HYDROLOGY G18/D7 3 PLANS

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3 PLANS

PRELIMINARY

STORM DRAINAGE STUDY

FOR

LAS PAMPAS ADDITION

ALBUQUERQUE, NEW MEXICO

PREPARED BY :
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PROJECT PRELIMINARY DRAINAGE STUDY LAS PAMPAS ADDITION SHEET OF JOB NO.
BY J.A. CHK'D DATE

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PROJECT Preliminary Drainage Study Las Ramos Add SHEET 1 of 4 JOB NO. 701
BY JAA CHK'D MATE 4-3-71

I. Computations for determining storm water runoff within the subdivision on each street entering intersection

A. Criteria as outlined in FHA Storm Drainage Design "Guide Lines" is as follows

1. Storm Frequency = 50 years
2. Runoff Coefficient (C) = 0.50
3. Rational Formula $Q = CIA$ - Runoff in cfs

B. Technical Publications used as aids in these computations are as follows.

1. Rainfall Intensity Duration Frequency Curve. for Southwestern U.S., 1935 (Standard Varnell)

2. Time of Concentration Nomograph. Based on study by P.Z. Kirpich Published in Civil Engineering, Vol 10, No. 6 June 1940 P. 362. This nomograph is for use on small drainage areas.

Las Pampas Pl. - La Ronda Pl. - Intersection

Las Pampas Pl. (South side of Intersection)

Drainage Area (A) = 1.07 Ac.

Time of Concentration (T_c)

Overland flow time = 4 min.
Street flow time = 2 min.
total = 6 min.

Rainfall Intensity (I) = 5.1 inches/hr.

Runoff Factor (C) = 0.50 See Sheet 1

$Q = CIA = (0.5)(5.1)(1.07) = 2.7$ cfs

La Ronda Pl. (East Side of Intersection)

Drainage Area (A) = 1.07 Ac.

Time of Concentration (T_c)

Overland flow time 4 min
Street flow time 1 min.
Total 5 min.

Rainfall Intensity (I) = 5.1"/hr.

$Q = CIA = (0.50)(5.1)(1.07) = 2.7$ cfs.

Las Pampas Pl. at South Side of City Park.

Las Pampas Pl. (from the South)

$A = 3.10$ Acres

T_c = Overland flow time = 4 min.
Street flow time = 3 min.
Total = 7 min.

$I = 5.1$ "/hr

$Q = CIA = (0.50)(5.1)(3.10) = 7.9$ cfs

Las Pampas Pl. (from the East)

$A = 0.79$ Acres

T_c = Overland Flow time = 4 min
Street Flow time = 1 min
Total = 5 min

$I = 5.1$ "/hr.

$Q = CIA = (0.50)(5.1)(0.77) = 2.0$ cfs

It is recommended that a drainage swale with a paved invert be provided across the city park in a north-south direction and that this swale alignment be the extension of the centerline of Las Pampas Pl. or the west curb line, as applicable. Use flow of 12.7 cfs as criteria for design of swale. (See sheet 4)

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PROJECT Preliminary ... Study Las Pampas ...

BY JH CHK'D

Las Pampas Pl at North Side of City Park

Las Pampas Pl. (from the swale in the City Park)

A = 4.98 Ac.

T_c = Overland flow time = 4 min.
street & drainage swale flow time = 6 min.
Total 10 min.

I = 5.1 inches/hr.

$Q = CIA = (0.50)(5.1)(4.98) = 12.7$ cfs

Las Pampas Pl (from the South)

A = 1.43 Ac.

T_c = Overland Flow time = 3 min
street flow time. = 2 min
Total 5 min

I = 5.1 inches/hr

$Q = CIA = (0.50)(5.1)(1.43) = 3.6$ cfs

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PROJECT Preliminary Drainage Study - Las Pampas Pl. SHEET 6 OF 11
JOB NO.
BY JA CHK'D DATE 4-12-76

Las Pampas Pl. and Cul de Sac Intersecton North of Kiowa Ave.

