City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

February 27, 2003

Pat Conley, PE
Smith Engineering Co.
6400 Uptown Blvd. Ste 500E
Albuquerque, NM 87110

Re: Irving/Golf Course Transportation Improvements Drainage Report
Engineer's Stamp dated 1-15-03, (B12/D11)

Dear Mr. Conley,

Based on your information provided in your submittal dated 1-16-03, the above referenced Drainage Report is approved for Work Order. Any minor comments can be addressed at DRC.

If you have any questions, you can contact me at 924-3986.

Sincerely,

Bradley L. Bingham, PE
Sr. Engineer, Planning Dept.
Development and Building Services

C: file

DRAINAGE REPORT

for the

IRVING/GOLF COURSE TRANSPORTATION

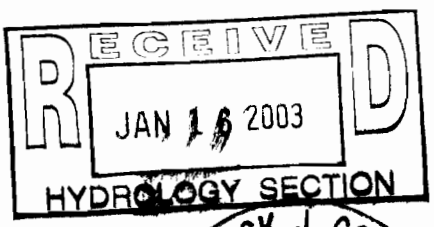
IMPROVEMENTS, COA PROJECT #5894.91

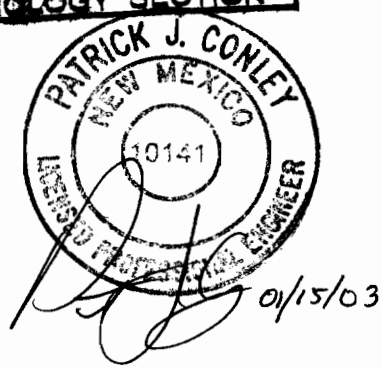
Prepared for:

CITY OF ALBUQUERQUE

TRANSPORTATION DEPARTMENT

January, 2003





Prepared by:

Smith Engineering Company
6400 Uptown Blvd. NE, Suite 500E
Albuquerque, New Mexico 87110

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I. INTRODUCTION

The City of Albuquerque Transportation Department is planning to construct a four lane facility on Irving Boulevard from Chantilly to just west of the intersection of Golf Course Road and a four lane facility on Golf Course Road from the Bernalillo county line on the south to the south side of the Calabacillas Arroyo. A vicinity map showing the location of the project area is shown in Figure 1, page 2.

Smith Engineering Company (SEC) has been retained by the COA PWD to provide civil engineering services for the proposed Irving Boulevard/Golf Course Improvements. Included in the civil engineering scope of work is to provide a drainage analysis for the project and design an storm drain system to convey the flows to the Calabacillas Arroyo.

This drainage report will analyze the hydrology assuming fully developed conditions and provide a hydraulic analysis of a storm drain system to be constructed as part of the project.

II. DRAINAGE AREA BOUNDARIES

The drainage basin boundary for the project is bounded by Chantilly on the east, the right-of-way on the north and south sides of Irving Boulevard, several tracts of vacant land at the southeast quadrant of the intersection of Golf Course and Irving Boulevard, and the east and west sides of Golf Course Road. The drainage areas are shown on Plates 1 and 2 contained in Appendix A of this report.

III. DRAINAGE BASIN CHARACTERISTICS

This report concerns itself only with developed conditions and the planned storm drain system as the existing drainage conditions do not have an impact on the design of the final facilities.

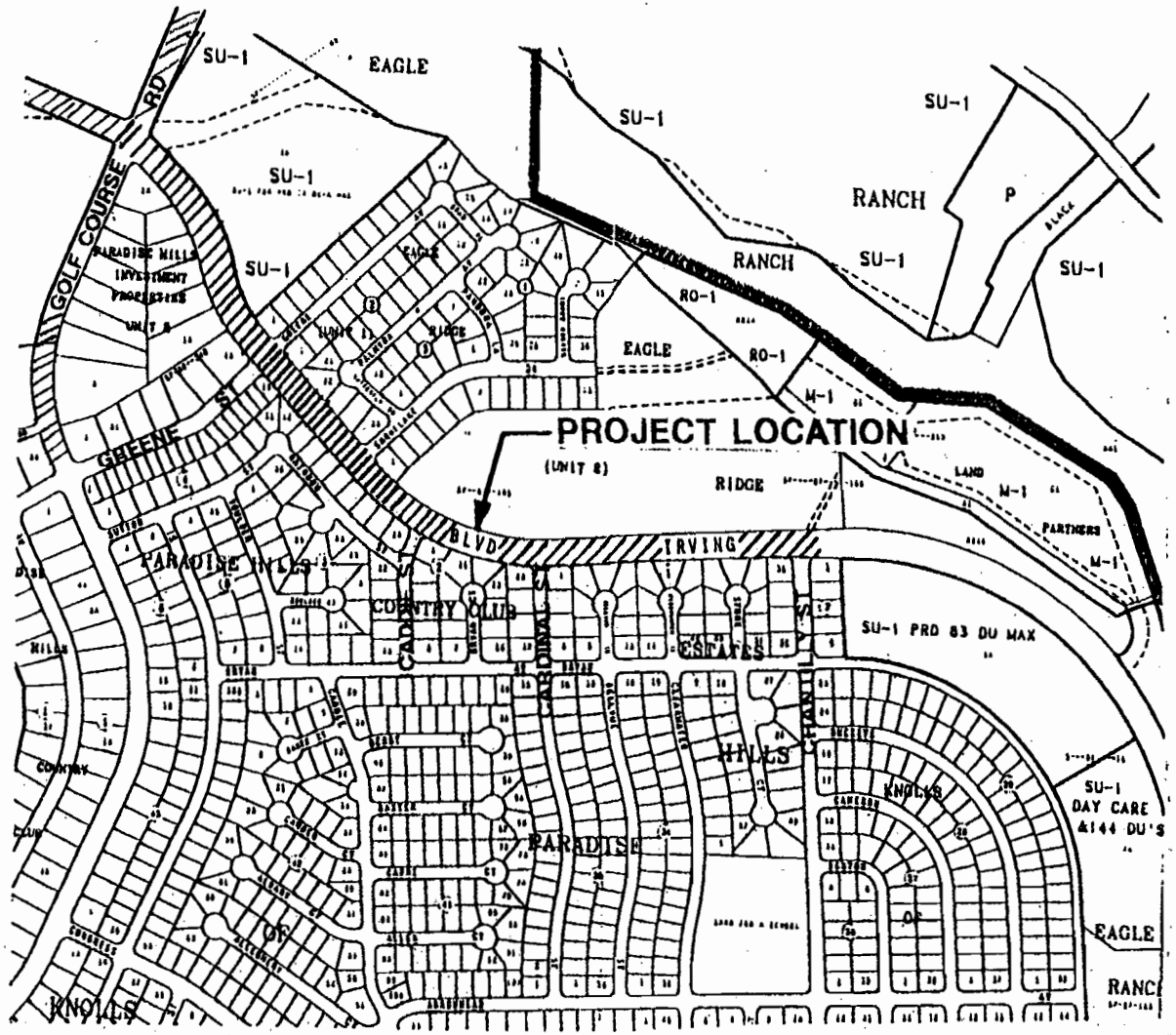
A. Drainage Basins

Irving Boulevard:

There is a grade break on Irving Boulevard near Green Street that creates two major drainage basins for Irving Boulevard. These are the area west of Green Street and the area east of Green Street. There are existing neighborhoods on each side of Irving Boulevard along the length of the improvement with walls on the right-of-way line. This report assumes that, due to the walls, the drainage in the backyards of the lots will not get to the Irving Boulevard right-of-way but will remain on the lots.

East of Green Street:

The major drainage basin east of Green Street is from the break-line at Green Street east to Chantilly Road. This basin drains to a proposed storm drain system in Irving Boulevard and Chantilly Road that connects to an existing storm drain system in Bryan



N

GRAPHIC SCALE

Figure No. 1 – Project Location Map

MAP NO.

B-12-Z
B-13-Z

Road. The existing system is referred to as the Cactus Pointe system in this report. The Cactus Pointe system discharges to the Calabacillas Arroyo.

Off-site drainage basins flow to the existing Cactus Pointe storm drain system to which the proposed Irving Boulevard storm drain system connects. This system has to accommodate the existing flows as well as the proposed flows from the Irving system.

West of Green Street:

The major drainage basin west of Green Street to Irving Boulevard is collected in the proposed storm drain system via inlets. This new storm drain system connects to an existing storm drain system at the intersection of Irving Boulevard and Golf Course Road. The proposed system conveys flows to the Calabacillas Arroyo. There are four undeveloped lots that drain to Irving Boulevard. These are designated as Basins E.2 and E.3 on the basin map. There are currently no development plans for the lots designated as E.2. The basin E.3 is currently under design by Mark Goodwin and Associates and is planned as a gas station and convenience store. Runoff from this tract will drain directly into the planned storm drain system using a connector pipe that will be constructed as part of this project. Basin E.2 will drain directly onto Irving Boulevard and, for this analysis, it has been assumed that the lots are fully developed.

There are two major off-site basins that drain to the existing storm drain system in Irving and Golf Course. These are the Paradise Greens, Unit II Subdivision at the southwest quadrant of the intersection of Golf Course and Irving, the Arroyo Villas Apartments, and the Eagle Ranch development at the northeast quadrant of the intersection. These basins currently drain into the existing storm drain system that outfall to the Calabacillas Arroyo and do not impact the drainage basin for the project. However, they do drain to the existing storm drain system and this system has to accommodate the existing developed conditions flows as well as the flows from the construction of the project and flows from the developed lots within the project area.

Golf Course Road:

The portion of Golf Course Road in this project drains overland from approximately the Bernalillo County line (just south of the Paradise Hills Golf Course) north to the intersection of Irving Boulevard and Golf Course Road. The runoff is collected in the proposed storm drain system via inlets just south of the intersection. The proposed storm drain system connects to the existing storm drain system at the intersection of Golf Course Road and Irving Boulevard. This existing system then conveys flows to the Calabacillas Arroyo. There are no off-site drainage basins impacting the Golf Course system.

The existing storm drain systems that the proposed storm drain systems connect to are described in Section IV, Existing Drainage Facilities.

B. Existing Vegetation

Existing vegetation is relatively sparse throughout the area and consists of open-type desert grassland (Drainage Basins E.1, E.2 and E.3). Under developed conditions, it is

anticipated that the area will be covered with hard impervious surfaces and various types of landscaping.

C. Land Use

Developed condition land uses were determined from the proposed roadway improvements and the potential development of the vacant lots. This report assumed the roadway as 100% "D" and the vacant lots as 30% "B: and 70% "D".

IV. EXISTING DRAINAGE FACILITIES

There are two existing storm drain systems to which the proposed storm drain will connect. The proposed storm drain for Irving Boulevard west of Green Street will connect to the Arroyo Villas Apartments system (contained in Appendix B). This system was constructed to provide drainage for the Paradise Greens, Phase II, Subdivision (southwest quadrant), the Arroyo Villas Apartments (northwest quadrants), and the Eagle Ranch Development (northeast quadrant). The existing system consists of pipes ranging from 18-inch diameter to 42-inches in diameter at the outfall. The proposed storm drain system in Irving Boulevard will connect to the existing system at MH #4. The as-built drawings for this system are located in the pocket at the back of the report.

The proposed storm drain system for Irving Boulevard east of Green Street will connect to the Cactus Pointe Subdivision storm drain (contained in Appendix C). This system begins at the intersection of Chantilly Street and Bryan Road and consists of 18-inch pipe up to 60-inch pipe at the outfall. The system winds through existing neighborhoods and outfalls to the Calabacillas Arroyo. The proposed storm drain for Irving Boulevard will connect to the existing storm drain at the beginning of the system at Bryan Street just east of Chantilly.

V. HYDROLOGY

The hydrology for the project was developed using Section 22.2 Hydrology of the Development Process Manual, Design Criteria for the City of Albuquerque, New Mexico. The design storm is the 100-Year, 6-Hour storm. The procedure used for the analysis was the Part A Procedure for 40-acre area and smaller drainage basins. The following information was taken fro the DPM for the analysis:

Precipitation zone:	1
Peak discharge/acre:	2.03 cfs (land use B)
	4.37 cfs (land use D)

Mapping for this study (shown on Plates 1 and 2) utilized the ortho-photography and vector contour composite images (part of the Bernalillo County Digital Mapping). The mapping was obtained from the Albuquerque Metropolitan Arroyo and Flood Control Authority (AMAFCA).

The drainage basins were determined based on two criteria: existing right-of-way and anticipated or proposed patting actions. The basins for the roadway improvements are

taken to be the right-of-way of the road as the lots adjacent to the right-of-way will not drain to the road and the land use was assumed to be 100% "D". These basins are designated as A, C, D, E and F.

The lots that are at the southeast quadrant of Irving Boulevard and Golf Course Road were assumed to develop as 30% "B" and 70% "D". The basin designated as B.3 is the proposed gas station and convenience store that is currently being designed by Mark Goodwin and Associates. This development will drain to an on-site system that will connect to the proposed storm drain in Irving Boulevard. The other lots, designated as B.1 and B.2 were assumed to overland flow to either Irving Boulevard or Golf Course Road based on frontage, and the runoff is intercepted by the proposed system catch basins.

