STERLING
DESIGN ASSOCIATES
Civil Engineers | Landscape Architects

March 28, 2022

Jacob James, P.E., City Engineer
City of Lone Tree, Community Development
9220 Kimmer Drive, Suite 100
Lone Tree, CO 80124

RE: Lone Tree Recreation Center – Pickle Ball Courts
Drainage Letter

Jacob,

The proposed project includes the redevelopment of a portion of Lone Tree Recreation Center at 10249 RidgeGate Circle in Lone Tree, CO. The portion of the site being redeveloped is currently a single row of parking for the recreation center and the remainder is vacant / native seed. The proposed improvements will include six (6) pickle ball courts, a shelter, and associated flatwork for access to the courts from the recreation center and adjoining right-of-way.

Per a meeting with City of Lone Tree staff on December 15, 2021, you stated that the design team would need to verify that water quality capture volume (WQCV) for the proposed improvements was included in the existing detention facility (Pond 309) to the west of the recreation center. The existing drainage facility is included in the *Phase III Drainage Report for Tract FF, Detention Pond 309 & Lone Tree Community Park at RidgeGate* as prepared by Merrick and dated July 2008. Per this report, the proposed improvements exist within sub-basin OS2B.

The report states that the sub-basins which are tributary to Pond 309 have an imperviousness of 30.5%. The proposed improvements associated with the pickle ball courts would increase this imperviousness to 32.5%. The report also calculates the 100 year volume for Pond 309 (inclusive of WQCV) by converting the imperviousness percentage to a "C" coefficient. The converted "C" coefficient for 30.5% imperviousness equals 0.57. The converted "C" coefficient for the proposed 32.5% imperviousness also equals 0.57. Therefore, if these improvements were included in the original design for Pond 309, the total volume of the pond would not have increased.

In regards to WQCV, the report calculates a required volume of 0.41 acre-feet based on the aforementioned 30.5% imperviousness. A 32.5% imperviousness would result in a volume of 0.42 acre-feet (686 cf increase). Utilizing the design geometry of Pond 309, this would result in a WQCV water surface elevation increase from 6022.16 to 6022.18 (0.02 feet or ¼"). This increase is negligible and would have no impact on the 1-7/16" diameter WQ design hole or other features of the existing pond.

Sincerely,

Ryan J. Loftus, P.E.
For and on behalf of
Sterling Design Associates, LLC

PHASE III DRAINAGE REPORT
FOR
TRACT FF, DETENTION POND 309 &
LONE TREE COMMUNITY PARK AT RIDGEGATE

JULY 2008

Prepared For:

Rampart Range Metropolitan District No. 1
8390 E. Crescent Parkway, Suite 500
Greenwood Village, CO 80111
Phone: (303) 779-4525
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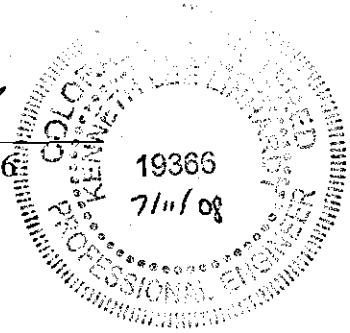
Prepared By:

Todd D. Hepworth
Project Engineer

Reviewed By:

Kenneth Lee Linhardt, P.E. No. 19366
Senior Project Manager



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CITY OF LONE TREE
PUBLIC WORKS DEPARTMENT
APPROVED
BY _____ DATE 7-21-08

Sub-Basin 3F is a portion of Basin A4 of the Martin & Martin Phase III drainage Report for the Eastern Recreation Center, March 13, 2003 revision, as referenced below with Basin OS2.)

Basin OS2 is a majority of the existing recreation center as identified from the Martin & Martin report for the Eastern Recreation Center (March 13, 2003 revision). The only region within the Martin & Martin report excluded from Basin OS2 is sub-basin B2,.which is a portion of Crossington Way and is tributary to Pond 308 (see Phase III Drainage Report for Crossington Way Road Extension Drainage Improvements, by Merrick & Company, July 2008, currently under review), and that portion of Basin A4 included as Sub-Basin 3F above. The sub-basins from the Martin & Martin report have been aggregated into three (3) sub-basins for the purposes of this report as follows:

Sub-Basin OS2A is the landscape area west of the Recreation Center building that sheet-flows into Basin 3F for discharge to Pond 309. This sub-basin corresponds to Basin A4 of the Martin & Martin report.

