HYDROLOGY

E17/D

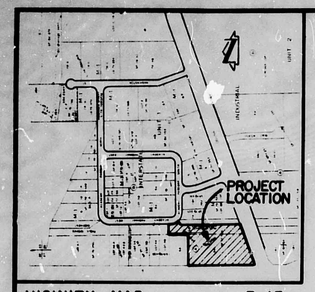
ONE PLAN

PLAN
FOR

CAPITAL EQUIPMENT

CO.

E.17 - D54



VICINITY MAP E-17
SCALE 1"=800'

PROJECT BENCH MARK=TBM

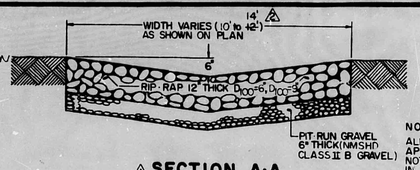
A.M.A.F.C.A. BRASS CAP LOCATED AT THE SOUTHWESTERN CORNER OF LOT 6A AS SHOWN BELOW
ELEVATION = 5092.30 FEET (MSLD)

LEGAL DESCRIPTION

LOT 6A, UNIT 1, INTERSTATE INDUSTRIAL PARK.

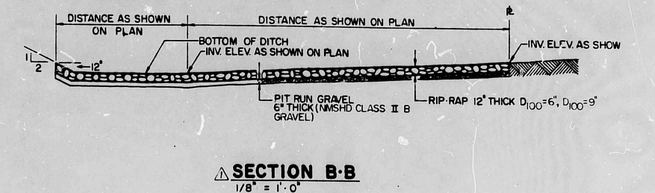
LEGEND

- EXIST. SPOT ELEVATION
- PROPOSED SPOT ELEVATION
- 5093 EXIST. CONTOUR
- 93 PROPOSED CONTOUR
- SWALE
- CONCRETE
- TC TOP OF CURB
- FL FLOWLINE
- EXIST. SIDE SLOPE



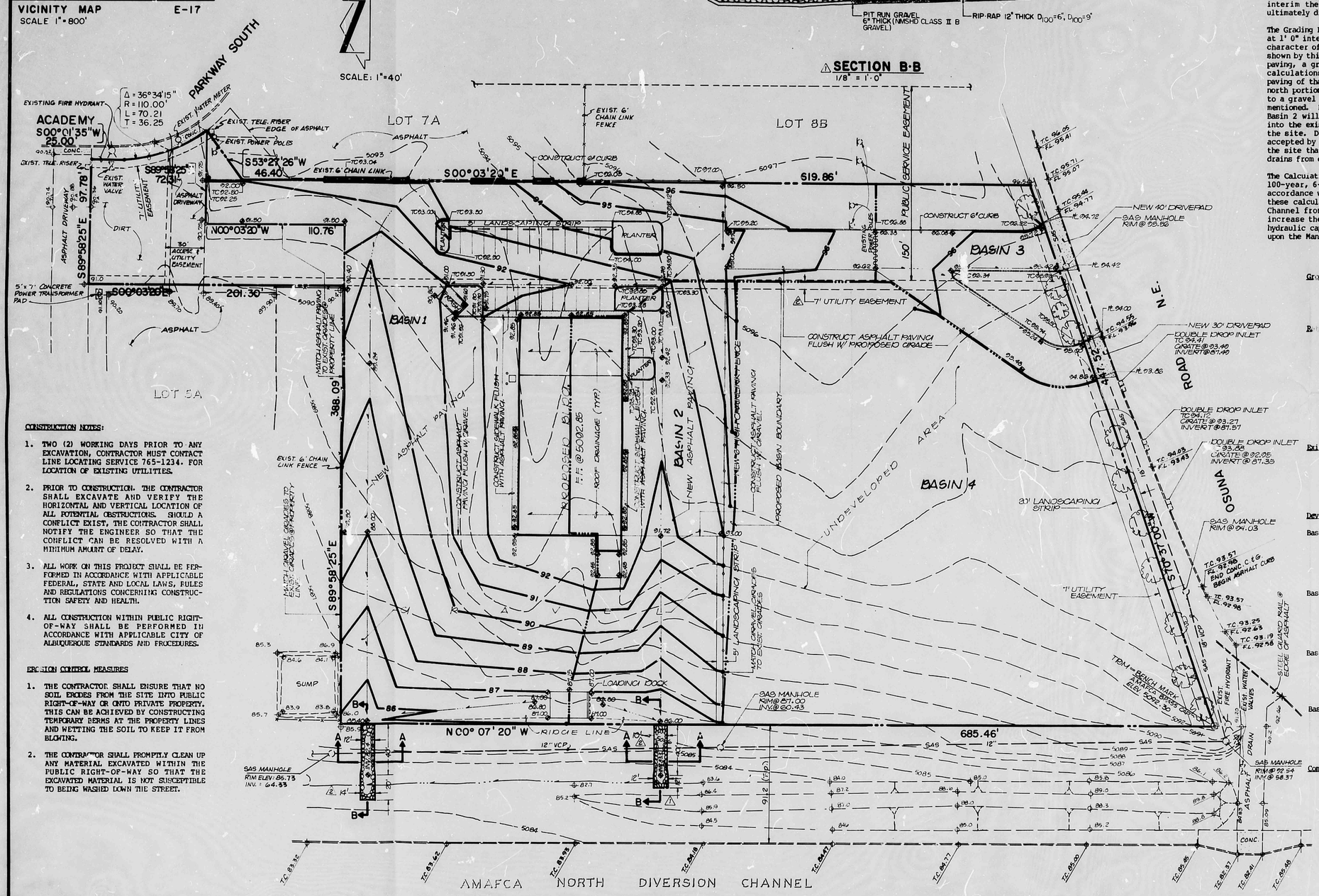
NOTE:
ALL WORK WITHIN AMAFCA R.O.W. MUST BE INSPECTED AND APPROVED BY A REPRESENTATIVE OF AMAFCA. NOTIFY AMAFCA ONE WEEK IN ADVANCE OF ANY WORK IN AMAFCA R.O.W.

