

# SECTION 1

# GENERAL NOTES

CITY OF SACHSE, TEXAS  
DEPARTMENT OF ENGINEERING

STANDARD CONSTRUCTION DETAILS

GENERAL NOTES

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REVISED:

Page 1

**CITY OF SACHSE, TEXAS**

Standards for the construction of Drainage Facilities, Water Facilities, Sewer Facilities, and Pavement of Public Streets, Highways, Alleys, Thoroughfares and other Public Facilities. Refer to North Central Texas Council of Governments (NCTCOG) standard specifications and drawings for further information on any public works standard details not covered by these guidelines.

**ARTICLE I  
GENERAL**

- A. All proposed facilities to be constructed shall meet the requirements of the City Zoning Ordinance and Subdivision Regulations.
- B. All Construction plans and specifications for drainage, water, sewer, street, alley or other public improvements shall be submitted for review and consideration of approval by the City prior to the start of any construction.
- C. Improvements for drainage, pavement, water and sewer facilities shall conform to the requirements of these standard construction details and related specifications.
- D. The developer, Builder or Owner shall be responsible for staking and for all Engineering, Planning and the Surveying required for the development of plans, specifications and construction supervision and shall certify the facilities have been constructed in accordance with the specifications.
- E. As-built plans and construction maintenance bond shall be provided to the City as required by the various regulations and ordinances prior to acceptance of the improvements by the City.
- F. The City has adopted the standard and specifications for Public Works Construction developed by the North Central Texas Council of Government.
- G. The Contractor shall furnish a maintenance bond for 10% of the cost of public improvements to the City to run for two (2) years from the date of acceptance of the system by the City.
- H. Engineering Inspection Fees of 4.5% are to be paid prior to the release of permits.

**ARTICLE II  
DESIGN FOR WATER SYSTEM IMPROVEMENTS**

Public Water System - All extensions and/or improvements to the public water system shall comply with the following requirements:

- A. All water distribution and transmission mains shall not be less than eight inches diameter and looped. Additional sized lines may be required to serve the improvements within the system depending upon the demands and supply capability.
- B. Standard three-way fire hydrants with six inch connection to mains shall be provided every 300 feet along the line in commercial and industrial areas and six hundred feet along the line in residential areas. Fire hydrants shall not be located the end of a cul-de-sac. Every building shall be within five hundred feet of a standard fire hydrant. Hydrants shall have one - 4 ½ inch and two 2 ½ inch openings with National Standard hose threads.
- C. Control valves with boxes shall be located such that a maximum spacing of 500 feet exists in commercial and industrial areas and 800 feet in residential areas.
- D. Air relief valves may be constructed and required at all high points in water lines and dead end lines.
- E. When dead end lines are necessary and approved by the City, the line shall have adequate concrete blocking to withstand expected pressures.

- F. Water lines shall not be located closer than nine (9') feet to existing or proposed sewer lines. Water and sewer lines which are closer than nine feet shall be encased in concrete or constructed of pressure pipe.
- G. When aerial creek crossing are required, supporting piers and encasements shall be provided.

**GENERAL NOTES FOR WATER SYSTEM IMPROVEMENTS**

All work and materials shall be in accordance with City Standard Specifications and General Design Standards.

