SECTION 15130

jacked pipe casing

# general

## scope of work

### This section includes materials and installation of jacked pipe casings. Where the CONTRACTOR proposes to install pipelines using directional drilling or boring, a complete submittal of the methods and materials shall be made to the DISTRICT prior to the initiation of the work.

## reference codes and standards

### The publications listed below form part of this specification to the extent referenced and are referred to in the text by the basic designation only. References shall be made to the latest edition of said standards unless otherwise called for.

#### ASTM A 36/A 36M – Standard Specification for Carbon Structural Steel

#### ASTM A 283/A 283M – Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates

#### ASTM A 568/A 568M – Standard Specification for Steel, Sheet and Strip, Carbon, Hot-Rolled, and Structural Quality Cold Rolled

## RELATED WORK SPECIFIED ELSEWHERE

### EVMWD Standard Drawings

### Section 01000 – General Requirements

### Section 01300 – Shop Drawings and Submittals

### Section 02223 – Trenching, Backfilling and Compaction

### Section 15000 – General Piping Systems and Appurtenances

## protection of existing utilities and facilities

### The CONTRACTOR shall be responsible for the care and protection of all existing utilities, facilities, and structures that may be encountered in or near the area of the work.

## safety and permitting requirements

### Pipe jacking and boring projects 750mm (30”) in diameter or larger are required to be classified by the State of California, Department of Industrial Relations, Division of Occupational Safety and Health.

### Protection of workers in trench excavation shall be as required by the State of California Construction Safety Orders, the State of California State Health and Safety Code, the requirements of CAL-OSHA and in accordance with Section 01000.

### All excavations shall be performed, protected, and supported as required for safety and in the manner set forth in the operation regulations prescribed by CAL-OSHA.

### It shall be the CONTRACTOR’s responsibility to obtain excavation permits, traffic control permits, or other applicable permits from the local DISTRICT which has jurisdiction

### A pre-job safety conference with representatives of the Division of Occupational Safety, CAL-OSHA, the DISTRICT, the CONTRACTOR and CONTRACTOR’s employees shall be held before the work begins.

### CONTRACTORs performing this type of work are required to hold a current C-34 or General Engineering Contracting License from the State of California.

## design requirements

### Pipe casing shall be provided for the carrier piping where shown on the Approved Plans or as required by the Engineer. The sizes and material type for pipe casing shall be as detailed in Part 2 of this Section.

### The Engineer may select a greater steel thickness and diameter as appropriate for the intended application.

## submittals

### The CONTRACTOR shall provide to the DISTRICT and the DISTRICT, or agencies, of jurisdiction a drilling, boring, and jacking plan prior to commencing boring operations. The submittal shall include:

#### Configuration of the jacking pits and jacking pit bracing or shoring. Pit excavations deeper than 20’ require the shoring system to certified by a Registered Civil Engineer.

#### The pipe casing material to be used. Include pipe material type, wall thickness, and welding details.

#### Casing spacers and end seals.

#### Jacking plan and profile drawing detailing the placement of the jacked casing.

#### Installation procedure.

#### Manufacturer and type of liquid epoxy paint, including proposed steel preparation and application methods to be used.

#### The jacking machinery and jacking head proposed to be used.

#### Summary of the backfilling method to be used.

#### Worker Protection and Safety Plan.

#### Cathodic Protection.

## delivery and handling

### Proper care shall be used to prevent damage in handling, moving and placing the pipe casing. All pipe- casing materials shall be lowered into the trench in a manner that prevents damage. The pipe casing shall not be dropped, dragged or handled in a manner that will cause dents, cracks, or other damage to the pipe casing.

## casing spacers and end seals

### Casing spacers and end seals shall be used for all pipe installations within casings.

### If the carrier pipe is not installed within the casing, as a continuous operation, following completion of jacking, then bulkhead the portals and backfill the approach trenches. Bulkheads will be removed at a later time to allow for the installation of the carrier pipe.

## tracer wire

### Tracer wire shall be installed atop all potable and recycled water carrier pipe in accordance with Standard Drawing W-35.

## recycled water identification

### Fittings and pipe appurtenances installed for recycled water shall be identified with purple color coating, purple polyethylene sleeve, identification labels or signs per the Approved Materials List.

# materials

## pipe casings

### Jacked pipe casings shall be steel.

### The minimum size and wall thickness of jacked steel pipe casings shall be as follows, unless otherwise required by the DISTRICT having jurisdiction over the road, utilities, or improvements.

|  |  |  |
| --- | --- | --- |
| **Carrier Pipe Size** | **Minimum Casing Size** | **Min. Steel Casing Wall Thickness** |
| 150mm (6”) | 350mm (14”) | 9.53mm (3/8”) |
| 200mm (8”) | 400mm (16”) | 9.53mm (3/8”) |
| 250mm (10”) | 450mm (18”) | 9.53mm (3/8”) |
| 300mm (12”) | 500mm(20”) | 9.53mm (3/8”) |
| 400mm (16”) | 750mm (30”) | 12.7mm (1/2”) |
| 500mm (20”) | 900mm (36”) | 12.7mm (1/2”) |
| 600mm (24”) | 1,050mm (42”) | 12.7mm (1/2”) |

### Pipe casing for carrier pipe sizes larger than 600mm (24”) shall be determined by the Engineer.

### The CONTRACTOR may submit a greater steel thickness and diameter as appropriate for the method of work and loadings involved, as suitable for the site and as limited by possible interferences. The CONTRACTOR shall submit any deviations in the approved design to the DISTRICT fourteen (14) working days in advance of jacking operations, and may not proceed with any work until the Engineer has approved the alternate methods proposed.

