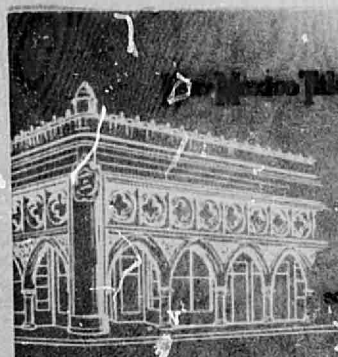
PLANS/PLATS ON FILE

FILE DESC: D-18 / D008

PLANS/PLATS 5



Lawyers Title Company

Representing
Lawyers Title Insurance Corporation

DIVISION
BERNALILLO COUNTY
ABSTRACT & TITLE

PRESIDENT
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SENIOR VICE PRESIDENT
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MARY LOU ROADY

801 GOLD AVE., S.W. • ALBUQUERQUE, NEW MEXICO • TELEPHONE 247-1011

September 9, 1977

City of Albuquerque
Engineering Dept.
P.O. Box 1313
Albuquerque, N.M. 87102

Attention: Bruno Conegliano

Re: Our File A-14,129

Dear Bruno:

Enclosed is a copy of the zone atlas page indicating the land I am interested in. Is any of this land in the flood area; and, if so, is flood insurance available?

Anything you can do to expedite this will be greatly appreciated. We have a closing Monday, September 12. If you have any questions, please call me.

Very truly yours,

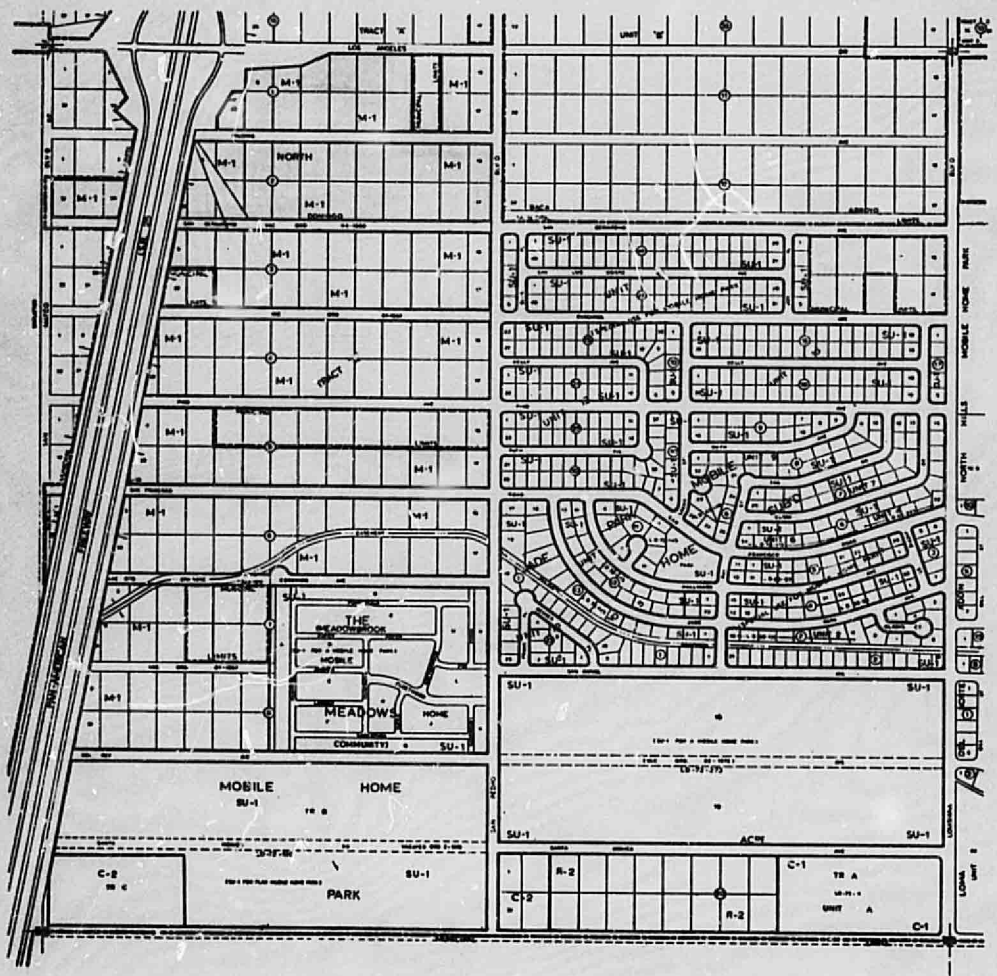
Margie R. Lucero

Margie R. Lucero
Vice President

MRL/mm

Enclosure

UPTOWN OFFICE: 1600 SAN PEDRO N.E., TELEPHONE 265-5701 • EAST HEIGHTS OFFICE: 4410-A WYOMING BLVD., N.E., TELEPHONE 298-6868


TRACT "K"
LOS ANGELES
UNIT "B"
M-1
NORTH
DOWNEY
TRACT
SU-1
UNIT
MOBILE HOME PARK
NORTH HILLS
NORTH
LOMA
LOMA UNIT B
THE
MEADOWBROOK
MOBILE
HOME
MEADOWS
COMMUNITY
MOBILE
HOME
PARK
ACRE
C-2
R-2
C-1
TR A
UNIT A
D-18-Z

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

MAYOR
Harry E. Kinney

CHIEF
ADMINISTRATIVE OFFICER
Frank A. Kleinhenz

September 12, 1977

D18-D84

Margie R. Lucero
New Mexico Title Company
301 Gold Ave. S.W.
Albuquerque, New Mexico

RE: BLOCKS 1 & 2, TRACT A, NORTH ALBUQUERQUE ACRES

Dear Ms. Lucero:

Please find enclosed a copy of the topographical map pertaining to the tracts of interest with an outline of the flood hazard area.

This outline was derived from the flood hazard boundary map and it appears that in the immediate vicinity of the Frontage Road the 100 year flood level is found at the approximate elevation of 5194 ft. M.S.L. To the South, along the arroyo, the flood elevation varies and no single elevation can be indicated.

Within the corporate limits of the City of Albuquerque flood insurance is available for any new construction that is outside the flood hazard area. Inside the flood hazard area flood insurance is also available if the property is outside the floodway and will be constructed so that the finished floor will be above the 100 year flood level.

If additional information is necessary, please do not hesitate to call me.

Sincerely,

Bruno Conegliano

Bruno Conegliano
Asst. City Engineer-Hydrology

BC/tl

Enclosure

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

1329-1811.12-81

August 25, 1981

Charles M. Easterling
City Engineers Office
P.O. Box 1293
Albuquerque, New Mexico 87103

Dear Mr. Easterling,

Please find enclosed two (2) copies of a drainage report for Chisel Smith's I-25 Frontage Road Property. If you have any questions or comments, please call me.

Respectfully,

Steven G. Corle
STEVEN G. CORLE

SGC:jm
Enclosure

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

D18-D8

September 1, 1981

Mr. Steve Corley
Gordon Herkenhoff & Associates
302 Eighth St. N.W.
Albuquerque, New Mexico 87102

Re: CHISEL SMITH I-25 FRONTAGE ROAD PROPERTY DRAINAGE REPORT

Dear Steve:

An initial review of the referenced drainage report has resulted in the following comments:

1. Will the lots be under private ownership? If so, will the drainage schemes of individual lots conform to the cntouring and proposed plan outlined in the report?

2. The drainage report states that verbal approval has been granted to modify grading of the frontage road ditch. Please supply this office with a written statement by the Highway Department concurring with this statement. Also, please supply a more detailed description of the proposed alterations.

3. You indicate that off-site flows enter the property along the southern boundary. Where and in what manner does the flow enter the site?

4. The following comments are in reference to the proposed swales and median pond:

   a. This office requests that easements be dedicated along the property lines and that a more permanent conveyance structure be installed. For example, gravel or a combination of earth and gravel (See enclosed example) could be utilized along the easement. This request is made because of the poor stability and erosion problems that accompany earthen swales.

   b. It appears that the swales should be constructed to the curb cut to assure that the anticipated runoff will reach the median driveway. (The swale between Tracts L and M is an example).

   c. Is the shallow swale nececessary between Tracts O and N? If so, how will runoff reach the proposed curb cuts from these lots?

LETTER TO MR. STEVE CORLEY
GORDON HERKENHOFF & ASSOC.
302 EIGHTH ST. N.W.
ALBUQUERQUE, N.M. 87102

d. How will runoff be conveyed along the eastern boundary of the entire site?

e. Is the common driveway pond to be landscaped? More spot elevations would be helpful in this area.

5. A completed drainage covenant will be required for this property.

I am looking forward to discussing the above matters with you. If I can be of further help, please call.

Very truly yours,

Brian G. Burnett

Brian G. Burnett
Civil Engineer/Hydrology

BGB/fs

cc: f/Reading
8243A
Enclosure

NEW MEXICO

STATE HIGHWAY DEPARTMENT

DISTRICT NO. 3

ADDRESS ALL CORRESPONDENCE
TO
DISTRICT ENGINEER
P. O. BOX 3768, STA. D

ALBUQUERQUE, NEW MEXICO 87190

September 3, 1981

Gordon Herkenhoff & Associates, Inc.
302 Eighth Street, N. W.
Albuquerque, NM 87102

ATTN: STEVEN G. CORLE

Dear Sir:

After reviewing the request of your letter and our conversation on September 2, 1981 concerning grading of State Right-of-Way, North of Pino Avenue on I-25 East Frontage Road, this office concurs with the following stipulations:

(1) Traffic Control shall be in accordance with Manual on Uniform Traffic Control Devices for Streets and Highways.

(2) The applicant will at all times indemnify and save harmless the State Highway Department from any and all claims of every kind or character caused by or incident to the alteration, removal or condition of these facilities in the Right-of-Way.

Final approval of permit will be determined after drainage study plans have been submitted and approved.

Sincerely,

L. A. Larranaga
District Highway Engineer

By: Paul S. Myers
Paul S. Myers
Permit Section

PSM:jc

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

D18-D8

September 4, 1981

Mr. Steve Corley
Gordon Herkenhoff & Associates
302 8th. Street N.W.
Albuquerque, New Mexico 87102

Re: Chisel Smith I-25 Property

Dear Steve:

Enclosed is a copy of the erosion control specifications which we discussed yesterday. The primary reasons for requiring this plan is to protect against both wind and water erosion. Please see that this erosion control measure is called out for all areas in which grading occurs and no immediate development takes place.

If I can be of further help on this matter, please call.

Very truly yours,

Brian G. Burnett
Civil Engineer/Hydrology

BGB/fs

Enclosure

1383-1811.12-81

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

September 8, 1981

RECEIVED
SEP 9 1981
CITY ENGINEER

Mr. Brian Burnette
City of Albuquerque Engineer's Office
P.O. Box 1293
Albuquerque, New Mexico 87103

Dear Brian:

In response to your letter dated September 2, 1981 regarding the Chisel Smith drainage report, I have the following information:

1) Regardless of the future ownership of the subject lots, it is Mr. Smith's intent to comply with the general scheme of the drainage report. The covenant ensures this.

2) Enclosed is a letter indicating the New Mexico Highway Department's general acceptance of the ditch grading work as you requested.

3) Offsite flow from the south enters from the cross hatched area shown on page (7) of the drainage report, and is sheet flow.

4) a. Easements along the tract lines seem to be an unnecessary and unreasonable burden to the landowner in light of the fact that a drainage covenant is required. This covenant provides the City with an enforceable guarantee that the approved discharges will continue to be met after development. Mr. Smith is prepared to guarantee that the covenant will be passed on to any future owners of this real estate.

b. Swales will be carried to the appropriate place on the site, to assure runoff is directed to the designated detention pond.

c. The shallow swale between tracts N and O is not necessary, and is herewith eliminated from the grading plan (as suggested by your office). Water from these tracts will be directed north and pass directly into the central driveway.

d. Runoff will be passed across the easterly driveway curbing as required, to drain the small area east of that curbing.

e. No shrubs of such a nature as to interfer with the median pond drainage, are planned for that area.

5) Mr. Smith will execute the required drainage covenant on approval of the drainage report by the City.

We appreciate your timely response to the drainage report, and if we may be of additional help, please call.

Respectfully,

Steven G. Corle

Steven G. Corle
Civil Engineer

SGC:er
Encl.

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

1393-1811.12-81

September 9, 1981

RECEIVED
SEP 10 1981
CITY ENGINEER

Mr. Brian Burnette
City of Albuquerque Engineer's Office
P.O. Box 1293
Albuquerque, New Mexico 87103

Dear Brian,

This is to inform you that we have reviewed the erosion control plan you provided for the Chisel Smith development, and have incorporated it into the post-grading plan on the project. Thank you most kindly for the assistance.

Respectfully,

Steven G. Corle

STEVEN G. CORLE

SGC:jm

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

D-18-D8

September 14, 1981

Mr. Steve Corely
Gordon Herkenhoff & Associates
302 8th NW
Albuquerque, NM 87103

RE: CHISEL SMITH I-25 PROPERTY DRAINAGE REPORT

Dear Steve,

The referenced drainage report is hereby approved based on your submittal of September 8 and the revised grading plan dated September 9, 1981. Following are some additional comments:

a) To expedite review, please supply this office with a copy of the grading and drainage plan contained in the construction set. The guidelines contained in the Construction Plan Checklist should be followed.

b) A note should be placed on the grading plan indicating that the erosin control measure will be implemented in areas graded, but not immediately developed.

c) Future developers of the individual lots should submit plans to this office indicating substantial compliance with the approved Master Plan.

If I can be of further help on these matters, please call.

Very truly yours,

Brian G. Burnett

Brian G. Burnett
Civil Engineer/Hyrdology

BGB/jm

STATE OF NEW MEXICO
HIGHWAY DEPARTMENT

RECEIVED
SEP 2 1 1981
ARCHIVE

BRUCE KING
GOVERNOR

COMMISSION

Louis M. Whitlock
Chairman, Carlsbad

James W. Chaney
Vice-Chairman, Moriarty

Sosimo Padilla
Secretary, Albuquerque

Albert N. Sanchez
Member, Santa Rosa

James T. Martin
Member, Las Cruces

DEPARTMENT

Chief Highway Administrator
J. J. Hewett

General Office
P.O. Box 1149
Santa Fe, NM 87503
505-983-0100

District One Office
P.O. Box 231
Deming, NM 88030
505-546-2603

District Two Office
P.O. Box 1457
Roswell, NM 88201
505-622-8441

District Three Office
P.O. Box 3768-Station D
Albuquerque, NM 87110
505-821-4651

District Four Office
P.O. Box 30
Las Vegas, NM 87701
505-425-7527

District Five Office
P.O. Box 4127-Coronado Sta.
Santa Fe, NM 87503
505-983-0221

AN EQUAL
OPPORTUNITY
EMPLOYER

M - Drainage

September 22, 1981

Gordon Herkenhoff & Associates
320 Eighth Street, N. W.
Albuquerque, N. M. 87102

Attn: Steve G. Corle

Gentlemen:

Subject: I-25 Frontage Road Property

Reference your letter of September 2, 1981, on subject location. The drainage report submitted to us appears to be satisfactory.

Very truly yours,

H. V. Parr
Drainage Engineer

jc

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

1531-1811.12-81

October 7, 1981

Richard Heller
City Engineer's Office
P.O. Box 1293
Albuquerque, New Mexico 87103

Dear Sir:

Please find eight copies of the construction plans for M. W. Smith's I-25 frontage road property accompanying this letter. As per your request for a drainage report approval letter and planning commission findings of September 18, 1981, I have enclosed that information, too. Do note that there has been no rezoning, or similar activity which would result in Environmental Planning Commission action. Thus, the sole action taken on this land regards the accompanying "vacation" ordinance for Ranchitos Road.

If I can be of any assistance in an expeditions review and approval, please call me at 247-0294. Thank you.

Respectfully,

STEVEN G. CORLE
Civil Engineer

SGC:js

Enclosure

RECEIVED
OCT 7 1981
CITY ENGINEER

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

D18-D8

October 16, 1981

Mr. Steve Corley
Gordon Herkenhoff & Associates
302 8th. N.W.
Albuquerque, New Mexico 87103

Re: Chisel Smith I-25 Construction Plans

Dear Steve:

An initial review of the referenced report has resulted in the comments listed below. The numbers indicated refer to the Drainage Report (DR) and Construction Plan (CP) Checklists. Please supply the following information:

a. CP #3 - A legal description should be included on the construction plans.

b. CP #4 - The grading plan needs reference to an Albuquerque control survey vertical datum.

c. CP#5 - The grading plan should indicate a temporary bench mark on site.

d. DR #23 - A signed Drainage Covenant must be submitted before Hydrology can sign off on the plans.

If I can be of further help on these matters, please call.

Very truly yours,

Jim Fink
Civil Engineer/Hydrology

JF/fs

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

1613-1811.12-81

October 23, 1981

Mr. Jim Fink
City Engineer's Office
City of Albuquerque
Albuquerque, New Mexico 87103

Dear Mr. Fink:

Per your letter dated October 16, 1981, which addressed additions to the plans for Mr. Chisel Smith's property (Plan Review Job #1289):

1. The property legal description has been added to the original cover sheet.

2. The grading sheet has been labeled with a bench mark on the northwest property corner. This has been tied to the City of Albuquerque Vertical Control Survey Station on the north side of Pino Avenue, approximately 65 feet east of the east I-25 frontage road.

