

DC7 – REQUIREMENTS FOR PUBLIC IMPROVEMENT PROJECT PLAN PREPARATION

DC7-001 **INTRODUCTION.** The following criteria is established to provide a uniform system of plan preparation that will aid the engineer in preparing plans for work within the City of Gardner.

DC7-002 **GENERAL.** All plans and specifications for public improvement construction shall be sealed by a professional engineer licensed in the state of Kansas and submitted to the office of the City Engineer for review. Subsequent to the review, the engineer will be notified of the approval of the plans as submitted, or of any necessary changes. (Refer to the section "Public Improvement Project Plan Submittal" for plan review procedures.)

Upon completion of the review and approval of the plans by the City Engineer, 2 sets of full size plan sets, 2 set of half size plan sets, 1 copy of the electric layout sheet, and 1 electronic copy of the plans in AutoCAD must be submitted for signing and distribution.

The suggested plan sheet size is 22" x 34" or 24" x 36" with all sheets in each set of plans being of the same size. Plan and profile shall be drawn on double or single plan and profile sheets to scales of one inch (1") equals fifty feet (50') horizontal by one inch (1") equals ten feet (10') vertical, unless otherwise approved by the city engineer for special cases.

The plans shall consist of:

1. Title Sheet
2. General Layout Sheet
3. Grading and Erosion Control Sheet
4. Electric Layout Sheet
5. Drainage Basin Map Sheet
6. Plan and Profile Sheets
7. Intersection Detail Sheets
8. Cross Section Sheets (Street Improvement Plans only unless otherwise required by the City Engineer.)
9. Standard Detail Sheets
10. Pavement Marking and Signage Sheet (as necessary)
11. Traffic Control Plan (as necessary)

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

DC7-003 **TITLE SHEET.** The following items shall be included on the title sheet:

1. Name of project
2. City project number
3. Index of sheets
4. A location map adequately showing project location in relation to major streets
5. A summary of plan quantities of principal items, such as:
 - Pipe sizes, number of manholes, etc. (sanitary sewers)
 - Length of curb and gutter, square yardage or tonnage of asphaltic concrete pavement, etc. (streets)
 - Pipe sizes, number of inlets, etc. (storm sewers)

- Pipe sizes and lengths, number of valves, etc. (water lines)
- 6. The location of the project benchmark per the Johnson County Horizontal and Vertical Control Network.
- 7. Name, address and telephone number of the Design Engineer and owner/developer.
- 8. List containing the name and telephone number of each utility company.
- 9. Zoning
- 10. Signature and stamp of Professional Engineer registered in the State of Kansas

DC7-004 GENERAL LAYOUT SHEET. The following items shall be included on the general layout sheet for all improvement projects:

1. A legend of symbols which shall apply to all sheets.
2. North arrow and scale. Scale of the general layout map shall be one (1) inch equals one hundred (100) feet, unless otherwise approved by the City Engineer.
3. Names of subdivision, block designation, lot designation, all 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. Project boundary, survey control and reference ties.
5. A list of general notes to the contractor to include at least those notes included in this Section.
6. Layout of sidewalks and access ramps.
7. Utility and street light layout.
8. Construction plan quantities.

In addition, the following items shall be included on the general layout sheet for the type of improvement shown:

Storm Drainage

Drainage calculation summary table containing the following information:

1. Pipe size and slope.
2. Pipe capacity.
3. Velocity.
4. Time of concentration.
5. Runoff coefficient.
6. Incremental tributary acreage.
7. Cumulative acreage.
8. Rainfall intensity.
9. Rainfall runoff.
10. Engineered swales and shear stress calculations for erosion protection.

Sanitary Sewer and Waterline

1. Location of all existing sanitary sewer and waterlines properly designated within or adjacent to the project area (list the City project name and number).
2. Connection point or points to existing facilities (tied to a known point on existing facility) and the type of connection to be utilized.
3. Location of all proposed sanitary sewer and waterlines and appurtenances with designation and sheet number on which they appear in plan and profile.
4. Preblast survey limits.

DC7-005 GRADING AND EROSION CONTROL SHEET. The grading and erosion control sheet shall be drawn at a scale of 1"=max 100' (1"=20', 1"=50', or 1"=100' are acceptable) with match lines for multiple sheets when necessary. The following items shall be included on the grading and erosion control sheet:

1. Existing topographic features – trees, hedges, brush, buildings, pavement, utilities, fences, curbs, drives, sidewalks, inlets, manholes, valves, and other manmade objects - shown in ½ tone.
2. The current physical features (both natural and manmade) of the property and adjacent land within 50', including contours at vertical intervals of not more than 5' where the slope is greater than 10% and not more than 2' where the slope is less than 10%.
3. Proposed contours shown at the same contour interval as the existing contours.
4. Lot and subdivision lines with lots and blocks numbered per the plat of the subject subdivision.
5. Street centerline alignment with edge of pavement lines, edge of sidewalk lines, and back of curb lines.
6. North arrow and bar scale.
7. Street names, R/W lines, existing and proposed easements (show centerline and limits of the easements).
8. 2% minimum grading is required for positive drainage.
9. 100-year floodplain and stream buffers (if applicable).
10. Appropriate erosion control measures and applicable notes (may be shown on separate sheet).
11. The consultant shall also submit a copy of the application for an NPDES permit.
12. Limits of construction.

