



D. Mark Goodwin & Associates, P.A.
Consulting Engineers

P.O. BOX 90606, ALBUQUERQUE, NM 87199
(505) 828-2200 FAX 797-9539
e-mail: dmgs@swcp.com

Snow Vista Basin

Pond at 98th & Encinita

November 7, 2000

Mr. Don Dixon
AMAFCA
2600 Prospect NE
Albuquerque, NM 87107

Re: **Revised Grading and Drainage Plan for Sunrise Ranch Unit 2**
Engineer's stamp 11-7-00 (L9/D6)

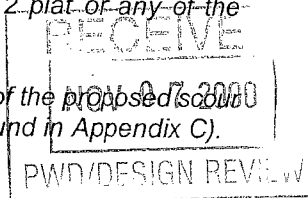
Dear Mr. Dixon,

This letter is in response to your letter dated October 18, 2000 and our subsequent meeting on November 1, 2000 with regard to the above referenced project:

1. The City of Albuquerque Hydrology Department has approved the proposed drainage plan to allow discharge from the mobile home park (revised subasin 190 B) to enter the 98th street storm drain system. Under current conditions the mobile home park has a retention pond that was designed to contain "developed" flows. If and when the land use changes for this site (redefined as subasin 190B), the site will be restricted to the 1.29 cfs/acre as defined in the Amole-Hubbell Drainage Plan. As requested a brief explanation of this drainage basin change along with an exhibit has been prepared to give to the AMAFCA board members and can be found in Appendix D. A concurrence letter from the City Hydrology Dept. will be provided to you with regard to this issue.
2. Per discussion at our meeting on November 1, Sunrise Ranch Unit 2 has been regraded to convey the allowable discharge for 'developed flows' from subasin 190A via Sunset Gardens Road to Roundup Road and then outfall to the Snow Vista Sedimentation Pond. (Refer to Appendix A)
3. A reproducible mylar of Figure N-4 with revised subasin boundaries for subasin 190A and 190 B is being provided. The flows into the Snow Vista Sedimentation pond have been reduced and a table showing these changes at critical points has been prepared. (Refer to Appendix A)
4. A temporary swale within the 98th street right-of-way will pick up 'developed' flows from Sunset Gardens and temporarily retain them within the 98th street right of way until the SAD 222 storm sewer is constructed to intercept these flows early next year. A concurrence letter from City Hydrology will be provided. (Refer to Appendix B)

With regard to offsite flows along lot 5, Block 7, a temporary drainage swale will be provided along the west property boundary within the existing temporary drainage easement to convey these flows to the Snow Vista Sedimentation pond as shown on the revised grading and drainage plan.

5. The FEMA floodplain was shown on the grading and drainage plan dated 8-8-00 revised 10-6-00. The FEMA floodplain is not part of the Sunrise Ranch Unit 2 plat or any of the remaining Tracts currently shown on the Unit 2 plat.
6. Scour depth calculations have been submitted with this letter. A detail of the proposed scour wall is shown on the revised G&D plan. Scour calculations can be found in Appendix C).

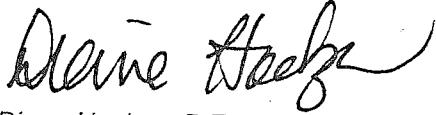


7. *The 25' public water and sewer easement has been removed from the AMAFCA property as is now reflected on the plat, grading and drainage plan and construction plans.*
8. *As requested in your letter, I am in the process of coordinating the easement for the storm drain connection to the Snow Vista basin with Martin Eckert.*

If you have any additional questions, please call me.

Sincerely,

MARK GOODWIN AND ASSOCIATES, P.A.

A handwritten signature in cursive script, appearing to read "Diane Hoelzer".

Diane Hoelzer, P.E.

cc. Brad Bingham, COA-Hydrology

file: sunrise.ran/draindex.ltr

RONALD D. BROWN, CHAIR
DANIEL W. COOK, VICE-CHAIR
CLIFFORD E. ANDERSON, P.E., SECRETARY-TREASURER
LINDA STOVER, ASST. SECRETARY-TREASURER
DANNY HERNANDEZ, DIRECTOR

JOHN P. KELLY, P.E.
EXECUTIVE ENGINEER



**Albuquerque
Metropolitan
Arroyo
Flood
Control
Authority**

2600 PROSPECT N.E. - ALBUQUERQUE, NM 87107

PHONE: (505) 884-2215
FAX: (505) 884-0214

October 18, 2000

Diane Hoelzer, PE
D. Mark Goodwin & Assoc.
PO Box 90606
Albuquerque, NM 87199

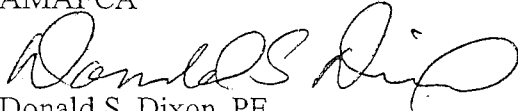
Re: Amendment Report for A-H DMP for Sunrise Ranch Unit 2 dated 8-9-00
(L9/D6) Submitted to AMAFCA 10-9-00

1. Provide documentation and/or calculations demonstrating that the SAD 222 system in 98th Street has capacity for the additional flow you propose.
2. Provide a preliminary construction plan with P & P sheet showing size, horizontal and vertical alignment of proposed drainage facility along the west property line from basin 190A. This must be capable of conveying future condition flow rates from basin 190A per the A-H DMP and meet DPM criteria. A permanent public drainage easement of sufficient size to allow for the construction, operation and maintenance of the proposed facility will be required.
3. Please provide an Exhibit suitable for reproduction showing the revised drainage basins, facilities, etc. for the changes you are proposing to the A-H DMP. Also, provide table showing the revised flow rates at critical points for the above changes. AMAFCA can supply a copy of the DMP hydrology in digital format to assist you.
4. I repeat my comment from 7-5-00, what is the interim plan for picking up drainage on Sunset Gardens? Off-site flows are currently entering Unit 2 just south of Sunset Gardens (at lot 5, Block 7). If you plan to divert these flow to Sunset Gardens, does it have the capacity? What is the flow rate? If you plan to divert to the arroyo to the south you will need to build the facility you propose in 2 above.
5. Show FEMA floodplain on plat as well as G & D Plan.
6. Are fences proposed at the property line for lots 17 and 18, Block 7? If the fence is within the erosion setback it will have to be extended down past scour depth.
7. Plat incorrectly states that AMAFCA has granted a 25' public water and sewer easement to COA. This has not been done. A detailed plan for both the water and sewer must be submitted to AMAFCA for review prior to any easement being considered. This must include profile as well as sections clearly showing utilities in relation to adjacent AMAFCA Snow Vista basin. Water and/or sewer lines may require a steel sleeve.
8. Easement for the storm drain connection to Snow Vista basin should be coordinated with Martin Eckert.

You may obtain a digital copy from AMAFCA of an orthophoto topographic map (flown in 1999) of the general area which may be of help with your design for 2 above. Contact me for details. Future bound submittals should be stamped by the Engineer and contain a unifying discussion so that the reviewer can figure out what the submitted data is in support of. When information is submitted piecemeal it adds to the review time.

If you have any questions please contact me at 884-2215.

AMAFCA

A handwritten signature in black ink, appearing to read "Donald S. Dixon". The signature is fluid and cursive, with a large, stylized "D" at the beginning.