- 1. Water Mains - All water mains shall have a minimum of 42" cover over the top of the pipe.
- 2. All water mains shall be hydraulically tested to not less than 150 p.s.i. pressure for at least a four hour period. Leakage rate shall not exceed 11.65 gallons per inch of nominal diameter of pipe per mile over a 24 hour period. The contractor shall flush and sterilize lines and prove lines to be free of chloroform organisms by obtaining samples for laboratory tests for contamination. The contractor shall reflush and resterilize until samples for test area are free from contamination. All ditches not under existing or proposed paving sections shall be water jetted. Where ditches cross proposed street or alley sections, the ditch shall be tamped and compacted to 95% Proctor Density.
- 3. All residential water service shall be as follows:
  - a. A water meter box with lock lid to be installed one (1) foot back of curb line.
  - b. The water service shall be SDR-9 Class 200 pipe, unless otherwise shown on the plans.
  - c. Contractor shall tie a 1" wide piece of blue plastic flagging to the water service meter line and shall leave a minimum of 36" flagging exposed after backfill, curb and paving is complete.
  - d. The utility contractor shall install the water services to a point two (2') feet from curb line at a depth of 12 inches. The meter box shall be furnished and installed by the contractor after the paving contractor has completed the fine grading in back of the curb. Each service location will be marked on the curb with a blue letter "W" by the Utility Contractor and field measurement tied to building corners or both property lines as shown on the "As-Built" drawings.
- 4. All bolts and nuts used with mechanical joint fittings shall be "Cor-Ten" steel or Cadmium Plated steel with retainer gland.
- 5. Valve boxes shall be furnished and set on each gate valve. After the final clean-up and alignment has been completed, the contractor (utility) shall pour a concrete block 24" x 24" x 6" around all valve box tops so the finished grade is level with the finished parkway.
- 6. The contractor shall be responsible for providing "As-Built" plans to the engineer showing the location of water services and valves by measured distance to both lot lines. This information shall be placed and marked "As-Built" by the design engineers. One Hard Copy and a CD or DVD with both PDF and AutoCad files of these "As-Built" plans shall be furnished to the City as required.

CITY OF SACHSE, TEXAS  
DEPARTMENT OF ENGINEERING

STANDARD CONSTRUCTION DETAILS

GENERAL NOTES

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Page 2

7. The installation of a blue Stemsonite (or equal) Model 88-SSA fire hydrant will be made by the contractor.
8. Fire hydrants shall be painted as follows:
  - a. Metallite Pure Aluminum #992 for 6 inch mains.
  - b. Alkyd Industrial Enamel, Imperial Blue #4564 for 8 inch mains.
  - c. Alkyd Industrial Enamel, Safety Yellow #4540 for 10 inch or larger water mains.
9. All hydrants are to be painted with two coats of aluminum paint. When a color code other than aluminum is required, the top bonnet, including the lip and all nozzle caps shall be painted the appropriate color.
10. All water mains shall be a minimum of eight (8) inches inside diameter, AWWA C900 Class 150 pressure rating. All PVC water pipe shall be Blue in color and installed with a "Tracer Tape" over the top of the pipe.

**ARTICLE III  
DESIGN FOR SEWAGE SYSTEM IMPROVEMENTS**

Public Sewerage System - All extensions and/or improvements to the public sewerage system shall comply with the following requirements:

- A. Sewer lines shall be constructed in accordance with the plans, specifications and standard details.
- B. All sewage collection lines shall be a minimum of eight (8") inches in diameter and house lateral lines shall have a minimum of four (4") inches in diameter extended to each Living Unit. For multi-family or commercial unit, a minimum size service shall be six (6") inches.
- C. Sewer line pipe shall be P.V.C. SDR 35 for depths up to 10' or SDR 26 for depths greater than 10', be green in color with a joint suitable of limiting infiltration to no greater than 100 gallons per inch of diameter per day per mile of pipe.
- D. Sewer lines shall be designed and constructed with the necessary embedment to withstand expected loads.
- E. In all sewer lines a minimum velocity of two feet per second shall be maintained for full flow or half full flow conditions.
- F. Aerial support for sewer lines across creeks or other depression areas shall be provided with supporting piers and concrete encasements.
- G. Location and sizing of any sewage lift station will be handled on an individual case basis.
- H. Where public sewer service is not available and private sewage disposal facilities are necessary, compliance shall be achieved thru the Public Health Department in accordance with the construction standards for onsite sewerage facilities developed and approved by the Texas Department of Health with an effective date June 13, 2001 or as may be amended.

**GENERAL NOTES FOR SANITARY SEWER SYSTEM IMPROVEMENTS**

All work and materials shall be in accordance with the City Standard Specifications and General Design Standards.

