REVISED DRAINAGE REPORT
FOR
PALOMA DEL SOL
ADDENDUM TO
JUNE, 1995 & NOVEMBER 1995
REPORTS

PREPARED FOR:
THE STROSNIDER COMPANY
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JANUARY, 1996

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1-24-96
Rev 3-8-96

TABLE OF CONTENTS

I. INTRODUCTION:

This is the Final Revised Drainage Report adding to the June and November 1995 Drainage Report for Paloma del Sol (approved for Preliminary Plat and Rough Grading) and is prepared for the purpose of pointing out changes between the earlier report and the Final Design of Infrastructure Plans. The revisions in this report include revised HGL calculations and an increase in the storm drain system pipe size in Baseline "B" in San Timoteo and Calle Contento Avenues.

Site Description, Drainage Criteria, Computational Procedures and Erosion Control have not changed. The June 1995 Report describes these items in detail, copies are provided in the Appendix C. Segments of the November 10, 1995 Addendum to Drainage Report for Paloma del Sol is provided in Appendix D.

II. OFF-SITE DRAINAGE

Contributing off-site drainage will be coming from two directions: at the west project boundary, a portion of the street drainage from Bandelier Drive and at the north project boundary, drainage from McMahon Boulevard. No off-site drainage is anticipated from the apartments located adjacent to the east project site boundary. All contributing off-site and on-site drainage will drain southward to the Calabacillas Arroyo.

Contributing off-site drainage from Bandelier Drive on the west will be approximately 2 cfs. This discharge will combine with on-site drainage and flow eastward along San Timoteo Avenue to a sump point near the middle of the project site where it will be intercepted and conveyed south in a storm drain system to the Calabacillas Arroyo.

Off-site drainage from the north project boundary will enter the project site at two locations. Inlets located in McMahon Blvd. immediately west of Dover Street will intercept "future condition" flows coming from the west along McMahon Blvd., totaling approximately 72.9 cfs and from the northeast near Dover Street, totaling approximately 6.7 cfs for a future total of 79.6 cfs at the first location. Forty cfs of the flow from west McMahon Blvd. is due to future development of McMahon Blvd. west of Bandelier Drive. Under "existing conditions", 32.9 cfs flows from the west along McMahon Blvd. for a total of 39.6 cfs at this location under present conditions. Inlets located at the intersection of McMahon and Redbud Street will intercept approximately 34 cfs from the north and west along McMahon and 33.5 cfs from the north and east along McMahon Blvd. for a total of 67.5 cfs at the second location. At each of these locations, a storm drain system will convey the off-site runoff south, intercepting on-site runoff at one of the two sump locations in San Timoteo Avenue before ultimately discharging into the Calabacillas Arroyo.

The determination of off-site flows referenced in this report were generated previously in the Tuscany - Unit 1 Drainage Report (Project No. 5208.92) dated November 10, 1995 and approved December 15, 1995.

III. ON-SITE DRAINAGE

On-site Drainage patterns have not been changed between the June, 1995 Drainage Report and this addendum. Basins have been combined and new basin designations assigned.

Surface drainage still flows to the two (2) Sump Points within the Tract, and will be intercepted into storm drain system and conveyed to Calabacillas Arroyo.

On-site runoff in San Timoteo Avenue from the westerly boundary (including off-site surface flow), Bandelier Drive, will be combined with flows from Los Suenos Court and Madrina Court and from a high point west of Aventura Court and flow to low point at the approximate center of the property. These flows will be collected in inlets and conveyed to the Calabacillas Arroyo via a storm drain. (Basins 101.1, 101.2 & 101.3) (See Revised Plate 2). Approximately 42 cfs will reach this sump point as surface flow and 79.6 cfs through the storm drain system from McMahon Blvd. for a future total of 121.6 cfs at this location.

On-site surface runoff from Calle Contento Avenue and the eastern portion of San Timoteo Avenue, totaling approximately 48.1 cfs will combine with off-site flows from McMahon Blvd. in the north through a storm drain system, totaling approximately 67.5 cfs at a second sump point location in San Timoteo Avenue. The future total discharge at this second sump point location will be approximately 115.6 cfs. From this location the storm drain system will be designed to convey two times the on-site 100-year discharge plus the contributing off-site discharge which equals approximately 163.7 cfs or (48.1 + 48.1 + 67.5 cfs).

The storm drainage system will be designed in accordance with the City of Albuquerque standards. Both of the outfall structures to the Calabacillas Arroyo will be designed in conjunction with AMAFCA policies and will be subject to the review and approval of AMAFCA as well as the City. Both of the outfall structures were designed to take potential scour into account. In addition, both structures were designed to start approximately six feet below the existing bottom surface of the Callabacillas Arroyo.

Runoff from some of the lots within the Paloma del Sol development will not entirely drain runoff towards the adjacent frontage road. Lots 24 through 27 of Block 1 will have private backyard retention ponds for rear lot drainage. These ponds will be designed per COA-DPM section 22. Lots 1 through 23 of Block 1 will be set 25 feet back from San Timoteo Avenue and will be required to drain roof runoff and the front 30 feet of the lot toward San Timoteo Avenue. Rear lot drainage for these lots will be accomplished through backyard retention ponds with overflow capabilities to the Calabacillas Arroyo. To be conservative, these flows were assumed to contribute to on-site surface runoff to one of the two sump inlet locations. Information on sump basin size is provided in an appendix to this report.

Plans for the storm drain system will be a part of the DRC improvement plan submittal. Final HGL calculations will be provided at the time of final design with this report.

