

SIOUXTM ★ CITY

Supplement
to

Iowa Statewide
Urban Design Standards
for Public Improvements



January 1, 2008

D
E
S
I
G
N

CONTENTS

CHAPTER 1 – GENERAL

SECTION 2	<u>CLASSIFICATION OF IMPROVEMENTS AND DEFINITIONS</u>	<u>PAGE</u>
2.4	SANITARY SEWER SERVICE PRIVATE	1
SECTION 4	<u>DETAILED PLANS FOR CONSTRUCTION OF PUBLIC IMPROVEMENTS</u>	
4.1	PUBLIC IMPROVEMENT PLAN SHEET REQUIREMENTS	1
4.8	ITEMS TO BE SPECIFIED ON PLANS	1
4.9	INCIDENTAL ITEMS	1
4.10	BID ITEMS	2
SECTION 5	<u>PUBLIC IMPROVEMENT CONTRACTS</u>	
5.2	CONTRACT DOCUMENTS	2
SECTION 8	<u>CONSTRUCTION ADMINISTRATION AND INSPECTION ON PUBLIC IMPROVEMENT CONTRACTS</u>	
8.1	GENERAL	2
8.2	POLICY	3
8.3	STARTUP PROCEDURES AND DOCUMENTATION	5
8.4	TESTING	6

CHAPTER 2 – STORM WATER MANAGEMENT AND DRAINAGE

SECTION 1	<u>GENERAL INFORMATION</u>	<u>PAGE</u>
1.1A	DESIGN CRITERIA	1
SECTION 3	<u>FLOW DETERMINATION OF STORM RUNOFF</u>	
3.2	DESIGN STORM	1
SECTION 4	<u>STORM SEWER DESIGN</u>	
4.7	HYDRAULIC DESIGN	1
SECTION 5	<u>STORM SEWER INTAKES/MANHOLES</u>	
5.8	REDUCTION FACTORS TO APPLY TO INTAKES	2
5.9	INTAKE CAPACITY	2
5.10	MANHOLE & INTAKE STANDARDS	2

SECTION 8	<u>STORM RUNOFF DETENTION</u>	
8.5	DETENTION FACILITIES REQUIREMENTS	2
 CHAPTER 3 – SANITARY SEWERS		
SECTION 3C-1	<u>FACILITY DESIGN</u>	<u>PAGE</u>
F.	SIZE OF SEWER PIPE	1
M.	SEWER SERVICES	1
SECTION 3D-1	<u>PIPE AND MANHOLE MATERIAL</u>	1
 CHAPTER 5 – ROADWAY DESIGN		
SECTION 5C-1	<u>URBAN GEOMETRIC DESIGN GUIDES</u>	<u>PAGE</u>
	FIGURES 1-5	1
SECTION 5C-2	<u>URBAN GEOMETRIC DESIGN CRITERIA</u>	
U.	PAVEMENT THICKNESS	1
SECTION 5C-2	<u>TYPES OF JOINTS</u>	
B.	LONGITUDINAL CONTRACTION JOINTS	1
 CHAPTER 8 – RECREATIONAL TRAILS & SIDEWALK		
SECTION 3	<u>SIDEWALK DESIGN</u>	<u>PAGE</u>
3.4	SIDEWALK THICKNESS	1
 CHAPTER 9 – UTILITY LOCATION		
SECTION 2	<u>UTILITY LOCATION DESIGN</u>	<u>PAGE</u>
2.2	DESIGN	1
 CHAPTER 10 – STREET TREE CRITERIA		
SECTION 2	<u>STREET TREE DESIGN</u>	<u>PAGE</u>
2.3A	LOCATION OUTSIDE PUBLIC RIGHT-OF-WAY	1

CHAPTER 12 – PARKING LOTS

SECTION 2	<u>SITE PROVISIONS</u>	<u>PAGE</u>
2.7	PARKING LOT SETBACK REQUIREMENTS	1
SECTION 3	<u>LAYOUT DESIGN CRITERIA</u>	
3.2	STANDARD SPACE DIMENSIONS	1
SECTION 4	<u>SURFACE DESIGN</u>	1

Chapter 1

General Provisions

**SECTION - 2
CLASSIFICATIONS OF IMPROVEMENTS AND DEFINITIONS**

2.4 SANITARY SEWER SERVICE PRIVATE

(The following figure replaces FIGURE 2.1- EXAMPLE OF SANITARY SEWER SERVICE)

