ORDINANCE NO. 96-4

An ordinance of the City of Center, Texas adopting DESIGN AND CONSTRUCTION SPECIFICATIONS FOR DEVELOPMENT OF INFRASTRUCTURE (hereinafter called Specifications) and providing for "grandfather" circumstances, providing for fines and penalties for non-compliance, providing for the repeal of all ordinances in conflict, providing for a severability clause, and providing for a date that this ordinance is to become effective.

Whereas, it is necessary that the Specifications be adopted by the City of Center; and

Whereas, the Center City Council believes it is in the best interest of the City of Center to adopt the Specifications;

Now therefore be it ordained by the City Council of the City of Center:

Section 1. That the Specifications attached hereto and made a part of by reference is hereby adopted as the official Specifications of the City.

Section 2. That any property or tract of land that is not in compliance with the provisions of this Ordinance, and is not provided City utility services as of the effective date of this Ordinance, shall not be provided City utility services and no improvements on the said property or tract of land shall be accepted by the City as public infrastructure.

Section 3. That any and all changes and improvements to any property or tract of land after the effective date of this Ordinace shall be in compliance with the provisions of this Ordinance. Example: A lot with multiple housing units may not add a housing unit or replace a housing without meeting compliance with the provisions of this Ordinace.

Section 4. That any person, firm, or corporation aggrieved by any requirements of this Ordinanace, which involves the jurisdiction of the City, shall appeal in writing to the City. Relief from any requirements of the Ordinance shall be authorized by the City through amendment of this Ordinance.

Section 5. That any person, firm, or corporation who shall violate or fail to comply with any of the provisions of this Ordinance for a particular piece of property or tract of land within the Corporate Limits or the Extraterritorial Jurisdiction of the City of Center shall be guilty of a misdemeanor and upon conviction shall be subject to the maximum fine allowed by the State, and each day that such violation continues shall constitute a seperate offense and shall be punishable accordingly. This section is applicable provided that the particular piece of property or tract of land in question was not already in non-compliance as of the date of passage of this Ordinance by the City Council.

Section 6. That all ordinances, or parts of ordinances, in conflict with this ordinance are hereby repealed and that all others not in conflict shall remain in full force and effect.

Section 7. If any paragraph, sentence or phrase of this ordinance be judged to be illegal or invalid, then all other parts of this ordinance shall remain in full force and effect.

Section 8. This ordinance shall become effective and be in full force and effect 30 days from and after its passage and approval by the City Council, duly attested by the Mayor and City Secretary, and publication in the newspaper.

PASSED AND APPROVED this 25th day of March, 1996.

John D. Windham, Mayor

ATTEST:

Shirley Green, City Secretary

APPROVED AS TO FORM:

Grover Russell, Jr., City Attorney

CITY OF CENTER

DESIGN AND CONSTRUCTION SPECIFICATIONS

FOR DEVELOPMENT OF INFRASTRUCTURE

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The purpose of this Ordinance is to provide for the orderly, safe and healthful development of the area within the City and to promote the health, safety, morals, and general welfare of the Community. Hereinafter every owner or developer of any tract of land situated within the corporate limits of the City of Center or within the extraterritorial jurisdiction of the City shall comply with the provisions of the Ordinance.

1. LOT STANDARDS

1.1 A lot size, width, depth, shape and orientation shall be appropriate for the location and type of development and shall not be less than 5,000 square feet in area. Also, the maximum single family residences (house, mobile home, prefabricated home, etc.) per lot shall be one.

1.2 Depth and width of properties reserved or laid out for commercial and industrial purposes shall be adequate to provide for the off-street service and parking facilities required by the type of use and development contemplated.

1.3 Each lot shall front upon a public street and shall have a 5 foot side building setback line with a 25 foot front building setback line. Exceptions to this will only be considered if the portion of the right-of-way from the public street not being utilized by the street surface, curbing, and drainage is adequate enough to allow less than a 25 foot setback.

1.4 Double frontage and reverse frontage lots shall be avoided, except where essential to provide separation of residential development from traffic arteries or to overcome specific disadvantages of topography and orientation.

1.5 Side lot lines shall be substantially at right angles or radial to street lines.

2. EASEMENT STANDARDS

2.1 Utility easements shall be provided within the proposed development as may be necessary to assure the proper design, installation and maintenance of either underground or aerial utilities. Easement widths shall be determined by the type of utility; however, an easement shall not normally be required along the rear of lots served by a dedicated alley.

2.2 When a proposed subdivision is traversed by a watercourse, drainageway, channel or stream or a proposed drainage easement, there shall be provided a storm water easement or drainage right-of-way conforming substantially with the line for such watercourse. The easement or right-of-way width for such watercourse shall be determined by good engineering practice and may require improvement or realignment to assure proper drainage of storm water.

2.3 The minimum width of a utility or drainage easement shall be twenty (20) feet.

Where residential and building sites are located in the floodway or flood plain, the minimum (regulatory flood) finish floor elevation shall be one (1) foot above the 100 year flood plain elevation.

3. STREETS

The physical design of the streets in the proposed development shall conform to the following minimum standards:

3.1 The arrangement of streets in a development shall either:

3.1.1 Provide for the continuation or appropriate projection of the existing principal streets in surrounding areas or;

3.1.2 Conform to a plan for a neighborhood approved or adopted by the City to meet a particular situation where topographical or other conditions make continuance or conformance of existing streets impractical.

3.2 Local streets shall be laid out so that their use by through traffic in residential areas will be discouraged.

3.3 Where a development abuts or contains an existing or proposed major street, the City may require such treatment as may be necessary for adequate protection of residential properties and to afford separation of through and local traffic.

3.4 Where a development borders on or contains a railroad right-of-way the City may require a street approximately parallel to and on each side of such right-of-way, at a distance suitable for the appropriate use of the intervening land. The distance of a street form a railroad shall recognize the problem of approach grades and future grade separations.

3.5 Street Intersections - Where more than two (2) streets intersect at a point shall be avoided.

3.5.1 No major street shall intersect any other major street at an angle of less than eighty (80) degrees.

3.5.2 No collector street shall intersect a major street at an angle of less than eighty (80) degrees, or another collector street at an angle of less than seventy (70) degrees.

3.5.3 No local street shall intersect any major street at an angle of less than eighty (80) degrees, or any collector street at an angle of less than eighty (80) degrees.

3.6 Cul-de-sacs may be permitted where the form or contour of the land or the shape of the property makes such street design appropriate. Such cul-de-sacs shall provide proper access to all lots and shall generally not exceed eight hundred (800) feet in length and a turn-around shall be provided at the closed end which has a minimum right-of-way radius of fifty (50) feet (60 feet in Commercial and Industrial areas. Dead end streets will not be allowed.

3.7 Street right-of-way width shall not be less than as follows:

Street Type	Right-of-Way Feet	Pavement Width in Feet Back Curb -Back Curb
Major Thoroughfare	60	36
Collector, Industrial or Commercial Street	60	36
Local, Residential	50	30

3.8 No street names shall be used which will duplicate or be confused with the names of existing streets. Street names shall be subject to approval of the City Manager or designee.

3.9 Street Construction Requirements - All development street construction shall be in accordance with the Texas Department of Transportation (TxDOT) Standard Specification for Construction of Highways, Streets and Bridges, latest edition, hereinafter referred to as the TxDOT. ITEM Copies of the TxDOT ITEM may be obtained from the TxDOT in Austin, Texas.

Local design standards, in accordance with TxDOT ITEM, are included as drawings within this section and shall be complied with by the developer.

3.9.1 Preparing Right of Way (TxDOT ITEM 100).

All areas shall be cleared of all structures and obstructions. Such obstructions shall be considered to include remains of houses, foundations, floor slabs, concrete, brick, lumber, plaster, septic tank drain fields, basements, abandoned utility pipes or conduits, equipment, fences, retaining ealls, and shacks. Those trees, shrubs and other landscape features specifically designated by the Engineer for preservation shall be carefully protected form abuse, marring, or damage during construction operations. Continual parking and/or servicing of equipment under the branches of trees markes for preservation and require pruning, they shall be trimmed as directed by the Engineer and all exposed cuts over 2 inches in diameter shall be treated with a material approved by the Engineer.

Holes remaining after removal of all obstructions, objectionable material, trees, stumps, etc., shall be backfilled with approved material, compacted and restored to approximately its original contours by blading, bulldozing, or by other methods, as approved by the Engineer. In areas to be immediately excavated, the backfillling of holes may not be required when approved by the Engineer.

Before backfilling, the remaining ends of all abandoned storm sewers, culverts, sanitary sewers, conduits, and water or gas pipes over 3 inches in diameter, shall be plugged with an adequate quantity of concrete to form a tight closure and inspected by City Manager or designee.

3.9.2 Excavation (TxDot ITEM 110).

Roadway excavation" shall consist of the required excavation within the limits of the roadway (except excavation otherwise designated as channel excavation, structural excavaton, etc.); the removal and proper utilization or disposal of all excavated materials; and the constructing, shaping and finishing of all earthwork on the entire length of roadway and approaches to same, in conformity with the required lines, grades and typical cross sections and in accordance with specification requirements herein outlined. Compaction of embankments shall conform to the method of "Ordinary Compaction".

All suitable excavated materials shall be utilized, insofar as practicable, in constructing the required roadway sections or in uniformly widening embankments, flattening slopes, etc. Unsuitable roadway excavation and roadway excavation in excess of that needed for construction shall be known as "Waste" and shall be disposed of outside the limits of the right-of-way. Unsuitable material encountered below subgrade elevation in roadway cuts, shall be replaced with other suitable material.

During construction the roadbed and ditches shall be maintained in a condition to insure proper drainage at all times. Ditches and channels shall be so constructed and maintained to avoid damage to the roadway section.

The street subgrade shall be constructed to a minimum depth of eight (8) inches below the lower limits of the base course.

3.9.3 Flexible Base (TxDOT ITEM 247).

Proir to delivery of the base material, the subgrade or existing roadbed shall be shaped to conform to the planned typical sections.

Base material shall be spread uniformly and shaped the same day as delivered. In the event inclement weather or other unforeseen circumstances render this impractical, the material shall be shaped as soon as practical.

Prior to compacting the flexible base, the flexible base material shall be bladed and shaped to conform to the typical sections as shown on the plans. All areas of segregated coarse or fine material shall be corrected or removed and replaced with well graded material.

Throughout this entire operation, the shape of each course shall be maintained by blading. Upon competion, the surface shall be smooth and in conformity with the typical section as shown on the plans and the established lines and grades. Prioir to placing the surfacing on the completed base, the base shall be cured. The flexible base shall be compacted by "Density Control".

Typical cross sections sre shown on the included plan and require 6 inches of compacted base material.

The flexible base shall be one of the following types, as follows:

Type A. Type A material shall be crushed stone produced from oversize quarried aggregate, sized by crushing and produced from a naturally occurring single source. Crushed gravel or uncrushed gravel shall not be acceptable for Type A material. No blending of sources and/or additive materials will be allowed in Type A material.

Type B. Type B material shall be crushed or uncrushed gravel.

Type C. Type C material shall be crushed gravel. Unless otherwise shown on the plans, crushed gravel shall have a minimum of 60 percent of the particles retained on the No. 4 sieve with two (2) or more crushed faces as determined by Test Method Tex-460-A, Part I.

The fexible base shall meet the physical requirements of Grade 1,2,3,4 or 5.

3.9.4 Lime Stabilized Subgrade (TxDOT ITEM 260)

This item shall govern for treating the existing subgrade by pulverizing, adding lime, mixing, and compacting the material as specified in this item.

Lime shall be in accordance with TxDOT Specifications Item No. 264.

In areas where lime stabilized subgrade is directed the amount of lime to be added shall be 32 lbs. per square yard. The soil and lime should be thoroughly mixed at the proper moisture content, an adequate mellowing period between initial and final mixing should be allowed, the moisture content should be adjusted to optimum or slightly above, and the mixture should be compacted to a minimum of 95 percent of ASTM D 698 (Standard Proctor) density.

3.9.5 Prime (TxDOT ITEM 310)

The completed base course shall receive a surface prime of MC30. The rate of application shall be a minimum of 0.25 gallons per square yard.

When the area and/or base is satisfactory to receive the prime coat, the surface shall be cleaned by sweeping or other approved methods. If found necessary, the surface shall be lightly sprinkled just prior to application of the asphaltic material. The asphaltic material shall be applied on the clean surface by an approved type of self-propelled pressure distributor so operated as to distribute the material in the quantity specified, evenly and smoothly under a pressure necessary for proper distribution. The develper shall provide all necessary facilities for determining the temperature of the asphaltic material in all of the heating equipment and in the distributor, for determining the rate at which it is applied, and for securing uniformly at the junction of two distributor loads.

The developer will select the temperature of application based on the temperature-viscosity relationship that will permit application of the asphalt within the limits recommended in the Item, "Asphalts, Oils and Emulsions". The recommended range for the viscosity of the asphalt is 100 to 125 centistokes. The developer shall apply the asphalt at a temperature within 15°F of the temperature selected.

The developer shall be responsible for the maintenance of the surface until the work is accepted.

No traffic, hauling or placement of any subsequent courses shall be permitted over the freshly applied prime coat until approved by the City Manager or designee.

3.9.6 Hot Mix Asphaltic Concrete Pavement (TxDot ITEM 340)

The pavement shall be constructed on the previously completed and approved subgrade, base, existing wearing surface, or in the case of a bridge, on the prepared slab or as otherwise specified herein and in accordance with the details shown on the plans.

The asphaltic material shall be placed on the primed base course at a rate of 165 pounds per square yard (approximately 1 ½ inches thick) and shall meet the requirments of Type "D" (Fine-Graded Surface Course).

The asphaltic material shall form from 4 to 8 percent of the mixture by weight, or form 9 to 19 percent of the mixture by volume.

