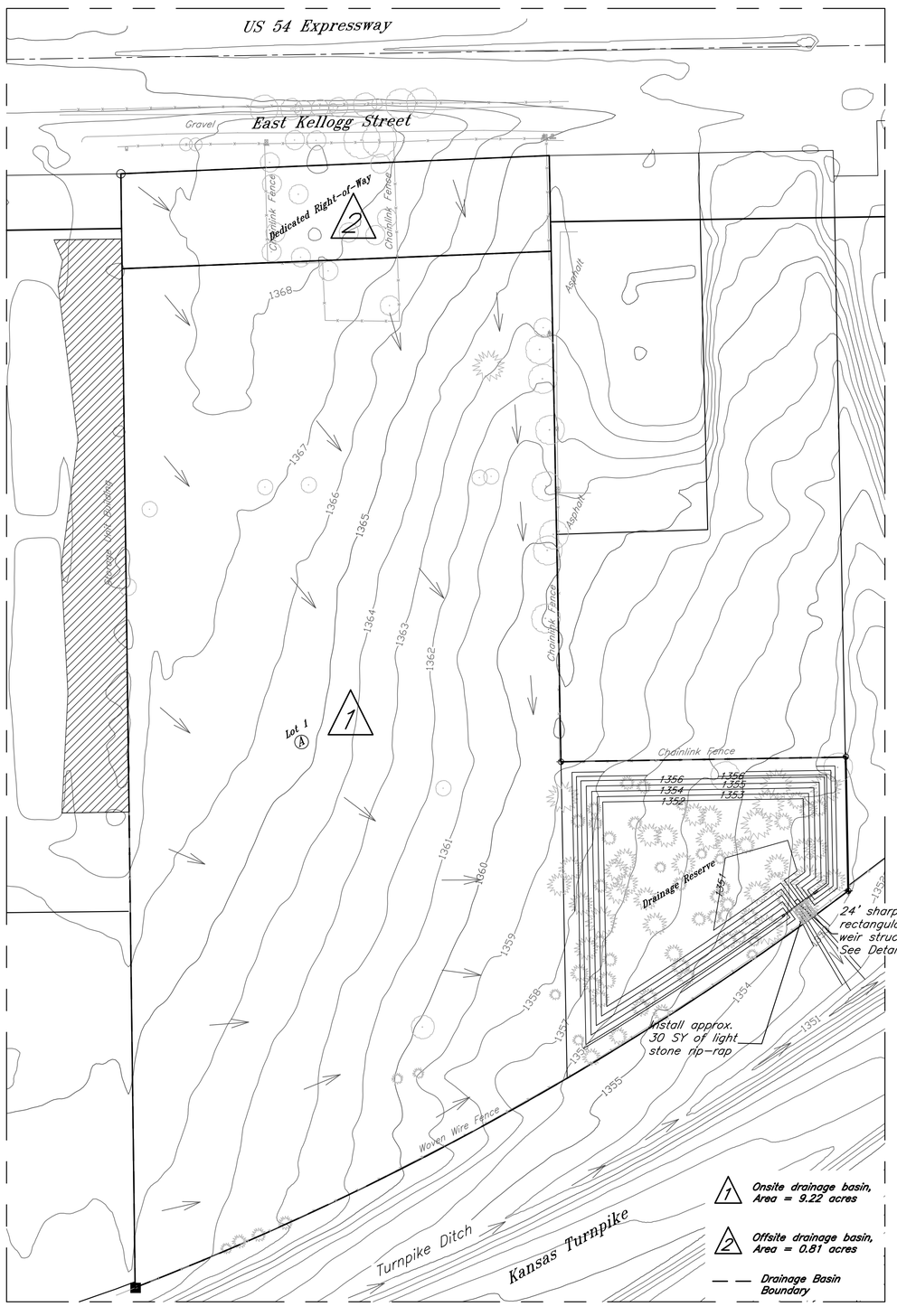
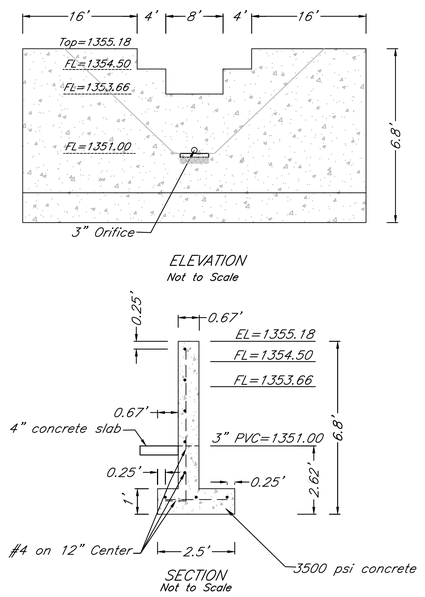
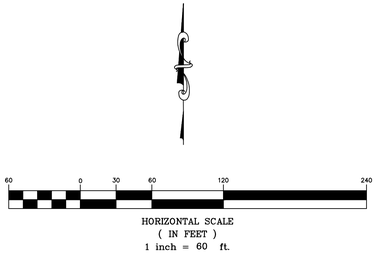




Concrete Weir Detail

Engineer's Notes:

1. Site drainage calculations were developed using the SCS Method for peak flow. Weighted CN and I values were established based on existing and proposed site conditions. Impervious area is assumed for commercial development with 85% of as indicated in drainage manual.
2. The site drainage will be maintained to the north ditch of I-35.
3. Future grading plan shall follow the drainage pattern as shown on plan indicated by flow arrows.
4. The property is not in designated 100-yr floodplain (FIRM Panel 20173C0387E, February, 2 2007.)
5. Design of Internal storm sewer system and/or surface drainage is required to drain all of the site to the proposed detention basin when site evolves.



