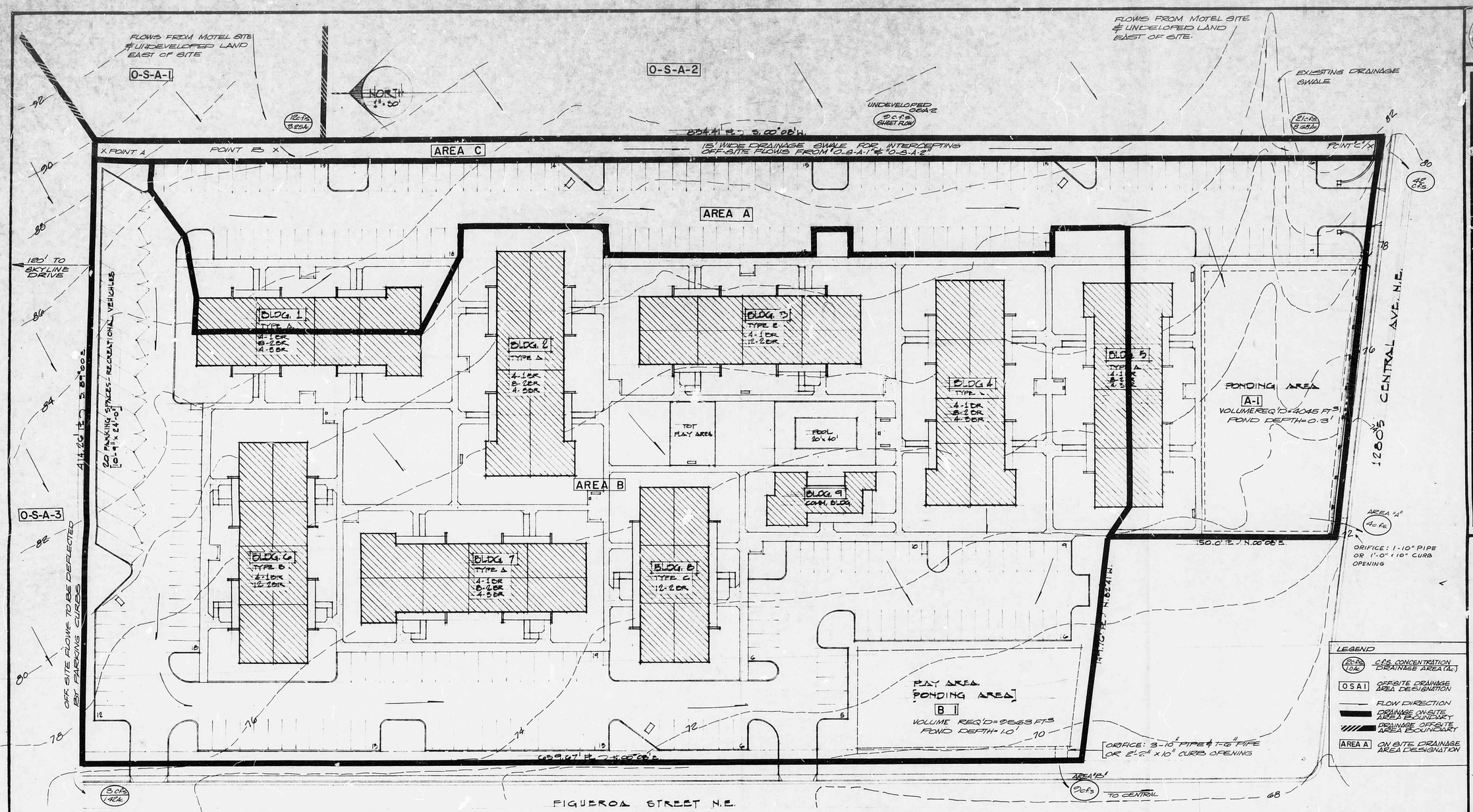
HYDROLOGY

L22/D45
TWO PLANS
NO DOCUMENTS

L 22/D 45

2 Plans

No Documents



OFF-SITE DRAINAGE FLOWS

O.S.A-1 AREA = 3.25 Ac. COMPRISED UNDEVELOPED LAND & PART OF A MOTEL COMPLEX.
Q = C1A = (0.60)(5.4)(3.25) = 12 c.f.s.

O.S.A-2 AREA = 8.68 Ac. COMPRISED OF UNDEVELOPED LAND & PART OF A MOTEL COMPLEX.
Q = C1A = (0.63)(5.4)(8.68) = 30 c.f.s.

