DRAINAGE REPORT
FOR
THE PINES AT SAWMILL CREEK
WICHITA, SEDGWICK COUNTY, KANSAS

August 27, 2007

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Engineering, Surveying, Land Planning

THE PINES AT SAWMILL CREEK
DRAINAGE ANALYSIS
August 27, 2007

INTRODUCTION

This report contains supporting documentation and calculations for the proposed plat The Pines at Sawmill Creek. The existing site is a triangle shaped undeveloped 3.3-acre tract of land located app. ½ mile east of Rock Road on the north side of 45th Street. The area is currently pasture land and drains westerly to a culvert under the Union Pacific Railroad right of way. Existing off-site drainage enters the site from the pasture from the east. FEMA map 20173C0240E, effective date Feb. 2, 2007 shows the proposed project site is located in unshaded Zone X, defined as areas located outside of the 500-year floodplain. Approximately 16.4 acres of offsite area currently flow through the site from the east. The site will be graded to direct 8.5 acres of offsite area to the railroad right of way while the remaining 7.9 acres will drain into the north ditch of 45th Street.

The site will be developed into multi family residential lots with on-site detention provided at the western corner of the site with a dry bottom detention pond.

HYDROLOGY

Peak flow rates for the tributary areas were determined using HEC-HMS. The hydrological soil group for the site is D. The times of concentration were calculated using the velocity method and overland flow rates from attachment E of the City of Wichita Drainage Criteria. The parameters and results of the existing and proposed analysis are shown in the tables below.

Existing	Area	CN	TC (min.)	Q2 (cfs)	Q5 (cfs)	Q10 (cfs)	Q25 (cfs)	Q100 (cfs)
Entire Site	3.25 ac.	85	15	6.7	9.6	11.4	14.3	19.4

Proposed	Area	CN	TC (min.)	Q2 (cfs)	Q5 (cfs)	Q10 (cfs)	Q25 (cfs)	Q100 (cfs)
Detained	0.90 ac.	87	15	2.0	2.8	3.3	4.1	5.5
Bypass	2.35 ac.	87	15	5.2	7.3	8.6	10.8	14.4

The rational method was used to determine peak flow rates for the basins located within the plat. The attached Drainage Plan shows the on site drainage calculations.

Pond Routing Information:

A single pond will provide the detention required for this development. The dry bottomed pond will be located at the western corner of the triangle shaped property and will outlet into the north ditch of 45th Street.

Rainfall Data: The SCS Type II Rainfall Distribution as modeled by the HEC-RAS program is used for analysis, with a total 100 year – 24 hour rainfall event of 7.8 inches (TR-55). This rainfall model is used for all basins.

The schematic hydraulic model indicates the modeling parameters for each of the basins draining to the detention pond area. A summary of the ponds' performance in the various design storms can be found in the tables below.

POND 1

Design Storm	Peak Inflow (cfs)	Peak Outflow (cfs)	Allowable Release (cfs)	Peak Storage (ac-ft.)	Peak Elevation
2-yr	2.0	0.8	1.5	0.1	1396.3
5-yr	2.8	1.2	2.3	0.1	1396.5
10-yr	3.3	1.5	2.8	0.1	1396.5
25-yr	4.1	2.0	3.5	0.1	1396.7
100-yr	5.5	2.9	5.0	0.1	1396.9

The stage-storage data was calculated by HEC-HMS using the parameters located in the table below.

Stage	Area (ac-ft)
1395.80	0.0000
1396.00	0.0340
1397.00	0.3050

The outlet of this pond shall be controlled by a 15" RCP culvert that will release to the north ditch of 45th Street. Lots 1 and 2, Block 1 as shown on the preliminary plat shall have a minimum pad elevation of 1399.00.

EXISTING CONDITIONS

Project: The Pines at Sawmill Simulation Run: 01 Exist 2

Start of Run: 01Jan2007, 12:00 Basin Model: Existing
End of Run: 02Jan2007, 12:05 Meteorologic Model: 2
Compute Time: 27Aug2007, 13:24:24 Control Specifications: Control 1

Volume Units: IN

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Subbasin-1	0.00508	6.7	02Jan2007, 00:08	2.01

Project: The Pines at Sawmill Simulation Run: 02 Exist 5

Start of Run: 01Jan2007, 12:00 Basin Model: Existing
End of Run: 02Jan2007, 12:05 Meteorologic Model: 5
Compute Time: 27Aug2007, 13:24:26 Control Specifications: Control 1

Volume Units: IN

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Subbasin-1	0.00508	9.6	02Jan2007, 00:08	2.90

Project: The Pines at Sawmill Simulation Run: 03 Exist 10

Start of Run: 01Jan2007, 12:00 Basin Model: Existing
End of Run: 02Jan2007, 12:05 Meteorologic Model: 10
Compute Time: 27Aug2007, 13:24:30 Control Specifications: Control 1