SECTION A-A
1/2" = 1'-0"



SECTION B-B
1/8" = 1'-0"

SCALE: 1"=40'



CONSTRUCTION NOTES:

1. TWO (2) WORKING DAYS PRIOR TO ANY EXCAVATION, CONTRACTOR MUST CONTACT LINE LOCATING SERVICE 765-1234. FOR LOCATION OF EXISTING UTILITIES.
2. PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL EXCAVATE AND VERIFY THE HORIZONTAL AND VERTICAL LOCATION OF ALL POTENTIAL OBSTRUCTIONS. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL NOTIFY THE ENGINEER SO THAT THE CONFLICT CAN BE RESOLVED WITH A MINIMUM AMOUNT OF DELAY.
3. ALL WORK ON THIS PROJECT SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL LAWS, RULES AND REGULATIONS CONCERNING CONSTRUCTION SAFETY AND HEALTH.
4. ALL CONSTRUCTION WITHIN PUBLIC RIGHT-OF-WAY SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE CITY OF ALBUQUERQUE STANDARDS AND PROCEDURES.

EROSION CONTROL MEASURES

1. THE CONTRACTOR SHALL ENSURE THAT NO SOIL ERODES FROM THE SITE INTO PUBLIC RIGHT-OF-WAY OR ONTO PRIVATE PROPERTY. THIS CAN BE ACHIEVED BY CONSTRUCTING TEMPORARY BERMS AT THE PROPERTY LINES AND WETTING THE SOIL TO KEEP IT FROM BLOWING.
2. THE CONTRACTOR SHALL PROMPTLY CLEAN UP ANY MATERIAL EXCAVATED WITHIN THE PUBLIC RIGHT-OF-WAY SO THAT THE EXCAVATED MATERIAL IS NOT SUSCEPTIBLE TO BEING WASHED DOWN THE STREET.

