F16-D3

SUNDT'S INDUSTRIAL CENTER

3 PLANS

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

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

April 20, 1984

Mr. John Andrews
Andrews, Asbury & Robert, Inc.
149 Jackson NE
Albuquerque, NM 87108

REF: ROUGH GRADING PLAN FOR LOTS 2 & 3, BLOCK 1 SUNDT'S INDUSTRIAL PARK (F16-D3A) RECEIVED APRIL 3, 1984

Dear John:

I have reviewed the submittal and am confused. What is the proposed grading for, e.g. what is proposed to be built? I cannot find these lot anywhere in the information we have on file. I think it may be lots 3 & 4 as shown on the copy of the plat, dated 11/30/83, that we have on file.

Please provide sufficient information for clarification and purpose of this submittal.

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

Yours truly,

Billy J. Goolsby

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

BJG:mrk

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

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

April 3, 1984

File-D3a

Mr. Fred Aguirre
City Engineering
City of Albuquerque
PO Box 1293
Albuquerque, NM 87103

SUBJECT: SUNDT'S INDUSTRIAL CENTER
LOTS 2 & 3, BLOCK 1

Dear Mr. Aguirre:

Transmitted herewith for your review and approval is a rough grading plan for portion of Lots 2 & 3 of Block 1 of subject subdivision.

Your early review and approval will be appreciated.

Very truly yours,

John A. Andrews

JOHN A. ANDREWS, P.E.

mt-303

RECEIVED
APR 03 1984

INFORMATION SHEET

PROJECT TITLE SUNDT'S INDUSTRIAL CENTER TYPE OF SUBMITTAL ROUGH GRADING PLAN

ZONE ATLAS PAGE NO. F-15 CITY ADDRESS N/A

LEGAL DESCRIPTION SUNDT'S INDUSTRIAL CENTER, LOTS 2 & 3, BLOCK 1

ENGINEERING FIRM ANDREWS, ASBURY & ROBERT, INC. CONTACT JOHN ANDREWS

ADDRESS 149 JACKSON NE, ALBUQUERQUE, NM 87108 PHONE 265-6631

OWNER ALBUQUERQUE GRAVEL PRODUCTS COMPANY CONTACT CHRIS HOOPER

ADDRESS PO BOX 829, ALBUQUERQUE NM 87103 PHONE 242-5265

ARCHITECT N/A CONTACT

ADDRESS PHONE

SURVEYOR ANDREWS, ASBURY & ROBERT, INC. CONTACT GAYLE JEWELL

ADDRESS 149 JACKSON NE, ALBUQUERQUE, NM 87108 PHONE 265-6631

CONTRACTOR KNC, INC. CONTACT TOM KRYFKO

ADDRESS PO BOX 14654, ALBUQUERQUE, NM 87191 PHONE 881-2511

PRE-DESIGN MEETING:

____ YES
_X_ NO
____ COPY OF CONFERENCE RECAP SHEET PROVIDED

PLEASE CHECK TYPE OF APPROVAL EXPECTED WITH THIS SUBMITTAL:

____ SKETCH PLAT APPROVAL
____ PRELIMINARY PLAT APPROVAL
____ SITE DEVELOPMENT PLAN APPROVAL
____ FINAL PLAT APPROVAL
____ BUILDING PERMIT APPROVAL
____ CERTIFICATE OF OCCUPANCY APPROVAL
_X_ ROUGH GRADING PERMIT APPROVAL
____ GRADING/PAVING PERMIT APPROVAL
____ OTHER _____ (SPECIFY)

RECEIVED
APR 03 1984
HYDROLOGY SECTION

DATE SUBMITTED: APRIL 3, 1984

BY: JOHN A. ANDREWS John A. Andrews

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

F16 - D3A

June 23, 1983

Mr. John Andrews
Andrews, Asbury & Roberts
149 Jackson N.E.
Albuquerque, N.M. 87108

RE: SUNDT' INDUSTRIAL CENTER DRAINAGE CRITERIA

Dear John:

This letter is to approve the criteria outlined in your letter of June 15, 1983. For the record, all individual sites will submit a drainage plan reflecting ponding for volumes above those generated in the existing conditions.

Per our earlier discussion regarding the large ponding area, plans should be submitted to this office for review. Your firm will be responsible for certification of the project.

Since financial bonds were provided in conjunction with the previous platting, no additional guarantees will be required at this time.

Please contact Mr. Fred Aguirre if you have any questions.

Very truly yours,

Brian G. Burnett
Civil Engineer/Hydrology

BGB/tsl

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

6/24/83

Fred,

These need to be reviewed and a letter sent with comments and the statement that Engineer will certify. Special Order No. 19 required for any work in Montano R-O-W.

Brian

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

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

June 22, 1983

F16-3A

Brian G. Burnett
Civil Engineering/Hydrology
City Engineering
City of Albuquerque
Post Office Box 1293
Albuquerque, NM 87103

SUBJECT: AGP/MONTBEL DETENTION BASIN

Dear Mr. Burnett:

Transmitted herewith are three (3) sets of construction plans for the AGP/MONTBEL Detention Basin for your review and approval.

Very truly yours,

John A. Andrews

JOHN A. ANDREWS, P.E.

mt-326

Attachments

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

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

June 15, 1983

F16-D30

RECEIVED
JUN 16 1983
ENGINEERING

Brian G. Burnett
Civil Engineering/Hydrology
City Engineering
City of Albuquerque
Post Office Box 1293
Albuquerque, New Mexico 87103

SUBJECT: SUNDT' INDUSTRIAL CENTER

Dear Mr. Burnett:

This letter is to serve as a conceptual drainage plan for the proposed Sundt's Industrial Center. The site is located south of Montano Road and west of Interstate 25, as indicated on the attached Zone Atlas Maps F-15 and F-16.

The site generally slopes from the southeast to the northwest at slightly more than one percent. The soils are of the Bluepoint Kokan series, and are classified as gravelly to loamy fine sand by the Soil Conservation Service. The soil is classified as belonging to hydrologic soil Type A (see Soils Map attached).

The Sundt's Industrial Center falls within the area covered by the Master Plan for Drainage of Lands of Albuquerque Gravel Products Company, Montbel Inc., and Montano Venture. This master plan of drainage was prepared by Andrews, Asbury and Robert, Inc. in December, 1981, and the proposed method of drainage of this project conforms to this master plan of drainage. A copy of this master plan of drainage is on file in the City Engineer's office.

The proposed improvements include the subdividing of Tracts 1-A, 3 and 5 of the Lands of Montbel and AGP into one to two acre parcels for individual industrial site development. A total of 15 lots are proposed. Improvements to these lots under this project will consist only of grading as required to direct all runoff flows to designated locations. Drainage improvements to be constructed consist of the major items of the drainage system. These drainage items include a large detention basin located at the northwest portion of the area, and a storm sewer located along the north side of Block 2 adjacent to the south right-of-way line of Montano Road.

The drainage basin will be designed to detain the 50 year frequency runoff under existing conditions. The storm sewer will be designed to carry the 100 year frequency runoff under existing conditions.

See attached preliminary plat of the Sundt's Industrial Center for proposed drainage patterns and improvements. All increases in runoff due to development of the properties (such as construction of pavement and buildings) is proposed to be handled individually at the time such development occurs. Detailed drainage reports of each individual development will be necessary prior to the improvements being constructed.

The streets within and adjacent to this subdivision are presently improved with pavement and curb and gutter. Also, these streets have existing water and sanitary sewer lines to service each of the proposed subdivided lots.

The site is not indicated as being located within any flood hazard areas by the Flood Hazard Boundary Map (see copy of Flood Hazard Boundary Map attached). This area was not addressed in the Albuquerque Master Drainage Study.

Upland and offsite flows will be provided for as indicated in the previously mentioned master plan of drainage.

We trust that this information provided herein, along with the attached preliminary plat and the referenced master plan of drainage will allow review of the proposed project.

