



**POLICY**

**FOR THE INSTALLATION**

**OF**

**PUBLIC & PRIVATE IMPROVEMENTS**

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## **A GUIDE TO LAND DEVELOPMENT**

The following outline is prescribed as a guide for developing land in the City of Granbury.

1. Make contact with the Director of Community Development of the City of Granbury (116 West Bridge Street, Granbury, Texas, 76048, phone number 817-573-1114) for guidance as to what steps are needed before land can be developed and used.
2. Make a formal request for annexation if area is not totally within the City.
3. File "conceptual site plan" with Community Development Department. Plan should show landscaping, streets, lot sizes, thoroughfares, abutting frontage streets, type of development, drainage, etc.
4. If property is not zoned properly, a zoning change request shall be filed previous to platting.
5. File "preliminary plat" with Community Development Department. File application to vacate streets, alleys, easements, and plat abandonment.
6. After approval of preliminary plat, make request by letter to the Director of Community Development for a Facility Improvement Agreement. Please include with the letter cost estimates and exhibits. (Public Improvements include streets, street lights, street name signs, storm drains, and certain water, sewer and park facilities.)
7. Execute the Facility Improvement Agreement and provide required security guarantees and fees. The Facility Improvement Agreement is then presented to the City Council for approval.
8. Submit "final plat" with Community Development Department. Upon approval of the Final plat, and after completion and acceptance of the subdivision, the City will file the plat at the courthouse to be part of the plat records
9. Construct public improvements as agreed to in the Facility Improvement Agreement and provide utilities as needed.
10. Depending on location of improvements after completion, request final acceptance letter along with plat recording information.
11. Development is now ready for building permits.

**NOTE:** The above outline is an abbreviated list of items to be used as a guide, and not meant to be a complete list of requirements and may not be applicable in all scenarios.

## **REQUIREMENTS FOR A FACILITY IMPROVEMENT AGREEMENT REQUEST**

### **TO BE SUBMITTED TO THE DIRECTOR OF COMMUNITY DEVELOPMENT**

1. Name of Developer/Mailing Address/(local) Phone Number/ also, whether Developer is a Company, Partnership, Joint Venture, Individual or etc.
2. Exact Name of Person(s) authorized to sign Facility Improvement Agreement, Title of Signatory in Development Company (President, Partner, Individual, etc.).
3. Applicable Filing Fee made payable to City of Granbury.
4. If Developer is a Joint Venture, we need the names of the joint venture's or a Joint Resolution or Power of Attorney giving the Signatory power to do so.
5. Submissions as per "Policy for the Installation of Public Improvements" below.

<b>COST ESTIMATE</b>	<b>ESTIMATE FOR DEVELOPER'S SHARE OF COSTS</b>	<b>ESTIMATE FOR CITY'S SHARE OF COSTS</b>	<b>ESTIMATE FOR TOTAL COSTS OF PROJECT</b>	<b>MYLAR EXHIBIT SHOWING CONFIGURATION OF DEVELOPMENT</b>
WATERLINES (If required)	<b>REQUIRED</b>	<b>REQUIRED</b>	<b>REQUIRED</b>	<b>EXHIBIT "A"</b>
SANITARY SEWER (If required)	<b>REQUIRED</b>	<b>REQUIRED</b>	<b>REQUIRED</b>	<b>EXHIBIT "B"</b>
STREETS (If required)	<b>REQUIRED</b>	<b>REQUIRED</b>	<b>REQUIRED</b>	<b>EXHIBIT "C"</b>
STORM DRAINAGE (If required)	<b>REQUIRED</b>	<b>REQUIRED</b>	<b>REQUIRED</b>	<b>EXHIBIT "D"</b>
STREET LIGHTS & STREET NAME SIGNS (If required)	<b>REQUIRED</b>	<b>REQUIRED</b>	<b>REQUIRED</b>	<b>EXHIBIT "E"</b>
ELECTRIC (If required)	<b>REQUIRED</b>	<b>REQUIRED</b>	<b>REQUIRED</b>	<b>EXHIBIT "F"</b>
TOTAL PROJECT	<b>REQUIRED</b>	<b>REQUIRED</b>	<b>REQUIRED</b>	<b>LOCATION MAP REQUIRED - Show Development's Relationship to City of Granbury</b>

*Exhibits should always be placed in alphabetical order, no matter what facilities are required: If only streets are required, then only Exhibit "C" would be in the submittal.*

# **PROCEDURES FOR OBTAINING A CONTRACT FOR THE INSTALLATION OF PUBLIC & PRIVATE IMPROVEMENTS**

**[also defined as: Public or Private, Facilities, per Section 1.17 Definitions, City of Granbury Subdivision Ordinance, as amended]**

## **I. Contract for the Installation of Public & Private Improvements Required:**

A contract for the installation of public & private improvements is required when public & private facilities are needed and whenever any new construction is planned. The life of a standard Facility Improvement Agreement shall be two (2) years, and it is understood that any obligations on the part of the City to make any refunds shall cease upon the expiration of the two (2) years from the date of execution of the Agreement. The surety shall remain in full force and effect until the cost of infrastructure has been disbursed for the construction of the project and acceptance granted by the City, or until two (2) years from the date of FIA approval, whichever comes first. At any time after one (1) year from the execution of the FIA, default by the Developer, or upon direction from the City Council after a hearing, the City, at its discretion, may draw upon the surety and complete the infrastructure improvements. If the construction under the Facility Improvement Agreement shall have started within the two-year period, the life of the Facility Improvement Agreement may be extended for an additional one-year period. Facility Improvement Agreement not completed within the time periods stated above will require renewal of the contract with all up-dated agreements being in compliance with the policies in effect at that time. Developers must recognize that City funds may not be available to pay all or a portion of the normal City share for renewed contracts. It must be understood by all parties to the Facility Improvement Agreement that any of the facilities or requirements included in the contract that are to be performed by the developer but not performed by the developer within the time periods stated above, may be completed by the City at the developer's expense, and the City of Granbury shall not be obligated to make any refunds due to the developer on any facilities constructed under this agreement until all provisions of the agreement are fulfilled.

## **II. Information Regarding Proposed Contracts:**

Information concerning proposed contracts for installation of public improvements can be obtained from the City of Granbury, Public Works Department, 401 N. Park St., Granbury, Texas 76048, (817) 573-7030

## **III. Requests for Preparation of Contracts:**

A request for the preparation of a proposed contract, requiring water and wastewater facilities, street improvements, storm drains, park facilities or street lights should be made by letter to the Community Development Director, together with a reproducible copy of exhibits clearly

designating the proposed area to be developed along with cost estimates of all public improvements needed. The letter should contain any specific or unusual requests-of the developer and the name and title of the person authorized to sign the Facility Improvement Agreement. Requests which do not include the required data, number of exhibits and/or cost information will be considered incomplete and not accepted for processing by the City until all required data is provided to the city staff.

#### **IV. Time Required for the Preparation of Contracts:**

As a general rule, contracts will be processed and contract documents returned to the developer for signature in a three or four-week period, unless additional time is needed to perform preliminary engineering.

#### **V. Approval of Contracts:**

After the contract has been signed by the developer and returned to the Community Development Director, together with necessary security guarantees, it will be routed to the Public Works Director, City Engineer and finally the Community Development Director for consideration and signature. Once processed by City staff, it will then be submitted to the City Manager for review. If the provisions of the contract conform with, or exceed minimum requirements of City Council policies for the installation of public improvements, the City Manager will submit the contract to the City Council for approval. If any special provisions or deviations from established policies are included in the contract, specific notice of those provisions are required. Approximately three weeks are normally required before the contract can be scheduled on the agenda of the City Council meeting, which is usually held the first and third Tuesday of each month.

#### **VI. Security Requirements:**

In order to be satisfied that all public improvements required will be constructed and to ensure that the City shall not incur liabilities in the event of default, the City requires that the developer provide security guarantees in the following amounts and under the following conditions:

1. If the total project cost is estimated to be under \$25,000 the City will generally not require a security deposit from the developer. Notwithstanding anything to the contrary herein, the City reserves the right to require a security deposit in this circumstance.
2. If the total project cost is estimated to be equal to or greater than \$25,000 the developer shall furnish a security deposit in one of the following ways:

- A. Furnish the City with a performance and payment bond executed by a surety company authorized to do business in the State of Texas in an amount equal to one hundred twenty percent (120%) of the estimated developer's share of the cost of installing the required public improvements. The bonds shall be subject to the approval of the City Attorney and must be executed by a corporate surety in conformance with Texas law; or
- B. Furnish an Irrevocable Letter of Credit, in correct form approved by the City Attorney, in an amount equal to one hundred percent (100%) of the construction costs. If an Irrevocable Letter of Credit is utilized, any alterations to the standard approved language must be pre-approved by the City Attorney; or
- C. Deposit either cash or check into a non-interest-bearing account with the City in an amount equal to one hundred percent (100%) of the construction costs. If funds are deposited with the City, such funds may, at the discretion of the City, be drawn upon to pay construction costs upon approval of both the developer and the City or as itemized in this policy.

As significant portions of the public improvements are completed in accordance with the applicable construction standards, the developer may make application to the Director of Public Works to reduce the amount of the security guarantee. If the City is satisfied that such portion of the improvements has been completed in accordance with City standards it may cause the amount of the security guarantee to be reduced, by such amount that it deems appropriate, so that the remaining amount adequately insures the completion of the remaining public improvements.

Where City participation is necessary or desired by the developer, the developer shall guarantee one hundred percent (100%) of the estimated City's share of the cost of the required public improvements by one of the methods discussed above.

In any one of the three security options itemized above in Section VI. 2. A - C, the City may, to ensure adequacy of fund balance to ensure completion of the facilities or improvements, may require the maintenance of a reasonable balance during the term of the project until completion and acceptance.

- D. A professional engineer hired by the developer and licensed to practice in the State of Texas shall furnish estimates of the cost of construction of all required improvements to the Director of Community Development, who shall review the estimates in order to determine the adequacy of the security guarantees for insuring the construction of the required facilities.

- E. The City shall inspect the installation of all required improvements to insure compliance with City requirements and the approved final construction plans. When all required improvements have been satisfactorily completed, the City shall either accept, in writing, the improvements as having been satisfactorily completed, or shall issue a punch list to the developer denoting items remaining to be completed. The City shall not accept dedications of required improvements, nor release a performance bond or other assurance, until such time as it is determined that:
  - A. All improvements have been satisfactorily completed; and
  - B. One (1) compact disc recording has been provided of each system improvement: water, wastewater, storm drainage system. Recording must be in mpeg 1 format or MP4 with H264 compression. (Must be approved prior to final acceptance)
  - C. The standard Letter of Inspection & Acceptance had been submitted by the Developer's Design Engineer (*see example in Facilities Improvement Agreement*), and;
  - D. The approved "as-built" set of Mylar's, signed and sealed by the Engineer of record that have been submitted too and accepted by the City; and
  - E. The required maintenance bonds have been provided; and
  - F. Any and all other requirements identified in this ordinance or other city codes and ordinances have been satisfied.

## **VII. Engineering**

The developer shall retain a professional civil engineer, licensed to practice in the State of Texas, for all design in new subdivisions or developments, including streets, storm drains, water, sanitary sewers and street lights.

The City will provide construction engineering, except for the setting of line and grade stakes for streets, storm drains, street lights, water and sanitary sewer on all projects regardless of size. The setting of line and grade stakes for streets, storm drains, street lights, water and sanitary sewer shall be the responsibility of the developer, except that the City reserves the right to pre-qualify persons and/or firms that are hired to provide this surveying and to check the accuracy of the surveying and the conformance of the stakes to the approved plans.

### **VIII. Award of Construction Contract**

Where City financial participation is involved in the installation of public improvements, the City, in its discretion, may advertise and receive bids on the project. The City shall make recommendations to the developer concerning the award of the construction contract. If there is no City participation in the cost, the developer has the option of advertising and awarding his own contract to the low bidder or awarding the contract on a negotiated basis. Regardless of the method utilized above, the developer shall employ a construction contractor who is approved by the City.

### **IX. Standard Policies Available**

Complete sets of the policy for the installation of public improvements as adopted by the City Council are available to all interested persons from the Director of Public Works, located at 401 North Park Street, (817) 573-7030.

## **DEFINITIONS**

For the purpose of these policies, the following terms, phrases, words and their derivations shall have the meaning given herein. When not inconsistent with the context, words used in the present tense include the future, words in the plural number include the singular number and words in the singular number include the plural number. Definitions not expressly prescribed herein are to be determined in accordance with customary usage in municipal planning and engineering practices. The word "shall" is always mandatory, while the word "may" is merely directory.

**A. Alley** - A minor public right-of-way not intended to provide the primary means of access to abutting lots, which is used primarily for vehicular service access to the back or sides of properties otherwise abutting on a street.

**B. Approach Mains:**

**a. Water**

The offsite main required to connect a development to a source of ample supply. It shall be not less than 8 inches in diameter and of a size large enough to serve both the development for which service is requested and future adjoining areas, as determined by the Public Works Department.

**b. Wastewater**

The sanitary sewer required by the Public Works Department to serve the entire sewer-shed area in which it is to be constructed, both inside and outside of a developer's property, shall conform to the City Master Plan and under ultimate development conditions, to connect sanitary sewer facilities in the development to the City wastewater system.

**C. Bond** - Any form of a surety bond in an amount and form satisfactory to the City.

**D. City** - The City of Granbury, Texas, together with all its governing and operating bodies.

**E. City Council** - The duly elected governing body of the City of Granbury, Texas.

**F. City Manager** - The person holding the position of city manager as appointed by the City Council according to the City Charter.

**G. Construction Engineering** - Consists of the following:

- a. Review and approval of plans and specifications and contract documents.
- b. Advertising and receipt of bids and award of contracts (if required).
- c. The setting of line and grade stakes from the approved plans.
- d. Necessary laboratory tests to assure compliance with plans and specifications except those specified in the project specification documents.
- e. Field inspection to assure compliance with plans and specifications.
- f. Review and approval of change orders submitted by developer's design engineer.
- g. Preparation of monthly estimates and final payments to the construction contractor if the contract is awarded by the City.
- g. Final inspection for acceptance of project by the City.

**F. Extraterritorial Jurisdiction (ETJ)** – The perimeter surrounding the boundaries of all incorporated cities, towns, and villages; the population level of the city determines the width of its ETJ.

**G. Design Engineering** - consisting of all necessary studies, tests, preliminary plans, etc., necessary for the preparation of final construction plans, specifications and contract documents meeting the approval of the City.

