

August 27, 1976

423-D1

Mr. Bo Johnson
Murray-McCormick, Suite F
2601 Wyoming Blvd. N.E.
Albuquerque, New Mexico 87110

RE: CANDLELITA TOWNHOUSE

Dear Mr. Johnson:

I have reviewed your request for an open channel in lieu of the pipe recommended in the drainage report for the subject property.

An open channel is an acceptable alternate. However, grass lined with 2:1 side slopes is unacceptable. Such steep slopes cannot be satisfactorily maintained.

I would also recommend the water be turned and directed north along the street to avoid possibility of flows climbing the water block. The pipe alternate satisfactorily provided that control of the water.

Very truly yours,

Kleston H. Laws
Assistant City Engineer-Hydrology

KHL/fs
cc John Robert

MURRAY-McCORMICK, INC.
ENVIRONMENTAL DESIGN
ARCHITECTURE · ENGINEERING · PLANNING · SURVEYING

August 11, 1976

Mr. Kleston Laws
Drainage Engineer
City of Albuquerque

Re: Candlelita Townhouse Tract 1, La Villita Drainage Report
Amendments.

Dear Mr. Laws:

The drainage report for the above referenced development was approved by your office on October 24, 1975.

The hydrology study incorporated in this approval included 15.36 c.f.s. in off-site. Flows coming from the low point in a private street on the east side of the site and draining to the south end of Candlelita Ct. This discharge was to be carried in a pipe in an easement along the southeast boundary.

As we discussed previously, this letter respectfully requests that the pipe structure be omitted in favor of a grassed swale as detailed on the enclosed plan.

The swale will be grassed (sodded) to minimize erosion with the concrete spillway in the areas of potential erosion.

Very Truly Yours,



Bo K. Johnson
Vice President

BKJ:cs
encl.

October 24, 1975

H23-D1
Mr. John Bettis
Enchantment Engineering
3240C Juan Tabo Blvd. NE
Albuquerque, New Mexico 87111

RE: DRAINAGE REPORT CANDELITA TOWNHOUSES

Dear Mr. Bettis:

The subject drainage report is approved subject to receiving 2 copies of the grading plan and final construction drawings being prepared for the drainage and street improvements.

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cc: John Robert, AMAFCA

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CANDELITA TOWNHOUSES

Computations for Trapezoidal Channel:



$$Q = A \times V$$

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

$$n = 0.030 \text{ (Earth)}$$

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$$R = A/P$$

$$A = 3 \text{ ft.}^2$$

$$= \frac{1.486}{0.03} \times 0.67 \times 0.25$$

$$P = 5.47 \text{ ft.}$$

$$V = 8.30 \text{ ft./sec}$$

$$R^{2/3} = 0.67$$

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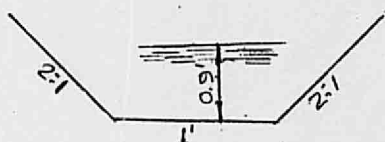
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$$V = 6.24 \text{ ft./sec.}$$

$$Q = A \times V$$

$$= 2.52 \times 6.24$$

$$= 15.72 \text{ c.f.s.}$$

$$n = 0.030 \text{ (Earth)}$$

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$$d = 0.9$$

APPROVED FOR DRAINAGE

24 OCT 75

KH Lums

ACE Hyd.

SIGNATURE

CONTRACT NO.

DRAINAGE REPORT

FOR

CANDELITA TOWN HOUSES

TRACT 1, LA VILLITA

OCTOBER, 1975

PREPARED FOR:

BURNSIDE ENTERPRISES

3107 EUBANK N.E.

ALBUQUERQUE, NEW MEXICO

PREPARED BY:

ENCHANTMENT ENGINEERING

3240 - C JUAN TABO N.E.

ALBUQUERQUE, NEW MEXICO



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PURPOSE:

THE PURPOSE OF THIS REPORT IS TO DEFINE THE RATE AND VOLUME OF RUNOFF RESULTING FROM A ONE HUNDRED YEAR STORM FALLING ON THE CANDELITA TOWNHOUSES.

LOCATION AND TERRAIN:

CANDELITA TOWNHOUSES COMPRISES TRACT 1 OF LA VILLITA, WHICH IS LOCATED ON THE SOUTH RIGHT-OF-WAY OF CANDELARIA BOULEVARD, AND APPROXIMATELY 1500 FEET EAST OF TRAMWAY BOULEVARD. THE SLOPES IN THIS AREA ARE APPROXIMATELY 7 PERCENT AND THE GROUND COVER MAY BE CLASSIFIED AS POOR GRASS SURFACE.

PROPOSED DEVELOPMENT:

CANDELITA TOWNHOUSES WILL BE DEVELOPED AS HIGH DENSITY, SINGLE FAMILY RESIDENCES. IT IS PROPOSED THAT THE DEVELOPMENT OF THIS PARCEL FOLLOW THE GUIDELINES SET FORTH IN THE ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITIES DRAINAGE RESOLUTION JULY 1972-2.

