Standard Sewer System Specifications

1. **GENERAL**
   a. This specification covers new sewer main installations.
   b. All labor, material, equipment, and testing required for a complete and functional system shall be furnished by the developer.
2. **MATERIALS**
   a. PIPE
      i. PVC Pipe shall be SDR 26 heavy wall sewer pipe meeting the requirements of ASTM D3034 for 4" to 15" gravity pipe and ASTM F679 for 18" and 21" gravity pipe. PVC force main pipe shall meet the requirements of ASTM D2241, pressure class 200 minimum. ALL PVC PIPE SHALL BE GREEN IN COLOR OR SHALL BE PAINTED GREEN BY THE CONTRACTOR DURING INSTALLATION. Gaskets for PVC shall be ASTM F477 elastomeric seals.
      ii. Ductile Iron Pipe shall meet the requirements of AWWA C151, pressure class 250 minimum, for force main installations and ASTM A746, pressure class 350, for gravity sewer pipe. All ductile iron pipe shall be cement lined in accordance with AWWA C104. D.I. Pipe shall be manufactured by U.S. Pipe and Foundry or American Cast Iron Pipe Company only. Gaskets for ductile iron pipe shall meet the requirements of AWWA C111 for rubber gaskets.
      iii. Casing pipe shall be ASTM A252, Grade 2, with casing spacers and end seals.
   b. FITTINGS
      i. Fittings on PVC or Ductile Iron force main piping shall be restrained joints as follows:
         1. Compact Ductile Iron in accordance with ANSI/AWWA C153/A21.53 with Mega-Lug type retainer glands with twist-off nuts.
         2. Joint restraint may be provided using Lok-Ring or equivalent pipe joints.
         3. Transition gaskets shall be used with pressure class PVC pipe on force mains.
      ii. Fittings shall not be used on gravity sewer piping. All changes in direction on gravity piping shall occur at a manhole.
   c. ENCASEMENT
      i. Polyethylene encasement for ductile iron pipe shall meet the requirements of ANSI/AWWA C105/A21.5.
      ii. All casing unless otherwise specified shall be twice the diameter and steel per ALDOT specifications.
   d. VALVES
      i. All valves installed in force mains shall be AWWA C515 resilient-seated gate valves with ductile iron body and bonnet, bronze or 304SS stems, non-rising stems, and 2" square operating nut.
      ii. Valve boxes shall comply with AWWA M44 for cast-iron valve boxes with adjustable extension and 5" diameter barrel. The use of PVC valve boxes and/or extensions is prohibited.
   e. MANHOLES
      i. All manholes shall be normal traffic precast reinforced concrete in accordance with ASTM C478, 48" minimum diameter, with provision for ASTM C443 rubber gasketed joints.
      ii. All manholes shall be furnished with precast concrete inverts.
      iii. All manholes shall be furnished with monolithic base section (6" minimum floor slab thickness), concentric cones, manhole steps, and Kor-N-Seal pipe connectors.
      iv. All manhole frames and covers shall be East Jordan Iron Works Model V-1480-1 lettered "Sanitary Sewer" or approved equivalent.

f. MISCELLANEOUS ACCESSORIES
   i. External Manhole Sealing Sleeve to prevent inflow and infiltration shall be as manufactured by Sealing Systems, Inc. or approved equivalent.

3. **INSTALLATION**
   a. PIPE
      i. Ductile iron force main and gravity sewer pipe shall be installed in accordance with AWWA C600.
      ii. PVC force main pipe shall be installed in accordance with AWWA M23. PVC gravity sewer pipe shall be installed in accordance with ASTM D2321.
      iii. Pipe shall be installed with a minimum of 36" of cover.
      iv. Manholes shall be installed at all changes in direction on gravity sewer piping.
      v. All gravity sewer pipe shall be bedded in a minimum of 6" of ALDOT #57 stone.
      vi. PVC gravity sewer pipe and all gravity sewer pipe in rock trenches shall be backfilled to 12" minimum above the pipe with ALDOT #8910 stone.
      vii. Ductile iron gravity sewer pipe shall be backfilled to 12"minimum above the pipe with material free of particles larger than 1".
      viii. All trenches under paving shall be backfilled completely with ALDOT #8910 stone.
      ix. All pipe shall have 12 gauge solid copper green locator wire installed 12" above main.
   b. FITTINGS
      i. Restrained joint ductile iron fittings shall be installed at all changes in direction on force main piping in accordance with AWWA C600.
   c. POLYETHYLENE ENCASEMENT
      i. Install polyethylene encasement in accordance with ASTM A674 or AWWA C105.
   d. VALVES
      i. Install resilient seat gate valves with stem pointing up in accordance with AWWA C600.
      ii. Valve boxes are required at all valves and shall be installed true and plumb, with top of box flush with grade.
   e. MANHOLES
      i. Install precast concrete manhole sections with gaskets in accordance with ASTM C891.
      ii. Set tops of frames and covers flush with final grade in pavement areas and 3" above finished grade in unpaved areas unless specifically noted otherwise.
      iii. Use precast concrete grade rings for final grade adjustment. The use of brick and mortar is prohibited.
   f. MISCELLANEOUS ACCESSORIES
      i. Exterior Manhole Sealing Sleeve – Install sleeves at all manhole joints and at the frame and cover connection to the grade rings after manhole and all grade rings are set. Follow manufacturer's written installation instructions.

4. **TESTING**
   a. All new force mains shall be pressure tested at a minimum of 1.5 times the anticipated working pressure or 150 psi, whichever is greater, for a minimum duration of 6 hours. Pressure charts shall be provided to the Board.
   b. All new force mains shall be leak tested in accordance with AWWA C600 for ductile iron or AWWA C605 for PVC.
   c. All new gravity mains shall be air tested according to UNI-B-6.
   d. All manholes shall be vacuum tested according to ASTM C1244.

5. **PUMPING STATIONS AND TREATMENT FACILITIES**
   a. Specifications for Pumping Stations and Treatment Facilities will be furnished on a case by case basis and will vary for each particular situation.
6. **SURVEYS AND AS-BUILT DRAWINGS**
   a. All surveys must be tied to Alabama State Plane Coordinates.
   b. As-Built Drawings must be furnished by the developer prior to acceptance by the Board.