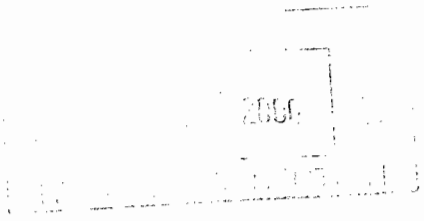
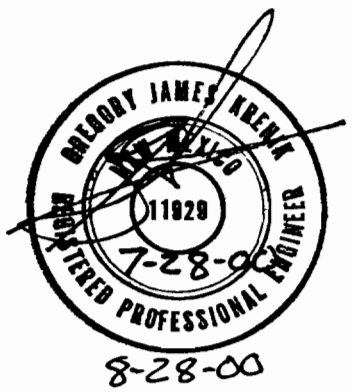
DRAINAGE CALCULATIONS

FOR

PARADISE SKIES UNIT 6





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PROJECT PARADISE SKIES UNIT 6
SUBJECT DRAINAGE CALCS
BY GJK DATE 7-27-00
CHECKED ____ DATE ____
SHEET 1 OF ____

- THIS SITE IS PART OF THE PARADISE SKIES SUBDIVISION UNITS 3-7 (A11/D3A) PREPARED BY TIERRA WEST, LLC 6-19-98.
- THIS SITE WAS ALSO PART OF THE PARADISE SKIES SUBDIVISION UNIT 4B REPORT (A11/D3A1) PREPARED BY MARK GOODWIN AND ASSOCIATES 5-10-00 (APPENDIX A)
  - SITE DOES NOT LIE IN A 100 YR FLOOD ZONE
  - RUNOFF WILL DISCHARGE TO THE STORMDRAIN DESIGNED IN UNIT 4B.
  - FROM UNIT 4B REPORT THE PER LOT RUNOFF IS 0.47565 CFS/LOT
  - TOTAL NUMBER OF LOTS

UNIT 4B = 36
UNIT 6 = 63
UNIT 7 = 52
TOTAL = 151 LOTS

TOTAL Q = 151 x 0.47565
= 71.82 CFS > 68.97 CFS FROM UNIT 4B

- SIZE FULL MOON

74 LOTS DRAIN S = 2.0% n = 0.017 28' F-F STD CHG

Q = 74 x 0.47565 = 35.20 CFS

d = 0.48
wP = 28.96
A = 7.25
V = 4.91 F/S
Q = 35.60 CFS > 35.20 OK

$d + V^2/2g = 0.85 = 0.67 + 0.18$ OK

- SIZE NEPTUNE

69 LOTS DRAIN TO NEPTUNE AND URSA
S = 2.0% n = 0.017 28' F-F STD CHG

Q = 69 x 0.47565
= 32.82 CFS

d = 0.47
wP = 28.94
A = 6.99
V = 4.79 F/S
Q = 33.51 CFS > 32.82 OK

$d + V^2/2g = 0.83 < 0.67 + 0.18$ OK

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PROJECT Paradise Skies Unit 6
SUBJECT Drainage Calcs
BY GSK DATE 7-27-00
CHECKED _____ DATE _____
SHEET 2 OF ____
REVISED 8-28-00

- VERIFY STORMDRAIN IN UNIT 4B HAS CAPACITY

FROM SHEET 4

d=0.47 Q FOR A DBL "A" INLET = 8.6 CFS

- Q PAST INLETS ON NEPTUNE

from wheels 2. $32.82 - 2(8.6) = 15.62$ CFS

FROM SHEET 4

d=0.48 Q FOR A DBL "A" INLET = 9.0 CFS

- Q PAST INLETS ON FULL MOON

$35.20 - 2(9.0) = 17.20$ CFS

- FIND TOTAL Q AT END OF NEPTUNE

$Q = 8(0.47565) + 15.62 + 17.20$
$= 36.63$ CFS

S = 4.0% 25' F-F STD C+G 10" CURB

d = 0.345
WP = 25.69
A = 5.75
V = 6.44 F/S
Q = 37.06 CFS ≈ 36.63 CFS OK

$d + V^2/2g = 0.989 < 0.83 + 0.18$ OK

- FIND d OF THE TWO DBL "A" SUMP INLETS

$Q/P = 3.0 H^{3/2}$ $P = 17.00 \times 2 = 34$

$H = 0.51' < 0.83'$ OK

- SIZE FOR DOUBLE Q

$H = 0.80' < 0.83'$ OK

- ROCKCLIFF AND SAGITTARIUS WILL NOT BE CONSTRUCTED UNTIL UNIT 5 IS COMPLETE SINCE THE OUTFALL FOR THESE STREETS IS IN UNIT 5. ATTACHED IS A COPY OF THE UNIT 5 REPORT.

