HYDROLOGY H13/D6 1 PLAN

H13/D6

1 Plan

cc: Villa de Marco

787

79 37159

RETURN TO:
4300 WYOMING BLVD., NE
NEW MEXICO TITLE CO. 7/21/79

DECLARATION OF COVENANTS, EASEMENTS AND RESTRICTIONS

SANCHEZ CONSTRUCTION, INC., a New Mexico Corporation ("Declarant"), on behalf of itself, its successors and assigns, hereby makes this Declaration of Covenants, Easements and Restrictions ("Declaration") affecting the premises hereafter described.

WHEREAS, Declarant is the owner of the following described premises:

> Lot numbered One-A (1-A), Two-A (2-A), Three-A (3-A) and Four-A (4-A), replat of Lots 1, 2, 3 and 4, of VILLA DE MARCO, as the same is shown and designated on said replat, filed in the Office of the County Clerk of Bernalillo County, New Mexico, on March 23, 1978.

WHEREAS, Declarant desires to establish certain easements and to establish the responsibility for the maintenance of certain drainage facilities located thereon.

NOW THEREFORE, the Declarant does make this Declaration as follows:

1. Drainage. The owner of each lot in the above described premises should have the obligation to maintain all drainage facilities including ponding areas, any portion of which shall have been constructed within such owner's lot, it being understood that such obligation shall be in common with and equal to that of the adjacent owner within whose lot the balance of such facility has been constructed. Specifically it shall be the equal obligation of A) the Owners of Lots 1A and 2A to maintain the drainage facilities heretofore constructed on the southerly side of Lot 1-A and the northerly side of Lot 2-A; B) the owners of Lots 2-A and 3-A to maintain the drainage facilities heretofore constructed on the southerly side of Lot 2-A and the northerly side of Lot 3-A; and C) the owners of Lots 3-A and 4-A to maintain the drainage facilities heretofore constructed on the southerly side of Lot 3-A and the northerly side of Lot 4-A.

2. Easements. Declarant does hereby establish the following easements:

A. Along the easterly 20 feet of Lots 1-A, 2-A, and 3-A an easement and right of way for ingress and egress between Lots 2-A, 3-A and 4-A respectively and Rice Avenue north of Lot 1-A, it being understood that the owners of Lots 1-A, 2-A, 3-A and 4-A shall contribute equally to the maintenance and repair of such right of way and that no person shall have the right to park vehicles upon, block or otherwise obstruct or encroach upon said right of way, nor shall any person at any time, have the right to interfere with the free and unrestricted use of same by any other person entitled to enjoy the benefits of this right of way, and

B. Along the easterly 20 feet of Lots 1-A, 2-A, 3-A, and 4-A an easement for the installation, operation, maintenance, repair and replacement of underground gas, electric, telephone, water and other public utility mains, lines, wires, pipes and other equipment used or to be used by any of the owners of any of the lots in the above described premises.

3. Covenants. This Declaration shall be deemed to be a covenant running with the land.

IN WITNESS WHEREOF, the Declarant has executed this Declaration the day and year first above written.

SANCHEZ CONSTRUCTION, INC.

By [illegible]

STATE OF NEW MEXICO,
County of Bernalillo...ss

The foregoing instrument was acknowledged before me this 18 day of May, 1979, by Edwin B. Chavez, of Sanchez Construction, Inc., a New Mexico Corporation, on behalf of said corporation.

Edwin B. Chavez
Notary Public

My Commission Expires:
10-25-79

FLOOD PROOFING
AND
DRAINAGE STUDY

VILLA DE MARCO
ALBUQUERQUE, NEW MEXICO

JULY 1978

FLOOD PROOFING
AND
DRAINAGE STUDY

VILLA DE MARCO
ALBUQUERQUE, NEW MEXICO

JULY 1978

FLOOD PROOFING
AND
DRAINAGE STUDY

VILLA de MARCO
SANCHEZ CONSTRUCTION

PREPARED BY:
SUBHAS K. SHAH P.E.
2829 JEFFERSON ST. N.E.
ALBUQUERQUE, N.M. 87110
(505) 268-8036

SUBHAS K. SHAH
STATE OF
NO. 6390
NEW MEXICO
REGISTERED PROFESSIONAL ENGINEER

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APPENDIX

APPENDIX	1	Frequency Factor
Figure	1	Location Plan
Figure	11	Typical Lot Drainage
Figure	111	Time of Concentration of Small Drainage Basins
Figure	1V	Intensity Duration Frequency Curves

FLOOD PROOFING
&
DRAINAGE STUDY
VILLA DE MARCO

GENERAL

This report will present the data analysis and calculations resulting from the drainage study of the proposed development. The lands from the proposed development is located in the City of Albuquerque. It is situated in Section 7, Township 10 North, Range 3 East.

