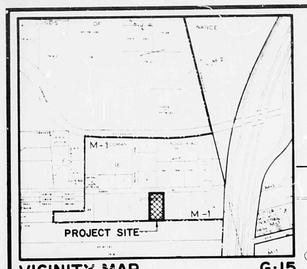
HYDROLOGY

G15/D23
ONE PLAN

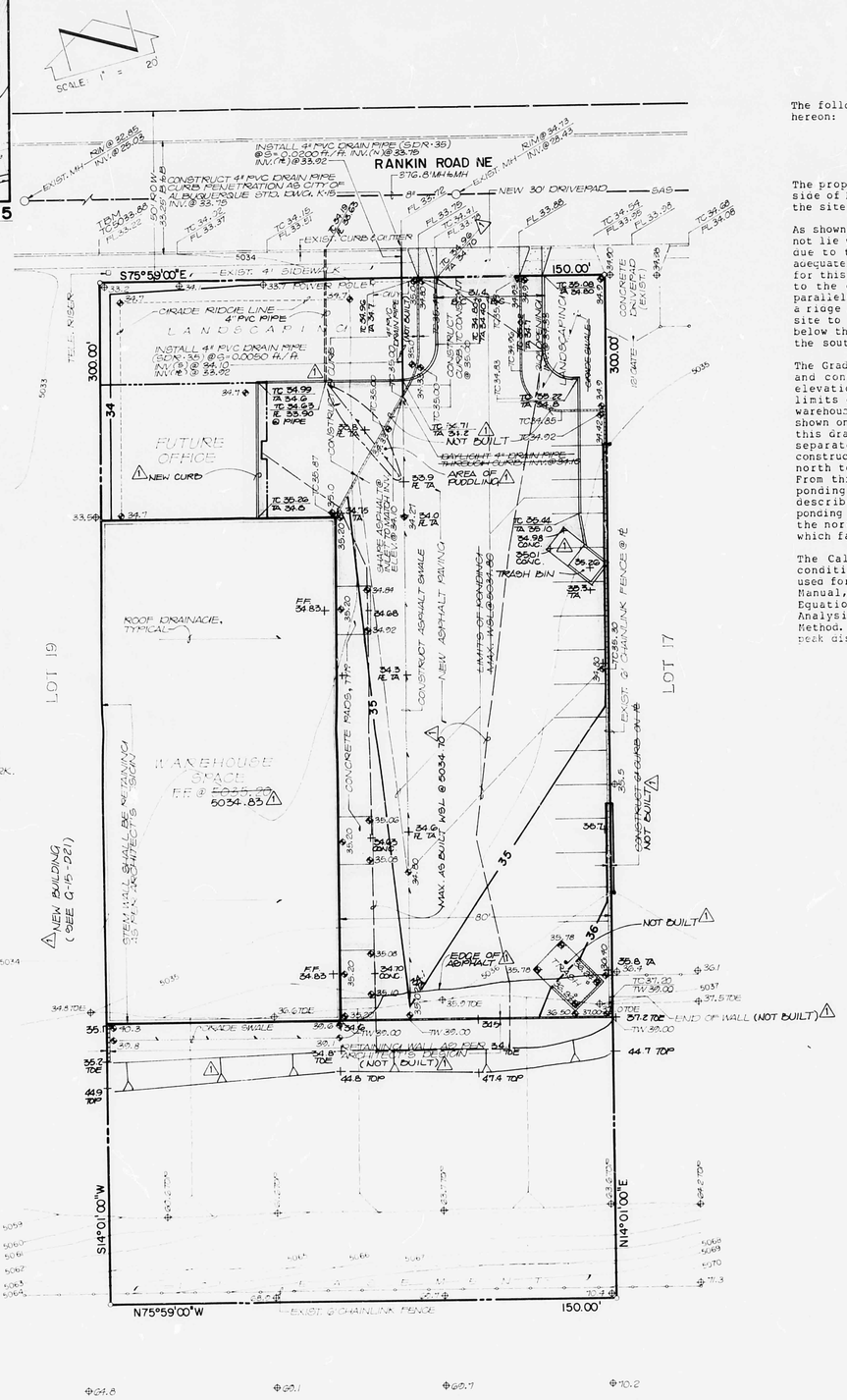
G15/D23

1 PLAN



VICINITY MAP G-15

1" = 800'