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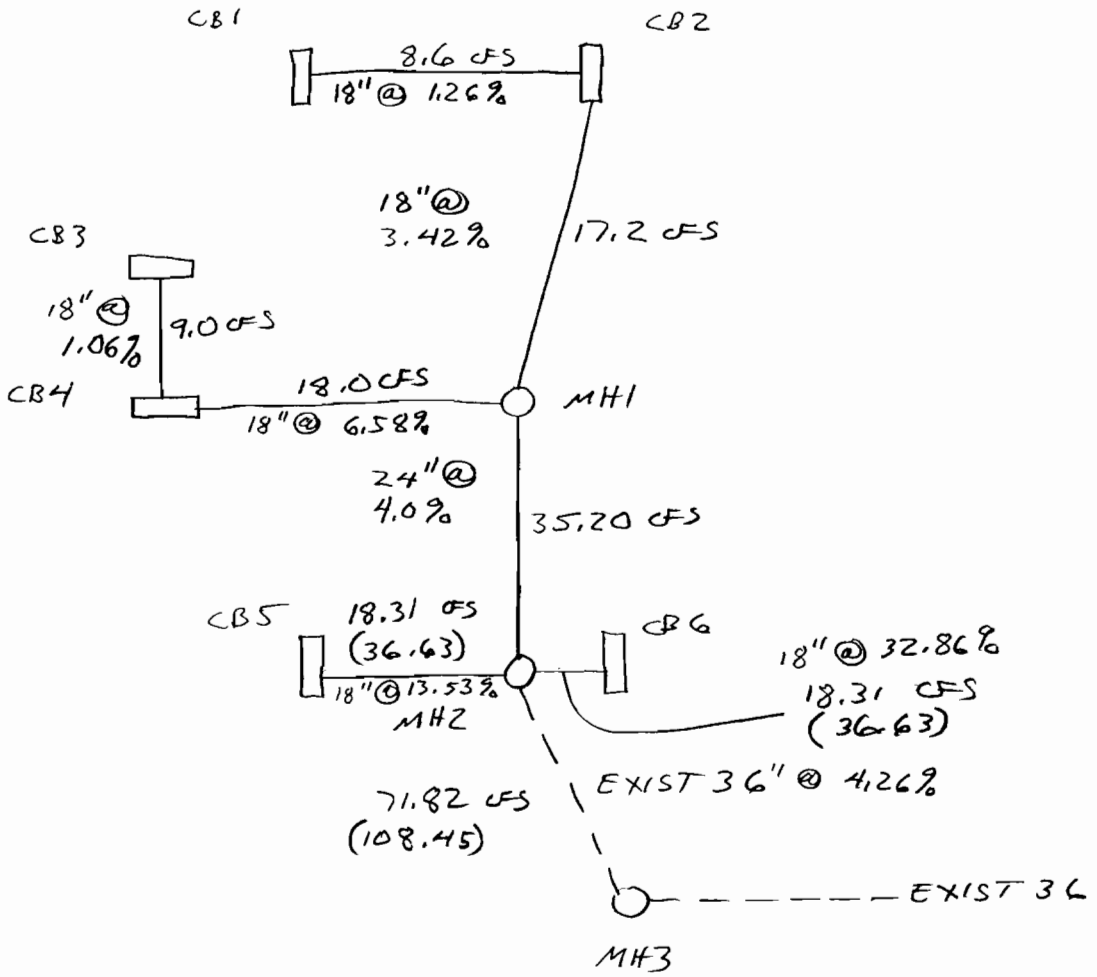
PROJECT Paradise Skies Unit 6
SUBJECT Drainage Calcs
BY GJK DATE 7-27-00
CHECKED _____ DATE _____
SHEET 3 OF ____



FROM NOMO SHEET 5

18" @ 1.26%	CARRIES	11.5 CFS	> 8.6 OK
18" @ 1.06%	CARRIES	10.5 CFS	> 9.0 OK
18" @ 6.58%	CARRIES	26.0 CFS	> 18.0 OK
24" @ 4.0%	CARRIES	45.0 CFS	> 35.2 OK
18" @ 13.53%	CARRIES	37.0 CFS	> 36.63 OK
36" @ 4.26%	CARRIES	140.0 CFS	> 108.45 OK

THE EXISTING STORM DRAIN HAS CAPACITY FOR UNITS 4B, 6 & 7.

