

APPENDIX B
GENERAL CONSTRUCTION NOTES

General:

1. Construct utilities in accordance to Toho approved plans and shop drawings. Any deviation from the approved plans shall be approved by the DEVELOPER'S ENGINEER and Toho.
2. A preconstruction meeting with the Toho's staff is required prior to initiating construction.
3. All required permits shall be obtained prior to initiating construction.
4. A minimum 12 foot wide access road shall be provided for all Toho owned utilities, which are located outside of roadways. The top 8" of the access road shall be stabilized to a Florida Bearing Value of 75 psi, and compacted to 98% of AASHTO T-180.
5. Pipe deflection cannot exceed 25% of the pipe manufacturer's recommendation.
6. Reference Toho's Standards, Specifications and Details, latest Edition for issues not specifically addressed below or on the Toho Accepted construction plans.
7. Current edition of Toho's Standards, Specifications and Details, at time of Toho plan acceptance shall supersede Accepted Plans. It is the contractor's responsibility to ensure Toho Standards, Specifications and Details are adhered to in construction.

Permits, Plans, Shop Drawings:

1. Permits or Letters of Determination from FDEP shall be obtained for the sanitary sewer collection system and water distribution system prior to commencement of construction.
2. A stamped accepted set of plans by Toho shall be present on the site at all times. Accepted plans are valid for 12 months from the date of plan acceptance. If construction does not begin within this 12 month period, the DEVELOPER must contact Toho for a project status review and possible approval for extension.
3. Shop drawings for all water, reuse, and sanitary sewer materials and structures shall be submitted to Toho prior to initiating construction.
4. Installation of materials and/or structures prior to shop drawing approval is done at the Contractor's own risk.
5. Two hard copies and one electronic copy of record drawings shall be submitted to Toho before the final inspection. Record drawings shall conform to sections 11.6 of Toho's Standards, Specifications and Details, latest edition.

Potable Water and Reuse Water - Testing:

1. Water line shall be installed, cleaned, flushed, disinfected and bacteriologically tested and cleared for service in accordance with the latest AWWA standards and FDEP rules and regulations.

All water distribution systems shall be flushed clean of all deleterious material prior to any testing. Lines 4" and greater shall be pigged.

2. Water line shall be pressure tested in accordance with AWWA-C600 (ductile iron pipe) and AWWA-C605/M23 (PVC pipe) specifications at 150 psi and witnessed by Toho personnel. No leakage shall be allowed.
3. All tapping saddles and sleeves shall be pressure tested at 150 psi and witnessed by Toho personnel prior to initiating the tap.
4. All water mains shall be disinfected in accordance with the latest version of AWWA C651 and witnessed by Toho personnel.
5. All bacteriological samples shall be witnessed by Toho personnel.

Water - Materials:

1. **PVC pipe:** four (4) inches through twelve (12) inches shall be AWWA C-900, latest edition. Fourteen (14) inches through thirty-six (36) inches shall be AWWA C-905, latest edition.
2. **DIP pipe:** four (4)" through fifty-four (54)" shall be ANSI/AWWA A21.51/C151 with a minimum working pressure class 150 pipe.

Any fittings required shall be mechanical joint ductile iron conforming to ANSI/AWWA A21.10/C110, 250 psi minimum pressure rating, or ductile iron compact fittings in accordance with ANSI/AWWA A21.53/C153.

Joints for ductile iron pipe shall be push-on or mechanical joints conforming to ANSI/AWWA A21.11/C111. Above ground joints shall be flanged with stainless steel bolts, nuts and washers. Flanged joints shall conform to ANSI Standard B 16.1-125 LB.

Where ductile iron pipe and fittings are to be below ground or installed in a casing pipe the coating shall be a minimum 1.0 mil thick in accordance with ANSI/AWWA A21.51/C151.

Where ductile iron pipe and fittings are to be installed above ground, pipe, fittings and valves shall be thoroughly cleaned and given one field coat (minimum 1.5 mils dry thickness) of rust inhibitor primer, and two finish coats (minimum 1.5 mils dry thickness each).