The asphaltic mixture, when placed with a spreading and finishing machine, or tack coat shall not be placed when the air temperature is below 50°F and is falling, but it may be placed when the air temperature is above 40°F and is rising. The asphaltic mixture, when placed with a motor grader, shall not be placed when the air temperature is below 60°F and is falling, but may be placed when the air temperature is above 50°F and rising. The air temperature shall be taken in the shade away from artificial heat. Mat thicknesses of 1 ½ inches and less shall not be placed when the temperature of the surface on which the mat is to be placed is below 50°F. No mixture with lightweight coarse aggregate shall be placed when the temperature of the surface on which the mat is to be placed is below 50°F. It is further provided that the tack coat or asphaltic mixture shall be placed only when the humidity, general weather conditions and temperature and moisture condition of the base are suitable.

If, after being discharged from the mixer and prior to placing, the temperature of the asphaltic mixture is 50°F or below, or 125°F or above, all or any part of the load may be rejected.

3.9.7 Concrete Pavement (TxDOT ITEM 360)

Concrete pavement may be used in place of asphalt and base within the development provided the subgrade is prepared as shown in the attached details.

The pavement shall consist of Type A Portland cement concrete, with reinforcement as shown on the plans, with monolithic curbs, constructed as herein specified on the prepared subgrade with the minimum thickness of 6 inches and to the lines and grades established. Steel reinforcement shall be placed in the concrete and shall be No. 4 bars spaced at 18 inches on center in both directions. Reinforcement shall be continuous.

Tranverse expansion joints shall be formed perpendicular to the centerline and surface of the pavement and shall be constructed in accordance with the sequence of operations shown on thw palns. The concrete faces of the joint seal space shall be left true to line and section throughout the entire length of the joint. On completion of curing of the pavement, the joint sealing filler of the type specified shall be placed in accordance with plans.

Tranverse contraction joints shall be formed or sawed joints perpendicular to the centerline and surface of the pavement and shall be constructed by the method, and in the squence of operations, as shown on palns. Where sawed joints are used, contraction joints at approximately 60-foot intervals shall be sawed as sppm as sawing can be accomplished without damage to the pavement and before 24 hours after the concrete has been placed. The remaining contraction joints shall be sawed in a uniform pattern and they shall be completed before placing concrete in succeeding lanes and before permitting traffice to use the pavement.

Longitudinal joints shall be of the type or alternate types shown on the plans and shall be constructed of specified materials in accordance with provisions of the plans. Longitudinal joints shall be constructed accurately to required lines, shall be perpendicular to the pavement surface at the joint, and the pavement surface over and adjacent to the joint shall be finished as specified.

Longitudinal joints shall be sawed as soon as sawing can be accomplished without damage to the pavement. Sawing shall not cause damage to the pavement and the groove shall be cut with a minimum of spalling. No traffic (including construciton traffic) shall be permitted on the pavement until the longitudinal joint is cut. When the flex plane type longitudinal joint is used, it shall be placed behind the longitudinal float.

3.9.8 Concrete Curb and Gutter and Valley Gutter

The curbs, gutters, and valley gutters shall be constructed of Class A (3000 PSI) concrete, shall receive membrane curing and shall comply with the included standard drawings.

Valley gutter shall be constructed at the street intersections where it is anticipated that storm water will cross the intersecting streets.

4. DRAINAGE

The drainage system in the proposed development shall conform to the minimum standards.

4.1 General Requirements

4.1.1 The streets, inlets, storm sewer pipe and all other drainage structures shall be designed to accommodate a 10 year storm. All lots within the development shall be required to be above the 100 year flood plain.

4.1.2 Provisions shall be made to prohibit the storm discharge from the proposed development from damaging the downstream property. Where required, drainage easements shall be obtained from downstream property owners by the developer.

4.2 Drainage Construction Requirements

4.2.1 Storm Sewer Pipe (TxDOT ITEM 464)

4.2.1.1 Storm sewer pipe shall be reinforced concrete in accordance with ASTM designation C76 and shall be either Class III or Class IV. Minimum size shall be 12".

4.2.1.2 The culvert pipe shall be installed in accordance with the requirements of these specifications, to the lines and grades shown on the plans, and shall be sizes and dimensions shown thereon. The installation of pipe shall include all joints or etc., as may required to complete the work. The location of private driveway and side road pipe may be varied as deemed necessary.

4.2.1.3 Pipe shall be substantially free form fractures, large or deep cracks and surface roughness. The ends of the pipe shall be normal to the walls and centerline of the pipe.

4.2.2 Excavation and Backfill for Structures (TxDOT ITEM 400)

Class C bedding shall apply and allows the pipe to be placed on a foundation of stable earth such that the bedding is shaped to fit the lower 10% height of the overall pipe.

4.2.3 Pipe Laying

Laying of the pipe on the prepared bedding shall start at the outlet end with the tongue end pointing downstream and proceed to the inlet end with the abutting sections properly matched and true to the grade shwon on the plans. When multiple pipes are installed in the same trench, the lateral clearance between the pipes shall be one-half diameter of the pipe.

4.2.4 Joints

Both ends of the pipe shall be clean and dry and shall be factory coated with a suitable asphaltic primer. The entire diameter of the grove shall be coated iwth a ½ inch thick layer of mastic. The tongue end shall be shoved home with sufficient pressure to make a tight joint. The lift holes in the roof of the pipe shall also be filled with mastic.

4.2.5 Inlets and Junction Boxes (TxDOT ITEM 465)

Inlets and junction boxes shall be constructed at the location shown on the plans and in accordance with the TxDOT standard drawings. The curb inlet may be recessed. The materials shall be Class A concrete.

4.2.6 Headwalls Wingwalls and Aprons (TxDOT ITEM 466)

Headwalls, wingwalls and aprons shall be constructed where pipe culverts cross under streets in the proposed subdivisions. These structures shall be cast in place using Class A concrete with steel reinforcement. These items shall also be required where storm sewer pipes discharge into open channels.

5. WATER

The proposed subdivision shall be served by an adequate water supply for consumer usage and fire protection. The system shall meet all the requirements of the State Health Department, State Board of Fire Insurance and the requirements of this Ordinance.

5.1 General Requirements

5.1.1 Minimum supply flow rates shall be 750 gallons per minute and minimum anticipated pressures shall be 35 psi. It shall be the developers responsibility to construct and connect the developments water mains to the existing source outside the proposed development.

5.1.2 Water mains shall be constructed four feet behind the curb or from edge of road base and generally be located on the north and west sides of the proposed streets or at a location approved by the City Manager or his designee based on future considerations for accessibility to perform maintenance.

5.1.3 Water mains shall be a minimum 6 inches in diameter or larger as required for necessary normal consumption and fire protection.

5.1.4 Water mains shall be placed no closer than nine feet to a sanitary sewer main.

5.1.5 Valves shall be placed at all main junctions to allow isolation of mains along lateral streets. A valve shall be placed at 1000 foot intervals along long feeder mains.

5.1.6 Water mains shall be constructed a minimum of 4 feet below the proposed finish grade of the surface.

5.1.7 Right-of -way clearing and rough grading to within 6 inches of final grade shall be accomplished prior to installation of water mains, services and fire hydrants.

5.1.8 Where water mains are to be constructed outside the limits of the street right-of-way, the developer shall provide a 20 foot wide dedicated easement.

5.1.9 Water mains constructed within the extraterritorial jurisdiction of the City shall meet all the requirements of this Ordinance.

5.1.10 All construction and planning costs shall be the responsibility of the developer.

5.1.11 Other utilities disturbed or broken during construction operations shall be responsibility of the subdivider and shall be repaired to like-new condition immediately.

5.2 Constructions Requirements

Construction shall be in accordance with the applicable American Water Works Association (AWWA) Specifications, the State Health Department, the State Fire Insurance Board and this Ordinance.

5.2.1 Clearing and Grubbing shall consist of the removal and disposal of trees, stumps, brush, roots, vegetation, logs, rubbish and other objectionable matter. The permanent easement shall be cleared of brush, logs, rubbish, trees and shrubs. All cleared and grubbed material shall be disposed of outside the easement or right-of-way.

5.2.2 When burning of brush is permitted, the following shall govern:

5.2.2.1 The City Fire Department and the Texas Forestry Service shall be notified of the intention to burn before burning any brush or other debris. Brush piles and fires shall be controlled as to size to eliminate possible dangers of forest or grass fires.

5.2.2.2 Where construction is on new location, the brush shall be piled and burned in center of the right-of-way. No timber shall be cut or defaced outside the permanent easement.

5.2.3 Trenches

All utility lines shall be constructed in open cut trenches. Trenches shall be sheathed and braced to the extent necessary to maintain the sides of the trench in vertical position throughout the construction period. Adequacy of the sheathing and bracing shall be the responsibility of the developer.

The trench bottom shall be continuous, relatively smooth and free of rocks and shall be constructed to provide a firm, stable and uniform support for the full length of the pipe. Bell holes shall be provided at each joint to permit proper joint assembly and alignment.

5.2.4 Trench Safety Systems

The developer shall be required to furnish and utilize a trench safety system. The trench safety system utilized shall meet all requirements of the proposed amendments to OSHA rules and regulations 29 CFR 1926 Subpart P Excavations. This standard classifies soil types and the corresponding method of protection required, shoring, sloping, benching and blocking. If the method being used does not correspond with the soil type encountered then the developer must furnish the appropriate method.

5.2.5 Bedding

Bedding shall be required to bring the trench bottom up to grade. Precautions shall be taken to ensure that adequate and uniform support is provided under the pipe and to avoid differential settlement of the pipe.

Bedding Classes A, B, C, or D, as described in ASTM C 12-74 shall be used for all rigid pipe.

Pipe embedment is shown on the included drawing.

5.2.6 Backfill

Trenches shall be backfilled with materials selected form trench excavations or obtained from other sources, which is free from stones of such size as to interfere with compaction and is free form large lumps which will not break down readily under compaction. Any material retained on a 3 inch sieve, or material excavated in such a manner as to produce large lumps not easily broken down or which cannot spread in loose layers shall not be used. In general, material excavated by means of a trenching machine will meet the requirements above, provided large stones are not present.

The pipe shall be uniformly and continuously supported over its entire length on firm, stable material. Blocking shall not be used to change pipe grade or to intermittently support pipe across excavated sections.

After bedding has been prepared and the pipes installed as required by the pertinent specifications, selected materials from excavation or borrow shall be placed along both sides of the pipe equally in uniform layers not exceeding 6 inches in depth (loose measurement). If required, the backfill may be wetted and thoroughly compacted. Each side of the pipe shall be supported by a berm of thoroughly compacted material at least as wide as the external diameter of the pipe, except insofar as undisturbed material protrudes into this area.

Filling and/or backfilling shall be continued in this manner to a point at least 6 inches over the top of the pipe. Special care shall be taken to secure thorough compaction of the material placed under the hunches of the pipe. All fill or backfill below the top of the pipe shall be compacted in the manner prescribed regardless of whether or not such material is placed within the limits of the embankment, or roadbed.

5.2.7 Water Mains

Piping for water lines shall be of types and materials specified herein. The interior of the pipe shall be thoroughly cleaned of foreign matter before being lowered into the trench and shall be kept clean during laying operations by plugging or other approved method. The full length of each section of pipe shall rest solidly upon the pipe bed, with recesses excavated to accommodate bells and joints. Any pipe that has the grade or joint disturbed after laying shall be taken up and relaid. Pipe shall not be laid in water, or when trench or weather conditions are unsuitable for the work. When work is not in progress, open ends of pipe and fittings shall be securely closed so that no trench water, earth or other substances will enter the pipes or fittings. Any section of pipe found to be defective before or after laying shall be replaced with sound pipe. Where pipe ends are left for future connections, they shall be valved, plugged or capped. The pipe and accessories shall be new and unused.

5.2.7.1 Plastic Pipe

This section designates the requirements for Polyvinyl Chloride Plastic (PVC) Pipe.

5.2.7.1.1 Materials

The PVC pipe shall conform to all the requirements set forth in AWWA C900 and shall be Class 150 and have cast iron equivalent outside diameter.

5.2.7.1.2 Installation

All pipe shall be installed in accordance with ASTM D2774 and have a minimum cover of 48". Pipe may be bent to the minimum radius recommended by the manufacturer for the kind, type, grade, wall thickness and diameter of the specified pipe. During pipe lowering operations, care shall be taken to avoid imposing strains that will over stress or buckle the pipe.

PVC pipe shall be stored so as to prevent damage by crushing or piercing. If stored for any extended length of time, it shall be under cover and not in direct sunlight.

5.2.7.2 Ductile Iron Pipe

This section designates the requirements for ductile iron pipe.

5.2.7.2.1 Material

The ductile iron pipe shall conform to all requirements set forth in the American Water Works Association Standard C151 shall be class 50.

5.2.7.2.2 Installation

All pipe shall be installed in accordance with AWWA C600. Proper implements, tools and facilities shall be provided and used for the safe and convenient performance of the work. All pipe shall be lowered carefully into the trench by means of a derrick, ropes, or other suitable tools or equipment in such a manner as to prevent damage to the pipe. Under no circumstances shall the pipe be dropped or dumped into the trench. The trench shall be de-watered prior to installation of the pipe.

All lumps, blisters and excess coating shall be removed from the socket and plain ends of each pipe. The outside of the plain end and the inside of the bell shall be wiped clean and dry and be free form dirt, sand, grit or any other foreign material before the pipe is laid.

As each length of pipe is placed in the trench, the joint shall be assembled and the pipe brought to correct line and grade. The pipe shall then be secured in place with approved backfill material.

5.2.7.3 Connection of Existing System to Proposed Improvements

The developer shall provide all fittings and perform the necessary work associated with connection of the existing piping systems (lines currently in use) to the completed distribution lines proposed.

5.2.7.4 Cleanup

Upon completion of the installation of the water lines and all appurtenances, the developer shall remove all debris and surplus materials resulting from the work.

5.2.8 Valves and Fittings

5.2.8.1 Gate Valves

5.2.8.1.1 Materials

All gate valves shall be mechanical joint Mueller gate valves, or approved equal. Gate valves shall be designed for a minimum water working pressure of not less than 150 pounds per square inch and shall conform to the requirements of the American Water Works Association Standard C500.

