HYDROLOGY

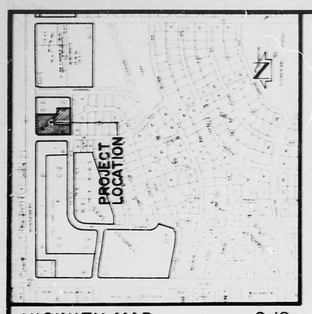
G19/D17

TWO PLANS

2 PLANS FOR

T. R. GREVE CO.

G19.D17



VICINITY MAP G-19
SCALE 1" = 800'

LEGEND

- 5840 — EXISTING CONTOUR
- —40— PROPOSED CONTOUR
- EXISTING SPOT ELEVATION
- PROPOSED SPOT ELEVATION
- PROPOSED ASPHALT
- PROPOSED CONCRETE

PROJECT BENCHMARK = TBM

A SQUARE "D" CHISELED ON TOP OF THE EBB CURB RETURN LOCATED AT THE INTERSECTION OF MONTGOMERY BOULEVARD NE & JULIE STREET NE
ELEVATION = 5832.12 FEET (MSLD)

LEGAL DESCRIPTION

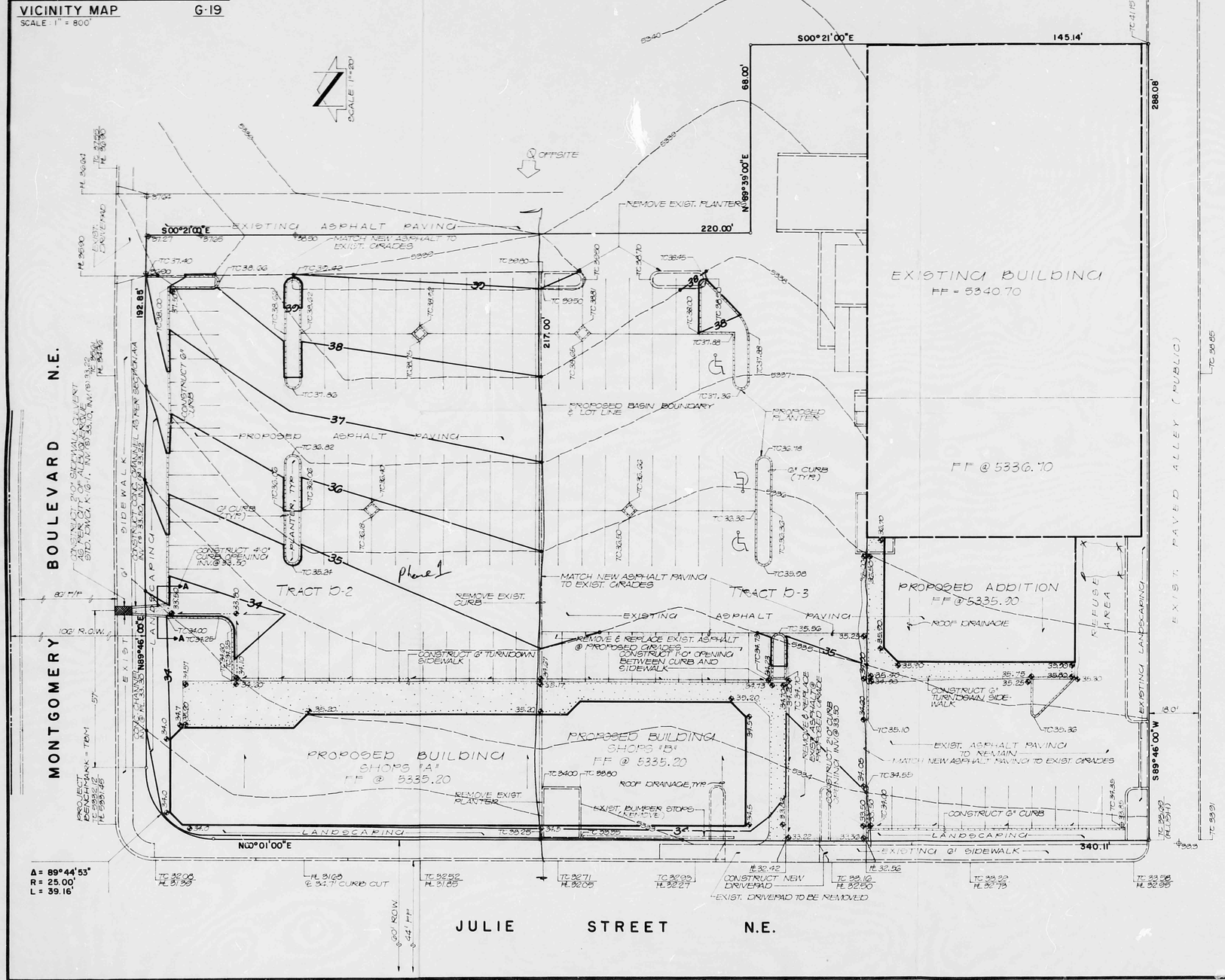
TRACTS D-2 AND D-3, UNIT 4, STARDUST SKIES.