All ductile iron pipe and fittings shall have an interior protective lining of cement-mortar with a seal coat of asphaltic material in accordance with ANSI/AWWA A21.4/C104.

The pipe shall be polyethylene encased (8 mil) where shown on the PLANS, in accordance with ANSI/AWWA A21.51/C105.

3. **Polyethylene pipe:** four (4)" through twelve (12)" shall be AWWA standard C906, PE3408 latest edition. The polyethylene pipe shall have a minimum working pressure rating of 160 psi and shall have a standard dimension ratio (SDR) of 11. Pipe shall be the same ID as ductile iron pipe.

Polyethylene pipe shall have fusion bonded joints.

Fittings used with polyethylene pipe shall be fusion fittings in accordance with AWWA Standard C906.

4. **Service pipes:** All service lines shall be ¾", 1", 1-1/2" or 2", blue for potable water and purple for reuse water, PC200, SDR9, polyethylene tubing conforming to specifications in AWWA C901, PE3608. 4" and larger service pipe shall be C-900 PVC or DIP. 3" service pipe shall not be permitted.
5. Valves shall be resilient wedge gate valves.

6. Valves shall be located at not more than 500 foot intervals in commercial, industrial and high density residential areas and at not more than 1000 foot intervals in all other areas. Appropriate valving shall also be provided on all sides of tees and crosses and on both sides of a directional bore or jack and bore.
7. All meters shall be installed by Toho after all payment of applicable fees and charges. All meters 2" and less in size shall be installed underground in an approved meter box. Meters larger than 2" shall be installed above ground. In general, meters 2" and larger shall be located in a meter easement located adjacent to the public right of way and outside of paved areas.

Sewer - Testing:

Prior to any testing to be witnessed, all passing soil density tests and slope surveys shall be submitted to the Toho Engineer and to the Toho Inspector.

1. All sanitary manholes shall be inspected by Toho personnel.
2. Sanitary sewers shall be video inspected and witnessed by Toho personnel in accordance with the TOHO Standards, Specifications, and Details Manual, latest edition.
3. Sanitary sewers shall be low pressure air tested with no allowable loss and witnessed by Toho personnel.
4. Gravity sanitary sewer mains shall require a mandrel test which shall be witnessed by the Toho inspector in accordance with the TOHO Standards, Specifications, and Details Manual, latest edition.

Gravity Sewer - Materials:

1. **PVC pipe:** four (4)" through fifteen (15)" shall be ASTM D3034, SDR 35. The joints shall be integral bell elastomeric gasket joints manufactured in accordance with ASTM D3212 and ASTM F477/ Applicable UNI-Bell Plastic Pipe Association standard is UNI B-4.

PVC pipe: eighteen (18)" through twenty-seven (27)" shall be ASTM F679, SDR 35. The joints shall be integral bell elastomeric gasket joints manufactured in accordance with ASTM D3212 and ASTM F477/ Applicable UNI-Bell Plastic Pipe Association standard is UNI B-7.

All PVC pipe shall bear the NSF-DW seal. The minimum standard length of pipe shall be thirteen (13) feet. PVC pipe with less than 15 ft of cover shall be SDR 35; 15 to 20 ft shall be SDR 26; and 20 to 30 ft shall be SDR 18.

2. **DIP pipe:** ANSI/AWWA A21.51/C151, class thickness designed per ANSI/AWWA A21.50/C150, with flange joints. An interior protective lining of "Protecto 401" epoxy, or equal, with a minimum dry film thickness 40 mils. DIP shall only be used on above ground pipe at sanitary lift stations.
3. Joint Materials:
 - PVC sewer pipe joints shall be flexible elastomeric seals per ASTM D3212.
 - Joints between pipes of different materials shall be made with a rigid, PVC, adaptor coupling. Fernco adapters shall only be permitted when transitioning between clay pipe and PVC.

Sewer Force Mains – Testing:

1. Force main piping shall be installed and pigged until clean.
2. Force main shall be pressure tested in accordance with AWWA-C600 (ductile iron pipe) and AWWA-C605/M23 (PVC pipe) specifications at 100 psi or 1.5 times the operating pressure, whichever is greater for a minimum of 2 hours and witnessed by TOHO personnel. No leakage shall be allowed.