IV. CONCLUSIONS

This addendum should address the comments previously mentioned in the letter from the City of Albuquerque dated July 18, 1995, and in the letter from AMAFCA dated July 14, 1995.

Drainage patterns stated in the June, 1995 Drainage Report have not been altered, but we have simplified the Drainage Basin Map.

The off-site flows from McMahon per the Smith Engineering Co. Drainage Report for C.P.N. 5208.90 and the proposed outfalls onto the Paloma del Sol project have been incorporated into the design of the storm drain system proposed for this project.

Details of the outfall structures and the spillways are provided in the infrastructure plans for the Paloma del Sol project (CPN 5300.90), concurrently under review by the DRC.

TABLE 1A
100-YEAR PEAK DISCHARGES
DEVELOPED CONDITIONS
(ON-SITE & OFF-SITE)

			LAND TREATMENT				INCREMENTAL	FUTURE TOTAL
Basin I.D.	Area (Sq.Mi.)	Sum Area (Sq.Mi.)	A	B	C	D	Q100 (cfs)	Q100 (cfs)
100.1	0.00070		0	0	12	88	1.98	
101.1	0.00694	0.00764	0	36	36	28	13.91	
101.2	0.01014	0.01778	0	36	36	28	20.32	
101.3	0.00289	0.02067	0	36	36	28	5.80	
San Timoteo Avenue surface flow at sump Station 20+85								42.01
*Off-site flow from McMahon Boulevard (West) (32.9 cfs + 40 cfs + 6.7 cfs)								79.6
Total storm drain discharge to Calabacillas Arroyo West Outfall								121.6
102.1	0.00901		0	36	36	28	18.06	
102.2	0.00423	0.01324	0	36	36	28	8.49	26.54
102.3	0.00539		0	36	36	28	10.81	
102.4	0.00536	0.01075	0	36	36	28	10.75	21.56
San Timoteo Avenue surface flow at sump Station 30+45								48.1
*Off-site flow from McMahon Boulevard (East) (16 cfs + 25.5 cfs + 26 cfs)								67.5 (64.0)*
Total storm drain discharge to Calabacillas Arroyo East Outfall.								115.6 (112.1)*
Total Storm Drain DESIGN discharge to Calabacillas Arroyo East Outfall (2 * 48.1 cfs + 67.5 cfs)								163.7 (160.2)*

*Revised Tuscany Drainage Report shows only 64.0 cfs, use of 67.5 cfs will be more conservative (See Revised Table 2 for Tuscany herein for reference)

TABLE 1B
BACK YARD POND VOLUMES & DISCHARGES
DEVELOPED CONDITIONS

							POND VOLUME (AF)	FUTURE DISCHARGE Q100
103.1	0.00323		0	50	50	0	0.152	5.33
103.2	0.00401		0	50	50	0	0.188	6.61
103.3	0.00201		0	50	50	0	0.094	3.32
103.4	0.00054		0	50	50	0	0.025	0.90
103.5	0.00003		0	50	50	0	0.001	0.06
Total for rear yard ponds (Basins 103.1 to 103.5)							0.461	16.22
104.1	0.00246		0	50	50	0		4.06
Total sheet flow to Calabacillas Arroyo								4.06

COMPUTER PERCENT IMPERVIOUS

N = 65 DU/29 acres = 2.24

$$\%D = 7(N^2 + 5N)^{0.5}$$
$$= 7(2.24^2 + 5(2.24))^{0.5}$$
$$= 28\%$$

*For explanation of off-site flows refer to the Tuscany Development Reference Table 2. These discharges we originally calculated in Tuscany Drainage Report dated 11-10-95.

Rev. 3/7/96

TABLE 1A
100-YEAR PEAK DISCHARGES
DEVELOPED CONDITIONS
(ON-SITE & OFF-SITE)

			LAND TREATMENT				INCREMENTAL	FUTURE TOTAL
Basin I.D.	Area (Sq.Mi.)	Sum Area (Sq.Mi.)	A	B	C	D	Q100 (cfs)	Q100 (cfs)
100.1	0.00070		0	0	12	88	1.98	
101.1	0.00694	0.00764	0	36	36	28	13.91	
101.2	0.01014	0.01778	0	36	36	28	20.32	
101.3	0.00289	0.02067	0	36	36	28	5.80	
San Timoteo Avenue surface flow at sump Station 20+85								42.01
*Off-site flow from McMahon Boulevard (West) (32.9 cfs + 40 cfs + 1/2(13 cfs))?								79.6
Total storm drain discharge to Calabacillas Arroyo West Outfall								121.6
102.1	0.00901		0	36	36	28	18.06	
102.2	0.00423	0.01324	0	36	36	28	8.49	26.54
102.3	0.00539		0	36	36	28	10.81	
102.4	0.00536	0.01075	0	36	36	28	10.75	21.56
San Timoteo Avenue surface flow at sump Station 30+45								48.1
*Off-site flow from McMahon Boulevard (East) (16 cfs + 25.5 cfs + 26 cfs)								67.5
Total storm drain discharge to Calabacillas Arroyo East Outfall								115.6
Total Storm Drain DESIGN discharge to Calabacillas Arroyo East Outfall (2 * 48.1 cfs + 67.5 cfs)								163.7

TABLE 1B
BACK YARD POND VOLUMES & DISCHARGES
DEVELOPED CONDITIONS

							POND VOLUME (AF)	FUTURE? DISCHARGE Q100
103.1	0.00323		0	50	50	0	0.152	5.33
103.2	0.00401		0	50	50	0	0.188	6.61
103.3	0.00201		0	50	50	0	0.094	3.32
103.4	0.00054		0	50	50	0	0.025	0.90
103.5	0.00003		0	50	50	0	0.001	0.06
Total for rear yard ponds (Basins 103.1 to 103.5)							0.461	16.22
104.1	0.00246		0	50	50	0		4.06
Total sheet flow to Calabacillas Arroyo								4.06

COMPUTER PERCENT IMPERVIOUS

N = 65 DU/29 acres = 2.24

$\%D = 7(N^2 + 5N)^{0.5}$
$= 7(2.24^2 + 5(2.24))^{0.5}$
$= 28\%$

*For explanation of off-site flows refer to the Tuscany Development Reference Table 2. These discharges were originally calculated in Tuscany Drainage Report dated 11-10-95.

