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CHAPTER 20. PUBLIC WORKS MANUAL

ARTICLE 1. PUBLIC WORKS MANUAL GENERAL PROVISIONS

SEC. 20.01.001. ADOPTION OF APWA CONSTRUCTION AND MATERIAL SPECIFICATIONS

The Construction and Material Specifications, titled Section 2000, approved and adopted on October 21, 1981, by the Kansas City Metropolitan Chapter of the APWA is hereby adopted as Article 1 of the Public Works Manual, within the City Code of the City of Independence, Missouri, with the additions, insertions, deletions, and changes, if any, prescribed in the following sections of this Article.

SEC. 20.01.002. ADDITIONS, INSERTIONS, DELETIONS, AND CHANGES.

The following numbered subsections and provisions of the approved edition of the APWA Construction and Material Specifications adopted by Section 20.01.001, are hereby amended to read as follows:

Sec. 2003. Add this section to read as follows:

"Prior to final acceptance of streets, storm sewers and sanitary sewers the developer shall furnish the City with as-built drawings. Two prints and one reproducible copy will be required."

Sec. 2004. Add this section to read as follows:

"A. Where in these specifications the following abbreviations are used, they shall be understood to mean as follows:

A.A.S.H.T.O. - American Association of State Highway Transportation Officials

A.C.I. - American Concrete Institute

A.I.S.C. - American Institute of Steel Construction

A.P.W.A. - Kansas City Metropolitan Chapter of the American Public Works Association

A.R.E.A. - American Railway Engineering Association

A.S.T.M. - American Society for Testing and Materials

A.N.S.I. - American National Standards Institute

A.W.W.A. - American Water Works Association

C.R.S.I. - Concrete Reinforcing Steel Institute

M.C.I.B. - Mid-West Concrete Industry Board, Inc.

M.H.T.C. - Missouri Highway and Transportation Commission

M.U.T.C.D. - Manual of Uniform Traffic Control Devices

B. The serial designation of each reference shall be the latest year of adoption or revision, unless otherwise specified."

Sec. 2005. Add this section to read as follows:

A. In these specifications the following words or terms are used, they shall be interpreted as follows:

CITY shall mean the City of Independence, Missouri.

CONSTRUCTION SPECIFICATIONS are the complete directions, provisions, and requirements contained in the Standard Specifications and Standard Drawings as may be necessary to describe work and the quality of materials to be furnished under the Permit.

CONTRACTOR shall mean the individual, firm, partnership, joint venture, corporation, or association contracting with the City, or private owner, to perform the work.

DIRECTOR shall mean the Director of Public Works.

ENGINEER shall mean the City Engineer or any Engineer, Architect or Agent designated by the Director of Public Works.

MATERIALS are any processed, manufactured or natural items placed in the work.

OR EQUAL: In order to establish a basis of quality for items of the work, certain processes, equipment, proprietary products or materials and their manufacturer may be mentioned by name. Such mention is not intended to exclude other processes, equipment, proprietary products or materials and their manufacturer, provided they are proven by the Contractor, to the satisfaction of the Engineer, to be equal in quality and performance to the name specified prior to their inclusion in the work.

PERMIT shall mean the official document issued by the City, authorizing the construction of an improvement, subject to City inspection, control and approval.

PLANS are the official drawings, Standard Drawings, profiles and typical cross sections approved or furnished by the Engineer which show the location, character, dimensions and details of the work.

PRIVATE OWNER shall mean the individual, corporation, partnership, joint venture, association or other legal entities paying all costs associated with the construction of an improvement under a permit granted by the City.

PUBLIC WORKS MANUAL shall mean the Standard Drawings and Standard Specifications as adopted by the City.

STANDARD DRAWINGS shall mean the official standard drawings approved by the Director and adopted by the City Council.

STANDARD SPECIFICATIONS shall mean the official standard specifications approved by the Director and adopted by the City Council.

STREET shall mean the whole area within the legally established right-of-way limits.

SUBGRADE is that portion of the construction area which has been pre-pared, as specified, and upon which a layer of specified material, sub-base course, base course, pavement or other improvement is to be placed.

TRAFFIC CONTROL shall mean any and all such devices as signs, pavement markings, barricades or other devices necessary for the temporary or permanent regulation, guidance, or warning of traffic as it travels on the public right-of-way in accordance with the Manual on Uniform Traffic Control Devices (MUTCD).

WORK OR THE WORK shall mean the furnishing of all labor, materials, equipment and other incidentals, necessary for the successful completion and the carrying out of all duties and obligations imposed by the permit or contract.

B. Where 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. The word 'shall' is always mandatory and not merely directory.

SEC. 20.01.003 - 20.01.999 RESERVED.

ARTICLE 2. STORM SEWER DESIGN CRITERIA

SEC. 20.02.001. ADOPTION OF APWA STORM DRAINAGE DESIGN CRITERIA.

The Design Criteria for Storm Drainage Systems and Facilities, titled Section 5600, approved and adopted on March 21, 1990, by the Kansas City Metropolitan Chapter of the APWA, is hereby adopted as the Storm Sewer Design Criteria Code as a part of the Public Works Manual, within the City Code of the City of Independence, Missouri, with the additions, insertions, deletions, and changes, if any, prescribed in the following sections of this Article.

SEC. 20.02.002. ADDITIONS, INSERTIONS, DELETIONS, AND CHANGES.

The following numbered subsections and provisions of the approved edition of the APWA Design Criteria for Storm Drainage Systems and Facilities, adopted by Section 20.02.001, are hereby amended to read as follows:

Sec. 5601.2(H) Amend to read as follows:

"H. Development: Any activity, including subdivision, that alters the surface of the land to create additional impervious surfaces, including, but not limited to, pavement, buildings, and structures; except:

1. Additions to, improvements, and repair of existing single-family and duplex dwellings.

2. Construction of any buildings, structures, and/or appurtenant service roads, drives, and walks on a site having previously provided storm water control as part of a larger unit of development.

3. Remodeling, repair, replacement, and improvements to any existing structure or facility and appurtenances that does not cause an increased area of impervious surface on the site in excess of ten percent (10%) of that previously existing.

4. Construction of any one new single-family or duplex dwelling unit, irrespective of the site area on which the same may be situated."

Sec. 5601.5(C) Amend to read as follows:

"C. Stormwater Detention/Retention Facilities: All developments, both residential and commercial require stormwater detention."

Sec. 5602.6 (A) Amend to read as follows:

"A. Watersheds Less than 25 Acres: The Rational Method may be used to calculate peak rates of runoff to elements of enclosed and open channel systems, including inlets, when the total upstream area tributary to the point of consideration is less than 25 acres. The Rational Method is defined as follows:

Q = K C i A, where

Q = Peak rate of runoff to system in C.F.S.

C = Runoff coefficient as determined in accordance with Paragraph 5602.2

i = Rainfall intensity in inches per hour as determined in accordance with Paragraph 5602.4

K = Dimensionless coefficient to account for antecedant precipitation as follows; except the product of "C" x "K" shall not exceed 1.0.

YEARS RETURN PERIOD	"K"
10 and Less	1.0
25	1.1
50	1.2
100	1.25"

Sec. 5603.1(C) Amend to read as follows:

"C. Configuration: Curb inlets shall be as follows (illustrated by Figure 8.0):

Opening length, inside	4.0 ft. (min)
Width, perpendicular to curb line, inside	3.0 ft. (min)
Setback curb line to face	1.0 ft. (min)
Opening, clear height	6.0 in. (min)
Gutter depression at inlet	6-1/4in.(min)
Gutter transition length	
(a) Both sides in sump and upstream side on slopes	5.0 ft. (min)
(b) Downstream side on slopes	3.0 ft. (min)

"Vertical inlet openings greater than eight inches (8") shall require access protection such that no vertical opening shall exceed eight inches (8"). Deflectors shall be placed at 45 degrees in the inlet throat on slopes of six percent (6%) or greater."

Sec. 5603.3 Amend to read as follows

"Inverts and Pipes: The crown(s) of pipe(s) entering a structure shall be at or above the crown of the pipe exiting from the structure and provide a minimum fall of the invert in the structure of 0.2-feet for straight flow through the structure or 0.5-feet fall for all other types of flow (bends more than 22.5 deflection angle, multiple lines entering, enlargement transition, ...etc.) through the structure. The desirable minimum fall across the invert is 0.5-feet.

Minimum depth of cover shall be nine inches (9").

Driveway culverts shall be sized to provide adequate capacity for the effected drainage area, but in no case shall the culvert be less than twelve inches (12") in diameter without the expressed authorization of the Director of Public Works. The culvert shall have a grade of two percent (2%) with all joints fitted per manufacturer's specifications. The minimum depth of cover, measured from the top of the culvert to the top of the driveway surfaces, will be nine inches (9"). The culvert material can be made out of reinforced concrete pipe, corrugated steel pipe, or smooth interior corrugated polyethylene pipe at the choice of the property owner and approval of said Director. When the streets are resurfaced and driveway culverts need to be laid, the property owner will, at the request of the Director of Public Works, or an agent, furnish the required diameter of culvert.

All driveway and crossroad pipe shall be laid and relaid pursuant to the terms of this Article under the direction, supervision, and authority of the office of the Director of Public Works.

When culverts are placed under roadways on improved streets as defined in the Public Works Manual, they shall extend to at least the limits of right of way and proper hydraulic structures should be provided for dissipation of velocity to prevent erosion."

Sec. 5604.2 Amend to read as follows:

"Capacity: Capacity shall be based on either inlet or outlet control, whichever condition indicates the least capacity. Minimum design pipe size shall be twelve inches (12") diameter. The minimum pipe size under a public street shall be fifteen inches (15") diameter."

Sec. 5605.1 Amend to read as follows:

"Easements: Permanent easements shall be dedicated to the City for operation and maintenance of open channels.

Open natural waterways are preferred and should be kept natural as much as possible. Open channels, natural or improved, shall be placed to the rear or side of properties where the design provides adequate protection for the residence or structure by having a set back of fifty feet (50') from the top of the bank of an open channel (or improved) on mapped FEMA Flooding (or more stringent regulations may apply). Open channels or natural waterways will be part of the common open space of the subdivision. The fifty foot (50') setback shall be shown on all plans as required by Section 5607.4. Open channels, except for natural waterways, are acceptable only when required pipe size is larger than seventy-two inches (72"). This provision shall not lessen the requirements of any other section of the City Code. The Public Works Director is to review proposed storm sewer piping systems for conflicts with the preservation and sensitive land plans. The resolution of any conflicting regulations is to be reported to the Planning Commission if their approval is required on development project.

A. Improved Open Channels: Easements shall be as wide as the top of bank width; plus ten feet (10') on each side. Easements shall be continuous between street right-of-way. When an improved channel begins or ends at a point other than the right-of-way of a dedicated street, a fifteen foot (15') or wider easement graded so as to permit access by truck shall be dedicated from the end of the channel to a street right-of-way.

B. Natural Channels: Natural open channel easements shall be the area between the lines of intersection of the natural ground with a plane twelve inches (12") above the design water surface, plus ten feet (10') measured horizontally on each side thereof; however the width of the easement shall not be less than thirty feet (30') and the width shall be increased if necessary to permit access by truck along the entire length of the channel."

Sec. 5606.1 Amend to read as follows:

"Scope: This section governs the requirements and design of stormwater detention and retention facilities.

1. Detention basin outlets shall be connected to a downstream open channel or storm sewer where the connection distance is two hundred feet (200') or less.

2. Residential subdivision detention basins shall be located on an easement on subdivision common area and remain in ownership and maintained by the homeowners association. Access easements to the basin are to be provided.

3. A concrete or rip-rap detention basin low flow channel is to be built where the basin slope is one percent (1%) or less.

4. Commercial subdivision detention basins shall not be altered and are to be maintained as designed by the commercial subdivision."

SEC. 20.02.003. PENALTY.

Any person who shall violate, fail, neglect, or refuse to comply with any provision or requirement of this Article or of any regulation or requirement made pursuant to it shall be guilty of a misdemeanor, and upon conviction shall be fined not less than Ten Dollars ($10.00) nor more than Five Hundred Dollars ($500.00) for each violation. Each day's continuation of a violation shall constitute a separate offense.

SEC. 20.02.004 - 20.02.999 RESERVED.

ARTICLE 3. STORM SEWER SPECIFICATIONS.

SEC. 20.03.001. ADOPTION OF APWA STORM SEWER SPECIFICATIONS CONSTRUCTION AND MATERIAL

The Construction and Material Specifications for Storm Sewers, titled Section 2600, approved and adopted on December 15, 1982, by the Kansas City Metropolitan Chapter of the APWA, is hereby adopted as the Storm Sewer Specifications Code as a part of the Public Works Manual within the City Code of the City of Independence, Missouri, with the additions, insertions, deletions, and changes, if any, prescribed in the following sections of this Article.

SEC. 20.03.002. ADDITIONS, INSERTIONS, DELETIONS, AND CHANGES.

The following numbered subsections and provisions of the approved edition of the APWA Standard Specifications and Design Criteria, Section 2600 Storm Sewers, adopted by Section 20.03.001, are hereby amended to read as follows:

Sec. 2601.2 Delete.

Sec. 2602.2 (G) Add to read as follows:

"G. Smooth Interior Corrugated Polyethylene Pipe.

1. Smooth interior corrugated polyethylene pipe shall conform to the requirements of AASHTO M-294. This pipe shall not be used under public streets.

2. Joints shall be made with split couplings corrugated to match the pipe corrugations. A neoprene gasket shall be utilized with the coupling to provide a soil tight joint.

3. A manufacturer's certification that the product was manufactured, tested and supplied in accordance with these specifications shall be furnished to the City."

Sec. 2602.3(B) Amend to read as follows:

"B. Laying and Jointing:

1. Handling and Protection: All pipe shall be protected during installation against shock and free fall, and be installed without cracking, chipping, breaking, bending, or damage to coating materials. Damaged pipe materials shall be replaced with new materials, except as repair may be permitted by the Engineer.

2. Grade Control: Maximum deviation from plan line or grade of any pipe after installation and backfilling shall not be greater than 0.1 foot. All pipe shall have a continuous slope free from depressions that will not drain. The Contractor shall establish such grade control devices as are necessary to maintain the above tolerances.

3. Laying: The laying of pipe in finished trenches shall be commenced at the lowest point and installed with the bell end forward or upgrade. All pipe shall be laid with ends abutting and true to line and grade. They shall be carefully centered so that when laid they will form a sewer with a uniform invert.

4. Bedding: The class of bedding required shall be as indicated on the plans or standard details. Bedding shall be rodded, spaded, and compacted as necessary to provide firm uniform support for the pipe; and not subject it to settlement or displacement.

Pipeline anchors shall be installed at no greater than a thirty-six feet (36') maximum spacing on all pipelines installed at greater than a twenty percent (20%) grade. The pipe line anchors shall be non reinforced concrete with a four feet (4') minimum width. The anchor length shall be the trench width, with a minimum length of two feet (2'). The concrete thickness below and above the pipeline shall be as follows:

Pipe Size	Thickness
8"	7"
10"	11"
12"	15"
Above 12"	24"

5. Jointing: Preparatory to making pipe joints, all surfaces of the portions of the pipe to be jointed shall be clean and dry. Lubricants, primers, adhesives, etc., that are used shall be compatible with the jointing material recommended or specified. all bell and spigot ends of concrete pipe shall be primed prior to application of a trowelable bitumastic plastic compound.

No pipes may be trimmed unless by order of the Engineer. Pipes having defects that do not cause their rejection shall be so laid as to place these defects where they will be of least consequence.

Trenches shall be kept water-free and as dry as possible during bedding, laying and jointing, and for as long a period as required to protect the pipe joints and concrete in structures.

As soon as possible after the joint is made, sufficient material shall be placed alongside each side of the pipe to offset conditions that might tend to move the pipe off line and guide.

a. Concrete Pipe: (1) Plastic joint sealant shall be applied to the tongue or spigot prior to its insertin prior to its insertion into the bell or groove. A sufficient amount of sealant shall beused to fill the annular joint space with some squeeze out. Wipe the outside surface of the joint with additional material to assure a complete seal. (2) Mortar: When cement mortar is used the joint surface shall be clean and soaked with water immediately before the joint is made. A layer of mortar shall be placed in the lower portion of the bell or groove of the installed pipe and on the upper portion of the tongue or spigot of the pipe section to be installed. The tongue or spigot shall then be inserted into the bell or groove of the installed pipe until the mortar is squeezed out on both the interior and exterior surfaces. The annular joint space shall be completely filled and the abutting joint sections flush and even, with excess mortar struck off. (3) Flexible Gaskets: Flat gaskets maybe cemented to the pipe tongue or spigot. O-ring gaskets shall be recessed in a groove on the pipe tongue or spigot and confined by the bell or groove after the joint is completed. Roll-on gaskets shall be placed around the tongue or spigot and rolled into position as the joint is assembled. Flat gaskets and O-ring gaskets shall be lubricated as recommended by the manufacturer.

b. Corrugated Steel Pipe: Corrugated steel pipes shall be joined with a band type of coupling. The band shall be drawn and secured on the pipe by connecting devices as furnished by the manufacturer. Pipe ends may be identical to the rest of the pipe barrel (plain ends), or in the case of helical pipe, the pipe ends at the joint ma =y be reformed to an annular corrugation or flange (reformed end). Gaskets, if required, shall be furnished in accordance with the plans and Special Provisions.

c. Connection to Structures: Pipe connecting to structures shall be cut parallel with the inside face of the structure for structures having plane walls and parallel with the spring line of the pipe for structures having curved walls. Projection of the pipe beyond the inside face shall not exceed 1 inch (25 mm) (measured at the springline for structures having curved walls.)"

Sec. 2602.3(C) Amend to read as follows:

"C. Backfill: All trenches and excavations shall be backfilled with suitable material placed and compacted in conformance with Section 2102.6 entitled "Embankment."

1. All Pipe: Granular bedding material shall be placed to the springline of the pipe, and may, at the Contractor's option, be placed to a point six inches (6") above the top of the pipe. Material shall be placed in 6 inch (maximum) lifts; and compacted by rodding, spading, or vibratory compaction as necessary to provide uniform contact with the pipe and trench to prevent settlement or displacement. Select soil backfill may be used in lieu of granular bedding material above the springline of the pipe. The select material shall be placed in 6 inch (maximum) lifts and shall be compacted to not less than 95% of maximum density at optimum moisture ± 2.0% as determined by ASTM D698 or within the tolerance of the moisture range for the type of material being used as determined by the Engineer.

2. Backfilling under areas to be paved and existing pavement from the top of the pipe embedment as shown on the approved standard drawings to a point at grade, backfill material shall be untreated aggregate meeting the requirements of Chapter 20 Article 6 and compacted to 95% maximum density as determined by ASTM 698.

3. Other Backfill: From a point six inches (6") above the top of the pipe to a point at grade, backfill material shall be placed in such a manner so as to obtain 90% of maximum density at optimum moisture ± 2.0% or within the tolerance of the moisture range for the type of material being used as determined by the Engineer. Lift thickness shall be within the capability of the compaction equipment used, but not greater than twenty-four inches (24").

4. Backfilling around a structure must be done in a manner that will maintain the integrity of the structure.

a. No backfill shall be placed over or around any structure until the concrete or mortar has attained a minimum strength of 2000 psi and can sufficiently support the loads imposed by the backfill without damage.

b. The Contractor shall use utmost care to avoid any wedging action between the side of the excavation and the structure that would cause any movement of the structure. Any damage caused by premature or unbalanced backfill or by the use of equipment on or near a structure will be the responsibility of the Contractor.

c. No excavated rock larger than four inches (4") maximum dimension shall be placed within one foot (1') of the exterior surface of any structure."

Sec. 2603.3(C) Amend to read as follows:

"1. Pipe shall be placed inside the casing to the plan line and grade by the use of wood skids or other equivalent methods. The wood shall be pressure treated with creosote, pentachlorophenol, or salt-type preservative in accordance with AWPA C2. Cut surfaces shall be given two (2) heavy brush coats of the same preservative. The wood skids shall be securely fastened to the sewer pipe with stainless steel straps.

2. End seals shall be constructed after the sewer pipe is installed and approved. A two inch (2") diameter weephole shall be installed in the downstream end.

3. If specified, the annular space between the casing and sewer pipe shall be filled with sand blown in, so that all space is filled without disturbing the alignment and grade of the sewer pipe."

Sec. 2604.2(B) Amend to read as follows:

"Concrete Materials: Concrete, whether reinforced or non=reinforced, shall conform to MCIB Specifications and to the requirements therein for the MCIB Mix Number specified. Concrete shall be mixed and transported in accordance with Section 501 of the latest edition of the Missouri Standard Specifications for Highway Construction."

Sec. 2604.2(L) Add to read as follows:

"Reinforced Concrete Box Culverts: The work covered by this section of the specifications covers the installation of concrete work complete in strict accordance with this section of the Specifications and the Standard Specifications for State Road and Bridge Construction, State Highway Commission of Missouri or Kansas and the applicable drawings. All concrete shall conform to Section 2604.2 of these specifications entitled `Material'."

Sec. 2606.1(1) Amend to read as follows:

"I. Riprap: By the square yard by actual field measurement of authorized placement."

SEC. 20.03.003. PENALTY.

Any person who shall violate, fail, neglect, or refuse to comply with any provision or requirement of this Article or of any regulation or requirement made pursuant to it shall be guilty of a misdemeanor, and upon conviction shall be fined not less than Ten Dollars ($10.00) nor more than Five Hundred Dollars ($500.00) for each violation. Each day's continuation of a violation shall constitute a separate offense.

SEC. 20.03.004 - 20.03.999 RESERVED.

ARTICLE 4. STANDARD DETAIL SHEETS

SEC. 20.04.001. GENERAL.

The following Standard Detail Sheets establish uniform design and construction plan details for public works facilities. These details are not intended to cover extraordinary situations, and in such instances, deviations from the detail may be allowed where justified, upon the approval of the City Engineer. Where the term "shall" is used, it is intended to mean a mandatory requirement insofar as any confirmation by the City Engineer.

SEC. 20.04.002. STANDARD SHEETS.

The following Standard Detail Sheets, as dated and identified, are hereby approved, with a standard sized copy of each being on file with the City Clerk:

1. Standard Detail Sheet `A', "Curbs and Sidewalks", dated June 19, 1989.

2. Standard Detail Sheet `B', "Sanitary Sewers", dated November 26, 2003.

3. Standard Detail Sheet `C', "Storm Sewer Structures", date June 19, 1989.

4. Standard Detail Sheet `D', "Utility Adjustments", dated June 19, 1989.

5. Standard Detail Sheet `E', "Typical Street Section", dated June 19, 1989.

6. Standard Detail Sheet `F', "Concrete Pavement", dated June 19, 1989.

7. Standard Detail Sheet 'G', "Storm Sewers", dated June 19, 1989.

8. Standard Detail Sheet `H', "Rural Streets", dated November 26, 2003."

SEC. 20.04.003. PENALTY.

Any person who shall violate, fail, neglect, or refuse to comply with any provision or requirement of this Article or of any regulation or requirement made pursuant to it shall be guilty of a misdemeanor, and upon conviction shall be fined not less than Ten Dollars ($10.00) nor more than Five Hundred Dollars ($500.00) for each violation. Each day's continuation of a violation shall constitute a separate offense.

SEC. 20.04.004 - 20.04.999 RESERVED.

ARTICLE 5. EXCAVATION, GRADING AND SITE PREPARATION SPECIFICATIONS

SEC. 20.05.001. ADOPTION OF APWA GRADING AND SITE PREPARATION SPECIFICATIONS.

The Construction and Material Specifications, titled Section 2100, approved and adopted on October 21, 1981, by the Kansas City Metropolitan Chapter of the APWA is hereby adopted as Article 5 of the Public Works Manual, within the City Code of the City of Independence, Missouri, with the additions, insertions, deletions, and changes, if any, prescribed in the following sections of this Article.

SEC. 20.05.002. ADDITIONS, INSERTIONS, DELETIONS, AND CHANGES.

The following numbered subsections and provisions of the approved edition of the APWA Construction and Material Specifications adopted by Section 21.05.001, are hereby amended to read as follows:

Sec. 2101.2(C). Amend to read as follows:

"C. **Demolition and Removal:** This work shall consist of demolishing, removing and disposing of all structures and improvements within the construction limits unless included in other items of work as shown on the plans or in the Special Provisions. This work shall apply to all structures and improvements, whether on, above or below the surface of the ground or subgrade.

Demolition and removal shall include but not be limited to items such as buildings, drainage structures, pipes, pavements, fences, retaining walls, guard rails and signs.

Removal or relocation of items such as fences and guardrail shall be in accordance with the plans and/or Special Provisions.

Relocation of signs, fences, guardrails, etc. shall be considered incidental to removal work except where such relocation is listed separately in the Itemized Proposal of the Special Provisions.

All pipes which are to be abandoned shall be removed unless otherwise shown on the plans or approved by the Engineer."

SEC. 2101.3. Amend by adding:

"H. **Mailboxes**: Where conflicting with the necessary operations of the construction, mailboxes shall be temporarily reset in a location accessible to both the mail carrier and the patron. The contractor shall properly reset mailboxes at designated locations prior to final acceptance of the work. Damaged mailboxes shall be replaced by the Contractor.

I. **Structure Demolition**: The Contractor shall be required to remove any foundations or slabs found to exist that conflict with the construction."

SEC. 2102.2 C. Amend by adding to the Suitable Material:

"(2 C.) Asphaltic Concrete and Concrete Materials: Demolition materials, Asphaltic Concrete, Concrete, or Rock may be placed in embankments outside pavement structure or structure area if reduced in size to a maximum of 24" dimension."

SEC. 2102.3. Replace the two paragraphs with the following five paragraphs:

"In general, the moving of utility facilities, which conflicts with the improvements, will be done by the respective controlling utility at its own expense and at no cost to the Contractor. The Contractor shall notify the owners of each utility identified on the plans, prior to the start of any construction. The work by these utilities may be completed before the Contractor progresses to the points affected. Under some

circumstances, however, the work of the utilities may have to be performed during the Contractor's construction. It shall be the responsibility of the Contractor to coordinate the work with that of the utility so as to cause the least possible delay in the work. No utility facilities, public or private, shall be moved to accommodate the Contractor's equipment or method of operation when such facility does not interfere with the improvement under construction, or, to be constructed, unless the Contractor has agreed to pay for all costs of such removal and replacement and the utility has granted permission.

Plans show utility information supplied by the various utilities. The location, depth and size of each facility shown on the plans is approximate only and is not guaranteed. The failure to show such facilities on the plans shall not relieve the Contractor of any responsibility for the protection and preservation of such utilities.

The Contractor shall be responsible for taking proper measures to support, sustain and protect existing pipes, conduits, poles, wires and other apparatus under, over, along, across or otherwise affected by the work. If such pipes, conduits, poles, wires or apparatus are damaged through carelessness or neglectful action of the Contractor, they will be repaired by the authorities having control of same, but the cost of such repairs shall be paid by the Contractor.

The Contractor shall enlist the assistance of the affected agencies in the location of their facilities. The Contractor will not be responsible to any agency for the cost of such assistance in the location of its facilities. If any underground facility, not shown on the plans nor located by the utility agency, is damaged by the Contractor, the Contractor shall be responsible for exercising good judgment and for taking such action as is reasonable and necessary to mitigate damages.

The Contractor shall also make every reasonable effort to protect private facilities. These facilities, which include the private service lines on private property, may not be shown on the plans. When these facilities are disturbed or damaged by the work, the Contractor shall make necessary arrangements for repairs to the facilities for continuous service prior to the close of that work day."

SEC. 2102.6 (E). Amend paragraph "E" to read as follows:

"E. Compacting the Embankment: Before placing any embankment, the surface of the existing ground shall be prepared as heretofore specified, moistened as required, and the top 6 inches (15.24 cm) compacted to a density of 90 percent as prescribed by the following paragraph.

All embankment shall be compacted to a density of at least 90 percent of the maximum density for the material as determined by ASTM D-698 and within a tolerance of minus 3 percent and plus 2 percent of the optimum moisture or within the tolerance of the moisture range for the type of material being used as determined by the Engineer. In addition to the above required compaction, the subgrade between lines 1 foot (30.48 cm) outside of the curbs and within the top 6 inches (15.24 cm) of the subgrade shall be compacted to a density of at least 95 percent of the maximum density for the material used as determined by ASTM D-698 and within a tolerance of minus 3 percent and plus 2 percent of optimum moisture or within the tolerance of the moisture range for the type of material being used as determined by the Engineer.

All the work involved in either adding moisture to or removing moisture from embankment materials to within the allowable limits shall be considered incidental to the completion of the grading operation."

SEC. 20.05.003. ADOPTION OF EXCAVATION AND GRADING SPECIFICATIONS.
Appendix J, entitled Grading, of the 2006 International Building Code is hereby adopted as the grading requirements as part of the Public Works Manual, within the City Code of the City of Independence, Missouri, with the additions, insertions, deletions, and changes, if any, prescribed in the following sections of this Article.

SEC. 20.05.004. ENGINEERING GRADING.
Grading in excess of 5,000 cubic yards shall be performed in accordance with the approved grading plan prepared by a professional engineer, and shall be designated as engineered grading.

SEC. 20.05.005. PERMIT REQUIREMENTS.
The exemptions to permit requirements listed in section J103.2. Exemptions, shall have item 8. added as follows:

"8. An excavation or fill less than one feet in depth, which does not exceed 50 cubic yards on any one lot and does not obstruct a drainage course."

SEC. 20.05.006. PERMIT FEES.

A. Fees shall be assessed in accordance with the provisions of this section or shall be set forth in the fee schedule adopted by the jurisdiction.

B. When a plan or other data are required to be submitted, a plan review fee shall be paid at the time of submitting plans and specifications for review. Said plan review fee shall be as set forth in the Schedule of Fees. Separate plan review fees shall apply to retaining walls or major drainage structures as required elsewhere in this code. For excavation and fill on the same site, the fee shall be based on the volume of excavation or fill, whichever is greater.

C. A fee for each grading permit shall be paid as set forth in the Schedule of Fees. Separate permits and fees shall apply to retaining walls or major drainage structures as required elsewhere in this code. There shall be no separate charge for standard terrace drains and similar facilities.

SEC. 20.05.007. GRADING COMPLETION.

Final grades in accordance with the approved grading plan are to be finished with temporary or permanent seeding or ground cover prior to any approval of the grading or certificate of occupancy. The stockpile of material is allowed for a maximum of one year following completion of the grading and requires a letter of credit or bond guaranteeing the removal of the stockpile per the Schedule of Fees per cubic yard of material to be stored. Each year beginning January 1, 2010, the unit cost per cubic yard shall be adjusted to reflect contemporary pricing using the construction cost index.

SEC. 20.05.008. PENALTY
Any person who shall violate, fail, neglect, or refuse to comply with any provision or requirement of this Article or of any regulation or requirement made pursuant to it shall be guilty of a misdemeanor, and upon conviction shall be fined not less than Ten Dollars ($10.00) nor more than Five Hundred Dollars ($500.00) for each violation. Each day's continuation of a violation shall constitute a separate offense.

SEC. 20.05.009 - 20.05.999 RESERVED.

ARTICLE 6. PAVING

SEC. 20.06.001. ADOPTION OF APWA PAVING SPECIFICATIONS.

