Technical Design & Finishing Guide

... a technical resource for Architects, Builders, and Homeowners that use Superior Walls products.
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Technical Design & Finishing Guide

Superior Walls are pre-engineered as residential basement and foundation walls for detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories in height with a separate means of egress.

Projects that involve details and conditions which are beyond the scope of the pre-engineering parameters described in this manual MUST be designed in accordance with accepted engineering practice and require project-specific review and detailing by a person competent in applying the structural design principles involved. In many jurisdictions this will require a registered design professional.

REQUIREMENTS, CAPACITIES, DESIGN VALUES & LIMITATIONS

Specifications

Specified Concrete Compressive Strength ($f'_c$) = 5,000 psi min. @ 28 days
Specified Water Cement Ratio = .40 (not to exceed)
Specified Entrained Air Range = 5% to 7%
Crushed Stone
Superior Walls must be supported on clean crushed stone. Clean crushed stone shall be free from organic, clayey or silty soils. Crushed stone shall be angular in nature and meet ASTM C33, with the nominal maximum size stone not to exceed 1/2”. If crushed stone footing is deeper than 8”, stone should be placed in 8” lifts and each lift consolidated with a plate vibrator.

Capacities

Maximum Uniform Load on Wall = 5,500 pounds/LF
(Assumes stud spacing is 24” o.c.)
(includes support ledge loads)

Maximum uniform load on support ledges = 2,900 pounds/LF
(This is to be included as part of the 5,500 lb/LF maximum uniform wall loading.)

Maximum lateral earth pressure (from backfill/soil)
10'-0” R-5 Wall = 45 PSF/Foot of depth
All other R-5 Wall heights = 60 PSF/Foot of depth
ALL Xi Wall heights = 100 PSF/Foot of depth

Tested Shear Capacity (Racking Shear) (In plane)
R-5 Walls (Per ESR-1553) = 380 lbf/LF
Xi Walls (Per ESR-1662) = 500 lbf/LF

Note: These tested shear capacity values are net values after applying a safety factor of 3.0 to the tested results. The computed shear capacity, based on ACI 318-05 Section 11.3.2.1, will obtain higher values.
PRODUCTION MINIMUM DISTANCES: Xi Wall

The following information is a summary of the minimum required distances that an opening (window, door, beam pocket) must be spaced from a particular point, listed by Xi form parts.

OUTSIDE CORNER 45°: Rough Opening (R.O.) to outer edge of the resulting 90° Corner.
- Windows / Doors less than 40-3/4" wide: 17-3/4"
- Windows / Doors over 40-3/4" wide: 21-7/16"
- Beam Pockets: 16-3/4"

OUTSIDE CORNER 22.5°: R.O. to the outer edge of the resulting 45° Corner.
- Windows / Doors less than 40-3/4" wide: 13-1/16"
- Windows / Doors over 40-3/4" wide: 17-5/16"
- Beam Pockets: 12-9/16"

INSIDE CORNER 45°: R.O. to the outer edge of the resulting inside 90° Corner.
- Windows / Doors less than 40-3/4" wide: 12-1/8"
- Windows / Doors over 40-3/4" wide: 16-7/16"

INSIDE CORNER 22.5°: R.O. to the outer edge of the resulting inside 45° Corner.
- Windows / Doors less than 40-3/4" wide: 10-5/16"
- Windows / Doors over 40-3/4" wide: 14-9/16"
- Beam Pockets: 9-13/16"

PANEL DIVIDERS: R.O. to the panel divider.
- Windows / Doors less than 40-3/4" wide: 12-5/16"
- Windows / Doors over 40-3/4" wide: 16-5/8"

INSIDE 90° CORNER (6” Overlap / with openings on the Butt Wall): R.O. to the face of the Receiving Wall.
- Windows / Doors less than 40-3/4" wide: 5-13/16"
- Windows / Doors over 40-3/4" wide: 10-1/8"

INSIDE 90° CORNER (6” Overlap / with openings on the Receiving Wall): R.O. to the face of the Butt Wall.
- All Openings: 4-1/8"

INSIDE 90° CORNER (10-1/4” Overlap / with openings on the Butt Wall): R.O. to the face of the Receiving Wall.
- Doors less than 40-3/4" wide: 18-3/16"
- Windows less than 40-3/4" wide: 5-7/8"
- Windows / Doors over 40-3/4" wide: 22-9/16"

INSIDE 90° CORNER (10-1/4” Overlap / with openings on the Receiving Wall): R.O. to the face of the Butt Wall.
- All Openings: 4”
RADIANT FLOOR HEATING

The following instructions provide a method for utilizing radiant floor heating with Superior Walls® Xi and R-5 wall systems. Other methods may be used to thermally isolate the floor slab from the foundation wall and to insulate the floor slab. However, if other methods are used, those methods need to adequately support the Superior Walls panels laterally and the vertical load transfer path to the soil cannot be compromised.

CAUTION:
- A minimum of 2500 psi concrete must be used for the floor slab, per 2009 IRC R402.2.
- Backfill must not exceed 60 pounds per cubic foot (PCF) equivalent fluid pressure (45 PCF equivalent fluid pressure for 10' R-5 walls).
- Refer to all applicable codes and manufacturer specifications for extruded (XPS) foam requirements.

1. Insulate beneath the entire floor slab area per the specifications of the heating contractor, cutting a 45° bevel along the edge of any foam that touches the footer beam of the Superior Walls panels.
2. Place one (1) 5,000 psi 4" x 4" x 1/4" plastic shim against the footer beam, as shown below, at each panel joint and as required to maintain a maximum spacing of one (1) shim per every 12'. Adhesive may be used to secure the shim to the footer beam.

   CAUTION: One shim MUST be placed and centered at each panel joint. The MAXIMUM shim spacing is 12' on center from one shim to the next.

3. Cut a 45° bevel on a 2" (min.) thick rip of foam, at a height equal to the desired depth of concrete.

   NOTE: Foam rip may need to be protected with a termite shield. Alternative materials may be substituted for the foam rip as required. Additionally, slab edge insulation may not be required in certain jurisdictions designated by the code official as having a very heavy termite infestation (see 2009 IRC section N1102.2.8).

4. Place rip of foam vertically against the footer beam, as shown below, between the plastic shims.
5. Pour concrete slab up to the vertical rip of foam.
Joist Strap Installation Procedures

1. NAIL JOIST STRAP TO JOIST WHILE MAINTAINING A 15 ANGLE FROM THE SILL PLATE.

2. BEND FRONT TAB OF JOIST STRAP DOWN TO SILL PLATE AND NAIL TO SILL PLATE.

Note:

A. Joist Strap can be used on joists that are perpendicular or parallel to wall.

B. This step is an alternative for using (3) 8d be-nails through the floor joist into the sill plate.

C. Use every nail hole.

Use (5) 10d 9ga X 1 1/2" Hot Galvanized Joist Hanger Nails after bending strap down.

P/N 153A
SIMPSON STRONG-TIE: Hold Down Devices

Simpson Strong-Tie® manufactures many types of hold down devices that may be used with Superior Walls panels to accommodate a wide range of loads. The local supplier and/or the www.strongtie.com website can be used to help determine the correct device for a specific project.

