



## **InsulStar®**

# **ARCHITECTURAL SPECIFICATIONS & INSTALLATION INSTRUCTIONS**

## **PART 1 - GENERAL**

### **1.01 SUMMARY**

InsulStar® provides building envelopes with seamless insulation which substantially reduces air infiltration. InsulStar can be applied: (1) to the full or partial thickness of stud-wall cavities, ceilings, floor joists, roof deck assemblies, and crawl space walls for a total insulation, air barrier and moisture vapor retarder package; or (2) in a ½- to 1-inch thickness in combination with conventional insulation. In either case, air infiltration is substantially reduced due to the sealing characteristics of the spray foam system.

### **1.02 QUALITY ASSURANCE**

InsulStar must be installed by a GoldStar Certified Applicator who is familiar with the operation and maintenance of his equipment and who is familiar with the properties of the NCFI Spray System which is being applied.

### **1.03 MATERIAL DELIVERY AND STORAGE**

A. Materials shall be delivered in their original, tightly sealed containers.

B. Keep the temperature of the chemicals above 70°F for several days prior to use. Cold chemicals can cause pump cavitation and, therefore, incorrect metering. Storage temperatures should not exceed 90°F. Do not store in direct sunlight. Keep drums tightly closed when not in use and under dry gas pressure of 2-3 psi after they have been opened. See individual product data sheets for specific storage recommendations and shelf life information (refer to Section 2.01).

### **1.04 SEQUENCE AND SCHEDULING**

The spray polyurethane insulation used in the InsulStar system is applied after the perimeter wall is in place, windows and doors installed, and rough-in plumbing and electrical inspections are complete.

### 1.05 VAPOR BARRIER: Install vapor barriers as required by local code.

InsulStar closed-cell spray polyurethane insulation system provides a degree of vapor retardance. In many circumstances, the use of this closed-cell insulation eliminates the need for an additional vapor barrier. The system used, the thickness to which it is applied, the adjoining building components, the exterior weather conditions, and the interior temperature and humidity all affect the need for a vapor barrier. Consult NCFI for specific recommendations.

### 1.06 SAFETY

A. **HANDLING OF LIQUID COMPONENTS:** Use caution in removing bungs from 55gallon drums. Loosen  $\frac{3}{4}$ -inch bung and let gas escape before completely removing. Avoid breathing of vapors. In case of chemical contact with eyes, flush with water for at least 15 minutes and get medical attention. For further information refer to “MDI-Based Polyurethane Foam Systems: Guidelines for Safe Handling and Disposal,” published by the Center for the Polyurethanes Industry, 1300 Wilson Boulevard, Arlington, VA 22209, [www.polyurethane.org](http://www.polyurethane.org).

B. **15-MINUTE THERMAL BARRIER:** Federal, state, and local building codes vary. All have requirements that spray-applied polyurethane foam insulation be separated from occupied spaces with an approved 15-minute fire rated thermal barrier. One typically approved material is  $\frac{1}{2}$ -inch gypsum wallboard (sheetrock) applied over the spray polyurethane foam insulation.

Exceptions to the thermal barrier requirement include certain headers, sill plates, attics and crawl spaces. Check the applicable building code and with local officials for specific requirements.

## PART 2 - PRODUCTS

### 2.01 POLYURETHANE CLOSED CELL INSULATION

The polyurethane insulation used shall be NCFI’s InsulStar.

See individual product data sheet for typical physical properties and application information.

### 2.02 SUPPLEMENTAL INSULATION: Use fiber glass batts or spray-on cellulose having the following typical properties:

Density	0.6 - 1.0	lb/ft <sup>3</sup>
R-value	3 - 4	hr/Btu.ft <sup>2</sup> .°F

## 2.03 ACCESSORIES

- A. Joint Filler Foam: Hilti CF 124 Filler Foam or equivalent.
- B. Moisture Detection Paper (MDP) strips produced by NCFI Polyurethanes.
- C. Caulk: Silkaflex 1a: Single Component polyurethane or equivalent

## PART 3 - EXECUTION

### 3.01 SURFACE PREPERATION

All surfaces to be sprayed with InsulStar must be dry, clean, and secure. Remove sawdust and other debris from areas to be sprayed by blowing with compressed air or vacuuming with a shop vacuum. Check surfaces with NCFI MDP strips to verify dryness. All metal to which foam is to be applied must be free of oil, grease, rust, etc. Primers should be used where necessary.

Mask off all areas not to receive spray foam with masking tape and plastic sheeting. Apply release agent to stud facing to facilitate removal of foam.

### 3.02 FOAM APPLICATION

Apply spray foam using a “picture framing” technique: apply a cant of foam between the exterior sheathing and the inner stud surface. Then spray-apply the required thickness of foam against the sheathing. For a nominal thickness of ½ inch, apply in one pass. For filling the stud wall cavity, apply the foam in two or more passes.

