

Unified Government - Sanitary Review: Gravity Main Checklist

Name of Development: _____

Review No.: _____

Review Date: _____

General

1	Validate that aerial crossing, pump station, inverted siphons, force main, or LPS are not present. If present forward a copy of the plans to an engineering supervisor for the review of the aforementioned elements of the sanitary sewer system.	OK _____	Revise _____	NA _____
<i>Comment:</i>				
2	Validate that the cover sheet is sealed and signed by an engineer licensed in the state of Kansas.	OK _____	Revise _____	NA _____
<i>Comment:</i>				
3	Validate that the cover sheet contains an approval block for the County Engineer.	OK _____	Revise _____	NA _____
<i>Comment:</i>				
4	Validate that a completed KDHE sewer extension permit application with flow calculations has been submitted.	OK _____	Revise _____	NA _____
<i>Comment:</i>				
5	Validate that the plans or a separate cover sheet show all land in the watershed that have potential for gravity flow through the project area.	OK _____	Revise _____	NA _____
<i>Comment:</i>				
6	Validate that manhole numbering and stationing is logical and consistent between the plan and profile and that adequate UG node numbers for existing lines are shown. Sanitary and storm sewer maps (with UG node numbers) and as-built drawings may be obtained from the Sewer Maintenance Department (913-573-5535).	OK _____	Revise _____	NA _____
<i>Comment:</i>				
7	Validate that all existing utilities and proposed sanitary and storm sewers are shown and are consistent between the plan and profile sheets.	OK _____	Revise _____	NA _____
<i>Comment:</i>				
8	Validate that the cover sheet contains a statement from the engineer describing his efforts to determine the existing utilities, the sources of information, and which utility locates were surveyed.	OK _____	Revise _____	NA _____
<i>Comment:</i>				
9	Validate that the following note referencing the UG Technical Provisions and Standard Drawings is in a prominent location:	OK _____	Revise _____	NA _____

"All work in public easements and Right-of-Way and all erosion control work must comply with the latest edition of the Technical Provisions & Standard Drawings for Roads and Sewers, of the Unified Government of Wyandotte County/Kansas City, Kansas. If any of the general notes conflict with the Technical Provisions & Standard Drawings for Roads and Sewers, of the Unified Government of Wyandotte County/Kansas City, Kansas, the UG's standards shall override."

Comment:

- | | | | | |
|----|---|-----------------------------|---------------------------------|-----------------------------|
| 10 | Validate that UG standard details are not present in the drawing set and that required special details not covered by UG standard details are included. | OK <input type="checkbox"/> | Revise <input type="checkbox"/> | NA <input type="checkbox"/> |
|----|---|-----------------------------|---------------------------------|-----------------------------|

Comment:

- | | | | | |
|----|--|-----------------------------|---------------------------------|-----------------------------|
| 11 | Validate that each manhole is shown with a coordinate pair identifying the manhole. (may be shown as a leader to each manhole or in table) | OK <input type="checkbox"/> | Revise <input type="checkbox"/> | NA <input type="checkbox"/> |
|----|--|-----------------------------|---------------------------------|-----------------------------|

Comment:

- | | | | | |
|----|--|-----------------------------|---------------------------------|-----------------------------|
| 12 | Validate that the location of the project benchmark is shown and that the datum is acceptable (State Plane Coordinate NAD 83). | OK <input type="checkbox"/> | Revise <input type="checkbox"/> | NA <input type="checkbox"/> |
|----|--|-----------------------------|---------------------------------|-----------------------------|

Comment:

- | | | | | |
|----|---|-----------------------------|---------------------------------|-----------------------------|
| 13 | Validate that offsite easements encompassing the limits of work have been submitted and approved. | OK <input type="checkbox"/> | Revise <input type="checkbox"/> | NA <input type="checkbox"/> |
|----|---|-----------------------------|---------------------------------|-----------------------------|

Comment:

Flow Analysis

- | | | | | |
|----|---|-----------------------------|---------------------------------|-----------------------------|
| 14 | Validate that the proposed system is adequately sized to carry the flow from the potential upstream service area. If the potential upstream service area is less than 36 acres the minimum pipe size of 8" is adequate. If greater than 36 acres check flow calculations. | OK <input type="checkbox"/> | Revise <input type="checkbox"/> | NA <input type="checkbox"/> |
|----|---|-----------------------------|---------------------------------|-----------------------------|

Comment:

- | | | | | |
|----|---|-----------------------------|---------------------------------|-----------------------------|
| 15 | Validate that the downstream sewer system has adequate capacity for the proposed development.
- Check with the SMD for a report of known problems.