NOTE: Superior Walls hold down capacity @ 16” from corner: 5,000 lbs. (2x4 construction) 6,000 lbs. (2x6 construction) (requires adequately sized device)

NOTE: Superior Walls hold down capacity in corner: 4,000 lbs. (with adequately sized device)

Typical connection to Superior Wall.
STEEL ALTERNATIVE STAIRWELL PROCEDURES

Steel Alternative Stairwell Header Procedure - Parallel Joists

DETAIL A

Top Flange Joist Hanger
Rim Joist
(2 X 10) Sill Plate
Steel Plate
Every 2'-0" O.C., Top Flange Joist Hanger
With Additional Support At Bond Beam

DETAIL B

Separation In Sill Plate
Continuous Steel Plate - Thickness And Length As Required By Design

SECTION A-A
Bolt Through Steel Plate In All Existing Bolt Hole Locations
(2 x 4) Nailed Through Subfloor At Solid Block

Bolt Through Steel Plate In
All Existing Bolt Hole Locations
Continuous Steel Plate No Spacing

TOP VIEW

Effective Beam Specified Backfill Area
Length Of Opening 24"
Steel Alternative Stairwell Header Procedure - Perpendicular Joists

**DETAIL A**
Bolt Through Steel Plate in All Existing Bolt Hole Locations

**SECTION A-A**
Continuous Steel Plate
No Splices

**DETAIL B**
Separation in Sill Plate

**TOP VIEW**
Length of Opening
24”

Effective Beam/Specail Backfill Area
Length of Opening
24”
ADDING A BEAM POCKET - STEEL COLUMN

INTERIOR ELEVATION

ADDING A BEAM POCKET INTO AN Xi WALL POST PRODUCTION
(BEAM SUPPORTED BY A STEEL COLUMN)

Locate the beam pocket so that no stud will be cut. Remove the EPS bond beam insulation from the area where the beam pocket is to be located. Carefully cut the concrete bond beam from the inside of the wall making sure that the saw blade does not penetrate the face shell of the Superior Wall panel. At the Bottom of the wall attach wood to the galvanized stud facers creating the form for the concrete base. Remove the EPS stud insulation from both adjacent studs up to the height of the top of the wooden form. Mix and pour concrete into the cavity created in the wall panel, providing a level surface to mount a steel column on.**

**Each job should be individually reviewed by a person competent in applying the structural design principals involved. In many jurisdictions this will require a registered design professional.

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REV: 04-27-09
ADDING A BEAM POCKET INTO AN Xi WALL POST PRODUCTION
(beam supported by treated lumber)

If the beam pocket is located so that no stud will be cut, remove the EPS bond beam insulation from the area where the beam pocket is to be located. Carefully cut the concrete bond beam from the inside of the wall making sure that the saw blade does not penetrate the face shell of the Superior Wall panel. Cut to fit the necessary amount of treated 2x6's to support the load.** Run threaded rod through the chase holes in the two nearest studs. Remove the EPS stud insulation from around the chase holes to accommodate a min. of a 2” washer on each side of the stud. Thread on nuts and tighten as shown at top of page.

**Each job should be individually reviewed by a person competent in applying the structural design principles involved. In many jurisdictions this will require a registered design professional.

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REV: 04-27-09
The following illustrations provide one method that may be used to attach a poured wall to the outside of a Superior Walls® foundation. R-5 wall system is shown.

CAUTION: An engineer, architect, or other person competent in applying the structural design principles involved shall evaluate each project and specify site-specific details.

**NOTE:**
This is the suggested method for attaching a poured in place concrete foundation, for an addition, to an existing Superior Walls foundation. There are other methods available for accomplishing this. All methods, including the suggested method above, should be evaluated by an engineer, an architect or other person competent in applying the structural design principles involved for each job specific scenario.
NOTE:
This is the suggested method for attaching a poured in place concrete foundation, for an addition, to an existing Superior Walls foundation. There are other methods available for accomplishing this. All methods, including the suggested method above, should be evaluated by an engineer, an architect or other person competent in applying the structural design principles involved for each job specific scenario.
This is a suggested method for adding a CMU addition to an existing Superior Walls® foundation.

CAUTION: An engineer, architect, or other person competent in applying the structural design principles involved shall evaluate each project and specify site-specific details.

CMU ADDITION TO AN EXISTING SUPERIOR WALLS FOUNDATION

Wall Ties Attached With Tapcon® Concrete Screws As Required

LINTEL

Concrete Footing

Virgin Soil

NOTE:
- VENEER TIES MAY BE ATTACHED TO SUPERIOR WALLS USING A TAPCON® TYPE FASTENER®

*This method for attaching a CMU foundation wall, to an existing superior walls foundation is the suggested method. There are other methods available for accomplishing this. All methods, including the suggested method above should be evaluated by an engineer for each, site-specific scenario.

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Two Layers 5/8" Type "X" Drywall

6" From Center Of Screws/Nails

Joints In Drywall Are To Be Staggered

When Connecting Two Adjacent Panels, The Connecting Bead Should Be Two-Hour Fire Caulk (3M CP25 WBM Fire Caulk)

4" Concrete Slab Not Shown

All Joints Are To Be Covered With Drywall Compound And Paper Joint Tape

All Screws/Nails In The Outer Layer Are To Be Covered With Drywall Compound

Joints In Drywall Are To Be Staggered
R-5 FOUNDATION WALL SECTION

Floor System
(By Others, Connection To Wall Must Comply With Builder Guideline Booklet Specifications)

½" Sill Plate Bolt

Steel Reinforced Bond Beam

Concrete Stud

Vertical #4 Rebar (Inside Each Stud)

Hole For Wiring And Plumbing

Pressure Treated Wood Stud Facing

Slab Connector (As Required)

Concrete Floor
(By Others, See Current Edition Of The Builder Guideline Booklet For Further Details)

1" Foam Insulation

Steel Reinforced Footing Beam

Filter Membrane (By Others)

Auxiliary Drain Pipe To Sump Or Daylight

Clean Crushed Stone Footing (Depth Varies Per Application)

Sill Plate (By Others)

#3 Bond Beam Rebar

1 ¾" Concrete Face Shell

10 ¼"
Xi FOUNDATION WALL SECTION

Floor System
(By Others, Connection To
Wall Must Comply With Builder
Guideline Booklet Specifications)

½'' Sill Plate Bolt

Steel Reinforced
Bond Beam

1'' EPS Bond Beam
Insulation

Concrete Stud
(Wrapped In 1'' EPS Insulation)

Vertical #4 Rebar
(Inside Each Stud)

Galvanized
Steel Stud Facing

Hole For Wiring
And Plumbing

Slab Connector
(As Required)

Concrete Floor
(By Others, See Current
Edition Of The Builder
Guideline Booklet For
Further Details)

2 ½'' Foam Insulation

Steel Reinforced
Footing Beam

Filter Membrane
(By Others)

Auxiliary Drain Pipe
To Sump Or Daylight

Clean Crushed Stone Footing
(Depth Varies Per Application)

1 ¾'' Concrete Face Shell

#3 Bond Beam Rebar

Sill Plate
(By Others)
This Structural Engineering Bulletin (SEB) should be filed with other SEBs and related Bulletins on materials or products as required by prescribed procedures.

The technical description, requirements and limitations expressed herein do not constitute an endorsement or approval by the Department of Housing and Urban Development (HUD) of the subject matter, and any statement or representation, however made, indicating approval or endorsement by HUD is unauthorized and false, and will be considered a violation of the United States Criminal Code, 18 U.S.C. 709.

**NOTICE:** THIS BULLETIN APPLIES TO DWELLING UNITS BUILT UNDER HUD HOUSING PROGRAMS. NON-HUD-INSURED UNITS MAY OR MAY NOT BE IN CONFORMITY WITH THE REQUIREMENTS OF THE HUD MINIMUM PROPERTY STANDARDS.