Sub-Basin OS2B is the Recreation Center roof, parking lot, and landscape areas captured by area drains that discharge to Pond 309. This area is served by an inlet and pipe system, identified in the Martin & Martin report, that discharges to the temporary drainage swale that will be piped through the park. This sub-basin corresponds to Basins R1, A1, A2 and A3 of the Martin & Martin report.

Sub-Basin OS2C is the perimeter of the Recreation Center site that is not captured for piping/discharge into Pond 309 and corresponds to Basins B1 and B3 of the Martin & Martin report. Sub-Basin OS2C runoff is detained in Pond 302 and does not contribute to sizing calculations for Pond 309. However, it is included with this report to draw attention to an apparent error in the Martin & Martin report, wherein runoff from the Rose Tuggle Way portion of Basin OS2C (M&M basin B3) was stated as flowing east on Ridgegate Circle, out of the Pond 302 tributary area, versus west along Ridgegate Circle as is intended.

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DETENTION BASIN REQUIREMENTS

Project: Pond 309
Date: 7/10/2008

PERCENT IMPERVIOUS AND TRIBUTARY AREA

Area Description	Area A (acres)	% Impervious Imp	A x Imp	I(%)	Soil Type B (acres)	Soil Type C/D (acres)
Basin OS1	1.20	52%	0.620			1.20
Basin 1A	0.27	0%	0.000			0.27
Basin 1B	0.43	0%	0.000			0.43
Basin 1C	0.60	20%	0.120			0.60
Basin 1D	1.19	50%	0.595			1.19
Basin 1E	3.82	50%	1.910			3.82
Basin 2A	2.77	0%	0.000		2.77	
Basin 2B	0.43	0%	0.000		0.43	
Basin 3A	0.13	10%	0.013			0.13
Basin 3B	1.28	10%	0.128			1.28
Basin 3C	4.35	10%	0.435			4.35
Basin 3D	0.68	100%	0.680			0.68
Basin 3E	2.54	10%	0.254			2.54
Basin 3F	0.68	10%	0.068			0.68
Basin OS2A	0.40	10%	0.040			0.40
Basin OS2B	5.83	56%	3.251			5.83
Totals	26.60		8.114	30.5%	3.20	23.40
					12%	88%

DETENTION VOLUME REQUIREMENTS

$V_2 = KIA$ (Sect 12.3.2, Doulas Co SDCTCM)

Where:

K =	1.10	inches
I =	0.305	Developed Basin % Impervious, as a ratio
A =	26.6	acres

(Note: The soon to be adopted Douglas County Standards have shifted from 10-yr/100-yr volumes to 2-yr/100-yr with the adoption of "full-spectrum" water quality per UDFCD, With a statement in Sect 12.3.2 that the new 2-yr volume req'd is approximately equal to the old 10-yr volume req'd.)

$V_{100} = KA$

Where:

K = 3.42*(I)^3-7.58*(I)^2+6.46*(I)-0.431 (Sect 12.3.2, Doulas Co SDCTCM)

I =	0.305	Developed Basin % Impervious, as a ratio
A =	26.6	acres
K_{100} =	0.931	inches
V_{100}=	**2.064**	Required 100-year Volume (Acre-ft) (includes 2-yr and WQCV)
V_2=	**0.744**	Required 2-year Volume (Acre-ft) (Includes WQCV)

WATER QUALITY CAPTURE VOLUME REQUIREMENTS

WQCV = 1.0 (0.91*I^3-1.19*I^2+0.78*I) (UDFCD Fig EDB-2, 40hr Drain Time)

WQCV = **0.15** Inches

Design Volume = (WQCV/12) * A * 1.2

Volume= **0.41** Acre-ft

TOTAL DETENTION + WATER QUALITY VOLUME

Volume=	**2.064**	Acre-ft	**REQUIRED VOLUME**
Volume=	**4.737**	Acre-ft	**PROVIDED VOLUME**

RELEASE RATE REQUIREMENTS

Release Rates (cfs/acre) by Soil Group

	A	B	C & D
2-year	0.02	0.03	0.04
10-year	0.13	0.23	0.3
100-year	0.5	0.85	1

ALLOWED DETENTION BASIN RELEASE RATES PER DRAINAGE CRITERIA:

Soils:	12%	B
	88%	C/D

	Rate	Area	Discharge
2-year	0.04	26.6	**1.03 cfs**
10-year	0.29	26.6	**7.76 cfs**
100-year	0.98	26.6	**26.12 cfs**

