HYDROLOGY K22/D7 4 PLANS

K22/07

---

4 Plans

Copy to B. Kielich
~~orig~~ letter received B.4 — cc

ORIG: La Cuesta

THE VAUGHAN COMPANY Realtors

17 August 1978

RECEIVED
AUG 18 1978
CITY ENGINEERS

SUBJECT: Drainage Channel Problem

TO: Mr Tony Tafoya
Engineering Division, Inspection Dept
City of Albuquerque
400 Marquette Avenue, Northwest
P. O. Box 1293
Albuquerque, N. M. 87103

Dear Mr Tafoya,

I am writing you in regard to the drainage problem at La Cuesta Apartments located at 6001 Topke, N. E. The city recently had the road paved at San Mateo Lane, NE, directly West of the La Cuesta Apartments. I understand that the work was done by the Universal Construction Company under a city contract.

At the South end of this paving project, you provided an admirable drainage channel for surface water draining from the Imperial House Apartments located at 6000 Topke, NE. On the North end of this project, you also provided an excellent drainage channel for surface water from the intersection of 4500 Overland Street, NE and 6000 Northland Avenue, NE.

Unfortunately, no drainage channel was provided for the surface water to drain from the La Cuesta Apartment complex to San Mateo Lane, NE. In fact, we had previously had an adequate dirt drainage channel leading to San Mateo Lane, NE, but this paving project completely blocked our old drainage channel and made our complex very vulnerable to flooding and water damage. From the viewpoint of the Owners of La Cuesta, the failure to retain the old drainage channel and its subsequent blockage represents gross negligence which, in the event of a serious rainstorm, could lead to serious damage to the complex as well as deterioration of our asphalt parking and roadway.

This matter was brought to your attention on 11 April 1978 by Mrs Francis Smith, the manager of La Cuesta. We would appreciate your looking into the matter and implementing plans to correct this problem at your earliest convenience. If you require additional information, please call me directly.

With my best wishes,

Fred G. Swafford

Fred G. Swafford Jr

July 9, 1979

TO WHOM IT MAY CONCERN:

I hereby give to Skate Center, Inc. permission to use Tract E of the lands of R. D. and Marjorie J. McConnell, being a replat of Block 28, portions of Lot 21 in Block 29, La Cuesta Subdivision, and portions of (vacated) Konejo Road (vacated) Chico Road and (vacated) Algodones Avenue, as the same is shown and designated on the plat of said Subdivision filed in the office of the County Clerk of Bernalillo County, New Mexico, on June 14, 1979,

To be used for ponding purposes until the State of New Mexico determines the drainage discharge point for the entire Master Plan.

Witness:
Beatrice B. Holmes

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

MAYOR
David Rusk

May 25, 1979

Mr. Michial M. Emery,
Bohannan-Huston Inc.
4125 Carlisle Blvd. N.E.
Albuquerque, NM 87107

Re: Christian Center

Dear Mr. Emery:

I have reviewed in a preliminary way the drainage report for the Christian Center together with your letter dated May 24, 1979 amending same. I am in general concurrence with the proposal submitted and I will, therefore, sign the Site development plan.

I hope that you will be able to resolve expeditously the question of the location of the point of discharge into the diversion channel north of the Freeway with the Highway Department so that the Site grading plan can be prepared in accordance with the concept submitted.

Very truly yours,

Bruno Conegliano
Assistant City Engineer-Hydrology

BC/ms

cc-Richard Heller, City Engineer
Richard Leonard - AMAFCA
Drainage File

BOHANNAN-HUSTON INC.
ENGINEERS & PHOTOGRAMMETRISTS
4125 CARLISLE BLVD., N.E. ALBUQUERQUE, NEW MEXICO 87107 505 881-2000

May 24, 1979

RECEIVED
MAY 25 1979
CITY ENGINEER
(Hand carried)

Mr. Bruno Conegliano
City Hydrologist
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

Re: Christian Center Drainage Report

Dear Mr. Conegliano:

On April 26, 1979, you met with Ron R. Bohannan on the above-referenced drainage report. At that time, it was requested to have your written comments on the drainage report sent to us for the appropriate action.

In the meantime, reviewing the memorandum of agreement between the City of Albuquerque and the Albuquerque Metropolitan Arroyo Flood Control Authority, dated February 20, 1979, it states that any channel that is paved is considered as having adequate capacity for drainage. Since the diversion channel running along I-40 is such a facility, the entire parcel should be able to drain its developed flow rate to the channel without using a ponding solution. The only question still unresolved would be the discharge point for the entire Christian Center parcel. At present, the site sheet flows to Juan Tabo Boulevard and then discharges into the I-40 channel. We would recommend that the site ultimately discharge directly to the I-40 channel at a point satisfactory to the Highway Department to be defined when the interchange is designed.

We would appreciate your comments on this suggestion and any comments on the original report. If you have any questions concerning this letter or the drainage report, please contact either Ron R. Bohannan or me of this office.

Sincerely yours,

Michial M. Emery

Michial M. Emery, P.E.
Vice President

cc: Mr. Ken Ballew

RRB/js
Job No. 79-077

BOHANNAN-HUSTON INC.
4125 CARLISLE BLVD., N.E. ALBUQUERQUE, NEW MEXICO 87107 505 881-2000

May 7, 1979

Mr. Bruno Conegliano
City Hydrologist
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

Re: Christian Center Drainage Addendum

Dear Mr. Conegliano:

This is to suppplement the approved drainage report prepared by Chambers, Campbell, Isaacson, and Chaplin, Inc. approved March, 1974. The site for the La Cuesta Subdivision has been purchased by the Christian Center and the uses presented in the enclosed site plan are proposed for the site. This drainage addendum is submitted to reflect the chanage in land use from residential to the church uses.