Installation

Prior to installation, gate valves shall be inspected for direction of opening, freedom of operation, tightness of pressure containing bolting, cleanliness of valve parts and especially setting surfaces, handling damages and cracks.

Gate valves shall be set plumb. Where feasible, valves shall be located outside the paved areas of roads and streets.

5.2.8.2 Valve Boxes

A valve box shall be provided for every valve. The valve box shall not transmit shock or stress to the valve and shall be centered over the operating nut of the valve. The box cover shall be set flush with the surface of the finished areas.

5.2.8.3 Fittings

5.2.8.3.1 Materials

All fittings shall be ductile iron and of the size shown on the plans. All fittings shall conform to American Water Works Association Standard C110.

5.2.8.3.2. Installation

All fittings shall be installed in the locations designated on the plans. Any blocking required, as shown on the included plans, shall be installed prior to the backfilling operation.

5.2.8.4 Water Service Connections

The developer shall furnish and install a water service connection at each lot and in accordance with the detail drawing included herein.

5.2.9 Fire Hydrants

5.2.9.1 Materials

All fire hydrants shall conform to the requirements of the American Water Works Association Standard C502. All fire hydrants shall be Mueller Compression Type with two (2) 2½" hose outlets and one (1) 4½" pumper outlet. Nozzle threads shall conform to NFPA number 194 for National Standard Fire Hose Coupling Screw Threads. Fire hydrants shall be 6" diameter and dry barrel with mechanical joint inlet connections.

Nipples used for fire hydrant connection shall be 6" diameter ductile iron pipe Class 50 and shall conform to the requirements of the American Water Works Association Standard C151.

Gate valves, tees and retaining glands shall be 6" diameter mechanical joint.

5.2.9.2 Installation

Prior to installation, all hydrants shall be inspected for nozzle threading, operating nut and capnut dimensions, cleanliness, handling damage and cracks.

All hydrants shall stand plumb and shall have their hose nozzles parallel with the roadway with the pumper nozzle facing the roadway street.

Hydrants shall be set to the established grade, with the centerline of the lowest nozzle 18" above ground. Each hydrant shall be

connected to the main with a 6" mechanical joint tee and a 6" diameter ductile iron pipe controlled by a 6" Mueller Gate Valve.

The fire hydrant shall be blocked and shall have a drainage system as shown on the plans to prevent damage to the barrel caused by freezing.

5.2.10 Disinfecting and Testing

All lines constructed in accordance with this Ordinance shall be disinfected and tested prior to final acceptance.

5.2.10.1 Disinfecting

The developer shall disinfect the lines in accordance with AWWA C651 and may elect to "Slug" segments of the line during installation with granulated chlorine such as HTH or an approved equal. This method or any alternate shall be performed in accordance with and at the chlorine concentrations specified in the AWWA C601 Specification. The developer shall sample the water in the mains after the chlorinated water has been flushed and replaced with water from the supply system. These samples shall be submitted for bacteriological testing by an approved laboratory. Mains failing these tests shall be disinfected, flushed and retested.

5.2.10.2 Testing

The developer shall perform a hydrostatic test on all completed lines. Upon completion and approval of the disinfecting of the lines, the necessary valves shall be opened to allow system-pressure to be exerted on the newly constructed lines. Care shall be exercised to remove all entrapped air from lines by draining the entire segment being tested. This can be accomplished by opening the relief valves, fire hydrants, bleed valves or service connection valves located at the highest elevations along the line. Once all air has been removed from the lines and the valves closed, the working line pressure shall be measured with a gauge applied to a fitting at or near the highest elevation along the line. All valves required to isolate the segment being tested shall be closed. With the test segment isolated, an external pump and potable water supply shall be used to increase the test segment pressure. Leakage, shall not exceed 10 gallons per inch of pipe diameter per mile of pipe per 24 hours when tested at 1½ times the working pressure.

Any line segment being tested that fails to meet the allowable pressure loss or leakage requirements established herein and by the AWWA C600 Specification shall be rejected. The developer shall repair any rejected segment, redisinfect the segment and retest the segment.

6. SANITARY SEWER

The proposed subdivision shall be served by an adequate sanitary sewer system and meet all the requirements of the Texas Natural Resources Conservation Commission and this Ordinance.

6.1 General Requirements

6.1.1 Sewer mains shall be constructed four feet behind the curb or road bed and generally located on the south and east sides of the proposed streets or at a location approved by the City Manager or his designee based on future considerations for accessibility to perform maintenance.

6.1.2 Sewer mains shall be a minimum of 6 inches in diameter or larger as required for design flows.

6.1.3 Sewer mains shall be placed no closer than nine feet to a water main. When a sewer main crosses a water main, the sewer main must be encased.

6.1.4 Manholes shall be placed at all sewer main junctions to allow for clean out. A manhole shall be placed at 500 foot intervals along long sewer mains.

6.1.5 Sewer mains shall be constructed such that the outer end of the service pipe is a minimum of 4 feet below the finished curb grade or edge of road bed fronting each lot in the development or at a depth approved by the City Manager or designee in certain circumstances.

6.1.6 Right-of-way clearing and rough grading to within 6 inches of final grade shall be accomplished prior to installation of manholes, cleanouts and services.

Where sewer mains are to be constructed outside the limits of the street right-of-way, the developer shall provide a 20 foot wide dedicated easement.

6.1.7 Sewer mains constructed within the extraterritorial jurisdiction of the City shall meet all the requirements of this Ordinance.

6.1.8 All construction and planning costs shall be the responsibility of the developer.

6.1.9 Other utilities disturbed or broken during construction shall be the responsibility of the developer and shall be repaired to like-new condition immediately.

6.1.10 All sewers shall be designed and constructed to give a velocity when flowing full of not less than 2 feet per second. The following shall be the minimum acceptable slopes:

Inside Diameter of Pipe	Fall in Feet Per 100 Feet of Sewer
6	0.50
8	0.33
10	0.25
12	0.20
15	0.15
18	0.11
24	0.08
30	0.055

6.1.11 Flow rates for sizing the sewer mains shall be established using the following table (peak flows):

Source	Daily Sewage Flow-Gallons Per Person	Number of Persons Per Residence	Peak Flow-Gallons Per Day
Residential	100	3	1200
Trailer Park	50	2½	500
Mobile Homes	75	3	900
School	20		
Office Building	20		
Factory	20		
Motel	50		
Hospital	200 per bed		
Nursing Home	100 per bed		
Restaurant	5 per meal		
Industrial	based on water consumption		

6.2 Construction Requirements

Construction shall be in accordance with the Texas Department of Health and this Ordinance. Sewer lines shall be designed considering the estimated contributory population to be served in the future, plus adequate allowance for institutional and

commercial flows. Strict attention shall be given to minimizing infiltration and inflow into the system.

6.2.1 Clearing and Grubbing

Shall consist of the same requirements established herein for water mains.

6.2.2 Burning of Brush

Shall consist of the same requirements established herein for water mains.

6.2.3 Trenches

Shall consist of the same requirements established herein for water mains.

6.2.4 Trench Safety Systems

Shall consist of the same requirements established herein for water mains.

6.2.5 Bedding

Bedding shall be required to bring the trench bottom up to grade. Precautions shall be taken to ensure that adequate and uniform support is provided under the pipe and to avoid differential settlement of the pipe.

Bedding Classes A, B, C, or D, as described in ASTM C12 shall be used for all rigid pipe.

Bedding Material Classes I, II or III as described in ASTM D2321 shall be used for all flexible and semi-rigid pipe.

6.2.6 Backfilling

Shall consist of the same requirements established herein for water mains.

6.2.7 Sewer Line Piping and Fittings

Piping for sewer lines shall be of types and materials specified herein. The interior of the pipe shall be thoroughly cleaned of foreign matter before being lowered into the trench and shall be kept clean during laying operations by plugging or other approved method. The full length of each section of pipe shall rest solidly upon the pipe bed with recesses excavated to accommodate bells and joints. Any pipe that has the grade or joint disturbed after laying shall be taken up and relaid. Pipe shall not be laid in water or when trench or

weather conditions are unsuitable for the work. When work is not in progress, open ends of pipe and fitting shall be securely closed so that no trench water, earth or other substances will enter the pipes or fittings. Any section of pipe found to be defective before or after laying shall be replaced with sound pipe. Where pipe ends are left for future connections, they shall be plugged or capped.

6.2.7.1 Plastic Pipe and Fittings

This sections designates the requirements for Polyvinyl Chloride Plastic (PVC) Pipe and fittings.

PVC pipe and fittings, sizes 4 inches and larger in diameter, shall conform to all the requirements set forth in ASTM D3034 with a SDR of 35.

All PVC pipe and fittings shall be installed in accordance with Section III, ASTM D2321-72, utilizing Class I material for embedment. Pipe shall be bent to the minimum radius recommended by the manufacturer for the kind, type, grade, wall thickness and diameter of the specified type. During pipe lowering operations, care shall be taken to avoid imposing strains that will over stress or buckle the pipe. Seal lubricant shall be applied in accordance with the pipe manufacturer's recommendations.

PVC pipe shall be stored so as to prevent damage by crushing or piercing. Is stored for any extended length of time, it shall be under cover and not in direct sunlight.

6.2.8 Service Connections

Service Connections shall be supplied and installed in accordance with this section, the applicable detail drawings and at all lots within the proposed development.

All materials used for service connections shall be 4 inch PVC sewer pipe and fittings, ASTM D3034 with a SDR of 35.

All service connections shall be installed in accordance with ASTM D2321 and the applicable detail drawings included. Any special adaptors required for connection of these service connections to any rigid or semi-flexible pipe shall also be furnished.

A ⅜ inch diameter steel rod shall be placed at the outboard end of each sewer service and extend vertically and terminate a minimum of 12 inches above the finished grade of the backfilled trench. This rod will serve as a marker for locating the end of the service connection. Care shall be exercised during the backfill operations to assure these markers are installed plumb. The upper end of the rod shall be formed to resemble an eye bolt to preclude possible injury to persons residing in the area.

6.2.9 Cleanouts

Cleanouts shall be supplied and installed in accordance with this section and the included detail drawings.

All materials used for cleanouts shall be 6 inch PVC sewer pipe and fittings in accordance with ASTM D3034 with an SDR of 35.

All sewer cleanouts shall be installed in accordance with ASTM D2321 and the applicable detail drawings. Any special adaptors required for connection of these sewer cleanouts to any rigid or semi-flexible pipe shall be furnished by the developer.

6.2.10 Creek and Ditch Crossing

All sewer lines crossing creeks or drainage ditches shall be encased with ¼ inch thick wall steel tubing. The encasement shall be anchored on both ends by concrete blocking.

6.2.11 Manholes

Manholes shall be precast or poured in place concrete type.

Precast reinforced concrete manholes shall conform to all requirements set forth in ASTM C478.

Poured-in-place manholes may be used in lieu of precast manholes. The base, wall and cover shall be poured and vibrated to assure a monolithic structure free from infiltration. All concrete shall have an average compressive strength at 28 days equal to or greater than 4,000 psi.

The concrete base for precast manholes shall have an average compressive strength at 28 days equal to or greater than 3,000 psi. The base shall be poured and vibrated to assure a structure free from infiltration.

The invert of standard manholes shall be formed in a pattern typical of the wall construction.

Flow channels equivalent to the diameter of the pipe shall be formed with concrete then troweled to a smooth, even finish with a steel trowel.

The manhole bottom from wall line to flow channels shall be sloped and troweled smooth on a grade of 1 inch/foot with a liberal radius applied at flow channel intercepts.

All manholes shall have a 300 pound cast iron ring and cover installed in accordance with the detail drawing included herein. Manhole covers with pick slots shall be used in all locations.

6.2.12 Sewer Piping Systems Test

All pipes carrying wastewater by means of gravity flow shall be tested as follows:

All lines shall be flushed.

Low pressure air testing shall be the method used to test all the sewer piping.

The developer shall apply the required test pressure to the piping system.

During air testing, the developer shall plug each end of the section being tested and apply 3.5 psi for the time period indicated in the following table:

Pipe Diameter	Time Minutes
4"	2
6"	3
8"	4
10"	5
12"	6
15"	7
18"	9
21"	10
24"	11

The maximum pressure loss shall not exceed ½ psi. Any line that loses more than ½ psi shall be repaired and retested.

