



# **CITY OF HIGHLAND VILLAGE, TEXAS**

**TCSS MANUAL - UTILITIES, STREETS &  
DRAINAGE / TECHNICAL CONSTRUCTION  
STANDARDS & SPECIFICATIONS**

## **SECTION 1. DEFINITIONS.**

### **Section 1.01 Definitions.**

The following terms when used herein shall have the following meanings:

- (a) "ASTM" shall mean the American Society of Testing Material.
- (b) "AWWA" shall mean the American Water Works Association.
- (c) "Commission" shall mean the City's Planning and Zoning Commission.
- (d) "City Engineer" shall mean the duly appointed engineer for the City.
- (e) "City" shall mean the responsible entity duly authorized to act on behalf of the City of Highland Village.
- (f) "N.C.T.C.O.G. Specifications" shall mean the North Central Texas Council of Governments "Standard Specifications for Public Works Construction".
- (g) "Tx-DOT" shall mean Texas Department of Transportation.
- (h) "Major Thoroughfare" is defined by the City's Thoroughfare Plan.
- (i) "Residential Roadways" is defined by the City's Thoroughfare Plan.
- (j) "Residential and Commercial Collectors" are defined by the City's Thoroughfare Plan.
- (k) "State Standards" shall mean the design standards of the Tx-DOT - Design Division, and specifications as established by the most recent of the Tx-DOT - Standard Specifications for Construction of Highways, Streets and Bridges.
- (l) "Subdivider" shall mean any person or any agent thereof, dividing or proposing to divide land so as to constitute a Subdivision as that term is defined herein. In any event, the term "Subdivider" shall be restricted to include only the owner, equitable owner, or authorized agent of such owner or equitable owner, such as developer, or land sought to be subdivided.
- (m) "TCEQ" shall mean the Texas Commission on Environmental Quality.

## **SECTION 2. GENERAL REQUIREMENTS.**

### **Section 2.01 Conformance with Standards.**

No improvement referred to in this Manual shall be constructed within any Development of the City unless such improvement is in conformance with the City's standards set forth herein or as outlined in the North Central Texas Council of Governments (NCTCOG) "Standard Specifications for Public Work Construction", the Paving Design Manual of the City of Dallas Department of

Public Works and the Tx-DOT Standard Specifications for Construction of Highway, street and bridges. In the event of a conflict, the Standards and Specifications of the City of Highland Village shall govern.

**Section 2.02 Plans and Specifications.**

- (a) Prior to commencing construction of any improvements, the Subdivider shall submit three (3) sets of Plans and Specifications for such improvements to the City Staff for approval. Lot Grading Plans and Construction Schedules shall be submitted with the Plans and Specifications. Such Plans and Specifications shall be prepared and sealed by a licensed Professional Engineer registered in the State of Texas.
- (b) When required by the City, revised Plans and Specifications shall be resubmitted until approval is granted.
- (c) Prior to final acceptance & issuing of building permit(s) by the City, a 1-year 100% maintenance bond or a 2-year 10% maintenance bond shall be submitted of the public improvements dedicated to the City to serve the development and the developer shall submit to the City one (1) set of blue-line prints with original P.E. seal and one (1) digital copy, (on a disc in the latest pdf format), of the civil plans including the paving, drainage, water, wastewater, plat and other improvements showing all changes made in the plans during construction and containing on each sheet an "AS-BUILT" or "Record Drawing" stamp bearing the signature of the Engineer and date.
- (d) "As-Built" plans shall include the following water and wastewater information:
  - 1) All sewer tap locations.
  - 2) All water tap locations.
  - 3) All valve locations.
  - 4) All manhole locations and/or clean out locations.
  - 5) All fire hydrant locations.
  - 6) All water line locations.
  - 7) All wastewater line locations.

**Section 2.03 Testing.**

- (a) Testing of materials as called for within these specifications shall be performed by a qualified testing laboratory as approved by the City.
- (b) The cost of all testing shall be borne by the Subdivider/Developer.

- (c) The Subdivider/Developer shall submit a proposed schedule of testing for review and approval, along with the Plans and Specifications outlined in Section 2.02.
- (d) No improvements requiring testing shall be covered, constructed upon, or utilized in any manner until City approval of testing has been granted.

