2007P015

PERMIT APPLICATION TO WORK WITHIN RIGHTS OF WAY (REAL PROPERTY) OF THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

GUADALUPE DAM OUTLET RELOCATION

PHOENIX, ARIZONA

Prepared For:
The Pointe at South Mountain
Mr. Stanley Gray
Grossman Company Properties
3101 N. Central Avenue, Suite 1390
Phoenix, AZ 85012
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Prepared By:
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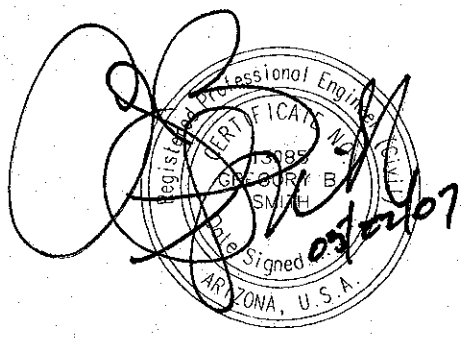

Revised May 2007
February 2007
CMX Project No. 7434

PERMIT APPLICATION TO WORK
WITHIN RIGHTS OF WAY (REAL PROPERTY) OF THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
FOR
GUADALUPE DAM OUTLET RELOCATION

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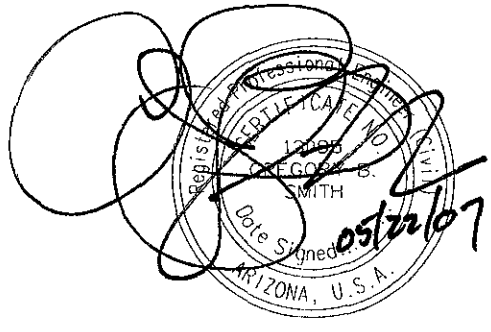
APPENDICES



APPLICATION CHECKLIST

APPLICATION SUBMITTAL CHECKLIST

to work within Rights of Way (Real Property) of the
Flood Control District of Maricopa County
2801 W. Durango Street, Phoenix, AZ 85009

Company Name: CMX Phone: 602-567-1900 Ext: 134

Contact Name: Greg Smith Fax: 602-567-1901

Company Address: 7740 North 16th Street Email: gsmith@cmxinc.com

Suite 100

Phoenix, AZ 85251

- [x] Completed Permit Application
- [x] Fees
- [x] Meeting Minutes
- [ ] ~~Operations and Liability Agreement~~
- [ ] ~~Proof of Insurance~~

  Bond Amount: N/A
- [ ] ~~Precondition Survey~~
- [ ] ~~Geotechnical Report~~
- [ ] ~~Temporary Emergency Action Plan~~
- [x] Proposed Schedule
- [x] Quality Control Plan
- [ ] ~~Issue/Incident Reporting Plan~~
- [ ] ~~Operations and Maintenance Plan~~
- [x] Six Full Plan Sets
- [x] Six Specifications

PERMIT APPLICATION

PERMIT APPLICATION

to work within Rights of Way (Real Property) of the
Flood Control District of Maricopa County
2801 W. Durango Street, Phoenix, AZ 85009

Contractor Name: To Be Determined

Address: TBD
Street

City State Zip

Arizona Contractors License Number: Review
(if a consultant is submitting plans on behalf of a client, they may enter "Review" in the above line.)

Contact Name: TBD

Phone Number: TBD Fax Number: TBD

Project Name: Pointe South Mountain Utility Relocation

Project Location: Phoenix, AZ

Section: 5 Township: 1 South Range: 4 East

Purpose of Project: Relocation of storm drain outlet for the Guadalupe Dam in order to accomodate a new lobby design at the Pointe South Mountain.

Proposed Construction Start Date: October 24, 2007

Proposed Construction End Date: December 21, 2007

Est. construction cost for work in District Right of Way: $108,703

Permanent easement required: (☒ Yes ☐ No)

Contact Shelby Brown at 602-506-4583 or Angie Hardesty at 602-506-5476 with any questions.

MEETING MINUTES

MEETING MINUTES

Date: October 12, 2006

Time: 3:30-4:30

Location: Flood Control District

Prepared by: CMX – (Jacob / Greg / John meeting minutes)

Attendees: Jacob Priego – CMX
Greg Smith – CMX
John Cowan – CMX
Dan Lawrence – FCD
Tom Renckly - FCD

***Project*:** **Pointe @ South Mountain (CMX Job No. 7434)**
***Subject*:** **Review & acquire information about the Guadalupe Dam & environmental information.**

***Distribution*: All Attendees**

The following items were discussed:

Item No.	Discussion	Action Required By:
1	All aerial mapping, topo, as-builts are public information. A nominal fee will be charged for all information obtained from FCD. A waiver must be signed when purchasing information @ the front desk.	
2	Larry Lambert would be the person to contract for survey dam line work.	
3	All structure plans have been scanned in already. Plans are available for copies.	
4	FCD survey consultant has surveyed the area last year. The most current information can be obtained from John Stock for the line work.	
5	We (CMX) should take a look at the datum used for our current topo drawing that have been done versus what the FCD has had there survey consultant use.	
6	FCD would like to see a trench bedding detail of our relocated storm drain pipe.	
7	Larry Lambert is on vacation for a couple of days (1 to 2 weeks). Tom will put a task list for Larry to work on for us.	
8	Dan Lawrence is meeting with ADWR to address our permit application process.	
9	Tom & Dan feel that they would do the initial meeting with ADWR to discuss what is being proposed by our relocation of the existing pipe. Once this meeting is held another meeting will be set up with FCD & ADWR to finalize any outstanding	

	issues.	
10	The right-of-way permit application can be submitted after the FCD meets with ADWR. FCD feels that if ADWR can agree to what is being proposed then there may not be a need to submit the permit applications typically used.	
11	Tom stated that video tests are held once every five years. They would let us have a copy of the video test done on the stretch of pipe that we are relocating. (A small fee will be charged for the DVD)	
12	John C. asked if there are guidelines for the spacing of manholes. Tom & Dan feel that there is no need to add more manholes to the current design.	
13	John C. proposed the use of a vault at the upstream manhole and to use measuring devices within the vault as well. Tom mentioned that if it was our intention to have cost sharing agreement in place for the construction of the vault. Tom would not be opposed to the use of the vault but would like to know if he needs to go to his people (FCD) to ask for money.	
14	John C. asked about the abandonment of the existing storm drain easement would be swapped for the new easement we would be proposing.	
15	Dan will ask Shelby (FCD) about the easements. How FCD will handle the swap of easements and if they (FCD) would be okay with this method. Tom feels that it would not be an issue but would rather default the question to Shelby to answer.	
16	After FCD meets w/ ADWR, Greg will call ADWR to attend the meeting on the 30th if necessary. Tom feels that asking ADWR to attend our meeting would not be beneficial. If they (ADWR) are okay with what FCD says will work during there meetings then they will default to FCD to make the decisions on the designs we use for the site.	
19	Dan will be meeting with ADWR on Wed. 10/18/06	
20	Tom stated that FCD will view this project as any other project regarding dam construction/improvements	

CMX believes that the statements contained in these minutes are accurate and complete. Please call CMX if you believe there are any errors or omissions within 2 business days of receipt of the minutes. If no comments are received within 2 business days of receipt, it will be assumed that everyone agrees that these meeting minutes are accurate and represent statements of fact to which all parties agree.

END OF MINUTES

DESIGN REPORT

HYDRAULIC ANALYSIS
OF
OUTLET CONDUIT
FOR

GUADALUPE FLOODWATER RETARDING STRUCTURE

PHOENIX, ARIZONA

Prepared For:
The Pointe at South Mountain
Mr. Stanley Gray
Grossman Company Properties
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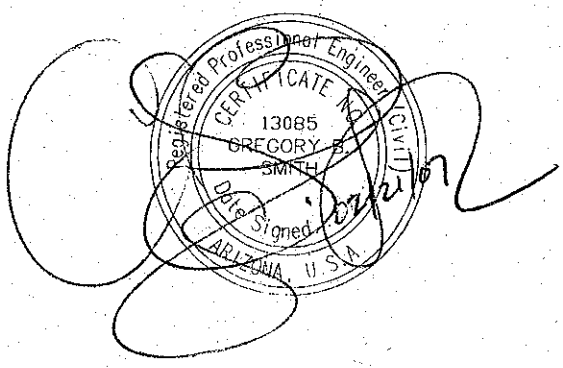

February 2007
CMX Project No. 7434

HYDRAULIC ANALYSIS OF OUTLET CONDUIT
FOR
GUADALUPE FLOODWATER RETARDING STRUCTURE

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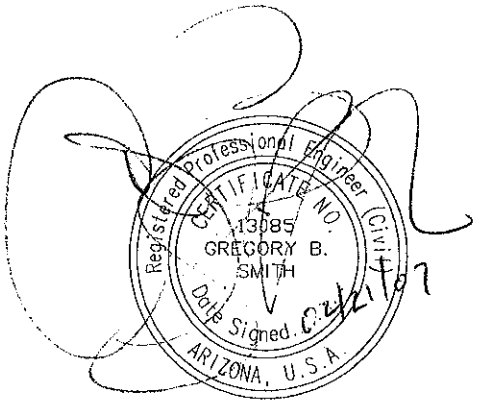


1.0 INTRODUCTION

1.1 Project Description

The Grossman Company Properties propose to remodel certain buildings adjacent to the outlet conduit for the Guadalupe Floodwater Retarding Structure (GFRS). The remodeling requires the relocation of a section of the outlet conduit. The purpose of this report is to perform two hydraulic analyses of the outlet conduit. The first analysis characterizes the flow of water in the outlet conduit as it currently exists. The second analysis characterizes the flow of water in the outlet conduit with the proposed realignment in place. The two analyses are being compared to determine whether the proposed realignment would have a material affect on the performance of the outlet conduit.

These analyses are being performed using StormCAD, Bentley Systems Inc. The physical characteristics of the outlet conduit are being taken from as-build drawings as shown on U.S. Department of Agriculture – Soil Conservation Service plan and profile drawings of the outlet conduit, copies of which are attached hereto in Appendix D. The existing and proposed alignments are shown on the drawings attached hereto in Appendix A.

Guadalupe Floodwater Retarding Structure is an earthen flood control dam located in Section 5, Township 1 South, Range 4 East, of the Gila and Salt River Base and Meridian, Maricopa County, Arizona. The site is located on the Guadalupe 7-1/2 minute USGS quadrangle map. The outlet conduit consists of approximately 5,800 feet of a combination of 24-inch diameter and 30-inch diameter reinforced concrete pipe (hereafter "RCP"). The outlet conduit is located in Section 5, Township 1 South, Range 4 East, and Section 23, Township 1 North, Range 4 East, of the Gila and Salt River Base and Meridian, in Maricopa County, Arizona.

The outlet conduit discharges into the Western Canal, which is operated by SRP. A 12-inch control orifice was designed to limit the outlet discharge to 23 cfs, which is the maximum allowable discharge into the Western Canal. Flow in the line is regulated by a gate valve in the inlet structure, as shown on the as-built drawings in Appendix D.

2.0 HYDRAULIC ANALYSIS

The flow of water in a conduit can be either open-channel flow or pipe flow. Open-channel flow in a conduit must have a free surface, so the hydraulic grade line is equivalent to the water surface. Under pipe flow conditions, there is no free surface because the water must fill the whole conduit. Accordingly, the hydraulic grade line will lie above the top of the pipe. If the hydraulic grade line lies above the surface of the ground in the location of manholes, water will fill such manholes and will then seek to rise to the elevation of the hydraulic grade line. Flooding may occur unless the system is designed to prevent the water from escaping from such manholes. One of the purposes of this hydraulic analysis is to determine the hydraulic grade line in the

outlet conduit when the FRS is full, which will create the highest possible hydraulic grade line. If the outlet conduit operates under open-channel flow when the FRS is full, it will operate under open-channel flow when the FRS is less than full. After this determination is made, a similar analysis will be made to determine whether open-channel flow conditions exist after the proposed outlet condition modifications are made.

2.1 Analysis of Existing Outlet Conduit

The following table has been created from information on the as-built drawings. "GC" indicates a grade change. "MH" indicates a manhole.

Station	Inv. Elev.	Distance	Grade
9 + 35.5 (inlet)	1246.0	210.0	.0023
11+45.5 (GC)	1245.5	112.5	.00904
12+58.0 (MH)			

NOTE: The original design drawings show an open channel from the toe of the FRS to the beginning of the outlet conduit. The as-built drawings indicate that a conduit was constructed instead of the open channel with a manhole at the point where the direction of the outlet conduit occurs. No detail of this change is given on the drawings. The as-built station of the invert-in of the beginning of the outlet conduit (at the end of the open channel between the toe of the FRS and the beginning of the conduit) is 14+05.8. The station of the end of the conduit under the FRS is 11+45.5. The numerical difference between these stations (1405.8 –1145.5) is 260.3-feet. There being no information on the as-built drawings as to the length of the pipe that replaced the channel, the distances were scaled. The scaled length of this pipe is 334-feet. There is, therefore, a 73-foot difference between the as-built stations and the scaled distance. The scaled distance was used in this analysis because it is longer, and represents more line losses (i.e., it is the "worst case"). Also, owing to this 73-foot difference, the stationing has a discontinuity. Accordingly, in order to utilize the stationing on the as-builts, this gap was inserted into this table. The values tabulated above used a scaled distance (112.5-feet) from the station of the invert-out of the pipe under the FRS to the first manhole (looking downstream). The values tabulated below used a scaled distance (221.4-feet) from the invert-in of the outlet conduit (at the end of the open-channel) to the manhole referred to immediately above. The grade of this pipe was assumed to be a straight line between the invert-out of the pipe under the FRS at station 11+45.5 and the invert-in of the conduit at station 14+05.8.

Station	Inv. Elev.	Distance	Grade
11+84.4	1244.48	221.4	.00904
14+05.8	1242.48	744.20	.01885
21+50	1228.5	920.0	.0223
30+70	1208.0	430.0	.00756
35+00	1204.75	1250	.0120
47+50	1189.75	1375.0	.0107
61+25	1175.39	603.0	.0022
67+28			

The following elevations have been taken from the as-built drawings of the inlet structure, as shown in Appendix B:

Crest of the emergency spillway = 1274.0
Top of inlet structure = 1277.0
Crest of FRS = 1281.5

There is a note on the as-builts that indicates "broken pipe" at station 21+35. It is not possible to model this condition without further information. Accordingly, the enclosed models ignore the noted condition.

