

Chapter 13
Plan Submittals

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Chapter 13

Plan Submittals

13.1 General

Detailed reproducible plans, prepared by or under the direct supervision with the signature, seal, and date of the licensed Professional Engineer in the state of South Dakota, shall be filed with the City Engineer for all work involved in public improvement contracts or private subdivisions resulting in public right-of-way dedication. Detailed plans shall conform to the City of Sioux Falls Computer-Aided Drafting Standards and to the following requirements.

13.2 Subdivision Plans

It is the purpose of the Engineering Design Standards to facilitate the orderly and responsible subdivision of land so as to coordinate streets/roads with other subdivisions and uses, to provide reliable water and sanitary sewer services, to afford proper drainage and flood control, and to do so in a manner that best protects the natural environment.

To achieve this, the subdivision of land shall require the submittal of a Concept Plan, Preliminary Plan, Development Engineering Plan, Plat, and Construction Plan.

13.2.1 **Concept Plan.** Unless waived by the City Engineer or Planning Director, a Concept Plan must be submitted to the Planning Office for City review. A Concept Plan shall include the following information:

1. The general layout of streets and access points to adjacent street systems; location of major drainageways, approximate flow paths and detention ponds; waterline locations; sanitary sewer line locations; natural features and amenities and preservation of public land, proposed zoning districts; and pedestrian connectivity.
2. The proposed name of the subdivision.
3. Any utilities or streets for which the applicant is expecting City reimbursement.
4. Vicinity map to scale, showing locations of the Concept Plan and other property for at least 660 feet in every direction.

13.2.2 **Preliminary Plan.** A Preliminary Plan shall be submitted to the Planning Office for City review. The Preliminary Plan shall be in conformance with

the Engineering Design Standards and shall include all information from the concept plan as well as the following information:

13.2.2.1 General

1. The proposed name of the subdivision.
2. The names of all adjoining subdivisions, showing connectivity with lot and block lines, easements, and right-of-way. Adjoining unplatted property shall be labeled as such.
3. Vicinity map to scale showing location of the Preliminary Plan and other property for at least 660 feet in every direction.
4. The owner, developer and engineer's names, addresses, and telephone numbers.
5. The legal description and notations stating acreage, scale, and north arrow.
6. The proposed zoning districts.
7. A systematic lot and block numbering pattern, lot lines, and street/road names.
8. Location and widths of all existing and proposed easements.
9. Existing contours.
10. Location and size of all public facilities, schools, libraries, fire stations, parks, tree masses, and other significant natural features.
11. Any expectations for City reimbursements.
12. Proposed phasing for the development with estimated timelines.

13.2.2.2 Streets

1. Compliance with Major Street Plan.
2. Adjacent property information: access points, right-of-way, city limits, development plans, and any other pertinent information needed for review.

3. Street right-of-way widths.
4. Identify minor and major collectors with conformance to Chapter 8 of the Engineering Design Standards.
5. Transportation connectivity within the development as well as connectivity with the surrounding properties. This also includes pedestrian connectivity.
6. Consideration of lots that front on the arterial streets and where their access points will be allowed. Note: Assessments will be required, if they are approved.
7. Note if access to the development is from a city street or a county highway.

13.2.2.3 Sanitary Sewer

1. Compliance with existing officially recognized large-scale plans (Facilities Plan Wastewater Collection System, Sioux Falls Year 2015 Comprehensive Development Plan).
2. Major individual commercial or industrial occupants (if any).
 - a. Type of sewage produced by major contributors identified above (if atypical).
 - b. Volume of sewage produced by major contributors identified above (if atypical).
3. Can developments and properties adjacent to the development under study be served by the existing sewer (from the standpoint of geography, gradient, and capacity)? (Note: City Engineering Office will furnish the design engineer with any available existing flow information within 30 working days of receipt of a written request.)
4. Estimated flow in planned sewer (cfs, mgd, or other unit).
5. Proposed pipe size for planned sewer.
6. Proposed pipe size for force main, if applicable.

