



THERMAL PERFORMANCE SPECIFICATION SHEET

2-Bead Wall System 4 Ft. Core Spacing

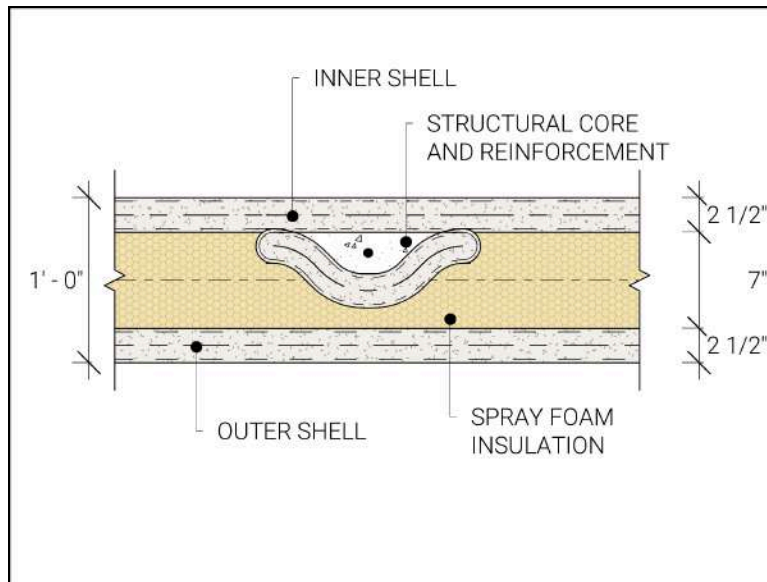
NOMINAL 12 INCH WALL

System Overview

The ICON wall system combines advanced 3D-printed concrete construction with high-performance spray foam insulation to deliver superior thermal efficiency. The dual-bead printed shell creates an insulated cavity that minimizes thermal bridging while maintaining structural integrity.

Key Features

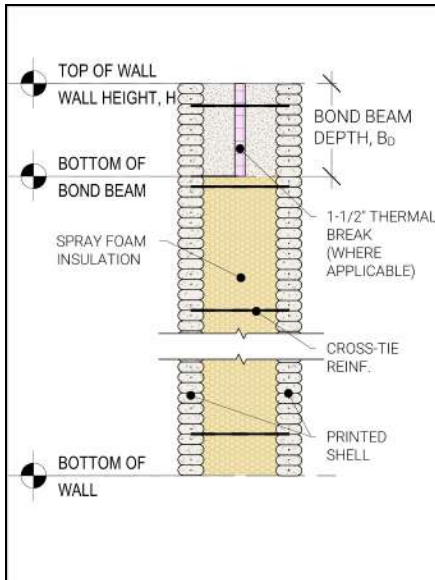
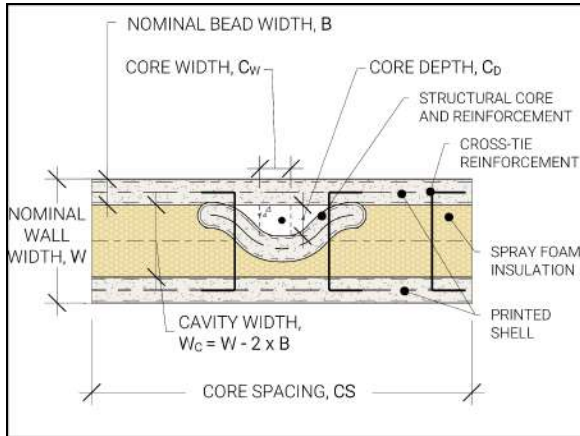
- **3D-printed CarbonX shell:** Durable, precision-manufactured concrete envelope
- **InsulSmart cavity insulation:** Injection open-cell spray foam for complete thermal barrier
- **Configurable core spacing:** 4 ft on-center structural cores
- **Bond beam integration:** Solid concrete sections for floor and roof connections
- **Cross-tie reinforcement:** Steel ties connecting inner and outer shells





Thermal Performance Data

Performance values represent whole-assembly thermal transmittance including all thermal bridges from cores, bond beams, and cross-tie reinforcement.



Core Size	Bond Beam Depth No Thermal Break			
	0 in	8 in	9 in	10 in
10 Ft. Wall				
3x3 in	0.056	0.092	0.095	0.099
3x4 in	0.058	0.094	0.097	0.101
4x4 in	0.082	0.115	0.119	0.122
12 Ft. Wall				
3x3 in	0.054	0.084	0.087	0.090
3x4 in	0.056	0.086	0.089	0.092
4x4 in	0.079	0.107	0.110	0.113

Core Size	Bond Beam Depth With Thermal Break			
	0 in	8 in	9 in	10 in
10 Ft. Wall				
3x3 in	0.056	0.062	0.063	0.065
3x4 in	0.058	0.064	0.065	0.067
4x4 in	0.082	0.086	0.087	0.089
12 Ft. Wall				
3x3 in	0.054	0.059	0.060	0.061
3x4 in	0.056	0.061	0.062	0.063
4x4 in	0.079	0.083	0.084	0.085



Material Properties

CarbonX Printing Material

- **Thermal Conductivity:** 1.600 W/mK (9.707 btu·in/h·ft²·°F)
- **Emissivity:** 0.5
- **Source:** Third-party testing (September 17, 2019)
- **Application:** Dual-bead printed shell structure

InsulSmart Spray Foam Insulation

- **Thermal Conductivity:** 0.029 W/mK (0.20 btu·in/h·ft²·°F)
- **Emissivity:** 0.9
- **Type:** Injection open-cell foam
- **Application:** Complete cavity fill between printed beads

Structural Components

- **Core Spacing:** 4 ft on-center (standard)
- **Core Sizes:** 3×3 in, 3×4 in, 4×4 in
- **Bond Beam Depths:** 8 in, 9 in, 10 in (as required by structural design)
- **Cross-tie Material:** Stainless steel reinforcement

Performance Analysis Summary

Analysis Method

- **Software:** SOLIDO by Physibel (three-dimensional finite element analysis)
- **Validation:** EN ISO 10211 for thermal bridge analysis
- **Standard Reference:** ASTM C1363 representative sample approach
- **Boundary Conditions:** ASHRAE Handbook - Fundamentals, Chapter 26, Table 10

Analysis Conditions

- **Interior Temperature:** 68°F (20°C)
 - **Exterior Temperature:** 32°F (0°C)
 - **Sample Size:** 8 ft wide × wall height with two cores
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Code Compliance Applications

These thermal performance values support code compliance under the International Energy Conservation Code (IECC) U-factor method. Design professionals should verify that selected configurations meet local jurisdictional requirements for the specific climate zone and building type.

Typical Climate Zone Compliance

Performance values vary by configuration. Consult with design professionals to determine appropriate core size and bond beam depth for specific project requirements and climate zones.

Important Notes

Analysis Scope

The thermal performance values in this specification represent steady-state heat transfer analysis including all thermal bridges from cores, bond beams, and cross-tie reinforcement. Values are based on three-dimensional finite element modeling of representative wall sections.

Installation Requirements

Thermal performance assumes proper installation per manufacturer specifications:

- Complete spray foam cavity fill with no voids or gaps
 - Proper core placement and reinforcement
 - Quality control during 3D printing process
 - Material consistency per specified thermal properties
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Technical Support

For additional information on selecting the appropriate wall configuration for your project, contact ICON or consult with a qualified design professional.

This specification sheet provides thermal performance data only. Complete structural analysis, code compliance verification, and project-specific design remain the responsibility of the design professional and authority having jurisdiction.