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

November 21, 1979

Mr. Michael Kenney
Vice President-Development
RESDECO
9460 Wilshire Blvd.
Suite 620
Beverly Hills, California 90212

Subject: Prospect Avenue Easterly of Juan Tabo N.E.

Dear Mr. Kenney:

This letter is written to clarify and summarize my meeting with you and Harold Thompson, representing Mr. John Claussen, regarding the improvement of Prospect Avenue easterly of Juan Tabo. The following numbered items should be used for guidelines in the developing of properties on the north and south sides of Prospect Avenue:

1. The total cost of providing engineering plans for street and storm drainage improvements shall be provided by the developer.

2. The total cost of street improvements should be borne by the developer.

3. The developers on the north side of Prospect Avenue will provide the City of Albuquerque with the necessary easement to construct the future storm drain from the southeast corner of their property to a suitable outlet point on Menaul.

4. The cost of constructing the storm drain is to be divided with RESDECO paying $10,000, Mr. John Claussen paying $5,000 and the City of Albuquerque paying the remainder of the construction costs. These funds must be deposited with the City of Albuquerque prior to the start of construction.

Should you have any questions or any other understandings regarding the outline above, please contact me at your earliest convenience.

Very truly yours,

Richard S. Heller
City Engineer

RSH/fs

cc - Harold T. Thompson
Jake Vigil
Bruno Conegliano

Steve Fuller
#208
344 7644

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

CORRECTED COPY

April 27, 1978

Albertson's Inc.
Attn: Mr. Jim Moore
P. O. Box 20
Boise, Idaho 83726

SUBJECT: STORM DRAINAGE PROSPECT TO MENAUL

Dear Mr. Moore:

In response to our telephone conversation on April 21, 1978 the City has proposed the following:

1. The City to pay the cost of a 30" diameter storm sewer from the entry point on Prospect Avenue to the exit point at Menaul Blvd. The rough estimate of this line is $21,000. This is a direct line diagonally across the Albertson property. An easement would be required and provisions for flows in excess of the line capacity on the surface and within the easement.

2. Should Albertson's wish the line to follow an alignment other than a straight line, Albertson's and the property owner to the south of Prospect would fund the difference in cost between the direct line and the selected alignment. In addition an easement would be provided for the line, and provisions for flows in excess of the line capacity on the surface and within the easement. The estimated additional cost for the alignment as now proposed is $10,000.

Note the figures quoted above are extremely rough by scaling maps, and the actual costs would be determined by the actual work order estimates.

Sincerely,

V. M. Kilmick
City Engineer

VMK/fs

cc - H. R. Orr
Bob Kielich
Bruno Conegliano

ELLISON - HAWKINS - VOGT & BYRNES, P.A.
ARCHITECTS - ENGINEERS
1617 University Blvd., NE Phone 242-1526
Albuquerque, New Mexico 87102

June 8, 1977

RECEIVED
JUN 10 1977
CITY ENGINEERS

Mr. LaVern Vinson
Furr's Cafeterias, Inc.
P. O. Box 6747
Lubbock, Texas 79413

Dear LaVern:

We met with Mr. Bruno Conegliano with the City of Albuquerque the morning of June 7, 1977 concerning the drainage problem for the Albertson property. The following items were discussed and the City of Albuquerque's recommendations are as noted.

1. That the present swale across the subject property was an interum solution which was agreed upon when the property was replated and rezoned.

2. That Albertsons will have to be committed to a permanent solution before the property can be developed further. Re-routing the present swale outside of the subject property is a temporary solution and will not be allowed.

3. The solution that the City of Albuquerque requests, is to provide a collector at the East Property line and Prospect Ave., then routing a 42" conduit North down an existing alley into a manhole, then West on Menaul Blvd., and connect into the existing storm sewer at the intersection of Paisano and Menaul Blvd. (See attached Plan). The advantage of this route would be to allow the greatest development of the property with the least amount of easements.

The City estimates that this work will cost approximately $75,000.00 to accomplish.

If you have any further questions or if you would like us to pursue the matter further, please advise.

