HYDROLOGY D18/D3

DEMERS CONSTRUCTION CO.

D18-D3

1 PLAN

CITY OF ALBUQUERQUE

ALBUQUERQUE, NEW MEXICO

INTER-OFFICE CORRESPONDENCE March 9, 1983 REF. NO._____

TO: Lori K. Lacedonia, Legal Investigator

FROM: Bruno Conegliano, Asst. Hydrology Engineer

SUBJECT: COMPLAINT FROM MR. HENRY DEMERS, 6[illegible] HALLMARK NE

In order to be approved by the City, drainage reports must meet two objectives:

1. Furnish a plan for the management of the additional runoff generated by the new development.

2. Demonstrate that the development will provide for the safe conveyance of the flood flows from the upstream lands across the property, and for the protection of the new construction from high water conditions.

Towards the end of May or during the first part of June, 1979, Mr. C. (Ted) Asbury with the consulting firm of Andrews, Asbury & Robert submitted a drainage report in anticipation of development of the lands owned by Mr. H. Demers. While that report supplied a plan for the management of the on-site runoff, the off-site flows were not taken into consideration. Yet, off-site flows affected Mr. Demer's properties both along their north and their south boundary lines. On the north side, San Francisco Blvd. conveyed the runoff collected from several units of the Loma Del Norte Subdivision. On the south side, Mr. H. Demer's properties abutted the North Arroyo del Pino. Correspondingly, the drainage report should have established finished floor elevations demonstrably higher than the flood flows in San Francisco (then still unimproved) and in the North Pino Arroyo. In addition, the report should have indicated what measures were going to be taken to protect the developed properties from erosion by the Arroyo. These omissions were serious enough to prevent me from granting approval to that report.

The above notwithstanding, Mr. Demers was able to obtain a building permit for new construction on Lot 15C. The City Hydrology file does not contain a copy of the grading and drainage plan attached to the construction plans. Neither does the record section of Code Administration have a microfilm of the Construction plans for a building at 6320 San Francisco Dr. Without such documentation it is impossible to say if the construction plans were reviewed and approved by the Hydrology Section, in advance of building permit issuance. In all cases, if the construction plans had contained a grading plan corresponding to that included with the drainage report, and if that grading plan had been faithfully executed, the property of Mr. H. Demers would not have suffered flood damages.

The record indicates that while a final inspection of the building at 6320 San Francisco was made, the City never granted a Certificate of Occupancy. In particular, there is no indication that the grading of the site was inspected and found satisfactory nor that Mr. Demers had fulfilled his obligation of providing erosion protection along the North Pino Arroyo. A cursory field inspection indicates that construction on the property in question is considerably at variance with the drainage plan contained in the report by the Consultant, Andrews, Asbury & Robert. Such discrepancy should absolve the City from any intimation of wrongful action.

BC/tsl

ANDREWS, ASBURY & ROBERT, INC.
Consulting Engineers
401 San Pedro, NE, Albuquerque, New Mexico 87108
(505) 265-6631

John A. Andrews, P.E.
Charles T. Asbury, P.E.
John B. Robert, P.E. & L.S.

RECEIVED

MAY 21 1979

CITY ENGINEER

May 21, 1979

Mr. Bruno Conegliano
Assistant City Engineer-Hydrology
CITY OF ALBUQUERQUE
PO Box 1293
Albuquerque, New Mexico 87103

HAND-DELIVERED
City Hall

SUBJECT: DEMERS CONSTRUCTION COMPANY - DRAINAGE REPORT

Dear Mr. Conegliano:

Transmitted herewith are two (2) copies of the Drainage Report for Lots 16, 15 and 12A, Block 6, Tract "A", North Albuquerque Acres Subdivision, for your review and approval.

Your earliest review and approval will be appreciated and, should any questions arise, please do not hesitate to contact me.

Very truly yours,

CHARLES T. ASBURY, P.E.

