M9/D1

10 PLANS

FILE COPY

MEMORANDUM:

April 30, 1987

ENGINEERING GROUP

TO: John Kelly, Storm Drain Maintenance Section

FROM: Roger A. Green, Utility Development Division; Hydrology Section

SUBJECT: PUBLIC DETENTION POND, NE CORNER OF SAGE ROAD AND WEST SKY STREET, WESTVIEW TOWNHOUSES (M-9/D1)

Attached is a copy of the Drainage and Maintenance Agreement for Westview Townhouses. This agreement makes the developer responsible for maintenance, not the City. Construction of Phase II is proceeding and I felt that you need to be aware of this detention pond.

Attachment

RAG/bsj

FILE COPY

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

Ken Schultz
Mayor

UTILITY DEVELOPMENT DIVISION
HYDROLOGY SECTION
(505) 768-2650

April 30, 1987

Lee Bell
DMJM
5700 Harper Drive, NE Suite 280
Albuquerque, New Mexico 87109

RE: GRADING PLAN SUBMITTAL OF WESTVIEW TOWNHOMES RECEIVED APRIL 17, 1987 FOR PAVING AND WORK ORDER APPROVAL (M-9/D1)

Dear Lee:

The above referenced submittal dated April 17, 1987, is approved for Hydrology sign-off of the Work Order construction drawings.

If you have any further questions, call me at 768-2650.

Cordially,

Roger A. Green, PE

Roger A. Green, P.E.
C.E./Hydrology Section

cc: Andre Houle, DRC

RAG/bsj

DMJM

RECEIVED
APR 17 1987
HYDROLOGY SECTION

April 17, 1987

Mr. Roger Green
Design Hydrology Section
City of Albuquerque
P. O. Box 1293
Albuquerque, New Mexico 87102

Dear Mr. Green:

The attached grading plan reflects a change of (.71') in the bench mark for this subdivision. This change keeps the elevations shown at Albuquerque datum. Some adjustments were made to the profile grades to match Phase one construction. No change is being made to the drainage concept. The storm water detention pond at the intersection of West Sky Street and Sage Road will remain as constructed with Phase one. The pad elevations shown on this grading plan are from a field survey by D.M.J.M. in February, 1987. No site grading will be necessary to build this subdivision.

If you have any questions, please call.

Thanks,

Lee Bell

Lee Bell

LB:cs

Attachments

Daniel, Mann, Johnson, & Mendenhall
Suite 280, 5700 Harper Drive, N.E.
Albuquerque, New Mexico 87109
Telephone: 505/822-7955

Planning
Engineering
Systems
Economics

DRAINAGE INFORMATION SHEET

PROJECT TITLE: Westview Townhomes ZONE ATLAS/DRAINAGE FILE # M9-D1

LEGAL DESCRIPTION: WESTVIEW TOWNHOMES ADDITION VOL. C-17 FOLIO 6-1-2

CITY ADDRESS: N/A

ENGINEERING FIRM: DMJM CONTACT: Lee Bell

ADDRESS: 5700 Harper Dr., N. E., Suite 280 PHONE: 822-7955

OWNER: Suncor Enterprises, Inc. CONTACT: Griff Pickard

ADDRESS: 3811 Atrisco Dr., N. W. PHONE: 884-3800

ARCHITECT: N/A CONTACT: _____

ADDRESS: _____ PHONE: _____

SURVEYOR: N/A CONTACT: _____

ADDRESS: _____ PHONE: _____

CONTRACTOR: N/A CONTACT: _____

ADDRESS: _____ PHONE: _____

PRE-DESIGN MEETING:

___ YES

X NO

___ COPY OF CONFERENCE RECAP SHEET PROVided

RECEIVED APR 17 1987 HYDROLOGY SECTION

DRB NO. _____

EPC NO. _____

PROJECT NO. _____

TYPE OF SUBMITTAL:

___ DRAINAGE REPORT

___ DRAINAGE PLAN

___ CONCEPTUAL GRADING & DRAIN PLAN

X GRADING PLAN

___ EROSION CONTROL PLAN

___ ENGINEER'S CERTIFICATION

CHECK TYPE OF APPROVAL SOUGHT:

___ SECTOR PLAN APPROVAL

___ 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

x GRADING/PAVING PERMIT APPROVAL

___ OTHER _____ (SPECIFY)

DATE SUBMITTED: April 17, 1987

BY: Lee Bell

REV 10/85

#1222

M9/01

85 64666

501

AGREEMENT AND GRANT OF

TEMPORARY

DRAINAGE EASEMENT

This Agreement and Grant of Drainage Easement is made and executed this 6th day of August, 1985, by and between SUNCOR ENTERPRISES, INC. (hereinafter referred to as "Grantors"), and the City of Albuquerque, New Mexico, a municipal corporation (hereinafter referred to as "Grantee").

WHEREAS, Grantors are the owners and lawfully seized of certain real property located within the Westview Townhomes Addition, a Subdivision within BERNALILLO COUNTY, NEW MEXICO, and more particularly described as follows:

Tract X' WESTVIEW TOWNHOMES ADDITION as designated on the PLAT of said addition filed in the Office of County Clerk, BERNALILLO COUNTY, NEW MEXICO, on July 3, 1980 in VOL: C17, FOLIO: 6-1-2;

and

WHEREAS, Grantee wishes to use said property for the detention of public drainage waters; and

WHEREAS, Grantors are agreeable to the contemplated use of the property;

NOW, THEREFORE, IN CONSIDERATION of the above and for other good and valuable consideration, receipt of which is acknowledged, the parties hereby agree as follows:

1. Grantors hereby give, grant, and convey to Grantee an easement upon and across the above-described property for the purpose of the dentention of public surface drainage waters, together with the right to enter said property to inspect the easement property as necessary and the further right to remove, at Grantors' expense, any obstacles which interfere with the use and operation of the property as a public drainage water detention reservoir. The maintenance responsibility is soley that of the grantor.

2. Grantors have constructed drainage reservoir and facilities in accordance with standards, plans, and specifications as prescribed and approved by the City and the construction has been approved by the City. Grantors shall at all times maintain a ponding volume of not less than FIFTY THOUSAND (50,000) cubic feet, and comply with all drainage conditions depicted on the attached Exhibit A.

3. The Grantors agree to defend, indemnify, and hold harmless, the Grantee, its officials, agents, and employees from and against any and all claims, actions, suits, or proceedings of any kind brought against said parties for or on account of any matter arising from the drainage facility provided for herein or the Grantors' failure to construct, maintain, or modify the drainage facility under this Agreement and including but not limited to the storm drain system draining the detention pond. Grantee shall not liable for any damages accruing to Grantors resulting from the construction, maintenance or modification of said public drainage reservoir.

4. This Agreement and the property rights granted herein shall remain in full force and effect until released in writing by Grantee. It is understood and agreed that the maintenance of said drainage facility is contemplated only so long as conditions require it, it being contemplated that the facility will be replaced by permanent storm sewer facilities included in the City's Master Plan for drainage for that area. When the facility is so replaced, this Agreement and the property rights granted herein will be released by an instrument in writing. If prior to the installation of such permanent facilities as contemplated by the Master Plan or any substitute therefor, the Grantors demonstrate to the reasonable satisfaction of the Grantee that downstream conditions warrant the release of this Agreement and the property rights granted herein, Grantee agrees to release this Agreement and all property rights granted herein by separate instrument.

5. The terms "Grantor" and "Grantee" include their respective successors in interest to their rights in the easement property. All provisions of this easement, including the benefits and burdens, run with the land and are binding upon and inure to the benefit of the successors in interest of the parties hereto.

EXECUTED this 6th day of August, 1985.

GRANTORS:

SUNCOR ENTERPRISES, INC.

BY: _____
H. Griffin Pickard, Jr.
President

GRANTEE:

CITY OF ALBUQUERQUE

BY: Bob V. Stover 8-2-85
Bob V. Stover
Chief Administrative
Officer

RECOMMENDED:

C. D. Sheppard 7/26/85
C. Dwayne Sheppard
City Engineer

APPROVED AS TO FORM:

Assistant City Attorney

Approved As To Form
City Attorney
Date: 7/31/85

ATTEST:

City Clerk

ACKNOWLEDGEMENTS

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

The foregoing instrument was acknowledged before me this 16th day July, 1985, by H. Griffin Pickard Jr., President of SUNCOR ENTERPRISES, INC.

John Tatman
Notary Public

OFFICIAL SEAL
JOHN TATMAN
NOTARY PUBLIC STATE OF NEW MEXICO
Notary Bond Filed with Secretary of State
My Commission Expires: 5/3/87

MY COMMISSION EXPIRES:

5/3/87

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

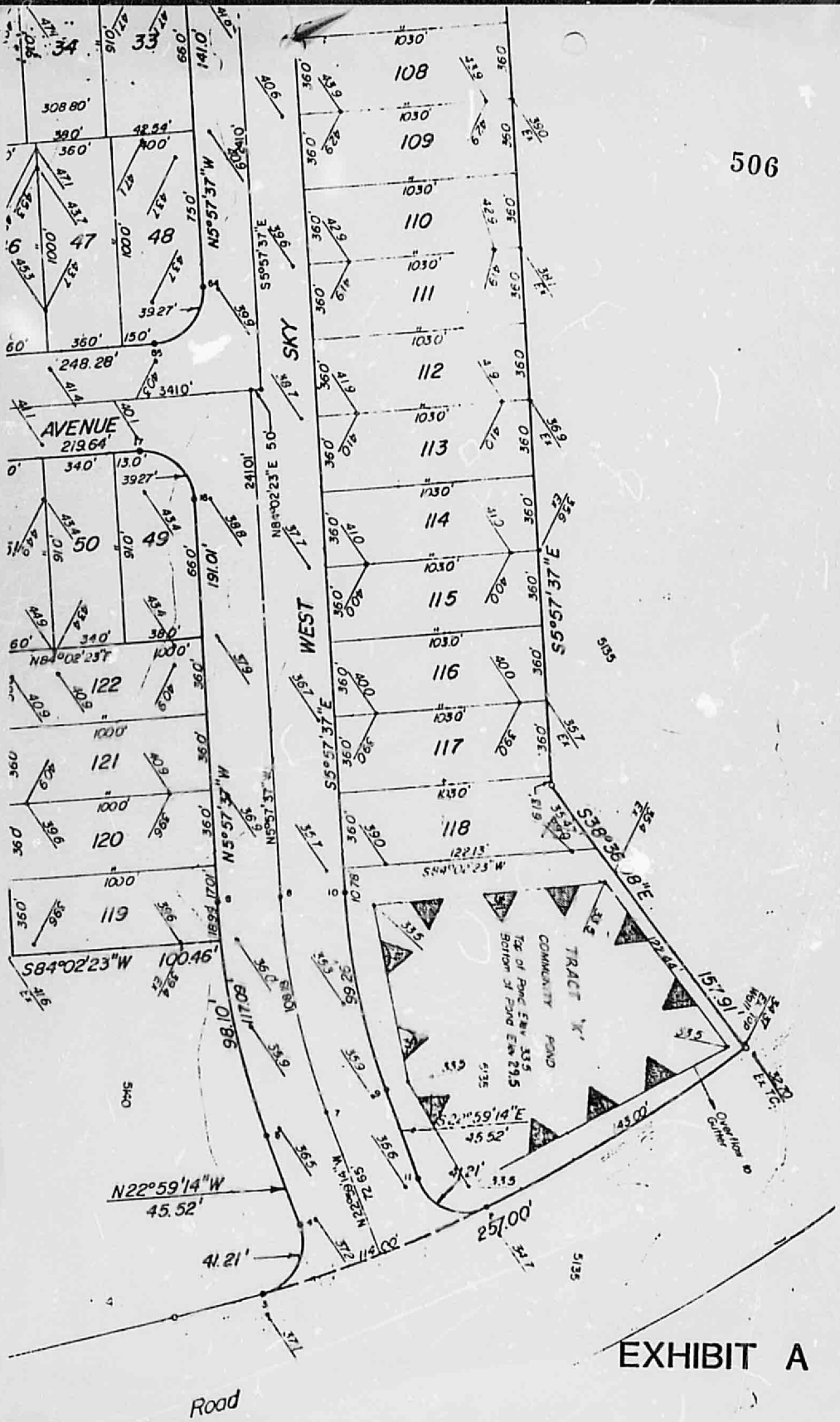
The foregoing instrument was acknowledged before me this 2nd day of August, 1985, Bob V. Stover, Chief Administrative Officer of the City of Albuquerque.

Ida L. Grant
Notary Public

MY COMMISSION EXPIRES:

12-18-88

STATE OF NEW MEXICO
COUNTY OF BERNALILLO
FILED FOR RECORD
1985 AUG -6 AM 10: 32
OFFICIAL RECORDS
BOOK 5357A PAGE 500-505
JOHN C. WALLER
COUNTY CLERK & RECORDER
(5) 20.00 DEPUTY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120
119
AVENUE
219.64'
SKY
WEST
TRACT 'K'
COMMUNITY POND
Top of Pond Elev. 33.5
Bottom of Pond Elev. 29.5
S38°36'18"E
157.91'
S84°02'23"W
100.46'
N22°59'14"W
45.52'
41.21'
257.00'
Curb Inlet
Gutter
Ex. P.C.
Road

EXHIBIT A

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

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

June 13, 1985

Mr. Charles Burm
DMJM/Adam, Hamlyn, Anderson
5700 Harper Drive NE, Suite 280
Albuquerque, NM 87109

REF: REVISED DRAINAGE PLAN AND DETAILS FOR WESTVIEW TOWNHOMES (M9-D1)
RECEIVED MAY 17 & JUNE 11, 1985

Dear Mr. Burm:

I have reviewed the above referenced submittals and do hereby give approval for drainage.

Please attach the appropriate copies to the construction set for Hydrology sign-off.

It is understood that the appropriate language is included in the required Subdivision Improvements Agreement for the detention pond maintenance responsibility (developers).

Should you have any questions or comments, please call me at 766-7644.

