

Existing Flow Rates

Auburn Hills 3rd Addition

Area = 9.2 acres C = 0.4 T_c = 15 min

Q_{avg} = 27 cfs

Auburn Hills Commercial Addition

Area = 12.6 acres C = 0.4 T_c = 15 min

Q_{avg} = 37.1

Net existing from both sites = 64 cfs

Auburn Hills 3rd Sub Alluvial 20 ft to be released
backford from Auburn Hills 3rd releases 7 cfs

total from Auburn Hills 3rd = 27 cfs

Allowable release from Auburn Hills Commercial = 64 - 27 = 37 cfs

Lot 3 Auburn Hills Commercial allows 5 cfs to drain to Maple

Allowable discharge from detention pond = 32 cfs

24" RCP at outlet allows to release of 26 cfs

Net change in Q_{avg} = 6 cfs lower

FLOOD HYDROGRAPH PACKAGE (HEC-1)
MAY 1991
VERSION 4.0.1E
Lahay 1771-EN/32 version 5.01
Dodson & Associates, Inc.
RUN DATE 05/22/97 TIME 09:39:30

U.S. ARMY CORPS OF ENGINEERS
HYDROLOGIC ENGINEERING CENTER
DAVIS, CALIFORNIA 95616
(916) 551-1748

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X X XXXXXX XXXX XXX

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1G, HEC1GB, AND HEC1GV.
THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIO- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSK- ON MM-CARD HAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE - SINGLE EVENT DAMAGE CALCULATION, DEFERRITE STAGE FREQUENCY,
DIS-READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE/GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

HEC-1 INPUT PAGE 1

LINE	ID	1	2	3	4	5	6	7	8	9	10
1	ID	AUBURN HILLS COMMERCIAL DETENTION									
2	IT	3	22MAY97	00000	300						
3		10	3	0							
4	KK	AUBCON									
5	SA	.018									
6	PR	0	0	0.86	1.8425	3.73	4.6	5.04	5.94	6.96	8.16
7	UD	.15									
8	LS	0	91								
9	KK	POND									
10	RS	1	ELEV	39							
11	SA	.8	1.0								
12	SE	39	43.0								
13	SL	39.5	3.14	.67	.5						
14	SS	42.5	10	2.86	1.5						
15	ZZ										

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD	6-HOUR	24-HOUR	72-HOUR	Basin Area	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	AUBCON	75	12.17	11	3	3	0.02			
ROUTED TO	POND	26	12.58	11	3	3	0.02	41.91	12.58	

*** NORMAL END OF HEC-1 ***

COMPUTED STORAGE-ELEVATION DATA

STORAGE	0.00	3.59
ELEVATION	39.00	43.00

COMPUTED OUTFLOW-ELEVATION DATA

OUTFLOW	0.00	0.00	16.48	17.57	18.82	20.27	21.95	23.93	26.32	29.22
ELEVATION	39.00	39.50	40.45	40.58	40.74	40.94	41.19	41.51	41.93	42.50

COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	0.00	0.41	1.21	1.33	1.47	1.65	1.87	2.16	2.56	3.10
OUTFLOW <th>0.00</th> <th>0.00</th> <th>16.48</th> <th>17.57</th> <th>18.82</th> <th>20.27</th> <th>21.95</th> <th>23.93</th> <th>26.32</th> <th>29.22</th>	0.00	0.00	16.48	17.57	18.82	20.27	21.95	23.93	26.32	29.22
ELEVATION <td>39.00</td> <td>39.50</td> <td>40.45</td> <td>40.58</td> <td>40.74</td> <td>40.94</td> <td>41.19</td> <td>41.51</td> <td>41.93</td> <td>42.50</td>	39.00	39.50	40.45	40.58	40.74	40.94	41.19	41.51	41.93	42.50

HYDROGRAPH AT STATION POND

PEAK FLOW	TIME	6-HR	24-HR	72-HR	24.92-HR
26	12.58	11	3	3	3
(INCHES)	5.519	6.645	6.645	6.645	6.645
(AC-FT)	5	6	6	6	6

CUMULATIVE AREA = 0.02 SQ MI

FLOOD HYDROGRAPH PACKAGE (HEC-1)
MAY 1991
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AUBURN HILLS COMMERCIAL DETENTION

OUTPUT CONTROL VARIABLES
IPRINT 3 PRINT CONTROL
IPLOT 0 PLOT CONTROL
OSCAL 0 HYDROGRAPH PLOT SCALE

HYDROGRAPH TIME DATA
IMIN 5 MINUTES IN COMPUTATION INTERVAL
IDATE 22MAY97 STARTING DATE
ITIME 0000 STARTING TIME
INOT 300 NUMBER OF HYDROGRAPH ORDINATES
IEND 23MAY97 ENDING DATE
IENDT 0005 ENDING TIME
ICENT 19 CENTURY MARK

COMPUTATION INTERVAL 0.08 HOURS
TOTAL TIME BASE 24.92 HOURS

ENGLISH UNITS
DRAINAGE AREA SQUARE MILES
PRECIPITATION DEPTH JUNCIES
FLOW LENGTH, ELEVATION FEET
FLOW CUBIC FEET PER SECOND
STORAGE VOLUME ACRES-Feet
SURFACE AREA ACRES
TEMPERATURE DEGREES FAHRENHEIT

