RAINBOW LAKES WEST 4th ADDITION

Cost Est. (SWS excluding Lake, spillway etc)

3	200 LF 30" Pipe @ $39	7800		
	40 LF 18" Pipe @ 24	960		
	10 LF 15" Pipe @ 20	200		
	4 ea Curb Inlets @ 1000	4000		
	1 ea Headwall @ 3000	3000	15,960	
4	200 LF 18" Pipe @ 24	4800		
	10 LF 15" Pipe @ 20	200		
	2 ea Curb Inlet @ 1000	2000		
	1 ea Headwall @ 2600	2600	9,600	
5	250 LF 30" Pipe @ 39	9750		
	40 LF 18" Pipe @ 24	960		
	10 LF 15" Pipe @ 20	200		
	4 ea Curb Inlet @ 1000	4000		
	1 ea Headwall @ 3000	3000	17,910	
6	240 LF 36" Pipe @ 47	11,280		
	50 LF 30 Pipe @ 39	1950		
	40 LF 18 Pipe @ 24	960		
	80 LF 15 Pipe @ 20	1600		
	10 ea Curb Inlet @ 1000	10,000		
	1 ea Headwall @ 3600	3600	29,390	72,860
	Eng, Insp. etc (11%)	8014.60		
	Adm (1.5%)	1092.90		
	Publication	200	9307.50	$104,127.50
	TOTAL			~~82,167.50~~

140' of 68"x43" RCP HE @ 68 = 9520 / 10,000
Two Hdw @ 5,000
19,520
2,440
$ 21,960
x 12.5%

Rainbow Lakes West 4th Add'n
Drainage Situation

WSK 7-20-79

1. On 7-13-78 the Preliminary Plat and Drainage plan concept were approved.

2 At a point on 135th St. West approx. 150' South of Rolling Hills Street, a culvert exists under 135th St. West. The flow is to the east. The flow is from 55 Ac. with an Q_2 = 96 cfs and Q_{100} = 213 cfs. The approved Drainage Plan Concept does not provide to drain this culvert. To do so requires one of the following:

A. Ditch between 135th St. West and Bridle Ct. from above culvert to approx 1150' south. Q as shown above. Depth of ditch = 8'±. This will require revision of Final Plat.

B. Install culvert under Bridle Ct. and thence ditch to proposed new lake. Drainage Area to lake would be 86 Ac± rather than 30.7 Ac as shown on Preliminary Plat. Would require new design of lake and revision of Final Plat.

3. @ South end of Bridle Ct. $Q_2 = 14.3$ cfs, $Q_{100} = 36.7$

Out fall pipe 30" × 200' Water surfaces @ Bridle Ct:

1345.0 = 2-yr permissible Ponding, 1345.4 = 100-yr Permissible Ponding; 1343.5 = Hydraulic surface for pipes Permanent pool of Lake = ~~1337.0~~ Hydraulic Grade of 30" pipe = $\frac{4.5}{200} \times 100 = 2.25\%$ 30" pipe $Q = 61.5$ cfs, $V = 12.53$ fps

Pipe Spillway = 1338.0 (Overflow Spillway = 1339.0) (Max WS Elev = 1340.0, 100-yr)

Slope required for 30" pipe for 36.7 cfs = 0.80%, 7.48 fps.

Use 4 inlet

Street Slope $\frac{2.3}{700} 100 = 0.33\%$

Permissible flow 2-yr frequency = 27 cfs

Permissible flow 100-yr frequency = 85 cfs

Minimum pad around lake shall be 1346.5 (seem high!)

4. @ South end of Saddle Ct. $Q_2 = 7$ cfs $Q_{100} = 16.8$

Use 2 inlets

18" × 200' RCP US WS = 1342 DS WS = 1339

$S = \frac{3}{200} 100 = 1.5\%$ 18" RCP $Q_n = 12.87$ cfs

Need swale over pipe for 4.0 cfs

5. @ Race horse 400' south of Saddle $Q_2 = 15.7$ $Q_{100} = 32$ cfs

Use 4 inlets

30" × 250' RCP US WS 1340.0 DS WS 1339

$S = \frac{1}{250} 100 = 0.4\%$ 30" RCP $Q_n = 25.94$

Need swale over pipe for 6.0 cfs

41°
31°
19'

6 @ Saddle & Rainbow Lake $Q_2 = 38.8$ $Q_{100} = 82.3$ cfs

Use 10 inlets

36"x 240' RCP USWS 1339.5 DSFL 1330

$S = \frac{9.5}{240} 100 = 3.96\%$ 36" $Q_4 = 132$ cfs

Slope required for 36" pipe $= \left(\frac{82.3}{66.6}\right)^2 100 = 1.53\%$ 11.64 fps

No swale required —

Saddle Slope @ 1% permissible flow 100 yr freq = 142 cfs

" 2-yr freq 47 cfs

$Q_2 = 27$ cfs

Flow on Saddle $Q_{100} = 57$ cfs

7 @ Rainbow Lake Road approx 800' south Central

Plan indicates 3 inlets with no pipes — need details

Also what area flows to cul-de-sac.

Need benefit district to drainage to Rainbow Lake Road & Saddle.

8. @ Rainbow Lake Road & Saddle

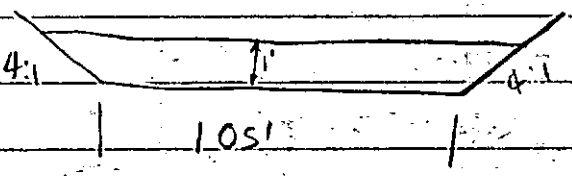
Need existing street pavement indicated.

9. @ Forestview & Central: How does this drain?

Is Central Paved with existing SWS System?

What is existing situation?

10 Need storage, discharge curve for proposed pond with spillway design, dam design and outlet structure design, if any. Also how is the pond emptied after once it is full? Is it designed for detention?



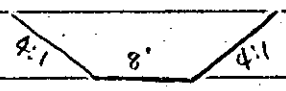
Area = 105 + 4 = 109 SF P = 105 + 8.25

Worst Case $V = \frac{1.486}{.03}\left(\frac{109}{113.25}\right)^{2/3}(.004)^{1/2}$

$V = 3.05$...

$Q = 333$ cfs

Flow in channel from 135th St. West to proposed Lake



$S = 0.2\%$ $Q_{100} = 213$ cfs

$n = 0.03$

Uniform flow King's p 7-78

$K' = \frac{Qn}{b^{8/3}S^{1/2}} = \frac{213(0.03)}{256(0.04472)} = 0.5581$

.38 .537
.558 = $\frac{x-1}{31}$ = .3868 or $D_n = 3.09'$ A_n $V = 3.39$ fps
.39 .568

Culvert 2-68"x43" HERCP L=55 $V = \frac{213}{2(16.6)} = 6.42$ fps Table 1051A H = 0.9' $D = 3.09 + 0.9 - 0.2 = 3.79'$

94' R/W

Bottom	8'
2D's @ 3.79 @ 4:1 =	30.32
2 Berms @ 15	30.00
2 Freeboards @ 3.21' @ 4:1 =	25.68
Total	94.00 R/W

V@n,s