Donald S. Dixon, PE
Drainage Engineer

Cc: B. Bingham, COA

SUNRISE RANCH UNIT 2
SUPPLEMENTAL INFORMATION

*Snow Vista
Sediment Pond*

EXHIBIT 1: EXISTING DEVELOPED DRAINAGE BASINS - SNOW VISTA BASIN

EXHIBIT 2: PROPOSED DEVELOPED DRAINAGE BASINS - SNOW VISTA BASIN

APPENDIX A - SUNRISE RANCH UNIT 2 STORM DRAIN TO SNOW VISTA SED. POND

APPENDIX B - TEMPORARY 98TH STREET SWALE

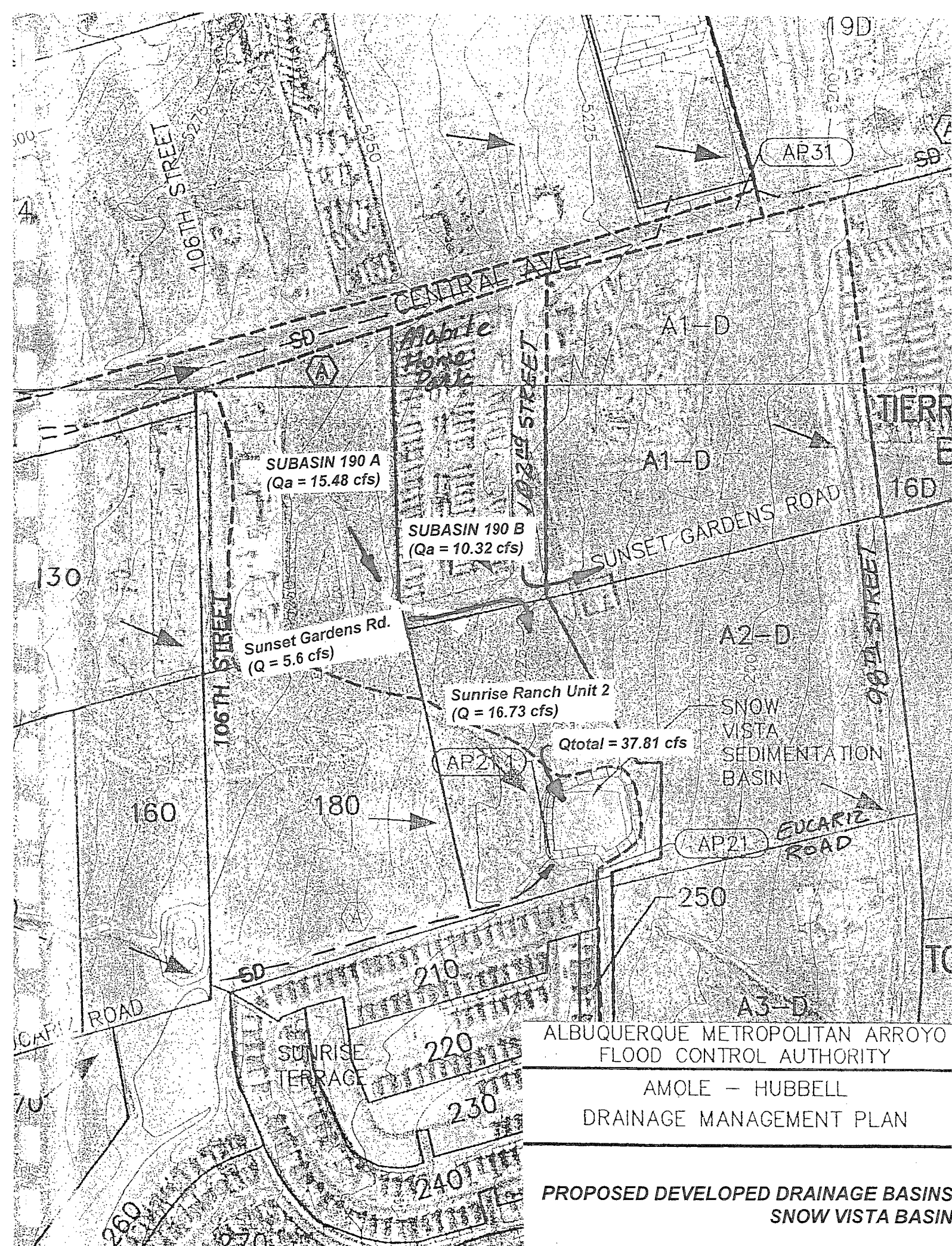
APPENDIX C - SCOUR CALCULATIONS

APPENDIX D - GRADING AND DRAINAGE PLAN, REVISED 11-16-00



L-09/D006





ALBUQUERQUE METROPOLITAN ARROYO
FLOOD CONTROL AUTHORITY

AMOLE - HUBBELL
DRAINAGE MANAGEMENT PLAN

PROPOSED DEVELOPED DRAINAGE BASINS
SNOW VISTA BASIN

Appendix A

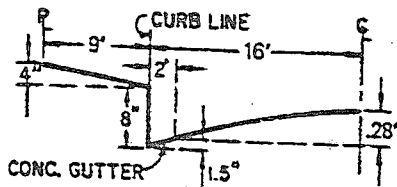
**SUNRISE RANCH UNIT 2
STORM DRAIN TO SNOW VISTA SEDIMENTATION POND**

GRATING CAPACITIES FOR TYPE DOUBLE

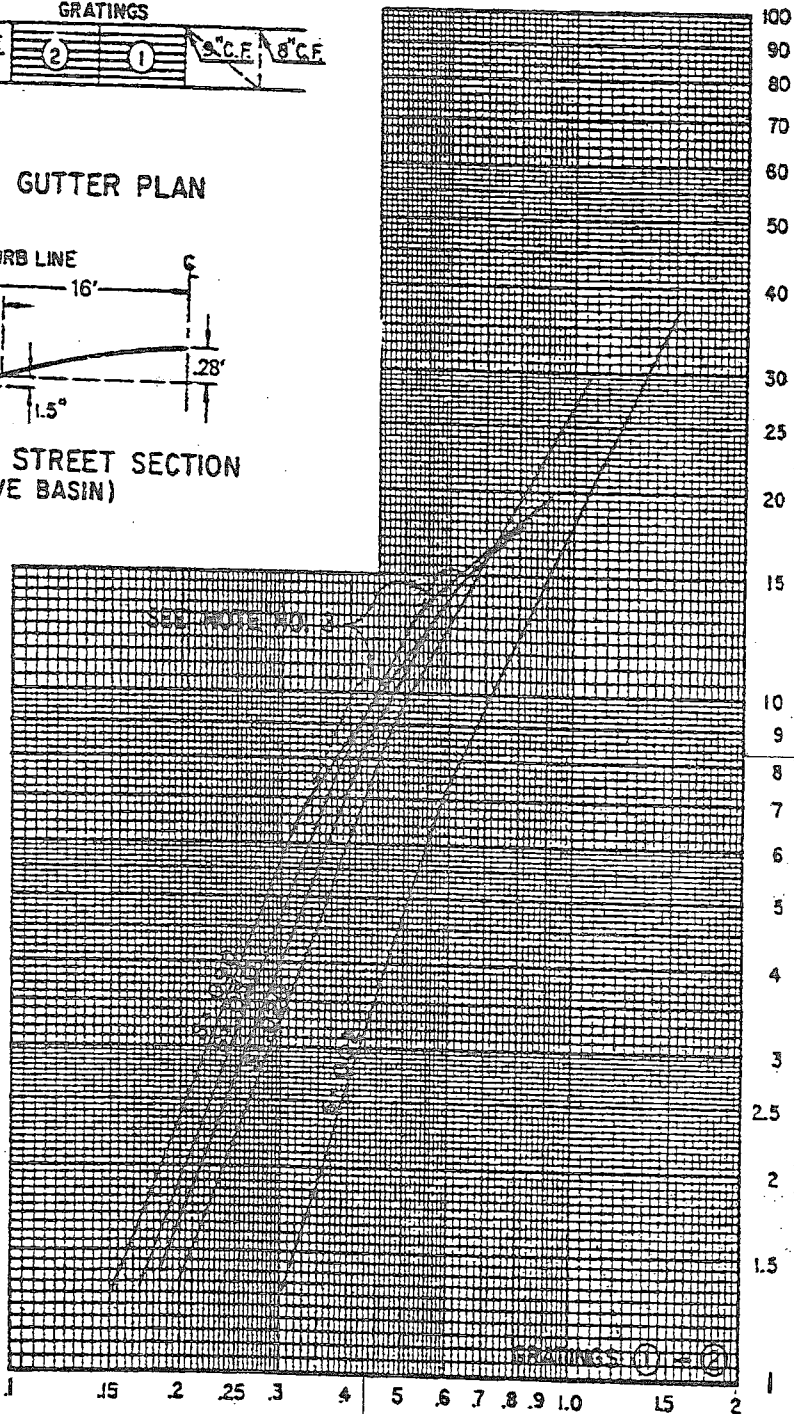
"C," AND "D"



