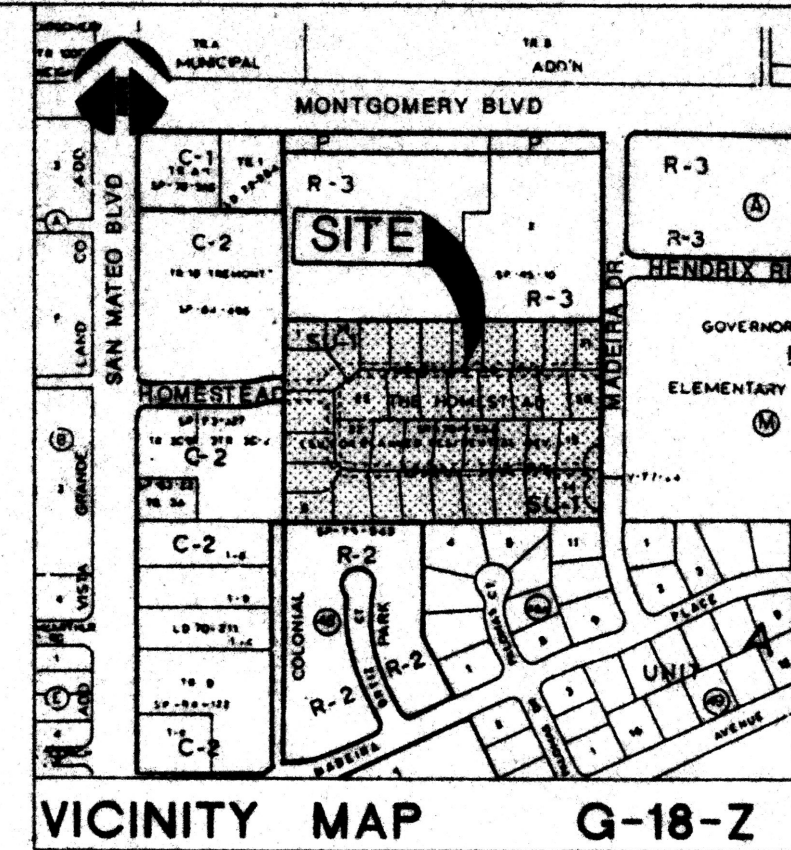


FEDERAL PLAZA OFFICE PARK GRADING AND DRAINAGE PLAN



NOTES:

DRAINAGE NOTES:

- THE SITE IS NOT WITHIN A 100-YR OR 500-YR FLOOD BOUNDARY AS SHOWN ON PANEL 24 OF 50, FLOODWAY FLOOD BOUNDARY AND FLOODWAY MAP, FEDERAL EMERGENCY MANAGEMENT AGENCY.
- EXISTING CONDITIONS HYDROLOGY:**
 - OFFSITE FLOWS** - THE SITE IS ISOLATED FROM OFFSITE FLOWS.
 - ONSITE FLOWS** - THE PROJECT SITE IS CURRENTLY UNDEVELOPED. THE NATURAL TOPOGRAPHY SLOPES FROM EAST TO WEST AT A GRADE OF APPROXIMATELY TWO PERCENT. THE EXISTING 100-YEAR FLOWRATE AND VOLUME ARE 29.5 CFS AND 0.92 ACRE-FOOT, RESPECTIVELY. AS SHOWN ON THE GRADING PLAN, THE SITE FLOWS ARE TO THE EAST, WITH ONLY VERY SMALL AREAS DISCHARGING TO THE NORTH AT THE NORTH PROPERTY BOUNDARY AND TO THE SOUTH AT THE SOUTH PROPERTY BOUNDARY.
- DEVELOPED CONDITIONS HYDROLOGY** - PROPOSED CONSTRUCTION INCLUDES TWO OFFICE BUILDINGS AND ASSOCIATED DRIVES AND PARKING. SITE IMPROVEMENTS WILL INCLUDE LANDSCAPING WITH A MINIMUM AREA EQUAL TO 15 PERCENT OF THE SITE PARKING AND ROADWAY AREA. DEVELOPED CONDITIONS 100-YEAR FLOWRATE AND VOLUME ARE 38.1 CFS AND 1.44 ACRE-FOOT, RESPECTIVELY. AS SHOWN ON THE GRADING PLAN, THE DEVELOPED SITE GRADING MAINTAINS THE EXISTING EAST TO WEST SITE SLOPE AND THE EXISTING FREE DISCHARGE TO THE ALLEY AND HOMESTEAD ROAD ON THE WEST SIDE OF THE PROPERTY.

