Special consideration shall be given to bridges supported on falsework with large openings where deflections could be harmful to the structure. Unless falsework requirements are strengthened or other means taken to ensure the bridge does not form tension cracks prior to tensioning, the maximum allowable tension in a precompressed tensile zone shall be limited to zero.

402.10 LOSS OF PRESTRESS (AASHTO 9.16)

For multi-span bridges, the cable path should have its low point at the midspan. Design should be based on usage of galvanized rigid ducts with K = 0.00000066 and μ = 0.25. Anchor set losses should be based on 16 millimeter set.

For creep of concrete, the variable fcds should be calculated using the total dead load applied after prestressing, including the 120 kg/m2 future wearing surface.

402.11 FLEXURAL STRENGTH (AASHTO 9.17)

In determining the negative ultimate moment capacity, the top layer of temperature and shrinkage and bottom layer of distribution reinforcing may be used. In determining the positive ultimate moment capacity, the longitudinal flange reinforcing (AASHTO 9.24) may be used.

402.12 SHEAR (AASHTO 9.20)

Girder webs will be designed for shear using the Ultimate Strength Method according to the 1979 Interim AASHTO Standard Specifications. The maximum girder web stirrup spacing will be 300 mm within 6 meters from the front face of the abutment diaphragms. This will eliminate the need for re-spacing the web stirrups at the point of web flare if the post-tensioning system requires flaring.

The value of "d" to be used in shear calculations shall be the larger of the calculated "d" value or 0.8 times the overall effective depth.

Horizontal shear shall be investigated in accordance with the provisions of AASHTO 9.20.4.

Calculations shall include the shear due to secondary moment and cable shear. For curved box girder bridges, the shear due to torsion shall be included.

402.13 FLANGE REINFORCEMENT (AASHTO 9.24)

Reinforcing in the bottom slab of box girders shall conform to the provisions of AASHTO 8.17.2.3 except that the minimum distributed reinforcing in the bottom flanges parallel to the girders as specified in AASHTO 8.17.2.3.1 shall be modified to be 0.30 percent of the flange area.

402.14 METHOD OF ANALYSIS

The superstructure may be designed using the system as described below:

1) The bottom slab, in the vicinity of the intermediate support, may be flared to increase its thickness at the face of the support when the required concrete strength exceeds 320 kg/cm^2. When thickened, the bottom slab thickness should be increased by a minimum of 50 percent. The length of the flare should be at least one-tenth of the span length (measured from the center of the support) unless design computations indicate that a longer flare is required.

2) Section properties at the face of the support should be used throughout the support; i.e. the solid cap properties should not be included in the model.

3) Negative moments should be reduced to reflect the effect of the width of the integral support.

4) Dead load forces should not produce any tension in the extreme fibers of the superstructure.

5) The superstructure should be designed as a unit with the number of live loads applied in accordance with Section 202.02 of this manual.

For box girders with severe sloping webs or boxes over 2 meter deep, transverse flange forces induced by laterally inclined longitudinal post-tensioning shall be considered in the design.