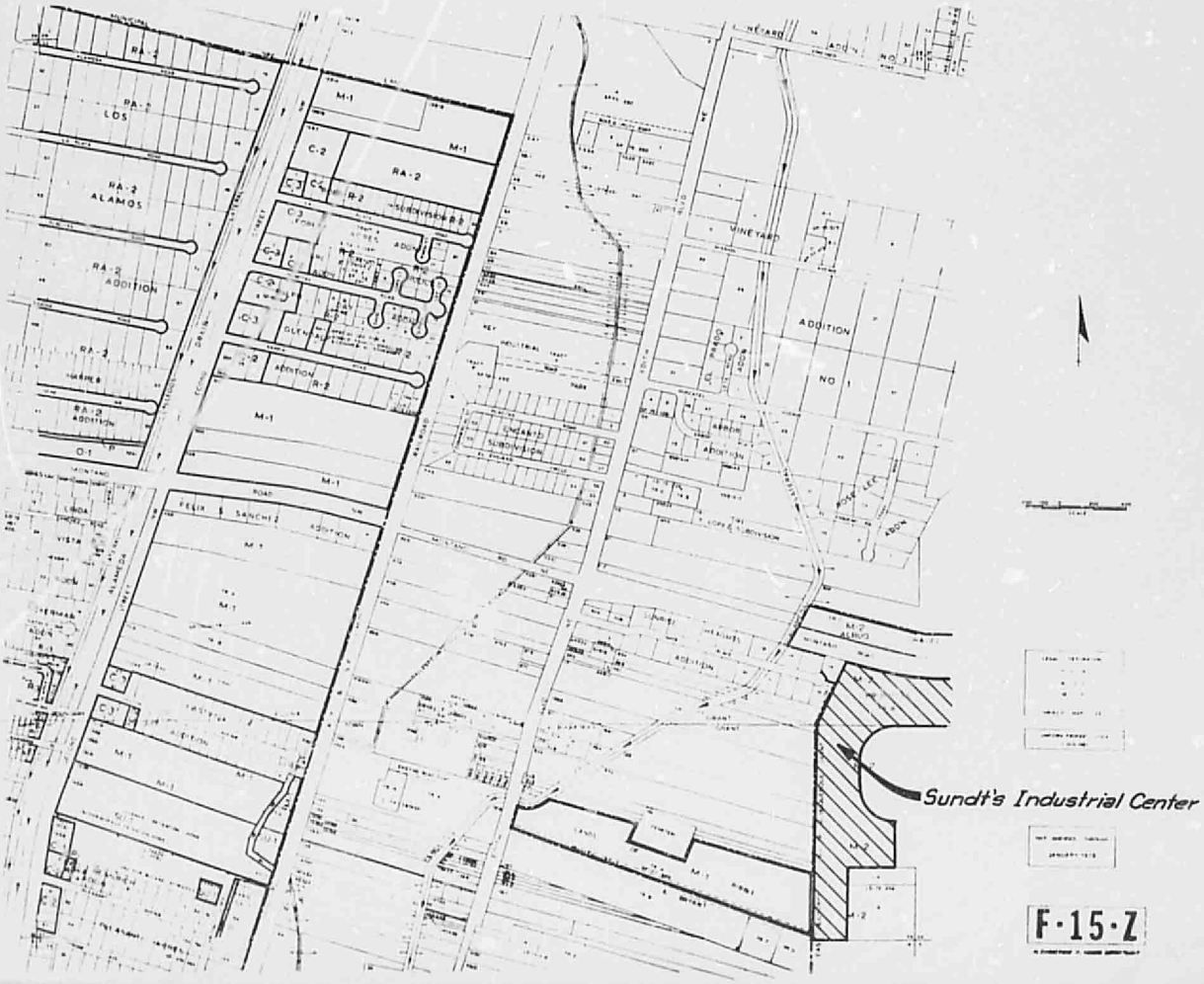
Very truly yours,

John A. Andrews

JOHN A. ANDREWS, P.E.

mt-339

Attachments



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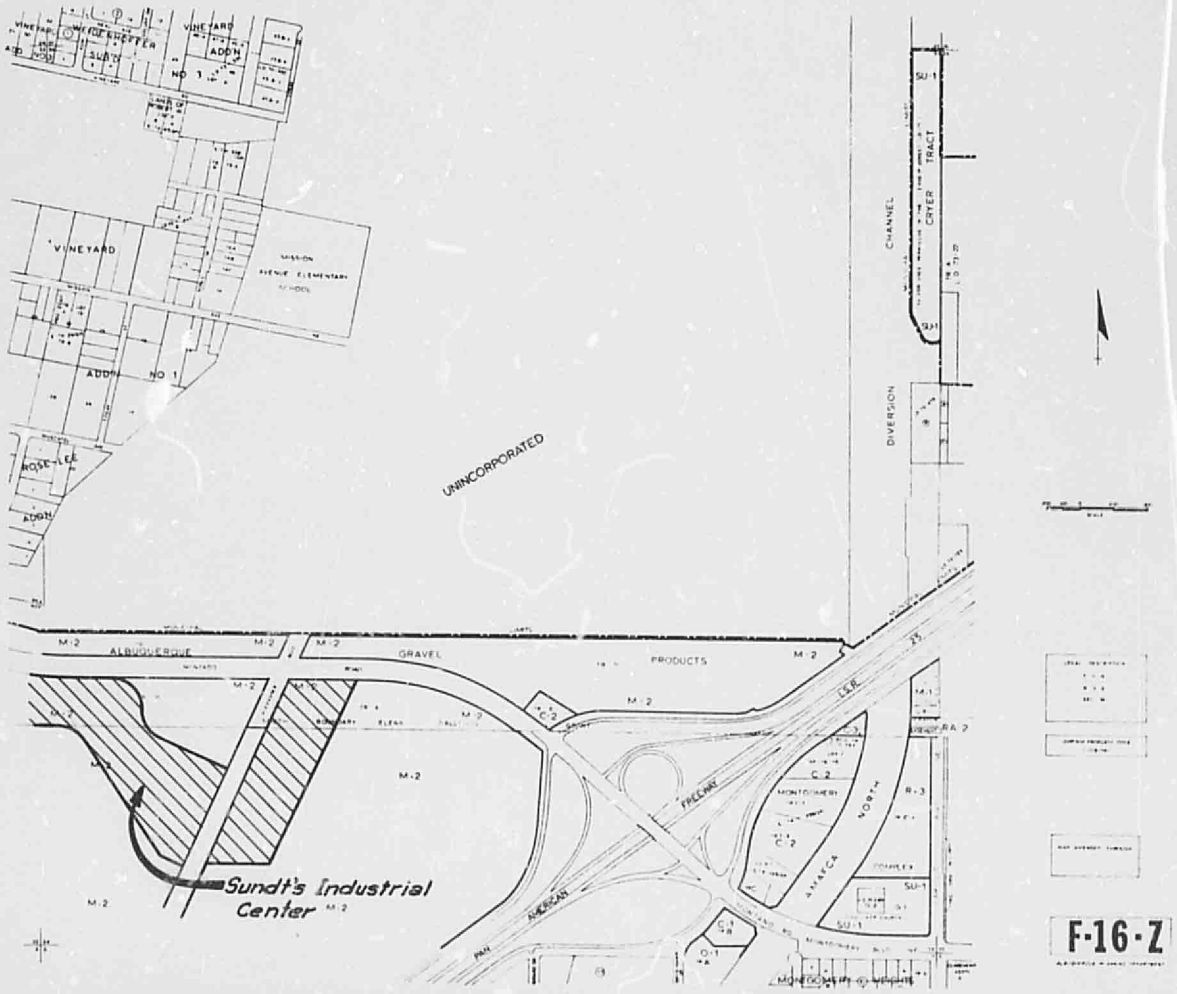
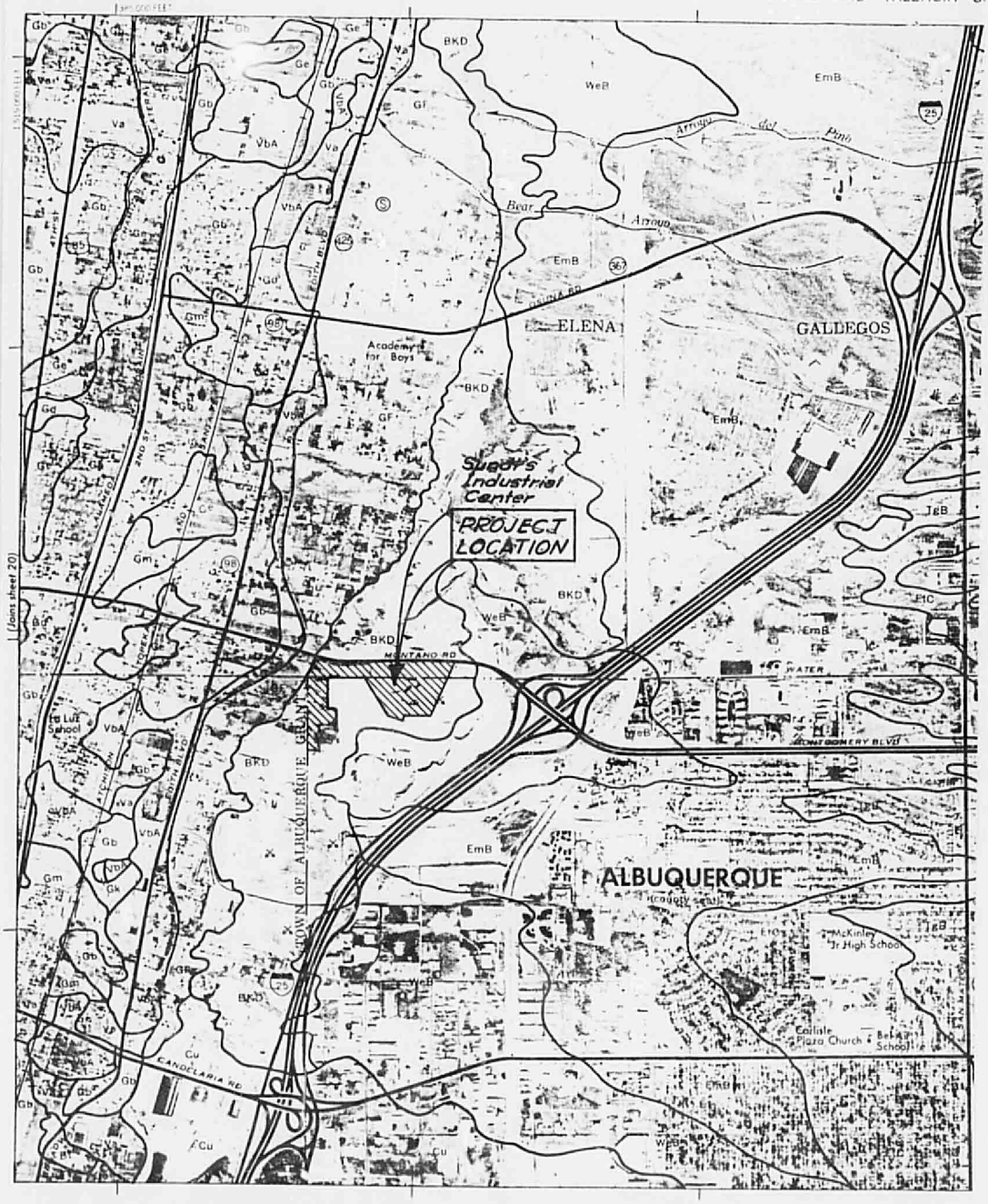
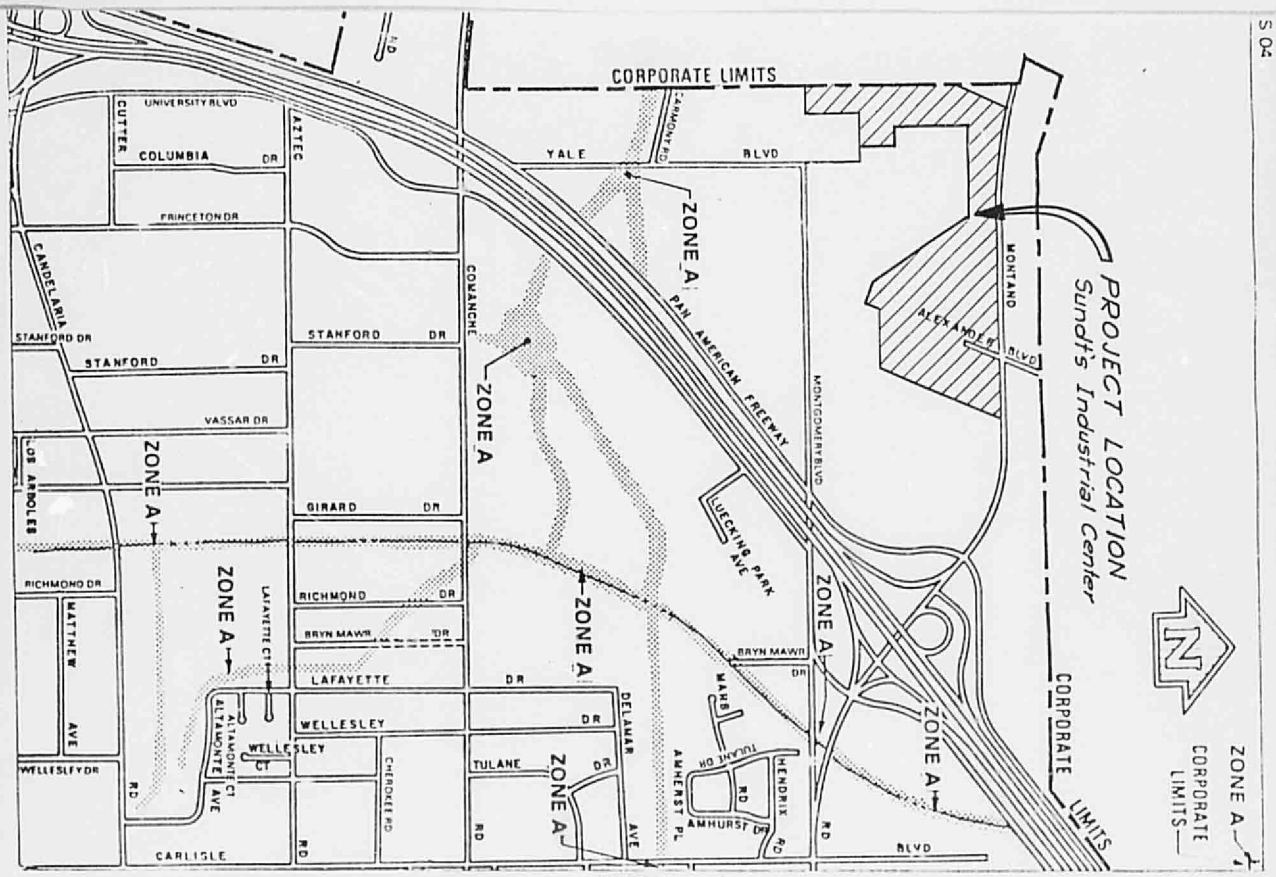