3. Mr. Smith is in the process of reviewing the City of Albuquerque recommend format for the Drainage covenant.

If I can be of further assistance, please let me know.

Respectfully,

Steven G. Corle

STEVEN G. CORLE
Civil Engineer

SGC:js

RECEIVED
OCT 23 1981
CITY ENGINEER

NEW MEXICO
STATE HIGHWAY DEPARTMENT
DISTRICT NO. 3

File No.
D18-08

P.O. BOX 3768, STATION D
ALBUQUERQUE, NEW MEXICO 87190-3768

September 4, 1984

Dura Bilt Products, Inc.
4808 Jefferson, N.E.
Albuquerque, New Mexico 87109

TO WHOM IT MAY CONCERN:

The small drainage pipe that drains water from the property at 7804 I-25 East Frontage Road into the highway right of way was recently inspected. There was no evidence of erosion, and the pipe appeared to be functioning as it had when it was originally installed.

Yours very truly,

D. G. ARP
District Highway Engineer

By: Carroll D. Young
CARROLL D. YOUNG
Maintenance Support Engineer

CDY:em

RECEIVED SEP 0 7 1984

1811.12

ENGINEER'S REPORT
ON
STORM DRAINAGE

RECEIVED
AUG 25 1981
ENGINEERING

CHISEL SMITH
I-25 FRONTAGE ROAD PROPERTY
ALBUQUERQUE, NEW MEXICO

August, 1981

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

1811.12

ENGINEER'S REPORT
ON
STORM DRAINAGE

CHISEL SMITH
I-25 FRONTAGE ROAD PROPERTY
ALBUQUERQUE, NEW MEXICO

August, 1981

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

I hereby certify that this Drainage Report for Chisel Smith Frontage Road Property, Albuquerque, New Mexico, was prepared under my direction, conforms to Drainage Resolution No. 1980-15 and City of Albuquerque Resolution No. 59-1976, and is true and correct to the best of my knowledge and belief.

Gordon Herkenhoff
Registered Professional Engineer No. 243

Aug 20 1981
Date

Approved:

For the City of Albuquerque

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

DRAINAGE REPORT INFORMATION SHEET

PROJECT TITLE Chisel Smith I-25 Frontage Road Property Located between Cemco Mfg. @7912 Pan Am. Frw N.E & Harris Trck'g. Co. @5225 Pino N.E.

ZONE ATLAS PAGE NO. D-18z CITY ADDRESS

LEGAL ADDRESS Tract "A" Unit "A" North Albuquerque Acres

ENGINEERING FIRM Gordon Herkenhoff & Associates CONTACT Steven G. Corle

ADDRESS 302 8th Street N.W. PHONE 247-0294

OWNER Chisel Smith CONTACT Chisel Smith

ADDRESS P.O. Box 3458, Alb., N.M. 87110 PHONE 884-2880

ARCHITECT/SURVEYOR Fred Sanchez CONTACT Fred Sanchez

ADDRESS 2119 Menaul Blvd. 87107 PHONE 884-2030

DATE SUBMITTED August 24, 1981

BY Steven G. Corle

MUNICIPAL DEVELOPMENT DEPARTMENT

[illegible] (505) 768-2467

TABLE OF CONTENTS

ITEM	PAGE
INTRODUCTION	1
PURPOSE	1
DESCRIPTION OF SITE AND PROJECT	2
HYDROLOGY AND HYDRAULICS	3
CITY MAP	7
RESULTS	9
TABLE 1 DIVERSIONARY DEVICE DATA	9
2 SMITH PROPERTY - STORM RUNOFF DISCHARGE RATES	10
FIGURE 1 HISTORIC AND DEVELOPED DISCHARGES OFF PROPERTY	11
TABLE 3 POND ENCROACHMENT ON PARKING LOTS	12
4 DISCHARGE RATES INTO FRONTAGE ROAD DITCH	13
CONCLUSIONS	13
GRADING PLAN SHEET	14
GUIDE TO THE APPENDICES	15

ENGINEER'S REPORT
STORM DRAINAGE FOR CHISEL SMITH
I-25 FRONTAGE ROAD PROPERTY DEVELOPMENT

I. INTRODUCTION:

The Chisel Smith I-25 Frontage Road Property is located approximately five (5), miles north of the I-25 and I-40 interchange. It has an area of approximately 2.8821 acres, and abuts the east I-25 frontage road right-of-way. The land is bounded by the following:

a. On the north, by Cemco Mfg. Co.
b. On the south, by Harris Truck and Equipment Co. which is then bounded on it's south side by Pino Ave.
c. On the east, by the City yards belonging to the City of Albuquerque.
d. On the west, by the east I-25 frontage road right-of-way.

Because the site is within the City limits, adjacent to similar development, and properly zoned M-1; no zone change is required.

II. PURPOSE:

The purpose of this report is to provide information regarding the drainage on the site as it exists prior to development, and the planned, post-development storm runoff management. It addresses the hydrology of the drainage plan, as well as the diversionary structures required to deliver the run off to the proper drainage area. The hydrology was by the rational method. Channel hydraulics were by Mannings equation.

III. DESCRIPTION OF SITE AND PROJECT:

A. Undeveloped State.

This part of Albuquerque is composed of gentle slopes, and soil classified as "Embudo Gravelly Fine Sandy Loam" by the Bernalillo County Soil Conservation Service-Survey Maps.

The Smith property slopes from the southeast to the northwest corner (in the undeveloped state), at a slope of approximately two (2) percent. Natural ground cover consists of native grasses. There is no discernible watercourse on the property, runoff consisting primarily of sheet flow. Storm runoff is collected in a ditch along the adjacent frontage road, and conveyed under the highway via an existing twenty-four (24), inch concrete culvert.

After passing under the highway, the water resumes sheet flow, and moves westward across undeveloped grasslands.

B. Developed State.

It is the intent of the owner to subdivide this parcel of land into six lots with areas ranging from approximately 0.66 acres at the largest, to 0.24 acres at the smallest.

Buildings will be in the vicinity of four thousand (4,000) square feet on lots l, m, n, and o. On the lower two lots (k and p), it is anticipated that the buildings will be slightly larger.

The lots are to be separated, three by three, on the north and south sides of the parcel. There will be a centrally located driveway, oriented in an east/west direction. Within the driveway will be a keyhole shaped median pond as part of the overall storm runoff-management plan (see Illustration #1 The Grading Plan).

Access to all sites will be available from the I-25 frontage road via the central driveway. Utilities will be brought up the central driveway right-of-way as feasible. The driveway is designed to accommodate light tractor-trailer truck traffic.

It should be noted that the New Mexico Highway Department has been consulted regarding this access plan and drainage concept, as well as acceptability of moderate grading to reshape the frontage road ditch. Tentative verbal approval has been granted, although permitting has not yet been initiated pending City approval.

IV. HYDROLOGY AND HYDRAULICS:

This drainage plan recognizes four basic drainage areas. These are:

a. Area I, which is composed of tract K.
b. Area II, which is composed of tracts l, m, n, o, and the central driveway.
c. Area III, which is composed of tract p.
d. Area IV, which is all offsite drainage.

These areas will be dealt with on an individual basis. First though, it is important to note that all the storm runoff from the site is presently passing under the highway via an existing twenty-four (24) inch, concrete pipe. It is the intent of this plan to prevent a rate of discharge from the Smith property, which exceeds the historical rate of discharge during a 100 year-1 hour rainfall event.

In order to accomplish this, each drainage area on the property was designed to discharge it's proportional share of the historical flow (based on it's area). By the Albuquerque Rational Method, this discharge rate for the entire property is 7.2 cubic feet per second. This, as well as all other relevant calculations are included in the appendices.

In addition to providing a detention pond for each of the on-site drainage areas, some nominal diversion was necessary along the tract lines to insure the water traveled to the right pond. These diversionary devices were limited to a one-half (½) foot high berm (On the K, and L tract line), and shallow "V" ditches with three to one (3:1) backslopes on all other tract-boundary lines.

Regarding flows originating off-site; each side of the property was investigated. Where water encroached on the property from the south, a shallow combination of "V" ditch, and dirt berm was utilized to carry the flow along the south property line and into the frontage road ditch.

Note on the grading plan sheet, that typical sections of ditches, berms and ponds are shown. This sheet is labeled "Illustration #1".

A. Area #1.

This area is composed of approximately 0.5338 acres of land abutting the frontage road, in the northwest corner of the property. Development will be approximately 70%. Grading is as shown on the grading plan sheet (Ill. #1), and delivers the storm runoff to a detention pond on the west tract boundary. This pond has a trapezoidal crossection, with a bottom width of one and one-half feet, and three to one (3:1) backslopes. The length is ninety (90) feet. It is intended that after reaching one (1) foot of depth, the pond will begin encroaching into a parking lot on the east side of the pond. This lot will have approximately two (2) degrees of slope towards the pond itself.

Water accumulating in the Area I pond is discharged via an eight (8) inch asbestos cement pipe into the frontage road ditch. It then flows to the existing twenty-four (24) inch concrete culvert and passes under the highway.

Water accumulating on the central driveway (which is at a higher elevation), shall be prevented from entering the drainage area by raising the parking lot entranct. Fugitive flow from tract L shall be prevented from flowing

across tract K by construction of a one-half (½), foot high dirt berm along the common boundary between the tracts.

B. Area #2.

This area is composed of approximately 1.6950 acres with a combined development of 70%. Storm water runoff is conveyed from parcels L, M, N, and O, to the outside curbing of the central driveway.

After reaching the outside curbing, the water from the previously mentioned tracts passes through curb cuts, across the central driveway to the inner curbing, and through curb cuts once again, to enter the median pond. A twelve (12) inch concrete pipe then conveys the water into the frontage road ditch, where it flows away via the existing twenty-four (24) inch concrete pipe under the frontage road.

C. Area #3.

This area is composed of approximately 0.6569 acres of land to be 85% developed. As shown on the grading plan; the storm runoff flows to the western property boundary, where it accumulates in a trapezoidal section pond identical to the tract K pond (except in length). The Area 3 pond has a length of one-hundred and twenty feet, and is designed to encroach on the parking lot area of tract P when the depth reaches one foot.

After accumulating in the pond, the water flows through an eight (8) inch asbestos cement pipe into the frontage road ditch (upstream of the central driveway). It then joins an offsite flow from the adjacent south property, and flows through a pair of two eighteen (18) inch metal pipe culverts, under the central driveway, and passes under the highway via the existing twenty-four (24) inch concrete culvert.

Fugitive flows from the central driveway (and tract P), will be prevented by constructing a waterbar in the north entrance of the tract, and a "V" ditch along the tracts O and P boundary line, respectively.

D. Area #4 - General.

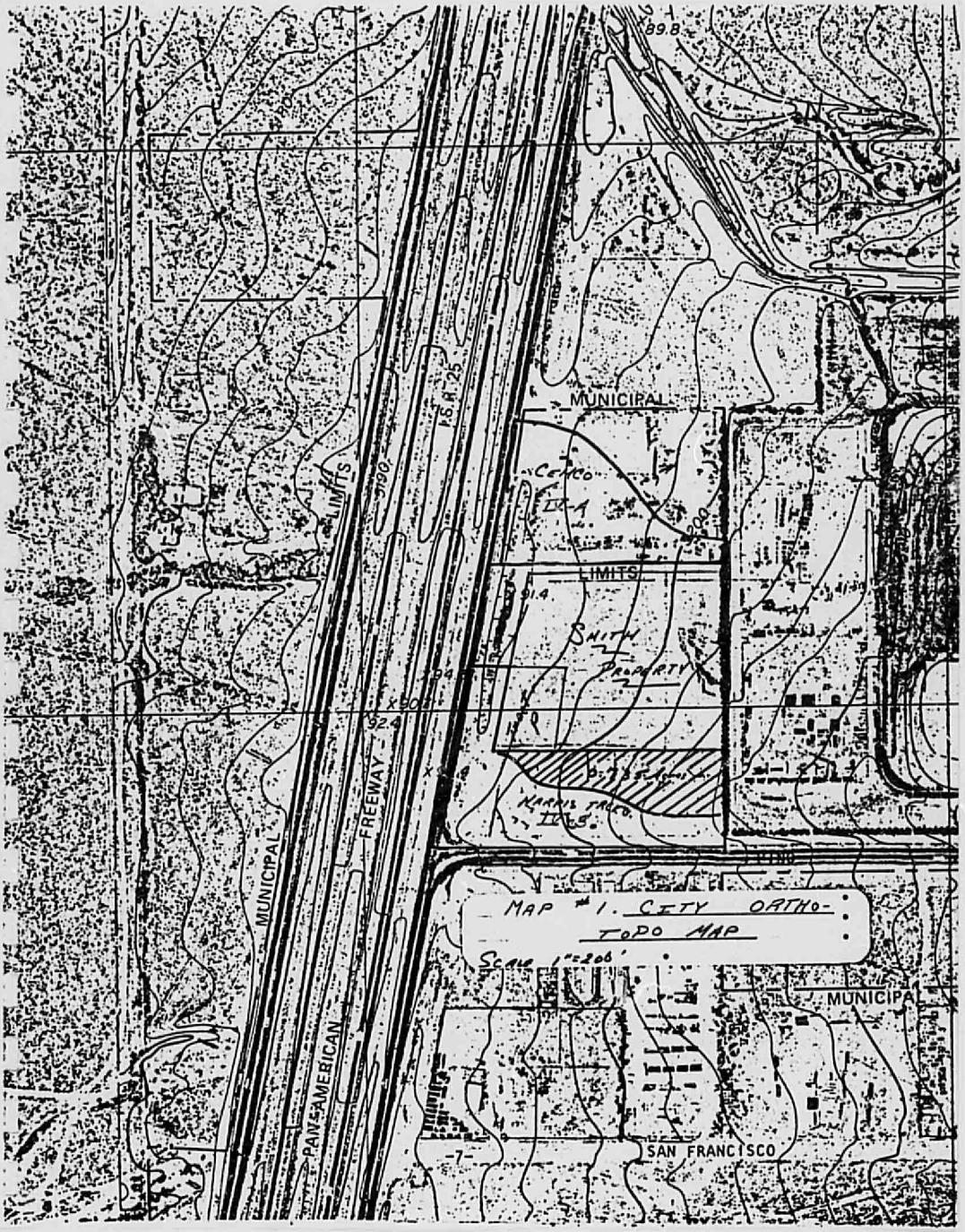
Area 4 is composed of all sources of off site flow onto the Smith property, or impacting directly on the development work. In order to be thorough, all sides of the property were investigated.

(1) East: On the east side of the Smith property lie the City yards. These include a large area of land with a high percentage of development. However; most runoff proceeds from the upper extremes of the property, to the lower via the two major east/west oriented streets shown on the City ortho-topo map (Map #1). Most of that water is intercepted by the north/south entrance driveway and flows either south to Pino Avenue and then down and across the frontage road, or to the north (and then south), to an outlet into the Domingo Baca Arroyo.

Of the remaining undrained area, about 3.67 acres drains to the west in a location where it could enter the Smith development. There, it is intercepted by a thirty-two (32) foot wide access drive with standard eight (8) inch curbs. These curbs are continuous to the north extreme of the City property, and act to divert the 100-year/1 hour runoff away from the Smith development. Field inspection shows no signs of curb overtopping, and analysis indicates almost twice the capacity in that street required to handle the 100 yr. runoff.

(2) North: To the north lie the lands of Cemco Mfg. Co. Refering once again to the City ortho-topo map, it can be seen that sheet flow occurs across the property in a direction which delivers the water directly to the frontage road ditch. Also notable is the existance of a drainage divide.

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



This is outlined on that map. The area is labeled IV-A on the map. No significant amount of water from Area IV-A flows onto the Smith land. Storm runoff from this area will continue to flow to the frontage road ditch and away via the twenty-four (24) inch concrete pipe, as it has in the past.

(3) South: To the south lie the lands of Harris Truck and Equipment Co. These are labeled IV-B on the City ortho-topo map. The area is significant for two reasons. They are:

a. Storm Runoff from the land and an adjacent one-half (½) width of street (and frontage road), contributes to the frontage road ditch flow (upstream of the central driveway).

b. Storm runoff from approximately 0.74 acres of the Harris land has historically flowed across the Smith property.

To accommodate item number one (1), pipes were sized to pass the Area IV-B storm runoff, as well as the Area III pond discharge under the central driveway, and to the highway culvert.

Item two (2), was provided for by a combination "V" ditch and berm on the south Smith property line. This will convey that water encroaching on the Smith property, directly to the frontage road ditch.

(4) West: On the west side of the Smith property is the east I-25 frontage road ditch. Because all discharges and overland flows conveyed to the ditch (and subsequently to the existing highway culvert), are at (or below), the historical discharge rate for the 100 year/1 hour event; this plan effectively prevents the rate of runoff from increasing over what has historically been carried by the concrete culverts downstream.