**H. Drainage Plan** - A general plan for handling the storm water affecting property proposed for development. The Drainage Plan shall show how and where water will be received from adjacent higher areas; how and where it will be collected and handled within the property; and how and where it will be discharged to a recognized drainage-way in a lower area. The plan shall deal with individual watershed areas as necessary; show the proposed phasing of development and attendant phasing of drainage improvements; describe any unusual water features anticipated;

provide topographic, physical and geographical information; and form the basis for subsequent review of design plans submitted for property to be final platted.

**I. Flood Plain** - Any land area susceptible to being inundated by water from a one hundred (100) year frequency storm. This condition could result from the overflow of inland waters or the unusual and rapid accumulation of runoff of surface waters.

**J. Homeowner's Association** - If required, the HOA shall be organized as a non-profit corporation with automatic membership in the HOA when property is purchased. This shall be specified in the covenants which run with the development, and which bind all subsequent owners. Covenants for maintenance assessments shall also run with the development. Assessments shall also be handled in covenant form rather than as articles of incorporation since the latter may be easily amended. Included in the maintenance covenants shall be procedures for changing them at stated intervals since maintenance costs may change over time. Deeds shall also mention the rights and responsibilities of property owners to the HOA. The HOA shall also be responsible for liability insurance, local taxes, and the maintenance of all commonly held facilities through the use of a pro rata share formula for all property owners.

**K. Improved Drainage Channel** - A drainage channel constructed to design standards, with constant cross sections, used to convey the 100-year design frequency storm, plus one foot of free board, within its banks.

**a. Unlined Channel** - This channel has a trapezoidal shape with side slopes no steeper than 3 feet horizontal to 1-foot vertical (4 to 1 preferred). The side slopes are smooth, free of rocks and are covered with approved turf. The bottom section has either a natural solid rock surface or a reinforced concrete pilot channel. If an unlined channel is constructed, an approved maintenance entity will be required to maintain the unlined channel. A maintenance agreement between the approved maintenance entity and the City is required describing the maintenance entity's responsibility for maintenance of the unlined channel.<sup>[CH1]</sup>

**b. Lined Channel** - This channel has a trapezoidal shape with side slopes no steeper than 1-foot horizontal to 1-foot vertical. The entire surface is covered with reinforced concrete.

**M. Off-site Facilities or Improvements** - Off-site facilities shall mean those facilities or improvements required for service to the site but not located within the boundaries of the plat. These include both public & private: streets, water lines, sewer lines, storm drainage, electric curb and gutter, and any other construction or reconstruction to serve the property

**N. Natural Channel** - An earthen drainage channel in its natural state, generally with irregular cross sections. This channel has its original meanders and does not have consistent side slopes. Such

channels may be modified by cutting or filling in accordance with plans approved by the City. Natural channels may be approved with or without channel improvements provided that:

- a. The design frequency storm flow cannot be contained in a seventy-two (72") inch internal diameter pipe,
- c. the smallest cross section can convey the 100-year design frequency storm, plus one foot of free board, within its banks,
- d. sufficient flood plain and floodway easements are dedicated to provide protection to adjacent properties or facilities, and
- e. agreements have been executed for perpetual maintenance by an approved maintenance entity.

**O. On-site facilities or improvements** - On site shall mean those existing or proposed facilities or improvements constructed within the property boundaries of the plat. On-site shall also mean those existing or proposed facilities required to be constructed or improved immediately adjacent to the property which are required to serve the development. These include streets, water lines, sewer lines, storm drainage, electric, curb and gutter and any other construction or reconstruction to serve the property.

**P. On-Site Mains:**

**a. Water**

An on-site water main is one that provides service within a development or subdivision.

**b. Wastewater**

An on-site sanitary sewer main is one designed to serve the entire sewer-shed area in which it is to be constructed both inside and upstream from all or part of a developer's property, under ultimate development conditions, but which is located entirely within the limits of the development.

**Q. Perimeter street** - Any existing or planned street which abuts the subdivision or addition to be platted.

**R. Public or Private, Facilities (also may be referred to as "Public or Private, Improvements")** - A water, wastewater, roadway, drainage, electric or park facility that is a part of one or more of the City's public facilities systems or private facilities system tied to the infrastructure network or system and which are required to be designed to the specifications and standards outlined in the Public Improvement Policy (PIP). These are distinguished from private service systems which solely serve a structure or private property and which are typically constructed under the issuance of a building or trade (plumbing, electrical, etc.) permit.

**S. Facility Improvement Agreement** - A contract between the developer and the City for the construction of one or more of the following public or private facilities within public or private right-of-way or a duly dedicated public or private easement for: water, sanitary sewer, street, storm drain, electric infrastructure, street light, and street name signs.

**T. Utility** - Water, sanitary sewer, electric, gas, telephone, cable TV or any other such item of service either for public or private use.

## **POLICY FOR WATER AND/OR WASTEWATER IMPROVEMENTS**

The following policy shall govern the installation of all water and/or wastewater improvements within the corporate limits of the City of Granbury, Texas, and its extraterritorial jurisdictional area.

### **I. DESIGN REQUIREMENTS**

1. All water and/or wastewater improvements shall be designated and constructed in accordance with applicable Federal and State regulations, the City of Granbury Subdivision Ordinance, these Public Improvements policies, the adopted Standard Specifications and Standard Details and other design criteria of the Public Works Department.
2. The developer shall retain a professional civil engineer, licensed to practice in the State of Texas, for the preparation of construction plans, specifications and contract documents for all public improvements required by the proposed development. No public improvements shall be installed until and unless said plans have been received and approved by the City.
3. The determination as to compliance of the plans and specifications with applicable policies, regulations and criteria shall be the sole responsibility of the City. Approval of the plans and specifications by the City signifies the City's acceptance of the general design concept and that the minimum criteria appear to be satisfied. Such approval shall not be deemed to be an assumption of responsibility or liability by the City of any negligent act, or omission in the performance of the developer's engineer or in his preparation of such plans and specifications.
4. Design and construction plans shall be submitted according to the requirements set forth herein and any adopted City standards and/or specifications. Plans for all improvements shall be submitted on sheets no larger than twenty-four inches by thirty-six inches (24"x 36") and at a scale of one inch equals 40 or 50 feet (1" = 40' or 50') horizontally and one inch equals four or five feet (1" = 4' or 5') vertically.

5. The following minimum number of plans and specifications shall be submitted to the City during the review phase, construction phase and upon completion of the project. Additional sets may be required for other departments and/or agencies.
  - A) Four (4) sets of the design plans and two (2) preliminary specifications each time a submittal is made to the City for review purposes.
  - B) Five (5) sets of the approved final construction plans and approved specifications prior to award of contract: one (1) set (24" x 36") and four (4) sets (11" x 17").
6. If the design plans and specifications are incomplete, a letter stating the necessary changes required or requested on the plans and/or specifications or one (1) set of plans and specifications marked with the necessary changes and/or comments, shall be returned to the developer's engineer for his use in making needed corrections. The letter or the marked plans and specifications must be returned to the City with the revised plans and specifications.
7. To determine the water and/or wastewater improvements required to provide service to the proposed development and the surrounding properties, the developer shall provide a comprehensive water and/or wastewater facilities study to evaluate the adequacy of the planned water and/or wastewater improvements for present and future needs. The study shall include a hydraulic study for water distribution systems and/or a drainage study for the wastewater collection system. The City will approve the sizes of on-site and/or approach facilities based on these studies, the current City design criteria, the City Fire Code and other applicable criteria.
8. The developer shall be responsible for providing all water and/or wastewater facilities required to provide necessary service to the development, subdivision or lot/tract. An approach (off site) main and its appurtenances, if required, must be capable of providing water and/or wastewater service to the development, from a point in the existing water and/or wastewater system that has adequate capacity as determined by the comprehensive study required by item 7 above.

## **9. WATER IMPROVEMENTS**

- A) Minimum water main pipe size shall be eight inches (8") nominal internal diameter or such larger size as may be necessary to properly serve the proposed development. All underground water pipe shall be PVC Class 150, AWWA C-900 or ductile iron, AWWA C151. Fittings shall be American manufactured cast or ductile iron.
- B) Water mains shall be located behind the curb and/or opposite sides of the street, alley, right-of-way's, or utility easements whenever possible, and shall have a minimum cover of forty-two (42") inches.

1. Water main piping shall be laid with the writing on the pipe facing up.
2. Water mains shall be marked under the ground surface two feet above the pipe by placing a 2" wide metalized plastic tape with the word "WATER" printed on the tape.
3. Water mains to be installed with a (#12 AWG EHS-CSS extra high-strength copper clad steel conductor, (EHS-CCS), insulated with a 45 mil, high-density, high molecular weight polyethylene (HDPE) insulation) tracer wire affixed to the top of the pipe and the wire extended up and to test stations at gate valve boxes and meter boxes. Make sure wires are accessible at gate valve boxes and meter boxes. (Tracer wire shall be Copperhead HS-CCS HDPE 30 mil or preapproved equal and made in the USA)
4. Test stations and connectors shall be Copperhead SnakePit or preapproved equal and made in the USA, Part number LD14B Lite Duty Box.
5. All tapping sleeves will be full circle stainless steel.

6. Water Main Embedment

Depth below pipe	-	6" minimum
Height above pipe	-	12" minimum
Width	-	O.D. + 18"
Material	-	Cushion sand or other approved material that is different in appearance from native soil
Density	-	95% standard proctor density under pavement 90% standard proctor density outside pavement

C) Water service lines shall be a minimum (one) 1" inch Type "K" copper, double strap bronze tapping saddles with compression brass fittings and shall be provided with a corporation at the main and a curb stop located at least two (2') feet outside of curb. Residential long side services shall be one (1") inch "K" copper (dual). All bullhead service shall be one (1") inch "K" copper.

D) Water services for each lot shall be stubbed out with an angle stop to the location required, as shown on the City of Granbury standard detail. A meter box (DFW-24181BA) or vault conforming to Public Works Department requirements shall be installed over the end of each service.

E) In general, fire hydrants shall be placed on block corners or near the center of the block in such a manner as to put all of every lot within four hundred and fifty (450') linear feet of a fire hydrant in residential areas and within four hundred and fifty linear feet (450') in commercial or industrial areas. Fire hydrants shall not be installed in the bulb of a cul-de-sac, and shall be installed no closer than the radius of the cul-de-sac intersection. At all locations flanged valve to "tee" connection or approved restraint coupling is required. Valve to tee connection shall be flanged or with approved restraint coupling.

F) All fire hydrants shall have one - five and one quarter inch (5 1/4") pumper nozzle and two (2) - two and one-half inch (2 1/2") hose nozzles with the City's standard threads, a main barrel valve opening of not less than five and one-quarter inches (5 1/4"). Six-inch gate valves shall be placed on all fire hydrant leads.

1. Quick disconnect Storz caps for each hydrant shall be provided.
2. The bonnets shall be painted to correspond with the flow determined color code.
3. Fire hydrants shall be Mueller brand or approved equal.

G) All fire protection service lines require back flow protection valves contained in a vault at the connection to City main. Resilient wedge valves shall be placed on main side of the vault, outside the vault. If a combination of fire and domestic water meter is required, then a vault would be required.

H) All valves two (2") inches and larger shall be resilient wedge type and shall be square head operating nut. Location and frequency of valves to be approved by the City. Valve boxes located in non-paved areas shall have a 2'x 2'x 6" reinforced concrete pad around the top.

1. Tees should have (3) three set valves and crosses (4) four set valves where applicable.
2. All valves shall open counter-clockwise and fitted with Foam Mud Plugs to prevent dirt and infiltration.

I) Other appurtenances such as air relief valves, blow off valves and flushing valves shall be placed as required by the City.

## 10. WASTEWATER IMPROVEMENTS

A) Minimum wastewater main pipe size shall be eight inches (8") nominal internal diameter or such larger size as may be necessary to properly serve the developments. All underground wastewater pipe shall be PVC SDR 26 or ductile iron, AWWAC151.

1. Sanitary Sewer Embedment

Depth below Pipe	-	6" min.
Height above Pipe	-	12" min.
Width	-	O.D. + 18"
Material	-	Course Crushed Rock or Natural Gravel covered with landscaping fabric
Density	-	95% Standard Proctor Density under Pavement
	-	90% Standard Proctor Density outside Pavement

2. Sewer mains shall be marked under the ground surface two (2') feet above pipe by placing 2" metalized tape with the word 'SEWER' printed on the tape at regular intervals.

3. Sewer mains to be installed with a (#12 AWG EHS-CSS extra high-strength copper clad steel conductor, (EHS-CCS), insulated with a 45 mil, high-density, high molecular weight polyethylene (HDPE) insulation) tracer wire affixed to the top of the pipe and the wire shall be extended up each service to the property line cleanout and up the outside of all manholes and stubbed out through the nonshrink group under the ring. (Tracer wire shall be Copperhead HS-CCS HDPE 30 mil or preapproved equal and made in the USA, connectors shall be Copperhead Snakebite Locking Connectors or pre-approved equal)

B) Wastewater service lines shall be a minimum four (4") inch internal diameter, schedule 40 PVC. Minimum grades for service lines is two (2%) percent. Curbs shall be stamped with a green "S" showing the location of sewer taps.

C) Wastewater service lines for each lot shall be carried to the property line at the center of the lot. Two-way clean outs shall be installed at the property line on services shallower than six (6') feet deep. A sweeping ell shall be installed at the base of the stack, at the property line, on services deeper than six (6') feet deep. Upon construction completion, the clean out assembly shall be fitted with a gasket tight threaded cap and terminated approximately six (6") inches below finished grade, and housed within a City approved vault or box. Precise location of the clean out needs to be indicated on the completed As-built and CAD file submitted to the City of Granbury upon final completion.

D) Where possible, wastewater mains shall be located in street or alley rights-of-way or utility easements, and shall be a minimum of thirty-six (36") inches deep to invert. Stacks shall be constructed for sewer connections where the services are more than 8' deep.

E) Grades and appurtenances of wastewater lines shall conform to the requirements of the Texas Commission on Environmental Quality (TCEQ).

F) The maximum distance between manholes shall be five hundred (500') feet and shall be concrete cast in place only. Manholes shall be located at changes in pipe size, direction or grade. Manholes shall include an inflow protector lid liner and epoxy coating. All manholes shall have a 32" man-way/entryway and be fitted with an approved corrosion proof composite ring and lid.

G) Where necessary, location and design of lift stations and other appurtenances shall be as approved by the Director of Public Works.

H) Utility easements shall be provided by the developer along the entire length of the system for all water and/or wastewater facilities outside of a public right-of-way. The width of all easements shall be approved by the City.