LEGEND

- DRAINAGE BASIN BOUNDARY
- (335) DRAINAGE BASIN IDENTIFICATION NUMBER
- (0.0259 SM) DRAINAGE BASIN AREA IN SQUARE MILES
- PROPOSED PROJECT SITE LOCATION
- TEMPORARY FLOW LINE
- DRAINAGE AREA BOUNDARY NETWORK

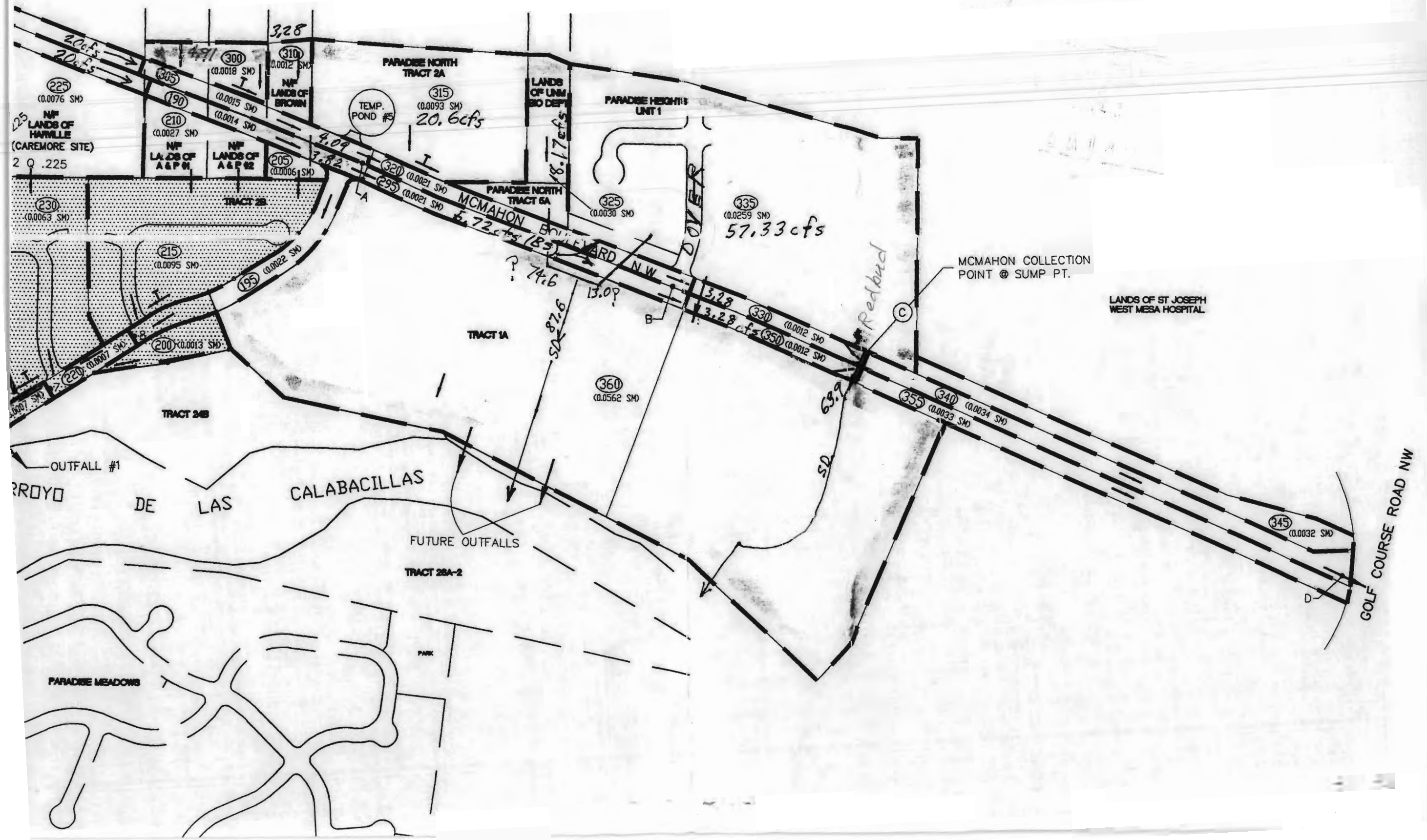


TABLE 1 (Revised)
ULTIMATE DEVELOPED CONDITION
REFERENCE **(If all properties, both on-site and off-site, developed) TP=0.1330**

