# Chapter I
# Procedure for
# Street & Storm Drainage Systems
# Project Plan Submittal

All developers and/or their design engineers submitting plans for street and storm drainage system projects in a new subdivision are required to follow the procedures outlined in this standard. No street or storm drainage project may be constructed in unincorporated Johnson County without the prior written approval of the County Engineer. The following procedure shall be used to obtain said approval:

1. Two complete sets of prints of the project plans shall be submitted to the office of the County Engineer for review.

2. The normal time for review shall be ten (10) working days. In the case of abnormally large sets of prints (greater than 20 sheets) or of complicated drawings, a longer time may be required for review.

3. Subsequent to the review of the plans, the design engineer or his representative shall be notified by telephone or mail that the check set is ready to be picked up.

4. The design engineer will be required to make all necessary corrections or revisions as noted on the check sets. Upon completion of the revisions and/or corrections, the plans will again be submitted to the County Engineer's office for further review. Revised sheets submitted shall contain a revision block with identifying notations and date of revisions. All previous check sets must accompany each resubmittal. If the check sets are not submitted with the revised drawings, the plans shall be returned to the design engineer, or held without action until such time as they are included with the submittal. An engineer's estimate of cost shall be submitted with the revised drawings.

5. The length of time for final plan approval by the County Engineer will normally be within five (5) working days. Upon notification of final approval of the plans by the County Engineer, four (4) sets of plans shall be submitted by the design engineer for signing and distribution.

6. Upon notification that the drawings have been approved, the design engineer shall send one (1) set of plans to each of the private and public utility companies having territorial jurisdiction in the area of the improvement.

7. Street and storm drainage plans are approved initially for one (1) year after the date noted on the returned cover sheet. After one (1) year, the plans shall become null and void and must be re-submitted prior to approval of construction of that project. Such plans shall be re-submitted to the office of the County Engineer in accordance with the foregoing outlined procedures and requirements.

# Chapter 2
# Design Engineer's Responsibility During Construction
# Street & Storm Drainage Systems

A. General

The developer/owner shall employ a licensed professional engineer to observe the project during construction to insure that the project is built to the lines, grades, and dimensions shown on the approved plans, and to note all changes made during the course of the work. The services of the engineer required by this chapter will not be paid for by Johnson County. This work shall be paid for by the Developer or Owner.

B. Construction Staking

In order to insure the work is built according to plan, the engineer's firm shall perform the construction staking, or shall be furnished field notes of the construction staking to check.

C. Rock and Paving Quantities

Whenever lime, flyash, rock, or hot mix is hauled to the project site for subgrade modification, paving, or shoulders, the engineer shall have a representative at the project site to take and check weight tickets. The weight tickets shall be tabulated to insure that the required quantities are incorporated into the work.

D. Construction Record Drawings

Construction record drawings shall be submitted to the County Engineer upon completion of the project and prior to final acceptance of the project by the County Engineer. The engineer shall provide the county with one (1) set of prints for the project 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 "Conforming to Construction Records" and shall include the date of revision.

E. Completion Certificate

Upon completion of the project and prior to final acceptance of the project by the County Engineer, the engineer shall certify in writing: (1) that the project was constructed to the lines, grades, and dimensions shown on the approved plans, (2) that sufficient lime, flyash, rock, concrete and hot mix were incorporated into the work to construct the project as designed.

# Chapter 3
# General Plan Requirements for Street & Storm Drainage Systems

A. Introduction

All plans submitted shall be prepared by, or under the direction of, a professional engineer, licensed in the State of Kansas, and shall be reviewed by the County Engineer for compliance with the minimum design requirements as established in this manual and the storm drainage standards officially adopted by the Board of County Commissioners (BOCC), effective the date of the plan submittal. Whenever extraordinary or unusual problems are encountered in conjunction with a proposed project, additional information and analysis beyond the minimum requirements of these standards and criteria may be required.

B. General

The required plan sheet size is 22" x 36" or 24" x 36" with all sheets in a given 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 (1) inch equals fifty (50) feet horizontal by one (1) inch equals ten (10) feet vertical, unless otherwise approved by the County Engineer.

The plans shall consist of:

- Title Sheet
- General Layout Sheets
- Standard and Special Detail Sheets
- Plan and Profile Sheets
- Cross-Section Sheets

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

Where feasible, storm drainage system construction details should be incorporated into street construction drawings. Additional storm drainage plan requirements are detailed in the storm drainage standards officially adopted by the Board of County Commissioners.