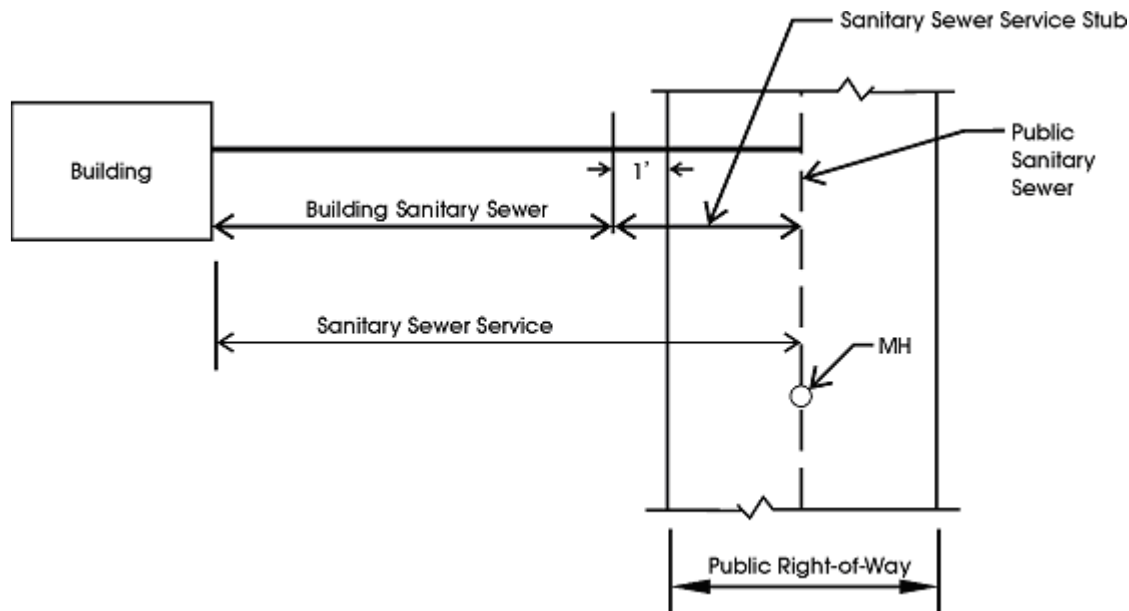


TABLE 2.1 – CLASSIFICATION OF IMPROVEMENTS

Private Water Mains and Private Sanitary Lift Stations shall also be built to Urban Design Standards as dictated by Sioux City’s City Code.

**SECTION – 4
DETAILED PLANS FOR CONSTRUCTION OF PUBLIC IMPROVEMENTS**

4.1 PUBLIC IMPROVEMENT PLAN SHEET REQUIREMENTS

This section is to be used only when projects involve Federal Funding.

4.8 ITEMS TO BE SPECIFIED ON PLANS OR IN CONTRACT DOCUMENTS

The Jurisdiction reserves the right to add or delete items from this list as necessary.

4.9 INCIDENTAL ITEMS

The Jurisdiction reserves the right to add or delete items from this list as necessary.

4.10 BID ITEMS

The Jurisdiction reserves the right to add or delete items from this list as necessary.

SECTION - 5 PUBLIC IMPROVEMENTS CONTRACT

5.2 CONTRACT DOCUMENTS

The Project Engineer should contact the Jurisdiction to obtain the appropriate contract or form. The following list is provided for normal Contract Documents:

1. Notice to bidders.
2. Private construction contract document between Owner and Contractor.
3. Performance bond from Contractor (amount of bid received).
4. Payment bond from Contractor (amount of labor cost and subcontractors).
5. Maintenance bond from Contractor (amount of replacement costs).
6. Public construction contract with Contractor and Jurisdiction.
7. Notice to proceed.
8. Change order form.
9. Plans.
10. Specifications, supplemental specifications and special provisions.

SECTION - 8 CONSTRUCTION ADMINISTRATION AND INSPECTION ON PUBLIC IMPROVEMENTS CONTRACTS

8.1 GENERAL

1. This section outlines procedures for construction administration and inspection on public improvement projects. Since many projects are state and federally funded, specific construction administration and testing requirements have to be followed according to the particular program. Therefore, the policies and procedures outlined herein are more for subdivisions and locally funded municipal and county projects such as streets, sanitary sewers, storm sewers, storm water management, waterlines, etc.
2. The definition of Jurisdictional Engineer, Project Engineer/Private Engineer and Inspector are described in Section 2.1, 2.2, and 2.3, respectively, in this chapter.