Cordially,

Billy J. Goolsby

Billy J. Goolsby, PE
Civil Engineer/Hydrology

BJG:mrk

DRAINAGE INFORMATION SHEET

PROJECT TITLE: WESTVIEW TOWNHOMES ZONE ATLAS/DRNG. FILE #: M-9 D-1

LEGAL DESCRIPTION: WESTVIEW TOWNHOMES ADDITION VOL. C-17 FOLIO: 6-1-2

CITY ADDRESS:

ENGINEERING FIRM: DMJM CONTACT: CHARLES BURM

ADDRESS: 5700 HARPER DRIVE, N.E., SUITE 280 PHONE: 822-7955

OWNER: GRIFF PICKARD & ASSOCIATES CONTACT:

ADDRESS: 2701 SAN PEDRO, N. E. PHONE:

ARCHITECT: CONTACT:

ADDRESS: PHONE:

SURVEYOR: CONTACT:

ADDRESS: PHONE:

CONTRACTOR: CONTACT:

ADDRESS: PHONE:

PRE-DESIGN MEETING:

X YES

NO

COPY OF CONFERENCE RECAP SHEET PROVIDED

RECEIVED JUN 11 1985 HYDROLOGY SECTION

DRB NO.

EPC NO.

PROJ. NO.

TYPE OF SUBMITTAL:

DRAINAGE REPORT

X DRAINAGE PLAN Additional Details

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

X OTHER Work order (SPECIFY)

DATE SUBMITTED: 6-11-85

BY: Charles Burm

DMJM/ Adam, Hamlyn, Anderson

Reply To: ☐ Phoenix, Arizona 85014 — 4751 North Fifteenth Street — 602-264-1397
☒ Albuquerque, NM 87109 — 5700 Harper Dr. N.E., Suite 280 — 505-822-7955

LETTER OF TRANSMITTAL

TO: City of Alb.
Design Hydrology

ATTN: Mr. Billy Goolsby

DATE:	PROJECT NO.
6-11-85	41090-02-01
PROJECT: Westview Townhomes	
M-9 D-1	

WE TRANSMIT:
(X) herewith ( ) under separate cover via
( ) in accordance with your request

FOR YOUR:
(X) approval ( ) distribution to parties ( ) information
( ) review & comment ( ) record
( ) use ( )

RECEIVED JUN 11 1985 HYDROLOGY SECTION

THE FOLLOWING:
(X) prints ( ) copy of letter ( ) change order
( ) originals ( ) specifications ( ) calculations
( ) shop drawings ( )

Copies	Dwg. No.	DESCRIPTION	Action Code
1		Sheet 8 of 14	E
1		Sheet 9 of 14	E

Action Code
A. REVIEWED
B. REVIEWED AS NOTED
C. REVISE & RESUBMIT
D. REJECTED
E. See REMARKS below

REMARKS: These are the Const. Details for the inlet + outlet to the pond.
Water Resources signed off on the plans 6-10-85 and Hydrology is the only department required now for Work order

COPIES TO:

If enclosures are not as noted, please inform us immediately.

SIGNED: Charles Brown

CITY OF ALBUQUERQUE

ALBUQUERQUE, NEW MEXICO

INTER-OFFICE CORRESPONDENCE

REF. NO._____

June 6, 1985

TO: Adelia Kearny; City Attorney

FROM: Fred J. Aguirre, P.E., Design Hydrologist; Design Hydrology Section FJA

SUBJECT: TEMPORARY EASEMENT - WESTVIEW TOWNHOMES (M-9/D1)

Attached herewith for your review and comments is temporary easement that was requested by this office for approval of a work order. The following is some history for your information:

1. The proposed development has been subdivided.
2. Upon drainage improvements downstream, the easements can be vacated.
3. The grantor will be responsible for the maintenance of the easement until easement has been vacated.

If you have any questions, please call me at 766-7644.

FJA/bsj

DMJM/Adam, Hamlyn, Anderson

May 17, 1985

City of Albuquerque
MDD/Engineering
Design Hydrology Section
P. O. Box 1293
Albuquerque, NM 87103

RECEIVED
MAY ~~APR~~ 17 1985
HYDROLOGY SECTION

ATTN: Mr. Fred Aquirre

RE: Westview Townhomes - Revised Drainage Calculations
M9-D1
DMJM No. 4690-02-01

Dear Mr. Aquirre:

Transmitted herewith are the following:

1. One (1) copy of the Drainage Design Calculations to update the Approved Drainage Report for the referenced project.

2. One (1) copy of the Grading Plan.

3. One (1) copy of the Drainage Sub-basins with the Analysis Points shown.

4. One (1) copy of April 3, 1985 conference recap.

The drainage calculations are per the criteria established in the April conference. The pond was sized to handle the 100 year 6 hr. storm with the discharge rate not to exceed the five (5) year undeveloped flow.

The power line channel has been extended to I-40 thus reducing the drainage areas to the west. FHA criteria will require a solid wall along the subdivision boundry providing additional protection along 98th Street and San Ygnacio Road.

The drainage design provides adequate protection for the subdivision and the detention pond provides for a substantial reduction in the peak developed discharge from the site.

If there are any questions, please call.

Sincerely,

Charles Burm

Charles Burm

Attachments

A Division of
Daniel, Mann, Johnson, & Mendenhall

Suite 280
5700 Harper Drive, N.E.
Albuquerque, New Mexico 87109
Telephone: 505/822-7955

Planning
Engineering
Systems
Economics

DRAINAGE INFORMATION SHEET

PROJECT TITLE: WESTVIEW TOWNHOMES ZONE ATLAS/DRNG. FILE #: M-9 D-1

LEGAL DESCRIPTION: WESTVIEW TOWNHOMES ADDITION VOL. C-17 FOLIO: 6-1-2

CITY ADDRESS:

ENGINEERING FIRM: DMJM CONTACT: CHARLES BURM

ADDRESS: 5700 HARPER DRIVE, N.E., SUITE 280 PHONE: 822-7955

OWNER: GRIFF PICKARD & ASSOCIATES CONTACT:

ADDRESS: 2701 SAN PEDRO, N. E. PHONE:

ARCHITECT: CONTACT:

ADDRESS: PHONE:

SURVEYOR: CONTACT:

ADDRESS: PHONE:

CONTRACTOR: CONTACT:

ADDRESS: PHONE:

PRE-DESIGN MEETING:

X YES DRB NO. —

___ NO EPC NO.

X COPY OF CONFERENCE RECAP SHEET PROVIDED PROJ. NO.

TYPE OF SUBMITTAL:

X 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
X OTHER Subdivision Improvements (SPECIFY)

RECEIVED MAY 17 1985 HYDROLOGY SECTION

DATE SUBMITTED: 5-17-85

BY: Charles Burm

CITY OF ALBUQUERQUE
MUNICIPAL DEVELOPMENT DEPARTMENT
ENGINEERING DIVISION/DESIGN HYDROLOGY SECTION

HYDROLOGY SECTION PROJECT NO.: M9-D1 DATE: 4/3/85

PLANNING DIVISION NOS. EPC: _____ DRB: _____

CONFERENCE RECAP

SUBJECT: M9-D1 WESTVIEW TOWNHOMES

APPROVAL REQUESTED:

____ PRELIMINARY PLAT ____ FINAL PLAT

____ SITE DEVELOPMENT PLAN ____ BUILDING PERMIT

✓ REENTRY WORK/DRAINAGE REPORT/ROUGH GRADING

	WHO	REPRESENTING
ATTENDENCE:	JAKE BORDENOVE	
	FRED J. AGUIRRE	

FINDINGS: (1) POND MUST BE DESIGNED FOR THE 100YR 6HR STORM WITH AN ALLOWABLE DISCHARGE RATE NOT TO EXCEED A 5YR UNDEVELOPED RATE (2) POND TREATMENT REQUIRED TO ELIMINATE STAGNANT WATER WITHIN THE POND. (3) POND MAINTENANCE WILL BE THE RESPONSIBILITY OF THE DEVELOPER UNTIL SUCH TIME THAT IMPROVEMENTS DOWNSTREAM ELIMINATE THE NEED FOR THE POND. UPON IMPROVEMENTS DOWNSTREAM THE CITY WILL ALLOW VACATION OF THE EASEMENT/R/W. HOWEVER CONNECTION TO THE SYSTEM WILL BE THE ~~[illegible]~~ RESPONSIBILITY OF THE DEVELOPER. (4) FENCING REQUIRED FOR POND DEPTH EXCEEDING 18". (5) AN AGREEMENT WILL BE REQUIRED TO ESTABLISH MAINTENANCE AND LIABILITY RESPONSIBILITY FOR THE POND'S MAINTENANCE.

The undersigned agrees that the above findings are summarized accurately and are only subject to change if further investigation reveals that they are not reasonable or that they are based on inaccurate information.

SIGNED:	Fred J. Aguirre	SIGNED:	R. Bachman
TITLE:		TITLE:	
DATE:	4/3/85	DATE:	4/3/85

NOTE PLEASE PROVIDE A COPY OF THIS RECAP WITH THE DRAINAGE SUBMITTAL

1136-1651.34-80

GORDON HERKENHOFF & ASSOCIATES, INC.
302 Eighth Street, N.W.
Albuquerque, New Mexico 87102
(505) 247-0294

June 4, 1980

m 9-01

Mr. Quentin R. Keilich
Assistant City Engineer-Design
Engineering Division
Municipal Development Department
City Hall
400 Marquette Avenue N.W.
Albuquerque, New Mexico 87102

RE: ENGINEERING DRAWINGS
WESTVIEW TOWNHOMES SUBDIVISION

Dear Bob:

Transmitted herewith please find one (1) set of the partially completed referenced drawings as the preliminary set to initiate our request for processing this subdivision.

As was agreed in the meeting on May 20th in the Traffic Engineer's Conference Room with Messrs. Walker, Heller, Fosnaugh, Conegliano, Mann, Whitman, Campbell, yourself, and myself present, Mr. Walker of Buttrum Construction Co. will finance the survey and a proposed street profile design for 98th Street (Snow Vista Blvd.) from the north boundary of the Mobile Home Park to the existing curb and gutter at the northwest corner of Westgate Heights Unit No. 2, so that the street design for 98th St. adjacent to the referenced subdivision can be incorporated into the final set of drawings for the subdivision. Survey information will also be furnished on Sage Road between the intersection with 98th Street and the southwest corner of Westview Townhomes to provide information for the final design of Sage Road in this reach together with the temporary Sage - 98th intersection modification agreed upon to ensure turning surface flows south along the existing flood control dike following the westerly right of way of Snow Vista Blvd. south of Sage Road to outfall in the Amole Arroyo.

In our meeting on the site on May 21st you and I agreed to the aforementioned required extent of the survey together with some vertical positioning and alignments for 98th Street which will be incorporated into our profile design. Also, we agreed to the basic design criteria regarding the temporary design for rerouting surface flows to the south at the Sage - 98th intersection.

June 4, 1980

The accompanying set of plans is complete excepting sheet 7 which includes the 98th Street Design and the pond drain design, and sheet 12 which included general and drainage appurtenance details. As we agreed, we are submitting this set of plans in order to expedite the processing while surveying and design work on 98th Street and Sage Road are proceeding.

If anything further is required, please advise us.

Very truly yours,

J. E. PINO
JEP:er
Encl. 1
cc: Richard Heller
City Engineer

Bruno Conegliano
Asst. City Engineer-Hydrology

Max Walker
Buttrum Construction Co.

7-1651.34-80

GORDON HERKENHOFF & ASSOCIATES, INC.
302 Eighth Street, N.W.
Albuquerque, New Mexico 87102
(505) 247-0294

-079-D1

RECEIVED
MAY 28 1980
CITY ENGINEER

May 28, 1980

Mr. Richard Heller
City Engineer
Municipal Development Department
Public Works Division
P.O. Box 1293
Albuquerque, New Mexico 87103

RE: MAINTENANCE OF COMMUNITY POND, WESTVIEW TOWNHOMES

Dear Mr. Heller:

Pursuant to our brief discussion on May 27th, we are submitting this correspondence as our request, on behalf of Buttrum Construction Company, to the City of Albuquerque to provide Buttrum with a letter stating that the City does hereby agree to maintain the community pond, shown as Tract "X" on the plat of Westview Townhomes Addition. As you are aware, Buttrum will require this letter in order to assure FAA financing on Westview.

I appreciate your aid in this matter. Should you have any questions please feel free to contact myself of Mr. Max Walker of Buttrum.

Sincerely,

Charles W. Campbell

CHARLES W. CAMPBELL

CWC:pd

cc: Max Walker

Coordinate the response

Response by June 5, 1980

BSH RSA		ADM	
HRO		SUR	
CDS		COUN	
DES		SEC	
INSP		FILE	
HYDRO		RETURN	

-1651.34-80

GORDON HERKENHOFF & ASSOCIATES, INC.
302 Eighth Street, N.W.
Albuquerque, New Mexico 87102
(505) 247-0294

RECEIVED
MAY 02 1980
CITY ENGINEER

m9-D1

May 5, 1980

Mr. Bruno Conegliano
Assistant City Engineer, Hydrology
City Engineering Division
Municipal Development Department
City Hall
400 Marquette Avenue, N.W.
Albuquerque, New Mexico 87102

RE: DRAINAGE REPORT - WESTVIEW TOWNHOMES

Dear Mr. Conegliano:

Please refer to your letter dated April 25, 1980 (received in this office on May 1, 1980) regarding the referenced subject and the unofficial draft copy of the proposed City Engineer's Interim Drainage Guidelines obtained from your office on May 2, 1980.

In response to the four items of concern expressed in your letter, we comment as follows:

1. The approval of our preliminary plat through the Subdivision Review Board was given on March 11, 1980. We immediately arranged for a meeting with Mr. Fosnaugh, City Traffic Engineer, to discuss the requirements for the development of Snow Vista Blvd. (98th Street) and the intersection with Sage Road. This meeting was held on March 24, 1980, and it was resolved that the requirements for this street would require consultation among several City Divisions and Departments. This consultation has been in progress ever since that time, and we have actively pursued its resolution. The Right of Way requirements were determined, and a summary plat indicating the dedication has been filed for record. No other determination has been finalized.

