

**DRAINAGE PLAN**

The following items concerning the Vineyard Estates III Drainage Plan are contained hereon:  
1. Vicinity Map 2. Grading Plan 3. Sections & Details 4. Calculations

As shown by the Vicinity Map, the site is located immediately east of Vineyard Estates Unit I. This locates the site at the approximate southwest corner of the intersection of Wilshire Avenue N.E. (to be realigned as Alameda Boulevard N.E.) and Ventura Street N.E. At present, the site is undeveloped. The area is zoned RD as set forth in the Vineyard Sector Plan. The proposed development is single family residential.

As shown by Panel 10 of 50 of the National Flood Insurance Program Flood Insurance Rate Maps (F.I.R.M.) for the City of Albuquerque, New Mexico, dated October 14, 1983, this site does not lie within a designated flood hazard zone. The North Arroyo de Domingo Baca Flood Zone does lie to the south of the proposed subdivision. The arroyo crosses through the Equestrian Center. A floodplain easement associated with that floodplain is being granted in conjunction with the proposed residential subdivision. No arroyo improvements or alterations are proposed. A culvert may be required where the tributary arroyo is crossed by Ventura Street N.E. If determined necessary, the culvert design will be included in the Ventura Street plan and profile design.

The Grading Plan shows existing and proposed grades indicated by spot elevations and contours at 1'0" intervals. The grading has been accomplished in a manner which is consistent with the Vineyard Estates Master Drainage Plan (C20/D3). The Master Drainage Plan identifies the developed drainage patterns by which the subdivision is to be graded. The detailed grading plan which follows conforms with the requirements of the Master Drainage Plan. Certain offsite improvements are identified in the Master Drainage Plan. Those offsite improvements will be constructed by City Work Order and will be included in the construction plans for the construction of public infrastructure. The magnitude of offsite flows, as calculated by the Master Drainage Plan, have been superimposed onto this plan for reference. The offsite flows generated upstream from Ventura Street will be intercepted by that roadway and diverted south to the North Arroyo de Domingo Baca. In order to ensure the positive drainage of Ventura Street N.E., the street grading for Ventura Street N.E. will extend to intercept the runoff generated by Basin NB-4. Detailed grading and design information will be presented in conjunction with the plan and profile design of Ventura Street N.E. as part of the Work Order plans. The grading of the road has been extended to the north beyond the project limits so as to avoid potentially blocking flows and adversely impacting future development to the north. The runoff intercepted by Ventura Street N.E. will be conveyed in a southerly direction to the North Arroyo de Domingo Baca. As an interim condition, the intercepted runoff will be discharged to a minor tributary of the arroyo. The tributary flows in a southwesterly direction across the Equestrian Center property. Under the full development scenario, that runoff will be diverted to the main arroyo which lies approximately 300' farther to the south. That diversion will occur in conjunction with the permanent paving of Ventura Street N.E. across the main arroyo and/or in conjunction with the development of the upstream drainage basins. In the meantime, the calculated 25.2 cfs will be diverted to the tributary and discharged into a platted/granted easement. Conveyance within the street can be accomplished with the paving section proposed, therefore, no additional drainage improvements are anticipated, except as noted above.

Minor offsite flows are anticipated from Lots 11 - 22, Block 6, North Albuquerque Acres, Tract 3, Unit 3. Those offsite flows will be accepted and conveyed in accordance with the Master Drainage Plan. Those lots will not be disturbed as part of this project, hence the control of erosion from that property is not a concern. A future church site, which encompasses Lots 13, 14, 19, and 20 has been identified. Plans are in progress for the development of that property. The development of that site will further serve to reduce overland (sheetflow) offsite flows from this undeveloped area.

Specific notes related to the grading of the residential lots are included on Sheet 3 of this submittal. In particular, all runoff generated by these lots shall be directed to the public right-of-way. With the exception of Lots 26A, 26B, and 26C, no onsite ponding is permitted. Lots 26B and 26C will sheet drain onto adjacent Tract B-2, Vineyard Estates. Lot 26A will sheet drain on Lots 23 and 24, Block 8, Tract 3, Unit 3, North Albuquerque Acres. Sheet drainage will be minor in magnitude and will require approval of the adjacent land owner, the Albuquerque Public Schools. Furthermore, the sheet drainage from these three residential lots will be significantly less than the existing discharge which currently enters those properties and now will be directed to the downstream detention pond. The runoff from this small basin is not intended for discharge into the Vineyard Detention Pond without modification to the design and analysis of that existing facility. As stated above, all other lots shall discharge directly to the street or to private drainage facilities to be constructed along the rear property lines of certain lots. Those lots are clearly depicted on the Grading Plan which follows. Retaining walls are also required throughout the subdivision. The limits of those walls are graphically shown on the Grading Plan. Plan and profile designs and specific wall sections have been designed and will be presented in conjunction with the Work Order plans.