The results of the StormCAD analysis of the as-built outlet conduit indicate that, under the "worst case", when the water surface elevation in the FRS is at the elevation of the emergency spillway (elevation 1277.0), that the stormdrain network flows slightly under pressure when conveying the 23 cfs in this scenario. Tables and profiles have been prepared to show the existing conditions alignment hydraulics and are located in Appendix B.

2.2 Analysis of Realigned Outlet Conduit

The proposed modification of the outlet conduit is shown on the drawing in Appendix A. A new segment of the outlet conduit consisting of approximately 477-feet (approximately an additional 21-feet more than the existing alignment) of 24-inch diameter rubber gasketed reinforced concrete pipe (hereafter "RGRCP") will be constructed along a new horizontal alignment from the existing manhole at station 20 + 89 to station 25+ 45 (existing stationing), where the new line will return to the as-built alignment. Three new manholes will be constructed, one at each of the two horizontal direction changes and one where the new line returns to the as-built alignment (see Appendix A).

StormCad analysis indicates that the proposed modification of the outlet conduit will not materially change the performance thereof of the existing stormdrain

network. Stormdrain output tables and a profile of the proposed alignment are included in Appendix C. A table has been prepared to show a comparison of the water surface elevations and energy grade lines between the existing drainage network and the proposed realigned drainage network and is included in Appendix C.

3.0 CONCLUSIONS

The proposed realignment of the stormdrain network was designed to comply with ADWR Dam Safety Requirements and standards outlined by the Flood Control District of Maricopa County. No adverse drainage impacts are expected downstream of the proposed realignment. Based on the analysis described herein:

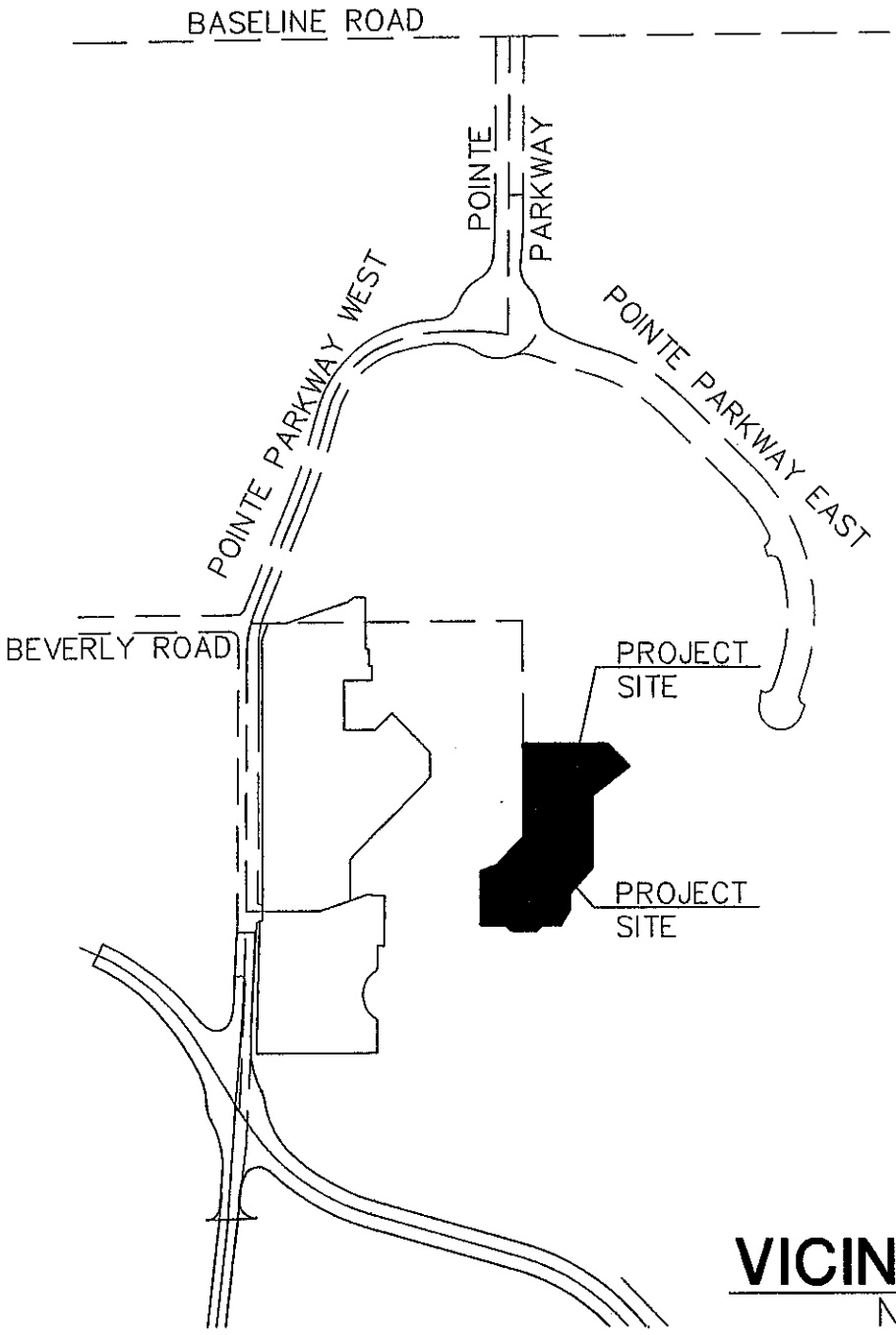
- An additional 21-feet of 24-inch stormdrain network is proposed to the existing drainage network.
- Three new manholes will be constructed, one at each of the two horizontal direction changes and one where the new line returns to the as-built alignment.
- No additional flows will be added to the 23 cfs in the proposed network, which is the maximum allowable discharge into the canal.
- No significant change in water surface elevations and energy grade line elevations will occur with the proposed realignment of the outlet structure.

4.0 REFERENCES

1. As-Built drawings titled *Plan & Profile of Outlet Conduit – Guadalupe Floodwater Retarding Structure – Guadalupe W.P.P. – Maricopa County, Arizona.* (November, 1973).
2. Drawings titled *Inlet Structure Details – Guadalupe Floodwater Retarding Structure – Guadalupe W.P.P. – Maricopa County, Arizona.* (November, 1973).
3. Ven Te Chow, (1959) *Open Channel Hydraulics*
4. StormCAD, Bentley Systems Inc.
5. Tetra Tech (2001), *Structures Assessment Program – Phase I; Individual Structures Assessment Report; Part II Section 2.0 Guadalupe FRS*, FCDMC.

APPENDIX A

FIGURES



VICINITY MAP

N.T.S.

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DRAWN BY:	JAWS
CHECKED BY:	

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POINTE SOUTH MOUNTIAN
LOBBY
PHOENIX, ARIZONA

FIGURE1: VICINITY MAP

PHOENIX OFFICE
7740 N. 16TH ST. STE 100
PHOENIX, ARIZONA
PH (602) 567-1900
FAX (602) 567-1901
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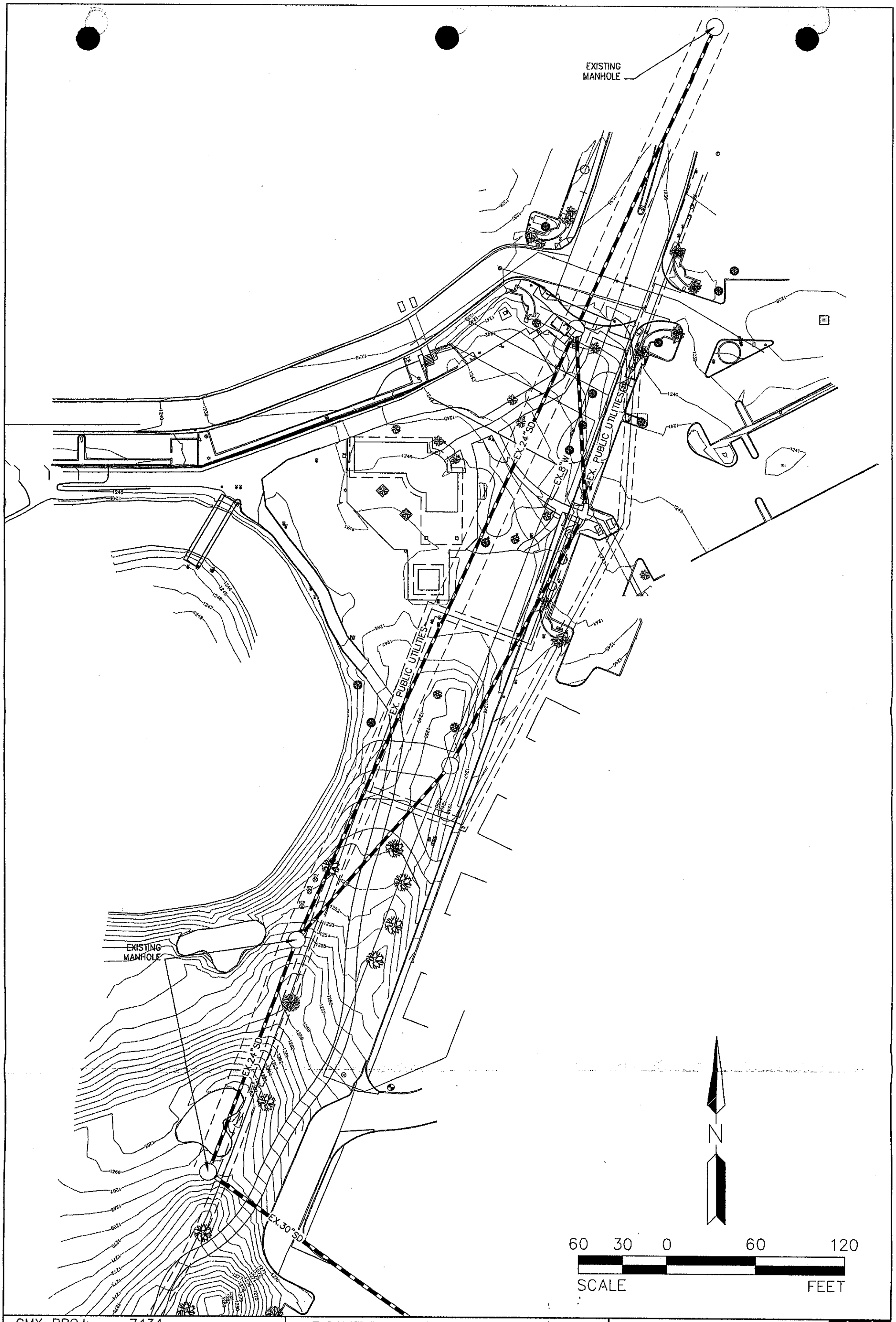
CMX



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POINTE @ SOUTH MOUNTAIN

PHOENIX, AZ

FIG. 2: EXISTING CONDITIONS - 1 OF 2

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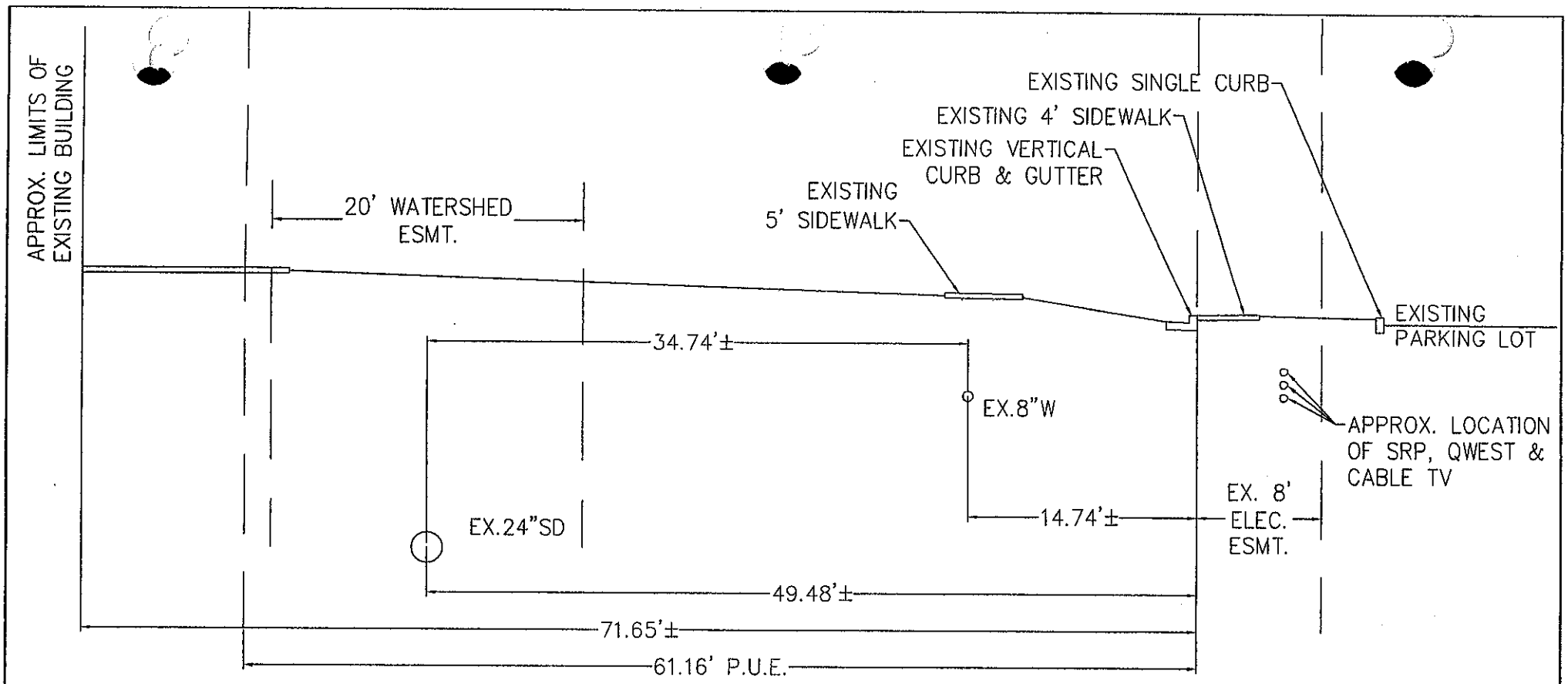

