#2653 8719
J23/D9E.UC 625

(Procedure "B")

86 63651

AGREEMENT TO CONSTRUCT
SUBDIVISION IMPROVEMENTS

THIS AGREEMENT made this 22nd day of August, 1986, by and between the City of Albuquerque, New Mexico (hereinafter referred to as "City") and Ralph Boone and Charles Griffin, Owners (hereinafter referred to as "Developer") pursuant to Section 6 of the City's Subdivision Ordinance (Enactment No. 56-1983, effective June 29, 1983).

WHEREAS, the Developer is developing certain lands within the City of Albuquerque, County of Bernalillo, State of New Mexico known as Summit Hills (hereinafter referred to as the "Subdivision"); and

WHEREAS, the Developer has submitted and the City has approved a preliminary plat identified as subdivision of Tract A-1 of Summit Hills describing the Subdivision; and

WHEREAS, Section 6 of the City's Subdivision Ordinance requires the Developer to install and construct certain public improvements at no cost to the City; and

WHEREAS, the City requires the execution of an Agreement to construct said public improvements, together with actual satisfactory construction or acceptable guarantees of construction as specified below, as a prerequisite to approval of a Final Plat of the Subdivision; and

WHEREAS, the Developer must obtain City approval of construction plans, specifications, and cost estimates for the improvements and upon City approval of such construction plans, specifications, and cost estimates the City is prepared to issue the Developer a Work Order permitting the commencement of construction activities upon execution of this Agreement and payment of all

required fees, all as set forth and specified in Exhibit "A", which is attached hereto and incorporated herein as if fully set forth in this Agreement; and

WHEREAS, the City is willing to inspect or monitor the private inspection of the improvements during the course of their construction and accept said improvements upon their satisfactory completion, all as set forth and specified in Exhibit "B", which is attached hereto and incorporated herein as if fully set forth in this Agreement; and

WHEREAS, the Developer financially guarantees the satisfactory completion of the infrastructure construction required herein and the payment of all labor and material costs and charges, all as set forth and specified in Exhibit "C", which is attached hereto and incorporated herein as if fully set forth in this Agreement;

NOW, THEREFORE, in consideration of the above, the City and the Developer hereby agree as follows:

1. The Developer shall, on or before the 1st day of December, 19 86, complete to the satisfaction of the City the improvements required for the Subdivision as set forth, specified and referenced in Exhibit "A" attached hereto. The improvements which the Developer shall satisfactorily complete within the time limitation stated above are described and identified in Exhibit "D", which is attached hereto and incorporated herein as fully set forth in this Agreement.

The time limitation stated above may be extended by the City Engineer for a period not to exceed twelve (12) months if the Developer shows adequate reasons for said extension.

2. After execution of this Agreement, payment of all fees as specified in Exhibit "A" attached hereto, and, if applicable, delivery of the financial guarantee specified in Exhibit "C" attached hereto, the Developer shall be issued a Work Order by the City. The Developer shall advise the City Engineer in advance of the actual start of construction and arrange for all inspections required and specified in Exhibit "B" attached hereto. The Developer shall permit the City or other participating agencies to make such tests and inspections during the construction of the improvements and upon completion of the improvements as are necessary or desirable.

3. Prior to final acceptance of the completed improvements by the City, the Developer shall furnish to the City Engineer all documentation of the completion of construction as set forth and specified in Exhibit "A" attached hereto.

4. Until acceptance of the improvements by the City, the Developer shall be solely responsible for maintaining the premises being subdivided in a safe condition. The Developer agrees to defend, indemnify and hold harmless the City and its officers, agents and employees from and against all suits, actions or claims of any character brought because of any injury or damage arising out of the design or construction of the improvements or by reason of any act or omission, or misconduct of the Developer, his agents, employees or the Engineer or Contractor or their agents or employees. The indemnity required hereunder shall not be limited by reason of the specifications of any particular insurance coverage in this Agreement. Nothing herein is intended to impair any right or indemnity under the laws of the State of New Mexico.

5. The Developer shall procure or cause to be procured and maintain public liability insurance in the amount of not less than One Million Dollars ($1,000,000) combined single limit for accidents or occurrences which cause bodily injury, death or property damage to any member of the public resulting from any condition of the lands of the subdivision or improvements therein or the construction activities thereon. The insurance policy must name the City of Albuquerque, its employees, and elected officials, as their interest may appear, as additional insureds. The Developer shall maintain such insurance until acceptance of the improvements by the City. Any cancellation provision must provide that if the policy is cancelled prior to the expiration date hereof, materially changed, or not renewed, the issuing company will mail 30 days written notice to the City, attention City Engineer. The Developer shall furnish the City Engineer a cerificate of said insurance prior to issuance of a Work Order for construction of the improvements.

6. If at the time that construction of the Project is completed the City does not own the real property on or in which the improvements are constructed, the Developer shall convey such real property and property rights as the City deems necessary, together with all improvements, to the City free and clear of all claims, encumbrances and liens prior to final acceptance of the improvements by the City. Conveyance may be appropriate dedication on the final plat of the subdivision.

7. At the time of acceptance of the completed improvements or any portion thereof by the City, the Developer shall furnish or cause to be furnished a bond or other suitable guarantee in a form and with a surety satisfactory to the City to guarantee the completed project against defective

materials and workmanship for a period of three (3) years following the date of acceptance by the City.

8. The City shall either perform or monitor the performance of inspections during the course of construction of the improvements and inspect the improvements upon their completion in a timely manner, all as set forth and specified in Exhibit "B" attached hereto.

9. The City shall designate a Construction Engineer and/or Inspector for this project.

10. The City shall make available at established reproduction costs for the use of the Developer or its agents all of its maps, records, laboratory tests, or other data pertinent to the work to be performed by the Developer or its agents pursuant to this Agreement and also any other maps, records, or other materials available to the City upon the City's request to any other public agency or body.

11. The City shall issue a Certificate of Completion and Acceptance for the Improvements upon final completion to the City's satisfaction of the Improvements as described in the plans and specifications as set forth and specified in Exhibit "A" attached hereto. However, the City Engineer, in his discretion, may issue a Certificate of Completion and Acceptance for a portion of the Improvements in accordance with the conditions and procedures set forth in Exhibit "C" attached hereto.

12. If the Developer has requested Final Plat approval by the City prior to the actual construction of the improvements, the City will approve the Final Plat for recordation upon execution of this Agreement, payment of all fees specified in Exhibit "A" attached hereto, delivery of the financial guarantee specified in Exhibit "C" attached hereto and full compliance with the City's Subdivision Ordinance.

13. This Agreement shall not be assigned except with the written consent of the parties hereto and the express written concurrence of any surety who has undertaken to guarantee the completion of the Improvements. If so assigned, this Agreement shall extend to and be binding upon the successors and assigns of the parties hereto.

14. In the event of the sale, conveyance, or assignment of the Subdivision or any portion thereof, the City will not release the Developer from its obligations under this Agreement and will continue to hold the Developer responsible for all Improvements until a successor in interest to the Developer has posted a suitable guarantee and entered into a Subdivision Improvement Agreement with the City. At such time as acceptable security has been posted by the Developer's successor in interest and the Agreement executed, the City will release the guarantee.

15. Should there be a conflict between the terms and conditions of this Agreement (with Exhibits A, B, C, and D) and the terms and conditions of any other document referred to herein, the terms and conditions of this Agreement (with Exhibits A, B, C, and D) shall govern.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the date first above written.

.0C 631

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the date first above written.

DEVELOPER: Ralph D. Boone

Charles Griffin

ATTEST:

N/A

City Clerk

CITY OF ALBUQUERQUE, NEW MEXICO

James N. Hicks Jr., Principal Engineer, Design Division, Public Works Dept.

Gene Romo

Gene Romo
Chief Administrative Officer

REVIEWED BY:

Assistant City Attorney

City Attorney

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

The foregoing instrument was acknowledged before me this 22 day of July, 1986, by Charles Griffin Ralph Boone of _____.

Janette M Walker
Notary Public

My commission expires:
April 4, 1989

OFFICIAL SEAL
JANETTE M. WALKER
NOTARY PUBLIC STATE OF NEW MEXICO
Notary Bond Filed with Secretary of State
My Commission Expires April 4, 1989

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

The foregoing instrument was acknowledged before me this 22 day of July, 1986, by ~~C.D. Sheppard~~, City Engineer of the City of Albuquerque.

My commission expires:

_____
Notary Public

_____

EXHIBIT "A"

TO SUBDIVISION IMPROVEMENT AGREEMENT
EXECUTED BY AND BETWEEN Ralph Boone & Charles Griffin, Owners,(Developer)
AND CITY OF ALBUQUERQUE, NEW MEXICO (CITY) ON
THE 22nd DAY OF August, 1986.

1. COMMITMENT TO CONSTRUCT IMPROVEMENTS.

The Developer shall construct in a manner satisfactory to the City the improvements listed in Paragraph 1 of the Subdivision Improvement Agreement and which are shown in greater detail on the Developer's proposed and approved Subdivision Improvements Plan, which was filed with the office of the City Engineer and identified as Project No. 2653.

2. DESIGN AND CONSTRUCTION METHODS.

As soon as reasonably practical after approval of the Developer's Preliminary Plat of the Subdivision, the Developer shall submit to the City Engineer final construction plans, specifications, and cost estimates for the proposed public improvements. At this time, the Developer shall pay all fees required under Section 12.D of the City's Subdivision Ordinance and Paragraph 4 of this Exhibit.

The Developer has engaged DTM Engineering as Engineer(s) for the construction project, who are Registered Professional Engineers in the State of New Mexico. The Developer shall ensure that the Engineer(s), in such capacity, shall provide the following services prior to, during, and after construction of the improvements:

"As Needed" As per Mr Baker's request.

The Developer shall ensure that the Engineer(s) perform all of the above services in a satisfactory manner and submit to the City Engineer any reports required by the City Engineer.

The Developer has engaged "will notify the City Engineer of selection in writing prior to issuance of work order". as Contractor(s), who is properly licensed in the State of New Mexico. The Developer shall ensure that the Contractor(s), in such capacity, shall in a manner satisfactory to the City construct the improvements as shown on Developer's proposed Subdivision Improvements Plan (Project No. 2653), incorporating any change orders approved by the City Engineer, City of Albuquerque Interim Standard Specifications for Public Works Construction, 1985, and all other applicable laws, regulations, and policies. Construction surveying and testing shall be performed as set forth in Exhibit "B" of the Subdivision Improvement Agreement between Developer and the City.

3. COMPLETION OF CONSTRUCTION.

The Developer shall report the completion of construction in writing to the City Engineer. Upon receipt of the report, the City Engineer or his representative shall visually inspect the public improvements to verify completion of construction according to plan. Subsequent to verification, the Developer shall submit to the City Engineer a "final acceptance package", which shall consist of the following documents:

a. "As-built" drawings of reproducible quality, depicting all construction of the public improvements as actually accomplished in the field and certified by a New Mexico Registered Professional Engineer or Land Surveyor, as appropriate,

b. A list of quantities of contract items in place, using the bid items in the City Engineer's Standard Estimated Unit Prices.

This list shall be divided into the following categories as applicable:

(1) Sanitary sewer items and quantities;

(2) Water service items and quantities;

(3) Street paving quantities;

(4) Street curb and gutter quantities; and

(5) Storm drainage improvements and quantities.

The City shall concurrently provide a written certification from the City Engineer that the construction has been performed in substantial compliance with the City of Albuquerque Interim Standard Specifications for Public Works Construction, 1985, and with the approved final plans and specifications for public improvements. If the City is acting as the Contractor for all or a portion of the improvements constructed pursuant to this Agreement, the City shall prepare its own final acceptance package documents for those improvements actually constructed by the City.

