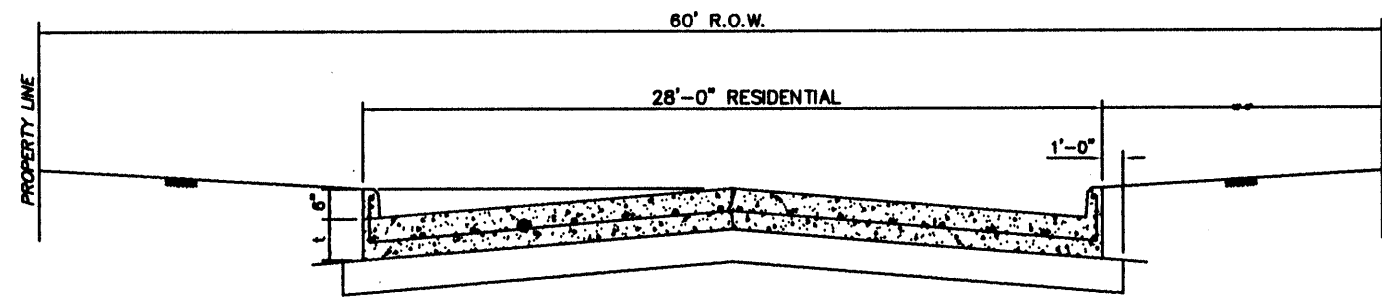


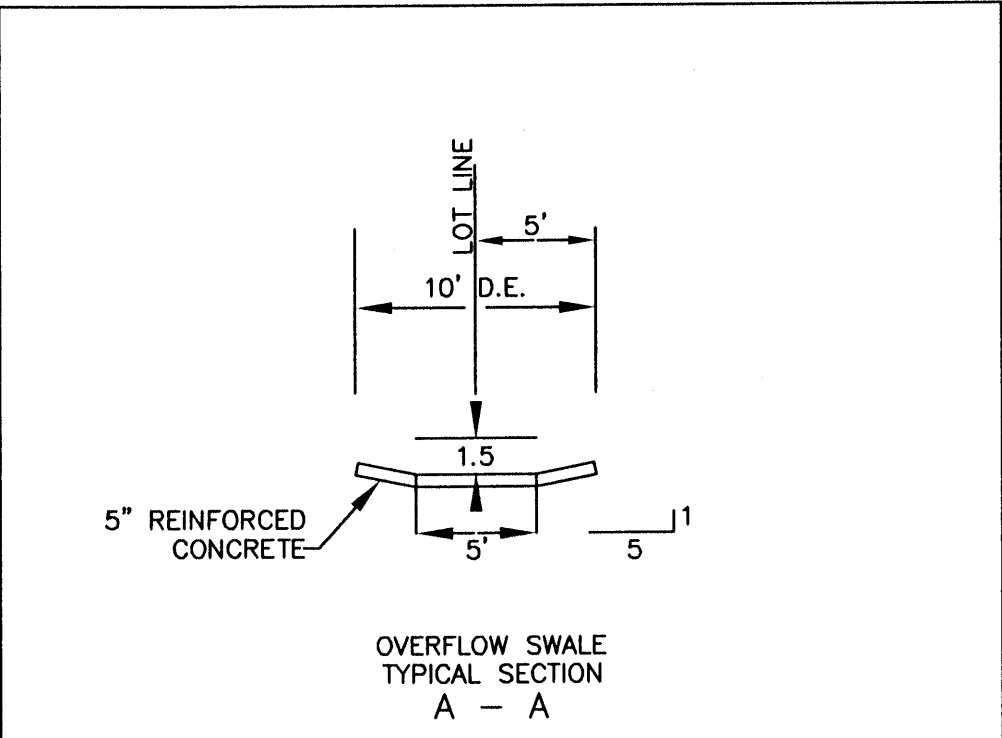
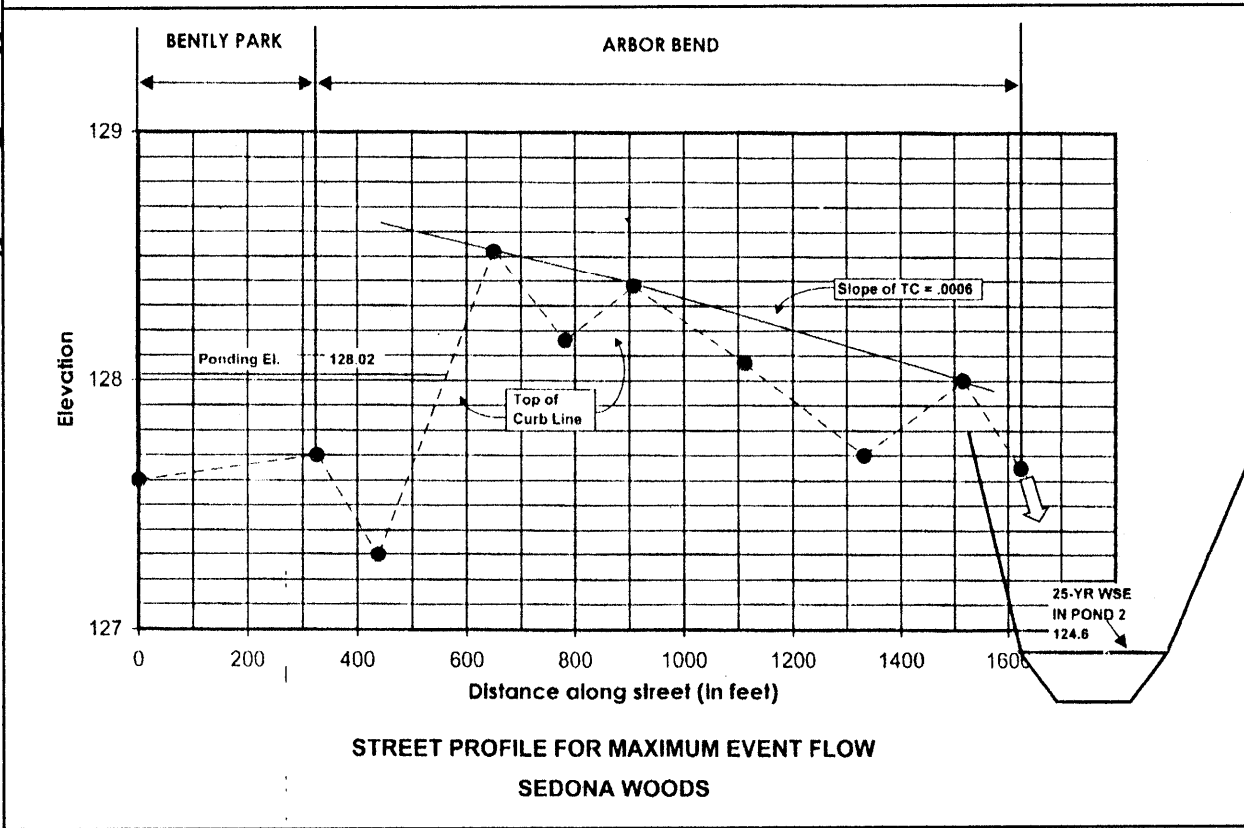