The basin designations and hydrology calculations are as follows:

BASIN #	TOTAL AREA	LANDUSE 'D' AREA	LANDUSE 'B' AREA	Q_{100} FLOW
	(acres)	(acres)	(acres)	(cfs)
A1	0.77	0.616	0.154	3.00
A2	0.67	0.536	0.134	2.61
B1	2.72	2.176	0.544	10.61
B2	2.22	1.776	0.444	8.66
B3	2.36	1.888	0.472	9.21
C1	1.98	1.584	0.396	7.73
C2	0.23	0.184	0.046	0.90
C3	0.78	0.624	0.156	3.04
C4	0.63	0.504	0.126	2.46
C5	0.42	0.336	0.084	1.64
C6	0.47	0.376	0.094	1.83
D	1.96	1.568	0.392	7.65
E1	0.52	0.416	0.104	2.03
E2	0.53	0.424	0.106	2.07
F1	0.11	0.088	0.022	0.43
F2	0.92	0.736	0.184	3.59
F3	0.84	0.672	0.168	3.28
F4	0.39	0.312	0.078	1.52
F5	0.41	0.328	0.082	1.60
Total	**18.93**	**15.14**	**3.79**	**73.86**

VI. HYDRAULICS

The hydraulics of the proposed storm drain system are based on utilizing the following system parts:

- Streets which act as open channels to convey storm water runoff the drop inlets.
- Underground piping which convey storm water runoff from the drop inlets to the final outfall at the Calabacillas Arroyo.

Street capacities were determined using "Flow Master", a computer program that utilizes Manning's Equation to determine hydraulic capacities of the roadways and the interception capacity of the inlets. Hydraulic grade lines for storm drain pipes were calculated using "Storm Cad", a computer program used to perform hydraulic analyses on storm drain pipe systems. "Storm Cad" utilizes Manning's Equation for open channel flow as well as pressurized flow incorporating friction head loss and other minor head losses within the storm drain system.

The results of the HGL calculations are shown in Appendix E and F and the hydraulic capacity of the roads in Appendix G.

PROPOSED STORM DRAIN

Two storm drain systems are proposed for the project, the Irving/Golf Course system and the Irving/Chantilly system. The plan-and-profile sheets for the proposed system is contained in Appendix D.

Irving/Golf Course System:

This system consists of RCP storm drain ranging in size from 18-inch to 36-inch and has two "legs"; one that proceeds up Irving Boulevard to the east from the existing MH 4 and one that proceeds south up Golf Course Road from the Irving Boulevard system at Station 9+93.

The system for Irving Boulevard collects flows generated west of Green Street as well as the on-site system from the future gas station/convenience store site. Catch basins will be constructed along the length of the system to collect street flows. The HGL analysis of the system shows that the system will function well and the HGL stays below the road surface and in some instances, the HGL stays within the pipe.

The Golf Course "leg" begins at the manhole at Station 9+93 in the Irving system and proceeds south up Golf Course for two pipe segments, each being 24-inch pipes. This system collects street flows in catch basins prior to the intersection. The HGL analysis of the system shows that the system will function well and the HGL stays below the road surface.

Irving/Chantilly System:

This system consists of RCP storm drain ranging in size from 18-inch to 24-inch. The system begins in Irving Boulevard at Station 29+04 and proceeds east to Chantilly. At Chantilly, the system turns south to Bryan Street and then east again to connect to the existing Cactus Pointe storm drain system. Catch basins will be constructed along the length of the system in Irving Boulevard to collect street flows. No catch basins will be constructed in Chantilly Street as they are not required. The flow that will be added to the existing system due to the proposed improvements in Irving Boulevard is 22 cfs. The proposed system and the existing system were analyzed to determine the effect of the additional flows on the combined system. The HGL analysis shows that the existing system cannot carry the additional flows from the proposed system due to an under-

sized storm drain for the first 95 feet of the existing system. This part of the existing system would have to be up-sized to a 30-inch pipe to keep the HGL in the ground. The HGL was re-calculated assuming that 22 cfs would get to the Cactus Pointe system from the Irving system while 11 cfs of the historic flow to the Cactus Pointe system from Bryan Avenue west of Chantilly would by-pass the system for the first two sets of catch basins. If 11 cfs of street flow is intercepted by the Cactus Pointe system at Station 5+20, the combined system would operate with the HGL below the street surface in Bryan Avenue and just above the street surface in Chantilly. Street flow calculations show that the 11 cfs of by-pass will be 0.31 feet deep at the curb and will be confined within the street section due to the street slopes (1.31 %) in that area (the street flow calculation is contained in Appendix G). Therefore, it is economically not feasible to up-size the existing system for only 95 feet when the by-pass flow can easily be accommodated within the street and intercepted not far from the original interception point.

VII. REFERENCES

City of Albuquerque, July 1997, "Development Process Manual, Section 22.2, Hydrology".

Haestad Methods Inc., August 2000, "FlowMaster PE Version 6.0 Computer Software".

Haestad Methods Inc., November 2000, "CulvertMaster Computer Software".

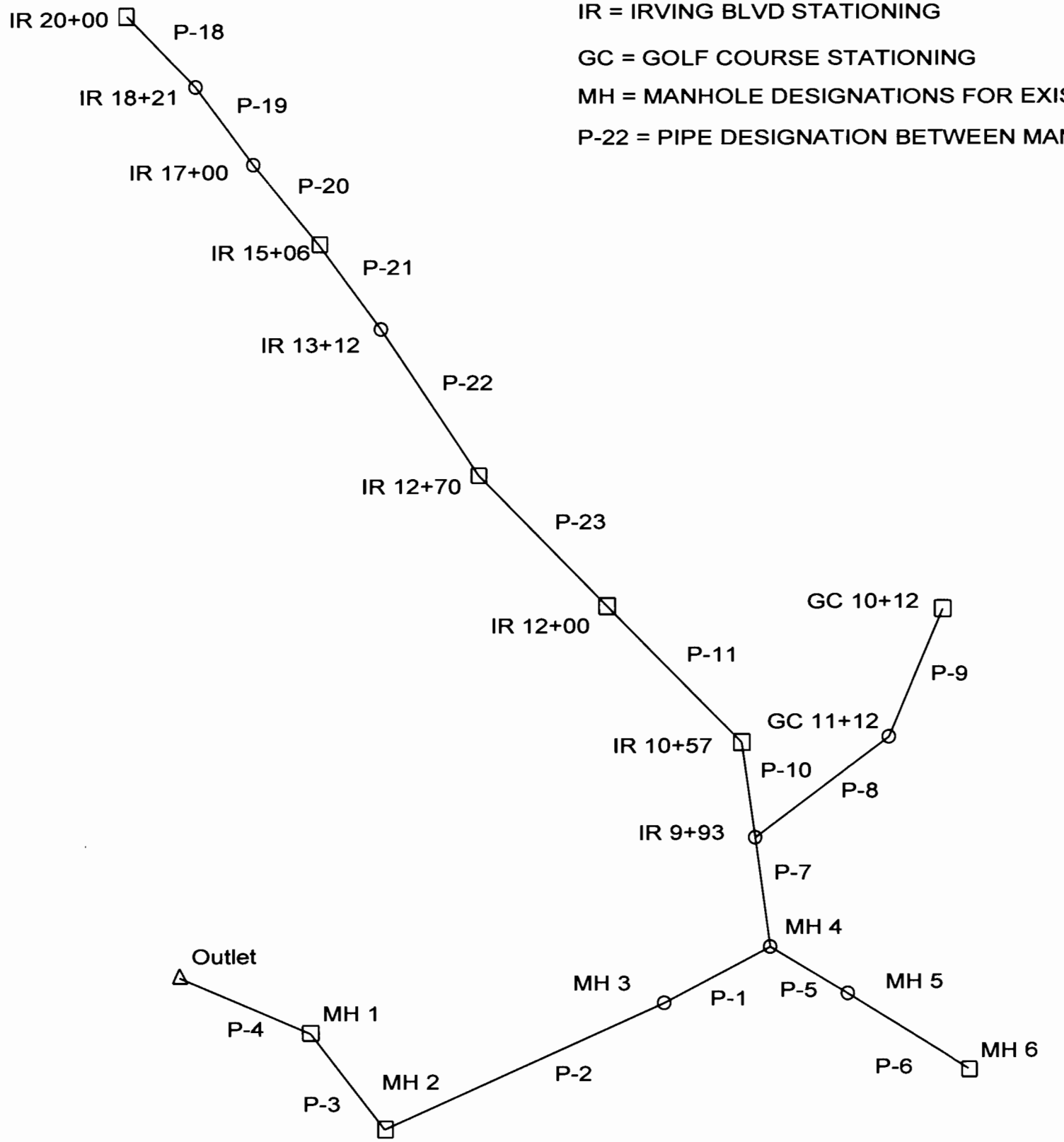
Haestad Methods Inc., December 1999, "StormCad Computer Software".

IR = IRVING BLVD STATIONING

GC = GOLF COURSE STATIONING

MH = MANHOLE DESIGNATIONS FOR EXISTING SYSTEM FROM PREVIOUS P & P DRAWINGS

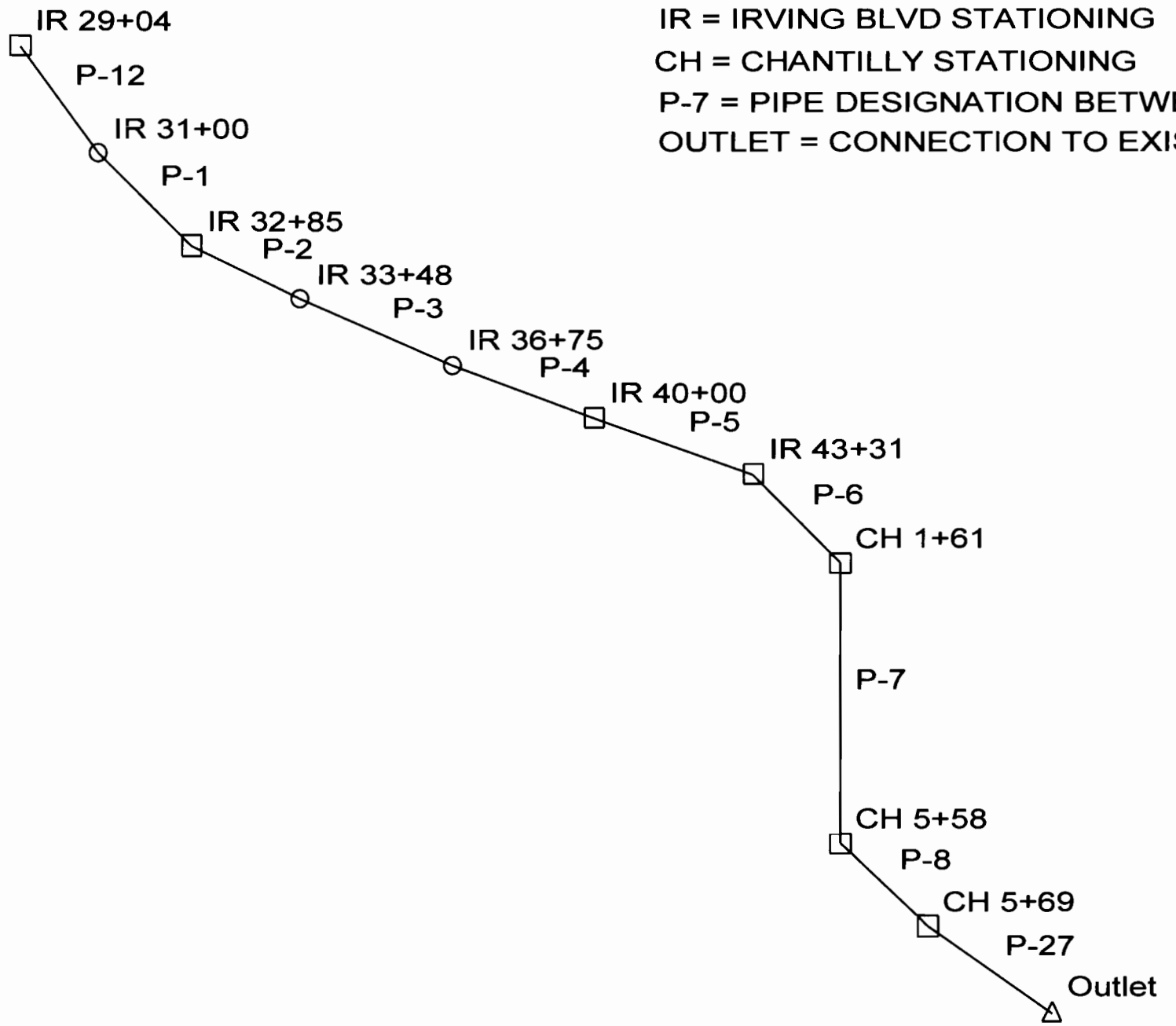
P-22 = PIPE DESIGNATION BETWEEN MANHOLES



