. 28
HILLSBORO SCHOOL DISTRICT
HILLSBORO, OREGON

DLR GROUP PROJECT NO. 74-18104-00

ADDENDUM 03

END OF SECTION 12 36 61.16

SECTION 12 36 61.19 - QUARTZ AGGLOMERATE COUNTERTOPS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Quartz agglomerate countertops.

1.3 DEFINITIONS

- A. WI – Woodwork Institute; <http://woodworkinstitute.com>; 916-372-9943.
- B. NAAWS - Definitions in the "North American Architectural Woodwork Standards" (NAAWS), latest edition, apply to the Work of this Section. 3.1 or latest edition, jointly published by the the Woodwork Institute (WI) and the Architectural Woodwork Manufacturers Association of Canada (AWMAC)
 - 1. For free downloads in PDF format, www.naaws-committee.com.
- C. CCP – Certified Compliance Program. <https://woodworkinstitute.com/services/certified-compliance-program/>.

1.4 SUBMITTALS

- A. Product Data: For countertop materials.
- B. Shop Drawings: For countertops. Show materials, finishes, edge and backsplash profiles, methods of joining, and cutouts for plumbing fixtures.
 - 1. Show locations and details of joints.
 - 2. Show direction of directional pattern, if any.
- C. Samples for Initial Selection: For each type of material exposed to view.
- D. Samples for Verification: For the following products:
 - 1. Countertop material, 6 inches (150 mm) square.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For fabricator.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For quartz agglomerate countertops to include in maintenance manuals. Include Product Data for care products used or recommended by Installer and names, addresses, and telephone numbers of local sources for products.

1.7

1.8 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate countertops similar to that required for this Project, and whose products have a record of successful in-service performance.
 - 1. Woodwork manufacturers and installers do not need to be members of WI nor an Accredited Millwork Company (AMC) for their work product to be inspected and certified in compliance with the NAAWS. It is the achievement of compliance with the standards *on each project* and not prior membership that is of paramount necessity.
 - 2. The woodwork manufacturer must have at least one project in the past 5 years where the value of the woodwork was within 20 percent of the cost of woodwork for this project.
- B. Installer Qualifications: Fabricator of countertops.
 - 1. An authorized representative who is trained and approved by manufacturer. Firm (woodwork manufacturer) with no less than 5 years of production experience similar to a specific project, whose qualifications indicate the ability to comply with the requirements of this Section.
- C. Single source responsibility: A single manufacturer shall provide and install the work of described in this Section.
 - 1.

1.9 FIELD CONDITIONS

- A. Field Measurements: Verify dimensions of countertops by field measurements after base cabinets are installed but before countertop fabrication is complete.

1.10 COORDINATION

- A. Coordinate locations of utilities that will penetrate countertops or backsplashes.

PART 2 - PRODUCTS

2.1 QUARTZ AGGLOMERATE COUNTERTOP MATERIALS, QS-1

- A. Quartz Agglomerate: Solid sheets consisting of quartz aggregates bound together with a matrix of filled plastic resin and complying with ICPA SS-1, except for composition.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Quartz Countertops by Wilsonart LLC.; www.wilsonart.com.
 - 2. Colors and Patterns: As indicated by manufacturer's designations.
 - a. Color: Model No. Q1009 "Grey Lake".
- B. Particleboard: ANSI A208.1, Grade M-2.

2.2 COUNTERTOP FABRICATION

- A. Fabricate countertops according to quartz agglomerate manufacturer's written instructions and Section 11 Countertops in the "North American Architectural Woodwork Standards." (NAAWS)
 - 1. Grade: Premium.
- B. Configuration:

1. Front: Straight, slightly eased at top.
- C. Countertops: 1/2-inch- (12.7-mm-) thick, quartz agglomerate with front edge built up with same material.
- D. Fabricate tops with shop-applied edges unless otherwise indicated. Comply with quartz agglomerate manufacturer's written instructions for adhesives, sealers, fabrication, and finishing.
- E. Joints: Fabricate countertops in sections for joining in field.
 1. Joint Locations: Not where a countertop section less than 36 inches (900 mm) long would result, unless unavoidable.
 2. Joint Type: Bonded, 1/32 inch (0.8 mm) or less in width.

2.3 INSTALLATION MATERIALS

- A. Adhesive: Product recommended by quartz agglomerate manufacturer.
 1. Adhesives shall have a VOC content of 70 g/L or less.
- B. Sealant for Countertops: Comply with applicable requirements in Section 07 92 00 "Joint Sealants."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates to receive quartz agglomerate countertops and conditions under which countertops will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of countertops.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install in compliance with NAAWS) Section 11 Countertops: Install countertops level to a tolerance of 1/8 inch in 8 feet (3 mm in 2.4 m), maximum. Do not exceed 1/64-inch (0.4-mm) difference between planes of adjacent units.
- B. Fasten subtops to cabinets by screwing through subtops into cornerblocks of base cabinets. Shim as needed to align subtops in a level plane.
- C. Secure countertops to subtops with adhesive according to quartz agglomerate manufacturer's written instructions. Align adjacent surfaces and, using adhesive in color to match countertop, form seams to comply with quartz agglomerate manufacturer's written instructions. Carefully dress joints smooth, remove surface scratches, and clean entire surface.
- D. Bond joints with adhesive and draw tight as countertops are set. Mask areas of countertops adjacent to joints to prevent adhesive smears.
 1. Clamp units to temporary bracing, supports, or each other to ensure that countertops are properly aligned, and joints are of specified width.
- E. Apply sealant to gaps at walls; comply with Section 07 92 00 "Joint Sealants."

END OF SECTION 12 36 61.19