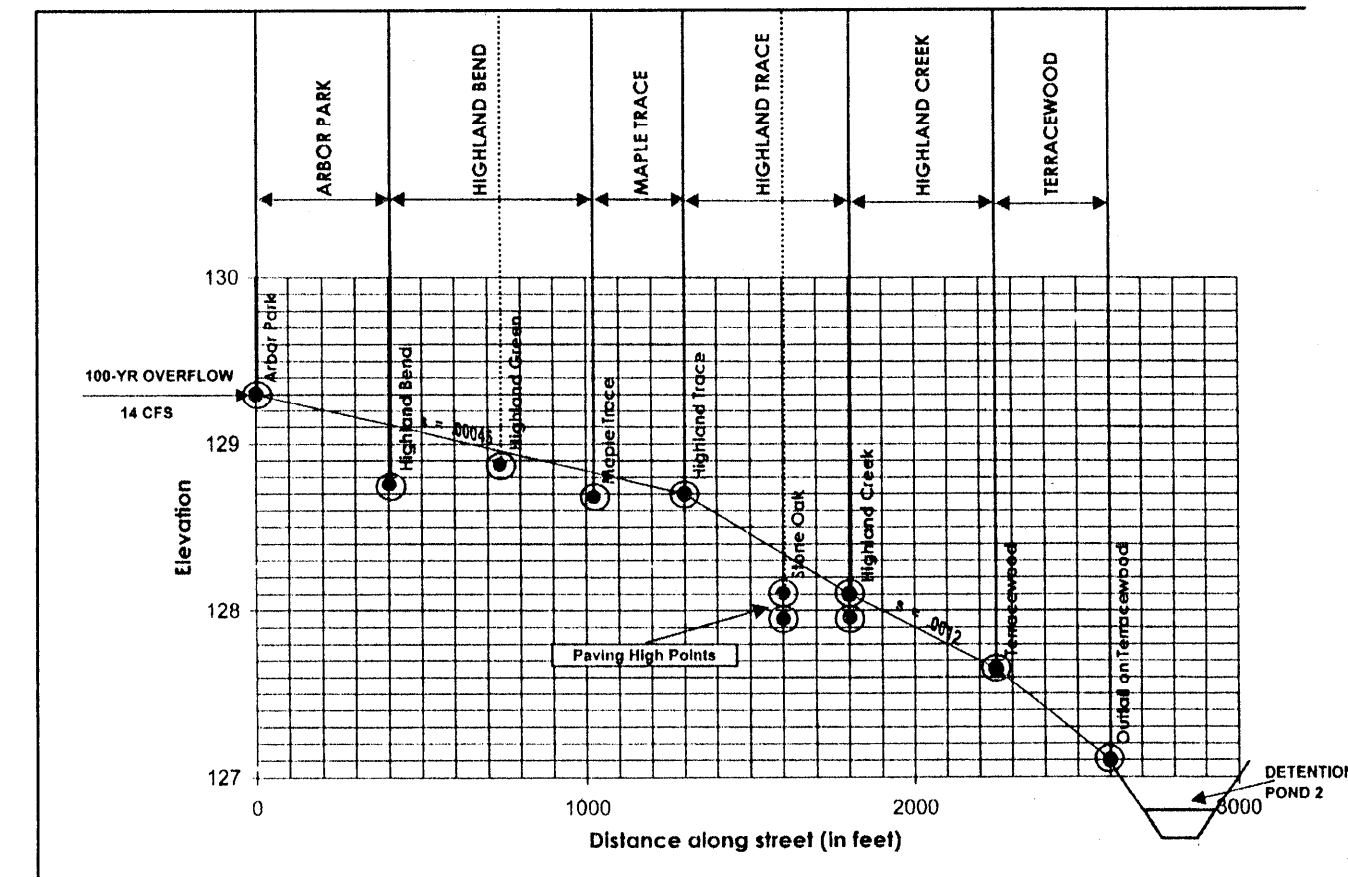
USING
 $Q = A \cdot V = 1.49 \cdot A \cdot R^{2/3} \cdot S^{1/2}$
 $RH = A/P$
 WHERE
 A = AREA OF FLOW
 P = WETTED PERIMETER
 R = HYDRAULIC RADIUS
 S = CHANNEL SLOPE
 n = MANNING COEFFICIENT = 0.025
 D = DEPTH OF WATER ABOVE CROWN

