DRAINAGE PLAN

The following items concerning the Downtown Daycare Grading and Drainage Plan are contained hereon:

1. Vicinity Map
2. F.I.R.M.
3. Grading Plan
4. Calculations

As shown by the Vicinity Map, the site is located on the west side of Sixth Street N.W. between Bellamah Avenue N.W. and Kinley Avenue N.W. At present, the site consists of an existing building, which will be expanded, along with associated paved and landscaped areas.

As shown by Panel 28 of 50 of the National Flood Insurance Program, Flood Insurance Rate Maps published by F.E.M.A. for the City of Albuquerque, New Mexico dated October 14, 1983, this site does not lie within a 100–year designated flood hazard area. The site drains to Sixth Street N.W., which is a designated 100–year flood hazard area which is designated as AO (Depth 1). As can be seen by the plan, the finished floor of the proposed building additions will be located more than two feet above the corresponding flowline elevation in the street. This will insure that the building finished floor will not lie below the designated flood level.

The Grading and Drainage 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 and proposed improvements, and 3) continuity between existing and proposed grades. The site is located in a developed residential area, making the construction a modification to an existing site within an infill area.

The site is characterized by three basins. All construction will be performed within Basins A and C. Basin B will remain unchanged. Due to the lack of positive slope in any direction in Basins A and C, storm drain inlets with associated pipe will be placed to allow these two basins to drain. The storm drain pipe will connect with the inlets in Basins A and C and outfall into an existing storm inlet located on Sixth Street N.W. As for Basin B, it will continue to drain to Sixth Street N.W. by sheetflow.

As for offsite flows, the western boundary is bordered by a retaining wall which blocks offsite flows from the west. The east is bordered by Sixth Street, which is a developed paved street which lies topographically lower than the site. Finally, the south and north properties bordering the site drain towards Sixth Street. Therefore, no offsite flows enter the site.

The Calculations which appear hereon analyze both the existing and developed conditions for the 100–year, 6–hour rainfall event. The Procedure for 40–acre and Smaller Basins, as set forth in the Revision of Section 22.2, Hydrology of the Development Process Manual, Volume 2, Design Criteria, dated January, 1993, has been used to quantify the peak rate of discharge and volume of runoff generated. As shown by these calculations, a very minor increase in total volume and runoff is anticipated due to the proposed construction.

CALCULATIONS

Site Characteristics

1. Precipitation Zone
2. $P_{6,100} = P_{360} =$
3. Total Area (A_T)
4. Existing Land Treatment

Treatment	Area (sf/ac)	%
Basin A:	4,260/0.10	100.0
C	4,195/0.098	98.0
D	65/0.002	2.0
Basin B:	4,530/0.10	100.0
D	4,530/0.10	100.0
Basin C:	1,520/0.04	100.0
C	1,330/0.036	87.5
D	190/0.004	12.5

5. Developed Land Treatment

Treatment	Area (sf/ac)	%
Basin A:	4,260/0.10	100.0
C	2,950/0.07	69.2
D	1,310/0.03	30.8
Basin B:	4,530/0.10	100.0
D	4,530/0.10	100.0
Basin C:	1,520/0.04	100.0
C	455/0.01	29.9
D	1,065/0.03	70.1

Existing Condition

Basin A:

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$

$E_W = [(1.13)(0.098)+(2.12)(0.002)]/(0.10) = 1.15$ in.

$V_{100} = (E_W/12)A_T$

$V_{100} = (1.15/12)(0.10) = 0.0096$ ac. ft.; 420 cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$

$Q_p = Q_{100} = (3.14)(0.098)+(4.70)(0.002) = 0.32$ cfs

Basin B:

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$

$E_W = (2.12)(0.10)/(0.10 = 2.12$ in.

$V_{100} = (E_W/12)A_T$

$V_{100} = (2.12/12)(0.10) = 0.0177$ ac. ft.; 770 cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$

$Q_p = Q_{100} = (4.70)(0.10) = 0.47$ cfs

Basin C:

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$

$E_W = [(1.13)(0.036)+(2.12)(0.004)]/(0.04) = 1.23$ in.

$V_{100} = (E_W/12)A_T$

$V_{100} = (1.23/12)(0.04) = 0.0041$ ac. ft.; 180 cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$

$Q_p = Q_{100} = (3.14)(0.036)+(4.70)(0.004) = 0.13$ cfs

Developed Condition

Basin A:

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$

$E_W = [(1.13)(0.07)+(2.12)(0.03)]/(0.10) = 1.43$ in.

