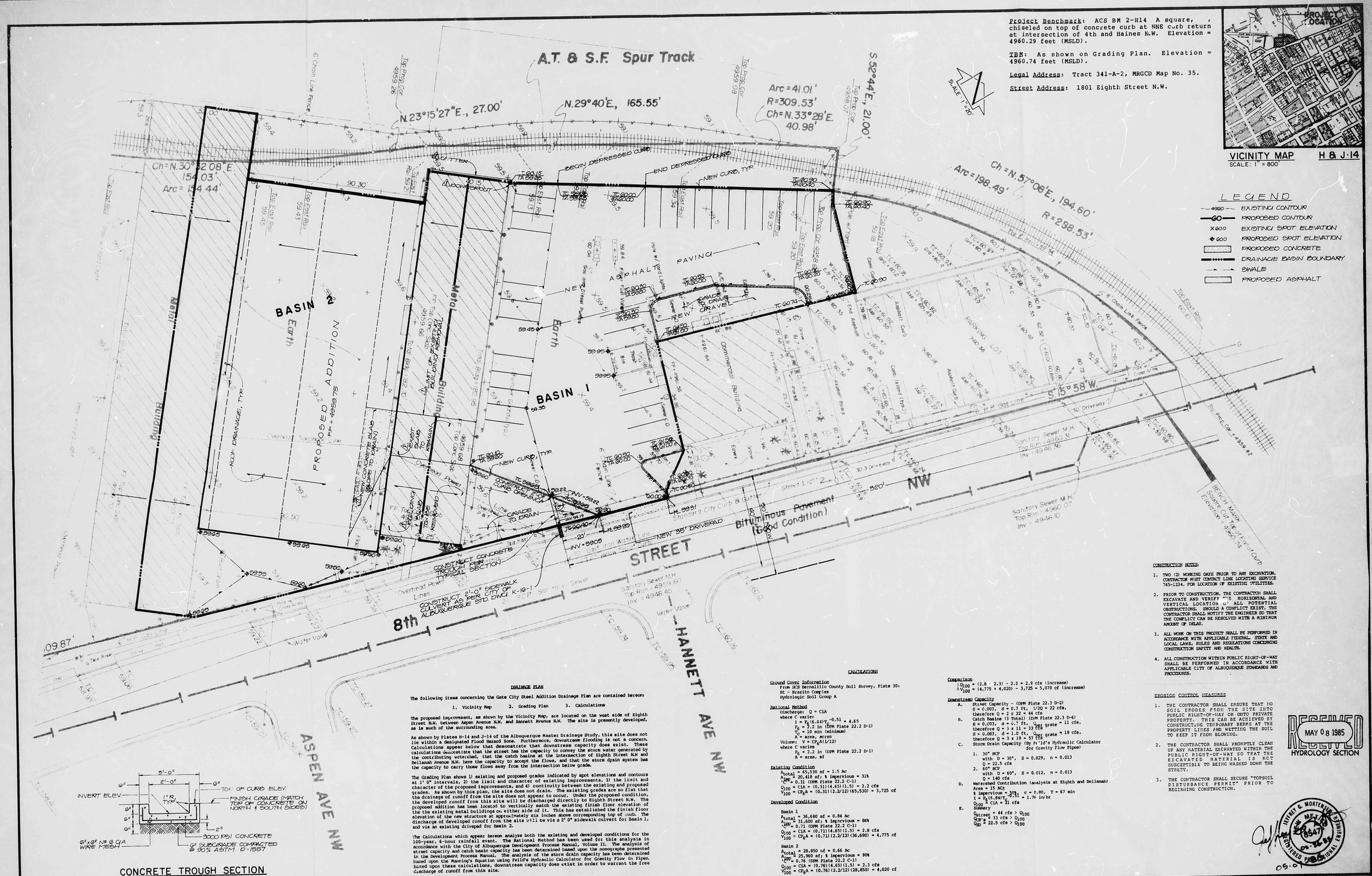
Hydrology H14/D23 Gate City Steel

H 14 / D23

Gate City
Steel

1 Plan



Project Benchmark: ACS BM 2-H14 A square, , chiseled on top of concrete curb at NNE curb return at intersection of 4th and Haines N.W. Elevation = 4960.29 feet (MSLD).

TBM: As shown on Grading Plan. Elevation = 4960.74 feet (MSLD).

Legal Address: Tract 341-A-2, MRGCD Map No. 35.

Street Address: 1801 Eighth Street N.W.

VICINITY MAP H 8 J·14
SCALE: 1" = 800'

LEGEND

- 4960 — EXISTING CONTOUR
- 60 — PROPOSED CONTOUR
- X 60.0 EXISTING SPOT ELEVATION
- + 60.0 PROPOSED SPOT ELEVATION
- PROPOSED CONCRETE
- DRAINAGE BASIN BOUNDARY
- SWALE
- PROPOSED ASPHALT

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

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MAY 08 1985
HYDROLOGY SECTION

DRAINAGE PLAN

The following items concerning the Gate City Steel Addition Drainage Plan are contained hereon:

1. Vicinity Map 2. Grading Plan 3. Calculations

The proposed improvement, as shown by the Vicinity Map, are located on the west side of Eighth Street N.W. between Aspen Avenue N.W. and Barnett Avenue N.W. The site is presently developed, as is such of the surrounding area.