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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 TIERRA WEST, LLC 6-19-98. (PSS)

- SITE DOES NOT LIE IN A 100YR 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" STORMDRAIN IN SAGITARIUS

TOTAL SITE = 5.9559 AC

- SUBTRACT OUT MILKY WAY AND URSA AVE ENTRANCE ROW — THIS AREA IS IN BASIN D_1

  5.9559 − 0.7349 = 5.2210 AC

  - AREA OF ROW WITHIN 4B = 1.7044 AC 20% "B" = 0.3409 AC 80% "D" = 1.3635 AC
  - NUMBER OF LOTS = 37

    PADS = 30 × 65 = 1950 SF
    DRIVE = 20 × 20 = 400
    2350 SF/PAD

    TYPE "D" AREA FOR PADS = 1.9961 AC
    TYPE "B" AREA FOR PADS = 1.5205 AC

  TOTAL TYPE "B" = 0.3409 + 1.5205 = 1.8614 AC
  TOTAL TYPE "D" = 1.3635 + 1.9961 = 3.3596 AC
  5.2210 AC

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

  $AREA_5$ = 0.8478 AC

  9 LOTS TYPE "B" = 0.3623 AC
  TYPE "D" = 0.4855 AC

- FIND TOTAL LAND TREATMENTS FOR A PER LOT Q

  TYPE "B" = 1.8614 + 0.3623 = 2.2237 AC 36.64%
  TYPE "D" = 3.3596 + 0.4855 = 3.8451 AC 63.36%
  6.0688 AC

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PROJECT PARADISE SKIES 4B
SUBJECT DRAINAGE CALCS
BY GJK DATE 3-2400
CHECKED ____ DATE ____
SHEET 2 OF ____

- FIND RUNOFF

$P_1 = 1.92$ in
$P_c = 2.22$ in
$P_{24} = 2.70$ in

FROM AHYMO OUTPUT SHEETS 8-10

$Q = 21.88$ CFS

- PER LOT RUNOFF = $21.88/37+9 = 0.47565$ CFS/LOT

- REVISE THE REMAINDER OF BASIN C WITH 40' LOTS

TOTAL = 145 INCLUDING UNIT 4B

$Q = 145 \times 0.47565$
$= 68.97$ CFS ≈ 69.26 CFS OK

- SIZE FULL MOON AVE

72 LOTS DRAIN

$Q = 72 \times 0.47565$
$= 34.25$ CFS

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

$d = 0.48$
$WP = 28.96$ $d + V^2/2g = 0.85 \approx .67 + .18 = .85$ OK
$A = 7.25$
$V = 4.91$ F/S
$Q = 35.60$ CFS ≈ 34.25 OK

- SIZE NEPTUNE ST.

69 LOTS DRAIN
$Q = 69 \times 0.47565$
$= 32.82$ CFS

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

$d = 0.39$
$WP = 28.78$
$A = 4.91$
$V = 5.38$ F/S
$Q = 26.42$ CFS < 32.82 NEED INLETS

SLOPE IS 2% THROUGH URSA INTERSECTION
$Q = 66$ LOTS $\times 0.47565 = 31.39$ CFS

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

• SIZE STORMDRAIN IN NEPTUNE THAT TIES INTO SAGITTARIUS.

• USE 2 DBL A INLETS

FROM SHEET 6

$Q_{grate} = 8.2$ CFS

$Q_{PAST\ INLETS} = 31.39 - 2(8.2) = 14.99$ CFS

$d = 0.46$
$wP = 28.92$
$A = 6.75$
$V = 4.69$ F/S
$Q = 31.63$ CFS ≈ 31.39 CFS OK

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

$Q = 70 \times 0.47565$
$= 33.30$ CFS

$d = 0.47$
$wP = 28.94$
$A = 6.99$
$V = 4.79$ F/S
$Q = 33.51$ CFS ≈ 33.30 OK

FROM SHEET 6

$Q_{grate} = 8.6$ CFS

$Q_{PAST\ INLETS} = 33.30 - 2(8.6)$
$= 16.10$ CFS

• FIND Q AT END OF NEPTUNE

$Q = 14.99 + 16.10 + 9(0.47565)$
$= 35.37$ CFS

• FIND CAPACITY OF STUB STREET WITH NO CROWN.

