HYDROLOGY G15/D19 AMERICAN FURNITURE

G15 / D19

AMERICAN
FURNITURE

2 PLANS

INFORMATION SHEET

PROJECT TITLE American Furniture TYPE OF SUBMITTAL Drainage and Grading

ZONE ATLAS PAGE NO. G-15 & CITY ADDRESS Comanche and I-25

LEGAL DESCRIPTION Tract 3 of the summary plat of lands of J. . Nance

ENGINEERING FIRM C.T.S. Inc. CONTACT Chris Weiss

ADDRESS 1100 Alvarado N.E. PHONE 266-3444

OWNER American Furniture CONTACT

ADDRESS PHONE

ARCHITECT CCIC CONTACT Dick Ingstrom

ADDRESS Indian School Rd N.E. PHONE 266-5522

SURVEYOR John Iscabel CONTACT

ADDRESS PHONE

CONTRACTOR CONTACT

ADDRESS PHONE

PRE-DESIGN MEETING:

___ YES
___ NO
___ COPY OF CONFERENCE RECAP SHEET PROVIDED

PLEASE CHECK TYPE OF APPROVAL EXPECTED WITH THIS SUBMITTAL:

___ SKETCH PLAT APPROVAL
___ PRELIMINARY PLAT APPROVAL
___ SITE DEVELOPMENT PLAN APPROVAL
___ FINAL PLAT APPROVAL
___ BUILDING PERMIT APPROVAL
___ CERTIFICATE OF OCCUPANCY APPROVAL
___ ROUGH GRADING PERMIT APPROVAL
___ GRADING/PAVING PERMIT APPROVAL
XX OTHER Drainage and Grading (SPECIFY)

DATE SUBMITTED: 4-26-84

BY: Chris Weiss

APR 26 1984
HYDROLOGY SECTION

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

DESIGN HYDROLOGY SECTION
123 Central NW, Albuquerque, NM 87102
(505) 766-7644

May 22, 1984

Mr. Chris Weiss
CTS, Inc.
1100 A Alvarado NE
Albuquerque, NM 87110

REF: GRADING AND DRAINAGE PLAN FOR AMERICAN FURNITURE (G15-D19)
RECEIVED APRIL 26, 1984

Dear Chris:

I have reviewed the above referenced submittal and forward the following comments:

1. The analysis of the upstream and on-site runoff is very well presented and I cannot disagree with it.

2. During our field inspection, as I recall, it was determined that the control point for the allowable discharge would be the downstream pond and the cutfall structure. The downstream capacity has not been addressed, other than the 2-36" pipe crossing the RR, to justify the proposed discharge rate of 120 c.f.s. Will the downstream system be able to except this proposed discharge without causing flooding on adjacent and downstream properties?

Should you have any questions or comments, please contact me.

Sincerely yours,

Billy J. Goolsby

Billy J. Goolsby, PE
City/County Flood Plain Admin.

BJG:mrk

G15-D19

H 16

P.O. Box 142, Sandia Park, New Mexico 87047

May 31, 1984

G15-D19

RECEIVED
JUN 06 1984
HYDROLOGY SECTION

Mr. Billy J. Goolsby
Design Hydrology Section
City of Albuquerque
P.O. Box 1293
Albuquerque, New Mexico 87102

REF: May 22, 1984 letter on American Furniture Grading and Drainage Plan.

Dear Billy:

As a result of your comments concerning the 120 cfs discharge rate from the proposed American Furniture pond and its potential for causing downstream flooding, we have conducted additional field work. A sketch of the area showing elevations at selected spots is attached.

From our previous analysis and the data shown of the sketch, we have the following comments:

1. The maximum head on the 2-36" culverts in the American Furniture pond is about 6', whereas on the National Industries pond culverts (west end) the maximum head will be 4-5'. At 3.2' of head, flow will begin exiting the National Industries pond through the north-side spillway (elevation = 5028.0'). At 4.7' of head (elevation = 5029.5) about 60 cfs will exit the pond via the spillway.

2. Field examination indicates that most of the flow from the spillway at the National Industries pond will move onto and across Carmony Road to the 42" RCP to the north-west. Some of the water could move to the west and then south to a large depression on the west side of the National Industries property. There are no structues in the vicinity of this depression.

May 31, 1984

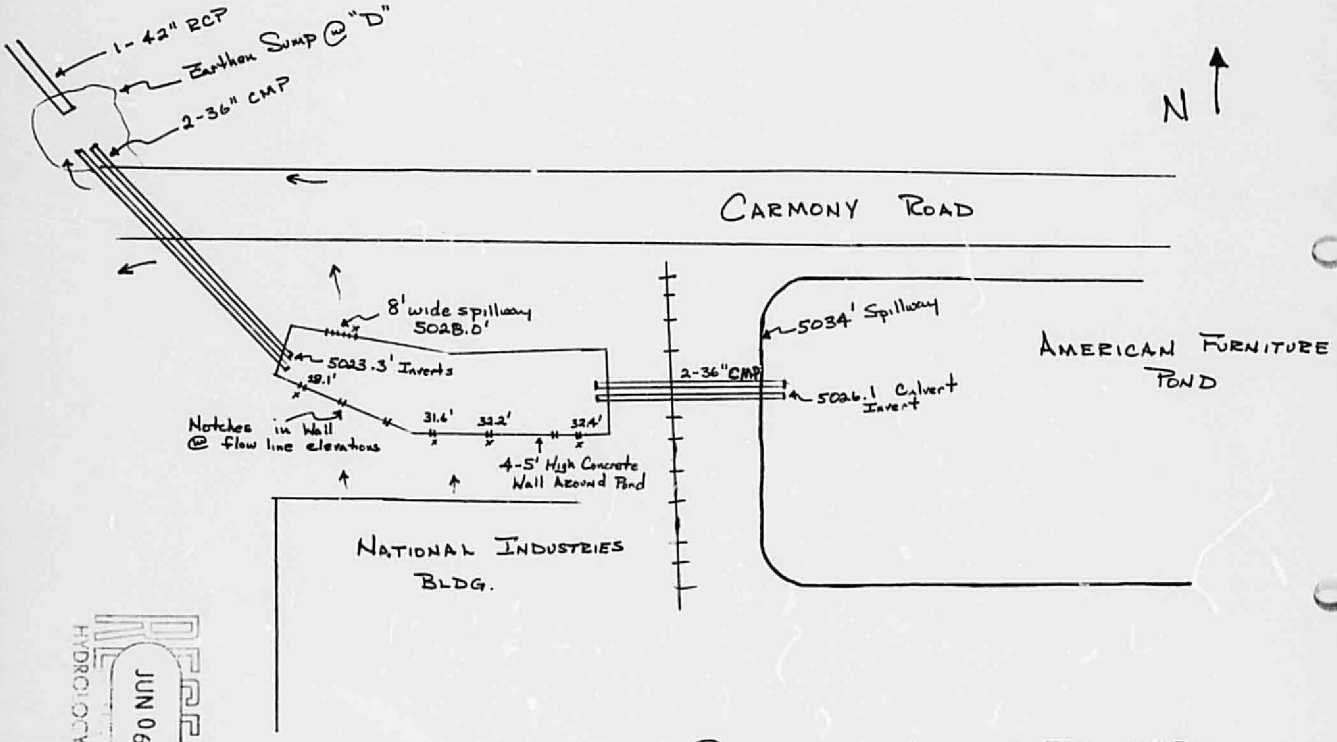
Mr. Billy Goolsby
Page Two

3. We believe there is virtually no chance that the proposed maximum discharge of 120 cfs will induce flooding problems on adjacent or downstream properties. Rather, the American Furniture pond with the controlled discharge of 120 cfs should dramatically reduce the existing downstream flood hazard. Without the pond, peak flow (Q100) is estimated at about 290 cfs.

Please call if you have additional comments. Thank you for your consideration and prompt review.

Yours Truly,

Christopher Weiss
C.T.S. Inc.



RECEIVED
JUN 06 1984
HYDROLOGY SECTION

SKETCH OF AMERICAN FURNITURE -
NATIONAL INDUSTRIES AREA
(No Scale)

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

DESIGN HYDROLOGY SECTION
123 Central NW, Albuquerque, NM 87102
(505) 766-7644

June 29, 1984

Mr. Christopher Weiss
CTS, Inc.
1100 A Alvarado NE
Albuquerque, NM 87110

REF: UPDATE TO GRADING AND DRAINAGE PLAN FOR AMERICAN FURNITURE WAREHOUSE (G15-D19) RECEIVED JUNE 6, 1984

Dear Chris:

Based on the information submitted, the above referenced plan and report, dated April 25, 1984, is approved.

Please attach a copy of this plan to the construction set prior to release of the building permit.

Also, for my information, did Mr. Hines really work on this report back in 1979?

