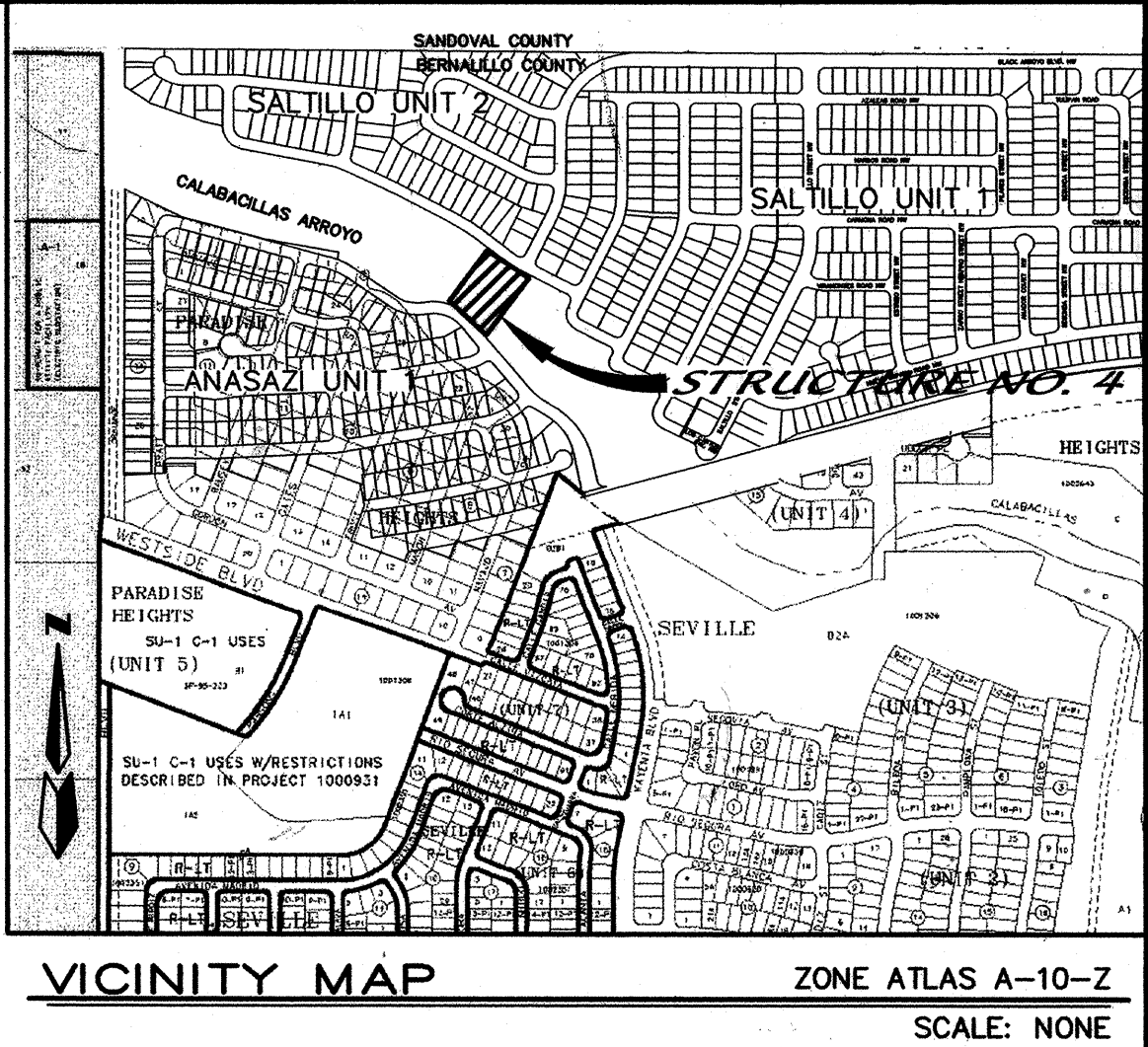


ALBUQUERQUE METROPOLITAN
ARROYO FLOOD CONTROL AUTHORITY

CONSTRUCTION PLANS
FOR

CALABACILLAS ARROYO IMPROVEMENTS
DROP STRUCTURE NO. 4

ALBUQUERQUE, NEW MEXICO



AMAFCA NOTES:

1. AMAFCA FIELD ENGINEER SHALL BE NOTIFIED 48 - HOURS PRIOR TO ANY WORK WITHIN THE AMAFCA RIGHT-OF-WAY.
2. NO WORK WILL BE PERFORMED WITHIN THE AMAFCA RIGHT-OF-WAY BETWEEN MAY 15 AND OCTOBER 15 WITHOUT WRITTEN PERMISSION FROM AMAFCA.
3. ALL SUBGRADE, BACKFILL AND EMBANKMENT SHALL BE COMPACTED TO 95% (MODIFIED PROCTOR) WITHIN AMAFCA RIGHT-OF-WAY. TESTING REPORTS SHALL BE PROVIDED TO AMAFCA FIELD ENGINEER.
4. AMAFCA FIELD ENGINEER WILL BE NOTIFIED 48 - HOURS PRIOR TO FINAL INSPECTION OF FACILITIES WITHIN THE AMAFCA RIGHT-OF-WAY.
5. ALL DISTURBED GROUND AREA SHALL BE REVEGETATED IN ACCORDANCE WITH THE CITY OF ALBUQUERQUE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, SECTION 1012 NATIVE GRASS SEEDING, AS CURRENTLY UPDATED.

APPROVED FOR CONSTRUCTION WITHIN AMAFCA RIGHT-OF-WAY:

BY James M. Mays 8-1-06
(FOR AMAFCA) DATE

INDEX TO DRAWINGS

SHEET NO.	SHEET
1	INDEX OF SHEETS
2	MASTER PLAN
3 - 5	CHANNEL PLAN & PROFILES
6	DROP STRUCTURE NO. 4 - PLAN & SECTION
7-8	DROP STRUCTURE NO. 4 - LAYER DETAILS
9	DROP STRUCTURE NO. 4 - SPECIFICATIONS

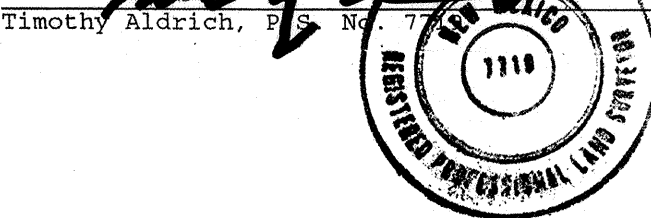
RECORD DRAWINGS

I, Patrick J. Conley of the firm of Smith Engineering Company, A Registered Professional Engineer in the State of New Mexico, do hereby state, to the best of my knowledge and belief, that the infrastructure installed as part of this project has been inspected by a qualified person under my direct supervision and has been constructed in general accordance with the City of Albuquerque Standard Specifications for Public Works plans and specifications, while someone from Smith Engineering Company was onsite, approved by the City Engineer and that the original design intent of the approved plans has been met, except as noted on the as-built construction drawings. The Certification is based on site inspections by me or personnel under my direction, and as-built survey information provided by TIM ALDRICH (Surveyor Name) NMPS number 7719 (PS#).



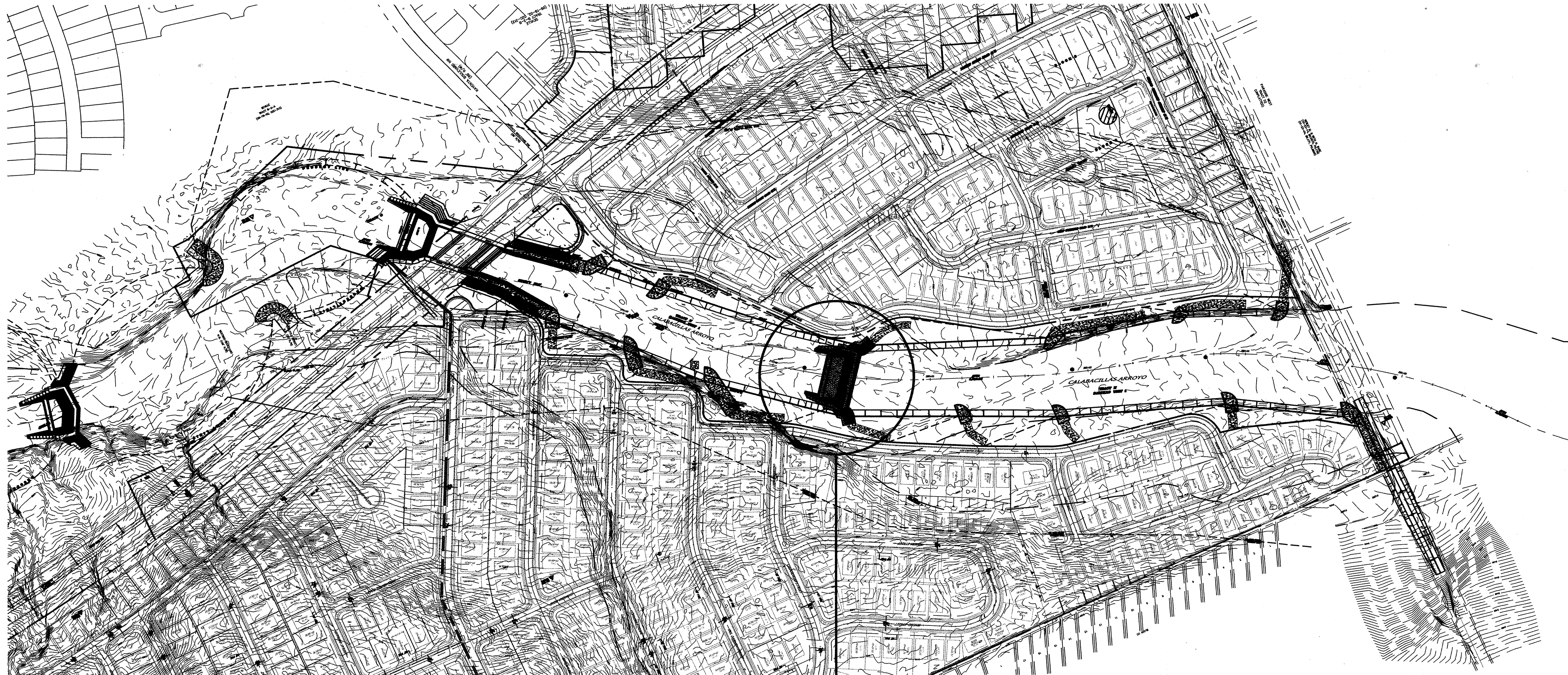
SURVEYOR'S CERTIFICATION

"I, Timothy Aldrich, a duly qualified Registered Professional Land Surveyor under the laws of the State of New Mexico, do hereby certify that the 'as-built' information shown on these drawings was obtained from field construction and 'as-built' surveys performed by me or under my supervision, that the 'as-built' information shown on these drawings was added by me or under my supervision, and that this 'as-built' information is true and correct to the best of my knowledge and belief." Aldrich Land Surveying is not responsible for any of the design concepts, calculations, or engineering.

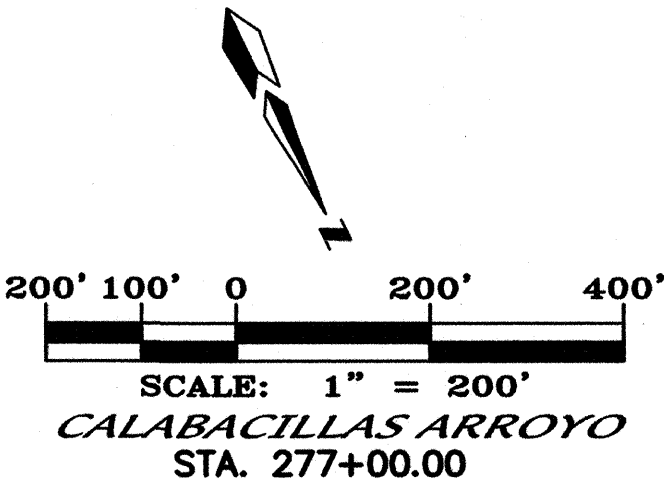


05/12/10
Date

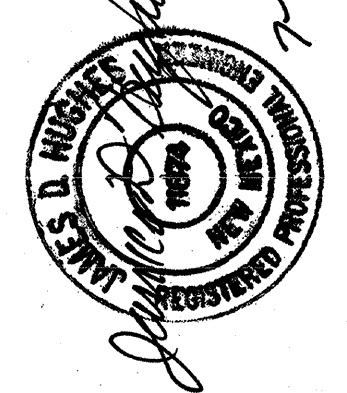
dmg D. MARK GOODWIN & ASSOCIATES, P.A. CONSULTING ENGINEERS P. O. BOX 90606 ALBUQUERQUE, NEW MEXICO 87199 (505) 828-2200, FAX (505) 797-9539		ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY	
ENGINEERS STAMP & SIGNATURE	APPROVALS	ENGINEER	DATE
	DRC CHAIRMAN		
	TRANSPORTATION		
	WATER/WASTEWATER		
	HYDROLOGY		
	CIP		
CONSTR. MNGMT.			
CONSTR. COORD.			
CITY PROJECT NO.		SHEET OF	
		1 9	