7. DRAWINGS

TYPICAL STREET SECTION W/O CURB & GUTTER

NTS

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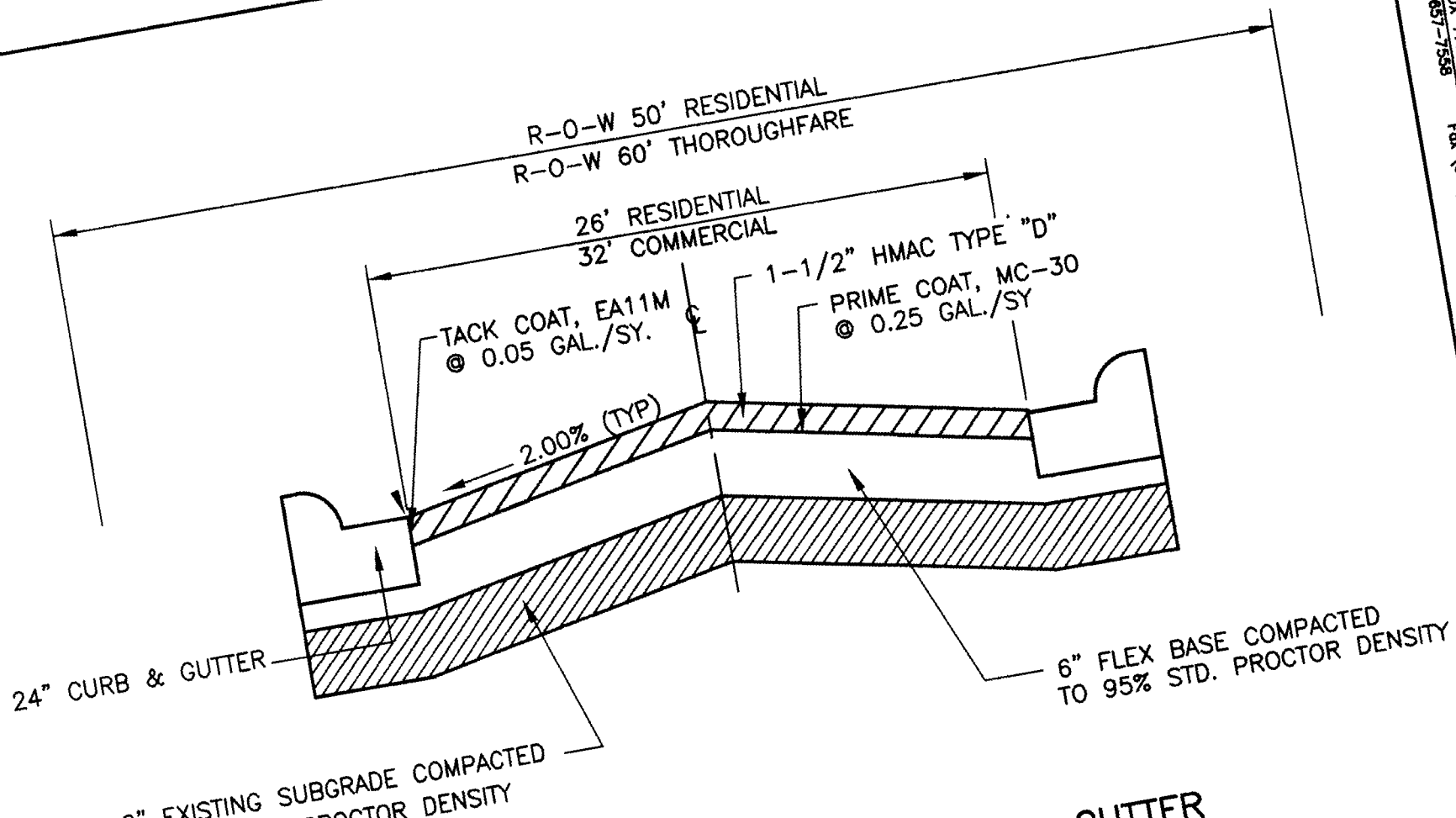
CITY OF CENTER

TYPICAL STREET SECTION

DWG NO. 1



TYPICAL STREET SECTION W/ CURB & GUTTER

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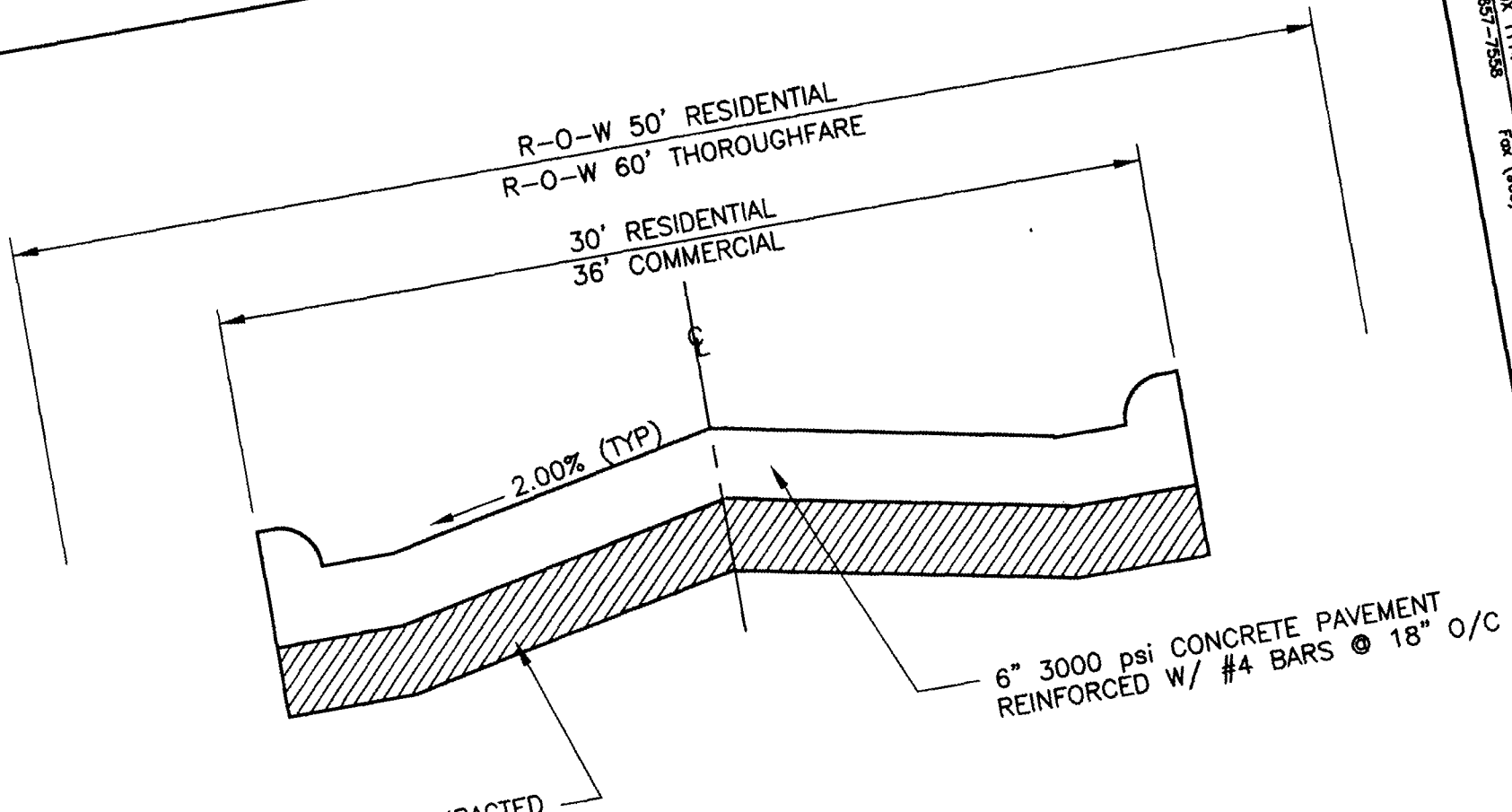
CITY OF CENTER

TYPICAL STREET SECTION

NO. 2



TYPICAL CONCRETE STREET SECTION

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CITY OF CENTER

TYPICAL STREET SECTION

NO. 3

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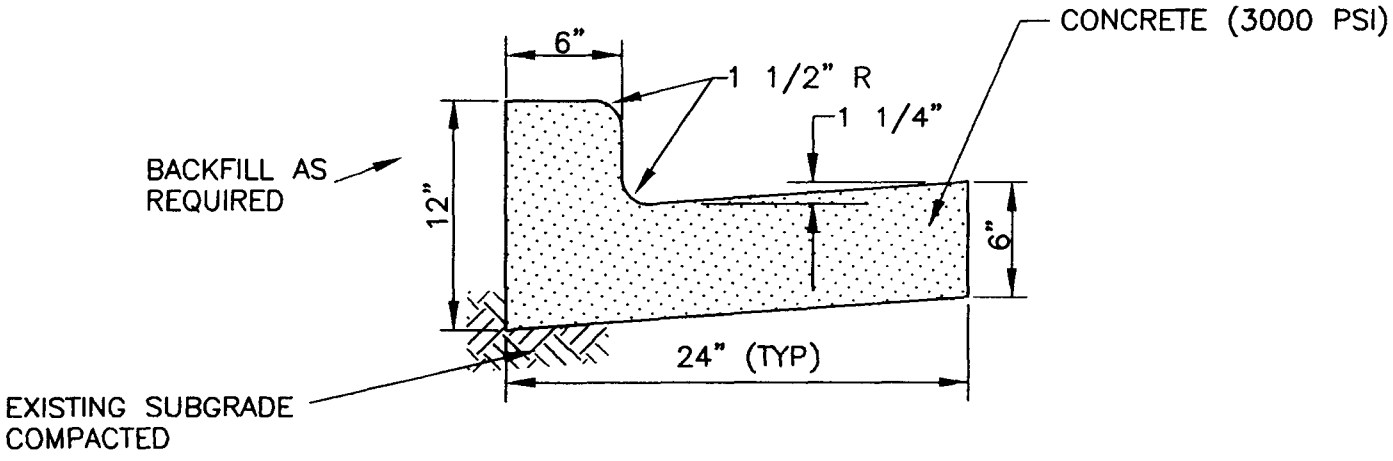
CITY OF CENTER

CURB & GUTTER

DWG NO. 4



TYPICAL SECTION

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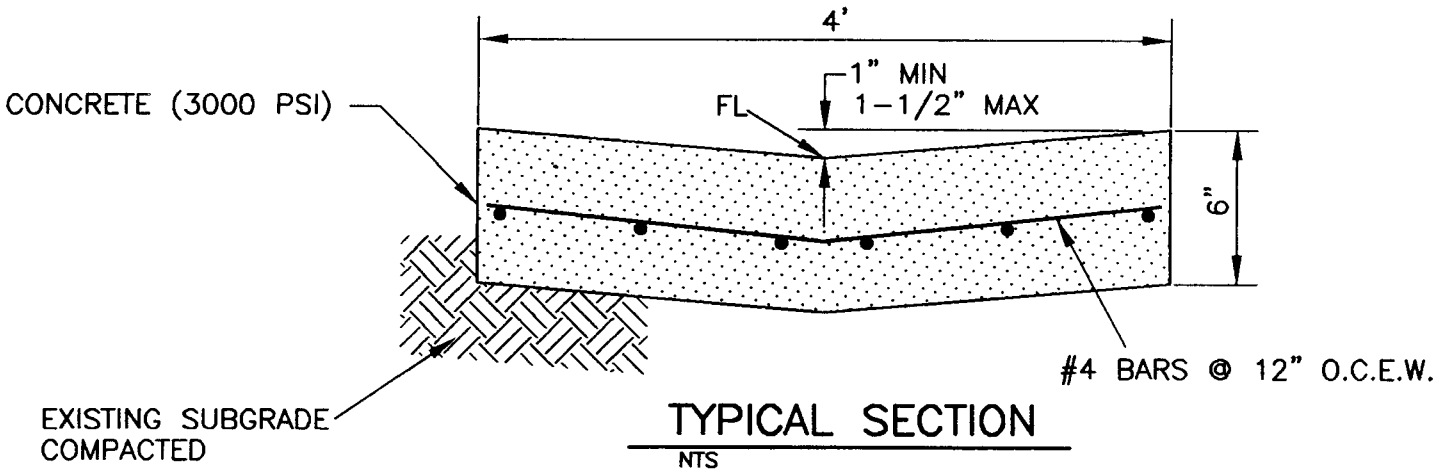
CITY OF CENTER

4' VALLEY GUTTER

DWG NO. 5



TYPICAL SECTION

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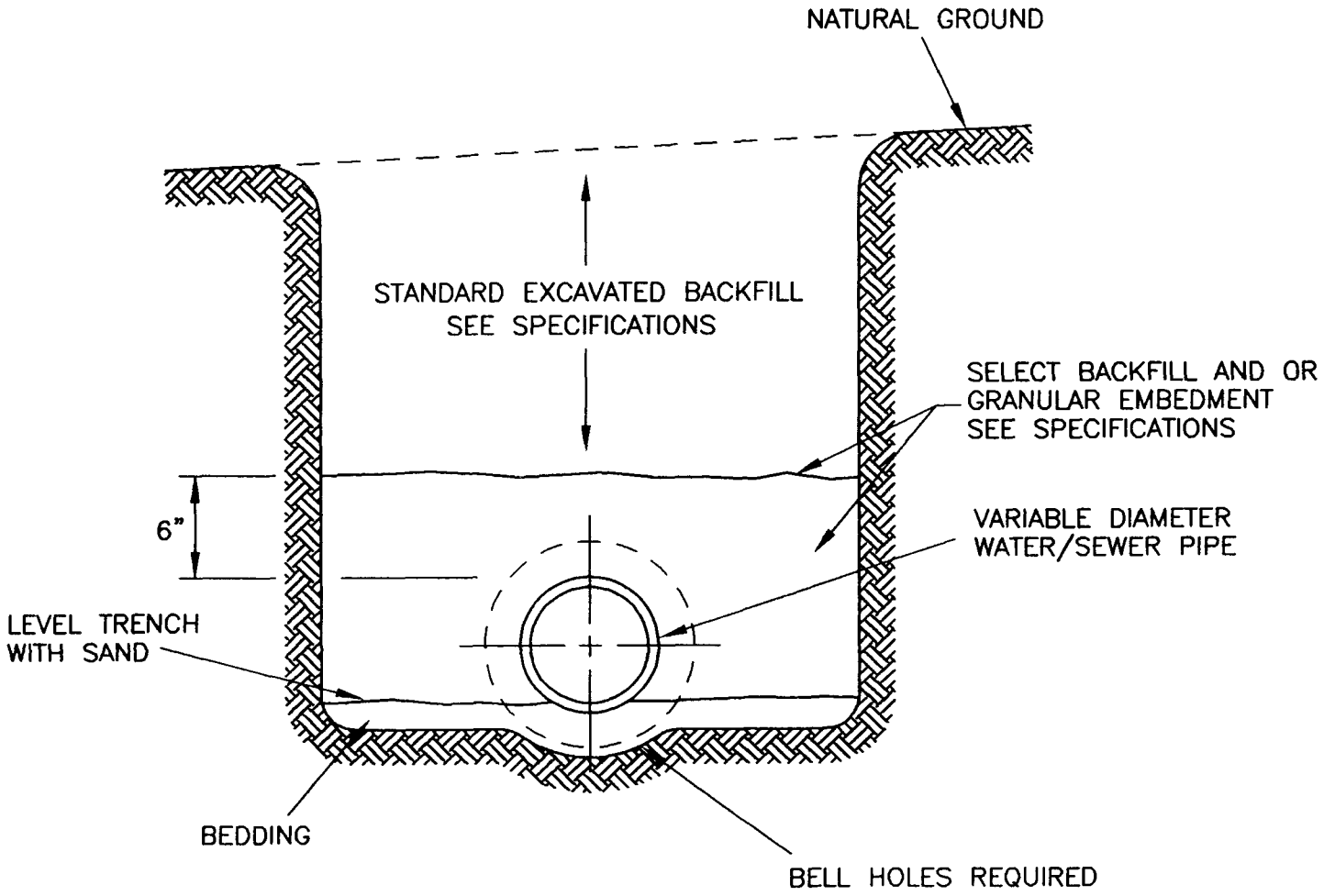
CITY OF CENTER