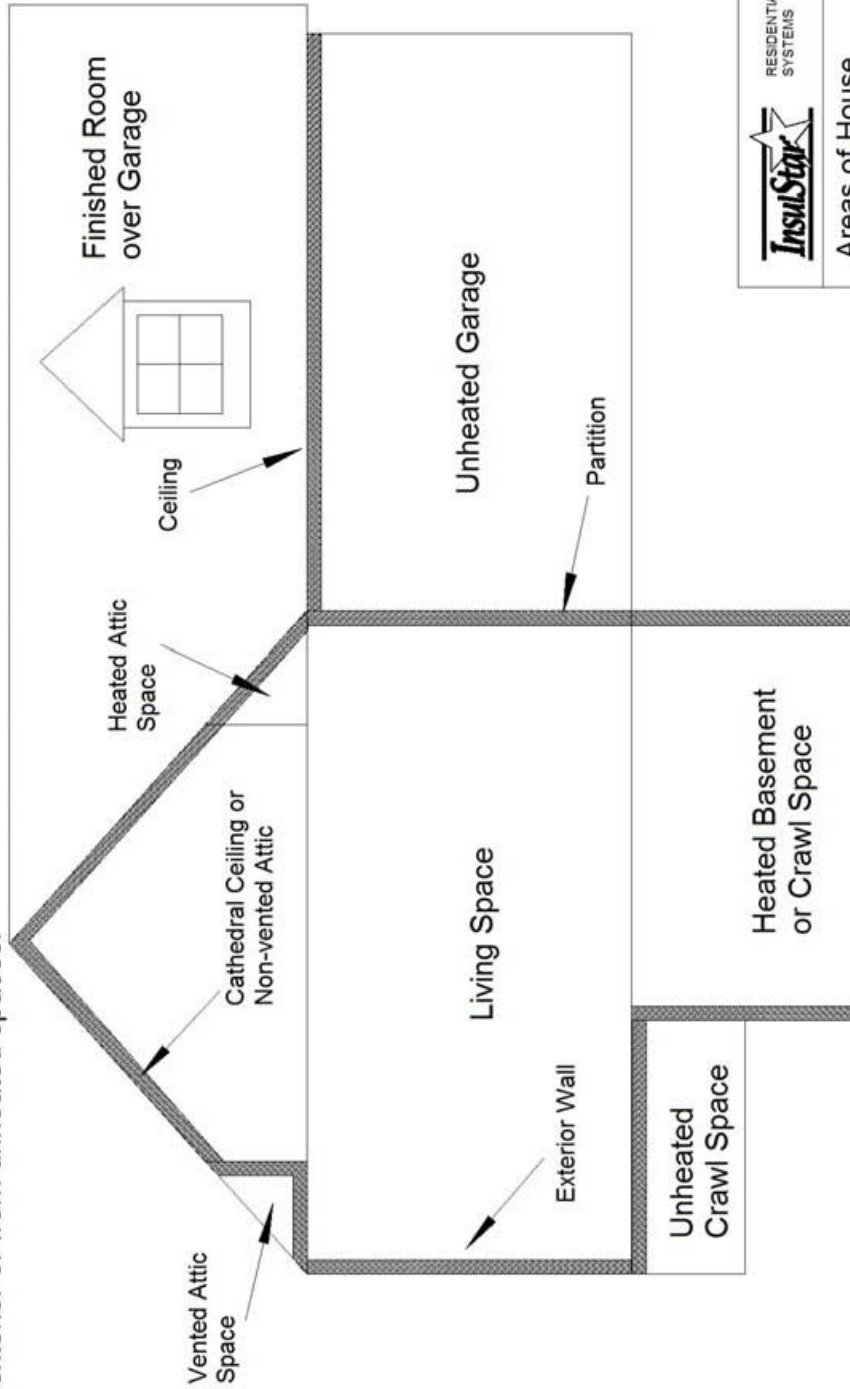
### 3.03 ACCESSORY APPLICATION

- A. Supplemental Insulation (Optional): If the stud wall cavity, roof deck, or ceiling is not completely filled with spray polyurethane foam, supplemental insulation may be installed to achieve desired R-values.
- B. Joint Filler Foam and Caulk: Use joint filler foam and/or caulk to seal around windows, doors, chimneys, electrical raceways, sill plates, multiple studs, etc. **Caution: Joint filler foam can tighten window frames and door jambs to the point that they will not open or close properly. Care must be used in these areas to avoid distortion of these members.**

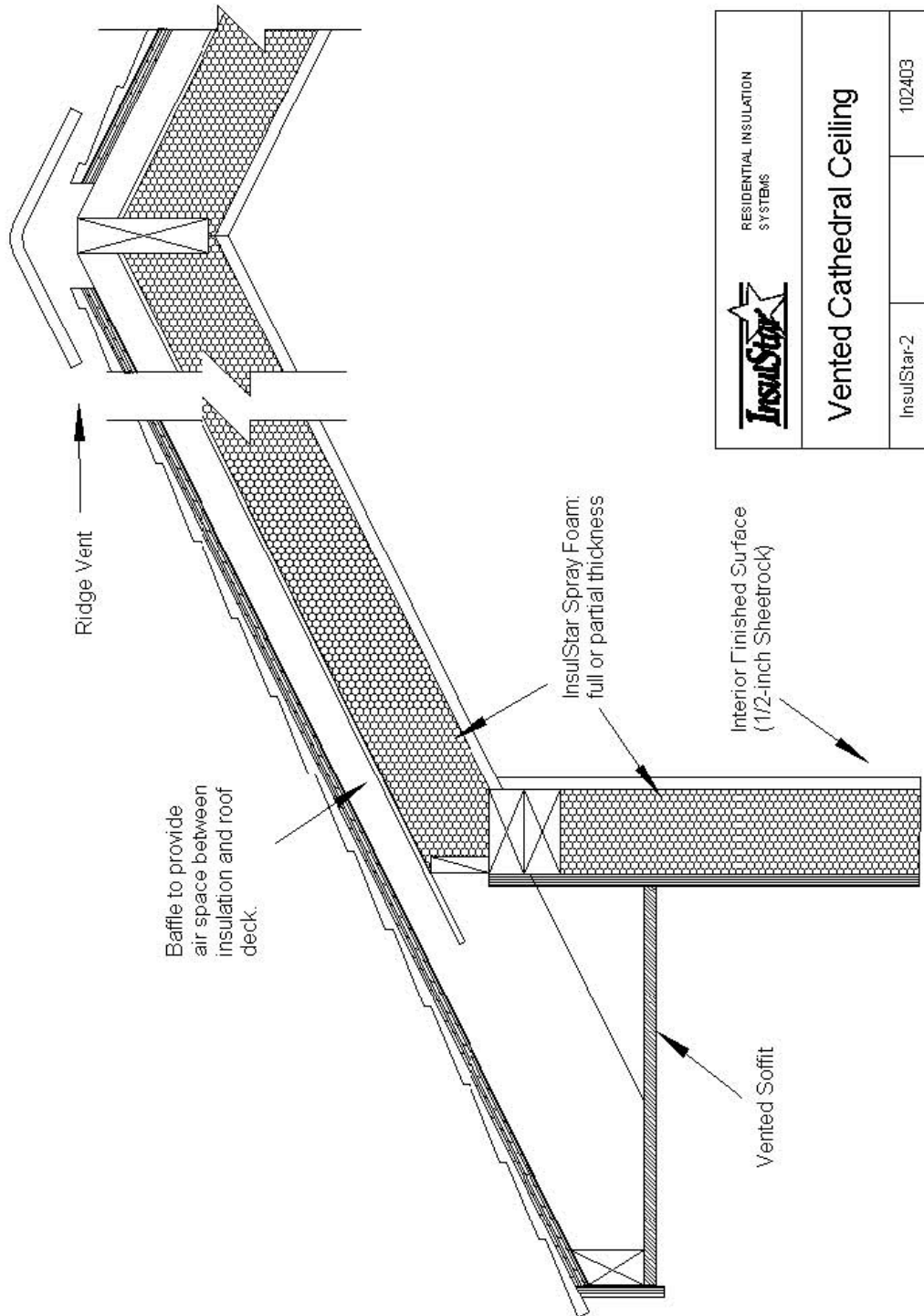
### 3.04 CLEAN UP


Clean off all overspray and overfill from the interior stud facings. For fully filled stud cavities, shave off the foam face to provide a surface flush with the stud for drywall installation. Remove all masking materials.