If I can be of further assistance, please contact me at 766-7644.

Sincerely yours,

Billy J. Goolsby

Billy J. Goolsby, PE
City/County Flood Plain Admin.

BJG:mrk

PROJECT TITLE Americ Furnitrue Company TYPE OF SUBMITTAL Drainage and Grading

ZONE ATLAS PAGE NO. G-15 & 16 D19 CITY ADDRESS None

LEGAL DESCRIPTION Tract 3 of the summary plot of lands of J.R. Nance.
Area = 19.892 acres.

ENGINEERING FIRM C.T.S. INc CONTACT Chris Weiss

ADDRESS 1100 Alvarado N.E. PHONE 266-3444

OWNER American Furniture Company CONTACT

ADDRESS PHONE

ARCHITECT CONTACT

ADDRESS PHONE

SURVEYOR CONTACT

ADDRESS PHONE

CONTRACTOR CONTACT

ADDRESS PHONE

PRE-DESIGN MEETING:

___ YES
___ NO
___ COPY OF CONFERENCE RECAP SHEET PROVIDED

PLEASE CHECK TYPE OF APPROVAL EXPECTED WITH THIS SUBMITTAL:

___ SKETCH PLAT APPROVAL
___ PRELIMINARY PLAT APPROVAL
___ SITE DEVELOPMENT PLAN APPROVAL
___ FINAL PLAT APPROVAL
___ BUILDING PERMIT APPROVAL
___ CERTIFICATE OF OCCUPANCY APPROVAL
___ ROUGH GRADING PERMIT APPROVAL
___ GRADING/PAVING PERMIT APPROVAL
XX OTHER Grading & Drainage (SPECIFY)

RECEIVED
JUL 10 1984
HYDROLOGY SECTION

DATE SUBMITTED: 7-6-84

BY: Christopher Weiss

Hydrology Accepted:

Date:

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

DESIGN HYDROLOGY SECTION
123 Central NW, Albuquerque, NM 87102
(505) 766-7644

July 26, 1984

Mr. Christopher Weiss
C.T.S., Inc.
1100 A Alvarado NE
Albuquerque, New Mexico 87110

RE: RESUBMITTAL OF GRADING & DRAINAGE PLAN FOR AMERICAN FURNITURE WAREHOUSE (G-15 D-19) RECEIVED JULY 10, 1984.

Dear Chris Weiss:

The above referenced plan, dated July 10, 1984 is approved.

Please attach a copy of this approved plan to the construction set prior to issuance of the building permit.

If I can be of further assistance, please contact me at 776-7644.

Sincerely,

Carlos Montoya
Civil Engineer/Hydrology

CM/cl

DRAINAGE INFORMATION SHEET

G15 / D19

PROJECT TITLE: American Furniture warehouse ZONE ATLAS/DRNG. FILE #: ~~G-15 & 16~~

LEGAL DESCRIPTION: Tract 3 of the summary plat of the lands of J.R. Nance.

CITY ADDRESS: Commanche & I25

ENGINEERING FIRM: Weiss-Hines Eng. CONTACT: Chriss Weiss

ADDRESS: 1100 Alvarado PHONE: 266-3444

OWNER: American Furniture CONTACT:

ADDRESS: PHONE:

ARCHITECT: Dick Engstrom CONTACT:

ADDRESS: 320 Central S.W. Suite 12 PHONE:

SURVEYOR: CONTACT:

ADDRESS: PHONE:

CONTRACTOR: CONTACT:

ADDRESS: PHONE:

SV 84 26 9/25/84

delegated to Sur. & Planning

PRE-DESIGN MEETING:

✓ YES

___ NO

___ COPY OF CONFERENCE RECAP SHEET PROVIDED

RECEIVED MAR 06 1985 HYDROLOGY SECTION

DRB NO. 84-529 7/31/84

EPC NO.

PROJ. NO.

TYPE OF SUBMITTAL:

___ DRAINAGE REPORT

___ DRAINAGE PLAN

___ CONCEPTUAL GRADING & DRAINAGE PLAN

___ GRADING PLAN

___ EROSION CONTROL PLAN

✓ ENGINEER'S CERTIFICATION

CHECK TYPE OF APPROVAL SOUGHT:

___ SKETCH PLAT APPROVAL

___ PRELIMINARY PLAT APPROVAL

___ SITE DEVELOPMENT PLAN APPROVAL

___ FINAL PLAT APPROVAL

___ BUILDING PERMIT APPROVAL

___ FOUNDATION PERMIT APPROVAL

✓ CERTIFICATE OF OCCUPANCY APPROVAL

___ ROUGH GRADING PERMIT APPROVAL

___ GRADING/PAVING PERMIT APPROVAL

___ OTHER _____ (SPECIFY)

DATE SUBMITTED: 3-6-85

BY: Dian Jordan

Date Received _____ Received by _____

WEISS-HINES ENGINEERING, INC.

March 5, 1985

Mr. Fred Aguirre, P.E.
City of Albuquerque, Engineering Division
P.O. Box 1293
Albuquerque, NM 87103

RECEIVED
MAR 06 1985
HYDROLOGY SECTION

Re: Certification of American Furniture Warehouse Improvements for Issuance of C.O. from Hydrology

Dear Fred:

On Tuesday the 5th, I inspected the above referenced site for compliance with the approved plan. Changes to plan regarding asphalt limits, curbs and walks are noted on the as-built submittal.

The site was constructed in substantial compliance to the approved plan. Aside from minor elevation variances, the site drains as planned.

Variations are as follows:

- Some of the parking islands were not constructed with concrete curb but rather stripped to follow the intended outline. No change to flow patterns have occured due to this change.

- The access loop around the south and west side of the building was not surfaced with asphalt, but has been graded to follow the grades of the approved plan and conveys runoff per the plan.

- The concrete retaining wall along the west side of the access loop at the SW corner of the site was not constructed. The grade differences are accomplished within the property with slope transitions.

CIVIL ENGINEERING / HYDROLOGY / ENVIRONMENTAL DESIGN
1100 ALVARADO N.E. SUITE B ALBUQUERQUE, NEW MEXICO 87110 (505) 266-3444

- A chain-link fence was constructed around the south and east portion of the site, with gates at Yale Blvd. and the loading dock areas.

- The parking stalls and walk apron at the building's entrance were changed as shown. Drainage patterns were unaffected.

I have signed the certification statement on the as-built plan. If you have any questions concerning the scope of these changes, please call me.

Thank you,

Christopher Weiss
Weiss-Hines Engineering

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

DESIGN HYDROLOGY SECTION
123 Central NW, Albuquerque, NM 87102
(505) 766-7644

March 14, 1985

Chris Weiss
Weiss-Hines Engineering
1100-A Alvarado, NE
Albuquerque, New Mexico 87110

RE: CERTIFICATION FOR AMERICAN FURNITURE WAREHOUSE
(G-15/D19) RECEIVED MARCH 6, 1985

Dear Mr. Weiss:

Based on the information provided on your March 6, 1985 submittal, certification for the referenced drainage plan is acceptable.

Please be advised that if the access road on the west side of the project is to be paved in the near future, adequate steps for slope stability may be required where the retaining wall was deleted.

If you have any questions or comments regarding this project, please call me at 766-7644.

Cordially,

Bernie J. Montoya

Bernie J. Montoya, C.E.
Engineering Assistant

BJM/bsj

SCANLON & ASSOCIATES INC.
CONSULTING ENGINEERS

June 10, 1986

85134

RECEIVED
JUN 11 1986
HYDROLOGY SECTION

G15-D19

Mr. Billy Goolsby, Engineer
Design Hydrology
City of Albuquerque
P.O. Box 1293
Albuquerque, NM 87103

Re: Alexander Blvd. Roadway Improvements
Comanche Road to Carmony Lane

Dear Mr. Goolsby:

Please find attached, the following supporting computations and information with regard to the effect of the above project on the existing American Furniture Warehouse Plus stormwater detention pond:

1. Copy of map showing "as constructed" dimensions of the detention basin vs. plan dimensions.

2. Copies of printouts from HYMO computer program models of the detention basin for both pre-project (Alexander Boulevard) and post-project conditions.

   a. The inflow hydrograph shown was taken directly from sheet 2 of 2 of the Drainage Plan for American Furniture Company developed by Consultants, Terra Sol Inc. in May 1983.

   b. The Stage-Storage-Outflow curve was generated from sheet 1 of 2 (the grading plan for the site) and a standard CMP discharge nomograph.

The pre-project model shows the detention pond to have overflowed at approximately time = 0.83 hrs when the present top of bank elevation 32.0 ± was exceeded. The estimated maximum water surface elevation obtained under existing conditions for a 100 year event is 33.0.

