

JIM WITT SUBDIVISION

DRAINAGE REPORT



I, George Nemeth, Registered Professional Engineer No. 12284, hereby certify that these documents were prepared by me, or directly under my supervision, and are true and correct to the best of my knowledge and belief.

A handwritten signature in cursive script, appearing to read "G. Nemeth", written over a horizontal line.

Registered Professional Engineer
No. 12284

Prepared by:



Resource Technology, Inc.

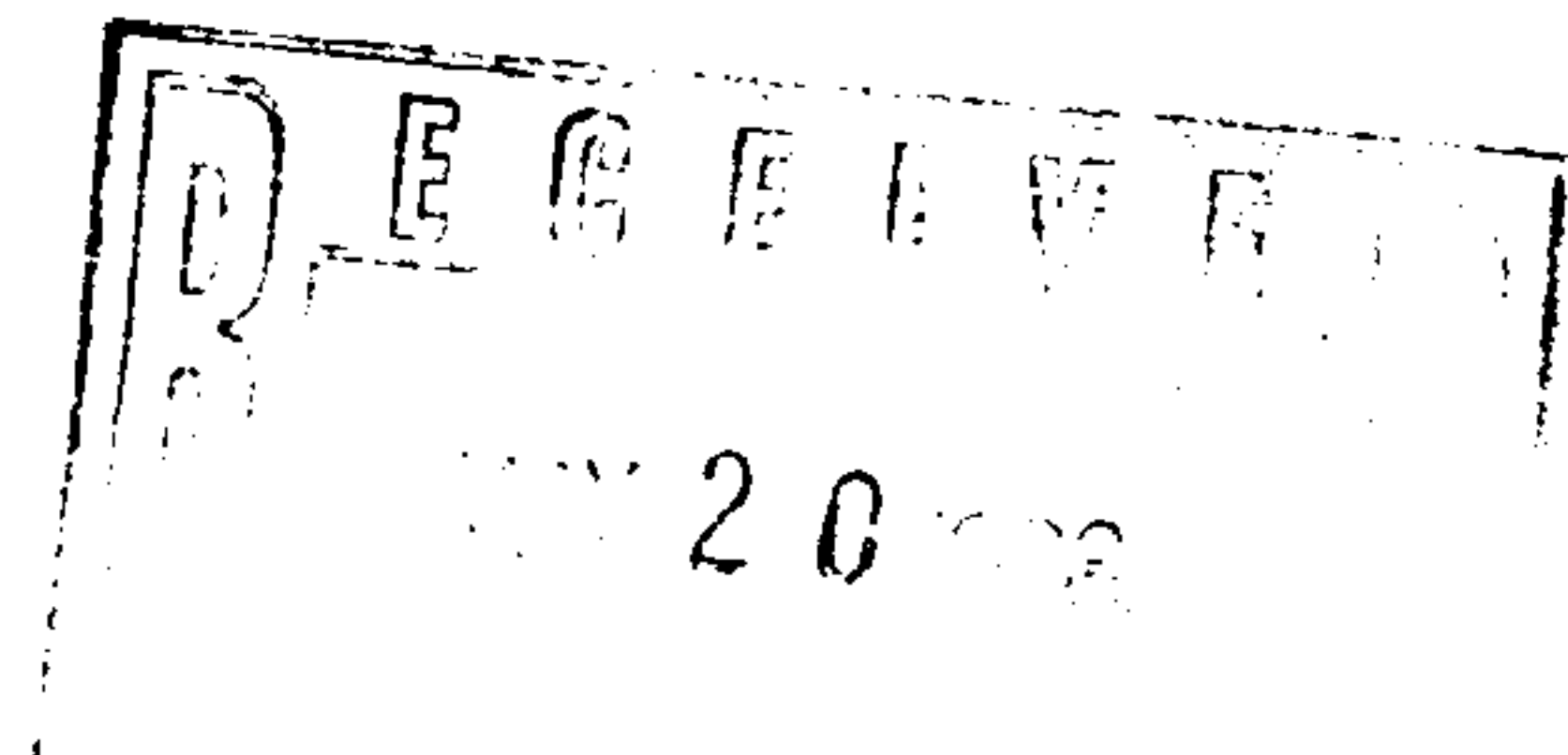
ENGINEERS AND ENVIRONMENTAL SCIENTISTS

2129 Osuna Rd. NE, Suite 200, Albuquerque, NM 87113

Telephone (505) 345-3115

Fax (505) 345-4132

May, 1996



JIM WITT SUBDIVISION DRAINAGE REPORT

SUMMARY

The existing site conditions make no provisions for stormwater management. Approximately 22% (1.16 ac) of the existing site drains directly to Tijeras Arroyo and approximately 8% (0.41 ac) is retained on site. The remaining 70% drains across the property onto the adjacent properties to the west. This amounts to approximately 0.39 ac.ft of runoff volume.

For the developed conditions some of the runoff is redirected to Tijeras Arroyo (1.28 cfs) thereby increasing the 100-year peak discharge in the arroyo (14,300 cfs) by one ten-thousandth of a percent (0.0001%). Additional on-site retention storage is provided thereby reducing the runoff volume to the adjacent properties to the west by 69%, from 0.39 ac.ft to 0.12 ac.ft. This 0.12 ac.ft is the runoff volume from Lot D which is to remain in its existing condition (i.e., no changes).

GENERAL INFORMATION

Floodplain - Tijeras Arroyo

The extent of this site within the FEMA mapped floodplain is shown on the attached drawing. Proposed house pad elevations are a minimum of 1 ft. above 100-year flood elevation.

Precipitation Zone

FF > EGL + Freeboard

The subject property is located south of I-40 and lies adjacent to the east side of Four Hills Road. This puts the property in Precipitation Zone 3.

