Baughman

NOV 10 2009

TRANSMITTAL

TO:	FROM:
Scott Lindebak	Pat Baer
COMPANY:	DATE:
City of Wichita, Storm Water Dept.	10/23/09
ADDRESS:	PROJECT:
455 N. Main	Steve Kelley 6th Addition
CITY/ STATE:	PROJECT NUMBER:
Wichita, KS 67211	09-10-E553

RE:
Drainage Report Submittal

VIA: MAIL

We are sending you: ☒ ATTACHED ☐ UNDER SEPARATE COVER

☐ PLANS ☒ PRINTS ☐ SHOP DRAWINGS ☐ SAMPLES ☐ SPECS
☐ COPY OF LETTER ☐ CHANGE ORDER ☐ DISK ☐ OTHER

COPIES	DATE	DESCRIPTION
1		**Drainage Report & Drainage Plan for Steve Kelley 6th Addition**

☐ URGENT ☒ FOR APPROVAL ☐ FOR YOUR INFO ☐ FOR REVIEW & COMMENT
☐ APPROVED AS NOTED ☐ REVISE AS NOTED ☐ REVISE AND RETURN
☐ AS REQUESTED ☐ PLEASE REPLY ☐ FOR BIDS DUE ☐

NOTES/ COMMENTS:
Scott,

Attached is the Drainage Report for Steve Kelley 6th Addition. A preliminary copy of emailed to you on October 2nd and Tim Davidson approved the Drainage Plan in the Preliminary Plat review. Please note the only revision I have made is to include some supporting documentation not included in the initial submittal. Thank you and please give me a call if you have any questions I can answer. Have a good day,

SIGNED: _____
Patrick S. Baer, PE

Copy:

ENGINEERING
SURVEYING
PLANNING
LANDSCAPE ARCHITECTURE

Baughman Company, P.A.
315 Ellis Street
Wichita, Kansas 67211
P 316.262.7271
F 316.262.0149

DRAINAGE PLAN
STEVE KELLEY 6TH ADDITION
TO
WICHITA, SEDGWICK COUNTY, KANSAS

PREPARED BY

Baughman
ENGINEERING | SURVEYING | PLANNING
LANDSCAPE ARCHITECTURE

6 November 2009

Project # 09-08-P528

PATRICK SHAWN BAER
LICENSED
16976
11/6/09
KANSAS
PROFESSIONAL ENGINEER

ENGINEERING | SURVEYING | PLANNING
LANDSCAPE ARCHITECTURE

DRAINAGE PLAN
STEVE KELLEY 6TH ADDITION

PRELIMINARY REPORT

Prepared by Baughman Company, P.A.
6 November 2009

By Patrick S. Baer, P.E.

REPORT CONTENTS

PROJECT NARRATIVE

EXISTING CONDITIONS

This rectangular lot is located east of Lark and 330' south of the intersection of Lark and Carr in the City of Wichita, KS. The site is currently three unplatted parcels. The site is bordered on the north and south by 2/3rd of an acre parcels with single family residences and bordered on the east with a 1.9acre parcel with a single family residence. The site is fronted by Lark Road to the west.

The entire 1.86 acre tract of land is currently vacant with a hedge row along the west lot line and a drainage channel along the east. The peak runoff was calculated using the Rational Method with the following site considerations: soil conditions, percentage of impervious area, surface slope and observed topography. The site drains from the west line to the east, with the drainage channel draining runoff to the north. The drainage channel routes runoff from this site, the 1.9acre property to the east, and an addition 7.5 acres located to the south. The overall limits of the runoff basin are limited East to West by Lark and Stoney Point, and North to South by 350' south of Carr and the drainage channel located just south of May.

PROPOSED CONDITIONS

The proposed backyards (basin 3) will drain to the east, the proposed front yard and Lark Court will drain to the west, into the existing Lark Lane. The proposed development will increase the overall impervious area of the site. The existing offsite drainage, draining along the east line of the addition will continue to drain along the proposed drainage and utility easement and drain to the north. Downstream of this site is an existing pair of detention ponds located on both the south and north side of Carr Road. The existing and proposed time of concentration will be equal at 15 minutes, the minimum time of concentration. The limited increase to the peak runoff by will have a negligible effect on the downstream detention pond. For this reason, detention basins will not be recommended for this project.

OFFSITE CONDITIONS

To the south and east, 9.36 acres of large single residential lots drain thru the channel located along the east line of this property, draining to the north. Directly downstream of this parcel, at the north east corner of the property, is located a detention pond. This detention pond extends under Carr Road, and drains into a second detention pond. This second detention pond then discharges into an abandoned railroad right of way, draining east and into the Cowskin creek. Cumulatively, 61 acres drain to these detention ponds. With the size and total detention pond drainage size, the in limited increased runoff, from the development of this parcel of land, will not create an observable increase in the peak runoff or peak detention pond elevation. Since the detention pond will not have an observable increase in the peak runoff or detention pond elevation, we propose the construction of detention basins for these improvements will have no benefit and not be required.

EXISTING CONDITIONS RUNOFF CALCULATIONS

DRAINAGE METHODS & STANDARDS

The following methods and standards, although not a complete list, were used in calculating the existing conditions runoff values.

