City of Albuquerque

February 17, 2000

Fred C. Arfman, P.E.
Isaacson & Arfman
128 Monroe Street NE
Albuquerque, New Mexico

RE: Grading and Drainage Certification Plan for Desert Mountain at High Desert, Unit One (E23/D3H) Submitted for Release of Financial Guarantees, Engineer's Certification Stamp Dated 2/3/00.

Dear Mr. Arfman:

The above referenced plan is adequate to satisfy the Grading and Drainage Certification requirement per the Infrastructure List dated January 12, 1999, and last revised on May 12, 1999, for the release of Financial Guarantees for Unit One of the Desert Mountain at High Desert Subdivision.

If you have any questions, or if I may be of further assistance to you, please call me at 924-3982.

Sincerely,

Susan M. Calongne, P.E.
City/County Floodplain Administrator

c: Terri Martin, DRB-98-379, Work Order No. 608681
Robert Lupton, Sivage Thomas Homes
File

City of Albuquerque

October 12, 1999

Melissa J. Combs, P.E.
Isaacson & Arfman
128 Monroe Street NE
Albuquerque, New Mexico

RE: Pool Grading and Drainage Plan for Tract A, Desert Mountain at High Desert (E23/D3H) Submitted for Building Permit Approval, Engineer's Stamp Dated 9/10/99.

Dear Ms. Combs:

Based on the information provided in the submittal of September 13, 1999, the above referenced plan is approved for Building Permit release.

As you are aware, the Engineer's Certification, per the D.P.M. is required prior to release of the Certificate of Occupancy for this site.

If you have any questions, or if I may be of further assistance to you, please call me at 924-3982.

Sincerely,

Susan M. Calongne, P.E.
City/County Floodplain Administrator

c: Whitney Reierson, City Hydrology
Robert Lupton, Sivage Thomas Homes
File

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

February 11, 1999

Fred C. Arfman, P.E.
Isaacson & Arfman
128 Monroe Street NE
Albuquerque, New Mexico

RE: Revised Drainage Report and Grading Plan for Desert Mountain at High Desert (E23/D3H) Submitted for Final Plat Approval, Grading Permit and Work Order Approval, Engineer's Stamp Dated 1/25/99.

Dear Mr. Arfman:

Based on the information provided in the submittal of January 26, 1999, the above referenced plan is approved for Final Plat. This revised Grading plan must be approved by the DRB.

It appears that this plan changes the Infrastructure List, therefore, the amended Infrastructure List must also be approved by the DRB. The Subdivision Improvements Agreement (SIA) should match the amended Infrastructure List.

The above referenced plan is also approved for Rough Grading and Work Order.

As you are aware, the Grading and Drainage Certification of the plan that is approved by the DRB is required prior to release of the SIA.

If you have any questions, or if I may be of further assistance to you, please call me at 924-3982.

Sincerely,

Susan Calongne

Susan M. Calongne, P.E.
City/County Floodplain Administrator

c: Fred Aguirre, DRB-98-379
Bill Mueller, Sivage Thomas Homes
File

THE CITY OF ALBUQUERQUE IS AN EQUAL OPPORTUNITY/REASONABLE ACCOMMODATION EMPLOYER

REVISED MASTER DRAINAGE REPORT

FOR

DESERT MOUNTAIN AT HIGH DESERT (PHASES ONE AND TWO)

A 180 LOT (TWO PHASE) SINGLE FAMILY RESIDENTIAL SUBDIVISION

ALBUQUERQUE, NEW MEXICO
JANUARY 1999

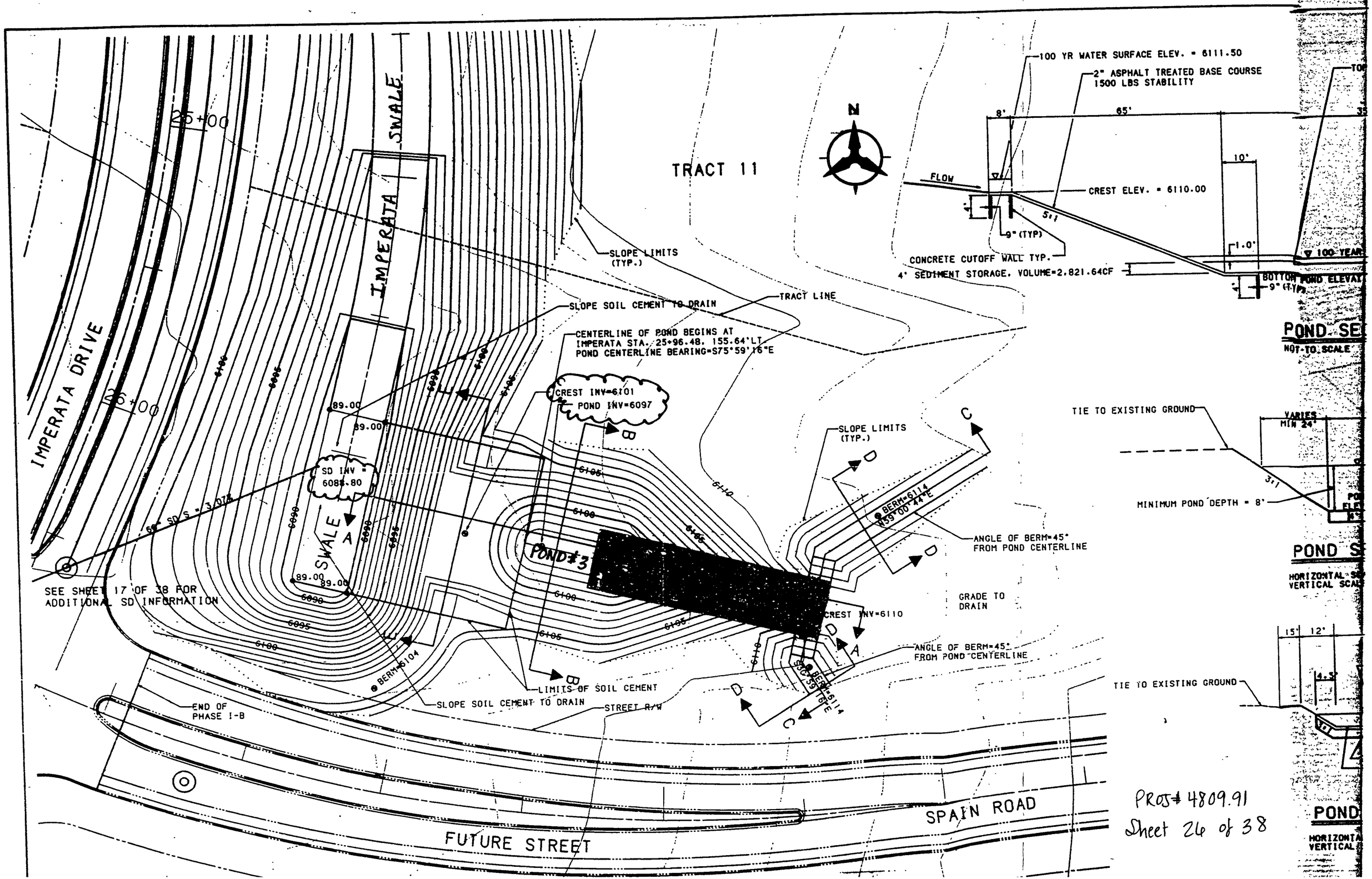
Prepared by:

ISAACSON & ARFMAN, P.A.
128 Monroe Street NE
Albuquerque, NM 87108
(505) 268-8828

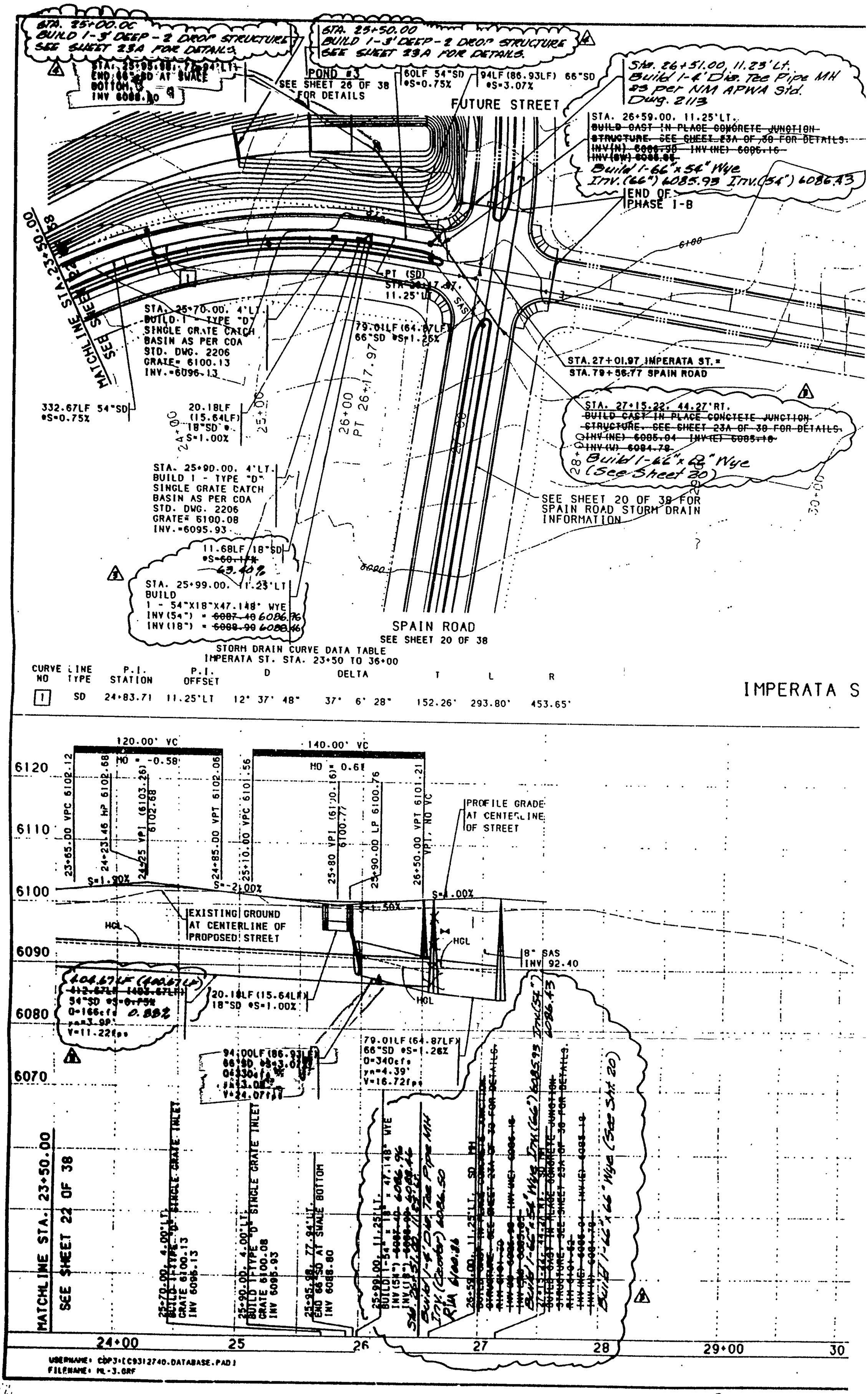
FRED C. ARFMAN
STATE OF
7322
NEW MEXICO
REGISTERED PROFESSIONAL ENGINEER

Fred C. Arfman 01-26-99

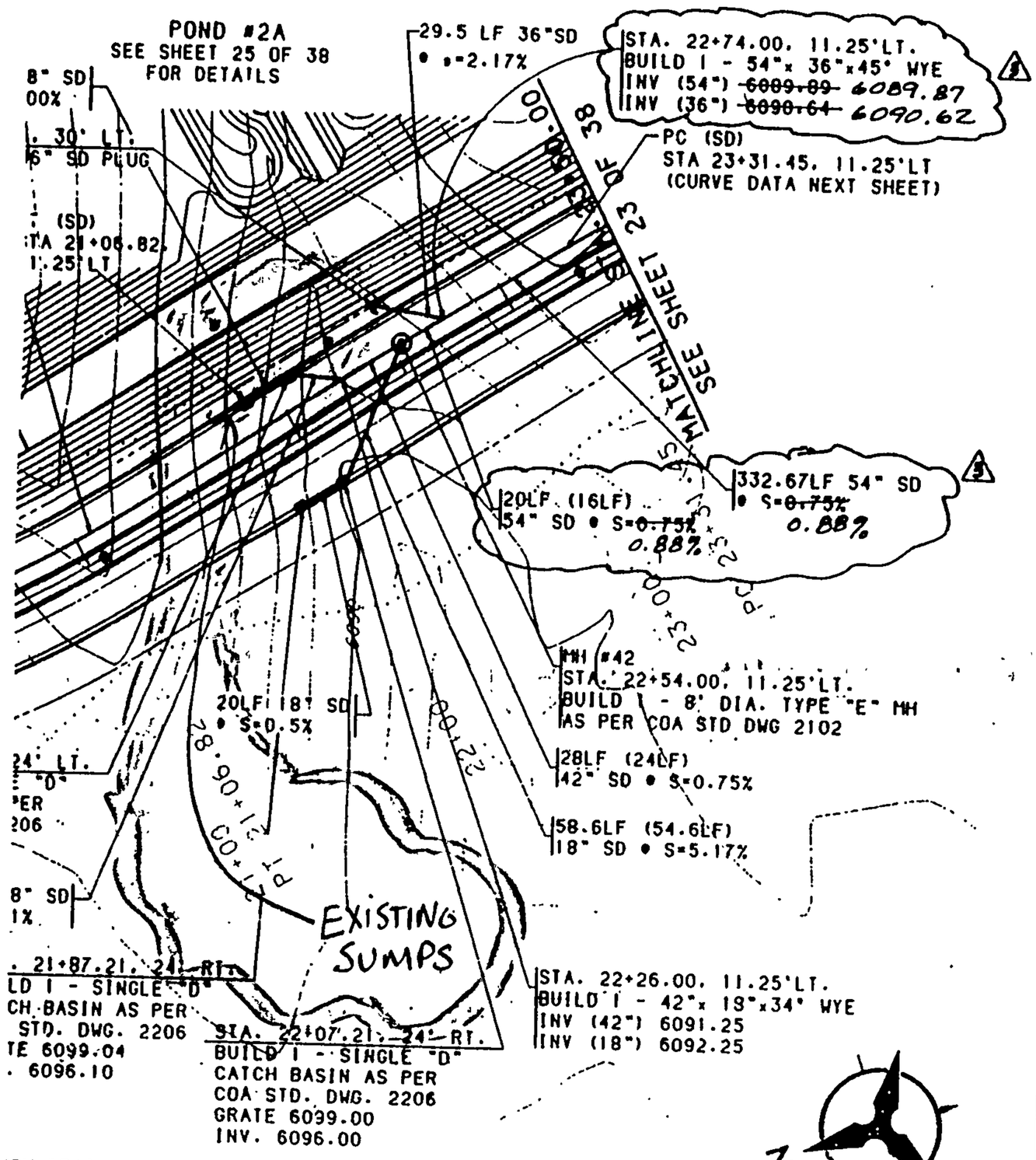
Fred C. Arfman, PE — Date



PROJ# 4809.91
Sheet 26 of 38



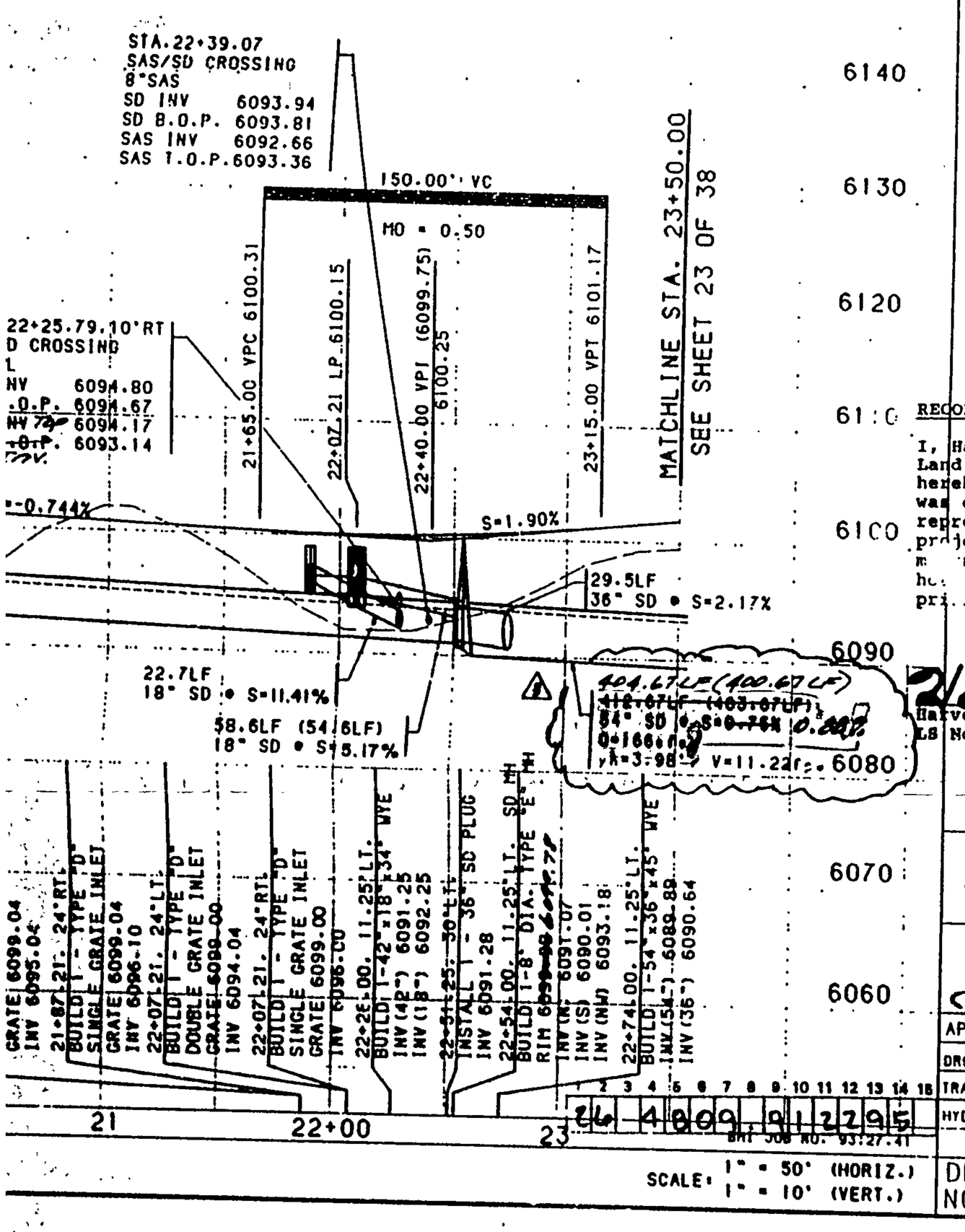
WO# 4809.91 Sheet 23 of 38



DRAIN DRAIN CURVE DATA TABLE
DATA ST. STA. 12+00 TO 23+50

D	DELTA	T	L	R
.3° 17' 21"	16° 31' 29.7"	62.61'	124.35'	431.15'
13° 17' 21"	26° 47' 10.8"	102.66'	201.57'	431.15'

SCALE: 1" = 50' (HORIZ.)



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

NOTES

1. ALL CURB DATA AND DIMENSIONS REFER TO FACE OF CURB UNLESS OTHERWISE SPECIFIED.

2. GRADE ELEVATIONS, WHERE NOTED, ARE FOR TOP OF STANDARD CURB UNLESS OTHERWISE SPECIFIED.

3. CONTRACTOR IS TO INSTALL A 4" X 4" X 5' POST AND EMD AT THE END OF EACH SANTITARY SEWER SERVICE.

4. ANY ADDITIONAL GRADING REQUIRED TO MATCH PROPOSED STREET GRADES SHALL BE INCIDENTAL TO PAVING ITEMS.

5. CONTRACTOR SHALL PROVIDE THE INSPECTORS (CITY AND PRIVATE) WITH THE PROPOSED HYDROSTATIC TESTING PLAN. THE PLAN MUST BE APPROVED BEFORE TESTING OPERATIONS BEGIN.

