HYDROLOGY C23/D7 1 PLAN

C23/D7

1 Plan

DRAINAGE INFORMATION SHEET

PROJECT TITLE: GRADY RESIDENCE ZONE ATLAS/DRAINAGE FILE # C23/D7

LEGAL DESCRIPTION: LOT 133-A-1-B, SANDIA HEIGHTS SOUTH UNIT 2

CITY ADDRESS: —

ENGINEERING FIRM: WEISS-HINES ENGINEERING CONTACT: STEVE CLARK

ADDRESS: 1100 ALVARADO NE PHONE: 266-3444

OWNER: DON GRADY CONTACT: 884-8300

ADDRESS: — PHONE: —

ARCHITECT: — CONTACT: —

ADDRESS: — PHONE: —

SURVEYOR: ROSS ELDER CONTACT: ROSS ELDER

ADDRESS: 530 JEFFERSON NE PHONE: 268-1830

CONTRACTOR: — CONTACT: —

ADDRESS: — PHONE: —

PRE-DESIGN MEETING:

X YES

__ NO

__ COPY OF CONFERENCE RECAP SHEET PROVIDED

DRB NO. 84-817 12/3/85

EPC NO. ____

PROJECT NO. ____

TYPE OF SUBMITTAL:

X DRAINAGE REPORT

__ DRAINAGE PLAN

X CONCEPTUAL GRADING & DRAIN PLAN

__ GRADING PLAN

__ EROSION CONTROL PLAN

__ ENGINEER'S CERTIFICATION

CHECK TYPE OF APPROVAL SOUGHT:

__ SECTOR PLAN APPROVAL

__ 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: ____

BY: ____

REV. 10/85

10

RECEIVED
JUN 16 1986
HYDROLOGY SECTION

WEISS·HINES ENGINEERING, INC.

June 11, 1986

RECEIVED
JUN 16 1986
HYDROLOGY SECTION

Mr. Carlos A. Montoya
County Flood Plain Administrator
123 Central NW
Albuquerque, NM 87103

Dear Carlos:

It is proposed that the westernmost Drainage Easement line on Lot 133-A-1-B of Sandia Heights South Unit 2 subdivision be changed as described below. The reason for the change is to provide a suitable amount of usable land for a building site on the lot.

Present Easement: the existing Drainage Easement lines as platted (Figure 1) correspond approximately to the FEMA floodplain boundaries in the Domingo Baca drainage system (Figure 2). The Drainage Easement defines the arroyo that passes through the lot. The arroyo is a wide flat channel with no well-defined flow path. The channel bed is medium and coarse sand (decomposed granite) with a heavy (greater than 50%) cover of vegetation (rabbit brush, grass, cholla, etc).

Extent of Change: sections 1, 2, and 3 of the existing west Drainage Easement line will be vacated between points A and B and will be replaced with an arc of a 400' radius circle as shown on Figure 1.

Method of Change: a concrete retaining wall will be designed and built on the proposed new Drainage Easement line. The wall will vary in height up to a maximum of approximately 4' above the arroyo bottom. The house site, west of the retaining wall, will have a finished floor elevation at least 3' above the projected 100-year storm high-water level. See Figure 3 for conceptual site grading.

Channel Flow Characteristics: two unnamed arroyos in the Domingo Baca drainage system converge approximately 200' upstream of the proposed building site and flow at a combined maximum rate of 227 cfs past the site. The SCS Method was used to determine the maximum flow rate (see Figure 4).

Using Manning's Equation and assuming a uniform rectangular channel cross-section, the depth of flow during a 100-year frequency storm is 0.4'

CIVIL ENGINEERING / HYDROLOGY / ENVIRONMENTAL DESIGN
1100 ALVARADO N.E. SUITE B ALBUQUERQUE, NEW MEXICO 87110 (505) 266-3444

across the existing channel (see Figure 5). With the proposed narrowing of the channel due to the retaining wall, the 100-year depth of flow increases to 0.6'.

The throttling effect caused by narrowing the channel may cause some scouring at the narrowest passage as the flow velocity increases from 5.4 fps to 6.9 fps (see Figure 5). This scouring would tend to alter the cross-section to more of a "V" shape and thus reduce the flow depth at this point below the 0.6' average depth. In any event, the proposed change will increase the channel flow depth to a maximum of 0.2' above the present maximum at the narrowest point.

The south end of the proposed retaining wall (new easement line) is coincident with the existing easement line at the south property line (Figure 1, point A). The flow transition from Lot 133-A-1-B to the adjacent property to the south (Lot 303) will be smooth and identical to existing conditions. Thus, altering the west Drainage Easement line on Lot 133-A-1-B will have no impact on downstream properties.