The Paving Specifications, titled Section 2200 approved and adopted on October 21, 1981, by the Kansas City Metropolitan Chapter of the APWA is hereby adopted as Article 6 of the Public Works Manual, within the City Code of the City of Independence, Missouri, with the additions, insertions, deletions, and changes, if any, prescribed in the following sections of this Article.

SEC. 20.06.002. ADDITIONS, INSERTIONS, DELETIONS, AND CHANGES.

The following numbered subsections and provisions of the approved edition of the APWA Paving Specifications adopted by Section 20.06.001, are hereby amended to read as follows:

SEC. 2201.3 (B). Amend paragraph "B" to read as follows:

"B. **Compacting the subgrade for pavements**: The top 6 inches (15.24 cm.) of subgrade for pavements shall be compacted to 95 percent of the maximum density for the material used as determined by ASTM D-698 and within a tolerance of plus 2 percent and minus 3 percent of optimum moisture or within the tolerance of the moisture range for the type of material being used as determined by the Engineer."

SEC. 2203. Delete.

SEC. 2205.2 Amend to read as follows:

"SEC. 2205.2 **Materials**: No material shall be used until it has been checked or tested for compliance with specifications and approved by the Engineer. Representative samples of all materials proposed for use under these specifications shall be submitted to the Engineer by the Contractor, at the Contractor's expense, for testing and the preparation of trail mixes to determine the job-mix formula. All tests necessary for determining conformance with the requirements specified herein will be performed under the supervision of the Engineer without cost to the Contractor.

Recycled materials obtained through the cold milling process, shall complement virgin materials to produce an asphaltic concrete pavement mixture that meets all applicable provisions of Section 2205 when incorporated into the mix. Reclaimed materials to be incorporated into the mix shall have representative samples submitted to the laboratory along with virgin materials for inclusion into the trial mixes in determining the job mix formula, in accordance with Section 2205.3B.

A. **Asphalt**: Asphalt cement used in the manufacture of asphalt paving mixtures shall be of the penetration grade 50-60, 60-70, 70-85 or 85-100 or AC Designations 2.5, 5, 10, or 20 as designated by the Engineer. Such designation will be made at the time of the job-mix formula determination.

Asphaltic material, as a residue from the utilization of milled material incorporated into the mix, shall be approved by the Engineer prior to incorporation into the mix. Cut-back asphaltic concrete and road oil shall not be incorporated into the mix.

The asphalt cement shall conform to ASTM D-946. Sampling shall be in accordance with ASTM D-140.

If stripping of asphalt from the aggregate occurs in the mixing process, 1 percent of single strength anti-stripping agent shall be added to the liquid asphalt.

Asphalt materials shall be approved by the Engineer prior to use in the work. However, the Engineer may accept a certified analysis by the refinery laboratory when a copy of the certified analysis accompanies each shipment of asphalt to the project. The Engineer will reserve the right of make check tests of the asphalt received on the job, and if the system of certified analysis proves to be unsatisfactory, the Engineer may discontinue this arrangement.

The Contractor or asphalt supplier shall furnish the Engineer with data on the temperature-viscosity relationship of each asphalt to be used on the project. This data shall cover the range of temperatures and viscosities within which the asphalt may be used. On the basis of this data, the Engineer will specify the temperature at which the material shall be used.

The Contractor shall not remove asphalt material from tank cars or storage tanks until the initial outage and temperature measurements have been taken, nor shall any cars or tanks be released until the final outage has been taken by the Engineer.

Copies of all freight bills and weigh bills shall be furnished to the Engineer as the work progresses.

B. Aggregate.

a. Coarse Aggregate: All coarse aggregate shall consist of sound, durable rock, free from cemented lumps or objectionable coatings. When tested in accordance with ASTM G-131 the maximum loss shall not exceed 40%. In general, limestone obtained from the Bethany Falls, Farley, or Argentine ledges is considered as suitable for use provided it can be quarried or mined in such a manner as to prevent the inclusion of deleterious materials such as shale, etc., from adjacent ledges. Limestone from other sources must be suitably analyzed from a physical standpoint before use. The percentage of deleterious substances shall not exceed the following values and the sum of percentages of all deleterious substances shall not exceed 8 percent.

Percent by Weight

Deleterious Rock..... 8.0 (ASTM-C235)

Shale 1.0

Other foreign material.....0.5

Additionally, the percentage of material finer than a No. 200 sieve shall not exceed 3.5 percent. When tested for soundness in accordance with ASTM C 88 using Sodium Sulphate - 5 cycles, the maximum loss shall not exceed 15 percent.

b. **Fine Aggregate**: Fine aggregate shall consist of natural sand, manufactured sand, or a combination thereof. The amount of deleterious substances in fine aggregate shall not exceed the following limits:

	Percent by Weight
Clay lumps and shall	1.0
Total lightweight particles including coal and lignite	0.5
Other deleterious substances	0.1

c. **Recycled Aggregate**: Aggregate, as a product from milled material, shall be approved by the Engineer prior to incorporation into the mix. Representative gradation determination of recovered aggregates shall be made in accordance with 2205.3C, Sampling and Testing of the Mixture.

d. **Sampling**: Sampling shall be in accordance with ASTM D=75. Gradation analysis shall be in accordance with Standard Method of Test for Material Finer than No. 200 (75 mm). Sieve in Mineral Aggregates by Washing, ASTM C-117 and Standard Method Test for Sieve Analysis of Fine and Coarse Aggregate, ASTM C=136"

SEC. 2205.3 (A). Insert the following at the end of paragraph "A" and before paragraph "B".

"Hot Recycled Asphaltic Concrete Mixtures shall be proportioned in accordance with the types specified. Asphalt Cement percentages shall be maintained through the complement of virgin and reclaimed materials. The maximum permissible variation from the job mix formula as specified herein shall be the combined virgin and reclaimed bituminous as determined as noted in Section 2205.3C.

Proportionary limits of reclaimed materials shall be as follows: (by mix wt.)

Asphaltic Concrete Base Type I - 15-50%

Asphaltic Concrete Surface Types II, III & IV - 15-30%

The actual percentage of reclaimed material shall be shown on the job mix formula. Variations shall be approved by the Engineer.

The method of including reclaimed material into the mixer shall be approved prior to usage. The reclaimed material shall be fed as a separate unit with individual controls integrated with a total master control."

SEC. 2205.4 (A) 11. Delete

SEC. 2205.4 (D). Amend to read as follows:

"D. **Special Requirements for Drum Dryer Mixing**: Asphaltic concrete mixtures may be manufactured by the process of incorporating asphalt cement with aggregate as the material passes through the dryer. The drum dryer mixer shall meet all the requirements of Section 404.5 Requirements for Dryer-Drum Mixers of the latest edition of the Missouri Standard Specifications for Highway Construction. The drum dryer mixing operations will be approved by the Engineer prior to the manufacture of asphaltic concrete mixes. The material so produced shall comply with the specifications and job-mix formula criteria."

SEC. 2205.8 (C). To specify the thickness for paving the first paragraph shall read as follows:

"C. **Spreading and Finishing**: The spreading and finishing of each course shall be to the thickness and width indicated on the plans or Special Provisions. The thickness of individual layers shall not exceed the following for the respective type of mixture unless previously approved by the Engineer.

Type 1	Asphalt Concrete Base	8" (20.32 cm)
Type 2	Asphalt Concrete Surface	3" (7.62 cm)
Type 3	Asphalt Concrete Surface	3" (7.62 cm)
Type 4	Asphalt Concrete Surface	1" (2.54 ca)"

SEC. 2206.4 (B) (2). Amend to read as follows:

2. **Aggregate for Slurry Seal**: The mineral aggregate used for this work shall be chat aggregate which is a by-product of the milling of lead and zinc ores and shall conform to one of the following gradations as specified by the Engineer:

Percent Passing

Sieve Size	Type I	Type 2
3/8" (9.5 mm)	100	100
No. 4 (4.75 mm)	98-100	82-94
No. 8 (2.32 mm)	75-90	45-65
No. 16 (1.18 mm)	50-75	25-46
No. 30 (600 um)	30-50	15-35
No. 50 (300 um)	18-35	10-25
No. 200 (75 um)*	5-15	5-15

* The percent passing the No. 200 (75um) sieve shall be determined in accordance with ASTM C=117."

SEC. 2208.2 (A). Amend to read as follows:

"A. **Concrete Control and Quality**: The current editions of the "Bulletins" and Approved Sections of the "Standard Concrete Specifications" issued by the Mid-West Concrete Industry Board, Inc. (MCIB) are made a part hereof by reference. However, when the provisions of this Specification differ from the provisions of such "Bulletins" and "Sections" the provisions of this Specification shall govern. Concrete shall be mixed and transported in accordance with Section 501 of the latest edition of the Missouri Standard Specifications for Highway Construction."

SEC. 2208.2 (F). Amend to read as follows:

"F. **Curing Membrane**: All material to be used or employed in curing Portland Cement Concrete must comply with the Mid-West Concrete Industry Board, Inc. (MCIB), Section 9."

SEC. 2209.2 (A). Amend to read as follows:

"A. **Concrete Mix**: Concrete shall conform to the requirements of MCIB Mix No. A558-1-2 or A618-1-4. Mix No. WA610-1-4 may be substituted for Mix No. A618-1-4."

SEC. 2209.5 (A). Amend to read as follows:

"A. **Concrete Placement**: Concrete shall be mechanically vibrated except for Mix No. A618-1-4 or Mix No. WA610-1-4 and shall not be allowed to extrude below the forms to cause an irregular alignment of the abutting street pavement."

SEC. 2209.7. Amend to read as follows:

"SEC. 2209.7. Joint Sealing and Cleanup. An approved joint sealer shall be applied in accordance with the manufacturer's directions within 7 days of the placement of the concrete.

The Contractor shall be responsible for the removal of excess dirt, rock, broken concrete, concrete splatters and overspray from the area of the construction."

SEC. 20.06.003. PENALTY.

Any person who shall violate, fail, neglect, or refuse to comply with any provision or requirement of this Article or of any regulation or requirement made pursuant to it shall be guilty of a misdemeanor, and upon conviction shall be fined not less than Ten Dollars ($10.00) nor more than Five Hundred Dollars ($500.00) for each violation. Each day's continuation of a violation shall constitute a separate offense.

SEC. 20.06.004 - 20.06.999 RESERVED.

ARTICLE 7. STREET DESIGN CRITERIA

SEC. 20.07.001. DEFINITIONS.

For the purposes of this Article 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 used in the plural include the singular, and words used in the singular include the plural. The word "shall" as used herein is not merely directory but is considered mandatory.

Unless otherwise specified, the following terms are defined:

ALLEY is a minor, permanent, public service-way that is used primarily for vehicular-service access to the back or the side of properties otherwise abutting on public streets.

ARTERIAL STREET means a street, identified as an arterial street on the Independence Thoroughfare Plan, intended to move through traffic to and from the major traffic generators and to serve as a route for traffic between communities or large areas.

COLLECTOR STREET means a street, identified as a collector street on the Independence Thoroughfare Plan, intended to move traffic from local streets to arterial streets.

CUL-DE-SAC is a local street with only one outlet and having an appropriate terminal for the safe and convenient reversal of traffic movement.

DECEASABLE TURNAROUND is a temporary cul-de-sac for use until such time as the street that it terminates is extended.

GRADE means the slope of a road, street or other publicway, specified in percent.

LOCAL STREET means a street intended to provide access to other roads from individual properties.

PRIVATE STREET means a private vehicular access that is over one hundred feet (100') in length connecting a public street to multiple ownership or more than one unit and constructed to City Code for the street classification.

PUBLIC STREET means a public right-of-way that affords principal means of vehicular access to property abutting thereon.

RIGHT-OF-WAY is land opened, reserved or dedicated for a street, walk, drainageway or other public purposes.

SUBDIVISION PLAT means the final map or drawing, described in these regulations, on which the subdivider's plan of subdivision is presented for approval and which, if approved, is to be submitted to the Jackson County Division of Property Records.

SEC. 20.07.002. GENERAL REQUIREMENTS.

A. The arrangement of streets shall conform with the Thoroughfare Plan. Streets shall connect with streets already dedicated and shall provide for future extensions. Streets proposed for future extension shall be terminated with deceasable turnarounds where the distance from an intersecting street line is greater than two hundred feet (200'). Deceasable turnaround shall have a deceasable right-of-way diameter of not less than one hundred feet, and a pavement diameter of eighty feet.

B. Cul-de-sacs shall be designed as follows:

Option	Minimum Right-of-way	Minimum Pavement Width	Required Landscape Area	Required Clear Zone	Maximum Length
A	100'	30'	20'	10'	500'
B	110'	30'	30'	0'	500'
C	160'	30'	80'	0'	1320'

Required landscape areas are to be constructed with lazy back curbs.

Clear zones are to be indicated on a subdivision plat and extend ten feet (10') back from the curb to a height of twelve feet (12'). Clear zones will be free of all obstructions including mailing boxes, light poles and landscaping.

Option C requires a loop street design. The landscape area will be the shape of a tear drop having a length of at least one hundred fifty feet (150').

No cul-de-sac street shall end less than two hundred feet (200') from a crest unless the vertical curve is such that safe sight distance can be maintained.

C. Centerline off-sets of intersection streets shall be at least one hundred fifty feet (50') apart.

D. Streets shall be laid out so as to intersect as nearly as possible at right angles and shall not intersect at less than seventy-five degrees (75º).

E. The right-of-way widths for interior streets and alleys included in any subdivision shall not be less than the minimum dimensions for each classification as follows:

TYPE	RIGHT-OF-WAY
Urban Highways	State Highway Standards
Divided Arterial Streets	100'
Major Arterial Streets	80'
Minor Arterial Streets	60'
Collector Streets	60'
Local Street	50'
Alleys	20'

F. The horizontal alignment on all streets where the centerline deflects two degrees (2º) or more shall be as follows:

RADII OF HORIZONTAL CURVES

Urban Highway	State Highway Standards
Arterial Streets	700' minimum
Collector Streets	400' minimum
Local Streets	175' minimum

A tangent of at least two hundred feet must be introduced between curves on arterial and collector streets.

G. All changes in grade over an algebraic change of two percent (2%) shall be connected by a vertical curve. No street grade shall be less than one percent (1%) and shall not exceed the following:

MAXIMUM STREET GRADES

Arterial Streets	6%
Collector Streets	8%
Local Streets	10%

DESIGN FOR CREST VERTICAL CURVES

The design for crest vertical curves shall be based on stopping sight distance as follows:

Design Speed, mph	Minimum stopping sight distance, feet	K = Rate of vertical curvature, length in feet per percent of A	
		Calculated	Rounded
30	200	28.6	28
40	275	54.0	55
50	350	87.5	85
60	475	161.2	160
65	550	216.1	215
70	600	257.1	255
75	675	25.9	325
80	750	402.3	400

DESIGN FOR SAG VERTICAL CURVES

The design for sag vertical curves shall be as follows:

Design Speed, mph	Minimum stopping sight distance, feet	K = Rate of vertical curvature, length in feet per percent of A	
		Calculated	Rounded
30	200	36.4	35
40	275	55.5	55
50	350	75.4	75
60	475	109.4	105
65	550	130.0	130
70	600	144.0	145
75	675	164.9	160
80	750	186.0	185

H. Design Speeds shall be as follows:

Local or Rural Street	30 mph
Collector	40 mph
Arterial	50 mph

Street right-of-way intersections shall be rounded to a radius of not less than twenty-five feet (25').

I. Raised medians, when specified, shall not encroach into any intersection beyond the beginning of the curb radius. The minimum street width of one way traffic adjacent to a median shall be eighteen feet (18') back of curb to back of curb. Medians shall be a part of the City right-of-way and shall be paved. The maximum radius of a median in a cul-de-sac shall be twelve feet (12') to the back of curb section.

J. Public Streets and Alleys shall be constructed in accordance with the approved standard drawings. Materials shall meet applicable provisions of Chapter 20, Article 6. Private streets shall be designed and constructed meeting Public Street Standards. Curb locations on private streets may vary to accommodate parking. Asphalt pavement base thickness for local streets shall be increased from six inches (6”) to eight inches (8”) on main subdivision entrance streets. Main subdivision entrance streets are designated at the time of preliminary plat review. They are to be designated on developments in excess of 100 dwelling units and are to include all streets that are principle access for fifty (50) or more dwelling units.

K. Streets shall be centered in the right-of-way, unless approved by the City Engineer.

L. Permanent traffic control devices shall be considered as part of the design of public streets in accordance with the Manual on Uniform Traffic Control Devices (MUTCD). An engineering traffic study shall be submitted for any intersection where signalization or a multiway stop is to be considered. Traffic control devices shall be shown on a plan drawing for review and approval by the City Engineer. It shall be the responsibility of the City Engineer to enter regulatory traffic control into the City Code.

SEC. 20.07.003. REQUIRED IMPROVEMENTS.

A. Sidewalks, which shall be required within the right-of-way on both sides of all collector and arterial streets and on one side of all local streets, shall be a minimum of four feet (4') in width and shall be located as shown on the approved standard drawing. Handicap ramps will be installed at all curb intersections. Handicap ramps shall be constructed of six inch (6”) thick concrete as shown on the approved standard drawing.

Sidewalks shall not be required to encircle cul-de-sac turnarounds, but shall continue to its intersection with the cul-de-sac curb line, as shown on the approved standard drawing. Sidewalk requirements on a cul-de-sac may be waived by the City Engineer if there is a minimal required length on one lot.

Sidewalks shall be constructed of concrete unless approved by the City Engineer, and shall meet the requirements of Chapter 20, Article 6 (see Sec. 2209.2(A)).

Curbs will be required on all streets, and shall be constructed in accordance with the approved standard drawings. All materials shall conform to applicable provisions of Chapter 20, Article 6.

Prior to the approval of a non-residential Survey Development, all adjacent facilities must meet the current minimum standards of the Public Works Manual and utility provision guidelines for placement of utilities and street lighting."

SEC. 20.07.004. PLAN REQUIREMENTS.

This section governs the preparation of plans for Street Improvements and includes the requirements for the scale to be used and other necessary information.

1. The plans shall include all information necessary to build and check the design of Street Improvement systems. The plans shall be arranged as required by the City Engineer. Standard details of the City may be included by reference. Plans shall be sealed by a Registered Professional Engineer and shall be submitted to the City Engineer for review and approval.

2. Plans shall be drawn at the following minimum scales. Larger scales may be needed to clearly present the design. Bar scales shall be shown on each sheet for each scale.

Plan:	1 inch = 50 feet
Horizontal Profile:	1 inch = 50 feet
Vertical Profile:	1 inch = 10 feet
Structural Plans:	1/4 inch = 1 foot
Graphic Drawings:	Varies

3. The following information will be required:

a. Plan View: All designed Street Improvements shall be drawn in plan view and shall contain the following:

(1) North arrow and bar scale.

(2) Identification and location of curbs, sidewalks, pavement, and ties to permanent reference points for each system located outside the street right-of-way.

(3) Identification and location of storm sewers, sanitary sewers, pipes and structures.

(4) Property lot and easement lines shall be shown, labeled, and dimensioned.

(5) Existing man-made and natural topographic features, such as buildings, fences, trees, channels, ponds, streams, etc., and all existing and proposed utilities.

(6) Location of test borings, if available.

(7) Existing and finish grade contours at intervals of 2.0 feet or less in elevation; or equivalent detail indicating existing and finish grades and slopes.

(8) A uniform set of symbols subject to approval by the City Engineer.

(9) The centerline of pavement.

(10) Benchmarks.

(11) Show horizontal curve data for proposed pavement.

b. Profile View: All designed Street Improvements shall be drawn in profile view and shall contain the following:

(1) Existing and finish surface grade shall be shown along the center line of the street. Widening plans shall show pavement edge grade.

(2) Slope shall be expressed in percent. Elevations shall be shown at fifty foot (50') intervals for proposed pavement.

(3) Show vertical curve data, including curve lengths and stopping sight distance. Show low point stations and elevations.

(4) Each existing utility line crossing the alignment shall be properly located and identified as to type, size and material, if available.

(5) Test borings, if available.

(6) The profile shall show existing grade above the centerline as a dashed line, proposed finish grades or established street grades by solid lines. Each line shall be identified.

(7) Sewer elevation, if applicable.

c. Typical Sections(s): All Street Improvements design shall include typical section(s) and shall contain the following:

(1) Right-of-way width.

(2) Pavement widths.

(3) Cross slopes.

(4) Sidewalk locations.

(5) Pavement depths and types of materials.

(6) Curb location and type.

(7) Subgrade compaction.

(8) Location if more than one section is required.

SEC. 20.07.005 Parkway Regulations.

A Parkway shall be defined as a thoroughfare street or any part thereof with at least two travel lanes in each direction generally separated by green open space as a median and characterized by features such as a wide median, sidewalks, bicycle paths, landscaping, and access restrictions. A parkway will function as an arterial street to transport traffic and shall have limited drive and intersection connections. The designation as a parkway shall only be granted by the City. A thoroughfare street designated as a parkway shall be subject to the following regulations:

A. There shall be no above ground utilities within Five Hundred Feet (500’) of a Parkway right-of-way, except for perpendicular crossing of high-voltage transmission lines when necessary.

B. Parking areas adjacent to a Parkway right-of-way shall be set back at least Fifty Feet (50’) from the edge of the Parkway right-of-way, shall be screened by buildings, plant materials and natural shaped berms, and shall utilize plantings to break up large areas of pavement.

C. The following shall not be located within One Hundred Feet (100') of a Parkway right-of-way:

1. Trash dumpsters;
2. Fences or walls, except those which are determined to be architecturally and aesthetically compatible with the parkway design; and
3. Drive-through lanes for fast-food businesses.

D. The following shall not be located within Two Hundred Fifty Feet (250') of a Parkway right-of-way:

1. Billboards and free-standing signs, except for ground or monument signs as defined in the Southeast Independence Overlay Zoning District;
2. Outdoor storage;
3. Trash dumpsters other than those enclosed in masonry structures;
4. Unscreened loading docks and loading areas, unless located on the side of a building opposite the parkway;
5. Buildings not having the similar architectural treatment on all four sides;
6. Businesses that are classified as:
   a. Self or mini-storage;
   b. New or used car dealerships;
   c. Vehicle repair;
   d. Service (gasoline) stations;
   e. Convenience stores;
   f. Pawn shops and short term loan service businesses;
   g. Businesses holding licenses as retailer of intoxicating liquor, non-intoxicating beer, malt liquor or light wine in the original package or by the drink;
   h. Adult businesses; or.
   i. Gambling establishments, including those licensed by the State of Missouri.

SEC. 20.07.006. PENALTY.

Any person who shall violate, fail, neglect, or refuse to comply with any provision or requirement of this Article or of any regulation or requirement made pursuant to it shall be guilty of a misdemeanor, and upon conviction shall be fined not less than Ten Dollars ($10.00) nor more than Five Hundred Dollars ($500.00) for each violation. Each day's continuation of a violation shall constitute a separate offense.

SEC. 20.07.007 - 20.07.999 RESERVED.

ARTICLE 8. SANITARY SEWER CONSTRUCTION AND MATERIAL SPECIFICATIONS

SEC. 20.08.001. SCOPE

This Division governs all work, materials and testing required for installation of gravity and pressure pipelines of the respective types and sizes shown on the Plans for the particular location and conforming to the requirements of these specifications. All pipelines shall be constructed to proper line and grade as shown on the Plans and shall result in an unobstructed, smooth and uniform conduit.

SEC. 20.08.002. GENERAL

A. Sanitary sewer construction shall consist of furnishing all labor, materials and equipment for the complete installation of sewers and appurtenances in accordance with the approved drawings, and this chapter of the City Code.

B. It is understood that throughout this section these Specifications may be modified by appropriate items in the Special Provisions or notes on the approved drawings.

C. When reference is made to a Standard Specifications i.e. ASTM, ANSI, AWWA, MCIB, the specification referred to shall be understood to mean the latest revision of said specification as amended at the time of the Notice to Bidders, except as noted on the Plans or in the Special Provisions.

SEC. 20.08.003 MATERIALS.

A. This section governs materials that may be required to complete pipeline construction, exclusive of structures, as shown on the Plans and/or as provided for in the Special Provisions.

1. Furnish pipe of materials, joint types, sizes, and strength classes indicated and specified. Higher strengths may be furnished at the Contractor's option at no additional cost to the Owner.

2. The manufacturer shall be experienced in the design, manufacture and commercial supplying of the specific material.

3. Inspection and testing shall be performed by the Manufacturer's quality control personnel in conformance with applicable standards. Testing may be witnessed by Owner, Engineer, or approved independent testing laboratory. The Contractor shall provide three (3) copies of certified test reports indicating that material does conform to the specifications.

4. The Manufacturer and Contractor shall use equipment and methods adequate to protect the pipe, joint elements and prevent shock contact of adjacent units during moving or storage. Damaged sections that cause reasonable doubt as to their structural strength or water-tightness will be rejected.

B. Furnish pipe and fittings of materials, joint types, sizes, strength classes, coatings and linings as indicated and specified.

1. Acrylonitrile-Butadiene-Styrene (ABS) Composite Sewer Pipe and Fittings shall conform to ASTM D 2680, except as otherwise specified herein.

a. Furnish maximum pipe lengths, normally produced by the manufacturer except for fittings, closures and specials. All exposed end sections shall be sealed in accordance with the manufacturers' recommendation.

b. Pipe shall consist of two (2) concentric thermoplastic tubes integrally braced across the annulus with resultant annular space filled with inert material to provide continuous support between inner and outer tubes. Bell-end shall be factory attached solvent weld coupling.

c. Pipe joints and fittings shall be solvent welded conforming to ASTM D 2680.

d. Fittings defined as tee or wye connections suitable for assembly to four inch (4") or six inch (6") building service lines shall be bell-end with a minimum wall thickness conforming to SDR35 and shall be provided by the pipe manufacturer.

2. Acrylonitrile-Butadiene-Styrene (ABS) Sewer Pipe and Fittings shall conform to ASTM D 2751, except as otherwise specified herein.

a. Furnish maximum pipe lengths, normally produced by the manufacturer, except for fittings, closures and specials.

b. Pipe shall have an integral wall bell and spigot joint and a minimum wall thickness conforming to SDR 23.5.

c. Pipe joints and fittings shall be type OR or SC conforming to ASTM D 2680. Gaskets for elastomeric joints shall conform to Section 3 of ASTM C 443. Joints shall also conform to ASTM D 3212.

d. Fittings defined suitable for assembly to four inch (4") or six inch (6") building service lines shall be bell-end with a minimum wall thickness conforming to SDR 23.5 and shall be provided by the pipe manufacturer.

3. Ductile-Iron Pipe and Fittings shall conform to ANSI A 21.51, except as otherwise specified herein.

a. Furnish maximum pipe lengths normally produced by the manufacturer except for fittings, closures and specials.

b. Mechanical and push-on joints for pipe and fittings shall conform to the requirements of ANSI A 2 1.11. Flanged joints for ductile iron pipe and fittings shall conform to the requirements of ANSI A 21.10. Gaskets shall be neoprene or other synthetic rubber material. Natural rubber gaskets will not be acceptable.

c. Fittings shall be in accordance with ANSI/AWWA C 110 and shall have a pressure rating of not less than that specified for the pipe. Fittings used with ductile iron pipe shall be ductile iron or cast iron. Fittings for pipe with mechanical joints shall have mechanical joints.

d. Where required pipe and fittings shall be furnished with exterior bituminous coating conforming to ANSI A 21.51.

e. All pipe and fitting linings, if specified, shall conform to the following:

(1) Pipe shall have an interior cement-mortar lining conforming to ANSI A 21.4.

(2) Fittings shall have an interior coating not less than one (1) mil in thickness which conforms to all appropriate requirements for seal coat in ANSI A 21.4.

4. Poly (Vinyl Chloride) (PVC) Plastic Pipe (SDR-PR) and Fittings shall conform to ASTM D 2241, except as otherwise specified herein.

a. Furnish maximum pipe lengths normally produced by the manufacturer, except for fittings, closures and specials. Pipe shall be used only for pressure flow systems.

b. The pipe shall be made of PVC plastic pipe having a cell classification of 12454 B or 12454 C as defined in ASTM D 1784.

c. Pressure flow systems, i.e., force mains, shall have a minimum wall thickness conforming to SDR 23.5 and a minimum hydrostatic design stress of 2000 psi conforming to pipe materials designation codes PVC 1120, PVC 1220, or PVC 2120.

d. Pressure flow systems, i.e., force mains shall be joined in accordance with ASTM D 3139 with particular attention given to Section 5.3.

e. Fittings for pressure flow systems, i.e., force mains shall have a minimum wall thickness conforming to SDE 23.5 and a minimum hydrostatic design stress of 2000 psi conforming to pipe materials designation codes PVC 1120, PVC 1220, and PVC 2120.

5. Type PSM Poly Vinyl Chloride (PVC) Sewer Pipe and fittings shall conform to ASTM D3034, except as otherwise specified herein.

a. Furnish maximum pipe lengths normally produced by the manufacturer except for fittings, closures and specials.

b. The pipe shall be made of PVC plastic having a cell classification of 12454B or 1245C or 13364B as defined in ASTM D 1784.

c. Pipe shall have an integral wall bell and spigot joint and a minimum wall thickness conforming to SDR 35.

d. Joints shall conform to ASTM D3212. Joints shall be push-on type only with the bell-end grooved to receive a gasket. Elastomeric seal (gasket) shall have a basic polymer of synthetic rubber conforming to ASTM F477. Natural rubber gaskets will not be accepted.

e. Fittings defined as tee or wye connections suitable for assembly to four inch (4") or six inch (6") building service lines shall be bell-end with a minimum wall thickness conforming to SDR 35 and shall be furnished by the pipe manufacturer.

6. Type PS 46 Poly Vinyl Chloride (PVC) Sewer Pipe and Fittings shall conform to ASTM F789, except as otherwise specified herein.

a. Furnish maximum pipe lengths normally produced by the manufacturer except for fittings, closures and specials.

b. The pipe shall be made of PVC plastic having a cell classification of 12164-B as defined in ASTM D1784.

c. Pipe shall have an integral wall bell and spigot joint and a minimum pipe stiffness of 46ps: (320kPa).

d. Joints shall conform to ASTM D3212. Joints shall be push-on type only with the bell#end grooved to receive a gasket. Elastomeric seal (gasket) shall have a basic polymer of synthetic rubber conforming to ASTM F477. Natural rubber gaskets will not be accepted.

e. Fittings defined as tee or wye connections suitable for assembly to four inch (4") or six inch (6") building service lines shall be bell-end conforming to all the requirements of ASTM F789 and shall be furnished by the pipe manufacturer.

7. Reinforced Concrete Pipe and Fittings shall conform to ASTM C 76 except as otherwise specified herein.

a. Furnish maximum lengths normally produced by the manufacturer except for fittings, closures and specials.

b. Fine aggregate shall be natural sand conforming to the requirements of MCIB section 4 - Materials. Reinforcement may be circular or elliptical. Elliptically reinforced pipe shall be marked in accordance with Section 17.2, ASTM C 76 for correct installation. Modified or special designs are prohibited unless so specified in the Special Provisions.

c. Pipe and fittings shall be furnished with either spigot groove type joint with O-ring gasket with the joint opening not greater than three-eights inch (3/8") or steel end joint with spigot groove and O-ring gasket. The basic polymer for O-ring gaskets shall be synthetic rubber and shall conform to ASTM C 361 and ASTM C 443.

d. Fittings and specials shall have strength equal to design D-loads of adjacent pipe and be fabricated as one of the following types:

(1) Steel cylinder segments not less than U.S. No. 16 gauge lined with three-fourths inch (3/4") concrete or mortar and reinforced concrete exterior.

