

DRAINAGE PLAN

INTRODUCTION AND EXECUTIVE SUMMARY

THIS PROJECT, LOCATED ON ALBUQUERQUE'S WEST SIDE WEST OF THE BLACK DIVERSION CHANNEL, REPRESENTS NEW CONSTRUCTION ON AN UNDEVELOPED SITE. THE DRAINAGE CONCEPT WILL BE CONSISTENT WITH THE MASTER DRAINAGE PLAN FOR THE SITE. THE MASTER PLAN ADDRESSES ONSITE AND OFFSITE FLOWS AS WELL AS DOWNSTREAM CAPACITY. THE SITE WILL DISCHARGE DEVELOPED RUNOFF INTO SEVEN BAR LOOP NW WHICH THEN DIRECTS RUNOFF INTO THE BLACK DIVERSION CHANNEL.

THIS SUBMITTAL IS MADE IN SUPPORT OF GRADING AND PAVING PERMIT APPROVAL.

PROJECT DESCRIPTION

AS SHOWN BY THE VICINITY MAP, THE SITE IS LOCATED AT THE SOUTHEAST CORNER OF ELLISON DRIVE NW AND SEVEN BAR LOOP NW. THE CURRENT LEGAL DESCRIPTION IS TRACT A2-B, SEVEN-BAR RANCH, AS SHOWN BY PANEL 108 OF 825 OF THE NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAPS PUBLISHED BY FEMA FOR BERNALILLO COUNTY, NEW MEXICO, SEPTEMBER 20, 1996, THIS SITE DOES NOT LIE WITHIN A DESIGNATED FLOOD HAZARD ZONE (ZONE A).

BACKGROUND DOCUMENTS

THIS SUBMITTAL IS BASED UPON THE MASTER DRAINAGE PLAN FOR SEVEN BAR ELEMENTARY SCHOOL PREPARED BY JEFF MORTENSEN & ASSOC., DECEMBER 2000. THIS PLAN ALLOWS DEVELOPED RUNOFF TO ENTER THE BLACK DIVERSION CHANNEL VIA THE SEVEN BAR LOOP RIGHT OF WAY AND DEMONSTRATES ADEQUATE STREET CAPACITY AS WELL AS STORM DRAIN CAPACITY TO DO SO.

EXISTING CONDITIONS

CURRENTLY, THE SITE IS UNDEVELOPED AND IS COMPRISED OF TWO DRAINAGE BASINS. ELLISON DRIVE NW AND SEVEN BAR LOOP NW ARE BOTH FULLY IMPROVED CITY STREETS. BASIN A, WHICH ACCOUNTS FOR ABOUT TWO-THIRDS OF THE SITE, DISCHARGES UNDEVELOPED RUNOFF TOWARD THE NORTH AND INTO ELLISON DRIVE NW. THE REMAINING PORTION OF THE SITE, BASIN B, DISCHARGES UNDEVELOPED RUNOFF TOWARD THE SOUTH AND INTO THE SEVEN BAR LOOP RIGHT OF WAY. THE RUNOFF WHICH IS RECEIVED BY ELLISON DRIVE NW TRAVELS TO THE EAST WITHIN THE ROADWAY AND DISCHARGES INTO THE BLACK DIVERSION CHANNEL. SIMILARLY, RUNOFF WHICH ENTERS SEVEN BAR LOOP NW ALSO IS DIRECTED TO THE EAST AND ENTERS THE BLACK DIVERSION CHANNEL.

DEVELOPED CONDITIONS

BASIN A, WHICH WILL CONSIST OF THE UNDEVELOPED PORTION OF THE SITE, WILL CONTINUE TO DISCHARGE INTO ELLISON DRIVE NW. THE DEVELOPMENT PROPOSED BY THIS PLAN WILL TAKE PLACE WITHIN THE DEVELOPED BASIN B AND CONSISTS OF THAT OUTLINED AS PHASE 1-A ON THE MASTER DRAINAGE PLAN. BASIN B WILL DISCHARGE INTO SEVEN BAR LOOP NW AS ALLOWED BY THE MASTER DRAINAGE PLAN. THE MAIN FOCUS OF THIS PHASE IS THE INSTALLATION OF SEVERAL PORTABLE CLASSROOMS. THIS WILL INCLUDE THE CONSTRUCTION OF A PERMANENT PAVED PARKING LOT WHICH WILL LATER BE PART OF THE ULTIMATE BUILDOUT OF THE SITE. IN ADDITION, A TEMPORARY PARKING LOT WILL BE CONSTRUCTED TO SUPPORT THE PORTABLE CLASSROOM PHASE, BUT WILL BE REMOVED AS PART OF THE FINAL CONSTRUCTION PHASE WHICH INCLUDES THE CONSTRUCTION OF TWO PERMANENT SCHOOL BUILDINGS AND THE REMOVAL OF SEVERAL OF THE PORTABLE CLASSROOMS INSTALLED AS PART OF THIS PLAN. IN SUPPORT OF PHASES I-B AND II WHICH WILL BE CONSTRUCTED IN THE FUTURE, A PORTION OF THE PRIVATE STORM DRAIN AS WELL AS THE OUTLET STRUCTURE AND SIDEWALK CULVERTS WHICH ARE SHOWN ON THE MASTER DRAINAGE PLAN WILL BE CONSTRUCTED AS PART OF THIS PLAN, BUT WILL NOT BECOME OPERATIONAL UNTIL THE TIME WHEN THE FUTURE CONSTRUCTION PHASES ARE COMPLETED.

