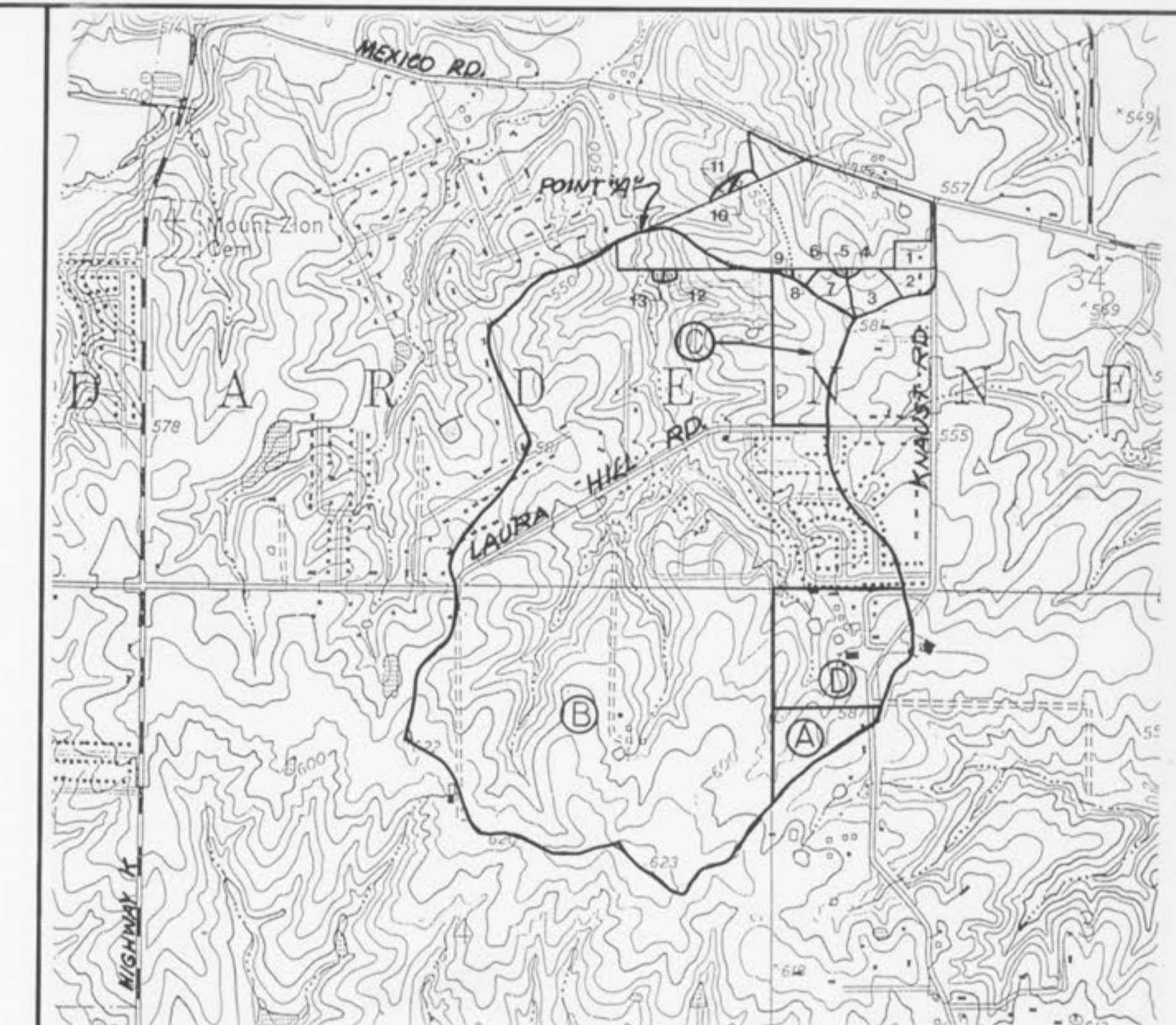
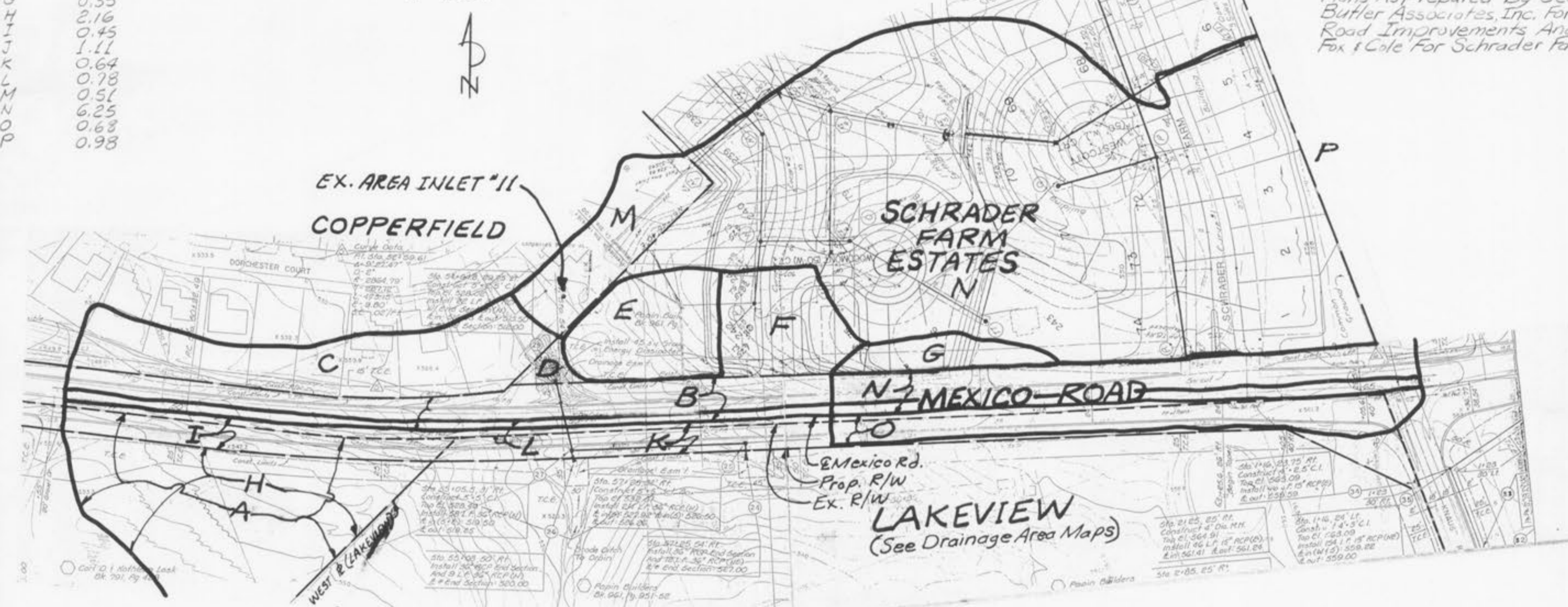