C. Title Sheet

The following items shall be included on the title sheet:

1. Name of project or subdivision.
2. Index of sheets included in plans.
3. A tabulation of quantities for all items of work with cross reference to all appropriate sections of Kansas Department of Transportation (KDOT) Standard Specifications and Special Provisions.
4. A location map showing project location in relation to major streets.
5. A blank line for approval by the County Engineer with the following note:

   These plans are approved for one year, after which they automatically become void. The County Engineer's plan review is only for general conformance with street and storm drainage standards adopted by Johnson County. The County did not check, and is not responsible for the accuracy and adequacy of the design, dimensions, elevations, and quantities.

6. The project control bench mark shall be identified as to location and elevation; USGS datum.
7. Name, address and telephone number of the design engineer and owner/developer.
8. List containing name and telephone number of each utility company in the area of the project.
9. A certification by the design engineer as follows:

   These plans have been prepared in accordance with Johnson County's Street Construction and Storm Drainage Standards, 1988 Edition. I hereby hold harmless Johnson County for errors or omissions in these plans.

D. General Layout Sheet

The following items shall be included on the general layout sheet:

1. A legend of symbols shall be shown 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.
3. A general layout map of the subdivision with existing and final grading contours. (Use 5' intervals if site grading is not required, use 2' intervals if site grading is required). Indicate on the layout map the one hundred year flood plain line. A drainage area map if drainage areas are not shown on layout map.

4. Drainage calculation summary table containing the following information on pipes and channel segments, (include road ditch segments where the required entrance culvert is large than 18" diameter):

    a. Pipe (channel) size & slope*
    b. Pipe (channel) capacity
    c. Drainage Area
    d. Time of Concentration
    e. Rainfall intensity
    f. Runoff Coefficient
    g. Design flow rate (indicate return period)
    h. Velocity at design flow
    i. Channel Lining Required

    *On open ditch type streets include a table with minimum entrance pipe sizes for each lot.

5. Typical sections of improved channel segments.

6. A site grading plan (if required) including the following information:

    a. Property lines - proposed & existing
    b. Final grading spot elevations at lot corners
    c. One hundred year flood plain line

7. The following general notes will be required as a minimum. The design engineer may insert additional notes for the specific conditions of the project. The notes may be placed on the sheet with the typical sections or title sheet if sufficient room is not available on the general layout sheet.

    a. The contractor shall have one (1) signed copy of the plans (approved by the County Engineer) and one (1) copy of the KDOT Standard Specifications at the job site at all times.

    b. Construction of the improvements shown or implied by this set of drawings shall not be initiated or any part thereof undertaken until the Owner/Developer receives the written approval of the County Engineer. The County Engineer will not approve commencing construction until all the required and properly executed easements, bonds, and improvement agreements are received by the County Engineer.

    c. A preconstruction conference with the Johnson County Public Works Department is required prior to any construction activity on this project. The Contractor, Owner, Design Engineer, and Surveyor are required to attend this conference.

d. All existing utilities indicated on the drawings are according to the best information available to the design engineer; however, all utilities actually existing may not be shown. Utilities damaged through the negligence of the contractor due to failure to obtain the location of same from the utility companies shall be repaired or replaced by the contractor at his expense.

e. One (1) compaction test shall be performed by a qualified testing laboratory for every 600 feet of street construction. Compaction tests shall be for the top 6" of the subgrade. Soil samples for such tests shall be collected by the laboratory technicians. Testing laboratory to furnish County Engineer with density curves and field density test results. All testing laboratory expenses shall be paid for by the contractor.

f. Contractor shall not be allowed to work Sundays, Holidays, or Saturdays without written permission of the County Engineer.

g. All work shall be performed in accordance with relevant KDOT Standard Specifications, the appropriate sections are listed on the title sheet.

h. All traffic control signs and barricades shall comply with the current edition of the Manual on Uniform Traffic Control Devices (MUTCD). The project shall be barricaded to public travel until the project is completed and approved by the County Engineer.

i. The Contractor shall notify the County Engineer 24 hours before beginning the following operations:

1. Construction signing & barricades
2. Clearing & grubbing
3. Setting pipes
4. Rough grading
5. Finish grading
6. Subgrade modification
7. Any concrete pours
8. Paving
9. Shoulders
10. Seeding & sodding

The County inspector will inspect and approve all work in one stage prior to Contractor proceeding to the next stage of construction. Failure to notify the County Engineer will be grounds to reject any work that was not properly inspected and approved by the County inspector.