The calculations which appear hereon analyze both the existing and developed conditions for the 100-year, 6-hour rainfall event. These calculations have been performed in accordance with the procedure for "40-acre and Smaller Basins" as set forth in Section 22.2, Hydrology of the Development Process Manual, Volume 2, Design Criteria for the City of Albuquerque, New Mexico, August, 1991, the land treatment characteristics identified in the Master Drainage Plan have been used in these computations to maintain consistency with the already approved plan. As shown by these calculations, the runoff to be generated onsite is equal to or less than the peak discharges identified in the Master Drainage Plan.

**CALCULATIONS****Site Characteristics**

- Precipitation Zone: 3
- $P_{6,100} = P_{360} = 2.60$
- Total Area ( $A_T$ ): 11.0 Ac. (Basin C-1 Undeveloped)  
6.26 Ac. (Basin C-1 Developed)  
11.84 Ac. (Basin C-2)
- Existing Land Treatment

	Treatment	Area (sf/ac)	%
Basin C-1 (Undev.)	A	480,000/11.0	100
Basin C-1 (Dev.)	A	272,900/6.26	100
Basin C-2	A	515,700/11.84	100
Basin MS-1A	A	65,340/1.50	100
Basin MS-1B	A	5,190/0.12	100

	Treatment	Area (sf/ac)	%
Basin C-1 (Undev.)	Same as Existing	73,680/1.69	27
Basin C-1 (Dev.)	B	73,680/1.69	27
	C	125,930/2.88	46
	D	139,240/3.20	27
Basin C-2	B	139,240/3.20	27
	C	237,220/5.44	46
	D	24,500/0.56	37.5
Basin MS-1A	B	24,500/0.56	37.5
	C	16,340/0.38	25
Basin MS-1B	B	1,300/0.03	25
	C	1,300/0.03	25
	D	2,590/0.06	50

