



303 S. TOPEKA ■ WICHITA, KANSAS 67202

**Professional Engineering Consultants, P.A.**

RETURN POSTAGE GUARANTEED

**To:** DRAINAGE PLAN AND SUPPORTING CALCULATIONS  
FOR  
NEWMARKET V TO WICHITA,  
SEDGWICK COUNTY, KANSAS  
PEC PROJECT NO. 36-05023-5697



**Professional Engineering Consultants, P.A.**

February 9, 2007

City of Wichita  
Storm Water Management  
7<sup>th</sup> Floor, City Hall  
Wichita, KS 67202

Attention Scott Lindebak

Reference New Market V Addition Comments  
PEC Project No. 35- 05023-5697

Dear Mr. Lindebak:

Here are the responses to your comments that are in your email letter dated 1/29/07 for New Market V Addition. I have included this letter with the revision package for your use.

- 1 Will the 100-yr overflow fit through the proposed 25' drainage reserve?

*Yes, a trapezoidal channel with a bottom width of 13.8 feet and 3:1 side slopes can carry the 100-yr. discharge from the ponds. The water will be 1.38 feet in depth and contained within the drainage reserve. I have included the calculations for this depth.*

- 2 The drainage plan has no flow arrows. Why not?

*The flow arrows have been included on the drainage plan. As stated in the Cadillac Drainage Report this site will drain to the proposed pond located on the west side of the site.*

- 3 The site specific drainage plan does not include offsite drainage areas, flowrates, etc.

*This has also been included on the drainage plan. These flowrates may possible change in location depending on the requirements for the proposed site just north of 29<sup>th</sup> Street North and the final design of the box culverts underneath 29<sup>th</sup> Street North.*

4. What is the proposed volume of fill at each incremental elevation for this 13.3 acre plat?

*I have attached a print out of the volumes that will be filled within the site boundaries. New Market Addition will require 32.15 Ac. – Ft. of fill to an elevation of 1351.9 which is the 100-yr. flood elevation based on the Cadillac Lake drainage Report dated August 2006..*

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303 S. TOPEKA

WICHITA, KANSAS

67202

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WICHITA

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5. Detention pond shall be included in the plat and the maintenance responsibility shall be specified in the plat's text. Why is the plat not included in the drainage plan? The volume excavated at each incremental elevation should be provided.

*The proposed detention pond and maintenance text is on the plat. The volume proposed to be excavated has been included in the drainage report. The pond will provide 35.65 Ac. - Ft. of storage which is an 11% increase from what is currently located within the property.*

- 6 BFE for the site and floodplain boundaries not shown on the drainage plan. The reference source should be noted.

*The BFE has been added to the drainage plan and a note stating that the whole site is located within a FEMA Zone A floodplain.*

- 7 The drainage plan should state a CLOMR and LOMR will be required for pre/post development of this parcel.

*This note hasn't been included on the plans because it is not a requirement from FEMA to take the site out of the floodplain. If the property owner is willing to accept purchasing flood insurance for the property then a CLOMR/LOMR isn't necessary.*

8. Plan should be provided using an approved datum.

*The contours have been changed to reflect the NGVD29 Datum.*

9. A PDF of the plan and report shall be provided

*The drainage plan will be submitted in PDF format once it has been approved.*

If you have any questions feel free to contact me at (316) 206-1316.

Sincerely,

PROFESSIONAL ENGINEERING CONSULTANTS, P.A.



Shawn R. Bryan, P.E.  
Project Engineer

SRB/tac

Encl: As noted

**Stormwater Pond Stage/Area/Storage Relationships  
And Weir Elevation Determination**

**Project**      *New Market V Addition  
Wichita, KS*  
**P.N.**          *5023*  
**By**             *PEC*  
**Date**          *02/09/07*

Existing Conditions		<b><i>New Market V Property</i></b>				
<b>Stage (feet)</b>	<b>Depth (feet)</b>	<b>Surface Area (square feet)</b>	<b>Surface Area (acres)</b>	<b>Average Area (acres)</b>	<b>Incremental Volume (ac-Ft)</b>	<b>Total Volume (ac-Ft)</b>
1346.00	0.00	0	0.00	0.00	0.00	0.00
1346.00	0.00	0	0.00	0.00	0.00	0.00
1347.00	1.00	0	0.00	0.00	0.00	0.00
1348.00	2.00	86,657	1.99	0.99	0.99	0.99
1349.00	3.00	244,207	5.61	3.80	3.80	4.79
1350.00	4.00	572,520	13.14	7.57	15.13	16.13
1351.00	5.00	574,906	13.20	9.40	18.80	23.60
1351.90	5.90	577,640	13.26	9.43	27.36	32.15