A

SECTION A

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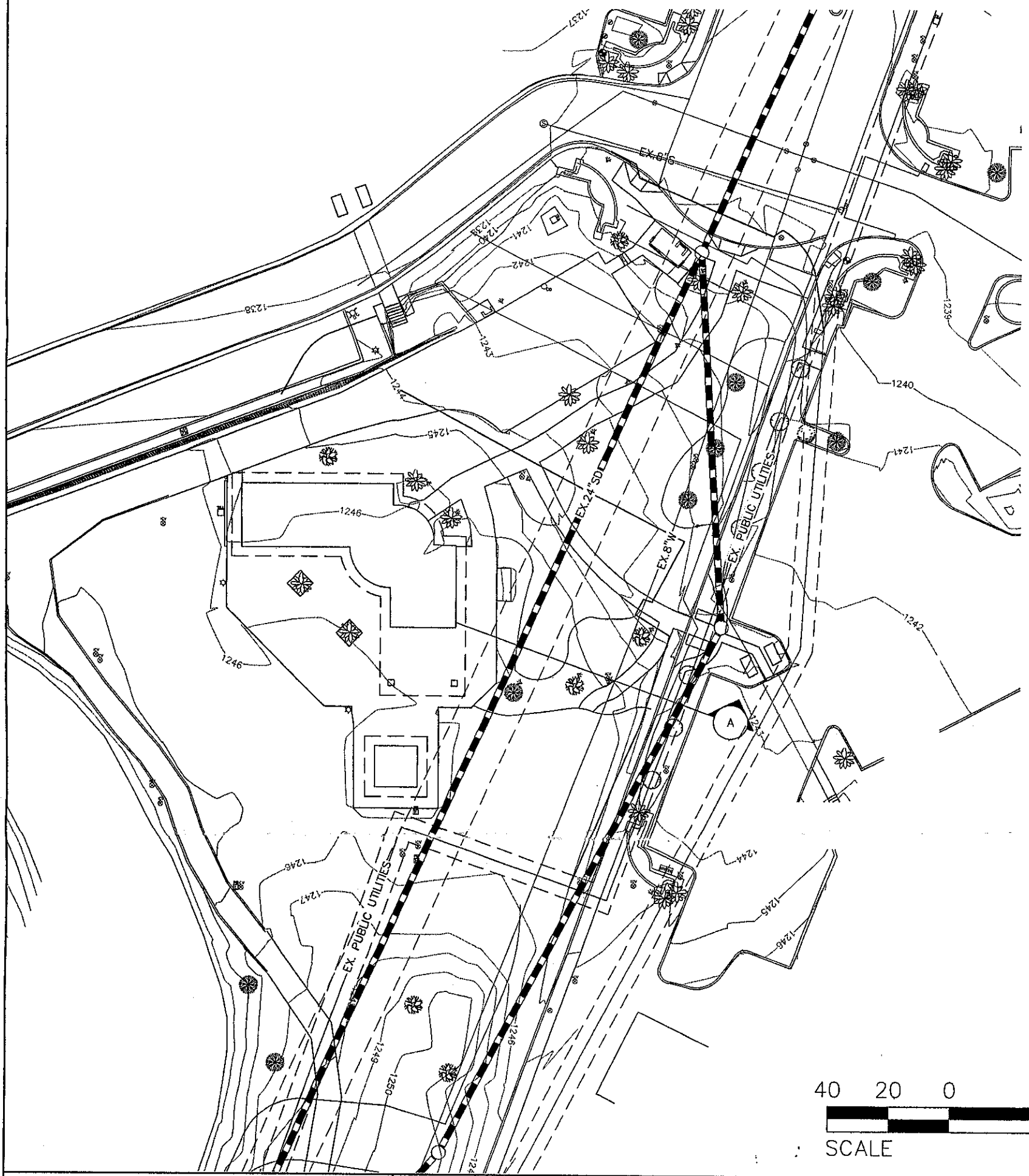

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POINTE @ SOUTH MOUNTAIN

PHOENIX, AZ

FIG. 2: EXISTING CONDITIONS - 2 OF 2

7740 N. 16TH ST. STE.100
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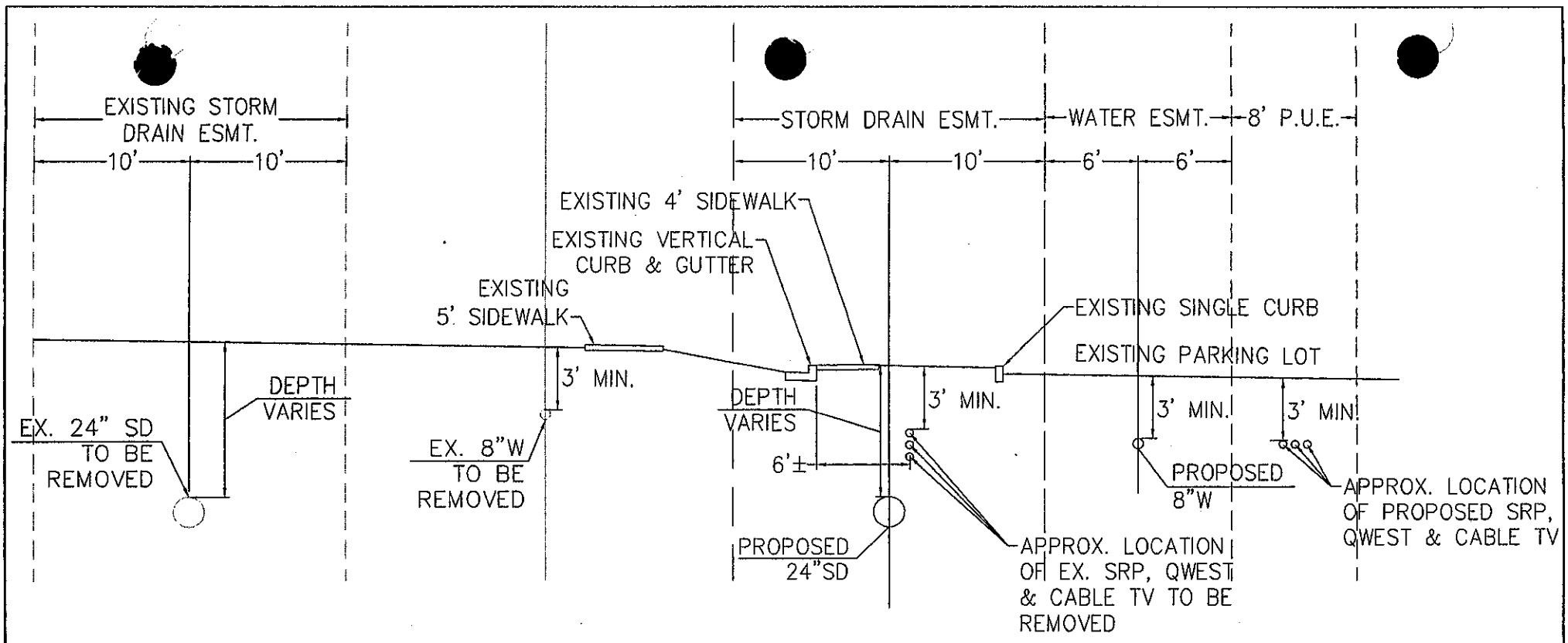

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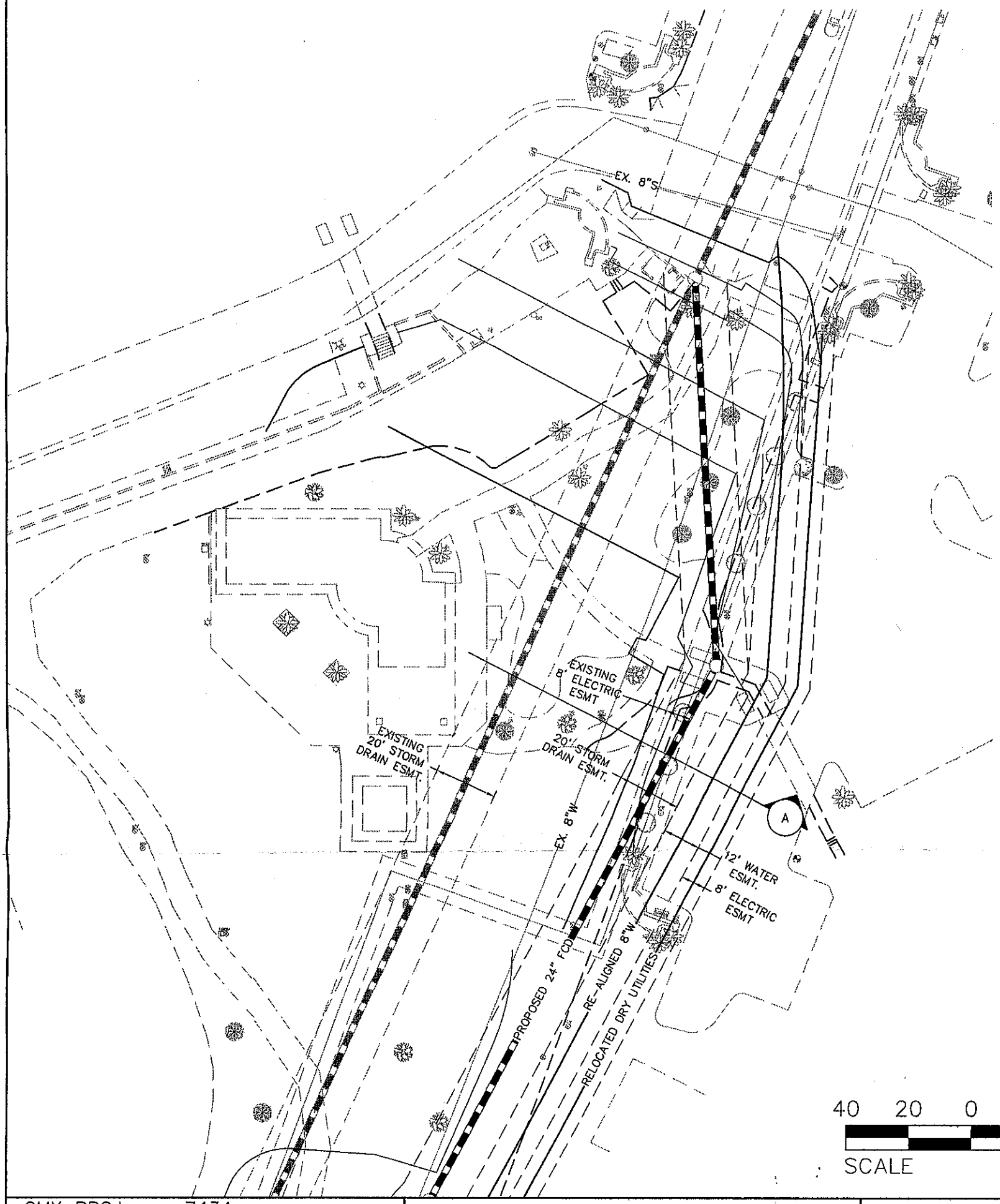
SECTION A

SCALE: 1"=10'



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POINTE @ SOUTH MOUNTAIN

PHOENIX, AZ

FIG. 3: PROPOSED UTILITY RELOCATION 2 OF 2

7740 N. 16TH ST. STE.100
PHOENIX, AZ 85020
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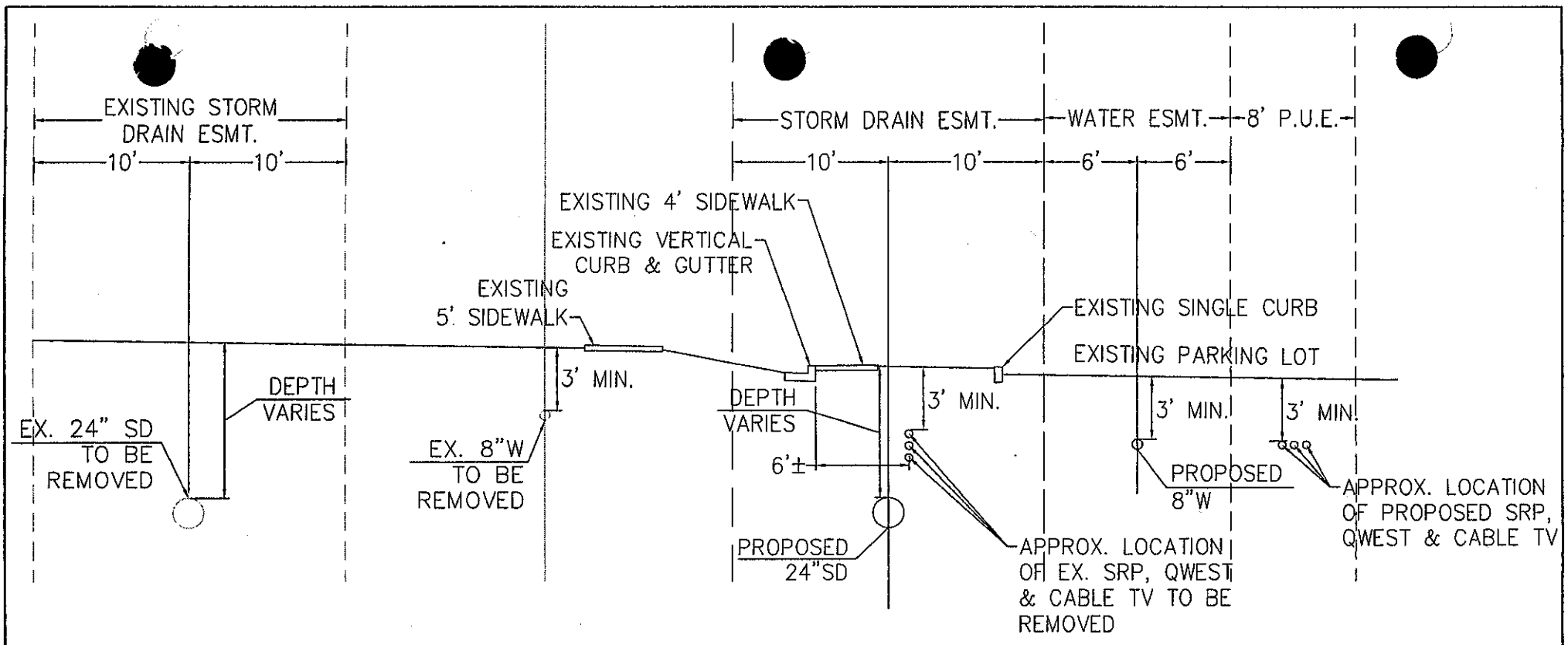

