SECTION 074213.23

ALUMINUM COMPOSITE MATERIAL (ACM) SYSTEM SPECIFICATION

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PART 1 – GENERAL

1.01 RELATED DOCUMENTS

1. Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this section.

1.02 SUMMARY

1. Definitions:
	1. An Aluminum Composite Material (ACM) Panel System includes ACM panels, joints, attachment system components and miscellaneous materials as appropriate for the design of the project to provide a weather-resistant exterior veneer system.

Note that Laminators Inc. Field-Fabricated ACM Panel Systems consist of the 1-Piece, Tight-Fit Molding Panel System and the Clip & Caulk Panel System.

* 1. A “Field-Fabricated” ACM Panel System is designed with components that permit the complete fabrication and installation of the system, in a single process in the field, without compromise to the overall quality and performance.
1. Section Includes:
	1. Exterior installation and performance of ACM panels and ACM Panel System components.
2. Related Sections:

Delete any of the following divisions that do not apply.

* 1. Division 03 – Concrete: Cast-In-Place Concrete
	2. Division 04 – Masonry: Unit Masonry
	3. Division 05 – Metals: Cold-Formed Metal Framing
	4. Division 05 – Metals: Structural Aluminum Framing
	5. Division 06 – Wood, Plastics, and Composites: Sheathing
	6. Division 07 – Thermal and Moisture Protection: Weather Barriers
	7. Division 07 – Thermal and Moisture Protection: Fluid-Applied Membrane Air Barriers
	8. Division 07 – Thermal and Moisture Protection: Sheet Metal Flashing and Trim
	9. Division 07 – Thermal and Moisture Protection: Joint Sealants
	10. Division 08 – Openings: Aluminum Windows
	11. Division 08 – Openings: Glazing
	12. Division 08 – Openings: Glazed Aluminum Curtain Walls

1.03 REFERENCES

1. General: Standards listed by reference, including revisions by issuing authority, form a part of this specification section to the extent indicated. Standards listed have either been identified by the International Building Code (IBC) or local building code or are specific requirements for this building construction type.
2. Aluminum Association (AA):
3. Aluminum Design Manual (ADM)
4. AA-M12C23A31: Anodized – Clear Coating

AA – Aluminum Association Designation

M12 – Mechanical finish (M) / As Fabricated (1) / Nonspecular as fabricated (2)

C23 – Chemical finish (C) / Etched (2) / Coarse matte (3)

A31 – Anodic Coatings (A) / Architectural Class II 0.4 to 0.7 mil (3) / Clear (1)

1. AA-M12C23A34: Anodized – Color Coating

AA – Aluminum Association Designation

M12 – Mechanical finish (M) / As Fabricated (1) / Nonspecular as fabricated (2)

C23 – Chemical finish (C) / Etched (2) / Coarse matte (3)

A34 – Anodic Coatings (A) / Architectural Class II 0.4 to 0.7 mil (3) / Electrolytically deposited color (4)

1. American Architectural Manufacturers Association (AAMA):
2. AAMA 501.1 Standard Test Method for Water Penetration of Windows, Curtain Walls and Doors Using Dynamic Pressure

Retain AAMA 501.2 reference if jobsite mock-ups are required.

1. AAMA 501.2 Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls and Sloped Glazing Systems
2. AAMA 609 & 610 Cleaning and Maintenance Guide for Architecturally Finished Aluminum
3. AAMA 2605 Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels
4. American Society of Civil Engineers (ASCE):
5. ASCE/SEI 7 Minimum Design Loads for Buildings and Other Structures
6. ASTM International:
7. ASTM A653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
8. ASTM B209 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
9. ASTM B221 Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
10. ASTM C645 Standard Specification for Nonstructural Steel Framing Members
11. ASTM C920 Standard Specification for Elastomeric Joint Sealants
12. ASTM C1193 Standard Guide for Use of Joint Sealants

Retain ASTM D635 reference for IBC 2012 & 2015 applications with ACM installations up to 75 feet in height. Delete for IBC 2009 applications.