Upon receipt of the Developer's "final acceptance package", the City Engineer shall review it for completeness and accuracy. If the documentation has been satisfactorily completed, the City Engineer shall approve the package and issue a Certificate of Completion and Acceptance. Any financial guarantee provided by the Developer in accordance with Section 6.0.2 of the City's Subdivision Ordinance and as described in Exhibit "C" to the Subdivision Improvement Agreement between the Developer and the City shall be released no later than sixty (60) days after approval of the final acceptance package by the City Engineer.

4. PAYMENT OF FEES.

Prior to issuance of a Work Order, the Developer shall pay to the City the following fees:

Type of Fee	Amount
Engineering Fee	6% of all construction cost
Excavation Ordinance Fee	As required per City approved
	engineer's estimate
Sidewalk Ordinance Fee	As required per City approved
	engineer's estimate

Prior to final acceptance of the improvements by the City, the Developer shall pay any other City fees which may have been incurred during the course of construction.

EXHIBIT "B"
TO SUBDIVISION IMPROVEMENT AGREEMENT
EXECUTED BETWEEN Ralph Boone & Charles Griffin, Owners (DEVELOPER)
AND THE CITY OF ALBUQUERQUE (CITY)
ON THE 22nd DAY OF August, 1986.

1. CONSTRUCTION INSPECTION METHODS.

Inspection of the subdivision improvement construction shall be performed by City of Albuquerque, a New Mexico Registered Professional Engineer, in accordance with all applicable laws, ordinances and regulations. If said inspection is performed by an entity other than the City, the City may monitor said inspection and the Developer shall ensure that the inspecting entity provides all inspection results, reports and related data to the City as required for review. The City retains the right to perform its own general overall inspection of the construction project at any time prior to final acceptance of the improvements if deemed necessary or advisable by the City Engineer. For any inspections performed by the City, the Developer shall pay to the City a reasonable fee therefor.

2. CONSTRUCTION SURVEYING.

Construction surveying for the subdivision improvement project shall be performed by City of Albuquerque in accordance with all applicable laws, ordinances and regulations. If said construction surveying is performed by an entity other than the City, the City may monitor said construction surveying and the Developer shall ensure that the construction surveying entity provides all construction surveying field notes, plats, reports and related data to the City as required for review. If any construction surveying is performed by the City, the Developer shall pay to the City a reasonable fee therefor.

3. FIELD TESTING.

Field testing of the subdivision improvement construction shall be performed by will notify the City of Selection in writing prior to w.o. issuance, a certified testing laboratory under the supervision of a New Mexico Registered Professional Engineer, in accordance with the technical standards contained in the applicable contract documents and all applicable laws, ordinances and regulations. If any field testing is performed by an entity other than the City, the City may monitor said field testing and the Developer shall ensure that the field testing entity provides all field testing results, reports and related data to the City as required for review. If any field testing is performed by the City, the Developer shall pay to the City a reasonable fee therefor.

4. RECORD TESTING.

Notwithstanding the provisions of Paragraph 3 above, the City retains the right to perform any and all record testing which may be deemed necessary or advisable by the City Engineer at the expense of the Developer.

EXHIBIT "C"
TO SUBDIVISION IMPROVEMENT AGREEMENT
EXECUTED BETWEEN Ralph Boone & Charles Griffin, Owners (DEVELOPER)
AND THE CITY OF ALBUQUERQUE (CITY) ON
THE 22nd DAY OF August, 1984.

1. PLAT APPROVAL STATUS

The Developer (has)/has not (circle one) requested final plat approval by the City prior to construction of the Subdivision Improvements described in Paragraph 1 of the Subdivision Improvement Agreement. If the Developer has not requested final plat approval prior to construction of the improvements, no financial guarantee is required by the City. However, the Developer understands and agrees that the City will not approve the Developer's proposed plat until the improvements are completed in accordance with the Agreement to which this document is attached as an Exhibit.

If the Developer has requested final plat approval prior to the construction of the improvements, a financial guarantee in an amount of not less than 125 percent of the costs of completing the improvements (as estimated by the City Engineer) is required pursuant to the City's Subdivision Ordinance. Said financial guarantee must be irrevocable in form and may be effected by a bond, letter of credit, escrow deposit, or other acceptable pledge of liquid assets payable to the City in the event of Developer's default under the Subdivision Improvement Agreement.

2. FINANCIAL GUARANTEE

With respect to the Subdivision Improvement Agreement to which this document is attached as an Exhibit, the Developer has acquired or is able to acquire the following described financial guarantee (describe fully, indicate amount, identification number, names of bank or bonding entity, inclusive dates of guarantee, and all other relevant information):

"Letter of Credit issued by the First National Bank of Clovis in the CC 640 amount of $39,962.75. Inclusive dates of June 4, 1986 through June 4, 1987."

The Developer understands and agrees that the original executed financial guarantee described above must be delivered to the City simultaneously with the City's execution of the Subdivision Improvement Agreement between Developer and the City; and must be in an amount of not less than 125 percent of the cost of completing the improvements, as estimated by the City Engineer.

In the event the Developer shall fail or neglect to fulfill his obligations under this Agreement, the City shall have the right to construct or cause to be constructed the Improvements specified herein, as shown on the Final Plat and in the plans and specifications as approved, and the Developer as Principal and the surety or sureties shall be jointly and severally liable to pay to and indemnify the City, the total cost to the City thereof, including but not limited to, engineering, legal, and contingent costs together with any damages, either direct or consequential, which the City may sustain on account of the failure of the Developer to carry out and execute all of the provisions of the Agreement to which this document is attached as an Exhibit. The City shall have the unconditional right to call upon the financial guarantee provided by the Developer described in this paragraph for the purposes specified and in the amounts enumerated in such guarantee.

3. PROCEDURES FOR REDUCTION OF FINANCIAL GUARANTEE UPON PARTIAL COMPLETION OF IMPROVEMENTS.

The Developer may request a reduction in the amount of financial guarantee upon partial completion of the subdivision improvements. To qualify for a financial guarantee reduction, the completed improvements must be of a free-standing nature, functionally independent of any uncompleted

improvements, and completed in substantial compliance with the subdivision improvement construction plans as determined by an inspection conducted by the City.

If the completed improvements meet the above requirements, the City Engineer will then estimate the cost of completing the remaining improvements. The Developer may then submit the following documents to the City for review and approval:

a) A revised financial guarantee in an amount of not less than 125 percent of the City Engineer's estimated cost of completing the remaining improvements;

b) A release of the original financial guarantee for execution by the City;

c) Documentation that the completed improvements and the land in which the completed improvements are located are subject to no liens, claims or other encumbrances;

d) A bond or other suitable instrument guaranteeing the completed improvements against defective materials and workmanship for a period of three (3) years as set forth in Paragraph 7 of the Subdivision Improvement Agreement between the Developer and the City.

Upon receipt of the above-described documents in forms acceptable to the City, the City shall issue a Certificate of Completion and Acceptance for the completed improvements and accepts the revised financial guarantee tendered by the Developer.

STATE OF NEW MEXICO
COUNTY OF BERNALILLO
FILED FOR RECORD

1986 SEP -3 PM 3:15

M 390A PG 625-642

DOLORES C. WALLER
CO. CLERK & RECORDER

Rev. 10/85 ~~Bell Brown DEPUTY~~

DENNEY-GROSS & ASSOCIATES, INC.
CONSULTING ENGINEERS
2400 COMANCHE ROAD, N.E.
ALBUQUERQUE, NEW MEXICO 87107
(505) 884-0696

RECEIVED
OCT 03 1985
HYDROLOGY SECTION

Exhibit "D"

642
RECEIVED
OCT 09 1985
CITY ENGINEER

PUBLIC INFRASTRUCTURES
FOR
TRACT A-1, SUMMIT HILLS SUBDIVISION
DRB #85-327
JULY 29, 1985

Sanitary Sewer

Manholes	1 ea.
8" Sewer Line	145 l.f.
Sewer Services	8 ea.

Water

Fire Hydrants	1 ea.
6" Water Line	175 l.f.
Water Services	8 ea.

Street

Curb & Gutter (Ea. side)	454 lf.
Residential Paving (28' Gutter to Gutter)	887 s.y.
Side Walks (4' Ea. side)	454 l.f.

Storm Sewer

Single D Inlet	1 ea.
GROUTED Rock Riprap	7 c.y.
SIDEWALK CULVERT	

9/24/85

Approved USE. 9.24.85

City Engineer/AMAFCA

Richard [signature]
Chairman DRB

[signature]
City ...

[signature]
Traffic Engineer 9-24-85

FILED WITH CITY CLERK'S OFFICE

9-4-85

FIRST NATIONAL BANK OF CLOVIS

DAN HARDISTY, PRESIDENT

June 4, 1986

IRREVOCABLE LETTER OF CREDIT AND AGREEMENT NO. 060486

Amount: $39,962.75

Mr. Gene Romo
Chief Administrative Officer
City of Albuquerque
P. O. Box 1293
Albuquerque, NM 87103

Dear Mr. Romo:

At the request of Ralph Boone and Charles Griffin, we establish our Irrevocable Letter of Credit in your favor for the account of Ralph Boone and Charles Griffin, to the extent of and not exceeding Thirty-Nine Thousand Nine Hundred Sixty-Two and 75/100 Dollars, ($39,962.75).

This Letter of Credit has been established to insure the completion of sidewalk improvements in Summit Hills, as provided by the Agreement between Ralph Boone and Charles Griffin, and the CITY OF ALBUQUERQUE which Agreement is recorded in Book Misc. 390-A, at pages 625 to 642, of the records of the County of Bernalillo, State of New Mexico (the "Agreement"). Draft or Drafts for any amount up to, but not in excess of Thirty-Nine Thousand Nine Hundred Sixty-Two and 75/100 Dollars, ($39,962.75) is/are available at sight at First National Bank of Clovis, New Mexico, between June 4, 1986 and June 4, 1987.

When presented for negotiation, the Draft(s) is/are to be accompanied by the following document:

> The City's notarized certification stating that Ralph Boone and Charles Griffin have failed to comply with the terms of the Agreement, and also certifying that "the undersigned is Chief Administrative Officer of the City of Albuquerque and is authorized to sign this statement," and also certifying that the amount of the Draft does not exceed 125% of the cost of completing the improvements specified in the Agreement.

We hereby agree with the drawer of Draft(s) drawn and under and in compliance with the terms of this credit that such Draft(s) will be duly honored on the presentation to the drawee if negotiated between June 4, 1986 and June 4, 1987.

The Draft(s) drawn under this credit must be endorsed and contain the clause: "Drawn under Letter of Credit and Agreement No. 060486 of First National Bank of Clovis, New Mexico, dated June 4, 1986"; the amount of such Draft(s) must be endorsed on the reverse side thereof, and this Letter of Credit must be attached to that Draft which exhausts this credit.

This credit is subject to the Uniform Customs and Practice for Documentary Credits (1983 Revision), International Chamber of Commerce, Publication No. 400.

This credit terminates at three o'clock p.m., New Mexico time, June 4, 1987.

FIRST NATIONAL BANK OF CLOVIS

Dan Hardisty

Dan Hardisty
President

APPROVED AS TO FORM:

Assistant City Attorney

City Attorney

DENNEY-GROSS & ASSOCIATES, INC.
CONSULTING ENGINEERS
2400 COMANCHE ROAD, N.E.
ALBUQUERQUE, NEW MEXICO 87107
(505) 884-0696

RECEIVED
OCT 03 1985
HYDROLOGY SECTION
J23/D9E

PUBLIC INFRASTRUCTURES
FOR
TRACT A-1, SUMMIT HILLS SUBDIVISION
DRB #85-327
JULY 29, 1985

Sanitary Sewer

Manholes	1 ea.
8" Sewer Line	145 l.f.
Sewer Services	8 ea.

