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

October 17, 1994

CERTIFICATE OF COMPLETION AND ACCEPTANCE

Jackson-Maple Properties, Inc.
6400 Uptown Blvd. N.E.
200 W
Albuquerque, NM 87110

RE: PROJECT NO. 4729.82 RIDGEFIELD NORTH PHASE II (MAP NO. D-20-Z)

Dear Sir:

This is to certify that the City of Albuquerque accepts Project No. 4729.82 as being completed according to approved plans and construction specifications. Please be advised this certificate of completion and acceptance shall only become effective upon final plat approval and filing in the office of the Bernalillo County Clerk's Office.

The project is described as follows:

- The project included water, sanitary sewer, paving, curb and gutter and storm drain improvements on Macallan Road and Macnish Drive. In addition a temporary right turn lane was added to Ventura Street at Paseo Del Norte and the North half of Palomas Avenue was paved as well as water and sanitary sewer services installed on Palomas. The onsite storm drain was connected to the existing storm drain in Ventura.

The contractor's correction period begins the date of this letter and will be effective for a period of one (1) year.

Sincerely,

Rick Roybal, P.E.
City Engineer,
Engineering Group
Public Works Department

Sincerely,

Russell B. Givler, P.E.
Chief Construction Engineer,
Engineering Group
Public Works Department

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

July 1, 1994

Steve Crawford, P.E.
Community Sciences Corp.
P.O.Box 1328
Corrales, N.M. 87048

RE: ENGINEER'S CERTIFICATION FOR RIDGEFIELD NORTH SUBD UNIT 2 (D-20/D8)
RECEIVED JUNE 29, 1994 FOR FINANCIAL GUARANTY RELEASE
ENGINEER'S STAMP DATED 6-27-94

Dear Mr. Crawford:

Based on the information included in the submittal referenced above, City Hydrology accepts the Engineer's Certification of grading & drainage and releases the Financial Guaranty for Project #4729.91.

If I can be of further assistance, You may contact me at 768-2727.

Sincerely,

John P. Curtin, P.E.
Civil Engineer/Hydrology

c: Lynda Michelle DeVanti, Project #4279.91

WPHYD/7578/jpc

City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

July 2, 1993

James D. Hughes, P.E.
Community Sciences Corp.
P.O.Box 1328
Corrales, N.M. 87048

RE: GRADING PLAN FOR RIDGEFIELD NORTH SUBDIVISION UNIT 2 (D-20/D8A)
RECEIVED JULY 1, 1993 FOR ROUGH GRADING PERMIT APPROVAL
ENGINEER'S STAMP DATED 6-26-93

Dear Mr. Hughes:

Based on the information included in the submittal referenced above, City Hydrology APPROVES this project for Rough Grading Permit.

A Topsoil Disturbance Permit must be approved by the Environmental Health Division prior to construction.

Check the proposed spot elevations between lots 6 & 7, and 87 & 106. There maybe drafting errors on lots 22 & 80. None of these should hold up rough grading.

If you have any questions about this project, you may contact me at 768-2727.

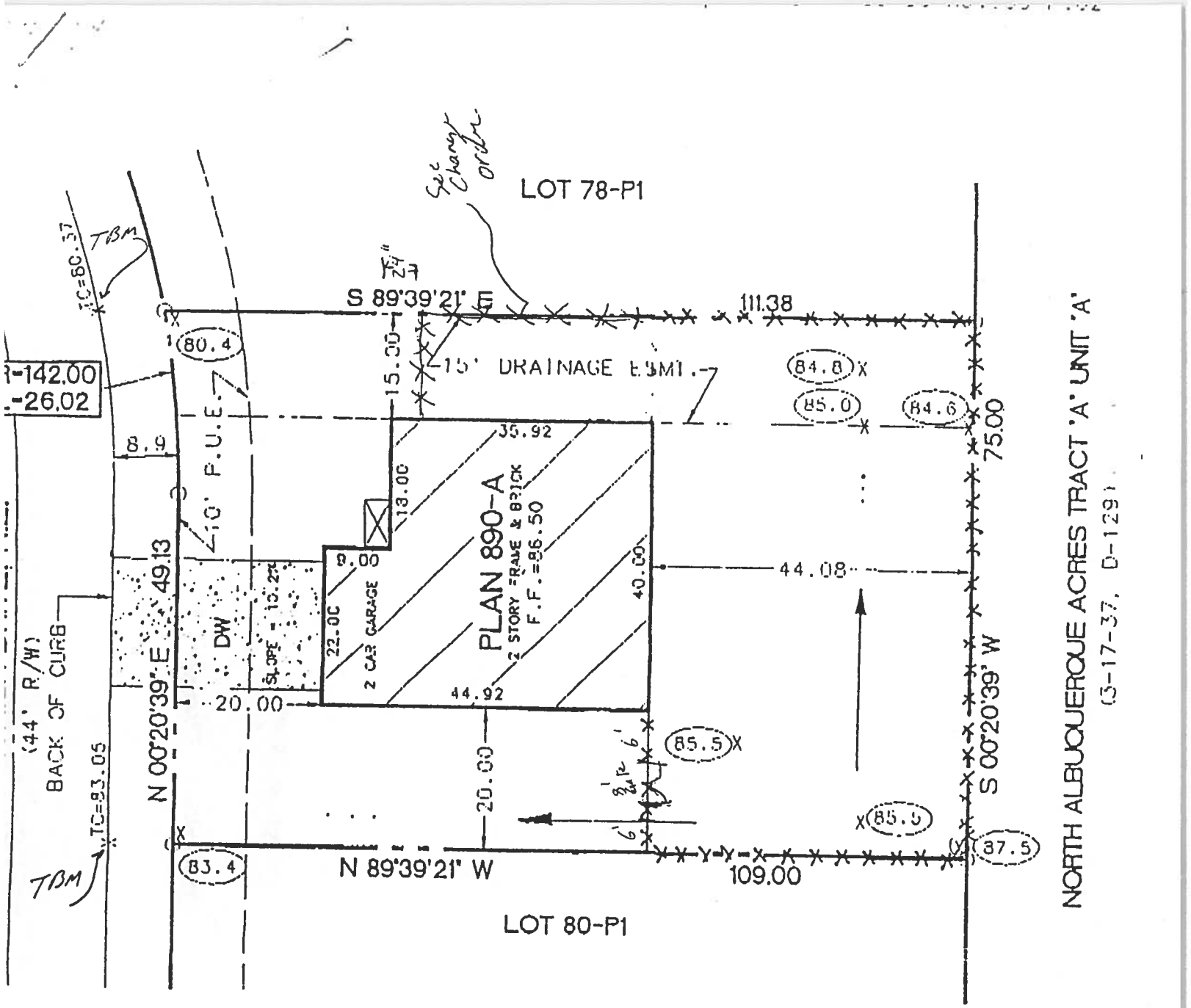
Sincerely,

John P. Curtin

John P. Curtin, P.E.
Civil Engineer/Hydrology

xc: Alan Martinez

WPHYD+7578;jpc



INDICATES 7 COURSE C.M.U. WALL.

N

SCALE: 1"=20'

PLOT PLAN

LOT 79-P1
RIDGEFIELD NORTH UNIT 2
3008 MACNISH DRIVE, N.E.

TABLE OF CONTENTS

I. PURPOSE AND SCOPE

Argus Development Company is currently planning for the development of Ridgefield North Subdivision. The proposed development consists of 26.8 acres and is to be subdivided, in two phases, into 109 single family, detached residential lots.

This report presents an overall Drainage Management and Conceptual Grading Plan for approval by the City of Albuquerque in order that subsequent subdivision and development may commence.

II. SITE DESCRIPTION AND HISTORY

The Ridgefield North Subdivision is legally described as Lots 1-23 and 25-32, Block 41, North Albuquerque Acres Tract A, Unit A, situated within the Elena Gallegos Grant "Projected" Section 20, T11N, R4E, NMPM, Bernalillo County, New Mexico. (See Vicinity Map, Plate 1.) The site is bounded on the north by Paseo del Norte (paved), on the south by Palomas Avenue (paved, with curb and gutter), on the west by Ventura Street (paved), and on the east by Holbrook Street (gravel). Lot No. 24 is currently owned by the City of Albuquerque and has a well site on it. The remainder of this block is in its natural, undisturbed state and has some small soil stockpiles on it. The site generally slopes from east to west at about 3% and has a 10' to 15' deep valley running diagonally through it from the southeast corner to the northwest corner. The floodplain encroachment at the southwest corner of this site, as shown on Plate 2, was removed as part of the Heritage Hills East construction.

This site is part of the approved Sector Development Plan for Heritage Hills East which established development at this density or higher as being appropriate. Although that plan did not include this site as part of the City annexation, a recent request for annexation is currently before the Environmental Planning Commission (EPC) and is awaiting their action.

Other drainage planning that affects this property includes the "Drainage Management Plan for Heritage Hills East Unit 6," the "Drainage Management Plan for Heritage Hills East Unit 7," and the "North and South Domingo Baca Arroyos and Paseo del Norte Corridor Drainage Management Plan." All three of these plans have been approved and the first two have actually been implemented. A fourth plan, "Draft Drainage Report for Paseo del Norte East of Wyoming to Tennyson" provides a slightly more detailed plan for implementing the improvements associated with the construction of Paseo del Norte which, according to the County Public Works Department, should be completed in three years.

III. DESIGN CRITERIA

A. Flood Control Regulations

The drainage plan presented in this report has been designed to comply with AMAFCA resolution 80-15, which requires that proposed land development projects be designed such that no flooding of private properties will occur during any storm up to and including the 100-year frequency event. Additionally, this drainage plan has been designed to comply with current "City of Albuquerque Drainage Ordinance" and Chapter 22 of the Development Process Manual (DPM), and subsequently adopted general policies of the City of Albuquerque.

1. 100-year storm - Stormwater flow depth not to exceed the top of curb in any street

2. 10-year storm:

   a. Local street - velocity times depth less than 6.5

   b. Arterial streets:

      i. Flow not to exceed a depth of 0.50

      ii. Velocity times depth less than 6.5

      iii. One driving lane in each direction free of stormwater

B. Engineering Parameters

In accordance with AMAFCA criteria, all hydrological analysis is based on the 100-year frequency, 6-hour duration storm, as represented in Section 22.2, Hydrology, of the "Development Process Manual, Volume 2, Design Criteria for the City of Albuquerque, New Mexico, August 1991."

Ten-year, 6-hour values were also used for subcatchments, in accordance with City drainage policies regarding street flow.

The four rainfalls pertinent to the study are as follows:

	10-Year	100-Year
One-Hour	1.45"	2.18"
Six-Hour	1.73"	2.60"

IV. COMPUTATIONAL PROCEDURES

The analysis approach follows standard engineering practice. Key points of confluence were selected and the associated individual and aggregate contributing basins were subsequently defined.

Hydrological computations were accomplished by means of the March 1992 version of AHYMO Computer Program as developed by AMAFCA. The input parameters and resulting flows for the basins are summarized on Table 1. Summary and detailed AHYMO printouts are contained in Appendix A.

Times of concentration were estimated using the Upland Method and then converted to times to peak (Lg), in accordance with the above referenced Section 22.2 which also establishes the minimum time of concentration as 12 minutes.

Flow characteristics for conveyance swales, channels, and streets were analyzed based on the Manning equation for uniform flow. Streets are assumed to have a 2% cross slope from curb to crown and a standard curb depth of 8". After accounting for the difference between the 1.5" fall across the 2' gutter pan and the height of fall of a 2% slope across the gutter pan, the allowable flow depth for standard curb was established

at 0.59' above the projected 2% slope, as measured at the face of curb. Similarly, the allowable depth for mountable curb was established at 0.31'.

V. OFF-SITE DRAINAGE

Existing Off-Site Drainage Basin No. 408.1 (see Plate 2) currently drains through the northwest corner of this site and then across Paseo del Norte.

Existing Basin No. 408.2 includes some drainage which was diverted north along Holbrook Street to Palomas Avenue as part of the Heritage Hills East Unit 6 construction. Flow from that area was then diverted west down Palomas where it is joined by flow from Area No. 120.2, which includes both on- and off-site areas (see Plate 3). That flow down Palomas is partially intercepted by inlets at the intersection of Ridgefield Court. That intercepted flow then flows through a 36" storm sewer down Ridgefield Court to the cul-de-sac where it is joined by flows coming in from Heritage Hills East Unit 6 (see Drainage Area No. 405.22 on Plate 3). From there, the combined flow goes through easements in a 54" pipe to the South Domingo Baca Arroyo. As stated in the recent report on that arroyo, the AHYMO hydrology for future conditions (which includes 50% imperviousness for currently undeveloped land) predicts that the capacity of the arroyo will be exceeded.