Any reproduction of this Bulletin must be in its entirety and any use of all or any part of this Bulletin in sales promotion or advertising is prohibited.

1. **General:**

This Bulletin sets forth specific requirements under the Technical Suitability of Products Program for determining the eligibility of housing to be constructed under HUD mortgage insurance, or other HUD housing programs.

2. **Scope:**

This Bulletin applies only to the structural features of this method of construction. Final determination of eligibility is made by the appropriate HUD Field Office. Other factors considered by the Field Office will be valuation, location, architectural planning and appeal, mechanical equipment, thermal characteristics, and market acceptance. Consideration is also necessary to determine whether a specific property will qualify under the specific HUD program, when constructed according to the method outlined in this Bulletin, and where the structure is to be located.
In geographical areas subject to hurricanes, earthquakes, or other severe conditions affecting dwelling structures, the HUD Field Office shall require additional safeguards in proposed designs, when necessary.

3. Minimum Property Standards (MPS):

Compliance with HUD MPS will be determined by the HUD Field Office or Homeownership Center on the same basis as submissions involving conventional construction, except for the special features described in this Bulletin.

4. Inspection:

Field compliance inspections covering conventional items of construction and any special features covered in this Bulletin shall be made in accordance with prescribed procedures.

The appropriate HUD Field Office or Homeownership Center shall furnish a copy of a HUD field inspection report to Headquarters, FHA Standards, Office of Manufactured Housing Programs, when there is:

a. Evidence of noncompliance with any portion of the system of construction described in this Bulletin.

b. Faulty shop fabrication, including significant surface defects.

c. Damage to shop fabricated items or materials due to improper transportation, storage, handling, or assembly.

d. Unsatisfactory field workmanship, or performance of the product or system.

e. Any significant degradation or deterioration of the product or evidence of lack of durability or performance.

Periodic plant inspections will be made by HUD Field Office, or Homeownership Center, State Agency personnel, or a HUD designated representative, in accordance with their prescribed procedures. Factory inspection reports shall be submitted to HUD Headquarters, upon request.

5. Certification:

The manufacturer named in this Bulletin shall furnish the builder with written certification stating that the product has been manufactured in compliance with HUD Minimum Property Standards (MPS), except as modified by this Bulletin. The Builder shall endorse the certification with a statement that the product has been erected in compliance with HUD MPS except as modified by this Bulletin, and that the manufacturer's certification does not relieve the builder, in any way, of responsibility under the terms of the Builder's Warranty required by the National Housing Act, or under any provisions applicable to any other housing program. This certification shall be furnished to the HUD Field Office upon completion of the property.
OUTLINE DESCRIPTION, CATEGORY II CONSTRUCTION

GENERAL:

Precast reinforced concrete insulated foundation basement wall panels for one and two family dwellings up to three (3) stories plus basement are furnished in this method of construction.

Wall panels may include various types of field applied interior and exterior finishes. All materials and methods of installation shall be in accordance with HUD Minimum Property Standards (MPS), Use of Materials Bulletins (UM), and Materials Releases (MR), except as may be specifically noted herein.

This Bulletin is based on a structural review of the Foundation Wall Panels of Superior Walls of America, Ltd. Dwelling design and nonstructural items (such as architectural, plumbing, heating and electrical features) are not covered by this Bulletin.

SPECIFICATIONS:

Form HUD-92005, "Description of Materials" specifying only the structurally related items (Nos. 1 to 12, 14, 26 and 27), as originally submitted for determination of technical suitability, describes the materials that shall be used in construction of housing units under this system of construction.

DRAWINGS:

The following documents by Superior Walls of America, Ltd. shall be considered an integral part of this Bulletin:

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<tr>
<th>Document No.</th>
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<tr>
<td>Document 1</td>
<td>January, 2008</td>
<td>Builder Guideline Booklet</td>
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The Builder shall submit construction drawings to the HUD Field Office or Homeownership Center with each application under HUD housing programs, which shall include the same or similar structural features as shown in the documents listed above. Copies of these listed documents shall also be furnished to the HUD Field Office or Homeownership Center by the Builder upon request.

SPECIAL CONSTRUCTION FEATURES:

Precast reinforced concrete insulated basement wall panels, nominal 4, 8, 9 and 10 feet high and up to 20 feet wide are furnished in this method of construction. Panels consist of: (1) reinforced concrete exterior face shell, (2) reinforced concrete interior studs, and (3) interior insulation. Minimum concrete compressive strength shall be 5,000 psi.

1. The concrete exterior face shell is 1 3/4” thick and monolithic with the 10 1/4” top bond
2. Reinforced concrete interior studs are 2 1/4" x 6 3/4" with a #4 vertical bar. Studs are spaced @ 24" on center and are EITHER:

   A: R-5 WALL-mechanically anchored to the concrete skin, concrete top bond beam and concrete bottom footing beam in accordance with the referenced drawings. Treated wood or galvanized steel facings are attached to the interior face of the studs, or

   B: Xi WALL-monolithically integrated to the concrete skin, concrete top bond beam and concrete bottom footing beam in accordance with the referenced drawings, wrapped with 1" expanded polystyrene insulation. Galvanized steel facings are attached to the interior face of the studs.

3. Interior insulation shall be 1" (R-5) or 2 ½" (Xi) extruded polystyrene by Dow Chemical, bonded in the factory to a concrete face shell.

Field installation of panels (crushed stone footing, sub-drainage, sub-grade, bracing, sealant, panel joints, etc.) shall be in accordance with the manufacturer's Builder Guideline Booklet and HUD MPS requirements.

DESIGN AND CONSTRUCTION REQUIREMENTS

Design Loads: Basement wall panels have a maximum allowable lateral load (earth pressure) of 60 pcf equivalent fluid pressure for 4'-0", 8'-2", and 9'-0" high R-5 walls; 45 pcf for 10'-0" high R-5 walls; 100 pcf for all Xi Walls; and a maximum allowable vertical load (building structure plus live loads) of 5500 plf. Actual lateral and vertical loads and the allowable soil bearing pressure shall be determined for specific sites on the same basis as for site-built basement walls and foundations.

Panels are suitable for Seismic Design Category A, B, and C. The Builder shall submit structural calculations to the local HUD Office or Homeownership Center for higher Seismic Zones.

MANUFACTURING PLANTS:

Components covered under this Bulletin will be produced in the following plants:

Superior Walls by Superior Walls by
   Advanced Concrete Systems, Inc.  Collier Foundation Systems, Inc.
55 Advanced Lane 1500 Ellsworth Ave.
Middleburg, PA 17842 Heidelberg, PA 15106
Ph: 570-837-3955 Ph: 412-279-5352

Guyer’s Superior Walls Great Lakes Superior Walls
580 Schommer Drive 4555 134th Avenue
Hudson, WI 54016 Hamilton, MI 49419
Ph: 715-381-2500 Ph: 269-751-4101
Superior Walls by Jointa Lime
301 Nott Street, Bldg. 346
Schenectady, NY 12308
Ph: 518-688-0250

Superior Walls of New Jersey
92 Reese Road
Millville, NJ 08332
Ph: 856-765-9088

Superior Walls of the Rockies
1114 Sixteen Road
Fruita, CO 81521
Ph: 970-858-9030