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SECTION A

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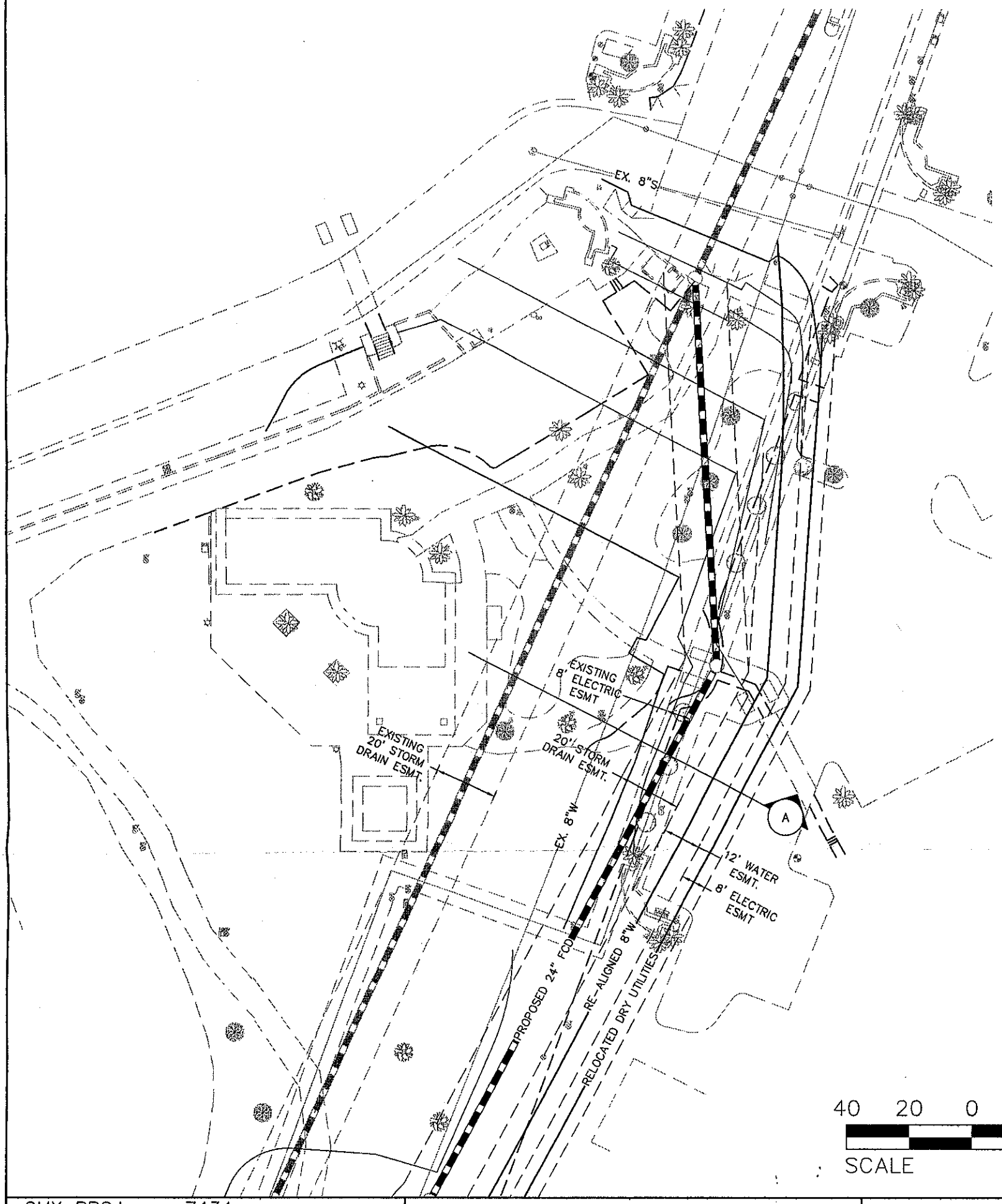

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POINTE @ SOUTH MOUNTAIN

PHOENIX, AZ

FIG. 3: PROPOSED UTILITY RELOCATION 2 OF 2

7740 N. 16TH ST. STE.100
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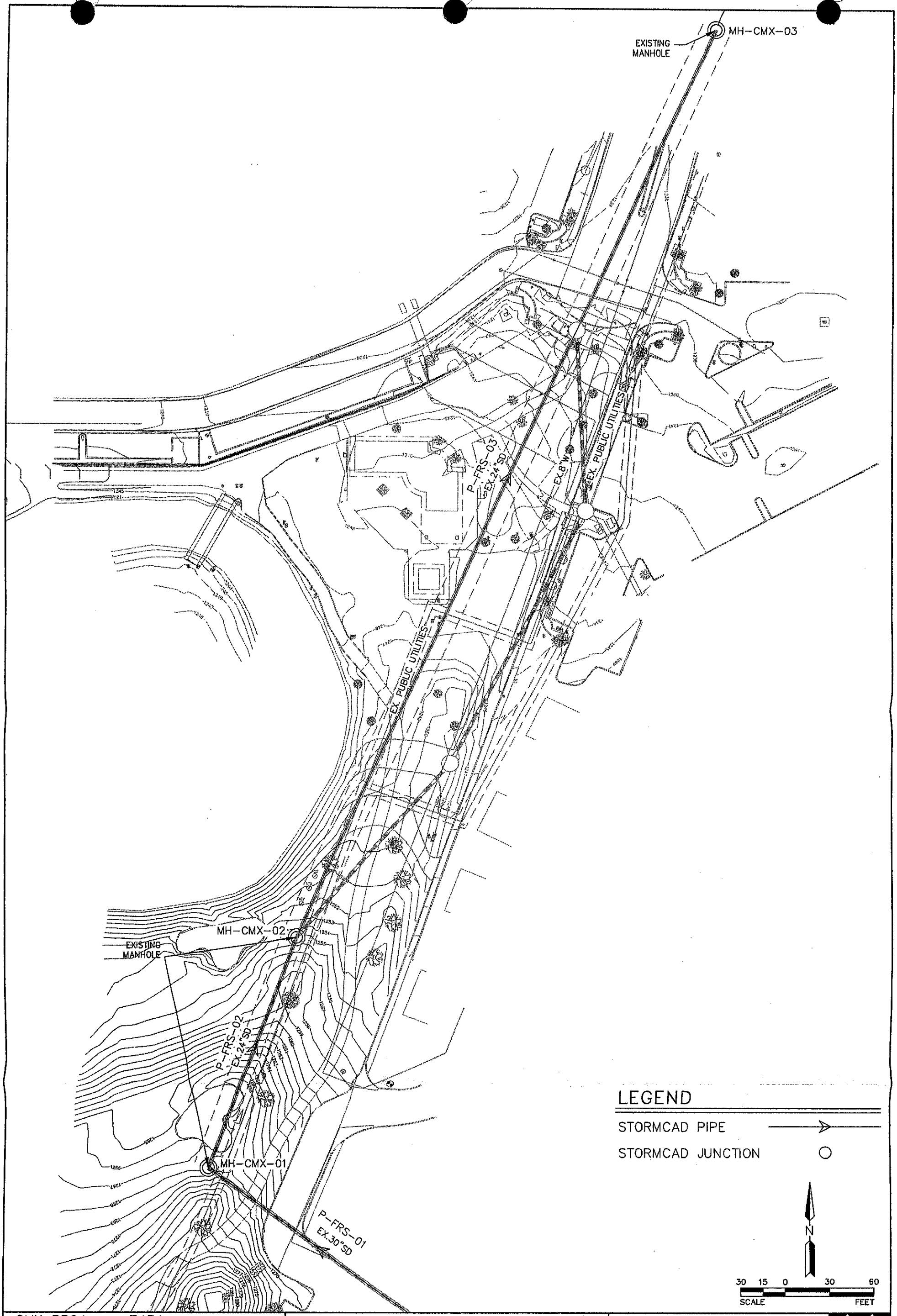
APPENDIX B

HYDRAULICS OF EXISTING ALIGNMENT OF THE OUTLET CONDUIT SYSTEM



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POINTE @ SOUTH MOUNTAIN

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EXISTING CONDITIONS - RELIEF LINE

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Inlet Report

Label	Rim Elevation (ft)	Ground Elevation (ft)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)	Sump Elevation (ft)	Inlet Location	Additional Flow (cfs)	Total Flow (cfs)
FRS OUTLET	1,277.00	1,277.00	1,247.97	1,247.97	1,246.00	In Sag	24.00	24.00

Pipe Report

Label	Upstream Node	Downstream Node	Total System Flow (cfs)	Length (ft)	Constructed Slope (ft/ft)	Section Size	Mannings n	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)	Average Velocity (ft/s)	Downstream Invert Elevation (ft)	Upstream Invert Elevation (ft)	Material
P-FRS-01	FRS OUTLET	MH-CMX-01	24.00	197.00	0.005127	30 inch	0.013	1,247.97	1,247.49	6.67	1,244.99	1,246.00	Concrete
P-FRS-02	MH-CMX-01	MH-CMX-02	24.00	170.00	0.012588	24 inch	0.013	1,247.03	1,245.12	7.64	1,242.85	1,244.99	Concrete
P-FRS-03	MH-CMX-02	MH-CMX-03	24.00	683.00	0.019136	24 inch	0.013	1,244.59	1,233.50	10.98	1,229.78	1,242.85	Concrete
P-FRS-04	MH-CMX-03	MH-STA.20+89.00	24.00	100.00	0.001301	24 inch	0.013	1,233.04	1,231.92	7.64	1,229.65	1,229.78	Concrete
P-FRS-05	MH-STA.20+89.00	GB-STA.21+50.00	24.00	61.00	0.018850	24 inch	0.013	1,231.39	1,230.77	10.91	1,228.50	1,229.65	Concrete
P-FRS-06	GB-STA.21+50.00	GB-STA.30+70.00	24.00	920.00	0.022283	24 inch	0.013	1,230.24	1,215.67	11.67	1,208.00	1,228.50	Concrete
P-FRS-07	GB-STA.30+70.00	MH-STA.33+35.00	24.00	265.00	0.007557	24 inch	0.013	1,215.22	1,212.23	7.64	1,206.00	1,208.00	Concrete
P-FRS-08	MH-STA.33+35.00	GB-STA.35+00.00	24.00	165.00	0.007560	24 inch	0.013	1,211.78	1,209.92	7.64	1,204.75	1,206.00	Concrete
P-FRS-09	GB-STA.35+00.00	MH-STA.47+06.00	24.00	1,206.00	0.012000	24 inch	0.013	1,209.47	1,195.89	7.64	1,190.28	1,204.75	Concrete
P-FRS-10	MH-STA.47+06.00	GB-STA.47+50.00	24.00	44.00	0.012000	24 inch	0.013	1,195.44	1,194.94	7.64	1,189.75	1,190.28	Concrete
P-FRS-11	GB-STA.47+50.00	GB-STA.52+75.00	24.00	525.00	0.010000	24 inch	0.013	1,194.49	1,188.58	7.64	1,184.50	1,189.75	Concrete
P-FRS-12	GB-STA.52+75.00	MH-STA.60+86.50	24.00	811.00	0.011055	24 inch	0.013	1,188.13	1,179.00	7.64	1,175.53	1,184.50	Concrete
P-FRS-13	MH-STA.60+86.50	GB-STA.61+25.00	24.00	13.00	0.011112	24 inch	0.013	1,178.55	1,178.40	7.64	1,175.39	1,175.53	Concrete
P-FRS-14	GB-STA.61+25.00	WESTERN CANAL OUTLET	24.00	619.00	0.002165	30 inch	0.013	1,178.21	1,176.10	4.89	1,174.05	1,175.39	Concrete