6. CONTRACTOR SHALL PARK EQUIPMENT AND VEHICLES AS NOT TO INTERFERE WITH NORMAL ACTIVITIES OF RESIDENTS OR OTHER CONTRACTORS ON SITE.

7. ANY DAMAGE TO THE EXISTING FACILITIES (CURB AND GUTTER, PAVEMENT, CONDUITS, LANDSCAPING, UTILITY LINES, ETC.) DURING CONSTRUCTION SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.

8. REMOVAL OF THE EXISTING CURB AND GUTTER SHALL BE AS PER COA STD. DWG. 2415 (SAWCUT ONLY).

9. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING UTILITY LOCATIONS AND NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

10. CONTRACTOR SHALL HAVE PROPOSED CURB STAKED PRIOR TO SETTING FINAL FIRE HYDRANT LOCATION. ANY SUBSEQUENT RELOCATION OF A FIRE HYDRANT TO CONFORM TO ACTUAL CURB LOCATIONS AND CITY OF ALBUQUERQUE STANDARD DETAILS SHALL BE MADE AT CONTRACTOR'S EXPENSE.

11. ALL WORK DETAILED ON THESE PLANS TO BE PERFORMED UNDER CONTRACT SHALL, EXCEPT AS OTHERWISE STATED OR PROVIDED FOR HEREON, BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF ALBUQUERQUE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, 1986 EDITION, AS AMENDED WITH UPDATE #4.

RECORD DRAWING

I, Harvey P. Phillips, Registered Professional Land Surveyor in the State of New Mexico, do hereby certify that this "as-built" information was obtained by me or under my supervision and represents the "as-built" conditions of this project, and is true and correct to the best of my knowledge and belief. All vertical and horizontal dimensions should be field verified prior to use on future projects.

Harvey P. Phillips 1/5/95
Harvey P. Phillips Date
LS No. 4767

HARVEY P. PHILLIPS NEW MEXICO 4767

AS-BUILT INFORMATION
CONTRACTOR New Concepts Inc
WORK STAKED BY New Concepts Inc DATE
INSPECTOR'S ACCEPTANCE BY BHI DATE
FIELD VERIFICATION BY BHI DATE
DRAWINGS CORRECTED BY NCI DATE
MICRO-FILM INFORMATION
RECORDED BY DATE
NO.

BENCH MARKS
The bench mark is a standard USC&GS brass tablet stamped "Tumble 1969" set in concrete located approximately 489 feet west and 35 feet north of the intersection of Tennyson Street and San Antonio Drive.
Plane coordinates: X=425 465.55 Y=1513 470.01
Ground-to-grid factor: 0.99961970
Elevation = 6009.155 feet

SURVEY INFORMATION
FIELD NOTES

NO.	BY	DATE

ENGINEER'S SEAL

NO.	DATE	REMARKS	BY
4	6-14-94	ADDED CROP STRUCTURE LOCATIONS.	CWH
3	6-2-94	Storm Drain Revisions	CWH

REVISIONS

DESIGN
DESIGNED BY CWM DATE 2/94
DRAWN BY PL, JAO DATE 2/94
CHECKED BY JRT DATE 2/94

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING

HIGH DESERT SUBDIVISION PHASE I-B
STORM DRAIN PLAN & PROFILE
IMPERATA ST. (STA. 12+00 TO 23+50 (SOUTH)

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
DRC CHAIRMAN		3-21-94	WATER	N/A RWK	3-10-94
TRANSPORTATION	N/A RHO	3-09-94	WASTE WATER	N/A RWK	3-10-94
HYDROLOGY		3-11-94			

DRAWING NO. 4809.91
MAP NO. E23 F23
SHEET 22 OF 38

CITY OF ALBUQUERQUE

INTRODUCTION

This report shall serve as a Master Drainage Report for Desert Mountain at High Desert, Phases One and Two. The two phases will consist of 70 and 110 single-family lots, respectively. This area was previously analyzed in the High Desert Drainage Management Plan approved by the City of Albuquerque in December 1993 and will be allowed free discharge in its developed state. All runoff from the site will flow east to Imperata Street and south to the Spain Road storm drain system. The Spain Road storm drain (COA Project No. 4809.91) was designed to accept the flows from this subdivision and from The Overlook at High Desert located just to the north of the property. It also accepts flows from High Desert Street and Imperata Street. This report shall provide an in depth analysis of this site and explain how the requirements of the High Desert Drainage Management Plan will be met by the development of this subdivision.

I. PROJECT INFORMATION

LEGAL DESCRIPTION: High Desert, Tract 11 (November 23, 1993, 93C-325)

ENGINEER: Isaacson & Arfman, P.A.
128 Monroe Street NE
Albuquerque, NM 87108
Attn: Fred C. Arfman, PE
(505) 268-8828

SURVEYOR: Aldrich Land Surveying, Inc.
Attn: Tim Aldrich, NMPLS No. 7719
(505) 884-1990

BENCHMARK: NGS/ACS Station "Tumble"
Elevation: 6009.155

ZONING: SU-2/RT

NUMBER OF PROPOSED LOTS:
Phase One: 70
Phase Two: 110

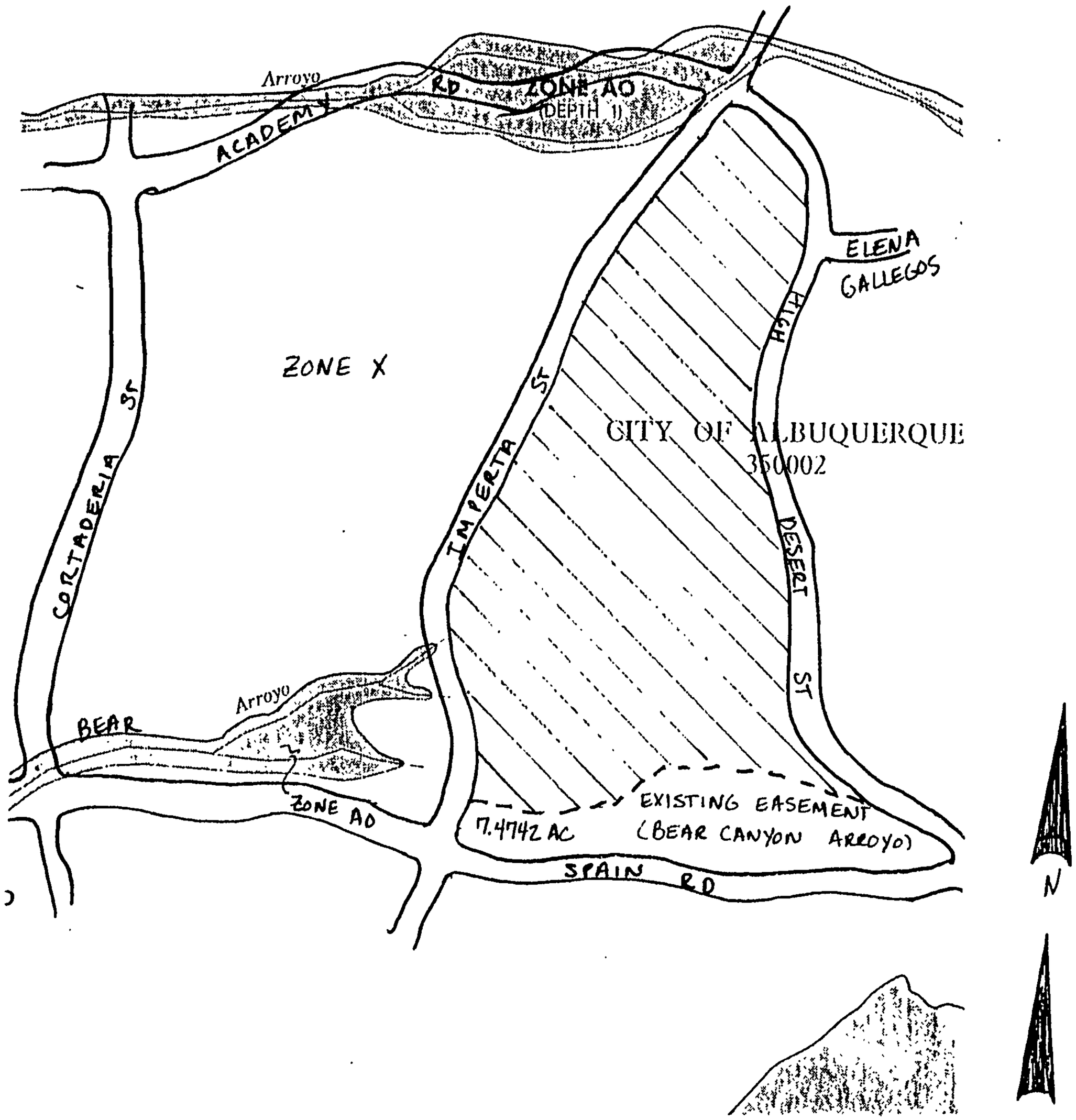
TOTAL AREA: 42.8533 Ac.
1,866,689.75 SF

II. SITE CHARACTERISTIC

FLOOD HAZARD: No portion of this site lies within a floodplain as determined by Panel No. 35001C0163 of the September 20, 1996 Edition of the F.E.M.A. Maps (see attached).

EXISTING CONDITIONS: This site is currently undeveloped and mostly undisturbed, with native ground cover typical of the City's east side (Land Treatment A). It has slopes averaging from 3% to 8% toward the west, and is bordered by High Desert Street to the east, Spain Road to the south, and Imperata Street to the west.

Runoff generated within the site flows to the south along Imperata Street and has free discharge to the Spain Road drainage system. This storm drain system was constructed under COA Project No. 4809.91 and was designed to accept the developed flows from High Desert Street, The Overlook at High Desert, Imperata Street, and the Desert Mountain at High Desert. This system has four stubs



CITY OF ALBUQUERQUE
350002

Scale 1":500'

ISAACSON & ARFMAN, P.A.

SUBJECT FEMA FLOODPLAIN MAP PANEL 163 OF 825 JOB NO.____
BY_____ DATE 9-20-96 SHEET NO.____ OF____

which serve the site. Three of the stubs branch off of the Imperata Street storm drain, which extends from Spain Road to a point approximately halfway between Spain Road and Academy Road. The fourth stub (66" diameter) is located at the northeast corner of Imperata Street and Spain Road. It extends into an existing drainage easement which was granted to the City of Albuquerque for the Bear Canyon Arroyo. This easement is adjacent to Spain Road and will remain undisturbed during the construction of this subdivision.

Undeveloped flows generated within the site are conveyed to Spain Road via the Imperata Swale. This swale also serves as a temporary method of conveyance for the runoff generated within the southern portion of The Overlook at High Desert Subdivision (Q = 67 cfs per the COA approved drainage report, E-23/D3K). These offsite flows are allowed to discharge to an existing arroyo which crosses the second phase of Desert Mountain at High Desert and connects to the Imperata Swale.

The remaining offsite runoff generated within The Overlook Subdivision and other northern subdivisions is collected by a detention facility located within Tract 15E, High Desert. This facility has a 66"-78" diameter outflow pipe which crosses the northern corner of Phase One Desert Mountain at High Desert.

This outfall pipe connects to the Academy Road storm drain system which was approved in the Final High Desert Subdivision Academy Storm Drain Design Report in September 1994.

High Desert Street is currently paved with standard curb and gutter adjacent to the first phase of the site. The remaining adjacent portion of High Desert Street will be financially guaranteed by the High Desert Investment Corporation. Spain Road has also been improved to meet City standards adjacent to the site. Imperata Street has been constructed adjacent to the second phase of the site. The remaining improvements will also be guaranteed by the High Desert Investment Corporation.

PROPOSED CONDITIONS:

Phase One: The first phase of development within this subdivision will consist of 70 units and a community facility/pool area. Each of the lots which are adjacent to Imperata Street will be allowed free rear yard discharge into this street (see Appendix B). All remaining developed runoff will be conveyed via street flow east and south along Goldfield Place and Buffalo Hills Road (see attached Table 2, Street Flow Depths). At Analysis Points 2 and 6 (AP2, AP6 as shown on the Basin Map) the street runoff will enter concrete channels which will convey the flows to the next street section (please refer to the FlowMaster sheets for channel calculations). No flows from this subdivision will be added to the

Academy Storm Drainage System which crosses this phase of the property. The portion of the Imperata Swale along the east boundary of this phase will be removed since it will no longer be necessary for conveying this runoff to Spain Road.

Interim: As an interim measure, flows will be conveyed via earthen swales along the phase line to a rundown which will connect to the Imperata Swale. Flows will then continue south to the existing 66" diameter storm drain stub at the intersection of Spain Road and Imperata Street. The offsite flows from The Overlook at High Desert will be allowed to continue in their existing flow pattern across Phase Two.

Ultimate: Upon construction of Phase Two, the earthen swales will be removed and the runoff from Phase One will be allowed to continue south along Goldfield Place and Buffalo Hills Road.

Phase Two: The second phase of this subdivision will be developed into 110 lots. Runoff from Phase One will be allowed to continue into Phase Two via street flow along Goldfield Place and Buffalo Hills Road. Flows generated within the northern half of Phase Two will combine with Phase One flows and continue south via a combination of street flow and storm drain to Analysis Point 12 (Imperata Street and Pinon Peak Avenue). The southern portion of the phase will flow east to Analysis Point 12 also in a combination

of street and storm drain flows.

Two storm drain systems will be required within this phase. One of the systems will connect to the existing 30" diameter stub at the north terminus of the Imperata Street storm drain. This pipe will extend to Goldfield Place through an easement between Lots 41 and 42, Block A. Most of the runoff generated within Phase One and the northern portion of Phase Two will be captured by this system (Q = 47.4 cfs) (see FlowMaster sheets for storm drain calculations).

The second system will consist of a 30" diameter storm drain along Slateridge Place and a 24" diameter northern branch along Goldfield Place. The offsite runoff from The Overlook at High Desert (Q = 67 cfs) will be re-routed through an existing 36" diameter stub located under High Desert Street, and connected to the new storm drain along Slateridge Place. Runoff generated within the southern half of Phase Two will also be captured and added to this storm drain (see Table 3, Inlet Capacity at Key Locations). This portion of the pipe will be financially guaranteed by the High Desert Investment Corporation. Runoff within this system will enter the Imperata storm drain system via a new 54" diameter connection at Pinon Peak Ave. The Imperata storm drain will function under pressure from this point to its connection with the Spain Road storm drain (refer to FlowMaster sheets for all

storm drain calculations).

As with Phase One, the rear yards of the lots which are adjacent to Imperata Street will be allowed to discharge directly to that street. These flows (12.03 cfs) plus the existing street flows (6.94 cfs) have a total (18.97 cfs) less than the designed street capacity (31.1 cfs). All of the Imperata Street flows will be captured by the existing inlet and sump inlets (refer to Appendix B for details).

Basin 103 +106

Upon completion of the subdivision improvements the Imperata Swale along this phase will be removed since it will no longer be necessary for the conveyance of flows

CONCLUSIONS & RECOMMENDATIONS

Desert Mountain at High Desert Phases One and Two are proposed to be developed consecutively. Onsite and offsite runoffs have been addressed as to how the subdivision will have a cohesive drainage solution. The Summary Tables provide a more in depth study of the street capacities, drainage basins, and inlet capacities. Attached FlowMaster calculation sheets show rundown and storm sizing calculations. Please refer to the Appendix for further supplemental information.

The recommendations for Phases One and Two construction are presented below:

- A temporary earthen swale will be graded along the southern boundary of Phase One to convey the developed flows to the Imperata Swale. Upon construction of Phase Two the swales will be removed.
- Berms or swale points shall be graded around the developing unit so that offsite runoff will not affect this unit.
- Lots running parallel to High Desert Street shall be graded to be close in elevation to the street grades.
- All required storm drain along Slateridge Place shall be included as part of the Phase Two required infrastructure, and will be financially guaranteed by the High Desert Investment Corporation.
- The Imperata Swale will be removed with construction of each phase as it will no longer be necessary for the conveyance of flows.
- Adjacent lots may share a common lot line drainage swale (see Typical Lot Grading Detail).
- All required storm drain from Phase Two contributing to the Imperata Street storm drain shall be included within the required infrastructure list for the unit.
- All lots which front Imperata Street shall be allowed free rear yard discharge to that street.

TABLE 1
ONSITE BASIN SUMMARY

Basin ID	Area (Sq. Mi.)	AP #	Contributing Basins	Cumulative Area (Sq. Mi.)	% A	% B	% C	% D	Basin Q (cfs)	Cumulative Q (cfs)
100	.00569	AP6	101,101A, 102,104,105	.01355	0	24	26	50	15.70	35.26
101	.00125		101	.00125	0	24	26	50	3.47	3.47
101A	.00110		101	.00235	40	20	20	20	2.30	5.76
102	.00165	AP1	101A*	.00400	0	24	26	50	4.47	10.33
103	.00270		103	.00270	0	24	26	50	7.46	7.46
104	.00192	AP3	104	.00192	0	24	26	50	5.31	5.31
105	.00194	AP4	105	.00194	0	24	26	50	5.37	5.37
106	.00104		103	.00374	0	24	26	50	2.89	10.35
107	.00350	AP7	107	.00350	0	24	26	50	9.67	9.67
108	.0050		107	.0085	0	24	26	50	13.80	22.90
109	.00195	AP9	109	.00195	0	24	26	50	5.40	5.40
110	.00373	AP10	110	.00373	0	24	26	50	10.30	10.30
111	.00616		110	.00989	0	24	26	50	17.00	25.67
112	.0034	AP12	100*,108*, 109,111*, 114*	.05049	0	24	26	50	9.39	133.65
113	.004	AP11	113	.004	0	24	26	50	11.05	11.05
114	.0092		113	.01320	0	24	26	50	25.38	34.16
115	.0006		115	.0006	0	24	26	50	1.68	1.68

*Cumulative Q of Basin

TABLE 2
STREET FLOW DEPTHS @ KEY LOCATIONS

Street	Location	Street Width	Curb Type	Slope (ft/ft)	Q100(cfs)	Depth (ft)	EG (ft)
PINON PEAK AVE	CB 18-21	54	STD	0.0059	34.45	0.59	0.70
PINE FOREST PL	CB1 & 2	28	STD	0.075	17.08	0.32	0.85
GOLDFIELD PL	CB5 & 6	28	STD	0.0123	34.76	0.52	0.79
GOLDFIELD PL	CB7 & 8	28	STD	0.0123	20.76	0.44	0.62
SILVER PEAK PL	CB9, 10 & 11	28	STD	0.055	21.7	0.36	0.83
GOLDFIELD PL	CB12 & 13	28	STD	0.018	34.09	0.48	0.81
SLATERIDGE PL	CB14 & 15	28	STD	0.058	22.28	0.36	0.85
SLATERIDGE PL	CB16 & 17	28	STD	0.058	18.3	0.34	0.79
DESERT MOUNTAIN DR	AP1	28	STD	0.05	10.33	0.29	0.60
GOLDFIELD PL	AP2	24	STD	0.014	20.88	0.43	0.65
BIGHORN RD	AP3	28	MTBL	0.081	5.31	0.16	0.46
BUCKSKIN RD	AP4	28	MTBL	0.08	5.37	0.16	0.46
GOLDFIELD PL	AP5**	24	STD	0.0374	35.26	0.33	0.62
GOLDFIELD PL	AP6, CB3 & 4	24	STD	0.0123	35.26	0.53	0.84
PINE FOREST PL	AP7	28	STD	0.075	9.67	0.27	0.67
PINE FOREST PL	AP8	28	STD	0.075	11.5	0.28	0.73
SENTENTIAL	AP9	28	MTBL	0.0625	5.4	0.16	0.42
SILVER PEAK PL	AP10	28	MTBL	0.054	10.3	0.21	0.53
SLATERIDGE PL	AP11	28	STD	0.058	11.05	0.29	0.64