8.2 POLICY

1. General: The Construction of public improvements shall normally be administered and inspected by the Jurisdiction or by consultant's forces if allowed/required by the Jurisdiction. All costs associated with inspection and surveying shall be paid for by the developer.
2. Project Administration: The Jurisdictional Engineer shall designate or approve a Project Engineer who will administer the overall construction activities of the project. Interpretation of the plans shall be the responsibility of the Engineer who certified the plans. The Project Engineer shall contact the office of the Jurisdiction Engineer for any unclear aspects of the specifications. Interpretation of specifications shall be made only by the Jurisdictional Engineer's office so that specifications will be uniformly enforced.
 - A. Preconstruction Conference: The Project Engineer shall arrange and conduct a preconstruction conference with the inspector, contractor, utility companies and Jurisdiction to review the contract requirements, details of construction, utility conflicts and work schedule prior to construction.
 - B. The testing of materials is to be as per the Jurisdiction Standard Specifications and as directed by the Project Engineer.
 - C. Periodic Site Inspection: The Project Engineer should make periodic visits to the construction site to (a) observe the progress and (b) determine if the results of the construction work substantially conform to the drawings and specification in the construction contract.
 - D. Contractor Payment Requests: If required, the Project Engineer shall review the requests of the contractor for progressive payment and shall approve a request, based on site observation, which authorizes payments and is a declaration that the contractor's work has progressed to the point indicated.
 - E. Notification of Nonconformance: The Project Engineer should notify the Jurisdiction of any work that the inspector observes which does not conform to the construction contract, make recommendations to the Jurisdiction for the correction of nonconforming work and notify the Contractor.
 - F. Shop Drawings: The Project Engineer shall review shop drawing and other submissions of the contractor for general compliance with the construction contract.
 - G. Reporting: The Project Engineer shall file all reports with the Jurisdiction on a timely basis. Working day statements shall be provided to the Jurisdiction with a copy sent to the Jurisdiction contractor.
 - H. Change Orders: When required, the Project Engineer shall prepare change orders for approval by the Jurisdictional Engineer.

- I. During the project construction, the Project Engineer and Jurisdictional Engineer should confer on the project status.
 - J. Substantially Complete and Final Inspection: The Project Engineer should perform a final construction review with the Jurisdictional Engineer and Contractor to determine if the project is substantially complete. The Project Engineer shall then prepare a letter to the Jurisdictional Engineer declaring that the project has been completed, the quantities completed and that they have been completed in substantial compliance with the plans and specifications. The letter shall also note deficiencies found and provide a recommendation on acceptance of the project.
 - K. As-Built Plans: Upon completion of the work, the Project Engineer shall provide an as-built tracing indicating all necessary recorded data including stubout locations for water and sewer. The drawing will be labeled as-built and dated.
3. Project Inspector: The Project Engineer may provide one or more resident inspectors for the project. Inspectors are placed on a project to keep the Project Engineer informed as to the work's progress and the manner in which it is being performed. The inspector is not responsible for the Contractor's work progress, methods, personnel, safety procedures or other activities of the Contractor. The observations of the inspector do not alter the Contractor's responsibility for plan and specification compliance.
- A. The Contractor is responsible for seeing that the work is constructed in accordance with the requirements of the plans and specification and any methods used to complete the work.
 - B. The inspector will observe the work to be completed by the Contractor that is to be in substantial compliance with the plans and specifications, but will not act as foreman and shall avoid activities that are the responsibility of the Contractor.
 - C. The inspector is not authorized to accept any portion of the work and is not permitted to modify provisions of the contract documents without approval of the Project Engineer and Jurisdiction.
 - D. The inspector is not to assume responsibility for any safety procedures. Should hazards be observed, he/she is to report the conditions to the Contractor and record them. If hazards are not immediately eliminated, the inspector will notify the Project Engineer.
 - E. The inspectors shall have in their possession and be familiar with the plans and specifications.
 - F. If any portion of the work or the materials observed does not conform to the requirements, the inspector is to notify the Contractor and explain why it does not conform and record it in the daily report. Should the Contractor ignore the notice, the inspector should promptly advise the Project Engineer and provide a written noncompliance notice to the Project Engineer for approval.

- G. In case of dispute between the Contractor and inspector as to quality of materials or manner of performing the work, the inspector shall have authority to reject materials until the question at issue can be decided by the Project Engineer and Jurisdiction.
- H. The inspector is to perform duties in a manner that will promote the progress of the work and be familiar with the construction schedule. The inspector will provide reasonably prompt construction observations so as not to delay work.
- I. The inspector is to understand the format and frequency of reports that are required for the project, grade and line stakes and the offsets.
- J. The inspector should know the limits of the project both in length and width and be aware of any easements acquired for the project needs.

