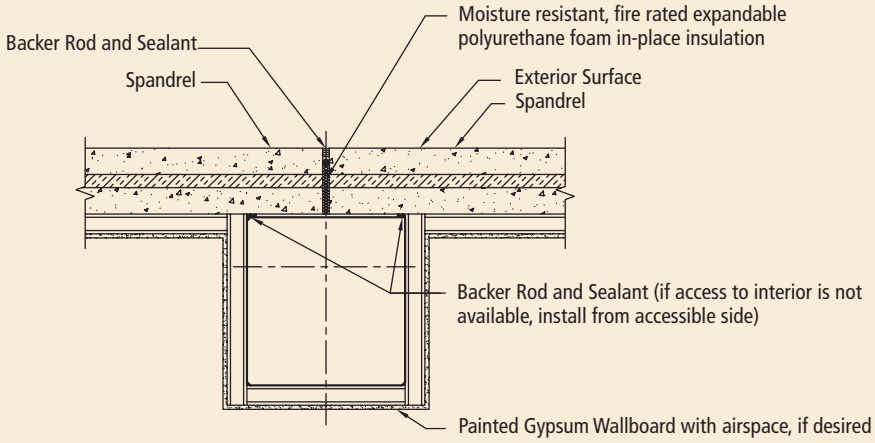
**Special Applications and Building Type.** Special precautions are required for buildings with high indoor humidities or spaces with sensitive electronic equipment or artifacts. These include swimming pools, ice rinks, cold storage, computer rooms, libraries, hospitals, nursing homes, museums, and some manufacturing facilities. Low permeance vapor retarders are often needed to separate indoor swimming pools or other special applications from the rest of the building.

**Details.** Figures 5.3.21 through 31 provide conceptual details on how to construct the precast concrete system to achieve energy savings while providing an air barrier and reducing the potential for moisture problems. The recommendations and details presented are based on specific analyses, engineering judgment, and best available practices at the time of publication. Performance testing of the details has not been performed. Detail drawings are provided in order to assist competent professionals in the detailing of the building insulation envelope. Reinforcing designations, structural connections, wythe thickness, and insulation indicated in drawings are to be used for reference only and are not intended to substitute for project specific judgment.

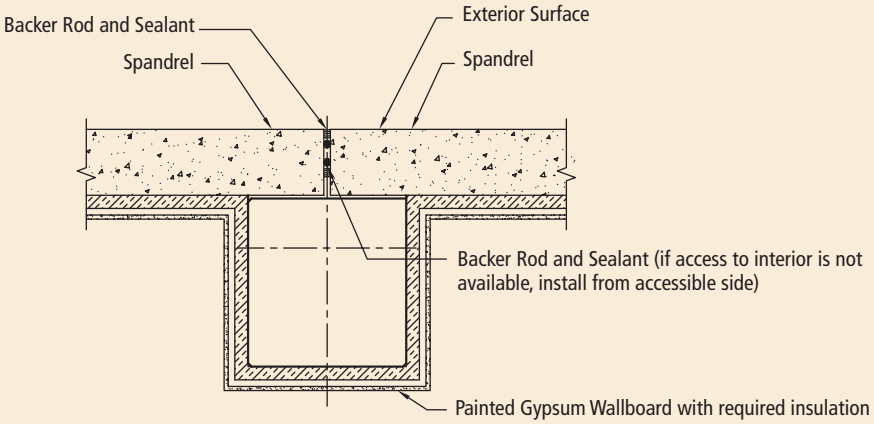
**Water Leakage.** The exterior surface of the precast concrete system acts as a weather barrier to prevent rain and snow from entering the building. As shown in Figs. 5.3.21 and 22, joints in the precast concrete generally have either two layers of sealant, or sealant and a secondary method of defense against water penetration. Joints around windows, doors, and other penetrations through the precast concrete building are designed with a primary and secondary method of defense against rainwater penetration.

**Floor Systems.** The provided details are for a double tee floor system. Details for hollow core floor systems will be similar, including insulation requirements. The main concept is to separate the floor slabs from the exterior concrete by insulation to reduce thermal bridges. This will reduce energy losses and the potential for condensation and moisture problems.

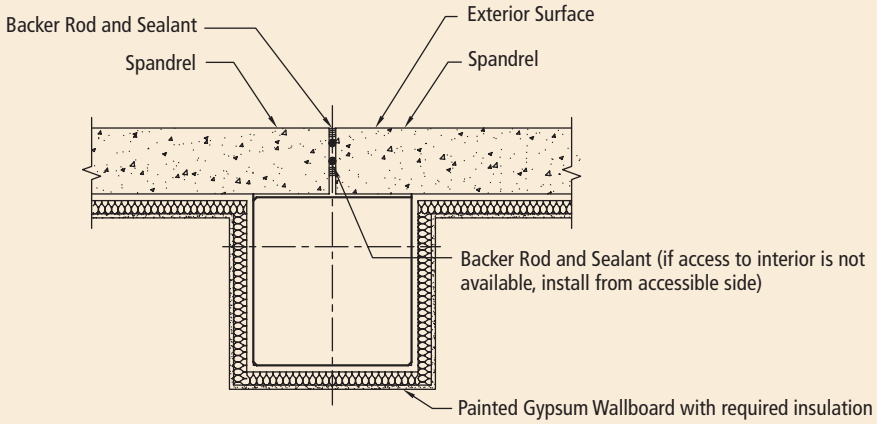
Figures 5.3.23 and 24 present two options for insulating floors above unconditioned spaces such as parking structures. In these cases the concrete floor acts as a semi-impermeable vapor retarder. Figure 5.3.23 with rigid insulation is preferable. If spray-on or batt insulation are used as shown in Fig. 5.3.24, it should be wrapped around the precast concrete stems.