O.S.A-3 AREA = 1.42 Ac. COMPRISED ENTIRELY OF UNDEVELOPED LAND.
Q = C1A = (0.35)(5.4)(1.42) = 3 c.f.s.

NOTE:
REFER TO TOPOGRAPHIC ORTHOPHOTO MAP Nº L-22, CITY OF ALBUQUERQUE MARCH 26, 1976, FOR OVERALL VIEW OF O.S.A-1 & O.S.A-2. THESE AREAS INCLUDE UNDEVELOPED LAND & MOTEL SITES IMMEDIATELY EAST OF APT. COMPLEX.

UNDEVELOPED SITE FLOW RATE

AREA OF SITE TO BE DEVELOPED = 7.4 AC.
Q = C1A = (0.35)(5.4)(7.4) = 14 c.f.s.
THEREFORE, DEVELOPED FLOW RATE CANNOT EXCEED 14 c.f.s. IN ORDER TO CONTROL RUNOFF RATES, TWO DETENTION PONDS WITH CONTROLLED ORIFICES WILL BE USED, PONDING AREA "A-1" & "B-1". CONTROLLED FLOW WILL EMPTY ONTO FIGUEROA STREET AND DIRECTLY ONTO CENTRAL

AREA A

AREA = 2.15 Ac., COMPOSITE C = 0.66 SET ALLOWABLE OUTFLOW = 4.0 c.f.s.

A) $Q = \frac{\text{ALLOWABLE OUTFLOW}}{\text{ACREAGE} \times \text{RUNOFF COEFF.}} = \frac{4.0}{(2.15)(0.66)} = 2.82$ c.f.s./Ac. Imp.

B) $T = -25 + \sqrt{70875/Q} = -25 + \sqrt{70875/2.82} = 25.14$ MIN TO REACH PEAK STORAGE FROM INSTANT STORAGE BEGINS.

C) $V_S = \frac{(1.340)T}{T+25} - 40Q, T = \frac{(1.340)(25.14)}{T+25} - 40(2.82)(25.14) = 2850.65$ FT³/Ac. Imp.

D) $V_T = V_S \times A_C \times$ RUN. COFFEC. $= (2850.65)(2.15)(0.66) = 4045$ FT³ VOL. REQ'D TO DETAIN FLOWS WHILE OUTLETTING @ 4.0 c.f.s.

E) SELECT OUTFLOW PIPE THAT YIELDS 4.0 c.f.s. UNDER HEAD OF 0.53'. $d = \frac{Q}{\sqrt{2gh}} = 0.82$. SELECT 1-10" ϕ PIPE.

AREA B

AREA = 4.96 Ac., COMPOSITE "C" = 0.66 SET ALLOWABLE OUTFLOW = 9.0 c.f.s.

A) $Q_a = \frac{\text{ALLOWABLE OUTFLOW}}{\text{ACREAGE} \times \text{RUNOFF COEFF.}} = \frac{9.0}{(4.96)(0.66)} = 2.75 \frac{\text{c.f.s.}}{\text{Ac. IMP.}}$

B) $T = -25 + \sqrt{70875/Q_a} = -25 + \sqrt{70875/2.75} = 25.8$ MIN TO REACH PEAK STORAGE FROM INSTANT STORAGE BEGINS.

C) $V_S = \frac{(1.340)T}{T+25} - 40Q_aT = \frac{(1.340)(25.8)}{50.8} - 40(2.75)(25.8) = 2921.29$ FT³/AC. IMP.

D) $V_T = V_S \times A_C \times$ RUNOFF COEFF. $= (2921.29)(4.96)(0.66) = 9563$ FT³ VOL. REQ'D TO DETAIN FLOWS WHILE OUTLETTING @ 9 c.f.s.

E) SELECT OUTFLOW PIPES THAT YEILD 9 c.f.s. UNDER HEAD OF 0.58'. $d = \frac{Q}{\sqrt{2gh}} = 1.84$ FT² SELECT 3-10" & 1-6" ϕ PIPES OR CONST. A 2'-2" x 10" CURB OPENING.

AREA C

Q = C1A = (0.30)(5.4)(0.89) = 0.5 c.f.s.

