DRAINAGE REPORT

FOR

Lampton's Addition
Wichita, Kansas

NOVEMBER 2007

CITY OF WICHITA

Public Works, Engineering Division
Final Drainage Plan Submittal Checklist

Reviewer: City of Wichita Date: November 15, 2007

Subdivision Name: Lampton's Addition Location: Wichita, Kansas

Total Land Area Of Ownership: 3 Acres

Type: ☐ Residential ☑ Commercial ☐ Industrial ☐ Recreation ☐ Municipal ☐ Other

Applicant: Lamtpon Brother's Investing Contact: Douglas Lampton Phone #:

Engineer: MKEC Engineering Consultants, Inc. Contact: Kara Anderson, P.E. Phone # 684-9600

Please check the appropriate box: I = Included; NA = Non-Applicable; R= Required prior to development
(If "NA" is checked, an explanation must be entered)

	Applicant			Engr	
Tab 1. Project Narrative	**I**	**NA**	**Explanation / Location in Plan**	**I**	**NA**
A. Site Location Map, using USGS Map	✔		Figure 1.1		
B. Discussion of development, existing conditions, and proposed impacts on stormwater, wetland, riparian, and flood plain	✔		Tab 1.B		
C. Discussion of offsite conditions	✔		Tab 1.C		
D. Summary of runoff calculations (pre/post development) No increase in peak discharge for all storm series	✔		Tab 1.D		
E. Narrative description of the type and function of the permanent best management practices that are incorporated into the site design	✔		Tab 1.E		
F. Copy of the plat	✔		Figure 1.3		
G. Preliminary grading plan (The final grading plan shall be sealed, signed and dated prior to Engineering receiving the final sanitary sewer plans. One plan sheet and PDF shall be submitted to the Subdivision Engineer.)	✔		Figure 1.4		
H. Professional Engineer seal, signature and date on cover of report	✔		Cover		
I. CD of drainage plan in PDF format (one file) and one paper copy bound with this checklist included behind the cover	✔		Tab 1.I		

	Applicant			Engr	
Tab 2. Existing Conditions Runoff Calculations	**I**	**NA**	**Explanation / Location in Plan**	**I**	**NA**
A. Copy of applicable orthophoto showing proposed project boundaries (preferable in color)	✔		Figure 2.1		
B. Runoff Method (Rational, Hydrograph Method, or other approved methods by Engineering)	✔		Tab 2.B		
C. Existing topography (no greater than 2-foot contours, 1-foot recommend)	✔		Figure 2.2		
D. Total Site Area and Total Impervious Area (acres)	✔		Tab 2.D		
E. Benchmarks used for site control	✔		Tab 2.E		
F. Streams, creeks, and waterway labeled	✔		Figure 2.2		
G. Predominant soils from USDA soil surveys, and/or on site soil borings	✔		Figure 2.4		
H. Location and boundaries of natural features such as wetlands, lakes, and ponds with the normal water elevation noted	✔		Tab 2.H		
I. Location of existing roads, buildings, parking lots and other impervious areas.	✔		Tab 2.I		

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J. Location of existing utilities (e.g., water, sewer, gas, electric) and easements	✔	☐	Tab 2.J	☐	☐
K. Location of existing conveyance systems such as storm drains, inlets, catch basins, channels, swales, and areas of overland flow	✔	☐	Tab 2.K	☐	☐
L. Flow paths	✔	☐	Figure 2.2	☐	☐
M. Location and dimensions of existing channels, bridges or culvert crossings	✔	☐	Tab 2.M	☐	☐
N. Existing conditions hydrologic analysis for runoff rates, volumes and velocities showing methodologies used and supporting calculations (2, 5, 10, 25 & 100 year, 24-hour storm events) or Critical Duration	✔	☐	Tab 2.N	☐	☐
O. Assumed pre-developed runoff curve numbers	✔	☐	Tab 2.O	☐	☐
P. Existing time of concentrations used in calculations	✔	☐	Tab 2.P	☐	☐
Q. Evaluate immediate downstream drainage capacity, not to exceed more than 0.25 miles downstream of site	✔	☐	Tab 2.Q	☐	☐
R. Existing structural elevations (e.g., invert of pipes, manholes, etc.)	✔	☐	Tab 2.R	☐	☐
S. Cross-section data for open channels	✔	☐	Tab 2.S	☐	☐
T. Ground water elevations, if applicable	✔	☐	Tab 2.T	☐	☐

	Applicant			Engr	
Tab 3. Post-Development Hydrologic Analysis	**I**	**NA**	**Explanation / Location in Plan**	**I**	**NA**
A. Proposed (post-development) conditions hydrologic and hydraulic analysis for runoff rates, volumes, HGL, and velocities showing the methodologies used and supporting calculations for all applicable design storms (2, 5, 10, 25 & 100 year, 24-hour storm events)	✔	☐	Tab 3.A and 2.N Figure 3.1	☐	☐
B. Proposed time of concentrations used in calculations	✔	☐	Tab 2.P	☐	☐
C. Assumed post-developed runoff curve numbers	✔	☐	Tab 3.O	☐	☐
D. Proposed contours for detention facilities (to equal area used in outlet rating curves)	✔	☐	Figure 3.1	☐	☐
E. Preliminary sizing calculations for stormwater controls including contributing drainage area, storage, and outlet configuration	✔	☐	Tab 3.E	☐	☐
F. Stage-storage-discharge or outlet rating curves and inflow and outflow hydrographs for storage facilities	✔	☐	Tab 2.N	☐	☐
G. Final analysis of potential upstream/downstream impact/effects of project, where necessary	✔	☐	Tab 3.G	☐	☐
H. Existing and proposed structural elevations (e.g., invert of pipes, manholes, etc.)	✔	☐	Tab 3.H	☐	☐
I. Design water surface elevations and normal pool elevation for ponds.	✔	☐	Tab 3.I	☐	☐
J. Typical detail for outlet structures, embankments, spillways, grade control structures, conveyance channels, etc. To include height, width, elevation, and/or diameter.	✔	☐	Tab 3.J	☐	☐
K. Proposed limits of clearing and grading	✔	☐	Tab 3.K	☐	☐
L. Location of existing and proposed roads, buildings, parking lots and other impervious areas.	✔	☐	Figure 3.1	☐	☐
M. Location of existing and proposed utilities (e.g., water, sewer) and easements	✔	☐	Figure 3.1	☐	☐
N. Location of existing and proposed conveyance systems such as storm drains, inlets, catch basins, channels, swales, and areas of overland flow	✔	☐	Figure 3.1	☐	☐
O. Preliminary location and dimensions of proposed channel modifications, such as bridge or culvert crossings	✔	☐	Tab 3.O	☐	☐

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P. Preliminary selection and location of stormwater controls	✔		Tab 3.P		
Q. Emergency overflow structure' s flow path	✔		Tab 3.Q		
R. Detention facility provides one-foot of freeboard above the HWL and emergency outfall shown (top of berm elevation shown)	✔		Tab 3.R		
S. The 100-year 24-hour HWL delineated on the plan for detention pond	✔		Tab 3.S		
T. Lowest opening elevations table on the plat for structures located adjacent to channels or ponds	✔		Tab 3.T		
U. Stormwater Management Facilities located within a Reserve	✔		Tab 3.U		
V. Maintenance responsibility of stormwater management facility shall be specified in the platters text. (e.g. HOA, Lot Owners Association, or lot)	✔		Tab 3.V		
W. Off-site drainage easements or agreements required, where necessary	✔		Tab 3.W		

	Applicant			Engr	
Tab 4. Floodplain Submittal	**I**	**NA**	**Explanation / Location in Plan**	**I**	**NA**
A. Provide source of flood profile		✔	Tab 4		
B. Nearest base flood elevations		✔	Tab 4		
C. Delineation of pre-developed regulatory floodplain/floodway limits		✔	Tab 4		
D. Delineation of post-developed regulatory floodplain and floodway limits		✔	Tab 4		
E. Floodplain boundary determination per elevation (project limits shown)		✔	Tab 4		
F. Provide source of floodway data table and discharges		✔	Tab 4		
G. Provide all hydrologic and hydraulic study information for site-specific floodplain studies, unnumbered Zone A area elevation determinations and flood plain map revisions or required permits		✔	Tab 4		
H. Provide regulatory floodway and four natural profile models (10,50,100, and 500-yr) for existing and future watershed conditions		✔	Tab 4		
I. Location of floodplain/floodway limits and relationship of site to upstream/downstream properties (floodplain limits to be per elevation and scaled location)		✔	Tab 4		
J. Flood plains and floodways located within a Reserve, where necessary		✔	Tab 4		

	Applicant			Engr	
Tab 5. Federal, State and Local Permits (to be provided prior to construction unless otherwise specified)	**I/R**	**NA**	**Explanation / Location in Plan**	**I/R**	**NA**
A. US Army Corps of Engineers - Regulatory program permits (404 water quality certification)		✔	Tab 5.A		
B. Kansas Department of Agriculture - Division of Water Resources Permits (Stream Obstruction, Channel Change, Flood Plain Fill, Levee, Water Appropriations, Dam safety permit, etc.)		✔	Tab 5.B		
C. Federal Emergency Management Agency (FEMA) Letter of Map Changes (LOMA, LOMR, LOMR-f, CLOMR, etc.) Shall be included and approved when project modifies the limits of the floodway.		✔	Tab 5.C		
D. Kansas Department of Transportation		✔	Tab 5.D		
E. Sedgwick County Right-of-way Permit		✔	Tab 5.E		

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Tab 1. Project Narrative

A. Location

The subject site is on the northwest corner of the Central and Washington Avenue intersection, on Mosley Avenue. The site is located in the southeast quarter of Section 16, Township 27 South, Range 1 East of the Sixth Principal Meridian. The site is shown on the USGS Map, Figure 1.1.

B. Discussion of Development

The site is approximately 3.0 acres. The only impervious area on site is an existing building with a footprint of about 0.8 acres. The rest of the property is pervious area, gravel/dirt parking areas and a gravel access road. The existing building will be torn down and a new building will replace it; an asphalt/concrete parking lot is also proposed. Dry detention is proposed within the parking area.

C. Discussion of Offsite

The site is located in central Wichita within a developed industrial corridor. Existing adjoining land uses include concrete manufacturing, commercial, retail and offices.

D. Summary of Runoff

The site is fairly flat; surface elevations vary from 1299, near Central Avenue to 1301 on the north edge of the site. After redevelopment, the site will continue to drain to the south to an existing stormsewer system that crosses Central Avenue. A comparison of the pre and post-project runoff rates are shown in the table below.

Comparison of Pre and Post-Development Flowrates

Description	Design Storm Flows (cfs)				
	2-Yr	5-Yr	10-Yr	25-Yr	100-Yr
Pre-project Flowrates	2.5	3.2	3.7	4.4	5.5
Post-Project Flowrates	2.2	2.6	2.9	3.4	4.2

E. Best Management Practices

The site will be entirely impervious area. Inlets will be kept clear of debris. The detention area will be maintained to ensure proper detention.

