

Drainage Report

Lewis Magnet School Addition, To Wichita, Sedgwick County, Kansas



February, 2010



516 S. Market
Wichita, Kansas 67202
(316) 264-0242

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USGS map with area highlighted
Preliminary Plat

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Electronic copies of Report

Drainage Report

Lewis Magnet School Addition

Introduction

The subject property is located on the Southeast corner of 29TH Street South and Osage Ave. The tract of land is approximately 6.75 acres and is zoned single-family SF-5, which is an acceptable zoning for schools. The site consists of a school building and playgrounds. The current proposed use of the land is to remove the existing school building and add a building, parking lots and other facilities.

Current Conditions

The site is in the City of Wichita. The site consists of a school building, a parking lot and play ground. There are two driveways to 29th street and one to Osage Ave. Most of the playground is covered with grass except some swing areas which are covered with sand. The property is fairly flat and drains towards southeast corner. The soils are of Type B with moderate runoff coefficients. The average slope of land is about 0.2 % towards southeast corner.

There are no signs of wetlands and the land is not in a floodplain. There is no any existing storm sewer system on 29th St and Osage nearby the property. Only nearby ex. storm sewer system is on Exchange Street about 400' South of the property. The Ex. Storm sewer system on Exchange and 30th St. South consists of three inlets tying into a manhole with 30" RCP going out of it towards South.

The attached plat with topography shows existing features including contours, utilities, storm sewer and proposed easements.

Proposed Improvements

The proposed improvement consists of removing of an existing building, parking lots, sidewalks and new construction of a building, playground, parking lot and other facilities for school use. The entire site in developed condition will drain storm water into the existing storm sewer system on Exchange St. and 30th St south through extended 24" RCP as proposed on concept drainage plan. Internal storm sewer pipes and inlets are used to collect the water from the site to existing sewer system. The existing and developed peak runoff calculations are attached on hydrological analysis. The Lewis Magnet School Addition in developed condition dictates 31.78 cfs where as the peak runoff in undeveloped condition is 9.19 cfs. The peak runoff after the development will be handled through detention. The required detention will be achieved through inlet and

pipe sizes in parking lot, driveways and other open spaces. The number of inlets and pipes will be added as needed to achieve the required detention. The detail detention calculations will be done as the final site layout and the grading of the site evolve.

Best management practices for erosion control will include, seeding of disturbed areas, inlet protection at all inlets, silt fence where applicable, and installing other city approved measures. The erosion control plan is attached in Tab 3.

Drainage plan illustrates there is significant increased in runoff after development of this site. The attached calculations show the existing and developed peak runoffs, including assumed coefficients and conditions.