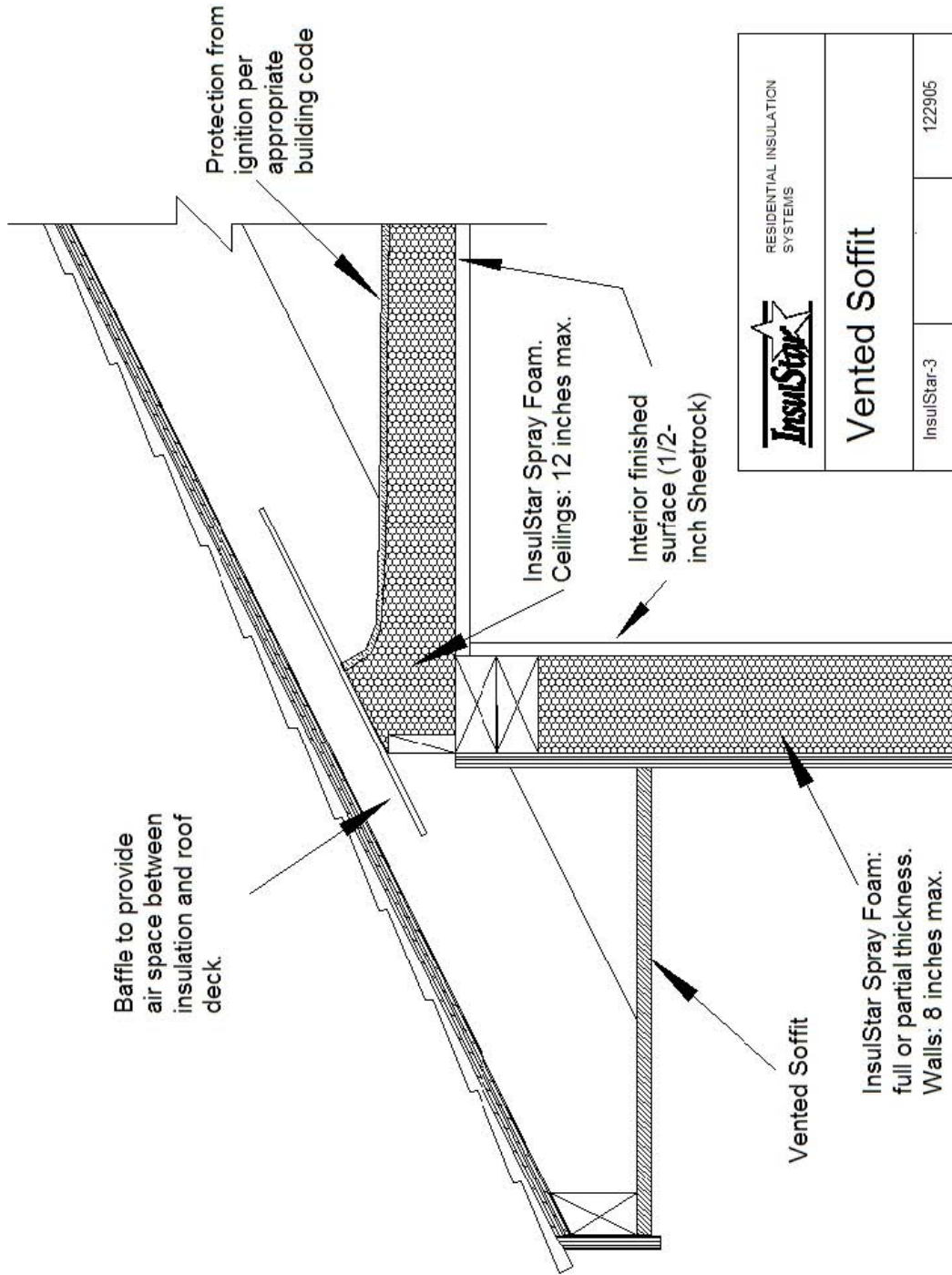
Note: Insulate walls, ceilings, and floors that separate interior areas from the exterior or from unheated spaces.