F. Plat

The plat is included, Figure 1.2.

G. Preliminary Grading Plan

The preliminary lot grading plan is included, Figure 1.3.

H. Professional Engineer Seal

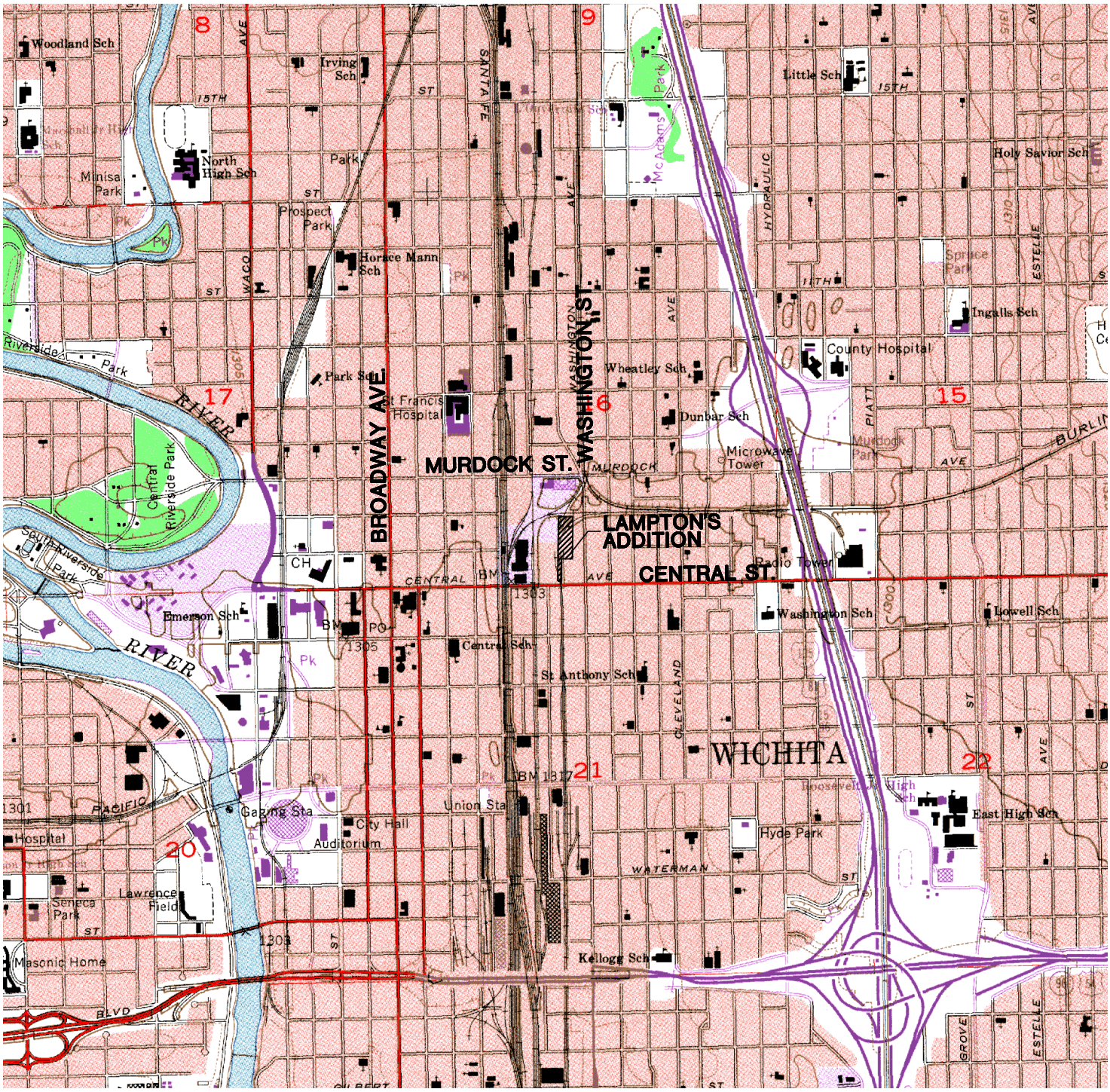
The cover of the report will be signed and dated.

I. CD

A CD of the drainage report in PDF format is attached to the inside front cover of the bound report.

Figure 1.1

USGS Quadrangle Map



SCALE 1:24 000

1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 5 FEET

NATIONAL GEODETIC VERTICAL DATUM OF 1929

N

J:\Civil\07728\Dwg\Dmg\07728 QUAD.dwg

MKEC ENGINEERING CONSULTANTS, INC.

411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

LAMPTON'S ADDITION
PROJECT NAME

QUAD MAP
SHEET TITLE

TMH	CMJ	KLA
DESIGN BY:	DRAWN BY:	CHECKED BY:
NOVEMBER 2007	07728	1 / 1
DATE	JOB NO.	SHEET/OF

Figure 1.2

Plat

LEGAL DESCRIPTION

A replat of Lots 2,4,6,8,10,12,14,16,18,20,22,24,26,28,30,32,34 and 36, on Dover Street, now Mosley Avenue, Throckmorton's Addition to the City of Wichita, Sedgwick County, Kansas, EXCEPT that part of said Lot 2 dedicated for street purposes lying within the following described tract: Commencing at the intersection of the West line of Washington Avenue with the South line of Murdock Avenue, as said streets are now established in the City of Wichita, Sedgwick County, Kansas; thence southerly along said West line of Washington Avenue, 485.25. feet for a point of beginning; thence continuing southerly along said West line of Washington Avenue, 40 feet; thence westerly parallel with the South line of Murdock Avenue aforesaid, 295 feet to the East line of Mosley Avenue as now established in said City; thence northerly along said East line of Mosley Avenue, 40 feet; thence easterly 295 feet to the point of beginning; TOGETHER WITH;

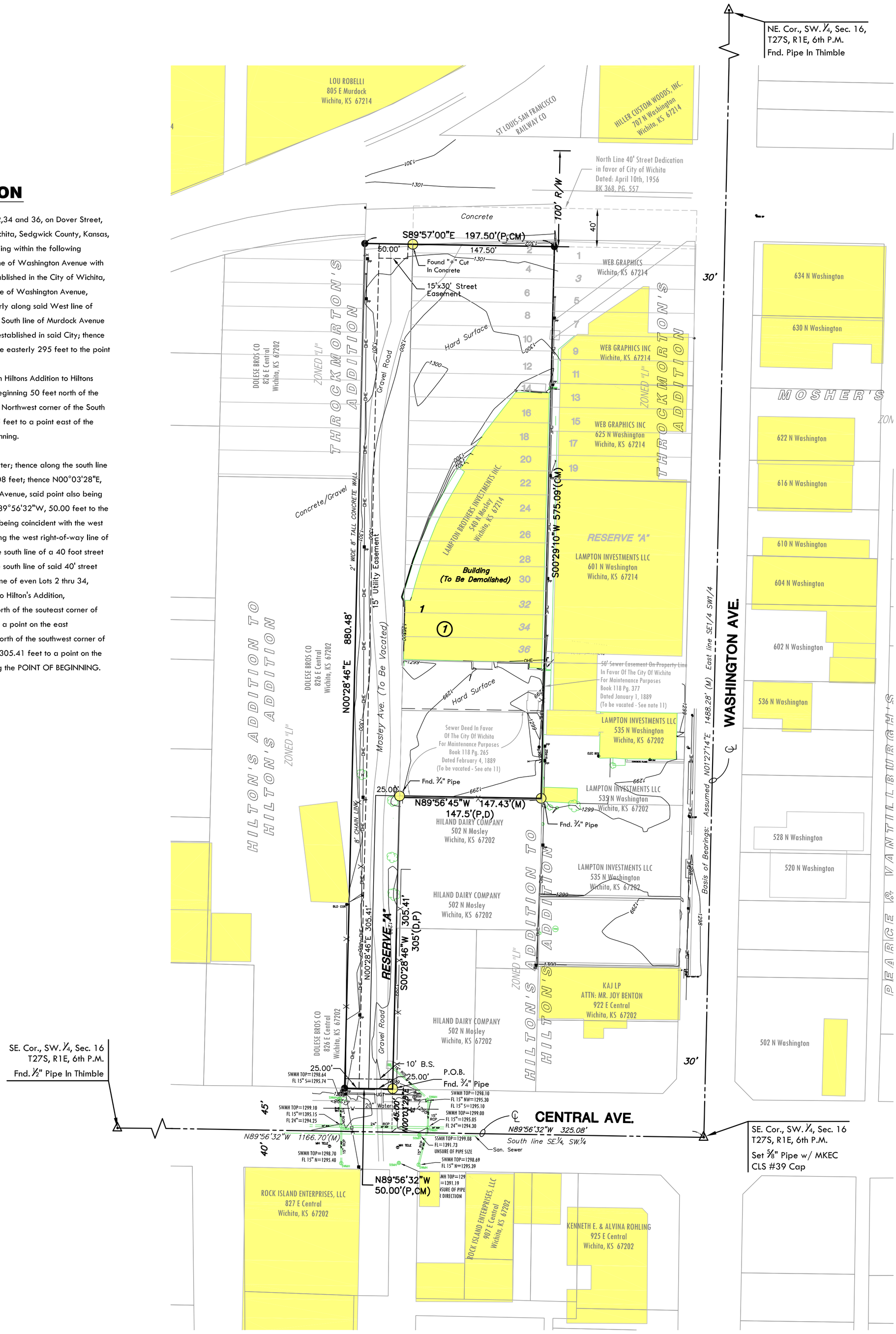
A part of Lots 6 and 8, on Dover Street, now Mosley Avenue, in Hiltons Addition to Hiltons Addition to Wichita, Sedgwick County, Kansas, described as beginning 50 feet north of the Southwest corner of said Lot 6, thence north 141.25 feet to the Northwest corner of the South Half of said Lot 8; thence east 147.5 feet; thence south 141.25 feet to a point east of the point of beginning; thence west 147.5 feet to the point of beginning.

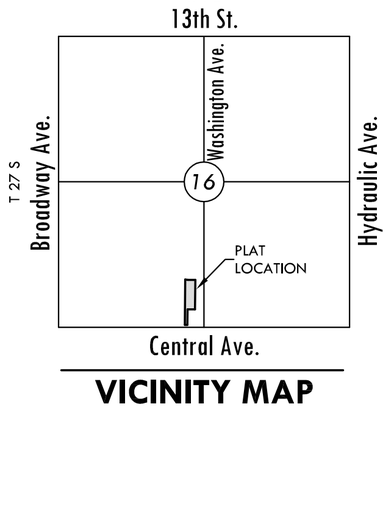
Said replat being more particularly described as follows:

COMMENCING at the southeast corner of said Southwest Quarter; thence along the south line of said Southwest Quarter, N89°56'32"W, a distance of 325.08 feet; thence N00°03'28"E, 45.00 feet to a point on the north right-of-way line of Central Avenue, said point also being the POINT OF BEGINNING; thence along said right-of-way, N89°56'32"W, 50.00 feet to the southeast corner of Lot 1, Hilton's Addition to Hilton's Addition, being coincident with the west right-of-way line of Mosley Avenue (Dover Street); thence along the west right-of-way line of Mosley Avenue, N00°28'46"E, a distance of 880.48 feet to the south line of a 40 foot street dedication recorded on Book 368, Page 557; thence along the south line of said 40' street dedication, S89°57'00"E, 197.50 feet; thence along the east line of even Lots 2 thru 34, Throckmorton's Addition and Lot 6 and Lot 8, Hilton's Addition to Hilton's Addition, S00°29'10"W, a distance of 575.09 feet to a point 50 feet north of the souteast corner of said Lot 6; thence N89°56'45"W, a distance of 147.43 feet to a point on the east right-of-way line of Mosley Avenue, said point being 50 feet north of the southwest corner of said Lot 6; thence along said right-of-way line S00°28'46"W, 305.41 feet to a point on the north right-of-way line of Central Avenue, said point also being the POINT OF BEGINNING.