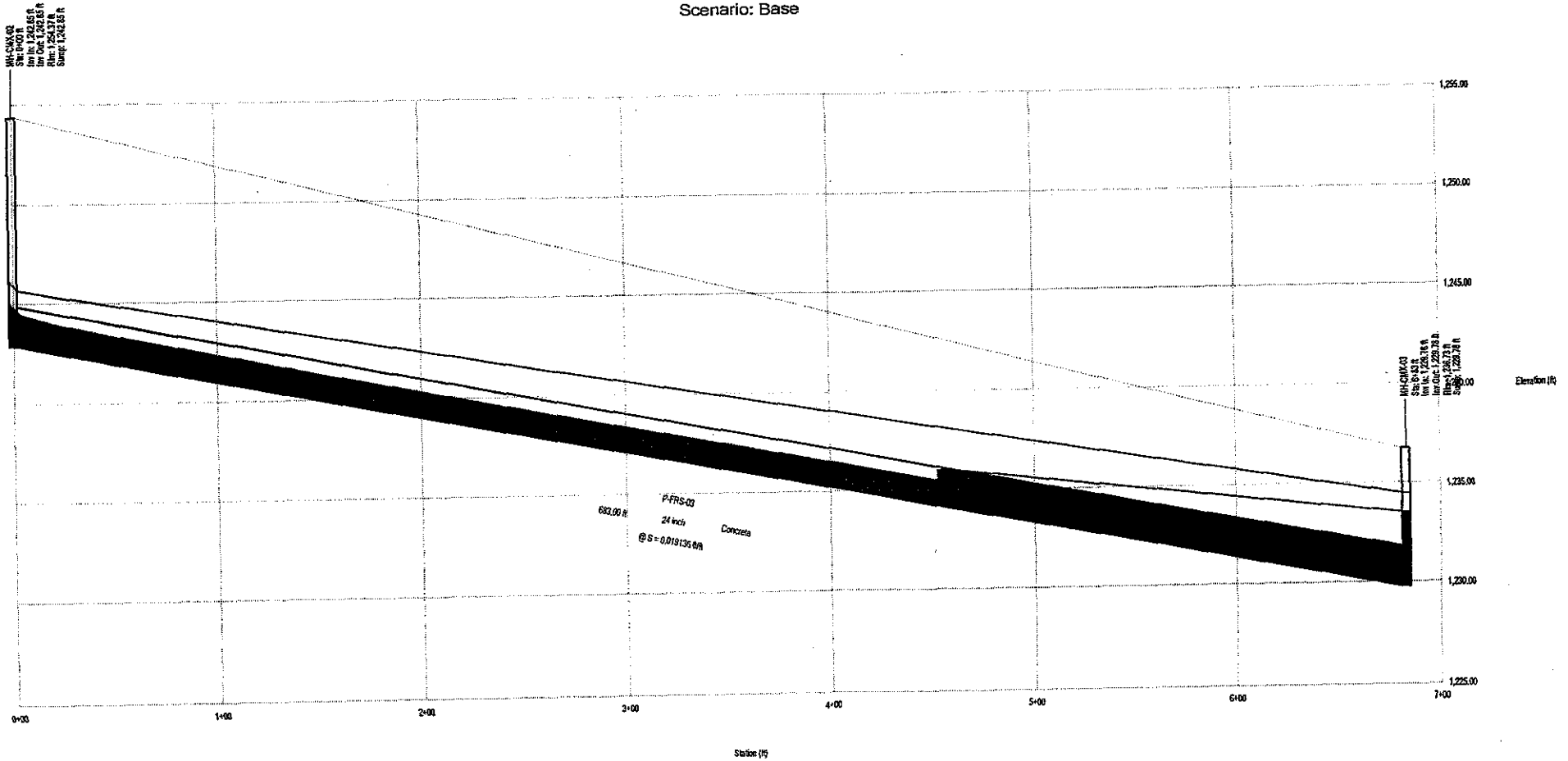
Junction Report

Label	Total System Flow (cfs)	Structure Type	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)	Sump Elevation (ft)	Ground Elevation (ft)	Rim Elevation (ft)	Structure Depth (ft)	Velocity In (ft/s)	Velocity Out (ft/s)	Headloss Method	Headloss Coefficient
GB-STA.21+50.00	24.00	Junction	1,230.77	1,230.24	1,228.50	1,236.20	1,236.20	7.70	8.29	8.29	Standard	0.50
GB-STA.30+70.00	24.00	Junction	1,215.67	1,215.22	1,208.00	1,220.30	1,220.30	12.30	7.64	7.64	Standard	0.50
GB-STA.35+00.00	24.00	Junction	1,209.92	1,209.47	1,204.75	1,215.90	1,215.90	11.15	7.64	7.64	Standard	0.50
GB-STA.47+50.00	24.00	Junction	1,194.94	1,194.49	1,189.75	1,198.10	1,198.10	8.35	7.64	7.64	Standard	0.50
GB-STA.52+75.00	24.00	Junction	1,188.58	1,188.13	1,184.50	1,190.87	1,190.87	6.37	7.64	7.64	Standard	0.50
GB-STA.61+25.00	24.00	Junction	1,178.40	1,178.21	1,175.39	1,179.20	1,179.20	3.81	4.89	4.89	Standard	0.50
MH-CMX-01	24.00	Junction	1,247.49	1,247.03	1,244.99	1,267.77	1,267.77	22.78	7.64	7.64	Standard	0.50
MH-CMX-02	24.00	Junction	1,245.12	1,244.59	1,242.85	1,254.37	1,254.37	11.52	8.29	8.29	Standard	0.50
MH-CMX-03	24.00	Junction	1,233.50	1,233.04	1,229.78	1,236.73	1,236.73	6.95	7.64	7.64	Standard	0.50
MH-STA.20+89.00	24.00	Junction	1,231.92	1,231.39	1,229.65	1,237.30	1,237.30	7.65	8.29	8.29	Standard	0.50
MH-STA.33+35.00	24.00	Junction	1,212.23	1,211.78	1,206.00	1,215.20	1,215.20	9.20	7.64	7.64	Standard	0.50
MH-STA.47+06.00	24.00	Junction	1,195.89	1,195.44	1,190.28	1,196.33	1,196.33	6.05	7.64	7.64	Standard	0.50
MH-STA.60+86.50	24.00	Junction	1,179.00	1,178.55	1,175.53	1,182.60	1,182.60	7.07	7.64	7.64	Standard	0.50

Outlet Report

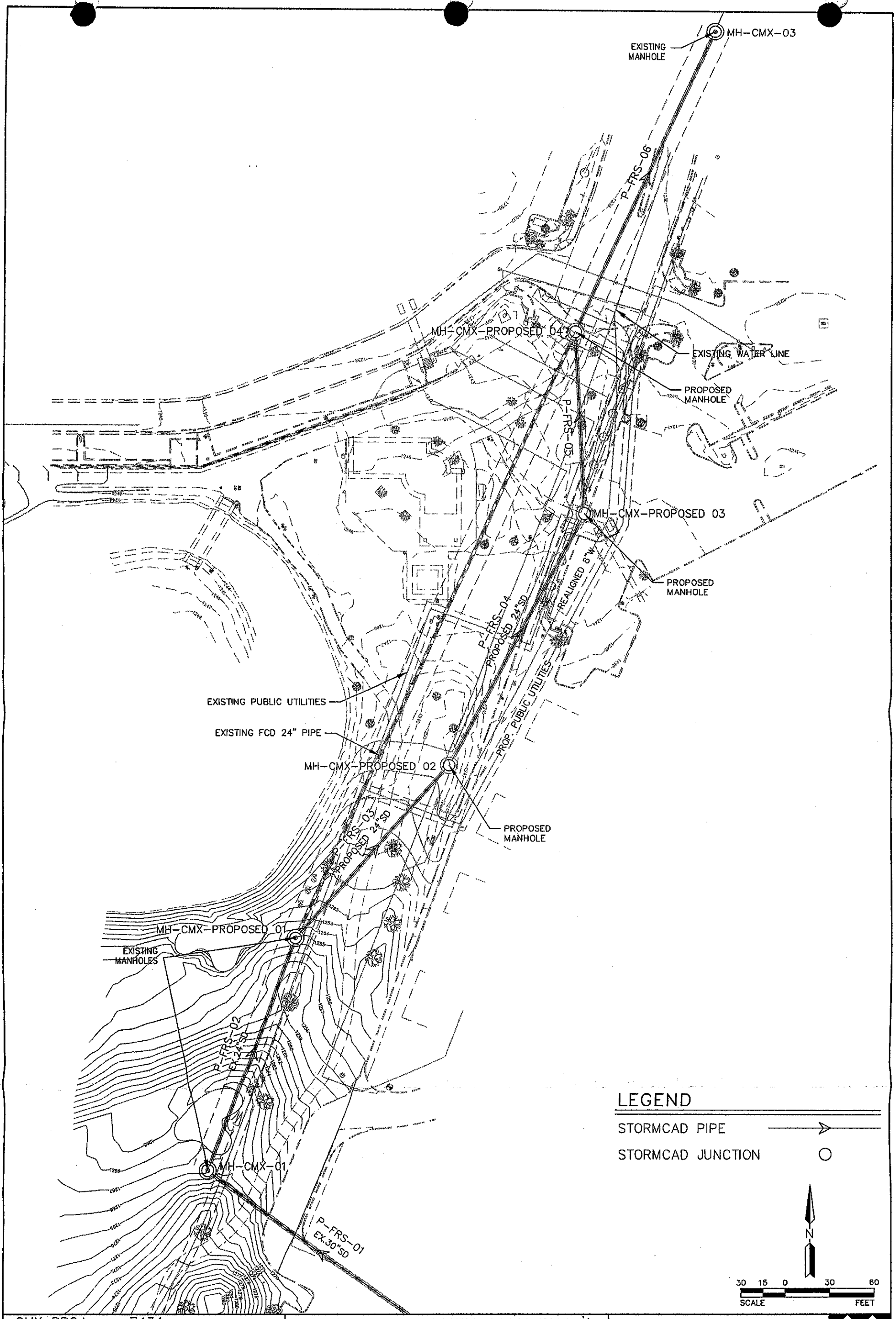
Label	Ground Elevation (ft)	Rim Elevation (ft)	Sump Elevation (ft)	Tailwater Condition	Energy Grade Line In (ft)	Total Flow (cfs)	Hydraulic Grade Line Out (ft)
WESTERN CANAL OUTLET	1,179.00	1,179.00	1,174.05	User-Specifie	1,176.10	24.00	1,176.10

Profile: EXISTING ALIGNMENT
Scenario: Base



APPENDIX C

HYDRAULICS OF PROPOSED ALIGNMENT OF THE OUTLET CONDUIT SYSTEM



CMX PROJ:	7434
DATE:	OCT. 2006
SCALE:	1"=60'
DRAWN BY:	JP
CHECKED BY:	GBS

W:\7400\7434\W-Res\W-Exhibits\Drg Rprt\PROPOSED RELOCATION.dwg 02-21-2007 - 1:19pm

POINTE @ SOUTH MOUNTAIN

PHOENIX, AZ

PROPOSED RELIEF LINE RELOCATION

7740 N. 16TH ST. STE.100
PHOENIX, AZ 85020
PH (602) 567-1900
FAX (602) 567-1901
www.cmxinc.com

CMX

TABLE 1: COMPARISON OF EXISTING RELIEF LINE AND PROPOSED RELIEF LINE WATER SURFACE ELEVATIONS							
		PROPOSED ALIGNMENT		EXISTING ALIGNMENT		COMPARISON OF WSEL'S	
	Sump Elevation (ft)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)
GB-STA.21+50.00	1,228.50	1,230.77	1,230.24	1,230.77	1,230.24	0.00	0.00
GB-STA.30+70.00	1,208.00	1,215.67	1,215.22	1,215.67	1,215.22	0.00	0.00
GB-STA.35+00.00	1,204.75	1,209.92	1,209.47	1,209.92	1,209.47	0.00	0.00
GB-STA.47+50.00	1,189.75	1,194.94	1,194.49	1,194.94	1,194.49	0.00	0.00
GB-STA.52+75.00	1,184.50	1,188.58	1,188.13	1,188.58	1,188.13	0.00	0.00
GB-STA.61+25.00	1,175.39	1,178.40	1,178.21	1,178.40	1,178.21	0.00	0.00
MH-CMX-01	1,244.99	1,247.49	1,247.03	1,247.49	1,247.03	0.00	0.00
MH-CMX-03	1,229.78	1,233.50	1,233.04	1,233.50	1,233.04	0.00	0.00
MH-CMX-PROPOSED 01	1,242.85	1,245.12	1,244.59	1,245.12	1,244.59	0.00	0.00
MH-CMX-PROPOSED 02	1,240.20	1,242.47	1,241.93			N/A	N/A
MH-CMX-PROPOSED 03	1,236.71	1,238.97	1,238.44			N/A	N/A
MH-CMX-PROPOSED 04	1,233.43	1,236.51	1,236.05			N/A	N/A
MH-STA.20+89.00	1,229.65	1,231.92	1,231.39	1,231.92	1,231.39	0.00	0.00
MH-STA.33+35.00	1,206.00	1,212.23	1,211.78	1,212.23	1,211.78	0.00	0.00
MH-STA.47+06.00	1,190.28	1,195.89	1,195.44	1,195.89	1,195.44	0.00	0.00
MH-STA.60+86.50	1,175.53	1,179.00	1,178.55	1,179.00	1,178.55	0.00	0.00

Inlet Report

Label	Rim Elevation (ft)	Ground Elevation (ft)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)	Sump Elevation (ft)	Inlet Location	Additional Flow (cfs)	Total Flow (cfs)
FRS OUTLET	1,277.00	1,277.00	1,247.97	1,247.97	1,246.00	In Sag	24.00	24.00

Pipe Report

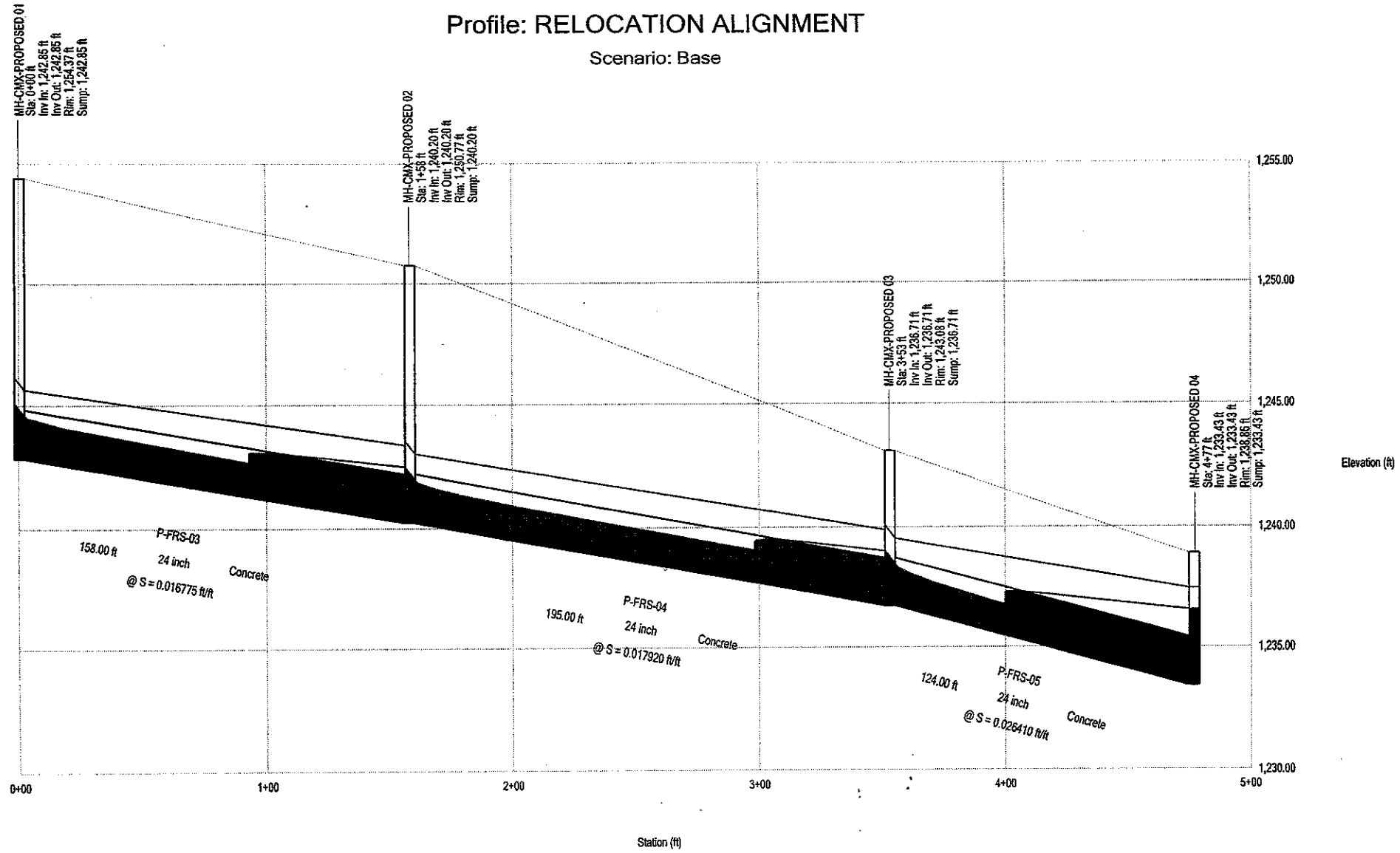
Label	Upstream Node	Downstream Node	Total System Flow (cfs)	Length (ft)	Constructed Slope (ft/ft)	Section Size	Mannings n	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)	Average Velocity (ft/s)	Downstream Invert Elevation (ft)	Upstream Invert Elevation (ft)	Material
P-FRS-01	FRS OUTLET	MH-CMX-01	24.00	197.00	0.005127	30 inch	0.013	1,247.97	1,247.49	6.67	1,244.99	1,246.00	Concrete
P-FRS-02	MH-CMX-01	MH-CMX-PROPOSED 01	24.00	170.00	0.012588	24 inch	0.013	1,247.03	1,245.12	7.64	1,242.85	1,244.99	Concrete
P-FRS-03	MH-CMX-PROPOSED 01	MH-CMX-PROPOSED 02	24.00	158.00	0.016775	24 inch	0.013	1,244.59	1,242.47	10.40	1,240.20	1,242.85	Concrete
P-FRS-04	MH-CMX-PROPOSED 02	MH-CMX-PROPOSED 03	24.00	195.00	0.017920	24 inch	0.013	1,241.93	1,238.97	10.69	1,236.71	1,240.20	Concrete
P-FRS-05	MH-CMX-PROPOSED 03	MH-CMX-PROPOSED 04	24.00	124.00	0.026410	24 inch	0.013	1,238.44	1,236.51	12.47	1,233.43	1,236.71	Concrete
P-FRS-06	MH-CMX-PROPOSED 04	MH-CMX-03	24.00	227.00	0.016080	24 inch	0.013	1,236.05	1,233.50	7.64	1,229.78	1,233.43	Concrete
P-FRS-07	MH-CMX-03	MH-STA.20+89.00	24.00	100.00	0.001301	24 inch	0.013	1,233.04	1,231.92	7.64	1,229.65	1,229.78	Concrete
P-FRS-08	MH-STA.20+89.00	GB-STA.21+50.00	24.00	61.00	0.018850	24 inch	0.013	1,231.39	1,230.77	10.91	1,228.50	1,229.65	Concrete
P-FRS-09	GB-STA.21+50.00	GB-STA.30+70.00	24.00	920.00	0.022283	24 inch	0.013	1,230.24	1,215.67	11.67	1,208.00	1,228.50	Concrete
P-FRS-10	GB-STA.30+70.00	MH-STA.33+35.00	24.00	265.00	0.007557	24 inch	0.013	1,215.22	1,212.23	7.64	1,206.00	1,208.00	Concrete
P-FRS-11	MH-STA.33+35.00	GB-STA.35+00.00	24.00	165.00	0.007560	24 inch	0.013	1,211.78	1,209.92	7.64	1,204.75	1,206.00	Concrete
P-FRS-12	GB-STA.35+00.00	MH-STA.47+06.00	24.00	1,206.00	0.012000	24 inch	0.013	1,209.47	1,195.89	7.64	1,190.28	1,204.75	Concrete
P-FRS-13	MH-STA.47+06.00	GB-STA.47+50.00	24.00	44.00	0.012000	24 inch	0.013	1,195.44	1,194.94	7.64	1,189.75	1,190.28	Concrete
P-FRS-14	GB-STA.47+50.00	GB-STA.52+75.00	24.00	525.00	0.010000	24 inch	0.013	1,194.49	1,188.58	7.64	1,184.50	1,189.75	Concrete
P-FRS-15	GB-STA.52+75.00	MH-STA.60+86.50	24.00	811.00	0.011055	24 inch	0.013	1,188.13	1,179.00	7.64	1,175.53	1,184.50	Concrete
P-FRS-16	MH-STA.60+86.50	GB-STA.61+25.00	24.00	13.00	0.011112	24 inch	0.013	1,178.55	1,178.40	7.64	1,175.39	1,175.53	Concrete
P-FRS-17	GB-STA.61+25.00	WESTERN CANAL OUTLET	24.00	619.00	0.002165	30 inch	0.013	1,178.21	1,176.10	4.89	1,174.05	1,175.39	Concrete

