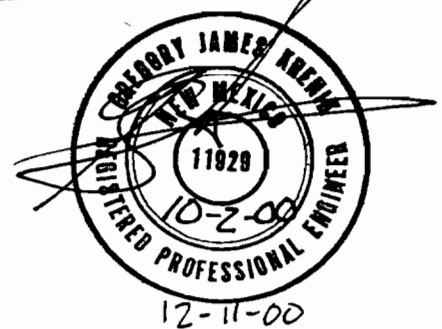
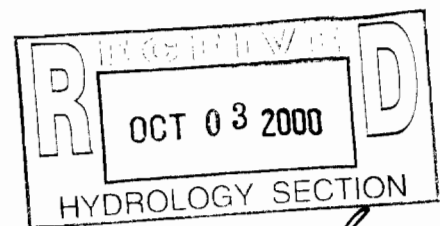


DRAINAGE CALCULATIONS
FOR
PARADISE SKIES UNITS 8 & 9





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PROJECT PARADISE SKIES UNITS 8+9
SUBJECT DRAINAGE CALCS
BY GJK DATE 9-28-00
CHECKED _____ DATE _____
SHEET 1 OF 1

- THIS SITE IS PART OF THE PARADISE SKIES SUBDIVISION UNITS 3-7 (A11/D3A) PREPARED BY TERRA WEST, LLC 6-19-98
- THIS SITE IS ADJACENT TO PARADISE SKIES UNIT 7 PREPARED BY MARK GOODWIN & ASSOCIATES.
- THIS SITE WILL TIE INTO THE STORM DRAIN DESIGNED IN THE PARADISE SKIES UNIT 4B REPORT PREPARED BY MARK GOODWIN & ASSOCIATES (A11/D3A1) 5-10-00.
- SITE DOES NOT LIE IN A 100 YR FLOOD ZONE
- THE SITE WILL BE SPLIT INTO 2 UNITS
UNIT 8 THE EAST HALF (72 LOTS)
UNIT 9 THE WEST HALF (78 LOTS)
- RUNOFF FROM ROCKCLIFF WILL FLOW SOUTH AND DISCHARGE THROUGH UNIT 5. (REPORT PREPARED BY MARK GOODWIN & ASSOCIATES) THIS RUNOFF WAS INCLUDED IN THE UNIT 5 REPORT.
- RUNOFF FROM MILKY WAY WILL FOLLOW THE PARADISE SKIES UNIT 3-7 REPORT PREPARED BY TERRA WEST. THIS FLOW WILL SHEET FLOW ACROSS MILKY WAY AND FLOW EAST DOWN PERSEUS AVE, CANIS AVE AND ANDROMEDA AVE.
- McMAHON BLVD WILL NOT BE CONSTRUCTED AS PART OF THIS PROJECT BUT FLOWS HAVE BEEN ANALYSED WITH THE PARADISE SKIES UNIT 3-7 REPORT. THESE FLOWS WILL TRAVEL EAST TOWARD UNSER. PER THE REPORT, STORM DRAIN IS NOT REQUIRED ALONG THIS FRONTAGE.
- RUNOFF FROM UNITS 8 & 9 WILL FLOW IN THE STREETS UNTIL STORM DRAIN IS REQUIRED. THIS STORM DRAIN WILL ENTER MILKY WAY AND FLOW SOUTH AND TIE INTO THE STORM DRAIN MUHOLE AT UNIT 7.
- SITE IS BASIN E OF THE PARADISE SKIES UNITS 3-7 REPORT WITH A Q OF 69.02 CFS (SEE ATTACHED BASIN MAP)



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PROJECT PARADISE SKIES UNITS 8 & 9
SUBJECT DRAINAGE CALCS
BY GJK DATE 7-28-00
CHECKED _____ DATE _____
SHEET 2 OF _____

