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# SECTION 07 21 00 THERMAL INSULATION

**PART 1 GENERAL**

* 1. SUMMARY
     1. Section Includes: Fiber Glass thermal and acoustical insulation (JM Formaldehyde-Free Fiberglass Insulation).
     2. Related Sections:
        1. Division 7 Section: Joint Sealants.
        2. Division 9 Section: Gypsum Board.
        3. Division 9 Section: Acoustical Ceilings.
        4. Division 15 Section: Mechanical: [Duct insulation] [Equipment insulation] [And] [Pipe insulation].
  2. REFERENCES

1. ASTM International:
   1. ASTM C165 Standard Test Method for Measuring Compressive Properties of Thermal Insulations.
   2. ASTM C356 Standard Test Method for Linear Shrinkage of Preformed High-Temperature Thermal Insulation Subjected to Soaking Heat.
   3. ASTM C411 Standard Test Method for Hot-Surface Performance of High-Temperature Thermal Insulation.
   4. ASTM C423 Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
   5. ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
   6. ASTM C612 Standard Specification for Mineral Fiber Block and Board Thermal Insulation.
   7. ASTM C665 Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
   8. ASTM C764 Standard Specification for Mineral Fiber Loose-Fill Thermal Insulation.
   9. ASTM C991 Standard Specification for Flexible Fibrous Glass Insulation for Metal Buildings
   10. ASTM C1014 Standard Specification for Spray-Applied Mineral Fiber Thermal and Sound Absorbing Insulation.
   11. ASTM C1015 Standard Practice for Installation of Cellulosic and Mineral Fiber Loose-Fill Thermal Insulation.
   12. ASTM C1104 Standard Test Method for Determining the Water Vapor Sorption of Unfaced Mineral Fiber Insulation.
   13. ASTM C1149 Standard Specification for Self-Supported Spray Applied Cellulosic Thermal Insulation
   14. ASTM C1304 Standard Test Method for Assessing the Odor Emission of Thermal Insulation Materials.
   15. ASTM C1320 Standard Practice for Installation of Mineral Fiber Batt and Blanket Thermal Insulation for Light Frame Construction.
   16. ASTM C1338 Standard Test Method for Determining Fungi Resistance of Insulation Materials and Facings.
   17. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials.
   18. ASTM E90 Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
   19. ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials.
   20. ASTM E119 Standard Test Methods for Fire Tests of Building Construction and Materials.
   21. ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C.
   22. ASTM E736 Standard Test Method for Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members.
   23. ASTM E759 Standard Test Method for Effect of Deflection on Sprayed Fire-Resistive Material Applied to Structural Members.
   24. ASTM E970 Standard Test Method for Critical Radiant Flux of Exposed Attic Floor Insulation Using a Radiant Heat Energy Source.
2. California Integrated Waste Management Board (CIWMB):
   1. Section 01350 Special Environmental Requirements Specification.
3. Leadership in Energy and Environmental Design (LEED):
   1. Materials and Resources (MR) Credit 4.1 - Recycled Content 10%.
   2. Materials and Resources (MR) Credit 4.2 - Recycled Content 20%.
   3. Materials and Resources (MR) Credit 5.1 – Regional materials 10%.
   4. Materials and Resources (MR) Credit 5.1 – Regional materials 20%.
   5. SYSTEM DESCRIPTION
4. Design Requirements: Provide [Products/systems] that have been manufactured, fabricated and installed to the following criteria:
   1. Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated, as determined by testing identical products per test methods indicated below or other testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.
      1. Surface Burning Characteristics (ASTM E84): [Specify flame spread/smoke developed ratings.].
      2. Assembly Fire Resistance Rating (ASTM E119): [Specify assembly rating and design number.].
      3. Combustion Characteristics (ASTM E136): [Specify non-combustible.].
   2. Assembly Sound Transmission Rating (ASTM E90): [Specify sound transmission class (STC).].
   3. Sound Absorption (ASTM C423): [Specify noise reduction coefficient.].
   4. Thermal Performance (ASTM C518): [Specify R-value.].
   5. [Specify any additional design requirements (fire, sound, thermal).].
5. Performance Requirements: Provide [Products/systems] that have been manufactured, fabricated and installed to the following criteria:
   1. Surface Burning Characteristics, Unfaced (ASTM E84): Flamespread index 25, smoke developed 50.
   2. Recycled Glass Content: 30% post-consumer.
   3. Combustibility (ASTM E136): Noncombustible. 4. Formaldehyde Content: Free of formaldehyde.
6. [Specify any additional performance requirements (fire, sound, thermal).].
   1. SUBMITTALS
7. General: Submit listed submittals in accordance with provisions of Section 01300 Administrative Requirements.
8. Product Data: Submit manufacturer’s product data and installation instructions, including manufacturer’s SPEC-DATA® sheets.
9. Samples: Submit manufacturer’s standard selection and verification samples.
10. Quality Assurance/Control Submittals: Submit the following:
    1. Test Reports: Upon request, submit [Fire] [Sound] [And] [Thermal] test reports from recognized test laboratories.
    2. Certificates: Submit manufacturer’s certificate that products meet or exceed specified requirements.
11. LEED Submittals: Provide documentation indicating how the requirements of Credit MR 4.1 [And 4.2] will be met.
    1. List of proposed materials with recycled content. Indicate post-consumer recycled content and pre-consumer recycled content for each product having recycled content.
    2. Product data and certification letter indicating percentages by weight of post-consumer and pre-consumer recycled content for products having recycled content.
    3. Documentation that the product passes CIWMB Section 01350 for indoor air quality.
    4. QUALITY ASSURANCE
12. Obtain each type of building insulation through a single source.
13. Installer Qualifications: Utilize an installer having demonstrated experience on projects of similar size and complexity.
14. Regulatory Requirements and Approvals: [Specify applicable requirements of regulatory agencies.].
    1. [Code agency name].
       1. [Report or approval number].
15. Mock-Ups: [Specify requirements for mock-up.].
    1. Subject to acceptance by owner, mock-up may be retained as part of finish work.
    2. If mock-up is not retained, remove and properly dispose of mock-up.
16. Preinstallation Meetings: [Specify requirements for meeting.].
    1. DELIVERY, STORAGE & HANDLING
17. General: Comply with Division 1 Product Requirement Section.
18. Delivery: Deliver materials in manufacturer’s original, unopened, undamaged containers with identification labels intact.
19. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.