(2) Concrete pipe sections cut while still green, reinforcing exposed and welded together at junctions and miters. Splice shall be built up to nominal wall thickness with mortar or concrete.

Miters shall not exceed thirty degrees (30°) at deflection angles between segments. Minimum center line curve radius shall not be less than twice the pipe diameter.

8. Vitrified Clay Pipe and Fittings shall conform to ASTM C 700 Extra Strength except as otherwise specified herein.

a. Furnish maximum pipe lengths normally produced by the manufacturer with either bell-end or plain-end except for fittings, closures and specials.

b. All pipe joints shall conform to ASTM C 425 with synthetic rubber seals.

9. Poly (Vinyl Chloride) (PVC) profile gravity sewer pipe and fittings based on controlled inside diameter shall meet the requirements of A.S.T.M. F 794.

a. Pipe is approved for use only in sizes 18" through 48" in diameter.

b. Furnish maximum pipe lengths normally produced by the manufacturer, except for fittings, closures and specials.

c. The pipe shall be made of PVC plastic having a minimum cell classification of 12454-C or 12364-C as defined in A.S.T.M. D 1784.

d. Pipe shall have an integral wall bell and spigot joint and a minimum pipe stiffness of 46 psi (320k Pa).

e. Joints shall conform to A.S.T.M. D 3212. Joints shall contain an elastomeric gasket meeting the requirements of A.S.T.M. F 477.

f. Fittings defined as wye or tee connections suitable for assembly to four inch (4") or six inch (6") building service lines shall be bell end with a minimum wall thickness conforming to A.S.T.M. D 3034, SDR 35 or A.S.T.M. F 789 and shall be furnished by the manufacturer.

C. Pipe embedment materials shall be furnished and installed to complete the work shown on the Plans or as called for in the Contract Documents.

1. All materials used for crushed stone pipe bedding shall conform to the requirements of MCIB Section 4 - Materials for Coarse Aggregate Table 2, Column III, modified to meet the following graduations:

Sieve Size Graduations	Percentage Passing
No. 3/8" Sieve	100
No. 4 Sieve	30-42
No. 10 Sieve	0-4

D. Concrete shall test not less than a twenty-eight (28) day compressive strength of 4000 psi and shall otherwise conform to specifications contained herein.

E. Reinforcing steel when required, shall be placed as shown on the plans and shall conform to specifications contained herein.

F. Backfill materials shall be as required and/or permitted to complete the work shown on the Plans or called for in the Contract Documents.

1. Granular backfill material shall meet the requirements as outlined in Article 6.

2. Select earth backfill material shall be finely divided job excavated material free from debris, organic matter, rocks larger than one inch (1") and/or frozen materials.

3. Other earth backfill may be a mixture of earth and rock not larger than one foot (1') measured along its longest axis.

G. Pipe encasement materials shall be furnished and installed to complete the work shown on the Plans or as called for in the Contract Documents.

1. Pipe encasement, when required and/or permitted, is intended to provide maximum support for pipe in locations where standard embedment or cover may be insufficient.

2. Concrete and reinforcing steel must meet standards.

a. Concrete used for pipe encasement shall test not less than a twenty-eight (28) day compressive strength of 3000 psi and shall otherwise conform to specifications contained herein.

b. Reinforcing steel, when required, shall conform to specifications contained herein.

H. This subsection governs the furnishing of all materials and equipment necessary for the construction of tunnels complete with lining, bulkheads, and stabilized sand fill at locations shown on the Plans or where constructed at the Contractor's option, when approved by the Engineer, to pass other utilities, streets, or obstructions without open excavation.

1. Furnish materials and necessary accessories with strengths, thicknesses, coatings, and fittings indicated, specified and/or necessary to complete the work.

2. Steel tunnel liner plates shall be Armco "Standard", Commercial Shearing and Stamping Company "Commercial", Republic "Truscon Paneled Out", or equal and shall be galvanized in accordance with ASTM A 123. The design and shape of the liner plates shall be such that assembly can take place entirely from within the tunnel liner. Liner plates shall be capable of withstanding the ring thrust load and transmitting this from plate to plate. The minimum outside diameter shall be four feet (4') and the minimum wall thickness shall be United States Standard Gauge 12 (0.2046 inches). Sufficient sections shall be provided with one and one-half inch (1 1/2") or larger grouting holes located near the centers so that when the plates are installed there will be one line of holes on either side of the tunnel and one at the crown; the lower line of holes on each side shall not be more than eighteen inches (18") above the invert. The holes in each line shall not be more than five feet (5') apart and unless otherwise approved, shall be staggered. Bolts and nuts shall conform to ASTM A 153, A 307, A 325 and A 449 as applicable. Steel liner plates shall have bolted joints in both longitudinal joints in adjacent rings when assembling.

3. Steel casings for bored or jacked construction shall be steel pipe conforming to ASTM A 139 with a minimum diameter as shown on the plans. Corrugated steel casing pipe will be considered on a case-by-case basis.

a. Minimum wall thickness shall be in accordance with the following table.

Diameter of Casing-Inches	Nominal Wall Thickness-Inches Under Railroads	All Other Uses
16	0.312	0.188
18	0.312	0.250
20	0.375	0.250
22	0.375	0.250
24	0.406	0.281
26	0.438	0.281
28	0.469	0.312
30	0.469	0.312
32	0.500	0.312
34	0.500	0.312
36	0.500	0.344

b. Steel shall be Grade B under Railroads and Grade A on all other uses.

c. Steel pipe shall have welded joints in accordance with AWWA C 206.

4. Reinforced Concrete Pipe used as casing shall conform to ASTM C 76 except as otherwise specified under Section 20.08.003 B 8 and as specified herein.

a. Provide ASTM C 76 circular pipe of the strength class required for the jacking of pipe when determined by method set forth in the latest printing of Concrete Pipe Design Manual prepared by the American Concrete Pipe Association.

b. Reinforced concrete pipe used for casing pipe shall be provided with steel end joint with a groove in the spigot end for an O-ring gasket. The spigot end for an O-ring gasket shall be synthetic rubber. Both joint and gasket shall otherwise conform to ASTM C 361.

c. Interior protection is not required for reinforced concrete pipe used for casing conduit.

5. Casing conduit grout shall be cement grout with a mixture of two (2) parts Portland Cement, one (1) part fly ash to not more than six (6) parts sand with the minimum amount of potable water to allow a workable mixture.

6. Cement - sand mixture used in casing conduits shall be a mixture of one (1) part Portland Cement to five (5) parts clean sand thoroughly mixed prior to being blown into the opening.

7. Wood skids shall be provided as indicated on the Plans. The wood shall be pressure-treated with creosote, pentachlorophenol, or salt type preservative in accordance with APWA C 2. Cut surfaces shall be given two (2) heavy brush coats of the same preservative.

SEC. 20.08.004. SITE PREPARATION.

A. This section governs normal project site preparation for construction.

1. Contractor shall do all clearing necessary for performance of the work and shall confine all operations to that area provided through easements, licenses, agreements and rights-of-way. The Contractor's entrance upon any lands outside of that area provided by easements, licenses, agreements or public rights-of-way, shall be at the Contractor's sole liability.

2. The Contractor shall not occupy any portion of the Project Site prior to the date established in the Notice to Proceed without prior approval of the Engineer.

3. All work shall be performed in according with applicable provisions of Chapter 20 of the City Code.

SEC. 20.08.005. EXCAVATION.

A. This section governs the methods and procedures required for pipeline excavations for open cut and tunneling.

B. The terms "excavation" and "trenching" shall mean the removal and subsequent handling of all material required to perform the work.

1. All pipeline excavation work shall be accomplished under supervision of a person experienced with the materials and procedures which will provide protection to existing improvements, including utilities and the proposed pipeline.

2. The alignment, depth, and pipe subgrades of all sewer trenches shall be determined by overhead grade lines parallel to the sewer invert.

3. The Contractor shall not open more trench in advance of pipe laying than is necessary. Four hundred feet (400') will be the maximum length of open trench allowed on any line under construction. All open trenches shall be adequately protected.

4. In the event hazardous wastes as defined by the Resource Conservation and Recovery Act of 1976 (PL94-580) are encountered, work shall be halted and the Engineer shall be notified. Works shall be resumed only after the Engineer notifies the Contractor. Removal, handling and disposal of hazardous wastes is the responsibility of Federal and State agencies.

C. Unclassified excavation is defined as the removal of all material encountered regardless of its nature. All material excavated will be considered as Unclassified Excavation unless the Special Provisions specify Classified Materials.

D. Rock excavation is defined as the removal of all rock ledges six inches (6") or more in thickness, and detached rock or boulders having a volume of more than 1 1/2 cubic yards and shale occurring in its natural state, hard and unweathered.

A rock ledge is defined as a continuous body of rock; which may include interbedded seams of soft materials. Such interbedded soft material less than 12 inches (300 mm) in thickness will be included in the measurement of rock excavation. Such seams 12 inches (300 mm) or greater in thickness will be included only in the measurement of earth excavation.

E. Earth excavation is defined as the removal of all material not defined as rock.

F. The Contractor shall remove any water which may accumulate, or be found in the trenches and other excavations made under the Contract.

G. Blasting shall be performed in accordance with provisions of Chapter 17, Article 13 of the City Code.

H. This item establishes the requirements to be followed for pipeline excavation performed by the open cut method (trenching).

1. Excavations for pipelines shall be accomplished by the open cut method (trenching) except as specified or approved by the Engineer. Trenching shall be performed with a minimum of inconvenience and disturbance to the general public. The Contractor shall sort and stockpile the excavated material so the proper material is available for backfill.

2. All trenches shall be excavated to depths required for proper pipe embedment. Overdepth excavation shall be required when the subgrade is unstable. Overdepth excavations shall be backfilled with granular pipe embedment material, unless otherwise directed by the Engineer.

3. Undercutting of trench walls is not permitted.

4. Trench widths shall be as follows:

a. Trench widths and pipe clearances shall be as shown on the approved drawing.

b. In areas where excessive trench width occur due to unstable materials, the applicable provisions of the appropriate ASTM or AWWA Installation Standards for the material types being used shall apply.

5. When reinforced concrete and ductile iron pipe is utilized the strength class and the maximum allowable trench width, as established by the Engineer will be shown on the Plan.

6. Contractor may perform excavation by tunneling methods as set forth herein, at no additional cost to the Owner provided prior approval for each such location is obtained from the Engineer.

I. This item establishes the requirements to be followed for pipeline excavation performed by tunneling, boring and jacking methods.

1. Tunneling includes all underground horizontal excavations necessary to install the pipeline. The Contractor shall submit to the Engineer, prior to actual work, a written description of the proposed tunneling operation. It shall include the types and locations of shafts, methods to provide safe support strength for the pipeline when the shafts or bore pits exceed maximum allowable trench widths and other features which would affect the pipeline.

Tunneling shall be accomplished with a minimum of inconvenience and disturbance to the general public and abutting property owners, and provide an adequate working area.

2. The tunnel shall be circular in cross section and of the size specified. Alternate size and shape may be submitted for consideration by the Engineer.

3. All tunnel excavation shall provide an excavation conforming to the outside diameter of the casing and/or carrier conduit. The excavation shall be to an alignment and grade which will allow the carrier conduit to be installed to proper line and grade as shown on the Plans and as established in Section 20.8.6 - Installation.

a. Conduct excavation in a manner to prevent disturbing overlying and adjacent material. Perform dewatering and chemical soil stabilization or grouting if necessary, due to existing field conditions.

SEC. 20.08.006 INSTALLATION.

A. This section governs construction methods and procedures for the installation of gravity and pressure pipelines and appurtenances.

B. All pipeline installations shall conform to the following requirements.

1. Sanitary sewer line installations shall comply with applicable State and Environmental requirements.

2. Contractor shall maintain a dry and stable trench and provide for the proper method of discharging such water from the work site at all times until pipeline installation is completed to the extent that hydrostatic pressure flotation or other adverse effects will not result in damage to the pipeline.

Proper dewatering techniques are the Contractor's sole responsibility. All work Performed by the Contractor which is adversely affected by failure to adequately dewater trenches will be subject to rejection by the Engineer. The Contractor shall repair and/or replace the affected pipeline without additional compensation.

3. Any pipeline crossing a well-defined drainage course, having less than three feet (3') of cover over the pipe, shall be encased in concrete. The length of encasement shall be as shown on the Plans or if not shown, as specified by the Engineer.

4. All shoring, bracing, or blocking, shall be furnished and installed as necessary to preserve and maintain exposed excavation faces, to protect existing improvements, to protect the proposed pipeline and to provide :or safety.

Shoring or other methods for support of trench walls is the responsibility of the Contractor and shall be so done by methods which will not adversely affect pipeline alignment, grade and/or structural integrity.

All bracing, sheeting and/or shoring installed below a horizontal plane six inches (6") above top of proposed pipe, shall not be disturbed or removed after pipe and/or pipe embedment has been installed, unless otherwise specified. The bottom skids of a trench-shield shall not extend lower than six inches (6") above top of proposed pipe.

5. All pipe embedment shall be as shown on the approved drawings. All Class A concrete embedments for rigid conduits shall begin and end at a pipe joint.

6. The trench subgrade shall be prepared to provide a uniform and continuous pipe support between pipe bells and joints.

a. Place and densify embedment material so that the pipe will be true to line and grade after installation.

b. After each pipe has been brought to grade, aligned, and placed in final position, deposit and densify by shovel slicing sufficient bedding material under the pipe haunches and on each side of the pipe to hold the pipe in proper position during subsequent pipe jointing, bedding, and backfilling operations. Place bedding material uniformly and simultaneously on each side of the pipe to prevent lateral displacement.

c. Place pipe that is to be bedded in Class A (concrete) embedment in proper position on temporary supports consisting of wood blocks or bricks with wood wedges. When necessary, anchor or weight the pipe to prevent flotation when the concrete is placed.

d. Place concrete for Class A (concrete) embedment or encasement uniformly on each side of the pipe and deposit at approximately its final position. Do not move concrete more than five feet (5') from its point of placement.

e. If unstable subgrade conditions are encountered and it is determined by the Engineer that the bedding specified will not provide suitable support for the pipe, additional excavation to the limits determined by the Engineer will be required. This additional excavation shall be backfilled with crushed stone material approved by the Engineer.

7. All Class A embedments require concrete providing a 28-day compressive strength of not less than 3,000 pounds per square inch, or as otherwise specified. After initial set of concrete, one foot (1') of backfill material should be placed over the conduit or concrete. The backfill above this point shall not be placed nor sheeting removed until at least forty-eight (48) hours after placement of the concrete. Time requirements may be adjusted by the Engineer to obtain structural integrity.

8. Class B embedments will require the pipe to be bedded in granular material, with a minimum depth below and above the pipe as shown on the approved drawings, meeting requirements of Sec. 20.08.003 F.

9. Pipeline anchors shall be installed at no greater than thirty-six feet (36’) maximum spacing on all pipelines installed at greater than a twenty percent (20%) grade. The pipe line anchors shall be non reinforced concrete with a four feet (4’) minimum width. The anchor length shall be the trench width, with a minimum length of two feet (2’). The concrete thickness below and above the pipeline shall be as follows:

Pipe Size	Thickness
8”	7”
10”	11”
12”	15”
Above 12”	24”

10. Tees, Wyes, and service lines shall be installed as shown on the Plans or specified herein.

a. Tees, wyes and saddles shall be installed at forty-five degree (45°) with pipe springline, for pipe sizes eight inch (8") through twenty-one inch (21") diameter. Tees, wyes and saddles shall not be installed in pipe sizes greater than or equal to twenty-one inch (21") diameter.

b. Service lines shall be installed with a straight alignment and at a uniform grade not less than one percent (1%) unless otherwise specified and shall be embedded with Class B embedment. When a service line grade exceeds twenty percent (20%), pipeline anchors shall be installed as required herein, with the first anchor not more than twelve feet (12') nor less than seven feet (7') upstream of the tee or wye.

c. The Contractor shall maintain an accurate record for submittal to the Engineer of location, size and direction of each tee, wye, saddle and/or location, size and length of each building service line. Locations shall use the pipeline stationing as shown on the Plans, or the distance from the first downstream manhole. In the event such records are not kept, or are lost before final acceptance of the work, the required information shall be redetermined by the Contractor at no additional cost to the Owner.

d. In addition, each wye branch, or house service lateral, shall be marked with a detectable plastic and metal marking tape from the main to terminal end of said lateral or branch, and shall be placed two feet (2’) below the ground surface. Tape shall be green in color and marked with wording "CAUTION SEWER LINE BURIED BELOW".

e. Wye branches shall be located at the points shown on the plans, or designated by the Engineer, and shall be constructed from the sewer main at least to the right-of-way or easement line adjacent to the property to be served prior to construction of the street. The Contractor shall be certain that the wye branch locations have been staked in advance of the construction of any sewer serving any property which will require sanitary sewer service and, in case such locations have not been so designated, shall stop the sewer construction until the necessary wye branch locations have been obtained and marked. Wye branches shall not be backfilled until the location of each has been recorded on the as-built plans to be submitted to the City Engineer for a permanent record.

Wye branches shall be closed by means of suitable stoppers, or otherwise according to manufacturer's specification for watertight fitting. Wye branches shall be completely supported with granular fill up to the mid-height of the branch.

11. All gravity sewers shall be installed to the alignment, elevation, slope, and with pipe embedment as specified and/or shown on the Plans.

12. All pressure sewers (force mains) shall be installed with required pipe embedment to slopes and depths shown on the Plans, and to a continuous slope when not shown. Approved air relief valves shall be installed at all locations shown on the Plans or where required by the Engineer.

The Contractor shall block and anchor the pipeline to accommodate thrust and testing forces at pipe deflections, bends, tees, and plugs in accordance with the Contract Documents. All damage caused by the Contractor's failure to provide adequate thrust supports shall be corrected by the Contractor at no additional cost to the Owner.

13. Pipelines shall be anchored in accordance with the table below:

PIPELINE ANCHORS

Percent of Grade	Center to Center Max. Spacing (Feet)
20-35	36
35-50	24
50	16

The anchor shall be of concrete or other material approved by the Engineer. Concrete anchors shall have a minimum thickness of twelve inches (12"). The anchor shall extend not less than one foot (1') into undisturbed earth on the sides and bottom and one foot above top of pipe. In incompressible material, the above dimensions may be six inches (6") each side and bottom. The anchor shall support a joint fitting.

14. All pipe shall be installed in accordance with the pipe manufacturer's recommendation, except as modified herein.

a. Pipe laying shall not proceed if the trench width as measured at the top of pipe exceeds the maximum allowable trench width. If this occurs the Contractor shall provide, to the approval of the Engineer better bedding for the pipe or pipe of sufficient strength to provide safe supporting strength.

b. All pipe and fittings shall be stored and handled with care to prevent damage thereto. Do not use hooks to transport or handle pipe or fittings. Do not drop pipe or fittings.

c. Rejected pipe and fittings shall be marked and removed from the project site at no cost to the Owner. All pipe and fittings shall be examined for soundness and specification compliance prior to placement in the trench and rejected pipe or fittings shall not be incorporated into the pipeline. Check the class or pipe strength to be sure proper pipe is installed.

d. Clean joint contact surfaces prior to jointing. Use lubricants, primers, or adhesives as recommended by the pipe or joint manufacturer.

e. Pipe laying normally shall begin at the lowest point.

f. Unless otherwise required, lay all pipe straight between manholes. Excavate bell holes for each pipe joint. When jointed, the pipe shall form a true and smooth pipeline.

g. Pipe connecting to a structure shall be supported with Class A embedment, cradle or encasement, to a point six inches (6") outside the structure excavation. If flexible wall connections are used, Class B embedment may be used.

h. All pipelines shall be plugged at the end of each day's progress. Plugs or other positive methods of sealing shall be utilized at all times to protect any existing system from entrance of stormwater or other foreign matter.

i. When a sanitary sewer line crosses an existing pipeline and the clearance is less than two feet (2'), special embedment may be required.

15. The connection of pipes of different materials shall be made using a proprietary transition coupling, and shall provide a permanent and watertight connection which will withstand the hydrostatic test pressure.

C. All pipes shall be installed in accordance with the following standards:

1. ASTM 2321 - ABS Solid Wall, ABS Composite Wall, ASTM 2321 - PVC Solid Wall.
2. ANSI/AWWA C 600 - Ductile Iron Pipe.
3. ASTM C 12 - Vitrified Clay Pipe.
4. Reinforced Concrete Pipe - Installed in accordance with American Concrete Pipe Association's "Installation Manual".

D. Casing and carrier conduits shall be installed at required locations by methods acceptable to the Engineer. Installation of the carrier conduit shall be completed prior to installation of the adjacent portions of the pipeline to allow for adjustments.

1. The types of casing to be used will be limited.

a. Steel Casing Pipe is a flexible conduit and shall be designed to conform with one of the following design concepts (other methods may be submitted to the Engineer for approval).

(1) Method A. The steel casing conduit is considered a temporary construction means for the installation of the carrier conduit; therefore, cathodic and corrosion protection is not required provided that the carrier and its joints are structurally designed to withstand all possible loadings (live, earth and superimposed) which would otherwise be supported by the casing conduit, and to withstand all pressures necessary to install the required grout. All exterior voids around the casing conduits and interior void between the carrier and casing conduits shall be filled with a casing conduit grout. Casing conduit grout shall be applied under pressure to fill all of the voids without adversely effecting the carrier conduits, joints, alignment and grade.

(2) Method B. The steel casing conduit is considered a permanent installation to protect the carrier conduit, and to support all loads, therefore cathodic and corrosion protection and watertight removable end seals are required for the casing conduit. Care shall be exercised to prevent the carrier conduit from floating and receiving any load transfer from the casing conduit unless it is designed for such loading. The void between casing and carrier conduits shall be treated as shown on the drawings. Cathodic and corrosion protection for method B shall be provided by two magnesium anodes, one at each end of the casing pipe, with a lead wire connected to the encasement pipe by thermite welding.

b. Reinforced Concrete Casing Pipe is a rigid conduit and shall be installed in accordance with recommended procedures in the latest printing of the Concrete Pipe Design Manual, prepared by the American Concrete Pipe Association.

2. Installation of casing shall be supervised by a supervisor experienced in such work. Casing shall be installed by a combination of auguring and jacking. Alignment and gradient shall be such that the carrier conduit can be installed to line and grade shown on the Drawings.

Welding shall be performed by a person experienced with the type of welding necessary. All welds shall conform to AWWA C 206.

3. Liner plates shall be assembled immediately following the excavation. Advance the liner plates or casing continuously with excavation. All voids between liner and surrounding earth shall be filled with casing conduit grout forced in under pressure. As the pumping through any hole is completed, it shall be plugged to prevent the back-flow of grout. After lining installation is complete, it shall be cleaned of all debris and all leaks sealed.

4. After completion of the installation of the casing, the carrier conduit shall be carefully pushed or pulled through the casing in a manner which will maintain proper jointing of the pipe joints and provide required gradient and alignment. Pipe skids shall be provided as indicated on the Plans. The skids shall be securely strapped to the pipe with stainless steel strapping material at least three-quarters inch (3/4") wide.

5. Annular space between lining and sewer pipe shall be filled with stabilized sand from end seal to end seal, if required. The fill shall be placed inside casing, tested and approved in a manner that will not disturb the alignment and/or grade of sewer pipe. Cement-sand mixture used in casing conduits shall be as specified herein. Stabilized sand shall be thoroughly mixed in a mechanical mixer and shall be blown into the casing so that all space is filled.

6. Construct end seals after sewer pipe has been installed and approved. Brick shall be in accordance with ASTM C 32, Grade SS or SM and mortar in accordance with ASTM C 270.

7. Air pressure, and/or exfiltrating test as required shall be successfully performed on the carrier conduit prior to filling the void between casing and carrier conduits with grout or other materials, or the sealing of the ends of the casing conduit.

8. Carrier conduits installed without casing shall be assembled at the entrance to the auger hole and carefully pushed or jacked through the opening using a method designed to prevent disturbing the assembled joints. Auger holes shall be sized to accommodate the carrier conduit with a minimum of annular space around the conduit. When finally in place, carrier conduit shall be true to the line and grade required on the Plans.

SEC. 20.08.007. BACKFILL

A. This section governs the furnishing of all labor, equipment, tools and materials to properly backfill trenches and structures.

1. All trash and debris shall be removed from the pipeline excavation prior to backfilling.
2. Unless otherwise specified, all sewer trenches and excavation around structures shall be backfilled to the original surface of the ground with earth or earth and rock. When earth and rock is used, it shall be placed and thoroughly consolidated with sufficient earth to completely fill all voids between the rocks.
3. The backfill material shall be placed in lifts. Each lift shall be compacted to the required density prior to the next lift being placed.
4. Commercial sand backfill shall not be used.
5. In areas marked "garden" or "flower garden" on the plans, the original topsoil shall be replaced to original elevation and depth.
6. Backfill material shall be carefully placed to avoid damage to or displacement of the pipe and other exposed utilities or structures.
7. Backfill shall not be placed when material contains frost, is frozen, or a blanket of snow prevents proper compaction. Backfill shall not contain waste material, trees, organic material, rubbish, or other deleterious substances.
8. No rock greater than one foot (1'), measured along its longest axis, shall be placed within two foot (2') of the top of the pipe in any excavation as backfill.

B. Backfilling under areas to be paved and existing pavement: From the top of the pipe embedment as shown on the approved standard drawings to a point at grade, backfill material shall be untreated aggregate meeting the requirements of Chapter 20, Article 6, and compacted to 95% maximum density as determined by ASTM D 698. Sidewalks and driveways are considered paved areas.

C. For those areas that will not be paved the backfill material from the top of the pipe embedment as shown on the standard drawings shall be compacted to no less than ninety percent (90%) of density at optimum moisture plus or minus two percent (2%)as determined by ASTM D 698, or within the tolerance of the moisture range for the type of material being used as determined by the Engineer. Lift thickness shall be within the capability of the compaction equipment used, but not greater than twenty-four inches (24").

D. Backfilling around a structure must be done in a manner that will maintain the integrity of the structure.

1. No backfill shall be placed over or around any structure until the concrete or mortar has attained a minimum strength of two thousand pounds per square inch (2000 psi) and can sufficiently support the loads imposed by the backfill without damage.

2. The Contractor shall use utmost care to avoid any wedging action between the side of the excavation and the structure that would cause any movement of the structure. Any damage caused by premature or unbalanced backfill or by the use of equipment on or near a structure will be the responsibility of the Contractor.

3. No excavated rock larger than four inches (4") maximum dimension shall be placed within one foot (1') of the exterior surface of any structure.

SEC. 20.08.008. TESTING.

A. This section governs the furnishing of all labor, equipment, tools and materials, and the performance of any or all acceptance tests.

B. The Contractor shall furnish all labor, equipment, materials and reports for the required acceptance tests. All pipelines, including building service lines shall undergo and pass tests to determine the soundness and workmanship regarding alignment, grade, infiltration, exfiltration and/or pressure. Pipelines which do not conform to the project requirements shall be repaired and/or replaced and shall be retested until the pipeline meets the project requirements. Test results shall be recorded by the Contractor and a copy shall be submitted to the Engineer. No testing shall be performed before backfill and compaction operation has been completed.

C. Alignment, grade and visible defects shall be checked as follows:

1. Contractor shall clean pipe of excess mortar, joint sealant and other dirt and debris prior to inspection.

2. Sewer will be inspected by flashing a light between manholes and/or by physical passage to determine the presence of any misaligned, displaced, or broken pipe and other defects.

3. Sewer lines installed under this project are subject to inspection by closed circuit television at the Owner's expense. Access to the sewer manholes shall be provided by the Contractor at no expense to the City.

D. Hydrostatic or air pressure tests may be required on sewers before acceptance by the Owner. For sewers with a diameter less than twenty-four inches (24") the infiltration-exfiltration shall not exceed two hundred (200) gallons per day per inch of nominal diameter per mile of sewer line for any section of the system. For sewers with a diameter twenty-four inches (24") or greater infiltration-exfiltration shall not exceed six thousand (6,000) gallons per day per mile of pipe.

1. Where sewers are laid within the ground water table, infiltration testing may be conducted. Where evidence of infiltration is discovered by the Engineer, the Contractor shall install weirs or other suitable flow rate measuring devices adequate to determine to the satisfaction of the Engineer that the specified infiltration limit is not exceeded for that reach of gravity sewer. Where the specified infiltration limit is exceeded, the Contractor shall repair or replace the defective reach of pipeline at no additional cost to the Owner. Following repair of the pipeline, the Contractor shall remeasure infiltration flow rates and make additional repairs until an acceptable infiltration flow rate is achieved.

2. Where sewers are laid above the ground water table, exfiltration tests may be conducted. Exfiltration tests shall be performed by the Contractor using one or a combination of methods as set forth below.

a. Hydrostatic Tests for Gravity Systems.

(1) Test section shall be filled not less than twelve (12) hours prior to testing. Refill test section prior to performing test.

(2) Perform at depths of water as measured above center line of pipe of not less than two feet (2') nor more than ten feet (10') (consideration shall be given for water table above said centerline). Maintain test as necessary to locate all leaks, but not less than two (2) hours.

b. Hydrostatic Tests for Pressure Systems.

(1) Perform hydrostatic pressure and leakage tests. Conform to AWWA C 600 procedures as modified herein. Tests shall apply to all pressure sewers.

(2) Test in segments between sectionalizing valves, between a sectionalizing valve and a test plug, or between test plugs. Contractor shall furnish and install test plugs at no additional cost to the Owner, including all anchors, braces, and other devices to withstand hydrostatic pressure on plugs. Contractor shall be responsible for any damage to public or private property caused by failure of plugs. Limit fill rate of line to available venting capacity.

(3) Pressure Test. Conduct at 1.5 times maximum operating pressure determined by the following formula:

Ppt = (1.5) (.433) (OP-GE), in which

Ppt = test pressure in psi at gauge elevation

OP = operating pressure in feet as indicated for highest elevation of the hydraulic gradient on each section of the line.

GE = elevation in feet at center line of gauge.

Perform pressure tests satisfactorily prior to determining leakage.

(4) Leakage Test. Conduct at maximum operating pressure determined by the following formula:

Plt = 0.433 (OP-GE), in which

Plt = test pressure in psi at gauge elevation OP and GE = as defined above.

All joints shall be watertight and free from leaks.

c. Air Testing of Gravity Systems.

(1) Each section of gravity pipeline between manholes and/or structures after backfill shall be tested as outlined below.

(2) Contractor may perform air tests for all pipe sizes.

(3) Furnish all facilities required including necessary piping connection, test pumping equipment, pressure gauges, bulkheads, regulator to avoid overpressurization, and all miscellaneous items required.