COMPOSITE "C" FLOWS

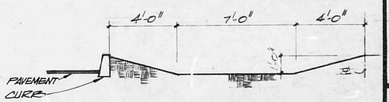
O.S.A-1
C = 0.90 (PAVED) = 1.97 Ac.
C = 0.35 (UNPAVED) = 1.28 Ac.
$\frac{1.97}{3.25}(0.90) = 0.55$
$\frac{1.28}{3.25}(0.35) = \frac{0.14}{0.69}$ = COMPOSITE "C"

O.S.A-2
C = 0.90 (PAVED) = 4.48 Ac.
C = 0.35 (UNPAVED) = 4.20 Ac.
$\frac{4.48}{8.68}(0.90) = 0.46$
$\frac{4.20}{8.68}(0.35) = \frac{0.17}{0.63}$ = COMPOSITE "C"

AREA A
C = 0.90 (ROOFS & PAVED) = 1.89 Ac.
C = 0.30 (GRASSED) = 0.26 Ac.
$\frac{1.89}{2.15}(0.90) = 0.54$
$\frac{0.26}{2.15}(0.30) = \frac{0.12}{0.66}$ = COMPOSITE "C"

AREA B
C = 0.90 (ROOFS & PAVED) = 2.81
C = 0.30 (GRASS) = 2.15
$\frac{2.81}{4.96}(0.90) = 0.51$
$\frac{2.15}{4.96}(0.30) = \frac{0.15}{0.66}$ = COMPOSITE "C"

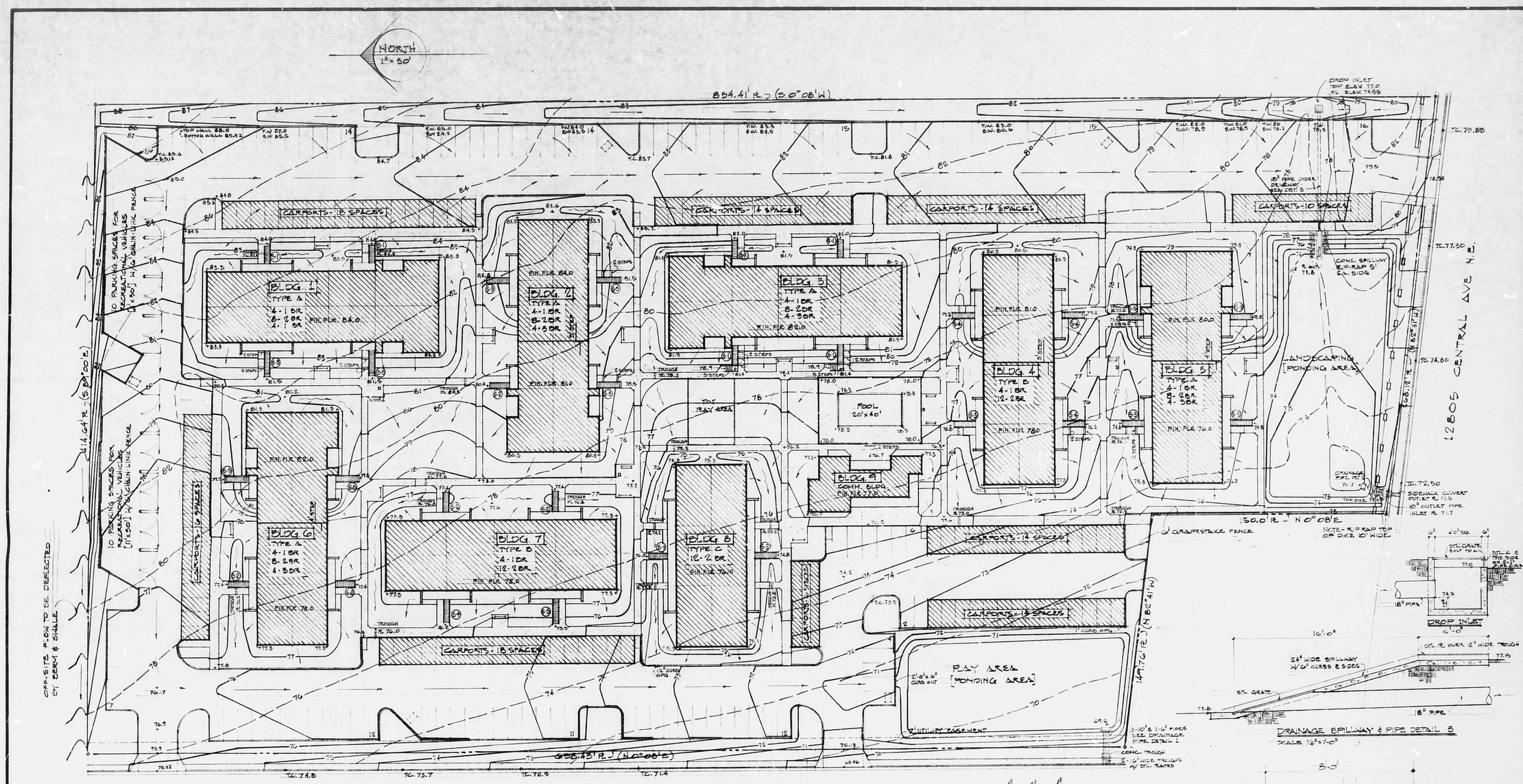
NOTE: CONSTRUCT DRAINAGE SWALE AS SHOWN IN TYPICAL SECTION BETWEEN PT. A & PT. C. O.S.A-1 CONTRIBUTES 12 C.F.S. UNDEVELOPED LAND IN O.S.A-2 CONTRIBUTES 2 c.f.s. IN SHEET FLOW BETWEEN PT. B & PT. C. REMAINING FLOWS ENTERING DRAINAGE SWALE @ SOUTH END FROM MOTEL SITE.



