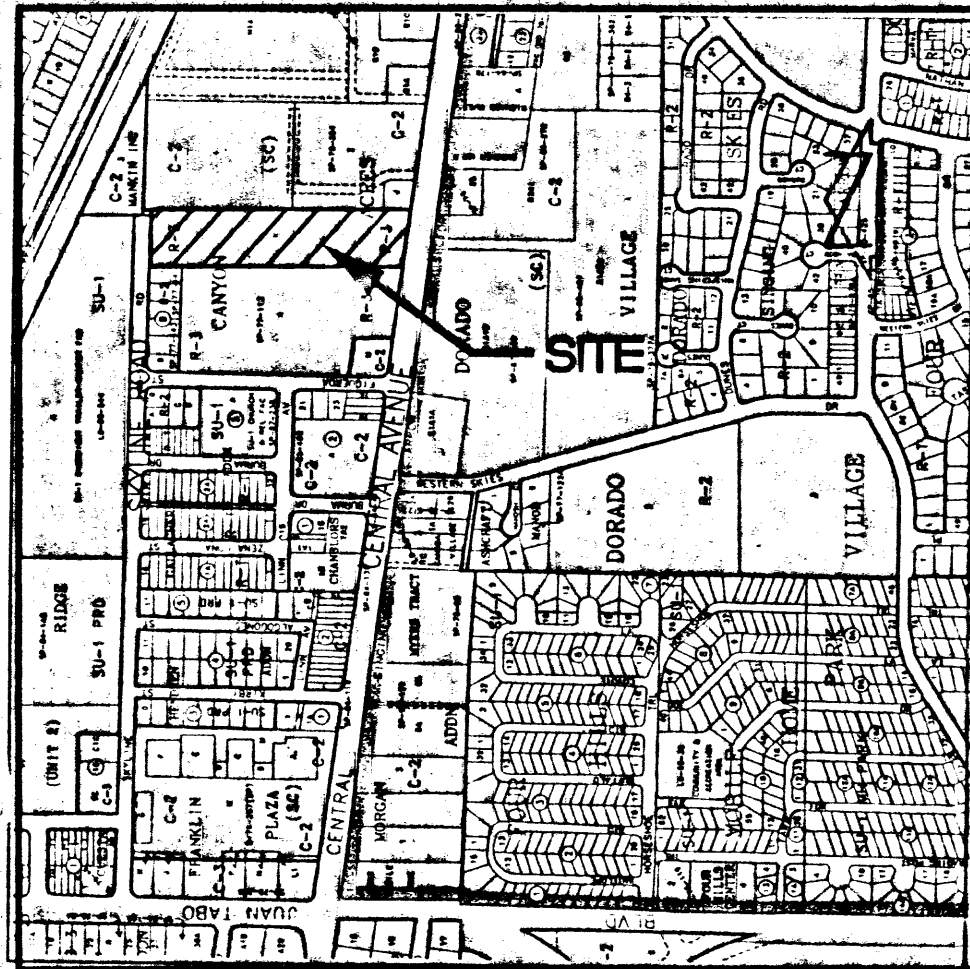




VICINITY MAP
SCALE: 1" = 750'

L-22

LEGAL DESCRIPTION

TRACTS K-2 THROUGH K-5, CANYON ACRES.

PROJECT BENCHMARK

STANDARD A.C.S. BRASS CAP STAMPED "4-127" LOCATED AT THE W.S.W. CURB RETURN AT THE INTERSECTION OF CENTRAL AVENUE AND WHISPERING SANDS. ELEVATION = 5583.83' (M.S.L.D.)

T.B.M.

T.B.M. #1
CHISELED, AS SHOWN ON DRAWING.
ELEVATION = 5580.80' (M.S.L.D.)

T.B.M. #2
CHISELED T.B.C. AS SHOWN ON DRAWING.
ELEVATION = 5591.12' (M.S.L.D.)

LEGEND

592.58	EXISTING SPOT ELEVATION
TC	TOP OF CURB
FL	FLOW LINE
TSW	TOP OF SIDEWALK
F.H.	FIRE HYDRANT
TOP	TOP OF CONCRETE
TP	TOP OF PIPE
DECIDUOUS TREE	
CONIFEROUS TREE	
SMALL TREE	
SMALL GROUP TREES	
STUMP	
84.0	PROPOSED SPOT ELEVATION
93	PROPOSED CONTOUR
DIRECTION OF FLOW	
NEW ASPHALT	

DRAINAGE PLAN

The following items concerning the Tracts K-2 through K-5, Canyon Acres Phase II Development are contained hereon:

- Vicinity Map
- Grading Plan
- Calculations

As shown by the Vicinity Map, the site is located between Central Avenue and Skyline Road N.E., approximately 425 feet east with the intersection of Figueroa Street N.E. Central Avenue is a fully developed public roadway with curb and gutter, asphalt paving, and public storm drain system.

As shown by Panel 37 of 50 of the National Flood Insurance Program Flood Insurance Rate Map published by F.E.M.A. for the City of Albuquerque, New Mexico dated October 14, 1983, this site does not lie within a designated flood hazard zone.

The Grading Plan shows: 1) existing and proposed grades indicated by spot elevations and contours at 10' intervals; 2) the limit and character of the existing improvements; 3) the limit and character of the proposed improvements; and 4) continuity between existing and proposed grades. The site is currently undeveloped, containing natural vegetation, various tree stumps and miscellaneous household debris. The site generally drains to the southwest. An offsite flow of 32.2 cfs impacts Tract K-5 of the south end of the site.

Development proposed for Phase II consists of a 15 unit apartment complex with associated parking facilities and landscaping. In addition to the apartment complex, a 25' wide private roadway will be constructed within existing 25' private access and drainage easement to connect the apartment complex with Central Avenue and to convey storm runoff. Runoff from this phase will flow westerly to a curb and gutter to be constructed parallel to the western property line. Runoff will be intercepted and conveyed southward for discharge into Central Avenue over an existing driveway. This development is consistent with a Master Drainage Plan previously submitted by this office. It is based upon the fact that this site lies within an infill area, this plan is consistent with other Grading and Drainage Plans in the area (refer to City of Albuquerque Hydrology File Nos. 122/041 and 122/044), public drainage facilities have been constructed downstream within Central Avenue, and this system eventually connects to the South Eubank Storm Drain System for discharge into the North Diversion Channel, that free discharge from this site is appropriate.

As discussed previously, an offsite flow of 32.2 cfs, also identified in the Master Drainage Plan, will continue to be accepted into Tract K-5. Regrading of Tract K-5 is necessary to convey this runoff into the new 25' private access road with curb and gutter. This regrading is necessary and is consistent with the Master Drainage Plan.

The Calculations which appear hereon analyze both the existing and developed conditions for the 100-year, 6-hour rainfall event. The Procedure for 40-acre and Smaller Basins, as set forth in the Revision of Section 22.2, Hydrology of the Development Process Manual, Volume 2, Design Criteria, dated January, 1993, has been used to quantify the peak rate of discharge and volume of runoff generated by Tracts K-2 through K-5. The calculations shown hereon for Tract K-2 are identical to those appearing on the Master Drainage Plan for Tract K-5. Canyon Acres development previously submitted by this office. Tracts K-3 through K-5 have been recalculated to reflect the development of the private access road and regrading required to convey onsite and offsite storm runoff. The Calculations show that there will be a net increase of storm runoff and peak discharge rate impacting Central Avenue. Manning's Equation was utilized to calculate the flow conditions of runoff being conveyed southerly in the private access road and for the exit condition via the driveway into Central Avenue.

CALCULATIONS

Site Characteristics

- Precipitation Zone = 3
- $P_{8,100} = P_{360} = 2.60$ in
- Total Area (A_T) = 166,910 sf/3.84 ac
- Existing Land Treatment

Treatment	Area (sf/ac)	%
A	40,600/0.93	94.4
C	2,400/0.06	5.6

Treatment	Area (sf/ac)	%
A	111,290/2.56	89.8
C	12,620/0.29	10.2

Developed Land Treatment

Treatment	Area (sf/ac)	%
B	15,680/0.36	36.5
D	27,320/0.63	63.5

Treatment	Area (sf/ac)	%
A	79,785/1.84	64.4
C	30,000/0.69	24.2
D	14,125/0.32	11.4

Existing Condition

A. Tract K-2

I. Volume

$$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$$

$$E_W = (0.66(0.93) + 1.29(0.06)) / 0.99 = 0.70 \text{ in.}$$

$$V_{100} = (E_W / 12) A_T$$

$$V_{100} = (0.70 / 12) 0.99 = 0.0578 \text{ ac.ft.} = 2,520 \text{ cf}$$

II. Peak Discharge

$$Q_p = Q_{PA} A_A + Q_{PB} A_B + Q_{PC} A_C + Q_{PD} A_D$$

$$Q_p = Q_{100} = 2.20(0.93) + 3.73(0.06) = 2.3 \text{ cfs}$$

B. Tracts K-3 through K-5

I. Volume

$$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$$

$$E_W = (0.66(2.56) + 1.29(0.29)) / 2.85 = 0.72 \text{ in.}$$

$$V_{100} = (E_W / 12) A_T$$

$$V_{100} = (0.72 / 12) 2.85 = 0.1710 \text{ ac.ft.} = 7,450 \text{ cf}$$

II. Peak Discharge

$$Q_p = Q_{PA} A_A + Q_{PB} A_B + Q_{PC} A_C + Q_{PD} A_D$$

$$Q_p = Q_{100} = 2.20(2.56) + 3.73(0.29) = 6.7 \text{ cfs}$$

Developed Condition

A. Tract K-2

I. Volume

$$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$$

$$E_W = (0.66(0.93) + 1.29(0.06)) / 0.99 = 0.70 \text{ in.}$$

$$V_{100} = (E_W / 12) A_T$$

$$V_{100} = (0.70 / 12) 0.99 = 0.0578 \text{ ac.ft.} = 2,520 \text{ cf}$$

II. Peak Discharge

$$Q_p = Q_{PA} A_A + Q_{PB} A_B + Q_{PC} A_C + Q_{PD} A_D$$

$$Q_p = Q_{100} = 2.20(0.93) + 3.73(0.06) = 2.3 \text{ cfs}$$

B. Tracts K-3 through K-5

I. Volume

$$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$$

$$E_W = (0.66(2.56) + 1.29(0.29)) / 2.85 = 0.72 \text{ in.}$$

$$V_{100} = (E_W / 12) A_T$$

$$V_{100} = (0.72 / 12) 2.85 = 0.1710 \text{ ac.ft.} = 7,450 \text{ cf}$$

II. Peak Discharge

$$Q_p = Q_{PA} A_A + Q_{PB} A_B + Q_{PC} A_C + Q_{PD} A_D$$

$$Q_p = Q_{100} = 2.20(2.56) + 3.73(0.29) = 6.7 \text{ cfs}$$

Private Access Road - Runoff Depth (Manning's Equation)