- STORM SERIES
  - 2-year, 5-year, 10-year, 25-year, 100-year Storm Events Modeled
  - Time of Concentration (TR55 Method) 15 min
  - 2-yr Rainfall Depth = 3.83 in
  - 5-yr Rainfall Depth = 4.54 in
  - 10-yr Rainfall Depth = 5.22 in
  - 25-yr Rainfall Depth = 6.06 in
  - 100-yr Rainfall Depth = 7.37 in

- FLOW DATA
  - Existing Conditions modeled using Rational Method.
  - Areas per USGS Quadrangle Sheet, Aerial Photos, and Site Visits
  - Runoff Coefficient:

Factors	Offsite	Ex. Site*
C_2 =	0.33	0.22
I_2 =	3.83	3.83
C_5 =	0.35	0.24
I_5 =	4.53	4.53
C_{10} =	0.4	0.3
I_{10} =	5.22	5.22
C_{25} =	0.43	0.32
I_{25} =	6.06	6.06
C_{100} =	0.51	0.41
I_{100} =	7.37	7.37

SITE CHARACTERISTICS

The current site has groups B soil classifications; with no impervious cover (buildings & parking lot) on site. The offsite area draining onto this parcel are large single residential lots (1/2 to 1 acre lots). Downstream (north) has two detention ponds with runoff routing from single family structures with approximately 4 lots per acre. Additionally a commercial site is located on the east side of the detention ponds. The aerial photograph with lidar information illustrates the drainage pattern.

EXISTING CONDITIONS HYDROLOGIC ANALYSIS

The site was analyzed for existing-development conditions using the rational method for the 2, 5, 10, 25 and 100 year storm events. The runoff coefficients were calculated for the existing soil conditions and percentage of impervious area for existing conditions. The time of concentration of 15 minutes has been used, per city of Wichita design requirement, since the TR55 method was calculated to be less this the minimum Tc. Below is a table with the peak discharge calculated for the

northeast corner of this parcel, including the offsite contribution of runoff. Basin #3 is the total peak runoff component for this parcel of land.

Existing Site Runoff table:

Basin #	Area (ac) (acres)	Q_2 (cfs)	Q_5 (cfs)	Q_{10} (cfs)	Q_{25} (cfs)	Q_{100} (cfs)
1	7.50	9.48	11.89	15.66	19.54	28.19
2	1.86	2.35	2.95	3.88	4.85	6.99
3*	1.86	1.57	2.02	2.91	3.61	5.62
Total Basin =	11.22	**13.4**	**16.9**	**22.5**	**28.0**	**40.8**

* = Existing site (undeveloped, soil Group B)

DOWNSTREAM DRAINAGE CAPACITY

Directly north, downstream of this parcel is a detention pond. This detention pond discharges to the north with multiple culvert pipes, crossing Carr Road. Runoff continues to drain north into 2 detention ponds tied in series, discharging into a channel located on the south line of an abandoned railroad right of way. The total drainage basin for these pond include approximately 61 acres, developed with residential lots located on the east and residential and commercial land developed along the west. The existing size and capacity of these detention ponds (225 cfs during a 100 year event) suggest the development of this parcel of land will not create a measurable increase in peak runoff.

POST-DEVELOPMENT HYDROLOGIC ANALYSIS

DRAINAGE METHODS & STANDARDS

The following methods and standards, although not a complete list, were used in developing the drainage and grading plans.

- STORM SERIES
  - 2-year, 5-year, 10-year, 25-year, 100-year Storm Events Modeled
  - Time of Concentration (TR55 Method) 15 min
  - 2-yr Rainfall Depth = 3.83 in
  - 5-yr Rainfall Depth = 4.54 in
  - 10-yr Rainfall Depth = 5.22 in
  - 25-yr Rainfall Depth = 6.06 in
  - 100-yr Rainfall Depth = 7.37 in

- FLOW DATA
  - Existing Conditions modeled by Rational Method.
  - Areas per USGS Quadrangle Sheet, Aerial Photos, and Site Visits
  - *Runoff Coefficient:*

Factors	Offsite	Prop. Site#
C_2 =	0.33	0.39
I_2 =	3.83	3.83
C_5 =	0.35	0.41
I_5 =	4.53	4.53
C_{10} =	0.4	0.47
I_{100} =	5.22	5.22
C_{25} =	0.43	0.5
I_{100} =	6.06	6.06
C_{100} =	0.51	0.57
I_{100} =	7.37	7.37

  - Peak calculated runoff:

Basin #	Area (ac) (acres)	Q_2 (cfs)	Q_5 (cfs)	Q_{10} (cfs)	Q_{25} (cfs)	Q_{100} (cfs)
1	7.50	9.48	11.89	15.66	19.54	28.19
2	1.86	2.35	2.95	3.88	4.85	6.99
3#	1.14	1.70	2.12	2.80	3.45	4.79
4#	0.72	1.08	1.34	1.77	2.18	3.02
Total Basin =	11.22	**14.6**	**18.3**	**24.1**	**30.0**	**43.0**

= Revised coefficient from proposed improvements

- GRADING CONSTRAINTS
  - Minimum 0.5% Street & Pavement Grades
  - Minimum 1.0% Rear Lot Grades, Goal of 1.5%
  - Double Curb Inlets utilized at all street sump locations
  - Emergency Overflows for 24-hr, 100-yr Storm Event

DETENTION FACILITIES

The construction of a detention basin for the development for this parcel has not shown to have a significant impact on the upstream or downstream properties. The limited increase to detention runoff and proximity to existing detention ponds appear to show no calculated increase in peak runoff or peak detention elevation.

DISCHARGE POINTS SUMMARY

The site currently sheet flows to the northeast corner of the site onto the land to the north. The 20' drainage and utility easement located along the north and south line will ensure backyard runoff travels directly east, into the existing channel (basin #3). The existing channel should be preserved to ensure no destruction to the existing vegetation and protect against erosion within the channel. Basin 4, the front yards and Lark Court will drain to the west and into Lark. Lark has a existing 6" full height curb with minimal slope to the north. This curb collects only the runoff from the street and adjacent drives and routes it to the north. The increase in runoff from the proposed Lark Court will increase the total runoff to Lark, however the existing curb has a capacity of 10 cfs.

POTENTIAL UPSTREAM/DOWNSTREAM IMPACTS

There do not appear to be any significant impacts upstream or downstream of this site due to the proposed development.

