

## SECTION 33 05 09.33

### THRUST RESTRAINT FOR UTILITY PIPING

#### PART 1 GENERAL

##### 1.1 SUMMARY

- A. Section Includes:
  - 1. Pipe joint restraint systems for all pressurized mains (water and wastewater force).
  - 2. Includes fittings, valves, dead-ends, and other locations where change in pipe direction requires joint restraint.
- B. Related Requirements:
  - 1. Section 33 05 05.31 – Hydrostatic Testing: Materials and methods for pipeline cleaning and testing.
  - 2. Section 33 05 07.13 - Horizontal Directional Drilling: Materials and methods for piping and appurtenances.
  - 3. Section 33 05 07.23 - Jacking and Boring: Materials and methods for carrier pipes and appurtenances.
  - 4. Section 33 14 13 - Water Distribution Piping and Appurtenances: Materials and methods for piping and appurtenances.
  - 5. Section 33 31 23 - Sanitary Sewer Force Mains, Valves and Appurtenances: Materials and methods for piping, valves, and appurtenances.

##### 1.2 REFERENCE STANDARDS

- A. American Water Works Association:
  - 1. AWWA C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances.
- B. ASTM International:
  - 1. ASTM A536 – Standard Specification for Ductile Iron Castings.

##### 1.3 COORDINATION

- A. General – Coordinate Work of this Section with the installation and modification of pressure main valves, bends, reducers, and dead-end fittings and pipe joints that require restraint.
- B. Joint Restraint Systems – Field or factory applied joint restraint systems shall be used unless otherwise indicated by the ENGINEER. When multiple valves, bends, fittings are in close proximity, ENGINEER to design adequate total restraint length required for fitting combination(s). The combined fitting restrained length total must equal the sum of the individual fitting restrained lengths. Individual restrained end lengths applied to combined fitting end lengths can result in failure during testing or operation.
- C. Thrust Blocks – Concrete thrust blocking shall only be used when required for special installations, such as such as cut-in tees, tapping sleeves, plugged/capped sections

removed from service, or other situations that would require retrofitting an existing service pipeline with joint restraints. ENGINEER shall design adequate size and weight of blocking to be installed for special installations.

#### 1.4 SUBMITTALS

- A. Product Data: Submit manufacturer catalog information for restrained joint details and installation instructions.
- B. Shop Drawings:
  - 1. Indicate restrained joint details and materials being used.
  - 2. Submit schedules showing restraint device models and locations to be installed.
  - 3. Include restrained joint installation procedures.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. Manufacturer Instructions: Submit detailed instructions on installation requirements, including storage and handling procedures.

#### 1.5 CLOSEOUT SUBMITTALS

- A. Project Record Documents: Record locations of joint restraints on design plan and profile drawings by begin and end station as proceeds daily and transfer field data to final record drawing submittal.

#### 1.6 QUALITY ASSURANCE

- A. Perform Work according to AWWA 600 standards and manufacturer instructions.
- B. Perform pressure testing according to Section 33 05 05.31 – Hydrostatic Testing.

#### 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
- B. Store materials according to manufacturer instructions.
- C. Protection:
  - 1. Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.
  - 2. Provide additional protection according to manufacturer instructions.

### PART 2 PRODUCTS

#### 2.1 PERFORMANCE AND DESIGN CRITERIA

- A. Provide pressure pipelines (water and force mains) with restrained joints and/or blocking at any change in direction including hydrant assemblies, bends, tees, reduc-

ers, blow-offs, dead-end mains, cut-in tees, tapping sleeves, etc. Thrust restraint shall be designed for a minimum pressure of **150 psi** at the lowest elevation in the pipeline test section.

## 2.2 JOINT RESTRAINT SYSTEMS

- A. Refer to CFPUA Material Specification Manual (MSM) for the following products:

| MSM Section | Material         |
|-------------|------------------|
| C           | Joint Restraints |

- B. Unless otherwise indicated, joint restraint systems may be factory or field applied systems.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Verify location of piping restraint locations in advance of pipe laying operations.
- B. Verify that pipe and fittings identified for restraint are ready to receive Work and the correct restraint device is applied to that location.
- C. Field measure and verify pipe restraint lengths indicated on drawings for Work to be installed.

### 3.2 PREPARATION

- A. Clean surfaces of pipe and fittings that are to receive joint restraint systems.

### 3.3 INSTALLATION

- A. Install joint restraint system such that joints are mechanically locked together to prevent joint separation in accordance with the manufacturer recommendations.
- B. In special installations where concrete thrust blocking is required, allow 7-day minimum cure time before placing pipe pressure load on concrete blocking.

END OF SECTION