The property encompassed approximately 0.68 acres and is subdivided into 4 R-3 lots. The natural ground is covered with some weeds and open spaces. It is fairly flat and slopes very gently towards south. The site is bounded north by Rice Avenue and all other sides by existing development.

According to Federal Insurance Administration Map, Approximately 75 % of proposed development is located into flood plain. Flood proofing methods are discussed in this report.

DESIGN CRITERIA

In analyzing the storm runoff, the Rational Formula, $Q = CIA\ C_f$, is used. [1]

WHERE:

Q = Runoff quantity in cubic feet/second.

A = Contributing area in acres.

C_f = Frequency factor for Rational Formula

I = Intensity in inches/hour fro a duration equal to the time of accumulation (duration) measured in minutes and obtained from Figure 1V, Intensity Duration Frequency Curves, Albuquerque Area 1961. (NOTE: Where a Time Concentration (Tc) is less than ten minutes figure 111 is used).

C = Runoff Coeffiecient (No Unit). This coefficient represents the integrated effects of infiltration, detention storage, evaporation, retention, flow routing, and interception which all affect the time destribution and peak rate of runoff.

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1 See Bibiography, Item 2, Paragraph 3.7

App.-1

ESTIMATED RUNOFF — UNDEVELOPED STATE:

Deainage with in the boundary of the site is basically overland flow. There are no off site flows entering the site.

$Q = C.I.A.T.^{C}f$

$= 0.32 \times 5.4 \times 0.68 \times 1.25$

$= 1.46$ c f s

C = 0.32 Underveloped state

$I = \frac{189}{T + 125} = 5.4$ T = 10 Min

A = 0.68 acres

Cf = 1.25 (100 yr. storm)

ESTIMATED RUNOFF - DEVELOPED STATE:

As developement occurs, the area of imperious surfaces increase and there by amount of runoff also increases. To offset this increase, on site restrictrions of flows must be incorporated into the development. While this can take different forms, the most practical solution for this type of developement is to use on-lot ponding.

Being this area located in North Valley there is no place for discharging storm runoff.

RUNOFF IN DEVELOPED STATE

Q = C.I.A.C.F.

= 'C'. L.A.

= 0.83 x 5.4 x 0.68

= 3.14 C.F.S.

C = 0.32 Underveloped

C = 0.8 Developed Land

C_f = 1.25

$I = \frac{189}{T + 25}$ T = 10 Min.

= 5.4

A = 0.68 Acres

Composite 'C'

$= \frac{(12500 \times 0.32 + 19850 \times 0.8)}{29850.0}$

= 0.67

'C' = 0.67 x 1.25
= 0.83

VOLUME OF STROAGE REQUIRED FOR EACH LOT

Total Area /lot = 7425 S.F.
= 0.17 acres

Volume of Storage = $\frac{2.2}{12}$ x 7425 x 1.0

= 1361.25 Cu. Feet

See Figure 11

FLOOD PROOFING DISCUSSION:

There is no off site flow entering the site. On site drainage will be controlled by on site ponding. Since this area is located in valley and no storm discharging facilities are available. 100% of on-site drainage will be retained on the property.

Approximately 75% of the proposed development lies in the flood plain. North 25% of area is outside the flood plain. From the Federal Insurance Administration Map A 100 year flood hazard elevation was estimated to be at an elevation 4960. Development in surrounding areas and flood control structures have reduced potencial flood threats to the proposed site.

To receive adequate flood insurance from F.I.A. different kinds of flood proofing measures are considered.