1. ASTM D635 Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position

Retain ASTM D1781 reference for Bonded ACM (ASTM C297 applies to Injection Molded ACM).

1. ASTM D1781 Standard Test Method for Climbing Drum Peel for Adhesives

Retain ASTM D1929 reference for IBC 2009 applications with ACM installations up to 50 feet in height and for IBC 2012 & 2015 applications with ACM installations up to 50 & 75 feet in height.

1. ASTM D1929 Standard Test Method for Determining Ignition Temperature of Plastics
2. ASTM D2244 Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates
3. ASTM D4214 Standard Test Methods for Evaluating the Degree of Chalking of Exterior Paint Films
4. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials
5. ASTM E283 Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
6. ASTM E330 Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls By Uniform Static Air Pressure Difference
7. ASTM E331 Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls By Uniform Static Air Pressure Difference
8. National Fire Protection Association (NFPA):
9. NFPA 285 Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components

1.04 SYSTEM DESCRIPTION

1. Performance Requirements:
2. Provide installed ACM Panel System designed to withstand project-specific design loads while maintaining System Requirements; Deflection and Thermal Movement; and Fire Performance without defects, damage, or failure as defined by the Manufacturer and required by this section.
3. System Requirements:
4. ASTM E283 Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen – Air flow measurement across the ACM Panel System (excluding jamb conditions) shall not be more than 0.06 cfm per sf of wall area when tested to a pressure difference of 6.24 psf.
5. ASTM E330 Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls By Uniform Static Air Pressure Difference – ACM Panel System must be engineered to meet the project-specific design loads for strength and serviceability requirements. In addition, the ACM Panel System must meet or exceed the Deflection and Thermal Movement criteria when tested to a minimum pressure of 40.0 psf.
6. ASTM E331 Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls By Uniform Static Air Pressure Difference – Water penetration across the ACM Panel System shall not occur when tested to a pressure difference of 12.0 psf.
7. AAMA 501.1 Standard Test Method for Water Penetration of Windows, Curtain Walls and Doors Using Dynamic Pressure – Water penetration across the ACM Panel System shall not occur when tested to a pressure difference of 15.0 psf.
8. Deflection and Thermal Movement: Provide installed ACM Panel System that has been designed to resist project-specific wind loads, acting both inward and outward:
9. Perimeter Framing Deflection: Deflection of the ACM panel perimeter framing member shall not exceed L/175 normal to plane of the wall, where L is the unsupported span of the perimeter framing member between fastener locations.
10. ACM Panel Deflection: Deflection of the ACM panel face shall not exceed L/60 normal to plane of the wall, where L is the unsupported span of the ACM panel between load transfer locations.
11. At 150% pressure, no permanent deformation exceeding L/1000 or failure to structural members is permitted.
12. Thermal Movements: Allow for free and noiseless horizontal and vertical thermal movement due to expansion and contraction of component parts over a temperature range of -20°F to +180°F at the material surface.
	1. Buckling, opening of joints, undue stress on fasteners, failure of sealants, or any other detrimental effects of thermal movement are not permitted.
	2. Field-fabrication and installation procedures shall consider the ambient temperature range at the time of the respective operation.
13. Fire Performance: Wall assemblies containing ACM Panel System shall meet the requirements of NFPA 285 using the Intermediate-Scale Multi-Story Test Apparatus (ISMA), where required by code based on the design of this project.