FLOW DISCHARGED FROM THE SITE WILL HEAD WEST ON HOMESTEAD TO SAN MATEO AND THEN NORTH ON SAN MATEO TO MONTGOMERY. THE EAST SIDE OF SAN MATEO HAS A CAPACITY OF 17.7 CFS JUST NORTH OF THE SAN MATEO AND HOMESTEAD INTERSECTION. IN THIS AREA, THE EAST SIDE OF SAN MATEO IS TWO LANES WIDE, AND FLOWS EXCEEDING 17.7 CFS WILL OVERTOP THE MEDIAN CURB AND FLOW INTO THE WEST SIDE OF SAN MATEO. THE CAPACITY OF THE EAST SIDE OF SAN MATEO INCREASES FARTHER NORTH OF HOMESTEAD ROAD AS THE STREET WIDENS TO INCLUDE DEDICATED RIGHT- AND LEFT-TURN LANES AT THE MONTGOMERY INTERSECTION.

RECENT IMPROVEMENTS AT THE SAN MATEO AND MONTGOMERY INTERSECTION INCLUDED THE UPGRADING OF DROP INLETS IN THE INTERSECTION. THESE INLETS DRAIN TO A 36-INCH STORM DRAIN LINE IN MONTGOMERY (THERE IS NO STORM DRAIN IN SAN MATEO). UPSTREAM (EAST) OF SAN MATEO THE MONTGOMERY STORM DRAIN HAS AN AVERAGE SLOPE OF 0.0210 FT/FT AND A CAPACITY OF 96 CFS. DOWNSTREAM OF SAN MATEO, THE STORM DRAIN HAS AN AVERAGE SLOPE OF 0.0170 FT/FT AND A CAPACITY OF 87 CFS.

THE EXISTING CONDITIONS ALBUQUERQUE MASTER DRAINAGE STUDY (AMDS) SIMULATION SHOWS A PEAK OF 163 CFS OF OVERLAND FLOW IN MONTGOMERY DOWNSTREAM OF SAN MATEO, CORRESPONDING TO A FLOW DEPTH OF 0.64 FEET. PER THE AMDS, OVERLAND FLOW IN MONTGOMERY DECREASES UNDER DEVELOPED CONDITIONS DUE TO THE INSTALLATION OF A 36-INCH STORM DRAIN ($Q_{max} = 55$ CFS) IN LOUISIANA FROM MONTGOMERY TO THE NORTH HAHN ARROYO. THIS STORM DRAIN, WHICH HAS BEEN CONSTRUCTED, ELIMINATES FLOODING ON MONTGOMERY FROM CARLISLE TO SAN MATEO. WITH THIS STORM DRAIN IN PLACE, OVERLAND FLOW ROUTED WEST ON MONTGOMERY TO THE SAN MATEO AND MONTGOMERY INTERSECTION IS REDUCED FROM A PEAK OF 102.5 CFS TO A PEAK OF 11.5 CFS, AND OVERLAND FLOW IN MONTGOMERY DOWNSTREAM OF SAN MATEO IS REDUCED FROM THE EXISTING PEAK OF 163 CFS TO A PEAK OF 135.1 CFS.

DEVELOPMENT OF THE FEDERAL PLAZA OFFICE PARK WILL INCREASE THE PEAK SITE DISCHARGE BY 8.6 CFS (FROM 29.5 CFS TO 38.1 CFS). THE SITE HYDROGRAPH SHOWS THAT THE 38.1 CFS DEVELOPED PEAK DISCHARGE IS REACHED AT 12.6 MINUTES AND IS MAINTAINED UNTIL 24.1 MINUTES. BY 43.5 MINUTES, THE DEVELOPED SITE FLOWS HAVE CEASED.

BASED ON THE AMDS DEVELOPED-CONDITIONS INFLOW HYDROGRAPH FOR THE SAN MATEO AND MONTGOMERY INTERSECTION, THE INTERSECTION INFLOW PEAKS AT 189 CFS AT 12 MINUTES AND DROPS TO 155 CFS BY 24 MINUTES, 96 CFS BY 36 MINUTES, AND 74.7 CFS BY 48 MINUTES.