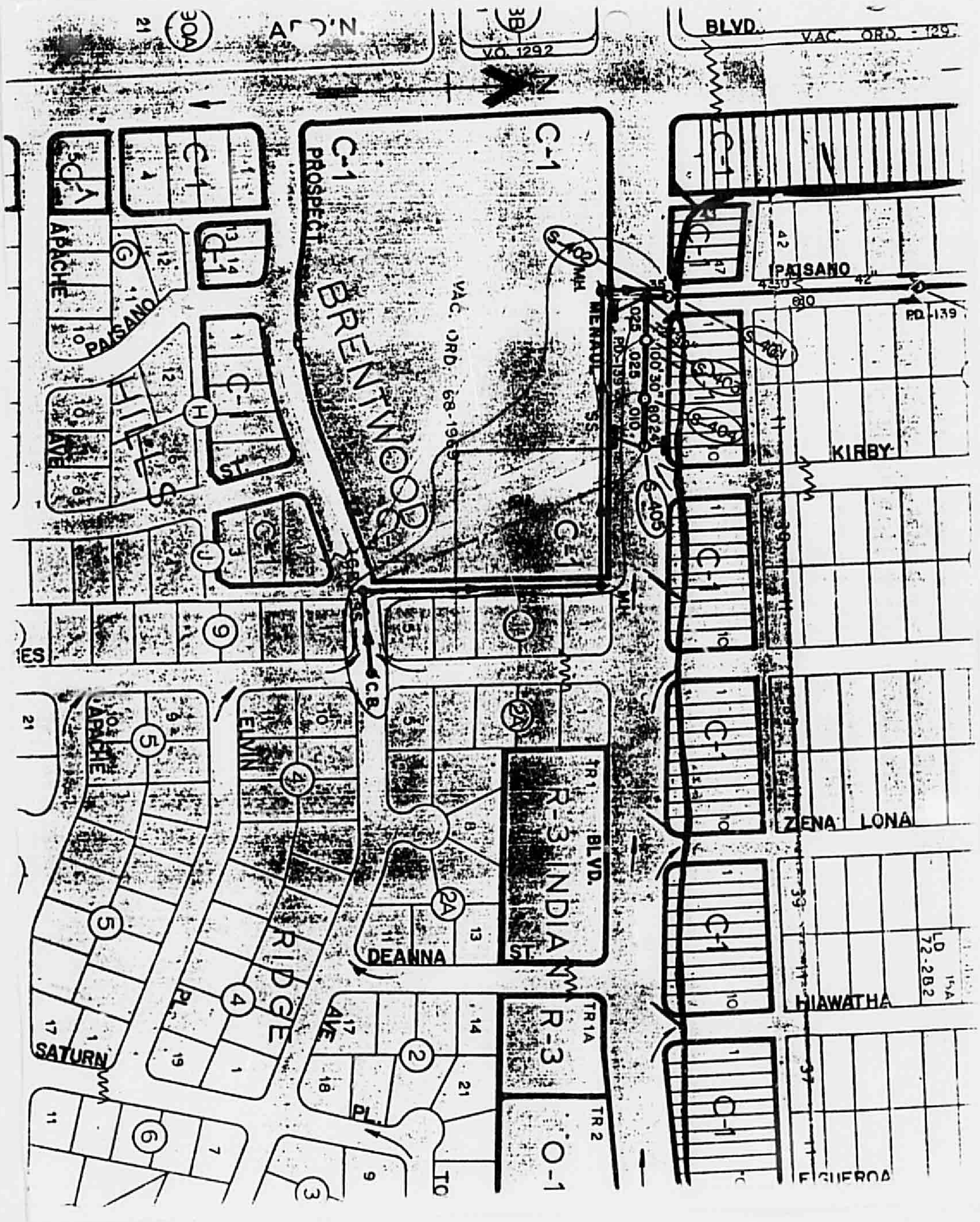
Very truly yours,

ELLISON HAWKINS VOGT & BYRNES, P. A.

S. John Hawkins

S. John Hawkins, Architect

SJH:njs
Encl.
cc: H. G. Pickard Associates, Inc.
Albertsons - Planning and Construction Dept.
Mr. Bruno Conegliano



ADD'N.
BLVD.
V.AC. ORD. - 129
V.O. 1292
C-1
PROSPECT
APACHE
PAISANO
BRENTWOOD
VAC. ORD. 68-1969
S-402
S-404
S-405
MENAUL
SS
KIRBY
ST.
C.B.
R-3
INDIAN
ZENA LONA
DEANNA
HIAWATHA
RIDGE
AVE
PL.
SATURN
TR 1
TR 1A
TR 2
O-1
FIGUEROA
LD 72-2B2

Jacob A. Vigil
Consulting Engineers

SUITE 1206
FIRST NATIONAL BANK
BUILDING - EAST
ALBUQUERQUE,
NEW MEXICO, 87108
(505) 255-5136

March 18, 1974

Albuquerque Metropolitan Arroyo
Flood Control Authority
2112 Girard Boulevard, N.E.
Albuquerque, New Mexico 87107

Attention: Mr. John Robert:

Dear Sir:

Thank you for your comments and recommendations on the report, "Storm Drainage Study Relative to Site Development of Albertson's Food Center - Store No. 836." Enclosed is Addendum No. 1 consisting of the following:

1. A revised table of contents incorporating the addendum.
2. A site plan of the development: 1" = 40 feet.
3. A revised "Conclusions and Recommendations."

I will be glad to supply any additional information you may desire.

Yours truly,

Jacob A. Vigil, P.E.
New Mexico Registration No. [illegible]

Enclosures: 3
bvm

Jacob A. Vigil
Consulting Engineers

SUITE 1706
FIRST NATIONAL BANK
BUILDING - E.
ALBUQUERQUE
NEW MEXICO 87108
(505) 268-5156

March 6, 1974

Dyer/McClernon Architects
6320 D Linn Avenue, N.E.
Albuquerque, New Mexico

Gentlemen:

Transmitted herewith is the "Storm Drainage Study Relative to Site Development of Albertson's Food Center - Store No. 836." This study consists of comprehensive analysis of storm runoff in accordance with the Requirements of Resolution No. 1972-2, Albuquerque Metropolitan Arroyo Flood Control Authority.

Thank you for the privilege of participating in your Design Project.

Yours truly,

Jacob A. Vigil, P.E.
New Mexico Registration No. 4570

ADDENDUM NO. 1: The following conclusions and recommendations supercede the initial conclusions and recommendations.

CONCLUSIONS AND RECOMMENDATIONS: On the basis of this study, the area under consideration can be developed as commercial property consisting of buildings and parking lots without creating flood threat to lower lying properties if the following recommendations are implemented:

1. Completed Development (9.77 acres).
   a. Provide a drainage channel in the form of an alley to convey runoff from Prospect Avenue to Menual Boulevard. This channel shall have a capacity of 85 cfs and shall be located at the east property line and will be flared between the building and Menual Boulevard so as to direct the flows into the existing drop inlets.
   b. Provide a water barrier on Prospect Avenue to divert water through the above mentioned channel.
   c. Grade tract to drain to streets without ponding preferable toward Menual Boulevard.
   d. The buildings shall contain controlled roof top drains.
   e. A strip of landscaped area consisting of gravel and shrubs shall parallel Juan Tabo

and Menual and lie within the property boundaries.