A. Tracts K-2 through K-4

I. Volume

$$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$$

$$E_W = (0.66(0.93) + 1.29(0.06)) / 0.99 = 0.70 \text{ in.}$$

$$V_{100} = (E_W / 12) A_T$$

$$V_{100} = (0.70 / 12) 0.99 = 0.0578 \text{ ac.ft.} = 2,520 \text{ cf}$$

II. Peak Discharge

$$Q_p = Q_{PA} A_A + Q_{PB} A_B + Q_{PC} A_C + Q_{PD} A_D$$

$$Q_p = Q_{100} = 2.20(0.93) + 3.73(0.06) = 2.3 \text{ cfs}$$

B. Tracts K-5 Exit Condition (Ultimate)

I. Volume

$$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$$

$$E_W = (0.66(2.56) + 1.29(0.29)) / 2.85 = 0.72 \text{ in.}$$

$$V_{100} = (E_W / 12) A_T$$

$$V_{100} = (0.72 / 12) 2.85 = 0.1710 \text{ ac.ft.} = 7,450 \text{ cf}$$

II. Peak Discharge

$$Q_p = Q_{PA} A_A + Q_{PB} A_B + Q_{PC} A_C + Q_{PD} A_D$$

$$Q_p = Q_{100} = 2.20(2.56) + 3.73(0.29) = 6.7 \text{ cfs}$$

Private Access Road - Runoff Depth (Manning's Equation)

A. Tracts K-2 through K-4

I. Volume

$$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$$

$$E_W = (0.66(0.93) + 1.29(0.06)) / 0.99 = 0.70 \text{ in.}$$

$$V_{100} = (E_W / 12) A_T$$

$$V_{100} = (0.70 / 12) 0.99 = 0.0578 \text{ ac.ft.} = 2,520 \text{ cf}$$

II. Peak Discharge

$$Q_p = Q_{PA} A_A + Q_{PB} A_B + Q_{PC} A_C + Q_{PD} A_D$$

$$Q_p = Q_{100} = 2.20(0.93) + 3.73(0.06) = 2.3 \text{ cfs}$$

B. Tracts K-5 Exit Condition (Ultimate)

I. Volume

$$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$$

$$E_W = (0.66(2.56) + 1.29(0.29)) / 2.85 = 0.72 \text{ in.}$$

$$V_{100} = (E_W / 12) A_T$$

$$V_{100} = (0.72 / 12) 2.85 = 0.1710 \text{ ac.ft.} = 7,450 \text{ cf}$$

II. Peak Discharge

$$Q_p = Q_{PA} A_A + Q_{PB} A_B + Q_{PC} A_C + Q_{PD} A_D$$

$$Q_p = Q_{100} = 2.20(2.56) + 3.73(0.29) = 6.7 \text{ cfs}$$

Private Access Road - Runoff Depth (Manning's Equation)

A. Tracts K-2 through K-4

I. Volume

$$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$$

$$E_W = (0.66(0.93) + 1.29(0.06)) / 0.99 = 0.70 \text{ in.}$$

$$V_{100} = (E_W / 12) A_T$$

$$V_{100} = (0.70 / 12) 0.99 = 0.0578 \text{ ac.ft.} = 2,520 \text{ cf}$$

II. Peak Discharge

$$Q_p = Q_{PA} A_A + Q_{PB} A_B + Q_{PC} A_C + Q_{PD} A_D$$

$$Q_p = Q_{100} = 2.20(0.93) + 3.73(0.06) = 2.3 \text{ cfs}$$

B. Tracts K-5 Exit Condition (Ultimate)

I. Volume

$$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$$

$$E_W = (0.66(2.56) + 1.29(0.29)) / 2.85 = 0.72 \text{ in.}$$

$$V_{100} = (E_W / 12) A_T$$

$$V_{100} = (0.72 / 12) 2.85 = 0.1710 \text{ ac.ft.} = 7,450 \text{ cf}$$

II. Peak Discharge

$$Q_p = Q_{PA} A_A + Q_{PB} A_B + Q_{PC} A_C + Q_{PD} A_D$$

$$Q_p = Q_{100} = 2.20(2.56) + 3.73(0.29) = 6.7 \text{ cfs}$$

Private Access Road - Runoff Depth (Manning's Equation)

A. Tracts K-2 through K-4

I. Volume

$$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$$

$$E_W = (0.66(0.93) + 1.29(0.06)) / 0.99 = 0.70 \text{ in.}$$

$$V_{100} = (E_W / 12) A_T$$

$$V_{100} = (0.70 / 12) 0.99 = 0.0578 \text{ ac.ft.} = 2,520 \text{ cf}$$

II. Peak Discharge

$$Q_p = Q_{PA} A_A + Q_{PB} A_B + Q_{PC} A_C + Q_{PD} A_D$$

$$Q_p = Q_{100} = 2.20(0.93) + 3.73(0.06) = 2.3 \text{ cfs}$$

B. Tracts K-5 Exit Condition (Ultimate)

I. Volume

$$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$$

$$E_W = (0.66(2.56) + 1.29(0.29)) / 2.85 = 0.72 \text{ in.}$$

$$V_{100} = (E_W / 12) A_T$$

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II. Peak Discharge

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$$Q_p = Q_{100} = 2.20(2.56) + 3.73(0.29) = 6.7 \text{ cfs}$$

Private Access Road - Runoff Depth (Manning's Equation)

A. Tracts K-2 through K-4

I. Volume

$$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$$

$$E_W = (0.66(0.93) + 1.29(0.06)) / 0.99 = 0.70 \text{ in.}$$

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$$V_{100} = (0.70 / 12) 0.99 = 0.0578 \text{ ac.ft.} = 2,520 \text{ cf}$$

II. Peak Discharge

$$Q_p = Q_{PA} A_A + Q_{PB} A_B + Q_{PC} A_C + Q_{PD} A_D$$

$$Q_p = Q_{100} = 2.20(0.93) + 3.73(0.06) = 2.3 \text{ cfs}$$

B. Tracts K-5 Exit Condition (Ultimate)

I. Volume

$$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$$

$$E_W = (0.66(2.56) + 1.29(0.29)) / 2.85 = 0.72 \text{ in.}$$

$$V_{100} = (E_W / 12) A_T$$

$$V_{100} = (0.72 / 12) 2.85 = 0.1710 \text{ ac.ft.} = 7,450 \text{ cf}$$

II. Peak Discharge

$$Q_p = Q_{PA} A_A + Q_{PB} A_B + Q_{PC} A_C + Q_{PD} A_D$$

$$Q_p = Q_{100} = 2.20(2.56) + 3.73(0.29) = 6.7 \text{ cfs}$$

Private Access Road - Runoff Depth (Manning's Equation)

A. Tracts K-2 through K-4

I. Volume

$$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$$

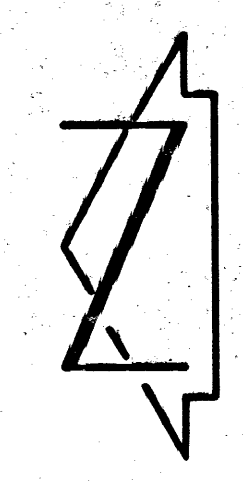
$$E_W = (0.66(0.93) + 1.29(0.06)) / 0.99 = 0.70 \$$

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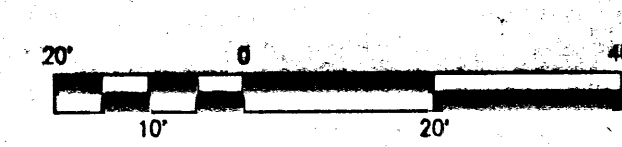


JEFF MORTENSON & ASSOCIATES, INC.
6810-B MIDWAY PARK BLVD. N.E.
ALBUQUERQUE, N.M. 87109
ENGINEERS & SURVEYORS (505) 349-4250

GRADING AND DRAINAGE PLAN - PHASE II TRACT K-2, CANYON ACRES



SCALE: 1" = 20'

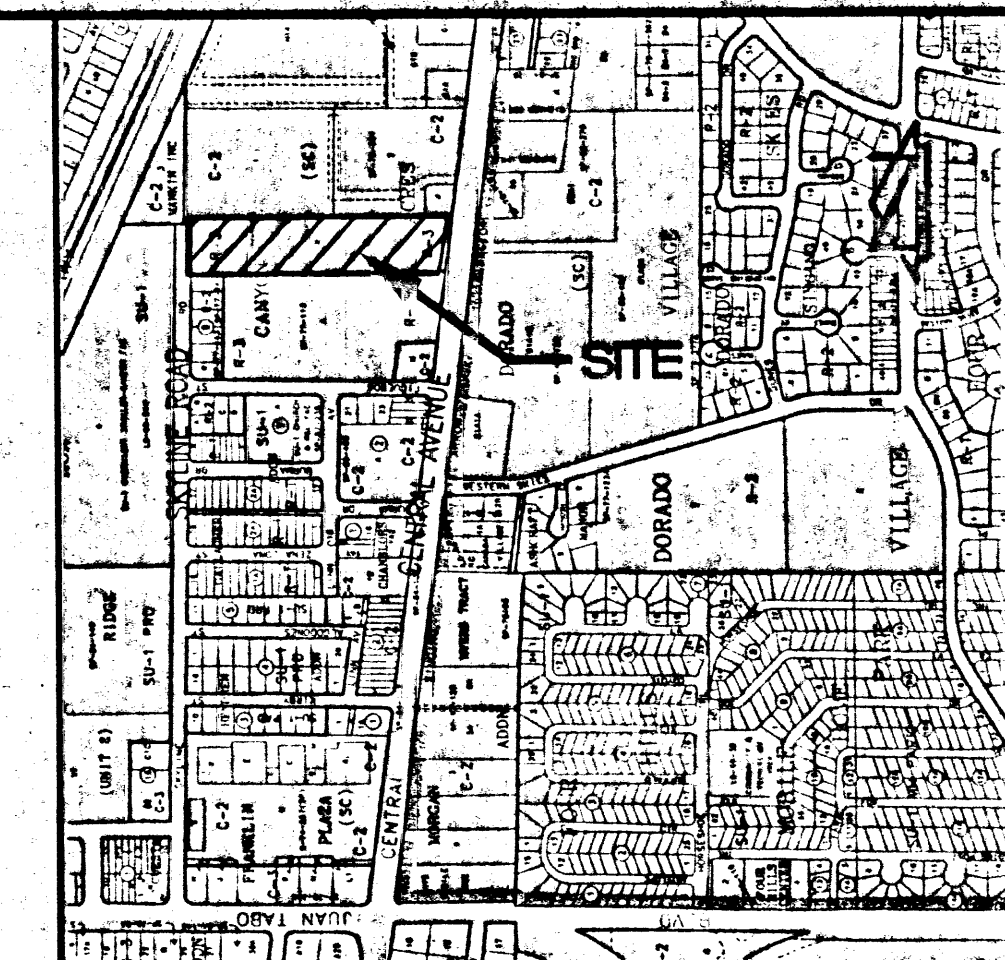


Construction Notes:

- Two (2) working days prior to any excavation, contractor must contact New Mexico One Call System 260-1990 (Albuquerque Area), 1-800-321-ALERT(2537) (Statewide), for location of existing utilities.
 - Prior to construction, the contractor shall excavate and verify the horizontal and vertical location of all potential obstructions. Should a conflict exist, the contractor shall notify the engineer in writing so that the conflict can be resolved with a minimum amount of delay. The Contractor shall be responsible for all interpretations it makes without first contacting the Engineer as required above.
 - All work on this project shall be performed in accordance with applicable federal, state and local laws, rules and regulations concerning construction safety and health.
 - All construction within public right-of-way shall be performed in accordance with applicable City of Albuquerque Standards and Procedures.
 - If any utility lines, pipelines, or underground utility lines are shown on these drawings, they are shown in an approximate manner only, and such lines may exist where none are shown. If any such existing lines are shown, the location is based upon information provided by the owner of said utility, and the information may be incomplete, or may be obsolete by the time construction commences. The engineer has conducted only a preliminary investigation of the location, depth, size, or type of existing utility lines, pipelines, or underground utility lines. This investigation is not conclusive, and may not be complete, therefore, makes no representation pertaining thereto, and assumes no responsibility or liability therefor. The contractor shall inform itself of the location of any utility line, pipeline, or underground utility line-in-or-near the area of the work in advance of and during excavation work. The contractor is fully responsible for any and all damage caused by its failure to locate, identify and preserve any and all existing utilities, pipelines, and underground utility lines. In planning and conducting excavation, the contractor shall comply with state statutes, municipal and local ordinances, rules and regulations, if any, pertaining to the location of these lines and facilities.
 - The design of planters and landscaped areas is not part of this plan. All planters and landscaped areas adjacent to the building(s) shall be provided with positive drainage to avoid any ponding adjacent to the structure. For construction details, refer to landscaping plan.
- ## Erosion Control Measures:
- The contractor shall ensure that no soil erodes from the site into public right-of-way or onto private property.
 - The contractor shall promptly clean up any material excavated within the public right-of-way so that the excavated material is not susceptible to being washed down the street.
 - The contractor shall secure "Topsoil Disturbance Permit" prior to beginning construction.
 - Any areas of excess disturbance (traffic access, storage yard, excavated material, etc.) shall be re-seeded according to C.O.A. Specification 1012 "Native Grass Seeding". This will be considered incidental to construction, therefore, no separate payment will be made.

KEYED NOTES:

- INSTALL 4" PVC SCHEDULE 40 DRAIN LINES WITH INVERTS AS NOTED.
- HANDICAP RAMPS WITH MAXIMUM SLOPE OF 1:12. SEE ARCHITECTURAL DRAWINGS FOR DETAILS AND SECTIONS.



VICINITY MAP
SCALE: 1" = 750'

LEGAL DESCRIPTION

TRACTS K-2 THROUGH K-5, CANYON ACRES, FILED IN VOL. 96C, FOLD 130, 03-25-96.

PROJECT BENCHMARK

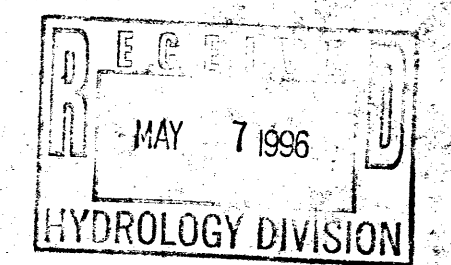
STANDARD A.C.S. BRASS CAP STAMPED "4-122" LOCATED AT THE W.S.W. CORNER RETURN AT THE INTERSECTION OF CENTRAL AVENUE AND WHISPERING SANDS. ELEVATION = 5583.63' (M.S.L.D.)

T.B.M.

- T.B.M. #1
CHISELED T.B.C. NEAR THE SOUTHWEST PROPERTY CORNER, TRACT K-5.
ELEVATION = 5580.80' (M.S.L.D.)
- T.B.M. #2
CHISELED T.B.C. NEAR THE NORTHWEST PROPERTY CORNER, TRACT K-1.
ELEVATION = 5591.12' (M.S.L.D.)

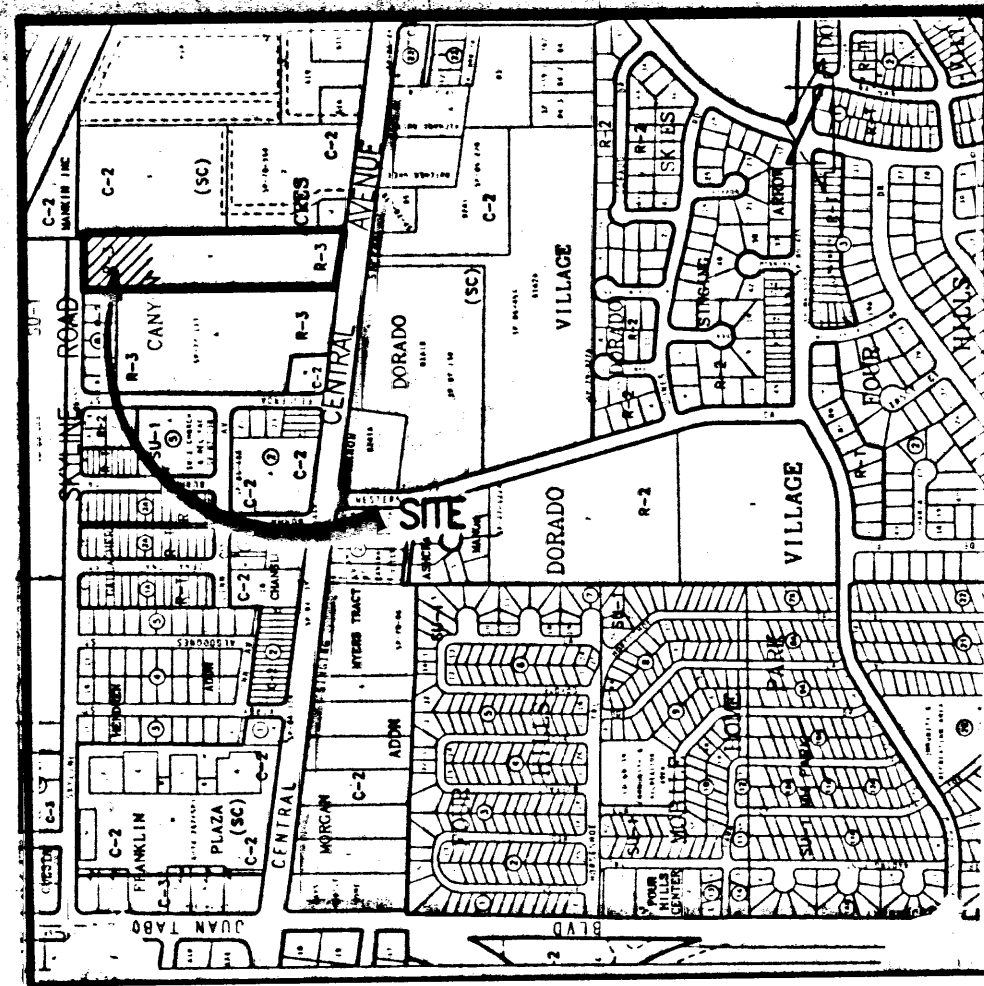
LEGEND

- EXISTING SPOT ELEVATION
- EXISTING DIRECTION OF FLOW
- TC
- FL
- TSW
- F.H.
- TOP
- TP
- TOP OF CURB
- TOP OF SIDEWALK
- TOP OF CONCRETE
- TOP OF PIPE
- DECIDUOUS TREE
- CONIFEROUS TREE
- SMALL TREE
- SMALL GROUP TREES
- STUMP
- EXISTING CONTOUR
- EXISTING RETAINING WALL
- PROPOSED SPOT ELEVATION
- DIRECTION OF FLOW
- PROPOSED CONTOUR
- PROPOSED RETAINING WALL
- PROPOSED ASPHALT



05-02-96

DESIGNED BY	DATE	BY	REVISIONS	JOB NO.
GRB				960411
DRAWN BY	DATE	BY	REVISIONS	DATE
E.M.S.				04-1996
APPROVED BY	DATE	BY	REVISIONS	SHEET
J.G.M.				2 OF 2



VICINITY MAP

SCALE: 1" = 750'

Construction Notes:

- Two (2) working days prior to any excavation, contractor must contact New Mexico One Call System 260-1990, for location of existing utilities.
- Prior to construction, the contractor shall excavate and verify the horizontal and vertical location of all potential obstructions. Should a conflict exist, the contractor shall notify the engineer in writing so that the conflict can be resolved with a minimum amount of delay.
- All work on this project shall be performed in accordance with applicable federal, state and local laws, rules and regulations concerning construction safety and health.
- All construction within public right-of-way shall be performed in accordance with applicable City of Albuquerque Standards and Procedures.
- If any utility lines, pipelines, or underground utility lines are shown on these drawings, they are shown in an approximate manner only, and such lines may exist where none are shown. If any such existing lines are shown, the location is based upon information provided by the owner of said utility, and the information may be incomplete, or may be obsolete by the time construction commences. The engineer has conducted only preliminary investigation of the location, depth, size, or type of existing utility lines, pipelines, or underground utility lines. This investigation is not conclusive, and may not be complete, therefore, makes no representation pertaining thereto, and assumes no responsibility or liability therefor. The contractor shall inform itself of the location of any utility line, pipeline, or underground utility line in or near the area of the work in advance of and during excavation work. The contractor is fully responsible for any and all damage caused by its failure to locate, identify and preserve any and all existing utilities, pipelines, and underground utility lines. In planning and conducting excavation, the contractor shall comply with state statutes, municipal and local ordinances, rules and regulations, if any, pertaining to the location of these lines and facilities.
- The design of planters and landscaped areas is not part of this plan. All planters and landscaped areas adjacent to the building(s) shall be provided with positive drainage to avoid any ponding adjacent to the structure. For construction details, refer to landscaping plan.

Erosion Control Measures:

- The contractor shall ensure that no soil erodes from the site into public right-of-way or onto private property.
- The contractor shall promptly clean up any material excavated within the public right-of-way so that the excavated material is not susceptible to being washed down the street.
- The contractor shall secure "Topsoil Disturbance Permit" prior to beginning construction.

