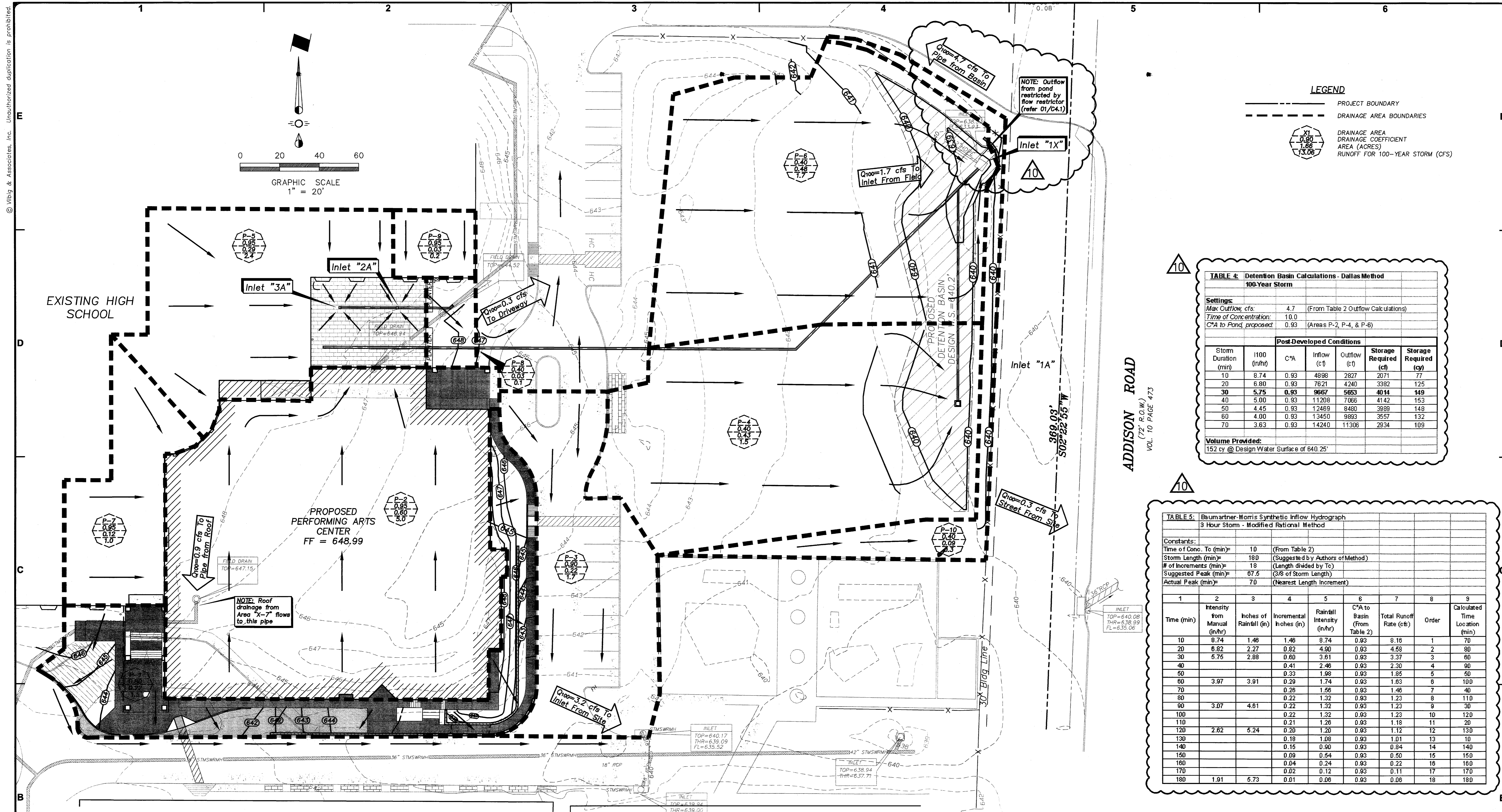


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LEGEND
 --- PROJECT BOUNDARY
 - - - DRAINAGE AREA BOUNDARIES
 X1
 0.80
 1.66
 13.06
 DRAINAGE AREA
 DRAINAGE COEFFICIENT
 AREA (ACRES)
 RUNOFF FOR 100-YEAR STORM (CFS)

TABLE 4: Detention Basin Calculations - Dallas Method
100-Year Storm

Settings:
 Max Outflow, cfs: 4.7 (From Table 2 Outflow Calculations)
 Time of Concentration: 10.0
 CFA to Pond, proposed: 0.93 (Areas P-2, P-4, & P-6)