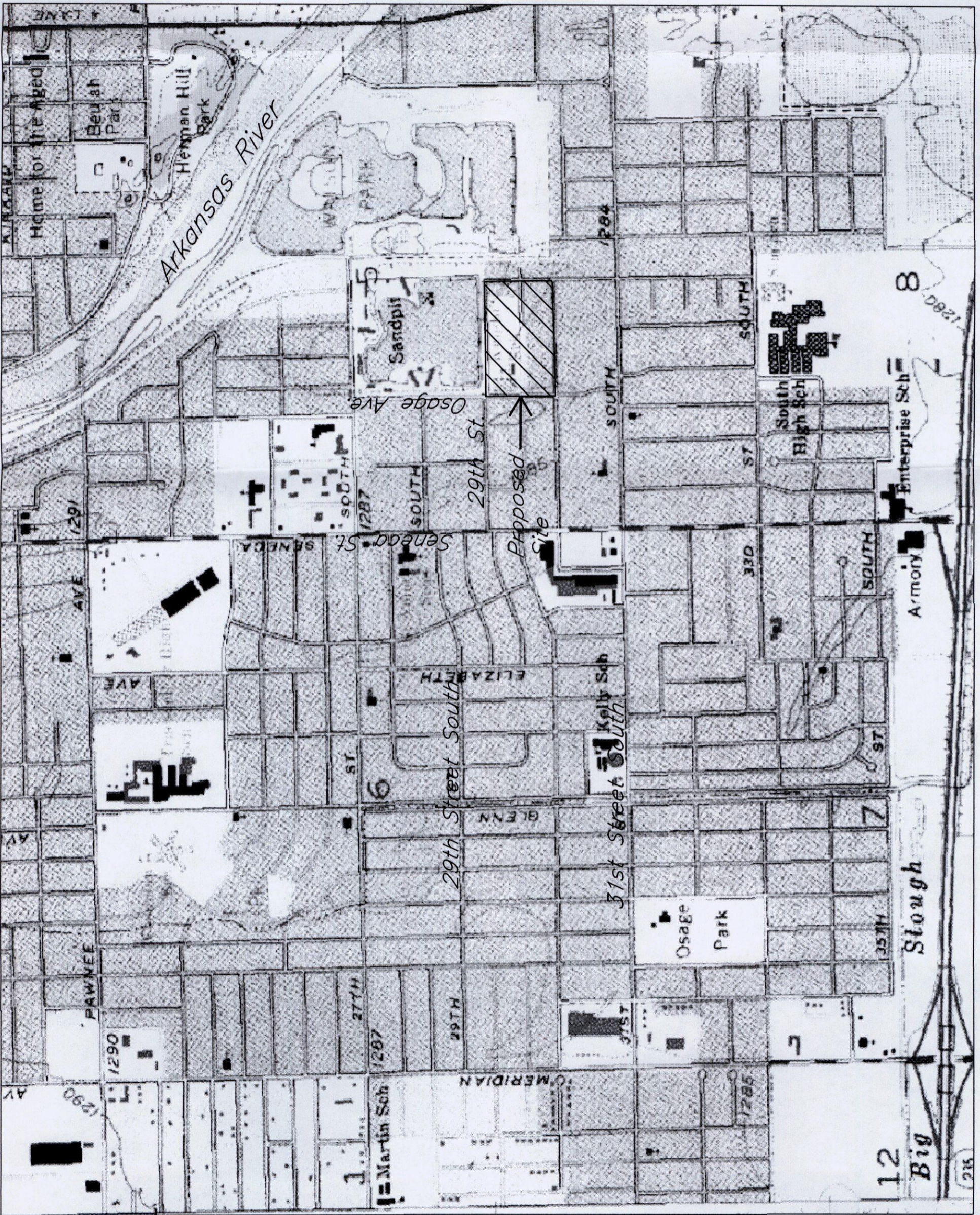
Site Hydrological Analysis

Existing and proposed site conditions have been modeled using the rational method. The Values for Rainfall Intensity and Runoff Coefficients were established using the *Drainage and Storm Sewer Policy for Design Criteria and Documentation, City of Wichita, Kansas*. Existing times of concentration were calculated from existing ground conditions and can be found in hydrological analysis section. Proposed times of concentration have been modeled using the proposed site runoff and accounting for the use of storm sewer pipes to route runoff from the area. A minimum time of concentration of 15 minutes was also considered as it is the minimum inlet time.

Future Development

There is construction of a new building, parking lots, sidewalks and driveways at this point. The site in future may have other school facilities added to it. The site will serve as school area.