DESIGN CRITERIA:

A ONE HUNDRED YEAR FREQUENCY STORM WAS USED IN CONJUNCTION WITH THE RATIONAL METHOD TO COMPUTE THE RATE OF FLOW RESULTING FROM THIS DEVELOPMENT. A ONE HUNDRED YEAR, SIX HOUR RAIN WAS USED TO COMPUTE THE VOLUME OF

THE RESULTING RUNOFF. THESE FLOWS AND VOLUMES WERE COMPUTED FOR BOTH THE DEVELOPED AND UNDEVELOPED CONDITIONS. THE CALCULATIONS FOR THE HYDROLOGIC ANALYSIS ARE PRESENTED IN THE APPENDIX OF THIS REPORT.

INTERNAL DRAINAGE

IN ORDER NOT TO INCREASE THE RUNOFF FROM THIS TRACT, IT WILL BE NECESSARY TO POND THE RUNOFF FROM THE SIDE AND REAR YARDS. ROOF TOP PONDING WILL ALSO BE INCORPORATED.

can it be
done with
into allow

IT WILL BE NECESSARY TO UTILIZE THE ENTIRE SIDE AND BACK YARDS AS A POND. THIS WILL BE ACCOMPLISHED BY THE CONSTRUCTION OF BLOCK GARDEN WALLS ALONG THE SIDE AND REAR PROPERTY LINES TO PREVENT RUNOFF FROM LEAVING THE POND AREA. THE FLOOR SLABS WILL BE RAISED A MINIMUM OF SIX (6) INCHES ABOVE THE REAR YARD TO ENSURE THAT STORM WATER DOES NOT ENTER THE DWELLING.

RUNOFF FROM THE ROOF AREA WILL BE CONTROLLED BY THE USE OF A MODIFIED ROOF CANALE. BY PLACING ONE SUCH CANALE ON THE FRONT OF EACH DWELLING, THE DISCHARGE FROM EACH ROOF WOULD BE EQUAL TO 0.031 cfs. (SEE APPENDIX FOR CALCULATIONS AND SKETCH OF MODIFIED ROOF CANALE.)

FOR THE MAJOR PART, THE RUNOFF AFTER DEVELOPMENT WILL FLOW IN THE STREETS IN A

NORTHERLY DIRECTION UNTIL IT FLOWS INTO CANDELARIA BOULEVARD. At this point the flow will proceed in a westerly direction, down CANDELARIA.

IN THE UNDEVELOPED STATE, THE TRACT UNDER CONSIDERATION DRAINS IN A NORTH WESTERLY DIRECTION AND THE RUNOFF EVENTUALLY FLOWS INTO CANDELARIA BOULEVARD.

EXTERNAL DRAINAGE:

EXTERNAL DRAINAGE AREA AFFECTING THE OVERALL DRAINAGE OF THE PROPOSED DEVELOPMENT EXIST TO THE EAST AND SOUTH.

THE DRAINAGE AREA TO THE EAST COMPRISES APPROXIMATELY 2.5 ACRES AND IS GENERATED FROM AN EXISTING TOWNHOUSE DEVELOPMENT. THE RUNOFF FROM THE SOUTH IS GENERATED FROM AN ASPHALTED PARKING AREA WITH THE ROOFS OF SOME TOWNHOUSES CONTRIBUTING TO THE RUNOFF. THIS AREA COMPRISES APPROXIMATELY 0.5 ACRES.

THE RUNOFF FROM THE EAST ENTERS THE PROPERTY IN QUESTION AT THE SOUTHEAST CORNER. IT IS PROPOSED THAT THIS FLOW BE TRANSFERRED THROUGH LOT 11, BLOCK 2, CANDELITA TOWNHOUSES IN AN 18 INCH DIAMETER PIPE THAT WOULD DISCHARGE INTO CANDELITA COURT N.E. THIS FLOW WOULD THEN PROCEED NORTH IN CANDELITA COURT TO CANDELARIA BOULEVARD N.E. *all calls are 24 hr*

THE RUNOFF FROM THE SOUTH ENTERS THE PROPERTY AS SHEET FLOW AND WILL PROCEED NORTH IN CANDELITA COURT N.E.

CONCLUSIONS:

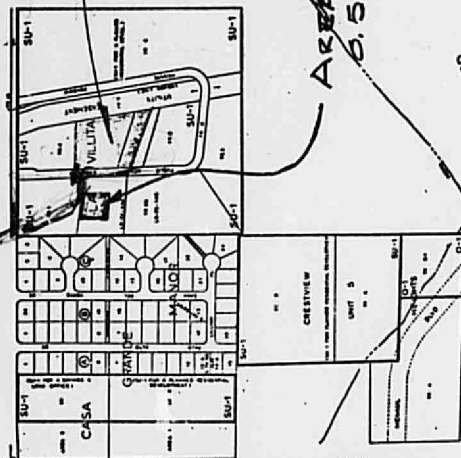
INTERNAL RUNOFF AFTER DEVELOPMENT
IS LESS THAN THAT IN THE NATURAL STATE.