V. RESULTS

A. Grading Plan and Routing.

Examination of the grading plan shows that the storm runoff will flow to the anticipated areas. Additionally, table number one indicates that where diversionary devices in the form of ditches, berms or curbs - divert water; the devices are capable of handling the 100 year/1 hour storm. Typical sections are shown on the grading plan.

Table #1. Diversionary Device Data

LOCATION	TYPE	PURPOSE	DEPTH OF FLOW (FT)	VELOCITY (FPS)
Tract K/L Bdry.	Dirt Berm	Divert Water from Tract L to Central Driveway	0.17	1.07
Tract L/M Bdry.	Shallow Ditch	Divert Water from Tract M to Central Driveway	0.46	2.08
Tract N/O Bdry.	Shallow Ditch	Divert Water from Tract N to Central Driveway	0.40	2.77
Tract O/P Bdry.	Shallow Ditch	Divert Water from Tract O to Central Driveway	0.40	2.87
South Prop. Line	Shallow Ditch & Berm Sect.	Divert Water from adjacent ppty. to Frontage Road Ditch	0.50	2.76
East Prop. Line (City Yards)	8" Standard Curb	Divert Water from Westerly pptys. to Domingo Baca Channel	0.35	5.87

B. Detention Ponds.

Table number two indicates the 100 year/1 hour peak historical discharge rate (from each area), the peak detention pond discharge rate, as well as the maximum pond depths. Note that these pond depths are at (or below), the eighteen (18) inch maximum the City specifies for non-fenced ponds.

Figure number one (the discharge hydrograph for the detention ponds), demonstrates graphically that the cummulative pond discharge is below the historical discharge (from the property), for the 100 year/1 hour rainfall event.

Table #2. Smith Property - Storm Run-off Discharge Rates
(100 yr. - 1 hr. Storm)

Area	Tracts	*Historical Discharge (cfs)	Maximum Pond Depth (ft.)	≠ Pond Discharge Rate (cfs)
I	K	1.55	1.35	1.60
II	L,M,N,L & Central Driveway	3.94	1.50	3.60
III	P	1.71	1.35	1.60
TOTAL of I, II & III		7.20		6.80

* By the Albuquerque rational method.
≠ By hyetograph and pond routing.

Q_{5u} =

Appendix N

GORDON HERKENHOFF & ASSOCIATES, INC. 302 Eighth Street, N.W. Albuquerque, New Mexico 87102 (505) 247-0294 ENGINEERING COMPUTATIONS	NAME OF PROJECT			SHEET NUMBER 1 OF 1
	COMPUTED BY Porle	CHECKED BY	JOB NUMBER	DATE Aug 16, 1981

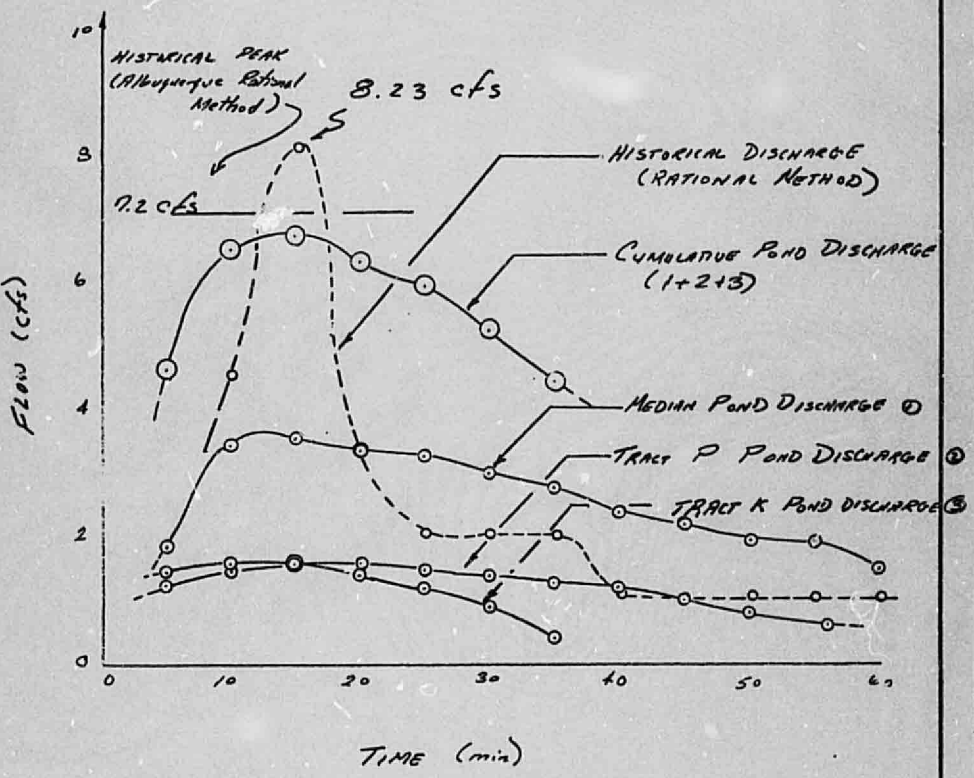


Fig. #1 HISTORIC AND DEVELOPED DISCHARGES OFF OF PROPERTY

C. Pond Encroachment in Parking Lots.

The following table (table #~~2~~ 3), indicates the extent of pond overflow within the property during the design storms.

Table #3. Pond Encroachment on Parking Lots

Area	10 yr./1 hr. Storm Depth(ft.)	10 yr./1 hr. Storm Encroachment(ft.)	100 yr./1 hr. Storm Depth(ft.)	100 yr./1 hr. Storm Encroachment(ft.)
I	0.18	9.0	0.35	17.5
II	0	0	0	0
III	0.15	7.5	0.35	17.5

Note: 1) The depth shown represents the maximum depth in the parking lot which occurs at the pond edge.

2) The encroachment is the distance the water penetrates into the parking lot from the pond edge.

D. Frontage Road Ditch and Driveways

Table number four shows that the total flow into the frontage road ditch (after development) occurs at a lesser rate than the historical discharge rate. This is due to some detention in the Frontage road ditch (upstream of the central driveway pipes), and reserve detention on the Smith property. Thus, the flow downstream is reduced by about sixteen percent by this development.

Consulting a concrete pipe nomograph, it is seen that the twenty-four (24) inch concrete culvert installed under the highway will convey this flow at a depth of 2.64 feet. Inlet control prevails on all detention pond-discharge pipes, as well as the driveway pipes.

Table #4. Discharge Rates Into Frontage Road Ditch
(100 yr./1 hr. Storm)

Area	Historical Discharge (cfs)	Developed Discharge (cfs)
I	1.55	1.60
II	3.94	3.60
III	1.71	1.60
IV-A	2.59	2.59
IV-B	11.40	8.40
TOTAL	21.19	17.80

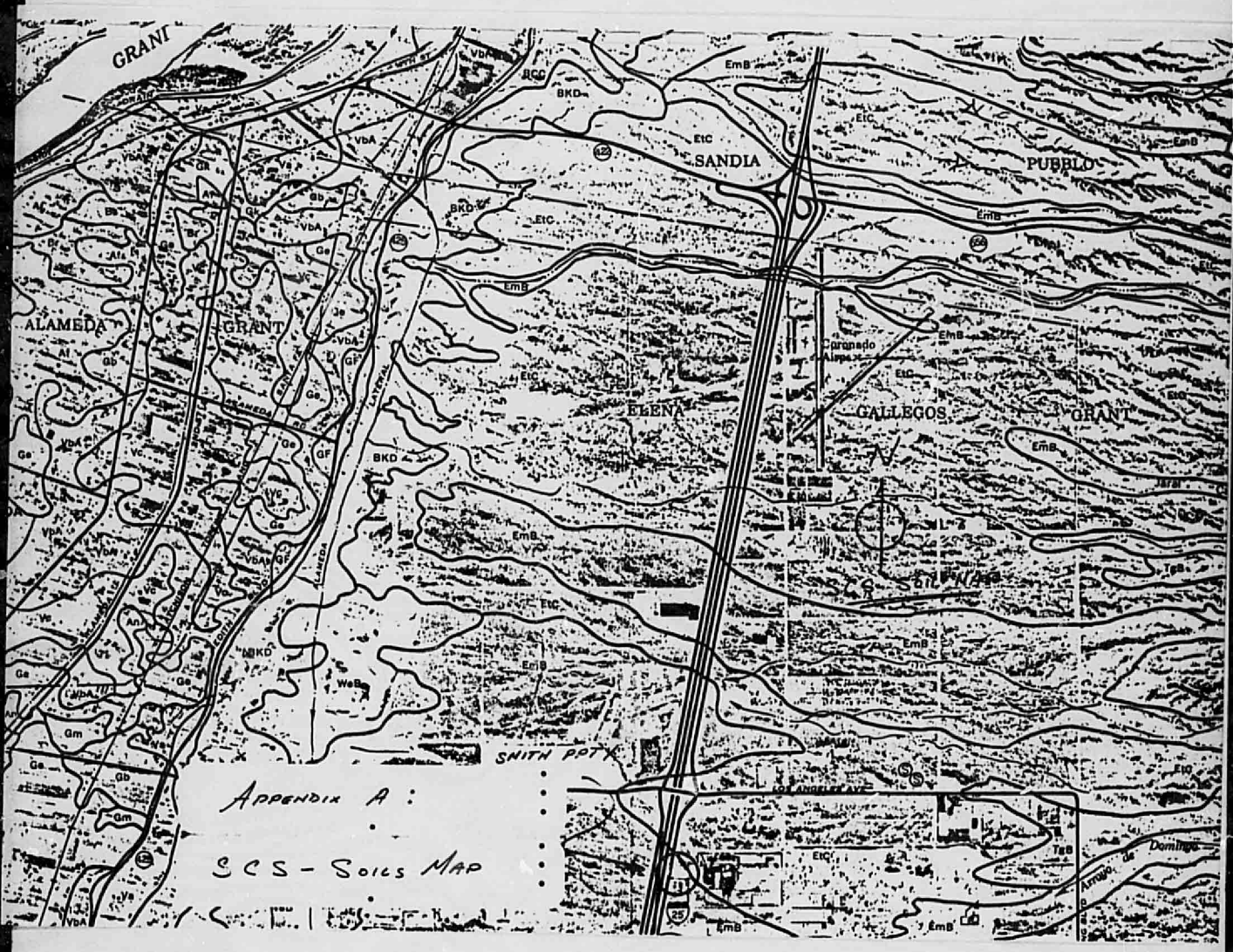
VI. CONCLUSIONS

This drainage plan complies with the substance and intent of the applicable statutes regarding discharge of storm runoff. It is thus recommended that it be approved in it's entirety so that development of the Chisel Smith property may proceed.

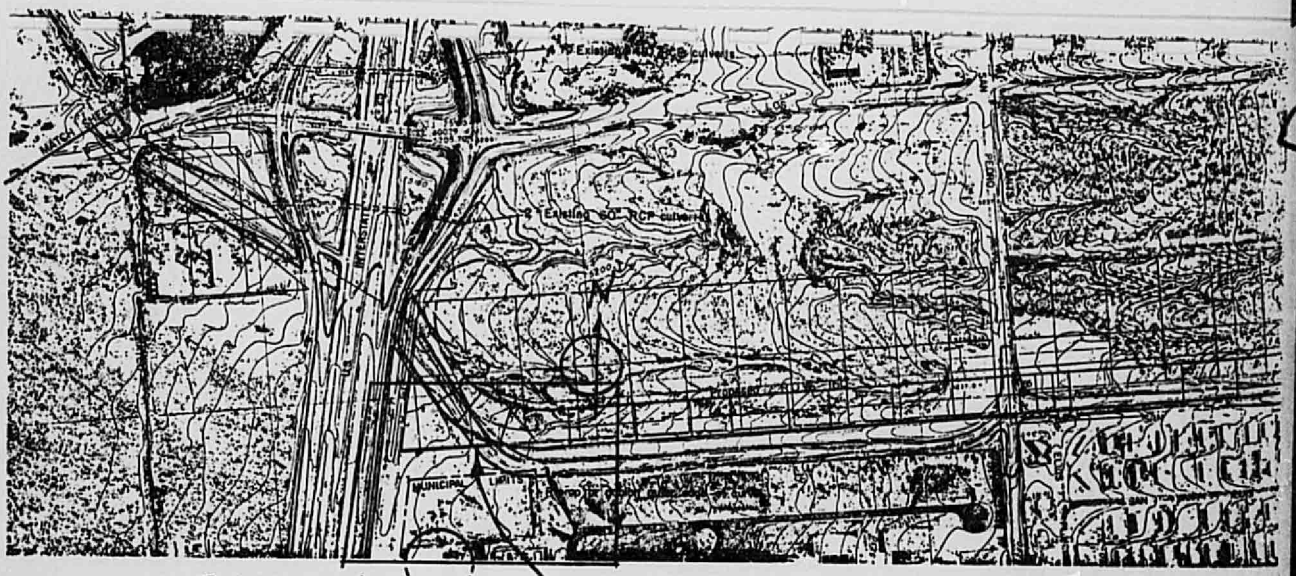
GUIDE TO THE APPENDICES

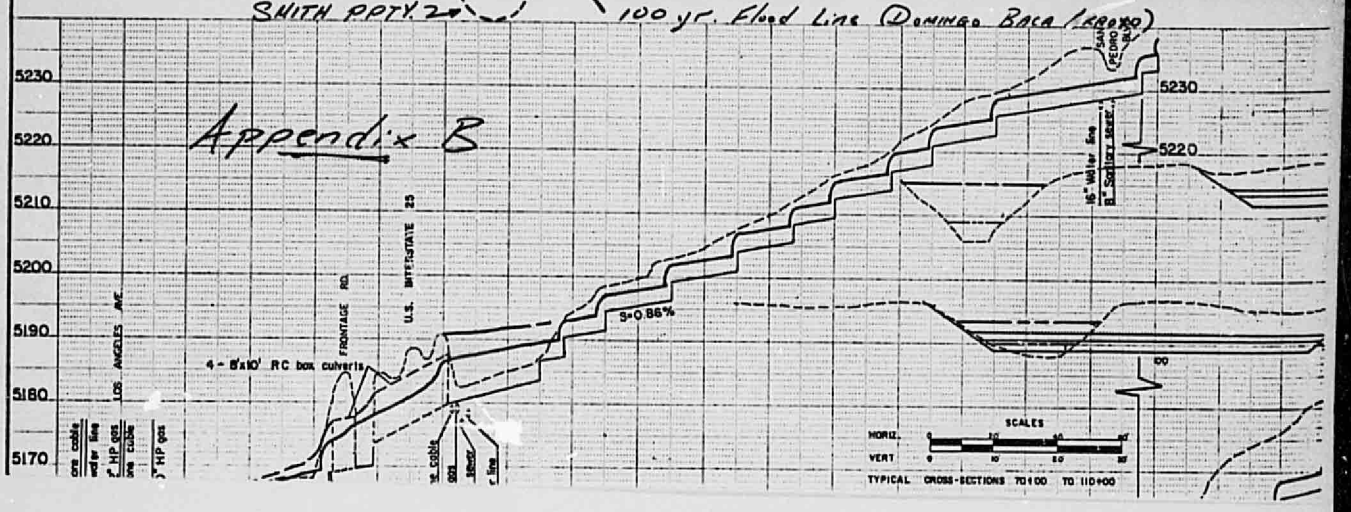
Appendix	Description
A	Soil Conservation Service Map
B	Flood Hazard Boundary Map
C	Albuquerque Zoning Map
D	Weather Service 100 yr./6 hr. Precipitation Map
E	Composite "C"'s Used In Report
F	Historical Runoff Calculations
G	SCS-TR55 Sheet Flow Velocity Figure
H	100 yr./1 hr. Storm Hyetograph
HH	Tract "P" Pond Crossection and Depth Vs. Volume Curve
I	Tract "P" Pond 100 yr./1 hr. Storm Data
J	Tract "K" Pond Crossection and Configuration, and Depth Vs. Volume Curve
L	Median Pond 100 yr./1 hr. Storm Data
M	Historical 100 yr./1 hr. Storm Discharge Data for Entire Property
N	Discharge Hydrograph Showing Historical and Developed Discharge Rates
O	Determination of Maximum Amount of Rainfall During 10 yr./1 hr. Storm by NOAA Weather Atlas Method
P	Tract "K" Pond 10 yr./1 hr. Storm, and Parking Lot Encroachment Data
Q	Tract "P" Pond 10 yr./1 hr. Storm, and Parking Lot Encroachment Data
R	Calculations Verifying No Flow Encroaches on Smith Property From the City Yards
S	Tract Line O-P Ditch Calculations
T	Tract Line N-O Ditch Calculations
U	Tract Line L-M Ditch Calculations
V	Tract Line K-L Dirt Berm Calculations
X	South Property Line Ditch and Berm Seccion Calculations
Y	Central Driveway Pipe Discharge Calculations
Z	Pipe Elevations Checked Back From Highway Pipe for Inlet Control