**Section 2.04 Construction Contracts.**

No subdivider shall award any construction contract or make payments to any contractor for improvements until the Plans and Specifications required by Section 2.02 and all other required submissions are approved by the City.

**Section 2.05 Damage to Improvements.**

Should any person damage or cause to be damaged any improvement, they shall submit and have approved by the City Engineer, the method and materials to repair such damage at their sole cost.

**Section 2.06 Minimum Improvements.**

Every Subdivision shall be constructed with the following minimum improvements:

- (a) All streets within Commercial and Industrial areas, all Arterial and Primary Collector streets and all other streets within six hundred feet (600') of any school, shall be constructed with sidewalks.
- (b) Each intersection shall have at least one street sign.
- (c) All roadways shall be lighted in accordance with the requirements of Section 11.
- (d) A water system, storm sewer system, wastewater system and all other utilities necessary to service the needs of the City and Subdivision shall be provided. All utilities shall be provided to the property line of each lot or to a point within each lot in a manner to allow the connection of such service without disturbing any improvement.
- (e) All parties participating in the construction shall meet with the City for a pre-construction conference to discuss the project prior to beginning work.
- (f) A complete list of Contractors, their representatives on the site, and telephone numbers where a responsible party may be reached at all times, must be submitted to the City.
- (g) Current American Disabilities Act (ADA) requirements shall be followed.

**SECTION 3. STREETS.**

**Section 3.01 General.**

- (a) All roadways shall be constructed with 4,000psi concrete pavement and curbs in

accordance with the Standards and Specifications of the City of Highland Village, N.C.T.C.O.G., the Standard Construction Details for the City of Dallas or Tx-DOT specifications. In the event of a conflict, the Standards and Specifications of the City of Highland Village shall govern. If additional details are required for the construction of a project, Tx-DOT Standards may be used provided approval is obtained from the City Engineer.

- (b) All pavement widths shall conform with the City of Highland Village Thoroughfare Plan except that local streets shall be no less than thirty feet (30') in width, measured from the face of curb and constructed of four-thousand (4,000) psi reinforced concrete. Depth of concrete paving shall be recommended by a licensed professional engineer, supported by a geotechnical report & approved by the City.
- (c) The subgrade of all roadways shall be inspected by the City Inspector after grading and prior to the commencement of subgrade stabilization. All spongy or soft material shall be removed by the Contractor and all depressions shall be filled with approved material having a Plasticity Index (PI) of less than 12. All embankments shall be compacted to a uniform density of not less than ninety-five percent (95%) of the maximum density determined by ASTM D698.
- (d) Any work related to the preparation of the subgrade, including lime stabilization and foundation courses, shall be performed to a point one foot (1') beyond the curb line, at a minimum.
- (e) Complete engineering design details, including such items as joint spacing, reinforcement area and spacing and other information deemed appropriate by the Design Engineer & approved by the City shall be shown on the Construction Plans.
- (f) Transverse contraction joints shall be spaced twelve feet (12') apart for six-inch (6") thick concrete pavement and sixteen feet (16') apart for eight-inch (8") thick concrete pavement.
- (g) The Subdivider shall provide the City with soil borings taken by a qualified testing laboratory to determine whether groundwater is present in the Subdivision. The soil borings shall be spaced no further apart than one thousand feet (1,000'), measured along the centerline of the Subdivision streets, or at the low points in the streets, whichever is more frequent. Where an underground water problem is identified, the City Engineer may require the design & installation of an under drain system behind the curb.

### **Section 3.02 Subgrade Stabilization.**

- (a) The subgrade of all streets shall be either lime stabilized or cement stabilized to a depth of six inches (6"). A minimum of seven percent (7%) hydrated lime unless the city approves a lesser percentage following receipt of independent laboratory tests supplied by the subdivider shall be used. Soils having a plasticity index (PI) of less than twelve (12) shall require cement stabilization and approval by the City

Engineer upon review of the laboratory tests.

- (b) Subgrade shall be compacted to a uniform density of not less than of ninety-five percent (95%) of the maximum density determined by ASTM D698.