PLEASE REPLY TO:
☑ ALBUQUERQUE, NEW MEXICO 87110-7897 — 8008 PENNSYLVANIA CIRCLE NE — TELEPHONE: (505) 265-8941
☐ ARTESIA, NEW MEXICO 88210-2041 — 510 WEST TEXAS AVENUE — TELEPHONE: (505) 746-1010
☐ SANTA FE, NEW MEXICO 87501-3981 — 1570 PACHECO STREET, SUITE-A-7 — TELEPHONE: (505) 983-3323

The current design of Alexander Boulevard would cause a reduction in the capacity of the detention pond of approximately 10%, but at the same time increase the top of bank elevation along the west end from 32.0 to 33.5. The post-project model shows an estimated maximum water surface elevation obtained of 33.34.

For this reason it appear that the Alexander Boulevard project will not appreciably reduce the present capacity of the pond, but may actually help the situation by adding some additional freeboard. In addition, approximately 2.7 acres of parking lot along the south end of the American Furniture building, originally envisioned to contribute runoff to the detention pond, will be redirected south to Comanche Road via the Alexander Boulevard project.

Let us know if you have any questions or comments. Thank you for you attention.

Sincerely,

SCANLON AND ASSOCIATES, INC.

Scott A. Verhines

Scott A. Verhines, PE
Project Manager

cc: Akbar Sharifian, C.O.A. Transporation Department

FILE COPY

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

DESIGN HYDROLOGY SECTION
123 Central NW, Albuquerque, NM 87102
(505) 766-7644

June 16, 1986

Mr. Scott Verhines
Scanlon & Associates, Inc.
8008 Pennsylvania Circle NE
Albuquerque, NM 87108

REF; DRAINAGE SUBMITTAL FOR ALEXANDER BOULEVARD ROADWAY IMPROVEMENTS
(G15/D19) RECEIVED JUNE 11, 1986

Dear Mr. Verhines:

The above referenced submittal is approved for the purpose of obtaining approval for the proposed improvements.

Prior to final sign-off, please provide this office with a copy of the recorded easement for discharge into the ponding area.

If I can be of further assistancce, please advise.

Cordially,

Billy J. Goolsby

Billy J. Goolsby, PE
CE/Hydrology

BJG:mrk

cc: Andre Houle
Dan Hogan
Akbar Sharifian, Transportation Department

G15/D19

RECEIVED
JUL 07 1986
HYDROLOGY SECTION
REF. NO._____

CITY OF ALBUQUERQUE

ALBUQUERQUE, NEW MEXICO

INTER-OFFICE CORRESPONDENCE July 7, 1986

TO: Dave Parks, Chief Transportation Engineer, Transportation Section Design Division, P.W.D.

FROM: Andre Houle, Sr. Civil Engineer, Design Review Section, Design Division, P.W.D. Andre Houle

SUBJECT: Alexander Blvd. Project No. 2613
Request For Final Sign-off

I have reviewed this project with Joe Luehring and find that I cannot endorse these plans for the following concerns:

1. On April 11, 1986 our section expressed concerns on how this project will effect an existing 8.5 acre-foot pond on private land. On June 10, 1986 Jack Verhins submitted to Hydrology a study of the revised hydraulics on the pond. Our section never received a copy of the revised plan. I received the revision on July 3, 1986 and discover that this project has revised the pond geometry and increased the pond from 8.5 to 10.7 acre-feet. This revision puts this facility under the State Engineer's jurisdiction. You must get direction from the state Engineer's office on the design standards (See Drainage Ordinance Section 6, subsection C).

2. At the Comment Review Meeting on May 20, 1986 I expressed concern for draining "public" runoff thru a private detention pond and how this will effect maintenance responsibility and public Liability. I specifically requested a drainage covenant or easement from American Furniture which would

   a) Recognize and allow public drainage to be routed thru their pond.
   b) Address Liability concerns.
   c) Address maintenance responsibility and provisions for non-performance of such by American Furniture site.
   d) Agreement must be attached to the site in the event this facility is sold to another private individual or entity.

Conclusion:

I cannot sign or recommend signing these plans until these two concerns are addressed. My recommendations to resolve these problems are:

1. Meet with the State Engineer and determine design standards.
2. Meet with your attorney to draft up a proper document addressing all concerns on the drainage covenant and easement.

cc: Jim Hicks
Fred Aguirre
Joe Luehring

G15/D19

235

86 51639

GRANT OF EASEMENT
FOR
STORM SEWER EASEMENT

RECEIVED
JUN 25 1986
HYDROLOGY SECTION

THIS INDENTURE made and executed this Third day of June, 1986 by and between The Tanager Company in the County of Bernalillo and State of New Mexico hereinafter called the Grantors and THE CITY OF ALBUQUERQUE, NEW MEXICO, a municipal corporation, hereinafter called the Grantee.

WITNESSETH, that for valuable considerations the receipt of which is hereby acknowledged the Grantors have this day bargained and sold and by these presents do sell, convey and deliver unto the City of Albuquerque a permanent easement as right-of-way including the permanent right to enter upon the real estate hereinafter described at any time that it may see fit and construct, maintain and repair storm sewer lines across, through, and under the lands hereinafter described and the further right to remove trees, bushes, undergrowth and obstructions interfering with the location, construction and maintenance of said utility.

The land affected by the grant of this easement and right-of-way is located in the County of Bernalillo and State of New Mexico and is more particularly described as follows:

SEE ATTACHED EXHIBIT "A"

TO HAVE AND TO HOLD the said right and easement for the uses and purposes aforesaid, unto Grantee its successors and assigns for so long as said easement shall not be abandoned for use as a right-of-way for aforesaid sewer lines.

The Grantors do hereby covenant with Grantee that they are lawfully seized and possessed of the real estate above described and that they have a good and lawful right to convey it or any part thereof, that it is free from all encumbrances except those of record and taxes due and owing the Treasurer of Bernalillo County and that they will forever warrant and defend the title thereto against the lawful claims of all persons whomsoever.

Page Two
Grant of Easement

As a part of the consideration for this grant, the Grantors do hereby release any and all claims for damages for whatsoever cause incidental to the exercise of the rights herein granted provided, however, that the Grantee agrees to save Grantors harmless from any and all liability that may arise as a result of the construction and use of the easement for the purposes set forth.

IN WITNESS WHEREOF, the parties have set their hands and seals this 3rd day of June, 1986.

THE TANAGER COMPANY

Lee Blaugrund

By: Lee Blaugrund
Partner

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

The foregoing instrument was acknowledged before me this 3rd day of June, 1986 by Lee Blaugrund, Partner, of The Tanager Company

Lorie Ann Howe
Notary Public

My commission expires:
April 5, 1988

STATE OF NEW MEXICO
COUNTY OF BERNALILLO
FILED FOR RECORD

1986 JUN -9 PM 2:46

Bk M5360 Pg 235-237
FLORES C. WALLER
CO. CLERK & RECORDER
Susan G DEPUTY

UTILITY EASEMENT
FOR
STORM DRAIN PIPE
FROM
ALEXANDER BOULEVARD
TO
AMERICAN FURNITURE WAREHOUSE PLUS
DETENTION BASIN

BEGINNING at a point on the east line of the road and utility easement for Alexander Boulevard from which the brass cap monument N.M. I-25-20 bears N 72° 26' 58" E a distance of 2062.28 feet; and from which the northwest corner of Tract 3 of the Amended Annexation Plat of the southwest portion of Tract 3 of the Land of J.R. Nance and Annexation of Comanche - Griegos Road N.E. (as filed in Vol. C25, Fol. 6) bears N 00° 54' 45" W a distance of 222.64 feet;

THENCE N 15° 09' 03" E a distance of 33.41 feet along the east line of said road and utility easement for Alexander Boulevard;

THENCE N 51° 55' 19" E a distance of 35.04 feet;

THENCE S 38° 04' 41" E a distance of 20.00 feet;

THENCE S 51° 55' 19" W a distance of 61.80 feet to the point of BEGINNING, containing 968.43 square feet (0.022 acres) more or less.

REGISTERED PROFESSIONAL ENGINEER AND LAND SURVEYOR
STATE OF NEW MEXICO
5396
NEAL F. GODWIN

EXHIBIT "A"

G15/D19

SCANLON & ASSOCIATES, INC.
8008 Pennsylvania Circle NE
ALBUQUERQUE, NEW MEXICO 87110
(505) 265-6941

LETTER OF TRANSMITTAL

RECEIVED
AUG 07 1986
HYDROLOGY SECTION

DATE 8-7-86	JOB NO. 85134.1
ATTENTION Mr. Billy Goolsby	
RE: Alexander Blvd. American Furniture Warehouse Plus detention pond analysis.	

