DRAINAGE PLAN

THE RANCH

AN ADDITION TO WICHITA, SEDGWICK COUNTY, KANSAS

Offsite from North
3x4 RCBC
Area = 57 acres
CN = 72*
Tc = 105 min
Q_2 = 22 cfs
Q_5 = 37 cfs
Q_{10} = 49 cfs
Q_{25} = 65 cfs
Q_{100} = 97 cfs

*Adjusted to closely match max capacity of 3x4 RCBC. At HW/D = 1, Q = 60 cfs. Max capacity before overtopping roadway, Q = 95 cfs.

LEGEND

- SWS — Proposed SWS
- Drainage Basin Boundary
- Proposed Flow Direction
- (A) Proposed Drainage Basin

0 100 200

DATE OF PREPARATION: 8 OCTOBER 2012
DATE OF TOPOGRAPHY: 27 SEPTEMBER 2012
CONTOUR INTERVALS = 1 FOOT

VICINITY MAP
SEC. 12, T27S, R2E

NORTH POND (Static = 1356.5)			
STAGE	INFLOW	OUTFLOW	ELEVATION
2 yr	65 cfs	20 cfs	1357.9
10 yr	118 cfs	46 cfs	1359.0
100 yr	202 cfs	92 cfs	1360.1

NORTH POND	
ELEVATION	AREA (sq ft)
1356.5	77500
1357	85400
1358	97000
1359	110310
1360	124000
1361	130000

MIDDLE POND (Static =1354.0)			
STAGE	INFLOW	OUTFLOW	ELEVATION
2 yr	35 cfs	21 cfs	1354.5
10 yr	67 cfs	47 cfs	1355.0
100 yr	121 cfs	76 cfs	1356.6

MIDDLE POND	
ELEVATION	AREA (sq ft)
1354	62300
1355	80000
1356	105900
1357	136100
1358	161500
1359	170000

SOUTH POND (Static = 1349.0)			
STAGE	INFLOW	OUTFLOW	ELEVATION
2 yr	56 cfs	23 cfs	1350.1
10 yr	108 cfs	56 cfs	1351.1
100 yr	190 cfs	104 cfs	1351.9

SOUTH POND	
ELEVATION	AREA (sq ft)
1349	134000
1350	143700
1351	153700
1352	164000
1353	174400
1354	185000

Land Use	Hydrologic Soil Group			
	A	B	C	D
Undisturbed	0.02	0.03	0.04	0.05
Turf or Disturbed Soils	0.15	0.20	0.23	0.25
Impervious Cover	0.95	0.95	0.95	0.95

Land Use	Hydrologic Soil Group			
	A	B	C	D
Undisturbed	58	71	80	84
Turf or Disturbed Soils	71	80	84	88
Impervious Cover	98	98	98	98

Basin #	Weighted Volumetric Runoff Coef., (R_v) (eq. 4-24")									WQ_v in^3 eq. 4-2.5"
	Undist. ft^2	Dist. ft^2	Red. Imp. ft^2	New Imp. ft^2	Total Area ft^2	U %	D %	Recov. I %	I %	R_v %	
Res Lots	0	326,700	0	980,100	1,306,800	0.000	0.063	0.000	0.713	0.7750	101,277
Estate Lots	1,215,330	0	0	135,030	1,350,360	0.025	0.000	0.000	0.095	0.1220	16,915
N Comm	0	26,130	0	145,100	174,230	0.000	0.027	0.000	0.805	0.8450	14,723
TOTALS	1,215,330	352,830	0	1,260,230	2,831,390						132,915

Pond Volume Below Static Pool						
Basin	Static Pond Bottom Area				Depth	Volume
	Sq.Ft.	Acre	Sq. Ft.	Acre	Feet	Acre-Ft.
N Pond	62154	1.4	34000	0.8	7	7.7
M Pond	54000	1.2	27500	0.6	7	6.3
S Pond	60000	1.5	50000	1.1	7	10.4
Totals:		1.4		0.8		24.7

Pond Volume = WQv		
Pond	WQv	Check
24.7	3.0	Yes

Basin	% Impervious	Composite CN
Residential Lots	25%	91
Estate Lots	10%	85
N Commercial	85%	97

Offsite from West
Ag Field
Area = 19 acres
CN = 80*
Tc = 75 min
Q_2 = 14 cfs
Q_5 = 22 cfs
Q_{10} = 27 cfs
Q_{25} = 35 cfs
Q_{100} = 49 cfs

*Pre-developed or Undisturbed Pervious in Soil Type C. Currently all farmed and tilled cropland.

(A) Offsite flow from the west enters the property and will be conveyed through SWS to the southern pond. The offsite flow will be detained and then released to the south channel section.

(B) The ultimate discharge point for this basin (including this site and offsite areas) is a railroad box culvert located at point B. The box is a 12x10 RCBC under the (former) elevated railroad. The proposed flow was calculated using the three upstream ponds detained flows and the undetained adjacent residential lots from the east and west.

Existing Flow at Point B
Q_2 = 44 cfs
Q_5 = 63 cfs
Q_{10} = 75 cfs
Q_{100} = 118 cfs

Proposed Flows at Point B
Q_2 = 33 cfs
Q_5 = 53 cfs
Q_{10} = 64 cfs
Q_{100} = 108 cfs

NOTES: There is no FEMA SFHA located on this property as of this date per FEMA FIRM Panel 385 of 700, for Wichita, Sedgwick County, Kansas; effective February 2, 2007.

The internal Storm Water Sewer will drain the developed lots/streets into the proposed pond system. On-site private SWS will serve individual lots and tie into the public SWS system as shown.

Basin	Description	Area (acres)	CN	Tc (min)	Q2 (cfs)	Q5 (cfs)	Q10 (cfs)	Q25 (cfs)	Q100 (cfs)
A	N Estate Lot & N Comm	13.5	84	15	33	48	58	72	97
B	W Dev to N Pond	10.3	87	15	28	40	48	58	77
C	W Dev to Middle Pond	6.0	87	15	16	23	28	34	45
D	Estate Lot to Mid Pond	5.2	84	15	13	18	22	28	38
E	SW Dev to South Pond	7.0	87	15	19	27	32	40	53
F	S Estate to South Pond	8.8	84	15	22	31	38	47	63
G	S Undetained	10.0	86	15	26	37	45	55	74

DRAINAGE PLAN
THE RANCH
25 SEPT 2013
18 JUNE 2013

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ENGINEERING | SURVEYING | PLANNING | LANDSCAPE ARCHITECTURE

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