# PART 2 PRODUCTS

* 1. FORMALDEHYDE-FREE™ BUILDING INSULATION
     1. Manufacturer: Johns Manville.
        1. Contact: 717 17th Street 80202, Denver, CO 80217-5108; Telephone: (303) 978-2434; E-mail: Jeffrey.job@jm.com; website: [www.JM.com.](http://www.specJM.com/)
     2. Fiber glass building insulation:
        1. JM Formaldehyde-free™ Unfaced Batts:
           1. Thermal Resistance (R-Value) (ASTM C518): [Specify R-value.].
           2. Combustion Characteristics (ASTM E136): Pass.
           3. Critical Radiant Flux (ASTM E970): Greater than 0.11 Btu/ft2 × s (0.12 W/cm2).
           4. Water Vapor Sorption (ASTM C1104): 5% or less.
           5. Odor Emission (ASTM C1304): Pass.
           6. Corrosiveness (ASTM C665): Pass.
           7. Fungi Resistance (ASTM C1338): Pass.
           8. Recycled Content: Certified by Scientific Certification Systems to contain minimum of 30% post-consumer on average of manufacturer’s products.
           9. GREENGUARD GOLD Certification.
           10. Thickness: [Specify thickness.].
           11. Flamespread (ASTM E84): 25, maximum.
           12. Smoke Developed (ASTM E84): 50, maximum.
           13. Material Standard: ASTM C665, Type I.
        2. JM Formaldehyde-free™ Kraft and Foil-faced Batts:
           1. Thermal Resistance (R-Value) (ASTM C518): [Specify R-value.].
           2. Critical Radiant Flux (ASTM E970): Greater than 0.11 Btu/ft2 × s (0.12 W/cm2).
           3. Water Vapor Permeance (ASTM E96): [0.05 perm (2.9 ng/Pa × s × m2) for foil faced] [1.0 perm (57.5 ng/Pa × s × m2) for Kraft faced].
           4. Water Vapor Sorption (ASTM C1104): 5% or less by weight.
           5. Odor Emission (ASTM C1304): Pass.
           6. Corrosiveness (ASTM C665, 13.8): Pass.
           7. Fungi Resistance (ASTM C1338): Pass.
           8. Recycled Content: Certified by Scientific Certification Systems to contain minimum of 30% post-consumer on average of manufacturer’s products.
           9. GREENGUARD GOLD Certification.
           10. Thickness: [Specify thickness.].
           11. Flamespread (ASTM E84):

Foil-faced Batts: 75, maximum.