LEGAL DESCRIPTION

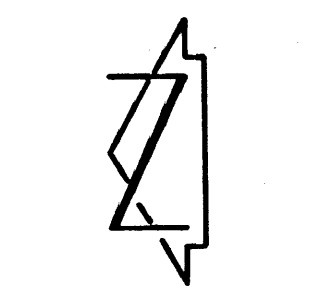
TRACT K, CANYON ACRES, TOWNSHIP 10 NORTH, RANGE 4 EAST, SECTION 27

PROJECT BENCHMARK

A STANDARD A.C.S. BRASS CAP STAMPED "4-122" LOCATED AT THE W.S.W. CURB RETURN AT THE INTERSECTION OF CENTRAL AVENUE AND WHISPERING SANDS S.E. ELEVATION = 5583.83 FEET (M.S.L.D.)

T.B.M.

A "C" CHISELED IN THE TOP OF CURB AT THE NORTHWEST CORNER OF TRACT K, CANYON ACRES, ON SKYLINE ROAD N.E. AS SHOWN ON THE DRAWING AND LABELED "T.B.M. #2" ELEVATION = 5591.12 FEET (M.S.L.D.)



SCALE: 1" = 20'

LEGEND

- EXISTING SPOT ELEVATION
- PROPOSED SPOT ELEVATION
- EXISTING CONTOUR
- PROPOSED CONTOUR
- DIRECTION OF FLOW
- TOP OF CURB
- TOP OF ASPHALT
- TOP OF SIDEWALK
- TOP OF WALL
- FLOWLINE
- PROPOSED TIMBER RETAINING WALL
- PROPOSED CONCRETE

AS-BUILTS = AS DESIGNED
ELEVATION CORRECTED FOR AS-BUILT CONDITIONS
AS-BUILT SPOT ELEVATION

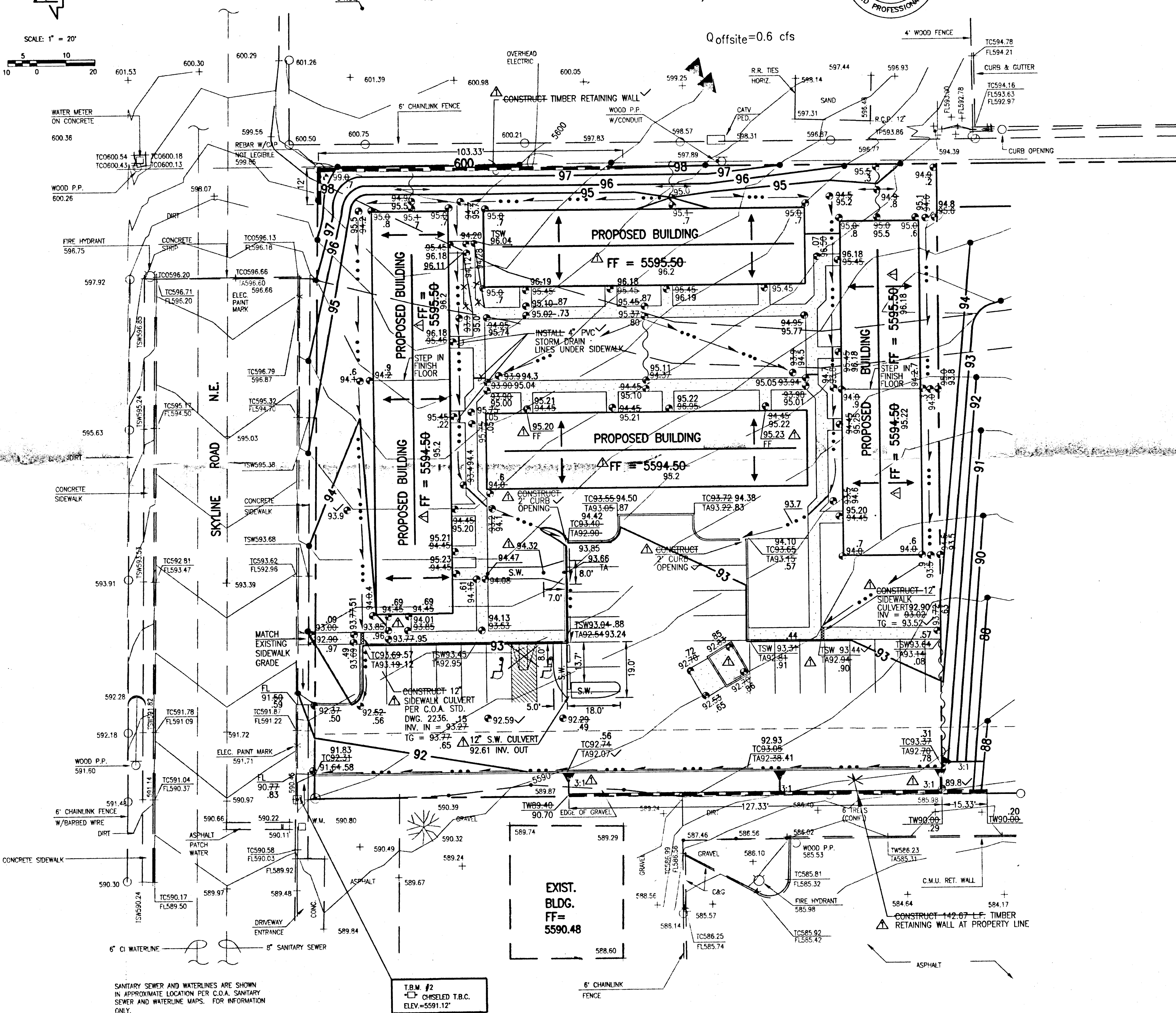
△ DRAINAGE CERTIFICATION

As indicated by the as-built information shown hereon, Phase I of the Tract K, Canyon Acres Apartment project has been constructed in substantial compliance with the approved grading & drainage plan. Finished floor elevations vary slightly from those previously approved. The intent of the plan, however, has been preserved. The developed runoff from the site discharges via the new driveway to Skyline Rd. N.E. It is based upon the information presented hereon in the analysis stated above that issuance of a Permanent Certificate of Occupancy for this project is hereby recommended. The information shown hereon has been obtained under me under my direct supervision and is true and correct to the best of my knowledge and belief.

Jeffrey G. Mortensen, MPE 8547



11-06-95
Date



DRAINAGE PLAN

The following items concerning the Tract K, Canyon Acres, Phase I Drainage Plan are contained hereon:

- Vicinity Map
- Grading Plan
- Calculations

As shown by the Vicinity Map, the site is located at the north end of Tract K, Canyon Acres, on Skyline Road N.E., approximately 425 feet north of the intersection of Figueroa Street N.E. Skyline Road N.E. is a fully developed public roadway with curb & gutter, asphalt pavement, sidewalks, sanitary sewerline, waterline, and storm drain system.

As shown by Panel 37 of 50 of the National Flood Insurance Rate Program Flood Insurance Rate Map (F.I.R.M.) for the City of Albuquerque, New Mexico, dated October 14, 1983, this site does not lie in a designated Flood Hazard Zone.

The Grading Plan shows 1) existing and proposed grades indicated by spot elevations and contours at 1'0" intervals, 2) the limit and character of the existing and proposed improvements, and 3) continuity between existing and proposed grades. The site is currently undeveloped containing natural vegetation, various tree stumps, and miscellaneous household debris. The site generally drains to the southwest. An offsite flow of 0.6 cfs impacts the site from an existing playground to the east.

Development proposed for Phase I consists of an 15 unit apartment complex with associated parking facilities and landscaping. Offsite flows will continue to be accepted. Runoff from this Phase will flow westerly to a curb and gutter to be constructed parallel to the western property line. Runoff will be intercepted and conveyed northward for discharge into Skyline Road N.E. over an proposed driveway. Discharge into Skyline Road N.E. does impact a Designated Flood Hazard Zone "AO" (depth 1) downstream. A Master Drainage Plan previously submitted by this office identifies that this zone has been improved by construction of a storm drain system identified under the Albuquerque Master Drainage Study. Flows being discharged into Skyline Road N.E. are accepted into the public storm drain system. Because the public storm drain system accepts runoff from Skyline Road N.E., the increase of runoff impacting the system is minor (4.3 cfs), and the site lies in an infill area, it is felt that free discharge from this site is appropriate. This Plan is consistent with a previously submitted Master Drainage Plan prepared by this office for Phases I - V of Tract K, Canyon Acres Development.

The Calculations which appear hereon analyze both the existing and developed conditions for the 100-year, 6-hour rainfall event. The Procedure for 40-acre and Smaller Basins, as set forth in the Revision of Section 22.2, Hydrology of the Development Process Manual, Volume 2, Design Criteria, dated January, 1993, has been used to quantify the peak rate of discharge and volume of runoff generated. These Calculations are identical to those appearing for Phase I Development on the Master Drainage Plan for Tract K, Canyon Acres Development, previously submitted by this office. The Calculations show an increase of runoff volume of 6,820 cf with a peak discharge rate of 4.3 cfs impacting Skyline Road N.E.