Sewer Force Mains - Materials:

1. **PVC pipe:** four (4)" through twelve (12)" shall be AWWA standard C900 and a dimension ratio (DR) of 25.

PVC pipe shall be integral bell, push-on type joints.

2. **DIP pipe:** four (4)" through fifty-four (54)" shall be ANSI/AWWA A21.51/C151 with a minimum of pressure class 150 and lined with Protecto 401 or equal.

Above ground fittings and joints shall be flanged with T5 cadmium plated bolts, nuts, and washers. Flanged joints shall conform to ANSI Standard B16.1-125 LB.

Ductile iron pipe, fittings, and valves shall be thoroughly cleaned and given one field coat (minimum 1.5 mils dry thickness) of rust inhibitor primer, and two finish coats (minimum 1.5 mils dry thickness each).

All ductile iron pipe and fittings shall have an interior protective lining of "Protecto 401" epoxy or equal with a minimum dry film thickness of 40 mils.

3. **Polyethylene (PE3408) pipe:** four (4)" through twelve (12)" shall be in accordance with AWWA standard C906, latest edition. The polyethylene pipe shall have a minimum working pressure rating of 100 psi and shall have a dimension ratio (DR) of 17.

Polyethylene pipe shall have fusion bonded joints.

Fittings used with polyethylene pipe shall be fusion fittings in accordance with AWWA Standard C906.

8. Wastewater force mains shall be equipped with air release valves located at piping high points immediately upstream of dips, or other elevation declines.
9. Valves shall be resilient wedge gate valves.
10. Valves shall be located at not more than 2,000 foot intervals in all areas.

Separation Requirements:

Per F.D.E.P. requirements and subject to TOHO approval.

Miscellaneous:

1. All tie-ins to existing manholes shall be core drilled. Connect pipe to manhole using a flexible connector or approved A-lok.
2. All mechanical joints shall be restrained. Thrust blocks are not permitted on Toho maintained infrastructure.

3. Maintain a minimum 36" of cover measured from the bottom of the sub-grade to the top of all water, reuse, and sanitary sewer pipes. If 36" of cover cannot be maintained notify engineer and Toho for evaluation.
4. Galvanized pipe is not allowed and if encountered shall be replaced with approved materials.
5. 3M Locate Tape shall be installed 12" to 18" over all pipe but no deeper than 4'. If a main is more than 60" deep to top of pipe the 3M marker tape shall be placed within the top 3' of fill and an additional layer of standard metallic marking tape shall be placed 12" above the pipe.
6. All PVC pipe shall be green in color (for sewer), blue in color (for water) and purple in color (for reuse). DIP shall have a continuous 2" wide, permanent blue/purple stripe (oil based enamel) on the top of the pipe.
7. Directional bores shall use 1 - 8 gauge steel core copper and 1 - 8 gauge copper wire.
8. One compaction test shall be taken for each 12" layer of fill from the springline of the pipe to the finish grade for each 300 feet of pipe and for every 100 square feet of backfill around structures.
9. All existing water, reuse and sanitary appurtenances on a project site which might be affected by project WORK shall be protected during construction and shall be brought to finished grade per the Toho Standards, Specifications, and Details Manual, latest edition.
10. All tree and shrub root balls shall be placed with a minimum of 5' horizontal separation from Toho maintained utilities.
11. If the underground contractor de-mobilizes between phases of a project and the water distribution system has been cleared for use by FDEP, the contractor will be required to install automatic flushing devices on all water main dead-ends whether intended as stub-outs or as incomplete construction. If the site has not been cleared for use by FDEP, the contractor will be required to physically disconnect all un-cleared mains from the points-of-connection to cleared mains.
12. When required by another regulatory agency, masonry walls around lift stations shall require barbed wire at the top of the wall. At Toho's discretion, alternative anti-climb measures may also be utilized in place of barbed wire, however, signage will be required on all exterior walls indicating the use of anti-climb measures that may not be visible.
13. All permanent structures including, but not limited to building foundations, walls, and light poles shall be placed with a minimum 12' horizontal separation from all Toho owned infrastructure.