DRAINAGE PATTERNS AFTER DEVELOPMENT
ARE SIMILAR TO THOSE EXISTING IN THE
NATURAL STATE.

LOCATION MAP
PLATE 1



Cibola National Forest



EXTERNAL DRAINAGE AREAS PLATE 2

Cibola National Forest



H-23-7

RUNOFF CALCULATIONS - UNDEVELOPED STATE

LENGTH OF LONGEST RUN = 520 ft

AVERAGE SLOPE = 7%

TOTAL AREA = 2.8 ACRES

FROM DESIGN Vol. 1 BY SEELYE, p. 18-01
(FIG. H)

TIME OF CONCENTRATION = 15 mins.

Then

$$\text{Intensity, } I = \frac{189}{T_c + 25} = 4.72 \text{ in/hr.}$$

$$C = 0.45$$

$$Q = CIA = 0.45 \times 4.72 \times 2.8 = 5.95 \text{ cfs.}$$

$$\text{Volume} = .45 \times 4.72 \times 3' \times \frac{1}{2} = 0.531 \text{ ac-ft}$$

RUNOFF CALCULATIONS: DEVELOPED STATE.

TOTAL AREA = 2.8 ACRES

- ASSUME RAIN FALLING ON REAR YARDS
WILL BE PONDED $\frac{1}{2}$
- THAT THE RUNOFF FROM THE ROOFS WILL
BE A CONTROLLED DISCHARGE.

$$\begin{aligned}\text{THEREFORE AREA CONTRIBUTING TO RUNOFF} \\ &= 2.8 - 1.545 \text{ ACRES (SEE TABULATION SHEET)} \\ &= 1.255 \text{ ACRES}\end{aligned}$$

OF THIS AREA 0.793 ACRES IS COMPRISED
OF DRIVES, ROADS, AND WALKS (ASSUME THAT

THE ENTIRE RIGHT-OF-WAY OF
CANDELITA COURT IS COMPRISED OF
ASPHALT AND CONCRETE CURBS AND WALKS.)

THEREFORE 0.462 ACRES WOULD BE
LEFT FOR LANDSCAPED AREAS.

LENGTH OF LONGEST RUN = 375 FT.
AVERAGE SLOPE = 4%

FROM DESIGN Vol 1 by Seelye p.18-01

THEREFORE TIME OF CONCENTRATION = 6 MINS
USE MINIMUM OF 10 MINS

$$\frac{I}{TC+25} = 5.4 \text{ in/hr.}$$

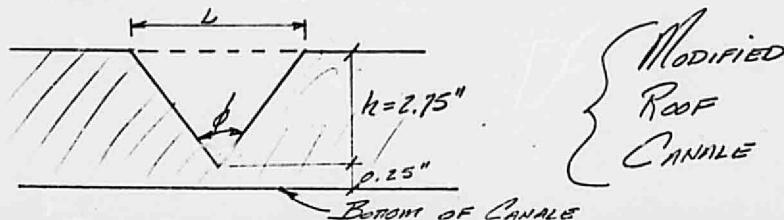
RUNOFF FROM IMPEVIOUS AREAS
 $= 0.95 \times 5.4 \times 0.793 = 4.06 \text{ cfs}$

RUNOFF FROM LANDSCAPED AREA
 $= 0.3 \times 5.4 \times 0.462 = 0.748 \text{ cfs}$

TOTAL = 4.81 cfs. (1)

DETERMINATION OF ROOF DISCHARGE

ASSUME A 3" MAXIMUM RAIN, AND THAT
THE RUNOFF WILL BE DISCHARGED THROUGH
A MODIFIED SCUPPER SHOWN BELOW:



$$\therefore h = 2.75 \text{ in} = .2292 \text{ ft}$$

$$\phi = 60^\circ \Rightarrow L = 2h \tan \phi/2 = 0.2647 \text{ ft.}$$

$$C = 0.58 \text{ FOR } 60^\circ \text{ NOTCH.}$$

THE DISCHARGE THROUGH THIS TYPE OF WEIR IS EXPRESSED BY THE EQUATION

$$\begin{aligned} Q &= C^{1/5} L h \sqrt{2gh} \\ &= .58 \times 1/5 \times .2292 \times .2647 \sqrt{2 \times 32.2 \times .2292} \\ &= 0.0361 \text{ cfs.} \end{aligned}$$

ASSUMING THAT THERE WILL ONLY BE ONE DISCHARGE SLUICER PER ROOF, AND SINCE THERE ARE 21 LOTS PROPOSED FOR DEVELOPMENT, THE TOTAL DISCHARGE FROM THE ROOFS WOULD BE

$$Q_{\text{ROOFS}} = 21 \times 0.0361 = 0.758 \text{ cfs}$$

THEN THE TOTAL DEVELOPED DISCHARGE FOR THIS AREA IS

$$\begin{aligned} 4.81 + .758 &= 5.57 \text{ cfs} \\ (\text{SEE PAGE 8-(1)}) &\quad \underline{\underline{\quad}} \end{aligned}$$

THIS DISCHARGE IS LESS THAN THE NATURAL RUNOFF OF 5.95 cfs.

