HYDROLOGY H16/D43 1 PLAN

H16/D43

1 PLAN

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

1116 - D43

January 17, 1983

Mr. Jake Vigil
Vigil Engineering
2932 Ortiz Dr. N.E.
Albuquerque, N.M. 87110

RE: DRAINAGE REPORT FOR ALBUQUERQUE GRANADA ROYAL HOMETEL

Dear Jake:

This letter serves as a conceptual approval for the referenced drainage report. However, prior to the issuance of a building permit, the following conditions must be met:

a. A grading-drainage plan must be submitted to this office for review to check compliance with the approved plan. I call your attention to pages 106-109 of DPM which outlines details that should be included on the plan.

b. An approved copy of Special Order No. 19 for the connection to the 54" storm sewer must be placed in the City construction sets.

If you have any questions concerning these matters, please call.

Very truly yours,

Brian G. Burnett
Civil Engineer/Hydrology

BGB/tsl

Jacob A. Vigil
Consulting Engineers

December 13, 1982

City of Albuquerque
P.O. Box 1293
Albuquerque, New Mexico 87103

RECEIVED
DEC 14 1982
CITY ENGINEER

Attention: Mr. Brian Burnett

Dear Mr. Burnett,

This letter constitutes a followup on the predesign conference held in your office on December 10, 1982, concerning the drainage affecting the proposed site for the Albuquerque Granada Royal Hometel. Those present at the meeting were Mr. Pat McClernon, Architect; Mr. Jacob A. Vigil, Engr.; and yourself Mr. Brian Burnett, City of Albuquerque.

It was agreed the site would be drained to the southwest corner of the property where a double "D" catch basin would be constructed to carry the 100 year storm runoff. The catch basin would be connected to an existing manhole located in Bryn Mawr with a 24 inch reinforced concrete pipe. The top of grate elevation of the catch basin would be set at approximately 5100.00 ± which corresponds to the 100 year high water mark in the North Diversion Channel. The existing 54 inch storm sewer draining into the North Diversion Channel would intercept the flows from the catch basin without requiring on site ponding nor affecting existing drainage patterns down stream.

If the information contained in this letter meets your approval, please sign below and return to Vigil Engineering at the above address.

Yours very truly,

Jacob A. Vigil

Looks OK!

Jacob A. Vigil, P.E.

Brian Burnett/ City of Albuquerque

12/24/82
Date

copy: Dyer/McClernon

Jacob A. Vigil
Consulting Engineers

December 13, 1982

City of Albuquerque
P.O. Box 1293
Albuquerque, New Mexico 87103

RECEIVED
DEC 16 1982
CITY ENGINEER

Attention: Mr. Brian Burnett

Dear Mr. Burnett,

This letter constitutes a followup on the predesign conference held in your office on December 10, 1982, concerning the drainage affecting the proposed site for the Albuquerque Granada Royal Hometel. Those present at the meeting were Mr. Pat McClernon, Architect; Mr. Jacob A. Vigil, Engr.; and yourself Mr. Brian Burnett, City of Albuquerque.

It was agreed the site would be drained to the southwest corner of the property where a double "D" catch basin would be constructed to carry the 100 year storm runoff. The catch basin would be connected to an existing manhole located in Bryn Mawr with a 24 inch reinforced concrete pipe. The top of grate elevation of the catch basin would be set at approximately 5100.00 ± which corresponds to the 100 year high water mark in the North Diversion Channel. The existing 54 inch storm sewer draining into the North Diversion Channel would intercept the flows from the catch basin without requiring on site ponding nor affecting existing drainage patterns down stream.

If the information contained in this letter meets your approval, please sign below and return to Vigil Engineering at the above address.

Looks OK!

Yours very truly,

Jacob A. Vigil

Jacob A. Vigil, P.E.

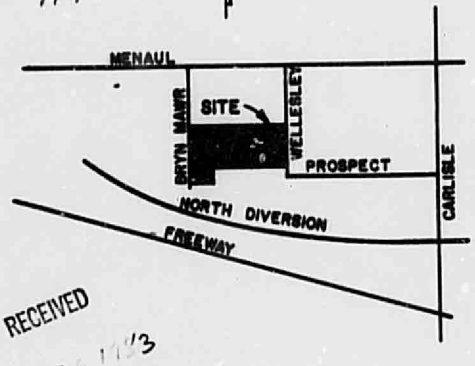
Brian Burnett, City of Albuquerque

12/21/82
Date

copy: Dyer/McClernon

DRAINAGE STUDY
FOR
ALBUQUERQUE GRANADA ROYAL HOMETEL

H16-043



RECEIVED
JAN 06 1983
ENGINEERING

DECEMBER 1982

VIGIL ENGINEERING
2932 ORTIZ DR., N.E. (505) 881-2455
ALBUQUERQUE, NEW MEXICO 87110

Jacob A. Vigil
Consulting Engineers

Vigil Engineering
[illegible] Ortiz Dr. N. E.
Albuquerque, NM 87110
Phone: (505) 881-2455