PIPE EMBEDMENT DETAIL

DWG NO. 6



PIPE EMBEDMENT SECTION

85932611

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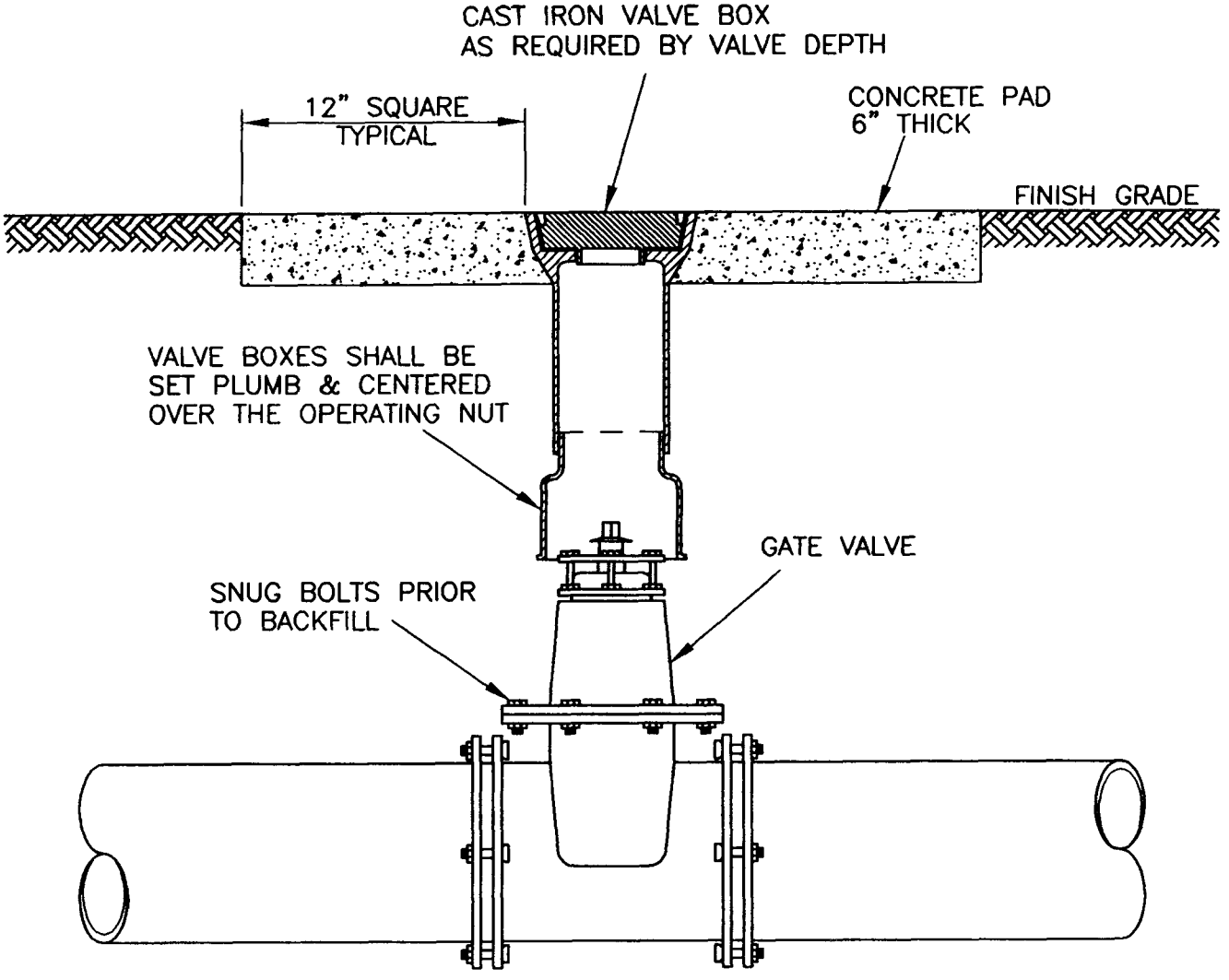
CITY OF CENTER

GATE VALVE INSTALLATIONS

DWG NO. 7



TYPICAL SECTION

NOTE:

SEE SPECIAL DETAIL FOR VALVES TO BE INSTALLED IN STREETS TO BE PAVED

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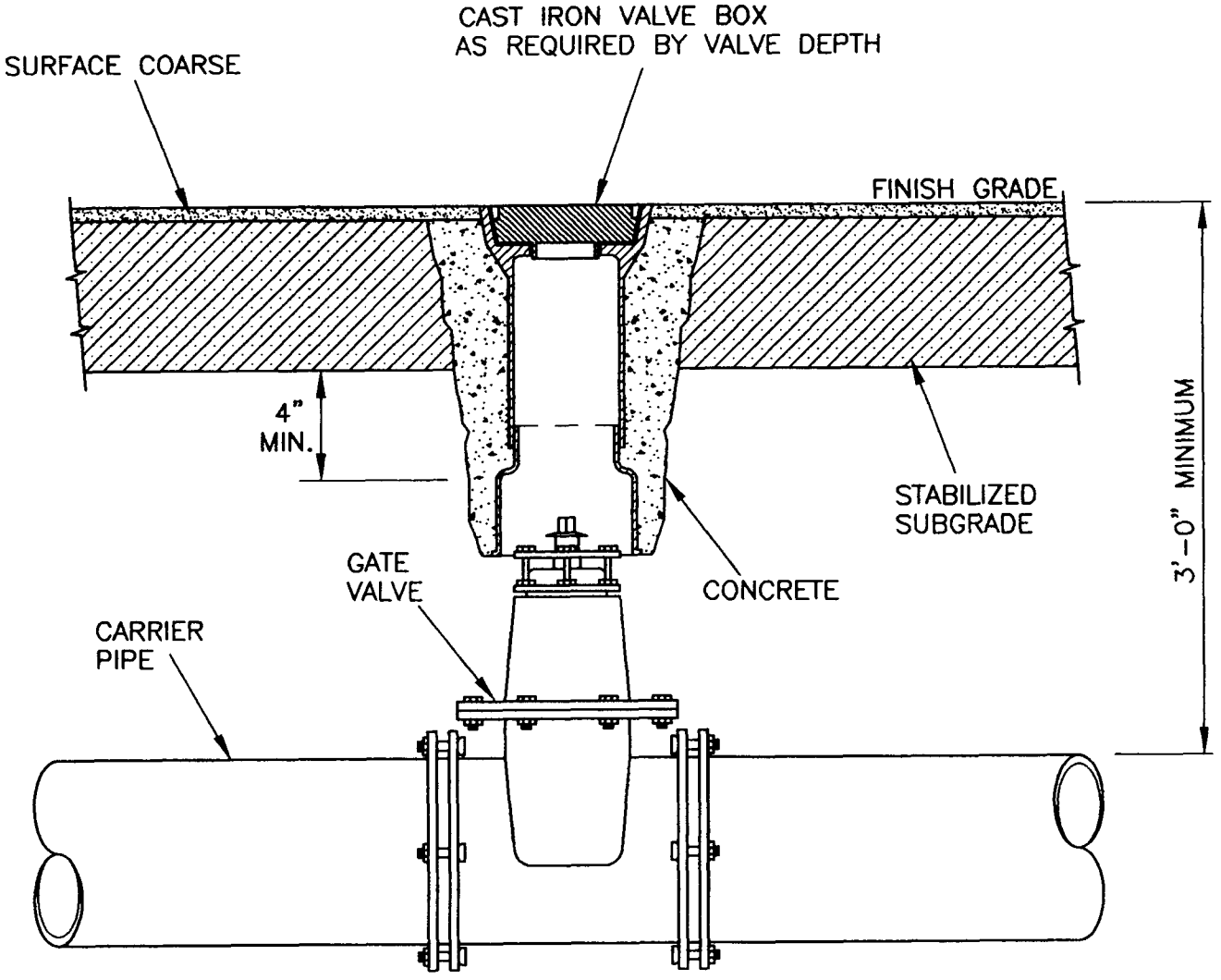
CITY OF CENTER

GATE VALVE INSTALLATIONS IN PAVED STREETS

DWG NO. 8



TYPICAL SECTION

CONSTRUCTION SEQUENCE

1. INSTALL GATE VALVE AND BACKFILL TO STREET SUBGRADE.
2. LIME STABILIZE SUBGRADE.
3. DIG OUT AND INSTALL VALVE BOX TO MATCH EXISTING PAVING GRADE.
4. BACKFILL TO TOP OF LIME STABILIZED SUBGRADE WITH CONCRETE.
5. INSTALL PAVING.

NOTE:
VALVE BOX SHALL BE SET PLUMB AND CENTERED OVER THE OPERATING NUT. SNUG ALL VALVE BOLTS PRIOR TO BACKFILL.

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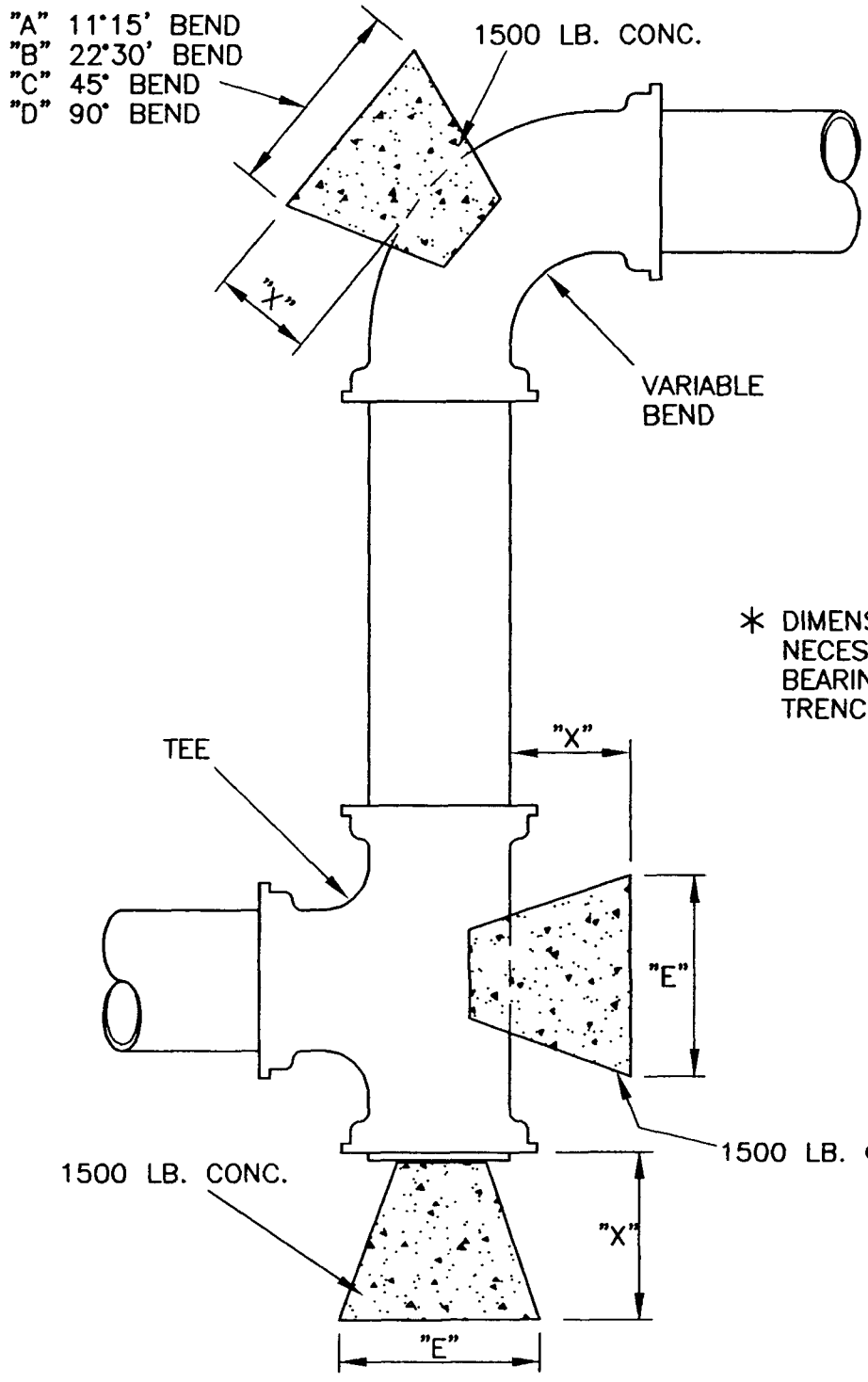
CITY OF CENTER

SCHEDULE OF HORIZONTAL BLOCKING

DWG NO. 9



* DIMENSION "X" MAY VARY IF NECESSARY TO PROVIDE BEARING AGAINST UNDISTURBED TRENCH WALL

PIPE SIZE	X * DIM	11°15'		22°30'		45°		90°		TEE & PLUG	
		"A"	MIN. AREA	"B"	MIN. AREA	"C"	MIN. AREA	"D"	MIN. AREA	"E"	MIN. AREA
4"	1'	11"	.8'	1'-0"	.9'	1'-0"	.9'	1'-0"	.9'	1'-2"	.6'
6"	1.5'	11"	.8'	1'-0"	.9'	1'-1"	1.1'	1'-9"	3'	1'-3"	1.4'
8"	1.5'	11"	.8'	1'-0"	.9'	1'-5"	2.0'	1'-11"	3.5'	1'-7"	2.5'
10"	1.5'	11"	.8'	1'-3"	1.6'	1'-10"	3.2'	2'-3"	5.6'	2'-0"	4'
12"	1.5'	1'-2"	1.2'	1'-6"	2.3'	2'-2"	4.5'	2'-10"	8'	2'-5"	5.7'
16"	2'	1'-5"	2.0'	2'-0"	4.0'	2'-10"	8.0'	3'-9"	14.1'	3'-2"	10'
20"	2'	1'-9"	3.1'	2'-7"	6.2'	3'-6"	12.4'	4'-9"	22'	3'-11"	15.6'
24"	2'	2'-2"	4.5'	3'-0"	9.0'	4'-3"	18.1'	5'-8"	32'	4'-9"	22.6'
30"	2.5'	2'-8"	7.1'	3'-10"	14.2'	5'-4"	28.2'	7'-1"	49.8'	5'-11"	35.3'