Superior Wall Systems, LLC
317 Providence Road
Oxford, NC 27565
Ph: 877-896-9255

Superior Walls of Ohio
1401 South Pine Avenue
Warren, OH 44483
Ph. 330-393-4101

Superior Walls by Weaver Precast
824 E. Main Street
Ephrata, PA 17522
Ph. 717-733-4823

Superior Walls of E. Tennessee
1226 Belmont Drive
McMinnville, TN 37110
Ph: 877-836-9255

Superior Walls of Central Virginia
15305 Patrick Henry
Amelia, VA 23002
Ph: 866-350-9255

Superior Walls of Greater Atlanta
703-A Corinth Road
Newnan, GA 30203
Ph: 866-538-9255

Superior Walls by Precast Systems, LLC
5877 Bullitt Road
Greencastle, PA 17225
Ph: 717-369-3773

Superior Walls of Upstate New York
7574 E. Main Road
Lima, NY 14485
Ph: 585-624-9390

Superior Wall Systems, LLC
DBA: Superior Walls of North Carolina
3570 S. Main Street
Salisbury, NC 28147
Ph: 704-636-6200

Superior Walls of the Hudson Valley
68 Violet Avenue
Poughkeepsie, NY 12601
Ph: 845-485-4033

Superior Walls of the Tri-State
3424 Grant Drive
Lebanon, OH 45036
Ph: 513-228-3480

Superior Walls by Precast Concrete Solutions
300 S. Martin Luther King Dr.
Springfield, IL 62703
Ph. 217-522-8565

Superior Walls by Carr-Mitchell
44 Industrial Drive
Cadiz, KY 42211
Ph: 877-522-9255

Superior Walls by Weaver Precast – South Carolina
8 Hudson Drive
Spartanburg, SC 29303
Ph: 877-542-1213
The appropriate HUD Field Office or Homeownership Center in whose jurisdiction the manufacturing plant is located, or HUD designated representative, will inspect these plants in accordance with prescribed procedures.

QUALITY CONTROL:

The appropriate HUD Field Office or Homeownership Center, in whose jurisdiction the manufacturing plant is located, shall review and approve plant fabrication procedures and quality control program to ensure compliance with approved plans and specifications. The quality control program shall include field erection and supervision by the Superior Walls Plant.

RECORD OF PROPERTIES:

Upon request, the manufacturer shall provide HUD a list of properties in which the component or system described in this Bulletin is used. The list shall include the complete address, or description of location, and approximate date of installation or erection. Failure of the manufacturer to provide HUD with the above information may result in cancellation of this Bulletin.

NOTICE OF CHANGES

The manufacturer shall inform HUD in advance of changes in production facilities, transportation, field erection procedures, design, or of materials used in this product. Further, the manufacturer must inform HUD of any revision to corporate structure, change of address, or change in name or affiliation of the prime manufacturer. Failure of the manufacturer to notify HUD of any of the above changes may result in cancellation of this Bulletin.

EVALUATION

This SEB is valid for a period of three years from the date of initial issuance or most recent renewal or revision, whichever is later. The holder of this SEB shall apply for a renewal or revision 90 days prior to the Review Date printed on this SEB. Submittals for renewal or revision shall be sent to:

U. S. Department of Housing and Urban Development
FHA Standards, Office of Manufactured Housing Programs
451 Seventh Street, S.W., Room 9168
Washington, DC  20410-8000

Appropriate User Fee shall be sent to:

U. S. Department of Housing and Urban Development
Miscellaneous Income - Technical Suitability of Products Fees
Bank of America
P. O. Box 198762
Atlanta, GA  30384-8762
If the Department determines that a proposed renewal or supplement constitutes a revision, the appropriate User Fee for a revision will need to be submitted in accordance with Code of Federal Regulations 24 CFR 200.934, "User Fee System for the Technical Suitability of Products Program," and current User Fee Schedule.

**CANCELLATION**

Failure to apply for a renewal or revision shall constitute a basis for cancellation of the SEB. HUD will notify the manufacturer that the SEB may be canceled when:

1. conditions under which the document was issued have changed so as to affect production of, or to compromise the integrity of the accepted material, product or system,

2. the manufacturer has changed its organizational form without notifying HUD, or

3. the manufacturer has not complied with responsibilities it assumed as a condition of HUD's acceptance.

However, before cancellation, HUD will give the manufacturer a written notice of the specific reasons for cancellation, and the opportunity to present views on why the SEB should not be canceled. No refund of fees will be made on a canceled document.

******************************************************************************

This Structural Engineering Bulletin is issued solely for the captioned firm, and is not transferable to any person or successor entity.

******************************************************************************
UL Certifications

General Comments

The Underwriters Laboratories Inc. (UL) is a not-for-profit, non-governmental organization that was formed in 1894 to help reduce injury, loss of life and property damage. For our purposes, UL is the third-party who evaluated our systems for Flame Spread and Smoke Development.

Third-party product safety certification is important. An independent, technically expert organization that doesn’t have a financial interest in the product’s ultimate profitability is needed to determine whether reasonably foreseeable risks associated with the product’s use have been eliminated or minimized. UL’s not-for-profit, independent status allows it to be unbiased in determining whether or not a product meets recognized safety standards.

The UL File Number is an alphanumeric designation assigned to a company upon successful completion of a product evaluation or company certification.

All foam used in the R-5 and the Xi systems has achieved UL Certification status for flame spread and smoke development as foam plastics.

Expanded Foam Plastic (EPS)

The UL Certifications for the expanded foam plastics used in Superior Walls Xi panels can be obtained from your local Superior Walls producer. A sample EPS UL Certification is shown on the following pages.

Extruded Foam Plastic (XPS)

The UL Certification for the extruded foam plastic used in Superior Walls R-5 and Xi panels is assigned the number BRYX.R3573 for DOW Chemical Co., our extruded foam vendor. See the following pages.
SAMPLE EPS UL Certification

BRYX.R18332
Foamed Plastic

Foamed Plastic

See General Information for Foamed Plastic

TRI STATE FOAM PRODUCTS INC
445 INDUSTRIAL PARK DR
RIDGEWAY, VA 24148 USA

Foamed plastic in the form of blocks and boards.

**SUR**

<table>
<thead>
<tr>
<th>Flame spread</th>
<th>1.5 pcf 6 In. Max +</th>
</tr>
</thead>
<tbody>
<tr>
<td>10###</td>
<td></td>
</tr>
<tr>
<td>300###</td>
<td></td>
</tr>
</tbody>
</table>

+Installed in a thickness.

# Flame spread at the furnace floor.

## Flame over the fur.

### Flame over the fur.

+ the original test position. Ignition of molten residue on spread index of 80 and smoke developed index of over 500.

---

<table>
<thead>
<tr>
<th>Flame spread</th>
<th>1.75 pcf 6 In. Max +</th>
<th>2pcf 6 In. Max +</th>
</tr>
</thead>
<tbody>
<tr>
<td>5#</td>
<td>20###</td>
<td></td>
</tr>
<tr>
<td>55-200#</td>
<td></td>
<td>250###</td>
</tr>
</tbody>
</table>

+Installed in a thickness, or stored in an effective thickness, as indicated.

# Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread index of 120-140 and smoke developed index of over 550.

## Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread index of 140 and smoke developed Classification of over 500.
Foamed Plastic

See General Information for Foamed Plastic

THE DOW CHEMICAL CO
FABRICATED PRODUCTS
200 LARKIN CENTER
1615 JOSEPH DR
MIDLAND, MI 48674 USA

Foamed plastic in the form of blocks and boards, with or without facing on one or both sides.