(Rate = Sum(Area % of Soil Type * Allowed Release Rate)

DETENTION VOLUME BY THE MODIFIED FAA METHOD

(See USDCM Volume 2 Storage Chapter for description of method)

Project: Rampart Range Metro District No. 1

Basin ID: Pond 309

(For catchments less than 160 acres only. For larger catchments, use hydrograph routing method)

(NOTE: for catchments larger than 90 acres, CUHP hydrograph and routing are recommended)

Determination of MINOR Detention Volume Using Modified FAA Method

Design Information (Input):

Catchment Drainage Imperviousness	I_a =	30.50	percent
Catchment Drainage Area	A =	26.600	acres
Predevelopment NRCS Soil Group	Type =	C	A, B, C, or D
Return Period for Detention Control	T =	10	years (2, 5, 10, 25, 50, or 100)
Time of Concentration of Watershed	Tc =	18	minutes
Allowable Unit Release Rate	q =	0.07	cfs/acre
One-hour Precipitation	P_1 =	1.66	inches
Design Rainfall IDF Formula $I = C_1 * P_1/(C_2+T_a)^{\wedge}C_3$			
Coefficient One	C_1 =	28.50	
Coefficient Two	C_2 =	10	
Coefficient Three	C_3 =	0.789	

Determination of Average Outflow from the Basin (Calculated):

Runoff Coefficient	C =	0.38	
Inflow Peak Runoff	Qp-in =	34.99	cfs
Allowable Peak Outflow Rate	Qp-out =	1.76	cfs
Mod. FAA Minor Storage Volume =		63,377	**cubic feet**
Mod. FAA Minor Storage =		1.455	**acre-ft**

δ = 5 <- Enter: Routing Increment (e.g., 5 for 5-Minutes)

Rainfall Duration minutes (Input)	Rainfall Intensity inches / hr (output)	Inflow Volume cubic feet (output)	Adjustment Factor (output)	Average Outflow cfs (output)	Outflow Volume cubic feet (output)	Storage Volume cubic feet (output)
0	0.00	0	0.00	0.00	0	0
5	5.58	16,936	0.64	1.13	339	16,597
10	4.45	26,993	0.79	1.38	828	26,166
15	3.73	33,954	0.93	1.63	1,467	32,486
20	3.23	39,206	1.00	1.76	2,107	37,099
25	2.86	43,396	1.00	1.76	2,633	40,762
30	2.58	46,867	1.00	1.76	3,160	43,707
35	2.35	49,826	1.00	1.76	3,687	46,139
40	2.16	52,401	1.00	1.76	4,213	48,188
45	2.00	54,681	1.00	1.76	4,740	49,941
50	1.87	56,725	1.00	1.76	5,267	51,459
55	1.76	58,579	1.00	1.76	5,793	52,786
60	1.66	60,275	1.00	1.76	6,320	53,955
65	1.57	61,839	1.00	1.76	6,847	54,992
70	1.49	63,289	1.00	1.76	7,374	55,916
75	1.42	64,643	1.00	1.76	7,900	56,742
80	1.36	65,912	1.00	1.76	8,427	57,485
85	1.30	67,106	1.00	1.76	8,954	58,153
90	1.25	68,236	1.00	1.76	9,480	58,756
95	1.20	69,307	1.00	1.76	10,007	59,300
100	1.16	70,325	1.00	1.76	10,534	59,792
105	1.12	71,296	1.00	1.76	11,060	60,236
110	1.08	72,225	1.00	1.76	11,587	60,638
115	1.05	73,115	1.00	1.76	12,114	61,001
120	1.02	73,969	1.00	1.76	12,640	61,329
125	0.99	74,790	1.00	1.76	13,167	61,623
130	0.96	75,582	1.00	1.76	13,694	61,888
135	0.93	76,346	1.00	1.76	14,220	62,125
140	0.91	77,084	1.00	1.76	14,747	62,336
145	0.88	77,798	1.00	1.76	15,274	62,524
150	0.86	78,489	1.00	1.76	15,800	62,689
155	0.84	79,160	1.00	1.76	16,327	62,833
160	0.82	79,811	1.00	1.76	16,854	62,958
165	0.80	80,444	1.00	1.76	17,380	63,064
170	0.79	81,060	1.00	1.76	17,907	63,153
175	0.77	81,660	1.00	1.76	18,434	63,226
180	0.75	82,244	1.00	1.76	18,960	63,284
185	0.74	82,814	1.00	1.76	19,487	63,327
190	0.72	83,370	1.00	1.76	20,014	63,356
195	0.71	83,913	1.00	1.76	20,541	63,373
200	0.70	84,444	1.00	1.76	21,067	63,377
205	0.68	84,963	1.00	1.76	21,594	63,369
210	0.67	85,471	1.00	1.76	22,121	63,350
215	0.66	85,968	1.00	1.76	22,647	63,321
220	0.65	86,455	1.00	1.76	23,174	63,281
225	0.64	86,932	1.00	1.76	23,701	63,231
230	0.63	87,400	1.00	1.76	24,227	63,173
235	0.62	87,859	1.00	1.76	24,754	63,105
240	0.61	88,309	1.00	1.76	25,281	63,029
245	0.60	88,751	1.00	1.76	25,807	62,944
250	0.59	89,186	1.00	1.76	26,334	62,852
255	0.58	89,613	1.00	1.76	26,861	62,752
260	0.57	90,032	1.00	1.76	27,387	62,645
265	0.56	90,444	1.00	1.76	27,914	62,530
270	0.55	90,850	1.00	1.76	28,441	62,409
275	0.55	91,249	1.00	1.76	28,967	62,282
280	0.54	91,642	1.00	1.76	29,494	62,148
285	0.53	92,029	1.00	1.76	30,021	62,008
290	0.53	92,410	1.00	1.76	30,547	61,863
295	0.52	92,785	1.00	1.76	31,074	61,711
300	0.51	93,155	1.00	1.76	31,601	61,554