Under future developed conditions, the Paseo del Norte construction will include paving with curb and gutter on Holbrook from Paseo del Norte to Palomas Avenue and storm sewer to divert the flow from future Basin No. 408.2 north along Holbrook to a large (66") storm sewer trunk line which is to go into Paseo del Norte for the entire length of this site.

With this diversion of off-site Area No. 408.2, the future flows down Palomas that ultimately end up in the South Domingo Baca Arroyo will be less than they are under existing conditions. Under future conditions, and as part of Phase 1 construction, two inlets (one Type A and one Type C) will be added to the north side of Palomas immediately opposite the two existing inlets (one Type A and one type C) just east of Ridgefield Court. The inlets were originally designed to intercept most, but not all, of the 100-year flow and they were therefore modeled in the AHYMO using a split flow rating curve which was generated by analyzing a series of flows with HEC-12. Then the split in AHYMO (see summary printout of future conditions in Appendix A) was checked against the final 100-year HEC-12 inlet calculations (Appendix B). The AHYMO run allows 0.10 cfs and 4.20 cfs to bypass the inlets and continue down Palomas for the 10-year and 100-year flows, respectively. According to the HEC-12 calculations for inlets 1 through 4, both sides of the street bypass 2.11 cfs 100-year flow, for a total of 4.22 cfs. OK. The storm sewer line from those inlets to the South Domingo Baca Arroyo, line A, flows under pressure flow for the future 100-year event. Hydraulic grade line calculations for line A are on a profile of that line in Appendix B and demonstrate that the existing lines have adequate capacity to convey the future developed peak 100-year flow and maintain a 1.33' freeboard, as measured from the energy grade line up to the top of curb at the inlets. OK.

The 4.22 cfs which continues past the inlets at the intersection of Palomas Avenue and Ridgefield Court is to be joined by drainage from Basin No. 120.2 (see Plate 3) which includes both on- and off-site area. That future 100-year peak flow is totally intercepted by four existing inlets (see Appendix B HEC-12 calculations for inlet Nos. 5, 6, 7, and 8) on the south side of Palomas Avenue just east of its intersection with Ventura Street. Storm sewer from those inlets goes to the existing 36" water well overflow line in Ventura. The 36" line in Ventura proceeds south to a point where flows from Off-Site Basin No. 405.24 are added, and the combined flow then proceeds on to the South

Domingo Baca Arroyo. The storm drain line does not function under pressure; instead, it has capacity at less than pipe-full flow depth, as indicated by the capacity calculations shown on the as-built plan and profiles of this line, Line B, in Appendix B. Street capacity calculations for Palomas, as shown on Table No. 2, demonstrate that the 100-year flow will not overtop the standard curb and gutter in Palomas.

Future off-site Drainage Basin Nos. 915.2, 408.1, 408.2, and 408.4 are the same as those used in the two previously mentioned drainage reports for Paseo del Norte. They model future conditions with 50% impervious assumptions and short times of concentration, as can be seen in Table No. 1. Similarly, future Basin Nos. 408.51 and 408.71 (see Plate 2) are the same as the portions of Basin Nos. 408.5 and 408.7, respectively (from the two previously mentioned reports), located north of the existing centerline of Paseo del Norte. Existing and future Basin Nos. 408.52 and 408.72 include both on-site areas and the off-site portions of Area Nos. 408.5 and 408.7, respectively (from the previously mentioned reports), which are located south of the existing centerline of Paseo del Norte. All of the flows from these areas are to be conveyed by the future storm sewers, as shown on Plate 3. The future storm sewers are to be constructed by others in the next three years and are not a part of this construction. The only future line in this report which was analyzed for capacity is the 66" line immediately below this site (see Appendix B, Profile), and even though the flow there was higher than that stated in the two previously mentioned reports, the pipe as currently designed in the draft report has enough capacity to flow at less than pipe-full depth, as indicated by the calculations in Appendix B.

VI. ON-SITE DRAINAGE

The typical street sections will be in accordance with City of Albuquerque street standards (intermittent parking regulations). Mountable curb and gutter will be used on the internal streets everywhere except where standard curb and gutter is needed for drainage, as indicated on the typical street section on Plate 3 and on the street capacity calculations on Table 1. The lots that front on Palomas will drain to Palomas and the drainage will be picked up in the six existing inlets (Inlet Nos. 1, 2, 5, 6, 7, and 8) and the two proposed Inlet Nos. 3 and 4, as shown on Plate 3. Street A handles most of the rest of the on-site drainage and will require standard curb and gutter over most of its length. Storm drainage from Street A will be picked up at the west end in two Type A and two Type Double C inlets. The inlets then discharge through a 36" storm sewer to the future Paseo del Norte construction, as shown on Plate 3.

Temporary measures for Phases 1 and 2 are to be replaced by the future construction of Paseo del Norte, probably in less than three years. With Phase 1 (the eastern half of this development), the existing diversion of Area. 408.2 down Palomas will continue to operate as originally designed with Heritage Hills East Unit 6. Additionally, there will be a temporary retention pond west of the end of Street A, Phase 1, which will be maintained by the developer. Then, with Phase 2, a temporary connection will be made from the end of the permanent storm drain construction (this project) to the existing 36" well drain line in Ventura Street. The connection will include an open-topped junction box surrounded by riprap at the end of the permanent construction. This junction box will allow the remaining capacity in the drain pipe (34.9 cfs from drain line capacity calculations at the end of Appendix B) to be used to temporarily limit the 100-year discharge (74.22 cfs - 34.9 cfs = 39.32 cfs) to a level that is nearly the same as existing conditions (38.63 cfs). Then, as part of the Paseo del Norte construction, the total flow will be redirected into the 66" trunk line and the temporary connection to the well drain line will be abandoned.

VII. EROSION CONTROL

Control of excessive soil erosion into City streets and drainage improvements during construction will be accomplished by use of temporary lot line, water-trap berms. These will be windrowed into place following mass grading operations and left in place until each home is constructed and sold. Plate 3 illustrates the dimensions of these berms, and they will be located along those boundaries of each lot which are common to City rights-of-way or public easements.

TABLE I

EXISTING DEVELOPMENT CONDITIONS

					LAND TREATMENT				INCREMENTAL		FUTURE TOTAL	
Basin I.D.	Area (Sq.Mi.)	Contr. Basin	Sum Area (Sq.Mi.)	T_c (Min.)	A	B	C	D	Q_{100} (cfs)	Q_{10} (cfs)	Q_{100} (cfs)	Q_{10} (cfs)
408.10	0.0954			12	41	21	21	17	177.38	85.16	177.38	85.16
408.52	0.0044			12	70	15	10	15	4.55	1.71	4.55	1.71
408.72	0.0017	310.10	0.0061	12	70	15	0	15	6.68	2.59	2.73	1.18
408.20	0.0377			12	41	21	21	17	59.20	25.20	59.20	25.20
120.20	0.0107	320.20	0.0484	12	11	22	23	44	81.46	37.79	26.41	15.48
120.30	0.0084			12	38	15	16	31	17.53	9.27	17.53	9.27
408.73	0.0179			12	85	10	5	0	17.02	4.37	17.02	4.37
408.74	0.0186	330.10 310.20	0.0409	12	90	5	0	5	42.88	13.29	25.07	8.83

FUTURE DEVELOPMENT CONDITIONS

					LAND TREATMENT				INCREMENTAL		FUTURE TOTAL	
Basin I.D.	Area (Sq.Mi.)	Contr. Basin	Sum Area (Sq.Mi.)	T_c (Min.)	A	B	C	D	Q_{100} (cfs)	Q_{10} (cfs)	Q_{100} (cfs)	Q_{10} (cfs)
915.20	0.0370			12	0	30	20	50	95.65	57.38	95.65	57.38
408.10	0.0260	915.20	0.0630	12	0	30	20	50	162.87	97.70	67.22	40.32
408.20	0.0740	408.10	0.1140	16	0	30	20	50	319.41	191.22	162.88	97.26
408.40	0.0260	408.20	0.1400	12	0	30	20	50	384.40	230.38	67.22	40.32
408.51	0.0130	408.40	0.1530	12	0	30	20	50	416.90	249.97	33.62	20.17
408.52	0.0040	408.51	0.1800	12	0	75	0	25	425.16	254.42	8.42	4.49
408.71	0.0130	408.52	0.1930	12	0	30	20	50	457.66	274.00	33.62	20.17
408.72	0.0018	408.71	0.1984	12	70	15	0	15	461.40	276.01	3.82	2.04
408.73	0.0146			12	0	30	20	50	37.76	22.65	37.76	22.65
408.74	0.0141	408.73	0.0287	12	0	30	20	50	74.22	44.52	36.46	21.87
408.75	0.0045	408.75 408.72	0.2199	12	0	77	10	13	541.78	323.65	8.76	4.40
120.20	0.0160			12	0	28	22	50	37.62	25.03	41.81	25.13
120.30	0.0092	120.20	0.0097	12	0	28	22	50	27.99	14.38	23.80	14.27
405.22	0.0484	120.20	0.0641	12	0	30	20	50	162.73	100.08	125.12	75.05
405.24	0.0095	120.30	0.0192	12	0	30	20	50	52.57	29.12	24.57	14.74

TABLE 2

STREET CAPACITY CALCULATIONS

Standard Curb & Gutter (26' F-F)

A = (0.59' + 0.33') x 13' = 11.96 sf
P = 26' + 2 x 0.59' = 27.18'
R = 11.96 sf ÷ 27.18' = 0.44'
n = 0.017
Q_{cap} = (1.486 ÷ 0.017) x (11.96 sf) x $(0.44')^{2/3}$ x $(S_o)^{0.5}$
Q_{cap} = 604.8 x $(S_o)^{0.5}$

Mountable Curb and Gutter (25' F-F)

A = (0.31' + 0.06') x 12.5' = 4.63 sf
P = 25' + 2 x 0.31' = 25.62'
R = 4.63 sf ÷ 25.62' = 0.18'
n = 0.017
Q_{cap} = (1.486 ÷ 0.017) x (4.63 sf) x $(0.18')^{2/3}$ x $(S_o)^{0.5}$
Q_{cap} = 129.0 x $(S_o)^{0.5}$

Street Name	Beginning Sta.	Ending Sta.	Curb Type	Minimum Street Slope (S_o, ft/ft)	Q_{cap} (cfs)	Q_{100} (cfs)	Acceptable (Yes/No)
Street A	0 + 00	3 + 35	Standard	0.0050	42.76	10.0 ±	Yes
Street A	3 + 35	19 + 50	Standard	0.0169	78.62	74.22	Yes
Street A	19 + 50	End	Mountable	0.0250	20.40	18.75	Yes
Palomas	0 + 00	11 + 00	Standard	0.0050	42.76	27.99	Yes
Palomas	11 + 00	End	Standard	0.035 ±	113.1 ±	41.10	Yes

RR 252-03-030
10YR PRE DEVELOPMENT

Saturday January 16, 1993 01:26:44 pm

AHYMO SUMMARY TABLE (AHYMO392) - AMAFCA VERSION OF HYMO - MARCH, 1992 RUN DATE (MON/DAY/YR) =01/16/1993
INPUT FILE = RIDG10PR.DAT USER NO.= J_HUGHES.S92