<table>
<thead>
<tr>
<th></th>
<th>Flame spread</th>
<th>Smoke developed</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.0 In. Max Thickness</td>
<td>5#</td>
<td>165#</td>
</tr>
<tr>
<td>2.4 lb/ft³ Max Density</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#Flame spread and smoke developed recorded while material remained in original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated Flame spread classification of 90 and smoke developed classification of over 500.

STYROFOAM CAVITYMATE ULTRA BRAND INSULATION

<table>
<thead>
<tr>
<th></th>
<th>Flame spread</th>
<th>Smoke developed</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.0 In. Max Thickness</td>
<td>10+</td>
<td>160+</td>
</tr>
<tr>
<td>1.9 lb/ft³ Max Density</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

+Flame spread and smoke developed were recorded while the material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel and smoke generation equivalent to a calculated Flame spread classification of 105 and a smoke developed classification of over 500.

STYROFOAM BRAND HIGH LOAD 60, 100, AND 115 INSULATION

STYROFOAM PLAZAMATE™ BRAND INSULATION

<table>
<thead>
<tr>
<th></th>
<th>Flame spread</th>
<th>Smoke developed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>15++</td>
<td>165++</td>
</tr>
</tbody>
</table>

Thickness: 4 in. (maximum)

Density: Greater than 2.4 lb/ft³ but less than or equal to 4.0 lb/ft³ (maximum).

++Flame spread and smoke developed were recorded while the material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel and smoke generation equivalent to a calculated Flame spread classification of 125 and a smoke developed classification of over 500.

STYROFOAM SUPE-R-MATE BRAND INSULATION

<table>
<thead>
<tr>
<th></th>
<th>Flame spread</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>15++</td>
</tr>
</tbody>
</table>
Smoke developed 165++

Thickness: 1 in. (maximum)

Density: Greater than 2.1 lb/ft³ (maximum).

++ Flame spread and smoke developed were recorded while the material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel and smoke generation equivalent to a calculated flame spread classification of 125 and a smoke developed classification of over 500.

<table>
<thead>
<tr>
<th>1-1/2 In. Max Thickness</th>
<th>1.3 lb/ft³ Max Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flame spread</td>
<td>45+</td>
</tr>
<tr>
<td>Smoke developed</td>
<td>0+</td>
</tr>
</tbody>
</table>

+ Flame spread and smoke developed were recorded while the material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel and smoke generation equivalent to a calculated flame spread classification of 10 and a smoke developed classification of 125.

Last Updated on 2008-01-09

STC RATINGS: Xi

Sound Transmission Class (STC) is a rating given a wall assembly, and to other elements, such as doors and windows, based upon the measured values of sound transmission loss in accordance with ASTM Classification E90.

The chart on the following page shows both the measure of sound reduction in dB (how much the sound energy is reduced) and the theoretical STC number (listed in the lower table). Both numbers are based on computer modeling, courtesy of The DOW Chemical Company, and not actual testing. The numbers are based upon the known sound properties of different materials. Testing may yield different results.

The sound modeling of the Xi Superior Wall yielded the following STC numbers:
- (43) with no drywall
- (50) with 1/2” drywall
- (52) with 5/8” drywall
- (53) with 5/8” drywall + 3.5” of fiberglass (not a recommended type of insulation)

NOTE: The mass of a material is the biggest contributor to its sound reduction properties. Concrete, therefore, is the most significant contributor to the sound reduction abilities of the Xi Wall. Windows and doors that are added to the wall panels should have a sound rating that is greater than or equal to the Xi STC numbers and they should be sealed per the manufacturer's specifications.
STC RATINGS: Xi STC Chart

Sound Reduction Index (1/3 oct)

Frequency in Hz

STC dB

- Superior Walls No Drywall: (43)
- Superior Walls Concrete with 1/2" Drywall: (50)
- Superior Walls Concrete with 5/8" Drywall: (52)
- Superior Walls Concrete 5/8" Drywall, 3.5" FG: (53)
R-5 UBC 26-3 Fire Test

SUMMARY

UBC 26-3 Room Fire Test
For Superior Walls R-5 Wall System
Omega Point Laboratories Project No. 15524-99646
Conducted March 6, 1996.

Testing to the UBC 26-3 (Formerly UBC 17-5) Room Fire Test Standard for Interior of Foam Plastic Systems, has been conducted using Superior Walls R-5 Precast Insulated Foundation System. The UBC 26-3 evaluates the burning characteristics of foam plastic assemblies in a standard room configuration. (Note that the UBC 26-3 standard is essentially the same as UL 1715.)

Omega Point Laboratories conducted this test. It is identified by Project No. 15524-99646 and is dated March 6, 1996.

In this case, the Superior Walls R-5 system was tested using two sections, joined at a 90 degree outside corner, bolted and sealed. The walls are precast, with one inch extruded polystyrene foam insulation in a steel-reinforced wall, with vertical studs on 24" centers.

Conclusion:

The sample submitted, installed and tested displayed very light, if any, smoke, and no flame spread characteristics. The foam at the extremities was melted slightly, leaving behind a ½" layer of foam near the top of the room. Based on these results, the specimen met the requirements of the UBC 26-3 test standard.

The International Code Council Evaluation Service, in ESR-1553, Section 4.4, recognizes that an independent thermal barrier, separating the foam plastic from the interior of the building, is not required based upon this testing conducted in accordance with UBC Standard 26-3.
SUMMARY
UL 1715, Fire Test of Interior Finish Material for
Superior Walls Xi Wall System

Testing to the UL 1715, Fire Test of Interior Finish Material, Third Edition, dated 9/9/97 has been conducted using Superior Walls Xi Precast Insulated Foundation System.

Guardian Fire Testing Laboratories, Inc. conducted this test. It is identified by Report No. GL-79703.5 and is dated February 21, 2003.

The Superior Walls Xi system was tested. The walls are precast, with 2-1/2” extruded polystyrene foam insulation in a steel-reinforced wall. The tested material covered an 8 foot high by 8 foot wide section of a rear wall and an 8 foot wide section of a side wall in an 8 foot high by 8 foot wide by 12 foot long room for a corner burn fire test. During the test, the interior finish 2-1/2” thick extruded polystyrene insulation showed no flaming and no smoking.

Conclusion:

The Superior Walls Xi wall system, with 2-1/2” thick extruded polystyrene insulation, did not flame and did not smoke during the test period. The tested materials successfully met the conditions of the test standard, UL 1715, Fire Test of Interior Finish Material, Third Edition, dated 9/9/97.

The International Code Council Evaluation Service, in ESR-1662, Section 4.4, recognizes that an “independent thermal barrier, separating the foam plastic from the interior of the building, is not required based on testing conducted in accordance with Section 2603.9 of the applicable code.”
SUMMARY
ASTM E119-95a Fire Tests of Building Construction and Materials
for Superior Walls R-5 Wall System
Omega Point Laboratories Project No. 15524-99645
Conducted March 27, 1996.

Testing to the ASTM E119-95a Fire Tests of Building Construction and Materials test standard has been conducted using Superior Walls R-5 Precast Insulated Foundation System. The ASTM E119-95a standard evaluates the duration for which the assembly will contain a fire and maintain its structural integrity. The test standard provided for exposure to a standard fire condition followed by a standard fire hose stream.

Omega Point Laboratories conducted this test. It is identified by Project No. 15524-99645 and is dated March 27, 1996.