CTAsm
Enclosure: Drainage Report (2)
cc: Demers Construction Company (w/encl.-1)

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

MAYOR
David Rusk

May 29, 1979

Mr. Charles T. Asbury
Andrews, Asbury & Robert, Inc.
401 San Pedro N.E.
Albuquerque, N.M. 87108

Re: Drainage Report - Demers Construction Co.
Block 6-Tract A

Dear Mr. Asbury:

Due to the large number of drainage reports received in the past three weeks by the City Engineer's Office and to the limited staff resources, it has not been possible to reply within the time specified by the AMAFCA Res. 72-2. This letter is to acknowledge the reception of your drainage report and assure you that the best efforts will be made to reply in the shortest possible time.

Very truly yours,

Richard S. Heller

Richard S. Heller
City Engineer

BC/RSH/ms

cc- Richard Leonard-AMAFCA
Drainage File

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

MAYOR
David Rusk

June 18, 1979

Mr. Charles T. Asbury
Andrews, Asbury & Robert, Inc.
401 San Pedro N.E.
Albuquerque, New Mexico 87108

Re: Demer's Construction Company - Lots 16, 15 and 12A
Block 6 - Tract "A"

Dear Mr. Asbury:

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

In order to protect these properties over time, it will be necessary to extend the lining along the northern bank of the North Arroyo del Pino. I believe we had some conversation on the subject and, as indicated, the owner must protect his property from the potential meandering of the flow, with consequent bank undercutting and erosion. Plans drawn on standard City of Albuquerque drawing sheets must be prepared and submitted for review to the City Engineer's Office together with the standard AHBA contract. This requirement will not prevent the release of the building permits but the construction of the channel must be concurrent with that of the buildings.

Certificate of Occupancy will not be granted if the channel construction has not been accepted by the City. Similarly, an agreement must be entered with the Office of the City Engineer in regard to the construction of the southern half of San Francisco Drive where it borders these properties.

Information must also be supplied in regard to the relationship of the finished floor elevations, to the elevation of the 100-year water flow in San Francisco Drive and in the North Arroyo del Pino, in order to comply with the requirements of the Flood Insurance Administration.

I have no objections to the internal scheme of drainage provided that positive conveyance of the roof runoff to the appropriate ponds is supplied and a better defined swale is constructed, to correct the runoff from Lots 12B-14 and to divert this flow from the building on Lot 12A.

If you wish to discuss this matter further, please do not hesitate to call this office.

Very truly yours,

Bruno Conegliano
Assistant City Engineer-Hydrology

BC/fs

cc - Rich Leonard
Richard Heller
Charles Volz
Bob Kielich
Fred Aguirre
Drainage File

ANDREWS, ASBURY & ROBERT, INC.
Consulting Engineers
401 San Pedro, NE, Albuquerque, New Mexico 87108
(505) 265-6631

John A. Andrews, P.E.
Charles T. Asbury, P.E.
John B. Robert, P.E. & L.S.

July 11, 1979

RECEIVED
JUL 12 1979
CITY ENGINEER

Mr. Bruno Conegliano
Assistant City Engineer-Hydrology
CITY OF ALBUQUERQUE
PO Box 1293
Albuquerque, New Mexico 87103

SUBJECT: DRAINAGE REPORT - DEMERS CONSTRUCTION COMPANY
BLOCK 6, TRACT A - NORTH ALBUQUERQUE ACRES

Dear Mr. Conegliano:

Pursuant to your letter of June 18, 1979, we have computed the storm water runoff elevation that would result along San Francisco Boulevard in the vicinity of San Pedro Boulevard, as a result of a 100-year storm.

In analyzing this condition, we have used the following methodology:

1) Drainage Sub-Basin: The area draining to San Francisco Boulevard, east of San Pedro was delineated from the orthotopographic maps (with your concurrence) for the approximate sub-basin boundaries. This area was determined to be 130.2 acres.

2) Runoff Coefficients: The basin area draining onto San Francisco Boulevard in the area of the proposed project is presently developed primarily with single-family residences. As a result of this development, a runoff coefficient of 0.65 was used.

3) Peak Runoff: The resulting peak discharge from a 100-year frequency storm was determined to be 347.8 CFS. (Rational Method of Analysis - see attached computations).

Predicated on the above analytical constants and assuming San Francisco Boulevard would be developed with a paved vehicular surface with standard City curb & gutters, it was determined the highest water elevation would be 0.46 feet above the curb elevation (see attached computation sheets).