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



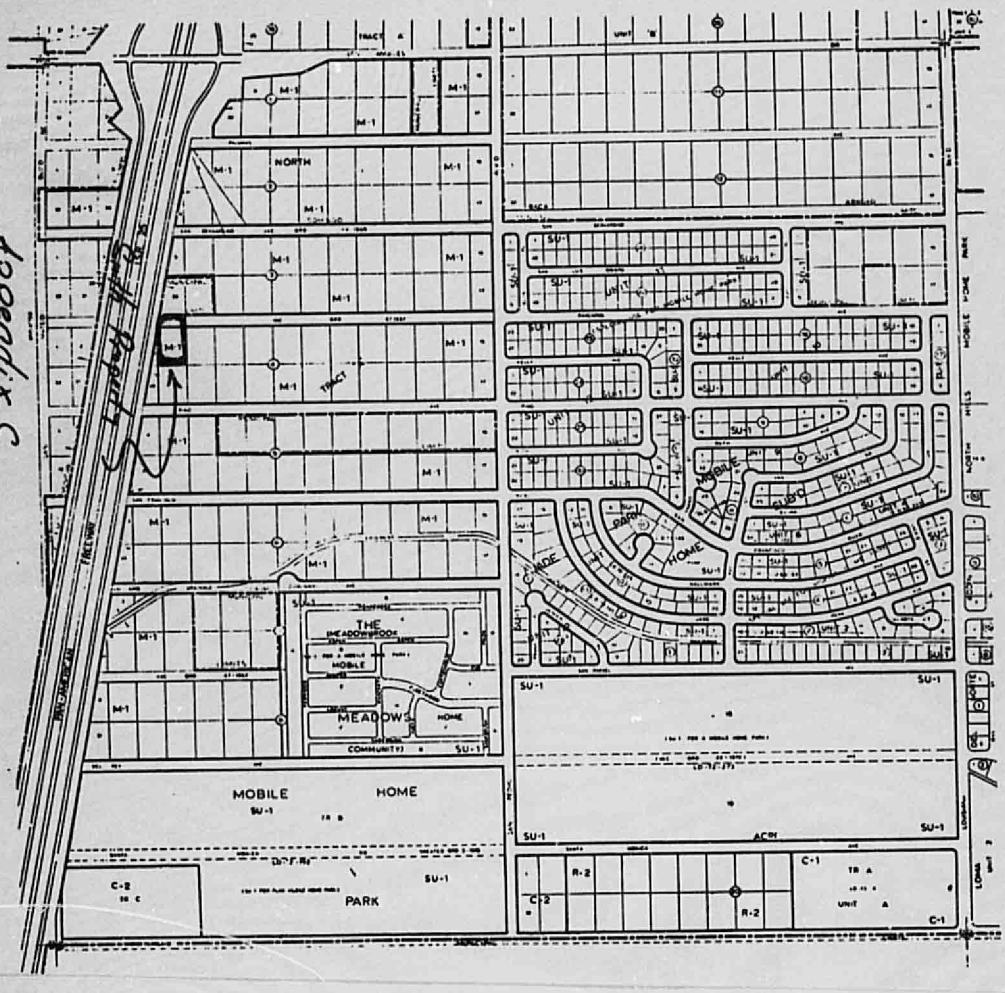
THIS MICROIMAGE IS THE BEST POSSIBLE REPRODUCTION DUE TO THE POOR QUALITY OF THE ORIGINAL DOCUMENT.



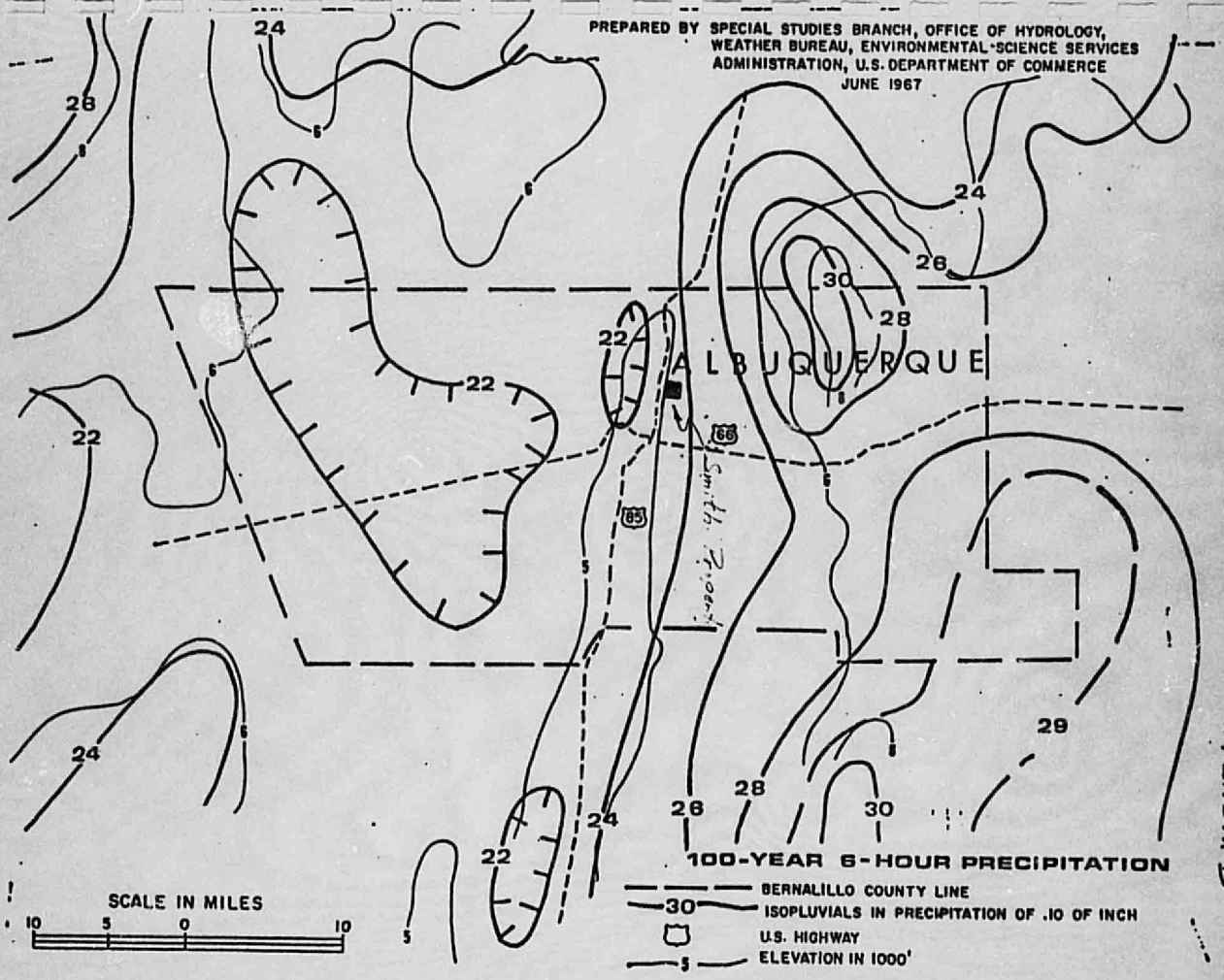


Appendix C

Ma 1977 Albuquerque Zoning Atlas



D-18-Z


PREPARED BY SPECIAL STUDIES BRANCH, OFFICE OF HYDROLOGY,
WEATHER BUREAU, ENVIRONMENTAL SCIENCE SERVICES
ADMINISTRATION, U.S. DEPARTMENT OF COMMERCE
JUNE 1967
ALBUQUERQUE
66
85
Smith Springs
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 D

Appendix E

DRAINAGE AREAS

AREA	Tracts	% Development	Rational C
I	K	70%	0.785
II	L, M, N, O	70%	0.785
III	P	85%	0.868

GORDON HERKENHOFF & ASSOCIATES, INC. 303 Eighth Street, N.W. Albuquerque, New Mexico 87102 (505) 247-0294 ENGINEERING COMPUTATIONS	NAME OF PROJECT Chris Smith -			SHEET NUMBER 2 OF 2
	COMPUTED BY	CHECKED BY	JOB NUMBER	DATE

Determination of Rational C for each area:

Given: C = 0.40 for barren areas

C = 0.95 for roofed & paved areas

Then:

(A) TRACT K:

70% Development — Area = 0.5338 Acres

C = 0.30 × 0.40 + 0.70 × 0.95 = 0.785

(B) TRACT P:

85% Development - Area = 0.6569 Acres

C = 0.15 × 0.40 + 0.85 × 0.95 = 0.868

(C) TRACTS L, M, N, O, & CENTRAL DRIVEWAY COMBINED

70% Development Area = 1.695 Acres

∴ C = 0.785

Appendix F

GORDON HERKENHOFF & ASSOCIATES, INC. 302 Eighth Street, N.W. Albuquerque, New Mexico 87102 (505) 247-0204 ENGINEERING COMPUTATIONS	NAME OF PROJECT SMITH PPTY - HISTORICAL RUNOFF			SHEET NUMBER 1 OF 2
	COMPUTED BY	CHECKED BY	JOB NUMBER	DATE

Undeveloped Historical Runoff From Property -

$C = 0.40$

Area = 2.882 Acres

$h = 5206.5 - 5190.07 = 16.43'$

$l = 556$ feet

$S = 0.0296$

V = (From SCS-TR55) = 1.75 fps

$$T_c = \frac{556}{1.75 \times 60} = 5.30 \text{ min.}$$

$$I_{100} = \frac{189}{5.3 + 25} = 6.24 \text{ in/hr}$$

$$Q_{100} = 6.24 \times 0.40 \times 2.882 = \underline{7.2 \text{ cfs}}$$

GORDON HERKENHOFF & ASSOCIATES, INC. 302 Eighth Street, N.W. Albuquerque, New Mexico 87102 (505) 247-0294 ENGINEERING COMPUTATIONS	NAME OF PROJECT			SHEET NUMBER 2 OF 2
	COMPUTED BY	CHECKED BY	JOB NUMBER	DATE

TRACT K

HISTORICAL RUNOFF :

Area = 0.5338
H = 5199.5 − 5190.0 = 9.5 feet
L = 150 feet
S = 0.0633
V = 2.5 fps (from SCS-TR55)

$T_c = \frac{150}{2.5 \times 60} = 1.0$ minutes

Albuquerque Rational Formula :

$I_{100} = \frac{189}{1+25} = 7.27$ in/hr

(Before Development) $Q_{100} = 7.27 \times 0.40 \times 0.5338 = \underline{1.55 \text{ cfs}}$

TRACT P

A = 0.66 Acres C = 0.40
H = 12 L = 425 S = 0.0282
V = 1.7 fps $T_c = \frac{425}{1.7 \times 60} = 4.17$ min.

$I = \frac{189}{4.17+25} = 6.48$ in/hr

$\therefore Q_{100} = 6.48 \times 0.66 \times 0.40 = \underline{1.71 \text{ cfs}}$

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Appendix G

— From SCS-TR55 sheet 1 of 1

then computed by dividing the total overland flow length by the average velocity.

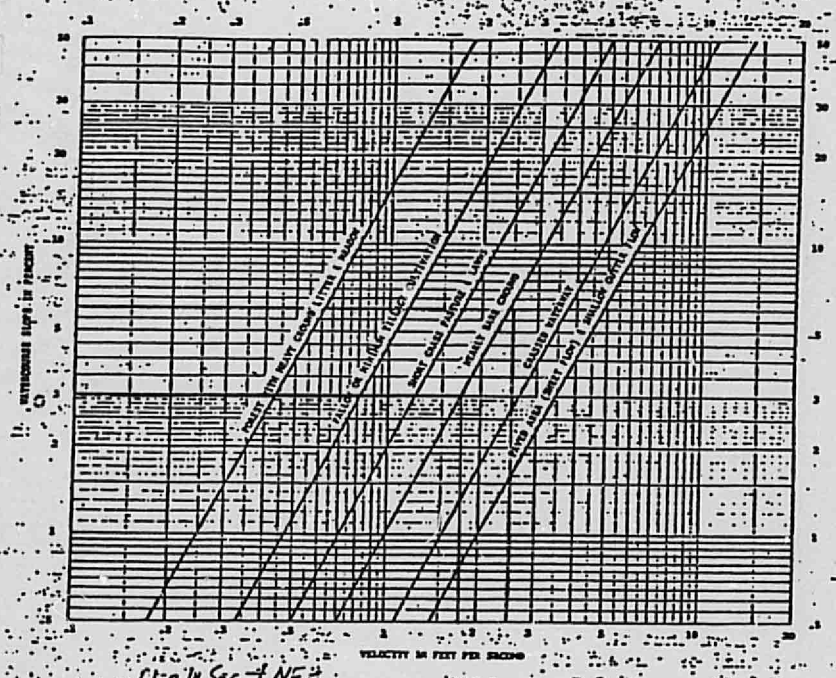


Figure 3-1.--Average velocities for estimating travel time for overland flow.

Storm sewer or road gutter flow

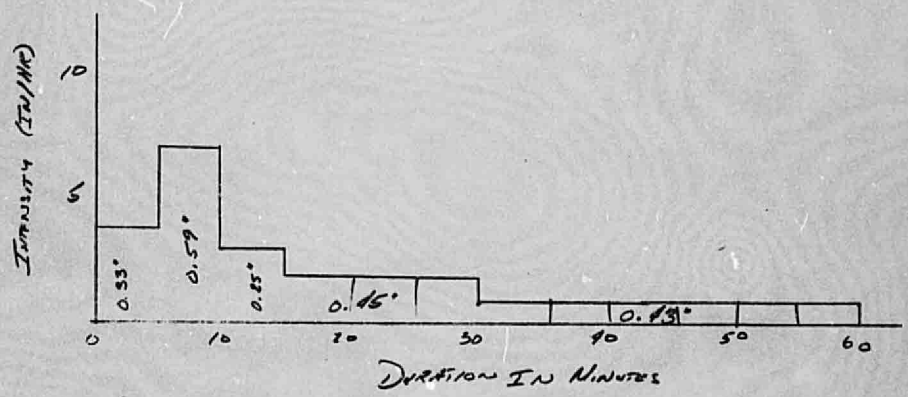
Travel time through the storm sewer or road gutter system to the main open channel is the sum of travel times in each individual component of the system between the uppermost inlet and the outlet. In most cases average velocities can be used without a significant loss of accuracy. During major storm events, the sewer system may be fully taxed and additional overland flow may occur, generally at a significantly lower velocity than the flow in the storm sewers. By using average conduit sizes and an average slope (excluding any vertical drops in the system), the average velocity can be estimated using Manning's formula.

Since the hydraulic radius of a pipe flowing half full is the same as when flowing full, the respective velocities are equal. Travel time may

Appendix H.

GORDON HERKENHOFF & ASSOCIATES, INC. 302 Eighth Street, N.W. Albuquerque, New Mexico 87102 (505) 247-0294 ENGINEERING COMPUTATIONS	NAME OF PROJECT			SHEET NUMBER 7 OF 1
	COMPUTED BY Corl	CHECKED BY	JOB NUMBER 1811.12	DATE Aug 3, 1981

NOTE: CHISEL SMITH PROPERTY IS LOCATED IN THE 2.4" TOTAL PRECIPITATION AREA.*
SO: USE THE 100yr-1hr STORM HYETOGRAPH SHOWN BELOW...

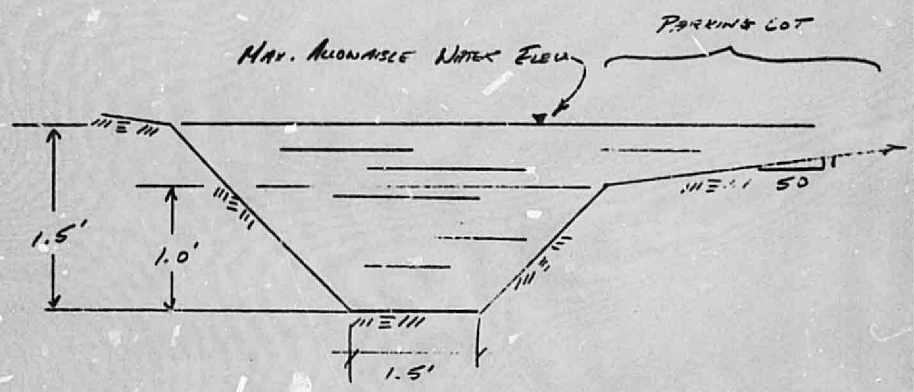


100 yr-1hr STORM HYETOGRAPH

* 100 yr-6 hr Storm Total Precipitation (See next sheet)

Appendix HH

GORDON HERKENHOFF & ASSOCIATES, INC. 302 Eighth Street, N.W. Albuquerque, New Mexico 87102 (505) 247-0294 ENGINEERING COMPUTATIONS	NAME OF PROJECT Pond "P" Cross Section			SHEET NUMBER 1 OF 2
	COMPUTED BY	CHECKED BY	JOB NUMBER	DATE



CROSSECTION OF POND TRACT "P"

Note: Pond For Tract "P" is 120 Feet Long

For: $0 = d < 1.0$ Foot

$$\forall = 120\,(1.5d + 3d^2)$$

For: $1.0 < d < 1.5$ Foot

$$\forall = 120\,\left[(1.5d + 3d^2) + (26.5d^2 - 45.5d + 19)\right]$$

G. MORTON HERKENHOFF & ASSOCIATES, INC.
ENGINEERING COMPUTATIONS

NAME OF PROJECT

COMPUTED BY | CHECKED BY | JOB NUMBER | DATE

SHEET NUMBER 2 OF 2

Depth Vs. Volume For Tract "P" Pond

Sheet 2/2

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Appendix I

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

ENGINEERING COMPUTATIONS

NAME OF PROJECT			SHEET NUMBER
SMITH PROPERTY - TRACT D			1 OF 2
COMPUTED BY	CHECKED BY	JOB NUMBER	DATE
Cole		1811.12	7-22-[illegible]

Assume: ONLY TRACT "P" DRAINS INTO THIS POND IN THE SOUTHWEST CORNER AND THEN DISCHARGES INTO THE FRONTAGE ROAD DRAINAGE DITCH.