The findings of the addendum are as follows:

1. Upland conditions East of Chelwood: Chelwood conveys all the upland flows to the south to a drainage easement paralleling Interstate 40 (see AMAFCA, Sheet K-22). Therefore, these flows do not impact the site.

2. Upland conditions West of Chelwood: Flows from Cloudview Estates (sheet K-22) between Chelwood and Zena Lona Street impact the Christian Center site. Flows from Domingo Road, Conejo Road and Cloudview Avenue discharge into Zena Lona Street from the east. The one hundred year flows are 47.4 cfs, 19.3 cfs, and 52.5 cfs, respectively. No flows exceed the unpublished city criterion that the velocity times the depth shall not be greater than four. There is a 5.5' by 3.3' CMC storm sewer in Zena Lona with drop inlets at all intersections except Cloudview Avenue. Using the Master Drainage Plan of 1963 prepared by Gordon Herkenhoff and Associates, the storm sewer is capable of accepting approximately 80 cfs due to the limited number of drop inlets. This storm sewer accepts all the flow along Zena Lona Street between Domingo Street and Cloudview Avenue. At this point 52.5 cfs is discharged into the street where it flows to the south in an existing eighteen foot wide concrete rundown section outfalling to the drainage channel along Interstate 40. At no time does the water reach a depth higher than the curb and gutter along Zena Lona throughout its entire reach.

We are proposing the following items be constructed to further protect the site:

1. Remove the curb returns on the west side of Cloudview Street and Conejo Street.

2. Place standard curb and gutter across the old west entrances of Conejo and Cloudview Streets matching the present grades along Zena Lona Street (see enclosed grading plan for location).

3. Construct a 3' high berm with 3 to 1 maximum side slopes along the west side of Zena Lona Street as shown on the grading plan. This berm serves two purposes; first, it acts as sound and sight barrier and second, in the small chance that the water would get out of the street it would act as an earth channel.

4. Construct pond as shown on the grading plan.

5. Coordinate, with the State Highway Department, concerning the location of a common discharge point for the entire parcel. This should coincide with the design of the Juan Tabo interchange.

At the present time, the architect's plans are in for review and signatures. If it is acceptable with you, the grading plan will serve as his site grading plan.

If there are any questions concerning this project, please contact Ron R. Bohannan of this office.

Sincerely,

C. J. Mead, P.E.
Vice President

cc: Mr. Ken Ballew

Enclosure

RRB/rv
Job No. 79-073

OFFICIAL NOTICE

CITY OF ALBUQUERQUE
PLANNING DEPARTMENT
Box 1293, Albuquerque, NM 87103

Date March 20, 1979

NOTIFICATION OF DECISION

Ronald D. McConnell
Christian Center of Albuquerque
12120 Copper NE
Albuquerque, NM 87123

File: V-79-14, Z-73-190-1, and Z-79-18
Location: See A, B, & C Below

On March 15, 1979, the Environmental Planning Commission approved the above-mentioned requests as follows:

SEE PAGE TWO

If you wish to appeal this decision, you may do so by 3-30-79 in the manner described below. A non-refundable filing fee of $40 is required at the time of application.

A. Appeal to Planning Commission. Any person aggrieved with any determination of the City staff acting under the Subdivision Ordinance may appeal to the Planning Commission by submitting written application on the Planning Department form to the Planning Department within 15 days after the date of the staff's decision. The date the determination in question is issued is not included in the 15-day period for filing an appeal, and if the fifteenth day falls on a Saturday, Sunday or holiday as listed in the Merit System Ordinance, the next working day is considered as the deadline for filing the appeal. Such appeal shall be heard and decided by the Planning Commission within 60 days of its filing.

B. Appeal to City Council. Any person aggrieved with any determination of the Planning Commission acting under this ordinance may file an appeal to the City Council by submitting written applicaton on the Planning Department form to the Planning Department within 15 days of the Planning Commission's decision (such 15 day period to be determined as in A. above). The City Council may decline to hear the appeal if it finds that all City plans, policies and ordinance have been properly followed. If it decides that all City plans, policies and ordinances have not been properly followed, it shall hear the appeal. Such appeal, if heard, shall be heard within 60 days of its filing.

You will receive notice if another person files an appeal. If there is no appeal you can receive building permits any time after the appeal deadline quoted above provided all conditions imposed at the time of approval have been met. Successful applicants are reminded that other regulations of the City must be complied with, even after approval of the referenced application(s).

Sincerely,

Jill Danforth

Jill Danforth
Board Secretary

Dick Dorman, 934 Old Taos Highway, Santa Fe, NM; 87501
John Salazar

Letter of
Advice

A. Approved a change of zone to SU-1 (Special Use for Church Related Facilities including a gym and skating rink) for Lot A, Block 27, the north half of Block 28, and a portion of Block 21, La Questa Addition;
B. Approved the site development plan for church related facilities, including a gym and skating rink for Blocks 28 and 29, La Questa Addition;
C. Approved the vacation (closing) of:
   - Domingo Street NE between Kirby and Zena Lona
   - Conejo NE between Zena Lona and the proposed right-of-way of the I-40/Juan Tabo interchange
   - Chico NE between Zena Lona and the proposed right-of-way of the I-40/Juan Tabo interchange
   - Zena Lona NE between Cloudview and the proposed right-of-way of the I-40/Juan Tabo interchange
   - Algodones NE between Domingo and the proposed right of way of the I-40/Juan Tabo interchange.