$S = 4.0\%$ 25' F-F STD C+G

$d = 0.34$
$wP = 25.68$
$A = 5.625$
$V = 6.35$ F/S
$Q = 35.73$ CFS ≈ 35.37 OK

$d + V^2/2g = 0.34 + 0.63 = 0.97$

USE 10" CURB
$0.83 + .18 = 1.01$

INSTALL 2-DBL "A" INLETS IN SUMP CONDITION

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

SIZE FOR DOUBLE Q $H = 0.78' < 0.83'$ OK

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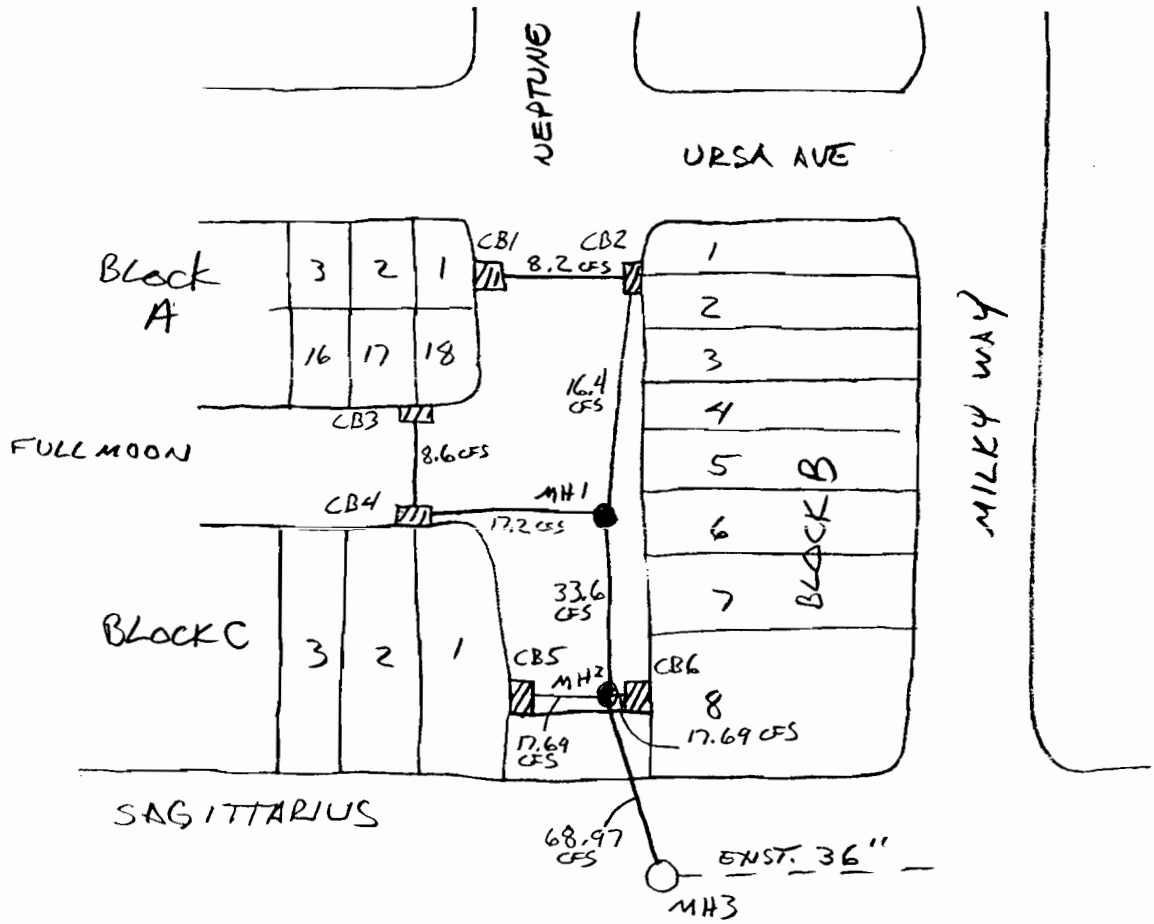
PROJECT PARADISE SKIES 4B
SUBJECT DRAINAGE CALCS
BY GJK DATE 3-21-00
CHECKED ____ DATE ____
SHEET 4 OF ____



STRUCTURE	RIM/GRATE	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.

