DRAINAGE REPORT
FOR TRACTS B-4, B-5 & B-6
SEVEN BAR NORTH SUBDIVISION

Prepared for:

BROWN/NZD DEVELOPMENT JOINT VENTURE
C/O BROWN & ASSOCIATES
3411 CANDELARIA NE
ALBUQUERQUE, NEW MEXICO 87107

Prepared by:

Job No. 93217.43

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Drainage Report
for
Tracts B-4, B-5 & B-6
Seven Bar North Subdivision

October 1994

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3411 CANDELARIA NE
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Prepared by:

Pierce Runnels

Under the Supervision of:

10/26/94

James Topmiller, P.E.

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APPENDICES

PLATES

I. INTRODUCTION/PURPOSE OF REPORT

This report presents the Drainage Management Plan for Preliminary Plat and rough grading approval for the development of Tracts B-4, B-5 and B-6 of the Seven Bar North Subdivision. The property is 45.5 acres, currently zoned R-1 and the proposed development is for 182 lots of detached, single family residential housing and the related streets and infrastructure. As shown on the location map on the Drainage Basin Map, the property is bounded by Seven Bar Loop Road on the east, Westside Boulevard on the north, undeveloped, vacant land on the west, and Black's Arroyo on the south.

The report outlines the study methodologies used and summarizes the existing and proposed drainage conditions. Calculations and supporting data are presented in the appendices. A drainage basin map, a preliminary grading plan and a copy of the Preliminary Plat are included in the Plates at the end of the report. The purpose of this report is to obtain drainage report approval for the Preliminary Plat for Tracts B-4, B-5 and B-6, and rough grading approval.

II. STUDY METHODOLOGIES

Undeveloped, existing conditions and proposed, developed conditions were analyzed for the 100-year, 6-hour storm event consistent with the City of Albuquerque Design Process Manual (DPM), including the January, 1993 revision of Section 22.2, Hydrology. The hydrology was also analyzed with the AHYMO Computer Program (AMAFCA Hydrologic Model). The analysis also references the previously submitted Drainage Master Plan for the Seven Bar North Subdivision, dated April, 1994 and revised June 6, 1994, and is consistent with that report.

Street hydraulics and channel capacities were analyzed using Manning's equation with the Manning's "n" values suggested in the DPM. Rating curves for

streets and channels are provided in the Appendices, along with all hydrologic and hydraulic calculations. Streets are designed to convey the energy grade line of the design storm event within the right-of-way. Normal flow depth is confined to the top of curb. Pipe hydraulics provided are for pressure flow conditions and are analyzed by computer methods.

III. EXISTING CONDITIONS

Site Characteristics

This site is currently undeveloped vacant land with slopes ranging from 2% to 8% in a generally southern direction. Soils are highly absorptive sandy soils with occasional clay lenses. Vegetation is light, consisting of grasses and small sagebrush.

The site is not located within a FEMA floodplain, as shown on the Floodplain Map provided on the Drainage Master Plan (enclosed in the rear of this report).

The existing drainage conditions are shown graphically on the "Existing Drainage Conditions" map and are summarized as follows:

Onsite Drainage Basin

Tracts B-4, B-5 and B-6, a total drainage basin of approximately 45.5 acres, currently drains to the south in primarily sheet flow, where it discharges in a concrete rundown into the Black's Arroyo Channel. The 100-year storm event currently generates 45.9 cfs of runoff from this basin.

Offsite Drainage Basins

Two off-site basins drain directly into the proposed development. The first basin(OFF1) lies north of Westside Boulevard in the City of Rio Rancho and generates a total of 24.9 cfs under the developed conditions. The flow is conveyed by CMP to Westside Boulevard, where it will be intercepted by the storm drain system in Seven Bar Loop Road. The appendix to the Drainage Master Plan provides the text and basin information excerpted from the Rio Rancho Special Assessment District Drainage Report prepared by Wilson & Company. Basin E-1 is approximately 23.8 acres and generates approximately 28.5 cfs which drains in sheet flow to the Seven Bar Loop Road right-of-way, where it continues south to the Black's Arroyo channel.

CHECK ON METHOD USE TO CALC. Q4.

Basins E-2 and E-3 do not drain onto Tracts B-4, B-5 & B6, but they are part of the Seven Bar North Subdivision and affect the pond calculations presented in Appendix 4. Both basins flow into the existing temporary drainage pond in the northeast corner of the Seven Bar Loop Road/Sierrita Road intersection.

Basin E-2 is approximately 36.0 acres, has 29.9 cfs of runoff in the 100-year storm and flows into the existing temporary drainage pond in the northeast corner of the Seven Bar Loop Road/Sierrita Road intersection. Basin E-2 drains in sheet flow to the channel on the north side of Sierrita Road, where it collects and is conveyed to the pond. Basin E-3, which is 19.0 acres and generates 23.9 cfs of runoff, runs in sheet flow to the northern boundary of the developed area of Units 1 and 2, and is conveyed by the V-ditch to the channel on the north side of Sierrita Road.

IV. PROPOSED DEVELOPED CONDITIONS

The proposed development is a single-family, detached-unit residential subdivision with 182 lots on 45.5 acres, producing a density of 4.00 D.U. per acre.

Proposed street configurations are shown on the Preliminary Plat, the Drainage Basin Map and on the Preliminary Grading Plan. For drainage, the development can be broken into two major areas. The first area is Unit 4 and the second is the combined areas of Units 5 and 6.

Unit 4 Development

Unit 4 includes the development of all of Tract B-4 and the construction of Seven Bar Loop Road and associated storm drain from Sierrita Road to the north boundary of Tract B-4. A swale along the north boundary of Tract B-4 will also be constructed during Unit 4 construction. The storm drain in Seven Bar Loop Road is designed to accommodate flows from Tract B-8 as shown in the Drainage Master Plan for the Seven Bar North Subdivision.

For purpose of analysis, Unit 4 is subdivided into four smaller sub-basins, Basins A-1 through A-4, as shown on the Drainage Basin Map. These basins together generate a fully developed runoff of 39.4 cfs (11.8+6.3+11.2+10.1). This flow is conveyed by street flow to the southern end of Unit 4 where it is picked up in catch basins and discharged into the Seven Bar Loop Road storm drain at an existing stub-out.

As stated in the Methodology Section of this report, street flows were calculated and energy grade lines confined to the right-of-way. A Summary Table of the street calculations is provided at the front of Appendix 2 for review and reference. The allowable locations for the use of roll curb have been identified on the Curb Type Identification Map in the rear of this report.

Units 5 & 6 Development

Units 5 & 6 development consist of the development of all of Tracts B-5 and B-6, the construction of Seven Bar Loop Road and the associated storm drain and the construction of Westside Boulevard from Seven Bar Loop Road to the existing pavement at the west boundary of Tract B-6. Units 5 & 6 are subdivided into 14 smaller sub-basins, Basins B-1 through B-14. These basins combine to generate a fully developed runoff of 154.7 cfs. This runoff is conveyed partially by street flow and partially in storm drain to the Unit 5 outflow.

The storm drain system consists of two "legs," which meet at the southeast end of Units 5 & 6 and combine flows into an existing 42" pipe-to-channel connection (Unit 5 outflow). The eastern leg begins at the intersection of Seven Bar Loop Road and Westside Boulevard where it picks up the flows from the offsite basin OFF1 (24.9 cfs) and Westside Boulevard basin S-1B (17.4 cfs). This leg turns into the subdivision at the Seven Bar Loop Road entrance and continues to the outflow. The storm drain is shown on plan and profile sheets in the appendix. The outflow connection will be coordinated with AMAFCA. The Drainage Master Plan analysis used 142.4 cfs peak flow into Black's Arroyo from this development, and the outflow calculated herein is actually 154.7cfs.

As stated in the Methodology Section of this report, street flows were calculated and energy grade lines confined to the right-of-way. A Summary Table of the street calculations is provided at the front of Appendix 2 for review and reference. The allowable locations for the use of roll curb have been identified on the Curb Type Identification Map.

Calculations are found in Appendix 3 for the two outflow configurations and all storm drain components.

Backyard Ponding

Several lots will require backyard ponds due to extreme elevation differences between streets. Pond locations are shown on the preliminary grading plans enclosed in the rear of this report.

Offsite Basins

The offsite basins that impact Tracts B-4, B-5 and B-6 are Basin OFF1, Basin S-1B and Basin E-1. As mentioned above, Basins OFF1 and Basin S-1B will be introduced into the Seven Bar Loop Road storm drain and conveyed ultimately to the Unit 5 outflow. These basins contribute a total of 38.8 cfs, which is consistent with the Master Drainage Plan. Basin E-1 consists of approximately 23.8 acres which generate a peak flow of 28.5 cfs. This flow will be captured in a temporary swale flowing adjacent to, and east of, Seven Bar Loop Road, and will be added to the existing pond at Sierrita Road. Calculations for the swale and pond are found in Appendix 4. The pond is designed to remove the sediment from the 10-year storm and have an orifice-controlled discharge into a connector pipe that runs to a storm drain manhole in Sierrita Road.

V. PHASING/BUILDING PERMIT/FINAL PLAT APPROVALS

This report requests only Preliminary Plat and rough grading approvals. Prior to final plat and building permit approvals, final grading plans and work order construction plans, by phase, must be submitted and approved by the City, AMAFCA and NMUI.

VI. CONCLUSION

The drainage management plan presented in this report for Tracts B-4, B-5 and B-6 provides a workable solution to the drainage issues created by the development of this property and should be approved as satisfying the requirements for Preliminary Plat drainage report and rough grading approval.

HYDROLOGY - FORMULAS USED

FROM SECTION 22.2 OF DPM - JANUARY 93 UPDATE

EXISTING CONDITIONS:

TIME OF CONCENTRATION, $t_c = \left(\frac{L_1}{V_1} + \frac{L_2}{V_2} + \ldots + \frac{L_x}{V_x}\right) / 3600$ sec/hr

WHERE $V = K\sqrt{S}$

K FROM TABLE B-1

S IS SLOPE IN PERCENT

$L_1 + L_2 + \ldots L_x \leq 4000$ FT

INTENSITY, $I = 0.726\left(\log(24.6 \times t_c)\right) \frac{P_{60}}{t_c}$

RATIONAL METHOD "C" = %A(.27) + %B(.43) + %C(.61) + %D(.93)

(ZONE 1, 100 YR, 6 HR STORM)

$Q_p = CIA$

DEVELOPED CONDITIONS

FOR SMALL WATERSHEDS t_p = 8 MINUTES

t_c = 12 MINUTES

RATIONAL METHOD "C" = %A(.27) + %B(.43) + %C(.61) + %D(.93)

(ZONE 1, 100 YR, 6 HR STORM)

"C" = %A(.08) + %B(.24) + %C(.47) + %D(.92)

(ZONE 1, 10 YR, 6-HR STORM)

EXCESS PRECIPITATION, E_c = %A(.44) + %B(.67) + %C(.99) + %D(1.97)

VOLUME = AREA(E_c)

BOHANNAN-HUSTON INC.

PROJECT NAME TRACTS A & D SHEET ____ OF ____

PROJECT NO. C2221740 BY PP DATE 3 5 96

SUBJECT HYDROLOGY CH'D ____ DATE ____

EXISTING DRAINAGE:

BASIN	%A
TR 4,5,6	100
E1	100
E2	95
E3	95

(SL 10%, UNDEVELOPED, PRIMARILY SHEET FLOW)

CALCULATION OF t_c:

t_c (TRACTS 4,5,6): L = 2100' (PRIMARILY SHEET FLOW)

$$t_c = \frac{\frac{2000}{0.7\sqrt{6}} + \frac{100}{3\sqrt{6}}}{3600}$$ (6% AVG)

$P_{60} = 1.87"$

$= 0.33$ HRS

$$I = 0.726\left(\log((24.6)(.33))\frac{1}{.33}\right)(1.87) = 3.74 \text{ IN/HR}$$

t_c (BASIN E-1): L = 1400' (PRIMARILY SHEET FLOW)

$$t_c = \frac{1400}{0.7\sqrt{6}} \Big/ 3600 = 0.23 \text{ HR} \quad I = 4.44 \text{ IN/HR}$$

t_c (BASIN E-2): L = 2200' (SHEET & CHANNEL)

$$t_c = \frac{\frac{1200}{0.7\sqrt{6}} + \frac{1000}{4\sqrt{2}}}{3600} = 0.24 \text{ HR}$$

$I = 4.33$ IN/HR

t_c (BASIN E-3) L = 1800' (SHEET & CHANNEL)

$$t_c = \frac{\frac{1200}{0.7\sqrt{6}} + \frac{600}{4\sqrt{2}}}{3600} = 0.22 \text{ HR}$$

$I = 4.53$ IN/HR

BASIN	C	I	A(Ac)	Qp
TRACTS 456	0.27	3.74	45.5	45.9
E1	0.27	4.44	23.8	28.5
E2	0.28	4.33	29.9	36.0
E3	0.28	4.53	19.0	23.9

BOHANNAN-HUSTON INC.

PROJECT NAME _____ SHEET _____ OF _____

PROJECT NO. _____ BY _____ DATE _____

SUBJECT _____ CH'D _____ DATE _____

FULLY DEVELOPED CONDITIONS

SUMMARY OF HYDROLOGIC DATA

BASIN ID	AREA AC	AREA SQ.MI.	% LAND TREATMENT A	B	C	D	TIME TO PEAK	10-YR DISCHARGE CFS/AC	Q(10YR) CFS	RATIONAL METHOD (100YR) COMPOSITE C	I (IN/HR)	Q(100YR) (CFS)
A1	3.315	0.0052	3.9	18.3	18.3	59.5	0.1333	2.14	7.1	0.75	4.70	11.8
A2	1.912	0.0030	3.4	24.7	24.7	47.2	0.1333	1.93	3.7	0.71	4.70	6.3
A3	3.065	0.0048	3.9	15.4	15.4	65.3	0.1333	2.24	6.9	0.78	4.70	11.2
A4	3.015	0.0047	3.4	23.4	23.4	49.8	0.1333	1.97	5.9	0.72	4.70	10.1
B1	1.747	0.0027	3.7	22.5	22.5	51.3	0.1333	2.00	3.5	0.72	4.70	5.9
B2	1.286	0.0020	3.6	18.1	18.1	60.2	0.1333	2.16	2.8	0.76	4.70	4.6
B3	1.401	0.0022	3.9	16.5	16.5	63.0	0.1333	2.20	3.1	0.77	4.70	5.1
B4	3.489	0.0055	3.7	20.6	20.6	55.2	0.1333	2.07	7.2	0.74	4.70	12.1
B5	2.892	0.0045	3.8	22.3	22.3	51.5	0.1333	2.00	5.8	0.72	4.70	9.8
B6	3.548	0.0055	3.9	21.7	21.7	52.8	0.1333	2.02	7.2	0.73	4.70	12.1
B7	2.799	0.0044	4.3	19.4	19.4	56.9	0.1333	2.09	5.9	0.74	4.70	9.8
B8	2.349	0.0037	3.5	21.9	21.9	52.6	0.1333	2.02	4.8	0.73	4.70	8.0
B9	2.038	0.0032	3.6	20.1	20.1	56.2	0.1333	2.08	4.2	0.74	4.70	7.1
B10	1.586	0.0025	4.1	20.1	20.1	55.8	0.1333	2.07	3.3	0.74	4.70	5.5
B11	1.589	0.0025	3.5	14.5	14.5	67.5	0.1333	2.29	3.6	0.79	4.70	5.9
B12	3.766	0.0059	3.2	26.3	26.3	44.2	0.1333	1.88	7.1	0.69	4.70	12.3
B13	2.861	0.0045	3.9	22.0	22.0	52.1	0.1333	2.01	5.7	0.72	4.70	9.7
B14	2.366	0.0037	3.9	22.2	22.2	51.7	0.1333	2.00	4.7	0.72	4.70	8.0

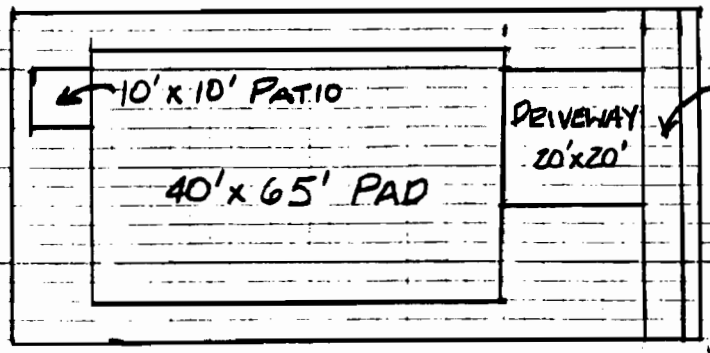
IMPERVIOUS AREA CALCULATIONS

LOT WIDTH(IN FEET)		50	55	60	65	70	75	80
PAD WIDTH		40	45	50	55	60	65	70
PAD DEPTH		65	65	65	65	65	65	65
DRIVEWAY	(20'x20')	400	400	400	400	400	400	400
WALKWAY	(4' WIDE)	200	220	240	260	280	300	320
PATIO	(10'x10')	100	100	100	100	100	100	100
TOTAL IMPERVIOUS		3300	3645	3990	4335	4680	5025	5370
		sq.ft/lot			sq.ft/lot	sq.ft/lot	sq.ft/lot	