- If the site generates less than 0.10 cfs peak hourly flow, and there is not a history of flow problems downstream, then the downstream capacity is acceptable. | OK <input type="checkbox"/> | Revise <input type="checkbox"/> | NA <input type="checkbox"/> |
|----|---|-----------------------------|---------------------------------|-----------------------------|

Comment:

- | | | | | |
|----|--|-----------------------------|---------------------------------|-----------------------------|
| 16 | Validate that the design of all sanitary sewer improvements are based on the design peak hourly flow rate with an approximate allowance for inflow and infiltration. | OK <input type="checkbox"/> | Revise <input type="checkbox"/> | NA <input type="checkbox"/> |
|----|--|-----------------------------|---------------------------------|-----------------------------|

Comment:

- | | | | | |
|----|--|----------|--------------|----------|
| 17 | Validate that pipe slopes shown correspond to slopes used in pipe design calculations and verify that a full pipe flow velocity is between 2.7 and 10 feet per second. If velocity is greater than 10 feet per second verify that there is a separate manhole detail showing protection against erosive force. | OK _____ | Revise _____ | NA _____ |
|----|--|----------|--------------|----------|

Comment:

Plan View

In order to meet the layout requirements of items 22, 23, and 28 it is typical to locate sanitary sewer under the street pavement.

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|----|--|----------|--------------|----------|
| 18 | Validate that the horizontal alignment of gravity sewers is straight between manholes. | OK _____ | Revise _____ | NA _____ |
|----|--|----------|--------------|----------|

Comment:

- | | | | | |
|----|--|----------|--------------|----------|
| 19 | Validate that easements are shown on the plan view and that they correspond with the platted easement. | OK _____ | Revise _____ | NA _____ |
|----|--|----------|--------------|----------|

Comment:

- | | | | | |
|----|--|----------|--------------|----------|
| 20 | Validate that sanitary sewers are not located under wetlands, ponds, lakes or wet/dry detention ponds. | OK _____ | Revise _____ | NA _____ |
|----|--|----------|--------------|----------|

Comment:

- | | | | | |
|----|---|----------|--------------|----------|
| 21 | Validate that the sanitary sewer layout is located primarily in the ROW, that side yard and backyard runs are minimized, and that crossing angles with other utilities are greater than 45 degrees. | OK _____ | Revise _____ | NA _____ |
|----|---|----------|--------------|----------|

Comment:

- | | | | | |
|----|--|----------|--------------|----------|
| 22 | Validate that the layout of the sanitary sewer provides a corridor for the installation of water main which will maintain a minimum horizontal separation of 10 feet between parallel water and sanitary sewer lines without unnecessary street crossings by either utility. | OK _____ | Revise _____ | NA _____ |
|----|--|----------|--------------|----------|

Comment:

- | | | | | |
|----|--|----------|--------------|----------|
| 23 | Validate that service connections are not connected to interceptor sewers, manholes, or force mains, service is provided adjacent to every platted lot, service lines are shown for all lots, do not cross property lines, do not run longitudinally in a street or alley, and extend to the property line of the building served. Large service connections from institutional or commercial/industrial sites may be to manholes. | OK _____ | Revise _____ | NA _____ |
|----|--|----------|--------------|----------|

Comment:

- | | | | | |
|----|--|----------|--------------|----------|
| 24 | Validate that duplexes have a separate sewer service connection for each unit. | OK _____ | Revise _____ | NA _____ |
|----|--|----------|--------------|----------|

Comment:

- | | | | | |
|----|---|----------|--------------|----------|
| 25 | For attached houses, other than duplexes, validate that:
a. They have a common sewer service connection. | OK _____ | Revise _____ | NA _____ |
|----|---|----------|--------------|----------|