2. Interim Development (5.00 acres).

   a. Provide a ditch block on Prospect Avenue and divert the water north through the undeveloped portion of the tract in a drainage swale.

   b. Grade the developed portion of the tract to drain into Menual Boulevard as much as possible.

   c. The building shall contain controlled roof top drains.

   d. A strip of landscaped area consisting of gravel and shrubs shall parallel Juan Tabo and Menual and lie within the property boundaries of the developed portion.

Provided the recommendations of the report are implemented, the tract may be satisfactorily developed.

Yours truly,

JACOB A. VIGIL
Consulting Engineers

Jacob A. Vigil

Jacob A. Vigil, P.E.
New Mexico Registration No. 4570

J. A. Vigil
1 MAR '74
PROJECT NO. 74-0401
SHT 1 OF 6

DETERMINATION OF RUNOFF COEFFICIENT, "C":

PAVED STREETS:

MENUAL:	95' x 5,400' =	513,000 FT²
JUAN TABO :	95' x 2050' =	194,750
BRENTWOOD :	48' x 3,300' =	158,400
CHELWOOD :	54' x 2,050' =	110,700
TOWNER :	40' x 3,400' =	136,000
SATURN PL :	40' x 700' =	28,000
PROSPECT :	40' x 4,620' =	184,800
ELVIN :	40' x 700' =	28,000
APACHE :	40' x 4300' =	172,000
ELAINE :	40' x 1900' =	76,000
MARIE PK :	40' x 1550' =	62,000
EAST RIDGE :	40' x 1,000' =	40,000
DEANNA :	40' x 280' =	11,200
ALGODONES :	40' x 1500' =	60,000
LANDMAN :	40' x 710' =	28,400
PAISANO :	40' x 1900' =	76,000
KIRBY :	40' x 420' =	16,800
KING CT :	40' x 250' =	10,000
REX CT :	40' x 225' =	9,000
CREST LINE :	40' x 700' =	28,000
VIEW CT. :	40' x 540' =	21,600
REGENT AVE :	40' x 850' =	34,000
ALLISON CT. :	40' x 350' =	14,000
LEAH CT. :	40' x 350' =	14,000
EUCLID CT. :	40' x 350' =	14,000
HAMLET CT. :	40' x 400' =	16,000
VENUS CT. :	40' x 400' =	16,000
ADONIS CT. :	40' x 400' =	16,000
SATURN CT. :	40' x 400' =	16,000
OTHELLO CT. :	40' x 400' =	16,000
MACBETH CT. :	40' x 400' =	16,000
CLEOPATRA CT. :	40' x 400' =	16,000
		2,152,650 FT² OR 49.42 AC.

J.A. Vigil
1 MAR '74
Project No. 74-02
Sht 3 of 6

Determination of Runoff Coefficient, "C".

R-2 Apartments

Along Menual: 250' x 1500' = 375,000 Ft²
150' x 2600' = 390,000 Ft²
765,000 Ft² or 17.5 Ac.

C-1 Commercial

Juan Tabo @ Brentwood 350' x 740' = 259,000 Ft²
Juan Tabo @ Menual 1200' x 800' = 960,000 Ft²
1,219,000 Ft² or 28.00 Ac.

Park - Chelwood & Brentwood

890' x 330' = 273,900 or 6.3 Acres

School - Brentwood

350' x 630' = 220,500 Ft² or 5.0 Acres

			"C"	Wt. "C"
Streets:	49.4 Acres	18.4%	0.90	.166
R-2	17.5 Acres	6.5%	0.62	.040
C-1	28.0 Acres	10.4%	0.81	.084
Park	6.3 Acres	2.3%	0.15	.001
School	5.0 Acres	1.9%	0.35	.006
R-1	162.8 Acres	60.5%	0.30	.182
	269.0 Acres	100%		0.48

J.A VIGIL
1MAR'14
PROJECT NO. 14-0401
SHT 3 OF 6

DETERMINATION OF T_c:

T_c @ INTERSECTION OF MENUAL & JUAN TABO:
Δ ELEV = 240' (5840'-5600')
LENGTH OF RUN = 6,900 FEET
AVE SLOPE = $\frac{240}{6900}$ = .03478% or 3.48%

VELOCITY OF FLOW @ INTERSECTION = 7.0 fps ASSUMING TOP OF WATER SURFACE AT TOP OF CURB.

AVE VELOCITY = $\frac{0+7.0}{2}$ = 3.5 fps

$T_c = \frac{6900 \text{ FT.}}{3.5 \times 60} + 5 \text{ min}$ (TIME ALLOWED FOR WATER TO REACH STREET)

= 38 min

I = 3.0 inches/hr for T_c = 38 min

$Q_{100} = CIA$

= 0.48 x 3 x 269

= 387 cfs

J. A. VIGIL
1 MAR '74
PROJECT NO. 74-04C
SHT 4 OF 6

DETERMINATION OF STORM SEWER CAPACITY:

36" RCP @ 1.40% AT MENUAL & CHELWOOD
$n = .013$, flowing full
$Q = 78.9$ cfs

42" RCP @ 1.0% AT MENUAL & PAISANO ST.
$n = .013$ full
$Q = 100.6$ cfs

TOTAL $Q = 78.9 + 100.6$

$Q = 179.5$ cfs USE 180 cfs

Q_{100} – STORM SEWER = Q_{STREET}

$Q_{STREET} = 387 - 180$

$= 207$ cfs

$Q_{CAPACITY\ OF\ STREET}$ (86' ARTERIAL GORDON HEEKENHOFF)
$= 202$ cfs @ 3.50% SLOPE

NOTE: THE ABOVE COMPUTATIONS DO NOT REFLECT STORM RELIEF MADE AVAILABLE BY SIDE STREETS ALONG THE NORTH SIDE OF MENAUL BETWEEN CHELWOOD AND JUAN TABO.

