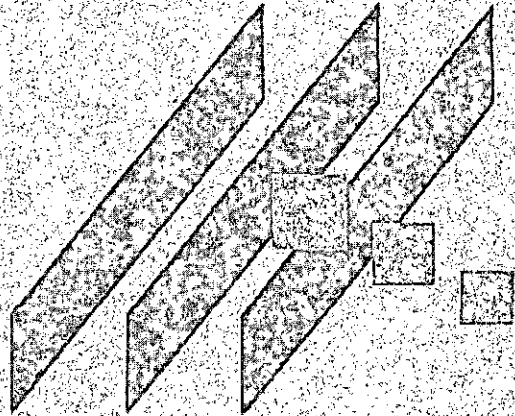


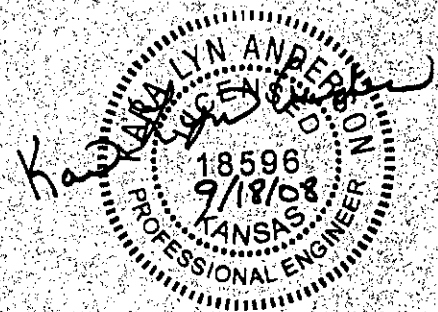
M K E C ENGINEERING CONSULTANTS, I N C



SUPPLEMENTAL DRAINAGE REPORT

FOR

REUSSER ADDITION
Sedgwick County, Kansas



SEPTEMBER 2008

Supplemental Drainage Report for Reusser Addition Sedgwick County, Kansas

Location

The subject property is in Sedgwick County, Kansas. The proposed residential development is located in the northeast $\frac{1}{4}$ of the southeast $\frac{1}{4}$ of Section 34, Township 26 South, Range 2 East. The Reusser Addition consists of 37.9 acres of property west of 127th Street East, between 29th and 37th Street North. Four Oaks Addition is just north of the site.

Update

This report is in response to comments received via email from Sedgwick County on September 10th, 2008. This is a supplement to the drainage report submitted to Sedgwick County and the City of Wichita on September 5th, 2008 (*Drainage Report for Reusser Addition, Sedgwick County, Kansas, September 2008*).

Comments and Response

Comment 1: "The west end of the cul de sac on Reusser Circle is more than a foot lower than the crest on the road. It may be better to route this drainage to the west, in a channel, from the cul de sac to the west end of the plat. Place in an easement on the property lines"

- Response: Although the natural drainage pattern of this area does trend to the west, the intention with this drainage design was to avoid draining a majority of the road between lots. The final grading will allow this flow pattern to be maintained and will direct flow away from the lots and structures.

Comment 2: "Drainage from lots 6 and 7 drains onto lots 4 and 5. Direct the storm water to the east and west in a channel from the crest to the road and plat line."

- Response: A channel is proposed to direct runoff from lots 6 and 7 to the west. The South Channel will have a 10-foot bottom with 4:1 side slopes, 0.5% channel slope and will convey 12.0 cfs in the 100-year event. The depth of this channel during the 100-year event will be 0.5'. The runoff from lot 6 that needs to be directed east is minimal because of the small contributing area. A defined channel is not proposed for this easement but final grading will direct runoff from this area east to the road. The channel calculations are in Appendix A and the revised Drainage and Utility Plan is in Appendix B.

Comment 3: "The drainage from the cul de sac on Reusser Court to the west needs to be in a channel. Show how you plan to keep this storm water from going to the northwest in the existing natural drainage area."

- Response: A channel is proposed to direct runoff from this area to the west. The North Channel will have a 10-foot bottom with 4:1 side slopes, 0.5% channel slope and will convey 18.8 cfs in the 100-year event. The depth of this channel during the 100-year event will be 0.7'. The proposed channel will direct flow to the west and into the west channel; therefore, re-directing the flow to avoid crossing the adjacent lot. The channel calculations are in Appendix A and the revised Drainage and Utility Plan is in Appendix B.

Comment 4: "Lot 3 may need drainage easements in the low areas of natural drainage."

- Response: Site runoff will be directed through the West Channel. The only runoff through the low area on lot 3 will be local runoff from the subject lot.

Comment 5: "The west line of the plat needs a channel for the storm water on the west line of lots 7, 4 and 3."