(4) The pipe plug for introducing air to the sewer line shall be equipped with two taps. One tap will be used to introduce air in to the line being tested through suitable valves and fittings, so that the input air may be regulated. The second tap will be fitted

with valves and fittings to accept a pressure test gauge indicating internal pressure in the sewer pipe. Additional valve and fitting will be incorporated on the tap used to check internal pressure so that a second test gauge may be attached to the internal pressure tap. The pressure test gauge will also be used to indicate loss of air pressure due to leaks in the sewer line.

(5) The pressure test gauge shall meet the following minimum specifications:

Size (diameter)	4-1/2 inches
Pressure Range	0-15 psi
Figure Intervals	1 psi increments
Minor Subdivisions	0.05 psi
Pressure Tube	Bourbon Tube or diaphragm
Accuracy	+/-0.25% of maximum scale reading
Dial	White coated aluminum with black lettering, 2700 arc and mirror edge
Pipe Connection	Low male 1/2 inch N.P.T.

Calibration data will be supplied with all pressure test gauges. Certification of pressure test gauge will be required from the gauge manufacturer. This certification and calibration data will be available to the Engineer whenever air tests are performed.

(6) Plug ends of line and cap or plug all connections to withstand internal pressure. One of the plugs provided must have two taps for connecting equipment. After connecting air control equipment to the air hose, monitor air pressure so that internal pressure does not exceed 5.0 psig. After reaching 4.0 psig, throttle the air supply to maintain between 4.0 and 3.5 psig for at least two (2) minutes in order to allow equilibrium between air temperature and pipe walls. During this time, check all plugs to detect any leakage. If plugs are found to leak, bleed off air, tighten plugs, and again begin supplying air. After temperature has stabilized, the pressure is allowed to decrease to 3.5 psig. At 3.5 psig, begin timing to determine the time required for pressure to drop to 2.5 psig. If the time, in seconds, for the air pressure to decrease from 3.5 psig to 2.5 psig is greater than that shown in the table below, the pipe shall be presumed free of defects.

Pipe Size	Required Time per 100 LF	Maximum Required Time
8"	70 sec.	227 sec.
10"	110 sec.	283 sec.
12"	158 sec.	340 sec.
15"	248 sec.	425 sec.

Pipe Size	Required Time per 100 LF	Maximum Required Time
18"	356 sec.	510 sec.
21"	485 sec.	595 sec.
24"	634 sec.	680 sec.
27"	765 sec.	765 sec.
30"	851 sec.	851 sec.

If air test fails to meet above requirements, repeat test as necessary after all leaks and defects have been repaired and backfilled.

E. Flexible pipelines may be tested for deflection by pulling a mandrel through the entire length thereof.

a. The mandrel (go/no-go) device shall be cylindrical in shape and constructed with nine (9) evenly spaced arms or prongs. Mandrels with less arms will be rejected as not sufficiently accurate. The dimensions of the mandrel shall be as listed in the accompanying table. The "D" mandrel dimension shall carry a tolerance of + or - 0.01 inch. Allowances for pipe wall thickness tolerances or ovality (from heat, shipping, poor production, etc.) shall not be deducted from the "D" dimension but shall be counted in as a part of the five percent (5%) or lesser deflection allowance. Contact length (L) shall be measured between points of contact on the mandrel arm. The length shall not be less than as shown in the accompanying table.

b. The Engineer shall be responsible for approving the mandrel. Proving rings shall be used to verify this.

c. The mandrel shall be hand-pulled by the Contractor through all sewer lines. Any sections of sewer not passing the mandrel test shall be uncovered and the Contractor, at no additional cost to the Owner, shall reround or replace the sewer to the satisfaction of the Engineer. These repaired sections shall be retested.

d. The testing shall be conducted after final trench backfill.

D and L Dimensions For
9 Arm Mandrel

Nominal Diameter	L	ASTM 3034 SDR 35 (5% Defl.)
8"	8"	7.56"
10"	10"	9.45"
12"	10"	11.26"
15"	12"	13.78"

SEC. 20.08.009. MANHOLES AND SPECIAL STRUCTURES

A. This section governs the furnishing of all labor, equipment, tools, and materials, and the performance of all work incidental to the construction of manholes, drop manholes and special sewer structures complete with covers, steps, fittings and appurtenances as required in accordance with the Plans and Special Provisions.

B. As used herein special structures refers to large manholes special junction structures, metering stations, siphons and similar structures constructed on the pipeline.

C. Manholes and special structures may be constructed of precast concrete sections or cast-in-place concrete.

1. All manholes and special structures shall be waterproofed. Waterproofing shall be coal-tar paint and conform to ASTM D 450. Interior surfaces which are exposed to raw sewage and sulfide gases shall be coated with Tnemec "46-449 Heavy Duty Black" or approved equal. Exterior applications shall be coated with Tnemec "46-450 Heavy Tnemecol" or approved equal. The minimum dry thickness for all waterproofings shall be 14.0 mils.

2. Pre-cast Concrete manholes shall conform to ASTM C 478 with the following modifications.

a. Wall thickness shall conform to the approved standard drawings.

b. Cement, Fine Aggregate, Coarse Aggregate and Water used in the manufacture of precast manholes shall be as specified herein.

c. The use of developed bases is recommended and approved. The diameter of the base pad shall be eight inches (8") greater than outside diameter of the manhole.

d. Pipe openings shall be circular. Flexible gaskets are required. Flexible gaskets shall be Press-wedge, A-Lock, or approved equal.

e. The minimum distance from the invert of the downstream pipe to the top surface of the base shall be three inches (3").

f. Joints shall be sealed with preformed bitumastic sealants, Kent-Seal, Ram-Nek, E-Z Stick or approved equal. The minimum bead dimension shall be three-fourths (3/4) of an inch square.

3. Manhole and Special Concrete shall conform to "The Mid-West Concrete Industry Board Incorporated" (MCIB) Specifications and to the requirements therein for the MCIB Mix Number as specified on the Drawings or as provided herein.

a. Standard Concrete used for concrete encasements and embedments, thrust blocks, pipe anchors, pipe collars, etc., shall be MCIB Mix number 479-1-4, (3000 psi 28-day strength), unless otherwise specified.

b. Structural Concrete used for aerial crossing piers, wet walls, manhole walls, bases, and flat slabs, etc. shall be MCIB Mix Number A 582-3/4-2, (4000 psi 28-day strength), unless otherwise specified.

c. Air-entraining admixtures shall provide an air content within the range of 4 1/2 to 7 1/2 percent by volume as measured by the pressure method (ASTM C 231). The air entraining admixtures shall meet the requirements of ASTM C 260.

d. Portland Cement shall conform to ASTM C 150 Type I. Where high early strength is desired, Type III can be used.

e. Fine Aggregate shall be clean, natural sand meeting the requirements of ASTM C 33. Grading shall be within the limits as set forth by MCIB.

f. Coarse Aggregate shall be limestone obtained from the Bethany Falls, Farley, or Argentine ledges meeting the requirements of ASTM C 33. The sum total of all deleterious material shall not exceed five percent (5%).

g. Water shall be clean and free from deleterious substances. Only potable water will be acceptable without testing.

h. Mixing and transporting of concrete shall be in accordance with Section 501 of the latest edition of the Missouri Standard Specifications for Highway Construction.

4. Reinforcement steel shall conform with the following minimum requirements.

a. Design. Reinforcing steel shall conform to one of the following.

(1) Welded Wire Fabric - ASTM A 185, Grade 40, or Grade 60.
(2) Reinforcing Bars - ASTM A 615, Grade 40, or Grade 60.
(3) Fabricated Steel Bar and Rod Mats - ASTM A 184, Grade 40, or Grade 60.

b. Fabricating Tolerances for concrete reinforcement shall conform to the following requirements.

(1) Sheared length = +/- 1 inch.
(2) Stirrups, ties, and spiral = +/- 2 inch.
(3) All other bends = +/- 1 inch.

5. Iron Castings shall conform to the requirements of ASTM A 48, Class 30. Castings shall be clean and without surface defects which will impair serviceability. Plugging or filling of holes or other defects will not be permitted. Parting fins and pouring gates shall be removed.

a. Rings and Covers shall meet the following minimum requirements.

(1) Bearing surfaces between the ring and cover shall be machine finished or ground to assure interchangeability and a nonrocking fit in any position.
(2) Provision shall be made for opening, such as concealed pick hole(s).
(3) Bolt-down type manhole rings shall be anchored to the manhole walls with not less than four (4) three-fourths inch (3/4") diameter steel bolts embedded a minimum of fourteen inches (14"), except where the entire ring is embedded in a concrete top slab.
(4) Rings and bolt-down covers shall be provided with machined surfaces, O-ring gaskets and five-eights inch (5/8") hex head brass cover bolts. Cover bolt heads shall fit flush or below the top of the cover. The O-ring rubber gasket shall be neoprene or other synthetic, sixty (60) plus or minus five
(5) hardness when measured by ASTM D 2240 type durometer.

b. Steps.
(1) Cast-iron steps shall meet the following minimum requirements.

(a) Minimum cross-sectional dimensions of one inch (1") horizontally and one and one-eighth inches (1 1/8") vertically.
(b) A skid resistant pattern in the step tread area consisting of multiple grooves one-eighth inch (1/8") deep and one-eighth inch (1/8") wide.
(c) Upward protruding lugs on corners of step a minimum of three-fourths inch (3/4") high.
(d) Provisions for secure anchorage in the manhole wall.

(2) Steel core plastic coated steps shall meet the following minimum requirements.

(a) The plastic coating shall be a copolymer polypropolene meeting ASTM D 2146.
(b) The steel core shall be a minimum of one-half inch (1/2") in diameter and grade 60.

D. Manhole Site Preparation shall be governed by Section 20.08.004.

E. Excavation for manholes and special structures shall be governed by this Section and Section 20.8.5. It shall be achieved in a suitable and orderly manner providing a minimum disturbance to the general public.

1. Depth of Excavation shall be to that required for proper installation of the manhole or structure. Over-depth excavation may be required by the Engineer if the subgrade is unstable. Overdepth excavation due to unstable subgrade shall be backfilled as required by the Engineer. Over-depth excavation occurring through an oversight by the Contractor shall be backfilled as required by the Engineer at no additional cost to the Owner.

2. Side Clearances outside the manhole and/or structures shall be no greater than to allow for forming, connection of piping, proper application of special coatings, if required, and to permit inspection. When concrete is to be placed directly against excavated faces, excavation shall be sufficiently outside of the manhole or structure to provide not less than three (3) inches of concrete cover over the steel reinforcement.

F. Manhole Installation shall be governed by this Section and Section 20.08.006. It shall be performed by the Contractor on a schedule which will provide an orderly progression of the work.

1. Bases for manhole installation will meet the following requirements.

a. Pre-cast developed bases shall be reinforced in accordance with ASTM C478.

b. If preferred developed bases are not used, poured concrete bases shall be used. Developed bases shall be installed on a maximum of 4 inches of crushed rock. Depths exceeding this amount shall be filled with mass concrete.

c. Poured in place bases shall have a minimum thickness of eight inches (8"). The bottom wall sections shall be embedded in the base section a minimum of four inches (4"). The bottom precast wall section shall not be set upon a previously poured base. Wood shall not be used for supporting or leveling the wall section prior to pouring the base.

2. The minimum horizontal clear distance in the barrel of the manholes shall not be less than four feet (4') unless otherwise specified on the Plans.

3. Precast concrete when used in Manhole installations will meet the following requirements:

a. Precast concrete components shall not be delivered to the job until representative concrete control cylinders have attained at least eighty per cent (80%) of the specified minimum design strength.

b. Precast concrete shall be inspected when delivered. Rejection of defective or cracked precast concrete components shall be in accordance with ASTM C478.

c. Wall thickness shall conform to the requirements of Section 20.08.009 C5a.

d. Precast sections shall be cleaned of all dirt, grass, and other deleterious matter. Seal each joint (including adjustment rings and castings) with a pre-formed flexible joint sealant. Sections shall be placed such that steps are aligned, but without rotation or damage to sealant integrity. Lift holes shall be patched with non-shrink grout.

4. Cast-In-Place concrete when used in manhole installations will meet the following requirements:

a. Wall thickness shall conform to the dimensions as shown on the drawings.

b. Reinforcement steel shall be placed as shown on the drawing. Tie-holes shall be patched with non-shrink grout. Wall sleeves, where required, shall be installed as shown on the drawings. Water stops shall be installed at the wall and slab connection and shall be of the size, thickness and material as shown on the drawings.

c. Interior protective coatings, where required, shall conform to the material specifications. Application shall conform to the manufacturer's recommendation.

5. Top slab thickness shall conform to the dimensions and reinforcement steel shall be placed, as shown on the drawings.

6. Pipe stubs shall be installed at the locations, angles, elevations and of the materials as shown on the drawings. A watertight removable stopper shall be installed in each pipe stub. Pipe stubs shall be installed so that a pipe joint will be two feet (2') or less from the outside manhole wall.

7. Inverts shall be standard concrete and steel-troweled to produce a dense, smooth finish. The invert channel shall be "U" shaped in cross section and extend upward three-fourths (3/4) of the inside pipe diameter. Smooth transitions shall be formed for pipes of different sizes, elevation and bends. The invert bench shall be sloped to drain.

8. Steps shall be aligned vertically below the casting and spaced at sixteen inch (16") centers. The top step shall be not more than one foot (1') below the top of the cone. The lowest step shall be not more than two feet (2') above the invert bench. Field drilled step holes are not permitted in precast concrete manholes.

9. The finished top elevation of manhole castings shall conform to the following, unless otherwise shown on the plans or directed by the Engineer.

a. In paved or future paved areas, the top of the casting shall conform to the slope of the pavement and finished pavement elevations.

b. In non-pavement areas, the top of the casting shall match the surrounding ground unless directed otherwise by the Engineer. The final elevation shall be at a point where water will not pond over the manhole cover.

10. All new manholes will be provided with adjustment ring(s) underneath the casting if shown on plans. The joints shall be sealed with preformed bitumastic sealant. The maximum allowable adjustment distance between the top of the cone and the bottom of the casting shall be as shown on the plans.

11. If the top of an existing manhole is required to be raised to an elevation which will exceed the maximum adjustment distance, or lowered more than the adjustment rings will allow, all vertical adjustments shall be made to the barrel of the manhole.

12. Castings shall be installed with the mud ring inserted inside the manhole opening and resting on a minimum of two rows of preformed bitumastic sealer. Bolt down castings shall be held in place as shown on the Plans.

G. Manhole Backfilling shall be governed by Section 20.08.007.

H. Restoration shall be governed by Chapter 20.

SEC. 20.08.010. MEASUREMENT & PAYMENT.

A. This section covers the methods of measurement and basis of payment for the furnishing of all labor, equipment, tools and materials and for the performance of all related work necessary to complete the item as specified.

1. Sanitary sewer pipe shall be measured per linear foot or tenth part thereof for each line between structures and made to the inside face of the connecting structure. Payment will be made at the contract unit bid price regardless of the type of pipe used. Price shall include trenching, bedding, furnishing and installation of pipe, couplings, backfilling, compaction, testing and all other items required to complete the installation as specified.

2. Manholes will be measured as a unit complete and in place of the various types constructed. Payment will be made at the contract unit price per each of the applicable types, size and depth of manholes listed in the proposal. Such payment shall constitute full compensation for all labor, material, equipment and the performance of all work necessary to complete the manholes, including excavation, backfilling and disposal of excess material.

3. Concrete encasement measurement will be made to determine the number of linear feet of encasement constructed in accordance with the plans and specifications. Payment will be made at the contract unit price bid per linear foot and shall include the cost of furnishing all labor, equipment, tools, materials and the performance of all work to complete the encasement as specified.

4. Manhole reconstruction measurement will be made to determine the number of vertical feet of manhole reconstruction in accordance with the plans and specifications. Payment will be made at the contract unit price to the nearest tenth (.1) vertical foot and shall include the cost of furnishing all labor, equipment, tools, materials and the performance of all work to complete the reconstruction as specified.

5. Manhole adjustments measurement will be made to determine the number of manholes adjusted. Payment will be made at unit price per each for each adjustment and shall include the cost of furnishing all labor, equipment, tools and material and the performance of all work to complete the manhole adjustments as specified.

6. Wye installation measurement will be made to determine the actual number of wyes installed. Payment will be made at the contract unit price per each and shall include the cost of trenching, installation, pipe materials, wyes, bedding, backfill, compaction and all items necessary to complete the installation as specified.

7. Connection to existing manhole measurement will be made to determine the actual number of connections made to existing manholes. Payment will be made at the contract unit price per each and shall include the cost of connecting new effluent, reshaping invert as needed, mortar, excavation, backfill and all other items necessary to complete the connections as specified.

8. Sanitary sewer lateral pipe shall be measured per linear foot or tenth part thereof for each line installed. Payment will be made at the contract unit bid price regardless of the type of pipe used. Price shall include trenching, bedding, furnishing and installation of pipe, couplings, backfilling, compaction, testing and all other items required to complete the installation as specified.

B. There shall be no measurement or separate payment or any other items of work not identified nor listed in the proposal and all costs pertaining thereto shall be included in the contract unit prices for other items listed in the proposal.

SEC. 20.08.011 - 20.08.999 RESERVED.

CHAPTER 20

ARTICLE 9. DESIGN CRITERIA FOR SANITARY SEWERS AND APPURTENANCES

SEC. 20.09.001. GENERAL.

The following design criteria establishes practical, uniform design of sanitary sewers for the City of Independence, Missouri. These criteria cover design factors and provide guidelines for evaluation of plans and specifications. These criteria are not intended to cover extraordinary situations, and in such instances deviations from the criteria may be allowed where justified, upon the approval of the City Engineer.

Where the term "shall" is used, it is intended to mean a mandatory requirement insofar as any confirmation by the City Engineer.

“Up-sizing” means increasing the size of a sewer line which was designed by the developer to meet only the needs of the proposed development to a size determined by the City to meet the needs of the entire watershed in which the sewer is located, taking into consideration the location of the sewer in the watershed, the natural topography of the watershed and the adopted Comprehensive Plan of the City.

“Off-site sewer system extension or off-site sewer extension or off-site extension” means construction of a sanitary sewer system from an existing public sewer system to a proposed development where that construction required the proposed system extension to either cross private property not owned by the developer or be constructed in public right-of-way either fronting or crossing private property not owned by the developer in order to connect to the public sewer system.

SEC. 20.09.002. GENERAL REQUIREMENTS.

Sanitary sewer systems shall be designed for the ultimate tributary population and shall be based on the best information available, including current zoning regulations and approved planning and zoning reports. Only gravity sewers, in accordance with provisions contained herein, shall be considered for acceptance by the City.

Sewers shall be designed to provide capacity based on the following criteria unless directed otherwise by the City Engineer:

A. Single Family Residential - .015 cfs/acre

B. Multi-Family Residential - .03 cfs/acre

C. Commercial - .02 cfs/acre

D. Industrial and High Rise (in excess of three stories). A unit flow study is required.

SEC. 20.09.003. PIPE SIZE.

No gravity sewer main shall be less than eight inches (8") in diameter. The sewer shall be sized based on the criteria set forth in Section 20.09.001 and 20.09.002. Pipe sizing shall be based on the Manning formula:

$$Q = \frac{1.486\ R^{2/3} S^{1/2}}{n}, \text{ where}$$

Q = Pipe flow capacity in cubic feet per second (cfs)

A = Inside area of pipe in square feet

R = Hydraulic Radius

S = Pipe slope in feet per foot

n = Pipe roughness coefficient

Value for n shall be as follows for the particular type used:

RCP	- .013
VCP	- .013
Plastic composite	- .011
Ductile Iron	- .012

Headwater depths in a manhole shall not exceed one foot above the pipe opening. Headloss coefficients (K) at the manhole shall be as follows:.

CONDITION	
Thru flow	.15
Junction	.4
Contraction transition	.1
Expansion transition	.2
90 degree bend	.4
45 degree and less bends	.3

SEC. 20.09.004. MINIMUM SLOPE.

The following minimum slopes will be required:

Sewer Size	Minimum Slope in Feet Per 100 Feet
8"	0.60
10"	0.44
12"	0.36
15"	0.28
18"	0.24
21"	0.20
24"	0.16

Exceptions to these minimum slopes be made for sewers serving less than thirty houses, where such sewer shall have a minimum slope of 0.76%. Where lateral sewers serve less than ten (10) houses, the minimum slope shall not be less than one percent (1%).

SEC. 20.09.005. ALIGNMENT.

Sewers shall be designed on straight alignment between manhole. The interior angle of the incoming and outgoing pipes in a manhole shall not be less than ninety degrees (90º).

SEC. 20.09.006. MANHOLE LOCATION.

Manholes shall be installed at the end of each line; at all changes in pipe size; or changes in alignment or grade; and at distances not greater than 400 hundred feet (400') for sewers twenty-one inches (21") and smaller and five hundred feet (500') for twenty-four inches (24") and larger. When a sewer is located in an easement, not abutting street or alley right-of-way, access should be provided to all manholes, and manholes shall be provided at street or alley crossings.

SEC. 20.09.007. MANHOLES.

A. The difference in elevation between the invert of any incoming sewer and the invert of the outgoing sewer shall not exceed twelve inches (12"), except where required to match crowns. When a sewer joins a larger one, the crown of the smaller sewer shall not be lower than the crown of the larger one. The minimum drop through manholes shall be two tenths of one foot (.2').

B. Drop manholes shall be avoided as much as possible and the use thereof will require the approval of the Engineer. Drop manholes shall be required when the difference in the invert elevations exceeds twelve inches (12").

C. The minimum horizontal clear distance within the barrel of manholes shall not be less than four feet (4'). Pipes through the manhole wall shall be so located, or the diameter of the manhole increased, so that a section of manhole wall is retained between the pipes which is four inches (4") or greater along the inside face. Minimum manhole diameter shall be in accordance with the approved drawings.

D. Manholes subject to surface water inundation shall be equipped with bolted pressure covers and frames shall be bolted to manholes or imbedded in concrete where poured manholes are used.

SEC. 20.09.008. SEWER LOCATIONS.

Sanitary sewers shall be located within street or alley rights-of-way, unless topography dictates otherwise. When located in easements on private property, access shall be provided from street or alley right-of-way.

SEC. 20.09.009. PIPE COVER.

All sewer mains are to have a minimum of three feet (3') of cover, except for aerial creek crossings. Sewer mains under paved areas are to have a minimum of six feet (6') of cover, or by ductile iron pipe or concrete encased. Aerial crossings shall be ductile from pipe with mechanical joints. Support shall be provided for all joints in pipes utilized for aerial crossings. The supports shall be designed to prevent frost heave, overturning and settlement. Precautions against freezing, such as insulation and increased slope, shall be provided. Expansion jointing shall be provided between above ground and below ground sewers. For aerial stream crossings, the impact of flood waters and debris shall be considered. The bottom of the pipe should be placed no lower than the elevation of the fifty (50) year flood.

SEC. 20.09.010. CLEAN OUTS AND LAMP HOLES.

Clean outs and/or lamp holes shall not be permitted.

SEC. 20.09.011. PROTECTION OF WATER SUPPLY.

The location of sanitary sewers relative to water facilities is a matter of public health and accordingly is regulated by the Missouri Department of Natural Resources. Vertical separations shall be at least eighteen inches (18") between the outside of the pipes. Horizontal separations shall be at least ten feet (10') measured edge to edge.

SEC. 20.09.012. SANITARY SEWER EASEMENTS.

All easements shall have a minimum fifteen feet (15') width. The sewer shall be located in the center of the easement. unless approved otherwise by the Engineer.

SEC. 20.09.013. SERVICE CONNECTIONS.

A. Wyes shall be placed to serve every building site. A wye shall be placed to serve each individual building. It shall be located at the lower 1/3 of the available sewer length to the property. Tees, wyes and saddles shall not be permitted in pipe sizes greater than or equal to twenty-one inch (21") diameter.

B. Service lines shall be required from the sewer main to the right of way or easement line adjacent to the property to be served. The service line shall be designed at a minimum of one percent (1%) slope. Every building shall have a separate service line to the main. Service lines shall be marked in accordance with Article 8, Section 20.08.006. Service lines shall be perpendicular to the sewer main.

SEC. 20.09.014. PLAN REQUIREMENTS.

A. This section governs the preparation of plans for Sanitary Sewers and includes the requirements for the scale to be used and other necessary information.

1. The plans shall include all information necessary to build and check the design of Sanitary Sewer systems. The plans shall be arranged as required by the City Engineer. Standard details of the City may be used. Plans shall be sealed by a Registered Professional Engineer and shall be submitted to the City Engineer for review and approval.

2. The plan sheet size shall be twenty-four inches by thirty-six inches (24" x 36").

3. Each sheet shall contain a sheet number, total number of sheets, the engineer's seal, proper project identification, and date.

4. Revised sheets submitted shall contain a revision block identifying the date and revised items.

B. Plans shall be drawn at the following minimum scales. Larger scales may be needed to clearly present the design. Bar scales shall be shown on each sheet for each scale.

Plan:	1 inch = 50 feet
Profile:	
Vertical	1 inch = 10 feet
Horizontal	1 inch = 50 feet

C. The plans will include:

1. Title Sheet - A title sheet may be used to present the following required information:

a. The proper designation of the project, including nature of project, identifying name or title, city, county, state, etc.

b. Index of sheets included in plans.

c. A location map adequately showing project location in relation to major streets.

d. The project control bench mark shall be an established bench mark and identified as to location and elevation. An assumed elevation datum shall not be used.

e. Name, address and telephone number of the consulting engineer and owner.

2. Plan and Profile Sheets - If a title sheet is not used, then the same information required on that sheet should appear on the Plan and Profile Sheet, in addition to the following:

a. Plan:

(1) A legend of symbols shall be shown which will apply to all sheets.

(2) North arrow and scale.

(3) Layout shall include names of subdivisions, block designation, if any, lot designation, or proposed block and lots, existing and proposed street names, and an accurate tie to at least one quarter section corner. An unplatted tract shall have an accurate tie to at least one quarter section corner.

(4) Location of all existing sewers, properly designated, within or adjacent to the project area.

(5) Connection point or points to existing facilities and tie to a known point on existing facility (manhole, station, etc.).

(6) Location of all proposed sewer lines.

(7) The name and telephone number of each utility, shall be listed and appear on the general layout sheet.

(8) If more than one sheet is necessary, there shall be an identified match line showing an overlap of each drawing.

(9) Detailed alignment of the proposed sewer with the manholes designated by station and with deflection angle shown at each manhole and where possible with manhole tied to permanent reference points.

(10) Existing and known proposed underground utilities, such as, electricity, gas, water, telephone, and storm and sanitary sewers. Each shall be shown in conformance with the records of the owner, or as field located by the utility. Whenever available, the size and type of material used in each utility line shall be indicated.

(11) Existing and known proposed improvements such as paved streets, curbs and gutters, driveways, culverts, fire hydrants, utility poles, trees, shrubs, fences, walls, and houses. Each shall be identified as to type, size, material, etc., as may be applicable.

(12) Right-of-way, property, easement, and construction limits shall be shown.

(13) The channel center line and top of bank of existing and proposed waterways.

(14) A uniform system of line and manhole designation shall be used.

(15) Boring information shall be shown if available.

(16) Station and elevation of service line at easement on right of way line.

b. Profile:

(1) The profile shall show existing grade above center line as a dashed line, proposed finish grades or proposed street grades by solid lines, and shall show the flow line of any drainage channel, either improved or unimproved and either crossed or paralleled. Depth and location of utilities and storm sewers shall be shown where such information is available. Each line shall be properly identified. The proposed sewer shall be shown as double solid lines properly showing the height of the pipe.

(2) All manholes shall be shown with manhole designation, station, and top of manhole and flow line elevations. Drop manholes shall be designated as such. Flow line elevations shown shall be the flow line of the pipe at the inside face of the manhole. Flow line elevations in and out of each manhole shall he shown. Distance between manholes shall be shown as well as the slope expressed in percent. pipe size and type of material.

(3) Elevations of the lowest floor surface, shall be shown, and identified, for all existing and/or proposed structures for all building sites to be served by the proposed sewer system.

(4) Test borings, if available, shall be shown.

3. Detail Sheets shall include the following information:

a. Standard Detail Sheets of the City may be used. Schedules which indicate all variable dimensions and elevations covered by standards or "typical" drawings shall be shown on the plans. All design details for nonstandard structures shall be indicated on the plans. A minimum of one plan view and one sectional view shall be shown on the plans for each structure. Additional views may be required if necessary to clearly define the design. A reinforcing bar list is not required. However, the grade, type, size and location of the bars shall be clearly indicated on the plans.

b. Drainage Area Map: A drainage area map shall be included and shall contain the following:

(1) Ridge line of the area tributary to each principal element of the system.

(2) Note the area in acres.

(3) The scale shall be no smaller than 1" = 1000'.

(4) State design flow rates using values provided in Section 20.09.002.

SEC. 20.09.015. SEWER EXTENSION.

All sanitary sewer system extensions must be placed on an easement dedicated to the City in accordance with provisions provided herein. All sanitary sewer system extensions shall be sized to serve the entire watershed that is intercepted by the extension. It shall be designed to take the natural topography into consideration, and shall be consistent with the Comprehensive Plan adopted by the City. Extensions will only be permitted where access to the City's public water system is available. This shall not prohibit or preclude extensions by the City to achieve development objectives, as determined by the City's Comprehensive Plan or to provide for in-fill development, all at the City's sole discretion.

SEC. 20.09.016. COST RECOVERY FOR UP-SIZING AND OFF-SITE EXTENSIONS.

Cost recovery for up-sizing and off-site extensions may be accomplished solely through a Sewer Extension Agreement by and between the developer and the City, which agreement shall be effective only for a period of ten (10) years after final acceptance of the sewer by the City. After expiration of the said ten (10) years, the developer shall no longer be entitled to any cost recovery. The formula for determining the amount of said cost recovery for up-sizing or for an off-site extension shall be as follows:

$$C_2 = [(A_2 \times F_2) \div (A_1 \times F_1)] \times C_1$$

A_1 is the area in acres of total watershed requiring upsizing or extension for service.

A_2 is the area in acres of the portion of the watershed under ownership of the person for whom the calculation is being made.

F_1 is the flow rate per acre in cubic feet per second from A_1 based upon the approved Land Use Plan and the Public Works Manual.

F_2 is the flow rate per acre in cubic fee per second from A_2 based upon the approved Lane Use Plan and the Public Works Manual.

C_1 is the total sewer cost for the extension or the up-sizing.

C_2 is the share of the cost to be borne by the owner of the property designated by A_2.

SEC. 20.09.017. CITY PLACED MAINS.

If a sewer main is extended by the City at the City's cost, and the extension provides a benefit to properties without said benefitted properties paying for its pro-rata fair share of the cost of said extension, then the City shall be reimbursed for said pro-rata fair share cost at the time that the benefitted property is developed and connects to the extended sewer main. Cost recovery for mains extended under these provisions shall be considered a fair share reimbursement payment and shall be over and above any required permit fees. The fair share reimbursement payment shall be determined in the same manner described in Section 20.09.016 above. The fair share reimbursement payment shall be paid in full, including interest, at the time the connection is made.

SEC. 20.09.018. PENALTY.

Any person who shall violate, fail, neglect, or refuse to comply with any provision or requirement of this Article or of any regulation or requirement made pursuant to it shall be guilty of a misdemeanor, and upon conviction shall be fined not less than Ten Dollars ($10.00) nor more than Five Hundred Dollars ($500.00) for each violation. Each day's continuation of a violation shall constitute a separate offense.