80960401

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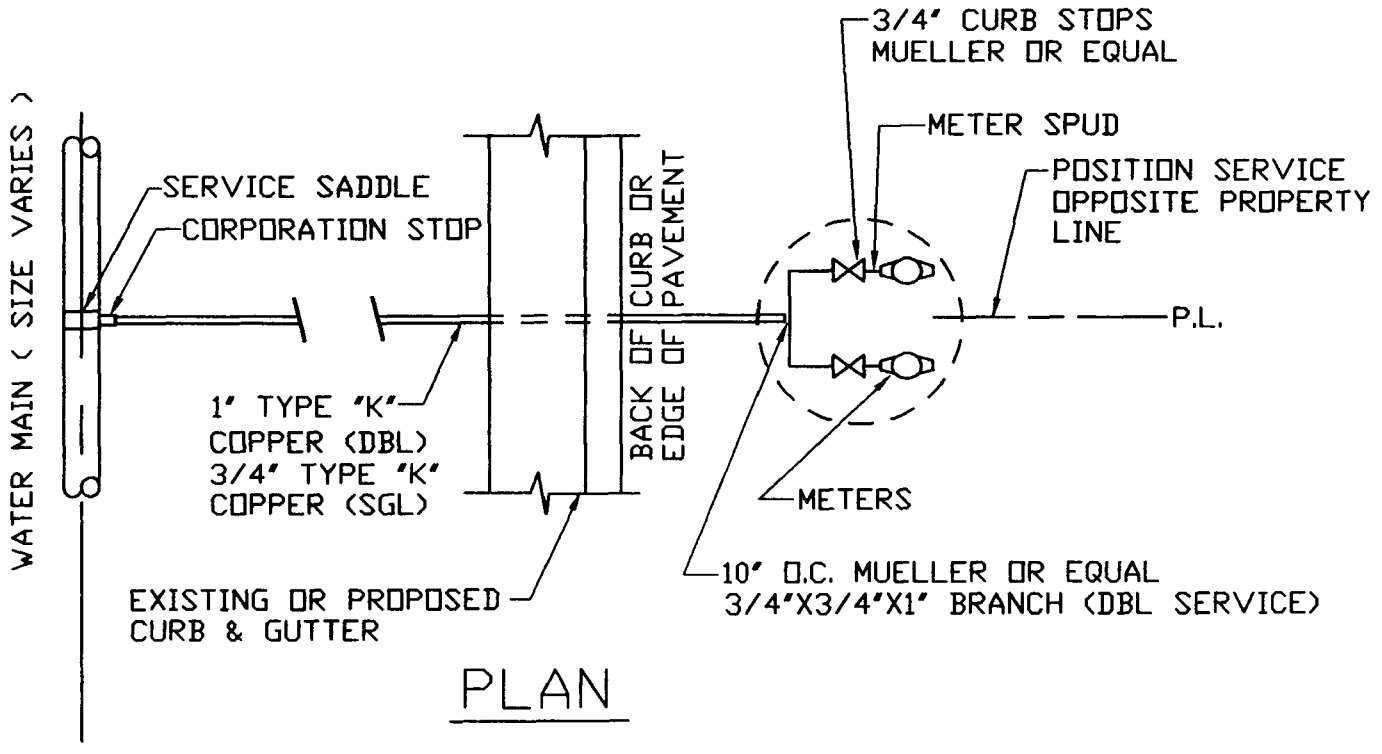
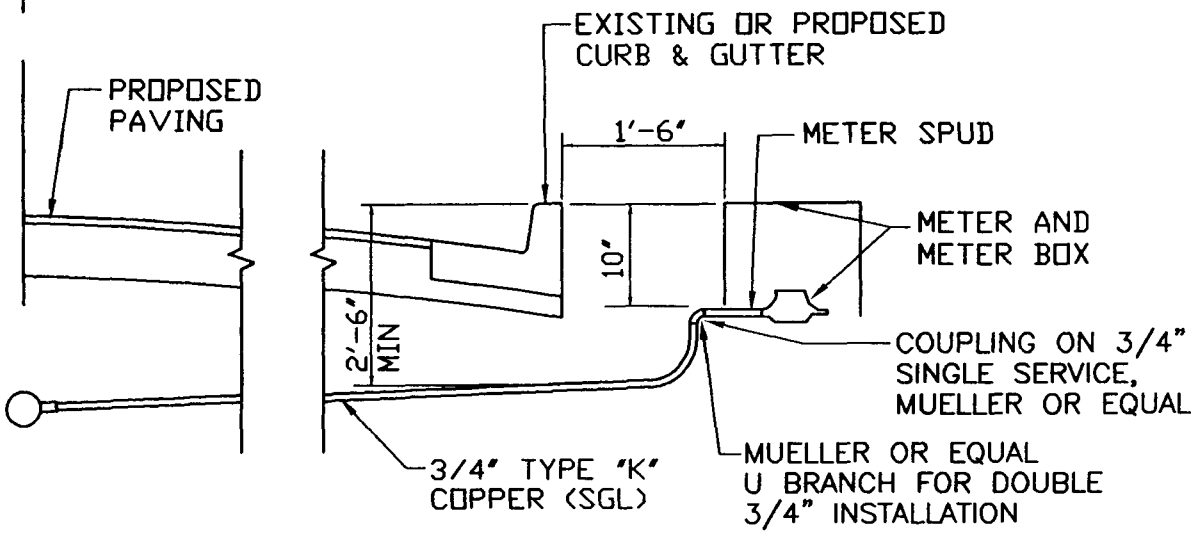
CITY OF CENTER

WATER SYSTEM STANDARDS

DWG NO. 10



PLAN



PROFILE - SINGLE AND DOUBLE WATER SERVICE DETAIL

NOTE: DEVELOPER SHALL HAVE SERVICE INSTALLED FROM THE MAIN TO THE CURB STOP AS DETAILED.
METERS AND METER BOXES WILL BE INSTALLED BY CITY AT DEVELOPERS EXPENSE.

80960902

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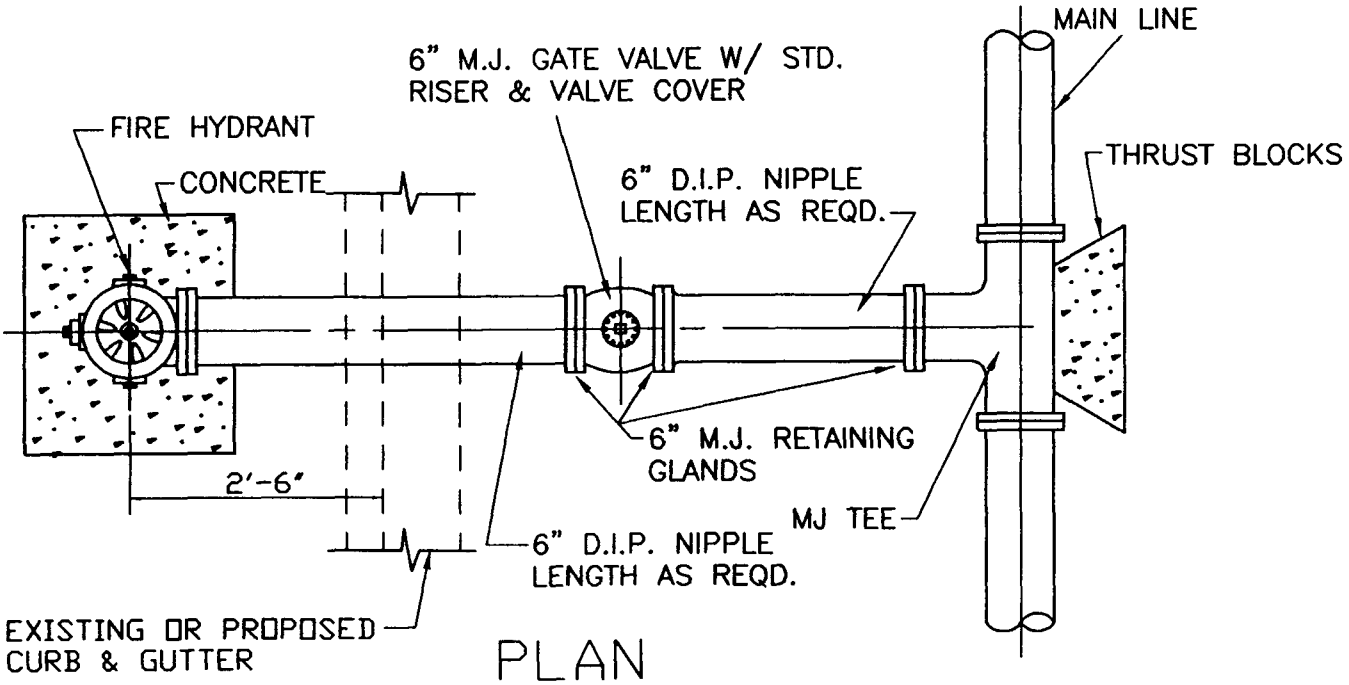
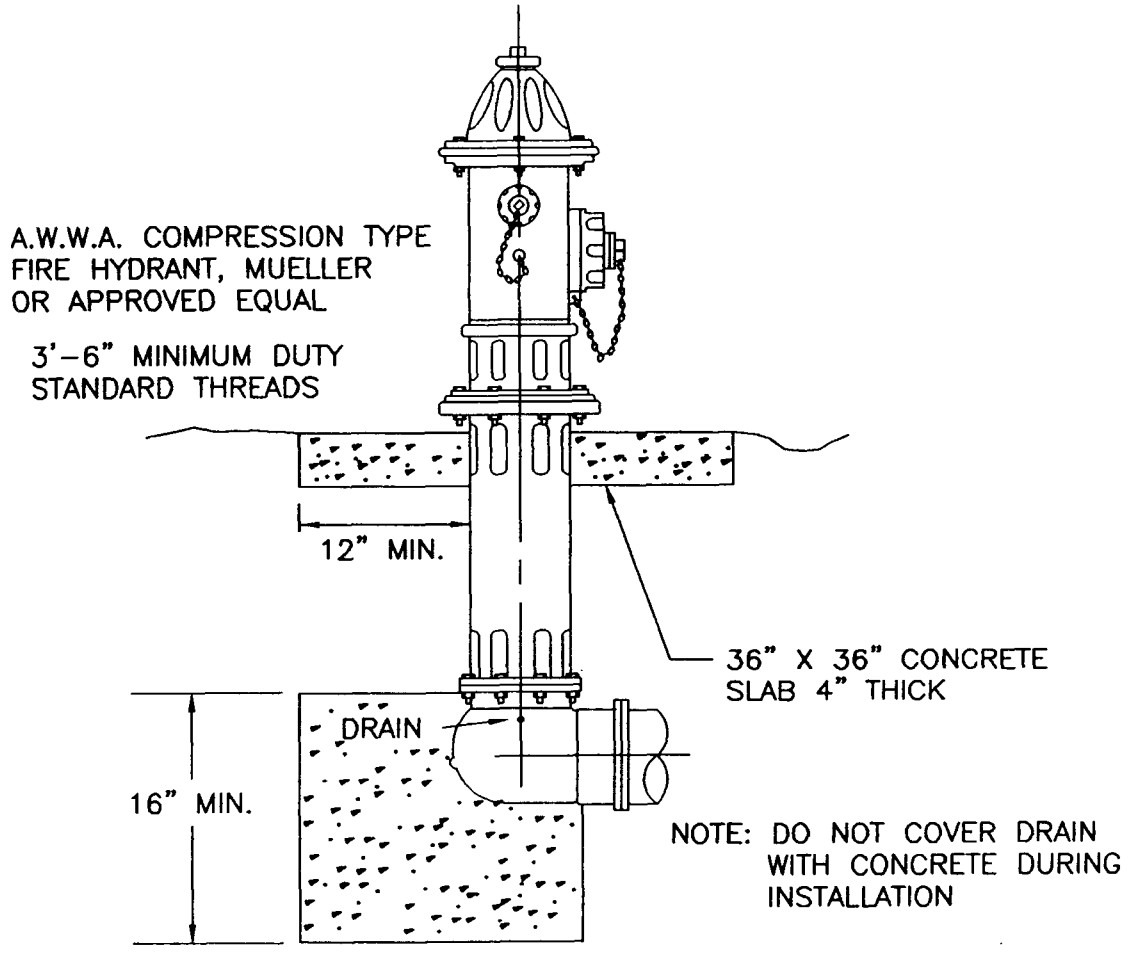
CITY OF CENTER