ROADWAY	TYPE 1	TYPE 2	TYPE 3	TYPE 4	CUL 1
F-F WIDTH	28	51	51	28	
SIDEWALK	4	4	4	4	0
RADIUS					40
	36	59	59	36	5027
	sq.ft/ft	sq.ft/ft	sq.ft/ft	sq.ft/ft	sq.ft

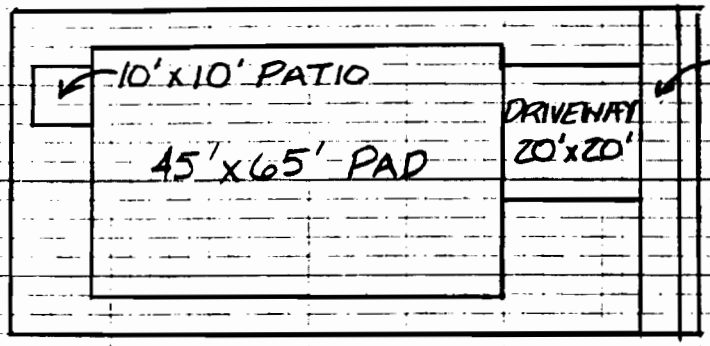
BASIN ID	AREA TYPE D AC	PERCENT TYPE D	TOTAL NUMBER OF 50' LOTS PER BASIN	55'	60'	65'	70'	75'	80'	TOTAL LENGTH OF TYPE 1 ROADWAY PER BASIN	TYPE 2	TYPE 3	TYPE 4	NUMBER OF CUL-DE-SACS PER BASIN
A1	1.97	59.5	0	0	9	5	0	0	0	602	103	0	0	0.125
A2	0.90	47.2	0	0	5	2	0	0	0	263	0	0	0	0.25
A3	2.00	65.3	0	0	10	3	0	0	0	917	0	0	0	0.25
A4	1.50	49.8	0	0	7	4	0	0	0	418	0	0	0	1
B1	0.90	51.3	0	0	1	6	0	0	0	233	0	0	0	0.125
B2	0.77	60.2	0	0	4	1	0	0	0	356	0	0	0	0.125
B3	0.88	63.0	0	0	3	3	0	0	0	375	0	0	0	0
B4	1.92	55.2	0	0	8	6	0	0	0	516	103	0	0	0.25
B5	1.49	51.5	0	0	8	4	0	0	0	435	0	0	0	0
B6	1.87	52.8	0	0	9	6	0	0	0	546	0	0	0	0
B7	1.59	56.9	0	0	5	8	0	0	0	411	0	0	0	0
B8	1.24	52.6	0	0	4	5	0	0	0	415	0	0	0	0.25
B9	1.15	56.2	0	0	3	5	0	0	0	416	0	0	0	0.25
B10	0.89	55.8	0	0	5	2	0	0	0	276	0	0	0	0
B11	1.07	67.5	0	0	0	6	0	0	0	575	0	0	0	0
B12	1.66	44.2	0	0	5	8	0	0	0	357	0	0	0	1
B13	1.49	52.1	0	0	8	4	0	0	0	294	0	0	0	1
B14	1.22	51.7	0	0	8	2	0	0	0	214	0	0	0	1

50' LOT



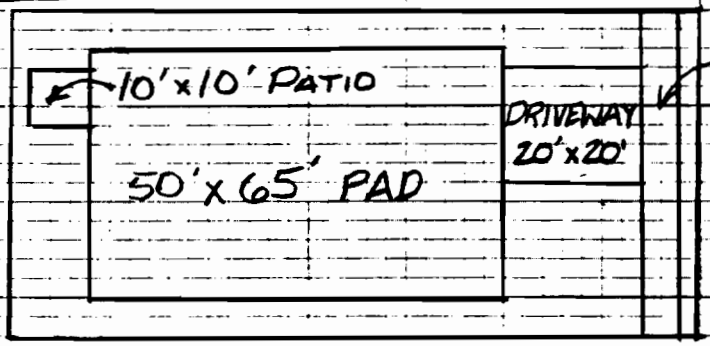
50' LOT TOTAL IMPERVIOUS AREA = 3300 ☐

55' LOT



55' LOT TOTAL IMPERVIOUS AREA = 3645 ☐

60' LOT



60' LOT TOTAL IMPERVIOUS AREA = 3990 ☐

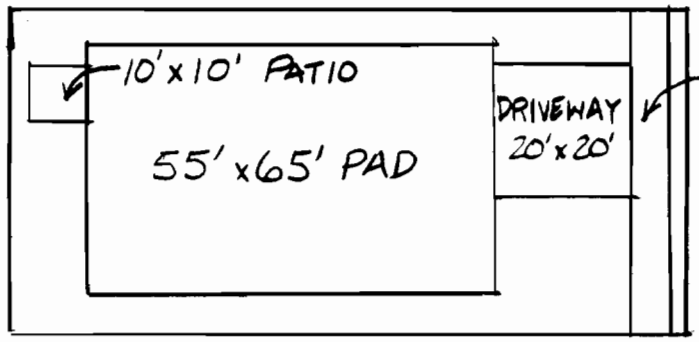
BOHANNAN-HUSTON INC.

PROJECT NAME TRACTS A & D SHEET 1 OF 2

PROJECT NO. 93217.40 BY PB DATE

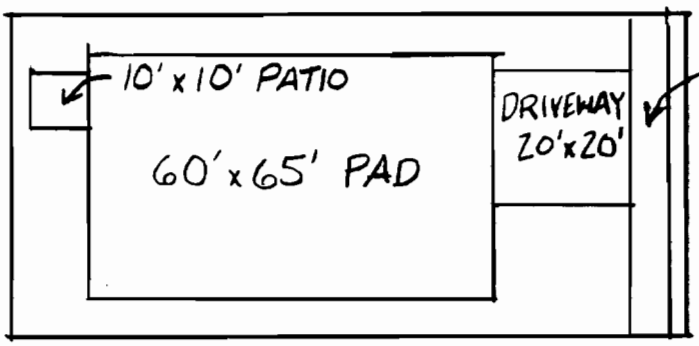
SUBJECT HYDROLOGY CH'D DATE

65' LOT



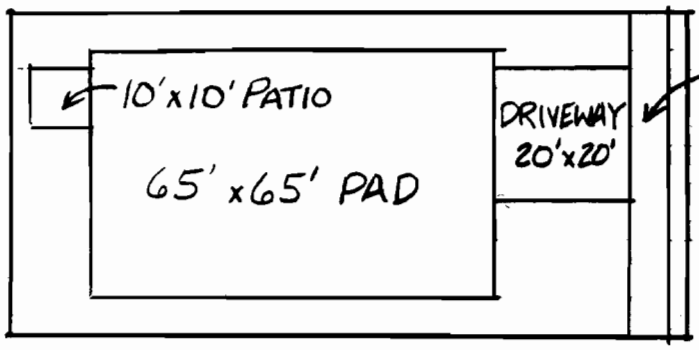
65' LOT TOTAL IMPERVIOUS AREA = 4335 ☐

70' LOT



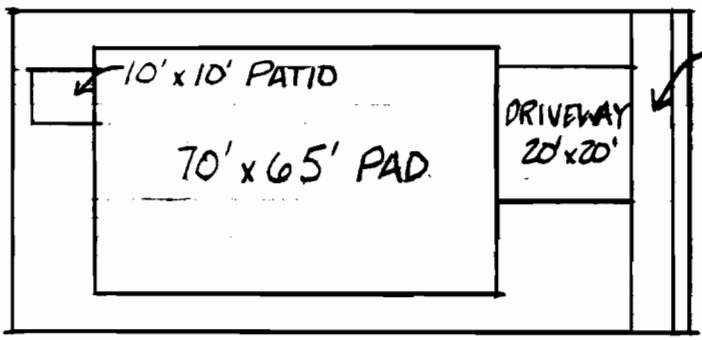
70' LOT TOTAL IMPERVIOUS AREA = 4680 ☐

75' LOT



75' LOT TOTAL IMPERVIOUS AREA = 5025 ☐

80' LOT



80' LOT TOTAL IMPERVIOUS AREA = 5370 ☐

BOHANNAN-HUSTON INC.

PROJECT NAME _____ SHEET _____ OF _____

PROJECT NO. _____ BY _____ DATE _____

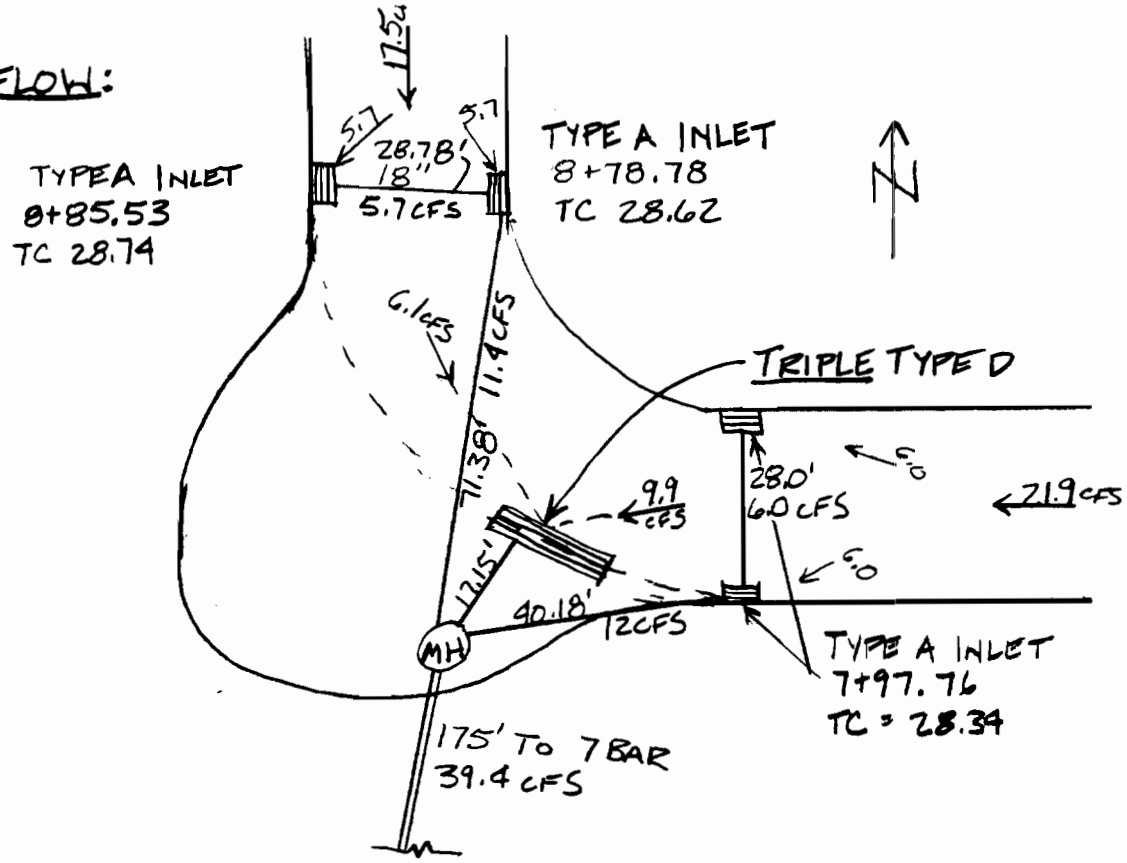
SUBJECT _____ CH'D _____ DATE _____

STREET CAPACITY ANALYSIS
SUMMARY TABLE
SEVEN BAR NORTH
UNITS 4, 5 AND 6

ANALYSIS POINT	SLOPE, %	TYPE OF CURB	Q-100YR (CFS)	DEPTH (FT)	V-100YR (FPS)	E-100YR (FT)	E<0.87'? <.51 ROLL	NOTES
A	2.50	STD	17.5	0.38	4.0	0.63	YES	USE STD
B	2.50	ROLL	11.2	0.28	3.4	0.46	YES	USE ROLL
C	6.21	STD	10.1	0.24	4.8	0.60	YES	USE STD TO CULDESAC
D	3.00	STD	21.9	0.39	4.5	0.70	YES	USE STD
2	1.35	STD	32.0	0.50	4.2	0.77	YES	USE STD
3	1.35	STD	26.1	0.47	3.8	0.69	YES	USE STD
4	1.00	STD	19.2	0.44	3.1	0.59	YES	USE STD
5	3.82	STD	26.9	0.40	5.3	0.84	YES	USE STD
6	1.00	ROLL	9.8	0.31	2.4	0.40	YES	USE ROLL
7	5.25	STD	7.2	0.26	4.1	0.52	YES	USE STD
7A	5.25	STD	20.8	0.36	5.4	0.81	YES	USE STD
8	1.00	ROLL	13.5	0.35 >.33	2.7	0.46	YES	USE ROLL
9	4.57	ROLL	8.0	0.23	4.0	0.48	YES	USE ROLL
10	4.57	STD	22.3	0.38	5.4	0.83	YES	USE STD
11	4.57	STD	12.5	0.32	4.6	0.65	YES	USE STD
12	3.25	STD	27.9	0.42	5.2	0.84	YES	USE STD
13	4.00	STD	12.3	0.32	4.3	0.61	YES	USE STD, TRANS 100'
14	4.00	ROLL	9.7	0.25	4.0	0.50	YES	USE ROLL

SUMMARY:Use roll curb only in Basins A3, B7, B10, B13, B14 and a portion of Basins A4 and B12.

UNIT 4 OUTFLOW:



CATCH BASINS:

TYPE A WEST:

$Q = 17.5$ CFS
$S = 2.50\%$
NORMAL $D = 0.38'$
VELOCITY = 4.0 FPS

CAPACITY OF SINGLE TYPE A = 5.7 CFS
(FROM COA NOMOGRAPH)

TYPE A EAST:

$Q = 21.9$ CFS
$S = 3.00\%$
NORMAL $D = 0.39'$
VELOCITY = 4.5 FPS

CAPACITY OF SINGLE TYPE A
= 6.0 CFS

FLOW REMAINING = $[17.5 - 2(5.7)] + [21.9 - 2(6.0)] = 16.0$ CFS

→ USING TYPE D IN SUMP, NO OVERFLOW PROVIDED, DESIGN FOR 200%:

$Q_{DES} = 2(Q_{100}) = 2(16) = 32.0$ CFS

ORIFICE EQN: TRIPLE GRATE

$Q = 0.6 A_{NET} \sqrt{2gh}$; $h = 0.83'$

$A_{NET} = 3(31)(18.5)/144 = 11.9$ SF

$Q = 0.6(11.9)(2(32.2)(.83))^{1/2}$

$= 52.2$ CFS > 32.0 ✓

WEIR EQUATION: TRIPLE GRATE

$Q = 2.68 P_{NET} H^{1.5}$

$P_{NET} = \frac{2(18.5) + 6(31)}{12} = 18.6$ FT

$Q = 39.1$ CFS > 32.0 ✓

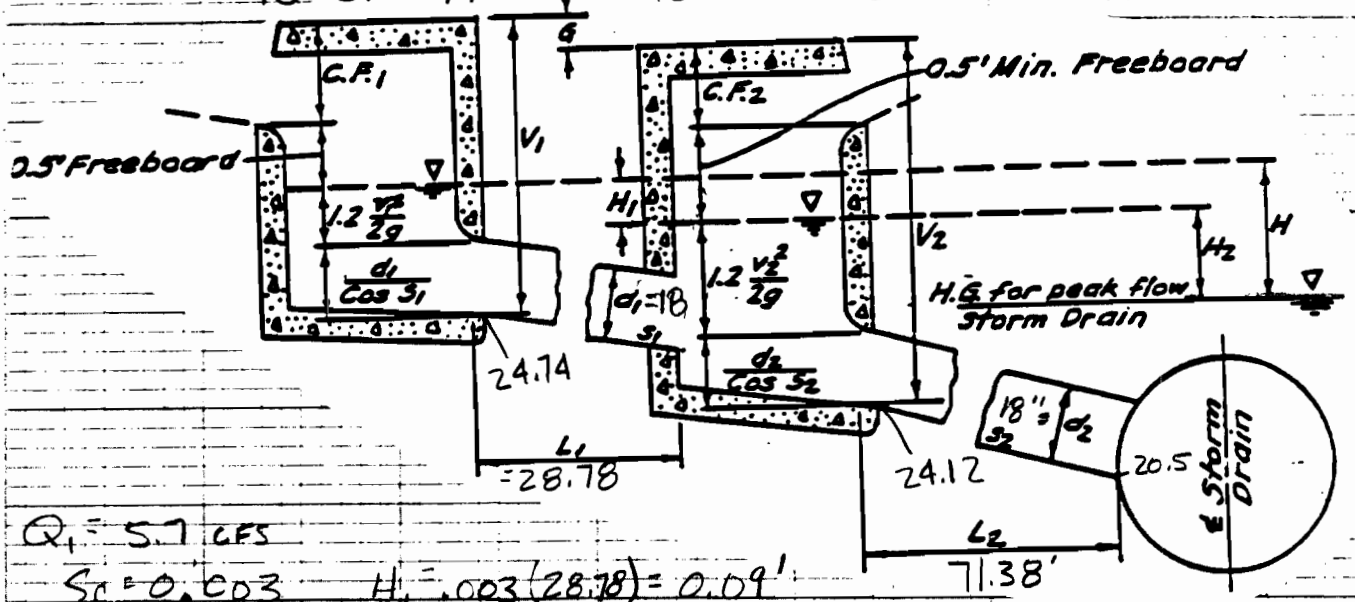
BOHANNAN-HUSTON INC.

