CONCRETE PIPE, CATTLE PASS, OR PRECAST CONCRETE BOX CULVERT TIES

- **EYE BOLT TIE (PIPES ONLY)**
  - 32" (Adj. + 1 1/2 min.)
  - 2" max.

- **ADJUSTABLE TIE (RCB AND PIPES ONLY)**
  - 32" (Adj. + 1 1/2 min.)
  - 2" max.

- **U BOLT TIE (RCB, PIPES, OR CATTLE PASSES)**
  - 32" + as required to produce an acceptable joint
  - 2" max.

- **WELDED TIE (RCB AND PIPES ONLY)**
  - 6" usable thread (typ.)
  - 40" 7/8" min.

- **HIDDEN TIE (RCB ONLY)**
  - 7/8" (typ.)

- **SECTION A-A**

- **DETAIL A**

- **DETAIL B**

**NOTES:**
1. The pipe size listed is the inside diameter of round pipe or the equivalent diameter of pipe with an oval cross-section.
2. Cattle passes and boxed pipe shall have pipe ribs inserted from the inside of the pipe and ground to the pipe. Ribs are manufactured within a diameter of 24" or less to not require pipe sizes.
3. Nuts and washers are not required on boxed pipe or ribs with a 34" diameter or less. Where nuts and washers are not used, the rib bars shall be threaded and grouted into place.
4. This is only for holding pipe or RCB sections together, not for pulling sections tight.
5. The bolt assembly shall be hot-dip galvanized in accordance with AASHTO M232.
6. Holes in pipe to accommodate tie bolts can be precut or drilled. Leave holes are permitted when precut. Holes shall have a diameter 1/3 larger than the diameter of the thread. Holes in precut RCB's shall contain ductile iron bolts with an inside diameter of 1 1/2".
7. The contractor has the option of selecting the type of tie bolt used from those shown.
8. The cost of precutting or drilling the required holes and running the tie bolts shall be included in the price bid for the applicable contract.
9. All centers and approach RCB culvert joints shall be hot. Storm drain systems shall have the first three bolts indicating the end section of all the work.
10. The bolt used shall be ASTM A 307. Threads shall not terminate at an angle or on mush. Outlet culverts with end terminations within drain adjacent catchments are examples of free ends.
11. Place joint wrap prior to installing ties. Overlap the joint by 1/2" in both directions.
12. The bolts shall conform to ASTM A 307. Nuts shall be hot-dip galvanized and conform to ASTM A 563. Washers shall conform to ASTM F 436. Type I, Welded pipe sleeves and cast-iron bolt sleeves shall conform to ASTM A 73, Grade B.