Please call if we can answer any questions.

Sincerely,

Steve Clark

Steve Clark
Weiss-Hines Engineering, Inc.

SC:tdq

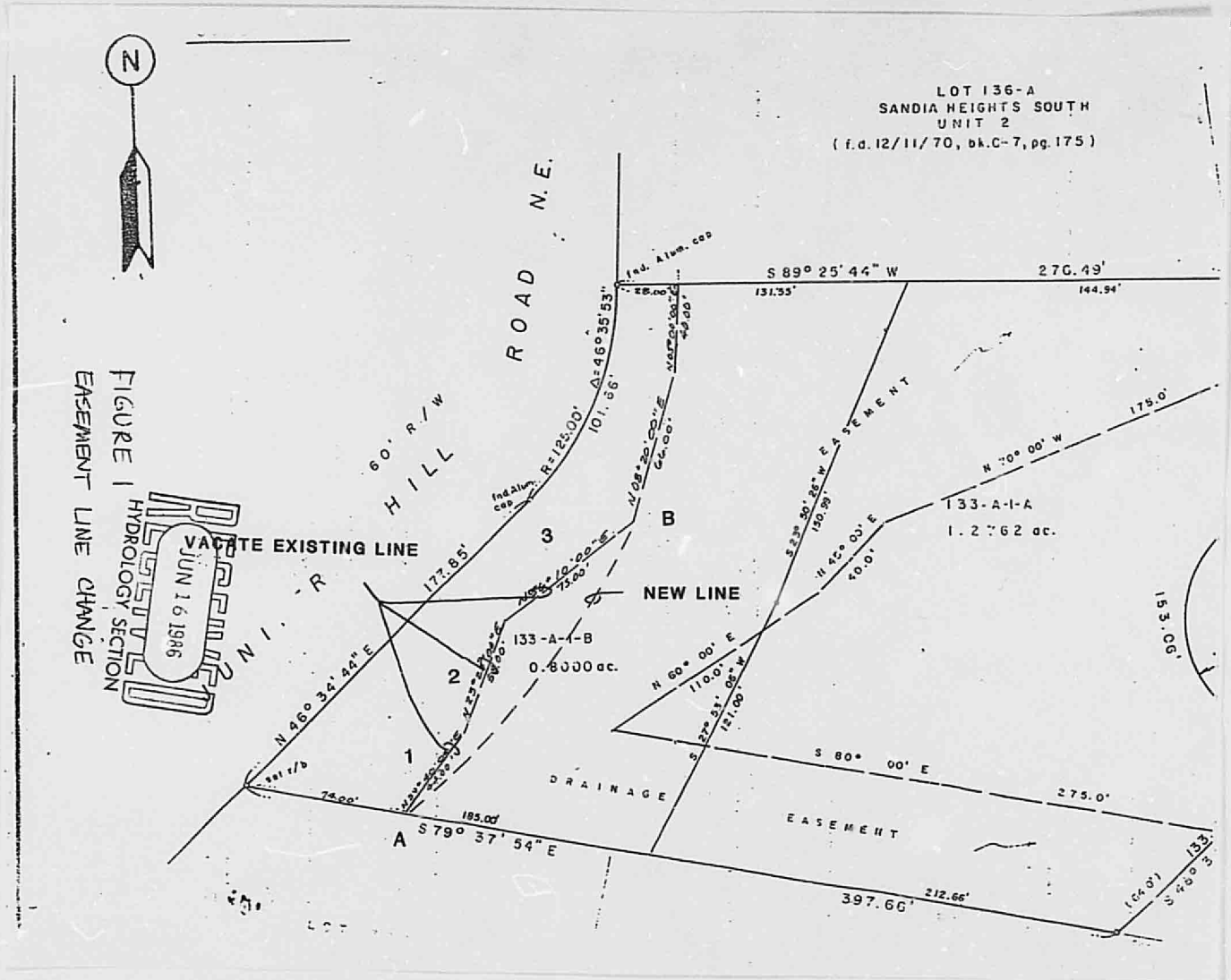

FIGURE 1
EASEMENT LINE CHANGE

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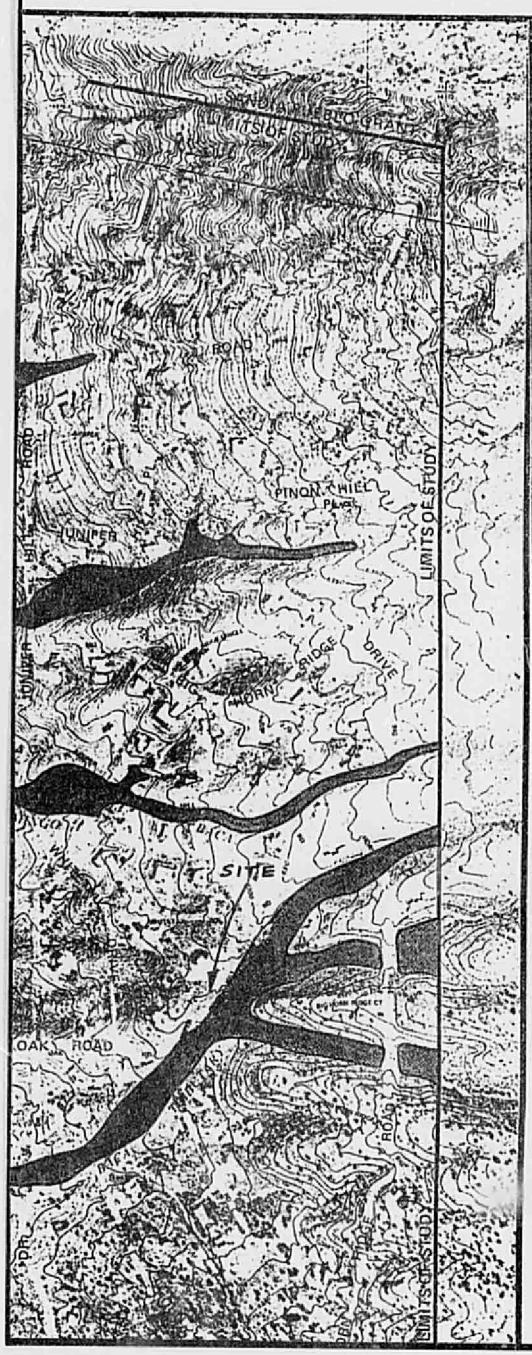
HYDROLOGY SECTION



SCALE 1"=500'