8.3 STARTUP PROCEDURES AND DOCUMENTATION

- 1. The Contractor is to obtain all necessary permits and provide proper notification to all affected parties before work commences.
- 2. No work shall commence on the project until the Contractor's proper equipment is on site and all traffic control devices (following the Manual on Uniform Traffic Control Devices) are in place.
- 3. Documentation by Inspector:
 - A. All inspection reports are considered as source documents, therefore, all entries on reports or logs shall be original field entries.
 - B. Keep a complete report of all inspections.
 - C. Enter positive action notes in the report, such as Contractor's progress or lack of it, and when certain actions are started.
 - D. Enter in the report all oral agreements which are to be approved by the Project Engineer and Jurisdiction.
 - E. Use sketches with notes and dimensions.
 - F. Use separate page for each pay item when required.
 - G. Use separate page for each day's report.
 - H. Record all testing performed and their location and visual observations on a daily basis including those of private testing firms. The test results may be tabulated on a composite sheet.
 - I. All utility service locations must be referenced to a lot corner and recorded. Complete listing by lots shall be kept.

8.4 TESTING

1. General: The following tests are required for the operation specified. The number, type and frequency of the test will follow the specifications of the Jurisdiction. See Table 1.1 for standard test designation.
2. Grading and Subgrade Preparations:
 - A. Preconstruction tests for cohesive and granular soils. See Chapter 6 for details.
 - B. Determine moisture-density relation of soils encountered in accordance with standard or modified Proctor method. Previous soil analysis at other locations will not be allowed except at the site.
 - C. Perform moisture and density tests of earthwork. Moisture is to be within 3% \pm of optimum.
 - D. Final proof rolling may be required by the Project Engineer on all or portions of the subgrade (particularly in cut sections) when subbase is suspect of pumping. A minimum 12,000 pound sheepsfoot roller of equivalent will be used for proof rolling. Subgrade that is pumping or deformed must be reworked.
3. Backfill of Utility Trench and Structures:
 - A. Supply material tests and certifications.
 - B. Moisture and density test as described in item 2.b and c.
 - C. Shelby tube density test may be required if Jurisdiction has reasons to believe that trench does not have adequate compaction.
4. Sanitary Sewers and Manholes:
 - A. Supply material test and certifications.
 - B. Deflection tests on PVC/ABS truss sewer pipe or PVC pipe.
 - C. Line low-pressure air test.
 - D. Manhole exfiltration tests.
 - E. Alignment test using laser beam or lamp.
5. Storm Sewers:
 - A. Supply material test and certifications.
 - B. Alignment testing using laser beam or batter boards

6. Water Lines
 - A. Supply material test and certifications.
 - B. Disinfection tests.
 - C. Hydrostatic tests.
 - D. Leakage tests.
7. Poured Intakes, Manholes or other Structures:
 - A. Supply material test and certifications.
 - B. Air and slump tests
 - C. Concrete compression cylinder tests.
8. Concrete Pavement and Sidewalks:
 - A. Supply material test and certifications.
 - B. Concrete mix tests using 7-day and 28-day tests.
 - C. Air and slump tests.
 - D. Concrete compression cylinders of concrete beam tests.
 - E. In-place concrete core thickness samples.
9. Asphalt Pavement:
 - A. Supply material tests and certifications.
 - B. Stability tests.
 - C. Density tests.
 - D. Extraction analysis.
 - E. Temperature tests.
 - F. Percent asphalt content measurement.
 - G. In-place core thickness samples.