CALCULATIONS

Site Characteristics (Phase I)

- Precipitation $P = 3.3$
- $P_{100} = P_{360} = 2.60$ in.
- Total Area $(A_T) = 45,390$ sf/1.04 ac.
- Existing Land Treatment

Treatment	Area (sf/ac)	%
A	41,540/0.95	91.0
C	3,850/0.09	09.0
- Developed Land Treatment

Treatment	Area (sf/ac)	%
B	16,280/0.37	35.9
C	1,790/0.04	3.9
D	27,320/0.63	60.2

Existing Condition

- Volume

$$E_w = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$$

$$E_w = [(0.66)(0.95) + (1.29)(0.09)] / (1.04) = 0.71$$
 in.

$$V_{100} = (E_w / 12) A_T$$

$$V_{100} = (0.71 / 12) (1.04) = 0.062$$
 ac.ft. = 2,680 cf
- Peak Discharge

$$Q_p = Q_{PA} A_A + Q_{PB} A_B + Q_{PC} A_C + Q_{PD} A_D$$

$$Q_p = Q_{100} = (2.20)(0.95) + (3.73)(0.09) = 2.4$$
 cfs

Developed Condition

- Volume

$$E_w = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$$

$$E_w = [(0.92)(0.37) + (1.29)(0.04) + (2.36)(0.63)] / (1.04) = 1.81$$
 in.

$$V_{100} = (E_w / 12) A_T$$

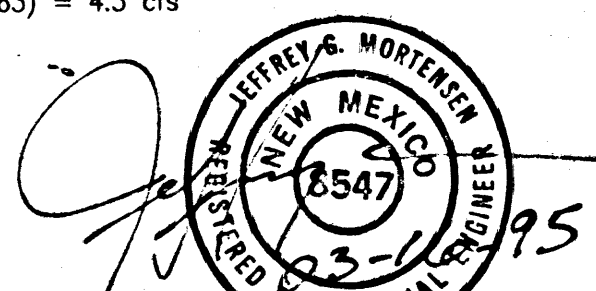
$$V_{100} = (1.81 / 12) (1.04) = 0.1566$$
 ac.ft. = 6,820 cf
- Peak Discharge

$$Q_p = Q_{PA} A_A + Q_{PB} A_B + Q_{PC} A_C + Q_{PD} A_D$$

$$Q_p = Q_{100} = (2.60)(0.37) + (3.45)(0.04) + (5.02)(0.63) = 4.3$$
 cfs

Comparison

- $\Delta V_{100} = 6,820 - 2,680 = 4,140$ cf (increase)
- $\Delta Q_{100} = 4.3 - 2.4 = 1.9$ cfs (increase)

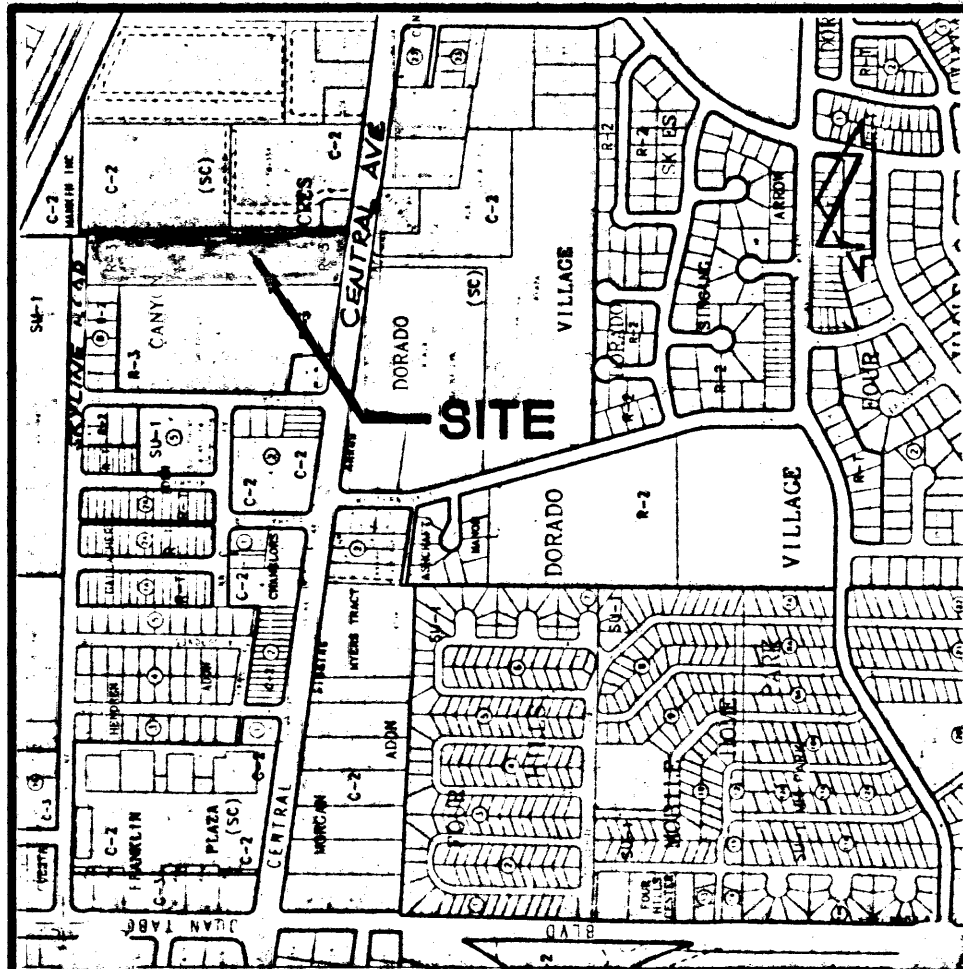


GRADING AND DRAINAGE PLAN - PHASE 1
TRACT K, CANYON ACRES

JEFF MORTENSEN & ASSOCIATES, INC.
6010-B HIGHWAY PARK BLVD. N.E.
ALBUQUERQUE, N.M. 87109
ENGINEERS & SURVEYORS (505) 545-4250

DESIGNED BY	DATE	BY	REVISIONS	JOB NO.
GM/G.R.B.	10/95	J.G.M.	AS-BUILT AND CERTIFY	941207
DRAWN BY				DATE
E.M.S.				03-1995
APPROVED BY				SHEET
J.G.M.				1 OF 1

Phase I Cert



VICINITY MAP

SCALE: 1" = 750'

LEGAL DESCRIPTION

TRACT K, CANYON ACRES, TOWNSHIP 10 NORTH,
RANGE 4 EAST, SECTION 27.

PROJECT BENCHMARK

STANDARD A.C.S. BRASS CAP STAMPED "4-L22" LOCATED
AT THE W.S.W. CURB RETURN AT THE INTERSECTION OF
CENTRAL AVENUE AND WESTERING SANDS.
ELEVATION = 5583.83' (M.S.L.D.)

T.B.M.

T.B.M. #1
CHISELED, AS SHOWN ON DRAWING.
ELEVATION = 5580.80' (M.S.L.D.)

T.B.M. #2
CHISELED T.B.C. AS SHOWN ON DRAWING.
ELEVATION = 5591.12' (M.S.L.D.)

LEGEND

- + 592.58 EXISTING SPOT ELEVATION
- TC TOP OF CURB
- FL FLOW LINE
- FSW FIRE HYDRANT
- TD TOP OF DRAINAGE
- TD TOP OF CONCRETE
- TD TOP OF PIPE
- DECIDUOUS TREE
- CONIFEROUS TREE
- SMALL TREE
- SMALL GROUP TREES
- STUMP
- PROPOSED SPOT ELEVATION
- PROPOSED CONTOUR
- 93 DIRECTION OF FLOW

The following items concerning the Tract K, Canyon Acres
Development Master Drainage Plan are contained herein:

- Vicinity Map
- Existing Conditions
- Developed Conditions
- Calculations

It is the intent of this plan to: 1) Identify and quantify runoff
volume and peak discharge rate under existing conditions, 2)
Calculate changes in runoff volume and peak discharge rate due to
proposed development, and 3) Present measures to attain favorable
drainage conditions under this development scenario.

As shown by the Vicinity Map, the site is located between Central
Avenue and Skyline Road N.E., approximately 425 feet east of their
intersection of Figueroa Street N.E. Central Avenue and Skyline
Road N.E. are fully developed public roadways with curb and gutter
sidewalks, waterline, and contain a storm drain system.

As shown by Panel 37 of 50 of the National Flood Insurance Program
Flood Insurance Rate Map (F.I.R.M.) for the City of Albuquerque,
New Mexico, dated October 14, 1983, this site does not lie nor
contribute to a designated flood hazard zone.

Existing Conditions

Sheet 1 of 2 shows the existing site conditions, currently
undeveloped. The site contains natural vegetation, various tree
stumps, and some miscellaneous household debris. The site is
generally level except it is traversed by two small drainage
channels. One is in the approximate north-south center of the site
appearing to carry natural runoff through the site. The other
channel runs in a roughly westerly direction and is near the south
end of the lot. In addition to natural runoff from the site, the
is ditch also accepts runoff from an adjacent apartment complex and
service station on the east side of the property via a curb
opening. This ditch apparently drains to an inlet that is missing
the grate, is partially full of debris, and looks to be on the
adjacent western property. No pipe is apparent in the inlet,
making it unclear where the its outfall is located. The runoff
then appears to enter into the parking lot of the adjacent property
to the west, developed as an apartment complex.

Developed Conditions

The development of this site has been divided into five (5) phases.
Phases one through four (1-4) have been identified for development
as apartment complexes. Each complex will be identical, each
containing fifteen (15) units, a manager's apartment/office,
associated parking facilities, and landscaping. Phase five (5) is
located along Central Avenue, and has been identified for future
commercial development.

Because the site will be developed in phases, a more detailed
Grading and Drainage Plan will be submitted as each phase is
presented for permit. However, preliminary grading has been shown.

As described earlier, Phase I Development consists of an apartment
complex. Runoff from an adjacent playground area is identified as
offsite Basin A. The peak discharge rate from this basin is 0.6
cfs, and will continue to be accepted. Runoff in this phase will
flow westerly to a curb and gutter that will be constructed
parallel to the western property line. This curb will then
intercept flows and convey them north to a proposed driveway for
discharge into Skyline Road N.W. Discharge into Skyline Road N.E.
does impact a Flood Hazard Zone AO (Depth 1) at the intersection of
Juan Tabo Blvd. N.E. However, volume II of the Albuquerque Master
Drainage Study prepared by Bohannon-Huston, Inc. dated January,
1981 identifies storm drain system 201-CIC to improve this Flood
Hazard Zone upon completion. Field verification has been performed
by this office to verify that this system has been constructed and
that flows from Phase I Development would be accepted into this
public facility. Because this system has been constructed, the
increase of runoff in minor(4.3 cfs) and the site lies in an infill
area, it is felt free discharge of runoff into Skyline Road N.E. is
appropriate.

Phases II through IV will also be developed as apartment complexes,
as described earlier. Storm runoff in these phases will continue
in a westerly direction following historic drainage patterns. A
curb and gutter to be constructed parallel to the western property
line will intercept these flows. However, a waterblock separating
the Phase I and Phase II Developments will be constructed causing
the flows to be directed southerly into Phase V via a private
access and drainage easement to be grouted along the western
property line in Phases III, IV, and V. When Phase II is
constructed, the proposed curb and gutter and access road will be
constructed to Central Avenue to allow the discharge of runoff from
Phase II and each subsequent phase.

Phase V will be developed commercially. An adjacent apartment
complex and service station contribute to another Offsite Basin
identified as 'B'. The peak discharge rate from offsite Basin 'B'
has been quantified to be 32.2 cfs. This runoff will continue to
be accepted into Phase V. The offsite runoff along with runoff
generated in Phase V Development will be discharged westerly
into Central Avenue via existing driveways or future private
entrances to the development. Any runoff that flowed westerly
would be intercepted by a curb and gutter described earlier
parallel to the western property line for eventual discharge into
Central Avenue along with runoff being accepted from Phases II,
III, and IV. Central Avenue is a fully developed public roadway
complete with curb and gutter, sidewalk, and asphaltic concrete
paving. It is based upon the fact that this site lies in an infill
area, this plan is consistent with other Grading and Drainage Plans
in the area (Refer to City of Albuquerque Hydrology File Numbers
L22-D41 and L22-D44), public drainage facilities have been
constructed downstream within Central Avenue, and this system
eventually connects to the South Eubank Storm Drain System for
discharge into the North Division Channel, that free discharge is
appropriate.

