



Approval #

BP-052100007-BVP
(Replaces DIS-122054302
and 201501-R)

Industry Services Division
4822 Madison Yards Way
P.O. Box 7302
Madison WI 53701-7302

Wisconsin Building Product Evaluation

Material

Trade Name: Xi
Precast Concrete Insulated Foundation Wall System

Manufacturer

Superior Walls of America
937 East Earl Road
New Holland PA 17557

SCOPE OF EVALUATION

GENERAL: This report evaluates the precast concrete, insulated foundation wall system, manufactured by Superior Walls of America, Ltd. for use in the construction of 1 & 2 family dwellings.

Where this evaluation includes a reference to an SPS code requirement, it is referring to the current **Wisconsin Uniform Dwelling Code (UDC)**, the code for 1 & 2 family dwellings.

This review includes the cited SPS code requirements below:

- **Structural Requirements:** The precast concrete, insulated foundation wall system was evaluated in accordance with the structural requirements of **ss. SPS 321.02, 321.18 (1) and 321.18 (2)**.
- **Foam Plastic Insulation Requirements:** The precast concrete, insulated foundation wall system was evaluated and approved in accordance with the requirements of **s. SPS 321.11 (2)**.
- **Drain Tile Requirements:** The precast wall system was evaluated in accordance with the drain tile requirements of **s. SPS 321.17**.

Note: The energy conservation requirements of **Chapter SPS 322** have not been evaluated.

DESCRIPTION AND USE

General Structural: Superior Walls are precast concrete, insulated foundation walls for use in one- and two-family homes. Panels furnished in this method of construction are nominal 4', 8'2", 9' and 10 feet high and up to 24 feet wide with a minimum concrete compressive strength of 5,000 psi. Panels consist of normal weight concrete that contains synthetic fibers.

The concrete exterior face shell is 1¾ inch thick and monolithic with the 10¼ inch top bond beam and bottom footing beam. Beams are reinforced with (2) #3 horizontal rebar.

The concrete interior studs are reinforced with a #4 vertical bar. Studs are spaced at 24 inches on center.

The Xi panels have studs - measuring 2¼ inches by 7½ inches that are monolithically cast to the face shell, with a concrete top bond beam and a concrete bottom footing beam. Studs are faced with galvanized steel channel for interior finish fastening. Access holes are cast into the web of the precast studs for plumbing and wiring.

The Xi panels use 2½ inch thick rigid cellular polystyrene, or Xi Plus panels use a 5 inch insulation assembly consisting of 4.5 inch rigid cellular polystyrene and 0.5 inch foil-faced polyisocyanurate foam plastic insulation bonded to the face shell on the inside face. Each stud is wrapped with 1 inch-thick expanded polystyrene insulation on the three exposed sides and is faced with a galvanized steel channel for interior finish fastening.

The exterior panel joints are to be continuously sealed and damp-proofed with sealant specified by Superior Walls of America, Ltd., and damp-proofed to meet the requirements of **s. SPS 321.18(3)(a)**. The damp-proofing is an integral part in the design mix of the concrete. Superior Walls Xi panel walls have been evaluated as an alternative method of providing foundation wall damp-proofing. No additional damp-proofing is required.

This approval includes a crushed stone footing for use in lieu of a concrete footing when installed as specified on pages 4 through 9 of the manufacturers 2018 Builder Guideline Booklet™.

Precast foundations shall not be backfilled until the precast wall footing beams are braced by a concrete basement floor slab and the top bond beams are braced by the first floor construction, or the walls have been sufficiently braced to prevent damage by backfill. Where floor joists run parallel to the walls, structural bracing or bridging in accordance with **s. SPS 321.18(1)(d)** shall be used between the floor joists to resist the backfill pressure except where the manufacturer's recommendations are more restrictive than the code.

Where a concrete floor slab is not installed, as in crawl space applications, the wall shall be braced in accordance with the manufacturer's recommendations.

All rigid cellular polystyrene used in Superior Walls is designed for use as nonstructural sheathing.

For additional information, please also consult ICC Evaluation Services Report ESR-1662 at this link: <https://icc-es.org/report-listing/esr-1662/>. Submitter's website is at www.superiorwalls.com.

TESTS AND RESULTS

Structural (including Wind): Above-grade foundation stem wall applications in which negative transverse loads (such as leeward side wind pressure) in accordance with the applicable code are developed, must be limited to applications where the negative design wind pressure does not exceed 80 psf (3.83 kN/m²). Above-grade foundation stem wall applications in which positive transverse wind loads, in accordance with the applicable code, are developed must be limited to applications where the allowable wind pressure does not exceed 155 psf (7.42 kN/m²).

Fire Test: Intertek Testing Services conducted a 2-hour fire test in accordance with ASTM E119. The test specimen consisted of a wall panel having a 1¾ inch thick face of 5000 psi concrete, which was covered on the interior side with a maximum of 5 inches of foam insulation board. The 2¼ inch wide steel reinforced concrete studs, located on 24-inch centers, were also covered with 1" foam insulation board and faced with 24 gage galvanized steel. Additionally, two layers of 5/8-inch Type X gypsum wallboard were installed and finished on the interior face of the wall prior to the test. The wall assembly was tested in accordance with ASTM E119. **Results:** The wall assembly met the requirements of ASTM E119 Fire Tests of Building Materials for a load bearing (5000 lbs./ft) fire resistance rating of 120 minutes.