DOT Report

Pipe	Node Upstream	Node Downstream	Int. Area (acres)	Int. CA (acres)	Total CA (acres)	Ground-Upstream Downstream (ft)	HGL-Upstream Downstream (ft)	Slope-Energy Constructed (ft/ft)	Section-Discharge Capacity (cfs)	Section-Shape Size	Length (ft)	Average Velocity (ft/s)	Description
P-7	I-6	I-7	0.80	0.43	0.43	143.30	143.41	0.000834	3.21	Circular	121.00	1.82	
P-8	I-7	I-8	0.50	0.27	0.70	143.30	143.30	0.003305	6.04	18 in	205.00	2.87	
P-9	I-8	I-9	0.50	0.27	0.97	143.30	143.18	0.002027	5.66	18 in	87.00	3.85	
P-10	I-9	I-10	2.30	1.24	2.21	144.00	142.82	0.003448	6.17	18 in	34.00	4.90	
P-11	I-10	I-11	0.80	0.43	2.65	144.00	142.47	0.002941	12.27	24 in	178.00	5.98	
P-12	I-11	Outlet	2.00	1.08	3.73	144.00	141.01	0.002247	10.72	24 in	170.00	6.14	
						142.00	136.00	0.022941	25.52	Circular	62.12	30 in	

Pipe Report

Pipe	Upstream Node	Downstream Node	Weighted Roughness Coefficient	Section Size	Roughness	Constructed Slope (ft/ft)	Length (ft)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Upstream Ground Elevation (ft)	Inlet Area (acres)	Total CA (acres)
P-20	I-20	I-19	0.54	18 inch	0.013	0.028070	114.00	140.00	136.80	143.00	1.80	0.97
P-26	I-15	I-16	0.54	18 inch	0.013	0.022747	182.00	140.90	140.40	143.70	0.90	0.49
P-10	I-17	I-18	0.54	18 inch	0.013	0.002941	34.00	140.40	140.30	144.10	2.10	1.13
P-17	I-16	I-14	0.54	24 inch	0.013	0.001976	253.00	140.20	138.70	144.10	2.60	3.02
P-27	I-12	I-13	0.54	18 inch	0.013	0.003062	302.00	140.90	138.40	145.20	0.90	0.49
P-14	I-13	I-14	0.54	24 inch	0.013	0.001178	85.00	139.50	138.80	144.50	1.80	5.67
P-18	I-14	I-18	0.54	36 inch	0.013	0.002778	36.00	139.30	138.60	144.50	2.20	4.70
P-19	I-18	I-19	0.54	36 inch	0.013	0.010185	216.00	139.00	136.60	144.00	0.90	7.13
P-21	I-19	J-2	0.54	36 inch	0.013	0.001538	130.00	136.60	136.40	141.00	0.90	7.13
P-22	J-2	Outlet	N/A	36 inch	0.013	0.016667	50.00	136.00	135.00	141.00	N/A	7.13

Node Report

Node	Inlet Area (acres)	Weighted Roughness Coefficient	Ground Elevation (ft)	Inlet CA (acres)	External CA (acres)	Carryover (cfs)	Total CA (acres)	Additional Flow (cfs)	Inlet TC (min)	Known Flow (cfs)	External TC (min)	Upstream Flow Time (min)	System Flow Time (min)
I-20	1.80	0.54	143.00	0.97	0.00	0.00	0.97	0.00	15.00	0.00	0.00	0.00	15.00
I-15	0.90	0.54	143.70	0.49	0.00	0.00	0.49	0.00	15.00	0.00	0.00	0.00	15.00
I-17	2.10	0.54	144.10	1.13	0.00	0.00	1.13	0.00	15.00	0.00	0.00	0.00	15.00
I-16	2.60	0.54	144.10	1.40	0.00	0.00	3.02	0.00	15.00	0.00	0.00	17.53	17.53
I-12	0.90	0.54	144.40	0.49	0.00	0.00	0.49	0.00	15.00	0.00	0.00	0.00	15.00
I-13	0.00	0.54	145.20	0.00	0.00	0.00	0.49	0.00	15.00	2.00	0.00	17.27	17.27
I-14	2.20	0.54	144.50	1.19	0.00	0.00	4.70	0.00	15.00	2.00	0.00	18.50	18.50
I-18	1.80	0.54	144.50	0.97	0.00	0.00	5.67	0.00	15.00	2.00	0.00	18.63	18.63
I-19	0.90	0.54	141.00	0.49	0.00	0.00	7.13	0.00	15.00	2.00	0.00	19.39	19.39
J-2	N/A	N/A	141.00	N/A	N/A	N/A	7.13	N/A	N/A	N/A	0.00	19.39	19.39
Outlet	N/A	N/A	140.00	N/A	N/A	N/A	7.13	N/A	N/A	N/A	0.00	20.23	20.23