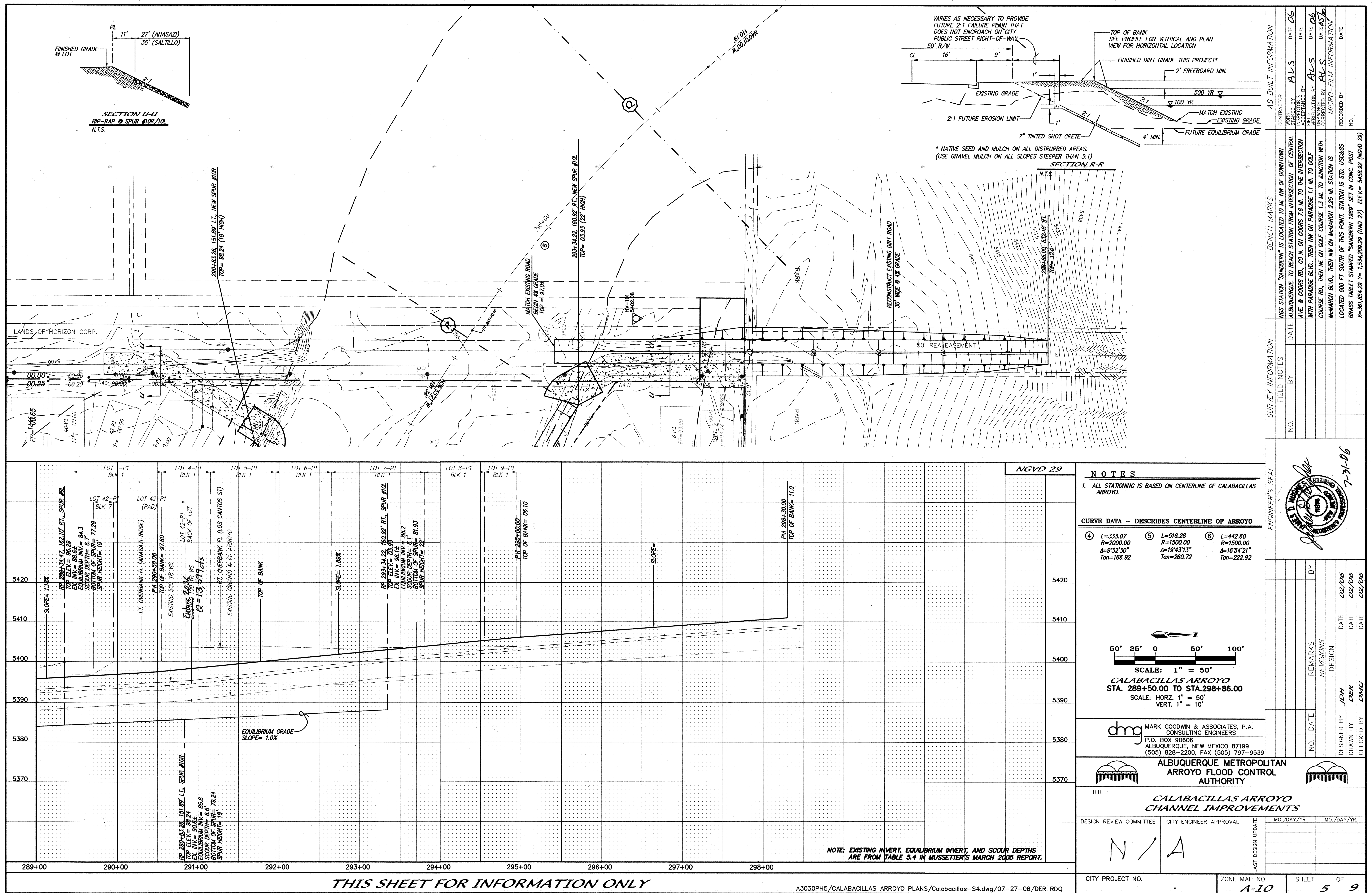


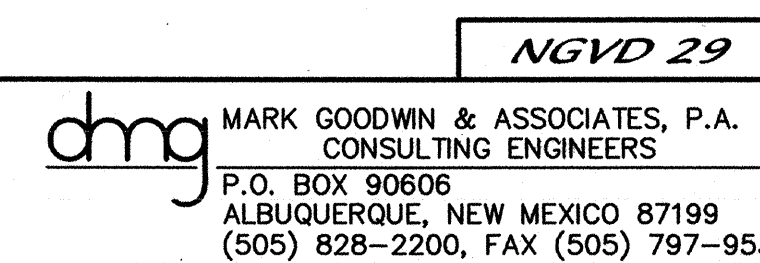
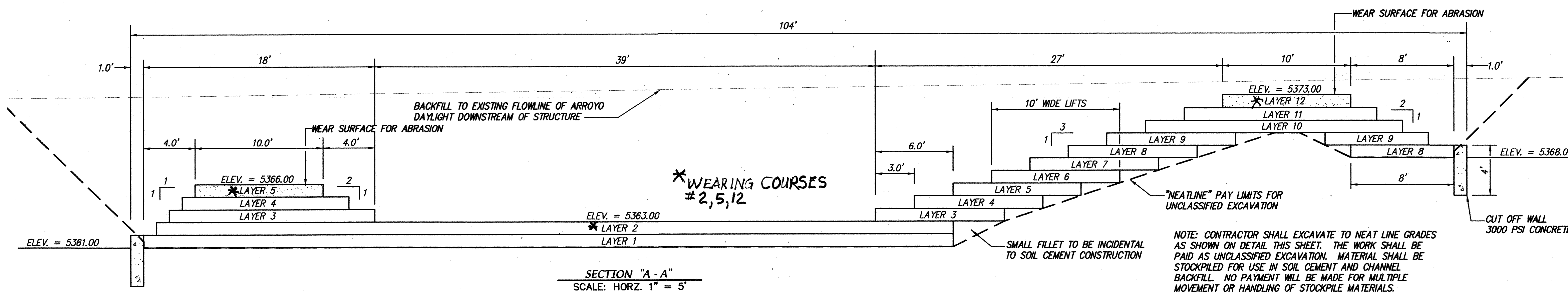
DROP STRUCTURE NO. 4
CONSTRUCTION THIS PROJECT



 MARK GOODWIN & ASSOCIATES, P.A. CONSULTING ENGINEERS P.O. BOX 90606 ALBUQUERQUE, NEW MEXICO 87199 (505) 828-2200, FAX (505) 797-9539		NGVD 29	
 ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY			
TITLE: ANASAZI RIDGE SUBDIVISION CALABACILLAS ARROYO IMPROVEMENTS MASTERPLAN			
DESIGN REVIEW COMMITTEE	CITY ENGINEER APPROVAL	MO./DAY/YR.	
N/A	A		
LAST DESIGN UPDATE		MO./DAY/YR.	
CITY PROJECT NO.		ZONE MAP NO.	SHEET OF
		A-10	2 9

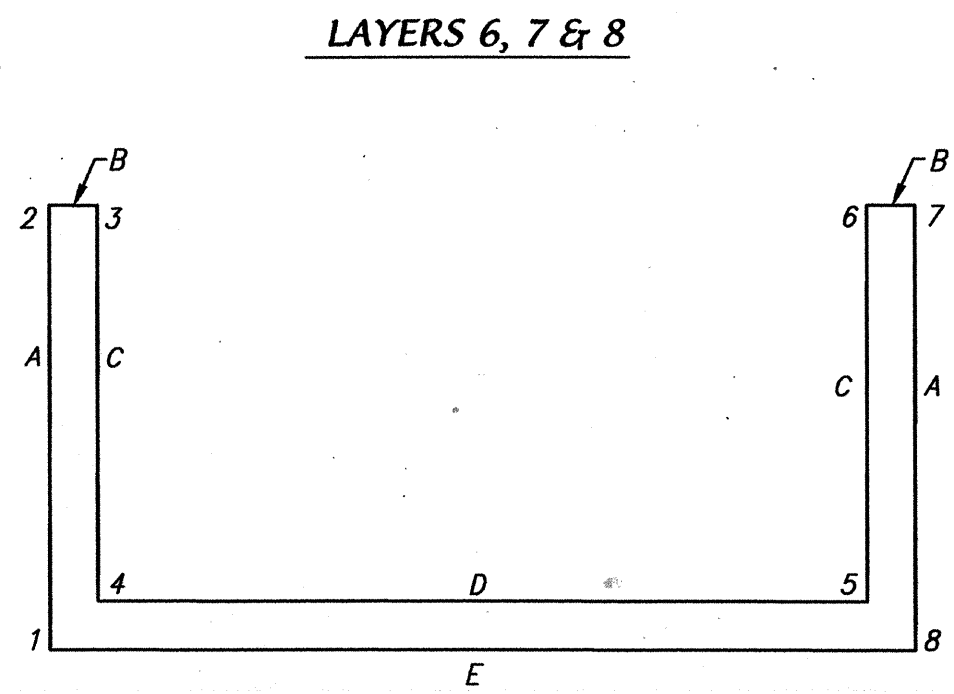
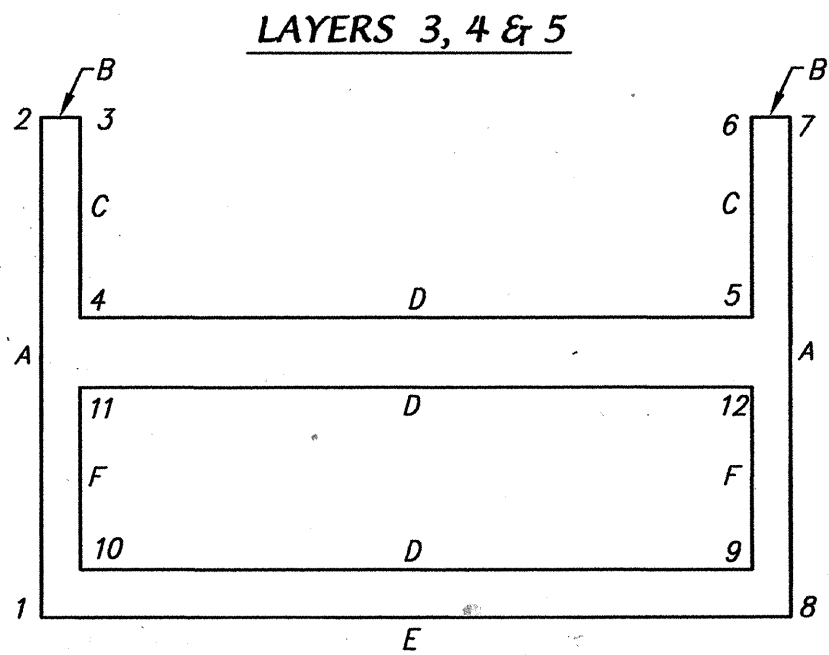
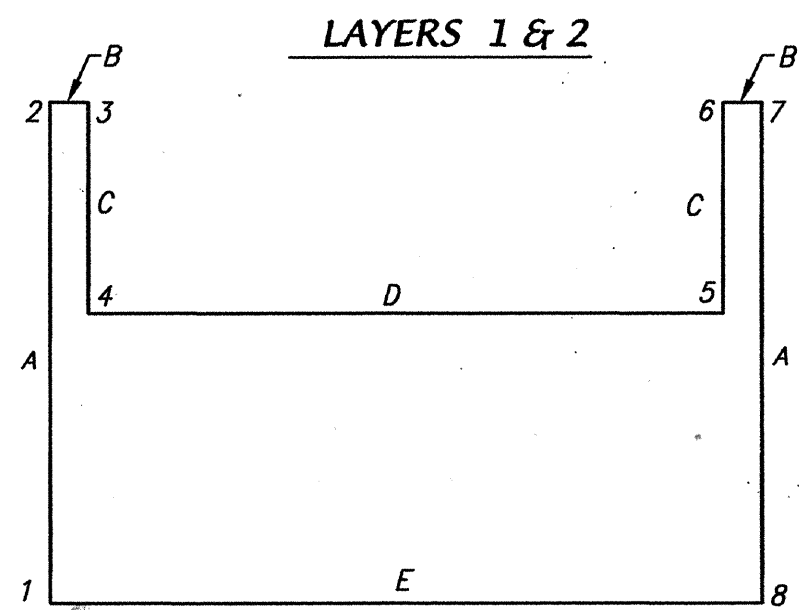
ENGINEER'S SEAL		SURVEY INFORMATION		BENCH MARKS		AS BUILT INFORMATION					
		FIELD NOTES		NGS STATION "SANDEEN" IS LOCATED TO MI. NW OF DOWNTOWN ALBUQUERQUE. TO REACH STATION FROM INTERSECTION OF CENTRAL AVE. & COORS RD., GO N. ON COORS 7.6 MI. TO THE INTERSECTION WITH PARADISE BLVD., THEN NW ON PARADISE 1.1 MI. TO GOLF COURSE RD., THEN NE ON GOLF COURSE 1.3 MI. TO JUNCTION WITH McMAHON BLVD., THEN NW ON McMAHON 2.25 MI. STATION IS LOCATED 600 FT SOUTH OF THIS POINT. STATION IS STD. USCAR5 BRASS TABLET STAMPED "SANDEEN 1989" SET IN CONC. POST X=361,854.29 Y= 1,534,209.29 (NAD 27) ELEV= 5456.92 (NAD 29)		CONTRACTOR		WORK		DATE	
NO.		BY		DATE		STAMPED BY		ALS		D6	
REMARKS		REVISIONS		DATE		DESIGNED BY		ALS		D6	
DESIGNED BY		DATE		DATE		DRAWN BY		ALS		D6	
RDQ		07/06		07/06		CHECKED BY		ALS		D6	
DMG		07/06		07/06		RECORDED BY		MICRO-FILM INFORMATION		DATE	





	ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY												
TITLE: ANASAZI RIDGE SUBDIVISION CALABACILLAS ARROYO IMPROVEMENTS DROP CONTROL STRUCTURE 4 - PLAN & SECTION													
GN REVIEW COMMITTEE N	CITY ENGINEER APPROVAL A	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td rowspan="5" style="width: 5%; text-align: center; vertical-align: middle;">LAST DESIGN UPDATE</td> <td style="width: 45%;">MO./DAY/YR.</td> <td style="width: 50%;">MO./DAY/YR.</td> </tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> <tr><td> </td><td> </td></tr> </table>	LAST DESIGN UPDATE	MO./DAY/YR.	MO./DAY/YR.								
LAST DESIGN UPDATE	MO./DAY/YR.	MO./DAY/YR.											
CITY PROJECT NO.	ZONE MAP NO. A-10	SHEET OF 6 9											

[illegible]



POINT	NORTHING	EASTING
1	N 1534488.5783	E 359188.999
2	N 1534423.1977	E 359272.4339
3	N 1534416.9007	E 359267.4995
4	N 1534443.423	E 359233.6533
5	N 1534339.7148	E 359152.3862
6	N 1534313.1925	E 359186.2324
7	N 1534306.8955	E 359181.2981
8	N 1534372.2761	E 359097.8632

POINT	NORTHING	EASTING
1	N 1534490.1525	E 359190.2326
2	N 1534427.2391	E 359270.519
3	N 1534419.7085	E 359267.1589
4	N 1534445.6141	E 359234.0998
5	N 1534338.7573	E 359150.3655
6	N 1534312.8518	E 359183.4246
7	N 1534306.5548	E 359178.4902
8	N 1534370.7019	E 359096.6296

POINT	NORTHING	EASTING
1	N 1534494.194	E 359188.3177
2	N 1534428.8134	E 359271.7526
3	N 1534422.5164	E 359266.8182
4	N 1534447.8051	E 359234.5462
5	N 1534337.7999	E 359148.3448
6	N 1534312.5112	E 359180.6168
7	N 1534306.2142	E 359175.6824
8	N 1534371.5948	E 359092.2475
9	N 1534371.7238	E 359105.0531
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12	N 1534347.6687	E 359135.7508

