Leviat®
A CRH COMPANY

thermomass®

Thermomass System CIP SL Series Connectors

Installation Procedures

INTRODUCTION

Thermomass System CIP is a patented construction method, utilizing state-of-theart technology in a single-pour, insulated concrete sandwich wall. The Thermomass SL fibercomposite connectors serve a dual purpose. During the construction of the wall, the connectors locate the insulation within the wall, allowing both concrete layers to be placed to the specified thickness. During service, the connectors may transfer lateral loads from the exterior concrete layer to the structural layer. System CIP connectors are not designed to transfer gravity loads from the exterior concrete layer to the structural layer.

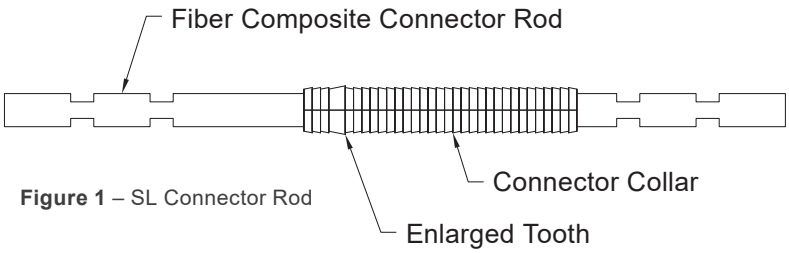

Figure 1 – SL Connector Rod

SYSTEM CIP – SL CONNECTORS

Each SL Connector comprises a connector rod and collar (Figure 1) with 2 retaining buttons (Figure 2). The collar on the connector has a series of inclined teeth, and the buttons have a central hole with six fingers. The fingers in the buttons act as detents that lock into the teeth on the collar producing a ratchet mechanism. Therefore, the buttons will slide onto the collar but cannot be removed without damaging the button or the collar. At one end of the collar, an enlarged tooth acts as a stop for the first button (Figure 1). This enlarged tooth sets the distance from the face of the form to the face of the insulation. In addition to the connectors, System CIP with SL Connectors can be supplied with pre-drilled insulation sheets, bi-directional adhesive tape for added strength (optional) and cut insulation (optional) and installation drawings upon request (optional). If supplied, the drawings show the locations of insulation sheets, connectors, and taped joints between sheets.

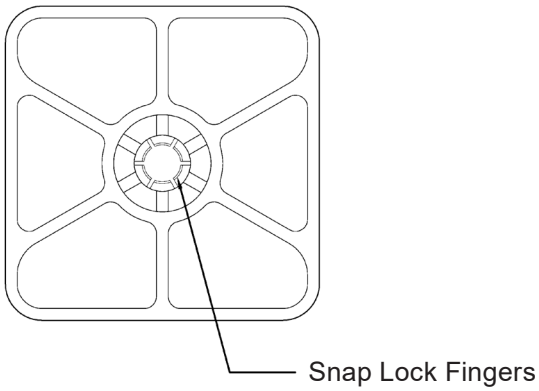

Figure 2 – Backside view of SL retaining button

INSTALLATION PROCEDURE

Formwork consisting of at least one stationary wall with reinforcing for one concrete layer and a base or platform of some sort is assumed to be in position prior to the installation of the System CIP. The following assembly instructions are for the installation of the System CIP with SL Connectors only.

1. INSTALL THE SL CONNECTORS

a. Leading with the end of the collar with the enlarged tooth, insert the connector into the front side of the button. Press the button until it comes to rest with the enlarged tooth completely engaged inside the hole in the button. Use caution not to force the button over the enlarged tooth, as this will destroy the snap-lock fingers.

   Note: The buttons cannot be removed once they have been inserted except by cutting the button or destroying the insulation. Make sure the first button is inserted on the side with only one lock ring and that all rods are inserted into the same side of the insulation board.

b. Install the connectors with pre-installed buttons into the pre-drilled holes in the insulation. Note that some projects require the use of several lengths of connectors. If supplied, the drawings will show where specific connectors are to be located.

c. Place the insulation on a flat surface so that the rods and buttons support the insulation. Install the final button on each connector by pressing the front side of button down onto the collar until the insulation is slightly compressed. The buttons on each side of the insulation will now clamp the insulation in place (Figure 3).

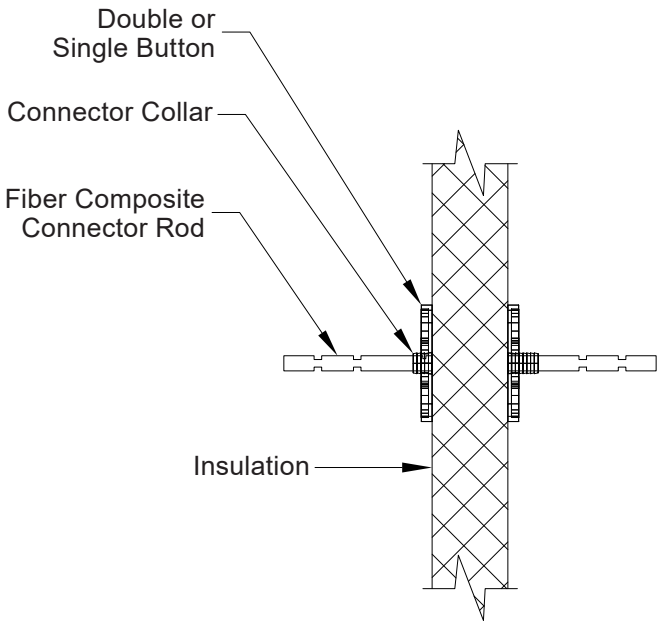

Figure 3 – Connector rod installed through insulation with snap lock buttons attached correctly

d. Continue this process for all insulation sheets.