The Calculations which appear herein analyze both the existing and
developed conditions for the 100-year, 6-hour rainfall event. The
Procedure for 40-acre and Smaller Basins, as set forth in the
Revision of Section 22.2, Hydrology of the Development Process
Manual, Volume 2, Design Criteria, dated January, 1993, has been
used to quantify the peak rate of discharge and volume of runoff
generated. As shown by these calculations, only a minor increase
in runoff is anticipated due to the proposed construction. The net
increase of volume of runoff has been identified to be 20,960 cf,
with a peak discharge rate of 9.4 cfs. Increase of runoff volume
(6820 cf) with a peak discharge of 4.3 cfs will impact Skyline Road
N.E., and an increase in volume of 14,140 cf with a peak discharge
rate of 5.1 cfs will impact Central Avenue with this proposed
development.

CALCULATIONS

Site Characteristics

- Precipitation Zone = 3
- $P_{6,100} = P_{360} = 2.60$ in.
- Total Area (A_T) = 4.87 ac.
- Existing Land Treatment

- Existing Condition
- Volume
- $E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$
- $E_W = [(0.66)(4.44) + (1.29)(0.43)] / (4.87) = 0.72$ in.
- $V_{100} = (E_W / 12) A_T$
- $V_{100} = (0.72 / 12) (4.87) = 0.2922$ ac.ft. = 12,730 cf
- Peak Discharge
- $Q_p = Q_{PA} A_A + Q_{PB} A_B + Q_{PC} A_C + Q_{PD} A_D$
- $Q_p = Q_{100} = (2.20)(4.44) + (3.73)(0.43) = 11.4$ cfs

Developed Land Treatment

A. PHASE I ($A_{TI} = 45,390$ sf/1.04 ac)

Treatment	Area (sf/ac)	%
B	16,280/0.37	35.9
C	1,790/0.04	3.9
D	27,320/0.63	60.2

B. PHASE II ($A_{TII} = 43,000$ sf/0.99 ac)

Treatment	Area (sf/ac)	%
B	15,680/0.36	36.5
D	27,320/0.63	63.5

C. PHASE III ($A_{TIII} = 43,000$ sf/0.99 ac)

Treatment	Area (sf/ac)	%
B	15,680/0.36	36.5
D	27,320/0.63	63.5

D. PHASE IV ($A_{TIV} = 43,000$ sf/0.99 ac)

Treatment	Area (sf/ac)	%
B	15,680/0.36	36.5
D	27,320/0.63	63.5

E. PHASE V ($A_{TV} = 37,910$ sf/0.87 ac)

Treatment	Area (sf/ac)	%
B	1,895/0.05	5.0
C	1,895/0.04	5.0
D	34,120/0.78	90.0

F. Offsite Basin "A" ($A_{TOA} = 10,000$ sf/0.23 ac)

Treatment	Area (sf/ac)	%
B	10,000/0.23	100.0

G. Offsite Basin "B" ($T_{TOB} = 300,800$ sf/6.91 ac)

Treatment	Area (sf/ac)	%
B	43,800/1.01	14.6
D	257,000/5.90	85.4

7. Developed Condition

A. Phase I

- Volume
- $E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$
- $E_W = [(0.92)(0.37) + (1.29)(0.04) + (2.36)(0.63)] / (1.04) = 1.81$ in.
- $V_{100} = (E_W / 12) A_T$
- $V_{100} = (1.81 / 12) (1.04) = 0.1566$ ac.ft. = 6,820 cf
- Peak Discharge
- $Q_p = Q_{PA} A_A + Q_{PB} A_B + Q_{PC} A_C + Q_{PD} A_D$
- $Q_p = Q_{100} = (2.60)(0.37) + (3.45)(0.04) + (5.02)(0.63) = 4.3$ cfs

B. Phase II

- Volume
- $E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$
- $E_W = [(0.92)(0.36) + (2.36)(0.63)] / (0.99) = 1.84$ in.
- $V_{100} = (E_W / 12) A_T$
- $V_{100} = (1.84 / 12) (0.99) = 0.1518$ ac.ft. = 6,610 cf
- Peak Discharge
- $Q_p = Q_{PA} A_A + Q_{PB} A_B + Q_{PC} A_C + Q_{PD} A_D$
- $Q_p = Q_{100} = (2.60)(0.36) + (5.02)(0.63) = 4.1$ cfs

C. Phase III

- Volume
- $E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$
- $E_W = [(0.92)(0.36) + (2.36)(0.63)] / (0.99) = 1.84$ in.
- $V_{100} = (E_W / 12) A_T$
- $V_{100} = (1.84 / 12) (0.99) = 0.1518$ ac.ft. = 6,610 cf
- Peak Discharge
- $Q_p = Q_{PA} A_A + Q_{PB} A_B + Q_{PC} A_C + Q_{PD} A_D$
- $Q_p = Q_{100} = (2.60)(0.36) + (5.02)(0.63) = 4.1$ cfs

D. Phase IV

- Volume
- $E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$
- $E_W = [(0.92)(0.36) + (2.36)(0.63)] / (0.99) = 1.84$ in.
- $V_{100} = (E_W / 12) A_T$
- $V_{100} = (1.84 / 12) (0.99) = 0.1518$ ac.ft. = 6,610 cf
- Peak Discharge
- $Q_p = Q_{PA} A_A + Q_{PB} A_B + Q_{PC} A_C + Q_{PD} A_D$
- $Q_p = Q_{100} = (2.60)(0.36) + (5.02)(0.63) = 4.1$ cfs

E. Phase V

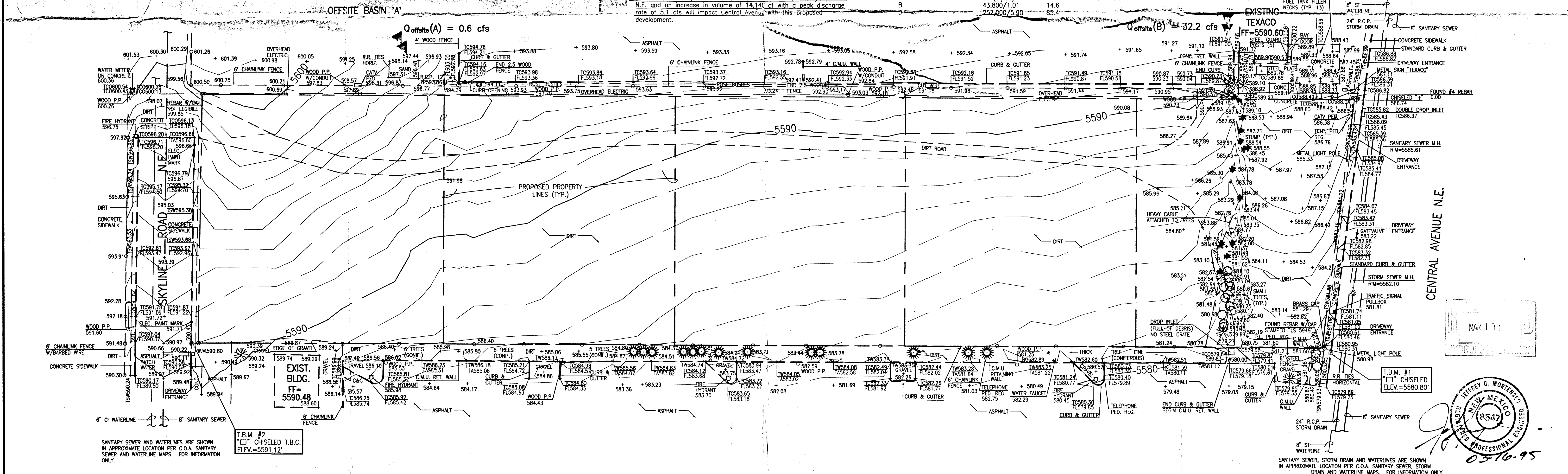
- Volume
- $E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$
- $E_W = [(0.92)(0.05) + (1.29)(0.04) + (2.36)(0.78)] / (0.87) = 2.23$ in.
- $V_{100} = (E_W / 12) A_T$
- $V_{100} = (2.23 / 12) (0.87) = 0.1617$ ac.ft. = 7,040 cf
- Peak Discharge
- $Q_p = Q_{PA} A_A + Q_{PB} A_B + Q_{PC} A_C + Q_{PD} A_D$
- $Q_p = Q_{100} = (2.60)(0.05) + (3.45)(0.04) + (5.02)(0.78) = 4.2$ cfs

F. Offsite Basin "A"

- Volume
- $E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$
- $E_W = [(0.92)(1.01) + (2.36)(5.90)] / (6.91) = 2.15$ in.
- $V_{100} = (E_W / 12) A_T$
- $V_{100} = (2.15 / 12) (6.91) = 1.2380$ ac.ft. = 53,930 cf
- Peak Discharge
- $Q_p = Q_{PA} A_A + Q_{PB} A_B + Q_{PC} A_C + Q_{PD} A_D$
- $Q_p = Q_{100} = (2.60)(1.01) + (5.02)(5.90) = 32.2$ cfs

G. Offsite Basin "B"

- Volume
- $E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$
- $E_W = [(0.92)(1.01) + (2.36)(5.90)] / (6.91) = 2.15$ in.
- $V_{100} = (E_W / 12) A_T$
- $V_{100} = (2.15 / 12) (6.91) = 1.2380$ ac.ft. = 53,930 cf
- Peak Discharge
- $Q_p = Q_{PA} A_A + Q_{PB} A_B + Q_{PC} A_C + Q_{PD} A_D$
- $Q_p = Q_{100} = (2.60)(1.01) + (5.02)(5.90) = 32.2$ cfs
- Comparison
- $\Delta V_{100} (\text{Net}) = 6,820 + 6,610(3) + 7,040 - 12,730 = 20,960$ cf (increase)
- $\Delta Q_{100} (\text{Net}) = 4.3 + 4.1(3) + 4.2 - 11.4 = 9.4$ cfs (increase)
- $\Delta V_{100} (\text{To Skyline}) = 6,820 - 0 = 6,820$ cf (increase)
- $\Delta Q_{100} (\text{To Skyline}) = 4.3 - 0 = 4.3$ cfs (increase)
- $\Delta V_{100} (\text{To Central}) = 6,610(3) + 7,040 - 12,730 = 14,140$ cf (increase)
- $\Delta Q_{100} (\text{To Central}) = 4.1(3) + 4.2 - 11.4 = 5.1$ cfs (increase)