TO CITY OF ALBUQUERQUE
PWD / Design - Hydrology

WE ARE SENDING YOU ☒ Attached ☐ Under separate cover via _____ the following items:

☐ Shop drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications
☐ Copy of letter ☐ Change order ☒ HYMO computations

COPIES	DATE	NO.	DESCRIPTION
	8-05-86	4 pgs	HYMO computer run printouts for retention pond analysis per discussions with City staff.
1	—	—	Copy of CMP Head-Discharge Nomograph

THESE ARE TRANSMITTED as checked below:

☒ For approval ☐ Approved as submitted ☐ Resubmit ____ copies for approval
☒ For your use ☐ Approved as noted ☐ Submit ____ copies for distribution
☒ As requested ☐ Returned for corrections ☐ Return ____ corrected prints
☐ For review and comment ☐ _____
☐ FOR BIDS DUE _____ 19____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS Billy,

Please let us know if you have any questions or need additional information.

thank you for your attention.

COPY TO FILE: 85134-B
Akbar Sharifian, PWD/Transportation

SIGNED: Scott A. Vahlias

If enclosures are not as noted, kindly notify us at once.

PRODUCT 240-3 NEBS Inc. Groton, Mass. 01471

```
* FILE: EE134EXMO.66 ALEXANDER BLVD JOB: EE134.1
*      AMERICAN FURNITURE DETENTION POND CAPACITY ANALYSIS
* DATE: 8-05-88  S.VERFIAIS TRIAL NO.8 - 4' EXCEDACEMENT
*       28' SPILLWAY @ 0.67' DEPTH
* POST PROJECT CONDITION - MODIFIED POND, 3:1 SIDE SLOPES, MAX EL= 33.00

START                 0.00 EE

STORE HYD             ID=1 HYDNO=101 DT=0.0833 HR DA=0.365 SQ MI
                      2 45 97 129 206 251 283 296 290 298 240 219 193 167
                      139 102 74 50 34 19 11 7 4 2 1

ROUTE RESERVOIR       ID=2 HYDNO=201 IA ID=1 COIF=1
                      OUTFLOW        STORAGE        ELEV
                        CFS           AC-FT          FT
                         0             0.000         27.0
                        20             1.275         28.0
                        37             2.667         29.0
                        70             4.176         30.0
                       100             5.815         31.0
                       124             7.565         32.0
                       142             9.565         33.0
                       142.1           9.609         33.05
                       149.2          10.020         33.25
                       160.2          10.432         33.45
                       173.7          10.843         33.65

PIPE FLOW ONLY

PIPE FLOW + WEIR FLOW

INFLOW HYDROGRAPH PER WEISS-HINDS STUDY FOR AMERICAN FURNITURE

STAGE - STORAGE - DISCHARGE CURVE FROM CMP NOMOGRAPH AND WEIR FLOW FORMULA:

Q = CLH^3/2 (broad crested)

C = coefficient (2.68-2.70)

Q = discharge (cfs)  L = weir length (ft)

H = head on weir (ft)

* * * * * * * * * * * * * * * * * * *

TIME      INFLOW     ELEV       VOLUME     OUTFLOW
(HRS)     (CFS)      (FEET)     (AC-FT)    (CFS)

.00        .00       27.00       .000       .00
.08      45.00       27.12       .147      2.31
.17      97.00       27.67       .596      9.34
.25     129.00       28.00      1.272     16.86
.33     206.00       28.76      2.247     31.88
.42     251.00       29.58      3.519     55.04
.50     283.00       30.43      4.888     82.89
.58     296.00       31.23      6.231    105.83
.67     297.00       31.93      7.470    122.40
.75     298.00       32.53      8.613    133.82
.83     240.00       33.11      9.516    142.01
.92     215.00       33.66     10.066    151.01
1.00    193.00       33.45     10.434    156.28
1.08    167.00       33.21     10.668    164.28
1.17    139.00       33.45     10.667    161.88
1.25    105.00       33.05     10.235    156.85
1.33     74.00       32.15      9.217    145.69
1.42     50.00       32.67      9.261    138.78
1.50     34.00       32.53      8.910    133.56
1.58     19.00       32.15      7.898    124.85
1.67     11.00       31.75      7.155    116.13
1.75      7.00       31.25      6.436    106.42
1.83      4.00       30.97      5.761     98.43
1.92      2.00       30.65      5.140     87.84
2.00      1.00       30.25      4.582     77.43
2.08       .00       29.94      4.085     68.00
2.17       .00       29.65      3.649     58.46
2.25       .00       29.49      3.275     49.29
2.33       .00       29.15      2.957     42.25
```

BEGIN FLOW OVER SPILLWAY @ EL. 33.00

MAXIMUM OUTFLOW = PIPE FLOW + WEIR FLOW

END FLOW OVER SPILLWAY @ EL. 33.00

2.42	.00	28.91	2.676	35.19
2.50	.00	28.83	2.472	34.11
2.58	.00	28.77	2.215	31.36
2.67	.00	28.52	1.998	28.83
2.75	.00	28.38	1.847	26.50
2.83	.00	28.28	1.832	24.36
2.92	.00	28.14	1.471	22.40
3.00	.00	28.02	1.323	20.59
3.08	.00	27.93	1.188	18.84
3.17	.00	27.84	1.067	16.73
3.25	.00	27.75	.957	15.02
3.33	.00	27.67	.855	13.48
3.42	.00	27.60	.771	12.10
3.50	.00	27.54	.692	10.86
3.58	.00	27.49	.621	9.75
3.67	.00	27.44	.558	8.75
3.75	.00	27.39	.500	7.85
3.83	.00	27.35	.449	7.05
3.92	.00	27.32	.403	6.32
4.00	.00	27.28	.362	5.68
4.08	.00	27.25	.325	5.09
4.17	.00	27.23	.292	4.57
4.25	.00	27.21	.262	4.10
4.33	.00	27.18	.235	3.68
4.41	.00	27.17	.211	3.31
4.50	.00	27.15	.189	2.97
4.58	.00	27.13	.170	2.66
4.66	.00	27.12	.152	2.39
4.75	.00	27.11	.137	2.15
4.83	.00	27.10	.123	1.93
4.91	.00	27.09	.110	1.73
5.00	.00	27.08	.099	1.55
5.08	.00	27.07	.088	1.39
5.16	.00	27.06	.080	1.25
5.25	.00	27.06	.072	1.12
5.33	.00	27.05	.064	1.01
5.41	.00	27.05	.058	.90
5.50	.00	27.04	.052	.81
5.58	.00	27.04	.048	.72
5.66	.00	27.03	.042	.65
5.75	.00	27.03	.037	.59
5.83	.00	27.03	.034	.53
5.91	.00	27.02	.030	.47
6.00	.00	27.02	.027	.42
6.08	.00	27.02	.024	.38
6.16	.00	27.02	.022	.34
6.25	.00	27.02	.020	.31
6.33	.00	27.01	.018	.28
6.41	.00	27.01	.016	.25
6.50	.00	27.01	.014	.22
6.58	.00	27.01	.013	.20
6.66	.00	27.01	.011	.18
6.75	.00	27.01	.010	.16
6.83	.00	27.01	.009	.14
6.91	.00	27.01	.008	.13
7.00	.00	27.01	.007	.12
7.08	.00	27.01	.007	.10
7.16	.00	27.00	.006	.09
7.25	.00	27.00	.006	.08

PEAK DISCHARGE = 164.285 CFS - PEAK OCCURS AT HOUR 1.66
MAXIMUM WATER SURFACE ELEVATION = 33.511
MAXIMUM STORAGE = 10.5584 AC-FT