To provide adequate protection for a 100-year storm, we have re-established a few of the finish floor elevations one foot (1') above the top of curb elevations predicated on a preliminary curb grade.

Additionally, we have determined the 100-year storm water elevation in the Arroyo Del Pino could reach a maximum level in the channel of three feet (3') below the finish floor elevations as shown on the grading plan.

We appreciate your attention to this matter and we have complied with your requests. We would appreciate your earliest approval of the revised plan.

Very truly yours,

CHARLES T. ASBURY, P.E.

CTAsm
Enclosure: Grading & Drainage Plan

LAW OFFICES
RICHARD B. ADDIS
4008 CARLISLE BOULEVARD, N.E.
ALBUQUERQUE, NEW MEXICO 87107

TELEPHONE
(505)883-8877

January 12, 1983

City Attorney's Office
Property Damage Division
P. O. Box 1293
Albuquerque, New Mexico 87103

Re: Henry Demers
6613 Hallmark, N.E.
Albuquerque, NM 87109

Gentlemen:

I am counsel to Henry Demers, and the purpose of this letter is to make formal demand of the City of Albuquerque for the property damage and water damage that Mr. Demers sustained in September of 1981 by reason of the negligence of the City of Albuquerque in the construction and maintenance of the street known as San Francisco, N.E. in the City of Albuquerque, and in particular at or near the intersection of San Pedro and San Francisco. On this occasion, the City, in the process of paving San Francisco and putting in sidewalks, made a cut into the curbing for the purpose of installing a handicap ramp into the sidewalk which disturbed the drainage on San Francisco and permitted a flood of water to flood onto the land of Mr. Demers causing property damage to the land (washed soil), flooding to his shop with water and mud, and required that he install a retaining wall and remove a fence, in the approximate cost of $10,000. Mr. Demers also was required to move some cabinets that were water damaged.

At the time, a complaint was made to Mayor Rusk's office and he dispatched an Aid, Mr. Wilson, who investigated the situation thoroughly and subsequently the City took measures to erect a retaining wall which thus far has abated the problem on the front of the lot. There remains, however, a flooding problem and potential problem on the rear of the lot at or near the arroyo to which your attention is invited, and we request that you take necessary steps to install a drain or drain trap with appropriate culverts to assure drainage from San Pedro to the arroyo without additional damage to Mr. Demers' property.

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

R.CHARD B. ADDIS

City Attorney's Office
January 12, 1983
Page Two

Would you please locate your file on this matter and contact my office for the purpose of settling this property damage at the earliest possible time. I might add that there is no personal injury involved in this claim.

Respectfully,

RICHARD B. ADDIS
Attorney at Law

RBA:eto

Cc: Office of the Mayor
City of Albuquerque

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

CITY OF ALBUQUERQUE

ALBUQUERQUE, NEW MEXICO

INTER-OFFICE CORRESPONDENCE

3/1/83

REF. NO._____

TO: Jim Finks, Civil Engineer

FROM: Lori K. Lacedonia, Legal Investigator LKL

SUBJECT: 6613 Hallmark NE

This memo is in reference to the conversation we had on 2/28/83. At that time you informed me that you had not received my earlier memo dated 1/28/83.

Attached is a letter from Attorney Richard B. Addis who is representing Henry Demers.

Property in question is 6613 Hallmark NE.

In summation they are stating the city permitted flooding and property damage to Mr. Demers property when they installed a handicap ramp.

I would like a copy of all your records pertaining to this address as well as a copy of any steps taken to solve this problem. Inparticular, the rear of claimant's lot so we can see if additional drainage facilities are needed.

I would appreciate your opinion as to the cause of the current flooding.

I need this information as soon as possible. Thanks for your cooperation.