DC7-006 ELECTRIC LAYOUT SHEET. For subdivision plans, the Electric Division for the City of Gardner will provide the design engineer with a schematic of the electric and street lighting layout to be included in the plans. The plans shall include street crossings, proposed street lighting layout, proposed conduit, and proposed layout of feedthrough cabinets, transformers, etc. This sheet will be used by the Electric Division to install the electric infrastructure once plans are approved.

DC7-007 DRAINAGE BASIN MAP SHEET. The drainage basin map sheet shall be drawn to such a scale as to fit on one sheet where possible, but shall not exceed 1"=1000', and shall include the following information:

1. A plan view of the project.
2. A layout of all pipe systems with the structures numbered.
3. Boundaries of all basins (there should be a sub-basin for each inlet) shall be shown, and each basin and sub-basin shall be labeled.
4. A data table providing stormwater calculations (K, C, I, Q, Q_{total}, t_c, HGL, etc.) and pipe data (length, slope, diameter, full pipe velocity, etc.). The data table should also include 100-year calculations for emergency overflows.

DC7-008 PLAN AND PROFILE SHEETS. The following items shall be included on the plan and profile sheets for all improvement projects.

1. North arrows and scale.
2. Existing and proposed streets with names and widths.

3. Existing and proposed property lines, lot numbers, block numbers and subdivision names.
4. All existing and proposed utilities such as power, gas, oil, water, telephone, sewer, streetlights, traffic signals and other items. The locations shall be in conformance with the best information available from the utility provider and/or field survey.
5. All existing and proposed improvements within seventy-five (75) feet each side of the center line. This shall include paved streets, curbs and gutters, driveways, culverts, fire hydrants, utility poles, trees, shrubs, fences, walls, houses, and other such items, and shall be identified as to type, size, material, etc.
6. All existing easement and right-of-way information recorded with the Johnson County Records and Tax Administration.
7. Minor construction notes shall appear on the proper plan and profile sheets.
8. Locations and widths of existing and proposed sidewalks and ramps.

In addition, the following items shall be included on the general layout sheet for the type of improvement shown:

Street

1. Horizontal curve data, vertical curve data, stopping sight distances, K values and design speed.
2. Gradient between vertical curves.
3. Center line stations.
4. Stations and grade at curb returns (at ¼ points).
5. Profile with the existing grade shown as a dashed line and proposed grades shown by solid lines.
6. Location of monument boxes.
7. Sight triangles.

Storm Drainage

1. Detailed alignment of the storm sewer, appurtenances, pipe size, capacity, and other details relating to the storm drainage system including inlet station, top elevation and invert elevation.
2. Proper ties to existing permanent facilities.
3. Distances between the storm sewer and other existing or future utilities in the right-of-way or drainage easement.
4. Drainage channel, slope and cross sections.
5. Existing and proposed street grades.
6. Proper elevations, slopes and lining for existing outfall ditches.
7. Locations of all bends and appurtenances.
8. Size, slope and material of each pipe on the profile.
9. Hydraulic grade line for design storm.
10. Location, cross-section, and capacity of overflow swales, including the velocity in the swale and erosion protection where necessary.
11. Property owner information for all properties directly adjacent to development.

Sanitary Sewer

1. Detailed alignment of the proposed sewer with ties to property corners or station and angle callouts at each manhole.
2. The channel center line of waterways within fifty (50) feet of the sanitary sewer lines.

3. All manholes with manhole designation, station, and invert elevations. Drop, shallow and special manholes shall be designated as such. Invert elevations shown shall be the invert of the pipe in and out of the manhole. The proposed top elevation of the manhole shall be shown. Distance between manholes shall be shown as well as the gradient, pipe size and pipe material.
4. Results of all rock borings.
5. Accurate elevations of lowest floor for all existing and/or proposed structures. Include minimum serviceable floor elevation (MSFE).
6. A uniform system of line and manhole designation as required by the City Engineer.
7. Station, slope, and length of each service line.
8. Profile of existing grade as a dashed line and the proposed grade by solid lines. The flow line of any drainage channel, either improved or unimproved, within fifty (50) feet of the sewer line shall also be included and properly identified. The proposed sewer shall be shown as double solid lines properly showing the height and flow line of the pipe.
9. All utility crossings with approximate elevations provided in the profile.