## Stormwater Pond Stage/Area/Storage Relationships

**Project** : New Market V Addition  
 Wichita, KS  
**P.N.** : 5023  
**By** : PEC  
**Date** : 02/09/07

<b>PROPOSED POND</b>						
<b>Stage (feet)</b>	<b>Depth (feet)</b>	<b>Surface Area (square feet)</b>	<b>Surface Area (acres)</b>	<b>Average Area (acres)</b>	<b>Incremental Volume (ac-Ft)</b>	<b>Total Volume (ac-Ft)</b>
1341.70	0.00	135,282	3.11	0.00	0.00	0.00
1343.00	1.30	138,180	3.17	3.14	4.08	4.08
1346.00	4.30	147,024	3.38	3.27	9.82	13.90
1348.00	6.30	150,021	3.44	3.41	6.82	20.72
1349.00	7.30	156,095	3.58	3.51	3.51	24.23
1350.00	8.30	159,167	3.65	3.55	7.10	27.82
1351.00	9.30	168,921	3.88	3.73	7.46	31.70
1352.00	10.30	175,348	4.03	3.80	11.41	35.65

Total Storage Volume = 35.65 Ac-Ft.  
 Increase in Storage Vol. = 3.50 Ac.-Ft. or 10.9 %

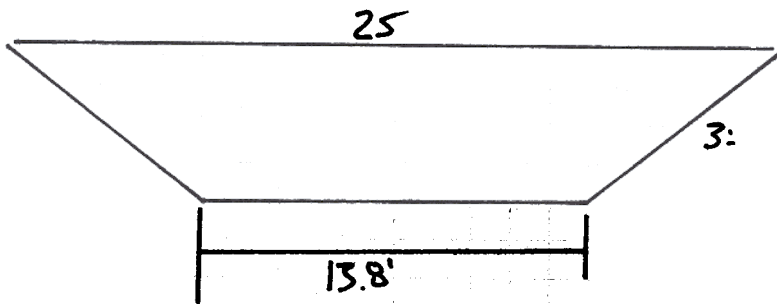


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Project NEW MARKET II Date 1/29/07  
Item 25' Drainage Reserve Capacity By SB

CRITICAL DEPTH:

$$Q_{100} = 69.7 \text{ cfs}$$



NORMAL DEPTH:

$$\frac{AR^{2/3}}{b^{8/3}} = \frac{Q_n}{1.49 S^{1/2} b^{8/3}}$$

$$n = 0.017$$

$$Q_{100} = 69.7 \text{ cfs}$$

$$S = 0.001$$

$$b = 13.8'$$

$$\frac{69.7(0.017)}{1.49(0.001)^{1/2}(13.8)^{8/3}} = 0.023$$

$$y_n = 0.08b \quad \text{Fig. 4-7 pg. 165} \quad \text{HYDRAULIC} \\ y_n = 0.08(13.8) = 1.10 \text{ ft}' \quad \text{Eng. (ROBERTSON,} \\ \text{CASSIDY, CHAUDRY)}$$

CHECK NORMAL DEPTH ENERGY

$$E = y + \frac{v^2}{2g} = 1.10 + \frac{3.66^2}{2(32.2)} \\ 1.31 \text{ ft.}$$

$$Q = VA$$

$$V = Q/A$$

$$A = (13.8)(1.10) + \frac{1}{2}(2)(1.1)(3.5)$$

$$A = 19.03$$

$$V = 69.7/19.03 = 3.66 \text{ ft/s}$$



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Project NEW MARKET IV

Date 1/29/07

Item 25' DRAINAGE RECEIVE CANAL

By SR

Minimum Specific Energy

$$= \left( \frac{Q^2}{g} \right)^{\frac{1}{3}} = \left( \frac{(49.7)^2}{32.2} \right)^{\frac{1}{3}} = 0.925 \text{ ft}$$

$$E = \frac{3}{2} Y_c = (0.925) \left( \frac{3}{2} \right) = 1.38 \text{ ft}$$

Normal Depth Energy < min. Specific Energy is ok  
1.38 ft TO ESTIMATE DEPTH OF FLOW.



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Project NEW MARKET II

Date 2/1/07

Item CAPACITY OF 7'x 2.5' RCB

By SB

$$Q = \frac{1.49}{n} (A)(R)^{2/3} (S)^{1/2}$$

For 7'x 2.5' RCB

$$A = (7 \times 2.5) = 17.5 \text{ ft}^2$$

$$R = \frac{A}{p} = \frac{17.5}{19} = 0.92105$$

$$14 + 2.5(2) = 19'$$

$$Q = \frac{1.49}{0.012} (17.5)(0.921)^{2/3} (0.001)^{1/2}$$

$$Q = \underline{\underline{65}} \text{ cfs}$$

**New Market V Addition**  
**Wichita, Sedgwick County, Kansas**  
12/7/06

New Market V Addition is a future 13.3 acre commercial development. This development is part of the New Market Development Master Plan. New Market V is a 13.3 acre, commercial development on the southwest corner of 29<sup>st</sup> Street North and Maize Road within the city limits of Wichita in Sedgwick County, Kansas. The development consists of parking lots, storm sewer, utilities services and detention pond that meet the requirements of the 2006 Cadillac Lake Drainage Study. This drainage report contains a drawing of the drainage plan and additional data for the New Market V Addition.