2. The statement from our drainage report eluding to "Structural Treatment Equivalent to the Existing Curb" means specifically that if permanent requirements for the street can be ascertained and the obligation for their construction can be allocated to this project, then the existing curb will be extended or a new curb will be installed in accord with the determination; however, if this resolution cannot be made then a temporary ditch-dike provision will be constructed to protect the subdivision.

3. We have performed extensive field surveillance and have studied contour maps and aerial photographs of this area, and it is our considered opinion that even large flows from Areas 2 and 3 will be directed toward the intersection of Sage Road and 98th Street. Our reasoning for this conclusion is predicated principally upon two pertinent observations: namely 1) The orientation of all natural major drainage swales in that area is in a southeasterly direction normal to contours, and the development of this

magnitude of flow will quickly develop the existing highly erosive soil material into channels oriented in this direction; and 2) The existing gradients along any walls or development in conjunction with the mobile home park will orient impinging flows in a southerly direction, and, even in the event of some structural failures in these facilities, resultant flows will still tend in that direction. While any estimate in this regard is speculative, we believe that lots within this subdivision would not be in the ultimate alignment of any resultant outflow. A recent examination of the intermin and final drainage concepts proposed in conjunction with the development of the land within drainage areas 2 and 3 indicate that runoff generated will be accumulated at the southeast corner of the development which further indicates the natural tendency for drainage orientation toward that intersection.

4. We have perused the City Engineer's Interim Drainage Guidelines, and have applied the criteria set forth to this subdivision. As you are undoubtedly aware, the ponding requirements are more than doubled and permissible outflow is almost halved with respect to values previously derived utilizing acceptable hydrologic data in conjunction with the stipulations set forth in Drainage Resolution 1972-2. Utilizing these guidelines, a pond with a volume of approximately 73,700 cubic feet would be required, and a pond seven feet deep in the location and configuration indicated on the attached rough grading plan can fulfill that requirement. An 18-inch diameter outflow pipe terminated in a curb inlet 300 feet downstream in Sage Road with the inlet grate at the elevation of the bottom of the pond would discharge a maximum of 14 C.F.S. which is equivalent to the permissible 14.80 C.F.S. generated during the 10 minute, 5 year storm in the undeveloped area. Routing through the pond was not performed in order to facilitate this response.

Attached please find one (1) print each of the proposed Rough Grading Plan and the Subdivision Tract Map for your information in reviewing this presentation.

Please advise us regarding your position relative to approving the plat for this subdivision at your earliest possible convenience. If any additional information is required, please advise us.

Very truly yours,

J. E. PINO

JEP:pd
Enclosures (2)

cc: Max Walker

CITY OF ALBUQUERQUE

ALBUQUERQUE, NEW MEXICO

INTER-OFFICE CORRESPONDENCE April 29, 1980 REF. NO._____

TO: Richard S. Heller, City Engineer

FROM: Bruno Conegliano, Assistant City Engineer/Hydrology B.C.

SUBJECT: North Towne Office Park

I have made the approval of the drainage report for the referenced development contingent upon your approval of the treatment for the roadway of Cuebro Dr.

I have done so because I feel we have some problems with the requirements for the treatment of the streets that surround parcels coming in for development. The existing procedure to ask for one half street construction, oftentimes with only temporary pavement, is not a satisfactory method to control the runoff.

I'd like to recall the development of Sunset West and the treatment San Ygnacio Rd. The fact that the street cross section may be able to convey the local runoff, does not necessarily reflect the capabilities of the systems downstream: in this case, Academy Blvd., in the case of Sunset West, Sage Rd.

It is the position of the Consultants that their investigation of downstream City's facilities is out of order and an impossible burdened to bear. In a way, this question is related to my memo of April 24, 1980; a method needs to be devised to establish what is the minimum acceptable level of improvements for the downstream facilities. This question has bearing for instance, on the approval of the Country Squire Subdivision and on the treatment of Sage Rd. In the case of the captioned development, I wonder if it is not time to initiate some design for improvements of the conditions in Academy Blvd. given the development of Tanoan, of lands of Gary Swearinger and of Dr. Edwards.

Can you make this topic a subject of discussion at the next staff meeting?

BC/lc

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

April 25, 1980

Chuck Campbell
Gordon Herkenhoff &
Associates, Inc.
302 Eight Street, N.W.
Albuquerque, New Mexico 87102

M9-D1

Reference: Westview Townhomes Drainage Report

Dear Mr. Campbell:

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

1. The drainage report does not discuss what will be the ultimate design of 98th St. and Sage Rd., nor who will build said ultimate roadway in the proximity of this parcel.

2. In the introduction on Page 1, the 4th sentence states "Structural treatment equivalent to the existing curb will be required to provide temporary protection for the remainder of the west side to the northwest corner of the tract." The extent and location of these provisions must be clarified.

3. In the event of a failure of the block walls around and along the Mobile Home Park adjacent to 98th St., in the absence also of the proposed AMAFCA diversion, wouldn't the flows from areas 2 & 3 on Exhibit A, potentially affect this parcel before they reach the intersection of Sage and 98th St.? Particularly since the drainage report estimates the potential discharge in 469 cfs, and talks of massive sheet flow.

4. According to the interim drainage guidelines published by the City Engineer's Office, the ponding requirement has been defined as that necessary to contain the developed runoff volume for the 100 yr. frequency storm with a maximum allowable discharge rate equivalent to the 5 yr. undeveloped flow. Test cases have shown that this approach allows the emptying of the ponding area in 3-4 hrs., the City would like to have this approach followed by this development as well.

I am enclosing a recommended methodology to be followed in the design of the detention area, with an example of the required inflow-outflow determination.

If you have any questions on the above, please don't hesitate to contact me.

Very truly yours,

Bruno Conegliano
Assistant City Engineer/Hydrology

BC/lc
encl.
xc: Richard Leonard, AMAFCA
Richard Heller, City Engineer

695-1651.34-80

GORDON HERKENHOFF & ASSOCIATES, INC.
302 Eighth Street, N.W.
Albuquerque, New Mexico 87102

(505) 247-0295

April 4, 1980

M9-D1

Mr. Bruno Conegliano
Assistant City Engineer-Hydrology
Municipal Development Department
City of Albuquerque
City Hall
400 Marquette Avenue N.W.
Albuquerque, New Mexico 87102

RECEIVED
APR 07 1980
CITY ENGINEER

RE: DRAINAGE REPORT WESTVIEW TOWNHOMES

Dear Mr. Conegliano:

Attached please find three (3) copies of the referenced report for your review.

We will appreciate it very much if you can expedite this review, so that we can proceed with construction drawings.

Very truly yours,

J. E. PINO
JEP:er

Encl: 3

cc: Max Walker, Buttrum Construction

236-1651.34-80 FEB 7 1980 S.P.

buttrum construction co.

757 98th Street, SW Suite 807 Albuquerque, New Mexico 87105 (505) 831-2505

February 6, 1980

Mr. Gerald D. Davenport
Director
Municipal Development Department
P.O. Box 1293
Albuquerque, New Mexico 87103

M9-D1

RE: WESTVIEW TOWNHOMES-WESTGATE HEIGHTS AREA-DRAINAGE

Dear Mr. Davenport:

Our Engineer, Mr. Charles Campbell of Gordon Herkenhoff and Associates, has informed me that Mr. Conegliano and Mr. Charles Johnston have indicated the referenced subdivision will not be approved due to drainage problems.

This issue greatly concerns me and I would like to schedule a meeting with yourself, Mr. Heller, Mr. Conegliano and Mr. Leonard to resolve these problems. I will be in Albuquerque from Phoenix on Thursday, February 14th and would ask that you please schedule a meeting for that date. I am sending copies of this letter to the aforementioned parties and would ask that they also place this on their schedules. I will direct Mr. Campbell to call early in the week to reaffirm the meeting.

Should you have any questions, please feel free to contact Mr. Campbell or our local office.

Sincerely,

Max Walker

Max Walker
MW:er

cc: Mr. Richard Heller
Mr. Bruno Conegliano
Mr. Richard Leonard

CITY OF ALBUQUERQUE

ALBUQUERQUE, NEW MEXICO

INTER-OFFICE CORRESPONDENCE November 26, 1979 REF. NO. [illegible]

TO: Gene Mares, Planner

FROM: Bruno Conegliano, Assistant City Engineer, Hydrology B. C.

SUBJECT: Comments on Vacation-Subdivision-Annexations
Actions due November 26, 1979

V-79-50

Refer to Comments by City Engineer.

AX-79-29
Z-79-150

Absence of drainage outfall facilities requires full retention of all the runoff generated by this site. Site planning must incorporate this requirement: possibly reservation of part of the site as a community pond may be necessary.

AX-79-30
Z-79-156

Defer to AMAFCA comments for approval of the zone change request. Proposal must not adversely affect the Mariposa Detention requirements. Propoerty bound along the South by the proposed drainage channel and by the Mariposa Retention Basin. Request that dedication of the master planned R.O.W., be dedicated on the plat for this development. Necessary drainage easements and conveyance facilities must also be reserved for the Mariposa North Channel, and for the outfall from the Homestead Hills Subdivision.

Z-79-149

Development proposal should be reviewed by M.R.G.C.D., Western portion of properly inside the 10 and 100 year flood area (see attachment.) Development may not displace the water accumulating on the site onto others, and in the absence of drainage outfall facilities 100% runoff retention must be provided.

S-79-53

Development in the Westgate Area has occured in the absence of drainage facilities to collect, convey, and safely dispose of the drainage and flood flows. Make shift solutions such as that provided for the Sunset West Subdivision and the several units of the Westgate Development, are not consistent with an organic approach to the provision of a fundamental utility such as drainage. It is incumbent on the City to provide this, as well as other utilities in order to achieve the orderly development of the community. An equitable assessment procedure for the construction of the necessary drainage facilities must also be devised to prevent excess future demand on public resources or private contributions. The present approach does not provide for order, equity, or protection of the properties.

With specific referenced to the captioned, subdivision action, a drainage report must be submitted, addressing the present flooding conditions before construction of the A.M.A.F.C.A. facilities to the West. In particular protective measures must be established along Sage Road. The drainage report must also be prepared recognizing the existing infiltration capabilities of the soils as reported in the Bernalillo County soil maps. It must be demonstrated that no increase in runoff will result after Development for all storm conditions. This requirement is established on the basis of the absence of drainage facilities East of the Westgate Development. Community ponding may be required, as an interim measure to achieve the goals stipulated above. At the time of the construction of the drainage network required to service the Westgate Area, this development will be assessed a "prorata" share of the construction costs. In return, the size of the required community pond will be reviewed, possibly reduced, with the excess land returned to the developer. Attention must also be paid to the collection of the offsite water generated by the land South of 94th Street through this Subdivision.

The Engineer for the Development is requested to contact my office before preparation of the drainage report.

BC/lc

cc: Laurence Frishman, City Planner
File

ENGINEER'S REPORT ON
STORM DRAINAGE
FOR WESTVIEW TOWNHOMES

INTRODUCTION: This subdivision area situates on a natural island between two ephemeral drainage swales, and existing upstream development has not apparently jeopardized the natural protection from flooding. Some diverted drainage will affe~ the Sage Road S.W. entrance, and some special design requirements are indicated at that intersection. Existing curb and gutter on the southerly protion of 98th Street S.W. (Snow Vista Boulevard S.W.) on the west side of the tract will adequately channel the small area of local runoff contributing to the street and will protect the subdivision from flows reaching the street. Structural treatment equivalent to the existing curb will be required to provide temporary protection for the remainder of the west side to the northwest corner of the tract. Final construction of 98th Street will provide permanent protection. Several drainage areas west of the tract between the drainage interceptor dike approximately one mile west of 98th Street on the alignment of the Bureau of Reclamation Electric Power Transmission Line and 98th Street will contribute runoff to Sage Road affecting access to this tract from the south. The Drainage Management Plan Western Albuquerque Area prepared for the Albuquerque Metropolitan Arroyo Flood Control Authority (A.M.A.F.C.A.) proposed a diversion facility approximately 1150 feet west of and parallel to 98th Street which would intercept a majority of that runoff, and would direct it to the Amole Arroyo on the south. A more recent study of this urban watershed has suggested alternative locations for the major diversion channel, but, even if the location of the major facility is changed, it will be necessary during the local development of the area to provide for interception and for outfall of the same drainage areas in a similiar locatio

and manner. Therefore, ultimate development of drainage facilities to the west will insure access to the tract from the south, and, coupled with the natural protected location, this should provide for a relatively secure location with respect to storm runoff.

PURPOSE: The purpose of this report is to present information and proposals regarding the management of storm runoff relating to this tract.

DESCRIPTION OF THIS SITE AND PROJECT: The site consists of a 14.6 acre tract which situates at the northeast corner of Sage Road and 98th Street S.W. between San Ygnacio Road S.W. on the north and Sage Road S.W. on the south and between 98th Street S.W. on the west and Sunset West Subdivision Unit 1 on the east. (see vicinity map)

The site will be subdivided into 122 lots for two unit townhouses. The design size for lots for individual units is 30 to 36 feet by 91 feet excluding space occupied by rear yard embankments. Each unit is anticipated to have a roof area of 1300 square feet including the single car garage.

Existing development in the immediate area consists of a mobile home park across 98th Street on the west and a single family subdivision under construction on the east.