Las Pampas Place (from the north)

$A = 0.27$ Ac

T_c = Overland flow time = 4 min
Street flow time = 1 min
Total = 5 min

$I = 5.1$ "/hr.

$Q = CIA = (0.50)(5.1)(0.27) = 0.7$ cfs

Las Pampas Pl. (from the East out of the Cul de Sac)

$A = 1.38$ Ac.

T_c = Overland flow time = 6 min
Street flow time = 1 min
Total = 7 min

$I = 5.1$ "/hr.

$Q = CIA = (0.50)(5.1)(1.38) = 3.5$ cfs

Las Pampas Pl & Kiowa Ave Intersection

Las Pampas Pl (South)

A = 7.72 Ac.

Tc = Overland flow time = 4 min
Street flow time = 8 min.
Total = 12 min.

I = 4.7 inches/hr.

Q = CIA = (0.50)(4.7)(7.72) = 18.1 cfs

Las Pampas Pl. (North)

A = 2.07 Ac.

Tc = Overland flow time = 6 min
Street flow time = 2 min
Total = 8 min.

I = 5.1 inches/hr.

Q = CIA = (0.50)(5.1)(2.07) = 5.3 cfs

Kiowa Ave. (East)

A = 0.65 Ac.

Tc = Overland flow time = 4 min
Street flow time = 1 min
Total = 5 min.

I = 5.1 inches/hr

Q = CIA = (0.50)(5.1)(0.65) = 1.7 cfs

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PROJECT Preliminary Drainage Study - Las Pampas Addn. SHEET 7 OF 11
JOB NO. 30
BY JA CHK'D DATE 4-15-71

Storm Water Runoff at West Edge of Subdivision on Kiowa Avenue.

Drainage Area (A) = 10.69 Acres

Tc: Overland flow time = 4 min
Street flow time = 8 min.
Total 12 min.

Intensity (I) = 4.7 "/hr

Q = CIA = (0.50)(4.7)(10.69) = 25.1 cfs

The storm water runoff after leaving the subdivision continues flowing in a westerly direction on Kiowa Avenue, which is a fully paved street at present, and enters the Hahn Arroyo in less than one half mile.

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PROJECT Preliminary Drainage Study Las Pampas Addn SHEET OF
BY J.A. CHK'D DATE 4-18-91

Drainage way Between Lots 7&8 Block 2 @ the North end of Las Pampas Pl.

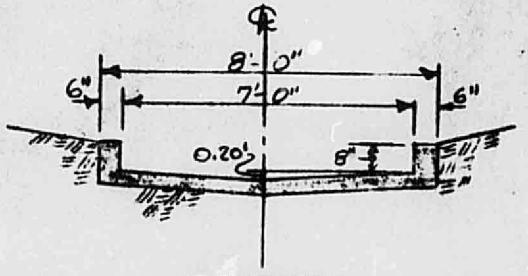
Drainage Area = 1.64 Acres

Tc = Overland flow time = 4 min
Street flow time = 2 min
Total = 6 min

I = 5.1 "/hr

Q = CIA = (0.50)(5.1)(1.64) = 4.2 cfs

A paved drainage way as detailed below is recommended with the outlet end connected to the concrete lining of the Hahn Arroyo.