IRVING/GOLF COURSE SYSTEM

Combined Pipe/Node Report

Pipe	Upstream Node	Downstream Node	Length (ft)	Section Size	Capacity (cfs)	Discharge (cfs)	Average Velocity (ft/s)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Constructed Slope (ft/ft)	Downstream Cover (ft)	Downstream Ground Elevation (ft)	Downstream HGL (ft)	Downstream Rim Elevation (ft)	Downstream Sump Elevation (ft)	Upstream Cover (ft)	Upstream Depth (ft)	Upstream Ground Elevation (ft)	Upstream HGL (ft)	Upstream Rim Elevation (ft)	Upstream Sump Elevation (ft)
P-18	IR 20+00	IR 18+21	182.00	18 inch	10.96	8.65	6.44	105.56	103.58	0.010879	7.77	112.85	104.59	112.85	103.48	6.79	1.14	113.85	106.70	113.85	105.56
P-19	IR 18+21	IR 17+00	182.00	18 inch	9.34	8.65	6.01	103.48	102.04	0.007912	7.46	111.00	103.18	111.00	101.94	7.87	1.14	112.85	104.62	112.85	103.48
P-20	IR 17+00	IR 15+06	194.00	18 inch	18.58	8.65	5.45	101.94	95.87	0.031289	7.13	104.50	97.77	104.50	95.87	7.56	1.14	111.00	103.08	111.00	101.94
P-21	IR 15+06	IR 13+12	192.00	24 inch	53.82	22.82	12.22	95.87	85.00	0.056615	7.00	94.00	85.91	94.00	85.00	6.63	1.70	104.50	97.57	104.50	95.87
P-22	IR 13+12	IR 12+70	42.00	30 inch	60.04	22.82	5.95	85.00	84.10	0.021429	6.40	93.00	86.22	93.00	84.10	6.50	1.63	94.00	86.63	94.00	85.00
P-23	IR 12+70	IR 12+00	69.00	30 inch	60.47	32.03	7.47	84.10	82.60	0.021739	5.90	91.00	84.78	91.00	82.60	6.40	1.93	93.00	86.03	93.00	84.10
P-11	IR 12+00	IR 10+57	141.00	30 inch	58.62	33.68	8.04	82.60	79.72	0.020426	6.28	88.50	81.73	88.50	79.62	5.90	1.97	91.00	84.57	91.00	82.60
P-9	GC 10+12	GC 11+12	82.00	24 inch	27.37	16.22	7.78	84.00	82.80	0.014634	5.20	90.00	83.92	90.00	82.59	9.00	1.45	95.00	85.45	95.00	84.00
P-6	MH 6	MH 5	60.00	36 inch	134.50	93.00	13.27	78.62	76.18	0.040667	7.32	86.50	80.25	86.50	76.18	6.88	2.86	88.50	81.48	88.50	78.62
P-10	IR 10+57	IR 9+93	71.50	36 inch	116.19	35.51	6.32	79.62	77.45	0.030350	6.55	87.00	80.16	87.00	77.35	5.88	1.94	88.50	81.56	88.50	79.62
P-8	GC 11+12	IR 9+93	117.00	24 inch	47.87	16.22	5.90	82.59	77.35	0.044786	7.65	87.00	80.16	87.00	77.35	5.41	1.45	90.00	84.04	90.00	82.59
P-5	MH 5	MH 4	57.00	36 inch	115.86	93.00	13.16	76.18	74.46	0.030175	7.54	85.00	79.14	85.00	74.21	7.32	4.07	86.50	80.25	86.50	76.18
P-7	IR 9+93	MH 4	82.80	36 inch	124.17	51.73	8.03	77.35	74.48	0.034662	7.52	85.00	79.14	85.00	74.21	6.65	2.34	87.00	79.69	87.00	77.35
P-1	MH 4	MH 3	196.00	36 inch	153.48	144.73	22.10	74.21	63.83	0.052959	11.17	78.00	66.25	78.00	63.83	7.79	2.98	85.00	77.19	85.00	74.21
P-2	MH 3	MH 2	335.00	36 inch	152.09	144.73	20.49	63.83	46.41	0.052000	8.59	58.00	49.88	58.00	46.41	11.17	2.98	78.00	66.81	78.00	63.83
P-3	MH 2	MH 1	126.00	42 inch	246.92	207.73	21.62	46.41	38.82	0.060238	6.68	49.00	42.30	49.00	38.82	8.09	3.47	58.00	49.88	58.00	46.41
P-4	MH 1	Outlet	67.00	42 inch	269.84	222.93	24.74	38.82	34.00	0.071940	-0.50	37.00	36.88	37.00	34.00	6.68	3.48	49.00	42.30	49.00	38.82



IR = IRVING BLVD STATIONING
CH = CHANTILLY STATIONING
P-7 = PIPE DESIGNATION BETWEEN MANHOLES
OUTLET = CONNECTION TO EXISTING CACTUS POINT STORM DRAIN

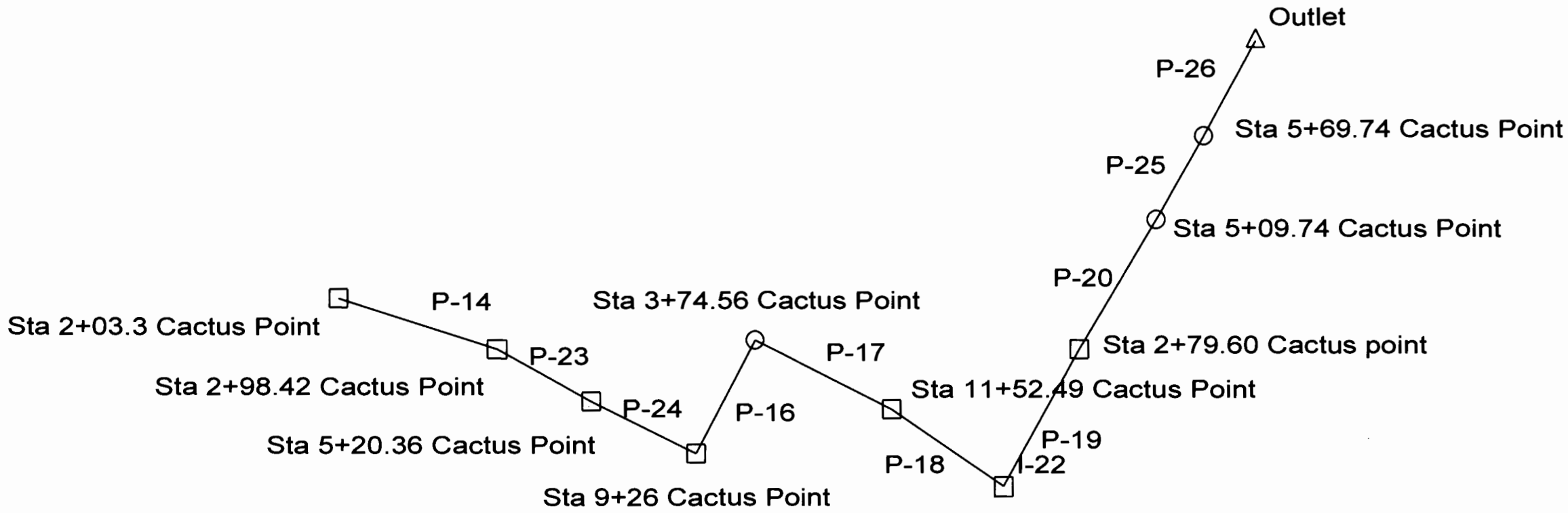
IRVING/CHANTILLY SYSTEM: FROM THE CONNECTION TO THE EXISTING CACTUS POINT SYSTEM NORTH ON CHANTILLY AND WEST ON IRVING BLVD

Combined Pipe/Node Report

Pipe	Upstream Node	Downstream Node	Length (ft)	Section Size	Capacity (cfs)	Discharge (cfs)	Average Velocity (ft/s)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Constructed Slope (ft/ft)	Downstream Cover (ft)	Downstream Ground Elevation (ft)	Downstream HGL (ft)	Downstream Rim Elevation (ft)	Downstream Sump Elevation (ft)	Upstream Cover (ft)	Upstream Depth (ft)	Upstream Ground Elevation (ft)	Upstream HGL (ft)	Upstream Rim Elevation (ft)	Upstream Sump Elevation (ft)
P-12	IR 29+04	IR 31+00	199.00	18 inch	14.87	7.64	5.36	101.60	97.61	0.020050	7.32	106.43	98.81	106.43	97.61	6.40	1.07	109.50	102.67	109.50	101.60
P-1	IR 31+00	IR 32+85	188.00	18 inch	14.43	7.64	5.10	97.61	94.06	0.018883	5.27	100.83	95.42	100.83	94.06	7.32	1.07	106.43	98.68	106.43	97.61
P-2	IR 32+85	IR 33+48	65.00	18 inch	14.33	9.66	6.32	94.06	92.85	0.018615	4.36	98.71	94.07	98.71	92.85	5.27	1.20	100.83	95.26	100.83	94.06
P-3	IR 33+48	IR 36+75	327.00	24 inch	46.97	9.66	5.04	92.85	78.75	0.043119	6.20	86.95	80.00	86.95	78.75	3.86	1.11	98.71	93.96	98.71	92.85
P-4	IR 36+75	IR 40+00	325.00	24 inch	47.12	9.66	4.31	78.75	64.65	0.043385	6.11	Actual 72.76	66.46	Actual 72.76	64.65	6.20	1.11	86.95	79.86	86.95	78.75
P-5	IR 40+00	IR 43+31	332.00	24 inch	38.57	19.05	6.63	64.65	55.00	0.029066	8.67	60.67 65.67	61.64	60.67 65.67	55.00	6.11	1.57	ACTUAL 72.76	66.22	A 72.76	64.65
P-6	IR 43+31	CH 1+61	70.00	24 inch	24.18	22.14	7.05	55.00	54.20	0.011429	7.55	58.75 63.75	60.73	58.75 63.75	54.20	8.67	6.40	60.67 65.67	61.40	60.67 65.67	55.00
P-7	CH 1+61	CH 5+58	398.00	24 inch	18.97	22.14	7.05	54.20	51.40	0.007035	7.60	56.00 61.00	56.69	56.00 61.00	51.40	7.55	6.30	58.75 63.75	60.50	58.75 63.75	54.20
P-8	CH 5+58	CH 5+69	64.00	24 inch	19.99	22.14	7.05	51.40	50.90	0.007813	7.15	55.00 60.05	55.84	55.00 60.05	50.90	7.60	5.06	56.00 61.00	56.46	56.00 61.00	51.40
P-27	CH 5+69	Outlet	64.00	24 inch	13.56	22.14	7.05	50.90	50.67	0.003594	2.33	55.00	55.00	55.00	50.67	7.15	4.71	55.00 60.05	55.61	55.00 60.05	50.90

NOTE: RIM/GROUND ELEVATIONS FOR MANHOLES AT IR 43+31, CH 1+61, CH 5+58 AND CH 5+59 ARE SET AT ARTIFICIAL ELEVATION IN ANALYSIS TO ALLOW THAT FLOW IS NOT "LOST" FROM THE SYSTEM DUE TO SURCHARGING. ACTUAL RIM/GROUND ELEVATIONS ARE SHOWN NEXT TO ARTIFICIAL RIM ELEVATIONS.

THE PROPOSED IRVING/CHANTILLY SYSTEM CONNECTS TO THE EXISTING CACTUS POINT SYSTEM AT STA. 2+03.3



EXISTING CACTUS POINT SYSTEM

Combined Pipe/Node Report

Pipe	Upstream Node	Downstream Node	Length (ft)	Section Size	Capacity (cfs)	Discharge (cfs)	Average Velocity (ft/s)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Constructed Slope (ft/ft)	Downstream Cover (ft)	Downstream Ground Elevation (ft)	Downstream HGL (ft)	Downstream Rim Elevation (ft)	Downstream Sump Elevation (ft)	Upstream Cover (ft)	Upstream Depth (ft)	Upstream Ground Elevation (ft)	Upstream HGL (ft)	Upstream Rim Elevation (ft)	Upstream Sump Elevation (ft)
P-14	Sta 2+03.3 Cactus Point	Sta 2+98.42 Cactus Point	95.00	24 inch	47.85	50.00	15.92	150.67	146.42	0.044737	4.58	153.00	150.56	153.00	146.42	2.33	4.53	155.00	155.20	155.00	150.67
P-23	Sta 2+98.42 Cactus Point	Sta 5+20.36 Cactus Point	232.00	30 inch	83.65	87.40	17.80	146.42	136.77	0.041595	2.73	142.00	139.53	142.00	136.28	4.08	3.64	153.00	150.06	153.00	146.42
P-24	Sta 5+20.36 Cactus Point	Sta 9+26 Cactus Point	395.00	36 inch	119.35	103.60	16.90	136.28	123.63	0.032025	4.37	131.00	125.79	131.00	122.83	2.72	2.91	142.00	139.19	142.00	136.28
P-16	Sta 9+26 Cactus Point	Sta 3+74.56 Cactus Point	285.00	48 inch	181.09	154.60	14.43	122.83	118.30	0.015895	3.70	126.00	121.18	126.00	118.30	4.17	3.63	131.00	126.46	131.00	122.83
P-17	Sta 3+74.56 Cactus Point	Sta 11+52.49 Cactus Point	135.00	48 inch	180.84	154.60	12.81	118.30	116.16	0.015852	2.84	123.00	119.87	123.00	116.07	3.70	3.63	126.00	121.93	126.00	118.30
P-18	Sta 11+52.49 Cactus Point	I-22	172.00	48 inch	175.58	184.90	15.32	116.07	113.50	0.014942	3.50	121.00	117.06	121.00	113.00	2.93	3.80	123.00	119.87	123.00	116.07
P-19	I-22	Sta 2+79.60 Cactus point	184.00	48 inch	562.41	208.90	16.71	113.30	85.09	0.153315	14.91	104.00	89.66	104.00	85.09	3.70	3.87	121.00	117.17	121.00	113.00
P-20	Sta 2+79.60 Cactus point	Sta 5+09.74 Cactus Point	227.00	60 inch	271.66	275.90	15.15	85.09	82.62	0.010881	12.38	100.00	86.83	100.00	82.62	13.91	4.57	104.00	89.66	104.00	85.09
P-25	Sta 5+09.74 Cactus Point	Sta 5+69.74 Cactus Point	62.00	60 inch	600.10	275.90	20.58	82.62	71.40	0.180968	1.60	78.00	74.02	78.00	71.40	12.38	4.57	100.00	87.19	100.00	82.62
P-26	Sta 5+69.74 Cactus Point	Outlet	40.00	60 inch	263.91	275.90	14.91	71.40	70.00	0.035000	0.00	75.00	74.37	75.00	70.00	1.60	4.57	78.00	75.97	78.00	71.40

Worksheet
Worksheet for Irregular Channel

Project Description	
Worksheet	Bryan Street
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Slope	0.013300	ft/ft
Discharge	11.00	cfs

Options	
Current Roughness Method	Improved Lotter's Method
Open Channel Weighting Metho	Improved Lotter's Method
Closed Channel Weighting Meth	Horton's Method

Results		
Mannings Coefficient	0.017	
Water Surface Elevation	0.31	ft
Elevation Range	0.00 to 0.83	
Flow Area	3.8	ft²
Wetted Perimeter	25.38	ft
Top Width	24.84	ft
Actual Depth	0.31	ft
Critical Elevation	0.34	ft
Critical Slope	0.007810	ft/ft
Velocity	2.86	ft/s
Velocity Head	0.13	ft
Specific Energy	0.44	ft
Froude Number	1.28	
Flow Type	Supercritical	

Calculation Messages:
Flow is divided.