EXISTING CONDITIONS

AREAS AND LAND TREATMENTS

- Basin I Land Treatment B is the Lawn on 0-10% slope.

Area B = 1.756 ac

Land Treatment C is the native grass steep slopes (>20%) on the south and east property perimeter.

Area C = 0.905 ac

Land Treatment D is the paved drive and buildings.

Area D = 0.188 ac

Total Area = 2.849 ac

- Basin II Land Treatment B is the Lawn on 0-10% slope.

$$\text{Area B} = 1.039 \text{ ac}$$

Land Treatment C is the native grass steep slopes (>20%) on the east property line.

$$\text{Area C} = 0.065 \text{ ac}$$

Land Treatment D is the paved drive and concrete pond lining.

$$\text{Area D} = 0.188 \text{ ac}$$

$$\text{Total Area} = 1.292 \text{ ac}$$

- Basin III Basin III drains directly to Tijeras Arroyo and is made up primarily of the arroyo bed and banks. This drainage basin is the same for both existing and developed conditions and no calculations will be done for it.

$$\text{Total Area} = 1.24 \text{ ac}$$

PEAK DISCHARGE, Q_p

Using the 100-year storm values from Table A-9 of the DPM, Q_p is determined for Basin I and Basin II for $T_c = 12 \text{ min}$.

$$Q_{P_I} = Q_{P_B} A_B + Q_{P_C} A_C + Q_{P_D} A_D \quad \text{where the subscripts B, C and D indicate the land treatment.}$$

$$Q_{P_I} = (2.60 \text{ cfs/ac})(1.756 \text{ ac}) + (3.45 \text{ cfs/ac})(0.905 \text{ ac}) + (5.02 \text{ cfs/ac})(0.188 \text{ ac})$$

$$Q_{P_I} = 8.6 \text{ cfs}$$

$$Q_{P_{II}} = (2.60 \text{ cfs/ac})(1.039 \text{ ac}) + (3.45 \text{ cfs/ac})(0.065 \text{ ac}) + (5.02 \text{ cfs/ac})(0.188 \text{ ac})$$

$$Q_{P_{II}} = 3.9 \text{ cfs}$$

RUNOFF VOLUME, V

The runoff volume for Basins I and II is $V_{360} = \frac{E_B A_B + E_C A_C + E_D A_D}{12 \text{ inch/ft}}$

$$V_{360} = \frac{(0.92)(2.795) + (1.29'')(0.970) + (2.36)(0.376)}{12 \text{ inch/ft}} = 0.39 \text{ ac.ft}$$

The 100-year 6-hour runoff volume is 0.39 ac.ft not including runoff directly into the Tijeras Arroyo.