GRADING PLAN

THE GRADING PLAN SHOWS: 1) EXISTING GRADES INDICATED BY SPOT ELEVATIONS AND CONTOURS AT 1'-0" INTERVALS AS TAKEN FROM THE TOPOGRAPHIC SURVEY PREPARED BY THIS OFFICE, DATED OCTOBER 2000, 2) PROPOSED GRADES INDICATED BY SPOT ELEVATIONS AND CONTOURS AT 1'-0" INTERVALS, 3) THE LIMIT AND CHARACTER OF THE EXISTING IMPROVEMENTS, 4) THE LIMIT AND CHARACTER OF THE PROPOSED IMPROVEMENTS, AND 5) CONTINUITY BETWEEN EXISTING AND PROPOSED GRADES. THE PROPOSED GRADING WILL TAKE PLACE WITHIN THE CONSTRUCTION LIMITS AS DELINEATED ON THE GRADING PLAN.

CALCULATIONS

THE CALCULATIONS CONTAINED HEREIN ANALYZE BOTH THE EXISTING AND DEVELOPED CONDITIONS FOR THE 100-YEAR, 6-HOUR RAINFALL. 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. THE CAPACITIES OF THE CONCRETE RUNDOWN AND SIDEWALK CULVERTS WERE DETERMINED USING MANNING'S EQUATION.

CONCLUSION

THE FREE DISCHARGE OF DEVELOPED RUNOFF FROM THIS SITE INTO SEVEN BAR LOOP NW IS APPROPRIATE DUE TO THE FOLLOWING FACTORS:

1. ADEQUATE DOWNSTREAM CAPACITY AS DEMONSTRATED BY THE MASTER DRAINAGE PLAN.
2. NO ADVERSE IMPACT ON DOWNSTREAM FLOOD HAZARD ZONES.

CALCULATIONS

I. PRECIPITATION ZONE = 1

$$\text{II. } P_{6,100} = P_{360} = 2.20 \text{ IN}$$

$$\text{III. TOTAL AREA } (A_T) = 500,640 \text{ SF}/11.49 \text{ AC}$$

IV. EXISTING LAND TREATMENT

$$\begin{aligned} \text{A. BASIN A} & \quad 390,530 \text{ SF}/8.97 \text{ AC} \\ \text{TREATMENT AREA (SF/AC)} & \quad \% \\ \text{C} & \quad 390,530/8.97 \quad 100 \end{aligned}$$

$$\begin{aligned} \text{B. BASIN B} & \quad 110,110 \text{ SF}/2.53 \text{ AC} \\ \text{TREATMENT AREA (SF/AC)} & \quad \% \\ \text{C} & \quad 110,110/2.53 \quad 100 \end{aligned}$$

V. DEVELOPED LAND TREATMENT

$$\begin{aligned} \text{A. BASIN A} & \quad 177,910 \text{ SF}/4.08 \text{ AC} \\ \text{TREATMENT AREA (SF/AC)} & \quad \% \\ \text{C} & \quad 177,910/4.08 \quad 100 \end{aligned}$$

$$\begin{aligned} \text{B. BASIN B} & \quad 322,730 \text{ SF}/7.41 \text{ AC} \\ \text{TREATMENT AREA (SF/AC)} & \quad \% \\ \text{C} & \quad 143,590/3.30 \quad 45 \\ \text{D} & \quad 179,140/4.11 \quad 55 \end{aligned}$$

VI. EXISTING CONDITION

A. BASIN A

1. VOLUME

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

$$E_W = [0.99(8.97)] / 8.97 = 0.99 \text{ IN}$$

$$V_{100,6-HR} = (E_W / 12) A_T$$

$$V_{100,6-HR} = (0.99 / 12) 8.97 = 0.7400 \text{ AC-FT} = 32,240 \text{ CF}$$

2. PEAK DISCHARGE

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

$$Q_P = Q_{100} = 2.87(8.97) = 25.7 \text{ CFS}$$

B. BASIN B

1. VOLUME

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

$$E_W = [0.99(2.53)] / 2.53 = 0.99 \text{ IN}$$

$$V_{100,6-HR} = (E_W / 12) A_T$$

$$V_{100,6-HR} = (0.99 / 12) 2.53 = 0.2087 \text{ AC-FT} = 9,090 \text{ CF}$$

2. PEAK DISCHARGE

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

$$Q_P = Q_{100} = 2.87(2.53) = 7.3 \text{ CFS}$$

VII. DEVELOPED CONDITION

A. BASIN A

1. VOLUME

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

$$E_W = [0.99(4.08)] / 4.08 = 0.99 \text{ IN}$$

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

$$V_{100} = (0.99 / 12) 4.08 = 0.3366 \text{ AC-FT} = 14,660 \text{ CF}$$

2. PEAK DISCHARGE

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

$$Q_P = Q_{100} = 2.87(4.08) = 11.7 \text{ CFS}$$

3. RUNDOWN CAPACITY

$$Q = 1.486/n R^{0.67} S^{0.5} A$$

WHERE:

$$n = 0.013$$

$$S = 0.0100$$

$$A = 6.5(0.5) = 3.25 \text{ SF}$$

$$P = 6.5 + 2(0.5) = 7.5 \text{ FT}$$

$$R = A/P = 0.43 \text{ FT}$$

THEN:

$$Q = 21.1 \text{ CFS} > Q_{100} = 12.2 \text{ CFS (FROM MDP)}$$

4. SIDEWALK CULVERT CAPACITY

$$Q = 1.486/n R^{0.67} S^{0.5} A$$

WHERE:

$$n = 0.013$$

$$S = 0.0100$$

$$A = 1.83(0.5) = 0.92 \text{ SF (1 SINGLE CULVERT)}$$

$$P = 1.83 + 2(0.5) = 2.83 \text{ FT}$$

$$R = A/P = 0.32 \text{ FT}$$

THEN:

$$Q = 4.9 \text{ CFS}$$

$$Q = 3 * 4.9 = 14.7 \text{ CFS} > Q_{100} = 12.2 \text{ CFS}$$

B. BASIN B

1. VOLUME

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

$$E_W = [0.99(3.30) + 1.97(4.11)] / 7.41 = 1.53 \text{ IN}$$

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

$$V_{100} = (1.53 / 12) 7.41 = 0.9470 \text{ AC-FT} = 41,250 \text{ CF}$$

2. PEAK DISCHARGE

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

$$Q_P = Q_{100} = 2.87(3.30) + 4.37(4.11) = 27.4 \text{ CFS}$$

CALCULATIONS (CONTINUED)