December 30, 1982

Dyer/McCleron Architects
1401 5th Street, N.W.
Albuquerque, New Mexico 87102

Dear Mr. McClernon,

Transmitted herewith is the drainage report entitled, " Albuquerque Granada Royal Hometel Drainage Report", dated December 1982. The recommendations in this report are in accordance with the requirements of the City of Albuquerque and the Albuquerque Metropolitan Arroya Flood Control Authority.

Thank you for the opportunity to participate in the design of this project.

Respectfully submitted,

Jacob A. Vigil

Jacob A. Vigil, P.E.

TABLE OF CONTENTS

LETTER OF TRANSMITTAL

DRAINAGE REPORT

I. PURPOSE ..... Page 1

II. SCOPE ..... Page 1

III. LOCATION ..... Page 1

IV. EXISTING DRAINAGE ..... Page 1

V. PROPOSED DEVELOPMENT ..... Page 1 - 2

VI. CONCLUSIONS AND RECOMMENDATIONS..... Page 2

APPENDIX

1. DESIGN CALCULATIONS ..... Page 1 - 4

2. MAP "A" ..... Page 5

ALBUQUERQUE GRANADA ROYAL HOMETEL
DRAINAGE REPORT

I. PURPOSE. The purpose of this report is to formulate a comprehensive drainage handling plan for the proposed development which plan must meet the drainage requirements and guidelines established by the City of Albuquerque and the Albuquerque Metropolitan Arroya Flood Control Authority.

II. SCOPE. This report is limited to runoff originating within the development and its impact on the existing off site drainage structures or systems adjacent to the development.

III. LOCATION. The site is located in the Northeast Heights between Bryn Mawr Drive and Wellesley Avenue and south of Menual Boulevard. The site comprises of a portion of Tract A of the Shollenbarger's Replat and a portion of Block 16 of the Miracerros Addition, City of Albuquerque Zone Atlas map H-16. The site consists of 4.58 acres of sparse to bare soil with a portion of the site containing dumped rubble.

IV. EXISTING DRAINAGE. The site slopes from east to west with an average slope of 2%; there are no gullies or arroyos traversing the property. The runoff from the existing site sheet flows across the property and is collected by an existing earthen ditch that parallels the North Diversion Channel right of way between the little league baseball fields and the North Diversion Channel. The earthen ditch discharges into a ponding area constructed during the construction of the North Diversion Channel. Stored water in the pond is periodically released into the Channel during low flows.

An existing 54 inch storm sewer is located on the center of Bryn Mawr Drive which collects water from catch basins located in Menual Boulevard and discharges the water directly into the North Diversion Channel. The grate elevations of the catch basins in Menual Boulevard are at approximately 5110. The 100 year runoff peak water elevation in the North Diversion Channel at the point of discharge for the 54 inch storm sewer is calculated to be approximately 5100. All the manholes along the 54 inch storm sewer in Bryn Mawr Drive have pressure covers.

V. PROPOSED DEVELOPMENT. The proposed site will be graded to drain to the southwest corner of the property. A double "D" catch basin will be constructed in the southwest parking lot to handle the 100 year storm runoff from the site. The catch basin will be connected to an existing manhole located in Bryn Mawr Drive with a 24 inch reinforced concrete pipe and the flows from the site will combine with the flows from Menual Boulevard in the existing 54 inch storm sewer which discharges directly into the Channel. The time to peak for the combined flows in the 54 inch storm sewer is less than the time to peak for the 100 year storm in the North Diversion Channel, thus permitting the 54 inch storm sewer to discharge freely into the Channel.

The grate of the mentioned catch basin will be constructed to an elevation of 5100 which corresponds to the elevation of the 100 year peak flow in the North Diversion Channel. If the water elevation in the Channel is greater than 5100 or if the flows in the 54 inch storm sewer become pressurized, the reverse flow in the catch basin would discharge directly into Bryn Mawr Drive and would have the same flow pattern as under the present undeveloped conditions.

