PROFESSIONAL ENGINEERING CONSULTANTS
1440 EAST ENGLISH
WICHITA, KANSAS
ZIP CODE / AREA

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Project Meadowlark

Item Drainage Concept

Detention Volume Required

Pre-development 3.19 ac-ft

Proposed development 5.98 ac-ft

Volume required 2.8 ac-ft

Maximum outflow

Pre-developed flowrate - 31 cfs

Pond Geometry

bottom - elevation 133 (city datum)
Sideslopes - 5:1
freeboard - 1 foot
berm - 10' @ elevation 138 (city datum)
inlet at bottom of pond

Pipe Selection

Pond to manhole - pipe selected to restrict flow to 31 cfs or less

18" CMP

Manhole to creek - pipe selected to handle 31(+) cfs

24" CMP

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Project Meadowlark

Item Drainage Concept

Pipe Selection (Pond to Manhole)

$Q = 0.285 C D^{2.63} S^{0.54}$ Hazen-Williams formula

Q - gal per min

D - inches

C - 140 RCP

C - 110 CMP

$D^{2.63} = Q / 0.285 C S^{0.54}$

$31 ft^3/sec \cdot 60 sec/min \cdot 1 gal / .134 ft^3$

$Q = 13,881$ gal/min $h = 37.0 - 27.5$

$S = 9.5'/180' = 0.053'/ft$

$D = (13881 / 0.285)(140)(.053)^{.54}$

$D = 16.9$ in

if $D = 15''$

$Q = 0.285(140)(15)^{2.63}(0.053)^{.54}$

$Q = 10,120$ gpm
$= 22$ cfs

if $D = 18''$

$Q = 36.5$ cfs RCP

$Q = 28.7$ cfs CMP ✓ 18"

Pipe Selection (Manhole to dock)

$Q = 0.285(110)(.021)^{.54} D^{2.63}$

$h = 30.5 - 26.0$
$S = 4.5 / 210 = 0.021$

D (in)	Q (cfs)
24"	37.5 cfs ✓

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PROFESSIONAL ASSOCIATION

July 1, 1980

Steve Lackey, Design Chief Engineer
Engineering Division, Department of Public Works
7th Floor - City Hall
455 N. Main
Wichita, Kansas 67202

RE: Meadowlark Addition - Drainage Concept
PEC File No. 30-79151-1081

Dear Mr. Lackey:

The Meadowlark C.U.P. has been approved with the following General Provision #4:

> Drainage: At the time of platting, the applicant shall submit a Drainage plan for the entire development and guarantee drainage improvements as may be required.
> The difference between developed 100 year storm water runoff and undeveloped 100 year storm water runoff shall be detained on the property and released at a rate not to exceed the undeveloped 100 year storm water runoff.

The "undeveloped" runoff has been calculated based on the area soil type and as a pasture in good condition. This would be identical to the adjacent golf course condition. The runoff flow rate is 31 cfs.

The proposed multi-family residential development is assumed to be 50% impervious and 50% open area. The flow rate is calculated to be 58 cfs for the design storm (100 year, 6 hour).

The detention volume required is 2.8 acre - feet. Attached are copies of the calculations. Also attached are calculations for the outlet pipe.

The attached Drainage Concept provides for a detention pond with a minimum capacity of 2.8 acre feet, and 1' freeboard. The entire site is to be graded to drain into the pond (except a 10' strip adjacent to the west and east property lines).

The Drainage Plan will be submitted for review and approval prior to submission of the Final Plat.

Very Truly Yours,

Richard W. Linn, P.E.
Manager, Land Development

cc: Mike Lindebak
Tom Allen
Louise Olivarez

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