

DRAINAGE REPORT
FOR
PARADISE SKIES UNIT 4B





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

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PROJECT PARADISE SKIES 4B
SUBJECT DRAINAGE CALCS
BY GJK DATE 3-21-00
CHECKED _____ DATE _____
SHEET 1 OF _____

REVISED 5-10-00

- THIS SITE IS PART OF THE PARADISE SKIES SUBDIVISION UNITS 3-7 (A11/D3A) PREPARED BY TERRA WEST, LLC 6-19-98. (PSS)

- SITE DOES NOT LIE IN A 100 YR FLOOD ZONE.
- SITE IS PART OF BASIN C OF THE PSS.

Q OF BASIN C IS 69.26 CFS PER THE PSS.

- RUNOFF WILL DISCHARGE TO THE 36" STORM DRAIN IN SAGITARIUS

TOTAL SITE = 5.9559 AC

- SUBTRACT OUT MILKY WAY AND URSA AVE ENTRANCE ROW - THIS AREA IS IN BASIN D,

$$5.9559 - 0.7349 = 5.2210 \text{ AC}$$

- AREA OF ROW WITHIN 4B
= 1.7044 AC 20% "B" = 0.3409 AC 80% "D" = 1.3635 AC

- NUMBER OF LOTS = 37

$$\text{PADS} = 30 \times 65 = 1950 \text{ SF}$$

$$\text{DRIVE} = 20 \times 20 = \frac{400}{2350 \text{ SF/PAD}}$$

$$\text{TYPE "D" AREA FOR PADS} = 1.9961 \text{ AC}$$

$$\text{TYPE "B" AREA FOR PADS} = 1.5205 \text{ AC}$$

$$\text{TOTAL TYPE "B"} = 0.3409 + 1.5205 = 1.8614 \text{ AC}$$

$$\text{TOTAL TYPE "D"} = 1.3635 + 1.9961 = 3.3596 \text{ AC}$$

$$5.2210 \text{ AC}$$

- AT THIS TIME WE WILL ADD THE NORTH LOTS ALONG URSA AVE IN UNIT 5 BECAUSE THEY WILL DRAIN TO THE ROADWAY.

$$\text{AREA}_5 = 0.8478 \text{ AC}$$

$$9 \text{ LOTS} \quad \text{TYPE "B"} = 0.3623 \text{ AC}$$

$$\text{TYPE "D"} = 0.4855 \text{ AC}$$

- FIND TOTAL LWD TREATMENTS FOR A PER LOT Q
TYPE "B" = $1.8614 + 0.3623 = 2.2237 \text{ AC}$ 36.64%
TYPE "D" = $3.3596 + 0.4855 = 3.8451 \text{ AC}$ 63.36%
6.0688 AC



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SHEET 2 OF _____

• FIND RUNOFF

$$P_1 = 1.92 \text{ in}$$

$$P_2 = 2.22 \text{ in}$$

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

FROM AH440 OUTPUT SHEETS 8-10

$$Q = 21.88 \text{ cfs}$$

• PER LOT RUNOFF = $21.88 / 37 + 9 = 0.47565 \text{ cfs/lot}$

• REVISE THE REMAINDER OF BASIN C WITH 40' LOTS

TOTAL = 145 INCLUDING UNIT 4B

$$Q = 145 \times 0.47565$$

$$= 68.97 \text{ cfs} \approx 69.26 \text{ cfs OK}$$

• SIZE FULL MOON AVE

72 LOTS DRAIN

$$Q = 72 \times 0.47565$$

$$= 34.25 \text{ cfs}$$

$$S = 2.00\% \quad n = 0.017 \quad 28' \text{ F-F STD C+G}$$

$$d = 0.48$$

$$WP = 28.96$$

$$A = 7.25$$

$$V = 4.91 \text{ F/S}$$

$$Q = 35.60 \text{ cfs} \approx 34.25 \text{ OK}$$

$$d + \frac{V^2}{2g} = 0.85 \approx .67 + .18 = .85 \text{ OK}$$

• SIZE NEPTUNE ST.

