

### **5.7.3.5 LONGITUDINAL REINFORCEMENT**

In equation 5.7.3.5-2 for the required tensile reinforcement at the inside edge of the bearing area of simple end supports to the section of critical shear, the values of  $V_u$ ,  $V_s$ ,  $V_p$ , and  $\theta$  calculated at the section of critical shear shall be used. Where there is an embedded steel bearing plate in the girder, the inside edge of the bearing area shall be taken as the inside edge of the embedded steel plate and the theoretical crack is assumed to propagate from the inside edge of the embedded steel plate at an angle of  $\theta$ , where  $\theta$  is calculated at the section of critical shear. Refer to Figure C5.7.3.5-1.

For prestressed girders, if the prestressing strands alone are not sufficient to resist the required tensile force, then the embedded steel plate can be lengthened slightly, mild steel can be utilized, or a combination of the two. Any lack of full development in either prestressing strands or the mild reinforcing shall be accounted for. Check development of mild reinforcing from the end of the girder to the point where the reinforcing bars cross the theoretical crack.

At other sections (critical section, 0.1L, 0.2L, etc.), the tensile capacity of the tensile reinforcement on the flexural tension side of the member shall be calculated using equation 5.7.3.5-1. The values of  $M_u$ ,  $N_u$ ,  $V_u$ ,  $V_s$ ,  $V_p$ , and  $\theta$  shall be the values that are calculated for the section under consideration.

Commentary: At sections other than at the end, the values of  $M_u$ ,  $N_u$ ,  $V_u$ ,  $V_s$ ,  $V_p$ , and  $\theta$  are assumed to apply over a bandwidth that is centered on the section under consideration. At the end, the bandwidth is taken as the distance from the inside edge of the bearing area to the section of critical shear. The code is not clear regarding what values of  $M_u$ ,  $N_u$ ,  $V_u$ ,  $V_s$ ,  $V_p$ , and  $\theta$  apply over the bandwidth at the end. The commentary allows using  $V_u$ ,  $V_s$ ,  $V_p$ , and  $\theta$  calculated at the section of critical shear over this bandwidth (Refer to C5.7.3.5.).  $M_u$  is taken as 0.0 ft-kips over this bandwidth. For uniformity within the Bridge Section, we have chosen to use the method in the commentary.

#### **Revisions:**

Oct 2017

Renumbered article from 5.8.3.5 to 5.7.3.5 to conform to the 8<sup>th</sup> Edition of the AASHTO LRFD Bridge Design Specifications.