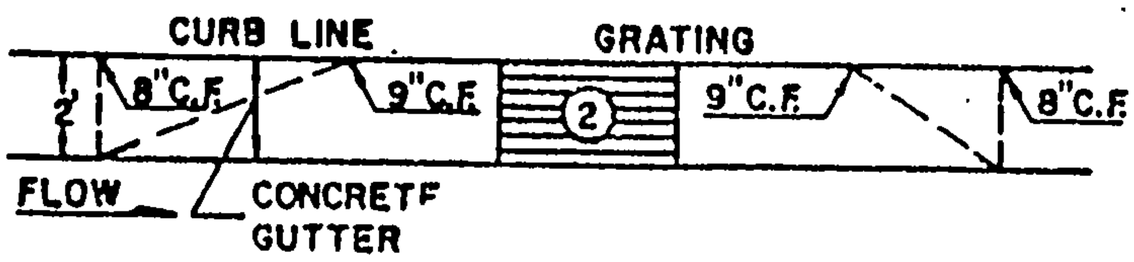
*ALL FLOWS LISTED ARE FOR FULL STREET WIDTH
**THIS SECTION IS BASED ON A FLAT STREET SECTION: NO CROWN
STREET FLOW DEPTHS CALCULATED USING MANNINGS EQUATION

TABLE 3
INLETS CAPACITY @ KEY LOCATIONS

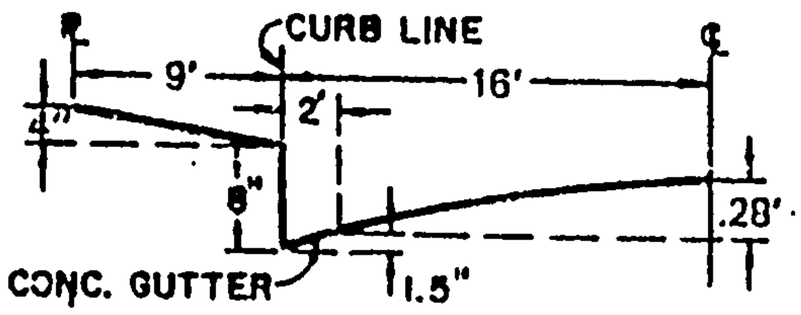
INLET NO	INLET TYPE	LOCATION	STREET WIDTH & CURB TYPE	% SLOPE	Q 100 (CFS)	Dn (FT)	Q intercepted (CFS)	Q by-pass (cfs)
CB1 & 2	A	Pine Forest & Buffalo Hills	28' FF, STD	7.50%	17.08	0.32	5.7 ea = 11.4 cfs	5.68
CB3 & 4	A	Goldfield Pl & Pine Forest	24' FF, STD	1.23%	35.26	0.53	6 ea = 12 cfs	23.26
CB5 & 6	A, DBL C	Goldfield Pl & Pine Forest	28' FF, STD	1.23%	34.76	0.52	Type A = 6 cfs Type C = 8 cfs	20.76
CB7 & 8	A, DBL C	Goldfield Pl & Sentinal Ct	28' FF, STD	1.23%	20.76	0.44	Type A = 5 cfs Type C = 5 cfs	10.76
CB9, 10 & 11	A	Silver Peak Pl	28' FF, STD	5.50%	21.7	0.36	6 ea = 18 cfs	3.7
CB12 & 13	A	Goldfield Pl & Silver Peak Pl	28' FF, STD	1.80%	34.09	0.48	5.0 ea = 10.0 cfs	24.09
CB14 & 15	A	Slateridge Pl	28' FF, STD	5.80%	22.28	0.36	6 ea = 12 cfs	10.28
CB 16 & 17	A	Slateridge Pl	28' FF, STD	5.80%	18.3	0.34	5.9 ea = 11.8 cfs	6.5
CB 18-21	A	Pinon Peak Ave	54' FF, STD	2.60%	34.45	0.47	8.4 ea = 33.6 cfs	0.85

*Q per inlet are calculated using DPM Plate 22.3, D-5

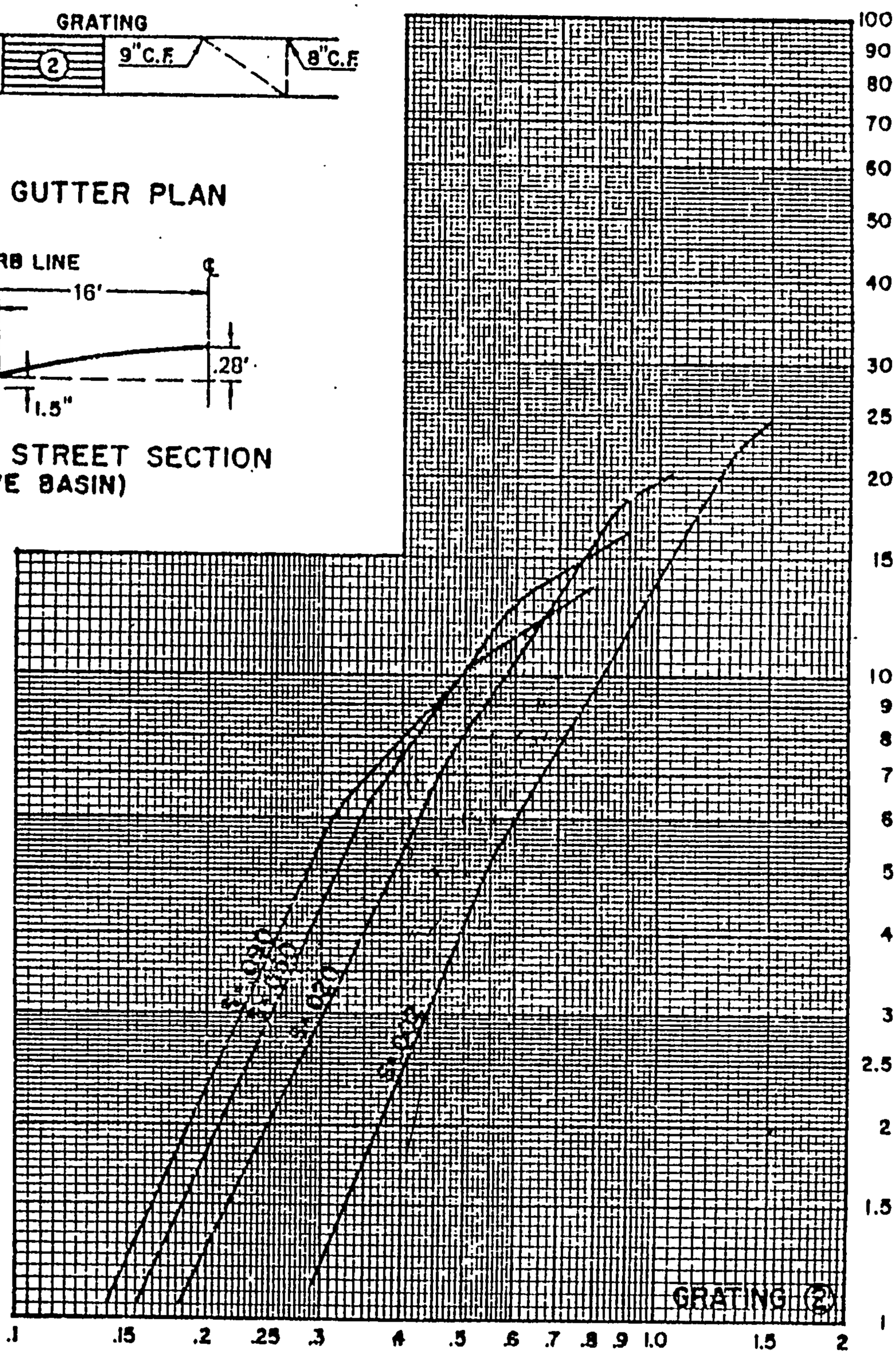
GRATING CAPACITIES FOR TYPE "A", "C" and "D"



GRATING & GUTTER PLAN



TYPICAL HALF STREET SECTION
(ABOVE BASIN)



EXISTING SPAIN MH TEE TO MH 7
Worksheet for Pressure Pipe

Project Description	
Project File	c:\haestad\fmw\cprwynd2.fm2
Worksheet	Spain MH Tee to MH 7
Flow Element	Pressure Pipe
Method	Hazen-Williams Formula
Solve For	Pressure at 1

Input Data	
Pressure at 2	4.50 feet H20
Elevation at 1	6,089.88 ft
Elevation at 2	6,086.43 ft
Length	389.67 ft
C Coefficient	105.0
Diameter	54.00 in
Discharge	229.65 cfs

Results		
Pressure at 1	6.22	feet H20
Headloss	5.17	ft
Energy Grade at 1	6,099.34	ft
Energy Grade at 2	6,094.17	ft
Hydraulic Grade at 1	6,096.10	ft
Hydraulic Grade at 2	6,090.93	ft
Flow Area	15.90	ft^2
Wetted Perimeter	14.14	ft
Velocity	14.44	ft/s
Velocity Head	3.24	ft
Friction Slope	0.013263	ft/ft

Notes:

MH TEE (EXIST INV) = ELEV 2 = 6086.43
MH 7 (INV EXIST) = ELEV 1 = 6089.88
MH 7 RIM = 6099.9 +/-
S = 0.88 %

MH 7 TO EXISTING MH 42
Worksheet for Pressure Pipe

Project Description	
Project File	c:\haestad\fmw\cprwynd2.fm2
Worksheet	MH7 TO MH42 (EXISTING)
Flow Element	Pressure Pipe
Method	Hazen-Williams Formula
Solve For	Pressure at 1

Input Data	
Pressure at 2	6.22 feet H20
Elevation at 1	6,090.01 ft
Elevation at 2	6,089.88 ft
Length	15.00 ft
C Coefficient	105.0
Diameter	54.00 in
Discharge	77.25 cfs

Results		
Pressure at 1	6.12	feet H20
Headloss	0.03	ft
Energy Grade at 1	6,096.49	ft
Energy Grade at 2	6,096.47	ft
Hydraulic Grade at 1	6,096.13	ft
Hydraulic Grade at 2	6,096.10	ft
Flow Area	15.90	ft^2
Wetted Perimeter	14.14	ft
Velocity	4.86	ft/s
Velocity Head	0.37	ft
Friction Slope	0.001764	ft/ft

Notes:

MH 7 (EXIST INV N) = ELEV 2 = 6089.88
MH 42 (INV EXIST S) = ELEV 1 = 6090.01
MH 42 RIM = 6099.78
S = 0.88 %

EXISTING MH 42 TO MH 41
Worksheet for Pressure Pipe

Project Description	
Project File	c:\haestad\fmw\cprwynd2.fm2
Worksheet	MH42 TO MH 41 (EXISTING)
Flow Element	Pressure Pipe
Method	Hazen-Williams Formula
Solve For	Pressure at 1

Input Data	
Pressure at 2	5.06 feet H20
Elevation at 1	6,093.64 ft
Elevation at 2	6,091.07 ft
Length	354.00 ft
C Coefficient	105.0
Diameter	42.00 in
Discharge	59.50 cfs

Results		
Pressure at 1	3.80	feet H20
Headloss	1.31	ft
Energy Grade at 1	6,098.03	ft
Energy Grade at 2	6,096.72	ft
Hydraulic Grade at 1	6,097.44	ft
Hydraulic Grade at 2	6,096.13	ft
Flow Area	9.62	ft^2
Wetted Perimeter	11.00	ft
Velocity	6.18	ft/s
Velocity Head	0.59	ft
Friction Slope	0.003698	ft/ft

Notes:

MH 42 (INV EXIST N) = ELEV 2 = 6091.07
MH 41 (INV EXIST S) = ELEV 1 = 6093.64
MH 41 RIM = 6101.88

EXISTING MH 41 TO MH 40
Worksheet for Pressure Pipe

Project Description	
Project File	c:\haestad\fmw\cprwynd2.fm2
Worksheet	MH41 TO MH 40 (EXISTING)
Flow Element	Pressure Pipe
Method	Hazen-Williams Formula
Solve For	Pressure at 1

Input Data	
Pressure at 2	3.22 feet H20
Elevation at 1	6,099.09 ft
Elevation at 2	6,094.22 ft
Length	276.76 ft
C Coefficient	105.0
Diameter	36.00 in
Discharge	59.50 cfs

Results		
Pressure at 1	0.52	feet H20
Headloss	2.17	ft
Energy Grade at 1	6,100.71	ft
Energy Grade at 2	6,098.54	ft
Hydraulic Grade at 1	6,099.61	ft
Hydraulic Grade at 2	6,097.44	ft
Flow Area	7.07	ft^2
Wetted Perimeter	9.42	ft
Velocity	8.42	ft/s
Velocity Head	1.10	ft
Friction Slope	0.007835	ft/ft

Notes:

MH 42 (INV EXIST N) = ELEV 2 = 6091.07
MH 41 (INV EXIST S) = ELEV 1 = 6093.64
MH 41 RIM = 6101.88

*THIS PIPE FUNCTIONS PARTIALLY UNDER GRAVITY AND PARTIALLY UNDER PRESSURE

EXISTING MH 40 TO MH 1
Worksheet for Circular Channel

Project Description	
Project File	c:\haestad\fmw\cprwynd2.fm2
Worksheet	MH 40 (EXISTING) TO MH 1
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.0225	ft/ft
Diameter	30.00	in
Discharge	47.40	cfs

Results		
Depth	1.65	ft
Flow Area	3.43	ft^2
Wetted Perimeter	4.73	ft
Top Width	2.37	ft
Critical Depth	2.26	ft
Percent Full	65.85	
Critical Slope	0.011702	ft/ft
Velocity	13.83	ft/s
Velocity Head	2.97	ft
Specific Energy	4.62	ft
Froude Number	2.03	
Maximum Discharge	66.18	cfs
Full Flow Capacity	61.52	cfs
Full Flow Slope	0.013356	ft/ft
Flow is supercritical.		

Notes:

MH 40 INV (E) = 6099.71
MH1 INV (W) = 6100.61
MH 1 RIM = 6112.5
LENGTH = 40 FT

MH 1 TO MH 2
Worksheet for Circular Channel

Project Description	
Project File	c:\haestad\fmw\cprwynd2.fm2
Worksheet	MH 1 TO MH 2
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.0200	ft/ft
Diameter	30.00	in
Discharge	47.40	cfs

Results		
Depth	1.72	ft
Flow Area	3.60	ft^2
Wetted Perimeter	4.89	ft
Top Width	2.32	ft
Critical Depth	2.26	ft
Percent Full	68.73	
Critical Slope	0.011702	ft/ft
Velocity	13.18	ft/s
Velocity Head	2.70	ft
Specific Energy	4.42	ft
Froude Number	1.86	
Maximum Discharge	62.40	cfs
Full Flow Capacity	58.00	cfs
Full Flow Slope	0.013356	ft/ft
Flow is supercritical.		

Notes:

MH 1 INV (E) = 6100.71
MH 2 INV (W) = 6103.21
MH 2 RIM = 6111.1
LENGTH = 125 FT

MH 2 TO MH 3
Worksheet for Pressure Pipe

Project Description	
Project File	c:\haestad\fmw\cprwynd2.fm2
Worksheet	MH 2 TO MH 3
Flow Element	Pressure Pipe
Method	Hazen-Williams Formula
Solve For	Pressure at 1

Input Data	
Pressure at 2	2.00 feet H20
Elevation at 1	6,104.26 ft
Elevation at 2	6,103.71 ft
Length	45.00 ft
C Coefficient	105.0
Diameter	24.00 in
Discharge	47.40 cfs

Results		
Pressure at 1	3.12	feet H20
Headloss	1.67	ft
Energy Grade at 1	6,110.92	ft
Energy Grade at 2	6,109.25	ft
Hydraulic Grade at 1	6,107.38	ft
Hydraulic Grade at 2	6,105.71	ft
Flow Area	3.14	ft^2
Wetted Perimeter	6.28	ft
Velocity	15.09	ft/s
Velocity Head	3.54	ft
Friction Slope	0.037054	ft/ft

Notes:

MH 2 INV (N) = ELEV 2 = 6103.71
MH 3 INV (S) = ELEV 1 = 6104.26
MH 3 RIM = 6111.5 +/-
S= 1.2%

MH 3 TO MH 4
Worksheet for Pressure Pipe

Project Description	
Project File	c:\haestad\fmw\cprwynd2.fm2
Worksheet	MH 3 TO MH 4
Flow Element	Pressure Pipe
Method	Hazen-Williams Formula
Solve For	Pressure at 1

Input Data	
Pressure at 2	3.02 feet H20
Elevation at 1	6,105.71 ft
Elevation at 2	6,104.36 ft
Length	90.00 ft
C Coefficient	105.0
Diameter	24.00 in
Discharge	37.40 cfs

Results		
Pressure at 1	3.82	feet H20
Headloss	2.15	ft
Energy Grade at 1	6,111.73	ft
Energy Grade at 2	6,109.58	ft
Hydraulic Grade at 1	6,109.53	ft
Hydraulic Grade at 2	6,107.38	ft
Flow Area	3.14	ft^2
Wetted Perimeter	6.28	ft
Velocity	11.90	ft/s
Velocity Head	2.20	ft
Friction Slope	0.023893	ft/ft

Notes:

MH 3 INV (N) = ELEV 2 = 6104.36
MH 4 INV (S) = ELEV 1 = 6105.71
MH 4 RIM = 6112 +/-
S= 1.5%

MH 4 TO MH 5
Worksheet for Pressure Pipe

Project Description	
Project File	c:\haestad\fmw\cprwynd2.fm2
Worksheet	MH 4 TO MH 5
Flow Element	Pressure Pipe
Method	Hazen-Williams Formula
Solve For	Pressure at 1

Input Data	
Pressure at 2	3.72 feet H20
Elevation at 1	6,107.51 ft
Elevation at 2	6,105.81 ft
Length	85.00 ft
C Coefficient	105.0
Diameter	24.00 in
Discharge	23.40 cfs

Results		
Pressure at 1	2.87	feet H20
Headloss	0.85	ft
Energy Grade at 1	6,111.24	ft
Energy Grade at 2	6,110.39	ft
Hydraulic Grade at 1	6,110.38	ft
Hydraulic Grade at 2	6,109.53	ft
Flow Area	3.14	ft^2
Wetted Perimeter	6.28	ft
Velocity	7.45	ft/s
Velocity Head	0.86	ft
Friction Slope	0.010026	ft/ft

Notes:

MH 4 INV (N) = ELEV 2 = 6105.81
MH 5 INV (S) = ELEV 1 = 6107.51
MH 5 RIM = 6113.3 +/-
S= 2.0%

MH 5 TO MH 6
Worksheet for Circular Channel

Project Description	
Project File	c:\haestad\fmw\cprwynd2.fm2
Worksheet	MH5 TO MH 6
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.0750	ft/ft
Diameter	18.00	in
Discharge	11.40	cfs

Results		
Depth	0.66	ft
Flow Area	0.74	ft^2
Wetted Perimeter	2.17	ft
Top Width	1.49	ft
Critical Depth	1.29	ft
Percent Full	43.76	
Critical Slope	0.010924	ft/ft
Velocity	15.33	ft/s
Velocity Head	3.65	ft
Specific Energy	4.31	ft
Froude Number	3.82	
Maximum Discharge	30.94	cfs
Full Flow Capacity	28.77	cfs
Full Flow Slope	0.011779	ft/ft
Flow is supercritical.		