1.05 SUBMITTALS

1. General: Provide submittals in accordance with Conditions of the Contract and Division 01 Submittal Procedures Section as follows:
2. Product Data: Submit material descriptions, dimensions of individual components and profiles, and finishes for each type of ACM Panel System.
3. ACM Panel System:
4. Submit system-specific design details including, but not limited to, ACM panel, molding, clip, adhesive, fastener, and sealant components.
5. Submit design data including, but not limited to, material properties, section properties, and capacities for each ACM Panel System component. Design data shall be supported by a qualified Design Professional licensed in the state of primary research and development, design, and manufacturing of the ACM Panel System.
6. Submit system-specific installation guide information.
7. Submit Shop Drawings indicating, but not limited to, elevations and reflected ceiling plans with joint locations and ACM panel sizes; sections with thicknesses and dimensions of components; edge conditions; interfaces with dissimilar materials; corners and transitions; flashings, trims, venting, fasteners, sealants, caulks, and adhesives; accessories; and/or colors.
8. Samples:
9. Selected Samples: Submit ACM Manufacturer’s color charts or chips illustrating full range of colors, finishes, patterns, and textures available for ACM panels with factory-applied finishes. Custom color selection requires color sample to be submitted for approval. Approval signature(s) are required by [**Owner**] [**Architect**].
10. Verification Samples:
11. ACM Panel System assembly: Submit 12 inches x 12 inches, or size as required, demonstrating system assembly. Samples to be provided in thickness specified, including ACM panel, molding, clip, adhesive, fastener, and sealant components. Sample need not be provided in the specified color.
12. Submit two samples of each color or finish selected that measure approximately 3 inches x 4 inches, minimum.
13. Custom color samples may contain drawdown lines. Sizes for custom color samples may vary.
14. Quality Assurance Submittals:
15. ACM Material Certification: Submit an official written statement from the Manufacturer documenting that product raw materials meet specified standards. Certification shall be backed by test reports and/or material certificates.
16. ACM Product Certification: Submit an official written statement from the Manufacturer documenting that product complies with specified Performance Requirements indicated in this specification. Certification shall be backed by test reports.
17. ACM Panel System Certification: Submit an official written statement from the Manufacturer documenting that the ACM Panel System complies with specified Performance Requirements indicated in this specification. Certification shall be backed by test reports.
18. Closeout Submittals:
19. Warranty: Submit Manufacturer and Installer warranty documents as specified within the Warranty section of this specification.
20. Maintenance: Submit Manufacturer’s recommendations document for Cleaning and Maintenance of the ACM Panel System.

1.06 QUALITY ASSURANCE

1. Qualifications:
2. Manufacturer Qualifications: Company with a minimum of 20 years of continuous experience manufacturing ACM panels in the United States of America of the type specified:
3. Able to provide specified warranty on finish.
4. Able to provide a list of other projects of similar size including approximate date of installation for each.
5. Installer Qualifications:
6. The Installer shall have:
	1. Been in business of a similar trade and under the present company name for at least five (5) years prior to the start of this project, and
	2. Experience with similar-sized ACM Panel System projects, and
	3. Installed at least three (3) successful projects of the specified ACM Panel System within the last five (5) years
		1. Acceptable, varying combinations of successful projects and/or years of experience shall be determined at the discretion of the Manufacturer.
7. The Installer must be capable of providing field service representation during installation.
8. Regulatory Code Agencies Requirements: Provide ACM Panel System that has been evaluated and is in compliance with the following, where required:
9. International Code Council (ICC)
10. Miami/Dade County Florida (Notice of Acceptance)
11. State of Florida (Florida Product Approval)

Retain the following section if jobsite mock-ups are required.

1. Mock-Ups: Install a mock-up at the project jobsite using acceptable products and Manufacturer-approved details. Obtain [**Owner’s**] [**Architect’s**] acceptance of finish color (drawdown samples to be used for color approval of nonstandard coil coated colors), texture and pattern, and workmanship standard. Comply with Division 01 Quality Control, Mock-Up Requirements Section.
2. Mock-Up Size: Provide as detailed in the construction documents if a stand-alone Mock-Up is required.
3. Maintenance: Maintain mock-up during construction for workmanship comparison; remove and legally dispose of mock-up when no longer required.
4. Incorporation: Mock-up may be incorporated into final construction upon Owner’s approval.
5. Additional Cost: Material required for custom color mock-ups may require special small quantity runs that increase cost and require additional time to obtain material.
6. Pre-installation Meeting: Conduct pre-installation meeting to verify project requirements, substrate conditions, and Manufacturer’s installation details.