1. All P.V.C. sewer pipe shall be P.V.C. SDR 35 for depths up to 10' or SDR 26 for depths greater than 10', and shall be laid on a minimum of Class "B-4" Embedment.
2. Contractor shall tie a 1" wide piece of red plastic flagging to the end of sewer service and shall leave a minimum of 36" of flagging exposed after backfill, curb and paving is completed. Contractor shall paint a red "S" on the curb or alley opposite location of the sewer service.

3. The Contractor shall furnish a maintenance bond for 10% of the cost of public improvements to the City to run for two (2) years from the date of acceptance of the system by the City.
4. The Contractor shall be responsible for providing "As-Built" plans to the Engineer showing the location of sewer service by distance to both lot lines. This information shall be placed on the Engineering Plans and marked "As-Built" by the Design Engineer. Copies of these "As-Built" plans shall be furnished to the City as required. Ties shall be made by distance measurements from both lot lines or from building corners for all manholes, cleanouts and services.
5. All sanitary sewer lines shall be tested for infiltration and exfiltration by the Low Pressure Air Test Method in accordance with the standard specifications and as shown on the plans.
6. All P.V.C. sewer pipe shall be installed with a "Tracer Tape" over the top of the pipe. All P.V.C. sewer pipe shall be green in color.
7. All P.V.C. sewer lines shall be tested using TV video inspecton and mandrel testing to insure the conduit system conforms to the Standard Specifications.
8. All sewer manholes shall be tested for infiltration by an approved process.

**GENERAL NOTES FOR UTILITY CROSSINGS**

1. Tunneling and boring under city streets shall be accomplished by means of jacking, boring or tunneling equipment.
2. The voids outside of the carrier pipe or casing pipe shall be backfilled by hydraulically placed material so that there are no open voids over the roof of the tunnel or bore. This shall be done without damage to the roadway surface.
3. All bore pits, trenches and inspection holes shall be backfilled within 48 hours after the installation of utility lines. The method of compaction shall be such that a soil density equal to that existing prior to the start of construction will be required. Any excess or surplus material resulting due to displacement of utility lines and conduits shall be disposed of in an acceptable manner to the City.
4. The sections that are shown as typical sections shall apply to any streets, alleys, driveways, roadways etc., that will be within the City right-of-way or easement.
5. The Contractor shall be required to install all necessary warning and safety devices that will protect the safety and health of the public until the work has been finished and accepted by the City.
6. The use of a casing pipe will be based upon the specific project location and soil conditions. The construction plans will show casing pipe to be used on the specific utility crossing.

CITY OF SACHSE, TEXAS  
DEPARTMENT OF ENGINEERING

STANDARD CONSTRUCTION DETAILS

GENERAL NOTES

APPROVED:

DATE: NOVEMBER 2008

REVISED:

Page 3

**ARTICLE IV  
DESIGN FOR STREETS, ALLEYS AND SIDEWALKS**

1. Concrete - all streets and alleys and sidewalks, except streets which conform to specific conditions shall be paved with concrete per the following requirements:
  - a. Streets, alleys and sidewalks shall be constructed in accordance with the standard construction details.
  - b. Concrete streets shall be constructed over a lime stabilized sub grade with a minimum thickness of 8 inches. The plasticity index must be reduced below fourteen (14) and the sub grade shall extend twelve (12") inches behind the curb.
  - c. All streets and alleys shall be constructed of a minimum of 3,500 p.s.i. strength concrete with the specified reinforcement.
  - d. All sidewalks and driveways shall be constructed with 3,000 p.s.i. strength concrete with the specified reinforcement.
  - e. The minimum grade on streets or alleys shall be 0.7% unless approved by the City Engineer.
2. Asphalt Streets - Streets may be paved with asphalt and constructed in accordance with a special design detail as specified and allowed by the City Ordinance.