FROM NOMO SHEET 7

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

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PROJECT PARADISE SKIES 4B
SUBJECT DRAINAGE CALCS
BY GSK DATE 3-21-00
CHECKED ____ DATE ____
SHEET 5 OF ____

REVISED 5-10-00

- FIND Q OF AREA D,

  A = 0.7349 AC
  12% "B" 88% D

  FROM AHYMO OUTPUT SHEETS 11-13
  Q = 3.10 CFS ≈ 3.39 CFS PER PSS. OK

- SIZE MILKY WAY STORMDRAIN

  S = 1.94 % n = 0.013

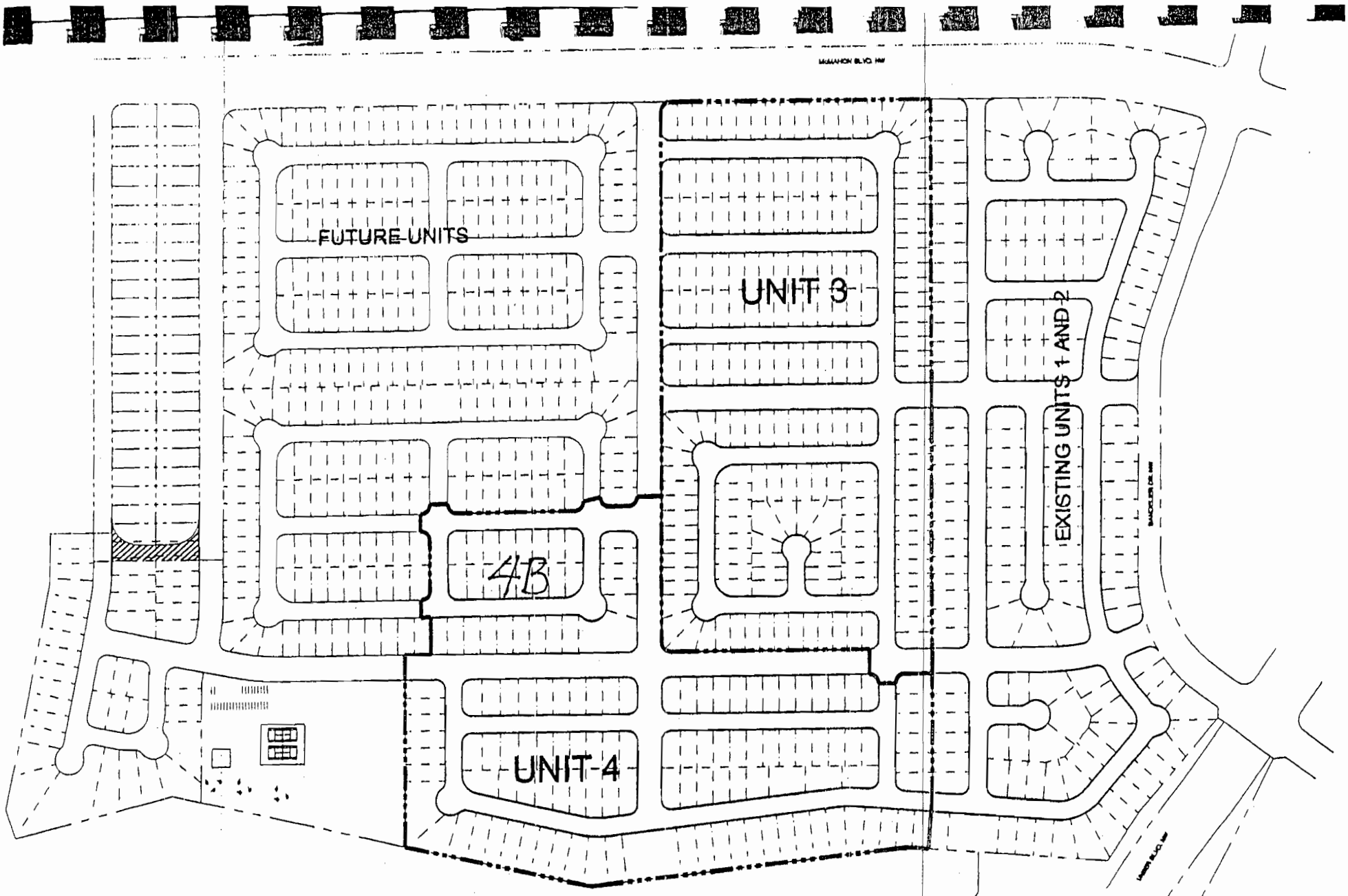
  FROM NOMO SHEET 7
  36" RCP CARRIES 90 CFS