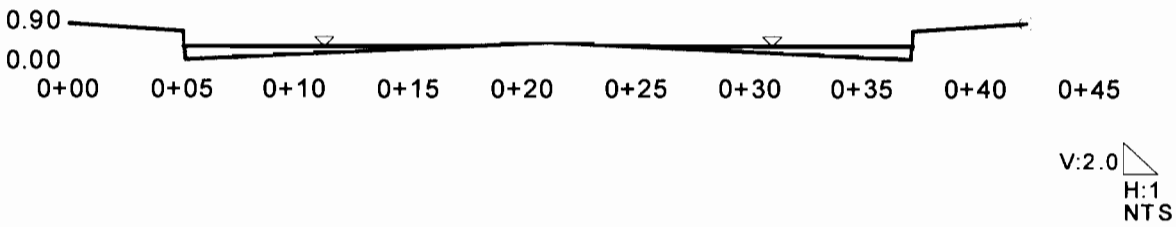
Roughness Segments		
Start Station	End Station	Mannings Coefficient
0+00	0+42	0.017

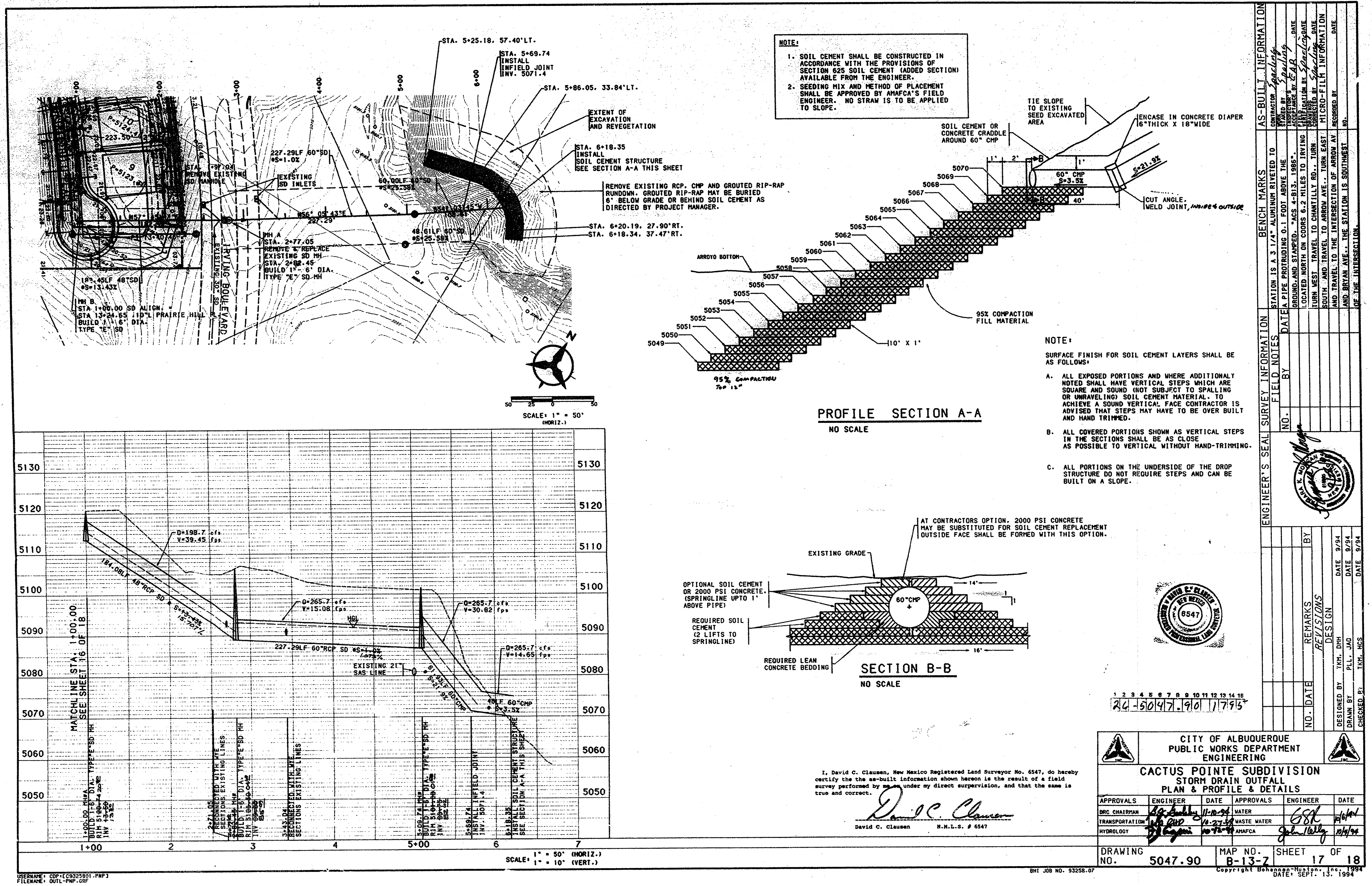
Natural Channel Points	
Station (ft)	Elevation (ft)
0+00	0.83
0+05	0.67
0+05	0.00
0+21	0.40
0+37	0.00
0+37	0.67
0+42	0.83

Cross Section
Cross Section for Irregular Channel

Project Description	
Worksheet	Bryan Street
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coefficient	0.017	
Slope	0.013300	ft/ft
Water Surface Elevation	0.31	ft
Elevation Range	0.00 to 0.83	
Discharge	11.00	cfs

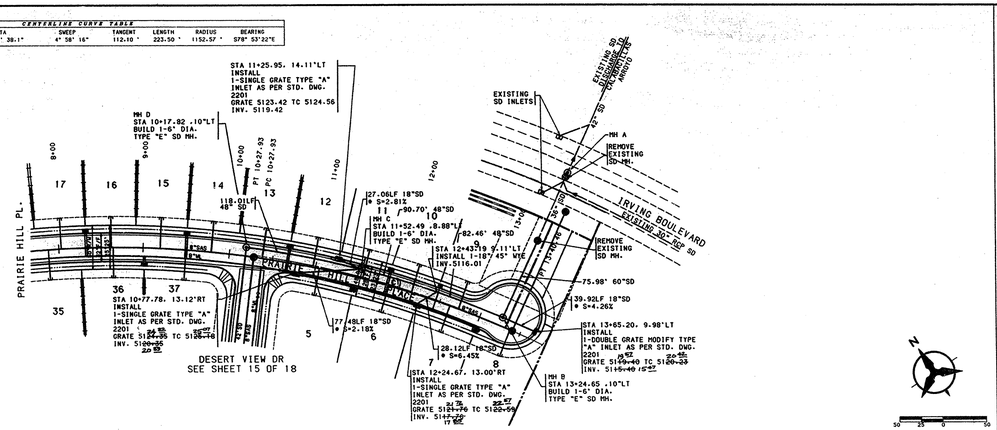


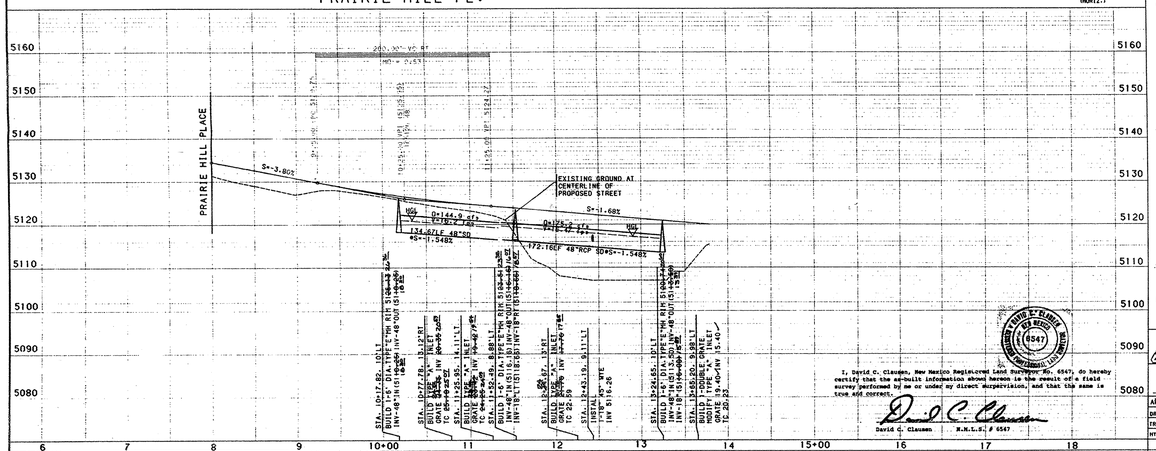


CITY OF ALBUQUERQUE

RECEIVED JAN 16 2003 HYDROLOGY SECTION

CENTERLINE CURVE TABLE							
CURVE	PI STA.	DELTA	SWEEP	TANGENT	LENGTH	RADIUS	BEARING
C1	12+15.03	11° 6' 38.1"	4° 58' 16"	112.10 '	223.50 '	1152.57 '	S78° 53'22"E





NOTES

1. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING UTILITY LOCATIONS AND NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.
2. ALL CURB RETURN RADII SHALL BE 25' TO FACE OF CURB UNLESS OTHERWISE SPECIFIED.
3. ALL CURVE DATA AND DIMENSIONS REFER TO FACE OF CURB UNLESS OTHERWISE SPECIFIED.
4. GRADE ELEVATIONS, WHERE NOTED, ARE FOR TOP OF STANDARD CURB UNLESS OTHERWISE SPECIFIED.
5. CONTRACTOR IS TO INSTALL A 4"x4"x5' POST AND END AT THE END OF EACH SANITARY SEWER SERVICE.
6. CONTRACTOR IS RESPONSIBLE FOR REPAIR AND/OR REPLACEMENT OF ALL UTILITY CONDUITS AND EXISTING LINES.
7. ANY ADDITIONAL GRADING REQUIRED TO MATCH PROPOSED STREET GRADES SHALL BE INCIDENTAL TO PAVING ITEMS.
8. CONTRACTOR SHALL PROVIDE THE INSPECTORS, (CITY AND PRIVATE) WITH THE PROPOSED HYDROSTATIC TESTING PLAN. THE PLAN MUST BE APPROVED BEFORE TESTING OPERATIONS BEGIN.
9. CONTRACTOR SHALL PARK EQUIPMENT AND VEHICLES AS NOT TO INTERFERE WITH NORMAL ACTIVITIES OF RESIDENTS OR OTHER CONTRACTORS ON SITE.
10. ANY DAMAGE TO THE EXISTING FACILITIES (CURB AND GUTTER, PAVEMENT, CONDUITS, LANDSCAPING, UTILITY LINES, ETC.) DURING CONSTRUCTION SHALL BE REPLACED AT THE CONTRACTORS EXPENSE.
11. REMOVAL OF THE EXISTING CURB AND GUTTER SHALL BE AS PER COA STD. DWG. 2415 (SAWCUT ONLY).
12. WHEEL CHAIR RAMPS SHALL BE CONSTRUCTED PRIOR TO ACCEPTANCE OF CURB AND GUTTER.

I, David C. Clausen, New Mexico Registered Land Surveyor No. 6547, do hereby certify that the as-built information shown hereon is the result of a field survey performed by me or under my direct surpervision, and that the same is true and correct.