### It is the CONTRACTOR’s responsibility to choose a size of casing at or above the minimum specified, and to insure that the jacking is done with a high degree of accuracy to permit installation of the carrier pipe to the lines and grades shown on the approved plans.

### Steel pipe casings, unless otherwise approved by the DISTRICT, shall be butt-welded sheets (spiral welding of pipe not allowed) conforming to ASTM A 36/A 36M, ASTM A 283/ A 283M, Grade D, or ASTM A 570/A 570M, Grade 33. Other steel grades may be used upon approval of the Engineer.

### Steel pipe casings shall include the installation of an anode in accordance with the Standard Drawings, unless otherwise directed by the Engineer.

## casing spacers

### Casing spacers shall be stainless steel, centered-position type with PVC liner and non-metallic anti-friction runners in accordance with the Approved Materials List.

## casing end seals

### Casing end seals, in accordance with the Approved Materials List, shall wrap around the casing and carrier pipe to provide a barrier to backfill material and seepage. The casing end seal shall be a minimum 6.25mm (¼”) thick styrene butadiene rubber sheet attached to the carrier pipe and casing with 25mm (1”) wide stainless steel bands. Zippered casing end seals with stainless steel bands may also be used.

## tracer wire (carrier pipe)

### Tracer wire materials shall be in accordance with Standard Drawing W-35 and the Approved Materials List.

## warning/identification tape

### Warning/Identification tape materials shall be in accordance with Standard Drawing W-35 and the Approved Materials List.

# execution

## trench excavation, backfill and compaction

### Trenching, bedding, backfilling and compaction operations shall be performed in accordance with SECTION 02223.

## jacking pit

### The approach trench for jacking or boring operations shall be adequately shored to safeguard existing substructures and surface improvements and to ensure against ground movement in the vicinity of the casing portal.

### Placement of equipment in the approach trench of the jacking pit shall be firmly bedded on the required line and grade using heavy timbers, structural steel, or concrete cradles of sufficient length to provide accurate control of jacking alignment. Provide space to insert the casing lengths to be jacked. Anchor the timbers and structural steel sections to ensure action of the jacks in line with the axis of the casing. Place a timber or structural steel bearing block between the jacks and the end of the casing to provide uniform bearing upon the casing end evenly distribute the jacking pressure.

### After jacking equipment and debris from the tunnel have been removed from the approach trench of jacking pit, prepare the bottom of the jacking pit as a pipe foundation. Remove all loose and disturbed materials below pipe grade to undisturbed earth and re-compact the material in accordance with SECTION 02223.

## pipe casing installation

### Installation of pipe casings shall be as described below and in accordance with the Standard Drawings. Only workers experienced in jacking operations shall be used in performing the work of jacking and boring.

#### The CONTRACTOR’s attention is called to the fact that extreme care is required in placing the casing so as to permit the installation of the carrier pipe to the lines and grades shown on the Approved Plans.

#### Gravity flow pipelines are designed at grades that do not permit variance from the lines and grade as shown on the Approved Plans.

#### Fit a sectional shield or steel jacking head to the leading section of the casing. The shield or head shall extend around the outer surface of the upper two-thirds of the casing and project at least 450mm (18") beyond the driving end of the casing. It shall not protrude more than 13mm (½") beyond the outer casing surface.

#### The leading section of casing shall be equipped with a jacking head securely anchored thereto to prevent any wobble or variation in alignment during the jacking operation.

#### To avoid loss of ground outside the casing, carry out excavation entirely within the jacking head and not in advance of the head. In general, excavated materials shall be removed from the casing as jacking progresses and no accumulation of excavated material within the casing will be permitted.

#### A jacking band to reinforce the end of the pipe receiving the jacking thrust will be required.

#### Control the application of jacking pressure and excavation of material ahead of the advancing casing to prevent it from becoming friction-bound or deviating from required line and grade. Do not encroach upon the minimum annular space detailed. Restrict the excavation of material to the least clearance to prevent binding in order to avoid settlement or possible damage to overlying structures or utilities.

#### Steel casing sections shall be full circumference butt-welded in the field. It shall be the CONTRACTORs responsibility to provide stress transfer across the joints capable of resisting the jacking forces involved.

## carrier pipe installation

### Carrier pipe shall be pushed into the casing incorporating the use of casing spacers as described below.

### PVC or ductile-iron carrier pipe joints shall be restrained either by mechanical means or by use of splined gaskets.

### Steel carrier pipe sections shall be lap joint welded in accordance with SECTION 15000.

### Upstream and downstream elevations of the carrier pipe shall be verified prior to installing the end seals.

### The portion of carrier pipe installed within a casing shall have pressure, leakage, and infiltration testing completed in accordance with SECTION 15044 prior to installation of the end seals.

### The annular space between the carrier pipe and casing shall not be filled with any material unless otherwise noted on the Approved Plans.

## casing spacers

### Casing spacers shall be used to prevent the carrier pipe bell from touching the casing and to maintain a uniform space between the carrier pipe and casing interior. Casing spacers shall be installed on the carrier pipe at intervals per the manufacturer's recommendations with a minimum of three spacers per pipe section equally spaced.

## casing end seals

### Casing end seals shall be installed in accordance with the manufacturer's recommendations.

### Carrier pipe shall pass hydrostatic or leakage tests in accordance with SECTION 15044 prior to the installation of casing end seals or backfilling operations.

## tracer wire

### Tracer wire shall be installed on the carrier pipe in accordance with the Standard Drawing W-35.

end of section