Water

Fire Hydrants	1 ea.
6" Water Line	175 l.f.
Water Services	8 ea.

Street

Curb & Gutter (Ea. side)	454 lf.
Residential Paving (28' Gutter to Gutter)	887 s.y.
Side Walks (4' Ea. side)	454 l.f.

Storm Sewer

Single D Inlet	1 ea.
GROUTED Rock Riprap	7 c.y.
SIDEWALK CULVERT	

9/24/85

Approved UoT. 9.24.85

[signature]
CITY ENGINEER / AMAFCA

[signature]
Chairman DRB

[illegible] City [illegible]

[signature]
Traffic Engineer 9-24-85

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

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

September 27, 1985

Mr. Joe Jones
D.T.M. & Association, Inc.
2400 Comanche NE
Albuquerque, NM 87110

REF: DRAINAGE REPORT FOR SUMMIT HILLS (J23-~~D2A~~ D9E)

Dear Mr. Jones:

The referenced plan dated 9/19/85 is approved for preliminary plat sign-off.

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

Cordially,

Carlos A. Montoya
City/County Flood Plain

CAM/cl

DRAINAGE INFORMATION SHEET

PROJECT TITLE: SUMMIT HILLS ZONE ATLAS/DRNG. FILE #: J-23 D28

LEGAL DESCRIPTION: Tract A-1, Summit Hills

CITY ADDRESS:

ENGINEERING FIRM: DENNEY-GROSS & ASSOCIATES, INC. CONTACT: Joe Jones

ADDRESS: 2400 Comanche, N.E. PHONE: 884-0696

OWNER: ENTITY CO., INC. CONTACT: Ralph Boone

ADDRESS: 2920 Axtell, Clovis, NM PHONE: 763-3177

ARCHITECT: N/A CONTACT: N/A

ADDRESS: PHONE:

SURVEYOR: DENNEY-GROSS & ASSOCIATES, INC. CONTACT: Steve Youtsey

ADDRESS: 2400 Comanche N.E. PHONE: 884-0696

CONTRACTOR: CONTACT:

ADDRESS: PHONE:

PRE-DESIGN MEETING:

X YES
____ NO
____ COPY OF CONFERENCE RECAP SHEET PROVIDED

85.327 (9/10/85)

DRB No. ~~85-237 (6-14-85)~~
EPC No. 2-88-18
PROJ. No.

TYPE OF SUBMITTAL:

X DRAINAGE REPORT
____ DRAINAGE PLAN
____ CONCEPTUAL GRADING & DRAINAGE PLAN
____ GRADING PLAN
____ EROSION CONTROL PLAN
____ ENGINEER'S CERTIFICATION

CHECK TYPE OF APPROVAL SOUGHT:

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

DATE SUBMITTED: 9/19/85

BY: Joe Jones
JOE JONES

RECEIVED
SEP 19 1985
HYDROLOGY SECTION

dtm & associates, inc
Denney-Tibljas-McLean & Associates, Inc.
Consulting Engineers ■ Planners ■ Surveyors

RECEIVED
SEP 05 1985
HYDROLOGY SECTION

September 5, 1985

Mr. Carlos Montoya
Hydrology Department
City of Albuquerque
123 Central Avenue NW
Albuquerque, NM 87103

Re: Summit Hills Subdivision
(J23-D2A)
DTM Job No. 723.32

Dear Mr. Montoya:

Enclosed for your approval are two copies of the revisions to the drainage and grading plan for the above referenced project.

The comments in your August 22nd, 1985, letter have been addressed as follows:

1. The 18" RCP was constructed under Change Order No. 2 for Project No. 2176.

2. Grades indicated on the plan are proposed for the developing adjacent properties.

3. Additional spots have been added to the plan.

4. An extra copy is enclosed.

5. The calculations have been reviewed and revised.

6. We have determined that there is no downstream capacity. However, the enclosed calculations show that this is an existing problem. Prior to the construction of Summit Hills, the flow at the analysis point was approximately 42 cfs. This resluted in a depth of 1.0 feet for the 100-year flow at the analysis point. Construction in the area has reduced the flow to 16.6 cfs and the depth to 0.66 feet. We propose to discharge an additional 4.3 cfs which will only increas the depth of the 100-year flow by 0.04 feet as shown in the calculations.

If you have any further questions, please feel free to call.

Very truly yours,

Joe Jones

Joe Jones

JJ/am
Enclosure

2400 COMANCHE ROAD, NE ■ ALBUQUERQUE, NM 87107
TELEPHONE (505) 884-0696

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

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

August 22, 1985

Mr. Joe Jones
D.T.M. & Association, Inc.
2400 Comanche NE
Albuquerque, NM 87110

REF: DRAINAGE REPORT FOR SUMMIT HILLS (J23-D2A) RECEIVED AUGUST 15, 1985

Dear Mr. Jones:

I have reviewed the referenced plan and forward the following comments:

1. Please submit the approved work order drawing which shows the 18 inch RCP from the rundown to catch basin number one (1). Indicate the work order number on the drainage plan.

2. Please show grades on the developing property to the east. Show how your property interfaces with this site.

3. Please show more proposed spot elevations on the lots. Especially address lots 3 & 4.

4. The use of the unlined channel shown on Section A is not a standard City section. We will be required to maintain this channel. Please submit two copies of your drainage plan for your next submittal. We will request Dan Hogan to review this channel for his concurrence.

5. The calculations on page 3 show a 6 to 1 side slope and a 0.0267 invert slope. Please review this design with the drainage plan and Section A. Review the velocity of the channel for erosion posibilities.

6. Reducing the developed flows below the existing flows does not relieve the engineer of checking downstream capacity. Please check the capacity of flows at Verbena Place and Snowdrop. We have been receiving complaints on this particular corner.

If you should have any questions, please feel free to call me at 766-7644.

Sincerely,

Carlos A. Montoya
City/County Flood Plain Admin.

CAM:mrk

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

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

July 17, 1985

Mr. Joe Jones
Denny-Gross & Assoc., Inc.
2400 Comanche Rd. NE
Albuquerque, N.M. 87107

RE: DRAINAGE PLAN FOR SUMMIT HILLS TRACT A-1, 8 LOTS (J23/D2A) RECEIVED JUNE 26, 1985.

Dear Mr. Jones:

I have reveiwed the referenced plan and forward the following comments.

1. Please indicate slopes in the back yards for the eight lots. Also, show more proposed elevations for each of the lots.

2. Please show the proposed interface elevations for the adjoining development to the east (Summit Hills) and to the Rebonito site.

3. Mr. Goolsby in his June 24, 1985 letter asked for a cross-section to show the relationship of this development and the existing development to the south. Please supply this cross-section.

4. If CMU walls are to be built between lots how will flows be conveyed through the 3 foot drainage easement?

5. We have complaints of overflowing in the streets at Verbena Pl. and snowdrop. Your discharge from the site will be directed down these streets. Please address street capacity at the intersection of Verbena Pl. and snowdrop.

6. Has the Rebonito Subdivision work order been changed to include 18" RCP from the new site.

If you have any questions, please contact this office at 766-7644.

Sincerely,

Carlos A. Montoya
City/County Flood Plain Admin.

CAM/cl

~~D24~~

DRAINAGE INFORMATION SHEET

PROJECT TITLE: SUMMIT HILLS ZONE ATLAS/DRNG. FILE #: J-23 / D95B

LEGAL DESCRIPTION: Tract A-1, Summit Hills

CITY ADDRESS:

ENGINEERING FIRM: DENNEY-GROSS & ASSOCIATES, INC. CONTACT: Joe Jones

ADDRESS: 2400 Comanche, N.E. PHONE: 884-0696

OWNER: ENTITY CO., INC. CONTACT: Ralph Boone

ADDRESS: 2920 Axtell, Clovis, NM PHONE: 763-3177

ARCHITECT: N/A CONTACT: N/A

ADDRESS: PHONE:

SURVEYOR: DENNEY-GROSS & ASSOCIATES, INC. CONTACT: Steve Youtsey

ADDRESS: 2400 Comanche N.E. PHONE: 884-0696

CONTRACTOR: CONTACT:

ADDRESS: PHONE:

PRE-DESIGN MEETING:

__X__ YES
_____ NO
_____ COPY OF CONFERENCE RECAP SHEET PROVIDED

RECEIVED
JUN 26 1985
HYDROLOGY SECTION

DRB No. _____
EPC No. _____
PROJ. No. _____

TYPE OF SUBMITTAL:

__X__ DRAINAGE REPORT
_____ DRAINAGE PLAN
_____ CONCEPTUAL GRADING & DRAINAGE PLAN
_____ GRADING PLAN
_____ EROSION CONTROL PLAN
_____ ENGINEER'S CERTIFICATION

CHECK TYPE OF APPROVAL SOUGHT:

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

DATE SUBMITTED: 6-26-85

BY: Joe Jones
JOE JONES

NNEY-GROSS & ASSOCIATES, INC.
CONSULTING ENGINEERS
2400 COMANCHE ROAD, N.E.
ALBUQUERQUE, NEW MEXICO 87107
(505) 884-0696

June 26, 1985

Mr. Billy Goolsby
City Hydrology
123 Central Ave. NW
Albuquerque, NM 87104

Re: Summit Hills Drainage Plan
DGA Job No. 723.32

Dear Mr. Goolsby:

Enclosed is a copy of the Drainage and Grading Plan for the above referenced project.

The comment of your June 12, 1985 letter concerning the pipe outlet has been addressed. The drainage stub from the Rebonito Channel will be extended as part of the Rebonito Project to the southwest corner of Summit Hills Subdivision.

We have also reanalyzed the flow in the Archuleta rundown. The developed flow in the rundown was calculated to be 10.6 cfs in the Rebonito Subdivision Drainage Report. Construction of Summit Hills Subdivision will decrease the flow to 9.4 cfs. The enclosed calculations show a normal depth in the channel of 0.21' and a conjugate depth of 0.44' at the outlet of the channel.

If you have any questions please feel free to call.