David C. Clausen N.M.L.S. # 6547

AS-BUILT INFORMATION	
BENCH MARKS	
STATION IS A 3 1/4" ALUMINUM RIVETED TO	
A PIPE PROTRUDING 0.1 FOOT ABOVE THE	
GROUND AND STAMPED "2405 4-813." 1985	
STATION IS A 3 1/4" ALUMINUM ROD, FLUSH	
WITH WEST TRAVEL TO CHANTILLY RD., TURN	
SOUTH AND TRAVEL TO ARROW AVE., TURN EAST	
AND TRAVEL TO THE INTERSECTION OF ARROW AV	
AND BRYAN AVE., THE STATION IS SOUTHWEST	
OF THE INTERSECTION. USD 1929 S1593.351	

ENGINEER'S SEAL	SURVEY INFORMATION		
	NO.	DATE	BY
	FIELD NOTES		

REVISIONS			
NO.	DATE	REMARKS	BY
		AS-BUILTS	
		REVISIONS	
DESIGNED BY	TKH, DPH	DATE 9/94	
DRAWN BY	BS, JAD, PLL	DATE 9/94	
CHECKED BY	TKH	DATE 9/94	

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
20-5047.90 11/6/95

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING

CACTUS POINTE SUBDIVISION
STORM DRAIN PLAN & PROFILE
PRAIRIE HILL PL. STA 8+00.0-13+78.66

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

DRAWING NO. 5047.90 | MAP NO. B-13-Z | SHEET 16 OF 18

BHI JOB NO. 932580-00

DATE: SEPT. 13, 1994

USERNAME= CDP(C932580).PWP
FILENAME= PRAIRIE-SD.DGN

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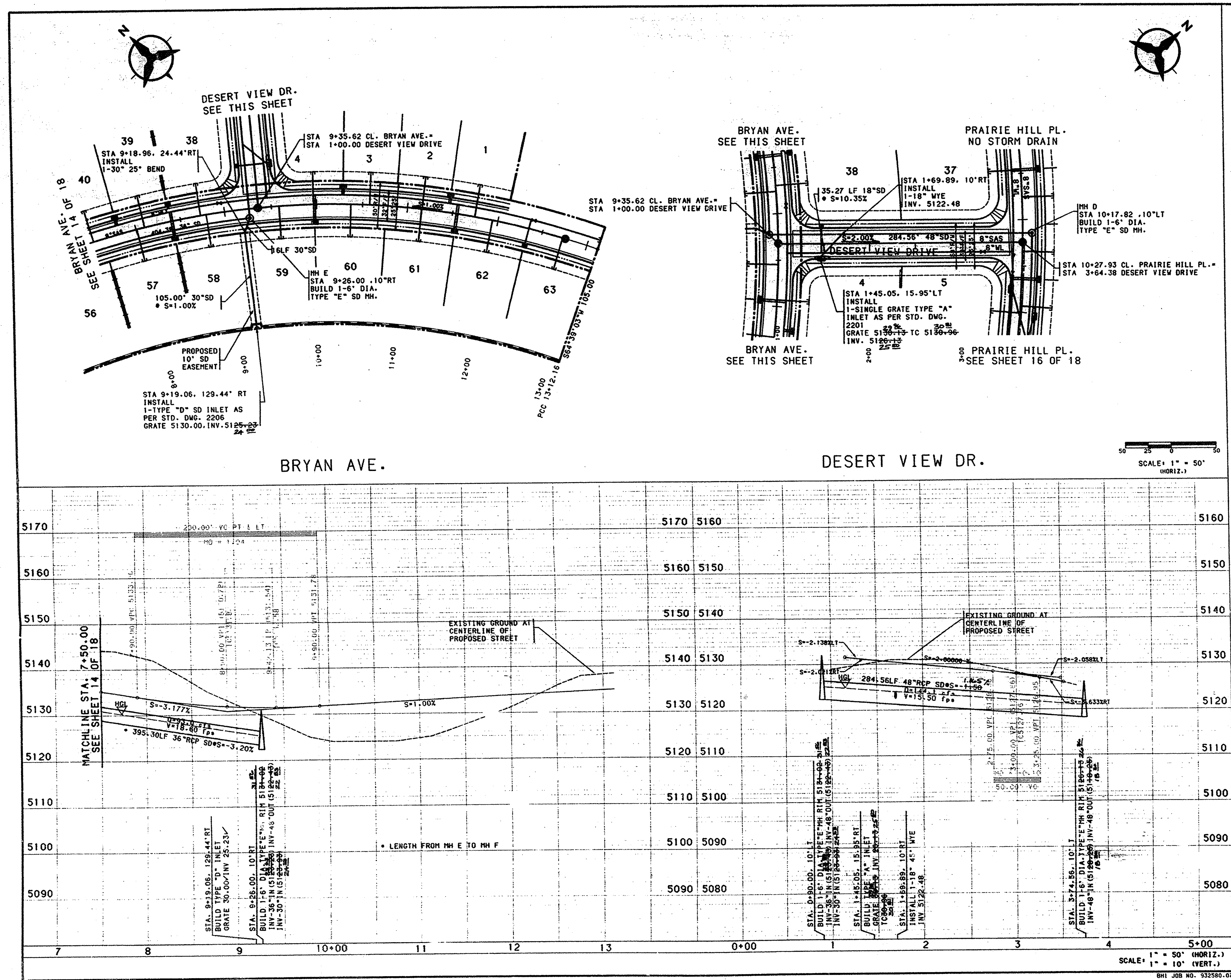
CITY OF ALBUQUERQUE

RECEIVED JAN 16 2003 HYDROLOGY SECTION

C



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AS-BUILT INFORMATION

CONTRACTOR Spading
WORK STAKED BY Spading
INSPECTOR'S ACCEPTANCE BY EAB
FIELD VERIFICATION BY Spading
MICRO-FILM INFORMATION

BENCH MARKS

STATION IS A 3 1/4" ALUMINUM RIVETED TO A PIPE PROTRUDING 0.1 FOOT ABOVE THE GROUND AND STAMPED. "ACS 4-B13. 1986". LOCATED NORTH ON COORS 6.2 MILES TO IRVING. TURN WEST TRAVEL TO CHANTILLY RD.. TURN EAST. SOUTH AND TRAVEL TO ARROW AVE.. THE STATION IS SOUTHWEST. AND BRYAN AVE.. THE STATION IS SOUTHWEST OF THE INTERSECTION. (SLD 1929) 5169.551

SURVEY INFORMATION — FIELD NOTES

NO.	BY	DATE

ENGINEER'S SEAL

I, David C. Clausen, New Mexico Registered Land Surveyor No. 6547, do hereby certify that the as-built information shown hereon is the result of a field survey performed by me or under my direct supervision, and that the same is true and correct.

David C. Clausen
N.M.L.S. # 6547

NO.	DATE	REVISIONS	BY
		DESIGN	

DESIGNED BY TKM,DMH DATE 9/94
DRAWN BY BS,JAD,PL DATE 9/94
CHECKED BY TKM DATE 9/94

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING

CACTUS POINTE SUBDIVISION
STORM DRAIN PLAN & PROFILE
BRYAN AVENUE & DESERT VIEW DRIVE

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
DRC CHAIRMAN	[signature]	11-10-94	WATER	[signature]	10/6/94
TRANSPORTATION	[signature]	10-27-94	WASTE WATER		
HYDROLOGY	[signature]	10-12-94			

DRAWING NO. 5047.90 | MAP NO. B-13-Z | SHEET 15 OF 18

BHI JOB NO. 932580.07

DATE: SEPT.13.1994

USERNAME: COP(EC9325801.PNP)
FILENAME: BRYAN2-SD.GRF

2C-5047.90 1595

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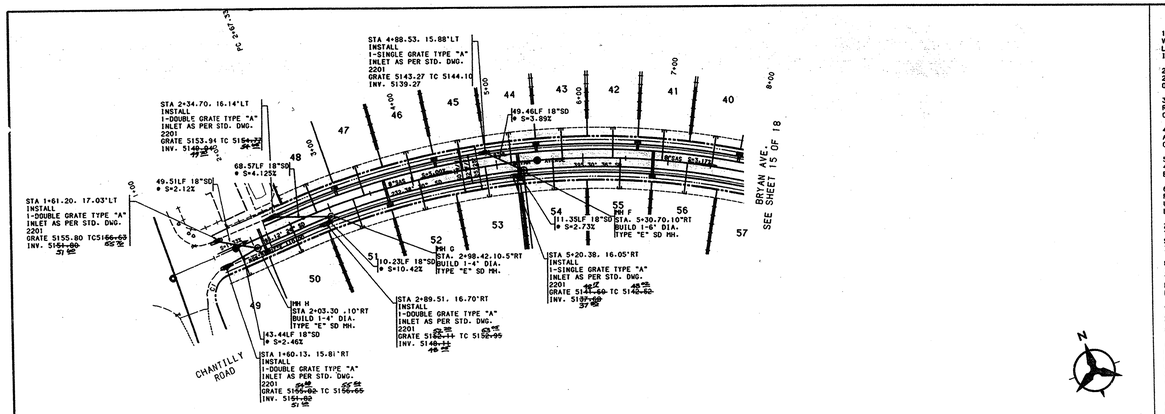
CITY OF ALBUQUERQUE

C



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ENGINEER'S SEAL SURVEY INFORMATION

FIELD NOTES PAGE NO. BY

BENCH MARKS

AS-BUILT INFORMATION

CONTRACTOR _____ DATE _____
SUPERINTENDENT _____ DATE _____
AS-BUILT INFORMATION PROVIDED BY _____ DATE _____
AS-BUILT INFORMATION CORRECTED BY _____ DATE _____
RECEIVED BY _____ DATE _____

NO.	DATE	REMARKS	BY
		REVISIONS	
		DESIGN	
		DESIGNED BY TKM/DPM	DATE 9/94
		DRAWN BY RS/JS/TLL	DATE 9/94
		CHECKED BY TKM	DATE 9/94

I, David C. Clausen, New Mexico Registered Land Surveyor No. 6547, do hereby certify that the as-built information shown hereon is the result of a field survey performed by me or under my direct supervision, and that the same is true and correct.

David C. Clausen
N.M.L.S. # 6547

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING

CACTUS POINTE SUBDIVISION
STORM DRAIN PLAN & PROFILE
BRYAN AVE. STA 1+00 - 7+50.00

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

DRAWING NO. 5047.90 | MAP NO. B-13-Z | SHEET 14 OF 18

DATE: SEPT. 13, 1994

USERNAME= CDP1(C9325801.PWP)
FILENAME= BRYAN1-SD.GRF

BHI JOB NO. 932580.07

2C-50447.190 11/19/96

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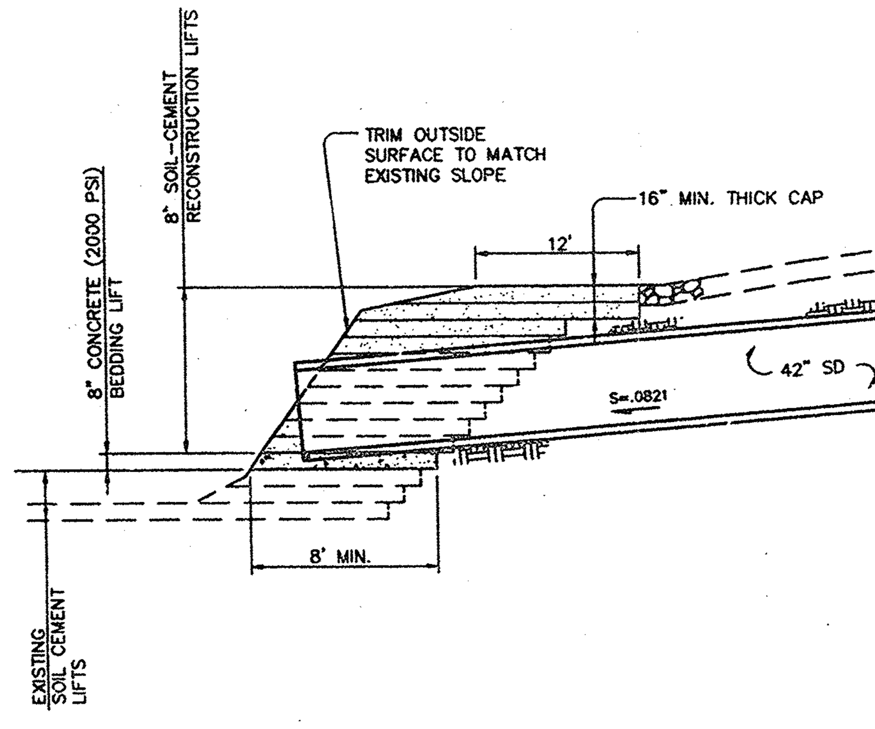
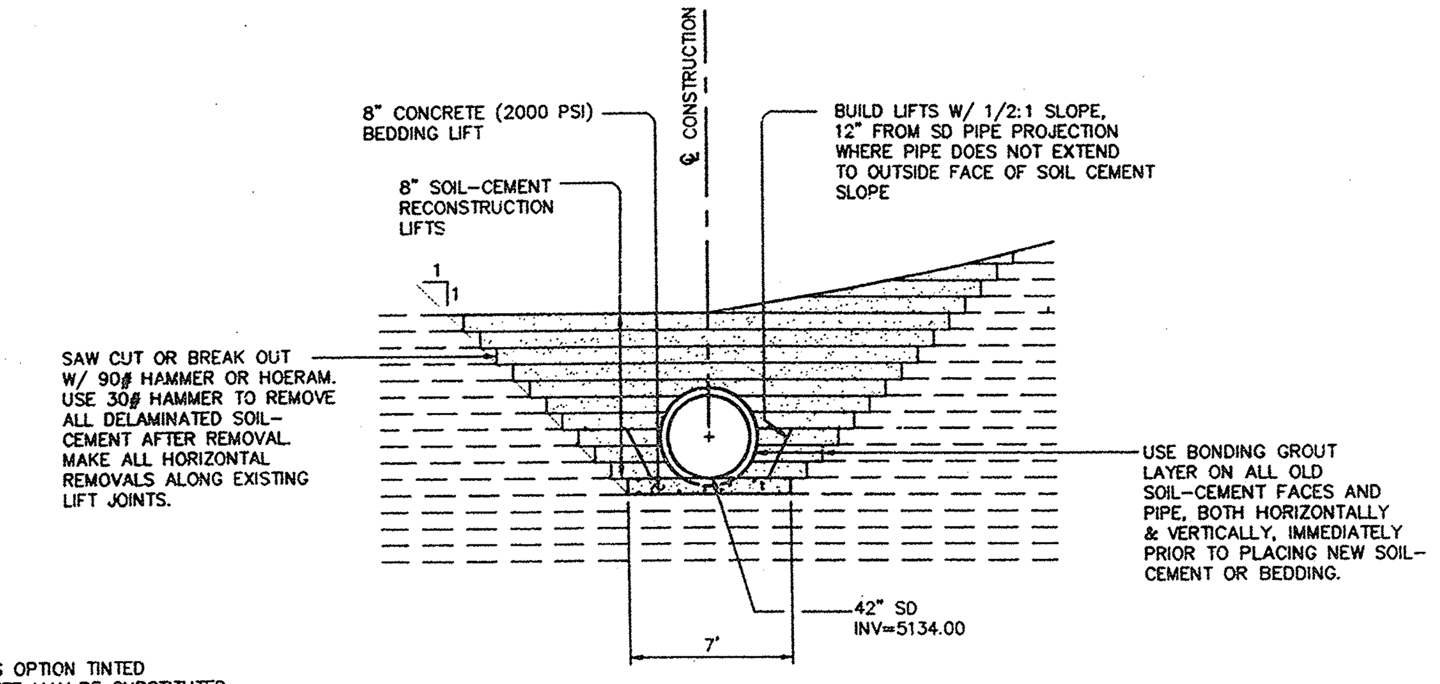
CITY OF ALBUQUERQUE

RECEIVED
JAN 16 2003
HYDROLOGY SECTION



NOTE: AT CONTRACTOR'S OPTION TINTED 2000 PSI CONCRETE MAY BE SUBSTITUTED FOR SOIL CEMENT REPLACEMENT. USE 1# DAVIS "SAN DIEGO BUFF" PER SACK OF CEMENT.