TABLE 1.1 - STANDARD TEST DESIGNATION			
TEST PROCEDURE	AASHTO	ASTM	AWWA/IDNR
Atterberg Limits (LL & PL)	T 89/T 90	D 4318	---
Gradation Analysis (except Hydrometer)	T 27	D 422	---
CBR (as modified in Section 5.2.4.1)	T 193	---	---
R-value (subgrade & base)	T 190	D 2844	---
Marshall Stability	T 245	D 1559	---
R-value	T 246	D 1560	---
Compaction Curve (Standard)	T 99	D 698	---
Compaction Curve (Modified)	T 180	D 1557	---
Compaction Curve (CTAB)	T 134	---	---
Field Density Test (Sand Cone)	T 191	D 1556	---
Field Density Test (Nuclear)	T 238/T 239	D 2922/D 3017	---
Field Density Test (Balloon)	T 205	D 2167	---
Concrete Slump	T 119	C 143	---
Concrete Air Content	T 152	C 231	---
Concrete Compressive Strength	T 22	C 39	---
Concrete Sampling	T 141	C 172	---
Strength of Soil-Line Mixtures	T220	---	---
Asphalt Flow	T 245	D 1559	---
Air Voids	T 245	D1559	---
Making and Curing Concrete Test Specimens in the Field	T 23	C 31	---
Disinfecting Water Mains	---	---	C 651
Hydrostatic Testing Water Mains	---	---	C 600
Low Pressure Air Testing	---	C 828	---
Deflection Testing	---	---	IDNR 12.7.1
Line Infiltration Test	---	---	IDNR 12.7.3.1
Line Exfiltration Test	---	---	IDNR 12.7.3.2
Manhole Exfiltration Test	---	---	IDNR 12.7.3.4

END OF SECTION 8

Chapter 2

Storm Water

SECTION - 1 GENERAL INFORMATION

1.1 A Design Criteria

The City of Sioux City has established general design criteria for storm water drainage. The general design criteria would limit the runoff from any site to the rate of flow experienced from an undeveloped site based of a 10 year recurrence interval storm.

For storms with a runoff less than the flow rate for a 10 year recurrence storm in the undeveloped condition, storm water management may be through a combination of on-site detention and downstream conveyance capacity.

For storms with a runoff from a 10 year recurrence interval storm in an undeveloped state, the use of detention will be required for most developments. The detention is designed to reduce the runoff from up to a 100 year event to a rate no greater than the runoff from a 10 year recurrence interval storm in an undeveloped condition.

Conveyance of storm water flow through storm sewers is generally encouraged up to a 10 year recurrence interval storm. Alternative conveyance facilities would be considered on a case-by-case basis.

To ensure adequate drainage, the City requires drainage reports to be submitted for all major development. The intent of the drainage report is to ensure there is a comprehensive and thorough evaluation of drainage, including the impact of upstream flows and the impact on downstream properties. The scope and extent of the drainage report needs to be correlated with the extent of the drainage concerns for any particular development. For complex developments with significant upstream and downstream conditions as well as drainage within the development. For smaller developments, or developments not requiring significant storm water drainage analysis, the scope and extent of the drainage report can be tailored to the scope of the drainage issues.

SECTION - 3 FLOW DETERMINATION OF STORM RUNOFF

3.2 DESIGN STORM

Replace conveyance of 5 year storms with 10 year storms.

SECTION - 4 STORM SEWER DESIGN

4.7 HYDRAULIC DESIGN

1. Pipe Friction Losses:

The Manning's coefficient for Plastic Pipe (Smooth Wall) shall be equal to 0.013.

2. Velocity within pipe:

Replace 5-year design storm flow with 10-year design storm flow.

**SECTION - 5
STORM SEWER INTAKES/MANHOLES**

5.8 REDUCTION FACTORS TO APPLY TO INTAKES

Replace TABLE 5.1 with the following table:

INTAKE REDUCTION FACTORS

Location	Minimum Reduction Factor
Continuous Grade	80% CURB ONLY
Low Point	INTAKES
Continuous Grade	75%
Low Point	65%

5.9 INTAKE CAPACITY

5. Capacity of Intakes at a Low Point

Figure 5.6 is to be used to determine the capacity Q of an intake at a low point.

5.10 MANHOLE & INTAKE STANDARDS

3. Intake Standards to be utilized

Type of standard intakes to be constructed shall be SWS-8 and DWS-12. In the event standard intakes are not acceptable for a particular application, the Project Engineer shall determine a suitable type of intake and provide details for size and capacity.

**SECTION - 8
STORM RUNOFF DETENTION**

8.5 DETENTION FACILITIES REQUIREMENTS

1. Earthen Detention
 - B. Change Concrete paved swale or channel bottom (cunette) and subsurface drain slope requirement from 1.5% to .75%.

Chapter 3

Sanitary Sewers

**SECTION – 3C-1
FACILITY DESIGN**

F. SIZE OF SEWER PIPE

Minimum size of building sanitary sewer stub shall be 6 inches in diameter for all properties. This size requirement is for pipe in the Right-of-Way only.

M. SEWER SERVICES

5. Individual single family residential services MAY be connected to a manhole with approval from the Jurisdictional Engineer.

**SECTION – 3D-1
PIPE AND MANHOLE MATERIAL**

Information in this section is to be used for reference only.