b.	The individual house services are ganged outside of the foundation.	OK _____	Revise _____	NA _____
c.	Covenants or plat restrictions provide for common maintenance of the ganged sewer service.	OK _____	Revise _____	NA _____
<i>Comment:</i>				
26	Validate that manhole covers are located away from curb, sidewalk, and drainage swales.	OK _____	Revise _____	NA _____
<i>Comment:</i>				
27	Validate that bolted manhole lids are shown on interceptor sewers.	OK _____	Revise _____	NA _____
<i>Comment:</i>				
28	Validate that a manhole/junction box is located within 10 feet of a property or benefit district boundary in order to provide connection to potential upstream service areas.	OK _____	Revise _____	NA _____
<i>Comment:</i>				
29	Validate that branch lines have a terminal manhole.	OK _____	Revise _____	NA _____
<i>Comment:</i>				
30	Validate that flow change in direction in manholes is not greater than 90°.	OK _____	Revise _____	NA _____
<i>Comment:</i>				
31	Validate that each manhole has convenient access and that the grading within access route and within 15 feet of each manhole does not exceed 6:1.	OK _____	Revise _____	NA _____
<i>Comment:</i>				
32	Validate that manholes are located outside of natural and manmade watercourses. When manholes located in the watercourse are justified in the design memorandum validate that they have bolt down lids.	OK _____	Revise _____	NA _____
<i>Comment:</i>				
33	Validate that stream crossings meet the following design criteria: - sewer line crosses nearly perpendicular to the stream flow. - upstream and downstream trench checks are included. - sewer line has concrete encasement or is DIP material. - upstream and downstream manholes located outside the likely meander of the stream.	OK _____	Revise _____	NA _____
<i>Comment:</i>				
34	Validate that manholes have a minimum 18 inch length of precast wall between penetrations. A manhole invert plan is required to demonstrate the minimum wall when ever any of the following conditions apply: - any pipe into or out of the manhole has a diameter of more than 18 inches.	OK _____	Revise _____	NA _____

- the angle between any two adjacent pipes is less than 117 degrees.

Comment:

Profile View

- 35 Validate that the drop through manhole meets the following: OK ____ Revise ____ NA ____
- for changes in flow direction up to and including 45 degrees, provide a drop of 0.2 feet.
 - for changes in flow direction between 45 and 90 degrees, provide a drop of 0.4 feet.
 - or an outside drop is provided.

Comment:

- 36 Validate that a manhole/junction box is located at every convergence of flows (except service connections); at every horizontal bend; at every change in pipe material, diameter, or slope; and at distances not to exceed 500 feet for diameters of 18 inches or less, and not to exceed 600 feet for pipe diameters larger than 18 inches. OK ____ Revise ____ NA ____

Comment:

- 37 Validate that the pipe material is PVC, DIP, Lined Reinforced Concrete, Composite Pipe or that deviation is justified in the approved designed memorandum. OK ____ Revise ____ NA ____

Comment:

- 38 Validate changes in pipe material take place at a manhole. OK ____ Revise ____ NA ____

Comment:

- 39 Validate that pipe size does not decrease in the direction of flow. OK ____ Revise ____ NA ____

Comment:

- 40 Validate that the minimum cover requirement of 6 feet is satisfied. OK ____ Revise ____ NA ____

Comment:

- 41 Validate that the existing utilities and proposed storm lines are shown and correlate with the plan view. OK ____ Revise ____ NA ____

Comment:

- 42 Validate there is a minimum of 2 feet clear space between crossing sanitary and storm sewer lines. OK ____ Revise ____ NA ____

Comment:

- 43 Validate that the proposed sanitary sewer line has a minimum of 2 feet clear space lower than existing water lines. OK ____ Revise ____ NA ____

Comment:

- 44 Validate that embankment fill conditions do not exist or are mitigated. Refer to figure 5609.8.R. OK ____ Revise ____ NA ____

Comment:

45	Validate that slope anchors are provided or are not needed. (Necessary if slope is greater than 20% and if there is a vertical drop greater than 8' in a reach)	OK _____	Revise _____	NA _____
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Comment:

46	Validate that the maximum depth of cover does not exceed 20 feet or that strength calculations are provided. If depth of cover is greater than 20 feet recalculate the strength analysis.	OK _____	Revise _____	NA _____
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Comment:

Plat

47	Validate that rights of way and easements are shown and provide adequate side distance from the edge of easement for maintenance (Easements to be 15' minimum or depth to flow line, which ever is greater, with pipe centered in easement).	OK _____	Revise _____	NA _____
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Comment:

48	For industrial/commercial/institutional properties verify that building footprints including roof overhang and footing do not encroach on the ROW or easements.	OK _____	Revise _____	NA _____
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Comment:

49	Validate that each manhole is provided with easements sufficient for maintenance activities.	OK _____	Revise _____	NA _____
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Comment:

50	Validate that minimum serviceable floor elevations, MSFE, are established on the plat for each lot where any of the following apply:	OK _____	Revise _____	NA _____
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- where a sewer pipe in road has less than 9 feet of cover.
- where a lot is served by a sewer main in a location other than road way fronting the lot.
- where the final grade elevation at the building setback line is lower than the back of curb on the adjacent.
- where a lot is unusually deep and any portion of the allowable building site is lower than the back of curb.

Comment:

Provide an operations and maintenance manual for the proposed swimming pool. Coordinate with Scott Craig, Environmental Manager, 913-573-1313, sCraig@wycokck.org for evaluation, testing, or other requirements to release pool water to the public sanitary sewer system.