Appendix B

General Construction Notes

General:

1. Where conflicts arise between the Toho accepted plans, Toho Standards & Specifications Manual, Toho Standard Details, best practices, or other applicable government or industry standards, the developer or their assigned representative shall seek guidance from Toho for direction on how to proceed.

2. Reference Toho's Standards, Specifications and Details, latest Edition for issues not specifically addressed below or on the Toho accepted plans.

4. Utilities shall be constructed in accordance with Toho accepted plans and shop drawings. Any deviation from the Toho accepted plans must be coordinated through the developer's engineer and approved by Toho.

6. A preconstruction meeting with the Toho's staff is required prior to initiating construction.

7. All required permits including but not limited to FDEP water and wastewater permits, right-of-way utilization permit(s), dewatering permit(s), and temporary construction easement(s) shall be obtained prior to initiating construction.

Permits, Plans, Shop Drawings:

1. FDEP Water and Wastewater Permits or Letters of Determination shall be obtained for the potable water distribution and sanitary sewer collection system prior to commencement of construction.

2. 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 Toho shop drawing approval is done at the Contractor's own risk. Any material or structure found to be out of compliance with Toho standards shall be removed at the expense of the contractor.

5. A stamped set of Toho accepted plans shall be always present on the site. Plans are valid for 12 months from the date of plan acceptance by Toho. 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.

6. One hard copy and one electronic copy of record drawings shall be submitted to Toho before the pre-final inspection. Record drawings shall conform to sections 11.6 of Toho's Standards, Specifications and Details, latest Edition.

Miscellaneous:

1. All tie-ins to existing manholes shall be via core drill. 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 the project 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 5' 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 place 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 green, blue, or purple stripe of oil based enamel on the top of the pipe.

7. Directional bores shall use 1 - 8 gauge steel core copper and 1 - 8 gauge solid copper tracer wire.

8. One compaction test shall be taken for each 12" layer of fill from the spring-line of the pipe to 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 sewer appurtenances on or around a project site which might be affected by the work shall be protected during construction and shall be brought to finished grade per the Toho's Standards, Specifications and Details, latest Edition.

10. All tree and shrub root balls shall be placed with a minimum of 5' horizontal separation from Toho owned and 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 potable 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 anti-climb measures at the top of the wall with appropriate signage 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.

14. A minimum 12-foot-wide access road shall be provided for all Toho owned utilities which are located outside of paved roadways. The top 8" of the access road(s) shall be stabilized to a Florida Bearing Value of 75 psi, and compacted to 98% of AASHTO T-180.

15. Pipe deflection for pressure pipe cannot exceed 25% of the pipe manufacturer's recommendation.

Separation Requirements:

1. Per FDEP requirements and subject to Toho approval.

Potable Water and Reuse Water - Testing:

1. Potable water lines 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.

    a. Disinfection and bacteriological sampling shall be done by an accredited contractor and/or lab and witnessed by Toho.

2. All potable water and reuse water distribution systems shall be flushed clean of all deleterious material prior to any testing. Mains 4" and larger shall be pigged and mains and services smaller than 4" shall be flushed. All pigging and flushing shall be through a metered source of potable water previously cleared for use by FDEP and Toho.

3. Potable water and reuse water lines 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.

4. All tapping saddles and sleeves shall be pressure tested at 150 psi and witnessed by Toho personnel prior to initiating the tap. The tapping valve or corporation stop shall be tested with the saddle or sleeve.

Potable Water and Reuse Water - Materials:

1. PVC pipe (4) inches through thirty-six (36) inches shall be AWWA C-900/905, 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.

    a. 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.

    b. 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.

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

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

    e. 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.

    f. The pipe shall be polyethylene encased (8 mil) where shown on the Toho accepted plans and 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.

    a. Polyethylene pipe shall have fusion bonded joints.

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

3. Polyethylene pipe three-quarter (¾)" through two (2)" shall be AWWA standard C901, PE3608, blue for potable water and purple for reuse water. The polyethylene pipe shall have a minimum working pressure rating of 160 psi and shall have a standard dimension ratio (SDR) of 9 (PC250). 4" and larger service pipe shall be C-900 PVC or DIP.

4. 3" service lines 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 2" and smaller 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.

8. Meters larger than 2" shall be installed above ground and are the responsibility of the developer. 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 or as shown on the Toho accepted plans.

Gravity Sewer - Testing:

1. Prior to any testing, passing soil density tests and slope surveys shall be submitted to Toho.

2. All sanitary manholes shall be inspected by Toho personnel prior to installing in ground and prior to backfilling once installed.

3. Sanitary sewers shall be video inspected and witnessed by Toho personnel in accordance with the Toho's Standards, Specifications and Details, latest Edition.

4. Sanitary sewers shall be low pressure air tested with no allowable loss and witnessed by Toho personnel.

5. Gravity sanitary sewer mains shall require a mandrel test which shall be witnessed by the Toho inspector in accordance with the Toho's Standards, Specifications and Details, latest Edition.

Gravity Sewer - Materials:

1. PVC pipe eight (8)" through twelve (12)" 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.

2. PVC pipe fifteen (14)" 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.

3. 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. Where permitted by Toho, PVC pipe with 15 to 20 ft of cover shall be SDR 26 and PVC pipe with 20 to 30 ft of cover shall be DR 18 pressure pipe conforming to AWWA C-900/C-905

4. Joint Materials:

    a. PVC sewer pipe joints shall be flexible elastomeric seals per ASTM D3212.

    b. Joints between pipes of different materials shall be made with a rigid PVC coupling. Fernco adapters shall only be permitted when transitioning between clay pipe and PVC.

Sanitary Sewer Force Mains – Testing:

1. All sanitary sewer force mains shall be flushed clean and pigged prior to any testing. All pigging shall be through a metered source of potable water already cleared for use by FDEP and Toho.

2. Sanitary sewer force mains 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.

Sanitary Sewer Force Mains - Materials:

1. PVC pipe four (4)" through twelve (12)" shall be AWWA standard C-900/905 with a dimension ratio (DR) of 25.

    a. 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 an interior protective lining of "Protecto 401" epoxy or equal with a minimum dry film thickness 40 mils.

    a. 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.

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

3. Polyethylene 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.

    a. Polyethylene pipe shall have fusion bonded joints.

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

4. Polyethylene pipe smaller than four (4)” shall be AWWA standard C901, PE3608, green. The polyethylene pipe shall have a minimum working pressure rating of 160 psi and shall have a standard dimension ratio (SDR) of 9 (PC250). 4” and larger service pipe shall be C-900 PVC or DIP.

5. Wastewater force mains shall be equipped with air release valves located at piping high points immediately upstream of dips, or other elevation declines and as shown on the Toho accepted plans.

6. Valves shall be resilient wedge gate valves.

7. Valves shall be located at not more than 2,000-foot intervals in all areas.