7. If pumping station is being proposed, list the type and capacity.
8. Adequacy of receiving sewer system.
9. Manhole locations with manholes numbered.
10. Flow direction, connections to existing system, and extensions to adjacent properties.
11. Extension of sanitary sewer to the adjacent upstream users.
12. Sanitary sewer shall be limited to a depth no greater than 15 feet.

13.2.2.4 Water

1. Compliance with Water Distribution System Master Plan.
2. Show valves, fire hydrants, and other water main appurtenance locations.
3. Extension of waterlines to perimeter of the development.
4. Proposed pipe sizes.

13.2.2.5 Drainage

1. The developer shall submit a drainage plan which complies with the City Master Drainage Plan for the drainage basin(s) of which the development is included. Scales as small as 1 inch equals 500 may be used to show the entire development.
2. The following information shall be included in the submittal:
 - a. A route outlet map will be required. This map shall show how the drainage from the proposed development will be transmitted to the nearest major drainageway. The map shall show any existing structure(s) which may limit the flow en route to the major drainageway. The route outlet map shall show the drainage area upstream of the proposed development and the estimate of flow

under current conditions presently draining onto and through the development.

- b. Data for minor and major storm flows within the proposed development for all drainage basins and sub-basins, as identified per the City Master Drainage Plan.
- c. Identification of drainage problems with proposed solutions to deal with the problems within the development.
- d. Identification of downstream and upstream facilities as shown on the route outlet map in accordance with the City Master Drainage Plan.
- e. Locations and size of proposed detention ponds as required by the City Master Drainage Plan and Best Management Practices Plan within the development shall be identified.
- f. General locations and size of potential wetlands shall be identified. Include copy of correspondence with United States Army Corp of Engineers (USACOE) requesting wetland determination and any responses. Also, note if any mitigated wetlands will be created.
- g. Any and all existing 100-year floodplains must be identified, as shown by FEMA maps or the City Master Drainage Plan. The Assistant Director of Building Services will provide needed FEMA maps.
- h. Existing contours.
- l. Location and size of existing open channels, bridges, culverts, storm sewers, and ponding areas within the development.
- j. Location of streets.
- k. Identification of all drainage basins tributary to the development.
- l. Drainage patterns within the proposed development.

- m. Provide adequate information as to the effect of the drainage pattern on adjacent property. Provide survey data as required for adequate information. Identify the storm water path to the major drainageway.

13.2.2.6 Street Lighting

1. Reserved for future.

13.2.3 **Development Engineering Plan.** The Development Engineering Plan shall be submitted to the City Engineering Office. The Development Engineering Plan shall include all information from the approved preliminary plan as well as the following information:

13.2.3.1 General

1. Compliance with conditions and approval requirements of the Preliminary Plan.
2. Existing and proposed easements shown and dimensioned from property lines and utilities.

13.2.3.2 Streets

1. Conformance with Chapters 5 and 8 of the Engineering Design Standards.
2. Note if street width conforms to street designation.
3. Conformance to traffic calming practices shown in Chapter 8 of the Engineering Designs Standards.
4. Inclusion of horizontal curve data for streets and radii.
5. Show proper driveway/intersection spacing.
6. Note if the arterial the development will be using is improved paved, improved to urban standard, or gravel. If gravel, development will need to petition for street improvements before development can continue. If rural section, petition will need to be submitted.
7. Development conforms to existing geography and with City-approved grade line for arterial streets.

13.2.3.3 Sanitary Sewer

1. Conformance with Chapter 9 of the Engineering Design Standards.
2. Manhole depths.
3. Manhole rim and invert elevations, including existing manholes that are being connected into.
4. Proposed basement locations.
5. Connections to existing system.