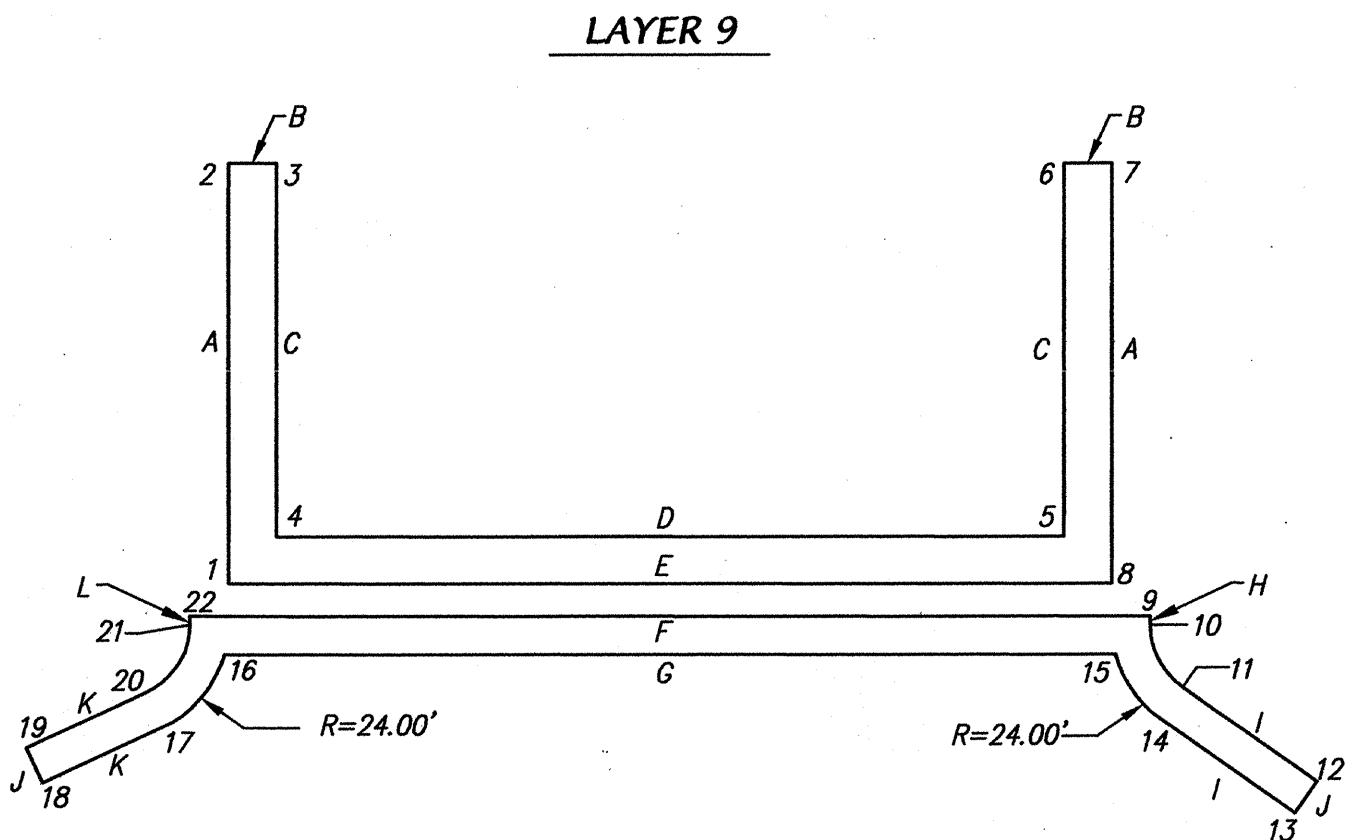
POINT	NORTHING	EASTING
1	N 1534497.6186	E 359187.19
2	N 1534431.6212	E 359271.412
3	N 1534425.3242	E 359266.4776
4	N 1534449.9961	E 359234.9927
5	N 1534336.8425	E 359146.3241
6	N 1534312.1705	E 359177.8089
7	N 1534305.8736	E 359172.8745
8	N 1534371.871	E 359088.6526
9	N 1534371.9999	E 359101.4582
10	N 1534485.1536	E 359190.1268
11	N 1534458.0145	E 359224.7601
12	N 1534344.8608	E 359136.0915

POINT	NORTHING	EASTING
1	N 1534501.0432	E 359186.0622
2	N 1534434.429	E 359271.0713
3	N 1534428.1321	E 359266.1369
4	N 1534452.1872	E 359235.4392
5	N 1534335.885	E 359144.3034
6	N 1534311.8299	E 359175.0011
7	N 1534305.5329	E 359170.0667
8	N 1534372.1471	E 359085.0576
9	N 1534372.2761	E 359097.8632
10	N 1534488.5783	E 359188.999
11	N 1534458.3552	E 359227.568
12	N 1534342.053	E 359136.4321

POINT	NORTHING	EASTING
1	N 1534506.0421	E 359186.168
2	N 1534438.8111	E 359271.9643
3	N 1534430.9399	E 359265.7963
4	N 1534492.0029	E 359187.8713
5	N 1534372.5522	E 359094.2682
6	N 1534311.4892	E 359172.1933
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8	N 1534370.849	E 359080.229

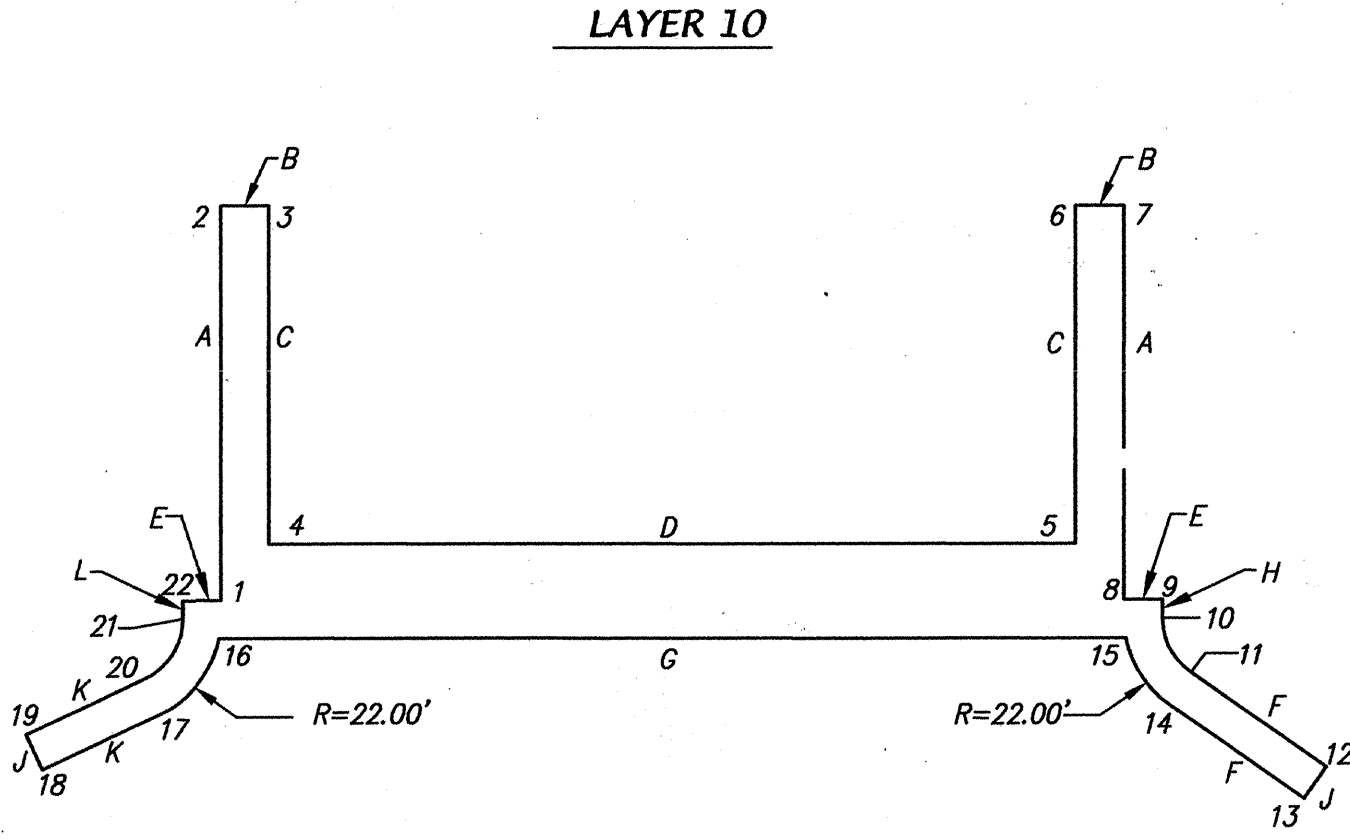
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1	N 1534509.4637	E 359185.0373
2	N 1534446.5533	E 359265.3266
3	N 1534438.6821	E 359259.1587
4	N 1534495.4275	E 359186.7435
5	N 1534372.8284	E 359090.6733
6	N 1534316.083	E 359163.0884
7	N 1534308.2118	E 359156.9205
8	N 1534371.1172	E 359076.6374

POINT	NORTHING	EASTING
1	N 1534512.8914	E 359183.9125
2	N 1534454.2956	E 359258.689
3	N 1534446.4243	E 359252.521
4	N 1534498.8522	E 359185.6157
5	N 1534373.1046	E 359087.0783
6	N 1534320.6767	E 359153.9836
7	N 1534312.8055	E 359147.8157
8	N 1534371.4013	E 359073.0391



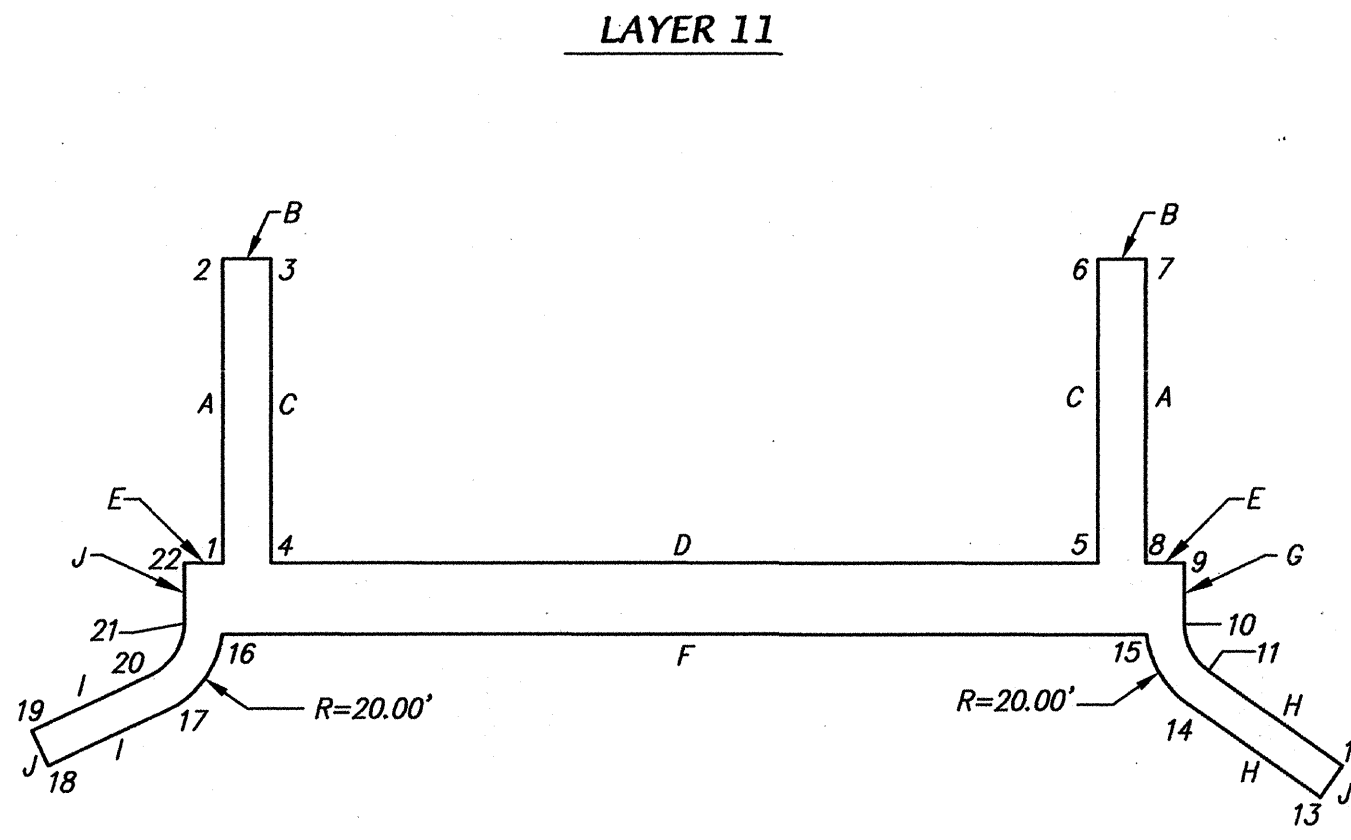
POINT	NORTHING	EASTING
1	N 1534516.316	E 359182.7847
2	N 1534462.0378	E 359252.0514
3	N 1534454.1666	E 359245.8834
4	N 1534502.2768	E 359184.488
5	N 1534373.3807	E 359083.4834
6	N 1534325.2704	E 359144.8788
7	N 1534317.3992	E 359138.7108
8	N 1534371.6775	E 359069.4442
9	N 1534369.6981	E 359058.9999
10	N 1534370.9317	E 359057.4257
11	N 1534373.6451	E 359042.9003

POINT	NORTHING	EASTING
12	N 1534363.7498	E 359010.3721
13	N 1534371.4035	E 359008.0438
14	N 1534381.2988	E 359040.572
15	N 1534380.3296	E 359057.1673
16	N 1534526.2018	E 359171.4748
17	N 1534546.0769	E 359167.2536
18	N 1534572.5148	E 359173.3831
19	N 1534570.7079	E 359181.1764
20	N 1534544.2701	E 359175.0469
21	N 1534528.0625	E 359180.7647
22	N 1534526.9306	E 359182.2093



POINT	NORTHING	EASTING
1	N 1534520.9743	E 359180.0827
2	N 1534469.78	E 359245.4138
3	N 1534461.9088	E 359239.2458
4	N 1534505.7015	E 359183.3602
5	N 1534373.6569	E 359079.8894
6	N 1534329.8642	E 359135.774
7	N 1534321.993	E 359129.606
8	N 1534373.1872	E 359064.275
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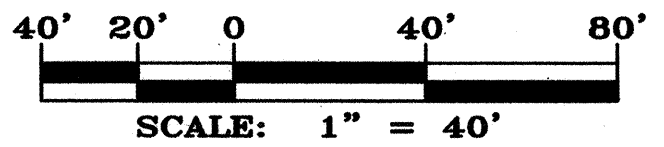
POINT	NORTHING	EASTING
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13	N 1534369.49	E 359008.6259
14	N 1534379.3854	E 359041.154
15	N 1534377.833	E 359057.7518
16	N 1534526.2218	E 359174.0311
17	N 1534545.6252	E 359169.202
18	N 1534572.0631	E 359175.3314
19	N 1534570.2562	E 359183.1247
20	N 1534543.8184	E 359176.9952
21	N 1534529.6366	E 359181.9986
22	N 1534527.2712	E 359185.0171



POINT	NORTHING	EASTING
1	N 1534516.9973	E 359188.4004
2	N 1534477.5222	E 359238.7762
3	N 1534469.651	E 359232.6082
4	N 1534509.1261	E 359182.2324
5	N 1534373.933	E 359076.2934
6	N 1534334.4579	E 359126.6692
7	N 1534326.5867	E 359120.5012
8	N 1534366.0618	E 359070.1255
9	N 1534359.7648	E 359065.1911
10	N 1534367.7632	E 359054.9585
11	N 1534369.8183	E 359044.0644

POINT	NORTHING	EASTING
12	N 1534359.9229	E 359011.5363
13	N 1534367.5766	E 359009.2079
14	N 1534377.472	E 359041.7361
15	N 1534375.2349	E 359058.2568
16	N 1534526.3418	E 359176.6661
17	N 1534545.1735	E 359171.1503
18	N 1534571.6114	E 359177.2797
19	N 1534569.8045	E 359185.073
20	N 1534543.3667	E 359178.9436
21	N 1534531.211	E 359183.2319
22	N 1534523.2943	E 359193.3348

LAYER	A	B	C	D	E	F	G	H	I	J	K	L	ELEV.	VOLUME (CY)
1	106.00	8.00	43.00	131.76	147.76	-	-	-	-	-	-	-	5362.00	370.25
2	104.00	8.00	42.00	135.76	151.76	-	-	-	-	-	-	-	5363.00	373.37
3	106.00	8.00	41.00	139.76	155.76	39.00	-	-	-	-	-	-	5364.00	197.39
4	107.00	8.00	40.00	143.76	159.76	44.00	-	-	-	-	-	-	5365.00	185.87
5	108.00	8.00	39.00	147.76	163.76	49.00	-	-	-	-	-	-	5366.00	173.45
6	109.00	10.00	99.00	151.76	171.76	-	-	-	-	-	-	-	5367.00	136.95
7	102.00	10.00	92.00	155.76	175.76	-	-	-	-	-	-	-	5368.00	133.22
8	95.00	10.00	85.00	159.76	179.76	-	-	-	-	-	-	-	5369.00	129.54
9	88.00	10.00	78.00	163.76	183.76	199.76	185.32	2.00	34.00	8.00	27.14	1.84	5370.00	212.06
10	83.00	10.00	71.00	167.76	187.76	34.00	188.52	4.00	-	8.00	27.14	3.83	5371.00	223.31
11	64.00	10.00	64.00	171.76	191.76	191.97	13.00	34.00	27.14	12.84	-	-	5372.00	189.64



