HYDROLOGY

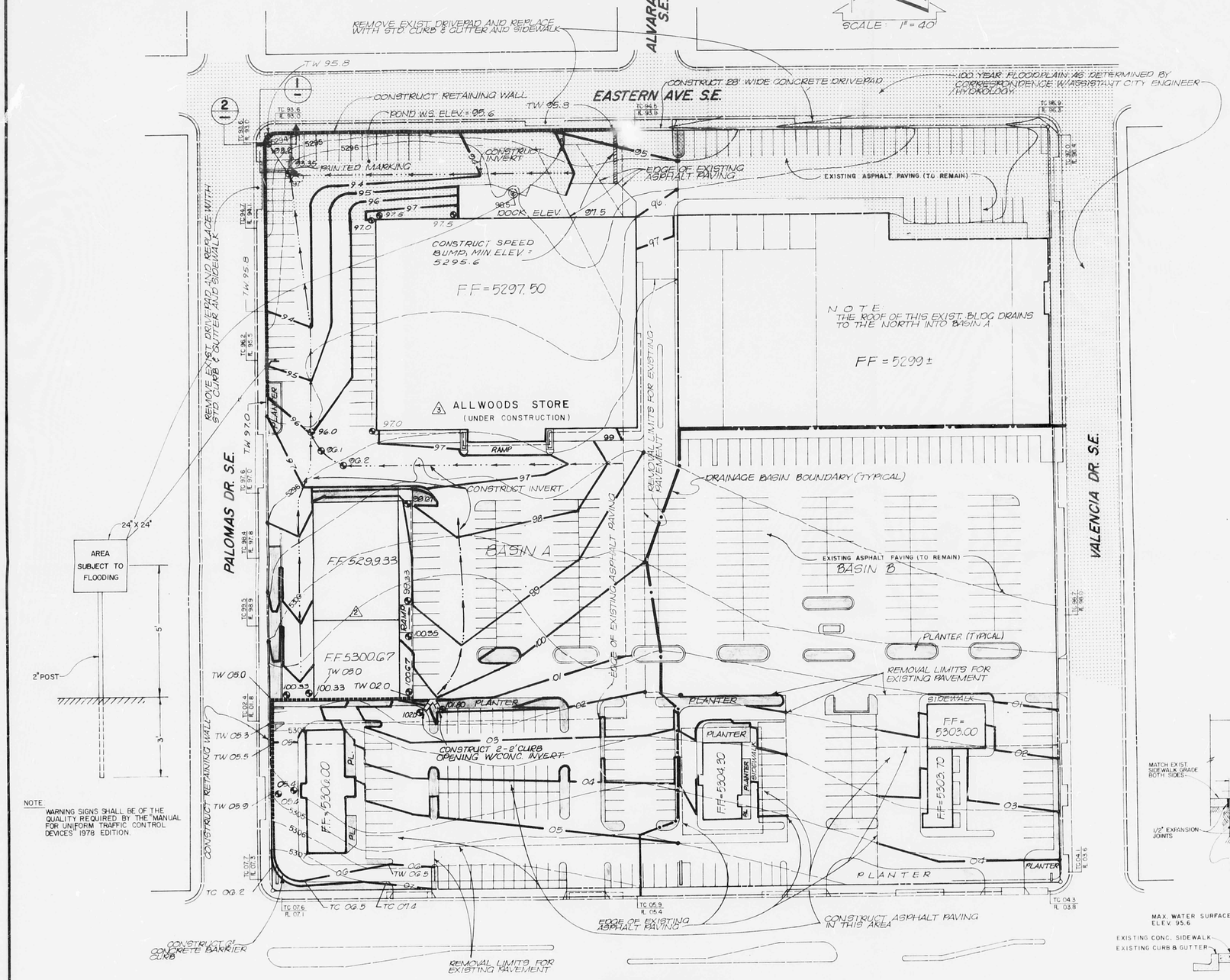
L18/D4
ONE PLAN

L18-D4

1 PLAN

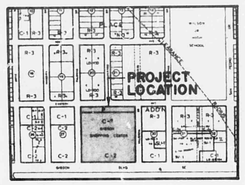
PROJECT BENCHMARK:
CITY OF ALBUQUERQUE B.M. 11-L18, A SQUARE, ☑, CHISELED ON THE TOP OF THE CONCRETE CURB ON THE NORTH SIDE OF GIBSON BLVD. S.E., OPPOSITE BATAAN MEMORIAL HOSPITAL. ELEV. 5301.601 FEET.

