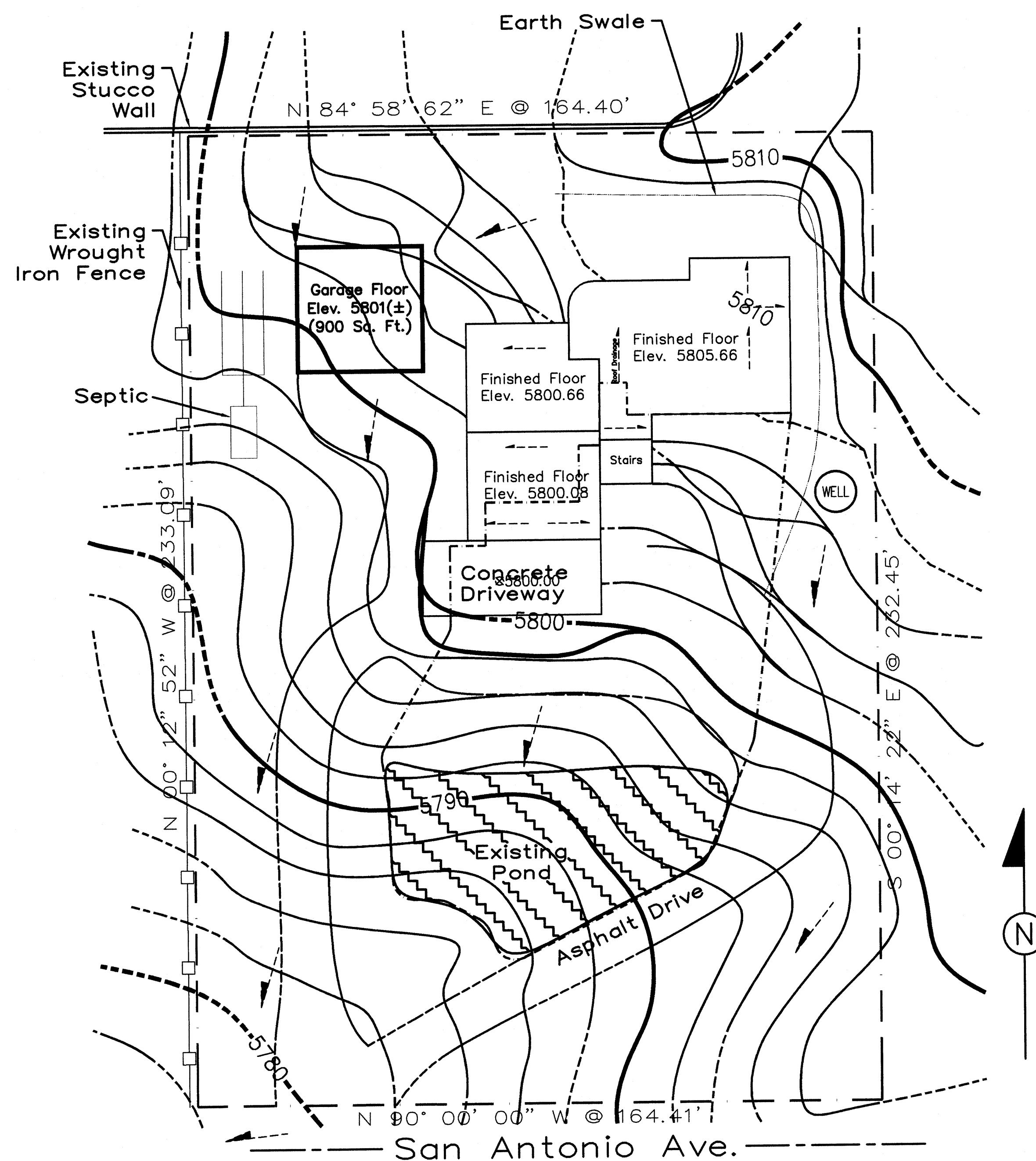
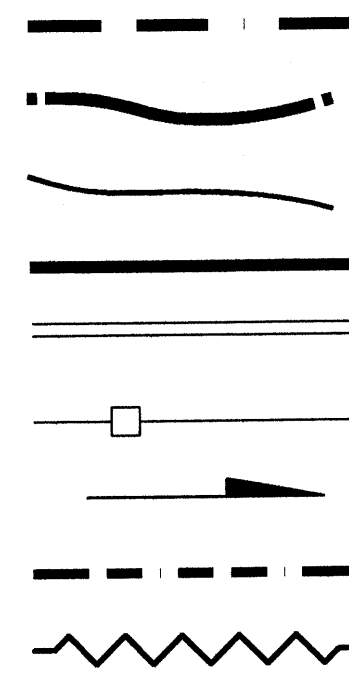