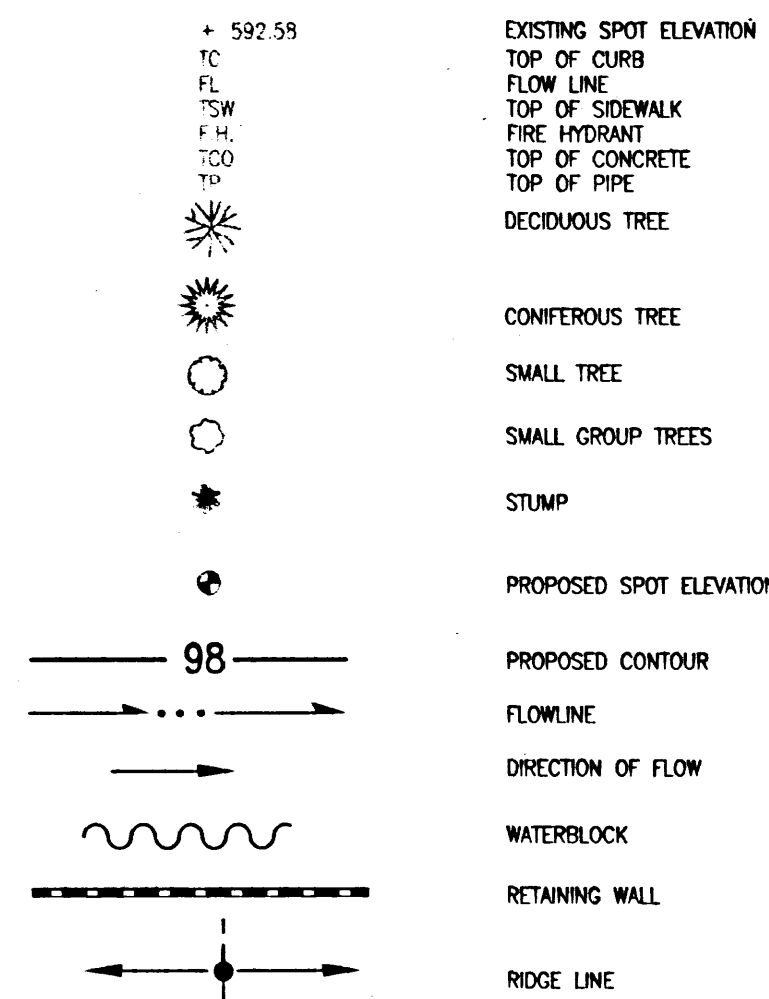
MASTER DRAINAGE PLAN EXISTING CONDITIONS TRACT K, CANYON ACRES DEVELOPMENT

DESIGNED BY	DATE	BY	REVISIONS	JOB NO.
G.R.B.				941204
DRAWN BY	DATE	BY	REVISIONS	DATE
C.J.H.				03-1995
APPROVED BY	DATE	BY	REVISIONS	SHEET
J.G.M.				1 OF 2

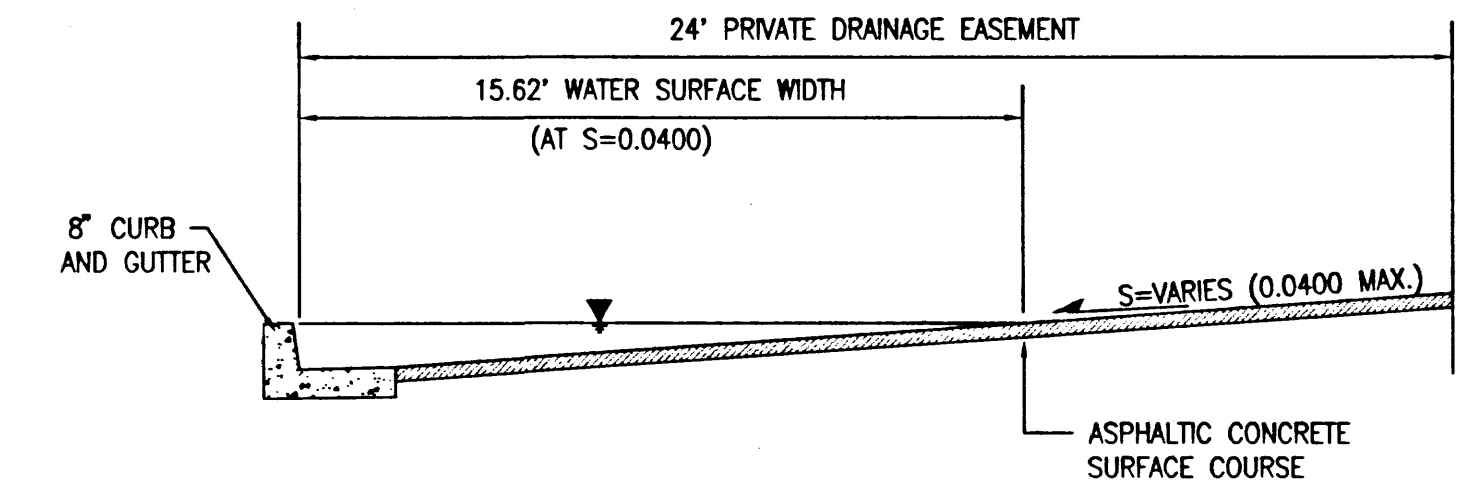
JEFF MORTENSEN & ASSOCIATES, INC.
6810-B MIDWAY PARK BLVD. N.E.
ALBUQUERQUE, NEW MEXICO 87109
ENGINEERS & SURVEYORS (505) 345-4250

MASTER PLAN

LEGEND

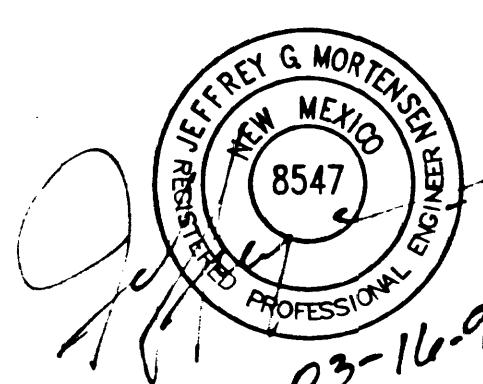
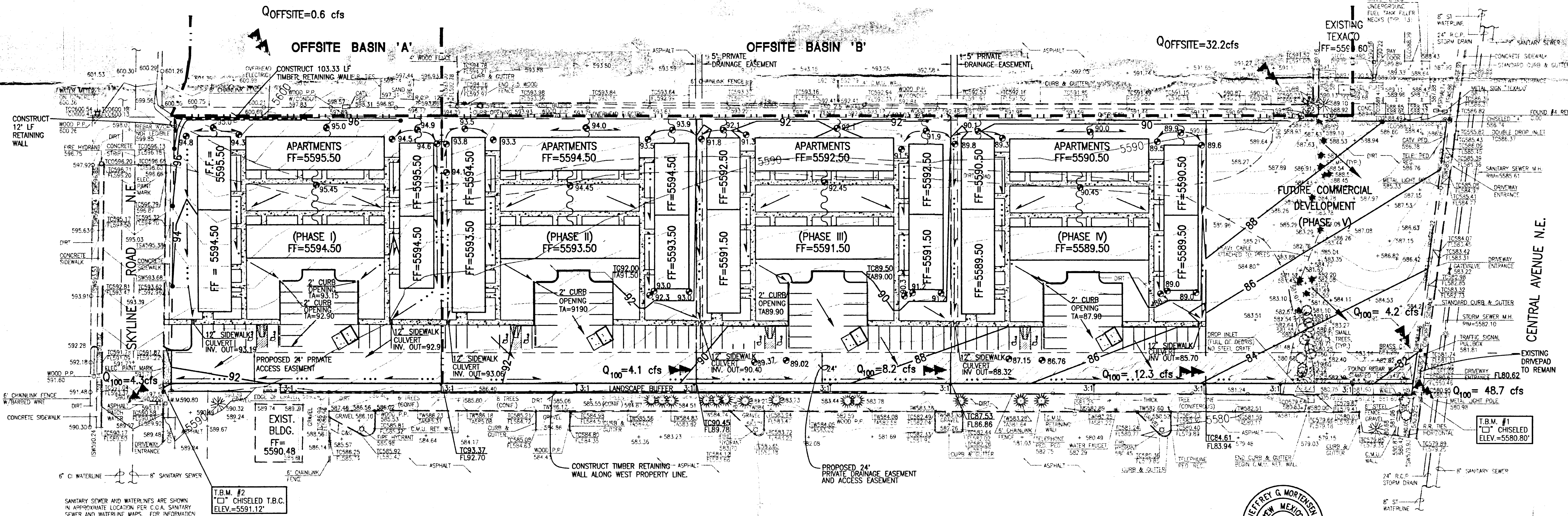


SCALE: 1" = 40'



DRAINAGE EASEMENT SECTION
SCALE: 1" = 4'

EASEMENT CAPACITY:
USING MANNING'S EQUATION
LET: A = 5.23 SF
WP = 15.63 FT
S = 0.0146 (SLOPE FROM PHASE II TO CENTRAL AVENUE)
n = 0.0170
THEREFORE: Q capacity = 26.7 cfs >> 12.3 cfs



JEFF MORTENSEN & ASSOCIATES, INC.
6000-B MIDWAY PARK BLVD. N.E.
ALBUQUERQUE, N.M. 87109
ENGINEERS SURVEYORS (505) 345-4250

MASTER DRAINAGE PLAN DEVELOPED CONDITION TRACT K, CANYON ACRES DEVELOPMENT

DESIGNED BY	DATE	BY	REVISIONS	JOB NO.
G.R.B.				941204
DRAWN BY	DATE	BY	REVISIONS	JOB NO.
C.J.H.				03-1995
APPROVED BY	DATE	BY	REVISIONS	JOB NO.
J.G.M.				2 OF 2