**"A" Precast Sandwich Panel Wall**
Not to scale

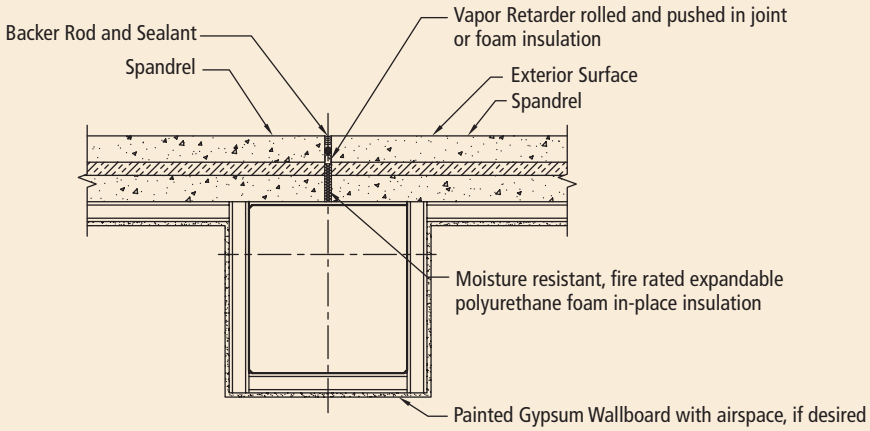



**"B" Precast Concrete with Rigid Insullation**
Not to scale

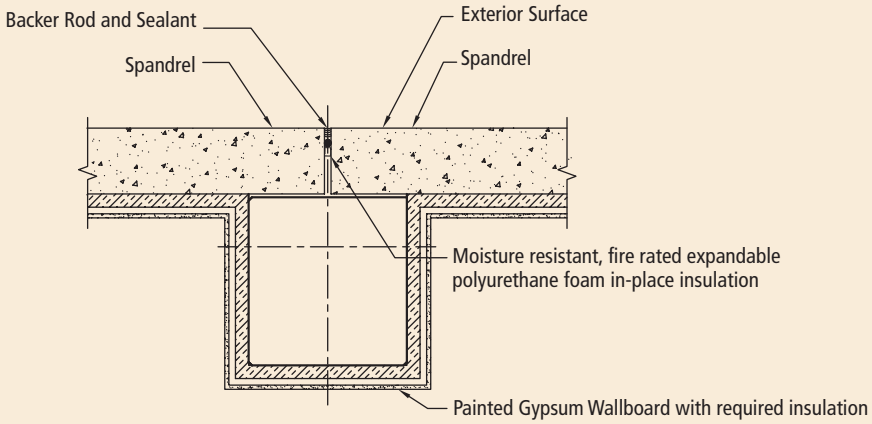



**"C" Precast Concrete with Batt Insullation**
Not to scale

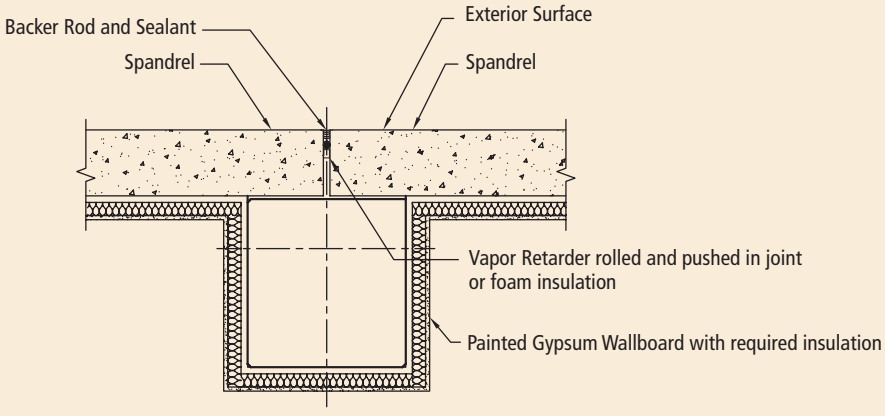
*Fig. 5.3.21*
*Typical spandrel/column detail – Option A.*