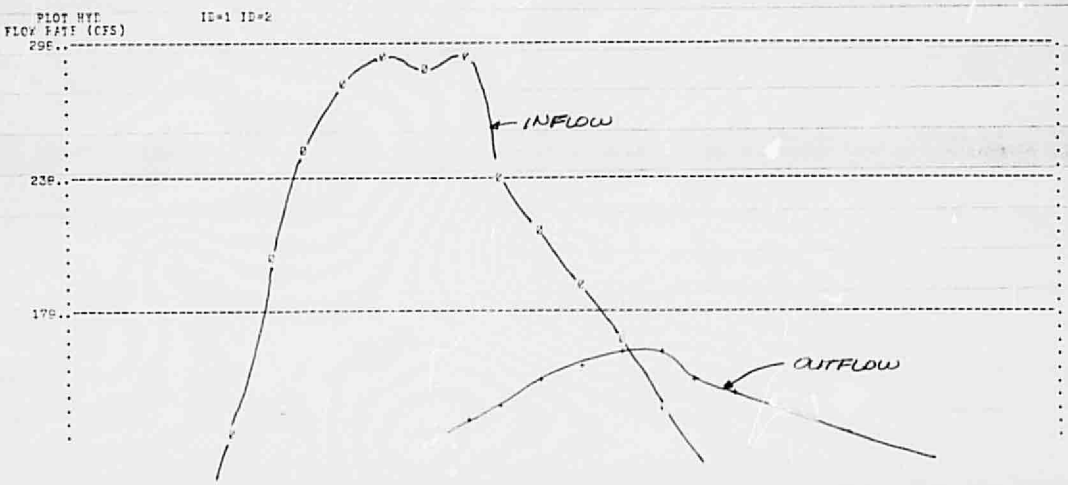
PRINT HYD ID=2 COD=0

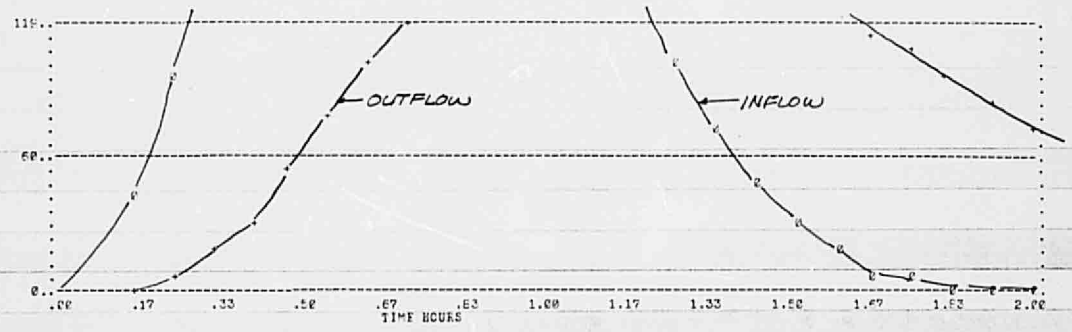
PARTIAL HYDROGRAPH 201.00

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	1.499	133.6	2.999	20.0	4.498	3.0	5.998	.4
.083	2.3	1.583	126.9	3.082	18.6	4.581	2.7	6.081	.4
.167	9.3	1.666	118.1	3.165	16.7	4.665	2.4	6.164	.3
.250	20.0	1.749	108.4	3.249	15.0	4.748	2.1	6.247	.3
.333	31.9	1.833	99.0	3.332	13.5	4.831	1.9	6.331	.3
.417	55.6	1.916	87.6	3.415	12.1	4.915	1.7	6.414	.2
.500	82.9	1.999	77.4	3.499	10.9	4.998	1.6	6.497	.2
.583	105.6	2.082	68.0	3.582	9.7	5.081	1.4	6.581	.2
.666	122.4	2.166	58.5	3.665	8.7	5.165	1.2	6.664	.2
.750	133.6	2.249	50.3	3.748	7.9	5.248	1.1	6.747	.2
.833	142.0	2.332	43.3	3.832	7.0	5.331	1.0	6.831	.1
.916	151.0	2.416	37.2	3.915	6.3	5.414	.9	6.914	.1
1.000	160.3	2.499	34.1	3.998	5.7	5.498	.8	6.997	.1
1.083	164.3	2.582	31.4	4.082	5.1	5.581	.7	7.080	.1
1.166	162.0	2.666	28.8	4.165	4.6	5.664	.7	7.164	.1
1.250	155.0	2.749	26.5	4.248	4.1	5.748	.6		
1.333	145.7	2.832	24.4	4.332	3.7	5.831	.5		
1.416	135.7	2.915	22.4	4.415	3.3	5.914	.5		

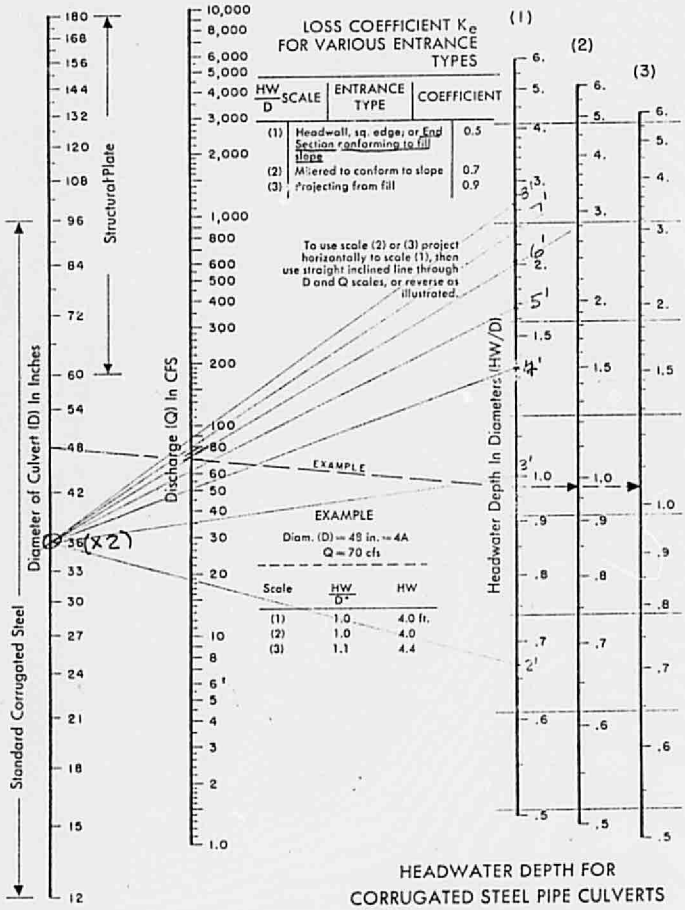
RUNOFF VOLUME = 1.3379 INCHES = 21.763 ACRE-FEET
PEAK DISCHARGE RATE = 164.2E CFS

PLOT HYD ID=1 ID=2





FINISH



HEADWATER DEPTH FOR CORRUGATED STEEL PIPE CULVERTS

G15-D19

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APR 26 1984
HYDROLOGY SECTION

Consultants terrasol inc.

DRAINAGE REPORT FOR
AMERICAN FURNITURE WAREHOUSE SITE
Albuquerque, New Mexico
April 1984

WALTER G. HINES
NEW MEXICO
7306
REGISTERED PROFESSIONAL ENGINEER
4-25-79

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NEW MEXICO
6653
REGISTERED PROFESSIONAL ENGINEER

INTRODUCTION

The proposed American furniture Warehouse site is on a 19.9 acre tract located just northwest of the corner of Comanche Road and the western I-25 frontage road. Refer to the Drainage sheet for location and flood hazard maps.

The site is situated on the west side of a developing industrial area which is bisected by I-25 and bounded on the north by the AMAFCA North Diversion Channel. Five subareas, Areas A, B, C, D, and E (total of approximately 195 acres) generate water which drains to the site. Prior to development, the Hahn Arroyo traversed the area and flowed across the northern boundary of the site. The Hahn, one of the major flood drainageways for eastern Albuquerque, is now completely diverted into the North Diversion Channel. The old channel of the Hahn, naturally sized by historic floods to convey large flows, provides a high infiltration capacity for the greatly reduced flows it now gets from local drainage.

CTS' hydrologic evaluation of the American Furniture development has been underway, off-and-on, for more than a year. The evaluation has been complicated by the modified Hahn system, uncertainties about drainage patterns along I-25, and disagreement over analytical techniques for routing offsite hydrographs to the site. Recently, more discussions with the City and additional fieldwork have been conducted.

Based on this work, we feel the new drainage plan provides a sound basis for managing on-and-off-site flows at the American Furniture site. Conservative assumptions have been used throughout the evaluation. The 8.5 acre foot detention pond, designed on the basis of a hydrograph routing analysis, should greatly reduce downstream flood hazards.

The remainder of the report describes the basic data, methods and results of the study. Please refer to the Drainage and Grading Plan sheets for many of the details mentioned in the discussion.

MAPS

The flood hazard boundary map (on Drainage sheet) was produced from 1" = 200' photomaps (G-15 and 16) taken from the Albuquerque Master Drainage Plan. The site location map was taken from the Albuquerque Zone Atlas (G-15 and 16). Detailed onsite topography for the Drainage and Grading Plans was based on a 1" = 50' topographic survey map (1' contours) prepared by John F. Esquibel (NMLS 5949) in December, 1981.

SOILS DATA

Soils data used in the hydrologic evaluation was taken from Soil Survey of Bernallilo County and Parts of Sandoval and Valencia Counties, New Mexico (Sheet 21) by SCS and others (1977). Soils in Areas A, B, and E are predominantly of the Embudo series (EmB), a gravelly sandy loam having infiltration rates of 0.6-2.0 inches per hour. Areas C and D are comprised mostly of

sandy and gravelly loam soils from the Embudo part of the Wink series (WeB). These soils have infiltration rates of 2.0-6.0 inches per hour. The American Furniture site has soils of the Bluepoint-Kokan series (BKD) which includes fine loamy sands and gravelly sands with very high infiltration rates of 6.0-20.0 inches per hour.