SECTION AT OUTLET
SCALE: 1"=5'

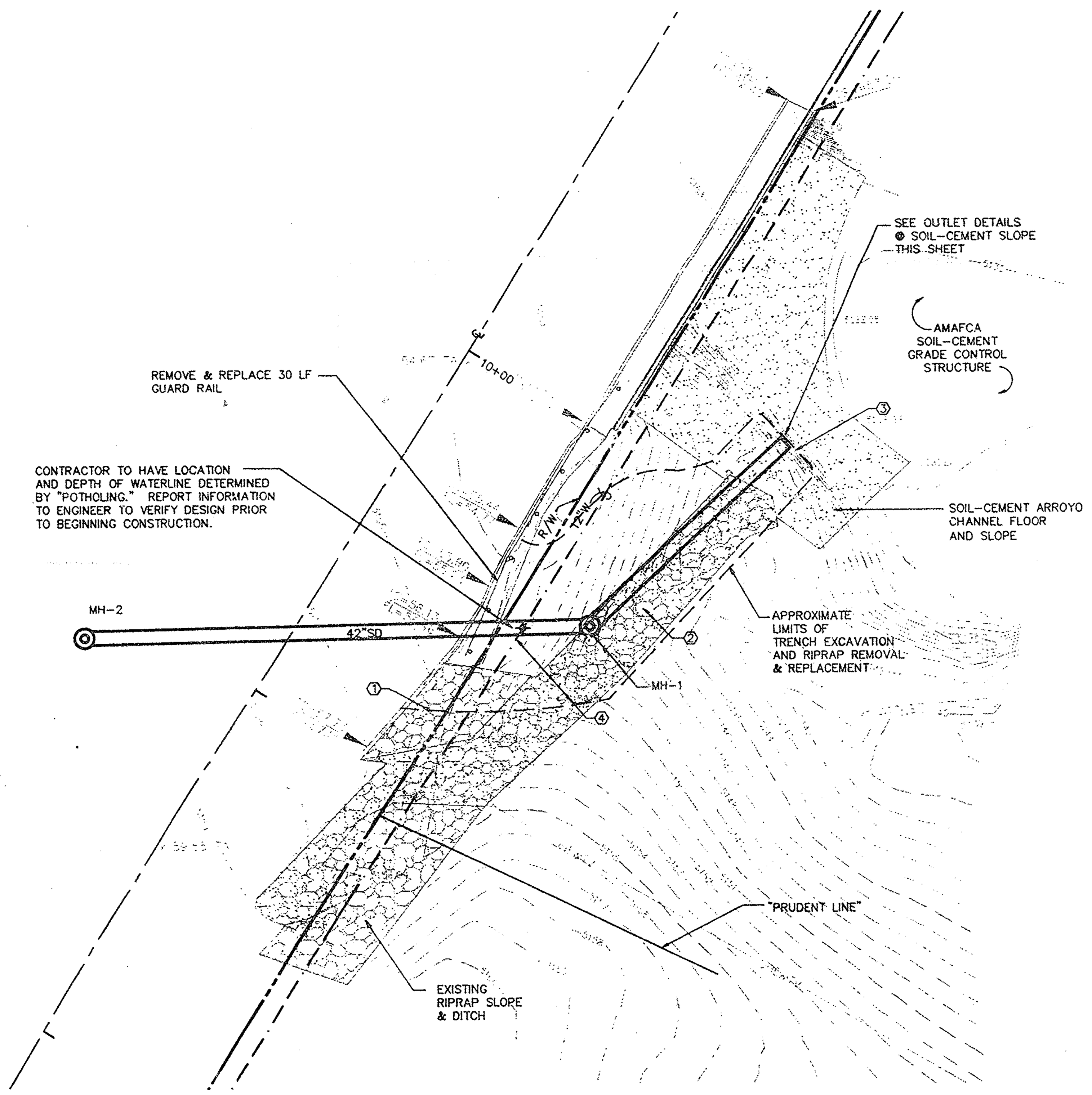


8" CONCRETE (2000 PSI) BEDDING LIFT
8" SOIL-CEMENT RECONSTRUCTION LIFTS
℄ CONSTRUCTION
BUILD LIFTS W/ 1/2:1 SLOPE, 12" FROM SD PIPE PROJECTION WHERE PIPE DOES NOT EXTEND TO OUTSIDE FACE OF SOIL CEMENT SLOPE
SAW CUT OR BREAK OUT W/ 90# HAMMER OR HOERAM. USE 30# HAMMER TO REMOVE ALL DELAMINATED SOIL-CEMENT AFTER REMOVAL. MAKE ALL HORIZONTAL REMOVALS ALONG EXISTING LIFT JOINTS.
USE BONDING GROUT LAYER ON ALL OLD SOIL-CEMENT FACES AND PIPE, BOTH HORIZONTALLY & VERTICALLY, IMMEDIATELY PRIOR TO PLACING NEW SOIL-CEMENT OR BEDDING.
42" SD
INV=5134.00
7'

END ELEVATION AT OUTLET
SCALE: 1"=5'

NOTES

1. NOTIFY AMAFCA 2 WORKING DAYS PRIOR TO EACH OCCURENCE OF GRADING OR CONSTRUCTION IN THE AMAFCA RIGHT-OF-WAY.
2. NO CONSTRUCTION SHALL TAKE PLACE WITHIN THE ARROYO BETWEEN MAY 15 AND SEPTEMBER 15 OF ANY YEAR. ANY WORK STARTED PRIOR TO MAY 15 SHALL BE COMPLETED BY MAY 15.



SEE OUTLET DETAILS @ SOIL-CEMENT SLOPE THIS SHEET
AMAFCA SOIL-CEMENT GRADE CONTROL STRUCTURE
REMOVE & REPLACE 30 LF GUARD RAIL
CONTRACTOR TO HAVE LOCATION AND DEPTH OF WATERLINE DETERMINED BY "POTHOLING." REPORT INFORMATION TO ENGINEER TO VERIFY DESIGN PRIOR TO BEGINNING CONSTRUCTION.
SOIL-CEMENT ARROYO CHANNEL FLOOR AND SLOPE
MH-2
42"SD
MH-1
APPROXIMATE LIMITS OF TRENCH EXCAVATION AND RIPRAP REMOVAL & REPLACEMENT
"PRUDENT LINE"
EXISTING RIPRAP SLOPE & DITCH

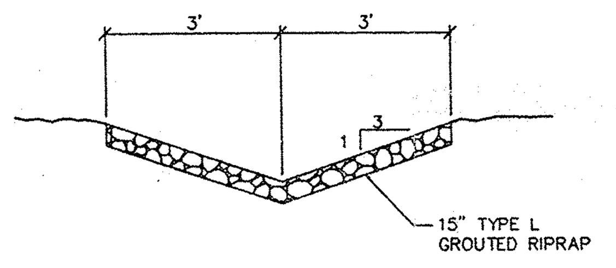
PLAN OF OUTLET
SCALE: 1"=20'

KEYED NOTES ⬡

1. REMOVE, STOCKPILE, AND REPLACE 35 SY LOOSE RIPRAP.
2. REMOVE & DISPOSE 150 SY GROUTED RIPRAP. RECONSTRUCT 150 SY GROUTED RIPRAP---SEE DETAIL THIS SHEET.
3. REMOVE 41 CY SOIL-CEMENT. CONSTRUCT 1.5 CY BEDDING CONCRETE LIFT. CONSTRUCT 36 CY SOIL-CEMENT REPLACEMENT LIFTS.
4. CONTRACTOR SHALL SUPPORT AND ANCHOR WATERLINE DURING CONSTRUCTION. NOTIFY BOB GAY, NEW MEXICO UTILITIES (898-2661) 48 HOURS PRIOR TO EXPOSING WATERLINE.

LEGEND

- SOIL-CEMENT CHANNEL SLOPE
- LOOSE RIPRAP
- GROUTED RIPRAP
- GUARD RAIL



GROUTED RIPRAP DITCH
NO SCALE

AS-BUILT INFORMATION
SURVEY INFORMATION — FIELD NOTES — NO. — BY — DATE
BENCH MARKS — "BLACK NO. 2" ELEV. = 5213.93
ENGINEER'S SEAL — 10-10-94
REVISIONS — NO. — DATE — REMARKS — BY
DESIGN — DESIGNED BY TOI DATE 6/94 — DRAWN BY ANW DATE 6/94 — CHECKED BY TOI DATE 6/94

26-5022.90 1295

ISAACSON & ARFMAN, P.A.
Consulting Engineering Associates
128 Monroe Street N.E.
Albuquerque New Mexico
779DTL4.DWGanw 10/19/94

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

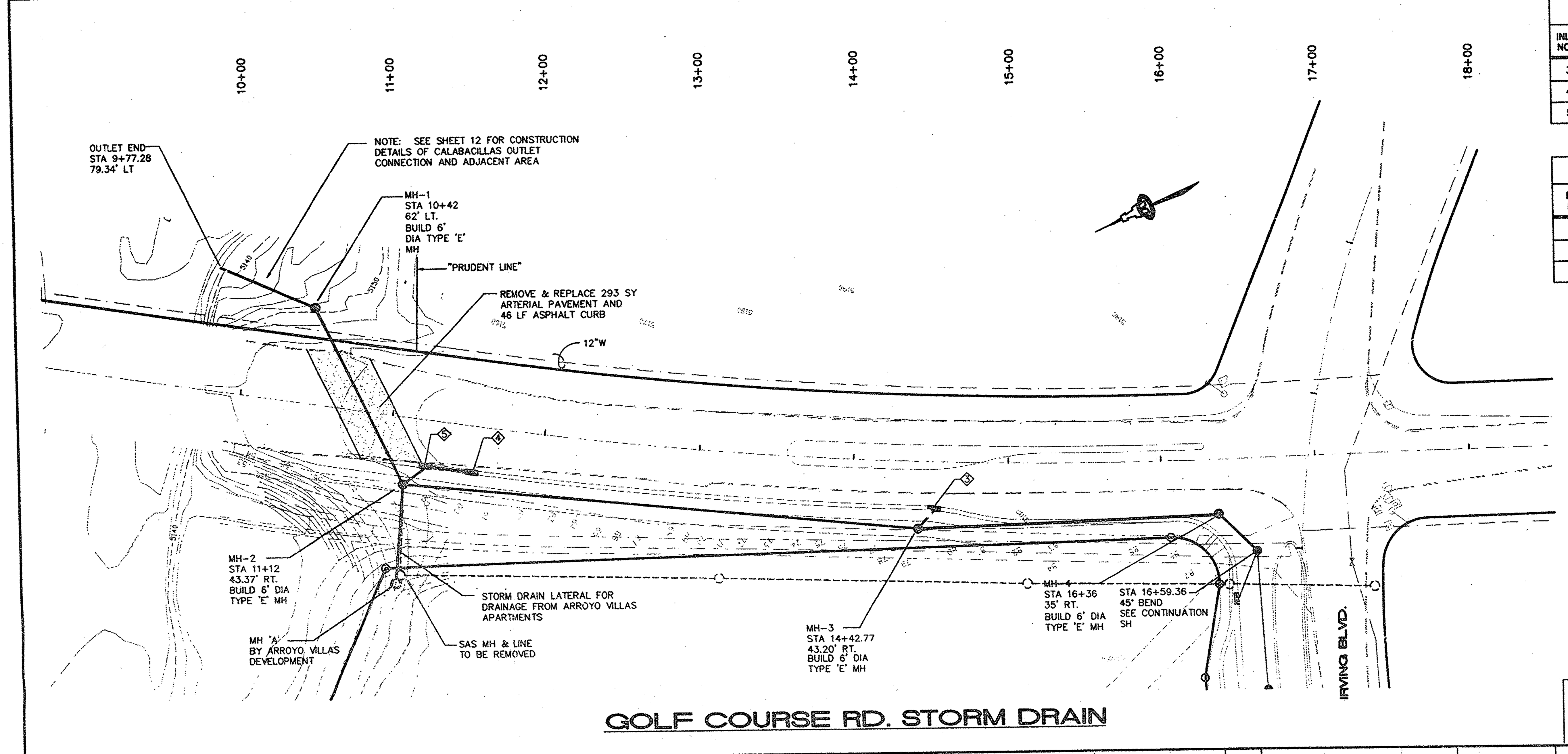
TITLE: **ARROYO VILLAS APARTMENTS**
CALABACILLAS ARROYO
STORM DRAIN OUTFALL DETAILS

