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SECTION 07 21 19 FOAMED-IN-PLACE INSULATION

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: This Section specifies closed cell, medium-density, spray foam insulation.

Specifier Note: Revise Paragraph below to suit project requirements. Add section numbers and titles per CSI *MasterFormat* and specifier's practice.

- B. Related Requirements:

Specifier Note: Include in this Paragraph only those sections and documents that directly affect the work of this section. If a reader of this section could reasonably expect to find a product or component specified in this section, but it is actually specified elsewhere, then the related section number(s) should be listed in the Subparagraph below. Do not include Division 00 documents or Division 01 sections since it is assumed that all technical sections are related to all project Division 00 documents and Division 01 sections to some degree. Refer to other documents with caution since referencing them may cause them to be considered part of the Contract.

1. Section 07 92 00 Joint Sealants.
2. Section [_____].

1.02 REFERENCES

Specifier Note: Paragraph below may be omitted when specifying manufacturer's proprietary products and recommended installation. Retain References Paragraph when specifying products and installation by an industry reference standard. List retained standard(s) referenced in this section alphabetically. Indicate issuing authority name, acronym, standard designation and title. Establish policy for indicating edition date of standard referenced. Contract Conditions Section [01 42 00 - References] may establish the edition date of standards. This Paragraph does not require compliance with standard(s). It is a listing of all references used in this section. Only include here standards that are referenced in the body of the specification in Parts 1, 2 and/or 3. Do not include references to building codes at any level.

- A. Reference Standards:

1. ASTM International (ASTM):
 - a. ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
 - b. ASTM D1623 Standard Test Method for Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics.
 - c. ASTM D1622 Standard Test Method for Apparent Density of Rigid Cellular Plastics.
 - d. ASTM D2842 Standard Test Method for Water Absorption of Rigid Cellular Plastics.
 - e. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials.
 - f. ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials.
 - g. ASTM E283 Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences Across the Specimen.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate work of this Section with work of other trades for proper time and sequence to avoid construction delays. Comply with Section [01 31 00 - Project Management and Coordination].

Specifier Note: Add additional text to specify unusual or detailed coordination requirements affecting the work results of this Section.

1. [_____].

- B. Preinstallation Meetings: Conduct meeting [one week] prior to commencing [work of this Section] [and] [on-site installations] to verify project requirements, substrate conditions and coordination with other building subtrades, and to review manufacturer's installation instructions and manufacturer's warranty requirements. Comply with Section [01 31 19 - Project Meetings].

Specifier Note: Add additional text to describe requirements for meetings to coordinate products and techniques and to sequence related work for sensitive and complex items.

1. [_____].

- C. Sequencing: Sequence work of this section in accordance with Section [01 12 16 - Work Sequence] [and manufacturer's written recommendations for sequencing construction operations].

Specifier Note: Specify additional text as required to describe the particular sequence of events required to coordinate work that must be done in sequence with, or at the same time as, work in another section.

1. [_____].

- D. Scheduling: Schedule work of this Section in accordance with Section [01 32 13 - Scheduling of Work].

Specifier Note: Specify additional text to include requirements for coordinating work that requires unusual scheduling with work of other sections.

1. [_____].

Specifier Note: Article below includes submittal of relevant data to be furnished by Contractor before, during or after construction. Coordinate this article with Architect's and Contractor's duties and responsibilities in Contract Conditions and Section [01 33 00 - Submittal Procedures].

1.04 ACTION SUBMITTALS

- A. General: Submit listed submittals in accordance with Contract Conditions and Section [01 33 00 - Submittal Procedures].
- B. Product Data: Submit specified products as follows:
 - 1. Manufacturer's product data, including manufacturer's product data sheet.
 - 2. Code Compliance Research Report # 0478
 - 3. Catalog pages illustrating products to be incorporated into project.
 - 4. Material Safety Data Sheets (MSDS).
- C. Shop Drawings: Indicate information on shop drawings as follows:
 - 1. Areas to be insulated with thickness of insulation.
 - 2. Details of insulation joints with sealants.