USGS Map with Area Highlighted
Preliminary plat



Lewis Magnet School Addition
 Drainage plan
 Wichita, Kansas

kemiller
 engineering

316 S. Market,
 Wichita, KS 67202

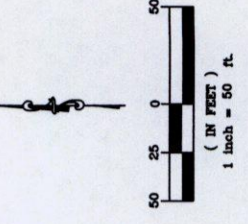
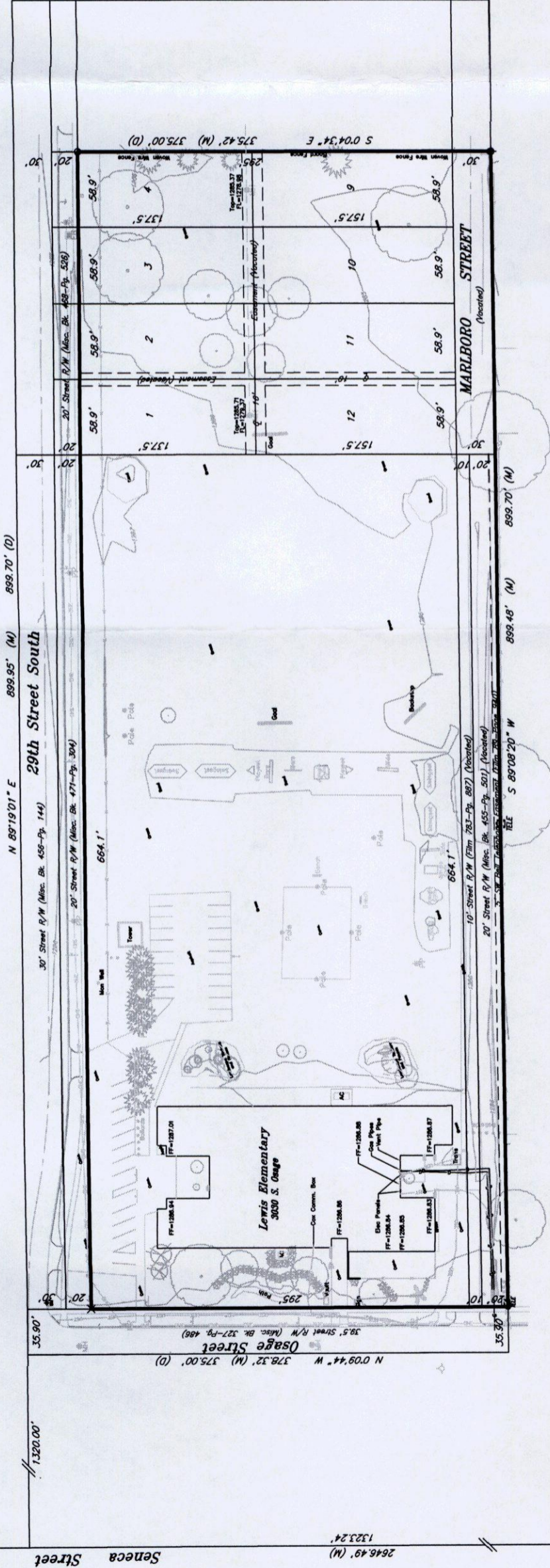
316/264-0242

PROJECT NUMBER	FILE	DATE	SHEET
KEM NO. 09148	ugs	02/2010	1
DESIGN KM	DRAWN GP	REVISED	OF

One-Step Final Plat Lewis Magnet School Addition, Kansas

Part of the SW 1/4, Section 5, Township 28 South, Range 1 East of the 6th. P.M.

1/4 Corner
Sec. 5, T28S, R1E

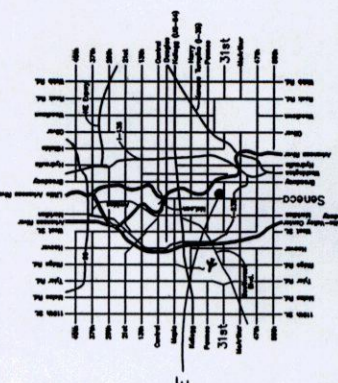


- LEGEND**
- Benchmark
 - Power Pole
 - Light Pole
 - Gas Valve
 - Fire Hydrant
 - Flag Pole
 - Water Valve
 - Water Meter
 - Sign
 - Cleanout
 - Cedar
 - Tree
 - Fence
 - Gas Line
 - Underground Electric
 - Overhead Electric
 - Underground Telephone
 - 1/2" Iron Pipe (found)
 - 5/8" Rebar (set) KEMPA GLS #157

NOTES:
Utility locations are from USD 265 records and Kansas One-Call.

Benchmarks:
City of Wichita disc on the Southwest corner of traffic signal light pole base at the northeast corner of 31st Street South and Seneca.
Elevation=1283.22

1/2" steel rod in curb east end of the southeast return at Osage and 29th Street South.
Elevation=1285.75



LOCATION MAP

Entered on transfer record this ___ day of _____, 2010.

Donald Braca, County Clerk

State of Kansas } ss
County of Sedgewick }

This is to certify that this plat has been filed for record in the Office of the Register of Deeds this day of _____, 2010, at _____ o'clock ___ M, and is duly recorded.

Bill Meek, Register of Deeds

Tanja Buckingham, Deputy

Reviewed in accordance with K.S.A. 58-2005 on this ___ day of _____, 2010.

State of Kansas } ss
City of Wichita }

This plat of Lewis Magnet School Addition, Wichita, Sedgewick County, Kansas, has been submitted to and approved by the Wichita-Sedgewick County Metropolitan Area Planning Commission, Wichita, Kansas. On _____, 2010, the Wichita-Sedgewick County Metropolitan Area Planning Commission.

