

**SECTION 02634
CARRIER PIPE AND BORED CASING**

PART 1: GENERAL

1.1 **SCOPE**

- A) This section includes all work necessary to install railroad and highway crossings and related work for the construction of the designated pipeline and other incidental work.
- B) Work shall include, but is not limited to, the following:
 - 1) Obtain all necessary permits, bonds and insurance required by Union Pacific Railroad, CDOT and other regulating authorities.
 - 2) Furnish and install casing for bored crossing as shown on the drawings.
 - 3) Installation of carrier pipe and appurtenances in casing.
 - 4) Coordinate with railroad, CDOT, and other regulating authorities.
 - 5) Furnish any and all protective fencing, berms and/or guard rails as required by the regulating authority.

1.2 **SUBMITTALS**

- A) Submittals shall conform to the requirements of these Contract Documents and shall include:
 - 1) Diameter, thickness, and class of steel casing.
 - 2) Location of approach trenches, pits, excavation.
 - 3) Schedule and method of construction including trench backfill and pipeline installation and backfill.
 - 4) Qualifications or written documentation supporting evidence of the qualifications of the superintendent.
 - 5) Settlement control plan to protect existing utilities, streets, properties, or other structures and improvements from damage due to construction.

- 6) As-built information of the work.
- 7) Certificate of insurance, applicable permits, bonds, and warranties and guaranties.

PART 2: PRODUCTS

2.1 EXCAVATION AND BACKFILL

- A) Conform to requirements of applicable sections contained herein.
- B) Backfill with same material as that used for carrier pipe.

2.2 CASING PIPE

- A) Contractor shall provide casing of a size to permit proper construction of the carrier pipe to the required lines and grades. Casing shall be welded smooth steel pipe conforming to the requirements of ASTM A-53 or AWWA C200 or approved equal.
- B) Welded joints shall have beveled ends for field welding, be butt welded with complete joint penetration welds around the entire circumference of the pipe, and be formed and accurately manufactured so that when pipes are placed together and welded they form a continuous casing with a smooth and uniform interior surface. Interlocking joints, i.e. Permalok, may be considered with written pre-approval from Engineer.
- C) Minimum casing wall thickness shall be as outlined below.

Casing Pipe - Minimum Size and Thickness

Carrier Pipe Diameter (inch)	Minimum Casing Pipe Diameter (inch)	Casing Minimum Wall Thickness (inch)
<6	8	0.188 (3/16)
6	10	0.281 (9/32)
8	14	0.281 (9/32)
10	16	0.313 (5/16)
12	18	0.344 (11/32)
14	22	0.375 (3/8)

Carrier Pipe Diameter (inch)	Minimum Casing Pipe Diameter (inch)	Casing Minimum Wall Thickness (inch)
16	24	0.406 (13/32)
18	26	0.438 (7/16)
20	28	0.469 (15/32)

- D) Casing pipe shall have a minimum yield strength of 35,000 psi.
- E) The class of casing specified is based upon the superimposed loads and not upon the stresses resulting from jacking or boring operations. Any increase in casing strength to withstand jacking or boring operations shall be the responsibility of the Contractor, supplied at no additional cost to the Owner.

2.3 CARRIER PIPE

- A) Carrier pipe shall conform to the plan requirements and specifications contained herein.
- B) PVC Pressure Pipe
 - 1) Integrally restrained joint PCV pipe or fusible PVC pipe in accordance with Section 02667.
- C) Ductile Iron Pipe
 - 1) Flexible restrained joint DI pipe or joint restraints for DI pipe (Field Lock or approved equal).

2.4 CASING SPACERS

- A) Casing spacers shall be carbon steel or stainless steel, bolt on style type with a shell made of at least two halves. The bands shall be 14 gauge at a minimum; the risers shall be 10 gauge at a minimum, and the coating shall be fusion-bonded epoxy or heat fused PVC. Acceptable manufacturers include:
 - 1) Advance Products and Systems, Inc. Model SI-12 or SSI-12
 - 2) BWM Company Model SS-12 or FB-12
 - 3) CCI Pipeline Systems
 - 4) Pipeline Seal and Insulator, Inc. Model C12G
 - 5) Calpico, Inc. Model M-12-FCE or M-12-SS

- B) A minimum of three (3) bands per length of pipe shall be required.

