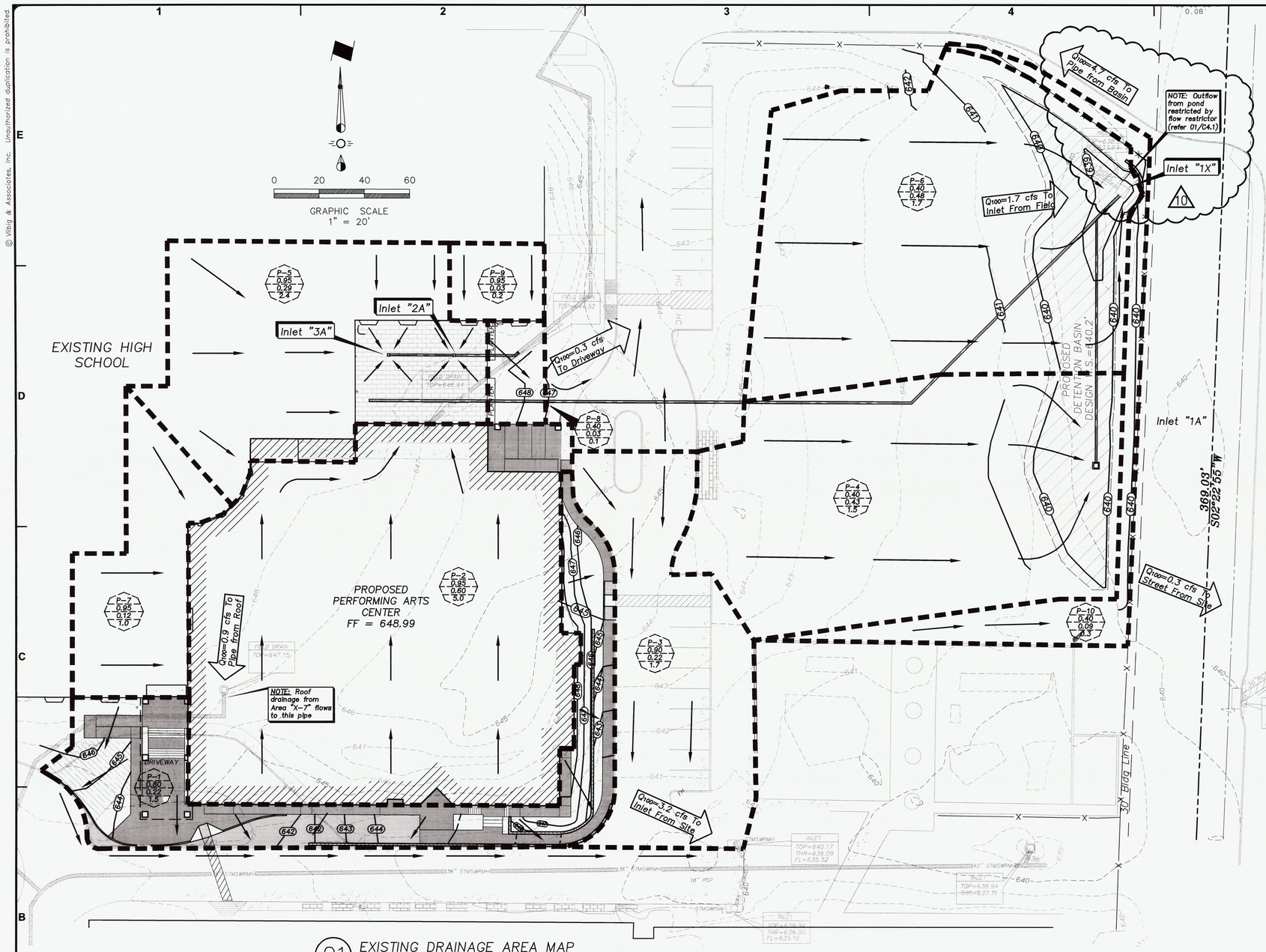

01 EXISTING DRAINAGE AREA MAP
SCALE: 1" = 20'

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)