Note: It is critical to the integrity and success of the System CIP that each retainer button and connector be securely placed and positioned in the form prior to placement of the concrete. Therefore, in the event a button is broken or dislodged, it must be replaced using the above procedure.

2. **INSTALL THE CIP INSULATION ASSEMBLY IN THE FORM** Using care install each assembly to ensure that the connectors correctly position the insulation in the form. Install filler assemblies cut from full assemblies where required. Filler assemblies consisting of two or fewer rows or columns of connectors shall have joint between insulation sheets taped or foam adhesive applied to maintain system stability during concrete placement. To help resist insulation assembly from rising or floating during concrete placement, tie sufficient number of connectors to the structural reinforcing bars to hold the insulation in place.

   Note: Using the connector notches to tie off to local reinforcement is not recommended and may compromise performance.

3. **PLACE THE REINFORCING FOR THE REMAINING CONCRETE LAYER** Tie to the connectors as needed. Close the form, again verifying that the insulation is properly located in the form.

   Note: Using the connector notches to tie off to local reinforcement is not recommended and may compromise performance.

4. **PLACE THE CONCRETE** Use accepted practice for concrete mix design and placement procedures for thin wall sections. If multiple walls intersect, start the concrete placement at the insulated walls. ***Ensure that the concrete is placed on both sides of the insulation with a maximum head differential of 12" (Figure 4).*** Vibrate concrete properly to ensure full consolidation around connectors and reinforcement and to assist with flow of concrete to required location.

   Concrete Mix & Workability Notes

   - Use a moderate, workable slump, typically 8 inches, or as appropriate for the specific mix design and placement method.
   - Avoid low slump mixes that may hinder concrete flowability and concrete consolidation around the connectors and reinforcement.

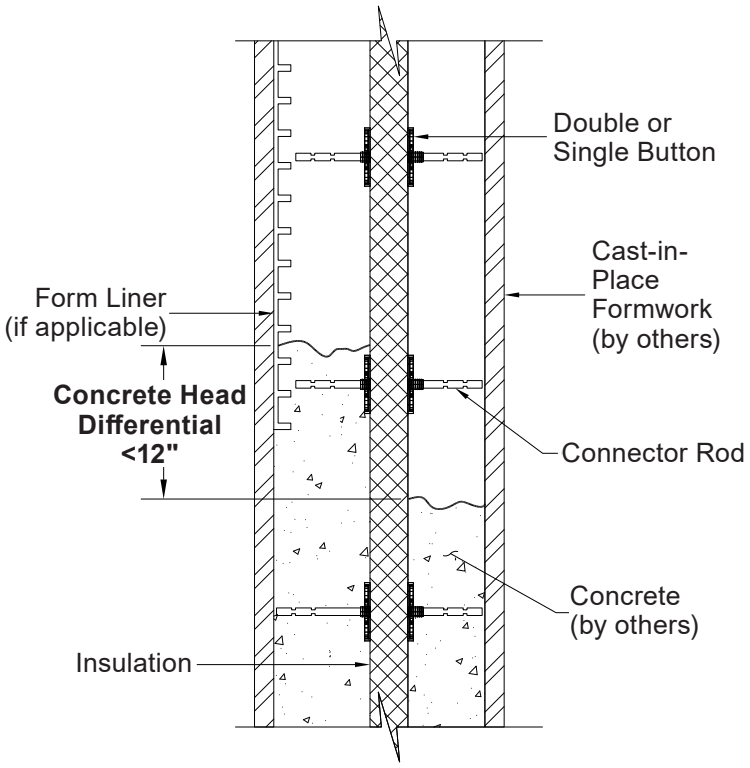

Figure 4 – Section through Thermomass CIP wall during concrete pouring process

Concrete Head Differential & Placement Pressure Notes:

- **Keep the concrete head differential between wythes to 12 inches or less.**
- Adjust concrete placement rate based on slump, slowing placement for higher-slump mixes to limit fluid pressure on the insulation during placement.
- Maintain a steady, controlled placement rate to prevent sudden spikes in head pressure.
- For installations using form-liners, maintain a positive differential head on the liner side to keep insulation and connectors pressed away from the liner.
- Contractor judgment is required to select placement methods suitable for field conditions, equipment, and project requirements.

DISCLAIMER

These procedures focus on the installation of the System CIP in the construction of cast-in-place insulated concrete sandwich walls. This document is not a construction specification. The information presented is based on the most recent, appropriate, industry standards and methods. The qualified designers, specifiers, suppliers, and contractors retained by the owner, must confirm all information.

For additional questions, please E-Mail: **engineeringsupport@leviat.us**