13.2.3.4 Water

1. Conformance with Chapter 10 of the Engineering Design Standards.

13.2.3.5 Drainage

1. The Final Drainage Plan shall be a detailed plan of the proposed development phase, as defined per Subdivision Ordinance. It shall include detailed data for all runoff within the proposed development phase and detailed data for the design of all drainage structures within the development phase. It shall comply with the master drainage plan and best management practices (BMP) plan for the area on file in the City Engineer's Office.
2. Drawings and data (actual calculations may be required with submittal) comprising of the Final Drainage Plan shall comply with Chapter 2—Submittal Procedures, and shall include, but not be limited to, the following information. Scale will be 1 inch equals 100 feet maximum.
 - a. Proposed contours and arrows indicating drainage paths for each lot.
 - b. Location and elevations of Bench Marks and lot corners.
 - c. Property lines.
 - d. Streets, names, and grades.

- e. Existing drainage facilities and structures, including existing roadside ditches, drainageways, gutter flow directions, culverts, etc. All pertinent information such as size, shape, slope, location, etc., shall also be included to facilitate review and approval of drainage plans. Flow areas will be delineated.
- f. Proposed storm sewers and open drainageways, easement, and right-of-way requirements, including proposed inlets, manholes, and culverts. General notes concerning erosion control and energy dissipation shall be provided.
- g. Proposed outfall point for runoff from the development phase.
- h. Routing and accumulative flows at various critical points for the minor and major storm runoff.
- i. 100-year flood level in all streets in which the curb is overtopped during the 100-year storm for sump condition or other critical points.
- j. Identify 100-year flood elevations for major and lateral drainageways.
- k. Inlet flow data.
- l. Pipe flow data.
- m. All floodplains, identified by FEMA maps, within the proposed development phase.
- n. Location and size of potential wetlands.
 - (1) Provide copy of correspondence with state and federal agencies related to the potential impact to wetlands or other cultural resources. This includes:
 - (a) Wetland determination for USACOE.
 - (b) Wetland mitigation plan.
 - (c) Any restrictive covenants that would prevent the City from performing maintenance activities such as excavating within the wetlands.

- o. Hydrological data for each drainage area.
 - (1) Areas. Show areas of the subdivision which will not be routing storm water to a water quality BMP structure.
 - (2) Watershed lengths, elevations, time of concentration.
 - (3) Rainfall intensity.
 - (4) Runoff coefficients.
 - (5) Projected land uses and existing physical features of areas contributing runoff.
 - (6) Storm duration.
 - (7) Reference to City Master Drainage Plan for plan flows is acceptable.
 - (8) Runoff (Q) (Note: This list of criteria assumes use of Rational Formula. If a different method is used, all relevant factors are to be enumerated).
 - (9) If subdivision will discharge storm water onto undeveloped land, show predevelopment flow rates for the 5- and 100-year return storm for predevelopment conditions and post development conditions.

- p. Major drainageways.
 - (1) Note if applicant intends to dedicate the drainageway.
 - (2) Alignments and profiles including existing and proposed.
 - (3) "n" values (Manning).
 - (4) Calculations of rainfall intensity and duration, acreage, volume, and velocities.
 - (5) Soils analysis with a discussion of the proposed channel erosion potential.
 - (6) Shear stress.

- q. Design recommendations.
 - (1) Dikes.
 - (2) Filling low areas.
 - (3) Provision of easements.
 - (4) Minimum recommended ground elevation for buildings, lowest recommended floor elevation, and recommendations against building in certain areas.
 - (5) Provisions for on-site retention and detention. Notate whether or not these retention and detention ponds will be dedicated to the City.
 - (6) Other as appropriate for conditions.

3. Sump Pump Collection System

- a. A sump pump collection system along with necessary structures shall be shown attached to the trunk drainage system.

13.2.3.6 Street Lighting

- 1. Reserved for future.

13.2.4 **Plat.** The plat shall be submitted to the City Engineering Office. One mylar, two paper copies, and one electronic DWG file shall be submitted. All copies shall comply with state statutes. The plat shall include the following information:

- 1. Comply with the Development Engineering Plan for layout of lot, block, right-of-way, and easements.
- 2. Name of subdivision.
- 3. Names of adjoining subdivisions showing lots, blocks, and easements. Unplatted property shall be labeled.
- 4. Site location map.
- 5. Drawn to a scale appropriate for the size of the parcel.
- 6. Lot and block numbering pattern, lot lines, street names, and square footage of all lots.