500 0 500

NATIONAL FLOOD INSURANCE PROGRAM

FLOODWAY

FLOOD BOUNDARY AND FLOODWAY MAP

CITY OF

ALBUQUERQUE, NEW MEXICO

BERNALILLO COUNTY

PANEL 11 OF 50

COMMUNITY-PANEL NUMBER
350002 0011

EFFECTIVE DATE:
OCTOBER 14, 1983

Federal Emergency Management Agency

FIGURE 2

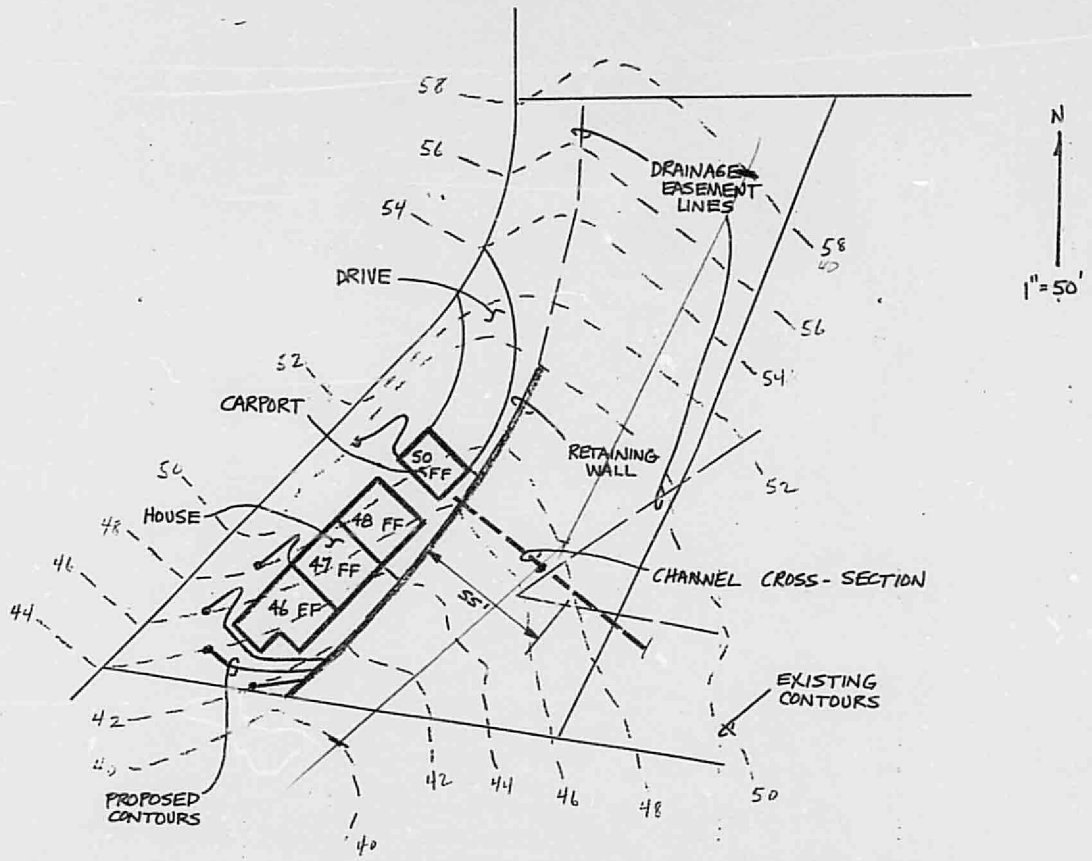


FIGURE 3

CONCEPTUAL SITE GRADING

Figure 4: Flow Rate (SCS Method)

1.	Drainage Area (planimetered from USGS Quad map)	A = 313 Acres
2.	Basin Length of Travel	L = 8000 FT
3.	Elevation change	H = 1800 FT
4.	Slope (H/L)	S = 0.225
5.	Runoff Curve Number (Type 'B' soil; 50% cover of Juniper-Grass)	CN = 57
6.	Time of Concentration	Tc = 15 min.
7.	Rainfall (24 hour, 100-year)	P_{24} = 3.8 IN
8.	Direct Runoff	Q = 0.5 IN
9.	Distribution Curve Number	DC = 75
10.	CFS/Acre/Inch Runoff	cfs/ac/in = 1.45

Peak Discharge
q = (A)(Q)(cfs/ac/in)
= (313)(0.5)(1.45)
= 227 cfs

NOTE: Approximately 500' upstream (east) of the site, the maximum flow rate (227 cfs) passes under Big Horn Ridge Road through 4 culverts. These four culverts, in combination, have a capacity of 400 cfs and cause no throttling of the flow.

Figure 5: Flow Depths and Velocities

Sections of Channel taken at "worst case" location as shown on Figure 3.

Assumptions for Manning's Equation use:

- Rectangular cross-section
- n = 0.035
- s = 0.058 (calculated)
- Q = 227 cfs (see Figure 4)

Existing Channel Maximum Flow Depth
(width = 105')

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

$$227 = \frac{1.49}{0.035}(105y)\left(\frac{105y}{102+2y}\right)^{2/3}(0.058)^{1/2}$$

$$y = 0.4'$$

Proposed Channel Maximum Flow Depth
(width = 55')

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

$$227 = \frac{1.49}{0.035}(55y)\left(\frac{55y}{55+2y}\right)^{2/3}(0.058)^{1/2}$$