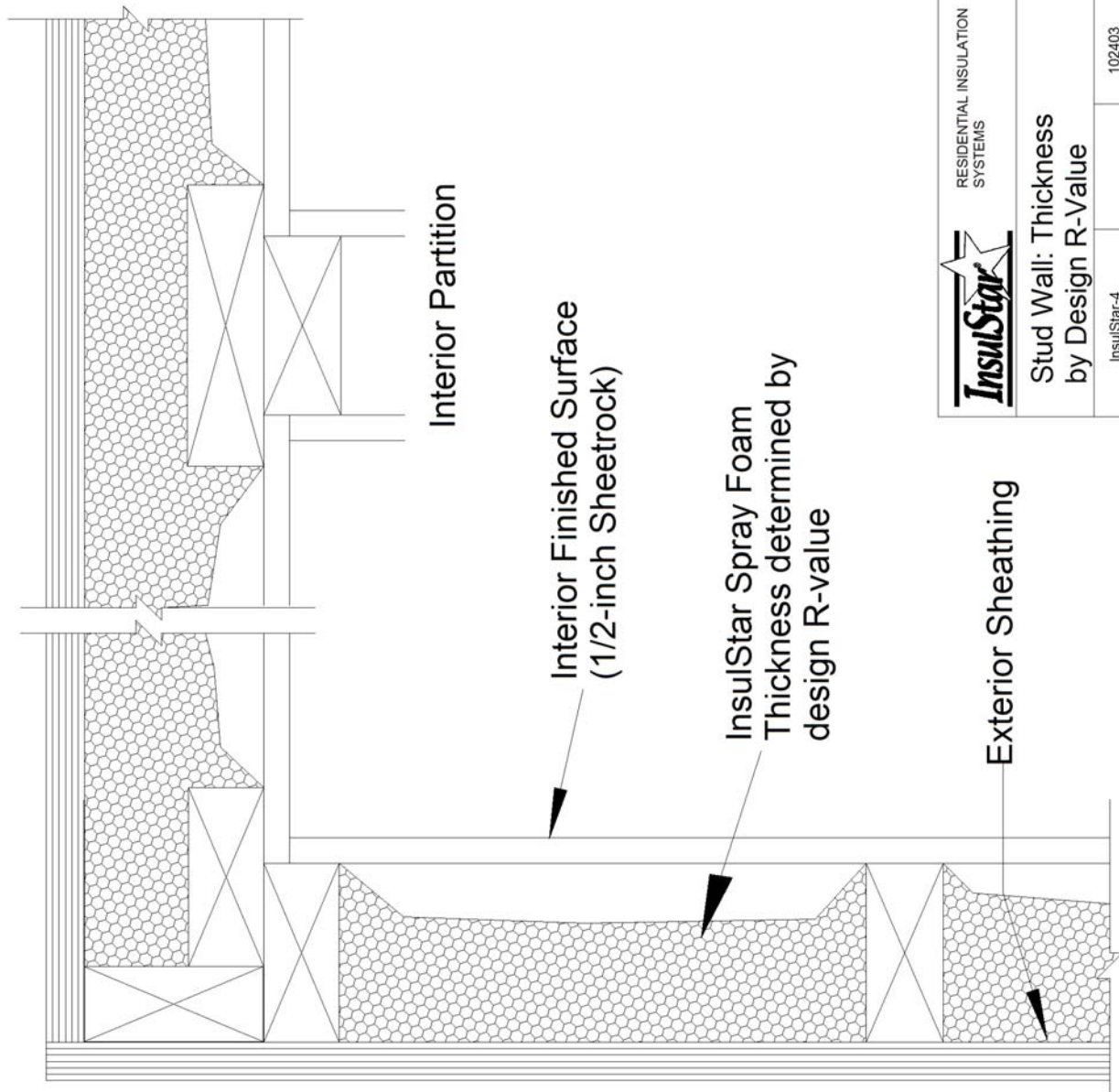


 RESIDENTIAL INSULATION SYSTEMS	
Areas of House to Insulate	
InsulStar-1	102403

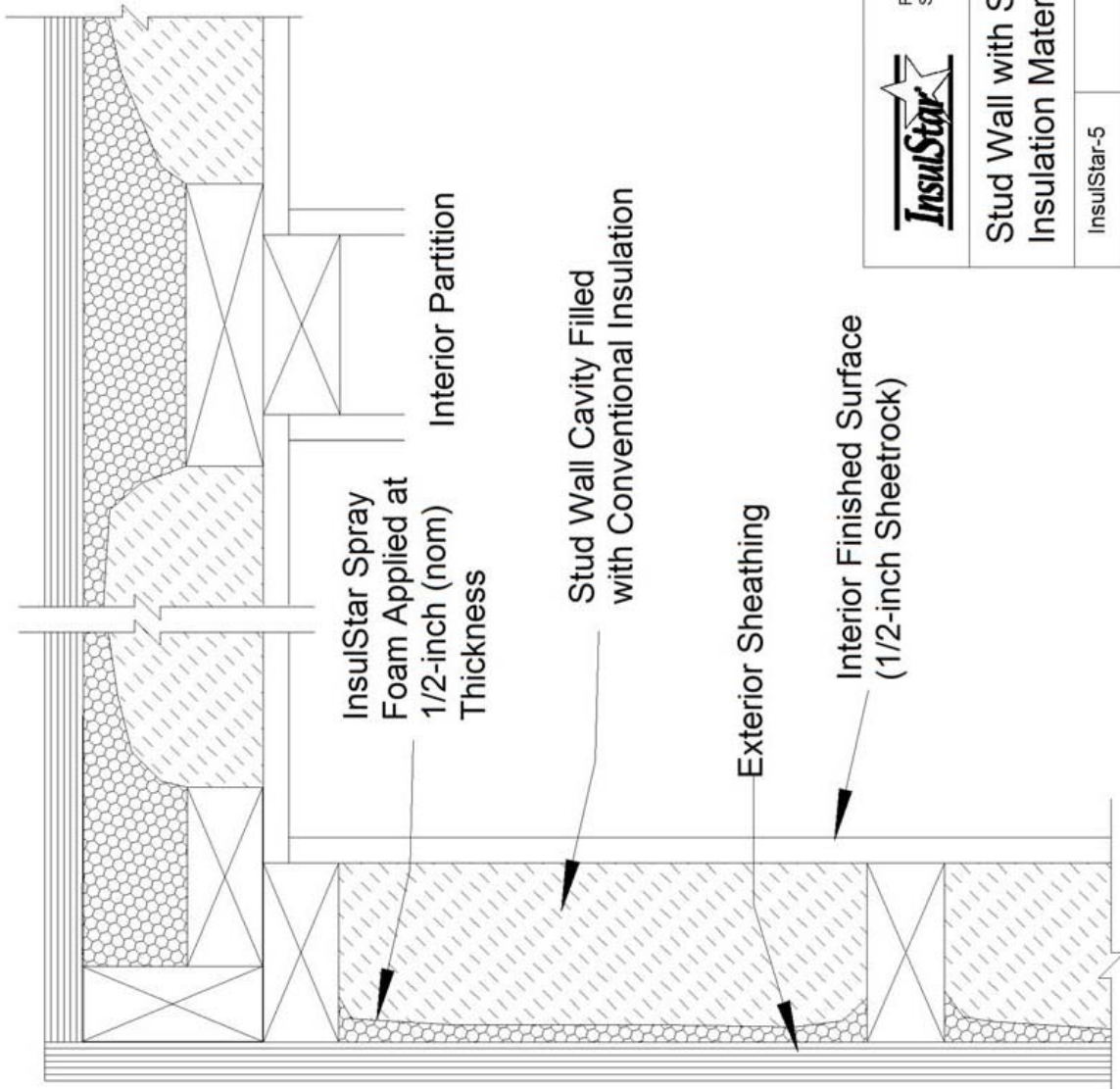



 RESIDENTIAL INSULATION SYSTEMS	
<b>Vented Cathedral Ceiling</b>	
InsulStar-2	102403