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)



D = DEPTH OF FLOW (FT.) ABOVE NORMAL GUTTER GRADE

PLATE 22.3 D-6

$D = 34.58$
 $0.43'$

8.3 cfs (2)
16.6 cfs

15.48 cfs
5.60 cfs
13.50 cfs
34.58 cfs
- 16.60 cfs
17.98 cfs
+ 3.23 cfs
21.21 cfs

TO SUMP
INLETS



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PROJECT Sunrise Ranch Unit 2

SUBJECT SB 190 A calcs

BY DLH DATE 11-6-00

CHECKED _____ DATE _____

SHEET _____ OF _____

Flows to Snow Viste Sedimentation Pond via Roundup

SB 190 A = 15.48 cfs (allowable)

Sunset Gardens = 5.6 cfs
* (106th St - Lasso)

Sunrise Ranch Unit 2 = 16.73 cfs

Q = 37.81 cfs (Design Flow to Snow
Viste Sedimentation Pond)

* Sunset Gardens (106th St - Lasso)

1080 LF (60' R/W) = 64,800 SF = .002324 sq. mi

Land Treat D = 75%

Land Treat B = 25%

STREET CAPACITY Q TO DBL 'A' INLETS

15.48 cfs

5.60 cfs

13.50 cfs

34.58 cfs

- 16.60 cfs (INTERCEPTED (2) DBL 'A' INLETS)

17.98 cfs

+ 3.23 cfs

21.21 cfs (TO SUMP INLETS)

Appendix B

TEMPORARY 98TH STREET SWALE



D. Mark Goodwin & Associates, P.A.
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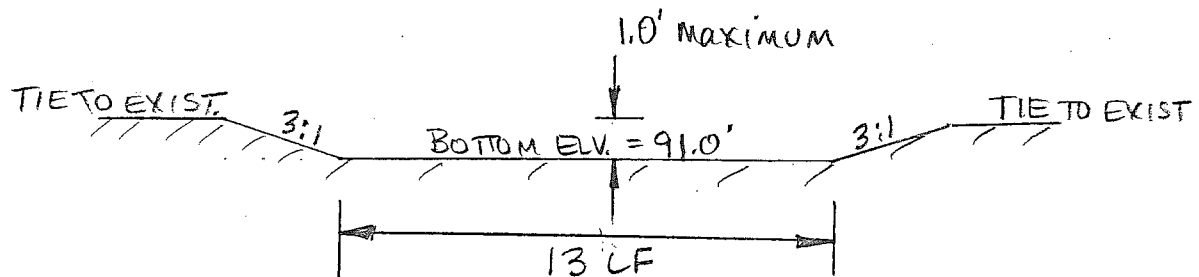
PROJECT Sunrise Ranch
SUBJECT Temporary Swale 98th
BY DLH DATE 11-5-00
CHECKED _____ DATE _____
SHEET _____ OF _____

Sunset Gardens 36' (1420 CF) = 51,120 SF = .00183 sq.mi

AHYMO @ (100) = 4.15 cfs

Volume = .180 A_c Ft (43560) = 7840 CF

$$\frac{7840 \text{ CF}}{500 \text{ LF}} = 15.68 \text{ SF}$$



```

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994
INPUT FILE = sun98sw.dat
RUN DATE (MON/DAY/YR) = 11/06/2000
USER NO. = M. GOODWIN. I01

```

[illegible]

```

*****
START      TIME=0.0
*****    SUNRISE RANCH LONGFORD HOMES (L-9)
*****    100-YEAR 24-HOUR STORM EVENT
*****    FILE: SUN98SW.DAT APR 2000 BY:DLH
*****    TYPE=2 RAIN QUARTER=0.0 IN
*****    RAIN ONE=1.87 IN RAIN SIX=2.20 IN
*****    RAIN DAY=2.66 IN DT=0.05 HR
*****    *****
*****    DEVELOPED CONDITIONS
*****    *****
*****    SUBEASIN 1 SUNSET GARDENS TEMPORARY SWALE IN 98TH STREET
*****    *****
*****    COMPUTE NM HYD
*****    ID=1 HYD NO=101 AREA=0.00183 SQ MI
*****    PER A=0 PER B=33 PER C=0 PER D=66
*****    TP=0.1333 HR MASS RAINFALL=-1
*****    ID=1 CODE=1
*****    PRINT HYD
*****    FINISH

```

Appendix C
Scour Calculations



D. Mark Goodwin & Associates, P.A.
Consulting Engineers

P.O. BOX 90606, ALBUQUERQUE, NM 87199
(505) 828-2200 FAX 797-9539
e-mail: dmgs@swcp.com

PROJECT Sunrise Ranch
SUBJECT Scour Well Calcs
BY DLH DATE 11-6-00
CHECKED _____ DATE _____
SHEET _____ OF _____

Scour Wall Calculations (Q100) (Eqn 3.88 SEDIMENT & EROSION DESIGN GUIDE)

$$\frac{Y_s}{Y_1} = 4 Fr^{0.33}$$

Fr = upstream Froude No = 1.06

Y₁ = avg. upstr. flow depth = 1.75'

$$Y_s = (1.75) 4 (1.06)^{0.33} = 7.13'$$

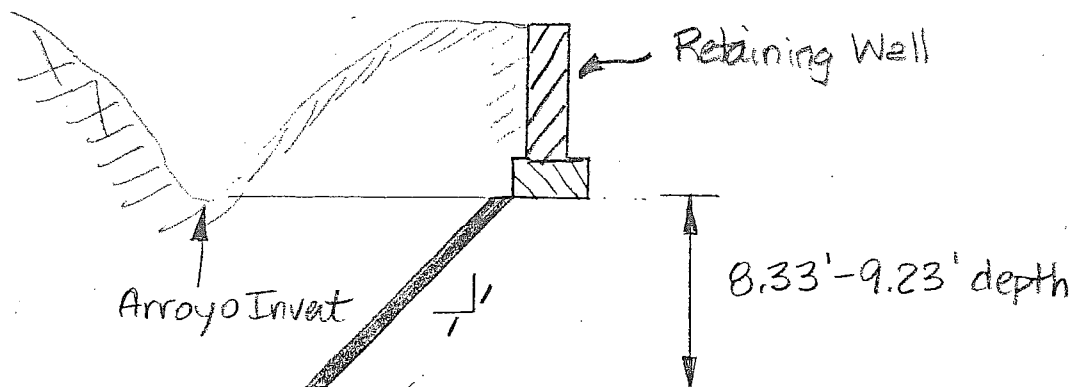
INVERT - Y_s

Scour Well Inv.