VIII. COMPARISON

A. BASIN A

1. VOLUME

$$\Delta V_{100} = 14,660 - 32,240 = -17,580 \text{ CF (DECREASE)}$$

2. PEAK DISCHARGE

$$\Delta Q_{100} = 11.7 - 25.7 = -14.0 \text{ CFS (DECREASE)}$$

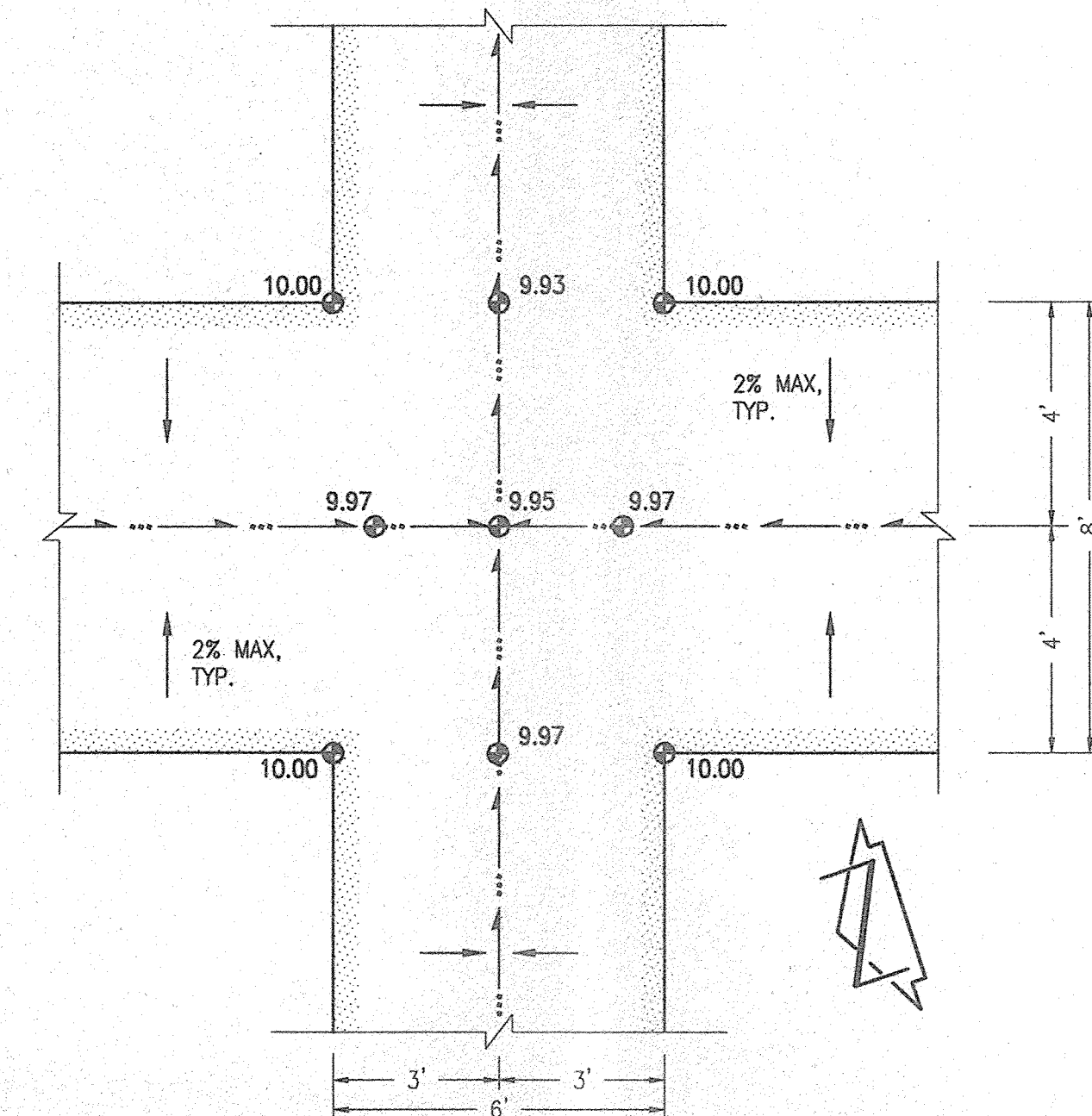
B. BASIN B