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 PRACTICES.

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.
3. THE CONTRACTOR SHALL SECURE "TOPSOIL DISTURBANCE PERMIT" PRIOR TO BEGINNING CONSTRUCTION.



DRAINAGE PLAN

The following items concerning the T. R. Greve 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 at the southeast corner of the intersection of Julie Street N.E. and Montgomery Boulevard N.E. The site consists of Tracts D-2 and D-3, Unit 4, Stardust Skies. Tract D-2 is currently undeveloped. Tract D-3 is developed as an existing building, asphalt paving and landscaping.

As shown by Plate G-19 of the Albuquerque Master Drainage Study (AMDS), this site does not lie within a designated Flood Hazard Zone. Further investigation reveals that the Hahn Arroyo Drainage Channel exists beneath Montgomery Boulevard N.E., a short distance east of the project site. From the review of the AMDS, it appears that the flooding in Montgomery Boulevard N.E. east of the channel is intercepted by the channel and conveyed to the southwest. In addition, downstream flooding in Montgomery Boulevard N.E. further to the west does not appear to be a problem as shown by Plate G-18 of the Albuquerque Master Drainage Study. Runoff generated by Tract D-2, existing mainly in the form of sheetflow, flows from east to west and discharges to Julie Street N.E. Runoff generated by Tract D-3 drains from east to west and discharges to Julie Street N.E. via the existing improvements. Runoff from both tracts then flows north to Montgomery Boulevard N.E., turns west and flows to the intersection of Louisiana Boulevard N.E. and Montgomery Boulevard N.E. As indicated on the City of Albuquerque Storm Drainage Facilities Maps, there is an existing water block located in Montgomery Boulevard N.E. just west of that intersection. Based upon these maps, it appears that the flows turn at this intersection and flow south in Louisiana Boulevard N.E. to the North Hahn Arroyo Drainage Channel where they are intercepted. Offsite flows will not enter the project site from the north or west since those offsite flows appear to be confined to the fully improved streets, Montgomery Boulevard N.E. and Julie Street N.E., respectively. Offsite flows will enter the subject site from the site to the east. These offsite flows are quantified in the calculations. Offsite flows will not enter the site from the south due to an existing paved alley adjacent to the south property line. The alley will accept offsite flows and convey them west to Julie Street N.E.

The Grading Plan shows 1) existing and proposed grades indicated by spot elevations and contours at 1' 0" intervals, 2) the limit and character of the existing improvements, 3) the limit and character of the proposed improvements, 4) continuity between existing and proposed grades, and 5) the proposed basin boundaries. As shown by this plan, the proposed improvements on Tract D-2 include a building, asphalt paving and landscaping. The proposed improvements on Tract D-3 include an addition to the existing building, a new building and landscaping. Tract D-2 will drain from southeast to northwest to the northwest corner of the parking lot. From there, the runoff will freely discharge to Montgomery Boulevard N.E. via the concrete lined drainage channel and sidewalk culvert. Tract D-3 will continue to drain from east to west and discharge to Julie Street N.E. via the new drivepad on the west side of the site.

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 4-foot curb opening has been analyzed based upon the Weir Equation for entrance conditions. The sidewalk culvert capacity has been analyzed based on the Manning Equation. As shown by these calculations, the proposed improvements on Tract D-2 will increase the peak discharge from that lot to Montgomery Boulevard N.E by approximately 1.8 cfs. The proposed improvements on Tract D-3 will actually decrease the peak discharge from that lot to Julie Street N.E. by approximately 0.2 cfs.