					LAND TREATMENT				INCREMENTAL		FUTURE TOTAL	
Basin I.D.	**Area (Sq.Mi.)**	**Contr. Basin**	**Sum Area (Sq.Mi.)**	**Tc (Min.)**	**A**	**B**	**C**	**D**	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**Q_{100} (cfs**	**Q_{10} (cfs)**
Future McMahon Boulevard (Unser to West Mesa Medical (Caremore Site))												
100	0.0035	------	0.0035	12	---	5	5	90	9.52		9.52	
100.1	0.0035	100	0.0070	12	---	5	5	90	9.52		19.05	
185	0.0024	------	0.0024	12	---	5	5	90	6.53		6.53	
185.1	0.0024	185 & 100.1	0.0118	12	---	5	5	90	6.53		32.12	
105	0.0366	185.1	0.0484	12	---	21	22	57	84.33		116.45	
Off-site Q at McMahon Boulevard (105) Q_{100} = 116.5 cfs (future inlets to be designed for 76.5 cfs) *NOTE #1: 40 cfs to be allowed to bypass future inlets in future McMahon to join flows at Bandelier to east.												
115	0.0146	105	0.063	12	---	21	22	57	33.65		148.32	
110	0.0171	115	0.0801	12	---	21	22	57	39.41		186.38	
Off-site Q to Tuscany Drive (110) Q_{100} = 186.4 cfs (future inlets to be designed for 146.4 cfs)*												
125	0.0090	110	0.0891	12	---	29	29	42	19.03		208.08	
Q in Tuscany Dr at Bandelier Dr (125) Q_{100} = 208.1 cfs (future inlets provided with Unit #3 for 168.1 cfs)*												
155	0.0324	------	0.0324	12	---	25	25	50	71.72		71.72	
Off-site Basins (future inlets to be designed for 35.9 cfs) (See NOTE #2 below) NOTE #2: 1/2 of Basin #155 (35.9 cfs) to join with Basin #150												
160	0.0012	155	0.0336	12	---	5	5	90	3.28		74.99	
165	0.0086	160	0.0422	12	---	25	25	50	19.05		94.04	
175	0.0085	------	0.0085	12	---	25	25	50	18.83		18.83	
170	0.0009	175 & 165	0.0516	12	---	5	5	90	2.46		114.38	
See Note #2 with 35.9 cfs diverted from Bandelier,. Q in Bandelier is 78.5 cfs (Basin #170)												
265	0.0025	170 & 125	0.1432	12	---	29	29	42	5.30		329.21	
180	0.0006	265	0.1438	12	---	5	5	90	1.65		330.79	
260	0.0005	180	0.1443	12	---	5	5	90	1.37		333.47	
255	0.0007	250	0.1550	12	---	29	29	42	1.49		334.93	
252	0.0090	250	0.1538	12	---	29	29	42	19.03		350.90	
250	0.0010	252	0.1543	12	---	5	5	90	2.73		353.96	
Q in Bandelier Drive at Sorrento Drive Q_{100} = 350.94cfs (Per NOTE #2 Q_{100} = 315.0)												
205	0.0006	------	0.0006	12	---	15	15	70	1.50		1.50	
210	0.0027	205	0.0033	12	---	15	15	70	6.67		8.17	
225	0.0038	------	0.0071	12	---	5	5	90	10.34		17.68	
215	0.0095	210	0.0166	12	---	29	29	42	20.08		35.94	
195	0.0022	215	0.0188	12	---	5	5	90	5.99		41.67	
220	0.0007	195	0.0195	12	---	5	5	90	1.92		43.53	
200	0.0013	------	------	------	---	46	47	7	2.19		45.70	
Park Site - Q100 = 2.2 cfs to inlet in park												
1/2 Basin # 225 joins #210												
230	0.0063	220	0.0063	12	---	29	29	42	13.32		58.64	
1/2 Basin # 225 joins #240 (partial flow from #355 to Sorrento Drive)												
225	0.0038	------	0.0038	12	---	5	5	90	10.34		10.34	
240	0.0077	225	0.0115	12	---	29	29	42	16.28		25.94	

Rev. 3-7-96

TUSCANY DEVELOPMENT
(REFERENCE TABLE 2)
TABLE 1 (Revised)
ULTIMATE DEVELOPED CONDITION (continued)
(If all properties, both on-site and off-site, developed) TP=0.1330