Notes:

MH 5 INV (E) = 6107.66
MH6 INV (W) = 6123.41
MH 1 RIM = 6128.5
LENGTH = 210 FT

*THIS PIPE FUNCTIONS PARTIALLY UNDER PRESSURE AND PARTIALLY UNDER GRAVITY FLOW

MH 7 TO MH 8
Worksheet for Pressure Pipe

Project Description	
Project File	c:\haestad\fmw\cprwynd2.fm2
Worksheet	MH7 TO MH 8
Flow Element	Pressure Pipe
Method	Hazen-Williams Formula
Solve For	Pressure at 1

Input Data	
Pressure at 2	5.22 feet H20
Elevation at 1	6,091.92 ft
Elevation at 2	6,090.88 ft
Length	45.00 ft
C Coefficient	105.0
Diameter	42.00 in
Discharge	152.40 cfs

Results		
Pressure at 1	5.13	feet H20
Headloss	0.95	ft
Energy Grade at 1	6,100.95	ft
Energy Grade at 2	6,100.00	ft
Hydraulic Grade at 1	6,097.05	ft
Hydraulic Grade at 2	6,096.10	ft
Flow Area	9.62	ft^2
Wetted Perimeter	11.00	ft
Velocity	15.84	ft/s
Velocity Head	3.90	ft
Friction Slope	0.021107	ft/ft

Notes:

MH 7 INV (E) = ELEV 2 = 6090.88
MH 8 INV (W) = ELEV 1 = 6091.92
MH8 RIM = 6001 +/-
S= 2.3%

MH 8 TO MH 9
Worksheet for Pressure Pipe

Project Description	
Project File	c:\haestad\fmw\cprwynd2.fm2
Worksheet	MH8 TO MH 9
Flow Element	Pressure Pipe
Method	Hazen-Williams Formula
Solve For	Pressure at 1

Input Data	
Pressure at 2	5.03 feet H20
Elevation at 1	6,094.41 ft
Elevation at 2	6,092.02 ft
Length	105.00 ft
C Coefficient	105.0
Diameter	42.00 in
Discharge	118.80 cfs

Results		
Pressure at 1	4.04	feet H20
Headloss	1.40	ft
Energy Grade at 1	6,100.82	ft
Energy Grade at 2	6,099.42	ft
Hydraulic Grade at 1	6,098.45	ft
Hydraulic Grade at 2	6,097.05	ft
Flow Area	9.62	ft^2
Wetted Perimeter	11.00	ft
Velocity	12.35	ft/s
Velocity Head	2.37	ft
Friction Slope	0.013308	ft/ft

Notes:

MH 8 INV (E) = ELEV 2 = 6092.02
MH 9 INV (W) = ELEV 1 = 6094.41
MH 9 RIM = 6003 +/-
S= 2.28%

MH 9 TO MH 10
Worksheet for Pressure Pipe

Project Description	
Project File	c:\haestad\fmw\cprwynd2.fm2
Worksheet	MH9 TO MH 10
Flow Element	Pressure Pipe
Method	Hazen-Williams Formula
Solve For	Pressure at 1

Input Data	
Pressure at 2	2.54 feet H20
Elevation at 1	6,097.16 ft
Elevation at 2	6,095.91 ft
Length	50.00 ft
C Coefficient	105.0
Diameter	24.00 in
Discharge	28.00 cfs

Results		
Pressure at 1	1.99	feet H20
Headloss	0.70	ft
Energy Grade at 1	6,100.38	ft
Energy Grade at 2	6,099.68	ft
Hydraulic Grade at 1	6,099.15	ft
Hydraulic Grade at 2	6,098.45	ft
Flow Area	3.14	ft^2
Wetted Perimeter	6.28	ft
Velocity	8.91	ft/s
Velocity Head	1.23	ft
Friction Slope	0.013979	ft/ft

Notes:

MH 9 INV (N) = ELEV 2 = 6095.91
MH 10 INV (S) = ELEV 1 = 6097.16
MH 10 RIM = 6003.6 +/-
S= 2.5%

* THIS PIPE FUNCTIONS PARTIALLY UNDER GRAVITY FLOW AND PARTIALLY UNDER PRESSURE FLOW

MH 10 TO MH 11
Worksheet for Pressure Pipe

Project Description	
Project File	c:\haestad\fmw\cprwynd2.fm2
Worksheet	MH10 TO MH11
Flow Element	Pressure Pipe
Method	Hazen-Williams Formula
Solve For	Pressure at 1

Input Data	
Pressure at 2	1.50 feet H20
Elevation at 1	6,098.76 ft
Elevation at 2	6,097.66 ft
Length	110.00 ft
C Coefficient	105.0
Diameter	18.00 in
Discharge	18.00 cfs

Results		
Pressure at 1	3.15	feet H20
Headloss	2.75	ft
Energy Grade at 1	6,103.53	ft
Energy Grade at 2	6,100.77	ft
Hydraulic Grade at 1	6,101.91	ft
Hydraulic Grade at 2	6,099.16	ft
Flow Area	1.77	ft^2
Wetted Perimeter	4.71	ft
Velocity	10.19	ft/s
Velocity Head	1.61	ft
Friction Slope	0.025039	ft/ft

Notes:

MH 10 INV (N) = ELEV 2 = 6097.66
MH 11 INV (S) = ELEV 1 = 6098.76
MH 11 RIM = 6004.8 +/-
S= 1.0%

MH 11 TO MH 12
Worksheet for Pressure Pipe

Project Description	
Project File	c:\haestad\fmw\cprwynd2.fm2
Worksheet	MH11 TO MH 12
Flow Element	Pressure Pipe
Method	Hazen-Williams Formula
Solve For	Pressure at 1

Input Data	
Pressure at 2	3.05 feet H20
Elevation at 1	6,102.46 ft
Elevation at 2	6,098.86 ft
Length	60.00 ft
C Coefficient	105.0
Diameter	18.00 in
Discharge	18.00 cfs

Results		
Pressure at 1	0.95	feet H20
Headloss	1.50	ft
Energy Grade at 1	6,105.02	ft
Energy Grade at 2	6,103.52	ft
Hydraulic Grade at 1	6,103.41	ft
Hydraulic Grade at 2	6,101.91	ft
Flow Area	1.77	ft^2
Wetted Perimeter	4.71	ft
Velocity	10.19	ft/s
Velocity Head	1.61	ft
Friction Slope	0.025039	ft/ft

Notes:

MH 11 INV (E) = ELEV 2 = 6098.86
MH 12 INV (W) = ELEV 1 = 6102.46
MH 12 RIM = 6007.6 +/-
S= 6.0 %

* THIS PIPE FUNCTIONS PARTIALLY UNDER PRESSURE AND PARTIALLY UNDER GRAVITY FLOW

MH 12 TO MH 13
Worksheet for Circular Channel

Project Description	
Project File	c:\haestad\fmw\cprwynd2.fm2
Worksheet	MH12 TO MH 13
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.0500	ft/ft
Diameter	18.00	in
Discharge	18.00	cfs

Results		
Depth	0.98	ft
Flow Area	1.23	ft^2
Wetted Perimeter	2.83	ft
Top Width	1.43	ft
Critical Depth	1.45	ft
Percent Full	65.60	
Critical Slope	0.025774	ft/ft
Velocity	14.65	ft/s
Velocity Head	3.33	ft
Specific Energy	4.32	ft
Froude Number	2.78	
Maximum Discharge	25.27	cfs
Full Flow Capacity	23.49	cfs
Full Flow Slope	0.029367	ft/ft
Flow is supercritical.		

Notes:

MH 12 INV (E) = 6102.56
MH13 INV (W) = 6106.56
MH 13 RIM = 6111.3
LENGTH = 80 FT

MH 9 TO MH 14
Worksheet for Pressure Pipe

Project Description	
Project File	c:\haestad\fmw\cprwynd2.fm2
Worksheet	MH 9 TO MH 14
Flow Element	Pressure Pipe
Method	Hazen-Williams Formula
Solve For	Pressure at 1

Input Data	
Pressure at 2	3.04 feet H20
Elevation at 1	6,100.66 ft
Elevation at 2	6,095.41 ft
Length	150.00 ft
C Coefficient	105.0
Diameter	30.00 in
Discharge	90.80 cfs

Results		
Pressure at 1	4.04	feet H20
Headloss	6.25	ft
Energy Grade at 1	6,110.02	ft
Energy Grade at 2	6,103.77	ft
Hydraulic Grade at 1	6,104.70	ft
Hydraulic Grade at 2	6,098.45	ft
Flow Area	4.91	ft^2
Wetted Perimeter	7.85	ft
Velocity	18.50	ft/s
Velocity Head	5.32	ft
Friction Slope	0.041653	ft/ft

Notes:

MH 9 INV (S) = ELEV 2 = 6095.41
MH 14 INV (N) = ELEV 1 = 6100.66
MH 14 RIM = 6106.8 +/-
S= 3.5%

MH 14 TO MH 15
Worksheet for Pressure Pipe

Project Description	
Project File	c:\haestad\fmw\cprwynd2.fm2
Worksheet	MH 14 TO MH 15
Flow Element	Pressure Pipe
Method	Hazen-Williams Formula
Solve For	Pressure at 1

Input Data	
Pressure at 2	3.94 feet H20
Elevation at 1	6,102.56 ft
Elevation at 2	6,100.76 ft
Length	60.00 ft
C Coefficient	105.0
Diameter	30.00 in
Discharge	90.80 cfs

Results		
Pressure at 1	4.64	feet H20
Headloss	2.50	ft
Energy Grade at 1	6,112.52	ft
Energy Grade at 2	6,110.02	ft
Hydraulic Grade at 1	6,107.20	ft
Hydraulic Grade at 2	6,104.70	ft
Flow Area	4.91	ft^2
Wetted Perimeter	7.85	ft
Velocity	18.50	ft/s
Velocity Head	5.32	ft
Friction Slope	0.041653	ft/ft

Notes:

MH 14 INV (E) = ELEV 2 = 6100.76
MH 15 INV (W) = ELEV 1 = 6102.56
MH 15 RIM = 6109.8 +/-
S= 3.0%

MH 15 TO MH 16
Worksheet for Pressure Pipe

Project Description	
Project File	c:\haestad\fmw\cprwynd2.fm2
Worksheet	MH 15 TO MH 16
Flow Element	Pressure Pipe
Method	Hazen-Williams Formula
Solve For	Pressure at 1

Input Data	
Pressure at 2	4.54 feet H20
Elevation at 1	6,110.09 ft
Elevation at 2	6,102.66 ft
Length	135.00 ft
C Coefficient	105.0
Diameter	30.00 in
Discharge	79.00 cfs

Results		
Pressure at 1	1.46	feet H20
Headloss	4.35	ft
Energy Grade at 1	6,115.57	ft
Energy Grade at 2	6,111.22	ft
Hydraulic Grade at 1	6,111.55	ft
Hydraulic Grade at 2	6,107.20	ft
Flow Area	4.91	ft^2
Wetted Perimeter	7.85	ft
Velocity	16.09	ft/s
Velocity Head	4.03	ft
Friction Slope	0.032187	ft/ft

Notes:

MH 15 INV (E) = ELEV 2 = 6102.66
MH 16 INV (W) = ELEV 1 = 6110.09
MH 16 RIM = 6116.2 +/-
S= 5.5%

* THIS PIPE FUNCTIONS PARTIALLY UNDER GRAVITY & PARTIALLY UNDER PRESSURE

MH 16 TO MH 17
Worksheet for Circular Channel

Project Description	
Project File	c:\haestad\fmw\cprwynd2.fm2
Worksheet	MH16 TO MH 17
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.0500	ft/ft
Diameter	30.00	in
Discharge	79.00	cfs

Results		
Depth	1.79	ft
Flow Area	3.76	ft^2
Wetted Perimeter	5.04	ft
Top Width	2.26	ft
Critical Depth	2.46	ft
Percent Full	71.57	
Critical Slope	0.033648	ft/ft
Velocity	21.02	ft/s
Velocity Head	6.86	ft
Specific Energy	8.65	ft
Froude Number	2.87	
Maximum Discharge	98.66	cfs
Full Flow Capacity	91.71	cfs
Full Flow Slope	0.037100	ft/ft
Flow is supercritical.		

Notes:

MH 16 INV (E) = 6110.19
MH17 INV (W) = 6113.19
MH 17 RIM = 6122.5 +/-
LENGTH = 60 FT

MH 17 TO MH 18
Worksheet for Circular Channel

Project Description	
Project File	c:\haestad\fmw\cprwynd2.fm2
Worksheet	MH 17 TO MH 18
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.0550	ft/ft
Diameter	30.00	in
Discharge	67.00	cfs

Results		
Depth	1.54	ft
Flow Area	3.16	ft^2
Wetted Perimeter	4.50	ft
Top Width	2.43	ft
Critical Depth	2.43	ft
Percent Full	61.45	
Critical Slope	0.023554	ft/ft
Velocity	21.18	ft/s
Velocity Head	6.97	ft
Specific Energy	8.51	ft
Froude Number	3.27	
Maximum Discharge	103.47	cfs
Full Flow Capacity	96.19	cfs
Full Flow Slope	0.026685	ft/ft
Flow is supercritical.		

Notes:

MH 17 INV (E) = 6113.29
MH18 INV (W) = 6124.84
MH 18 RIM = 6132.8 +/-
LENGTH = 210 FT

MH 18 TO MH 19
Worksheet for Circular Channel

Project Description	
Project File	c:\haestad\fmw\cprwynd2.fm2
Worksheet	MH 18 TO MH 19
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.0390	ft/ft
Diameter	30.00	in
Discharge	67.00	cfs

Results		
Depth	1.73	ft
Flow Area	3.63	ft^2
Wetted Perimeter	4.92	ft
Top Width	2.30	ft
Critical Depth	2.43	ft
Percent Full	69.36	
Critical Slope	0.023554	ft/ft
Velocity	18.44	ft/s
Velocity Head	5.28	ft
Specific Energy	7.02	ft
Froude Number	2.59	
Maximum Discharge	87.13	cfs
Full Flow Capacity	81.00	cfs
Full Flow Slope	0.026685	ft/ft
Flow is supercritical.		

Notes:

MH 18 INV (E) = 6124.94
MH19 INV (W) = 6139.55
MH 19 RIM = 6151.7 +/-
LENGTH = 375 FT

MH 19 TO MH 20
Worksheet for Circular Channel

Project Description	
Project File	c:\haestad\fmw\cprwynd2.fm2
Worksheet	MH 19 TO MH 20
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.0500	ft/ft
Diameter	30.00	in
Discharge	67.00	cfs

Results		
Depth	1.59	ft
Flow Area	3.28	ft^2
Wetted Perimeter	4.61	ft
Top Width	2.41	ft
Critical Depth	2.43	ft
Percent Full	63.45	
Critical Slope	0.023554	ft/ft
Velocity	20.40	ft/s
Velocity Head	6.46	ft
Specific Energy	8.05	ft
Froude Number	3.08	
Maximum Discharge	98.66	cfs
Full Flow Capacity	91.71	cfs
Full Flow Slope	0.026685	ft/ft
Flow is supercritical.		

Notes:

MH 19 INV (E) = 6139.65
MH 20 INV (W) = 6142.65
MH 20 INV (EXIST END OF STUB) = 42.75
MH 20 RIM = 6156+/-
LENGTH = 60 FT

RUNDOWN @ AP2
Worksheet for Rectangular Channel

Project Description	
Project File	c:\haestad\fmw\cprwynd2.fm2
Worksheet	RUNDOWN @ AP2
Flow Element	Rectangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.014	ft/ft
Bottom Width	10.00	ft
Discharge	20.88	cfs

Results		
Depth	0.33	ft
Flow Area	3.35	ft^2
Wetted Perimeter	10.67	ft
Top Width	10.00	ft
Critical Depth	0.51	ft
Critical Slope	0.003503	ft/ft
Velocity	6.24	ft/s
Velocity Head	0.61	ft
Specific Energy	0.94	ft
Froude Number	1.90	
Flow is supercritical.		

RUNDOWN @ AP6
Worksheet for Rectangular Channel

Project Description	
Project File	c:\haestad\fmw\cprwynd2.fm2
Worksheet	RUNDOWN @ AP6
Flow Element	Rectangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.037	ft/ft
Bottom Width	10.00	ft
Discharge	35.26	cfs

Results		
Depth	0.34	ft
Flow Area	3.42	ft^2
Wetted Perimeter	10.68	ft
Top Width	10.00	ft
Critical Depth	0.73	ft
Critical Slope	0.003281	ft/ft
Velocity	10.30	ft/s
Velocity Head	1.65	ft
Specific Energy	1.99	ft
Froude Number	3.10	
Flow is supercritical.		

TEMPORARY EARTHEN SWALE
Worksheet for Triangular Channel

Project Description	
Project File	c:\haestad\fmw\cprwynd2.fm2
Worksheet	TEMPORARY EARTHEN SWALE
Flow Element	Triangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.022	
Channel Slope	0.030	ft/ft
Left Side Slope	3.00	H : V
Right Side Slope	3.00	H : V
Discharge	13.88	cfs

Results		
Depth	0.85	ft
Flow Area	2.17	ft^2
Wetted Perimeter	5.38	ft
Top Width	5.11	ft
Critical Depth	1.06	ft
Critical Slope	0.009353	ft/ft
Velocity	6.39	ft/s
Velocity Head	0.63	ft
Specific Energy	1.49	ft
Froude Number	1.73	
Flow is supercritical.		

TEMPORARY RUNDOWN @ THE IMPERATA SWALE
Worksheet for Trapezoidal Channel

Project Description	
Project File	c:\haestad\fmw\cprwynd2.fm2
Worksheet	TEMPORARY RUNDOWN @ THE IMPERATA SWALE
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.040	
Channel Slope	0.020	ft/ft
Left Side Slope	4.00	H : V
Right Side Slope	4.00	H : V
Bottom Width	12.00	ft
Discharge	49.14	cfs

Results		
Depth	0.81	ft
Flow Area	12.33	ft^2
Wetted Perimeter	18.67	ft
Top Width	18.48	ft
Critical Depth	0.74	ft
Critical Slope	0.027767	ft/ft
Velocity	3.98	ft/s
Velocity Head	0.25	ft
Specific Energy	1.06	ft
Froude Number	0.86	
Flow is subcritical.		

Notes:

RUNDOWN WILL BE RIPRAPED AT THE CREST OF THE SWALE

Desert Mountain Landscaped Rundown Calc'
Worksheet for Triangular Channel

Project Description	
Project File	c:\haestad\fmw\junk.fm2
Worksheet	dm
Flow Element	Triangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.035	
Channel Slope	0.027900	ft/ft
Left Side Slope	3.000000	H : V
Right Side Slope	3.000000	H : V
Discharge	3.47	cfs

Results		
Depth	0.61	ft
Flow Area	1.12	ft^2
Wetted Perimeter	3.86	ft
Top Width	3.66	ft
Critical Depth	0.61	ft
Critical Slope	0.028476	ft/ft
Velocity	3.10	ft/s
Velocity Head	0.15	ft
Specific Energy	0.76	ft
Froude Number	0.99	
Flow is subcritical.		