7. Location of all monuments, permanent control points, and survey pins.
8. All dimensions, linear and angular, necessary for locating the boundaries of the subdivision lots, roadways, easements, and other areas for public and private use. For curves, this shall include radii, chords, length of curve, and point of tangency.
9. Identification and delineation of any portions of the property to be dedicated or granted for public use such as schools, parks, drainageways, BMPs, or other.
10. Existing and proposed easements or right-of-way dimensioned from property lines or known points.
11. Boundary lines of the floodway and 100-year flood zones along with the base flood elevation on each lot as delineated on the Flood Insurance Rate Maps (FIRM).
12. Surveyor's certificate.
13. Acknowledgement by the owner of any restrictions, as well as use of common areas.
14. Formal irrevocable offers of dedication.
15. Approved assurance agreements or development agreements.
16. Certificates of approval for endorsement by the City Engineer, Planning Director, City Clerk, City Planning Commission, and Mayor.

13.2.5 **Construction Plans.** Construction Plans shall be submitted to the City Engineering Office. Construction Plans shall include all information from the Development Engineering Plan as well as the following information:

1. Plans shall conform to all chapters of the Sioux Falls Engineering Design Standards, supplemental specifications, and shall include all necessary standard plates.
2. All plans shall be submitted as 11- x 17- inch electronic format plans with the proper scaling.
3. The final approved Construction Plans shall be submitted in a single electronic DWG file for insertion into GIS database.

4. Provide the following note: “All construction shall be in accordance to the City’s General Conditions and Supplemental Standard Specifications for Public Improvements.”
5. Final Construction Plans shall be submitted in accordance with Chapter 2 of the Engineering Design Standards.
6. Update of proposed phasing for development if known.

13.3 Capital Improvement Project Plans

It is the purpose of the Engineering Design Standards to facilitate the safe and responsible construction of public infrastructure. These standards shall apply to regulate and guide the preparation of construction plans for facilities that will be used by the public and owned or operated by the City of Sioux Falls. The City Engineer may require additional standards and/or regulations not inconsistent herewith when deemed necessary to protect the health, safety, and welfare of the public.

13.3.1 **General.** Electronic copies of plans shall be submitted with the detailed paper copy plans. The Engineer must follow state laws in submitting electronic copies. The electronic plans shall conform to the City’s Computer-Aided Drafting Standards and Standard Plan Format.

13.3.1.1 **Plan Sheet Size.** Prepare plans on sheets 11 inches by 17 inches in size, except for special layout sheets when specifically accepted by the City Engineer. Review plans may be submitted on sheets 22 inches by 34 inches.

13.3.1.2 **Names on Sheets.** All persons designing, detailing, and checking plans shall legibly place their names on the plan sheets in a space provided for this purpose.

13.3.1.3 **Title Block.** A title block listing the name of the project, Owner, and Engineer along with sheet title, date, sheet number, and space to denote revisions. Title block shall go in lower right corner or right edge of each sheet except the title sheet so as to be read from the bottom or right side. Page numbers shall be in the lower right corner of each sheet.

13.3.1.4 **Precision and Detail.** Plans shall be prepared with such precision and in such detail as to be within the customary degree of accuracy for work of this kind and so permit the convenient layout in the field for construction and for other purposes. They shall also be of such character as to provide for the production of an accurate estimate of quantities for

the several pertinent items of work to be performed in the construction of the improvement.

- 13.3.1.5 **Special Provisions.** Plans shall include special provisions for items of work included in the plans which are not covered by the Standard Specifications and accepted special provisions of the South Dakota Department of Transportation and the City of Sioux Falls as may be required to properly cover the work contemplated by the plans. Special provisions may be prepared on 8 1/2-inch by 11-inch paper and bound with other bid documents.

13.3.2 Title Sheet

The following information shall be shown when applicable.

