In Class 4:

Analyze alternative envelope strategies

Organization

- Break into the groups you've created
- Do, and report on the in-class problem
- Turn in materials produced, with names of participants, for credit

Background Information

- Section 1405.3 of the 2009 IBC states: Class I or II vapor retarders shall be provided on the interior side of frame walls in Zones 5,6,7,8 and Marine 4
- It lists these exceptions
  - basement walls
  - below grade portion of any wall
  - Construction where moisture or its freezing will not damage the materials
- Section 1405.3.1 states that Class III vapor retarders shall be permitted where any one of the conditions in Table 1405.3.1 is met.
- Section 1405.2.3 describes classes of vapor retarders
  - Class I - Sheet polyethlene, nonperforated aluminum foil
  - Class II: kraft-faced fiberglass batts or pain with a perm rating greater than 0.1 and less than or equal to 1.0
  - Class III - Latex or enamel paint

- Joseph Lstiburek, of the Building Science Corporation, states in his paper "Understanding Vapor Barriers" that "Incorrect use of vapor barriers is leading to an increase in moisture related problems. Vapor barriers were originally intended to prevent assemblies from getting wet. However, they often prevent assemblies from drying."

- Mr. Lstiburek goes on to say: "The fundamental principle of control of water in the vapor form is to keep it out and to let it out if it gets in. Simple right? No chance. It gets complicated because sometimes the best strategies to keep water vapor out also trap water vapor in. This can be a real problem if the assemblies start out wet because of rain or the use of wet materials.

- It gets even more complicated because of climate. In general water vapor moves from the warm side of building assemblies to the cold side of building assemblies. This is simple to understand except we have trouble deciding what side of a wall is the cold or warm side. Logically, this means we need different strategies for different climate We also have to take into account differences between summer and winter."

- "The BSA Building Envelope Committee was approached by the Board of Building Regulations and Standards to develop building envelope details demonstrating compliance with the new energy code. ….. The task force developed the details ...., which were then reviewed by the building envelope committee members."

- Three of the BSA Envelope committee details are included with this in-class assignment.
- A copy of figure 1405.3 from the 2009 IBC with climate zones is included
- A copy of 1405.3.1 is included.

Discussion / Writing /Sketching

1 Look at each of the three designs to see if they comply with 1405.3's requirement for a vapor retarder on interior side, or if they make use of the other options

2 Describe how you think water vapor moves through each of the designs, and how the designs mitigate its potential negative effects

3 Discuss and decide if any of these three designs is better suited to being used in other climates, such as that of Mobile, Alabama and Albuquerque, NM