RUNOFF CALCULATIONS - EXTERNAL DRAINAGE AREAS

$$\text{AREA TO EAST (1)} = 2.4 \text{ ACRES}$$

$$\text{AREA TO SOUTH (2)} = 0.5 \text{ ACRES}$$

PRESENTLY ALL EXTERNAL DRAINAGE AREAS ARE IN A DEVELOPED STATE. BECAUSE OF THE STEEP LANDSCAPED AREAS, PITCHED ROOFS AND LARGE ASPHALTED AREAS PRESENT IN THE EXTERNAL DRAINAGE AREA, A RUNOFF COEFFICIENT OF 0.95 WAS ASSUMED.

THE INTENSITY OF RAINFALL WAS ASSUMED TO BE A MAXIMUM OF 5.4 in/hr FOR THESE AREAS.

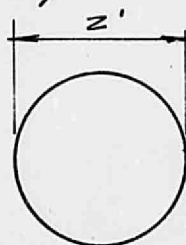
$$\text{RUNOFF AREA 1} = Q = CIA = .95 \times 5.4 \times 2.5 = 12.8 \text{ CFS}$$

$$\text{RUNOFF AREA 2} = Q = " = .95 \times 5.4 \times .5 = 2.56 \text{ CFS}$$

$$\text{TOTAL} = 15.36 \text{ CFS}$$

$$\text{TOTAL DISCHARGE FROM EXTERNAL AREAS} = \underline{\underline{15.36 \text{ CFS}}}$$

PIPE CAPACITY:



SLOPE = 4%

TOTAL CAPACITY WHEN FLOWING FULL:

$$n = 0.015$$

$$A = R^2 \pi = \pi$$

$$P = D \pi = 2\pi$$

$$R = \frac{A}{P} = \frac{1}{2} \Rightarrow R^{2/3} = 0.63$$

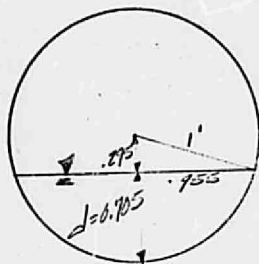
$$S^{1/2} = 0.06^{1/2} = 0.245$$

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

$$Q = \frac{1.486}{0.015} \times 0.63 \times 0.245 \times \pi = 48.04 \text{ cfs}$$

$$V = \frac{Q}{A} = 15.3 \text{ ft/sec.}$$

When $Q = 12.8 \text{ cfs}$



Assume $d = 0.705 \text{ ft}$

$$\therefore A = 0.987 \text{ ft}^2$$

$$P = 2.542 \text{ ft}$$

$$R = \frac{A}{P} = 0.387 \Rightarrow R^{2/3} = 0.533$$

$$Q = \frac{1.486}{0.015} \times 0.533 \times 0.245 \times 0.987 = 12.8 \text{ cfs}$$

$$V = \frac{Q}{A} = 12.9 \text{ ft/sec.}$$

TABULATION OF SURFACE AREA

12

BLOCK 1

<u>LOT</u>	<u>ROOF</u>	<u>DRIVES</u>	<u>FRONT YARD</u>	<u>BACK YARD</u>
1	2112	540	757	1772
2	"	600	839	958
3	"	400	809	950
4	"	420	832	884
5	"	520	821	740
6	"	420	749	940
7	"	500	794	870
8	"	540	1004	1008
9	"	620	1084	1042
10	"	440	2038	1359
<u>TOTAL</u>	<u>21120 #</u>	<u>5000 #</u>	<u>9682</u>	<u>10723</u>
	0.485 AC	0.115 AC	0.222 AC	0.246 AC

BLOCK 2

<u>LOT</u>	<u>ROOFS</u>	<u>DRIVES</u>	<u>FRONT YARD</u>	<u>BACK YARD</u>
1	2112	420	1602	1068
2	"	400	824	757
3	"	580	817	1178
4	"	640	869	1093
5	"	480	839	1093
6	"	460	884	1331
7	"	540	734	1386
8	"	420	824	1056
9	"	400	794	757
10	"	560	892	716
11	"	800	1391	1407
<u>TOTAL</u>	<u>23232 #</u>	<u>5700</u>	<u>10470</u>	<u>12242</u>
	0.533 AC	0.131	0.24	0.281

Road R.O.W = 23838 # = 0.547 AC

UNIT ONE
CASA GRANDE ESTATES SUBD.