Volume Units: IN

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Subbasin-1	0.00508	11.4	02Jan2007, 00:08	3.45

Project: The Pines at Sawmill Simulation Run: 04 Exist 25

Start of Run: 01Jan2007, 12:00 Basin Model: Existing
End of Run: 02Jan2007, 12:05 Meteorologic Model: 25
Compute Time: 27Aug2007, 13:24:32 Control Specifications: Control 1

Volume Units: IN

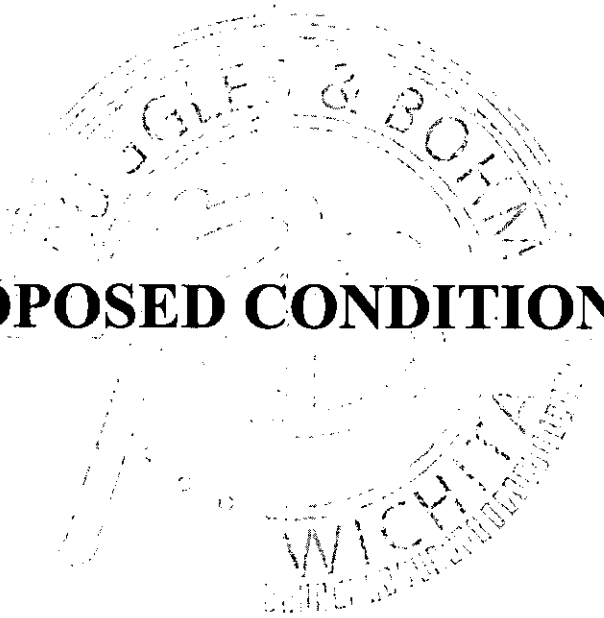
Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Subbasin-1	0.00508	14.3	02Jan2007, 00:08	4.38

Project: The Pines at Sawmill Simulation Run: 05 Exist 100

Start of Run: 01Jan2007, 12:00 Basin Model: Existing
End of Run: 02Jan2007, 12:05 Meteorologic Model: 100
Compute Time: 27Aug2007, 13:24:35 Control Specifications: Control 1

Volume Units: IN

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Subbasin-1	0.00508	19.4	02Jan2007, 00:07	6.00



PROPOSED CONDITIONS

Project: The Pines at Sawmill Simulation Run: 06 Prop 2

Start of Run: 01Jan2007, 12:00 Basin Model: Proposed
End of Run: 02Jan2007, 12:05 Meteorologic Model: 2
Compute Time: 27Aug2007, 13:21:26 Control Specifications: Control 1

Volume Units: IN

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Junction-1	0.005077	5.7	02Jan2007, 00:08	2.17
Onsite Bypass	0.003670	5.2	02Jan2007, 00:08	2.17
Onsite Detained	0.001407	2.0	02Jan2007, 00:08	2.17
Pond-1	0.001407	0.8	02Jan2007, 00:26	2.16

Project: The Pines at Sawmill Simulation Run: 07 Prop 5

Start of Run: 01Jan2007, 12:00 Basin Model: Proposed
End of Run: 02Jan2007, 12:05 Meteorologic Model: 5
Compute Time: 27Aug2007, 13:21:41 Control Specifications: Control 1

Volume Units: IN

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Junction-1	0.005077	8.1	02Jan2007, 00:08	3.08
Onsite Bypass	0.003670	7.3	02Jan2007, 00:08	3.09
Onsite Detained	0.001407	2.8	02Jan2007, 00:08	3.09
Pond-1	0.001407	1.2	02Jan2007, 00:24	3.07

Project: The Pines at Sawmill Simulation Run: 08 Prop 10

Start of Run: 01Jan2007, 12:00 Basin Model: Proposed
End of Run: 02Jan2007, 12:05 Meteorologic Model: 10
Compute Time: 27Aug2007, 13:22:03 Control Specifications: Control 1

Volume Units: IN

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Junction-1	0.005077	9.5	02Jan2007, 00:08	3.64
Onsite Bypass	0.003670	8.6	02Jan2007, 00:08	3.65
Onsite Detained	0.001407	3.3	02Jan2007, 00:08	3.65
Pond-1	0.001407	1.5	02Jan2007, 00:24	3.63

Project: The Pines at Sawmill Simulation Run: 09 Prop 25

Start of Run: 01Jan2007, 12:00 Basin Model: Proposed
End of Run: 02Jan2007, 12:05 Meteorologic Model: 25
Compute Time: 27Aug2007, 13:22:21 Control Specifications: Control 1