  THIS IS SIZED FOR BASIN E OF THE PSS
  Q = 69.02 CFS

- FIND CAPACITY OF EXISTING 30" RCP IN MILKY WAY

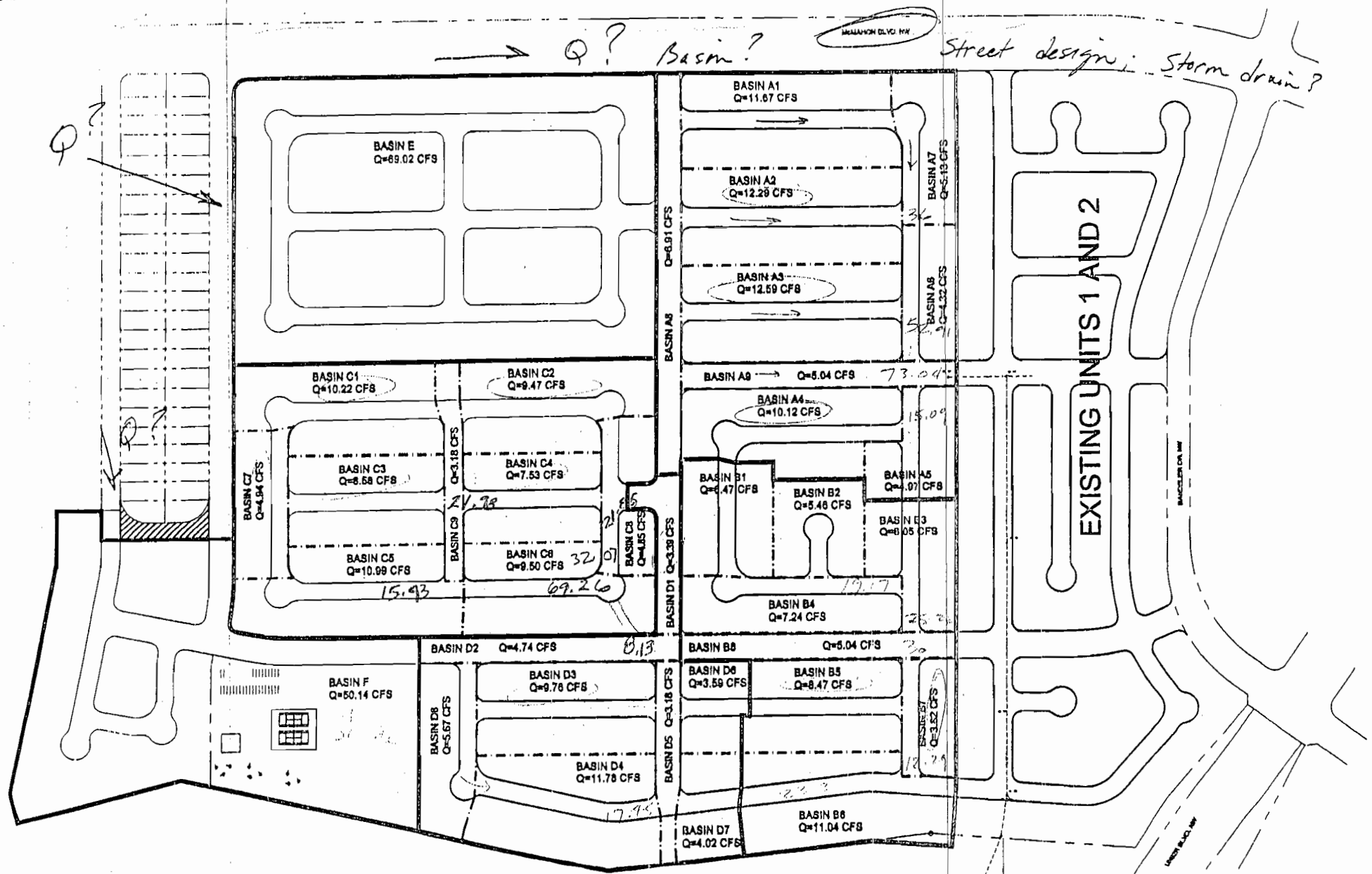
  S = 5.44 % n = 0.013

  FROM NOMO SHEET 7