HYDROLOGY AND HYDRAULICS: A study was made of available mapping and information together with field examination in order to ascertain the conditions relating to offsite storm runoff. The topographic map in Appendix A depicts those findings. Indications are that prior to development of the mobile home park west of the tract across 98th Street, storm drainage accumulations flowed in a southeasterly direction in existing ephemeral drainage swales north and south of the tract without eroding into the tract area. It is believed that the

construction of the mobile home park did not substantially alter this expectation, and the larger scale (1" = 200') orthophoto-contour map in Appendix B clearly indicates the general orientation of a majority of the offsite drainage toward the intersection of Sage Road and 98th Street S.W. Some minimum capacity formal drainage facilities were constructed within the mobile home park, but those would only suffice for very small storms. Runoff from a storm of the magnitude of the 100 year frequency event would accumulate flows at the southeast corner until possible structural failure of the park concrete block wall would release the impoundment. Other structural failures of the block wall surrounding the park would be possible during such a storm, however a close examination of the facility indicates that flows would continue to be directed toward the southeast corner and subsequently the street intersection. The anticipated flow from the 100 year frequency storm accumulated at the intersection of Sage Road and 98th Street S.W. is 469 cubic feet per second (C.F.S.), and it is believed that existing constructed facilities would cause this to result in massive sheetflow. Close examination of the map in Appendix B indicates that such a flow would be divided with the large portion following a southeasterly alignment normal to contours. The small ephemeral channel scoured by discharge from existing constructed drainage improvements existing on the north side of Sage Road will intercept some of this sheetflow. It is estimated that approximately one-fourth of the total with a maximum of 150 C.F.S. can be expected to utilize this channel under the most adverse conditions. This channel will direct flows onto the proposed new pavement section of Sage Road, and a four foot deep cutoff wall will be constructed at the beginning of the pavement to insure maintenance of the integrity of the constructed section proposed. A 12 inch high straight curb and gutter section will be utilized in order to improve the hydraulic capacity of the street, and a temporary pavement section will be designed at the intersection with

the south subdivision entrance street connection to existing Sage Road pavement to provide for accomodating the anticipated flow within the new street until permanent upstream facilities are installed to relieve this problem. This development is adjacent to Sage Road only at the south entrance street intersection and the ponding area, therefore no hazard exists to habitable properties. This partial street construction will terminate on the east into the constructed partial street for Sunset West Subdivision Unit 1.

Offsite flows anticipated on the west side of the subdivision tract would be quite easily handled in the existing section of 98th Street extended north to San Ygnacio approximately 400 feet. San Ygnacio Road on the north is located on a topographic ridge, therefore no offsite flows will enter the street from the north or from 98th Street. 98th Street has a potential of receiving some overflow from the mobile home park from a flume through the east block wall near the San Ygnacio intersection, and the total anticipated rate of flow expected in the street near the southwest corner of [illegible]ubdivision during a 100 year frequency storm is 60 C.F.S. The existing street section or its equivalent channel section will handle approximately 114 C.F.S.

The subdivision will be graded to drain entire lot areas to the streets without on-lot ponding, and the street system will accumulate runoff and will discharge it into a community ponding area at the southeast corner of the tract (see Grading Concept Contour Map in Appendix I). This concept complies with Drainage Resolution 1972-2 as well as recent City suggestions. A small outlet pipe will be provided to drain the pond into the street through a curb opening downstream in Sage Road.

The gross developed area exluding those adjacent street areas which do not contribute drainage (San Ygnacio, 98th Street, and Sage Road S.W.) and excluding the ponding area is 14.22 acres. All onsite computations relating to drainage are shown in Appendix H. The anticipated rate of onsite runoff generated by the 100 year frequency storm prior to development is 26 C.F.S., and the volume of runoff expected is 45,219 cubic feet. (C.F.). The comparable quantities anticipated after development are a rate of 59 C.F.S. and a volume of 79,483 C.F. To comply with the dictates of Drainage Resolution 1972-2, a maximum (4) discharge rate of 26 C.F.S. is permissible and a pond volume of 34,064 C.F. is required.

The maximum rate of flow to be expected in a 32 foot wide residential street within the tract is 45 C.F.S. for the 100 year frequency storm, and this would produce a flow 6 inches deep at the curb face in the standard street section. The total flow anticipated in the 40 foot wide entrance street is the 59 C.F.S. developed rate, and this would be handled with less than a depth of 7 inches at the curb face in a standard street section. Total street capacity for standard street sections of the 32 foot street is 95 C.F.S. and of the 40 foot street is 104 C.F.S.

Detention will be accomplished by diverting surface flows from the street into a pond on the parcel of land in the southeast corner of the subdivision. Drainage regulations coupled with the mechanics of managing the ponding of drainage dictate that the total runoff must be channeled through the pond. A six inch diameter pipe drain will be provided to control the discharge emptying the entire pond volume through a curb outlet at a maximum rate of less than 2 C.F.S. The overflow spillway will be through a concrete underwalk-curb opening discharge flume with a maximum rate of flow of 24 C.F.S. In order to comply with all requirements, it will be necessary to impound more than the excess volume generated by development, thus the runoff from the 25 year-6 hour

precipitation will be detained below the floor elevation of the overflow discharge flume. The top area of the pond will be approximately 19,500 square feet, and the depth will be about 5 feet utilizing 3:1 side slopes.

RECOMMENDATION: It is recommended that the City of Albuquerque approve this report, since it does provide for adequate site protection together with adhering to the requirements set forth in drainage regulations.

Although the anticipated flows on Sage Road S.W. are not a threat to proposed development in this tract and have only a minor affect on one entrance, it is recommended that the City give careful consideration to temporarily modifying the intersection of 98th Street (Snow Vista Boulevard) and Sage Road S.W. (Gibson Boulevard) to ensure that storm runoff accumulated at that point will be positively directed south to the dike constructed along Snow Vista Boulevard S.W. for that purpose to provide outfall to the Amole Arroyo. It is believed that such a temporary modification would not interfere with traffic at this four way stop intersection, and, pending construction of the proposed A.M.A.F.C.A. facility(ies) upstream, this would afford protection to a substantial already inhabited area together with relieving street flows in several developing and proposed subdivisions by channelizing the runoff to its ultimate discharge point in the Amole Arroyo.

ENGINEER'S REPORT

1651.34

ON

STORM DRAINAGE

FOR

WESTVIEW TOWNHOMES

GORDON HERKENHOFF & ASSOCIATES, INC.
302 Eighth Street, N.W.
Albuquerque, New Mexico 87102
ENGINEERS ARCHITECTS PLANNERS

ENGINEER'S REPORT

1651.34

ON

STORM DRAINAGE

FOR

WESTVIEW TOWNHOMES

RECEIVED
APR 07 1980
CITY ENGINEER

GORDON HERKENHOFF & ASSOCIATES, INC.
302 Eighth Street, N.W.
Albuquerque, New Mexico 87102
ENGINEERS ARCHITECTS PLANNERS

I hereby certify that this Drainage Report for Westview Townhomes was prepared under my direction, conforms to Drainage Resolution 1972-2 and City of Albuquerque Resolution No. 59-1976, and is true and correct to the best of my knowledge and belief.

Gordon Herkenhoff
N.M.P.E. No. 243

3-31-80
Date

G. E. HERKENHOFF
NEW MEXICO
243
REGISTERED PROFESSIONAL ENGINEER

Approved:

For the City of Albuquerque

N

SCALE: 1"=1000'

VICINITY MAP:
WESTVIEW TOWNHOMES
ALBUQUERQUE, NEW MEXICO

ZONE ATLAS SHEETS
L-9-Z & M-9-Z

ENGINEER'S REPORT ON
STORM DRAINAGE
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APPENDIX INDEX

Appendix A - Presentation Topographic Map

Appendix B - Orthophoto-Contour Map of Area in the Vicinity of The Intersection of Sage Road (Gibson Blvd.) and 98th Street (Snow Vista Blvd.) S.W.

Appendix C - Intensity-Duration-Frequency Curves Albuquerque, New Mexico 1961

Appendix D - Nomograph to Determine Time of Concentration (California Culvert Practice)

Appendix E - Soil Conservation Service Chart Indicating Average Velocities for Estimating Travel Time for Overland Flow

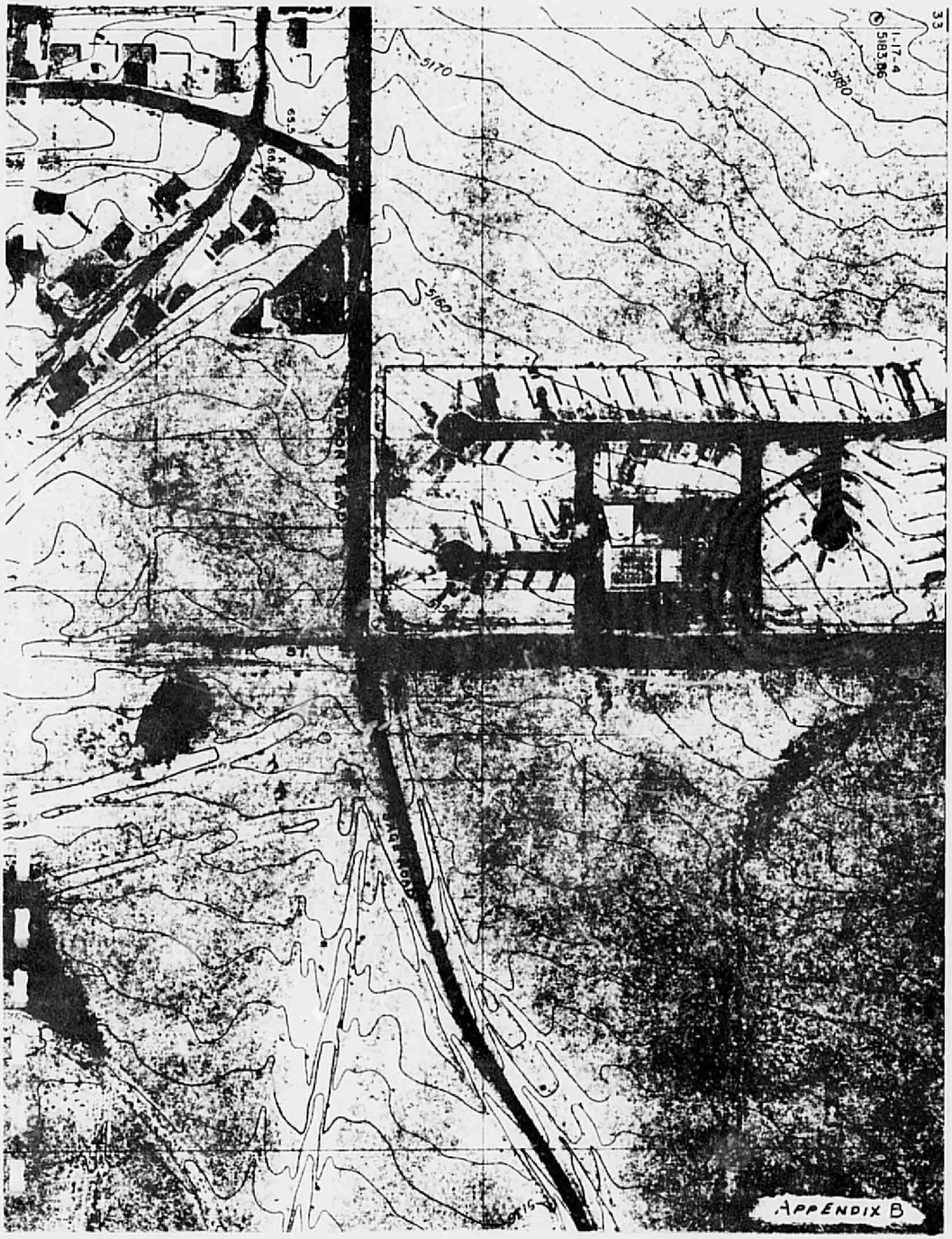
Appendix F - American Society of Civil Engineers Chart of Coefficients of Runoff for Rational Formula Computations

Appendix G - National Oceanic and Atmospheric Administration (NOAA) Altas 2 Isopluvial Map of the 100 Year - 6 Hour Precipitation for Bernalillo County, New Mexico

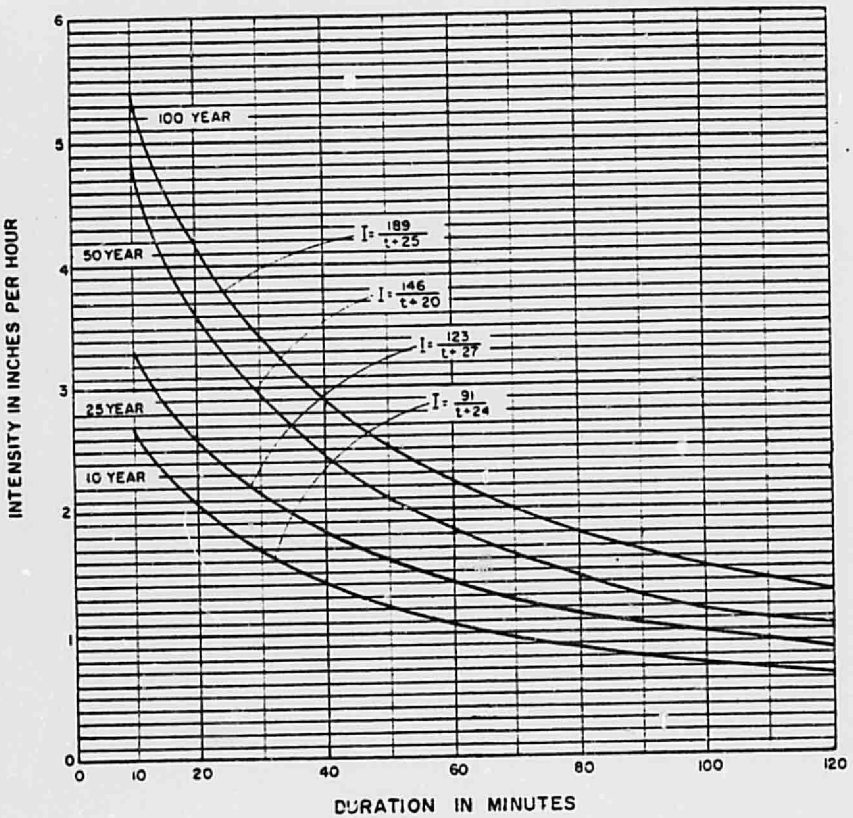
Appendix H - Hydrologic and Hydraulic Computations