STREET FLOW CALCULATIONS



USING A DEPTH OF 6" AND A SLOPE OF:		USING A DEPTH OF 1" AND A SLOPE OF:	
A = 22.0 sq. ft.	P = 42.96 ft.	A = 46.0 sq. ft.	P = 26.8 ft.
S = 0.005	Q = 50.0 cfs	S = 0.005	Q = 130.3 cfs
S = 0.002	Q = 37.5 cfs	S = 0.002	Q = 106.4 cfs
S = 0.001	Q = 28.5 cfs	S = 0.001	Q = 78.2 cfs
S = 0.0012	Q = 31.8 cfs	S = 0.0012	Q = 82.0 cfs
S = 0.0005	Q = 17.8 cfs	S = 0.0005	Q = 58.4 cfs

STREET CROSS SECTION



OVERFLOW SWALE FLOW CAPACITY USING MANNING FORMULA

$$Q = Va = 1.49 \cdot A \cdot R^{2/3} \cdot S^{1/2}$$

$$= 114.6 \cdot 11.25 \cdot 1.025^{2/3} \cdot 0.005^{1/2}$$

$$= 1321 \text{ S.F.}^2$$

FOR d = 1.5 ft
 A = 11.25
 P = 10.83
 R = 1.038

WHEN s = 0.005 Q = 72 cfs
 0.002 58 cfs
 0.001 42 cfs
 0.0005 29 cfs

FOR d = 1 ft
 A = 6.46
 P = 7.93
 R = 0.81

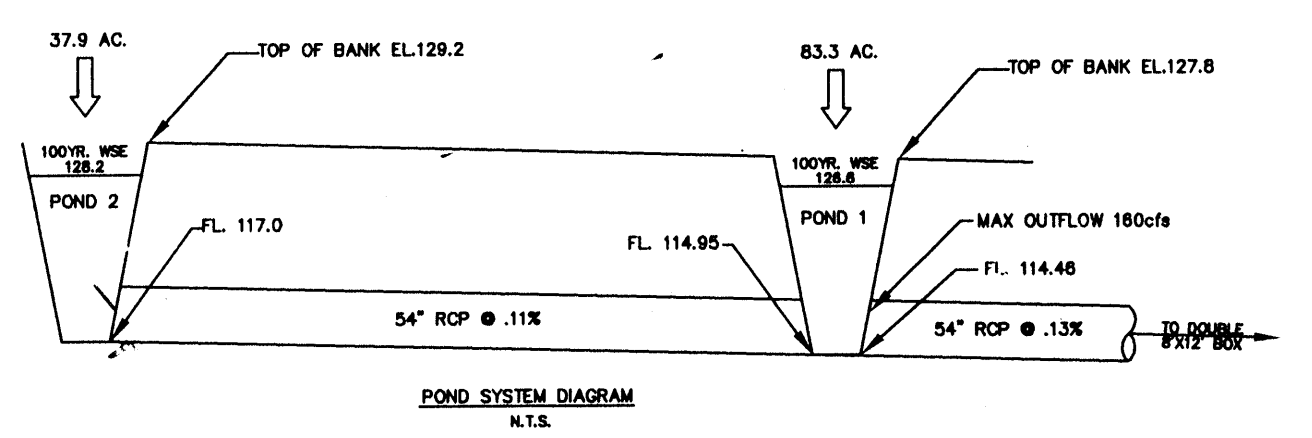
WHEN s = 0.005 Q = 35 cfs
 0.002 29 cfs
 0.001 20 cfs
 0.0005 14 cfs

FOR d = 7.5 ft
 A = 4.59
 P = 7.92
 R = 0.59

WHEN s = 0.005 Q = 21 cfs
 0.002 17 cfs
 0.001 12 cfs
 0.0005 9 cfs

DETENTION SUMMARY Pond 1 (in conjunction with Pond 2)		DETENTION SUMMARY Pond 2 (in conjunction with Pond 1)	
1. Area Served = 83.3 acres	1. Area Served = 57.9 acres	2. Detention Storage Rate = Cs = 0.48	2. Detention Storage Rate = Cs = 0.40
3. Detention Storage Volume Required = 38.1 acre-feet	3. Detention Storage Volume Required = 13.5 acre-feet	4. Detention Storage Volume Provided = 39.76 acre-feet	4. Detention Storage Volume Provided = 15.1 acre-feet
5. Maximum Design Water Surface Elevation = 126.57	5. Maximum Design Water Surface Elevation = 128.20	6. Maximum Outflow Rate Allowed = 175 cfs (1)	6. Maximum Outflow Rate Allowed = 70 cfs
7. Maximum Outflow Rate Provided = 160 cfs	7. Maximum Outflow Rate Provided = 58.76 cfs	8. Restrictor Size = 54 inches	8. Restrictor Size = 54 inches

Note (1) Maximum outflow for Pond 1 and Pond 2 combined



Rev. Date Description App.

PRIVATE UTILITY LINES SHOWN

La Waterwell 12/29/99
 RELIANT ENERGIES, INC./ENTEX

Mike Bolin 12/29/99
 SOUTHWESTERN BELL TELEPHONE CO.
 Valid for One Year Only

La Waterwell 12/29/99
 RELIANT ENERGIES, INC./HL&P, CO.
 Approval Only for Crossing Underground
 Ductlines Unless Noted. Valid at Time of Review Only.

CITY OF HOUSTON
 DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

REVIEWED BY: CITY FUNDED PUBLIC WORKS

Victor Saldana 1-6-2000
 WATER

1-6-2000
 WASTEWATER

D. P. 1-6-2000
 STORM WATER

PROJECT MANAGER

CONSTRUCTION

CHIEF ENGINEER

OTHER APPROVAL

TRAFFIC AND TRANSPORTATION SPONSOR DEPARTMENT

CITY ENGINEER DATE
 1/1/2000

DESIGNED BY: BOBBY WILSON
 SCALE: 1" = 200'
 DRAWN BY: BILL DORRIS
 DATE: OCTOBER 1999 SHEET NO. 3 OF 11 SHEETS
 SURVEY BY: CITY DWG. NO. ARDLAOT.DWG
 F B NO: 481