LEGEND

- EDGE OF TREES
- 3IN - DECIDUOUS TREE
- SN - SIGN
- PP - POWER POLE
- ELEC BOX - ELECTRIC BOX
- LP - LIGHT POLE
- FH - FIRE HYDRANT
- WV - WATER VALVE
- WM - WATER METER
- SWMH - STORM WATER MANHOLE
- SSMH - SANITARY SEWER MANHOLE
- SWB - TELEPHONE MANHOLE
- TR - TELEPHONE RISER
- GRATE INLET
- GM - GAS METER
- BM - BENCHMARK
- Set 5/8" REBAR/MKEC CLS 39
- PROPERY CORNER FOUND
- SECTION CORNER FOUND
- EASEMENT
- BUILDING SETBACK
- FENCE
- STORM SEWER PIPE
- WATER LINE
- SANITARY SEWER LINE
- GAS LINE
- TELEPHONE LINE
- UGE - UNDERGROUND ELECTRIC LINE
- OHT - OVERHEAD TELEPHONE
- OHE - OVERHEAD ELECTRIC
- EXISTING BUILDING/STRUCTURE





VICINITY MAP

NORTH
1"=60' / 1 : 720
60 0 60

NOTES

1. GEOGRAPHY: Located in central Wichita in an industrial corridor. The property has access to Central Avenue. Existing adjoining land uses include: concrete manufacturing, commercial, and offices.
2. LOT TOTAL - 1
3. EXISTING/PROPOSED USES: Industrial/Welding
4. ZONING: Existing / no change in zoning is planned - "LI" Limited Industrial
5. PLAT AREA: 2.96 acres
6. SURVEY DATE: October 2007 (by MKEC)
7. RESERVES: Reserve "A" is platted for landscaping, irrigation, open space, and private access. The Reserve shall be owned and maintained by Hiland Dairy Company and is reserved for uses stated
8. FLOOD: According to FEMA FIRM Community Unit Panel 20173C0355E, effective date February 7th, 2007; this property lies within flood zone "X", *"Areas determined to be outside the 0.2% annual chance floodplain."*
9. DRAINAGE: A drainage report shall accompany this plat and submitted to the Engineering Department.
10. RAILROAD RIGHT-OF-WAY: The west 50 feet of the plat is encumbered by a Burlington Northern Santa Fe perpetual franchise as recorded in Ordinace No. 392, Dated December 13, 1886 for the construction, maintenance and operation of tracks; together with supplemental Ordinances Nos. 586, dated September 25, 1888; 613, December 31, 1888; 1924, Dated July 18, 1902; and 1925, Dated July 18, 1902.
11. UTILITIES: All utilities lying within the east 10 feet of Lot 1 are intended to be relocated and confined to easements as determined at the time of final platting. Sewer easements recorded in Book 118, Page 265, and Book 118, Page 377 shall be vacated and replatted by KSA 512-B
12. PLATS: Throckmorton's Addition recorded March 9, 1886
    Hilton's Addition to Hilton's Addition recorded March 23, 1872
13. VACATION OF DOVER STREET/MOSLEY AVENUE: Prior to the recording of the final plat of Lampton Brothers Addition; A Quit-Claim Deed shall be granted from the Dolese Brothers Co. to Lampton Brothers Investment Inc. for their interest in Dover Street now Mosley Avenue.
14. STREETS: A hammerhead turn-around shall be provided within the 15' x 30' street easement located at the northwest corner of Lot 1.

PRELIMINARY PLAT

A portion of the SE. 1/4, SW1/4, Sec. 16, T27S, R1E, 6th P.M.

Date submitted: November 9, 2007
Subdivision Hearing: November 29th, 2007

LAMPTON BROTHERS ADDITION

OWNERS / DEVELOPERS: Lampton Brothers Investment, Inc. 601 N. Washington Wichita, KS 67214 (316)-263-3293 (As to Lot 1)
Hiland Dairy Company 700 E Central Ave Wichita, KS 67214 (316) 267-4221 (As to Reserve "A")

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316 - 684 - 9600

Figure 1.3

Preliminary Grading Plan

LEGEND

- 6IN - CONIFEROUS TREE
- 3IN - DECIDUOUS TREE
- SN - SIGN
- PP - POWER POLE
- ELEC BOX - ELECTRIC BOX
- LP - LIGHT POLE
- FH - FIRE HYDRANT
- WV - WATER VALVE
- WM - WATER METER
- BENCHMARK
- EASEMENT
- BUILDING SETBACK
- X - FENCE
- STORM SEWER PIPE
- W - WATER LINE
- SANITARY SEWER LINE
- G - GAS LINE
- P - GAS PIPELINE
- UGT - TELEPHONE LINE
- UGE - UNDERGROUND ELEC.
- OHE - OVERHEAD ELECTRIC
- FOC - FIBER OPTIC CABLE !
- XXXX - SPOT ELEVATIONS
- FLOW ARROW

BENCHMARKS

BM NE CORNER OF CENTRAL AND WASHINGTON
CITY OF WICHITA DATUM
(COW DATUM=NGVD 29-1187.4)

R1E
13th St.
T 27 S
Broadway Ave.
Hydraulic Ave.
16
PLAT LOCATION
Central Ave.

VICINITY MAP

ZONED "LI"
THROCKMORTON'S ADDITION
ZONED "LI"
THROCKMORTON'S ADDITION
HILTON'S ADDITION TO
HILTON'S ADDITION
ZONED "LI"
HILTON'S ADDITION TO
HILTON'S ADDITION
ZONED "LI"
WASHINGTON AVENUE
2' WIDE 8' TALL CONCRETE WALL
8' CHAIN LINK
RESERVE "A"
1
40
1299.00
1298.00
PROP FL=1297.78
PROP FL=1297.00
PROP FL=1296.10
EXIST. 15" SWS FL=1295.15
EXIST. 24" SWS FL=1294.25
EXIST. 15" SWS FL=1295.40
EXIST. 15" SWS FL NW=1295.30 FL S=1295.10
EXIST. 15" SWS FL NW=1295.05
EXIST. 24" SWS FL=1294.30
EXIST. 15" SWS FL=1295.39
CENTRAL AVENUE
SE. Cor., SW. 1/4, Sec. 16 T27S, R1E, 6th P.M.
Set 5/8" Pipe w/ MKEC CLS #39 Cap
SE. Cor., SW. 1/4, Sec. 16 T27S, R1E, 6th P.M.
Fnd. 1/2" Pipe In Thimble
N
SCALE: 1"= 40'
0 20 40 80

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LAMPTON'S ADDITION
PROJECT NAME

PRELIMINARY LOT GRADING PLAN
SHEET TITLE

TMH	TMH	KLA
DESIGN BY:	DRAWN BY:	CHECKED BY:
NOVEMBER 2007	07728	1 / 1
DATE	JOB NO.	SHEET/OF

Tab 2. Existing Conditions Runoff Calculations

A. Orthophotograph

The aerial photograph is included, Figure 2.1.

B. Runoff Method

Because of the relatively small footprint of the site, the rational method in Hydraflow Hydrographs 2007 by Intelisolve was used to model the site.

C. Existing Topography

The site is very flat with slopes less than 0.5% across the site. Elevations on the site range from 1301 feet to 1299 feet at the south property line. The existing topography is shown on the Existing Conditions Drawing, Figure 2.2.

D. Site Areas

The Lampton Addition is 3.0 acres. Because the site is within a highly-developed area, most areas drain to the streets rather than through adjacent lots.

E. Benchmarks

The benchmark used for site control is on the northeast corner of Central and Washington and is in City of Wichita Datum.

F. Streams, Creeks, and Waterways

No portion of the site is included in a regulatory floodplain. The site is in Zone X, areas outside the 0.2% annual chance event, as shown on FIRM Panel 355 of 700, Sedgwick County, Kansas February 2, 2007 in Figure 2.3.

G. Soils

According to the NRCS (SCS) Sedgwick County Soil Survey, Figure 2.4, the entire site is Urban land - Elandco complex, 0-1% slopes. The Hydrologic Soil Group (HSG) for the soil is “B”.

H. Natural Features

There are no natural bodies of water on or adjacent to the site.

I. Location of Existing Impervious Areas

The site is located in central Wichita within a developed industrial corridor. Existing adjoining land uses include concrete manufacturing, commercial, retail and offices. The only impervious area on site is an existing building with a footprint of about 0.8 acres. The rest of the property is pervious area, gravel/dirt parking areas and a gravel access road.

J. Location of Existing Utilities

Water and sanitary sewer are on-site.

K. Location of Existing Conveyance Systems

There is an existing stormsewer area inlet approximately 26 feet north of the south property line. The site is graded to drain to this point. A graded drainageway commences approximately 225 feet north of the south property line. The upstream flowline is 1298.58 and the drainageway outlets at the inlet with a flowline of 1298.31. The inlet ties into an existing 15" reinforced concrete pipe (RCP), flowline 1296.10. This stormsewer line then crosses Central Avenue and ties into an existing 24" RCP stormsewer line and flows west from this junction.

L. Flow Paths

Flow paths are shown on the Existing Conditions Drawing, Figure 2.2.

M. Location and Sizes of Existing Structures

There is an existing area inlet, 3.6'x2.3' in dimension, approximately 26 feet north of the south property line. The site is graded to drain to this point. This inlet ties into an existing 15" RCP which then ties into an existing 24" RCP on the south side of Central Avenue.

N. Existing Conditions Hydrologic Analysis

Because the site is within a highly-developed area, most areas drain to the streets rather than through adjacent lots. Offsite runoff is negligible; the site was analyzed as one drainage area as shown on the Existing Conditions drawing, Figure 2.4. The site currently drains north to south to the area inlet.

The resulting pre-project flows are reported in the table below. Runoff calculations are in Figure 2.5.

Pre-Development Flowrates

Description	Design Storm Flows (cfs)				
	2-Yr	5-Yr	10-Yr	25-Yr	100-Yr
Pre-project Flowrates	2.5	3.2	3.7	4.4	5.5

O. Pre-Developed Runoff Curve Numbers

A weighted rational coefficient of 0.46 was used for the Lampton's site. Coefficient calculations are in Figure 2.6.