j. Contractor shall take all necessary precautions to prevent soil erosion from bare areas due to his construction activity from causing sedimentation or pollution of adjacent land, channels and ponds.

k. Construction staking shall be the responsibility of the Contractor and/or Design Engineer. Slope stakes shall be set at 100 feet intervals for rough grading. Blue top stakes at center line and pin flags at shoulder line will be required at 100 feet intervals prior to finish grading. Blue top stakes at center line & shoulder line at 100 feet intervals will be required at completion of subgrade modification and prior to paving. On projects with curb and gutter grade stakes shall be set back of curb line at 50 feet intervals, grade will be checked with a string line for finish grading and subgrade modification. Slope stakes at 100 feet intervals will be required on improved channels.

l. Prior to paving or constructing curb and gutter the Contractor shall proof-roll the subgrade while being observed by the County inspector. Proof-rolling shall be performed with a fully loaded tandem axle dump truck. All soft or spongy areas shall be dug out, recompacted and proof-rolled again until the County inspector is satisfied that the subgrade is stable.

m. The top 12" of the subgrade in both cut and fill areas shall be compacted to 95% or greater of Standard Density.

n. Hot mix base quantities shall include an allowance equivalent to 1/2" thickness to allow for normal unevenness in the subgrade.

o. All disturbed areas shall be seeded and mulched or sodded. (The Design Engineer shall include an appropriate note on seeding and sodding, include seeding rates, types, and quantity.)

p. Prior to expiration of the one (1) year maintenance period, disturbed areas, where grass seed did not grow properly, and eroded areas shall be repaired then reseeded and mulched or sodded.

E. Standard and Special Detail Sheets

Detail sheets shall be included to show all details of appurtenances, materials, and construction. Details and typical sections shall conform to standards adopted by Johnson County and are to be drawn clearly and neatly with proper identifications, dimensions, materials, and other information necessary to insure the desired construction. For items that Johnson County does not have adopted standards, such as storm sewer inlets, manholes, sidewalks, etc., use the current City of Olathe, Kansas standards and details. A traffic control plan shall be detailed showing location of barricades, include signing need when working adjacent to public roads or private roads.

F. Plan and Profile Sheets

The following items shall be included on the plan and profile sheets for all improvement projects.

1. North arrow and scale.
2. Elevation and location of all applicable bench marks (USGS datum).
3. Existing and proposed streets with names or numbers and street widths and right-of-way widths.
4. Property lines properly identified as to existing or proposed lot, block and subdivision.
5. All existing and proposed utilities such as power, cable TV, gas, oil, water, telephone, sewer, and other items shall be properly located in conformance with the best information available in the records of the owner of such facilities, or field location, and identified as to size, material, and type of construction.
6. All existing and known proposed improvements within seventy-five (75) feet each side of center line shall be shown at their proper locations. This shall include such existing items as 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., as may be applicable. In case of new developments, some irrelevant items may be omitted.
7. All existing easement and right-of-way information recorded with the Register of Deeds and the Public Works Department.
8. Minor construction notes shall appear on the proper plan and profile sheets.
9. Locations and widths of existing and proposed sidewalks, if any.
10. Horizontal curve data, vertical curve data, and stopping sight distances.
11. Gradient between vertical curves.
12. Typical section and slope of improved channels.
13. Stations and grade at curb returns (at 1/5 points).
14. Profile shall show existing grade at center line as a dashed line, proposed finish grades or established street grades by solid lines.
15. Existing elevations for existing outfall ditches.
16. Special ditch grades if needed.
17. Show size, location, and flow line of all culverts.

G. Cross Section Sheets

The following items shall be included on the cross-section sheets:

1. Street cross-section at each station showing existing grade by dashed lines and proposed grade by a solid line. Cross-sections to show existing grade lines a minimum of ten (10) feet beyond right-of-way lines.
2. Center line elevation of top of pavement.
3. Cross-sections shall be shown at all intersecting streets and driveways.

4. Channel cross-sections shall be shown for all drainage channel improvements at 100 feet intervals.
5. Additional cross-sections shall be shown as required to clearly describe the extent of the grading operations.

# Chapter 4
# Design Criteria and Standards

A. General

Street and storm drainage systems for proposed subdivisions shall be designed in conformance with the standards in this chapter, and the drawings in Chapter 6.

B. Classification of Streets

The classification of streets shall be as described in the relevant zoning and subdivision regulations made applicable for unincorporated Johnson County. The Johnson County Planning Department will designate collector streets on the preliminary plat review.