## **II. CONSTRUCTION REQUIREMENTS**

1. Standard Specifications for Public Works Construction, North Central Texas Council of Governments are hereby adopted by reference and made part of this policy, which shall be controlling in construction and installation of all water and/or wastewater improvements required herein. A copy of these standard specifications and/or design standards can be obtained from the North Central Texas Council of Governments. Specifications and/or design standards utilized locally by the City of Granbury may be obtained from the Public Works Department.
2. Construction of water, wastewater and storm water improvements shall be by a contractor employed by the City of Granbury, by Water/Wastewater employees of the City of Granbury or by a contractor employed by the developer as described in Section IV below.
3. Water and/or wastewater facilities and appurtenances shall be constructed at the locations and to the line and grade established in the approved final construction plans. It is the responsibility of the developer and his contractors to perform all construction in accordance with the approved construction plans and specifications. Any change in design required during construction shall be made by the Engineer whose seal and signature are shown on the plans. All changes shall be approved by the Director of Public Works.
4. All construction shall be performed in accordance with applicable local, State and Federal safety standards and requirements.
5. Residential service connections shall be installed at the same time as the water and/or wastewater mains are constructed.

6. Water lines shall be tested hydrostatically at 150 PSI for a minimum of four (4) hours or at 200 PSI for a minimum of (2) hours, both with no loss in pressure and disinfected per City and the Texas Commission on Environmental Quality (TCEQ) specifications prior to placement in use.
7. Air relief valves, blow off valves and flushing valves determined to be required by the City during construction, shall be constructed at designated locations in accordance with approved specifications.
8. The City will provide construction engineering and inspection, except for the setting of line and grade stakes for water and/or wastewater improvements on all projects regardless of size. The setting of line and grade stakes for water and/or wastewater improvements shall be the responsibility of the developer, except that the City reserves the right to pre-qualify persons and/or firms that are hired to provide this surveying and to check the accuracy of the surveying and the conformance of the stakes to the approved plans.

### **III. DISTRIBUTION OF COST**

1. The developer shall be responsible for one hundred percent (100%) of the cost of installing all standard water and/or wastewater improvements required by the City. Standard water main pipe size shall be eight inches (8") diameter or such larger size as may be necessary to properly serve the proposed development. Standard wastewater main pipe size shall be eight inches (8") diameter, or such larger size as may be necessary to properly serve the proposed development.
2. In the event that the City's Master Water/Wastewater Plan, Capital Improvements Plan or the City approved developer's comprehensive water or wastewater facilities study indicate that larger sized water and/or waste water improvements are needed, than those required to provide exclusive service to the proposed development, for ultimate growth considerations, the developer shall be responsible for one hundred percent (100%) of the cost of all improvements designed to provide exclusive service to the proposed development. Should the City elect to install larger facilities than indicated to be necessary for the exclusive service to the development, the additional incremental cost shall be borne by the City based on the unit prices contained in the lowest responsible bid received from a qualified bidder.
3. The developer shall be responsible for one hundred percent (100%) of the cost of installation of all water and/or wastewater services to each proposed or existing lot or tract within the development.

4. Any replacement or relocation of an existing water and/or wastewater facility required by the developer to accommodate a contemplated or projected use of a property shall be the responsibility of the developer. In the event that the City requests that a larger line be substituted for the existing line, the City shall be responsible for the additional incremental cost. If the increase in size is necessary to properly serve the proposed development or to provide capacity at least equivalent to that of the existing line the developer shall be responsible for the total cost. The plans for any such replacement or relocation shall be approved in writing by the Director of Public Works prior to initiation of construction.
5. No permanent structures shall be constructed over an existing water main or an existing wastewater main or lateral. In the event that the developer desires to construct a permanent structure over an existing water and/or wastewater facility, the developer shall be responsible for the total cost of relocating the existing facility.
6. In those situations, where the construction of water main transmission facilities or wastewater collector main facilities are not economically feasible, the developer may petition the Director of Public Works to construct water supply facilities and/or package wastewater treatment facilities or water/wastewater pumping facilities, and, subject to the approval of the City Manager and the City Council, construct same.
  - A) When the special facilities are designed to provide service exclusively to the development, the developer shall be responsible for one hundred percent (100%) of the cost of such facilities. In the event that the City requires larger facilities be constructed to provide service to other areas, the developer shall be responsible for the portion which represents the cost of constructing facilities to provide proportionate service to the proposed development and the City shall be responsible for the remainder of the cost. In the event City funds are not available, the developer shall install those special facilities as are required to provide service to the proposed development.
  - B) The special facilities-statement of this policy shall not be construed as requiring the City to provide water and/or wastewater service to areas where normal service, as defined in this policy, is not" immediately or economically available. Rather, it is intended to permit an equitable method of providing such water and/or wastewater service where the best interests of the City will be served by the use of such facilities.
7. The developer shall pay a construction inspection and materials testing deposit. The deposit will be estimated at \$150 per day for each working day of the project from Notice to Proceed to Final Punchlist Completed as determined by Exhibit K. The construction inspection and materials testing deposit shall be submitted to the Director of Public Works as a cash deposit

with the signed Facilities Improvement Agreement (FIA). The construction inspector will invoice against this deposit each month based on actual site visits requested by the contractor. If the deposit is not sufficient to cover the requested inspections through Final Punchlist Completed, an additional deposit will be required based on the estimated number of days remaining until Final Punchlist Completed at a rate of \$150.00 a day. A final accounting will be done prior to final acceptance of the project and the final invoice shall be reconciled prior to obtaining City acceptance of the project.

8. The City shall assume a share of the cost of the water and/or wastewater improvements only if funds are available for such participation. In the event that no funds are available for City participation, the developer shall award the contract and deposit with the City cash or a bond in the amount of the total construction cost of the facility.

#### **IV. GENERAL ARRANGEMENTS AND FINANCING**

1. Subsequent to the approval of the-preliminary subdivision plat preliminary design plans and an adequate cost estimate, the developer shall request a Facility Improvement Agreement to provide for the installation of water and/or wastewater improvements. Such request and accompanying information shall be in writing and addressed to the Director of Community Development. No construction shall begin until a Facility Improvement Agreement has been executed by the developer and the City.
2. The Public Works Department shall review and may approve or modify the improvement plans deemed necessary, submitted by the developer's engineer. The Director of Public Works will submit the approved or modified plans to the Director of Community Development.
3. Simultaneous with the execution of the proposed Facility Improvement Agreement by the developer, the developer shall furnish necessary security guarantees as specified under Item VI, Procedures for Obtaining a Contract for the Installation of Public improvements.
4. Where City financial participation is utilized and desired by the developer, the City may advertise and receive bids on the project. The City, in its sole discretion, may use any authorized method or procedure to comply with Texas laws related to awarding of contracts for the project, including, but not limited to, the procedures permitted by Texas Local Government Code, Chapter 252, as amended, or Texas Government Code, Chapter 2269, as amended. The developer shall not award the contract for the project until such time as he/she has received written approval from the Director of Public Works to do so. Under this procedure the developer is required to:

- A) Require the contractor to furnish to the City satisfactory carriage of insurance in accordance with Item 1.26, Insurance, Standard Specifications for Public Works Construction, North Central Texas. Certificates of each policy shall be delivered to the City along with a written statement from the issuing company stating that said policy shall not be canceled, non-renewed or materially changed without advance notice being given to the City.
- B) Require the contractor(s) to furnish to the City performance, payment and maintenance bonds executed by a surety company authorized to do business in the State of Texas and subject to the approval of the City Attorney in an amount equal to one hundred percent (100%) of the contract price of the improvements. The performance and payment bonds shall be submitted prior to the City issuing the Notice to Proceed. The two (2) year maintenance bond(s) shall be submitted and approved prior to acceptance of the project.
- C) Following the installation of property pins and the setting of line and grade by a private surveyor hired by the developer, the contractor shall provide survey cut sheets and give 48 hours' notice to the Building Department so that inspection personnel will be available. No work shall begin until the assigned inspector gives his consent to proceed.
- D) Any change order to the contract must be approved in writing by the City.
- E) Except for partial payments as provided below, the City's participation, if any, will not become due and payable to the developer until all work has been completed by the contractor and accepted by the City as complete, as evidenced by a letter stating such acceptance, and until the developer has submitted evidence satisfactory to the City that final payment to the contractor has been made, and that all subcontractors and persons furnishing labor and materials have been paid in full and all claims settled. The City's participation shall be based upon actual quantities constructed as measured and calculated by the developer's engineer and approved by the Building and Inspections and the Public Works Department.
- F) For projects involving City participation and where the participation amount is fully secured by either performance and payment bonds or an equivalent escrow deposit, the developer may request partial payments of the City's participation, based on completed work. All estimates for partial payments shall be approved by the Director of Public Works prior to payment to the developer. The approval of any partial payment shall in no way constitute acceptance of the work, nor in anyway affect the obligations of the

developer under this policy or the Facility Improvement Agreement. Such partial payments may be approved on a monthly basis, and such payment checks will be issued by the City upon receipt of an affidavit executed by the contractor certifying that he had received payment for the accomplished work in accordance with contract documents.

5. Where no City financial participation is utilized or where City financial participation is utilized but not desired by the developer, the developer has the option of advertising and awarding his own construction contract to the responsive low bidder or awarding the contract on a negotiated basis. Under this procedure the developer is required to comply with items a) through d) listed in paragraph 4 above, plus the following:

- A) The developer shall employ a construction contractor who is approved by the City. This contractor must meet the City's requirements for being registered and bonded to perform work in a public right-of-way.

- B) Prior to commencing work, the developer shall furnish copies of the contract between the developer and the contractor as required by the City. Upon approval by City officials, the developer will be notified in as to when he may commence work.

6. When all work required under the Facility Improvement Agreement has been completed by the contractor and the following items have been accomplished, the City will accept the project as being complete, as evidenced by a letter to the developer stating such acceptance.

- A) A final inspection of all improvements has been accomplished and the resulting 'Punch List' corrected, and

- B) The contractor has provided the City a Maintenance Bond indicating that he will be responsible for defects in the project due to faulty materials and/or workmanship for a period of two (2) years from date of final acceptance, and

- C) The developer has submitted evidence satisfactory to the City that final payment to the contractor has been made, and that all subcontractors and persons furnishing labor and materials have been paid in and all claims settled, and

- D) One (1) set of 11" x 17" (half size) set of "as-built" Mylar's signed and sealed by the Engineer of record have been submitted too and accepted by the City, and

- E) The standard Letter of Inspection & Acceptance submitted by the Developer's Design Engineer along with a compact disk containing both CAD and .pdf files

7. Utility easements shall be provided to the City by the developer free of cost. Where a public or community necessity for such easement(s) has been determined by the City Council, and the requesting developer provided written evidence, including affidavits as appropriate, that he/she is unable to negotiate the purchase of the necessary easement(s) at a fair price, the City may expeditiously undertake to acquire same using its powers, provided the requesting developer agrees to pay the actual cost of the easement and any and all other costs connected with such attempted acquisition.
  
8. The Director of Public Works may require a developer to begin and complete construction of any water/wastewater facility included in the Facility Improvement Agreement when, in the judgement of the Director of Public Works, the facility is needed for the proper and orderly development of the area. When the Director of Public Works determines that a water and/or wastewater facility should be constructed, he shall notify the developer in writing to make arrangements for construction of the facility. Within 15 calendar days after receiving the notice, the developer shall begin constructing the facilities, including making the necessary payment to the City in accordance with this policy. Construction shall be completed within 90 days from the date on which the developer received notice from the City to proceed with construction. If construction has not been completed within the 90-day period, the City may take whatever action is required to insure prompt completion of the facilities, including but not limited to, awarding a construction contract for the facilities and requiring forfeiture of the security guarantee to pay all costs resulting from failure of the developer to complete the facilities. Such costs shall include, but not be limited to, construction costs, engineering costs, administrative and legal expenses, damages, etc.

**V. OWNER AND MAINTENANCE**

1. All water and wastewater mains installed in connection with a development project, which are located within a dedicated public right-of-way or public utility easement, shall be and shall remain the property of the City, and after expiration of the maintenance bonds, shall be maintained by the City.
  
2. All domestic/irrigation water services, from the water main to the meter (to include the meter and meter box or vault), installed in connection with a development project on private property shall be and shall remain the property of the developer or single customer property owner. After the expiration of the maintenance bonds, these water services shall be maintained by the developer or single customer property owner. The City assumes no responsibility for the maintenance and/or operation of such services or lines.
  
3. All fire protection service lines, from the water main to the gate valve on the main side of the check valve, installed in connection with a development project, shall be and shall remain the

property of the City. After expiration of the maintenance bonds, these lines shall be maintained by the City.

4. All domestic fire protection service lines, from the water main to the structure on the structure side of the main valve, installed in connection with a development project, shall be and shall remain the property of the developer or single customer property owner. After the expiration of the maintenance bonds, these service lines shall be maintained by the developer or single customer property owner. The City assumes no responsibility for the maintenance and/or operation of such services or lines.
5. All wastewater services installed in connection with a development project shall be and shall remain the property of the developer or single customer property owner. The City assumes no responsibility for the maintenance and/or operation of such service, even though the service is within a public right-of-way.

## **VI. EFFECTIVE DATE**

This policy shall apply on all projects on which a Facility Improvement Agreement (including all necessary engineering, technical materials, cost estimates and exhibits) has not been fully executed by the Public Works Department by the date of policy adoption by the City Council and on any Facility Improvement Agreement that has not been fully executed and bonded by the developer and the City within ninety (90) days after the date of adoption of this policy by the City Council.

## **POLICY FOR STORM DRAINAGE FACILITIES**

The following policy shall govern the installation of all drainage facilities within the corporate limits of the City of Granbury, Texas, and its extraterritorial jurisdictional area.

### **I. DESIGN REQUIREMENTS**

1. All storm drainage improvements shall be designed and constructed in accordance with the City of Granbury Subdivision Ordinance, these Public Improvements policies, the Standard Specifications for Public Works Construction, North Central Texas Council of Governments and other design criteria of the Public Works Department
2. The developer shall retain a professional civil engineer, licensed to practice in the State of Texas, for the preparation of construction plans, specifications and contract documents for all public improvements required by the proposed development. No public improvements shall be installed until and unless said plans have been received and approved by the City.