Pipe Report

Pipe	Upstream Node	Downstream Node	Weighted Roughness Coefficient	Section Size	Roughness	Constructed Slope (ft/ft)	Length (ft)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Upstream Ground Elevation (ft)	Inlet Area (acres)	Total CA (acres)
P-8	I-5	I-2	0.54	18 inch	0.013	0.002972	286.00	38.90	38.05	41.00	1.60	0.86
P-1	I-1	I-2	0.54	18 inch	0.013	0.002727	165.00	38.50	38.05	43.00	0.80	0.43
P-2	I-2	I-3	0.54	18 inch	0.013	0.003007	143.00	37.93	37.50	41.00	0.80	1.73
P-3	I-3	I-4	0.54	24 inch	0.013	0.004167	36.00	37.40	37.25	43.00	1.00	2.27
P-4	I-4	J-1	0.54	30 inch	0.013	0.002083	144.00	37.15	36.85	43.00	1.10	2.86
P-5	J-1	Outlet	N/A	30 inch	0.013	0.001923	26.00	36.75	36.70	40.00	N/A	2.86

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Baughman Company, P.A.
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StormCAD v1.0
Page 1 of 1

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StormCAD v1.0
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Node Report

Node	Inlet Area (acres)	Weighted Roughness Coefficient	Ground Elevation (ft)	Inlet CA (acres)	External CA (acres)	Carryover (cfs)	Total CA (acres)	Additional Flow (cfs)	Inlet TC (min)	Known Flow (cfs)	External TC (min)	Upstream Flow Time (min)	System Flow Time (min)
I-5	1.60	0.54	41.00	0.86	0.00	0.00	0.86	0.00	15.00	0.00	0.00	0.00	15.00
I-1	0.80	0.54	43.00	0.43	0.00	0.00	0.43	0.00	15.00	0.00	0.00	0.00	15.00
I-2	0.80	0.54	41.00	0.43	0.00	0.00	1.73	0.00	15.00	0.00	0.00	16.51	16.51
I-3	1.00	0.54	43.00	0.54	0.00	0.00	2.27	0.00	15.00	0.00	0.00	16.86	16.86
I-4	1.10	0.54	43.00	0.59	0.00	0.00	2.86	0.00	15.00	0.00	0.00	16.97	16.97
J-1	N/A	N/A	40.00	N/A	N/A	N/A	2.86	N/A	N/A	N/A	0.00	17.43	17.43
Outlet	N/A	N/A	39.00	N/A	N/A	N/A	2.86	N/A	N/A	N/A	0.00	17.51	17.51

DOT Report

Pipe	Node-Downstream	Inlet Area (acres)	Inlet CA (acres)	Total CA (acres)	Ground-Downstream (ft)	HGL-Downstream (ft)	Slope-Constructed (ft/ft)	Section-Discharge Capacity (cfs)	Section-Shape	Length (ft)	Average Velocity (ft/s)	Description
P-8	I-5	1.60	0.86	0.86	41.00	42.07	0.003734	6.42	Circular	286.00	3.63	
P-1	I-2	0.80	0.43	0.43	41.00	41.00	0.002972	5.73	18 inch	165.00		
	I-1	0.80	0.43	0.43	41.15	41.00	0.000934	3.21	Circular	165.00	1.82	
P-2	I-2	0.80	0.43	1.73	41.00	41.00	0.002727	5.49	18 inch	143.00		
	I-3	0.80	0.43	1.73	41.42	0.013813	12.35	Circular	143.00	6.99		
P-3	I-3	1.00	0.54	2.27	43.00	39.44	0.003007	5.76	18 inch	36.00		
	I-4	1.00	0.54	2.27	43.00	39.36	0.004495	16.06	Circular	36.00	5.14	
P-4	I-4	1.10	0.59	2.86	43.00	39.12	0.002940	20.21	Circular	144.00	5.20	
	J-1	1.10	0.59	2.86	40.00	38.59	0.002083	18.72	30 inch	144.00		
P-5	J-1	N/A	N/A	2.86	40.00	38.50	0.004034	18.89	Circular	26.00	5.93	
	Outlet	N/A	N/A	2.86	39.00	38.22	0.001923	17.99	30 inch	26.00		