CASA GRANDE UNIT TWO ESTATES SUBD.

UNIT TWO

Candelaria Road N.E.

CANDELITA TOWNHOUSES

TRACT NO. 1 OF AMENDED PLAT. LA VILLITA

2.798 ACRES

AI BILIEROUE. NEW MEXICO

September 10, 1975

DECLARATION

The addition of that certain tract shown hereon and shown as Tract No. 1 of the Amended Plat of La Villa, Abilene, New Mexico is done with the free consent and in accordance with the desires of the undersigned owners, and the foregoing shown hereon and enclosures as shown are herewith

William D. Davis

100

Country of Birth (a) 179
in this case of _____ 1974, the foregoing instrument was acknowledged before me by _____ a New York corporation.

Handwritten signature

2000

Scale: 1"=50'



CASA GRANDE MANOR SUBD.

TRACT NO. 4

TRACT NO. 8: A PRIVATE ROADWAY AND PUBLIC UTILITY EASEMENT

TRACT NO. 2

DRAINAGE & UTILITY EASEMENT

I, John A. Little, hereby certify that I am a Registered Professional Engineer and that this plat was prepared from notes of a field survey made under my supervision and is true and correct to the best of my knowledge and belief.

John M. Butts

Join in, Bertis

[illegible]

August 27, 1976

423-01

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Murray-McCormick, Suite F
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RE: CANDLELITA TOWNHOUSE

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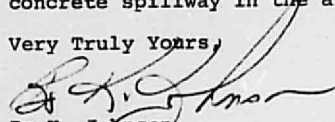
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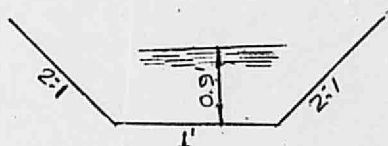
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KH Lums

24 Oct 75
ACE Hyd.

file copy

SIGNATURE

CONTINUATION

DRAINAGE REPORT

FOR

CANDELITA TOWN HOUSES

TRACT 1, LA Villita

OCTOBER, 1975

PREPARED FOR:

BURNSIDE ENTERPRISES

3107 EUBANK N.E.

ALBUQUERQUE, NEW MEXICO

PREPARED BY:

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THE RESULTING RUNOFF. THESE FLOWS AND VOLUMES WERE COMPUTED FOR BOTH THE DEVELOPED AND UNDEVELOPED CONDITIONS. THE CALCULATIONS FOR THE HYDROLOGIC ANALYSIS ARE PRESENTED IN THE APPENDIX OF THIS REPORT.

INTERNAL DRAINAGE

IN ORDER NOT TO INCREASE THE RUNOFF FROM THIS TRACT, IT WILL BE NECESSARY TO POND THE RUNOFF FROM THE SIDE AND REAR YARDS. ROOF TOP PONDING WILL ALSO BE INCORPORATED.

can it be
done with
sub allow

IT WILL BE NECESSARY TO UTILIZE THE ENTIRE SIDE AND BACK YARDS AS A POND. THIS WILL BE ACCOMPLISHED BY THE CONSTRUCTION OF BLOCK GARDEN WALLS ALONG THE SIDE AND REAR PROPERTY LINES TO PREVENT RUNOFF FROM LEAVING THE POND AREA. THE FLOOR SLABS WILL BE RAISED A MINIMUM OF SIX (6) INCHES ABOVE THE REAR YARD TO ENSURE THAT STORM WATER DOES NOT ENTER THE DWELLING.

RUNOFF FROM THE ROOF AREA WILL BE CONTROLLED BY THE USE OF A MODIFIED ROOF CANALE. BY PLACING ONE SIX IN CANALE ON THE FRONT OF EACH DWELLING THE DISCHARGE FROM EACH ROOF WOULD BE EQUAL TO 0.031 cfs. (SEE APPENDIX FOR CALCULATIONS AND SKETCH OF MODIFIED ROOF CANALE.)

FOR THE MAJOR PART, THE RUNOFF AFTER DEVELOPMENT WILL FLOW IN THE STREETS IN A

NORTHERLY DIRECTION UNTIL IT FLOWS INTO CANDELARIA BOULEVARD. AT THIS POINT THE FLOW WILL PROCEED IN A WESTERLY DIRECTION, DOWN CANDELARIA.

IN THE UNDEVELOPED STATE, THE TRACT UNDER CONSIDERATION DRAINS IN A NORTH WESTERLY DIRECTION AND THE RUNOFF EVENTUALLY FLOWS INTO CANDELARIA BOULEVARD.

EXTERNAL DRAINAGE:

EXTERNAL DRAINAGE AREA AFFECTING THE OVERALL DRAINAGE OF THE PROPOSED DEVELOPMENT EXIST TO THE EAST AND SOUTH.