**Hydrology**

The proposed plat lies in the NE 1/4, Section 6, T27S, R1W. The soil on-site is comprised primarily of Waurika, which is classified in hydrologic group D. This site is located within the Cadillac Lake boundaries. Approximately 1 acre of the site is possibly considered wetlands and could be regulated by the Department of Army Corps of Engineers. The land is currently vacant and is grassland throughout with the exception of the wetland area stated above. The site is bordered to the north by 29<sup>st</sup> Street North, to the south by the Target Store property, to the east by Maize Road and to the west by the Aberdeen Addition. This property is naturally used as a detention facility for approximately 1,217 acres. There is a 36" RCP that is at the SE corner of the property with drains under Maize Road and into Cadillac Lake. The existing RCP can't handle the amount of runoff from the basin on the west side of Maize Road, which is detained, filling up the proposed New Market V site. Then detention storage (Proposed New Market V Addition) isn't large enough to handle the flows from the 1,217 acres, the flows back water up flooding 29<sup>th</sup> Street North where there is additional storage on the north side of the road.

The proposed site will be filled, and elevation of and the storm water off will drain to proposed detention facility behind the property. In the Cadillac Lake Drainage Study the detention pond west of the property had to be increased to handle the additional from the fire base for the 100 storm event. The property included the drainage study therefore the detention pond be enlarged with this site development to meet the Cadillac Lake Drainage Study requirements. HEC-2 input and output files included this report due to the Cadillac Lake Study and the proposed detention pond. The water from the site will drain into the proposed detention pond the bottom elevation of where be pumped out by a small pump station 2,000 gpm, to the Cadillac Lake area on the west side of Maize Road. The finished elevation for the building will be set feet higher than Maize Road or the detention pond 100 elevation. The filling of the property will require permits from the District Water Resources and the Corps of Engineers which will be applied for at a later date.

### **Storm Sewer Design**

The storm hydrology analysis not performed for this site. Due to commercial property changing layouts and the property being already included in the Cadillac Lake Drainage Study. The drainage plan shows the emergency 100 overflow the drainage locations. The storm water system will be designed for a 100 storm event at a later date when the site layout has been determined and finalized. It is known that all the storm water runoff will drain to the detention pond the west side of the property behind the proposed building location.

### **Design Aids**

This section includes material used to assist in designing the drainage system. A 100 scale Drainage Plan map (Attachment A).

### **References**

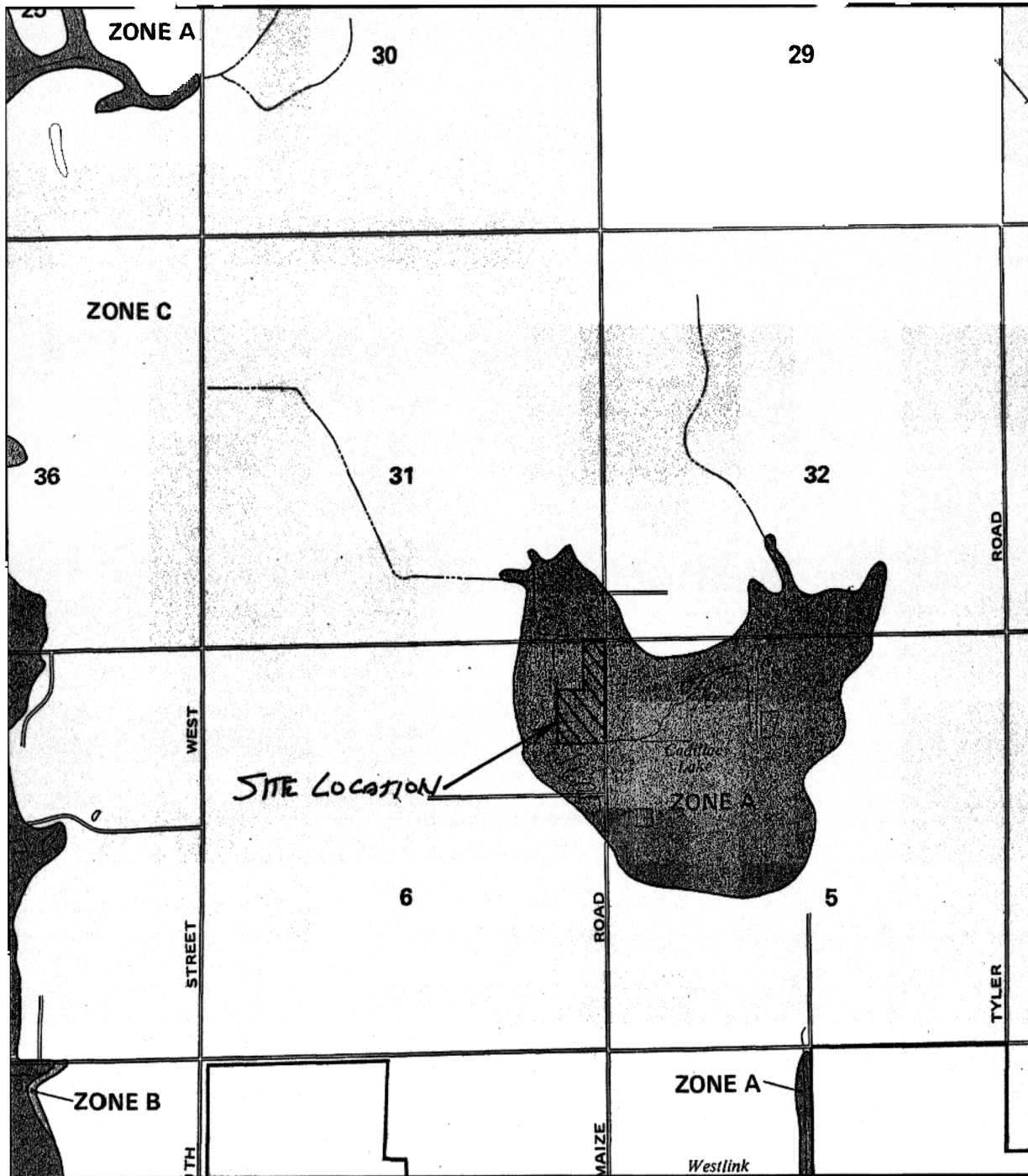
Design of Urban Highway Drainage – The State of the Art, by Reitz & Jens, Inc., April 1980.

