

**SECTION 1220 - STEEL CASING PIPE BORED AND JACKED UNDER RAILROADS AND OTHER RAILROAD CROSSINGS**

**PART 1 - GENERAL**

**1.1 SCOPE OF WORK:**

Provide all labor, materials, equipment and services required to furnish and install all steel casings bored and jacked under railroads and other railroad crossings as shown on the Drawings and/or specified herein.

**1.2 SUBMITTALS:**

- A. Descriptive literature, catalog cuts, and dimensional prints clearly indicating all dimensions and materials of construction, shall be submitted on all items specified herein to the ENGINEER for review before ordering.
- B. At the time of submission, the CONTRACTOR shall, in writing, call ENGINEER's attention to any deviations that the submittals may have from the requirements of the ENGINEER's Contract Drawings and Specifications.

**PART 2 - PRODUCTS**

**2.1 RAILROAD CROSSINGS:**

- A. Where designated on the drawings, crossings beneath maintained railroads not to be disturbed shall be accomplished by boring and jacking a steel casing pipe in place to the limits and elevations shown on the drawings. Casing pipe shall be steel, plain end, have a minimum yield point strength of 35,000 psi and conform to ASTM A 252 Grade 2 or ASTM A 139 Grade B without hydrostatic tests. The steel pipe shall have welded joints and be in at least 18 foot lengths (except last section, if a shorter section is needed to obtain total casing length). The exterior of the casing pipe shall be coated with coal tar epoxy or bituminous asphalt. All joints between lengths shall be solidly butt-welded with a smooth non-obstructing joint inside. The casing pipe shall be installed without bends.
- B. Steel casing pipe diameter and wall thickness shall not be less than the following:

<u>Carrier Pipe Nom. Diameter</u>	<u>Min. Casing Pipe Diam. (O.D.)</u>	<u>Wall Thickness</u>
33"-36"	54"	0.781"
30"	48"	0.688"
27"	42"	0.688"
24"	36"	0.532"
20"-21"	36"	0.532"
18"	30"	0.469"
15"-16"	30"	0.469"
12"	24"	0.375"
10"	22"	0.375"
8"	20"	0.375"
6"	18"	0.375"

Larger diameter casing pipes may be substituted by the CONTRACTOR, but there shall be no extra cost to the OWNER for this substitution. The Railroad affected must approve any changes in casing pipe diameter or thickness. The Railroad Crossing Permit shall govern if it specifies or requires a casing pipe thickness greater than indicated above. Permit approval sheets will be included in the bid documents when possible or otherwise made available to the CONTRACTOR.

- C. All railroad crossing carrier pipe shall be Ductile Iron restrained joint Class 56 pipe, in accordance with AWWA C151/ASTM A21.51 (latest revision) unless otherwise indicated on the plans and the Railroad Crossing Permit. The carrier pipe shall be installed after the casing pipe is in place, and shall

extend a minimum of two (2) feet beyond each end of the casing to facilitate making joint connections. The carrier pipe shall be braced within the casing pipe with stainless steel casing spacers that place the carrier pipe in a "restrained" position to preclude possible flotation while providing ½"-1" clearance between the top runners and the casing pipe. If Carrier pipe grade adjustment is needed, CONTRACTOR shall obtain permission from OWNER to work with casing spacer manufacturer to obtain custom casing spacers. Casing pipe filler shall NOT be used unless required on plans or by roadway authority.

- D. Stainless steel casing spacers shall be installed within one (1) foot of each side of carrier pipe joints, within on (1) foot of each end of the casing pipe and on 6 foot centers thereafter. Casing spacers shall be bolt-on style with a shell made of heavy T-304 stainless steel. Connecting flanges shall be ribbed for extra strength. The shell shall be lined with a PVC liner .090" thick with a Durometer "A" 85-90 hardness. All nuts and bolts are to be 18-8 stainless steel. Runners shall be made of ultra high molecular weight polymer with inherent high abrasion resistance and a low coefficient of friction. Runners shall be supported by risers made of heavy t-304 stainless steel. The supports shall be mig welded to the shell and all welds shall be fully passivated. The height of the supports and runners combined shall be sufficient to keep the carrier pipe at least 0.75" from the casing pipe wall at all times. There shall be two (2) runners on top and two (2) runners on bottom of casing spacer for carrier pipe diameters of 4-12" or two (2) runners on top and four (4) runners on bottom for carrier pipe diameters of 14-36". Casing spacers shall be Cascade Waterworks Mfg. Model CSS.

Hardwood skids shall NOT be used in place of manufactured casing spacers.