The EmB and WeB soils are classified in Hydrologic Soil Group B; the BKD soil is in Group A. From the standpoint of estimating "C" and "CN" factors in the Rational and Curve Number approaches, the EmB and WeB are more accurately placed in the Group A category. To ensure conservative runoff estimates, however, the EmB and WeB soils were considered as Group B for use with Plates 22.2 C-1 and C-2.

STUDY METHODOLOGY

The study methodology followed procedures outlined in the Albuquerque Development Process Manual and A Guide To Hydrologic Analysis Using SCS Methods, by McCuen (1982).

Topographic maps were examined and several site visits made to identify drainage boundaries and important drainage structures. Soils were classified and soil boundaries identified and overlain on the topographic maps. Times-of-concentration were estimated for each of the five upstream areas and the 20-acre site.

Peak flows (Q_p = 100 year) for upstream areas were estimated by both the Rational and Curve Number (CN) methods. Little difference in estimates resulted, and the Q_p's calculated by the CN

Method were chosen. This was because for Tc's $\geq$ 10 minutes we felt the CN Method is slightly more accurate. Results are shown on the Drainage sheet under II. Offsite Drainage Basins and Drainage Structures.

Onsite Q_p's (Tc < 10 minutes) were calculated by the Rational Method as shown under Undeveloped Onsite Drainage and Developed Onsite Drainage.

Hydrographs were developed for all areas using the triangular dimensionless hydrograph approach (Plate 22.2 E-1) based on the calculated Q_p and T_c values. This resulted in individual hydrographs at Study Points A, B, C, D, E and at the American Furniture site (see hydrographs on Drainage sheet).

Hydrograph Routing Method

The method used to route and combine individual hydrographs was based on the TR-20 "convex routing method" described by McCuen (1982, p. 59-63). The method uses the following simple equation

$$O_{t + \Delta t} = (1-C_r)\, O_t + CI_t$$

where $O_{t + \Delta t}$ = flow at downstream point (outflow) at time $t + \Delta t$

O_t = flow at downstream point (outflow) at time t

I_t = flow at upstream point (inflow) at time t

C_r = routing coefficient ($0 \leq C \leq 1$)

Routing coefficients (C_r) were estimated from a combination of two approaches and a general knowledge of routing distances, channel and ponding area geometry. The two approaches for estimating C_r are based on the equations

$C_r = t/K$ and

$$C_r = \frac{V}{V + 1.7} \text{ where}$$

t = routing interval (5 minutes)

K = reach travel time

V = steady flow water velocity

An example showing the procedure for routing the hydrograph from Area B to AP 603 is given below.

Time (min)	Inflow (cfs)	Computation ($C_r = 0.5$)	Outflow (cfs)
0	0	$(1-C_r)O_t + CI_t$	0
5	38	(0.5)0 + (0.5)0	0
10	81	(0.5)0 + (0.5)38	19
15	106	(0.5)19 + (0.5)81	50
20	92	(0.5)50 + (0.5)(106)	78
25	82	(0.5)78 + (0.5)92	85
30	72	(0.5)85 + (0.5)82	84
35	62	(0.5)84 + (0.5)72	78
40	52	(0.5)78 + (0.5)62	70
45	42	(0.5)70 + (0.5)52	61
50	32	(0.5)61 + (0.5)42	52
55	22	(0.5)52 + (0.5)32	42
60	12	(0.5)42 + (0.5)22	32
65	2	(0.5)32 + (0.5)12	22
70	0	(0.5)22 + (0.5)2	12

Time (min)	Inflow (cfs)	Computation (C_r = 0.5)	Outflow (cfs)
75	0	(0.5)12 + (0.5)0	6
80	0	(0.5)6 + 0	3
85	0	(0.5)3 + 0	2
90	0	(0.5)2 + 0	1
95	0	(0.5)1 + 0	0

Routing Scheme

Hydrograph A: Pt. A → Route 1000' in bar ditch to AP 603 → combine with routed hydrographs from Areas B and C → route 450' via overland flow across E to Study Pt. E → combine with Hydrograph E and routed hydrograph from D → route 600' in old Hahn channel to NW corner of American Furniture site → combine with onsite hydrograph and calculate final composite hydrograph.

Hydrograph B: Pt. B → Route 1350' in earth channel across Area C to Study Pt. C., through ponded area, and 200' via culvert under I-25 to AP 603 → combine with routed hydrographs from Areas A and C → route 450' via overland flow across E to Study Pt. E → combine with Hydrograph E and routed hydrograph from D → route 600' in old Hahn channel to NW corner of American Furniture site → combine with onsite hydrograph and calculate final composite hydrograph.

Hydrograph C: Allow brief ponding lag at Study Pt. C and route 200' via culvert under I-25 to AP 603 → combine with routed hydrographs from Areas A and B → route 450' via overland flow across E to Study Pt. E → combine with Hydrograph E and routed

hydrograph from D → route 600' in old Hahn channel to NW corner of American Furniture site → combine with onsite hydrograph and calculate final composite hydrograph.

Hydrograph D: Allow brief ponding lag at Study Pt. D and route 250' via culvert under I-25 and 650' along old Hahn channel to Study Pt. E → combine with Hydrograph E and routed composite hydrograph from AP 603 → route 600' in old Hahn channel to NW corner of American Furniture site → combine with onsite hydrograph and calculate final composite hydrograph.

Hydrograph E: Study pt. E → Combine with Hydrograph D composite hydrograph from AP 603 → route 600' in old Hahn channel to NW corner of American Furniture site → combine with onsite hydrograph and calculate final composite hydrograph.

RESULTS OF HYDROLOGIC EVALUATION

Results of the routing and compositing of the hydrographs are shown under Section III of the Drainage sheet. The final composite hydrograph at the NW corner of the American Furniture site has a peak flow of about 290 cfs and a T_c = 45 minutes. Note, however, that the peak is quite "flat." Flows are estimated to remain at or above 200 cfs from T = 20 minutes to nearly T = 60 minutes.

The shaded area on the final composite hydrograph (outflow) represents the estimated volume of detention storage needed at the site. Although no detailed reservoir routing study was done at the proposed pond site (i.e., other than the "convex routing"

procedure, the 372,000 ft^3 pond should ensure that downstream peak flows will be much less than existing peak flows.

CONCLUSIONS AND RECOMMENDATIONS

Field observations indicate that the calculated final hydrograph and detention requirements are quite conservative. In the several decades since construction of the North Diversion Channel, the old natural channel of the Hahn has been partly filled with debris and sediment. Trees are growing in the channel in several spots. The 2-36" culverts above and below the American Furniture site are partially clogged with coarse sediment. There is no evidence of overland flow from AP 603 across Area E, even though AP 603 is presumably a concentration point for flows from Areas A, B, C, and D.

These observations strongly suggest that the permeable soils in the area and the rapid infiltration in the old Hahn channel would reduce storm runoff to levels well below the calculated final hydrograph (100 year storm). Nonetheless, we recommend that the full 372,000 acre foot detention pond be constructed. In addition to providing detention and reducing downstream flood peaks, the pond would serve as a debris and sediment trap.

Hopefully, as upstream areas develop the illegal dumping of debris in the old Hahn channel will cease. If future plans are made to line the Hahn channel, the discharge capacity of the inlet and outlet culverts to the detention pond should be greatly increased.

It is also recommended that a maintenance program be conducted to ensure that all culverts and other drainage structures are kept clear of sediment and debris.

