

## Introduction

The Cast-in-Place method of construction combines the specialization of precast construction and the on-site convenience of tilt-up construction. The Thermomass System CIP is a patented construction method, utilizing state-of-the-art technology in a single-pour, insulated concrete sandwich wall. The fiber-composite connectors incorporated in System CIP 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 and gravity loads from the exterior concrete layer to the structural layer.

## System

The System CIP comprises of connectors and pre-cut, rigid insulation with pre-installed twist-lock retainers. Each connector comprises a fiber-composite connector with a polymer wing that controls the position of the connector within the twist-lock retainer and provides leverage during connector installation (*Fig. 1*). When installed in the twist-lock retainers, the connectors position the insulation in the form during concrete placement.

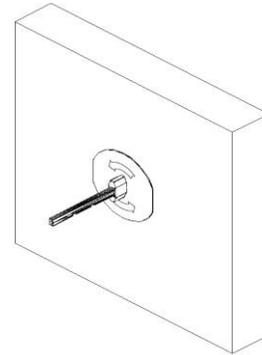


Figure 1

## Installation Procedure

- 1) Install the insulation assembly in the form.
- 2) Install System CIP connectors:
  - a. With the connector oriented as shown in (*Fig. 1*), insert the connector in the rectangular hole in the twist-lock assembly.
  - b. Push the connector through the thickness of the insulation until the wing comes to rest against the face of the twist-lock assembly.
  - 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 assembly. Note that the connectors will rotate 90 degrees until an internal detent in the retainer stops the rotation.
  - d. Continue this process for all of the connectors for a panel.
- 3) Using the notches on the fiber composite connectors, tie sufficient connectors to the structural reinforcing bars to hold the insulation in place. Alternatively, the connectors can be pre-installed and insulation system can be pre-wired to the reinforcing cage before installation in the form.
- 4) Place the reinforcing for the remaining concrete layer and tie to the connectors as needed. Verify that the insulation is properly located in the form and close the form.
- 5) During concrete placement, 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 differential head of approximately one foot (*Fig. 2*).
- 6) In installations with form-liners, maintain a positive differential head on the liner side to push the insulation and the connectors away from the liner.

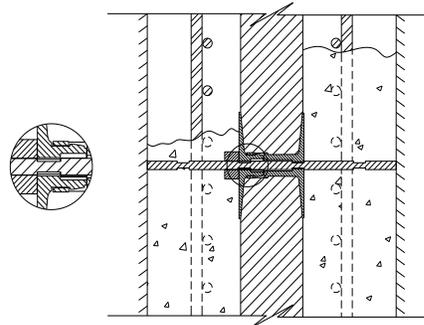


Figure 2

## Twist Lock Retainer Replacement

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 form prior to placement of the concrete. Therefore, in the event a retainer is broken or dislodged, it must be replaced using following procedure.

The System CIP repair kit comprises of two male retainer sides and one connector with polymer wing (*Fig. 3*). The pre-installed twist-lock retainers are comprised two interlocking parts; one female side and one male side (*Fig. 2*). The depth of the female part is larger than that of the male part due to the extended latches. For purposes of this repair, discard the female side. Additional male retainer sides are supplied with each box of connectors.

### Replacement Procedure

This procedure may be carried out by one person; however it requires that one has access to each side of the insulation.

- 1) Insert connector into one of male retainer sides and **turn the connector** in the direction indicated on the retainer (CCW).
- 2) Place the connector end opposite the wing through the hole in the insulation left vacant by the dislodged retainer. Continue this procedure on the opposite side of the foam.
- 3) Pull the connector through the thickness of the insulation until the twist-lock assembly comes to rest flush with the insulation on the side opposite.
- 4) Place the second male twist-lock retainer on the connector and move toward insulation until flush.
- 5) 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 arrow (CW).

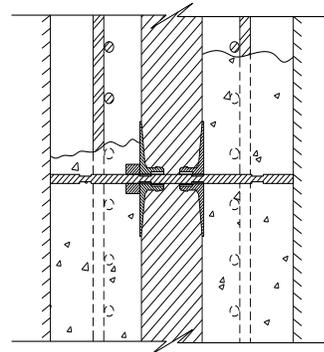


Figure 3

Please note that for the repair assembly to fit properly, the twist-lock retainers must be “locked” into the correct connector notches (*Fig. 3*).

If you have additional questions or concerns, please call. **Phone: (515)-433-6075**

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