PROJECT NAME SEVEN BAR N. 7-8-9 SHEET ____ OF ____
PROJECT NO. 93217.43 BY PR DATE 10/12/94
SUBJECT DRAINAGE CH'D ____ DATE ____

UNIT 4 CATCH BASINS (WEST LEG)

STA 8+85.53, 14'RT
TYPE "A"
TC = 5128.74

STA 8+78.78, 14'LT
TYPE "A"
TC = 5128.62



$Q_1 = 5.7$ CFS

$S_f = 0.003$ $\quad H_1 = .003(28.78) = 0.09'$

$V = 5.23$ FPS,

$\frac{1.2V^2}{2g} = 0.19'$

$V_{MIN} = 1.33 + .19 + 1.5 = 3.02$

USE 4' (MINIMUM)

$Q_2 = 11.4$ CFS

$V_2 = 6.45$ $\quad S_f = 0.0118$

$\frac{1.2V^2}{2g} = 0.78'$

$V_2 = 1.33 + 0.09 + 0.78 + 1.5 = 0.12$
$= 3.58$

USE 4.5 (ALLOW SOME SLOPE ON PIPE 1)

CHECK HEAD LOSSES TO SEVEN BAR LOOP ROAD:

LOSSES: $H_{f1} = 0.09'$

$H_{f2} = S_f L = .0118(71.38) = 0.84'$

$$H_j = \frac{39.4(803) - 11.4(6.45) - 28(\cos 45) + 8\left(\frac{.051+.022}{2}\right)\left(\frac{1.77+4.91}{2}\right)}{32.2} + h_{v_1} - \frac{1}{2}(1.77+4.91)$$

(6.93, .98, 3.34)

$= 2.37' + 0.65 - 1.00 = 2.02$

$H_{f3} = 0.0092(175) = 1.61$

BOHANNAN-HUSTON INC.

PROJECT NAME _____ SHEET _____ OF _____

PROJECT NO. _____ BY _____ DATE _____

SUBJECT _____ CH'D _____ DATE _____

HGL@ 7 BAR LOOP ROAD = 5120.6

$H_{AVAILABLE}$ = 28.74 - 1.33 - 20.6

= 6.81

$H_{f1} + H_{f2} + H_J + H_{f3}$ = 0.09 + 0.84 + 2.02 + 1.61 = 4.56 < 6.81 OK.

BOHANNAN-HUSTON INC.

PROJECT NAME _____ SHEET _____ OF _____

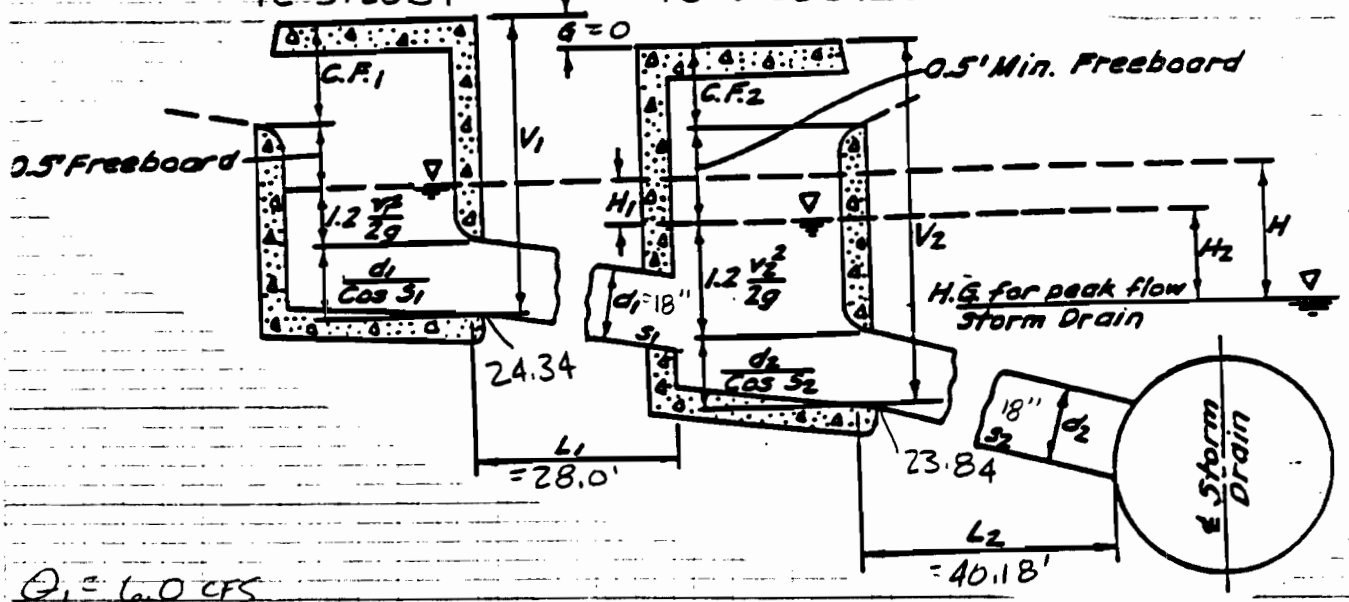
PROJECT NO. _____ BY _____ DATE _____

SUBJECT _____ CH'D _____ DATE _____

UNIT 4 CATCH BASINS (EAST LEG)

STA 7+97.76, 14' RT
TYPE A
TC 5128.34

STA 7+97.76, 14' LT
TYPE A
TC 5128.34



$Q_1 = 6.0$ CFS

$S_f = 0.0033$ $H_f = .0033(28) = 0.09'$

$V = 3.4$ FPS $\frac{1.2V^2}{2g} = 0.21'$

$V_{1MIN} = 1.33 + 0.21 + 1.5 = 3.04'$

USE 4' (MIN.)

$Q_2 = 12.0$ CFS

$V_2 = 6.79$ FPS; $\frac{1.2V^2}{2g} = 0.86'$

$V_{2MIN} = 1.33 + .09 + .86 + 1.5 - 0$

$= 3.78$

USE 4.5' (PROVIDE SLOPE ON CONNECTOR PIPE)

CHECK HEAD LOSSES TO SEVEN BAR LOOP ROAD:

LOSSES: $H_{f1} = 0.09$

$H_{f2} = S_f L = 0.013(40.18) = 0.52'$ 4.49 14

$$H_j = \frac{39.4(8.03) - 12(6.79) - 27.4(\cos 45^\circ) + 8\left(\frac{.083+.022}{2}\right)\left(\frac{1.77+4.91}{2}\right)}{\frac{32.2}{2}(1.77+4.91)} \text{ thru}$$

$= 2.42' + 0.72 - 1.00 = 2.14$

$H_{f3} = 1.61$

HGL @ 7 BAR LOOP ROAD = 5120.6

H AVAILABLE = 28.34 − 1.33 − 20.6 = 6.41

$H_{f1} + H_{f2} + H_j + H_{f3} = 4.36 < 6.41$ OK

BOHANNAN-HUSTON INC.

PROJECT NAME _____ SHEET _____ OF _____

PROJECT NO. _____ BY _____ DATE _____

SUBJECT _____ CH'D _____ DATE _____

CATCH BASIN CALCULATION SHEET

Sht___ of___

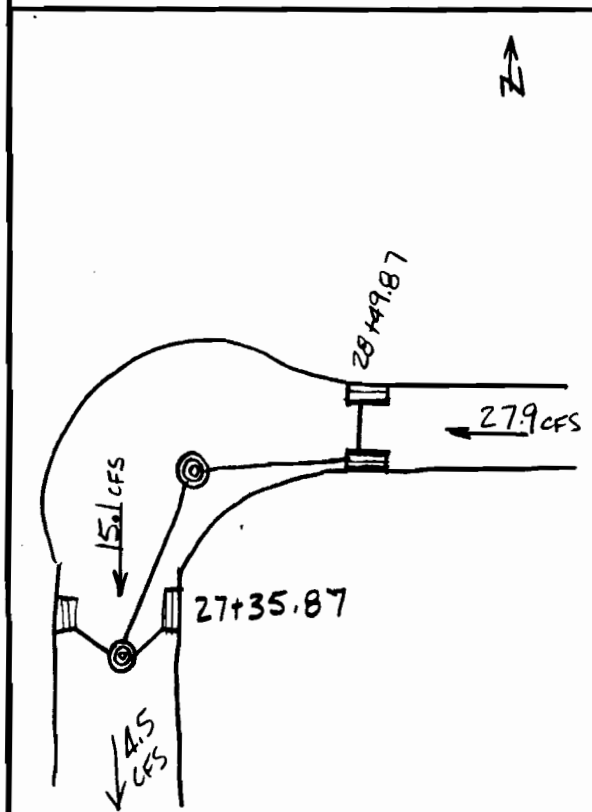
PROJECT _____ CALCULATED BY _____

DESIGN FREQUENCY _____ DATE _____

4-82

80

PLATE 22.3 D-10

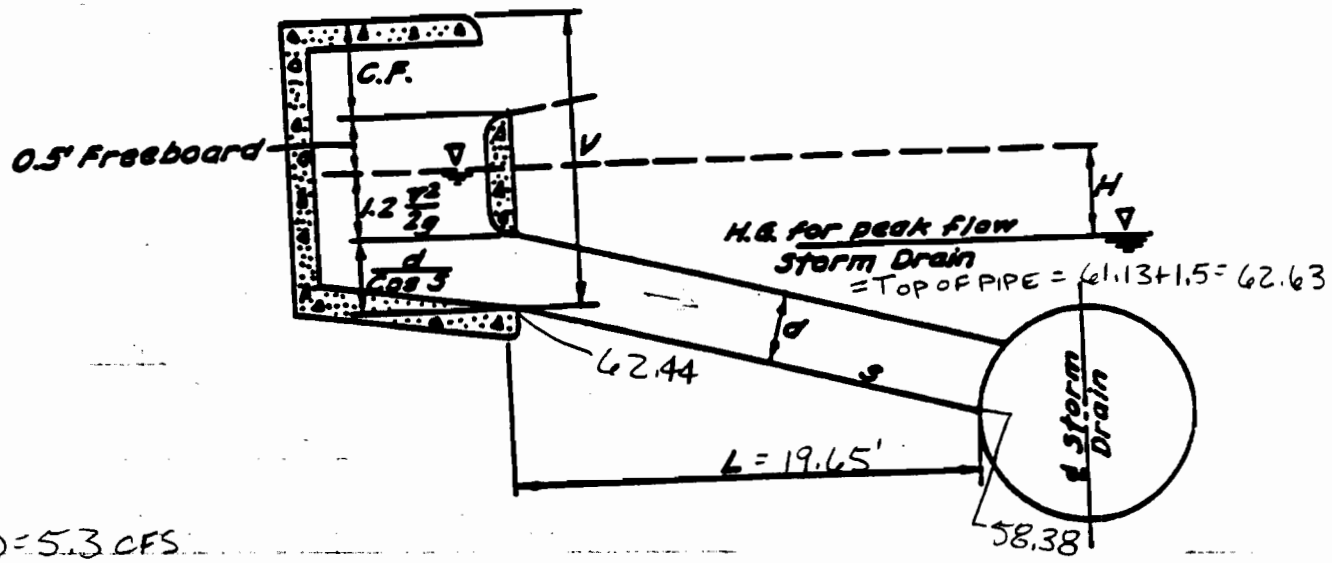


FLOW DIAGRAM (Indicate street slopes)	Sym.	Drain. Area	Q Total	Q Inter.	Cap. of ½ Street	Gutter "d"	C.B. No.	C.B. Size	Connector Pipe Head	Connector Pipe L	Connector Pipe Dia.	V Depth
	28+49.87		27.9	2x6.4 12.8		0.41	2	"A"				
	27+35.87		15.1	2x5.3 10.6		0.34	2	"C"				
			4.5									

22.3

CATCH BASINS - UNITS 5 | 6

STA 27+35.87, 14' RT & LT
SINGLE TYPE C
TC 66.44



$Q = 5.3$ CFS

$V_{EL} = 3.0$ FPS

$\frac{1.2 V_{EL}^2}{2g} = 0.17'$

$V_{MIN} = 1.33 + 0.17 + 1.5 = 3.00$

Use 4' (MIN)

BOHANNAN-HUSTON INC.

PROJECT NAME _____ SHEET _____ OF _____

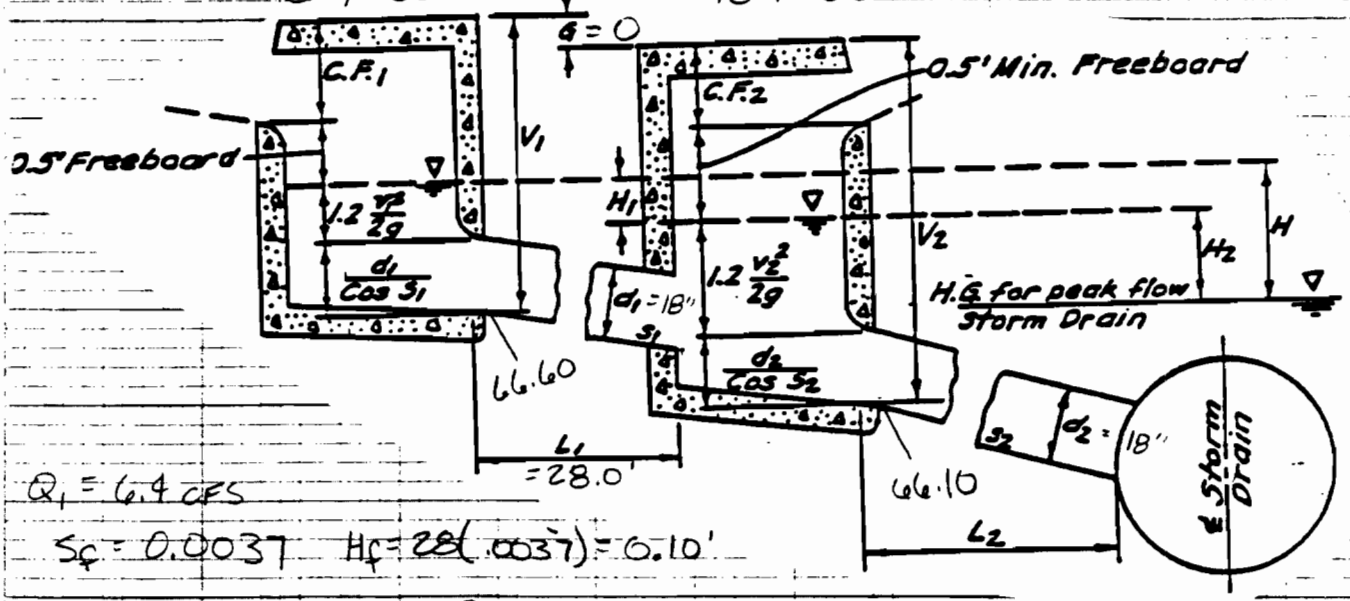
PROJECT NO. _____ BY _____ DATE _____

SUBJECT _____ CH'D _____ DATE _____

CATCH BASINS

STA 28+49.87, 14' LT — SINGLE TYPE "A" — TC 70.60

14' RT — SINGLE TYPE A — TC 70.60



$Q_1 = 6.4$ CFS

$S_f = 0.0037$ $H_f = 28(.0037) = 0.10'$

$V_{EL} = 3.62$ FPS $\frac{1.2 V_{EL}^2}{2g} = 0.24'$

$V_{1\,MIN} = 1.33 + 0.24 + 1.5 = 3.07'$

USE 4' (MIN)

$Q_2 = 12.8$ CFS

$V_{EL\,2} = 7.24$

$1.2 V_{EL}^2 / 2g = 0.81'$

$S_f = 0.015$

$V_{2\,MIN} = 1.33 + 0.10 + 0.81 + 1.5 - 0$

$= 3.74'$

USE 4.5'

$FB_2 = 4.5 - 1.5 - .81 = .83 = 1.6 > .5$ ✓

BOHANNAN-HUSTON INC.