Drainage of Highway Pavements, Hydraulic Engineering Circular #12, by Tye Engineering, Inc., March 1984.

Interim Drainage and Storm Sewer Policy for Design Criteria and Documentation, City of Wichita, Kansas, 1985.

Soil Survey of Sedgwick County, Kansas, US Department of Agriculture, Soil Conservation Service, 1979.

# FIS Information



APPROXIMATE SCALE  
 2000 0 2000 FEET

NATIONAL FLOOD INSURANCE PROGRAM

**FIRM**  
 FLOOD INSURANCE RATE MAP

SEDGWICK,  
 COUNTY,  
 KANSAS  
 (UNINCORPORATED AREAS)

PANEL 125 OF 300

COMMUNITY-PANEL NUMBER  
 200321 0125 A

EFFECTIVE DATE:  
 JUNE 3, 1986



Federal Emergency Management Agency

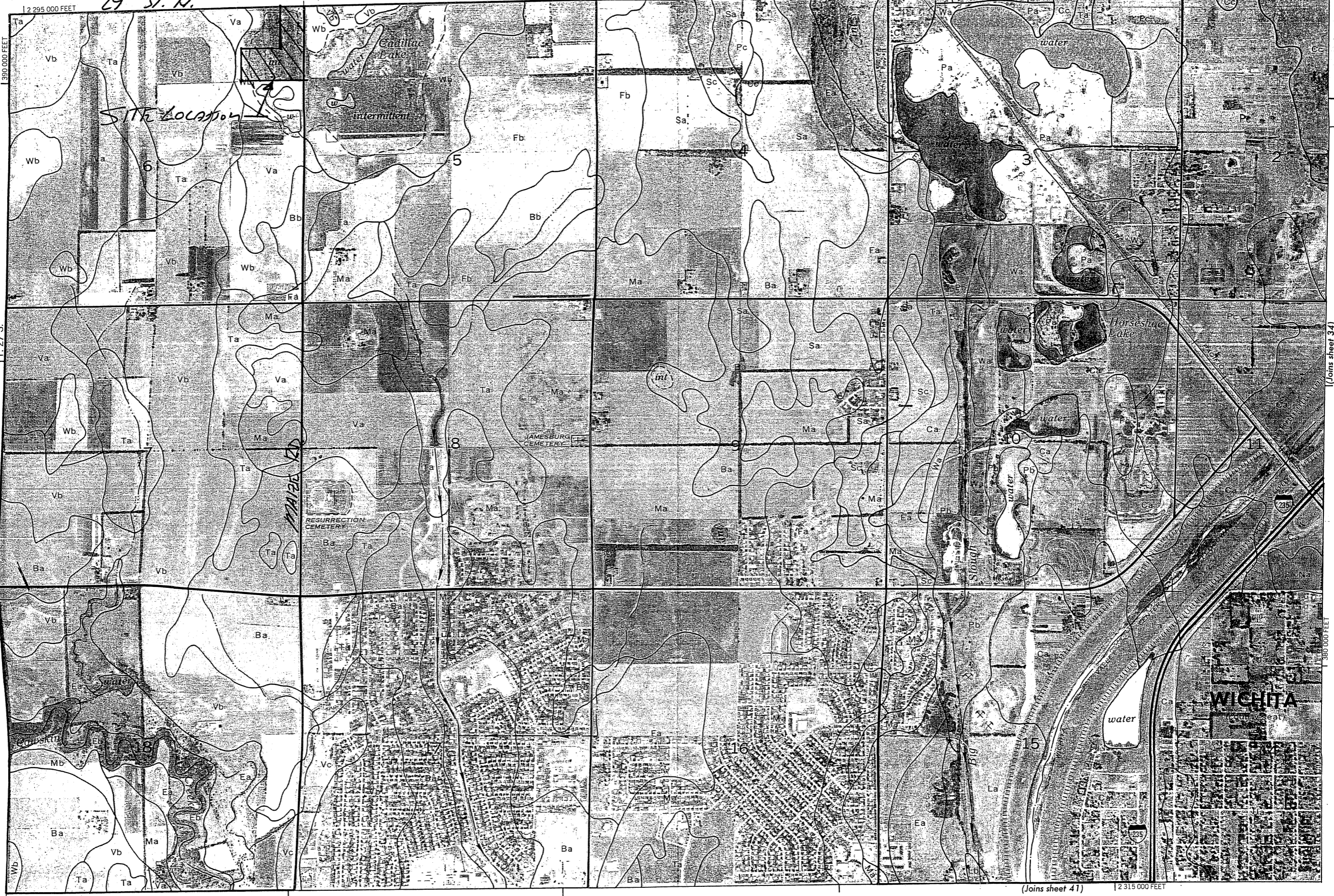
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at [www.msc.fema.gov](http://www.msc.fema.gov)