**Existing Condition**

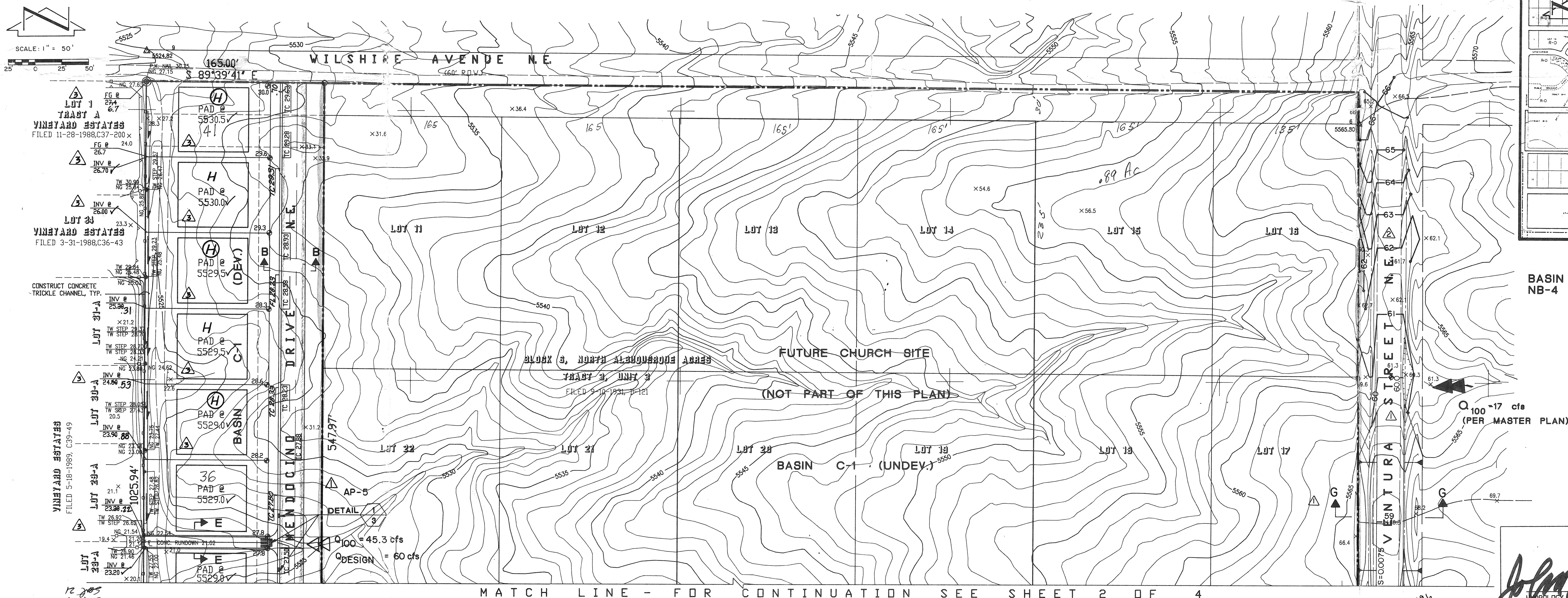
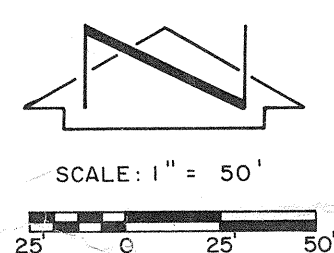
- Basin C-1 (Undev.)
  - Volume  
 $E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$   
 $E_W = (0.66) (11.0) / 11.0 = 0.66$  in  
 $V_{100} = (E_W / 12) A_T$   
 $V_{100} = (0.66 / 12) 11.0 = 0.61$  Ac Ft = 26,570 cf
  - Peak Discharge  
 $Q_p = Q_{PA} A_A + Q_{PB} A_B + Q_{PC} A_C + Q_{PD} A_D$   
 $Q_p = Q_{100} = (1.87) (11.0) = 20.6$  cfs
- Basin C-1 (Dev.)
  - Volume  
 $E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$   
 $E_W = (0.66) (6.26) / 6.26 = 0.66$  in  
 $V_{100} = (E_W / 12) A_T$   
 $V_{100} = (0.66 / 12) 6.26 = 0.34$  Ac Ft = 15,000 cf
  - Peak Discharge  
 $Q_p = Q_{PA} A_A + Q_{PB} A_B + Q_{PC} A_C + Q_{PD} A_D$   
 $Q_p = Q_{100} = (1.87) (6.26) = 11.7$  cfs

- Basin C-2
    - Volume  
 $E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$   
 $E_W = (0.66) (11.84) / 11.84 = 0.66$  in  
 $V_{100} = (E_W / 12) A_T$   
 $V_{100} = (0.66 / 12) 11.84 = 0.65$  Ac Ft = 28,370 cf
    - Peak Discharge  
 $Q_p = Q_{PA} A_A + Q_{PB} A_B + Q_{PC} A_C + Q_{PD} A_D$   
 $Q_p = Q_{100} = (1.87) (11.84) = 22.1$  cfs
  - Basin MS-1A
    - Volume  
 $E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$   
 $E_W = (0.66) (1.5) / 1.5 = 0.66$  in  
 $V_{100} = (E_W / 12) A_T$   
 $V_{100} = (0.66 / 12) 1.5 = 0.08$  Ac Ft = 3,600 cf
    - Peak Discharge  
 $Q_p = Q_{PA} A_A + Q_{PB} A_B + Q_{PC} A_C + Q_{PD} A_D$   
 $Q_p = Q_{100} = (1.87) (1.50) = 2.8$  cfs
  - Basin MS-1B
    - Volume  
 $E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$   
 $E_W = (0.66) (0.12) / 0.12 = 0.66$  in  
 $V_{100} = (E_W / 12) A_T$   
 $V_{100} = (0.66 / 12) 0.12 = 0.007$  Ac Ft = 300 cf
    - Peak Discharge  
 $Q_p = Q_{PA} A_A + Q_{PB} A_B + Q_{PC} A_C + Q_{PD} A_D$   
 $Q_p = Q_{100} = (1.87) (0.12) = 0.2$  cfs
- Developed Condition**
- Basin C-1 (Undev.) - No Change
  - Basin C-1 (Dev.)
    - Volume  
 $E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$   
 $E_W = [(0.92) (1.69) + (1.29) (1.69) + (2.36) (2.88)] / 6.26 = 1.68$  in  
 $V_{100} = (E_W / 12) A_T$   
 $V_{100} = (1.68 / 12) 6.26 = 0.88$  Ac Ft = 38,180 cf
    - Peak Discharge  
 $Q_p = Q_{PA} A_A + Q_{PB} A_B + Q_{PC} A_C + Q_{PD} A_D$   
 $Q_p = Q_{100} = (2.60) (1.69) + (3.45) (1.69) + (5.02) (2.88) = 24.7$  cfs
  - Basin C-2
    - Volume  
 $E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$   
 $E_W = [(0.92) (3.20) + (1.29) (3.20) + (2.36) (5.44)] / 11.84 = 1.68$  in  
 $V_{100} = (E_W / 12) A_T$   
 $V_{100} = (1.68 / 12) 11.84 = 1.66$  Ac Ft = 72,200 cf
    - Peak Discharge  
 $Q_p = Q_{PA} A_A + Q_{PB} A_B + Q_{PC} A_C + Q_{PD} A_D$   
 $Q_p = Q_{100} = (2.60) (3.20) + (3.45) (3.20) + (5.02) (5.44) = 46.7$  cfs