WITH SIDE STREET RELIEF:
207 cfs – 60 cfs = 147 cfs

PROJECT NO. 14-0401
J.A. VIGIL
DRAINAGE - MENUAL
SHT. 5 OF 6

DETERMINATION OF PEAK FLOWS AT PROSPECT AND EAST PROPERTY LINE:

DRAINAGE AREA: 40 ACRES
LENGTH OF WATER COURSE (STREET) = 2350'
Δ ELEVATION: 82.0 FT.
S = 0.0349 ft/ft OR 3.49 %

APPROX. $Q_{100} = 40 \times 1.5 = 60$ cfs

DEPTH OF FLOW = 0.57' STREET FLOW ≯ FULL

$\therefore \frac{60 \text{ cfs}}{2} = 30$ cfs PER HALF STREET

$y = 0.44$

AREA = 4.84 FT²

$V = 30 \div 4.84 = 6.20$ fps

$V_{AVE} = \frac{6.20}{2} = 3.10$ fps

$T_c = \frac{2350}{3.10 \times 60} + 5 = 17.63$ min.

$\therefore$ USE 18 min.

$I_{100} = 4.35$ in/HR.

$Q_{100} = 0.49 \times 4.35 \times 40$

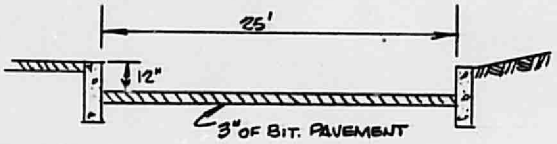
$= 85$ cfs

PROJECT No. 74-0401
J.A. VIGIL
DRAINAGE - MENUAL & JUAN TABO

SHT 6 OF 6

DESIGN OF WATER CARRYING ALLEY (ALLEY RUNNING APPROXIMATELY PARALLEL TO EAST PROPERTY LINE:

DESIGN Q_{100} = 85 cfs (SAME AS Q_{100} FOR PROSPECT ST.)
SLOPE OF ALLEY = $\frac{2.0}{450}$ = .0044 ft/ft OR 0.44 %



n = 0.0
S = .0044
A = 25 FT²
P = 27.00
r = 0.925
V = 4.68 fps
Q = 117 cfs

DEPTH OF FLOW FOR 85 cfs = 0.83 FT.

PROVIDE WATER BLOCK ON PROSPECT TO DIVERT FLOWS INTO MENUAL THROUGH ALLEY.

STORM DRAINAGE STUDY
RELATIVE TO SITE DEVELOPMENT OF
ALBERTSON'S FOOD CENTER
STORE NO. 836
ALBUQUERQUE, NEW MEXICO

MARCH 1974

JACOB A. VIGIL
Consulting Engineers
Albuquerque, New Mexico

TABLE OF CONTENTS

STORM DRAINAGE STUDY RELATIVE TO SITE
DEVELOPMENT OF ALBERTSON'S FOOD CENTER,
STORE NO. 836

PURPOSE: The purpose of this report is to formulate a comprehensive study of drainage affecting the site development and to establish criteria for the design of drainage structures. It is shown that the development does not restrict drainage in a manner to cause damage to adjacent land owners and the streets do not flow above capacity as a result of additional runoff.

AVAILABLE DATA: The following is a list of maps, charts, drawings and reports available for these studies:

1. Topographic and Orthophoto Map, H-21 and H-22, prepared by Albuquerque Metropolitan Arroyo Flood Control Authority.
2. Chelwood Park Boulevard Storm Sewer - P.D. 148 sheets 29 and 30.
3. Paving District No. 139 sheet 18.
4. Master Plan of Drainage, City of Albuquerque, New Mexico and Environs, 1963, prepared by Gordon Herkenhoff and Associates.
5. U.S. Weather Bureau, Technical Bulletin No. 40.

LOCATION: The site is located on the east side of Juan Tabo Boulevard between Menual Boulevard and Prospect Avenue and consists of 9.77 acres of sparse grass to bare soil. The general slope of the land is downward from east to west at approximately 3.25%. There are no significant geological or topographic features.

DESCRIPTION OF AREA STUDIED: The watershed area studied for this report consists primarily of the drainage basin delineated on the east by Tramway Boulevard, on the west by Juan Tabo Boulevard, on the north by Menual Boulevard, and on the south by Indian School Road. (see overlay for map H-22 in appendix.)

The total area studied consists of 269 acres and peak flow determinations were made assuming the area was fully developed according to the "Zoning Atlas."

EXISTING DRAINAGE FACILITIES: A storm sewer system is located along Chelwood Park Boulevard which intercepts flows from an area comprising of 121 acres. The drainage area is bounded on the west by Chelwood Park Boulevard, on the east by Tramway Boulevard, on the north by Menual Boulevard, and on the south by Indian School Road. The storm sewer has a capacity of 79 cfs at the intersection of Menual and Chelwood Park; all excess surface flows are diverted into Menual by a series of water blocks along the west side of Chelwood Park Boulevard.

An additional storm sewer system consisting of eight drop inlets is located along Menual Boulevard between Paisano and Kirby Streets. The storm sewer has a carrying capacity of 100 cfs at the intersection of Menual and Paisano with the excess surface flows continuing west on Menual Boulevard.