Kraft-faced Batts: Unrated.

* + - * 1. Smoke Developed (ASTM E84):

Foil-faced Batts: 450, maximum.

Kraft-faced Batts: Unrated.

* + - * 1. Material Standard:

Foil-faced Batts: ASTM C665, Type III, Class B, Category 1.

Kraft-faced Batts: ASTM C665, Type II, Class C, Category 1.

* + - 1. JM Formaldehyde-free™ FSK-25 Faced Batts:
         1. Thermal Resistance (R-Value) (ASTM C518): [R-11] [R-13] [R-19] [R-30].
         2. Combustion Characteristics (ASTM E136): Pass.
         3. Critical Radiant Flux (ASTM E970): Greater than 0.11 Btu/ft2 × s (0.12 W/cm2).
         4. Water Vapor Permeance (ASTM E96): 0.05 perm (3 ng/Pa × s × m2).
         5. Water Vapor Sorption (ASTM C1104): 5% or less.
         6. Odor Emission (ASTM C1304): Pass.
         7. Corrosiveness (ASTM C665, 13.8): Pass.
         8. Fungi Resistance (ASTM C1338): Pass.
         9. Recycled Content: Certified by Scientific Certification Systems to contain minimum of 30% post-consumer on average of manufacturer’s products.
         10. Thickness: [Specify thickness.].
         11. Flamespread (ASTM E84): 25, maximum.
         12. Smoke Developed (ASTM E84): 50, maximum.
         13. Material Standard: ASTM C665, Type III, Class A, Category 1.
      2. JM Formaldehyde-free™ ComfortTherm® Poly-Encapsulated Batts:
         1. Thermal Resistance (R-Value) (ASTM C518): [Specify R-value.].
         2. Combustion Characteristics (ASTM E136): Pass.
         3. Critical Radiant Flux (ASTM E970): Greater than 0.11 Btu/ft2 × s (0.12 W/cm2).
         4. Water Vapor Permeance (ASTM E96): 0.5 perm (30 ng/Pa × s × m2).
         5. Water Vapor Sorption (ASTM C1104): 5% or less by weight.
         6. Odor Emission (ASTM C1304): Pass.
         7. Corrosiveness (ASTM C665, 13.8): Pass.
         8. Fungi Resistance (ASTM C1338): Pass.
         9. Recycled Content: Certified by Scientific Certification Systems to contain minimum of 30% post-consumer on average of manufacturer’s products.
         10. Thickness: [Specify thickness.].
         11. Flamespread (ASTM E84): 25, maximum.
         12. Smoke Developed (ASTM E84): 50, maximum.
         13. Material Standard: ASTM C665, Type II, Class A (membrane-faced surface with a flamespread of 25 or less), Category 1 (membrane is a vapor barrier).
      3. JM Formaldehyde-free™ FSK-25 and PSK-faced Panel Deck Batts:
         1. Thermal Resistance (R-Value) (ASTM C518): [R-19] [R-30].
         2. Combustion Characteristics (ASTM E136): Pass.
         3. Critical Radiant Flux (ASTM E970): Greater than 0.11 Btu/ft2 × s (0.12 W/cm2).
         4. Water Vapor Permeance (ASTM E96): 0.05 perm (3 ng/Pa × s × m2).
         5. Water Vapor Sorption (ASTM C1104): 5% or less.
         6. Odor Emission (ASTM C1304): Pass.
         7. Corrosiveness (ASTM C665, 13.8): Pass.
         8. Fungi Resistance (ASTM C1338): Pass.
         9. Recycled Content: Content: Certified by Scientific Certification Systems to contain minimum of 30% post-consumer on average of manufacturer’s products.
         10. GREENGUARD Certification.
         11. Thickness: [Specify thickness.].
         12. Flamespread (ASTM E84): 25, maximum.
         13. Smoke Developed (ASTM E84): 50, maximum.
         14. Material Standard:

FSK-25 Faced Panel Deck Batts: ASTM C665, Type III, Class A, Category 1.