Appendix I - Grading Concept Plan for Westview Townhomes

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



APPENDIX B



MASTER PLAN OF DRAINAGE CITY OF ALBUQUERQUE - NEW MEXICO AND ENVIRONS	
INTENSITY DURATION FREQUENCY CURVES (ALBUQUERQUE AREA - 1961)	
GORDON HERKENHOFF & ASSOC CONSULTING ENGINEERS ALBUQUERQUE, NEW MEXICO	CHART 1

APPENDIX C

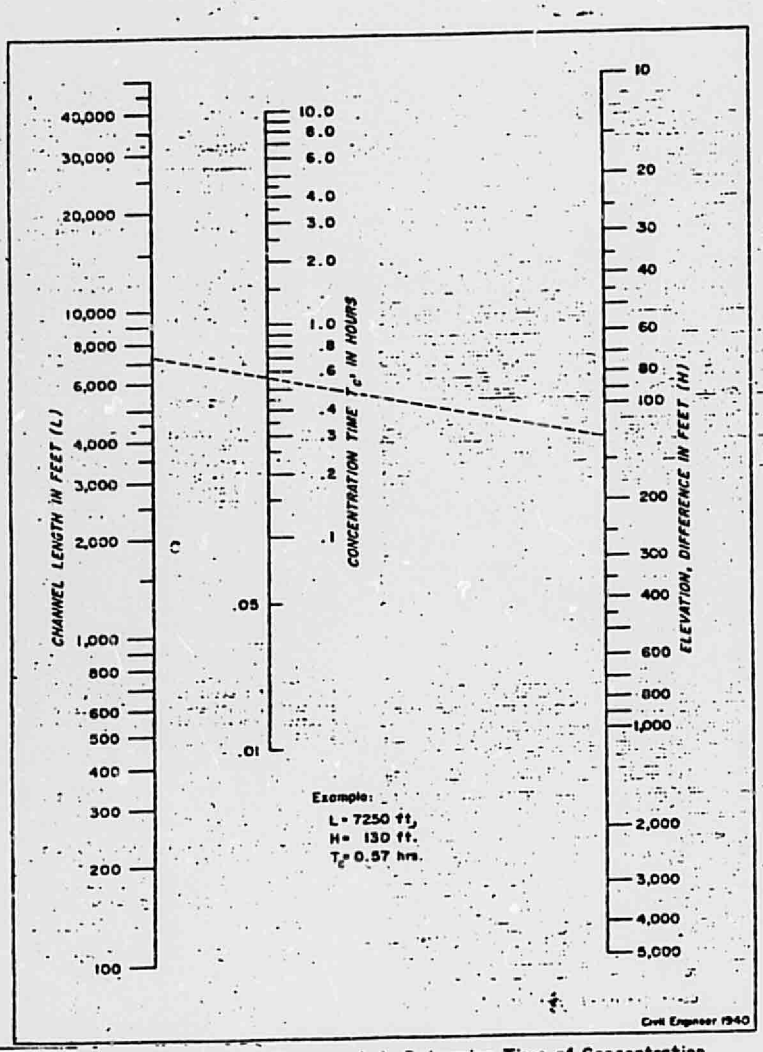
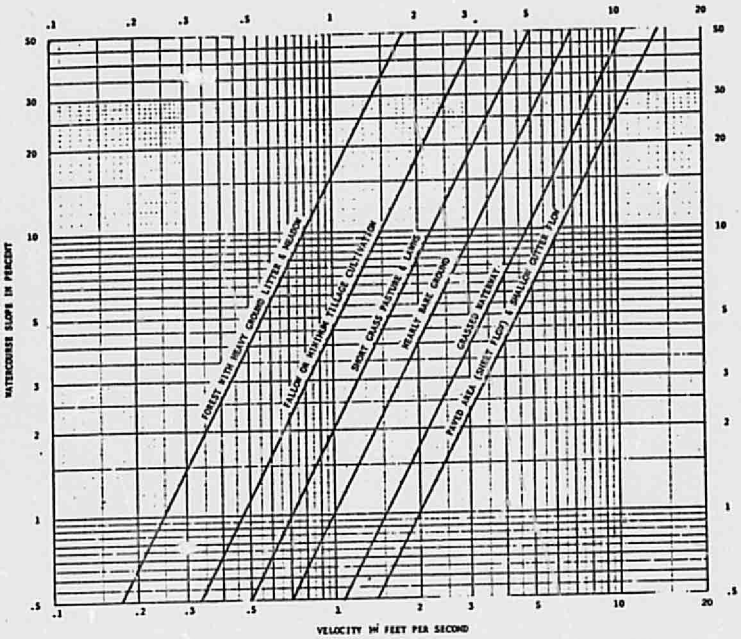


Figure 2-2 --- Nomograph to Determine Time of Concentration

CALIFORNIA CULVERT PRACTICE —

$$T_c = \left[11.9\,(L_{MILES})^3 / H_{FEET}\right]^{0.385}$$



AVERAGE VELOCITIES FOR ESTIMATING TRAVEL TIME FOR OVERLAND FLOWS
SOIL CONSERVATION SERVICE

APPENDIX E

DESIGN AND CONSTRUCTION OF SANITARY AND STORM SEWERS
A.S.C.E. - 1969

storm, is common. The range of coefficients, classified with respect to the general character of the tributary area reported in use, is:

Description of Area	Runoff Coefficients
Business	
Downtown	0.70 to 0.95
Neighborhood	0.50 to 0.70
Residential	
Single-family	0.30 to 0.50
Multi-units, detached	0.40 to 0.60
Multi-units, attached	0.60 to 0.75
Residential (suburban)	0.25 to 0.40
Apartment	0.50 to 0.70
Industrial	
Light	0.50 to 0.80
Heavy	0.60 to 0.90
Parks, cemeteries	0.10 to 0.25
Playgrounds	0.20 to 0.35
Railroad yard	0.20 to 0.35
Unimproved	0.10 to 0.30

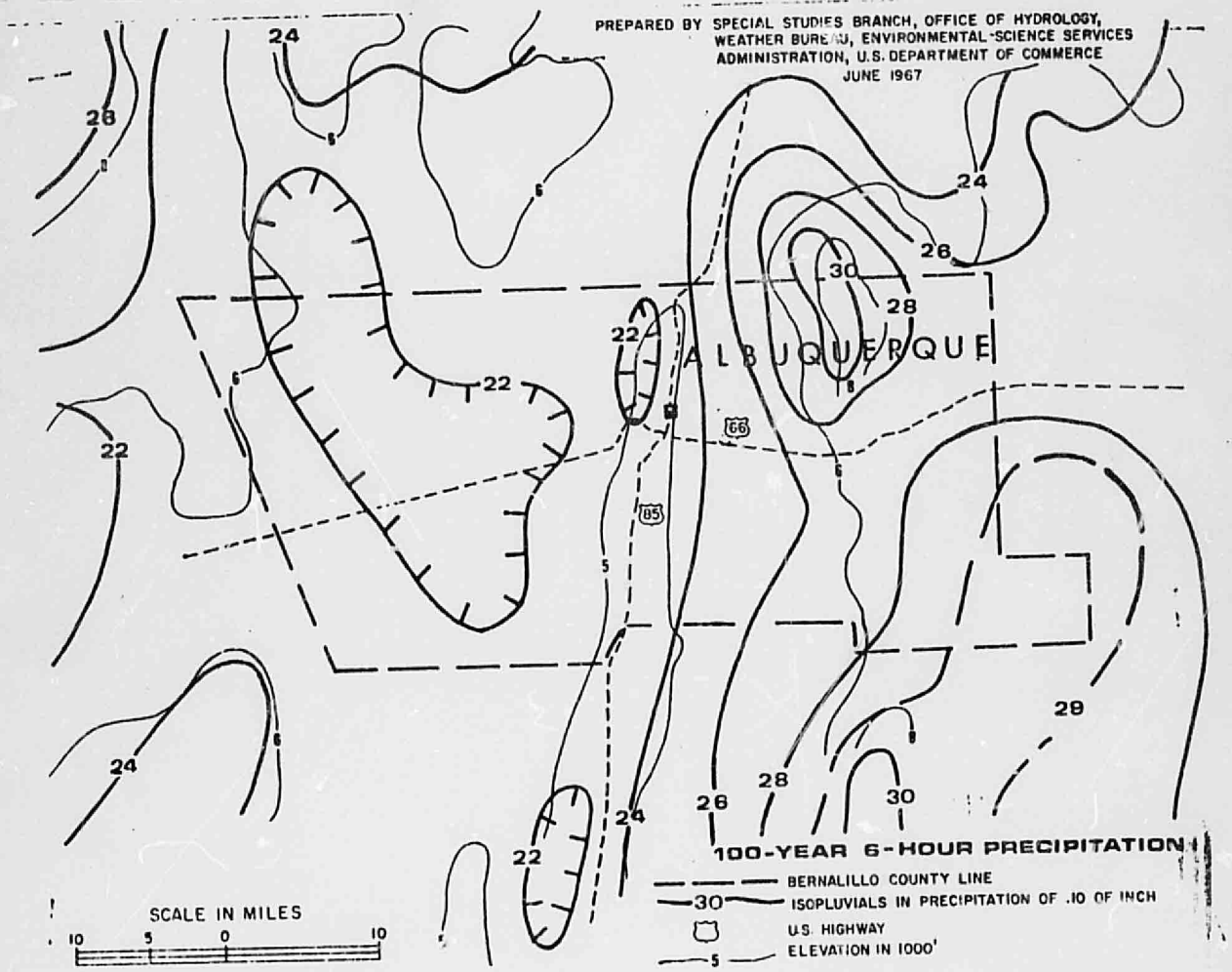
It often is desirable to develop a composite runoff coefficient based on the percentage of different types of surface in the drainage area. This procedure often is applied to typical "sample" blocks as a guide to selection of reasonable values of the coefficient for an entire area. Coefficients with respect to surface type currently in use are:

Character of Surface	Runoff Coefficients
Pavement	
Asphaltic and Concrete	0.70 to 0.95
Brick	0.70 to 0.85
Roofs	0.75 to 0.95
Lawns, sandy soil	
Flat, 2 percent	0.05 to 0.10
Average, 2 to 7 percent	0.10 to 0.15
Steep, 7 percent	0.15 to 0.20
Lawns, heavy soil	
Flat, 2 percent	0.13 to 0.17
Average, 2 to 7 percent	0.18 to 0.22
Steep, 7 percent	0.25 to 0.35

The coefficients in these two tabulations are applicable for storms of 5- to 10-yr frequencies. Less frequent, higher intensity storms will require the use of higher coefficients because infiltration and other losses have a proportionally smaller effect on runoff. The coefficients are based on the assumption that the design storm does not occur when the ground surface is frozen.

(c) Coefficients Varying with Time.—Figure 11 shows the variation of the runoff coefficient with respect to length of time of prior wetting,

APPENDIX F


PREPARED BY SPECIAL STUDIES BRANCH, OFFICE OF HYDROLOGY,
WEATHER BUREAU, ENVIRONMENTAL-SCIENCE SERVICES
ADMINISTRATION, U.S. DEPARTMENT OF COMMERCE
JUNE 1967
ALBUQUERQUE
66
85
24
26
22
30
28
29
100-YEAR 6-HOUR PRECIPITATION
BERNALILLO COUNTY LINE
30 ISOPLUVIALS IN PRECIPITATION OF .10 OF INCH
U.S. HIGHWAY
5 ELEVATION IN 1000'
SCALE IN MILES
10 5 0 10

APPENDIX G.

GORDON HERKENHOFF & ASSOCIATES, INC. 302 Eighth Street, N.W. Albuquerque, New Mexico 87102 (505) 247-0294 ENGINEERING COMPUTATIONS	NAME OF PROJECT WESTVIEW TOWNHOMES HYDROLOGIC & HYDRAULIC COMPUTATION			SHEET NUMBER 1 OF 5
	COMPUTED BY JP	CHECKED BY	JOB NUMBER	DATE 3/28/80

HYDROLOGY:

DRAINAGE FROM AREAS 1,2,3,4 & MOBILE HOME PARK (APPENDIX A) –
AREA = 421.37 ACRES ; TIME OF CONCENTRATION (T_c) = 49.70 MINUTES
I_{100} = 189/(25+49.70) = 2.53 INCHES / HOUR
COMPOSITE RUNOFF FACTOR (C_{COMP}) –
[(DEVELOPED 49.82 Ac. * 0.7) + (UNDEVELOPED 371.5[illegible] Ac. * 0.4)] / 421.37
C_{COMP} = 0.44
Q_{100} = 421.37 * 0.44 * 2.53 = 469.07 C.F.S.

FLOW 98TH STREET @ SOUTHWEST CORNER TRACT –
VELOCITY – 1% SHALLOW FLOW PAVED AREA = 2 F.P.S.
T_c = 1600 / 2 * 60 = 13.33 MIN.
I_{100} = 189 / (25 + 13.33) = 4.93 IN. / HR.
AREA = 3.70 (STREET) + 10.33 (MOBILE HOME PARK) = 14.03 AC.
C_{COMP} = [(10.33 * 0.75) + (3.70 * 0.64)] / 14.03 = 0.72
Q_{100} = 49.87 C.F.S. (14.03 * 4.93 * 0.72)
IN THE EVENT THAT THE MOBILE HOME PARK SHOULD REVERT TO C1 USE – AREA = 27.55 Ac C1 & 3.70 STREET
C_{COMP} = [(27.55 * 0.35) + (3.70 * 0.7)] / 31.25 = 0.39
(COMMERCIAL WOULD POND UNDEVELOPED FLOW)
Q_{100} = 31.25 * 4.93 * 0.39 = 60.08 C.F.S.