C. Street Improvement Types

1. Type A Streets:

Type A streets are paved streets with concrete curb and gutter. Type A streets are required in subdivisions with lots smaller than three (3) acres, and are allowed in all subdivisions.

2. Type B Streets:

Type B streets are paved streets with rock shoulders and open road ditches. Type B streets are allowed only in subdivisions with lots three (3) acres or larger.

3. Type C Streets:

A Type C street is a rock road with open ditches. Type C streets are allowed only in residential subdivisions with all lots larger than ten (10) acres and smaller than twenty (20) acres. Type C street shall be a cul-de-sac street with a minimum 200' building setback. No more than seven (7) lots may have access onto a single Type C street. The final subdivision, plat or recorded deed restrictions must contain suitable wording to allow only one dwelling per original lot until the owners in the subdivision have paid for improvement of the street to Type B standards. Type C streets will be allowed only under unusual circumstances when recommended by the zoning board and approved by the Board of County Commissioners. Type C streets are to be allowed only where the cost of a paved street may prevent the orderly layout of ten (10) acre lots and potentially prevent further lot densification through replats.

D. Street Design Criteria

| **Classification:** | **Collector** | | **Local** | | |
|---|---|---|---|---|---|
| **Type:** | **A** | **B** | **A** | **B** | **C** |
| Design Speed (MPH) | 40 | 40 | 30* | 30* | 30* |
| Stopping sight distance | 300’ | 300’ | 200’ | 200’ | 200’ |
| Minimum Grade | 0.8% | 0% | 0.8% | 0% | 0% |
| Maximum grade within 200’ of an intersection | 3% | 3% | 5% | 5% | 5% |
| Minimum ditch grade | - | 0.6% | - | 0.6% | 0.6% |
| Maximum Grade | 8% | 8% | 10% | 10% | 10% |
| Minimum radius of horizontal curve | 500’ | 500’ | 250’ | 250’ | 250’ |
| Curb return radius | 30’ | 30’ | 25’ | 25’ | 25’ |
| Minimum R/W width | 60’ | 90’ | 50’ | 80’ | 80’ |
| Tan. between reverse curves with super | 200’ | 200’ | 100’ | 100’ | 100’ |
| Tan. between reverse curves (no super) | 100’ | 100’ | 50’ | 50’ | 50’ |
| Cul-de-sac radius (R/W) | - | - | 50’ | 65’ | 75’ |
| Cul-de-sac radius | - | - | 39’ | 39’ | 50’ |
| Maximum rate of super elevation | 0.04 | 0.08 | 0.04 | 0.08 | 0.08 |

*Minimum design speed for permanent cul-de-sac streets shall be 20 MPH.

Arterials: Standards for adjacent arterial streets will be more rigorous than required for collector streets. Normal right of way width will be 100 feet on minor arterials and 120 feet on major arterials as classified on the Major Street Plan. Normal design speed will be 50 mph. Other standards will be considered on a case-by-case basis.

E. Cross Road culverts

Crossroad culverts shall be CMP or RCP with manufactured end sections. Downstream ends of CMP larger than 30” diameter and all RCP shall have poured concrete toewalls. CMP culverts smaller than 36” diameter shall be 16 gauge. CMP culverts from 36” to 48” diameter shall be 14 gauge. Larger diameter culverts will be analyzed on an individual basis.

F. Erosion Protection in Road Ditches

Erosion control requirements in road ditches will be the same as required in the adopted drainage standards for improved open channels.

G. Seeding

Seeding and mulching of all disturbed areas is required and shall be included as part of the street and storm drainage plans and may be included in the improvement agreement with the Board of County Commissioners.

H. Temporary Cul-De-Sacs

Temporary cul-de-sacs shall be constructed where required by the applicable county zoning and subdivision regulations.

I. Storm Drainage Standards

All storm drainage works shall be designed in accordance with the storm drainage standards officially adopted by the Board of County Commissioners effective as of the date of the plan submittal to the County Engineers.

J. KDOT Specifications

All construction procedures and materials shall meet Kansas Department of Transportation (KDOT) specifications. The title sheet of the plans should reference all appropriate KDOT specifications that apply to the project.

K. Subgrade Modification

Subgrade modification is required as shown on the standard street drawings. The Design Engineer shall submit lab tests at the time of preliminary plan submittal to verify the required percentage of fly ash, lime, or aggregate. The subgrade modification shall be compacted to 95% of Standard Density. In lieu of subgrade modification, the hot mix base thickness may be increased 2", the rock shoulder thickness shall match the pavement thickness.