4 Write your results on the overhead projector slides provided.

Presentation: Report out your results to the class

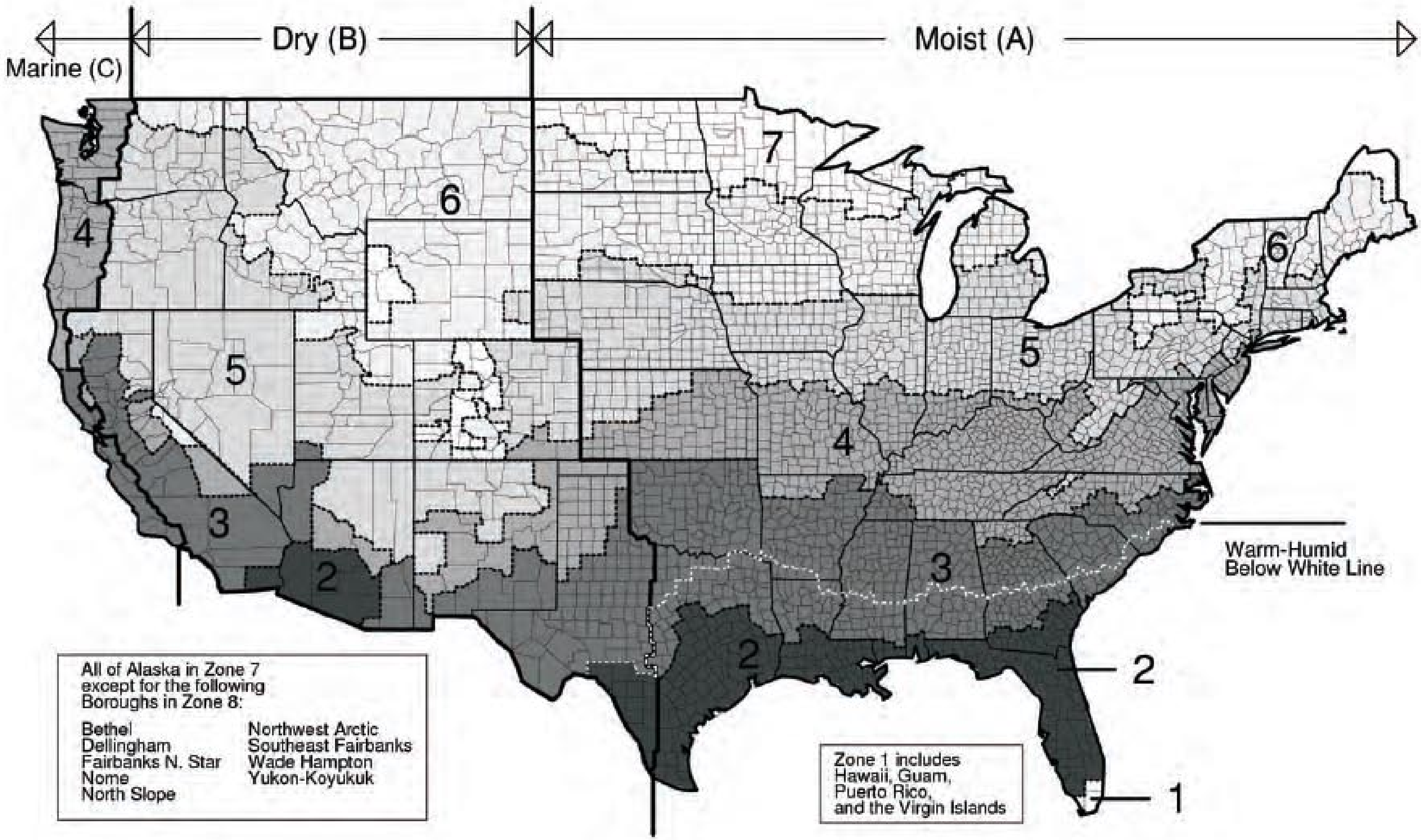


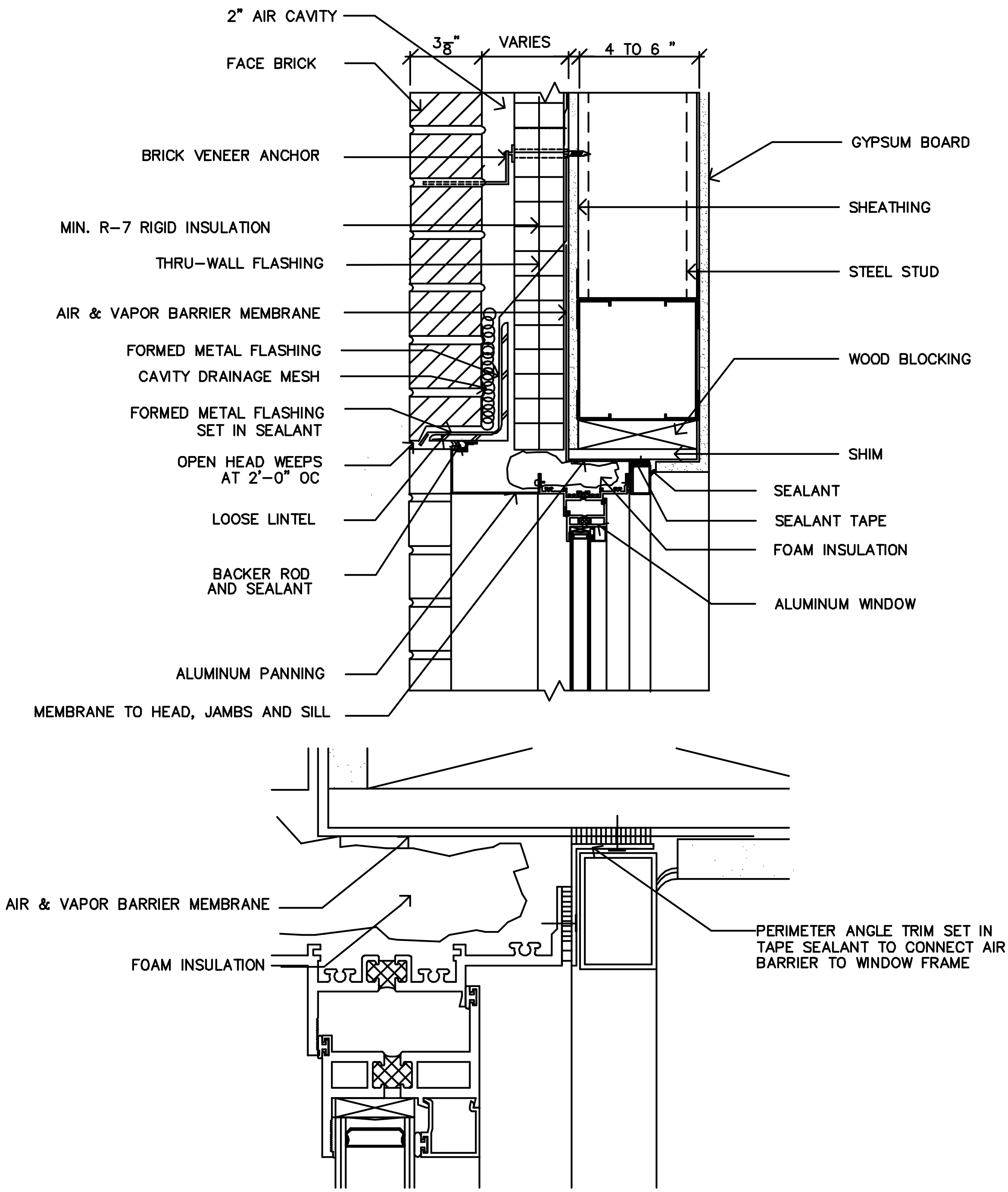
FIGURE 1405.3
CLIMATE ZONES

TABLE 1405.3.1
CLASS III VAPOR RETARDERS

ZONE	CLASS III VAPOR RETARDERS PERMITTED FOR:[a]
Marine 4	Vented cladding over OSB Vented cladding over plywood Vented cladding over fiberboard Vented cladding over gypsum Insulated sheathing with *R*-value ≥ R2.5 over 2×4 wall Insulated sheathing with *R*-value ≥ R3.75 over 2×6 wall
5	Vented cladding over OSB Vented cladding over plywood Vented cladding over fiberboard Vented cladding over gypsum Insulated sheathing with *R*-value ≥ R5 over 2×4 wall Insulated sheathing with *R*-value ≥ R7.5 over 2×6 wall
6	Vented cladding over fiberboard Vented cladding over gypsum Insulated sheathing with *R*-value ≥ R7.5 over 2×4 wall Insulated sheathing with *R*-value ≥ R11.25 over 2×6 wall
7 and 8	Insulated sheathing with *R*-value ≥ R10 over 2×4 wall Insulated sheathing with *R*-value ≥ R15 over 2×6 wall

For SI: 1 pound per cubic foot = 16 kg/m^3.