1. VOLUME

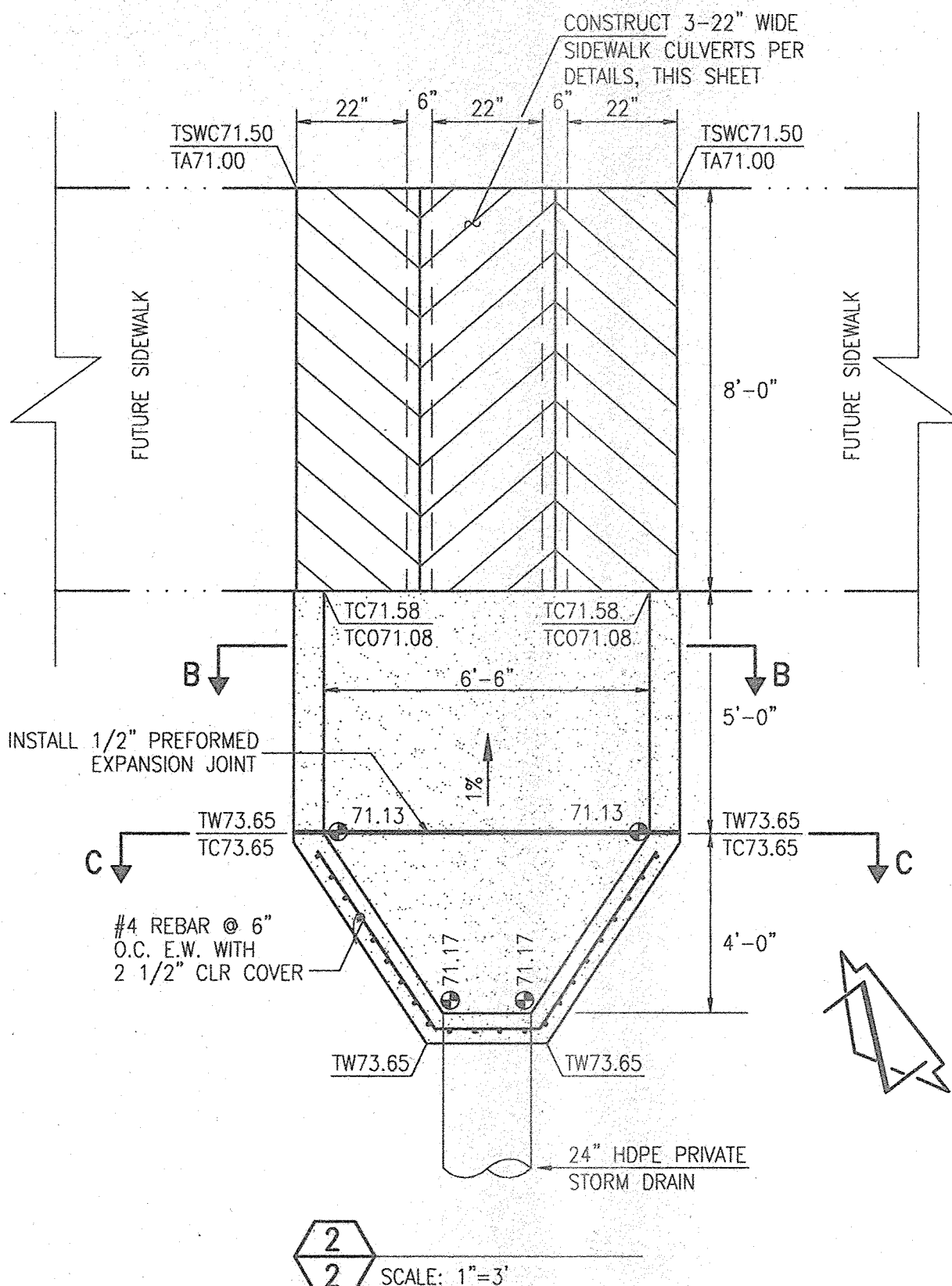
$$\Delta V_{100} = 41,250 - 9,090 = 32,160 \text{ CF (INCREASE)}$$

2. PEAK DISCHARGE

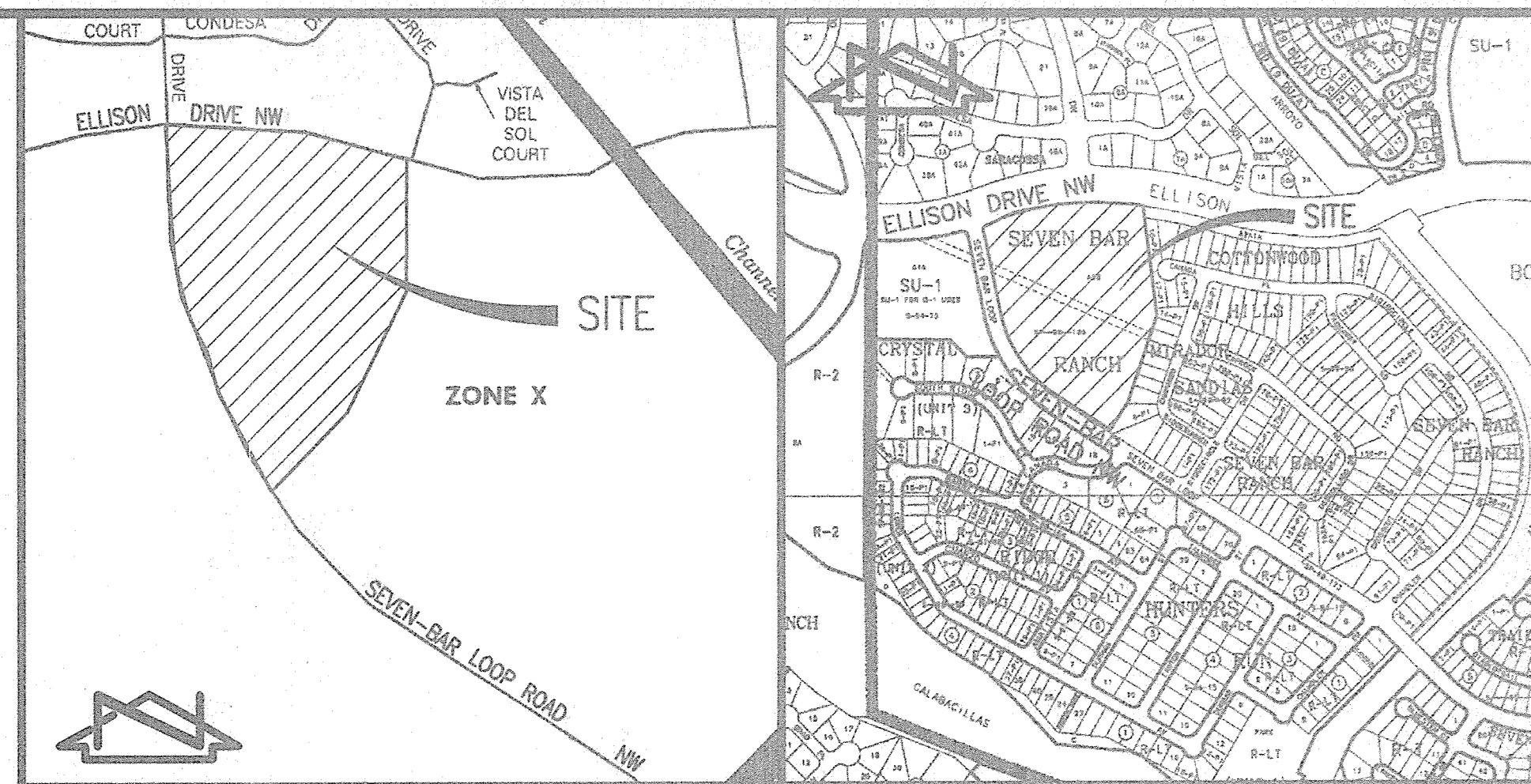
$$\Delta Q_{100} = 27.4 - 7.3 = 20.1 \text{ CFS (INCREASE)}$$