CALCULATIONS

Ground Cover Information

From SCS Bernalillo County Soil Survey, Plate 21:
Etc, Embudo-Tijeras Complex; Gravelly Fine Sandy Loam
Hydrologic Soil Group B

Rational Method

Discharge: $Q = CiA$
where C varies
$i = P_6\ (6.84)\ T_c^{-0.51} = 4.93$ in/hr
$P_6 = 2.33$ in (DPM Plate 22.2D-1)
$T_c = 10$ min (minimum)
A = area, acres

Volume: $V = CP_6A(1/12)$
where C varies
$P_6 = 2.33$ in (DPM Plate 22.2D-1)
A = area, sf

Existing Condition

Tract D-2
$A_{total} = 31{,}235$ sf $= 0.72$ Ac
$A_{imp} = 2{,}016$ sf; impervious = 6%
$C = 0.38$ (DPM Plate 22.2C-1)
$Q_{100} = CiA = 0.38\ (4.93)(0.72) = 1.3$ cfs
$V_{100} = CP_6A = 0.38\ (2.33/12)(31{,}235) = 2{,}305$ cf

Tract D-3
$A_{total} = 58{,}415$ sf $= 1.34$ Ac
$A_{imp} = 56{,}724$ sf; % impervious = 97%
$C = 0.95$ (DPM Plate 22.2C-1)
$Q_{100} = CiA = 0.95\ (4.93)(1.34) = 6.3$ cfs
$V_{100} = CP_6A = 0.95\ (2.33/12)(58{,}415) = 10{,}775$ cf

Developed Condition

Tract D-2
$A_{total} = 31{,}235$ sf $= 0.72$ Ac
$A_{imp} = 28{,}050$ sf; % impervious = 90%
$C = 0.86$ (DPM Plate 22.2C-1)
$Q_{100} = CiA = 0.86\ (4.93)(0.72) = 3.1$ cfs
$V_{100} = CP_6A = 0.86\ (2.33/12)(31{,}235) = 5{,}215$ cf

Tract D-3
$A_{total} = 58{,}415$ sf $= 1.34$ Ac
$A_{imp} = 56{,}130$ sf; % impervious = 96%
$C = 0.93$ (DPM Plate 22.2C-1)
$Q_{100} = CiA = 0.93\ (4.93)(1.34) = 6.1$ cfs
$V_{100} = CP_6A = 0.93\ (2.33/12)(58{,}415) = 10{,}550$ cf

Comparison

Tract D-2 (discharge to Montgomery Boulevard N.E.)
$\Delta Q_{100} = 3.1 - 1.3 = 1.8$ cfs (increase)
$\Delta V_{100} = 5{,}215 - 2{,}305 = 2{,}910$ cf (increase)

Tract D-3 (discharge to Julie Street N.E.)
$\Delta Q_{100} = 6.3 - 6.1 = 0.2$ cfs (decrease)
$\Delta V_{100} = 10{,}775 - 10{,}550 = 225$ cf (decrease)

Hydraulic Capacities

4'-0" Curb Opening
$Q = 3.33\ L\ h^{1.5}$
where L = 4.0 ft
h = 0.5 ft
$Q = 3.33\ (4.0)(0.5)^{1.5}$
$Q = 4.7$ cfs $> Q_{100}$ (Tract D-2)

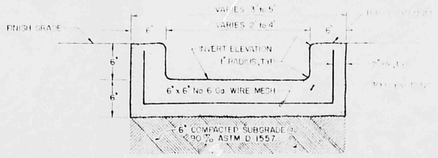
2'-0" Sidewalk Culvert

$Q = 1.49/n\ R^{2/3}\ s^{1/2}\ A$ (Manning Equation)
where n = 0.013 (concrete)
A = 1.0 sf
W.P. = 3 ft
R = A/WP = 1.0/3 = 0.33 ft
s = 0.0200 ft/ft

$Q = 1.49/0.013\ (0.33)^{2/3}\ (0.0200)^{1/2}\ (1.0)$
$Q = 7.7$ cfs $> Q_{100}$ (Tract D-2)

Offsite Flows

A = 36,740 sf = 0.84 Ac
$A_{imp} = 0$ sf; % impervious = 0%
$C = 0.34$ (DPM Plate 22.2C-1)
$Q_{100} = 0.34\ (4.93)(0.84) = 1.4$ cfs



SECTION A-A
SCALE 1" = 1'-0"