DEVELOPED CONDITIONS

The existing property will be divided into four individual lots (A, B, C, and D).

AREAS AND LAND TREATMENTS

- Lot A Of the total 1.06 ac, 0.63 ac drains directly into the arroyo leaving 0.43 ac to account for also draining to Lot A is a portion of the access road runoff (see drawing). Retention storage for the 100-year 10-day storm will be provided on Lot A for Lot A and the small amount of road drainage. Total draining to Lot A - 0.58 ac.

Land Treatment B = 0.22 ac

Land Treatment C = 0.09 ac

Land Treatment D = 0.27 ac (assuming a 4000 ft² house and garage and 100' x 12' drive and 300' x 22' access road)

- Lot B Fill will be placed on Lot B and the total area of 1.04 ac will drain directly into the arroyo. Therefore, no calculations are provided for Lot B runoff. See page 6 for additional information.

- Lot C Retention storage for the 100-year 10-day storm will be provided on Lot C for Lot C. Total draining Lot C = 1.58 ac to 0.2 ac off-site

Land Treatment B = 0.68 ac

Land Treatment C = 0.91 ac

Land Treatment D = 0.19 ac (assuming a a 4000 ft² house and garage and 200' x 12' drive and two existing buildings of 28' x 50' and 16' x 20')

- Lot D Lot D will remain undisturbed as a result of this division of land. Therefore, no calculations are provided for Lot D runoff.

RUNOFF VOLUME, ∇

Since there is no available storm drainage system, the stormwater for Lots A and C will be retained on the respective lots. Therefore, runoff volume will be calculated rather than peak discharge.

All runoff from Lot B will drain directly into the arroyo without retention or detention. Lot D will remain unchanged.

The retention pond on each lot will be designed for the 100-year 10-day storm event. First the 100-year 6-hour runoff volume, ∇_{360} , will be computed. Then from Equation a-9 of the DPM, the 100-year 10-day runoff volume, ∇_{10DAY} , will be computed.

Excess precipitation, E, for the 100-year 6-hour storm is found in Table A-8 of the DPM.

- Lot A

$$\nabla_{360} = \frac{E_B A_B + E_C A_C + E_D A_D}{12 \text{ inch/ft}}$$

$$\nabla_{360} = \frac{(0.92)(0.22 \text{ ac}) + (1.29'')(0.09) + (2.36)(0.27 \text{ ac})}{12 \text{ inch/ft}} = 0.08 \text{ ac.ft}$$

(EQ. a-9) $\nabla_{10DAY} = \nabla_{360} + A_D (P_{10DAY} - P_{360}) / 12 \text{ inch/ft}$ where P = precipitation (in)

Table A-2 of the DPM give precipitation, in inches, for various storms

$$\nabla_{10DAY} = 0.08 \text{ ac.ft} + 0.27 \text{ ac} (4.9'' - 2.6'') / 12 \text{ inch/ft} = 0.13 \text{ ac.ft}$$

The retention pond for Lot A must store 0.13 ac.ft.

- Lot C
$$V_{360} = \frac{(0.92)(0.68 \text{ ac}) + (1.29'')(0.91 \text{ ac}) + (2.36)(0.19 \text{ ac})}{12 \text{ inch/ft}} = 0.19 \text{ ac.ft}$$

$$V_{10\text{DAY}} = 0.19 \text{ ac.ft} + 0.19 \text{ ac} (4.9'' - 2.6'') / 12 \text{ inch/ft} = 0.22 \text{ ac.ft}$$

The retention pond for Lot C must store 0.22 ac.ft.