Volume Units: IN

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Junction-1	0.005077	12.0	02Jan2007, 00:08	4.59
Onsite Bypass	0.003670	10.8	02Jan2007, 00:07	4.60
Onsite Detained	0.001407	4.1	02Jan2007, 00:07	4.60
Pond-1	0.001407	2.0	02Jan2007, 00:22	4.58

Project: The Pines at Sawmill Simulation Run: 10 Prop 100

Start of Run: 01Jan2007, 12:00 Basin Model: Proposed
End of Run: 02Jan2007, 12:05 Meteorologic Model: 100
Compute Time: 27Aug2007, 13:22:53 Control Specifications: Control 1

Volume Units: IN

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (IN)
Junction-1	0.005077	16.3	02Jan2007, 00:08	6.23
Onsite Bypass	0.003670	14.4	02Jan2007, 00:07	6.23
Onsite Detained	0.001407	5.5	02Jan2007, 00:07	6.23
Pond-1	0.001407	2.9	02Jan2007, 00:21	6.21

DETENTION POND

Project : The Pines at Sawmill Simulation Run : 06 Prop 2 Reservoir: Pond-1

Start of Run :	01Jan2007, 12:00	Basin Model :	Proposed
End of Run :	02Jan2007, 12:05	Meteorologic Model :	2
Compute Time :	27Aug2007, 13:21:26	Control Specifications :	Control 1

Volume Units : IN

Computed Results

Peak Inflow :	2.0 (CFS)	Date/Time of Peak Inflow :	02Jan2007, 00:08
Peak Outflow :	0.8 (CFS)	Date/Time of Peak Outflow :	02Jan2007, 00:26
Total Inflow :	2.17 (IN)	Peak Storage :	0.1 (AC-FT)
Total Outflow :	2.16 (IN)	Peak Elevation :	1396.3 (FT)

Project : The Pines at Sawmill Simulation Run : 07 Prop 5 Reservoir: Pond-1

Start of Run :	01Jan2007, 12:00	Basin Model :	Proposed
End of Run :	02Jan2007, 12:05	Meteorologic Model :	5
Compute Time :	27Aug2007, 13:21:41	Control Specifications :	Control 1

Volume Units : IN

Computed Results

Peak Inflow :	2.8 (CFS)	Date/Time of Peak Inflow :	02Jan2007, 00:08
Peak Outflow :	1.2 (CFS)	Date/Time of Peak Outflow :	02Jan2007, 00:24
Total Inflow :	3.09 (IN)	Peak Storage :	0.1 (AC-FT)
Total Outflow :	3.07 (IN)	Peak Elevation :	1396.5 (FT)

Project : The Pines at Sawmill Simulation Run : 08 Prop 10 Reservoir: Pond-1

Start of Run :	01Jan2007, 12:00	Basin Model :	Proposed
End of Run :	02Jan2007, 12:05	Meteorologic Model :	10
Compute Time :	27Aug2007, 13:22:03	Control Specifications :	Control 1

Volume Units : IN

Computed Results

Peak Inflow :	3.3 (CFS)	Date/Time of Peak Inflow :	02Jan2007, 00:08
Peak Outflow :	1.5 (CFS)	Date/Time of Peak Outflow :	02Jan2007, 00:24
Total Inflow :	3.65 (IN)	Peak Storage :	0.1 (AC-FT)
Total Outflow :	3.63 (IN)	Peak Elevation :	1396.5 (FT)

Project : The Pines at Sawmill Simulation Run : 09 Prop 25 Reservoir: Pond-1

Start of Run :	01Jan2007, 12:00	Basin Model :	Proposed
End of Run :	02Jan2007, 12:05	Meteorologic Model :	25
Compute Time :	27Aug2007, 13:22:21	Control Specifications :	Control 1

Volume Units : IN

Computed Results

Peak Inflow :	4.1 (CFS)	Date/Time of Peak Inflow :	02Jan2007, 00:07
Peak Outflow :	2.0 (CFS)	Date/Time of Peak Outflow :	02Jan2007, 00:22
Total Inflow :	4.60 (IN)	Peak Storage :	0.1 (AC-FT)
Total Outflow :	4.58 (IN)	Peak Elevation :	1396.7 (FT)

Project : The Pines at Sawmill Simulation Run : 10 Prop 100 Reservoir: Pond-1

Start of Run :	01Jan2007, 12:00	Basin Model :	Proposed
End of Run :	02Jan2007, 12:05	Meteorologic Model :	100
Compute Time :	27Aug2007, 13:22:53	Control Specifications :	Control 1

