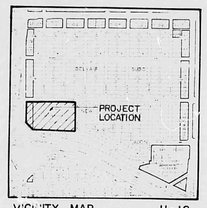


VICINITY MAP
SCALE 1 = 800'

H-18

LEGAL DESCRIPTION

TRACTS A, OF THE CORTEZ ELEMENTARY SCHOOL

T.B.M.

FOUND NEGNAIL LOCATED AT THE SW. CORNER OF THE PROPERTY AS SHOWN HEREON.
ELEV = 5282.82 ft (M.S.L.D)

PROJECT BENCHMARK

THE STATION MARK IS A STANDARD N.M.H.C. BRASS TARGET STAMPED "1972 N.M. SCT." SET IN TOP OF A CONCRETE POST FLUSH W/ THE GROUND. THE STATION IS LOCATED IN THE CENTER OF THE MEDIAN ON SAN MATEO JUST NORTH OF THE INTERSECTION OF SAN MATEO BLVD N.E. & CUTLER AVE. N.E.
ELEV. = 5204.29 ft (M.S.L.D.)

LEGEND

- 5285 — EXISTING SPOT ELEVATION
- 5285 — PROPOSED SPOT ELEVATION
- 15 — EXISTING CONTOUR
- 15 — PROPOSED CONTOUR
- EXISTING CONCRETE
- EXISTING CHAIN LINK FENCE
- EXISTING CABLE FENCE
- EXISTING TREES
- WATER BLOCK
- TC — TOP OF CURB
- TA — TOP OF ASPHALT
- FL — FLOW LINE
- PROPOSED SWALE

DRAINAGE PLAN

The following items concerning the New Futures School Drainage Plan are contained herein:

1. Vicinity Map 2. Grading Plan 3. Calculations

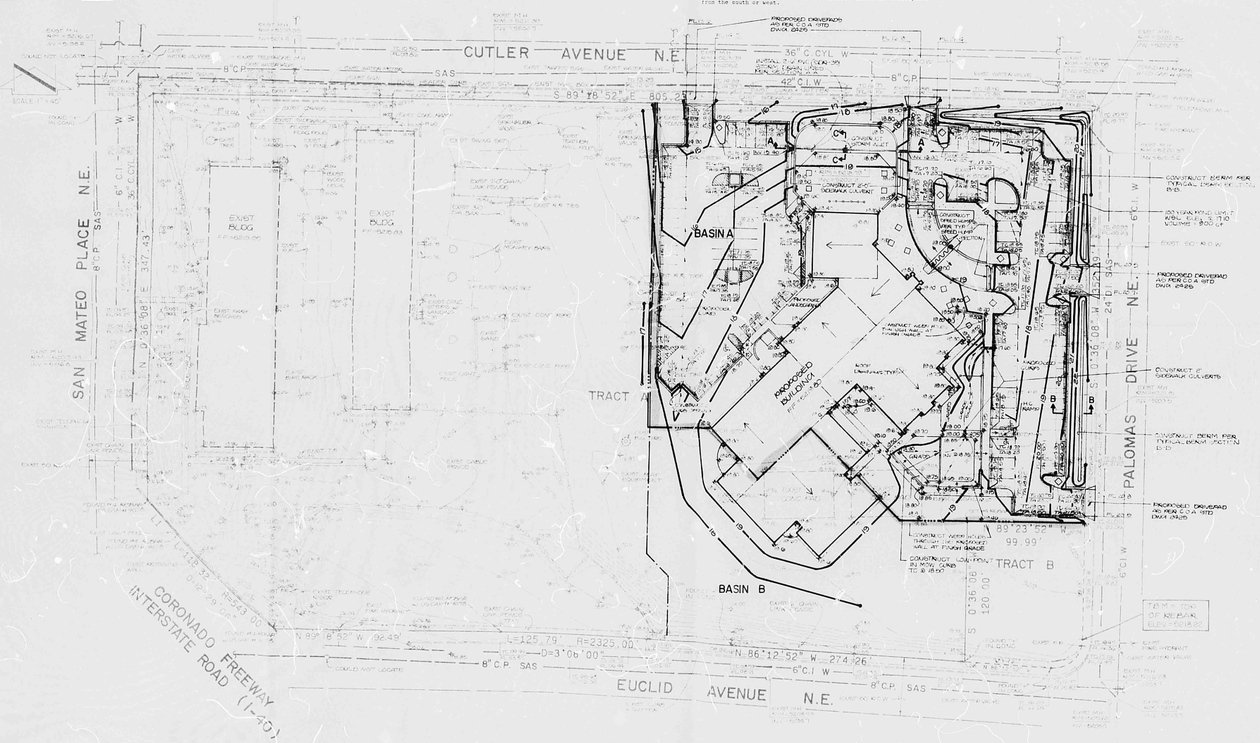
As shown by the Vicinity Map, the site is located at the southwest corner of the intersection of Paloma Drive N.E. and Cutler Avenue N.E. The site consists of the easterly half of the existing Cortez Elementary School site. At present, the site is partially developed with a couple of basketball courts and baseball field. The rest of the site is also currently developed. Thereby making this a modification to an existing site within an infill area.