BASIC DRAINAGE DESIGN CRITERIA: The hydrologic design criteria is based upon the rainfall intensity frequency curve for 100 years contained in the "Master Plan of Drainage," City of Albuquerque, New Mexico and Environs, compiled by Gordon Herkenhoff and Associates, 1963. Since the drainage areas are small, the Rational Formula, Q=CIA, was used for determining peak flows. The runoff coefficient used for all the drainage computations was 0.48. The time of concentration, Tc, was determined using Manning's Formula, $V=\frac{1.486}{n} R^{2/3} S^{1/2}$, and the appropriate street section.

PROPOSED DRAINAGE PLAN: The general plan for handling storm runoff is to utilize the existing storms sewers to their maximum capacity and to divert surface runoff from those streets already carrying considerable quantities of water.

The area tributory to Prospect Avenue at Algodones Street comprises of 40 acres and is bounded on the west by Algodones Street on the east by Chelwood Park Boulevard,

on the north by Menual Boulevard, and on the south by Brentwood Hills Boulevard. The drainage area produces a peak discharge of 85 cfs. Since neither Juan Tabo Boulevard nor Brentwood Hills Boulevard have a storm sewer system, the runoff going west on Prospect Avenue will be diverted north to Menual Boulevard at the east property line through a 25 foot wide alley. The existing drop inlets on Menual will remove the nuisance flows that normally go into Juan Tabo. Other than this, the drainage patterns remain the same.

The peak discharge at the intersection of Menual and Juan Tabo is 387 cfs excluding runoff relief offered by the existing side streets north of Menual between Chelwood Park and Juan Tabo. Providing runoff relief which occurs at those existing streets the discharge is reduced to 327 cfs. The total storm sewer capacity is 180 cfs with the remaining 147 cfs being conveyed west past Juan Tabo by Menual Boulevard. The street capacity of Menual at this location is 202 cfs.

The peak flow at Menual Boulevard and the Piedra Lisa Arroyo is approximately the same as at Juan Tabo because the additional contributing area is very small.

The commercial buildings will consist of flat roof construction with parapet walls capable of regulating roof runoff through the proper selection of downspouts. The parking area will be paved with bituminous material and will

contain some landscaped areas.

CONCLUSIONS AND RECOMMENDATIONS: On the basis of this study, the area under consideration can be developed as commercial property consisting of buildings and parking lots without creating flood threat to lower lying properties if the following recommendations are implemented:

1. Provide a drainage channel in the form of an alley to convey runoff from Prospect Avenue to Menual Boulevard. This channel shall have a capacity of 85 cfs and shall be located at the east property line.
2. Provide a water barrier on Prospect Avenue to divert water through the above mentioned channel.
3. Grade tract to drain to streets without ponding preferable toward Menual Boulevard.

Provided the recommendations of the report are implemented, the tract may be satisfactorily developed.

Yours truly,
JACOB A. VIGIL
Consulting Engineers

Jacob A. Vigil, P.E.
New Mexico Registration No. 4570

ADDENDUM NO. 1: The following conclusions and recommendations supercede the initial conclusions and recommendations.

CONCLUSIONS AND RECOMMENDATIONS: On the basis of this study, the area under consideration can be developed as commercial property consisting of buildings and parking lots without creating flood threat to lower lying properties if the following recommendations are implemented:

1. Completed Development (9.77 acres).
   a. Provide a drainage channel in the form of an alley to convey runoff from Prospect Avenue to Menual Boulevard. This channel shall have a capacity of 85 cfs and shall be located at the east property line and will be flared between the building and Menual Boulevard so as to direct the flows into the existing drop inlets.
   b. Provide a water barrier on Prospect Avenue to divert water through the above mentioned channel.
   c. Grade tract to drain to streets without ponding preferable toward Menual Boulevard.
   d. The buildings shall contain controlled roof top drains.
   e. A strip of landscaped area consisting of gravel and shrubs shall parallel Juan Tabo

and Menual and lie within the property boundaries.

2. Interim Development (5.00 acres).

   a. Provide a ditch block on Prospect Avenue and divert the water north through the undeveloped portion of the tract in a drainage swale.

   b. Grade the developed portion of the tract to drain into Menual Boulevard as much as possible.

   c. The building shall contain controlled roof top drains.

   d. A strip of landscaped area consisting of gravel and shrubs shall parallel Juan Tabo and Menual and lie within the property boundaries of the developed portion.

Provided the recommendations of the report are implemented, the tract may be satisfactorily developed.

Yours truly,

JACOB A. VIGIL
Consulting Engineers

Jacob A. Vigil, P.E.
New Mexico Registration No. 4570

APPROVED for general compliance with requirements of Albuquerque Metropolitan Arroyo Flood Authority Resolution No. 1972-2.

_____ _____

John Robert, P.E. Executive Engineer Date

APPROVED for general compliance with requirements of City of Albuquerque.

_____ _____

Varne Kimmick, P.E., City Engineer Date

Bruno —

Jacob A. Vigil
Consulting Engineers

SUITE 1206
FIRST NATIONAL BANK
BUILDING - EAST
ALBUQUERQUE,
NEW MEXICO, 87108
(505) 255-5186

October 19, 1977

Mr. Verne Kimmick
City Engineer
City of Albuquerque
P. O. Box 1293
Albuquerque, New Mexico 87103

Dear Sir:

Transmitted herewith is the Addendum No. 2 to the drainage report "Storm Drainage Study Relative to Site Development of Albertson's Food Center - Store No. 836." This addendum consists of a revised drainage plan as discussed in your office and is officially submitted for approval. The addendum meets the requirements of Resolution No. 1972-2, Albuquerque Metropolitan Arroyo Flood Control Authority.

