

Thermomass System CIP TL Series Connectors

Installation Procedures

INTRODUCTION

Thermomass System CIP is a patented construction method, utilizing state-of-the-art technology in a single-pour, insulated concrete sandwich wall. The Thermomass TL 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.

SYSTEM CIP – TL Connectors

System CIP with TL Connectors includes rigid insulation with pre-installed twist-lock retainers (spools). Each fibercomposite TL connector has an integral polymer wing that controls the position of the connector within the twist-lock retainer and provides means to insert, turn and lock the connector within the retainers during connector installation. System CIP with TL connectors can be supplied with bi-directional adhesive tape for added strength and installation drawings upon request. If supplied, the drawings show the locations of the insulation sheets, connectors and taped joints between the sheets.

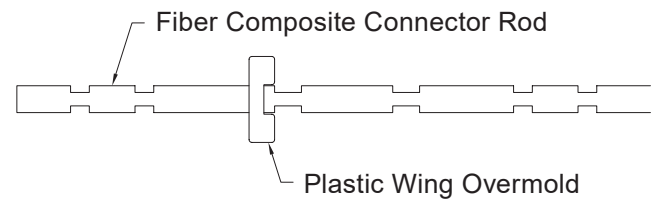


Figure 1 – TL Connector Rod

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 TL connectors only.

1. INSTALL SYSTEM CIP CONNECTORS

- a. With the connector oriented as shown in Figure 2, insert the connector into the rectangular hole in the twist-lock retainer.
- b. Push the connector through the thickness of the insulation until the wing comes to rest against the face of the twist-lock retainer.

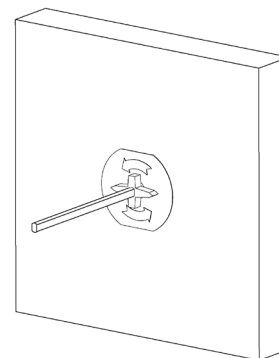


Figure 2 – Twist-lock assembly as installed through sheet insulation

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- c. Using the wing for leverage, use the thumb and index finger to twist the connector in the direction indicated by the arrows on the face of the twist-lock retainer (arrows shown in Figure 2). Note that the connectors will rotate 90 degrees until an internal detent in the retainer stops the rotation. Pull the connector perpendicular to the face of the insulation to insure connector is locked into the retainer properly.
- d. Continue this process for all twist-lock connectors to be installed in all twist-lock retainers in insulation.

Note: It is critical to the integrity and success of the System CIP that each twist-lock retainer and connector be securely placed and positioned in the insulation prior to placement of the concrete. Therefore, in the event a retainer is broken or dislodged, it must be replaced using the procedure at the end of this document.

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 the 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

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 3). Vibrate concrete properly to ensure full consolidation around connectors and reinforcement and to assist with flow of concrete to required location.

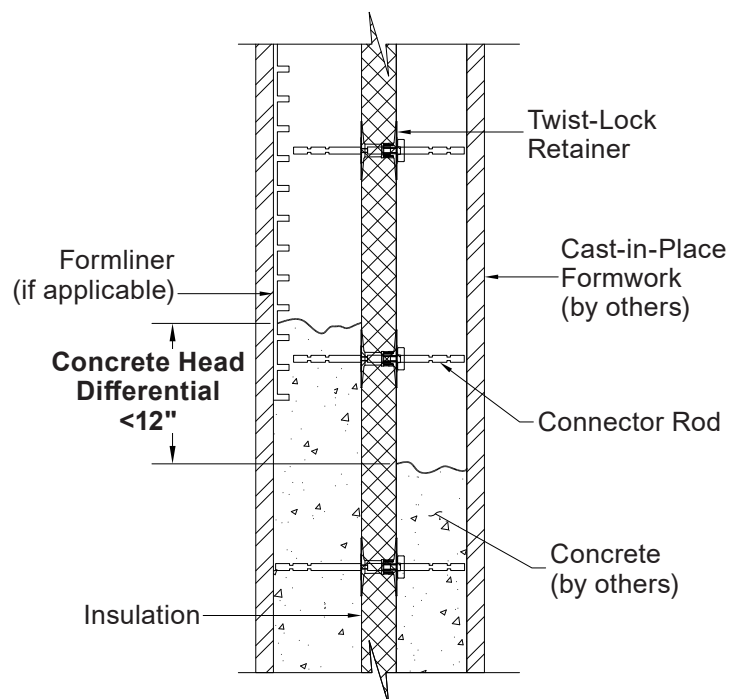


Figure 3 – Cast-in-place twist-lock connector as placed within wall assembly.

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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.

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.

TWIST-LOCK RETAINER REPLACEMENT PROCEDURE

This procedure requires access to each side of the insulation.

1. Contact LeviaT to request twist-lock (TL) spool repair kit(s). Each TL Connector repair kit includes male retainer sides.
2. Remove both halves of the broken or dislodged TL retainer from insulation board.
3. Insert the TL connector into one of male retainer sides until the wing is tight to the retainer and turn the connector in the direction indicated by the arrows on the retainer to lock the TL connector to the retainer.
4. Insert the connector end opposite the wing and pre-installed retainer through the hole in the insulation left vacant by the dislodged retainer. The procedure is now complete on this side of the insulation. It is now necessary to continue this procedure from the opposite side of the insulation.
5. Pull the TL connector through the thickness of the insulation until the pre-assembled twist-lock retainer comes to rest flush with the insulation on the side opposite.
6. Place the second male twist-lock retainer onto the connector and push toward insulation board until flush. Pull the connector tightly while pushing the adjacent retainer flush against the insulation. While holding the connector stationary, rotate the twist-lock retainer in the opposite direction of the arrows.

Please note that for the repair assembly to fit properly, the twist-lock retainers must be “locked” into the correct connector notches (Figure 4).

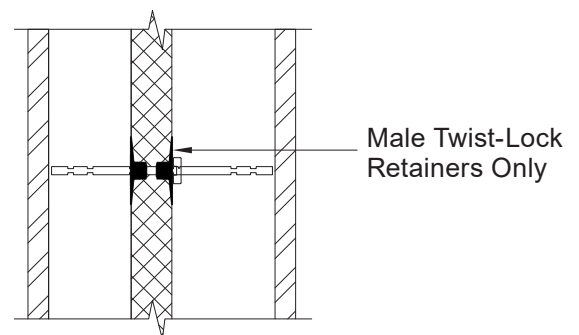


Figure 4 – Cast-in-place male twist-lock retainers as placed within wall assembly. Note how connector notches line up with shape of retainer wall when retainers are properly installed

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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: engineering support@leviat.us