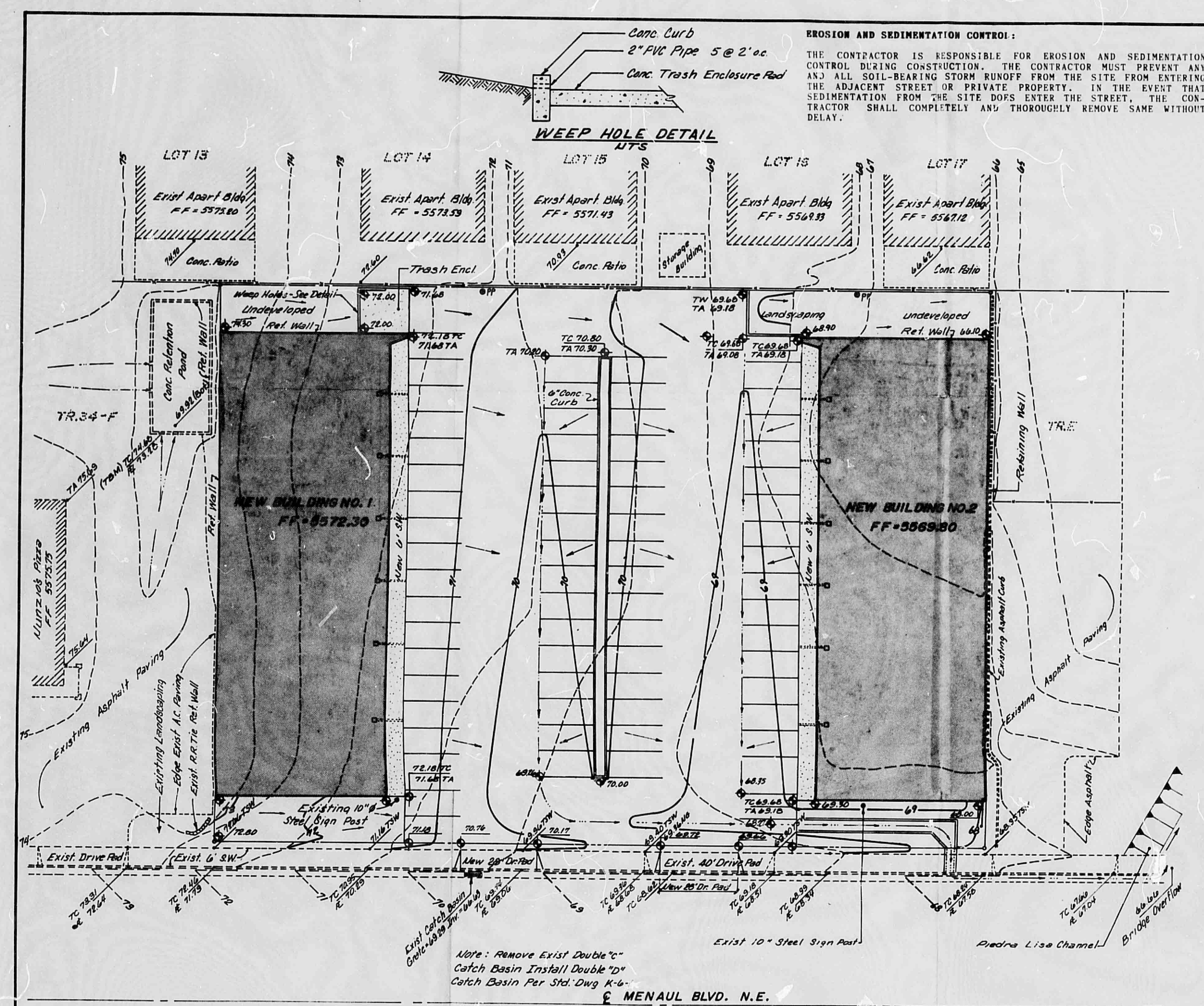




DRAINAGE CALCULATIONS & COMMENTS

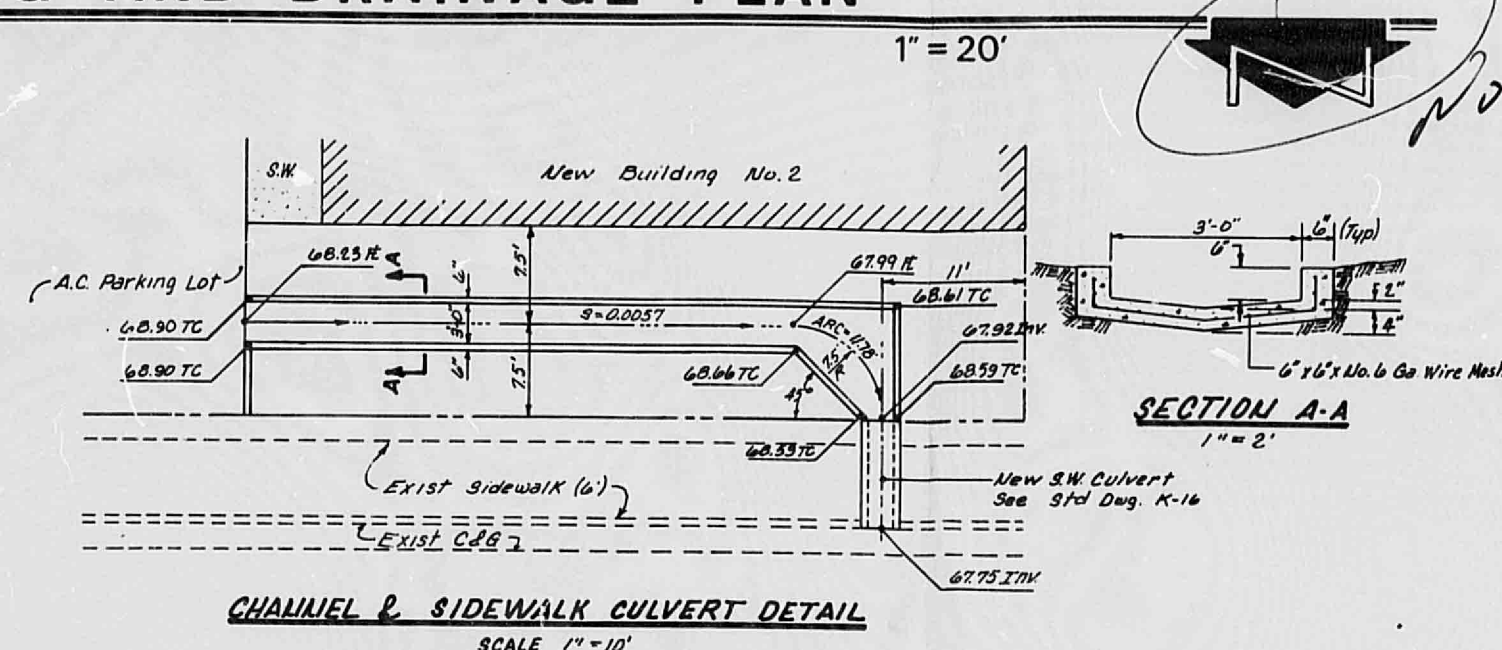
- REFERENCES:**
 - City of Albuquerque Development Process Manual (DPM) Volume 2, Design Criteria, Chapter 22, Drainage, Flood Control and Erosion Control.
 - Soil Survey of Bernalillo County and Parts of Sandoval and Valencia Counties, New Mexico, United States Department of Agriculture, Soil Conservation Service.
 - GENERAL INFORMATION:**
 - Soil Type (See Ref. A, Sheet No. 32) Soil type is Emb. Embudo gravelly clay sandy loam. The Hydrologic Soil Group is "B".
 - Imperviousness:

Type of Surface	Existing Area Sq.Ft. - Acres	Proposed Area Sq.Ft. - Acres
Building roof	16,500	16,500
Concrete Surfaces	2,050	2,050
Asphalt Surfaces	22,785	22,785
Landscaping	3,015	3,015
Undeveloped surface	45,000 1.0331	675
Site total	45,000 1.0331	45,000 1.0331
Percent impervious	02	925
 - "C" Factor (See Ref. A, Plate 22.2 C-1)**
 - Undeveloped "C" Factor = 0.34
 - Developed "C" Factor = 0.88