• SITE AREA = 19,2058 AC

$$\begin{aligned} \text{PADS} &= 30 \times 65 = 1950 & \text{150 LOTS} \\ \text{DRIVES} &= 20 \times 20 = 400 \\ & \quad \quad \quad 2350 \text{ SF / LOT TYPE "D"} \end{aligned}$$

$$\text{AREA "D" FOR LOTS} = 8.0923 \text{ AC}$$

• ROW AREA = 2.5868 AC

$$20\% \text{ "B"} = 0.5174 \text{ AC}$$

$$80\% \text{ "D"} = 2.0694 \text{ AC}$$

$$\text{TOTAL "D"} = 8.0923 + 2.0694 = 10.1617 \text{ AC} = 52.91\%$$

$$\text{TOTAL "B"} = 19,2058 - 10.1617 = 9.0441 \text{ AC} = 47.09\%$$

• FIND PER LOT RUNOFF

$$P_1 = 1.42 \text{ in}$$

$$P_6 = 2.22 \text{ in}$$

$$P_{24} = 2.70 \text{ in}$$

FROM A144MO OUTPUT SHEETS 11-13

$$Q = 64.40 \text{ cfs} < 69.02 \text{ cfs PER UNIT 3-7 REPORT}$$

$$\text{PER LOT RUNOFF} = \frac{64.40}{150} = 0.4293 \text{ cfs / LOT}$$

• RUNOFF FOR UNIT 8

$$72 \times 0.4293 = 30.91 \text{ cfs}$$

• RUNOFF FOR UNIT 9

$$78 \times 0.4293 = 33.49 \text{ cfs}$$

• SIZE STREETS

$$28' \text{ F-F } n = 0.017$$

STD C+G

	5%	3.85%	3%	1%	2%
d =	0.37	0.4	0.43	0.57	0.48
WP =	28.74	28.80	28.86	29.14	
A =	4.23	5.07	5.91	9.55	
V =	5.45 F/S	5.387 F/S	5.26 F/S	4.16 F/S	
Q =	23.05 cfs	27.31 cfs	31.09 cfs	39.68 cfs	
$d + V^2/2g =$	0.83	0.85	0.86	0.84	
NUMBER OF LOTS		63.61	72.41	92.42	
	53.69				



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PROJECT PARADISE SKIES UNITS 8 & 9

SUBJECT DRAINAGE CALCS

BY GSK DATE 9-28-00

CHECKED _____ DATE _____

SHEET 3 OF _____

28' F-F $n = 0.017$ MOUNTABLE C+G

5%

$d = 0.22$

WP = 10.095

$A = 0.99765$

$V = 4.178$ F/S

$Q_{1/2} = 4.168$ CFS

NUMBER OF LOTS

9.71 per HALF

3%

$d = .28$

WP = 13.155

$A = 1.68$

$V = 3.84$ F/S

$Q_{1/2} = 6.45$ CFS

15.02 per HALF

- STAR GAZER AVE IS AT 3%

10' TRANSITION FROM MOUNTABLE TO STD C+G
OCCURS AT THE EAST EDGE OF LOT 11 BLK U
(30 LOTS TOTAL)

- CANIS AVE IS AT 5%

10' TRANSITION FROM MOUNTABLE TO STD C+G
OCCURS AT THE EAST EDGE OF LOT 17, BLK M
AND THE EAST EDGE OF LOT 4, BLK K (18 LOTS)

- BLACK HOLE AVE IS AT 5%

10' TRANSITION FROM MOUNTABLE TO STD C+G
OCCURS AT THE EAST EDGE OF LOT 18, BLK R
AND THE EAST EDGE OF LOT 4, BLK M (18 LOTS)