SCALE: 1" = 40'

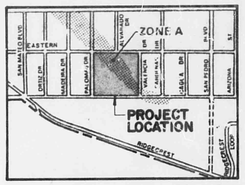


NOTE
WARNING SIGNS SHALL BE OF THE QUALITY REQUIRED BY THE "MANUAL FOR UNIFORM TRAFFIC CONTROL DEVICES" 1978 EDITION.

NOTE: THIS DRAWING WAS REVISED 10/27/81 TO EXPAND THE BUILDING DESIGNATED BY ⚠2 AND TO REGRADE AROUND THAT BUILDING ACCORDINGLY. THESE CHANGES DO NOT ALTER THE ORIGINAL DRAINAGE CONCEPTS AS SUBMITTED ON 6/10/81.



VICINITY MAP L-18-Z
SCALE: 1" = 800'



FLOOD HAZARD MAP PG. 8 & 9
SCALE: 1" = 1000'

DRAINAGE PLAN

The following items concerning the Siesta Hills Shopping Center drainage plan are contained hereon:

1. Vicinity Map
2. Flood Hazard Map
3. Grading Plan
4. Calculations

The proposed improvements are located south of Eastern Avenue, SE, north of Gibson Boulevard, SE, and between Palomas and Valencia Drives, SE. Two (2) existing buildings are located on the site. Five (5) buildings are proposed for the site, one (1) of which will replace an existing structure of comparable size at the southwest corner of the site. At present, approximately 65% of the site is developed, mostly as parking area.

The land surrounding the project site is developed and slopes to the north. The Flood Hazard Map indicates that the site lies within a flood hazard zone. Further study has revealed this to be inaccurate and hence, has been revised as per correspondence with the Assistant City Engineer/Hydrology dated 4/21/81. The surrounding streets which convey the majority of the offsite runoff are paved and have curb and gutter. In addition, the project does not lie adjacent to a natural or artificial water course, and has no drainage easements on the property.

The Grading Plan shows (1) drainage basins A and B, (2) existing contours at 1'-0" intervals, (3) proposed grades indicated by spot elevations and contours, (4) swales, (5) continuity between proposed and existing elevations, (6) that all runoff from Basin A will be conveyed into a pond before leaving the site, (7) Basin B drains directly off the site, and (8) that approximately 500 lineal feet of retaining wall will be necessary.

The site has been divided into Basins A and B for analysis. Basin A drains to the northwest corner of the site to a pond. Runoff drains from the pond onto Palomas Drive at a maximum rate equivalent to the runoff from a Q_5 storm. Basin A has been analysed as a changing rate orifice retention basin. The pond is, at the lowest point, 1.8 feet deep if flooding occurs to elevation 95.0. This will only be of short-term concern because the pond is designed to drain. Basin B is an existing basin which drains northeasterly onto Valencia Drive. The runoff from Basin B will not be ponded because it is an existing basin which drains directly offsite.

Finished floor elevations have been determined to avoid flooding. Finished floor elevations, proposed and existing, are above the existing grade of adjacent streets and above the level of the 100-year floodplain. Erosion will not result from the proposed improvements.

CALCULATIONS

Areas:
Total Area = 7.9 AC
Area of Basin A = 5.48 AC
Impervious Area = 0.93 (5.48) = 5.10 AC
Pervious Area = 0.07 (5.48) = 0.38 AC
Area of Basin B = 2.42 AC
Impervious Area = 0.93 (2.42) = 2.25 AC
Pervious Area = 0.07 (2.42) = 0.17 AC

Composite 'C' = $\frac{2.35}{7.9}(0.95) + \frac{0.55}{7.9}(0.40) = \underline{0.91}$

By Rational Formula, Q = CIA.
Where $C_{perv} = 0.40$
$C_{imperv} = 0.95$
$i_{100} = 5.4$ in/hr
$i_5 = 2.82$ in/hr