UNDEVELOPED AREA RUNOFF –
C = 0.40 ; AREA = 14.22 Ac. (619,345 SQ. FT.)
T_c : TRAVEL = 1360 L.F. @ 30' VERT. FALL = 2% SLOPE → 1.4 F.P.S. VELOCITY
= 1360 / 1.4 * 60 = 16 MIN.
I_{100} = 189 / (16 + 25) = 4.61 IN. / HR.
Q_{100} = 14.22 * 4.61 * 0.40 = 26 C.F.S.
VOL. 100 = 619,345 * 2.2/12 * 0.40 = 45,419 C.F.
(N.O.A.A. 6 HR. - 100 YR PRECIP.)

DEVELOPED AREA RUNOFF –
CONTRIBUTING AREAS –

HARD SURFACE STREET RIGHTS OF WAY (R.O.W.)		
(2,742.15 * 41.24) + (422.64 * 49.24) + (122 * 10 * 4.38 DRIVEWAYS)	=	139,241 S.F.
UNPAVED AREA STREET R.O.W.		
(2,742.15 * 8.76) + (422.64 * 10.76)	=	23,225 S.F.
HOUSE (ROOF & PATIO) = 1,400 * 122	=	170,800 S.F.
DRIVEWAYS = 122 * 20 * 10	=	24,400 S.F.
LOT AREA (SOFT) =	=	261,679 S.F.
TOTAL TRACT AREA (14.22 Ac)	=	619,345 S.F.

$C_{COMP.}$ = [(139,241 + 170,800 + 24,400) [illegible] + (261,679 + 23,225) 0.40] / 619,345
= 0.67
USE $C_{COMP.}$ = 0.70

GORDON HERKENHOFF & ASSOCIATES, INC. 302 Eighth Street, N.W. Albuquerque, New Mexico 87102 (505) 247-0294 ENGINEERING COMPUTATIONS	NAME OF PROJECT WESTVIEW TOWNHOMES HYDROLOGIC & HYDRAULIC COMPUTATION			SHEET NUMBER 2 OF 5
	COMPUTED BY P	CHECKED BY	JOB NUMBER	DATE 3/28/80

HYDROLOGY (CONT'D):

DEVELOPED AREA RUNOFF (CONT'D)—

T_c : 140' LOT @ 1.4 F.P.S.; 1,496' STREET @ 5.0 F.P.S.

$= 140/1.4 \times 60 + 1{,}496/5.0 \times 60 = 6.65$ MIN.

$I_{100} = 189/(25+6.65) = 5.97$ IN./HR.

$Q_{100} = 14.22 \times 5.97 \times 0.7 = 59$ C.F.S.

$VOL._{100} = 619{,}345 \times 2.2/12 \times 0.7 = 79{,}483$ C.F.

DISCHARGE RATE & PONDING VOLUME REQUIRED—

RATE = 26 C.F.S. (UNDEVELOPED)

VOLUME OF PONDING—

DEVELOPED VOLUME OF RUNOFF =	= 79,483 C.F.
UNDEVELOPED VOLUME OF RUNOFF =	= 45,419 C.F.
VOLUME DUE TO DEVELOPMENT (TO BE PONDED)	= 34,064 C.F.

MAXIMUM FLOW EXPECTED IN 32' WIDE STREET—

(@ INTERSECTION W/ 60' R.O.W. — NORTH SIDE)

CONTRIBUTING AREA = 10.15 AC.

T_c : 140' LOT @ 1.4 F.P.S. + 963' STREET @ 5.0 F.P.S.

$= (140/1.4 \times 60) + (963/5.0 \times 60) = 4.88$ MIN.

$I_{100} = 189/(25+4.88) = 6.33$ IN./HR.

$Q_{100} = 10.15 \times 6.33 \times 0.7 = 44.97$ C.F.S.

MAXIMUM FLOW EXPECTED IN 40' WIDE STREET—

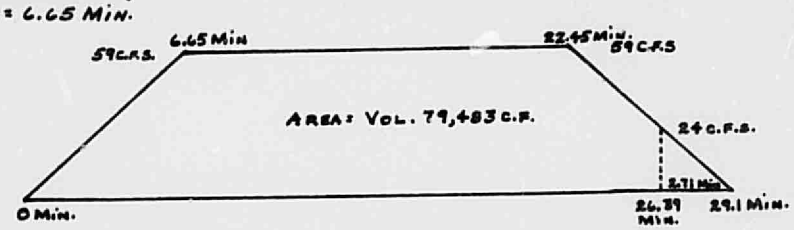
(SAME AS DEVELOPED AREA RUNOFF)

$Q_{100} = 59$ C.F.S.

MODIFIED RATIONAL HYDROGRAPH — (DEVELOPED AREA)

(BASED ON $Q_{DEV} = 59$ C.F.S. & $VOLUME_{DEV.} = 79{,}483$ C.F.S.)

$T_c = 6.65$ MIN.



$VOL_{100} = 2(6.65 \times 60 \times 59/2) + (15.80 \times 59 \times 60) = 79{,}473$ C.F. ✓

GORDON HERKENHOFF & ASSOCIATES, INC. 302 Eighth Street, N.W. Albuquerque, New Mexico 87102 (505) 247-0294 ENGINEERING COMPUTATIONS	NAME OF PROJECT WESTVIEW TOWNHOMES HYDROLOGIC & HYDRAULIC COMPUTATION			SHEET NUMBER 3 OF 5
	COMPUTED BY J	CHECKED BY	JOB NUMBER	DATE 3/28/80

HYDROLOGY (CONT'D):

MODIFIED RATIONAL HYDROGRAPH — (DEVELOPED AREA) — (CONT'D)

MAXIMUM DISCHARGE PERMITTED FROM POND IS 26 C.F.S.

MAX. DISCHARGE FROM FLUME = 26 C.F.S. - MAX. DRAIN DISCHARGE (2 C.F.S.)
= 24 C.F.S.

IN ORDER TO PROVIDE FOR THE MAXIMUM PERMISSIBLE 24 C.F.S. DISCHARGE THROUGH THE OUTFALL FLUME WITHOUT OVERFLOWING THE POND, A 24 C.F.S. INFLOW TO THE POND MUST BE REALIZED ON THE DESCENDING LIMB OF THE HYDROGRAPH WHEN THE POND IS FULL

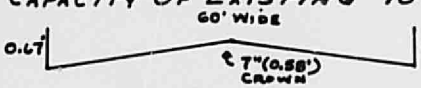
TIME @ 24 C.F.S. = 24/59 × 6.65 = 2.71 MIN.

VOL. POND @ 26.39 MIN. = 79,483 C.F. − (2.71 × 60 × 24/2) =
= 77,535 C.F. (@ TOP DISCHARGE FLUME)

GORDON HERKENHOFF & ASSOCIATES, INC. 302 Eighth Street, N.W. Albuquerque, New Mexico 87102 (505) 247-6294 ENGINEERING COMPUTATIONS	NAME OF PROJECT WESTVIEW TOWNHOMES HYDROLOGIC & HYDRAULIC COMPUTATION			SHEET NUMBER 4 OF 5
	COMPUTED BY P	CHECKED BY	JOB NUMBER	DATE 3/28/80

HYDRAULICS:

CAPACITY OF EXISTING 98TH STREET:



SLOPE = 0.01

AREA = $2\left(\frac{0.67+0.08}{2}\right)30 = 22.50$ S.F

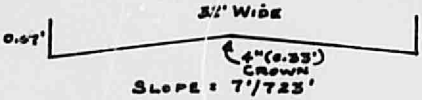
WETTED PERIMETER (W.P.) = 61.33'

$R^{2/3} = 0.51$ $n = 0.015$

$V = 1.486/0.015 \times 0.51 \times (0.01)^{1/2} = 5.05$ FPS

$Q = 22.50 \times 5.05 = 113.68$ C.F.S.

32' WIDE STREET: (STANDARD SECTION)



SLOPE = 7'/723'

FLOW DEPTH @ 45 C.F.S. ± — (0.58 CURB)

AREA = $2\left(\frac{0.58+0.17}{2}\right)16 = 10.72$ S.F.

WP = 33.00' $n = 0.015$ $R^{2/3} = 0.47$

$V = 1.486/0.015 \times 0.47 \times (7/723)^{1/2} = 4.58$ FPS

$Q = 10.72 \times 4.58 = 49$ C.F.S.

CAPACITY (CURB FULL) —

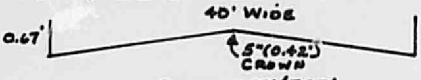
AREA = $2\left(\frac{0.67+0.23}{2}\right)16 = 16.00$ S.F.

WP = 33.33' ; $n = 0.015$; $R^{2/3} = 0.61$

$V = 1.486/0.015 \times 0.61 \times (7/723)^{1/2} = 5.95$ F.P.S.

$Q = 16.00 \times 5.95 = 95$ C.F.S.

40' WIDE STREET: (STANDARD SECTION)



SLOPE = 7'/723'

FLOW DEPTH @ 59 C.F.S. ± — (0.58' @ CURB)

AREA = $2\left(\frac{0.58+0.17}{2}\right)20 = 15.00$ S.F.

WP = 41.17' ; $n = 0.015$; $R^{2/3} = 0.51$

$V = 1.486/0.015 \times 0.51 \times (7/723)^{1/2} = 4.97$ F.P.S.

$Q = 15.00 \times 4.97 = 75$ C.F.S.

CAPACITY (CURB FULL) —

AREA = $2\left(\frac{0.67+0.25}{2}\right)20 = 18.40$ S.F.

WP = 41.33' ; $n = 0.015$; $R^{2/3} = 0.58$

$V = 1.486/0.015 \times 0.58 \times (7/723)^{1/2} = 5.65$ F.P.S.

$Q = 18.40 \times 5.65 = 104$ C.F.S.

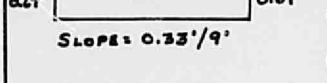
6" PIPE DRAIN LINE @ POND —

NO PIPE SLOPE ; HEAD = 5' ; LENGTH = 250'

$S = \frac{V^2}{2g} + 0.01\left(\frac{250}{0.5}\right)\left(\frac{V^2}{2g}\right)$; $V = 7.30$ F.P.S.

$Q = 0.196 \times 7.30 = 1.43$ C.F.S. ; USE $Q_{MAX} = 2$ C.F.S.

OUTFALL FLUME: — (CONCRETE CONSTRUCTION)



SLOPE = 0.33'/9'

AREA = $3.0' \times 2/3' = 2.00$ S.F.

WP = 4.33' ; $n = 0.015$; $R^{2/3} = 0.60$

$V = 1.486/0.015 \times 0.60 \times (0.33'/9')^{1/2} = 11.38$ F.P.S.

$Q = 2.00 \times 11.38 = 22.76$ C.F.S.

GORDON HERKENHOFF & ASSOCIATES, INC.
302 Eighth Street, N.W.
Albuquerque, New Mexico 87102
(505) 247-0294
ENGINEERING COMPUTATIONS

NAME OF PROJECT			SHEET NUMBER
WESTVIEW TOWNHOMES HYDROLOGIC & HYDRAULIC COMPUTATION			5 OF 5
COMPUTED BY	CHECKED BY	JOB NUMBER	DATE
JP			3/28/80

HYDRAULICS (CONT'D):

DETENTION POND:

AREA AVAILABLE TOTAL LOT = 0.5169 Ac = 22,516 S.F.
LESS PERIMETER - 595' × 5' = 2975 S.F.
POND AREA AVAILABLE @ TOP OF FLUME = 19,541 S.F.
DEPTH = 5' ±

REDUCTION IN VOLUME TO BOTTOM OF FLUME —
(19,541 × 0.67) − (560 × 2.0 × 0.67/2) = 12,717 C.F.

VOLUME OF POND TO BOTTOM (FLOOR) OF FLUME —
77,535 − 12,717 = 64,818 C.F. (90% MORE THAN REQ'D).

TOTAL RAINFALL IMPOUNDED —
64,818 × 12 / 619,345 × 0.7 = 1.79" (25 YR - 6 HR PRECIPITATION 1.8")

POND VOLUME REQUIRED FOR 100 YR - 24 HR PRECIPITATION
DEVELOPED LESS UNDEVELOPED VOLUME —
619,345 × 2.7/12 × (0.7 − 0.4) = 41,806 C.F.
64,818 C.F. TO BE PONDED = 55% MORE THAN 41,806 C.F.

1157

DMJM/Adam, Hamlyn, Anderson

CITY OF ALBUQUERQUE
MUNICIPAL DEVELOPMENT DEPARTMENT
ENGINEERING DIVISION/DESIGN HYDROLOGY SECTION

HYDROLOGY SECTION PROJECT NO.: M9-D1 DATE: 4/3/85

PLANNING DIVISION NOS. EPC: _____ DRB: _____

CONFERENCE RECAP

SUBJECT: M9-D1 WESTVIEW TOWNHOMES

APPROVAL REQUESTED:

____ PRELIMINARY PLAT ____ FINAL PLAT

____ SITE DEVELOPMENT PLAN ____ BUILDING PERMIT

✓ RETAINING WORK/DRAINAGE report ROUGH GRADING

	WHO	REPRESENTING
ATTENDENCE:	JAKE BORDENAVE	
	FRED J. AGUIRRE	

FINDINGS: (1) POND MUST BE DESIGNED FOR THE 100YR 6HR STORM WITH AN ALLOWABLE DISCHARGE RATE NOT TO EXCEED A 5YR UNDEVELOPED RATE (2) POND TREATMENT REQUIRED TO ELIMINATE STAGNANT WATER WITHIN THE POND. (3) POND MAINTENANCE WILL BE THE RESPONSIBILITY OF THE DEVELOPER UNTIL SUCH TIME THAT IMPROVEMENTS DOWNSTREAM ELIMINATE THE NEED FOR THE POND. UPON IMPROVEMENTS DOWNSTREAM THE CITY WILL ALLOW VACATION OF THE EASEMENT/R/W. HOWEVER CONNECTION TO THE SYSTEM WILL BE THE ~~EXPENSE~~ RESPONSIBILITY OF THE DEVELOPER. (4) FENCING REQUIRED FOR POND DEPTH EXCEEDING 18". (5) AN AGREEMENT WILL BE REQUIRED TO ESTABLISH MAINTENANCE AND LIABILITY RESPONSIBILITY FOR THE POND'S MAINTENANCE.