SEC. 20.09.019 - 20.09.999 RESERVED.

ARTICLE 10. SEEDING AND SODDING

SEC. 20.10.001. ADOPTION OF APWA CONSTRUCTION AND MATERIAL SPECIFICATIONS.

The Construction and Material Specifications, titled Section 2400, approved and adopted on October 21, 1981, by the Kansas City Metropolitan Chapter of the APWA is hereby adopted as Article 10 of the Public Works Manual, within the City Code of the City of Independence, Missouri, with the additions, insertions, deletions, and changes, if any, prescribed in the following sections of this Article.

SEC. 20.10.002. ADDITIONS, INSERTIONS, DELETIONS, AND CHANGES.

The following numbered subsections and provisions of the approved edition of the APWA Construction and Material Specifications adopted by Section 20.10.001, are hereby amended to read as follows:

Sec. 2401.3(C). Amend to read as follows:

"C. **Planting Seeds**: The kinds of seeds and the rate of sowing pure live seed shall be as specified on the Plans or in the Special Provisions. Unless directed otherwise by the Engineer, one of the following mixtures shall be used.

1. **Type "A" Seed**: This seeding mixture will be used where seeding is required in areas of established yards, shoulders and slopes in street right of way, and any other areas deemed necessary by the Engineer. The seed mixture will be as follows:

Kind of Seed	Minimum Pure Live Seed (%)	Rate of Pure Live Seed (Lbs. per Acre) (Kg per hectare)
Alta Fescue or Kentucky 31 Fescue (Festuca Elatior) Var. Arundinces	75	25 (28.02)
Rye Grass (Lolium Perenne or L. Multi-florum)	80	25 (28.02)
Kentucky Blue Grass (Pac. Pratensis)	75	20 (22.42)
Creeping Red Fescue (Festuca Rubra)	85	10 (11.21)
TOTAL		80 (89.67)

2. **Type "B" Seed**: This seeding mixture will be used to seed areas off street rights-of-way that are not maintained.

Kind of Seed	Minimum Pure Live Seed (%)	Rate of Pure Live Seed (Lbs. per Acre) (Kg per hectare)
Alta Fescue or Kentucky 31 Fescue (Festuca Elatior) Var. Arundinces	75	90 (100.89)
Rye Grass (Lolium Perenne or L. Multi-florum)	80	50 (56.04)
TOTAL		140 (156.93)

All seeding work shall be done between the dates of February 1 and April 15 for spring planting or August 15 and October 15 for fall planting. Sowing shall be accomplished by use of an approved mechanical seeder or drill (hand spreader can be used in small areas), making sure that successive seed strips overlap to provide uniform coverage. Seed should be drilled to a depth of 1/2 inch (1.27 cm)."

Sec. 2402. 2(A). Amend to read as follows:

"A. **Sod**. All areas to be sodded shall be resodded with the type of sod that is existing prior to construction (Zoysia or Bluegrass). The sod shall be densely rooted nursery grown Kentucky Blue Grass or Nursery Grown Meyer 2-52 Zoysia. The sod shall contain a growth of not more than 10 percent of other grasses and clovers, shall be free from all prohibited and noxious weeds, and shall be cut in strips of uniform thickness, the range of acceptable thickness shall be 3/4 to 1 1/4 inch (1.91 to 3.18 cm); each strip containing at least one (1) square yard. Sod shall be cut in strips not less than 12 inches wide (30.5 cm)."

Sec. 2402.3 (C-2). Amend to read as follows:

"**2. Maintenance**: The sodded area shall be thoroughly watered daily for a period of fifteen days after placing except when thoroughly wetted by rain. Any portion of the sod that is not in good growing condition shall be replaced with fresh live sod."

Sec. 2403.4. Amend to read as follows:

"**2403.4 Methods of Measurement**: The quantities of accepted work shall be measured or determined as follows:

"**A. Seeding**:

1. All Public Works Construction other than Sanitary Sewer: Seeding will be measured per acre (hectare) or hundredth part thereof.

2. Sanitary Sewer Construction: Seeding will be measured horizontally in linear feet (decimeter) along the centerline of sewer, regardless of the width of disturbed areas or type of seed used. Seeding will be measured only when centerline of sewer lies in grassed areas to be seeded as shown on the plans. When centerline of sewer lies in areas that are not grassed, such as street paving, driveways, parking areas, gardens, etc., no measurement will be made. Areas that are disturbed which lie outside the Contractor's normal trenching operation areas will not be measured for payment, but shall be restored at the Contractor's expense. Each area measured will be measured either as seeding or sodding, but not as both. When sewer ends in grassed area, measurement will be made only to centerline of manhole.

B. Sodding:

1. All Public Works Construction other than Sanitary Sewer: Sodding will be measured per square yard (square meter) or tenth part thereof.

2. Sanitary Sewer Construction: Sodding will be measured horizontally in linear feet (decimeter) along the centerline of sewer, regardless of width of disturbed areas or type sod used. Sodding will be measured only when centerline of sewer lies in grassed areas to be sodded as shown on the plans. When centerline of sewer lies in areas that are not grassed, such as street paving, driveways, parking areas, gardens, etc., no measurement will be made. Areas that are disturbed which lie outside the Contractor's normal trenching operation areas will not be measured for payment, but shall be restored at the Contractor's expense. Each area measured will be measured as either seeding or sodding, but not as both. When sewer ends in grassed area, measurement will be made only to centerline of manhole."

Sec. 2403.5. Amend to read as follows:

"**2403.5 Basis of Payment**: Payment for the accepted work will be made as follows:

A. Seeding:

1. All Public Works Construction Other Than Sanitary Sewer: Payment for seeding will made by one of the following:

a. Contract unit bid price.
b. Contract lump sum bid price.

2. Sanitary Sewer Construction: Payment will be made at the contract unit bid price.

B. Sodding:

1. All Public Works Construction Other Than Sanitary Sewer: Payment for sodding will be made by one of the following:

a. Contract unit bid price.
b. Contract lump sum price.

2. Sanitary Sewer Construction: Payment will be made at the unit bid price."

SEC. 20.10.003. PENALTY.

Any person who shall violate, fail, neglect, or refuse to comply with any provision or requirement of this Article or of any regulation or requirement made pursuant to it shall be guilty of a misdemeanor, and upon conviction shall be fined not less than Ten Dollars ($10.00) nor more than Five Hundred Dollars ($500.00) for each violation. Each day's continuation of a violation shall constitute a separate offense.

SEC. 20.10.004 - 20.10.999 RESERVED.

ARTICLE 11. INCIDENTAL CONSTRUCTION

SEC. 20.11.001. GENERAL.

This Article governs all work, materials and testing required for the construction of incidental construction items specified herein as shown on the Plans for the particular location.

SEC. 20.11.002. PORTLAND CEMENT CONCRETE SIDEWALKS AND DRIVEWAYS.

A. This section governs the furnishing of all labor, equipment, tools, material, and the performance of all work necessary to construct or reconstruct sidewalks and driveways.

B. All items of material included in this section shall conform in general to the requirements of Chapter 20, Article 6.

1. Concrete Mix: Concrete shall conform to the requirements of MCIB Mix A-558-1-1 or A-618-1-4. Mix No. WA-610-1-4 may be substituted for Mix No. A-618-1-4.

2. Reinforcement: Reinforcement shall be as shown on the plans.

C. The sidewalks or driveways shall be constructed or reconstructed to the configuration, as shown in Article 4 and to the lines and grades indicated on the plans unless otherwise directed by the Engineer. Generally sidewalks and driveways should be constructed after the curbing, if applicable.

1. Removal: Existing sidewalks or driveways shall be totally removed to the nearest contraction or expansion joint. With the approval of the Engineer, the sidewalk or driveway may be sawed provided no "free section" is left of less than fifteen (15) square feet. It is preferred that the section be sawed full depth; however, as a minimum the section shall be sawed one-half (1/2) the depth of the concrete.

2. Grading and Subgrade Preparation: All excavation or embankment required in the grading or subgrade preparation shall be as defined in Article 5, entitled "Grading and Site Preparation" and "Subgrade Preparation", defined in Article 6. The top six inches (6") of the subgrade shall be compacted to a density of at least ninety-five percent (95%) of the maximum density for the material used as determined by ASTM D-698 and within a tolerance of minus three percent (-3%) and plus two percent (+2%) of optimum moisture or within the tolerance of the moisture range for the type of material being used as determined by the Engineer.

All the work involved in either adding moisture to or removing moisture from embankment materials to within the allowable limits shall be considered incidental to the completion of the grading operation.

If during construction operations additional fill material is needed beneath sidewalks or driveways it shall be of crushed limestone, placed in maximum lifts of four inches (4"), moistened if necessary, and compacted by mechanical tampers to a density of ninety-five percent (95%) of the maximum.

3. Forms: All forms shall be in good condition, clean, and free from imperfections. Each form shall not vary more than one-fourth inch (1/4") in horizontal or vertical alignment for each ten feet (10') in length.

a. Size: Forms shall have a height equal to or greater than the depth of the sidewalk or driveway section.

b. Installation: The forms shall be set true to line and grade, and shall be supported to remain in position while depositing and consolidating the concrete.

c. Preparation: The forms shall be lubricated and shall be designed to permit their removal without damage to the concrete.

D. Unless directed by the Engineer the joints shall be formed at right angles to the alignment of the sidewalk or driveway, and to the configuration specified by the plans or standards.

1. Contraction Joint Type 'B'

a. Sidewalks: Sidewalk surfaces shall be marked with a transverse contraction Joint Type 'B' spaced at a distance equal to the width of the sidewalk. Sidewalks greater than six feet (6') in width shall be divided by longitudinal joints spaced not less than thirty inches (30") nor more than forty-eight inches (48") with transverse joints spaced to form a square pattern. Edger tool marks shall remain showing.

b. Wide Driveways: Driveways in excess of fourteen feet (14') in width shall have a transverse Contraction Joint Type 'B' located in the center.

2. Expansion Joint Type `C': Expansion joints shall be placed where directed by the plans or Engineer. The expansion joints shall be located to give the sidewalk or driveway an appearance of continuity.

a. Material: Expansion joints shall be formed by a 1 piece, one-half inch (1/2") performed joint filler cut to the configuration of the correct section. The filler material shall be as specified in Article 6, of the Public Works Manual.

b. Stability: Expansion joints shall be secured in a manner so they will not be disturbed by depositing and consolidating the concrete.

c. Edging: The edges of these joints shall be rounded with an edging tool of one-fourth inch (1/4") radius.

3. Contraction Joints: Contraction joints or false joints shall be to a minimum depth of one-fourth (1/4) the slab thickness.

a. Edging: Edger marks or "Ribbons" shall be left on sidewalks and driveways.

b. Contraction Joints: Contraction joints may be sawed with the approval of the Engineer.

c. Joint Sealer: Joint sealer is not required on contraction joints.

E. Concrete work for sidewalks and driveways shall be placed in accordance with the requirements of MCIB Standard Concrete Specifications. Joints shall be constructed as in Section 20.11.002 "D", or as modified by the plans. Concrete shall be mixed and transported in accordance with Section 501 of the latest edition of the Missouri Standard Specifications for Highway Construction.

1. Concrete Placement: Concrete shall not be allowed to extrude from below the forms. Vibration is not required for sidewalks or driveways.

2. Finishing: After placing and the initial strike off, if the surface of the concrete is sufficiently wet that a ridge is formed at the inside of the edging tool, finishing will cease until the excessive moisture has evaporated. No water, dryer or additional mortar shall be applied to the free surface of the concrete.

After finishing, the surface of the concrete shall be broomed with a fine clean broom to provide an antiskid surface, and the edges and joints retooled.

In all cases the finished sidewalk or driveway shall have a true surface, free from sags, twists, or warps and shall have a uniform color and appearance.

3. Curing: As soon as practical after the concrete is finished it shall be cured with one of the acceptable liquid curing membranes applied according to the manufacturer's directions.

If forms are removed from sidewalks or driveways within a period of seventy-two (72) hours of placement those surfaces shall also be cured.

Wet burlap, cotton mats, waterproof paper, polyethylene sheeting or earth backfill shall not be acceptable as curing methods for sidewalks or driveways.

4. Protection: The Contractor shall protect the concrete work against damage or defacement of any kind until it has been accepted by the City. Concrete which is damaged or defaced, shall be removed and replaced or repaired to the satisfaction of the Engineer, at the expense of the Contractor.

5. Temperature Limitations: Concrete shall be placed in accordance with requirements of MCIB Sections 10 and 11.

F. A minimum of twenty-four (24) hours shall lapse before forms are removed and sidewalks or driveways are backfilled unless otherwise approved by the Engineer.

Backfill shall be accomplished in accordance with Article 5 entitled "Grading and Site Preparation" and Article 6 entitled "paving". The Contractor shall be responsible for the repair of any pavement disturbed by the construction.

G. The Contractor shall be responsible for the removal of excess dirt, rock, broken concrete, splatters and overspray from the area of the construction within 10 days of the date of placement.

H. Sidewalks or driveways shall have a surface tolerance of one-fourth inch (1/4") in ten feet (10') when checked with a ten foot (10') straightedge.

SEC. 20.11.003. ASPHALTIC CONCRETE.

A. This section governs the placement of asphalt sidewalks and driveways.

B. Asphalt shall not be used in the construction of any approved permanent sidewalk. Asphalt may be used as material for temporary sidewalks if approved in advance by the City Engineer.

C. Asphalt driveways may be constructed with prior approval of the Engineer in accordance with the provisions of Article 6 "Paving and Curbing", as applicable.

SEC. 20.11.004. COMMERCIAL DRIVEWAY DESIGN.

A. Before approval of the plat or drawing of a commercial driveway the Director of Public Works shall see that combined driveways do not exceed sixty percent (60%) of the frontage of the property on which said driveways are to be constructed where it crosses the right of way; that adjacent one-way driveways are separated by a median at least six feet (6') in width with a six inch (6") straight back perimeter curb.

B. All driveways serving commercial and industrial property, schools, churches, and apartments shall be constructed in accordance with the approved details in Article 4 of this chapter, and shall be a width of twenty-six to forty feet (26'-40') for two-way traffic and fifteen to twenty feet (15'-20') for one-way traffic, measured where the driveway crosses the property line (R/W line):

Driveways serving predominantly truck and bus traffic should be designed using a fifty foot (50') width with a minimum radii of thirty feet (30') subject to approval of the City Engineer. The radii of all other curb returns shall be a twenty foot (20') minimum.

C. Driveways located near a street intersection shall be a minimum forty feet (40') from the intersection of street lines (R/W line) measured along the R/W line. Existing driveways shall be reconstructed to conform with this standard in conjunction with a building permit. Separation between any two driveways on the same property shall be a minimum of twenty-five feet (25'). Driveways of adjacent property owners may abut the property line and have combined use of the R/W for their approach.

D. Commercial driveways are to be concrete, however, driveways located on local streets having no existing curbs may be asphaltic concrete. Thickness shall be in accordance with the typical section shown in Article 4 of this chapter.

E. Unless an approach is common to adjacent property owners, it shall not extend beyond the property line extension to the street.

SEC. 20.11.005. RESIDENTIAL DRIVE DESIGN.

A. All residential driveways shall be constructed in accordance with the approved details in Article 4 of this chapter. Driveway approaches on streets with existing curb and gutter sections shall be portland cement concrete or an approved equal. Driveways shall meet the requirements of Chapter 20, Article 6. Driveway approaches on non-curb and gutter streets may be constructed of either portland cement concrete or asphaltic concrete meeting the requirements of Article 6 of this chapter. Driveway approaches on rural streets may be constructed of aggregate, subject to approval of the Engineer. If aggregate is used, the maximum slope of the driveway shall be fifteen percent (15%).

B. Driveways of adjacent property owners may abut the property line and have combined use of the right of way for their approach. Unless an approach is common to adjacent property owners, it shall not extend beyond the property line extension to the street.

C. Driveway approaches for single family residential structures shall have a minimum width of ten feet (10') and a maximum width of twenty-six feet (26') at the right of way line.

D. Except for cul-de-sacs, driveway approach width at the right of way line shall not exceed sixty percent (60%) of the frontage of the property on which said driveways are to be constructed where it crosses the right of way.

E. On non-curbed streets, adequate stormwater provisions shall be constructed in accordance with Article 2 of this chapter.

SEC. 20.11.006. PARKING LOTS.

A. All parking lots shall be constructed with either an asphaltic concrete or portland cement concrete surface. Surface requirements for temporary parking for construction access for a time not to exceed 180 calendar days may be waived subject to the approval of the Engineer. Approved methods of erosion and dust control shall be required.

B. Storm water detention shall be provided in accordance with Article 2 when the parking lot area exceeds 1,500 square feet.

C. The surface shall be constructed of either a minimum two inch (2") asphaltic concrete or four inch (4") portland cement concrete.

D. Parking lots shall be designed to meet applicable provisions of Chapter 14 of the City Code.

E. Parking lots shall be constructed so that parked vehicles shall not project over the public right of way.

SEC. 20.11.007. TRAFFIC CONTROL.

Traffic control for management of traffic around and through construction areas shall be provided in accordance with Part VI of the latest revision of the Manual on Uniform Traffic Control Devices (MUTCD), unless otherwise approved by the Engineer. All traffic control plans shall have prior approval by the Engineer.

Newly constructed streets, when observed to have traffic volumes sufficient to warrant control as decided by the Engineer, shall have permanent traffic control devices installed at the developer’s expense, as submitted on a plan drawing and approved by the City Engineer.

SEC. 20.11.008. GUARD RAIL.

A. This section governs the furnishing of all labor, equipment, tools, materials and the performance of all work necessary to construct guard rail.

B. All placement and materials shall conform to the applicable provisions of the latest revision of Section 606 of the Missouri Standard Specifications for Highway Construction. Guard rails shall be placed in accordance with the approved detail sheet shown in Article 4.

C. Unless approved otherwise by the Engineer, guard rails shall be required at the following locations:

1. Bridge ends.

2. Medians containing non-break away obstacles.

3. 2:1 slope exceeding twelve foot (12') height.

4. 3:1 slope exceeding twenty foot (20') height.

D. Guard rails shall be installed one foot (1') inside the right of way line, unless directed otherwise by the Engineer.

SEC. 20.11.009. ROCK BLANKET.

A. This section governs the construction of a protecting blanket of rock or broken concrete on slopes, channel banks or stream banks.

B. The material for a rock blanket shall be durable stone or broken concrete containing a combined total of not more than ten percent (10%) of earth, sand. shale and non-durable rock. It is preferable that the material contain a large percentage of pieces as large as the thickness of the blanket will permit, with enough smaller pieces of various sizes to fill the larger voids. Acceptance of quality and size of material may be made by visual inspection at the job site.

1. Type 1: For Type 1 Rock Blanket, at least forty percent (40%) of the mass shall be of pieces having a volume of one cubic foot (0.0283 cubic meter) or more.

2. Type 2: For Type 2 Rock Blanket, at least sixty percent (60%) of the mass shall be of pieces having a volume of one cubic foot (0.283 cubic meter) or more.

C. A trench at the toe of the slope shall be excavated to the elevation as shown on the plans or to a minimum of two feet (2') when not shown. The slopes shall conform to the proper cross section and be compacted to a uniform density as required for adjacent material. The rock or broken concrete shall be placed on the slope, to the prescribed thickness, elevation and extent, and shall be manipulated so that the flat sides are in contact, thereby eliminating large voids. The outside of the blanket shall present an appearance free from segregation and with a proportionate amount of the larger pieces showing.

Rock Blanket shall be placed at storm sewers as shown on Standard Sheet G as approved in Article 4.

D. Unless specified otherwise herein, or unless approved otherwise by the Engineer, all rock blankets shall be a minimum of fifteen inches (15") thick.

SEC. 20.11.010. FENCE.

A. This section governs the furnishing of all labor, equipment, tools, materials and the performance of all work necessary to construct fence.

B. All placement and materials shall conform to applicable provisions of the latest revision of Section 607 of the Missouri Standard Specifications for Highway Construction, except as modified herein or approved by the Engineer.

C. Fence shall be placed at locations shown on the approved plans and in accordance with :he approved detail sheet shown in Article 4.

D. Except at athletic fields, or as otherwise approved by the Engineer, all fence fabric shall be 11 gauge.

SEC. 20.11.011. RETAINING WALLS.

A. This section governs the furnishing of all labor, equipment, tools, materials and the performance of all work necessary to construct retaining walls.

B. Retaining walls shall be constructed of either reinforced portland cement concrete or mortar rubble masonry, unless otherwise approved by the Engineer.

C. Portland Cement Concrete walls shall be constructed in accordance with standard details in Article 4 of Chapter 20, or plans approved by the Engineer. The contractor constructing a Portland Cement Concrete retaining wall will be required to furnish all plant, labor, equipment and materials, and perform operations necessary for the construction.

D. Any contractor constructing a retaining wall of mortar rubble masonry will be required to furnish all plant, labor, equipment and materials, and perform operations necessary for the construction of the masonry wall as shown on the plans and as specified herein.

1. Mortar rubble masonry shall be coursed and shall consist of roughly squared and dressed stone laid in cement mortar. Mortar shall consist of one (1) part cement and three (3) parts sand. The stone shall be kept free from dirt, oil or other injurious materials which may prevent proper adhesion of the mortar. Individual stones shall have a thickness and a width of the stones in the existing wall and shall be the approximate same coloration of the existing stone and mortar. No stones, except headers, shall have a length of less than one-and-one half times their width.

2. Headers in walls two feet (2') or less in thickness shall extend entirely through the wall.

3. The stones shall be roughly squared on joints, beds and faces. Selected stone, roughly squared and pitched to line, shall be used at all angles and ends of wall. All shaping or dressing of stone shall be done before the stone is laid in the wall. No dressing or hammering which will loosen the stone will be permitted after it is placed.

4. The existing concrete cap shall be removed so as to expose the existing stone and joints for adherence to the new stone and mortar.

5. Stone masonry shall not be constructed in freezing weather or when the stone contains frost, except with written Permission of the Engineer and subject to such conditions as may be required.

6. The masonry shall be laid to line and in courses along the slope of the existing wall. Each stone shall be cleaned and thoroughly saturated with water before being set and the bed which is to receive it shall be cleaned and well moistened. All stones shall be well bedded in freshly made mortar. The mortar joints shall be full and the stones carefully settled in place before the mortar has set. No spalls will be permitted in the beds. Joints and beds will have an average thickness of not more than one inch (1").

7. The face joints shall be pointed properly before the mortar becomes set whenever possible. Joints which cannot be so pointed shall be prepared for pointing by raking them out to a depth of two inches (2") before the mortar has set. The face surfaces of the stone shall not be smeared with the mortar forced out of the joints or that used for pointing.

8. The vertical joints in each course shall break joints with those in adjoining courses at least six inches (6"). In no case shall a vertical joint be located so as to occur directly above or below a header.

9. In case any stone is moved, or joint broken, the stone shall be taken up, the mortar thoroughly cleaned from bed and joints, and the stone reset in fresh mortar.

10. Joints not pointed at the time the stone is laid shall be thoroughly wet with clean water and filled with mortar. The mortar shall be well driven into the joints and finished with an approved pointing tool. The wall shall be kept wet while pointing is being done and in hot, dry weather the pointed masonry shall be protected from the sun and kept wet for a period of at least three (3) days after completion.

SEC. 20.11.012. UNDERDRAINS.

A. This section governs the furnishing of all labor, equipment, tools, materials, and the performance of all work necessary to construct underdrains.

B. All placement and materials shall conform to applicable provisions of the latest revision of Section 605 of the Missouri Standard Specifications for Highway Construction for Class A Underdrains, except as modified herein or approved by the Engineer.

C. Underdrains shall be placed at locations shown on the approved plans or as directed by the Engineer and in accordance with the approved detail chart shown in Article 4.

SEC. 20.11.013. WATER SERVICE.

A. This section governs the furnishing of all labor, equipment, tools, materials, and the performance of all necessary work to construct Water Service facilities.

B. Adjustment of water service lines, valves and meters shall be as shown on the contract drawings or directed by the Engineer.

C. Pipe shall conform to the latest federal specifications for Type K flexible copper tubing. Fittings shall be brass flared compression fittings.

D. Existing piping between the existing shoulder line and limits of the grading shall be carefully exposed and raised or lowered as directed by the Engineer to clear construction by this contract. Existing copper piping material may be reused, except new pipe and fittings shall be installed as required to lengthen the service line or replace existing iron pipe or damaged services. In cases where street construction is being performed, any service found to be iron (galvanized) pipe under the pavement will be replaced from the City's water main to the City's right-of-way line. A new cut-off valve will be installed at a point on public right-of-way one foot (1') from the property line.

E. Relocate meter and meter vault or tile to the indicated position outside the right of way line. Existing meter tile and casting, meeting Water Department specifications, may be reused if in undamaged condition. Replace with new material if damaged.

F. All adjusted or relocated water service lines shall be pressure tested at line pressure before backfilling the trench. Repair all leaks and retest service.

G. Notify the property owner or tenant twenty-four (24) hours before beginning work on any planned water service line or meter adjustment.

H. The Contractor shall relocate or adjust the top elevation of all water service cut-off valves as required, or as directed by the Engineer. All such valves shall be located on the existing service line at a point one foot (1') behind the new curb, or if no curb is to be constructed, at a point on public right of way one foot (1') from the property line.

I. All excavation, trenching and backfill specified herein shall be in accordance with Article 3 of the Public Works Manual.

J. All service line, meter well, or cut-off valve adjustments or replacements shall be in compliance with the most current Rules and Regulations of the Water Department.

SEC. 20.11.014. MEASUREMENTS AND PAYMENTS.

A. This section governs the method of measurement and the basis of payment for furnishing all labor, equipment, tools, and materials and for the performance of all related work necessary to complete any construction specified in this Article.

B. Unless specifically altered by the Special Provisions, the methods of measurement and payment shall be as specified herein, and as listed in the Proposal.

C. There shall be no measurements or separate payment for any item of work not specifically identified and listed in the Proposal and all costs pertaining thereto shall be included in the contract unit prices for other items which are listed in the proposal.

D. The quantities of accepted work shall be measured or determined as follows:

1. Portland Cement and Temporary Asphalt Sidewalks will be measured to the nearest one tenth square foot and paid to the nearest square foot.

2. Portland Cement and asphalt driveways will be measured to the nearest one tenth square foot and paid to the nearest square yard.

3. Untreated aggregate driveways shall be measured through the load tickets for the actual amount used and paid to the nearest ton.

4. Parking lots will be measured to the nearest one tenth square foot and paid to the nearest square yard.

5. Traffic Control shall be measured and paid per each as listed in the proposal.

6. Guard rail will he measured to the nearest 1/2 linear foot for each increment along a line passing through the center line of each post, and totaled to the nearest linear foot for the sum of the increments on the project. The length will be measured separately for each type from the center of the end post to the center of end post, excluding bridge anchor sections and terminal sections.

a. The accepted quantities of guard rail. terminal sections, and bridge anchor sections complete in place, will be paid for at the unit Price for each of the pay items included in the contract. No direct payment will be made for end sections or buffer ends.

7. Rock blanket shall be measured to the nearest one tenth of a square foot and paid to the nearest square yard.

8. Fence shall be measured to the nearest one tenth of a foot and paid to the nearest foot.

9. Portland Cement Concrete Retaining Walls shall be measured to the nearest one tenth of a cubic foot and paid to the nearest one tenth of a cubic yard. Mortar rubble masonry walls will be measured to the nearest one tenth square foot of face area, excluding footing, and paid to the nearest square foot.

10. Underdrains shall be measured to the nearest one tenth of a foot of pipe and paid to the nearest foot of pipe.

11. Water service lines shall be measured to the nearest one tenth of a foot and paid to the nearest foot. Meter and valve adjustments shall be measured and paid per each.

SEC. 20.11.015. PENALTY.

Any person who shall violate, fail, neglect, or refuse to comply with any provision or requirement of this Article or of any regulation or requirement made pursuant to it shall be guilty of a misdemeanor, and upon conviction shall be fined not less than Ten Dollars ($10.00) nor more than Five Hundred Dollars ($500.00) for each violation. Each day's continuation of a violation shall constitute a separate offense.

SEC. 20.11.016 - 20.11.999 RESERVED.

ARTICLE 12. SPECIAL ASSESSMENT BENEFIT DISTRICT

SEC. 20.12.001. POLICIES AND PROCEDURES.

This Article governs the specific procedures for establishment of Special Assessment Benefit Districts and explains the process from its initiation to completion, as authorized by Article 11 of the Independence City Charter. Public works projects considered for Special Assessment Benefit Districts are sanitary sewers, sidewalks, storm sewers, streets and water lines.

SEC. 20.12.002. GENERAL.

A Special Assessment Benefit District is a geographical area in which a public improvement project is paid for by the benefitted property owners within the area. The City of Independence has the authority to pay for public improvements out of an available fund and be reimbursed by special assessments on benefitted real property.

SEC. 20.12.003. INITIATION.

When a majority of the property owners of a contiguous area desire a specific public works project, they can petition the City for a Special Assessment Benefit District. A sample copy of a petition for the establishment of a Special Assessment Benefit District can be secured from the City Clerk, Public Works or Water Departments. Upon receipt of the petition, the Director of Public Works (or the Water Department Director) establishes the district boundary, and determines if the petitioners represent a majority of the benefitted property owners of record within the service area, whose addresses are known. If this majority is established, a Resolution of Necessity is prepared. A copy of the petition, a property owner list and a sketch of the service area is attached to the Resolution of Necessity and submitted to the City Council for consideration. The area described in the Resolution represents the total area to be served by the Special Assessment Benefit District project. All ownership contained within the boundary will be a part of the benefit district, and will be subject to the reimbursement assessment.

SEC. 20.12.004. RESOLUTION OF NECESSITY.

The Resolution of Necessity defines the proposed district boundary to be assessed, the proposed method of payment, the date of the Hearing of Necessity and the proposed method of apportioning the cost among the individual parcels of land in the district. The Resolution of Necessity is published in full, within 10 days after passage by the City Council, in the Independence Examiner. A copy of the Resolution and notices of the Hearing of Necessity are mailed to all persons, whose addresses are known, who are shown by property tax records at the time of passage of the Resolution to be owners of property in the proposed Special Assessment Benefit District.

SEC. 20.12.005. HEARING OF NECESSITY.

The Hearing of Necessity is held no earlier than seven (7) days after Publication and mailing of the Resolution of Necessity and notice of the hearing. The hearing is conducted by the Director of Public Works (or the Water Department Director), who reports recommendations to the City Council. The nature of the project is explained at the hearing, along with the assessment procedure.

The recommendation to the City Council is made based upon project feasibility, need, compliance with master plan for City improvements, and a vote of the benefitted property owners at the hearing. Absentee votes must be signed and submitted to the City Clerk within ten (10) days following the Hearing of Necessity. Absentee voting is not solicited. Votes not received are considered negative. In general, a failure to receive a majority of favorable votes from the benefitted property owners will defeat the district. A record of the voting will be submitted to the City Council along with the recommendation of the Department. If the City Council decides to proceed with the work, it shall adopt a Resolution of Intent to proceed.