69 LOTS DRAIN

$$Q = 69 \times 0.47565$$

$$= 32.82 \text{ cfs}$$

$$S = 4.00\% \quad n = 0.017 \quad 28' \text{ F-F STD C+G}$$

$$d = 0.39$$

$$WP = 28.78$$

$$A = 4.91$$

$$V = 5.38 \text{ F/S}$$

$$Q = 26.42 \text{ cfs} < 32.82 \text{ NEED INLETS}$$

SLOPE IS 2% THROUGH URSA INTERSECTION

$$Q = 66 \text{ LOTS} \times 0.47565 = 31.39 \text{ cfs}$$



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SHEET 3 OF _____

• SIZE STORM DRAIN IN NEPTUNE THAT TIES INTO SAGITTARIUS.

• USE 2 DBL A INLETS

FROM SHEET 6

$$Q_{\text{gate}} = 8.2 \text{ cfs}$$

$Q_{\text{past inlets}}$

$$= 31.39 - 2(8.2) = 14.99 \text{ cfs}$$

$$d = 0.46$$

$$WP = 28.92$$

$$A = 6.75$$

$$V = 4.69 \text{ f/s}$$

$$Q = 31.63 \text{ cfs} \approx 31.39 \text{ cfs} \text{ OK}$$

• INSTALL 2 DBL A INLETS ON FULL MOON AVE
BETWEEN LOTS 17+18 BLOCK A AND LOTS 1+2 BLOCK C

$$Q = 70 \times 0.47565$$

$$= 33.30 \text{ cfs}$$

$$d = 0.47$$

$$WP = 28.94$$

$$A = 6.99$$

$$V = 4.79 \text{ f/s}$$

$$Q = 33.51 \text{ cfs} \approx 33.30 \text{ OK}$$

FROM SHEET 6

$$Q_{\text{gate}} = 8.6 \text{ cfs}$$

$$Q_{\text{past inlets}} = 33.30 - 2(8.6)$$

$$= 16.10 \text{ cfs}$$

• FIND Q AT END OF NEPTUNE

$$Q = 14.99 + 16.10 + 9(0.47565)$$

$$= 35.37 \text{ cfs}$$

• FIND CAPACITY OF STUB STREET WITH NO CROWN.

$$S = 4.0\% \quad 25' \text{ F-F STD C+G}$$

$$d = 0.34$$

$$WP = 25.68$$

$$A = 5.625$$

$$V = 6.35 \text{ f/s}$$

$$Q = 35.73 \text{ cfs} \approx 35.37 \text{ OK}$$

$$d + \frac{V^2}{2g} = 0.34 + 0.63 = 0.97$$

USE 10" CURB

$$0.83 + 1.18 = 1.01$$

INSTALL 2-DBL "A" INLETS IN SUMP CONDITION

$$Q/p = 3.0 H^{3/2} \quad 35.37/34.00(3) = H^{3/2} \Rightarrow H = 0.49' < 0.83' \text{ OK}$$