GRADING AND DRAINAGE PLAN

LEGEND

- Property Line
- Existing Contours (2.0 Ft.)
- Earth Swale
- Proposed Development
- Existing Stucco Wall
- Existing Wrought Iron Fence
- Drainage: Indicated by Arrows
- Area Drains to Pound (Boundary)
- Existing Pond Limits



PURPOSE

Update drainage plan to include existing house, 30' x 30' garage, and asphalt paving.

SAMPLE DRAINAGE CALCULATIONS

Using the simplified procedures outlined in the DPM, this lot falls in zone 4.

Excess precipitation factors for 100 year event are:

$$E_A = 0.80, E_B = 1.08, E_C = 1.46, \text{ and } E_D = 2.64$$

$$\text{Weighted } E = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / (A_A + A_B + A_C + A_D)$$

$$\text{Volume of excess precipitation} = V_{360} = \text{Weighted } E (A_A + A_B + A_C + A_D)$$

Current land treatment areas are:

$$\begin{aligned} A_A &= 0.200 \text{ ac.} \\ A_B &= 0.147 \text{ ac.} \\ A_C &= 0.247 \text{ ac.} \\ A_D &= 0.296 \text{ ac.} \end{aligned}$$

$$E = [0.80(0.20) + 1.08(0.147) + 1.46(0.247) + 2.64(0.296)] / 0.89 = 1.641 \text{ in.}$$

$$V = [1.641 / 12] / 0.89 = 0.121 \text{ Ac.-Ft.} = 5303 \text{ c.f.}$$

$$Q = 2.20(0.20) + 2.92(0.147) + 3.73(0.247) + 5.25(0.296) = 3.44 \text{ cfs}$$

NAA drainage master plan allows $Q = 2.82 \text{ cfs}$ and $V = 4203 \text{ c.f.}$, therefore, mitigation is required.

Existing pond must be considered. Existing pond is 1700 s.f. with an average depth of 1.5 ft., and a volume of 2550 c.f. The treatment areas captured by this pond are:

$$\begin{aligned} A_A &= 0.0630 \text{ ac.} \\ A_B &= 0.0315 \text{ ac.} \\ A_D &= 0.1033 \text{ ac.} \\ \text{Total Area} &= 0.1978 \text{ ac.} \end{aligned}$$

Excess precipitation captured is

$$E = [0.80(0.0630) + 1.46(0.0315) + 2.64(0.1033)] / 0.1978 = 1.866 \text{ in.}$$

$$V = 1.866(0.1978) = 0.0307 \text{ a.f.} = 1340 \text{ c.f.}$$

$$Q = 2.20(0.0630) + 3.73(0.0315) + 5.25(0.1033) = 0.798 \text{ cfs}$$

Check volume for larger storms:

$$\begin{aligned} V_{24 \text{ hr}} &= V_{1440} = V_{360} + [A_D(P_{1440} - P_{360})] / 12 \\ &= 0.0307 + 0.1033(3.65 - 2.90) / 12 = 0.0372 \text{ a.f.} = 1618 \text{ c.f.} \end{aligned}$$

$$\begin{aligned} V_{4 \text{ day}} &= V_{360} + A_D(P_{4 \text{ day}} - P_{360}) / 12 \\ &= 0.0307 + 0.1033(4.70 - 2.90) / 12 = 0.0461 \text{ a.f.} = 2012 \text{ c.f.} \end{aligned}$$

$$\begin{aligned} V_{10 \text{ day}} &= V_{360} + A_D(P_{10 \text{ day}} - P_{360}) / 12 \\ &= 0.0307 + 0.1033(5.95 - 2.90) / 12 = 0.0569 \text{ a.f.} = 2480 \text{ c.f.} \end{aligned}$$

Therefore, entire volume captured by pond can be considered.