$V_{100} = (E_W/12)A_T$

$V_{100} = (1.43/12)(0.10) = 0.0119$ ac. ft.; 520 cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$

$Q_p = Q_{100} = (3.14)(0.07)+(4.70)(0.03) = 0.36$ cfs

3. Inlet and Pipe Hydraulics
Gravity Flow (Using Open Channel Flow Module by Haestad Methods)

$Q = 1.49/n\ AR^{2/3}s^{1/2}$

$n = 0.013$

$A = 0.1963$ sf

$S = 0.0025$

$Q_f = 0.28$ cfs (full flow)

$Q_m = 0.30$ cfs (max flow)

Pressure Flow

$Q = CA(2gh)^{1/2}$

$C = 0.6$

$A = 0.1963$ sf

$h = 0.75$ ft (depth to top of grate minus 1/2 pipe diameter)

$g = 32.2\ ft/s^2$

$Q_p = 0.82$ cfs (max pressure flow)

$Q_{100} = 0.36$ cfs (Basin A) $< Q_p$

Basin B:

1. Volume
(No change) 0.49 cfs

2. Peak Discharge
(No change)

Basin C:

1. Volume

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D)/A_T$

$E_W = [(1.13)(0.01)+(2.12)(0.03)]/(0.04) = 1.87$ in

$V_{100} = (E_W/12)A_T$

$V_{100} = (1.87/12)(0.04) = 0.0062$ ac. ft.; 270 cf

2. Peak Discharge

$Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$

$Q_p = Q_{100} = (3.14)(0.01)+(4.70)(0.03) = 0.17$ cfs

3. Inlet and Pipe Hydraulics
Gravity flow (Using Open Channel Flow Module by Haestad Methods)

$Q = 1.49/n\ AR^{2/3}s^{1/2}$

$n = 0.013$

$A = 0.3491$ sf

$s = 0.0025$

$Q_f = 0.61$ cfs (full flow)

$Q_m = 0.66$ cfs (max flow)

$Q_{100} = Q_{100}$ (Basin A)$+Q_{100}$(Basin C)

$Q_{100} = 0.36 + 0.17 = 0.53$ cfs $< Q_f$

Comparison

Basin A:

1. $\Delta V_{100} = 520-420 = 100$ cf (increase)
2. $\Delta Q_{100} = 0.36 - 0.32 = 0.04$ cfs (increase)

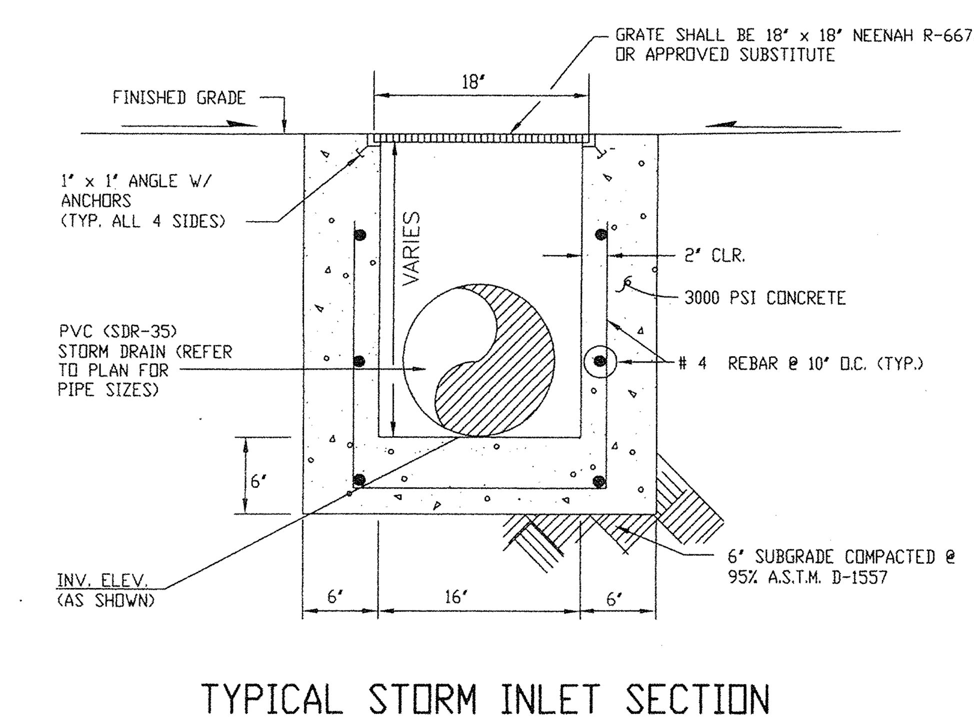
Basin B:

1. $\Delta V_{100} = 770 - 770 = 0$ cf (no change)
2. $\Delta Q_{100} = 0.47 - 0.47 = 0$ cfs (no change)

Basin C:

1. $\Delta V_{100} = 270 - 180 = 90$ cf (increase)
2. $\Delta Q_{100} = 0.17 - 0.13 = 0.04$ cfs (increase)

A+C=0.53 cfs



TYPICAL STORM INLET SECTION

SCALE: 1" = 1' - 0"

SEP 13 1995
HYDROLOGY DIV.

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DRAINAGE PLAN, SECTIONS, AND CALCULATIONS
DOWNTOWN DAYCARE

DESIGNED BY M.F.D.
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APPROVED BY J.G.M.

NO.	DATE	BY	REVISIONS

JOB NO. 950601
DATE 07-1995
SHEET 2 OF 2