As shown by Panel 14 of the Federal Emergency Management Agency Flood Insurance Rate Map and Flood Insurance Study, this site does not lie within a designated Flood Hazard Zone. This site appears to contribute some runoff to a flood hazard area at the end of Cutler Avenue N.E. where it intersects the Interstate Highway 40 right-of-way. Because the site is situated at the end of the roadway, the runoff will pass long before the peak discharge which causes the flooding to occur. Any detention would merely serve to aggravate the existing condition. Therefore, it is the fact that this is a modification to an existing site within an infill area, and the proximity of this site to the outfall to the interstate, the free discharge of runoff from this site is appropriate.

The Grading Plan shows 1) existing contours at 1'or' intervals, 2) proposed grades indicated by spot elevations and contours at 1'or' intervals, 3) the list and character of the existing improvements, and 4) the list and character of all proposed improvements. The list of the proposed improvements consist of paving, landscaping and the construction of a building. Flows generally flow from northeast to southwest. Offsite runoff from the site discharges along the south side of the site into Euclid Avenue N.E. Offsite flows from the north are contained in Cutler Avenue N.E. and flows from the east are contained in Paloma Drive N.E. No offsite flows are anticipated from the south or west.

As shown by this plan, the site will be divided into two major basins. Flows in Basin A will be directed to the driveway at the northwest corner of the site. The flows will be discharged into Cutler Avenue N.E. via the driveway. Some runoff will flow west through the parking lot and ponding in the lowered area at the intersection with San Mateo Place N.E. In order for this flow to cross the culvert system will be used on the north side of the plan to convey flows from Basin A-2 through Basin A-1 to the driveway at the northwest corner. The culvert system has been designed to carry 2.3 cfs. The 100-year discharge for Basin A-2 is 5.5 cfs. The 100-year pond elevation in Basin A-2 will be approximately 0.2' below the finish floor of the building. Because of the slope of the site, Basin B, will flow to Euclid Avenue N.E. as in the existing condition. Because of the flows in Basins A-1 and A-2 being discharged into Cutler Avenue N.E., the flows discharged from Basin B into Euclid Avenue N.E. have been decreased from 7.6 cfs to 5.3 cfs. The flows in Basin B will be directed to the flow within Euclid Avenue N.E. to the west where the street intersects the Interstate Highway 40 right-of-way. At this point, the end of the roadway is choked with weeds and grasses and hence its ability to discharge runoff to the Interstate drainage system is questionable. The San Mateo Place N.E. intersection, on the other hand, is fully paved and possesses unrestricted flow into the Interstate drainage system.