AHYMO SUMMARY TABLE (AHYMO194) - AMAFCA Hydrologic Model - January, 1994 RUN DATE (MON/DAY/YR) =12/06/1998
INPUT FILE = cprwind2.dat USER NO.= ISCARFNM.I01

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	NOTATION
START										TIME= .00
RAINFALL TYPE= 1										RAIN6= 2.870
*S **********										
*S **RUNOFF CONTRIBUTING TO AP										
*S **********										
*S **BASIN 100										
COMPUTE NM HYD	100.00	-	1	.00569	15.70	.587	1.93555	1.500	4.313	PER IMP= 50.00
*S **BASIN 101										
COMPUTE NM HYD	101.00	-	2	.00125	3.47	.129	1.93555	1.500	4.333	PER IMP= 50.00
*S **BASIN 101A										
COMPUTE NM HYD	101.10	-	3	.00110	2.30	.077	1.31786	1.500	3.260	PER IMP= 20.00
*S **ADD BASINS 101 & 101A										
ADD HYD	101.20	3& 2	4	.00235	5.76	.206	1.64621	1.500	3.831	
*S **BASIN 102										
COMPUTE NM HYD	102.00	-	5	.00165	4.57 desert mtn	.170	1.93555	1.500	4.327	PER IMP= 50.00
*S **ADD BASINS 101.2 & 102										
ADD HYD	102.10	5& 4	6	.00400	10.33 AP1	.377	1.76549	1.500	4.035	
*S **ROUTE BASIN 102.1 THROUGH 100										
ROUTE	102.20	6	7	.00400	10.10 + 15.7 25.0 - Channel	.377	1.76562	1.533	3.946	
*S **BASIN 103** FLOWS TO IMPERATA										
COMPUTE NM HYD	103.00	-	8	.00270	7.46 AP2	.279	1.93555	1.500	4.319	PER IMP= 50.00
*S **BASIN 104										
COMPUTE NM HYD	104.00	-	9	.00192	5.31 AP3	.198	1.93555	1.500	4.324	PER IMP= 50.00
*S **ADD BASINS 104 & 102.2										
ADD HYD	~~104.10~~	~~9& 7~~	10	.00592	~~15.20~~ 31.11	.575	1.82063	1.533	4.012	
*S **ROUTE BASIN 104.1 THROUGH 100 ?										
ROUTE	104.20	10	11	.00592	15.03	.575	1.82071	1.533	3.968	
*S **BASIN 105										
COMPUTE NM HYD	105.00	-	12	.00194	5.37	.200	1.93555	1.500	4.324	PER IMP= 50.00
*S **ADD BASINS 104.2 & 105										
ADD HYD	105.10	12&11	13	.00786	20.18 36.5	.775	1.84896	1.533	4.013	
*S **ADD BASINS 105.1 & 100										
ADD HYD	105.20	13& 1	14	.01355	35.26 AP5 channel	1.362	1.88530	1.533	4.066	
*S **BASIN 106** FLOWS TO IMPERATA *										
COMPUTE NM HYD	106.00	-	15 28.994	.00104	2.89	.107	1.93555	1.500	4.338	PER IMP= 50.00
*S **ADD BASINS 106 & 103										
ADD HYD	106.10	15& 8	16	.00374	10.35	.386	1.93541	1.500	4.324	
*S **BASIN 107										
COMPUTE NM HYD	107.00	-	17	.00350	9.67 AP7	.361	1.93555	1.500	4.316	PER IMP= 50.00
*S **ROUTE BASIN 107 THROUGH 108										
ROUTE	107.10	17	18	.00350	9.48	.361	1.93562	1.533	4.231	
*S **BASIN 108										
COMPUTE NM HYD	108.00	-	19	.00500	13.80	.516	1.93555	1.500	4.314	PER IMP= 50.00
*S **ADD BASINS 108 & 107.1										
ADD HYD	108.10	19&18	20	.00850	22.90 AP8 pine forest	.877	1.93549	1.500	4.210	
*S **ADD BASINS 108.1 & 105.2										
ADD HYD	108.20	20&14	1	.02205	57.98	2.240	1.90465	1.533	4.109	
*S **ROUTE BASIN 108.2 THROUGH 112										
ROUTE	108.30	1	2	.02205	58.74 goldfield	2.240	1.90467	1.533	4.162	
*S **BASIN 109										

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	NOTATION
COMPUTE NM HYD	109.00	-	3	.00195	5.40 AP9	.201	1.93555	1.500	4.324	PER IMP= 50.00
*S **ADD BASINS 109 & 108.3										
ADD HYD	109.10	3& 2	4	.02400	63.92	2.441	1.90715	1.533	4.161	
*S **ROUTE BASIN 109.1 THROUGH 112										
ROUTE	109.20	4	5	.02400	64.44 AP15	2.441	1.90717	1.533	4.195	
*S **BASIN 110										
COMPUTE NM HYD	110.00	-	6	.00373	10.30 AP10	.385	1.93555	1.500	4.316	PER IMP= 50.00
*S **ROUTE BASIN 110 THROUGH 111										
ROUTE	110.10	6	7	.00373	9.35	.385	1.93561	1.533	3.918	
*S **BASIN 111										
COMPUTE NM HYD	111.00	-	8	.00616	17.00	.636	1.93555	1.500	4.312	PER IMP= 50.00
*S **ADD BASINS 110.1 & 111										
ADD HYD	111.10	8& 7	9	.00989	25.67 silver peak	1.021	1.93551	1.533	4.056	
*S **ADD BASINS 111.1 & 109.2										
ADD HYD	111.20	9& 5	10	.03389	90.11	3.462	1.91543	1.533	4.154	
*S **ROUTE BASIN 111.2 THROUGH 112										
ROUTE	111.30	10	11	.03389	90.47	3.462	1.91544	1.533	4.171	
*S **BASIN 112										
COMPUTE NM HYD	112.00	-	12	.00340	9.39	.351	1.93555	1.500	4.317	PER IMP= 50.00
*S **ADD BASINS 112 & 111.3										
ADD HYD	112.10	11&12	13	.03729	99.49 Goldfield	3.813	1.91726	1.533	4.169	
*S **BASIN 113										
COMPUTE NM HYD	113.00	-	14	.00400	11.05 AP11	.413	1.93555	1.500	4.315	PER IMP= 50.00
*S **ROUTE BASIN 113 THROUGH 114										
ROUTE	113.10	14	15	.00400	9.85	.413	1.93562	1.567	3.849	
*S **BASIN 114										
COMPUTE NM HYD	114.00	-	17	.00920	25.38	.950	1.93555	1.500	4.311	PER IMP= 50.00
*S **ADD BASINS 113.1 & 114										
ADD HYD	114.10	17&15	18	.01320	34.16	1.363	1.93552	1.533	4.044	
*S **BASIN 115** FLOWS TO IMPERATA										
COMPUTE NM HYD	115.00	-	19	.00060	1.68	.062	1.93555	1.500	4.362	PER IMP= 50.00
*S **ADD BASINS 115 & 106.1										
ADD HYD	115.10	16&19	20	.00434	12.03 to Imp.	.448	1.93537	1.500	4.329	
*S **ADD BASINS 114.1 & 112.1										
ADD HYD	114.20	18&13	1	.05049	133.65 total	5.176	1.92203	1.533	4.136	
FINISH										

Imperata Street Hydraulics Summary - Undeveloped

(per the Final High Desert Phase One Hydrology & Design Drainage Report dated March 1994)

- Q max in Imperata (east side only) = 31.1 CFS

- Existing storm drain (36", 42", & 54")
  - Q design for 36" ϕ = 81 CFS
  - Q design for 42" ϕ = 81 CFS
  - Q design for 54" ϕ = 166 CFS

- Q (west side of Imperata @ Inlets 1 & 2)
  - Q_{inlets} = 4.6 CFS (See sheet 3 attached)
  - Q_{bypass} = 1.6 CFS

- Q (west Imperata @ STA 22+07.21 - Sumps)
  - Q = 3.38 CFS + 1.6 CFS = 5.4 CFS (sheet 2)

- Q (east side of Imperata @ Inlet 3)
  - Q = 4.57 CFS (Sheet 7)

- Q (east side of Imperata @ STA 22+07.21 - Sumps)
  - Q = 2.37 + 4.57 = 6.94 CFS (Sheet 7)
  - Sump Capacity = 31.55 CFS (Sheet 11)

Developed Desert Mountain at High Desert

Imperata Street Hydraulics

- @ Inlet #3 (East Side)

Q_{TOT} = 4.57 (street runoff) + 10.35 (runoff from adjacent lots)

= 14.92 CFS

D_n = 0.5 ft (per Supplemental Sheet 9)

per DPM plate # 22.3 D-6 Q_{cap} = 7.5 CFS

$\therefore Q_{bypass}$ = 7.45 CFS

- Total Q in existing 36" Ø & 42" Ø Storm drains

Q_{TOT} = 47.4 CFS (from
+ 7.5 CFS (east side of Imperata)
+ 4.6 CFS (west side of Imperata)

59.5 CFS < 81 CFS (design) ✓ OK

- @ STA 22+07.21 - Sump Inlets

Q = 7.45 (bypass flows)
+ 0.85 (
+ 1.68 (rear-yards of adjacent lots)
+ 2.37 (east side Imperata runoff)

12.35 CFS < 31.55 CFS SUMP CAPACITY ✓ OK

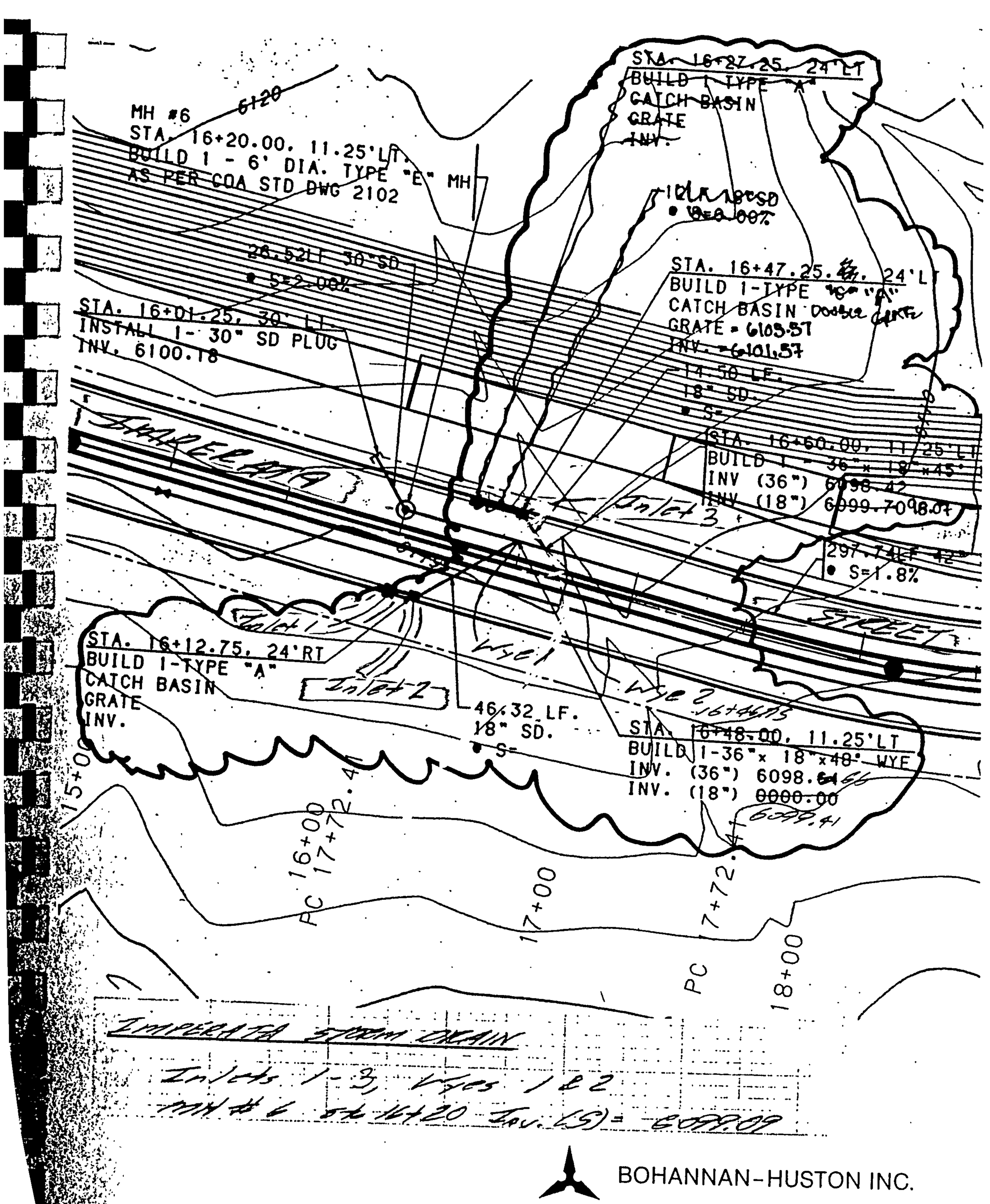
Developed Imperata
Con't

- Total Q in existing 54"ϕ

Q_{TOT} = 152.40 CFS (
+ 59.5 CFS (existing storm drain flows)
+ 12.35 CFS (east sump - additional flow)
+ 5.4 CFS (west sump - additional flow)

229.65 CFS > 166 CFS = Qdesign

* See Flow Master Sheets in the Summary Table section of the report. for capacity calculations. Qdesign was not under pressure conditions, but the pipe has capacity for the larger flows when functioning under pressure.



BOHANNAN-HUSTON INC.

PROJECT NAME HGR DESERT SHEET 1 OF

PROJECT NO. BY DATE

SUBJECT IMPERIAL STORM DRAIN CH'D DATE

IMPERIA STORM DRAIN

EAST SIDE

Design for Fully Developed Conditions

Drainage Area: West Half of Future Proposed Improvements

Sta 1+50 to 16+12.75

L = 1462.75
W = 41 } Area = 1.38 acres

Note: This portion of Improvements is Shown Section C-C

From Attached Street Length Calculation Spreadsheet

$C_{25}/L^{1/3}(C-C) = 0.00722$

$(1462.75)(41/70)(0.00722) = 6.18$ cfs

Note: Upstream of Proposed Inlet

Amount = 6.9 cfs

Capacity of Proposed Inlet

Amount = 5.1 cfs

High Point @ Sta 24+23.46

Low Point @ Sta 22+07.21

Sta 16+12.75 to 24+23.46

$Q = (0.71)(41/71)(0.00722)$

$Q = 3.38$ cfs

→ Inlet at Sta 16+12.75 has Capacity

$= (6.2 + 3.4) - 5.1 = 4.50$ cfs

Max Flow = 5.1 − 3.4 = 1.7 cfs

Street Flow @ Inlet from Manning's

S = 0.013

n = 0.021

V = 2.8 fps

Q TOTAL WISE = 3.38 + 6.18 = 9.56 CFS

BOHANNAN-HUSTON INC.

PROJECT NAME HEH DESERT SHEET 2 OF

PROJECT NO. BY DATE

SUBJECT IMPERIA STORM DRAIN CH'D DATE

IMPERATA STREET (WEST SIDE)
FROM PLATE 22.3 D-5

First Inlet: Q_{100} = 6.2 cfs
Type "A" Double Grate y_n = 0.32' Grate Capacity = 3.1 cfs
Residual Flow = 3.10 cfs

Second Inlet: Q_2 = 3.1 cfs
Type "C" Single Grate y_n = 0.25' Grate Capacity = 1.50 cfs
Residual Flow = 1.60 cfs

TOTAL Q to Storm drain
= 3.1 + 1.5 = 4.6 cfs

Inlet Design
Inlet #1 Sta 15+92.75 TC = 6106.83 FG = 6107.58
Q_{grate} = 3.10 cfs Using 18" connector pipe check orifice
$Q = CA(2gh)^{1/2}$ C = 0.62 A = 1.77 sf g = 32.17 h = ?
solve for h = 0.12 does not act as an orifice

use standard minimum dimensions for inlet
(see COA Std DWG) TOG = 6106.49
INV = 6102.49

Inlet #2 Sta 16+12.75 TC = 6106.57
flow from Inlet #1 = 3.1 cfs ; $Q_{grate\#2}$ = 1.50 cfs
Q_T = 4.60 cfs check using orifice eq for an 18" pipe
$Q = CA(2gh)^{1/2}$ h = 0.27 Does not act as an orifice

Grate elev = 6105.74
Inv elev = 6102.57

use standard min dimensions
(see COA Std DWG)

BOHANNAN-HUSTON INC.

PROJECT NAME High Desert SHEET 3 OF
PROJECT NO. BY DATE
SUBJECT Imperata Storm Drain CH'D DATE

IMPERATA STREET (WEST SIDE)

Inlet #1 to Inlet #2 Use an 18" ϕ connector pipe

Length = 20 LF
Inv (#1) = 6102.83
Inv (#2) = 6102.57

slope = 1.68 %
Qcap = 11.1 cfs (gravity flow) < 3.1 cfs

OK

Inlet #2 to WYE

Sta 16+96.75 11.25' LT (WYE)

Length 48.08
Inv (#2) = 6102.57
Inv (WYE) = 6099.41

Slope = 6.57 %
Qcap = 14.5 cfs < 4.6 cfs

OK

BOHANNAN-HUSTON INC.

PROJECT NAME _____ SHEET 4 OF _____
PROJECT NO. _____ BY _____ DATE _____
SUBJECT _____ CH'D _____ DATE _____

IMPERATA STORM DRAIN @ STA. 16+12.75

STREET SECTION C-C HALF ROADWAY SECTION USING ROLL TYPE CURB

MANNING'S N = .0170 SLOPE = .0130

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.33	3	2.63	0.06	5	27.50	1.05
2	1.31	0.00	4	27.00	0.55			

WSEL (FT)	DEPTH INC	FLOW AREA (SQ FT)	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOP WID
0.05	0.05	0.0	0.0	1.3	0.8	1.2
0.1	0.1	0.1	0.2	3.6	1.2	3.6
0.15	0.15	0.4	0.6	6.3	1.6	6.3
0.2	0.2	0.8	1.5	9.0	1.9	9.0
0.25	0.25	1.3	3.0	11.7	2.3	11.7
Yn = 0.252		Q(RESIDUAL) = 3.10				
0.3	0.3	1.9	5.1	14.4	2.6	14.4
---------- Q(100) = 6.2 CFS			Yn = 0.32'		V = 2.76 FPS	----------
0.33	0.33	2.4	6.7	16.0	2.8	16.0

IMPERATA STORM DRAIN - EAST SIDE

Design for Fully Developed Conditions

Drainage Area: Basin: VMBA-30

East Side of Imperata Sta 14+50 to 16+47.25, (Section C-C)

Total Q

Basin VMBA-30 = 36

Imperata (1497.25)(30/71)(0.00722) = 4.57

Total Q_{10} = 40.6

NOTE: Upstream of Proposed Inlet

$Q_{max\ street}$ = 41.1 cfs

Downstream of Inlet

$Q_{max\ street}$ = 31.2 cfs

Low Point @ Sta 22+07.21

High Point @ Sta 24+23.46

Sta 16+47.25 to 24+23.46

$Q = (776.21)(30/71)(0.00722)$

$Q = 2.37$ cfs

⇒ Inlet(s) @ Sta 16+47.25 Rated Capacity

$= (40.6 + 2.37) - 31.2 = 11.8$ cfs

⇒ Max Residual Flow $= 31.2 - 2.4 = 28.8$ cfs

(IN IMPERATA) TOTAL = 4.57 + 2.37 = 6.94 CFS

BOHANNAN-HUSTON INC.

PROJECT NAME _____ SHEET 7 OF _____

PROJECT NO. _____ BY _____ DATE _____

SUBJECT _____ CH'D _____ DATE _____

EAST SIDE (IMPERATA CONTINUED)

~~Determine Inlet Capacity Using DPM Plate 22.3 D-5~~ Sta 16+47.25, 24.0' LT

~~First Inlet~~

~~Type "A" Double grate~~

~~$y_p = 0.665$~~ ~~$Q_{cap} = 13$ cfs~~

~~$Q_{RESID} = 27.6$ cfs~~ < 29.5 cfs

See re-design on Sheet B-2 for developed conditions

OK

Design Inlet #3

Sta 16+47.25 TC = 6106.40

Determine depth of inlet by using orifice equation

$Q = CA(2gh)^{1/2}$ C=0.62 A=1.77 g=32.17 h=?

Q=13 cfs

solve for h = 2.18

using a 4 ft deep inlet would allow 1.07 ft of freeboard

TOG = 6105.57

INV = 6101.57

WYE STATION 16+60.00, 11.25' LT

36" x 18" x 45°

S = 26.9%

INV (36") = 6098.42

INV (18") = 6098.07

LENGTH 14.5

Qcap = 42.26 cfs < 13 cfs

OK

BOHANNAN-HUSTON INC.