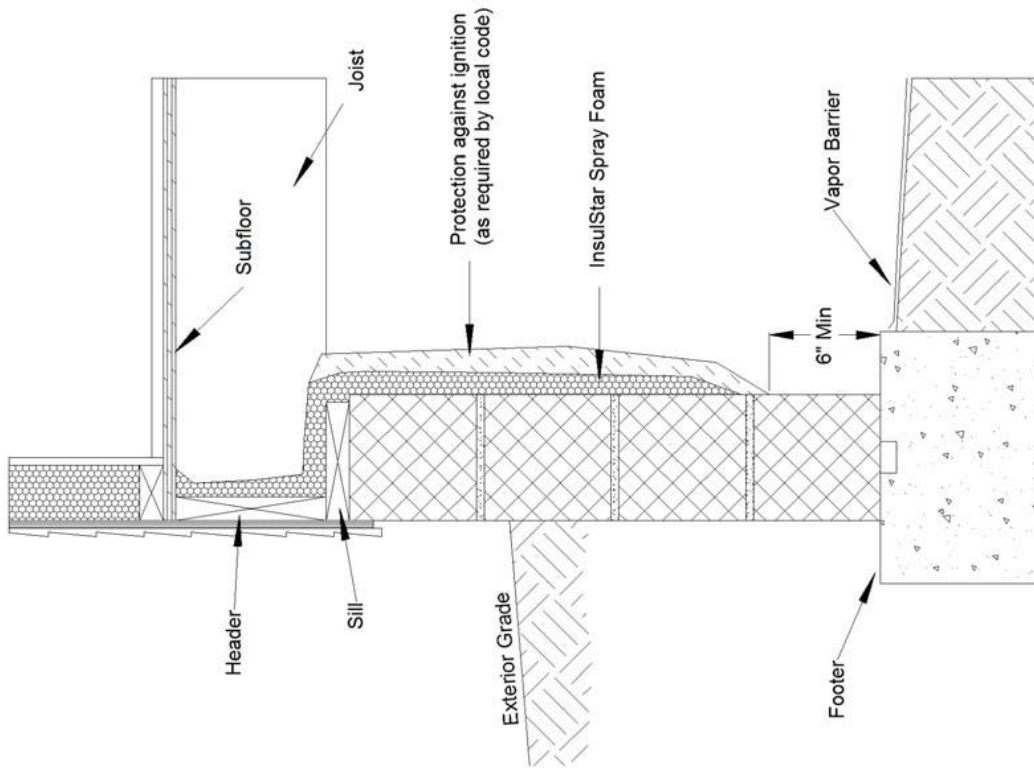





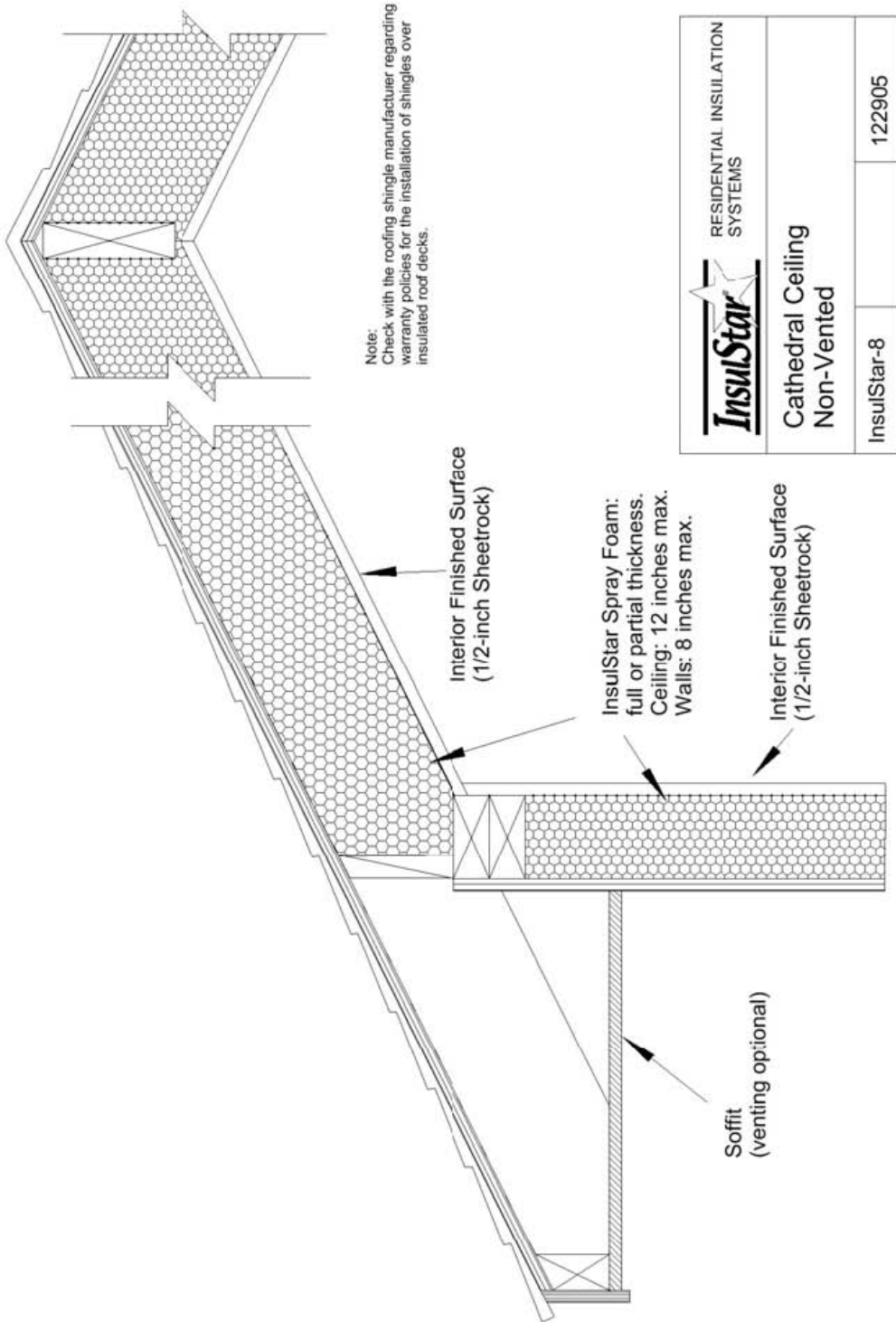
 RESIDENTIAL INSULATION SYSTEMS	
Stud Wall: Thickness by Design R-Value	
InsulStar-4	102403



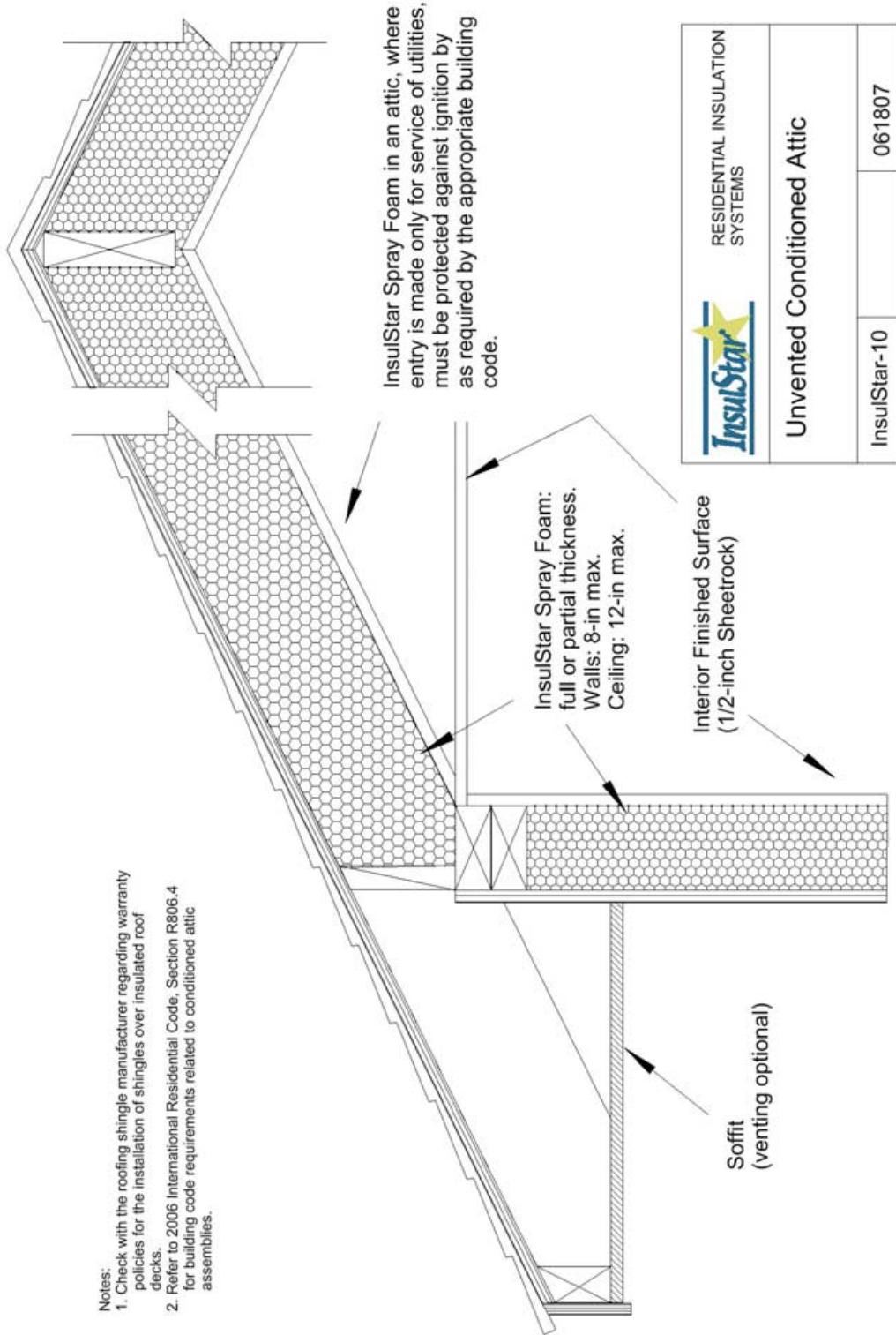
 RESIDENTIAL INSULATION SYSTEMS	
<b>Stud Wall with Supplemental Insulation Material</b>	
InsulStar-5	102403