3. The determination as to compliance of the plans and specifications with applicable policies, regulations and criteria shall be the sole responsibility of the City. Where there is a question as to the justification or size of facilities required, doubt will be resolved in favor of additional drainage capacity. Approval of the plans and specifications by the City signifies the City's acceptance of the general design concept and that the minimum criteria appear to be satisfied. Such approval shall not be deemed to be an assumption of responsibility or liability by the City of any negligent act, or omission in the performance of the developer's engineer or in his preparation of such plans and specifications.
4. Design and construction plans shall be submitted according to the requirements set forth herein and any adopted City standards and/or specifications. Plans for all public improvements shall be submitted on sheets no larger than twenty-four inches by thirty-six inches (24"x 36") and at a scale of one inch equals 40 or 50 feet (1" = 40' or 50') horizontally and one inch equals four or five feet (1" = 4' or 5') vertically.
5. The following minimum number of plans and specifications shall be submitted to the City during the review phase, construction phase and upon completion of the project. Additional sets may be required for other departments and/or agencies.
  - A) Four (4) sets of the design plans and two (2) preliminary specifications each time a submittal is made to the City for review purposes.
  - B) Five (5) sets of the approved final construction plans and approved specifications prior to award of contract: one (1) set (24" x 36") and four (4) sets (11" x 17").
6. If the design plans and specifications are incomplete, a letter stating the necessary changes required or requested on the plans and/or specifications or one (1) set of plans and specifications marked with the necessary changes and/or comments, shall be returned to the developer's engineer for his use in making needed corrections. The letter or the marked plans and specifications must be returned to the City with the revised plans and specifications.
7. For any set of plans which is 2 years old or older, a new submittal, review and new signatures shall be required before a construction contract can be let.
8. This policy is based on a total concept design which includes the carrying capacity of the street, the right-of-way or easement section and the underground drainage system or channel, which in combination will provide the necessary total carrying capacity to protect from runoff of a storm of 100-year design frequency magnitude.

9. Storm flow resulting from a one hundred (100) year frequency storm, once contained in a public right-of-way and/or drainage easement, shall continue to be retained within public easements or rights-of-way, unless approved by the City under a strictly controlled set of criteria. Over flow swells intended to convey "public" storm flow shall be contained in a drainage easement, included in the design plans and constructed in conjunction with the storm drainage improvements.
  
10. There are several methods of relating runoff to precipitation in general use. As indicated in Section 3.10 Storm Drainage Facilities of the Subdivision Ordinance, two methods have been approved and accepted for use in the City of Granbury. The methods are (1) the use of the Rational Method for watersheds less than 500 acres, and (2) the use of synthetic unit hydrographs, developed from runoff data collected from watersheds judged similar to watersheds in or near Granbury, for watersheds equal to or greater than 500 acres.

The relationship between rainfall and runoff is expressed through application of the Rational Method with satisfactory accuracy for small watersheds, but the accuracy diminishes as the watershed to which the procedure is applied increases in size. Without actual records, it is believed that the use of the synthetic unit hydrograph procedure provides the best means for estimating the relationship between rainfall for the larger watersheds.

The following procedure will provide satisfactorily accurate estimates of the runoff for which the storm drainage and flood control systems must be designed. The Rational Formula will be used until the watershed area reaches approximately 500 acres. At that point, the peak rate of runoff will be estimated by both the Rational Formula and by the unit hydrograph method. If use of the unit hydrograph produces the greater estimate, it will be used to estimate runoff discharges for all further increases in the watershed area.

If the Rational Formula produces the greater estimate, the above comparison will be repeated at incremental increases of approximately 100-acres in watershed area until the unit hydrograph produces the greater result, after which it will be used for further estimates, or until the design of the system serving the watershed is complete.

11. Drainage Area/Watershed - The size and shape of the watershed for each installation (project) must be determined. The area of each watershed may be determined through the use of planimetric maps and topographic maps of the area, supplemented by field surveys in areas where topographic data has changed or where the contour interval is insufficient to adequately determine the direction of flow.

The outline of the drainage area contributing to the system being designed and outline of the sub-drainage area contributing to each inlet point shall be determined the outline of the drainage divides must follow actual drainage lines rather than the artificial land divisions used in locating the drainage lines in the design of storm sewers. The drainage lines are determined

by the pavement slopes, location of down spouts, paved and unpaved yards, grading of lawns and many other features that are altered by the development of a city.

A drainage area map shall be provided for each installation on a scale no smaller than 1 inch equals 200 feet (1" = 200').

12. The following table provides approximate values for the runoff coefficient pertaining to land uses to be used in the determination of storm runoff:

**RUNOFF COEFFICIENT "C"**

LAND USE	"C"
PARKS OR OPEN AREAS	0.30
RESIDENTIAL (LOTS > 1.0 ACRE)	0.35
RESIDENTIAL (LOTS < 1.0 ACRE)	0.50
INDUSTRIAL	0.70
APARTMENTS	0.75
BUSINESS	0.80

In the event that an innovative design concept would result in a coefficient of runoff sufficiently different than that shown above, the Director of Public Works may allow the design runoff coefficient to be determined from approved cover data by applying 90% runoff from impervious areas and 20% runoff from pervious areas.

13. Time of concentration - The time of concentration is defined as the longest time without reasonable delay, that will be required for a drop of water to flow from the upper limit of a drainage area to the point of concentration. The time of concentration to any point in a storm drainage system is a combination of the "inlet time" and the time of flow in the drain. The inlet time is the time for water to flow over the surface of the ground to the storm drain inlet. Because the area tributary to most storm drain inlets is relatively small, it is customary in practice to determine the inlet time on the basis of experience under similar conditions. Inlet time decreases as the slope and the imperviousness of the surface increase, and it increases as the distance over which the water has to travel and the retention by the contact surfaces increase. The shortest inlet time to be allowed for impervious areas on steep slopes shall be 5 minutes. All "inlet time" should be verified by direct overland flow computations.

The following table provides the minimum values for inlet time of concentration which are recognized by the City of Granbury:

**MINIMUM INLET TIME OF CONCENTRATION**

TYPE OF AREA	MINIMUM INLET TIME
PARKS AND OPEN AREAS	20 MINUTES
RESIDENTIAL	15 MINUTES
INDUSTRIAL	10 MINUTES
BUSINESS	10 MINUTES
MERCANTILE DISTRICT	5 MINUTES

14. The minimum storm frequency to be used in the design of various elements of the storm drainage system shall be as follows:

STREETS	5 YEARS
SYSTEMS COLLECTING ON GRADE INLETS	5 YEARS
SYSTEMS COLLECTING LOW POINT INLETS	100 YEARS
CULVERTS, BRIDGES, CHANNELS, CREEKS, STREET RIGHT-OF-WAY	100 YEARS

15. The relationship between rainfall intensity, storm duration, and frequency vary widely from place to place and with each storm, and there is no reliable method of predicting rainfall intensity with any degree of accuracy. In the design of storm drainage systems therefore, it is considered that the best procedure is to rely on historical records of duration, intensity; and frequency of storms that have occurred in the past. The U. S. Department of Commerce, through the U. S. Weather Bureau, has compiled a considerable amount of information that is useful in this regard. This information is published by the U. S. Department of Commerce in Technical Paper No. 25 (T.P. 25), "Rainfall Intensity-Duration-Frequency Curves", December 1955 and Technical Paper No. 40 (T.P. 40), "Rainfall Frequency Atlas of the United States" May 1961.

When submitting the drainage calculations for the drainage plan or the Construction plans the developer's engineer shall submit to the City a copy of the Design Storm Frequency curves versus Rainfall Intensity and Storm Duration used in the calculations and the source of the data.

16. When the Unit Hydrograph Method is used for developing drainage calculations the developer's engineer shall submit to the City a copy of the design output highlighting the unit period, the values used for watershed coefficients and the procedure or program used.

17. Each installation (project) and/or development phase shall provide a drainage system which is fully functional and readily maintained.
18. Whenever the capacity of a street to the top of either adjacent curb is exceeded by storm runoff from a five (5) year design frequency storm, a storm drainage system shall be designed and constructed.
19. Storm flow which can be contained in a seventy-two (72') inch internal diameter pipe, or smaller sized pipe, shall be carried in an underground drainage system constructed in streets, alleys or drainage easements.
20. Main lines of an enclosed storm drainage system shall not be smaller than a twenty-four (24") inch diameter RCP pipe. Inlet lead lines for an enclosed system shall not be smaller than an eighteen inch (18") diameter pipe.
21. Manholes shall be located at intervals not to exceed four hundred (400') feet for pipe thirty-six (36") inches in diameter or smaller. Manholes for pipe greater than thirty-six (36") inches in diameter shall be located at points where design indicates entrance into the system is desirable. However, in no case should the distance between openings exceed one thousand (1,000') feet. Manholes should preferably be located at street intersections, junctions or changes in alignment.
22. In those cases, where storm flow cannot be handled by a pipe seventy-two (72") inches or smaller in diameter, the developer shall either install a lined drainage channel, of approved design, or continue the underground drainage system with larger capacity pipe or box culvert to the development boundary into a natural channel.
23. Drainage channels shall be designed to convey the 100-year design frequency storm while maintaining one foot of free board within its banks. Detailed drainage calculations substantiating the channel design shall be submitted to the City for its approval.
  - 1) Unlined channels shall have a maximum side slope of 3:1 and a minimum grade of 0.3 foot per 100 feet. The minimum design velocity should be 3 fps, based on a 10year frequency storm, to reduce siltation. The maximum design velocity shall be less than 8 fps, based on a 100-year frequency storm, to control erosion. Unless the excavated channel bottom is Austin Chalk, limestone, or other similar acceptable rock, a reinforced concrete pilot channel of sufficient width shall be required by the City. If an unlined channel is built the developer shall sod or seed the exposed ground, up to the top of banks, to prevent erosion. Where the design velocity exceeds eight feet (8') per

second the channel shall be lined with reinforced concrete. If an unlined channel is constructed, an approved maintenance entity will be required to maintain the unlined channel. A maintenance agreement between the approved maintenance entity and the City is required describing the maintenance entity's responsibility for maintenance of the unlined channel.

24. Under some unusual circumstances which would preclude an adequate outfall condition, an on-site detention system may be allowed. In this case, the design of the detention system shall be such that the additional runoff generated by the proposed development will be detained on site until it can be safely discharged off-site, and will not increase the amount of original discharge nor change the time of concentration downstream. The provision of either an adequate outfall condition or an on-site detention system shall be subject to the approval of the City. Drainage easements along a required outfall channel or ditch shall be provided until the flowline "day lights" on natural grade. The minimum grade allowed on an outfall channel or ditch will be 0.3 foot per 100 feet. Drainage easements will generally extend at least twenty-five (25') feet past an outfall head wall to provide an area for maintenance operations.
25. All coordination required with public and/or private utility agencies to eliminate conflicts with proposed storm drainage facilities shall be the responsibility of the developer and/or his engineer. Likewise, coordination with agencies requiring special conditions (i.e., railroads and the Texas Department of Transportation) shall be the responsibility of the developer and/or his engineer.
26. Drainage easements shall be provided by the developer along entire length of the system for all storm drainage facilities and to an adequate outfall condition acceptable to the City outside of public right-of-way.

## **II. CONSTRUCTION REQUIREMENTS**

1. Standard Specifications for Public Works Construction, North Central Texas Council of Governments, are hereby adopted by reference and made part of this policy, which shall be controlling in construction and installation of all storm drainage facilities and other public improvements required herein. Standard Specifications for Construction of Highways, Streets and Bridges, 2014, Texas Department of Transportation, may also be referenced as applicable for particular items. A copy of the preceding standard specifications and/or design standards can be obtained from the identified originating agency. Specifications and/or design standards utilized locally by the City of Granbury may be obtained from the Public Works Department.

2. Construction of storm drainage facilities shall be by a contractor employed by the City of Granbury or by Public Works forces as described in Section III or by a contractor employed by the developer as described in the GENERAL ARRANGEMENTS AND FINANCING section below.
3. Storm drainage facilities and appurtenances shall be constructed to the line and grade established in the approved final construction plans. It is the responsibility of the developer and his contractors to perform all construction in accordance with the approved construction plans and specifications. Any change in design required during construction shall be made by the Engineer whose seal and signature are shown on the plans. All changes shall be approved by the Director of Public Works.
4. All construction shall be performed in accordance with applicable local, state and federal safety standards and requirements.
5. The City may provide construction engineering and inspection, except for the setting of line and grade stakes for street and/or storm drainage improvements on all projects regardless of size. The setting of line and grade stakes for streets and storm drains shall be the responsibility of the developer, except that the City reserves the right to pre-qualify persons and/or firms that are hired to provide this surveying and to check the accuracy of the surveying and the conformance of the stakes to the approved plans.

### **III. DISTRIBUTION OF COST**

1. For existing developments, the City may bear the cost of drainage facilities where the drainage conditions, overall existing development, or planned improvement projects (e.g. street reconstruction) justify the installation of drainage facilities. Such financing of drainage facilities in these areas shall be limited to the availability of City funds and subject to the following exceptions:
  - A) Individual property owners may request the extension of an existing enclosed drainage facility across their property. Such an extension will be installed provided the benefitted property owner supplies a drainage easement to the City free of cost and furnishes the required and necessary storm drainage pipe. The Public Works Department will provide the design and the Street Department will provide construction forces for the installation of the extension. This arrangement shall be limited to the availability of necessary personnel and equipment.
  - B) Drainage facilities installed in conjunction with paving projects adjacent to platted property may be at City expense, except portions of systems which are adjacent to undeveloped, newly developing or redeveloping (re-platting) property or which extend

out of the street right-of-way into new developments where it shall be financed in accordance with Item 2. below.

2. For New Developments and for Redeveloping property, the City may participate in the cost of storm drainage facilities located adjacent to the development and to an appropriate outfall facility based on the following.

A) Residential Subdivisions or Additions

- 1) Where storm drainage pipes smaller than or equal to seventy-two (72") inches in diameter are installed the developer shall pay the total cost of the line and appurtenances required to complete the system.

- 2) Where storm drainage pipes larger than seventy-two (72") inches in diameter or a structure of some other shape with an internal cross-sectional area of more than 28.3 square feet is used, the City may pay twenty-five percent (25%) of the difference in the material cost between the 72-inch diameter pipe and the larger diameter pipe or structure. The developer shall pay the remaining percentage of the difference in cost plus the total cost of an equivalent 72-inch (72") inch diameter pipe. There shall be no City participation in the cost of any trench excavation, manholes, inlets, lead lines and/or any other facilities required to complete the system.

- 3) Where an improved drainage channel is installed, whether lined or unlined, the developer shall dedicate at his own expense a drainage easement of sufficient width to permit the construction and maintenance of the channel. The developer shall pay the total cost of the facility and all appurtenances required to complete the system. If an unlined channel is constructed, an approved maintenance entity, such as an HOA, will be required to maintain the unlined channel. A maintenance agreement between the approved maintenance entity and the City is required describing the maintenance entity's responsibility for maintenance of the unlined channel.

- 4) Where bridges or culverts under roadways require an opening larger than double 72-inch (72") diameter pipes or a structure of some other shape with an internal cross-sectional area of more 56.5 square feet the City will participate to the extent of twenty-five percent (25%) of the additional cost of the structure as approved by the City Council of the City of Granbury, and shall reimburse the developer for such costs when City funds become available.