TIME	Hydrograph Pump	Hydr.	Vol. Into Pond	Division	Flow [illegible]
5	0.33	C=0.87 (1852 Dev. Area) A=28.6410			
10	0.59	0.87 x 0.6569 x 43,560 / 12 = 2074.56	685		2.28
15	0.25		1,224		4.07
20	0.15		519		1.73
25	0.15		311		1.04
30	0.15		311		1.04
35	0.08		311	300 Seconds	1.04
40	0.08		166		0.55
45	0.08		166		0.55
50	0.08		166		0.55
55	0.08		166		0.55
60	0.08		166		0.55
65			166		0.55

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302 Eighth Street, N.W.
Albuquerque, New Mexico 87102
(505) 247-0294

ENGINEERING COMPUTATIONS

NAME OF PROJECT			SHEET NUMBER
SMITH - PARKA POND			2 OF 2
COMPUTED BY	CHECKED BY	JOB NUMBER	DATE

TRACT "P" POND

USE CROSSSECTION OF TRACT "K" POND.

OVERALL LENGTH = 120 FEET. 8" Asbestos Cement Pipe

TIME (MIN.)	INK. VOLUME (AF)	ACC. VOL. (AF-S)	DEPTH (FT)	Q OUT (CFS)	VOL. OUT (AF-S)	NET [illegible] (AF-S)
0	—	—	—	—	—	—
5	0	685	1.08	1.3	390	295
10	122	1,519	1.17	1.5	450	1069
15	519	1588	1.35	1.6	480	1108
20	311	1419	1.33	1.6	480	939
25	311	1250	1.27	1.5	450	800
30	311	1111	1.22	1.4	420	691
35	166	857	1.10	1.3	390	467
40	166	633	1.04	1.2	360	273
45	166	439	0.85	1.0	300	139
50	166	305	0.67	0.8	240	65
55	166	231	0.57	0.6	180	51

$1.6 \leq 1.71$ cfs $= Q_{100}$ (Area P) O.K.

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

$$\frac{24500}{43560} = .56$$

$$Q_{5_u} = 3.45 \times .56 \times .4 = .78$$

$$Q_{100_D} = \frac{(.785)(5.4)}{10}$$

$$V = .786\left(\frac{2.5}{12}\right)(43560)$$

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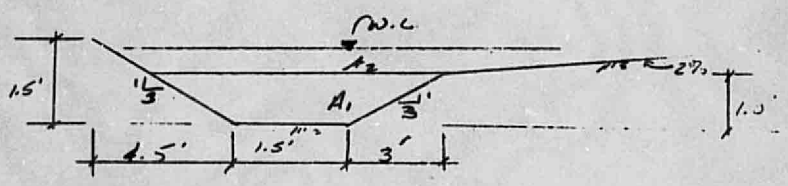
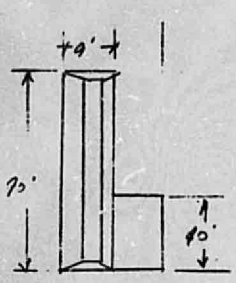
APPENDIX J

GORDON HERKENHOFF & ASSOCIATES, INC. 302 Eighth Street, N.W. Albuquerque, New Mexico 87102 (505) 247-0204 ENGINEERING COMPUTATIONS	NAME OF PROJECT Frontage Rd. Property - Smith's			SHEET NUMBER 1 OF 5
	COMPUTED BY Carle	CHECKED BY	JOB NUMBER 1811.12	DATE Aug 16, 1981

TRACT K POND:

Assume: 1 foot deep ditch section x 9 foot width (@ top) & use 40' frontage of parking lot for last 1/2 foot of storage.





$A_1 = 1.5d + 3d^2$

$A_2 = (7.5 + 1.5(d-1))(d-1) + 25(d-1)(d-1)$

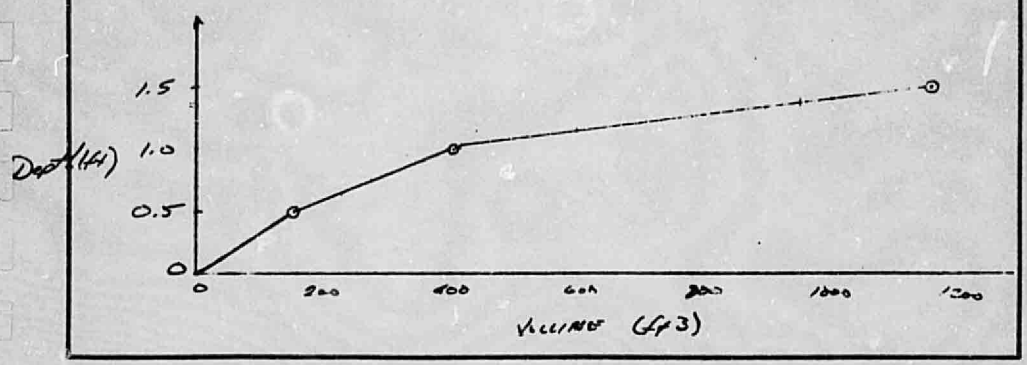
-or- $A_2 = 26.5d^2 - 45.5d + 19$

FROM $0 = d < 1.0$ Ft.

$V = 90(1.5 + 3d^2)$

& FROM $1.0 < d < 1.5$ Ft.

$V = 90(1.5 + 3d^2) + 40(26.5d^2 - 45.5d + 19)$



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Appendix E

Sheet 2 of 3

SMITH PROPERTY

TRACT "K"

Inflow Hydrograph

END OF PERIOD TIME (MIN)	HYDROGRAPH PRECIPITATION in.	MULTIPLIER	VOL. INTO POND cf	DIVISION	INFLOW RATE cfs
5	0.33"				
10	0.59"	$0.785 \times 0.5938 \times \frac{43,560}{12} = 15214.09$	502	÷ 300 SECONDS	1.67
15	0.25"		897		2.99
20	0.15"		380		1.27
25	0.15"		228		0.76
30	0.15"		228		0.76
35	0.08		228		0.76
40	0.08		122		0.41
45	0.08		122		0.41
50	0.08		122		0.41
55	0.08		122		0.41
60	0.08		122		0.41
65			122		0.41
	2.10				

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

NAME OF PROJECT			SHEET NUMBER
SMITH - TRACT F POND			3 OF 3
COMPUTED BY	CHECKED BY	JOB NUMBER	DATE
Carla			Aug 16 '94

TRACT F POND HYDROGRAPH

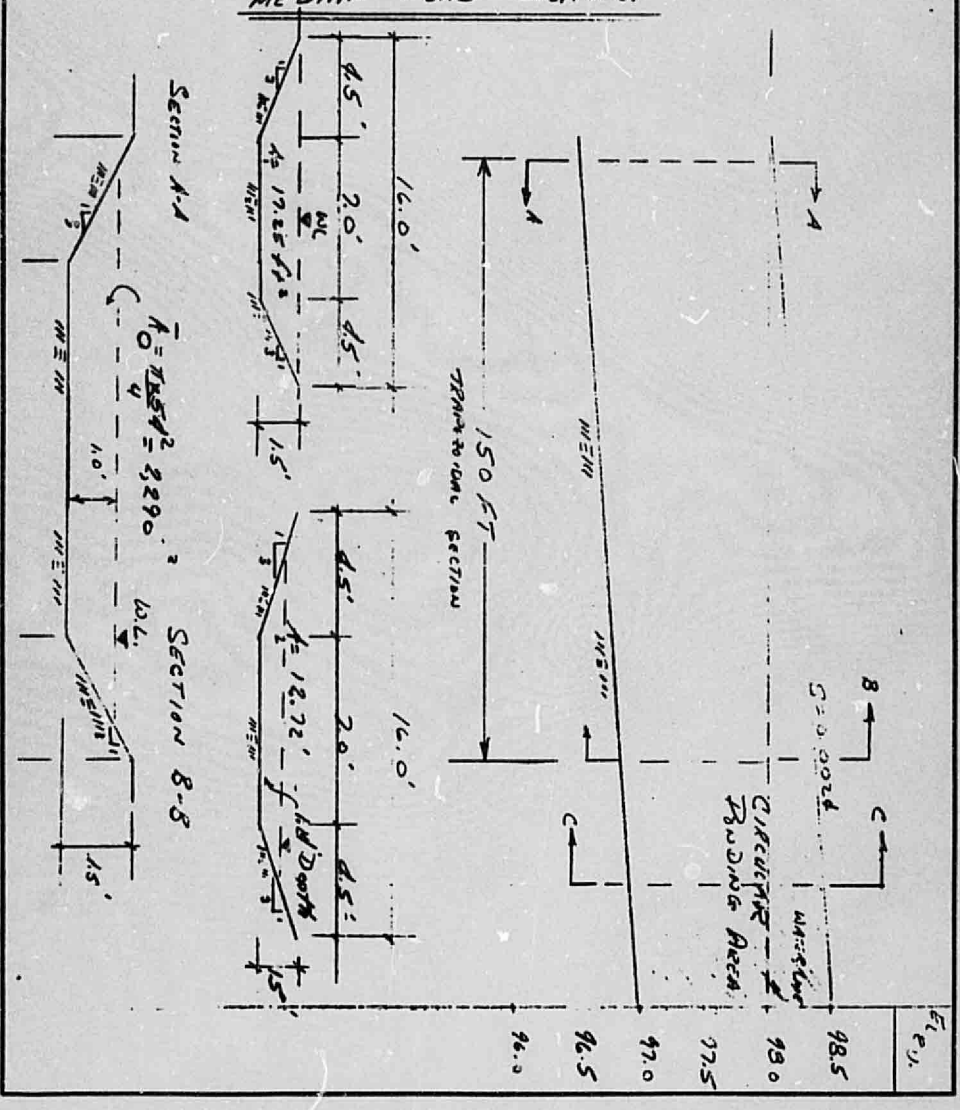
ASSUME AN 8" ASBESTOS CEMENT PIPE

TIME (min)	INC. VOL. (ft^3)	ACC. VOL. (ft^3)	DEPTH (ft)	Q OUT (cfs)	VOL. OUT (cf)	NET. RET. (cf)
0	—	—	—	—	—	—
5	0	502	1.05	1.5	450	52
10	897	949	$\boxed{1.35}$	$\boxed{1.6}$	480	469
15	380	849	1.30	1.6	480	369
20	228	597	1.15	1.4	420	177
25	228	405	1.0	1.2	360	45
30	228	273	0.75	0.9	270	3
35	122	125	0.40	0.4	120	5
40						
45						

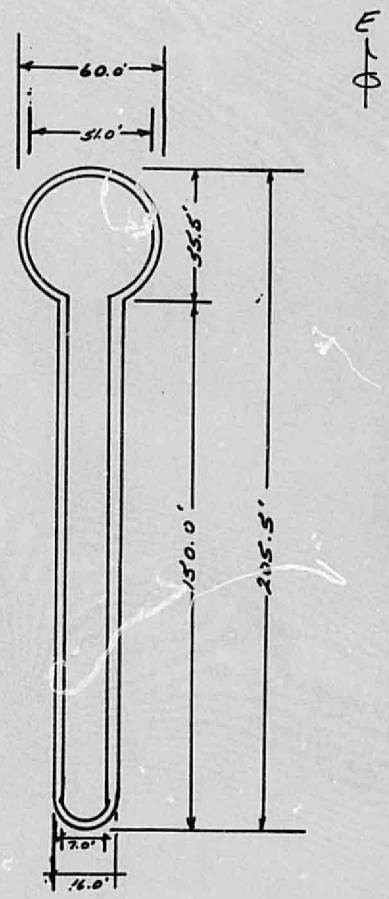
Appendix F

GORDON HERKENHOFF & ASSOCIATES, INC. 302 Eighth Street, N.W. Albuquerque, New Mexico 87102 (505) 247-0094 ENGINEERING COMPUTATIONS	NAME OF PROJECT SMITH- MEDIAN POND X-SECT			SHEET NUMBER 1 OF 3
	COMPUTED BY	CHECKED BY	JOB NUMBER	DATE D. 23, 1971

MEDIAN POND SECTIONS.



GORDON HERKENHOFF & ASSOCIATES, INC. 302 Eighth Street, N.W. Albuquerque, New Mexico 87102 (505) 247-0294 ENGINEERING COMPUTATIONS	NAME OF PROJECT Chisel Smith – Median Pond			SHEET NUMBER 2 OF 3
	COMPUTED BY Cook	CHECKED BY	JOB NUMBER	DATE

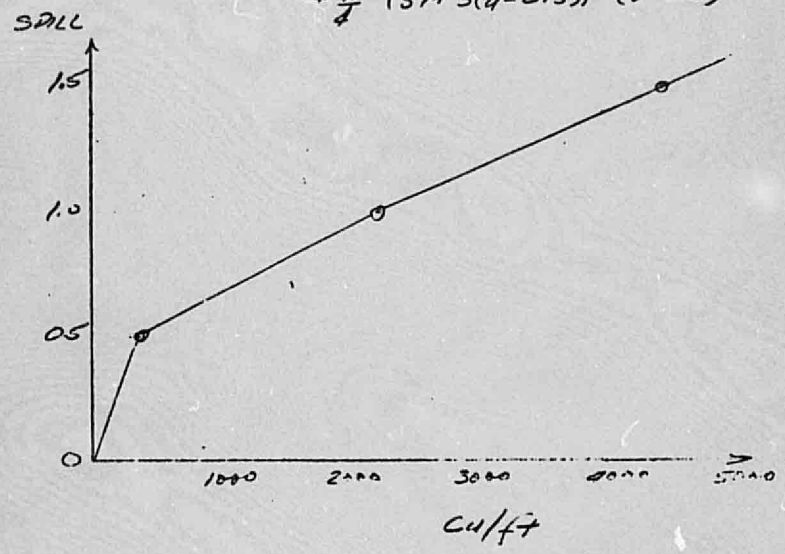


PLAN VIEW OF MEDIAN POND
N.T.S.

