HYDROLOGY K23/D8 3 PLANS

K23/D8

3 Plans

D 24 C 20 B 16 A 12 CITY OF ALBUQUERQUE C D

AREA OF SITE: 3.88 ACRES (168,945 SQ FT)

UNDEVELOPED RUNOFF VOL_{100} = (2.6"/12)(168,945 ft²)(.40) = 13,818 ft³

DEVELOPED RUNOFF VOL_{100} = (2.6"/12)(168,945 ft²)(.74) = 25,559 ft³

POND REQ'MTS. FOR EACH AREA: DEVELOPED 100-YR. VOL. - UNDEVELOPED 100-YR. VOL.

UNDEVELOPED CONDITIONS:

AREA A
VOL. = (2.6"/12)(11,880)(.40) = 7703 ft³
DIFF. = REQ'D POND VOL. = 1471 ft³

AREA B
VOL. = (2.6"/12)(15,680)(.40) = 10,165 ft³
DIFF. = REQ'D POND VOL. = 1009 ft³

AREA C
VOL. = (2.6"/12)(7,000)(.40) = 3640 ft³
DIFF. = REQ'D POND VOL. = 1989 ft³

AREA D
VOL. = (2.6"/12)(98,018)(.40) = 63,545 ft³
DIFF. = REQ'D POND VOL. = 8999 ft³

DEVELOPED CONDITIONS:

AREA A
VOL. = (2.6"/12)(11,880)(.74) = 9203 ft³

AREA B
VOL. = (2.6"/12)(15,680)(.74) = 12,147 ft³

AREA C
VOL. = (2.6"/12)(7,000)(.74) = 4424 ft³

AREA D
VOL. = (2.6"/12)(98,018)(.74) = 75,954 ft³

AREA A
AVAILABLE POND AREA = 6,930 ft² @ 3.0' DEPTH, VOL. = (6.0 ft³) (6,930 ft²) = 41,580 ft³ REQ'D. REMAINING 17,628 ft³ TO OVERFLOW ASPHALT. SPEED RAMP: WATER STOP & ENTER COPPER ST. CHANNEL DIRECTLY BY WAY OF THE BRIDGE DRAIN

OUTFLOW PIPE SIZED FOR FLOW RATE OF Q_{100} = (2.6)(.74)(.62)(.62) = 0.7 cfs
PROPOSED HEAD = 1.0', PIPE SIZE = 22.1 in² = 1-6" PIPE
PROPOSED PIPE INLET = 0.5' RECESS = ELIMINATING ASPHALT TO PROVIDE FULL FLOW CONDITIONS

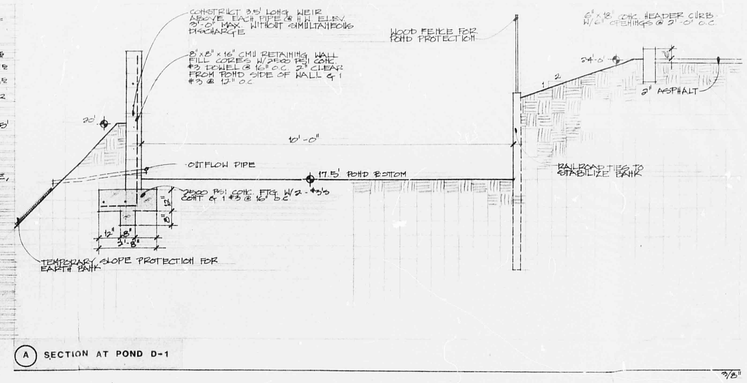
AREA B
AVAILABLE POND AREA:
CONTOUR 3.0' = 7100 ft² > 990(3) = 1980 ft³ > 1028 ft³ REQ'D.
MAX. WATER HT. @ 1028 ft³
REQUIRE 30% OVERFLOW IN 1009 ft³ TO DISCHARGE OVER WEIR ON LEFT FOR Q_{100} FOR AREA B
Q_{100} = (2.6)(.74)(.62)(.62) = 0.7 cfs
C = 2.6 @ 0.7' WHERE C = 2.61 FOR A BREADTH OF 2.0'
2.6 @ MAX. HEIGHT OF 0.7'. WEIR CREST @ ELEV. 0.7'
OUTFLOW PIPE SIZED FOR FLOW RATE Q_{100} = (2.6)(.74)(.62)(.62) = 0.7 cfs
PROPOSED HEAD = 1.0', PIPE SIZE = 11 in² = 1-3/4" PIPE, INVERT @ 0.0'