The above actions are subject to the following conditions:
1. Access and parking on Zena Lona to the gym and skating rink is unacceptable and must be provided from Copper Avenue;
2. A drainage plan is required prior to final plan sign-off;
3. Final disposition of the vacated right-of-way shall be handled through the City Property ~~Management Division~~;
4. An updated Master Plan is required;
5. A revised site plan and landscape plan is required prior to issuance of building permits.
6. Street trees as shown on the previously approved site development plan for the parking areas to the east and north must be provided.
7. The proposed sign located at the southeast corner of the site shall not exceed 20 ft. in height and 5 ft. by 24 ft., and must read "Christian Center - ~~An~~ Interdenominational ~~Church~~."
8. Surveys
9. Soil test [illegible]

When the applicant and the City Real Estate Officer have agreed upon final disposition of the vacated rights-of-way (see condition 3), the Planning Department will prepare the required resolution which must be recorded in the office of the Bernalillo County Clerk. Please note that the vacations are <u>not</u> final until said resolution has been recorded.

It should also be noted that revised site development plans in compliance with the conditions imposed by the Environmental Planning Commission must be signed off by the Planning Department before building permits may be issued.

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

MAYOR
David Rusk

February 1, 1979

Mr. John Bettis
Enchantment Engineering
1517 Eubank Boulevard N.E.
Albuquerque, New Mexico 87112

Ref: Drainage Report for the Southern 1/2 of Block 16, La Cuesta Subdiv.

Dear Mr. Bettis:

I have reviewed the drainage report for the referenced project and my comments are as follows:

A vicinity topographic map showing the watershed draining through this property must be attached to this drainage report. The amount of offiste run off potentially entering the site must be evaluated and quantified; it must also be verified that this offsite flow will not affect the proposed development.

It is also requested that the amount of flow anticipated in Skyline Drive be estimated to evaluate whether a potential flooding problem exists. The provisions for the handling of the internal drainage as well as the site grading plan appear to be satisfactory. The drainage report will be approved after the submission of the additional information requested.

Very truly yours,

Bruno Conegliano
Assistant City Engineer-Hydrology

BC/fs

cc - Dick Heller
Rich Leonard
Drainage File

THIS MICROIMAGE IS THE BEST POSSIBLE
REPRODUCTION DUE TO THE POOR QUALITY
OF THE ORIGINAL DOCUMENT

DRAINAGE REPORT

for

BILL C. HENDERSON

South 1/2 of Block 16 together with
a portion of Girly Street, N.E. vacated
by V.O. 28-1972
LA CUESTA SUBDIVISION
Albuquerque, New Mexico

February 7, 1979

PREPARED BY

ENCHANTMENT ENGINEERING
1517 EUBANK BOULEVARD, N.E.

K22-D7

DRAINAGE REPORT

FOR

BILL C. HENDERSON

South 1/2 of Block 16 together with
a portion of Kirby Street, N.E. vacated
by V.O. 28-1972
LA CUESTA SUBDIVISION
Albuquerque, New Mexico

February 7, 1979

PREPARED BY

ENCHANTMENT ENGINEERING
1517 EUBANK BOULEVARD, N.E.

DRAINAGE REPORT
FOR
BILL C. HENDERSON

PURPOSE:

The purpose of this report is to present to governing agencies a reasonable method of complying with City ordinance 59-1976 and thereby lessen runoff from the proposed development to an amount not in excess of the flow to be expected from the property in its present state. The report is composed of a narrative of existing and proposed conditions and computations to determine recommended runoff control structures.

LOCATION AND TERRAIN:

The proposed development is located on the northeast corner of the intersection of Skyline Road and Paisano Street in the Northeast Quadrant of the City. (See Plate 1 for location)

The property slopes from east to west at a rate of approximately 2.2 percent. The open soil found on the site is composed primarily of sandy silt. A building and a parking area already exist on the site. The remainder of the parcel is open area and is nearly devoid of vegetation. No natural or man-made retention areas currently exist on the parcel. Considering the slope, soil and improvements, the current rate of infiltration may be assumed to be no more than one-half inch per hour.

PROPOSED NEW DEVELOPMENT

The drainage plan included within this report shows both existing improvements and immediate proposed additions to the building and parking area and a possible future extension of the building. Included with the plan also are existing contours,

proposed contours and finished grades for drainage purposes. Parking ares are to be asphalt and the new addition to the building is to be of masonry construction with a flat composition roof. All landscaping and stormwater ponding areas are to have natural surfaces. (See Drainage Plan, Plate 2)

UPLAND DRAINAGE

Flows entering the property from the north and east will be directed via swales as shown on the drainage plan into the retention pond and will be discharged into the Skyline and Paisano intersection after pond capacity is attained.

INTERNAL DRAINAGE

Portions of the flows developed onsite will be stored in a retention pond located on the southwest corner of the property. The pond shown is designed to retain the excess runoff generated by the proposed new building and paving additions and the possible future expansions of both. (Note: the actual required retention for the proposed addition is 531 ft^3 while the pond design allows for 1079 ft^3.) If the pond is constructed as shown, it will contain the total expected runoff during a 6-hour, 100-year frequency storm that is in excess of that now generated by the property. Stored runoff will be dissipated by infiltration and evaporation.