PSK-faced Panel Deck Batts: ASTM C665, Type II, Class A, Category 1.

* + - 1. JM Microlite “L” Formaldehyde-free™ Thermal and Acoustical Metal Building Insulation
         1. Thermal Resistance (R-Value) (ASTM C518): [Specify R-value.].
         2. Combustion Characteristics (ASTM E136): Pass.
         3. Flamespread (ASTM E84): 25, maximum.
         4. Smoke Developed (ASTM E84): 50, maximum.
         5. ASTM C991 Type I
         6. NIAMA 202-96 Certified Fiber Glass Metal Building Insulation.
         7. GREENGUARD Certification.
  1. SEMI-RIGID AND RIGID FIBERGLASS BOARD INSULATION
     + 1. JM Unfaced Insul-SHIELD® Board:
          1. Thermal Resistance (R-Value) (ASTM C518): [Specify R-value.].
          2. Combustion Characteristics (IS 300 Only) (ASTM E136): Pass.
          3. Maximum Use Temperature (ASTM C411): 350 degrees F (177 degrees C).
          4. Water Vapor Sorption (ASTM C1104): 5% or less by weight.
          5. Compressive Resistance (IS 300 and 600 Only) (ASTM C165): 25 psf (1.2 kPa) at 10%.
          6. Linear Shrinkage (ASTM C356): None.
          7. Odor Emission (ASTM C1304): Pass.
          8. Corrosiveness (ASTM C665, 13.8): Pass.
          9. Fungi Resistance (ASTM C1338): Pass.
          10. Thickness: [Specify thickness.].
          11. Flamespread (ASTM E84): 25, maximum.
          12. Smoke Developed (ASTM E84): 50, maximum.
          13. Material Standard: ASTM C612, Type IA or IB.
       2. JM FSK-25 and PSK-faced Insul-SHIELD® Board:
          1. Thermal Resistance (R-Value) (ASTM C518): [Specify R-value.].
          2. Combustion Characteristics (IS 300 Only) (ASTM E136): Pass.
          3. Maximum Use Temperature (ASTM C411): 250 degrees F (121 degrees C).
          4. Water Vapor Permeance (ASTM E96): 0.05 perm (3 ng/Pa × s × m2).
          5. Water Vapor Sorption (ASTM C1104): 5% or less by weight.
          6. Compressive Resistance (IS 300 and 600 only) (ASTM C165): 25 psf (1.2 kPa) at 10%.
          7. Linear Shrinkage (ASTM C356): None.
          8. Odor Emission (ASTM C1304): Pass.
          9. Corrosiveness (ASTM C665, 13.8): Pass.
          10. Fungi Resistance (ASTM C1338): Pass.
          11. Thickness: [Specify thickness.].
          12. Flamespread (ASTM E84): 25, maximum.
          13. Smoke Developed (ASTM E84): 50, maximum.
          14. Material Standard: ASTM C612, Type IA or IB.
       3. JM Black Faced Insul-SHIELD® Board:
          1. Thermal Resistance (R-Value) (ASTM C518): [Specify R-value.].
          2. Combustion Characteristics (ASTM E136): Pass.
          3. Maximum Use Temperature (ASTM C411): 250 degrees F (121 degrees C) for faced.
          4. Water Vapor Sorption (ASTM C1104): 5% or less by weight.
          5. Compressive Resistance (ASTM C165): 25 psf (1.2 kPa) at 10%.
          6. Linear Shrinkage (ASTM C356): None.
          7. Odor Emission (ASTM C1304): Pass.
          8. Corrosiveness (ASTM C665, 13.8): Pass.
          9. Fungi Resistance (ASTM C1338): Pass.
          10. Thickness: [Specify thickness.].
          11. Flamespread (ASTM E84): 25, maximum.
          12. Smoke Developed (ASTM E84): 50, maximum.
          13. Material Standard: ASTM C612.
       4. JM Black Coated Insul-SHIELD® Roll:
          1. Thermal Resistance (R-Value) (ASTM C518): [Specify R-value.].
          2. Maximum Use Temperature (ASTM C411): 250 degrees F (121 degrees C) for faced.
          3. Water Vapor Sorption (ASTM C1104): 5% or less by weight.
          4. Linear Shrinkage (ASTM C356): None.