NGVD 29

dmg MARK GOODWIN & ASSOCIATES, P.A.
CONSULTING ENGINEERS
P.O. BOX 90606
ALBUQUERQUE, NEW MEXICO 87199
(505) 828-2200, FAX (505) 797-9539

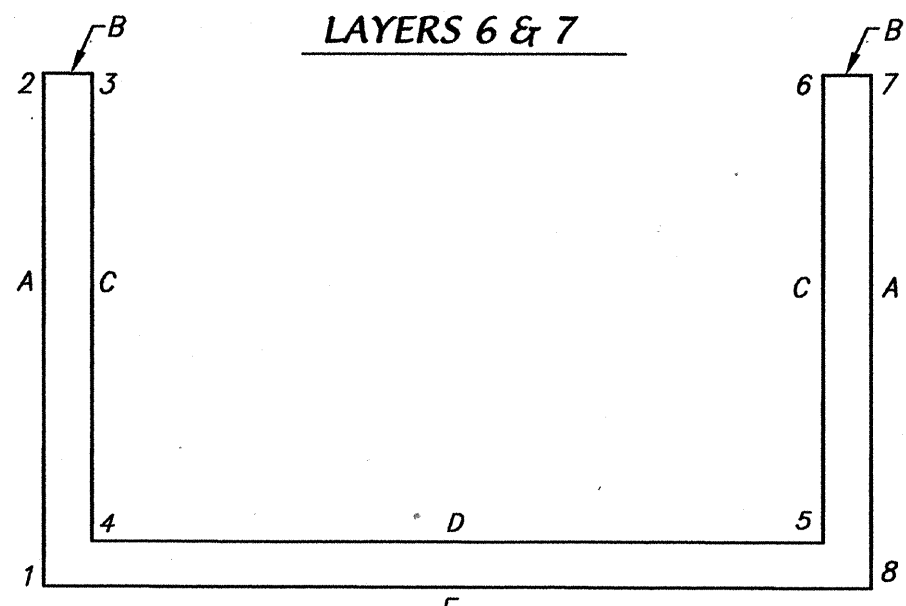
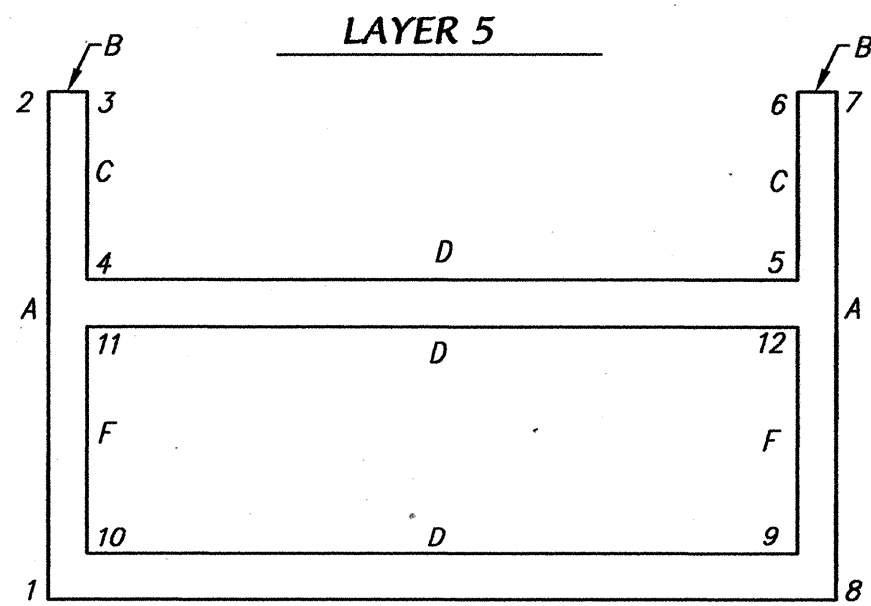
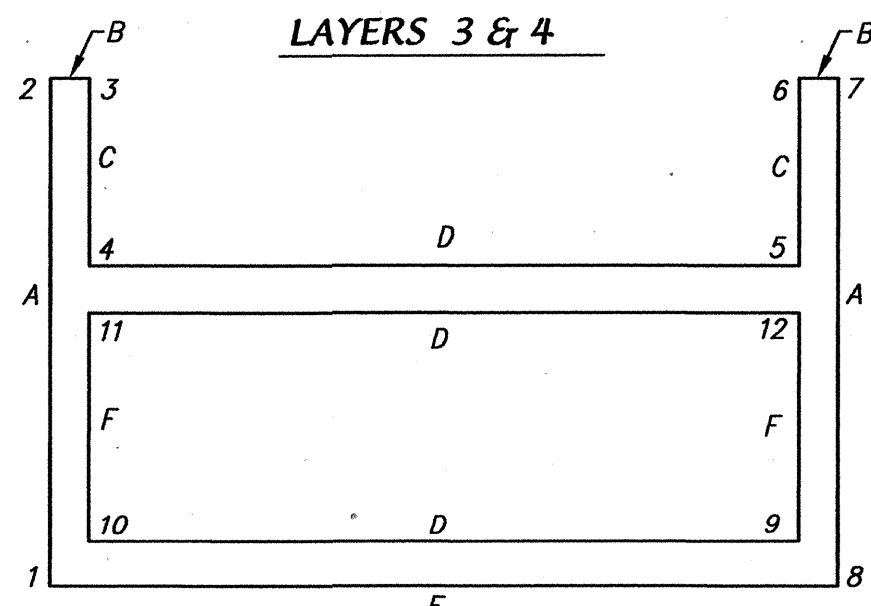
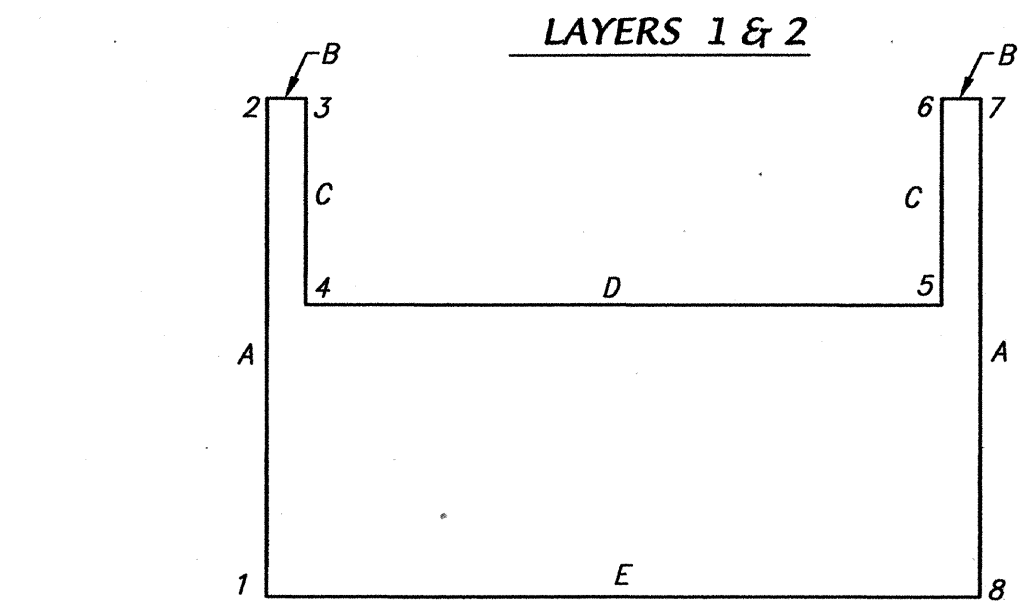
ALBUQUERQUE METROPOLITAN
ARROYO FLOOD CONTROL
AUTHORITY

TITLE: ANASAZI RIDGE SUBDIVISION
CALABACILLAS ARROYO IMPROVEMENTS
GRADE CONTROL STRUCTURE 4 - LAYER DETAILS

DESIGN REVIEW COMMITTEE CITY ENGINEER APPROVAL

DESIGNED BY JDH DATE 02/06
DRAWN BY RDQ DATE 02/06
CHECKED BY DMG DATE 02/06

CITY PROJECT NO. ZONE MAP NO. A-10 SHEET 7 OF 9

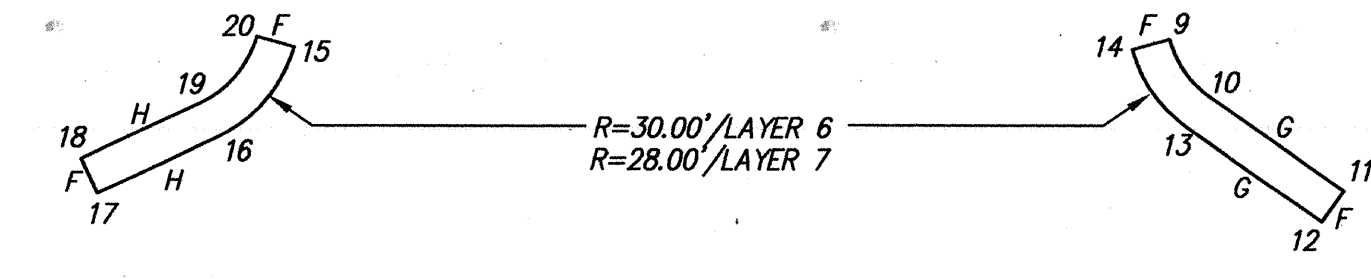
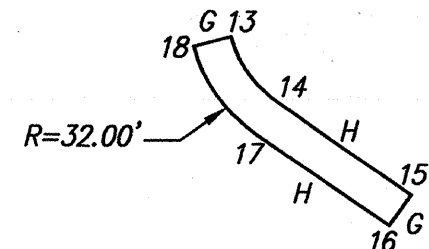
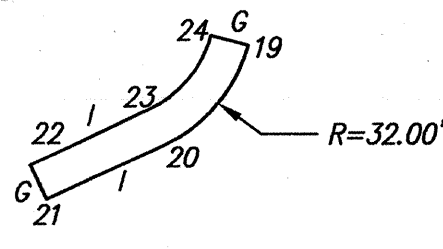


POINT TABLE ~ LAYER 1		
POINT	NORTHING	EASTING
1	N 1534488.5783	E 359188.999
2	N 1534423.1977	E 359272.4339
3	N 1534416.9007	E 359267.4995
4	N 1534443.423	E 359233.6533
5	N 1534339.7148	E 359152.3862
6	N 1534313.1925	E 359186.2324
7	N 1534306.8955	E 359181.2981
8	N 1534372.2761	E 359097.8632

POINT TABLE ~ LAYER 2		
POINT	NORTHING	EASTING
1	N 1534490.1525	E 359190.2326
2	N 1534427.2391	E 359270.519
3	N 1534419.7085	E 359267.1589
4	N 1534445.6141	E 359234.0998
5	N 1534338.7573	E 359150.3655
6	N 1534312.8518	E 359183.4246
7	N 1534306.5548	E 359178.4902
8	N 1534370.7019	E 359096.6296

POINT TABLE ~ LAYER 3		
POINT	NORTHING	EASTING
1	N 1534494.194	E 359188.3177
2	N 1534428.8134	E 359271.7526
3	N 1534422.5164	E 359266.8182
4	N 1534447.8051	E 359234.5462
5	N 1534337.7999	E 359146.3241
6	N 1534312.5112	E 359180.6168
7	N 1534306.2142	E 359175.6824
8	N 1534371.5948	E 359092.2475
9	N 1534371.7238	E 359105.0531
10	N 1534481.729	E 359191.2546
11	N 1534457.6739	E 359221.9523
12	N 1534347.6687	E 359135.7508

POINT TABLE ~ LAYER 4		
POINT	NORTHING	EASTING
1	N 1534497.6186	E 359187.19
2	N 1534431.6212	E 359271.412
3	N 1534425.3242	E 359266.4776
4	N 1534449.9961	E 359234.9927
5	N 1534336.8425	E 359146.3241
6	N 1534312.1705	E 359177.8089
7	N 1534305.8736	E 359172.8745
8	N 1534371.871	E 359088.6526
9	N 1534371.9999	E 359101.4582
10	N 1534485.1536	E 359190.1268
11	N 1534458.0145	E 359224.7601
12	N 1534344.8608	E 359136.0915