**"A" Precast Sandwich Panel Wall**
Not to scale

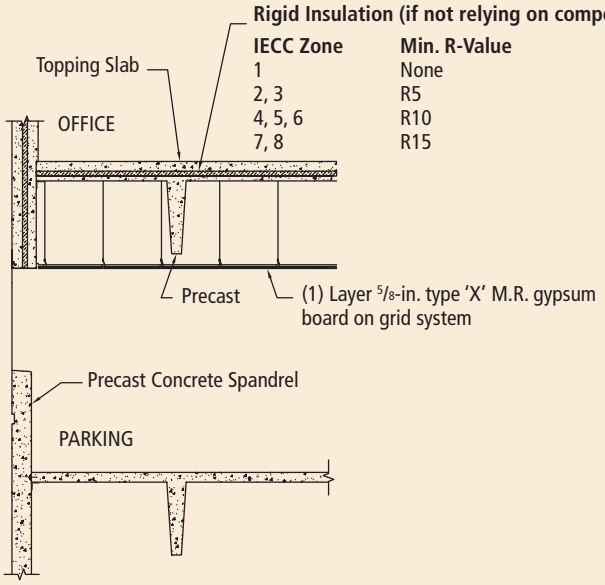



**"B" Precast Concrete with Rigid Insulation**
Not to scale



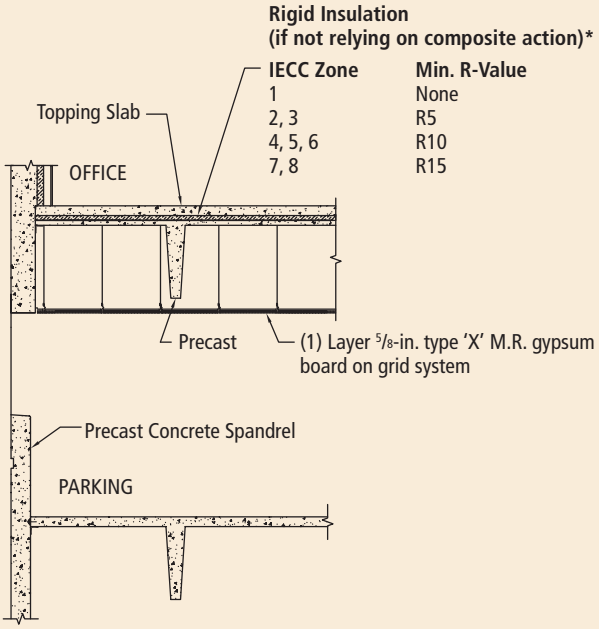

**"C" Precast Concrete with Batt Insulation**
Not to scale

*Fig. 5.3.22*
*Typical spandrel/column detail – Option B.*

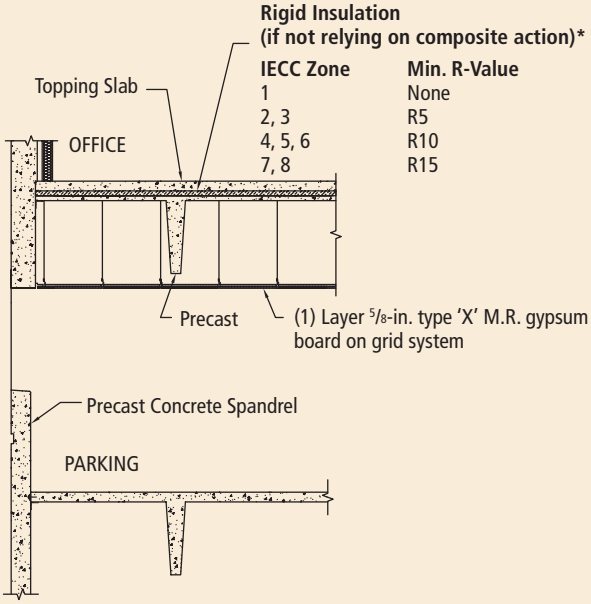



**"A" Precast Sandwich Panel Wall**
Not to scale

*NOTE: Add topping slab below insulation for composite action



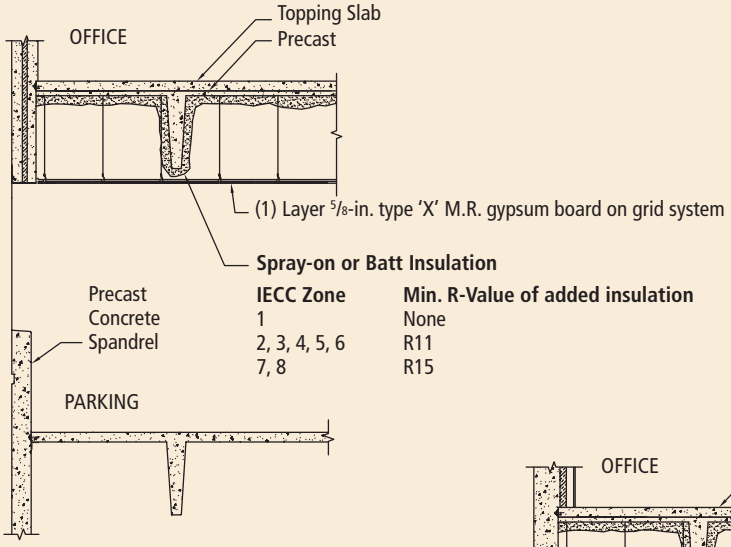

**"B" Precast Concrete with Rigid Insulation**
Not to scale




**"C" Precast Concrete with Batt Insulation**
Not to scale

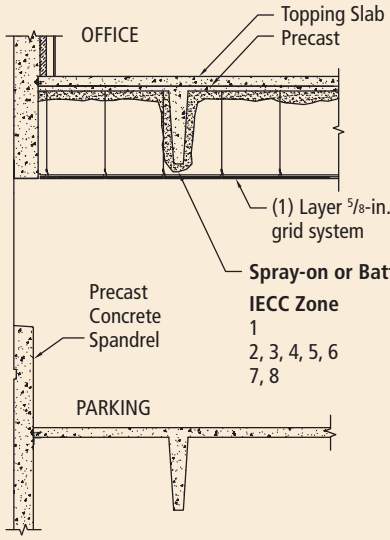
*(See Fig. 5.3.25 for Spandrel/DT insulation}*

*Fig. 5.3.23 Typical floor detail – rigid insulation.*



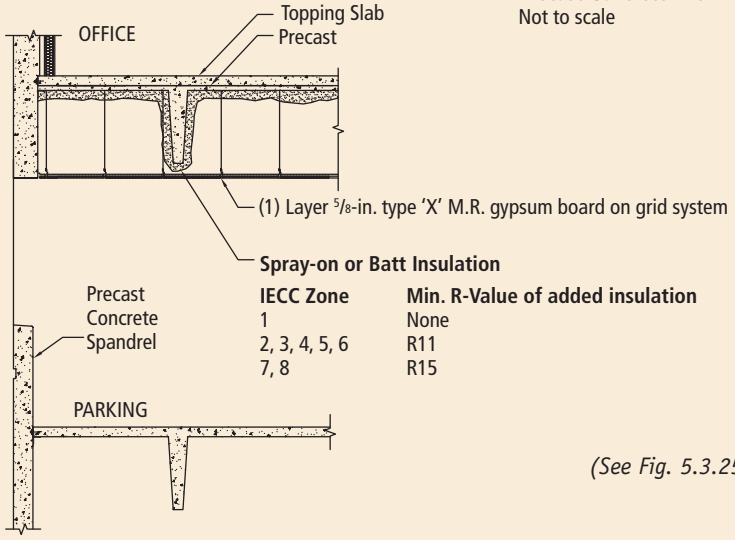

| IECC Zone | Min. R-Value of added insulation |
|---|---|
| 1 | None |
| 2, 3, 4, 5, 6 | R11 |
| 7, 8 | R15 |