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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	
*C*A to Pond, proposed:*	0.93	(Areas P-2, P-4, & P-6)

	Post-Developed Conditions					
Storm Duration (min)	I100 (in/hr)	C*A	Inflow (cf)	Outflow (cf)	**Storage Required (cf)**	**Storage Required (cy)**
10	8.74	0.93	4898	2827	2071	77
20	6.80	0.93	7621	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	3989	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'

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

Constants:		
Time of Conc. Tc (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)

1	2	3	4	5	6	7	8	9
Time (min)	Intensity from Manual (in/hr)	Inches of Rainfall (in)	Incremental Inches (in)	Rainfall Intensity (in/hr)	C*A 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	60
40			0.41	2.46	0.93	2.30	4	90
50			0.33	1.98	0.93	1.85	5	50
60	3.97	3.91	0.29	1.74	0.93	1.63	6	100
70			0.26	1.56	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

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TABLE 2: Proposed Drainage Areas

Area No.	Area ac.	"C"	C*A	Tc min	I100 in/hr	Q100 cfs	Remarks
P-1	0.22	0.80	0.18	10	8.74	1.5	Proposed Sidewalks & Landscaping
P-2	0.60	0.95	0.57	10	8.74	5.0	Proposed Building to Line "A"
P-3	0.22	0.90	0.20	10	8.74	1.7	Existing Drive & Sidewalks
P-4	0.43	0.40	0.17	10	8.74	1.5	Surface Flow To Inlet "1A"
P-5	0.29	0.95	0.28	10	8.74	2.4	Patio & Roof to Inlets "1B" & "2B"
P-6	0.48	0.40	0.19	10	8.74	1.7	To Existing Inlet "1X"
P-7	0.12	0.95	0.11	10	8.74	1.0	Existing Roof to Ex. Drain Line
P-8	0.03	0.40	0.01	10	8.74	0.1	Proposed Landscaping to East/North
P-9	0.03	0.95	0.03	10	8.74	0.2	Existing Roof to Area "P-8"
P-10	0.09	0.40	0.04	10	8.74	0.3	To Addison Road
TOTAL FLOW	**2.51**	0.71	**1.77**			**15.5**	

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**	

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TABLE 3: Stage-Storage-Discharge Table

Constants:	
Contraction Coefficient Cc (unitless):	0.61
Elevation of Outlet Pipe CL (ft):	635.8
Diameter of Outlet Restriction (ft):	0.75

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
638.3	2.0	0.5	4.0	638.3
638.6	2.4	0.4	3.6	638.6
638.7	2.7	0.3	3.7	638.7
638.8	3.3	0.6	3.7	638.8
638.9	4.3	1.0	3.8	638.9
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	162.2	27.6	4.6	640.3
640.4	189.7	22.5	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	278.2	31.5	4.8	640.7

*Outflow restriction provided by restrictor per Detail 01/C4.1.

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TABLE 6: Pond Flow Calculations - Stage-Discharge

Outflow Restriction Safety Factor
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 3 - Column 8)**	**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	638.9	
70	8.16	181.3	638.9	4.3	3.8	3.0	67.7	113.6	117.9	640.1	
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	-28.6	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.

STATE OF TEXAS — DAVID A. VILBIG — 67207 — REGISTERED PROFESSIONAL ENGINEER

THE SEAL APPEARING ON THIS DRAWING IS AUTHORIZED BY DAVID A. VILBIG, P.E. NO. 67207 ON MAR. 30 2009

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TRINITY CHRISTIAN ACADEMY NEW PERFORMING ARTS BLDG.

BUILDING CONSTRUCTION PLANS
17001 ADDISON RD., ADDISON, TX 75001

PROPOSED DRAINAGE AREA MAP

Project : AS-081

C4.0b

DO NOT SCALE DRAWING