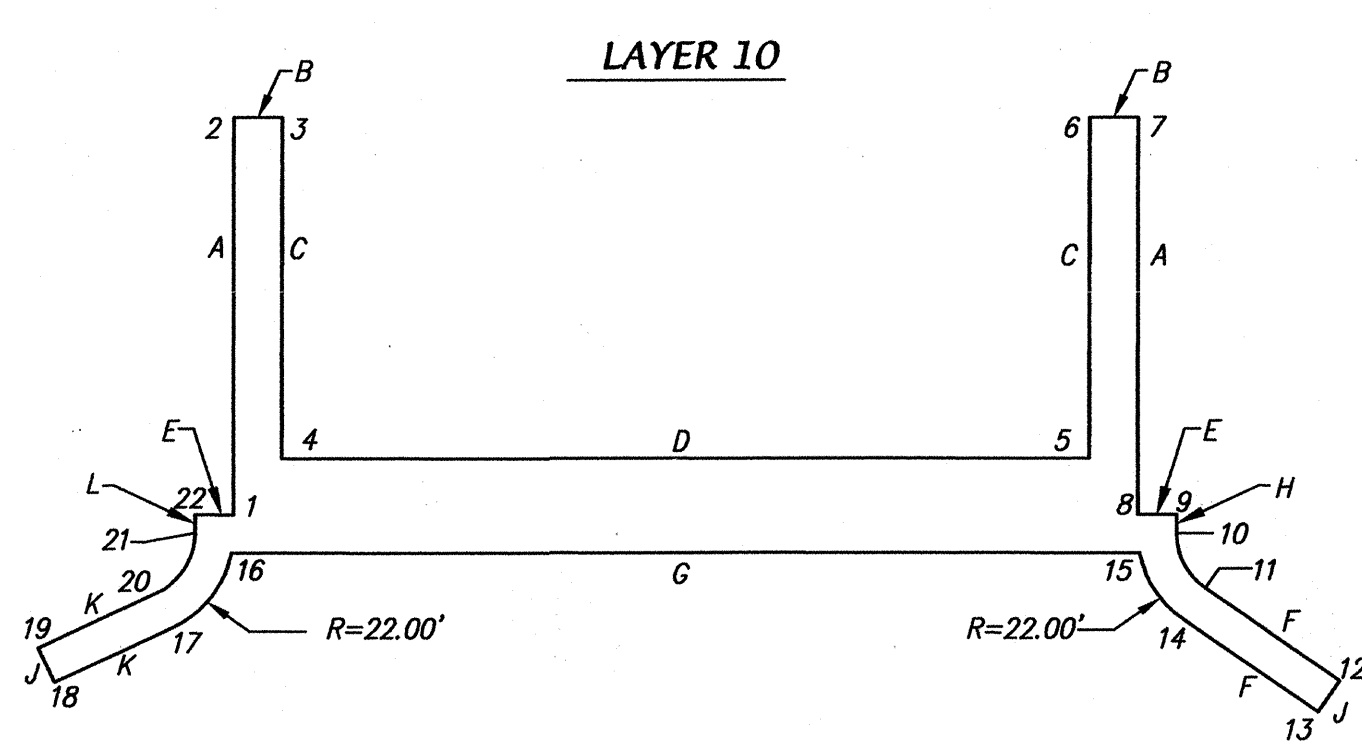
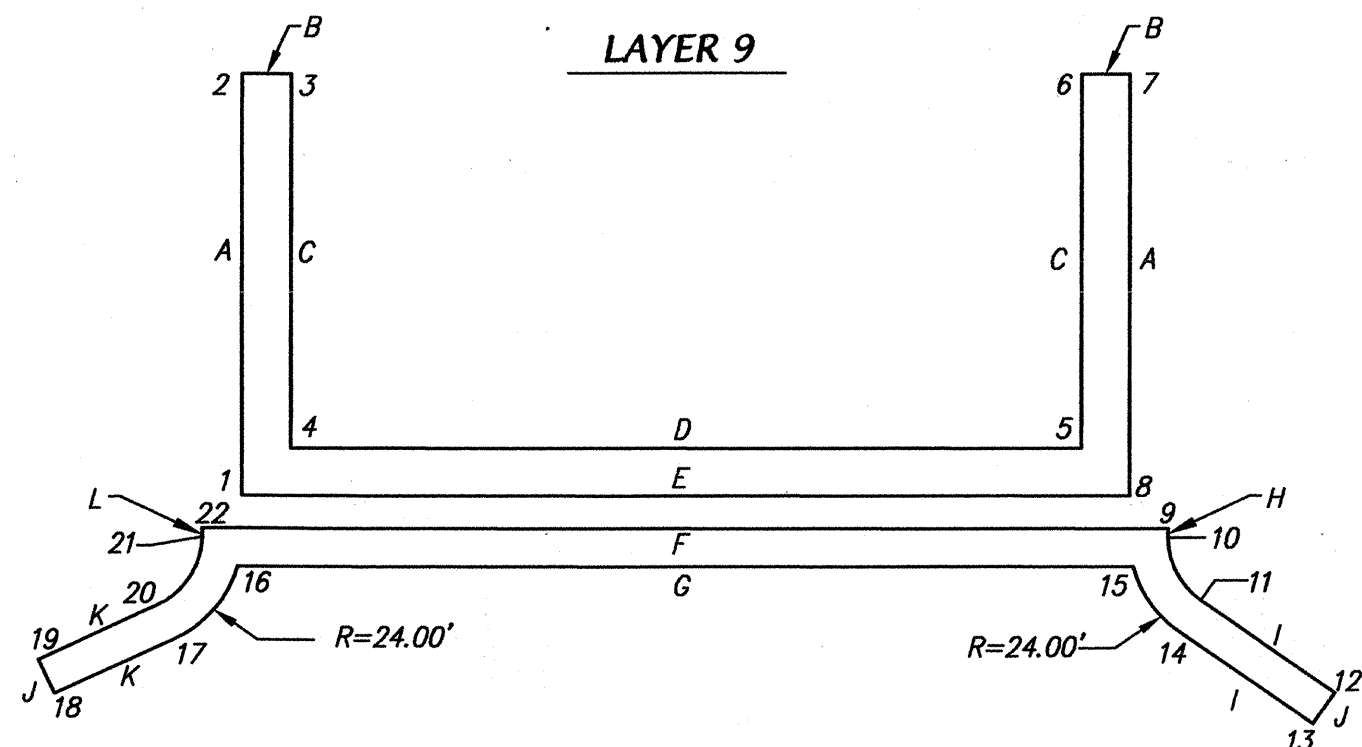


POINT TABLE ~ LAYER 5		
POINT	NORTHING	EASTING
1	N 1534501.0432	E 359186.0622
2	N 1534434.429	E 359271.0713
3	N 1534428.1321	E 359266.1369
4	N 1534452.1872	E 359235.4321
5	N 1534335.885	E 359144.3034
6	N 1534311.8299	E 359175.0011
7	N 1534305.5329	E 359170.0667
8	N 1534372.1471	E 359085.0576
9	N 1534372.2761	E 359097.8632
10	N 1534488.5783	E 359188.999
11	N 1534458.3552	E 359227.568
12	N 1534342.053	E 359136.4321
13	N 1534380.3296	E 359057.1673
14	N 1534381.2988	E 359040.572
15	N 1534371.4035	E 359008.0438
16	N 1534379.0571	E 359005.7155
17	N 1534388.9525	E 359038.2436
18	N 1534387.6602	E 359080.3707
19	N 1534521.3383	E 359165.1226
20	N 1534547.8837	E 359159.4603
21	N 1534574.3216	E 359165.5898
22	N 1534572.5148	E 359173.3831
23	N 1534546.0769	E 359167.2536
24	N 1534526.2018	E 359171.4746

POINT TABLE ~ LAYER 6		
POINT	NORTHING	EASTING
1	N 1534506.0421	E 359186.168
2	N 1534438.8111	E 359271.9643
3	N 1534430.9399	E 359265.7963
4	N 1534492.0029	E 359187.8713
5	N 1534372.5522	E 359094.2682
6	N 1534311.4892	E 359172.1933
7	N 1534303.618	E 359166.0253
8	N 1534370.849	E 359080.229
9	N 1534376.6459	E 359056.0173
10	N 1534379.3854	E 359041.154
11	N 1534369.49	E 359008.6259
12	N 1534377.1437	E 359006.2975
13	N 1534383.0391	E 359038.8257
14	N 1534386.0307	E 359059.0838
15	N 1534522.9702	E 359166.4014
16	N 1534547.432	E 359161.4087
17	N 1534573.8699	E 359167.5381
18	N 1534572.0631	E 359175.3314
19	N 1534545.6252	E 359169.202
20	N 1534527.6866	E 359172.8633

POINT TABLE ~ LAYER 7		
POINT	NORTHING	EASTING
1	N 1534509.4637	E 359185.0373
2	N 1534446.5533	E 359265.3266
3	N 1534438.6821	E 359259.1587
4	N 1534495.4275	E 359186.7435
5	N 1534372.8284	E 359090.6733
6	N 1534316.083	E 359163.0884
7	N 1534308.2118	E 359156.9205
8	N 1534371.1172	E 359076.6374
9	N 1534376.9485	E 359054.8808
10	N 1534377.472	E 359041.7361
11	N 1534367.5766	E 359009.2079
12	N 1534375.2303	E 359006.8796
13	N 1534383.1222	E 359039.4078
14	N 1534384.3928	E 359057.8104
15	N 1534524.6109	E 359167.687
16	N 1534546.9803	E 359163.357
17	N 1534573.4182	E 359169.4864
18	N 1534571.6114	E 359177.2797
19	N 1534545.1735	E 359171.1503
20	N 1534529.1954	E 359174.2432

POINT TABLE ~ LAYER 8		
POINT	NORTHING	EASTING
1	N 1534512.8914	E 359183.9125
2	N 1534454.2956	E 359258.689
3	N 1534446.4243	E 359252.521
4	N 1534498.8522	E 359185.6157
5	N 1534373.1046	E 359087.0783
6	N 1534320.6767	E 359153.9836
7	N 1534312.8055	E 359147.8157
8	N 1534371.4013	E 359073.0391
9	N 1534372.5059	E 359058.6593
10	N 1534375.5585	E 359042.3182
11	N 1534365.6632	E 359009.79
12	N 1534373.3169	E 359007.4617
13	N 1534383.1222	E 359039.9899
14	N 1534382.7444	E 359056.5187
15	N 1534526.2626	E 359168.9813
16	N 1534546.5286	E 359165.3053
17	N 1534572.9665	E 359171.4347
18	N 1534571.1596	E 359179.228
19	N 1534544.7218	E 359173.0886
20	N 1534526.5905	E 359179.4019

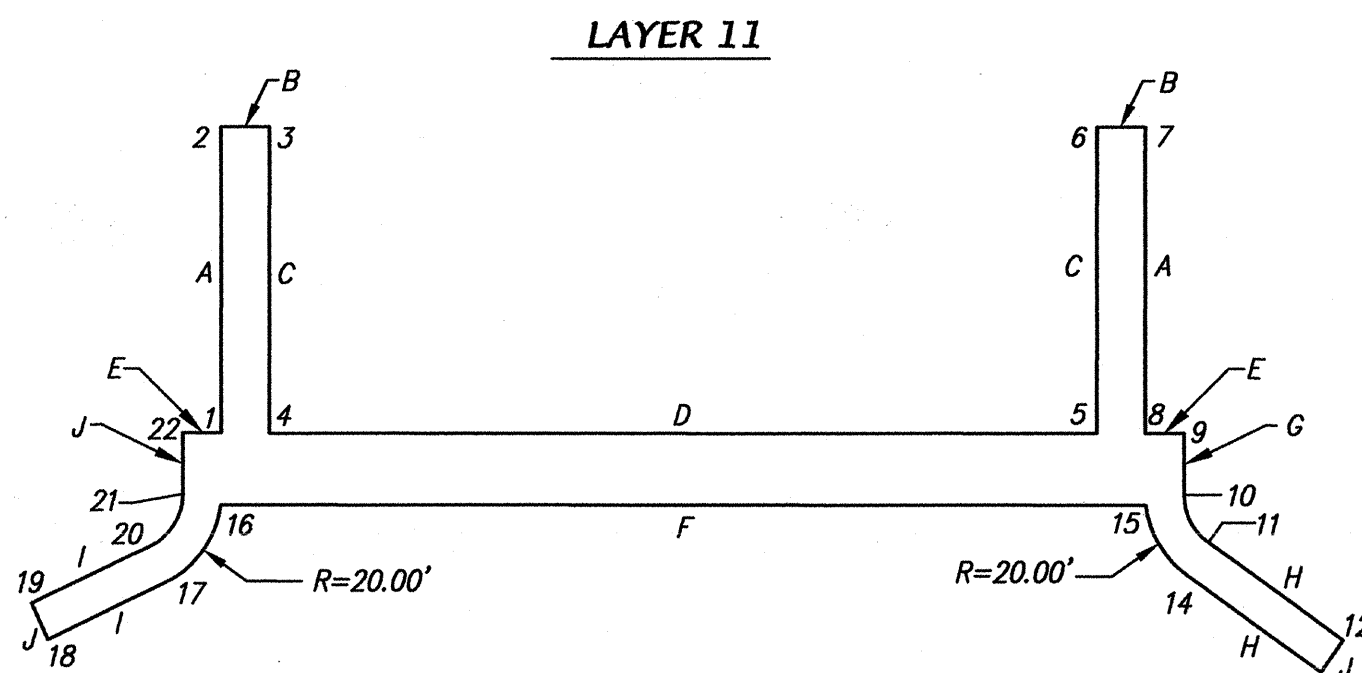


POINT TABLE ~ LAYER 9		
POINT	NORTHING	EASTING
1	N 1534516.316	E 359182.7847
2	N 1534462.0378	E 359252.0514
3	N 1534454.1666	E 359245.8834
4	N 1534502.2768	E 359184.488
5	N 1534373.3807	E 359083.4834
6	N 1534325.2704	E 359144.8788
7	N 1534317.3992	E 359138.7108
8	N 1534371.6775	E 359069.4442
9	N 1534369.6981	E 359058.9999
10	N 1534370.9317	E 359057.4257
11	N 1534373.6451	E 359042.9003

POINT TABLE ~ LAYER 9		
POINT	NORTHING	EASTING
12	N 1534363.7498	E 359010.3721
13	N 1534371.4035	E 359008.0438
14	N 1534381.2988	E 359040.572
15	N 1534380.3296	E 359057.1673
16	N 1534526.2018	E 359171.4746
17	N 1534546.0769	E 359167.2536
18	N 1534572.5148	E 359173.3831
19	N 1534570.7079	E 359181.1764
20	N 1534544.2701	E 359175.0469
21	N 1534528.0625	E 359180.7647
22	N 1534526.9306	E 359182.2093

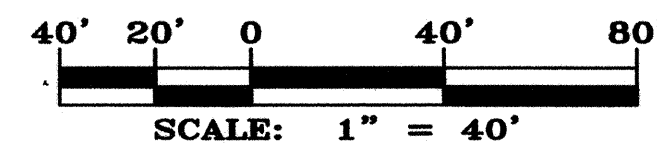
POINT TABLE ~ LAYER 10		
POINT	NORTHING	EASTING
1	N 1534520.9743	E 359180.0827
2	N 1534469.78	E 359245.4138
3	N 1534461.9088	E 359239.2458
4	N 1534505.7015	E 359183.3602
5	N 1534373.6569	E 359079.8884
6	N 1534329.8642	E 359135.774
7	N 1534321.993	E 359129.606
8	N 1534373.1872	E 359064.275
9	N 1534366.8903	E 359059.3406
10	N 1534369.3574	E 359056.1921
11	N 1534371.7317	E 359043.4824

POINT TABLE ~ LAYER 10		
POINT	NORTHING	EASTING
12	N 1534361.8363	E 359010.9542
13	N 1534369.49	E 359008.6259
14	N 1534379.3854	E 359041.154
15	N 1534377.833	E 359057.7518
16	N 1534526.2218	E 359174.0311
17	N 1534545.6252	E 359169.202
18	N 1534572.0631	E 359175.3314
19	N 1534570.2562	E 359183.1247
20	N 1534543.8184	E 359176.9952
21	N 1534529.6366	E 359181.9986
22	N 1534527.2712	E 359185.0171

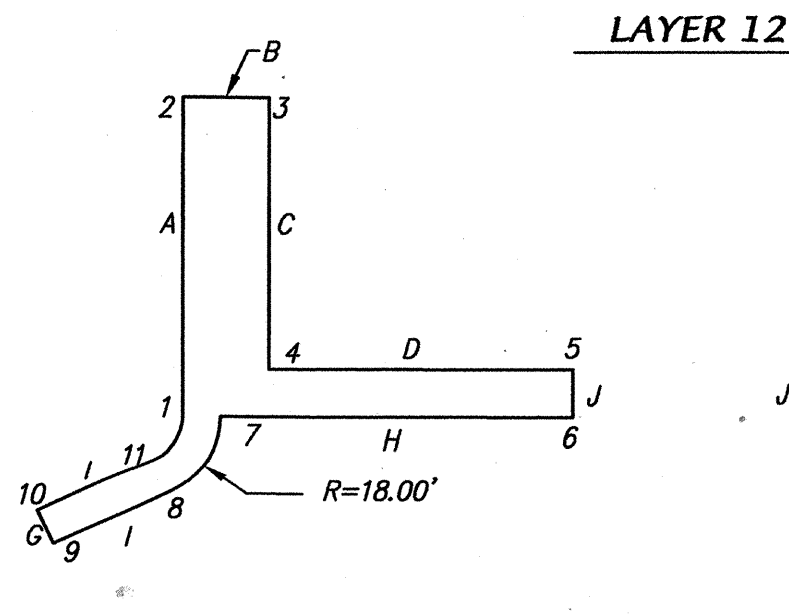


POINT TABLE ~ LAYER 11		
POINT	NORTHING	EASTING
1	N 1534516.9973	E 359188.4004
2	N 1534477.5222	E 359238.7762
3	N 1534469.651	E 359232.6082
4	N 1534509.1261	E 359182.2324
5	N 1534373.933	E 359076.2934
6	N 1534334.4579	E 359126.6692
7	N 1534326.5867	E 359120.5012
8	N 1534366.0618	E 359070.1255
9	N 1534359.7648	E 359065.1911
10	N 1534367.7832	E 359054.9585
11	N 1534369.8183	E 359044.0644