CS 1030	121.03 - 7.13'	113.90
CS 1046	121.40 - 7.13' =	114.27
CS 1076	121.80 - 7.13' =	114.67
CS 1102	122.30 - 7.13' =	115.17
CS 1130	122.65 - 7.13' =	115.52

Bkvd Elev - Scour Well Invert = Scour Well Δ Depth.

CS 1046	123.5 - 114.27 =	9.23'
CS 1076	123.6 - 114.67 =	8.93'
CS 1102	123.5 - 115.17 =	8.33'
CS 1130	123.5 - 115.52 =	7.98'
CS 1030	123.5 - 113.90 =	9.60



Location	Scour Well Elev.	
	TOP	BOTTOM
XS 1030	123.5	113.9
XS 1046	123.5	114.27
XS 1076	123.5	114.67
XS 1102	123.5	115.17
XS 1130	123.5	115.52

Offsite Arroyo - HEC-2 Analysis (cross sections on grading plan)

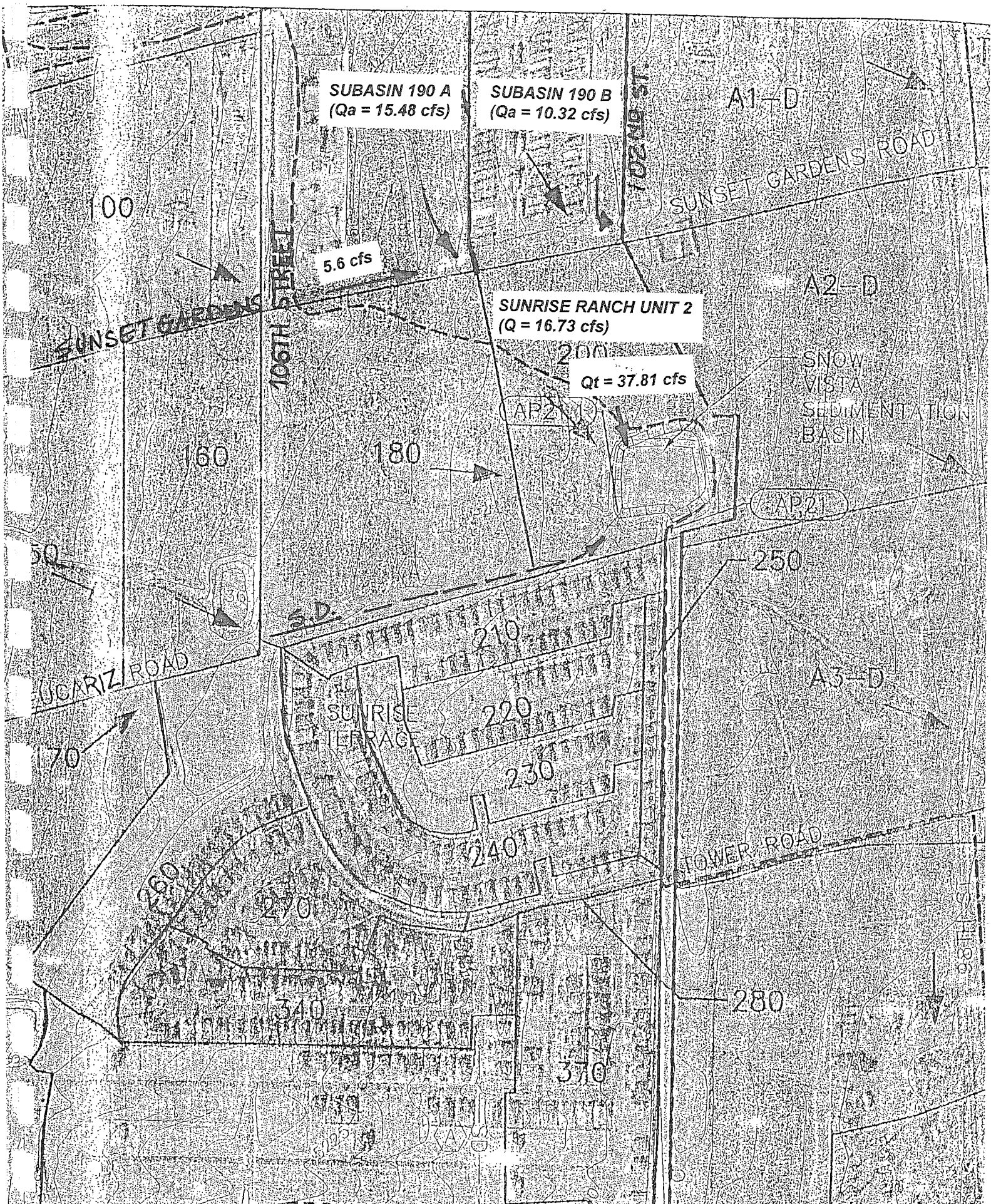
HEC-RAS Plan: Plan 01 Reach: SUNRISE

River Sta.	Q Total	Min Ch El	W.S. Elev	Crk W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
	(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
1375	212.00	28.60	31.35	31.91	33.04	0.040021	10.43	20.32	13.47	1.50
1366.75*	212.00	28.20	31.14	31.42	32.29	0.025720	8.61	24.62	15.98	1.22
1336.5*	212.00	27.80	30.62	30.91	31.78	0.026818	8.63	24.56	16.60	1.25
1320.25*	212.00	27.40	30.11	30.39	31.26	0.027243	8.60	24.66	17.13	1.26
1302	212.00	27.00	29.63	29.89	30.74	0.025954	8.43	25.15	17.44	1.24
1285.33*	212.00	26.30	28.61	29.09	30.15	0.040352	9.97	21.27	16.04	1.52
1268.66*	212.00	25.60	27.77	28.29	29.43	0.044626	10.33	20.52	15.85	1.60
1252	212.00	24.90	26.96	27.50	28.69	0.047123	10.53	20.14	15.79	1.64
1235.33*	212.00	24.57	26.78	27.08	27.85	0.032603	8.30	25.55	22.07	1.36
1218.66*	212.00	24.23	26.95		27.39	0.013228	5.35	39.66	33.87	0.87
1202	212.00	23.90	26.61	26.61	27.13	0.018782	5.74	36.95	36.89	1.01
1185.66*	212.00	23.55	25.69	26.01	26.70	0.028494	8.05	26.33	21.49	1.28
1169.33*	212.00	23.20	25.09	25.43	26.20	0.032019	8.44	25.11	20.91	1.36
1153	212.00	22.85	24.58	24.90	25.69	0.032076	8.45	25.10	20.98	1.36
1141.5*	212.00	22.75	24.66	24.79	25.44	0.022620	7.09	29.89	25.09	1.14
* 1130	212.00	22.65	24.56	24.65	25.26	0.021592	6.73	31.50	27.69	1.11
1116*	212.00	22.47	24.38	24.44	25.00	0.019718	6.32	33.54	30.36	1.06
* 1102	212.00	22.30	24.18	24.19	24.73	0.018074	5.91	35.89	33.80	1.01
* 1089*	212.00	22.05	23.71	23.87	24.43	0.027025	6.82	31.08	31.94	1.22
* 1076	212.00	21.80	23.46	23.54	24.07	0.021752	6.25	33.92	33.80	1.10
1061*	212.00	21.60	23.20	23.24	23.74	0.020291	5.92	35.82	36.79	1.06
* 1046	212.00	21.40	22.94	22.95	23.46	0.019144	5.82	36.41	36.66	1.03
1030.66*	212.00	21.03	22.74	22.69	23.20	0.015885	5.45	38.89	37.60	0.94
1015.33*	212.00	20.67	22.56		22.97	0.012726	5.17	41.03	36.37	0.86
* 1000	212.00	20.30	22.15	22.15	22.73	0.017591	6.10	34.75	30.52	1.01