Downstream runoff will be slightly less than that now experienced after both the proposed addition and the future expansion of building and parking areas are completed.

Runoff Coefficient (C) = .35 Undeveloped
= 1.0 developed (Heller)

1.0 − .35 = .65 = AC

Area of development (A) = 89650 Ft^2
= 2.06 Ac

Excess volume generated = A (Ft^2) x AC x Rainfall (Ft)

89650 x .65 x 2.8/12 = 13600 Ft^3

Volume Required = 13,600 Ft^3

Pond Volume:

Pond Bottom = 7040 Ft^2

Pond Depth = 2.0 Ft

Available Volume = 7040 x 2.0 = 14080

Additional Volume will be held on side slopes thus allowing some free-board

PROJECT NAME SHEET OF
PROJECT NO. BY DATE
SUBJECT CH'D DATE

12005 SKYLINE NE

DRAINAGE REPORT

12005 SKYLINE NE

DRAINAGE REPORT

FOR

BILL C. HENDERSON

South 1/2 of Block 16 together with
a portion of Kirby Street, N.E. vacated
by V.O. 28-1972
LA CUESTA SUBDIVISION
Albuquerque, New Mexico

February 7, 1979

REGISTERED PROFESSIONAL ENGINEER AND LAND SURVEYOR
3441
NEW MEXICO
JOHN W. BETTIS

PREPARED BY

ENCHANTMENT ENGINEERING
1517 EUBANK BOULEVARD, N.E.

DRAINAGE REPORT
FOR
BILL C. HENDERSON

PURPOSE:

The purpose of this report is to present to governing agencies a reasonable method of complying with City ordinance 50-1976 and thereby lessen runoff from the proposed development to an amount not in excess of the flow to be expected from the property in its present state. The report is composed of a narrative of existing and proposed conditions and computations to determine recommended runoff control structures.

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Downstream runoff will be slightly less than that now experienced after both the proposed addition and the future expansion of building and parking areas are completed.