1.07 PROJECT CONDITIONS

1. Substrate Tolerances: The General Contractor is responsible for providing an acceptable substrate per Manufacturer’s requirements including:
2. Adjacent substrate faces out-of-plane offset: +/- 1/8 inch, and
3. Level, plumb, and location control lines as indicated: 1/4 inch in any 20 feet, and
4. Any building elevation direction deviation: +/- 1/2 inch
5. Field Measurements: Verify locations of wall framing members and wall opening dimensions by field measurements prior to the field-fabrication of the ACM Panel System. Field measurements to be taken once all substrate materials and adjacent materials are installed.

1.08 WARRANTY

1. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.
2. ACM Panel Manufacturer’s Material Warranty: Submit, to the Owner, the Manufacturer’s standard warranty.
3. Warranty Period:
4. Material and Product Integrity: Five (5) years against delamination at any manufactured bond line
5. PVDF Painted Finish: Twenty (20) years against:

Note that ASTM D4214 replaced ASTM D659.

* 1. Chalking in excess of a numerical rating of eight (8) when measured in accordance with ASTM D4214
	2. Fading or change color in excess of eight (8) E units (NBS) when calculated in accordance with ASTM D2244, paragraph 6.3
	3. Cracking, chipping, splitting, blistering, or peeling. Minute fracturing (i.e. crazing or cracking) as a result of routing and bending of the ACM panels shall be excluded.
1. Polyester Painted Finish: Ten (10) years against:

Note that ASTM D4214 replaced ASTM D659.

* 1. Chalking in excess of a numerical rating of eight (8) when measured in accordance with ASTM D4214
	2. Fading or change color in excess of eight (8) E units (NBS) when calculated in accordance with ASTM D2244, paragraph 6.3
	3. Cracking, chipping, splitting, blistering, or peeling. Minute fracturing (i.e. crazing or cracking) as a result of routing and bending of the ACM panels shall be excluded.
1. Anodized Finish: Five (5) years against cracking, chipping, splitting, blistering, or peeling. Minute fracturing (i.e. crazing or cracking) as a result of routing and bending of the ACM panels shall be excluded.
2. Installation Warranty: Installer shall submit to the Owner a standard warranty document executed by an authorized company official. The warranty shall be in addition to, and not a limitation of, other rights Owner may have under the Contract Documents.
3. Warranty Period:
4. Workmanship: **[One (1) year]** **[Other]** warranty period commencing on Date of Substantial Completion.

PART 2 – PRODUCTS

2.01 ACM PANEL MANUFACTURERS AND FIELD-FABRICATED ACM PANEL SYSTEM SUPPLIERS

1. ACM Panel Manufacturers:
2. Omega-Lite ACM panels manufactured by Laminators Inc. – [www.laminatorsinc.com](http://www.laminatorsinc.com)

Contact a local Laminators Inc. Architectural Sales Representative for assistance with additional listings.

1. [**Other ACM panel manufacturer who meets the requirements of this specification**]
2. [**Other ACM panel manufacturer who meets the requirements of this specification**]
3. Field-Fabricated ACM Panel System Suppliers:
4. Laminators Inc. – [www.laminatorsinc.com](http://www.laminatorsinc.com)

Contact a local Laminators Inc. Architectural Sales Representative for assistance with additional listings.

1. [**Other Field-Fabricated ACM Panel System supplier who meets the requirements of this specification**]
2. [**Other Field-Fabricated ACM Panel System supplier who meets the requirements of this specification**]