SECTION

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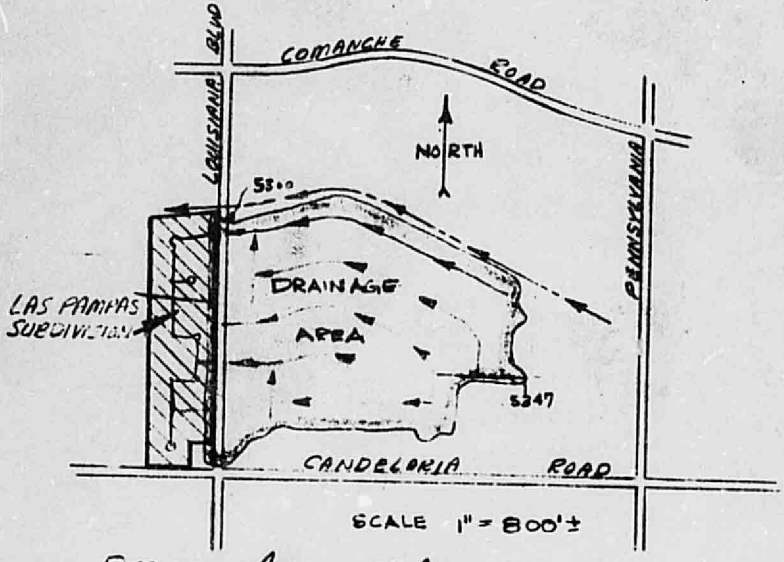
PROJECT Preliminary Drainage Study Las Pampas Add. SHEET 9 OF 11 JOB NO. 301
BY JA CHK'D DATE 4-12-71

II Computations for determining storm water runoff on Louisiana Blvd. East Side of Subdivision

A. Design criteria same as shown on sheet 1

B. Technical Publication - Same as shown on sheet 1 except the Time of Concentration Nomograph used is from the Soil Conservation Service - "Hydrology Guide for Use in Watershed Planning" Fig. 2.15-3



Drainage Area = 59 Acres
Length of Drainage Area = 5700'
High Elev. Pt. 5347
Low Elev. Pt. 5300
Elev. Diff = 47 feet.

Tc = 0.30 Hrs = 18 min.
Intensity (I) = 3.95 inches / hr.

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PROJECT Preliminary Drainage Study - Las Pampas Add SHEET 10 OF 11
JOB NO. 501
BY JA CHK'D DATE 8-15

$Q = CIA = (0.50)(3.95)(59) = 116 cfs$

The above flow of 116 cfs indicates runoff to Louisiana Blvd at the north end of the the Las Pampas Add.

The City of Albuquerque has constructed a storm sewer system on Louisiana Blvd to intercept a flow of 180 cfs, which is the runoff from a 100 yr frequency storm. Therefore this existing storm sewer has more than ample capacity to carry the flow of 116 cfs generated from a 50yr. frequency storm as computed above.

It is noted here that there is a curb type inlet presently located on the west side of Louisiana Blvd at the intersection of Las Pampas Place. This curb type inlet will require revisions when the west curb is removed to accommodate Las Pampas Pl. entrance to Louisiana Blvd. It is recommended that this inlet be revised to provide a drive over type inlet drain with an open grating surface area equivalent in capacity to the existing curb inlet.

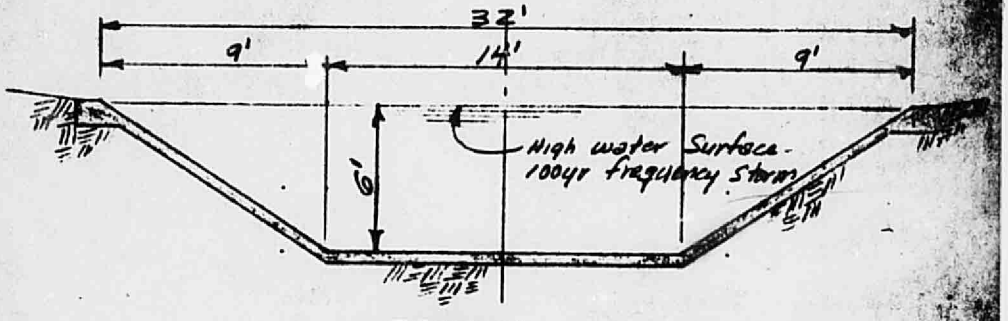
III Hahn Arroyo - North side of Subdivision.

The City of Albuquerque has recently constructed a concrete lined Channel to carry the the Storm water flows in the Hahn Arroyo. (See Plate 2)

This Concrete lined channel was designed and constructed to carry the flows generated by a 100 year frequency storm.

Elevations of the top of the concrete lined channel are shown on Plate 2.

A section of the concrete lined channel is shown below.



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HAHN ARROYO CHANNEL LINING