Sincerely,

Joe Jones

Joe Jones

JJ/bjk
Enclosures

DENNEY - GROSS & ASSOCIATES, INC.
ENGINEERS SURVEYORS PLANNERS
2400 COMANCHE ROAD N.E.
ALBUQUERQUE, NEW MEXICO 87107
(505) 884-0695

LOCATION SUMMIT HILLS
PROJ. NO. 723.32
DATE 6-26-85
DESIGNER J. JONES
PAGE

MANNINGS
CHANNEL
Q=9.40 CFS
YN=0.18 FT
n=0.0130
B=9.30 FT
H/V=0.00
V=5.50 FPS
S=0.02333 F/F
Yc=0.32 FT
Vc=3.19 FPS
Sc=0.00395 F/F

Superelevation

MANNINGS
CHANNEL
Q=9.40 CFS
YN=0.21 FT
n=0.0130
B=9.30 FT
H/V=0.00
V=4.82 FPS
S=0.01510 F/F
Yc=0.32 FT
Vc=3.19 FPS
Sc=0.00395 F/F

Superelevation

MANNINGS
CHANNEL
Q=9.40 CFS
YN=0.09 FT
n=0.0130
B=9.30 FT
H/V=0.00
V=11.56 FPS
S=0.27053 F/F
Yc=0.32 FT
Vc=3.19 FPS
Sc=0.00395 F/F

Superelevation

MANNINGS
CHANNEL
Q=9.40 CFS
YN=0.12 FT
n=0.0130
B=9.30 FT
H/V=0.00
V=8.45 FPS
S=0.09600 F/F
Yc=0.32 FT
Vc=3.19 FPS
Sc=0.00395 F/F

Superelevation

DENNEY - GROSS & ASSOCIATES, INC.
ENGINEERS SURVEYORS PLANNERS
2400 COMANCHE ROAD N.E.
ALBUQUERQUE, NEW MEXICO 87107
(505) 884-0695

LOCATION
PROJ. NO.
DATE
DESIGNER
PAGE

STANDARD
STEP

STA=0.00
Q=9.40
X=0.00
B=9.30
Y=0.32
A=2.98
R=0.30
R†4/3=0.2003
V=3.16
VH=0.1704
Ec=0.4904
dE=0.0000
SF=0.00379
SFa=0.00000
S=0.02333
S-SFa=0.02333
dX=0.0000

STA=6.00
Q=9.40
X=6.00
B=9.30
Y=0.22
A=2.05
R=0.21
R†4/3=0.1249
V=4.59
VH=0.3604
Ec=0.5804
dE=0.0900
SF=0.01286
SFa=0.00833
S=0.02333
S-SFa=0.01500
dX=6.0000

STA=10.00
Q=9.40
X=4.00
B=9.30
Y=0.12
A=1.07
R=0.11
R†4/3=0.0545
V=8.75
VH=1.3073
Ec=1.4229
dE=0.8424
SF=0.10699
SFa=0.05993
S=0.27053
S-SFa=0.21060
dX=4.0000

STA=15.00
Q=9.40
X=5.00
B=9.30
Y=0.10
A=0.89
R=0.09
R†4/3=0.0425
V=10.58
VH=1.9115
Ec=2.0070
dE=0.5842
SF=0.20040
SFa=0.15369
S=0.27053
S-SFa=0.11684
dX=5.0000

STA=20.00
Q=9.40
X=5.00
B=9.30
Y=0.09
A=0.84
R=0.09
R†4/3=0.0393
V=11.24
VH=2.1570
Ec=2.2469
dE=0.2399
SF=0.24471
SFa=0.22256
S=0.27053
S-SFa=0.04797
dX=5.0000

STA=25.00
Q=9.40
X=5.00
B=9.30
Y=0.09
A=0.82
R=0.09
R†4/3=0.0383
V=11.47
VH=2.2457
Ec=2.3338
dE=0.0869
SF=0.26158
SFa=0.25315
S=0.27053
S-SFa=0.01738
dX=5.0000

STA=30.00
Q=9.40
X=5.00
B=9.30
Y=0.10
A=0.95
R=0.10
R†4/3=0.0466
V=9.86
VH=1.6604
Ec=1.7629
dE=-0.5709
SF=0.15878
SFa=0.21018
S=0.09600
S-SFa=-0.11418
dX=5.0000

STA=35.00
Q=9.40
X=5.00
B=9.30
Y=0.13
A=1.17
R=0.12
R†4/3=0.0605
V=8.07
VH=1.1115
Ec=1.2368
dE=-0.5261
SF=0.08186
SFa=0.12032
S=0.01510
S-SFa=-0.10522
dX=5.0000

STA=40.00
Q=9.40
X=5.00
B=9.30
Y=0.14
A=1.34
R=0.14
R†4/3=0.0728
V=6.99
VH=0.8353
Ec=0.9298
dE=-0.2570
SF=0.05112
SFa=0.06649
S=0.01510
S-SFa=-0.05139
dX=5.0000

STA=50.00
Q=9.40
X=10.00
B=9.30
Y=0.18
A=1.63
R=0.17
R†4/3=0.0937
V=5.75
VH=0.5651
Ec=0.7408
dE=-0.2390
SF=0.02688
SFa=0.03900
S=0.01510
S-SFa=-0.02390
dX=10.0000

DENNEY - GROSS & ASSOCIATES, INC.
ENGINEERS SURVEYORS PLANNERS
2400 COMANCHE ROAD N.E.
ALBUQUERQUE, NEW MEXICO 87107
(505) 884-0695

LOCATION
PROJ. NO.
DATE
DESIGNER
PAGE

STA=60.00
Q=9.40
X=10.00
B=9.30
Y=0.19
A=1.80
R=0.19
R↑4/3=0.1060
V=5.22
VH=0.4659
Ec=0.6594
dE=-0.0013
SF=0.01959
SFa=0.02323
S=0.01510
S-SFa=-0.00813
dX=10.0000

STA=70.00
Q=9.40
X=10.00
B=9.30
Y=0.20
A=1.88
R=0.19
R↑4/3=0.1123
V=4.99
VH=0.4256
Ec=0.6281
dE=-0.0314
SF=0.01689
SFa=0.01824
S=0.01510
S-SFa=-0.00314
dX=10.0000

STA=80.00
Q=9.40
X=10.00
B=9.30
Y=0.21
A=1.92
R=0.20
R↑4/3=0.1152
V=4.89
VH=0.4090
Ec=0.6156
dE=-0.0125
SF=0.01582
SFa=0.01635
S=0.01510
S-SFa=-0.00125
dX=10.0001

STA=90.00
Q=9.40
X=10.00
B=9.30
Y=0.21
A=1.94
R=0.20
R↑4/3=0.1165
V=4.85
VH=0.4022
Ec=0.6105
dE=-0.0051
SF=0.01539
SFa=0.01561
S=0.01510
S-SFa=-0.00051
dX=10.0000

STA=100.00
Q=9.40
X=10.00
B=9.30
Y=0.21
A=1.94
R=0.20
R↑4/3=0.1170
V=4.84
VH=0.3994
Ec=0.6084
dE=-0.0021
SF=0.01522
SFa=0.01531
S=0.01510
S-SFa=-0.00021
dX=10.0000

STA=110.00
Q=9.40
X=10.00
B=9.30
Y=0.21
A=1.95
R=0.20
R↑4/3=0.1172
V=4.83
VH=0.3983
Ec=0.6076
dE=-0.0008
SF=0.01515
SFa=0.01518
S=0.01510
S-SFa=-0.00008
dX=10.0001

STA=115.00
Q=9.40
X=5.00
B=9.30
Y=0.21
A=1.95
R=0.20
R↑4/3=0.1172
V=4.83
VH=0.3980
Ec=0.6074
dE=-0.0002
SF=0.01513
SFa=0.01514
S=0.01510
S-SFa=-0.00004
dX=5.0000

STA=123.00
Q=9.40
X=8.00
B=9.30
Y=0.22
A=2.06
R=0.21
R↑4/3=0.1261
V=4.56
VH=0.3550
Ec=0.5767
dE=-0.0307
SF=0.01255
SFa=0.01384
S=0.01060
S-SFa=-0.00384
dX=8.0000

CONJUGATE
DEPTH
Q=9.40 CFS
BW=9.30 FT
H/V=0.00
Y1=0.22 FT
V1=4.56 FPS
Y2=0.44 FT
V2=2.32 FPS

CITY OF ALBUQUERQUE

ALBUQUERQUE, NEW MEXICO

INTER-OFFICE CORRESPONDENCE REF. NO._____

June 24, 1985

TO: Richard Dineen, Chairman; D.R.B.

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

SUBJECT: COMMENTS FOR JULY 2, 1985 DRB PUBLIC HEARING

S-85-17
DRB-85-327:

The DRB number on application and legal description of the request is incorrect, it should be DRB-85-327.

1. City Surveyor's signature is required prior to preliminary and final plat approval.

2. The drainage scheme has been approved conceptually; however, prior to preliminary plat approval, drainage report will be required addressing comments submitted to the developer's engineer on June 24, 1985.

3. A listing of the required public/private infrastructures (approved by DRB) will be a requirement for preliminary plat approval.

4. An executed Subdivision Improvements Agreement will be required for final plat approval.

J-23/D2A: Drainage Report for Preliminary Plat submitted May 22, 1985. Approved as to concept (June 12, 1985).

FJA/bsj

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

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

June 24, 1985

Mr. Gary Tibljas
Denney-Gross & Associates, Inc.
2400 Comanche Road NE
Albuquerque, NM 87107

REF: DRAINAGE MANAGEMENT PLAN FOR SUMMIT HILLS SUBDIVISION TRACT A-1
(J23-D2A) RECEIVED MAY 22, 1985

Dear Gary:

I am hereby forwarding this letter as clarification of my previous letter dated June 12, 1985.

I had indicated that I had agreed with the concept of the proposed drainage management. However, I qualified that other conditions would change the plan, whereby, preliminary plat approval cannot be granted at this time. The previously mentioned concerns will need to be addressed. Also, since the proposed outfall configuration is not available, the required listing of infrastructures for preliminary plat approval will have to be revised. Another item of concern that was not previously mentioned in my letter is that there is a significant difference in grade along the south property line, please provide a cross section to show the relationship of this development and the existing development to the south. It will be required that a section be provided to clearly show this condition and address as to how it will be resolved.

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

Sincerely,

Billy J. Goolsby

Billy J. Goolsby, PE
Civil Engineer/Hydrology

BJG:mrk

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

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

June 12, 1985

Mr. Gary Tibljas
Denney-Gross & Associates, Inc.
2400 Comanche Road NE
Albuquerque, NM 87107

REF: DRAINAGE MANAGEMENT PLAN FOR SUMMIT HILLS SUBDIVISION TRACT A-1 (J23-D2A)
RECEIVED MAY 22, 1985

Dear Gary:

I have reviewed the above referenced submittal and do agree with the concept; however, it has been brought to my attention that the proposed outlet as identified has been changed. Also, a concerned citizen that lives just south and west of the proposed development has issued a complaint concerning the increased flow in Verbena Place that is flooding his driveway and yard.

Please address and or clarify the above referenced issues. Should you have any questions or comments, please call this office at 766-7644.

Sincerely,

Billy J. Goolsby

Billy J. Goolsby, PE
Civil Engineer/Hydrology

BJG:mrk

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

PRE-DESIGN CONFERENCE RECAP

HYDROLOGY SECTION PROJECT NO.: J-23 DATE: 5/3/85

PLANNING DIVISION NOS. EPC: _____ DRB: _____

SUBJECT: Renonito 2 - 8 Lots

LEGAL DESCRIP.: Tract A-1 of Summit Hills Subd.

APPROVAL REQUESTED

X	PRELIMINARY PLAT	X	FINAL PLAT
____	SITE DEVELOPMENT PLAN	____	BUILDING PERMIT
X	City Work Order Process ROUGH GRADING		

ATTENDANCE:	WHO:	REPRESENTING:
	Joe Jones	Denny Gross & Assoc.
	Billy Goolsby	City

X Approved ~~Conceptual~~ Drainage Plan/~~Report~~ required for Preliminary Plat ~~and/or Site Development Plan~~ sign-off.

____ Approved Drainage Plan/Report required for Final Plat and/or Building Permit sign-off.

X Subdivision Improvements Agreement or Financial Security required.

