

Longitudinal (Strong Direction) Splice Options for Exodermic® Decks

Longitudinal (Strong Direction) Exodermic® deck panel splices are primarily used on cast-in-place projects in which the panels are placed parallel to the direction of traffic spanning floor beams, or on projects with panels placed transverse to traffic spanning stringers with staged construction. The centerline of the splice primarily coincides with the centerline of the support; however, it is possible to make a splice off of the support. When the centerline of the splice is over the support, the panel is in negative bending and concrete is not included in the determination of the section properties. For standard WT sizes, the negative bending neutral axis is generally located between the bottom of the cross bar and the top of the WT. After deducting for the shear hole and cross bar punches, very little main bar web steel in this region is considered to contribute to the strength of the section, leaving the primary rebar to carry the tension bending forces. Although concrete is not considered to contribute to the strength of the section, the haunch concrete in the full depth section below the neutral axis helps bear the compressive bending forces.

Cast-in-Place Splice over Support

At a cast-in-place splice over a support, the ends of the panels are fabricated with 1/4" x 2" trim bars shop fillet welded flush to the bottom of the WT main bearing bars. The panels are set in the field leaving approximately 2" between the webs of the main bar, or approximately 1-1/2" between the trim bars. See *Figure 1*. Continuous rebar mats are placed in each direction and the concrete deck is placed.

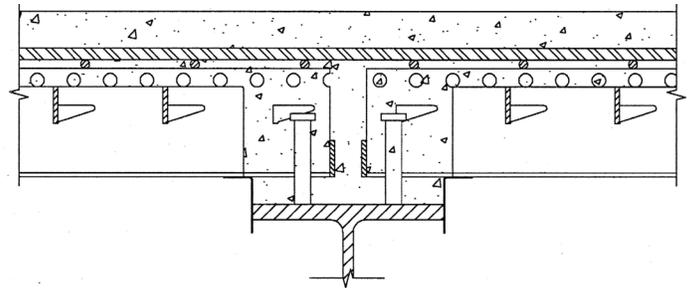


Figure 1

Precast Splice over Support

For precast panels, the bare grid is fabricated identically to a cast-in-place panel. The preferred splice method incorporates the use of mechanical couplers. At the precaster facility, one panel is precast with a female end mechanical coupler at the end of the primary rebar. See *Figure 2*. The end of the coupler lines up closely to the end of the main bearing bar. The precast limit shown lines up with the shop installed vertical bulkhead but could terminate further to the right. The next panel is placed and aligned with the first panel and leveled. A sufficient opening in the precast limit of the second panel shall be provided to accommodate the required lap splice (provided by the designer) of the primary reinforcement. The primary rebar in the second panel shall extend from the precast limit approximately to the end of the grid. A male end threaded dowel is mated with the female coupler and lapped with the extending rebar from the second panel. A monolithic closure pour is then made over the support.

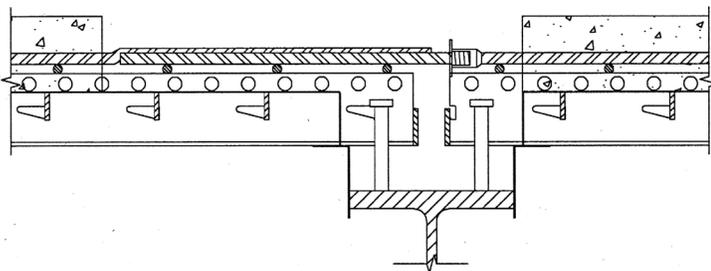


Figure 2

Staged Construction

Stage line construction is nearly identical to the typical precast panel splice over a support. *Figure 3* shows staged construction utilizing precast panels; cast-in-place construction would be similar. Remove approximately half the flange width of the existing concrete deck. Set the stage 1 panel. Form to the edge of the panel and female end mechanical coupler. Pour a small closure pour attaching the first stage construction to the support. Stage 2 construction then begins with the setting of the second panel as described above.

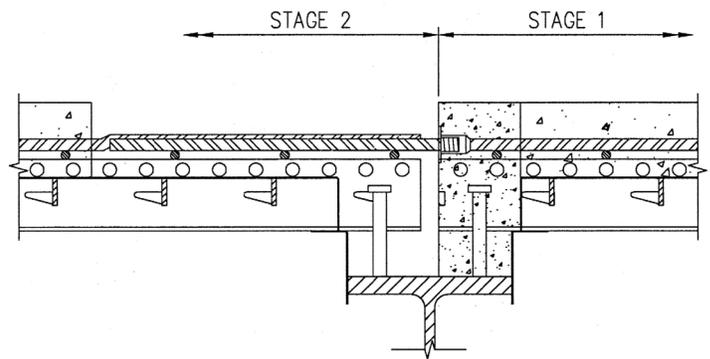


Figure 3

Splice off Support

A splice placed off of the support during staged construction consists of a bolted main bar connection in addition to a rebar mechanical coupling as used in previously discussed scenarios. *Figure 4* shows a cast-in-place splice; a precast splice is achievable. Because this is a fatigue sensitive detail, it is recommended that the splice be located at or near the inflection point. Connection plates are shop fillet welded to the ends of the panels and have oversized holes. On the stage 1 panel, a nut is shop welded to the inside of the connection plate and the primary rebar terminates at the end of the panel with a female end mechanical coupler. The stage 2 panel is fabricated with a length of missing deck form pan to field install the connection bolts. The stage 2 panel is placed in position then bolted to the stage 1 panel with appropriate washers. A male end threaded dowel is mated with the female coupler and lapped with the rebar in the stage 2 panel. Form pans are field installed and the deck is ready for concrete placement.

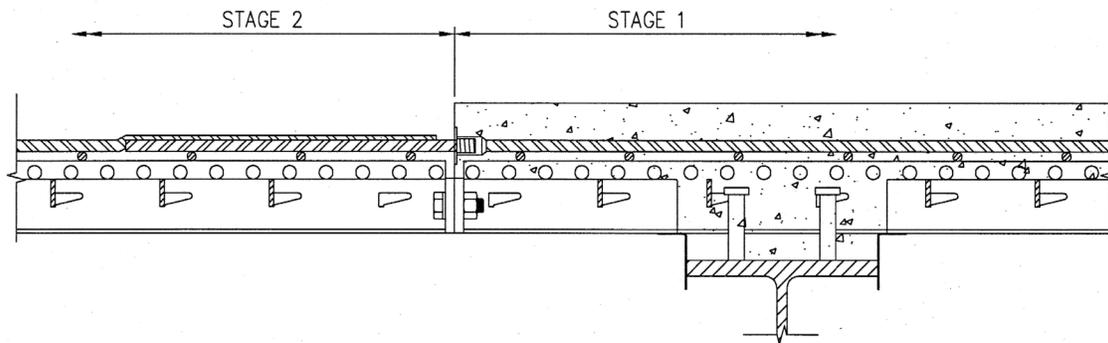


Figure 4



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