FLOODPLAIN SUBMITTAL

SOURCE OF FLOODPLAIN INFORMATION

The site is not located within a mapped FEMA SFHA. The location of the property, on FEMA FIRM Panel 340 of 700, map 20173 C, is attached as Exhibit 5 (for Sedgwick County, Kansas; effective February 2, 2007).

FEDERAL, STATE, & LOCAL PERMITTING

US ARMY CORPS OF ENGINEERS
There does not appear to be any USACOE permitting needed on the proposed site at this time.

KANSAS DEPT OF AGRICULTURE – DWR PERMITTING
There does not appear to be any DWR permitting needed on the proposed site at this time.

FEMA
There is no mapped floodplain located upon the proposed site. Therefore, no FEMA permitting is expected at this time.

KANSAS DEPT OF TRANSPORTATION
There does not appear to be any KDOT permitting needed on the proposed project.

SEDGWICK COUNTY PERMITTING
No portion of the site will discharge into County Street Right of Way and will therefore not require a county ROW Permit.

EXHIBITS

EXHIBIT 1: Aerial Photo Exhibit with Topography

EXHIBIT 2: Plat – Half Scale

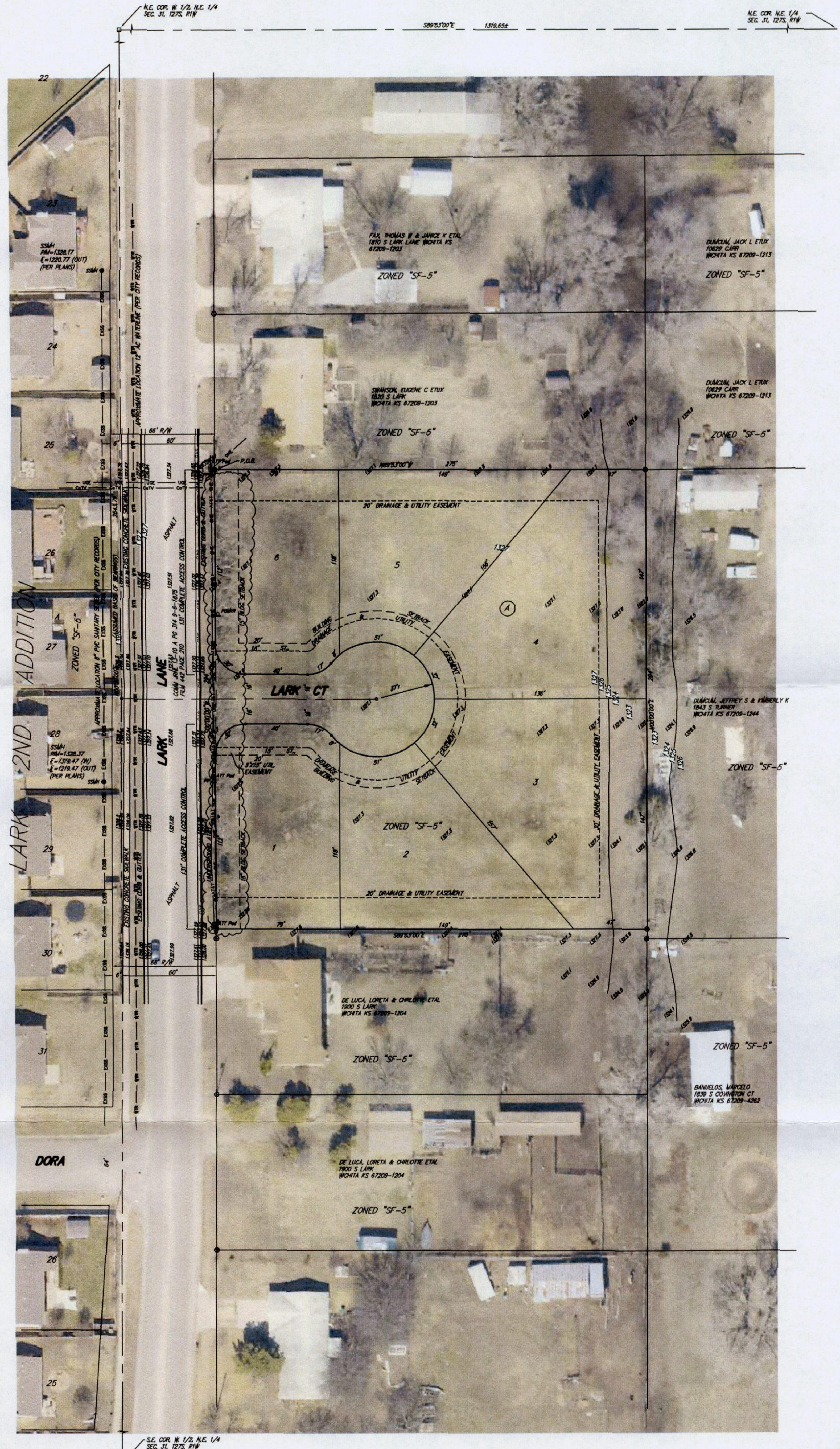
EXHIBIT 3: Drainage Plan – Half Scale

EXHIBIT 4: FIRMETTE

PRELIMINARY PLAT

STEVE KELLEY 6TH ADDITION

WICHITA, SEDGWICK COUNTY, KANSAS



0 30 60

DATE OF PREPARATION: 28 SEPTEMBER, 2009
DATE OF TOPOGRAPHY: 14 SEPTEMBER, 2009
CONTOUR INTERVALS = 1 FOOT

OWNER/DEVELOPER:
KELLEY & COLEMAN INC
633 N. KESSLER,
WICHITA, KS 67203 PH:
316-393-5254

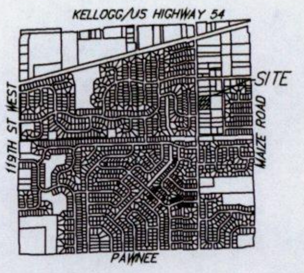
LEGAL DESCRIPTION:
BEGINNING AT A POINT 1269.66 FEET WEST OF THE NORTHEAST CORNER OF SEC. 31, TWP. 27-S, R-1-W OF THE 6TH P.M., SEDGWICK COUNTY, KANSAS; THENCE WITH A DEFLECTION LEFT OF 90°07', A DISTANCE OF 1741.11 FEET TO A POINT OF BEGINNING; THENCE SOUTH 294.00 FEET; THENCE EAST 275.00 FEET; THENCE NORTH 294.00 FEET THENCE WEST 275.00 FEET TO A POINT OF BEGINNING.