PROJECT NAME _____ SHEET 8 OF _____

PROJECT NO. _____ BY _____ DATE _____

SUBJECT _____ CH'D _____ DATE _____

IMPERATA STORM DRAIN - EAST SIDE STA. 16+47.25

STREET SECTION C-C HALF ROADWAY SECTION USING STANDARD CURB

MANNING'S N = .0170 SLOPE = .0130

POINT	DIST	ELEV	POINT	DIST	ELEV	POINT	DIST	ELEV
1	0.00	0.67	3	2.17	0.13	5	24.17	0.5
2	0.17	0.00	4	22.17	0.52	6	24.17	0.8

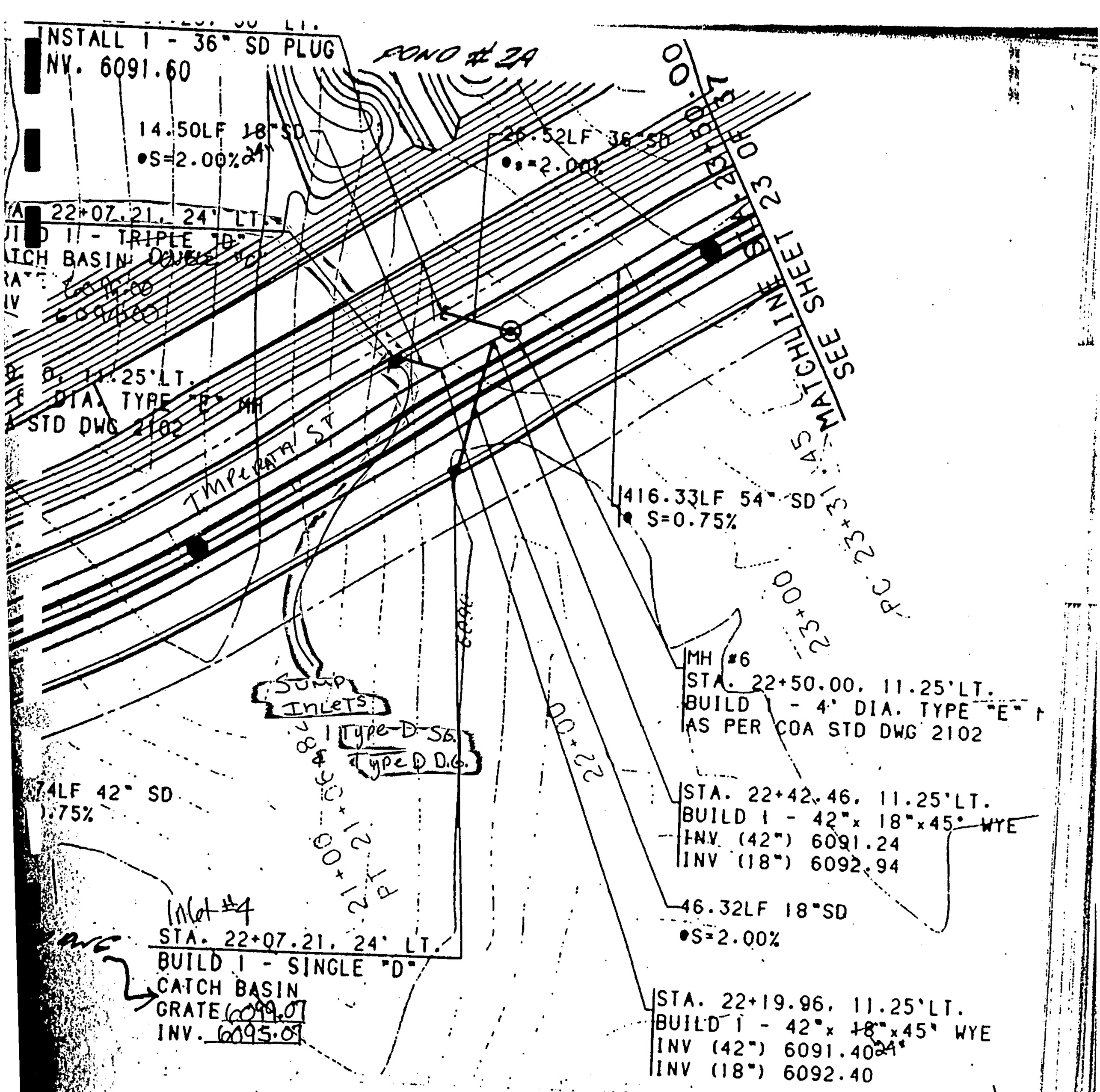
WSEL (FT)	DEPTH INC	FLOW AREA (SQ FT)	FLOW RATE (CFS)	WETTED PER (FT)	FLOW VEL (FPS)	TOP WID
0.05	0.1	0.0	0.0	0.9	0.8	0.8
0.1	0.1	0.1	0.1	1.7	1.3	1.6
0.15	0.2	0.2	0.3	3.4	1.5	3.3
0.2	0.2	0.4	0.7	6.0	1.7	5.8
0.25	0.3	0.8	1.6	8.5	2.0	8.3
0.3	0.3	1.3	2.9	11.1	2.3	10.8
0.35	0.4	1.9	4.9	13.6	2.6	13.3
0.4	0.4	2.6	7.6	16.2	2.9	15.8
0.45	0.5	3.4	11.1	18.7	3.2	18.4
0.5	0.5	4.4	15.5	21.3	3.5	20.9
0.55	0.6	5.6	20.6	24.6	3.7	24.1
Yn = 0.594		Q(RESIDUAL) =	27.6		V = 4.14	
0.6	0.6	6.8	28.5	24.7	4.2	24.1
0.65	0.7	8.0	37.3	24.8	4.7	24.2
Yn = 0.667		Q(100) =	40.6		V = 4.88	
0.67	0.7	8.5	41.1	24.8	4.9	24.2

PHASE I-A

STREET SECTION	AREA PER LF OF ROADWAY (SF)	LAND TREATMENT PERCENTAGES A	B	C	D	PEAK DISCHARGE PER ACRE A	B	C	D	PEAK DISCHARGE (CFS/LF)
A-A	91.00	0.00	32.42	0.00	67.58	2.20	2.92	3.73	5.25	0.009390
B-B	91.00	0.00	28.02	0.00	71.98	2.20	2.92	3.73	5.25	0.009604
C-C	71.00	0.00	35.22	0.00	64.78	2.20	2.92	3.73	5.25	0.007220
D-D	91.00	0.00	19.78	0.00	80.22	2.20	2.92	3.73	5.25	0.010005

PHASE I-B

STREET SECTION	AREA PER LF OF ROADWAY (SF)	LAND TREATMENT PERCENTAGES A	B	C	D	PEAK DISCHARGE PER ACRE A	B	C	D	PEAK DISCHARGE (CFS/LF)
A-A	91.00	0.00	32.42	0.00	67.58	2.20	2.92	3.73	5.25	0.009390
B-B	91.00	0.00	49.45	0.00	50.55	2.20	2.92	3.73	5.25	0.008561
C-C	71.00	0.00	35.22	0.00	64.78	2.20	2.92	3.73	5.25	0.007220
D-D	91.00	0.00	19.78	0.00	80.22	2.20	2.92	3.73	5.25	0.010005
E-E	91.00	0.00	41.21	0.00	58.79	2.20	2.92	3.73	5.25	0.008962


INSTALL 1 - 36" SD PLUG
INV. 6091.60
POND #24
14.50LF 18" SD
S=2.00%
22+07.21, 24' LT.
BUILD 1 - TRIPLE "D"
CATCH BASIN
TYPE "D" MH
STD DWG 2102
IMPERATA ST
416.33LF 54" SD
S=0.75%
MH #6
STA. 22+50.00, 11.25'LT.
BUILD 1 - 4' DIA. TYPE "E"
AS PER COA STD DWG 2102
SUMP INLETS
1 Type D S6.
& Type D D.G.
STA. 22+42.46, 11.25'LT.
BUILD 1 - 42" x 18" x 45° WYE
INV (42") 6091.24
INV (18") 6092.94
46.32LF 18" SD
S=2.00%
Inlet #4
STA. 22+07.21, 24' LT.
BUILD 1 - SINGLE "D"
CATCH BASIN
GRATE 6099.07
INV. 6095.07
STA. 22+19.96, 11.25'LT.
BUILD 1 - 42" x 18" x 45° WYE
INV (42") 6091.40
INV (18") 6092.40
IMPERATA STORM DRAIN Basin:
Inlets 4 and 5 Sta 16+12.75 - 24+23.46 Imperata
Q = 776.12 (.00722) = 2.37 Q_T = 2.37 + 27.6 = 30.00
BOHANNAN-HUSTON INC.
PROJECT NAME
SHEET 11 OF
PROJECT NO.
BY DATE
SUBJECT
CH'D

IMPERATA STORM DRAIN (SUMP INLETS)

STATION 22+07.21 (Low point in Imperata St.) TC = 6099.67

Inlet capacity for:

Orifice eq: $Q = CA(2gh)^{1/2}$

$C = 0.62$

Type D

		less 15%
Single Grate		
Std Curb = 18.56 cfs		15.78 cfs
Roll Curb = 13.03 cfs		11.07 cfs
Double Grate		
Std curb = 37.12 cfs		31.55 cfs — CAPACITY
Roll curb = 26.05 cfs		22.14 cfs

> 12.35 CFS OK

Type C

Single grate w/ opening =	26.22 cfs	22.29 cfs
Double grate w/ opening =	44.78 cfs	38.07 cfs

WEST SIDE

$Q_{100} = Q_R + 3.38 = 1.60 + 3.38 = 4.98$ cfs say 5.0 cfs

Inlet #4

Build 1 - Type D Single Grate (West side)

Sta 22+07.21 24.0' RT

use min dimension and check w/ orifice eq. 18" ϕ connect pipe

h = 0.32 does not act as orifice.

TOG = 6099.67

INV = 6095.67

EAST SIDE

Inlet #5

$Q_{100} = Q_R + 2.37 = 27.6 + 2.37 = 29.97$ say 30.0 cfs

Build 1 - Type C Double Grate (East side)

Sta 22+07.21 24.0' LT

try 5'0 depth and check w/ orifice eq. 24" ϕ connect pipe.

h = 3.69 5.0' - (3.69 + 1.0) = 0.31'

TOG = 6099.00 INV (24") = 6094.00

BOHANNAN-HUSTON INC.

PROJECT NAME _____ SHEET 12 OF _____

PROJECT NO. _____ BY _____ DATE _____

SUBJECT _____ CH'D _____ DATE _____

CITY OF ALBUQUERQUE

THREE HUNDRED YEARS
1706 • 2006
ALBUQUERQUE
Making History

February 4, 2005

Fred Arfman, PE
Isaacson & Arfman
128 Monroe NE
Albuquerque, NM 87108

Re: Dolan Residence @ Desert Mountain-High Desert Drainage Plan
Engineer's Stamp dated 1-27-05, (E23/D3H)

Dear Mr. Arfman,

Based upon the information provided in your submittal dated 1-28-05, the above referenced plan is approved for SO#19 Permit. Upon completion of the project, please obtain acceptance from Matt Cline at Storm Drain Maintenance section of the Department of Municipal Development and forward to me.

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

Sincerely,

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

C: Pam Lujan, Excavation and Barricading
Matt Cline, Storm Drain Maintenance
file

P.O. Box 1293
Albuquerque
New Mexico 87103
www.cabq.gov

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

June 21, 2001

Fred C. Arfman, P.E.
Isaacson & Arfman
128 Monroe NE
Albuquerque, New Mexico 87108

RE: **DESERT MOUNTAIN @ HIGH DESERT UNIT 2 (E-23/D3H)**
Engineers Certification For Release of Financial Guaranty
Engineers Stamp dated 3/14/2000
Engineer's Certification dated 6/14/2001

Dear Mr. Arfman:

Based upon the information provided in your submittal dated June 14, 2001, the above referenced plan is adequate to satisfy the Grading and Drainage Certification requirements for Release of Financial Guaranty.

If you have any questions, please call me at 924-3981.

Sincerely,

Teresa A. Martin
Hydrology Plan Checker
Public Works Department

C: Arlene Portillo, PWD – #608682
File

THE CITY OF ALBUQUERQUE IS AN EQUAL OPPORTUNITY/REASONABLE ACCOMMODATION EMPLOYER

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

April 17, 2000

Fred C. Arfman, P.E.
Isaacson & Arfman
128 Monroe Street NE
Albuquerque, New Mexico

RE: Revised Grading Plan for Unit Two, Desert Mountain at High Desert (E23/D3H) Submitted for Final Plat Approval, Engineer's Stamp Dated 3/14/00.

Dear Mr. Arfman:

Based on the information provided in the submittal of April 4, 2000, the above referenced plan is approved for Final Plat action.

As you are aware, the Grading plan that is approved by the DRB must be certified prior to release of the financial guarantees or the Subdivision Improvements Agreement. Therefore, the above referenced Grading plan will have no status until it is approved by the DRB.

If you have any questions, or if I may be of further assistance to you, please call me at 924-3982.

Sincerely,

Susan Calongne

Susan M. Calongne, P.E.
City/County Floodplain Administrator

c: Robert Lupton, Sivage Thomas Homes
File

THE CITY OF ALBUQUERQUE IS AN EQUAL OPPORTUNITY/REASONABLE ACCOMMODATION EMPLOYER

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

February 15, 1996

Bruce Stidworthy
Bohannan Huston, Inc.
7500 Jefferson NE
Albuquerque, NM 87109

RE: DRAINAGE REPORT FOR IMPERATA SWALE REGRADING (E-23/D3H)
RECEIVED JANUARY 23, 1996 FOR GRADING PERMIT
ENGINEER'S STAMP DATED 1/23/96

Dear Mr. Stidworthy:

Based on the information included in the submittal referenced above, City Hydrology accepts the drainage report and grants a Grading Permit.

Engineer's Certification of grading & drainage per DPM Checklist is required when the grading is completed.

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

Sincerely,

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

c: Andrew Garcia
Larry Caudill, Environmental Health

THE CITY OF ALBUQUERQUE IS AN EQUAL OPPORTUNITY/REASONABLE ACCOMMODATION EMPLOYER

DRAINAGE REPORT
FOR
REGRADING OF THE IMPERATA SWALE

JANUARY 1996

Prepared by:

BOHANNAN-HUSTON INC.
COURTYARD I, 7500 JEFFERSON STREET N.E.
ALBUQUERQUE, NM 97109

Prepared for:

HIGH DESERT INVESTMENT CORP.
13000 ACADEMY ROAD NE
ALBUQUERQUE, NM 87111

PREPARED BY:

Bruce Stidworthy 1/23/96
Bruce Stidworthy, E.I. Date

UNDER THE SUPERVISION OF:

James R. Topmiller 1/23/96
James Topmiller, P.E. Date

JAMES R. TOPMILLER
NEW MEXICO
9354
REGISTERED PROFESSIONAL ENGINEER

I. PURPOSE

The purpose of this report is obtain permission from City Hydrology for the partial filling of the Imperata Swale. In order to receive the above permission, this report presents historic and current drainage conditions for the drainage swale adjacent to Imperata Street in the High Desert Subdivision.

II. METHODOLOGIES AND BACKGROUND

Site conditions are analyzed for a 100-year, 6-hour storm event in accordance with the City of Albuquerque Drainage Ordinance and the Development Process Manual (DPM) Volume 2, Section 22.2, Hydrology, dated January 1993. The latest version of AHYMO was utilized to model the current drainage conditions for the swale.

The existing swale adjacent to Imperata Street, hereafter referred to as "the Imperata Swale", was approved by City Hydrology through the *Final High Desert Phase I Hydrology & Design Drainage Report*, dated March 1994, and prepared by Bohannan-Huston Inc. The swale was constructed with High Desert Subdivision Phase 1-B, City Project # 4809.91.

The swale was originally designed and constructed to receive flows from Basins 1, 2, 4, 5, & 6 of the *Final High Desert Phase I Hydrology & Design Drainage Report*, and direct them to the Spain Road storm drain. The construction of the Phase 1-B-1, Academy Storm Drain facilities intercepted the flows from Basin 1 and a majority of Basin 2. Those facilities were approved through the *Final High Desert Subdivision Academy Storm Drain Design Report*, dated September 1994. Due to the construction of the above mentioned upstream drainage facilities, the peak flow entering the Imperata Swale has significantly decreased. Therefore, a corresponding decrease in the capacity of the swale is proposed with this report. It is proposed that this reduction in capacity be achieved by filling the bottom 2 to 5 feet of the swale.

III. SITE LOCATION AND CHARACTERISTICS

The Imperata Swale is located along the east side of Imperata Street in the High Desert Subdivision. The swale runs from north to south, between the South Bear Tributary and Spain Road. The swale is unlined, and has soil cement drop structures for erosion control. Nominally, the dimensions of the existing swale are as follows; 5' deep, 20' wide at the base, with 3:1 side slopes on both sides.

No significant vegetation exists in the swale itself. Vegetation in the area surrounding the swale consists primarily of prairie grasses and a few juniper trees.

IV. HYDROLOGIC CONDITIONS PRIOR TO THE CONSTRUCTION OF UPSTREAM DRAINAGE FACILITIES

The approved *Final High Desert Phase I Hydrology & Design Drainage Report* thoroughly explains the hydrologic conditions relative to the Imperata Swale, which existed prior to the construction of the South Bear Tributary Arroyo Pond (which was constructed with the Academy Storm Drain - Phase 1-B-1). Summary maps and tables from that report have been included in the appendix for reference.

V. CURRENT HYDROLOGIC CONDITIONS

Please refer to the Current Drainage Conditions Summary Map enclosed in the appendix of this report.

Due to the construction of the South Bear Tributary Pond, flow from that arroyo to the Imperata Swale has been reduced from 370 cfs to 13.7 cfs. The remaining arroyos and basins which contribute to the Imperata Swale remain unchanged.

VI. PROPOSED REGRADING

Please see the enclosed grading plan in the appendix of this report.

This report proposes to reduce the capacity of the Imperata Swale, to more closely correspond to the current flows. The simplest and most logical way to reduce the capacity of the swale is to reduce the depth of the swale by filling the bottom. A summary table showing amount of fill, slope, flow depth, velocity, freeboard, and other pertinent data for various points along the swale has been included with this report. As the summary table shows, the flow velocity along the majority of the swale is below 3.0 fps, and is therefore non-erosive. However, in order to help prevent excessive sediment from being washed into the storm drain at the end of the swale, no fill has been placed over the final two drop structures prior to the storm drain inlet. This is graphically illustrated in the "Profile Graph" included in the appendix.

VII. CONCLUSION

This report has presented a comprehensive explanation of prior, as well as current, drainage conditions relative to the Imperata Swale. The plan provides safe and adequate drainage protection for future and current downstream development. It is recommended that this plan be approved as presented.

Summary Table
of Grading and Hydraulic Information

Location (by Imp. Stationing)	Dist Betwn (along swale)	Elev. @ PL	Old Inv. @ Drop Struct. Top	Old Inv. @ Drop Struct. Bottom	Fill (1) depth (FT.)	Bottom width (FT.)	New Inv.	New Slope	Flowrate (CFS)	Depth (FT.)	Velocity (FPS)	Freeboard (FT.)	Req'd (3) freebd. (FT.)
1088		115.69	109.50	107.50	3.50	41.00	113.00		27.3 13.7			2.69 (ok)	
1230	150	112.20	107.18	105.18	3.42	40.52	110.60	1.60%	27.3	0.26	2.5	1.34 (ok)	1.04
1400	180.09	109.74	104.75	102.75	2.97	37.81	107.72	1.60%	27.3	0.27	2.6	1.75 (ok)	1.04
1590	190	107.26	102.28	100.28	2.40	34.39	104.68	1.60%	27.3	0.29	2.7	2.29 (ok)	1.04
1775	185	104.82	99.80	97.80	1.92	31.51	101.72	1.60%	27.3	0.3	2.8	2.80 (ok)	1.05
1875	85.99	102.60	97.60	95.60	2.74	36.46	100.34	1.60%	27.3	0.28	2.6	1.98 (ok)	1.04
2100 (2)	193.5	100.20	95.00	95.00	3.37	40.21	98.37	1.02%	44.9	0.4	2.7	1.43 (ok)	1.05
2210 (2)	110	99.79	94.73	94.73	2.52	35.09	97.25	1.02%	44.9	0.44	2.8	2.10 (ok)	1.05
2500	318	101.40	94.00	92.00	0.00	32.00	94.00	1.02%	98.9	0.74	3.9	6.66 (ok)	1.09

As shown on the profile grades graph, no fill is proposed beyond Imperata Station 2500.

(1) For stations with drop stuctures, this is the fill depth measured from the top of the drop stucture.

(2) These two stations do not have drop structures, they are provided in the table simply for information.

(3) Req'd Freeboard was calculated based on the freeboard eqn. given in the DPM Sec. 22.3, 1+.025*V*d^.3333

0 DESCRIPTION	HYDROGRAPH LABEL	FROM ID NO	TO ID NO	AREA SQ MI	DISCHARGE CFS	CURVE NO	TIME TO PEAK HR	CFS PER ACRE
HYDROGRAPH AT	NMBA1B (2)	4	-	0.0085	13.7	NA	1.50	2.50
ROUTED		4	5					
	NMBA1B (2)	4		0.0085	13.7		1.50	
	RAP1	5		0.0085	8.7		1.60	
HYDROGRAPH AT	NMBA2A (4)	1	-	0.0130	20.3	NA	1.50	2.44
COMBINED FLOW AT	AP1A	5& 1	2	0.0215	27.3		1.53	
ROUTED		2	3					
	AP1A	2		0.0215	27.3		1.53	
	RAP1A	3		0.0215	26.1		1.57	
HYDROGRAPH AT	NMBA2B (5)	4	-	0.0130	20.3	NA	1.50	2.44
COMBINED FLOW AT	AP2	3& 4	2	0.0345	44.9		1.53	
ROUTED		2	3					
	AP2	2		0.0345	44.9		1.53	
	RAP2	3		0.0345	40.5		1.60	
HYDROGRAPH AT	NMBA2C (6)	6	-	0.0410	63.9	NA	1.50	2.44
COMBINED FLOW AT	AP2A	3& 6	7	0.0755	98.9		1.53	
HYDROGRAPH AT	NMBA1C (3)	8	-	0.0720	85.4	NA	1.57	1.85
COMBINED FLOW AT	AP3	7& 8	9	0.1475	183.5		1.57	
RESERVOIR HYD	POND3OUT	9	14	0.1475	177.6		1.60	

(#) - BASIN NUMBERS AS SHOWN ON THE PHASE I DRAINAGE REPORT, PLATE 1 (SUMMARY MAP)

E23 / D003 H

TERMINATION OF REVOCABLE PERMIT

THIS TERMINATION OF REVOCABLE PERMIT is made and entered into as of the 12th day of November, 2002, by the City of Albuquerque, (the "City").