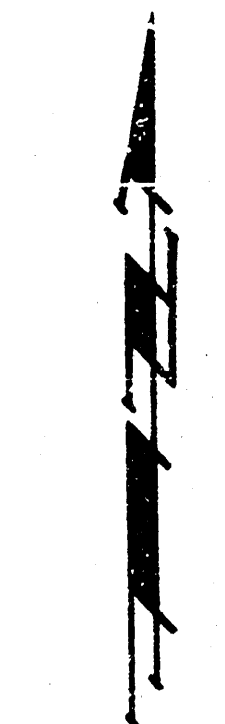
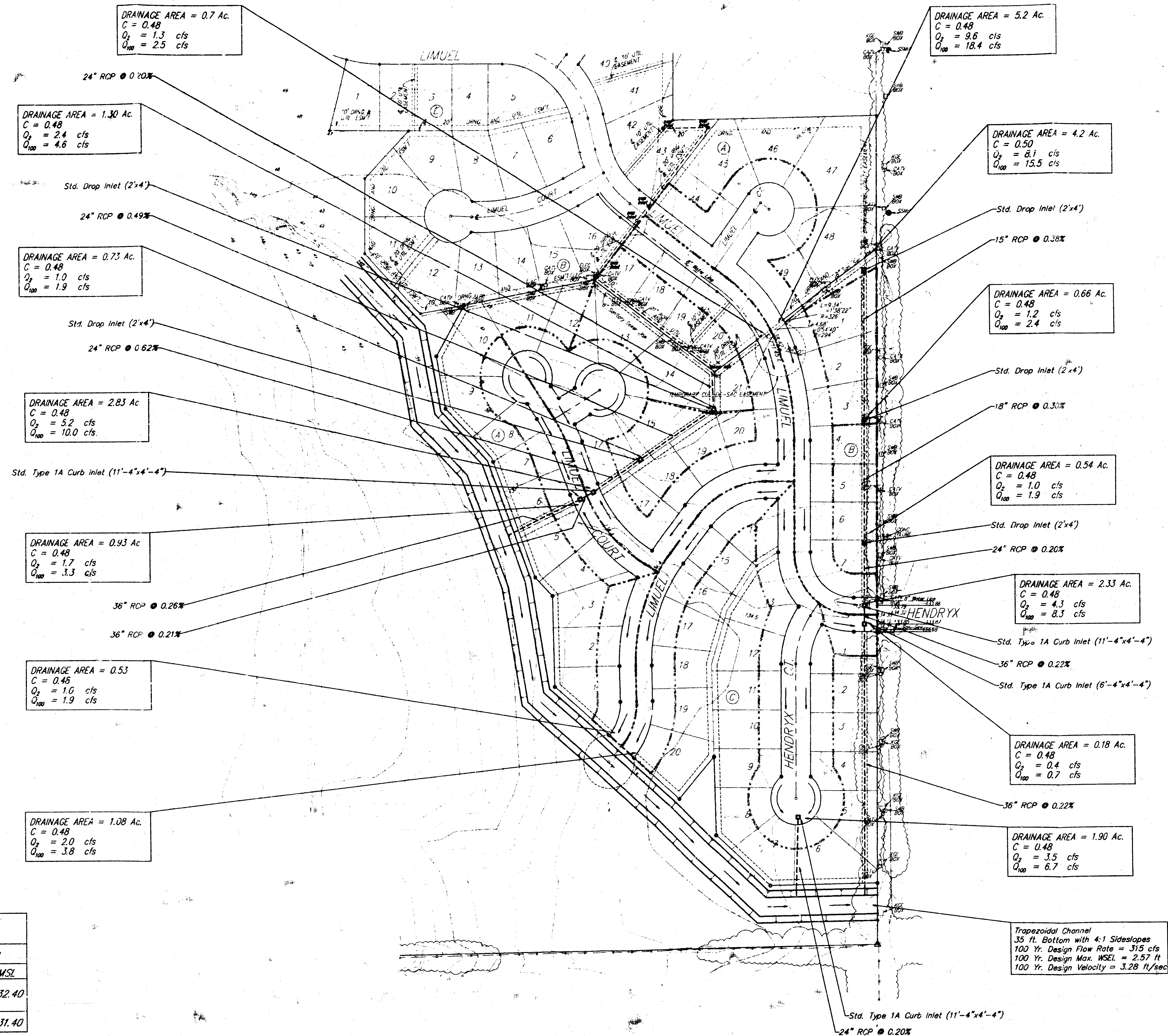
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StormCAD v1.0
Page 1 of 1