The Calculations which appear hereon analyze both the existing and developed conditions for the 100-year, 6-hour rainfall event. The National Method has been used to quantify the peak rate of runoff. The Soil Conservation Service (SCS) Method for the volume of runoff. Both Methods have been used in accordance with the City of Albuquerque Development Process Manual, Volume 2I, and the Mayor's Emergency Rule adopted January 14, 1986. The net increase in runoff will be approximately 2.0 cfs. The 10-year pond volume was determined using the Average End Over Area Method and discharge from the culvert system was determined using the orifice Equation.



CALCULATIONS

Ground Cover Information

From SCS Bernalillo County Soil Survey, Plate 31: ETC - Ebsebo Tierras Complex
Hydrologic Soil Group: B
Existing Pervious CN = 70 (DPM Plate 22.2 C-2: Pasture or Range lands: fair condition)
Developed Pervious CN = 61 (DPM Plate 22.2 C-2: Open spaces: good condition)

Time of Concentration/Time to Peak

$t_p = 0.0078 L^{0.77}/S^{0.385}$ (Kirpich Equation)

$t_p = T_c = 10$ min.

Point Rainfall

$P_6 = 2.2$ in. (DPM Plate 22.2 D-1)

Rational Method

Discharge: Q = CIA

where C varies
$i = P_6 (6.84) T_c^{-0.54} = 4.4$ in/hr
$P_6 = 2.2$ in (DPM Plate 22.2D-1)
$T_c = 10$ min. minimum
A = area, acres

SCS Method

Volume: V = 3630(DRO) A

where DRO = Direct runoff in inches
A = area, acres

Existing Condition

Area1 = 162,775 sf = 3.74 Ac
Roof area = 4,800 sf (0.03)
Dirt area = 157,975 sf (0.97)
C = 0.42 (weighted average per Emergency Rule, 1/14/86)
Q100 = CIA = (0.42)(4.4)(3.74) = 5.6 cfs
Assume 90% of the impervious area is
Composite CN = 91 (DPM Plate 22.2 C-3)
DRO = 0.4 in (DPM Plate 22.2 C-4)
V100 = 3630 (DRO)A = 5,430 cf

Developed Condition

1. Basin A-1

Area1 = 55,920 sf = 1.28 Ac
Roof area = 14,920 sf (0.27)
Paved area = 28,775 sf (0.51)
Landscaped area = 7,200 sf (0.13)
Dirt area = 5,025 sf (0.09)
C = 0.76 (weighted average per Emergency Rule, 1/14/86)
Q100 = CIA = (0.76)(4.4)(1.28) = 5.0 cfs
Assume 90% of the impervious area is
Composite CN = 90 (DPM Plate 22.2 C-3)
DRO = 1.2 in (DPM Plate 22.2 C-4)
V100 = 3630 (DRO) A = 5,270 cf

2. Basin A-2

Area2 = 65,315 sf = 1.50 Ac
Roof area = 23,025 sf (0.35)
Paved area = 35,930 sf (0.55)
Landscaped area = 14,550 sf (0.22)
Dirt area = 1,560 sf (0.02)
C = 0.76 (weighted average per Emergency Rule, 1/14/86)
Q100 = CIA = (0.76)(4.4)(1.50) = 5.5 cfs
Assume 90% of the impervious area is
Area = 47,260 sf is impervious = 1.08 ac
Composite CN = 87 (DPM Plate 22.2 C-3)
DRO = 1.1 in (DPM Plate 22.2 C-4)
V100 = 3630 (DRO) A = 5,990 cf

3. Basin B

Area3 = 41,540 sf = 0.95 Ac
Roof area = 7,730 sf (0.19)
Paved area = 33,810 sf (0.81)
Landscaped area = 0 sf (0.00)
C = 0.59 (weighted average per Emergency Rule, 1/14/86)
Q100 = CIA = (0.59)(4.4)(0.95) = 2.3 cfs
Assume 90% of impervious = 20 ac
Composite CN = 76 (DPM Plate 22.2 C-3)
DRO = 0.6 in (DPM Plate 22.2 C-4)
V100 = 3630 (DRO) A = 2,070 cf