### **Section 3.03 Street Sign Standards**

- (a) Nine inches (9") wide, .080 Gauge Anodized Aluminum Flat Blade.
- (b) Color 6" x 1/2 " reflective white block letters on Highland Village Blue background.
- (c) Block No. 2 1/4" x 3/8" white only as required by the City.
- (d) All street signs shall have Lettering on front and back.
- (e) Letters and background shall be of diamond prismatic (high intensity prismatic) reflective sheeting as approved by the City.

## **SECTION 4. STORMWATER COLLECTION SYSTEMS.**

### **Section 4.01 System Design Requirements.**

No storm water collection system shall be constructed within the City unless it is designed by a Professional Engineer registered in the State of Texas, and approved by the City Engineer. All developed areas shall have concrete curb and gutter drainage unless the development has a minimum lot size of twenty thousand square feet (20,000 SF). These lower density developments can utilize roadside ditch drainage systems. All plans submitted to the City Engineer for approval shall include a layout of the storm water collection system, together with supporting calculations for the design of the system. In addition to any other requirements established by the City, the Plan shall conform to the City of Highland Village Public Works Department's "Drainage Criteria Manual" as well as the following requirements:

- (a) All storm water collection systems shall be designed in accordance with the Drainage Criteria Manual and Standards and Specifications of the City of Highland Village, however the Standard Construction Details of the City of Dallas may be utilized under special circumstances and approved by the City Engineer. In the event of a conflict, the Standards and Specifications of the City of Highland Village shall govern.
- (b) All plans shall take into account all storm water runoff emanating or discharging from areas that surround the Subdivision or contribute runoff to it. Furthermore, each Plan shall accommodate both the existing off-site land usage as well as any potential land usage contemplated by the City in its Master Plan.
- (c) All drainage systems must be designed to detain or capture the one hundred year (100-year) storm intensity and release as to not cause erosion or flooding

downstream.

- (d) The allowable spread of water collected in curb and guttered streets shall be in accordance with the Highland Village Drainage Criteria Manual.
- (e) No cross street flow of runoff perpendicular to the direction of traffic shall be permitted unless approved by the City Engineer.
- (f) For erosion and sedimentation control, the developer shall follow the City's current ordinances and BMP's. The Construction Plans and Specifications shall include temporary and permanent erosion control measures.
- (g) All storm sewers and culverts shall be located in a drainage easement or common space unless the storm sewer or culvert conveys runoff from a single lot. Maintenance of those storm sewers and culverts that are located on private property shall be the responsibility of the property owners. Maintenance of those storm sewers and culverts that are located within a common space shall be the responsibility of the homeowners association.
- (h) The Subdivider shall provide a drainage easement or common space for any natural creeks located within the Subdivision unless the City elects to accept dedication of the creek property for park use. In the event that the natural creek is not dedicated for park use, it shall be the property owners' responsibility to maintain the creek.
- (i) If the Subdivider alters the natural condition of a creek, or if a new channel is created within the Subdivision, the creek or channel shall be located in a drainage easement or common space. If the velocity in the improved creek or channel is less than six feet per second (6 fps), a grass cover shall be established on the side slopes. If the velocity in the creek or channel exceeds 6 fps, either a reinforced concrete pilot channel or concrete-lined channel shall be required to prevent erosion. If the Subdivider elects to install a reinforced concrete pilot channel, a grass cover shall be established on the unlined channel side slopes. The maximum side slopes for unlined channels are set forth in the Drainage Criteria Manual. The drainage easements required for lined channels and reinforced concrete pilot channels shall be of sufficient width to allow City maintenance of the channel. The maintenance of unlined creeks or channels shall be the responsibility of the property owners.
- (j) Runoff conveyed in roadway ditches shall be confined to the ditch. The flow in the ditch shall not exceed six feet per second (6 fps) and the side slope shall not exceed 3:1. The edge of the ditch nearest the road shall be at least three feet (3') from the road edge.
- (k) A Stormwater Pollution Prevention Plan (SWP3) shall be submitted to the City for record. The City shall receive a copy of the Notice of Intent (NOI) submitted to the TCEQ. All Best Management Practices (BMP) shall be adhered to pre-construction and post construction.

## **SECTION 5. WATER SYSTEM.**

### **Section 5.01 Minimum Size.**

The water system in the Subdivision shall be designed to furnish adequate and sufficient water for both domestic use and fire protection to each lot within the Subdivision. Water mains shall be sized to meet the City's requirements as may be determined by Subdivider or the City Engineer. Water main sizes determined by the Subdivider are subject to the approval of the City Engineer.