FINDINGS: ① Detailed grading plan per DPM will be required for review & approval prior to Construction Plan sign-off. ② Discharge to correspond to existing downstream Reponito Drainage Report ③ Listing of required infrastructure to accompany preliminary plat application

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

SIGNED:	Billy J. Goolsby	SIGNED:	Joe Jones
TITLE:	CE/Design Hydrology	TITLE:	
DATE:	5/3/85	DATE:	5/3/85

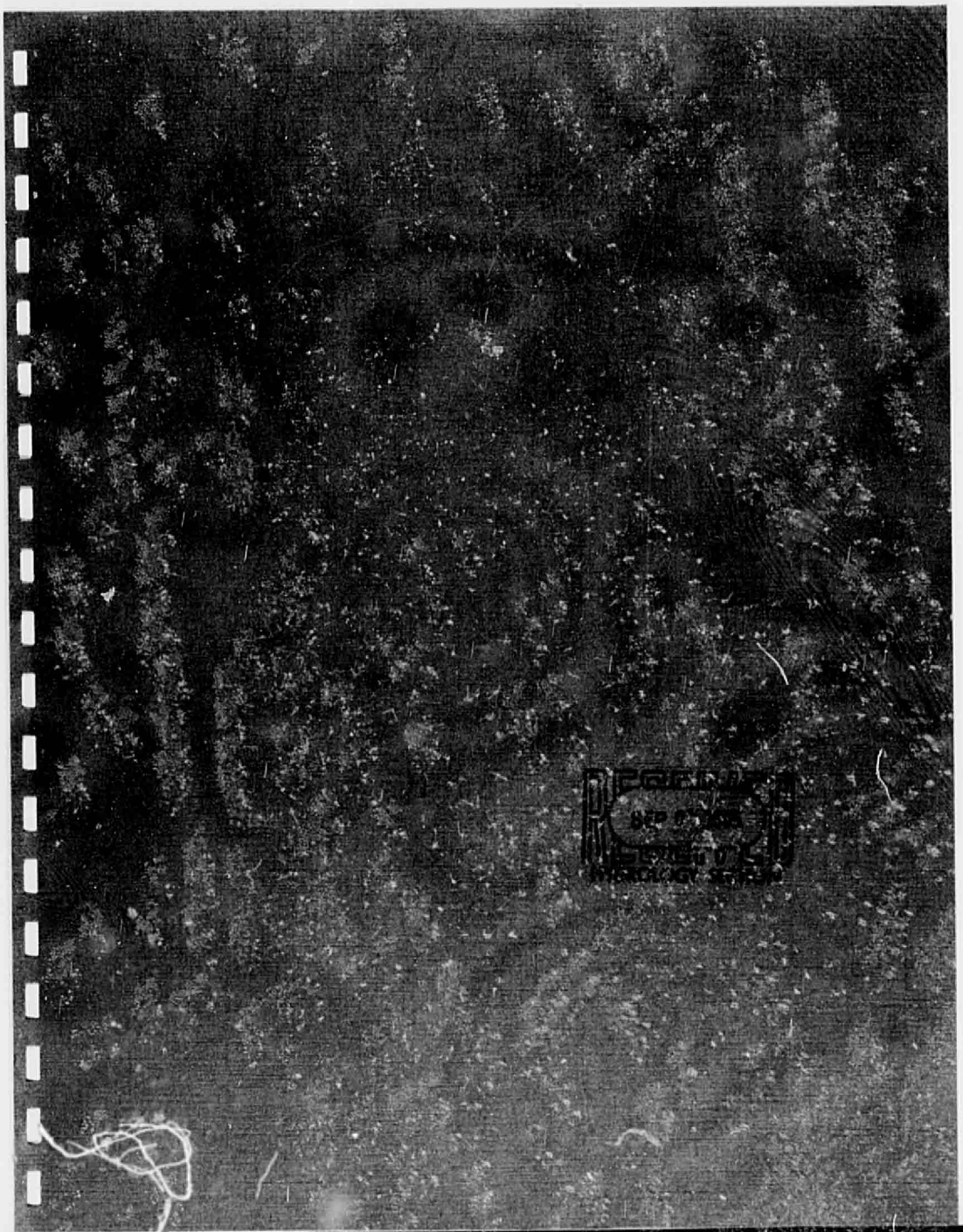
NOTE PLEASE PROVIDE A COPY OF THIS RECAP WITH THE DRAINAGE SUBMITTAL

DRAINAGE MANAGEMENT PLAN
SUMMIT HILLS SUBDIVISION
TRACT A-1

PREPARED FOR:
ENTITY CO., INC.

AUGUST, 1985
DGA JOB NO. 723.32

PREPARED BY:
DENNEY-TIBLJAS-MCLEAN & ASSOCIATES, INC.
Consulting Engineers
2400 Comanche Road Northeast
Albuquerque, New Mexico 87107



DRAINAGE INFORMATION SHEET

PROJECT TITLE: SUMMIT HILLS ZONE ATLAS/DRNG. FILE #: J-23

LEGAL DESCRIPTION: Tract A-1, Summit Hills

CITY ADDRESS: _____

ENGINEERING FIRM: DENNEY-TIBLJAS-MCLEAN & ASSOC, INC. CONTACT: Joe Jones

ADDRESS: 2400 Comanche, N.E. PHONE: 884-0696

OWNER: ENTITY CO., INC. CONTACT: Ralph Boone

ADDRESS: 2920 Axtell, Clovis, NM PHONE: 763-3177

ARCHITECT: N/A CONTACT: N/A

ADDRESS: _____ PHONE: _____

SURVEYOR: DENNEY-TIBLJAS-MCLEAN & ASSOCIATES, INC. CONTACT: Fred Denney

ADDRESS: 2400 Comanche N.E. PHONE: 884-0696

CONTRACTOR: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

PRE-DESIGN MEETING:

___X___ YES
_____ NO
___X___ COPY OF CONFERENCE RECAP SHEET PROVIDED

RECEIVED
SEP 05 1985
HYDROLOGY SECTION

DRB No. _____
EPC No. _____
PROJ. No. _____

TYPE OF SUBMITTAL:

___X___ DRAINAGE REPORT
_____ DRAINAGE PLAN
_____ CONCEPTUAL GRADING & DRAINAGE PLAN
_____ GRADING PLAN
_____ EROSION CONTROL PLAN
_____ ENGINEER'S CERTIFICATION

CHECK TYPE OF APPROVAL SOUGHT:

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

DATE SUBMITTED: 8/15/85

BY: Joe Jones
JOE JONES

DRAINAGE INFORMATION SHEET

PROJECT TITLE: SUMMIT HILLS ZONE ATLAS/DRNG. FILE #: J-23

LEGAL DESCRIPTION: Tract A-1, Summit Hills

CITY ADDRESS:

ENGINEERING FIRM: DENNEY-TIBLJAS-MCLEAN & ASSOC, INC. CONTACT: Joe Jones

ADDRESS: 2400 Comanche, N.E. PHONE: 884-0696

OWNER: ENTITY CO., INC. CONTACT: Ralph Boone

ADDRESS: 2920 Axtell, Clovis, NM PHONE: 763-3177

ARCHITECT: N/A CONTACT: N/A

ADDRESS: PHONE:

SURVEYOR: DENNEY-TIBLJAS-MCLEAN & ASSOCIATES, INC. CONTACT: Fred Denney

ADDRESS: 2400 Comanche N.E. PHONE: 884-0696

CONTRACTOR: CONTACT:

ADDRESS: PHONE:

RECEIVED
SEP 05 1985
HYDROLOGY SECTION

PRE-DESIGN MEETING:

___X___ YES
_____ NO
_____ COPY OF CONFERENCE RECAP SHEET PROVIDED

DRB No. _____
EPC No. _____
PROJ. No. _____

TYPE OF SUBMITTAL:

___X___ DRAINAGE REPORT
_____ DRAINAGE PLAN
_____ CONCEPTUAL GRADING & DRAINAGE PLAN
_____ GRADING PLAN
_____ EROSION CONTROL PLAN
_____ ENGINEER'S CERTIFICATION

CHECK TYPE OF APPROVAL SOUGHT:

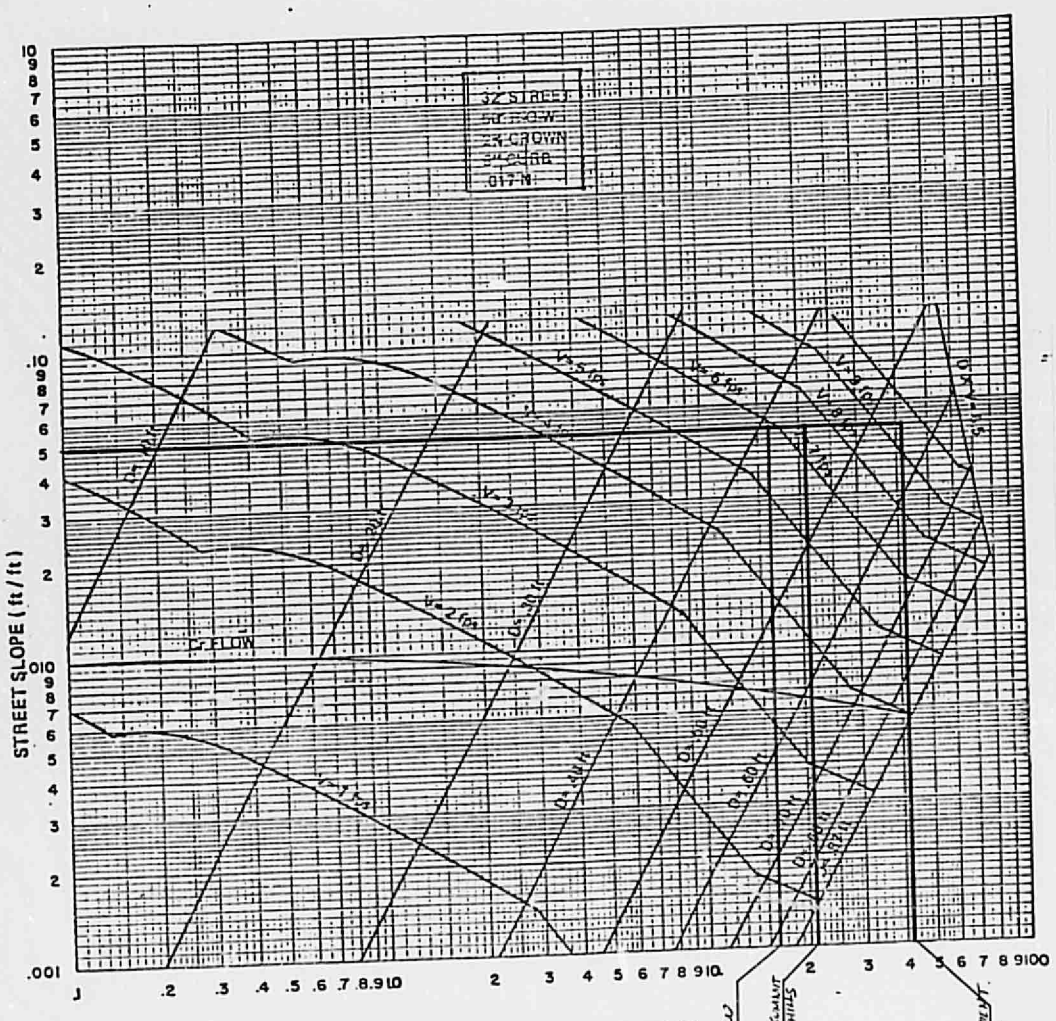
_____ SKETCH PLAT APPROVAL
___X___ PRELIMINARY PLAT APPROVAL
_____ SITE DEVELOPMENT PLAN APPROVAL
_____ FINAL PLAT APPROVAL
_____ BUILDING PERMIT APPROVAL
_____ FOUNDATION PERMIT APPROVAL
_____ CERTIFICATE OF OCCUPANCY APPROVAL
_____ ROUGH GRADING PERMIT APPROVAL
_____ GRADING/PAVING PERMIT APPROVAL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

DATE SUBMITTED: 9-5-85

BY: Joe Jones
JOE JONES

STREET CAPACITY

VERBENA @ SNOWDROP



INITIAL STREET FLOWS (cfs)

PLATE 22.3 D-1

REV. 3-83

DENNEY - GROSS & ASSOCIATES, INC.
ENGINEERS SURVEYORS PLANNERS
2400 COMANCHE ROAD N.E.
ALBUQUERQUE, NEW MEXICO 87107
(505) 884-0695

LOCATION SUMMIT HILLS
PROJ. NO. 7233
DATE 9-3-85
DESIGNER J. JONES
PAGE 3 (REVISED)

CAPACITY OF CHANNEL @ S. WELLS

SECTION A-A

$Q = 2.5$ cfs

Manning's

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

$S = 0.0247$
$n = 0.025$

$2.5 = \frac{1.486}{0.025} (.0247)^{1/2} AR^{2/3}$

$AR^{2/3} = 0.26$

d = DEPTH OF 100 YR. FLOW

TRY $d = 0.32'$

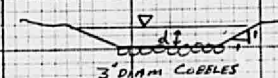
$A = \frac{1}{2}(1.92)(.32) = 0.61$

$R = A/p = 0.31$ $\quad AR^{2/3} = 0.28$ (OK)

$V = Q/A = 2.5/0.61 = 4.1$ fps

$Q = 2.5$ cfs
$S = 0.076$

$2.5 = \frac{1.486}{0.025} (0.076)^{1/2} AR^{2/3}$



SECTION D-D

$AR^{2/3} = 0.153$

TRY $d = 0.22'$

$A = \frac{1}{2}(2 + 2.44)(.22) = 0.49$

$R = A/p = 0.49/2.5 = 0.2$

$AR^{2/3} = 0.16$ (OK)

$V = Q/A = 2.5/0.49 = 5.1$ fps

USE 3" COBBLES FOR EROSION CONTROL.