Mod. FAA Minor Storage Volume (cubic ft.) = 63,377

Mod. FAA Minor Storage Volume (acre-ft.) = 1.4549

Determination of MAJOR Detention Volume Using Modified FAA Method

Design Information (Input):

Catchment Drainage Imperviousness	I_a =	30.50	percent
Catchment Drainage Area	A =	26.600	acres
Predevelopment NRCS Soil Group	Type =	C	A, B, C, or D
Return Period for Detention Control	T =	100	years (2, 5, 10, 25, 50, or 100)
Time of Concentration of Watershed	Tc =	18	minutes
Allowable Unit Release Rate	q =	0.44	cfs/acre
One-hour Precipitation	P_1 =	2.60	inches
Design Rainfall IDF Formula $I = C_1 * P_1/(C_2+T_a)^{\wedge}C_3$			
Coefficient One	C_1 =	28.50	
Coefficient Two	C_2 =	10	
Coefficient Three	C_3 =	0.789	

Determination of Average Outflow from the Basin (Calculated):

Runoff Coefficient	C =	0.57	
Inflow Peak Runoff	Qp-in =	82.21	cfs
Allowable Peak Outflow Rate	Qp-out =	11.68	cfs
Mod. FAA Major Storage Volume =		99,742	**cubic feet**
Mod. FAA Major Storage Volume =		2.290	**acre-ft**