AREA C
AVAILABLE POND AREA = CONTOUR 1.0 = 7,000 ft² > 990(2) = 1980 ft³ > 1989 ft³ REQ'D. CONTOUR 1.6 = 8,016 ft²
MAX. WATER HT. @ VOL. 1989 = 1.6'
OVERFLOW C = 2.6 ft³ TO DISCHARGE OVER WEIR SIZED FOR Q_{100} FOR AREA C
Q_{100} = (2.6)(.74)(.62)(.62) = 2.5 cfs
C = 2.6 @ 2.5', WHERE C = 2.64 FOR A BREADTH OF 4'.
2.6 @ MAX. HT. OF 1.6'. WEIR CREST @ ELEV. 2.6'
OUTFLOW PIPE SIZED FOR FLOW RATE Q_{100} = (2.6)(.74)(.62)(.62) = 2.5 cfs
PROPOSED HEAD = 1.5, PIPE SIZE = 15 in² = 1-4½" PIPE, INVERT @ 1.4'.

AREA D
AVAILABLE POND AREA, EACH POND = 800 ft² X 3 PONDS = 2400 ft² @ 3' DEPTH = 7200 ft³ REQ'D. REMAINING 8,098 ft³ TO OVERFLOW INDIVIDUAL POND WEIRS

POND D-1 - MAX. WATER HT. @ VOL. 2400 ft³ = ELEV. 20.8
PLACE WEIR CREST @ THIS ELEV.
POND D-2 - MAX. WATER HT. @ VOL. 4800 ft³ = ELEV. 24.8
PLACE WEIR CREST @ THIS ELEV.
POND D-3 - MAX. WATER HT. @ VOL. 7200 ft³ = ELEV. 28.8
PLACE WEIR CREST @ THIS ELEV.
SIZE EACH POND WEIR TO ACCOMODATE TOTAL Q_{100} FOR AREA D

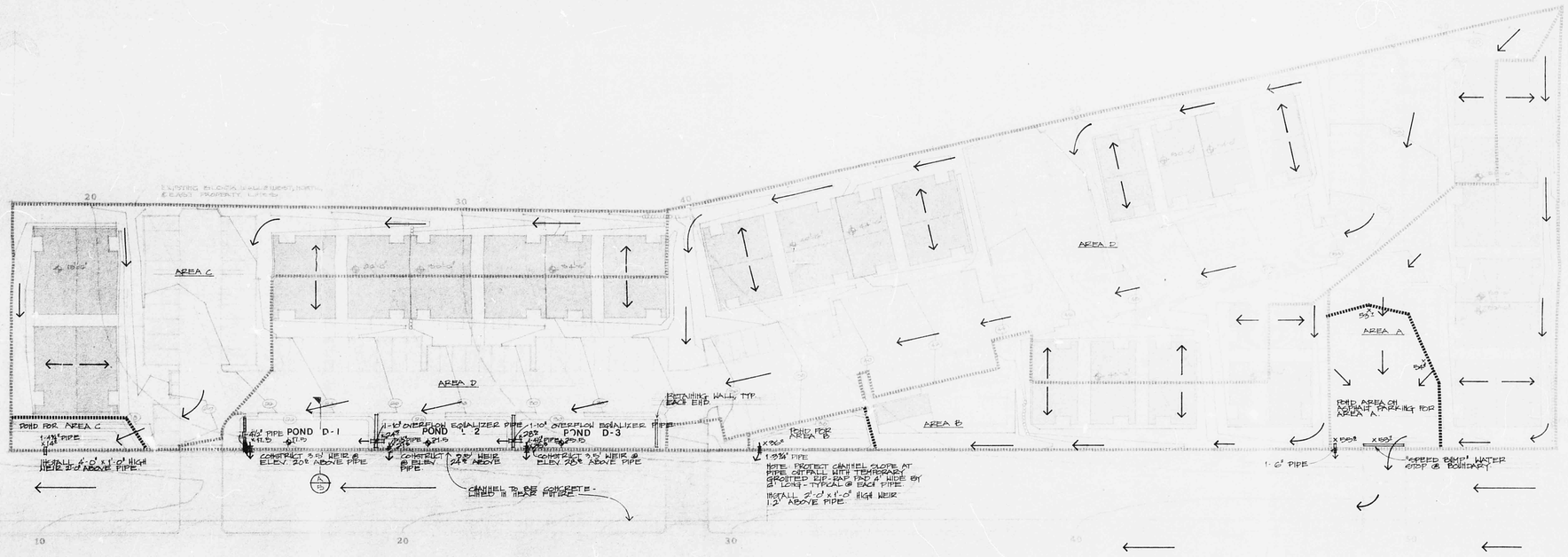
Q_{100} = (2.6)(.74)(.62)(.62) = 2.7 cfs
C = 2.6 @ 2.7', WHERE C = 2.66 FOR A BREADTH OF 3.0'
2.6 @ MAX. HT. OF 1.0' ABOVE WEIR CREST ELEVATIONS SHOWN FOR EACH POND.
OUTFLOW PIPE SIZED FOR Q_{100}/3
2.7/3 = (2.6)(.74)(.62)(.62) = 1.1 cfs
PROPOSED HEAD = 2.0', PIPE SIZE = 15.6 in² = 1-4½" PIPE, EACH POND @ INVERTS SHOWN ON PLAN.