DEMERS CONSTRUCTION COMPANY

IN

ALBUQUERQUE, NEW MEXICO

RECEIVED
MAY 21 1970
CITY ENGINEER

DRAINAGE REPORT
FOR

LOT 16, 15 & 12A
BLOCK 6, TRACT "A"
NORTH ALBUQUERQUE ACRES SUBDIVISION

Prepared by

ANDREWS, ASBURY & ROBERT, INC.
Consulting Engineers

401 San Pedro, NE
Albuquerque, New Mexico 87108

505-265-6631

DRAINAGE REPORT
FOR
DEMERS CONSTRUCTION COMPANY
IN
ALBUQUERQUE, NEW MEXICO

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MAPS		
	Location Map	
	Grading Plan	

(See special pocket at back of report for Grading Plan)

I

INTRODUCTION

A. GENERAL

This Drainage Plan was prepared for Demers Construction Company by Andrews, Asbury & Robert, Inc., Consulting Engineers.

The property discussed in this report is located at the intersection of San Pedro Boulevard and San Francisco Road, Block 6 of Tract "A", Unit "A", North Albuquerque Acres Subdivision. More particularly, the property described consists of Lots 16, Lot 15 (divided into three 55' x 234' parcels) and the westerly one-third of Lot 12 (designated 12-A). See Location Map.

A one-hundred year frequency occurrence interval storm was used in the computations which are included in this report to determine the peak rate of storm water runoff from the applicable drainage areas.

B. EXISTING SITE CONDITIONS

1. Lot 16 is presently undeveloped with the exception of City utilities and fencing along the west property line. The site is a parcel containing 0.73 acres of which approximately 6250 ft.^{2} will be used to construct a prefabricated steel building (50' x 125'). No paving or other improvements beyond the building are proposed for this site.

2. Lots 15A, B & C are presently undeveloped with the exception of City utilities and fencing around the boundary. These sites are parcels containing 0.30 acres, of which approximately 2250 ft.^{2} will be used to

construct a prefabricated steel building (30' x 75') on Lot 15C, and approximately 1250 ft.^{2} will be used to construct prefabricated steel buildings (50' x 75') on Lots 15A and 15B. It is not proposed, at this time, to improve the remaining area with pavement or gravel or to make any other improvements beyond the building construction (see Grading Plan).

3. Lot 12A is presently undeveloped with the exception of City utilities and fencing around the boundary. This site is a parcel containing 0.30 acres of which approximately 1250 ft.^{2} will be used to construct a prefabricated steel building (25' x 50'). No other site improvements are proposed for this parcel.

4. Drainage Channel. An existing major drainage channel has been constructed along the south property line. The channel has been concrete-lined from the box culvert under San Pedro Boulevard, and this lining extends to the West approximately 200 feet.

5. Topography. The area topography of this area consists of a generally mild terrain which gently slopes from the east to the west at a grade of approximately 2%.

6. Solution. The Engineering Computations, which are included in this report, address the storm water runoff which would occur based on a 100-year frequency storm. These computations depict the initial storm water runoff, the resulting runoff after improvements are made and the proposed ponding which will prevent any increased runoff.

ENGINEERING

COMPUTATIONS

ANDREWS, ASBURY & ROBERT, INC.
CONSULTING ENGINEERS
401 San Pedro, NE., Albuquerque, N.M. 87108
Telephone (505) 265-6631

STORM DRAINAGE ANALYSIS

1. CRITERIA

RUNOFF VOLUME SHALL NOT INCREASE DUE TO DEVELOPED CONDITIONS. THE BASIS OF STORMWATER RUNOFF COMPUTATIONS SHALL BE A 100 YEAR FREQUENCY STORM.

RAINFALL = 2.6 INCHES = 100 YEAR FREQUENCY STORM.

2. RUNOFF

C = COEFFICIENT OF RUNOFF.

C = 0.95 ROOF SURFACE
C = 0.40 UNSURFACED AREAS.