          5. Odor Emission (ASTM C1304): Pass.
          6. Corrosiveness (ASTM C665, 13.8): Pass.
          7. Fungi Resistance (ASTM C1338): Pass.
          8. Thickness: [Specify thickness – 1” or 2”].
          9. Flamespread (ASTM E84): 25, maximum.
          10. Smoke Developed (ASTM E84): 50, maximum.
          11. Material Standard: ASTM C612.
  2. BLOW-IN FIBERGLASS INSULATION
     + 1. JM Formaldehyde-free™ Climate Pro® Loose Fill Insulation:
          1. Thermal Resistance (R-Value) (ASTM C518): [Specify R-value.].
          2. Combustion Characteristics (ASTM E136): Pass.
          3. Critical Radiant Flux (ASTM E970): 0.11 Btu/ft2 × s (0.12 W/cm2) or greater.
          4. Water Vapor Sorption (ASTM C1104): 5% or less.
          5. Odor Emission (ASTM C1304): Pass.
          6. Corrosiveness (ASTM C665, 13.8): Pass.
          7. Fungi Resistance (ASTM C1338): Pass.
          8. Thickness: [Specify thickness.].
          9. Flamespread (ASTM E84): 25, maximum.
          10. Smoke Developed (ASTM E84): 50, maximum.
          11. Material Standard: ASTM C764.
       2. JM Spider™ Plus Blown-In Insulation
          1. Thermal Resistance (R-Value) (ASTM C 518): [Specify R-value.].
          2. Combustion Characteristics (ASTM E136): Pass.
          3. Critical Radiant Flux (ASTM E970): 0.11 Btu/ft2 × s (0.12 W/cm2) or greater.
          4. Smoldering Combustion (ASTM C 1149): Pass
          5. Water Vapor Sorption (ASTM C1104): 5% or less.
          6. Odor Emission (ASTM C1304): Pass.
          7. Corrosiveness (ASTM C764): Pass.
          8. Fungi Resistance (ASTM C1338): Pass.
          9. Fungi Resistance (ASTM G21): Pass.
          10. Adhesive/Cohesive bond strength (ASTM E 736): Pass
          11. Substrate Deflection (ASTM E 759): Pass
          12. Thickness: [Specify thickness.].
          13. Flamespread (ASTM E84): 25, maximum.
          14. Smoke Developed (ASTM E84): 50, maximum.
          15. VOC Emissions (ES Section 01350): Pass
     1. Insulating Materials:
        1. General: Provide insulating materials that comply with requirements and referenced standards.
           1. Preformed Units: Sizes to fit applications indicated; selected from manufacturer's standard thicknesses, widths and lengths.
           2. Loose-fill: Provide required thickness and density per manufacturer’s instructions to achieve indicated R-value.
        2. Recycled Content: To meet the requirements of LEED Credit MR 4.1 [And MR 4.2], provide insulating materials complying with the following:
           1. Credit MR 4.1: Provide insulating materials with post-consumer recycled content constituting a minimum of 5% of cost of materials used for project or post-consumer recycled content plus one-half of pre-consumer recycled content constituting a minimum of 10% of cost of materials used for project.
           2. Credits MR 4.1 and MR 4.2: Provide insulating materials with post-consumer recycled content [Constituting a minimum of 10% of cost of materials used for project or post-consumer recycled content plus one-half of pre- consumer recycled content constituting a minimum of 20% of cost of materials used for project] [Constituting a minimum of 20% post-consumer recycled content plus 5% pre-consumer recycled content, consisting of a minimum of 25%].
  3. PRODUCT SUBSTITUTIONS:

1. Substitutions: No substitutions permitted.
   1. ACCESSORIES
2. Tape: Self-adhesive vapor retarder tape with flamespread index of 25 or less, smoke developed index of 50 or less.