Rainfall Duration minutes (Input)	Rainfall Intensity inches / hr (output)	Inflow Volume cubic feet (output)	Adjustment Factor (output)	Average Outflow cfs (output)	Outflow Volume cubic feet (output)	Storage Volume cubic feet (output)
0	0.00	0	0.00	0.00	0	0
5	8.75	39,789	0.64	7.51	2,252	37,537
10	6.97	63,418	0.79	9.18	5,505	57,913
15	5.85	79,771	0.93	10.84	9,759	70,012
20	5.06	92,110	1.00	11.68	14,013	78,097
25	4.48	101,952	1.00	11.68	17,516	84,436
30	4.03	110,109	1.00	11.68	21,019	89,089
35	3.68	117,080	1.00	11.68	24,523	92,536
40	3.38	123,111	1.00	11.68	28,026	95,086
45	3.14	128,467	1.00	11.68	31,529	96,938
50	2.93	133,271	1.00	11.68	35,032	98,238
55	2.75	137,626	1.00	11.68	38,535	99,090
60	2.59	141,610	1.00	11.68	42,039	99,572
65	2.46	145,283	1.00	11.68	45,542	99,742
70	2.33	148,691	1.00	11.68	49,045	99,646
75	2.23	151,871	1.00	11.68	52,548	99,323
80	2.13	154,853	1.00	11.68	56,052	98,801
85	2.04	157,660	1.00	11.68	59,555	98,105
90	1.96	160,313	1.00	11.68	63,058	97,255
95	1.88	162,829	1.00	11.68	66,561	96,268
100	1.82	165,222	1.00	11.68	70,064	95,157
105	1.75	167,504	1.00	11.68	73,568	93,936
110	1.70	169,685	1.00	11.68	77,071	92,615
115	1.64	171,776	1.00	11.68	80,574	91,202
120	1.59	173,782	1.00	11.68	84,077	89,705
125	1.55	175,712	1.00	11.68	87,581	88,132
130	1.50	177,572	1.00	11.68	91,084	86,488
135	1.46	179,366	1.00	11.68	94,587	84,779
140	1.42	181,100	1.00	11.68	98,090	83,010
145	1.39	182,777	1.00	11.68	101,593	81,184
150	1.35	184,402	1.00	11.68	105,097	79,306
155	1.32	185,979	1.00	11.68	108,600	77,379
160	1.29	187,509	1.00	11.68	112,103	75,406
165	1.26	188,996	1.00	11.68	115,606	73,390
170	1.23	190,443	1.00	11.68	119,109	71,333
175	1.21	191,852	1.00	11.68	122,613	69,239
180	1.18	193,224	1.00	11.68	126,116	67,108
185	1.16	194,563	1.00	11.68	129,619	64,944
190	1.13	195,870	1.00	11.68	133,122	62,747
195	1.11	197,145	1.00	11.68	136,626	60,520
200	1.09	198,392	1.00	11.68	140,129	58,264
205	1.07	199,612	1.00	11.68	143,632	55,980
210	1.05	200,805	1.00	11.68	147,135	53,669
215	1.03	201,973	1.00	11.68	150,638	51,334
220	1.01	203,117	1.00	11.68	154,142	48,975
225	1.00	204,238	1.00	11.68	157,645	46,593
230	0.98	205,337	1.00	11.68	161,148	44,189
235	0.97	206,416	1.00	11.68	164,651	41,764
240	0.95	207,473	1.00	11.68	168,155	39,319
245	0.94	208,512	1.00	11.68	171,658	36,856
250	0.92	209,533	1.00	11.68	175,161	34,372
255	0.91	210,535	1.00	11.68	178,664	31,871
260	0.89	211,521	1.00	11.68	182,167	29,353
265	0.88	212,490	1.00	11.68	185,671	26,819
270	0.87	213,443	1.00	11.68	189,174	24,269
275	0.86	214,381	1.00	11.68	192,677	21,704
280	0.85	215,304	1.00	11.68	196,180	19,124
285	0.83	216,213	1.00	11.68	199,684	16,529
290	0.82	217,108	1.00	11.68	203,187	13,921
295	0.81	217,989	1.00	11.68	206,690	11,299
300	0.80	218,858	1.00	11.68	210,193	8,665

Mod. FAA Major Storage Volume (cubic ft.) = 99,742

Mod. FAA Major Storage Volume (acre-ft.) = 2.2898

1.45 Ac-ft

2.29 Ac-ft

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Engineering Calculation Sheet

Date 7/10/08 Sheet 1 of 1

Contract

Calculation No.

Subject POND 309 WSEL CALC'S

Revision	By	Date	Chk'd	Date

DETERMINE $WSEL_{WQCV}$, $WSEL_{10}$, AND $WSEL_{100}$

FOR V_{WSEL} = 0.41 AC-FT (DETENTION POND REQMT SPREADSHEET)

V_{10} = 1.45 Ac-Ft

V_{100} = 2.29 Ac-Ft } MODIFIED FAA SPREADSHEET

FROM UDFCD POND STAGING SPREADSHEET

$WSEL_{(WQCV)}$ → 0.41 > 0.34 (6022.0)

$$\frac{0.41-0.34}{0.77-0.34} = \frac{X-6022.0}{6023.0-6022.0}$$

$X = 6022.16$

REVISED:

(0.42 - 0.34) = (X - 6022.0)
(0.77 - 0.34) (6023.0 - 6022.0)

X = 6022.18

$WSEL_{10}$ → 1.45 > 1.42 (6024.0)

$$\frac{1.45-1.42}{2.30-1.42} = \frac{X-6024.0}{6025.0-6024.0}$$

$X = 6024.03$

$WSEL_{100}$ = 2.29 > 1.42 (6024)

$$\frac{2.29-1.42}{2.30-1.42} = \frac{X-6024.0}{6025.0-6024.0}$$

$X = 6024.99$

Orifice Plate Perforation Sizing

Circular Perforation Sizing

This table may be used to size perforation in a vertical plate of riser pipe.