Buildings on flood plains can be damaged by seepage of flood waters through walls and foundations, by ground water pressure on floor slabs and walls, by the backup of water through sewerage systems etc. The permeability of the materials at a building site largely determine the movement of ground water around and under the foundation walls and floor slabs. Ground water pressure could cause flooding but can be remedied by drainage. Creating a pumping cone under the building.

For the proposed development the most economical method is raising the finished floor higher than flood level. The finished floor elevation of proposed building must be higher then 4961.00.

The site grading shall be done in such a way that it slopes away from building. There shall be a 5' buffer zone all around the building.

This buffer zone will protect walls. In no case should flood waters be allowed to stand against the walls. No basement, are suggested for this project.

Flooring for the building shall not contain wood or paper products. Flooring material is usually impercous but diminsionally unstable. Sheet type floor coverings (linoleum, rubber, vinyle) restricts evaporation from slabs.

Floor shall be of cement formed in place or precast concrete. Concrete tiles are accepted. Vinyle sheets with chemical set adhesives are accepted.

Walls and ceilings which contain wood, wood products or gypsum products which dissolves or deteriorates, loses structural intergrity or adversely affected by water should not be used. Also materials which are not resistant to allkali or acid in water, imperious but dimensianally unstable, absorb or retain water excessibly after submergence should not be used. Asbestos cement boards, bricks, cast stone in water proof mortar, clay tiles etc. shall be used in construction.

When flood proffing, a building provision should be made to eliminate the trreat of flooding by way of gas mains, sewers, conveyor systems and water pipes or drain tiles which enter the building.

Gate valves or one way swing valves can be installed in utility pipes to provide protection against the threat of this source of flooding. V.C.P. should not be used within the confines of building walls and they should never be located next to an entry valve. If sewers are to be valved off they should be cast iron steel or reinforced concrete, otherwise the pressure built up in the line could cause a rupture.

Fuses and circuit breakers servicing flooded building areas should be clearly marked and easily accessible. Electrical circuits serving lower building levels should be designed or modified so that they can be cut off if flooding begins. This will protect against fires and loss of life due to electrical shocks. As another precaution, valuable electrical appliances which cannot be moved should be disconnected at the unit to prevent short circuiting and damage to their power compenents.

Water lines and sewer lines should have water proof joints. Water mains normally should be kept under sufficient pressure to avoid contamination by flood waters.

Man hole covers should be air tight and leak proof to prevent any entry of flood waters into the system.

Windows and vents should be sealable to prevent flood waters. Windows and vents should be reinforced.

RECOMMENDATIONS:

The following is a summary of the recommendations which must be incorporated in the construction drawing and field inspections at the time of construction.

1. The lots shown as ponded should be graded to store the water.
2. Since there being unavailability of storm runoff discharging facility within this area, 100% of the storm water generated due to development must be retained in this proposed development.
3. Approxamitely 75% of the proposed development lies in the regulartory flood datum and 25% is outside the regulartary flood datum. The regulartory flood datum elevation is 4960.00.
4. The site grading shall be done as shown on plan. The slope of the open area shall be away from the building. A minimum of 5' buffer zone should be allowed. all around the building. This buffer zone will protect the walls.
5. In no case should flood waters be allowed to stand against the walls.
6. No basements are recommended.
7. Floor material shall be cement or concrete cast in place.
8. Walls and ceilings should be asbestos cement boards, bricks, cast stone in water proof mortar, clay tiles etc.

9. Vitrified clay pipes should not be used for sewer within the confines of building walls and they should never be located next to an entry valve.

10. Water lines & sewer lines should have water tight joints.

11. Sewer manholes covers should be air tight to prevent any flood water entering into the system.

12. Water mains should be kept under sufficient pressure to avoid contamination by flood waters.

13. Windows and vents should be sealable in case of flood.

BIBLIOGRAPHY OF REFERENCES

(1) Herkenhoff, Gordon & Associates, "Master Plan of Drainage City of Albuquerque, New Mexico and Environs, 1963". Albuquerque; Gordon Herkenhoff & Associates, Consulting Engineers.

(2) Wright-McLaughlin Engineers, "Urban Strom Drainage Criteria Manual, Volume 1", Denver, Colorado: Wright-McLaughlin Engineers, 1969.