Comparison

1. Basin A-1 + A-2

Q100 = 5.0 + 5.5 = 10.5 cfs (increase)
V100 = 5,270 + 5,990 = 12,260 cf (increase)

2. Basin B

Q100 = 7.6 - 2.3 = 5.3 cfs (decrease)
V100 = 5,430 - 2,070 = 3,360 cf (decrease)

3. Net Discharge Basin A

Q100 = Basin A-1: Q100 + Basin A-2: Culvert Q100 = 2.3 + 7.7 cfs (increase)

4. Net Change

Q100 = (Basin A + Basin B) - (5.3 + 5.3) = 4.0 cfs (increase)

Culvert System Discharge

$Q = CA\sqrt{2gh}$ (Orifice Equation)
Let C = 0.75
A = area of pipe in feet = 0.196 sf (6" pipe)
g = 32.2 ft/sec²
h = head in feet

Single Pipe
Qrelease = 0.75(0.196)(.2(32.2)(17.19 - 16.15)
= 2.15 cfs
Therefore Qrelease = 2 (Single pipes) = 2.3 cfs

100-Year Pond Volume

V = 1/2(Area1 + Area2)(Elevation - Elevation)
= 1/2(1,560 + 0)(17.25 - 16.25)
= 2,340 cf Required = 2,030 cf

REF. 21 DATE 2-24-93 OF 1 OF 1
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PLANS/PLATS ON FILE

FILE DESC: H-18/D007C

PLANS/PLATS 2

SHEET 1 of 2

F 30 D 24 C 20 B 16 A 12

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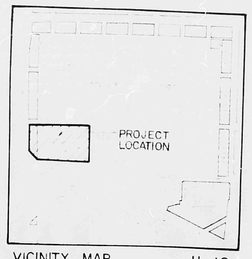
C D F