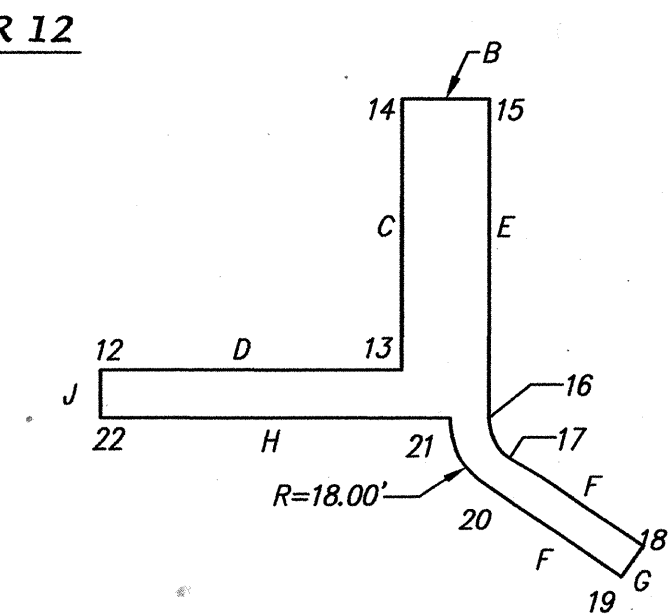
POINT TABLE ~ LAYER 11		
POINT	NORTHING	EASTING
12	N 1534359.9229	E 359011.5363
13	N 1534367.5766	E 359008.2079
14	N 1534377.472	E 359041.7361
15	N 1534375.2349	E 359058.2568
16	N 1534526.3418	E 359176.6661
17	N 1534545.1735	E 359171.1503
18	N 1534571.6114	E 359177.2797
19	N 1534569.8045	E 359185.073
20	N 1534543.3667	E 359178.9436
21	N 1534531.211	E 359183.2319
22	N 1534523.2943	E 359193.3348



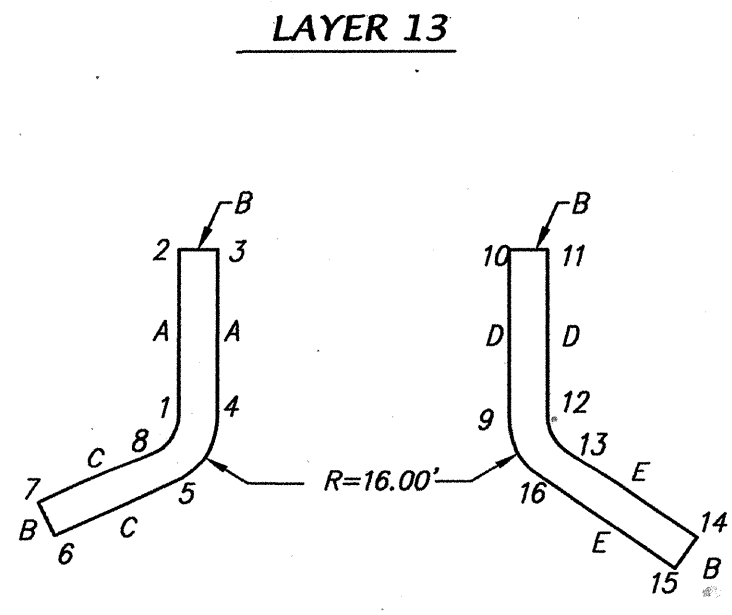
DIMENSION TABLE												
LAYER	A	B	C	D	E	F	G	H	I	J	K	L
1	106.00	8.00	43.00	131.76	147.76	-	-	-	-	-	-	5362.00
2	104.00	8.00	42.00	135.76	151.76	-	-	-	-	-	-	5363.00
3	106.00	8.00	41.00	139.76	155.76	39.00	-	-	-	-	-	5364.00
4	107.00	8.00	40.00	143.76	159.76	44.00	-	-	-	-	-	5365.00
5	108.00	8.00	39.00	147.76	163.76	49.00	8.00	34.00	27.14	-	-	5366.00
6	109.00	10.00	99.00	151.76	171.76	8.00	34.00	27.14	-	-	-	5367.00
7	102.00	10.00	92.00	155.76	175.76	8.00	34.00	27.14	-	-	-	5368.00
8	95.00	10.00	85.00	159.76	179.76	195.76	182.33	34.00	27.14	8.00	-	5369.00
9	88.00	10.00	78.00	163.76	183.76	199.76	185.32	2.00	34.00	8.00	27.14	5370.00
10	83.00	10.00	71.00	167.76	187.76	8.00	34.00	188.52	4.00	-	8.00	5371.00
11	64.00	10.00	64.00	171.76	191.76	191.97	13.00	34.00	27.14	12.84	-	5372.00



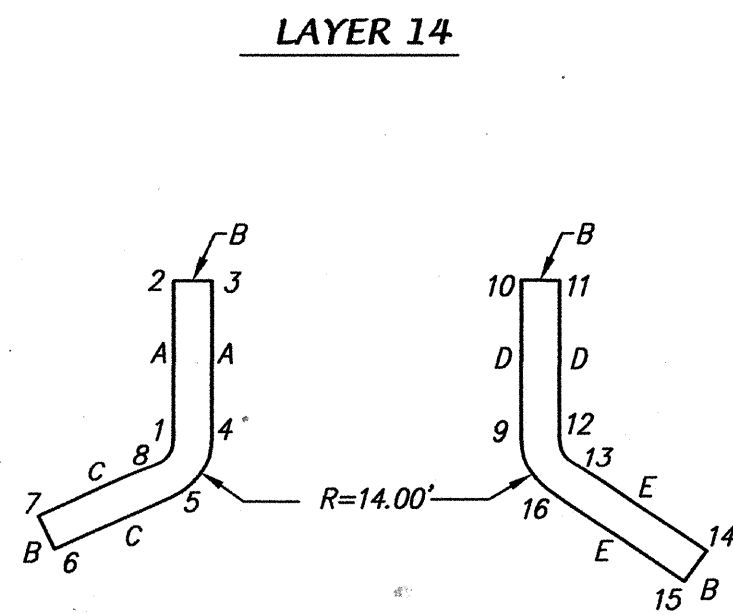
POINT TABLE ~ LAYER 12		
POINT	NORTHING	EASTING
1	N 1534532.7852	E 359184.4655
2	N 1534491.5614	E 359237.0729
3	N 1534477.3932	E 359225.9706
4	N 1534512.5507	E 359181.1047
5	N 1534463.058	E 359142.3215
6	N 1534469.228	E 359134.4503
7	N 1534526.5905	E 359179.4019
8	N 1534544.7218	E 359173.0986
9	N 1534571.1596	E 359179.228
10	N 1534569.3528	E 359187.0213
11	N 1534542.915	E 359180.8919



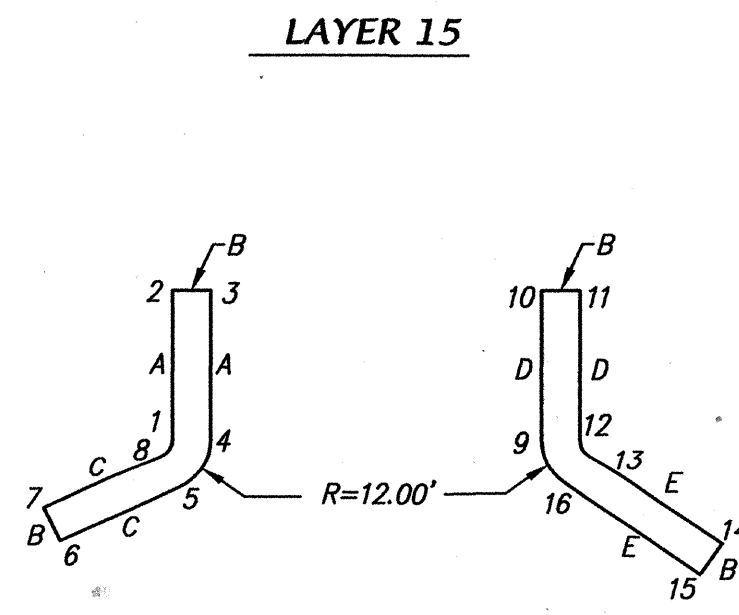
POINT TABLE ~ LAYER 12		
POINT	NORTHING	EASTING
12	N 1534423.7019	E 359111.4816
13	N 1534374.2092	E 359072.6985
14	N 1534339.0517	E 359117.5644
15	N 1534324.8835	E 359106.462
16	N 1534366.209	E 359053.7249
17	N 1534367.9048	E 359044.6465
18	N 1534358.0095	E 359012.1183
19	N 1534365.6632	E 359009.79
20	N 1534375.5585	E 359042.3182
21	N 1534372.5059	E 359058.6593
22	N 1534429.8699	E 359103.6104



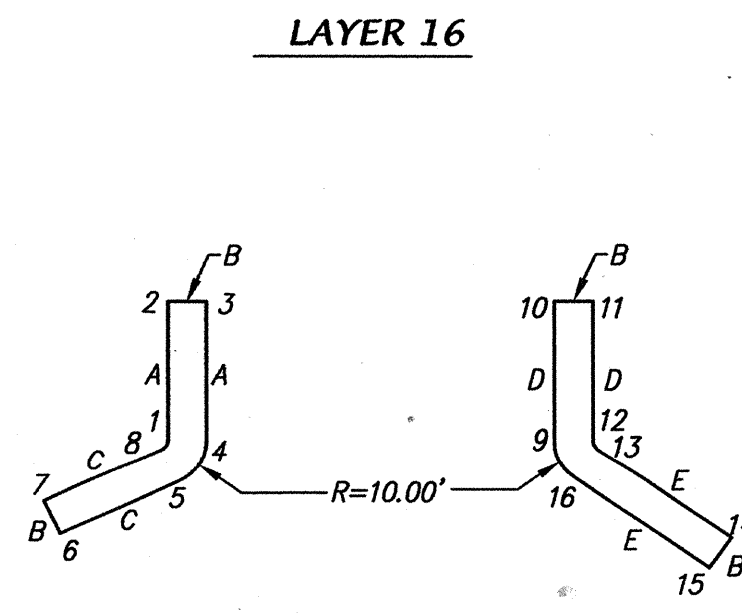
POINT TABLE ~ LAYER 13		
POINT	NORTHING	EASTING
1	N 1534534.3595	E 359185.6991
2	N 1534512.8732	E 359213.1186
3	N 1534506.5762	E 359208.1843
4	N 1534528.0625	E 359180.7647
5	N 1534544.2701	E 359175.0469
6	N 1534570.7079	E 359181.1764
7	N 1534568.9011	E 359188.9696
8	N 1534542.4633	E 359182.8402
9	N 1534370.9317	E 359057.4257
10	N 1534349.3437	E 359084.9749
11	N 1534343.0468	E 359080.0405
12	N 1534364.6347	E 359052.4913
13	N 1534365.9914	E 359045.2286
14	N 1534356.0961	E 359012.7004
15	N 1534363.7498	E 359010.3721
16	N 1534373.6451	E 359042.9003



POINT TABLE ~ LAYER 14		
POINT	NORTHING	EASTING
1	N 1534535.9337	E 359186.9327
2	N 1534515.681	E 359212.778
3	N 1534509.3841	E 359207.8436
4	N 1534529.6368	E 359181.9983
5	N 1534543.8184	E 359176.9952
6	N 1534570.2562	E 359183.1247
7	N 1534568.4494	E 359190.918
8	N 1534542.0116	E 359184.7885
9	N 1534369.3574	E 359056.1921
10	N 1534349.0031	E 359082.1671
11	N 1534342.7061	E 359077.2327
12	N 1534363.0605	E 359051.2577
13	N 1534364.078	E 359045.8107
14	N 1534354.1827	E 359013.2825
15	N 1534361.8363	E 359010.9542
16	N 1534371.7317	E 359043.4824

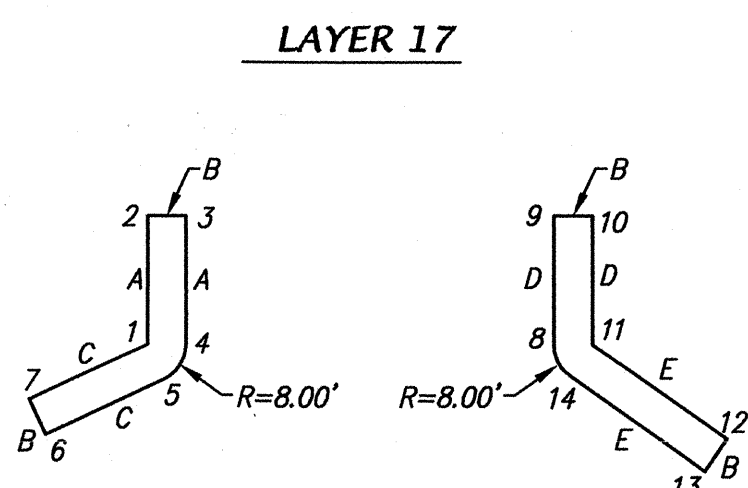


POINT TABLE ~ LAYER 15		
POINT	NORTHING	EASTING
1	N 1534537.508	E 359188.1663
2	N 1534518.4889	E 359212.4374
3	N 1534512.1919	E 359207.503
4	N 1534531.211	E 359183.2319
5	N 1534543.3667	E 359178.9436
6	N 1534569.8045	E 359185.073
7	N 1534567.9977	E 359192.8663
8	N 1534541.5599	E 359186.7369
9	N 1534367.7832	E 359054.9585
10	N 1534348.6625	E 359079.3593
11	N 1534342.3655	E 359074.4249
12	N 1534361.4862	E 359050.0241
13	N 1534362.1646	E 359046.3928
14	N 1534352.2692	E 359013.8646
15	N 1534359.9229	E 359011.5363
16	N 1534368.8183	E 359044.0644

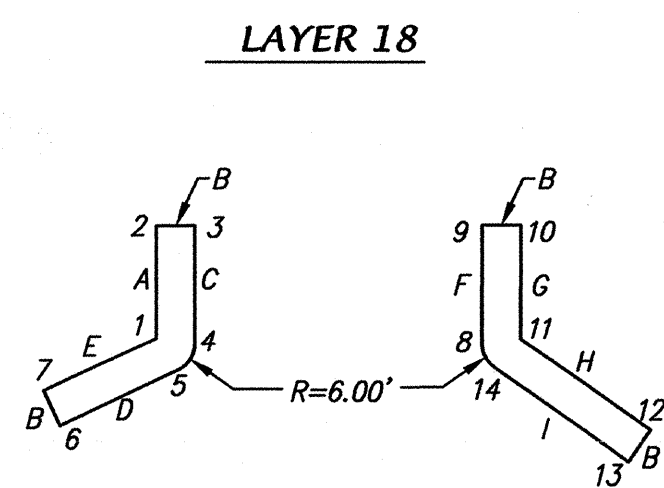


POINT TABLE ~ LAYER 16		
POINT	NORTHING	EASTING
1	N 1534539.0822	E 359189.3999
2	N 1534521.2967	E 359212.0967
3	N 1534514.9998	E 359207.1623
4	N 1534532.7852	E 359184.4655
5	N 1534542.915	E 359180.8919
6	N 1534569.3528	E 359187.0213
7	N 1534567.546	E 359194.8146
8	N 1534541.1082	E 359188.6852
9	N 1534366.209	E 359053.7249
10	N 1534348.3218	E 359076.5514
11	N 1534342.0248	E 359071.617
12	N 1534359.912	E 359048.7905
13	N 1534360.2512	E 359046.9748
14	N 1534350.3558	E 359014.4467
15	N 1534358.0095	E 359012.1183
16	N 1534367.9048	E 359044.6465