DENNEY - GROSS & ASSOCIATES, INC.
ENGINEERS SURVEYORS PLANNERS
2400 COMANCHE ROAD N.E.
ALBUQUERQUE, NEW MEXICO 87107
(505) 884-0695

LOCATION SUMMIT HILLS
PROJ. NO. 723.32
DATE 9-3-85
DESIGNER J JONES
PAGE 5

SUPERELEVATION

VERBENA @ SNOWDROP

$S = \frac{1.15 V^2 (b + 2Z D)}{2gR}$ (DPM 22.3 Pg 59)

DEPTH:

BEFORE DEVELOPMENT OF SUMMIT HILLS

$Q = 42.0$ cfs $d = 0.55'$ $V = 9.5$ fps (DPM 22.3 D-1)

Z = COT OF BANK SLOPE : ASSUME BANK SLOPE = 22.5°
B = CHANNEL BOTTOM WIDTH $\cong$ 20'
R = RADIUS OF CURVE $\cong$ 185'

$S = 1.3 \frac{(9.5)^2 (20 + 2(\cot 22.5)(0.55))}{(32.2)(185)}$

$S = 0.45'$

TOTAL DEPTH OF FLOW = $S + d = 0.45 + .55 = 1.0'$

DEPTH:

AFTER DEV. BUT NOT INCLUDING FLOW FROM SUMMIT HILLS

$Q = 16.6$ cfs $d = 0.42'$ $V = 7.0$ fps

$S = 1.3 \frac{(7)^2 (20 + 2(\cot 22.5)(.42))}{(32.2)(185)}$

$S = 0.24'$

TOTAL DEPTH OF FLOW = $S + d = .24 + .42 = 0.66'$

DEPTH:

INCLUDING SUMMIT HILLS

$Q = 20.9$ cfs $d = 0.44'$ $V = 7.4$ fps

$S = 1.3 \frac{(7.4)^2 (20 + 2(\cot 22.5)(0.44))}{(32.2)(185)}$

$S = 0.26'$

TOTAL DEPTH OF FLOW = $S + d = 0.26 + 0.44 = 0.70'$

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

PRE-DESIGN CONFERENCE RECAP

HYDROLOGY SECTION PROJECT NO.: J-23 DATE: 5/3/85

PLANNING DIVISION NOS. EPC: _____ DRB: _____

SUBJECT: Rebonito 2 -- 8 Lots

LEGAL DESCRIP.: Tract A-1 of Summit Hills Subd.

APPROVAL REQUESTED

X PRELIMINARY PLAT — X FINAL PLAT

_____ SITE DEVELOPMENT PLAN — _____ BUILDING PERMIT

X City Work Order Process ROUGH GRADING

	WHO:	REPRESENTING:
ATTENDANCE:	Joe Jones	Denny-Gross & Assoc.
	Billy Goolsby	City

X Approved ~~Accepted~~ Drainage Plan/~~Report~~ required for Preliminary Plat ~~and/or Site Development Plan~~ sign-off.

_____ Approved Drainage Plan/Report required for Final Plat and/or Building Permit sign-off.

X Subdivision Improvements Agreement or Financial Security required.

FINDINGS: ① Detailed grading plan per D.P.M. will be required for review & approval prior to Construction Plan sign-off. ② Discharge to correspond to existing downstream Rebonito Drainage Report. ③ Listing of required infrastructure to accompany preliminary plat application.

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

SIGNED:	Billy J. Goolsby	SIGNED:	Joe Jones
TITLE:	CE/Design Hydrology	TITLE:	
DATE:	5/3/85	DATE:	5/3/85

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

I, Gary W. Tibljas, hereby certify that the enclosed documents and drawings were prepared under my supervision and are true and correct to the best of my knowledge and belief.

New Mexico Professional Engineer No. 8117

TABLE OF CONTENTS

	Page No.
PURPOSE.	1
GENERAL.	1
DRAINAGE	1
CONCLUSION	2
CALCULATIONS	
APPENDIX	
EXHIBIT I - LOCATION MAP	
EXHIBIT II - F.E.M.A. FLOOD PLAIN MAP	
EXHIBIT III - GRADING AND DRAINAGE PLAN	

SUMMIT HILLS SUBDIVISION
TRACT A-1
DRAINAGE MANAGEMENT PLAN

PURPOSE

The purpose of this report is to determine an effective storm-water management plan for Summit Hills Subdivision, Tract A-1.

GENERAL

Summit Hills Subdivision, Tract A-1, consists of 8 lots and is located at the southern cul-de-sac end of Wells Drive Northeast. (See Exhibit I.) Drainage for this tract has already been established within the Rebonito Subdivision Drainage Report, portions of which are included in the Appendix of this report.

Presently, there are two subdivisions under construction adjacent to Tract A-1. Rebonito Subdivision is adjacent to the north and west of Tract A-1, while Summit Hills is adjacent to the east. The construction of these two subdivisions has resulted in that no offsite flows will cross Tract A-1.

The soil on this site is of the Tesajo Series Type "C", and the site is not located within a Flood Plain. (See Exhibit II.)

DRAINAGE

Presently the development site drains from the northeast to the southwest, and all flows enter the Archuleta Rundown.

The site will be graded such that the eastern most lots will drain into the street and the runoff will flow south to an earthen

channel. The western most lots will be graded to drain to an earthen channel located within a drainage easement along the rear of the lots. (See Exhibit III)

These two channels carry a total flow of 4.3 cfs and intersect at a single Type "D" catch basin at the southwest corner of the site. The catch basin will connect to an existing 18" RCP Stub located at the property line. This stub was installed specifically for Summit Hills and drains into the Rebonito Channel.

The total discharge from Tract A-1 entering the Rebonito Channel is 4.3 cfs. An additional 5.1 cfs from Archuleta drive also enters the Channel. This total runoff of 9.4 cfs flows into the Archuleta Rundown and into Verbena Place.

Runoff entering the Archuleta Rundown was analyzed at 10.6 cfs within the approved Rebonito Subdivision Drainage Report. (See Appendix) Development in the area has decreased this runoff to 9.4 cfs. Since the flow has decreased, the Archuleta Rundown has not been reanalyzed.

CONCLUSION

Drainage patterns for the proposed development area have already been established within the Rebonito Subdivision Drainage Report. Although a few changes in design have been made, this report follows the concept of the Rebonito Report. The major difference is that earthen channels and one catch basin will now be used instead of a concrete drainage channel.

DENNEY · GROSS & ASSOCIATES, INC.
ENGINEERS SURVEYORS PLANNERS
3400 COMANCHE ROAD N.E.
ALBUQUERQUE, NEW MEXICO 87107
(505) 884-0695

LOCATION TRACT A-1 SUMMIT HILLS
PROJ. NO. 77337
DATE 5-6-85
DESIGNER J JONES
PAGE 1

A = 1.99 ACRES — UNDEVELOPED RUNOFF

0% IMPERVIOUS
C = 0.16 (DPM 22.2 C-1)

SOIL SERIES Tc TYPE "C" "SOIL SURVEY OF BERNALILLO COUNTY"

L = 400'
S = 0.0675

$T_c = \frac{0.0078 (400)^{0.77}}{(0.0675)^{0.385}}$

T_c = 2.2 MIN. USE T_c = 10 MIN

R = 2.6 INCHES (DPM 22.2 D-1)

$i = 6.84(2.6)(10)^{-0.51} = 5.5$

$Q = CiA$ $Q = 0.16(5.5)(1.99) =$ 1.75 CFS UNDEVELOPED RUNOFF

DEVELOPED RUNOFF

% IMPERVIOUS

PAD = 50 X 50 = 2500 SF
DRIVE = 20 X 10 = 200 SF
STREET = 70 X 20 = 1400 SF
TOTAL IMPERVIOUS = 4100 SF

LOT + ROW = 9310 SF

$\frac{4100}{9310} = 0.44 =$ 44 % IMPERVIOUS .·. C = 0.39

$Q = CiA = 0.39(5.5)(1.99) =$ 4.3 CFS DEVELOPED RUNOFF

DENNEY - GROSS & ASSOCIATES, INC.
ENGINEERS SURVEYORS PLANNERS
2400 COMANCHE ROAD N.E.
ALBUQUERQUE, NEW MEXICO 87107
(505) 884-0695

LOCATION SUMMIT HILL TRACT-1
PROJ. NO. 723.32
DATE 5-9-85
DESIGNER J. JONES
PAGE 2

LOTS 1-4 (DRAIN TO STREET)

A = 1.1631 Ac
i = 5.5 (SEE SHT 1)
C = 0.39

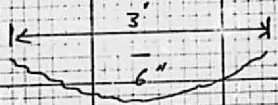
$Q = CiA = 0.39(5.5)(1.1631) = 2.5$ cfs

NOTE: 2.5 cfs WILL DRAIN INTO A SIDEWALK CULVERT LOCATED IN COL-DE-SAC.

LOTS 6-8 (DRAIN TO REAR OF LOT INTO DRAINAGE EASEMENT)

A = 0.8223
C = 0.39
i = 5.5

$Q = CiA = 0.39(5.5)(0.8223) = 1.8$ cfs



DRAINAGE EASEMENT ALONG WEST BOUNDARY

MANNING'S

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

Q = 1.8 cfs
n = 0.025
S = 0.03

$1.8 = \frac{1.486}{0.025}(0.03)^{.5} AR^{2/3}$

$AR^{2/3} = 0.17$

TRY d = 0.42'

A = 0.53 ft²
R = 0.18

$AR^{2/3} = 0.53(0.18)^{2/3} = 0.17$ (OK)

CONCLUSION: MAXIMUM DEPTH OF FLOW IN THE DRAINAGE EASEMENT IS 0.42'.

Q = VA
1.8 = V(.53) V = 3.4 fps

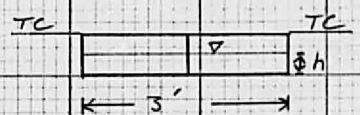
DENNEY - GROSS & ASSOCIATES, INC.
ENGINEERS SURVEYORS PLANNERS
2400 COMANCHE ROAD N.E.
ALBUQUERQUE, NEW MEXICO 87107
(505) 884-0695

LOCATION SUMMIT HILL TRACT A-1
PROJ. NO. 723.32
DATE 8-14-85
DESIGNER J JONES
PAGE 3

SIDEWALK CULVERT CAPACITY

$Q = 2.5$ cfs

WEIR EQUATION



$Q = CLh^{3/2}$

$L = 3'$
$C = 3.0$

$2.5 = 3.0(3)(h)^{3/2}$

$h = 0.42'$ (OK)

CAPACITY OF CHANNEL AT SOUTH OF WELLS DR.