SEC. 20.12.006. RESOLUTION OF INTENT.

The Resolution of Intent will set forth the general nature of the work or improvement, the method of payment, the boundaries of the district within which property is to be assessed, and the method of apportioning the cost among the individual parcels of land within the district. It will order the preparation of detailed plans and specifications, an estimate of the total cost of the project, and the amount which would be assessed against each parcel of land in the district. No error or inaccuracy in such estimate will affect the validity of subsequent proceedings.

The Resolution of Intent may also state the date for the Hearing of Intent, if the cost estimate and assessment information is known. The cost estimate and notice of the Hearing of Intent will be published in the Independence Examiner, and a copy of the estimate and a notice of the hearing will be mailed to all owners of record, whose addresses are known, of real property in the benefit district at the time of passage of the Resolution of Necessity. An individual statement of the amount estimated to be charged against the individual property may be mailed. Failure of a property owner to receive the estimate and the notice will not affect the validity of the proceedings.

SEC. 20.12.007. HEARING OF INTENT.

The Hearing of Intent will be held no earlier than seven (7) days after publication of notice and mailing. The Director of Public Works (or Water Department Director) will hold a Hearing of Intent to discuss the nature of the project, the individual assessments, the reimbursement procedures, and the detailed plans for the improvements. A vote of the property owners in the Special Assessment Benefit District will be taken at the Hearing to determine if the work is to go forward. Absentee votes must be signed and submitted to the City Clerk within ten (10) days following the Hearing of Intent. Absentee voting is not solicited. A report is made to the City Council, with recommendations concerning the project. Generally, the district is terminated unless a majority of the benefitted property owners vote in favor of proceeding. If the City Council decides to proceed, and the improvements are to be made by outside contractor, an Ordinance will be passed directing the advertisement of bids for the public work. If the work is to be done by City staff, the Ordinance directs the City forces to proceed with the work.

SEC. 20.12.008. LEVY AND ASSESSMENT OF COSTS.

Upon completion and acceptance of the Special Assessment Benefit District Project, the entire cost of the project is computed, as it is to be charged against the individual parcels of land in the Benefit District. These assessed costs are submitted to the City Council as an Ordinance levying and assessing the costs to be reimbursed by special assessments against the individual parcels of land in the Benefit District, fixing the amount to be charged against each parcel, and directing the issuance of special tax bills.

SEC. 20.12.009. SPECIAL TAX BILLS.

A. Each tax bill will contain a brief general statement of the facts authorizing its issuance or the purpose for which it is issued, a description of the land against which it is issued, the name of the contractor or other to who it is issued, the rate of interest which it bears, and when it begins to bear interest; and will state that it is a lien against the land therein described, and give the time that the lien continues. It need not give the name of the owner of the land against which it is issued.

B. All special tax bills will become due and payable sixty (60) days after the date of issuance, except in the case of tax bills payable in installments as herein provided.

C. The cost of constructing or acquiring any public work or improvement which is to be charged to a benefitted parcel of land, for which a special tax bill is issued, may be paid in ten (10) annual installments, provided the owner of the property described in the special tax bill files a written request with the Director of Finance within thirty (30) days after the issuance of the special tax bill requesting that their tax bill or bills be made payable in installments. In such case, the tax bill or bills will be payable in annual installments as follows: One-tenth in one (1) year, one-tenth in two (2) years, one-tenth in three (3) years. one-tenth in four (4) years, one-tenth in five (5) years, one-tenth in six (6) years, one-tenth in seven (7) years, one-tenth in eight (8) years, one-tenth in nine (9) years, and one-tenth in ten (10) years after the date of their issue.

D. Special tax bills will provide that if any annual installment or the interest thereon is not paid when due then all of the remaining installments will, at the option of the holder of the tax bill, become immediately due and payable. The owner or anyone with an interest in the property assessed with an installment tax bill will have the privilege of paying the installments early by paying the total amount of the principal due plus accrued interest to the date of the principal payment.

E. Every special tax bill and all lawful interest and charges thereon, will be a lien against the parcel of land described therein for a period of ten (10) years after date of issue, unless sooner paid, except in the case of special tax bills payable in installments, the lien of which shall

not expire until one (1) year after the date of maturity of the last installment, and except in any case where it becomes necessary to bring a suit to enforce the lien of any special tax bill, the lien of which will continue until the expiration of the litigation.

F. Special tax bills may bear interest not to exceed the rate on ten-year United States treasury notes as established at the most recent auction, payable annually, from sixty (60) days after the date of issue until paid.

SEC. 20.12.010. ALTERNATE PROVISIONS.

Notwithstanding the earlier provisions to the contrary, if the City Council finds that there exists a public health, safety or community welfare need for a public works project in a given definable, contiguous area and a petition from a majority of the property owners in that area has not been received, or if during the process of hearings regarding a benefit district it is determined that a majority of the benefitted property owners no longer favor proceeding, the City Council may proceed without having that majority. Where the City Council proceeds with said project and the project is estimated to cost less than $100,000, the cost will be apportioned between the City and the property owners in the following manner:

Labor and Equipment - paid 100% by the City
Materials - paid 100% by the property owners.

Each resolution and ordinance involved in the process will specifically state the majority is lacking, whenever that condition does exist, and will specifically state the reason for proceeding without the majority support, but otherwise the previously detailed provisions will apply.

SEC. 20.12.011 - 20.12.999 RESERVED.

ARTICLE 13. CONTRACT GENERAL PROVISIONS

SEC. 20.13.001. GENERAL.

This Article governs general provisions for all contracts entered into between the City of Independence (also referred to as Owner) and contractors for the construction of public works contracts bid by the City of Independence, except those contracts or agreements excluded by the Purchasing Manual and Professional Services agreements.

SEC. 20.13.002. CONTRACT DOCUMENTS.

The contract documents, sometimes referred to as, "the contract", include the Invitation to Bid, the Instructions to Bidders, the Contract Agreement, the Payment, Performance and/or Maintenance Bond, the Specifications and Special Provisions, supplementary provisions or addenda as may be issued, the Proposal and the plans or contract drawings. The specifications referred to herein are the Public Works Manual, Chapter 20 of the City Code. All the contract documents are intended to be cooperative and to describe and provide for a complete work. A requirement occurring in one is as binding as though occurring in all. Should there be any lack of accord in the various documents, the Special Provisions prevail over the Specifications and the Specifications prevail over the plans.

SEC. 20.13.003. GENERAL INTENT.

The general intent of the contract document and provisions thereof is that the Contractor shall, for the compensation set forth, furnish all plant, equipment, tools, labor, materials, superintendence, all things and services, assurances and guarantees, assumptions of risk and responsibilities; shall begin promptly and proceed expeditiously and continuously without cessation or shutdown of work unless specifically approved in writing by the Owner; shall construct, complete and ready for its intended purposes, within accordance with the contract documents; that the prices proposed and bid by the Contractor and accepted by the Owner are agreed to be fair, full and complete compensation; and that time is of the essence in the contract fulfillment.

SEC. 20.13.004. CONTRACTOR'S RESPONSIBILITY.

A. The Contractor explicitly understands and agrees that the Owner is in no way responsible for the cost to the Contractor of the work, nor for the cost of the risks involved in executing the work, and that the payments herein provided include compensation for all risks as well as for all completed construction. It is expressly understood that the Contractor is in all respects an independent contractor for this work and is in no respect an agent, servant or employee of the Owner. The Contractor specifically represents that in performing work covered by this agreement he or she is the sole employer of all labor to be furnished in the performance of this work and that, within the meaning of all federal and state unemployment compensation, insurance or other laws and all State Worker's Compensation Acts, the contractor's employees and the employees of all subcontractors are not employees of the Owner for any purpose whatsoever; also that the Contractor accepts exclusive liability for all contributions, taxes, interest and penalties necessarily paid by the Owner under unemployment compensation, insurance or other laws on account of all persons employed by the Contractor or any subcontractors hereunder, and the Contractor hereby agrees to reimburse the Owner for all contributions, taxes, interest, penalties, if any, necessarily paid by the Owner under unemployment compensation, insurance or other laws covering employees of the Contractor or any subcontractors.

B. The Contractor agrees to pay in full for all furnished materials and for all employed labor for the work or any part thereof, and to save the Owner free and harmless from any lien for work or labor performed, or materials or supplies furnished in the performance of the work under this agreement, and from every claim, demand or lien arising from or growing out of any act or thing done or suffered by the contractor or any agent, servants or subcontractors, and any employees in, about or connected with the construction of the work aforesaid. The Contractor agrees to pay and discharge all bills and claims against the Contractor in any way incurred in connection with the work herein provided for; it being intended hereby to cover the payment of all items, whatsoever their nature, in addition to items which entitle the claimant to a lien upon any property of said Owner by virtue of the laws of the State of Missouri.

C. The Contractor shall require any subcontractors deemed a transient employer as defined by State law to show proof of having filed a financial assurance instrument with the State Director of Revenue and to show proof that the subcontractor holds a current valid certificate of insurance for worker's compensation coverage in Missouri prior to the subcontractor performing any work under the Contract. If required by the State Director of Revenue or the State Director of the Division of Worker's Compensation, the Contractor will withhold all or any part of payment to the subcontractor to satisfy State law.

D. The Contractor agrees to comply in all respects with the requirements of law relating to furnishing reports and statements, or as may be reasonably required by the Owner.

E. It shall be the responsibility of the Contractor to examine the site of the work to determine the amount of work to be done in connection with the construction herein specified, the quantities of material required, and the construction equipment and labor necessary for the performance of the contract. By submission of a proposal for this work, the Contractor represents that he or she has investigated the character of the work and conditions which may be encountered, and the quantities and types of related work not covered by unit prices, and agrees that the data furnished herein is merely informative and represents the best information available at the time of advertising for bids. The Contractor understands that such information or data is furnished to the bidder without guarantee of its accuracy and that variations from the indicated amounts or types of work, other than that covered by contract unit prices, required to complete the contract will not entitle the Owner to any credits or the Contractor to any extra payment.

SEC. 20.13.005. APPLICABLE CODES AND STANDARDS.

A. Reference to standard specifications of any technical society, organization or association, or to codes of local or state authorities, shall mean the latest such standard, code, specification or tentative specification adopted and published at the date of taking of bids, unless specifically otherwise stated. Applicable codes and standards referred to in these specifications shall establish minimum requirements for equipment, materials and construction and shall be superseded by more stringent requirements of drawings and specifications when and where they occur.

B. All construction methods and tools shall meet all State of Missouri safety requirements and comply with commonly accepted standards for safety and health of personnel engaged in construction work.

SEC. 20.13.006. COMPLIANCE WITH LAWS, PERMITS, LICENSES AND TAXES.

A. The Contractor shall conform to and comply with all applicable laws, bylaws, regulations and ordinances with regard to all and every action and operation, and shall require conformity and compliance of all subcontractors and employees in such a manner as to save the Owner harmless. The Contractor shall secure and be financially responsible for all permits, licenses, approvals, acceptances, etc., relative

to the conduct of all work and shall give all notices necessary to the due and lawful prosecution of the work. Fees for required City permits for work within the construction limits will be waived.

B. The City is exempt from sales tax. This includes purchases by contractors for City projects. The City will provide a certificate to contractors for their use in obtaining the sales tax exemption. Contractors are to prepare their bids for City projects without including sales tax.

SEC. 20.13.007. PATENTS.

All fees or royalties for any patented article or operation of construction used in this work or any part thereof, or any materials, tools, implements, machinery, fixtures, or anything used by the Contractor, shall be included in the price stipulated in the contract for the work and the Contractor shall protect and hold harmless the Owner against all demands for such fees, royalties and claims.

SEC. 20.13.008. SUPERVISION AND INSPECTION.

A. The work herein considered is to be constructed in accordance with the contract documents. Wherever the words "directed, permitted, approved. acceptable, satisfactory," or words or phrases of similar import occur in the contract documents, they shall be understood to be functions of the Engineer and to be exercised at the Engineer's discretion.

B. Methods of construction and procedure shall be of the Contractor's own selection, provided no requirement of the contract documents is violated and the work is completed within the time allowed. Approval of the Engineer of any construction device or method, or absence of disapproval, shall not relieve the Contractor of full responsibility for any failure thereof and shall not connote and is not intended to connote that the Owner will direct the manner in which the work is to be performed under the contract.

C. All materials and every process of manufacture and construction shall be subject to inspection at all times and the Engineer or any representative shall have free access to all operations. The Contractor shall provide necessary facilities for inspecting workmanship and testing of materials, and the Engineer shall have the right to select suitable samples of materials for testing and examination, which the Contractor shall supply without charge. In case such samples must be shipped to some other point for inspection or testing, the Contractor shall box or crate samples as necessary and shall deliver them at points designated for shipment, without charge. Omission of inspection shall not relieve the Contractor of any obligation to produce the work required by plans and specifications.

D. Rejected materials shall be removed promptly from the vicinity of the work and the Contractor shall promptly remove, reconstruct, replace and make good as may be directed, without charge, any defective work. If in the judgment of the Engineer, the defective work would perform within an allowable tolerance, the Contractor may be given the choice of receiving reduced payment for the work or removing and replacing the defective work. Oversight or error of judgment of inspectors, or previous acceptance, shall not relieve the Contractor from the obligation to make good defects whenever discovered. If the Contractor does not make corrections of such condemned work and remove rejected materials within a reasonable time, as fixed by written notice, the Owner may make removals and corrections and charge the expense to the Contractor.

E. The Contractor shall furnish to the Engineer any information concerning the nature or source of any material or equipment or part thereof which the Contractor proposes to use. Tests may be conducted

where, in the opinion of the Owner or Engineer, such are necessary. Where the Contractor desires to propose for use in the work any material or product as an alternative or equivalent to a material or product specified herein, the Contractor will be required to submit samples to a testing bureau designated by the Engineer, and shall pay the cost of such testing and analysis as may be required to determine the suitability of such materials and products.

SEC. 20.13.009. PERSONAL LIABILITIES.

In carrying out any of the provisions of a contract or in exercising any power or authority granted to them thereby, there shall be no personal liability upon any member, agent or representative of the Owner. No act or failure to act on the part of the Engineer or any agent of the Owner, payment for the work in whole or in part, extension of time or possession taken of the work, shall operate as a waiver of any right to damages therein provided for; nor shall waiver or breach of contract be held to be a waiver of any other or subsequent breach.

SEC. 20.13.010. SUBLETTING OR ASSIGNING CONTRACT.

A. The Contractor shall not sublet, sell, transfer, assign or otherwise dispose of the contract or contracts or any portion thereof, or of the Contractor's right, title or interest therein, without written consent of the Engineer. Request for permission to sublet, assign or otherwise dispose of any portion of the contract shall be in writing and shall be accompanied by evidence that the organization which will perform the work is particularly experienced and equipped for such work.

1. In case such consent is given, the Contractor will be permitted to sublet a portion thereof, but the Contractor shall perform work amounting to not less than 50% of the total contract cost, except that any items designated by the Engineer as specialty items so performed by subcontract may be deducted from the total contract cost before computing the amount of work required to be performed by the Contractor.

The value of the work sublet will be determined by multiplying the number of units of any contract item sublet by the unit price as set forth in the original contract, or by a price agreed to by the Engineer where no unit price is included in the contract for the work sublet. Approval of the subcontract is in no way approval of the unit prices in the subcontract. The subcontractor shall perform the work described in the subcontract agreement. The Contractor shall furnish the Owner a signed copy of the subcontract on request.

B. No subcontracts or transfer of contract shall in any case release the Contractor of his or her liability under the contract and bonds.

SEC. 20.13.011. COOPERATION WITH OTHERS.

The Contractor and subcontractors will be expected to cooperate with forces of the City, utility companies or other contractors who may be working in the area. No delay of this contract work, due to avoidable conflicts, will be allowed. The Contractor shall, as far as possible, arrange work schedules and dispose of materials so as not to interfere with the operations of other contractors or others engaged upon the project or nearby. The Contractor shall also join his or her work to that of others in a proper manner, in accordance with the spirit and intent of the contract documents and perform his or her work in proper sequence in relation to that of other contracts.

SEC. 20.13.012. PLANS (CONTRACT DRAWINGS).

A. Certain plans prepared on behalf of the Owner, and elsewhere described and named to accompany and supplement these provisions, constitute a part of the contract documents. Such plans are agreed to be constructively attached to the contract documents, although convenience may preclude physical attachment.

B. The Owner shall have the right to modify details of these plans to provide final, or checked, plans in lieu of any preliminary or unchecked plans, as the work proceeds, all of which shall be considered as plans accompanying the contract documents. The Contractor shall not take advantage of any errors or discrepancies discovered in the plans, but shall report same, and the Engineer will make or approve the necessary corrections.

C. The Contractor will be provided, at no cost, a maximum of ten sets of contract documents. Additional sets of these documents will be supplied at the cost of printing, materials and delivery.

SEC. 20.13.013. NOTICE TO PROCEED.

A. Upon receipt of contract documents fully executed by the Owner, the Contractor shall immediately proceed with activities pertaining to the work, such as specified coordination submittals and required conferences. The Contractor shall not move onto the site until the Owner has issued a written Notice to Proceed.

B. The Notice to Proceed will be issued upon completion of (a) receipt of acceptable copies of insurance policies and certificates, (b) acceptance of specified coordination submittals, i.e., Program of Construction, Schedule of Values, etc., and (c) the conclusion of initial coordination conferences. The date of Notice to Proceed shall be that on which the Contractor may move onto the site, unless otherwise set forth in the said notice, which date will not be more than thirty days after the date of contract, unless Owner and Contractor agree upon a longer time. The completion time of contract shall be the number of calendar days stated in the Contract Agreement, beginning with the date of Notice to Proceed, or date stated therein, exclusive of the period between December 15 and March 15.

SEC. 20.13.014. PROGRAM OF CONSTRUCTION AND PROGRESS CONTROL.

A. Within ten days after signing the Contract Agreement, the Contractor shall furnish the Engineer a graphic construction schedule and progress report form showing construction schedule on the form, for approval. The Contract shall be broken down into major phases or items of work, with beginning and completion dates for each phase or item shown. If the scope of the work involved so indicates, or at the request of the Engineer, a supplementary outline shall be submitted to show the proposed operations and the order of completion of the various parts in sufficient detail to demonstrate to the Engineer the adequacy of the program to complete the construction within the time provided.

B. The Engineer will review the schedule submitted for approval and promptly request any revisions or changes required so the Contractor's work will not delay or interfere with other crews that might be working in the area, so far as may be known. The Engineer will furnish the Contractor three prints of the approved schedule without prior approval from the Engineer in writing. No payment shall be made to the Contractor on any estimate until such a program of construction has been submitted and approved.

C. Should it become evident at any time during the construction that operations will, or may, fall behind the schedule of the approved program of construction, the Contractor shall promptly submit revised written schedules setting out changes in operations, methods, equipment, added amount of labor or of working shifts, night work, etc., by which lost time shall be made up and shall confer with the Engineer until an approved modification of the original program is secured. Should operations actually fall behind to an extent that the completion of the work within the fixed time would appear doubtful, the Owner may request the Contractor to add equipment and construction forces or to increase the working hours per

week. No payments on any estimates shall be made after such a request is made until an approved modification of the program has been provided by the Contractor. Execution of the work according to the accepted program of construction, or approved modifications thereof shall be an obligation of the Contractor at all times during the life of the contract.

SEC. 20.13.015. WORKING DRAWINGS AND INFORMATION.

A. All materials and equipment to be supplied and installed under any contract are subject to approval by the Engineer. For this purpose, the Contractor shall provide the Engineer with four copies of shop and other supplemental drawings. The Contractor is required to present such drawings and other information in an orderly manner and each delivery of such material to the Engineer shall be accompanied by a letter of transmittal listing the material transmitted.

1. The ordering or installation of any of the above described equipment or material prior to the return to the Contractor of drawings approved by the Engineer will be done at the risk of the Contractor and same may be subject to removal and replacement. Working drawings shall not be issued for use until after approval with the date of approval noted on the tracing. No work shall be done until the drawings have been so approved.

B. All working drawings shall be submitted to the Engineer. Two sets will be returned showing corrections required, if any. Revised copies shall be resubmitted after correction until approved. The Owner shall not be responsible for errors on working drawings, even though approved, or for quantities on bills of material which may be included. Any failure of the Engineer to correct errors on working drawings, or approval or implied approval thereof, shall not relieve the Contractor of the full responsibility for the safe and adequate execution of the work in accordance with the plans and specifications.

C. For reinforcing steel, working drawings shall include whatever diagrams or drawings are necessary to supplement the reinforcing details of the plans, including any special features or variations from details as shown or to serve the convenience of the Contractor; order bills of bars shall include diagrams for the bonding of each bar not to be used straight.

SEC. 20.13.016. CONSTRUCTION PROCEDURE.

A. The Engineer and the Contractor shall discuss and follow mutually agreed methods and procedures. Practices shall be as established in the industry and best modern methods in accordance with the contract requirements as set forth herein.

B. All workers, mechanics, tradesmen, artisans and other employees engaged on the work by the Contractor shall be trained and skilled in their various occupations. All plant, tools and equipment of every kind shall be suitable in character and ample in quantity and capacity to carry out and complete the work of the contract in the required times and according to approved program of construction. The Contractor shall supply all materials and work incidental to the construction included under the contract, notwithstanding minor omissions in the plans and specifications. Materials and workmanship of every kind shall conform to all the requirements of these specifications and wherever not explicitly described shall conform to best current practices.

C. The Contractor shall perform the contracted work in proper sequence relative to the work of other contractors and to the acts or operations of the Owner. No deviation from the plans or specifications will be permitted, unless authorized in writing by the Engineer.

SEC. 20.13.017. GENERAL PROVISIONS CONCERNING TIME.

A. The construction herein provided for is to be completed within certain times as set forth in the contract documents. Calendar days specified in the contract exclude the period between December 15 and March 15. No payment shall be made to the Contractor on account of any delays whatsoever, no matter by what or by whom caused, even by other contractors on the same work, or by reason of the

Engineer's acts in giving directions, in rejecting materials, methods or workmanship, or by seasons, weather or stream fluctuations. The amount provided in the contract for payment for the work items is understood and agreed to include and cover all expenses due to delays. Extensions of time for completion will be granted under the following conditions:

1. If the Owner should, in writing, direct deferment of the beginning of work beyond the formal date to begin work, or if the Owner should order the work closed down or temporarily discontinued, corresponding extensions of time would be granted with due consideration for changed working conditions incident to seasons and weather.

2. If the final contract cost, as increased by duly executed change order(s), exceeds the total contract cost based on the estimated quantities as given in the Proposal, the time of completion will be set forward a number of working days in the proportion that such excess cost bears to the cost based on estimated quantities.

3. The Contractor is requested to bring to the attention of the Engineer, by letter, during the progress of the work, the occurrence of events which the Contractor considers may warrant extension of time under the conditions of the contract. If the contract is not completed within the time stipulated, the Contractor shall, at the conclusion of the work, present a written statement to the Engineer concerning all matters of time extensions.

4. The amount of all extensions of time, for whatever reason drafted, shall be determined by the Engineer with due consideration of working seasons and working conditions. In general, only actual and not con structive or hypothetical days of delay will be considered. The Owner shall have authority to draft additional extensions of time as the Owner may deem advisable and justifiable. Approved time extensions shall be added to the March 15 date if the current contract time expires, or time extensions extend, to the period between December 15 and March 15.

5. If the Contractor fails to complete the work within the time fixed by the contract or extensions thereof, and if the Owner shall nevertheless permit the Contractor to continue and complete the same, such per mission shall neither modify nor waive any liability of the Contractor for damages arising from non-compliance of the work within the said time, but all liabilities shall continue in full force against the Contractor.

B. With only the exceptions outlined herein, all work under any contract shall be completed and ready for operation within the time listed in the Proposal after the issuance of Notice to Proceed.

SEC. 20.13.018. LIQUIDATED DAMAGES.

A. If the Contractor shall neglect, refuse or fail to complete the work within the time set forth above, or any proper extension thereof granted by the Owner, the Contractor shall pay to the Owner the amount specified in the Special Provisions for each day the entire work is incomplete. Said obligation of the Contractor is not a penalty, but is liquidated damages for loss to the City and the public, after the expiration of the time stipulated in the contract, as adjusted by duly executed change orders, and will be deducted from any money due the Contractor under the contract. The Contractor and the surety of record shall be liable for any and all liquidated damages.

B. The Contractor shall forfeit, as a penalty to the City of Independence, Missouri, Ten Dollars ($10.00) for each worker employed for each calendar day or portion thereof, if such worker is paid less than the prevailing wage rate as set forth in the specifications for any work done under a given contract, or by any subcontractor working under such contract. (The prevailing wage rates are included in Contract Special Provisions.) In addition to the penalty, progressive contract payment shall be withheld until there is compliance with the prevailing wage rate.

SEC. 20.13.019. BOND AND MAINTENANCE GUARANTEE.

A. The Contractor shall provide a bond for faithful performance of the contract and for persons performing labor or furnishing materials in connection therewith, with sureties satisfactory to the Owner and in the form provided. This performance bond shall be in the full amount of the contract and shall have as surety thereon a company authorized to do business in the State of Missouri, qualified as acceptable surety for United States government deposits, and acceptable to the Owner.

The Contractor will guarantee that the equipment, materials and workmanship furnished under the contract will be as specified and will be free from defect for a period of two years from the date of final City acceptance. In addition, the equipment or materials furnished by the Contractor shall, upon receipt of notice from the Owner, be repaired or replaced without expense to the Owner, and the Contractor shall save the Owner harmless from any damage from faulty workmanship or materials installed under the contract.

SEC. 20.13.020. TAKING OVER WORK AND WITHHOLDING PAYMENTS.

A. If the Contractor shall become insolvent or be declared bankrupt, or commit any act of bankruptcy or insolvency, or if it should become evident to the Engineer that the Contractor is not making proper progress to insure completion within the specified time, or is prosecuting the work with insufficient, inadequate or unsuitable plant and equipment, or has failed to make good rejected work or materials, the Owner shall have the right, without violation of contract, after giving the Contractor seven days' notice in writing, to undertake itself either by administration or by letting contract(s) to other parties, the completion of the said work which is being thus neglected, or to supplement the Contractor's work and operations by supplying additional plant, equipment, materials or labor.

B. Should the Owner's work cost less than the Contractor would have been paid, the difference shall be paid to the Contractor. However, should it cost more, the difference shall be payable by the Contractor and the Contractor shall, on demand, pay the amount of excess to the Owner. Under these circumstances and for these purposes, the Owner shall have the right to enter upon and take temporary possession of the plant, tools and supplies of said Contractor, or any part thereof.

In addition to the percentage of payments to be temporarily retained by the Owner, pending completion of the work, the Owner shall have the right to withhold sufficient amounts of any payment otherwise due the Contractor to cover failure of the Contractor to make proper payment on amounts past due and payable for just claims for labor, materials and services applied to the work of the contract, and for defective work not remedied. The Owner shall have the right to act as agent for the Contractor in disbursing such withheld funds to the party or parties entitled thereto, and in case of such disbursements shall render the Contractor a full accounting for all such funds.

C. The Owner shall not be obligated to take any such action and the failure of the Owner to act under this and similar clauses of the specifications shall not relieve the Contractor from any responsibilities, obligations or liabilities resulting from failure to complete the contract within the times prescribed.

SEC. 20.13.021. USE OF COMPLETED WORK.

The Owner may, prior to the completion of all the work performed by the Contractor, or acceptance thereof by the Owner, enter upon and use any portion of said work without any compensation or payment whatever to the Contractor for any delay in the work caused by such use. Such taking possession and use shall not be deemed as acceptance of the work so taken and used, or any part thereof.

SEC. 20.13.022. EASEMENTS AND RIGHTS-OF-WAY.

A. The project will be constructed through easements obtained by the Owner and/or on public rights-of-way. The Contractor shall confine operations to construction limits shown on the plans and be responsible for obtaining, at no expense to the Owner, any additional space required. The Contractor shall confine work on private property to easements obtained in advance by the Owner. Disturbed areas shall be restored as stated in the contract documents.

B. The Contractor shall be responsible for any loss suffered by adjacent property owners as a result of, or by reason of, the work done and shall indemnify and save the Owner harmless from any such loss on private property.

C. In case work is to be done in State right-of-way, a permit is to be obtained by the Contractor from the Missouri State Highway Department, 5117 East 31st Street, Kansas City, Missouri 64128.

SEC. 20.13.023. LOCATION OF UTILITIES.

A. All known utilities such as gas, water, telephone, power, television cable, sanitary and storm sewers, will have been located on the plans to the best of the Owner's knowledge, but the Contractor shall ascertain in the field the exact location of all such utilities, including individual services, if any exist, and shall be fully responsible for the replacement of damaged utility, either public or private.

B. Special emphasis is placed upon the necessity that care shall be exercised to prevent damage to existing structures, overhead lines and underground lines, and pipes lying within or adjacent to construction or storage areas, and where indicated on plans. The Contractor shall make every effort to locate all underground facilities, by contacting utility owners or otherwise locating pipelines, conduit and structures in advance of earthwork operations. The Contractor will be responsible for repair of all damage to existing facilities during the contract, even if done by a subcontractor.

C. Should there be on or under the property buildings, poles, wires, pipes, sewers, conduits or similar structures which the Contractor would desire removed or relocated, either temporarily or permanently, it will be the responsibility of the Contractor to accomplish such action unless otherwise specifically provided.

SEC. 20.13.024. SALVAGE OF MATERIALS REMOVED.

The Contractor shall carefully remove all materials designated to be salvaged and reused in a manner to prevent damage. Any damaged material will be replaced at the Contractor's expense, if so designated. Materials shall be protected and stored on site until ready for reuse as approved by the Engineer.

SEC. 20.13.025. FACILITIES AT SITE.

A. The Contractor shall have at all times copies of the plans and specifications at the work site and shall require each foreman to have at the work site a copy of that part of the plans and specifications which pertain to the work when the construction is in progress, to confer with the Engineer or any representatives, and to receive such directions or approvals as the Engineer may desire to give.

B. The Contractor shall provide power for lighting, operation of the equipment, testing, or for any other uses required for the proper completion of the work. Water for and in connection with the work, including testing of pipes, drinking, or for any other use as may be required for the proper completion of the work to be performed, shall be provided by the Contractor.

C. The Contractor shall provide, maintain and enforce the use of approved sanitary facilities for employees. Toilets shall be of the chemically treated type to comply with the City Health Department and with City ordinances. To the extent possible, toilet shall be obscured from public view. The Contractor shall maintain these temporary facilities in a neat and sanitary condition and supply with toilet paper. The Contractor shall be responsible for the removal of such temporary toilet facilities when the work is completed and shall be constrained to commit no public or private nuisance.

D. Care shall be exercised to protect all equipment and material during the storage period at work site, during and after installation, and prior to acceptance. Right-of-way for existing streets and highways shall not be used for storage areas. Cooperation with the Owner and other contractors or utilities to maintain the project site in a well-ordered condition shall be required. The Contractor shall coordinate delivery of materials and supplies with the program of construction so that an undue amount of storage space is not required on site.

E. The Contractor shall provide, erect, maintain and remove when so requested, all scaffolding, staging, platforms, flooring guards, railings, stairs, etc., as required for the protection of workers and the public, and to provide properly for all operations of construction and inspection. Compensation for all facilities at the site shall be covered by the amounts paid for completed construction as provided under the bid items in the Proposal.