PROJECT NAME _____ SHEET _____ OF _____

PROJECT NO. _____ BY _____ DATE _____

SUBJECT _____ CH'D _____ DATE _____

CATCH BASIN CALCULATION SHEET

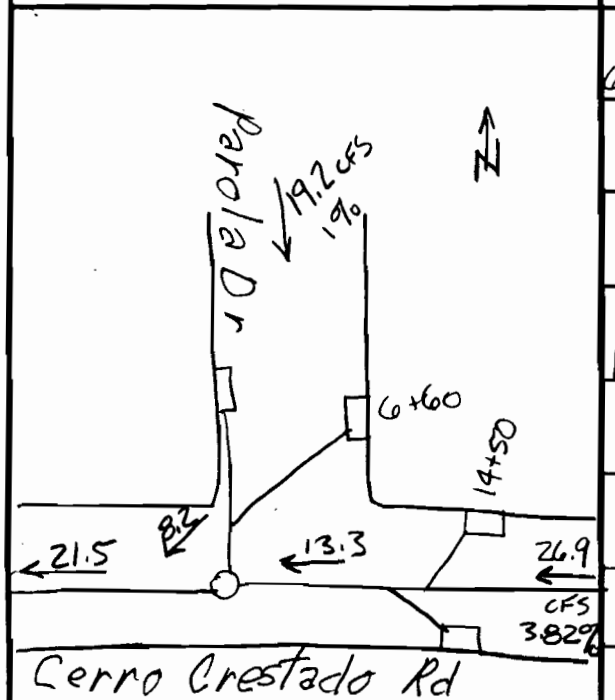
Sht.___ of___

PROJECT _____ CALCULATED BY _____

DESIGN FREQUENCY _____ DATE _____

4-82

80



Sym.	Drain. Area	Q Total	Q Inter.	Cap. of ½ Street	Gutter "d"	C.B. No.	C.B. Size	Connector Pipe Head	Connector Pipe L	Connector Pipe Dia.	V Depth
6+60		19.2	5.5 x 2 = 11		0.44	2	"A"				
		8.2									
14+50		26.9	2 x 6.8 = 13.6		0.40						
		13.3									

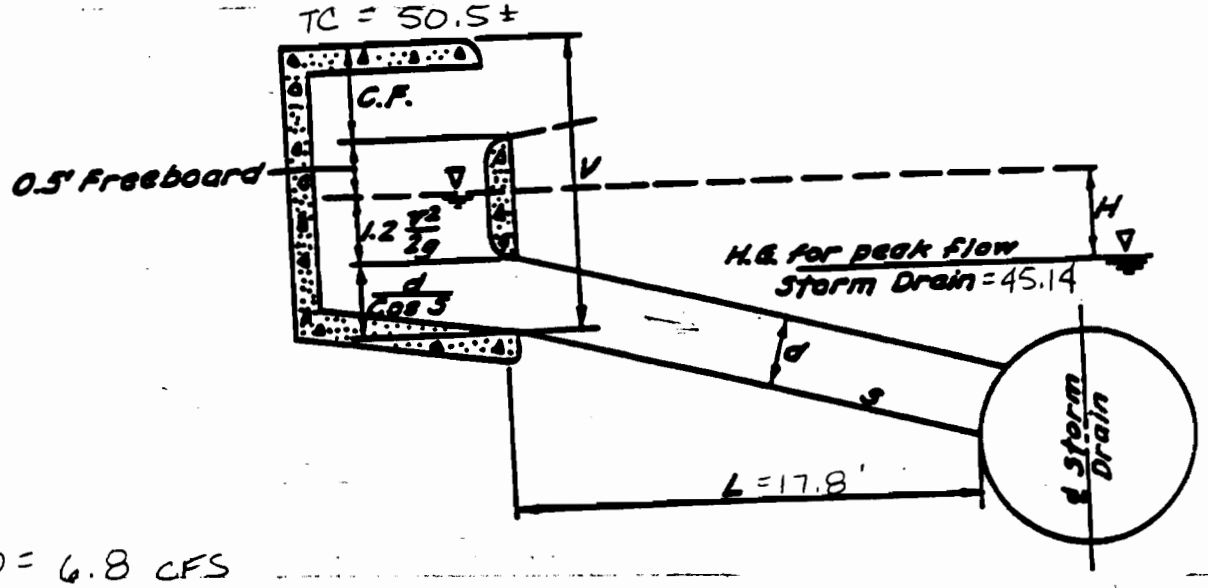
PLATE 22.3 D-10

22.3

STA 14+56, 14' RT, LT

SINGLE TYPE "A"

TC = 50.5 ±



$Q = 6.8$ CFS

$V_{EL} = 3.85$ FPS

$\frac{1.2\ V_{EL}^2}{2g} = 0.28'$

$V_{MIN} = 1.33 + 0.28 + 1.5 = 3.11'$

USE 4' (MIN)

$S_f = 0.0042$

$HGL + H = 45.14 + .0042(17.8) < 50.5 - 1.33$

$45.21 < 49.17$

BOHANNAN-HUSTON INC.

PROJECT NAME _____ SHEET _____ OF _____

PROJECT NO. _____ BY _____ DATE _____

SUBJECT _____ CH'D _____ DATE _____

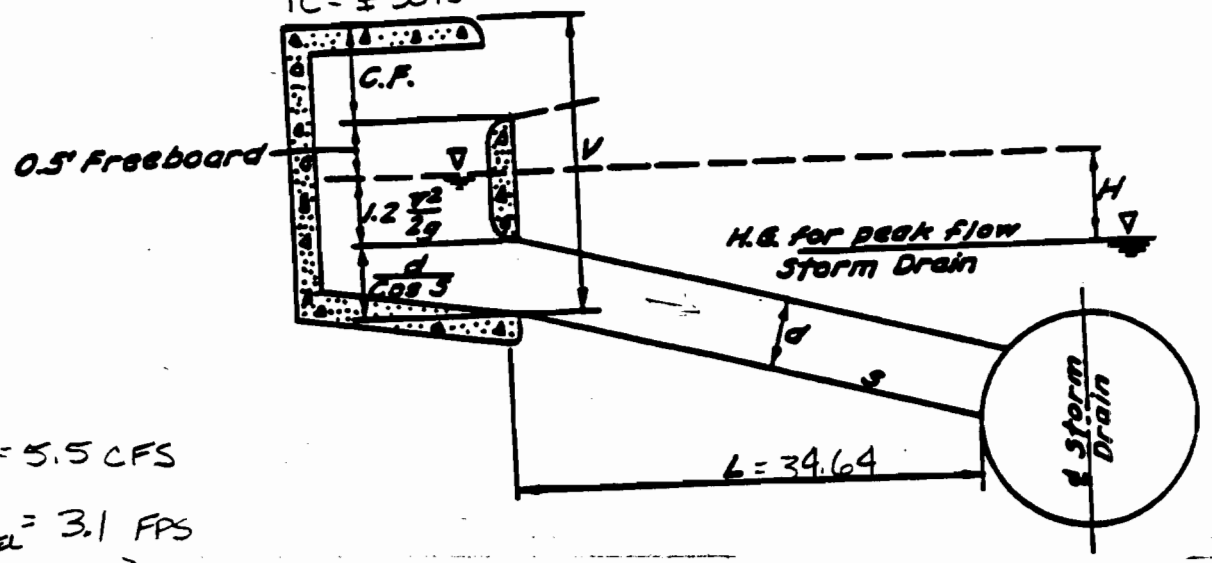
CATCH BASINS - UNIT 5/6

(CONNECTING FROM SIDE STREET TO MH # SD4 - FROM BASINS B9 & B6)

STA 6+61.60

SINGLE TYPE A

TC = ± 50.5



$Q = 5.5$ CFS

$V_{EL} = 3.1$ FPS

$\frac{1.2\ V_{EL}^2}{2g} = 0.18'$

$V_{MIN} = 1.33 + 0.18 + 1.5 = 3.01'$

USE 4' (MIN)

BOHANNAN-HUSTON INC.

PROJECT NAME _____ SHEET _____ OF _____

PROJECT NO. _____ BY _____ DATE _____

SUBJECT _____ CH'D _____ DATE _____

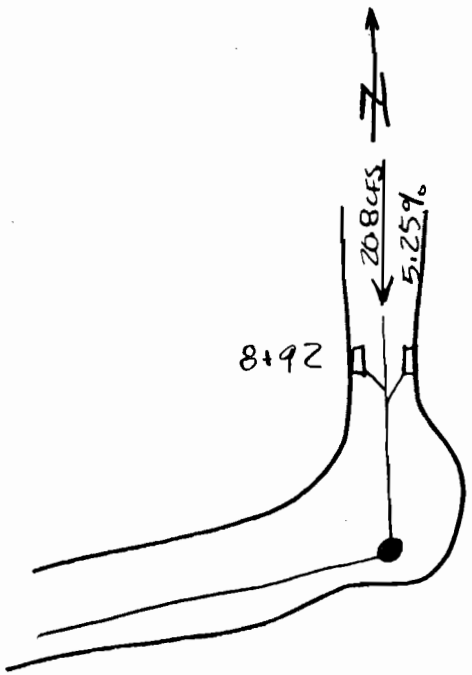
CATCH BASIN CALCULATION SHEET

Sht___ of___

PROJECT _____ CALCULATED BY _____

DESIGN FREQUENCY _____ DATE _____

4-82



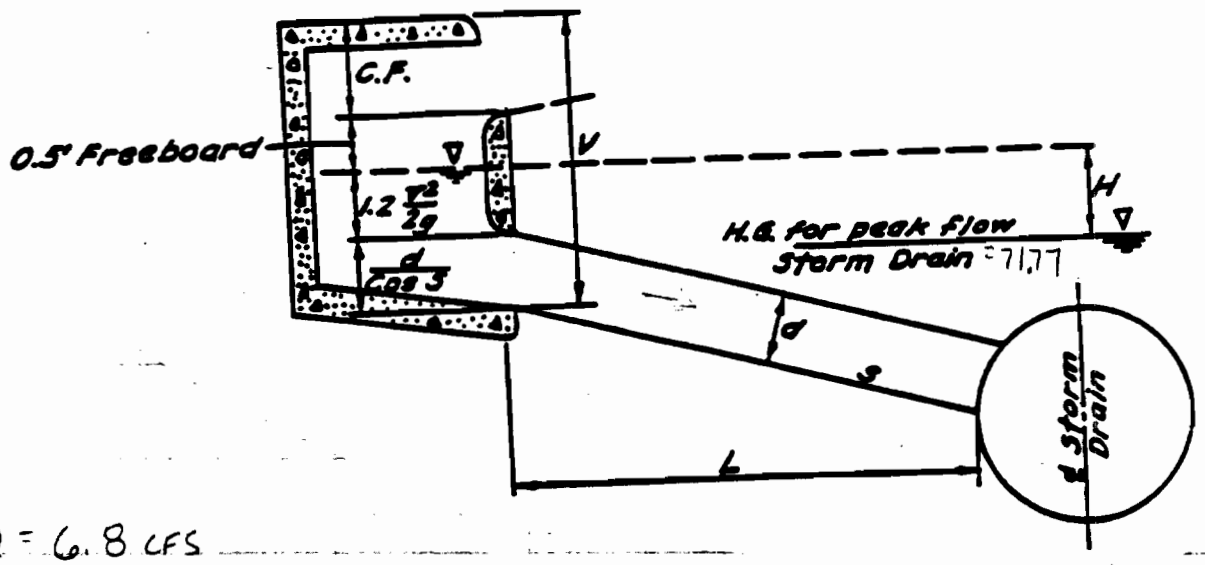
FLOW DIAGRAM (Indicate street slopes)	Sym.	Drain. Area	Q Total	Q Inter.	Cap. of ½ Street	Gutter "d"	C.B. No.	C.B. Size	Connector Pipe Head	Connector Pipe L	Connector Pipe Dia.	V Depth
				2x6.8								
	8+85		20.8	13.6		.36	2	"A"				

80

PLATE 22.3 D-10

22.3

STA 8+92
TC ± 75.7
TYPE "A"



$Q = 6.8$ CFS

$S_f = 0.0042$

$V_{EL} = 3.85$ FPS

$1.2 V_{EL}^2/2g = 0.28'$

$V_{MIN} = 1.33 + 0.28 + 1.5 = 3.11$

Use 4' (MIN)

HGL + H =

$71.77 + 17.9(.0042) < 75.7 - 1.33$

$71.69 < 74.37$

BOHANNAN-HUSTON INC.

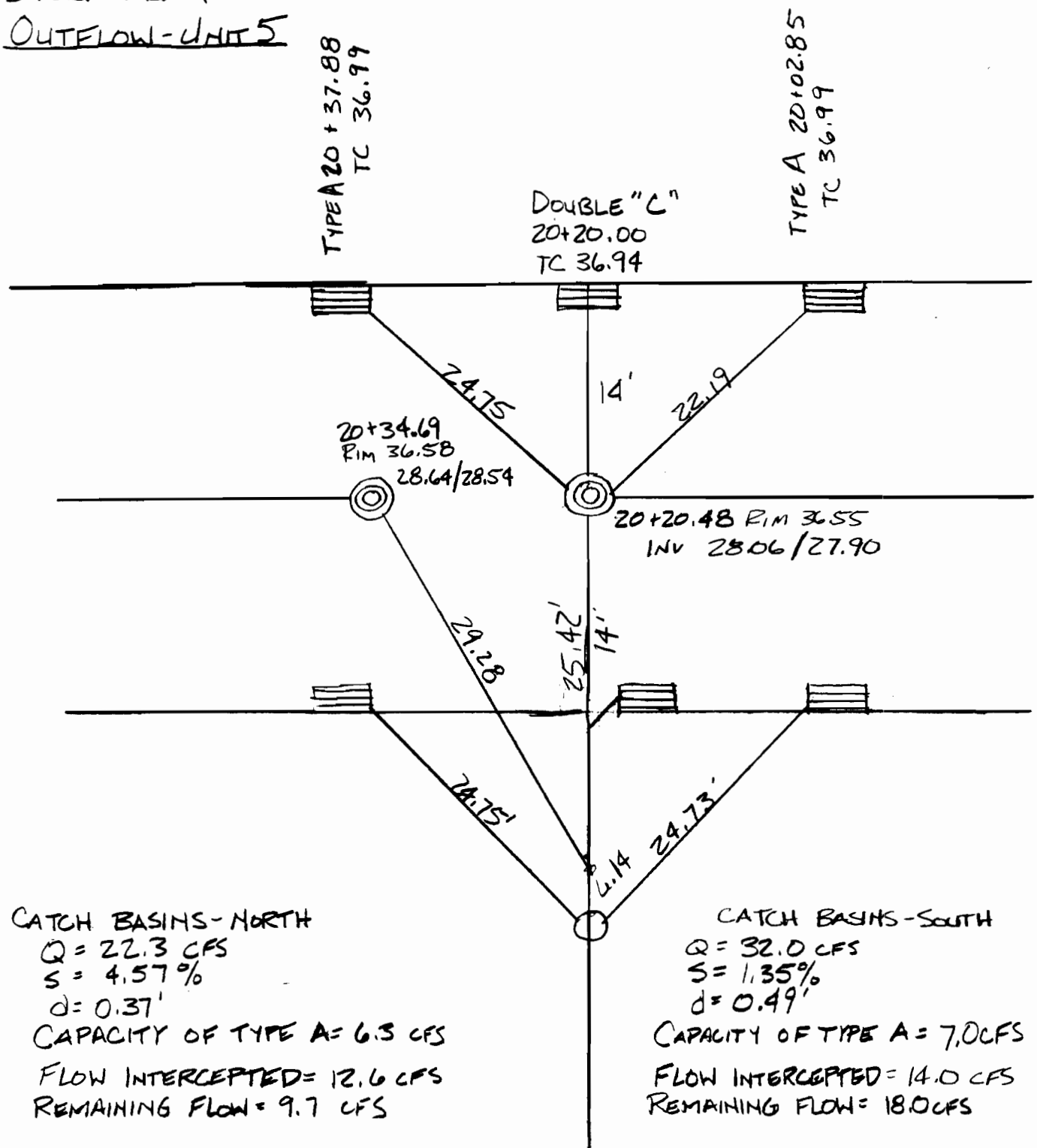
PROJECT NAME _____ SHEET _____ OF _____

PROJECT NO. _____ BY _____ DATE _____

SUBJECT _____ CH'D _____ DATE _____

STORM DRAIN

OUTFLOW - UNIT 5



CATCH BASINS - NORTH
- Q = 22.3 CFS
- S = 4.57%
- d = 0.37'
- CAPACITY OF TYPE A = 6.3 CFS
- FLOW INTERCEPTED = 12.6 CFS
- REMAINING FLOW = 9.7 CFS

CATCH BASINS - SOUTH
- Q = 32.0 CFS
- S = 1.35%
- d = 0.49'
- CAPACITY OF TYPE A = 7.0 CFS
- FLOW INTERCEPTED = 14.0 CFS
- REMAINING FLOW = 18.0 CFS

TOTAL REMAINING FLOW = 9.7 + 18.0 = 27.7 CFS

BOHANNAN-HUSTON INC.