**"A" Precast Sandwich Panel Wall**
Not to scale




| IECC Zone | Min. R-Value of added insulation |
|---|---|
| 1 | None |
| 2, 3, 4, 5, 6 | R11 |
| 7, 8 | R15 |

**"B" Precast Concrete with Rigid Insulation**
Not to scale

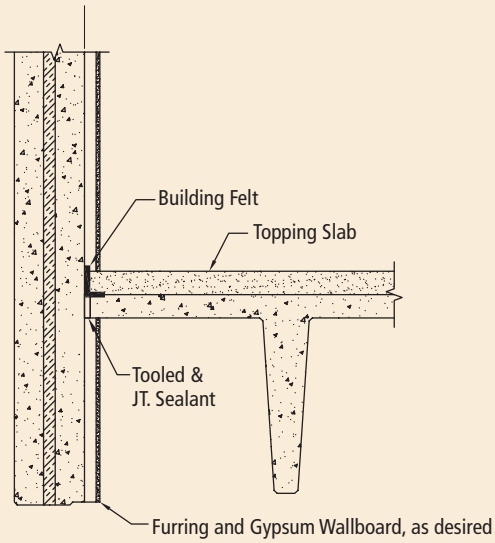



| IECC Zone | Min. R-Value of added insulation |
|---|---|
| 1 | None |
| 2, 3, 4, 5, 6 | R11 |
| 7, 8 | R15 |

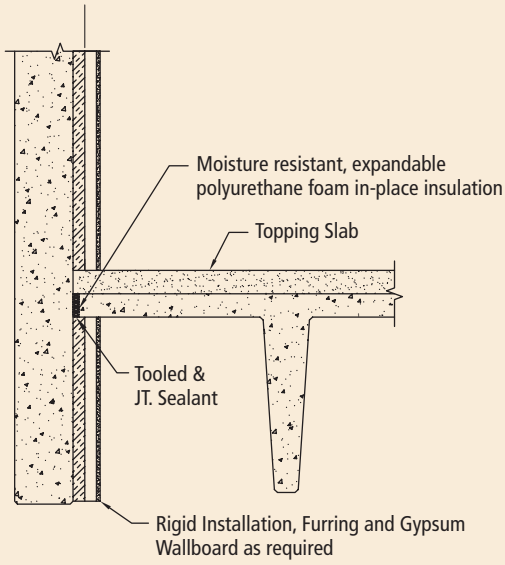
**"C" Precast Concrete with Batt Insulation**
Not to scale

*(See Fig. 5.3.25 for Spandrel/DT insulation}*

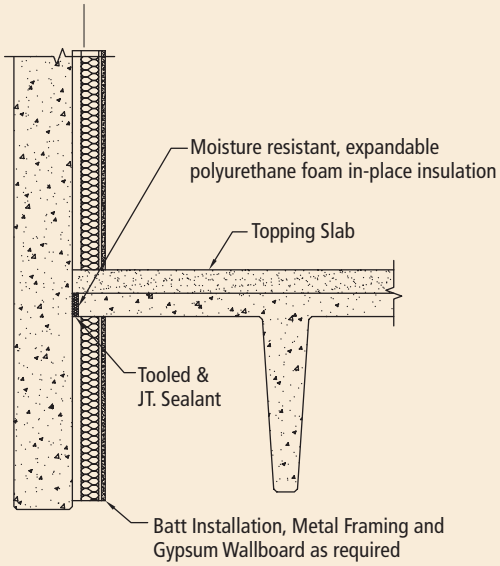
*Fig. 5.3.24 Typical floor detail – alternate batt insulation.*