- Lot B Lot B area is 1.0403 ac. Under existing conditions, approximately 50% drains directly to Tijeras Arroyo. This 50% includes the arroyo bed and banks. Under developed conditions, approximately 89% of Lot B drains to the arroyo and includes the arroyo bed and banks and the filled building site. Since nothing in the arroyo will change as a result of this project, the additional runoff to the arroyo will come from the filled site.

Under developed conditions, the additional area of Lot B contributing runoff to Tijeras Arroyo is approximately 0.406 ac.

- Land Treatment B Area = 0.311 ac
- Land Treatment D Area = 0.095 ac

$$Q_{PB} = (2.60 \text{ cfs/ac})(0.311 \text{ ac}) + (5.02 \text{ cfs/ac})(0.095 \text{ ac}) = 1.28 \text{ cfs } 100\text{-year } 6\text{-hour}$$

The effective FEMA study for Albuquerque (1983) indicates that one mile upstream from the study limits the 100-year storm peak discharge is 14,300 cfs. (This project is located at the upstream study limits.) This means the increase in the 100-year peak flow rate is approximately,

$$\frac{1.28 \text{ cfs}}{14,300 \text{ cfs}} \times 100 = 0.00009\% \text{ or about one ten-thousandth of a percent.}$$

*what is
the Q_{100}
used in
study?
RT1*

RESOURCE TECHNOLOGY, INC.

JIM WITT SUBDIVISION
RTI PROJECT No. 96-020

MEETING MINUTES

Meeting Date: 6-19-96

Meeting Place: City of Albuquerque

Attendees: Susan Calongne & Dan Hogan, City; Kurt Browning, AMAFCA
George Nemeth, RTI

Author of Minutes: George Nemeth, P.E., RTI

Discussion:

The meeting focused on the history of the property as documented in the files from AMAFCA. Court documents determined that a flood control structure was to be designed by a licensed engineer and constructed to provide flooding protection against the 100-year storm event for the residences in the area. Apparently, the structure that was built by the Varetto's was not designed by an engineer and is not constructed of engineered fill. Approval of the subdivision of this property will require design of a flood control structure as determined by the courts. The improvements are required only on the subject property and need not extend beyond.

Analysis of the 100-year storm event in the Tijeras Arroyo must use the flow rate determined by the latest Tijeras Arroyo restudy currently under way by RTI. This flow rate is 18,065 cfs which is greater than the 100-year storm flow rate of 14,300 cfs for the currently effective FEMA study. This reflects a flow rate utilizing the AHYMO hydrology, which was not used on the previous study, and will be used for the required Conditional Letter of Map Revision (CLOMR) submittal.

Also, during construction of the Four Hills Road Bridge, the City recommended that the residences on the west side of the new bridge access Four Hills Road from the south side of the arroyo rather than continue access from the north side by crossing the arroyo. This recommendation was not accepted by the residents of the time. This option is still open and may be incorporated into this set of subdivision plans. (Indeed, this may be required in order to design a proper flood control structure as required above.)

The above reflects the authors understanding of items discussed at the meeting. If there are any additional comments, revisions, or questions about these minutes please contact the author immediately.