- 5) There shall be no City participation in the cost of parkway improvements, including pedestrian ways, guardrails, etc.

6) If the City desires a roadway width greater than required, one hundred percent (100%) of the additional cost of the drainage facility necessary for that excess width will be paid by the City of Granbury.

7) If the developer constructs a roadway wider than determined necessary by the City, then there shall be no City participation for the additional cost of the drainage facility necessary for the excess width.

#### B) Commercial and Industrial Developments

1) The developer shall pay the total cost of all underground drainage systems regardless of the size of the largest diameter of pipe required to carry the design storm flow.

2) Where an improved drainage channel is installed, whether lined or unlined, the developer shall dedicate at his own expense a drainage easement of sufficient width to permit the construction and maintenance of the channel. The developer shall pay the total cost of the facility and all appurtenances required to complete the system. If an unlined channel is constructed, an approved maintenance entity will be required to maintain the unlined channel. A maintenance agreement between the approved maintenance entity and the City is required describing the maintenance entity's responsibility for maintenance of the unlined channel.

3) Where bridges or culverts under roadways require an opening larger than double 72-inch (72") diameter pipes or a structure of some other shape with a cross sectional area of more than 56.5 square feet, the City may participate to the extent of ten-percent (10%) of the additional construction cost of the structure as approved by the City Council of the City of Granbury and shall reimburse the developer for such costs when City funds become available.

4) There shall be no City participation in the cost of parkway improvements, including pedestrian ways, guardrails, etc.

5) If the City desires a roadway width greater than required, one hundred percent (100%) of the additional cost of the drainage facility necessary for that excess width will be paid by the City of Granbury

- 6) If the developer constructs a roadway wider than determined necessary by the City, then there shall be no City participation for the additional cost of the drainage facility necessary for the excess width.
  - C) Bids and estimates for the construction of bridges and culverts shall be prepared on a unit cost basis for the length of the basic structure (width of the street) with all appurtenances such as guard rail, wing walls, etc., being separate bid items, so that the cost distribution due to oversize structures can be readily determined.
  - D) Storm flow shall not be diverted from its natural drainage course to a perimeter street unless approved by the City. Where storm flow is diverted, in the opinion of the City, there shall be no City participation for the additional cost of constructing and/or over sizing any drainage facility or appurtenance required to handle such diverted storm flow and the City's participation shall stay the same as if the diversion did not occur.
3. The developer shall pay a construction inspection and materials testing deposit. The deposit will be estimated at \$150 per day for each working day of the project from Notice to Proceed to Final Punchlist Completed as determined by Exhibit K. The construction inspection and materials testing deposit shall be submitted to the Director of Public Works as a cash deposit with the signed Facilities Improvement Agreement (FIA). The construction inspector will invoice against this deposit each month based on actual site visits requested by the contractor. If the deposit is not sufficient to cover the requested inspections through Final Punchlist Completed, an additional deposit will be required based on the estimated number of days remaining until Final Punchlist Completed at a rate of \$150.00 a day. A final accounting will be done prior to final acceptance of the project and the final invoice shall be reconciled prior to obtaining City acceptance of the project.
4. Any replacement or relocation of an existing storm drainage facility required by the developer to accommodate a contemplated or projected use of a property shall be the responsibility of the developer. The plans for any such replacement or relocation shall be approved in writing by the Director of Public Works prior to initiation of construction.
  5. No permanent structures shall be constructed over an existing or proposed storm drainage facility. In the event that the developer desires to construct a permanent structure over an existing storm drainage facility, the developer shall be responsible for the total cost of relocating the existing facility.
  6. The City shall assume a share of the cost of the storm damage facilities only if funds are available for such participation. In the event that no funds are available for City participation,

the developer shall award the contract and deposit with the City cash or a bond in the amount of the total construction cost of the facility.

#### **IV. GENERAL ARRANGEMENTS AND FINANCING**

1. Subsequent to the approval of a Drainage Plan, the preliminary subdivision plat, preliminary design plans and an adequate cost estimate, the developer shall request a Facility Improvement Agreement to provide for the installation of storm drainage improvements. Such request and accompanying information shall be in writing and addressed to the Director of Community Development. No construction shall begin until a Facility Improvement Agreement has been executed by the developer and the City.
2. The Public Works Department shall review and may approve or modify the drainage facilities deemed necessary by the developer's engineer. The Director of Public Works will submit the Public Works portion of the Facility Improvement Agreement to the Director of Community Development.
3. Simultaneous with the execution of the proposed Facility Improvement Agreement by the developer, the developer shall furnish necessary security guarantees as specified under Item VI, Procedures for Obtaining a Contract for the Installation of Public Improvements.
4. Where City financial participation is provided for and desired by the developer, the City may advertise and receive bids on the project. The City, in its sole discretion, may use any authorized method or procedure to comply with Texas laws related to awarding of contracts for the project, including, but not limited to, the procedures permitted by Texas Local Government Code, Chapter 252, as amended, or Texas Government Code, Chapter 2269, as amended. The developer shall not award the contract for the project until such time as he has received written approval from the Director of Public Works to do so. Under this procedure the developer is required to:
  - A) Require the contractor to furnish to the City satisfactory carriage of insurance in accordance with Item 1.26, Insurance, Standard Specifications for Public Works Construction, North Central Texas. Certificates of each policy shall be delivered to the City along with a written statement from the issuing company stating that said policy shall not be canceled, non-renewed or materially changed without advance notice being given to the City.
  - B) Require the contractor(s) to furnish to the City performance, payment and maintenance bonds executed by a surety company authorized to do business in the State of Texas and subject to the approval of the City Attorney in an

amount equal to one hundred-percent (100%) of the contract price of the improvements. The performance and payment bonds shall be submitted prior to the City issuing the Notice to Proceed. The two (2) year maintenance bond(s) shall be submitted and approved prior to acceptance of the project.

- C) Following the setting of line and grade by a private surveyor hired by the developer, the contractor shall give forty-eight (48) hours' notice to the Water/Wastewater Department so that inspection personnel will be available. No work shall begin until the assigned inspector gives his consent to proceed.
- D) Any change order to the contract must be approved in writing by the City.
- E) Except for partial payments as provided below, the City's participation will not become due and payable to the developer until all work has been completed by the contractor and accepted by the City as complete, as evidenced by a letter stating such acceptance, and until the developer has submitted evidence satisfactory to the City that final payment to the contractor has been made, and that all subcontractors and persons furnishing labor and materials have been paid in full and all claims settled. The City's participation shall be based upon actual quantities constructed as measured and calculated by the developer's engineer and approved by the Public Works Department.
- F) For projects involving City participation and where the participation amount is fully secured by either performance and payment bonds or an equivalent escrow deposit, the developer may request partial payments of the City's participation, based on completed work. All estimates for partial payments shall be approved by the Director of Public Works prior to payment to the developer. The approval of any partial payment shall in no way constitute acceptance of the work, nor in anyway affect the obligations of the developer under this policy or the Facility Improvement Agreement. Such partial payments may be approved on a monthly basis, and such payment checks will be issued by the City upon receipt of an affidavit executed by the contractor certifying that they had received payment for the accomplished work in accordance with contracts documents.

- 5. Where no City financial participation is utilized or where City financial participation is utilized but not desired by the developer, the developer has the option of advertising and awarding his own construction contract to the responsive low bidder or awarding the contract on a

negotiated basis: Under this procedure, the developer is required to comply with items A) through D) listed in paragraph 4 above, plus the following:

- A) The developer shall employ a construction contractor who is approved by the City. This contractor must meet the City's requirements for being registered and bonded to perform work in a public right-of-way.
  - B) Prior to commencing work, the developer shall furnish copies of the contract between the developer and the contractor as required by the City. Upon approval by City officials, the developer will be notified in writing as to when he may commence work.
6. When all work required under the Facility Improvement Agreement has been completed by the contractor and the following items have been accomplished, the City will accept the project as being complete, as evidenced by a letter to the developer stating such acceptance.
- A) A final inspection of all improvements has been accomplished and the resulting 'Punch List' corrected, and
  - B) The contractor has provided the City a Maintenance Bond indicating that he will be responsible for defects in the project due to faulty materials and/or workmanship for a period of two (2) years from date of final acceptance, and
  - C) The developer has submitted evidence satisfactory to the City that final payment to the contractor has been made, and that all subcontractors and persons furnishing labor and materials have been paid in full and all claims settled, and
  - D) One (1) set of 11" x 17" (half size) of "as-built" Mylar's, signed and sealed by the Engineer of record have been submitted too and accepted by the City.
  - E) The standard Letter of Inspection & Acceptance submitted by the Developer's Design Engineer along with a compact disk containing both CAD and .pdf files.
7. Drainage easements shall be provided to the City by the developer free of cost. Where a public or community necessity for such easement(s) has been determined by the City Council, and the requesting developer provided written evidence, including affidavits as appropriate, that he is unable to negotiate the purchase of the necessary easement(s) at a fair price, the City may expeditiously undertake to acquire same using its powers, provided the requesting developer agrees to pay the actual cost of the easement and any and all other costs connected with such attempted acquisition.

8. The Director of Public Works may require a developer to begin and complete construction of any storm drainage facility included in the Facility Improvement Agreement contract when, in the judgement of the Director of Public Works, the facility is needed for the proper and orderly development of the area.

When the Director of Public Works determines that a storm drainage facility should be constructed, he shall notify the developer in writing to make arrangements for construction of the facility. Within fifteen (15) calendar days after receiving the notice, the developer shall make arrangements for constructing the facility, including making the necessary payment to the City in accordance with this policy. Construction must be completed within ninety (90) days from the date on which the developer received notice from the City to proceed with construction. If construction has not been completed within the ninety (90) day period, the City may take whatever action is required to insure prompt completion of the improvements, including but not limited to, awarding a construction contract for the improvements and requiring forfeiture of the security guarantees to pay all costs resulting from failure of the developer to complete the improvements. Such costs shall include, but not be limited to, construction costs, engineering costs, administrative and legal expenses, damages, etc.

## **V. OWNERSHIP AND MAINTENANCE**

1. All underground storm drainage facilities installed in connection with a development project and which are in a public right-of-way and/or easement shall be and shall remain the property of the City, and shall be operated and maintained by the City unless special agreements to the contrary are entered into by the developer and the City.
2. The developer may choose to construct a reinforced concrete lined channel for facilities located in a public right-of-way and/or easement. When all City standards, including special design criteria, are satisfied the City shall own, operate and maintain the channel, unless special agreements to the contrary are entered into by the developer and the City.
3. Where the developer chooses to construct storm drainage facilities on private property, an improved unlined channel, detention or retention pond or leave a natural creek in its natural state in accordance with this policy, the drainage facilities shall be maintained by an approved maintenance entity. The plat shall contain a perpetual maintenance statement and the maintenance entity shall also be required to enter into an agreement which would indemnify the City against any harm that may come to person or property.

## **VI. EFFECTIVE DATE**

This policy shall apply on all projects on which a Facility Improvement Agreement (including all necessary engineering, technical materials, cost estimates and exhibits) has not been fully executed by the Public Works Department by the date of policy adoption by the City Council and on any Facility Improvement Agreement that has not been fully executed and bonded by the developer and the City within ninety (90) days after the date of adoption of this policy by the City Council.

## **POLICY FOR STREET IMPROVEMENTS**

The following shall govern the installation of all street, alley and parkway improvements with the corporate limits of the City of Granbury, Texas, and its extraterritorial jurisdictional area.

### **I. DESIGN REQUIREMENTS**

1. All street, alley and parkway improvements shall be designed and constructed in accordance with the City of Granbury Subdivision Ordinance, these Public Improvement Policies, the adopted Standard Specifications and Standard Details and other design criteria of the Public Works Department.
2. The developer shall retain a professional civil engineer, license to practice in the State of Texas, for the preparation of construction plans, specifications and contract documents for all public improvements required by the proposed development. Not public improvements shall be install until and unless said plans have been received and approved by the City.
3. The determination as to compliance of the. plans and specifications with applicable policies, regulations and criteria shall be the sole responsibility of the City. Approval of the plans and specifications by the City signifies the City's acceptance of the general design concept and at the minimum criteria appears to be satisfied. Such approval shall not be deemed to be an assumption of responsibility or liability by the City of any negligent act, or omission in the performance of the developer's engineer or in his preparation of such plans and specifications.
4. Design and construction plans shall be submitted according to the requirements set forth herein and any adopted City standards and/or specifications. Plans for all public improvements shall be submitted on sheets no larger than twenty-four inches by thirty-six inches (24" x 36") and at a scale of one inch equals 40 or 50 feet (1" = 40' or 50') horizontally and one inch equals four or five feet (1" = 4' or 5') vertically.

5. The following minimum number of plans and specifications shall be submitted to the City during the review phase, construction phase and upon completion of the project. Additional sets may be required for other departments and/or agencies:
  - A) Four (4) sets of the design plans and two (2) preliminary specifications each time a submittal is made to the City for review purposes.
  - B) Five (5) sets of the approved final construction plans and approved specifications prior to award of contract: one (1) set (24" x 36") and four (4) sets (11" x 17").
6. If the design plans and specifications are incomplete, a letter stating the necessary changes required or requested on the plans and/or specifications or one (1) set of plans and specifications marked with the necessary changes and/or comments, shall be returned to the developer's engineer for his/her use in making needed corrections. The letter or the marked plans and specifications must be returned to the City with the revised plans and specifications.
7. All dedicated public streets shall conform to the "General Design Criteria" provided in the following table:

**GENERAL DESIGN CRITERIA**

STREET CLASSIFICATION		*MINIMUM ROW WIDTH	MINIMUM ROADWAY WIDTH FACE TO FACE	NUMBER OF LANES & WIDTH
PRIMARY THOROUGHFARE	P6U	100'	80'	3 – 12' 4 – 11'
SECONDARY THOROUGHFARE	S4D	84'	2' – 24'	4 – 12'
SECONDARY THOROUGHFARE	S4U	68'	48'	4 – 12'
COMMERCIAL/ INDUSTRIAL	C/I	60'	40'	2 – 12' 2 – 8'
COLLECTOR	C	60'	36'	2 – 10' 2 – 8'
RESIDENTIAL	R	50'	27'	1 – 11' 2 – 8'

\*Additional right-of-way other than the minimums shown above in the General Design Criteria, may be required at intersections and high-volume driveways for turning lanes. This additional right-of-way will be determined by the City during the design phase of the street system and before submittal of the final plat.

All proposed streets shall be planned, designed and constructed based on their anticipated function, traffic volumes, adjacent land use and system continuity.