**"A" Precast Sandwich Panel Wall**
Not to scale

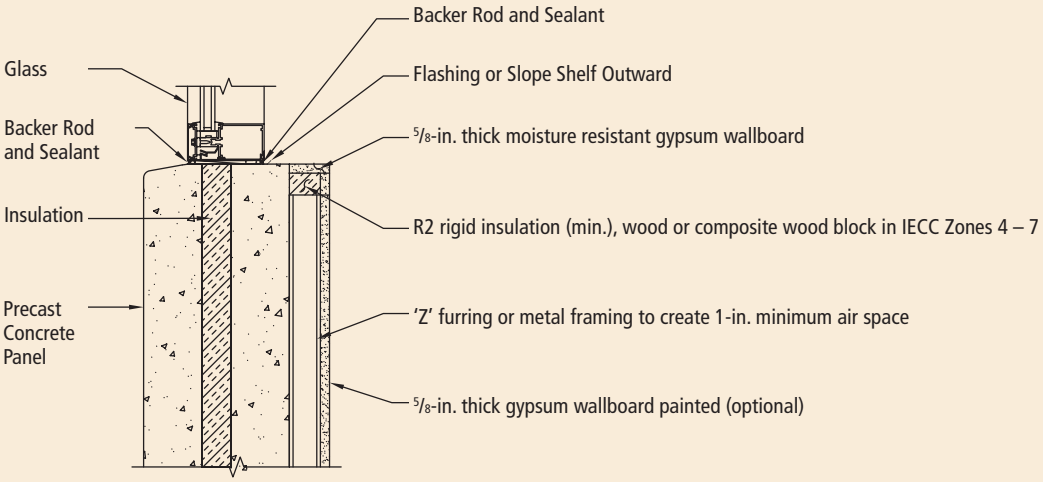



**"B" Precast Concrete with Rigid Insulation**
Not to scale

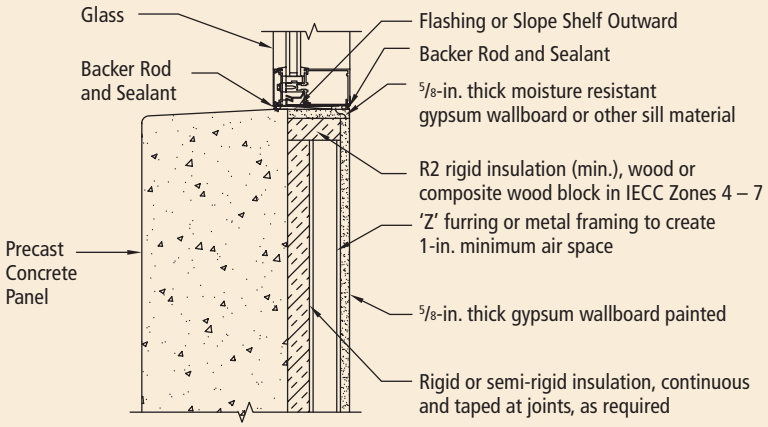



**"C" Precast Concrete with Batt Insulation**
Not to scale

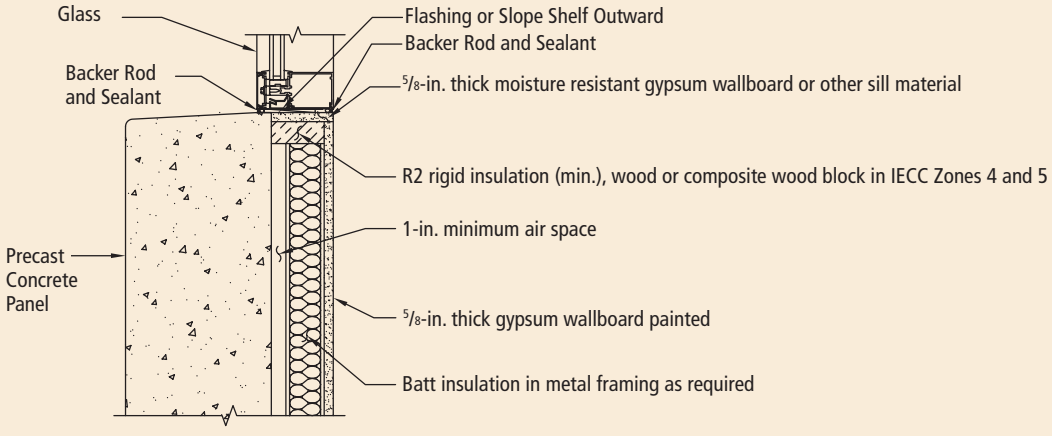
*Fig. 5.3.25 Typical non-loadbearing spandrel/DT detail.*




**"A" Precast Sandwich Panel Wall**
Not to scale

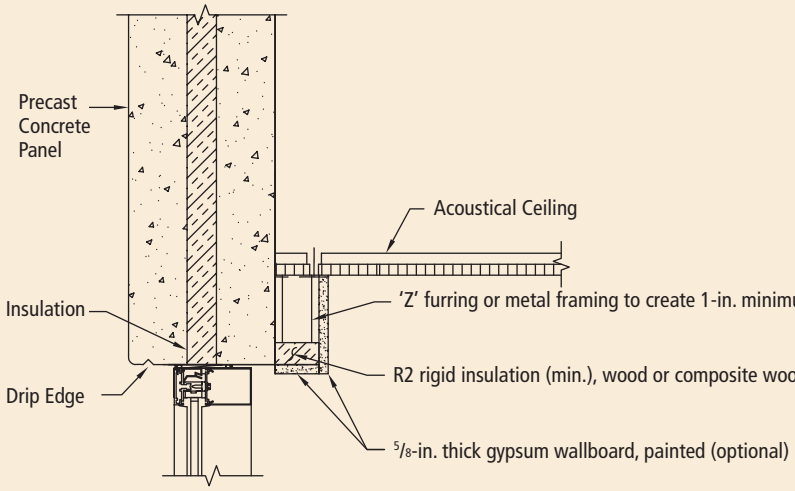



**"B" Precast Concrete with Rigid Insulation**
Not to scale

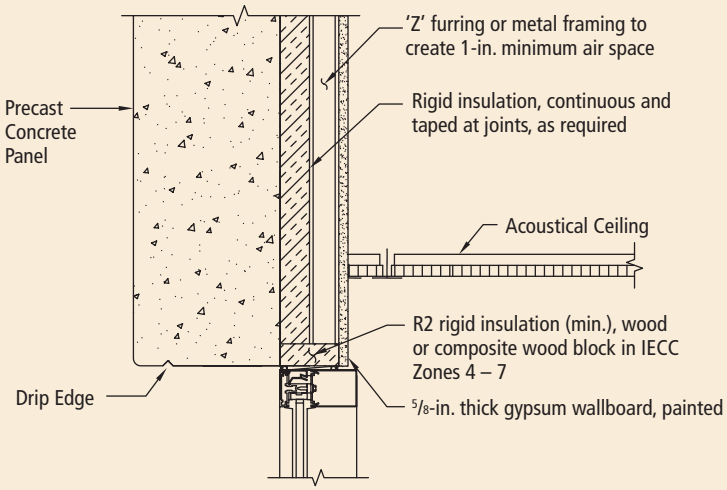



**"C" Precast Concrete with Batt Insulation**
Not to scale

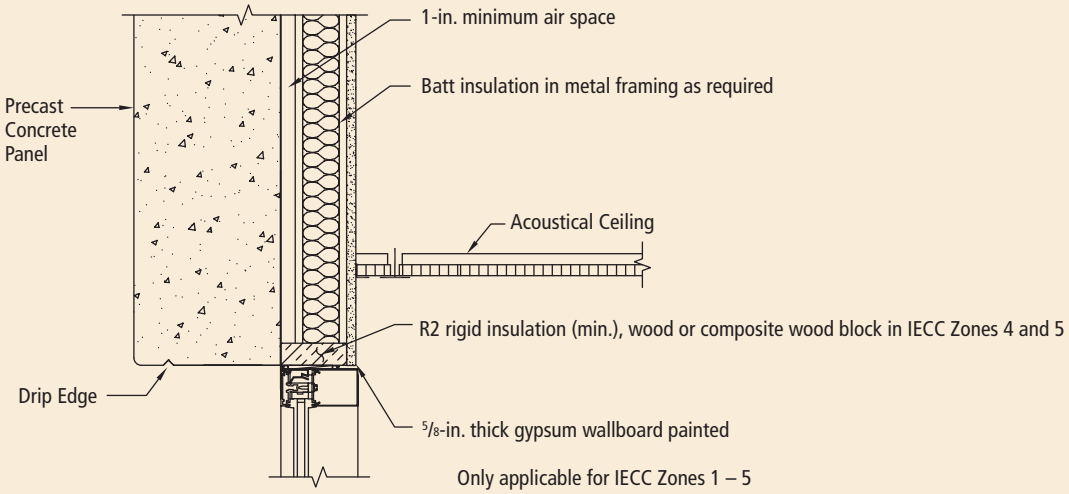
*Fig. 5.3.26 Typical window sill detail.*