F. If explosives are to be used in the construction, on-site storage shall be in a secure manner, clearly marked, as approved by the Independence Fire Department. On-site explosive storage shall be in care of competent watchers at all times.

G. Utmost care shall be taken to establish and maintain the best possible relationship with adjacent and surrounding property owners. Special care shall be taken where fences are to be breached on private property to contact owners and insure proper protection of anything within the enclosure. The Contractor shall maintain the site and operate so as to avoid creating a public nuisance.

H. Work shall be conducted so as to avoid and eliminate unnecessary noise, dust and dirt. Attention shall be directed to the condition of roadways in use by equipment associated with the construction and should muddy conditions develop, the Contractor shall keep public roadways clean to the best possible extent.

I. The Contractor's signs shall be placed in locations so as not to interfere with or obstruct the view of traffic or operations of construction; placement shall comply with directions of the Engineer. Signs shall be removed promptly upon completion of the project, or as the need for them is ended.

J. Upon completion of the work of construction, and before acceptance, all surplus material, temporary structures and debris shall be removed and the premises left in a sightly condition. No separate payment shall be made for final cleaning up, but shall be included in amounts paid for the completed work as bid.

SEC. 20.13.026. SAFETY PRACTICES AND ACCIDENT PREVENTION.

A. In the performance of the contract, the Contractor and subcontractors shall comply with and observe all of the requirements of the Federal Occupational Safety and Health Act (OSHA), and all rules and regulations published in connection therewith. The Contractor shall provide equipment and medical facilities as are necessary to supply first aid to anyone who may be injured in connection with the project. Provisions must also be made for the immediate removal and hospitalization in case of emergency. Anyone acting in a supervisory capacity should have authority to order such emergency action.

B. Precaution shall be exercised at all times for the protection of persons and property. The safety provisions of applicable laws, building and construction codes and the like shall be observed. Machinery and equipment and other hazards shall be guarded in accordance with the safety provisions of the Manual of Accident Prevention in Construction, published by the Associated General Contractors of America, to the extent that such provisions are consistent with applicable law or regulation.

C. The Contractor shall provide, erect and maintain all necessary barricades, suitable and sufficient red or yellow lights, danger signals, warning and closure signs and shall provide watchers and take all necessary precautions for the protection of the work and the safety of the public.

SEC. 20.13.027. EXPLOSIVES AND BLASTING.

A. No explosives shall be used without written permission secured in advance from the Owner. Before using explosives, the Contractor shall comply with all requirements of law and obtain a blasting permit, which requires a separate insurance certificate to be filed with the Owner.

B. Before obtaining any explosives, the Contractor shall become familiar with all state statutes governing the storage and use of explosives, and the requirements of the City, and shall govern the operations according to the regulations thereof. The time of placing, size and firing of charges shall at all times be subject to the approval of the Engineer, but the Contractor shall be fully responsible for any damage resulting from their use.

SEC. 20.13.028. EXISTING THOROUGHFARES.

A. The Contractor shall not close any thoroughfare without the written consent of the Director of Public Works/Engineering of the City of Independence, Missouri. The Director can be reached in the Engineering Division of the Public Works Department, 111 East Maple, Independence, Missouri, telephone 816-325-7601.

B. All operations shall be conducted in such manner as to insure the least possible obstruction to traffic. Open trenches shall be bridged where necessary, and personnel employed to direct traffic through construction areas. If it should become necessary to close a section of an existing road or street and a detour is required to accommodate the traveling public, or for use of the Contractor, the work of constructing the detour shall be done by the Contractor to the satisfaction of the Engineer. Such detour shall be constructed so as to be safe and to cause no unreasonable delay in public travel. If constructed solely for the use of public traffic and if ordered by the Engineer, the work shall be paid for at the respective prices as listed in the Proposal and/or as authorized by change order. If constructed for the use of the Contractor, the Contractor shall be responsible for the construction and maintenance.

SEC. 20.13.029. LIABILITIES, DAMAGES AND ACCIDENTS.

A. The Contractor shall assume and be responsible for and shall indemnify, protect and save harmless the Owner against any and all claims, demands or causes of action by any party or parties whatsoever for loss, injury or damage of any kind or character, either to persons or to property, directly or indirectly arising out of his/her operations or the acts or omissions of the contractor, any agents or workers. The Contractor shall pay all judgments obtained by reason of accidents. injuries or damages in any suit or suits against the Owner, including all legal costs, court expenses and other like expenses; the Contractor shall have the option of assuming the sole defense of such suits.

B. The Contractor shall assume all risks of loss and damage to the Contractors property and to property in his/her custody and to the property of any employees, agents and servants, howsoever caused; all risks of damage resulting from the death of or injury to himself/herself, any agents and servants, while engaged in said work and while traveling to and from the same; and he/she agrees to hold the Owner free and harmless from all loss, cost and expense on account thereof, and agrees to indemnify and save harmless the Owner from all loss, cost and expense arising or growing out of any injury to any employee of the Owner caused by the negligence of the Contractor or any employees; also from all loss, cost and expense arising or growing out of any injury to any person while upon the premises of the Owner caused by the negligence of the Contractor, or any employee; also from all loss, cost and expense arising or growing out of any damage to any property, whether belonging to the Owner or not.

C. All delivered materials and portions of completed work shall be deemed to have become the property of the Owner, but the Contractor shall store materials and shall be responsible for and shall maintain partly or wholly finished work during the continuance of the contract, and until final acceptance of the work covered by the contract. If any materials or parts of the work be lost, damaged or destroyed by any means whatsoever, the Contractor shall satisfactorily repair and replace the same at his or her own cost.

SEC. 20.13.030. INSURANCE REQUIREMENTS.

The Contractor shall not commence work under this contract until he or she has obtained all insurance required under this section and elsewhere in the contract documents, such as exceptional insurance requirements outlined in the Contract Special Provisions, and such insurance has been approved by the Owner. The Owner shall be named as an additional insured on the policies and certificates. Any and all certificates of insurance must be approved and on file with the City Clerk before work commences under this contract. Should the Owner so request, copies of policies may be required for examination. The following are the required insurance coverages:

A. Worker's Compensation Insurance.

The Contractor shall comply with the Worker's Compensation laws of the state, including the site of construction, and furnish to the Owner a certificate of evidence that he or she has complied with all such laws and that he or she has paid all contributions required by the state thereunder.

In the event that any class of employees engaged in hazardous work at the site of the project under this contract does not come under the protection of the Worker's Compensation Act of the state, including the site of construction, the Contractor shall provide and shall cause each subcontractor to provide adequate insurance coverage for the protection of such employees. The Contractor shall be required to carry Employer's Liability Insurance.

B. Public Liability.

The Contractor shall have in force throughout the life of this contract insurance for both General Public Liability with Excess Coverage and Umbrella and Broadform property damage and Automotive Liability to at least the following limits:

Bodily injury	- $ 300,000.00 per person
	- $2,000,000.00 per occurrence
Property damage	- $2,000,000.00 per occurrence

Equal limits of coverage must be provided by the Contractor in an Owner's Protective Liability Policy and endorsements covering subcontractors or evidence of insurance in force must be provided by each subcontractor before that subcontractor commences work.

C. Special Insurance Requirements

1. If blasting is required, provisions of Chapter 17 shall be followed, including permit, insurance, seismograph and notification.

2. Builder's Risk will be required for protection against vandalism and malicious mischief when the construction involves a building when there is a probable risk of loss exceeding $25,000.00. When equipment and/or materials of $25,000.00 or more are involved, Inland Marine Insurance may be required to protect such items in transit.

3. When construction work is required on railroad property, the Contractor shall obtain, pay for and maintain a Protective Liability Insurance contract for and in behalf of each railroad involved and as specified in the Special Provisions.

SEC. 20.13.031. DIMENSIONS, GRADIENT AND ALIGNMENT.

The Contractor shall verify in the field all dimensions and elevations which require connections to existing structures and utilities and for modifications inside existing structures. Benchmarks are shown on the plans; however, control stakes shall not be furnished by the Engineer. The Contractor shall make whatever measurements and alignments he or she may find necessary or convenient to enable him or her to construct each element of the work in the correct position to correspond to the information shown on the plans and given by the Engineer during the progress of the work.

Elevations shown on the drawings and referred to in the contract documents are based on benchmarks shown. The Contractor shall employ competent personnel for making position, gradient and alignment determinations and measurements. All monuments, benchmarks, reference points and stakes shall be carefully preserved. In case of destruction, the Contractor shall be charged with resulting expense of replacement. The Contractor shall be responsible for any mistakes or loss of time caused by unnecessary loss or disturbance of monuments, benchmarks, reference points and stakes.

SEC. 20.13.032. CHANGE IN AMOUNTS OF WORK.

The Owner shall have the right to increase or diminish the quantity, to change the order, or to dispense with portions of the work at any time without impairing the contract and without changing the unit prices to be paid. In case of the reduction in amount of work, no payment will be made on account of work not done if the total amount paid to the Contractor for the entire contract, exclusive of added line items, is as much as 80% of the total bid as included in the Contactor's Proposal. If the total amount is less than 80%, an allowance to be fixed by the Engineer will be paid due to the administration and plant costs.

The Owner shall have the right to eliminate from the contract at the bid price minor items on which bids may appear to the Engineer unreasonably unbalanced and to provide for the construction by unclassified work, or otherwise. A minor item shall be one involving not more than approximately 2% of the total of the contract, or for which probable quantities cannot be estimated in advance.

In case of increase in amount of work, payment for such increase at the unit price bid for the work of the classes so increased shall be full compensation for the work done. When changes to work not covered in the contract documents and involving added cost occur, they will be performed only on a written change order signed by the Contractor and duly processed by the Owner. All costs and indirect costs, including overhead, bond and profit shall be submitted as a maximum cost figure on this change order. **The Contractor shall not proceed with any work under a change order requiring additional materials or costs until written approval is given by the Engineer**.

The Owner may at or prior to contract award appropriate up to ten percent more than the contract value to be reserved for change orders to the project. Administrative change orders may be processed for the contract up to appropriation amounts. Administrative change orders may be for unit price extensions, cost plus additions or negotiated prices, and are to be in written form approved by the City Manager and attested by the City Clerk. All other change orders require approval by the City Council.

SEC. 20.13.033. NEW ITEMS.

A. The Owner shall have the right to require the Contractor to perform work or supply materials essential to the completion of the work, of a class or type not provided for in the contract documents, or not included and covered under classifications for which price payments are provided in the contract. This work shall be added as a new line item.

B. When a new item is ordered, it shall be paid for as the Owner may elect, either by a lump sum or by unit prices mutually agreed upon by the Owner and the Contractor in writing, or, if such agreement cannot be made or the Owner so elects, on the basis of estimated cost to the Contractor of constituent unfabricated materials, including fuel, or applied labor, and of liability insurance for labor, plus 20% thereof to cover and include Contractor's profit, superintendence, overhead and indirect expense, including interest on borrowed money and premiums on bonds, and for the use of plant, equipment, tools and appliances. Where manufactured or fabricated materials or articles are to be purchased for installation, or some of the work is done by subcontract, the Contractor shall estimate 5% over and above the Contractor's costs of such items instead of 20%. For such work, plant and tools shall be provided of the same general character as employed for similar kinds of operations on the project.

C. The Contractor shall not begin any work for which new items are provided in the contract without written approval from the Engineer.

SEC. 20.13.034. NOTICE OF CLAIMS FOR EXTRA COMPENSATION.

Should any conditions arise which in the Contractor's opinion will require any claims or demands for extra or additional compensation above that fixed by the contract, or on which he or she contemplates bringing claims for such extra compensation, the Contractor shall promptly and before incurring any expenses, notify the Owner in writing of the conditions and circumstances and that such claims are anticipated. The Contractor agrees that any claims made without such advance notice, and not presented in such a way as to enable the Engineer to observe conditions as they occur and to verify expenses as they occur and to determine with certainty the correctness of such claims and of the expenses involved, are waived and shall be null and void. The Contractor shall not proceed with any work requiring added compensation until written approval is given by the Engineer.

SEC. 20.13.035. AS-BUILT DRAWINGS.

As-built, or record, drawings are required and will serve as a permanent record of construction details.

A. The Contractor shall submit complete record drawings, or marked-up prints of contract drawings, as final as-built drawings. All changes in the contract work, added work, and work deleted, shall be shown in contrasting colors on these record drawings.

B. The Contractor shall maintain a set of record drawings at the job site. These shall be kept current and legible and be available for the inspection of the Engineer at all times.

C. Upon substantial completion of the project work, the Contractor shall submit these marked-up drawings for the approval of the Engineer. The Engineer shall be the sole judge of the acceptability of these drawings as submitted.

D. Receipt and approval of as-built record drawings shall be a prerequisite for Contractor's final payment on the contract. Condition of as-built drawings must be suitable for recording on microfilm.

SEC. 20.13.036. ACCEPTANCE OF WORK.

No part of the construction will be finally accepted until the entire contract shall have been completed. Upon final completion of the work, the Engineer will make final inspection and when it is found that the Contractor has completed the entire contract in accordance with the contract documents, the Owner will thereupon issue a formal order of acceptance and the final pay estimate will be rendered.

SEC. 20.13.037. METHODS OF PAYMENT.

A. Lump Sum Payment: When so indicated in the Contract Special Provisions under the section entitled "Measurement and Payment," payment will be made for the entire contract in cash or by check by the City of Independence, Missouri, upon completion, final inspection, approval of as-built record plans and acceptance of the work.

B. Partial (Progress) Payments: Payments will be made at unit prices shown in the Proposal, with work in place as described in the contract documents as a basis for making monthly pay estimates. Before the first application for payment, the Contractor shall submit to the Engineer a schedule of values of the various portions of the work, including quantities, if required by the Engineer, aggregating the total contract sum, divided according to subcontractors and prepared in such form as the Engineer and the Contractor may agree upon, and supported by such data to substantiate its correctness as the Engineer may require. Each item in the schedule of values shall include its proper share of overhead and profit and this schedule, when approved, shall be used only as a basis for the Contractor's application for payment.

At least fifteen days before each payment will fall due, the Contractor shall submit to the Owner an itemized application for payment, supported to the extent required by the Engineer by receipts or vouchers showing payments for materials and labor, payments to subcontractors, and such other evidence of the right to payment as the Engineer may direct. On or about the first day of the month, the Engineer will make an estimate of the value of the total work done. After each estimate shall have been approved by the Owner, the Owner shall pay to the Contractor, within fifteen (15) days, 90% of the amount of such estimated sum, less the sum of all previous payments. No payments will be made on account of materials not to be incorporated in the work. Progress payments will be made to the Contractor based on ninety percent (90%) of the value of the work satisfactorily completed and for the unused material on hand at the time of the progress estimate. After the contract is fifty percent (50%) completed, payments may be increased by the full value of the additional work satisfactorily completed. The retained percentage will be withheld by the City until final payment is authorized by the Director, except that when the work is stated as substantially complete in writing, the Engineer may reduce the retained percentage to an amount equal to two hundred percent of the remaining minor items to be completed.

As directed in writing by the Engineer, adjustments may be made in the estimates for quantities shown under each bid item at the unit prices named in the Proposal, so long as these adjustments do not result in an excess of the total contract amount. All other variations must be made as provided under Section 20.13.032, Change in Amounts of Work.

It is agreed by the Contractor that any payments or advancements of funds to be made to the Contractor under provisions of this agreement shall not be assigned or pledged by Contractor unless consent in writing is first obtained from the Owner.

C. Force Account may be applied under the following conditions:

1. Force account work will be measured and paid for on a Contractor's cost, plus a percentage basis.

2. The "Contractor's cost" is hereby defined for purposes of this Article to be, and shall include, the amounts required to pay subcontractors, plus the costs of Contractor's as follows:

a. Labor Costs

(1) The payroll cost for all workers such as foremen, mechanics. craftsmen and laborers.
(2) All incidental labor expenses incurred as a direct result of the performance of the work, including payroll taxes, worker's compensation, pension and retirement allowances and social security insurance or other regular payroll charges on same.

b. Material and Equipment Costs

(1) The cost of all materials and equipment required, delivered to the construction site, which are not furnished by Owner or others.
(2) Sales and use taxes applicable to such materials and equipment.

c. Supplemental Costs

(1) Rental for all power-driven equipment at agreed-upon rates shall be charged against Force Account work only for the actual time which the equipment is used specifically therefore.

(2) Transportation charges necessarily incurred in connection with such equipment which is not already on the site.

(3) Cost of power, fuel, lubricants and water required for such equipment (may be included in agreed-upon rate).

(4) Additional cost for surety bonds, liability and property damage, and other insurance required, where cost is necessarily increased by coverage of the Force Account Work.

d. The above definitions and requirements apply equally to work done by subcontractors, suppliers and manufacturers.

e. The percentage which shall be added to the several items of Contractor's cost are as follows:

(1) Amounts paid to subcontractors	- 5%
(2) Labor costs	- 10%
(3) Material and equipment costs	- 10%
(4) Supplemental costs	- 0%

3. The above percentages shall be understood to include all other costs and full compensation for profit, overhead, superintendence, field office expense and all other elements of cost not included in the "Contractor's cost," as herein defined.

4. The Contractor shall keep and present in an acceptable form an accurate account with vouchers of the several items of cost, including those of subcontractors performing Force Account work.

D. Late Payment Clause: If the Owner fails to make a monthly pay estimate thirty (30) days after approval by the Engineer, in addition to other remedies available to the Contractor, then interest shall be added to each payment at the maximum legal rate, commencing on the first day after said payment is due and continuing until the payment is received by the Contractor. The legal rate of interest shall be as specified in R.S.Mo 34.057.

SEC. 20.13.038. ACCEPTANCE AND FINAL PAYMENT.

Upon determination by the Engineer that all work has been completed in accordance with the contract, and approval of as-built plans submitted for record, the Owner will accept the project as such by an approved Letter of Acceptance.

When the work has been so completed and certified by the Owner, a final estimate will be executed and submitted, which will provide payment to the Contractor for the entire sum due as set forth in the contract documents, including all amounts previously retained by the Owner. All prior partial estimates and payments shall be subject to correction by the Owner in this final estimate and payment.

Payments for the work will be made by check by the City of Independence, Missouri, as herein specified.

SEC. 20.13.039 - 20.13.999 RESERVED.

ARTICLE 14. PERMITS AND FEES

SEC. 20.14.001. BUILDING PLAN REVIEWS AND FEES.

The Public Works Department shall review all building permit applications for compliance with the Public Works Manual. A fee per application will be charged on all applications, except for Commercial Developments, per the Schedule of Fees.

SEC. 20.14.002. COMMERCIAL PLAN REVIEW FEE.

The Public Works Department shall review all Commercial Building Permit Applications for compliance with the Public Works Manual. A fee shall be charged on all applications for review, per the Schedule of Fees.

SEC. 20.14.003. RESERVED.

SEC. 20.14.004. FINAL INSPECTIONS AND FEES.

A. The Public Works Department shall perform a final inspection at the site of each residential and commercial building to verify compliance with the Public Works Manual and all applicable provisions of the City Code. A fee will be charged for each inspection in accordance with the Schedule of Fees.

B. Reinspection Fees: The inspection fee provides for an inspection and, if required, one reinspection. If additional reinspections are required because of incomplete or faulty work the fee for the reinspection shall be assessed in accordance with the Schedule of Fees. The fee shall be paid by the permittee before another inspection can be requested.

SEC. 20.14.004 - 20.14.999 RESERVED.

ARTICLE 15. DISPOSAL OF CITY OWNED REAL ESTATE

SEC. 20.15.001. SCOPE.

This Article governs procedures for the surplusing of all City owned real estate within the City of Independence, Missouri.

SEC. 20.15.002. DECLARATION OF SURPLUS PROPERTY.

A. City owned real estate shall be declared surplus, and the procedure spelled out for the disposal of that surplus property, by an ordinance passed by the City Council. This ordinance shall include establishment of a minimum sale price, which shall be used in the advertisement of the sale.

B. The Director of Public Works shall be authorized by the ordinance to proceed with the surplus process, to include the following:

1. The sale shall be advertised for three (3) days in a local newspaper.

2. Sealed bids shall be considered within thirty (30) days of the last date of advertisement.

3. If no acceptable bids are received during the above referenced thirty (30) days, offers to purchase the property will be received. Offers exceeding the minimum bid and any other offers deemed in the best interest of the City shall be forwarded to the City Council with a recommendation for approval.

SEC. 20.15.003. APPRAISALS OF SURPLUS PROPERTY.

Any tract with an estimated value of greater than Two Thousand Five Hundred Dollars ($2,500.00) shall be appraised by a competent real estate appraiser, unless this requirement is waived by the Director of Public Works.

SEC. 20.15.004. FEDERALLY FUNDED SURPLUS PROPERTY.

The surplusing and disposal of any real estate acquired with participating Federal funding shall be in conformance with the rules and regulations of the government agency which provided the funding.

SEC. 20.15.005 - 20.15.999 RESERVED.

CHAPTER 20 - PUBLIC WORKS MANUAL

ARTICLE 16. EROSION CONTROL REQUIREMENTS

SEC. 20.16.001. SCOPE.

A. This Division governs all design work, and materials required for temporary water pollution control measures which shall be required on all construction projects where earth is disturbed.

As defined herein, best management practices shall be performed throughout the life of the project to control water pollution. Construction of permanent drainage facilities as well as performance of other work which may contribute to the control of siltation shall be accomplished at the earliest practicable time. Pollutants such as chemicals, fuels, lubricants, bitumens, raw sewage, or other harmful material shall not be discharged from the project.

B. This work shall consist of furnishing, installing, maintaining, and removing temporary control measures as shown on the plans or ordered by the engineer. The control of water pollution through use of berms, slope drains, ditch checks, sediment basins, seeding and mulching, bales, silt fences, and other erosion control devices or methods, shall be used in accordance with this Article.

C. The temporary pollution control provisions contained herein shall be coordinated with any permanent erosion control features specified elsewhere in the plan or contract documents to assure effective and continuous erosion control. These provisions shall also apply to work within easements designated for the project.

SEC. 20.16.002. EROSION CONTROL PLANS.

Prior to any construction, a plan shall be submitted for acceptance for the implementation of temporary and permanent erosion control work, as are applicable for clearing and grubbing; grading; bridges and other structures at watercourses; construction; and paving. No work shall be started until the erosion control sequences and methods of operations have been approved by the engineer and in place.

SEC. 20.16.003. CONSTRUCTION REQUIREMENTS.

A. The engineer may limit the surface area of erodible earth material exposed by clearing and grubbing, the surface area of erodible earth material exposed by excavation, borrow, and fill operations, and may require the immediate permanent or temporary pollution control measures to prevent contamination of adjacent streams or other watercourses, lakes, ponds, or other areas of water impoundment. Such work may involve the construction of temporary berms, dikes, dams, sediment basins, slope drains, and use of temporary mulches, seeding or other control devices or methods as required on the plans or in the contract document.

B. All permanent erosion control features shall be incorporated into the project at the earliest practicable time. Temporary pollution control measures shall be used to correct conditions that develop during construction which were not foreseen during the design state; that are needed prior to installation of permanent pollution control features; or that are needed temporarily to control erosion that develops during normal construction practices, but are not associated with permanent control features on the project.

C. Clearing and grubbing operations shall be so scheduled and performed that grading operations and permanent erosion control features will follow immediately thereafter. The surface area of erodible earth material exposed at one time by clearing and grubbing, by excavating, by fill, or by borrow shall not exceed 750,000 square feet without written approval of the engineer.

D. The engineer will limit the area of clearing and grubbing, excavation, borrow, and embankment operations in progress commensurate with the capability and progress in keeping the finish grading, mulching, seeding, and other such permanent pollution control measures current. Should seasonal limitations make such coordination unrealistic, temporary erosion control measures shall be taken immediately.

E. The engineer may increase or decrease the amount of surface area of erodible earth material to be exposed at one time by clearing and grubbing, excavation, borrow and fill operations based upon an analysis of project conditions.

F. Unless otherwise provided or approved in writing by the Engineer, construction operations in rivers, streams, and impoundments shall be restricted to those areas which must be entered for the construction of temporary or permanent structures. Rivers, streams, and impoundments shall be promptly cleared of all falsework, piling, debris or other obstructions placed therein or caused by the construction operations.

G. Frequent fording of live streams with construction equipment will not be permitted. Temporary bridges or other structures shall be used wherever an appreciable number of stream crossings are necessary. Unless otherwise approved in writing by the Engineer, mechanized equipment shall not be operated in live streams except as may be required to construct channel changes and temporary or permanent structures. If a Section 404 permit is applicable, its requirements and/or conditions shall prevail.

H. The location of all local material pits, other than commercially operated sources, and all excess material areas shall be subject to the approval of the Engineer and construction operations shall be conducted and pollution control measures implemented so that erosion will not result in water pollution.

I. In the event of conflict between these requirements and pollution control laws, rules, or regulations of other Federal, State, or local agencies, the more restrictive laws, rules, or regulations shall apply.

SEC. 20.16.004. TEMPORARY BERMS.

A. A temporary berm is a temporary ridge of compacted soil, with or without a shallow ditch, constructed at the top of fill slopes or transverse to centerline on fills.

B. The purpose of these ridges is to divert storm runoff from small areas away from steep slopes and direct this water to temporary outlets where the water can be discharged with minimum erosion.

C. These temporary ridges are used at the top of newly constructed slopes to prevent excessive erosion until permanent controls are installed and/or slopes are stabilized, as well as transverse to grade to divert runoff to stabilized slope drains. Two types of temporary berms will be utilized under conditions listed below, unless directed otherwise by the Engineer:

Type "A" berms will be constructed at the end of each day's operations on embankments.

Type "B" berms will be constructed when embankment operations are shut down over the winter season or discontinued at the direction of or with the concurrence of the Engineer.

D. Interceptor berms transverse to centerline may be used when temporary berms are installed on all grades in excess of one percent (1%) and at all locations where water is to be carried down the fill slope by temporary or permanent slope drains.

SEC. 20.16.005. CONSTRUCTION REQUIREMENTS.

Type "A" Berms shall be constructed in accordance with the Standard Drawings as shown in Article 4. These berms will be machine compacted with a minimum of one pass over the entire width of the berm with a dozer tread, grader wheel, or other compaction device.

Type "B" Berms will be constructed in accordance with the Standard Detail as shown in Article 4. These berms will be machine compacted with a minimum of 3 passes over the entire width of the berm with a dozer tread, grader wheel, or other compaction device.

Temporary berms must drain to a compacted outlet at a slope drain. The top width of these berms may be wider and the side slopes flatter on transverse berms to allow equipment to pass over these berms with minimal disruption.

SEC. 20.16.006. TEMPORARY SLOPE DRAINS.

A. A temporary slope drain is a temporary facility consisting of stone, concrete or asphalt gutters, half-round pipe, metal pipe, plastic pipe, or flexible rubber pipe, used to carry water down slopes to reduce erosion. The method selected shall meet the approval of the Engineer.

Temporary slope drains shall be required to carry water flowing from cut sections down the fill slopes prior to the time permanent facilities are installed. Temporary slope drains shall also be required on fill slopes at approximately five hundred foot (500') intervals or as directed by the Engineer.

All temporary slope drains will be adequately anchored to the slope to prevent disruption by the force of the water flowing in these drains. The inlet end will be properly constructed to channel water into the temporary drain. The outlet ends of these temporary slope drains will have some means of dissipating the energy of this water to reduce erosion downstream. Unless otherwise specified by the Engineer all temporary slope drains will be removed when no longer necessary and the site restored.

SEC. 20.16.007. DITCH CHECKS.

Ditch Checks shall be constructed in accordance with the detail shown in Article 4.

1. Rock Ditch Checks shall be constructed of 2 to 3 inch (2"-3") clean gravel or limestone placed according to the configuration show on the plans. Hand or mechanical placement will be necessary to achieve complete coverage of the ditch or swale and to insure that the center of the check is lower than the edges.

2. Straw Bale Ditch Checks shall be constructed according to the plans and specifications for the ditch application of the straw bale ditch check as shown on the plans.

3. Silt Fence Ditch Checks shall be constructed according to the plans and specifications for the ditch application of the silt fence ditch check as shown on the plans.

SEC. 20.16.008. MAINTENANCE OF DITCH CHECKS.

A. Rock Ditch Checks shall be checked for sediment accumulation after each significant rainfall. Sediment shall be removed when it reaches one-half of the original height. Regular inspections shall be made to insure that the center of the check is lower than the edges. Erosion caused by high flows around the edges of the check shall be corrected immediately.

B. Straw Bale Ditch Checks shall have sediment deposits removed after each storm event. Deposits shall be removed when approximately one-half the height of the barrier is reached.

C. Silt Fence Ditch Checks shall have sediment deposits removed after each storm event. Sediment must be removed when deposits reach approximately one-half the height of the barrier.

SEC. 20.16.009. SEDIMENT BASINS.

Sediment Basins as required herein shall be constructed in accordance with the details shown in Article 4. A sediment basin can be an excavated or dammed storage area with rock riprap placed in inlet and outlet areas with defined side slopes.

Sediment basins are constructed to trap and store sediment from erodible areas in order to protect properties and stream channels below the installation from excessive siltation. These structures trap and store sediment that unavoidably occurs in spite of temporary erosion control measures in use.

The area where a sediment basin is to be constructed shall be cleared of vegetation to enable removal of sediment.

The inlets of these sediment basins shall be constructed with a wide cross-section and a minimum grade to prevent turbulence and allow deposition of the soil particles. When the depth of sediment reaches 1/3 of the depth of structures in any part of the pool, all accumulation shall be removed.

Sediment basins shall normally remain in service until all disturbed areas draining into the structure have been satisfactorily stabilized. When use of temporary sediment basins is to be discontinued, all excavations are to be backfilled and properly compacted. Any fill material shall be removed and the existing ground restored to its natural or intended condition.

Removed accumulated sediment and excavated material during construction shall be disposed of in such locations that the sediment will not again erode into the construction areas or into natural waterways.

SEC. 20.16.010. TEMPORARY SEEDING AND MULCHING.

Temporary seeding and mulching required herein shall be preferred in accordance with applicable provisions in Article 10.

Temporary seeding and mulching is to produce a quick ground cover to reduce erosion in disturbed areas that are expected to be redisturbed at a later date.

Seeding and/or mulching will be a continuous operation on all cut and fill slopes, waste sites, and borrow pits during the construction process, as directed by the Engineer. All disturbed areas shall be seeded and mulched when and where necessary to eliminate erosion, as directed by the Engineer.

Temporary seeding mixtures according to the planting season shall be as follows:

December 1 to March 1 - Per Acre

50 lbs. Oat Grain

March 1 to December 1 - Per Acre

50 lbs. (cereal rye or wheat)

Temporary Mulch and Fertilizer for seeding shall meet applicable provisions of Article 10 of the Public Works Manual.

SEC. 20.16.011. STRAW BALES.

Bales of straw used as a means of controlling pollution and erosion as required herein, are to be placed in accordance with the plans and as approved by the Engineer. Straw may be used to obstruct the flow of water to allow deposit of sediment and/or to divert water. Straw may be used at the bottom of embankment slopes to divert runoff from sheet flow and also catch some of the sediment picked up in the sheet flow, and as ditch checks in small ditches and drainage areas. Straw may also be used on the lower side of the cleared area to catch sediment from sheet flow.