8. In addition to the "General Design Criteria" shown in item 7 above, all dedicated streets shall conform to the "Technical Design Criteria" provided in the following table:

**TECHNICAL DESIGN CRITERIA**

STREET CLASSIFICATION		MINIMUM DESIGN SPEED (MPH)	MAXIMUM GRADE (%)	MINIMUM GRADE (%)	AREA FREE OF 5-YEAR FREQ. STORM
PRIMARY THOROUGHFARE	P6U	45	6	0.4	ONE LANE EACH DIRECTION
SECONDARY THOROUGHFARE	S4D	45	6	0.4	ONE LANE EACH DIRECTION
SECONDARY THOROUGHFARE	S4U	40	6	0.4	CENTER 16 FT.
COMMERCIAL/ INDUSTRIAL	C/I	30	8	0.4	CENTER 12 FT.
COLLECTOR	C	35	8	0.4	CENTER 12 FT.
RESIDENTIAL	R	25	10	0.4	N/A

9. Soil samples to determine the Plasticity Index (PI) of the natural soil, at the ultimate level of the pavement base course, shall be taken at least once per block or every 400 feet, whichever is less. A minimum of two (2) samples per project will be tested. Should the PI vary considerably from one sample to another, additional samples will be taken as determined by the Director of Public Works. All soil testing shall be paid for by the developer.

A) If the PI of the soil is less than 10, soil stabilization will not generally be required.

- B) If the PI of the soil is between 10 and 20, the subgrade shall be stabilized to a depth of at least 5 inches (5") with the application of 4% by weight of Portland cement or 6% by weight of lime.
  - C) If the PI exceeds 20, soil stabilization to a depth of at least 6 inches (6") will be required utilizing 6% by weight of either Portland cement or lime.
  - D) At the developer's option and expense, a lime series test may be made by an approved, qualified testing firm, and lime may then be applied at the optimum rate indicated by the test.
  - E) When a proper subgrade cannot be constructed in soils having a low PI, cement stabilization may be required when deemed necessary by the Director of Public Works.
10. The following assumptions were made in determining the minimum pavement sections required by this policy.
- A) The concrete design achieves a 28-day compressive strength ( $f_c$ ) of at least 3600 psi (minimum requirement – 5 sack mix).
  - B) The concrete design achieves a 28-day modulus of rupture (MR) of at least 3600 psi when measured in accordance with the American Society for Testing Materials, ASTM C78, third-point loading.
11. Residential roadways shall have a minimum pavement section of (6) six inches (6") of reinforced concrete on a subgrade stabilized as required by item 9, above. This pavement section with subgrade stabilization is equivalent to a structural number of 3.30.
12. Collector roadways shall be designed based on their anticipated vehicular and truck traffic and the existing subgrade characteristics. Collector roadways shall have a minimum pavement section of six inches (6") of reinforced concrete on a subgrade stabilized as required by item 9, above. This pavement section with subgrade stabilization is equivalent to a structural number of 3.55.
13. Commercial roadways shall have a minimum payment section-of eight inches (8") of reinforced concrete on a subgrade stabilized as required by item 9, above.
14. Industrial and secondary thoroughfare streets shall have a minimum pavements section of eight inches (8") of reinforced concrete on a subgrade stabilized as required by item 9 above.

15. Primary thoroughfare streets shall have a minimum pavement section of eight inches (8") of reinforced concrete on a subgrade stabilized as required by item 9 above.
16. The City shall retain the right to require the developer's engineer to design a greater pavement thickness based on American Concrete Pavement Association or AASHTO design criteria, if it is determined that the anticipated loading characteristics, traffic volumes or soil conditions warrant a greater pavement strength.
17. All streets shall be designed to accommodate storm water runoff resulting from a 100year frequency design storm. The 100-year storm shall be contained within the available right-of-way and/or drainage easements. The capacity of the street and parkway and/or easement must be designed so as to safely accommodate both pedestrian and vehicular traffic.
18. Collector streets shall be designed to allow at least one 12-foot wide lane to be open to traffic and free of storm water (using the 5-year design storm) at all times. Undivided secondary thoroughfare streets shall be designed to allow at least one 16-foot wide (two 8foot wide) lane to be open to traffic and free of storm water (using the 5-year design storm) at all times. Divided secondary thoroughfares and primary thoroughfares shall be designed to allow at least one 12-foot wide lane to be open to traffic in each direction and free of storm water (using the 5-year design storm) at all times.

**19. Alleys**

- A) Alleys serving residential areas shall have a right-of-way width of twenty (20') feet and a paved width of fifteen (15') feet, exclusive of any items which may be required for drainage purposes. Alleys serving non-residential areas shall have a minimum rightof-way and paving width of twenty (20') feet. Alleys shall be paved with reinforced concrete.
- B) Alley pavement sections shall be constructed in accordance with the City of Granbury's Standard Details.
- C) Alley paving should have a minimum grade of 0.4% and a maximum grade of 10.0%.
- D) Alleys shall intersect streets at right angles or radially to curved streets. The intersection of a street and an alley shall be constructed as a standard driveway approach.
- E) Dead end alleys shall be avoided where possible, but, if unavoidable, shall be provided with an adequate turnaround at the dead end as approved by the Director of Public Works.

## **20. Sidewalks**

- A) If sidewalks are constructed they shall be a minimum of four (4') feet. In residential areas, the sidewalks are to be placed five (5') feet behind the back of curb or as directed by the Director of Public Works.
  
- B) In commercial and industrial areas, the sidewalks may either be placed one (1') foot in front of the property line or adjacent to the streets curb. If sidewalks are located a minimum of five (5) feet behind the back of curb, a minimum width of four (4') feet is required. If sidewalks are located adjacent to the streets curb, a minimum width of five (5') feet is required.
  
- C) Sidewalks not less than six (6') feet wide shall be required by the Public Works Director where deemed essential to provide circulation or access to public/community facilities such as schools, shopping centers, transportation hubs and other similar locations.
  
- D) In commercial, industrial and multi-family areas, the cost and installation of the required sidewalk shall be the responsibility of the developer and such cost shall be itemized and included in the Facilities Improvement Agreement (FIA). The installation of the sidewalk to city specifications shall be subject to a final inspection and acceptance prior to the release of any surety and issuance of any building permits.
  
- E) In single-family areas, the cost and installation of the required sidewalk may be accomplished by the homebuilder as a part of the building permit request for the street frontage. The City will have sole discretion to:
  - 1)) deny a final inspection; or,
  
  - 2) refuse to turning-on utilities to the building, until the final inspection and acceptance of the sidewalk has been conducted.

In single-family areas where the builder cannot construct the sidewalk as a part of the permit activity (near common areas, parks, ponds, streets or boulevards which do not propose lots fronting the street, etc.), the cost and installation of the required sidewalk shall be the responsibility of the developer. Such costs shall be itemized and included in the Facilities Improvement Agreement (FIA).

The installation of the sidewalk to city specification shall be subject to a final inspection and acceptance prior to the release of any surety and issuance of any building permits.

21. All railroad crossings on roadway widths less than forty (40') feet shall be full depth timber crossings. Railroad crossings on roadway widths forty (40') feet or greater shall be either rubber type or concrete crossings without exception. If it is necessary for the City to condemn railroad property, the developer shall reimburse the City the entire cost of the condemnation process including attorney fees plus any other costs associated with the right-of-way and or easement acquisition.
22. All necessary storm drainage facilities shall be installed in accordance with the "Policy for Storm Drainage Facilities".
23. All coordination required with public and/or private utility agencies to eliminate conflicts with proposed street grades or storm drainage facilities shall be the responsibility of the developer and/or his engineer. Likewise, coordination with agencies requiring special conditions (i.e., railroads and the Texas Department of Transportation) shall be the responsibility of the developer and/or his engineer.

## **II. CONSTRUCTION REQUIREMENT**

1. Standard Specifications for Public Works Construction, 2004 or as adopted in the future as updated, North Central Texas Council of Governments, are hereby adopted by reference and made part of this policy, which shall be controlling in construction and installation of street paving, curbs and gutters, sidewalks, utilities and other public improvements required herein. Standard Specifications for Construction of Highways, Streets and Bridges, 2014, Texas Department of Transportation, may also be referenced as applicable for particular items. A copy of the preceding standard specifications and/or design standards can be obtained from the identified originating agency Specifications and/or design standards utilized locally by the City of Granbury may be obtained from the Public Works Department.
2. Construction of street, alley and sidewalk improvements shall be by a contractor employed by the City of Granbury, by Public Works forces or by a contractor employed by the developer as described in Section IV below.
3. Streets, including parkways, and alleys shall be constructed to the line and grade established in the approved final construction plans. It is the responsibility of the developer and his contractors to perform all construction in accordance with the approved construction plans and specifications. Any change in design required during construction shall be made by the Engineer whose seal and signature are shown on the plans. All changes shall be approved by the Public Works Director.

4. All construction shall be performed in accordance with applicable local, State and Federal safety standards and requirements.
5. For purposes of this design criteria the City of Granbury considers six-inch (6") curb to be standard.
6. Parkways shall be graded for their full width to provide suitable finished grades for sidewalks, driveways and planting strips with adequate surface drainage and convenient access to adjacent lots.
7. All utilities and services to be located in the parkway shall be installed at least two (2') feet back of the curb line prior to the construction of curb and gutter and the paving of the roadway. All trenches shall be backfilled in accordance with the standard specifications.
8. Sub-drains determined to be required by the City during construction, shall be constructed at designated locations in accordance with approved specifications.
9. The City will provide construction engineering and inspection, except for the setting of line and grade stakes for street and storm drainage improvements on all projects regardless of size. The setting of line and grade stakes for streets and storm drains shall be the responsibility of the developer, except that the City reserves the right to pre-qualify persons and/or firms that are hired provide this surveying and to check the accuracy of the surveying and the conformance of the stakes to the approved plans.

### **III. DISTRIBUTION OF COST**

The arrangement, character, extent and location of all streets shall conform to the requirements of this ordinance and the City of Granbury Comprehensive Plan, and shall be considered in their relation to existing and planned streets or driveways, to topographical conditions, to drainage constraints, to public safety and in their appropriate relations to the proposed uses of the land to be served by such streets. All proposed streets shall be planned, designed and constructed based on their anticipated function, traffic volumes, adjacent land use and system continuity.

#### **1. A) Interior Streets -**

- 1) The developer shall bear the full cost of constructing all street improvements meeting the adopted specifications for roadway widths equal to or less than forty (40') feet, unless it is determined through engineering analysis or study that a greater roadway width is required to support the proposed development. In this

case, the developer would be responsible for all street improvement costs as stipulated in the engineering analysis or study

- 2) The developer shall bear the cost of constructing the full width of the streets within a properly dedicated right-of-way as provided in Section III. 1. A. 1. Above. For City requested roadway widths greater than required by the developer in Section III. 1. A. 1. Above, the City Council may for the additional widths and lengths when City funds are available.
- 3) The developer shall bear the cost of constructing a pavement section up to the value required as listed in Section II, 11-16 above, of reinforced concrete on a stabilized subgrade for zoning other than industrial. For industrial development, the developer shall bear the cost of constructing a pavement section equivalent to eight inches (8") of reinforced concrete on a stabilized subgrade. For secondary and primary thoroughfares, the Developer shall bear the excess cost of pavement sections greater than eight inches (8") of concrete for all zoning other than industrial. For industrial zoning, the City shall bear the excel cost of pavement sections greater than eight inches (8") of concrete.
- 4) If the developer chooses to construct a wider or thicker street than required or requested by the City, there shall be no City participation for the cost of the extra width or thickness. The City may at its discretion, choose to contribute monetarily for extra street width and thickness beyond the developer's construction cost requirements as stipulated in Section III. 1. A. 1 above.

B) Perimeter Streets -

- 1) If the City Council determines that an improved roadway is needed for the proper and orderly development of the surrounding area, the perimeter street improvements shall be constructed at the time of development. The developer shall bear the full cost of constructing one-half of required street improvements for all widths equal to or less than forty (40') feet, unless it is determined through engineering analysis that a greater roadway width is required to support the proposed development.
- 2) For secondary and primary thoroughfares, the City shall bear the excess cost of pavement thickness as described in paragraph 3) above, based on the adjacent zoning.
- 3) Should the City Council determine that it is not feasible to construct or improve the perimeter road at the time of development, the developer shall provide the City with funds equivalent to the cost of constructing his share of the roadway improvements (i.e., pavement, curb and gutter, storm drainage, water and wastewater, street lights and street signs) as described in item 1) above.

C) Alleys - The developer shall bear the full cost of construction required improvements within alley right-of-way.

D) Sidewalks - The developer shall bear the cost of constructing sidewalks in new additions where they are required by the Facility Improvement Agreement.

E) Railroad Crossings -

- 1) The developer shall bear the full cost of constructing railroad crossings for roadway widths less than forty (40') feet, unless it is determined through engineering analysis that a greater roadway width is required to support the proposed development. In this case, the developer would be responsible for all street improvement cost as stipulated in the engineering analysis or study
- 2) For City requested roadway widths greater in width than required by the developer in Section III. 1. E. 1 above, the City Council may pay for the additional widths and length when City funds are available.
- 3) If the developer constructs a wider street than required by the City, there shall be no City participation in the cost of the crossing through the extra width.

2. The developer shall pay a construction inspection and materials testing deposit. The deposit will be estimated at \$150 per day for each working day of the project from Notice to Proceed to Final Punchlist Completed as determined by Exhibit K. The construction inspection and materials testing deposit shall be submitted to the Director of Public Works as a cash deposit with the signed Facilities Improvement Agreement (FIA). The construction inspector will invoice against this deposit each month based on actual site visits requested by the contractor. If the deposit is not sufficient to cover the requested inspections through Final Punchlist Completed, an additional deposit will be required based on the estimated number of days remaining until Final Punchlist Completed at a rate of \$150.00 a day. A final accounting will be done prior to final acceptance of the project and the final invoice shall be reconciled prior to obtaining City acceptance of the project.

3. The developer shall award the contract and deposit with the City cash or a bond in the amount of the total construction cost of the facility in accordance with the Facility Improvement Agreement.

#### **IV. GENERAL ARRANGEMENTS AND FINANCING**

1. Subsequent to the approval of the preliminary subdivision plat, preliminary design plans and an adequate cost estimate, the developer shall request a Facility Improvement Agreement to provide for the installation of street and alley improvements. Such request and accompanying information shall be in writing and addressed to the Director of Community Development. No construction shall begin until a Facility Improvement Agreement has been executed by the developer and the City.