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
DRC CHAIRMAN	[signature]	11-15-94	WATER	NA RWK	10-18-94
TRANSPORTATION	N/A [signature]	10-20-94	WASTE WATER	N/A RWK	10-18-94
HYDROLOGY	[signature]	10-25-94	AMAFCA	[signature]	10/11/94

PROJECT NO.	MAP NO.	SHEET	OF
5022.90	B-12	12	20

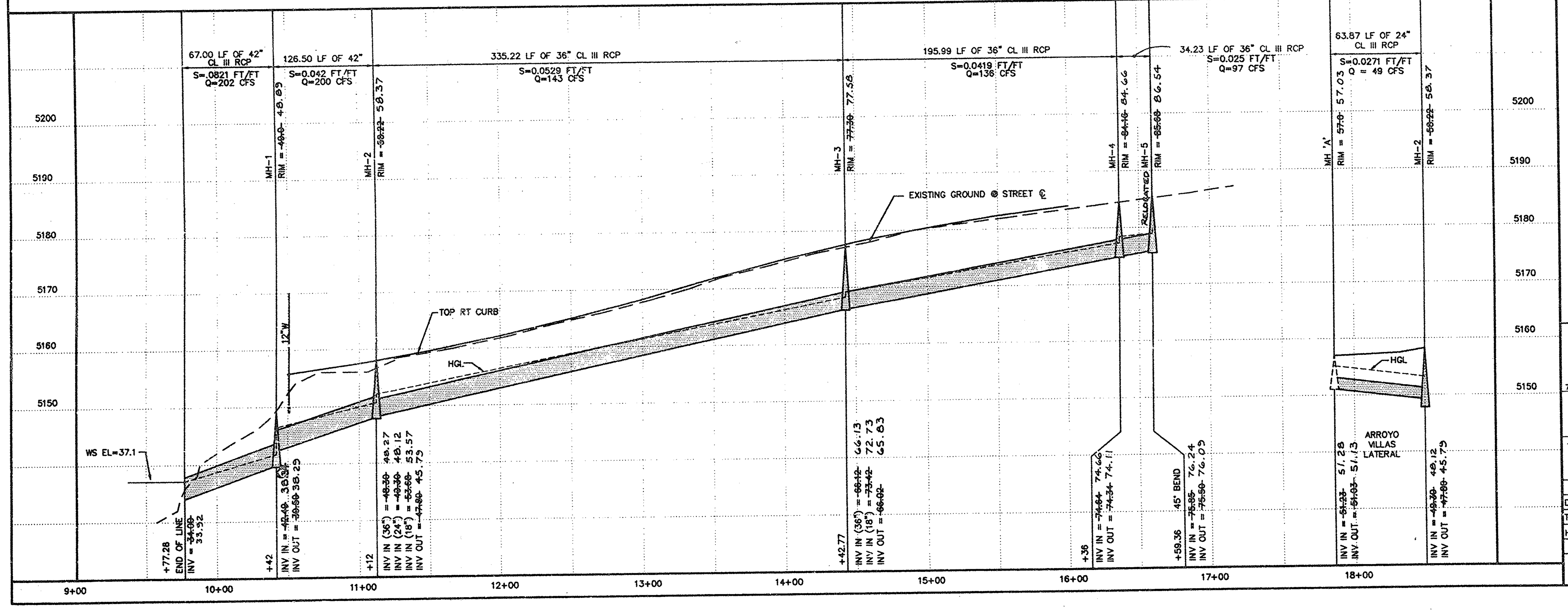
RECEIVED JAN 16 2003 HYDROLOGY SECTION

CITY OF ALBUQUERQUE



NOTE: SEE SHEET 12 FOR CONSTRUCTION DETAILS OF CALABACILLAS OUTLET CONNECTION AND ADJACENT AREA
OUTLET END STA 9+77.28 79.34' LT
MH-1 STA 10+42 62' LT. BUILD 6' DIA TYPE 'E' MH
"PRUDENT LINE"
REMOVE & REPLACE 293 SY ARTERIAL PAVEMENT AND 46 LF ASPHALT CURB
MH-2 STA 11+12 43.37' RT. BUILD 6' DIA TYPE 'E' MH
STORM DRAIN LATERAL FOR DRAINAGE FROM ARROYO VILLAS APARTMENTS
MH 'A' BY ARROYO VILLAS DEVELOPMENT
SAS MH & LINE TO BE REMOVED
MH-3 STA 14+42.77 43.20' RT. BUILD 6' DIA TYPE 'E' MH
MH-4 STA 16+36 35' RT. BUILD 6' DIA TYPE 'E' MH
STA 16+59.36 45° BEND SEE CONTINUATION SH
IRVING BLVD.
GOLF COURSE RD. STORM DRAIN

SCALES:
1"=40' HOR.
1"=10' VERT.



67.00 LF OF 42" CL III RCP S=.0821 FT/FT Q=202 CFS
126.50 LF OF 42" S=0.042 FT/FT Q=200 CFS
335.22 LF OF 36" CL III RCP S=0.0529 FT/FT Q=143 CFS
195.99 LF OF 36" CL III RCP S=0.0419 FT/FT Q=136 CFS
34.23 LF OF 36" CL III RCP S=0.025 FT/FT Q=97 CFS
63.87 LF OF 24" CL III RCP S=0.0271 FT/FT Q = 49 CFS
EXISTING GROUND @ STREET ℄
TOP RT CURB
HGL
WS EL=37.1
ARROYO VILLAS LATERAL
45° BEND

STORM DRAIN INLET INFORMATION

INLET NO. ◇	STATION	INLET TYPE	TOP CURB ELEVATION	TOP GRATE ELEVATION	INVERT IN	INVERT OUT
3	14+53	'A'	77.73 ~~77.55~~	76.78 ~~76.65~~	--	74.28 ~~73.90~~
4	11+49	'A'	59.54 ~~59.58~~	58.55 ~~58.68~~	--	55.74 ~~56.08~~
5	11+25	2C	58.43 ~~58.52~~	57.27 ~~57.62~~	54.52	54.47 ~~54.22~~

CONNECTOR PIPE INFORMATION

FROM INLET NO. ◇	DIA (IN)	LENGTH (FT)	SLOPE
3	18	16	0.030
4	18	21	0.050
5	18	18	0.030

AS-BUILT INFORMATION
CONTRACTOR J.R. Hale, Inc.
WORK STAKED BY Surv-Tek
INSPECTOR'S ACCEPTANCE BY [signature] DATE 10-26-95
FIELD VERIFIED BY Surv-Tek
MICRO-FILM INFORMATION

BENCH MARKS
"BLACK NO. 2"
ELEV. = 5213.93

SURVEY INFORMATION
NO. | FIELD NOTES | BY | DATE

ENGINEER'S SEAL
4.27.94

NO.	DATE	REVISIONS	REMARKS	BY
		DESIGN	DATE 6/94	

DESIGNED BY TOI
DRAWN BY ANW
CHECKED BY TOI

26-5022.90 11 95

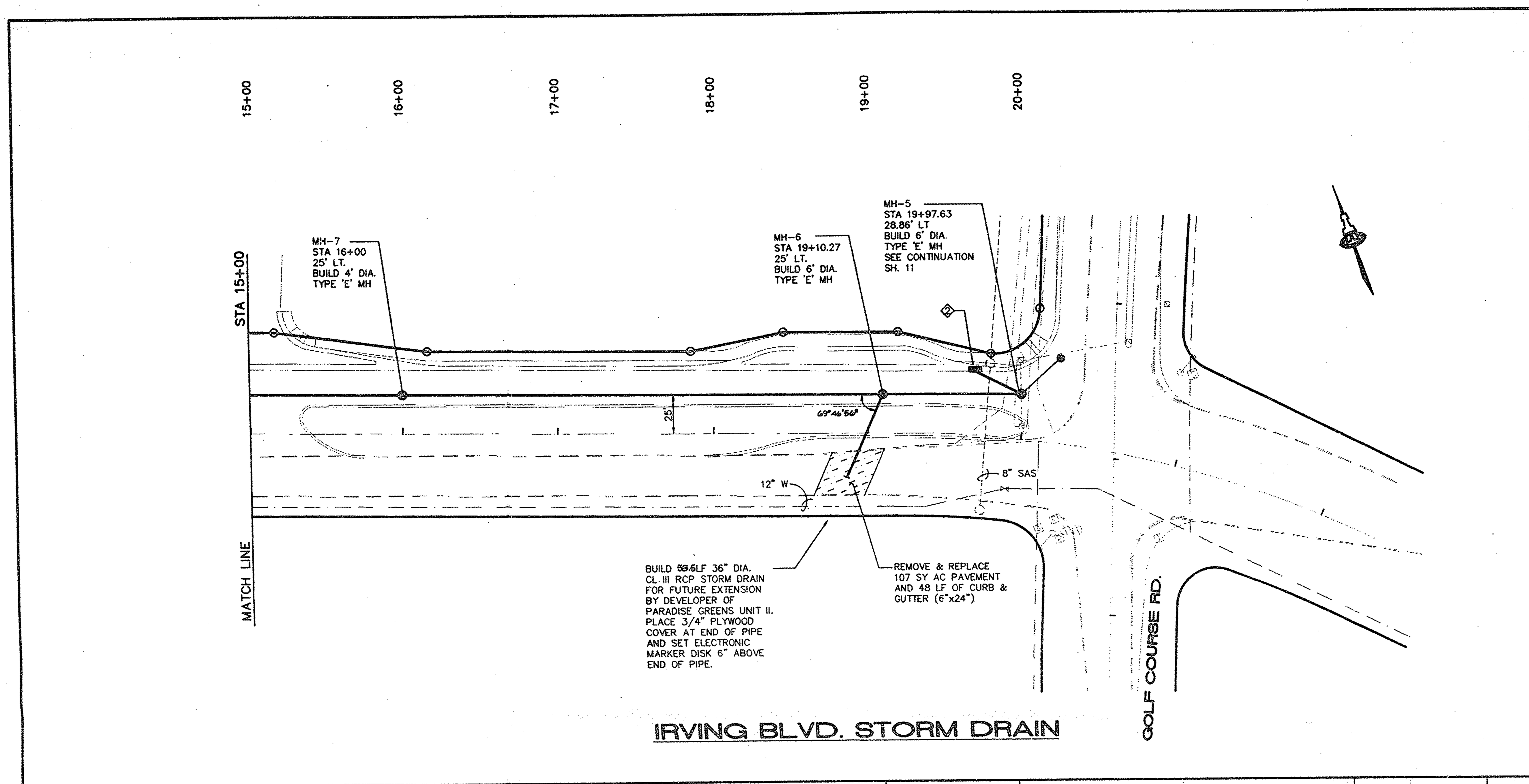
ISAACSON & ARFMAN, P.A.
Consulting Engineering Associates
128 Monroe Street N.E.
Albuquerque New Mexico
770UTL9.DWGanw 9/22/94

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

TITLE: **ARROYO VILLAS APARTMENTS**
GOLF COURSE RD. STORM DRAIN

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
DRC CHAIRMAN	[signature]	11-15-94	WATER	N/A RWK	10-18-94
TRANSPORTATION	n/a CHO	10-20-94	WASTE WATER	N/A RWK	10-18-94
HYDROLOGY	[signature]	10-21-94			

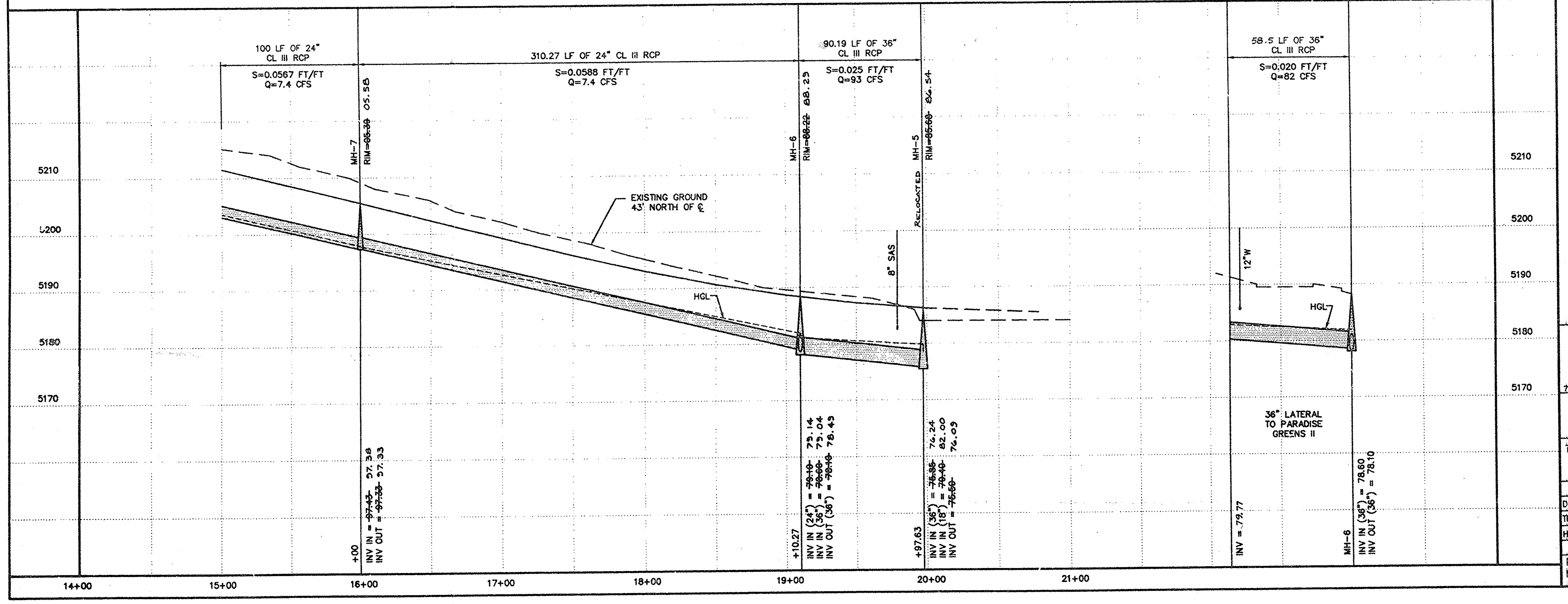
PROJECT NO. 5022.90 | MAP NO. B-12 | SHEET 11 OF 20