Thank you for your cooperation in this matter.

Sincerely yours,

Jacob A. Vigil

Jacob A. Vigil, P.E.

JAV/bvm

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ADDENDUM NO. 2: The following proposed drainage plan with conclusions and recommendations supersede the initial conclusions and recommendations and the subsequent Addendum No. 1.

PROPOSED DRAINAGE PLAN: The developer of the tract (Albertsons Food Chain) agreed to allow diversion of runoff across the tract which historically had flowed along Prospect Avenue to Juan Tabo Boulevard to assist the City of Albuquerque alleviate the existing drainage problem at the corner of Menaul and Juan Tabo. Based on several conferences with the City of Albuquerque it was decided to construct a storm sewer line from the parking lot to the existing 42 inch reinforced concrete line at the corner of Paisano and Menaul. The developer would install the necessary drop inlets and if required a ponding area in the parking lot to contain the flows.

Because of the difficulty in establishing top of inlet elevations due to possible changes in floor elevations of the adjacent buildings, it was necessary to design an interim system that would provide the same protection as the final concept.

The interim system utilizes a shallow ditch as shown on Plate 2 to divert water from Prospect Avenue to the ponding area. The pond is 3.5 feet deep with the crest elevation at 5625.25 and contains two, 24 inch corrugated metal pipes at the northwest corner to serve as a primary spillway. An emergency spillway ten feet wide, one and a half feet deep, at the northeast corner is constructed in existing ground to minimize scouring and eliminate the need for slope protection. The flows through the emergency spillway would be short duration with non-scouring velocities.

The final design system utilizes one double inlet and one double combination drop inlet (Plate 1) with a 24 inch and 30 inch collector lines. The high water depth for the 25 year storm at the drop inlets would be 0.7 feet; for the 100 year storm the depth

would be 1.0 feet because of additional water depth necessary to overtop the high points. The storm sewer line between drop inlets would be a 24 inch reinforced concrete line and the connector line to the existing 42 inch reinforced concrete line would be a 30 inch reinforced concrete pipe. The diverted flow from Prospect Avenue is distributed equally to each drop inlet as much as possible. Any excess flows are diverted to Menaul Boulevard. The drop inlets were designed for 50% efficiency.

See Appendix "A" for Design Calculations.

RECOMMENDATIONS AND CONCLUSIONS: The tract can be developed commercially and alleviate present drainage problems if the above drainage plan is adopted. As an additional safety margin the buildings shall contain controlled roof top drains.

Jacob A. Vigil, P.E.
New Mexico Registration 4570

APPROVED for general compliance with requirements of Albuquerque Metropolitan Arroyo Flood Authority Resolution No. 1972-2.

James Smith, P.E., Executive Engineer _____ Date _____

APPROVED for general compliance with requirements of City of Albuquerque.

Verne Kimmick, P.E., City Engineer _____ Date _____

ALBERTSONS TRACT - MENUAL & JUAN TABO

JACOB A. VALIC
OCTOBER 17, 1977
SHT. 1 OF 6

1. DESIGN OF INTERIM POND & OUTLET:

DESIGN STORM = 10YR PONDING, 100 YR. SPILLWAY
DESIGN OUTLET FOR 2-YR STORM
AREA = 40 ACRES (CONTRIBUTING AREA)
LENGTH OF WATER COURSE = 2350 FT.
Δ ELEV. = 82 FT.
S = 82/2350 x 100 = 3.49%
TIME OF CONCENTRATION = 20 MIN.
i = 1.55"/HR., C = 0.49
Q = CiA
= 0.49(1.55)(40)
= 30.38 CFS
THEREFORE DESIGN OUTLET FOR 30CFS
USE: 2-24" C.M.P. PIPES
REQ'D H = 1.2 x 2.0
= 2.4 FT.
SIZE OF POND = 100 x 200 x 2.4' ÷ 43,560
= 1.10 AC-FT OF STORAGE

$$Q_o = \frac{\text{ALLOWABLE OUTFLOW}}{\text{ACREAGE} \times \text{RUNOFF COEFFICIENT}}$$

$$= \frac{30 \text{ CFS}}{40 \times 0.49}$$

$$= 1.53$$

$$I_{10yr} = \frac{91}{T+24}$$

$$T = -24 + \sqrt{\frac{3276}{Q_o}}$$

$$T = -24 + \sqrt{\frac{3276}{1.53}}$$

$$T = -24 + 46$$

$$T = 22 \text{ MIN}$$

1. CONT'D.

$V_n = \frac{5460T}{T+24}$

$= \frac{5460 \times 22}{22+24}$

$= 2611$

$V_o = 40 Q_o T$

$= 40 (1.53)(22)$

$= 1346$

$V_s = V_n - V_o$

$= 2611 - 1346$

$= 1265$

$V_T = 1265 \times 40 \times 0.49$

$= 24794 FT^3$ OR 0.57 AC-FT. < 1.10 NOT ENOUGH HEAD FOR 30CFS DISCHARGE.

DESIGN RENTENTION FOR 25YR STORM:

$T = -27 + \sqrt{\frac{4981.5}{Q_o}}$

$T = -27 + \sqrt{\frac{4981.5}{1.53}}$

$T = -27 + 57$

$T = 30 MIN.$

$V_n = \frac{123}{T+27} \times T \times 60 SEC/MIN$

$= 3884$

$V_o = 40 Q_o T$

$= 40 \times 1.53 \times 30$

$= 1836$

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$V_s = V_n - V_o$
$= 3884 - 1836$
$= 2048$

$V_T = V_s \times$ ACREAGE $\times$ RUNOFF COEFFICIENT
$V_T = 2048 \times 40 \times 0.49$
$= 40140.8\ FT^3$ OR 0.92 AC-FT. $\cong 1.10$ O.K.