THIS MICROIMAGE IS THE BEST POSSIBLE REPRODUCTION DUE TO THE POOR QUALITY OF THE ORIGINAL DOCUMENT.

BERNALILLO COUNTY, AND PARTS OF SANDOVAL AND VALENCIA C




S 04
PROJECT LOCATION
Sundt's Industrial Center
CORPORATE LIMITS
ZONE A
CORPORATE LIMITS
ZONE A
ZONE A
ZONE A

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

February 8, 1982

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

Re: MASTER PLAN OF DRAINAGE FOR ALBUQUERQUE GRAVEL PRODUCTS, MONTBEL INC, AND MONTANO JOINT VENTURE

Dear John,

The referenced Master plan is approved in concept. Per our conversation this morning, we agree to work out the remaining details with you and the owners before final signatures are placed on the construction drawings.

If I can be of further help, please call.

Very truly yours,

Brian G. Burnett

Brian G. Burnett
Civil Engineer/Hydrology

cc. Mr. Jack Alexander
Mr. Ray Montgomery
Mr. John Meyers

RECEIVED
ANDREWS, ASBURY & ROBERT, INC.
CONSULTING ENGINEERS
DATE FEB 10 1982 ANDREWS
JOB 195 ASBURY
COMMENTS ROBERT
FILE

RECEIVED
DEC 21 1983
ENGINEERING

ANDREWS, ASBURY & ROBERT, INC.
Consulting Engineers
401 San Pedro, NE, Albuquerque, New Mexico 87108-1894
(505) 265-6631

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

February 5, 1982

Mr. Brian G. Burnett,
Civil Engineer/Hydrology
City Engineering Division
Municipal Development Department
City of Albuquerque
Post Office Box 1293
Albuquerque, New Mexico 87103

SUBJECT: MASTER PLAN OF DRAINAGE FOR ALBUQUERQUE GRAVEL PRODUCTS; MONTBEL, INC. AND MONTANO JOINT VENTURE

Dear Mr. Burnett:

This letter is in response to your letter of January 19, 1982, and the meeting held in Chuck Easterling's office on January 28, 1982.

Those present at the meeting were:

Brian Burnett	City Engineering/Hydrology
Chuck Easterling	City Engineering/Hydrology
John Andrews	Andrews, Asbury & Robert, Inc.
John Robert	Andrews, Asbury & Robert, Inc.
John Meyers	Johnson & Lanphere

Item numbers referenced below correspond to the item numbers in your letter.

ITEM 1.

The owners acknowledge your intent to obtain City funds for construction of a storm sewer in Montano Road and to collect and convey storm water runoff on Montano Road that is presently discharged on private property west of the Interstate 25/Montano Road Interchange.

The City should acknowledge that the City's failure to provide these facilities may result in contravention of City policy regarding retention of water.

ITEM 2.

It is our opinion that further investigations of the Hahn Arroyo and Vineyard Arroyo, downstream from the study site, are necessary and that the City should

perform these investigations in the same manner as the City has done for most other surrounding areas under the Albuquerque Master Drainage Study.

ITEM 3.

The owners of subject lands cannot agree to your requirement that no runoff from the site will be allowed, even as an interim measure because presently there is some runoff from the site and it is not possible for the owners to unequivocably commit to zero runoff. However, the owners agree that the improvements when constructed as shown on Map No. 2 of the report (i.e. ramps and portions of Alexander Boulevard and Alexander Loop) will generate no additional runoff from the site.

The owners agree to take measures as reasonably practicable to minimize runoff from the site. The owners, as they have in the past, will continue to work with the City and/or County to minimize any downstream flooding that may occur.

ITEM 3a.

For ease in further reference, the following definitions are given for the future detention areas shown on Map No. 2 of referenced Report.

Detention Area No. 1 - Detention area located at the northwest corner of the Area South of Montano Road.

Detention Area No. 2 - Detention area located at the southwest corner of the Area North of Montano Road.

As stated in the drainage report, it is proposed to size Detention Areas No. 1 and No. 2 to detain the runoff volume generated from a 50 year frequency storm based on existing conditions and including increased runoff from proposed streets to be constructed. Water from these detention areas will be released at a controlled rate. As development occurs, the developed properties shall detain all increased runoff created by the development of the property and released at a controlled rate commensurate with the standards at the time of development. The required volumes of both Detention Area No. 1 and No. 2 are shown on the attached computation sheets.

Criteria to establish C values in the report is as follows:

Soils in the area consist of bluepoint series and wink series which are sandy gravelly soils and permeability is fairly rapid, therefore, a C value of 0.35 was chosen for existing earth surfaces. Allowances for proposed street construction were made based on eight percent (8%) of the area consisting of paved

streets. Using a C value of 0.96 for paved streets, the resultant overall C value for the area was computed as follows:

$$C = 92\% \times 0.35 + 8\% \times 0.96 = 0.40$$

The C value for specific drainage areas that did not fall within the criteria outlined above was determined by multiplying the proportional amount of each type of surfacing by its applicable C value and taking the sum of the results.

ITEM 3b.

An evaluation of the feasibility of constructing the detention areas relative to the area shown on Map No. 2 of the report is shown on attached computation sheets.

ITEM 3c.

An evaluation of whether the ponds will ultimately drain is provided on the attached sketches which show the sections of Detention Areas No. 1 and No. 2.

ITEM 4.

Storm drainage improvements needed to be constructed prior to ultimate development of the Area south of Montano Road consist of the following:

1. Construction of street systems.

2. Construction of Detention Area No. 1.

3. Drain line from Detention Area No. 1 to Montano Road and/or storm sewer.

4. Construction of drainage facilities as outlined in the report at the intersection of the railroad tracks and Montano Road.

An earth dike presently exists along the north and west sides of the property at the northwest corner of the Area south of Montano Road. This dike provides for a detention volume of 5.2 acre feet and by filling in a few depressions in the dike a volume of approximately 9 acre feet could be provided.

The runoff water from Area A-1 now flows north under Montano Road at the Railroad Bridge. This water is then ponded on the north side of Montano Road in existing depressions.

Based on the temporary drainage facilities that now exist, it is our opinion that at least 50 percent of the area lying South of Montano Road could be developed prior to constructing the permanent facilities except for the street system which should be constructed prior to or at the time development occurs.

By the implementation of interim measures, development would occur well beyond the 50 percent mentioned above. However, temporary provisions to accept runoff flows from the Area south of Montano Road need to be maintained on the north side of Montano Road until Detention Area No. 2 and facilities to collect and convey the storm runoff thereto have been constructed.

For the City's information, as a part of the construction of the On-Off Ramps at Montano Road, it is proposed to construct detention ponds in the triangular shaped areas at the On-Off Ramps directly north and south of Montano Road. It is the intent to utilize these ponds to detain the developed runoff waters from Drainage Areas E-1 and F-1.

Drainage facilities that will be needed for complete or partial development of the Area north of Montano Road cannot be determined at this time. This determination can be made only when the existing gravel mining activity and regrading has been performed. However, it is our opinion that Areas F-1, G-1, G-2, and portions of H-3 could be developed at any time.

ITEM 5.

The owners of subject lands do not propose to construct all drainage facilities for ultimate development initially. It is proposed to construct the facilities as the need arises and only development of the lands will dictate when the drainage improvements are to be provided.

Very truly yours,

John A. Andrews

JOHN A. ANDREWS, P.E.