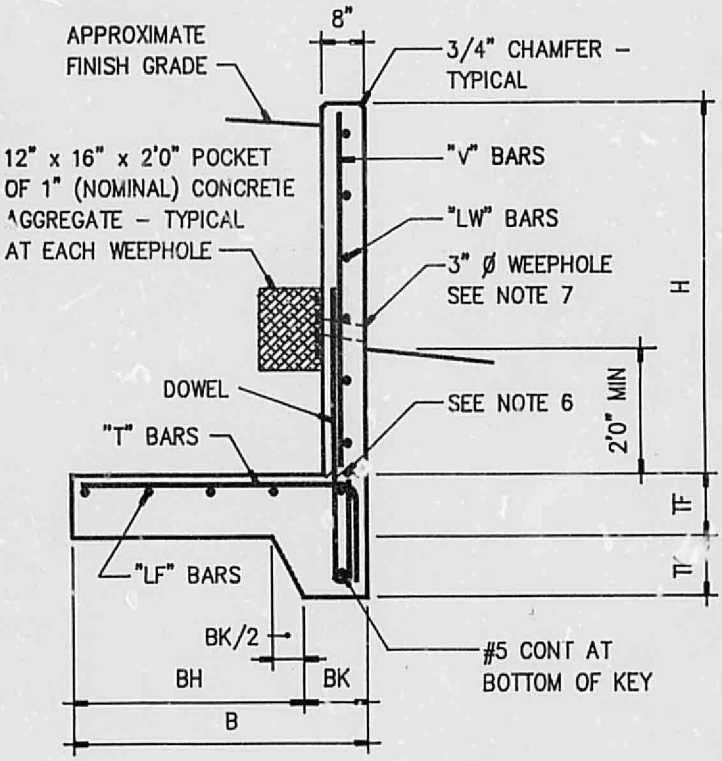
$$y = 0.6'$$

Existing Channel Flow Velocity

$$Q = AV \qquad V = Q/A = \frac{227}{(105)(0.4)} = 5.4 \text{ fps}$$

Proposed Channel Flow Velocity

$$Q = AV \qquad V = Q/A = \frac{227}{(55)(0.6)} = 6.9 \text{ fps}$$



TYPICAL SECTION - RETAINING WALL

RETAINING WALL SCHEDULE

DIMENSIONS						REINFORCING				
						FOOTING			WALL	
H	TF	TK	B	BH	BK	LF Bars (Note 4)	T Bars	Dowels (Note 5)	V Bars	LW Bars
3'0" TO 5'0"	1'0"	1'0"	8'	4'6"	1'0"	5-#5	#4@8"o/c	#4@12"o/c	#4@12"o/c	#4@12"o/c
5'0" TO 7'0"	1'0"	1'0"	8"	6'8"	1'0"	7-#5	#5@8"o/c	#5@12"o/c	#4@12"o/c	#4@12"o/c

TYPO

GENERAL NOTES - RETAINING WALL CONSTRUCTION

1. EARTHWORK. Retaining wall footings are to be placed on subgrade which has been prepared as follows:
   a. All organic and other deleterious material shall be removed from the subgrade;
   b. The subgrade shall be scarified to a depth of not less than two feet beneath the bottom of footing elevation, moistened or dried as necessary to achieve optimum moisture content, and compacted to not less than 95% of maximum density as determined by ASTM D-1557.

   Backfill on both sides of wall shall be placed in uniform layers approximately 12 inches thick before compaction and compacted to not less than 90% of maximum density as determined by ASTM D-1557.

2. FOOTING STEPS. Footings shall be set at the elevation necessary to provide not less than 2'0" of soil cover over the top of the footing on the front side of the wall. Footings shall be stepped as necessary to maintain minimum soil cover. Footing steps shall be constructed in accordance with the typical detail provided.

3. SHEAR KEY. Shear key at bottom of footing is to be placed monolithically with footing.

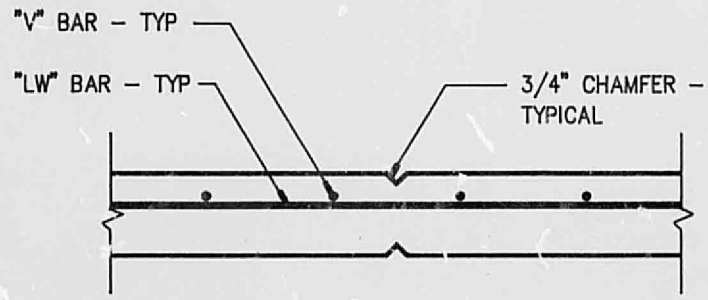
4. LONGITUDINAL REINFORCING IN FOOTING (LF BARS): Number of bars shown is in addition to #5 bar required at the bottom of the shear key. Bars are to be equally spaced.

5. DOWELS. Hooks at bottoms of dowels shall be standard ACI 180 degree hooks with extensions as required to reach to within 2 inches of top of footing. Dowels shall be cocked as required so that concrete cover is between 3 and 4 inches. Lengths of vertical legs of dowels shall be not less than 5'0". At Contractor's option, lengths of vertical legs of dowels may be increased to extend to top of wall. If this option is taken, vertical bars in wall may be deleted.

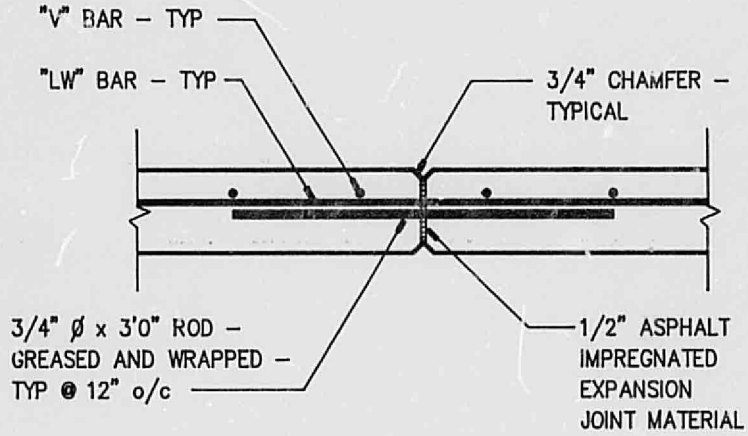
6. ROUGHENED SURFACES. Top surface of footing beneath wall shall be intentionally roughened in both directions to an amplitude of not less than 1/2 inch.

7. WEEP HOLES. Weep holes shall be spaced at 10 feet on center for the full length of wall. Distance between weep holes and control or expansion joints (see below) shall be not less than 5'0". Provide and install a 12 inch square piece of galvanized mesh at each weep hole. Mesh wires shall be not less than 10 gage and spacing of wires in each direction shall be not less than 1/2 inch nor greater than 3/4 inch.

