

ITEM 17

PIPELINE CASING & CARRIER PIPE

1.0 DESCRIPTION. The Contractor shall furnish all labor, materials and equipment to properly provide and install all casing and carrier pipe and/or tunnel, to the sizes, lines, grades and at the locations as indicated on the detail drawings. This work shall include but is not limited to; earth excavation for shafts and tunnels; casing pipe, carrier pipe, end seals, casing spacers, tunnel lining, grout, concrete, pipe, annular void fill, dewatering, bore and receiving pits, wood or steel sheeting; granular backfill; and all restoration of disturbed areas.

Casing pipe and carrier pipe shall be paid as a complete piping system unit per linear foot. No separate payment will be made for individual casing or carrier pipe under this item.

Wherever possible, casing pipes of smooth bore and exterior, of the size and weight specified herein or on the Contract drawings, shall be jacked in place. Whenever it is not feasible to jack a casing pipe in place, the work may be done in a tunnel. No tunnel work will be permitted under state highways except with special permission.

2.0 SUBMITTALS. The Contractor shall submit the following in accordance with the conditions of the Contract.

A. Reference Standards. The work done under this item, in general, also may include but is not limited to, the following work which shall be performed as specified under the items which apply.

1. ASTM A139 & ASTM A1097
2. SCMSD Item 1 Earth Excavation
3. SCMSD Item 4 Concrete
4. SCMSD Item 6 Granular Backfill
5. SCMSD Item 7 Excavation Support Systems
6. SCMSD Item 11 Ductile Iron Pipe
7. SCMSD Item 14 PVC Pipe
8. SCSE Item 21 Pavement, Curbs and Gutters and Sidewalks
9. SCSE Item 25 Topsoil & Seeding

B. Shop Drawings. Shop drawings shall include but not be limited to all materials as listed below.

1. The Contractor shall provide one (1) electronic copy of all materials listed below for shop drawing approval.
2. Shop drawings shall complete in details and indicate all materials i.e. casing pipe, carrier pipe, etc. utilized for jack and bore pipe installation and the listed materials as specified herein.

3. Manufacturer's catalog or general web-site information will not be sufficient to fulfill shop-drawing requirements.
4. All shop drawings submitted for review and approval shall be returned within 10 working days either approved or marked up for further design.
5. After examination of such drawings by the Engineer and the return thereof, the Contractor shall make such correction to the drawings as have been indicated and shall furnish the Engineer with electronic corrections.
6. If requested by the Engineer, the Contractor must furnish additional hard copies.

C. Calculations. This section is not applicable.

D. Certifications. This section is not applicable.

3.0 MATERIALS. Only materials approved by the SCMSD may be used for this project.

A. Casing Pipe.

1. Casing pipes for the various sizes and kinds of pipe lines shall be new steel with a smooth bore and smooth exterior.
2. Minimum yield strength of pipe material shall be 35,000 psi.
3. The sizes of the casing pipe and the thickness of the walls shall not be less than those listed in Table 1 below:

TABLE 1.	
Minimum Wall Thickness for Steel Casing Pipe	
NOMINAL DIAMETER (INCHES)	*THICKNESS
Under 14	0.188
14 & 16	0.219
18	0.250
20	0.281
22	0.312
24	0.344
26	0.375
28 & 30	0.406
32	0.438
34 & 36	0.469
38, 40, & 42	0.500
48	0.563
54	0.625

*The interior and exterior of casing shall be coated according to AWWA C210 with a minimum dry film thickness of 16 mils. The epoxy may be modified with coal tar. Approved coating system manufacturers include Tnemec and Sherwin Williams.

If a cathodic protection system is approved by the Engineer, wall thickness may be reduced by 0.063" in above table, except for under 14" diameter.

B. Carrier Pipe. All carrier pipe provided under this specification shall be as follows:

1. Kind and size designated on the drawings.
2. Conforming to SCSE specifications Items 14 for PVC, or other applicable pipe specification.
3. Strength class as indicated on all drawings.
4. All pipes in casings shall be mechanical joint restraint system and shall be Megalug, as manufactured by Ebba Iron, Inc., Field Lok gaskets, as manufactured by U.S. Pipe, Inc., or approved equivalent.