RECEIVED
MAR 04 1985
HYDROLOGY SECTION

JEFFREY G. MORTEMEIER
NEW MEXICO
8547
03-01-85
REGISTERED PROFESSIONAL ENGINEER

TONN VARNI ASSOCIATES, INC.
811 DALLAS, N.E. · ALBUQUERQUE · NEW MEXICO · 87110
ENGINEERS

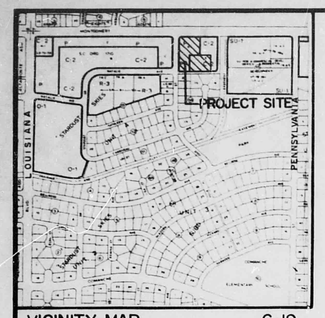
NO.	DATE	BY	REVISIONS

DESIGNED BY: JTO
DRAWN BY: LBD
APPROVED: JGM
JOB NO. 41132
DATE 2·85

GRADING & DRAINAGE PLAN
T. R. GREVE CO.

G19 / D17

FILE NO.
SHEET 1 OF



VICINITY MAP G-19

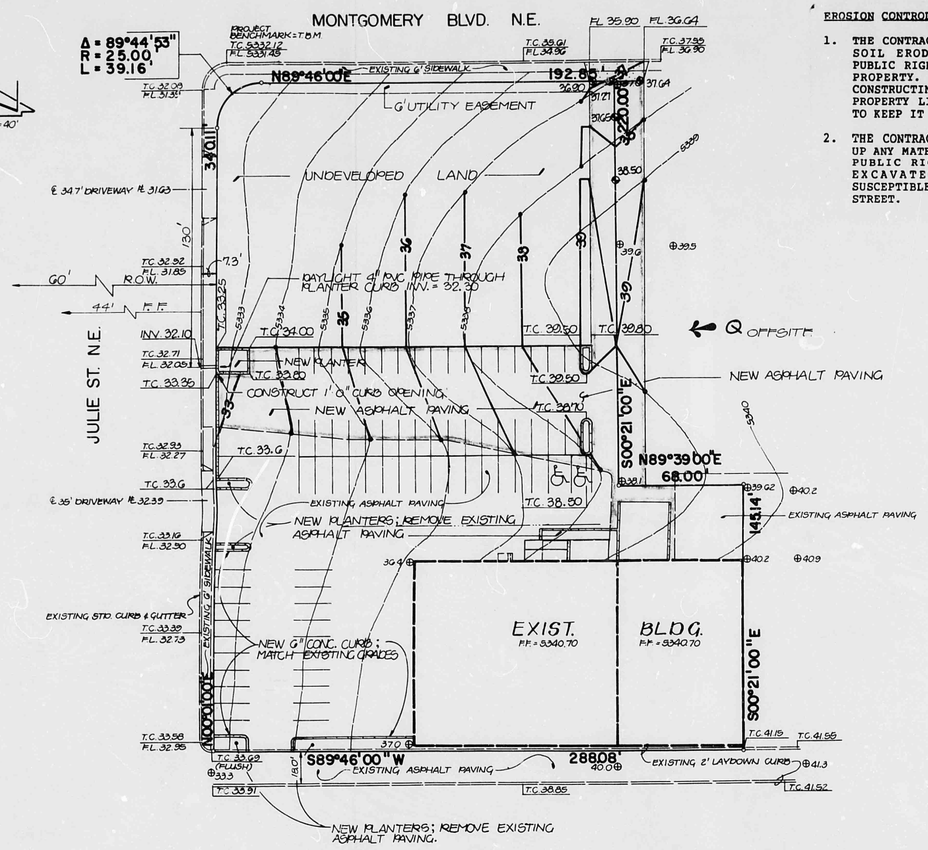
SCALE: 1" = 800'

·LEGEND·

- PROPOSED SPOT ELEVATION
- EXISTING SPOT ELEVATION
- 5G — PROPOSED CONTOUR
- 5555G — EXISTING CONTOUR
- SWALE

PROJECT BENCHMARK = T.B.M.

A SQUARE, Ø, CHISELED ON TOP OF THE E.S.E. CURB RETURN LOCATED AT THE INTERSECTION OF MONTGOMERY BLVD N.E. & JULIE ST. N.E. ELEVATION: 5332.12 FEET (M.S.L.D.)



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 Southwest Produce Drainage Plan are contained hereon:

1. Vicinity Map
2. Grading Plan
3. Calculations

The proposed improvements, as shown by the Vicinity Map, are located at the southeast corner of the intersection of Julie Street N.E. and Montgomery Boulevard N.E. At present, the site is partially developed. The site currently supports an existing building with adjacent asphalt paving. The proposed construction consists of the expansion of the asphalt parking area along with the addition of several landscaped planters.