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*S	EXISTING 10 YR.CONDITIONS FOR RIDGEFIELD NORTH SUBDIVISION									
RAINFALL TYPE= 1										RAIN6= 1.730
COMPUTE NM HYD		408.10	-	1	.09540	85.16	2.621	.51509	1.499	1.395 PER IMP= 17.00
COMPUTE NM HYD		408.52	-	2	.00440	3.04	.096	.40988	1.499	1.081 PER IMP= 15.00
ROUTE		10.20	2	13	.00440	1.71	.096	.40993	1.632	.609
COMPUTE NM HYD		408.72	-	3	.00170	1.18	.037	.40988	1.499	1.086 PER IMP= 15.00
ADD HYD		310.10	3&13	14	.00610	2.59	.133	.40971	1.565	.662
COMPUTE NM HYD		408.20	-	4	.03770	34.32	1.036	.51509	1.499	1.423 PER IMP= 17.00
ROUTE		20.10	4	11	.03770	25.20	1.036	.51509	1.598	1.045
COMPUTE NM HYD		120.20	-	5	.01070	15.48	.506	.88616	1.499	2.261 PER IMP= 44.00
ADD HYD		320.20	11& 5	12	.04840	37.79	1.541	.59710	1.565	1.220
COMPUTE NM HYD		120.30	-	6	.00840	9.27	.301	.67118	1.499	1.725 PER IMP= 31.00
COMPUTE NM HYD		408.73	-	7	.01790	7.94	.212	.22181	1.532	.693 PER IMP= .00
ROUTE		30.10	7	9	.01790	4.37	.212	.22184	1.632	.381
COMPUTE NM HYD		408.74	-	8	.01860	8.83	.262	.26388	1.532	.742 PER IMP= 5.00
ADD HYD		330.10	9& 8	10	.03650	11.80	.474	.24324	1.532	.505
ADD HYD		310.20	13&10	15	.04090	13.29	.570	.26115	1.565	.508
FINISH										

RR252-03-030

100 YR PREDEVELOPMENT

AHYMO SUMMARY TABLE (AHYMO392) - AMAFCA VERSION OF HYMO - MARCH, 1992 RUN DATE (MON/DAY/YR) =01/16/1993
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*S	EXISTING 100 YR.CONDITIONS FOR RIDGEFIELD NORTH SUBDIVISION									
RAINFALL TYPE= 1										RAIN6= 2.590
COMPUTE NM HYD	408.10	-	1	.09540	177.38	5.661	1.11256	1.499	2.905	PER IMP= 17.00
COMPUTE NM HYD	408.52	-	2	.00440	7.05	.223	.95044	1.499	2.503	PER IMP= 15.00
ROUTE	10.20	2	13	.00440	4.55	.223	.95050	1.632	1.615	
COMPUTE NM HYD	408.72	-	3	.00170	2.73	.086	.95044	1.499	2.513	PER IMP= 15.00
ADD HYD	310.10	3&13	14	.00610	6.68	.309	.95026	1.565	1.712	
COMPUTE NM HYD	408.20	-	4	.03770	70.67	2.237	1.11256	1.499	2.929	PER IMP= 17.00
ROUTE	20.10	4	11	.03770	59.20	2.237	1.11256	1.565	2.454	
COMPUTE NM HYD	120.20	-	5	.01070	26.41	.910	1.59437	1.499	3.857	PER IMP= 44.00
ADD HYD	320.20	11& 5	12	.04840	81.46	3.147	1.21906	1.565	2.630	
COMPUTE NM HYD	120.30	-	6	.00840	17.53	.585	1.30568	1.499	3.261	PER IMP= 31.00
COMPUTE NM HYD	408.73	-	7	.01790	23.52	.677	.70938	1.532	2.053	PER IMP= .00
ROUTE	30.10	7	9	.01790	17.02	.677	.70941	1.632	1.486	
COMPUTE NM HYD	408.74	-	8	.01860	25.07	.752	.75823	1.499	2.106	PER IMP= 5.00
ADD HYD	330.10	9& 8	10	.03650	38.63	1.429	.73427	1.565	1.654	
ADD HYD	310.20	13&10	15	.04090	42.88	1.652	.75750	1.565	1.638	
FINISH										

10 YR FUTURE
DEVELOPMENT

AHYMO SUMMARY TABLE (AHYMO392) - AMAFCA VERSION OF HYMO - MARCH, 1992 RUN DATE (MON/DAY/YR) =01/30/1993
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START										TIME= .00
*S	POST-DEVELOPMENT 10 YR.CONDITIONS FOR RIDGEFIELD NORTH SUBDIVISION									
RAINFALL TYPE= 1										RAIN6= 1.730
COMPUTE NM HYD	915.20	-	1	.03700	57.38	1.920	.97273	1.499	2.423	PER IMP= 50.00
COMPUTE NM HYD	408.10	-	2	.02600	40.32	1.349	.97273	1.499	2.423	PER IMP= 50.00
ADD HYD	1.10	1& 2	3	.06300	97.70	3.268	.97272	1.499	2.423	
COMPUTE NM HYD	408.20	-	4	.07400	97.26	3.839	.97273	1.565	2.054	PER IMP= 50.00
ADD HYD	1.20	3& 4	5	.13700	191.22	7.107	.97273	1.532	2.181	
COMPUTE NM HYD	408.40	-	6	.02600	40.32	1.349	.97273	1.499	2.423	PER IMP= 50.00
ADD HYD	1.30	5& 6	7	.16300	230.38	8.456	.97273	1.532	2.208	
COMPUTE NM HYD	408.51	-	8	.01300	20.17	.674	.97273	1.499	2.424	PER IMP= 50.00
ADD HYD	1.40	8& 7	9	.17600	249.97	9.131	.97272	1.532	2.219	
COMPUTE NM HYD	408.52	-	10	.00400	4.49	.135	.63305	1.499	1.753	PER IMP= 20.83
ADD HYD	1.50	10& 9	11	.18000	254.42	9.266	.96517	1.532	2.208	
COMPUTE NM HYD	408.71	-	12	.01300	20.17	.674	.97273	1.499	2.424	PER IMP= 50.00
ADD HYD	1.60	12&11	13	.19300	274.00	9.940	.96568	1.532	2.218	
COMPUTE NM HYD	408.72	-	14	.00180	2.04	.064	.66745	1.499	1.769	PER IMP= 27.00
ADD HYD	1.70	14&13	15	.19480	276.01	10.004	.96293	1.532	2.214	
COMPUTE NM HYD	408.73	-	16	.01460	22.65	.757	.97273	1.499	2.424	PER IMP= 50.00
COMPUTE NM HYD	408.74	-	17	.01410	21.87	.731	.97273	1.499	2.424	PER IMP= 50.00
ADD HYD	2.10	17&16	18	.02870	44.52	1.489	.97271	1.499	2.424	
COMPUTE NM HYD	408.75	-	19	.00450	4.40	.127	.52957	1.532	1.528	PER IMP= 13.00
ADD HYD	2.20	19&18	20	.03320	48.91	1.616	.91264	1.499	2.302	
ADD HYD	2.30	20&15	1	.22800	323.65	11.620	.95560	1.532	2.218	
COMPUTE NM HYD	120.20	-	2	.01610	25.13	.839	.97749	1.499	2.439	PER IMP= 50.00
DIVIDE HYD	5.10	2	3	.00001	.10	.001	.97748	1.499	11.375	
	5.20	AND	4	.01609	25.03	.839	.97748	1.499	2.431	
COMPUTE NM HYD	120.30	-	5	.00920	14.27	.477	.97273	1.499	2.424	PER IMP= 50.00
ADD HYD	3.10	3& 5	6	.00921	14.38	.478	.97271	1.499	2.438	
COMPUTE NM HYD	405.22	-	7	.04840	75.05	2.511	.97273	1.499	2.423	PER IMP= 50.00
ADD HYD	3.20	4& 7	8	.06449	100.08	3.350	.97391	1.499	2.425	
COMPUTE NM HYD	405.24	-	9	.00950	14.74	.493	.97273	1.499	2.424	PER IMP= 50.00
ADD HYD	3.30	9& 6	10	.01871	29.12	.971	.97271	1.499	2.431	
FINISH										

100 YR FUTURE DEVELOPMENT

C:\TEMP\RIDG99PO.SUM
Saturday January 30, 1993 09:43:00 am

AHYMO SUMMARY TABLE (AHYMO392) - AMAFCA VERSION OF HYMO - MARCH, 1992 RUN DATE (MON/DAY/YR) =01/30/1993
INPUT FILE = RIDG99PO.DAT USER NO.= J_HUGHES.S92

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	PAGE = 1 NOTATION
START										TIME= .00
*S	POST-DEVELOPMENT 100 YR.CONDITIONS FOR RIDGEFIELD NORTH SUBDIVISION									
RAINFALL TYPE= 1										RAIN6= 2.600
COMPUTE NM HYD	915.20	-	1	.03700	95.65	3.388	1.71685	1.499	4.039	PER IMP= 50.00
COMPUTE NM HYD	408.10	-	2	.02600	67.22	2.381	1.71685	1.499	4.040	PER IMP= 50.00
ADD HYD	1.10	1& 2	3	.06300	162.87	5.769	1.71684	1.499	4.039	
COMPUTE NM HYD	408.20	-	4	.07400	162.88	6.776	1.71685	1.565	3.439	PER IMP= 50.00
ADD HYD	1.20	3& 4	5	.13700	319.41	12.544	1.71685	1.532	3.643	
COMPUTE NM HYD	408.40	-	6	.02600	67.22	2.381	1.71685	1.499	4.040	PER IMP= 50.00
ADD HYD	1.30	5& 6	7	.16300	384.40	14.925	1.71684	1.532	3.685	
COMPUTE NM HYD	408.51	-	8	.01300	33.62	1.190	1.71685	1.499	4.041	PER IMP= 50.00
ADD HYD	1.40	8& 7	9	.17600	416.90	16.115	1.71684	1.532	3.701	
COMPUTE NM HYD	408.52	-	10	.00400	8.42	.275	1.28973	1.499	3.290	PER IMP= 20.83
ADD HYD	1.50	10& 9	11	.18000	425.16	16.391	1.70735	1.532	3.691	
COMPUTE NM HYD	408.71	-	12	.01300	33.62	1.190	1.71685	1.499	4.041	PER IMP= 50.00
ADD HYD	1.60	12&11	13	.19300	457.66	17.581	1.70799	1.532	3.705	
COMPUTE NM HYD	408.72	-	14	.00180	3.82	.127	1.32332	1.499	3.318	PER IMP= 27.00
ADD HYD	1.70	14&13	15	.19480	461.40	17.708	1.70443	1.532	3.701	
COMPUTE NM HYD	408.73	-	16	.01460	37.76	1.337	1.71685	1.499	4.041	PER IMP= 50.00
COMPUTE NM HYD	408.74	-	17	.01410	36.46	1.291	1.71685	1.499	4.041	PER IMP= 50.00
ADD HYD	2.10	17&16	18	.02870	74.22	2.628	1.71683	1.499	4.041	
COMPUTE NM HYD	408.75	-	19	.00450	8.76	.277	1.15618	1.499	3.040	PER IMP= 13.00
ADD HYD	2.20	19&18	20	.03320	82.97	2.905	1.64083	1.499	3.905	
ADD HYD	2.30	20&15	1	.22800	541.78	20.613	1.69517	1.532	3.713	
COMPUTE NM HYD	120.20	-	2	.01610	41.81	1.481	1.72423	1.499	4.058	PER IMP= 50.00
DIVIDE HYD	5.10	2	3	.00045	4.20	.041	1.72421	1.499	14.610	
	5.20	AND	4	.01565	37.62	1.439	1.72421	1.499	3.755	
COMPUTE NM HYD	120.30	-	5	.00920	23.80	.842	1.71685	1.499	4.042	PER IMP= 50.00
ADD HYD	3.10	3& 5	6	.00965	27.99	.884	1.71717	1.499	4.533	
COMPUTE NM HYD	405.22	-	7	.04840	125.12	4.432	1.71685	1.499	4.039	PER IMP= 50.00
ADD HYD	3.20	4& 7	8	.06405	162.73	5.871	1.71864	1.499	3.970	
COMPUTE NM HYD	405.24	-	9	.00950	24.57	.870	1.71685	1.499	4.042	PER IMP= 50.00
ADD HYD	3.30	9& 6	10	.01915	52.57	1.754	1.71700	1.499	4.289	
FINISH										