Chapter 5

Roadway Design

**SECTION – 5C-1
URBAN GEOMETRIC DESIGN GUIDES**

FIGURES 1-5

See Sioux City, City Code section 24.10.060 for a description of typical cross sections for **local** streets.

**SECTION – 5C-2
URBAN GEOMETRIC DESIGN CRITERIA**

U. PAVEMENT THICKNESS

Update TABLE 10A as shown below.

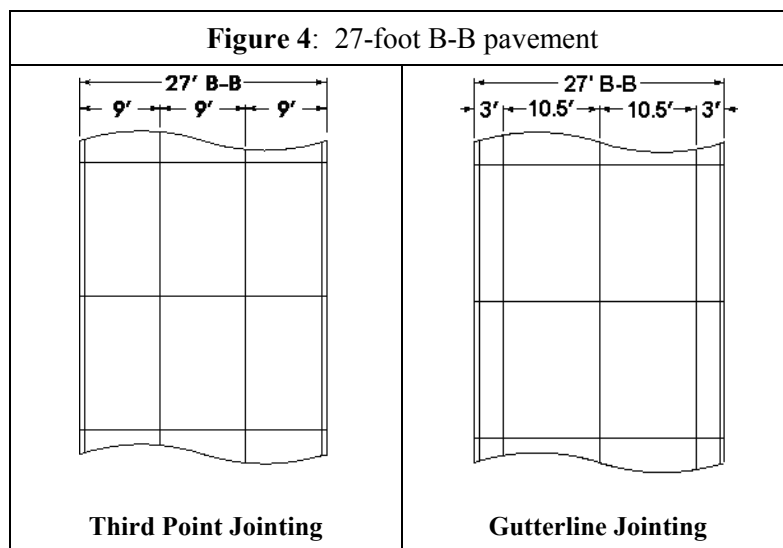
TABLE 10A MINIMUM PCC PAVEMENT THICKNESS

Street Classification	Pavement Thickness		
	Commercial/ Industrial	Residential or Fringe	Rural
Local	7"	6"	6"
Minor Collector	8"	6"	6"
Major Collector	Special Design (See Section 5F)		
Minor/Major Arterial	Special Design (See Section 5F)		

**SECTION – 5G-2
TYPES OF JOINTS**

B. LONGITUDINAL CONTRACTION JOINTS

Replace Figure 4 as shown below. Sioux City’s standard residential street section is 27’ wide not 26’.