THE DRAINAGE AREA TO THE EAST COMPRISES APPROXIMATELY 2.5 ACRES AND IS GENERATED FROM AN EXISTING TOWNHOUSE DEVELOPMENT. THE RUNOFF FROM THE SOUTH IS GENERATED FROM AN ASPHALTED PARKING AREA WITH THE ROOFS OF SOME TOWNHOUSES CONTRIBUTING TO THE RUNOFF. THIS AREA COMPRISES APPROXIMATELY 0.5 ACRES.

THE RUNOFF FROM THE EAST ENTERS THE PROPERTY IN QUESTION AT THE SOUTHEAST CORNER. IT IS PROPOSED THAT THIS FLOW BE TRANSFERRED THROUGH LOT 11, BLOCK 2, CANDELITA TOWNHOUSES IN AN 18 INCH DIAMETER PIPE THAT WOULD DISCHARGE INTO CANDELITA COURT N.E. THIS FLOW WOULD THEN PROCEED NORTH IN CANDELITA COURT TO CANDELARIA BOULEVARD N.E.

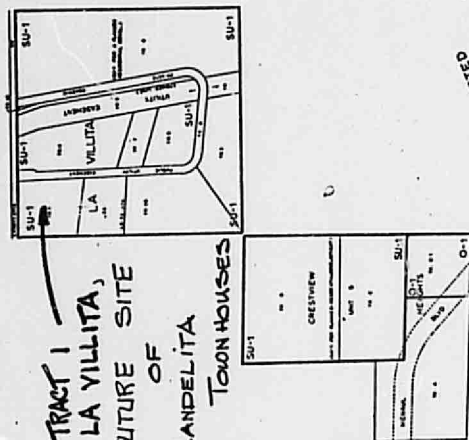
THE RUNOFF FROM THE SOUTH ENTERS THE PROPERTY AS SHEET FLOW AND WILL PROCEED NORTH IN CANDELITA COURT N.E.

CONCLUSIONS:

INTERNAL RUNOFF AFTER DEVELOPMENT
IS LESS THAN THAT IN THE NATURAL STATE.

DRAINAGE PATTERNS AFTER DEVELOPMENT
ARE SIMILAR TO THOSE EXISTING IN THE
NATURAL STATE.

TRACT 1
LA VILLITA,
FUTURE SITE
OF
CANDELITA
TOWN HOUSES



LOCATION - MAP
PLATE 1

NORTH

Cibola National Forest

DATE	PAGE
0-8-60	

H-23-Z

Legend

Legend

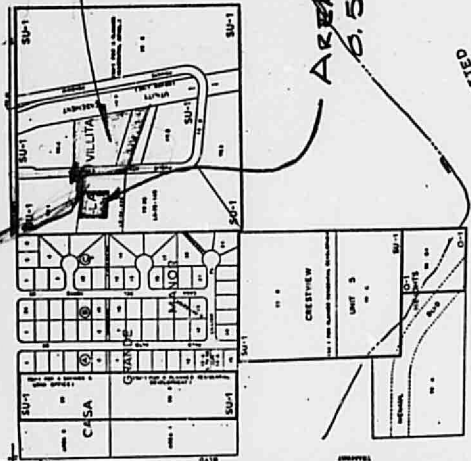
Legend

EXTERNAL DRAINAGE AREAS PLATE 2

AREA 1
2.4 AC.

AREA 2
0.5 AC.

UNPLANTED



Chicago National Forest

ADON

PAVE

ROAD

ROAD

ROAD

ROAD

ROAD

ROAD

ROAD

ROAD

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ROAD

7

RUNOFF CALCULATIONS - UNDEVELOPED STATE

LENGTH OF LONGEST RUN = 520 ft

AVERAGE SLOPE = 7%

TOTAL AREA = 2.8 ACRES

FROM DESIGN Vol. 1 by Seelye, p. 18-01
(FIG. H)

TIME OF CONCENTRATION = 15 mins.

Then

$$\text{Intensity, } I = \frac{189}{TC + 25} = 4.72 \text{ in/hr.}$$

$$C = 0.45$$

$$Q = CIA = 0.45 \times 4.72 \times 2.8 = 5.95 \text{ cfs.}$$

$$\text{Volume} = .45 \times 4.72 \times 3 \times \frac{1}{12} = 0.531 \text{ ac-ft}$$

RUNOFF CALCULATIONS: DEVELOPED STATE.