* Cross Sections used in scour calculations

Appendix A

***SUNRISE RANCH UNIT 2
STORM DRAIN TO SNOW VISTA SEDIMENTATION POND***



SUBBASIN 190 A
($Q_a = 15.48$ cfs)

SUBBASIN 190 B
($Q_a = 10.32$ cfs)

SUNRISE RANCH UNIT 2
($Q = 16.73$ cfs)

$Q_t = 37.81$ cfs

5.6 cfs

A1-D

A2-D

SNOW
VISTA
SEDIMENTATION
BASIN

A3-D

SUNRISE
TERRACE

210

220

230

240

270

340

370

280

TOWER ROAD

SUGARIZ ROAD

SUNSET GARDENS ROAD

106TH STREET

15th St

15th St



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e-mail: dmgs@swcp.com

PROJECT Sunrise Ranch Unit 2
SUBJECT SB 190 A calcs
BY DLH DATE 11-6-00
CHECKED _____ DATE _____
SHEET _____ OF _____

Flows to Snow Viste Sedimentation Pond via Roundup

SB 190 A = 15.48 cfs (allowable)

* Sunset Gardens = 5.6 cfs
* (106th St - Lasso)

Sunrise Ranch Unit 2 = 16.73 cfs

$Q = 37.81 \text{ cfs}$ (Design Flow to Snow
Viste Sedimentation Pond)

* Sunset Gardens (106th St - Lasso)

1080 LF (60' RLW) = 64,800 SF = .002324 sq. mi

Land Treat D = 75%

Land Treat B = 25%

STREET CAPACITY Q TO DBL 'A' INLETS

15.48 cfs

5.60 cfs

13.50 cfs

34.58 cfs

- 16.60 cfs (INTERCEPTED (2) DBL 'A' INLETS)

17.98 cfs

+ 3.23 cfs

21.21 cfs (TO SUM P. INLETS)

TABLE III-3
HYDROLOGIC SUMMARY
SNOW VISTA BASIN
(REVISED 11-6-00)

AP NO.	MAP NO.	DESCRIPTION	VARIABLE	PROPOSED DMP FACILITIES	
				DMP	FUTURE CAPACITY
21.1	4	SNOW VISTA SEDIMENTATION BASIN	Q (cfs) Tvol (AF) Dvol (AF) Runoff (in) cfs/ac	400 51.5 6.3 2.07 1.36	484
21	4	SNOW VISTA CHANNEL AT HEAD	Q (cfs) Tvol (AF) Runoff (in) cfs/ac	372 51.5 2.07 1.25	375
22	4	SNOW VISTA BELOW SECTION LINE JUNCTION	Q (cfs) Tvol (AF) Runoff (in) cfs/ac	726 93 1.97 1.29	810
22.1	4	SNOW VISTA BELOW SAGE CROSSING	Q (cfs) Tvol (AF) Runoff (in) cfs/ac	895 112.1 1.92 1.28	930
22.2	4	SNOW VISTA BELOW INLET FROM WESTGATE	Q (cfs) Tvol (AF) Runoff (in) cfs/ac	1012 119.4 1.92 1.36	1050
23	4	SNOW VISTA BELOW BENAVIDES INLET	Q (cfs) Tvol (AF) Runoff (in) cfs/ac	2045 165.1 1.88 1.92	2100
24	7	SNOW VISTA AT ENTRANCE TO AMOLE ARROYO	Q (cfs) Tvol (AF) Runoff (in) cfs/ac	2065 181.1 1.87 1.77	2100

Appendix B

TEMPORARY 98TH STREET SWALE



D. Mark Goodwin & Associates, P.A.
Consulting Engineers

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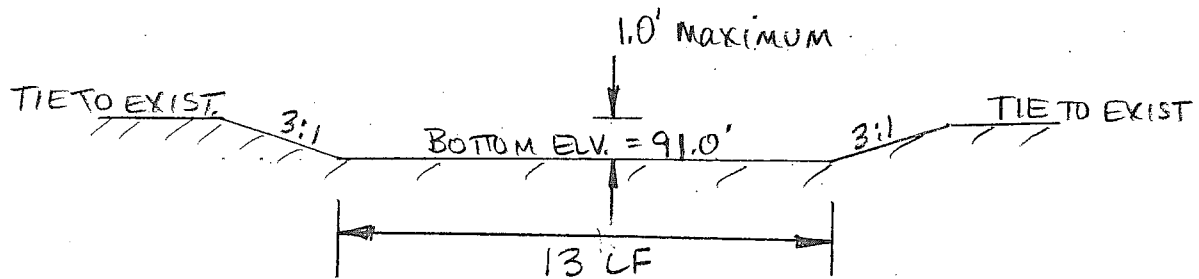
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SUBJECT Temporary Swale 98th
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CHECKED _____ DATE _____
SHEET _____ OF _____

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AHYMO @ (100) = 4.15 cfs

Volume = .180 Ac Ft (43560) = 7840 CF

$$\frac{7840 \text{ CF}}{500 \text{ LF}} = 15.68 \text{ SF}$$



AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =11/06/2000
 INPUT FILE = sun98sw.dat USER NO.= M_GOODWN.I01

COMMAND	HYDROGRAPH IDENTIFICATION	FROM TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	PAGE = 1	NOTATION
START										
RAINFALL TYPE= 2										
COMPUTE NM HYD	101.00	- 1	.00183	4.15	.180	1.84028	1.500	3.547		RAIN24= 2.660
FINISH										PER IMP= 66.67

START TIME=0.0
 ***** SUNRISE RANCH LONGFORD HOMES (L-9)
 ***** 100-YEAR 24-HOUR STORM EVENT
 ***** FILE: SUN98SW.DAT APR 2000 BY:DLH
 RAINFALL TYPE=2 RAIN QUARTER=0.0 IN
 RAIN ONE=1.87 IN RAIN SIX=2.20 IN
 RAIN DAY=2.66 IN DT=0.05 HR
 ***** DEVELOPED CONDITIONS *****
 ***** SUBASIN 1 SUNSET GARDENS TEMPORARY SWALE IN 98TH STREET *****

 COMPUTE NM HYD ID=1 HYD NO=101 AREA=0.00183 SQ MI
 PER A=0 PER B=33 PER C=0 PER D=66
 TP=0.1333 HR MASS RAINFALL=-1
 ID=1 CODE=1
 PRINT HYD
 FINISH