In this case, the Superior Walls R-5 system was tested. The walls are precast, with one inch extruded polystyrene foam insulation in a steel-reinforced wall, with vertical studs on 24” centers. A 4 foot long panel was joined to a 6 foot long panel with two ½” diameter bolts, one top and one bottom, with ½” Bead of 3M® CP25 WBM caulk to the joint contact area, and a ½” bead of Bostik® Chem-Calk 915 caulk applied towards the interior of the joint. Two layers of 5/8” Type X gypsum wallboard were installed in a staggered pattern on the interior. The drywall joints and nail heads of the outer layer were spackled with drywall compound and the joints were taped.

Conclusion:
The wall assembly met the requirements of ASTM E119-95a Fire Tests of Building Construction and Materials for a load bearing (6000 pounds total force per stud) fire resistance of 120 minutes. In ESR-1553, Section 4.2, the International Code Council Evaluation Service recognizes a two-hour fire-resistance-rating for Superior Walls R-5 walls. In ESR-1662, Section 4.2, the ICC-Evaluation Service also recognizes a two-hour fire-resistance-rating for Superior Walls Xi walls. Both of these Evaluation Service Reports relied on this same test.
R and U-VALUES FOR Xi SUPERIOR WALLS

This calculation for the U-value for the Superior Wall system is calculated using the isothermal planes method. Results are based on percent of actual wall area for a 24 inch section of the wall area (See section detail below). REScheck™ has been used for this calculation.

<table>
<thead>
<tr>
<th>Stud Center R-value: (A)</th>
<th>Cavity Space R-value: (B)</th>
<th>Stud Side R-value: (C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-3/4” normal weight structural concrete</td>
<td>0.14</td>
<td>0.14</td>
</tr>
<tr>
<td>Concrete stud 2-1/4” x 7-1/2”</td>
<td>0.60</td>
<td>—</td>
</tr>
<tr>
<td>Insulation: 2-1/2” XPS</td>
<td>—</td>
<td>12.5</td>
</tr>
<tr>
<td>Insulation: EPS</td>
<td>3.8</td>
<td>—</td>
</tr>
<tr>
<td>Inside air film</td>
<td>0.68</td>
<td>0.68</td>
</tr>
<tr>
<td>Total R-values:</td>
<td>5.22</td>
<td>13.32</td>
</tr>
<tr>
<td>Total U-values (1/R)</td>
<td>0.191571</td>
<td>0.075075</td>
</tr>
</tbody>
</table>

Object Dimension as a Percentage of 24” Section
Concrete stud width ratio 0.09375
Cavity width ratio 0.82292
Stud side insulation ratio 0.08333

U-Value of Object as it Contributes to 24” Section
Stud (A) = 0.191571 x 0.09375 = 0.01796
Cavity (B) = 0.075075 x 0.82292 = 0.06178
Stud Sides (C) = 0.027685 x 0.08333 = 0.00231

(Note: Galvanized steel stud facing omitted as a negligible thickness and contribution.)

U-VALUE (Total System) = 0.082
R-VALUE (Total System) = 12.19
R-VALUE FOR Xi SUPERIOR WALLS
(R-Value Computation Method)

This calculation for the R-value for the Superior Wall system is calculated using an area weighted R-Value computation method (2009 IRC Section N1102.1.1 and IECC 402.1.2). Results are based on percent of actual wall area for a 24 inch section of the wall area (See section detail below). This R-value computation method uses insulation materials only and does not include any R-value for other building materials or air films.

<table>
<thead>
<tr>
<th>Stud Center R-value:</th>
<th>Cavity Space R-value:</th>
<th>Stud Side R-value:</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A)</td>
<td>(B)</td>
<td>(C)</td>
</tr>
</tbody>
</table>

Insulation: 2-1/2" XPS — 12.5 —
Insulation: EPS 3.8 — 22.8

Total R-values: 3.8 12.5 22.8

Object Dimension as a Percentage of 24" Section
Concrete stud width ratio 0.094
Cavity width ratio 0.823
Stud side insulation ratio 0.083

R-Value of Object as it Contributes to 24" Section
Stud (A) = 3.8 x 0.094 = 0.357
Cavity (B) = 12.5 x 0.823 = 10.3
Stud Sides (C) = 22.8 x 0.083 = 1.89

R-VALUE = 12.5
R and U-VALUES FOR R-5 SUPERIOR WALLS – GSF

This calculation for the U-value for the Superior Wall system is calculated using the isothermal planes method. Results are based on percent of actual wall area for a 24 inch section of the wall area (See section detail below). REScheck™ has been used for this calculation.

<table>
<thead>
<tr>
<th>Stud Center R-value: (A)</th>
<th>Cavity Space R-value: (B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-3/4” normal weight structural concrete</td>
<td>0.14</td>
</tr>
<tr>
<td>Concrete stud: 2-1/4” x 6-3/4”</td>
<td>0.54</td>
</tr>
<tr>
<td>Insulation: 1” XPS</td>
<td>5.00</td>
</tr>
<tr>
<td>Insulation: 3/4” EPS</td>
<td>2.85</td>
</tr>
<tr>
<td>Inside air film</td>
<td>0.68</td>
</tr>
</tbody>
</table>

Total R-values: 9.21 5.82

Total U-values (1/R) 0.10858 0.17182

Object Dimension as a Percentage of 24” Section
Concrete stud width ratio 0.09375
Cavity width ratio 0.90625

U-Value of Object as it Contributes to 24” Section
Stud (A) = 0.10858 x 0.09375 = 0.010179
Cavity (B) = 0.17182 x 0.90625 = 0.155713

(Note: Galvanized steel stud facing omitted as a negligible thickness and contribution. Calculation excludes the effects of the connectors between the concrete stud and exterior concrete.)

U-VALUE (Total System) = 0.1659
R-VALUE (Total System) = 6.0280
R and U-VALUES FOR R-5 SUPERIOR WALLS – Wood Stud Facing

This calculation for the U-value for the Superior Wall system is calculated using the isothermal planes method. Results are based on percent of actual wall area for a 24 inch section of the wall area (See section detail below). REScheck™ has been used for this calculation.

<table>
<thead>
<tr>
<th></th>
<th>Stud Center R-value:</th>
<th>Cavity Space R-value:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(A)</td>
<td>(B)</td>
</tr>
<tr>
<td>1-3/4&quot; normal weight structural concrete</td>
<td>0.14</td>
<td>0.14</td>
</tr>
<tr>
<td>Concrete stud: 2-1/4&quot; x 6-3/4&quot;</td>
<td>0.54</td>
<td>—</td>
</tr>
<tr>
<td>Wood Stud Facing: 3/4&quot; x 2-1/4&quot;</td>
<td>0.94</td>
<td>—</td>
</tr>
<tr>
<td>Insulation: 1&quot; XPS</td>
<td>5.00</td>
<td>5.00</td>
</tr>
<tr>
<td>Inside air film</td>
<td>0.68</td>
<td>0.68</td>
</tr>
<tr>
<td><strong>Total R-values:</strong></td>
<td><strong>7.30</strong></td>
<td><strong>5.82</strong></td>
</tr>
<tr>
<td><strong>Total U-values (1/R)</strong></td>
<td><strong>0.13699</strong></td>
<td><strong>0.17182</strong></td>
</tr>
</tbody>
</table>

Object Dimension as a Percentage of 24" Section

Concrete stud width ratio 0.09375
Cavity width ratio 0.90625

U-Value of Object as it Contributes to 24" Section

Stud (A) = 0.13699 x 0.09375 = 0.012843
Cavity (B) = 0.17182 x 0.90625 = 0.155713

(Note: Calculation excludes the effects of the connectors between the concrete stud and exterior concrete.)