1
2 SCALE: 1"=3'



2
2 SCALE: 1"=3'



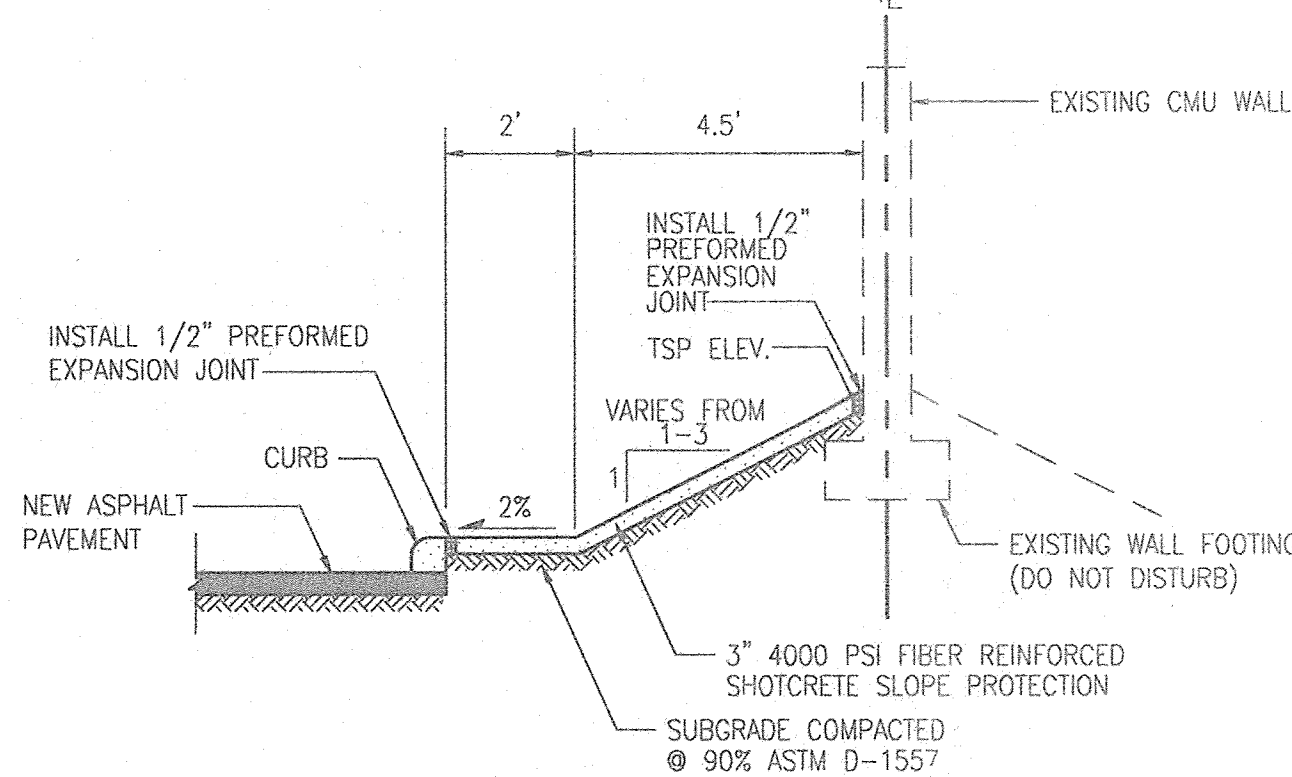
FLOOD PLAIN MAP

SCALE: 1" = 500'

PANEL 108 OF 825 VICINITY MAP

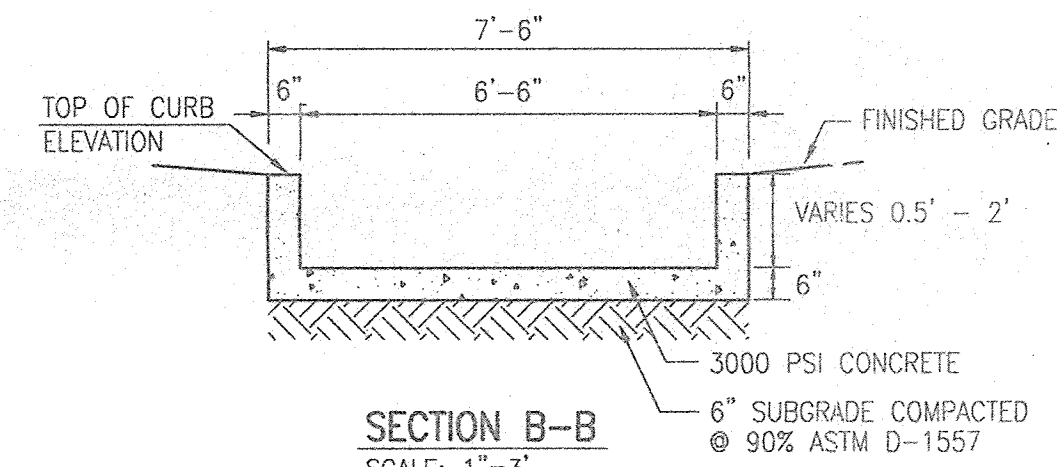
SCALE: 1" = 750'