WATER SYSTEM STANDARDS

DWG NO. 11



PLAN



NOTE: DO NOT COVER DRAIN WITH CONCRETE DURING INSTALLATION

TYPICAL FIRE HYDRANT ASSEMBLY

809604Q2

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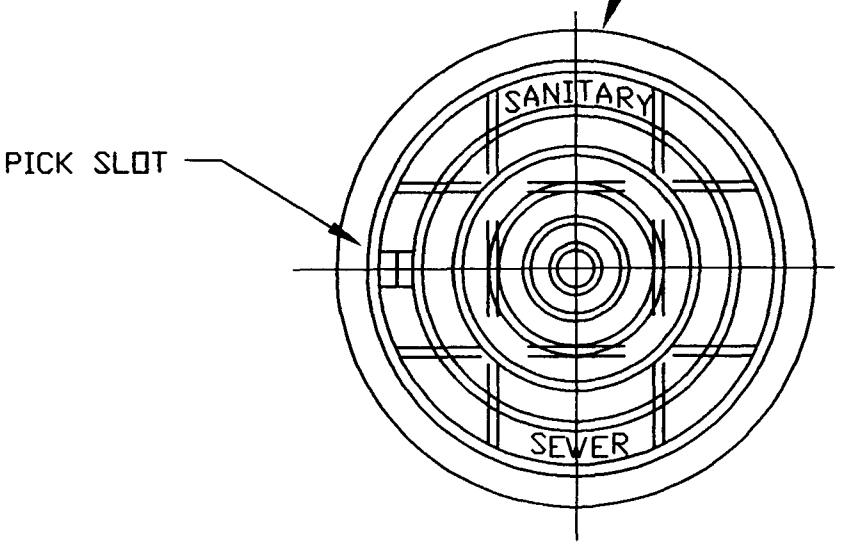
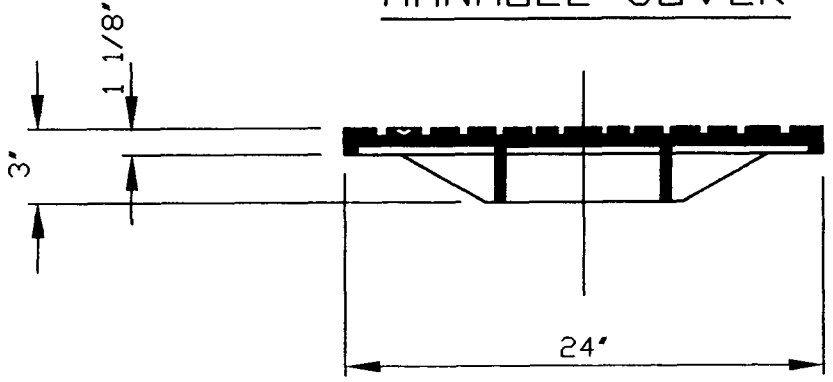
SEWER STANDARDS

DWG NO. 12

STANDARD, 300LB. CAST IRON RING & COVER FOR MANHOLES SHALL BE FURNISHED AND INSTALLED BY CONTRACTOR.



MANHOLE COVER

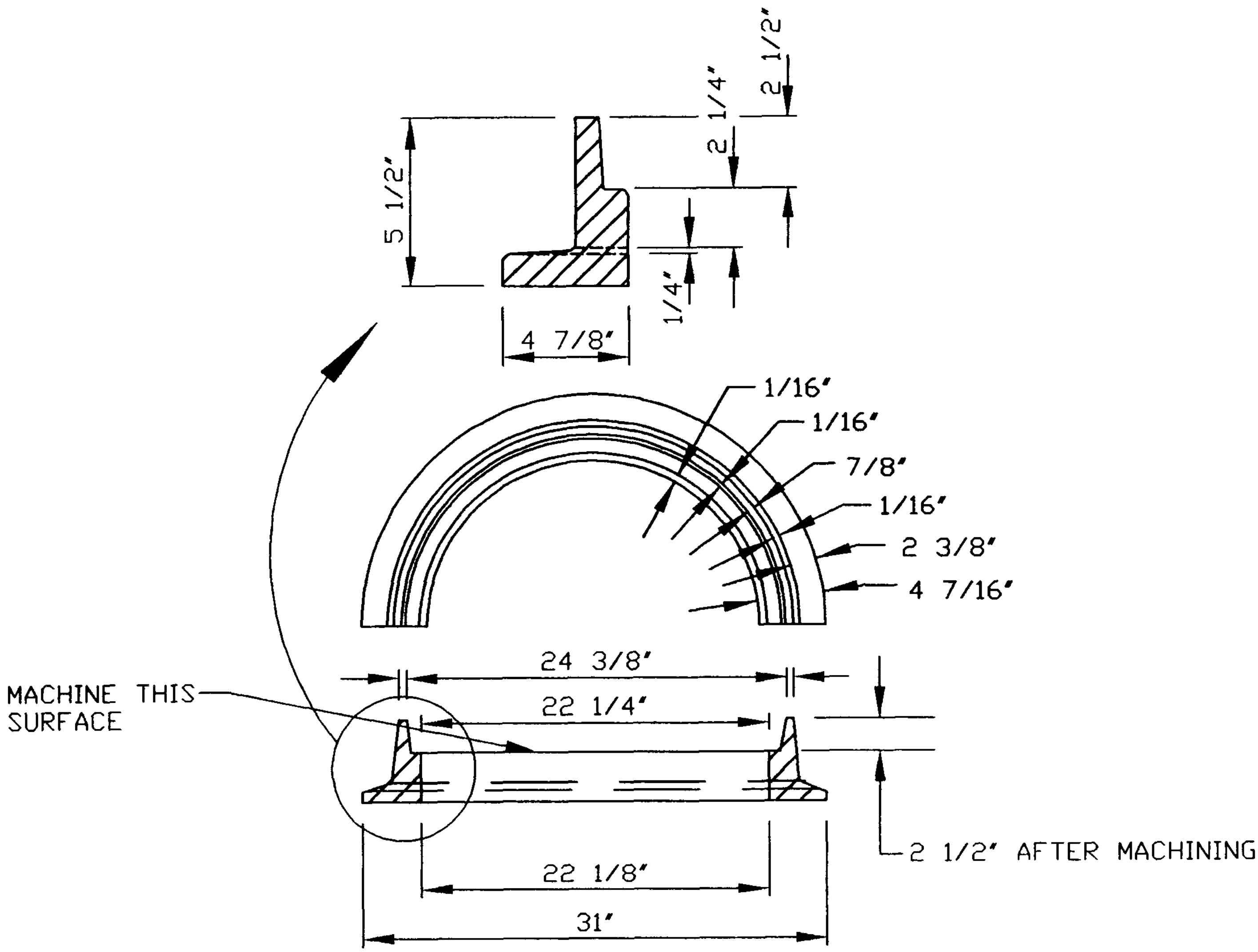


SECTION OF COVER

NOTES:

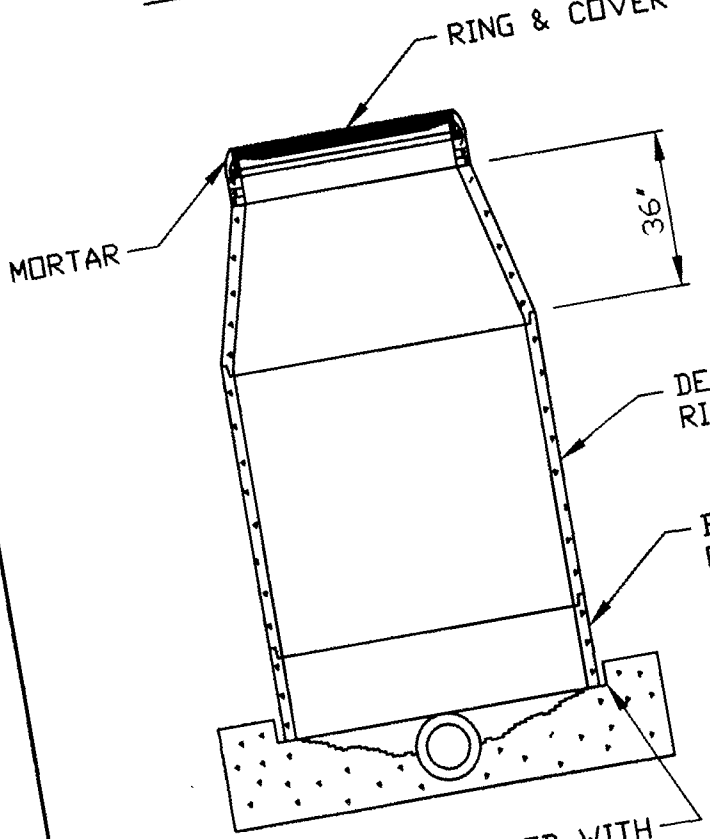
1. WHERE DESIGNATED IN THE PLANS PRESSURE TYPE M. H. RING & COVER WILL BE USED IN LIEU OF STANDARD. NO SEPARATE BID ITEM WILL BE MADE FOR FURNISHING PRESSURE TYPE M. H. RING & COVER.

STOKES & ASSOCIATES, INC. CONSULTANT ENGINEERS P.O. BOX 1114 HENDERSON, TEXAS 75653 (903) 657-7558 Fax (903) 657-7864	CITY OF CENTER SEWER STANDARDS	DWG NO. 13

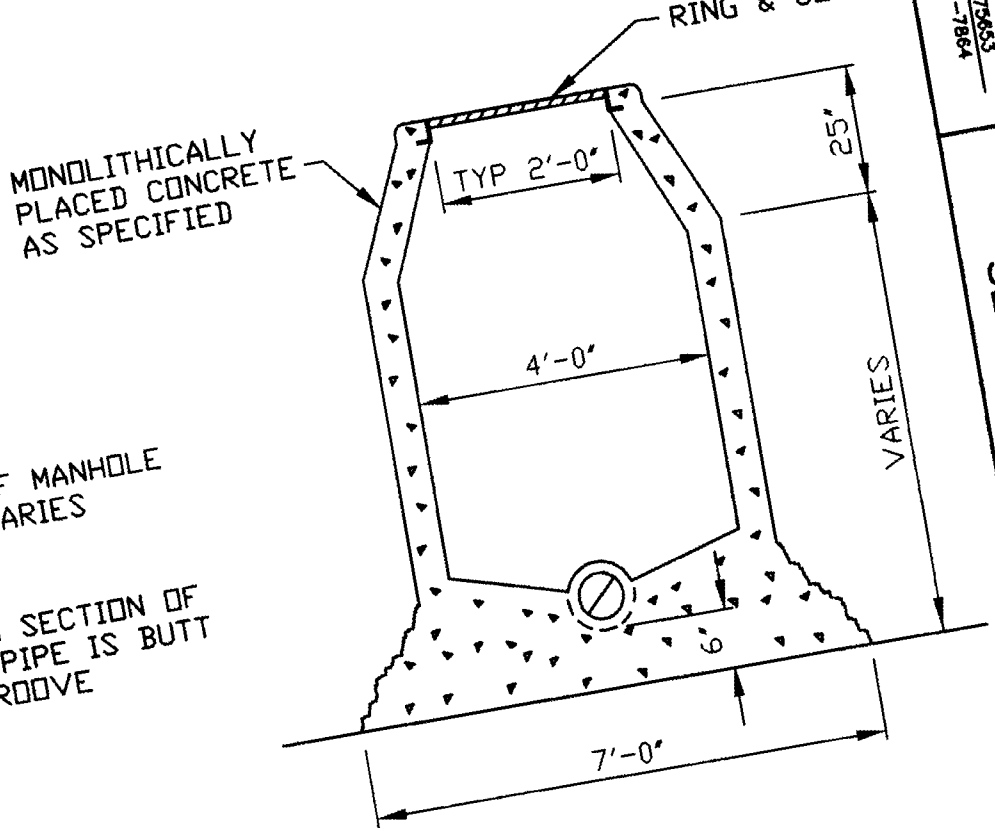


HALF PLAN & SECTION OF RING

48" PRECAST CONCRETE MANHOLE CONCENTRIC CONE TONGUE & GROOVE JOINTS



STANDARD CAST-IN-PLACE MANHOLE



NOTE:

1. TYPICAL FOR ALL MANHOLE INSTALLATIONS, BREAK OUT TOP HALF OF PIPE AFTER INVERT IS POURED.

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CITY OF CENTER

SEWER STANDARDS

NO. 14

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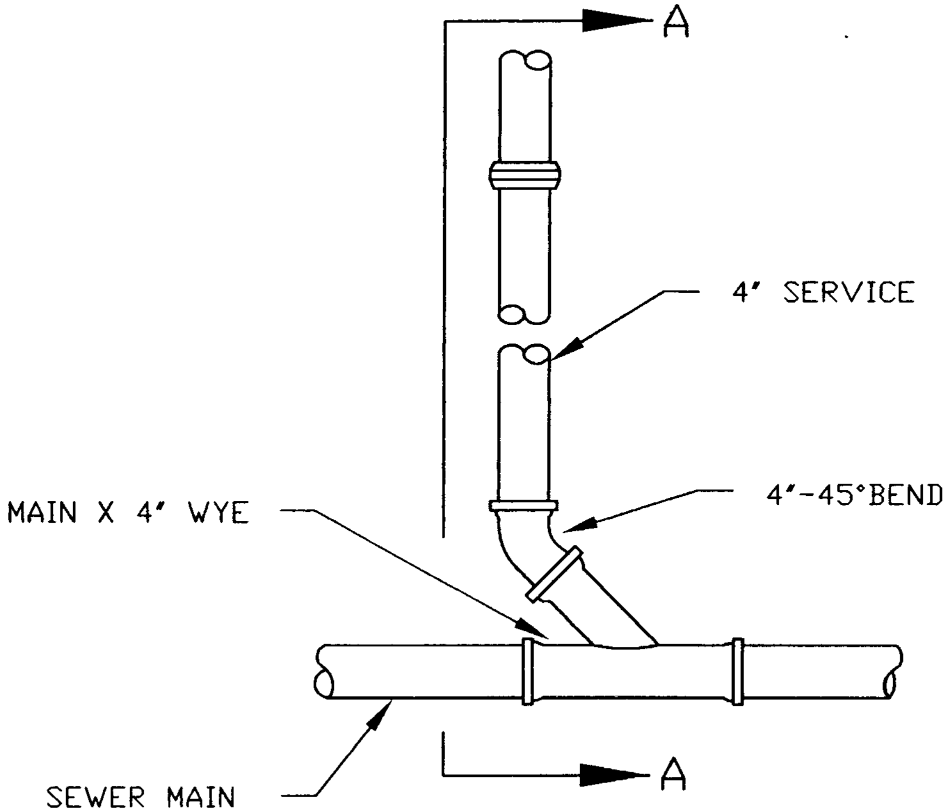
CITY OF CENTER