BENCHMARK:
SQUARE CUT TOP OF CURVE 9 FEET WEST OF NORTHWEST CORNER OF LOT AT 1900 S. LARK
ELEV.=1328.49 (NAVD 88)

◉ = #4 REBAR W/ "BAUGHMAN" CAP (FOUND)
○ = 1/2" IRON (FOUND)
⊠ = 3/4" IRON PIPE IN CONC. (FOUND)
□ = #1" IRON (FOUND)

PP = Power Pole
SSMH = Sanitary Sewer Manhole
ATT Ped = ATT Pedestal
FOMKR = Fiberoptic Marker

WATER LINE — WTR
SOUTHWESTERN BELL — AT&T
GAS LINE — GAS
CABLE TV — CaTV
FENCE
OVERHEAD ELECTRIC LINE — OHE
SANITARY SEWER — EXSS
UNDERGROUND ELECTRIC LINE — UGE
PIPELINE — PIPELINE

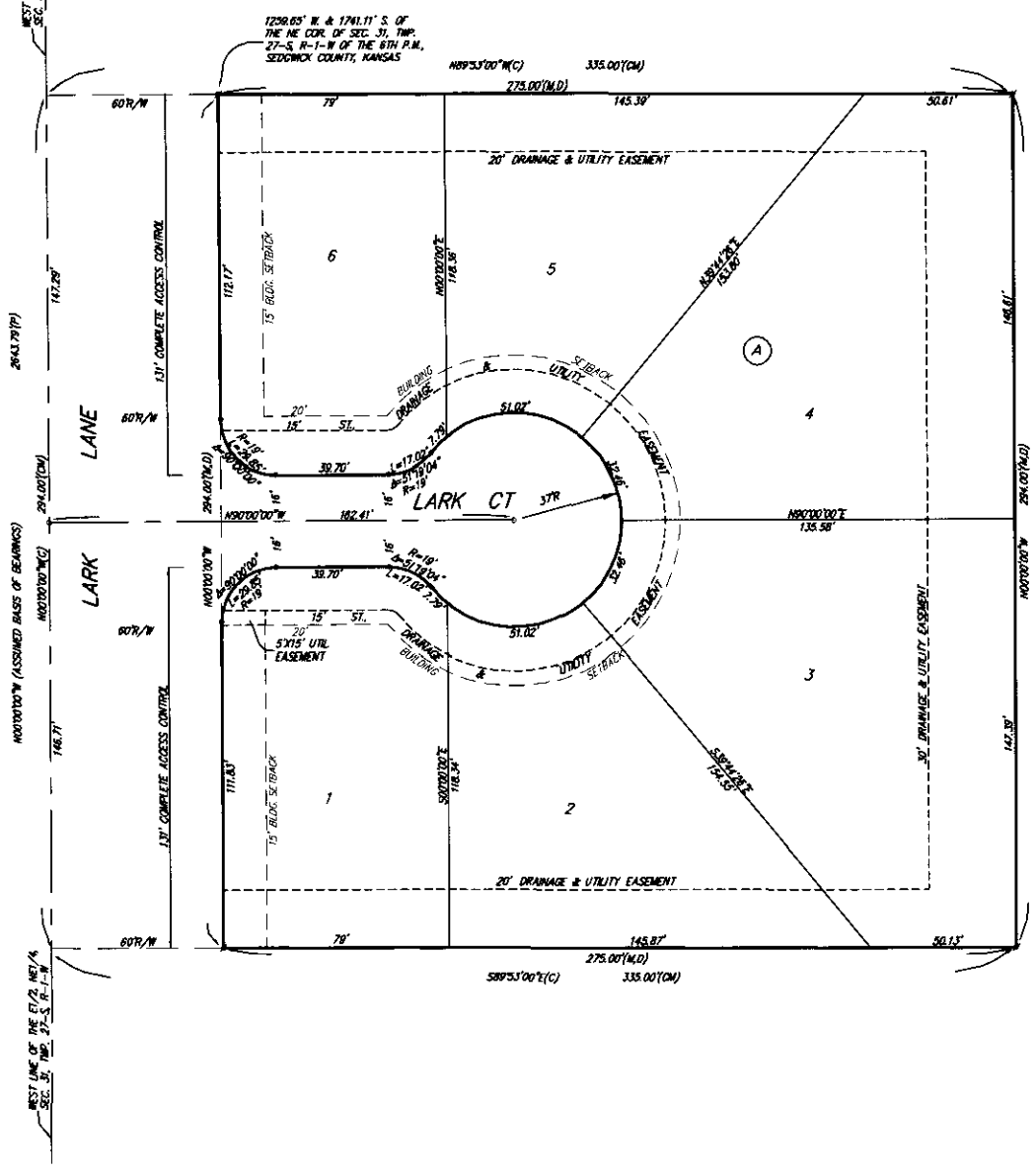


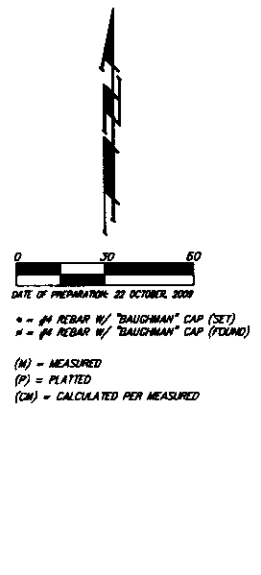
VICINITY MAP
SEC. 31, T27S, R1W

STEVE KELLEY 6TH ADD.
28 SEPTEMBER, 2009

Baughman Company, P.A.
315 Ellis St. Wichita, KS 67211 P 316-262-7271 F 316-262-0149
Baughman ENGINEERING | SURVEYING | PLANNING | LANDSCAPE ARCHITECTURE