Net volume of drainage to San Antonio Drive is

$$V = 5303 \text{ c.f.} - 1340 \text{ c.f.} = 3963 \text{ c.f.}$$

Net discharge is

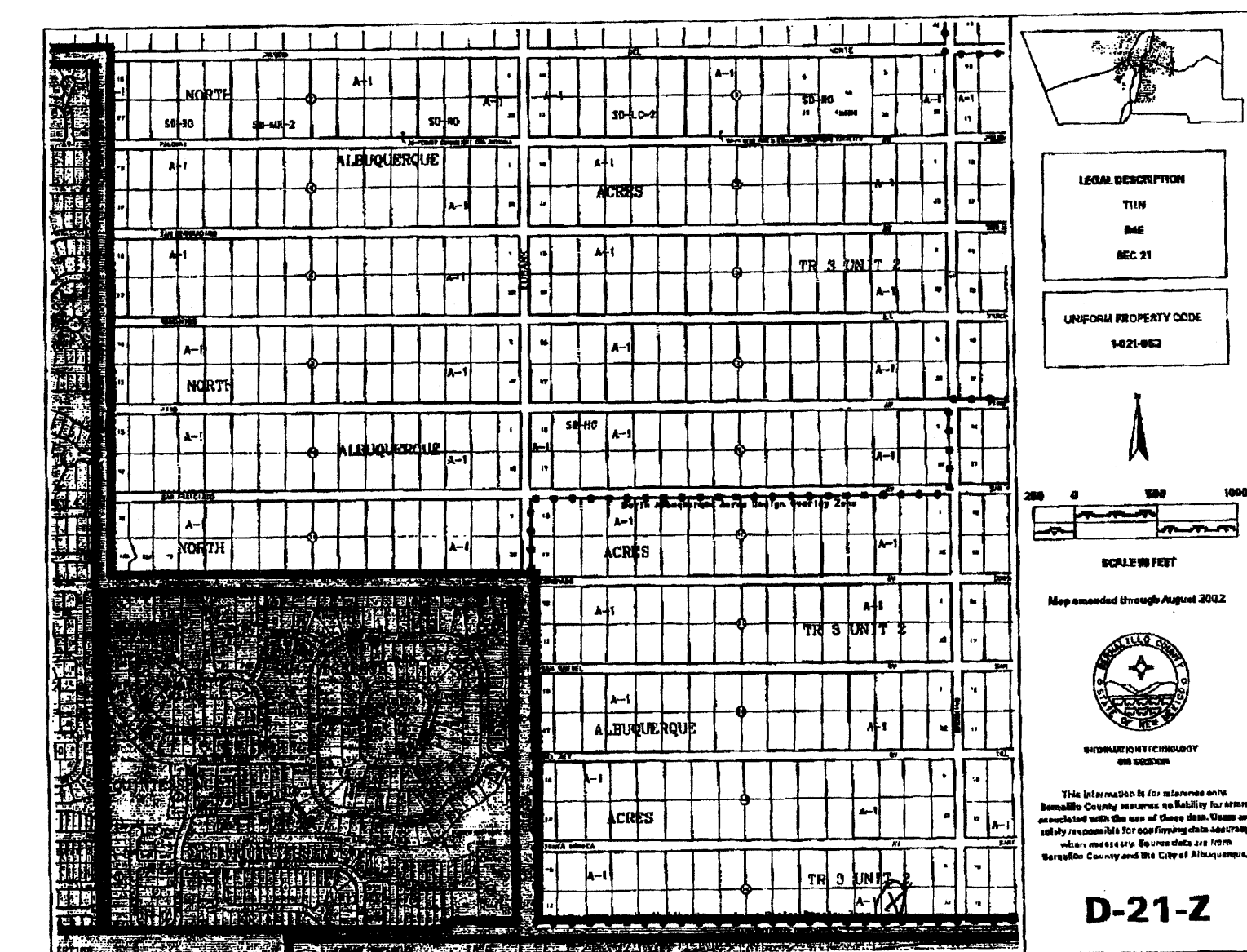
$$Q = 3.309 \text{ cfs} - 0.798 \text{ cfs} = 2.51 \text{ cfs}$$