DRAINAGE PLAN

The following items concerning the Capital Equipment Company Drainage Plan are contained hereon:

1. Vicinity Map
2. Grading Plan
3. Calculations

The proposed improvements, as shown by the Vicinity Map, are located on the north side of Osuna Road N.E., just east of the AMAFCA North Diversion Channel. Presently, the site is undeveloped.

As shown by Plate 16 of the Flood Boundary and Floodway Maps, City of Albuquerque, New Mexico, Bernalillo County, the site does not lie within a designated Flood Hazard Zone. Further investigation reveals that an adequate downstream facility exists adjacent to the site. This facility is the AMAFCA North Diversion Channel located directly west of the subject site. Presently, runoff drains from east to west and is discharged to an existing ditch located within the AMAFCA right-of-way. This ditch conveys this runoff northward to an existing rundown on the east side of the channel. The adjacent site to the north exists as an office/warehouse building, asphalt paving and landscaping. Offsite flows will not enter the project site from the adjacent site to the north due to the fact that the topography of that site that is parallel to the project site. Offsite flows will enter the project site from the adjacent site to the east, mainly in the form of sheet flow, until such time as that site is developed. In the interim these offsite flows will be accepted and conveyed through the subject size and ultimately discharge into the AMAFCA Channel.

The Grading Plan shows 1) existing and proposed grades indicated by spot elevations and contours at 1' 0" intervals, 2) continuity between existing and proposed elevations, 3) the limit and character of the proposed improvements, and 4) the proposed drainage basin boundaries. As shown by this plan, the proposed improvements include an office/warehouse building, asphalt paving, a gravelled area, and landscaping. The gravelled area has been included in the runoff calculations for the developed conditions as a 100% impervious area to allow for the future paving of that area. There are four drainage basins shown on the plan. Drainage Basin 1 is the north portion of the developed area of the site. Drainage Basin 1 will drain from east to west to a gravel rip-rap rundown which will discharge runoff into the existing ditch previously mentioned. Drainage Basin 2 is the south portion of the developed area of the site. Drainage Basin 2 will also drain from east to west to a second gravel rip-rap rundown which will outlet into the existing ditch. Drainage Basin 3 is approximately located in the southeast corner of the site. Drainage Basin 3 will discharge to Osuna Road N.E. via the new drivepads; then be accepted by the existing catch basins in the street. Drainage Basin 4 will be the portion of the site that will remain in the existing condition. Runoff, mainly in the form of sheet flow, drains from east to west and discharges into the ditch previously mentioned.

The Calculations which appear hereon analyze both the existing and developed conditions for the 100-year, 6-hour rainfall event. The Rational Method has been used for this analysis in accordance with the City of Albuquerque Development Process Manual, Volume II. As shown by these calculations, the proposed improvements will increase the peak discharge to the AMAFCA Channel from the this site by approximately 7.5 cfs. Also, the proposed improvements will increase the peak discharge from the site to Osuna Road N.E. by approximately 1.1 cfs. The hydraulic capacity of the gravel rundown has been analyzed for the maximum peak discharge based upon the Manning Equation. The maximum peak discharge carried has been taken to be 9.5 cfs.

CALCULATIONS

Ground Cover Information

From SCS Bernalillo County Soil Survey, Plate 21:
EmB - Embudo Gravelly Fine Sandy Loam
Hydrologic Soil Group B

Rational Method

Discharge: $Q = CIA$
where C varies
$i = P_6 (6.84)\, T_c^{-0.51} = 4.65$ in/hr
$P_6 = 2.2$ in (DPM Plate 22.2 D-1)
$T_c = 10$ min (minimum)
A = area, acres

Volume: $V = CP_6A(1/12)$
where C varies
$P_6 = 2.2$ in (DPM Plate 22.2 D-1)
A = area, sf

Gravel Rundown Capacity

$Q = 1.49/n\, R^{2/3}\, S^{1/2} A$ (Manning Equation)
where n = 0.040 (Rip-Rap)
A = 2.5 sf
WP = 10.0 ft
R = A/WP = 2.5/10.0 = 0.25
S = 0.0675 ft/ft
$Q = 1.49/0.040\,(0.25)^{2/3}\,(0.0675)^{1/2}\,(2.5)$
$Q = 9.6$ cfs $> Q_{1,100}$ (maximum peak discharge)