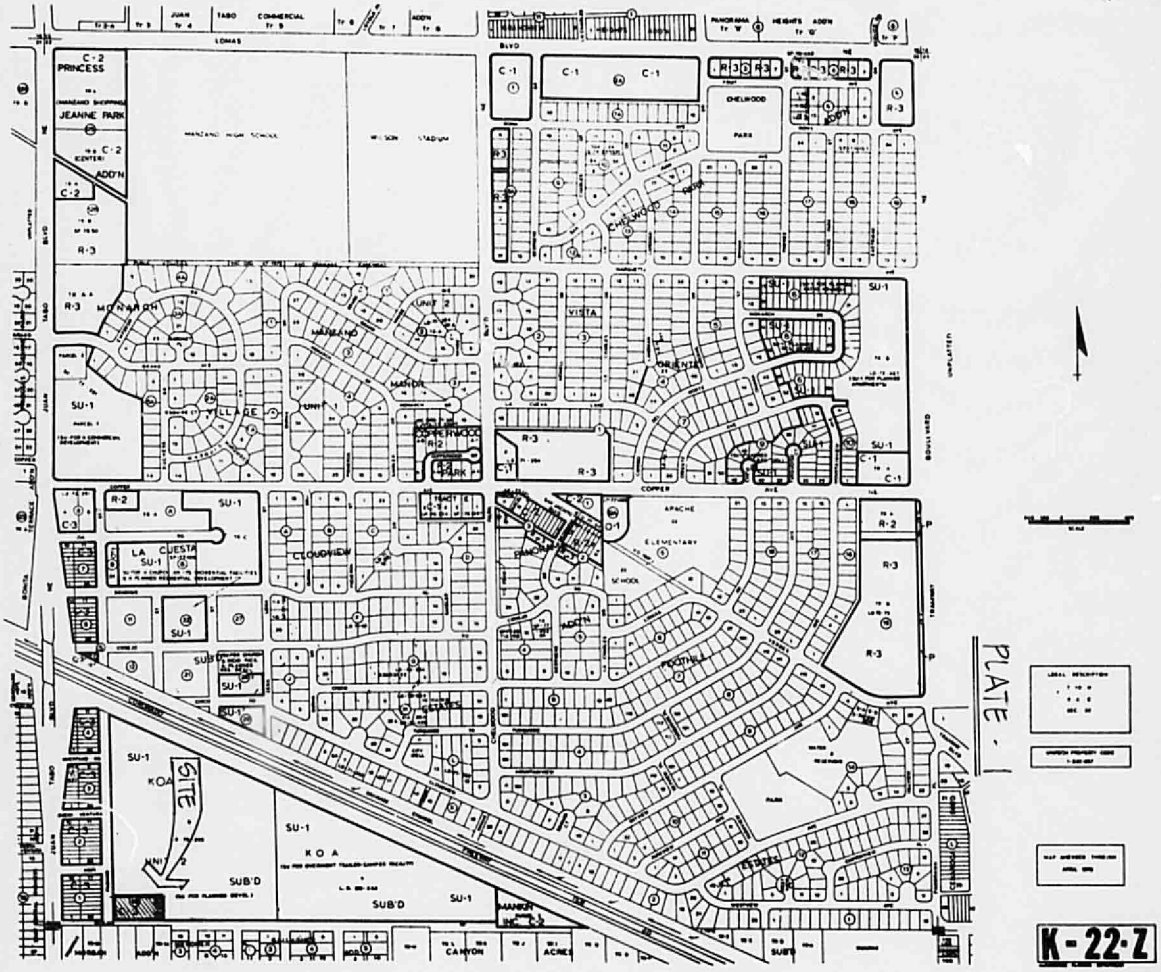


PLATE - 1
SITE
K-22-Z
C-2
PRINCESS
JEANNE PARK
C-2
CENTER
ADD'N
R-3
MONARCH
VILLAGE
UNIT 1
UNIT 2
MANZANO
MANOR
SU-1
LA CUESTA
SU-1
R-2
C-3
CLOUDVIEW
ESTATES
KOA
SUB'D
MANOR
CANYON
ACRES
SUBD
C-1
CHELWOOD
PARK
VISTA
ORIENTA
COPPER
APACHE
ELEMENTARY
SCHOOL
FOOTHILL
ESTATES
PALMS
R-2
R-3
O-1
LOMAS
BLVD
TABO
JUAN
EDITH
BLVD
UNIVERSITY
BOULEVARD
CHAPARRAL
LEGAL DESCRIPTION
MAP AMENDED THIS DAY

HYDROLOGY K22/D7 1 PLAN

K22/D7

1 Plan

KEN TEKIN, INC.
Realtor - Developer - Property Manager

CITY CENTRE • 6400 UPTOWN BLVD., N.E. • SUITE 525E
ALBUQUERQUE, NEW MEXICO 87110
(505) 883-5151

June 23, 1981

Mr. Fred J. Aguirre
City of Albuquerque
Hydrology Dept.
123 Central, N.W.
Albuquerque, NM 87102

RE: Franklin Plaza Shopping Center
Drainage

Dear Fred:

As per our telephone conversation yesterday morning, we understand that there may be a problem with the drainage of the shopping center. We are giving this letter to you as Managing Agent for the owner of Franklin Plaza Shopping Center. We agree to maintain drainage on the site properly.

If you need anything further from us, please let us know.

Thank you.

Sincerely,

Ann Tekin

Ann Tekin, CPM

AT:bc

cc: Mr. Martin Weinberg

RECEIVED
JUN 25 1981

MEETING SCHEDULED FOR SOMETIME IN JULY TO INSPECT GRAVEL PITS. MS ANN TEKIN WILL CALL TO SET DATE. 6-25-81

Member, International Council of Shopping Centers

Accredited Management Organization

DEC 1 1 1975

ENGINEER'S DRAINAGE REPORT

FOR

FRANKLIN PLAZA

AT NORTHEAST CORNER OF CENTRAL AVENUE & JUAN TABO BOULEVARD

ALBUQUERQUE, NEW MEXICO

WILSON & COMPANY

ALBUQUERQUE, NEW MEXICO

APRIL 1973

ENGINEER'S DRAINAGE REPORT
FOR
PROPOSED FRANKLIN PLAZA
AT NORTHEAST CORNER OF CENTRAL AVENUE & JUAN TABO BOULEVARD
ALBUQUERQUE, NEW MEXICO

PURPOSE: The purpose of this report is to analyze the amount of run-off entering the study area and the carrying capacity of existing and proposed streets and storm sewers.

CLIMATOLOGICAL INFORMATION: A 100 year design frequency has been used to calculate the flow. The City of Albuquerque has adopted a drainage master plan which presents the following formula for calculating the intensity of rainfall that is probable for a 100 year design storm:

$$i_{100} = \frac{189}{t_c + 25}$$

i_{100} = rainfall inches per hour

t_c = time of concentration in minutes

RUN-OFF CALCULATION: The Rational Method was used to calculate the run-off from the study area. The Rational Formula is:

$Q = CiA$

Q = Quantity of run-off in cubic feet per second

C = Coefficient of run-off expressed in a ratio of rainfall to run-off

i = Rainfall intensity expressed in inches per hour

A = Drainage area expressed in acres

DISCUSSION: The City plans to improve Central Avenue this summer. A storm sewer is to be included as a part of these improvements. All the flow from the south of Central Avenue will be intercepted by the proposed improvements. This will reduce the amount of flow that crosses the property from the southeast.

The City also plans to extend an existing 36" storm sewer in Buena Ventura east

to Juan Tabo Boulevard. At the intersection of Juan Tabo and Buena Ventura, which is a low point, it is planned to construct a cattle guard type inlet. The City plans to extend this storm sewer and improve Buena Ventura from Maxine to Juan Tabo when the plans for proposed I-40 - Juan Tabo interchange are completed.

We analyzed the flow within the affected drainage area from the intersection of Skyline Road and I-40 to the intersection of Chico Road and Eubank Boulevard. The summary of the analysis of the capacity of the streets and storm sewers are exceeded at two locations:

(1) On Chico Road between Dorothy Street and Morris Street the capacity (359 cfs) is exceeded by 27 cfs.

(2) The capacity on Chico Road at Eubank Boulevard (488 cfs) is exceeded by 86 cfs.

If it had been assumed that the elevation at the property lines was 6 inches above the elevation of the top of the curb, the capacity of the streets and storm sewers would not have been exceeded.

The area south of Chico Road is undeveloped and it was assumed this property would develop as residential. If this property were to develop as Special Use or Commercial, it would be necessary for the developer to control the run-off from the property. If the run-off is controlled, the design flow at Chico and Eubank would only exceed the capacity by 60 cfs.