The undersigned agrees that the above findings are summarized accurately and are only subject to change if further investigation reveals that they are not reasonable or that they are based on inaccurate information.

SIGNED: Fred Aguirre SIGNED: P. Bohnenkamp

TITLE: _____ TITLE: _____

DATE: 4/3/85 DATE: 4/3/85

and volume to be for not a peak 100 year volume rather than on total 100 year volume

DMJM / AHA ALBUQUERQUE	PROJECT WESTVIEW TOWNHOMES	PROJECT NO. 4690-02-01	PAGE 1
		BY: C. Burm / DATE: 5-9-85	

SUBJECT DRAINAGE DESIGN

DESIGN CRITERIA

1. Pond will be designed for the 100yr 6hr storm with an allowable discharge rate not to exceed a 5yr undeveloped rate.

2. 100yr · 6hr Rainfall : 2.2 inches
   Plate 22.2 D-1

3. 5yr storm factor 0.54
   Plate 22.2 D-1

4. Soils Type:

   BCC - Bluepoint loamy fine sand Type 'A' soil
   PAC - Pajarito loamy fine sand Type 'B' soil

5. UNDEVELOPED 'C' factor = 0.3

6. $I = 2.2(6.84)\,T_c^{-0.51}$
   $= 15.05\,T_c^{-0.51}$ PLATE 22.2D-2

7. A = 14.22 Acres.

   1980 Drainage Report for Westview Townhomes by Gordon Herkenoff and Associates.

DMJM / AHA ALBUQUERQUE	PROJECT WESTVIEW TOWNHOMES	PROJECT NO. 4690-02-01	PAGE 2
		BY: C. Burm / DATE: 5-9-85	

SUBJECT DRAINAGE DESIGN

UNDEVELOPED CONDITION

L = 850 ft.

S = 22/850

= 0.026 ft/ft (Avg)

FROM PLATE 22.2 B-1

V = 0.96 ft/sec

T_c = 850 / 0.96 x 60

= 15 min

I = 15.05 $(15)^{0.61}$

= 3.78

Q = C I A

Q_{100} = (0.3)(3.78)(14.22)

= 16.1 cfs

Q_5 = 0.54(16.1)

8.7 cfs MAX RATE OF DISCHARGE FROM POND

DMJM / AHA ALBUQUERQUE	PROJECT WESTVIEW TOWNHOMES	PROJECT NO 4690.02.01	PAGE 5
		BY: C. Burm / DATE: 5-9-85	

SUBJECT DRAINAGE DESIGN

DEVELOPED CONDITION

Composite 'C'

from 1980 Report

HARD Surfaces (streets + sidewalks)	=	139,250 SF
House (Roof + PATIO) 122 X 1400	=	170,800 SF
Driveways (122 x 12' x 20')	=	29,280 SF
UNPAVED (Gross + LANDSCAPE)	=	280,015 SF
TOTAL AREA (14.22 Ac)	=	619,345 S.F.

$$\text{Comp. 'C'} = \frac{(139,250 + 170,800 + 29,280)0.95 + (280,015)0.30}{619,345}$$

$$= 0.66$$

Incremental AREA per lot for street flows

$$A_i = 619,345/122$$

$$= 5,076.6 \text{ S.F.}$$

Peak Developed Q

$$T_c = 1100/3.1 \times 60 + 210/4.95 \times 60 + 115/3.9 \times 60 + 120/0.8 \times 60$$

$$= 9.6 \text{ min}$$

use 10 min

$$Q_{100} = (0.66)(1.05)(10)^{-0.51}(14.22)$$

$$= 43.6 \text{ cfs}$$

DMJM / AHA ALBUQUERQUE	PROJECT WESTVIEW TOWNHOMES	PROJECT NO. 4690-02-01	PAGE 4
		BY: C. Burm / DATE: 5-10-85	

SUBJECT DRAINAGE DESIGN

Vol = (14.22)(43560)(0.66)(2.2)/12

= 74,950 cf

Effective AREA to POND

= (14.22)(43560)(0.66) + Pond Site Area

= 408,820 + 22,500

= 431,320 S.F

POND INFO.

Bottom Area @ elev 29.5 11,200 SF

Top Area @ elev 33.5 18,000 S.F

Available Storage = 58,400 cf.

OUTLET 12" orifice

FROM BASIN ROUTING

PEAK DISCHARGE = 6.5 cfs < 8.7 allowable

MAX WATER Surface = elev 32.97

MAX Storage = 49,100 cf

DMJM / AHA ALBUQUERQUE	PROJECT WESTVIEW TOWNHOMES	PROJECT NO 4690-02-01	PAGE 5
		BY: C. Burm / DATE: 5-10-85	

SUBJECT Drainage Design

STREET FLOWS:

Analysis Point	Num. of Lots	Area SF	C	T_c min	I in/hr	Q_{100} cfs
1	11	55,843	.66	10	4.65	3.9
2	20	101,532	.66	10	4.65	7.2
3	31	157,375	.66	10	4.65	11.1
4	43	218,294	.66	10	4.65	15.4
5	12	60,919	.66	10	4.65	4.3
6	19	96,455	.66	10	4.65	6.8
7	12	60,919	.66	10	4.65	4.3
8	39	197,987	.66	10	4.65	13.9
9	12	60,919	.66	10	4.65	4.3
10	60	304,596	.66	10	4.65	21.5
11	112	568,579	.66	10	4.65	40.0
12	122	619,345	.66	10	4.65	43.6

FOR ANALYSIS POINT LOCATIONS SEE DRAINAGE SUBBASINS PLATE 1

DMJM/AHA ALBUQUERQUE	PROJECT WESTVIEW TOWNHOMES	PROJECT NO 4690.02.01	PAGE 6
SUBJECT DRAINAGE DESIGN		BY: C. Burm DATE: 5-13-85	

ANALYSIS POINT NO.	Street Width ft.	Street Slope (ft/ft)	Q_{100} (cfs)	D_{100} (ft)	V_{100} ft/sec	$D \times V$	Q_{10} (cfs)	D_{10} (ft)	V_{10} (ft/sec)	$D \times V$
1	32	0.01615	3.9	0.32	2.7	0.86	2.6	0.28	2.4	0.67
2	32	0.01615	7.2	0.38	3.1	1.2	4.7	0.34	2.8	0.95
3	32	0.02175	11.1	0.42	3.9	1.6	7.3	0.37	3.5	1.30
4	32	0.02175	15.4	0.46	4.2	1.96	10.1	0.405	3.8	1.55
5	32	0.03383	4.3	0.29	3.7	1.08	2.8	0.26	3.3	0.87
6	32	0.01346	6.8	0.39	2.9	1.12	4.5	0.34	2.6	0.89
7	32	0.03176	4.3	0.30	3.6	1.06	2.8	0.26	3.2	0.85
8	32	0.01346	13.9	0.48	3.4	1.66	9.1	0.42	3.1	1.31
9	32	0.02851	4.3	0.30	3.4	1.04	2.8	0.27	3.1	0.83
10	32	0.01346	21.5	.55	3.8	2.13	14.1	0.485	3.5	1.68
11	40	0.01346	40.0	.553	4.0	2.21	26.3	.49	3.4	1.69
12	40	0.01346	43.6	.566	4.1	2.34	28.6	.51	3.5	1.77

DMJM/AHA
ALBUQUERQUE

PROJECT: WESTVIEW TOWNHOMES

SUBJECT: DRAINAGE DESIGN

PROJECT NO: 4690-02-01

BY: C. Burm

DATE: 5-13-85

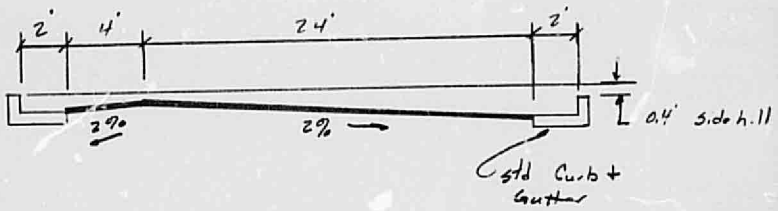
PAGE: 10

ANALYSIS POINT NO.	Street Width ft.	Street Slope (ft/ft)	Q_{100} (cfs)	D_{100} (ft)	V_{100} ft/sec	$D \times V$	Q_{10} (cfs)	D_{10} (ft)	V_{10} (ft/sec)	$D \times V$
1	32	0.01615	3.9	0.32	2.7	0.86	2.6	0.28	2.4	0.69
2	32	0.01615	7.2	0.38	3.1	1.2	4.7	0.34	2.8	0.95
3	32	0.02175	11.1	0.42	3.9	1.6	7.3	0.37	3.5	1.30
4	32	0.02175	15.4	0.46	4.2	1.96	10.1	0.[illegible]	3.8	1.55
5	32	0.03383	4.3	0.29	3.7	1.08	2.8	0.26	3.3	0.87
6	32	0.01346	6.8	0.39	2.9	1.12	4.5	0.34	2.6	0.89
7	32	0.03176	4.3	0.30	3.6	1.06	2.8	0.26	3.2	0.85
8	32	0.01346	13.9	0.48	3.4	1.66	9.1	0.42	3.1	1.31
9	32	0.02851	4.3	0.30	3.4	1.04	2.8	0.27	3.1	0.83
10	32	0.01346	21.5	.55	3.8	2.13	14.1	0.485	3.5	1.68
11	40	0.01346	40.0	.553	4.0	2.21	26.3	.49	3.4	1.69
12	40	0.01346	43.6	.566	4.1	2.34	28.6	.51	3.5	1.77

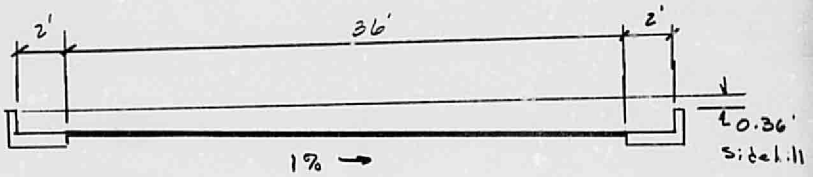
DMJM / AHA ALBUQUERQUE	PROJECT WESTVIEW TOWNHOMES	PROJECT NO 4690-02-01	PAGE 7
		BY: C Burm / DATE: 5-10-85	