Chapter 8

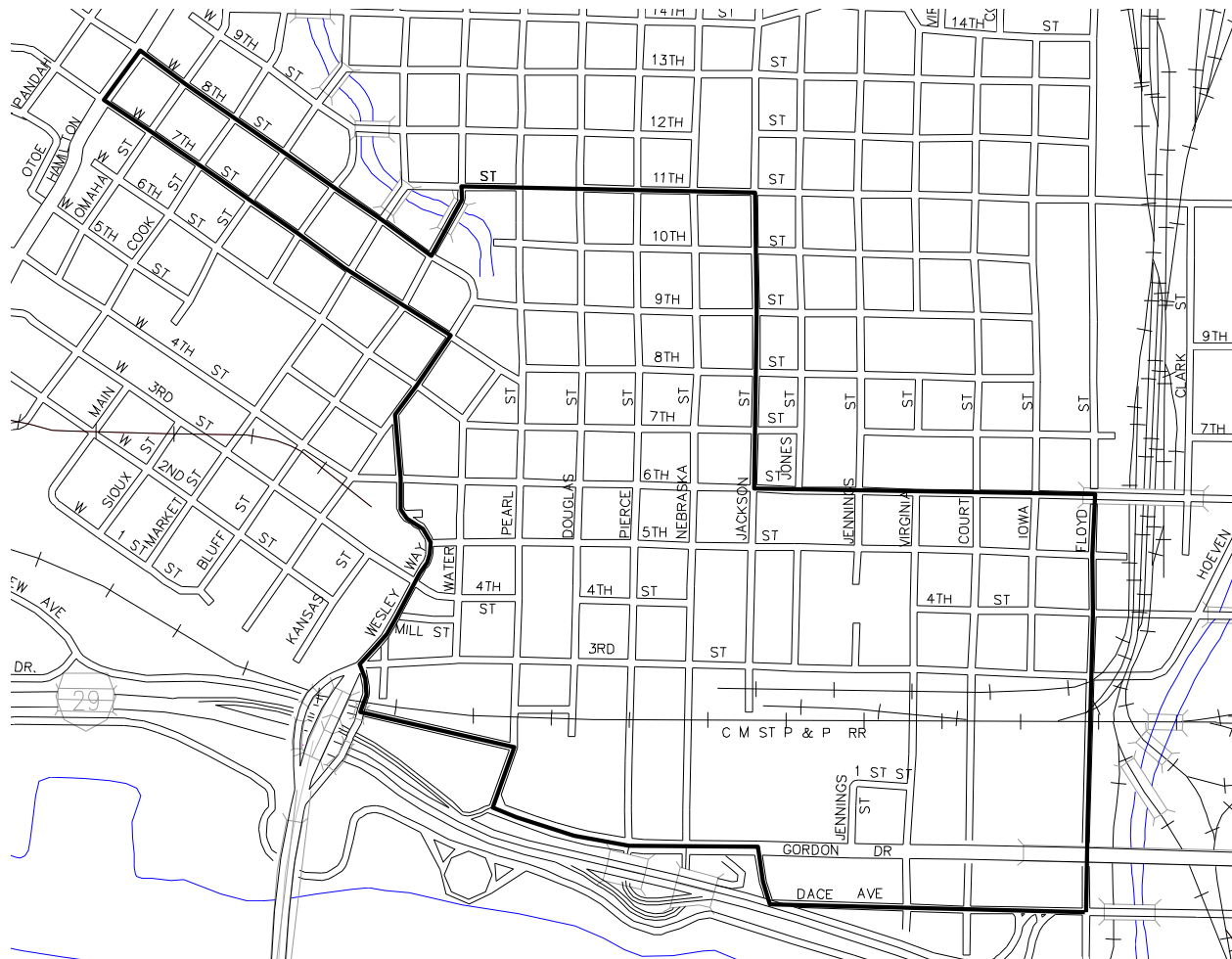
Rec. Trails & Sidewalks

**SECTION - 3
SIDEWALK DESIGN**

3.4. SIDEWALK THICKNESS

The sidewalk thickness in the downtown area as designated by the jurisdiction shall be 6" of Portland cement concrete pavement. See figure below.

**6" Required Sidewalk Thickness
Boundary**



Chapter 9

Utility Locations

SECTION - 2
UTILITY LOCATION DESIGN

2.2 DESIGN

Replace Figures 2.1, 2.2, and 2.3 with Sioux City's STANDARD UTILITY LOCATION FOR 60' RESIDENTIAL R.O.W. sheet located at the back of this supplement.

Chapter 10

Street Tree Criteria

**SECTION - 2
STREET TREE DESIGN**

2.3A LOCATION OUTSIDE PUBLIC RIGHT-OF-WAY

Where the Jurisdiction does not allow street trees in public right-of-way the trunk of the tree should be located no closer than 5 feet outside of the public right-of-way line or utility easement line, as long as the horizontal and vertical clear zones as described in Section 2.3 are followed.

Chapter 12

Parking Lots

**SECTION - 2
SITE PROVISIONS**

2.7 PARKING LOT SETBACK REQUIREMENTS

Delete Section, setback controlled by Planning Department.

**SECTION - 3
LAYOUT DESIGN CRITERIA**

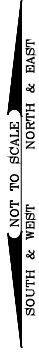
3.2 STANDARD SPACE DIMENSIONS

Delete Section, dimensions controlled by Planning Department.

**SECTION - 4
SURFACE DESIGN**

4.4 RIGID AND FLEXIBLE PAVEMENT DESIGN

This section is to be used for reference only.