Guardian Fire Testing Laboratories, Inc conducted a room corner fire test according to UL 1715 "Fire Test of Interior Finish Material, Third Edition, dated 9/9/97". The sample submitted, installed, and tested consisted of a panel with a 1¾ inch thick face shell of 5000 psi concrete covered on the interior with a 2½ inch thick layer of extruded polystyrene board. **Results:** The wall system sample, with 2½ inch thick extruded polystyrene insulation did not flame and did not smoke during the test period. Based on these results, 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".

Guardian Fire Testing Laboratories, Inc. conducted a room corner fire test according to UL 1715 "Fire Test of Interior Finish Material, Third Edition", and to ICC-ES AC 12, effective March 1, 2011. The sample submitted, installed, and tested consisted of a panel with a 1¾ inch thick face shell of 5000 psi concrete covered on the interior cavities between the reinforced concrete studs with a 4½ inch thick layer of expanded polystyrene board covered with ½ inch of DOW THERMAX™. The 2¼ inch wide steel reinforced concrete studs are located on 24 inch centers, covered with 1 inch of EPS, and faced with 24 gage galvanized steel. **Results:** The wall system sample as described above, with 4½ inch thick EPS covered with ½ inch of DOW THERMAX™ insulation did not flame or smoke during the test period. The tested materials successfully met the conditions of the test standard, UL 1715, Fire Test of Interior Finish Material. (The product DOW THERMAX™ was rebranded as DUPONT™ THERMAX™ in 2019.)

Guardian Fire Testing Laboratories, Inc. conducted a room corner fire test according to UL 1715 "Fire Test of Interior Finish Material, Third Edition", and to ICC-ES AC 12, effective June 2015. The sample submitted, installed, and tested consisted of a panel with a 1¾ inch thick face shell of 5000 psi concrete covered on the interior cavities between the reinforced concrete studs with a 4½ inch thick layer of expanded polystyrene board covered with ½ inch of OX ISO RED MAX™ polyisocyanurate insulation. The 2¼ inch steel reinforced concrete studs are located on 24 inch centers, covered on face and sides with 1 inch of EPS, and faced with 4¼ inch-wide 24 gage galvanized steel. **Results:** The wall system sample as described above, with 4½ inch thick EPS covered with ½ inch of OX ISO RED MAX™ polyisocyanurate insulation did not flame and there was a low amount of smoke during the test period.

The tested materials successfully met the conditions of the test standard, UL 1715, Fire Test of Interior Finish Material.

DRAIN TILE MATERIAL AND INSTALLATION REQUIREMENTS:

- In lieu of the drain tile requirements of **s. SPS 321.17**, the Superior Walls of America, Ltd., system may be installed with drainage pipe or tile meeting all of the following criteria, on either side of the foundation walls. Filter membranes shall be installed over the Superior Walls of America, Ltd. drainage system prior to backfill as specified in the manufacturer's 2018 Builder Guideline Booklet™.
- Drain tile or pipes used for foundation drainage shall be at least 3 inches inside diameter.
- Where individual tiles are used, they shall be laid with 1/8 inch open joints. Joints between the tiles shall be covered with a strip of sheathing paper or asphalt or tar saturated felt.
- When tile or pipes are installed inside or outside the wall system, they shall be covered with clean crushed stone as specified on pages 4 through 9 of the manufacturers 2018 Builder Guideline Booklet™ and are permitted to be placed on the soil.
- Tile or pipe shall be installed 12 inches from the foundation walls nearest surface, except where specifically called for by the manufacturer's recommendations.
- The drain tiles or pipe that lead from the footing tiles to the sump pit or natural grade shall be laid at a grade of not less than 1/8-inch per foot leading to the sump pit or natural grade. The remaining drain tiles or pipe shall be level or graded downward to a line that leads to the sump.
- **DRAIN TILE DISCHARGE.** Drain tiles shall be connected to a sump pit or daylight. The sump shall discharge to natural grade or be equipped with a pump to discharge water away from the dwelling via surface drainage channels.

LIMITATIONS OF APPROVAL

Except where modified by this approval, the use and installation of this product shall be in accordance with the current version of the **Wisconsin Uniform Dwelling Code** for 1 & 2 family dwellings:

The thermal barrier called for in **s. SPS 321.11(1)(b)** is not be required if installed in accordance with the assembly as tested against either the UBC 26-3 Room Fire Test standard for interior finish of foam plastic systems or else the UL 1715, Fire Test of Interior Finish Material. Unless additional foam plastic insulation is added to the Superior Wall Panels, they may be left exposed in basements and crawl spaces.

Installation shall be in strict accordance with the manufacturer's instructions.

To show compliance with the energy conservation requirements of **Chapter SPS 322**, insulation R-value, heat loss calculations, etc., must be submitted on a job-by-job basis in accordance with **s. SPS 320.09(6)**. **Note:** The energy conservation requirements of **Chapter SPS 322** have not been evaluated.

DISCLAIMER

This approval will be valid through 12/31/2026 unless manufacturing modifications are made to the product or a re-examination is deemed necessary by the department. The Wisconsin Building Product Evaluation Number must be provided when plans that include this product are submitted for review. This approval addresses only the specified applications for the product and does not waive any code requirement not specified in this document. The department is not endorsing or advertising this product.

Reviewed by: *Jack A. Miller*

Approval Date: 05/14/2021 By: Jack A. Miller
Commercial building plan examiner and product reviewer

Peer Review: JLH