RECEIVED
JUN 11 1986
HYDROLOGY SECTION

```
* FILE: B5134HYMO.M1 ALEXANDER BLVD
*       AMERICAN FURNITURE DETENTION POND CAPACITY CHECK
* DATE: 6-2-86   S.VEAHINES

* PRE PROJECT CONDITION - EXISTING POND

START                 0.00 HR

STORE HYD             ID=1 HYDNO=101 DT=0.0833 HR DA=0.305 SQ MI
                      0 45 97 129 205 251 283 298 290 258 240 219 193 167
                      139 105 74 50 34 19 11 7 4 2 1

ROUTE RESERVOIR       ID=2 HYDNO=201 IN ID=1 CODE=1
                      OUTFLOW      STORAGE      ELEV
                        CFS         AC-FT        FT
                         0            0         26.5
                         5          0.243       27.0
                        23          1.437       28.0
                        54          3.008       29.0
                        88          4.712       30.0
                       110          6.560       31.0
                       130          8.559       32.0
                       150         10.716       33.0

* * * * * * * * * * * * * * * * * *

   TIME      INFLOW      ELEV       VOLUME     OUTFLOW
   (HRS)     (CFS)      (FEET)     (AC-FT)     (CFS)

    .00        .00       26.50       .000        .00
    .08      45.20       26.80       .145       3.01
    .17      97.00       27.29       .538      10.23
    .25     129.20       27.65      1.262      20.34
    .33     205.00       28.48      2.212      38.29
    .42     251.00       29.25      3.438      62.57
    .50     283.20       30.02      4.756      88.52
    .58     298.00       30.75      6.091     104.42
    .67     290.00       31.40      7.350     117.91
    .75     258.00       31.98      8.522     129.63
    .83     240.00       32.41      9.452     138.27
    .92     219.00       32.70     10.060     143.91
   1.00     193.00       32.89     10.475     147.75
   1.08     167.00       32.99     10.690     149.74
   1.17     139.00       33.20     11.717     149.94
   1.25     105.00       32.91     10.525     148.21
   1.33      74.00       32.73     10.133     144.59
   1.42      50.00       32.47      9.583     138.48
   1.50      34.00       32.17      8.935     133.46
   1.58      19.00       31.83      8.219     128.58
   1.67      11.00       31.46      7.477     119.17
   1.75       7.00       31.08      6.743     111.84
   1.83       4.00       30.72      6.029     103.80
   1.92       2.00       30.38      5.372      95.86
   2.00       1.00       30.02      4.748      88.43
   2.08        .50       29.69      4.131      77.41
   2.17        .00       29.42      3.582      67.46
   2.25        .00       29.14      3.245      58.79
   2.33        .00       28.91      2.889      51.26
   2.42        .00       28.70      2.539      44.74
   2.50        .00       28.52      2.250      39.05
   2.58        .00       28.36      1.989      34.08
```

2.67	.00	28.22	1.779	29.74
2.75	.00	28.10	1.587	25.96
2.83	.00	27.99	1.419	22.74
2.92	.00	27.88	1.271	20.50
3.00	.00	27.75	1.136	18.49
3.08	.00	27.65	1.015	16.66
3.17	.00	27.55	.906	15.02
3.25	.00	27.47	.808	13.54
3.33	.00	27.40	.719	12.21
3.42	.00	27.33	.640	11.01
3.50	.00	27.27	.567	9.92
3.58	.00	27.22	.503	8.95
3.67	.00	27.17	.444	8.07
3.75	.00	27.13	.391	7.27
3.83	.00	27.09	.344	6.56
3.92	.00	27.05	.301	5.91
4.00	.00	27.02	.262	5.33
4.08	.00	26.97	.227	4.74
4.17	.00	26.91	.197	4.10
4.25	.00	26.86	.171	3.55
4.33	.00	26.81	.148	3.08
4.41	.00	26.77	.128	2.67
4.50	.00	26.73	.111	2.31
4.58	.00	23.70	.096	2.00
4.66	.00	26.67	.083	1.73
4.75	.00	26.65	.072	1.50
4.83	.00	26.63	.062	1.30
4.91	.00	26.61	.054	1.13
5.00	.00	25.60	.047	.97
5.08	.00	26.59	.041	.84
5.16	.00	26.57	.035	.73
5.25	.00	25.55	.030	.63
5.33	.00	26.55	.026	.55
5.41	.00	26.55	.023	.48
5.50	.00	26.54	.020	.41
5.58	.00	26.54	.017	.36
5.66	.00	26.53	.015	.31
5.75	.00	26.53	.013	.27
5.83	.00	26.52	.011	.23
5.91	.00	26.52	.010	.20
6.00	.00	26.52	.008	.17
6.08	.00	26.52	.007	.15
6.16	.00	26.51	.006	.13
6.25	.00	26.51	.005	.11
6.33	.00	26.51	.005	.10
6.41	.00	26.50	.000	.00

PEAK DISCHARGE = 149.941 CFS - PEAK OCCURS AT HOUR 1.17
MAXIMUM WATER SURFACE ELEVATION = 32.997
MAXIMUM STORAGE = 18.7116 AC-FT

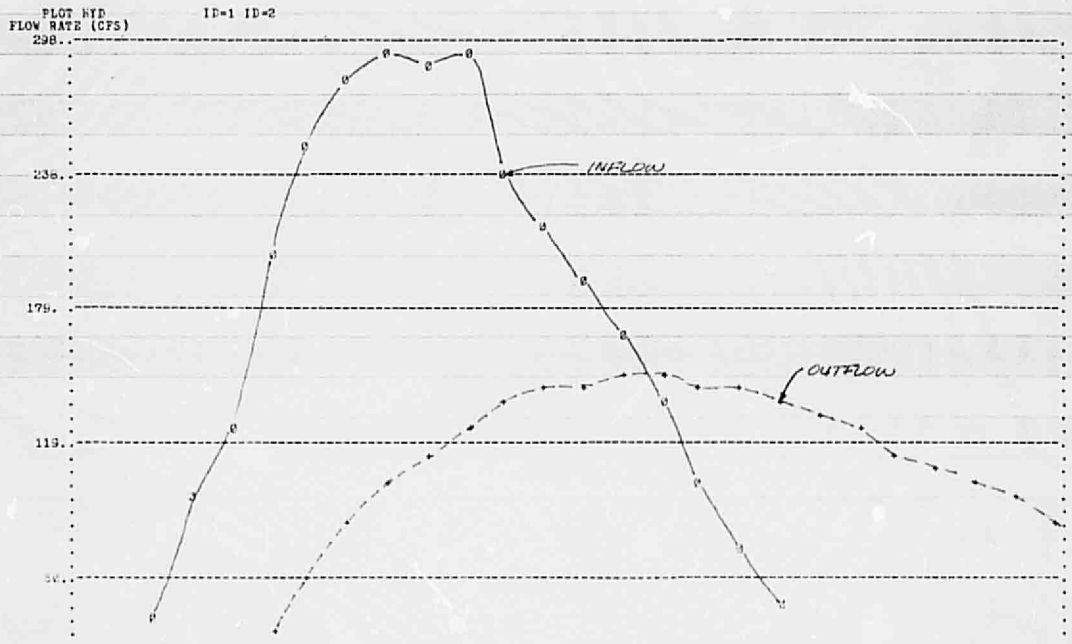
PRINT HYD IH=2 COLF=2

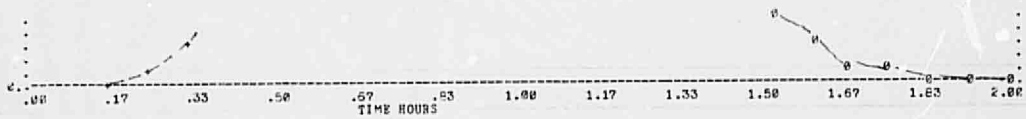
PARTIAL HYDROGRAPH 201.20

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.083	.7	1.333	144.6	2.666	29.7	3.998	5.3	5.331	.5
.167	10.2	1.416	139.5	2.749	26.0	4.082	4.7	5.414	.5
.250	18.3	1.499	133.5	2.832	22.7	4.165	4.1	5.498	.4
.333	24.3	1.583	126.6	2.915	20.5	4.248	3.6	5.581	.4
.417	32.6	1.666	119.2	2.999	18.5	4.332	3.1	5.664	.3
.500	38.5	1.749	111.3	3.082	16.7	4.415	2.7	5.748	.3
		1.833	103.8	3.165	15.2	4.498	2.3	5.831	.2

.583	104.4	1.916	95.9	3.249	13.5	4.581	2.0	5.914	.2
.666	117.9	1.999	88.4	3.332	12.2	4.665	1.7	5.998	.2
.750	128.6	2.082	77.4	3.415	11.0	4.748	1.5	6.081	.2
.833	138.3	2.166	67.5	3.499	9.9	4.831	1.3	6.164	.1
.916	143.9	2.249	58.8	3.582	8.9	4.915	1.1	6.247	.1
1.000	147.7	2.332	51.3	3.665	8.1	4.998	1.0	6.331	.1
1.083	149.7	2.415	44.7	3.748	7.3	5.081	.8		
1.166	149.9	2.499	39.0	3.832	6.6	5.165	.7		
1.250	148.2	2.582	34.1	3.915	5.9	5.248	.6		

RUNOFF VOLUME = 1.3379 INCHES = 21.764 ACRE-FEET
PEAK DISCHARGE RATE = 149.94 CFS





FINISH

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* FILE: 85134HYMO.M1 ALEXANDER BLVD
*      AMERICAN FURNITURE DETENTION POND CAPACITY CHECK
* DATE: 6-3-86   S.VERMINES

* POST PROJECT CONDITION - MODIFIED POND

START                 0.00 HR

STORE HYD             ID=1 HYDNO=101 DT=2.0833 HR DA=0.305 SQ MI
                      0 45 97 129 206 251 283 298 290 298 240 219 193 167
                      139 105 74 50 34 19 11 7 4 2 1