**U-VALUE** (Total System) = 0.1686

**R-VALUE** (Total System) = 5.9327
January 1, 2009

 Builders and Home Developers:

 Superior Walls Foundation Sealant, Superior Sealant™, is a high performance, one component polyurethane sealant designed for long term waterproofing in construction joints. This product cures in the presence of atmospheric moisture to a flexible yet durable polyurethane rubber.

 This sealant meets the following specifications:
   Federal Specifications TT-S-00230C and TT-S-1543A
   ASTM C-920, Type S, Grade NS, Class 25, Use NT, M, G, A, O
   Canadian 19.13-M87
   California Air Resources Board 2003 Volatile Organic Contents Requirement

 Polyurethane sealants have been used for over 20 years for the weatherproofing/waterproofing of joints in Precast concrete construction. This sealant has been tested for cohesion and adhesion with Superior Walls Precast panels and has shown the highest quality of performance.

 As with all polyurethane sealants, surface discoloration may occur due to ultraviolet ray exposure. The overall performance of the sealant particularly in subterranean applications where there is no UV exposure will be excellent. As such, contact with moist soil will not have a significant effect on the sealant performance.

 We concur with Superior Walls of America that this sealant will significantly out perform any masonry mortar joint for water intrusion particularly for subterranean Precast panel applications.

 Sincerely,

 Joe Butler
 National Sales Manager
INTERIOR FINISHING: Corner Studs at 45° O.C.

45 DEGREE OUTSIDE CORNER

R-5 Product

Cut Pressure Treated Lumber (2x4) As Shown

Pressure Treated Lumber Attached To Footer Beam Using Construction Adhesive (2x4 Shown)

Drywall

Xi Product

Cut Pressure Treated Lumber (2x4) As Shown

Pressure Treated Lumber Attached To Footer Beam Using Construction Adhesive (2x4 Shown)

Drywall

Section A-A

©2008 Superior Walls of America, Ltd.
INTERIOR FINISHING: Corner Studs at 90° O.C.

90 DEGREE OUTSIDE CORNER

R-5 Product

Pressure Treated Lumber Attached To Footer Beam Using Construction Adhesive (2x4 Shown)

3½" 2" Scrap

Cut Pressure Treated Lumber (2x4) As Shown

Drywall

Xi Product

Pressure Treated Lumber Attached To Footer Beam Using Construction Adhesive (2x4 Shown)

1" 2½" 2½"

Cut Pressure Treated Lumber (2x4) As Shown

©2008 Superior Walls of America, Ltd.
INTERIOR FINISHING: Corner Studs at 90° I.C.

90 DEGREE INSIDE CORNER

R-5 Product

Drywall

Cut Pressure Treated Lumber (2x4)
As Shown

Xi Product

Drywall

Cut Pressure Treated Lumber (2x4)
As Shown

©2008 Superior Walls of America, Ltd.
The following new construction window details are shown as examples only. Actual customer window details and rough opening requirements may vary.

NOTE: The concrete-embedded wood must always be protected from weather exposure.
The following replacement window details are shown as examples only. Actual customer window details and rough opening requirements may vary.

NOTE: The concrete-embedded wood must always be protected from weather exposure.

**Xi Replacement Window Detail**

**R-5 Replacement Window Detail**
The following replacement window details (with brick veneer) are shown as examples only. Actual customer window details and rough opening requirements may vary.

NOTE: The concrete-embedded wood must always be protected from weather exposure.
DOOR INSTALLATION DETAILS

The following new construction door details are shown as examples only. Actual customer door details and rough opening requirements may vary.

NOTE: The concrete-embedded wood must always be protected from weather exposure.

Xi New Construction Door Detail

R-5 New Construction Door Detail
The following replacement door details are shown as examples only. Actual customer door details and rough opening requirements may vary.

NOTE: The concrete-embedded wood must always be protected from weather exposure.

**Xi Replacement Door Detail**

**R-5 Replacement Door Detail**
GARAGE DOOR DETAILS

The following garage door details are shown as examples only. Actual customer door details and rough opening requirements may vary.

NOTE: The concrete-embedded wood must always be protected from weather exposure.

Xi Garage Door Jamb (Minimal Trim)

R-5 Garage Door Jamb (Minimal Trim)
The following garage door details are shown as examples only. Actual customer door details and rough opening requirements may vary.

NOTE: The concrete-embedded wood must always be protected from weather exposure.

Xi Garage Door Jamb (Ornate Trim)

R-5 Garage Door Jamb (Ornate Trim)
Carefully follow the instructions and cautions listed below when adding a window to an Xi Superior Walls® foundation.

**CUTTING A WINDOW OPENING INTO AN Xi WALL**

Locate the opening so that only one stud will be cut, and where the band board and sill plate run continuously over the opening. If there is a splice, a properly sized header must be placed above the opening, preferably installed in the floor system above the Superior Wall to stretch across the existing full length concrete studs.** The header can be placed directly above the window opening but must bear on wooden jack studs. Cut wooden framing at a 45° angle to fit tightly against top and bottom beam and bolt to existing concrete studs through the precast chase holes. One inch boards can be used to shim between the jamb and the concrete studs. Remove the stud insulation wherever shims are located so that the shims rest directly against the concrete stud. Install the new window according to the manufacturer's specifications.

**Never cut in a door or window opening under a beam pocket or point loaded area.**

**Each job should be individually reviewed by a person competent in applying the structural design principles involved. In many jurisdictions this will require a registered design professional.**

©2009 Superior Walls of America, Ltd.  
REV: 04-27-09
Carefully follow the instructions and cautions listed below when adding a window to an R-5 Superior Walls® foundation.

**ELEVATION**
CUTTING A WINDOW OPENING INTO AN R-5 WALL

Locate the opening so that only one stud will be cut, and where the band board and sill plate run continuously over the opening. If there is a splice, a properly sized header must be placed above the opening, preferably installed in the floor system above the Superior Wall to stretch across the existing full length concrete studs.** The header can be placed directly above the window opening but must bear on wooden jack studs. Cut wooden framing at a 4 deg angle to fit tightly against top and bottom beam and bolt to existing concrete studs through the precast holes. One inch boards can be used to shim between the jamb and the concrete studs. Install the new window according to the manufacturer's specifications.

**Never cut in a door or window opening under a beam pocket or point loaded area.
**Each job should be individually reviewed by a person competent in applying the structural design principals involved. In many jurisdictions this will require a registered design professional.
ADDING A DOOR TO AN Xi WALL

Carefully follow the instructions and cautions listed below when adding a door to an Xi Superior Walls® foundation.

LOCATE THE OPENING SO THAT ONLY ONE STUD WILL BE CUT, AND WHERE THE BAND BOARD AND SILL PLATE RUN CONTINUOUSLY OVER THE OPENING. IF THERE IS A SPLICE, A PROPERLY SIZED HEADER MUST BE PLACED ABOVE THE OPENING, PREFERABLY INSTALLED IN THE FLOOR SYSTEM ABOVE THE SUPERIOR WALL TO STRETCH ACROSS THE EXISTING FULL LENGTH CONCRETE STUDS.** THE HEADER CAN BE PLACED DIRECTLY ABOVE THE DOOR OPENING BUT MUST BEAR ON WOODEN JACK STUDS. CUT WOODEN FRAMING AT A 4 DEG ANGLE TO FIT TIGHTLY AGAINST TOP AND BOTTOM BEAM AND BOLT TO EXISTING CONCRETE STUDS THROUGH THE PRECAST CHASE HOLES. ONE INCH BOARDS CAN BE USED TO SHIM BETWEEN THE JAMB AND THE CONCRETE STUDS. REMOVE THE STUD INSULATION WHICHEREVER SHIMS ARE LOCATED SO THAT THE SHIMS REST DIRECTLY AGAINST THE CONCRETE STUD. INSTALL THE NEW DOOR ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS.