10YR PREDEVELOPMENT OUTPUT


```
        AHYMO PROGRAM (AHYMO392) - AMAFCA VERSION OF HYMO - MARCH, 1992
             RUN DATE (MON/DAY/YR) = 01/16/1993
             START TIME (HR:MIN:SEC) = 12:15:20     USER NO.= J_HUGHES.S92
             INPUT FILE = RIDG10PR.DAT

     START                TIME=0.0
     *S       EXISTING 10 YR.CONDITIONS FOR RIDGEFIELD NORTH SUBDIVISION
     *        FILE RIDG10PR.DAT
     RAINFALL             TYPE=1 RAIN QUARTER=0.0
                          RAIN ONE=1.45 RAIN SIX=1.73
                          RAIN DAY=2.07 DT=0.0333

                  COMPUTED 6-HOUR RAINFALL DISTRIBUTION BASED ON NOAA ATLAS 2 - PEAK AT 1.40 HR.
                  DT =    .033300 HOURS       END TIME =     5.994000 HOURS
                     .0000   .0015   .0030   .0046   .0062   .0078   .0095
                     .0112   .0130   .0148   .0166   .0185   .0204   .0224
                     .0245   .0266   .0288   .0310   .0333   .0357   .0382
                     .0408   .0435   .0462   .0491   .0522   .0553   .0586
                     .0621   .0658   .0697   .0737   .0779   .0825   .0920
                     .1136   .1470   .1951   .2607   .3471   .4574   .5947
                     .7624   .9234   .9895  1.0451  1.0944  1.1393  1.1806
                    1.2190  1.2548  1.2884  1.3200  1.3498  1.3780  1.4046
                    1.4299  1.4538  1.4765  1.4981  1.5186  1.5244  1.5290
                    1.5334  1.5376  1.5416  1.5455  1.5492  1.5528  1.5562
                    1.5595  1.5628  1.5659  1.5689  1.5719  1.5748  1.5776
                    1.5803  1.5830  1.5856  1.5881  1.5906  1.5930  1.5954
                    1.5978  1.6001  1.6023  1.6045  1.6067  1.6088  1.6109
                    1.6130  1.6150  1.6170  1.6190  1.6209  1.6228  1.6247
                    1.6265  1.6284  1.6302  1.6319  1.6337  1.6354  1.6371
                    1.6388  1.6405  1.6421  1.6438  1.6454  1.6470  1.6485
                    1.6501  1.6516  1.6531  1.6546  1.6561  1.6576  1.6590
                    1.6605  1.6619  1.6633  1.6647  1.6661  1.6675  1.6689
                    1.6702  1.6715  1.6729  1.6742  1.6755  1.6768  1.6781
                    1.6793  1.6806  1.6818  1.6831  1.6843  1.6855  1.6867
                    1.6879  1.6891  1.6903  1.6915  1.6926  1.6938  1.6949
                    1.6961  1.6972  1.6983  1.6995  1.7006  1.7017  1.7028
                    1.7038  1.7049  1.7060  1.7071  1.7081  1.7092  1.7102
                    1.7112  1.7123  1.7133  1.7143  1.7153  1.7163  1.7173
                    1.7183  1.7193  1.7203  1.7213  1.7223  1.7232  1.7242
                    1.7251  1.7261  1.7270  1.7280  1.7289  1.7298

     COMPUTE NM HYD       ID=1 HYD NO= 408.1 DA=0.0954 SQ MI
                          PER A=41 PER B=21 PER C=21 PER D=17 TP=0.133
                          RAIN=-1

         K =   .073832HR    TP =   .133000HR    K/TP RATIO =   .555131     SHAPE CONSTANT, N =  6.941092
         UNIT PEAK =   63.221    CFS   UNIT VOLUME =    .9993       B =   518.46      P60 = 1.4500
         AREA =      .016218 SQ MI    IA =    .10000 INCHES    INF =    .04000 INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300


         K =   .146373HR    TP =   .133000HR    K/TP RATIO =  1.100552     SHAPE CONSTANT, N =  3.211944
         UNIT PEAK =   177.81    CFS   UNIT VOLUME =    1.000       B =   298.67      P60 = 1.4500
         AREA =      .079182 SQ MI    IA =    .53614 INCHES    INF =   1.35120 INCHES PER HOUR
         RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =   .033300

     PRINT HYD            ID=1 CODE=1

                                       HYDROGRAPH FROM AREA   408.10


         RUNOFF VOLUME =      .51509 INCHES     =       2.6208 ACRE-FEET
         PEAK DISCHARGE RATE =      85.16 CFS  AT   1.499 HOURS   BASIN AREA =   .0954 SQ. MI.


     COMPUTE NM HYD       ID=2 HYD NO= 408.52 DA=.0044 SQ MI
                          PER A=70 PER B=15 PER C=0 PER D=15 TP=0.13
                          RAIN=-1

         K =   .070850HR    TP =   .130000HR    K/TP RATIO =   .545000     SHAPE CONSTANT, N =  7.106420
         UNIT PEAK =   2.6719    CFS   UNIT VOLUME =    .9960       B =   526.28      P60 = 1.4500
```

PROJECT 25203030
HEC12 Version: V2.30 User S/N: 77010133 Run Date: 01-12-1993

INLET NUMBER 1 LENGTH 7.3 STATION 1096.36

TOTAL PEAK DISCHARGE = 20.95 (cfs)

GUTTER SLOPE = 0.0501 FT/FT PAVEMENT CROSS SLOPE = 0.0200 FT/FT

SPREAD	W	W/T	SW	SW/SX	Eo	a	S'W	SE
16.63	2.0	0.12	0.0625	3.1	0.33	3.8	0.157	0.072

XXXXXXXXX COMBINATION GRATE CURB INLET ON A GRADE XXXXXXXXX
SLOT INTERCEPTS 2.99 CFS GRATE INTERCEPTS 9.65 CFS
CFS INTERCEPTED= 12.63 CFS CARRYOVER= 8.32

INLET NUMBER 3 LENGTH 7.3 STATION 1096.36

TOTAL PEAK DISCHARGE = 20.95 (cfs)

GUTTER SLOPE = 0.0501 FT/FT PAVEMENT CROSS SLOPE = 0.0200 FT/FT

SPREAD	W	W/T	SW	SW/SX	Eo	a	S'W	SE
16.63	2.0	0.12	0.0625	3.1	0.33	3.8	0.157	0.072

XXXXXXXXX COMBINATION GRATE CURB INLET ON A GRADE XXXXXXXXX
SLOT INTERCEPTS 2.99 CFS GRATE INTERCEPTS 9.65 CFS
CFS INTERCEPTED= 12.63 CFS CARRYOVER= 8.32

PROJECT 25203030
HEC12 Version: V2.30 User S/N: 77010133 Run Date: 01-12-1993

INLET NUMBER 2 LENGTH 3.3 STATION 1049.36

TOTAL PEAK DISCHARGE = 8.32 (cfs)

GUTTER SLOPE = 0.0501 FT/FT PAVEMENT CROSS SLOPE = 0.0200 FT/FT

SPREAD	W	W/T	SW	SW/SX	Eo	a	S'W	SE
11.45	2.0	0.17	0.0625	3.1	0.47	3.8	0.157	0.095

XXXXXXXXX COMBINATION GRATE CURB INLET ON A GRADE XXXXXXXXX
SLOT INTERCEPTS 0.00 CFS GRATE INTERCEPTS 6.21 CFS
CFS INTERCEPTED= 6.21 CFS CARRYOVER= 2.11

PROJECT 25203030
HEC12 Version: V2.30 User S/N: 77010133 Run Date: 01-12-1993

INLET NUMBER 4 LENGTH 3.3 STATION 1049.36

TOTAL PEAK DISCHARGE = 8.32 (cfs)

GUTTER SLOPE = 0.0501 FT/FT PAVEMENT CROSS SLOPE = 0.0200 FT/FT

SPREAD	W	W/T	SW	SW/SX	Eo	a	S'W	SE
11.45	2.0	0.17	0.0625	3.1	0.47	3.8	0.157	0.095

XXXXXXXXXX COMBINATION GRATE CURB INLET ON A GRADE XXXXXXXXXX
SLOT INTERCEPTS 0.00 CFS GRATE INTERCEPTS 6.21 CFS
CFS INTERCEPTED= 6.21 CFS CARRYOVER= 2.11

PROJECT 25203030
HEC12 Version: V2.30 User S/N: 77010133 Run Date: 01-14-1993

INLET NUMBER 5 LENGTH 7.3 STATION 1

TOTAL PEAK DISCHARGE = 27.99 (cfs)

GUTTER SLOPE = 0.0050 FT/FT PAVEMENT CROSS SLOPE = 0.0200 FT/FT

SPREAD	W	W/T	SW	SW/SX	Eo	a	S'W	SE
29.05	2.0	0.07	0.0625	3.1	0.19	3.8	0.157	0.050

XXXXXXXXX COMBINATION GRATE CURB INLET ON A GRADE XXXXXXXXX
SLOT INTERCEPTS 5.56 CFS GRATE INTERCEPTS 9.35 CFS
CFS INTERCEPTED= 14.92 CFS CARRYOVER= 13.07

INLET NUMBER 6 LENGTH 6.6 STATION 1

TOTAL PEAK DISCHARGE = 13.87 (cfs)

GUTTER SLOPE = 0.0050 FT/FT PAVEMENT CROSS SLOPE = 0.0200 FT/FT

SPREAD	W	W/T	SW	SW/SX	Eo	a	S'W	SE
22.19	2.0	0.09	0.0625	3.1	0.25	3.8	0.157	0.059

XXXXXXXXX COMBINATION GRATE CURB INLET ON A GRADE XXXXXXXXX
SLOT INTERCEPTS 0.00 CFS GRATE INTERCEPTS 10.21 CFS
CFS INTERCEPTED= 10.21 CFS CARRYOVER= 3.66

INLET NUMBER 7 LENGTH 6.6 STATION 1

TOTAL PEAK DISCHARGE = 3.66 (cfs)

GUTTER SLOPE = 0.0050 FT/FT PAVEMENT CROSS SLOPE = 0.0200 FT/FT

SPREAD	W	W/T	SW	SW/SX	Eo	a	S'W	SE
13.12	2.0	0.15	0.0625	3.1	0.42	3.8	0.157	0.086

XXXXXXXXX COMBINATION GRATE CURB INLET ON A GRADE XXXXXXXXX
SLOT INTERCEPTS 0.00 CFS GRATE INTERCEPTS 3.24 CFS
CFS INTERCEPTED= 3.24 CFS CARRYOVER= 0.42

INLET NUMBER 8 LENGTH 6.6 STATION 1

TOTAL PEAK DISCHARGE = 0.42 (cfs)

GUTTER SLOPE = 0.0050 FT/FT PAVEMENT CROSS SLOPE = 0.0200 FT/FT

SPREAD	W	W/T	SW	SW/SX	Eo	a	S'W	SE
4.76	2.0	0.42	0.0625	3.1	0.87	3.8	0.157	0.157

XXXXXXXXX COMBINATION GRATE CURB INLET ON A GRADE XXXXXXXXX
SLOT INTERCEPTS 0.00 CFS GRATE INTERCEPTS 0.42 CFS
CFS INTERCEPTED= 0.42 CFS CARRYOVER= 0.00

PROJECT 25203030
HEC12 Version: V2.30 User S/N: 77010133 Run Date: 01-23-1993

INLET NUMBER 9 LENGTH 7.3 STATION 335

TOTAL PEAK DISCHARGE = 37.11 (cfs)

GUTTER SLOPE = 0.0169 FT/FT PAVEMENT CROSS SLOPE = 0.0200 FT/FT

SPREAD	W	W/T	SW	SW/SX	Eo	a	S'W	SE
25.64	2.0	0.08	0.0625	3.1	0.22	3.8	0.157	0.054

XXXXXXXXXX COMBINATION GRATE CURB INLET ON A GRADE XXXXXXXXXX
SLOT INTERCEPTS 4.85 CFS GRATE INTERCEPTS 11.63 CFS
CFS INTERCEPTED= 16.48 CFS CARRYOVER= 20.63

PROJECT 25203030
HEC12 Version: V2.30 User S/N: 77010133 Run Date: 01-23-1993

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INLET NUMBER 10 LENGTH 7.3 STATION 335

TOTAL PEAK DISCHARGE = 37.11 (cfs)

GUTTER SLOPE = 0.0169 FT/FT PAVEMENT CROSS SLOPE = 0.0200 FT/FT

SPREAD	W	W/T	SW	SW/SX	Eo	a	S'W	SE
25.64	2.0	0.08	0.0625	3.1	0.22	3.8	0.157	0.054

XXXXXXXXX COMBINATION GRATE CURB INLET ON A GRADE XXXXXXXXX
SLOT INTERCEPTS 4.85 CFS GRATE INTERCEPTS 11.63 CFS
CFS INTERCEPTED= 16.48 CFS CARRYOVER= 20.63

PROJECT 25203030
HEC12 Version: V2.30 User S/N: 77010133 Run Date: 01-23-1993

INLET NUMBER 11 LENGTH 7.5 STATION 275

TOTAL PEAK DISCHARGE = 20.63 (cfs)

GUTTER SLOPE = 0.0110 FT/FT PAVEMENT CROSS SLOPE = 0.0200 FT/FT

SPREAD AT A SLOPE OF .011 (ft./ft.) IS 22.22 (ft.)