DRAINAGE PLAN

AUBURN HILLS 2nd ADDITION

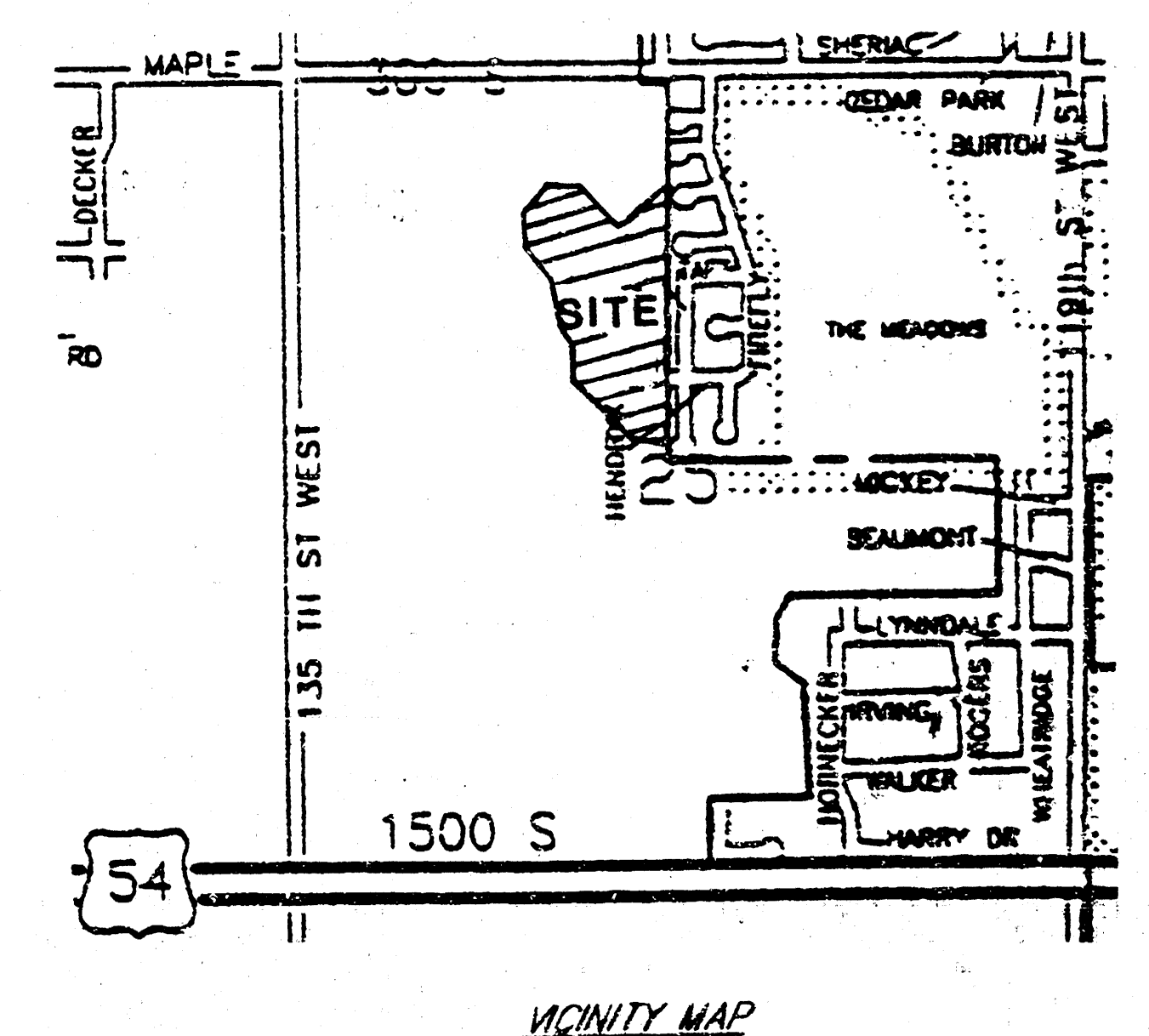
SEDGWICK COUNTY, KANSAS



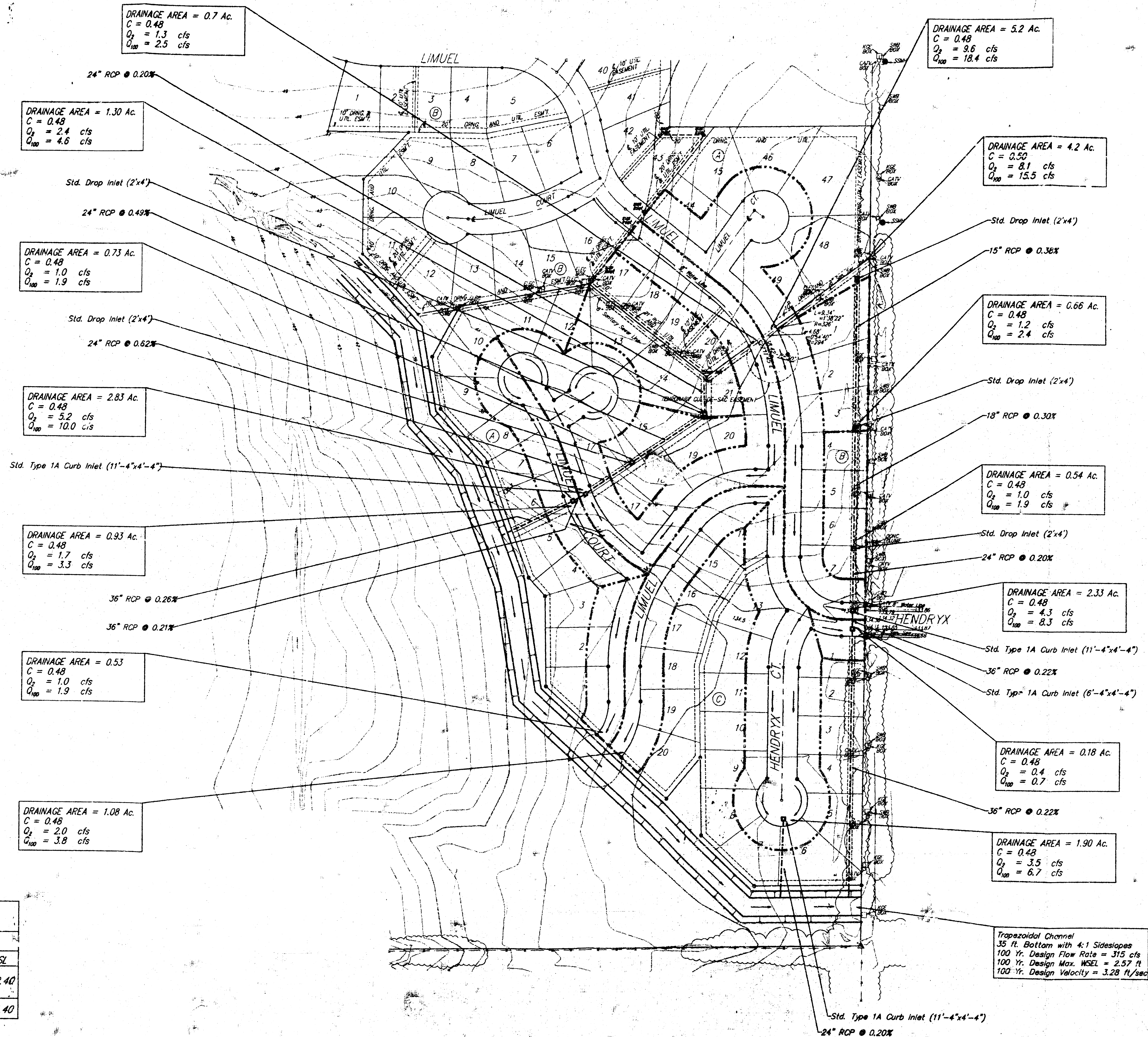
SCALE: 1"=100'