STEVE KELLEY 6TH ADDITION
WICHITA, SEDGWICK COUNTY, KANSAS





● = ⅝" REBAR W/ "BAUGHMAN" CAP (SET)
■ = ⅝" REBAR W/ "BAUGHMAN" CAP (FOUND)

(M) = MEASURED
(P) = PLATTED
(CM) = CALCULATED PER MEASURED

State of Kansas)
Sedgwick County) SS

We, Baughman Company, P.A., Surveyors in aforesaid county and state do hereby certify that we have surveyed and platted "STEVE KELLEY 6TH ADDITION", Wichita, Sedgwick County, Kansas and that the accompanying plat is a true and correct exhibit of the property surveyed, described as beginning at a point 1259.65 feet West of the Northeast corner of Sec. 31, Twp. 27-S, R-1-W of the 6th P.M., Sedgwick County, Kansas; thence with a deflection left of 90°07", a distance of 1741.11 feet to a point of beginning; thence south 294.00 feet, thence east 275.00 feet; thence north 294.00 feet thence west 275.00 feet to a point of beginning.

Existing public easements and dedications being vacated by virtue of K.S.A. 12-512(b).

Baughman Company, P.A.

_____, Surveyor
Michael G. Conrey

Know all men by these presents that we, the undersigned, have caused the land in the surveyors certificate to be platted into Lots, a Block, and a Street, to be known as "STEVE KELLEY 6TH ADDITION", Wichita, Sedgwick County, Kansas. The utility easements are hereby granted as indicated for the construction and maintenance of all public utilities. The drainage and utility easements are hereby granted as indicated for drainage purposes and for the construction and maintenance of all public utilities. The street, drainage and utility easements are hereby granted as indicated for street related purposes, for drainage purposes, and for the construction and maintenance of all public utilities. The street is hereby dedicated to and for the use of the public. Access controls shall be as depicted on the face of the plat and are hereby granted to the City of Wichita, Kansas.

Kelley & Coleman, Inc.

_____, President
Stephen R. Kelley

State of Kansas)
Sedgwick County) SS

The foregoing instrument acknowledged before me, this ____ day of _____, 2009, by Stephen R. Kelley, President of the Kelley & Coleman, Inc., on behalf of the corporation.

_____ Notary Public

My App't. Exp. _____

This plat of "STEVE KELLEY 6TH ADDITION", Wichita, Sedgwick County, Kansas has been submitted to and approved by the Wichita-Sedgwick County Metropolitan Area Planning Commission, Wichita, Kansas.

Dated this ____ day of _____, 2009.
Wichita-Sedgwick County Metropolitan Area Planning Commission

_____, Chair
G. Nelson Van Fleet

_____, Secretary
John L. Schlegel

This plat approved and all dedications shown hereon accepted by the City Council of the City of Wichita, Kansas, this ____ day of _____, 2009.

_____, Mayor
Carl Brewer

_____, City Clerk
Karen Sublett

Reviewed in accordance with K.S.A. 58-2005 on this ____ day of _____, 2009.

_____
Tricia L. Robello, L.S. #1246
Deputy County Surveyor
Sedgwick County, Kansas

Entered on transfer record this ____ day of _____, 2009.

_____, County Clerk
Kelly B. Arnold

State of Kansas)
Sedgwick County) SS

This is to certify that this plat has been filed for record in the office of the Register of Deeds, this ____ day of _____ 2009 at ____ o'clock ____M; and is duly recorded.

_____, Register of Deeds
Bill Meek

_____, Deputy
Tonya Buckingham

NOTE:
A master grading plan for drainage has been developed for this subdivision and is on file with the City of Wichita, Kansas. All drainage easements, right-of-ways, or reserves shall remain at established grades or as modified with the approval of the City Engineer of the City of Wichita, Kansas. No obstructions which impede the flow of this drainage system shall be allowed.