WHEREAS, the City of Albuquerque, as Grantor, entered into a Revocable Permit, (the "Permit") with Sivage-Thomas Homes, Inc., a New Mexico corporation, as Permittee, which Permit was recorded December 17, 1999, in the office of the County Clerk of Bernalillo County, New Mexico, in Book 9916, Page 3748; as Document No. 1999154229; and

WHEREAS, the City of Albuquerque has determined that the Permit is no longer required.

THEREFORE, City of Albuquerque, terminates the Permit and hereby releases and discharges the property described in the Permit:

IN WITNESS WHEREOF, the undersigned has executed this Termination of Revocable Permit as of the day and year first above written.

CITY OF ALBUQUERQUE
a municipal corporation

By: _____ 11/5/02
City Engineer

11-12-02
Dated

KJC 11/14/02

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

This instrument was acknowledged before me on November 12, 2002, by Fred J. Aguirre for the City of Albuquerque, a New Mexico municipal corporation on behalf of said corporation.

Gloria D. Saavedra
Notary Public

My Commission Expires:

11-15-2003

Agrekjc/term&Release ofRevocable Permit SivageThomas

Mary Herrera Bern. Co. TERM R 9.00

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Page: 1 of 1
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Bk-A44 Pg-7485

#608681

REVOCABLE PERMIT

THIS REVOCABLE PERMIT, made and entered into this 17th day of December, 1999, by and between the City of Albuquerque, New Mexico, a municipal corporation (hereinafter referred to as the "City") as grantor and Sivage-Thomas Homes, Inc. (hereinafter referred to as the "Permittee") as permittee.

WITNESSETH, that in consideration of the mutual obligations and covenants herein, the parties hereto do mutually agree as follows:

1. Permit. Subject to the terms and conditions of this Permit, the City grants Permittee the right to construct, install, operate, maintain, replace and remove a Poolside Pavilion (hereinafter referred to as the "Facility") within the public rights-of-way* at the following locations, as more particularly shown on the drawing which is attached hereto as Exhibit A and made a part of this Permit:

20' public storm drain easement adjacent to Goldfield Place NE and contained within Tract A (Private Community Recreational Area) as found on the plat of Desert Mountain at High Desert, Unit One (5/4/99, Vol. 99C, Page 106)

(hereinafter referred to as the "Location")

2. Use. The Permittee shall use the Location solely for Private Pool Amenity within Desert Mountian at High Desert and will not use it for any other purpose whatsoever without first obtaining the written consent of the City.

3. Compensation. As compensation for this Permit, the Permittee shall pay the City the sum of One Hundred and No/100---------- Dollars ($ 100.00) as a one time administration fee.

The One time administration Fee shall be paid to the City upon execution of this Permit.

4. Term, Termination and Removal. This Permit will remain in effect for a period of Ten (10) years from the date of execution of this Permit (hereinafter referred to as the "Term"), unless terminated and revoked as a result of:

a. The Permittee's breach of any provision of or default in the performance of any obligation pursuant to this Permit. If Permittee breaches any of the provisions hereof or is in default in the performance of any obligation imposed hereunder, the City may give thirty (30) days written notice (the "Notice Period") to the Permittee of the termination of this Permit. If the Permittee remains in default or the breach of any provision hereof remains incurred at the end of the Notice Period, this

*In this agreement, the term "public rights-of-way" does not mean property owned in fee by the City but means a public storm drainage easement.

1999127677 5315626 Page: 1 of 7 12/17/1999 11:43A Bk-9916 Pg-3748 R 19.00 Judy D. Woodward Bern. Co. REVO

Permit shall terminate; or

b. The City's giving the Permittee written notice ninety (90) days in advance of termination; or

c. The Permittee's giving the City written notice ninety (90) days in advance of termination; or

d. An order of a court of competent jurisdiction.

Upon termination of this Permit and any renewal hereof, the Permittee shall abandon the use of the Facility, and shall remove the Facility and restore the right-of-way as nearly as possible to the condition it was in prior to removal, all at the sole expense of the Permittee.

If, after termination and within thirty (30) days after being directed to do so by the City, the Permittee fails to remove the Facility and restore the right-of-way, the City may perform the work and the Permittee shall reimburse the City within thirty (30) days after the City submits a bill to the Permittee for the costs of such work.

Termination of this Permit for any reason shall not release the Permittee from any liability or obligation relating to the installation, operation, maintenance or removal of the Facility or any other term of this Permit.

5. Renewal of Permit. If both the City and the Permittee wish to extend the Term of this Permit, then, before the expiration of the Term, the City and the Permittee shall enter into good faith negotiations, the object of which will be to agree upon the terms of a renewal of this Permit. The agreement of the City shall not be withheld unreasonably. If an agreement is reached, all terms, including the agreed-upon consideration, shall be reduced to a writing signed by both parties.

6. Location, Installation, Maintenance and Removal. At its own expense, the Permittee shall install and construct the Facility of such material, and in a manner that will not at any time be a source of danger to, or interfere with the City's present or future use of the right-of-way, or the use of the right-of-way by any utility presently franchised by the City, or interfere with its use as a public way. If during installation it becomes evident that the Permittee's proposed installation will interfere with existing City installations or any existing underground installations, then the Permittee shall modify its installation at the Location to avoid the conflict, after obtaining the City's approval for the change, at the sole expense of the Permittee. All permits required by the City for work within the right-of-way will be the responsibility of the Permittee's contractor.

After installation of the Facility, the Permittee shall back-fill, compact, repair and repave all resulting trenches, curbs, gutters and pavement to the satisfaction of the City, restoring them to as close to their original condition as is reasonably possible.

If, in the judgement of the City, the Permittee at any time fails to perform its obligations under this section, the City, at the City's option, may perform whatever work the City deems necessary for the public safety, health and welfare, and the Permittee shall reimburse the City within thirty (30) days after the City submits a bill to the Permittee for the costs of performing such work. However, the City is not required to perform such work, and any failure by the City to perform the Permittee obligations shall not release the Permittee from liability for any loss or damage caused by the Permittee's failure to perform its obligations.

Installation, maintenance and removal of the Facility shall be accomplished in a manner which will not unreasonably impede traffic adjacent to the Location or impede its use as a public way, as determined by the City. The timing and manner of such construction, maintenance and removal shall be done in compliance with the City's requirements.

If the facility or any part thereof is the cause of an emergency condition, and the City determines that the situation makes it unreasonable to notify the Permittee or await action by the Permittee, the City may take whatever actions it deems necessary to remedy the emergency situation at the sole expense of the Permittee, which will reimburse the City within thirty (30) days after the City submits a bill to the Permittee for the costs of such actions.

7. As-Builts. Upon completion of the construction and installation of the Facility, the Permittee shall promptly provide the City with one set of reproducible as-built, record drawings, reflecting construction and installation as actually accomplished.

8. Insurance. During the Term of this Permit, including renewals, if any, the Permittee shall obtain and maintain liability insurance in an amount of not less than $1,000,000 combined single limit for accidents or occurrences which cause bodily injury, death or property damage to any member of the public caused by or related to the construction, installation, operation, maintenance, replacement, removal or other activity related to the Facility. The insurance policy shall name the City of Albuquerque, its employees and elected officials, as their interest may appear, as additional insured. Any cancellation provision must provide that if the policy is cancelled prior to the expiration date of the Permit, materially changed or not renewed, the issuing company will mail thirty (30) days written notice to the City, Attention: Risk Management. A certificate of insurance in compliance

with the above must be furnished to the City with the execution of this Permit and prior to commencement of construction.

9. Indemnity/Liability. At all times the Permittee shall defend, indemnify and save harmless the City, its officers, agents and employees against all claims, demands, damages and causes of action which results from or arises out of the construction, installation, operation, maintenance, replacement or removal of the Facility including any loss, damage or expense arising out of loss of or damage to property, injury to or death of persons, or mechanics' or other liens of any character, or taxes or assessments of any kind, except to the extent or degree that the City itself is found contributorily negligent. To the extent, if at all, Section 56-7-1 NMSA 1978 is applicable to this Agreement, this Agreement to indemnify will not extend to liability, claims, damages, losses or expenses, including attorney's fees, arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs or specifications by the indemnitee, or the agents or employees of the indemnitee; or (2) the giving of or the failure to give direction or instructions by the indemnitee, where such giving or failure to give directions or instructions is the primary cause of bodily injury to persons or damage to property. The indemnification required hereunder shall not be limited as a result of the specifications of any applicable insurance coverage. Nothing herein is intended to impair any right or immunity under the laws of the State of New Mexico.

Judy D. Woodward Bern. Co. REVO R 19.00 Bk-9916 Pg-3748 12/17/1999 11:43A Page: 4 of 7 5315626

10. Entire Agreement. This Permit contains the entire agreement of the parties regarding the Facility and supersedes any and all other agreements or understandings, oral or written, whether previous to the execution hereof or contemporaneous herewith.

11. Changes. Changes to this Permit are not binding unless made in writing, signed by both parties.

12. Captions. The captions to the sections or paragraphs of this Permit are not part of this Permit and will not affect the meaning or construction of any of its provision.

13. Binding Effect. This Permit is binding upon and inures to the benefit of the successors and/or assigns of the parties.

14. Compliance with Laws. The Permittee and its contractors shall comply with all federal, state and local laws, ordinances, regulations and rules and will not discriminate illegally against any person. The Permittee's attention is specifically drawn to 62-14-1 et seq. NASA, (1978 Comp., 1984 Repl. Pamphlet) regarding excavation damage to pipelines and underground utility lines.

15. Applicable Law. This Permit is governed by and construed and enforced in accordance with the laws of the State of New Mexico.

16. Construction and Severability. If any part of this Permit is held to be invalid or unenforceable, the remainder of this Permit will remain valid and enforceable if the remainder of the Permit is reasonably capable of completion.

17. Assignment. The Permittee shall not assign any interest in this Agreement and shall not transfer any interest in this Agreement (whether by assignment or novation).

18. Notice. For purposes of giving formal written notice to the Permittee, the Permittee's address is:

Sivage-Thomas Homes, Inc.
7445 Pan American, NE
Albuquerque, Nwe Mexico 87109
Phone No. 821-5511

For purposes of giving formal, written notice of the City, the City's address is:

Mayor
City of Albuquerque
P.O. Box 1293
Albuquerque, New Mexico 87103

Copies of any notices to the City must also be given to:

Director, Public Works Department
City of Albuquerque
P.O. Box 1293
Albuquerque, New Mexico 87103

Written notice must be made either personally or by certified United States Mail. If the notice is mailed, the notice will be complete when deposited in the United State Mail, postage paid, and addressed as required in this Section. Notice of change of address will be given in the same manner as required by this section.

19. Approval Required. This Permit Agreement shall not become effective or binding until approved by the City's Public Works Department Director.

Judy D. Woodward Bern. Co. REVO R 19.00
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Bk-9916 Pg-3748

IN WITNESS WHEREOF, the City and the Permittee have executed this Permit Agreement the day and year first above written.

CITY OF ALBUQUERQUE

Approved By:

Director, Public Works Dept.

Date: 12-17-99

City Engineer 12/17/99

Permittee: Sivage-Thomas Homes, Inc.

By:

Title: Division President

12/17/99

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Bk-9916 Pg-3748
Judy D. Woodward Bern. Co. REVO R 19.00

CITY'S NOTARY

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

This instrument was acknowledged before me on 17th day of December, 1999, by ~~Robert E. Gurule~~ for Larry A. Blair, Director, Public Works Department of the City of Albuquerque, a municipal corporation on behalf of said corporation.

Gloria D. Saavedra
Notary Public

My Commission Expires:
11-15-2003

PERMITTEE'S NOTARY

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

This instrument was acknowledged before me on 16th day of December, 1999, by Vincent Pizzonia, President of Sivage-Thomas Homes, Inc., a New Mexico Corporation on behalf of said Sivage-Thomas Homes, Inc.

Debra E. Whitlock
Notary Public

My Commission Expires:

OFFICIAL SEAL
DEBRA E. WHITLOCK
NOTARY PUBLIC
STATE OF NEW MEXICO
My Commission Expires 10-29-03

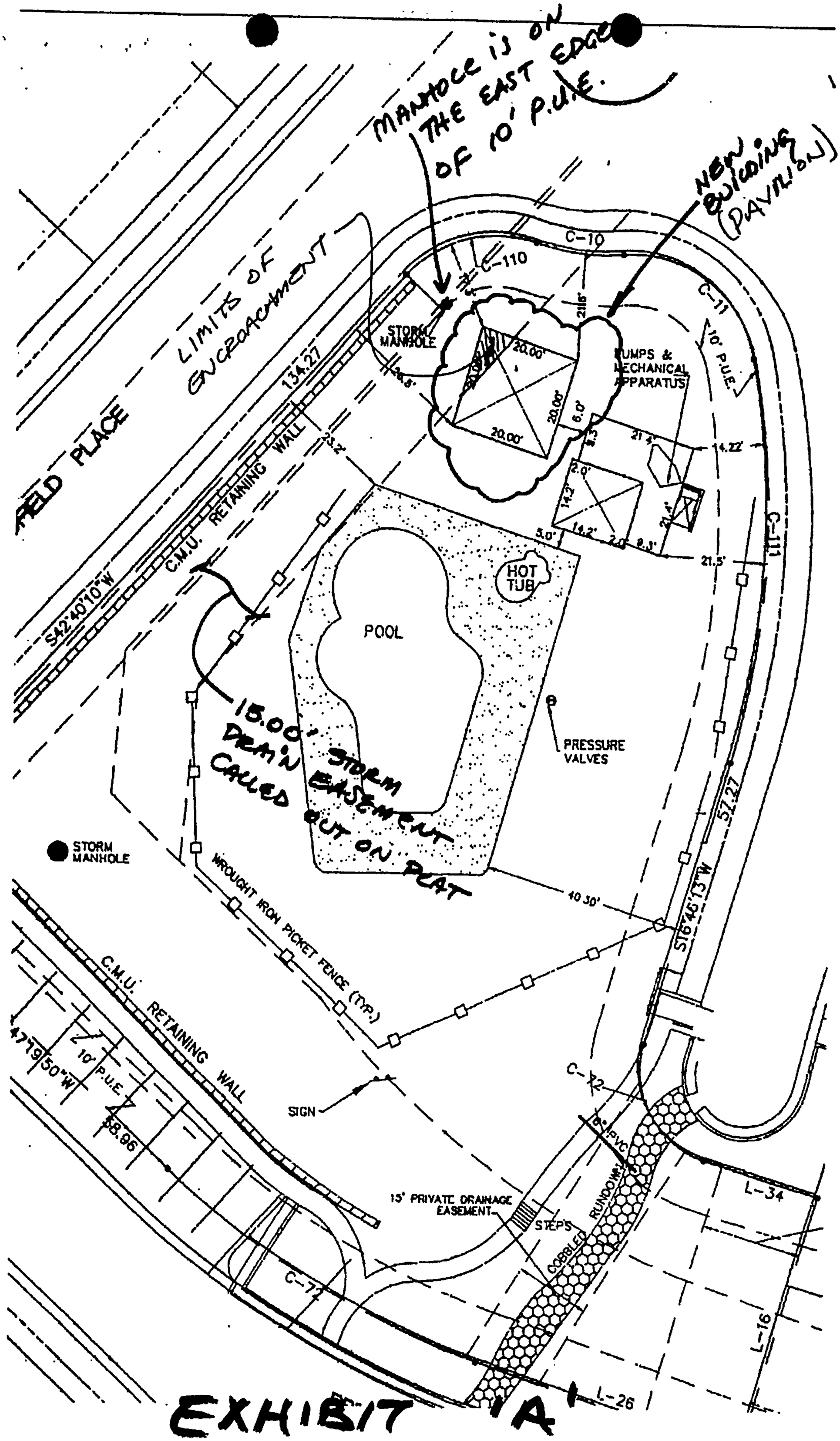

EXHIBIT "A"

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R 19.00
REVO
Judy D. Hoodward Bern. Co.

ADDENDUM TO COVER PAGE

6/22/01
(Date)

TO: Kevin Curran, Assistant City Attorney, Legal Department

FROM: Project Administrator, Project Review Sec., PWD

SUBJECT: PROJECT TITLE: La Vida Nueva Subd PROJECT # 615181

The attached documents have been review, approved, initialed and/or signed by the DRC Chairman and are submitted for your action as noted.

6/22/01

ITEM	ACTION: Review & Approval	ACTION: Reference	Comments
Procedure "A"	☐☐☐	☐☐	
Procedure "B"	☐☐☐	☐☐	
Procedure "B" Modified Non Work Order	☐☐☐	☐☐	
Procedure "C"	☐☐☐	☐☐	
Procedure "C" Modified	☐☐☐	☐☐	
Special Agreement	☐☐☐	☐☐	
Sidewalk Deferral Agreement	☐☐☐	☐☐	
Amendment	☐☐☐	☐☐	
Assignment	☐☐☐	☐☐	
Financial Guarantee	☐☐☐	☐☐	
Construction Paperwork:			
Contractors Proposal	☐☐☐	☐☐	
Performance/Warranty Bonds	☐☐☐	☐☐	
Labor/Material Bonds	☐☐☐	☐☐	
Certificate of Insurance	☐☐☐	☐☐	
Engineers Cost Estimate	☐☐☐	☐☐	
Extension	☐☐☐	☐☐	
Release/Agreement	☐☐☐	☐☐	
Release/Financial Guarantee	☑☐☐	☑☐	
Calling Notice	☐☐☐	☐☐	
Letter of Commitment	☐☐☐	☐☐	
Reduction Letter	☐☐☐	☐☐	
License Agreement	☐☐☐	☐☐	
Monitoring Well Permit	☐☐☐	☐☐	
Agreement & Covenant	☐☐☐	☐☐	
Drainage Covenant	☐☐☐	☐☐	
Revocable Permit	☐☐☐	☐☐	
Encroachment	☐☐☐	☐☐	
Permanent Easement	☐☐☐	☐☐	
Temporary Easement	☐☐☐	☐☐	

Other:

Please Call Kathy at 3996 if you have any questions regarding the above or when the documents are ready to be picked up.

No. of Attachments (3)

1900

E23/D003H

#608681

REVOCABLE PERMIT

THIS REVOCABLE PERMIT, made and entered into this 12th day of February, 2002, by and between the City of Albuquerque, New Mexico, a municipal corporation (hereinafter referred to as the "City") as grantor and High Desert Residential Owners Association, Inc. a New Mexico non profit corporation (hereinafter referred to as the "Permittee") as permittee.

WITNESSETH, that in consideration of the mutual obligations and covenants herein, the parties hereto do mutually agree as follows:

1. Permit. Subject to the terms and conditions of this Permit, the City grants Permittee the right to construct, install, operate, maintain, replace and remove a Poolside Pavilion (hereinafter referred to as the "Facility") within the public rights-of-way at the following locations, as more particularly shown on the drawing which is attached hereto as Exhibit A and made a part of this Permit:

> 20' public storm drain easement adjacent to Goldfield Place NE and contained within Tract A (Private Community Recreational Area) as found on the plat of Desert Mountain at High Desert, Unit One (5/4/99, Vol. 99C, Page 106)
> (hereinafter referred to as the "Location")

2. Use. The Permittee shall use the Location solely for Private Pool Amenity within Desert Mountain at High Desert and will not use it for any other purpose whatsoever without first obtaining the written consent of the City.