P. Existing Time of Concentration

The time of concentration for pre-development conditions is shown in the following table. Time of concentration calculations are in Figure 2.6.

Existing Time of Concentration and Rational Coefficient

Area	T_c	Rational Coefficient
	minutes	
Lampton's Addition	54.1	0.46

Q. Downstream Drainage Capacity

Existing condition flows will be maintained under post-project conditions. The 15-inch and 24-inch RCPs downstream will function as they currently do and the current capacity of these RCPs will not be compromised by the proposed development.

R. Existing Structural Elevations

The on-site inlet is a grated inlet, 3.6'x2.3' in dimension, with a flowline elevation of 1298.31. The existing 15-inch RCP has a flowline of 1296.10.

S. Open Channels

There is a graded drainageway commencing approximately 225 feet north of the south property line. The upstream flowline is 1298.58 and the drainageway outlets at the inlet with a flowline of 1298.31.

T. Groundwater Elevations

Groundwater elevations are not applicable for this project.

Figure 2.1

Orthophotograph

SCALE 1:24 000

1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 5 FEET

NATIONAL GEODETIC VERTICAL DATUM OF 1929

N

J:\Civil\07728\Dwg\Dmg\07728 AERIAL.dwg

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411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

LAMPTON'S ADDITION
PROJECT NAME

AERIAL MAP
SHEET TITLE

TMH	CMJ	KLA
DESIGN BY:	DRAWN BY:	CHECKED BY:

NOVEMBER 2007	07728	1 / 1
DATE	JOB NO.	SHEET/OF

Figure 2.2

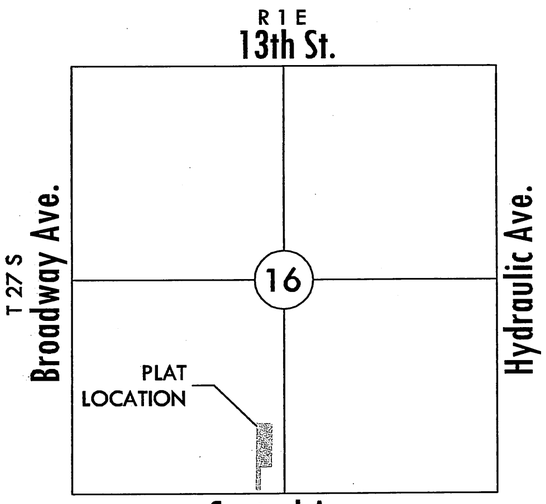
Existing Conditions Drawing

LEGEND

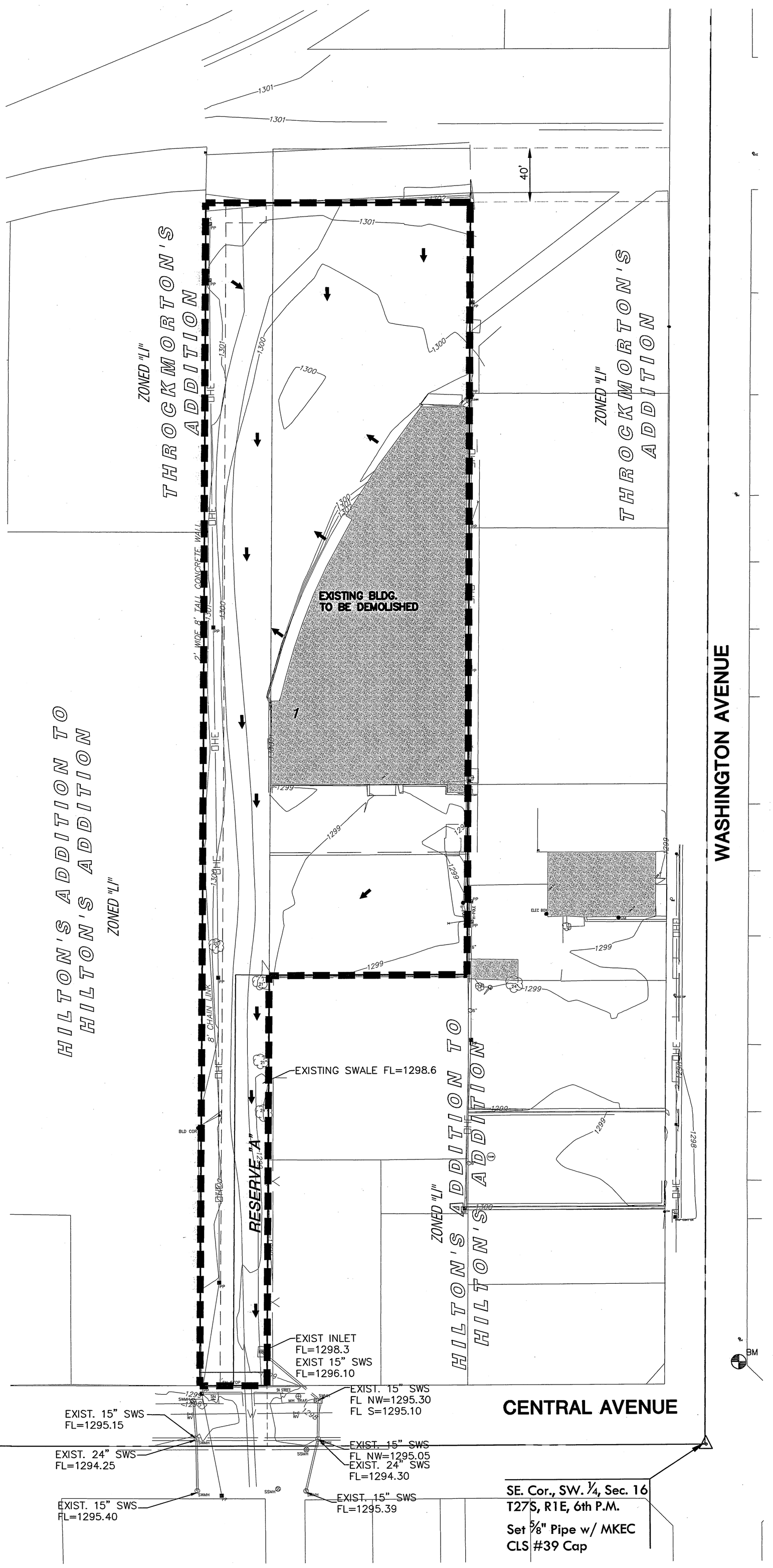
- 6IN - CONIFEROUS TREE
- 3IN - DECIDUOUS TREE
- SN - SIGN
- PP - POWER POLE
- ELEC BOX - ELECTRIC BOX
- LP - LIGHT POLE
- FH - FIRE HYDRANT
- WV - WATER VALVE
- WM - WATER METER
- BENCHMARK
- EASEMENT
- BUILDING SETBACK
- FENCE
- STORM SEWER PIPE
- WATER LINE
- SANITARY SEWER LINE
- GAS LINE
- GAS PIPELINE
- TELEPHONE LINE
- UNDERGROUND ELEC.
- OVERHEAD ELECTRIC
- FIBER OPTIC CABLE !
- DRAINAGE SUB BASIN
- FLOW ARROW

BENCHMARKS

BM NE CORNER OF CENTRAL AND WASHINGTON
CITY OF WICHITA DATUM
(COW DATUM=NGVD 29-1187.4)



VICINITY MAP



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MKEC ENGINEERING CONSULTANTS, INC.
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

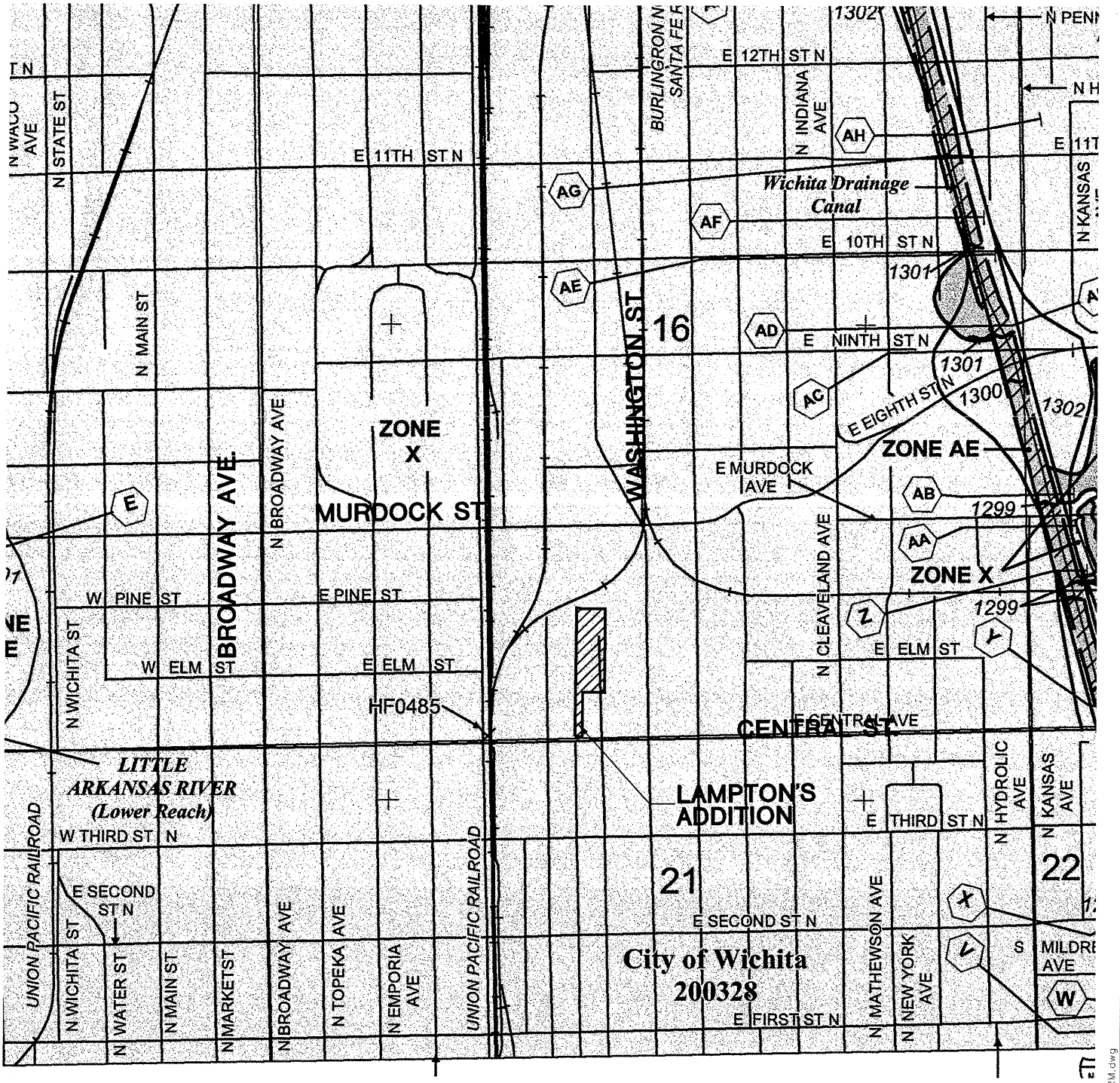
LAMPTON'S ADDITION
PROJECT NAME

EXISTING CONDITIONS
SHEET TITLE

DESIGN BY:	DRAWN BY:	CHECKED BY:
TMH	TMH	KLA
DATE	JOB NO.	SHEET/OF
NOVEMBER 2007	07728	1 / 1

Figure 2.3

FIRM



PANEL 0355E

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

SEDGWICK COUNTY, KANSAS
AND INCORPORATED AREAS

PANEL 355 OF 700

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
WICHITA, CITY OF	200328	0355	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
20173C0355E

EFFECTIVE DATE
FEBRUARY 2, 2007
Federal Emergency Management Agency

N

MAP SCALE 1" = 1000'

500 0 1000 2000 FEET

300 0 300 600 METERS

J:\Civil\07728\Dwg\Dmg\07728 FIRM.dwg

MKEC ENGINEERING CONSULTANTS, INC.

