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FAQs on Restrained Joints for Ductile Iron Pipe

We have highlighted three common questions about designing restrained joint lengths to address thrust conditions underground.

[Click here](#) to see details for FAQs on thrust restraint and Ductile iron pipe.

Q: Do I need to be concerned with axial stresses in Ductile iron pipe when using restrained joints?

A: No. Due to the conservatism of ANSI/AWWA C150/A21.50 and utilizing a conservative analysis, the maximum stress is always less than half the minimum yield strength of Ductile iron pipe. This is accounted for in the pressure ratings given for various restrained joint types.

THRUST RESTRAINT DESIGN
FOR DUCTILE IRON PIPE

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Q: What design soil parameters should be used if restrained joint pipe is laid in trench backfill with markedly different support characteristics than the native soil?

A: As the pipe is pressurized, it will transmit passive pressure through the backfill material to the native soil. Therefore, the material that results in the smaller unit bearing resistance (R_s) should be used for the passive resistance. But friction occurs by interacting with the backfill material, so the unit frictional force (F_s) should be based on the backfill material surrounding the pipe.

Q: Should I be concerned with thrust restraint of valves, and if so, why ?

A: Normally, thrust restraint of valves in small-diameter pipe and/or low pressures is not a major concern. Because the required resisting force may build over only one or two lengths of pipe on the low-pressure side of the valve, no restraint is required on the high pressure side.

On the other hand, with larger diameter piping, thrust restraint of valves can be a greater concern due to the magnitude of the thrust forces involved. Since the high pressure side of the valve could be on either side, both sides may require restrained lengths to be calculated as if they were dead ends.

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Please visit dipra.org, and check out our [Resources](#) section for FAQs on Ductile iron pipe manufacturing, design, installation, tapping, and more.

Thank you,
Patrick Hogan
President, DIPRA