For Basin A, $Q_{undev} = 0.40(5.4)(5.48) = 11.84$ cfs
$Q_{dev} = 0.91\ (5.4)(5.48) = 26.93$ cfs
$Q_{Allow} = Q_5 = 0.40\ (2.82)(5.48) = 6.18$ cfs

By Analysis as a Changing Rate Orifice,

$Q_o = \frac{Q_{Allow}}{A(c)} = \frac{6.18}{5.48\ (0.91)} = 1.24$ cfs/Ac

$T = 25 + \sqrt{\frac{708\ T.S.}{Q_o}} = 51$ min

$V_s = \frac{43,560}{T.S.} = 43\ Q_o T = 5080$ cf/Ac
$V_t = V_s(A)(c) = 5080\ (5.48)(0.91)$
$V_t = 25,333$ cf

By Average End Area Method,

Elev.	Area, sf	Vol., cf	Σ Vol., cf
93.2	0		
94	8,400	3,360	3,360
95	15,700	12,050	15,410
95.6	19,000	10,410	25,820

V_{pond} = 25,820 cf @ elev. 5295.6

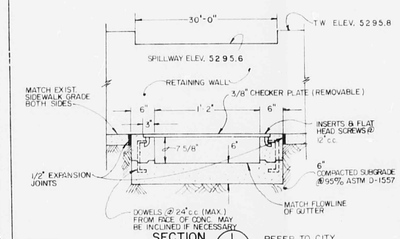
Outlet (Submerged Orifice):
$v = C_v\sqrt{2gh} = 8.83$ fps
where $C_v = 0.82$
$g = 32.2$ ft/sec^2
$h = 1.8'$

$Q = vA$ or $A = \frac{Q}{v}$

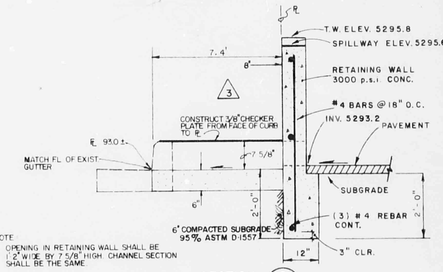
$A = \frac{6.18}{8.83} = 0.70$ sf

Let outlet be 1'-2" x 7 5/8" rectangle

For Basin B, $Q_{dev} = 0.91(5.4)(2.42) = 11.9$ cfs

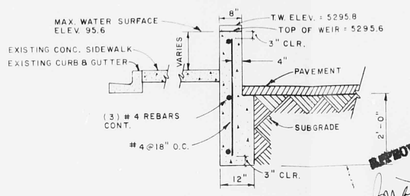


SECTION 1
NO SCALE
REFER TO CITY STD. DWG. K-15



NOTE
OPENING IN RETAINING WALL SHALL BE 1'-2" WIDE BY 7 5/8" HIGH. CHANNEL SECTION SHALL BE THE SAME.

SECTION 2
NO SCALE



⚠3 TYPICAL RETAINING WALL SECTION
NO SCALE

APPROVED FOR DRAINAGE
12/21/81
DATE
TITLE
SIGNATURE
CONTINGENCIES

REGISTERED PROFESSIONAL ENGINEER
STATE OF NEW MEXICO
THOMAS T. MANN, JR.
3792
PROFESSIONAL ENGINEER AND LAND SURVEYOR

6/10/81
10/27/81
12/18/81

811 DALLAS, N.E. · ALBUQUERQUE · NEW MEXICO · 87110
ENGINEERS

NO.	DATE	BY	REVISIONS
⚠1	5/12/81	JM	REVISE RETAINING WALL STEEL; REGRADE FOR FF = 5297.50
⚠2	10/27/81	JM	REVISE BLDG. LAYOUT & ADJACENT GRADING
⚠3	12/17/81	JM	REGRADE N.&W. SIDES OF ALLWOODS STORE; REDESIGN RETAINING WALL; REVISE POND CALCS.

DESIGNED BY JM
DRAWN BY PO
APPROVED TM

JOB NO. 1-016
DATE 5/81

SIESTA HILLS SHOPPING CENTER GRADING AND DRAINAGE PLAN

L18/D4

FILE NO.
SHEET 1 OF 1