(A) SECTION AT POND D-1

3/8"

DRAINAGE GUIDELINES
1. BASED ON 1979 ABQ CITY INTERIM DRAINAGE GUIDELINES
2. 100-YR., 6-HR. STORM FOR SITE: 2.6"
3. SITE IS NOT LOCATED WITHIN A FLOOD HAZARD AREA (FIRM - FIA 20)
4. SITE IS BOUNDED ON EAST, WEST & WEST SIDES BY EXISTING SUBDIVISION - BOUNDARY SURROUNDED BY BLOCK WALL - NO OFFSITE DRAINAGE FROM THESE AREAS
5. EXISTING SOFT-LINED CHANNEL ALONG COPPER ST. BORDER SOUTH SIDE OF SITE. ESTIMATED FLOWS CONTAINED WITHIN DRAINAGE/STREET R.O.W.
6. REQ'D. PONDS SHALL HAVE A VOL. = DEVELOPED 100-YR. VOL. MINUS UNDEVELOPED 100-YR. VOL. IN A POSITIVE DISCHARGE = Q_{100} UNDEVELOPED TO CHANNEL
7. FORMULAS USED: FLOW RATE: $Q = CIA$; PIPE FLOW: $A = \frac{Q}{C \cdot 0.62g}$
8. VOLUMES CALCULATED DO NOT ACCOUNT FOR SIMULTANEOUS RELEASE THROUGH PIPES. ACTUAL POND VOLUMES WILL NOT REACH DEPTHS SHOWN UNLESS CASE OF PLUGGED PIPE