**"A" Precast Sandwich Panel Wall**
Not to scale

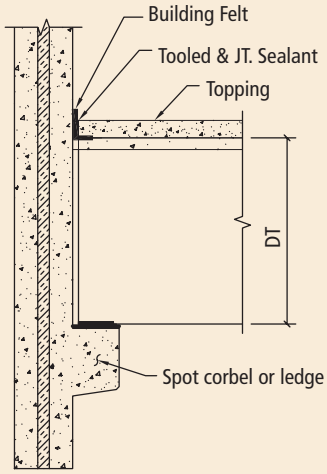



**"B" Precast Concrete with Rigid Insulation**
Not to scale

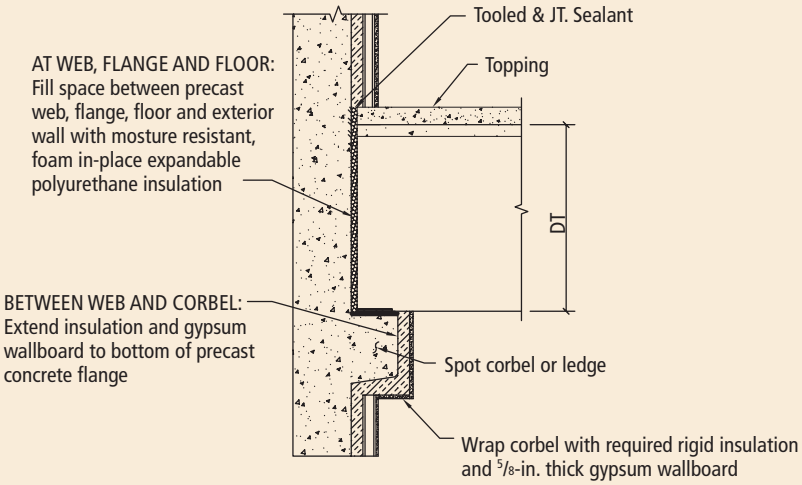



**"C" Precast Concrete with Batt Insulation**
Not to scale

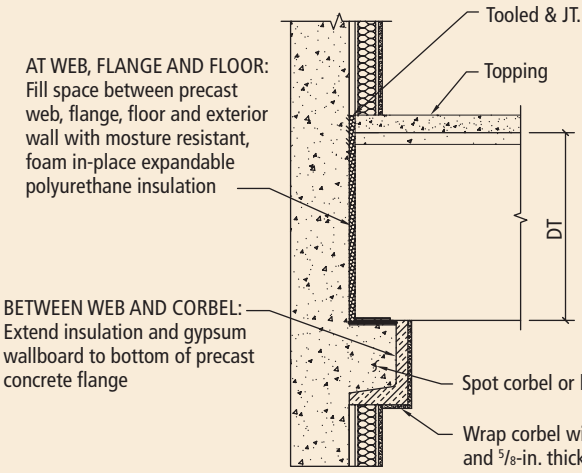
*Fig. 5.3.27 Typical window head detail.*




**"A" Precast Sandwich Panel Wall**
Not to scale




**"B" Precast Concrete with Rigid Insulation**
Not to scale



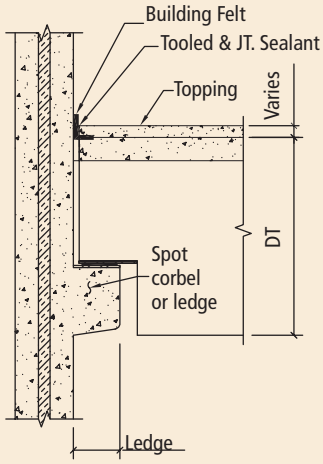

**For Sections B & C – corbel insulation**

| IECC Zone | Min. R-Value of Added Insulation |
|---|---|
| 1, 2 | None |
| 3B | None |
| 3A (Below "Warm Humid Line") | None |
| 3A (Above "Warm Humid Line") | R7.5 |
| 3C, 4A, 4B | R7.5 |
| 4C, 5, 6* | R10 |
| 7 | R12.5 |