1.05 INFORMATION SUBMITTALS

Specifier Note: Specify submittal of test reports or evaluation service reports intended to document required tests without repeating the test requirements specified in Division 01.

- A. General: Submit listed submittals in accordance with Contract Conditions and Section [01 33 00 - Submittal Procedures].
- B. Test and Evaluation Reports:
 - 1. Certified test reports showing compliance with specified performance characteristics and physical properties.

Specifier Note: Specify submittals intended to document manufacturer installation, storage and other instructions.

- C. Manufacturer's Instructions: Submit manufacturer's storage and application instructions.
- D. Source Quality Control: Submit documentation verifying that components and materials specified in this Section are from single manufacturer.

Specifier Note: Coordinate with Field Quality Control in Part 3. When manufacturer's services are specified during construction operations to verify installation, include following Paragraph for the submittal of instructions and reports. If no field inspections are required, delete the following Paragraph.

- E. Manufacturer's Reports: Manufacturer's field reports specified.
- F. Qualification Statements:

1. Submit letter of verification for Manufacturer's Qualifications.
2. Submit letter of verification for Installer's Qualifications.

1.06 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer:
 - a. [5] years experience manufacturing components similar to or exceeding requirements of project.
 - b. Having sufficient capacity to produce and deliver required materials without causing delay in work.
 - c. Capable of providing field service representation during construction.
2. Installer: Acceptable to the manufacturer, experienced in performing work of this section and has specialized in installation of work similar to that required for this project.

Specifier Note: Retain the following Paragraph when certification related to sustainability submittals is a project requirement.

- B. Sustainability Standards Certification: Provide certification for [_____] materials certified by [certification organization's name] in accordance with [certification organizations standard].

Specifier Note: If a mock-up is required, retain Paragraph below.

- C. Mock-Up: Construct mock-up where [indicated] [directed] by [Owner] [Architect] [Consultant] in accordance with Section [01 43 00 - Quality Assurance].
 1. Construct showing [section subject matter] work.
 2. Dimensions and Process: Construct to [___] feet × [___] feet ([___] × [___] m)] using proposed procedures, colors, textures, finishes and quality of work.
 3. Purpose: To judge quality of work, substrate preparation, operation of equipment and material application.
 4. Locate [where directed] [where indicated].
 5. Do not proceed with work prior to receipt of written acceptance of mock-up.
 6. When accepted, mock-up will demonstrate minimum standard of quality required for this work. [Approved mock-up may [not] remain part of finished work]. [Remove mock-up and dispose of materials when no longer required and when directed by [Owner] [Architect] [Consultant]].

1.07 DELIVERY, STORAGE & HANDLING

A. Delivery and Acceptance Requirements:

1. Deliver material in accordance with Section [01 61 00 - Common Product Requirements] and in accordance with manufacturer's written instructions.
2. Deliver materials in manufacturer's original packaging with identification labels intact and in sizes to suit project.

B. Storage and Handling Requirements:

1. Store materials protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.

C. Packaging Waste Management:

Specifier Note: The disposal of packaging waste into landfill sites demonstrates an inefficient use of natural resources and consumes valuable landfill space. Specifying appropriate packaging and construction waste management and disposal procedures may contribute to points required for USGBC's LEED® construction project certification.

Specifier Note: Include the following Subparagraphs to specify information that will provide direction to the Contractor for the disposal of construction waste materials using environmentally responsible methodology other than landfill resources.

1. 1. Separate waste materials for [reuse] [and] [recycling] in accordance with Section [01 74 19 - Construction Waste Management and Disposal].

Specifier Note: USGBC's LEED certification includes credits for the diversion of construction waste from landfill. Diversion can be tracked by either weight or volume but must be consistent for all materials. Manufacturer may reclaim packaging and delivery materials for recycling.

2. Remove packaging materials from site and dispose of at appropriate recycling facilities.
3. Collect and separate for disposal [paper] [plastic] [polystyrene] [corrugated cardboard] packaging material [in appropriate onsite bins] for recycling.

4. Fold metal and plastic banding, flatten and place in designated area for recycling.

Specifier Note: Add additional Subparagraphs to include pallets, crates, padding and other packing materials that are typically associated with the specified products.