M.S. Mitchell, Chair

John L. Schlegel, Secretary

State of Kansas } ss
City of Wichita }

This plat approved and all dedications shown herein accepted by the City Council of the City of Wichita, Kansas, this ___ day of _____, 2010.

At the Direction of the City Council

Carl Brewer, Mayor

Karen Sublett, City Clerk

State of Kansas } ss
County of Sedgewick }

Know all men by these presents, that we, the undersigned, have caused the land described in the surveyor's certificate to be platted into a Lot and Block to be known as Lewis Magnet School Addition, Wichita, Sedgewick County, Kansas. Any easements are hereby granted as indicated for constructing, maintaining, operating, and repairing public utilities. A drainage plan has been developed for the plot and all drainage easements, rights-of-way, or reserves shall remain at established grades or as modified with the approval of the applicable City or County Engineer, and unobstructed to allow for the conveyance of stormwater. And further that the land contained herein is held and shall be conveyed subject to any applicable restrictions, reservations and covenants of record on file or hereinafter filed in the Office of the Register of Deeds of Sedgewick County, Kansas.

By: _____, owner Date _____

State of Kansas } ss
County of Sedgewick }

This instrument was acknowledged before me on this ___ day of _____, 2010, by _____, owner

Notary Public
My Commission Expires: _____

State of Kansas } ss
County of Sedgewick }

I, Bradley C. Ward, a licensed land surveyor of the State of Kansas, do hereby certify that the foregoing described tract of land was surveyed on the 12th day of November, 2009, and that all the monuments shown herein actually exist and their positions are correctly shown to the best of my knowledge and belief.

LEGAL DESCRIPTION

Beginning 80 rods East of the Northwest Corner of the South Half of the Southwest Quarter; thence South 375 feet; thence East 700 feet; thence North 375 feet; thence West to the Point of Beginning, EXCEPT the West 39.5 feet and the South 30 feet, dedicated as street right-of-way, of Section 5, Township 28 South, Range 1 East, of the Sixth Principal Meridian, Sedgewick County, Kansas.

AND: Lots 1-4, and 9-12, Block 1, Gibbs First Addition, to Wichita, Kansas.

All easements and Rights of Way within said tract are hereby vacated by virtue of KSA 12-512(b) amended.