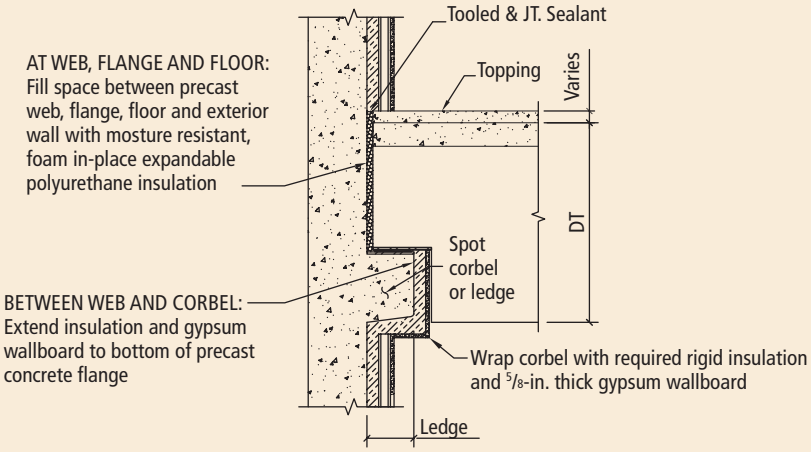
*Not Applicable for Section C

**"C" Precast Concrete with Batt Insulation**
Not to scale

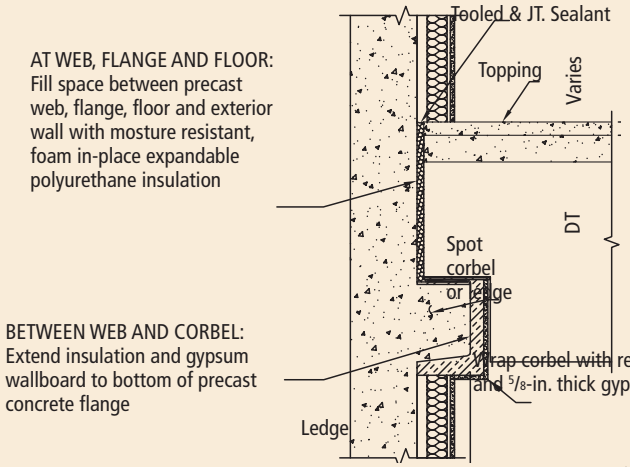
*Fig. 5.3.28*
*Typical loadbearing spandel with corbel/DT detail.*




**"A" Precast Sandwich Panel Wall**
Not to scale




**"B" Precast Concrete with Rigid Insulation**
Not to scale

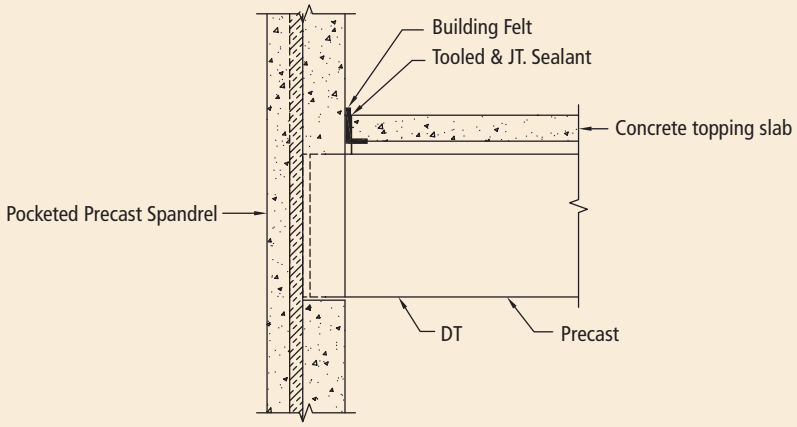



**"C" Precast Concrete with Batt Insulation**
Not to scale

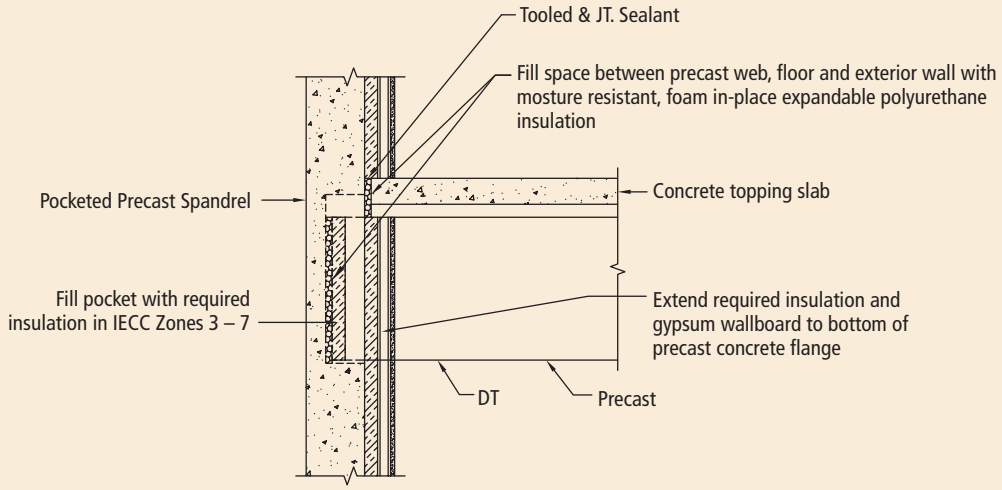
**For Sections B & C – corbel insulation**

| IECC Zone | Min. R-Value of Added Insulation |
|---|---|
| 1, 2 | None |
| 3B | None |
| 3A (Below "Warm Humid Line") | None |
| 3A (Above "Warm Humid Line") | R7.5 |
| 3C, 4A, 4B | R7.5 |
| 4C, 5 | R10 |

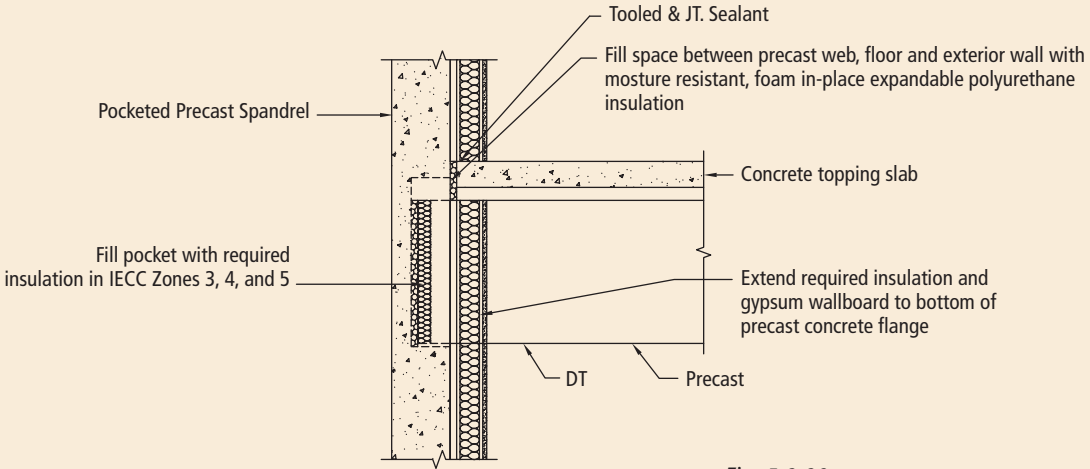
*Fig. 5.3.29*
*Typical loadbearing spandrel with corbel/dapped DT detail.*