BOTH THE SAN MATEO AND MONTGOMERY INTERSECTION INFLOW HYDROGRAPH AND THE FEDERAL PLAZA SITE DISCHARGE HYDROGRAPH SHOW PEAK FLOW OCCURRING AT APPROXIMATELY 12 MINUTES. THEREFORE, THE FEDERAL PLAZA DEVELOPMENT WILL INCREASE THE PEAK INTERSECTION INFLOW BY A MAXIMUM OF 8.6 CFS. THE ACTUAL IMPACT OF THE FEDERAL PLAZA DEVELOPMENT ON THE PEAK INTERSECTION INFLOW WILL BE LESS THAN 8.6 CFS, SINCE ROUTING OF THE FEDERAL PLAZA HYDROGRAPH FROM THE WEST SIDE OF THE SITE TO THE SAN MATEO AND MONTGOMERY INTERSECTION WILL DELAY THE PEAK OF THE SITE HYDROGRAPH.

CALCULATIONS:

DRAINAGE CALCULATIONS:

- USE COA DPM PROCEDURE FOR 40 ACRE AND SMALLER BASINS.
- FROM FIGURE A, SITE IS IN PRECIPITATION ZONE 3.
- USE A 6-HR, 100-YR DESIGN STORM.
- FROM TABLE 4:
 - EXISTING LAND TREATMENT = TYPE C (8.54 ACRES)
 - DEVELOPED LAND TREATMENT = TYPE B FOR LANDSCAPING (1.97 ACRES)
 - = TYPE D FOR PAVEMENT AND ROOFS (6.57 ACRES)
- FROM TABLE 8:
 - EXCESS PRECIPITATION FOR TYPE B = 0.92 INCHES
 - EXCESS PRECIPITATION FOR TYPE C = 1.29 INCHES
 - EXCESS PRECIPITATION FOR TYPE D = 2.36 INCHES
- VOLUME OF RUNOFF = $\frac{(\text{EXCESS PRECIPITATION})(\text{AREA IN ACRES})}{12}$
- FROM TABLE 9:
 - PEAK DISCHARGE FACTOR FOR TYPE B = 2.60 CFS/ACRE
 - PEAK DISCHARGE FACTOR FOR TYPE C = 3.45 CFS/ACRE
 - PEAK DISCHARGE FACTOR FOR TYPE D = 5.02 CFS/ACRE
- PEAK DISCHARGE = (PEAK DISCHARGE FACTOR)(AREA IN ACRES)
- EXISTING CONDITIONS RUNOFF VOLUME = $\frac{(1.29)(8.54 \text{ AC})}{12} = 0.92 \text{ AC. FT.}$
- EXISTING CONDITIONS PEAK DISCHARGE = $\frac{(3.45 \text{ CFS})(8.54 \text{ AC})}{12} = 29.5 \text{ CFS}$
- DEVELOPED CONDITIONS RUNOFF VOLUME = $\frac{(0.92)(1.97 \text{ AC}) + (2.36)(6.57 \text{ AC})}{12} = 1.44 \text{ AC. FT.}$
- DEVELOPED CONDITIONS PEAK DISCHARGE = $\frac{(2.60 \text{ CFS})(1.97 \text{ AC}) + (5.02 \text{ CFS})(6.57 \text{ AC})}{12} = 38.1 \text{ CFS}$
- SAN MATEO BOULEVARD CAPACITY USING MANNING'S FORMULA:
 - $Q = \frac{1.486(A)(R)^{\frac{2}{3}}(S)^{\frac{1}{2}}}{N}$
 - WHERE
 - Q = FLOWRATE (CFS)
 - A = AREA (SQ FT)
 - R = HYDRAULIC RADIUS (FT)
 - S = SLOPE (FT/FT)
 - N = MANNING'S ROUGHNESS COEFFICIENT = 0.017 FOR STREETS PER COA DPM
- ASSUME MAXIMUM WATER SURFACE ELEVATION = TOP OF MEDIAN CURB OR TOP OF EAST ROADWAY CURB, WHICHEVER IS LOWER. USE ROADWAY SECTION WITH MINIMUM AREA. USE SECTION APPROXIMATELY 185 FT NORTH OF THE CENTERLINE OF HOMESTEAD ROAD N.E.
 - $Q = \frac{1.486(8.52 \text{ SQ FT})(0.24 \text{ FT})^{\frac{2}{3}}(0.0038 \text{ FT/FT})^{\frac{1}{2}}}{0.017}$
 - Q = 17.7 CFS
- FEDERAL PLAZA HYDROGRAPH USING DPM PROCEDURE:
 - $T_b = \frac{121(E)(A)^{\frac{1}{4}}}{Q_p}$
 - WHERE
 - Tb = BASE TIME (MIN)
 - E = WEIGHED AVERAGE EXCESS PRECIPITATION (IN)
 - A = TOTAL AREA (AC)
 - Qp = PEAK FLOWRATE (CFS)
 - Ad = AREA IN TREATMENT D (AC)