# Design Aids

29<sup>th</sup> St. N.

R. 1 W.

Pb La (Joins sheet 25)



(Joins sheet 33)

(Joins sheet 32)

(Joins sheet 34)

(Joins sheet 41)

39000 FEET  
T. 27 S.

3900000 FEET  
T. 27 S.

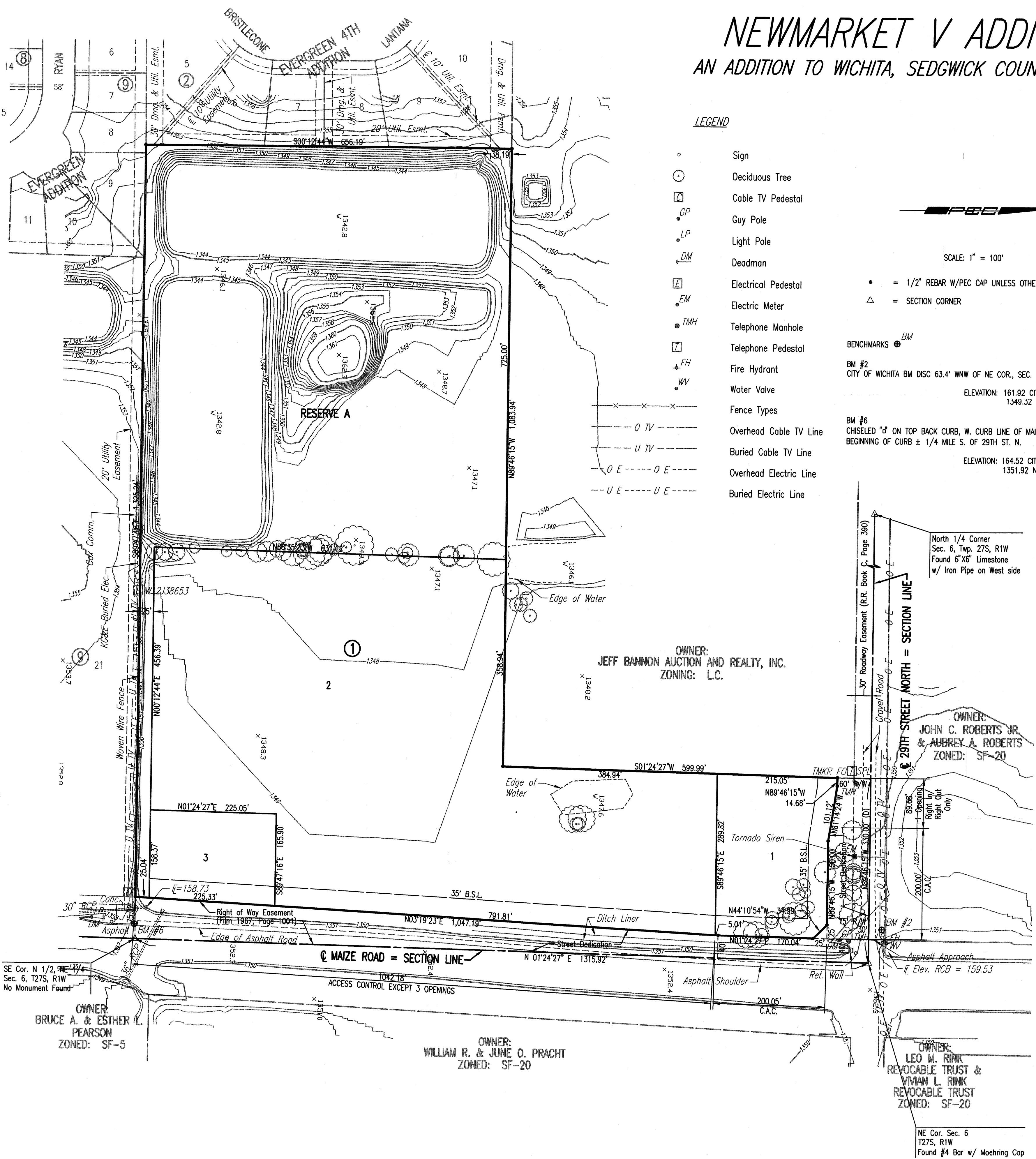
1 Mile  
0  
1/4  
1/2  
3/4

2 315 000 FEET

# Plan Map

# NEWMARKET V ADDITION

## AN ADDITION TO WICHITA, SEDGWICK COUNTY, KANSAS



### LEGEND

- Sign
- Deciduous Tree
- Cable TV Pedestal
- GP Guy Pole
- LP Light Pole
- DM Deadman
- Electrical Pedestal
- EM Electric Meter
- TMH Telephone Manhole
- Telephone Pedestal
- FH Fire Hydrant
- WV Water Valve
- Fence Types
- TV Overhead Cable TV Line
- U TV Buried Cable TV Line
- E Overhead Electric Line
- U E Buried Electric Line