					LAND TREATMENT				INCREMENTAL		FUTURE TOTAL	
Basin I.D.	Area (Sq.Mi.)	Contr. Basin	Sum Area (Sq.Mi.)	Tc (Min.)	A	B	C	D	Q_{100} (cfs)	Q_{10} (cfs)	Q_{100} (cfs	Q_{10} (cfs)
240T	--------	230	0.1923	12	---	---	---	---	--------		86.95	
235	0.0007	255 & 240T	0.1943	12	---	5	5	90	1.92		435.09	
Total Q in Bandelier Drive (235) SUMP Q_{100} = 435.1 cfs: (359.2 cfs to outfall #1) (Reduction in Q_{100} to outfall #1 is result of Note #1 & Note #2 flow diversions)												
270	0.0096	--------	0.0096	12	---	27	27	46	20.78		20.78	
275	0.0076	270	0.0172	12	---	27	27	46	16.45		34.81	
280	0.0122	275	0.0294	12	---	27	27	46	26.40		57.55	
Total Q at Sump in Sicily Place Q_{100} = 57.6: to outfall # 2												
130	0.0277	--------	0.0277	12	---	25	25	50	61.62		61.62	
135	0.0017	130	0.0294	12	---	5	5	90	4.63		65.95	
140	0.0115	--------	0.0115	12	---	25	25	50	25.47		88.69	
145	0.0018	135 & 140	0.0427	12	---	5	5	90	4.91		93.38	
150	0.0007	145	0.0434	12	---	5	5	90	1.92		95.21	
152	0.0148	150	0.0582	12	---	25	25	50	32.77		116.70	
292	0.027	152	0.0852	12	---	25	25	50	59.77		175.99	
Total Q at temp. Off-site Pond #1 and #2 (292T) Q_{100} = 176.0 cfs (ultimate flows)(211.9 cfs to future outfall) The increase in Q at future outfall is a result of Note #2 diversion.												
305	0.0015	--------	0.0015	12	---	5	5	90	4.09		4.09	
190	0.0014	--------	0.0029	12	---	5	5	90	3.82		3.82	
Q in McMahon Boulevard at Bandelier Drive (N/S=24.1 cfs & S/S=23.8 cfs) *NOTE #1												
300	0.0018	305	0.0018	12	---	5	5	90	4.91		9.00	
310	0.0012	300	0.0030	12	---	5	5	90	3.28		12.27	
315	0.0093	310	0.0123	12	---	25	25	50	20.60		32.87	(*WEST)
Q on Borrow Site - North of McMahon Boulevard (315) Temporary pond #5 Q_{100} = 32.9 cfs (ultimate)												
320	0.0021	315	0.0159	12	---	5	5	90	5.72		32.16	
295	0.0021	190	0.0035	12	---	5	5	90	5.72		7.97	
325	0.0030	320	0.0224	12	---	5	5	90	8.17		39.57	(*WEST)
Total Q at Inlets near Dover Street Q_{100} = 39.6 cfs (ultimate) (N/S Q = 59.6; S/S Q = 28.0 cfs) @ B Due to addition of future 40 cfs (see Note #1), the Q_{100} to inlets west of Dover is 87.6. ~~(13 cfs Bypassed)~~ Capture by Pi												
335	0.0259	325	0.0483	12	---	25	25	50	57.33		88.92	
330	0.0012	335	0.0495	12	---	5	5	90	3.28		92.05	
350	0.0012	330 & 295	0.0507	12	---	5	5	90	3.28 63.89 cfs		102.11	
Total Q to Calabacillas in S.D. - McMahon Boulevard (350) Q_{100} = 102.1 cfs (ultimate) See Note #1 about 40 cfs bypass. (Total future flow to Calabacillas is 142.1 cfs) (3 inlets intercept: N/S west of Dover Q = 59.6 & S/S = 15.0 cfs N/S inlet east of Dover = 13.0 cfs) (*EAST) WEST = 87.6 cfs @ B (3 inlets intercept: N/S inlet of west Redbud = 13.0 cfs; N/S inlet east of Redbud = 25.5 cfs & S/S inlet = 16 cfs) E = 54.5 @ C (*EAST) (*EAST) (*EAST)												
340	0.0034	--------	0.0034	12	---	5	5	90	9.25		9.25	
355	0.0033	340	0.0067	12	---	5	5	90	8.98		18.23	
345	0.0032	355	0.0099	12	---	5	5	90	5.68		23.91	
Q from McMahon Boulevard to Golf Course Road (345) Q_{100} = 23.9 cfs (ultimate)												

Rev. 12-13-95

REFERENCE

TABLE 1 (Revised)
ULTIMATE DEVELOPED CONDITION (continued)
(If all properties, both on-site and off-site, developed) TP=0.1330

					LAND TREATMENT				INCREMENTAL		FUTURE TOTAL	
Basin I.D.	**Area (Sq.Mi.)**	**Contr. Basin**	**Sum Area (Sq.Mi.)**	**Tc (Min.)**	**A**	**B**	**C**	**D**	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**Q_{100} (cfs**	**Q_{10} (cfs)**
240T	-------	230	0.1923	12	---	---	---	---	--------		86.57	
235	0.0007	255 & 240T	0.1943	12	---	5	5	90	1.92		434.29	
Total Q in Bandelier Drive (235) SUMP Q_{100} = 434.3 cfs: (359.2 cfs to outfall #1) (Reduction in Q_{100} to outfall #1 is result of Note #1 & Note #2 flow diversions)												
270	0.0096	-------	0.0096	12	---	27	27	46	20.78		20.78	
275	0.0076	270	0.0172	12	---	27	27	46	16.45		34.81	
280	0.0122	275	0.0294	12	---	27	27	46	26.40		57.55	
Total Q at Sump in Sicily Place Q_{100} = 57.6: to outfall # 2												
130	0.0277	-------	0.0277	12	---	25	25	50	61.32		61.32	
135	0.0017	130	0.0294	12	---	5	5	90	4.63		65.95	
140	0.0115	-------	0.0115	12	---	25	25	50	25.47		88.69	
145	0.0018	135 & 140	0.0427	12	---	5	5	90	4.91		93.38	
150	0.0007	145	0.0434	12	---	5	5	90	1.92		95.21	
152	0.0148	150	0.0582	12	---	25	25	50	32.77		116.70	
292	0.027	152	0.0852	12	---	25	25	50	59.77		175.99	
Total Q at temp. Off-site Pond #1 and #2 (292T) Q_{100} = 176.0 cfs (ultimate flows : 211.9 cfs to future outfall) The increase in Q at future outfall is a result of Note #2 diversion.												
305	0.0015	-------	0.0015	12	---	5	5	90	4.09		4.09	
190	0.0014	-------	0.0029	12	---	5	5	90	3.82		3.82	
Future inlets west of Bandelier will pick-up 40 cfs (20 cfs n/s & 20 cfs s/s) & be conveyed in S.D. to outfall through Tract 1A. Q in McMahon Boulevard at Bandelier Drive (N/S=24.1 cfs & S/S=23.8 cfs) *NOTE #1												
300	0.0018	305	0.0018	12	---	5	5	90	4.91		9.00	
310	0.0012	300	0.0030	12	---	5	5	90	3.28		12.27	
315	0.0093	310	0.0123	12	---	25	25	50	20.60		32.87	
Q on Borrow Site - N/S McMahon Boulevard (315) to Temporary pond #5 Q_{100} = 28.8 cfs (ultimate), when Temporary Pond #5 eliminated, total Q_{100} in McMahon Blvd., east of Bandelier Dr. will be 32.9 cfs.												
320	0.0021	315	0.0159	12	---	5	5	90	5.72		32.16	
295	0.0021	190	0.0035	12	---	5	5	90	5.72		7.97	
325	0.0030	320	0.0224	12	---	5	5	90	8.17		39.57	
Total Q at two (2) Inlets west of Dover Street (325)Q_{100} = 39.6 cfs (ultimate) on N/S McMahon: 32.9 cfs & 6.7 cfs, respectively. On S/S of McMahon a single inlet will P/U about 1 cfs ±; total future Q in the west S.D. is 72.9 cfs (*Note 1) and 6.7 cfs at Dover inlet (Total Q at Mid-Pt TR 1-A is 79.6 cfs).												
335	0.0259	325	0.0483	12	---	25	25	50	57.33		88.92	Not
330	0.0012	335	0.0495	12	---	5	5	90	3.28		92.05	Valid
350	0.0012	330 & 295	0.0507	12	---	5	5	90	3.28		102.11	
Total Q to Calabacillas in S.D. from McMahon Boulevard (350) Q_{100} = 102.1 cfs (now-ultimate) Future flows total Q_{100} = 142.1 cfs through all inlets in McMahon (*See Note #1 - Re: 40 cfs Bypass) Basin #335 on N/S of McMahon Blvd. divides its flows as follows: Net Total Q_{100}= 49.3 cfs, about 1/2 to Dover Q=26 cfs, then flows to inlet west of Redbud & 1/2 to Redbud Q = 23.3 cfs, that joins with Basin #330 for total Q_{100}= 26.5 cfs, flows to sump inlet east of Redbud. South side of McMahon, Q_{100}=11.5 cfs, P/U at inlet (S/S) west of Redbud & sump inlet east of Redbud. Total Q_{100} in SD at east end Tract 1A is about 64 cfs.												
340	0.0034	--------	0.0034	12	---	5	5	90	9.25		9.25	
355	0.0033	340	0.0067	12	---	5	5	90	8.98		18.23	
345	0.0032	355	0.0099	12	---	5	5	90	5.68		23.91	
Q from McMahon Boulevard to Golf Course Road (345) Q_{100} = 23.9 cfs (ultimate)												