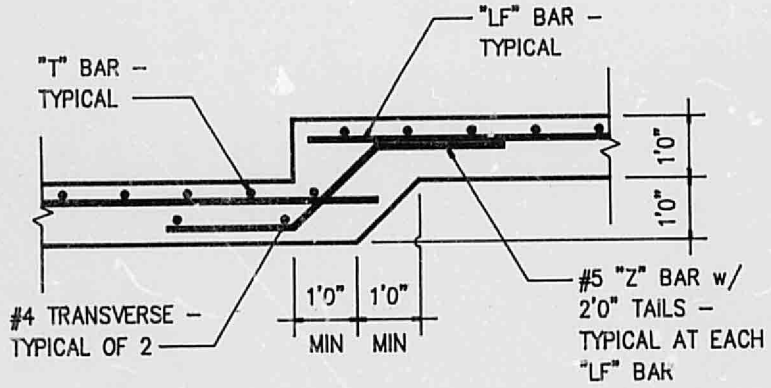
8. CONTROL AND EXPANSION JOINTS. Control and expansion joints in walls shall be constructed in accordance with the typical details provided. Joints shall be uniformly spaced along the length of the wall at a distance not to exceed 20'0" with every third joint to be an expansion joint. Vertical construction joints shall occur only at control or expansion joints. Horizontal construction joints in the wall are not permitted.



TYPICAL DETAIL – CONTROL JOINT



TYPICAL DETAIL – EXPANSION JOINT



TYPICAL DETAIL - FOOTING STEP

DRAINAGE INFORMATION SHEET

PROJECT TITLE: _____ ZONE ATLAS/DRAINAGE FILE # C-23-207

LEGAL DESCRIPTION: LOT 133-A-1-B-1, SANDIA HGTS. SO. UNIT 2

CITY ADDRESS: BERNALILLO COUNTY

ENGINEERING FIRM: WEISS-HINES ENG. CO CONTACT: STEVE CLARK

ADDRESS: 1100 ALVARADO NE PHONE: 266-3444

OWNER: DON GRADY CONTACT: _____

ADDRESS: 5808 McLEOD NE., POB 3549 PHONE: 884-8300

ARCHITECT: — CONTACT: _____

ADDRESS: — PHONE: _____

SURVEYOR: ELDER CO CONTACT: ROSS ELDER

ADDRESS: 530 JEFFERSON NE PHONE: 268-1830

CONTRACTOR: — CONTACT: _____

ADDRESS: — PHONE: _____

PRE-DESIGN MEETING:

X YES

___ NO

___ COPY OF CONFERENCE RECAP SHEET PROVIDED

DRB NO. 86-418

EPC NO. —

PROJECT NO. 1-86-87

RECEIVED JUL 15 1986 HYDROLOGY SECTION

TYPE OF SUBMITTAL:

X DRAINAGE REPORT

___ DRAINAGE PLAN

X CONCEPTUAL GRADING & DRAIN PLAN

___ GRADING PLAN

___ EROSION CONTROL PLAN

___ ENGINEER'S CERTIFICATION

TYPE OF APPROVAL SOUGHT:

___ SECTOR PLAN APPROVAL

___ SKETCH PLAT APPROVAL

___ PRELIMINARY PLAT APPROVAL

___ SITE DEVELOPMENT PLAN APPROVAL

X FINAL PLAT APPROVAL (VACATION)

___ BUILDING PERMIT APPROVAL

___ FOUNDATION PERMIT APPROVAL

___ CERTIFICATE OF OCCUPANCY APPROVAL

___ ROUGH GRADING PERMIT APPROVAL

___ GRADING/PAVING PERMIT APPROVAL

___ OTHER _____ (SPECIFY)

DATE SUBMITTED: _____

BY: _____

REV. 10/85

Carlos Montoya

BOARD OF COUNTY COMMISSIONERS
PATRICK J. PADILLA, CHAIRMAN
DISTRICT 1
ORLANDO VIGIL, MEMBER
DISTRICT 2
LENTON MALRY, MEMBER
DISTRICT 3
PATRICIA H. CASSIDY, MEMBER
DISTRICT 4
MARION M. COTTRELL, MEMBER
DISTRICT 5
ALEX ABEYTA, JR., COUNTY MANAGER

County of Bernalillo

State of New Mexico

ONE CIVIC PLAZA, N.W.
ALBUQUERQUE, NEW MEXICO 87102

ALVIN J. CAMPBELL, SHERIFF
JAMES B. LEWIS, TREASURER
DOLORES C. WALLER, COUNTY CLERK
JACK H. DARLING, ASSESSOR
ROBERT H. SCOTT, PROBATE JUDGE