The development of the job site increases the run-off by 21 cfs. This amount is determined by the following:

Developed $Q_{100} = .90 \times 4.2 \times 11.2 = 42$ cfs

Undeveloped $Q_{100} = .45 \times 4.2 \times 11.2 = \underline{21 \text{ cfs}}$

Difference = 21 cfs

RECOMMENDATIONS: There are several alternatives for detention of excess run-off:

(1) The run-off can be collected in low spots within the parking lot area. The grate inlets can be sized to limit the flow to 21 cfs. The storm drain system could be discharged into the storm sewer system on Central Avenue or to the system that will begin at the intersection of Juan Tabo Boulevard and Buena Ventura Road.

(2) The run-off can be ponded on the roofs and the parking lot and the discharge to the streets would be on a controlled basis. The control would be by properly sized roof drains, pipes and curb openings.

(3) It has been suggested that the run-off from the development be discharged into the paved ditch along I-40. A profile of Paisano Street beginning at Paisano and Skyline Road, going north to I-40, was surveyed. As shown on sheet 3 of the plan-profile sheets, the flow line of the paved ditch is 4 feet higher than the intersection of Paisano and Skyline.

COMP. RFS

CK.

DATE 3 APRIL 73

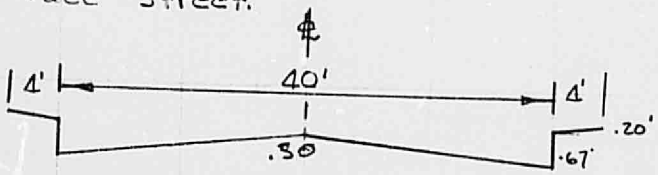
WILSON & COMPANY
ENGINEERS & ARCHITECTS
DENVER
ALBUQUERQUE
KANSAS

LOC. Albuquerque FILE 73-505

PROJ. FRANKLIN PLAZA SHEET 1

SUBJ. DR. REPORT OF 10

40' Face - Face Street.



Area = A = $20 \times 0.5 + .17 \times 40 + 0.2\left(\frac{40+48}{2}\right)$

A = 10.0 + 6.8 + 8.8

A = 25.6 Sq Ft.

Wetted Perimeter = WP = $40 + (2 \times .67) + 8$

WP = 49.34

Hydraulic Radius = $R = \frac{A}{WP} = \frac{25.6}{49.34} = .5188$

$R^{2/3} = .646$

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

FOR STREET ASSUME

n = .015

40' St.

$V_{40} = \frac{1.486}{.015} \times .646 \times s^{1/2}$

$V_{40} = 64.00\, s^{1/2}$

Q = AV

$Q = 25.6 \times 64.00 \times s^{1/2}$

$Q = 1638.4\, s^{1/2}$

W. C. & E. FORM 164

COMP RFS
CK
DATE 3 APRIL 73

WILSON & COMPANY ENGINEERS & ARCHITECTS BOX 1638 SALINA KANSAS

LOC Albuquerque FILE 73-505
PROJ FRANKLIN PLAZA SHEET 2
SUBJ OF 10

Design Q Use 100 year.

$Q_{100} = CiA$

C = 0.90 Developed Commercial
= 0.65 Residential
= 0.50 Camp Ground

$i_{100} = \frac{189}{t_c + 25}$

t_c = time of concentration

A = AREA in ACRES.

Point 1 to Point 2

Skyline Rd. Proposed 40' Street.

DA	C
5.6	.90
30.7	.50
23.5	.65
59.8	

$C = \frac{(5.6)(.9) + (30.7)(.5) + (23.5)(.65)}{59.8}$

C = .60

A = 59.8 Ac.

SLOPE = S
FROM CITY PROPOSED GRADES

1800 FT @ .03 ft/ft
1000 FT @ .0228 ft/ft.

$V_{40} = 64 \times .03^{1/2} = 11.08$ ft/sec

$V_{40} = 64 \times .0228^{1/2} = 9.66$ ft/sec

ASSUME OVERLAND TIME = 15 MIN.

$t_c = \left(\frac{1800}{11.08} + \frac{1000}{9.66}\right) \frac{1}{60} + 15 = 3 + 15 = 18$ min.

W & C 2 FORM 184

$i = \frac{189}{18+25} = \frac{189}{43} = 4.4$

$Q_{100} = CiA = (.60)(4.4)(59.8)$

Q_{100} @ (2) = 158 cfs

Capacity st @ (2)

$Q_{cap} = 1638.4 \times .0228^{1/2}$

$Q_{cap} = 247$ cfs.

POINT (3)

SKYLINE S = .0228 Length = 375'
JUAN TABO S = .0100 Length = 450

DA	C
5.6	0.90
9.2	0.50
11.3	0.65
26.1	

$C = \frac{(5.6)(.90)+(9.2)(.50)+(11.3)(.65)}{26.1}$

$C = .65$

$A = 26.1 Ac$

$V_{40} = 64 \times .0228^{1/2} = 11.08$ ft/sec

$V_{40} = 64 \times .01^{1/2}$ 6.40 ft/sec

$t_c = \left(\frac{375}{11.08} + \frac{450}{6.40}\right)\frac{1}{60} + 18$ min

$t_c = 2 + 18 = 20$ min

$i = \frac{189}{20+25} = \frac{189}{45} = 4.2$

$Q_{100} = (.65)(4.2)(26.1) = 71$ cfs.

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$Q_{TDES} = 71 + 158 = 229$ cfs.

AT POINT 3 CITY PLANS TO INSTALL A LARGE GRATE INLET THE STORM SEWER IS PLANNED AS 36" RCP ON 1.60% GRADE.