- Basin MS-1A
    - Volume  
 $E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$   
 $E_W = [(0.92) (0.56) + (1.29) (0.56) + (2.36) (0.38)] / 1.5 = 1.42$  in  
 $V_{100} = (E_W / 12) A_T$   
 $V_{100} = (1.42 / 12) 1.5 = 0.18$  Ac Ft = 7,840 cf
    - Peak Discharge  
 $Q_p = Q_{PA} A_A + Q_{PB} A_B + Q_{PC} A_C + Q_{PD} A_D$   
 $Q_p = Q_{100} = (2.60) (0.56) + (3.45) (0.56) + (5.02) (0.38) = 5.3$  cfs
  - Basin MS-1B
    - Volume  
 $E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$   
 $E_W = [(0.92) (0.03) + (1.29) (0.03) + (2.36) (0.06)] / 0.12 = 1.73$  in  
 $V_{100} = (E_W / 12) A_T$   
 $V_{100} = (1.73 / 12) 0.12 = 0.017$  Ac Ft = 740 cf
    - Peak Discharge  
 $Q_p = Q_{PA} A_A + Q_{PB} A_B + Q_{PC} A_C + Q_{PD} A_D$   
 $Q_p = Q_{100} = (2.60) (0.03) + (3.45) (0.03) + (5.02) (0.06) = 0.5$  cfs
- Comparison**
- Basin C-1 (Undev.) - No Change
  - Basin C-1 (Dev.)
    - $\Delta V_{100} = 38,180 - 15,000 = 23,180$  cf (increase)
    - $\Delta Q_{100} = 24.7 - 11.7 = 13.0$  cfs (increase)
  - Basin C-2
    - $\Delta V_{100} = 72,200 - 28,370 = 43,830$  cf (increase)
    - $\Delta Q_{100} = 46.7 - 22.1 = 24.6$  cfs (increase)
  - Basin MS-1A
    - $\Delta V_{100} = 7,840 - 3,600 = 4,240$  cf (increase)
    - $\Delta Q_{100} = 5.3 - 2.8 = 2.5$  cfs (increase)
  - Basin MS-1B
    - $\Delta V_{100} = 740 - 300 = 440$  cf (increase)
    - $\Delta Q_{100} = 0.5 - 0.2 = 0.3$  cfs (increase)
  - Net Comparison
    - $\Delta V_{100} = 71,690$  cf (increase)
    - $\Delta Q_{100} = 40.4$  cfs (increase)