- SKY WATCHER STREET IS AT 3.85% SOUTH OF CANIS

FIND Q AT CANIS FROM SOUTH

57 LOTS

$Q = 24.47$ CFS < 27.31 CFS ALLOWABLE OK

- SKY WATCHER STREET IS AT 1% NORTH OF CANIS

FIND Q AT CANIS FROM NORTH

51 LOTS

$Q = 21.90$ CFS < 39.68 CFS ALLOWABLE OK

- CANIS AVE IS AT 5%

FIND Q AT SKY WATCHER

42 LOTS

$Q = 18.03$ CFS < 23.05 CFS ALLOWABLE OK



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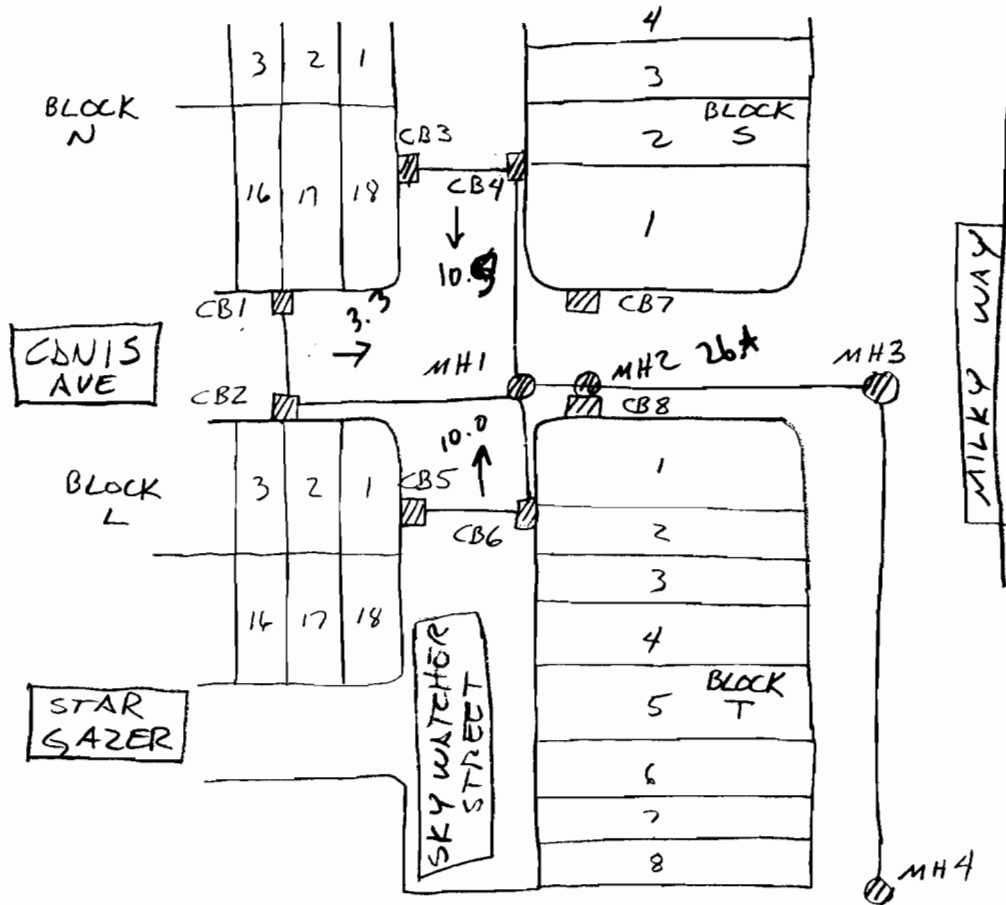
PROJECT PARADISE SKIES UNITS 819

SUBJECT DRAINAGE CALCS

BY GJK DATE 9-28-00

CHECKED _____ DATE _____

SHEET 4 OF _____



- FIND ACTUAL d AT INLET LOCATIONS
- INSTALL A "A" INLET ON CANIS BETWEEN LOTS 16 & 17, BLOCK N AND LOTS 2 & 3, BLOCK L. (CB1 & CB2)

$$Q = (42 - 4)(0.4293) \\ = 16.31 \text{ cfs}$$

$$d = 0.34$$

$$wp = 13.09$$

$$A = 1.71$$

$$V = 5.033 \text{ F/S}$$

$$Q_{1/2} = 8.61 \text{ cfs} \approx 16.31/2 = 8.155 \text{ OK}$$

FROM NOMO SHEET 8

$$Q_{\text{GATE}} = 6.5 \text{ cfs}$$

Q PAST INLETS 1

$$Q = 16.31 - 2(6.5) \\ = 3.31 \text{ cfs}$$



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PROJECT PARADISE SKIES UNITS 8+9
SUBJECT DRAINAGE CALCS
BY GJK DATE 9-28-00
CHECKED _____ DATE _____
SHEET 5 OF _____