PROJECT NAME _____ SHEET _____ OF _____

PROJECT NO _____ BY _____ DATE _____

SUBJECT _____ CH'D _____ DATE _____

USE TYPE "DOUBLE C" IN SUMP @ LOW POINT: WILL OVERFLOW TO OTHER INLETS

$Q_{DES} = Q_{100} = 27.7 CFS$

ORIFICE EQ'N

$Q = 0.6 A_{NET} \sqrt{2gh}$; $h = 0.83$

$A_{NET} = 2(31)(18.5)(1/144) = 7.97 SF$

$Q = 0.6(7.97)\sqrt{2(32.2)(.85)} = 35.38$

USING 2-DOUBLE C'S, $Q = 2(35.38) = 70.8 > 27.7$ OK

WEIR EQ'N

$Q = 2.68 P_{NET} H^{1.5}$ $\quad P_{NET} = \frac{2(18.5) + 2(31)}{12} = 8.25'$

$Q = 2.68(8.25)(.85)^{1.5} = 17.3$

USING 2- DOUBLE C'S, $Q = 2(17.3) = 34.6 > 27.7$ ✓

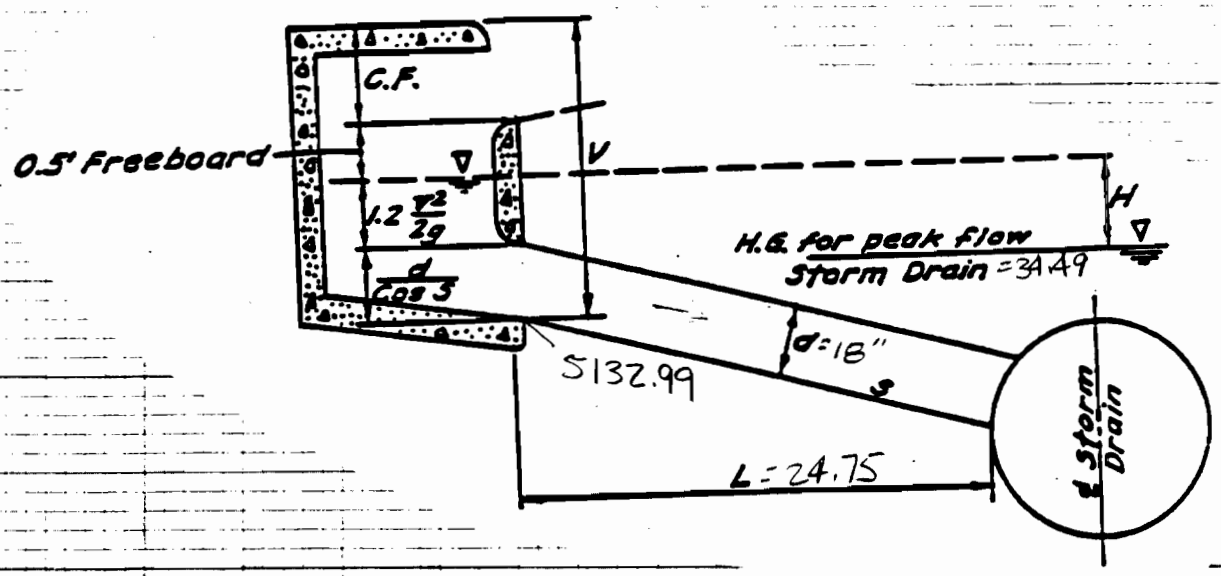
BOHANNAN-HUSTON INC.

PROJECT NAME _____ SHEET _____ OF _____

PROJECT NO. _____ BY _____ DATE _____

SUBJECT _____ CH'D _____ DATE _____

STA 20+37.88, 14' RT
TC 5136.99
TYPE "A"



$Q = 6.3$ CFS

$S_f = 0.0036$

$V = 3.57$ FPS

$\frac{1.2V^2}{2g} = 0.237'$

$V_{MIN} = 1.33 + 0.24 + 1.5 = 3.07'$

USE 4' (MIN)

$HGL + H = 34.49 + 0.0036(24.75) = 34.58 < 36.99 - 1.33 = 35.66$ ✓

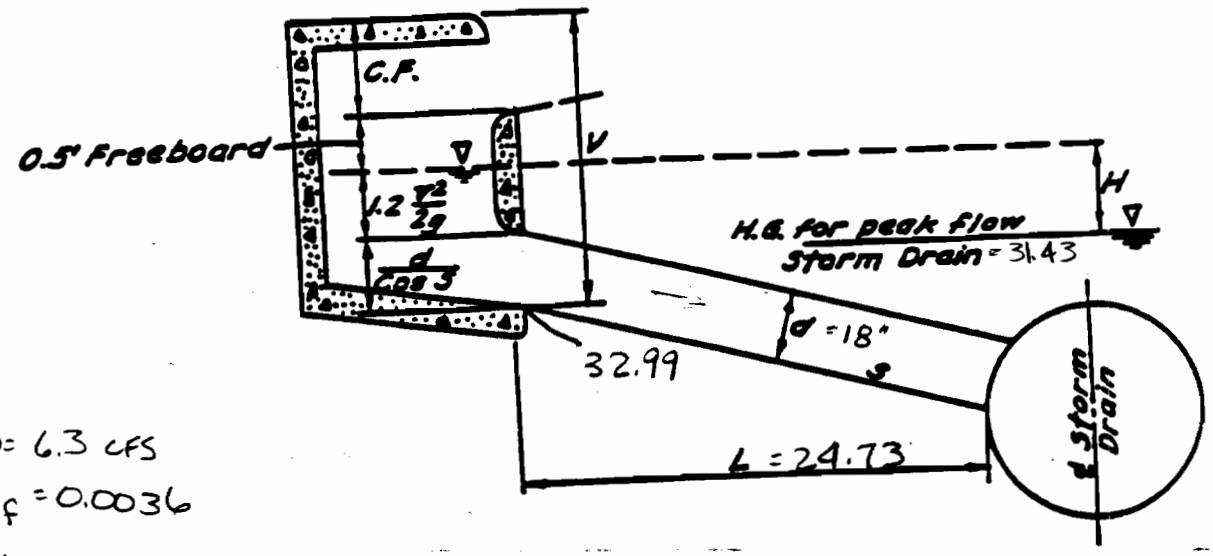
BOHANNAN-HUSTON INC.

PROJECT NAME _____ SHEET _____ OF _____

PROJECT NO. _____ BY _____ DATE _____

SUBJECT _____ CH'D _____ DATE _____

STA 20+37.88, 14' LT
TC 5136.99
TYPE "A"



$Q = 6.3$ CFS

$S_f = 0.0036$

$V_{EL} = 3.57$ FPS

$\frac{1.2V^2}{2g} = 0.24'$

$V_{MIN} = 1.33 + 0.24 + 1.5 = 3.07'$

USE 4' (MIN)

$HGL + H = 31.43 + 0.0036(24.73) = 31.52 < 36.99 - 1.33 = 35.66$

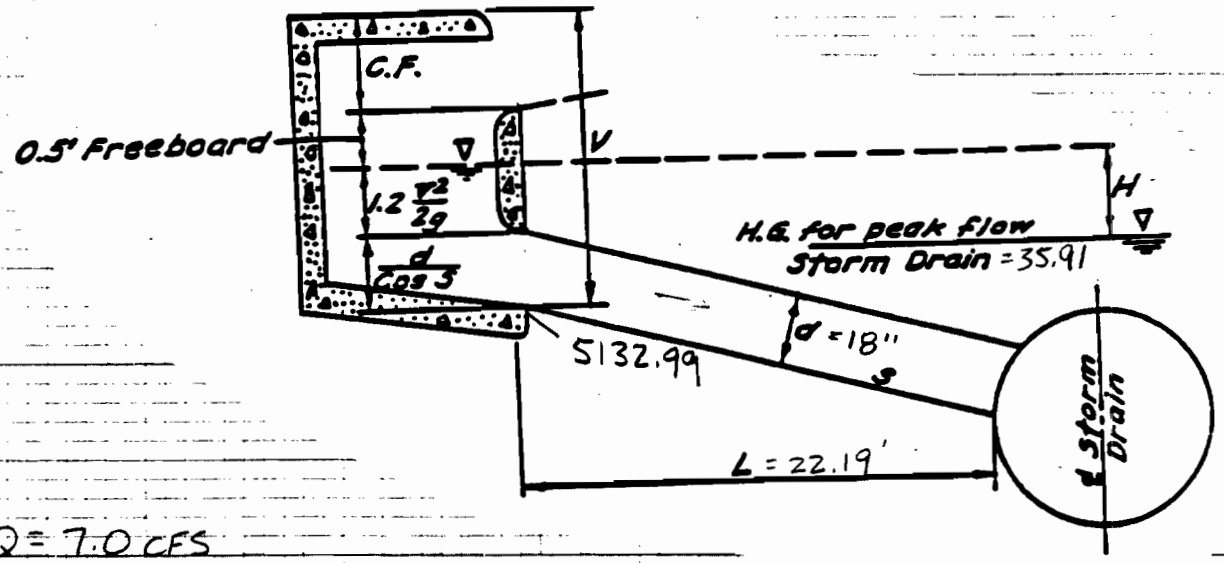
BOHANNAN-HUSTON INC.

PROJECT NAME _____ SHEET _____ OF _____

PROJECT NO. _____ BY _____ DATE _____

SUBJECT _____ CH'D _____ DATE _____

STA 20+02.85, 14' RT
TC 5136.99
TYPE A



$Q = 7.0$ CFS
$S_f = 0.0044$
VEL = 4.0 FPS

$\frac{1.2(VEL)^2}{2g} = 0.29'$

$V_{MIN} = 1.33 + 0.29 + 1.5 = 3.12'$
USE 4' (MIN)

HGL + H = 34.49 + 0.0044(22.19) = 34.59 < 36.99 - 1.33 = 35.66 ✓

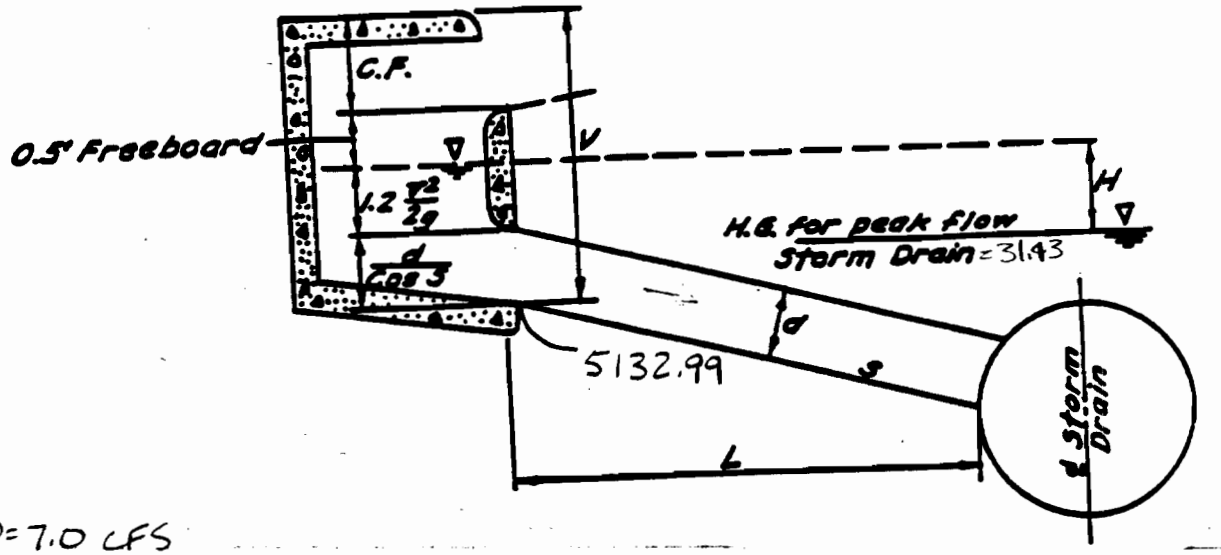
BOHANNAN-HUSTON INC.

PROJECT NAME _____ SHEET _____ OF _____
PROJECT NO. _____ BY _____ DATE _____
SUBJECT _____ CH'D _____ DATE _____

STA 20+02.85, 14' LT

TC 5136.99

TYPE "A"



$Q = 7.0$ CFS

$S_f = 0.0044$

VEL = 4.0 CFS

$\frac{1.2V^2}{2g} = 0.29'$

$V_{MIN} = 1.33 + 0.29 + 1.5 = 3.12$

USE 4' (MIN)

HGL + H = $5131.43 + 0.0044(24.73) = 31.53 < 36.99 - 1.33 = 35.66$ —

BOHANNAN-HUSTON INC.

PROJECT NAME _____ SHEET _____ OF _____

PROJECT NO. _____ BY _____ DATE _____

SUBJECT _____ CH'D _____ DATE _____

SWALE CALCULATIONS

SWALE ADJACENT TO SEVEN BAR LOOP TO CONVEY FLOWS FROM BASIN E-1:

AREA = 23.8 ACRE
%A = 100
t_c = 6.23 HRS
I = 4.44 IN/HR E = 0.44"

Q_{100} = 28.5 CFS

4.85

V = 0.87 AC-FT

① CONVEY FLOWS IN AN EARTHEN SWALE ADJACENT TO SEVEN BAR LOOP ROAD.

MANNINGS "n" = 0.030
MAX SLOPE = 4.85%

TO KEEP VELOCITY IN SWALE < 8 FPS, USE A V-DITCH WITH SIDE SLOPES = 3:1. MAX DEPTH = 1.05', USE 2' DEPTH.

S = 4.85%, VEL = 6.9 FPS, d = 1.05'
4.66 VEL = 7.0 FPS, d = 1.10
1.50 VEL = 4.5 FPS, d = 1.35'

PROVIDE A LINED HEIGHT OF 2.5', GIVING A FREEBOARD > 1' IN ALL LOCATIONS.

② CHECK POND SIZE:

TOTAL FLOW INTO POND = 28.5 + 36.0 + 23.9 = 88.4 CFS
V_{100} = (23.8 + 29.9 + 19.0)(.44)/12 = 2.67 ac-ft. = 116,300 CF

2A- POND SIZE BASED ON SETTLING VELOCITY: (V_s)

ASSUME - DESIGN PARTICLE: VERY FINE SAND (D = 0.06 mm)
- 100% REMOVAL FOR 10 YR STORM
- V_s = 0.009 FPS FOR VERY FINE SAND

P_{60-10} = 1.87 x 0.667 = 1.25"

$$I = 0.726\left(\log((24.6)(.23))\frac{1}{.23}\right)(1.25) = 2.97 \text{ IN/HR}$$

C = .08
A = 23.8 + 29.9 + 19.0 = 72.7 ACRE
Q = CIA = 0.08 (2.97) (72.7) = 17.3 CFS

BOHANNAN-HUSTON INC.

PROJECT NAME _____ SHEET _____ OF _____
PROJECT NO _____ BY _____ DATE
SUBJECT _____ CH'D _____ DATE

SURFACE AREA = SA = $1.2(Q_{10}) / V_S$

$SA = 1.2(17.3) / .009 = 2307$ SF

KEEP LENGTH = 77' $W = \frac{2307}{77} = 30'$

POND IS NOW 77 x 26
INCREASE TO 77' x 30'

2B FROM USLE SPREADSHEET (ATTACHED), THE AVERAGE ANNUAL SEDIMENT YIELD IS 371 CY = 10016 FT3

ASSUME; MAXIMUM SEDIMENT STORAGE DEPTH = 3'
MINIMUM SETTLING DEPTH = 2'

USING SA = 2307 (FROM 2A) (Z = POND DEPTH)

BOTTOM AREA = (77)(30) = 2310 FT^2

TOP AREA = $2310 + 642z + 36z^2$

$$\text{VOLUME} = \frac{(\text{BOTTOM AREA}) + (\text{TOP AREA})}{2} z$$

$$= 2310z + 321z^2 + 18z^3$$

$V = 10016 \text{ FT}^3 = 2310z + 321z^2 + 18z^3$

$z = 2.94' < 3'$

SEDIMENT STORAGE DEPTH = 2.94'

POND VOLUMETRICS

POND DEPTH = 5'
POND VOLUME = 21,825 FT^3 = 0.501 AC-FT
VOLUME IN = 116,300 CF = 2.67 AC-FT
$Q_{IN} = 88.4$ CFS

$$V_{PONDED} = \left(\frac{V_{TOTAL}}{Q_{IN}^2}\right) Q_{OUT}^2 - (\text{DURATION}) Q_{OUT} + V_{TOTAL}$$

$$\text{DURATION} = \frac{2 V_{TOTAL}}{Q_{IN}} = \frac{2(116,300)}{88.4} = 2631 \text{ SEC}$$

$$21,825 \text{ FT}^3 = \left(\frac{116,300}{88.4^2}\right) Q_{OUT}^2 - (2631) Q_{OUT} + 116,300$$

BOHANNAN-HUSTON INC.

PROJECT NAME _____ SHEET _____ OF _____
PROJECT NO _____ BY _____ DATE _____
SUBJECT _____ CH'D _____ DATE _____

$$14.88 Q_{OUT}^2 - 26.31 Q_{OUT} + 94.475 = 0$$

$Q_{OUT} = 50.1$ CFS TO MAINTAIN VOLUMETRICS

ORIFICE CONTROL:

HEAD = 5' - SEDIMENT STORAGE DEPTH:

$$A = \frac{Q}{.6\sqrt{2gh}} = \frac{50.1}{.6\sqrt{2(32.2)(2.06)}} = 7.25 \text{ FT}^2 = \frac{\pi D^2}{4}$$

$D = 3.04'$

USE EXISTING 36" CMP STANDPIPE, REMOVE ORIFICE PLATE.

CONNECTOR PIPE SLOPE = 2.56% ✓
36" RCP, 97', Q = 50.1 CFS

SUMMARY: ① BUILD 2.5' DEEP LINED DITCH ON THE EAST SIDE OF 7BAR LOOP ROAD, 3:1 SIDES

② "WIDEN" POND #0 30' x 77' FROM 26' x 77'.

③ REMOVE ORIFICE PLATE ON POND OUTFLOW.