JAAmt

cc: Mr. Jack Alexander, Albuquerque Gravel Products (w/enclosures)
Mr. Ray Montgomery, Montbel, Inc. (w/enclosures)
Mr. John Meyers, Johnson & Lanphere (w/enclosures)

enclosures

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

Project AGP-1 TBEL- Sheet 1 of 2
MONTANO ITURE LANDS Job No. 195
By JA Chk'd ✓ Date 2-2-81

DETENTION AREA NO. 1

This detention area is located south of Montano Rd.

Drainage Basins Contributing runoff to this detention area are as follows:

AREA	ACRES	c Value	Rainfall	Runoff Volume
B-1	2.59	0.40	2.05"	0.177 Ac.Ft.
B-2	10.21	0.40	"	0.698 "
B-3	13.59	0.40	"	0.929
B-4	9.18	0.40	"	0.627
B-5	0.50	0.90	"	0.077
C-1	4.68	0.40	"	0.320
C-2	15.37	0.40	"	1.050
C-3	3.48	0.40	"	0.238
D-6	1.55	0.85	"	0.225
D-7	0.46	0.90	"	0.071
E-1	4.76	0.40	"	0.325
		TOTAL RUNOFF VOLUME		4.737 AF

Land: Area for Detention Area Site = 1.2 Ac±

Allow 20' strip around perimeter of Site for access and Slopes

Perimeter = 750' Area = 750×20 = 15,000 ft² = 0.34 Ac.

Area available for ponding = 1.20 - 0.34 = 0.86 Acres

Depth of Pond = 4.737/0.86 = 5.51 feet

Detention Area to be fenced.

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

Project AGP MONTBEL - MONTANO VENTURE LANDS Sheet 2 of 2 Job No. 195
By JA Chk'd ✓ Date 2-3-82

DETENTION AREA NO. 2

This detention area is located north of Montano Rd.

Drainage Basins Contributing runoff to this detention area are as follows:

AREA	ACRES	C-Value	Rainfall	Runoff Volume
A-1	46.95	0.40	2.05"	3.21 Ac.Ft.
A-2	14.12	0.40	"	0.96
A-3	1.57	0.40	"	0.11
D-1	2.13	0.40	"	0.15
D-2	1.14	0.82	"	0.16
D-3	0.90	0.82	"	0.13
D-4	0.76	0.82	"	0.11
D-5	1.56	0.85	"	0.23
F-1	4.32	0.40	"	0.30
G-1	7.26	0.40	"	0.50
G-2	5.22	0.40	"	0.36
H-1	20.68	0.50	"	1.77
H-2	3.54	0.30	"	0.18
H-3	74.66	0.40	"	5.10
H-4	10.11	0.40	"	0.69
H-5	58.02	0.40	"	3.96
				17.92 Ac.Ft.

Land Area for Detention Area Site = 4.5 Ac.±

Allow 50' strip around perimeter of site - (3 sides) for access and slopes.

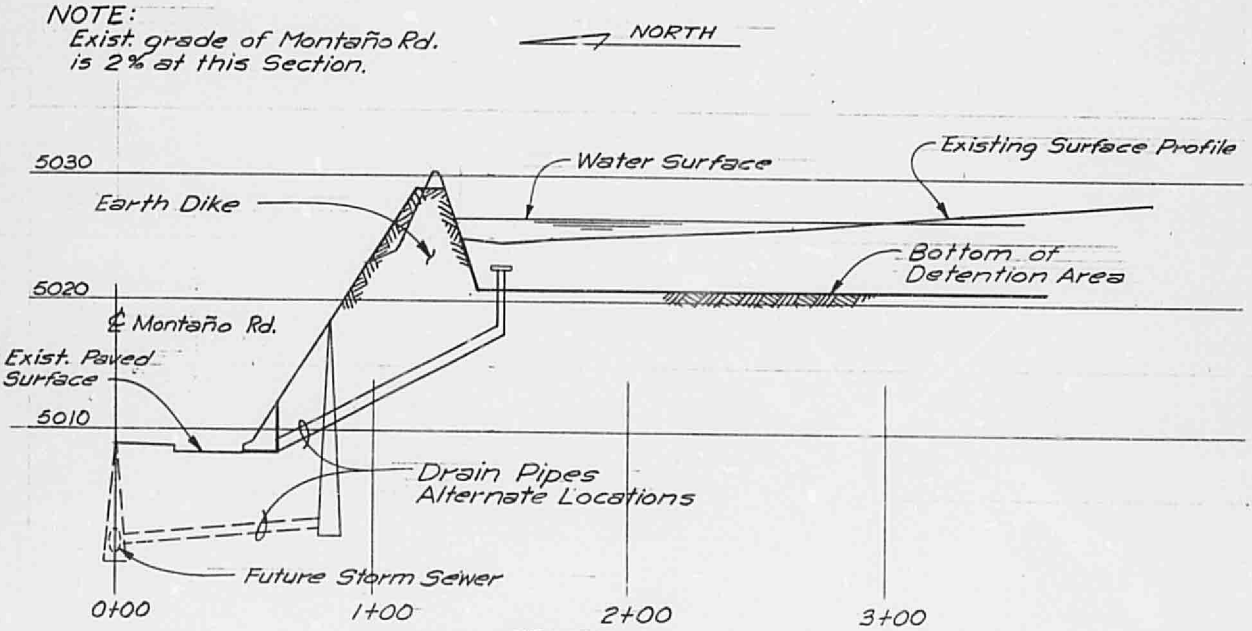
Perimeter = 1000', Area = 1000 x 50 = 50,000 ft² = 1.15 Ac

Available Area for ponding = 4.50 - 1.15 = 3.35 Ac.

Depth of Pond = 17.92/3.35 = 5.35'

Detention Area to be fenced.

NOTE:
Exist. grade of Montaño Rd.
is 2% at this Section.



SECTION

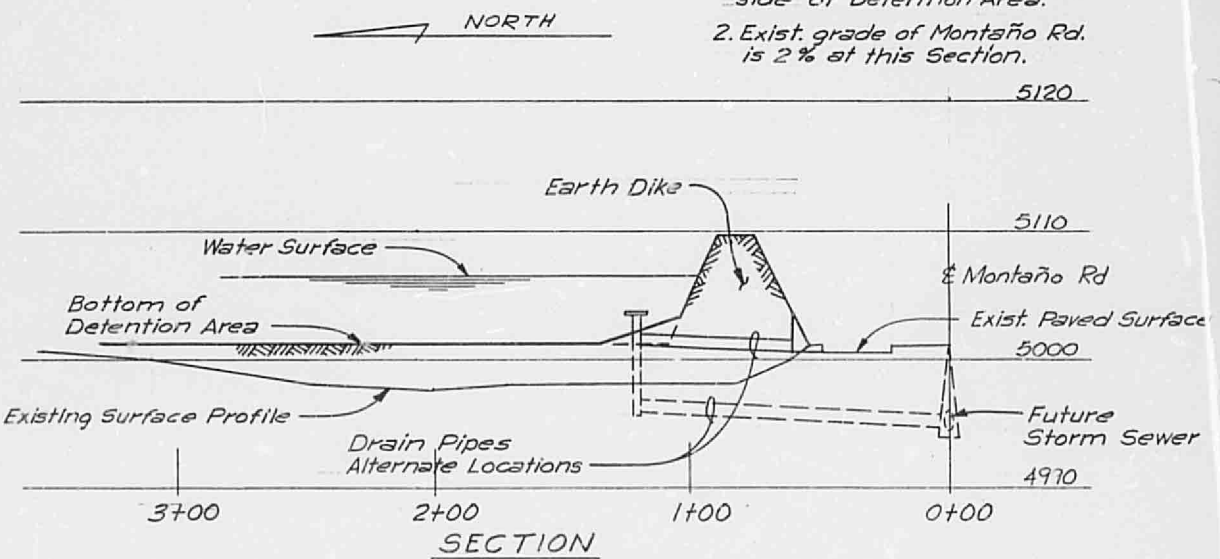
DETENTION AREA No. 1

Located at Northwest Corner
of Area South of Montaño Rd.

SCALE: 1" = 50' Horiz.
1" = 10' Vert.

MASTER PLAN OF DRAINAGE
AGP, MONTBEL MONTAÑO
VENTURE

NOTE:
1. Section taken along west side of Detention Area.
2. Exist. grade of Montaño Rd. is 2% at this Section.



SECTION

DETENTION AREA No. 2

Located at Southwest Corner of Area North of Montaño Rd.

SCALE: 1" = 50' Horiz.
1" = 10' Vert.

MASTER PLAN OF DRAINAGE
AGP, MONTBEL MONTAÑO VENTURE

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

G15 - D7

RECEIVED
ANDREWS, ASBURY & ROBERT, INC.
CONSULTING ENGINEERS
DATE JAN 28 1982
JOB 195
COMMENTS
ANDREWS
ASBURY
ROBERT
FILE

January 19, 1982

Mr. John Andrews
Andrews, Asbury & Roberts, Inc.
401 San Pedro Dr. N.E.
Albuquerque, N.M. 87108

RE: MASTER PLAN OF DRAINAGE FOR AGP, MONTBEL & MONTANO VENTURE

Dear John:

As a follow-up to our meeting on January 15, 1982, I am forwarding concerns and comments of this office in regards to the referenced project. Incorporated in this correspondence are items expressed in my letter dated January 8, 1982.

1. We are going to request that CIP bond funds be programmed in the 1983 cycle for the construction of a storm sewer in Montano Rd. This appears to be the most expeditious means of handling the City's outstanding commitment to construct this outfall. We need to point out, however that this recommendation is subject to EPC, Council, and voter approval.

2. The Hahn and Vineyard arroyos are identified as outfalls for runoff generated on and adjacent to the site. A further investigation should be made as to existing downstream capacity and the effect runoff will have on the system. If it is determined that each arroyo provides an adequate outfall, an evaluation of possible conveyance systems and outfall structures should be made.