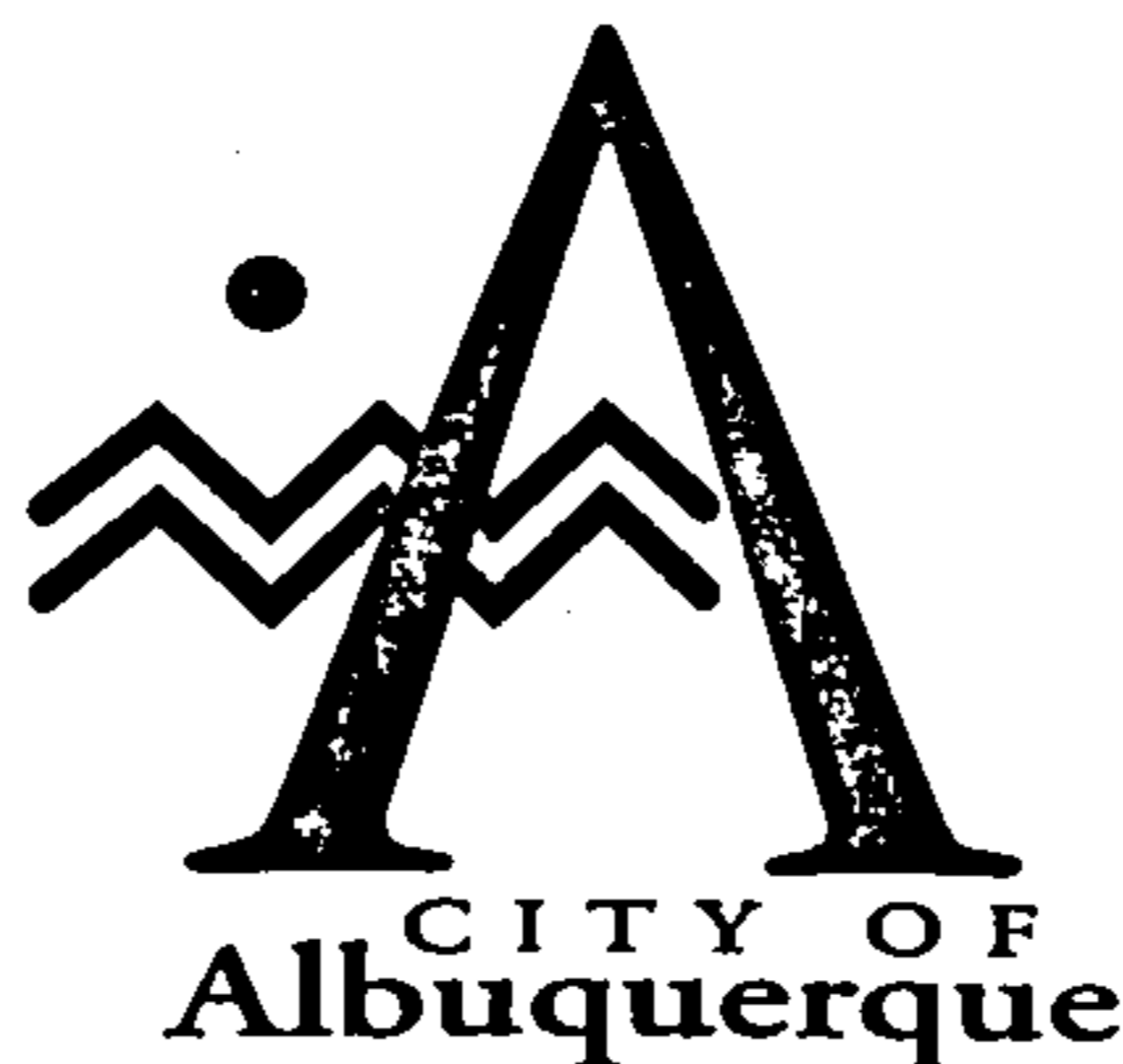
Signed:



JUN 24 1996

Copies to: Attendees, Jim Witt, file

HYDROLOGY DIVISION



June 5, 1996

Martin J. Chávez, Mayor

George Nemeth, P.E.
Resource Technology, Inc.
2129 Osuna NE
Albuquerque, New Mexico

RE: GRADING AND DRAINAGE PLAN FOR JIM WITT SUBDIVISION, (L23/D6B)
SUBMITTED FOR PRELIMINARY PLAT APPROVAL, ENGINEER'S STAMP DATED
5/17/96.