TOTAL AREA = 2.8 ACRES

- ASSUME RAIN FALLING ON REAR YARDS
WILL BE PONDED &
- THAT THE RUNOFF FROM THE ROOFS WILL
BE A CONTROLLED DISCHARGE.

$$\begin{aligned} \text{THEREFORE AREA CONTRIBUTING TO RUNOFF} \\ &= 2.8 - 1.545 \text{ ACRES (SEE TABULATION SHEET)} \\ &= 1.255 \text{ ACRES} \end{aligned}$$

OF THIS AREA 0.793 ACRES IS COMPRISED
OF DRIVES, ROADS, AND WALKS (ASSUME THAT

THE ENTIRE RIGHT-OF-WAY OF
CANDELITA COURT IS COMPRISED OF
ASPHALT AND CONCRETE CURBS AND WALKS.)

THEREFORE 0.462 ACRES WOULD BE
LEFT FOR LANDSCAPED AREAS.

LENGTH OF LONGEST RUN = 375 FT.
AVERAGE SLOPE = 4%

FROM DESIGN Vol 1 by SEELYE p.18-01

THEREFORE TIME OF CONCENTRATION = 6 MINS
USE MINIMUM OF 10 MINS

$$I = \frac{189}{T_C + 25} = 5.4 \text{ in/hr.}$$

RUNOFF FROM IMPEVIOUS AREAS

$$= 0.95 \times 5.4 \times 0.793 = 4.06 \text{ CFS}$$

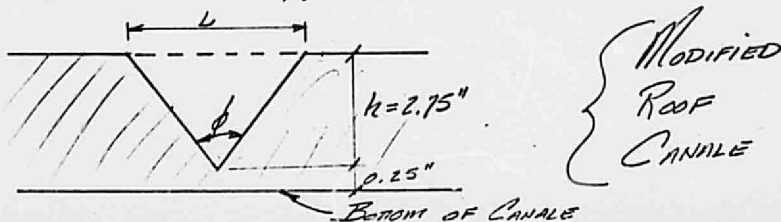
RUNOFF FROM LANDSCAPED AREA

$$= 0.3 \times 5.4 \times 0.462 = 0.748 \text{ CFS}$$

TOTAL = 4.81 CFS. (1)

DETERMINATION OF ROOF DISCHARGE

ASSUME A 3" MAXIMUM RAIN, AND THAT
THE RUNOFF WILL BE DISCHARGED THROUGH
A MODIFIED SCUPPER SHOWN BELOW:



$$\therefore h = 2.75 \text{ in} = .2292 \text{ ft}$$

$$\phi = 60^\circ \Rightarrow L = 2h \tan \frac{\phi}{2} = 0.2647 \text{ ft.}$$

$$C = 0.58 \text{ FOR } 60^\circ \text{ NOTCH.}$$

THE DISCHARGE THROUGH THIS TYPE OF WEIR IS EXPRESSED BY THE EQUATION

$$\begin{aligned} Q &= C^{1/5} L h \sqrt{2gh} \\ &= .58 \times 1/5 \times .2292 \times .2647 \sqrt{2 \times 32.2 \times .2292} \\ &= 0.0361 \text{ cfs.} \end{aligned}$$

ASSUMING THAT THERE WILL ONLY BE ONE DISCHARGE SLUICER PER ROOF, AND SINCE THERE ARE 21 LOTS PROPOSED FOR DEVELOPMENT, THE TOTAL DISCHARGE FROM THE ROOFS WOULD BE

$$Q_{\text{ROOFS}} = 21 \times 0.0361 = 0.758 \text{ cfs}$$

THEN THE TOTAL DEVELOPED DISCHARGE FOR THIS AREA IS

$$\begin{aligned} 4.81 + .758 &= \underline{\underline{5.57 \text{ cfs}}} \\ (\text{SEE PAGE 8-(1)}) \end{aligned}$$

THIS DISCHARGE IS LESS THAN THE NATURAL RUNOFF OF 5.95 cfs.

Runoff Calculations - External Drainage Areas

$$\text{Area to East (1)} = 2.4 \text{ acres}$$

$$\text{Area to South (2)} = 0.5 \text{ acres}$$

PRESENTLY ALL EXTERNAL DRAINAGE AREAS ARE IN A DEVELOPED STATE. BECAUSE OF THE STEEP LANDSCAPED AREAS, PITCHED ROOFS AND LARGE ASPHALTED AREAS PRESENT IN THE EXTERNAL DRAINAGE AREA, A RUNOFF COEFFICIENT OF 0.95 WAS ASSUMED.