SCALE: 1" = 100'

- = 1/2" REBAR W/PEC CAP UNLESS OTHERWISE NOTED
  - △ = SECTION CORNER
- BENCHMARKS**
- BM #2 CITY OF WICHITA BM DISC 63.4' WNW OF NE COR., SEC. 6, T27S, R1W  
ELEVATION: 161.92 CITY DATUM  
1349.32 N.G.V.D.
  - BM #6 CHISELED "d" ON TOP BACK CURB, W. CURB LINE OF MAIZE RD. AT BEGINNING OF CURB ± 1/4 MILE S. OF 29TH ST. N.  
ELEVATION: 164.52 CITY DATUM  
1351.92 N.G.V.D.

STATE OF KANSAS }  
COUNTY OF SEDGWICK } SS

WE, PROFESSIONAL ENGINEERING CONSULTANTS, P.A., ENGINEERS AND SURVEYORS IN AFORESAID STATE AND COUNTY, DO HEREBY CERTIFY THAT OF THIS \_\_\_\_\_ DAY OF \_\_\_\_\_, 2007, WE HAVE SURVEYED AND PLATTED NEWMARKET V ADDITION, AN ADDITION TO WICHITA, SEDGWICK COUNTY, KANSAS, INTO LOTS, A BLOCK, AND A RESERVE THE SAME BEING DESCRIBED AS FOLLOWS:

COMMENCING AT THE SOUTHEAST CORNER OF THE NORTH HALF OF THE NORTHEAST QUARTER, SECTION 6, TOWNSHIP 27 SOUTH, RANGE 1 WEST; THENCE BEARING N89°47'16"W, A DISTANCE OF 75.02 FEET TO THE POINT OF BEGINNING; THENCE BEARING N03°19'23"E, A DISTANCE OF 1,047.19 FEET; THENCE BEARING N01°24'27"E, A DISTANCE OF 170.04 FEET; THENCE BEARING N44°10'54"W, A DISTANCE OF 34.99 FEET; THENCE BEARING N89°46'15"W, A DISTANCE OF 150.00 FEET; THENCE BEARING N81°14'24"W, A DISTANCE OF 101.12 FEET; THENCE BEARING N89°46'15"W, A DISTANCE OF 14.68 FEET; THENCE BEARING S01°24'27"W, A DISTANCE OF 599.99 FEET; THENCE BEARING N89°46'15"W, A DISTANCE OF 1,083.94 FEET; THENCE BEARING S00°12'44"W, A DISTANCE OF 656.19 FEET; THENCE BEARING S89°47'16"E, A DISTANCE OF 1,325.24 FEET TO THE POINT OF BEGINNING.

ALL PUBLIC EASEMENTS LYING WITHIN THE ABOVE DESCRIBED TRACT OF LAND ARE HEREBY VACATED AND REPLATTED BY VIRTUE OF KSA 12-512(b) AMENDED.

JAMES R. BECKETT, R.L.S. NO. 832  
PROFESSIONAL ENGINEERING CONSULTANTS, P.A.

ALL ABUTTERS RIGHT OF ACCESS TO AND FROM 29TH STREET NORTH OVER AND ACROSS THE NORTH PROPERTY LINE, AND TO AND FROM MAIZE ROAD OVER AND ACROSS THE EAST PROPERTY LINE IS HEREBY GRANTED TO THE CITY OF WICHITA, PROVIDED HOWEVER THAT THERE SHALL BE ACCESS TO 29TH STREET NORTH AT 1-OPENING AND ACCESS TO MAIZE ROAD AT 3-OPENINGS. ALL ACCESS OPENINGS SHALL BE IN ACCORDANCE WITH MINIMUM SPACING REQUIREMENTS OF THE WICHITA/SEDGWICK COUNTY ACCESS MANAGEMENT STANDARDS.

THE STREET DEDICATION ALONG THE NORTH AND EAST PROPERTY LINES ARE HEREBY DEDICATED TO AND FOR THE USE OF THE PUBLIC.

EASEMENTS FOR THE CONSTRUCTION AND MAINTENANCE OF PUBLIC UTILITIES ARE HEREBY GRANTED.

A DRAINAGE PLAN HAS BEEN APPROVED FOR THIS PLAT. ALL DRAINAGE EASEMENTS, RIGHTS-OF-WAY, OR RESERVES SHALL REMAIN AT ESTABLISHED GRADES AND UNOBSTRUCTED TO ALLOW FOR THE CONVEYANCE OF STORM WATER, UNLESS MODIFIED WITH THE APPROVAL OF THE CITY ENGINEER.