 - Rainfall, 100-year, 6-hour, R_6 :** (See Ref. A, Plate 22.2 D-1) $R_6 = 2.45$ inches.
 - Time of Concentration, T_c :** L = 308 feet, Delta Elev. is 10 feet; $S = 10/308 = 0.032$ (1/4) By Kirpich Equation: $T_c = 0.0078(308^{0.77}/0.03^{0.385})$ $T_c = 2.48$ min, use 10 minutes for both developed and undeveloped conditions.
 - Rainfall Intensity, i :** (See Ref. A, Plate 22.2 D-2) $i = R_6 \times 6.94 \times T_c^{-0.51} = 2.45 \times 6.94 \times (10)^{-0.51}$ $i = 5.18$ in/hr
- PEAK DISCHARGE:**
 - Undeveloped Conditions: By Rational Equation $Q = CIA$ $Q_{100} = 0.34 \times 5.18 \times 1.0331 = 1.86$ cfs $Q_{10} = 0.657 \times 1.86 = 1.09$ cfs
 - Developed Conditions: $Q_{100} = 0.88 \times 5.18 \times 1.0331 = 4.71$ cfs $Q_{10} = 0.657 \times 4.71 = 3.09$ cfs
- PEAK VOLUME:**
 - Undeveloped Condition: (Rational Method per 100-yr. 6-hour rainfall.) $V_{100} = 0.34(2.45/12)45000 = 3,124$ cf $V_{10} = 0.657 \times 3,124 = 2,052$ cf
 - Developed Condition: $V_{100} = 0.88(2.45/12)45,000 = 8,085$ cf $V_{10} = 0.657 \times 8,085 = 5,312$ cf
- SIDEWALK CULVERT CAPACITY:**