2.5 CASING END SEALS

- A) Provide preformed end seals designed to prevent entry of water or loss of material from casing. The end seals shall be made of 1/8-inch thick 60 durometer EPDM or neoprene rubber. Wrap around seals shall overlap the casing pipe by 2-inches and shall be held on with AISI 304L stainless steel worm gear clamps held together with mastic strips to seal the edges. Custom pull-on end seals shall be seamless with vulcanized edges.
 - 1) Advance Products and Systems, Inc. Model AC, AW
 - 2) Calpico, Inc. Model C, W

2.6 TRACER WIRE

- A) Section 02667 for the minimum requirements.

2.7 CATHODIC PROTECTION

- A) Protect the steel casing pipe with sacrificial anodes and test station per Section 13110.

PART 3: EXECUTION

3.1 GENERAL

- A) Construction in all cases shall conform to the requirements of regulating authority. A minimum of seven (7) days notice to the regulating authority is required prior to entry of right-of-way for construction of bored crossing.
- B) Before the start of work, Contractor shall submit satisfactory evidence to the Engineer that he has complied with all permit and insurance requirements.
- C) Temporary fencing and warning barricades shall be installed around the boring pit(s) in accordance with all Federal, State, local and regulating authority requirements.

3.2 EXCAVATION

- A) Excavation shall be unclassified and shall include whatever materials are encountered to the depths shown or required. Contractor shall provide sheeting

and shoring and dewatering as necessary to maintain water level at least two feet below casing invert. Shoring and dewatering systems shall be of Contractor's design.

3.3 INSTALLATION OF CASING PIPE

- A) Casing pipe shall not deviate from established line or grade at either end by more than the following:
- | | |
|--------------------------|-----------|
| Line or lateral movement | ±6-inches |
| Vertical grade | ±3-inches |
- B) Sections of casing pipe shall be joined by welding joints with a continuous weld around the circumference of the pipe. It shall be the Contractor's responsibility to provide joints capable of resisting boring or jacking forces without failure.
- C) Boring pits shall be braced and shored as required by Federal, State or local laws and regulations. A safe and satisfactory means of removing boring material from the pit shall be provided.
- D) The boring shall be no larger than the outside diameter of the casing.

3.4 PIPE INSTALLATION IN CASING

- A) General
- 1) Casing spacers or insulators shall be placed on the carrier pipe as shown on the drawings or specified herein so that pipe is supported continuously by the skids and is not supported by the bells.
 - 2) Carrier pipe and skids shall be gently pulled through casing to avoid damage to pipes and couplings.
 - 3) All carrier pipe joints within the casing pipe shall be fully restrained.

3.5 TRACER WIRE INSTALLATION

- A) Contractor shall provide means of securing the tracer wire to the carrier pipe without the use of unnecessary splices and ensure successful continuity of signal.
- B) At casing ends, splice tracer wire from carrier pipe and connect using a cadweld or similar method to casing pipe according to Standard Details.

3.6 CLOSURE OF CASING AFTER CARRIER PIPE INSTALLATION

- A) Ends of the casing shall be closed using casing end seals.

3.7 PLACING FILL IN CASING

- A) When required, the Contractor shall completely fill the annular space between the pipe and the casing with approved sand to prevent pipe flotation.
- B) The Contractor shall accomplish the filling by pouring or pumping from the two ends as necessary.

3.8 RESTORATION OF TRENCH LINES

- A) Where pipe must be laid across the bore pit, the pit shall be filled with compacted granular material to the pipe spring line.
- B) Trench backfill and surface restoration shall conform to the specification contained herein.

PART 4: SPECIAL PROVISIONS

4.1 MEASUREMENT AND PAYMENT

- A) When not listed in the proposal, all "CARRIER PIPE AND BORED CASING" costs will be considered incidental work for which no separate payment will be made.
- B) When listed in the Proposal, payment for work specified under this section will be made at the prices named in the Proposal and as outlined below, complete and acceptable to the Engineer.
 - 1) Payment for bored crossing to be made at the lump sum price named in the Proposal installed complete, tested, disinfected and acceptable to the Engineer.
- C) Payment to include complete compensation for all labor, materials, equipment and incidentals necessary to install bored crossing to the pay limits shown on plans. Payment includes complete compensation for all bore pits, backfill, casing, carrier pipe and temporary fencing, berms and/or guardrails. No additional compensation to be allowed.

- D) No payment to be made for pipe or valves which have not passed a hydrostatic leakage test.

END OF SECTION