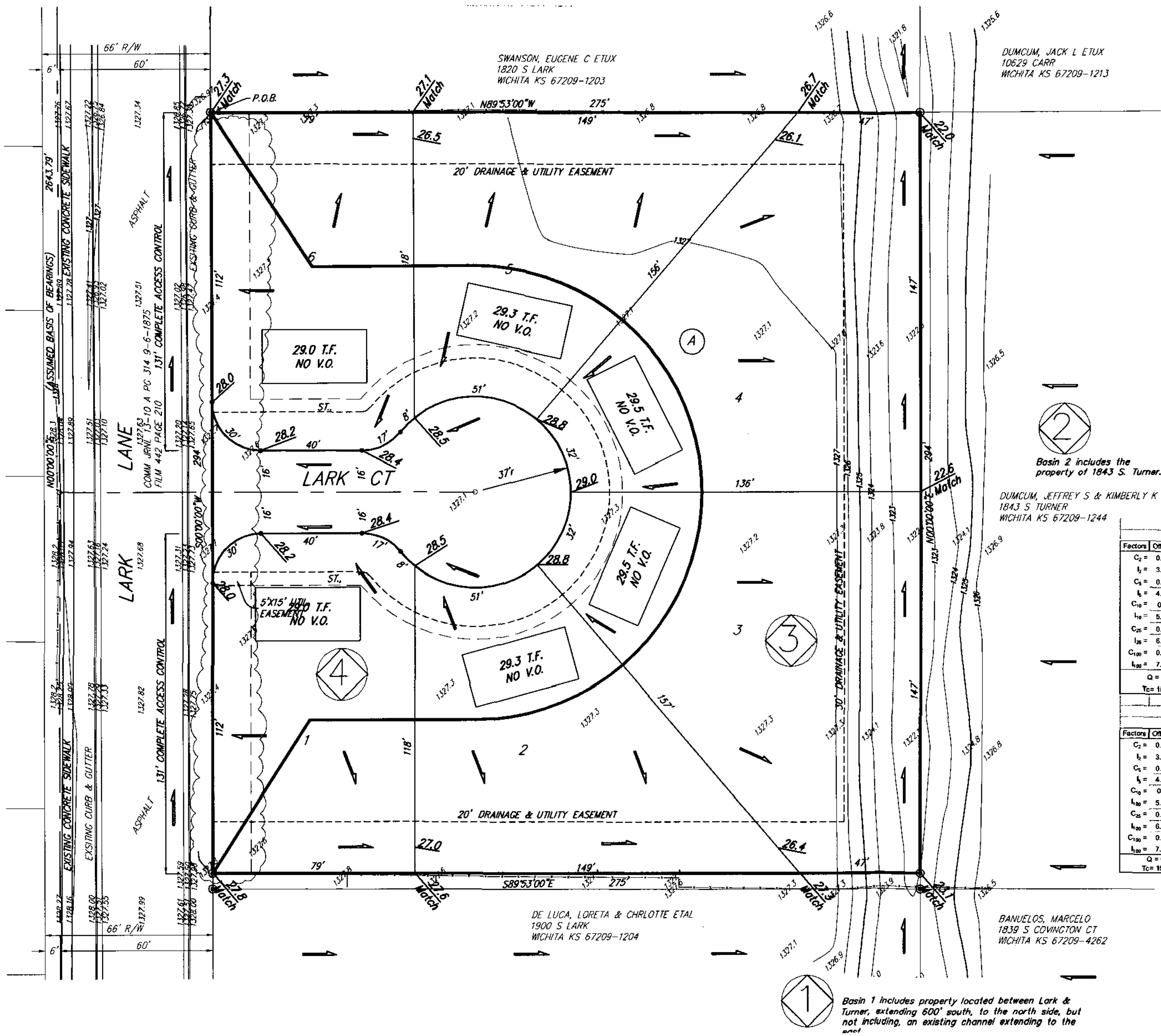
STEVE KELLEY 6TH ADD.
26 OCTOBER, 20

Baughman Company, P.A.
315 Elfin St. Wichita, KS 67211 P 316-267-7271 F 316-262-2149
Baughman ENGINEERING | SURVEYING | PLANNING | LANDSCAPE ARCHITECTURE

DRAINAGE & GRADING PLAN

STEVE KELLEY 6TH ADDITION

WICHITA, SEDGWICK COUNTY, KANSAS



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- = #1" IRON (FOUND)

PATRICK SHAWN BAER LICENSED 10970 KANSAS PROFESSIONAL ENGINEER 11/6/09

Existing Site Runoff
(Calculated by Rational Method)

Factors	Offsite	Ex. Site*
C_2 =	0.33	0.22
I_2 =	3.83	3.83
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C_{25} =	0.43	0.32
I_{25} =	6.06	6.06
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I_{100} =	7.37	7.37
Q = C * I * A		
Tc= 15 minutes		

Basin #	Area (ac) (acres)	Q_2 (cfs)	Q_5 (cfs)	Q_{10} (cfs)	Q_{25} (cfs)	Q_{100} (cfs)
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Total Basin =	11.22	13.4	16.9	22.5	28.0	40.8

* = Existing site (undeveloped, soil Group B)

Proposed Site Runoff
(Calculated by Rational Method)

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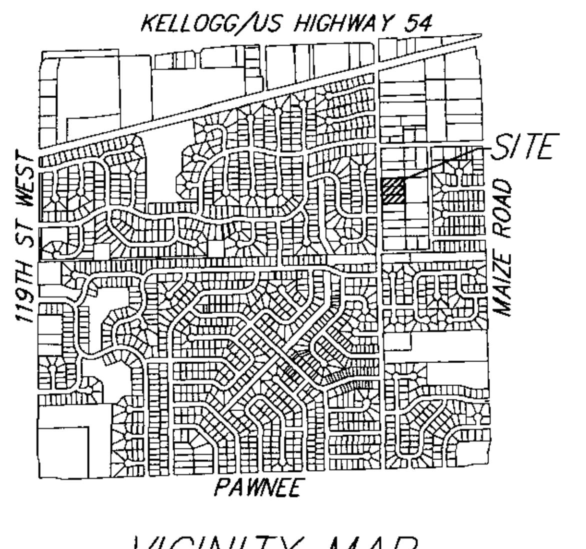
3#	1.14	1.70	2.12	2.80	3.45	4.79
4#	0.72	1.08	1.34	1.77	2.18	3.02
Total Basin =	11.22	14.6	18.3	24.1	30.0	43.0