2.02 ALUMINUM COMPOSITE MATERIAL (ACM)

1. ACM System Type:
2. ACM Panel Description
3. Construction:
4. Two sheets of aluminum bonded to a core of extruded thermoplastic manufactured in a laminated batch (i.e. discontinuous) process using adhesive(s) between dissimilar materials. The core material shall not contain foam plastic insulation.
5. Thickness: 0.236 inch (6 mm)
6. Sheets:
7. Face Thickness: 0.020 inch nominal or thicker
8. Backer Thickness: 0.0125 inch nominal or thicker
9. Combined Minimum Thickness: 0.0325 inch nominal (Face + Backer)
10. Product:
11. On Types I, II, III, and IV Construction to any height above grade in accordance with the provisions of IBC Section 1407.10.
12. On Type V Construction to any height above grade in accordance with the provisions of IBC Section 1407.12.
13. Fire Performance:
14. ACM panels tested in accordance with ASTM E84: Class A Material
	1. ACM panels shall have a Flame Spread Index (FSI) of not more than 25 as intended for use.
	2. ACM panels shall have a Smoke Developed Index (SDI) of not more than 450 as intended for use.
15. Bond Integrity:
16. ACM panels tested in accordance with ASTM D1781:
17. ACM panels shall have a Climbing Drum Peel Strength of at least 22.5 in-lb/in as intended for use.
18. Chemically-bonded to the core material in a laminated batch process

2.03 FINISH

1. Exterior Finish: Finish shall meet the performance criteria of AAMA 2605.

Choose one – If multiple finishes are needed, be sure to properly label each color and the locations on all applicable drawings.

Referred to as Laminators “PVDF/Kynar 500”, “Polyester”, “Designer Series”, and “Natural Series”.

1. Standard and Standard Metallic Finishes:
2. Selected from a Manufacturer’s standard color chart

Referred to as Laminators “PVDF/Kynar 500”, “Polyester”, “Designer Series”, and “Natural Series”.

1. Custom Finish:
2. Selected by the [**Owner**] [**Architect**] and coordinated with Manufacturer

Referred to as Laminators “PVDF/Kynar 500”, “Polyester”, “Designer Series”, and “Natural Series”.

1. Standard Specialty Finish:
2. Selected from a Manufacturer’s standard color chart
3. Exterior Finish: Finish shall meet the performance criteria of the AA.

Referred to as Laminators “Natural Series”.

1. Anodized:

Choose one – If multiple coatings are needed, be sure to properly label each color and the locations on all applicable drawings.

1. Clear Coating: AA-M12C23A31 Architectural Class

AA – Aluminum Association Designation

M12 – Mechanical finish (M) / As Fabricated (1) / Nonspecular as fabricated (2)

C23 – Chemical finish (C) / Etched (2) / Coarse matte (3)

A31 – Anodic Coatings (A) / Architectural Class II 0.4 to 0.7 mil (3) / Clear (1)

1. Color Coating: AA-M12C23A34 Architectural Class

AA – Aluminum Association Designation

M12 – Mechanical finish (M) / As Fabricated (1) / Nonspecular as fabricated (2)

C23 – Chemical finish (C) / Etched (2) / Coarse matte (3)

A34 – Anodic Coatings (A) / Architectural Class II 0.4 to 0.7 mil (3) / Electrolytically deposited color (4)

2.04 SYSTEM COMPONENTS

1. General: Provide Manufacturer’s standard ACM Panel System-specific components, including, but not limited to, mountings, adhesives, connections, and fasteners for specific applications indicated on contract documents.

2.05 RELATED MATERIALS

1. General: Refer to Related Sections specified herein for other materials, including concrete, masonry, framing, sheathing, barriers, flashing and trim, sealants, windows, glazing, and/or curtain walls.

PART 3 – EXECUTION

3.01 INSTALLER INSTRUCTIONS

1. Compliance: Comply with Manufacturer’s product data, including, but not limited to, installation guides, design details, product technical bulletins, supplemental technical instructions, and any other product packaging instructions.

3.02 PREPARATION

1. Site Verification of Conditions: Verify that conditions of substrate previously installed under other sections are acceptable for the ACM Panel System installation. Documentation should be provided indicating any conditions detrimental to the performance of the ACM Panel System.

3.03 FIELD-FABRICATED INSTALLATION

“1PTF” denotes the 1-Piece, Tight-Fit Molding Panel System and “C&C” denotes the Clip & Caulk Panel System.