1. Project name and location.
2. Type of project.
3. Small scale map showing project location. Plan and profile sheet layout shall be shown on location map.
4. Index (a complete sheet index is to be shown).
5. File number (to be filled in by City Engineer's Office).
6. Engineer's firm name and address.
7. Acceptance Block—show acceptance block in lower right-hand corner with signature line for City Engineer.

Accepted:

City Engineer's Office

Date

8. Estimate of quantities (may be placed on second sheet). Development plan shall contain utility quantities only.
9. Design Engineer's certification, registration number, and date certified.

10. General Notes (show all general notes pertaining to construction. Include a general note that project shall be constructed in accordance with the City of Sioux Falls Standard Specifications).
11. Legend (define all symbols shown in the plans).
12. Legal Description, including section, township, and range.

13.3.3 **General Information to be Shown on Detailed Plans**

The following information shall be shown when applicable:

1. Construction limits.
2. Benchmarks.
3. Street names.
4. Right-of-way widths.
5. Removal of large trees, buildings, pavement, structures, or other features as required.
6. Horizontal and Vertical Control. Alignment notes and benchmark descriptions are to be located on the plan portion of the sheets. All vertical control shall be based on NAVD 1988 vertical datum.
7. Lot and block numbers and subdivision name in new subdivisions. Otherwise, show property addresses.
8. Lot dimensions (along rights-of-way or easements).
9. Show scale (usually 1" = 20' horizontal and 1" = 5' vertical reduced to 1" = 40' horizontal and 1" = 10' vertical) using a bar-type diagram and standard north arrow together. Show arrow on right-hand side pointing to top or left of sheet.
10. Existing and proposed utilities—type, size, and location. (Show existing features less prominently or dashed.)
11. Pavement widths.
12. Where stationing is continuous from one sheet to the next, the last station on one sheet is to be the first station shown on the next. If possible, locate on the sheet to avoid “breaking” the plan and profile.

13. Existing trees, fences, walks, drainage structures, ditches, pavements, buildings, and other obstacles or improvements that are in or near the work area. (Show existing features less prominently or dashed.)
14. Survey line or reference line shall be shown on plan view.
15. Temporary and permanent easements with the property owners listed and the dimensions off designated known points.
16. Special details and special notes when required.
17. Plan view and profile shall line up whenever possible.
18. Symbols and abbreviations used on plans if different from those shown in Standard Specifications or Standard Plates.
19. Any soils information available. (Show test hole locations on plan and profile sheets.)
20. When it is required by the City Engineer, a traffic control plan shall be shown on plans.
21. Other information deemed necessary by the Design Professional certifying the plans.
22. Revision block showing description, date, and by.
23. City standard drawings and details.

13.3.4 **Street and Storm Sewer Plans**

The following information shall be shown when applicable:

1. Show BEGIN STA. and END STA.
2. Storm sewer plans shall be shown on the same sheets as paving unless it is a major installation or a benefit district.
3. Match lines to other plan and profile sheets where they do not follow in order in the plans such as at an intersection.
4. Horizontal curve data near curve or code for clarity if several are to be shown or if the sheet is crowded. Show Point of Intersection (PI) Station, Δ angle, degree, radius, tangent, length, and super-

elevation, if any. Show Point of Curvature (PC), Point of Intersection (PI), and Point of Tangent (PT) station on the plan. For vertical curves show stationing, length, and elevations of Point of Vertical Curvature (PVC), Point of Vertical Intersection (PVI), and Point of Vertical Tangent (PVT). Also show "K" value as defined in *A Policy on Geometric Design of Highways and Streets* published by AASHTO, latest English edition.