XXXXXXXXX COMBINATION GRATE CURB INLET IN A SUMP XXXXXXXXX
DEPTH OF WATER (ft) = 0.75 SPREAD (ft) = 37.47
PERIMETER OF GRATE = 10.60 (ft.) AREA = 8.20 (sq.ft.)
LENGTH OF INLET = 7.5 (ft.) H = 0.540 (ft.)

PROJECT 25203030
HEC12 Version: V2.30 User S/N: 77010133 Run Date: 01-23-1993

INLET NUMBER 12 LENGTH 7.5 STATION 275

TOTAL PEAK DISCHARGE = 20.63 (cfs)

GUTTER SLOPE = 0.0110 FT/FT PAVEMENT CROSS SLOPE = 0.0200 FT/FT

SPREAD AT A SLOPE OF .011 (ft./ft.) IS 22.22 (ft.)

XXXXXXXXXX COMBINATION GRATE CURB INLET IN A SUMP XXXXXXXXXX
DEPTH OF WATER (ft) = 0.75 SPREAD (ft) = 37.47
PERIMETER OF GRATE = 10.60 (ft.) AREA = 8.20 (sq.ft.)
LENGTH OF INLET = 7.5 (ft.) H = 0.540 (ft.)

DRAIN LINE CAPACITY CALCULATIONS

The flow capacity of the 36" drain line is based on the following set of equations:

1. **Friction loss in 454.54' from Heritage East Unit 7 MH to South Domingo Baca is:**

$$Q_{Div} + 52.57 \text{ cfs} = 666.9\sqrt{S_o}$$

Q_{Div} is excess capacity over and above ultimate 100-year flow (52.57 cfs) from other inlets

$$H_L = 454.54' \times S_o$$

$$= 454.54 \times [(Q_{Div} + 52.57)/666.9]^2$$

$$= .001022 (Q_{Div}^2 + 103.04Q_{Div} + 2763.6)$$

2. **Friction loss in 200' from Palomas to Heritage East Unit 7 MH is:**

$$Q_{Div} + 27.99 \text{ cfs} = 666.9S\sqrt{_o}$$

$$H_L = 200 \times [(Q_{Div} + 27.99)/666.9]^2$$

$$= 0.000450 (Q_{Div}^2 + 55.98Q_{Div} + 783.44)$$

3. **Friction loss in 530' from this development's outfall point to Palomas is:**

$$Q_{Div} = 666.9\sqrt{S_o}$$

$$H_L = (Q_{Div}/666.9)^2 \times 530$$

$$= 0.001192Q_{Div}^2$$

4. **Initial energy at outfall is:**

$$EH = [(Q_{Div} + 52.57 \text{ cfs})/7.068 \text{ sf}]^2/64.4$$

$$= 0.000311(Q_{Div}^2 + 103.04Q_{Div} + 2763.6)$$

5. **The energy losses roughly include:**

90° bend at new MH

$$EL_1 = 0.25(Q_{Div}/7.068)^2/64.4$$
$$= 0.000078Q_{Div}^2$$

Average of two through MHs

$$EL_2 = .1[(Q_{Div} + 40 \text{ cfs})/7.068]^2/64.4$$
$$= 0.000031 (Q_{Div}^2 + 80Q_{Div} + 1600)$$

The sum of these losses accounts for the change in elevation from the soffit at the South Domingo Baca Arroyo (Elev = 36.0) to the energy grade line elevation at the outfall pipe from this

subdivision, which would be at least as high as the soffit of that pipe (Elev = 49.6).
Thus, Q_{Div} is the maximum capacity of the 36" storm drain pipe which will be available at the outfall from this subdivision during the 100-year event, and it is the flow necessary to make the sum of the above losses equal 13.6'. So:

$$\begin{aligned}
13.6" = {} & 0.0010222\ Q_{Div}^2 + 0.001022 \times 103.04\ Q_{Div} + 0.001022 \times 2763.6 \\
& + 0.000450\ Q_{Div}^2 + 0.000450 \times 55.98\ Q_{Div} + 0.000450 \times 783.44 \\
& + 0.001192\ Q_{Div}^2 \\
& + 0.000311\ Q_{Div}^2 + 0.000311 \times 103.04\ Q_{Div} + 0.999311 \times 2763.6 \\
& + 0.000078\ Q_{Div}^2 \\
& + 0.000031\ Q_{Div}^2 + 0.000031 \times 80\ Q_{Div} + 0.000031 \times 1600
\end{aligned}$$

$$13.6' = 0.003084\ Q_{Div}^2 + 0.165023\ Q_{Div} + 4.086$$

$$3084.95 = Q_{Div}^2 + 53.51\ Q_{Div}$$

$$3084.95 + 715.81 = Q_{Div}^2 + 53.51\ Q_{Div} + 715.81$$

$$= (Q_{Div} + 26.755)^2$$

$$61.65 = Q_{Div} + 26.755$$

$$Q_{Div} = 34.90 \text{ cfs}$$

F.A.V.A. Region No.	STATE	NMP	SHEET NO.	TOTAL SHEETS
6	NEW MEXICO	PROJ NO.	3-33	

AVID ENGINEERING, INC.

Sta. 220+00 Paseo del Norte Blvd.
Build MOL 79' Lt.
Build MOL 79' Rt.
Connect MOL to MOL w/(1)-24" RCP

Sta. 225+00 Paseo del Norte Blvd.
Build MOL 79' Lt.
Build MOL 79' Rt.
Connect MOL to MOL w/(1)-24" RCP

Sta. 233+00 Paseo del Norte Blvd.
Build MOL 79' Lt.
Build MOL 79' Rt.
Connect MOL to MOL w/(1)-24" RCP

MATCHLINE STA. 220+00

225+00

230+00

MATCHLINE STA. 233+00

R/W LINE

SLOPE LIMITS

BICYCLE/PEDESTRIAN PATH

DITCH

℄ CONST. S89°36'00"E 1,563.99'

SLOPE LIMITS

PT STA. 227+84.21

DITCH

R/W LINE

CONST CL.
P.I. STA. 222+84.21
Δ=04°41'04"
D=00°30'00"
T=468.72'
L=936.92'
R=11,459.16'

SCALE:
HORZ.: 1"=50'
VERT.: 1"=10'

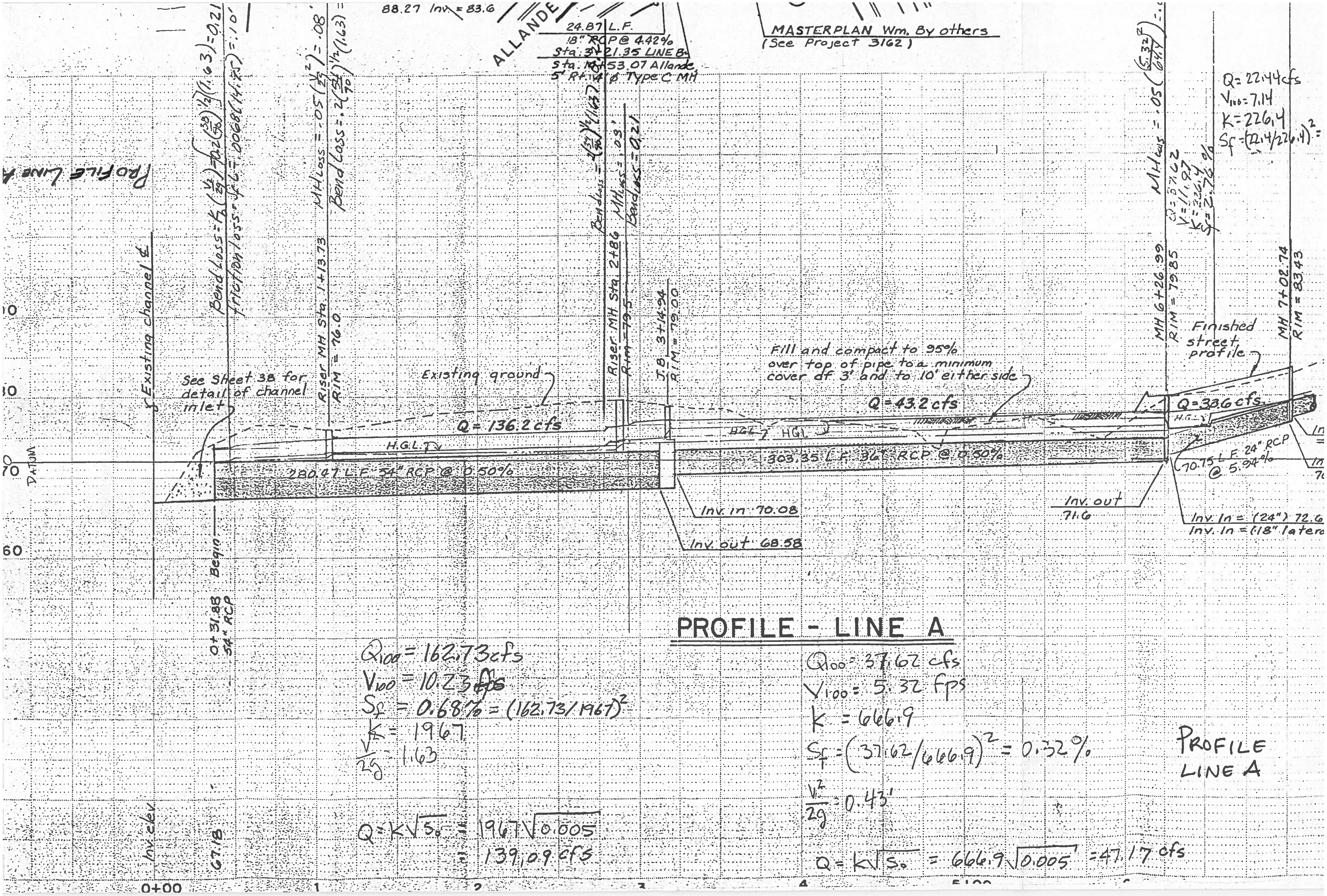
5620
5610
5600
5590
5580
5570
5560
5550
5540
5530

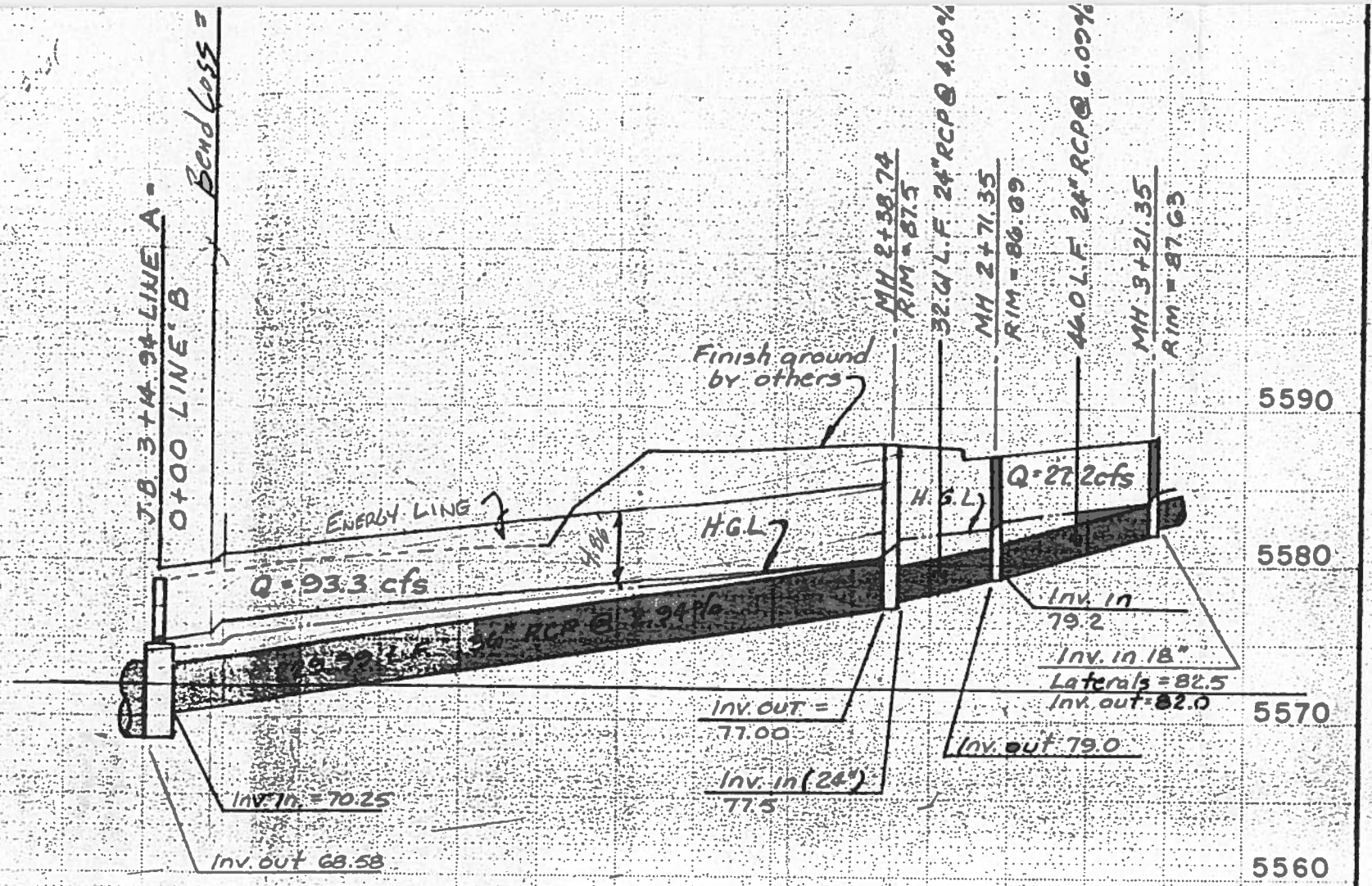
PROFILE GRADE
EXISTING PROFILE
S=3.00%
66" RCP
66" RCP