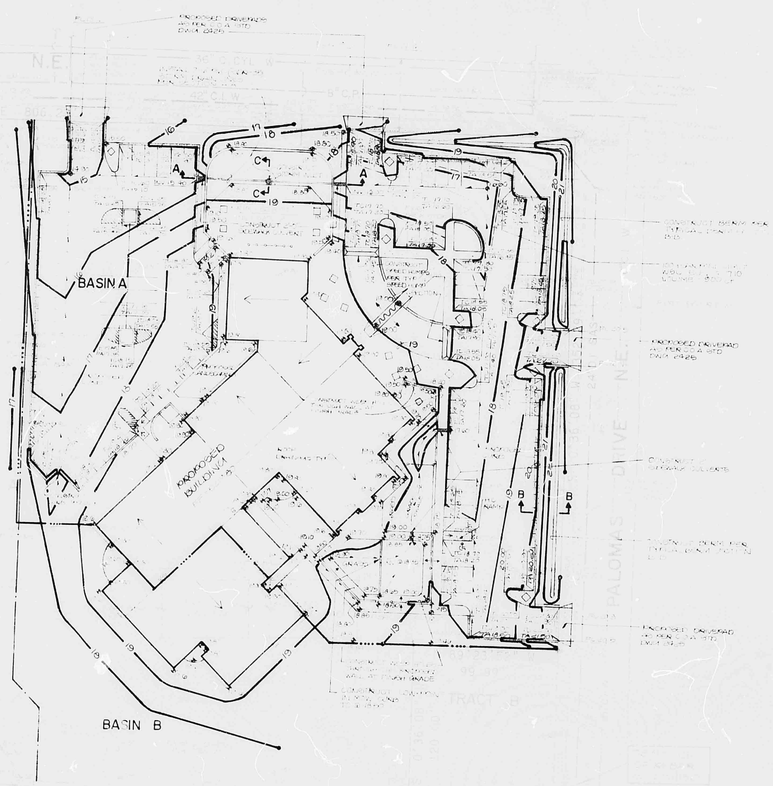
VICINITY MAP H-18

LEGAL DESCRIPTION

TIBM

PROJECT BENCHMARK

LEGEND



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D 24 C 20 B 16 A 12

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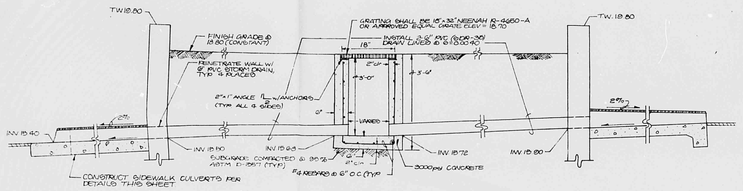
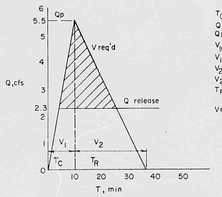
C D



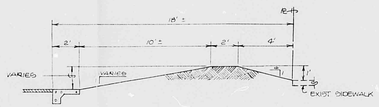
SECTION A-A

SCALE: 1" = 2'-0"



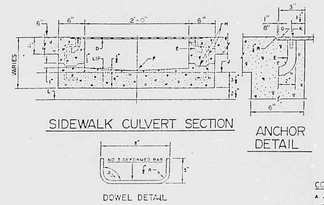
T_C = 10 min
Q release = 2.3 cfs
$Q_p = Q_{100}$ = 5.5 cfs
V_{100} = 5,990 cf
V_1 = 1/2 (10)(60)(5.5) = 1,650 cfs
$V_2 = V_{100} - V_1$ = 4,340 cf
V_2 = 1/2 T_R 60 Q_{100}
T_R = $2V_2$ / (60) Q_{100}
= 2 (4,340)/(60)5.5 = 26.3 min
Vreq'd = 1/2(2)(1)(60)(3.2)
= 2,030 cf

BASIN A-2 HYDROGRAPH



TYPICAL BERM SECTION B-B

SCALE: 1" = 4'-0"



SIDEWALK CULVERT SECTION

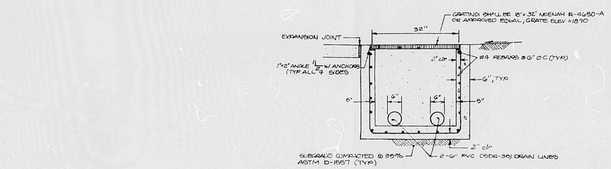
ANCHOR DETAIL

DOWEL DETAIL

SIDEWALK CULVERT DETAILS

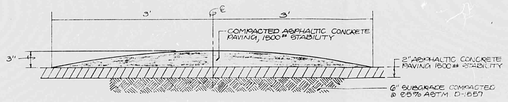
CONSTRUCTION NOTES:

A. JOIN NEAREST SCORE LINE OR WEAKENED PLANE JOINT. PLACE ½" EXPANSION JOINT MATERIAL.
B. SIDEWALK OR SIDEWALK, (VARIABLE).
C. 3' RADIUS, (TYPICAL).
D. ⅜" CHECKERED STEEL PLATE CULVERT TOP.
E. ALSO ANCHOR 2" x 2".
F. "V" INVERT.
G. SIDEWALK GRADE.
H. DOWEL AND JOINT, (OPTIONAL).
I. GUTTER FLOWLINE ELEV.
J. ⅜" x 1" FH CSUNK STAINLESS STL MACHINE SCREW
K. BOTTOM OF GUTTER
M. DRAIN WIDTH 24"
N. SLOPE ½ PER FT. MIN.



SECTION C–C

SCALE: 1" = 2'-0"



TYPICAL SPEED HUMP SECTION

SCALE: 1" = 1'-0"

BOHNING ASSOCIATES
811 DALLAS N.E. • ALBUQUERQUE • NEW MEXICO • 87110
ENGINEERS

HERBERT E. MORTENSEN
NEW MEXICO
8547
REGISTERED PROFESSIONAL ENGINEER

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