GRADING PLAN : DRAINAGE LAYOUT

REVISED 8-19-80

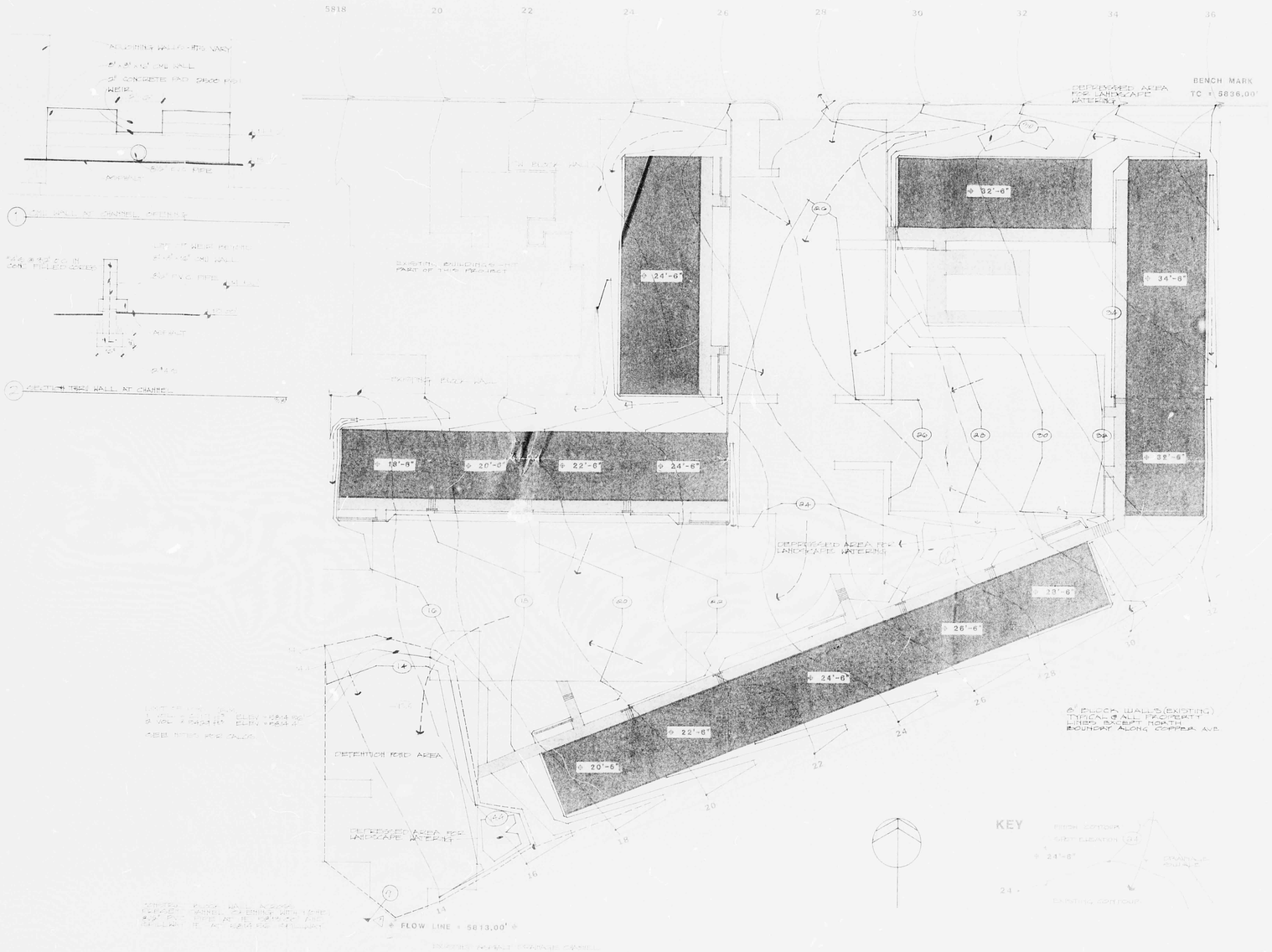
COPPER ST. APARTMENTS

5

3/6/80

CITY OF ALBUQUERQUE
THIS MICROIMAGE IS THE BEST POSSIBLE REPRODUCTION DUE TO THE POOR QUALITY OF THE ORIGINAL DOCUMENT

D 24 C 20 B 16 A 12 | CITY OF ALBUQUERQUE C D



NOTES

DRAINAGE

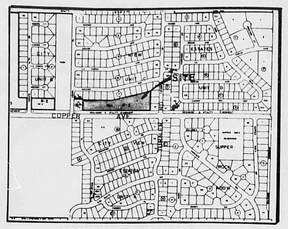
POND VOLUME CALCULATIONS

GRADING & DRAINAGE PLAN

D 24 C 20 B 16 A 12

CITY OF ALBUQUERQUE

C D

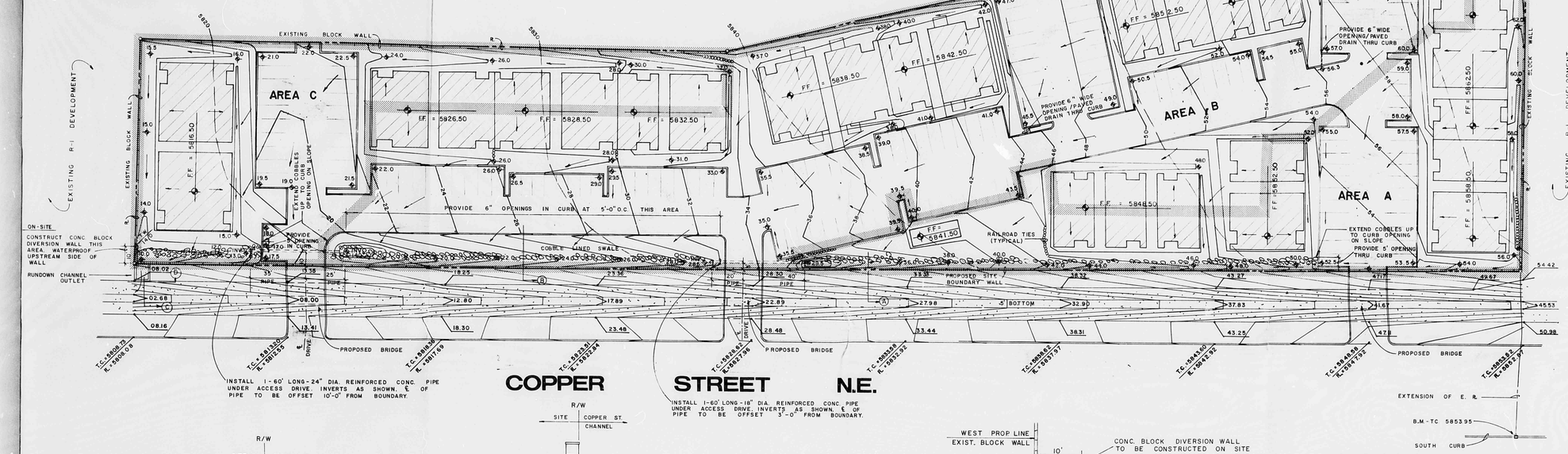


VICINITY MAP -L-23

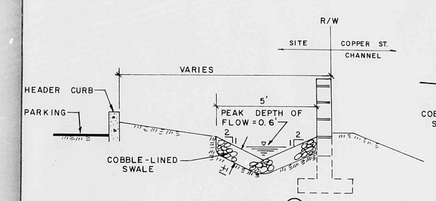
LEGEND

12.7	EXISTING SPOT ELEVATION
12	EXISTING CONTOUR (10' INTERVALS)