Project Narrative:

The site is located between Kellogg and I-35 (Kansas Turnpike), about 1/4 mile west of the intersection. The total site is about 9.22 acres. The entire site is undeveloped and covered by grass. Site is zoned limited commercial (LC) and will remain same in developed condition. The proposed use of the land is to develop in to a commercial area with buildings, parking lot and other impervious stone display area for stone company. The entire site is the drainage basin of the north turnpike ditch which drains to the south of turnpike through culverts. The drainage condition remains same in developed condition. An extended detention basin is proposed at southeast corner for channel protection and flood detention.

Water Quality and TSS Removal Calculation:

Water Quality Volume (WQv) Calculation						
Calculation for water quality volume (WQv=P*Rv*A/12)				Soil Group 'D'		
85th percentile storm event (1.2 inches),P =	1.20	inches		Calulation of Rv		
Total area, A =	9.22	acres			Coeff.	Area
Rainfall Coeff, Rv, =	0.845	cf		Coeff for undisturbed area, R_{VU}=	0.05	0.00
Required Vol. for Water Quality =	**0.78**	ac-ft		Coeff for turf cover,disturbed, R_{VT}=	0.25	1.38
Corresponding Water Quality Peak Flow =	**7.57**	cfs		Coeff for impervious area, R_{VI}=	0.95	7.84
				Weighted, Rv =	**0.845**	

Total water quality volume will be treated in one or more proprietary systems. Total water quality flow needs to treated= 7.57 cfs

No of HG-5 (Hydroguard) unit required =3. Each Hydroguard unit (HG-5) will be sized to accommodate about 2.70 cfs of treatment flow for 80 % TSS removal. The location and drainage basin for each hydroguard unit will be designed as the site evolves.

Water Quality Peak Flow Calculation		
Aera=	9.22	acres
WQv=	1.014	inches
Pond and Swamp Factor, Fp=	0.700	
Calculated CN=	98.3	
S=	0.174	inches
Ia=	0.035	inches
Ia/P=	0.029	
qu	740.0	cfs/sq.mi/in
Water quality peak flow	**7.57**	**cfs**

Water Quality and TSS Removal Calculation:

Channel protection volume for entire site (1) is detained in extended detention basin located at southeast corner of the property. The required extended detention is archived by 3" orifice located at an elevation of 1351.0 on the wall of proposed weir structure. Detention time for CPv= 24.05 hrs (centroid-centroid)

Channel Protection Volume Calculation									
Drainage Basin	Acres	Developed				Existing			
		24 hr 1 yr Storm	Curve Number (CN)	S	Runoff Volume inches	24 hr 1 yr Storm	Curve Number (CN)	S	Runoff Volume inches
1	9.22	2.80	96	0.417	**2.36**	2.80	84	1.905	**1.35**

Runoff Calculations (2-, 5-, 10-, 25-, and 100-yr)

EXISTING CONDITION:
Onsite Area, A1 = 9.22 acres,
Impervious Area = None, Grass Area= 100%, Hydrological Soil Group =D

EXISTING SITE									
DRAINAGE AREA	ACRES	Tc min	CN	Q2	Q5	Q10	Q25	Q100	REMARKS
On-site (1)	9.22	21	84	19.15	27.76	33.86	41.78	56.81	Onsite draining south
Off-site (2)	0.81	21	84	1.63	2.44	2.97	3.67	4.99	Kellogg Right of Way

DEVELOPED CONDITION:
Onsite Area, A1 = 9.22 acres,
Impervious Area =85% for commercial use, Grass Area= 15%, Land use: LC
Hydrological Soil Group =D

DEVELOPED SITE									
DRAINAGE AREA	ACRES	Tc min	CN	Q2	Q5	Q10	Q25	Q100	REMARKS
On-site (1)	9.22	15	96	33.47	43.68	50.79	59.90	77.03	Onsite draining south
Off-site (2)	0.81	15	96	2.94	3.84	4.46	5.28	6.77	Kellogg Right of Way

OUTFLOW							
DRAINAGE AREA	ACRES	Q2	Q5	Q10	Q25	Q100	REMARKS
Off-site (1+2)	10.03	4.81	15.05	24.06	37.90	61.82	Total area drainaing to basin

BENCHMARK:
COW Disc in the center median on the west side of the intersection of Zelta and Kellogg. Approximately 57 feet southwest of a fire hydrant and 11 feet south of the south edge of asphalt of the westbound lane.
Elevation=1362.64 NAVD 88

Absolute Natural Stone Addition

Drainage Plan

Wichita, Kansas

kemiller engineering
516 S. Market, Wichita, KS 67202 (316)264-0242

PROJECT NUMBER

KEM. NO.	FILE	DATE	SHEET
12018	drainage	02/2013	1.0
DESIGN GP	DRAWN GP	REVISED	