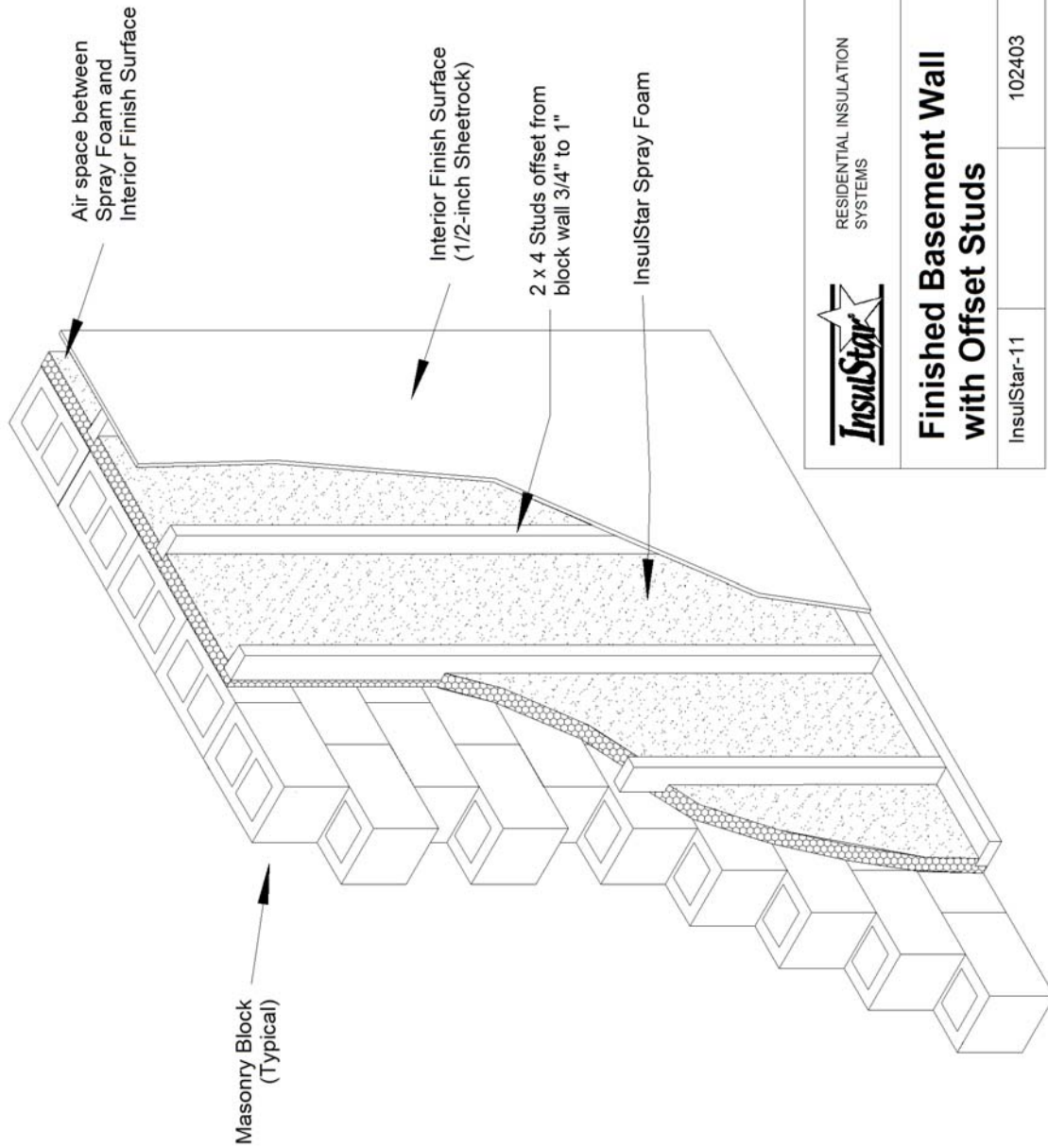



 RESIDENTIAL INSULATION SYSTEMS	
<h2>Crawl Space</h2>	
InsulStar-6	102403

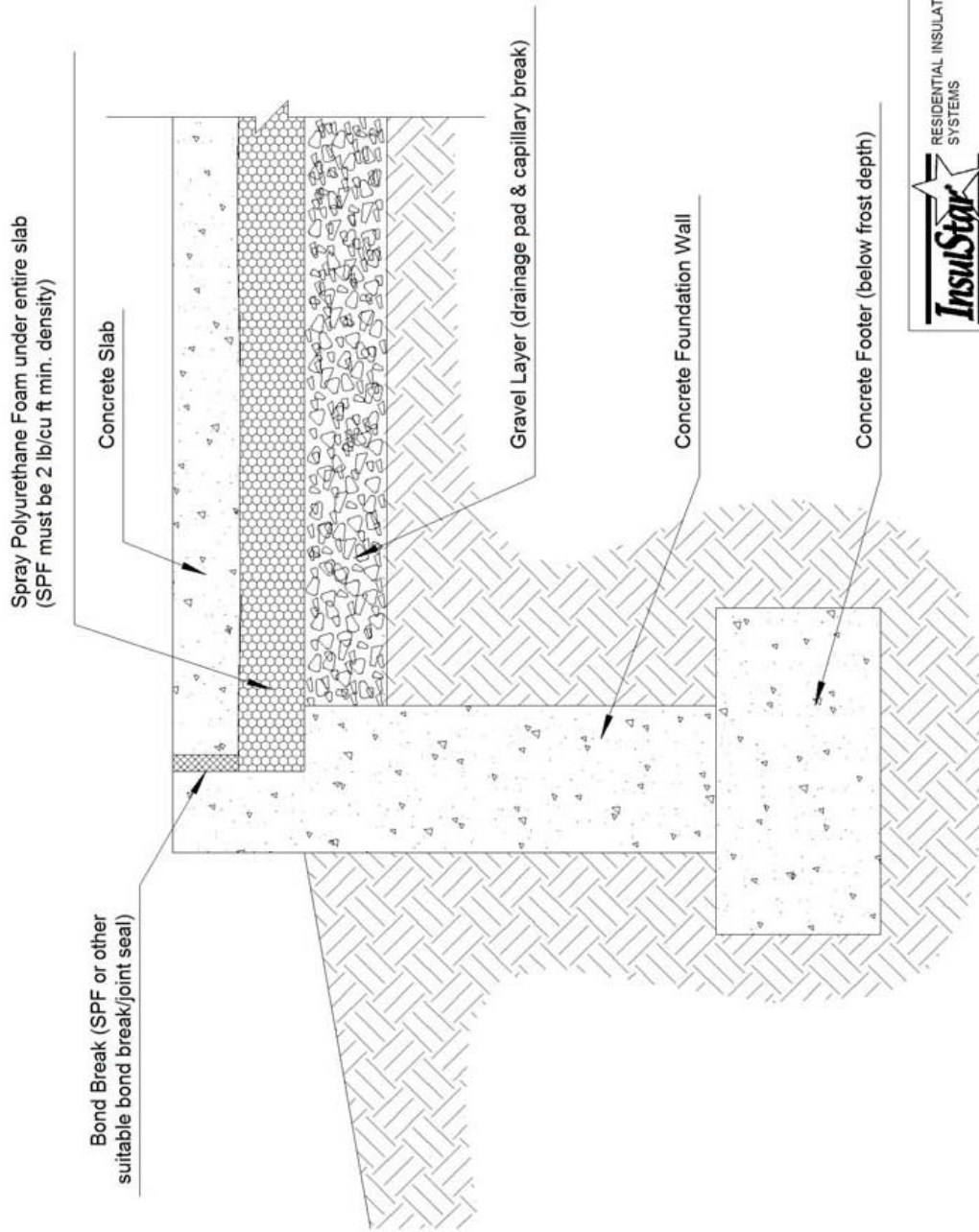



 RESIDENTIAL INSULATION SYSTEMS	
Cathedral Ceiling Non-Vented	
InsulStar-8	122905

