Division of Industry Services
1400 East Washington Ave.
Madison, WI 53703

Approval # 201501-R

(Replaces 200903-R)

Wisconsin
Building Product Evaluation

Material: Xi Precast Concrete Insulated Foundation Wall System

Manufacturer: Superior Walls of America, Ltd.
937 East Earl Road
New Holland, PA 17557

Additional Listee: Great Lakes Superior Walls
4555 134th Avenue
Hamilton, Michigan 49419

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

For additional information, please also consult ICC Evaluation Services Report # ESR-1662.

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, 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 1- ¾ inch thick and monolithic with the 10- ¼ 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 @ 24 inches on center.

The Xi panels have studs - measuring 2 ¼-inches by 7 ½-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 2 ½-inch-thick rigid cellular polystyrene, or 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 caulked 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 6 and 10 of the manufacturers 2013 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.

TESTS AND RESULTS

Structural and 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/m^2). 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/m^2).

Fire Test: A test specimen consisting of a panel 1-3/4 inch thick face of 5000 psi concrete, covered on the interior with a 1-inch thick layer of extruded polystyrene board 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 (6000 pounds total force per stud) fire resistance rating of 120 minutes.

Omega Point Laboratories conducted a room corner fire test according to UBC 26-3 "Room Fire Test Standard for Interior of Foam Plastic Systems". The test specimen consisted of a panel with a 1 ¾-inch thick face shell of 5000 psi concrete covered on the interior with a 1-inch thick layer of extruded polystyrene board. **Results:** 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–inch layer of foam near the top of the room. Based on these results, the specimen met the requirements of the UBC 26-3.

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 1 ¾-inch thick face shell of 5000 psi concrete covered on the interior with a 2 ½-inch thick layer of extruded polystyrene board. **Results:** The wall system sample, with 2 ½-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 1-3/4 inch thick face shell of 5000 psi concrete covered on the interior cavities between the shell reinforced

concrete studs with a 4-1/2 inch thick layer of expanded polystyrene board covered with ½ inch of DOW THERMAX ™ . The 2-1/4 inch 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 4-1/2 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.

WISCONSIN UNIFORM DWELLING CODE (1-2 FAMILY) COMPLIANCE

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 (UDC), for 1 & 2 family dwellings:**

The thermal barrier called for in **s. SPS 321.11 (2)** 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 the UL 1715, Fire Test of Interior Finish Material.

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)**.

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 2013 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 6 and 10 of the manufacturers 2013 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.

DISCLAIMER

The department is not endorsing or advertising this product. This approval addresses only the specified applications for the product and does not waive or modify any code requirement not specified in this document.

EXPIRATION

This approval will be valid through December 31, 2020, unless manufacturing modifications are made to the product or a re-examination is deemed necessary by the department. The product approval is applicable to projects approved under the current edition of the applicable codes. This approval may be void for project approvals made under future applicable editions.

Approval Date: March 31, 2015	By: Duane Hubeler, PE Bureau of Technical Services Duane D Hubeler