DESIGN OF SPILLWAY REQUIRES SYNTHETIC HYDROGRAPH; THEREFORE USE THE FOLLOWING SHAPE FACTORS:

$T_b = 2.67\ T_p$ (SOIL CONSERVATION SERVICE)
$T_p = 0.7\ T_c$
$T_p = 0.7 \times 20$
$= 14$ MIN

$T_b = 2.67 \times 14$
$= 37.4$ MIN.

DESIGN SPILLWAY FOR 100 YR - STORM:
$P = 1.25$" (20 MIN DURATION)
CURVE NUMBER 90 (SCS)
RUNOFF RATIO = 0.50
VOLUME = $40\ AC \times \frac{1.25}{12} \times 0.50$

$= 2.08$ AC-FT.

VOLUME UNDER HYDROGRAPH SHOULD EQUAL TOTAL RUNOFF VOLUME,

$Q_p = \frac{2.08\ AC\text{-}FT \times 43{,}560 \times 2}{37.4 \times 60\ SEC/MIN}$

$= 80.9$ CFS USE 80 CFS

FLOOD ROUTING THROUGH RESERVIOR NOT NECESSARY, THEREFORE DESIGN SPILLWAY FOR $Q_{100} - Q_{25}$:

$Q_{25} = CiA = 0.49 \times 3.0 \times 40$
$= 59$ CFS

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$Q_{100} - Q_{25} = 80\text{CFS} - 59\text{CFS}$
$= 21\text{CFS}$

THEREFORE DESIGN SPILLWAY FOR 21CFS HOWEVER WITH FLOOD ROUTING IT WOULD BE LESS.

DESIGN OF SPILLWAY:

$Q = 3.087\, C\, b\, H^{3/2}$ $\quad C = 0.8$, $H = 1.0\text{FT.}$

$$L = \frac{Q}{3.087(0.8)(1)^{3/2}}$$

$$b = \frac{21}{3.087(0.8)(1)}$$

$b = 8.50\text{FT.}$

TRY $b = 10'$

$$H = \left(\frac{21}{3.087(0.8)(10)}\right)^{2/3}$$

$H = 0.90\text{FT.}$

TOTAL HEIGHT OF POND WITHOUT FREEBOARD:

DEPTH OF POND FOR 25YR STORM = 2.0FT.
DEPTH FOR SPILLWAY = 0.9
2.9FT.

TOTAL HEIGHT = 2.90 + 0.60' FREEBOARD.
= 3.50FT.

2. DESIGN OF FINAL DRAINAGE SCHEME:

BASED ON CONVERSATIONS AND CONFERENCES WITH CITY – PROVIDE DROP INLETS TO TIE INTO EXISTING 42" R.C.P. AT PAISANO STREET & MENUAL.

PROVIDE: 1 – DOUBLE INLET WITH 0.7 FT ± HEAD @ 25 YR & 1.0 ± @ 100 YR.

For 25 YR H = 0.7' $Q = CLH^{3/2}$ L = 16 FT.

$Q = 3.34(16)(0.7)^{3/2}$

$Q = 31.3$ CFS

For 100 YR H = 1.0' $Q = CLH^{3/2}$

$= 3.34(16)(1)^{3/2}$

$= 53$ CFS

Q = 25 YR: 31.3 CFS PER INLET 100% EFFICIENT. 100 YR – 53 CFS PER INLET – 100%

16 CFS PER INLET @ 50% EFFICIENT. – 27 CFS " " – 50%

PROVIDE: 1 – DOUBLE COMBINATION INLET WITH 0.7 FT. ± HEAD @ 25 YR. & 1.0 ± @ 100 YR.

CURB OPENING – $Q = 3.087 L h^{3/2}$

$Q_{25} = 11.75$ CFS @ 100% (EFF.) 6 CFS @ 50% (EFF.)

$Q_{100} = 3.087 \times 6.5 \times 1.0^{3/2}$ 10 CFS @ 50% (EFF.)

$= 20$ CFS @ 100% (EFF.)

GRATE INLET – $Q = CLH^{3/2}$

$Q_{25} = 3.34(10)(0.7)^{3/2}$ $Q_{100} = 3.34(10)(1.0)^{3/2}$

$Q_{25} = 17.56$ CFS @ 100% $= 33.40$ CFS @ 100%

10.0 CFS @ 50% 17.0 CFS @ 50%

TOTAL = 6 + 10

= 16 CFS FOR 25 YR.

TOTAL = 10 + 17

= 27 CFS

FOR PRACTICAL DESIGN PURPOSES USE: 16 CFS x 2 = 32 CFS FOR 25 YR.