= Revised coeficent from proposed improvements

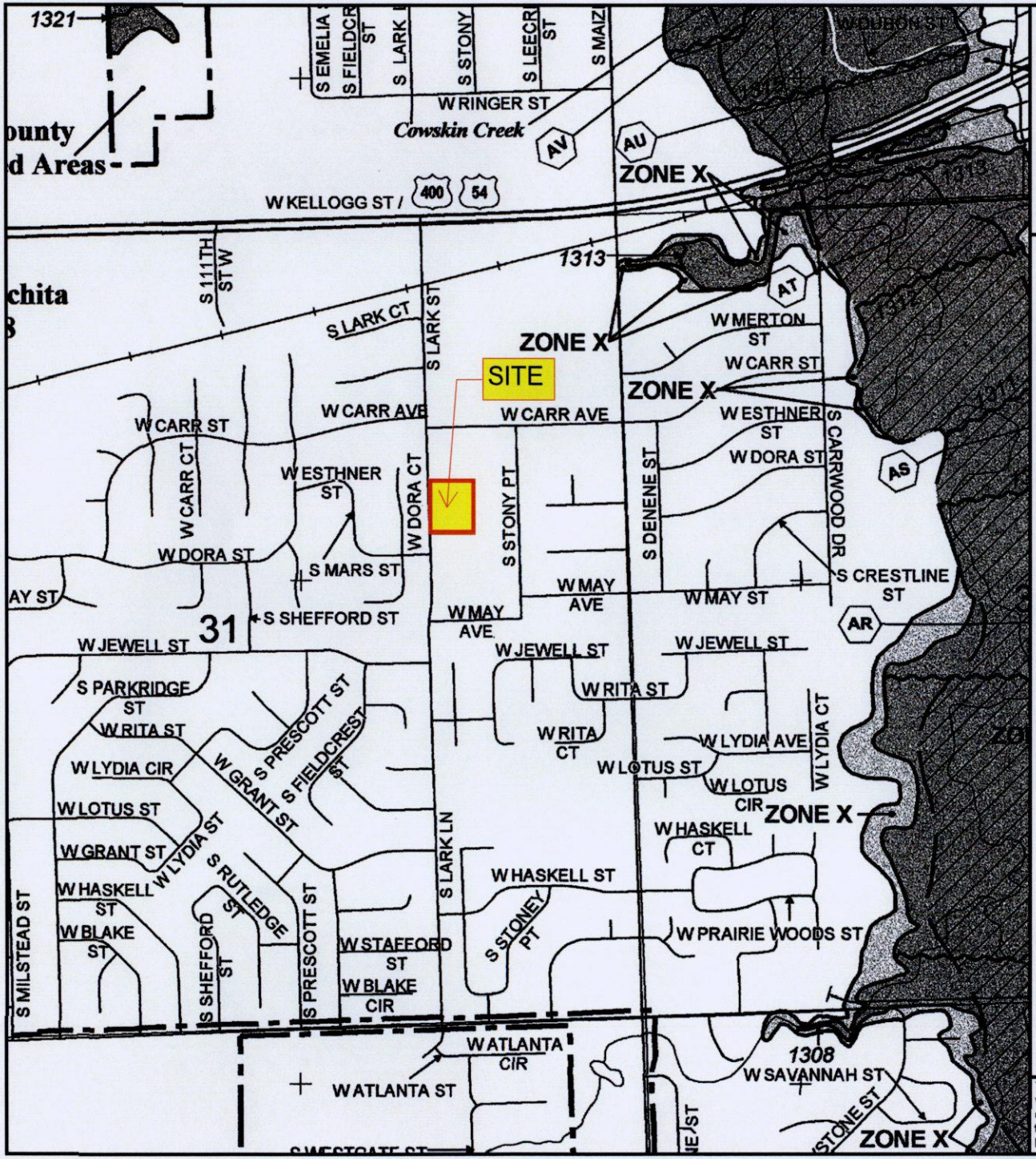
NOTE: This site does not lie within a FEMA SFHA based on FEMA FIRM Panel 340 of 700 for Community Kit #20173C for Sedgwick County, Kansas, effective February 2, 2007.



VICINITY MAP
SEC. 31, T27S, R1W

DRAINAGE & GRADING PLAN
STEVE KELLEY 6TH ADDITION
SEPTEMBER 23th, 2009

Baughman Company, P.A.
315 Ellis St. Wichita, KS 67211 P 316-262-7271 F 316-262-0149
ENGINEERING | SURVEYING | PLANNING | LANDSCAPE ARCHITECTURE



MAP SCALE 1" = 1000'

500 0 1000 2000 FEE

300 0 300 600

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0340E

FIRM

FLOOD INSURANCE RATE MAP

SEDGWICK COUNTY, KANSAS AND INCORPORATED AREAS

PANEL 340 OF 700

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
SEDGWICK COUNTY	200321	0340	E
WICHITA, CITY OF	200328	0340	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
20173C0340E