L. Compaction Requirements

The top 12" of the subgrade in both cut and fill areas shall be compacted to equal to or greater than 95% of Standard Density.

M. Hot Mix Asphalt Quantities

The hot mix base quantities shall be increased to allow for normal unevenness in the subgrade. Allow 1/2" additional hot mix base for this unevenness.

# Chapter 5
# Improvement Agreement

In those instances where roads, storm drainage systems or other similar improvements are proposed to be constructed in an unincorporated portion of Johnson County, Kansas, the owner, developer and/or contractor shall first be required to enter into a contract with the Board of County Commissioners of Johnson County, Kansas (BOCC), concerning the construction, installation, and maintenance of the proposed improvements. This contract shall be referred to as an "Improvement Agreement" and will be prepared by the County's Legal Department for execution by the proper parties. The purpose of the Improvement Agreement is to insure that the proposed improvements will be constructed in a timely manner in accordance with the County's standards and will be properly maintained after their completion. Once the County is informed by the owner, developer and/or contractor that a road, storm drainage improvement or other similar improvement is desired to be constructed, whether as part of a subdivision development or not, the County's Planning Office shall require the owner and/or developer to fill out and return a document referred to as an "Improvement Agreement Questionnaire." The Questionnaire is designed to elicit the information required for the Legal Department to properly draft the Improvement Agreement. Once completed, the Questionnaire should be returned promptly to the Legal Department. The Improvement Agreement will not be drafted and the commencement of construction shall not be allowed until a properly completed Questionnaire has been returned as requested.

The BOCC shall not hear any application for final plat approval until an Improvement Agreement has been executed by the owner, developer and/or contractor and surety satisfactory to the County's Legal Department has been submitted as security for the proposed improvements. The final plat shall not be filed with the County Register of Deeds, nor shall construction of the proposed improvements be permitted to commence, until the Improvement Agreement is executed by the BOCC and the agreements and bonds are filed in the proper county offices.

Depending upon the type of improvement proposed to be constructed, a standard Improvement Agreement may contain the following requirements or clauses, among others:

1. The owner shall construct the proposed streets and storm drainage improvements at his own expense. Construction shall not commence until the owner receives the prior written approval of the County Engineer.

2. The streets and storm drainage improvements will be constructed in accordance with the County's standards and according to the plans approved by the County Engineer.

3. The owner will employ a licensed professional engineer to design the street and storm drainage systems to County standards and to inspect the construction to

insure that the improvements are built according to the lines, grades and dimensions on the approved plans.

4. The owner shall provide the County with sufficient surety in the form of performance and maintenance bonds or an Irrevocable Letter of Credit, in an amount equal to or greater than the certified estimate of the County Engineer, to insure that the construction will be built and will be maintained in accordance with the County's standards. The construction must be completed by the owner and approved in writing by the County Engineer within one (1) year from the date of the bonds and/or letter of credit. The owner shall be responsible for maintenance of the completed road for a period of one (1) year following the above written approval of the County Engineer. The owner shall also provide the County with a Labor and Payments Bond in an amount equal to or greater than the certified estimate of the County Engineer.

5. The streets will be barricaded to public travel until the improvements are completed and approved by the County Engineer.

6. The owner shall pay the County Public Works Department for costs incurred for inspections necessary to assure the County that the work is being constructed according to the approved plans and standards.

7. The County Engineer shall have the authority to reject work that does not conform to approved plans and standards.

8. The County will install all the necessary permanent street, warning, and regulatory signs, the cost incurred for installation to be paid to the County by the owner within twenty (20) days of the billing date.

9. A "Certificate of Occupancy" will not be issued by the County Building Codes Division regarding any buildings, structures, or other similar construction until the street and storm drainage improvements are satisfactorily completed and approved by the County Engineer.

10. Prior to the acceptance by the County of a road offered in dedication, and in any event prior to the filing of the final plat with the Office of the Register of Deeds, the owner of the real property offered in dedication shall exhibit proof of title to said property and proof of release of any mortgages, liens or encumbrances thereon, if any, in a manner satisfactory to the County's Chief Counsel or his designate.

11. At the completion of major construction, but prior to final approval of the County Engineer, the owner will employ, at his own expense, a registered land surveyor to set or verify the location of all property markers shown on the final subdivision plat.

# Chapter 6
# Detail Drawings

## INDEX