Appendix C
Scour Calculations



D. Mark Goodwin & Associates, P.A.
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Fr = upstream Froude No = 1.06

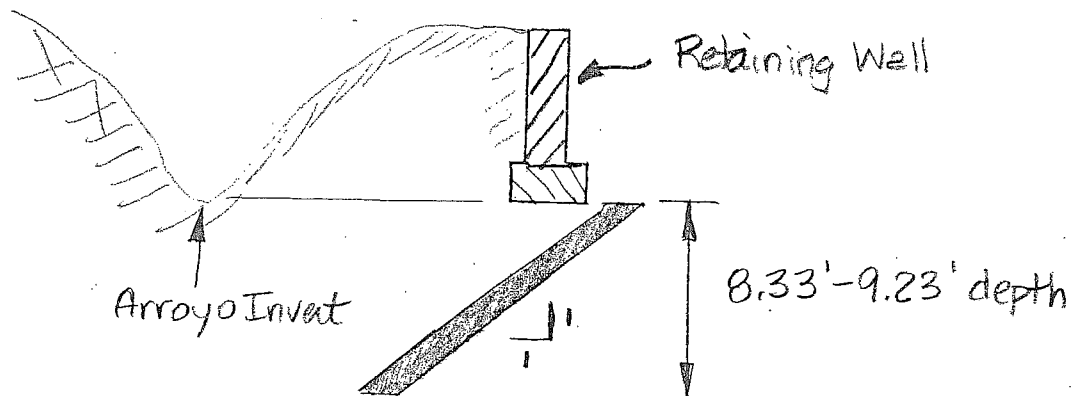
Y_1 = avg. upstr. flow depth = 1.75'

$$Y_s = (1.75) 4(1.06)^{0.33} = 7.13'$$

	INVERT - Y_s	Scour Wall Inv.
CS 1030	121.03 - 7.13'	113.90
CS 1046	121.40 - 7.13' =	114.27
CS 1076	121.80 - 7.13' =	114.67
CS 1102	122.30 - 7.13' =	115.17
CS 1130	122.65 - 7.13' =	115.52

Bkyl Elev - Scour Wall Invert = Scour Wall Δ Depth.

CS 1046	123.5 - 114.27 =	9.23'
CS 1076	123.6 - 114.67 =	8.93'
CS 1102	123.5 - 115.17 =	8.33'
CS 1130	123.5 - 115.52 =	7.98'
CS 1030	123.5 - 113.90 =	9.60



Location	Scour Wall Elev.
	TOP BOTTOM
XS 1030	123.5 113.9
XS 1046	123.5 114.27
XS 1076	123.5 114.67
XS 1102	123.5 115.17
XS 1130	123.5 115.52

HEC-RAS Plan: Plan 01 Reach: SUNRISE

River Sta.	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
	(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
1375	212.00	28.60	31.35	31.91	33.04	0.040021	10.43	20.32	13.47	1.50
1356.75*	212.00	28.20	31.14	31.42	32.29	0.025720	8.61	24.62	15.98	1.22
1338.5*	212.00	27.80	30.62	30.91	31.78	0.026818	8.63	24.56	16.60	1.25
1320.25*	212.00	27.40	30.11	30.39	31.26	0.027243	8.60	24.66	17.13	1.26
1302	212.00	27.00	29.63	29.89	30.74	0.025954	8.43	25.15	17.44	1.24
1285.33*	212.00	26.30	28.61	29.09	30.15	0.040352	9.97	21.27	16.04	1.52
1268.66*	212.00	25.60	27.77	28.29	29.43	0.044626	10.33	20.52	15.85	1.60
1252	212.00	24.90	26.96	27.50	28.69	0.047123	10.53	20.14	15.79	1.64
1235.33*	212.00	24.57	26.78	27.08	27.85	0.032603	8.30	25.55	22.07	1.36
1218.66*	212.00	24.23	26.95		27.39	0.013228	5.35	39.66	33.87	0.87
1202	212.00	23.90	26.61	26.61	27.13	0.018782	5.74	36.95	36.89	1.01
1185.66*	212.00	23.55	25.69	26.01	26.70	0.028494	8.05	26.33	21.49	1.28
1169.33*	212.00	23.20	25.09	25.43	26.20	0.032019	8.44	25.11	20.91	1.36
1153	212.00	22.85	24.58	24.90	25.69	0.032076	8.45	25.10	20.98	1.36
1141.5*	212.00	22.75	24.66	24.79	25.44	0.022620	7.09	29.89	25.09	1.14
1130	212.00	22.65	24.56	24.65	25.26	0.021592	6.73	31.50	27.69	1.11
1116*	212.00	22.47	24.38	24.44	25.00	0.019718	6.32	33.54	30.36	1.06
1102	212.00	22.30	24.18	24.19	24.73	0.018074	5.91	35.89	33.80	1.01
1089*	212.00	22.05	23.71	23.87	24.43	0.027025	6.82	31.08	31.94	1.22
1076*	212.00	21.80	23.46	23.54	24.07	0.021752	6.25	33.92	33.80	1.10
1061*	212.00	21.60	23.20	23.24	23.74	0.020291	5.92	35.82	36.79	1.06
1046	212.00	21.40	22.94	22.95	23.46	0.019144	5.82	36.41	36.66	1.03
1030.66*	212.00	21.03	22.74	22.69	23.20	0.015885	5.45	38.89	37.60	0.94
1016.33*	212.00	20.67	22.56		22.97	0.012726	5.17	41.03	36.37	0.86
1000	212.00	20.30	22.15	22.15	22.73	0.017591	6.10	34.75	30.52	1.01

MEMORANDUM

To: AMAFCA Board Members
From: Diane Hoelzer, P.E.
Mark Goodwin & Associates, PA
Subject: Amole-Hubbell Drainage Management Plan
Revised Drainage Subasin 190
Date: November 7, 2000

Under existing conditions, Subasin 190 is part of the Tower-Sage Drainage Basin. (Refer to attached Exhibit). Under developed conditions, subasin 190 was placed in the Snow Vista Basin according to the Amole-Hubbell Drainage Management Plan.

As a result of the existing grades in the area and more specifically the existing low lying area east of the present mobile home park in 102nd street midway between Central Avenue and Sunset Gardens Road, it has been proposed to remove approximately 40 percent of the eastern portion of subasin 190 (subasin 190 B) and make it part of the Tower-Sage Basin 98th street storm drain system. The remaining 60 percent of subasin 190 will remain in the Snow Vista Drainage Basin as shown on the attached exhibit (Subasin 190 A) and will be allowed to drain to the Snow Vista Sedimentation Pond through the currently developing Sunrise Ranch Unit 2 subdivision. The mobile home park site will still be restricted to an allowable discharge rate of 1.29 cfs/acre (10.32 cfs) as was previously determined for subasin 190 as part of the Snow Vista Drainage Basin. This increase in discharge to the Tower-Sage 98th street storm drain system equates to approximately 5.7 cfs at the Eucariz-98th street intersection, an overall increase of approximately 3 percent.

HYDRAULIC REPORT FOR

SUNRISE RANCH

STORM DRAIN ANALYSIS

OUTFALL TO SNOW VISTA

SEDIMENTATION POND

INITIAL HGL =114.6

NOVEMBER 2000

MARK GOODWIN & ASSOCIATES

DLH

LINE 1 / Q = 37.8 / HT = 30 / WID = 30 / N = .013 / L = 42 / JLC = .1

OUTFALL-MH43 / Outfall

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	114.60	30.00	111.00	7.70	115.52	0.00	6.5	4.91
UPSTRM	114.96	30.00	111.81	7.70	115.88	0.00	4.88	4.91

Drainage area (ac)	=	0	Slope of invert (%)	=	1.929
Runoff coefficient	=	0	Slope energy grade line (%)	=	0.850
Time of conc (min)	=	1	Critical depth (in)	=	24.65
Inlet time (min)	=	0	Req'd length curb inlet (ft)	=	0.0
Intensity (in/hr)	=	0.00	Req'd grate area (sf)	=	0.0
Cumulative C*A	=	0.0	Depth at inlet opening (in)	=	0
Flow contrib (cfs)	=	37.8	Confluence angle (deg)	=	0
Default Q (cfs)	=	37.81	Natural ground elev. (ft)	=	119.2
Line capac. (cfs)	=	57.0	Line storage (cuft)	=	206