BOHANNAN-HUSTON INC.

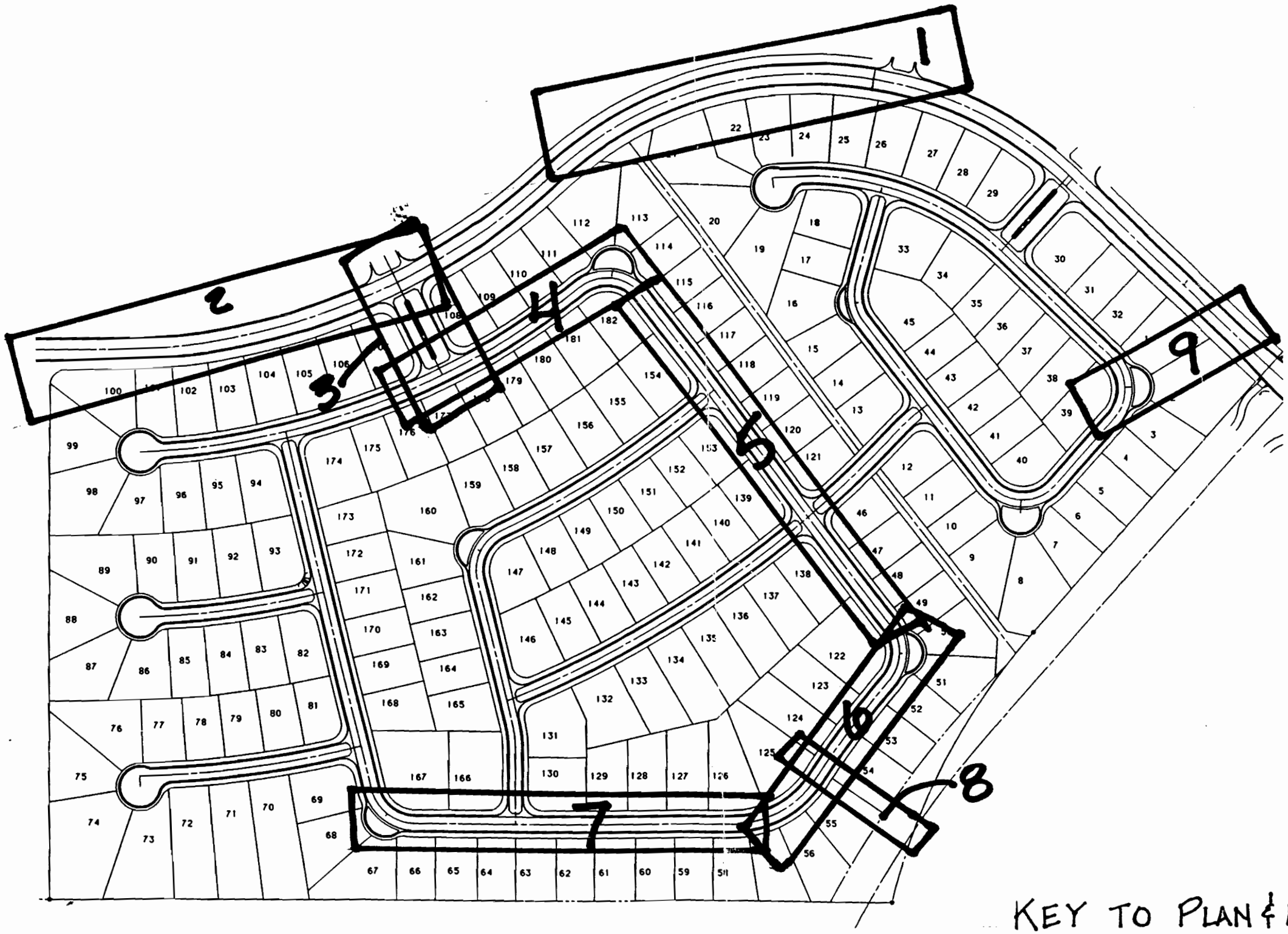
PROJECT NAME _____ SHEET _____ OF _____
PROJECT NO _____ BY _____ DATE _____
SUBJECT _____ CH'D _____ DATE _____

SEVEN BAR RANCH NORTH SEDIMENT YIELD ANALYSIS
UNIVERSAL SOIL LOSS EQUATION

DESCRIPTION	VARIABLE	UNIT		
BASIN				
Drainage Area	DA	Sq. Mi.	0.114	
Slope	S	Ft/Ft	0.050	
Slope Angle	THETA	Radians	0.050	
	L	Feet	1900.000	
Rainfall	R		25.000	
Soil Erodability*	K		0.240	
Slope Length Factor	LS		1.682	
Cover*	C		0.170	
Support Practice Factor	P		1.000	
Sediment Yield	A	Tons/Acre	1.716	
		Tons	125.204	
		Cy	92.744	
			Total Annual Sediment Yield	92.744 Cy
Estimated Soil Unit Weight	100.000	Lbs/Cf	Adjustment Factor	4.000

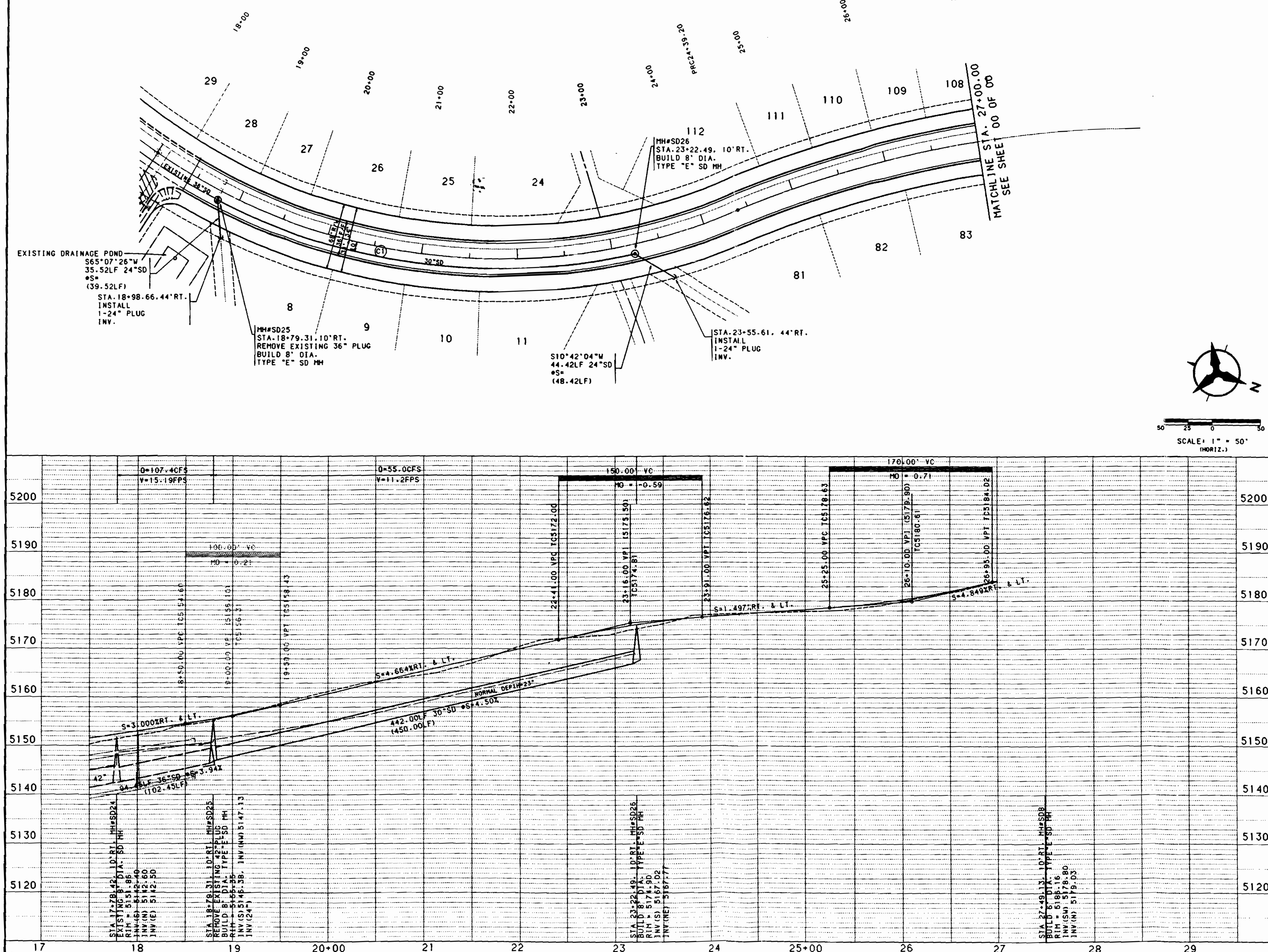
			Adjusted Sediment Yield	370.974 Cy
				10016.299 Cf

NOTE: The Universal Soil Loss Equation typically underestimates the actual sediment yield by 4 times so a factor of 4 is applied to the total annual sediment yield.



KEY TO PLAN & PROFILE SHEETS

STORM DRAIN CURVE DATA					
NUMBER	PI STA.	DELTA	TANGENT	ARC	RADIUS
C1	21+13.45	39°03'55"	234.14'	450.00'	660.00'



SCALE: 1" = 50' (HORIZ.) 1" = 10' (VERT.)

BHI JOB NO. 93217.44

COPY:[C93217]40-DATABSE.PAD]456-7BAR3.CRF

H14, S14 (MAIN H1)

NOTES

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12. WHEEL CHAIR RAMPS SHALL BE CONSTRUCTED PRIOR TO ACCEPTANCE OF CURB AND GUTTER.

AS-BUILT INFORMATION

CONTRACTOR
WORK STAKED BY
INSPECTOR'S ACCEPTANCE BY — DATE
FIELD VERIFICATION BY — DATE
DRAWINGS CORRECTED BY — DATE

MICRO-FILM INFORMATION

BENCH MARKS

TBM NO.205
CHISLED "X" LOCATED APPROXIMATELY 459 FEET SOUTH OF THE BLACK'S DIVERSION INLET STRUCTURE ON THE EAST WALL.
ELEV. 5110.55

SURVEY INFORMATION

FIELD NOTES

NO.	BY	DATE

ENGINEER'S SEAL

NO.	DATE	REMARKS	BY
		REVISIONS	
		DESIGN	
DESIGNED BY		PR. OF	DATE 10/94

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING

SEVEN BAR NORTH - UNIT 4,5 & 6
STORM DRAIN PLAN & PROFILE
SEVEN BAR LOOP ROAD

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
DRC CHAIRMAN			WATER		
TRANSPORTATION			WASTE WATER		
HYDROLOGY					

DRAWING NO. 0000 | MAP NO. A-13 | SHEET 00 OF

DATE: OCTOBER 199

H16, S16 (MAIN H10)

BHI JOB NO. 9321.44

SCALE: 1" = 20' (HORIZ.)
1" = 10' (VERT.)

DRAWING NO. 0000 | MAP NO. A-13 | SHEET 00 OF

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER
DRC CHAIRMAN			WATER	
TRANSPORTATION			WASTE WATER	
HYDROLOGY				

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING

SEVEN BAR NORTH - UNIT 4,5 & 6
STORM DRAIN PLAN & PROFILE
456M-STREET

DESIGNED BY PR. OF DATE 10/94

NO.	DATE	REMARKS	BY
		REVISIONS	

ENGINEER'S SEAL

SURVEY INFORMATION

FIELD NOTES BY DATE

BENCH MARKS

AS-BUILT INFORMATION

CONTRACTOR
WORK STARTED BY
WORK INSPECTED BY
FINAL INSPECTION'S ACCEPTANCE BY
DATE
DATE
DRAWINGS CHECKED BY
DRAWINGS CORRECTED BY
DATE
DATE

TBM NO.205
CHISLED "X" LOCATED APPROXIMATELY 459 FEET SOUTH OF THE BLACK'S DIVERSION INLET STRUCTURE ON THE EAST WALL.
ELEV. 5110.55

MICRO-FILM INFORMATION

RECORDED BY
DATE

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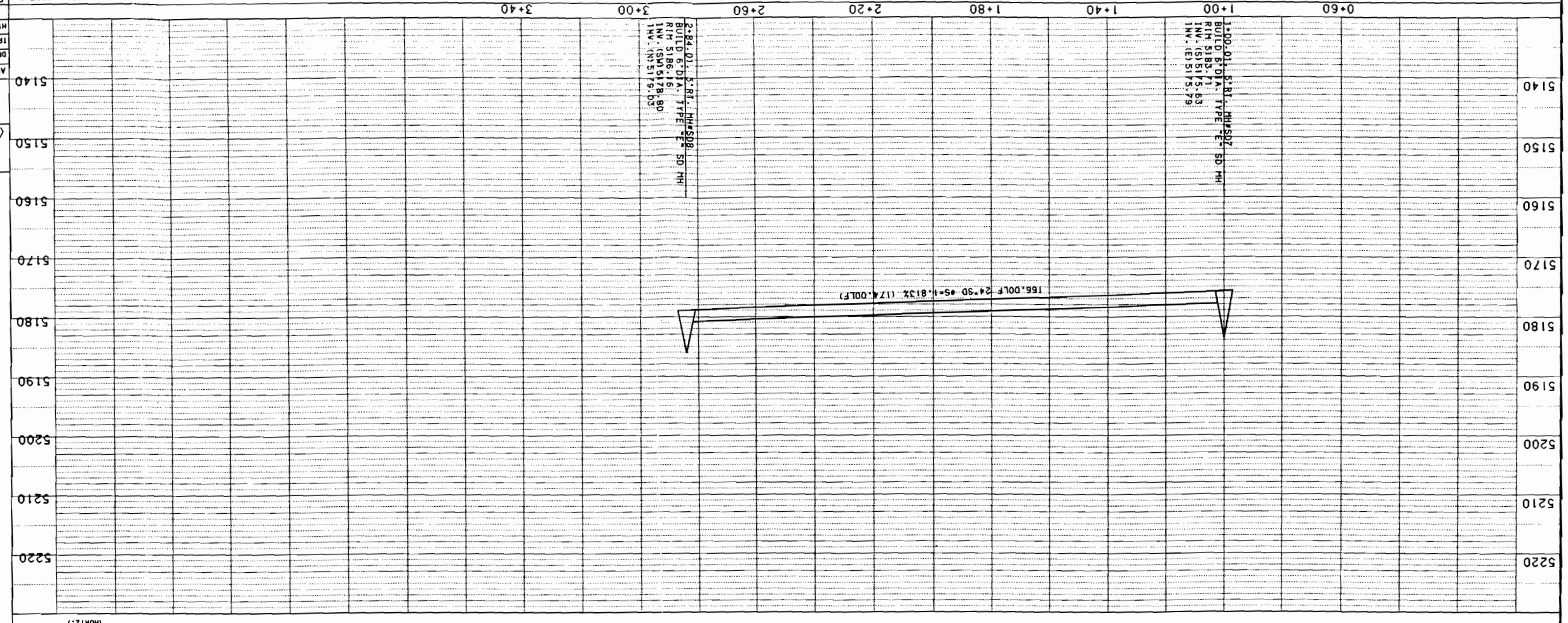
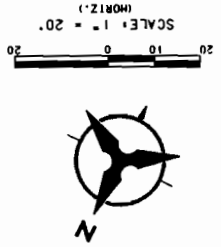
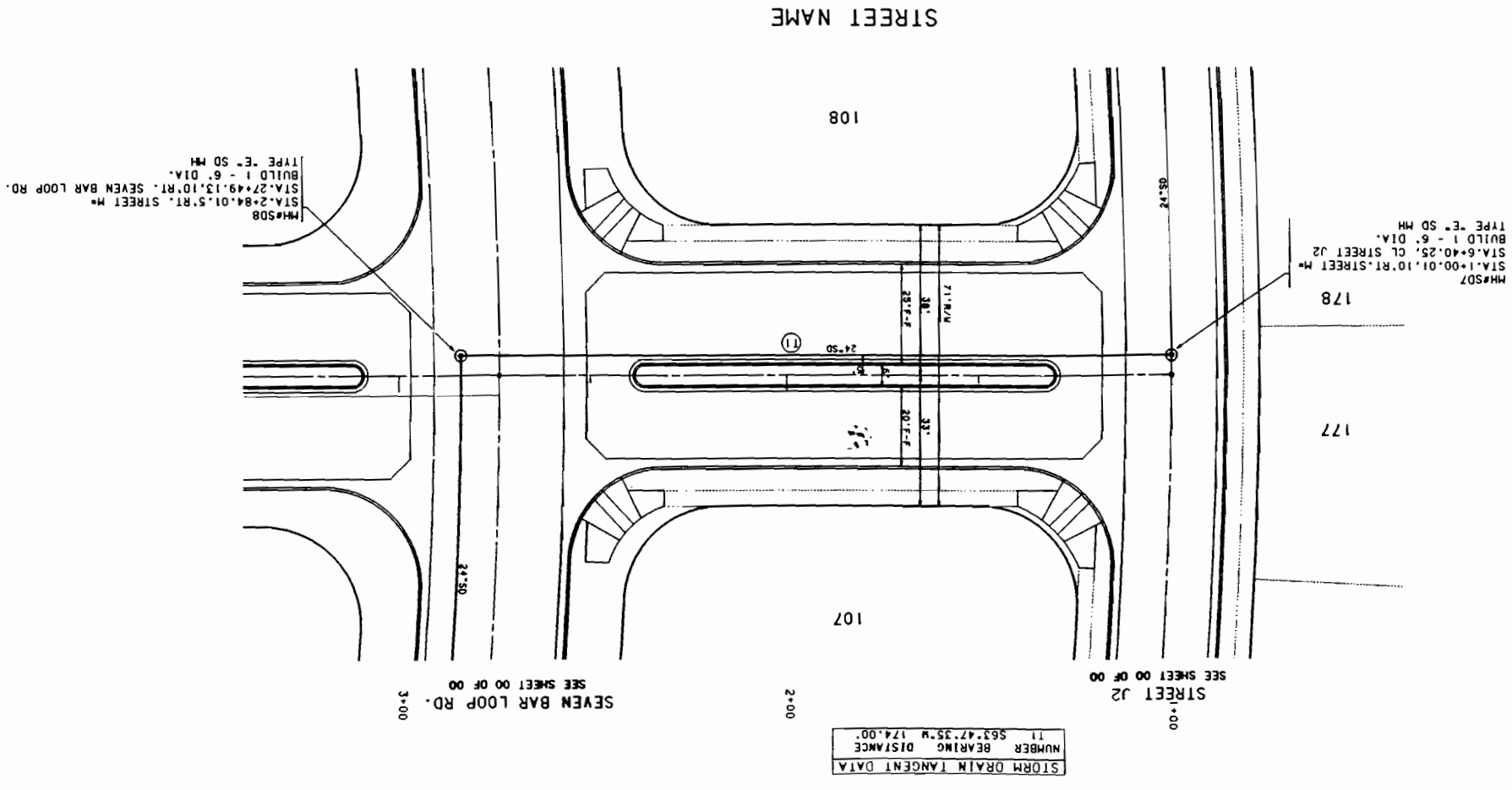
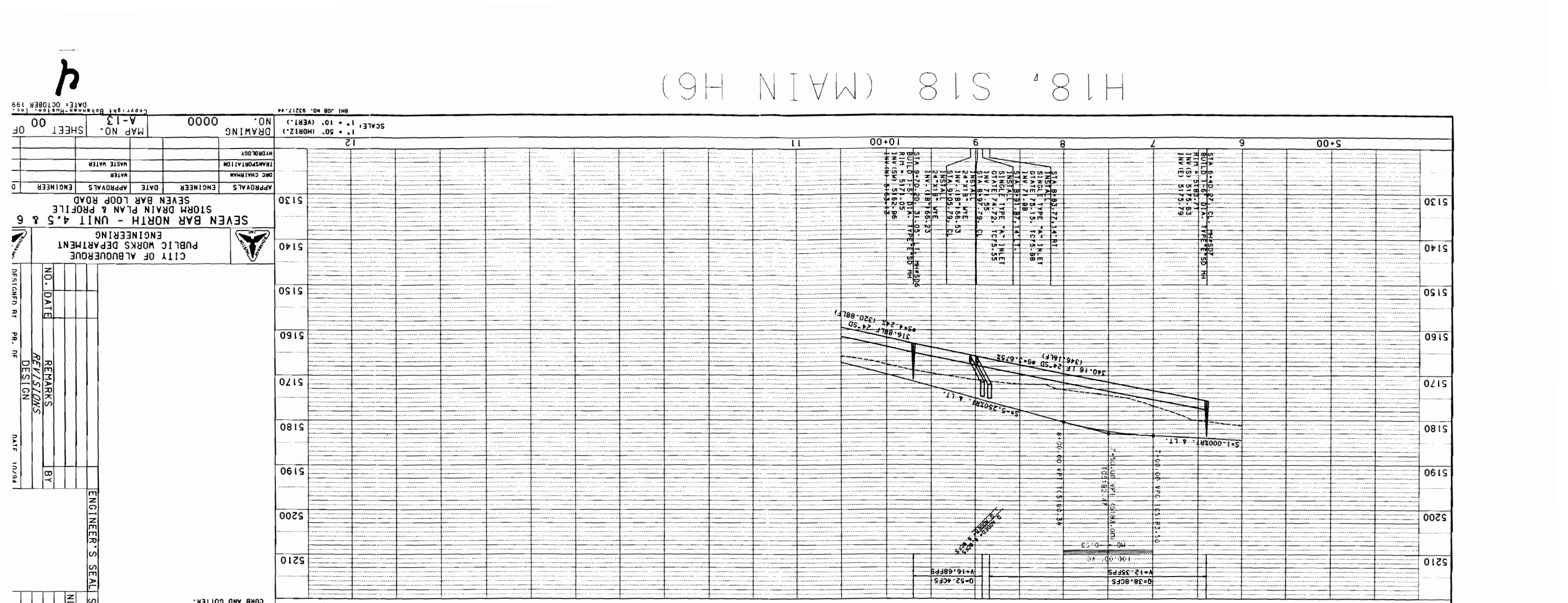