Hole Dia. (in.) *	Hole Dia. (in.)	Min. S_c (in.)	Area per Row (sq. in.)		
			n = 1	n = 2	n = 3
1/4	0.250	1	0.05	0.10	0.15
5/16	0.313	2	0.08	0.16	0.24
3/8	0.375	2	0.11	0.22	0.33
7/16	0.438	2	0.15	0.30	0.45
1/2	0.500	2	0.20	0.40	0.60
9/16	0.563	3	0.25	0.50	0.75
5/8	0.625	3	0.31	0.62	0.93
11/16	0.688	3	0.37	0.74	1.11
3/4	0.750	3	0.44	0.88	1.32
13/16	0.813	3	0.52	1.04	1.56
7/8	0.875	3	0.60	1.20	1.80
15/16	0.938	3	0.69	1.38	2.07
1	1.000	4	0.79	1.58	2.37
1 1/16	1.063	4	0.89	1.78	2.67
1 1/8	1.125	4	0.99	1.98	2.97
1 3/16	1.188	4	1.11	2.22	3.33
1 1/4	1.250	4	1.23	2.46	3.69
1 5/16	1.313	4	1.35	2.70	4.05
1 3/8	1.375	4	1.48	2.96	4.44
1 7/16	1.438	4	1.62	3.24	4.86
1 1/2	1.500	4	1.77	3.54	5.31
1 9/16	1.563	4	1.92	3.84	5.76
1 5/8	1.625	4	2.07	4.14	6.21
1 11/16	1.688	4	2.24	4.48	6.72
1 3/4	1.750	4	2.41	4.82	7.23
1 13/16	1.813	4	2.58	5.16	7.74
1 7/8	1.875	4	2.76	5.52	8.28
1 15/16	1.938	4	2.95	5.90	8.85
2	2.000	4	3.14	6.28	9.42
n = Number of columns of perforations					
Minimum steel plate thickness			1/4"	5/16"	3/8"
* Designer may interfere to the nearest 32nd inch to better match the needed area if desired.					

Rectangular Perforation sizing

Use only one rectangular column whenever two 2;inch diameter circular perforations cannot provide needed outlet area.

Rectangular Height = 2-inches

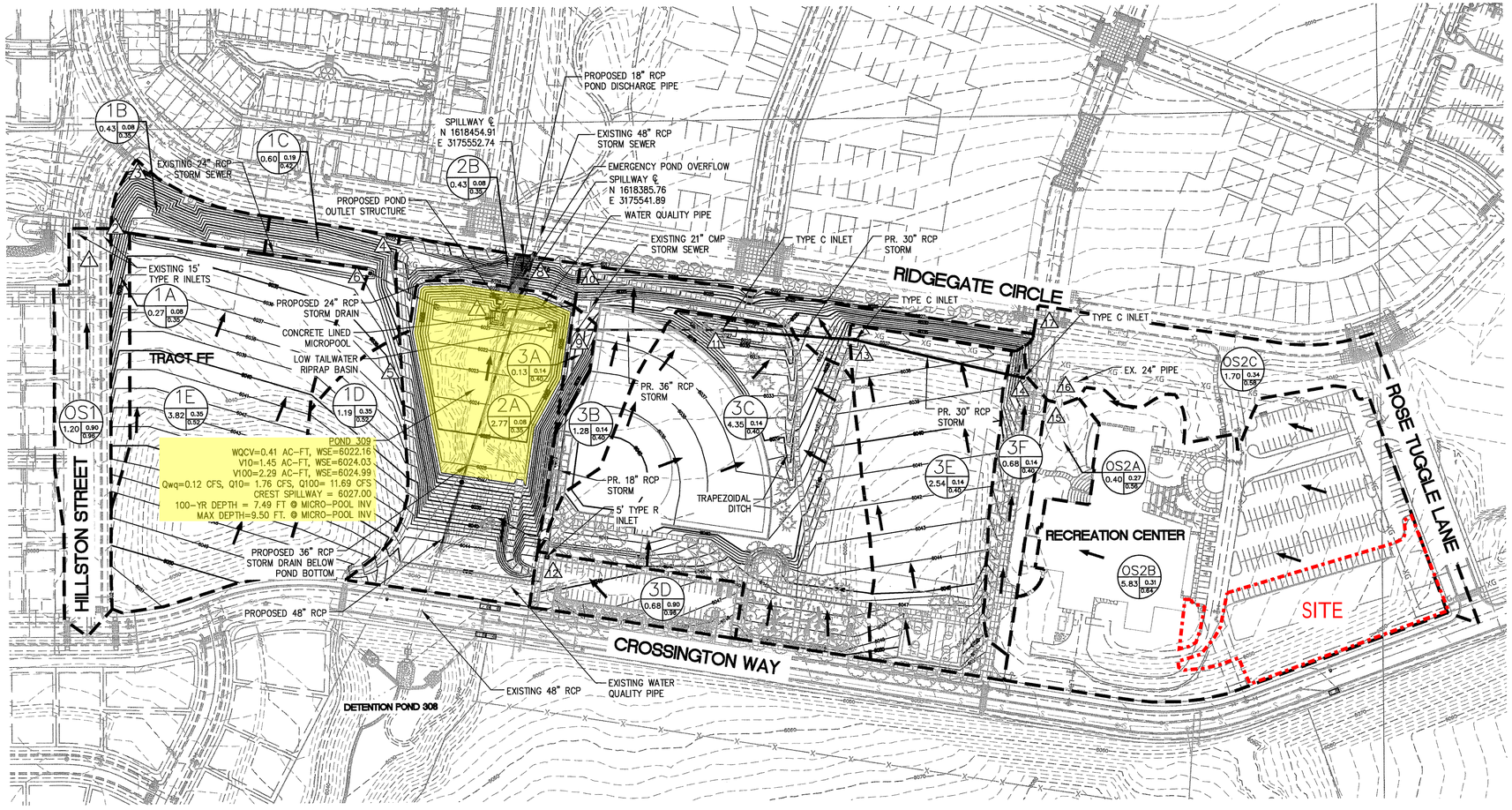
Rectangular Width = Required Area per Row / 2"