As shown by Plates H-14 and J-14 of the Albuquerque Master Drainage Study, this site does not lie within a designated Flood Hazard Zone. Furthermore, downstream flooding is not a concern. Calculations appear below that demonstrate that downstream capacity does exist. These calculations demonstrate that the street has the capacity to convey the storm water generated by the contributing watershed, that the catch basins at the intersection of Eighth Street NW and Bellamah Avenue NW, have the capacity to accept the flows, and that the storm drain system has the capacity to carry those flows away from the intersection below grade.

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 existing improvements, 3) the limit and character of the proposed improvements, and 4) continuity between the existing and proposed grades. As shown by this plan, the site does not drain. The existing grades are so flat that the drainage of runoff from the site does not appear to occur. Under the proposed condition, the developed runoff from this site will be discharged directly to Eighth Street N.W. The proposed addition has been located to vertically match the existing finish floor elevation of the the existing metal buildings on either side of it. This has established the finish floor elevation of the new structure at approximately six inches above corresponding top of curb. The discharge of developed runoff from the site will be via a 2' 0" sidewalk culvert for Basin 1, and via an existing drivepad for Basin 2.

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 street capacity and catch basin capacity has been determined based upon the nomographs presented in the Development Process Manual. The analysis of the storm drain capacity has been determined based upon the Manning's Equation using Fellr's Hydraulic Calculator for Gravity Flow in Pipes. Based upon these calculations, downstream capacity does exist in order to warrant the free discharge of runoff from this site.

CALCULATIONS

Ground Cover Information
From SCS Bernalillo County Soil Survey, Plate 30:
BR - Brazito Complex
Hydrologic Soil Group A

Rational Method
Discharge: $Q = CIA$
where C varies
$i = P_6(6.84)T_c^{-0.51} = 4.65$
$P_6 = 2.2$ 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

Existing Condition
$A_{total} = 65{,}530$ sf = 1.5 Ac
$A_{imp} = 20{,}418$ sf; % impervious = 31%
$C^{imp} = 0.31$ (DPM Plate 22.2 C-1)
$Q_{100} = CIA = (0.31)(4.65)(1.5) = 2.2$ cfs
$V_{100} = CP_6A = (0.31)(2.2/12)(65{,}530) = 3{,}725$ cf

Developed Condition

Basin 1
$A_{total} = 36{,}680$ sf = 0.84 Ac
$A_{imp} = 31{,}600$ sf; % impervious = 86%
$C^{imp} = 0.71$ (DPM Plate 22.2 C-1)
$Q_{100} = CIA = (0.71)(4.65)(1.5) = 2.8$ cfs
$V_{100} = CP_6A = (0.71)(2.2/12)(36{,}680) = 4{,}775$ cf

Basin 2
$A_{total} = 28{,}850$ sf = 0.66 Ac
$A_{imp} = 25{,}960$ sf; % impervious = 90%
$C^{imp} = 0.76$ (DPM Plate 22.2 C-1)
$Q_{100} = CIA = (0.76)(4.65)(1.5) = 2.3$ cfs
$V_{100} = CP_6A = (0.76)(2.2/12)(28{,}850) = 4{,}020$ cf

Comparison
$\Delta Q_{100} = (2.8 + 2.3) - 2.2 = 2.9$ cfs (increase)
$\Delta V_{100} = (4{,}775 + 4{,}020) - 3{,}725 = 5{,}070$ cf (increase)

Downstream Capacity
A. Street Capacity - (DPM Plate 22.3 D-2)
$S = 0.003$, $d = 0.7$ ft, $1/2O = 22$ cfs,
therefore $Q = 2 \times 22 = 44$ cfs
B. Catch Basins (3 Total) (DPM Plate 22.3 D-6)
$S = 0.003$, $d = 0.7$ ft, $Q_{per\ grate} = 11$ cfs,
therefore $Q = 3 \times 11 = 33$ cfs
$S = 0.003$, $d = 1.0$ ft, $Q_{per\ grate} = 19$ cfs,
therefore $Q = 3 \times 19 = 57$ cfs
C. Storm Drain Capacity (By Fr'ld's Hydraulic Calculator for Gravity Flow Pipes)
1. 30" RCP
with $D = 30"$, $S = 0.029$, $n = 0.013$
$Q = 22.5$ cfs
2. 60" RCP
with $D = 60"$, $S = 0.012$, $n = 0.013$
$Q = 140$ cfs
D. Watershed Contribution (analysis at Eighth and Bellamah)
Area = 15 ACS
% impervious = 50%, $c = 0.80$, $T = 67$ min
$i = P_6(6.84)T_c^{-0.51} = 1.76$ in/hr
$Q_{100} = CIA = 21$ cfs
E. Summary
$Q_{street} = 44$ cfs $> Q_{100}$
$Q_{CB's} = 33$ cfs $> Q_{100}$
$Q_{SD} = 22.5$ cfs $> Q_{100}$

CONCRETE TROUGH SECTION
SCALE: 1" = 2'-0"

ENTRY & MORTENSEN ASSOCIATES, INC.
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ENGINEERS

NO.	DATE	BY	REVISIONS
1	5/85	JCM	REVISE BLDG FOOTPRINT & ROOF DRAINAGE

DESIGNED BY: JCM & LBD
DRAWN BY: LBD
APPROVED: JCM

JOB NO. 30272
DATE 01/85

GRADING & DRAINAGE PLAN
GATE CITY STEEL

H14 / D23

FILE NO.
SHEET 1 OF 1

JOSEPH E. MORTENSEN
NEW MEXICO
8547
REGISTERED PROFESSIONAL ENGINEER
05-01-85