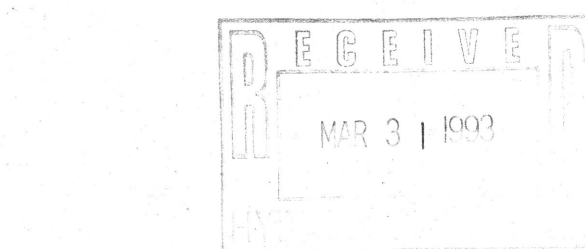
$$T_b = \frac{121(2.01 \text{ IN})(8.54 \text{ AC}) - 15(6.57 \text{ AC})}{38.1 \text{ CFS}} = 8.54 \text{ AC}$$
$$T_b = 43.5 \text{ MIN}$$
$$T_c = \text{TIME OF CONCENTRATION (MIN)} = 12 \text{ MIN PER COA DPM}$$
$$T_p = 0.7(T_c) + 8 - \frac{5(Ad)}{At}$$

WHERE T_p = TIME TO PEAK (MIN)

$$T_p = 0.7(12 \text{ MIN}) + 8 - \frac{5(6.57 \text{ AC})}{8.54 \text{ AC}}$$
$$T_p = 12.6 \text{ MIN}$$
$$\text{PEAK DURATION} = \frac{15(Ad)}{At}$$
$$\text{PEAK DURATION} = \frac{15(6.57 \text{ AC})}{8.54 \text{ AC}}$$
$$\text{PEAK DURATION} = 11.5 \text{ MIN}$$

LEGAL DESCRIPTION:

Being that certain parcel of land situated within Section 1, Township 10 North, Range 3 East, New Mexico Principal Meridian, Bernalillo County, New Mexico and being also identified as Tracts A & B, THE HOMESTEAD, as said tracts are shown and designated on "PLAT OF TRACTS A & B, THE HOMESTEAD, ALBUQUERQUE, BERNALILLO COUNTY, NEW MEXICO" filed for record in the Office of the County Clerk of Bernalillo County, New Mexico on February 19, 1993 in Volume 93-C, Folio 44.

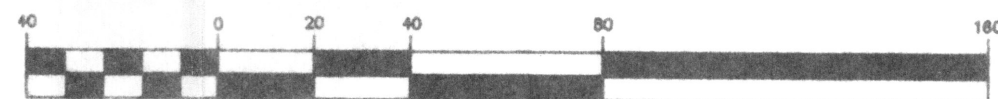


CHAVEZ-GRIEVES / CONSULTING ENGINEERS, INC.
4800-C Montgomery Blvd. N.E.
Albuquerque, New Mexico 87109
(505) 881-7378

TITLE: FEDERAL PLAZA OFFICE PARK GRADING AND DRAINAGE PLAN COVER SHEET					
APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
D.R.C. Chair			Water		
Trans. Dev.			Wastewater		
Hydrology					
Const. Coord.					
DRAWING NO.	MAP NO. G-18-Z		SHEET C3		OF



