



- General Notes:
- 1) While a RCP culvert is detailed, this Safety End shall also be used with RCPA, ACMP, ACMPA, PVC and RCB culverts. Safety Ends for skewed culverts shall also be skewed with walls parallel to the centerline of the culvert.
  - 2) The slope of the Safety End walls ( $S_L:1$ ) shall match the embankment foreslope required on the typical section. If no foreslope is given, a slope of 4:1 shall be required. Skewed Safety Ends shall require flatter wall slopes to match embankment foreslopes.
  - 3) Pipe Runners shall be galvanized steel pipe conforming to ASTM A53, Type E or S, Grade B, 35ksi; or ASTM A501, 36ksi. Required Pipe Runner diameters and strengths for various maximum spans are:

Nominal Diameter	Strength/Schedule	Maximum* Span	Outside Diameter	Wall Thickness	Weight Per Foot
3"	XS/80	14'-5"	3.5"	0.300"	10.25 lbs
3 1/2"	Std/40	15'-6"	4.0"	0.226"	9.11 lbs
3 1/2"	XS/80	20'-4"	3.548"	0.318"	12.50 lbs
4"	Std/40	20'-10"	4.5"	0.237"	10.78 lbs
4"	XS/80	27'-8"	4.5"	0.337"	14.98 lbs
5"	Std/40	35'-4"	5.563"	0.258"	14.62 lbs
5"	XS/80	48'-2"	5.563"	0.375"	20.78 lbs
6"	Std/40	55'-1"	6.625"	0.280"	18.97lbs
6"	XS/80	79'-0"	6.625"	0.432"	28.57lbs

\* Pipe Runners are designed for a traversing load of 1,800 pounds at yield.

- 4) For culvert widths of 60" and less a single pipe runner is required. For larger culvert widths, multiple pipe runners are required. The maximum pipe runner spacing is 30".
- 5) Safety End to be joined to existing headwall with 12" long #4 dowel bars. Dowels are to be set in epoxy in 5/8" diameter holes drilled 6" deep into existing headwall.