Bales of straw will be utilized to control erosion, trap sediment, and divert runoff as directed and approved by the Engineer. When used to trap sediment or divert runoff, the bales must be adequately braced from behind.

SEC. 20.16.012. SILT FENCE.

A. A Silt Fence as required herein shall consist of furnishing, installing, maintaining, and removing a geotextile barrier-fence designed to remove suspended particles from water passing through the fence.

This Silt Fence may be either a wire-supported geotextile silt fence or a self-supporting geotextile silt fence.

B. Fibers used in the manufacture of geotextiles shall consist of longchain synthetic polymers, composed of at least eighty-five percent (85%) by weight polyolefins, polyesters, or polyamides. They shall be formed into a network such that the filaments or yarns retain dimensional stability relative to each other, including salvages. The geotextile shall be free of any treatment or coating which might adversely alter its physical properties after installation. Unless otherwise specified, geotextile shall be furnished in thirty-six inch (36") width rolls.

C. Geotextile rolls shall be furnished with suitable wrapping for protection against moisture and extended ultraviolet exposure prior to placement. Each roll shall be labeled or tagged to provide product identification sufficient for inventory and quality control purposes. Rolls shall be stored in a manner which protects them from the elements.

D. The Silt Fence shall be supported by either wood, steel, or synthetic posts. Posts shall have a minimum length of thirty-six inches (36") plus embedment depth and be of sufficient strength to resist damage during installation and to support applied loads.

E. Support Fence, as required herein, shall be at least twenty-four inches (24") high and strong enough to support applied loads.

F. Prefabricated fence systems may be used, provided they meet all of the above material requirements.

G. A temporary silt fence shall be installed as shown on the plans, and at other locations as directed by the Engineer. Fence construction shall be adequate to handle the stress from hydraulic and sediment loading. Geotextile at the bottom of the fence shall be buried as indicated on the standard drawings shown in Article 4. The trench shall be backfilled and the soil compacted over the geotextile. The geotextile shall be spliced together as indicated on the standard drawings.

H. Post spacing shall not exceed eight feet (8') for wire support fence installations or five feet (5') for self-supported installations. Posts shall be driven a minimum of twenty-four inches (24") into the ground. Where rock is encountered posts shall be installed in a manner approved by the Engineer. Closer spacing, greater embedment depth and/or wider posts shall be used as necessary in low areas and soft or swampy ground to ensure adequate resistance to applied loads.

I. When support fence is used, the mesh shall be fastened securely to the up-slope side of the post. The mesh shall extend into the trench a minimum of two inches (2") and extend a maximum of thirty-six inches (36") above the original ground surface.

When self-supported fence is used, the geotextile shall be securely fastened to fence posts.

J. The integrity of silt fences shall be maintained to contain sediment runoff. Any deficiencies shall be immediately corrected.

K. Sediment deposits shall be removed when the deposit approaches one-half the height of the fence or as directed by the engineer.

L. The silt fence shall remain in place until the Engineer directs that it be removed. Upon removal, silt shall be removed and disposed of and the area finished to the satisfaction of the Engineer.

SEC. 20.16.013. PHYSICAL REQUIREMENTS[1] FOR TEMPORARY SILT FENCE GEOTEXTILES.

Property	Test Method	Wire Fence Supported Requirements	Self Supported Requirement
Tensile Minimum[2] Strength, Lbs.	ASTM D4632	90 Minimum[2]	90
Elongation at 50% Minimum tensile strength. (45 Lbs.)	ASTM D4632	N/A	50 Maximum
Filtering Efficiency, %	VTM-513	75	75
Flow Rate, gal/ft^2/min	VTM-513	0.3	0.3
Ultraviolet Degradation at 500 hrs.	ASTM D4355	Minimum 70% Strength Retained	Minimum 70 Strength Retained

1. All numerical values represent minimum average roll value.

2. When tested in any principal direction.

3. Virginia DOT test method.

SEC. 20.16.014. PERMITS REQUIRED.

An erosion control permit is required for all clearing, grubbing, grading and building construction projects, except where land disruption is 1,000 square feet or less. An application for an erosion control permit shall be made to the Public Works Director on forms furnished. The application must be accompanied by an erosion control plan prepared in accordance with applicable provisions contained herein.

SEC. 20.16.015. FINANCIAL SURETY.

A performance and maintenance bond, letter of credit, or other financial surety shall be provided by the owner in the amount of $1,000 per acre or fraction thereof, with a maximum not to exceed $10,000, and shall be provided prior to issuance of permit or beginning of any work. Release of the surety shall be two years from installation of Erosion Control measure.

SEC. 20.16.016. PERMIT FEE.

No person shall perform any clearing, grubbing, grading, or building construction without first obtaining an erosion control permit and paying the permit fee.

SEC. 20.16.017 - 20.16.999 RESERVED.

ARTICLE 17. BIDS ON PUBLIC WORKS PROJECTS

SEC. 20.17.001. ADVERTISEMENT.

A. Whenever public advertisement of a notice to bidders is required by ordinance or the laws of the State of Missouri, unless otherwise provided in this Code, the same shall be advertised in a newspaper of general circulation within the City.

B. A notice to bidders desiring to bid upon a public works project shall be by three (3) insertions in a newspaper of general circulation within the City; provided that the last day of insertion may not be the last day for the receipt of bids; provided further, that there shall be no more than one (1) insertion per day of any said notice to bidders.

SEC. 20.17.002. ADDITIONAL NOTIFICATION REQUIREMENTS.

A. In addition to the required advertisements, an additional advertisement will be placed in a legal publication newspaper accepted for notice to contractors when the estimate for the cost of the project exceeds $200,000.00.

B. The Invitation To Bid will be submitted to all the known public works publication houses in the metro area and the full set of specifications and plans will be made available to them if they have a means of displaying for the use of prospective contractors.

C. The Invitation To Bid will also be mailed to all contractors known to have an interest in a project of this type.

SEC. 20.17.003. PREFERENCES.

Each Invitation to Bid shall include a statement that reflects the preferences and vendor qualification provisions set out in Section 8.06.003 of the City Code.

SEC. 20.17.004. FEE FOR PLANS AND SPECIFICATIONS.

Plans and Specifications, prepared for Bidders, can be picked up at the Department designated in the bid advertisement. A non-refundable fee shall be deposited to the City of Independence, Missouri, at the time of receipt of the Plans and Specifications for the specific project being bid.

SEC. 20.17.005. WHERE BIDS TO BE DEPOSITED.

Bidders will be required to submit their sealed bids on a public improvements project to the City Clerk at the time and under the conditions prescribed in the request for bid and the public notices inviting bids.

SEC. 20.17.006. BID OPENING PROCEDURE.

Bids shall be opened at the prescribed time and location as specified in the Invitation To Bid and said bid opening shall be open to the public. All bids shall be read aloud and a bid tabulation shall be prepared. A copy of the bid tabulation shall be provided to any bidder upon request.

All bids received at or prior to the stated bid opening time will be opened. All bids received after the stated bid opening time will be returned unopened, when feasible.

SEC. 20.17.007. DEBARMENT OR SUSPENSION.

Except to the extent prohibited by law, persons who are debarred or suspended by the City or the State of Missouri shall be excluded from bidding, and shall not be awarded contracts for public works for the City of Independence, in accordance with the provisions of Chapter 8 of the City Code.

SEC. 20.17.008 - 20.17.999 RESERVED.

ARTICLE 18. PRIVATE CONSTRUCTION OF PUBLIC WORKS

SEC. 20.18.001. REGULATIONS AND APPLICATION.

Any person, firm, partnership, corporation, association, co-partnership, or trust prior to commencing any private work on public works projects in the City of Independence, Missouri, shall comply with the following regulations and provisions:

1. Plans and specifications for the private construction of public works projects, including but not limited to streets, drainage systems, sewers, or thoroughfares to be dedicated to and maintained by the City of Independence, Missouri, shall be submitted to the Director of Public Works for approval.

2. A permit shall be obtained from the Director of Public Works authorizing the construction mentioned and set forth in the plans and specifications submitted.

3. No permit shall be issued by the Director of Public Works until the applicant has paid a permit fee for sewers and street projects, such funds to be payable to the Director of Finance and Administration, and to be used to defray the cost of reviewing the plans, specifications and progress of the work on said project. Additionally, the applicant shall pay a plan review fee each time the plans and specifications are reviewed by the Public Works Department after they are reviewed on two separate instances.

4. No construction shall be accomplished, and the permit provided for herein shall not be issued until a maintenance bond in an amount equal to seventy-five percent (75%) of the cost of construction and satisfactory to the Director of Public Works shall be posted with the Director of Public Works, guaranteeing against defects in construction of any public works project, including but not limited to street, sewers and curbs, and materials used for a period of two (2) years after acceptance by the City of said public works project; and further guaranteeing and insuring that such construction shall be accomplished in a workman-like manner, and further protecting the City of Independence, Missouri, and insuring said City from any loss or damage.

In those instances where the City is required to obtain a permit to allow the applicant to make connection(s) to the facilities of others, the applicant will provide a performance bond acceptable to the Director of Public Works to the City equal to the cost of the proposed construction and a certificate of insurance naming the City as additional insured for damage to the property of another person in the amount of not less than One Hundred Thousand Dollars ($100,000.00) for any one accident.

Additionally, the Developer or Owner shall post a performance bond or deposit in the amount of the greater of Five Hundred and NO/100 Dollars ($500.00) or two percent (2%) of the project value for preparation of as-built drawings of the project.

5. No construction work shall be commenced until the permit provided for has been issued and a written notice to proceed shall have been issued by the Director of Public Works.

6. Following the issuance of the permit provided for herein, actual construction operations shall not be started until at least twenty-four (24) hours after the Director of Public Works has been notified as to the time, location and scope of the construction.

7. All construction work may be stopped at any time by the Director of Public Works or an agent, when in the opinion of the Director of Public Works, the workmanship, materials used, or procedures of work do not meet the requirements or comply with the City codes, ordinances, specification and procedures for such work.

8. All work accomplished by means of a permit issued under this Article shall be subject to final inspection and approval for City maintenance by the Director of Public Works.

9. Detention basins or approved interim facilities shall be constructed prior to the development of any impervious area.

SEC. 20.18.002. PENALTY.

Any person, firm, or corporation who shall violate any of the provisions of this Article shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be subject to a fine of Fifty Dollars ($50.00) and each and every day on which said violation continues shall constitute a separate offense.

SEC. 20.18.003 - 20.18.999 RESERVED.

ARTICLE 19. USE OF PUBLIC RIGHTS-OF-WAY

SEC. 20.19.001. SCOPE.

The provisions of this Article shall, to the extent permitted by law, apply to all persons desiring to perform work, construct, operate, or maintain Facilities in, along, across, under or over public rights-of-way within the City.

SEC. 20.19.002. DEFINITIONS.

For the purposes of this Article, the following terms, phrases, words, and abbreviations shall have the meanings given herein. The words "shall" and "will" are mandatory, and "may" is permissive.

APPLICANT means the specific person applying for and receiving a Right-of-Way permit.

APPLICATION means that form designed by the Public Works Department which an applicant must use to obtain a permit to conduct Facilities work across, over or under the City's public rights-of-way.

CITY shall mean the City of Independence, Missouri.

DIRECTOR shall mean the Director of Public Works or any designee.

EXCAVATION means any act by which earth, asphalt, concrete, sand, gravel, rock or any other material is cut into, dug, uncovered, removed, displaced, relocated or bulldozed, and shall include the conditions resulting therefrom.

FACILITIES means any new conduit, duct, line, pipe, wire, hose, cable, culvert, tube, pole, receiver, transmitter, satellite dish, micro call, Pico cell, repeater, amplifier, or other device, material, apparatus, or medium, useable (whether actually used for such purpose or not) for the transmission or distribution of any service or commodity installed below or above ground within the public rights-of-way of the City, whether used privately or made available to the public. This definition also includes maintenance of existing facilities which require a sidewalk or pavement cut.

PERMIT means a permit granted by the Public Works Director to perform work within the public rights-of-way, as per Chapter 17, Article 5.

PERSON shall mean an individual, partnership, association, joint stock company, trust, organization, limited liability company, corporation, or other entity, or any lawful successor thereto or transferee thereof.

PUBLIC RIGHTS-OF-WAY means the surface, the air space above the surface, and the area below the surface of any public street, highway, lane, path, alley, sidewalk, boulevard, drive, bridge, tunnel, parkway, easement, or other similar property in which the City now or hereafter holds any property interest, which was dedicated as rights-of-way. No reference herein, or in any permit, to "public rights-of-way" shall be deemed

to be a representation or guarantee by the City that its interest or other right to control the use of such property is sufficient to permit its use for such purposes. "Public rights-of-way" does not include the airwaves above the rights-of-way with regards to cellular or other non-wire telecommunications or broadcast services, or easements obtained by private or public utilities or private easements in platted subdivisions or tracts.

SEC. 20.19.003. PERMITTING PROVISIONS FOR THE CONSTRUCTION OF NEW FACILITIES

Any person desiring to construct Facilities in, along, across, under, or over public rights-of-way or any person desirous to maintain or repair facilities that require cutting into the public rights-of-way must complete all required registration, obtain all required permitting, and follow all required procedures set forth herein and in accordance with the provisions set forth in Chapter 17, Article 5 and all other local state, and federal requirements.

SEC. 20.19.004. CONSTRUCTION STANDARDS FOR NEW AND EXISTING FACILITIES.

A. The construction, operation, maintenance, and repair of facilities in the right-of-way shall be in accordance with applicable health, safety and construction codes as well as those standards promulgated by the Director.

B. The pavement or sidewalk shall be opened by saw cutting, or other prior approved method, the pavement in straight lines to form a square or rectangular shape.

C. Backfill material under pavement or sidewalk shall be untreated, compacted aggregate meeting the requirements of the Public Works Manual, Article 6, unless other materials are approved by the Director of Public Works. If clean gravel is permitted, the cut shall either be covered by secure acceptable plates or temporarily patched with cold mix asphaltic concrete.

D. Compaction of backfill will meet the following standards:

1. All backfill under pavement or sidewalk shall be compacted to 95% of maximum density as determined by A.S.T.M. D-698.

2. All backfill within the public rights-of-way not under pavement or sidewalk shall be compacted to 90% of maximum density as determined by A.S.T.M. D-698.

E. Untreated, compacted aggregate shall be placed to the level of the area surrounding the excavation and extended to a minimum of ten feet (10') beyond the edge of pavement. Crushed rock bedding material meeting the requirements of the Public Works Manual, Article 8, shall be placed around the pipe or structure being backfilled to a point six inches (6") above the top of the pipe or structure, except for gas lines.

F. The thickness of the replacement pavement or sidewalk shall be equal to or greater than the thickness of the pavement or sidewalk that was cut, but in no case shall the replacement pavement be less than eight inches (8") for roadways, six inches (6") for driveways, or four inches (4") for sidewalks. Pavement shall be replaced inkind, except that a minimum of eight inches (8") of portland cement concrete base and two inches (2") of asphaltic concrete surface is required in asphalt roadways. Asphalt pavement must be sawcut twelve inches (12") on all sides beyond the excavation limits so that the concrete base edges are placed on undisturbed material, except for cuts not exceeding eight inches (8") in width. The concrete base and existing pavement edges must be tack coated with liquid asphalt prior to placement of the asphalt surface.

SEC. 20.19.005. PERFORMANCE GUARANTEES AND REMEDIES.

At reasonable discretion of the Director, and in accordance with the provisions set forth in Chapter 17, Article 5, a performance bond shall be issued by a surety acceptable to the City, and shall contain the following endorsement: "This bond may not be canceled, or allowed to lapse until sixty (60) days after receipt by the City, by certified mail, return receipt requested, of a written notice from the issuer of the bond of intent to cancel or not to renew."

SEC. 20.19.006. MISCELLANEOUS PROVISIONS.

A. Any permit granted pursuant to this Article, Chapter 17, Article 5, and any applicable local, state, and federal laws shall by implication include a provision that shall incorporate by reference this Article into such permit as fully as if copied therein verbatim.

B. If any term, condition, or provision of this Article shall, to any extent, be held to be invalid or unenforceable, the remainder hereof shall be valid in all other respects and continue to be effective. In the event of a subsequent change in applicable law so that the provision that has been held invalid is no longer invalid, said provisions shall thereupon return to full force and effect without further action by the City and shall thereafter be binding on the applicant and the City.

SEC. 20.19.007. ANNEXATION.

The provisions hereof shall specifically apply to any lands or property annexed as of the date of such annexation.

SEC. 20.19.008. STANDARDS APPLICABLE TO CITY.

Any standards in this Article relating to Facilities work shall be fully applicable to work performed by the City and its departments.

SEC. 20.19.009. NEIGHBORHOOD BLOCK PARTY PERMITS.

The neighborhood block party permit authorizes the applicant to barricade a specified portion of the named residential street, using City approved barricades, denying access to through traffic (except emergency vehicles and residents who reside within the barricaded area) to conduct a neighborhood block party. Neighborhood block party permits shall be issued without charge.

The applicant must be either a neighborhood resident or the neighborhood homes association group. The application shall be made on a form provided by the director. The applicant must provide evidence on the application form that all the residents who live in the blocked-off area have been notified in writing of the proposed neighborhood block party and that a minimum of sixty percent (60%) of those residents are in favor.

Neighborhood block parties shall be conducted only between the hours of 7:00 a.m. and 10:00 p.m. The applicant is responsible for post-event cleanup on the street, sidewalks and public rights-of-ways.

SEC. 20.19.010. PLATED CUTS.

If plates are used to cover a roadway excavation during the period from November 1 to March 31 the Director of Public Works shall be notified. Additionally, a lighted barricade shall be placed beside the roadway at the location of the plate. The Director may deny the use of plates during the aforementioned period of time, set restrictions on use of plates, and may direct the removal of plates at any time. The Right-of-Way User and approved, registered contractors, in accordance with Chapter 17, Article 5, are responsible for the maintenance of plates on the roadway at all times and must be available to repair, replace, or remove plates at all times during their use.

SEC. 20.19.011. PENALTY.

Any person, firm, or corporation who shall violate any of the provisions of this Article shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be subject to a fine of not less than One Hundred Dollars ($100.00) nor more than Five Hundred Dollars ($500.00) for each violation. Each day's continuation of a violation shall constitute a separate offense. Any person, firm, or corporation who shall place the facility outside where they are supposed to be, shall have no claim against the City for relocation.

SEC. 20.19.012 - 20.19.999 RESERVED.

ARTICLE 20. CONDEMNATION

SEC. 20.20.001. CONDEMNATION PROCEEDINGS.

All proceedings for the condemnation of property, or in the exercise of the right of eminent domain, shall be in accordance with RSMo Secs. 88.010 to 88.130 and any other general provisions of State law relating thereto.

SEC. 20.20.002 - 20.20.999 RESERVED.

ARTICLE 21. TRAFFIC CALMING DEVICES

SEC. 20.21.001. SCOPE.

This Article governs all protocol required to evaluate requests for traffic calming devices on existing streets and the construction of devices which are intended to achieve traffic calming in new development.

SEC. 20.21.002. DEFINITIONS.

For the purposes of this Article 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 used in the plural include the singular, and words used in the singular include the plural. The word “shall” as used herein is not merely directory but is considered mandatory.

85TH PERCENTILE SPEED means the speed at which eighty-five percent (85%) of drivers drive at or below during a twenty-four (24) hour period.

ADT means the twenty-four (24) hour average daily traffic count.

HORIZONTAL DEFLECTION DEVICES means the traffic calming devices which cause traffic to deflect horizontally from the normal driving path.

IMPACT AREA includes the street or intersection under review and the immediate area around it. The Traffic Calming Committee will define the boundary of the impact area based upon the existing or proposed street network.

RESIDENTIAL STREET means the classification assigned to streets whose primary function is to provide direct access to adjacent residential properties.

TRAFFIC CALMING means the combination of mainly physical measures that reduce the negative effects of motor vehicles, alter driver behavior, and improve conditions for non-motorized street users.

TRAFFIC CALMING COMMITTEE consists of five (5) members including the Public Works Traffic Engineer, Public Works Chief Engineer, and one representative each assigned by the Community Development Director, Police Chief, and Fire Chief.

VERTICAL DEFLECTION DEVICES means traffic calming devices which cause traffic to deflect vertically from the normal driving elevation.

SEC. 20.21.003. TRAFFIC CALMING ON EXISTING STREETS.

Traffic calming requests from residents or homeowner/neighborhood associations for traffic calming on existing streets shall be in writing and must be submitted to the Director of Public Works. All letters shall identify an appropriate point of contact and be endorsed by signatures from at least five property owners owning property within a one thousand two hundred feet (1,200') section of the particular street to be considered. All requests will be acknowledged in writing.

Based on traffic history, the Public Works Department may initiate traffic studies and recommend streets for traffic calming devices without initiation by neighborhood request.

The Police Department, schools, or other service agencies may request traffic studies be undertaken to determine the suitability of traffic calming for particular concerns.

SEC. 20.21.004. EXISTING STREETS ELIGIBILITY.

For streets under consideration for traffic calming, the Traffic Engineer will inventory the street for geometric features, sidewalks, roadside ditches, and nearby public facilities and conduct a study of the street to determine prevalent speeds and traffic volumes. The traffic study will be converted to a point system where points are assigned for the 85^{th} percentile traffic speed, traffic volumes, traffic calming effect upon emergency services, accident trends, street proximity to schools and presence of sidewalks. The greater number of points assessed to a street indicates a greater potential for traffic calming impact.

General eligibility requirements are that traffic on the street must be predominately residential in nature, the street must be an uncontrolled segment length of six hundred feet (600') or greater, and the project must be supported by at least seventy percent (70%) of households on properties adjacent to the proposed street segment.

Streets may be ineligible for traffic calming if one or more of the following issues exists:

1. Excessive traffic volume would be diverted to other residential streets.

2. Grades, curvature, or other physical conditions make, in Public Work's judgement, the application of traffic calming unsafe.

3. The street is used as a routine emergency service route or a major public transit route.

4. The street is scheduled for resurfacing withing the next two budget years. If meeting all other criteria, such streets would become eligible for traffic calming following the completion of resurfacing.

SEC. 20.21.005. TRAFFIC CALMING COMMITTEE.

The Traffic Calming Committee will evaluate the traffic study findings and be the final arbiter to determine eligibility for traffic calming. Other duties include defining the impact area and discussing the findings with the citizen point of contact defined in the letter of request. When the Traffic Calming Committee finds that a project meets criteria, Public Works will proceed with design and cost estimate. The Traffic Calming Committee shall review the design and be present to discuss the design at neighborhood meetings or other venue for citizen review and discussion.

SEC. 20.21.006. PROJECT PRIORITIZATION.

The Traffic Calming Committee will establish priorities for those projects that have satisfied the criteria for the placement of traffic calming devices. The Director of Public Works shall have final approval of project priority.

SEC. 20.21.007. TRAFFIC CALMING DEVICES.

Specific traffic calming devices shall be recommended depending upon the nature of the traffic problem and the needs of the residents within the impact area. Using data from the field study, the Traffic Engineer will design a traffic calming scheme using best management practices available.

SEC. 20.21.008. PUBLIC INVOLVEMENT.

The designated citizen point of contact for a particular street will be responsible for arranging meetings and for developing consensus. Representatives from the Traffic Calming Committee will attend public meetings to present findings, discuss design alternatives, and to answer questions. If a consensus is reached on a traffic calming design, then a ballot will be sent out to residents within the impact area.

Seventy percent (70%) of all ballots sent to the impact area must be returned with a positive response to the Traffic Calming Committee in order for the installation of the traffic calming measure to proceed.

SEC. 20.21.009. FOLLOWUP EVALUATION.

Within six (6) to fourteen (14) months after traffic calming devices are installed, Public Works will conduct a followup traffic study to develop a comparison of "before and after" 85th percentile speed and volume data. The Traffic Calming Committee will review the data to determine what, if any, change in driving performance has occurred. If the results are positive, no other action will be planned. Future review may be considered if development or other changes occur in the area.

SEC. 20.21.010. MODIFICATION/REMOVAL OF TRAFFIC CALMING DEVICES.

If the traffic calming devices fail to achieve the desired traffic calming goals and if area residents are significantly dissatisfied, they can submit a petition for modification or removal that has been signed by over fifty percent (50%) of the households in the defined impact area. The Traffic Calming Committee will develop a proposal for modification or removal of the traffic calming measure and present it at a public meeting. After the meeting, ballots will be sent out to the property owners in the impact area. To proceed with the plan, the number of owners voting in favor of the modification or removal must be over fifty percent (50%) of total ballots issued.

If a public safety issue is identified after installation of any traffic calming measure, the Public Works department may direct that modification be made without the required fifty percent (50%) homeowners approval.

SEC. 20.21.011. TRAFFIC CALMING IN NEW DEVELOPMENT.

Public Works will review new plans and recommendations as part of the project approval process defined in Chapter 14, PLANNING, ZONING, SUBDIVISIONS, MOBILE HOMES.

Designers for new developments shall use best management practices available for traffic calming device designs.

SEC. 20.21.012. TRAFFIC CALMING STANDARDS.

A. Speed Humps

Documents used for design reference for speed humps may include the "Guidelines for the Design and Application of Speed Humps", a Recommended Practice of the Institute of Transportation Engineers (ITE), June 1997. Primary aspects for speed humps include:

1. For uncontrolled lengths of street between six hundred (600') and one thousand feet (1000') in length, one speed hump shall be installed as near as practicable to the midpoint of the segment.

2. For uncontrolled lengths of street over one thousand feet (1000') in length, speed humps shall be spaced at intervals of at least three hundred feet (300') and not exceeding six hundred feet (600').

3. Parking restrictions may be necessary to insure the visibility of accessory traffic signs or to comply with provisions of Missouri law where speed humps are used as pedestrian crosswalks.

4. Design of speed humps shall generally conform to the parabolic profile (twelve feet (12') or fourteen feet (14') in length) or a "flat-top" profile (twenty-two feet (22') in length) for planned pedestrian use.

B. Roundabouts

Reference documents for design of roundabouts may include "Roundabouts: An Informational Guide" as published by the U.S. Department of Transportation Federal Highway Administration. Primary characteristics of roundabouts include:

1. Vehicles entering the roundabout on all approaches are required to yield to vehicles within the circulating roadway.

2. All vehicles circulate counterclockwise, passing to the right of the central island.

3. The speed at which a vehicle is able to negotiate the circulating roadway is controlled by the location of the central island with respect to the alignment of the right-entry curb and the circulating roadway cross-section.

4. Roundabouts shall be one-lane unless it is shown that traffic volumes necessitate a two-lane design.

5. Parking prohibitions may be necessary to insure unrestricted access around the roundabout and no pedestrian activities will take place on the central island.

6. Signage and pavement markings shall be included in the design.

7. Some type of aesthetic treatment (brick inlay and/or landscaping) will be used in the design of the roundabout.

8. Sidewalks may be incorporated into the design where right-of-way is available.

9. Any associated sidewalk work shall have wheelchair ramps constructed.

C. Other Traffic Calming Devices

As design guidelines are published by recognized authorities in transportation engineering such as the Institute of Transportation Engineers or the Federal Highway Administration, those guidelines will be used as resource for best design practices.

SEC. 20.21.013 - 20.21.999 RESERVED.

ARTICLE 22. REGIONAL DETENTION BASIN OPTION

SEC. 20.22.001. SCOPE.

This Article establishes the procedure to determine if contribution to a regional detention basin can be made in lieu of on-site detention required in Article 2 of the Public Works Manual, and determines what the amount of contribution would be if contribution is approved.

SEC. 20.22.002. DEFINITIONS.

For the purposes of this Article 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 used in the plural include the singular, and words used in the singular include the plural. The word "shall" as used herein is not merely directory, but is considered mandatory.

ON-SITE DETENTION means storm water storage in acre-feet, with a controlled release rate within a development property as computed in accordance with applicable provisions contained herein and approved by the Public Works Director.

REGIONAL DETENTION means storm water storage in acre-feet with a controlled release rate that is to be provided off site in accordance with the applicable provisions contained herein and approved by the Public Works Director.

SEC. 20.22.003. PARTICIPATION GUIDELINES.

It shall be the duty of the Public Works Director to determine if a proposed development will qualify for participation in a regional detention basin in lieu of constructing on-site detention. Participation shall only be approved when it has been determined that allowing non detained runoff to the area does not have an adverse impact on the watershed as determined by flow studies sealed by a Professional Engineer and approved by the Public Works Director. The flow studies are to be done using the methodology allowed in Article 2 of the Public Works Manual. Participation shall only be considered for projects in the following locations:

1. The site storm water discharge is directly to a Little Blue River, Big Blue River or Missouri River tributary within a distance of one thousand two hundred feet (1,200') of the confluence with such stream, or a distance approved by the Director, or

2. The site storm water discharge is directly upstream from existing regional detention basin facilities, or

3. The site storm water discharge is directly to a regulatory flood plain with no evidence of flooding from the direct discharge, or

4. The site storm water discharge is directly to a channel where a planned regional basin will offset the increased flow rate.

Participation may be requested by the developer or the Public Works Director, however, participation must be by mutual agreement. The decision of the Director to not participate cannot be appealed to the Board of Building and Engineering Appeals.

SEC. 20.22.004. PARTICIPATION COST.

The participation cost shall be based on the product of the unit cost per acre foot of storage required to locate, acquire, engineer, permit, construct and maintain a regional detention or retention basin and the total acre feet of storage required as on-site detention as required in Article 2 of the Public Works Manual. The participation cost shall be paid at the time of the first construction or building permit for the project.

The unit cost per acre foot of storage as listed in the Schedule of Fees shall include, but not be limited to the following: Land price, appraisals, legal costs, other easements, permits, administration, engineering, inspection, survey, construction and maintenance. Maintenance will be based on a thirty (30) year life. A credit to the costs above may be allowed for unique storm water features that will be required by the Public Works Department in cases where detention or retention is not placed on-site. Any credits determined and authorized by the Public Works Director shall not exceed One Thousand Five Hundred Dollars ($1,500.00) per acre foot. Each year, the unit cost per acre foot shall be adjusted to reflect contemporary pricing and the construction cost shall be adjusted using the construction cost index as approved by the Water Pollution Control and Public Works Directors. Any adjustment to the unit cost per acre foot, including calculations, shall be filed with the City Clerk.

SEC. 20.22.005. REGIONAL DETENTION BASIN FEE.

The participation cost fee collected shall be deposited in the Storm Water Fund and shall be used for or applied to the construction and maintenance of a regional detention or retention basin or other storm water improvements within the Little Blue River, Big Blue River or Missouri River Basins or any of the tributary watersheds, as determined by the Water Pollution Control Director.

SEC. 20.22.006. APPLICATION AND APPROVAL.

Application for participation shall be made to the Public Works Director on an application form provided by the Public Works Department, and must include the flow study as required herein. The application for participation must be approved by the Public Works Director before any Council action is taken to approve development on the property and the Director's approval shall be noted in the information provided to Council at the first time any resolution or ordinance related to the development is presented to the Council. The action by the Council on the ordinance shall constitute approval of the payment in lieu of on-site detention.

SEC. 20.22.007 – 20.22.999 RESERVED.