411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

LAMPTON'S ADDITION
PROJECT NAME

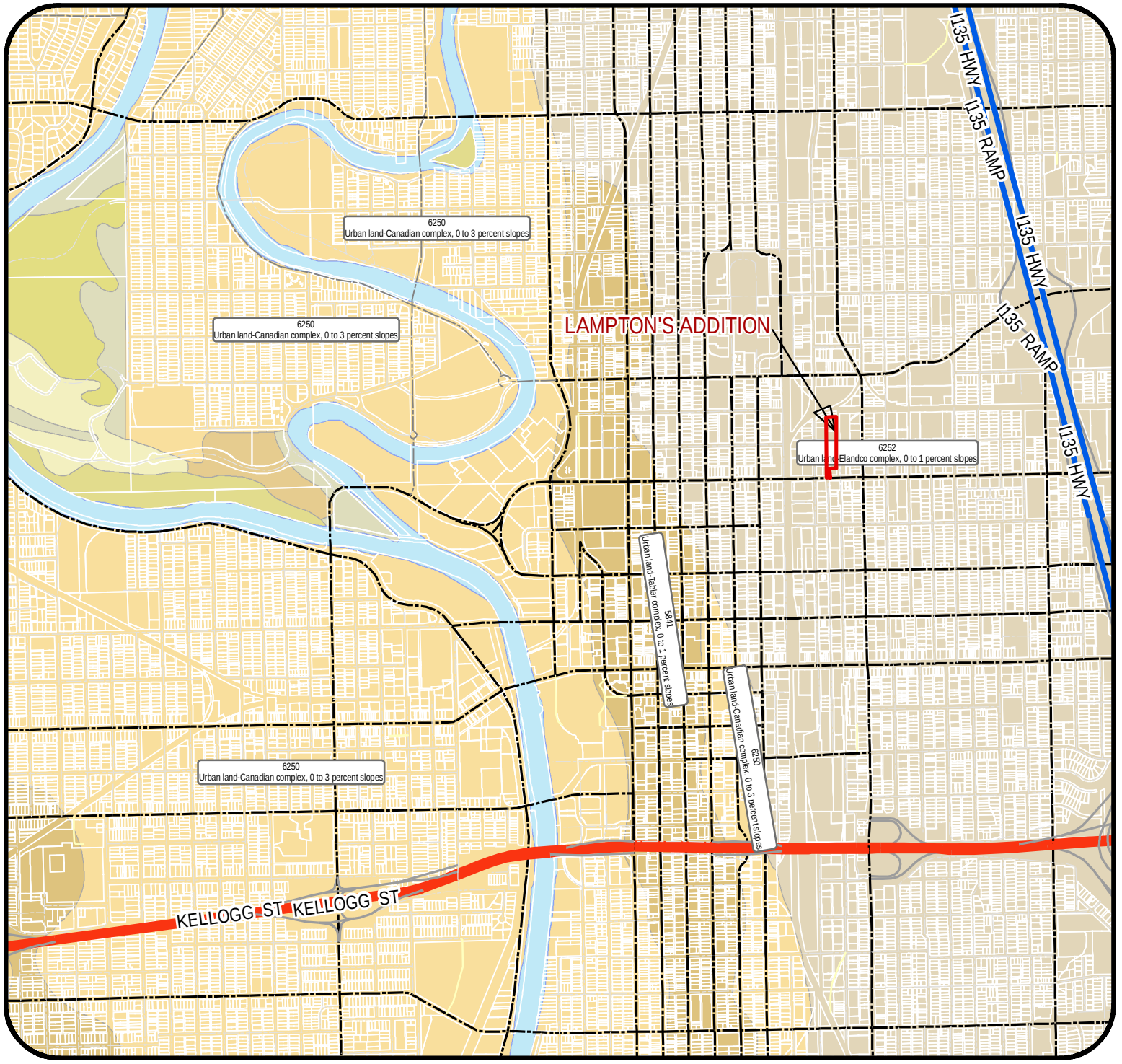
FIRM MAP
SHEET TITLE

TMH	CMJ	KLA
DESIGN BY:	DRAWN BY:	CHECKED BY:

NOVEMBER 2007	07728	1 / 1
DATE	JOB NO.	SHEET/OF

Figure 2.4

Soil Survey



1 0.5 0 1 Miles

1,000 500 0 1,000 2,000 3,000 4,000 5,000 6,000 7,000 Feet

1 0.5 0 1 Kilometers

LAMPTON'S ADDITION
Project Name:

Soil Survey - Sedgwick County, KS
Sheet Title:

MKEC ENGINEERING CONSULTANTS, INC.

CMJ	NOV. 2007
Drawn By:	Date:
AF/KLA	07728
Design / Review:	Job No.:

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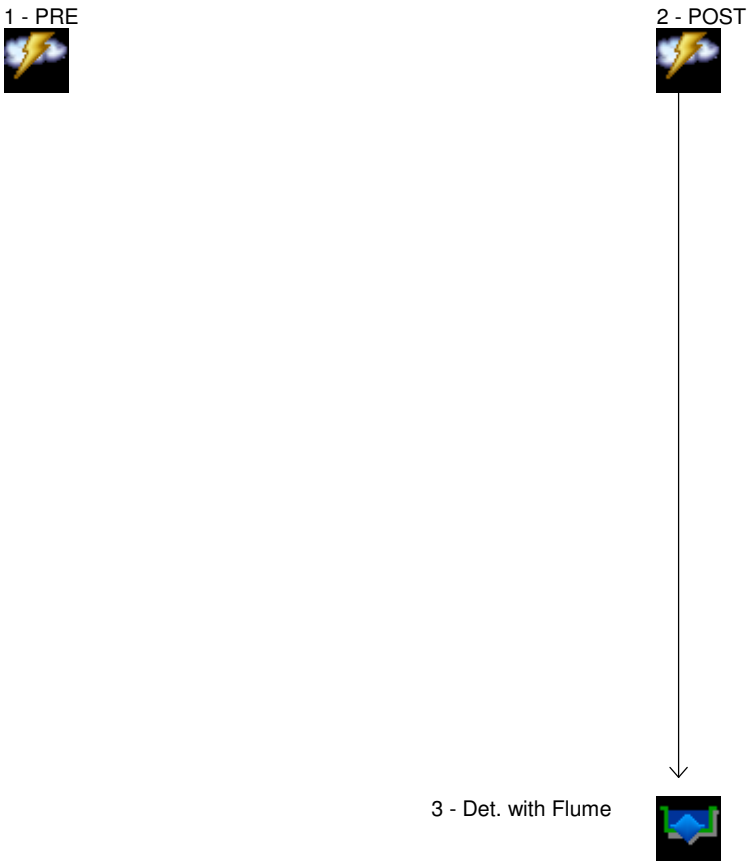
Figure 2.5

Hydraflow Hydrographs

Watershed Model Schematic



Legend

Hyd.	Origin	Description
1	Rational	PRE
2	Rational	POST
3	Reservoir	Det. with Flume

Hydrograph Return Period Recap

Hydraflow Hydrographs by Intelisolve v9.23

Hyd. No.	Hydrograph type (origin)	Inflow Hyd(s)	Peak Outflow (cfs)								Hydrograph description
			1-Yr	2-Yr	3-Yr	5-Yr	10-Yr	25-Yr	50-Yr	100-Yr	
1	Rational	-------	-------	2.513	-------	3.169	3.721	4.377	-------	5.462	PRE
2	Rational	-------	-------	9.427	-------	11.20	12.89	14.96	-------	18.25	POST
3	Reservoir	2	-------	2.231	-------	2.576	2.927	3.393	-------	4.187	Det. with Flume

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.23

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph description
1	Rational	2.513	1	54	0.187	----	------	------	PRE
2	Rational	9.427	1	18	0.234	----	------	------	POST
3	Reservoir	2.231	1	32	0.233	2	1298.31	0.176	Det. with Flume

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.23

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph description
1	Rational	3.169	1	54	0.236	----	------	------	PRE
2	Rational	11.20	1	18	0.278	----	------	------	POST
3	Reservoir	2.576	1	32	0.277	2	1298.44	0.211	Det. with Flume

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.23

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph description
1	Rational	3.721	1	54	0.277	----	------	------	PRE
2	Rational	12.89	1	18	0.319	----	------	------	POST
3	Reservoir	2.927	1	32	0.318	2	1298.57	0.244	Det. with Flume

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.23

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph description
1	Rational	4.377	1	54	0.326	----	------	------	PRE
2	Rational	14.96	1	18	0.371	----	------	------	POST
3	Reservoir	3.393	1	32	0.370	2	1298.73	0.285	Det. with Flume