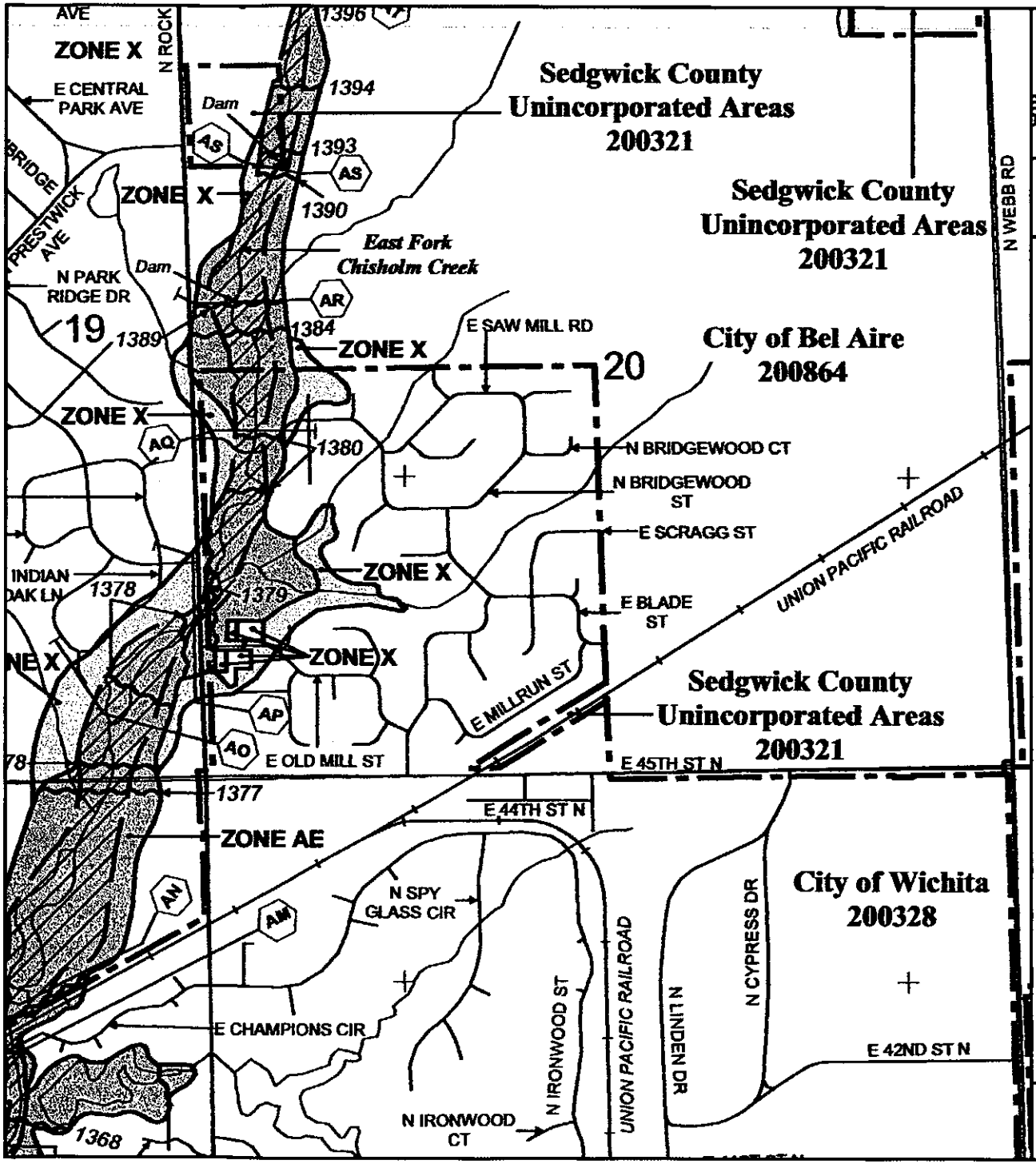
Volume Units : IN

Computed Results

Peak Inflow :	5.5 (CFS)	Date/Time of Peak Inflow :	02Jan2007, 00:07
Peak Outflow :	2.9 (CFS)	Date/Time of Peak Outflow :	02Jan2007, 00:21
Total Inflow :	6.23 (IN)	Peak Storage :	0.1 (AC-FT)
Total Outflow :	6.21 (IN)	Peak Elevation :	1396.9 (FT)

PROPOSED CONDITIONS DRAINAGE MAP

FEMA FIRM



MAP SCALE 1" = 1000'

500 0 1000 2000 FEET

0 300 600 METERS

PANEL 0240E

FIRM

FLOOD INSURANCE RATE MAP

SEDGWICK COUNTY, KANSAS
AND INCORPORATED AREAS

PANEL 240 OF 700

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BEL AIRE, CITY OF	200864	0240	E
KECHI, CITY OF	200429	0240	E
SEDGWICK COUNTY	200321	0240	E
WICHITA, CITY OF	200328	0240	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
20173C0240E

EFFECTIVE DATE
FEBRUARY 2, 2007

Federal Emergency Management Agency