LEGEND

5035	EXIST. CONTOUR
35	PROPOSED CONTOUR
+	EXIST. SPOT ELEVATION
	PROPOSED SPOT ELEVATION
	PROPOSED CONCRETE
TC	TOP OF CURB
FL	FLOWLINE
	RETAINING WALL
	RIDGE LINE
	SWALE
	EXIST. SLOPE
+	AS BUILT SPOT ELEVATION

PROJECT BENCHMARK
NGS HD_ BASIS: PID KE 26-29
ELEVATION @ 5079.41 FT. (NGVD)

TEMPORARY BENCHMARK
TOP OF CONCRETE CURB @ NE CORNER OF THE INTERSECTION OF LOT 18, COMAN INDUSTRIAL PARK.
ELEVATION @ 5038.88 FT. (NGVD)

LEGAL DESCRIPTION
LOT 18, BLOCK 1, COMAN INDUSTRIAL PARK.

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.

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.

DRAINAGE PLAN

The following items concerning the Maddox Sales 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 south side of Rankin Road N.E. east of the intersection with Rankin Lane N.E. At present, the site is undeveloped.

As shown by Plate G-15 of the Albuquerque Master Drainage Study (AMDS), the site does not lie within a designated Flood Hazard Zone. Downstream flooding conditions exist due to the fact that there is no curb and gutter in Comanche Boulevard N.E. to adequately convey flows, therefore the controlled discharge of runoff is required for this site. Offsite flows will not enter the subject site from the adjacent sites to the east and the west, due to the fact that the topography of those sites parallels that of the project site. It has been determined by field observation that a ridge line exists on the property line between the project site and the adjacent site to the south. This ridge line diverts runoff generated on that site to a point below the project site, therefore, no offsite flows will enter the project site from the south.

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 limits of ponding. As shown by this plan, the proposed improvements include a warehouse building, asphalt paving and landscaping. A future office building is also shown on the plan. The impervious area of the future building has been considered by this drainage plan as part of the runoff calculations for the developed condition. A separate grading and drainage plan will be required at the time of the future construction in order to obtain a building permit. The site will drain from south to north to a 4" PVC drain pipe located at the northwest corner of the parking lot. From this point, the runoff will discharge to Rankin Road N.E. As a result, interim ponding will occur in the parking lot with controlled release as previously described. The pond depth will not exceed 0.70 feet with overflow runoff from the ponding area discharging to Rankin Road via the new drivepad. The landscaped area in the northwest corner of the site will be graded flat to retain only that rainfall which falls upon it. No roof runoff will be contributed to this pervious area.

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. The analysis of the pond release rate is based upon the Orifice Equation. The determination of the required pond volume is based upon Hydrograph Analysis. The pond volume provided is analyzed based upon the Average End-Area Method. As shown by these calculations, the proposed improvements will decrease the peak discharge from this site by approximately 0.4 cfs.

DRAINAGE CERTIFICATION (G15-D23)

As shown by the as-built data which appears hereon, the subject project differs significantly from the original design. Despite the changes in grades, parking lot configuration and building finished floor, the site drains as intended. The site still continues to drain from south-to-north to a 4-inch PVC drainpipe which discharges to Rankin Road N.E. Review of the as-built pond volume, which achieves a maximum water surface level of 5034.70, reveals that the site has been provided with greater ponding capacity than originally designed. The 100-year water surface level is anticipated to be 5034.65 which is approximately 0.2' below the finished floor of the new building. This does not represent an extremely conservative amount of freeboard, but should keep the new building safe from extensive flooding should a greater rainfall event occur. Lastly, the retaining wall which appeared on the original design was deleted by the owner, and, instead, the slope was cut back to eliminate the need for the wall. Review of the as-built conditions in the field indicates that this retaining wall is not an integral part of the site design. The builder and owner have both confirmed that the rear wall of the building was built as a retaining wall.