A-13 / B-13



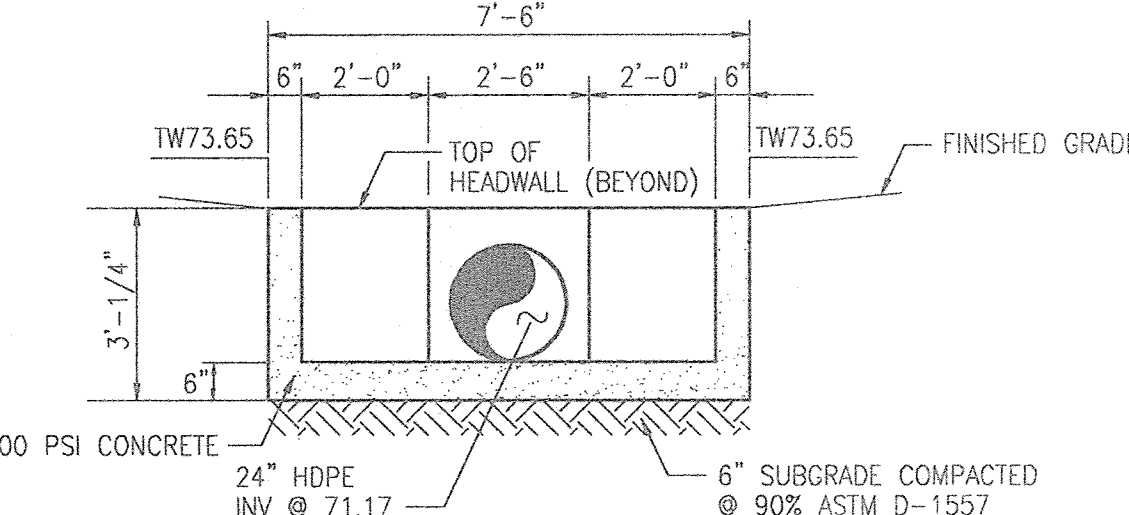
SECTION A-A

SCALE: 1"=3'



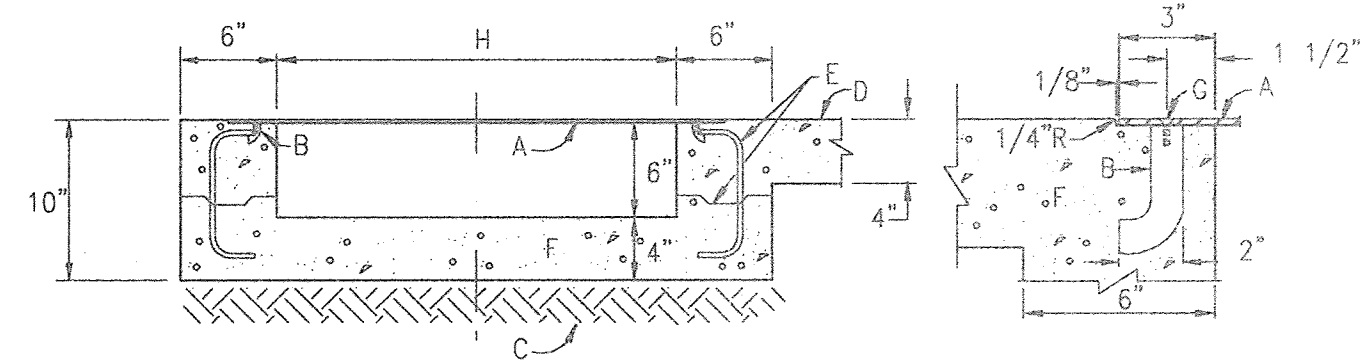
SECTION B-B

SCALE: 1"=3'



SECTION C-C

SCALE: 1"=3'



DOVEL DETAIL

NO.3 DEFORMED BAR 3"

1"R 90°

DOVEL DETAIL

DOVEL DETAIL

DOVEL DETAIL

DOVEL DETAIL

DOVEL DETAIL

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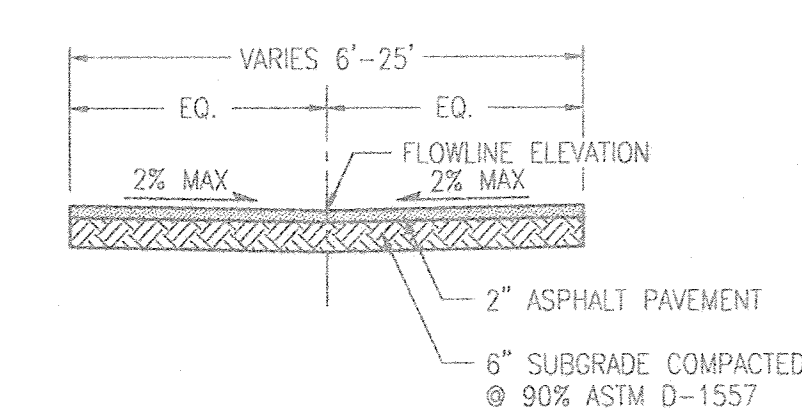
DOVEL DETAIL