Storm Duration (min)	I100 (in/hr)	CFA	Inflow (cfs)	Outflow (cfs)	Storage Required (cfs)	Storage (cy)
10	8.74	0.93	4898	2827	2071	77
20	6.80	0.93	7821	4240	3382	125
30	5.75	0.93	9667	5653	4014	149
40	5.00	0.93	11208	7066	4142	153
50	4.45	0.93	12469	8480	3999	148
60	4.00	0.93	13450	9893	3557	132
70	3.63	0.93	14240	11306	2934	109

Volume Provided:
 152 cy @ Design Water Surface of 640.25'

TABLE 5: Baumertner-Morris Synthetic Inflow Hydrograph
3 Hour Storm - Modified Rational Method

Constants:
 Time of Conc. (to min): 10 (From Table 2)
 Storm Length (min): 180 (Suggested by Authors of Method)
 # of Increments (min): 18 (Length divided by Tc)
 Suggested Peak (min): 67.5 (3/8 of Storm Length)
 Actual Peak (min): 70 (Nearest Length Increment)

Time (min)	Intensity from Manual (in/hr)	Inches of Rainfall (in)	Incremental Intensity (in/hr)	Rainfall Intensity (in/hr)	CFA to Basin (From Table 2)	Total Runoff Rate (cfs)	Order	Calculated Time Location (min)
10	8.74	1.46	1.46	8.74	0.93	8.16	1	70
20	6.82	2.27	0.82	4.90	0.93	4.58	2	80
30	5.75	2.88	0.60	3.61	0.93	3.37	3	80
40			0.41	2.46	0.93	2.30	4	90
50			0.33	1.98	0.93	1.85	5	90
60	3.97	3.91	0.29	1.74	0.93	1.63	6	100
70			0.26	1.66	0.93	1.46	7	40
80			0.22	1.32	0.93	1.23	8	110
90	3.07	4.61	0.22	1.32	0.93	1.23	9	30
100			0.22	1.32	0.93	1.23	10	120
110			0.21	1.26	0.93	1.18	11	20
120	2.62	5.24	0.20	1.20	0.93	1.12	12	130
130			0.18	1.08	0.93	1.01	13	10
140			0.15	0.90	0.93	0.84	14	140
150			0.09	0.54	0.93	0.50	15	150
160			0.04	0.24	0.93	0.22	16	160
170			0.02	0.12	0.93	0.11	17	170
180	1.91	5.73	0.01	0.06	0.93	0.06	18	180

01 EXISTING DRAINAGE AREA MAP
 SCALE: 1" = 20'

TABLE 2: Proposed Drainage Areas

Area No.	Area ac.	"C"	C*A	Tc min	I100 in/hr	Remarks
P-1	0.22	0.80	0.18	10	8.74	Proposed Sidewalks & Landscaping
P-2	0.60	0.95	0.57	10	8.74	Proposed Building to Line "A"
P-3	0.22	0.90	0.20	10	8.74	Existing Drive & Sidewalks
P-4	0.43	0.40	0.17	10	8.74	Surface Flow To Inlet "1A"
P-5	0.29	0.95	0.28	10	8.74	Patio & Roof to Inlets "1B" & "2B"
P-6	0.48	0.40	0.19	10	8.74	To Existing Inlet "1X"
P-7	0.12	0.95	0.11	10	8.74	Existing Roof to Ex. Drain Line
P-8	0.03	0.40	0.01	10	8.74	Proposed Landscaping to East/North
P-9	0.03	0.95	0.03	10	8.74	Existing Roof to Area "P-8"
P-10	0.09	0.40	0.04	10	8.74	To Addison Road
TOTAL FLOW	2.51	0.71	1.77			

Outflow Calculations
 Max Outflow from site, total, cfs: 12.1 (Table 1)
 Flow Bypassing Prop. Basin, cfs: 7.3 (Areas P-1, P-3, P-5, & P-7 thru P-10)
 Max Outflow from Basin, cfs: 4.7

TABLE 3: Stage-Storage-Discharge Table

Constants:
 Contraction coefficient (K): 0.81
 Elevation of outlet pipe (ft): 636.8
 Diameter of outlet restrictor (ft): 0.35

