



GENEVA PIPE

Concrete products, concrete reliability

JACKING PIPE GUIDELINES

1465 West 400 North
Orem, Utah 84057
Telephone: (801) 225-2416
Fax: (801) 802-9637

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Geneva Pipe Jacking Pipe Guidelines

Scope

This is a recommended standard for materials design and manufacture of reinforced concrete pipe intended for use as conveyance systems of sewage and storm water, and for the construction of culverts, installed and constructed by jacking pipe methods.

Reference Documents

This document is to be read in conjunction with these reference documents. The reference documents for this specification shall be those included in the following ASTM C361, ASTM C655, and ASTM C497, with additional references being added as necessary.

Performance Criteria

Safety Factor On Axial Load Capacity

A factor of safety on axial load capacity shall be 3.20 (based on the ultimate strength of the concrete) for pipes installed by jacking methods. This assumes the load is uniformly distributed over the bearing surface. The effect of the eccentric and/or concentrated loadings on the pipe faces should be evaluated for effective surface contact area and reduction in the factor of safety.

Pipe Characteristics

Materials

Requirements for cement, aggregate, reinforcement and other additives shall be specified in the appropriate ASTM pipe materials standards

Nominal Dimensions

Typical nominal dimensions for reinforced concrete pipe are detailed in Geneva Pipes standard jacking pipe specifications details. Pipe meeting these requirements are generally acceptable for jacking. The permissible variation allowed with respect to these and other dimensions shall be in accordance with the provisions herein.

Pipe Lengths

When designing individual projects, consult Geneva Pipes specific pipe length information available on the individual detail sheets for jacking pipe.

Axial Compressive Strength

Concrete cores may be used in the verification of compressive strength provided they are extracted and handled in accordance with ASTM C42 specification. Alternately, compressive strength tests shall be made on cured concrete test cylinders cast in accordance with ASTM C39 and tested in accordance with ASTM C39. The concrete shall have a minimum crushing strength as specified for the appropriate pipe class. In no instance shall the compressive strength be less than 5,000 psi.

Lubricant Ports

It shall be the responsibility of the pipe manufacturer to supply lubricant ports as requested by the purchaser when the jacking pipe diameter is suitable. The design and location of the ports shall be approved prior to pipe manufacture. A recommended design is shown on the insert in Attachment 2.

Permissible Variation

Variations of the pipe tolerance shall be such that there are no appreciable irregularities in the flow line.

Internal Diameter

The internal diameter of 12-inch to 24-inch pipe shall vary not more than $\pm 1/4$ -inch from the design diameter. The internal diameter of 27-inch and larger pipe shall not vary from the design diameter by more than $\pm 1\%$ or $\pm 3/8$ -inch, whichever is less.

Outside Diameter

The outside diameter of 12-inch to 24-inch pipe shall vary not more than $\pm 1/4$ -inch from the design diameter. The outside diameter of 27-inch and larger pipe shall not vary from the design diameter by more than $\pm 1\%$ or $\pm 3/8$ -inch, whichever is less.

Wall Thickness

At any location along the length of the pipe, or at any point around its circumference, the wall thickness shall not vary by more than $\pm 5\%$ or $3/16$ -inch, whichever is greater.

Roundness

The outside diameter of the pipe shall not vary from a true circle by more than 1%. The out-of-round dimensions shall be one half the difference between the maximum and minimum outer diameter of the pipe at any one location along the barrel.

Taper

The outside barrel of the pipe shall not vary in taper from the tongue end to the bell end by more than $1/8$ -inch.

Length of Pipe

Finished pipe length shall not deviate from design length by more than $\pm 3/16$ -inch with a maximum variation of $\pm 3/8$ -inch in any length of pipe.

Length of Two Opposite Sides

Variations in laying length of two opposite sides of the pipe shall not be more than $3/16$ -inch for any size of pipe.

End Squareness

End squareness shall govern over length of two opposite sides.