5. Remove:
 - a. Pallets from site [and return to supplier or manufacturer].
 - b. [].

1.08 [FIELD] [SITE] CONDITIONS

A. Ambient Conditions:

1. Maintain materials, substrates and surrounding air temperature between 25 degrees F (-4 degrees C) and 130 degrees F (54 degrees C) prior to, during, and 48 hours after completion of foamed-in-place insulation application.

PART 2 PRODUCTS

Specifier Note: Retain Article below for proprietary method specification. Add product attributes, performance characteristics, material standards and descriptions as applicable. Use of such phrases as "or equal," "or approved equal" or similar phrases may cause ambiguity in specifications. Such phrases require verification (procedural, legal and regulatory) and assignment of responsibility for determining "or equal" products.

2.01 YETI

Specifier Note: Include in the following Paragraph manufacturer's name, address, phone number, fax number, e-mail address and website URL.

A. Manufacturer: SWD Urethane.

1. Contact: 540 South Drew Street, Mesa, AZ 85201; Phone: 800-828-1394, Phone: Fax: 480-461-6936; E-mail: sales@swdurethane.com; Website: www.swdurethane.com.

Specifier Note: Substitution procedures must either be in the Contract Conditions or in Section [01 25 00 - Substitution Procedures]. Do not include substitution procedures here.

2. Single Source Responsibility: Provide components and materials specified in this section from a single manufacturer.
3. Substitution Limitations:
 - a. Substitutions: [In accordance with [Contract Conditions] Section [01 25 00 - Substitution Procedures] [No substitutions permitted].

Specifier Note: Include an overall description of the system, assembly, product or material. Include required properties or characteristics that do not obviously belong under other titles. Examples: Configuration, size and color.

B. Description:

Specifier Note: Paragraph below should list obligations for compliance with specific code requirements particular to this section. General statements to comply with a particular code are typically addressed in Contract Conditions and Section [01 41 00 - Regulatory Requirements]. Repetitive statements should be avoided.

1. Regulatory Requirements:
 - a. In accordance with Section [01 41 00 - Regulatory Requirements].
 - b. [].
2. Sustainability Characteristics:
 - a. Product shall be free of Hydrofluorocarbons (HFC)
 - b. [].
3. Compatibility:
 - a. Ensure components and materials are compatible with specified accessories and adjacent materials.

Specifier Note: Performance characteristics are usually stated with some form of evaluation or verification. Performance usually, but not universally, applies to systems and assemblies. Performance criteria can include structural, safety, fire resistance, vapor retardancy, acoustical, thermal, operational capacity and durability.

Specifier Note: The term "Design Criteria" is used when describing the intended characteristics of a product for which the Contractor is assigned design responsibility.

C. Performance Criteria:

1. Thermal Resistance (R), ASTM C518 at 180 days aged: 6.6 degrees F. ft.²; h/Btu at 1 inch thickness and 6.5 degrees F. ft.²; h/Btu at 3.5 inch thickness, minimum.
2. Water Vapor Permeability, ASTM E96: 1.72 perm-inch
3. Water Absorption, Percent by Volume, ASTM D2842: 1.0 percent, maximum.
4. Air Leakage, ASTM E283: <0.02 L/s-m².
5. Core Density, ASTM D1622: Nominal 2.0 lb./ft.²
6. Tensile Strength, ASTM D1623: >15 psi.
7. Compressive Strength, ASTM D1621: 25 psi.
8. Flame Spread, ASTM E84: ≤25
9. Smoke Developed, ASTM E84: ≤450

D. Materials:

1. Medium-density, rigid, two component, closed cell, spray applied, polyurethane system.
 - a. [_____].

E. Mixes:

1. In accordance with manufacturer's recommendations.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verification of Conditions: Verify that conditions of substrates previously installed under other sections or contracts are acceptable for product installation in accordance with manufacturer's instructions prior to foamed-in-place insulation application.
1. Inform [Owner] [Architect] [Consultant] of unacceptable conditions immediately upon discovery.
 2. Proceed with installation only after unacceptable conditions have been remedied [and after receipt of written approval from [Owner] [Architect] [Consultant]].
 3. [_____].