June 20, 1986

FILE COPY

Steve Clark
Weiss-Hines Engineering
1100 Alvarado, NE
Albuquerque, New Mexico 87110

RE: DRAINAGE PLAN FOR RELOCATING DRAINAGE EASEMENT
LOT 133-A-1-B SANDIA HEIGHTS SOUTH, UNIT 2 (C-23/D7)

Dear Mr. Clark:

I have reviewed the referenced plan received June 16, 1986, and forward the following comments:

1 Please show top of wall and ground line elevations for the retaining wall. Depth of flow and the direction of flow toward the wall will determine the height of wall.

2. Please submit a cross section of the retaining wall indicating depth below ground level of the foundation. Erosion is our main concern in requesting this information.

3 It appears that the retaining wall will need to wrap around the driveway at the north portion of the property. Please address this request.

4. By shifting the arroyo, we will need added drainage easement at the east property line.

5. Please be advised that the Sandia Heights covenants need to be reviewed for further restrictions.

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

Cordially,

Carlos A. Montoya

Carlos A. Montoya, P.E.
City/County Floodplain Administrator

CAM/bsj

RECEIVED
JUL 02 1986
HYDROLOGY SECTION

BOARD OF COUNTY COMMISSIONERS
PATRICK J. PADILLA, CHAIRMAN DISTRICT 1
ORLANDO VIGIL, MEMBER DISTRICT 2
LENTON MALRY, MEMBER DISTRICT 3
PATRICIA H. CASSIDY, MEMBER DISTRICT 4
MARION M. COTTRELL, MEMBER DISTRICT 5
ALEX ABEYTA, JR., COUNTY MANAGER

County of Bernalillo

State of New Mexico

ONE CIVIC PLAZA, N.W.
ALBUQUERQUE, NEW MEXICO 87102

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DOLORES C. WALLER, COUNTY CLERK
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June 20, 1986

Steve Clark
Weiss-Hines Engineering
1100 Alvarado, NE
Albuquerque, New Mexico 87110

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TO BE SUBMITTED WEEK OF 7/7/86

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CLARIFIED 6/30/86

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Carlos A. Montoya

Carlos A. Montoya, P.E.
City/County Floodplain Administrator

CAM/bs;