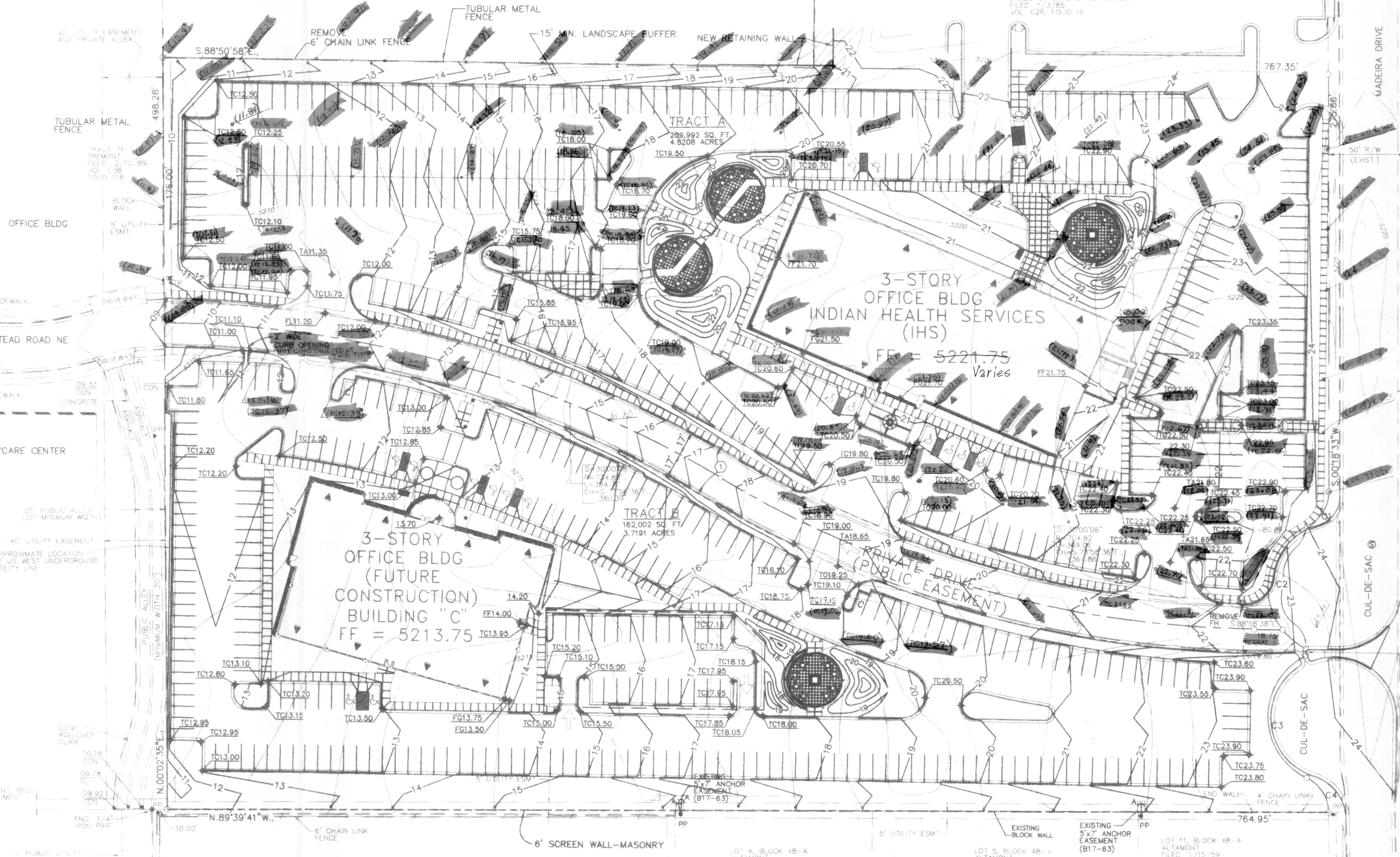
GRAPHIC SCALE



(IN FEET)
1 inch = 40 ft.