Hydraflow Table of Contents

07728Storage.gpw

Hydraflow Hydrographs by Intelisolve v9.23

Thursday, Nov 15, 2007

100 - Year

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.23

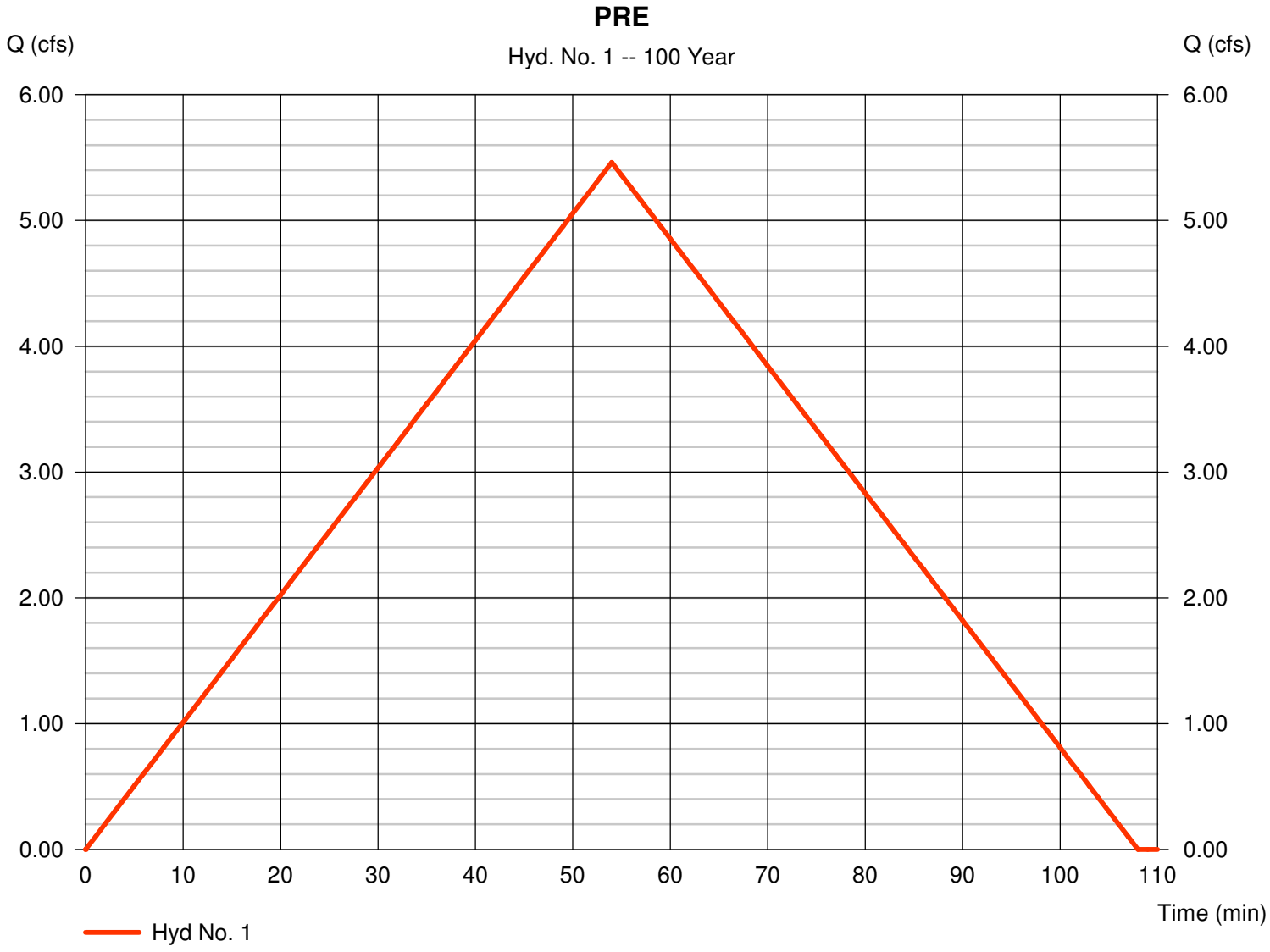
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (acft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (acft)	Hydrograph description
1	Rational	5.462	1	54	0.406	----	------	------	PRE
2	Rational	18.25	1	18	0.452	----	------	------	POST
3	Reservoir	4.187	1	32	0.451	2	1298.97	0.348	Det. with Flume

Hydrograph Report

Hyd. No. 1

PRE

Hydrograph type	=	Rational	Peak discharge	=	5.462 cfs
Storm frequency	=	100 yrs	Time to peak	=	54 min
Time interval	=	1 min	Hyd. volume	=	0.406 acft
Drainage area	=	3.000 ac	Runoff coeff.	=	0.46
Intensity	=	3.958 in/hr	Tc by User	=	54.00 min
IDF Curve	=	SedgwickCoKS.IDF	Asc/Rec limb fact	=	1/1

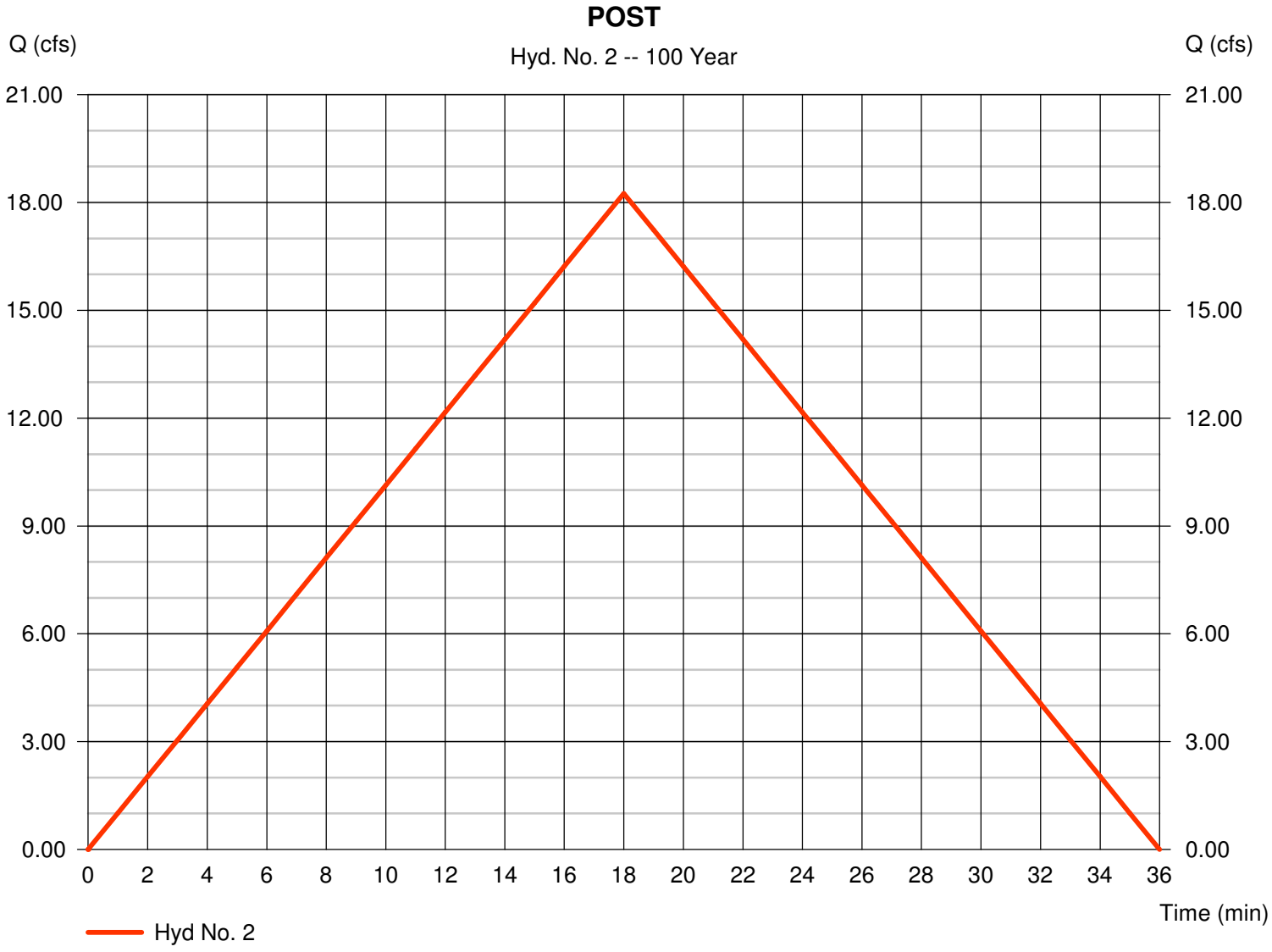


Hydrograph Report

Hyd. No. 2

POST

Hydrograph type	=	Rational	Peak discharge	=	18.25 cfs
Storm frequency	=	100 yrs	Time to peak	=	18 min
Time interval	=	1 min	Hyd. volume	=	0.452 acft
Drainage area	=	3.000 ac	Runoff coeff.	=	0.89
Intensity	=	6.834 in/hr	Tc by User	=	18.00 min
IDF Curve	=	SedgwickCoKS.IDF	Asc/Rec limb fact	=	1/1



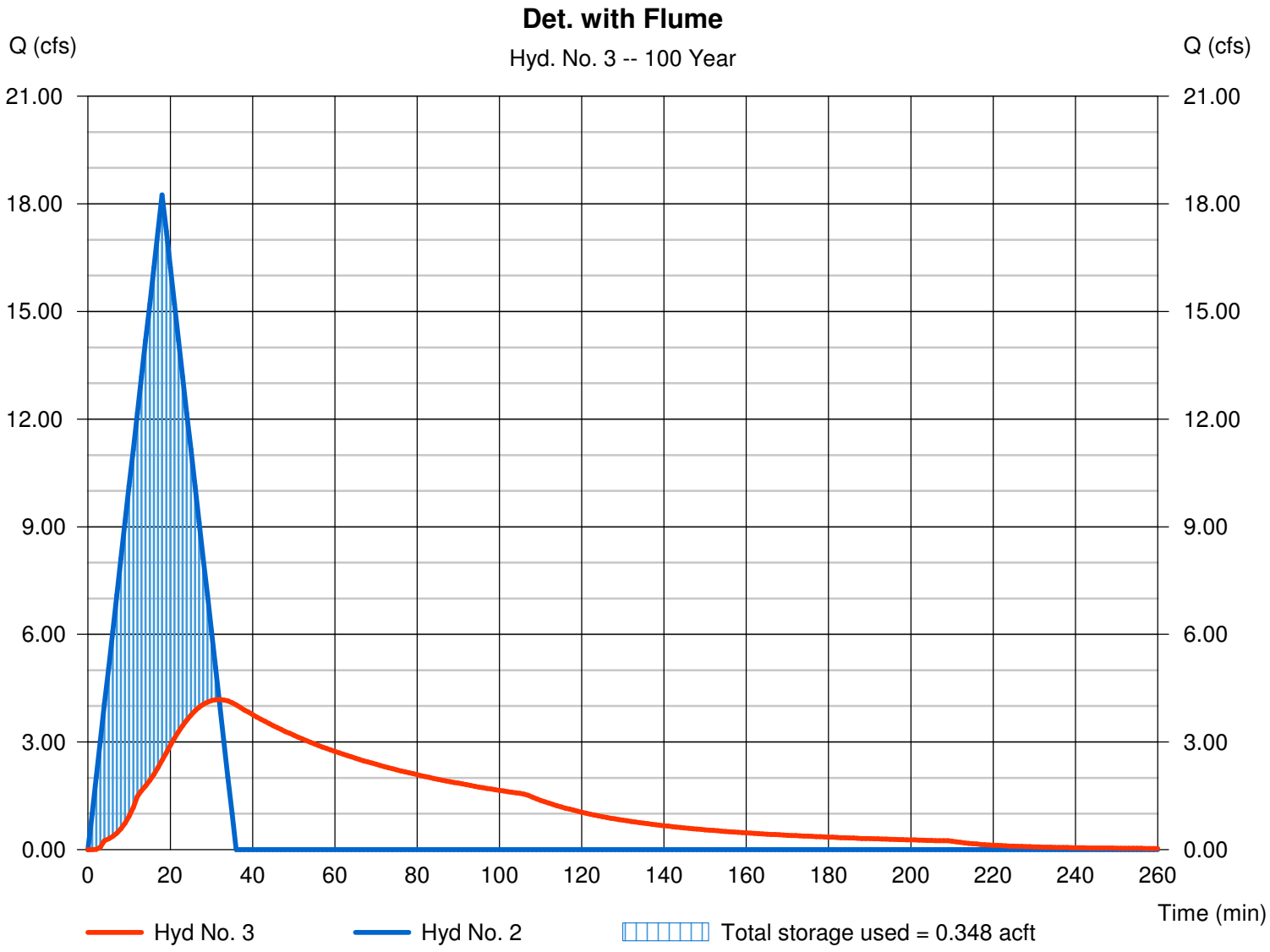
Hydrograph Report

Hyd. No. 3

Det. with Flume

Hydrograph type	=	Reservoir	Peak discharge	=	4.187 cfs
Storm frequency	=	100 yrs	Time to peak	=	32 min
Time interval	=	1 min	Hyd. volume	=	0.451 acft
Inflow hyd. No.	=	2 - POST	Max. Elevation	=	1298.97 ft
Reservoir name	=	FLUME	Max. Storage	=	0.348 acft

Storage Indication method used.