3. Because of flooding problems downstream of the project, no runoff from the site will be allowed until a suitable outfall is constructed. As an interim solution, the proposed ponds should be designed to handle the 100 yr. developed runoff volume. At the same time however, any design should allow for a positive discharge into the storm sewer system. Please provide:

a. An estimate of the required pond volumes. The identification of criteria used to establish C values for both developed and undeveloped conditions should be included.

b. An evaluation as to the feasibility of construction for each pond (i.e. the ponds to be constructed in the area indicated and still maintain adequate capacity?).

c. An evaluation of whether the ponds could ultimately drain. This should include preliminary vertical and horizontal location and slope for the storm sewer in Montano.

4. Even though final platting and a construction timetable have not been determined at this time, a phasing scheme for required drainage improvements should be developed. For example, if Tract A-1 were to develop initially, what drainage improvements would be required for this to occur? This type of analysis is especially important for the area south of Montano Rd. since it is anticipated that development will begin in the near future.

5. The developer has two options for constructing storm drainage facilities. First, all improvements can be constructed to the ultimate solution. This, of course, requires a large first cost expenditure. Or the improvements can be temporary in nature with a commitment by the developer to construct the ultimate scheme at some point in the development phasing. If the second alternative is selected, the Master Plan should identify the point at which the ultimate solution is required.

Please call if you have any questions concerning these matters. Perhaps another meeting would prove beneficial to address these issues.

Very truly yours,

Brian G. Burnett
Civil Engineer/Hydrology

BGB/tsl

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

RECEIVED
ANDREWS, ASBURY & ROBERT, INC.
CONSULTING ENGINEERS
DATE JAN 8 1982
JOB 195
COMMENTS
ANDREWS
ASBURY
ROBERT
FILE

January 8, 1982

Mr. John Andrews
Andrews, Asbury, & Roberts
401 San Pedro Drive N.E.
Albuquerque, New Mexico 87108

RE: AGP-MONTBEL-MONTANO VENTURE LANDS MASTER DRAINAGE REPORT

Dear John:

This letter is a follow-up to our conversations concerning the referenced master plan. As we discussed, the ultimate drainage solution is challenging and quite complex.

The Hydrology Section is currently discussing the drainage plan with the Traffic and Planning Divisions in an effort to establish the City's position for development and improvements in the area. Initial concerns of this secton are:

1. Anticipated phasing of development south of Montano and the identification of required drainage improvements relating to this phasing.

2. Interim method of handling runoff generated by the proposed roadways (i.e., discharge of 73 cfs north of Montano).

3. The possibility of providing one outfall for the development and thus eliminating retention requirements for each site.

4. The possibility of eliminating the retention ponds along I-25 and providing a permanent facility to convey runoff to the Hahn Arroyo.

5. Specific location of drainage easements, both temporary and permanent.

6. Assuming that a storm sewer will be constructed in Montano Boulevard in the near future may not be valid. The Master Drainage Study does not propose any storm sewer improvements in this area.

7. Will Yale Boulevard be utilized to convey runoff from J-1, K-1 and L-1 to the Hahn Arroyo? What type of facilities will need to be constructed at the arroyo to handle this water?

8. Identification of criteria used to establish C values for both developed and undeveloped conditions.

9. What is the rational for sizing ponds to handle a 50 year frequency storm based on existing surface conditions? Valley requirements dictate ponding sized for the 50 year developed storm.

The above comments are "first" reactions. It is obvious that further dialogue between the Engineer, the Developer, and City staff will be beneficial in obtaining an acceptable solution to all parties.

If I can answer any questions concerning the above items, please call.

Sincerely,

Brian G. Burnett

Brian G. Burnett
Civil Engineer, Hydrology

BGB:gc
9619A
cc Drainage File
f/Reading

MASTER PLAN OF DRAINAGE
for
ALBUQUERQUE GRAVEL PRODUCTS COMPANY
MONTBEL, INC.
and
MONTANO VENTURE

F-16 DSA Sundstrand.

MASTER PLAN OF DRAINAGE

for

LANDS OF

ALBUQUERQUE GRAVEL PRODUCTS COMPANY
MONTBEL, INC.
MONTANO VENTURE

December, 1981

RECEIVED
DEC 21 1983
ENGINEERING

Andrews, Asbury & Robert, Inc.
Consulting Engineers
Albuquerque, New Mexico

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APPENDIX A - Agreement to Roadway Slope & Drainage

ENCLOSURES

Map No. 1 Existing Conditions
Map No. 2 Proposed Developed Conditions
Map No. 3 Vicinity Map

LOCATION MAP

SCALE: 1" = 2000' ±

AGP - MONTBEL - MONTANO VENTURE
MASTER PLAN OF DRAINAGE
ANDREWS, ASBURY & ROBERT, INC. CONSULTING ENGINEERS ALBUQUERQUE NEW MEXICO

I

INTRODUCTION

This report together with the enclosed maps are to provide a Master Plan of Drainage of lands presently owned by Albuquerque Gravel Products Company, Montbel, Inc. and Montano Venture. These lands are located in the Northeast Quadrant of the Albuquerque Metropolitan Area, west of the North Diversion Channel and lie northwest and southwest of the Montano Road-Interstate (I-25) Interchange (Location Map follows).

As shown on the location map, Montano Road west of the I-25 Interchange bisects subject lands. The portion of lands lying north of Montano Road, consisting of approximately 370 acres, are currently being actively mined of gravel. The portion of lands lying south of Montano Road, consisting of approximately 160 acres, have previously been mined of gravel; however, all mining activities have been completed and the lands have been regraded and restored to a usable condition except the grading that will be required by the individual users.

II

EXISTING CONDITIONS

Existing off site and on site drainage patterns and drainage areas are shown on Map No. 1 enclosed in the back of this report.

Due to the drainage characteristics and responsibilities for drainage, the lands are separated into three separate parts as follows:

A. Area south of Montano Road

B. Montano Road

C. Area north of Montano Road

A. Area South of Montano Road

As mentioned previously, this area has previously been mined of its gravel resources. The mining of the gravel in the area has been completed and the surface of the lands has been restored and graded to provide a relatively smooth terrain having a slope of approximately one (1%) percent to the northwest.

As shown on Map No. 1, this southerly area is bounded on the South and East by Interstate 25 and due to the gravel mining that has taken place, the Interstate roadways lie from 10 feet to 40 feet above the surface of subject property; except for a strip of land varying from 100 feet to 125 feet in width lying adjacent to the Interstate which is at relatively the same grade as the Interstate Frontage Road.

The major off site drainage flows reaching subject lands originate from Interstate 25 right-of-way with only small areas lying east of the Interstate contributing to off site flows. These off site flows are directed to the southwest boundary of the property at confined points by culverts under Interstate 25. The owners of subject lands have excavated retention areas at the outlet of these culverts and any overflow from these retention areas is directed southerly along the west side of Interstate 25 to the Hahn Arroyo.

Existing on site drainage areas are as shown on Map No. 1 enclosed.

An existing Railroad Spur Line as shown on Map No. 1 basically diverts all runoff flows from Area AX to the north and under Montano Road at the Railroad Spur Bridge and are retained on the lands north of Montano Road.

Drainage flows from Area BX are collected by a graded roadway and are also directed northerly under Montano Road at the Alexander Boulevard Bridge and retained on the lands north of Montano Road.

Drainage flows from Area CX generally consist of over land type flows and are collected in a retention area lying directly south of Montano Road and at the northwest corner of subject lands that lie south of Montano Road. Any overflow from this retention area will flow onto Montano Road.

Drainage flows from Areas EX, FX and GX flow off the property onto adjacent lands to the west.

B. Montano Road

Flows generated by Montano Road, a public street

(Drainage Areas D-2 through D-6), are collected by a series of inlets, pipes and run downs that are directed to the north side of Montano Road.

An agreement between the City of Albuquerque and Albuquerque Gravel Products Company made at the time Montano Road was constructed, states that these waters would be allowed to be discharged onto private (AGP) lands for a five year period after construction of Montano Road. This period of time has since expired and the City of Albuquerque is presently in default of the agreement. Albuquerque Gravel Products Company therefore, requests that the City make other arrangements for disposal of these waters.

A copy of the above mentioned agreement is included in the back of this report as Appendix A.

C. Area North of Montano Road

As stated previously, this area is currently being actively mined of gravel and the surface topography lies in a very rough condition with numerous depressions and mounds.

The major portion of the area is bounded on the east side by the North Diversion Channel and off site drainage reaching subject lands is limited to an area adjacent to the far northeast corner and to an area adjacent to the southeast corner of subject property.

The area directly adjacent to subject property at the northeast corner is presently being mined of gravel, therefore, drainage from this area onto subject lands is minimal at this time.

The off site drainage areas at the southeast corner, Areas HX-1 and HX-2, consist of Interstate right-of-way and a partially developed area lying east of the Interstate.

Flows from these off site areas are discharged to subject property by culverts under the Interstate. The existing culvert draining area HX-2 is presently plugged therefore runoff waters from this area are basically held on the Interstate right-of-way. A retention area at the outlet of the culvert draining area HX-1, has been constructed to confine these off site flows.

A review of the existing topography consisting of the numerous mounds and depressions created by the gravel mining activity indicates that basically all on site drainage flows are contained on the property. However, it is noted that this containment of water is only temporary and upon completion of the mining activity, the lands will be graded to drain generally towards the west as was historical to the site prior to beginning mining operations.

III

PROPOSED DEVELOPED CONDITIONS

The Master Plan of Drainage under proposed developed conditions is shown on Map No. 2.

It is not the intent of this report to provide a detailed analysis of drainage for the complete development of subject properties. Rather, this is a Master Plan of Drainage to establish drainage patterns for the overall area and to provide a guide to be used in the preparation of future drainage plans on an individual basis when actual development of various parcels of land occurs.

The City of Albuquerque Master Drainage Study dated January, 1981, does not address the drainage conditions for the subject lands covered by this report. It is requested that the City accept this Master Plan of Drainage for the subject lands and take into consideration this plan in conjunction with their Master Drainage Study when designing and constructing facilities or drainage systems downstream and adjacent to the area.

As under Existing Conditions, the lands are separated into three (3) separate parts for discussion as follows:

A. Area south of Montano Road

B. Montano Road

C. Area north of Montano Road

A. Area South of Montano Road

Off site areas contributing runoff to subject lands will remain basically the same under Developed Conditions as under Existing Conditions, which in the most part consist of Interstate 25 right-of-way. The New Mexico State Highway Department is in the process of redesigning a portion of the Montano Road/I-25 Interchange and the East and West Frontage Roads. Discussions have been held with the Highway Department and requests have been made of them to consider retainage of storm waters that fall on the Interstate right-of-way in their design. The Highway Department has indicated that such consideration will be made.