Bradley C. Ward, L.S. #920 Date _____

518 S. Market, Wichita, KS 67202 316/784-0242

Aerial Photograph
Drainage Plan
Preliminary Plat
Erosion Control Plan



Lewis Magnet School Addition
Aerial Map
Wichita, Kansas



316 S. Maxwell,
Wichita, KS 67202

316/264-0242

DESIGN: KM

DRAWN: GP

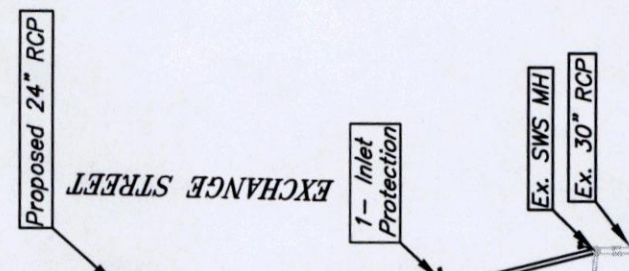
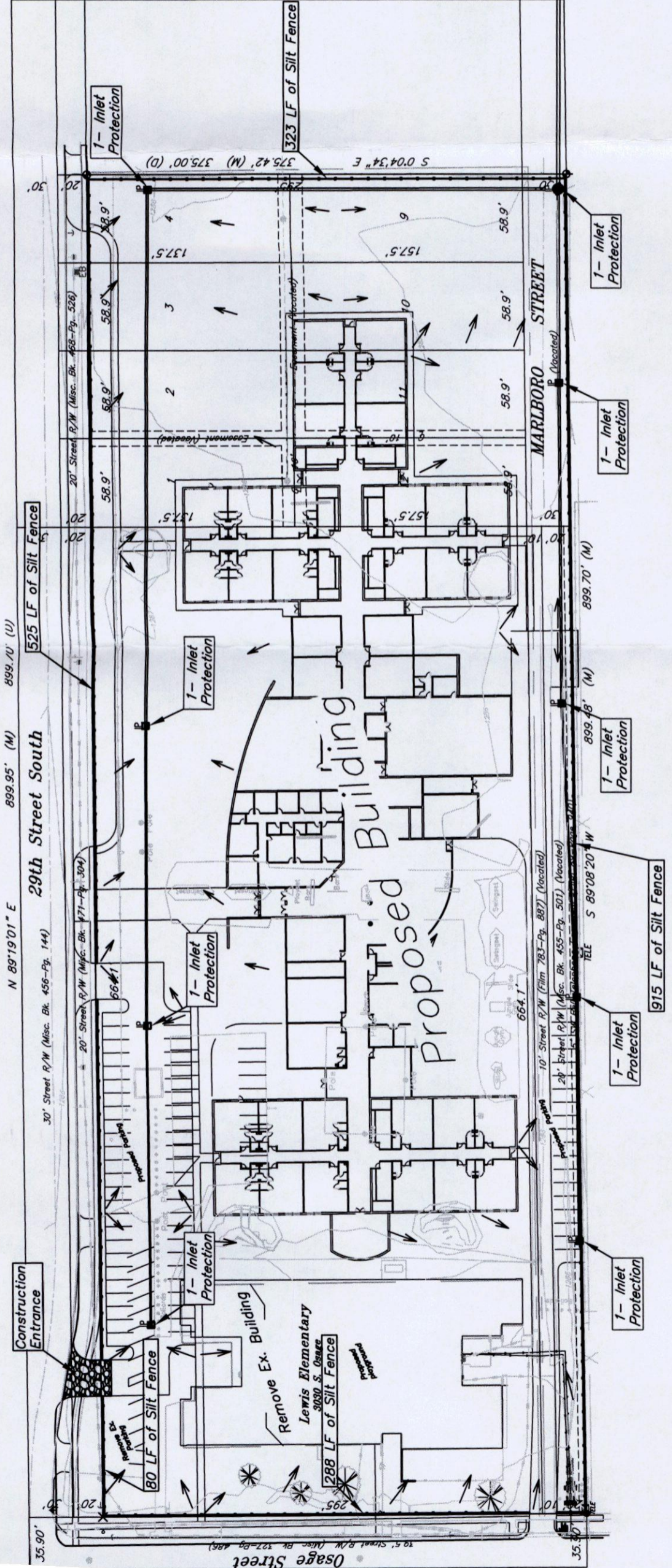
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PROJECT NUMBER

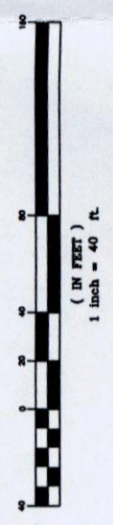
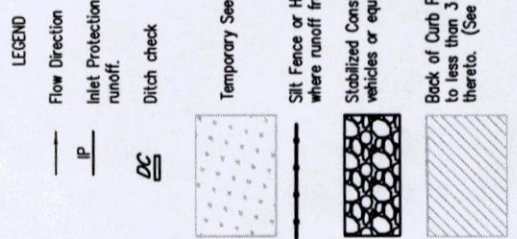
SHEET 1 OF 1

DATE: 02/2010

REVISION



- General Notes**
- The BMP's shown on this sheet are considered minimum standards. Whenever sediment enters the streets, storm sewers, ditches, or ponds, contractor will install additional BMP's, as needed, to correct the problem.
 - The soil erosion BMP's shown hereon must be in place at all times during construction until such time as the site is re-established with paving or grass.
 - Back of Curb Protection: Can include hay bale, silt fence, curbs, or approved alternate as shown on BMP standard details. This BMP must remain in place until the area between the curb and right-of-way line has been permanently stabilized.
 - The General Contractor is responsible for the installation and maintenance per the prevention maintenance plan.
 - Concrete trucks will be permitted to wash out only at approved locations, then maintain and clean up as conditions require, by contractor. No hazardous materials are expected to be encountered. Any spills (diesel, fuel, oil, etc.) will be cleaned up and removed immediately. Portable toilets will be supplied and maintained at various sites along the project. Disposal of sewage will be handled by a contracting firm specializing in this activity.
 - The above mentioned stormwater prevention methods will be monitored daily and maintained as required. A weekly erosion control log will be posted in the job trailer onsite, and updated weekly. Site inspections are required within 24 hours after a precipitation event of 0.5" or greater.