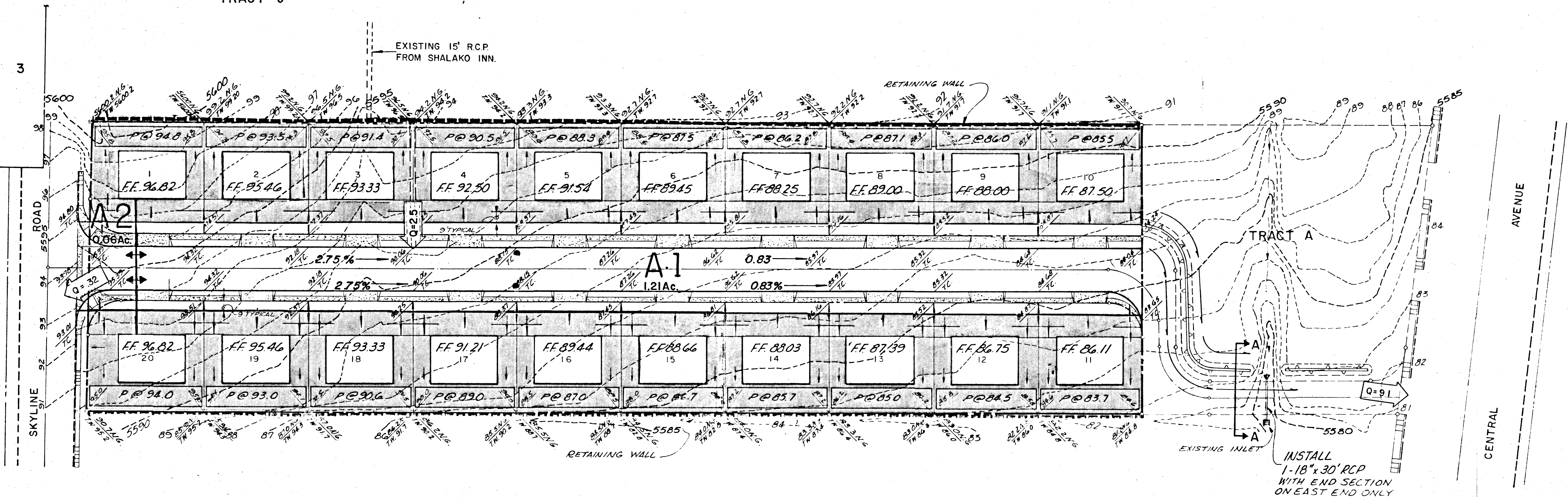
CANYON RIDGE

TRACT J

SCALE: 1"=40'

MANKIN PARCEL 3

K. O. A. SUBDIVISION



Historic Runoff

Total Area On-Site	= 3.85 Ac.
Total Area Off-Site	= 0.39 Ac.
Total Area	= 4.24
Composite Runoff Coefficient	= 0.45

Channel Flow-Undeveloped

Off-Site Channel No. 1	L = 280' @ 0.67%
Off-Site 15" Pipe Flow	L = 280' @ 0.67%
On-Site Channel No. 2	L = 750' @ 1.71%

Accumulation Time

Channel No. 1	Velocity = 1.7 ft./sec.; Time = 2.7 min.
15" Pipe Flow	Velocity = 4.3 ft./sec.; Time = 1.1 min.
Channel No. 2	Velocity = 1.7 ft./sec.; Time = 7.4 min.

$$I = \frac{189}{11.2 + 25} = 5.22 \quad 11.2 \text{ min.}$$

$$Q \text{ c.f.s.} = C.I.A. = (0.45)(5.22)(4.24) = 9.96 \text{ c.f.s.}$$

COMPOSITE RUNOFF COEFFICIENT

Undeveloped Land:

$$C = 0.40$$

Developed Land

Subdivision Gross Area	3.85 Ac.
Average Lot Area	6366.6 ft. ²
Typical Lot Width	77.50'

Ponded Lots (Area drained from lot; includes 1/2 street)

C = .90	Sidewalk Area = 4' x 77.50' = 310 sq.ft.
	Street Area = 16' x 77.50' = 1240 sq.ft.
	Parking Area = 9 x 71.50' = 643.5 sq.ft.
	Total Impervious Area = 2193.5 sq.ft.

C = .40	Grossed area @ front and side of parking area = 304 sq.ft.
	Total Pervious Area = 304.00 sq.ft.
Impervious Area	2193.50 sq.ft. 88% @ .90 = 0.79
Pervious Area	304.00 sq.ft. 12% @ .40 = 0.05
	2497.50 sq.ft. 100% 0.84

Ponding Requirements

Full Roof Area	(0.9) 34 x 50 = 1700 sq.ft.
2/3 Parking Area	(0.9) 18 x 71.5 = 1287 sq.ft.
Rear Lawn Area	(0.4) 23 x 77.5 = 1794 sq.ft.
Side Yards	(0.4) 13.75 x 34(2) = 935 sq.ft.
Total Area Draining to Pond	5716 sq.ft.

Pond Volume Requirements:

100-year storm precipitation = 2.4 inches

$$V = (0.9 - 0.4) \times \frac{2.4}{12} \times \text{Area (ft.)} = 0.1 \times \text{Area}$$

$$V = 0.1 \times 5716 = 571.60 \text{ ft.}^3$$

Depth of Pond 0.58 ft. (7")

Minimum area of pond = 985.52

Pond area as percentage of area drained = 17%

RUNOFF COMPUTATIONS

Drainage Area No. A-1

- * Area = 1.21 Acres On-Site
- * Area = 0.93 Acres Off-Site
- * Acreages shown are for areas which contribute runoff only.

Maximum Channel Flow:

Off-Site Channel No. 1	L = 280' @ 0.67%
Off-Site 15" Pipe Flow	L = 280' @ 0.67%
On-Site 15" Pipe Flow	L = 124' @ 0.67%
On-Site Channel No. 2	L = 75' @ 2.75%
On-Site Channel No. 3	L = 466' @ 0.83%
Thru Tract "A"	
On-Site Channel No. 4	L = 281' @ 0.83%

Accumulation Time:

Channel No. 1 Velocity	= 1.7 ft./sec.; Time = 2.7 min.
Channel No. 2 Velocity	= 3.3 ft./sec.; Time = 0.4 min.
Channel No. 3 Velocity	= 2.0 ft./sec.; Time = 3.9 min.
Channel No. 4 Velocity	= 1.5 ft./sec.; Time = 3.0 min.
Pipe Flow Velocity	= 4.3 ft./sec.; Time = 2.5 min.

$$\frac{189}{12.5 + 25} = 5.04$$

$$Q = C.I.A. = (.84)(5.04)(2.14) = 9.1 \text{ c.f.s.}$$

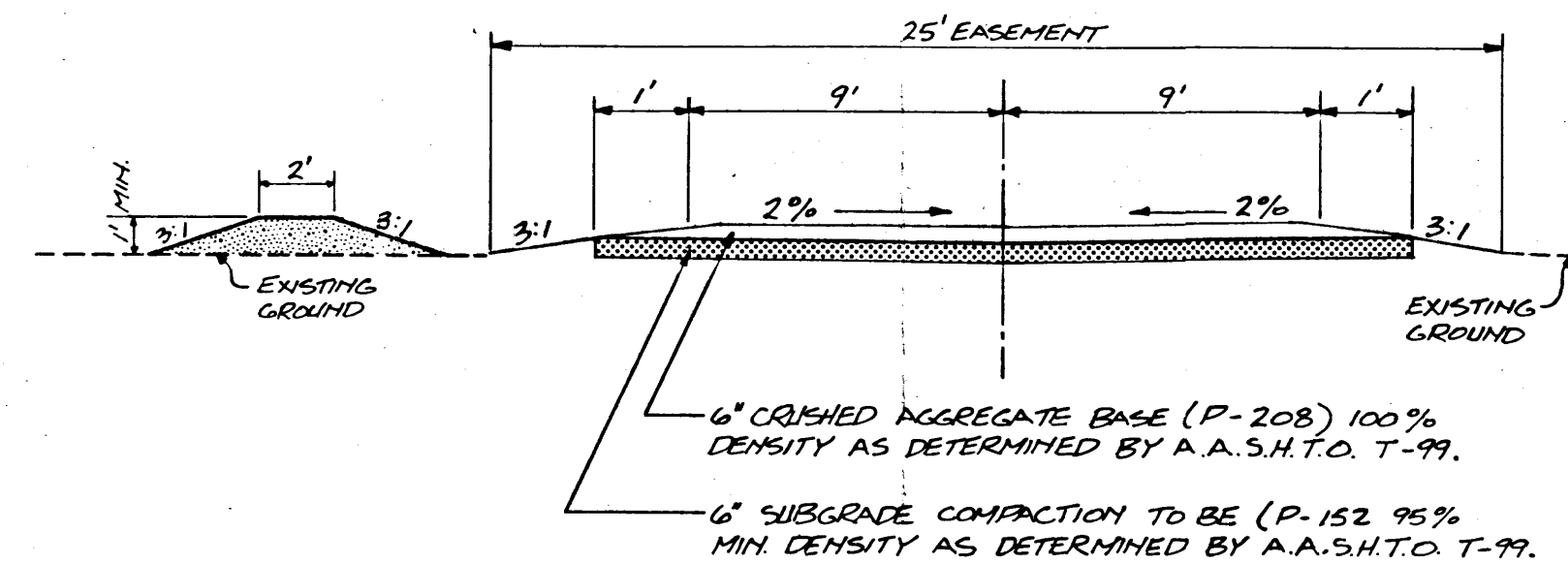
Drainage Area No. A-2

Area = 0.08 Acres	
Maximum Overland Flow:	L = 30' @ 2.50%
Maximum Channel Flow:	
Channel No.	L = 40' @ 4.00%

Accumulation Time:	
Overland Flow or Inlet Time:	3.0 min.
Channel No. 1 Flow:	
Velocity = 4.0 ft./sec.; Time = $\frac{40}{4 \times 60}$	= 0.2 min.
Total Accumulation Time:	T = 3.2 min.
$\frac{189}{5 + 25} = 6.3$	
Q = C.I.A. = (.84)(6.3)(0.06)	= 0.32 c.f.s.

LEGEND

- H.P. = HIGH POINT
- DRAINAGE AREA BOUNDARY
- Q NO (QTY. AND DIRECTION FLOW FOR DEVELOPED RUN OFF AT POINT IN C.F.S.)
- VALLEY GUTTER
- AREA DESIGNATION
- Q = PEAK FLOW IN CU. FT./SEC.
- PONDED AREA
- BERM



SECTION A-A
NO SCALE

PLANS PREPARED
UNDER THE DIRECTION
OF

C. J. D. Smith

NO.	DATE	BY	REVISIONS
1	4/18/79	J.H.	AS SHOWN
2	4/18/79	J.H.	AS SHOWN
3	4/18/79	J.H.	AS SHOWN
4	4/18/79	J.H.	AS SHOWN
5	4/18/79	J.H.	AS SHOWN
6	4/18/79	J.H.	AS SHOWN
7	4/18/79	J.H.	AS SHOWN
8	4/18/79	J.H.	AS SHOWN
9	4/18/79	J.H.	AS SHOWN
10	4/18/79	J.H.	AS SHOWN

BURNSIDE ENTERPRISES INC.

CANYON RIDGE

DEVELOPED DRAINAGE

CHARACTERISTICS

MEURER, SERAFINI AND MEURER, INC.

CONSULTING ENGINEERS • SURVEYORS • PLANNERS

2801 Wyoming Blvd., N.E. Albuquerque, New Mexico 87110

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Atch #1