### **Section 5.02 Service to Property Line.**

- (a) Water lines shall be a minimum of 1" and extend to the property line of each lot or to a point within each lot so that service connections can be made without disturbing any other Improvement.
- (b) A box for a water meter shall be provided for each lot.
- (c) All water services shall be copper with compression type fittings. No sweat joints or flare joints shall be accepted.
- (d) All water taps shall be marked with one hash mark on the curb and painted blue to indicate location of water service to each lot.
- (e) All water services shall have a 3M Brand locator device for services placed six (6) inches above corporation at the main and not to exceed 36 inches in depth from final grade. Device will be directly over water main where corporation penetrates main line.

### **Section 5.03 Ductile-Iron Pressure Pipe.**

- (a) All such pipe shall have a diameter of six inches (6") or greater and shall conform to AWWA Designation C150. Such resistivity tests shall be conducted by the Subdivider at the Subdivider's expense.
- (b) All such pipe shall be designed to withstand a minimum working pressure of two hundred pounds per square inch (200 psi). Pipe having diameters of six inches (6") to twelve inches (12"), inclusive, shall conform to AWWA Designation 50. Any pipe having diameters greater than twelve (12") or having cover depths greater than ten feet (10') must be approved by the City Engineer.
- (c) Joints shall conform to AWWA Designations C110 and C111. Fittings shall conform to AWWA Designation C110 for pipe sizes twenty inches (20") and larger and C153 for pipe sizes eighteen inches (18") and smaller and be secured with locking joint restrainers (megalug). Double strap brass saddles or tapped couplings shall be used for water service connections.

### **Section 5.04 Polyvinyl Chloride Pipe.**

- (a) Polyvinyl Chloride Pipe (PVC) water pipe shall be approved for potable water usage



by the National Sanitation Foundation Testing Laboratory. Such pipe shall meet or exceed the requirements of AWWA Designation C900.

- (b) PVC water pipe shall conform to AWWA Designation C900 for pipe with a minimum diameter ratio of eighteen (18).
- (c) PVC water pipe shall be installed with a rubber rising at each joint and an integral thickened bell as part of each joint. Pipe joints and fittings for PVC water pipe shall conform to AWWA Designation C110 for pipe sizes twenty inches (20") and larger and C153 for pipe sizes eighteen inches (18") and smaller and be secured with locking joint restrainers (megalug). Saddles or tapped couplings shall be used for water service connections.

### **Section 5.05 Concrete Cylinder Pressure Pipe.**

This section includes material, fabrication, and delivery of concrete cylinder pipe and specials of the various sizes and classes required in the Project Plans and Specifications. All concrete cylinder pipe shall be manufactured in accordance with the requirements of American Water Works Standard C303-78, entitled "Reinforced Concrete Water Pipe - Steel Cylinder Type, Pre-Stressed," with additional requirements and/or modifications as described herein.

### **Section 5.06 Pipe Bends.**

Each pipe bend must have an area sufficient to accept appropriate blocking. Each bend must be sufficiently reinforced to counter all thrust when used with this blocking. Blocking charts should be included in each set of plans.

### **Section 5.07 Water Main Testing.**

The following tests are hereby authorized:

- (a) Sterilization of mains according to Texas Commission on Environmental Quality (TCEQ) standards.
- (b) Pressure tests meeting the following requirements: Two hundred (200) psi for two (2) hours with leakage not exceeding 11.65 gal/inch/dia. per mile of pipe over a twenty-four-hour (24-hour) period.
- (c) All testing costs shall be borne by the Developer and test results shall be submitted to the City.
- (d) Bacteriological samples will be submitted by the developer to an approved lab for analysis. The original results with the subdivision name clearly marked on the form, shall be submitted to the manager of the utilities division. All analysis costs shall be borne by the Developer.

