



## 9-8 WIDENING CLOSED END CELLULAR ABUTMENTS

Some existing structures incorporate closed end, cellular type abutments. These abutments can be bin type, see *Bridge Design Details: Section 6 - Abutments, Wingwalls*, or closure type (pier walls with adjacent closure walls), reference *Bridge Design Aids: Section 10 - Type Selection*. This memo will address the widening of these structures.

The space inside a closed end, cellular abutment is considered a confined space. New structure designs should not create confined spaces as they inhibit Structure Maintenance and Investigations' ability to adequately inspect structures for damage indicators. They also increase the hazards associated with staff entry for inspection, construction, or maintenance purposes, and require substantial entry preparation to meet strict CAL-OSHA guidelines. Widening structures with closed end cellular abutments raises concerns over how to handle existing confined spaces, and specifically, whether to remove the exterior girder in a bin type abutment or the closure walls in a closure type abutment. A number of issues must be addressed before determining the appropriate course of action, including safety, maintenance concerns, and final aesthetics considerations.

The following criteria have been established to address these issues.

- (1) If the widening is less than three (3) meters, and the skew of the structure is less than thirty (30) degrees, no modifications are required to the existing closure walls.
- (2) If either of the above criteria is not met, the existing closure walls should be removed, and new closure walls constructed incorporating the widening. Designers will need to check the load carrying capacity of the exterior girder in a bin type abutment to determine if this course of action is feasible. Bridge Aesthetics should be consulted to review the details when the walls are not reconstructed to match the new widening limits.
- (3) Variances from the above should be approved by the Office Chief in the design office performing the work.

Access to confined spaces should be provided with a hinged door that locks. Where the widening does not require new closure walls, any existing access doors which are bolted should be replaced with a hinged locking door.

*Original signed by Rick Land*

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