• = #4 REBAR W/ "BAUGHMAN CAP (SET)"
= #4 REBAR W/ "BAUGHMAN CAP (FOUND)"
S = Storm Water Sewer Man Hole
SS = Sanitary Sewer Man Hole

MINIMUM BUILDING PAD ELEV. LOWEST OPENING TO STRUCTURE			
LOT	BLOCK	ELEVATION	
		CITY DATUM	MSL
1, 2, 3, 4, 5, 6, 7, 8, 9, 10	A	145.00	1332.40
6, 7, 8, 9, 20	C	144.00	1331.40

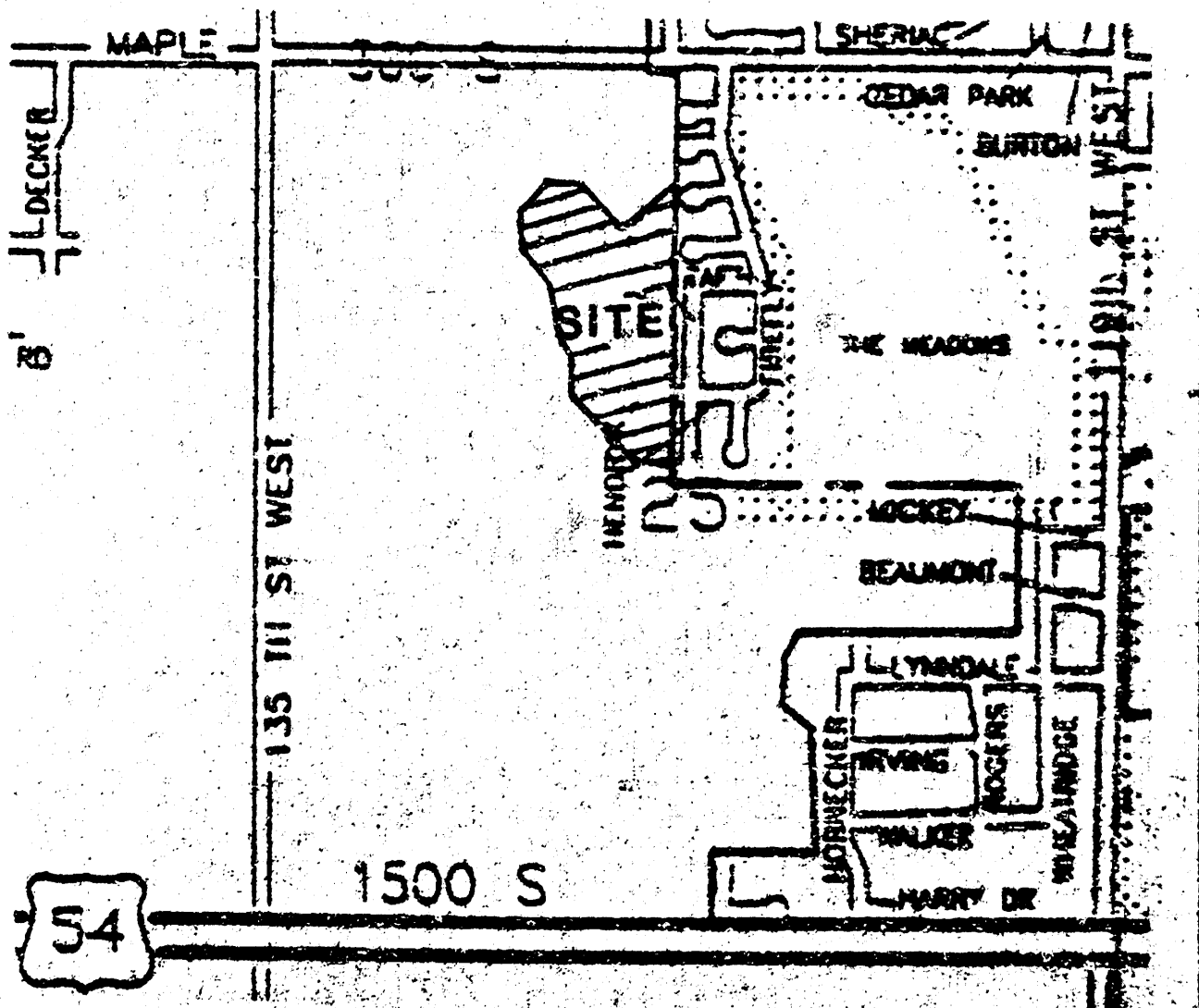


DRAINAGE PLAN AUBURN HILLS 2nd ADDITION SEDGWICK COUNTY, KANSAS



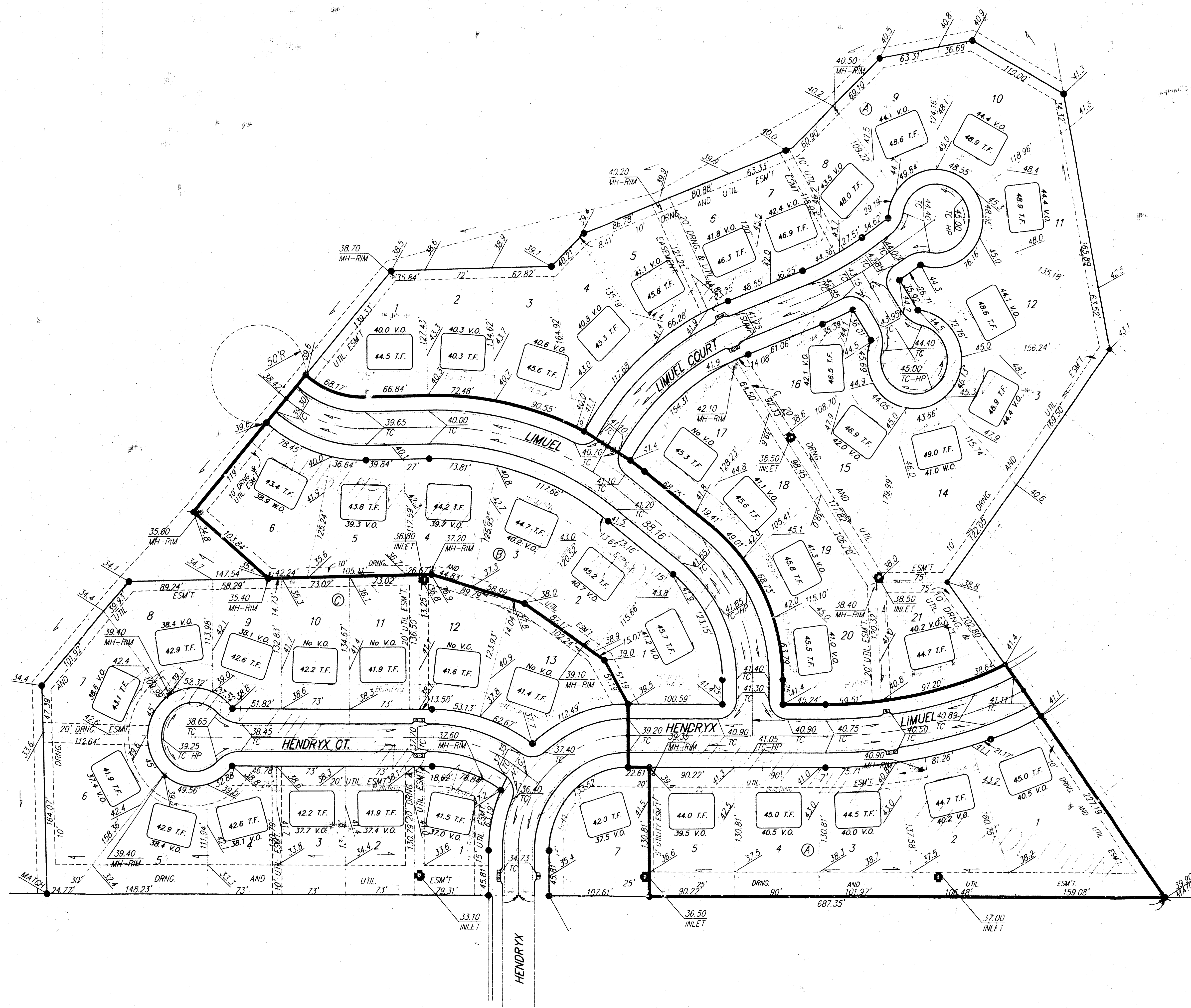
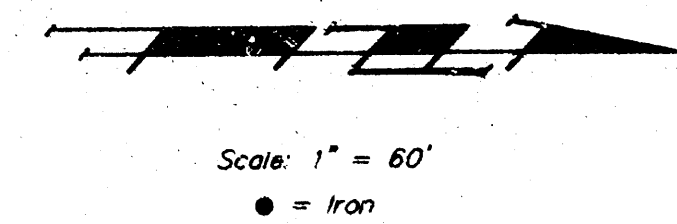
SCALE: 1"=100'

• = 1/4" REBAR W/ 2" BAUGHMAN CAP (SET)
= 1/4" REBAR W/ 2" BAUGHMAN CAP (FOUND)
+ = Storm Water Sewer Man Hole
- = Sanitary Sewer Man Hole