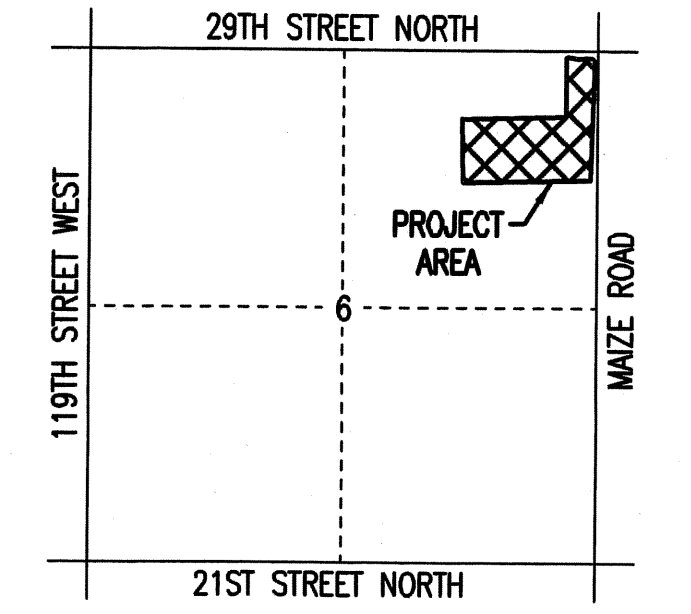
RESERVE "A" IS HEREBY PLATTED FOR DRAINAGE, LANDSCAPING, RECREATIONAL USES, SIDEWALKS, AND UTILITIES, CONFINED TO EASEMENTS. RESERVE "A" SHALL BE OWNED AND MAINTAINED BY AN OWNER'S ASSOCIATION TO BE FORMED WITHIN NEWMARKET V ADDITION.

FEMA FLOOD PLAIN AND REGULATORY FLOODWAY BOUNDARIES ARE SUBJECT TO PERIODIC CHANGE, AND SUCH CHANGE MAY AFFECT THE INTENDED LAND USE WITHIN THE SUBDIVISION.

KNOW ALL MEN BY THESE PRESENTS THAT WE, THE UNDERSIGNED PROPERTY OWNERS OF THE LAND AS ABOVE SET FORTH IN THE SURVEYOR'S CERTIFICATE, HAVE CAUSED THE LAND TO BE SURVEYED AND PLATTED INTO LOTS, A BLOCK, AND A RESERVE THE SAME TO BE KNOWN AS NEWMARKET V ADDITION, AN ADDITION TO WICHITA, SEDGWICK COUNTY, KANSAS.

OWNERS:  
NEWMARKET V, LLC, A KANSAS LIMITED LIABILITY COMPANY

GEORGE SHERMAN, VICE PRESIDENT  
R1W



STATE OF KANSAS }  
COUNTY OF SEDGWICK } SS

THIS INSTRUMENT WAS ACKNOWLEDGED BEFORE ME ON THIS \_\_\_\_\_ DAY OF \_\_\_\_\_, 2007, BY KENT G. VOTH, CORPORATE COUNSEL OF NEWMARKET OFFICE, LLC, A KANSAS LIMITED LIABILITY COMPANY

KENT G. VOTH, NOTARY PUBLIC

MY APPOINTMENT EXPIRES: \_\_\_\_\_

THIS PLAT IS APPROVED AND ALL DEDICATIONS SHOWN HEREON, IF ANY ARE ACCEPTED BY THE CITY COUNCIL OF THE CITY OF WICHITA, KANSAS, THIS \_\_\_\_\_ DAY OF \_\_\_\_\_, 2007.

\_\_\_\_\_, MAYOR  
\_\_\_\_\_, CITY CLERK

STATE OF KANSAS }  
COUNTY OF SEDGWICK } SS

THIS PLAT OF NEWMARKET V ADDITION, AN ADDITION TO 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 \_\_\_\_\_, 2007.

WICHITA-SEDGWICK COUNTY METROPOLITAN AREA PLANNING COMMISSION

DARRELL A. DOWNING, CHAIRMAN

JOHN L. SCHLEGEL, SECRETARY

REVIEWED IN ACCORDANCE WITH K.S.A. 58-2005 ON THIS \_\_\_\_\_ DAY OF \_\_\_\_\_, 2007.

TRICIA L. ROBELLO, LS #1246  
DEPUTY COUNTY SURVEYOR  
SEDGWICK COUNTY KANSAS

ENTERED ON TRANSFER RECORD THIS \_\_\_\_\_ DAY OF \_\_\_\_\_, 2007.

DON BRACE, COUNTY CLERK

THIS IS TO CERTIFY THAT THIS INSTRUMENT WAS FILED FOR RECORD IN THE REGISTER OF DEEDS OFFICE AT \_\_\_\_\_ M., ON THE \_\_\_\_\_ DAY OF \_\_\_\_\_, 2007.