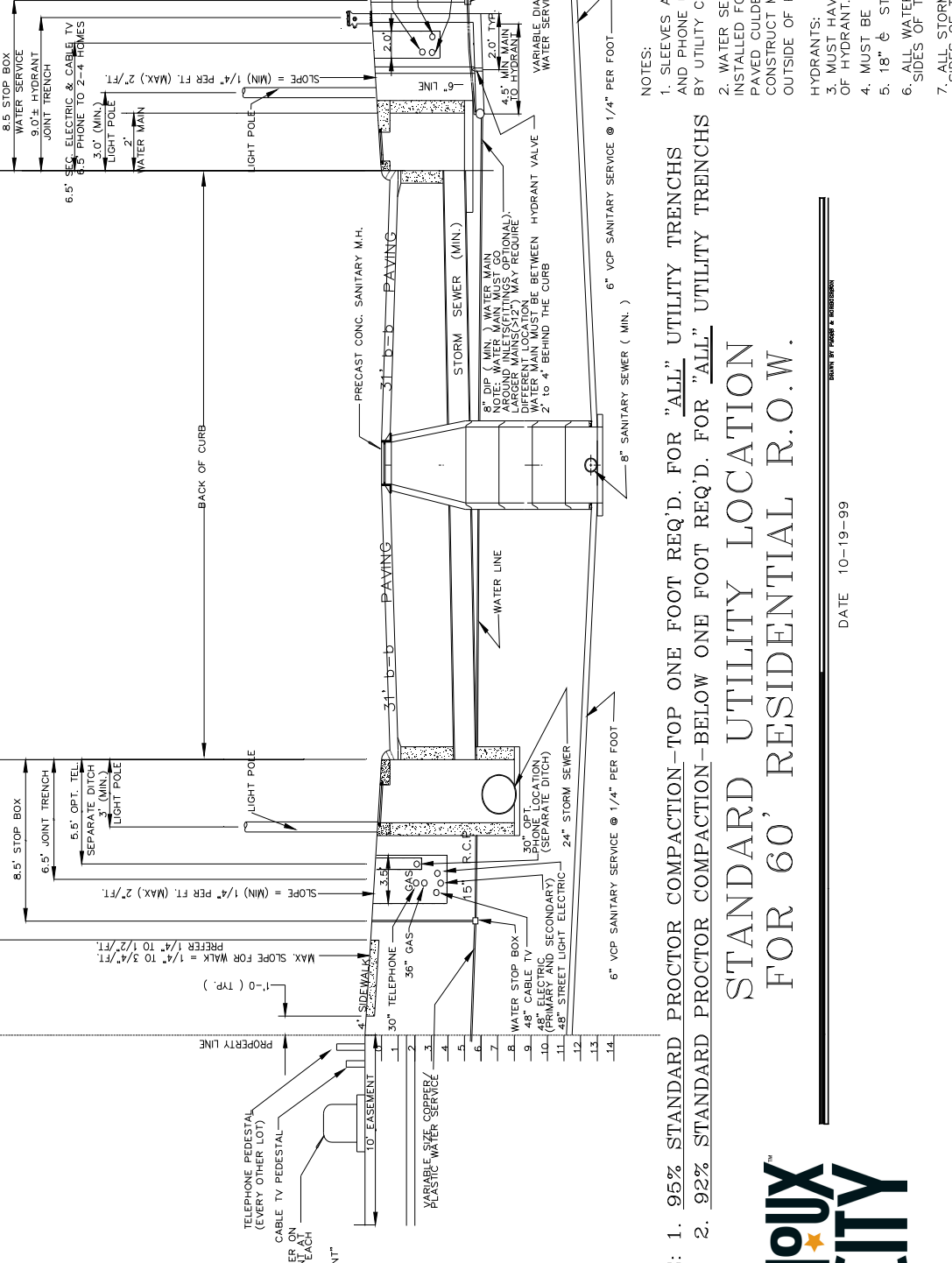
60' RESIDENTIAL RIGHT OF WAY

31' PAVING

31' PAVING

BACK OF CURB

PROPERTY LINE



NOTES:

1. SLEEVES ARE OPTIONAL FOR ELECTRIC, GAS, AND PHONE UNDER PAVING. CONSTRUCTION INSTALLATION BY UTILITY COMPANY. (PAID BY DEVELOPER)
2. WATER SERVICES TO THE STOP BOX MUST BE INSTALLED FOR ALL LOTS AROUND THE 70' DIAMETER PAVED CULDESAC. (WHEN CUL-DE-SAC IS BUILT) OR CONSTRUCT MAIN AROUND CUL-DE-SAC WITH FITTINGS OUTSIDE OF PAVING.

HYDRANTS:

3. MUST HAVE 3' CIRCULAR SPACE ALL SIDES OF HYDRANT.
4. MUST BE 18" FROM FACE OF CURB.
5. 18" Ø STEAMER CONNECTION TO FINISHED GRADE.
6. ALL WATER MAINS TO BE ON THE NORTH & EAST SIDES OF THE STREETS
7. ALL STORM SEWERS TO BE ON THE SOUTH & WEST SIDES OF THE STREETS

NOTE: 1. 95% STANDARD PROCTOR COMPACTION - TOP ONE FOOT REQ'D. FOR "ALL" UTILITY TRENCHS
 2. 92% STANDARD PROCTOR COMPACTION - BELOW ONE FOOT REQ'D. FOR "ALL" UTILITY TRENCHS

STANDARD UTILITY LOCATION FOR 60' RESIDENTIAL R.O.W.



DATE 10-19-99