- INSTALL A DBL "A" INLET ON SKYWATCHER
ON EACH SIDE OF ROAD BETWEEN LOTS 1+2, BKS
(CB3 + CB4)

$$Q = (51 - 1)(0.4293) \\ = 21.47 \text{ CFS}$$

$$d = 0.45$$

$$WP = 28.90$$

$$A = 6.47$$

$$V = 3.22 \text{ F/S}$$

$$Q = 20.85 \text{ CFS} \approx 21.47 \text{ CFS} \quad \text{OK}$$

FROM NOMO SHEET 8

$$Q_{\text{gate}} = 5.5 \text{ CFS}$$

$Q_{\text{past inlets}}$

$$Q = 21.47 - 2(5.5) \\ = 10.47 \text{ CFS}$$

- INSTALL A DBL "A" INLET ON SKYWATCHER ON
EACH SIDE OF THE ROAD BETWEEN LOTS 1+2, BKT
(CB5 + CB6)

$$Q = (57 - 1)(0.4293) \\ = 24.04 \text{ CFS}$$

$$d = 0.39$$

$$WP = 28.78$$

$$A = 4.79$$

$$V = 5.19 \text{ F/S}$$

$$Q = 24.86 \text{ CFS} \approx 24.04 \text{ CFS} \quad \text{OK}$$

FROM NOMO SHEET 8

$$Q_{\text{gate}} = 7.0 \text{ CFS}$$

$Q_{\text{past inlets}}$

$$Q = 24.04 - 2(7) \\ = 10.04 \text{ CFS}$$

- FIND Q ENTERING INTERSECTION

$$Q = 3.31 + 10.47 + 10.04 + 6(0.4293) \\ = 26.39 \text{ CFS}$$



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PROJECT PARADISE SKIES UNITS 8+9

SUBJECT DRAINAGE CALCS

BY GSK DATE 7-28-00

CHECKED _____ DATE _____

SHEET 6 OF _____

- INSTALL A "B" INLET ON THE EAST SIDE OF SKY WATCHER ON CANIS AT THE RETURNS

FIND d 40' F-F $S = 2\%$ $n = 0.017$
(CB7+CB8) $d = 0.45$

$WP = 18.70$

$A = 3.42$

$V = 3.98 \text{ F/S}$

$Q_{1/2} = 13.59 \text{ cfs} \approx 26.39/2 = 13.195 \text{ cfs} \text{ @ } 1/2$