Basin #190 + [illegible]

Rev. 3/7/96

CSC#20-03-036/20-03az.rep

TUSCANY DEVELOPMENT
(REFERENCE TABLE 2)
TABLE 1 (Revised)
ULTIMATE DEVELOPED CONDITION
(If all properties, both on-site and off-site, developed) TP=0.1330

					LAND TREATMENT				INCREMENTAL		FUTURE TOTAL	
Basin I.D.	Area (Sq.Mi.)	Contr. Basin	Sum Area (Sq.Mi.)	Tc (Min.)	A	B	C	D	Q_{100} (cfs)	Q_{10} (cfs)	Q_{100} (cfs	Q_{10} (cfs)
Future McMahon Boulevard (Unser to West Mesa Medical)												
100	0.0035	--------	0.0035	12	---	5	5	90	9.52		9.52	
100.1	0.0035	100	0.0070	12	---	5	5	90	9.52		19.05	
185	0.0024	--------	0.0024	12	---	5	5	90	6.53		6.53	
185.1	0.0024	185 & 100.1	0.0118	12	---	5	5	90	6.53		32.12	
105	0.0366	185.1	0.0484	12	---	21	22	57	84.33		116.45	
Off-site Q at McMahon Boulevard (105) Q_{100} = 116.5 cfs (future inlets to be designed for 76.5 cfs) *NOTE #1: 40 cfs to be allowed to bypass future inlets in future McMahon to join flows at Bandelier to east.												
115	0.0146	105	0.063	12	---	21	22	57	33.65		148.32	
110	0.0171	115	0.0801	12	---	21	22	57	39.41		186.38	
Off-site Q to Tuscany Drive (110) Q_{100} = 186.4 cfs (future inlets to be designed for 146.4 cfs)*												
125	0.0090	110	0.0891	12	---	29	29	42	19.03		208.08	
Q in Tuscany Dr at Bandelier Dr (125) Q_{100} = 208.1 cfs (future inlets provided with Unit #3 for 168.1 cfs)*												
155	0.0324	--------	0.0324	12	---	25	25	50	71.72		71.72	
Off-site Basins (future inlets to be designed for 35.9 cfs) (See NOTE #2 below)												
160	0.0012	155	0.0336	12	---	5	5	90	3.28		74.99	
165	0.0086	160	0.0422	12	---	25	25	50	19.05		94.04	
175	0.0085	--------	0.0085	12	---	25	25	50	18.83		18.83	
170	0.0009	175 & 165	0.0516	12	---	5	5	90	2.46		114.38	
NOTE #2: 1/2 of Basin #155 to join with Basin #150. Q in Bandelier is 78.5 cfs												
265	0.0025	170 & 125	0.1432	12	---	29	29	42	5.30		329.21	
180	0.0006	265	0.1438	12	---	5	5	90	1.65		330.79	
260	0.0005	180	0.1443	12	---	5	5	90	1.37		333.47	
255	0.0007	250	0.1550	12	---	29	29	42	1.49		334.93	
252	0.0090	250	0.1538	12	---	29	29	42	19.03		350.90	
250	0.0010	252	0.1543	12	---	5	5	90	2.73		353.96	
Q in Bandelier Drive at Sorrento Drive Q_{100} = 350.94cfs (Per NOTE #2 Q_{100} = 315.0)												
205	0.0006	--------	0.0006	12	---	15	15	70	1.50		1.50	
210	0.0027	205	0.0033	12	---	15	15	70	6.67		8.17	
215	0.0095	210	0.0128	12	---	29	29	42	20.08		27.24	
195	0.0022	215	0.0150	12	---	5	5	90	5.99		33.02	
220	0.0007	195	0.0157	12	---	5	5	90	1.92		35.23	
200	0.0013	--------	--------	--------	---	46	47	7	2.19		37.40	
Park Site - Q100 = 2.2 cfs to inlet in park												
1/2 Basin # 225 joins #230 (partial flow from #225 to Vecchio Drive)												
225	0.0038	--------	0.0038	12	---	5	5	90	10.34		10.34	
230	0.0063	225 & 220	0.0258	12	---	29	29	42	13.32		60.46	
1/2 Basin # 225 joins #240 (partial flow from #355 to Sorrento Drive)												
225	0.0038	--------	0.0038	12	---	5	5	90	10.34		10.34	
240	0.0077	225	0.0115	12	---	29	29	42	16.28		25.94	