Dear Mr. Nemeth:

According to the City Zone Atlas it appears that a portion of this site is within the County, therefore the above referenced plan must be submitted to the Bernalillo County Public Works Division. Since this site is adjacent to the Tijeras Arroyo, it will be reviewed by AMAFCA as well as the County and myself. After only a cursory review, the following issues must be addressed prior to resubmittal:

1. Please use the Zone Atlas to identify the site on the Vicinity Map. Also identify which portions are within the City and which are in the County. If this site has already been annexed into the City, please provide that information.
2. The plan must show the limits of the existing FEMA floodplain, as well as a copy of the FEMA Flood Insurance Rate Map with the site delineated on it.
3. A complete analysis of the Tijeras Arroyo must be included with the plan. If any development, including grading, is proposed within the floodplain, then an analysis of the proposed condition must also be included to show that grading will not adversely affect any adjacent properties. If you propose to change the existing floodplain, then a Letter of Map Revision must be obtained from FEMA.
4. The legend identifies water surface elevations for the arroyo. Please reference the study used. What Q was used? Please plot the HGL and EGL on the plan.
5. The plan indicates an existing easement for the bridge and floodway in the Tijeras Arroyo. What is this easement based on and who is the easement granted to? Is this easement adequate for the proposed development?

Good for You, Albuquerque!



George Nemeth, P.E.

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6. Do any off-site flows impact this site? If so, the basins must be identified and the flows quantified.
7. Although retention ponds are allowed in the County, they may only be used in the City on a temporary basis. It appears that with some modifications the ponds may become detention ponds which ultimately drain to the Tijeras Arroyo. Drainage swales or pipes between the ponds may be placed within private drainage easements.
8. Please calculate the erosion setback limit per AMAFCA's Sediment and Erosion Design Guide and plot this on the plan. Flood protection may be required for development within the erosion setback limit.
9. Typically finish floor elevations are set above the energy grade elevation plus freeboard.

After discussing this plan in-house, it appears that there is some history with this site. You may wish to research this further at AMAFCA. I suggest that you set up a meeting with myself, AMAFCA and the County, if applicable, to discuss this site further. If you should have any comments regarding these comments, please feel free to call me at 768-2666.

Sincerely,



Susan M. Calongne, P.E.

City/County Floodplain Administrator

- c: Kurt Browning, Albuquerque Metropolitan Arroyo Flood Control Authority
Roger Paul, Bernalillo County Public Works Division
Jim Witt, Owner

File

PROJECT TITLE: JIM WITT SUBDIVISION ZONE ATLAS/DRNG. FILE #: L-23-LD6B
DRB #: _____ EPC #: _____ WORK ORDER #: _____
LEGAL DESCRIPTION: TRACT A-1-3-a AND TRACT A-1-4-a, EXECUTIVE HILLS
CITY ADDRESS: 601-B FOUR HILL RD. SE ALBUQUERQUE, NM 87123
ENGINEERING FIRM: RESOURCE TECHNOLOGY, INC. CONTACT: GEORGE NEMETH
ADDRESS: 2129 OSUNA NE ALBUQUERQUE PHONE: 345-3115
OWNER: JIM WITT CONTACT: JIM WITT
ADDRESS: 601-B FOUR HILLS RD. SE PHONE: 292-2230
ARCHITECT: N.A. CONTACT: _____
ADDRESS: _____ PHONE: _____
SURVEYOR: SOUTHWEST SURVEYING CO., INC. CONTACT: DAN GRANEY
ADDRESS: 333 LOMAS BLVD. NE ALBUQUERQUE PHONE: 247-4444
CONTRACTOR: N.A. CONTACT: _____
ADDRESS: _____ PHONE: _____

TYPE OF SUBMITTAL:

- ☒ DRAINAGE REPORT
☐ DRAINAGE PLAN
☐ CONCEPTUAL GRADING & DRAINAGE PLAN
☐ GRADING PLAN
☐ EROSION CONTROL PLAN
☐ ENGINEER'S CERTIFICATION
☐ OTHER _____

PRE-DESIGN MEETING:

- ☒ YES
☐ NO
☐ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

- ☐ SKETCH PLAT APPROVAL
☒ PRELIMINARY PLAT APPROVAL
☐ S. DEV. PLAN FOR SUB'D. APPROVAL
☐ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
☐ SECTOR PLAN APPROVAL
☐ FINAL PLAT APPROVAL
☐ FOUNDATION PERMIT APPROVAL
☐ BUILDING PERMIT APPROVAL
☐ CERTIFICATE OF OCCUPANCY APPROVAL
☐ GRADING PERMIT APPROVAL
☐ PAVING PERMIT APPROVAL
☐ S.A.D. DRAINAGE REPORT
☐ DRAINAGE REQUIREMENTS
☐ SUBDIVISION CERTIFICATION
☐ OTHER _____ (SPECIFY)

DATE SUBMITTED: _____

BY: _____

MAR 20 1981

PROJECT TITLE: JIM WITT SUBDIVISION ZONE ATLAS/DRNG. FILE #: L-23-106B
DRB #: _____ EPC #: _____ WORK ORDER #: _____
LEGAL DESCRIPTION: TRACT A-1-3-a AND TRACT A-1-4-a, EXECUTIVE HILLS
CITY ADDRESS: 601-B FOUR HILL RD. SE ALBUQUERQUE, NM 87123
ENGINEERING FIRM: RESOURCE TECHNOLOGY, INC. CONTACT: GEORGE NEMETH
ADDRESS: 2129 OSUNA NE ALBUQUERQUE PHONE: 345-3115
OWNER: JIM WITT CONTACT: JIM WITT
ADDRESS: 601-B FOUR HILLS RD. SE PHONE: 292-7230
ARCHITECT: N.A. CONTACT: _____
ADDRESS: _____ PHONE: _____
SURVEYOR: SOUTHWEST SURVEYING CO., INC. CONTACT: DAN GRANEY
ADDRESS: 333 LOMAS BLVD. NE ALBUQUERQUE PHONE: 247-4444
CONTRACTOR: N.A. CONTACT: _____
ADDRESS: _____ PHONE: _____

TYPE OF SUBMITTAL:

- ☒ DRAINAGE REPORT
☐ DRAINAGE PLAN
☐ CONCEPTUAL GRADING & DRAINAGE PLAN
☐ GRADING PLAN
☐ EROSION CONTROL PLAN
☐ ENGINEER'S CERTIFICATION
☐ OTHER _____

PRE-DESIGN MEETING:

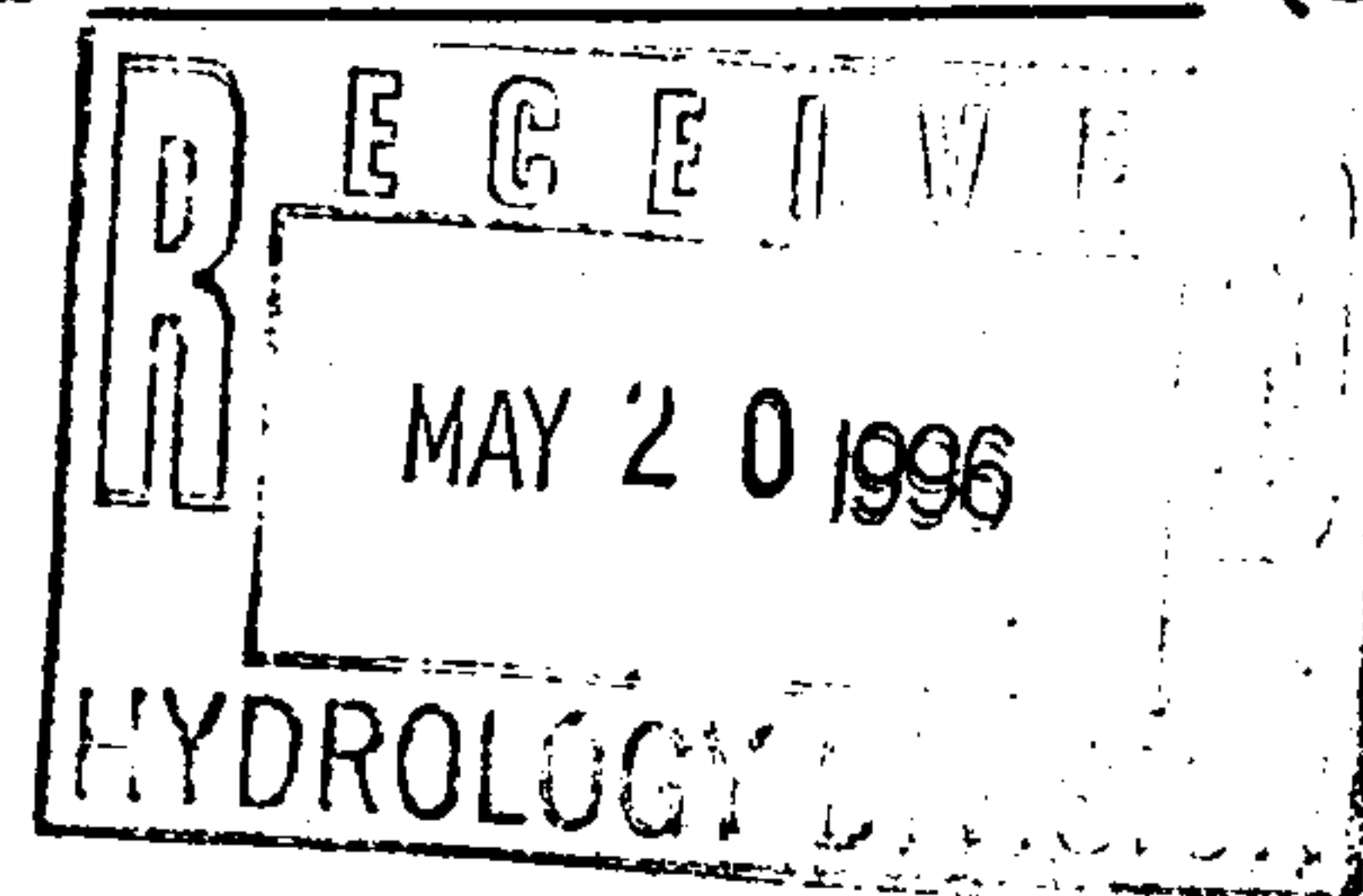
- ☒ YES
☐ NO
☐ COPY PROVIDED

CHECK TYPE OF APPROVAL SOUGHT:

- ☐ SKETCH PLAT APPROVAL
☒ PRELIMINARY PLAT APPROVAL
☐ S. DEV. PLAN FOR SUB'D. APPROVAL
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☐ GRADING PERMIT APPROVAL
☐ PAVING PERMIT APPROVAL
☐ S.A.D. DRAINAGE REPORT
☐ DRAINAGE REQUIREMENTS
☐ SUBDIVISION CERTIFICATION
☐ OTHER _____ (SPECIFY)

DATE SUBMITTED: _____

BY: _____





2129 OSUNA ROAD NE, SUITE 200
ALBUQUERQUE, NEW MEXICO 87113
(505) 345-3115
FAX (505) 345-4132

May 17, 1996

Ms. Susan Calongne
City/County Floodplain Administrator
City Hall
Albuquerque, NM 87103

**RE: Jim Witt Subdivision
RTI File No. 96-020**

Dear Susan:

We hereby submit the Grading and Drainage Report for the above-referenced project for your review and approval. Southwest Surveying Company will also submit for City D.R.B. review and approval of the Preliminary Plat.

Please call if you have any questions or require additional information.

Sincerely,

RESOURCE TECHNOLOGY, INC.

George Nemeth, P.E.

GN/ljc

Enclosure

cc: Jim Witt
Dan Graney, Southwest Survey