**NEVER CUT IN A DOOR OR WINDOW OPENING UNDER A BEAM POCKET OR POINT LOADED AREA.
**EACH JOB SHOULD BE INDIVIDUALLY REVIEWED BY A PERSON COMPETENT IN APPLYING THE STRUCTURAL DESIGN PRINCIPLES INVOLVED. IN MANY JURISDICTIONS THIS WILL REQUIRE A REGISTERED DESIGN PROFESSIONAL.
ADDING A DOOR TO AN R-5 WALL

Carefully follow the instructions and cautions listed below when adding a door to an R-5 Superior Walls® foundation.

![Diagram of adding a door to an R-5 wall](image)

**ELEVATION CUTTING A DOOR OPENING INTO AN R-5 WALL**

Locate the opening so that only one stud will be cut, and where the band board and sill plate run continuously over the opening. If there is a splice, a properly sized header must be placed above the opening, preferably installed in the floor system above the Superior Wall to stretch across the existing full length concrete studs.** The header can be placed directly above the door opening but must bear on wooden jack studs. Cut wooden framing at a 45 degree angle to fit tightly against top and bottom beam and bolt to existing concrete studs through the precast holes. One inch boards can be used to shim between the jamb and the concrete studs. Install the new door according to the manufacturer's specifications.

**Never cut in a door or window opening under a beam pocket or point loaded area.**

**Each job should be individually reviewed by a person competent in applying the structural design principals involved. In many jurisdictions this will require a registered design professional.**
Carefully follow the instructions and cautions listed below when adding a patio door to an Xi Superior Walls® foundation.

**CUTTING A PATIO DOOR OPENING INTO AN Xi WALL**

If a patio door opening is missing or added to the plans after production, it can be field cut (It is advisable that the door used has a Max. width of 5'-0''). Locate the opening so that only two studs will be cut, and where the band board and sill plate run continuously over the opening. A properly sized header must be placed above the opening.** Cut wooden framing square on the top end and at a 4 deg angle on the bottom to fit tightly against top and bottom beam and bolt to existing concrete studs through the precast chase holes. 1" X 2" boards can be used to shim between the jamb and the concrete studs. Remove the stud insulation wherever shims are located so that the shims rest directly against the concrete stud. Install the new door according to the manufacturer’s specifications.

**Never cut in a door or window opening under a beam pocket or point loaded area.
**Each job should be individually reviewed by a person competent in applying the structural design principals involved. In many jurisdictions this will require a registered design professional.
ADDING A PATIO DOOR TO AN R-5 WALL

Carefully follow the instructions and cautions listed below when adding a patio door to an R-5 Superior Walls® foundation.

**CUTTING A PATIO DOOR OPENING INTO AN R-5 WALL**

If a patio door opening is missing or added to the plans after production, it can be field cut (It is advisable that the door used has a Max. width of 5'-0"). Locate the opening so that only two studs will be cut, and where the band board and sill plate run continuously over the opening. A properly sized header must be placed above the opening.** Cut wooden framing at a 4 deg angle to fit tightly against top and bottom beam and bolt to existing concrete studs through the precut holes. 1" X 2" boards can be used to shim between the jamb and the wooden jack studs. Keep the 2" X 8" jamb flush on the inside. Install the new door according to the manufacturer's specification.

**Never cut in a door or window opening under a beam pocket or point loaded area.**

**Each job should be individually reviewed by a person competent in applying the structural design principals involved. In many jurisdictions this will require a registered design professional.**
ATTACHING A DECK TO SUPERIOR WALLS

The following illustrations provide one method that may be used to attach a ledger board to the outside of a Superior Walls® foundation. Xi Wall system is shown.

CAUTION: An engineer, architect, or other person competent in applying the structural design principles involved shall evaluate each project and specify site-specific connection details.

EXTerior wood deck bolted through superior walls

NOTE:
USE POLYURETHANE SEALANT AT BOLT HOLES THROUGH SUPERIOR WALLS

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CAUTION: An engineer, architect, or other person competent in applying the structural design principles involved shall evaluate each project and specify site-specific connection details.

EXTERIOR WOOD DECK BOLTED THROUGH SUPERIOR WALLS

HORIZONTAL SECTION SHOWING BOLTING PATTERN

EXTERIOR ELEVATION SHOWING BOLTING PATTERN

NOTE:
- USE POLYURETHANE SEALANT AT BOLT HOLES THROUGH SUPERIOR WALLS
- BOLT SPACING IS DEPENDENT UPON ENGINEERING REQUIREMENTS
- SPACE BOLTS TO AVOID CONCRETE STUDS IN SUPERIOR WALL

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Holes may be drilled through the (top) bond beam for wiring and plumbing drops. See the drawing below for proper hole placement.

**CAUTION:** Carefully follow drawing below to avoid contact with steel reinforcement. Do NOT cut or drill into any Superior Walls stud.

**SAFE LOCATION TO DRILL THROUGH BOND BEAM**

**R-5 WALL SHOWN / XI WALL SIMILAR**

Max. Hole Size 3½" Diameter (Locate Hole Between Studs)
Holes may be drilled through the (top) bond beam for wiring and plumbing drops. See the drawing below for proper hole placement.

**CAUTION:** Carefully follow drawing below to avoid contact with steel reinforcement. Do NOT cut or drill into any Superior Walls stud.

**SAFE LOCATION TO DRILL THROUGH BOND BEAM**

**Xi WALL SHOWN / R-5 WALL SIMILAR**

Max. Hole Size 3½" Diameter (Locate Hole Between Studs)

SECTION VIEW

PLAN VIEW

#3 Rebar

2" X 10" Sill Plate Shown Here
ELECTRICAL WIRING – Xi Wall System

The simplest and most effective way to attach an electrical box to a Superior Wall stud facing is to use a box with a side bracket, as shown in the detail below. An electrical box with a side bracket can be screwed directly to the face of the stud. A metal or nonmetallic box may be used as required.

The wire may be secured to the side of the stud using a cable tie and cable tie mounting base.

Suggested Method for Installing Electric in an Xi Wall
The simplest and most effective way to attach an electrical box to a Superior Wall stud facing is to use a box with a side bracket, as shown in the detail below. An electrical box with a side bracket can be screwed directly to the face of the stud. A metal or nonmetallic box may be used as required.

The wire may be secured to the side of the stud using a cable tie and cable tie mounting base.

**Suggested Method for Installing Electric in an R-5 Wall**
ATTACHING A CIRCUIT BREAKER PANEL – Xi

The following is a possible method for mounting a circuit breaker panel to an Xi (R-5 similar). Other methods may be acceptable.

- Attach Plywood To Cross Braces
- Attach Plywood To Sides Of Galvanized Stud Facing Using Screws
- Screws Are To Penetrate Plywood And Hemmed Side Of Galvanized Stud Facing
- Mount Circuit Breaker Panel To Cross Braces (2x4 Shown)
- Plywood (1/2” Shown)
- Xi Wall Panel
- Interior Finish

NOTE: This is one possible method for mounting a circuit breaker panel to an Xi wall; other methods may be acceptable.