2. The Public Works Department shall review and may approve or modify the street improvements deemed necessary by the developer's engineer. The Director of Public Works will submit the Public Works portion of the Facility Improvement Agreement to the Director of Community Development.
3. Simultaneous with the execution of the proposed Facility Improvement Agreement by the developer, the developer shall furnish necessary security guarantees as specified under Item VI, Procedures for Obtaining a Contract for the Installation of Public Improvements.
4. Where City financial participation is utilized by this policy and desired by the developer, the City may advertise and receive bids on the project. The City, in its sole discretion, may use any authorized method or procedure to comply with Texas laws related to awarding of contracts for the project, including, but not limited to, the procedures permitted by Texas Local Government Code, Chapter 252, as amended, or Texas Government Code, Chapter 2269, as amended. The developer shall not award the contract for the project until such time as he has received written approval from the Director of Public Works to do so. Under this procedure the developer is required to:
  - A) Require the contractor(s) to furnish to the City satisfactory carriage of insurance in accordance with Item 103.4, Insurance, Standard Specifications for Public Works Construction, North Central Texas. Certificates of each policy shall be delivered to the City along with a written statement from the issuing company stating that said policy shall not be canceled non-renewed or materially changed without advance notice being given to the City.
  - B) Require the contractor(s) to furnish to the City performance, payment and maintenance bonds executed by a surety company authorized to do business in the State of Texas and subject to the approval of the City Attorney in an amount equal to one hundred percent (100%) of the contract price of the improvements. The performance and payment bonds shall be submitted prior to the City issuing the Notice to Proceed. The two (2) year maintenance bond(s) shall be submitted and approved prior to acceptance of the project.
  - C) Following the setting of line and grade by a private surveyor hired by the developer, the contractor shall give 48-hours' notice to the Public Works Department so that inspection personnel will be available. No work shall begin until the assigned inspector gives his consent to proceed.
  - D) Any change order to the contract must be approved in-writing by the City.

- E) Except for partial payments as provided below, the City's participation will not become due and payable to the developer until all work has been completed by the contractor and accepted by the City as complete, as evidenced by a letter stating such acceptance, and until the developer has submitted evidence satisfactory to the City that final payment to the contractor has been made, and that all subcontractors and persons furnishing labor and materials have been paid in full and all claims settled. The City's participation shall be based upon actual quantities constructed as measured and calculated by the developer's engineer and approved by the Public Works Department.
  - F) For projects involving City participation and where the participation amount is fully secured by either performance and payment bonds or an equivalent escrow deposit, the developer may request partial payments of the City's participation, based on completed work. All estimates for partial payments shall be approved by the Director of Public Works prior to payment to the developer. The approval of any partial payment shall in no way constitute acceptance of the work, nor in anyway affect the obligations of the developer under this policy or the Facility Improvement Agreement. Such partial payments may be approved on a monthly basis, and such payment checks will be issued by the City upon receipt of an affidavit executed by the contractor certifying that he had received payment for the accomplished work in accordance with contracts documents.
5. Where no City financial participation is provided for by this policy or where City financial participation is provided for but not desired by the developer, the developer has the option of advertising and awarding his own construction contract to the responsive low bidder or awarding the contract on a negotiated basis. Under this procedure the developer is required to comply with items A) through D) listed in paragraph 4 above, plus the following:
- A) The developer shall employ a construction contractor who is approved by the City. This contractor must meet the City's requirements for being registered and bonded to perform work in a public right-of-way.
  - B) Prior to commencing work, the developer shall furnish copies of the contract between the developer and the contractor as required by the City. Upon approval by City officials, the developer will be notified in writing as to when he may commence work.
6. When all work required under the Facility Improvement Agreement has been completed by the contractor and the following items have been accomplished, the City will accept the project as being complete, as evidenced by a letter to the developer stating such acceptance.
- A) A final inspection of all improvements has been accomplished and the resulting 'Punch List' corrected, and

- B) The contractor has provided the City a Maintenance Bond indicating that he will be responsible for defects in the project due to faulty materials and/or workmanship for a period of two (2) years from date of final acceptance, and
  - C) The developer has submitted evidence satisfactory to the City that final payment to the contractor has been made; and that all subcontractors and persons furnishing labor and materials have been paid in full and all claims settled, and
  - D) One (1) set of 11" x 17" (half size) set of "as-built" Mylar's signed and sealed by the Engineer of record has been submitted too and accepted by the City, and
  - E) The standard Letter of Inspection & Acceptance submitted by the Developer's Design Engineer along with a compact disk containing both CAD and .pdf files
7. The Director of Public Works may require a developer to begin and complete construction of any street or storm drainage included in the Facility Improvement contract when, in the judgement of the Director of Public Works, the facility is needed for the proper and orderly development of the area. In addition, installation of all underground utilities will be required before the paving is installed.

When the Director of Public Works determines that a street or streets, including underground utilities, should be constructed, he shall notify the developer in writing to make arrangements for construction of the facilities. Within fifteen (15) calendar days after receiving the notice, the developer shall make arrangements for constructing the streets and utilities including making the necessary payment to the City in accordance with this policy. Within ninety (90) calendar days after receiving the notice, the developer shall have completed construction of the utilities and streets. In the event the developer fails to complete the required street and/or utility improvements within the ninety (90) calendar day period, as required by the Director of Public Works, the City may take whatever action is required to insure prompt completion of the improvements, including, but not limited to, awarding a construction contract for the street and/or utilities improvements or the incomplete portions of such improvements, and requiring forfeiture of the security guarantees to pay all costs-resulting from the failure of the developer to complete the improvements as required. Such costs shall include, but not be limited to, street and/or utilities construction costs, engineering costs, administrative and legal expenses, damages, etc.

**V. OWNERSHIP AND MAINTENANCE**

- 1. All street and alley improvements installed in connection with a development project located within the city boundary which are within a dedicated street or alley dedicated to

the public, shall be and shall remain the property of the City and after expiration of the maintenance bonds, shall be maintained by the City.

2. All street and alley improvements installed in connection with a development project which are within a dedicated street or alley dedicated to a private maintenance entity or Homeowner's Association (HOA), shall be and shall remain the property of the HOA<sup>[TL2]</sup>. All street and alley improvements, which are within a dedicated street or alley dedicated to the public, installed in connection with a development project located outside of the city boundary, within Hood County and within the cities ETJ, shall be maintained by the County unless specified otherwise on the plat or other recording documents.

## **VI. EFFECTIVE DATE**

This policy shall apply on all projects on which a Facility Improvement Agreement (including all necessary engineering, technical materials, cost estimates and exhibits) has not been fully executed by the Public Works Department by the date of policy adoption by the City Council and on any Facility Improvement Agreement that has not been fully executed and bonded by the developer and the City within ninety (90) days after the date of adoption of this policy by the City Council.

## **POLICY FOR STREET LIGHT INSTALLATION**

The following policy shall govern all street light installations within the corporate limits of the City of Granbury, Texas.

### **I. DESIGN REQUIREMENTS**

1. All street light improvements shall be designed and installed in accordance with the City of Granbury Subdivision Ordinance, these Public Improvement policies, the adopted Standard Specifications and Standard Details and other design criteria of the Public Works Department. The Director of Public Works shall specify the equipment and materials which will be acceptable for all street lighting projects.
2. The developer shall furnish exhibit plat at a standard engineering scale showing street light locations and a cost estimate along with his submittal of the request for a Facility Improvement Agreement. For developments scheduled to be done in phases, the developer shall submit an exhibit plat showing the total development.
3. The developer shall employ an engineer proficient in street light design and registered in the State of Texas for preparation of required plans and specifications. All plans and specifications must be approved by the City. Approval of the plans and specifications by the City signifies the

City's acceptance of the general design concept and that the minimum criteria appear to be satisfied. Such approval shall not be deemed to be an assumption of responsibility or liability by the City of any negligent act, or omission in the performance of the developer's engineer or in his preparation of such plans and specifications.

4. A minimum of three (3) sets of design plans and specifications shall be submitted to the City for review by appropriate staff. Additional sets may be required for other departments and/or agencies.
5. If the design plans and specifications are incomplete, either:
  - a) A letter stating the necessary changes required or requested on the plans and/or specifications, or
  - b) One (1) set of plans and specifications marked with the necessary changes and/or comments, shall be returned to the developer's engineer for his use in making needed corrections. The letter or the marked plans and specifications must be returned to the City with the revised plans and specifications.
6. The following criteria highlights, the City's minimum design standards based on street classification:

A) Residential or Local Streets

- 1) Street lights shall be installed at the following locations:
  - a) At all intersections
  - b) On all cul-de-sac or dead-end streets longer than 250 feet
  - c) At all significant changes in direction of the roadway
  - d) At mid-block if the block is longer than 600 feet. Mid-block lights will be equally spaced within the block so that lights are less than 500 feet apart, except as required in c) above.
- 2) The design standard for local or residential streets shall consist of a mast-arm mounted, 50-60 Watt LED, mounted at a 28-foot height above the roadway surface on a metal pole using underground wiring in accordance with the National Electric Code.
- 3) Existing utility poles may only be used with the prior approval of the City.

B) Collector Streets

- 1) Street lights shall be installed at the following locations:
  - a) At all intersections, and
  - b) Equally spaced within the block between 250 and 300 feet apart.

2) The design standard for collector streets shall consist of a mast-arm mounted, 90125 Watt LED, mounted at a 28-foot height above the roadway surface, on a metal pole using underground wiring in accordance with the National Electrical Code.

3) Existing utility poles may only be used with the prior approval of the City.

C) Thoroughfare Streets

1) Street lights shall be installed at the following locations:

a) At all intersections, and

b) Equally spaced along the block at 200 foot intervals. On divided road-ways the lighting can be back to back along the center of the median. On undivided roadways lighting shall be provided on both sides of the roadway.

2) The design standard for thoroughfare streets shall consist of a mast-arm mounted, 90125 Watt LED, mounted at a 40-foot height above the roadway surface, on a steel pole using underground wiring in accordance with the National Electrical Code.

D) Frontage/Service Roads

1) Street light installation on any frontage road, service road or other roadway adjacent to a U. S. or State highway or a County road will be determined by the City on an individual basis.

7. Requests for approval of designs other than the City's minimum standard design must include calculations of average, maximum and minimum light levels demonstrating that the proposed design equals or exceeds the current ANSI criteria and the City's minimum standard.

**I. CONSTRUCTION REQUIREMENTS**

1. Standard Specifications for Public Works Construction, North Central Texas, are hereby adopted by reference and made part of this policy, which shall be controlling in construction and installation of all street lighting facilities and other public improvements required herein. Standard Specifications for Construction of Highways, Streets and Bridges, 1993, Texas Department of Transportation, may also be referenced as applicable for particular items. Design Standards together with all exhibits, charts, drawings and diagrams pertaining hereto, which have been approved by the City may be obtained from the Public Works Department.

2. Installation of street lighting facilities shall be by a contractor employed by the City of Granbury, by Public Works forces or by a contractor employed by the developer which has been approved by the City.

3. The developer's contractor shall give 48-hour notice to the Electric Superintendent and the appropriate utility company prior to start of construction so that inspection personnel will be available.
4. The developer's contractor shall provide electrical service to each street light in conformity with the approved plans and specifications.
5. Inspection of all street light construction work shall be performed by the Building and Permit Department.

### **III. DISTRIBUTION OF COST**

1. For existing developments where either one (1) street light has not been installed or two (2) street lights do not meet current design standards, the City will pay 100% of the cost to install the minimum standard design if:
  - A) A majority of the adjacent property owners petition the Public Works Department for a street light, and
  - B) The property owners agree to provide the necessary utility easements for the electrical service to the light.
  - C) Street light installations requested by petitioning citizens which are of a different design (i.e. ornamental) or at a higher level of service than the minimum design standard required by the City will have to be approved by the Director of Public Works. If approved for installation, all additional costs will be paid by the petitioning citizens.
  - D) Installation of street lighting is subject to the availability of City funds for lighting projects.
2. For new developments and for redeveloping property the cost participation for installing street lighting shall be as follows:
  - A) Interior Streets – all costs paid 100% by the developer
  - B) Perimeter Streets -
    - 1) Adjacent to un-platted property - all costs paid 100% by the developer
    - 2) Adjacent to platted property - 50% by the developer and 50% by the City
    - 3) Adjacent to City Parks - 50% by the developer and 50% by the City

- C) The developer shall pay for the electricity until building permits are issued or for two (2) years from the date of installation, after which the City shall pay for the electricity.
- D) The City's cost participation will be based on the cost to install improvements meeting the minimum standards described in Section 1, item 6 above.
- E) The developer shall pay a construction inspection and materials testing deposit. The deposit will be estimated at \$150 per day for each working day of the project from Notice to Proceed to Final Punchlist Completed as determined by Exhibit K. The construction inspection and materials testing deposit shall be submitted to the Director of Public Works as a cash deposit with the signed Facilities Improvement Agreement (FIA). The construction inspector will invoice against this deposit each month based on actual site visits requested by the contractor. If the deposit is not sufficient to cover the requested inspections through Final Punchlist Completed, an additional deposit will be required based on the estimated number of days remaining until Final Punchlist Completed at a rate of \$150.00 a day. A final accounting will be done prior to final acceptance of the project and the final invoice shall be reconciled prior to obtaining City acceptance of the project.

#### **IV. GENERAL ARRANGEMENTS AND FINANCING**

1. Simultaneous with the execution of the proposed Facility Improvement Agreement by the developer, the developer shall furnish security guarantees as specified under Item VI, Procedures for Obtaining a Contract for the Installation of Public Improvements. The release of said guarantees shall be conditioned upon satisfactory compliance with the provisions of the Facility Improvement Agreement, or when the developer deposits cash equal to that of the most recent cost estimate. Partial release may be granted provided that work remaining to be done is financially guaranteed.
2. The Director of Public Works may require a developer to install any street lights included in a developer's contract at a specified time when, in his judgement, the lights are needed for the proper and orderly development of the area. When it is determined that street should be constructed, the Director of Public Works shall notify the developer in writing to make arrangements for construction of the lights. Within fifteen (15) calendar days after receiving the notice, the developer shall make arrangements for construction of the street lights, including making any necessary payment to the City in accordance with this policy. Construction must be completed within ninety (90) calendar days from the date on which the developer receives notice from the City to proceed with construction. If the improvements have not been completed with the ninety (90) day period, the City may take whatever action is required to insure prompt completion of the uncompleted portion of the improvements,

including forfeiture of the security guarantees required above to pay all costs result from the failure of the developer to complete the improvements as required. Such costs shall include, but not limited to, construction and engineering costs, administrative and legal expenses, damages, etc.

3. The developer shall provide on the final plat all necessary utility easements required for the street lighting-system.

## **V. OWNERSHIP AND MAINTENANCE**

All street lights installed under this policy shall be and shall remain, the property of the City or the utility company in whose jurisdiction it is located. The street lights- will be maintained by either the City or the appropriate electric service company depending on whose jurisdiction it is located.