- Response: A channel is proposed to convey runoff from the west property line north. The West Channel will have a 10-foot bottom with 4:1 side slopes, 1.5% channel slope and will convey 37.9 cfs in the 100-year event. The depth of this

channel during the 100-year event will be 0.7'. The channel calculations are in Appendix A and the revised Drainage and Utility Plan is in Appendix B.

Summary

This supplemental report addresses comments received from Sedgwick County on September 10th, 2008 regarding the Reusser Addition. Channel calculations and a revised Drainage and Utility Plan are included.

Appendix A
Flowmaster Calculations

Flowrate Calculations by Rational Method
 Reusser Addition

$$Q = cIA$$

Area Name	Area (ac)	Rational Runoff Coefficient: C				Time of Concentration (min): T _c				Rainfall Intensity (in/hr): I				Flow Rate (cfs): Q				Design Storm (Q (cfs))	Design (Q (cfs))
		2-Year	5-Year	10-Year	100-Year	2-Year	5-Year	10-Year	100-Year	2-Year	5-Year	10-Year	100-Year	2-Year	5-Year	10-Year	100-Year		
North Channel	5.3	0.48	0.48	0.48	0.48	15.0	15.0	15.0	15.0	3.83	4.56	5.22	7.37	9.74	11.60	13.28	18.75	100	18.75
South Channel	3.4	0.48	0.48	0.48	0.48	15.0	15.0	15.0	15.0	3.83	4.56	5.22	7.37	6.25	7.44	8.52	12.03	100	12.03
West Channel	10.7	0.48	0.48	0.48	0.48	15.0	15.0	15.0	15.0	3.83	4.56	5.22	7.37	19.67	23.42	26.81	37.85	100	37.85

Worksheet for North- 1

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Roughness Coefficient	0.030	
Channel Slope	0.00500	ft/ft
Left Side Slope	4.00	ft/ft (H:V)
Right Side Slope	4.00	ft/ft (H:V)
Bottom Width	10.00	ft
Discharge	18.75	ft ³ /s

Results

Normal Depth	0.65	ft
Flow Area	8.16	ft ²
Wetted Perimeter	15.34	ft'
Top Width	15.18	ft
Critical Depth	0.45	ft
Critical Slope	0.01815	ft/ft
Velocity	2.30	ft/s
Velocity Head	0.08	ft
Specific Energy	0.73	ft
Froude Number	0.55	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.65	ft
Critical Depth	0.45	ft
Channel Slope	0.00500	ft/ft
Critical Slope	0.01815	ft/ft

Worksheet for South- 1

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Roughness Coefficient	0.030	
Channel Slope	0.00500	ft/ft
Left Side Slope	4.00	ft/R (H:V)
Right Side Slope	4.00	ft/R (H:V)
Bottom Width	10.00	ft
Discharge	12.03	ft ³ /s

Results

Normal Depth	0.50	ft
Flow Area	6.05	ft ²
Wetted Perimeter	14.15	ft
Top Width	14.03	ft
Critical Depth	0.34	ft
Critical Slope	0.01970	ft/ft
Velocity	1.99	ft/s
Velocity Head	0.06	ft
Specific Energy	0.57	ft
Froude Number	0.53	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.50	ft
Critical Depth	0.34	ft
Channel Slope	0.00500	ft/ft
Critical Slope	0.01970	ft/ft

Worksheet for West- 1

Project Description

Friction Method Manning Formula
Solve For Normal Depth

Input Data

Roughness Coefficient	0.030	
Channel Slope	0.01500	ft/ft
Left Side Slope	4.00	ft/ft (H:V)
Right Side Slope	4.00	ft/ft (H:V)
Bottom Width	10.00	ft
Discharge	37.85	ft ³ /s

Results

Normal Depth	0.71	ft
Flow Area	9.05	ft ²
Wetted Perimeter	15.82	ft
Top Width	15.65	ft
Critical Depth	0.69	ft
Critical Slope	0.01606	ft/ft
Velocity	4.18	ft/s
Velocity Head	0.27	ft
Specific Energy	0.98	ft
Froude Number	0.97	
Flow Type	Subcritical	

GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.71	ft
Critical Depth	0.69	ft
Channel Slope	0.01500	ft/ft
Critical Slope	0.01606	ft/ft

Appendix B
Revised Drainage and Utility Plan