(3) U.S. Department of Commerce, "Technical Paper, No. 40, Rainfall Frequency Atlas of the United States", Washinton, D.C., U.S. Government Printing Office, 1963.

(4) Introduction to Flood Proofing John R. Shaeffer.

(5) Flood Proofing regulations
Office of the Chief of Engineers
U.S. Army, Washington D.C. June 1972

3.6 Continued

TABLE 3-2 (8)

RATIONAL METHOD RUNOFF COEFFICIENTS FOR COMPOSITE ANALYSIS

Character of Surface	Runoff Coefficients
Streets:	
Asphaltic	0.70 to 0.95
Concrete	0.80 to 0.95
Drives and Walks	0.75 to 0.85
Roofs	0.75 to 0.95
Lawns, Sandy Soil:	
Flat, 2%	0.05 to 0.10
Average, 2 to 7%	0.10 to 0.15
Steep, 7%	0.15 to 0.20
Lawns, Heavy Soil:	
Flat, 2%	0.15 to 0.20
Average, 2 to 7%	0.20 to 0.25
Steep, 7%	0.25 to 0.35

The coefficients in these two tabulations are applicable for storms of 5-year to 10-year frequencies. Less frequent higher-intensity storms will require modification of the coefficient because infiltration and other losses have a proportionally smaller effect on runoff, as given in the following section.

3.7 Adjustment for Infrequent Storms

The adjustment of the Rational Method for use with major storms can be made by multiplying the right side of the Rational Formula by a frequency factor C_f, which is used to account for antecedent precipitation conditions. The Rational Formula now becomes:

$$Q = CIAC_f \qquad (3\text{-}2)$$

The following table of C_f values can be used. The product of C times C_f should not exceed 1.0.