SUBJECT DRAINAGE DESIGN

Typical Street Sections



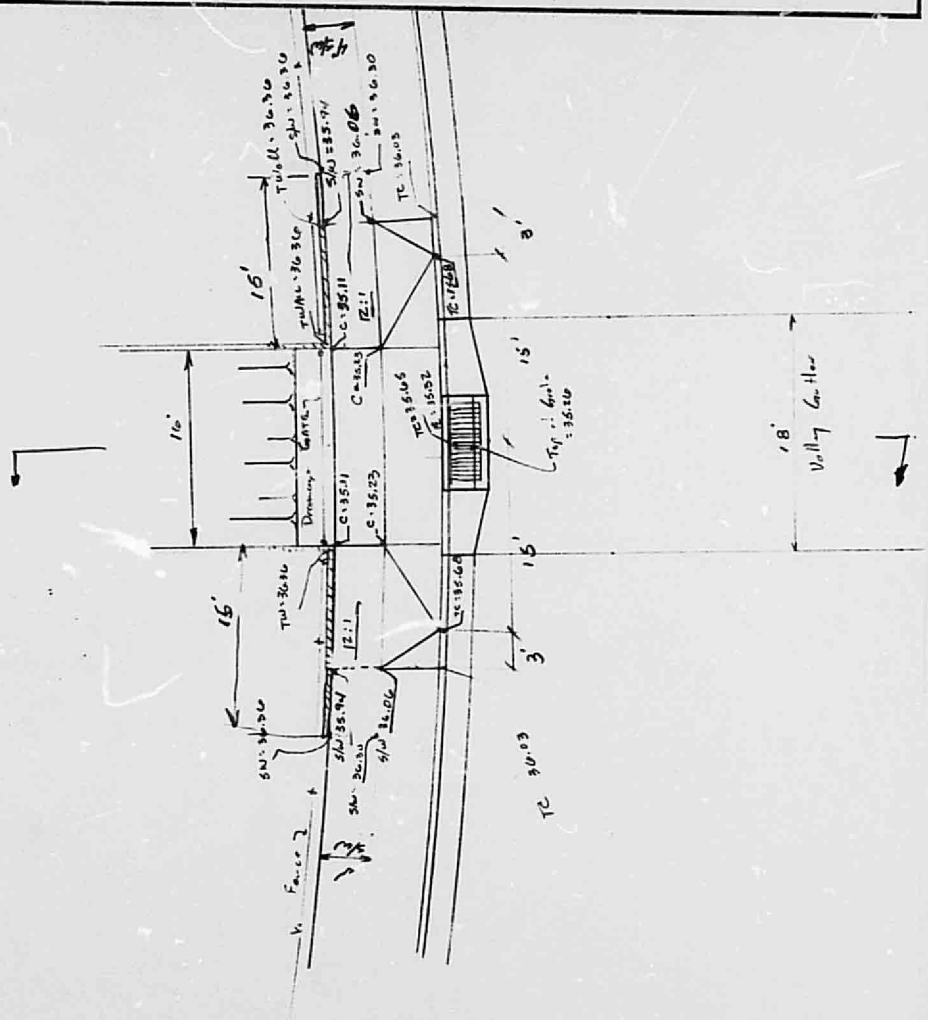
32' street



40' street

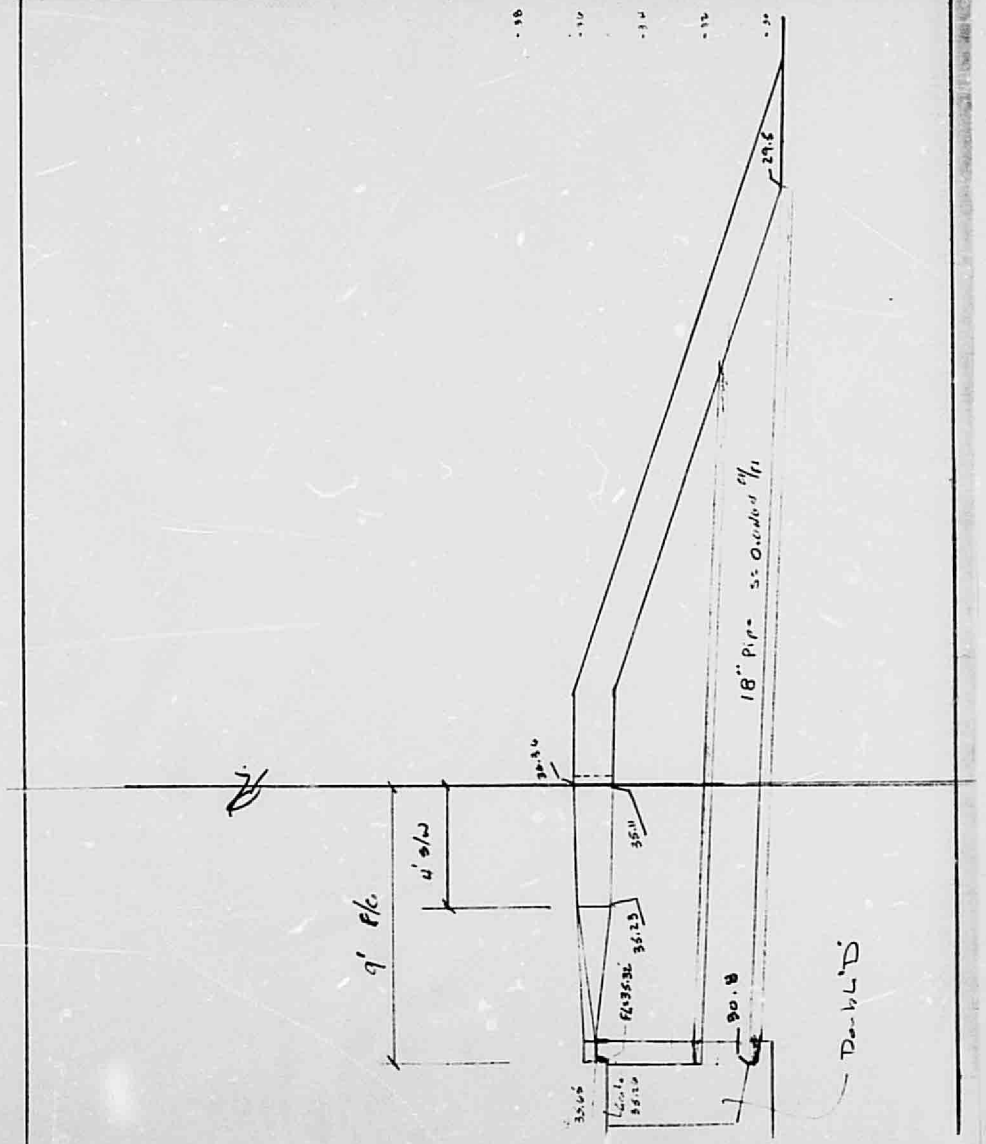
DMJM / AHA ALBUQUERQUE	PROJECT Westview Townhomes	PROJECT NO. 4690.02.01	PAGE 8
		BY: C. Bom	DATE: 5-14-85

SUBJECT Drainage Design



DMJM / AHA ALBUQUERQUE	PROJECT WESTVIEW TOWNHOMES	PROJECT NO. 4690.02.01	PAGE 9
		BY: C. Burm	DATE: 5-14-85

SUBJECT DRAINAGE DESIGN



DMJM / AHA ALBUQUERQUE	PROJECT WESTVIEW TOWNHOMES	PROJECT NO. 4690-02-01	PAGE 10
		BY: C. Burm / DATE: 5-14-85	

SUBJECT DRAINAGE DESIGN

POND INLET

1. Catch Basin for Nuisance flows and low flow
2. Curb line will act as a weir
3. flow will be critical through the entrance to pond channel
4. Reduce curb height to 4" at Wier section.

USE DOUBLE 'D' Catch Basin.

IN SUMP CONDITION at POND INLET

Catch Basin Acts as Wier inlet

L: 2 x 2.1 + 6.5 = 10.7'

Q = 2.8 (10.7)(.4)^3/2 (for 4" curb + 3/4" depressed Grate)

= 7.6 cfs. loss 50% for Clogging

Q = 3.8 use 4 cfs

at h = 0.8'

Q = 2.8 (10.7)(.8)^3/2

= 21.4 cfs loss 50% for Clogging

Q = 10.7 use 11 cfs.

DMJM / AHA ALBUQUERQUE	PROJECT Westview Townhomes	PROJECT NO. 4690-02-01		PAGE 11
		BY: C. Burm	DATE: 5-14-85	

SUBJECT Drainage Design

Discharge over the curb

$Q = 43.6 - 4$

$= 39.6$ cfs

For weir length of 30'

$39.6 = (2.8)(30)(h^{3/2})$

$h^{3/2} = 0.47$

$h = 0.60'$

for $Q = 43.6 - 11$ cfs

$= 32.6$

$h^{3/2} = 32.6/(2.8)(30)$

$h^{3/2} = 0.39$

$h = 0.53'$

Discharge over curb ≈ 33 + 39 cfs.

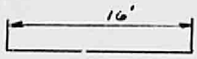
Elev WS at curb ≈ 35.65 + 0.6

≈ 36.25

DMJM / AHA ALBUQUERQUE	PROJECT WESTVIEW TOWNHOME	PROJECT NO. 4690.02.01	PAGE 12
		BY: C. BURM / DATE: 5-14-85	

SUBJECT DRAINAGE DESIGN

INLET CHANNEL



Q_{DES} = 39.6 cfs.

Critical Depth

$Q = K' b^{5/2}$ from KING + BRATER TABLE 8.5

$K' = 39.6 / 16^{5/2}$

$= 0.0787$

$D_c / b = 0.036$

$D_c = 0.58'$

WS at channel ENTRANCE

$= 35.11 + .58$

$= 35.69$

$V_{ch} = 39.6 / (16 \times .58)$

$= 4.26$ ft/sec

$EGL = 35.69 + \left(4.26^2 / 64.4 \right)$

$= 35.97$

DMJM / AHA ALBUQUERQUE	PROJECT WESTVIEW TOWNHOMES	PROJECT NO 4690.02.01	PAGE 13
		BY: C. Burm / DATE: 5-15-85	

SUBJECT DRAINAGE DESIGN

CATCH BASIN CONNECTOR PIPE

Q = 11 cfs

d = 18"

Available Head when pond is full

= 35.26 - 33.5 - 0.5'

= 1.26'

L = 30'

Available slope = 1.26/30 = 0.0420 ft/ft

$Q = K S^{1/2}$

K for 18" = 105 (Plate 22.3 B-5)

Capacity of 18"

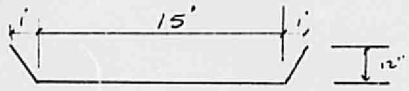
$Q = 105 (0.0420)^{1/2}$

= 21.5 cfs

DMJM / AHA ALBUQUERQUE	PROJECT Westview Townhomes	PROJECT NO. 4690.02.01	PAGE 14
		BY: C. Burem / DATE: 5-15-85	

SUBJECT Drainage Design

Overflow Spillway - where is this?



Channel will act as weir and discharge will be at critical depth at entrance.

$Q = 43.6$ cfs

$Q = K_c' b^{5/2}$ King & Brater Table 8.5

$K_c' = 43.6 / 15^{5/2}$

$= 0.0500$

$D_c/b = 0.042$

$D_c = 0.63'$

$V = 43.6 / (15 \times .63) + 2 \times (.63 \times .63/2)$

$= 4.43$ ft/sec

$V^2/2g = 0.30$

Pond Elev above outlet: $0.63 + 0.3$

$= .93'$

BASIN ROUTING

DMJM
5700 HARPER DR. NE SUITE 280
ALBUQUERQUE, NEW MEXICO 87109

PROJECT: WESTVIEW TOWNHOMES
DATE: 05/10/85

EFFECTIVE AREA 431320 SQ.FT.
TOTAL RAINFALL 2.20 INCHES

STORAGE BASIN

ELEV	AREA SQ.FT.	VOLUME CU.FT.
29.50	11200	0
33.50	18000	58400

INFILTRATION 1ST HALF HOUR = 0.50 IN./HR.
INFILTRATION 2ND HALF HOUR = 0.25 IN./HR.
INFILTRATION AFTER 1 HOUR = 0.25 IN./HR.

OUTLET INFORMATION:

ROUND ORIFICE

DIAMETER INCHES	INVERT ELEV.
12.0	29.50

WEIR

LENGTH FEET	INVERT ELEV.
20.00	33.50

TIME MIN.	RAINFALL INCHES	ACCUM. INFLOW CUBIC FEET	POND ELEV.	AVG. POND ELEV.	ACCUM. OUTFLOW CUBIC FEET	STORAGE CUBIC FEET
0	0.000	0	29.500	29.500	0	0
	INFILTRATION			40 CU.FT.		
	ORIFICE FLOW		0.141 CFS	42 CU.FT.		
	WEIR FLOW		0.000 CFS	0 CU.FT.		
5	0.125	4507	29.883	29.691	82	4424
	INFILTRATION			42 CU.FT.		
	ORIFICE FLOW		1.196 CFS	359 CU.FT.		
	WEIR FLOW		0.000 CFS	0 CU.FT.		
10	0.281	10121	30.310	30.097	484	9637
	INFILTRATION			46 CU.FT.		
	ORIFICE FLOW		3.244 CFS	973 CU.FT.		
	WEIR FLOW		0.000 CFS	0 CU.FT.		
15	0.624	22457	31.161	30.736	1503	20954
	INFILTRATION			51 CU.FT.		
	ORIFICE FLOW		4.814 CFS	1444 CU.FT.		
	WEIR FLOW		0.000 CFS	0 CU.FT.		
20	1.045	37560	32.080	31.620	2999	34561
	INFILTRATION			54 CU.FT.		
	ORIFICE FLOW		5.616 CFS	1684 CU.FT.		
	WEIR FLOW		0.000 CFS	0 CU.FT.		
25	1.203	43254	32.330	32.205	4739	38515
	INFILTRATION			56 CU.FT.		
	ORIFICE FLOW		5.857 CFS	1757 CU.FT.		
	WEIR FLOW		0.000 CFS	0 CU.FT.		
30	1.315	47287	32.468	32.39[illegible]	6552	40734
	INFILTRATION			57 CU.FT.		
	ORIFICE FLOW		6.065 CFS	3039 CU.FT.		
	WEIR FLOW		0.000 CFS	0 CU.FT.		
40	1.513	54403	32.676	32.572	10248	44155
	INFILTRATION			58 CU.FT.		
	ORIFICE FLOW		6.27[illegible] CFS	3[illegible] CU.FT.		
	WEIR FLOW		0.0[illegible] CFS	0 CU.FT.		
50	1.639	60[illegible]	[illegible]	[illegible]	[illegible]	46667

	INFILTRATION		58 CU.FT.				
	ORIFICE FLOW	6.436 CFS	3862 CU.FT.				
	WEIR FLOW	0.000 CFS	0 CU.FT.				
60	1.865	67055	32.967	32.897	17991	49064	max.
	INFILTRATION		116 CU.FT.				
	ORIFICE FLOW	6.338 CFS	7605 CU.FT.				
	WEIR FLOW	0.000 CFS	0 CU.FT.				
80	1.931	69428	32.650	32.808	25714	43714	
	INFILTRATION		113 CU.FT.				
	ORIFICE FLOW	5.964 CFS	7157 CU.FT.				
	WEIR FLOW	0.000 CFS	0 CU.FT.				
100	1.986	71405	32.324	32.487	32984	38420	
	INFILTRATION		109 CU.FT.				
	ORIFICE FLOW	5.560 CFS	6672 CU.FT.				
	WEIR FLOW	0.000 CFS	0 CU.FT.				
120	2.032	73065	31.999	32.162	39766	33279	
	INFILTRATION		156 CU.FT.				
	ORIFICE FLOW	5.009 CFS	9016 CU.FT.				
	WEIR FLOW	0.000 CFS	0 CU.FT.				
150	2.083	74884	31.509	31.754	40939	25946	
	INFILTRATION		148 CU.FT.				
	ORIFICE FLOW	4.271 CFS	7697 CU.FT.				
	WEIR FLOW	0.000 CFS	0 CU.FT.				
180	2.116	76070	31.042	31.276	56776	19293	
	INFILTRATION		140 CU.FT.				
	ORIFICE FLOW	3.467 CFS	6241 CU.FT.				
	WEIR FLOW	0.000 CFS	0 CU.FT.				
210	2.142	77019	30.639	30.840	63158	13864	
	INFILTRATION		134 CU.FT.				
	ORIFICE FLOW	2.610 CFS	4698 CU.FT.				
	WEIR FLOW	0.000 CFS	0 CU.FT.				
240	2.162	77731	30.318	30.478	67991	9739	
	INFILTRATION		256 CU.FT.				
	ORIFICE FLOW	1.387 CFS	4995 CU.FT.				
	WEIR FLOW	0.000 CFS	0 CU.FT.				
300	2.193	78838	29.951	30.150	75243	5594	
	INFILTRATION		247 CU.FT.				
	ORIFICE FLOW	0.546 CFS	3677 CU.FT.				
	WEIR FLOW	0.000 CFS	0 CU.FT.				
360	2.200	79016	[illegible]	[illegible]	[illegible]	324	

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

MAXIMUM OUT FLOW IS AT POND ELEV. 32.967
ORIFICE OUTFLOW IS 6.515 CFS
WEIR OUTFLOW IS 0.000 CFS

1178

DMJM/Adam, Hamlyn, Anderson

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Albuquerque, New Mexico 87109
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Planning
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