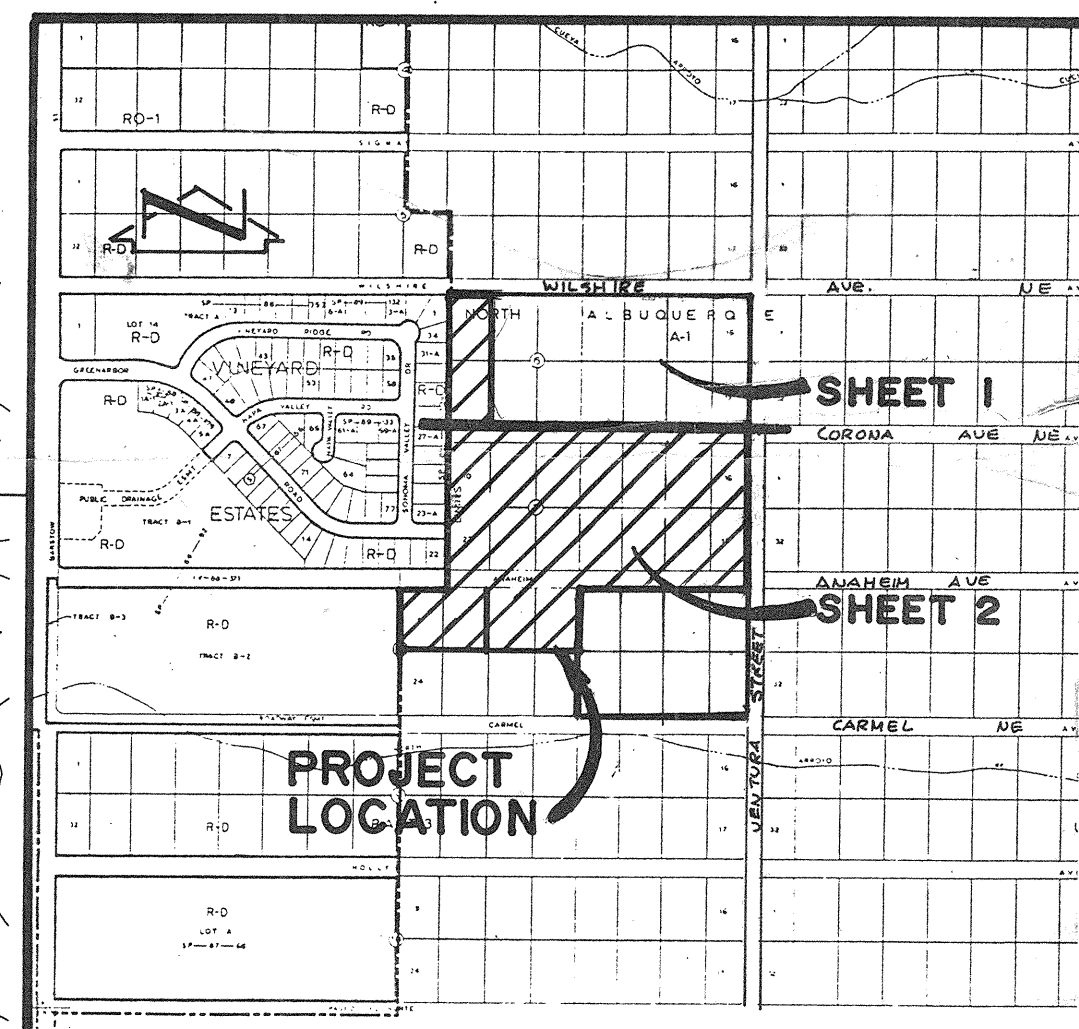


NOTE: REFER TO SHEET 20F4 FOR CERTIFICATION

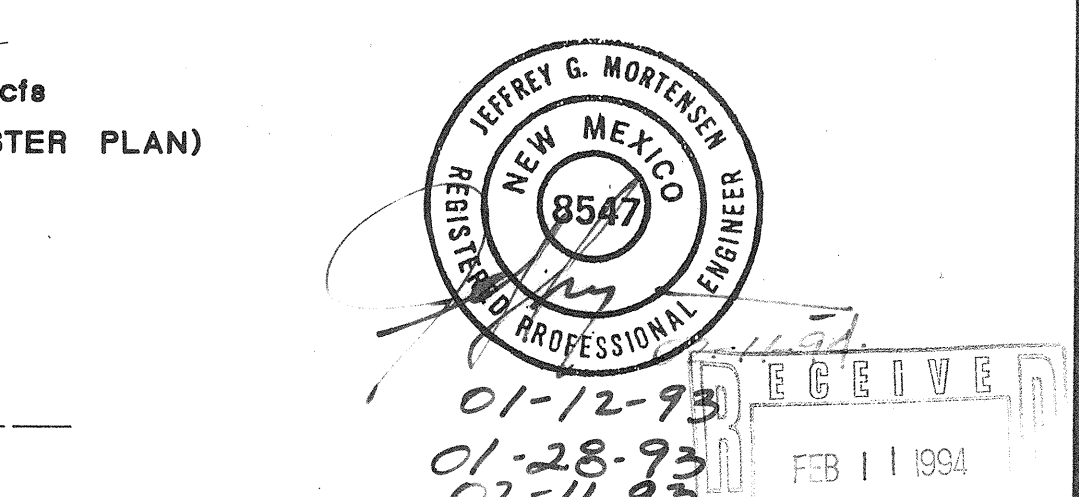


- LEGEND**
- (H) HOUSE CONSTRUCTION COMPLETED
- (H) HOUSE PRESENTLY UNDER CONSTRUCTION
- ✓ AS-BUILT ELEVATION = DESIGN ELEVATION
- TW TOP OF RETAINING WALL