GORDON HERKENHOFF & ASSOCIATES, INC.
ENGINEERING COMPUTATIONS

NAME OF PROJECT: Chisol Smith - Median Pond
COMPUTED BY | CHECKED BY | JOB NUMBER | DATE
SHEET NUMBER 4 OF

$$V = 75\left\{(7d+3d^2)+7(d-0.36)+3(d-0.36)^2\right\} + \frac{\pi}{4}\left(5+3(d-0.5)\right)^2(d-0.5)$$



Depth Vs Volume For MEDIAN POND
(POND IS KEYHOLE SHAPED)

Sheet 3 of 3

Appendix L

GORDON HERKENHOFF & ASSOCIATES, INC. 302 Eighth Street, N.W. Albuquerque, New Mexico 87102 (505) 247-0294 ENGINEERING COMPUTATIONS	NAME OF PROJECT SMITH PROPERTY			SHEET NUMBER 1 OF 3
	COMPUTED BY	CHECKED BY	JOB NUMBER	DATE

MEDIAN POND INFLOW HYDROGRAPH

ASSUME: WATER FROM L, M, N, O, & CENTRAL DRIVEWAY INTO MEDIAN POND

AREA = 1.695 ACRES

C FOR 70% DEVELOPMENT = 0.785

END OF PERIOD (MIN)	HYETOGRAPH PRECIP. (IN)	NET.	VOL. IN (CF)	INFLOW RATE (CFS)
5	0.33	$0.785 \times 1.695 \times \frac{13.560}{12} = 1829.99$		
10	0.59		1594	5.31
15	0.25		2850	9.50
20	0.15		1207	4.02
25	0.15		724	2.41
30	0.15		724	2.41
35	0.08		724	2.41
40	0.08		386	1.29
45	0.08		386	1.29
50	0.08		386	1.29
55	0.08		386	1.29
60	0.08		386	1.29
65			386	1.29

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

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

ENGINEERING COMPUTATIONS

NAME OF PROJECT			SHEET NUMBER
SMITH PROP. - Helina Pond			6 OF 3
COMPUTED BY	CHECKED BY	JOB NUMBER	DATE
Clark		181[illegible]	[illegible] 28, 1987

Assume; TRACTS L, M, N, O, & THE CENTRAL DRIVEWAY DRAIN INTO THIS POND

A = .695 Acres 1/50 12" Concrete Pipe

TIME	INCREMENTAL VOL (IN)	ACCUM. VOL (CF)	POND DEPTH (FT)	Q OUT (CFS)	VOL. OUT POND (CF)	NET (ACCUMULATED) VOLUME IN POND
0	—	—	—	—		
5	—	1594	0.87	1.85	555	1,039
10	2850	3,889	1.45	3.50	1,050	2,839
15	1207	4,046	1.50	3.60	1,080	2,966
20	724	3,690	1.40	3.40	1,020	2670
25	724	3,394	1.34	3.30	990	2404
30	724	3128	1.27	3.00	900	2,228
35	386	2614	1.14	2.80	840	1,774
40	386	2160	1.04	2.20	660	1500
45	386	1886	0.94	2.10	630	1256
50	386	1642	0.88	1.95	585	1057
55	386	1443	0.82	1.95	585	858
60	386	1244	0.75	1.50	450	794

(Next Sheet)

GORDON HERKENHOFF & ASSOCIATES, INC. 302 Eighth Street, N.W. Albuquerque, New Mexico 87102 (505) 247-0294 ENGINEERING COMPUTATIONS	NAME OF PROJECT			SHEET NUMBER 3 OF 3
	COMPUTED BY	CHECKED BY	JOB NUMBER	DATE

Now: To satisfy the drainage scheme, the median pond must drain at a rate equal to the site historical

$$Q_{100}^{\text{(MEDIAN POND)}} \leq Q_{100}^{\text{(SITE)}} - Q_{100}^{\text{(TRACT "K")}} - Q_{100}^{\text{(TRACT "P")}}$$

Where: By Albuquerque Rational Method

C = 0.40 AREA = 2.882 Acres H = 5206.5 − 5195.1 = 11.4'

V = (From SCS-TR55) = 1.75 fps $T_c = \frac{556}{1.75 \times 60} = 5.30$ min

$I_{100} = 189/1.75^{.25} = 6.24$ ∴ $Q_{100} = 6.24 \times 0.40 \times 2.882 = \underline{7.2 \text{ cfs}}$

HISTORICAL SITE DISCHARGE, Pond "K" Discharge

Then: $Q_{100}^{\text{MEDIAN POND}} \leq 7.2 - 1.6 - 1.6 = 4.0$ cfs

Pond "P" Discharge

& FROM PREVIOUS SHEET:

$Q_{100}^{\text{MEDIAN POND}} = 3.6$ cfs ≤ 4 cfs o.k.

Appendix M

GORDON HERKENHOFF & ASSOCIATES, INC. 202 Eighth Street, N.W. Albuquerque, New Mexico 87102 (505) 247-0204 ENGINEERING COMPUTATIONS	NAME OF PROJECT Chisel Smith Properties			SHEET NUMBER 1 OF 1
	COMPUTED BY	CHECKED BY	JOB NUMBER	DATE

CHISEL SMITH:

HISTORICAL DISCHARGE DATA FOR ENTIRE PROPERTY:

100yr-1hr storm

Area = 2.8821 Acres

C = 0.40

TIME (MIN)	PRECIP. (IN)	MULT.	VOL. IN (AF)		INFLOW RATE (CFS)
5	0.33	$0.40 \times 2.8821 \times \frac{43,560}{12} = 4188.81$			
10	0.59		1381		4.60
15	0.25		2469		8.23
20	0.15		1046		3.49
25	0.15		628		2.09
30	0.15		628		2.09
35	0.08		628		2.09
40	0.08		335	÷ 300	1.12
45	0.08		335		1.12
50	0.08		335		1.12
55	0.08		335		1.12
60	0.08		335		1.12
65			335		1.12

Appendix N

GORDON HERKENHOFF & ASSOCIATES, INC. 302 Eighth Street, N.W. Albuquerque, New Mexico 87102 (505) 247-0294 ENGINEERING COMPUTATIONS	NAME OF PROJECT			SHEET NUMBER 1 OF 1
	COMPUTED BY Cole	CHECKED BY	JOB NUMBER	DATE Aug 16, 1981

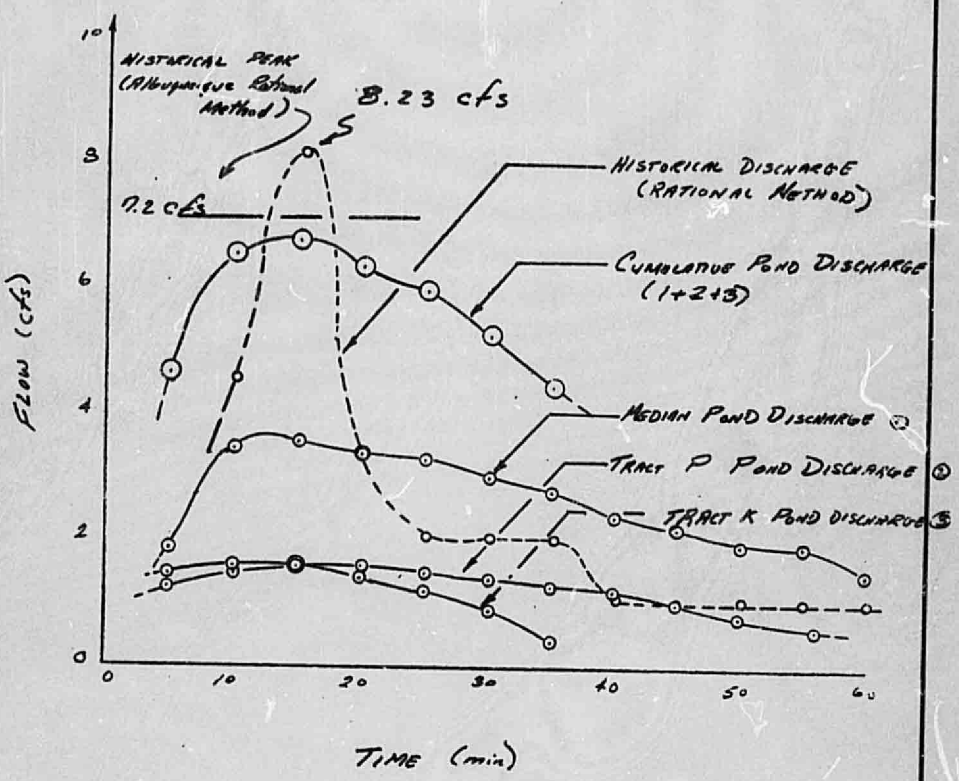


Fig. #1 HISTORIC AND DEVELOPED DISCHARGES OFF OF PROPERTY

Appendix O

GORDON HERKENHOFF & ASSOCIATES, INC. 302 Eighth Street, N.W. Albuquerque, New Mexico 87102 (505) 247-0294 ENGINEERING COMPUTATIONS	NAME OF PROJECT Smith			SHEET NUMBER 11 OF 71
	COMPUTED BY Cole	CHECKED BY	JOB NUMBER	DATE

ESTIMATE AMOUNT OF RAINFALL FOR 10yr STORM:

FROM 1973 NOAA WEATHER ATLAS:

$$Y_2 = -0.011 + 0.982\,[(X_1)(X_1/X_2)] = 2yr-1hr \text{ est. value}$$

$$Y_{100} = 0.494 + 0.755\,[(X_3)(X_3/X_4)] = 100yr-1hr \text{ est. value}$$

Where: X_1 = 2yr-6hr value from prec. freq. maps

X_2 = 2yr-24hr " " "

X_3 = 100yr-6hr " " "

X_4 = 100yr-24hr " " "

Then: $X_1 = 1.3"$, $X_2 = 1.4"$, $X_3 = 2.4"$, $X_4 = 3.4"$

$\therefore$ $Y_2 = 1.13"$ & $Y_{100} = 1.77"$

From Below: $Y_{10} = \underline{1.45"}$

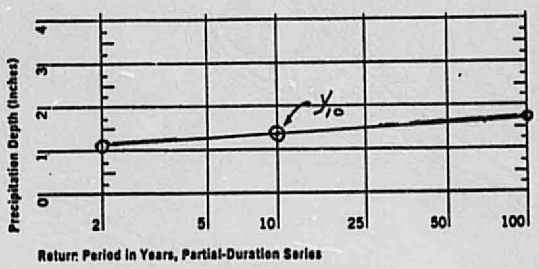


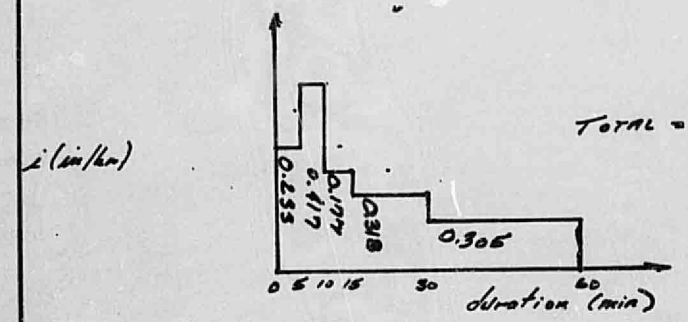
Figure 6. *Precipitation depth versus return period for partial-duration series.*

From: 1973 NOAA WEATHER ATLAS

Appendix P

GORDON HERKENHOFF & ASSOCIATES, INC. 302 Eighth Street, N.W. Albuquerque, New Mexico 87102 (505) 247-0204 ENGINEERING COMPUTATIONS	NAME OF PROJECT K Area Pond Overflow			SHEET NUMBER 1 OF 2
	COMPUTED BY	CHECKED BY	JOB NUMBER	DATE

For: $Y_{10} = 1.45''$



TOTAL = 1.45 inches

10yr-1hr hyetograph

End of Period	Hyetograph Precip. (in)	Meas.	Vol. In (cf)	Division	Inflow Rate (cfs)
5	0.233				
10	0.417		384		1.18
15	0.177		634		2.11
20	0.106		269		0.90
25	0.106		161		0.54
30	0.106		161		0.54
35	0.072		161		0.54
40	0.072		110		0.37
45	0.072		110		0.37
50	0.072		110		0.37
55	0.072		110		0.37
60	0.072		110		0.37
65			110		0.37

$C = 0.785$

$0.785 \times 0.5338 \times \frac{43,560}{12} = 1621.09$

÷ 300 sec/5 min

GORDON HERKENHOFF & ASSOCIATES, INC. 302 Eighth Street, N.W. Albuquerque, New Mexico 87102 (505) 247-0296 ENGINEERING COMPUTATIONS	NAME OF PROJECT			SHEET NUMBER 2 OF 2
	COMPUTED BY Cark	CHECKED BY	JOB NUMBER	DATE

Pond "K" Hydrograph
Check Overflow For 10yr-1hr Storm
Assume 8" Asbestos Cement Pipe

Time (min)	Inc. Vol. (cf)	Acc. Vol. (cf)	Depth (ft)	Q OUT (cfs)	Vol. OUT (cf)	Net Rem. (cf)
0	—	—	—	—	—	—
5	0	354	0.90	1.2	360	0
10	634	634	$\boxed{1.18}$	$\boxed{1.5}$	450	184
15	269	453	1.05	1.3	390	63
20	161	224	0.65	0.8	240	0
25	161					
30	161					
35						
40						
45						
50						
55						
60						
65						

Let E = Distance water encroaches on parking lot.

$\therefore E_{10} = (1.18 - 1.0)\,50 = 9.0$ feet

$\therefore E_{100} = (1.35 - 1.0)\,50 = 17.5$ feet

Appendix Q

GORDON HERKENHOFF & ASSOCIATES, INC. 302 Eighth Street, N.W. Albuquerque, New Mexico 87102 (505) 247-0204 ENGINEERING COMPUTATIONS	NAME OF PROJECT			SHEET NUMBER 1 OF 2
	COMPUTED BY	CHECKED BY	JOB NUMBER	DATE

Pond "P":

Check Pond "P" For Encroachment on Parking Lot During 10yr-1hr Storm...

END OF PERIOD	HYETOGRAPH PARCIP. (IN)	MULT.	VOL. IN CF	DIV.	INFLOW RATE (CFS)
5	0.233				
10	0.417		483		1.61
15	0.177		865		2.88
20	0.106		367		1.22
25	0.106		220		0.73
30	0.106	$0.87 \times 0.6569 \times \frac{43,560}{12} = 20,456$	220	÷300	0.73
35	0.072		220		0.73
40	0.072	$C = 0.87$	149		0.50
45	0.072		149		0.50
50	0.072		149		0.50
55	0.072		149		0.50
60	0.072		149		0.50
65			149		0.50

GORDON HERKENHOFF & ASSOCIATES, INC. 302 Eighth Street, N.W. Albuquerque, New Mexico 87102 (505) 247-0294 ENGINEERING COMPUTATIONS	NAME OF PROJECT			SHEET NUMBER 2 OF 2
	COMPUTED BY Carle	CHECKED BY	JOB NUMBER	DATE

Pond "P" Hydrograph

10 yr Storm - Parking Lot Encroachment

Assume 8" Asbestos Cement Pipe

TIME (min)	INC. VOL. (ft3)	ACC. VOL. (ft3)	DEPTH (ft)	Q OUT (cfs)	VOL. OUT (cf)	NET REM. (cf)
0	—	—	—	—	—	—
5	0	483	0.92	1.3	390	93
10	865	958	$\boxed{1.15}$	$\boxed{1.5}$	450	508
15	367	875	1.13	1.5	450	425
20	220	645	1.05	1.3	390	255
25	220	475				
30						
35						

$E_{10} = (1.15 - 1.0)50 = 7.5$ feet

$E_{100} = (1.35 - 1.0)50 = 17.5$ feet

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

Appendix R

GORDON HERKENHOFF & ASSOCIATES, INC. 302 Eighth Street, N.W. Albuquerque, New Mexico 87102 (505) 247-0294 ENGINEERING COMPUTATIONS	NAME OF PROJECT Chisel Smith			SHEET NUMBER 1 OF 2
	COMPUTED BY	CHECKED BY	JOB NUMBER	DATE Aug 12, 1981

Check For Flow Across Property From City Yards ...

FROM FIGURE BELOW - CROSSHATCHED AREA IS ASSUMED TO CONTRIBUTE TO MAX FLOW IN CITY YARD STREET, AT POINT A. THIS IS THE NORTHEAST PROPERTY CORNER OF THE SMITH LAND.

BY PLANIMETER — Area Crosshatched = 4 in²

Bldg. & Paved Area = 3½ in² ∴ Bare Ground = ½ in²

Rational $C = \frac{1/2}{4} \times 0.4 + \frac{3\frac{1}{2}}{4} \times 0.95 = 0.8813$

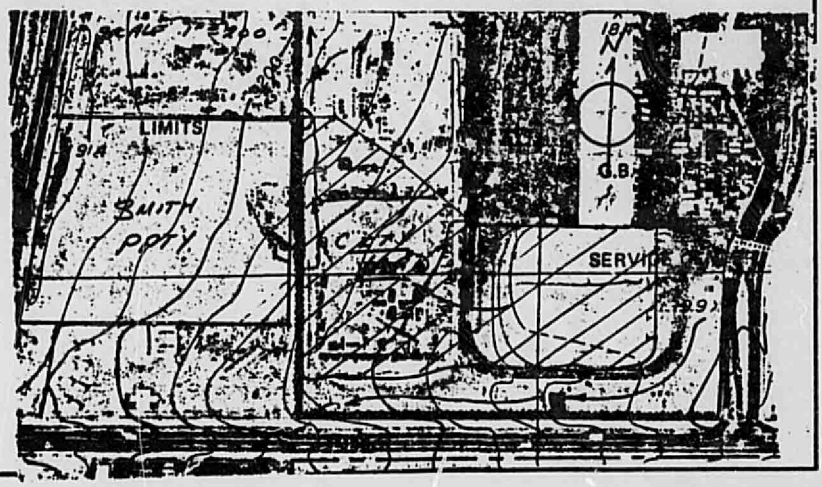
Area Crosshatched $= \frac{4 \times 200^2}{43{,}560} = 3.6731$ Acres

$S = \frac{212-202}{350} = 0.03$ $V = 3.4$ fps (From SCS-TR-55)

$T_c = \frac{350}{3.4 \times 60} = 1.72$ Min & $I_{100} = \frac{189}{1.72+25} = 7.07$ in/hr

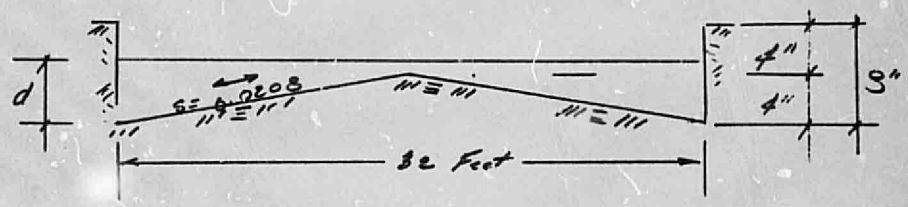
∴ $Q_{100} = 0.8813 \times 7.07 \times 3.6731 = \underline{22.89}$ cfs

See Next Sheet



GORDON HERKENHOFF & ASSOCIATES, INC. 202 Eighth Street, N.W. Albuquerque, New Mexico 87102 (505) 247-0294 ENGINEERING COMPUTATIONS	NAME OF PROJECT			SHEET NUMBER 2 OF 2
	COMPUTED BY	CHECKED BY	JOB NUMBER	DATE

$Q_{100} = 22.89\ cfs$



Assume $d > 4''$

Then: $A = \frac{4}{12} \times 16 + (d - 4/12)\,32 = 32d - 5.33$

$P_w = 2d + 2\,\frac{(4/12)}{\sin 1.19^\circ} = 2d + 32.10$

$S = \frac{8}{700} = 0.011d$ & $n = 0.013$

Then: $Q_{100} = \frac{1.49}{0.013}\,\frac{(32d - 5.33)^{5/3}}{(2d + 32.10)^{2/3}}\,0.011d^{1/2}$

By Programmable Calculator ... $d \doteq \underline{0.35}$ Feet

$F.S. = \frac{8''/12''}{.35} = 1.9$

STREET HAS ALMOST TWICE THE CAPACITY REQUIRED TO CARRY THIS FLOW.