Rev. 12-13-95

INLET CAPACITY CALCULATIONS

San Timoteo Avenue Station 20+85

Assume Weir Control on double grate inlet:

$Q = 3.0 LH^{3/2}$

$H = (Q \div 3.0L)^{2/3}$

$1/2\ Q_{100} = 21.0$ cfs

$L = 10.67'$

$A = 8.8\ ft^2$

$H = [21.0 \div (3.0 * 10.67)]^{2/3}$

$H = 0.76' < 1.0'$

Check Orifice Control:

$Q = 0.65\ A(2gH)^{1/2}$

$H = (Q \div 0.65A)^2 \div 64.4$

$H = [21.0 \div (0.65 * 8.8)]^2 \div 64.4$

$H = 0.21'$

Weir Control: Use Type A - Double grate, Double throat inlet (Inlets #1 and 2)

San Timoteo Avenue Station 30+45

Assume Weir Control on double grate inlet:

$H = (Q \div 3.0L)^{2/3}$

$1/2\ Q_{100} = 24.05$ cfs

$L = 10.67'$

$H = (24.05 \div 3.0 * 10.67')^{2/3}$

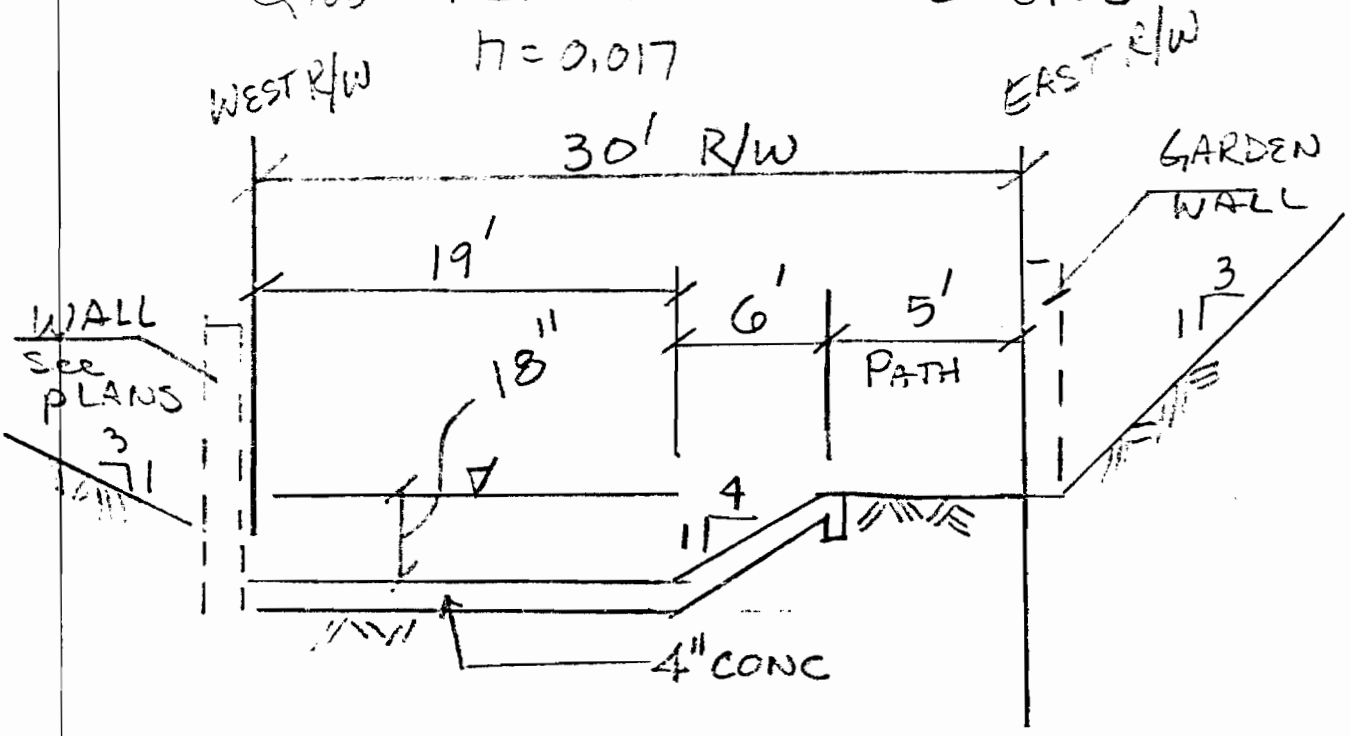
$H = 0.82' < 1.0'$

Weir Control: Use Type A - Double grate, Double throat inlet (Inlets #3 and 4)