1. Field measurements of site conditions shall be coordinated with approved Shop Drawings prior to beginning installation of the ACM Panel System for locations of intermediate adhesive supports, joints, and edge locations.
2. Field-coordinate placement of [**moldings**] (Retain for 1PTF) [**joints**] (Retain for C&C) relative to substrate prior to field-fabrication of ACM panels.
3. Field-fabricate ACM panels to sizes and joint configurations indicated on approved Shop Drawings.
4. Fabricate ACM panels with sharply cut edges and no displacement of face or backer sheets or protrusion of core. Form ACM panel angles, breaks, corners, lines, and returns to be sharp, true, and free of buckle and/or warp.
5. Fabrication Tolerances:
6. Width: +/- 1/16- inch
7. Length: +/- 1/16 inch
8. Squareness: +/- 1/16 inch
9. ACM Panel Installation:
10. Install the ACM Panel System plumb, level, and true in compliance with Manufacturer’s recommendations and approved Shop Drawings.
11. Comply with the Manufacturer’s instructions for installation of concealed fasteners; provisions of Section 079200; and manufacturer’s recommendations for installation of joint sealants.
12. Installation Tolerances:
13. Adjacent vertical or horizontal [**molding**] (Retain for 1PTF) [**ACM panel**] (Retain for C&C) out-of-plane offset: +/- 1/16 inch
14. [**ACM panel edge shall not be exposed short of the finished face of molding.**] (Retain for 1PTF) [**Vertical or horizontal joint width: +/- 1/16 inch**] (Retain for C&C)
15. Adjacent vertical or horizontal [**molding**] (Retain for 1PTF) [**ACM panel**] (Retain for C&C) edge alignment: +/- 1/16 inch
16. Adjacent vertical or horizontal joint deviation: +/- 1/16 inch
17. Maximum vertical or horizontal joint deviation: 1/4 inch in any 20 feet
18. Do not cut, trim, weld, or braze ACM Panel System-specific components during installation in a manner which would damage the finish, decrease strength, or result in visual imperfection or a failure in performance.
19. Separate contact of dissimilar metals with approved methods as defined by the Manufacturer in order to eliminate the possibility of corrosive or electrolytic action between metals.
20. Related Products Installation Requirements: Refer to other sections in Related Sections for installation of related products.

3.04 FIELD QUALITY REQUIREMENTS

1. Field Quality Control: When required, mock-up shall be constructed and tested at the direction of the [**Owner**] [**Architect**] [**General Contractor**]. Water-spray testing on the mock-up of the ACM Panel System shall be in accordance with AAMA 501.2.
2. Testing Agency: If required, the [**Owner**] [**Architect**] [**General Contractor**] shall engage a qualified testing agency to perform tests and inspections.

3.05 REMEDIATION AND CLEANING

1. Remediation:
2. Remove and replace ACM Panel System-specific components damaged as a direct result of activities in the ACM panel Installation section.
3. Remove protective masking immediately after installation of ACM Panel System. Masking intentionally left in place after ACM panel Installation on an elevation at the direction of the General Contractor shall become the responsibility of the General Contractor.
4. ACM panel Installation completion shall be agreed-upon between the Installer and the General Contractor.
5. Following Panel Installation completion, any determination of repair or replacement of ACM Panel System-specific components is at the discretion of the Architect. Such repair or replacement shall become the responsibility of the General Contractor.
6. At the discretion of the Architect, repair damaged ACM Panel System components such that repairs are not discernible at a distance of 10 feet from the surface at a 90° angle per AAMA 2605.
7. Removal and replacement of ACM Panel System-specific components damaged by other trades shall be the responsibility of the General Contractor.
8. If required after ACM panel Installation, any additional protection of the ACM Panel System shall be the responsibility of the General Contractor.
9. Remove from project site damaged ACM Panel System-specific components, protective masking, and other debris attributable to work of this section.
10. Cleaning:
11. Final Cleaning shall not be part of the work of this section.
12. Cleaning and Maintenance of the ACM Panel System shall be in accordance with AAMA 609 & 610.

END OF SECTION