

Channel Caps and Cap Plates

Channel caps or cap plates are frequently used to provide adequate top flange capacity to transfer lateral loads to the crane columns and to provide adequate lateral torsional stability of the runway girder cross section. It should be noted that the cap channel or plate does not fit perfectly with 100 percent bearing on the top of the wide flange. The tolerances given in ASTM A6 allow the wide flange member to have some flange tilt along its length, or the plate may be cupped or slightly warped, or the channel may have some twist along its length. These conditions will leave small gaps between the top flange of the girder and the top plate or channel. The passage of the crane wheel over these gaps will tend to distress the channel or plate to top flange welds. Calculation of the stress condition for these welds is not practical. Because of this phenomenon, cap plates or channels should not be used with Class E or F cranes. For less severe duty cycle cranes, shear flow stress in the welds can be calculated and limited according to the AISC (1999) fatigue provisions in Appendix K3, Table A-K3.1, Section 8.2. The channel or plate welds to the top flange can be continuous or intermittent. However, the AISC design stress range for the base metal is reduced from Category B (Section 3.1) for continuous welds to Category E (Section 3.4) for intermittent welds.