AREA ACRES  
 0.49  
 0.40  
 1.02  
 0.06  
 0.64  
 0.45  
 0.35  
 0.16  
 0.45  
 0.11  
 0.64  
 0.78  
 0.25  
 0.68  
 0.95

**MAP #2**  
 1" = 100'



**AREAS TRIBUTARY TO EXIST. AREA INLET #11 IN COPPERFIELD AND DETENTION BASIN #1 ALLOWABLE DISCHARGE**

LOCATION	ACRES	15 YEAR		25 YEAR		100 YEAR	
		C.F.S./AC.	C.F.S.	C.F.S./AC.	C.F.S.	C.F.S./AC.	C.F.S.
LAKEVIEW (SITE) SEE D.A. MAPS SHTS. 2112?	21.51	1.87	40.22	2.15	46.25	2.95	63.45
SOUTH OF SITE 1-B MAP #1 (THIS SHEET)	9.56	1.87	17.88	2.15	20.55	2.95	28.20
WEST OF SITE A MAP #2	2.49	1.87	4.66	2.15	5.35	2.95	7.35
MEXICO RD. B MAP #2	2.40	3.30	7.92	3.80	9.12	5.21	12.50
COPPERFIELD C.M. MAP #2	1.53	3.30	5.05	3.80	5.81	5.21	7.97
SCHRADER FARM D,E,F,G MAP #2	7.75	3.30	25.58	3.80	29.45	5.21	40.38
EAST OF SCHRADER P MAP #2	0.98	1.87	1.83	2.15	2.11	2.95	2.89
<b>TRIBUTARY TO EXIST. AI. =</b>	<b>46.22</b>		<b>103.14</b>		<b>118.64</b>		<b>162.74</b>