Pond Report

Pond No. 5 - FLUME

Pond Data

Contours - User-defined contour areas. Conic method used for volume calculation. Begining Elevation = 1296.10 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (acft)	Total storage (acft)
0.00	1296.10	00	0.000	0.000
0.90	1297.00	1,500	0.010	0.010
1.90	1298.00	6,500	0.085	0.095
2.90	1299.00	17,000	0.260	0.356

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 15.00	0.00	0.00	0.00
Span (in)	= 15.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 1296.10	0.00	0.00	0.00
Length (ft)	= 0.00	0.00	0.00	0.00
Slope (%)	= 0.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

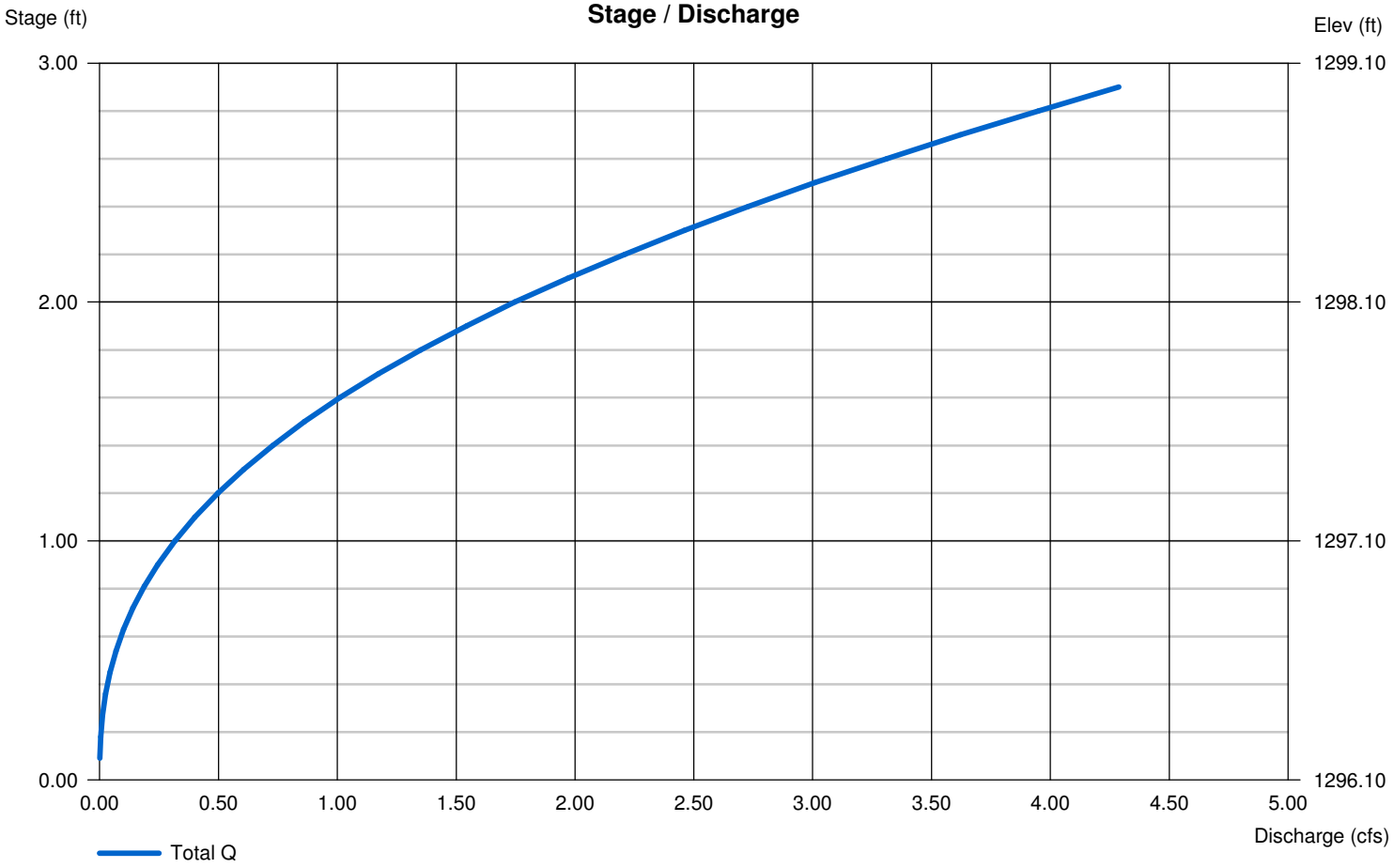
	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 1296.10	0.00	0.00	0.00
Weir Coeff.	= 0.33	3.33	3.33	3.33
Weir Type	= 15 degV	---	---	---
Multi-Stage	= Yes	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Discharge



Hydraflow Rainfall Report

Return Period (Yrs)	Intensity-Duration-Frequency Equation Coefficients (FHA)			
	B	D	E	(N/A)
1	0.0000	0.0000	0.0000	--------
2	76.3137	14.3000	0.8844	--------
3	0.0000	0.0000	0.0000	--------
5	52.6224	11.2000	0.7497	--------
10	55.1841	11.1000	0.7229	--------
25	60.7012	11.1000	0.7068	--------
50	66.9222	11.3000	0.7004	--------
100	62.2794	10.1000	0.6624	--------

File name: SedgwickCoKS.IDF

Intensity = B / (Tc + D)^E

Return Period (Yrs)	Intensity Values (in/hr)											
	5 min	10	15	20	25	30	35	40	45	50	55	60
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	5.57	4.54	3.85	3.35	2.97	2.67	2.43	2.23	2.06	1.92	1.80	1.69
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	6.52	5.33	4.55	3.99	3.57	3.24	2.97	2.75	2.57	2.41	2.27	2.15
10	7.40	6.09	5.22	4.60	4.13	3.76	3.46	3.21	3.00	2.82	2.67	2.53
25	8.51	7.03	6.05	5.35	4.81	4.39	4.05	3.76	3.52	3.32	3.14	2.98
50	9.47	7.86	6.78	6.00	5.41	4.94	4.56	4.24	3.98	3.75	3.55	3.37
100	10.31	8.53	7.37	6.53	5.90	5.40	5.00	4.66	4.37	4.13	3.92	3.73

Tc = time in minutes. Values may exceed 60.

Precip. file name: SedgwickCoKS.pcp

Storm Distribution	Rainfall Precipitation Table (in)							
	1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr
SCS 24-hour	0.00	3.48	0.00	4.55	5.25	6.30	7.10	7.80
SCS 6-Hr	0.00	2.52	0.00	3.47	4.13	5.00	5.65	6.40
Huff-1st	0.00	1.55	0.00	2.75	4.00	5.38	6.50	8.00
Huff-2nd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-3rd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-4th	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Huff-Indy	0.00	1.55	0.00	2.75	4.00	5.38	6.50	8.00
Custom	0.00	2.50	0.00	0.00	0.00	4.60	5.20	5.90

Figure 2.6

Time of Concentration Calculations

Time of Concentration Calculations by the FAA method and Composite Rational Coefficient Results

Lampton's Addition

Project Number 07728

$$T_c = \frac{(1.1-C)L^{1/2}}{100\ S^{1/3}}$$

Area Name	Area (Acres)	Land Use	Soil Group	Maximum Elevation	Minimum Elevation	Flow Length (L)	Rational Runoff Coefficient, C				Composite Runoff Coefficient,C				Time of Concentration (min), T_c			
							2-Year	5-Year	10-Year	100-Year	2-Year	5-Year	10-Year	100-Year	2-Year	5-Year	10-Year	100-Year
Pre-project	*0.7*	*Roofs*	*B*				0.80	0.85	0.90	0.93								
	2.3	*Streets - Gravel*	*B*	*1301.0*	*1299.0*	*850*	0.24	0.26	0.33	0.48	0.37	0.40	0.46	0.59	62.0	59.7	54.1	43.8
Post-project	*0.8*	*Roofs*	*B*				0.80	0.85	0.90	0.93								
	2.2	*Drive, Parking Lots & Walks*	*B*	*1301.0*	*1299.0*	*850*	0.87	0.87	0.88	0.89	0.85	0.86	0.89	0.90	21.1	20.0	18.2	16.9

Tab 3. Post-Development Hydrologic Analysis

A. Proposed Conditions Hydrologic and Hydraulic Analysis

The post-project drainage boundaries are shown in Figure 3.1. Hydraflow Hydrographs, 2007 by Intelisolve was used to complete the hydrologic analysis for Lampton's Addition. The runoff calculations are in Figure 2.5 and the resulting flows are in the table below.

Post-Development Flowrates

Description	Design Storm Flows (cfs)				
	2-Yr	5-Yr	10-Yr	25-Yr	100-Yr
Post-project Flowrates	2.2	2.6	2.9	3.4	4.2

Dry detention is proposed within the parking area and Reserve A as shown on the Drainage and Utility Plan, Figure 3.1. After development the detention area will be graded to outlet into the existing 15" stormsewer line, in the southeast corner of the site. The existing inlet will be removed and a 15-degree v-notch weir with a flowline of 1296.10 will meter outflow from the detention area into the 15-inch pipe. For the 100-year storm, under developed conditions, the discharge from the site will be 4.2 cfs with a dry detention water surface elevation of 1299.0.

B. Proposed Time of Concentration

Because of the dramatic increase in impervious area from pre to post-project conditions, the post-project time of concentration is significantly less than the pre-project value. The following table shows the post-development time of concentration. Time of concentration calculations are in Figure 2.6.

C. Assumed Post-Developed Curve Numbers

A weighted rational coefficient of 0.89 was used for Lampton's site. Coefficient calculations are in Figure 2.6.