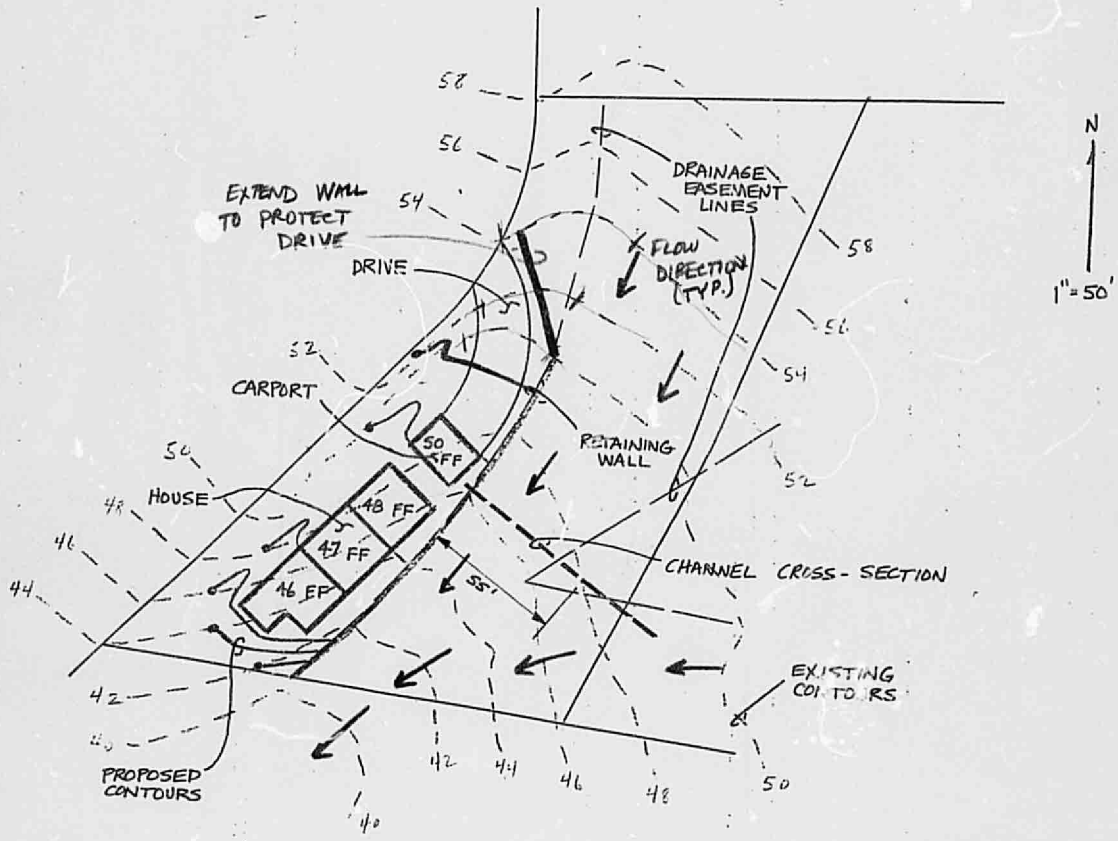


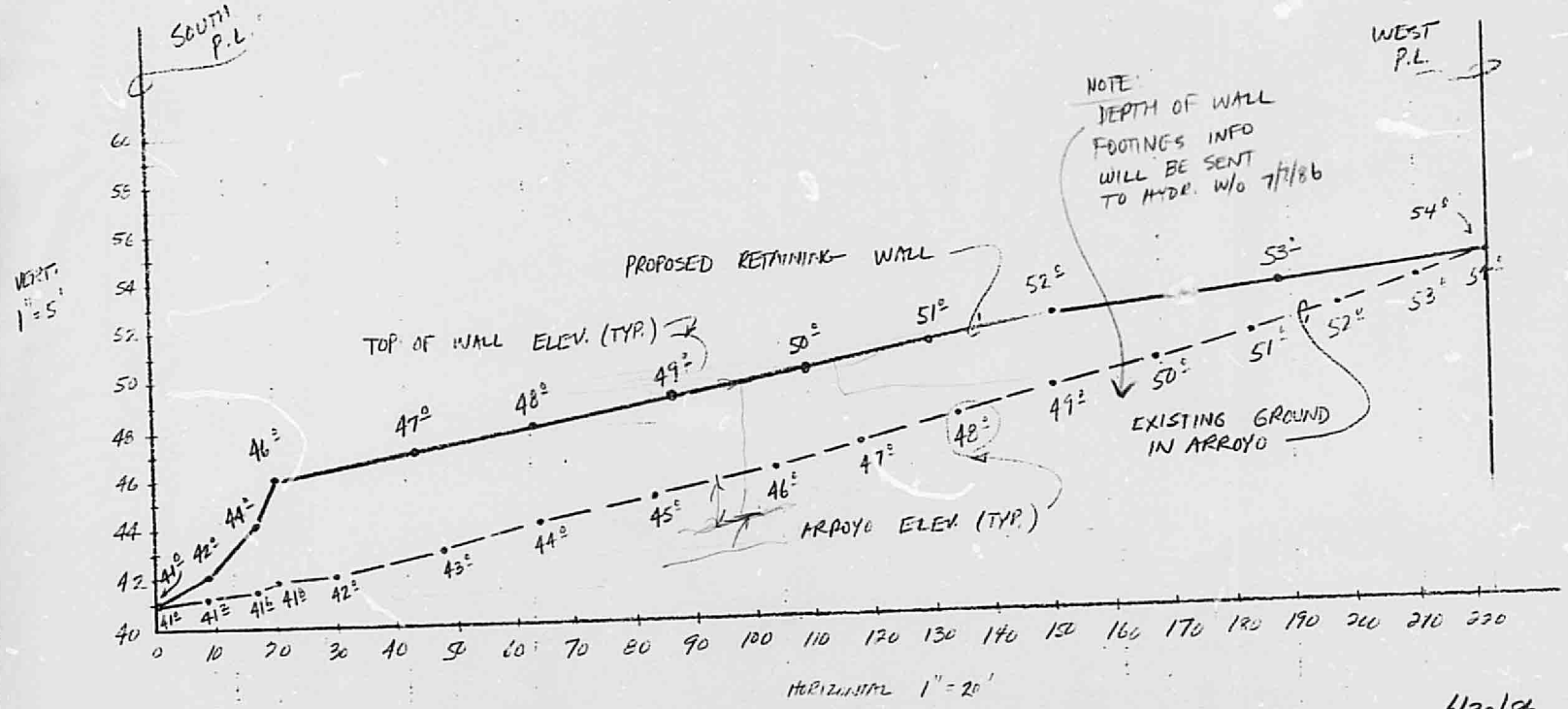
FIGURE 3

CONCEPTUAL SITE GRADING

Revised 6/30/86

Revised 6/30/86
SC

RETAINING WALL ELEVATION VIEW



6/30/86
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