STORM DRAIN TANGENT DATA

NUMBER	BEARING	DISTANCE
T1	S63°47'35"W	174.00'



STORM DRAIN TANGENT DATA		
NUMBER	BEARING	DISTANCE
T1	S37°08'41"E	76.95'
T2	S52°51'19"W	320.88'

STORM DRAIN CURVE DATA					
NUMBER	PI STA.	DELTA	TANGENT	ARC	RADIUS
C1	7+75.36	12°06'26"	135.11'	269.21'	1274.00'

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ENGINEER'S SEAL

SURVEY INFORMATION

FIELD NOTES BY DATE

BENCH MARKS

NO. DATE

TBM NO.205
CHISLED "X" LOCATED APPROXIMATELY 459 FEET SOUTH OF THE BLACK'S DIVERSION INLET STRUCTURE ON THE EAST WALL.
ELEV. 5110.55

AS-BUILT INFORMATION

CONTRACTOR
STARTED
COMPLETED
INSPECTOR'S ACCEPTANCE BY
VERIFICATION BY
RECORDED BY
MICRO-FILM INFORMATION

DATE

REVISIONS

NO.	DATE	REMARKS	BY

DESIGNED BY
PR. DF
DATE 10/94

ENGINEER

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING

SEVEN BAR NORTH - UNIT 4,5 & 6
STORM DRAIN PLAN & PROFILE
SEVEN BAR LOOP ROAD

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER
ARC CHAIRMAN			WATER	
TRANSPORTATION			WASTE WATER	
HYDROLOGY				

DRAWING NO. 0000 | MAP NO. A-13 | SHEET 00 OF

DATE: OCTOBER

DATE: OCTOBER 199

BHI JOB NO. 93217.44

SCALE: 1" = 10' (VERT.) 1" = 50' (HORIZ.)

DRAWING NO. 0000 | MAP NO. A-13 | SHEET 00 OF

	ENGINEER	DATE	APPROVALS	ENGINEER
APPROVALS				
DBC CHAIRMAN				
TRANSPORTATION			WATER	WASTE WATER
HYDROLOGY				

SEVEN BAR NORTH - UNIT 4,5 & 6
STORM DRAIN PLAN & PROFILE
SEVEN BAR LOOP ROAD

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING

DESIGNED BY PR. DF DRAFT 10/94

NO.	DATE	REMARKS
		REVISIONS
		DESIGN
		BY

ENGINEER'S SEAL | SURVEY INFORMATION | BENCH MARKS | AS-BUILT INFORMATION

FIELD NOTES BY DATE

TBM NO. 205
CHISLED "X" LOCATED APPROXIMATELY 459 FEET SOUTH OF THE BLACK'S DIVERSION INLET
STRUCTURE ON THE EAST WALL.
ELEV. 5110.55

CONTRACTOR
STAKED BY
FIELD VERIFICATION BY
DRAWING CORRECTED BY
MICRO-FILM INFORMATION

DATE
DATE
DATE
DATE

RECORDED BY DATE

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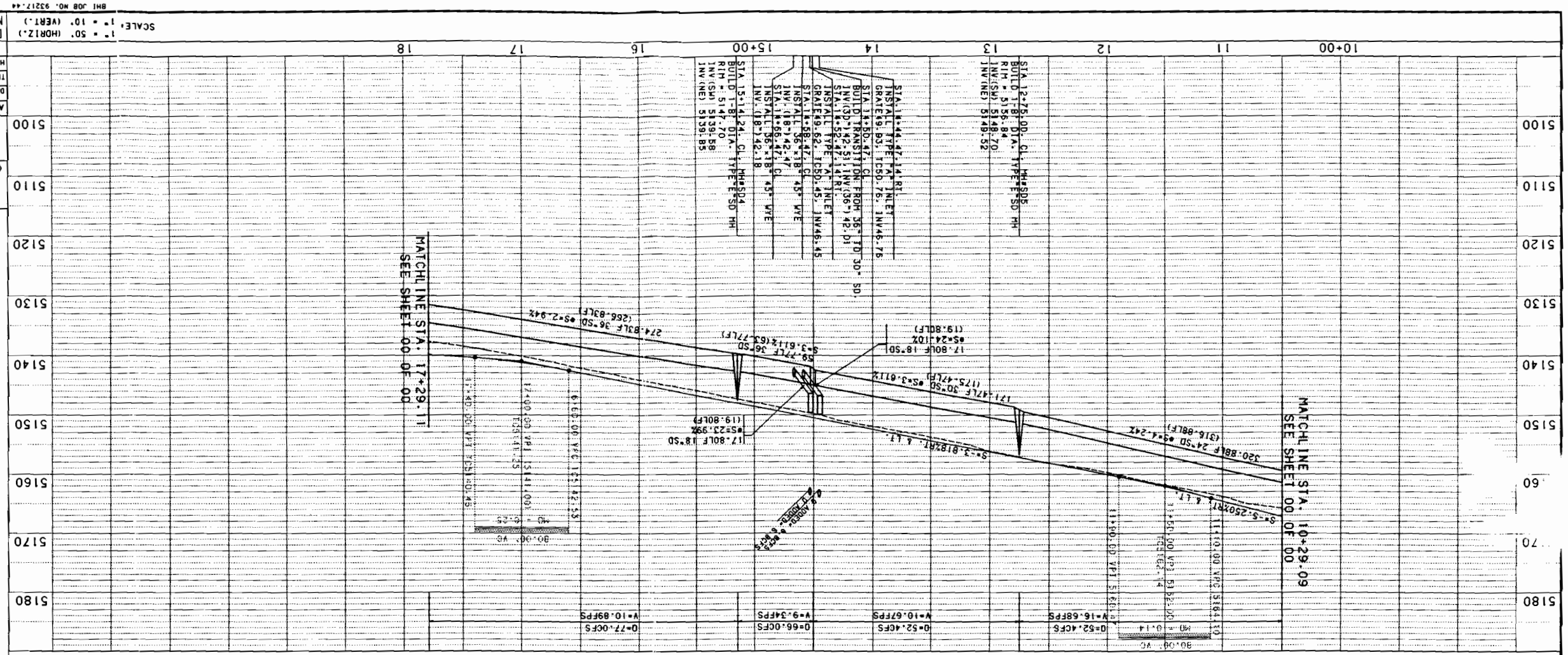
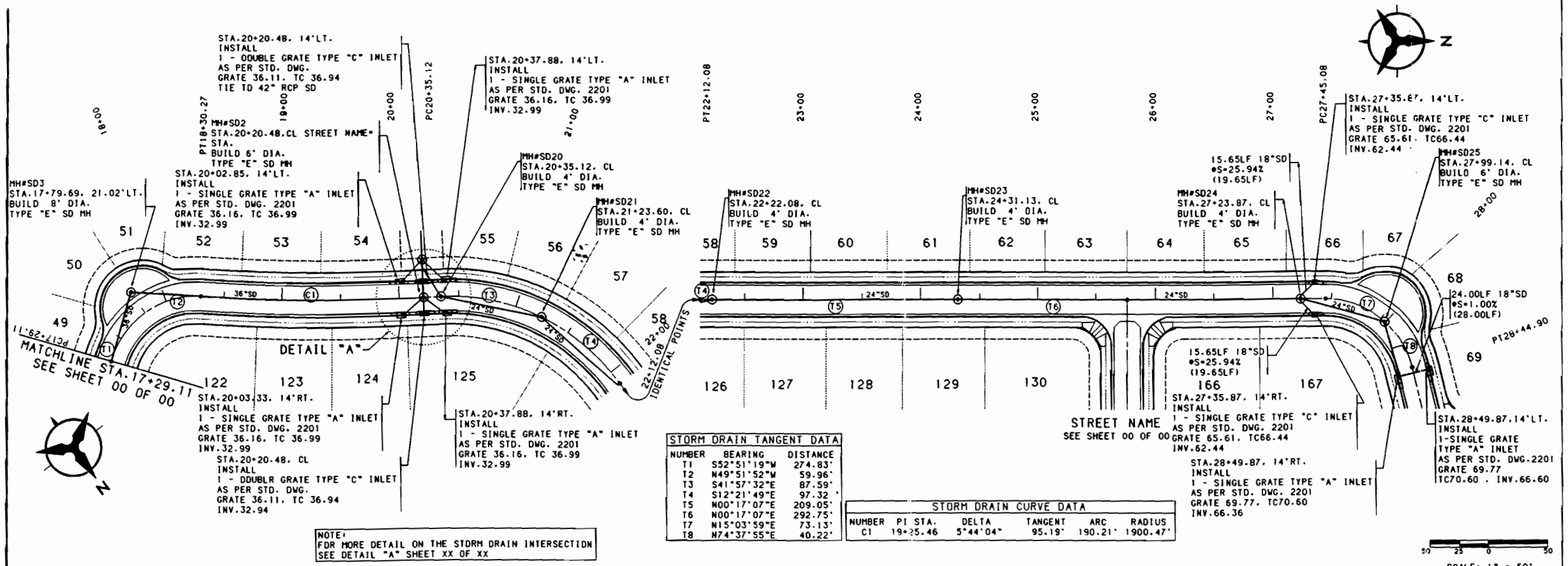
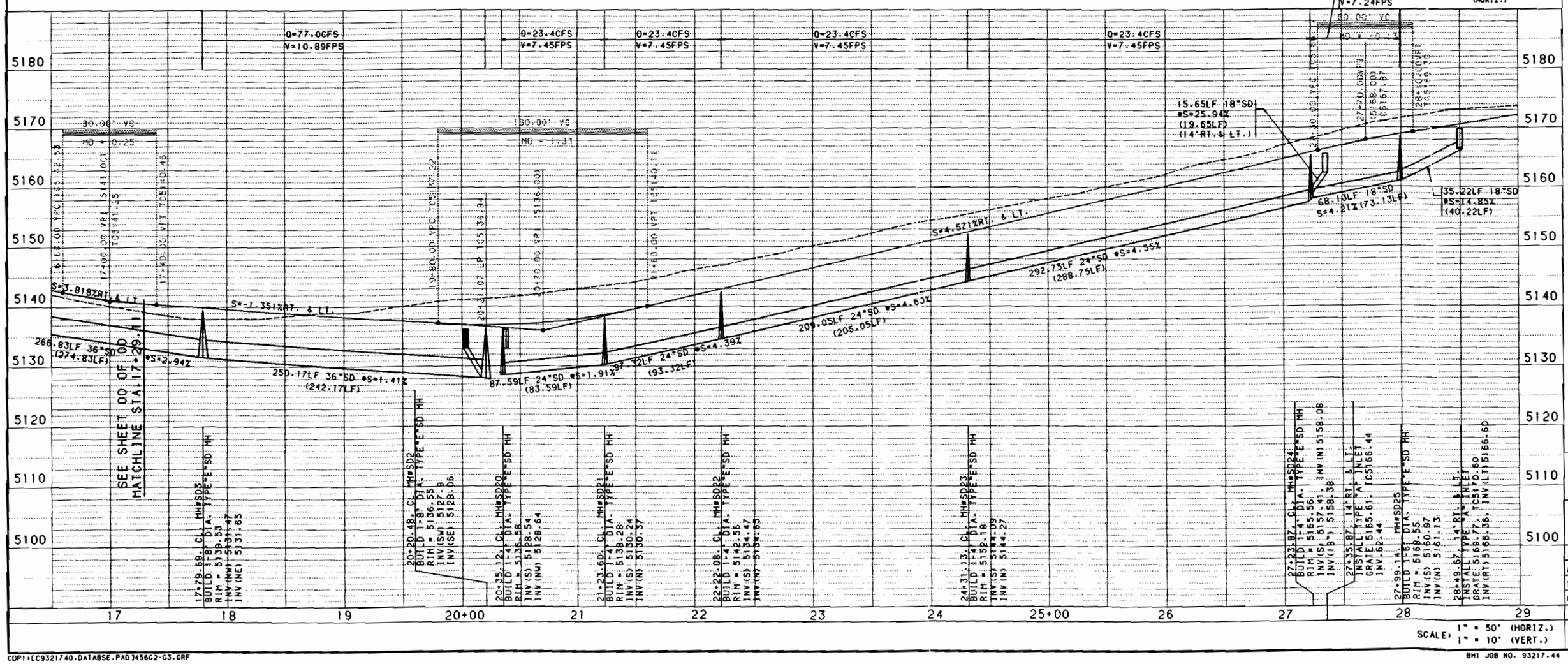