Junction Report

Label	Total System Flow (cfs)	Structure Type	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)	Sump Elevation (ft)	Ground Elevation (ft)	Rim Elevation (ft)	Structure Depth (ft)	Velocity In (ft/s)	Velocity Out (ft/s)	Headloss Method	Headloss Coefficient
GB-STA.21+50.00	24.00	Junction	1,230.77	1,230.24	1,228.50	1,236.20	1,236.20	7.70	8.29	8.29	Standard	0.50
GB-STA.30+70.00	24.00	Junction	1,215.67	1,215.22	1,208.00	1,220.30	1,220.30	12.30	7.64	7.64	Standard	0.50
GB-STA.35+00.00	24.00	Junction	1,209.92	1,209.47	1,204.75	1,215.90	1,215.90	11.15	7.64	7.64	Standard	0.50
GB-STA.47+50.00	24.00	Junction	1,194.94	1,194.49	1,189.75	1,198.10	1,198.10	8.35	7.64	7.64	Standard	0.50
GB-STA.52+75.00	24.00	Junction	1,188.58	1,188.13	1,184.50	1,190.87	1,190.87	6.37	7.64	7.64	Standard	0.50
GB-STA.61+25.00	24.00	Junction	1,178.40	1,178.21	1,175.39	1,179.20	1,179.20	3.81	4.89	4.89	Standard	0.50
MH-CMX-01	24.00	Junction	1,247.49	1,247.03	1,244.99	1,267.77	1,267.77	22.78	7.64	7.64	Standard	0.50
MH-CMX-03	24.00	Junction	1,233.50	1,233.04	1,229.78	1,236.73	1,236.73	6.95	7.64	7.64	Standard	0.50
MH-CMX-PROPOSED 01	24.00	Junction	1,245.12	1,244.59	1,242.85	1,254.37	1,254.37	11.52	8.29	8.29	Standard	0.50
MH-CMX-PROPOSED 02	24.00	Junction	1,242.47	1,241.93	1,240.20	1,250.77	1,250.77	10.57	8.29	8.29	Standard	0.50
MH-CMX-PROPOSED 03	24.00	Junction	1,238.97	1,238.44	1,236.71	1,243.08	1,243.08	6.37	8.29	8.29	Standard	0.50
MH-CMX-PROPOSED 04	24.00	Junction	1,236.51	1,236.05	1,233.43	1,238.86	1,238.86	5.43	7.64	7.64	Standard	0.50
MH-STA.20+89.00	24.00	Junction	1,231.92	1,231.39	1,229.65	1,237.30	1,237.30	7.65	8.29	8.29	Standard	0.50
MH-STA.33+35.00	24.00	Junction	1,212.23	1,211.78	1,206.00	1,215.20	1,215.20	9.20	7.64	7.64	Standard	0.50
MH-STA.47+06.00	24.00	Junction	1,195.89	1,195.44	1,190.28	1,196.33	1,196.33	6.05	7.64	7.64	Standard	0.50
MH-STA.60+86.50	24.00	Junction	1,179.00	1,178.55	1,175.53	1,182.60	1,182.60	7.07	7.64	7.64	Standard	0.50

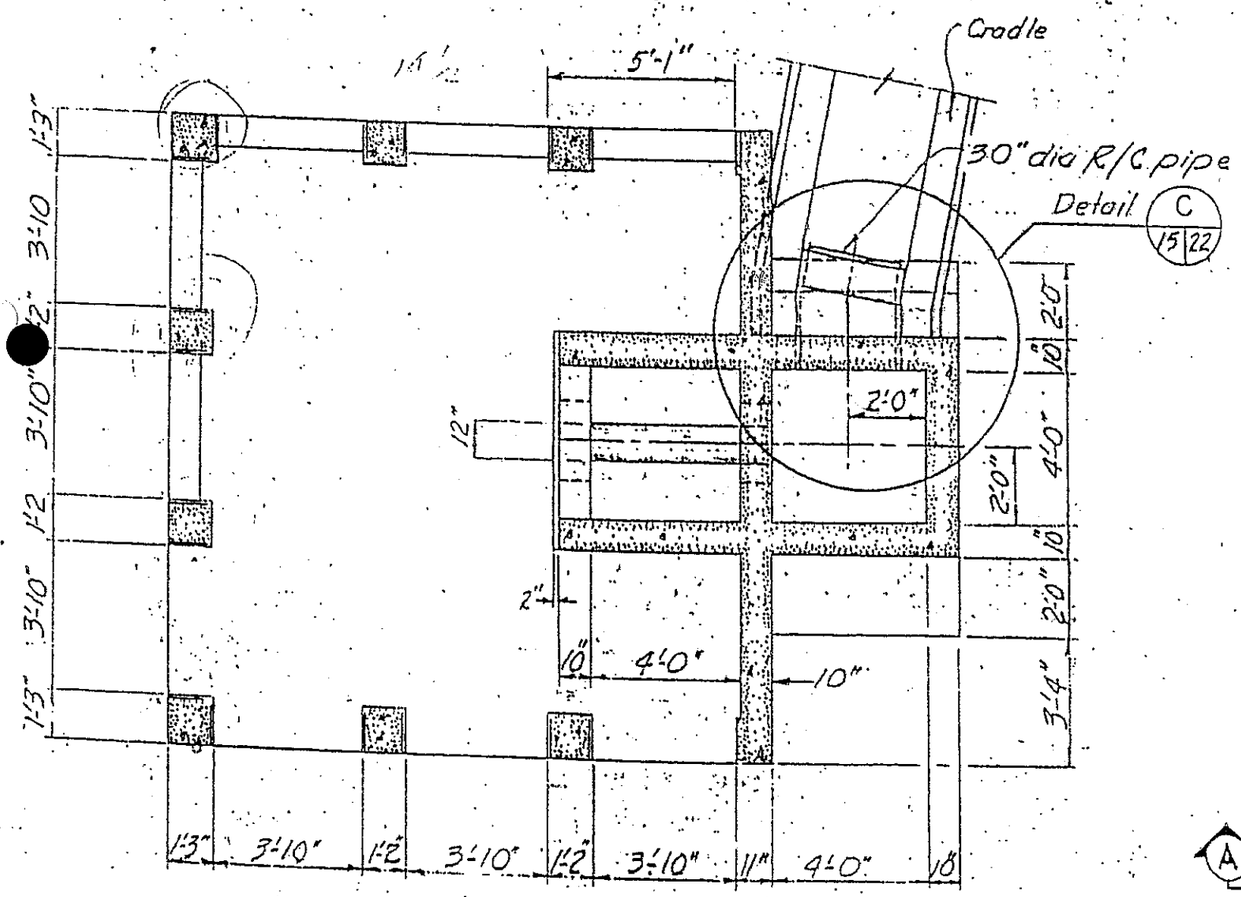
Outlet Report

Label	Ground Elevation (ft)	Rim Elevation (ft)	Sump Elevation (ft)	Tailwater Condition	Energy Grade Line In (ft)	Total Flow (cfs)	Hydraulic Grade Line Out (ft)
WESTERN CANAL OUTLET	1,179.00	1,179.00	1,174.05	User-Specifie	1,176.10	24.00	1,176.10


Profile: RELOCATION ALIGNMENT
Scenario: Base
MH-CMX-PROPOSED 01
Sta: 0+00 ft
Inv In: 1,242.85 ft
Inv Out: 1,242.85 ft
Rim: 1,254.37 ft
Sump: 1,242.85 ft
MH-CMX-PROPOSED 02
Sta: 1+58 ft
Inv In: 1,240.20 ft
Inv Out: 1,240.20 ft
Rim: 1,250.77 ft
Sump: 1,240.20 ft
MH-CMX-PROPOSED 03
Sta: 3+53 ft
Inv In: 1,236.71 ft
Inv Out: 1,236.71 ft
Rim: 1,243.08 ft
Sump: 1,236.71 ft
MH-CMX-PROPOSED 04
Sta: 4+77 ft
Inv In: 1,233.43 ft
Inv Out: 1,233.43 ft
Rim: 1,238.86 ft
Sump: 1,233.43 ft
P-FRS-03
158.00 ft
24 inch
Concrete
@ S = 0.016775 ft/ft
P-FRS-04
195.00 ft
24 inch
Concrete
@ S = 0.017920 ft/ft
P-FRS-05
124.00 ft
24 inch
Concrete
@ S = 0.026410 ft/ft
1,255.00
1,250.00
1,245.00
1,240.00
1,235.00
1,230.00
Elevation (ft)
0+00
1+00
2+00
3+00
4+00
5+00
Station (ft)

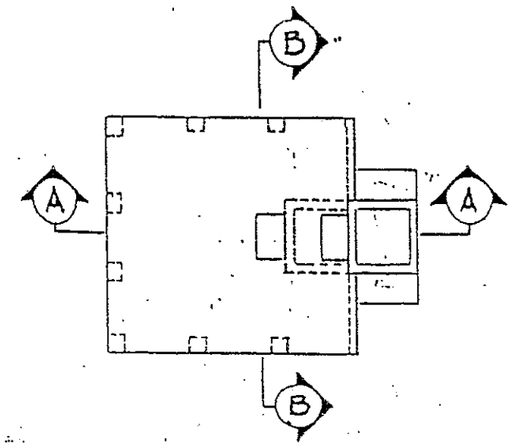
APPENDIX D

INLET DETAIL STRUCTURES AND AS-BUILT INFORMATION

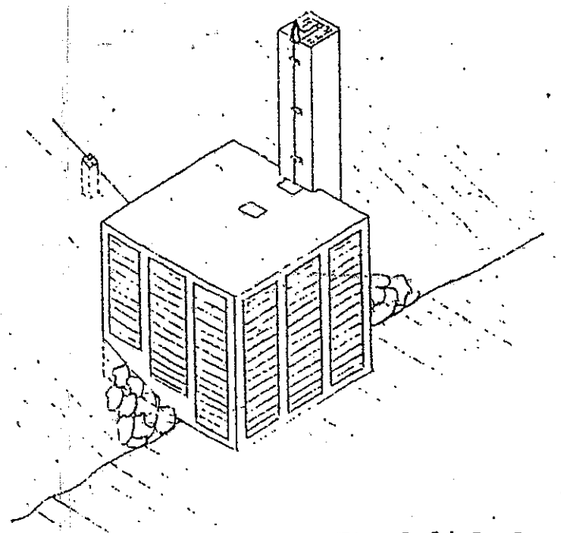


SECTION C 15|15

SCALE 1 IN 0 5 10 FEET



KEY PLAN



AS BUILT

ISOMETRIC VIEW

INLET STRUCTURE DET.

