904 CONSTRUCTION JOINT GUIDELINES FOR BRIDGE CONSTRUCTION

904.01 GENERAL

The type of structure and method of construction, combined with sound engineering judgment, should be used in determining the number and location of superstructure construction joints. The use of construction joints should be minimized for ease of construction and subsequent cost savings. Some items which should be considered are:

1. Method of construction - earthen fill falsework, conventional falsework or girder bridge without falsework.
2. Phase construction because of physical constraints such as traffic handling.
3. Span length and estimated rotation and deflection.
4. Degree of fixity at abutments and piers.
5. Effects of locating a construction joint in a region of negative moment.
6. Volume of concrete to be poured without a joint.
7. Consequences of continuous pour, including adverse effects caused by a breakdown during the pour.

Some important requirements regarding construction joints contained in the Standard Specifications are as follows:

1. The sequence of concrete placement shall be as shown on the project plans or as approved by the Engineer when not shown on the project plans.
2. The rate of concrete placement and consolidation shall be such that the formation of cold joints within monolithic sections of any structure will not occur.
3. The rate of concrete placement for major structures shall not be less than 27 cubic meters per hour unless otherwise specified or approved in writing by the Engineer.
4. Placement of the deck concrete shall be in accordance with the placing sequence shown on the project plans.
5. The Contractor shall submit drawings showing the placement sequence, construction joint locations, directions of the concrete placement and any other pertinent data to the Engineer for his review. The drawing shall be submitted at least four weeks prior to the date of deck placement.
6. Construction joints shall be placed in the locations shown on the project plans or as approved by the Engineer.
7. All construction joints shall be perpendicular to the principal lines of stress and in general located at points of minimum shear and moment.

904.02 LONGITUDINAL CONSTRUCTION JOINTS

Longitudinal construction joints in bridge decks and/or superstructures should be identified as optional unless required by construction phasing. The optional deck joints should be placed on lane lines or at center of structure. All longitudinal construction joints should be keyed.

904.03 PRECAST CONCRETE GIRDER BRIDGES

Precast concrete girder bridges made continuous over supports shall have transverse construction joints placed so that the girders undergo their positive moment deflections prior to the final pour over the negative moment areas of the fixed piers or abutments. There shall be no horizontal construction joint between fixed pier diaphragm or abutment diaphragm and the deck.

Girder bridges will usually require details on the plans showing a plan view with joint locations, deck pour sequence and direction of pour, if required. There should be a minimum of 12 hours between adjacent pours. A continuous pour from abutment to abutment will not be allowed. Construction joints where required should be parallel to the centerline of the pier. Their location will be near the point of minimum dead load plus live load moment and shear. This distance is generally one-quarter of the span length from the pier if the adjacent spans are approximately equal length.