220+00 1 2 3 4 225+00 6 7 8 9 230+00 1 2 3

PASEO DEL NORTE – DRAINAGE N.M. PROJECT NO. PROJ NO. SHEET NO. 3-33

ROTATE 180°


PROFILE LINE A
88.27 Inv = 83.6
ALLANDE
24.87 L.F.
18" RCP @ 4.42%
Sta. 3+21.35 LINE B
Sta. 14+53.07 Allande
5' Rt. 4' ø Type C MH
MASTERPLAN Wm. By others
(See Project 3162)
Q = 22.44 cfs
V100 = 7.14
K = 226.4
Sf = (22.4/226.4)²
Existing channel ℄
Bend Loss = Kb(V²/2g) = 0.2(38/90)^½(1.63) = 0.21
friction loss = Sf L = .0068(14.75) = .10'
MH Loss = .05(V²/2g) = .08
Bend Loss = .2(54/90)^½(1.63)
Riser MH Sta. 1+13.73
RIM = 76.0
See Sheet 38 for detail of channel inlet
Existing ground
Q = 136.2 cfs
H.G.L.
280.47 L.F. 54" RCP @ 0.50%
Bend loss = .2(54/90)^½(1.63)
MH Loss = .03'
Bend Loss = 0.21
Riser MH Sta. 2+86
RIM = 79.5
J.B. 3+14.94
RIM = 79.00
Inv. in 70.08
Inv. out 68.58
Fill and compact to 95% over top of pipe to a minimum cover of 3' and to 10' either side
Q = 43.2 cfs
HGL
303.35 L.F. 36" RCP @ 0.50%
Inv. out 71.6
MH Loss = .05(5.32²/64.4)
Q = 37.62
V = 11.97
K = 226.4
Sf = 2.76%
MH 6+26.99
RIM = 79.85
Finished street profile
Q = 33.6 cfs
H.G.L.
70.75 L.F. 24" RCP @ 5.94%
MH 7+02.74
RIM = 83.43
Inv. In = (24") 72.6
Inv. In = (18" lateral)
DATUM
70
60
0+00
1
2
3
4
5+00
Inv. elev.
67.18
0+31.88 Begin
54" RCP
PROFILE - LINE A
Q100 = 162.73 cfs
V100 = 10.23 fps
Sf = 0.68% = (162.73/1967)²
K = 1967
V²/2g = 1.63
Q = K√S0 = 1967√0.005
= 139.09 cfs
Q100 = 37.62 cfs
V100 = 5.32 fps
K = 666.9
Sf = (37.62/666.9)² = 0.32%
V²/2g = 0.43'
Q = K√S0 = 666.9√0.005 = 47.17 cfs
PROFILE LINE A



$Q_{100} = 125.12$

$V_{100} = 125.12 / \frac{\pi}{4}(3)^2 = 17.70$ fps

$k = 666.9$

$S_f = (125.12/666.9)^2 = 3.52\%$

$\frac{V^2}{2g} = 4.86$

$Q = k\sqrt{S_o} = 666.9\sqrt{0.0294} = 114.35$ cfs

Inv. elev.

PROFILE - LINE B

ENGINEER'S SEAL

KENT W. WHITMAN
NEW MEXICO
6170
REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	REMARKS	BY

REVISIONS

DESIGNED BY K.M.W. DATE 3-87

DRAWN BY W.J.W. DATE 3-87

CHECKED BY K.M.W. DATE 3-87

SCALE:
1" = 50' HOR.
1" = 10' VER.

community sciences corporation
LAND PLANNING ENGINEERING SURVEYING
P.O. Box 1328 Corrales, N.M. 87048

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

PROFILE LINE B

TITLE: HERITAGE EAST - UNIT SIX

STORM SEWER - PLAN AND PROFILE

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
D.R.C. Chair		4/30/87			
Trans. Dev.		4/22/87			
Utility Dev.		4-22-87			
Hydrology		4-22-87			