# PART 3 EXECUTION

* 1. MANUFACTURER’S INSTRUCTIONS
     1. Comply with the instructions and recommendations of the building insulation manufacturer.
  2. EXAMINATION

1. Site Verification of Conditions:
   1. Verify that site conditions are acceptable for installation of building insulation.
   2. Do not proceed with installation of building insulation until unacceptable conditions are corrected.
   3. PREPARATION
2. Protection: Protect adjacent work areas and finish surfaces from damage during product installation.
   1. INSTALLATION
3. General: Comply with insulation manufacturer's written instructions applicable to products and application indicated.
   1. Install insulation that is undamaged, dry and unsoiled and that has not been left exposed at any time to ice and snow.
   2. Extend insulation in thickness indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation.
   3. Water Piping Coordination: If water piping is located on inside of insulated exterior walls, coordinate location of piping to ensure that it is placed on warm side of insulation and insulation encapsulates piping.
   4. Apply single layer of insulation to produce thickness indicated, unless multiple layers are otherwise shown or required to make up total thickness.
4. Installation of General Building Insulation:
   1. Seal joints between closed-cell (non-breathing) insulation units by applying adhesive, mastic or sealant to edges of each unit to form a tight seal as units are shoved into place. Fill voids in completed installation with adhesive, mastic or sealant as recommended by insulation manufacturer.
   2. Set vapor-retarder-faced units with vapor retarder to warm side of construction, unless otherwise indicated. Do not obstruct ventilation spaces, except for firestopping.
      * + 1. Tape ruptures in vapor retarder, and seal each continuous area of insulation to surrounding construction to ensure airtight installation.
   3. Install glass-fiber blankets in cavities formed by framing members according to the following requirements:
      * + 1. Use blanket widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill cavity, provide lengths that will produce a snug fit between ends.
          2. Place blankets in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
          3. For metal-framed wall cavities where cavity heights exceed 96 inches (2438 mm), support unfaced blankets mechanically and support faced blankets by taping stapling flanges to flanges of metal studs.
   4. Wood-Framed Construction: Install mineral-fiber blankets in accordance with ASTM C1320 and as follows:
      * + 1. With faced blankets having stapling flanges, secure insulation by friction fit inset or face stapling flanges to sides of framing members.
          2. With faced blankets having stapling flanges, lap blanket flange over flange of adjacent blanket to produce airtight installation after concealing finish material is in place.
   5. Acoustical Insulation Installation: Install insulation where indicated in sound rated assemblies. Maintain acoustical rating of assembly.
   6. Metal Building Construction:
      * + 1. If vapor retarding facer is applied, install with facer towards conditioned space.
          2. Insulation is typically applied over or between purlins and girts.
          3. Insulation can be held in place by cover material or support system.
          4. Blanket insulation may be used in both single and double layer metal building systems.
          5. Actual recovered thickness will depend on facer type and lamination process.
   7. Board Insulation Installation: Install insulation where indicated:

a. Cut and friction fit insulation between vertical or Z-shaped framing.

b. Alternatively install insulation on impaling pins or with suitable adhesives.

c. Place pins 3 inches - 5 inches (76 - 127 mm) from edges of insulation.

* 1. Loose-Fill Insulation: Place loose-fill insulation into spaces and onto surfaces as shown, by machine blowing to comply with ASTM C1015. Level horizontal applications to uniform thickness as indicated. Hold insulation back from air vents, flues and heat-generating appliances.

1. Installation of Vapor Retarders:
   1. General: Extend vapor retarder to extremities of areas to be protected from vapor transmission. Secure in place with adhesives or other anchorage system as indicated. Extend vapor retarder to cover miscellaneous voids in insulated substrates, including those filled with loose-fiber insulation.
   2. Firmly attach vapor retarders to substrates with mechanical fasteners or adhesives as recommended by vapor retarder manufacturer.
   3. Seal joints caused by pipes, conduits, electrical boxes and similar items penetrating vapor retarders with vapor retarder tape to create an airtight seal between penetrating objects and vapor retarder.
   4. Repair any tears or punctures in vapor retarders immediately before concealment by other work. Cover with vapor retarder tape or another layer of vapor retarder.
   5. PROTECTION
2. Protect installed work from damage due to subsequent construction activity on the site. Repair damage to installed products prior to installation of finish materials.

# END OF SECTION