Regent Park Assisted Living

Supplemental Drainage Report

January 21, 2011

Project Location

Regent Park Assisted Living is located approximately a ¼ mile west of Greenwich Road along 13th Street North, Wichita, KS. The site is platted as a portion of Greenwich Office Park Addition.

Discussion of Development

Drainage calculations were previously completed for this area in the Drainage Report for Waterfront Commercial, Waterfront Residential and Greenwich Office Park dated August 2007.

The site will have two buildings, parking, sidewalks, and grass areas. The site will be 63% impervious and 37% disturbed pervious area. Storm water sewer and detention ponds have been designed and constructed to control runoff from the development.

Portions of the site drain into the pond in the Waterfront Residential Addition. The current pond outlet structure functions in two stages. The normal pool elevation and small storm events are controlled by 4-6"x24" openings around structure. Once the pond elevation increases 1' above the normal pool, water is able to enter a 4'x4' grated opening on top of the structure. Modifications will be made to the outlet structure of the southwest Waterfront Residential pond to provided detention for water quality and channel protection.

Detention Requirements

Water Quality (WQ_v) and Channel Protection Volume (CP_v) requirements have been calculated for this site is accordance with the City of Wichita/Sedgwick County Storm Water Manual. Water quality calculations are made assuming a precipitation event of 1.2". Table 1 shows the water quality volume calculations;

Table 1. Water Quality Volume

Area impervious	5.74	ac
Area disturbed pervious	3.39	ac
Area undisturbed	0.00	ac
Total Area	9.13	ac
HSG	D	
R_v =	0.69	
WQ_v =	0.63	ac-ft
Q_{wv} =	0.83	in

The development will be required to provide 0.63 ac-ft of storage for water quality control. The current pond has 0.85 ac-ft of storage available between the first and second stage of the outlet. The first stage opening will be reduced from 4-6"x24" openings to 1-3" pipe. This reduction will take advantage of the available volume in the pond for water quality.

CP_v for the site was calculated assuming a 1-year, 24-hour rain event of 2.8". Table 2 shows the CP_v Calculations;

Table 2. Channel Protection Volume

Q_{wv} =	1.93	in
CN =	91.54	
S =	0.92	
I_a =	0.18	in
I_a/P =	0.07	
q_u =	920	$cfs/mi^2/in$
Q_{wq} =	25.36	cfs
Q =	1.93	In
Q_p =	25.36	cfs
q_o/q_i =	0.02	
V_s/V_r =	0.65	
$V_s = CP_v$ =	0.96	Ac-ft

The development will be required to provide a CP_v of 0.96 ac-ft. The existing pond with the modified outlet structure will provide approximately 1.4 ac-ft of storage during a 2.8", 24-hr rain event. This is approximately 45% more storage than required for channel protection.