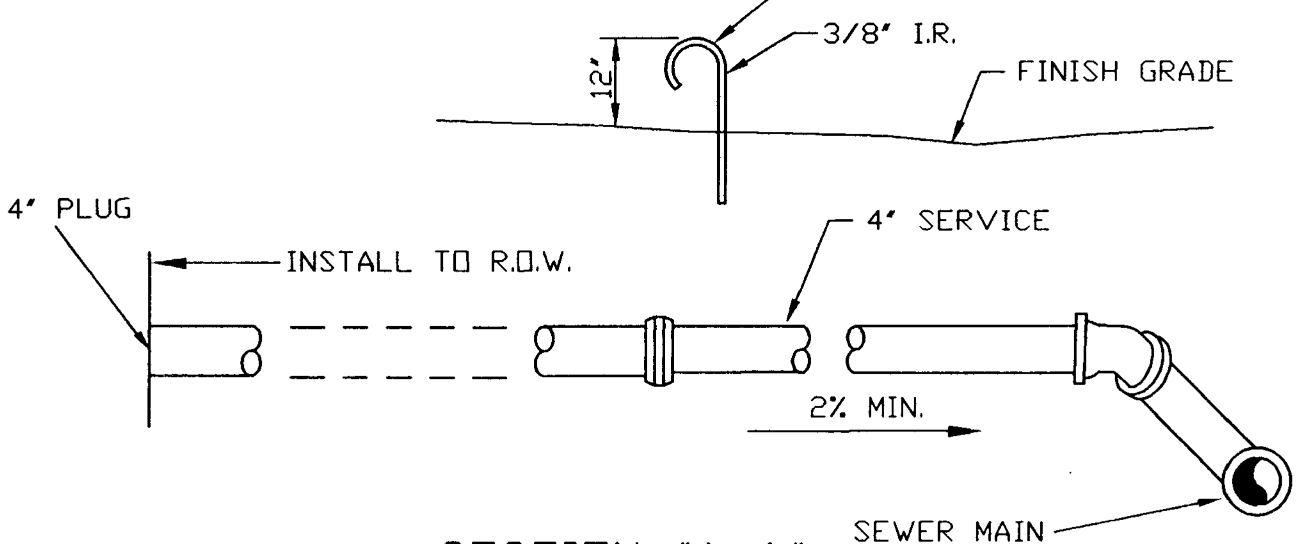
SEWER STANDARDS

DWG NO. 15



TYPICAL SERVICE CONNECTION

NOTE:
THE CONTRACTOR SHALL INSTALL A 3/8" STEEL ROD AT THE OUTBOARD END OF THE INSTALLED SERVICE CONNECTION. THIS ROD SHALL EXTEND VERTICALLY AND TERMINATE 12" ABOVE THE TRENCH BACKFILL FINISHED GRADE. THIS ROD WILL SERVE AS A LOCATOR FOR THE SERVICE. THE END OF THE EXPOSED ROD SHALL BE FORMED IN A CIRCULAR SHAPE FOR SAFETY PURPOSES AS SHOWN.



SECTION "A-A"

80960402

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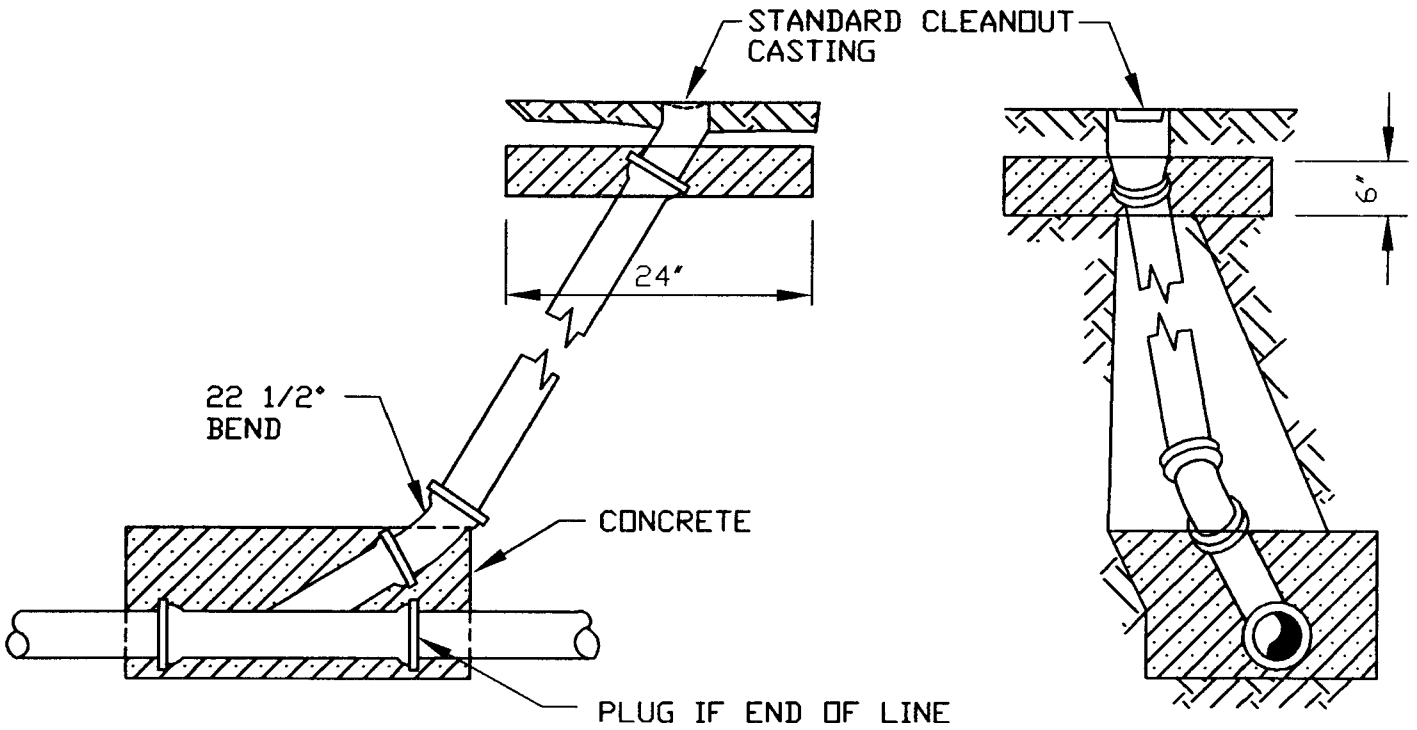
CITY OF CENTER

SEWER STANDARDS

DWG NO. 16



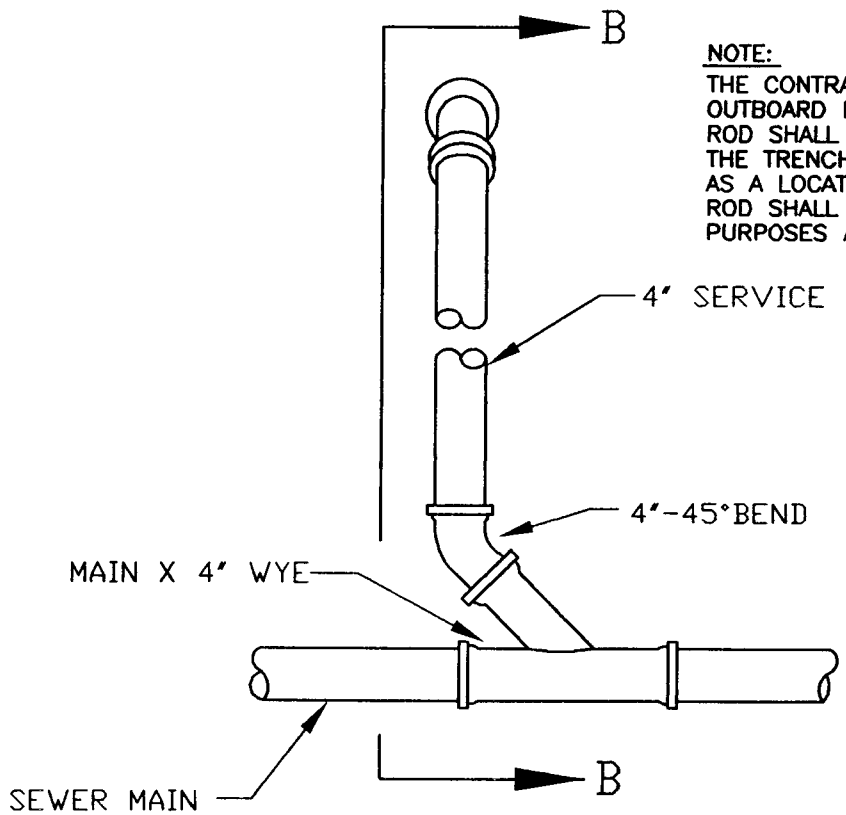
CLEANOUT DETAIL

S&A STOKES & ASSOCIATES, INC.
CONSULTANT ENGINEERS
P.O. BOX 1114 HENDERSON, TEXAS 75653
(903) 657-7558 Fax (903) 657-7864

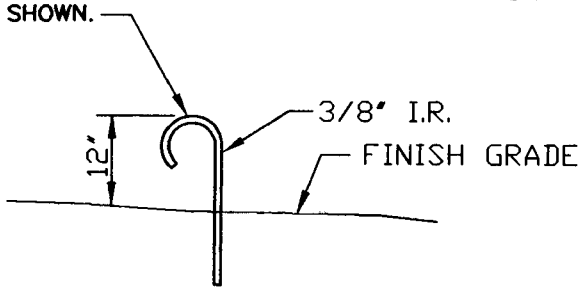
CITY OF CENTER

SEWER STANDARDS

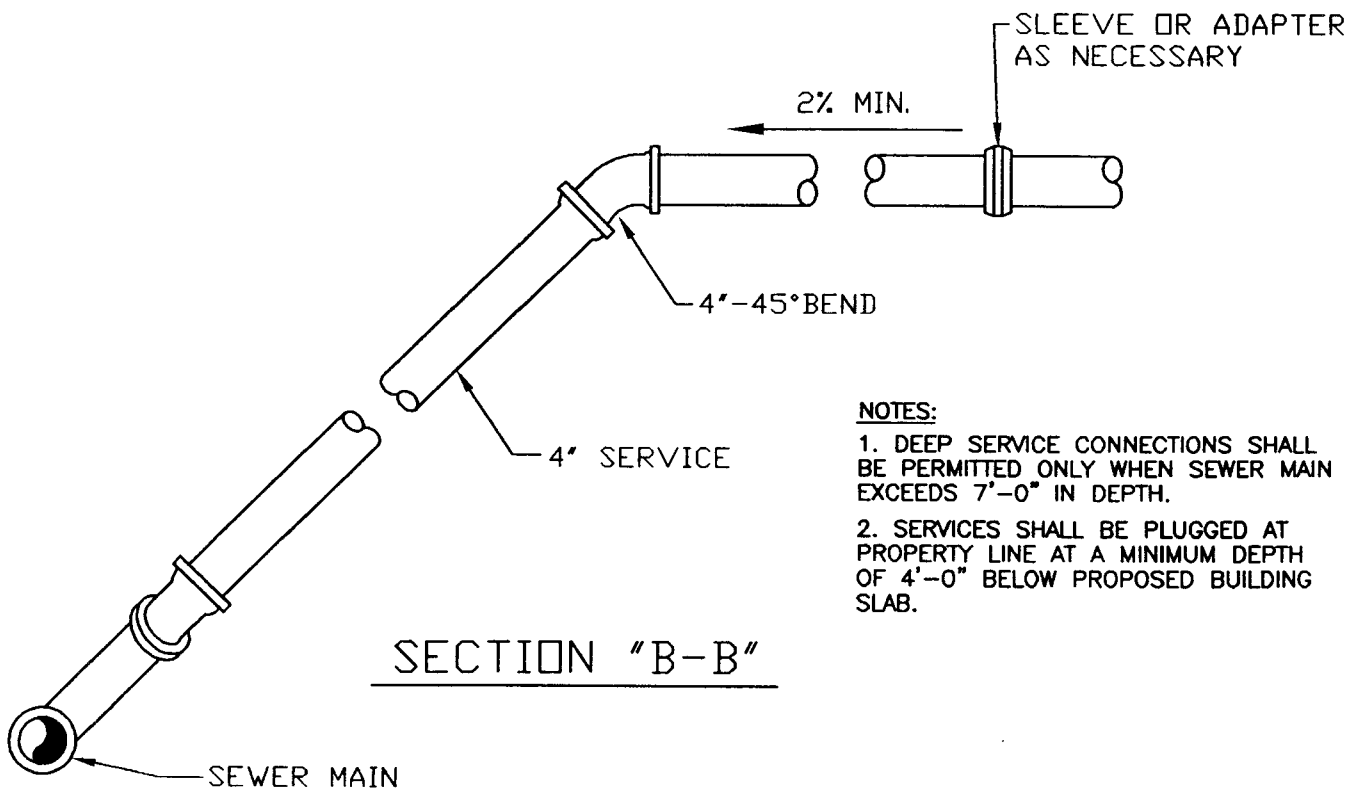
DWG NO. 17



NOTE:
THE CONTRACTOR SHALL INSTALL A 3/8" STEEL ROD AT THE OUTBOARD END OF THE INSTALLED SERVICE CONNECTION. THIS ROD SHALL EXTEND VERTICALLY AND TERMINATE 12" ABOVE THE TRENCH BACKFILL FINISHED GRADE. THIS ROD WILL SERVE AS A LOCATOR FOR THE SERVICE. THE END OF THE EXPOSED ROD SHALL BE FORMED IN A CIRCULAR SHAPE FOR SAFETY PURPOSES AS SHOWN.



DEEP SERVICE CONNECTION



NOTES:
1. DEEP SERVICE CONNECTIONS SHALL BE PERMITTED ONLY WHEN SEWER MAIN EXCEEDS 7'-0" IN DEPTH.
2. SERVICES SHALL BE PLUGGED AT PROPERTY LINE AT A MINIMUM DEPTH OF 4'-0" BELOW PROPOSED BUILDING SLAB.

SECTION "B-B"

8096DET02