Appendix S

GORDON HERKENHOFF & ASSOCIATES, INC. 300 Eighth Street, N.W. Albuquerque, New Mexico 87102 (505) 247-0201 ENGINEERING COMPUTATIONS	NAME OF PROJECT			SHEET NUMBER 1 OF 3
	COMPUTED BY Gale	CHECKED BY	JOB NUMBER	DATE April 1991

NOTE: These Figures Are Conservative Because All Flow Was Assumed To Flow Through Ditches...

Check To See If Upper Tract Ditches Are Adequate...

Check Tract "O" ...

Assume All flow From Tract 'O' Flows Into Ditch...
(Conservative)

Area ≅ 0.2454 Acres 70% Developed ⇒ C = 0.785

l = 230 feet h = 5203.0 − 5198.1 = 4.9 ft

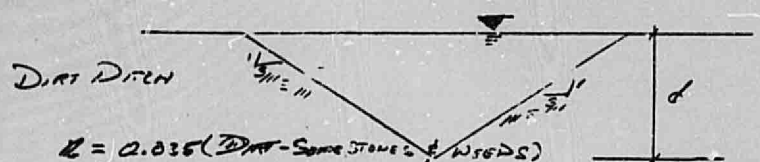
$S = \frac{4.9}{230} = 0.0213$ V = (from SCS-TR-55) ≅ 2.8 fps

$T_c = \frac{230}{2.8 \times 60} = 1.37$ min (Assume Paved Worst Condition)

$\frac{I}{100} = \frac{189}{1.37425} = 7.17$ in/hr ⇒ $Q_{100} = 0.785 \times 7.17 \times 0.2454 = 1.38$ cfs

Check Ditch Capacity...

Manning Formula: $Q = \frac{1.49}{n} A R_h^{2/3} S^{1/2}$



n = 0.035 (DIRT - SOME STONES & WEEDS)

$A = 3d^2$; $P_w = 2((3d)^2 + d^2)^{1/2}$; $R_h = \frac{A}{P_w} = \frac{3d^2}{2((3d)^2+d^2)^{1/2}}$

$S = \frac{5199.0 - 5198.12}{42.0} = 0.040$

(next sheet)

GORDON HERKENHOFF & ASSOCIATES, INC. 202 Eighth Street, N.W. Albuquerque, New Mexico 87102 (505) 247-0234 ENGINEERING COMPUTATIONS	NAME OF PROJECT			SHEET NUMBER 2 OF 2
	COMPUTED BY	CHECKED BY	JOB NUMBER	DATE

Then:

$$Q_{100} = A R_h^{2/3} S^{1/2} \frac{1.49}{n}$$

$$1.38 = \frac{1.49}{0.025}(3d^2)\left(\frac{3d^2}{2((3d)^2+d^2)^{1/2}}\right)^{2/3}(0.0210)^{1/2}$$

$$0.1598 = \frac{(3d^2)^{5/3}}{(2((3d)^2+d^2)^{1/2})^{2/3}} \Rightarrow d \cong 0.40$$

$$A = 3 \times 0.4^2 = 0.48 \text{ ft}^2$$

$$V = \frac{1.38}{.48} \cong \underline{2.87 \text{ fps}} \quad @ \sim 1.38 \text{ cfs} \quad \text{o.k.}$$

Appendix T

GORDON HERKENHOFF & ASSOCIATES INC. 303 Eighth Street N.W. Albuquerque, New Mexico 87102 (505) 247-0204 ENGINEERING COMPUTATIONS	NAME OF PROJECT			SHEET NUMBER 1 OF 1
	COMPUTED BY	CHECKED BY	JOB NUMBER	DATE

TRACT N: Area = 0.2351 Acres

$C_{70\%} = 0.785$

BREAK INTO TWO (2) PARTS -

$l_1 = 35$ feet 1) The STEEP BACK CORNER PART (5206.5 TO 5203.0)

$l = 180$ feet 2) The MORE GENTLE PART (5203.0 TO 5192.0)

$h_1 = 3.5$ feet

$S_1 = \frac{3.5}{35} = 0.10$

$V_1 = 3.2$ fps (Nearly All Bare Ground) SCS - TR55

$T_{c_1} = \frac{35}{3.2 \times 60} = 0.182$ min

$h_2 = 4.0$ feet

$S_2 = \frac{4.0}{180} = 0.02$

$V_2 = 2.8$ fps (Paved)

$T_{c_2} = \frac{180}{2.8 \times 60} = 1.07$ min

TOTAL TIME OF CONCENTRATION:

$T_c = T_{c_1} + T_{c_2} = 1.07 + 0.18 = 1.25$ min.

$I_{100} = \frac{189}{1.25^{0.425}} = 7.2$ in/hr

$\therefore \quad Q_{100} = 7.2 \times 0.785 \times 0.2351 = \underline{\underline{1.33 \text{ cfs}}}$

Using same ditch section as previous sheet:

New: $S = \frac{5201 - 5200}{35} = 0.0286$

By Programmable Calculator & Manning ⇒ $d = \underline{0.40}$ feet ok

& $V = 2.77$ fps ok

@ 1.33 cfs

Appendix 4

GORDON HERKENHOFF & ASSOCIATES, INC. 302 Eighth Street, N.W. Albuquerque, New Mexico 87102 (505) 247-0204 ENGINEERING COMPUTATIONS	NAME OF PROJECT			SHEET NUMBER 1 OF 1
	COMPUTED BY	CHECKED BY	JOB NUMBER	DATE

TRACT M: AREA = 0.2351 ACRES $C_{70\%}$ = 0.785

ℓ = 90+120 = 210 feet & h = 5203.0 − 5199.0 = 4.0 feet

$S = \frac{4}{210} = 0.019$ & V = 2.5 fps (Mostly Paved Assumed) SCS-TR55

$T_c = \frac{210}{2.5 \times 60} = 1.4$ min.

$I_{100} = \frac{189}{1.4+25} = 7.16$ in/hr

$Q_{100} = 7.16 \times 0.785 \times .2351 = 1.32$ cfs

By Programmable Calculator & Manning...

$S = \frac{5200 - 5199}{100} = 0.01$

Then: d = 0.46 & V = 2.08 fps @ 1.32 cfs

Appendix V

GORDON HERKENHOFF & ASSOCIATES, INC. 302 Eighth Street, N.W. Albuquerque, New Mexico 87102 (505) 247-0204 ENGINEERING COMPUTATIONS	NAME OF PROJECT			SHEET NUMBER 1 OF 3
	COMPUTED BY	CHECKED BY	JOB NUMBER	DATE

TRACT C:

GIVEN: 1/2 FOOT BERM DIVERTING WATER ALONG WEST BOUNDARY

ASSUME: ALL FLOW TRAVELS ALONG BERM

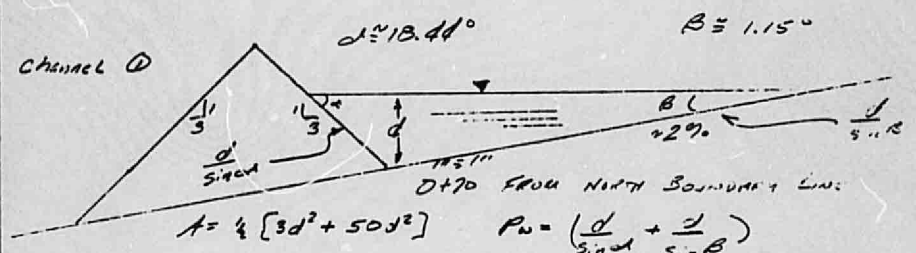
DETERMINE: IF RUNOFF WILL OVERTOP BERM

SPLIT INTO TWO PARTS...
(DIFFERENT CHANNEL SECTIONS)

① NORTH BOUNDARY TO 70 FEET SOUTH OF NORTH BOUNDARY...

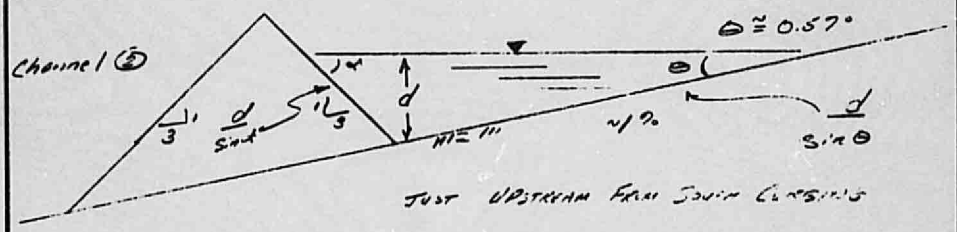
② FROM 70 FEET SOUTH OF BOUNDARY TO SOUTH CURBING.

Channel ①



$A = \frac{1}{2}[3d^2 + 50d^2]$ $\quad P_w = \left(\frac{d}{\sin\alpha} + \frac{d}{\sin\beta}\right)$

Channel ②



$A = \frac{1}{2}[3d^2 + 100d^2] = 51.5d^2$

$P_w = \left(\frac{d}{\sin\alpha} + \frac{d}{\sin\theta}\right)$

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	COMPUTED BY Cole	CHECKED BY	JOB NUMBER	DATE [illegible]

Tract "2" (Cont'd)

Area Flowing Through ① ...

$C_{100} = 0.785$

$A_1 = \frac{70 \times 90.87}{43560} = 0.1860$ acres & $l = 160$ feet

$S = \frac{5200.0 - 5198.5}{160} = 0.009$

$V = 1.9$ fps (SCS TR-55) $\quad T_c = \frac{160}{1.9 \times 60} = 1.4$ min

$I_{100} = \frac{189}{1.4125} = 7.16$ in/hr

$Q_{100} = 7.16 \times 0.1860 \times 0.785 = \underline{0.821}$ cfs

Programmable Calculator & Manning ...

$n = 0.025$

$$Q = \frac{1.49}{n} A R_h^{2/3} S^{1/2}$$

$$\frac{0.821 \times 0.025}{1.49 \times (0.009)^{1/2}} = \frac{(26.5 d^2)^{5/3}}{\left[d\left[\frac{1}{\sin 184.4^\circ} + \frac{1}{\sin 115^\circ}\right]\right]^{2/3}}$$

@ 0+70 $\therefore d = 0.17$ feet & $V \cong 1.07$ fps

GORDON HERKENHOFF & ASSOCIATES, INC. 202 Eighth Street, N.W. Albuquerque, New Mexico 87102 (505) 247-0204 ENGINEERING COMPUTATIONS	NAME OF PROJECT			SHEET NUMBER 3 OF 3
	COMPUTED BY	CHECKED BY	JOB NUMBER	DATE

AREA FLOWING THROUGH (2) ...

$C_{90\%} = 0.785$

$A = 0.2454$ Acres & $l = 232$ feet

$h = 5200 - 5198 = 2$ feet

$S = \frac{2}{232} = 0.0086$ $V = 1.3$ fps

$T_c = \frac{232}{1.3 \times 60} = 2.15$ min $T_{100} = \frac{189}{2.15 + 25} = 6$ min

$Q_{100} = 6.96 \times 0.785 \times 0.2454 = \underline{1.34}$ cfs

By Programmable Calculator & Mannings:

Channel Slope $= \frac{5199.0 - 5198.1}{142} = 0.006$

$n = 0.025$ $A = 51.5d^2$ $P_w = d\left(\frac{1}{\sin 18.43^\circ} + \frac{1}{\sin 45^\circ}\right)$

-or- $P_w = 103.68d$

Then: $1.34 = \frac{1.49}{.025}(51.5d^2)\frac{(51.5d^2)^{2/3}}{(103.68d)^{2/3}}\,0.006^{1/2}$

$0.2903 = \frac{(51.5d^2)^{5/3}}{(103.68d)^{2/3}}$

$\therefore d \cong 0.18$ feet $\ll 0.5$ feet

& $V \cong 0.80$ fps ok

@ $Q = 1.34$ fps

Appendix X

GORDON HERKENHOFF & ASSOCIATES, INC. 302 Eighth Street, N.W. Albuquerque, New Mexico 87102 (505) 247-0294 ENGINEERING COMPUTATIONS	NAME OF PROJECT			SHEET NUMBER 1 OF 3
	COMPUTED BY	CHECKED BY	JOB NUMBER	DATE Oct. 11 1991

Check of Ditch & Berm Sections Along South Property Line ...

Area Drained To ditch = 0.7346 Acres
(See Attached Photo)

Development = 50% ⇒ $C_{50\%}$ = 0.675

$h = 5206.0 - 5195.0 = 11.0$ feet

$l = 420$ feet

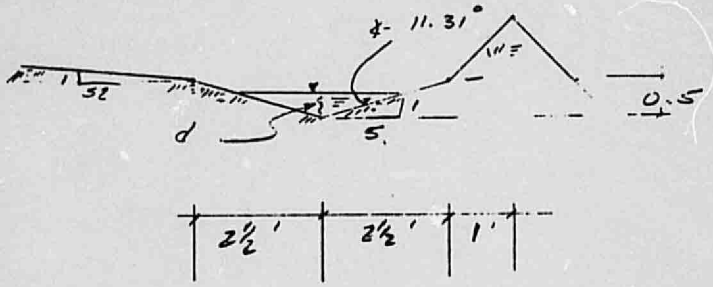
$\therefore \quad S = \frac{11.0}{420} = 0.026$

$V = SCS\text{-}TR55 = 3.2$ fps & $T_c = \frac{420}{3.2 \times 60} = 2.19$ min

$I_{100} = \frac{137}{2.19^{.25}} = 6.95$ in/hr $\quad Q_{100} = 6.95 \times 0.675 \times 0.7346$

$\therefore \quad Q_{100} = 3.45$ cfs

Typical Ditch & Berm Section :



$S \approx \frac{1}{70} = 0.014$ for flatter sections

(next sheet)

GORDON HERKENHOFF & ASSOCIATES, INC. 303 Eighth Street, N.W. Albuquerque, New Mexico 87102 (505) 247-0294 ENGINEERING COMPUTATIONS	NAME OF PROJECT			SHEET NUMBER .2. OF 5.
	COMPUTED BY	CHECKED BY Corle	JOB NUMBER	DATE August 1981

(South line ditch cont'd)

Assume Water does not get over 3½ feet steep...