Offsite Flow

$A_{total} = 0.9$ Ac; i = 4.65 in/hr
% impervious = 0%; 'C' = 0.34 (DPM Plate 22.2 C-1)
$Q_{100} = CIA = 0.34\,(4.65)(0.9) = 1.4$ cfs

Existing Condition

$A_{total} = 262{,}500$ sf = 6.0 Ac
$A_{imp} = 0$ sf; % impervious = 0%
'C' = 0.34 (DPM Plate 22.2 C-1)
$Q_{100} = CIA = (0.34)(4.65)(6.0) = 9.5$ cfs
$V_{100} = CP_6A = (0.34)(2.2/12)(262{,}500P) = 16{,}360$ cf

Developed Condition

Basin 1
$A_{total} = 99{,}790$ sf = 2.3 Ac
$A_{imp} = 92{,}690$ sf; % impervious = 93%
'C' = 0.89 (DPM Plate 22.2 C-1)
$Q_{1,100} = CIA = 0.89\,(4.65)(2.3) = 9.5$ cfs
$V_{1,100} = CP_6A = 0.89\,(2.2/12)(99{,}790) = 16{,}280$ cf

Basin 2
$A_{total} = 39{,}850$ sf = 0.9 Ac
$A_{imp} = 36{,}655$ sf; % impervious = 92%
'C' = 0.88 (DPM Plate 22.2 C-1)
$Q_{2,100} = CIA = 0.88\,(4.65)(0.9) = 3.7$ cfs
$V_{2,100} = CP_6A = 0.88\,(2.2/12)(39{,}850) = 6{,}430$ cf

Basin 3
$A_{total} = 17{,}480$ sf = 0.4 Ac
$A_{imp} = 9{,}710$ sf; % impervious = 56%
'C' = 0.61 (DPM Plate 22.2 C-1)
$Q_{3,100} = CIA = 0.61\,(4.65)(0.4) = 1.1$ cfs
$V_{3,100} = CP_6A = 0.61\,(2.2/12)(17{,}480) = 1{,}955$ cf

Basin 4
$A_{total} = 105{,}380$ sf = 2.4 Ac
$A_{imp} = 0$ sf; %impervious = 0%
'C' = 0.34 (DPM Plate 22.2 C-1)
$Q_{4,100} = CIA = 0.34\,(4.65)(2.4) = 3.8$ cfs
$V_{4,100} = CP_6A = 0.34\,(2.2/12)(105{,}380) = 6{,}570$ cf

Comparison

Discharge to AMAFCA Channel (Basins 1,2 & 4)
$\Delta Q_{100} = (9.5 + 3.7 + 3.8) - 9.5 = 7.5$ cfs (increase)
$\Delta V_{100} = (16{,}280 + 6{,}430 + 6{,}570) - 16{,}360 = 12{,}920$ cf (increase)

Discharge to Osuna Road N.E. (Basin 3)
$\Delta Q_{100} = 1.1 - 0 = 1.1$ cfs (increase)
$\Delta V_{100} = 1{,}955 - 0 = 1{,}955$ cf (increase)

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JEFFREY G. MORTENSEN NEW MEXICO 6547 12-07-84 REGISTERED PROFESSIONAL ENGINEER

Tom Mann Associates Inc.
811 DALLAS N.E. · ALBUQUERQUE · NEW MEXICO · 87110
ENGINEERS

NO.	DATE	BY	REVISIONS
1	12/84	JTO	Address AMAFCA Comments
2	1/85	JTO	7' Utility Easement; Revise Gravel Rundowns Plan & Sections

DESIGNED BY: JTO
DRAWN BY: S.G.H.
APPROVED: JGM
JOB NO. 40373
DATE 9-84

GRADING & DRAINAGE PLAN
CAPITAL EQUIPMENT COMPANY

E17/D54

FILE NO.
SHEET 1 OF 1