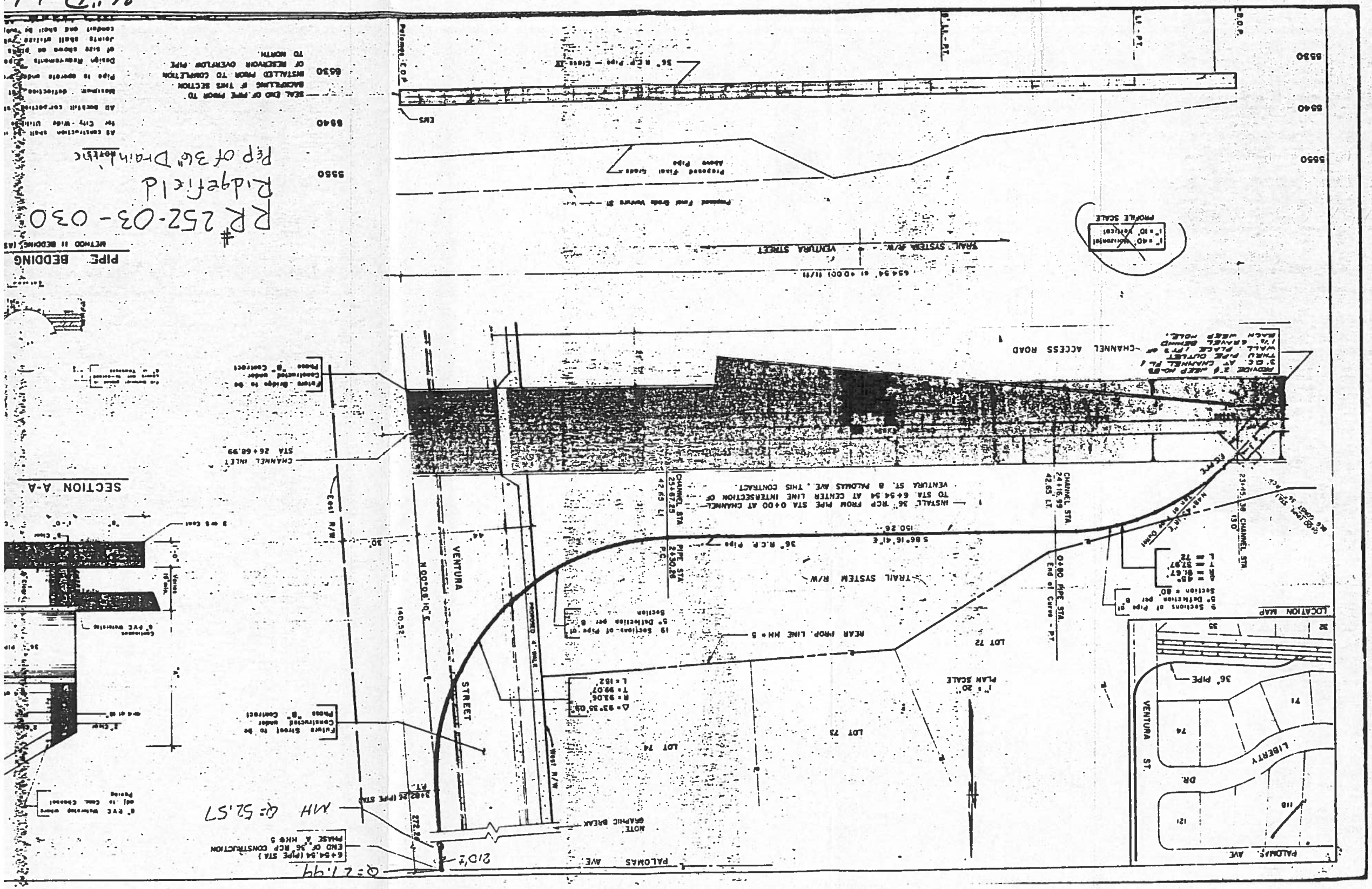
DRAWING NO. 3140

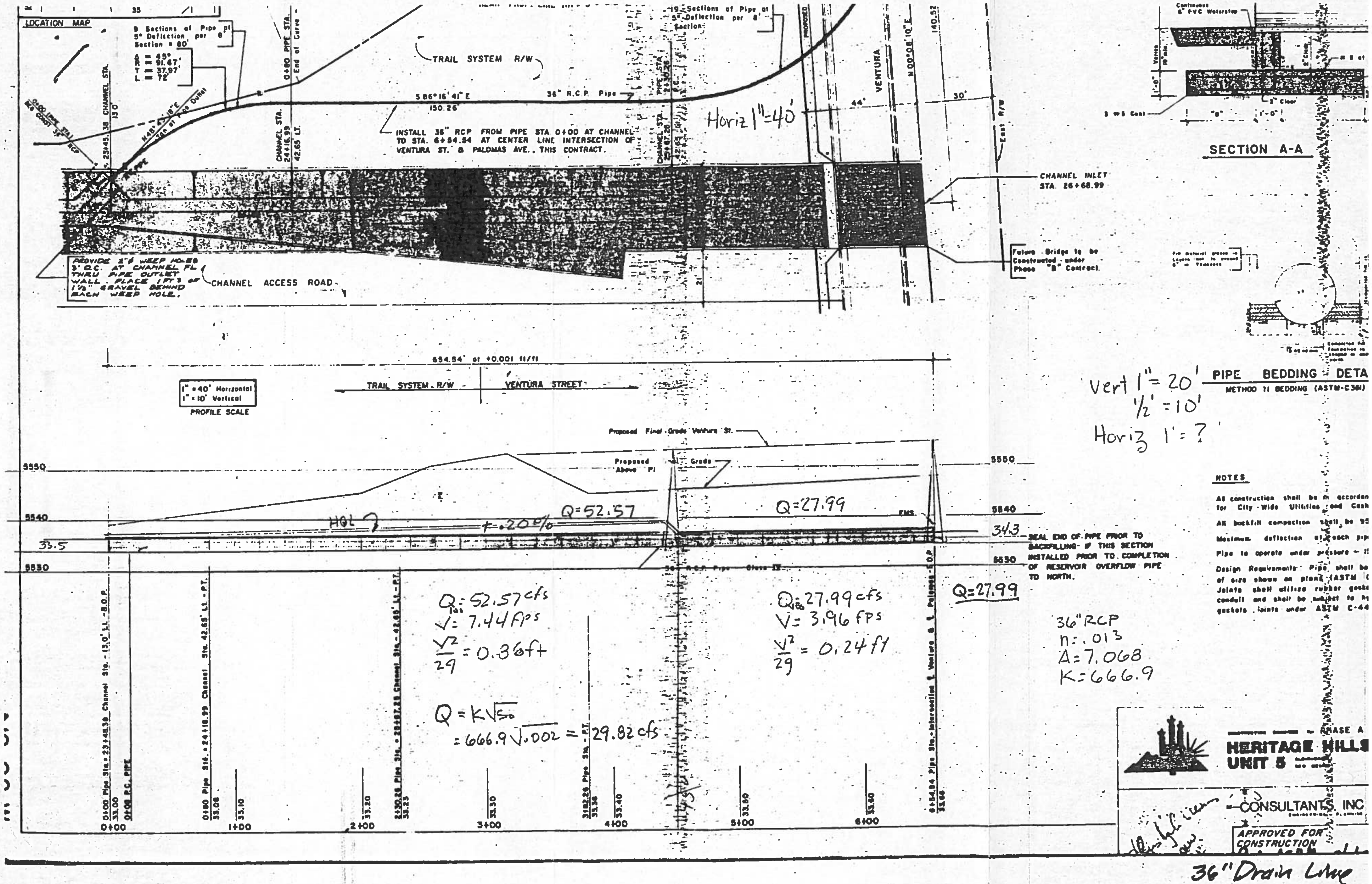
MAP NO. D-20

SHEET 37 OF 39

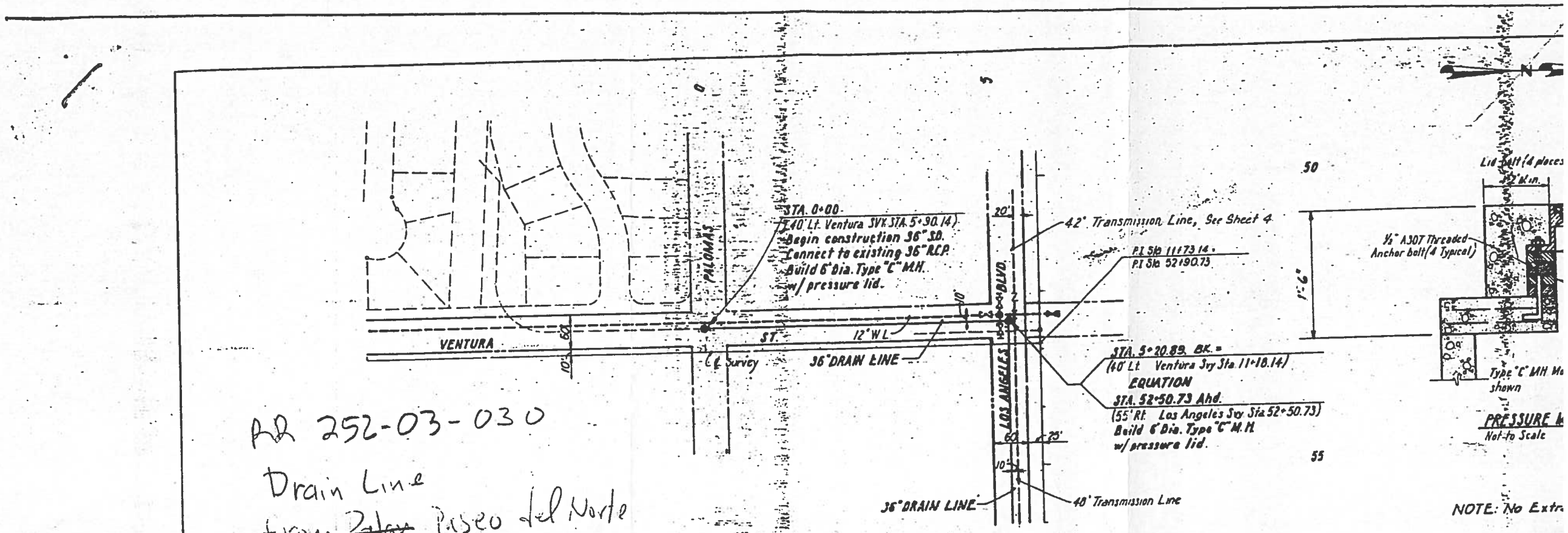
36" Main L...

RR# 252-03-030
Ridgefield
Rep of 36" Drain letter



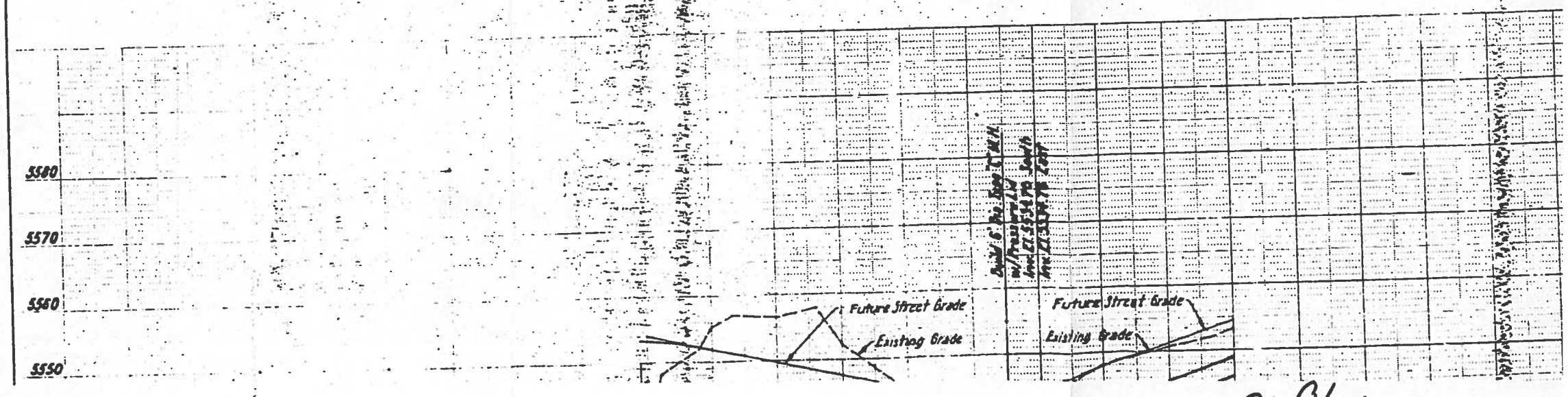


LOCATION MAP
9 Sections of Pipe at 5° Deflection per 8' Section = 80'
Δ = 45° R = 91.67' T = 37.97' L = 72'
23+45.38 CHANNEL STA. 13.0'
0+80 PIPE STA. End of Curve
CHANNEL STA. 24+16.99 42.65 LT.
TRAIL SYSTEM R/W
S 86°16'41" E 150.26'
36" R.C.P. Pipe
INSTALL 36" RCP FROM PIPE STA 0+00 AT CHANNEL TO STA. 6+84.54 AT CENTER LINE INTERSECTION OF VENTURA ST. & PALOMAS AVE., THIS CONTRACT.
19 Sections of Pipe at 5° Deflection per 8' Section
PIPE STA. 2+30.26
CHANNEL STA. 25+87.26
Horiz 1"=40'
PROPOSED
VENTURA
N 00°08'10" E
140.52
44'
30'
East R/W
CHANNEL INLET STA. 26+68.99
Future Bridge to be Constructed under Phase "B" Contract.
PROVIDE 2" Ø WEEP HOLES 3' O.C. AT CHANNEL FL THRU PIPE OUTLET WALL. PLACE 1 FT³ OF 1½" GRAVEL BEHIND EACH WEEP HOLE.
CHANNEL ACCESS ROAD
654.54' at +0.001 ft/ft
TRAIL SYSTEM R/W
VENTURA STREET
1" = 40' Horizontal
1" = 10' Vertical
PROFILE SCALE
Proposed Final Grade Ventura St.
Proposed Above PI
Grade
5550
5540
5530
33.5
34.3
HGL ?
+.20%
Q=52.57
Q=27.99
SEAL END OF PIPE PRIOR TO BACKFILLING IF THIS SECTION INSTALLED PRIOR TO COMPLETION OF RESERVOIR OVERFLOW PIPE TO NORTH.
Q=27.99
0+00 Pipe Sta. = 23+45.38 Channel Sta. - 13.0' Lt. - B.O.P. 33.00
0+08 P.C. PIPE
0+80 Pipe Sta. = 24+16.99 Channel Sta. 42.65' Lt. - P.T. 33.08
33.10
33.20
2+30.26 Pipe Sta. = 25+87.26 Channel Sta. - 42.65' Lt. - P.T. 33.23
33.30
3+82.26 Pipe Sta. - P.T. 33.38
33.40
33.50
33.60
6+84.54 Pipe Sta. - Intersection ℄ Ventura & ℄ Palomas - E.O.P. 33.66
0+00
1+00
2+00
3+00
4+00
5+00
6+00
Q = 52.57 cfs
V = 7.44 fps
V²/2g = 0.86 ft
Q = 27.99 cfs
V = 3.96 fps
V²/2g = 0.24 ft
Q = K√S₀
= 666.9√.002 = 29.82 cfs
36" RCP
n = .013
A = 7.068
K = 666.9
SECTION A-A
Vert 1" = 20'
½" = 10'
Horiz 1" = ?
PIPE BEDDING DETA
METHOD II BEDDING (ASTM-C361)
NOTES
HERITAGE HILLS
UNIT 5
PHASE A
CONSULTANTS, INC
APPROVED FOR CONSTRUCTION
36" Drain Line

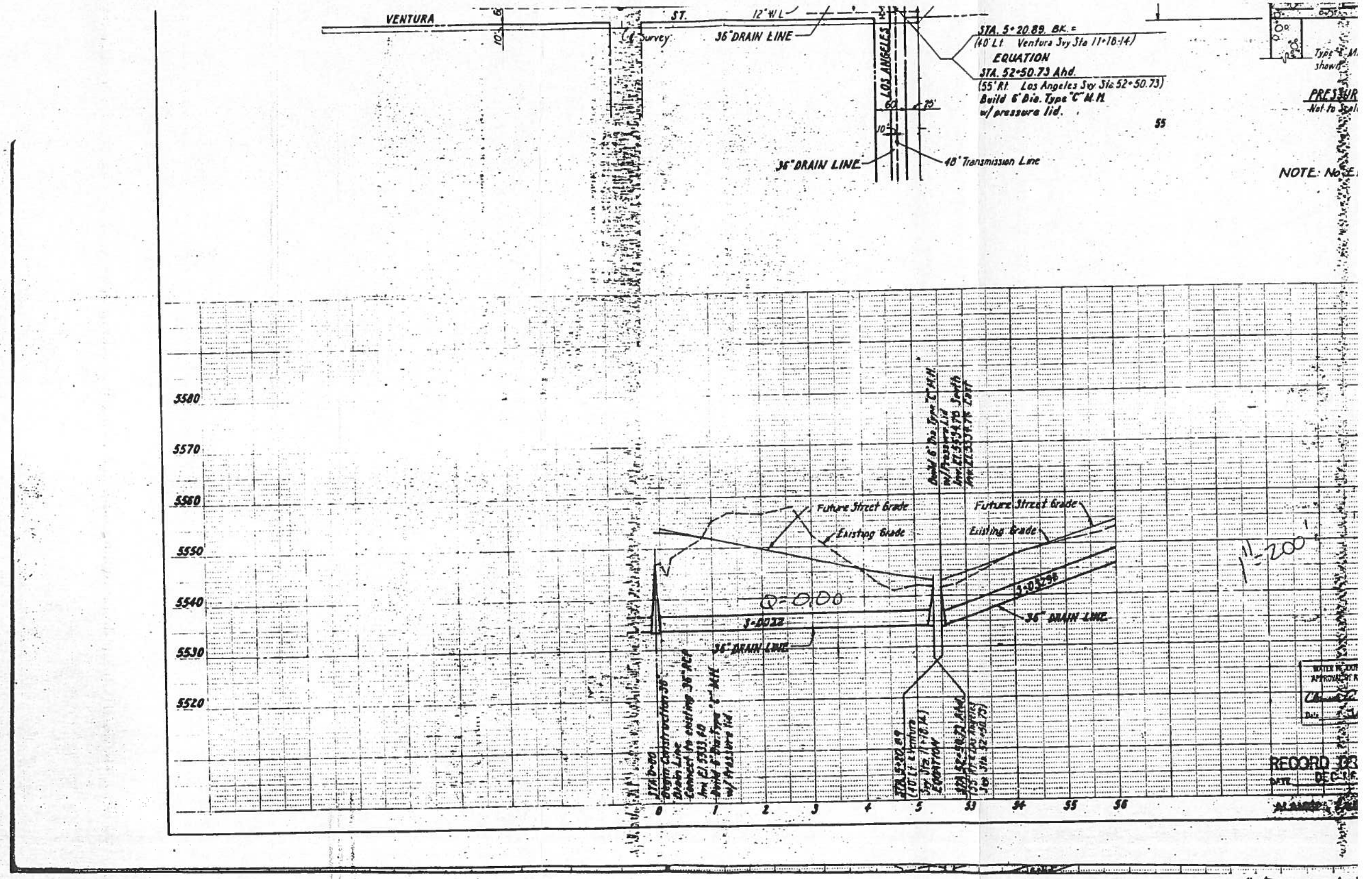


AR 252-03-030

Drain Line
from ~~Palm~~ Paseo del Norte
S. to channel



profiles
36" Drain Line


VENTURA
ST.
12" W.L.
36" DRAIN LINE
LOS ANGELES
STA. 5+20.89 BK. =
(40' Lt Ventura Svy Sta 11+16.14)
EQUATION
STA. 52+50.73 Ahd.
(55' Rt Los Angeles Svy Sta 52+50.73)
Build 6' Dia. Type "C" M.H.
w/ pressure lid.
55
36" DRAIN LINE
48" Transmission Line
NOTE: No
5580
5570
5560
5550
5540
5530
5520
Future Street Grade
Existing Grade
Q=0.00
S=0.0022
36" DRAIN LINE
Future Street Grade
Existing Grade
S=0.0298
36" DRAIN LINE
1" = 200'
0
1
2
3
4
5
53
54
55
56

36" Drain Li

AVID ENGINEERING, INC.