EFFECTIVE DATE
FEBRUARY 2, 2007

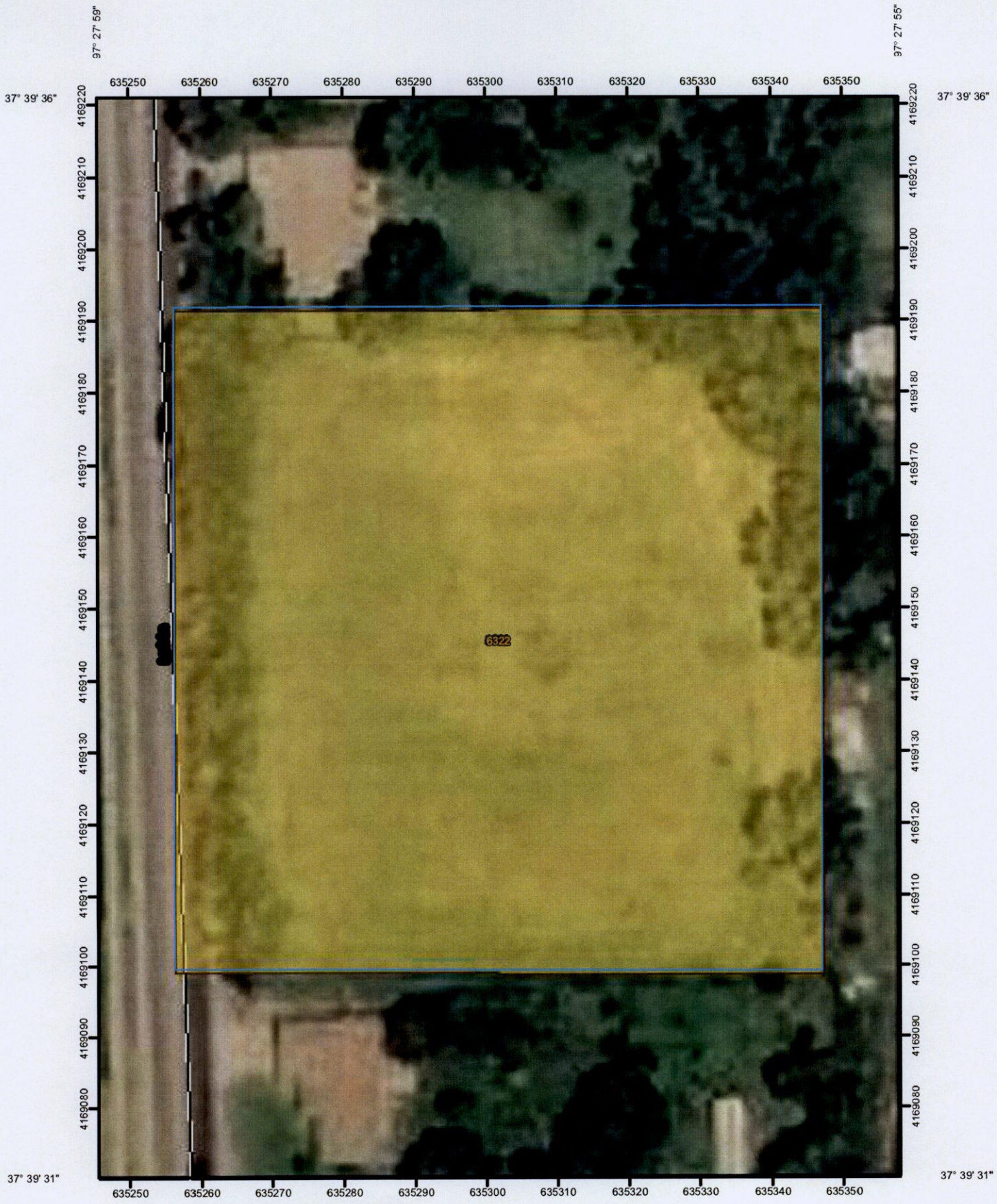
Federal Emergency Management Agency

APPENDICES - SUPPORTING CALCULATIONS

APPENDIX A: **CDM Soil Map**

APPENDIX B: **Runoff Coefficient & Calculations**

CDM Soil Map


97° 27' 59"
97° 27' 55"
37° 39' 36"
37° 39' 31"
635250
635260
635270
635280
635290
635300
635310
635320
635330
635340
635350
4169220
4169210
4169200
4169190
4169180
4169170
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4169140
4169130
4169120
4169110
4169100
4169090
4169080
6322
97° 28' 0"
N
Map Scale: 1:720 if printed on A size (8.5" x 11") sheet.
Meters
0 5 10 20 30
Feet
0 25 50 100 150

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Units

Soil Ratings
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Political Features
- Cities

Water Features
- Oceans
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:720 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 14N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Sedgwick County, Kansas
Survey Area Data: Version 5, Dec 3, 2008

Date(s) aerial images were photographed: 6/30/2006

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Sedgwick County, Kansas				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
6322	Blanket silt loam, 0 to 1 percent slopes	C	2.1	100.0%
Totals for Area of Interest			**2.1**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: *None Specified*

Tie-break Rule: Lower

Runoff Coefficient & Calculations

Steve Kelley 6th Addition

Existing Site Runoff

(Calculated by *Rational Method*)

Factors	Offsite	Ex. Site*
C_2 =	0.33	0.22
I_2 =	3.83	3.83
C_5 =	0.35	0.24
I_5 =	4.53	4.53
C_{10} =	0.4	0.3
I_{10} =	5.22	5.22
C_{25} =	0.43	0.32
I_{25} =	6.06	6.06
C_{100} =	0.51	0.41
I_{100} =	7.37	7.37
Q = C * I * A		
Tc= 15 minutes		

Basin #	Area (ac) (acres)	Q_2 (cfs)	Q_5 (cfs)	Q_{10} (cfs)	Q_{25} (cfs)	Q_{100} (cfs)
1	7.50	9.48	11.89	15.66	19.54	28.19
2	1.86	2.35	2.95	3.88	4.85	6.99
3*	1.86	1.57	2.02	2.91	3.61	5.62
Total Basin =	11.22	**13.4**	**16.9**	**22.5**	**28.0**	**40.8**

* = Existing site (undeveloped, soil Group B)

Proposed Site Runoff

(Calculated by Rational Method)

Factors	Offsite	Prop. Site#
C_2 =	0.33	0.39
I_2 =	3.83	3.83
C_5 =	0.35	0.41
I_5 =	4.53	4.53
C_{10} =	0.4	0.47
I_{100} =	5.22	5.22
C_{25} =	0.43	0.5
I_{100} =	6.06	6.06
C_{100} =	0.51	0.57
I_{100} =	7.37	7.37
Q = C * I * A		
Tc= 15 minutes		

Basin #	Area (ac) (acres)	Q_2 (cfs)	Q_5 (cfs)	Q_{10} (cfs)	Q_{25} (cfs)	Q_{100} (cfs)
1	7.50	9.48	11.89	15.66	19.54	28.19
2	1.86	2.35	2.95	3.88	4.85	6.99
3#	1.14	1.70	2.12	2.80	3.45	4.79
4#	0.72	1.08	1.34	1.77	2.18	3.02
Total Basin =	11.22	**14.6**	**18.3**	**24.1**	**30.0**	**43.0**

= Revised coeficent from proposed improvements

DRAINAGE PLAN **Scale 1:20**