12.7	PROPOSED SPOT ELEVATION
12	PROPOSED FINISHED CONTOUR
	SURFACE FLOW DIRECTION
	DRAINAGE BOUNDARY
	COBBLE LINED SWALE

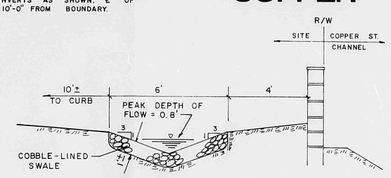
0 10 20 30 60



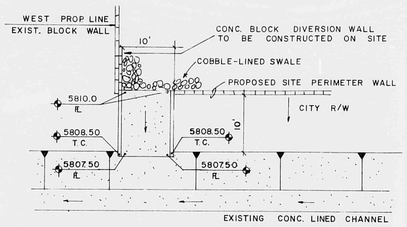
COPPER STREET N.E.



SECTION (A)
SCALE: 1" = 3'



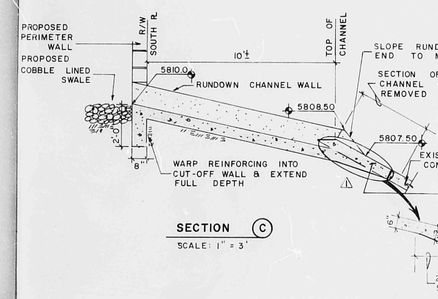
SECTION (B)
SCALE: 1" = 3'



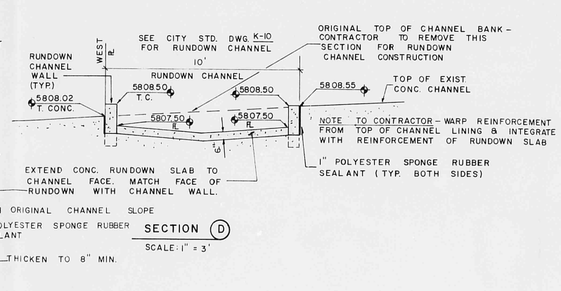
CHANNEL OUTLET PLAN

RECEIVED
MAR 23 1982
ENGINEERING

APPROVED FOR DRAINAGE
9-30-82
DATE
Bernie J. Montoya
SIGNATURE
ADVISE PRIOR TO GRADING INSPECTION WITH GRADING ENGINEER



SECTION (C)
SCALE: 1" = 3'