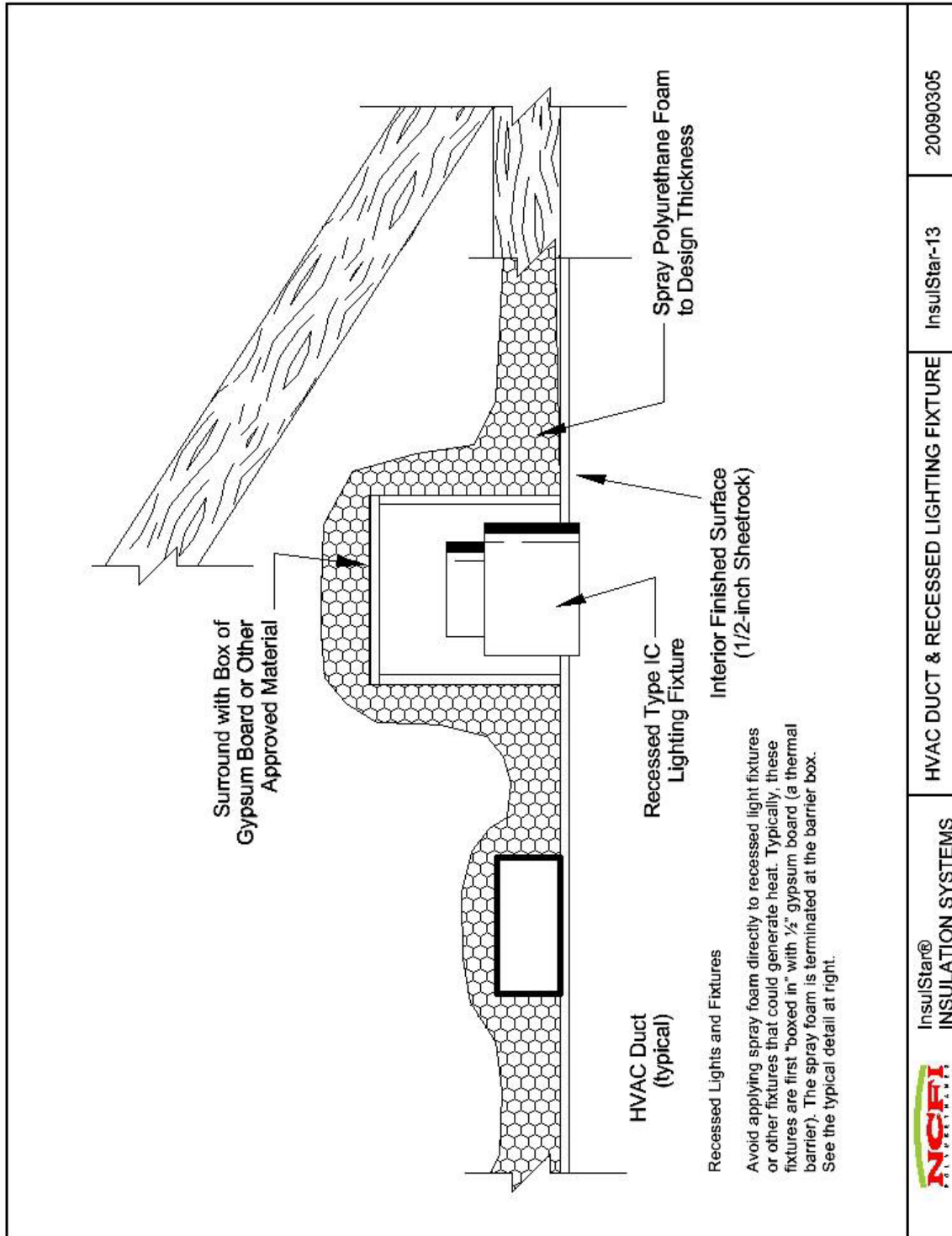




 RESIDENTIAL INSULATION SYSTEMS	<b>Finished Basement Wall with Offset Studs</b>	InsulStar-11	102403



 RESIDENTIAL INSULATION SYSTEMS	
<b>Concrete Slab on Grade</b>	
InsulStar-12	102403