LINE 2 / Q = 37.8 / HT = 30 / WID = 30 / N = .013 / L = 176.04 / JLC = .1

MH43-MH44 / DNLN = 1

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	115.05	30.00	111.81	7.70	115.97	0.00	4.88	4.91
UPSTRM	116.55	30.00	113.02	7.70	117.47	0.00	2.63	4.91

Drainage area (ac)	=	0	Slope of invert (%)	=	0.687
Runoff coefficient	=	0	Slope energy grade line (%)	=	0.850
Time of conc (min)	=	0	Critical depth (in)	=	24.65
Inlet time (min)	=	0	Req'd length curb inlet (ft)	=	0.0
Intensity (in/hr)	=	0.00	Req'd grate area (sf)	=	0.0
Cumulative C*A	=	0.0	Depth at inlet opening (in)	=	0
Flow contrib (cfs)	=	37.8	Confluence angle (deg)	=	20
Default Q (cfs)	=	37.81	Natural ground elev (ft)	=	118.15
Line capac. (cfs)	=	34.0	Line storage (cuft)	=	864

LINE 3 / Q = 21.2 / HT = 24 / WID = 24 / N = .013 / L = 9.422 / JLC = .1

MH44-INL11 / DNLN = 2

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	116.64	24.00	113.52	6.75	117.35	0.00	2.63	3.14
UPSTRM	116.72	24.00	113.66	6.75	117.43	0.00	2.1	3.14

Drainage area (ac)	=	0	Slope of invert (%)	=	1.486
Runoff coefficient	=	0	Slope energy grade line (%)	=	0.880
Time of conc (min)	=	0	Critical depth (in)	=	19.57
Inlet time (min)	=	0	Req'd length curb inlet (ft)	=	0.0
Intensity (in/hr)	=	0.00	Req'd grate area (sf)	=	0.0
Cumulative C*A	=	0.0	Depth at inlet opening (in)	=	0
Flow contrib (cfs)	=	21.2	Confluence angle (deg)	=	40
Default Q (cfs)	=	21.21	Natural ground elev (ft)	=	117.77
Line capac. (cfs)	=	27.6	Line storage (cuft)	=	30

LINE 4 / Q = 21.2 / HT = 18 / WID = 18 / N = .013 / L = 7 / JLC = .1

INL#11-INL#12 / DNLN = 3

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	116.79	18.00	114.16	12.00	119.03	0.00	2.1	1.77
UPSTRM	117.30	18.00	114.27	12.00	119.54	0.00	2.25	1.77

Drainage area (ac)	=	0	Slope of invert (%)	=	1.571
Runoff coefficient	=	0	Slope energy grade line (%)	=	7.276
Time of conc (min)	=	0	Critical depth (in)	=	17.84
Inlet time (min)	=	0	Req'd length curb inlet (ft)	=	0.0
Intensity (in/hr)	=	0.00	Req'd grate area (sf)	=	0.0
Cumulative C*A	=	0.0	Depth at inlet opening (in)	=	0
Flow contrib (cfs)	=	21.2	Confluence angle (deg)	=	-45
Default Q (cfs)	=	21.21	Natural ground elev (ft)	=	118.02
Line capac. (cfs)	=	13.2	Line storage (cuft)	=	12

LINE 5 / Q = 16.6 / HT = 18 / WID = 18 / N = .013 / L = 48.57 / JLC = .1

 MH#44-MH#45 / DNLN = 2

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	116.64	18.00	114.02	9.40	118.01	0.00	2.63	1.77
UPSTRM	117.85	18.00	114.90	9.39	119.22	0.00	2.54	1.77

Drainage area (ac)	=	0	Slope of invert (%)	=	1.812
Runoff coefficient	=	0	Slope energy grade line (%)	=	2.499
Time of conc (min)	=	0	Critical depth (in)	=	17.32
Inlet time (min)	=	0	Req'd length curb inlet (ft)	=	0.0
Intensity (in/hr)	=	0.00	Req'd grate area (sf)	=	0.0
Cumulative C*A	=	0.0	Depth at inlet opening (in)	=	0
Flow contrib (cfs)	=	16.6	Confluence angle (deg)	=	-15
Default Q (cfs)	=	16.6	Natural ground elev (ft)	=	118.95
Line capac. (cfs)	=	14.1	Line storage (cuft)	=	86

LINE 6 / Q = 8.3 / HT = 18 / WID = 18 / N = .013 / L = 19.71 / JLC = .1

 MH#45-INL#14 / DNLN = 5

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	117.99	18.00	114.90	4.70	118.33	0.00	2.54	1.77
UPSTRM	118.15	18.00	115.26	4.70	118.49	0.00	2.5	1.77

Drainage area (ac)	= 0	Slope of invert (%)	= 1.826
Runoff coefficient	= 0	Slope energy grade line (%)	= 0.799
Time of conc (min)	= 0	Critical depth (in)	= 13.19
Inlet time (min)	= 0	Req'd length curb inlet (ft)	= 0.0
Intensity (in/hr)	= 0.00	Req'd grate area (sf)	= 0.0
Cumulative C*A	= 0.0	Depth at inlet opening (in)	= 0
Flow contrib (cfs)	= 8.3	Confluence angle (deg)	= -15
Default Q (cfs)	= 8.3	Natural ground elev (ft)	= 119.26
Line capac. (cfs)	= 14.2	Line storage (cuft)	= 35

LINE 7 / Q = 8.3 / HT = 18 / WID = 18 / N = .013 / L = 16.64 / JLC = 0

MH#45-INL#13 / DNLN = 5

	HGL	DEPTH	INVERT	VEL	EGL	T WID	COVER	AREA
DNSTRM	117.99	18.00	114.90	4.70	118.33	0.00	2.54	1.77
UPSTRM	118.09	18.00	115.12	4.70	118.44	0.00	2.5	1.77

Drainage area (ac)	=	0	Slope of invert (%)	=	1.322
Runoff coefficient	=	0	Slope energy grade line (%)	=	0.625
Time of conc (min)	=	0	Critical depth (in)	=	13.19
Inlet time (min)	=	0	Req'd length curb inlet (ft)	=	0.0
Intensity (in/hr)	=	0.00	Req'd grate area (sf)	=	0.0
Cumulative C*A	=	0.0	Depth at inlet opening (in)	=	0
Flow contrib (cfs)	=	8.3	Confluence angle (deg)	=	75
Default Q (cfs)	=	8.3	Natural ground elev (ft)	=	119.12
Line capac. (cfs)	=	12.1	Line storage (cuft)	=	29

* U.S. ARMY CORPS OF ENGINEERS
* THE HYDROLOGIC ENGINEERING CENTER
* 609 SECOND STREET, SUITE D
* DAVIS, CALIFORNIA 95616-4687
* (916) 756-1104, (916) 551-1748

* WATER SURFACE PROFILES
* VERSION OF SEPTEMBER 1988
* ERROR: 01.02
* UPDATED: 4 APRIL 1989
* RUN DATE 11/ 6/ 0 TIME 17:31:24

X X XXXXXXXX XXXXX
X X X X X
X X X X X
XXXXXXXX XXXX
X X X X X
X X X X X
X XXXXXXXX XXXXX

XXXXX
X
XXXXX
X
XXXXXX

END OF BANNER

THIS RUN EXECUTED 11/ 6/ 0 17:31:24

HEC2 RELEASE DATED SEP 88 UPDATED APR 1989

ERROR CORR - 01.02

MODIFICATION -

T1 SUNRISE RANCH UNIT 2 STREET CAPACITY (44' ROW)

T2 26'FF W/ STANDARD CURB (Roundup)