ASSUME $n = .013$

$Q_{CAP\ 36"} = \frac{1.486}{.013} \times .825 \times .126 \times 7.07 = 84$ cfs

---

POINT 4

BUENA VENTURA $S = .015$ $L = 650'$
MURIEL $S = .0052$ $L = 750'$

$A = 17.0$ Ac $C = 0.65$

$V_{60} = 64 \times .015^{1/2} = 7.84$ ft/sec

$V_{60} = 64 \times .0052^{1/2} = 4.62$ ft/sec

$t_c = \left(\frac{650}{7.84} + \frac{750}{4.62}\right)\frac{1}{60} + 20$ min

$t_c = 4 + 20 = 24$ min

$i = \frac{189}{24+25} = \frac{189}{49} = 3.86$

$Q_{DES} = CiA = .65 \times 3.86 \times 17 = 43$ cfs

$Q_{DES\ T} = 43 + 229 = 272$ cfs

$Q_{CAP\ ST} = 1638.4 \times .015^{1/2} = 201$ cfs

$Q_{CAP\ ST + ST\ SEW} = 201 + 84 = 285$ cfs.

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POINT 4 to POINT 5

EXISTING 36" RCP @ 2.00% SLOPE $n = .013$

Q_{36} @ 2.00% = 94 cfs.

POINT 5

JANE ST $S = .02$ $L = 240'$
$S = .0033$ $L = 400'$

$V_{40} = 64 \times .02^{1/2} = 9.05$ ft/sec
$V_{40} = 64 \times .0033^{1/2} = 3.67$ ft/sec

$t_c = \left(\frac{240}{9.05} + \frac{400}{3.67} \right) \frac{1}{60} + 24$ min

$t_c = 2 + 24 = 26$ min

$A = 4.6$ Ac $C = .65$ $i = \frac{189}{26 + 25} = \frac{189}{51} = 3.71$

$Q_{DES} = CiA = .65 \times 3.71 \times 4.6 = 11$ cfs

$Q_{DEST} = 272$ cfs $+ 11 = 283$ cfs.

$Q_{CAP\ ST} = 1638.4 \times .015^{1/2} = 201$ cfs

$Q_{CAP} = ST + ST.\ SEW = 201 + 94 = 295$ cfs.

POINT 5 to POINT 6

EXISTING 48" RCP @ 1.03% slope ; $n = .013$

Q_{48} @ 1.03% = 146 cfs

JANE ST $S = .0033$ $L = 920'$

$V_{40} = 64 \times .0033^{1/2} = 3.67$ ft/sec

$t_c = \left(\frac{920}{3.67} \right) \left(\frac{1}{60} \right) + 26$ min

$t_c = 4 + 26 = 30$ min

W.C.E. FORM 104

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$A = 6.4$ Ac. $C = 0.65$

$i = \frac{189}{30+25} = \frac{189}{55} = 3.44$

$Q_{DES} = CiA = 0.65 \times 3.44 \times 6.4 = 15$ cfs.

$Q_{DES\ TOT} = 15 + 283 = 295$ cfs.

$Q_{CAP\ ST} = 1638.4 \times .0033^{1/2} = 94$ cfs

$Q_{CAP\ T} = Q_{CAP\ ST} + Q_{CAP\ ST\ SEW} = 94 + 146 = 240$ cfs.

SINCE Q_{DES} EXCEEDS Q_{CAP}. IT IS ASSUMED 55 CFS WILL FLOW WEST FROM INTERSECTION OF BUENA VENTURA LANE

POINT 6

CHICO RD $S = 0.0157$ $L = 305'$
$S = 0.0150$ $L = 610'$
MURIEL ST $S = 0.0040$ $L = 880'$

~~V_{40} @ $.0157 = 64 \times .0157^{1/2} = 8.02$~~
~~V_{40} @ $.0150 = 64 \times .0150^{1/2} = 7.84$~~
~~V_{40} @ $.0040 = 64 \times .0040^{1/2} = 4.04$~~
~~$t_c = \left(\frac{305}{8.02} + \frac{610}{7.84} + \frac{880}{4.04}\right)\frac{1}{60} + 30$~~

$t_c = 30$

$i = \frac{189}{30.25} = \frac{189}{55} = 3.44$

$A = 20.5$ Ac $C = .65$

$Q = CiA = .65 \times 3.44 \times 20.5 = 46$ cfs.

$Q_{DES\ TOT} = 240 + 46 = 286$ cfs.

POINT 6 to POINT 7
EXISTING 48" RCP STORM SEWER @ 1.30% SLOPE; $n = .015$

Q_{48} @ 1.30% = 164 cfs

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$Q_{CAP\ ST} = 1638.4 \times .0198^{1/2} = 230$ cfs

$Q_{CAP\ TOT} = 164 + 230 = 394$ cfs

$Q_{100} = 282$ cfs.

POINT (1) TO POINT (8)

MEMORIA ST: S = .0040 Length = 920'

V_{40} @ .0040 = $64 \times .0040^{1/2} = 4.05$ ft/sec

$t_c = \frac{920}{4.05} \times \frac{1}{60} + 30$

$t_c = 4 + 30 = 34$ min

A = 7.7 Ac. C = .65 $i = \frac{189}{34+25} = 3.20$

Q_{DES} CiA = $.65 \times 3.20 \times 7.7 = 16$ cfs

$Q_{DES\ TOT}$ = 286 + 16 = 302 cfs.

