

## **Coachella Valley Water District** **Restrained Joint Guidelines**

1. Restrained Joints shall be installed in the following situations unless otherwise directed by a Coachella Valley Water District representative:
  - a. On all fittings in accordance with the attached table.
  - b. On both sides of in-line valves that are potential dead ends (follow guidelines for dead ends).
  - c. Non-pavement areas.
  - d. Fire hydrant and/or blow off assemblies at the end of a line.
  - e. Commercial complex – all pipes restrained.
  - f. Apartment complex – all pipes restrained.
  - g. Any pipe located under decorative paving.
  - h. When clearance over/under storm drain crossing is less than 3 feet.
  - i. Siphons (above or below utility conflict).
  
2. Types of restrained joints that may be used on ductile iron pipe:
  - a. “Field Lok” gaskets as manufactured by U.S. Pipe or approved equal may be used for 18-inch diameter and smaller “push on” joint ductile iron pipe.
  - b. “T.R. Flex” restrained joint pipe and fittings as manufactured by U.S. Pipe or approved equal may be used for 24-inch diameter pipe and greater.
  - c. “T.R. Flex” restrained joint pipe and fittings shall be utilized when ductile iron pipe is installed in non-pavement areas unless otherwise directed by a Coachella Valley Water District representative.
  - d. Mechanical thrust restraining devices for mechanical joint ductile iron pipe shall be “Mega Lug” restraining glands as manufactured by E.B.A.A. Iron Works with ductile iron trim or approved equal.
  
3. Fire Hydrants will utilize both thrust blocks and restrained joints.
  
4. Other than fire hydrants, thrust blocks do not need to be installed if pipe is restrained unless otherwise directed by a Coachella Valley Water District representative.

## RESTRAINED JOINT REQUIREMENTS FOR DUCTILE IRON PIPE<sup>\*\*\*</sup>

| <b>90° Bend</b>    |                                       |      | <b>Tee<sup>***</sup></b> |  |      | <b>Dead End &amp; In-line Valves</b> |                                       |      | <b>Reducer</b>                |                                       |      |
|--------------------|---------------------------------------|------|--------------------------|--|------|--------------------------------------|---------------------------------------|------|-------------------------------|---------------------------------------|------|
| Pipe size<br>(in.) | Required length of<br>restraint (ft.) |      | Pipe size<br>(in.)       | Required length of<br>branch restraint (ft.) |      | Pipe size<br>(in.)                   | Required length of<br>restraint (ft.) |      | Fitting size (in.X in.)       | Required length of<br>restraint (ft.) |      |
|                    | Poly-<br>wrapped                      | Bare |                          | Poly-<br>wrapped                             | Bare |                                      | Poly-<br>wrapped                      | Bare |                               | Poly-<br>wrapped                      | Bare |
| 6                  | 51                                    | 43   | 6X6X6                    | 115  | 81   | 6                                    | 131                                   | 92   | 36X30, 30X24, 24X18,<br>12X6  | 175                                   | 125  |
| 8                  | 65                                    | 56   | 8X8X8                    | 153  | 107  | 8                                    | 169                                   | 119  | 36X24, 30X18, 24X12,<br>18X12 | 320                                   | 224  |
| 12                 | 91                                    | 78   | 12X12X12                 | 223  | 156  | 12                                   | 239                                   | 168  | 36X18, 30X12, 24X6            | 400                                   | 300  |
| 18                 | 126                                   | 109  | 18X18X18                 | 320  | 224  | 18                                   | 337                                   | 236  | 24X8                          | 375                                   | 263  |
| 24                 | 157                                   | 136  | 24X24X24                 | 411  | 287  | 24                                   | 428                                   | 299  | 36X12                         | 516                                   | 361  |
| 30                 | 185                                   | 160  | 30X30X30                 | 492  | 345  | 30                                   | 510                                   | 357  | 18X6                          | 295                                   | 206  |
| 36                 | 210                                   | 182  | 36X36X36                 | 568  | 397  | 36                                   | 586                                   | 410  | 18X8                          | 265                                   | 185  |
|                    |                                       |      |                          |  |      |                                      |                                       |      | 8X6                           | 71                                    | 50   |

  

| <b>45° Bend</b>    |                                       |      | <b>22.5° Bend</b>  |                                       |      | <b>11.25° Bend</b> |                                       |      |
|--------------------|---------------------------------------|------|--------------------|---------------------------------------|------|--------------------|---------------------------------------|------|
| Pipe size<br>(in.) | Required length of<br>restraint (ft.) |      | Pipe size<br>(in.) | Required length of<br>restraint (ft.) |      | Pipe size<br>(in.) | Required length of<br>restraint (ft.) |      |
|                    | Poly-<br>wrapped                      | Bare |                    | Poly-<br>wrapped                      | Bare |                    | Poly-<br>wrapped                      | Bare |
| 6                  | 21                                    | 18   | 6                  | 10                                    | 9    | 6                  | 5                                     | 4    |
| 8                  | 27                                    | 23   | 8                  | 13                                    | 11   | 8                  | 6                                     | 5    |
| 12                 | 38                                    | 32   | 12                 | 18                                    | 16   | 12                 | 9                                     | 8    |
| 18                 | 52                                    | 45   | 18                 | 25                                    | 22   | 18                 | 12                                    | 11   |
| 24                 | 65                                    | 56   | 24                 | 31                                    | 27   | 24                 | 15                                    | 13   |
| 30                 | 77                                    | 66   | 30                 | 37                                    | 32   | 30                 | 18                                    | 16   |
| 36                 | 87                                    | 75   | 36                 | 42                                    | 36   | 36                 | 21                                    | 18   |

\* Based on the following:

150 p.s.i. Internal water pressure

3 feet of cover

Type 2 Laying Condition: flat-bottom trench w/backfill lightly consolidated to centerline of pipe.

Soil Type: Sand Silt

Factor of Safety: 1.5

\*\* Restrained length may be reduced at the discretion of the Engineering and/or Development Services Department.

\*\*\*Assumes 10' pipe length to first joint. Restraint joint lengths shown are for horizontal installations only.

\*\*\*Restraint joint lengths on vertical installations, siphons, inverted siphons, and other special installations can be determined using DIPRA Thrust Restraint software.