### **Section 5.08 Installation Requirements.**

- (a) Pipe and fittings shall be installed pursuant to manufacturer's specifications and as shown on approved engineering plans. Pipe shall have a six-inch (6") sand bedding with six-inches (6") of sand on each side and twelve-inches (12") of sand over the top of pipe. See Highland Village details.
- (b) All brass fittings shall be compression type.
- (c) Water pipe shall be installed outside of the pavement section within the right-of-way (R.O.W.) or within drainage and utility easements along the roadway.
- (d) THE CITY SHALL OPERATE ALL VALVES FOR LOADING, TESTING, OR BLOWING OFF OF NEW LINES.
- (e) Bacteriological sampling stations may be required to be installed at the discretion of the Utilities Division.
- (f) All water mains shall be installed with a 14 Ga. tracer wire that is compatible with and will allow detection by Radiodetection Corporation's digital PXL - 2 pipe locator. The tracer wire shall be installed just above the proposed water mains and throughout the length of the water mains.
- (g) All pipefittings shall be installed with a megalug type pipe restraint.
- (h) If approved, all tapping sleeves shall be stainless steel full-seal type.

### **Section 5.09 Meter Box.**

All water meter boxes shall meet the following requirements:

- (a) plastic lid or approved equal. Must accept the City's AMA radio device.
- (b) 18 inches (18") in diameter and 18 inches (18") tall.
- (c) Locking lid.
- (d) Double slotted.
- (e) Placed two-inches (2") above sub-grade.
- (f) See City's Standard Details.

### **Section 5.10 Dead End Lines.**

No dead end lines shall be accepted, except in rare cases where the Utilities Division and the Director of Public Works both agree there is no other option. If a dead end water line is approved and installed, the following shall apply:

- (a) A flushing device shall be installed at the end of the line.

- (b) A Hydro-guard HG-1 integrated flush unit (or equal as approved by the Utilities Division) shall be installed to allow for automatic flushing of the water main.
- (c) A variance is submitted and approved by the City Council.

## **SECTION 6. GATE VALVES FOR ORDINARY WATERWORKS SERVICE.**

### **Section 6.01 General.**

Gate valves having diameters from six inches (6") to twelve inches (12") shall be designed to withstand a working pressure of two hundred (200) psi and a test pressure of four hundred (400) psi. Such valves shall conform to the AWWA Designation C509 and epoxy coated per AWWA C550. Gates valves shall operate as to turn right to close and left to open.

### **Section 6.02 Description.**

All gate valves shall be iron body, stainless steel mounted, non-rising stem, internal wedging type. Mechanical joint ends and punch-on joint ends shall conform to AWWA Designation C111. Flanged ends shall conform to AWWA Designation C110 for Class 250.

### **Section 6.03 Installation.**

Gate valves shall be installed pursuant to manufacturing specifications and as shown on approved Construction Plans or Highland Village details.

### **Section 6.04 Valve Boxes.**

All valve boxes shall be of the adjustable type. The following requirements shall apply:

- (a) The valve box shall be centered over the valve.
- (b) The valve box shall be free of dirt or debris.
- (c) The valve box shall have a concrete pad poured around it at finished grade. This pad shall be 2' x 2' square.
- (d) All valve boxes shall have a rain guard under lid.

### **Section 6.05 Additional Requirements.**

Three (3) complete sets of manufacturing detailed drawings and service manuals shall be furnished to the City for each type valve installed. All gate valves shall be installed within an adjustable cast iron valve box. Valves on all mains shall be located such that

the distance between valves is a maximum of five hundred (500) feet or as approved by the City. Valves shall be furnished with extensions, such that the working nut is a maximum of twenty-four inches (24") below grade.

## **SECTION 7. FIRE HYDRANTS.**

### **Section 7.01 General.**

Hydrants shall conform to AWWA Designation C502 for dry barrel hydrants. Additionally, all hydrants shall meet the following requirements:

- (a) All Fire hydrants shall be Mueller, Clow, American, AVK, Kennedy, Waterous or M&H brand. (Or similar equal as approved by the Utilities Division)
- (b) Shut-off valves shall be either upward closing or downward closing, and be of the horizontal-seat, compression-valve type.
- (c) Inlet connections shall be at least six inches (6") in diameter and shall be of the standard mechanical joint hub type. Inlet connections shall be installed with a gate valve.
- (d) Hydrants shall have two (2) hose nozzles, two and one-half inches (2 1/2") in diameter and one (1) pumper nozzle, four and one-half inches (4 1/2") in diameter. Such nozzles shall conform to National Standard Fire Hose Coupling Screw Standards.
- (e) All fire hydrants shall have a clear space of at least fourteen inches (14") between the top of the pumper nozzle and the bottom of the hydrant nut.
- (f) Hydrants shall be of the breakable, safety type and repairable by replacing the stem coupling and bolting the head back onto the standpipe. Such repair shall not require excavation or any work on the design of the stem to disconnect the stem from the hydrant parts above the standpipe breakpoint, in event of a traffic accident.
- (g) Hydrants shall be constructed so that the nozzles may be faced in any desired direction.
- (h) All fire hydrants shall be installed with a flanged end mechanical joint gate valve which shall be affixed to the "tee" of the water main with a mechanical joint and a "flanged" or "rotating gland" ring.
- (i) All fire hydrants shall be installed with a solid cap w/gasket on each pumper nozzle as specified by City.
- (j) Minimum fire hydrants spacing shall meet the State Insurance Board Criteria as well as the following minimum standards:
  - (1) No structure may be located more than two hundred and fifty feet (250') of street distance from any given hydrant in a residential district.

- (2) No structure may be located more than one hundred fifty feet (150') of street distance from any given hydrant in commercial, institutional or multi-family districts.

### **Section 7.02 Painting.**

Hydrants shall be dedicated to the City primer coated as received from the manufacture. Reflective (blue) fire hydrant spotters shall be installed on all streets at a point opposite fire hydrants; located along centerline of street, closest to the fire hydrant. When fire hydrants are located at intersection corners, blue spotters shall be placed on both streets.

### **Section 7.03 Color Codes.**

All Fire hydrants shall be color coded using the following City of Highland Village Fire Department's color codes:

- (a) Hydrant body shall be silver.
- (b) 6" main, red bonnet
- (c) 8" main, blue bonnet
- (d) 10" main and larger, green bonnet

#### Flow in Gallons Per Minute (GPM)

0-500 gpm, red 2 ½" caps

500-1000 gpm, orange 2 ½" caps

1000-2000 gpm, green 2 ½" caps

Over 2000 gpm, blue 2 ½" caps

### **Section 7.04 Installation Requirements.**

All fire hydrants shall be installed in accordance with the following requirements:

- (a) Hydrants shall be installed upon a concrete slab not less than four inches (4") thick and not less than one square foot (1'sq.) of surface area.
- (b) At least seven cubic feet (7') of crushed rock or clean gravel shall be provided for drainage around each hydrant.
- (c) All weep holes shall have gravel placed around and under them.
- (d) Hydrants shall be carefully and substantially blocked with concrete against firm trench walls.
- (e) Hydrants and valve boxes shall be level with finished grade within six feet (6') of street curb.

- (f) A gate valve shall be installed for all fire hydrants. A locating device shall be placed next to all valves in the system. Locating device shall be such that a 3M locating device will detect.
- (g) Fire hydrants may be required to be installed with a grade lock device as approved by the City's Utility Division.
- (h) Flow Testing shall be performed prior to City acceptance of hydrants.
- (i) See Highland Village details.

### **Section 7.05 Sample Sites.**

All new subdivisions shall be required to furnish the City a test site. This is to allow the City to take daily water samples. The test site shall be as follows:

- (a) Water Plus Corporation Model #15005834 with backflow. (Or similar equal as approved by the Utilities Division.)

## **SECTION 8. WASTEWATER SYSTEM.**

### **Section 8.01 Minimum Size.**

The wastewater system in the Subdivision shall be designed to adequately conduct the domestic and commercial wastewater flows generated within the subdivision as well as future upstream development. The wastewater mains shall be sized to meet the City requirements as determined by the Subdivider or the City Engineer. Wastewater main sizes determined by the Subdivider are subject to approval by the City Engineer.

### **Section 8.02 Service to the Property Line.**

Sewer lines shall extend to the property line of each lot to allow connection of service without disturbing any other Improvement. A wye connection cleanout with riser shall be provided at the property line for each lot. Sewer service for each lot shall have a minimum depth of ground cover at the property line of four feet (4') and a maximum of six feet (6'). There shall be a separate sewer service provided from the property to the sewer main for each lot. Exceptions to this shall be granted by permission of the Manager of Utilities or the Director of Public Works.