5. Drainage arrows designating direction of runoff.
6. Stationing of paving projects will generally run from north to south or from west to east so that the north arrow will point to the top or left-hand side of the sheet. Sewer stationing, when used, shall run from the lower end of the project on the left of the sheet toward the higher end on the right.
7. New construction and information notes in accordance with standard "Typical Notes."
8. Show profile of existing ground or proposed street high enough to allow for storm sewer information and profile grades below. Show street profile grade elevations every 25 feet, typical. Label the existing ground line and show percent of grade on the new grade line (usually top of curb).
9. Show profile flow line elevations on all inlets, catch basins, pipes, and culverts. Show size, type, class (if necessary), and percent of grade on storm sewer pipes.
10. Show intersection details to the extent necessary to ensure proper horizontal and vertical alignment. The following additional information is required:
 - a. Spot elevations along centerlines and along curb lines extended through the intersection.
 - b. Drainage arrows showing direction of storm water flow.

Additional geometric information may be required including key distances, stations, angles, curve data, and elevations necessary for design and staking.
11. Show typical sections as required including information on the following:
 - a. Shoulder slopes, back slopes, side slopes.

- b. Paving widths, thicknesses, and types.
- c. Lane widths.
- d. Pavement cross slopes.
- e. Sidewalks and slopes.
- f. Subgrades and paving treatment.
- g. Median details.
- h. Typical right-of-way lines.
- l. Other typical details of paving or grading sections as appropriate not otherwise covered on the standard paving details.

Typical sections may be waived for private development plans if it is a standard section.

13.3.5 Sanitary Sewer Plans

The following information shall be shown when applicable:

1. Stationing, location, and type of all manholes or other structures. Type of structures shall be in conformance with the Standard Specifications and Standard Plates.
2. Details shall be shown for all structures that are not in accordance with City of Sioux Falls standards.
3. Plan and profiles of all sewer lines (including existing ground profile and proposed finished grade profile).
4. Size, length, and grade of sewers.
5. Type of pipe materials and strengths (if necessary).
6. On reconstruction projects, location, size, and type of all sewer stub outs, wyes, or tees. Stub out locations shall be referenced to lot corners. When risers are to be installed, riser location and size shall be shown on reconstruction plans.
7. Estimates shall include stub out quantities when they are to be constructed by City contract.

8. Rim and invert elevations and the depths of existing and proposed manholes and structures.
9. Manholes shall be identified with a City of Sioux Falls numbering system on plan **and** profile.
10. Class of pipe bedding if necessary.
11. Existing underground utilities such as cables, water, sewer, or gas lines or any other underground features that cross or are near the proposed sewer. Show exact elevations, if possible, where there may be conflict with new construction.

13.3.6 **Drainage Ditch and Drainageway Plans**

The following information shall be shown when applicable:

1. Stationing and flowline elevation at beginning and end of ditch construction.
2. Size, type, length, and grade of ditch.
3. Typical sections showing ditch dimensions, backslopes, and invert and slope treatment.
4. Invert elevations at all structures.
5. All special structures shall be detailed on plans.
6. Drainage design data.
7. Cross-sections and topographic map showing existing ground and finished grade at intervals of 100 feet.

13.3.7 **Water Main Plans**

The following information shall be shown when applicable:

1. Stationing, location, and type of all water lines, manholes, valves, fire hydrants, or other appurtenances.
 - a. Stationing and type of structure shall be shown on station bar.
 - b. Location shall be shown on plan or on station bar if referenced to survey line or centerline.

- c. Type of structures shall be in conformance with Standard Specifications or Standard Plates.
2. Details shall be shown for all structures that are not standard in Standard Specifications or Standard Plates.
3. Plan and profiles of all water lines where future changes in grade are possible.
4. Size and length of water lines.
5. Type of pipe materials and strengths if necessary.
6. Top of pipe grade to be 6 feet below finished grade.
7. On reconstruction projects, location, size, and type of all water stubs, wyes, or tees. Stub locations shall be referenced to lot corners and stubbed to property line.
8. Estimates shall include stub out quantities when they are to be constructed by City contract.
9. Curb elevations at all hydrant locations.
10. All castings shall be City standard where maintained by the City.
11. Class of pipe bedding if necessary.

13.3.8 **Erosion Control Plans**

An erosion control plan shall be submitted as detailed in Chapter 12 of these Design Standards and Standard Plates.