$Q = 2.5$ cfs

MANNING'S

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

$S = 0.0267$ (min)
$n = 0.025$

TRY $d = 0.48'$

$A = \frac{1}{2}(.48)(2.88) = 0.69$ SF

$R = \frac{A}{P} = 0.23$

$Q = \frac{1.486}{0.025}(.026)^{1/2}(0.69)(0.23)^{.67}$

$Q = 2.5$ cfs (OK)

$V = 3.6$ FPS

CONCLUSION:

MAXIMUM DEPTH OF FLOW IN CHANNEL IS 0.48'.

DENNEY - GROSS & ASSOCIATES, INC.
ENGINEERS SURVEYORS PLANNERS
2400 COMANCHE ROAD N.E.
ALBUQUERQUE, NEW MEXICO 87107
(505) 884-0695

LOCATION SUMMIT HILLS
PROJ. NO. 723.32
DATE 8-14-85
DESIGNER J JONES
PAGE 4

CATCH BASIN CAPACITY (SUMP CONDITION)

CHECK CRITICAL DEPTH

$F^2 = \frac{V^2}{gd} = 1$ @ CLITICAL DEPTH

$V = \frac{Q}{A_o}$

$\left(\frac{4.3}{4.69}\right)^2 = 32.2d$

$Q = 4.3$ cfs

OPEN AREA $= A_o = 4.69$ SF

$d = 0.03'$ DEPTH OF WATER ABOVE CATCH BASIN GRATE

$g = 32.2$

CAPACITY OF 18" RCP

MANNING'S

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

$Q = 4.3$ cfs
$n = 0.013$
$S = 0.041Z$

$4.3 = \frac{1.486}{0.013}(.041Z)^{1/2} AR^{2/3}$ $\quad AR^{2/3} = 0.185$

TRY $D/2 = 0.31$ (DPM 22.3 B-6)

$A = 0.47$
$R = 0.26$ $\quad AR^{2/3} = 0.19$ (OK)
$\therefore D = 1.5(.31)$

$D = 0.47'$ $\quad V = 9.1$ FPS

CONCLUSION:

18" RCP FLOWS APPROXIMATELY 1/3 FULL.

DENNEY - GROSS & ASSOCIATES, INC.
ENGINEERS SURVEYORS PLANNERS
2400 COMANCHE ROAD N.E.
ALBUQUERQUE, NEW MEXICO 87107
(505) 884-0005

LOCATION
PROJ. NO.
DATE
DESIGNER
PAGE 26 (REV NOV 8, 1984)

POINT 1B - AT SOUTH END of ALCHULETA

DRAINAGE AREA ABOVE EASEMENT (ALL TR - C = 0.37)

$\frac{204 + 203 + 202}{3}$ = 203 P.U. = 115,121 SF = 2.7 AC

ASSUME t_c = 10 MIN ⇒ I = 5.50

Q_{100} = 0.37 (5.50) (2.7) = 5.5 CFS (THROUGH EASEMENT 6)

Q - TOTAL AREA = 10.6 CFS (from p.)

Q ON ALCHULETA = 10.6 - 5.5 = 5.1 CFS (CONFINED TO W. FLOWLINE)

S - WEST SIDE of ALCHULETA = 0.011

FROM P. A-5 APPENDIX: V = 2.8 FPS, d = 0.39' < 0.5 OK

d x V = 0.39 (2.8) = 1.1 < 6.5 OK

TOTAL Q THROUGH SUNDOWN S END of ALCHULETA

= 5.5 + 5.1 = 10.6 CFS

DENNEY - GROSS & ASSOCIATES, INC.
ENGINEERS SURVEYORS PLANNERS
2400 COMANCHE ROAD N.E.
ALBUQUERQUE, NEW MEXICO 87107
(505) 884-0695

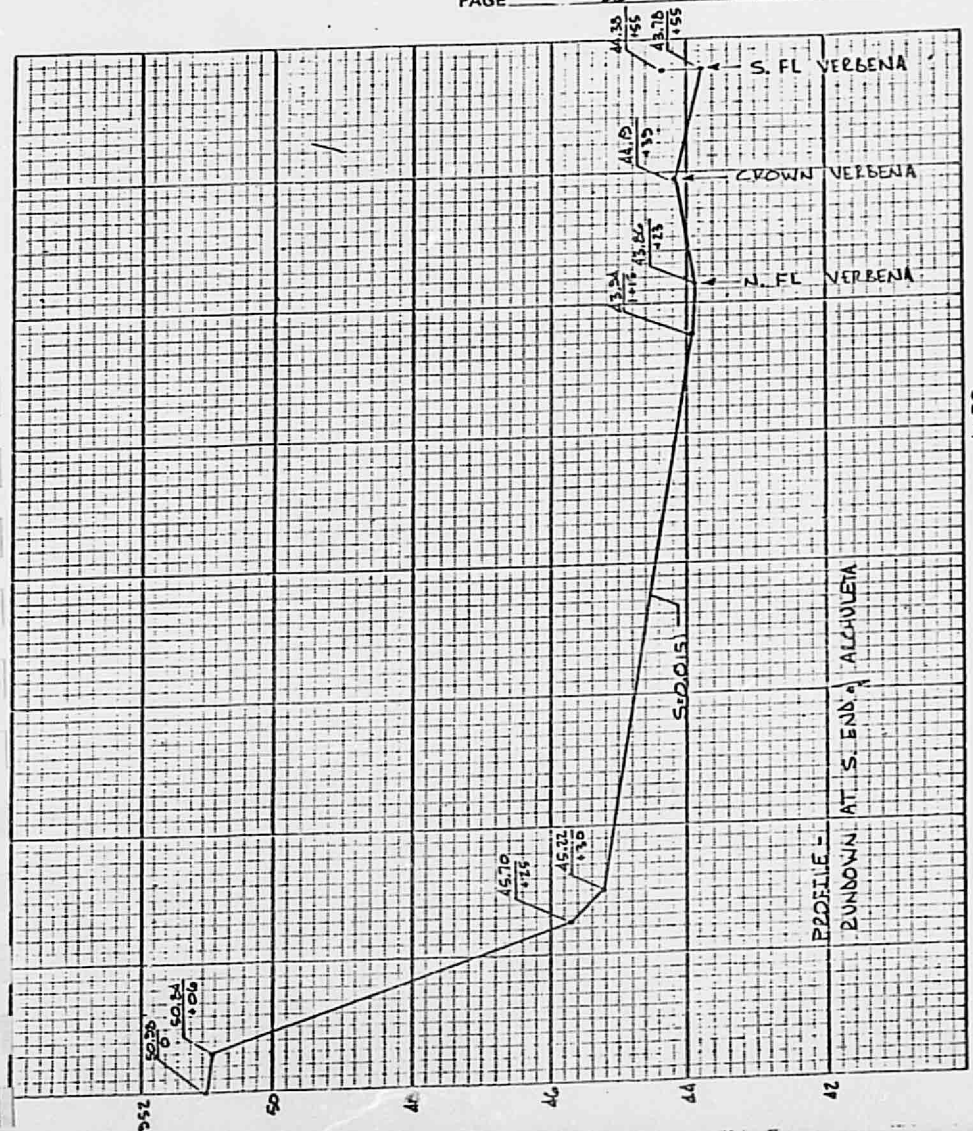
LOCATION _____

PROJ. NO. _____

DATE _____

DESIGNER _____

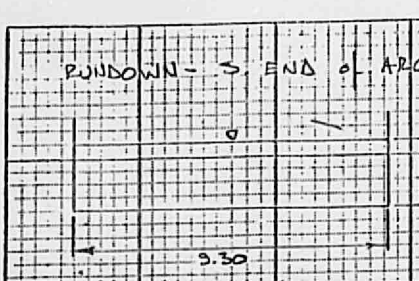
PAGE 28



I ENNEY - GROSS & ASSOCIATES, INC.
E IGINEERS SURVEYORS PLANNERS
2400 COMANCHE ROAD N.E.
ALBUQUERQUE, NEW MEXICO 87107
(505) 884-0695

LOCATION
PROJ. NO.
DATE
DESIGNER
PAGE 25

RUNDOWN - 3, END of ARCHULETA (SEE PROFILE p. 28)



SECTION

ANALYZE REACH WITH S = 0.0151

$Q = \frac{1.486}{n} A r^{\frac{2}{3}} s^{\frac{1}{2}} \Rightarrow A r^{\frac{2}{3}} = \frac{Qn}{1.486 s^{\frac{1}{2}}}$

Q = 10.6 CFS (from p. 26)

n = 0.013 (POURED CONCRETE)

$A r^{\frac{2}{3}} = \frac{10.6(0.013)}{1.486(0.0151)^{\frac{1}{2}}} = 0.755$

A = 9.30d

WP = 2d + 9.30

for d = 0.23':

A = 9.30(0.23) = 2.14 sf

WP = 2(0.23) + 9.30 = 9.76'

$r = \frac{2.14}{9.76} = 0.219$

$A r^{\frac{2}{3}} = 2.14(0.219)^{\frac{2}{3}} = 0.778 > 0.755$ OK

$V = \frac{1.486}{n} r^{\frac{2}{3}} s^{\frac{1}{2}} = \frac{1.486}{0.013}(0.219)^{\frac{2}{3}}(0.0151)^{\frac{1}{2}} = 5.10$ FPS

$d + \frac{v^2}{2g} = 0.23 + \frac{(5.10)^2}{2(32.2)} = 0.63$

I ENNEY - GROSS & ASSOCIATES, INC.
ENGINEERS SURVEYORS PLANNERS
2400 COMANCHE ROAD N.E.
ALBUQUERQUE, NEW MEXICO 87107
(505) 884-0095

LOCATION
PROJ. NO.
DATE
DESIGNER
PAGE 30

CROWN ON VERBENA = 44.19 - 43.86 = 0.33

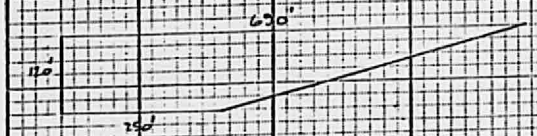
ASSUME FLOWS ≤ d = 0.33 STAY IN N FLOWLINE of VERBENA, REMAINDER CROSSES TO S FLOWLINE

S - VERBENA = $\frac{4}{110}$ = 0.0364

FROM PLATE 22.3 D-1 (for d = 0.33): Q = 6.8 CFS, V = 4.2 FPS

Q CROSSING TO S FLOWLINE = 10.6 - 6.8 = 3.8 CFS

NOW ADD OFFSITE FLOWS IN VERBENA:



DRAINAGE AREA = $\frac{250+630}{2}$ (120) = 56,400 SF = 1.3 AC

SOIL TYPE - TE (C = 0.37)