LOT 16

EXISTING CONDITIONS:

AREA = 135' x 234' = 31,590 FT²
C = 0.40 (NO IMPROVEMENTS)
VOLUME OF RUNOFF
$\frac{2.6 \text{ IN}}{12 \text{ IN/FT}}$ (31,590 FT²)(0.40) = 2738 FT³

DEVELOPED CONDITIONS:

BUILDING (50' x 125') = 6250 FT²
UNSURFACED AREA = 31,590 FT² − 6250 FT² = 25,340 FT²

VOLUME OF RUNOFF RESULTING FROM IMPROVED CONDITIONS

$\frac{2.6 \text{ IN}}{12 \text{ IN/FT}}$ (25,340 FT²)(0.40) = 2196 FT³

$\frac{2.6 \text{ IN}}{12 \text{ IN/FT}}$ (6250 FT²)(0.95) = 1286 FT³

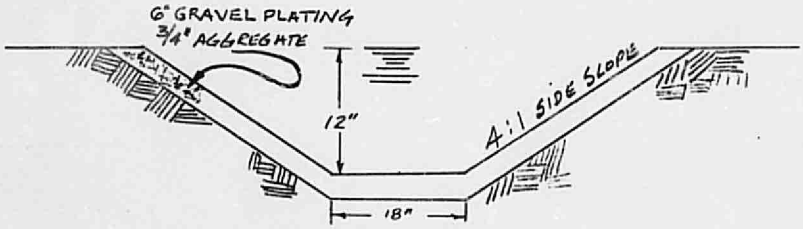
2196 + 1286 = 3,482 FT³

(IMPROVED) − (ORIGINAL) = PONDING REQUIRED
3,482 FT³ − 2738 FT³ = 744 FT³

THEREFORE A DETENTION POND WITH A CAPACITY OF 744 FT³ WILL BE REQUIRED

ANDREWS, ASBURY & ROBERT, INC. CONSULTING ENGINEERS 401 San Pedro, NE., Albuquerque, N.M. 87108 Telephone (505) 265-6631	Project DEMERS CONSTRUCTION COMPANY Sheet 2 of 6 Lot 16, Tract "A", No. Alb. Acres Job No. 79-161 By CTA Chk'd _____ Date May, 1979

LOT 16



TRENCH SECTION

BUILD TRENCH SECTION 170 FEET LONG, ALONG WEST SIDE OF PROPERTY, PARALLEL TO WEST FENCE LINE.

AVERAGE SECTIONAL AREA REQUIRED

$\frac{744 \text{ FT}^3}{170 \text{ FT}} = 4.38 \text{ FT}^2$ (SEE GRADING & DRAINAGE PLAN)

AVERAGE AREA $= \frac{(4 \times 1) + (4 \times 1)}{2} + (1 \times 1\frac{1}{2}) = 5.5 \text{ FT}^2$

$5.5 \text{ FT}^2 > 4.38 \text{ FT}^2$ OK

CONSTRUCT A TRENCH WITH 4:1 SIDESLOPES, ONE FOOT DEEP WITH AN 18" BOTTOM SECTION 170 FT LONG.

ANDREWS, ASBURY & ROBERT, INC. CONSULTING ENGINEERS 401 San Pedro, NE., Albuquerque, N.M. 87108 Telephone (505) 265-6631	Project DEMERS CONSTRUCTION COMPANY Sheet 3 of 6 Lot 15, Tract "A", No. Alb. Acres Job No. 79-161 By CTA Chk'd _____ Date May, 1979

LOT 15-C

EXISTING CONDITIONS

AREA = 55' x 234' = 12,870 FT²
C = 0.40 (NO IMPROVEMENTS)
VOLUME OF RUNOFF.

$\frac{2.6 \text{ IN}}{12 \text{ IN/FT}}$ (12,870 FT²)(0.40) = 1115 FT³.

DEVELOPED CONDITIONS.

BUILDING (75' X 30') = 2250 FT²
UNSURFACED AREA = 12,870 FT² - 2250 FT² = 10,620 FT²

VOLUME OF RUNOFF RESULTING FROM IMPROVED CONDITIONS

$\frac{2.6 \text{ IN}}{12 \text{ IN/FT}}$ (10,620 FT²)(0.40) = 920 FT³

$\frac{2.6 \text{ IN}}{12 \text{ IN/FT}}$ (2250 FT²)(0.95) = 463 FT³

920 FT³ + 463 FT³ = 1383 FT³

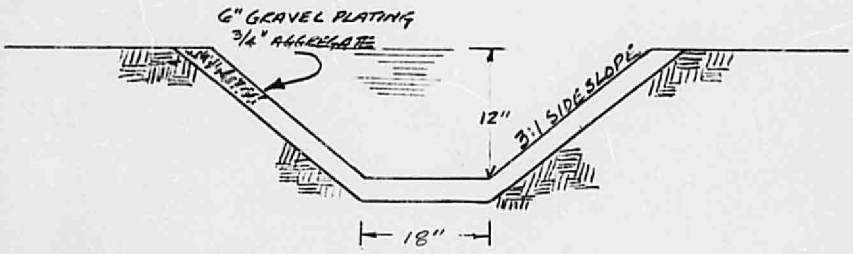
(IMPROVED) − (ORIGINAL) = PONDING REQUIRED