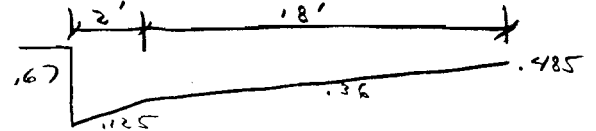
FROM NOMO SHEET 9

$Q_{\text{GATE}} = 10.5 \text{ cfs}$

$Q_{\text{PAST INLETS}}$

$Q = 26.39 - 2(10.5)$

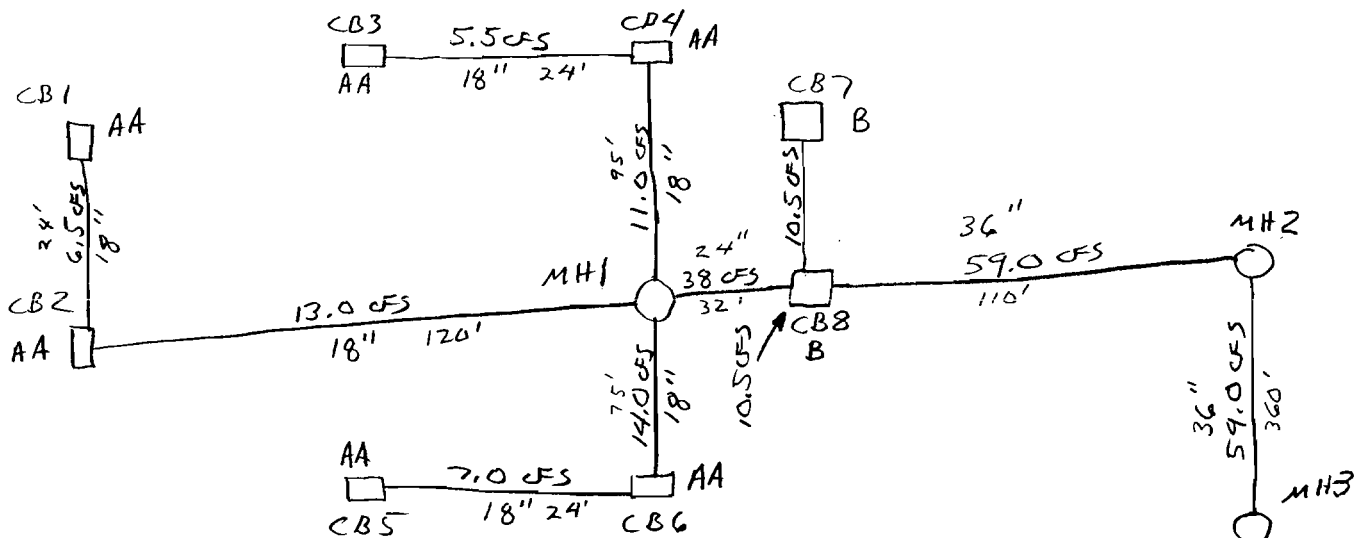
$= 5.39 \text{ cfs}$



THIS FLOW WILL ENTER MILKY WAY AND FLOW DOWN CANIS AND ANDROMEDA AVE TO THE EAST.

ASSUME FLOW IS SPLIT BETWEEN THE TWO STREETS. BASIN A1 & A2 OF THE 3-7 REPORT CHANGE FROM $Q_{A1} = 11.67 \text{ cfs}$ TO 14.37 cfs AND $Q_{A2} = 12.29 \text{ cfs}$ TO 14.98 cfs

TOTAL Q INTO THE EXISTING STORMMAIN IS 70.60 cfs . ADDING 5.39 FOR 75.99 cfs IS WELL WITHIN THE CAPACITY 104.61 cfs PER THE 3-7 REPORT





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SHEET 7 OF _____

STRUCTURE	RIM/GNITE	INV	FLOW LEAVING	SLOPE LEAVING	SIZE LEAVING
CB1	55.10	48.60	6.5 CFS	1.0%	18"
CB2	55.10	48.36	13.0 CFS	2.6%	18"
CB3	51.61	48.11	5.5 CFS	1.0%	18"
CB4	51.61	47.87	11.0 CFS	2.8%	18"
CB5	52.46	48.09	7.0 CFS	1.0%	18"
CB6	52.46	47.85	14.0 CFS	3.5%	18"
CB7	49.32	43.70	10.5 CFS	1.0%	18"
CB8	49.63	43.46	59.0 CFS	0.80%	36"
MH1	50.35	45.24/44.74	38.0 CFS	4.0%	24"
MH2	46.87	42.58	59.0 CFS	0.80%	36"
MH3	52.02	39.70	59.0 CFS	0.80%	36"
EXIST STUB	50.79	37.38	59.0 CFS	1.94%	36"

FROM NOMO SHEET 10

18" @ 1% = 10.5 CFS
18" @ 2.6% = 16.5 CFS
24" @ 4.0% = 43.0 CFS
36" @ 0.8% = 60.0 CFS
36" @ 1.94% = 95.0 CFS