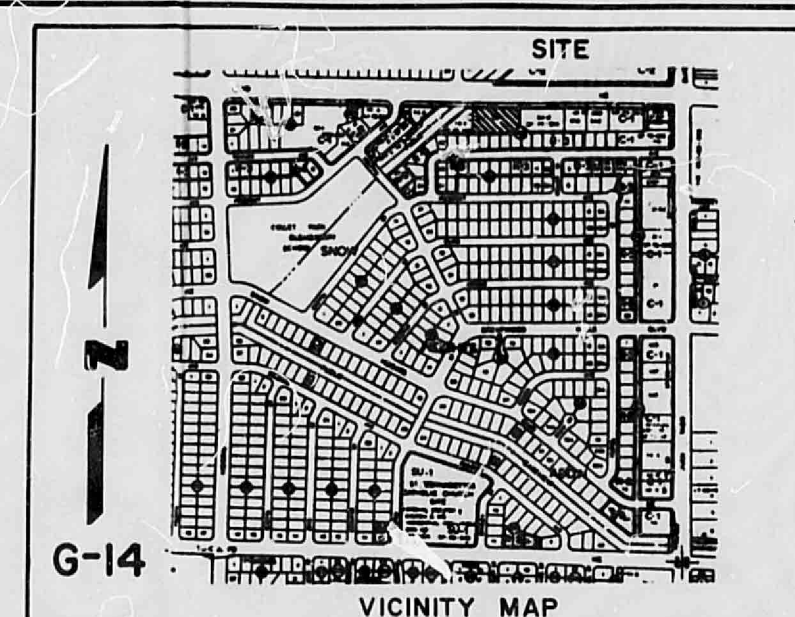
Try 2' width, 4.5" flow depth: $n = 0.013$; $s = 0.02$ ft/ft Manning's Equation $A = 0.375 \times 2 = 0.75$ P = 2.75 $R = A/P = 0.75/2.75 = 0.2727$ $Q = 0.75(1.486/0.013)(0.2727)^{2/3}/(0.02)^{1/2}$ $Q = 5.10$ cfs > 4.71 cfs (Adequate) $V = 5.10/0.75 = 6.8$ fps
- CHANNEL CAPACITY:**

Try 3' width, 1" flow depth: Depth of channel to vary from 6" to 8" at sidewalk culvert. By Manning's Equation $A = 0.4167 \times 3.0 = 1.25$ sf $P = 2 \times 0.4167 + 3.0 = 3.83$ R = $1.25/3.83 = 0.3264$ $n = 0.013$ $s = 0.005$ ft/ft $Q = 1.25(1.486/0.013)(0.3264)^{2/3}/(0.005)^{1/2}$ $Q = 4.79$ cfs > 4.71 cfs (Adequate) $V = 4.79/1.25 = 3.83$ fps
- DRAINAGE COMMENTS:**
 - OFF-SITE FLOODS DO NOT ENTER THE SITE AT ANY POINT IN EITHER THE UNDEVELOPED OR DEVELOPED CONDITIONS.
 - IN THE UNDEVELOPED STATE, FLOW LEAVES THE SITE AT THE S.W. CORNER. IN THE DEVELOPED STATE, ALL FLOW WILL BE DIRECTED TO MENAUL BOULEVARD EXCEPT FOR THE SMALL LANDSCAPED/ON-DEVELOPED AREA AT THE SOUTH END OF NEW BUILDING NO. 2. WHATEVER FLOODS IN THIS AREA WILL REMAIN THERE. A VERY SIGNIFICANT DECREASE IN RUNOFF AT THE S.W. CORNER OF THE SITE WILL RESULT.
 - BUILDINGS WILL DRAIN TO THE FRONT VIA INTERIOR ROOF DRAINS THAT WILL DISCHARGE THROUGH THE VERTICAL FACE OF THE SIDEWALK.
 - PER PRE-DESIGN CONFERENCE RECAP, FREE DISCHARGE IS PERMITTED DUE TO 1) THE SITE BEING AN INFILL AREA, AND 2) MINIMUM FLOODING DOWNSTREAM.