DOVEL DETAIL

DOVEL DETAIL

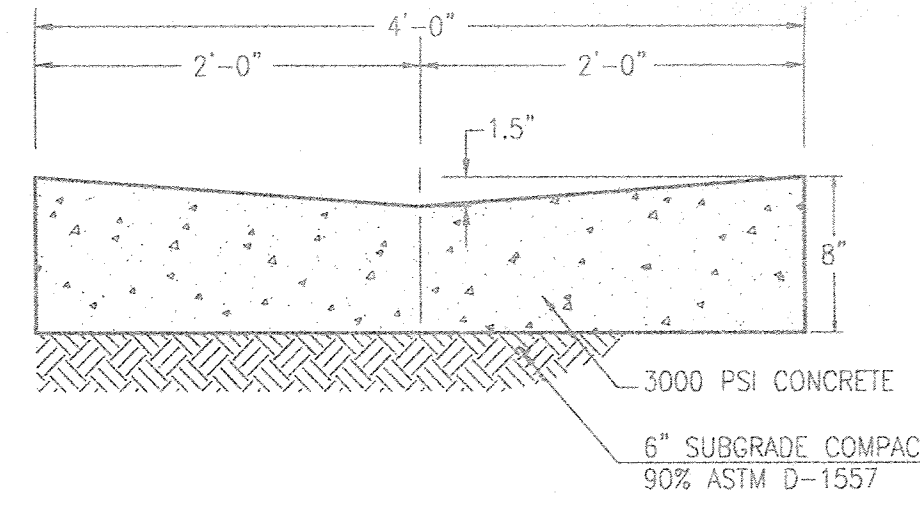
DOVEL DETAIL

DOVEL DETAIL



TYPICAL ASPHALT PAVED WALKWAY SECTION

SCALE: 1"=3'



VALLEY GUTTER SECTION

SCALE: 1" = 1'-0"

CONSTRUCTION NOTES:

- A. 3/8" CHECKERED STEEL PLATE.
- B. ROD ANCHOR 1" x 5'.
- C. SUBGRADE COMPACTED @ 90% ASTM D-1557.
- D. SIDEWALK GRADE.
- E. DOWEL AND JOINT, (OPTIONAL).
- F. 3000 PSI CONCRETE.
- G. 3/8" x 1" F.H. C'SUNK STAINLESS STEEL MACHINE SCREW.
- H. DRAIN WIDTH, 24" MAX. 12" MIN.

DEC 27 2000
HYDROLOGIST

JEFF MORTENSEN & ASSOCIATES, INC.
NEW MEXICO
8547
REGISTERED PROFESSIONAL ENGINEER

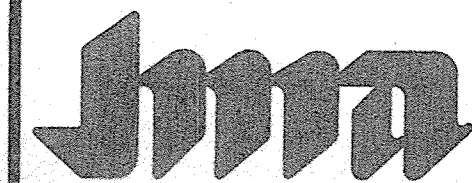
12-27-2000

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DRAINAGE PLAN, CALCULATIONS, SECTIONS AND DETAILS SEVEN BAR ELEMENTARY SCHOOL PORTABLES

DESIGNED BY	NO.	DATE	BY	REVISIONS	JOB NO.
C.J.S.					991845
DRAWN BY					DATE
J.Y.R.					12-2000
APPROVED BY					SHEET
J.G.M.					1 OF 2

BLOCK 1A
SARAGOSSA
(FILED 04-12-1989, C39-1)

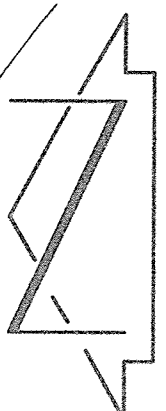
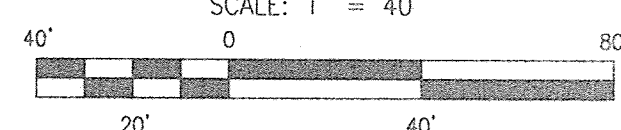


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GRADING PLAN SEVEN BAR ELEMENTARY SCHOOL PORTABLES

BOUNDARY TABLE					
CURVE	RADIUS	LENGTH	CHORD BEARING	CHORD	DELTA
C1	616.00'	491.30'	N 34°26'57" W	478.38'	45°41'50"
C2	25.00'	36.33'	N 30°01'32" E	33.21'	83°15'08"
C3	1122.00'	408.33'	N 82°04'39" E	406.08'	20°51'06"
C4	2132.70'	172.16'	S 85°10'35" E	172.11'	04°37'30"

BOUNDARY TABLE		
LINE	DIRECTION	DISTANCE
L1	S 07°27'36" E	459.93'
L2	S 18°52'24" W	378.00'
L3	S 32°42'08" W	149.38'
L4	N 57°17'52" W	232.26'
L5	N 11°36'02" W	327.73'
L6	N 71°39'06" E	89.44'



LEGAL DESCRIPTION
TRACT A-2B, SEVEN-BAR RANCH, ALBUQUERQUE, NEW MEXICO, AS THE SAME IS SHOWN AND DESIGNATED ON THE PLAT FILED IN THE OFFICE OF THE COUNTY CLERK OF BERNILLO COUNTY, NEW MEXICO ON JANUARY 05, 1995, BOOK 95C, PAGE 2.

PROJECT BENCHMARK
USGS BRASS TABLET STAMPED "BLACK-2 1977", SET FLUSH WITH GROUND, NEAR THE SOUTHWEST CORNER OF THE INTERSECTION OF GOLF COURSE ROAD N.W. WITH McMAHON BOULEVARD N.W.
ELEVATION = 5213.93 FEET (M.S.L.D.)

T.B.M. #1
CHISELED "C" ON TOP OF EAST CURB ON SEVEN-BAR LOOP ROAD N.W. NEAR NORTHWEST PROPERTY CORNER
ELEVATION = 5187.14 FEET (M.S.L.D.)

T.B.M. #2
CHISELED "C" ON TOP OF NORTH CURB ON SEVEN-BAR LOOP ROAD N.W. NEAR SOUTHERN MOST PROPERTY CORNER
ELEVATION = 5168.07 FEET (M.S.L.D.)