CERTIFICATION

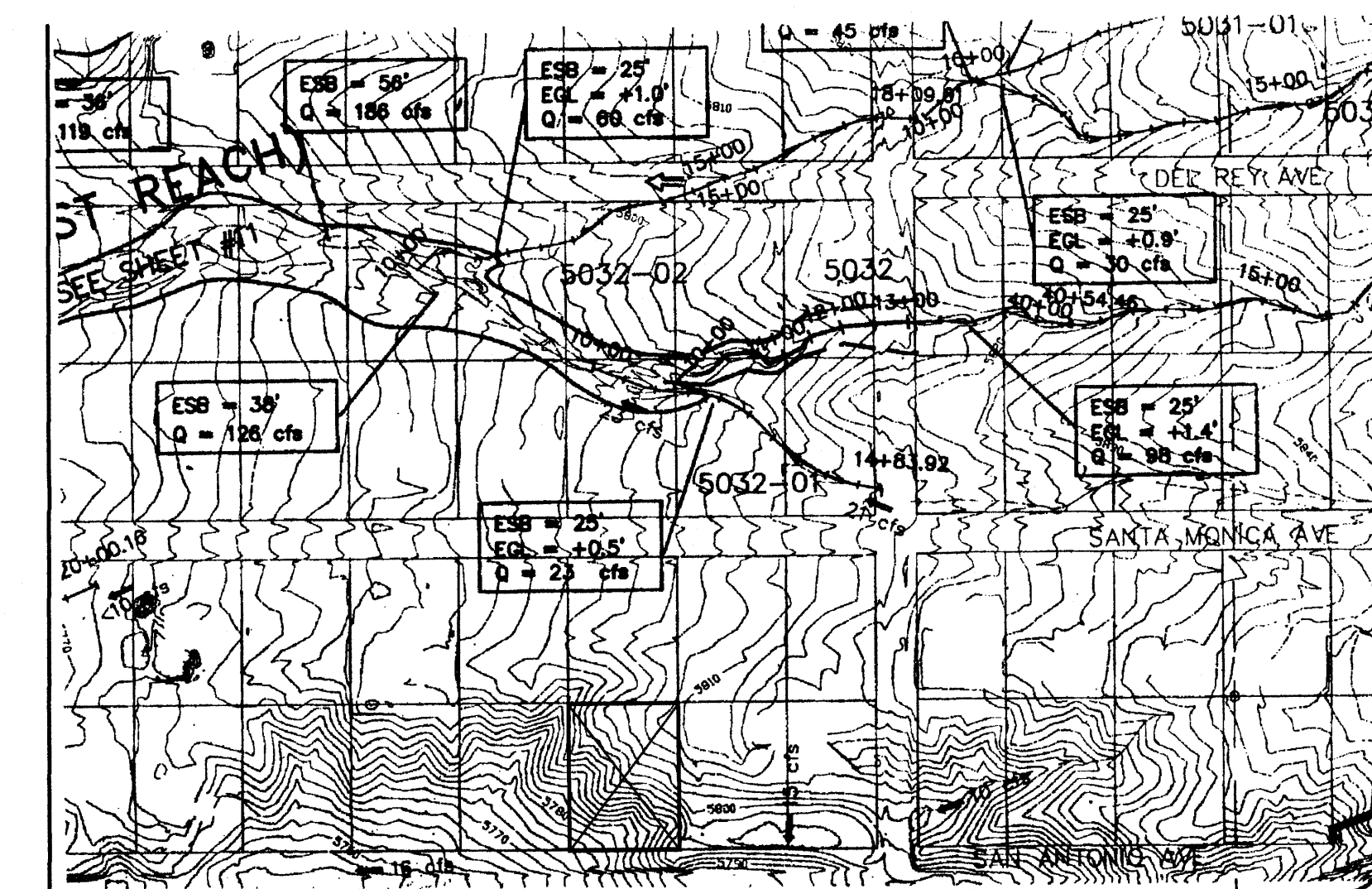
I have personally inspected the site and I certify that no grading, filling, or excavation has occurred since the preparation of the topography shown on the plan.



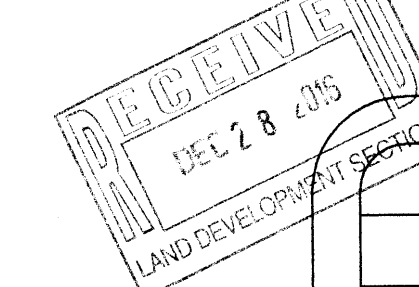
Arthur R. Valverde, P.E. Date: 12/22/16



VICINITY MAP



FEMA FLOODWAY MAP



General Notes		
1	Revised Grading and Drainage Plan	12/21/2016
No.	Revision/Issue	Date

GRADING AND DRAINAGE PLAN
LOT 30, BLK 9, TRACK 3, UNIT 2
NORTH ALBUQUERQUE ACRES

ARTHUR VALVERDE, P.E.
OWNER/BUILDER
11009 San Antonio Ave. N.E.
Albuquerque, New Mexico 87122

Project VALVERDE	Sheet 1 OF 1
Date December 9, 2016	
Scale 1 INCH = 20'	