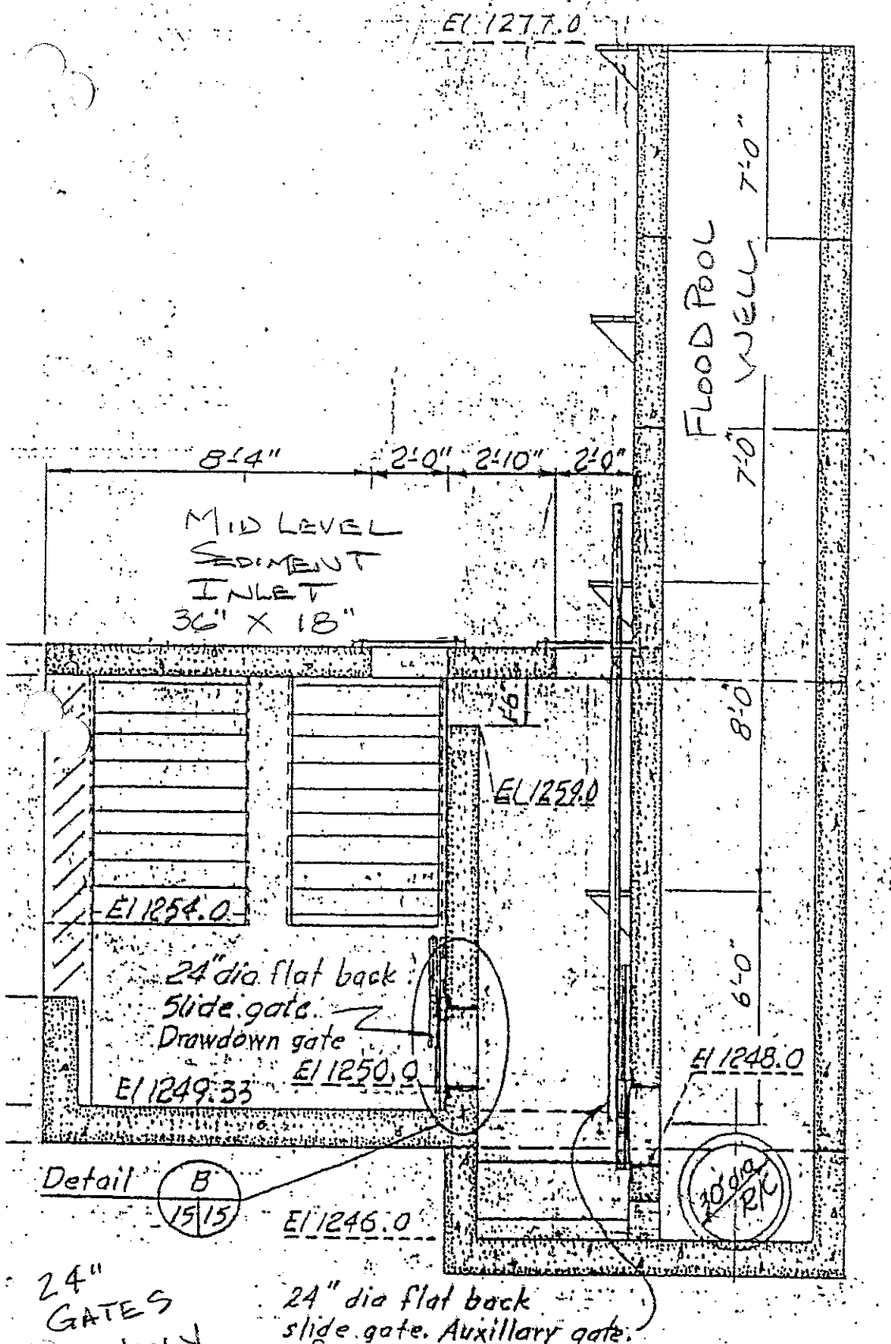
GUADALUPE FLOODWATER RETARDING STR.

GUADALUPE W.P.P.

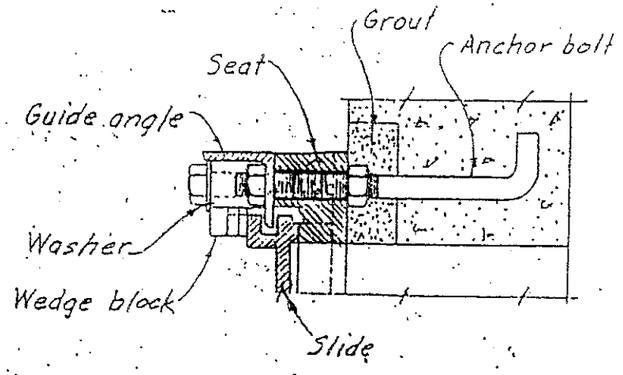
MARICOPA COUNTY, ARIZONA

U. S. DEPARTMENT OF AGRICULT
SOIL CONSERVATION SERVIC

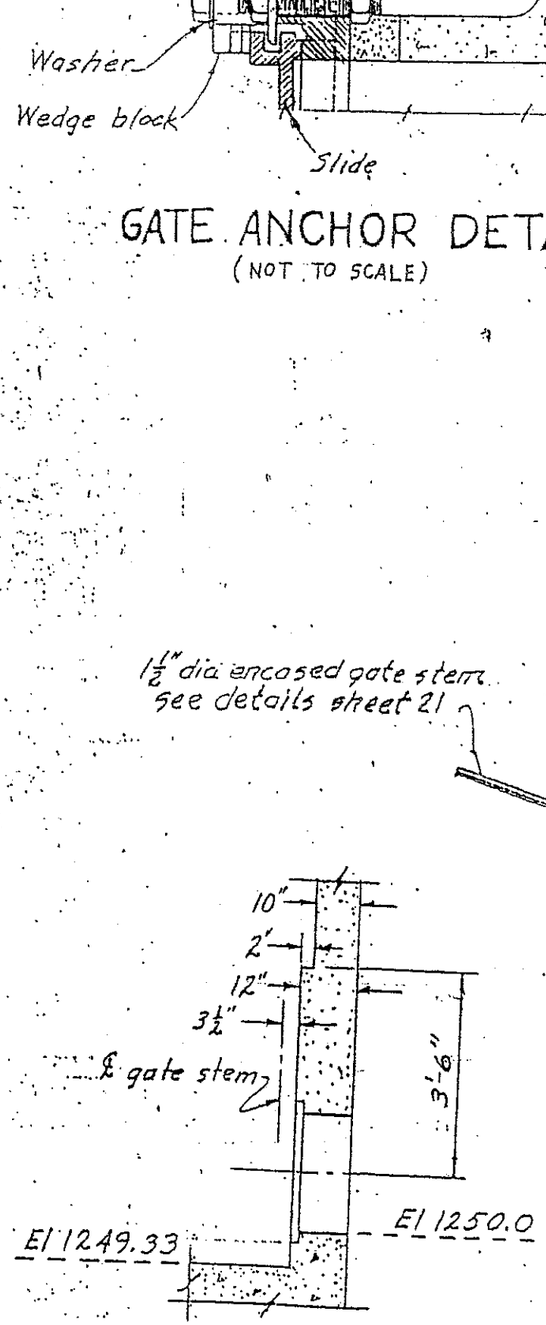
	Date		
Designed W. H. Erion	9-73	Approved by	
Drawn J. D. Land	9-73	Title	
Traced SHEET 15		Title	
		Sheet	Drawing No.



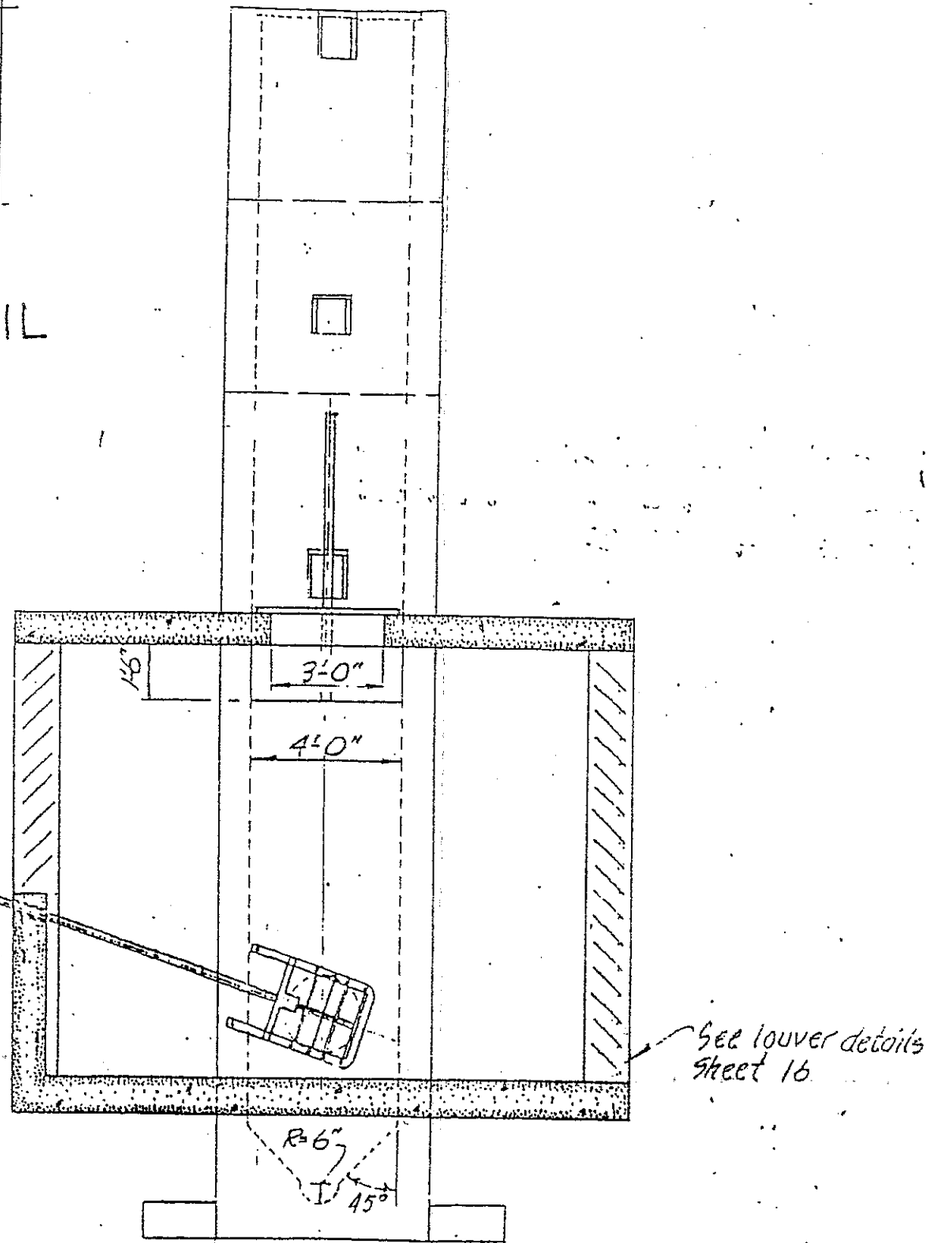
SECTION A 15 15



GATE ANCHOR DETAIL
(NOT TO SCALE)