End Squareness Across Outside Diameter	
Pipe Size Nominal inches	Maximum Variation inches
6 - 30	$1/8$
33 - 60	$5/32$
66 - 84	$3/16$
94 - 120	$9/32$

Joint Selection

Careful joint selection should be made based on the anticipated jacking conditions, proposed alignments, and calculated jacking forces for specific site conditions. The type of pipe required and the jointing system to be used shall be specified by the purchaser, based on these factors.

It shall be the responsibility of the pipe manufacturer to supply a product meeting the specified criteria in terms of both required jacking strength and allowable tolerances.

Joints

Joint assemblies incorporate fixed collar type and confined rubber gaskets, as shown on Attachment 1. Factors influencing the selection of this joint type, include the magnitude of the anticipated jacking forces, the joint deflection characteristics, joint shear strength required during the jacking operation, and the specific site design parameters.

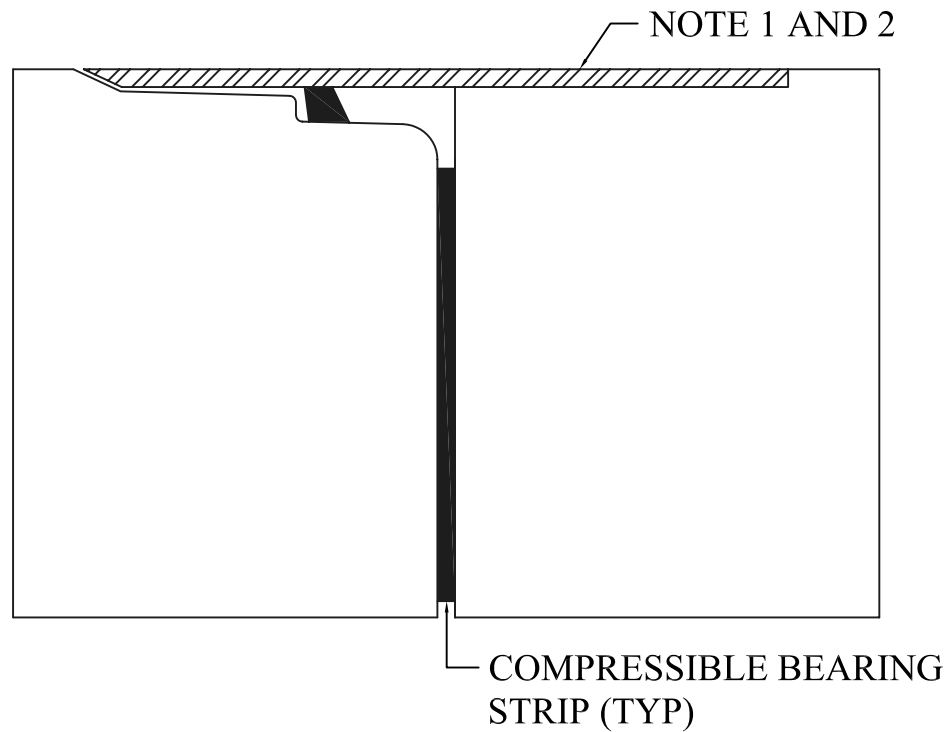
Test Requirements

Three-Edge Bearing Test

Reinforced pipe will be tested in accordance with the appropriate ASTM specification. Agency will be responsible to pay for this test, because the pipe is not usable after this test.

Concrete test cylinders will be required with each pour.

JACKING PIPE JOINT DETAIL ATTACHMENT 1



NOTES:

1. COLLARS FABRICATED FROM MILD STEEL MAY BE SUSCEPTIBLE TO CORROSION FROM GROUNDWATER OR GROUND CONDITIONS. STEEL END RINGS MUST BE COATED, OR MADE FROM STAINLESS STEEL IN ACCORDANCE WITH MANUFACTURE'S RECOMMENDATIONS.
2. COLLARS MAY BE FABRICATED FROM OTHER MATERIALS SUBJECT TO MANUFACTURE'S RECOMMENDATIONS.



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Orem, Utah Phone: 801-225-2416
Moapa, Nevada Phone: 702-864-2620
Hurricane, Utah Phone: 435-635-9255