1-15-69

3.7 Continued

TABLE 3-3

FREQUENCY FACTORS FOR RATIONAL FORMULA

Recurrence Interval (years)	C_f
2 to 10	1.0
25	1.1
50	1.2
100	1.25

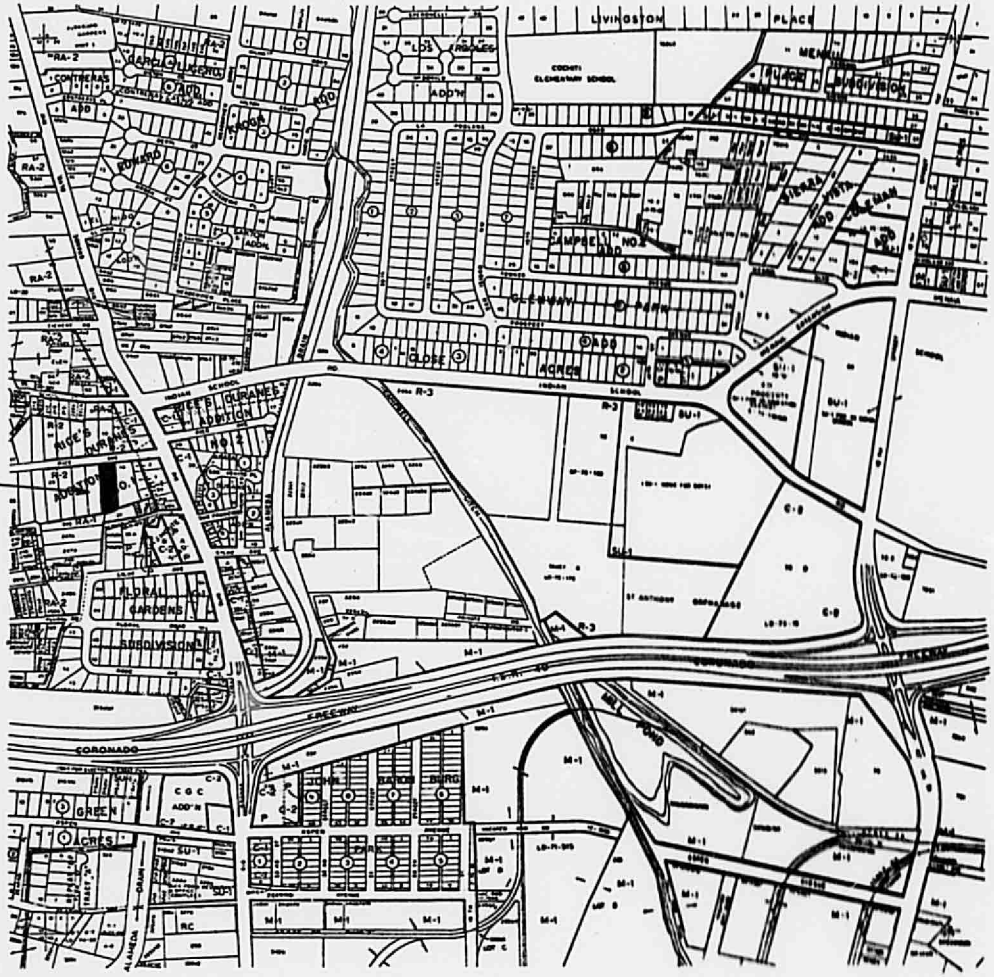
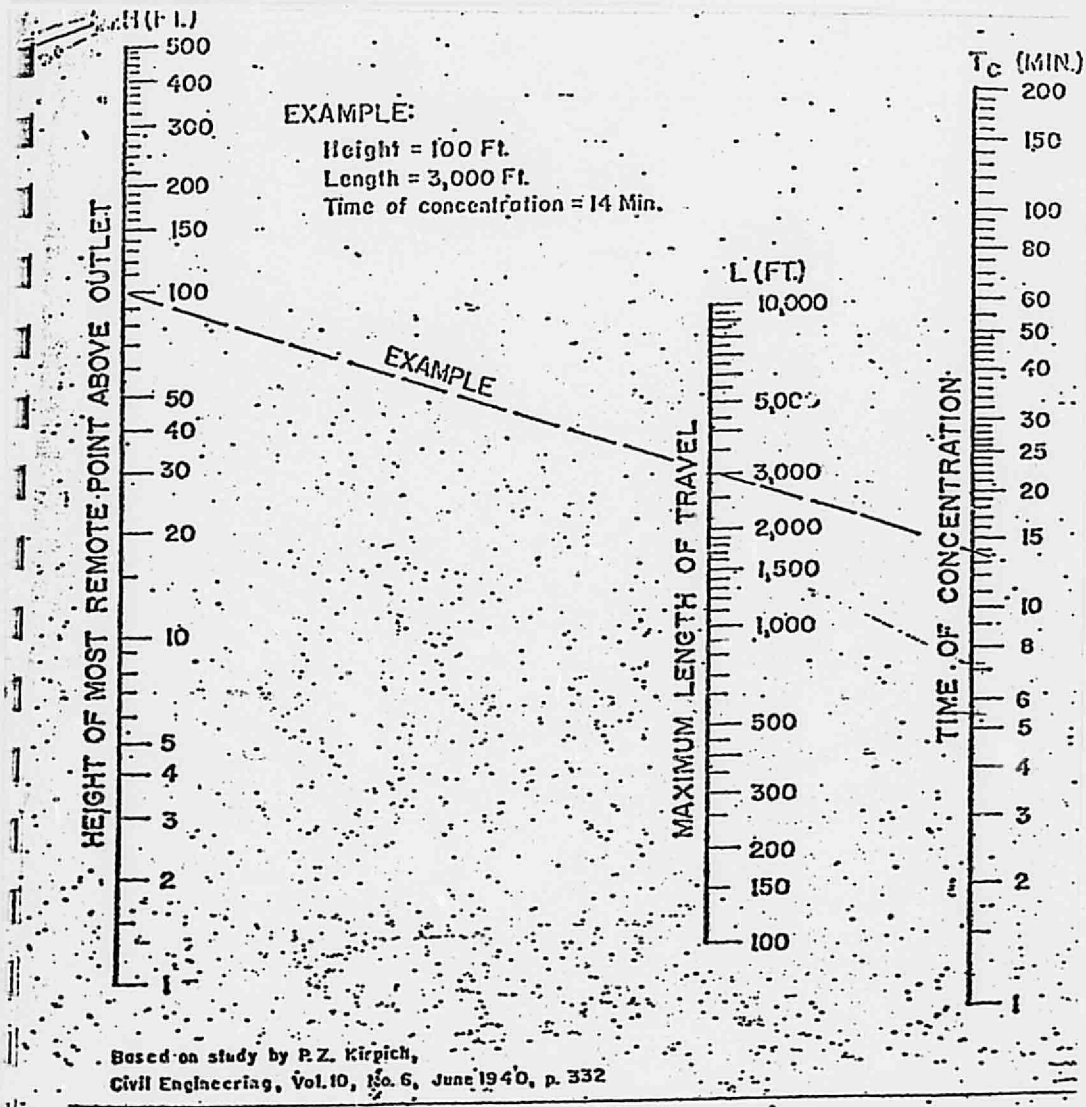