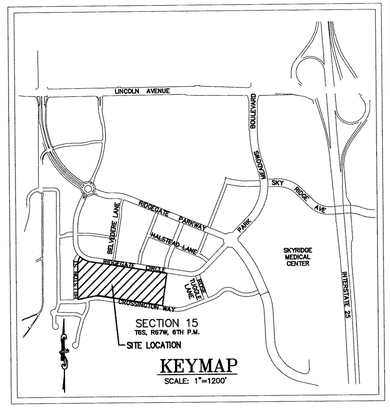
Rectangular hole Width	Min. Steel Thickness
5"	1/4 "
6"	1/4 "
7"	5/32 "
8"	5/16 "
9"	11/32 "
10"	3/8 "
> 10"	1/2 "

Figure 5—WQCV Outlets Orifice Perforation Sizing.

Table RO-5— Runoff Coefficients, *C*

Percentage Imperviousness	Type C and D NRCS Hydrologic Soil Groups					
	2-yr	5-yr	10-yr	25-yr	50-yr	100-yr
0%	0.04	0.15	0.25	0.37	0.44	0.50
5%	0.08	0.18	0.28	0.39	0.46	0.52
10%	0.11	0.21	0.30	0.41	0.47	0.53
15%	0.14	0.24	0.32	0.43	0.49	0.54
20%	0.17	0.26	0.34	0.44	0.50	0.55
25%	0.20	0.28	0.36	0.46	0.51	0.56
30%	0.22	0.30	0.38	0.47	0.52	0.57
35%	0.25	0.33	0.40	0.48	0.53	0.57
40%	0.28	0.35	0.42	0.50	0.54	0.58
45%	0.31	0.37	0.44	0.51	0.55	0.59
50%	0.34	0.40	0.46	0.53	0.57	0.60
55%	0.37	0.43	0.48	0.55	0.58	0.62
60%	0.41	0.46	0.51	0.57	0.60	0.63
65%	0.45	0.49	0.54	0.59	0.62	0.65
70%	0.49	0.53	0.57	0.62	0.65	0.68
75%	0.54	0.58	0.62	0.66	0.68	0.71
80%	0.60	0.63	0.66	0.70	0.72	0.74
85%	0.66	0.68	0.71	0.75	0.77	0.79
90%	0.73	0.75	0.77	0.80	0.82	0.83
95%	0.80	0.82	0.84	0.87	0.88	0.89
100%	0.89	0.90	0.92	0.94	0.95	0.96
	→ TYPE B NRCS HYDROLOGIC SOILS GROUP					
0%	0.02	0.08	0.15	0.25	0.30	0.35
5%	0.04	0.10	0.19	0.28	0.33	0.38
10%	0.06	0.14	0.22	0.31	0.36	0.40
15%	0.08	0.17	0.25	0.33	0.38	0.42
20%	0.12	0.20	0.27	0.35	0.40	0.44
25%	0.15	0.22	0.30	0.37	0.41	0.46
30%	0.18	0.25	0.32	0.39	0.43	0.47
35%	0.20	0.27	0.34	0.41	0.44	0.48
40%	0.23	0.30	0.36	0.42	0.46	0.50
45%	0.26	0.32	0.38	0.44	0.48	0.51
50%	0.29	0.35	0.40	0.46	0.49	0.52
55%	0.33	0.38	0.43	0.48	0.51	0.54
60%	0.37	0.41	0.46	0.51	0.54	0.56
65%	0.41	0.45	0.49	0.54	0.57	0.59
70%	0.45	0.49	0.53	0.58	0.60	0.62
75%	0.51	0.54	0.58	0.62	0.64	0.66
80%	0.57	0.59	0.63	0.66	0.68	0.70
85%	0.63	0.66	0.69	0.72	0.73	0.75
90%	0.71	0.73	0.75	0.78	0.80	0.81
95%	0.79	0.81	0.83	0.85	0.87	0.88
100%	0.89	0.90	0.92	0.94	0.95	0.96