STORM DRAIN TANGENT DATA		
NUMBER	BEARING	DISTANCE
T1	S52°51'19"W	274.83'
T2	N49°51'52"W	59.96'
T3	S41°57'32"E	87.59'
T4	S12°21'49"E	97.32 '
T5	N00°17'07"E	209.05'
T6	N00°17'07"E	292.75'
T7	N15°03'59"E	73.13'
T8	N74°37'55"E	40.22'

STORM DRAIN CURVE DATA					
NUMBER	PI STA.	DELTA	TANGENT	ARC	RADIUS
C1	19+25.46	5°44'04"	95.19'	190.21'	1900.47'

NOTE:
FOR MORE DETAIL ON THE STORM DRAIN INTERSECTION
SEE DETAIL "A" SHEET XX OF XX



BHI JOB NO. 93217.44

CDP1:[C9321740.DATABSE.PAD]456G2-G3.GRF

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ENGINEER'S SEAL

SURVEY INFORMATION

NO.	DATE	BY	FIELD NOTES

BENCH MARKS

TBM NO.205
CHISLED "X" LOCATED APPROXIMATELY 459 FEET SOUTH OF THE BLACK'S DIVERSION INLET STRUCTURE ON THE EAST WALL.
ELEV. 5110.55

AS-BUILT INFORMATION

CONTRACTOR
STAKED BY
FIELD VERIFICATION BY
CHANGES
CORRECTED BY
MICRO-FILM INFORMATION

NO.	DATE	BY	REMARKS
			REVISIONS
			DESIGN

DESIGNED BY PR. OF DATE 10/94

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING

SEVEN BAR NORTH - UNIT 4.5 & 6
STORM DRAIN PLAN & PROFILE
456G2-G3 STREET

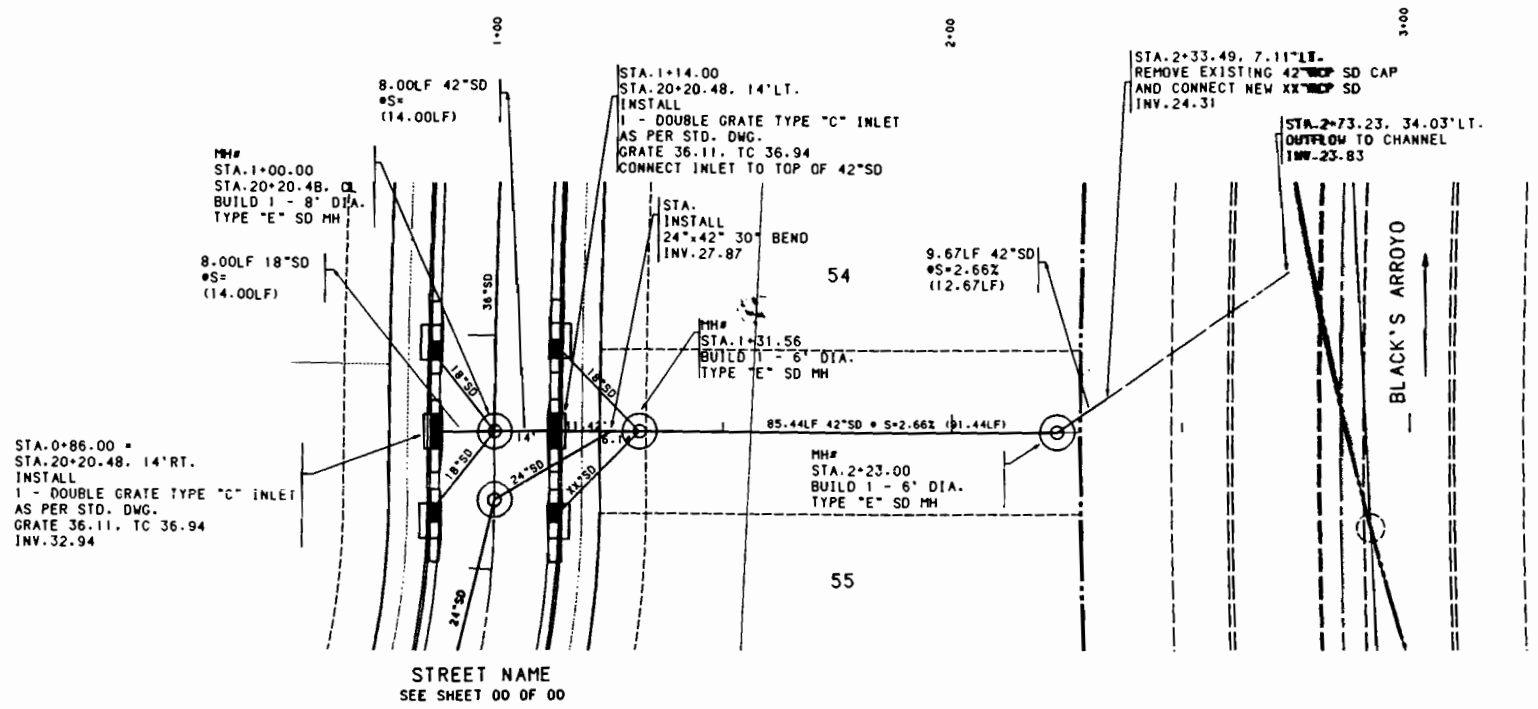
APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	D
DRC CHAIRMAN			WATER		
TRANSPORTATION			WASTE WATER		
HYDROLOGY					

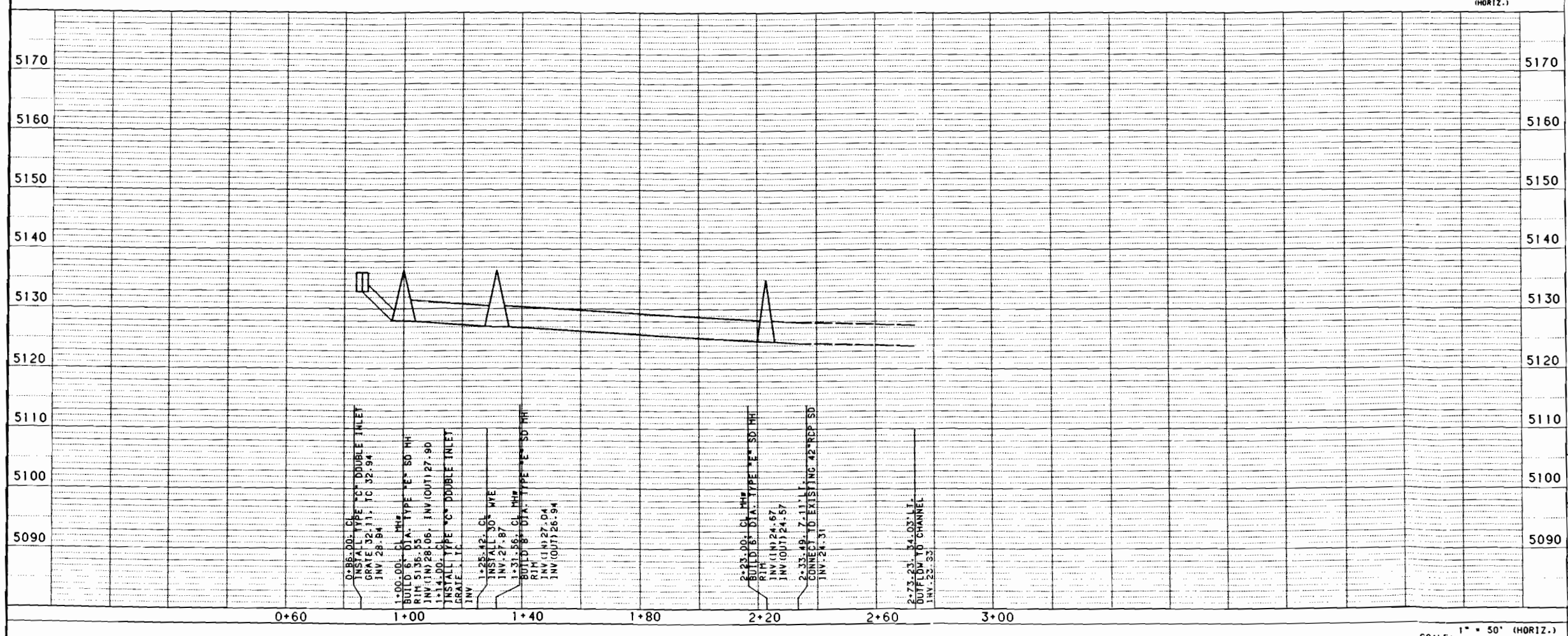
DRAWING NO. 0000
MAP NO. A-13
SHEET 00 OF

DATE: OCTOBER 199

H20, H21, S20 (MAIN H7)

6+7





SCALE: 1" = 50' (HORIZ.)
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BHI JOB NO. 93217.44

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SURVEY INFORMATION

FIELD NOTES

NO.	BY	DATE

BENCH MARKS

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ELEV. 5110.55

AS-BUILT INFORMATION

CONTRACTOR
STAKED BY — DATE
INSPECTOR'S FIELD CHANGES BY — DATE
VERIFICATION BY — DATE
CORRECTED BY — DATE

MICRO-FILM INFORMATION

DESIGNED BY — DATE

NO.	DATE	REMARKS
		REVISIONS
		DESIGN

DESIGNED BY PR. OF DATE 10/94

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING

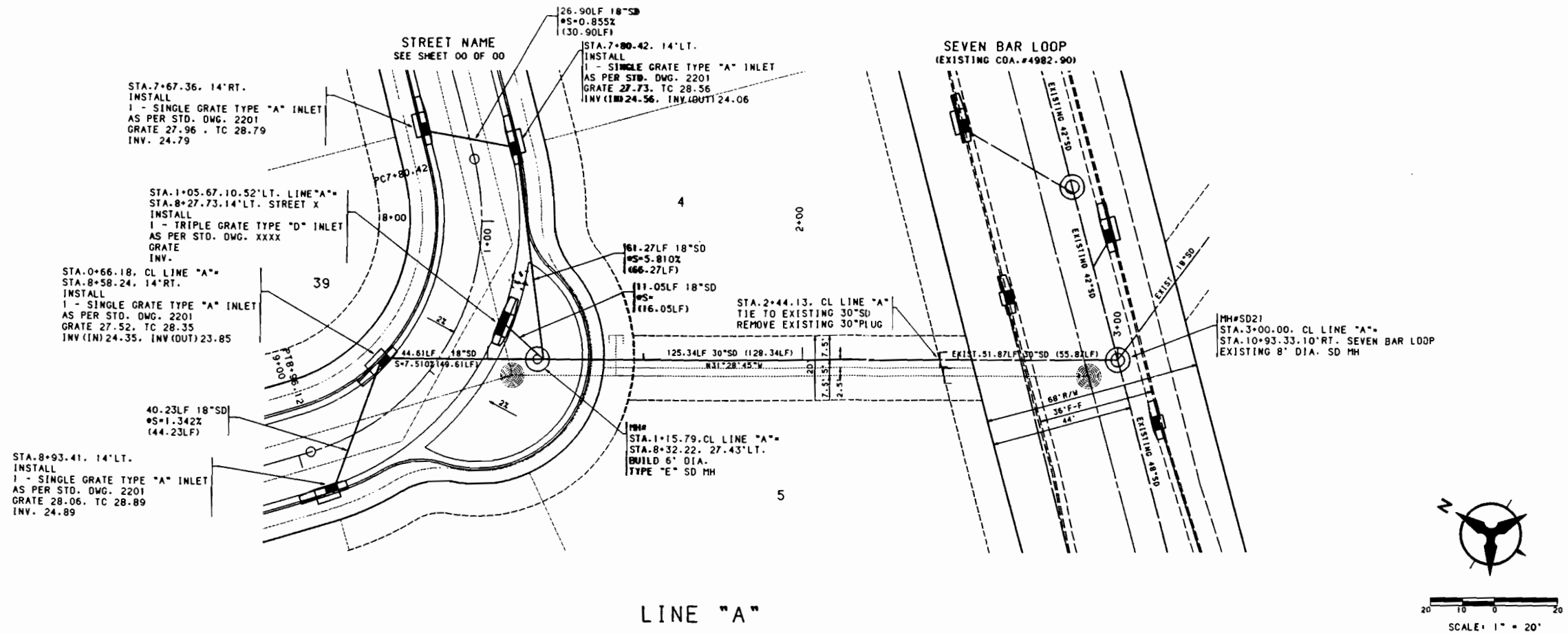
SEVEN BAR NORTH - UNIT 4,5 & 6
STORM DRAIN PLAN & PROFILE
456-OUTFLOW

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	D
DRC CHAIRMAN			WATER		
TRANSPORTATION			WASTE WATER		
HYDROLOGY					

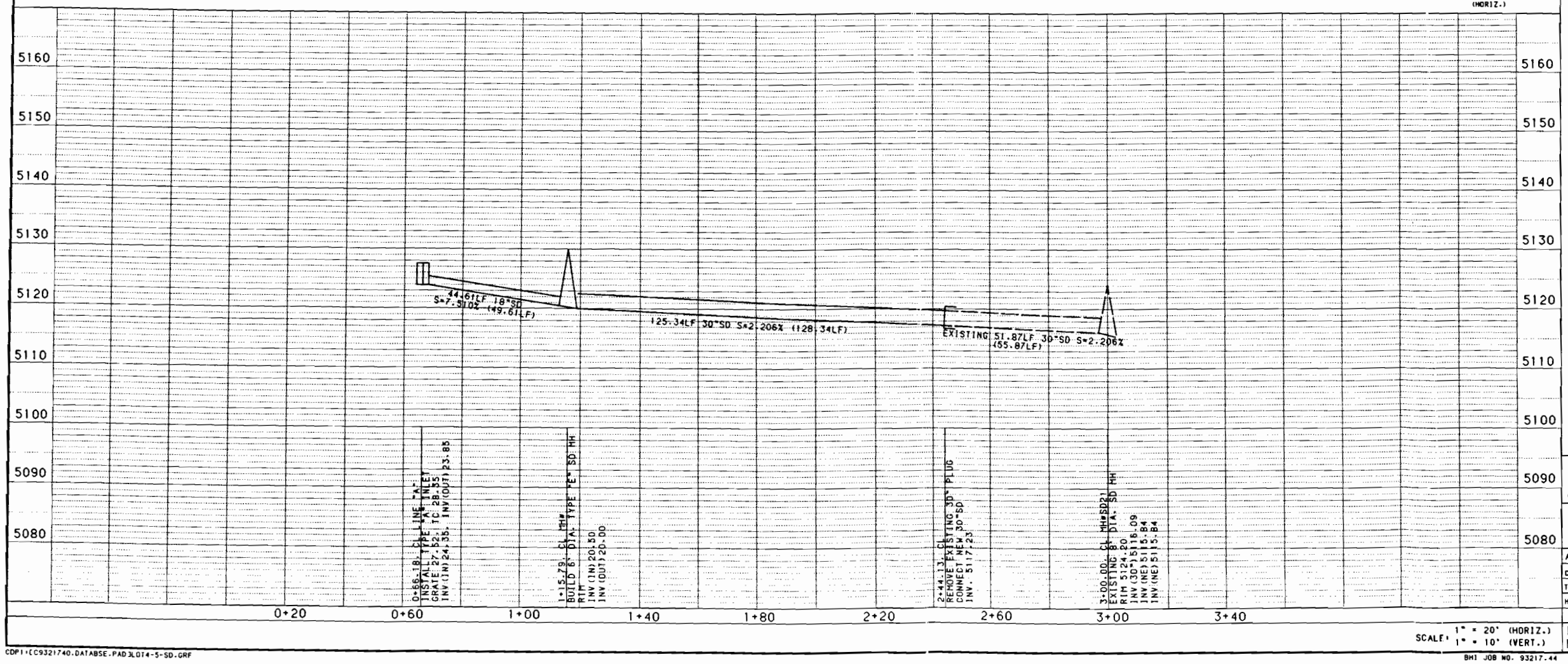
DRAWING NO. 0000 | MAP NO. A-13 | SHEET 00 OF

DATE: OCTOBER 199

H22. S (MAIN H)



LINE "A"



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BHI JOB NO. 93217.44

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SURVEY INFORMATION

FIELD NOTES BY DATE

NO.

BENCH MARKS

TBM NO.205
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ELEV. 5110.55

AS-BUILT INFORMATION

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STAKED BY DATE
INSPECTOR'S FIELD CHANGES BY DATE
VERIFICATION BY
CORRECTED BY DATE

MICRO-FILM INFORMATION

RECORDED BY DATE

NO.	DATE	REMARKS	BY
		REVISIONS	
		DESIGN	

DESIGNED BY PR. DF DATE 10/94

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING

SEVEN BAR NORTH - UNIT 4.5 & 6
STORM DRAIN PLAN & PROFILE
SD LOT4-5

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	D
DRC CHAIRMAN			WATER		
TRANSPORTATION			WASTE WATER		
HYDROLOGY					

DRAWING NO. 0000

MAP NO. A-13

SHEET 00 OF

DATE: OCTOBER 199

H23, H24, S23 (MAIN H3)