Under the Developed Conditions, it is proposed that the off site flows that reach the subject property from I-25 culverts be detained in detention ponds at the outlet

of the culverts, if the Highway Department is unable to accomodate the flows presently being discharged through the culvert within the highway right-of-way, the overflows from any detention areas would be directed south along the west side of the West Frontage Road and discharged into the Hahn Arroyo, as shown on Map No. 2.

Initially, and in the immediate future, the owners of subject lands propose to construct on and off ramps from Montano Road to Alexander Boulevard together with the construction of a portion of Alexander Boulevard and a portion of Alexander Loop. Included will be the construction of water and sewer lines in all streets to receive curb and gutter and pavement. The limits of this street construction are shown on the enclosed Map No. 2 as Phase I and have been included in the Master Plan of Drainage for this area.

On site drainage in the Developed Conditions is proposed to be directed in much the same way as under present Existing Conditions. Drainage runoff from Area A-1 is proposed to be directed to the south side of Montano Road on the east side of the Railroad Spur Line. At this point waters will be divided, with portions of the water taken north under Montano Road at the Railroad Spur Bridge by the installation of a 24 inch diameter pipe on the east side of the tracks. The remainder

of the water will be accomodated by the installation of pipes (18 inch diameter) under the railroad tracks. Waters will flow from these pipes by surface methods in a hard lined drainage channel or swale on the south side of Montano Road to Alexander Boulevard.

Area A-2 will be collected by Alexander Boulevard and carried northerly under Montano Road.

Flows from Areas B-1 through B-3 will be carried by Alexander Loop to the northwest corner of the area as will flows from Areas C-1 and C-3. Areas B-4 and C-3 will flow directly to this same corner area.

It is proposed to construct a detention area in the future at the northwest corner of this area directly south of Montano Road. Overflows and draining of the detention area is proposed to be directed onto Montano Road or to a yet to be constructed storm sewer. In accordance with City policy, this detention area will be sized to detain the flows generated from contributing areas by a 50 year frequency storm based on existing surface conditions. It is not intended that this detention area be sized to hold all runoff waters from the area when properties are fully developed.

All increases in runoff due to development of properties (such as construction of pavement and buildings) is proposed to be handled individually at the time such development occurs.

Flows from Areas J-1, K-1 and L-1 will be allowed to flow westerly to adjacent properties as under existing conditions.

See the paragraph entitled "Montano Road" for a discussion of the method of draining Area E-1.

B. Montano Road

As stated under the existing drainage conditions of this report, Montano Road is drained by a series of inlets, pipes and rundowns that direct the flows to the north, and in accordance with an agreement between the City of Albuquerque and Albuquerque Gravel Products Company, the disposal of these flows are the responsibility of the City of Albuquerque. (See Appendix A.)

It is proposed that Albuquerque Gravel Products

Company, the owner of lands on the north side of Montano Road, work with the City of Albuquerque monetarily and physically to dispose of these waters in a more appropriate manner. Development of the lands directly north of Montano Road is proposed in the near future and the continuation of the present drainage arrangement will be quite damaging to the value of their property.

Flows from Areas E-1 and F-1 are proposed to be directed to the islands created by the south and north on and off ramps as they meet Montano Road.

A detention area will be constructed in these islands to accomodate the increase in flows generated by the development of Areas E-1 and F-1 when such development occurs. All existing flows will be allowed to flow through these island detention areas and on to the west. Culverts will be installed under the ramps at the time the ramps are constructed to accomodate the flows generated. Maintenance of these detention areas, as proposed, will be the responsibility of the owners of the land they serve.

C. Area North of Montano Road

As stated under Existing Conditions, this area is presently being actively mined of gravel. This area is proposed to be developed in phases as the gravel mining activity is completed. Development phasing is proposed to commence in the southerly portion of this area, (area directly north of Montano Road) and move in a northerly direction.

As shown on Map No. 2, a drainage divide line is shown which is proposed to be the major division of drainage. All areas to the south of this line will be finish graded to drain to the south and west to a future detention area located directly north of Montano Road as shown on the Map. This area will also receive the flows coming from the areas south of Montano Road and these flows will be directed to the west to the future detention area. Overflows and draining of this detention area is proposed to be directed onto Montano Road or to a yet to be constructed storm sewer. All areas to the north of this drainage divide line will be finish graded to drain towards a future detention area in the vicinity of the Vineyard Arroyo near the Mission School. These detention areas are to be sized to accomodate the 50 year frequency storm runoff from the undeveloped lands.

Interim detention areas are proposed to be provided by the owners until permanent facilities are constructed.

Updating of the Master Plan of Drainage will be necessary when the development of these lands begins to take place.

The method of draining Area F-1 is discussed under the above paragraph entitled "Montano Road".

A vicinity map is included herein in the back of this report as Map No. 3 which shows the proposed method of disposal of waters after leaving the subject lands covered by this report.

The Hahn Arroyo located to the south of subject property will be utilized for disposal of waters eminating from Interstate 25 and also for ultimate disposal of flows from Drainage Areas J-1, K-1 and L-1.

Montano Road along with a future storm sewer, is pro posed to be utilized in draining the detention areas

located both north and south of Montano Road at the west edge of subject lands. At the time Montano Road was constructed, the City of Albuquerque had plans to construct a storm sewer in Montano Road beginning at the Alemeda Drain located directly west of Second Street and extending easterly to provide for drainage of subject lands and Montano Road. It is assumed that the City has not abandoned their plans for this storm sewer and that construction will be accomplished in the not too distant future.

The existing Vineyard Arroyo as shown on Map No. 3 is proposed to be utilized for disposal of waters generated from the northerly portion of subject lands.

IV

DRAINAGE ANALYSES

Following are the Drainage Analyses (computations) made for the drainage areas affecting subject lands, both in the existing and proposed developed conditions.

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DRAINAGE ANALYSES

CRITERIA

Design Storm - 100 year frequency

REFERENCE MATERIAL

1. Intensity / Duration Frequency Curve Albuquerque, New Mexico
2. Time of Concentration Nomograph P. Z. Kirpich

DESIGN PARAMETERS

1. Peak Runoff Rate-Rational Formula
   $Q = CIA$
2. Runoff Coefficients
   Existing Ground Surface = 0.40
   Paved Surfaces - 0.96

INDEX

EXISTING CONDITIONS - Sheets 1-5
DEVELOPED CONDITIONS = Sheets 6-23

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EXISTING CONDITIONS

AREA AX

Drainage Area = 47.17 Ac.

Length of Drainage Area = 2550'

Elev. Difference = 5050 − 5035 = 15'

T_c - Time of Concentration = 24 minutes

I_{100} = 3.9 inches / hour

$Q = CIA = (0.40)(3.9)(47.17) = \underline{73.6 \text{ cfs}}$

AREA BX

Drainage Area = 26.71 Ac.

Length of Drainage Area = 2250'

Elev. Difference 5050 − 5031 = 19'

T_c = 19 minutes

I_{100} = 4.4 inches / hour

$Q = (0.40)(4.4)(26.71) = \underline{47.0 \text{ cfs}}$

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AREA CX

Drainage Area = 49.57 Ac.

Length of Drainage Area. = 2150'

Elev. Difference = 5047 - 5025 = 22'

Te - Time of Concentration = 17 x 1.5 = 25 minutes

I_{100} = 3.8 in./hr.

Q = (0.40)(3.8)(49.57) = 75.3 cfs.

AREA DX-1

Same as D-1 - See Sheet 12

Q = 4.9 cfs

AREA DX-2

Same as D-2 - See Sheet 12

Q = 5.4 cfs

AREA DX-3

Same as D-3 - See Sheet 12

Q = 4.3 cfs

AREA DX-4

Same as D-4 - See Sheet 13

Q = 3.6 cfs.

AREA DX-5

Drainage Area = 1.31 Acres

$T_c \leq 10$ min. $I_{100} = 5.8$ inches/hr.

$Q = (0.82)(5.8)(1.31) = 6.2$ cfs

AREA DX-6

Drainage Area = 1.20 Acres

$T_c \leq 10$ min. $I_{100} = 5.8$ inches/hr.

$Q = (0.82)(5.8)(1.20) = 5.7$ cfs.

AREA DX-7

Drainage Area = 4.40 Acres

$T_c \leq 10$ min. $I_{100} = 5.8$ inches/hr.

$Q = (0.65)(5.8)(4.40) = 16.6$ cfs

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AREA EX

Drainage Area = 9.15 Acres

Length = 650' Elev. Diff = 5140 - 5130 = 10'

$T_c \leq 10$ min. $I_{100} = 5.8$ inches/hr.

$Q = (0.40)(5.8)(9.15) = \underline{21.2 \text{ cfs}}$

AREA FX

Drainage Area = 8.16 Acres

Length = 900', Elev. Diff = 5150 - 5144 = 6'

$T_c = 10$ min. $I_{100} = 5.8$ inches/hr.

$Q = (0.40)(5.8)(8.16) = \underline{18.9 \text{ cfs}}$

AREA GX

Drainage Area = 14.32 Acres

Length = 1300', Elev. Diff = 5050 - 5040 = 10'

$T_c = 13$ min., $I_{100} = 5.3$ inches/hr

$Q = (0.40)(5.3)(14.32) = \underline{30.3 \text{ cfs.}}$

AREA HX-1

Same as H-1, See Sheet. 16

Q = 55.8 cfs

AREA HX-2

Same as H-2, See Sheet. 16

Q = 5.2 cfs,

AREA IX-1

Same as I-1, See Sheet 22

Q = 51.7 cfs

AREA IX-3

Same as I-3, See Sheet 22

Q = 27.6 cfs

PROPOSED DEVELOPED CONDITIONS

AREA- A-1

Drainage Area = 46.95 Acres

Length of Drainage Area = 2550 feet

Elev. Difference 5050 - 5035 = 15'

T_c - Time of Concentration = 24 minutes

I_{100} = 3.9 inches/hr.