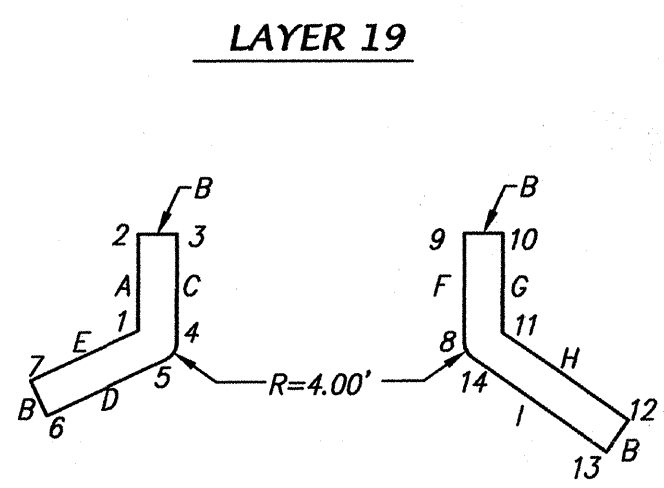
DIMENSION TABLE												
LAYER	A	B	C	D	E	F	G	H	I	J	ELEV.	VOLUME (CY)
12	66.84	18.00	57.00	62.88	67.00	34.00	8.00	72.88	27.14	10.00	5373.00	162.66
13	34.84	8.00	27.14	35.00	34.00	-	-	-	-	-	5374.00	46.25
14	32.84	8.00	27.14	33.00	34.00	-	-	-	-	-	5375.00	43.83
15	30.84	8.00	27.14	31.00	34.00	-	-	-	-	-	5376.00	41.40
16	28.84	8.00	27.14	29.00	34.00	-	-	-	-	-	5377.00	38.97
17	26.84	8.00	27.14	27.00	34.00	-	-	-	-	-	5378.00	36.55
18	23.56	8.00	24.84	27.14	25.87	25.00	23.96	32.96	34.00	-	5379.00	34.11
19	20.29	8.00	22.84	27.14	25.59	23.00	20.92	31.92	34.00	-	5380.00	31.63
20	17.01	8.00	20.84	27.14	23.32	21.00	17.88	30.88	34.00	-	5381.00	29.12
21	13.74	8.00	18.84	27.14	22.05	19.00	14.84	29.84	34.00	-	5382.00	26.58



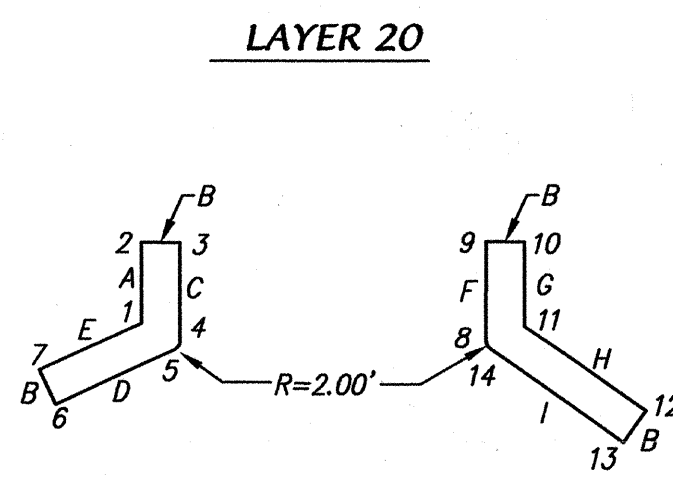
POINT TABLE ~ LAYER 17		
POINT	NORTHING	EASTING
1	N 1534540.6565	E 359190.6335
2	N 1534524.1046	E 359211.7561
3	N 1534517.8076	E 359206.8217
4	N 1534534.3595	E 359185.6991
5	N 1534542.4633	E 359182.8402
6	N 1534568.9011	E 359188.9696
7	N 1534567.0943	E 359196.7629
8	N 1534364.6347	E 359052.4913
9	N 1534347.9812	E 359073.7436
10	N 1534341.6842	E 359068.8092
11	N 1534358.3377	E 359047.5569
12	N 1534348.4424	E 359015.0287
13	N 1534356.0961	E 359012.7004
14	N 1534365.9914	E 359045.2286



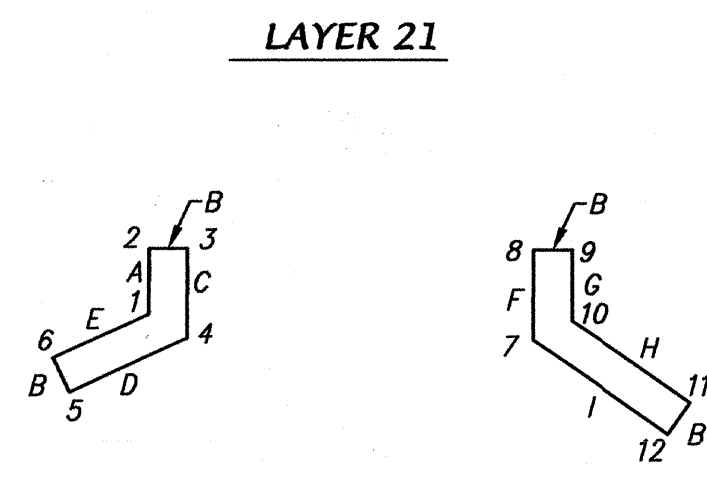
POINT TABLE ~ LAYER 18		
POINT	NORTHING	EASTING
1	N 1534541.4453	E 359192.8694
2	N 1534529.7202	E 359211.4154
3	N 1534520.6154	E 359206.481
4	N 1534535.9337	E 359186.9327
5	N 1534542.0116	E 359184.7885
6	N 1534568.4494	E 359190.918
7	N 1534566.6426	E 359198.7113
8	N 1534363.0605	E 359051.2577
9	N 1534347.6405	E 359070.9357
10	N 1534341.3435	E 359066.0013
11	N 1534356.1213	E 359047.1429
12	N 1534346.529	E 359015.6108
13	N 1534354.1827	E 359013.2825
14	N 1534364.078	E 359045.8107



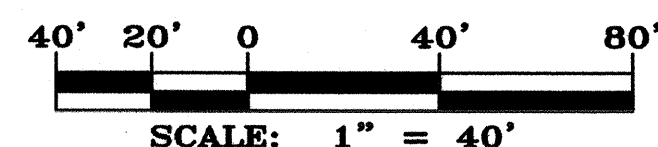
POINT TABLE ~ LAYER 19		
POINT	NORTHING	EASTING
1	N 1534542.2341	E 359195.1054
2	N 1534529.7202	E 359211.0748
3	N 1534523.4233	E 359206.1404
4	N 1534539.0822	E 359188.1663
5	N 1534541.5599	E 359186.7369
6	N 1534567.9977	E 359192.8663
7	N 1534565.7392	E 359202.6079
8	N 1534361.4862	E 359050.0241
9	N 1534347.2999	E 359068.1279
10	N 1534341.0029	E 359060.3857
11	N 1534353.9048	E 359046.7288
12	N 1534344.6155	E 359016.1929
13	N 1534352.2692	E 359013.8646
14	N 1534362.1646	E 359046.3928



POINT TABLE ~ LAYER 20		
POINT	NORTHING	EASTING
1	N 1534543.0229	E 359197.3413
2	N 1534532.5281	E 359210.7341
3	N 1534526.2311	E 359205.7997
4	N 1534539.0822	E 359188.1663
5	N 1534541.1082	E 359188.6852
6	N 1534567.546	E 359194.8146
7	N 1534565.3377	E 359047.5569
8	N 1534359.912	E 359048.7905
9	N 1534346.9592	E 359065.3201
10	N 1534340.6623	E 359060.3857
11	N 1534351.6884	E 359046.3148
12	N 1534342.7021	E 359016.775
13	N 1534350.3558	E 359014.4467
14	N 1534360.2512	E 359046.9748



POINT TABLE ~ LAYER 21		
POINT	NORTHING	EASTING
1	N 1534543.8117	E 359199.5772
2	N 1534535.3359	E 359210.3935
3	N 1534529.039	E 359205.4591
4	N 1534540.6565	E 359190.6335
5	N 1534567.0943	E 359196.7629
6	N 1534565.2875	E 359204.5562
7	N 1534358.3377	E 359047.5569
8	N 1534346.6186	E 359062.5122
9	N 1534340.3216	E 359057.5778
10	N 1534349.4719	E 359045.9007
11	N 1534340.7887	E 359017.3571
12	N 1534348.4424	E 359015.0287



NGVD 29	
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ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY	
TITLE: ANASAZI RIDGE SUBDIVISION CALABACILLAS ARROYO IMPROVEMENTS GRADE CONTROL STRUCTURE 4 LAYER DETAILS	
DESIGN REVIEW COMMITTEE	CITY ENGINEER APPROVAL
N / A	N / A
CITY PROJECT NO.	ZONE MAP NO.
	A-10
	SHEET 8 OF 9

SECTION 180 - SOIL CEMENT

180.1 DESCRIPTION

The work shall consist of furnishing, transporting, placing and compacting and curing soil-cement as indicated in the drawings for the emergency spillway, Maintenance road ramps, and inlet plunge pool, and as specified herein.

180.2 MATERIALS

180.2.1 Cement for Soil Cement

A. Portland Cement

Portland Cement shall comply with Section 101 of the Specifications for Portland Cement Type II (ASTM C150, CSA A-5, or AASHTO M85). The use or substitution of flyash for any portion of the cementitious materials shall not be allowed.

180.2.2 Water. Water shall comply with Section 101 of the Specifications.

180.2.3 Aggregate. The soil used in the soil-cement mix shall come from the borrow pit identified in the Dam pool area and shall meet the following gradation.

Sieve Size	Percent Passing (Dry Weight) WEARING COURSES	Percent Passing (Dry Weight) OTHER COURSES
1-1/2"	100%	100%
3/4"	80% - 95%	80% - 100%
# 4	50% - 70%	50% - 92%
# 200	5% - 30%	5% - 30%

The soil aggregate shall have a Plasticity Index no greater than 8. Clay and silt lumps larger than 1/2 inch shall be unacceptable, and screening will be required whenever this type of material is encountered.

180.3 PROPORTIONING

A mix design shall be established by the Owner's testing lab for the soil-aggregate and cement approved for use on the project. The Contractor shall submit the materials for testing. The design mix shall be based on the compressive strength of specimens molded in accordance with ASTM D1632, cured 7 days at 100% relative humidity at 73.4° ±3°, soaked in water for four 4 hours, then broken in compression (ASTM D1633).

A minimum of three different cement contents shall be tested to determine the cement necessary to develop 7 day compression strength of 1,000 psi. The design cement content shall be 2% more than the percentage required to attain 1,000 psi. In no case will a cement content less than 7% of the dry weight of the soil-aggregate be approved.

In addition, the following additional tests may be run by the Owner's testing laboratory to establish cement amounts:

- AASHTO - T-134
- ASTM-D1633 - Compressive strength of Molded Soil Cement Cylinders

The Contractor shall use the soil aggregate, cement content, and moisture content determined by the Project Manager in accordance with laboratory tests. The Contractor shall allow a minimum of 10 days for the cement content results. During the course of the work, the Project Engineer may require the Contractor to adjust the soil-cement mix portions whenever necessary in order to achieve the minimum design strength shown in durability and other physical properties. The contractor may have to blend silty soils with clean sand soils to maintain ideal soil properties as specified below and avoid cement overrun. Blending shall require constructing separate stockpiles for materials to be blended. Blending shall be performed by the methods to achieve a uniform soil-cement mix as approved by the Project Engineer.

Water shall be added to the soil-cement mix to produce a moisture content of the material after processing of not less than optimum minus 1% nor more than optimum plus 2% as determined by the Owner's testing laboratory. Testing during the project may require frequent adjustment of water added in order to achieve the specified moisture content. In no case will moist soil aggregate be utilized which would cause the maximum moisture content to be exceeded.

180.4 MIX DESIGN

7-day samples will be taken to monitor output. The amount of cement thus determined by laboratory testing shall continue to be monitored throughout the life of the project with modification as required to meet existing field conditions.

180.5 MIX DESIGN FOR BIDDING PURPOSES

For Bidding estimate purposes only, the estimated mix design for the project shall be as follows:

Cement Content 10.0%

The percent of cement to be used in the mix shall be calculated to be the weight of cement divided by the total weight of the dry compacted soil-cement. The actual mix design used on this project shall be determined by laboratory tests on materials stockpiled and as specified to the nearest 0.1%.

180.6 CONSTRUCTION REQUIREMENTS

180.6.1 Required Contractor Submittals

Prior to the start of construction, the Contractor shall submit, in writing for approval, the following items:

- The type of compaction equipment to be used.
- The number and type of watering equipment to be used.
- The method used to keep surfaces continuously moist until subsequent layers of soil-cement are placed.
- The method used to cure permanently exposed surfaces.
- The proposed source of soil, if other than from required excavations.
- The method of plant calibration.

Such approval shall not relieve the Contractor of the responsibility of achieving the desired result of constructing sound soil-cement, free from defects, according to the Specifications and plans.

180.6.1.1 Test Section

Prior to the placement of either gradation of soil-cement the Contractor shall construct a test section. The purpose of the test section is to demonstrate the suitability of the Contractor's equipment, methods and personnel. The test section shall be a minimum of 2 lifts in height and of thickness as specified on plans, fifty 30 feet in length and a minimum of 10 feet in width. The site of the test section shall be approved by the Project Engineer. The test section shall also demonstrate the lift edge treatment to be used. The Project Engineer shall approve all equipment, methods and personnel after completion of the test section. The Project Engineer will verify the completed Soil-Cement Test Section. Quality testing will be done by the Contractor's Testing Laboratory and Quality Assurance Testing will be done by Owner's Testing Laboratory.

180.6.2 Preparation

Before soil-cement placement begins, the area to receive soil-cement shall be graded and shaped to lines and grades as shown on the plans or specified by the Project Engineer. The subgrade shall be prepared and compacted to a minimum of 95% of the maximum density as determined by ASTM D 1557 or 80% of the maximum relative density as determined by ASTM D4253 and D4254.

Immediately prior to placement of the soil-cement mixture, the subgrade shall be moistened if necessary. Soft or yielding subgrade shall be corrected and made stable before soil cement placement proceeds. Subgrade preparation for soil cement shall be incidental to soil cement.

180.6.4 Mixing

Soil-cement shall be central-plant mixed in an approved twin shaft, continuous-flow or batch-type pugmill or shall be mixed in a traveling pugmill single or multiple transverse shaft plant. The Plant shall be equipped with screening, feeding, and metering devices that will add the soil, cement, and water into the mixer in the specified quantities. The mixing time shall be that time which is required to secure a homogeneous, intimate, uniform mixture of the soil, stabilizer, and water. Soil and cement shall be mixed sufficiently to prevent cementitious balls from forming when water is added. The plant shall be located in the confines of the Swineburne Dam or an approved site.