15+00
16+00
17+00
18+00
19+00
20+00
STA 15+00
MATCH LINE
MH-7
STA 16+00
25' LT.
BUILD 4' DIA.
TYPE 'E' MH
MH-6
STA 19+10.27
25' LT.
BUILD 6' DIA.
TYPE 'E' MH
MH-5
STA 19+97.63
28.86' LT
BUILD 6' DIA.
TYPE 'E' MH
SEE CONTINUATION
SH. 11
8" SAS
12" W
BUILD 58.5LF 36" DIA.
CL III RCP STORM DRAIN
FOR FUTURE EXTENSION
BY DEVELOPER OF
PARADISE GREENS UNIT II.
PLACE 3/4" PLYWOOD
COVER AT END OF PIPE
AND SET ELECTRONIC
MARKER DISK 6" ABOVE
END OF PIPE.
REMOVE & REPLACE
107 SY AC PAVEMENT
AND 48 LF OF CURB &
GUTTER (6"x24")
GOLF COURSE RD.
IRVING BLVD. STORM DRAIN

STORM DRAIN INLET INFORMATION						
INLET NO. ◇	STATION	INLET TYPE	TOP CURB ELEVATION	TOP GRATE ELEVATION	INVERT IN	INVERT OUT
2	19+70	'A'	~~86.56~~ 86.45	~~85.66~~ 85.58	--	~~80.00~~ 82.48

CONNECTOR PIPE INFORMATION			
FROM INLET NO. ◇	DIA (IN)	LENGTH (FT)	SLOPE (FT/FT)
2	18	30	0.020

SCALES:
1"=40' HOR.
1"=10' VERT.


100 LF OF 24" CL III RCP
S=0.0567 FT/FT
Q=7.4 CFS
310.27 LF OF 24" CL III RCP
S=0.0588 FT/FT
Q=7.4 CFS
90.19 LF OF 36" CL III RCP
S=0.025 FT/FT
Q=93 CFS
58.5 LF OF 36" CL III RCP
S=0.020 FT/FT
Q=82 CFS
EXISTING GROUND
43' NORTH OF ℄
HGL
8" SAS
12"W
36" LATERAL
TO PARADISE
GREENS II
5210
5200
5190
5180
5170
14+00
15+00
16+00
17+00
18+00
19+00
20+00
21+00

26-5022.90 1/096

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128 Monroe Street N.E.
Albuquerque New Mexico

77SUTLB.DWGenw VIEW: 2 9/22/94

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

TITLE: **ARROYO VILLAS APARTMENTS**
IRVING BLVD. STORM DRAIN

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
DRC CHAIRMAN	[signature]	11-15-94	WATER	N/A RWK	10-18-94
TRANSPORTATION	N/A [signature]	10-20-94	WASTE WATER	N/A RWK	10-18-94
HYDROLOGY	[signature]	10-21-94			

PROJECT NO. 5022.90 | MAP NO. B-12 | SHEET 10 OF 20

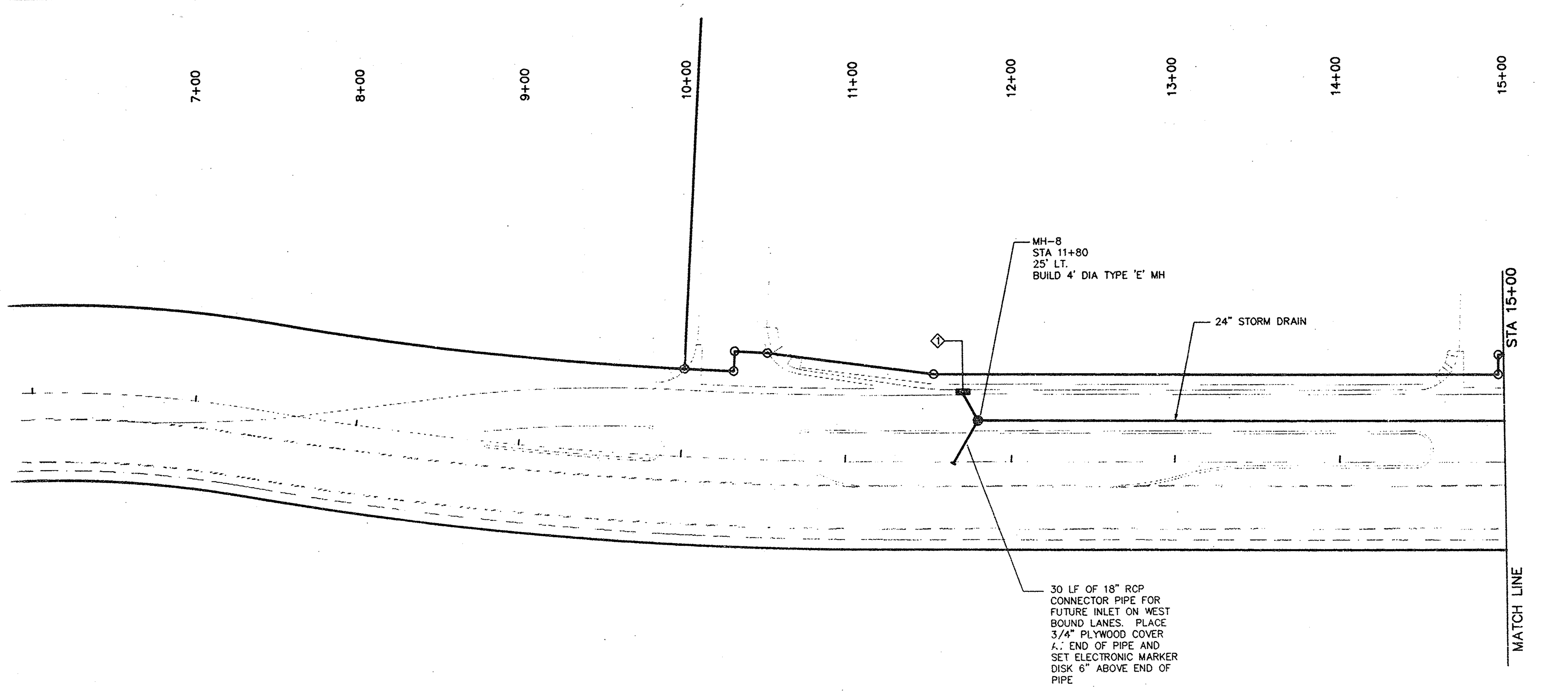
AS-BUILT INFORMATION
CONTRACTOR J.B. Hayes, Inc.

BENCH MARKS
"BLACK NO. 2"
ELEV. = 5213.93

SURVEY INFORMATION
FIELD NOTES
NO. BY DATE

ENGINEER'S SEAL

REVISIONS
NO. DATE REMARKS BY
DESIGNED BY TDI DATE 6/94
DRAWN BY KNW DATE 6/94
CHECKED BY TDI DATE 6/94


7+00
8+00
9+00
10+00
11+00
12+00
13+00
14+00
15+00
MH-8
STA 11+80
25' LT.
BUILD 4' DIA TYPE "E" MH
24" STORM DRAIN
STA 15+00
MATCH LINE
30 LF OF 18" RCP CONNECTOR PIPE FOR FUTURE INLET ON WEST BOUND LANES. PLACE 3/4" PLYWOOD COVER A. END OF PIPE AND SET ELECTRONIC MARKER DISK 6" ABOVE END OF PIPE

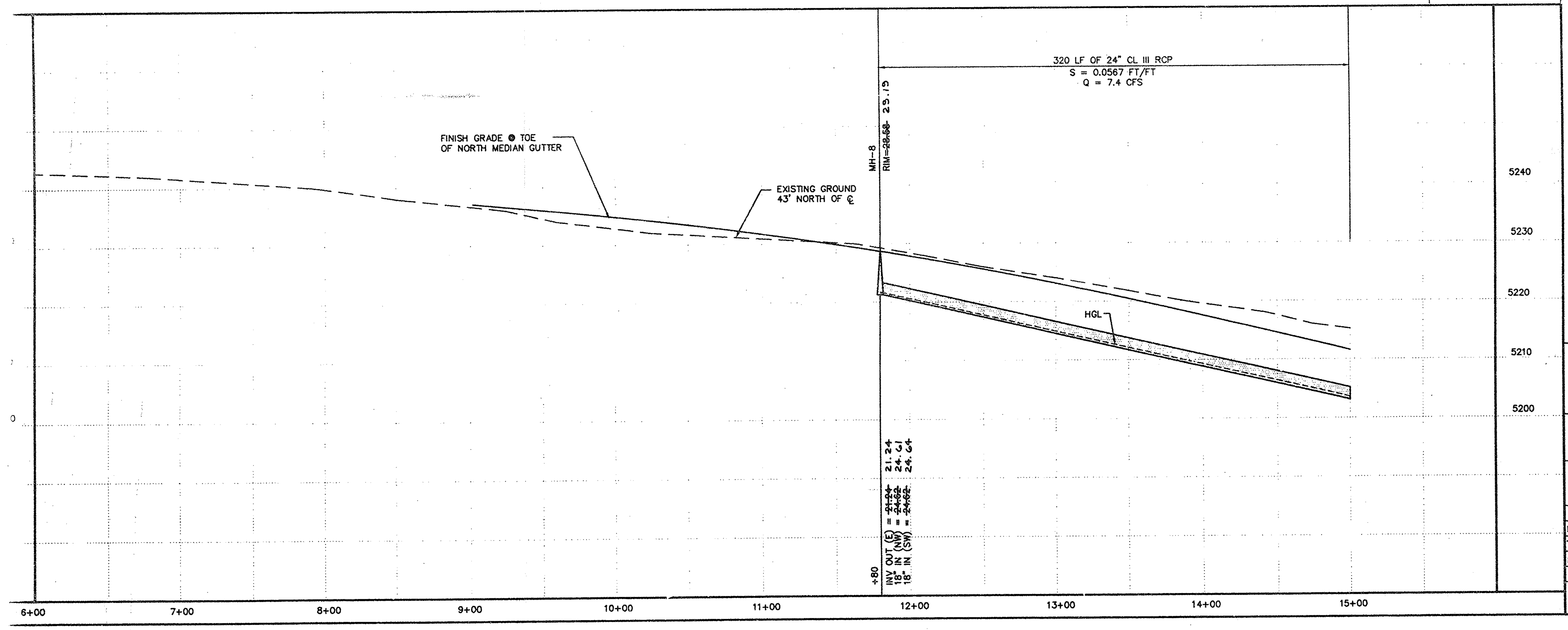
STORM DRAIN INLET INFORMATION						
INLET NO. ◇	STATION	INLET TYPE	TOP CURB ELEVATION	TOP GRATE ELEVATION	INVERT IN	INVERT OUT
1	11+71	'A'	~~29.17~~ 29.80	~~28.27~~ 28.88	--	~~25.16~~ 25.51

CONNECTOR PIPE INFORMATION			
FROM INLET NO. ◇	DIA (IN)	LENGTH (FT)	SLOPE (FT/FT)
1	18	18	0.030
*	18	30	0.030

*MH-7

IRVING BLVD. STORM DRAIN

SCALES:
1"=40' HOR.
1"=10' VERT.



GENERAL NOTES

1. ALL BEDDING SHALL BE CLASS C.

AS-BUILT INFORMATION
CONTRACTOR: J.R. Hale
WORK STAKED BY: Surv-Tek
INSPECTOR'S ACCEPTANCE BY: Koolo ... 10-14-95
FIELD VERIFICATION BY: Surv-Tek
DRAWINGS CORRECTED BY: Surv-Tek
MICRO-FILM INFORMATION
RECORDED BY
NO.

BENCH MARKS
"BLACK NO. 2"
ELEV. = 5213.93

SURVEY INFORMATION
FIELD NOTES
NO. | BY | DATE

ENGINEER'S SEAL
10-18-94

REVISIONS
NO. | DATE | REMARKS | BY

DESIGN
DESIGNED BY TOI DATE 6/94
DRAWN BY ANW DATE 6/94
CHECKED BY TOI DATE 6/94

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
26-5022.90 0995

ISAACSON & ARFMAN, P.A.
Consulting Engineering Associates
128 Monroe Street N.E.
Albuquerque New Mexico
779UTL9.DWG anw VIEW: 1 10/10/94

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

TITLE: **ARROYO VILLAS APARTMENTS**
IRVING BLVD. STORM DRAIN

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
DRC CHAIRMAN	[signature]	11-16-94	WATER	N/A RWK	10-18-94
TRANSPORTATION	[signature]	10-20-94	WASTE WATER	N/A RWK	10-18-94
HYDROLOGY	[signature]	10-21-94			

PROJECT NO. 5022.90 | MAP NO. B-12 | SHEET 9 OF 20