C. Pipeline Support/Spacers. Pipeline support shall be:

1. Premanufactured casing spacers of stainless steel with plastic insulating runners manufactured by:
 - a. Cascade Waterworks Manufacturing of Yorkville, Il.
 - b. Approved engineering equal.
2. Installed on each side of the pip joint.
3. Maximum spacing is 5'-0"
4. Installed per manufacturer's recommendations except as noted on SCSE detail drawing No. 8A.
5. Shop drawing submittal shall include manufacturers catalog cuts and scale drawings showing proposed spacer location for the bore specified Pipe or Tunnel.

D. Tracer Wire System. All wiring and material requirements for the provision of the tracer wire system on all non-ferrous water and sewer pressure pipe (force mains, HDD, jack & bore and pipe burst) applications shall conform with SCSE Specification Item 60" Tracer Wire for Water & Wastewater Non-ferrous Pipe".

4.0 EXECUTION.

A. Low Strength Mortar.

1. Once the boring and jacking operation begins, it shall be completed without interruption. The pipe shall be properly jointed, aligned and secured in the casing pipe or tunnel lining so that no movement of the pipe will take place.
2. The entire space outside of the pipe and the inside of the tunnel or casing pipe (annular void) shall be completely filled with, Low Strength Mortar (LSM) grout with super plasticizer. All LSM shall comply with:
 - a. ODOT Item 613 Standards for LSM and plasticizer additives.
 - b. The grout shall be carefully placed so that proper alignment and grade of the pipeline or sewer will be maintained.

B. Tracer Wire System.

1. All wiring and material requirements for the provision of the tracer wire system on all non-ferrous water and sewer pressure pipe (force mains, HDD, jack & bore

and pipe burst) applications shall conform with SCSE Specification Item 60 "Tracer Wire for Water & Wastewater Non-ferrous Pipe".

5.0 ELECTRICAL. This section is not applicable.

6.0 QUALITY ASSURANCE. The contractor shall provide the following testing and warranty on the pipeline in casing or tunneling in accordance with the following requirements below.

A. Testing.

1. The work covered under this section of the Specification is intended to be the work, materials, labor and equipment required to install the sewer system as described above.
2. All material used on this project shall be new and unused unless otherwise specified and all workmanship shall be of the best quality. Only qualified and skilled workmen/women shall be employed for all phases of this project.
3. All workmen/women shall be trained in trench safety.
4. Deflection testing; Deflection testing shall be required after a minimum of 30 days post construction as specified in Appendix 'D'.
5. Continuity Testing required for the Tracer Wire System shall be done in accordance with SCSE Item 60 specification.

B. Observation.

1. Post CCTV - The Contractor shall be responsible to provide post CCTV of the entire sewer system after completion of all installation and testing.
2. All post video work shall comply with and be paid for under SCSE Item 40.

C. Warranty.

1. The Contractor shall guarantee all materials and workmanship for a period of one (1) year from the acceptance of the sewer system after successfully passing all sewer testing requirements above.
2. The Contractor, at their costs, shall be responsible to repair any defects or failures, due to workmanship reported to the Contractor after the testing procedures and/or within the one (1) year warranty period. All repairs shall be made within one (1) week of notification of said defect/failure.
3. In addition to the one (1) year warranty as specified above the Contractor shall provide a two (2) year maintenance bond on the entire system equal to the amount of the Contract.
4. All warranty for the Tracer Wire system shall be in accordance with SCSE Specification Item 60.

7.0 MEASUREMENT. The number of lineal feet of casing and carrier pipe and/or tunnel is to be measured for payment under this item.

A. Casing & Carrier.

It shall be the actual length constructed in casing and carrier pipe and/or tunnel, measured along the center line from end of casing to end of casing. No separate measurement will be made for bore and receiving pits, or for any sheeting required under this item.

B. Tracer Wire.

The entire tracer wire system installed shall be included as part of the total number of lineal feet and size of actual casing and carrier pipe furnished and placed, under this item, as indicated above. No additional payments for the tracer wire system shall be made.

5.0 PAYMENT. The unit pricing stipulated for provision of all labor, equipment and materials necessary for the casing and carrier pipes, as specified above and located on detail drawings shall be unit pricing as follows:

<u>Item</u>	<u>Unit</u>	<u>Description</u>
17	LF	__" Casing Pipe w/ __" Carrier Pipe "Complete"

END OF SECTION