FIGURE - I

H-13-Z



Based on study by P.Z. Kirpich,
Civil Engineering, Vol.10, No. 6, June 1940, p. 332

TIME OF CONCENTRATION OF SMALL DRAINAGE BASINS

Reprinted from "Design of Roadside Drainage Channels - Hydraulic Engineering

FIG. III

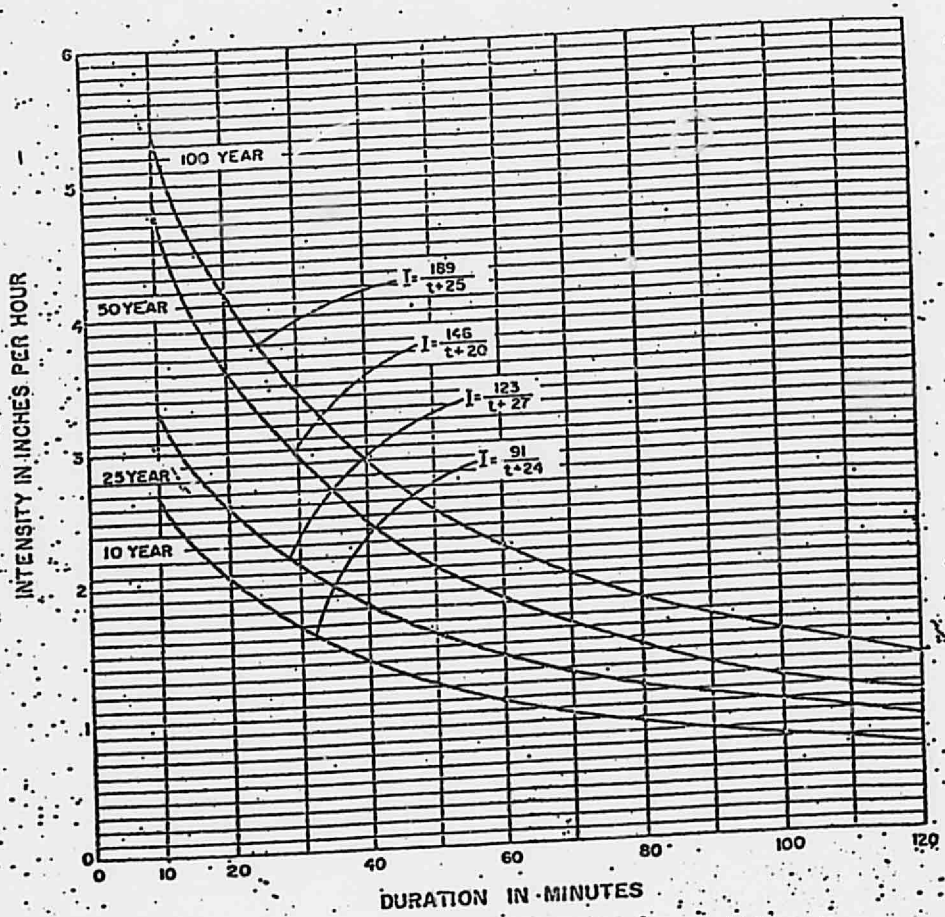


FIGURE IV

MASTER PLAN OF DRAINAGE
CITY OF ALBUQUERQUE - NEW MEXICO
AND ENVIRONS

INTENSITY DURATION
FREQUENCY CURVES

(ALBUQUERQUE AREA-1960)

GORDON KEHKENHOFF & ASSOC
CONSULTING ENGINEERS

CHART
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