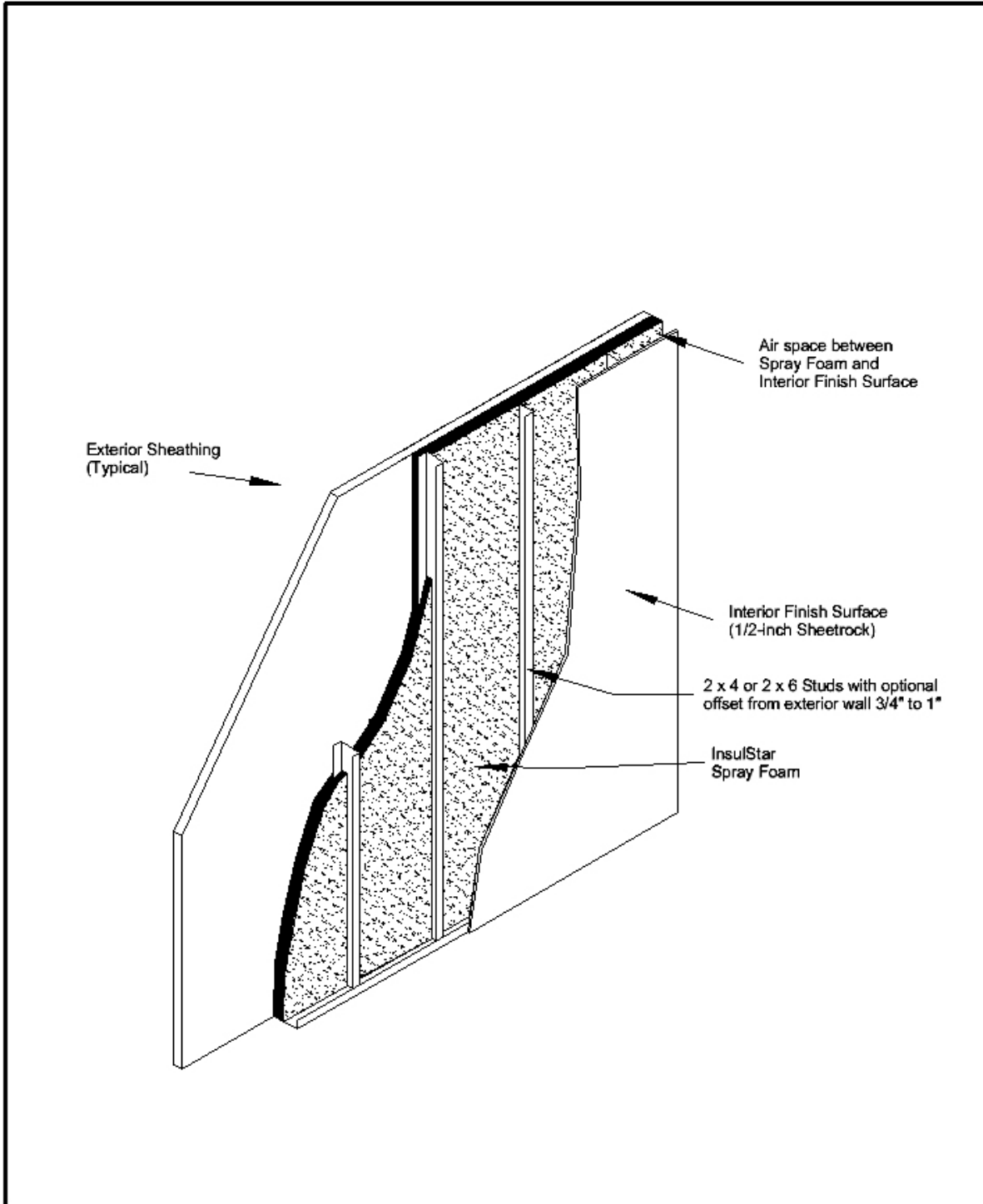


InsulStar®  
INSULATION SYSTEMS

HVAC DUCT & RECESSED LIGHTING FIXTURE

InsulStar-13

20090305



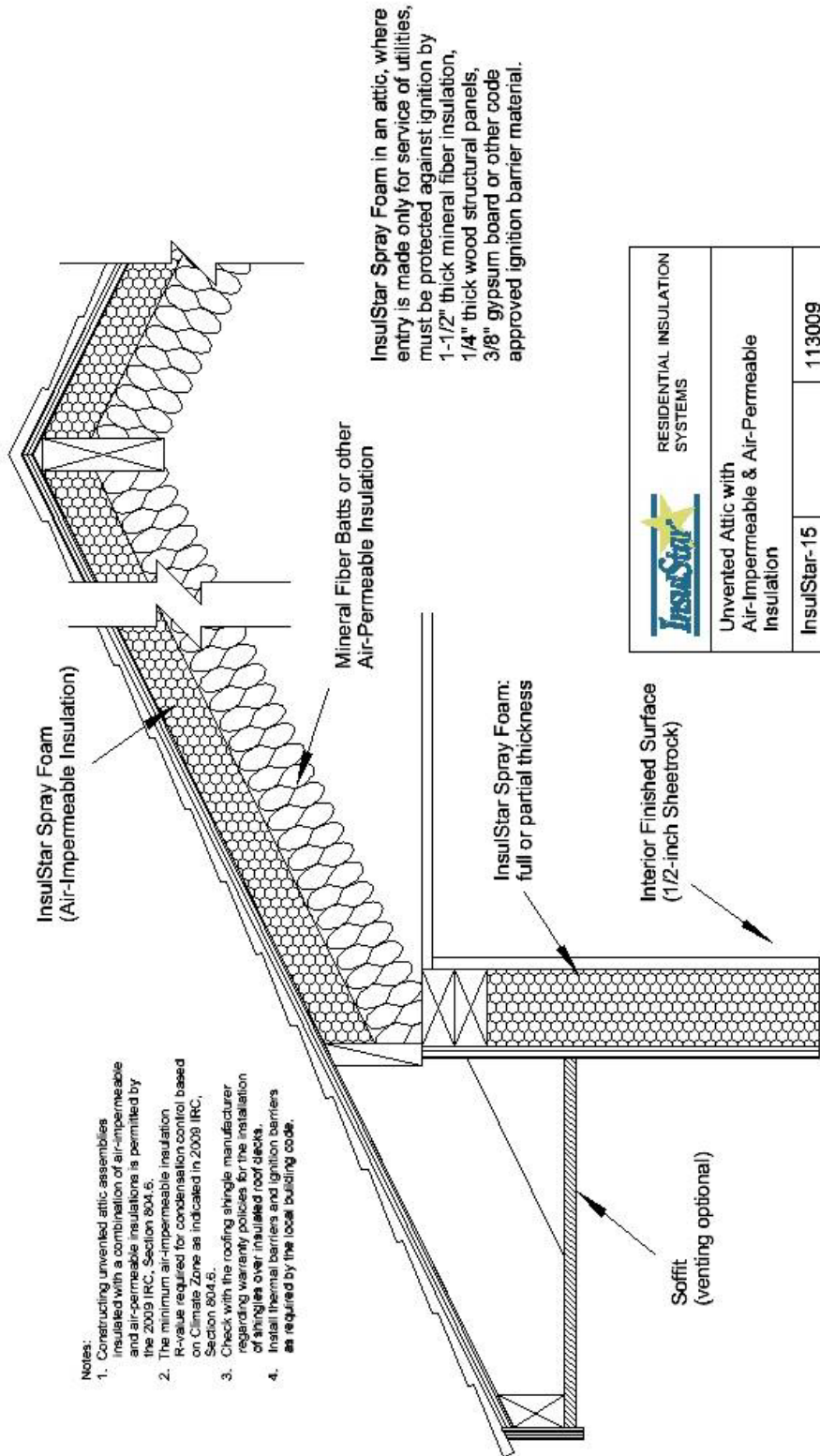
InsulStar® Wall  
Insulation

Exterior Sheathing with  
Metal Studs (Typical)

These details are intended for use by design professionals and users of NCFI products and systems to assist in developing project specific details. They should be modified where necessary to accommodate specific project conditions. Final details and specifications must be approved by a licensed professional.

Dwg. # InsulStar-14

9-29-09  
N.T.S.



- Notes:
1. Constructing unvented attic assemblies insulated with a combination of air-impermeable and air-permeable insulation is permitted by the 2009 IRC, Section 804.6.
  2. The minimum air-impermeable insulation R-value required for condensation control based on Climate Zone as indicated in 2009 IRC, Section 804.6.
  3. Check with the roofing shingle manufacturer regarding warranty policies for the installation of shingles over insulated roof decks.
  4. Install thermal barriers and ignition barriers as required by the local building code.

InsulStar Spray Foam in an attic, where entry is made only for service of utilities, must be protected against ignition by 1-1/2" thick mineral fiber insulation, 1/4" thick wood structural panels, 3/8" gypsum board or other code approved ignition barrier material.

 RESIDENTIAL INSULATION SYSTEMS	
Unvented Attic with Air-Impermeable & Air-Permeable Insulation	
InsulStar-15	113009