Water Lines

1. Alignment of the proposed water line dimensioned from curb lines or right-of-way lines.
2. Designation by station of all fire hydrants, line valves, tees, bends, and crosses.
3. Pipe material, size, and location of required restraint.
4. Results of all rock borings.
5. All utility crossings with approximate elevations provided in the profile.

DC7-009 **INTERSECTION DETAIL SHEETS.** The intersection detail sheets shall show the intersections at 1"=20' or 1"=10'. The following items shall be included on the intersection detail sheets:

1. North arrow and bar scale.
2. Back of curb and face of curb lines and edge of pavement line.
3. Radius line for curb returns with length of radius labeled.
4. Storm inlets, manholes, other proposed items.
5. Plus station for start/stop of tapers, turn lanes, curb returns—with offsets where appropriate.
6. Top of curb elevations and stations every 25' with plus station, elevations and offsets at curb returns and at midpoint of curb returns.
7. Horizontal alignment data (same as Plan and Profiles).
8. Location of sidewalks, handicap ramps, with dimensions for sidewalks.
9. Street lighting poles, etc.

DC7-010 **CROSS-SECTION SHEETS.** The following items shall be included on the cross-section sheets. Cross Section Sheets are not required for privately financed projects unless requested by the City Engineer.

1. Street cross-section at each station showing existing grade as a dashed line and proposed grade as a solid line. Cross-sections shall include existing grade lines a minimum of ten (10) feet beyond right-of-way lines. Show cut and/or fill quantities at each cross-section.

2. Center line elevation at top of pavement.
3. Cross-sections at all intersecting streets and driveways.
4. Channel cross-sections for all drainage channel improvements.
5. Additional cross-sections as required to clearly describe the extent of the grading operations.

DC7-011 PAVEMENT MARKING AND SIGNAGE SHEET. The pavement marking and signage sheet shall be typically drawn to scale at 1"=50'. The following items shall be included on the pavement marking and signage sheet:

1. North arrow and bar scale.
2. Legend.
3. Existing topographic features – trees, hedges, brush, buildings, pavement, utilities, fences, curbs, drives, sidewalks, inlets, manholes, valves, and other man-made objects—screened to 65%.
4. Horizontal alignment of the proposed streets, including centerline and stationing.
5. Proposed drainage structures and other proposed structures.
6. Proposed edges of pavement and sidewalk, and back of curb lines.
7. Station equation at all proposed intersections (including an intersection of a proposed street with an existing street).
8. Street names.
9. Proposed and existing right-of-way.
10. Construction limits.
11. Easements of all types, existing and proposed.
12. Proposed and existing street light poles.
13. Stationing of all proposed pavement markings.
14. Lane width dimensions.
15. Stationing and MUTCD number for all proposed signs.
16. General Notes that include but are not limited to:

All markings shall be in accordance with the latest edition of the MUTCD.

All existing markings that conflict with the proposed markings shall be completely removed.

The contractor shall maintain ALL existing signs not shown on the plans as to be removed.

DC7-012 TRAFFIC CONTROL PLAN SHEET. The traffic control plan sheet shall be provided as necessary. This plan shall be prepared by a certified traffic control consultant and shall be reviewed and approved by the City Engineer. The traffic control plan sheet shall include construction sequencing and overall phasing plan, work areas identified by shading and/or line patterns, construction notes describing each phase of construction, a detour plan (if applicable), etc.

DC7-013 STANDARD DETAIL SHEETS. Detail sheets shall be included to show all details of appurtenances, materials, and construction whether or not covered by the Gardner, Kansas, standards. Details shall conform to the City of Gardner standards and are to be drawn clearly and neatly with proper identifications, dimensions, materials, and other information necessary to ensure the desired construction.

DC7-014 CONSTRUCTION RECORD DRAWINGS. Construction Record Drawings shall be submitted to the City Engineer upon completion of the project and prior to final acceptance of the project by the City of Gardner. The Design Engineer shall provide the City with prints for all public improvement projects corrected to show the project as constructed and shall accurately and completely denote all changes made during the course of the work. Each sheet within the plans shall be clearly marked as "Record Drawings" and shall include the revision date and certifications by the Design Engineer. The horizontal and vertical location of the storm sewer structures and pipe, sanitary sewer structures and pipe and all lot corners provided on the Record Drawings shall be based upon field survey data. Listed below are the required sets of construction record drawings.

Construction Record Drawings:

Street and Storm Improvements	1 Sets & Digital Copy (CAD & PDF FORMAT)
Street Lights	1 Sets & Digital Copy (CAD & PDF FORMAT)
Sanitary Sewer	1 Sets & Digital Copy (CAD & PDF FORMAT)
Waterline	1 Sets & Digital Copy (CAD & PDF FORMAT)
Grading	1 Full Set & Digital Copy (CAD & PDF FORMAT)