Then: $A = 5d^2$; $P_w = \left(\frac{d}{\sin 11.31^\circ}\right)^2$

$n = 0.025$

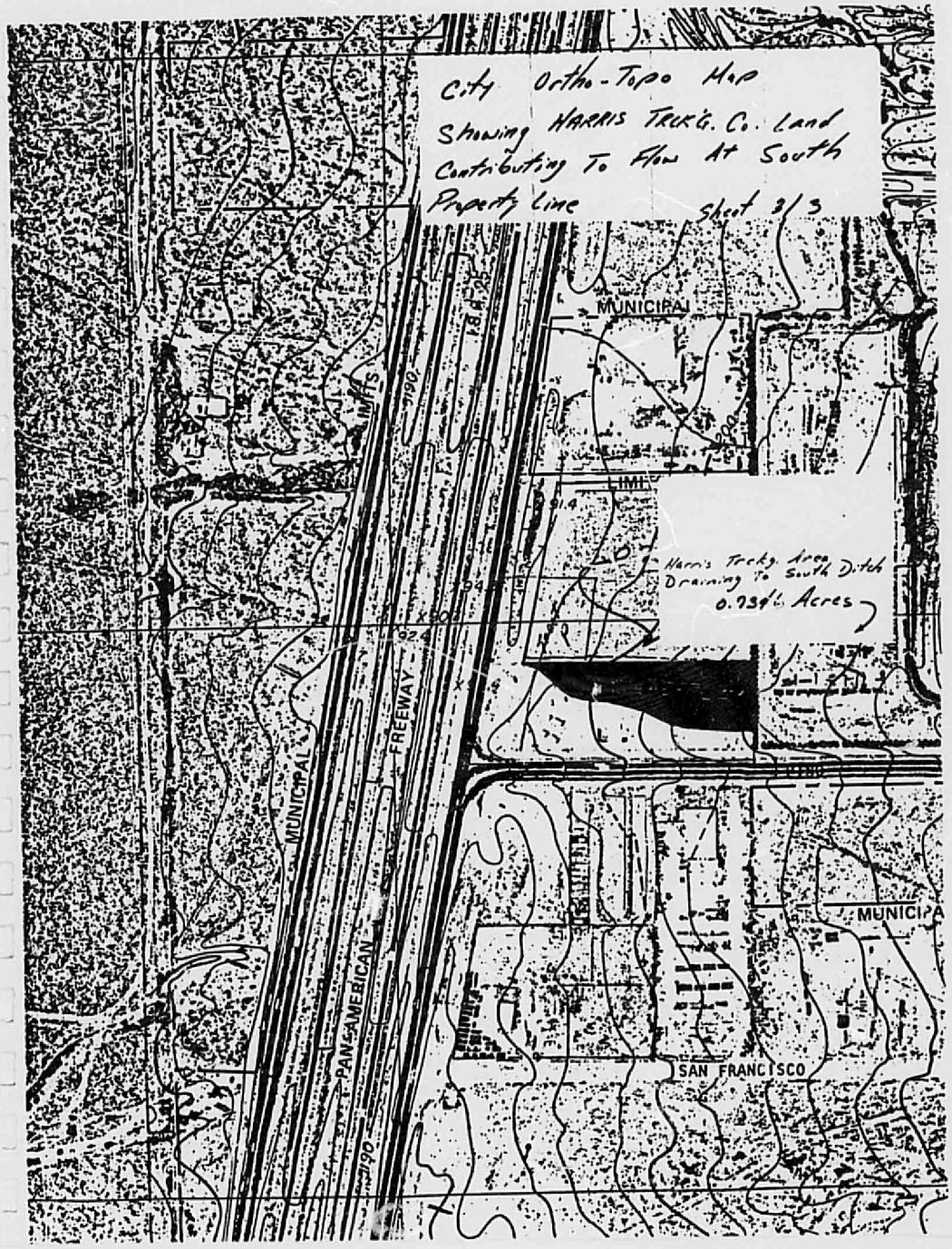
so: $Q = \frac{1.49}{0.025} \frac{(5d^2)^{5/3}}{\left(2\,d/\sin 11.31^\circ\right)^{2/3}} 0.014^{1/2}$

$d = 0.50 \leq 0.50$ feet o.k.

$V = 2.76$ fps o.k.

@ $Q = 3.44 \approx 3.45$ cfs

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



PLAN/PLATS

ON

FILE

GRADING PLAN

1 of 1

GORDON HERKENHOFF & ASSOCIATES, INC. 302 Eighth Street, N.W. Albuquerque, New Mexico 87102 (505) 247-0294 ENGINEERING COMPUTATIONS	NAME OF PROJECT Chisel Smith			SHEET NUMBER OF
	COMPUTED BY	CHECKED BY	JOB NUMBER	DATE

DRIVEWAYS &

ROADSIDE DITCH ANALYSIS

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

APPENDIX Y

GORDON HERKENHOFF & ASSOCIATES, INC. 302 Eighth Street, N.W. Albuquerque, New Mexico 87102 (505) 247-0294 ENGINEERING COMPUTATIONS	NAME OF PROJECT Chisel Smith-			SHEET NUMBER 2 of 3
	COMPUTED BY	CHECKED BY	JOB NUMBER	DATE Aug 19, 1.6

Inflow Hydrograph For Upstream of Central Drainway -

Depth Vs. Volume of Storage on Next Sheet

Area = 2.1947 Acres

50% Developed → C = 0.675

TIME (MIN)	PRECIP. (IN)	MULT.	VOL. INTO POND (FT³) (FROM HARRIS TRACK'S PROPERTY)	AREA INFLOW RATE (CFS)	* FROM TRACT "D" INFLOW RATE (CFS)	TOTAL INFLOW RATE (CFS)
5	0.33			—	1.5	[illegible]
10	0.50		1919.19	6.4	1.6	8.0
15	0.25		3431.29	11.4	1.7	13.1
20	0.15		1453.94	4.9	1.6	6.5
25	0.15		872.36	2.9	1.5	4.4
30	0.15		872.36	2.9		
35	0.08					
40	0.08					
45	0.08					
50	0.08					
55	0.08					
60	0.08					
65						

C = 0.675

0.73 × 2.1947 × 43,560 / 12 = 58152 ft³

÷ 300 SEC / 5 MIN

* FROM TRACT "D" POND-DISCHARGE DATA

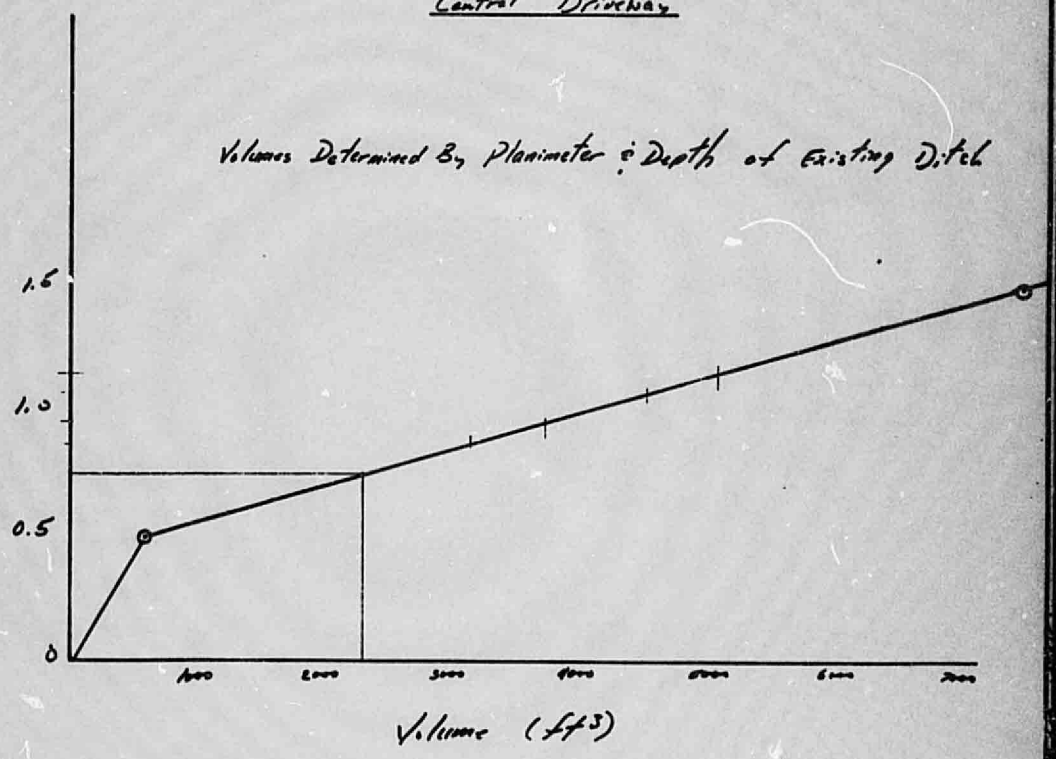
GORDON HERRENSCHOFF & ASSOCIATES, INC.
ENGINEERING COMPUTATIONS

NAME OF PROJECT

COMPUTED BY | CHECKED BY | JOB NUMBER | SHEET NUMBER OF | DATE

Depth Vs Storage Volume For Frontage Road Ditch South of Central Driveway

Volumes Determined By Planimeter & Depth of Existing Ditch



USE 2-18" CM. W/ LIMITED END.

TIME (MIN)	* TRACT "D" OUTFLOW VOL. (FT³)	+ # WOODS TRACT RUNOFF (FT³)	= INC. VOL (FT³)	ACC. VOL. (FT³)	DEPTH (FT)	Q_{OUT} (CFS)	VOL. OUT (FT³)	NET REM. (FT³)
0	—	—	—	—	—	—	—	—
5	390	1919	2309	2309	0.75	2x1.9	1,140	1,169
10	510	3431	3941	5110	1.15	2x4.2	2,520	2,590
15	510	1454	1964	4554	1.07	2x3.6	2,160	2,394
20	480	872	1352	3746	0.96	2x3.2	1,920	1,826
25	480	872	1352	3178	0.87	2x2.7	1,620	1,558
30								
35								
40								

SOUTH CENTRAL DRIVEWAY DITCH HYDRAULICS (UNDER CENTRAL DRIVEWAY)

* TAKEN FROM TRACT "D" SHEET (100 yr - 1hr STORM)

\# FROM PRECEDING SHEET

PEAK DEPTH = 1.15 FEET

PEAK FLOW = 8.4 CFS

GORDON HERKENHOFF & ASSOCIATES, INC.
ENGINEERING COMPUTATIONS

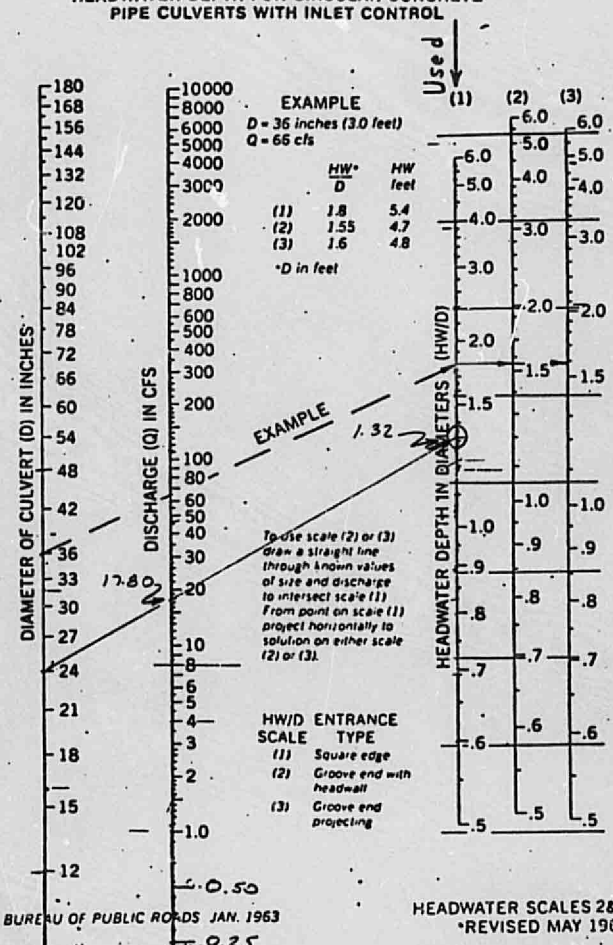
NAME OF PROJECT: Chisel Smith
COMPUTED BY: [illegible]
CHECKED BY:
JOB NUMBER:
DATE: Aug 12, 19[illegible]
SHEET NUMBER: 3 OF 3

Appendix 2 - Sheet 1 of 2

4

FIGURE 29

HEADWATER DEPTH FOR CIRCULAR CONCRETE PIPE CULVERTS WITH INLET CONTROL



Then:
Depth @ 24"
Concrete Culvert Under
Highway = 2.64 feet

Source:
Concrete Pipe Design
Manual

10

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	COMPUTED BY	CHECKED BY	JOB NUMBER	DATE

Check Pipe Elevations ...

TRACT P OUTLET INVERT ELEVATION 5195.73

THEN FOR INLET CONTROL ON PIPE P

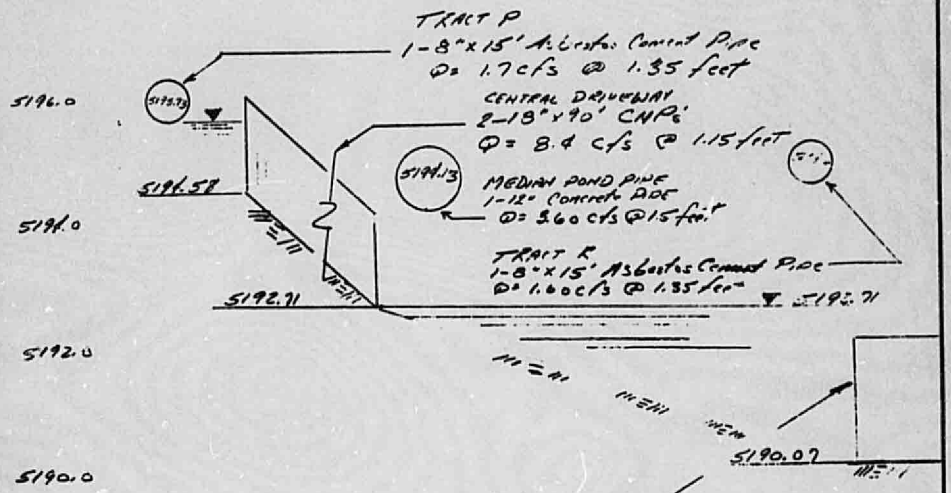
MUST HAVE : 5195.73 - 1.15 = 5194.58

So: CENTRAL DRIVEWAY PIPES INLET INVERT = 5194.58

" " " OUTLET " = 5192.71

MEDIAN POND PIPE OUTLET INVERT = 5194.13

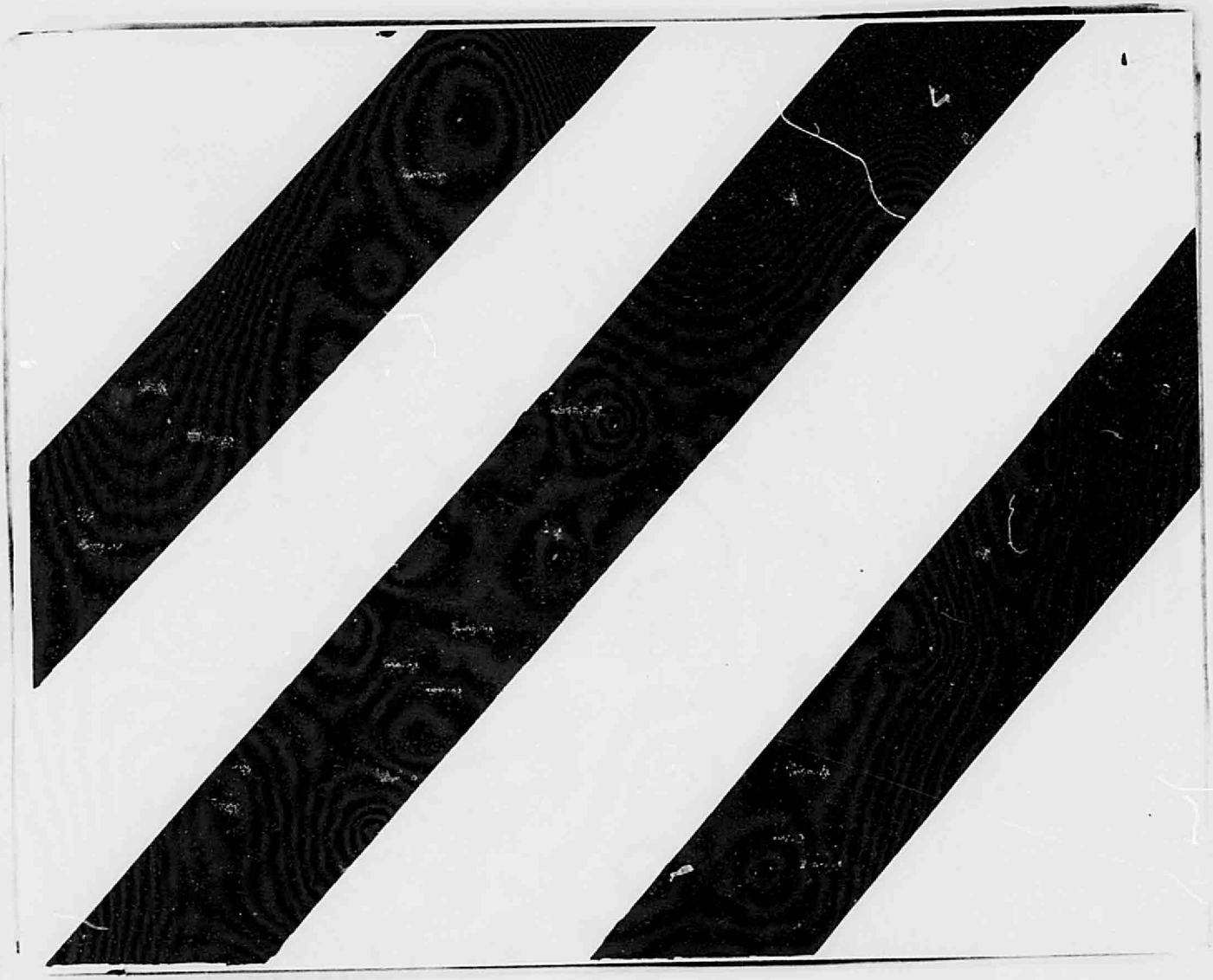
TRACT K " " " " = 5194.60



HIGHWAY CULVERT
1-24" CONCRETE PIPE
Q= 17.80 cfs @ 2.64 feet

CONCLUSION : Inlet Control THROUGHOUT ALL PIPES UPSTREAM OF 24" CULVERT

PLAN/PLATS

ON

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