As shown by Plate G-19 of the Albuquerque Master Drainage Study, this site does not lie within a designated Flood Hazard Zone. Downstream flooding does not appear to be a problem as shown by Plate G-18 of the Albuquerque Master Drainage Study. Because of this, the runoff from this site will be permitted the free discharge to Julie Street N.E. and Montgomery Boulevard N.E. This is the existing pattern of runoff for the site.

The Grading Plan shows 1) existing and proposed grades indicated by spot elevations and contours at 1' 0" intervals, 2) the limit and character of the existing improvements, 3) the limit and character of the proposed improvements, and 4) continuity between existing and proposed grades. As shown by this plan, the site drains from east to west and discharges its runoff to Julie Street N.E. and Montgomery Boulevard N.E. The majority of the already improved site will continue to discharge its runoff to Julie Street N.E. via the existing driveway cut along the west side of the site. The majority of the new paving will direct its runoff to a proposed planter area which will drain via a 4-inch pipe to Julie Street N.E. This routing of the runoff will tend to attenuate potential nuisance flows. The new driveway entrance from the north will discharge its runoff directly to Montgomery Boulevard N.E. via a proposed drivepad. This proposed scheme of drainage is consistent with the existing pattern of runoff and is in accordance with the predesign conference conducted on July 18, 1984, with the City of Albuquerque Hydrology Section.

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 offsite flows is also based upon the Rational Method. The offsite flows will be accepted and conveyed through this site. As shown by these calculations, the increase in runoff due to the proposed improvements is negligible and should have an insignificant impact on downstream conditions. It is based upon this that the free discharge of runoff is permitted.

CALCULATIONS

Ground Cover Information

From SCS Bernalillo County Soil Survey, Plate 21:
EtC Embudo-Tijeras Complex
Hydrologic Soil Group B

Rational Method

Discharge: $Q = CiA$
Where C varies
$i = P_6 (6.84)\, T_c^{-0.51} = 4.93$ in/hr
$P_6 = 2.33$ in (DPM Plate 22.2D-1)
$T_c = 10$ min (minimum)
A = area, acres

Volume: $V = CP_6A(1/12)$
where C varies
$P_6 = 2.33$ in (DPM PLate 22.2D-1)
A = area, sf

Existing Condition

$A_{total} = 89{,}650$ sf $= 2.06$ Ac
$A_{imp} = 46{,}760$ sf; % impervious = 52%
'C' = 0.59 (DPM Plate 22.2C-1)
$Q_{100} = CiA = 0.59(4.93)(2.06) = 6.0$ cfs
$V_{100} = CP_6A = 0.59(2.33/12)(89{,}650) = 10{,}270$ cf

Developed Condition

$A_{total} = 89{,}650$ sf $= 2.06$ Ac
$A_{imp} = 58{,}740$ sf; % impervious = 66%
'C' = 0.66 (DPM Plate 22.2C-1)
$Q_{100} = CiA = 0.66(4.93)(2.06) = 6.7$ cfs
$V_{100} = CP_6A = 0.66(2.33/12)(89{,}650) = 11{,}490$ cf

Comparison

$\Delta Q_{100} = 6.7 - 6.0 = 0.7$ cfs (increase)
$\Delta V_{100} = 11{,}490 - 10{,}270 = 1220$ cf (increase)

Offsite Flows

A = 36,740 sf = 0.84 Ac
A_{imp} = 0 sf; % impervious = 0%
C = 0.34
$Q_{100} = 0.34(4.93)(0.84) = 1.4$ cfs

RECEIVED JUN 12 1985 HYDROLOGY SECTION

JEFFREY G. MORTENSEN NEW MEXICO REGISTERED PROFESSIONAL ENGINEER

Tom Wasylenko Associates, Inc. 811 DALLAS, N.E. · ALBUQUERQUE · NEW MEXICO · 87110 ENGINEERS	NO. / DATE / BY / REVISIONS	DESIGNED BY: J.G.M. DRAWN BY: C.G.C. APPROVED: J.G.M.	JOB NO. 4-1131 DATE 8/84	GRADING & DRAINAGE PLAN SOUTHWEST PRODUCE	G19/D17	FILE NO. SHEET 1 OF 1

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