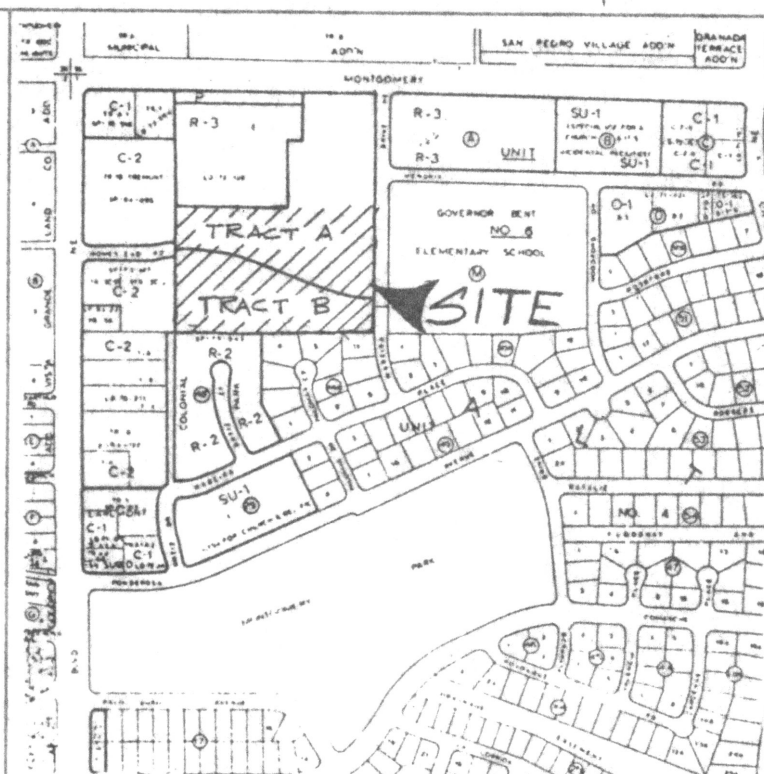
LOT 1
AMENDED CERTIFICATE OF SURVEY
LANDS OF EARL C. MONTGOMERY
FILED: 2/14/72
VOL. C26, FOLIO 25

LOT 2
LANDS OF EARL C. MONTGOMERY
FILED: 1/3/85
VOL. C26, FOLIO 16



CURVE DATA					
CURVE	RADIUS	LENGTH	DELTA	CHORD (BRNG. DIST.)	
C1	25.00	28.20	64°37'23"	5.38°37'14"	26.73
C2	45.00	100.72	138°14'07"	5.00°11'47"	80.97
C3	45.00	100.72	138°14'07"	5.00°11'47"	80.97
C4	25.00	28.20	64°37'23"	5.38°37'14"	26.73

GRADING AND DRAINAGE PLAN



VICINITY MAP G-18-Z

LEGEND:

- EXISTING CONTOUR
- NEW CONTOUR
- EXIST. CURB & GUTTER
- NEW CURB & GUTTER
- EXIST. SPOT
- NEW SPOT
- PROPERTY LINE
- NEW BUILDING
- DIRECTION OF FLOW
- ROOF DRAIN AND OVERFLOW DRAIN
- AS BUILT ELEVATION (22.50)

ABBREVIATIONS:

- EXIST. PP
- EXIST. MH
- EXIST. FL
- EXIST. TC
- EXIST. CON
- EXIST. STND
- EXIST. ESM
- EXIST. W/TA
- EXIST. FG
- EXIST. FF
- EXISTING POWER POLE
- EXISTING MANHOLE
- EXISTING FLOWLINE
- EXISTING TOP OF CURB
- EXISTING CONCRETE
- EXISTING STANDARD EASEMENT
- EXISTING WITH TOP OF ASPHALT
- EXISTING FINISH GRADE
- EXISTING FINISH FLOOR
- R/W SAN
- RIGHT-OF-WAY SANITARY

KEYED NOTES

- 1 34' PUBLIC ROADWAY, PUBLIC UTILITY, AND PUBLIC DRAINAGE EASEMENT

I HEREBY CERTIFY THIS AS-BUILT DRAINAGE PLAN IS IN SUBSTANTIAL COMPLIANCE WITH THE APPROVED DRAINAGE PLAN.
SIGNED: *Sanj Baloch*
DATE: *Dec. 14, 1995*

RECORD DRAWING

THIS RECORD DRAWING IS BASED ON "AS-CONSTRUCTED" INFORMATION PROVIDED BY ALBUQUERQUE SURVEYING COMPANY. CHAVEZ-GRIEVES CONSULTING ENGINEERS DID NOT VERIFY ALBUQUERQUE SURVEYING COMPANY'S DATA AND MAKES NO CLAIM AS TO THE ACCURACY OF THE "AS-CONSTRUCTED" INFORMATION SHOWN ON THIS PLAN.

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Albuquerque, New Mexico 87109
(505) 881-7376

TITLE:

FEDERAL PLAZA OFFICE PARK
GRADING AND DRAINAGE PLAN

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
D.R.C. Chair			Water		
Trans. Dev.			Wastewater		
Hydrology					
Const. Coord.					

DRAWING NO. MAP NO. G-18-Z SHEET C4

FILE: USDA-CADWG (12-23-92)
(REV. 04-07-93)
AS BUILT ELEV. 12-8-93 LEO