Specifier Note: Specify actions required to prepare the surface, area or site for incorporation of the section's primary products. Describe requirements for exposure or removal of existing assemblies, components, products or materials.

3.02 PREPARATION

Specifier Note: Specify preparatory work required prior to installation/application/erection of primary products.

- A. Ensure structure or substrate is adequate to support foamed-in-place insulation.
- B. Surface Preparation: Prepare surface in accordance with manufacturer's written recommendations and coordinate with Section [01 71 00 - Examination and Preparation].
1. [_____].

Specifier Note: Specify preparatory work, such as selective removal of existing work, required prior to execution of new work. Specify requirements for exposure or removal of existing assemblies, components, products or materials.

C. Demolition/Removal:

1. [_____].

3.03 APPLICATION

- A. Coordinate application of [systems] [components] [products] in accordance with Section [01 73 13 - Application].
1. [_____].

Specifier Note: Specify how existing work is to be repaired, restored and cleaned.

3.04 [REPAIR]/[RESTORATION]

- A. Coordinate [repair] [restoration] of [systems] [components] [products] in accordance with Section [01 73 13 - Application].
1. [_____].

3.05 FIELD QUALITY CONTROL

Specifier Note: Specify requirements if manufacturers are to provide field quality control with onsite personnel for instruction or supervision of product installation, application, erection or construction. Manufacturers' field reports are included under Part 1, Submittals.

A. Manufacturer Services:

Specifier Note: Use the following Subparagraphs only when manufacturer's field services are provided and are required to verify the quality of the installed components. Establish the number and duration of periodic site visits required by manufacturer and specify below. Consult manufacturer for services required. Delete if field services are not required.

1. Coordinate manufacturer's services with Section [01 45 00 - Quality Control]. Have manufacturer review work involved in handling, installation/application, protection and cleaning of product[s], and submit written reports in acceptable format to verify compliance of work with Contract.
2. Manufacturer's Field Services: Provide manufacturer's field services consisting of product use recommendations and periodic site visits for product installation inspection in accordance with manufacturer's instructions.
3. Schedule site visits to review work at stages listed:
 - a. After delivery and storage of products, and when preparatory work on which work of this Section depends is complete, but before installation begins.
 - b. [Twice] during progress of work at [25 percent] and [60 percent] complete.
 - c. Upon completion of work, after cleaning is carried out.
4. Obtain reports within [three] days of review and submit immediately to [Owner] [Architect] [Consultant].

3.06 CLEANING

- A. Perform cleanup in accordance with Section [01 74 00 - Cleaning and Waste Management] and Section [01 74 13 - Progress Cleaning].
- B. Upon completion, remove surplus materials, rubbish, tools and equipment in accordance with Section [01 74 23 - Final Cleaning].

Specifier Note: Specify special measures needed to minimize waste, collect recyclable waste and dispose of or recycle field-generated construction waste created during demolition, construction or final cleaning.

C. Waste Management:

1. Coordinate recycling of waste materials with [01 74 19 - Construction Waste Management and Disposal].
2. Collect recyclable waste and dispose of or recycle field generated construction waste created during demolition, construction or final cleaning.
3. Remove recycling containers and bins from site.
4. [_____].

Specifier Note: Specify protection methods completed after installation, but prior to acceptance by the owner. Protection of surrounding areas and surfaces during application or installation is included under Part 3, Preparation. Include only statements unique to this Section.

Specifier Note: Coordinate the following Article with Section [01 76 00 - Protecting Installed Construction].

3.07 PROTECTION

- A. Protect installed product from damage during construction in accordance with Section [01 76 00 - Protecting Installed Construction].
- B. Repair damage to adjacent materials caused by foamed-in-place insulation application.
- C. [_____].

Specifier Note: Specify attachments such as schedules, tables, illustrations or forms in this location if they are not incorporated directly within the specification text.

3.08 ATTACHMENTS

Specifier Note: Schedules are sometimes placed in the specifications rather than on the drawings. Include schedules that indicate item/element/product/equipment, location and other coordinating data.

A. Schedules:

1. [_____].

END OF SECTION