Proposed Time of Concentration and Rational Coefficient

Area	T_c	Rational Coefficient
	minutes	
Lampton's Addition	18.2	0.89

D. Proposed Contours for Detention

The parking area and a proposed concrete flume in Reserve A will be constructed to provide 0.35 ac-ft of detention. The parking lot will be graded to outlet into the flume, which will convery runoff to the 15-degree v-notch weir just upstream of the existing 15-inch stormsewer. A concrete curb will be constructed to provide detention within the flume and parking area. This curb will vary in height from 2.9 feet at the most downstream end to a standard 6-inch curb in the parking area.

E. Preliminary SWS Sizing Calculations

Sheet flow will be the main method of stormwater conveyance. Assuming the existing inlet and stormsewer system function adequately under current conditions, this system will be sufficient for

the proposed development. Rain leaders will be constructed to drain the roof of the proposed building.

F. Stage-Storage-Discharge

The stage-storage-discharge for the dry detention area is in Figure 2.5.

G. Analysis of upstream/downstream impact

Runoff flows for all design storms remain the same or decrease from pre to post-development; therefore, upstream/downstream impacts are unchanged from current conditions.

H. Existing and Proposed Structural Elevations

The existing building on-site has an elevation of 1302.9 feet with a loading dock elevation of 1302.75 feet. Minimum pad elevations will be set 3 feet above the 100-year water surface elevation. When feasible, current grade will dictate structural elevations.

I. Pond Design Elevations

The dry detention basin is designed to provide 0.35 ac-ft. of detention and will have a 100-year water surface elevation of 1299.0.

J. Structure Details

Lampton's Addition will re-develop into anindustrial welding service and supply.

K. Limits of Clearing and Grading

The entire site will be cleared and graded.

L. Location of Impervious Areas

Roads, parking areas and buildings will be located as shown on the Drainage and Utility Plan, Figure 3.1.

M. Location of Utilities

Water and sanitary sewer are already on-site. Utilities are shown on the Drainage and Utility Plan, Figure 3.1.

N. Location of Conveyance Systems

Proposed grading will direct runoff from the site to the proposed flume and existing stormsewer, Figure 3.1.

O. Location of Channel Modifications

The existing drainageway will be modified to accommodate the proposed detention. A concrete flume is proposed for stormwater conveyance and detention. The flume will be graded to convey flow from the detention outlet to the existing stormsewer, Figure 3.1.

P. Selection and Location of Stormwater Controls

Stormwater controls consist of grading and paving to direct stormwater to the detention area, a dry detention area and the existing stormsewer system. The outflow from the dry detention area will be controlled by a 15-degree v-notch weir with a flowline of 1296.10. The existing area inlet will be removed.

Q. Emergency Overflow

The proposed flume will maintain the current overflow path to the stormsewer system.

R. Freeboard

The detention area and drainage swale design will include a 1-foot freeboard for added safety.

S. 100-Year High Water Line

Hydraflow Hydragraphs 2007, by Intellisolve was used to determine that the 100-year water surface elevation for the dry detention basin is 1299.0.

T. Lowest Openings

The lowest opening for the proposed building is 1302.0.

U. Stormwater Management Facilities

The detention corridor onsite is located within a reserve.

V. Maintenance Responsibility

The maintenance of the reserve will be the responsibility of the owner.

W. Offsite-Drainage Easements

Not applicable to Lampton' s Addition.

Figure 3.1

Drainage and Utility Plan

LEGEND

- 6IN - CONIFEROUS TREE
- 3IN - DECIDUOUS TREE
- SN - SIGN
- PP - POWER POLE
- ELEC BOX - ELECTRIC BOX
- LP - LIGHT POLE
- FH - FIRE HYDRANT
- WV - WATER VALVE
- WM - WATER METER
- BENCHMARK
- EASEMENT
- BUILDING SETBACK
- FENCE
- STORM SEWER PIPE
- WATER LINE
- SANITARY SEWER LINE
- GAS LINE
- GAS PIPELINE
- TELEPHONE LINE
- UNDERGROUND ELEC.
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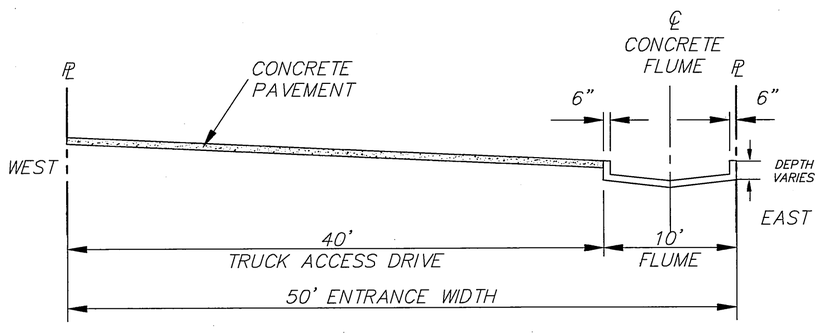
- DRAINAGE SUB BASIN
- FLOW ARROW

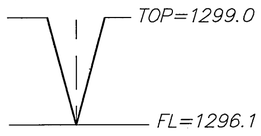
BENCHMARKS

BM

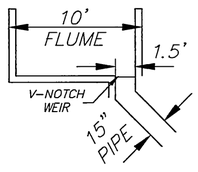
NE CORNER OF CENTRAL AND WASHINGTON
CITY OF WICHITA DATUM
(COW DATUM=NGVD 29-1187.4)



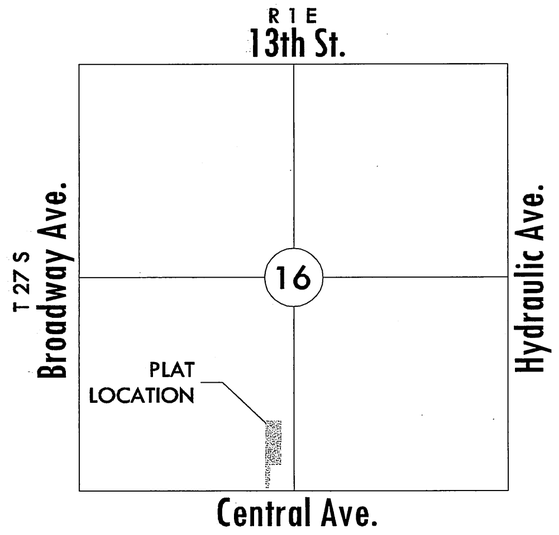
SECTION A-A



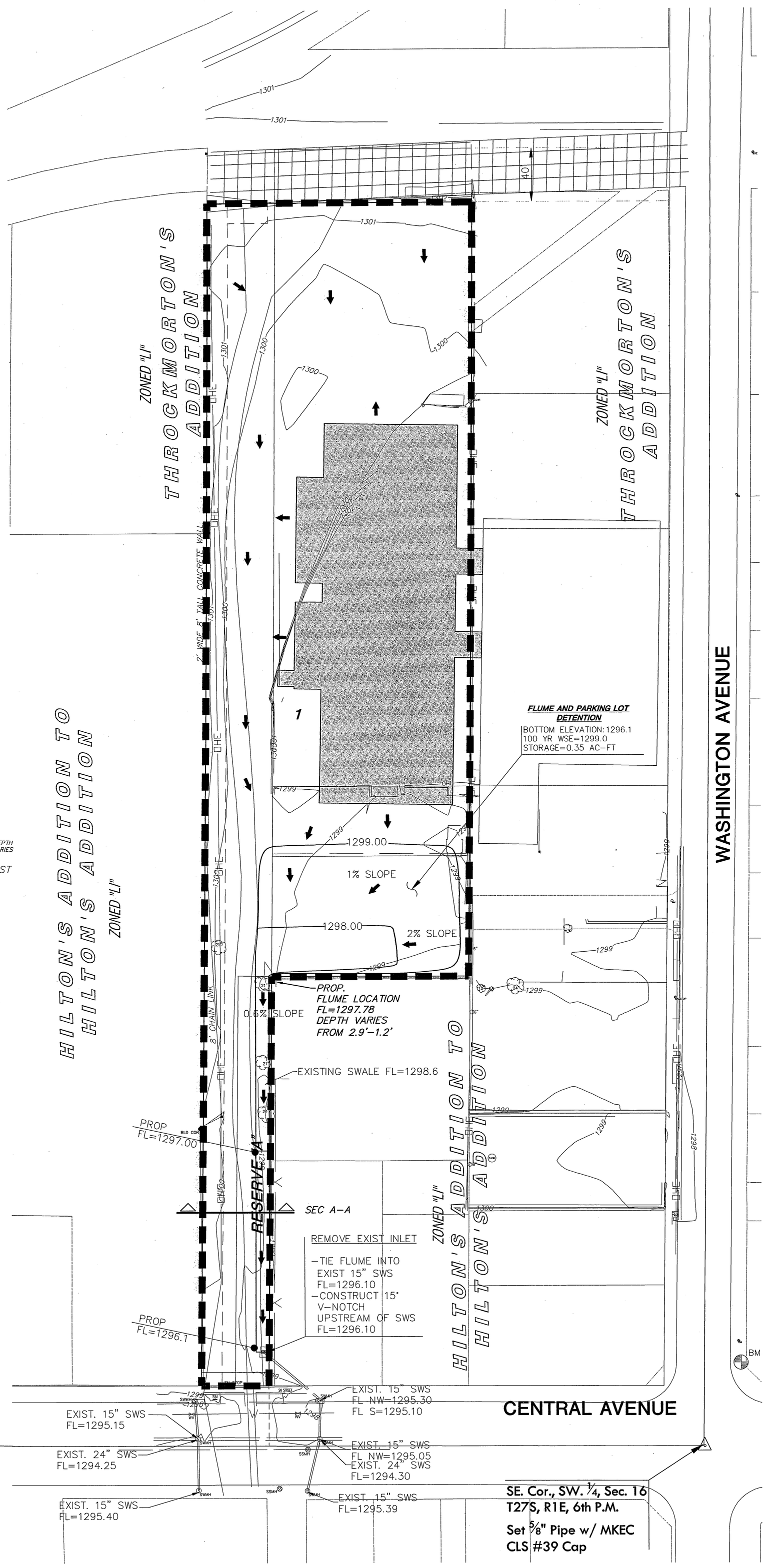
15° V-NOTCH WEIR



TIE IN PLAN



VICINITY MAP



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MKEC ENGINEERING CONSULTANTS, INC.
411 N. WEBB ROAD
WICHITA, KS. 67206
316 - 684 - 9600

LAMPTON'S ADDITION
PROJECT NAME

DRAINAGE AND UTILITY PLAN
SHEET TITLE

TMH	TMH	KLA
DESIGN BY:	DRAWN BY:	CHECKED BY:
NOVEMBER 2007	07728	1 / 1
DATE	JOB NO.	SHEET/OF

Tab 4. Floodplain Submittal

Not applicable to Lampton's Addition.

Tab 5. Permits

A. US Army Corps of Engineers

Not applicable to Lampton's Addtion.

B. Kansas Department of Agriculture

Not applicable to Lampton's Addtion.

C. Federal Emergency Agency (FEMA)

Not applicable to Lampton's Addtion.

D. Kansas Department of Transportation

Not applicable to Lampton's Addtion.

E. Sedgwick County Right-of-way Permit

Not applicable to Lampton's Addtion.