1383 FT³ − 1115 FT³ = 268 FT³

THEREFORE A DETENTION POND WITH A CAPACITY OF 268 FT³ WILL BE REQUIRED.

ANDREWS, ASBURY & ROBERT, INC. CONSULTING ENGINEERS 401 San Pedro, NE., Albuquerque, N.M. 87108 Telephone (505) 265-6631	Project DEMERS CONSTRUCTION COMPANY Sheet 4 of 6 Lot 15, Tract "A", No. Alb. Acres Job No. 79-161 By CTA Chk'd Date May, 1979

LOT 15C



TRENCH SECTION

BUILD A TRENCH SECTION 60 FEET LONG, ALONG WEST SIDE OF PROPERTY, PARALLEL TO WEST FENCE LINE.

AVERAGE SECTIONAL AREA REQUIRED

$$\frac{268\ FT^3}{60\ FT} = 4.47\ FT^2 \text{ (SEE GRADING \& DRAINAGE PLAN)}$$

$$\text{AVERAGE AREA} = \frac{(3 \times 1) + (3 \times 1)}{2} + (1 \times 1\tfrac{1}{2}) = 4.5\ FT^2$$

$$4.5\ FT^2 > 4.47\ FT^2 \quad \underline{OK}$$

CONSTRUCT A TRENCH WITH 3:1 SIDESLOPES, ONE FOOT DEEP WITH AN 18" BOTTOM SECTION 60 FEET LONG.

ANDREWS, ASBURY & ROBERT, INC.
CONSULTING ENGINEERS
401 San Pedro, NE., Albuquerque, N.M. 87108
Telephone (505) 265-6631

Project DEMERS CONSTRUCTION COMPANY Sheet 5 of 6
Lots 15 & 12A, Tract "A", No. Alb. Acres Job No. 79-161
By CTA Chk'd Date May, 1979

LOTS 15 B, A AND 12 A

EXISTING CONDITIONS.

AREA = 55 X 234 = 12,870 FT²
C = 0.40 (NO IMPROVEMENTS)
VOLUME OF RUNOFF

$\frac{2.6 \text{ IN}}{12 \text{ IN/FT}}$ (12,870 FT²)(0.40) = 1115 FT³

DEVELOPED CONDITIONS

BUILDING (25' X 50') = 1250 FT²
UNSURFACED AREA = 12,870 FT² - 1250 FT² = 11620 FT²

VOLUME OF RUNOFF RESULTING FROM IMPROVED CONDITIONS

$\frac{2.6 \text{ IN}}{12 \text{ IN/FT}}$ (11620 FT²)(0.40) = 1007 FT³

$\frac{2.6 \text{ IN}}{12 \text{ IN/FT}}$ (1250 FT²)(0.95) = 257 FT³

1007 FT³ + 257 FT³ = 1264 FT³

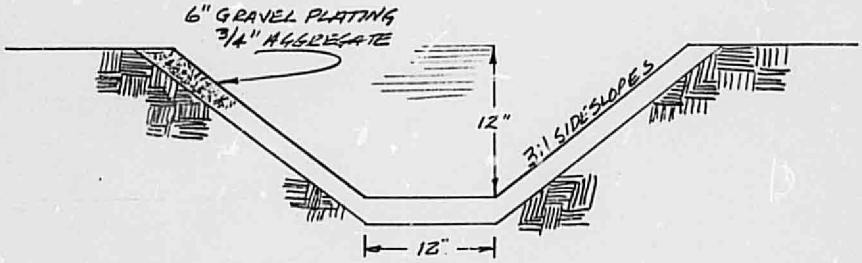
(IMPROVED) - (ORIGINAL) = PONDING REQUIRED