\_\_\_\_\_, REGISTER OF DEEDS

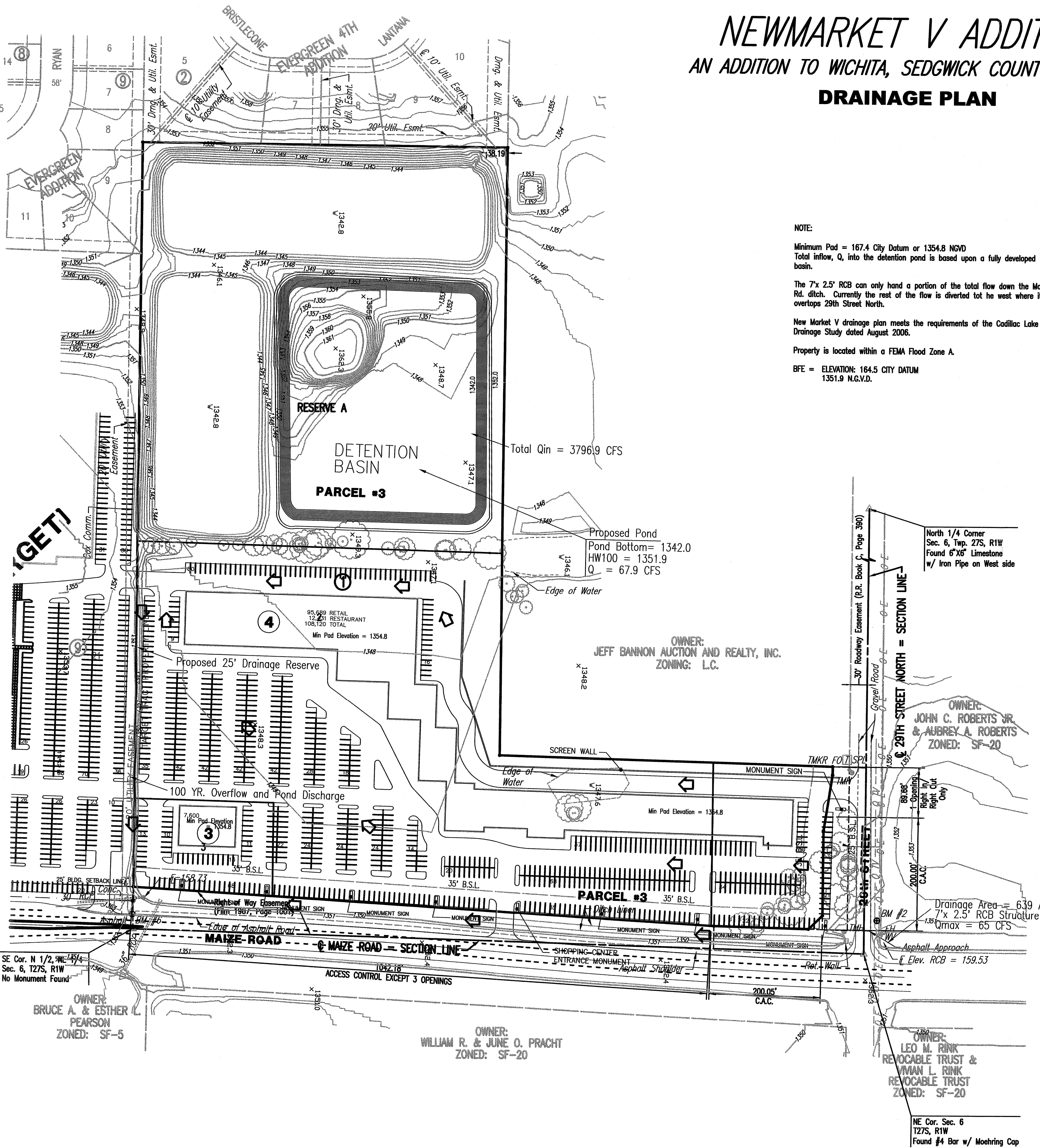
BILL WEEK, DEPUTY

TONYA BUCKINGHAM, DEPUTY

# NEWMARKET V ADDITION

## AN ADDITION TO WICHITA, SEDGWICK COUNTY, KANSAS

### DRAINAGE PLAN



SCALE: 1" = 100'

- BENCHMARKS**
- BM #2  
CITY OF WICHITA BM DISC 63.4' WNW OF NE COR., SEC. 6, T27S, R1W  
ELEVATION: 161.92 CITY DATUM  
1349.32 N.G.V.D.
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CHISELED "J" ON TOP BACK CURB, W. CURB LINE OF MAIZE RD. AT BEGINNING OF CURB ± 1/4 MILE S. OF 29TH ST. N.  
ELEVATION: 164.52 CITY DATUM  
1351.92 N.G.V.D.

**LEGEND**

- Sign
- ⊙ Deciduous Tree
- ⊠ Cable TV Pedestal
- ⊙ Guy Pole
- ⊙ Light Pole
- ⊙ Deadman
- ⊙ Electrical Pedestal
- ⊙ Electric Meter
- ⊙ TMH Telephone Manhole
- ⊙ Telephone Pedestal
- ⊙ FH Fire Hydrant
- ⊙ WV Water Valve
- Fence Types ---
- O TV --- Overhead Cable TV Line
- O E --- Buried Cable TV Line
- O E --- Overhead Electric Line
- O E --- Buried Electric Line