KEYED EASEMENT AND MONUMENTATION NOTES

- 10' PUBLIC UTILITY EASEMENT GRANTED BY PLAT C40-21
- 10' PUBLIC UTILITY EASEMENT GRANTED BY PLAT 95C-2
- 36" GAS COMPANY OF NEW MEXICO RIGHT OF WAY AND EASEMENT GRANTED BY DOCUMENT EXECUTED ON 07-12-1995 (UNRECORDED)
- 10' NEW MEXICO UTILITY, INC. WATER LINE EASEMENT GRANTED BY DOCUMENT FILED 09-01-1995, BOOK 95-21, PAGE 3880, DOC. #95089330
- 30' SOUTHERN UNION GAS COMPANY RIGHT-OF-WAY EASEMENT GRANTED BY DOCUMENT FILED 01-14-1946, BOOK 220, PAGE 547, AND AMENDED BY SUPPLEMENTAL RIGHT-OF-WAY GRANT FILED 03-07-1961, BOOK D585, PAGE 409, DOC. #10263, AS MODIFIED BY RELEASE OF CONVEYANCE FILED 01-12-1989, BOOK MISC. 702-A, PAGE 863, DOC. #892675
- 7' M.S.T.&T. RIGHT-OF-WAY EASEMENT GRANTED BY DOCUMENT FILED 04-21-1965, BOOK R/W 143, PAGE 329, DOC. #50547
- 10' PUBLIC UTILITY EASEMENT GRANTED BY PLAT 99C-169 (OFFSITE)
- 10' PUBLIC UTILITY EASEMENT GRANTED BY PLAT 99C-170 (OFFSITE)
- VACATED PORTION OF 30' SOUTHERN UNION GAS COMPANY AND 7' M.S.T.&T. RIGHT-OF-WAY EASEMENT BY V-98-71 (OFFSITE)
- #5 REBAR W/CAP STAMPED "NEW MEXICO PS 11184"
- P.K. NAIL (NO I.D.) IN WALL FOOTING
- #5 REBAR (NO I.D.), TAGGED W/WASHER STAMPED "NMPS 11184"
- #5 REBAR WITH CAP STAMPED "PS6544", NOT HONORED (0.08' EAST OF PROPERTY LINE)
- MAG NAIL W/WASHER STAMPED "NMPLS10042" IN TOP OF WALL
- ASPHALT NAIL W/WASHER STAMPED "PS6544" IN TOP OF WALL
- P.K. NAIL W/WASHER STAMPED "NMPS 11184" IN TOP OF WALL

CONSTRUCTION KEYED NOTES:

- CONSTRUCT 4' VALLEY GUTTER @ S=0.0050 PER SECTION, SHEET 1
- CONSTRUCT SLOPE PAVING PER SECTION A-A, SHEET 1
- SEE DETAIL 1 FOR GRADES AT PAVED WALKWAY INTERSECTION
- INSTALL 24" HDPE PRIVATE STORM DRAIN @ S=0.0030 (TO SUPPORT PHASE I-B AND PHASE II CONSTRUCTION)
- INSTALL 4" DIA. TYPE "E" STORM DRAIN MANHOLE PER C.O.A. STD DWG 2102 INV IN = 71.80; INV OUT = 71.75
- INSTALL 24" CAP @ INV=72.10
- CONSTRUCT OUTLET STRUCTURE AND SIDEWALK CULVERTS PER DETAIL 2
- CONSTRUCT FLOWLINE AND INVERT PER TYPICAL ASPHALT PAVED WALKWAY SECTION, SHEET 1, TYP.

LEGEND

CMU CONCRETE	CONCRETE MASONRY UNIT	VHPG	VERY HIGH PRESSURE GAS LINE
DWS	DASHED WHITE STRIPE	W	WATER
DYS	DOUBLE SOLID YELLOW STRIPE	W/W	WHEEL CHAIR RAMP
ECF	EROSION CONTROL FENCE	WS	WOOD SIGN
EXC	EXTRUDED CONCRETE CURB	WVB	WATER VALVE BOX
FL	FLOWLINE	WV	PROPERTY CORNER
ID	IDENTIFICATION		MANHOLE
INV	INVERT		WATER VALVE BOX
MH	MANHOLE		TRAFFIC SIGN
PKW	PEDESTRIAN CROSSWALK		TRAFFIC SIGNAL
R.O.W.	RIGHT-OF-WAY		TRAFFIC SIGNAL PULLBOX
SAS	SANITARY SEWER		TELEPHONE CABINET
STD	STANDARD CURB AND GUTTER		UTILITY PAINT MARK
SW	SIDEWALK		CONTOUR LINE
SWS	SOLID WHITE STRIPE		WIRE/BARBED WIRE FENCE
TA	TOP OF ASPHALT		EASEMENT LINE
TC	TOP OF CURB		ADJOINER LINE
TCB	TELEPHONE CABINET		PROPERTY LINE
TCO	TOP OF CONCRETE		PROPOSED CONTOUR
TMB	TRAFFIC MAST ARM BASE		PROPOSED CONCRETE
TOP	TOP OF FOOTING		PROPOSED ASPHALT PAVING
TS	TRAFFIC SIGNAL		PROPOSED FLOWLINE
TSG	TRAFFIC SIGNAL		HIGH POINT
TSP	TOP OF SLOPE PAVING		PROPOSED SPOT ELEVATION
TSPB	TRAFFIC SIGNAL PULLBOX		
TW	TOP OF WALL		
VG	VALLEY GUTTER		
FG	FINISHED GRADE		

TOF 74.95
PORTABLE CLASS ROOM BUILDING

--- EXISTING BASIN BOUNDARY
--- PROPOSED BASIN BOUNDARY



DESIGNED BY				REVISIONS				JOB NO.	
CJS								991845	
DRAWN BY								DATE	
JYP								12-2000	
APPROVED BY								SHEET	
JGM								2 OF 2	