Although the as-built conditions differ greatly from the approved design, the site appears to function in compliance with the parameters and guidelines around which this site was designed. The as-built data and analysis reveal that the site does comply with the intent of the approved design.

Jeffrey G. Mortensen, 10-03-85
Date

JEFFREY G. MORTENSEN NEW MEXICO 8547 REGISTERED PROFESSIONAL ENGINEER

CALCULATIONS

Ground Cover Information

From SCS Bernalillo County Soil Survey, Plate 21:
BkD, Bluepoint-Kokan Association; Loamy Fine Sand and Gravelly Sand
Hydrologic Soil Group A

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 22.2D-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 22.2D-1)
A = area, sf

Existing Condition

$A_{total} = 45{,}000$ sf $= 1.03$ Ac
$A_{imp} = 0$ sf; % impervious = 0%
$C = 0.16$ (DPM Plate 22.2C-1)
$Q_{100} = CiA = 0.16\ (4.65)(1.03) = 0.8$ cfs
$V_{100} = CP_6A = 0.16\ (2.2/12)(45{,}000) = 1320$ cf

Developed Condition

Partial Development

$A_{total} = 45{,}000$ sf $= 1.03$ Ac
$A_{imp} = 26{,}000$ sf; % impervious = 58%
$C = 0.48$ (DPM Plate 22.2C-1)
$Q_{100} = CiA = 0.48\ (4.65)(1.03) = 2.3$ cfs
$V_{100} = CP_6A = 0.48\ (2.2/12)(45{,}000) = 3960$ cf

Full Development

$A_{total} = 45{,}000$ sf $= 1.03$ Ac
$A_{imp} = 28{,}000$ sf; % impervious = 62%
$C = 0.50$ (DPM Plate 22.2C-1)
$Q_{100} = CiA = 0.50\ (4.65)(1.03) = 2.4$ cfs
$V_{100} = CP_6A = 0.50\ (2.2/12)(45{,}000) = 4125$ cf

4"-Diameter Pipe Capacity

$Q_{release} = CA\sqrt{2gh}$ (Orifice Equation)
where $C = 0.80$
$A = 0.0873$ sf
$g = 32.2$ ft/sec^2
$h = 0.53$ ft
$Q_{release} = 0.80\ (0.0873)\sqrt{2(32.2)(0.53)}$
$Q_{release} = 0.4$ cfs

Pond Volume

$V_{pond} = 1/2\ [A_{top\ elev} + A_{bottom\ elev}](\text{top elev} - \text{bottom elev})$
$V_{pond} = 1/2\ [6410 + 0]\ (34.80 - 34.10)$
$V_{pond} = 2945$ cf $> V_{pond}$ required
By Hydrograph Analysis, $V_{pond\ required} = 2{,}868$ cf

Comparison

$\Delta Q_{100} = 0.8 - 0.4 = 0.4$ cfs (decrease)
$\Delta V_{100} = 4125 - 1320 = 2805$ cf (increase)

As-Built Pond Volume 1

$V_{pond} = 1/2[(A_{33.8} + A_{33.9})(0.1) + (A_{33.9} + A_{34.7})(0.8)]$

$= 1/2[(0 + 200)(0.1) + (200 + 9{,}400)(0.8)] =$

$V_{pond} = 1/2[20 + 7{,}680] = 3{,}850$ cf $>> V_{required}$

If WSL @ 5,034.6, $V_{pond} = 1{,}600$ cf±
100 WSL @ 5,034.65±

RECEIVED OCT 04 1985 HYDROLOGY SECTION

JEFFREY G. MORTENSEN NEW MEXICO 8547 REGISTERED PROFESSIONAL ENGINEER 10-04-85

BOHNINGHAUSEN & ASSOCIATES
811 DALLAS N.E. - ALBUQUERQUE - NEW MEXICO - 87110
ENGINEERS

NO	DATE	BY	REVISIONS
1	9/86	JGM	AS BUILT & CERTIFICATION

DESIGNED BY J. T. O.
DRAWN BY T. M. A.
APPROVED J. G. M.

JOB NO 41731
DATE 1/85

GRADING & DRAINAGE PLAN
MADDOX SALES COMPANY

FILE NO
SHEET 1 OF 1