CHANNEL ③ Section of Project

$Q_{100} = 42.1$ CFS $S = 0.05$

$n = 0.017$



MAX. CAP. = $D = 18"$; $A = 33.0$SF ; $R = 1.32$

$$Q_{mx} = \frac{1.486}{.017}(33)(1.32)^{2/3}(.05)^{1/2} = \underline{776.0 \text{ CFS}}$$

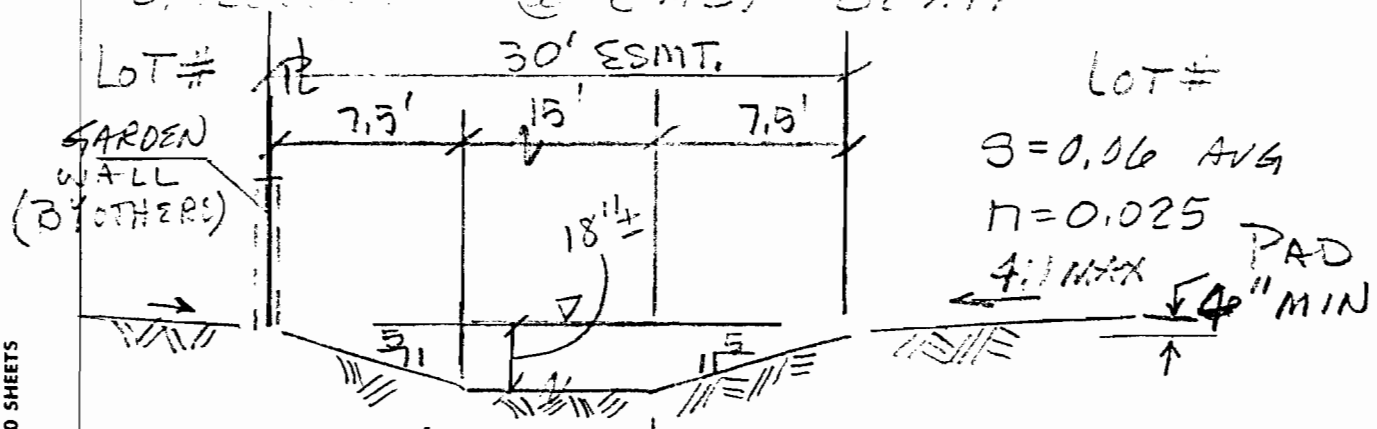
W/ 1' FREEBOARD = $D = 6"$; $A = 10.0$SF ; $R = 0.476$

$$Q_{CAP} = \frac{1.486}{.017}(10.0)(.476)^{2/3}(.05)^{1/2} = \underline{119.2 \text{ CFS}}$$

$42.1 \text{ CFS} < 119.2$ ∴ ok

Flow will be less than 6" Deep.

SWALE #4 @ EAST SUMP



(TO BE LANDSCAPED, NO TREES OR SHRUBS)

MAX. CAPACITY; D=18"; A = 33.75SF; R = 1.125

$$Mx.Q_{CAP} = \frac{1.486}{.025}(33.75)(1.125)^{2/3}(.06)^{1/2} = \underline{531.6\ CFS}$$

1' FREEBOARD: D=6"; A = 8.75SF; R = .438

$$Q_{CAP} = \frac{1.486}{.025}(8.75)(.438)^{2/3}(.06)^{1/2} = \underline{73.5\ CFS}$$

$Q_{100} = 48.1\ CFS < 73.5$ ∴ FLOW WILL BE LESS THAN 6" DEEP

PROVIDE OUTLET THROUGH REAR PERIMETER GARDEN WALL FOR THIS OVERFLOW. TO ACT AS WEIR:

$$Q = C L H^{2/3} \qquad C \cong 2.7$$

ASSUME: H = 4"; Q = 48.1 CFS @ SUMP PT.

$$L = Q/C\,H^{2/3} = 48.1/2.7(.33)^{2/3} \cong 37\ LF$$

INLET CAPACITY CALCULATIONS

San Timoteo Avenue Station 20+85

Assume Weir Control on double grate inlet:

$Q = 3.0\ LH^{3/2}$ $\qquad$ $1/2\ Q_{100} = 21.0$ cfs

$H = (Q \div 3.0L)^{2/3}$ $\qquad$ $L = 10.67'$

$A = 8.8\ ft^2$

$H = [21.0 \div (3.0 * 10.67)]^{2/3}$

$H = 0.76' < 1.0'$

Check Orifice Control:

$Q = 0.65\ A(2gH)^{1/2}$

$H = (Q \div 0.65A)^2 \div 64.4$

$H = [21.0 \div (0.65 * 8.8)]^2 \div 64.4$

$H = 0.21'$

Weir Control: Use Type A - Double grate, Double throat inlet (Inlets #1 and 2)

San Timoteo Avenue Station 30+45

Assume Weir Control on double grate inlet:

$H = (Q \div 3.0L)^{2/3}$ $\qquad$ $1/2\ Q_{100} = 24.05$ cfs

$L = 10.67'$

$H = (24.05 \div 3.0 * 10.67')^{2/3}$

$H = 0.82' < 1.0'$

Weir Control: Use Type A - Double grate, Double throat inlet (Inlets #3 and 4)