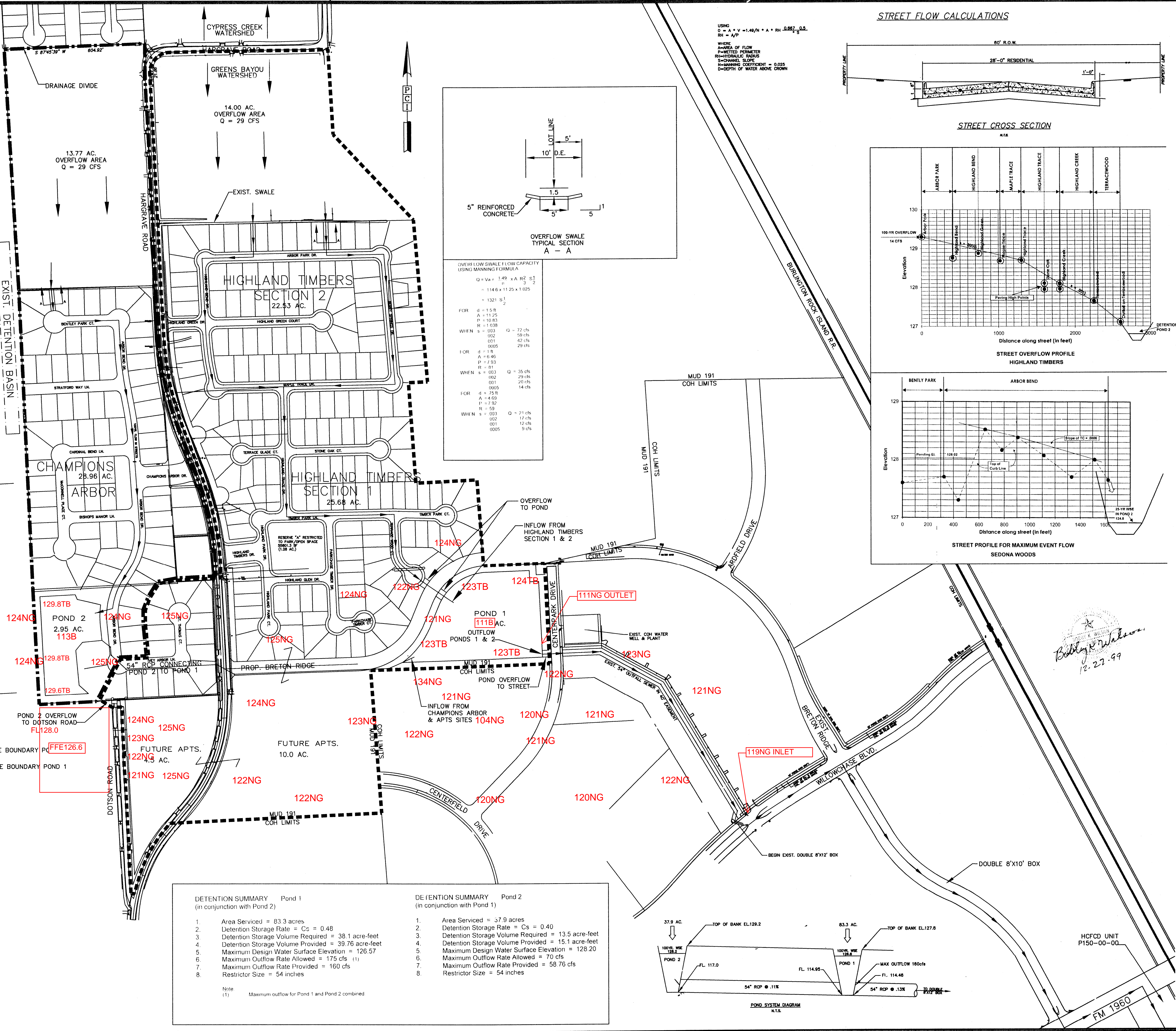
HARRIS COUNTY MUD 191
 DETENTION FACILITIES
 to serve
 HIGHLAND TIMBERS
 SECTION 1 & 2
 OVERALL AREA DRAINAGE

PCI PROVIDENT CONSULTING, INC.
 1200 WEST 11TH ST.
 HOUSTON, TEXAS 77008
 (713)802-1019

2a. Puhar
 1/6/2000

Bobby Wilson
 12.22.99

SCHROEDER ROAD
 DEVELOPED TRACTS DRAINAGE TO SCHROEDER ROAD



LEGEND
 --- DRAINAGE BOUNDARY POND 1
 --- DRAINAGE BOUNDARY POND 2