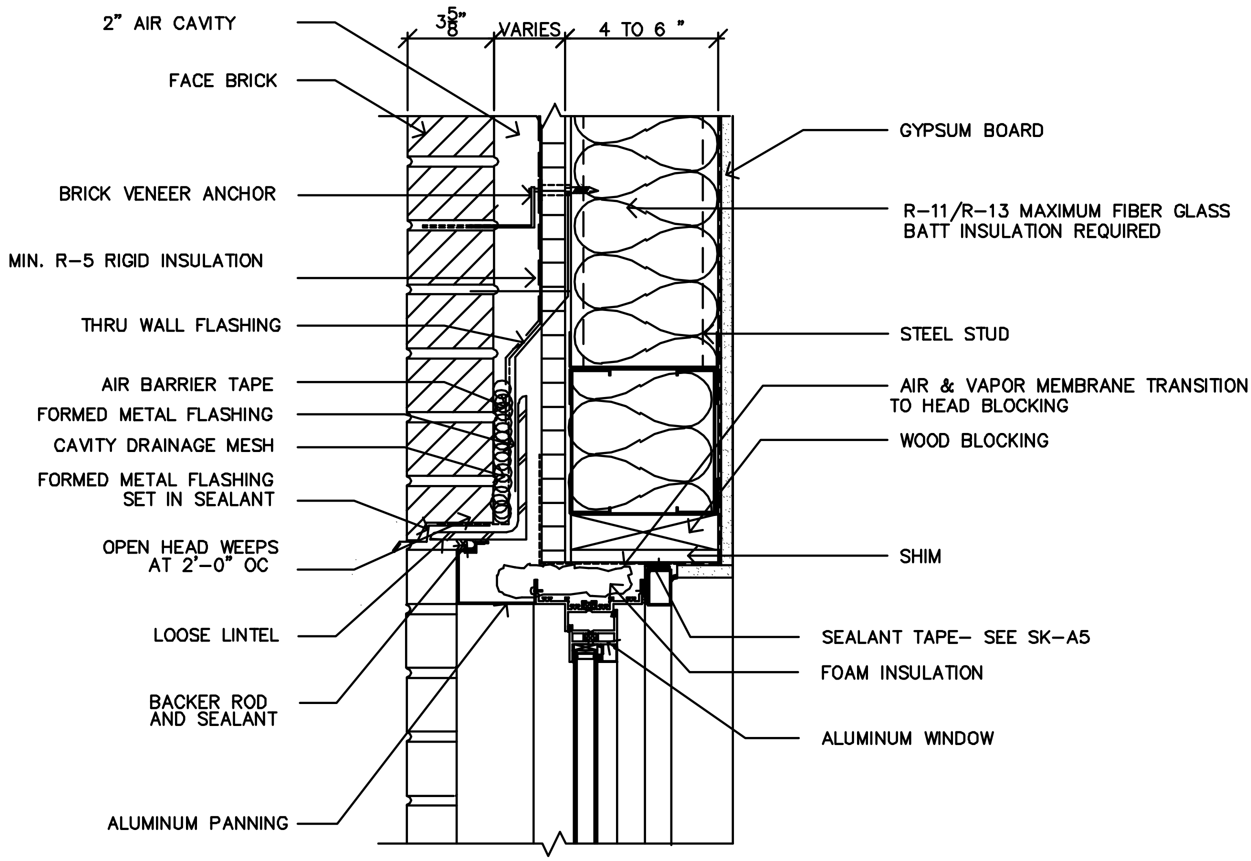
a. Spray foam with a minimum density of 2 lbs/ft^3 applied to the interior cavity side of OSB, plywood, fiberboard, insulating sheathing or gypsum is deemed to meet the insulating sheathing requirement where the spray foam *R*-value meets or exceeds the specified insulating sheathing *R*-value.



DETAIL AT WINDOW HEAD

REFERENCE DETAIL: REGISTERED PROFESSIONAL TO REVIEW PRIOR TO USE

DETAIL	TITLE: WALL: BRICK VENEER DESIGN A	SKETCH NUMBER
ENERGY CODE: CONCEPTUAL DETAILS FOR EDUCATIONAL PURPOSES ONLY	Date: 10/10/2001 Scale: 1-1/2"=1'-0" Drawn: ---	SK-A5 6 OF 11