LOCATION	ACRES	15 YEAR		25 YEAR		100 YEAR	
		C.F.S./AC.	C.F.S.	C.F.S./AC.	C.F.S.	C.F.S./AC.	C.F.S.
LAKEVIEW (RESIDENTIAL)	6.42	2.64	16.95	3.04	19.52	4.17	26.77
LAKEVIEW (CHURCH)	2.44	3.85	9.39	4.43	10.81	6.08	14.84
SOUTH OF SITE SEE NOTE MAP #1	2.81	1.87	5.25	2.15	6.04	2.95	8.29
WEST OF SITE H MAP #2	3.16	1.87	4.04	2.15	4.64	2.95	6.37
MEXICO ROAD I,J,K MAP #2	2.20	3.30	7.26	3.80	8.36	5.21	11.46
COPPERFIELD C.M. MAP #2	1.53	3.30	5.05	3.80	5.81	5.21	7.97
SCHRADER FARM D,F MAP #2	6.76	3.30	22.31	3.80	25.69	5.21	35.22
EAST OF SCHRADER P MAP #2	0.98	1.87	1.83	2.15	2.11	2.95	2.89
<b>TRIBUTARY BY PASSING BASIN #1 25.30**</b>			<b>72.08</b>		<b>82.93</b>		<b>113.81</b>

LOCATION	ACRES	15 YEAR		25 YEAR		100 YEAR	
		C.F.S./AC.	C.F.S.	C.F.S./AC.	C.F.S.	C.F.S./AC.	C.F.S.
LAKEVIEW (RESIDENTIAL)	0.71	2.64	1.87	3.04	2.16	4.17	2.96
LAKEVIEW (COMMERCIAL)	9.91	3.85	38.15	4.43	43.90	6.08	60.25
SOUTH OF SITE SEE NOTE MAP #1	6.87	1.87	12.85	2.15	14.77	2.95	20.27
MEXICO ROAD N,O MAP #2	1.53	3.30	5.05	3.80	5.81	5.21	7.97
SCHRADER FARM E,G MAP #2	0.99	3.30	3.27	3.80	3.76	5.21	5.16
<b>TRIBUTARY TO BASIN #1</b>	<b>20.01</b>		<b>61.19</b>		<b>70.40</b>		<b>**96.61</b>

**MAXIMUM "Q" ALLOWED TO BE DISCHARGE FROM BASIN #1**  
 15 YEAR: 103.14 C.F.S. - 72.08 C.F.S. = 31.06 C.F.S. (Actual Discharge = 29.83 C.F.S. - See Routing)  
 25 YEAR: 118.64 C.F.S. - 82.93 C.F.S. = 35.66 C.F.S. (Actual Discharge = 34.83 C.F.S. - See Routing)  
 100 YEAR: 162.74 C.F.S. - 113.81 C.F.S. = 48.93 C.F.S. (Actual Discharge = 46.89 C.F.S. - See Routing)

\*25 YEAR STORM WAS USED FOR DESIGN OF BASIN #1 LOW FLOW & OVERFLOW  
 \*\*100 YEAR STORM WAS USED FOR DESIGN OF EMERGENCY SPILLWAY ONLY  
 NOTE: 0.91 Acres Currently Tributary To Exist. AI #11 In Copperfield Regraded To Be Tributary To Basin #2.

**EXISTING BOX CULVERT ANALYSIS**

TOTAL AREAS TRIBUTARY TO THE EXISTING BOX CULVERT UNDER MEXICO ROAD  
 25 YEAR PRE-DEVELOPMENT: CASE #1

DRAINAGE LOCATION	ACRES	C.F.S./AC.	C.F.S.
LAKEVIEW - SITE	21.51	2.15	46.25
SOUTH OF SITE (1-B MAP #1)	9.56	2.15	20.55
WEST OF SITE (A MAP #2)	2.49	2.15	5.35
MEXICO ROAD (L MAP #2)	0.78	3.80	2.98
<b>TOTAL</b>			<b>75.11</b>

25 YEAR POST-DEVELOPMENT: CASE #2 (ASSUMES CHURCH SITE DEVELOPED, MEXICO RD. UNIMPROVED AND LAKEVIEW RESIDENTIAL & COMMERCIAL GRADED PER PLAN, BUT NO IMPROVEMENTS MADE.)