FHWA Region No.	STATE	NMP	SHEET NO.	TOTAL SHEETS
6	NEW MEXICO	PROJ NO.	3-45	

PALOMAS AVE.

43+00

R/W LINE

Sta. 43+80 Holbrook
Build CDL 18' LL
Build CDL 25' RL
Connect w/(1) 24" RCP

Sta. 48+81 Holbrook
Build CDL 33' LL
Build CDL 5' LL
Connect w/(1) 24" RCP

PASEO DEL NORTE

50+00

Sta. 52+00 Holbrook
Build CDL 45' LL
Build CDL 9' RL
Build CDL 36' RL
Connect w/(1) 24" RCP

HOLLYWOOD AVE.

53+00

56+00

SLOPE LIMITS

HOLBROOK ST.

℄ CONST HOLBROOK ST.

N00°24'00"E

718.13'

366.63'

SLOPE LIMITS

SLOPE LIMITS

240+00

R/W LINE

R/W LINE

DITCH

DITCH

BICYCLE/PEDESTRIAN PATH

NOTE: FOR INTERSECTION GEOMETRICS SEE INTERSECTION PLAN SHEETS

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

100' V.C. M.O.=+0.54'

PVC STA. 42+50.00 EL. 5630.00

VPI STA. 43+00.00 EL. 5628.75

VPT STA. 43+50.00 EL. 5628.85

S=-2.500%

S=1.800%

200' V.C. M.O.=-.70'

PVC STA. 45+50.00 EL. 5633.25

VPI STA. 48+50.00 EL. 5638.05

VPT STA. 47+50.00 EL. 5634.05

PROFILE GRADE

S=-1.000%

24" RCP

100' V.C. M.O.=+0.22'

PVC STA. 51+50.00 EL. 5630.05

VPI STA. 52+00.00 EL. 5629.55

VPT STA. 52+50.00 EL. 5629.95

S=0.800%

EXISTING PROFILE

25" RCP

200' V.C. M.O.=-.70'

PVC STA. 53+50.00 EL. 5630.75

VPI STA. 54+50.00 EL. 5631.55

VPT STA. 55+50.00 EL. 5629.75

S=-1.800%

Storm Sewer
Holbrook St

3 4 45+00 6 7 8 9 50+00 1 2 3 4 55+00 6

HOLBROOK ST. – DRAINAGE N.M. PROJECT NO. PROJ NO. SHEET NO. 3-

AVID ENGINEERING, INC.

F.H.W.A. Region No.	STATE	NMP
6	NEW MEXICO	PROJ NO.

43+00 | 49+00 | 210+00 | 53+00 | 57+00

PALOMAS AVE.

R/W LINE

Sta. 44+87 Ventura
Build CDI, 33' Lt.
Build CDI, 5' Rt.
Connect w/(1) 24" RCP

Sta. 46+73 Ventura
Build CDI, 33' Lt.
Build CDI, 5' Lt.
Connect w/(1) 24" RCP

PASEO DEL NORTE

SLOPE LIMITS

VENTURA ST.

Sta. 54+18 Ventura
Build CDI, 33' Lt.

HOLLYWOOD AVE.

6' CONST. VENTURA ST.

N00°11'28"E 584.58

N00°11'28"E 500.00'

DITCH

BICYCLE/PEDESTRIAN PATH

DITCH

R/W LINE

215+00

NOTE: FOR INTERSECTION GE
INTERSECTION PLAN S

200' V.C. M.O.=-0.38'

PVC STA. 45+50.00 EL. 5555.33

VPI STA. 46+50.00 EL. 5553.83

VPT STA. 47+50.00 EL. 5554.83

100' V.C. M.O.=-0.14'

PVC STA. 52+00.00 EL. 5550.33

VPI STA. 53+50.00 EL. 5549.83

VPT STA. 53+00.00 EL. 5548.78

S=0.500%

S=-1.000%

S=-2.100%

PROFILE GRADE

24" RCP

24" RCP

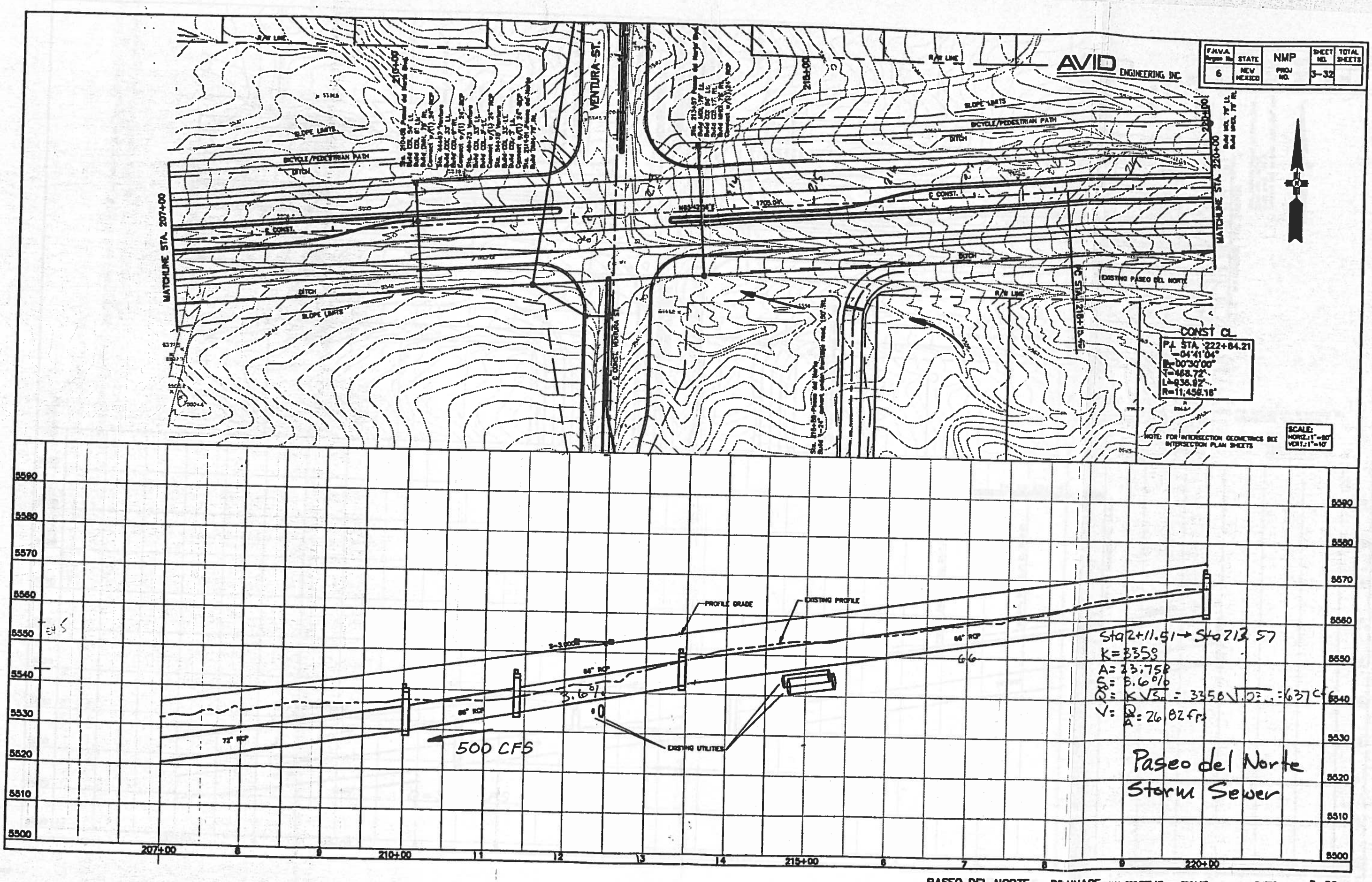
EXISTING PROFILE

Future Q_{100}=29

STORM SEWER
VENTURA ST

3 4 45+00 6 7 8 9 50+00 1 2 3 4 55+00 6

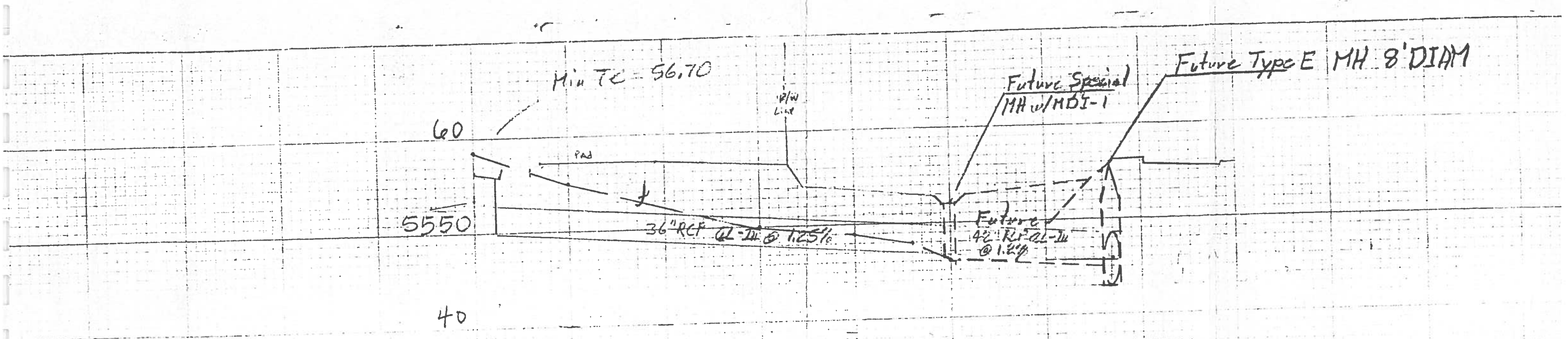
VENTURA ST. – DRAINAGE N.M. PROJECT NO. PROJ NO. SHEET NO



Sta 212+11.51 → Sta 213.57
K = 3358
A = 23.758
S = 3.6%
Q = KVS_c = 3358 $\sqrt{.036}$ = 637 cfs
V = $\frac{Q}{A}$ = 26.82 fps

Paseo del Norte
Storm Sewer

PASEO DEL NORTE – DRAINAGE N.M. PROJECT NO. PROJ NO. SHEET NO. 3-32



$Q_{100} = 74.22 cfs$

$V_{100} = 10.5 fps$

$Q_{cap} = 666.9(0.125)^{0.5} = 74.56 cfs$

$Q_{100} = 94 cfs$ ±

$V_{100} = 1066(.0012)^{0.5} = 110.20 cfs$

PROPOSED ONSITE 36" RCP STREET A

PROFILE
Ridgefield N. Subd.
ONSITE 36" RCP
STREET A

5543 = Sta