  30" RCP CARRIES 84 CFS > 69.02 CFS OK



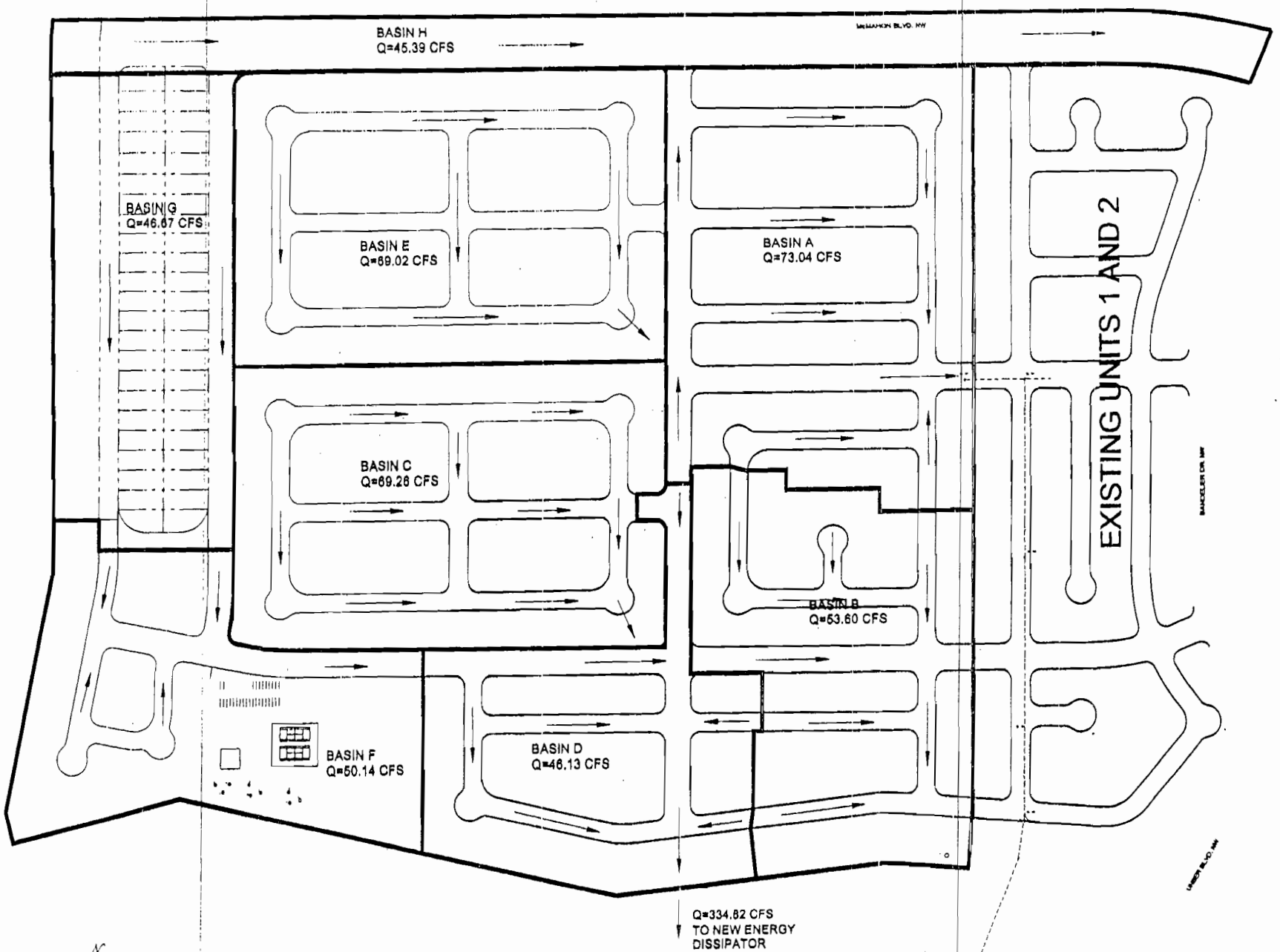
UNIT LAYOUT

EXHIBIT 1



PROPOSED BASIN LAYOUT

EXHIBIT 3



PROPOSED BASIN LAYOUT

EXHIBIT 3A