1264 FT³ - 1115 FT³ = 149 FT³

THEREFORE, A DETENTION POND WITH A CAPACITY OF 149 FT³ WILL BE REQUIRED

ANDREWS, ASBURY & ROBERT, INC. CONSULTING ENGINEERS 401 San Pedro, NE., Albuquerque, N.M. 87108 Telephone (505) 265-6631	Project DEMERS CONSTRUCTION COMPANY Sheet 6 of 6 Lots 15 & 12A, Tract "A", No. Alb. Acres Job No. 79-161 By CTA Chk'd _____ Date May, 1979

LOT 15B, 15A & 12A



TRENCH SECTION

BUILD A TRENCH SECTION 50 FEET LONG, ALONG WEST SIDE OF PROPERTY, PARALLEL TO FENCE LINE.

AVERAGE SECTIONAL AREA REQUIRED

$\frac{149 \text{ FT}^3}{50 \text{ FT}} = 2.98 \text{ FT}^2$ (SEE GRADING & DRAINAGE PLAN)

AVERAGE AREA $= \frac{(3 \times 1) + (3 \times 1)}{2} + (1 \times 1) = 4 \text{ FT}^2$

$4 \text{ FT}^2 > 2.98 \text{ FT}^2$ OK

CONSTRUCT A TRENCH WITH A 3:1 SIDESLOPES, ONE FOOT DEEP WITH A 12" BOTTOM SECTION 50 FEET LONG.

ANDREWS, ASBURY & ROBERT, INC.
CONSULTING ENGINEERS
401 San Pedro, NE., Albuquerque, N.M. 87108
Telephone (505) 265-6631

Project: Demers Const. Sheet 1 of 2
Supplemental Calc. Job No. 161
By: RSF Chk'd: Date: July 10, 77

Off Site Runoff

Total Area = 130.2 ac.

Elevation difference = ΔH = 5430 - 5242 = 188 ft.

Length of basin = 7590 ft.

TC = 21 mins (from P.2. Kirpich)

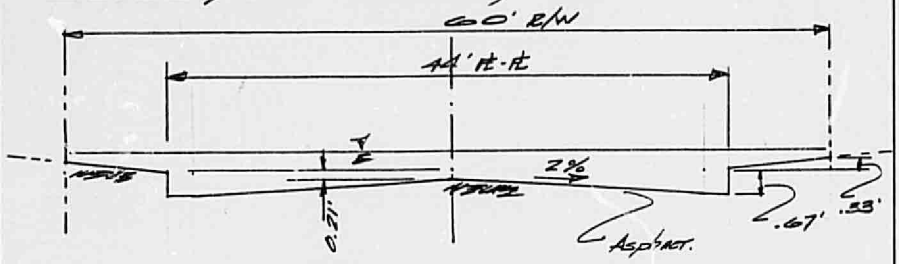
C = residential area = 0.65

$$I = \frac{189}{25+TC} = \frac{189}{46} = 4.11 \text{ in/hr.}$$

$$Q = CIA = .65 \times 4.11 \times 130.2 = 347.8 \text{ cfs}$$

∴ peak flow in San Francisco at San Pedro = 347.8 cfs

Determination of water surface in San Francisco Drive for a future developed state, for



Typical Street Section

ANDREWS, ASBURY & ROBERT, INC.
CONSULTING ENGINEERS
401 San Pedro, NE., Albuquerque, N.M. 87108
Telephone (505) 265-6631

Project Demers Const. Sheet 2 of 2
Supplementary Calc. Job No. 161
By RSE Ch'd _____ Date July 10, 79

Assume water surface is 0.46 ft above top of curb

$\therefore$ $A = 29.4\ ft^2$

$P = 61.6\ ft$

$R^{2/3} = 0.6092$

$S = 2.87\%$ $\Rightarrow$ $S^{1/2} = 0.1694$

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

$$= \frac{1.486}{.013} \times 0.6092 \times 0.1694 \times 29.4 = 346.8\ cfs$$

OK

Then water surface, for 100 year storm, is approximately 0.46 ft above the future top of curb.