Lewis Magnet School Addition
Erosion Control Plan plan
Wichita, Kansas

PROJECT NUMBER	FILE	DATE	SHEET
	09148	02/2010	OF
DESIGN	DRAWN	REVISION	
KM	CP		

316/284-0242
316 S. Market, Wichita, KS 67202



Hydrological Analysis

Existing Onsite Runoff Information

Area Name	Description	Land use	Maximum Elevation	Minimum Elevation	Area (acres)
A	Lewis Magnet Addition	Partially developed for school use.	1286.5	1284.5	6.75

Time of Concentration

Area	Max Elevn	Min Elevn	Flow Length(L)	Rational Runoff Coefficients(C)					Time of Concentration, Mins
				2 year	5 year	10-yr	25-yr	100 year	
Pre Developed									
Existing site	1286.3	1284.3	924' Mixed flow	0.16	0.18	0.24	0.30	0.34	53
Post Developed (School Area)									
Developed Site	1286.3	1284.0	1020' Mixed flow	0.49	0.51	0.56	0.62	0.66	see individual area

Area #	Acres	Time of Concentration, Tc Mins
1	0.3	15
2	0.67	15
3	1.17	15
4	0.98	18
5	1.29	20
6	0.45	15
7	0.8	15
8	0.67	15
9	0.42	15

** Calculation is shown in drainage plan.

Public Works, Eng. Div. Storm water checklist
Electronic copies of Report



Public Works, Engineering Division Stormwater Management Subdivision Submittal Checklist

Reviewer: _____ Date: _____
 Subdivision Name: Lewis Magnet Addition Location: 3030 S Osage Ave.
 Total Land Area Of Ownership: 6.75 Acres
 Type: Residential Commercial Industrial Recreation Municipal Other
 Applicant: USD 259 Contact: xxxxxxx Phone #: xxxxxx
 Engineer: K E Miller Eng. PA Contact: Kirk Miller Phone # 264-0242

Please check the appropriate box:

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

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

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

Stormwater Management Subdivision Submittal Checklist

J. Location of existing utilities (e.g., water, sewer, gas, electric) and easements	X		Plan		
K. Location of existing conveyance systems such as storm drains, inlets, catch basins, channels, swales, and areas of overland flow	X		Plan		
L. Flow paths	X		Drainage Plan		
M. Location and dimensions of existing channels, bridges or culvert crossings		X			
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	X		Drainage Plan		
O. Assumed pre-developed runoff curve numbers	X		Report/Drainage Plan		
P. Existing time of concentrations used in calculations	X		Report/ Drainage Plan		
Q. Evaluate immediate downstream drainage capacity, not to exceed more than 0.25 miles downstream of site		X			
R. Existing structural elevations (e.g., invert of pipes, manholes, etc.)		X			
S. Cross-section data for open channels		X			
T. Ground water elevations, if applicable		X	Not Required		

Tab 3. Post-Development Hydrologic Analysis	Applicant			Engr	
	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)	X		Drainage Plan		
B. Proposed time of concentrations used in calculations	X		Drainage Plan		
C. Assumed post-developed runoff curve numbers	X		Drainage Plan		
D. Proposed contours for detention facilities (to equal area used in outlet rating curves)		X			
E. Preliminary sizing calculations for stormwater controls including contributing drainage area, storage, and outlet configuration		X			
F. Stage-storage-discharge or outlet rating curves and inflow and outflow hydrographs for storage facilities		X			
G. Final analysis of potential upstream/downstream impact/effects of project, where necessary		X			
H. Dam safety analysis, where necessary		X			
I. Existing and proposed structural elevations (e.g., invert of pipes, manholes, etc.)		X			
J. Design water surface elevations and normal pool elevation for ponds.		X			
K. Typical detail for outlet structures, embankments, spillways, grade control structures, conveyance channels, etc. To include height, width, elevation, and/or diameter.		X			
L. Proposed limits of clearing and grading		X	Includes Entire Site		
M. Location of existing and proposed roads, buildings, parking lots and other impervious areas.	X		Plan		
N. Location of existing and proposed utilities (e.g., water, sewer) and easements	X		Plan		
O. Location of existing and proposed conveyance systems such as storm drains, inlets, catch basins, channels, swales, and areas of overland flow	X		Drainage Plan		
P. Preliminary location and dimensions of proposed channel modifications, such as bridge or culvert crossings		X	No Downstream Improv		

Stormwater Management Subdivision Submittal Checklist

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

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

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