GRADING AND DRAINAGE PLAN



GRADING & DRAINAGE PLAN
FOR
CIMARRON SQUARE RETAIL CENTER
10,900 Menaul Blvd. NE
Albuquerque, New Mexico



DATE 3-24-85

CITY OF ALBUQUERQUE
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The photographic process used meets the Basic Microfilm Standards of the National Micrographics Association (MS15-1977)

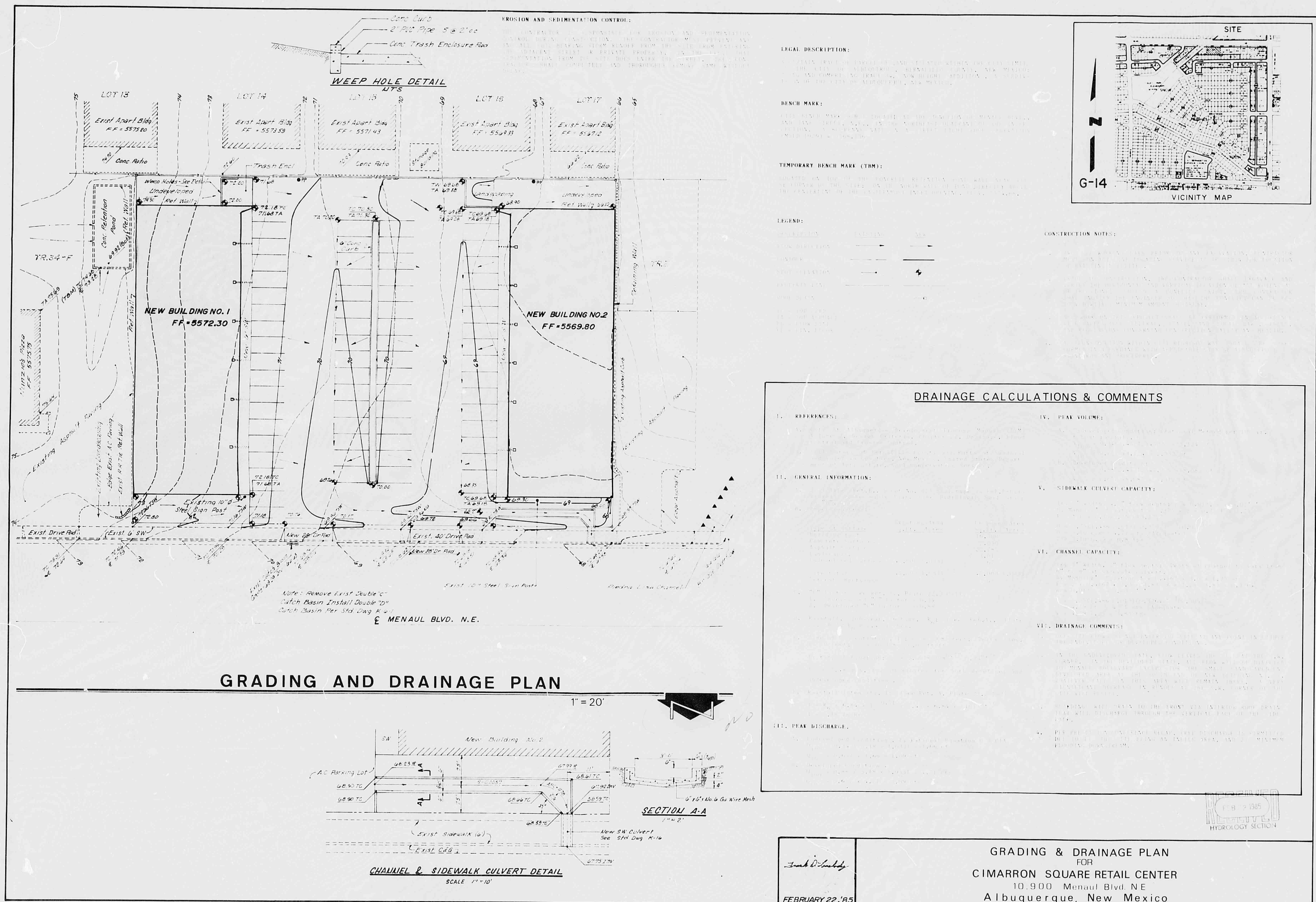
DIRECTOR

NOTARY PUBLIC
Roberta Duran

PLANS/PLATS ON FILE

FILE DESC: H21/D25

PLANS/PLATS 1



PEAK SHOT TWICE
ONCE ON LIGHT
ONCE ON DARK

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