DRAINAGE LOCATION	ACRES	C.F.S./AC.	C.F.S.
LAKEVIEW RESIDENTIAL	7.13	2.15	15.33
LAKEVIEW COMMERCIAL	9.91	2.15	21.31
LAKEVIEW CHURCH	2.44	4.43	10.81
SOUTH OF SITE (SEE NOTE MAP #1)	9.68	2.15	20.81
MEXICO ROAD (I,K,O MAP #2)	1.77	3.80	6.73
WEST OF SITE (H MAP #2)	2.16	2.15	4.64
<b>TOTAL</b>			<b>79.63</b>

25 YEAR POST DEVELOPMENT: CASE #3 ASSUMES TOTAL LAKEVIEW DEVELOPED, MEXICO RD. UNIMPROVED AND DETENTION BASIN WORKING PER DESIGN.

DRAINAGE LOCATION	ACRES	C.F.S./AC.	C.F.S.
LAKEVIEW RESIDENTIAL	6.42	3.04	19.52
LAKEVIEW CHURCH	2.44	4.43	10.81
SOUTH OF SITE (SEE NOTE MAP #1)	2.81	2.15	6.04
WEST OF SITE (H MAP #2)	2.16	2.15	4.64
MEXICO ROAD (I-K MAP #2)	1.09	3.80	4.14
<b>TOTAL</b>			<b>45.15</b>

THE EXISTING BOX CULVERT HAS A 5' x 5' x 4.6' SUMP ON THE UPSTREAM END. THE EXISTING BOX CULVERT IS 5' WIDE BY 4.6' HIGH (FOR USE OF HEADWATER DEPTH CHART. THE SIZE WAS ASSIGNED TO BE 5' WIDE BY 4.5' HIGH)  
 THE TOP OF HEADWALL/JENK OF PAVEMENT ELEV. = 523.06 (CONCRETE CURB/TOP)  
 FLOWLINE OF SUMP & BOX CULVERT = 515.16, TOP = 519.76

USE WEIR EQUATION ON SUMP, Q = CLH<sup>3/2</sup>, WHERE C = 3.00, L = 5(3) x .15'

CASE #1: Q = 75.11 C.F.S., SOLVE FOR H = 1.41'  
 519.76 + 1.41' = 521.17, 523.06 - 521.17 = 1.89' FREEBOARD

CASE #2: Q = 79.63 C.F.S., SOLVE FOR H = 1.46'  
 519.76 + 1.46' = 521.22, 523.06 - 521.22 = 1.84' FREEBOARD ← *Worst Case*

CASE #3: Q = 45.15 C.F.S., SOLVE FOR H = 1.00'  
 519.76 + 1.00' = 520.76, 523.06 - 520.76 = 2.30' FREEBOARD

USE HEADWATER DEPTH CHART FOR BARREL OF CULVERT

CASE #1: Q = 75.11 C.F.S., HW/D = .73, HW = .73 x 4.5' = 3.29'  
 HW ELEV. = 515.16 + 3.29' = 518.45  
 523.06 - 518.45 = 4.61' FREEBOARD

CASE #2: Q = 79.63 C.F.S., HW/D = .76, HW = .76 x 4.5' = 3.42'  
 HW ELEV. = 515.16 + 3.42' = 518.60  
 523.06 - 518.60 = 4.46' FREEBOARD

CASE #3: Q = 45.14 C.F.S., HW/D = .52, HW = .52 x 4.5' = 2.34'  
 HW ELEV. = 515.16 + 2.34' = 517.50  
 523.06 - 517.50 = 5.56' FREEBOARD

Therefore The Worst Case For Hydraulic Analysis Of The Existing Box Culvert Is Case #2 (Max. Q) And The Sump/Inlet To The Culvert Acting Under Weir Flow.

**EXISTING 36" F.E.S. (INTD COPPERFIELD) ANALYSIS**

TOTAL AREAS TRIBUTARY TO THE EXISTING 36" F.E.S. IN COPPERFIELD  
 25 YEAR PRE-DEVELOPMENT: CASE #1

DRAINAGE LOCATION	ACRES	C.F.S./AC.	C.F.S.
LAKEVIEW - SITE	21.51	2.15	46.25
SOUTH OF SITE (1-B MAP #1)	9.56	2.15	20.55
WEST OF SITE (A MAP #2)	2.49	2.15	5.35
MEXICO ROAD (B MAP #2)	2.40	3.80	9.12
COPPERFIELD (C MAP #2)	1.02	3.80	3.88
SCHRADER FARM (D-G MAP #2)	1.50	3.80	5.70
<b>TOTAL</b>			<b>90.85</b>