DETAIL AT WINDOW HEAD

REFERENCE DETAIL: REGISTERED PROFESSIONAL TO REVIEW PRIOR TO USE

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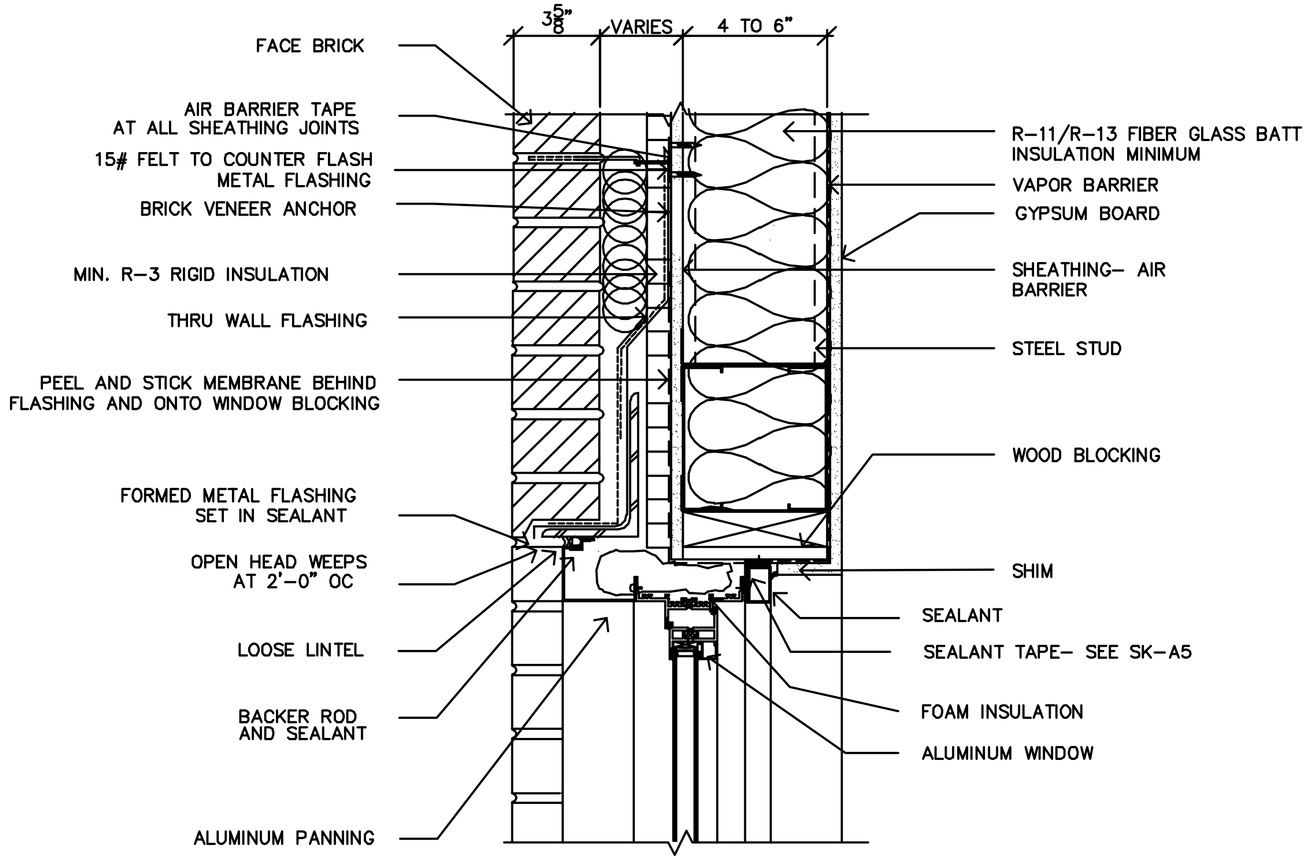

DETAIL AT WINDOW HEAD

REFERENCE DETAIL: REGISTERED PROFESSIONAL TO REVIEW PRIOR TO USE

DETAIL	TITLE: WALL: BRICK VENEER DESIGN C		SKETCH NUMBER
ENERGY CODE: CONCEPTUAL DETAILS FOR EDUCATIONAL PURPOSES ONLY		Date: 10/10/2001 Scale: 1-1/2"=1'-0" Drawn: ---	SK-C4 5 OF 8