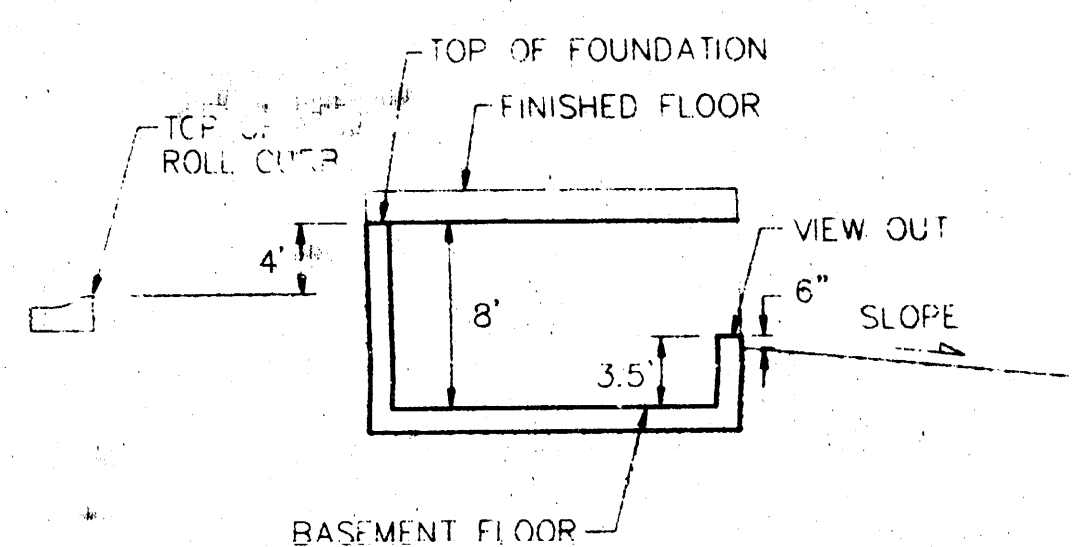


MINIMUM BUILDING PAD ELEV. LOWEST OPENING TO STRUCTURE			
LOT	BLOCK	ELEVATION	
		CITY DATUM	MSL
1, 2, 3, 4, 5, 6, 7, 8, 9, 10	A	145.00	1332.40
6, 7, 8, 9, 20	C	144.00	1331.40

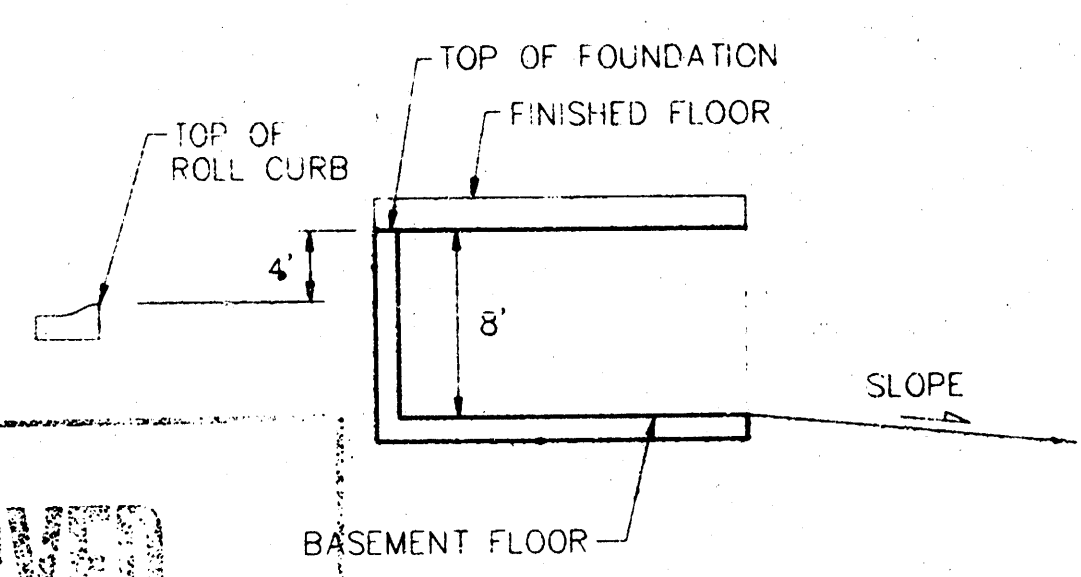
BENCHMARKS:
 BM #1 "□" On Top of Curb Located
 on the South Side of Hendryx
 15' West of the East Line of
 Auburn Hills 2nd Addition.
 Elev. = 134.32 City Datum
 BM #2 "□" On Top of Curb Located
 at 14.29' North and 38.05' West
 of the Northeast corner of Lot
 13, Block B, Auburn Hills Addition.
 Elev. = 144.83 City Datum



NOTE:
 Proposed top of foundation elevations
 are shown on plans.
 Contractor to set finish floor elevation.
 All street elevations shown on plans
 are for top of curb (full height).
 View-out elevations are denoted as
 XX.X V.O.
 Work-out elevations are denoted as
 XX.X W.O.



TYPICAL VIEW OUT
 NO SCALE



TYPICAL WALK OUT
 NO SCALE

**APPROVED
 DRAINAGE PLAN**

Revised 12/31/97 bjp

LOT GRADING PLAN

BAUGHMAN COMPANY P.A.
 ENGINEERS, SURVEYORS & PLANNERS

DESIGN	DRAWN	APPROVED	DATE	SCALE	SHEET
					1