T3 Double Type 'A' Inlet

J1 ICHECK INQ NINV IDIR STRT METRIC HVINS Q WSEL FQ
0 2 0 1 .03464 0 0 0 0 0

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

	38	43	1	2	26	4	68	3
NC	.017	.017	.017	.1	.3			
QT	1	34.58						
X1	1	9	0	44	0			0
GR	.85	0	.67	8.9	0	.125	11	23
GR	.125	33	0	35	.67	.85	44	

SECTO	DEPTH	CWSEL	CRWS	WSELK	EG	HV	HL	OLOSS	BANK ELEV
Q	QLOB	QCH	QROB	ALOB	ACH	AROB	VOL	TWA	LEFT/RIGHT
TIME	VLOB	VCH	VROB	XNL	XNCH	XNR	WTN	ELMIN	SSTA
SLOPE	XLOBL	XLCH	XLOBR	ITRIAL	IDC	ICONT	CORAR	TOPWID	ENDST

*PROF 1

CCHV= .100 CEHV= .300

*SECNO 1.000

2096 WSEL NOT GIVEN, AVG OF MAX, MIN USED

1.00	.43	.43	.59	.00	.97	.54	.00	.00	.85
35.	0.	35.	0.	0.	6.	0.	0.	0.	.85
.00	.00	5.89	.00	.000	.017	.000	.000	.00	8.94
.034618	0.	0.	0.	0	11	5	.00	26.13	35.06

THIS RUN EXECUTED 11/ 6/ 0 17:31:24

 HEC2 RELEASE DATED SEP 88 UPDATED APR 1989
 ERROR CORR - 01,02
 MODIFICATION -

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

Double Type 'A' Inlet

SUMMARY PRINTOUT

SECNO	Q	CWSEL	CRWS	VCH	TOPWID	FRCH	EG
1.000	34.58	.43	.59	5.89	26.13	2.19	.97

11/ 6/ 0 17:31:24

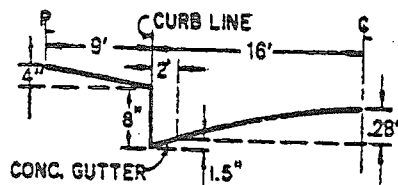
SUMMARY OF ERRORS AND SPECIAL NOTES

GRATING CAPACITIES FOR TYPE DOUBLE

'C,' AND 'D'



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)

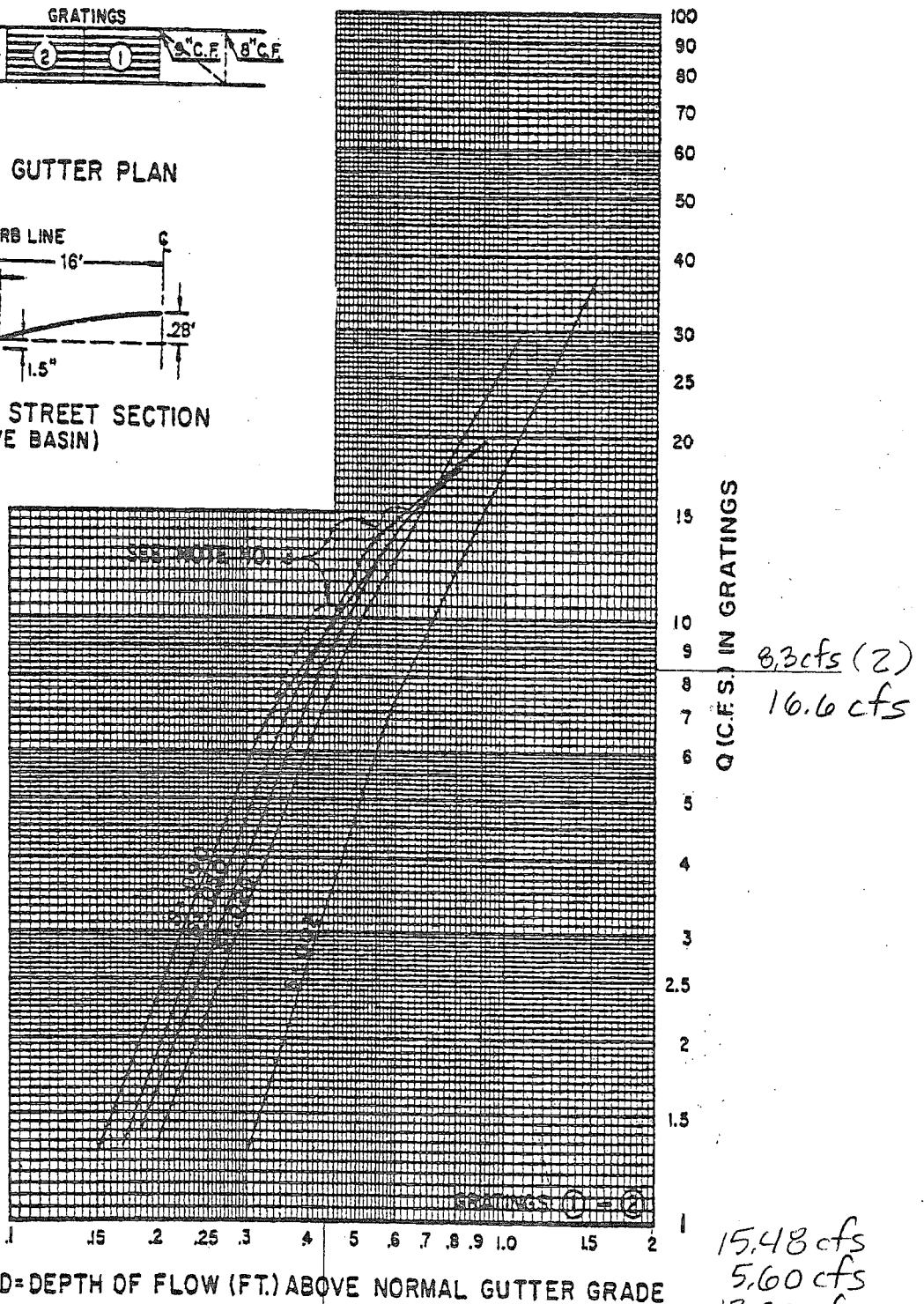


PLATE 22.3 D-6

$Q = 34.58$
 $0.43'$

TO SUMP
INLETS

15.48 cfs
5.60 cfs
13.50 cfs

34.58 cfs
- 16.60 cfs

17.98 cfs
+ 3.23 cfs

21.21 cfs

CALCULATIONS FOR SUMP INLETS
for
Sunrise Ranch Unit 2

Capacity is measured by the weir equation at the lip of the gutter assuming an allowable ponding elevation equal to the lowest adjacent right of way elevation. The length of the double grate facing the street is 6.5' and the maximum depth is 0.725' at the lip of the gutter. The sides are each 2' long and the average depth is 0.892'. These depths assume an 8" curb with right of way 9' behind the curb for an additional depth of 0.18' above the top of curb. From the weir equation:

Roundup Culdesac sump inlets:

For a double 'C' type inlet

Front $Q \text{ cap} = (3.0) \times (6.5') \times (0.725) **1.5 = 12.04 \text{ cfs}$

Sides $Q \text{ cap} = (3.0) \times (4.0') \times (0.892) **1.5 = 10.11 \text{ cfs}$

Total $Q \text{ cap} = 12.04 \text{ cfs} + 10.11 \text{ cfs} = 22.15 \text{ cfs}$

The 100 year flow to the sump 21.21 cfs. Since no overflow is provided to the Snow Vista Pond the sump inlets are designed for at minimum 2 times the flow or 42.42 cfs. Two double 'C' type inlet has a capacity of 44.30 cfs.