3. Compensation. As compensation for this Permit, the Permittee shall pay the City the sum of One Hundred and No/100---------- Dollars ($ 100.00) as a one time administration fee.

The One time administration Fee shall be paid to the City upon execution of this Permit.

4. Term, Termination and Removal. This Permit will remain in effect perpetually from the date of execution of this Permit (hereinafter referred to as the "Term"), unless terminated and revoked as a result of:

a. The Permittee's breach of any provision of or default in the performance of any obligation pursuant to this Permit. If Permittee breaches any of the provisions hereof or is in default in the performance of any obligation imposed hereunder, the City may give thirty (30) days written notice (the "Notice Period") to the Permittee of the termination of this Permit. If the Permittee remains in default or the breach of any provision hereof remains incurred at the end of the Notice Period, this Permit shall terminate; or

b. The City's giving the Permittee written notice one hundred twenty (120) days in advance of termination; or

Mary Herrera Bern. Co. AGRE R 19.00
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c. The Permittee's giving the City written notice one hundred twenty (120) days in advance of termination; or

d. An order of a court of competent jurisdiction.

Upon termination of this Permit and any renewal hereof, the Permittee shall abandon the use of the Facility, and shall remove the Facility and restore the right-of-way as nearly as possible to the condition it was in prior to removal, all at the sole expense of the Permittee.

If, after termination and within thirty (30) days after being directed to do so by the City, the Permittee fails to remove the Facility and restore the right-of-way, the City may perform the work and the Permittee shall reimburse the City within thirty (30) days after the City submits a bill to the Permittee for the costs of such work.

Termination of this Permit for any reason shall not release the Permittee from any liability or obligation relating to the installation, operation, maintenance or removal of the Facility or any other term of this Permit.

5. Renewal of Permit. If both the City and the Permittee wish to extend the Term of this Permit, then, before the expiration of the Term, the City and the Permittee shall enter into good faith negotiations, the object of which will be to agree upon the terms of a renewal of this Permit. The agreement of the City shall not be withheld unreasonably. If an agreement is reached, all terms, including the agreed-upon consideration, shall be reduced to a writing signed by both parties.

6. Location, Installation, Maintenance and Removal. At its own expense, the Permittee shall install and construct the Facility of such material, and in a manner that will not at any time be a source of danger to, or interfere with the City's present or future use of the right-of-way, or the use of the right-of-way by any utility presently franchised by the City, or interfere with its use as a public way. If during installation it becomes evident that the Permittee's proposed installation will interfere with existing City installations or any existing underground installations, then the Permittee shall modify its installation at the Location to avoid the conflict, after obtaining the City's approval for the change, at the sole expense of the Permittee. All permits required by the City for work within the right-of-way will be the responsibility of the Permittee's contractor.

After installation of the Facility, the Permittee shall back-fill, compact, repair and repave all resulting trenches, curbs, gutters and pavement to the satisfaction of the City, restoring them to as close to their original condition as is reasonably possible.

If, in the judgement of the City, the Permittee at any time fails to perform its obligations under this section, the City, at the City's option, may perform whatever work the City deems necessary for the public safety, health and welfare, and the Permittee shall reimburse the City within thirty (30) days after the City submits a bill to the Permittee for the costs of performing such work. However, the City is

not required to perform such work, and any failure by the City to perform the Permittee obligations shall not release the Permittee from liability for any loss or damage caused by the Permittee's failure to perform its obligations.

Installation, maintenance and removal of the Facility shall be accomplished in a manner which will not unreasonably impede traffic adjacent to the Location or impede its use as a public way, as determined by the City. The timing and manner of such construction, maintenance and removal shall be done in compliance with the City's requirements.

If the facility or any part thereof is the cause of an emergency condition, and the City determines that the situation makes it unreasonable to notify the Permittee or await action by the Permittee, the City may take whatever actions it deems necessary to remedy the emergency situation at the sole expense of the Permittee, which will reimburse the City within thirty (30) days after the City submits a bill to the Permittee for the costs of such actions.

7. As-Builts. Upon completion of the construction and installation of the Facility, the Permittee shall promptly provide the City with one set of reproducible as-built, record drawings, reflecting construction and installation as actually accomplished.

8. Insurance. During the Term of this Permit, including renewals, if any, the Permittee shall obtain and maintain liability insurance in an amount of not less than $1,000,000 combined single limit for accidents or occurrences which cause bodily injury, death or property damage to any member of the public caused by or related to the construction, installation, operation, maintenance, replacement, removal or other activity related to the Facility. The insurance policy shall name the City of Albuquerque, its employees and elected officials, as their interest may appear, as additional insured. Any cancellation provision must provide that if the policy is canceled prior to the expiration date of the Permit, materially changed or not renewed, the issuing company will mail thirty (30) days written notice to the City, Attention: Risk Management. A certificate of insurance in compliance with the above must be furnished to the City with the execution of this Permit and prior to commencement of construction.

9. Indemnity/Liability. At all times the Permittee shall defend, indemnify and save harmless the City, its officers, agents and employees against all claims, demands, damages and causes of action which results from or arises out of the construction, installation, operation, maintenance, replacement or removal of the Facility including any loss, damage or expense arising out of loss of or damage to property, injury to or death of persons, or mechanics' or other liens of any character, or taxes or assessments of any kind, except to the extent or degree that the City itself is found contributorily negligent. To the extent, if at all, Section 56-7-1 NMSA 1978 is applicable to this Agreement, this Agreement to indemnify will not extend to liability, claims, damages, losses or expenses, including attorney's fees, arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs or specifications by the indemnitee, or the agents or employees of the indemnitee; or (2) the giving of or the failure to give direction

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Mary Herrera Bern. Co. AGRE R 19.00

or instructions by the indemnitee, where such giving or failure to give directions or instructions is the primary cause of bodily injury to persons or damage to property. The indemnification required hereunder shall not be limited as a result of the specifications of any applicable insurance coverage. Nothing herein is intended to impair any right or immunity under the laws of the State of New Mexico.

10. Entire Agreement. This Permit contains the entire agreement of the parties regarding the Facility and supersedes any and all other agreements or understandings, oral or written, whether previous to the execution hereof or contemporaneous herewith.

11. Changes. Changes to this Permit are not binding unless made in writing, signed by both parties.

12. Captions. The captions to the sections or paragraphs of this Permit are not part of this Permit and will not affect the meaning or construction of any of its provision.

13. Binding Effect. This Permit is binding upon and inures to the benefit of the successors and/or assigns of the parties.

14. Compliance with Laws. The Permittee and its contractors shall comply with all federal, state and local laws, ordinances, regulations and rules and will not discriminate illegally against any person. The Permittee's attention is specifically drawn to 62-14-1 et seq. NASA, (1978 Comp., 1984 Repl. Pamphlet) regarding excavation damage to pipelines and underground utility lines.

15. Applicable Law. This Permit is governed by and construed and enforced in accordance with the laws of the State of New Mexico.

16. Construction and Severability. If any part of this Permit is held to be invalid or unenforceable, the remainder of this Permit will remain valid and enforceable if the remainder of the Permit is reasonably capable of completion.

17. Assignment. The Permittee shall not assign any interest in this Agreement and shall not transfer any interest in this Agreement (whether by assignment or novation).

18. Notice. For purposes of giving formal written notice to the Permittee, the Permittee's address is:

High Desert Residential Owner s Association
13000 Academy Road NE
Albuquerque, NM 87111
Phone No. 505-823-9360
Attention: President

For purposes of giving formal, written notice of the City, the City's address is:

Mayor
City of Albuquerque
P.O. Box 1293
Albuquerque, New Mexico 87103

Copies of any notices to the City must also be given to:

Director, Public Works Department
City of Albuquerque
P.O. Box 1293
Albuquerque, New Mexico 87103

Written notice must be made either personally or by certified United States Mail. If the notice is mailed, the notice will be complete when deposited in the United State Mail, postage paid, and addressed as required in this Section. Notice of change of address will be given in the same manner as required by this section.

19. Approval Required. This Permit Agreement shall not become effective or binding until approved by the City Engineer.

IN WITNESS WHEREOF, the City and the Permittee have executed this Permit Agreement the day and year first above written.

CITY OF ALBUQUERQUE

Approved By:

City Engineer
Public Works Department
Date: 2-12-02

2/12/02 2/12/02

Permittee: High Desert Residential Owner s Association, Inc.

Name: Jack Eichorn
Title: President

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Mary Herrera

CITY'S NOTARY

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

This instrument was acknowledged before me on 12th day of February, 2002, by Fred J. Aguirre, City Engineer, Public Works Department of the City of Albuquerque, a municipal corporation on behalf of said corporation.

Gloria D. Saavedra
Notary Public

My Commission Expires: 11-15-2003

PERMITTEE'S NOTARY

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

This instrument was acknowledged before me on 7 day of JANUARY, 2002, by JACK EICHORN, PRESIDENT of HIGH DESERT RESIDENTIAL, a New Mexico CORPORATION on behalf of said CORPORATION.

Notary Public
Linda Smith

My Commission Expires:
8/14/02

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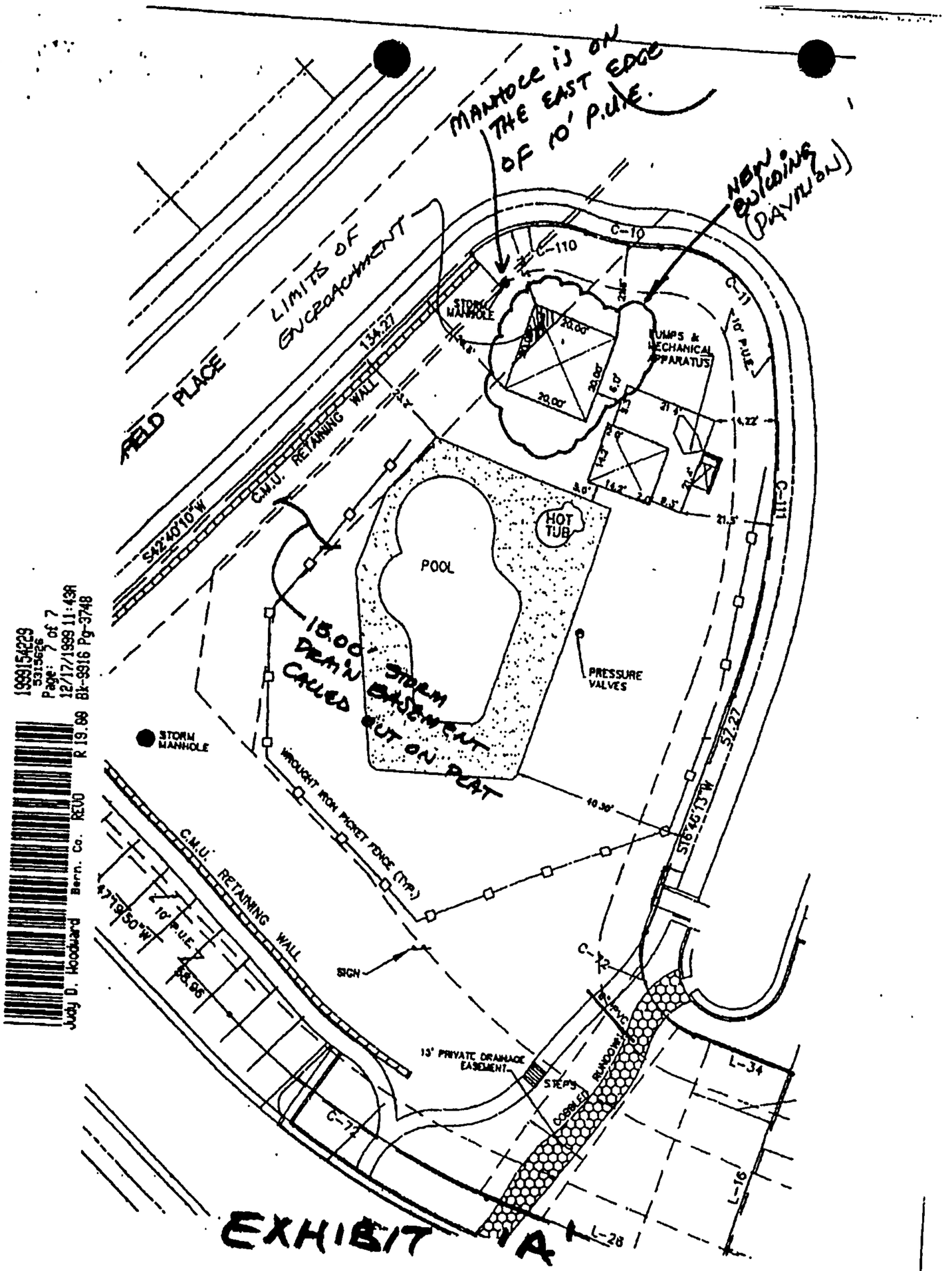
Mary Herrera Bern. Co. AGRE R 19.00

One-Time 1/00



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Mary Herrera Bern. Co. AGRE R 19.00

ACORD CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YY) 01/29/2002

PRODUCER (505)265-8481 FAX (505)266-3500
Western Assurance
2001 Carlisle NE
P.O. Box 3889
Albuquerque, NM 87190

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

INSURED High Desert Residential Owners Assoc
13000 Academy Rd. N. E.
Albuquerque, NM 87111

INSURERS AFFORDING COVERAGE

INSURER A:	Mountain States Mutual
INSURER B:	Fireman's Fund
INSURER C:	
INSURER D:	
INSURER E:	

COVERAGES

THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. AGGREGATE LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIMITS	
A	GENERAL LIABILITY [X] COMMERCIAL GENERAL LIABILITY [ ] CLAIMS MADE [X] OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: [ ] POLICY [ ] PRO-JECT [ ] LOC	CPP007387501	08/23/2001	08/23/2002	EACH OCCURRENCE	$ 1,000,000
					FIRE DAMAGE (Any one fire)	$ 100,000
					MED EXP (Any one person)	$ 10,000
					PERSONAL & ADV INJURY	$ 1,000,000
					GENERAL AGGREGATE	$ 2,000,000
					PRODUCTS - COMP/OP AGG	$ 1,000,000
	AUTOMOBILE LIABILITY [ ] ANY AUTO [ ] ALL OWNED AUTOS [ ] SCHEDULED AUTOS [ ] HIRED AUTOS [ ] NON-OWNED AUTOS				COMBINED SINGLE LIMIT (Ea accident)	$
					BODILY INJURY (Per person)	$
					BODILY INJURY (Per accident)	$
					PROPERTY DAMAGE (Per accident)	$
	GARAGE LIABILITY [ ] ANY AUTO				AUTO ONLY - EA ACCIDENT	$
					OTHER THAN AUTO ONLY: EA ACC	$
					AGG	$
B	EXCESS LIABILITY [X] OCCUR [ ] CLAIMS MADE [ ] DEDUCTIBLE [ ] RETENTION $	XYZ00084660380	08/23/2001	08/23/2002	EACH OCCURRENCE	$ 2,000,000
					AGGREGATE	$ 2,000,000
						$
						$
						$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY				[ ] WC STATU-TORY LIMITS [ ] OTH-ER	
					E L. EACH ACCIDENT	$
					E L. DISEASE - EA EMPLOYEE	$
					E.L. DISEASE - POLICY LIMIT	$
	OTHER					

DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/EXCLUSIONS ADDED BY ENDORSEMENT/SPECIAL PROVISIONS
RE: Poolside Pavilion-High Desert-Desert Mountain
City of Albuquerque named as additional insured on general liability

CERTIFICATE HOLDER | ADDITIONAL INSURED; INSURER LETTER: ____

Mayor
City of Albuquerque
PO Box 1293
Albuquerque, NM 87103

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING COMPANY WILL ~~INDEAVOR TO~~ MAIL 10 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, ~~BUT FAILURE TO MAIL SUCH NOTICE SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE COMPANY, ITS AGENTS OR REPRESENTATIVES.~~

AUTHORIZED REPRESENTATIVE
Gordon Macaulay/DENISE

©ACORD CORPORATION 1988

ACORD CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YY) 01/29/2002

PRODUCER (505)265-8481 FAX (505)266-3500
Western Assurance
2001 Carlisle NE
P.O. Box 3889
Albuquerque, NM 87190

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

INSURED High Desert Residential Owners Assoc
13000 Academy Rd. N. E.
Albuquerque, NM 87111

INSURERS AFFORDING COVERAGE

INSURER A:	Mountain States Mutual
INSURER B:	Fireman's Fund
INSURER C:	
INSURER D:	
INSURER E:	

COVERAGES

THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. AGGREGATE LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIMITS	
A	GENERAL LIABILITY [X] COMMERCIAL GENERAL LIABILITY [ ] CLAIMS MADE [X] OCCUR GEN'L AGGREGATE LIMIT APPLIES PER: [ ] POLICY [ ] PRO-JECT [ ] LOC	CPP007387501	08/23/2001	08/23/2002	EACH OCCURRENCE	$ 1,000,000
					FIRE DAMAGE (Any one fire)	$ 100,000
					MED EXP (Any one person)	$ 10,000
					PERSONAL & ADV INJURY	$ 1,000,000
					GENERAL AGGREGATE	$ 2,000,000
					PRODUCTS - COMP/OP AGG	$ 1,000,000
	AUTOMOBILE LIABILITY [ ] ANY AUTO [ ] ALL OWNED AUTOS [ ] SCHEDULED AUTOS [ ] HIRED AUTOS [ ] NON-OWNED AUTOS				COMBINED SINGLE LIMIT (Ea accident)	$
					BODILY INJURY (Per person)	$
					BODILY INJURY (Per accident)	$
					PROPERTY DAMAGE (Per accident)	$
	GARAGE LIABILITY [ ] ANY AUTO				AUTO ONLY - EA ACCIDENT	$
					OTHER THAN AUTO ONLY: EA ACC	$
					AGG	$
B	EXCESS LIABILITY [X] OCCUR [ ] CLAIMS MADE [ ] DEDUCTIBLE [ ] RETENTION $	XYZ00084660380	08/23/2001	08/23/2002	EACH OCCURRENCE	$ 2,000,000
					AGGREGATE	$ 2,000,000
						$
						$
						$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY				[ ] WC STATU-TORY LIMITS [ ] OTH-ER	
					E.L. EACH ACCIDENT	$
					E.L. DISEASE - EA EMPLOYEE	$
					E.L. DISEASE - POLICY LIMIT	$
	OTHER					

DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/EXCLUSIONS ADDED BY ENDORSEMENT/SPECIAL PROVISIONS
Re: Poolside Pavilion-High Desert-Desert Mountain
City of Albuquerque named as additional insured on general liability

CERTIFICATE HOLDER [ ] ADDITIONAL INSURED; INSURER LETTER: ____

Director, Public Works Dept
City of Albuquerque
PO Box 1293
Albuquerque, NM 87103

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING COMPANY WILL ~~ENDEAVOR TO~~ MAIL 10 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, ~~BUT FAILURE TO MAIL SUCH NOTICE SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE COMPANY, ITS AGENTS OR REPRESENTATIVES.~~

AUTHORIZED REPRESENTATIVE
Gordon Macaulay/DENISE

©ACORD CORPORATION 1988

TREASURER'S REPORT OF DEPOSITS

DEPOSITOR:

Savage-Thomas, Inc.
7445 Pan American Fwy NE
Alb NM 87109

Check # 012337

DESCRIPTION:

Revocable permit
poolside pavilion
Desert Mountain
@ High Desert 1

COMMENTS:

project 608681

FUND:
ACCOUNT: 425015
ACTIVITY: 5815000
AMOUNT: 100.00

~~**FUND:**~~
~~**ACCOUNT:**~~
~~**ACTIVITY:**~~
~~**AMOUNT:**~~

TOTAL AMOUNT: 100.00
VERIFIED BY: : Kathy Jaramillo
PHONE NUMBER: 924-3996
DEPOSIT DATE: 2/6/2002

City Of Albuquerque
Treasury Division

02/06/2002 4:75PM
RECEIPT# 00016143 WS# 006 TRANS# 0071
Account 425015 Fund 0110
Activity 5815000 TRSKDM
Trans Amt $100.00
J24 Misc $100.00
CK $100.00
CHANGE $0.00