ASSUME t_c = 10 MIN ⇒ I = 5.50

Q = 0.37 (5.50)(1.3) = 2.6 CFS

FROM PLATE 22.3 D-1: V = 3.3 FPS, d = 0.26

NORTH FLOWLINE: 2.6 + 6.8 = 9.4 CFS

ASSUME FLOWS WITH d ≤ 0.33 STAY IN N. FLOWLINE of VERBENA, REMAINDER CROSSES TO SOUTH FLOWLINE

FROM PLATE 22.3 D-1: Q = 6.8 CFS, V = 4.2 FPS

$d + \frac{V^2}{2g} = 0.33 + \frac{(4.2)^2}{2(32.2)} = 0.60 < 0.87$ OK

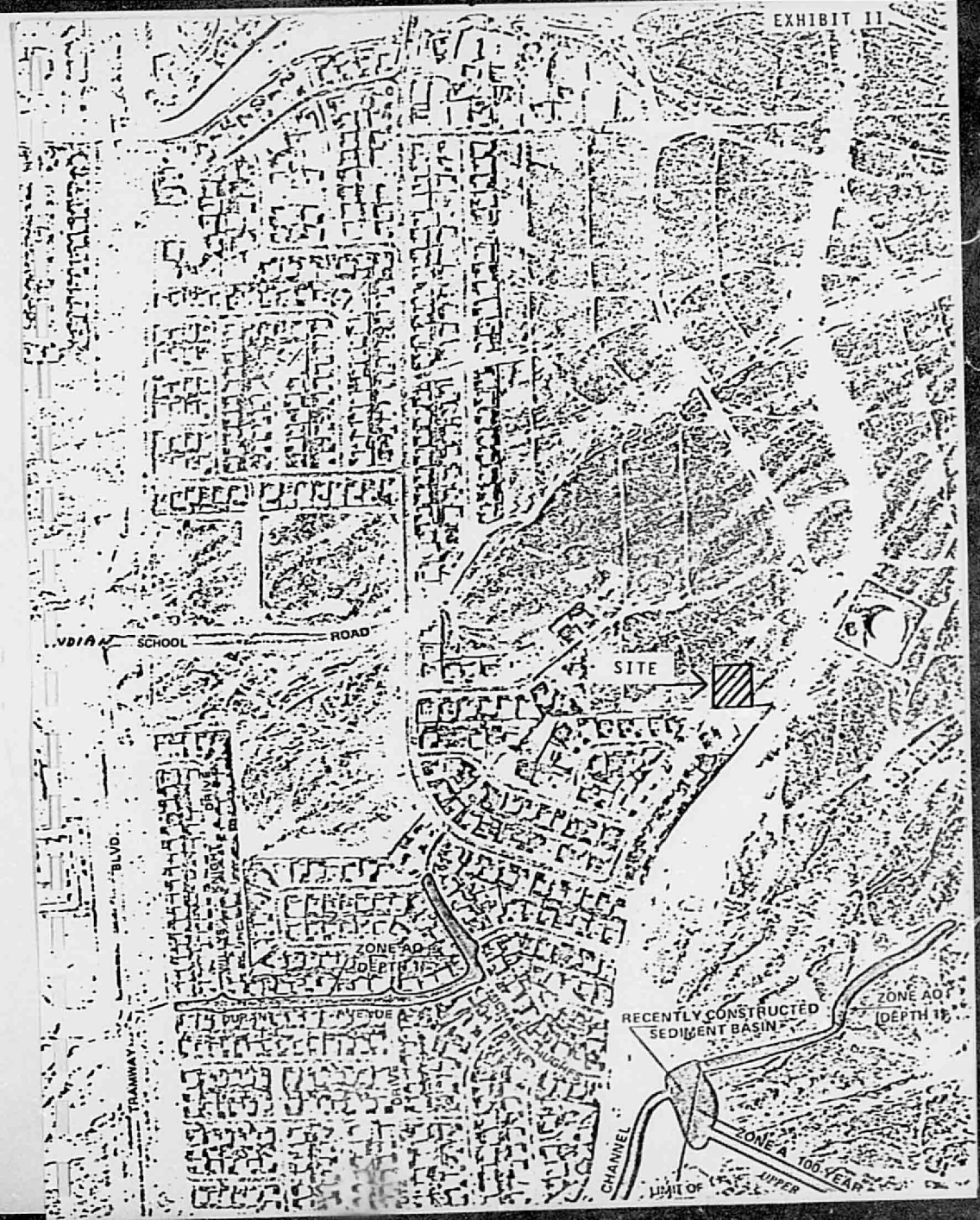
SOUTH FLOWLINE: 3.8 + (9.4 - 6.8) = 6.4 CFS

FROM PLATE 22.3 D-1: V = 4.1 FPS, d = 0.32 < 0.50 OK

$d + \frac{V^2}{2g} = 0.32 + \frac{(4.1)^2}{2(32.2)} = 0.58 < 0.81$ OK

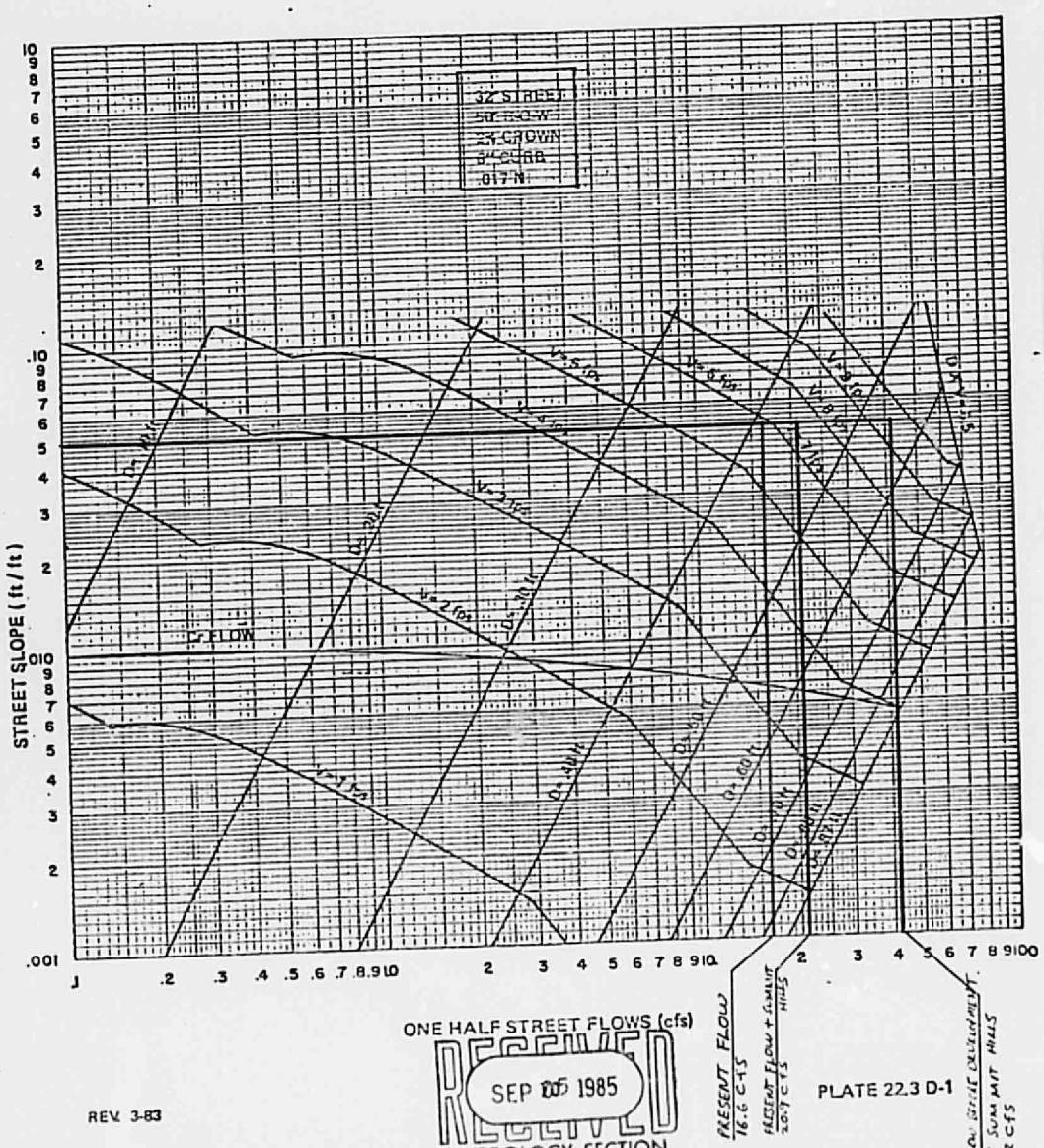
J·23·Z

EXHIBIT II


SCHOOL
ROAD
SITE
TRAMWAY
BLVD.
ZONE AO
DEPTH 1'
RECENTLY CONSTRUCTED
SEDIMENT BASIN
ZONE AO
DEPTH 1'
CHANNEL
ZONE A
100-YEAR
LIMIT OF
UPPER

STREET CAPACITY

VERBENA @ SNOWDROP



REV. 3-83

PLATE 22.3 D-1

DENNEY - GROSS & ASSOCIATES, INC.
ENGINEERS SURVEYORS PLANNERS
2400 COMANCHE ROAD N.E.
ALBUQUERQUE, NEW MEXICO 87107
(505) 884-0695

LOCATION SUMMIT HILLS
PROJ. NO. 723.32
DATE 9-3-85
DESIGNER J. JONES
PAGE 3 (REVISED)

CAPACITY OF CHANNEL @ S. WELLS

SECTION A-A

Q=2.5 cfs

MANNING'S

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

S=0.0267
n=0.025

$2.5 = \frac{1.486}{0.025} (.0267)^{1/2} AR^{2/3}$

$AR^{2/3} = 0.26$

d = DEPTH OF 100 YR. FLOW

TRY d = 0.32'

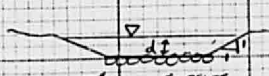
$A = \frac{1}{2}(1.92)(.32)2 = 0.61$

$R = A/P = 0.31 \quad AR^{2/3} = 0.28$ (OK)

$V = Q/A = 2.5/0.61 = 4.1$ FPS

Q=2.5 cfs
S=0.076

$2.5 = \frac{1.486}{0.025} (0.076)^{1/2} AR^{2/3}$



SECTION D-D

$AR^{2/3} = 0.153$

TRY d = 0.22'

$A = \frac{1}{2}(2 + 2.44)(.22) = 0.49$

$R = A/P = 0.49/2.5 = 0.2$

$AR^{2/3} = 0.16$ (OK)

$V = Q/A = 2.5/0.49 = 5.1$ FPS

USE 3" COBBLES FOR EROSION CONTROL.

DENNEY - GROSS & ASSOCIATES, INC.
ENGINEERS SURVEYORS PLANNERS
2400 COMANCHE ROAD N.E.
ALBUQUERQUE, NEW MEXICO 87107
(505) 884-0695

LOCATION SUMMIT HILLS
PROJ. NO. 723.32
DATE 9-3-85
DESIGNER J JONES
PAGE 5

SUPERELEVATION

VERBENA & SNOWDROP

$S = \frac{1.15 V^2 (b + 2z D)}{2gR}$ (DPM 22.3 Eq 59)

DEPTH:

BEFORE DEVELOPMENT OF SUMMIT HILLS

$Q = 42.0$ cfs $d = 0.55'$ $V = 9.5$ fps (DPM 22.3 D-1)

z = COT OF BANK SLOPE : ASSUME BANK SLOPE = 22.5°
B = CHANNEL BOTTOM WIDTH $\cong$ 20'
R = RADIUS OF CURVE $\cong$ 185'

$$S = 1.3 \frac{(9.5)^2 (20 + 2(\cot 22.5)(0.55))}{(32.2)(185)}$$

$S = 0.45'$

TOTAL DEPTH OF FLOW = $S + d = 0.45 + .55 = 1.0'$

DEPTH:

AFTER DEV. BUT NOT INCLUDING FLOW FROM SUMMIT HILLS

$Q = 16.6$ cfs $d = 0.42'$ $V = 7.0$ fps

$$S = 1.3 \frac{(7)^2 (20 + 2(\cot 22.5)(.42))}{(32.2)(185)}$$

$S = 0.24'$

TOTAL DEPTH OF FLOW = $S + d = .24 + .42 = 0.66'$

DEPTH:

INCLUDING SUMMIT HILLS

$Q = 20.9$ cfs $d = 0.44'$ $V = 7.4$ fps

$$S = 1.3 \frac{(7.4)^2 (20 + 2(\cot 22.5)(0.44))}{(32.2)(185)}$$

$S = 0.26'$

TOTAL DEPTH OF FLOW = $S + d = 0.26 + 0.44 = 0.70'$