EXISTING 48" RCP STORM SEW @ 1.50%; n = .013

Q_{48} @ 1.50% = 176 cfs

$Q_{CAP\ 40'\ ST} = 1638.4 \times .0157^{1/2} = 205$ cfs

$Q_{CAP\ TOT} = 176 + 205 = 381$ cfs

POINT (8) TO POINT (9)

DOROTHY ST: S = .0040 L = 920'

BUENA VENTURA S = .0240 L = 315'

S = .0100 L = 315

V_{40} @ .0040 = $64 \times .0040^{1/2} = 4.05$ ft/sec

V_{40} @ .0240 = $64 \times .0240^{1/2} = 9.91$ ft/sec.

V_{40} @ .0100 = $64 \times .0100^{1/2} = 6.40$ ft/sec.

COMP. RFS

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$t_c = \left(\frac{220}{4.05} + \frac{315}{9.91} + \frac{315}{6.40}\right)\frac{1}{60} + 34$

$t_c = 5 + 34 = 39$ min $\quad i = \frac{189}{39+25} = \frac{189}{64} = 2.95$

A = 15.9 Ac $\quad$ C = 0.65

$Q_{DES} = (0.65 \times 2.95 \times 15.9) + 55 = 85$ cfs

$Q_{DES\ TOT} = 297 + 85 = 382$ cfs

(CHKD) $Q_{CAP\ 48'ST} = 1638.4 \times .028^{1/2} = 192$ cfs

EXIST 48" RCP @ 1.35% ; n = .013

$Q_{@\ 1.35\%} = 167$ cfs

$Q_{TOT\ CAP} = 192 + 167 = 359$ cfs

CAPACITY EXCEEDED BY 23 cfs.

POINT 9 TO POINT 10

IDA PLACE $\quad$ S = .0080 $\quad$ L = 510'

$V_{40\ @.0080} = 64 \times .0080^{1/2} = 5.72$ ft/sec

$t_c = \frac{510}{5.72} \times \frac{1}{60} + 39 = 1 + 39 = 40$

$i = \frac{189}{40+25} = \frac{189}{65} = 2.91 \quad$ A = 2.2 Ac. $\quad$ C = 0.65

Q_{DES} C · A = .65 × 2.91 × 2.2 = 4 cfs

$Q_{DES\ TOT} = 382 + 4 = 386$ cfs.

Q_{CAP} = SAME AS ABOVE = 359 cfs.

CAPACITY EXCEEDED BY 27 cfs

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POINT (10)

FLOW FROM SOUTHEAST

A = 45.8 Ac. C = 0.65

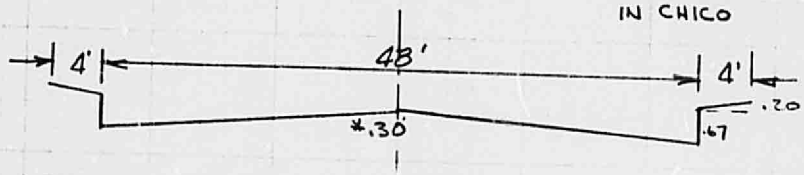
t_c = 40 min $i = \frac{189}{40+25} = \frac{189}{65} = 2.91$

$Q = CiA = 0.65 \times 2.91 \times 45.8 = 87$ cfs

LEAVING POINT 10

$Q_{100} = 386 + 87 = 473$ cfs.

* MEASURED MAX CROWN IN CHICO



$A = 24 \times .3 + .37 \times 48 + 0.2\left(\frac{48+56}{2}\right)$

$A = 7.2 + 17.76 + 10.40 = 35.36$ Sq Ft.

Wetted Perimeter = $48 + (2 \times .67) + 8 = 57.34$

Hydraulic Radius = $R = \frac{A}{WP} = \frac{35.36}{57.34} = .6166$

$R^{2/3} = .7245$

$V = \frac{1.486}{n} R^{2/3} s^{1/2}$ FOR STREETS ASSUME $n = .015$

$V_{48} = \frac{1.486}{.015} .7245 s^{1/2}$

$V_{48} = 71.77 s^{1/2}$

$Q = AV$

$Q_{48} = 35.36 \times 71.77 \times s^{1/2}$

$Q_{48} = 2537.9 s^{1/2}$

W.C.E. FORM 147

COMP RFS

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PROJ FRANKLIN PLAZA SHEET 10

SUBJ. OF 10

CAPACITY STREET LEAVING POINT (10)

$Q_{CAP\ 68'\ ST} = 2537.9 \times .0117^{1/2} = 275$ cfs.

LEAVING POINT 10

54" RCP @ .0117 ft/ft.

$Q_{CAP\ 54\ @\ 1.17\%} = 1967 \times .0117^{1/2} = 213$ cfs

$Q_{CAP\ TOT} = 275 + 213 = 488$ cfs

$Q_{100} = 473$

FLOW ENTERING POINT 11 FROM EAST.

CHICO ST S = .0117 L = 2500 ft.

$V_{48} = 71.77 \times .0117^{1/2} = 7.76$ ft/sec

$t_c = \frac{2500}{7.76} \times 1/60 + 40 = 5 + 40 = 45$ min

$i = \frac{189}{45+25} = \frac{189}{70} = 2.70$

A = 57.4 Ac = C = .65

$Q_{100} = CiA = .65 \times 2.70 \times 57.4 = 101$ cfs.

DESIGN FLOW @ POINT (11) FROM EAST ON CHICO

$Q_{100} = 473 + 101 = 574$ cfs.

CAPACITY = 488

CAPACITY EXCEEDED BY 86 cfs.