- E. At each end of the casing pipe, the carrier and casing pipe shall be wrapped with Cascade Waterworks Mfg. Model CCES end seals.

- F. All water or sewer line crossings of railroads shall be prominently marked at railroad right-of-way lines, on both sides of the track crossing, by durable, weatherproof signs located over the center of the water or sewer line. When possible, signs shall be located so that when standing at one sign, the other marker is visible. Signs shall show the following:

1. Name and address of OWNER
2. Contents of pipe
3. Pressure in pipe
4. Pipe depth below grade at point of sign
5. Emergency telephone number in event of pipe rupture

- G. The boring method shall consist of pushing the pipe into the earth with a boring auger rotating within the pipe to remove the spoil.

1. The front of the pipe shall be provided with mechanical arrangements or devices that will positively prevent the auger from leading the pipe so that there will be no unsupported excavation ahead of the pipe.
2. The auger and cutting head arrangement shall be removable from within the pipe in the event an obstruction is encountered. If the obstruction cannot be removed without excavation in advance of the pipe, the pipe shall be abandoned in place and immediately filled with coarse sand rammed in or grout pumped in.
3. The over-cut by the cutting head shall not exceed the outside diameter of the pipe by more than 2-inch. If voids should develop or if the bored hole diameter is greater than the outside diameter of the pipe by more than approximately 1-inch, grouting or other approved methods must be used to fill such voids.

4. The face of the cutting head shall be arranged to provide a reasonable obstruction to the free flow of soft or poor material.
  5. Any method which does not have this boring arrangement will not be permitted. The CONTRACTOR's boring arrangement plans and methods must be submitted to, and approved by, the Chief Engineer of the particular railroad.
- H. The CONTRACTOR must adhere to all safety requirements of the railway line involved in the crossing.
1. All operations shall be conducted so as not to interfere with, interrupt, or endanger the operation of trains nor damage, destroy, or endanger the integrity of railroad facilities. The CONTRACTOR shall provide written acknowledgment to the railway line that the CONTRACTOR and its employees have received, read, and understood the safety rules. Operations will be subject to inspection at any and all times.
  2. All cranes, lifts, or other equipment that will be operated in the vicinity of the railroad's electrification and power transmission facilities shall be electrically grounded in an approved manner.
  3. At all times, while work is in progress, a field supervisor with no less than twelve (12) months experience in the operation of the equipment being used shall be present. If boring equipment or similar machines are being used, the machine's operator shall also have a minimum of twelve (12) months experience in the operation of the equipment being used.
  4. Whenever equipment or personnel are working closer than fifteen (15) feet from the centerline of an adjacent track, that track shall be considered to be obstructed. Operations shall be conducted no less than this distance, and operations closer than fifteen (15) feet from the centerline of the track shall be conducted only with the permission of, and as directed by, a duly qualified railroad employee present at the site of the work.
  5. Crossing the tracks at grade by equipment and personnel is prohibited except by prior arrangement with, and as directed by, the railroad line. A separate permit must be obtained, by the CONTRACTOR, for any "at grade" crossing of the tracks.
- I. All railroad costs incurred by the railway line due to work associated with the crossing (inspection, flagging, track work, etc.) shall be paid by the OWNER for County-bid projects or the Developer for projects associated with new development. However, it is the CONTRACTOR's responsibility to coordinate the work with the railway.
- J. The CONTRACTOR shall notify the railway line's Area Engineer a minimum of 14 working days prior to the desired start of construction.
- K. All requirements of Section 1210 shall also apply to this work except where contradictory to the requirements of this section.
- L. The OWNER reserves the right to make reasonable adjustments in the limits and lengths of all bores without affecting the unit price.

## **2.2 CONTRACTOR'S RESPONSIBILITIES:**

- A. Obtain a copy of the Railroad Crossing Permit before beginning construction.
- B. Attend a preconstruction meeting at the construction site with the County Inspector, Railroad Inspector, ENGINEER, Developer (if applicable) and CONTRACTOR being present.
- C. Construct the pipeline across the railroad property subject to the following terms and conditions. These terms and conditions shall apply during the construction period and remain in effect until the Maintenance Bond has been released:

1. The pipeline shall be constructed and maintained at such time or times, in such manner, with such material and under such general conditions as shall be satisfactory to and approved by the chief engineering officer of the Railway, or his duly authorized agent. The pipeline shall be constructed and maintained in accordance with American Railway Engineering Association "Specifications for Pipelines for Conveying Flammable and Non-Flammable Substances," Part 5, Pipelines, dated 1972 and shall be at least 3.0 feet below the surface of the ground and below the bottom of ditches of the Railway and at points where the pipeline passes under the track it shall be at least 5.5 feet below base of rail, and shall not interfere with the proper and safe use and operation of the property of the Railway. After completing the construction of the pipeline, the premises of the Railway shall be restored to the same or as good conditions as they were in, prior to commencing the construction of such pipeline.
2. All of the acts to be performed by the CONTRACTOR and/or Developer, or by the CONTRACTOR's agents, or servants of the CONTRACTOR and/or Developer, in connection with the construction of the pipeline, or in connection with any repair, shall be performed at the sole risk and expense of the CONTRACTOR and/or Developer. For Developer projects, the County and the Railway shall be reimbursed by the CONTRACTOR or Developer for any and all costs and expenses incurred as the result of making any changes in the Railway's tracks or appurtenances necessitated by the construction of the pipeline; in the checking of plans; for the wages of any inspectors or watchmen which, in the judgment of the County and/or the chief engineering officer of the railway, may be required during such construction; and for the proper and safe protection of the property, traffic and business of the Railway. The CONTRACTOR and/or Developer agree to pay unto the County and the Railway such costs and expenses upon presentation of bills therefore.
3. Whenever it may be necessary to make any repairs to the pipeline in or upon the premises of the Railway, such repairs shall be made under the supervision and control of the County and said chief engineering officer of the Railway, or his duly authorized agent, at the sole expense of the CONTRACTOR and/or Developer in such a manner as to interfere as little as possible with the premises, property and business of the Railway. The CONTRACTOR and/or Developer shall, at their own cost, restore the premises of the Railway to the same or as good a condition as existed prior to making such repairs; or the Railway may, at its selection, make such repairs, and the expense thereof shall be paid to it by the CONTRACTOR and/or Developer as hereinbefore provided.
4. The CONTRACTOR and/or Developer shall and will indemnify and save harmless the County and the Railway, its officers, agents and employees, from and against any and all detriment, damages, losses, claims, demands, suits, costs or expenses covering damage to property or injury to or death of persons, which the Railway, its officers, agents or employees, may suffer sustain or be subject to, directly or indirectly, caused either wholly or in part by reason of the construction or repair of the pipeline, except where detriment, damages, losses, claims, demands, suits, costs or expenses are due to the sole negligence of the Railway.
5. It is agreed that in no event shall any pipe, or other structures, be placed under the tracks or upon the property of the Railway, except those mentioned or shown on the plans, without the express permission in writing from the County and the Railway.
6. Insurance
  - a. During the period of construction or any period of maintenance, repair, of the pipeline, the CONTRACTOR and/or Developer shall insure the obligations assumed in ARTICLE FOUR in a manner and with a company satisfactory to the County and the Railway and with a combined single limit (bodily injury, death or property damage) of not less than \$2,000,000.

- b. The CONTRACTOR shall furnish the County and the Railway with a Railroad Protective Liability Insurance Policy naming Railway as the named insured and issued to the CONTRACTOR, with a combined single limit of \$2,000,000 for all damages arising out of bodily injury, death, property damage liability and physical damage to property liability per occurrence with an aggregate limit of \$6,000,000.
  - c. Evidence of such insurance (Certificate of Insurance for the General Liability insurance policy and the original policy of Railroad Protective Liability insurance) must be furnished to and approved by the County and the Railway, prior to occupancy of the Railway's property or commencement of construction on Railway's premises.
- 7. The Agreements herein contained shall be binding upon the heirs, executors, administrators, lessees, successors and assigns of the CONTRACTOR and/or Developer.
  - 8. CONTRACTOR and/or Developer shall not create or permit to be created or to exist in or about said pipeline any nuisance, public or private, during the continuance of this agreement, and CONTRACTOR and/or Developer hereby agrees to save and keep harmless the County and the Railway, its officers, agents and employees, from any suit or claim growing out of any nuisance arising from the presence, use or operation of the CONTRACTOR and/or Developer in violation of any applicable laws, ordinances or governmental regulations, including, without limitation, laws, ordinances and governmental regulations controlling air, water, noise, solid wastes and other pollution.

### **PART 3 - BASIS OF PAYMENT**

The steel casing pipe required to be bored and jacked under railroads will be measured from end to end of the completed cover pipe in place, and paid for at the Contract unit price per linear foot, complete in place, which price shall include the casing pipe, the casing spacers, material for blocking the ends and all other items necessary for its construction as shown on the drawings and/or described in the specifications.

END OF SECTION