### **Section 8.03 General.**

- (a) PVC sewer pipe used in gravity drainage sewer systems shall conform to ASTM Specification D3034 for pipe having a standard diameter ratio of thirty-five (35).
- (b) PVC joints shall be rubber compression type seal. Assembly of joints shall be in accordance with the manufacturer's recommendations.

- (c) Sewer flows shall be between two cfs (2 cfs) and ten cfs (10 cfs).
- (d) All manholes shall be equipped with a manhole rain pan and chimney seal. These devices must be a product, which has been approved by the City.
- (e) Manhole spacing shall not exceed five hundred feet (500'). Cleanouts shall not be spaced greater than (200') two hundred feet apart.
- (f) All manholes shall be flush with finished grade.
- (g) All cleanouts shall have a two foot by two foot (2' x 2') concrete pad poured around them.
- (h) See City Standard Details for Sanitary Sewer covers.
- (i) See City Standard Details for cleanout castings.

**Section 8.04 Installation.**

- (a) Sewer pipe and fittings shall be installed pursuant to manufacturer's specifications and as shown on approved engineering plans. Pipe shall be bedded with six inches (6") of crushed stone below to six inches (6") over the top of the pipe.
- (b) Sewer pipe shall be installed outside of the pavement section within the ROW or within drainage and utility easements along the roadway.
- (c) All sewer pipe shall have locator tape installed one (1) foot above the pipe.
- (d) See Highland Village details.

**Section 8.05 Sewer Main Testing.**

The following tests are hereby authorized:

- (a) Mandrel Test - manhole to manhole.
- (b) Pressure Test - three psi (3 psi) for thirty (30) minutes, no leakage.
- (c) TV Camera Inspection - shall be required for final acceptance and one (1) month before the expiration of the Maintenance Bond with the documentation furnished to the City.
- (d) All testing costs shall be borne by the Developer and tests results submitted to the City.

**Section 8.06 Sewer Taps.**

All sewer taps being installed in any new subdivision shall be as follows:

- (a) The pipe shall be PVC SDR 35.
- (b) The tap shall be brought to property line.
- (c) The tap shall be raised to a maximum depth of four (4) feet deep of finished grade.
- (d) A locating device shall be placed over end of tap. The locating device must be a type that a 3M sewer tap locator will trace.
- (e) Each tap shall be capped.
- (f) All sewer taps shall be marked with 2 hash marks on the curb and painted green to indicate location of sewer tap.
- (g) See Highland Village details.

## **SECTION 9. UNDERGROUND PIPE EMBEDMENT AND BACKFILL.**

### **Section 9.01 Embedment.**

All underground pipe shall be laid, embedded and back filled in accordance with the minimum standards as described above.

- (a) For trenches under roadways, six percent (6%) cement stabilization shall be used when required by the City Engineer.
- (b) All materials used to backfill utilities shall be approved by the City and shall be compacted to at least ninety-five percent (95%) maximum density under roadways and at least ninety percent (90%) maximum density elsewhere.

## **SECTION 10. SIDEWALKS.**

### **Section 10.01 General.**

All sidewalks shall be a minimum of four feet (4') wide, four inches (4") thick and constructed of three thousand (3,000) psi reinforced concrete. Sidewalks shall meet current American Disabilities Act (ADA) mandates and designed by a licensed professional engineer registered in the state of Texas and approved by the City Engineer.

## **SECTION 11. STREET LIGHTS.**

### **Section 11.01. Street Lights.**

All roadways shall be lighted to provide for "Safety Lighting" in accordance with State Standards. Lighting plans and design shall be prepared by a licensed Professional



Engineer registered in the state of Texas and approved by the City Engineer.

**SECTION 12. PARK LAND DEDICATED TO THE CITY.**

**Section 12.01 Maintenance.**

All park land dedicated to the City must be cleaned up by the property owner to the satisfaction of the City prior to dedication. The clean up shall include, but not be limited to, mowing of grass and weeds, removal of all debris, trimming of dead branches from trees, and the installation of erosion control measures in accordance with Section 4.01.

## APPENDIX

### **City of Highland Village items located on the City's web page:**

- City of Highland Village standard details
- Benchmark Monument Data
- Drainage Criteria Manual
- Excavation permit
- Utility Registration permit
- Culvert / Approach permit
- Lane Closure / Detour application