**"A" Precast Sandwich Panel Wall**
Not to scale

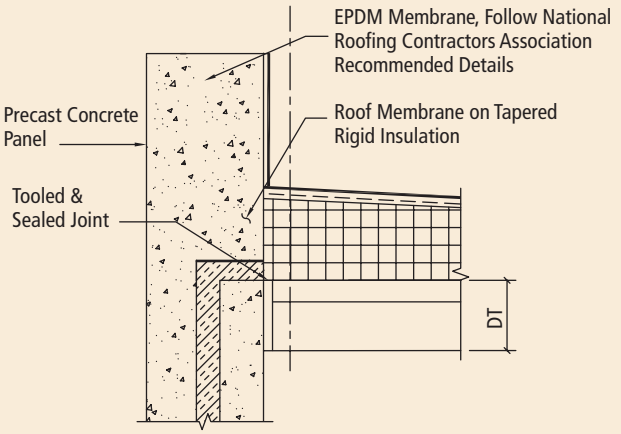



**"B" Precast Concrete with Rigid Insulation**
Not to scale



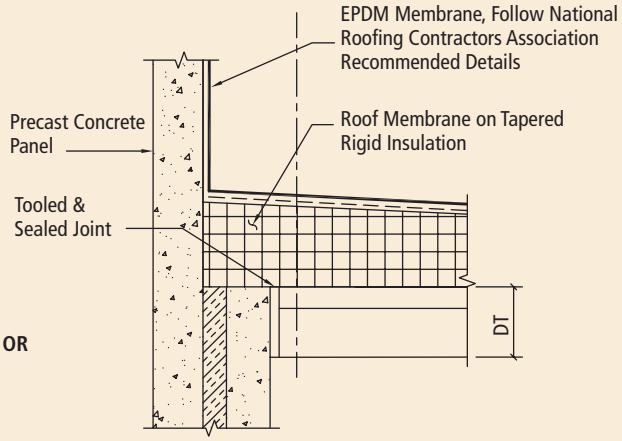

**"C" Precast Concrete with Batt Insulation**
Not to scale

*Fig. 5.3.30*
*Typical pocketed loadbearing spandrel/DT detail.*

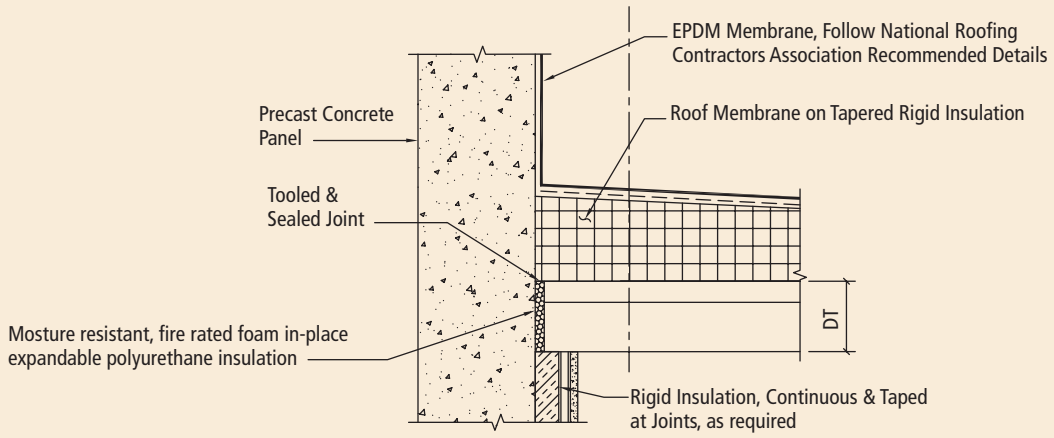



**"A" Precast Sandwich Panel Wall**
Not to scale

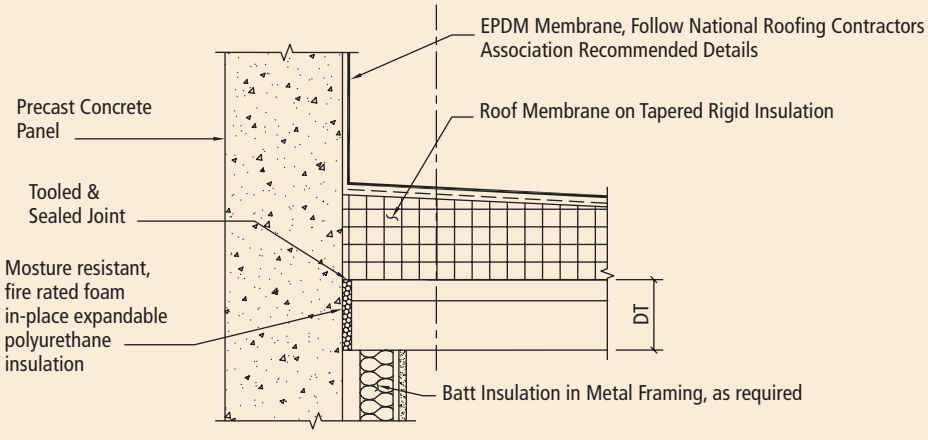
OR




**"A" Precast Sandwich Panel Wall**
Not to scale




**"B" Precast Concrete with Rigid Insulation**
Not to scale




**"C" Precast Concrete with Batt Insulation**
Not to scale

*Fig. 5.3.31 Typical roof parapet detail.*