25 YEAR POST DEVELOPMENT: CASE #2\*

DRAINAGE LOCATION	ACRES	C.F.S./AC.	C.F.S.
LAKEVIEW RESIDENTIAL	6.42	3.04	19.52
LAKEVIEW CHURCH	2.44	4.43	10.81
SOUTH OF SITE (SEE NOTE MAP #1)	2.81	2.15	6.04
WEST OF SITE (H MAP #2)	2.16	2.15	4.64
MEXICO ROAD (I-K MAP #2)	1.20	3.80	4.56
COPPERFIELD (C MAP #2)	1.02	3.80	3.88
SCHRADER FARM (D-E MAP #2)	0.91	3.80	3.46
<b>TOTAL</b>			<b>55.19</b>

ROSE HEADWATER DEPTH CHART FOR 36" R.C.P.  
 CASE #1: Q = 90.85 C.F.S., HW/D = 2.50, HW = 2.50 x 3' = 7.50'  
 HW ELEV. = 510.39 + 7.50' = 517.89  
 \*\*522.00 - 517.89 = 4.11' FREEBOARD ← *Worst Case*

CASE #2: Q = 55.19 C.F.S., HW/D = 1.35, HW = 1.35 x 3' = 4.05'  
 HW ELEV. = 510.39 + 4.05' = 514.44  
 \*\*522.00 - 514.44 = 7.56' FREEBOARD

\*Under 25 year Storm, All The Discharge From Detention Basin #1 Is Directly Into AI #11, Via Low Flow Control Structure, By Passing The 36" F.E.S.  
 \*\*Control Elevation = S.E. Corner Of House On Lot 16 In Copperfield. (Elevation of 522.00 per Mexico Road Improvements By George Butler Associates, Inc.)

Areas Piped Across Site For Creek Hydraulics

**(MAP #1) DRAINAGE AREA MAP: 1" = 1000'**

LAND USE PLAN	% IMPERVIOUS	AREA ACRES	C.F.S./ACRE			Q (C.F.S.)		
			15YR	25YR	100YR	15YR	25YR	100YR
A PARKS	5	9.50	1.87	2.15	2.95	17.77	20.43	28.03
B LOW DENSITY	40	312.50	2.64	3.04	4.17	825.00	950.00	1303.13
C MEDIUM DENSITY	70	17.00	3.30	3.80	5.21	56.10	64.60	88.57
D SCHOOL	70	25.60	3.30	3.80	5.21	84.48	97.28	133.38
<b>SITE</b>	<b>40</b>	<b>6.55</b>	<b>2.64</b>	<b>3.04</b>	<b>4.17</b>	<b>17.29</b>	<b>19.91</b>	<b>27.31</b>
<b>TOTAL CREEK FLOW @ POINT "A"</b>		<b>371.50</b>				<b>1000.64</b>	<b>1152.22</b>	<b>1580.42</b>

**OFF-SITE DRAINAGE AREAS**

NO.	LAND USE	% IMPERVIOUS	AREA ACRES	C.F.S./AC.	C.F.S.
1	MEDIUM DENSITY	70	1.51	3.30	5.74
2	"	"	2.29	"	8.70
3	"	"	2.75	"	10.45
4	"	"	.21	"	0.80
5	"	"	.11	"	0.42
6	"	"	.09	"	0.34
7	"	"	2.25	"	7.43
8	"	"	.35	"	1.33
9	"	"	.12	"	0.46
10	"	"	.53	"	1.75
11	"	"	.57	"	1.88
12	"	"	.17	"	0.65
13	"	"	.16	"	0.61

\*Tributary To Existing Box Culvert, 36" F.E.S. & Existing Area Inlet In Copperfield Prior To "LAKEVIEW" Being Developed.  
 NOTE: 1 thru 9 = 9.68 Acres; of This, 2.81 Ac. Will "By-Pass" The Basin By Way of The Existing Box Culvert & 36" F.E.S.

**LAKEVIEW**  
**DRAINAGE AREA MAPS**

**HALL, HALSEY & WIND**  
 LAND PLANNING  
 CIVIL ENGINEERING  
 LANDSCAPE ARCHITECTURE

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Drawn By <b>VLB</b>	Checked By <b>DCW</b>	Project Number <b>86025</b>	Sheet Number <b>20 OF 22</b>
Date <b>2/28/87</b>			
Revisions <i>City 5-21-87</i>			

NOTE: SEE SHEETS 21 & 22 FOR ALL ON-SITE DRAINAGE AREAS.  
 SEE SHEETS 17 & 18 FOR ROUTING OF BASINS 1 & 2.