## **VI. EFFECTIVE DATE**

This policy shall apply on all projects on which a Facility Improvement Agreement (including all necessary engineering, technical materials, cost estimates and exhibits) has not been fully executed by the Public Works Department by the date of policy adoption by the City Council and on any Public Improvements contract that has not been fully executed and bonded by the developer and the City within ninety (90) days after the date of adoption of this policy by the City Council.

## **POLICY FOR STREET NAME SIGNS**

The following policy shall govern the installation of street name signs within the corporate limits of the City of Granbury, Texas. The intent of this policy is to provide guidelines for the installation of street name signs, on both public and private streets, for the information and convenience of emergency vehicles, postal services and the general public.

### **I. INSTALLATION REQUIREMENTS**

1. Street name signs shall be installed at all intersecting public streets as per current design standards.
2. Intersections created by streets within a subdivision that intersect a perimeter street shall also be considered intersections within the subdivision.

3. In order to provide uniformity and consistency in materials and workmanship throughout the City, the Public Works Department shall obtain, locate and install all street name signs for public streets within the City. The signs will be installed by City forces when street improvements have met final approval.
4. Street name signs shall be installed at all intersecting private streets. Private street name signs shall be noticeably different in design and/or color than public street name signs. The background of the sign face shall be fabricated using reflective material with a reflective legend. The words "PRIVATE STREET" shall be placed across the bottom of the sign in upper case letters a minimum of one-half inch high. The design and location of private street-name signs must be approved by the City. Installation will be performed by a contractor employed by the developer.
5. All street name signs installed at the intersection of a public street and a private street shall be located on private property.

## **II. DISTRIBUTION OF COST**

1. The developer shall be responsible for the initial cost of street name sign, installation, at all public street intersections. The cost will be provided to the City in the form of a deposit per intersection within a subdivision.
2. The cost per intersection shall be determined annually by the Public Works Department and shall be based on prevailing costs of materials and labor
3. The developer shall pay the total cost of obtaining and installing private street name signs.

## **III. GENERAL ARRANGEMENTS AND FINANCING**

1. The developer shall deposit with the City:
  - A) A fixed sum of money as specified in the Facility Improvement Agreement, based on the number of intersections within the subdivision.
  - B) If the developer deposits cash funds with the City simultaneous with the execution of the Facility Improvement Agreement, the cost of street name signs will be at the rate prevailing at the time. If the developer elects to wait until the time when street signs are to be installed the cost of street name signs will be at the rate prevailing at the time the developer deposits the money with the City.

#### **IV. OWNERSHIP AND MAINTENANCE**

1. All street name signs installed within a dedicated public street shall be, and shall remain, the property of the City, and shall be maintained by the City.
2. All private street name signs which identify a private street shall be, and shall remain, the property of the developer or a Home Owners Association, and shall be maintained by the developer or the Home Owners Association.

#### **V. EFFECTIVE DATE**

This policy shall apply on all projects on which a Facility Improvement Agreement (including all necessary engineering, technical materials, cost estimates and exhibits) has not been fully executed by the Public Works Department by the date of policy adoption by the City Council and on any Public Improvements contract that has not been fully executed and bonded by the developer and the City within ninety (90) days after the date of adoption of this policy by the City Council.

### **POLICY FOR ELECTRICAL IMPROVEMENTS**

The following policy shall govern the installation of all electrical improvements within the City of Granbury Electric service area:

#### **I. DESIGN REQUIREMENTS**

1. All electrical improvements shall be designed and installed in accordance with the City of Granbury Subdivision Ordinance, these Public Improvement policies, the adopted Standard Specifications and Standard Details and other design criteria of the Public Works Department. The Electric Superintendent for each respective Utility District shall specify the equipment and materials which will be acceptable for all electrical improvement projects.
2. The developer shall furnish exhibit plat at a standard engineering scale showing electrical improvement locations and a cost estimate along with his submittal of the request for a Facility Improvement Agreement. For developments scheduled to be done in phases, the developer shall submit an exhibit plat showing the total development.
3. The developer shall employ an engineer proficient in electric design and registered in the State of Texas for preparation of required plans and specifications. All plans and specifications must be approved by the City. Approval of the plans and specifications by the City signifies the City's

acceptance of the general design concept and that the minimum criteria appear to be satisfied. Such approval shall not be deemed to be an assumption of responsibility or liability by the City of any negligent act, or omission in the performance of the developer's engineer or in his preparation of such plans and specifications.

4. The following minimum number of plans and specifications shall be submitted to the City during the review phase, construction phase and upon completion of the project. Additional sets may be required for other departments and/or agencies.
  - A) Four (4) sets of the design plans and two (2) preliminary specifications each time a submittal is made to the City for review purposes.
  - B) Five (5) sets of the approved final construction plans and approved specifications prior to award of contract: one (1) set (24" x 36") and four (4) sets (11" x 17").
5. If the design plans and specifications are incomplete, either:
  - a) A letter stating the necessary changes required or requested on the plans and/or specifications, or
  - b) One (1) set of plans and specifications marked with the necessary changes and/or comments, shall be returned to the developer's engineer for his use in making needed corrections.
  - c) The letter or the marked plans and specifications must be returned to the City with the revised plans and specifications.

## **II. CONSTRUCTION REQUIREMENTS**

1. The developer shall only construct and install the required ditching, conduit and transformer pads throughout the development based on the approved electrical improvement design. Other electrical facilities including, but not limited to, cable, conductors, transformers and pedestals shall be installed and inspected by the City of Granbury Electric Department.

## **III. DISTRIBUTION OF COST**

1. The developer shall be responsible for one hundred percent (100%) of the cost of all standard electrical improvements required by the City to each proposed or existing lot or tract within the development. Standard electrical improvements shall include those necessary to properly serve the proposed development. The developer shall be responsible for such costs as materials, engineering design, labor, installation and operation equipment, clearing, right-

ofway or easement acquisition and installation, which shall be provided in the (licensed) engineer's estimate of probable cost to the electric provider. The cost shall be itemized on the FIA as 'Cash Payments' and made payable to the City of Granbury service area only. As the monies used under 'Cash Payments' for the electric infrastructures is for both labor and capital equipment purchases, it will be non-refundable.

2. In the event that the City's Master Electrical Plan, Capital Improvements Plan, a proportionality assessment by the City Engineer or the City approved developer's comprehensive electrical facilities study indicate that larger sized or additional improvements are needed than those required to provide exclusive service to the proposed development for ultimate growth consideration, the developer shall be responsible for one hundred percent (100%) of the cost of all improvements designed to provide proportional service to the proposed development. Should the City elect to install larger or additional facilities than those indicated to be necessary for the proportional service to the development, the additional incremental cost shall be borne by the City. The cost shall be itemized on the FIA as 'Cash Payments' and made payable to the City of Granbury service area only. As the monies used under 'Cash Payments' for the electric infrastructures is for both labor and capital equipment purchases, it will be non-refundable.
3. Any replacement or relocation of an existing electrical facility required by the developer to accommodate a contemplated or projected use of a property shall be the responsibility of the developer. In the event that the City requests that a larger or additional electrical improvement be substituted for the existing improvement, the City shall be responsible for the additional incremental cost. If the increase in size is necessary to properly serve the proposed development or to provide capacity at least equivalent to that of the existing improvement, the developer shall be responsible for the total cost. The plans for any such replacement or relocation shall be approved in writing by the Director of Public Works prior to the execution of the Facility Improvement Agreement.
4. No permanent structures shall be constructed over or under an existing, public, electrical improvement. In the event that the developer desires to construct a permanent structure over or under an existing, public, electrical improvement, the developer shall be responsible for the total cost of relocating the existing electrical infrastructure, and provide copies of the necessary, recorded easements.
5. In those situations, where the construction of electrical transmission facilities is not economically feasible, the developer may petition the Director of Public Works to construct electric transmission facilities, subject to the approval of the City Manager and the City Council to construct same. The developer or City shall be responsible for costs to construct special facilities as follows:

A) When the electrical transmission facilities are designed to provide service proportional to the development, the developer shall be responsible for one hundred percent (100%) of the cost of such facilities. In the event that the City requires larger or additional facilities be constructed to provide service to other areas, the developer shall be responsible for the portion which represents the cost of constructing facilities to provide proportional service to the proposed development and the City shall be responsible for the remainder of the cost. In the event City funds are not available, the developer shall install those electrical transmission facilities as are required to provide service to the proposed development.

B) The electrical transmission facilities statement of this policy shall not be construed as requiring the City to provide electrical service to areas where normal service, as defined in this policy, is not immediately or economically available. Rather, it is intended to permit an equitable method of providing such electrical service where the best interests of the City will be served by the use of such facilities.

6. The developer shall pay a construction inspection and materials testing deposit. The deposit will be estimated at \$150 per day for each working day of the project from Notice to Proceed to Final Punchlist Completed as determined by Exhibit K. The construction inspection and materials testing deposit shall be submitted to the Director of Public Works as a cash deposit with the signed Facilities Improvement Agreement (FIA). The construction inspector will invoice against this deposit each month based on actual site visits requested by the contractor. If the deposit is not sufficient to cover the requested inspections through Final Punchlist Completed, an additional deposit will be required based on the estimated number of days remaining until Final Punchlist Completed at a rate of \$150.00 a day. A final accounting will be done prior to final acceptance of the project and the final invoice shall be reconciled prior to obtaining City acceptance of the project.

#### **IV. GENERAL ARRANGEMENTS AND FINANCING**

The developer shall bear 100% of the cost to install all electrical improvements. The developer shall submit a cash payment to the City equal to the cost estimate approved by the City to install all required electrical improvements prior to the filing of the Facility Improvement Agreement, excluding, but not limited to ditching, electrical conduit, fill material and transformer pads.

1. The City will not order material for construction until payment in full as required by this policy has been received from the developer and a Facility Improvement Agreement has been executed. If the approved cost estimates exceed the actual construction cost, the difference between the actual and estimated costs will be refunded to the developer. If the actual construction cost exceeds the approved cost estimate, the difference will be billed to the developer and shall be paid to the City by the developer prior to acceptance.

2. Subsequent to the approval of the preliminary subdivision plat, electrical design plans and associated costs, the developer shall request a Facility Improvement Agreement to provide for the installation of electrical conduit, transformer pads, fill material and associated ditching to support the development in accordance with the approved electrical design plans. Such request, accompanying information and cash payment described in IV.1 above shall be submitted to the Public Works Department. No construction shall begin until payment has been made and a Facility Improvement Agreement has been executed by the developer and the City.
3. Simultaneous with the filing of the proposed Facility Improvement Agreement by the developer, the developer shall furnish necessary security guarantees as specified under Item VI, Procedures for Obtaining a Contract for the Installation of Infrastructure for electrical conduit, transformer pads, ditching and fill material, but not limited to these items, to be installed by the developer in accordance with the approved electrical design plans. The Facility Improvement Agreement shall be deemed incomplete and returned to the developer if the required surety is not included. The release of said guarantees shall be conditioned upon satisfactory compliance with the provisions of the Facility Improvement Agreement, or when the developer deposits cash equal to that of the most recent cost estimate. Partial release may be granted provided that work remaining to be done is financially guaranteed.
4. The Director of Public Works will submit the electrical portion of the Facility Improvement Agreement to the Director of Community Development.
5. Where City financial participation is provided for and desired by the developer, the Director of Public Works shall provide a cost estimate for those electrical improvements to be paid for by the City and by the developer.
6. Where no City financial participation is provided for or where City financial participation is provided for but not desired by the developer, the developer has the option of advertising and awarding his own construction contract to the responsive low bidder or awarding the contract on a negotiated basis for the installation of electrical conduit, transformer pads, ditching a fill material. Under this procedure, the developer is required to comply with the following:
  - A) The developer shall employ a construction contractor who is approved by the City. This contractor must meet the City's requirements for being registered and bonded to perform work in a public right-of-way.

- B) Prior to commencing work, the developer shall furnish copies of the contract between the developer and the contractor as required by the City. Upon approval by City officials, the developer will be notified in writing as to when he may commence work.
  - C) The developer shall require the contractor to furnish to the City satisfactory coverage of insurance in accordance with Item 1.26.1-4, Insurance and Standard Specifications for Public Works Construction, North Central Texas. Certificates of each policy shall be delivered to the City along with a written statement from the issuing company stating that said policy shall not be canceled, non-renewed or materially changed without advance notice being given to the City.
  - D) The contractor or developer shall furnish to the City maintenance bonds executed by a surety company authorized to do business in the State of Texas and subject to the approval of the City Attorney. Maintenance bond(s) shall be in an amount equal to one hundred percent (100%) of the contract price of the electrical conduit improvements installed by the developer. The two (2) year maintenance bond(s) shall be submitted and approved prior to acceptance of the project.
  - E) Following the setting of line and grade by a private surveyor hired by the contractor, the contractor shall give 48-hour notice to the City of Granbury Electric Department so that inspection personnel will be available to perform inspections. No work shall continue until the assigned inspector gives his consent to proceed.
  - F) Any change order to the contract must be approved in writing by the City.
8. When all work required under the Facility Improvement Agreement has been completed by the contractor and all requirements of the policies of the City have been accomplished, the City will accept the project as being complete, as evidenced by a letter to the developer stating such acceptance.
- A) A final inspection of all improvements has been accomplished and the resulting 'Punch List' corrected, and
  - B) The contractor has provided the City a Maintenance Bond indicating that he will be responsible for defects in the project due to faulty materials and/or workmanship for a period of two (2) years from date of final acceptance, and
  - C) The developer has submitted evidence satisfactory to the City that final payment to the contractor has been made, and that all subcontractors and persons furnishing labor and materials have been paid in and all claims settled, and

D) One (1) set of 11" x 17" (half size) set of "as-built" Mylar's signed and sealed by the Engineer of record have been submitted too and accepted by the City, and

E) The standard Letter of Inspection & Acceptance submitted by the Developer's Design Engineer along with a compact disk containing both CAD and .pdf files.

**V. OWNERSHIP AND MAINTENANCE**

All electric installed under this policy shall be and shall remain, the property of the City or the utility company in whose jurisdiction it is located. The electric will be maintained by either the City or the appropriate electric service company depending on whose jurisdiction it is located.

**VI. EFFECTIVE DATE**

This policy shall apply on all projects on which a Facility Improvement Agreement (including all necessary engineering, technical materials, cost estimates and exhibits) has not been fully executed by the Public Works Department by the date of policy adoption by the City Council and on any Public Improvements contract that has not been fully executed and bonded by the developer and the City within ninety (90) days after the date of adoption of this policy by the City Council.