ROUTE RESERVOIR       ID=2 HYDNO=201 IN ID=1 CODE=1
                      OUTFLOW        STORAGE        ELEV
                        CFS          AC-FT          FT
                         0             0            26.5
                         5           2.214          27.0
                        23           1.221          28.0
                        54           2.682          29.0
                        88           4.198          30.0
                       110           5.842          31.0
                       130           7.623          32.0
                       150           9.549          33.0
                       160          11.639          34.0

* * * * * * * * * * * * * * * * * *

   TIME      INFLOW     ELEV      VOLUME    OUTFLOW
   (HRS)     (CFS)     (FEET)     (AC-FT)   (CFS)

    .00        .00     26.50       .000       .00
    .08      45.00     26.83       .143      3.35
    .17      97.00     27.34       .582     11.21
    .25     129.00     27.97      1.244     22.38
    .33     206.00     28.64      2.173     42.74
    .42     251.00     29.45      3.381     69.23
    .50     283.00     30.27      1.539     93.08
    .58     298.00     31.25      5.932    111.01
    .67     290.00     31.73      7.145    124.63
    .75     298.00     32.34      8.269    136.71
    .83     240.00     32.79      9.149    145.84
    .92     219.00     33.08      9.700    150.76
   1.00     193.00     33.25     10.082    152.55
   1.08     167.00     33.34     10.248    153.44
   1.17     139.00     33.34     10.265    153.42
   1.25     105.00     33.24     10.052    152.41
   1.33      74.00     33.04      9.626    150.37
   1.42      50.00     32.73      9.037    144.88
   1.50      34.00     32.39      8.355    137.68
   1.58      19.00     32.00      7.516    129.82
   1.67      11.00     31.57      6.454    121.37
   1.75       7.00     31.15      5.114    113.81
   1.83       4.00     30.73      3.400    104.09
   1.92       2.00     30.33      2.734     95.19
   2.00       1.00     29.95      1.121     85.27
   2.08        .00     29.59      1.573     73.57
   2.17        .00     29.24      1.180     63.37
   2.25        .00     28.81      2.505     54.20
   2.33        .00     28.70      2.148     46.60
   2.42        .00     28.55      2.148     40.02
   2.50        .00     28.37      1.734     34.34
```

2.58	.00	28.21	1.574	29.48
2.67	.00	28.07	1.385	25.31
2.75	.00	27.95	1.222	22.01
2.83	.00	27.81	1.079	19.60
2.92	.00	27.69	.952	17.44
3.00	.00	27.58	.838	15.53
3.08	.00	27.49	.737	13.83
3.17	.00	27.41	.647	12.31
3.25	.00	27.33	.567	10.95
3.33	.00	27.26	.495	9.75
3.42	.00	27.20	.432	8.68
3.50	.00	27.15	.376	7.73
3.58	.00	27.10	.326	6.88
3.67	.00	27.06	.281	6.13
3.75	.00	27.03	.241	5.45
3.83	.00	26.99	.206	4.80
3.92	.00	26.91	.175	4.09
4.00	.00	26.85	.149	3.49
4.08	.00	26.80	.127	2.96
4.17	.00	26.75	.108	2.52
4.25	.00	26.71	.092	2.15
4.33	.00	26.68	.078	1.83
4.41	.00	26.66	.067	1.55
4.50	.00	26.63	.057	1.32
4.58	.00	26.61	.048	1.13
4.66	.00	26.60	.041	.96
4.75	.00	26.59	.035	.82
4.83	.00	26.57	.030	.69
4.91	.00	26.56	.025	.59
5.00	.00	26.55	.022	.50
5.08	.00	26.54	.018	.43
5.16	.00	26.54	.015	.36
5.25	.00	26.53	.013	.31
5.33	.00	26.53	.011	.26
5.41	.00	26.52	.010	.22
5.50	.00	26.52	.008	.19
5.58	.00	26.52	.007	.16
5.66	.00	26.51	.006	.14
5.75	.00	26.51	.005	.12
5.83	.00	26.51	.004	.10
5.91	.00	26.51	.004	.09
6.00	.00	26.50	.000	.00

PEAK DISCHARGE = 153.439 CFS - PEAK OCCURS AT HOUR 1.08
MAXIMUM WATER SURFACE ELEVATION = 33.344
MAXIMUM STORAGE = 10.2578 AC-FT

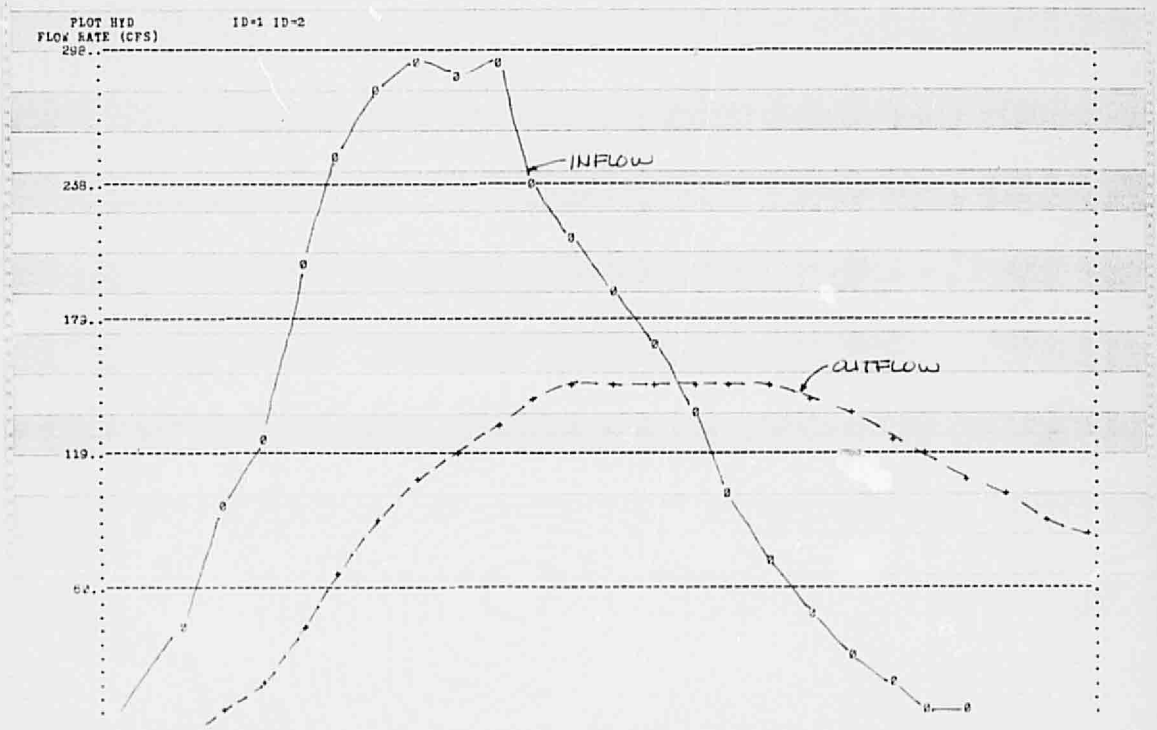
PRINT HYD IP=2 CODE=0

PARTIAL HYDROGRAPH 201.00

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
.000	.0	1.250	152.4	2.499	24.3	3.748	5.5	4.998	.5
.083	3.5	1.333	152.4	2.582	29.5	3.832	4.8	5.081	.4
.167	11.2	1.416	144.7	2.666	25.3	3.915	4.1	5.165	.4
.250	22.4	1.499	137.6	2.749	22.0	3.998	3.5	5.248	.3
.333	42.7	1.583	129.9	2.832	19.6	4.082	3.0	5.331	.3
.417	63.2	1.666	121.4	2.915	17.4	4.165	2.5	5.414	.2
.500	87.8	1.749	117.0	2.999	15.5	4.249	2.1	5.498	.2
.583	111.0	1.833	104.1	3.082	13.8	4.332	1.8	5.581	.2
.666	124.6	1.916	95.2	3.165	12.3	4.415	1.6	5.664	.1
.750	130.7	1.999	86.3	3.249	11.0	4.498	1.3	5.748	.1
.833	143.6	2.082	74.0	3.332	9.8	4.581	1.1	5.831	.1

.916	150.8	2.166	63.4	3.415	8.7	4.665	1.0	5.914	.1
1.000	152.5	2.243	54.3	3.499	7.7	4.743	.8		
1.083	153.4	2.332	45.5	3.582	6.9	4.831	.7		
1.166	153.4	2.416	40.0	3.665	6.1	4.915	.5		

RUNOFF VOLUME = 1.3380 INCHES = 21.765 ACRE-FEET
PEAK DISCHARGE RATE = 153.44 CFS



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