**GENERAL NOTES FOR PAVING IMPROVEMENTS**

- All work and materials shall be in accordance with the City Standard Specifications and General Design Standards.
1. The Street and alley right-of-way width shall be excavated full width in accordance with the street and sidewalk section to be constructed.
  2. The sub grade for all street and alley paving shall be stabilized with Hydrated Lime material. The amount of lime material shall be that amount which will reduce the plasticity index (P.I.) below fourteen (14). If no laboratory control is used the contractor shall furnish and place an amount of lime equal to six percent (6%) by unit dry weight of soil estimated at 95 pounds per cubic foot, or 44 pounds of lime per square yard of surface area treated to an eight (8") inch thickness, with laboratory control.
  3. All concrete paving for streets and alley construction shall have a minimum of five (5) sacks per cubic yard and develop a compressive strength of 3,500 pounds per square inch in 28 days. The design must be submitted by a certified lab.
  4. All roadway embankments shall be compacted to a density of 95 percent AASHO Standard Proctor at Optimum Moisture Content unless otherwise shown approved by the City.
  5. All stabilized lime treated sub grade shall be compacted to a density of 95 percent AASHO Standard Proctor at Optimum Moisture Content.
  6. All new concrete should be placed and struck off using a mechanical device such as a power screed or slip form paver. Hand finishing shall be permitted only for small repairs (1 or 2 panel replacements), in intersections and in areas inaccessible to a finishing machine as determined by The City of Sachse Public Works & Engineering Department.
  7. Testing of materials required for the construction of the specified street and alley improvements shall be performed by an approved agency for testing materials. The City Engineer shall approve the laboratory nominated to do the testing of materials. It shall be the Contractors responsibility to show by standard testing procedures that the work constructed does meet the requirements of the specifications.

8. The Contractor shall furnish a maintenance bond for 10% of the cost of public improvements to the City to run for two (2) years from the date of acceptance by the City.
9. All dumpster sites or solid waste container units shall have a paved lane up to the site that shall consist of a minimum of seven (7") inches of 3,500 p.s.i. strength reinforced concrete on a six (6") inch lime stabilized sub grade.

**ARTICLE V  
DESIGN FOR DRAINAGE FACILITIES**

Drainage Facilities shall be designed in accordance with the City Comprehensive Drainage and Storm water control ordinance.

**GENERAL NOTES FOR DRAINAGE IMPROVEMENTS**

All work and materials shall be in accordance with the City Standard Specifications and General Design Standards.

1. Storm Sewer Pipe Embedment
  - a. A compacted crushed stone or pea gravel cushion, four (4") inches thick shall be required under the bottom of the pipe unless otherwise shown on the construction plans.
  - b. The initial backfill of select material or fine granular material be required to a minimum of six (6") inches over the top of the pipe unless otherwise shown on the construction plans.
  - c. All ditches not under existing or proposed paving sections shall be water jetted. Where ditches cross existing or proposed street or alley sections, the ditch section shall be tamped and compacted to 95% Standard Proctor Density or backfilled with free flowing sand.
2. Concrete Pipe Joints
 

The joints shall be constructed and joined together in such a manner that no spill through of backfill will occur. This includes the lift holes used in certain size pipe. The use of the following types of joint materials are acceptable.

  - a. Cold applied, plastic asphalt joint compound
  - b. Rubber gaskets
  - c. Cold applied, preformed plastic gasket
3. Storm Drainage Inlets
  - a. The type of drainage inlet shall be as indicated on the construction plans. For secondary and major street sections, a recessed type inlet shall be required. For industrial and residential streets, a curb line inlet will be acceptable unless otherwise shown on the construction plans.
  - b. The variable height curb, throat section and leave out of the drainage inlet shall be included in the cost of the drainage inlet.
  - c. A round manhole cover with locking device shall be placed on all inlet tops. The top shall be placed near the outlet pipe.
  - d. The inlet throat shall be constructed with a rounded section with a maximum depth of opening of seven and one-half (7 1/2") inches unless otherwise shown on the construction plans.

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DATE: NOVEMBER 2008	REVISED:	Page 4