27 CFS x 2 = 54 CFS FOR 100 YR.

THEREFORE; (100 YR) 80 CFS – 54 = 26 CFS OVERFLOW < 30 CFS (25 YR STORM)

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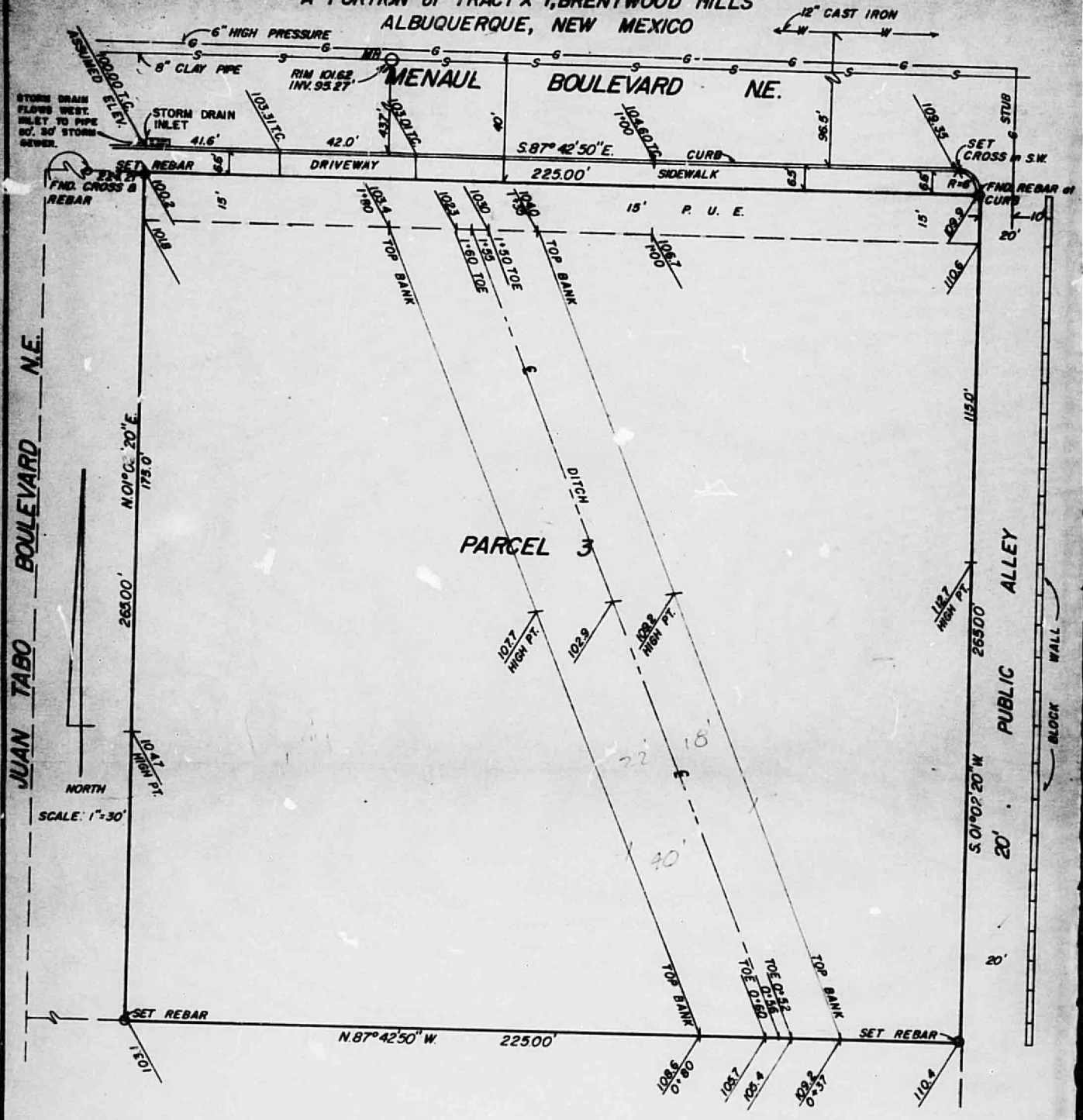
SELECT SIZE OF SEWER PIPE: USE : 30" R.C.P. @ 1.5% SLOPE Q = 55 CFS
THEREFORE USE: 24" R.C.P BETWEEN INLETS AND USE 30" R.C.P. BETWEEN LAST INLET AND MANHOLE AT PIASANO ST.

SURVEY PLAT and TOPOGRAPHY PLAT
of
A PORTION of TRACT X-1, BRENTWOOD HILLS
ALBUQUERQUE, NEW MEXICO



DESCRIPTION:

A certain Tract of Land situate in the City of Albuquerque, Bernalillo County, New Mexico, and being a Portion of Tract "X-1" of the Summary Plat Showing Tracts "X-1", "X-2" & "X-3",(Comprising a Replat of Tract "X") of BRENTWOOD HILLS, a Subdivision, Albuquerque, New Mexico, as the same is shown and designated on said Summary Plat, filed in the office of the County Clerk of Bernalillo County, New Mexico, on February 28, 1975, and being more particularly described by metes and bounds survey made by Hall Surveying Co. in April, 1977, as follows:
BEGINNING at the Northeast Corner of said Tract"X-1",being the intersection of the South line of Menaul Blvd. N.E. and the West line of a Public Alley, and running thence; S. 01 deg. 02' 20" W. along the West line of said Alley, 265.00 feet; thence, N. 87 deg. 42' 50" W., parallel to the South line of said Menaul Blvd. N.E., 225.00 feet; thence, N. 01 deg. 02' 20" E., 265.00 feet to a point on the South line of said Menaul Blvd. N.E.; thence, S. 87 deg. 42' 50" E. along the South line of said Menaul Blvd. N.E., 225.00 feet to the Point of Beginning and Containing 1.3688 Acres, more or less.

I, Verlon E. Hall, licensed under the laws of the State of New Mexico, hereby certify that I am a Registered Land Surveyor, and that the above plat was prepared by me or under my supervision, from notes of an actual field survey and is true and correct to the best of my knowledge and belief.

IN WITNESS WHEREOF, this certificate is executed at Albuquerque, New Mexico, on this 22nd day of April, 1977.

Verlon E. Hall
N.M.L.S. No. 3241

PREPARED BY:
HALL SURVEYING CO.
511 San Mateo N.E.
Albuquerque, New Mexico

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