TYP. SWALE SECTION BETWEEN POINTS A & C
NO SCALE
MIN. SLOPE = 0.010
n = 0.030
Q CAPACITY = 52 C.F.S.

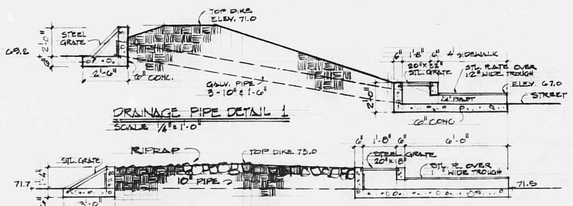
SHELTON & WELLER, ARCHITECTS A.I.A.

SHAN-ANN PLAZA APARTMENTS
ALBUQUERQUE, NEW MEXICO
DEVELOPED SITE FLOW CHARACTERISTICS



FINISH GRADING PLAN

SCALE 1" = 30'

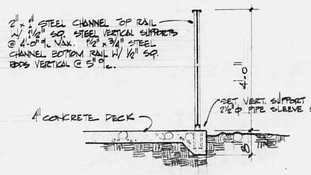


DRAINAGE PIPE DETAIL 1

SCALE 1/4" = 1'-0"

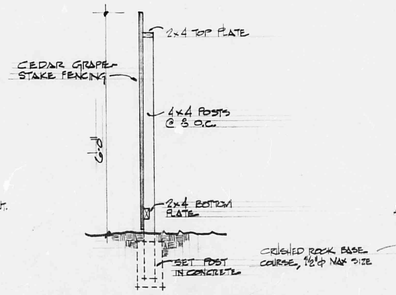
DRAINAGE PIPE DETAIL 2

SCALE 1/4" = 1'-0"



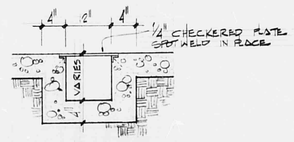
STEEL FENCING @ SWIMMING POOL

SCALE 1/2" = 1'-0"



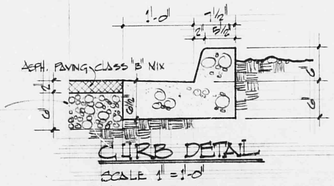
GRAPESTAKE FENCE

SCALE 1/2" = 1'-0"



TROUGH DETAIL

SCALE 1" = 1'-0"



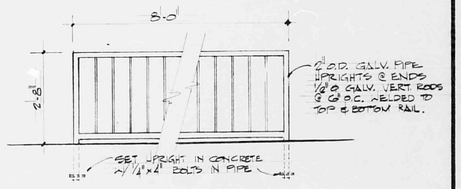
CURB DETAIL

SCALE 1" = 1'-0"

* THIS CURB & GUTTER TO BE AT ALL PAVED AREAS NOT BORDERED BY SIDEWALK

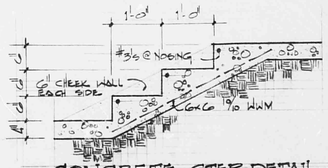
DRAINAGE SPILLWAY & PIPE DETAIL 3

SCALE 1/4" = 1'-0"



BIKE RACK DETAIL

SCALE 1" = 1'-0"



CONCRETE STEP DETAIL

SCALE 3/4" = 1'-0"

SHELTON & WELLER, ARCHITECTS, A.I.A.

SHAN-ANN PLAZA APARTMENTS

ALBUQUERQUE, NEW MEXICO

A-2