SECTION (D)
SCALE: 1" = 3'

NOTES:

1. LEGAL: BLOCK 7, TRACT A, UNIT C, CITY VIEW ESTATES SUBDIVISION. (3.58 ACRES)
2. SURVEYOR: AS-BUILT OF COPPER STREET CHANNEL BY WALKER SURVEY CO., 1-13-82.
3. BENCH MARK: TOP OF CURB ON SOUTH SIDE OF COPPER ST. IN LINE WITH EXTENSION OF EAST PROPERTY LINE. ELEVATION = 5853.95
4. SITE NOT COVERED BY MASTER STUDY DRAINAGE MAP. SITE NOT LOCATED IN FLOOD HAZARD ZONE.

⚠1 REV. 2-82 - CHANNEL/RUNDOWN CONNECTION DETAIL

⚠2 REV. 3-82 - REVISED F.F.'s/SITE GRADES TO MATCH CHANGES BY ARCHITECT'S GRADING PLAN

GENERAL INFORMATION

This revised grading/drainage plan updates the approved drainage report prepared in March, 1980, which used inflow/outflow control ponds. At the time of the original report, the Copper Street Channel had not been constructed. In the intervening time period, the channel was completed, but the site was not. Due to the present existence of this channel, the site drainage concept is being revised, per a pre-design meeting with the City Engineers Office 1/5/82, to allow free discharge of the site into the channel.

CALCULATIONS

Area A: Drainage of this area accumulates in a lined swale located along the south side of the site for discharge into Area B through a pipe located under the middle access street.

Peak Rate: $Q100 = (0.74)(5.4)(0.78\ Ac.) = 3$ cfs
Pipe Capacity/HW D = 1.0, entrance type - groove end projecting, nomogram for concrete pipe culverts with entrance control, an 18" diameter pipe's capacity = 7 cfs. 3 cfs from Area A.
Capacity of swale/Z = 2:1, n = 0.030, s = 0.035, Q = 3 cfs, depth of flow = 0.6'.

Area B: Drainage of this area accumulates and combines with flows from Area A in a lined swale located along the south side of the site for discharge into Area C through a pipe located under the westerly access street.
Combined A and B flow:

Peak Rate: $Q100 = (0.74)(5.4)(2.96\ Ac.) = 12$ cfs
Pipe Capacity/HW D = 1.0, entrance type - groove end projecting, nomogram for concrete pipe culverts with entrance control, a 24" diameter pipe's capacity = 14 cfs. 12 cfs from Areas A and B.
Capacity of swale/Z = 3:1, n = 0.030, s = 0.050, Q = 12 cfs, depth of flow = 0.8'.

Area C: Drainage of this area combines with flow from Areas A and B for free discharge into the Copper Street Channel.
Combined A, B, C flow:

$Q100 = (0.74)(5.4)(3.58\ Ac.) = 14$ cfs
Capacity of swale/Z = 3:1, n = 0.030, s = 0.050, Q = 14 cfs, depth of flow = 0.9'.

Capacity of Drainage Rundown/Rectangular Section
Bottom width = 9', n = 0.015, s = 0.20, Q = 14 cfs, depth of flow = 0.2'.

RECOMMENDATIONS

1. Construct revised drainage improvements on-site as shown:
   a. Install 1 - 60' long 18" diameter reinforced concrete pipe under middle access drive, at inverts shown.
   b. Install 1 - 60' long 24" diameter reinforced concrete pipe under west access drive, at inverts shown.
   c. Line drainage swale along south side of site with large cobble, to cross sections shown.
   d. Construct concrete block diversion wall adjacent to existing wall at downstream entrance of concrete rundown to channel, as shown.
   e. Construct concrete drainage rundown into existing Copper Street Channel, per Std. City Drawing #K-10.

Special Order #19 Documents to be submitted with plan.

ALBUQUERQUE
NEW MEXICO

GRADING/DRAINAGE PLAN for Copper Street Apartments

Consultants terra-01 inc.

Chris Cline 1/19/82

D 24 | C 20 | B 16 | A 12

CITY OF ALBUQUERQUE

C D