Free and safe access to the plant must be provided to the Project Engineer at all times for observation of the plant's operation, and for sampling the soil-cement mixture and its components. If the actual quantities of the mix vary more than 2% by weight of the specified quantities, the Project Engineer may require the Contractor to make changes in the plant operation and equipment as will provide accuracy within 2% by weight. Calibration of the plant will be done daily at the start of operations, or as otherwise directed by the Project Engineer.

The Contractor shall take care during filling of cement silo and mixing soil cement to prevent flying cement dust. Conveyors shall be covered.

180.6.5 Scales

Unless the plant is equipped with suitable scales to measure the cement and aggregate feeds, the Contractor shall furnish and install a set of truck scales at the plant location to monitor plant output. All scales shall be calibrated and certified by the Contractor and approved by the Project Engineer at least 48 hours prior to the start of production. Each scale shall be calibrated to an accuracy of plus/minus 2%. Scales shall be inspected and calibrated as often as the Project Engineer deems necessary to assure their accuracy.

180.6.6 Required Moisture

The moisture content of the mix shall be adjusted as needed to meet the specified moisture content.

180.6.7 Handling

The soil-cement mixture, if transported, shall be transported from the mixing area to the structure in clean equipment provided with suitable protective devices in unfavorable weather. The total elapsed time between the addition of cement to the mixture and the start of compaction shall be the minimum possible. In no case should the total elapsed time exceed 45 minutes. (This time may be reduced by the Project Engineer when the air temperature exceeds 90°F, or when there is a breeze or wind which promotes rapid drying of the soil-cement mixture.)

The Contractor shall take all necessary precautions to avoid damage to completed soil-cement by the equipment, and to avoid the deposition of raw earth or foreign materials between layers of soil-cement. Earth ramps crossing completed soil-cement must have at least 2 foot compacted thickness. Where ramps are constructed over soil-cement that is not to grade, all foreign materials and the uppermost 1 inch of the previously placed soil-cement mixture must be removed prior to continuation of the soil-cement construction.

180.6.8 Placing

Soil cement shall not be placed unless the combination of air temperature, temperature of fresh soil cement, relative humidity, and wind velocity at the site are such that the rate of evaporation is less than 0.20 pounds per square foot.

The uncompacted soil-cement shall be six inches to one foot maximum in thickness. The mixture shall be placed on the moistened subgrade or previously completed soil-cement, with spreading equipment that will produce layers of such widths and thicknesses as are necessary for compaction to the required dimensions of the completed soil-cement layers. If the Contractor can demonstrate the ability to compact thicker layers for their full depth, the Project Engineer may waive this requirement.

Each successive layer shall be placed as soon as practicable after the preceding layer is completed and accepted. Bonding grout is required when placing against cement or on soil cement that has set for over 12 hours or is dried out (see 180.11). This requirement may be waived if the surface is left sufficiently rough and clean to provide mechanical bond as determined by the Project Manager. This will require indentations left with a sheepfoot roller at least 1 inch deep, or equivalent treatment. Prior to placement of soil cement, all loose material shall be swept or blown off. Muddy material that adheres to the soil cement may need to be washed off at the direction of the Project Engineer.

All soil-cement surfaces that will be in contact with succeeding layers of soil-cement shall be kept continuously moist by fog spraying, shading or wet covering until placement of the subsequent layer, provided that the Contractor will not be required to keep such surfaces continuously moist for a period longer than 7 days.

Mixing shall not proceed when the soil aggregate or the area on which the soil-cement is to be placed is frozen. Soil-cement shall not be mixed or placed when the air temperature is below 45°F, unless the air temperature is at least 40°F and rising. Compacted soil-cement shall be protected from freezing by a method approved by the Project Engineer for a minimum period of 7 days. Areas damaged by freezing shall be removed and replaced at no cost to the Owner.

180.6.9 Compaction

Soil-cement shall be uniformly compacted to a minimum of 96% of maximum density as determined by ASTM D558. Wheel rolling with only hauling equipment shall not be an acceptable part of the compaction process.

At the start of compaction, the mixture shall be in a uniform, loose condition throughout its full depth. It's moisture content shall be as specified in Section 180.3. No section shall be left undisturbed for longer than 30 minutes during compaction operations. Compaction of each layer shall be done in such a manner as to produce a dense surface, free of compaction planes, in not longer than 1-1/2 hours from the time cement is added to the mixture. Whenever the Contractor's compaction operation utilizes smooth wheel or rubber tired rollers to produce a smooth top surface, the top surface of the completed layer, if smooth, shall be longitudinally scarified to a depth of at least 1/4 inch, at a spacing of not greater than 1 inch on center, with a spike tooth instrument, prior to actual placement of the soil-cement mixture for the next lift. The requirement for scarification may be waived by the Project Engineer if the compaction equipment utilized produces a surface of sufficient roughness that adequate bond between soil-cement layers is achieved.

180.7 FINISHING

After compaction, the soil-cement shall not be trimmed or shaped except as necessary to remove loose soil-cement and where shown on the drawings. The final finish of the exposed soil-cement lining shall be the stair step configuration where and as shown on the drawings with the provisions that the stair steps are at minimum built to the "theoretical slope line" indicated. See the plans for locations where vertical faces are required and/or slope trimming is required. The projecting corners may be more rounded or chamfered than the square corners indicated on the drawings. The total elapsed time allowed for finishing after the addition of cement to the soil-cement mixture shall not exceed 2-1/2 hours.

180.7.1 Curing

Temporarily exposed surfaces shall be kept moist as specified in Subsection 180.6.8.

Care must be exercised to ensure that no curing material other than water is applied to the surfaces that will be in contact with succeeding layers.

Permanently exposed surfaces shall be kept in a moist condition for 7 days or they may be covered with a suitable protective curing material. Any damage to the protective covering within 7 days shall be repaired.

Regardless of the curing material used, the permanently exposed surfaces shall be kept moist until the protective cover is applied. Such protective cover is to be applied as soon as practicable, with a maximum time limit of 24 hours between the finishing of the surface and the application of the protective cover or membrane.

The soil-cement shall be protected from freezing for 7 days after its construction by a covering of loose earth, straw, or other suitable material approved by the Project Engineer.

180.7.2 Construction Joints

At the end of each day's work, or whenever construction operations are interrupted for more than 2 hours, a 15 minimum skew traverse construction joint shall be formed by cutting back into the completed work to form a full-depth vertical face as directed by the Project Manager. If construction joints are formed at more than one layer, the construction joint for each layer shall be staggered at 8 feet horizontally from the construction joint of the layer below.

180.7.3 Maintenance

The Contractor shall be required, within the limits of his Contract, to maintain the soil-cement in good condition until all work is completed and accepted. Maintenance shall include immediate repairs of any defects that may occur. This work shall be done by the Contractor at his own expense and repeated as often as necessary. Faulty work shall be replaced for the full depth of a layer.

180.7.4 Inspection and Testing

The Project Engineer, with the assistance and cooperation of the Contractor, shall make such observations and tests as he deems necessary to verify that the Contractor's work is in conformance with the Contract documents. These observations and tests may include, but shall not be limited to: (1) the taking of test samples of the soil-cement and its individual components at all stages of processing and after completion, and (2) the close observation of the operation of all equipment used on the work. Only those materials, machines, and methods meeting these requirements of the Contract documents shall be used by the Contractor.

All testing of soil-cement or its individual components, unless otherwise provided specifically in the Contract documents, shall be in accordance with the latest applicable NMSHTD, ASTM, or AASHTO Specifications in effect as of the date of advertisement for bids on the project.

Testing, by the Project Engineer, for proper compaction shall be done on at least every other lift of compacted soil-cement at any location chosen by the testing personnel. If the lift being tested does not pass the minimum 96% density requirements, it must be reworked until it passes or be removed at the Contractor's expense. The Contractor shall not continue placing lifts of soil-cement on any lift which has failed the compaction test until such time as that lift has been reworked, retested, and passed so as to meet density requirements.

180.8 MEASUREMENT AND PAYMENT

180.8.1 Measurement

This work shall be measured: (1) in cubic yards of completed-in-place soil-cement and used for tests by the Project Engineer or the Owner's Testing Laboratory and: (2) in tons of cement incorporated into the soil-cement used in accordance with computation below and for tests by the Project Engineer. Any waste of soil cement materials by the Contractor during the handling, mixing, placing, etc., operations, or any use of materials in excess of quantities and percentages specified, or any use by the Contractor's own testing shall not be paid for.

Soil cement will be measured as the number of cubic yards of soil cement mixes satisfactorily placed within the finish lines of the structures and the excavation pay lines, as applicable, as indicated on the drawings and/or specified herein.

The quantity of Portland cement to be measured will be the number of tons used in soil cement mixes. The quantity to be paid will not exceed 110% of the theoretical pound weight of cement which will be determined by multiplying the theoretical pound weight of Portland cement per cubic yard in soil cement mix by the number of cubic yards of the applicable soil cement mix. Payment will be made at the contract unit price per ton of which payment shall include the cost of required transportation, unloading, hauling, weighing, handling and storage at the site of all Portland cement used in the soil-cement.

180.8.2 Payment

The work shall be paid for at the Contract Unit Price per cubic yard of soil-cement and at the Contract Unit Price per ton of cement furnished, multiplied by the quantities obtained in accordance with Subsection 180.8.1. Such payment shall constitute full reimbursement for all work necessary to complete the soil-cement structure, dewatering, watering, mixing, placing, compacting, curing, and all other incidental operations. Such payment shall also constitute reimbursement for assistance with inspection and testing that the Owner may require.

Items governed by this section shall include:

PAY ITEM	PAY UNIT
Soil Cement	Cubic Yard
Cement for Soil Cement & Cement Treated Soil	Ton

180.9 STOCKPILE OF AGGREGATE

Soil aggregate stockpile shall be constructed on level, firm ground free of brush, trees, stumps, roots, rubbish, debris, and other objectionable or deleterious materials and shall be located so as to provide a distance of not less than 20 feet from the outside bottom edge of the conical stockpile built up under the processing plant conveyor or any other existing stockpile. The stockpile shall be constructed in layers; each layer not exceeding 3 feet in thickness. Ramps formed for stockpile construction shall be of the same material as that being stockpiled, and will be considered a part of the stockpile. Before steepening a ramp, any contaminated surface material shall be removed.

Stockpiled material should be thoroughly mixed throughout its depth, width, and length before utilization. The material should be homogeneous and uniform in color, gradation and moisture throughout.

Stockpiled material shall conform to the requirements of Subsection 180.3 - PROPORTIONING

Stockpiled sampling will be done by the Project Engineer after the required amount of soil aggregate for soil-cement placement, has been excavated and stockpiled. After the stockpile has been sampled and approved, no material will be added to it without concurrence by the Project Engineer. Stockpile (s) shall be completed at least 8 days prior to start of soil-cement production.

180.10 TESTING

180.10.1 Sampling

Samples of soil-cement for quality control moisture content and laboratory compaction tests shall be taken directly from the area being constructed as scheduled or periodic intervals during construction. The samples shall be representative of the material being placed and compacted.

180.10.2 Laboratory Compaction Tests.

The optimum moisture content-maximum density relationship shall be determined in accordance with ASTM D558. Gradation tests shall be performed on each laboratory compaction test sample in accordance with ASTM D422.

180.10.3 Titration Testing - Deleted

180.10.4 Compressive Strength Test

Compressive strength specimens shall be molded from field samples material and tested in a manner described in Section 180.3.

180.10.5 Moisture Content

The frequency of moisture contents tests as determined by nuclear methods shall not be less than 5 tests per 1,000 cubic yards of compacted fill.

180.10.6 Density Tests

180.10.6.1 Nuclear Methods

The frequency of nuclear density tests (ASTM D2922) shall not be less than 5 test for each 1,000 cubic yards of compacted fill. Tests shall be by the single probe, direct transmission method only. A minimum of 2 one-point compaction tests shall be run on every 10 nuclear tests to confirm the estimated maximum dry density. The materials for the one-point compaction test shall be obtained from the location of the nuclear gauge test. Frequency of laboratory compaction tests shall be not less than 1 test for each 1,500 cubic yards of compacted soil-cement fill.

180.10.6.2 Titration Testing - Deleted

180.10.6.3 Compressive Strength Testing

Frequency shall be one test for every one-point compaction test. The sample shall be obtained from the location of the nuclear gauge test.

180.10.6.4 Failing Quality Control Tests

Failing quality control tests will not be considered in above frequency of quality control sampling and testing.

180.11 BONDING GROUT

Prior to placing soil-cement against concrete, a bonding grout should be vigorously broomed into the exposed concrete channel lining to displace all air films and cover all surfaces, including the vertical faces, to a uniform thickness of 1/8 to 1/4 inch. The grout should consist of 1 part Portland cement, and about 1/2 part water to give a thick paint-like consistency. In hot, dry weather the surface of the old concrete can be dampened by light fogging but the grout should not be applied to an extremely wet surface or when hollows and rough areas contain free water. Excess water can be removed with compressed air. In no case should the grout be allowed to dry to a whitish appearance before the soil-cement is placed. Bonding grout will be used on any soil cement that has set more than 12 hours or that has dried out on the surface, as determined by the Project Engineer. This requirement may be waived if the surface is sufficiently rough to provide mechanical bond as determined by Project Engineer.

AS BUILT INFORMATION

CONTRACTOR	WORK	DATE
STAKED BY	INSPECTED BY	DATE
FIELD ADJUSTED BY	FIELD ADJUSTED BY	DATE
DRAWINGS CORRECTED BY	DRAWINGS CORRECTED BY	DATE
MICRO-FILM INFORMATION	RECORDED BY	DATE

BENCH MARKS

NMS STATION "SANDBERN" IS LOCATED 10 MI. NW OF DOWNTOWN ALBUQUERQUE TO REACH STATION FROM INTERSECTION OF CENTRAL AVE. & COORS RD., GO N. ON COORS 7.6 MI. TO THE INTERSECTION WITH PARADISE BLVD., THEN NW ON PARADISE 1.1 MI. TO GOLF COURSE RD., THEN NE ON GOLF COURSE 1.3 MI. TO JUNCTION WITH MCMAHON BLVD., THEN NW ON MCMAHON 2.25 MI. STATION IS LOCATED 600 FT SOUTH OF THIS POINT. STATION IS STD. USCARGS BRASS TABLET STAMPED "SANDBERN 1969" SET IN CONC. POST X=361,654.29 Y=1,534,209.29 (NAD 27) ELEV.= 5465.92 (NGVD 29)
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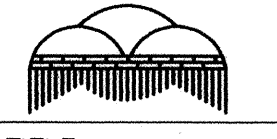
SURVEY INFORMATION

FIELD NOTES	DATE	BY
NO.		

ENGINEER'S SEAL

REMARKS	BY
REVISED	
DESIGN	
DATE	07/06
DRAWN BY	RDQ
CHECKED BY	DMG

7-31-06

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 ALBUQUERQUE METROPOLITAN ARROYO FLOOD CONTROL AUTHORITY	
TITLE: ANASAZI RIDGE SUBDIVISION CALABACILLAS ARROYO IMPROVEMENTS SOIL CEMENT SPECIFICATIONS	
DESIGN REVIEW COMMITTEE	CITY ENGINEER APPROVAL
LAST DESIGN UPDATE	
MO./DAY/YR.	
MO./DAY/YR.	
CITY PROJECT NO.	
ZONE MAP NO.	
SHEET OF	