No on site ponding will be required because the double "D" catch basin and connecting pipe has been designed to carry the 100 year storm flows.

VII. CONCLUSIONS AND RECOMMENDATIONS. On the basis of this report the property under consideration can be developed as proposed if a double "D" catch basin is constructed on the southwest parking lot and connected into the existing manhole in Bryn Mawr Drive with a 24 inch reinforced concrete pipe. The west curb of the parking lot should not be constructed higher than 6 inches to permit the flows from the site to discharge into Bryn Mawr Drive freely.

HOMETEL (FAT MCCLERNON ARCH)

JACOB A. VIGIL
DECEMBER 14, 1982
SHT 1 OF 1

1. TOTAL DRAINAGE AREA FOR "ON SITE" DEVELOPMENT:

3.44 AC
+ 1.14 AC
4.58 ACRES

2. RUNOFF FOR 100 YEAR FREQUENCY:

TIME OF CONCENTRATION = 10.0 MIN
COEFFICIENT OF RUNOFF = 0.90
INTENSITY (10 MIN) = 4.86 $\frac{\text{INCHES}}{\text{HOUR}}$

$Q_{100} = CIA$
$= 0.90(4.86)(4.58)$
$= 20.0$ CFS

3. SELECT SIZE OF CATCH BASIN:

$Q_{100} = 20.0$ CFS

TRY: ONE DOUBLE "D" CATCH BASIN WITH 1.0 FT OF HEAD

AREA OF GRATE:
$(3.42' \times 2.12)(2) = 11.08\ FT^2$
LESS BARS: $20(0.142)(2) = 5.68\ FT^2$
$11.08\ FT^2$
$-\ 5.68$
$5.40\ FT^2$ = NET AREA

$Q = CA\sqrt{2gh} = 0.70(5.40)\sqrt{2(32.2)(1.0)}$

$Q = 30.33$ CFS

ASSUME 70% EFFECTIVE
$30.33 \times 0.70 = 21.2$ CFS > 20.0 CFS O.K.
THEREFORE USE: 1 - DOUBLE "D" CATCH BASIN

HOMETEL
BY: PAT McCLERNON ARCH.

JACOB A. VIGIL
DECEMBER 14, 1992
SHT 2 OF 4

4. SELECT SIZE OF STORM SEWER LINE CONNECTING CATCH BASIN TO MANHOLE:
INVERT ELEVATION OF 54" R.C.P @ MANHOLE = 5087.70
ELEV. @ CROWN OF 54" R.C.P. = 5087.70 + 4.50 = 5092.20 FT.

DETERMINE REQ'D HEAD FOR INLET CONTROL:

15" R.C.P. : $Q = CA\sqrt{2gh}$

$2gh = \left(\frac{Q}{CA}\right)^2$

$h = \left(\frac{Q}{CA}\right)^2\left(\frac{1}{2g}\right)$

$h = \left[\frac{20}{0.5(1.23)}\right]^2 \frac{1}{64.4}$

$h = 16.42$ FT.

$A = \frac{\pi D^2}{4} = \frac{3.14}{4}(1.25)^2$

$A = 1.23\ FT^2$

18" R.C.P : $h = \left(\frac{Q}{CA}\right)^2\left(\frac{1}{2g}\right)$

$h = \left[\frac{20}{0.5(1.77)}\right]^2\left(\frac{1}{64.4}\right)$

$h = 7.93$ FT.

$A = \frac{\pi D^2}{4} = \frac{3.14(1.50)^2}{4}$

$A = 1.77\ FT^2$

24" R.C.P : $h = \left(\frac{Q}{CA}\right)^2\left(\frac{1}{2g}\right)$

$h = \left[\frac{20}{0.5(3.14)}\right]^2 \frac{1}{64.4}$

$h = 2.52$ FT.

$A = \frac{\pi D^2}{4} = \frac{3.14(2.0)^2}{4}$

$A = 3.14\ FT^2$

USE: 24" R.C.P. FOR INLET CONTROL

HOMETEL
BY: PAT McCLERNON

JACOB A. VIGIL
DECEMBER 14, 1982
SHT. 3 OF ±

5. DETERMINE MINIMUM SLOPE FOR 24" R.C.P:

$$V = \frac{1.486}{n} R^{2/3} S^{1/2}$$

$$S^{1/2} = \frac{Vn}{1.486 R^{2/3}}$$

$$S = \left(\frac{Vn}{1.486 R^{2/3}}\right)^2$$

$$S = \left(\frac{6.37 \times 0.012}{1.486 \times 0.50^{2/3}}\right)^2$$

$$S = .0067 \text{ FT/FT}$$

$Q = A \cdot V$

$V = \frac{Q}{A} = \frac{20.0}{3.14}$

$V = 6.37$ fps.