LEGEND

- BASIN BOUNDARY LINE
- BASIN IDENTIFICATION
- COMPOSITE RUNOFF COEFFICIENTS
- BASIN AREA (ACRES)
- DESIGN POINT
- PROPOSED STORM SEWER
- 5715 — EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- 5715 — PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- DIRECTION OF FLOW

SUMMARY RUNOFF TABLE				
			RUNOFF	
BASIN ID.	DESIGN POINT	AREA (AC.)	Q-5 (CFS)	Q-100 (CFS)
OS1	1	1.20	2.7	6.5
1A	2	0.27	0.1	0.6
1B	3	0.43	0.1	1.0
1C	4	0.60	0.4	1.7
1D	5	1.19	1.5	4.0
1E	6	3.82	4.5	12.3
2A	7	2.77	0.8	6.2
2B	8	0.43	0.2	1.3
3A	9	0.13	0.1	0.5
3B	10	1.28	0.6	3.3
3C	11	4.35	2.1	10.7
3D	12	0.68	2.8	5.5
3E	13	2.54	1.2	6.3
3F	14	0.68	0.3	1.7
OS2A	15	0.40	0.2	1.1
OS2B	16	5.83	9.0	24.4
OS2C	17	1.70	**	**

BASINS NOT FLOWING TO POND 309 BUT ACCOUNTED FOR WITH "OVER-DETENTION"	Q-5 (CFS)	Q-100 (CFS)
OS1, 1A, 1B, 1C, 2B, 3B	4.1	14.4

** SEE MARTIN & MARTIN REPORT "SOUTH SUBURBAN RECREATION DISTRICT EASTERN RECREATION CENTER," MARCH 13, 2003 REVISION REGARDING OS2C (BASIN OS2C IS COMPRISED OF BASINS B1 AND B3 OF SAID REPORT)

-100 0 50 100 200

SCALE: 1" = 100'
ORIGINAL GRAPHIC SCALE

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REV	REVISION DESCRIPTION	DATE	CHANGED BY	CHECKED BY	APPROVED BY

MERRICK® BUILDING QUALITY SOLUTIONS

MERRICK	SIGNATURE	DATE
DRAWN	SPH/TDH	07/11/08
DESIGNED	SPH/TDH	07/11/08
QC REVIEW	JSJ	07/11/08
APPROVED	KLL	07/11/08
CLIENT	SIGNATURE	DATE
REVIEW		
APPROVED		
CAD FILE NAME	5769-DRN	

RRMD NO. 1
8390 E. CRESCENT PKWY, SUITE 500
GREENWOOD VILLAGE, CO 80111

CLIENT PROJECT NO.	N/A
MERRICK PROJECT NO.	03015769
SCALE:1"=100'	

COLORADO REGISTERED KENNETH LEE LINHARDT 19366 PROFESSIONAL ENGINEER

KENNETH L. LINHARDT
Colorado Registered Professional Engineer #19366
For and on Behalf of Merrick & Company

TITLE:
RIDGEGATE - SECTION 15 TRACT FF, POND 309 AND COMMUNITY PARK DRAINAGE MAP

REVISION:	DRAWING NO.	SHEET NO.
		1