VICINITY MAP (SCALE: 1"=800'-APPROX.) C-20



- LEGEND**
- X31.6 EXISTING SPOT ELEVATION
- 5530 EXISTING CONTOUR
- 300 PROPOSED SPOT ELEVATION
- 30 PROPOSED CONTOUR
- PROPOSED RETAINING WALL
- DIRECTION OF FLOW
- TV TOP OF WALL
- NG NATURAL GROUND (EXISTING)
- FL FLOW LINE
- TSW TOP OF SIDEWALK
- TC TOP OF CURB
- FG FINISHED GRADE (PROPOSED)
- INV INVERT (PROPOSED)
- BASIN BOUNDARY LINE
- PROPOSED ASPHALT



APPROVED FOR ROUGH GRADING

*John P. Carter* 2-26-93

HYDROLOGY DATE

**Jma**

JEFF MORTENSEN & ASSOCIATES, INC.  
6010-B MIDWAY PARK BLVD. N.E.  
ALBUQUERQUE, NEW MEXICO 87109  
ENGINEERS & SURVEYORS (505)345-4250

**GRADING AND DRAINAGE PLAN**  
**VINEYARD ESTATES III**

PROJECT NO.:

DESIGNED BY J.G.M.

DRAWN BY ACAD

APPROVED BY J.G.M.

NO.	DATE	BY	REVISIONS	JOB NO.
1	01/93	JGM	CLARIFY HYDROLOGY; SECTION G-G	920834
2	02/93	JGM	GRADE VENTURA TO WILSHIRE; REVISE TEXT	DATE
3	2/94	JGM	AS-BUILT & CERTIFY	01-1993
			Vineyard Estates Unit III C20/D30	SHEET 1 OF 4



MATCH LINE - FOR CONTINUATION SEE SHEET 1 OF 4

*Jeff Mortensen 2-26-93*

DRAINAGE CERTIFICATION

As indicated by the as-built information shown hereon, the house pads, curb, trickle channels, and retaining walls have been constructed in substantial conformance with the approved grading and drainage plan. All house pad elevations were verified prior to the commencement of home construction. Retaining wall as-builts are provided for reference. The trickle channels along the west edge of the project were raised during construction due to conflicts with the existing retaining wall footing along that property line. The existing wall footing protruded into the project site at a grade that was in conflict with the finished grades as proposed. In response, the trickle channel elevations were raised so that the bottom of concrete of the trickle channel now sits on the top of footing of the existing wall. This plan further illustrates those lots upon which houses have been

100 PER MASTER DRAINAGE PLAN

completed or are under construction. The above information was obtained by me or under my direct supervision and is true and correct to the best of my knowledge and belief.

Jeffrey G. Mortensen  
NMPE 8547  
Date 02-11-93

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FEB 11 1994

LEGEND

- (H) HOUSE CONSTRUCTION COMPLETED  
H HOUSE PRESENTLY UNDER CONSTRUCTION  
✓ AS-BUILT ELEVATION = DESIGN ELEVATION  
TW-TOP OF RETAINING WALL

RECEIVED  
FEB 11 1994

JEFFREY G. MORTENSEN  
NEW MEXICO  
8547  
REGISTERED PROFESSIONAL ENGINEER

02-12-93  
01-28-93

PROJECT NO.:  
DESIGNED BY: J.G.M.  
DRAWN BY: ACAD  
APPROVED BY: J.G.M.

NO. DATE BY  
1 01/93 JGM  
2 02/93 JGM  
3 2/94 JGM

REVISIONS  
ADD EASEMENTS; SECTION G-G; ADD PADS  
REGRADE LOTS 26A, 26B, 26C  
AS-BUILT & CERTIFY

JOB NO.  
920834  
DATE  
01-1993  
SHEET  
2 OF 4