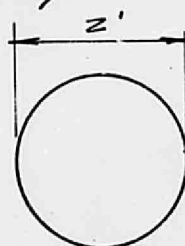
THE INTENSITY OF RAINFALL WAS ASSUMED TO BE A MAXIMUM OF 5.4 in/hr FOR THESE AREAS.

$$\begin{aligned} \text{Runoff Area 1} &= Q = CIA = .95 \times 5.4 \times 2.5 = 12.8 \text{ cfs} \\ \text{Runoff Area 2} &= Q = " = .95 \times 5.4 \times .5 = 2.56 \text{ cfs} \end{aligned}$$

$$\text{TOTAL} = 15.36 \text{ cfs}$$

$$\text{TOTAL DISCHARGE FROM EXTERNAL AREAS} = \underline{\underline{15.36 \text{ cfs}}}$$

PIPE CAPACITY:



SLOPE = 4%

CMP

TOTAL CAPACITY WHEN FLOWING FULL:

$$R = 0.015$$

$$A = R^2 \pi = \pi$$

$$P = 2\pi = 2\pi$$

$$R = \frac{A}{P} = \frac{1}{2} \Rightarrow R^{2/3} = 0.63$$

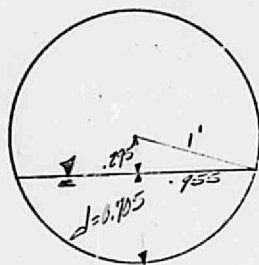
$$S^{1/2} = 0.06^{1/2} = 0.245$$

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

$$Q = \frac{1.486}{0.015} \times 0.63 \times 0.245 \times \pi = 48.04 \text{ CFS}$$

$$V = \frac{Q}{A} = 15.3 \text{ ft/sec.}$$

When $Q = 12.8 \text{ CFS}$



Assume $d = 0.705 \text{ ft}$

$$\therefore A = 0.987 \text{ ft}^2$$

$$P = 2.542 \text{ ft}$$

$$R = \frac{A}{P} = 0.387 \Rightarrow R^{2/3} = 0.533$$

$$Q = \frac{1.486}{0.015} \times 0.533 \times 0.245 \times 0.987 = 12.8 \text{ CFS}$$

$$V = \frac{Q}{A} = 12.9 \text{ ft/sec.}$$

TABULATION OF SURFACE AREA

12

BLOCK 1

<u>LOT</u>	<u>ROOF</u>	<u>DRIVES</u>	<u>FRONT YARD</u>	<u>BACK YARD</u>
1	2112	540	757	1772
2	"	600	839	958
3	"	400	809	950
4	"	420	832	884
5	"	520	824	740
6	"	420	749	940
7	"	500	794	870
8	"	540	1004	1008
9	"	620	1034	1042
10	"	440	2038	1359
<u>TOTAL</u>	<u>21120 #</u>	<u>5000 #</u>	<u>9682</u>	<u>10723</u>
	<u>0.485 AC</u>	<u>0.115 AC</u>	<u>0.222 AC</u>	<u>0.246 AC</u>

BLOCK 2

<u>LOT</u>	<u>ROOFS</u>	<u>DRIVES</u>	<u>FRONT YARD</u>	<u>BACK YARD</u>
1	2112	420	1402	1068
2	"	400	824	757
3	"	580	817	1178
4	"	640	869	1093
5	"	480	839	1093
6	"	460	884	1331
7	"	540	734	1386
8	"	420	824	1056
9	"	400	794	757
10	"	560	892	716
11	"	800	1391	1407
<u>TOTAL</u>	<u>23232 #</u>	<u>5700</u>	<u>10470</u>	<u>12242</u>
	<u>0.533 AC</u>	<u>0.131</u>	<u>0.24</u>	<u>0.281</u>

Road R.O.W = 23838 # = 0.547 AC

211-7

ENGINEERING
3240-C JUAN TABO N.E.
ALBUQUERQUE, N.M. 87106

UNIT ONE
CASA GRANDE ESTATES SUBD.

TRACT NO. 1 OF AMENDED PLAT, LA VILLITA

ERQUE, NEW

September 10, 1975

DEDICATION

The decision of test certain trust shown herein and known as Trust No. 1 of the Amended Will of the late William A. Williams, at Lawrence, New Jersey is one with the free consent and in accordance with the desires of the undersigned donor, and the trust-shares shown herein and easements as shown are herewith assigned to the public use forever.

Hubert Duma

[illegible]

Commission expires 7/2/77.

68117 Chaqueques, Mexico

7
1850

Public Service Company of New Mexico

5064

Vol. 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846,

as specified by Subsection 22.1.20 of the Atiquetque Subdivision Ordinance.

10-28-75 at 4-23 SP-75-266

where the Company hereby certifies that all taxes have been paid in full for the period of the past ten (10) years, up to and including the year 1924 for all of the property included in the list upon which this certificate appears.

RECEIVED
JAN 10 1964
U.S. DEPARTMENT OF AGRICULTURE
WASHINGTON, D.C. 20250

... entered _____ in block numbered _____ of CAMPUSES subdivision in Albuquerque, New Mexico, as the same is shown and designated on the plat thereof, filed in the office of the County Clerk of Bernalillo County, New Mexico.

I, John A. Lewis, hereby certify that I am a registered professional engineer and land surveyor and that this plat was prepared from notes of a field survey made under my supervision and is true and correct to the best of my knowledge and belief.

John M. Butler

John W. Berlin
Reg. F. & L. 3442

Exhibit B