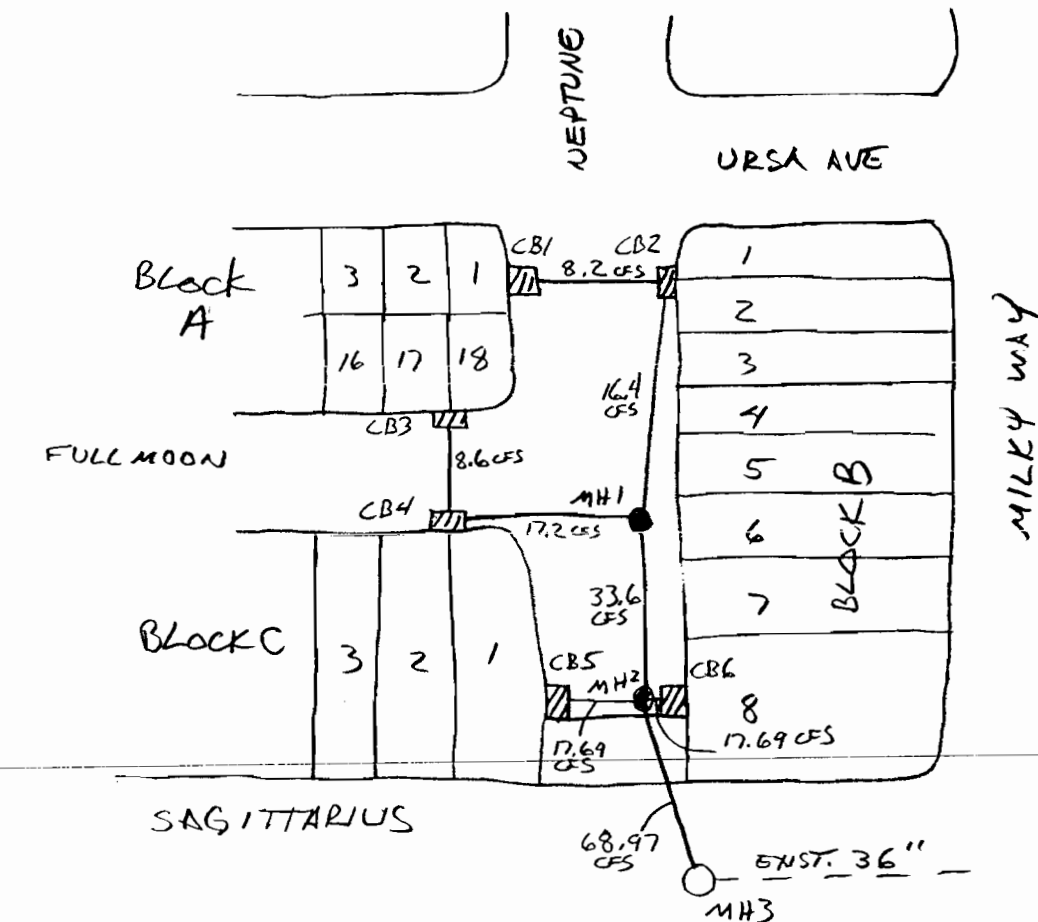
$$\text{SIZE FOR DOUBLE } Q \quad H = 0.78' < 0.83' \text{ OK}$$



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SHEET 4 OF _____



STRUCTURE	RIM/GATE	INV	SIZE PIPE LEAVING	SLOPE OF PIPE	FLOW IN PIPE
CB1	51.36	45.86	18" RCP	1%	8.2
CB2	51.36	45.58	18" RCP	4%	16.4
CB3	45.35	39.85	18" RCP	1%	8.6
CB4	45.27	39.57	18" RCP	3.3%	17.2
CB5	41.60	35.60	18" RCP	11.5%	17.69*
CB6	41.60	35.60	18" RCP	46%	17.69*
MH1	44.08	37.10	24" RCP	4%	33.6
MH2	41.70	33.30	30" RCP	8.4%	68.97*
EXIST. MH3	36.57	27.45	36" RCP	2.2%	68.97

* THESE VALUES ARE FOR ONLY THE 100 YR STORM
THE PIPES HAVE BEEN SIZED TO TAKE TWICE
THE FLOW BECAUSE OF SUMP CONDITIONS.

18" AT 1% CARRIES 10.5 CFS
18" AT 3.3% CARRIES 17.5 CFS
18" AT 4% CARRIES 21.0 CFS
18" AT 11.5% CARRIES 33.0 CFS
24" AT 4% CARRIES 45.0 CFS
30" AT 8.4% CARRIES 102.0 CFS

FROM NOMO SHEET 7



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- FIND Q OF AREA D ,

$$A = 0.7349 \text{ AC}$$
$$12\% \text{ "B" } 88\% \text{ D}$$

FROM AHYMO OUTPUT SHEETS 11-13

$$Q = 3.10 \text{ CFS} \approx 3.39 \text{ CFS PER PSS. OK}$$

- SIZE MILKY WAY STORM DRAIN

$$S = 1.94\% \quad n = 0.013$$

FROM NOMO SHEET 7

36" RCP CARRIES 90 CFS

THIS IS SIZED FOR BASIN E OF THE PSS

$$Q = 69.02 \text{ CFS}$$

- FIND CAPACITY OF EXISTING 30" RCP
IN MILKY WAY

$$S = 5.44\% \quad n = 0.013$$

FROM NOMO SHEET 7

$$30" \text{ RCP CARRIES } 84 \text{ CFS} > 69.02 \text{ CFS OK}$$

PROPOSED BASIN LAYOUT

Units?