$Q = CIA = (0.40)(3.9)(46.95) =$ 73.2 cfs

AREA A-2

Drainage Area = 14.12 Acres

Length of Drainage Area = 1500 feet

Elev. Difference 5045 - 5031 = 14'

T_c = 10 minutes

I_{100} = 5.8 inches/hour

$Q = (0.40)(5.8)(14.12) =$ 32.8 cfs.

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Area A-1 and A-3

Drainage Area. = 46.95 + 1.57 = 48.52 Acres

Tc for Area A-1 See Sheet 1 = 24 minutes

Tc for Area A-3 = 3 min.

Total Tc = 24 + 3 = 27 min.

I_{100} = 3.7 inches/hour

Q = (0.40)(3.7)(48.52) = 71.8 cfs

Proportional flow from Area A-1 @ I = 3.7 inches/hour reaching Alexander Blvd

Q = (0.40)(3.7)(46.95) = 69.5 CFS

69.5 X 43.2/73.2 = 41.0 CFS

Flow from Area A-3

Q = (0.40)(3.7)(1.57) = 2.3 CFS

Total flow to Alexander Blvd from Area A-1 & A-3 = 41.0 + 2.3 = 43.3 cfs

HYDROLOGY F16/D3 SUNDT'S INDUSTRIAL CENTER 2 OF 2

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FLOW ON ALEXANDER BLVD
AT MONTANO ROAD.

Flow to Alexander Blvd from Area A-1 & A-3
From Sheet 2 = 43.3 CFS

Flow from Area A-2 @ I = 3.7 Inches/hr.
Q = (0.40)(3.7)(14.12) = 20.9 cfs

Flow on Alexander Blvd =
43.3 + 20.9 = 64.2 cfs

AREA B-1

AREA B-1

Drainage Area = 2.59 Ac.

Length of Drainage Area 700'

Elev. Difference = 5047 − 5043 = 4 ft.

T_c = 10 minutes

I_{100} = 5.8 inches/hr.

$Q = (0.40)(5.8)(2.59) =$ 6.0 cfs.

AREA B-2

Drainage Area = 10.21 Ac.

Length of Drainage Area 1200'

Elev. Difference 5050 − 5043 = 7 ft.

T_c = 14 minutes

I_{100} = 5.1 inches/hr.

$Q = (0.40)(5.1)(10.21) =$ 20.8 cfs.

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AREA B-3

Drainage Area = 13.59 Acres

Length of Drainage Area = 2050'

Elev. Difference = 5046 - 5030 = 16'

T_c = 18 minutes

I_{100} = 4.6 inches/hr.

Q = (0.40)(4.6)(13.59) = 25.0 cfs.

AREA B-1, B-2 & B-3

Drainage Area = 2.59 + 10.21 + 13.59 = 26.39 Ac.

Length of Drainage Area = 2600'

Elev. Difference = 5050 - 5030 = 20 ft.

T_c = 22 minutes

I_{100} = 4.1 inches/hr.

Q = (0.40)(4.1)(26.39) = 43.3 cfs.

AREA B-4

Drainage Area = 9.18 Acres

Length = 1650' Elev. Diff. = 5143 - 5026 = 17'

T_c = 13 minutes, I_{100} = 5.3 inches/hr.

Q = (0.40)(5.3)(9.18) = 19.5 cfs

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AREAS C-1 & C-2

Drainage Area = 4.68 + 15.37 = 20.05 Acres

Length of Drainage Area = 2350'

Elev. Difference = 5049 − 5031 = 28'

T_c = 16 minutes

I_{100} = 4.8 inches/hr.

$Q = (0.40)(4.8)(20.05) =$ 38.5 cfs.

AREAS - B-1 thru B-3 & C-1 & C-2

Drainage Area = 26.39 + 20.05 = 46.44 Acres

Length of Drainage Area = 2600'

Elev. Difference = 5050 − 5030 = 20'

T_c = 22 minutes

I_{100} = 4.1 inches/hr.

$Q = (0.40)(4.1)(46.44) =$ 76.2 cfs.

AREA C-3

Drainage Area = 3.48 Acres

Length = 600' Elev. Diff. = 5132 − 5126 = 6'

T_c = < 10 min. I_{100} = 5.8 inches/hr.

$Q = (0.40)(5.8)(3.48) =$ 8.1 cfs

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AREA D-1

Drainage Area = 2.13 Acres

T_c = 10 min

I_{100} = 5.8 inches/hr.

Q = (0.40)(5.8)(2.13) = 4.9 cfs.

AREA D-2

Drainage Area = 1.14 Ac.

T_c = 10 min ; I_{100} = 5.8 inches/hr.

Q = (0.82)(5.8)(1.14) = 5.4 cfs

AREA D-1 & D-2

Drainage Area = 2.13 + 1.14 = 3.27 Acres

T_c = 10 minutes ; I_{100} = 5.8 inche/hr.

Q = 4.9 + 5.4 = 10.3 cfs.

AREA D-3

Drainage Area = 0.90 Ac.

T_c = 10 minutes ; I_{100} = 5.8 in./hr.

Q = (0.82)(5.8)(0.90) = 4.3 cfs

AREA D-4

Drainage Area = 0.76 Ac.

T_c = 10 min.; I_{100} = 5.8 in/hr.

Q = (0.82)(5.8)(0.76) = 3.6 cfs

AREA D-5

Drainage Area = 1.56 Ac.

T_c = 10 min.; I_{100} = 5.8 in/hr.

Q = (0.85)(5.8)(1.56) = 7.7 cfs.

AREA D-6

Drainage Area = 1.55 Ac.

T_c = 10 min.; I_{100} = 5.8 in./hr.

Q = (0.85)(5.8)(1.55) = 7.6 cfs

AREA D-7

Drainage Area = 0.46 Ac.

T_c = 10 min; I_{100} = 5.8 in/hr

Q = (0.90)(5.8)(0.46) = 2.4 cfs

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AREA D-6 & D-7

Drainage Area = 1.55 + 0.46 = 2.01 Ac.

T_c = 10 min.

Q = 7.6 + 2.4 = 10.0 cfs.

AREA D-8

Drainage Area = 4.17 Ac.

T_c = 10 min. I_{100} = 5.8 in/hr

Q = (0.65)(5.8)(4.17) = 15.7 cfs.

AREA E-1

Drainage Area = 4.76 Ac.

T_c = 10 min. I_{100} = 5.8 in./hr.

Q = (0.40)(5.8)(4.76) = 11.0 cfs.

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AREA F-1

Drainage Area = 4.32 Ac.

T_c = 10 min. I = 5.8

$Q = (0.40)(5.8)(4.32) =$ 10.0 cfs.

AREA G-1

Drainage Area = 7.26 Ac.

T_c = 10min. ; I = 5.8

$Q = (0.40)(5.8)(7.26) =$ 16.8 cfs

AREA G-2

Drainage Area = 5.22 Ac.

T_c = 10min. ; I = 5.8

$Q = (0.40)(5.8)(5.22) =$ 12.1 cfs.

AREA H-1

Drainage Area = 20.68 Acres

Length of Drainage Area. = 1100'

Elev. Difference 5106 - 5100 = 6'

T_c = 12 min. ; I_{100} = 5.4 inches/hr.

Q = (0.50)(5.4)(20.68) = 55.8 cfs.

AREA H-2

Drainage Area = 3.54 Acres

Length of Drainage Area = 850'

Elev. Difference 5097 - 5095 = 2'

T_c = 15 min. ; I = 4.9 in./hr.

Q = (0.30)(4.9)(3.54) = 5.2 cfs

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AREA H-3

Drainage Area = 74.66 Ac.

Length of Drainage Area. 2700'

Elev. Difference 5060 - 5033 = 27'

T_c = 21 min. ; I_{100} = 4.2 in./hr.

Q = (0.40)(4.2)(74.66) = 125.4 cfs

AREA H-4

Drainage Area = 10.11 Acres

Length of Drainage Area = 1150'

Elev. Difference = 5037 - 5028 = 9'

T_c = 12 min ; I_{100} = 5.4 inches/hr.

Q = (0.40)(5.4)(10.11) = 21.8 cfs.

AREA H-1, H-2, H-3 & H-4

Drainage Area = 20.68 + 3.54 + 74.66 + 10.11 = 108.99 Ac.

Length of Drainage Area = 3200'

Elev. Difference = 5060 - 5028 = 32'

T_c = 23 min. ; I = 4.0 in./Hr.

Q = (0.40)(4.0)(108.99) = 174.4 cfs.

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FLOW ON ALEXANDER BLVD. NORTH OF NORTH RAMPS

T_c = T_c for Area A-1 + A-3 = 27 minutes
+ T_c on Alex. Blvd. north of Montano = 3 minutes

Total T_c = 27+3 = 30 minutes

I_{100} for 30 minutes = 3.4 inches / hr.

Proportional flow from Area A-1 @ 3.4 inches/hr reaching Alexander Blvd

$Q = (0.40)(3.4)(46.95) = 63.9$ cfs.

$63.9 \times 43.2/73.2 = \underline{37.7}$ cfs

Areas draining directly to Alexander Blvd.
= A-2, A-3, G-1 & G-2
= 14.12 Ac + 1.57 Ac. + 7.26 Ac. + 5.22 Ac. = 28.17 Ac.

$Q = (0.40)(3.4)(28.17) = \underline{38.3}$ cfs.

Add flow from A-1 = 37.7 + 38.3 = $\underline{\underline{76 \text{ cfs.}}}$

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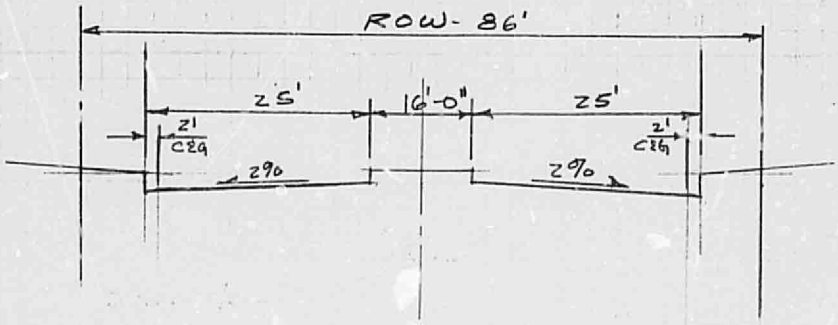
ALEXANDER BLVD CAPACITY



STREET AREA-

@ Curb Height.