$R = \frac{A}{P} = \frac{3.14}{6.28} = 0.50$

$R = \frac{D}{4} = \frac{2.0}{4.0} = 0.50$

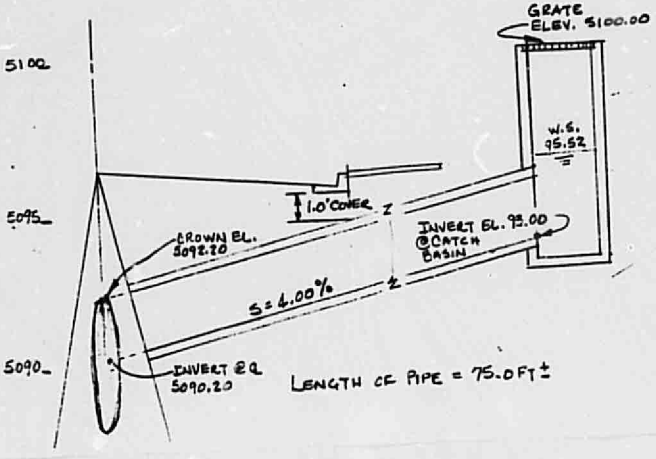
MIN. SLOPE = .0067 FT/FT (PIPE FLOWING FULL)

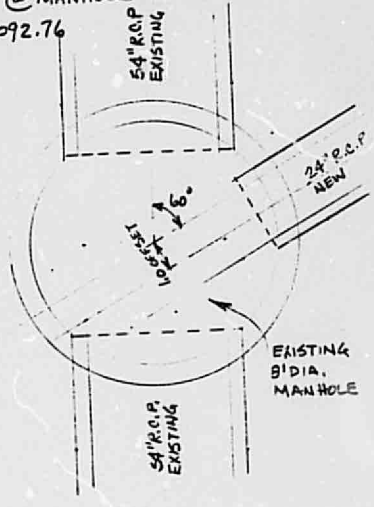
USE: MINIMUM S = .007 FT/FT OR 0.70%

6. DETERMINE HYDRAULIC GRADE LINE:

ASSUMPTION: BECAUSE OF THE SHORT TIME OF CONCENTRATION AND PROXIMITY TO THE NORTH DIVERSION ASSUME HYDRAULIC GRADE LINE @ MANHOLE TO BE AT:

$\left(5092.20 + \frac{6.0^2}{2g}\right) = 5092.76$





HOMETEL.
BY: PAT McCLERNON

JACOB A. VIGIL
DECEMBER 14, 1982
SHT. 4 OF 4

PT #1 @ OUTLET OF 24" R.C.P. H.G.L. = 5092.76

PT #2 @ INLET OF 24" R.C.P. $H_L = 1.50\frac{V^2}{2g} + .021\frac{L}{D}\frac{V^2}{2g}$

$= 1.87\frac{V^2}{2g}$

$= 1.87\frac{(6.37)^2}{64.4}$

$H_L = 1.18$ FT. (IF PIPE FLOWS FULL)

HGL @ PT #2 = 5092.76 + 1.18
= 5093.93 < (93.00 + 2.52)
THEREFORE PIPE IS NOT FLOWING FULL AND INLET CONTROLS

THEREFORE WATER SURFACE INSIDE CATCH BASIN IS AT ELEV. 95.52

7. CHECK CAPACITY AND DEPTH OF FLOW AT CATCH BASIN IF FLOW INTO CATCH BASIN IS CONSIDERED TO ACT AS A WEIR.

L = 17.0 FT. C = 3.10

$Q = CLH^{3/2}$

H = DEPTH OF FLOW = $\left(\frac{Q}{CL}\right)^{2/3}$

$H = \left(\frac{20}{3.10(17)}\right)^{2/3}$

H = 0.52 FT. O.K. ALL FOUR SIDES OPERATING

$H = \left(\frac{20}{3.10(11.5)}\right)^{2/3}$ L = 11.5 FT LONG SIDE AGAINST CURB 3 SIDES OPERATIONAL.

H = 0.68 FT. O.K.