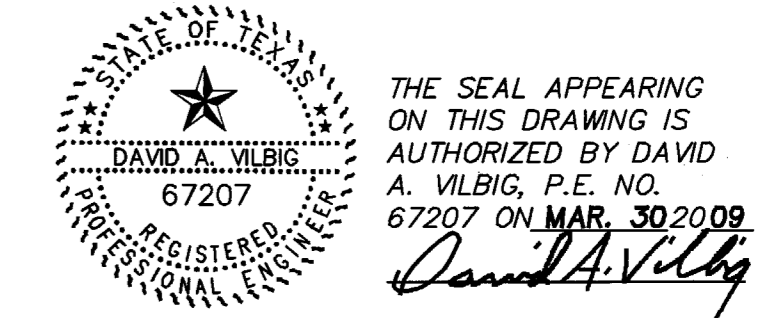
1	2	3	4	5
Elevation (ft)	Storage (cy)	Incremental Storage (cy)	Discharge (cfs)	Elevation (ft)
637.0	0.0	0.0	2.0	637.0
638.0	1.5	1.5	3.0	638.0
639.0	3.0	1.5	4.0	639.0
639.6	2.4	0.4	3.6	639.6
638.7	2.7	0.3	3.7	638.7
639.8	3.3	0.6	3.7	639.8
639.9	4.3	1.0	3.8	639.9
639.0	5.8	1.5	3.9	639.0
639.1	7.9	2.1	3.9	639.1
639.2	10.6	2.7	4.0	639.2
639.3	14.5	3.9	4.0	639.3
639.4	19.8	5.3	4.1	639.4
639.5	26.9	7.1	4.2	639.5
639.6	36.1	9.2	4.2	639.6
639.7	47.6	11.5	4.3	639.7
639.8	61.8	14.2	4.3	639.8
639.9	78.3	16.5	4.4	639.9
640.0	96.8	18.5	4.4	640.0
640.1	117.3	20.5	4.5	640.1
640.2	139.6	22.3	4.5	640.2
640.3	163.2	23.6	4.6	640.3
640.4	189.7	26.5	4.6	640.4
640.5	217.6	27.9	4.7	640.5
640.6	247.2	29.6	4.7	640.6
640.7	287.7	31.5	4.8	640.7

TABLE 6: Pond Flow Calculations - Stage-Discharge

Outflow Restriction Safety Factor: 0.80 (unitless)

1	2	3	4	5	6	7	8	9	10	11	12
Time, minutes	Runoff to Basin (cfs) from Table 5	Incremental Inflow (cy)	Pond Elevation (ft), start of step	Pond Volume (cy), start of step, from Table 3	Outflow Rate @ Column 5 Elevation (cfs), from Table 3	Safety Factored Outflow Rate, cfs	Incremental Outflow @ Column 7 Flow Rate (cy)	Incremental Volume (cy) (Column 8 - Column 9)	Cumulative Storage Volume (cy) (Column 5 + Column 9)	Pond Elevation, feet	Notes
10	1.01	22.4	637.0	0.0	2.0	1.6	35.6	-13.1	0.0	637.0	
20	1.18	26.2	637.0	0.0	2.0	1.6	35.6	-9.3	0.0	637.0	
30	1.23	27.3	637.0	0.0	2.0	1.6	35.6	-8.2	0.0	637.0	
40	1.46	32.4	637.0	0.0	2.0	1.6	35.6	-3.2	0.0	637.0	a
50	1.85	41.1	637.0	0.0	2.0	1.6	39.0	2.1	2.1	638.3	a
60	3.37	74.9	638.3	2.0	4.0	3.2	71.1	3.8	5.8	639.9	
70	8.16	181.3	638.9	4.3	3.8	3.0	67.7	113.6	117.9	640.1	b
80	4.58	101.8	640.1	117.3	4.5	3.6	79.7	22.1	139.4	640.1	b
90	2.30	51.1	640.1	117.3	4.5	3.6	79.7	-26.6	88.7	639.9	
100	1.63	36.2	639.9	78.3	4.4	3.5	77.8	-41.6	36.7	639.6	
110	1.23	27.3	639.6	36.1	4.2	3.4	74.9	-47.6	0.0	637.0	
120	1.23	27.3	637.0	0.0	2.0	1.6	35.6	-8.2	0.0	637.0	
130	1.12	24.9	637.0	0.0	2.0	1.6	35.6	-10.7	0.0	637.0	c

Notes:
 a Incremental outflow manually adjusted to provide smooth and even increase in storage curve. Curve dipped and spiked before adjustment.
 b Peak storage and outflow value. Outflow restriction safety factor (Column 7) serves as conservative design assumption in case of additional outlet restriction.
 c Time increments past 130 minutes omitted because basin is already empty.



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 Project Manager: Chris Walton, P.E.
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PROPOSED DRAINAGE AREA MAP
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