C & G (Gutter Area) = 0.12 x 2/2 = 0.12 ft²

Crown = 0.02 x 23 = 0.46'

@ C & G = (0.46)(2) + street = 23 (0.46)/2 = 6.21 ft²

Street = 0.67 - 0.46 - 0.12 = 0.09'

½ Street.

(0.09)(25) = 2.25 ft²

Area = 8.58 ft²

Wetted Perimeter.

0.67' + 25' + 0.09' = 25.76 ft

$R = \frac{8.58}{25.76} = 0.333$

$V = \frac{1.486}{.015}(.333)^{2/3}(.005)^{1/2} = 3.37$ fps

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ALEXANDER BLVD CAPACITY CONT'D.

½ Street- $Q = AV = 8.58 \times 3.37 = 28.91$ CFS

Full Street Width = $2 \times 28.91 = 57.82$ cfs

WATER AT 0.20 ft. above Top of Curb

Area = From previous page = 8.58 ft²

+ 25 x 0.20' = 2.50 ft²

BK of Curb = 0.2 x 10/2 = 1.00

12.08 ft²

$WP = 10' + 0.67 + 25 + 0.29 = 35.96$

$R = \frac{12.08}{35.96} = 0.336$

$V = \frac{1.486}{.016}(.405)^{2/3}(.005)^{1/2} = 3.38$ fps

½ street. $Q = (12.08)(3.38) = 40.83$ cfs

Full Street $Q = 40.83 \times 2 = \underline{81.66 \text{ cfs}}$

AREA H-5

Drainage Area = 58.02 Acres

Length of Drainage Area = 2800'

Elev. Difference 5040 - 5015 = 25'

T_c = 21 minutes, ; I_{100} = 4.2 in/hr.

Q = (0.40)(4.2)(58.02) = 97.5 cfs.

FLOW TO DETENTION AREA
NORTH OF MONTANO ROAD

Drainage Areas: A-1, A-2, A-3, = 62.64
D-1, D-2, D-3, D-4, D-5 = 6.61
F-1, = 4.32
G-1, G-2 = 12.48
H-1, H-2, H-3, H-4, H-5 = 167.01

Total Area. 253.06

T_c - flow on Alexander Blvd. - North of North Ramps = 30 minutes

Additional T_c to Detention Area:
length = 2400', Elev. Diff. = 10'
T_c = 25 min.

Total T_c = 30 min + 25 min. = 55 minutes

I_{100} = 2.3 inches

Q = (0.42)(2.3)(253.06) = 244.5 cfs

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AREA I-1

Drainage Area = 41.04 Acres

Length of Drainage Area = 2200 feet

Elev. Difference = 5096 - 5084 = 12 feet

T_c = 21 minutes

I_{100} = 4.2 inches/hr.

$Q = (0.30)(4.2)(41.04) = 51.7$ cfs

AREA I-3

Drainage Area = 15.18 Acres

Length of Drainage Area = 1400 feet

Elev. Difference = 5090 - 5078 = 12 feet.

T_c = 13 minutes

I_{100} = 5.2 inches/hr

$Q = (0.35)(5.2)(15.18) = 27.6$ cfs

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AREA J-1

Drainage Area = 6.53 Acres

$T_c \leq 10$ min. $I_{100} = 5.8$ inches/hr.

$Q = (0.40)(5.8)(6.53) =$ 15.1 cfs.

AREA K-1

Drainage Area = 6.35 Acres.

$T_c \leq 10$ min. $I_{100} = 5.8$ inches/hr.

$Q = (0.40)(5.8)(6.35) =$ 14.7 cfs.

AREA L-1

Drainage Area = 14.65 Acres

Length = 1300', Elev. Diff = 5050 - 5040 = 10'

$T_c = 13$ min. $I_{100} = 5.3$ inches/hr.

$Q = (0.40)(5.3)(14.65) =$ 31.1 cfs

AGREEMENT AS TO ROADWAY SLOPE AND DRAINAGE

WHEREAS, the City of Albuquerque, New Mexico will, in the immediate future, construct, widen, repave and otherwise improve that portion of Montano Road running from Interstate Highway 25 westerly to 2nd Street, N.W., in and near the City of Albuquerque, and

WHEREAS, the construction and grading will require sloping upon the lands of Albuquerque Gravel Products Co., Inc., and due to the contour of the ground, reshaping of Albuquerque Gravel's land where necessary, and

WHEREAS, until such time as the City is able to design and construct permanent drainage facilities it will be necessary to provide for runoff of waters from the roadway on to Albuquerque Gravel's property at certain designated areas,

NOW, THEREFORE, Albuquerque Gravel Products Co., Inc. hereby consents and agrees as follows:

First: The City may create, occupy and use the slope areas shown on the attachments hereto marked A, B, and C, the same being profile sheets 8, 9, and 10 of the engineering plans for the construction of Montano Road and Water Transmission Line prepared by William Matotan and Associates, Engineers. However, the right of the City to use the slope areas shown on attachments A, B, and C shall cease and terminate as to each area at such time that Albuquerque Gravel adjusts its land to the finished grade of the roadway by filling up to the road level

thereby furnishing lateral support for the roadway, or grading down to the road level.

Second: The City may, in its construction, provide for the runoff of waters from the roadway on to Albuquerque Gravel's land at the areas designated on Attachments A, B, and C, for a period of five (5) years after completion of the roadway construction. During this term the City will exercise its best efforts to provide permanent drainage facilities to cease the diversion of water from the roadway on to Albuquerque Gravel's land.

The City of Albuquerque hereby agrees to save Albuquerqu Gravel harmless from any and all liability to others which may arise solely from the diversion of waters onto Albuquerque Gravel' property from the roadway.

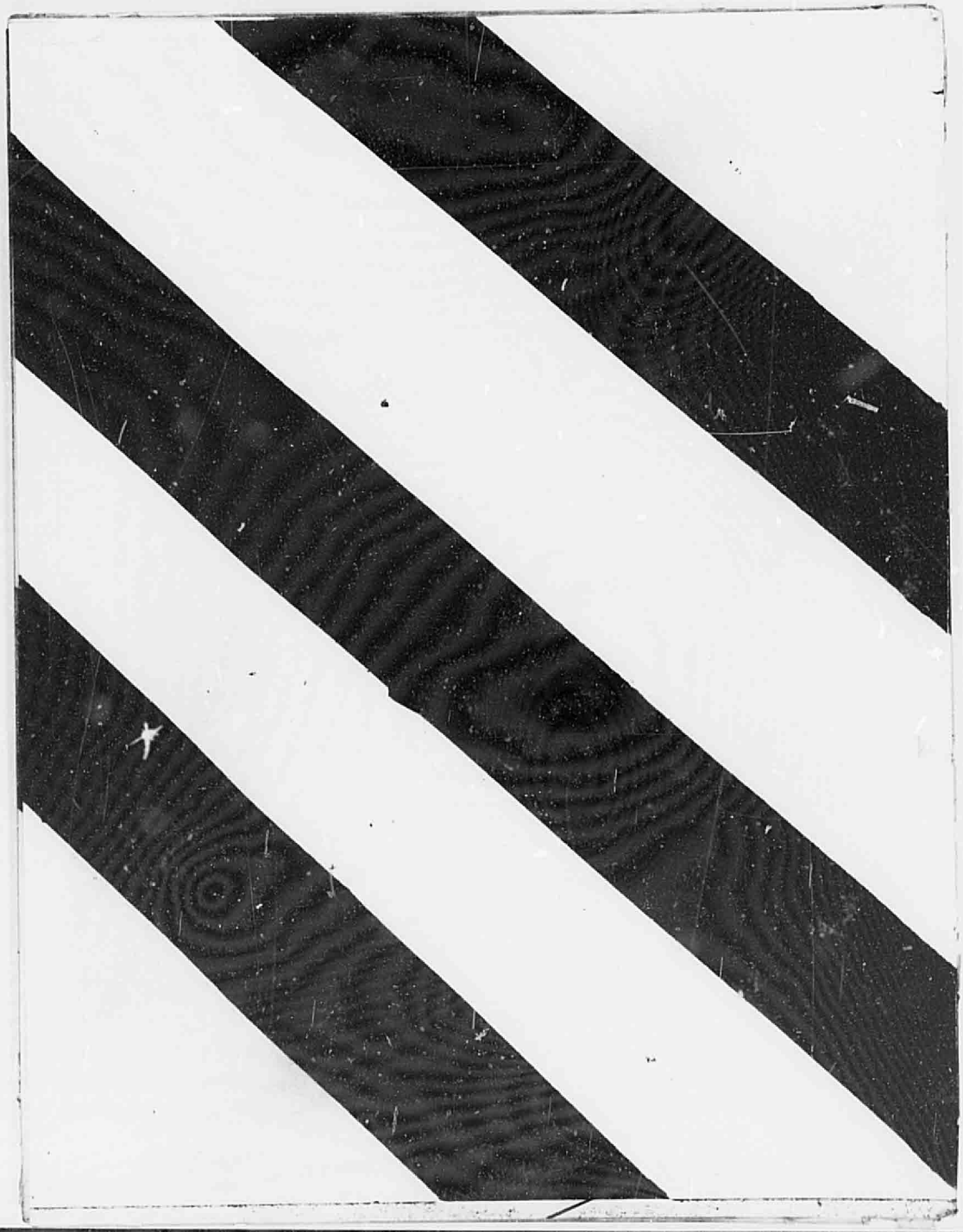
IN WITNESS WHEREOF, the parties have set their hands and seals this 5th day of July, 1973.

CITY OF ALBUQUERQUE, NEW MEXICO

By: Herbert H. Smith
Herbert H. Smith
City Manager

ATTEST:

Lucille Fitzgerald
City Clerk

ALBUQUERQUE GRAVEL PRODUCTS CO., INC

By: John H Doyle V.P.