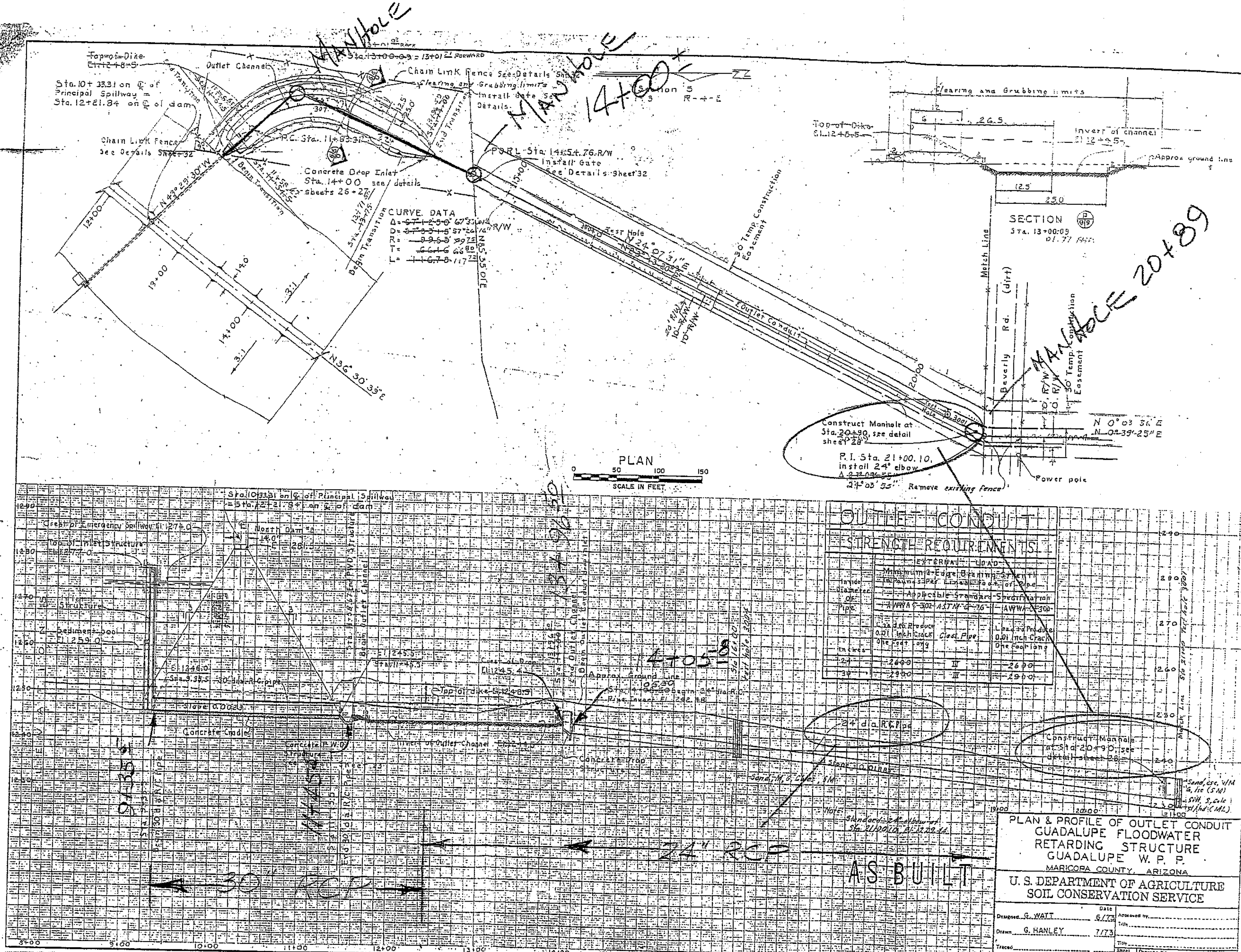


DETAIL B 15 15



SECTION B 15 15

SHEET 15



OUTLET CONDUIT STRENGTH REQUIREMENTS

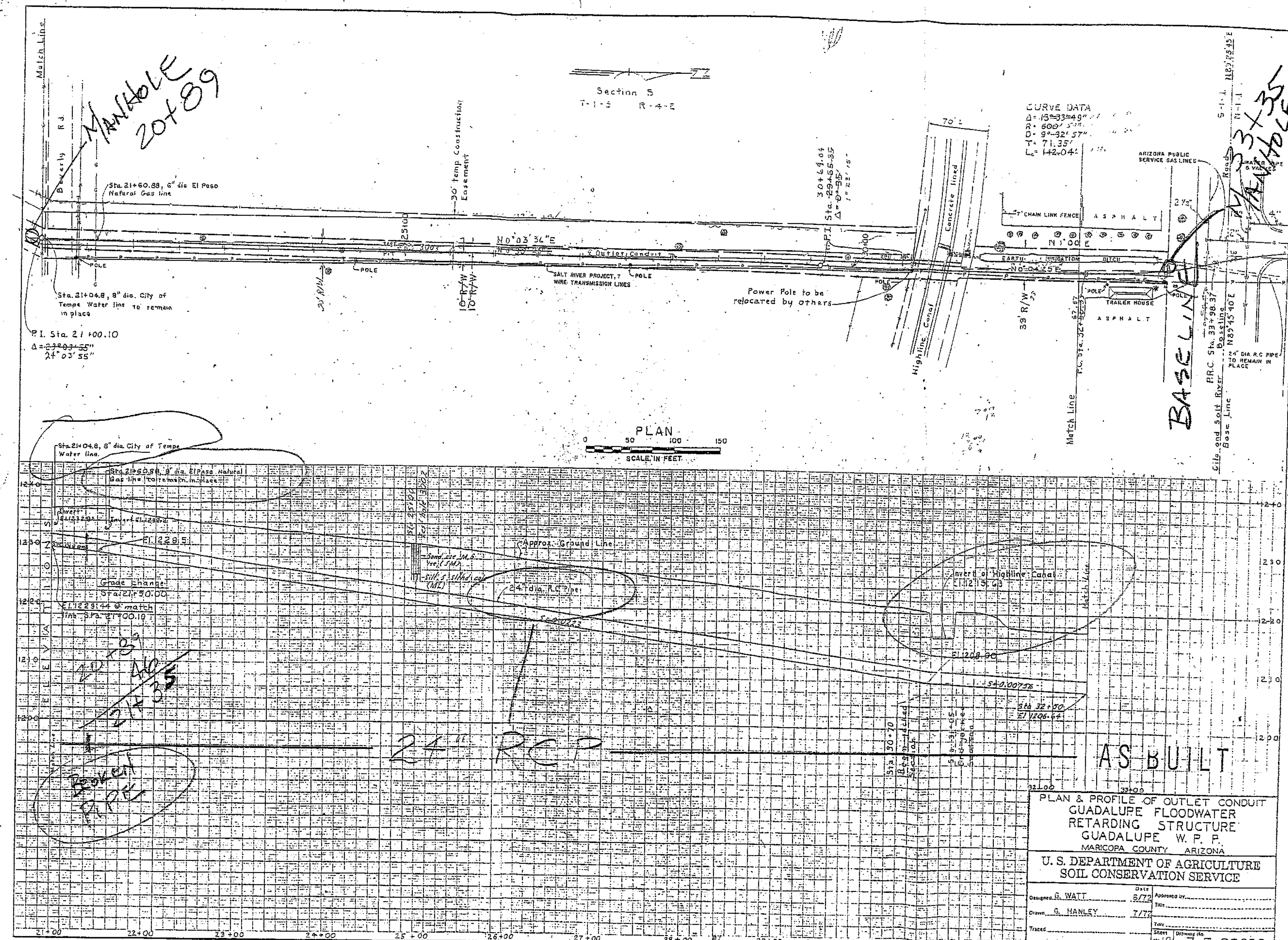
Inside Diameter of Pipe	External Load — Minimum 3-Edge Bearing Strength in Pounds per Lineal Foot of Pipe — Applicable Standard Specification		
	AWWA C-302	ASTM C-76	AWWA C-300
Inches	Load to Produce 0.01 Inch Crack One Foot Long	Class Pipe	Load to Produce 0.01 Inch Crack One Foot Long
24	2600	III	2600
30	2900	III	2900

PLAN & PROFILE OF OUTLET CONDUIT
GUADALUPE FLOODWATER
RETARDING STRUCTURE
GUADALUPE W. P. P.
MARICOPA COUNTY, ARIZONA

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed G. WATT	Date 6/73	Approved by
Drawn G. HANLEY	7/73	Title
Traced		Title
Checked J.L.S., P.J.M., HWF	11/73	Sheet No. 9 of 38 — Drawing No. 7-E-22659

FORM SCS - 317 (NOV. 1966)

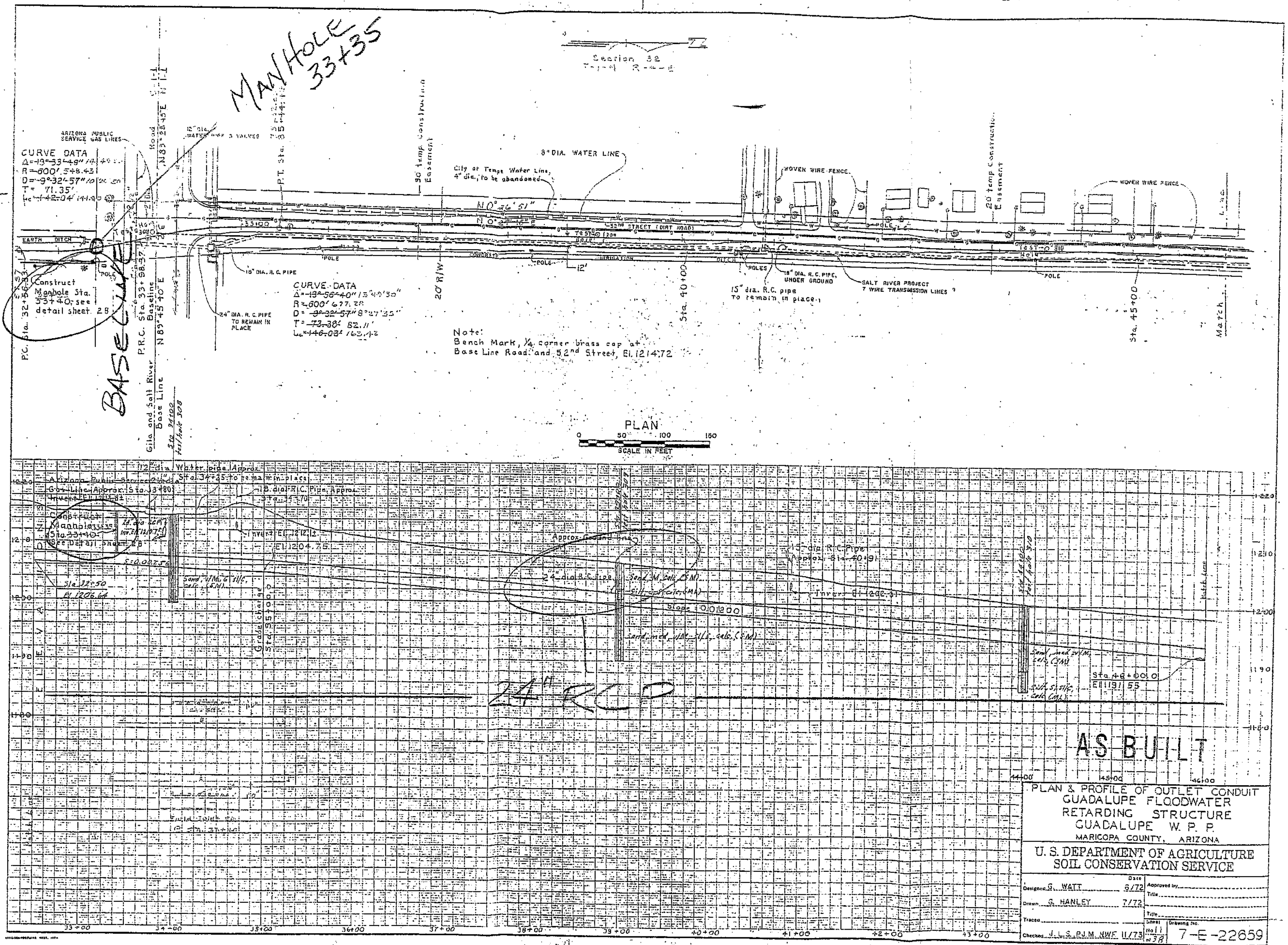


MANHOLE 20+89
Match Line
Beverly Rd.
Section 5
T-1-S R-4-E
30' temp Construction Easement
Sta. 21+60.88, 6" dia El Paso Natural Gas line
Sta. 21+04.8, 8" dia. City of Tempe Water line to remain in place
P.I. Sta. 21+00.10
Δ= 24°03'55"
POLE
N 0°03'34" E
℄ Outlet Conduit
SALT RIVER PROJECT, 7 WIRE TRANSMISSION LINES
10' R/W
30' R/W
Power Pole to be relocated by others
P.I. Sta. 30+64.04
Highline Canal
Concrete lined
70'
CURVE DATA
Δ= 13°33'49"
R= 600'
D= 9°32'57"
T= 71.35'
Lc= 142.04'
ARIZONA PUBLIC SERVICE GAS LINES
7' CHAIN LINK FENCE
ASPHALT
N 1°00' E
EARTH IRRIGATION DITCH
N 0°04'25" E
TRAILER HOUSE
33' R/W
Match Line
BASE LINE
MANHOLE 33+35
P.R.C. Sta. 33+98.37
Gila and Salt River Base Line
N 89°45'40" E
24" DIA R.C. PIPE TO REMAIN IN PLACE
PLAN
SCALE IN FEET
0 50 100 150
Sta. 21+04.8, 8" dia. City of Tempe Water line.
Sta. 21+60.88, 6" dia. El Paso Natural Gas line to remain in place
Invert El. 1232.9
Invert El. 1233.0
El. 1229.5
Approx. Ground Line
Grade Change Sta. 21+50.00
El. 1229.44 @ match line Sta. 21+00.10
24" dia. R.C. Pipe
S= 0.0223
Sand, silt (M.L.)
Invert of Highline Canal El. 1215.63
El. 1208.90
S= 0.00756
Sta. 32+50 El. 1206.64
Sta. 30+70
24" RCP
AS BUILT
BROKEN PIPE
21+00 22+00 23+00 24+00 25+00 26+00 27+00 28+00 29+00 30+00 31+00 32+00 33+00
1240 1230 1220 1210 1200
ELEVATIONS

PLAN & PROFILE OF OUTLET CONDUIT
GUADALUPE FLOODWATER RETARDING STRUCTURE
GUADALUPE W. P. P.
MARICOPA COUNTY ARIZONA

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

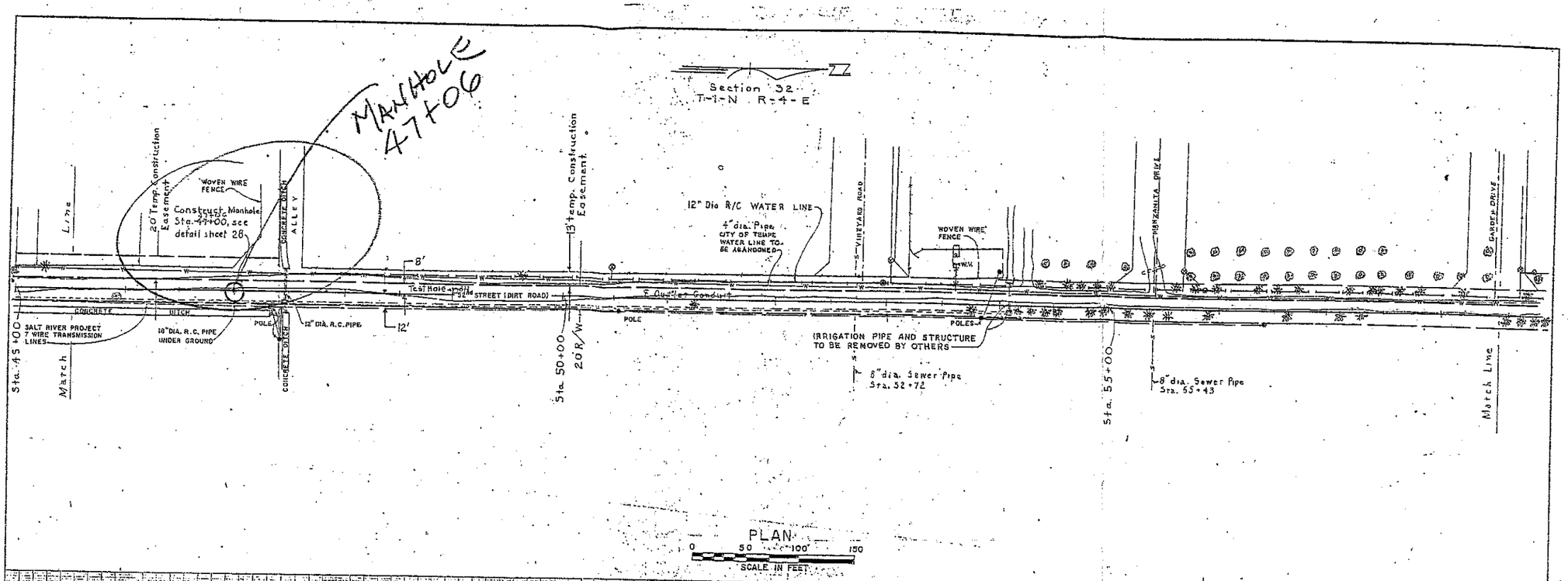
Designed G. WATT	6/72	Approved by
Drawn G. HANLEY	7/72	Title
Traced		
Checked J.L.S. P.J.M. HWF	11/73	Sheet No. 10 of 38 — Drawing No. 7-E-22659



PLAN & PROFILE OF OUTLET CONDUIT
GUADALUPE FLOODWATER
RETARDING STRUCTURE
GUADALUPE W. P. P.
MARICOPA COUNTY, ARIZONA

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

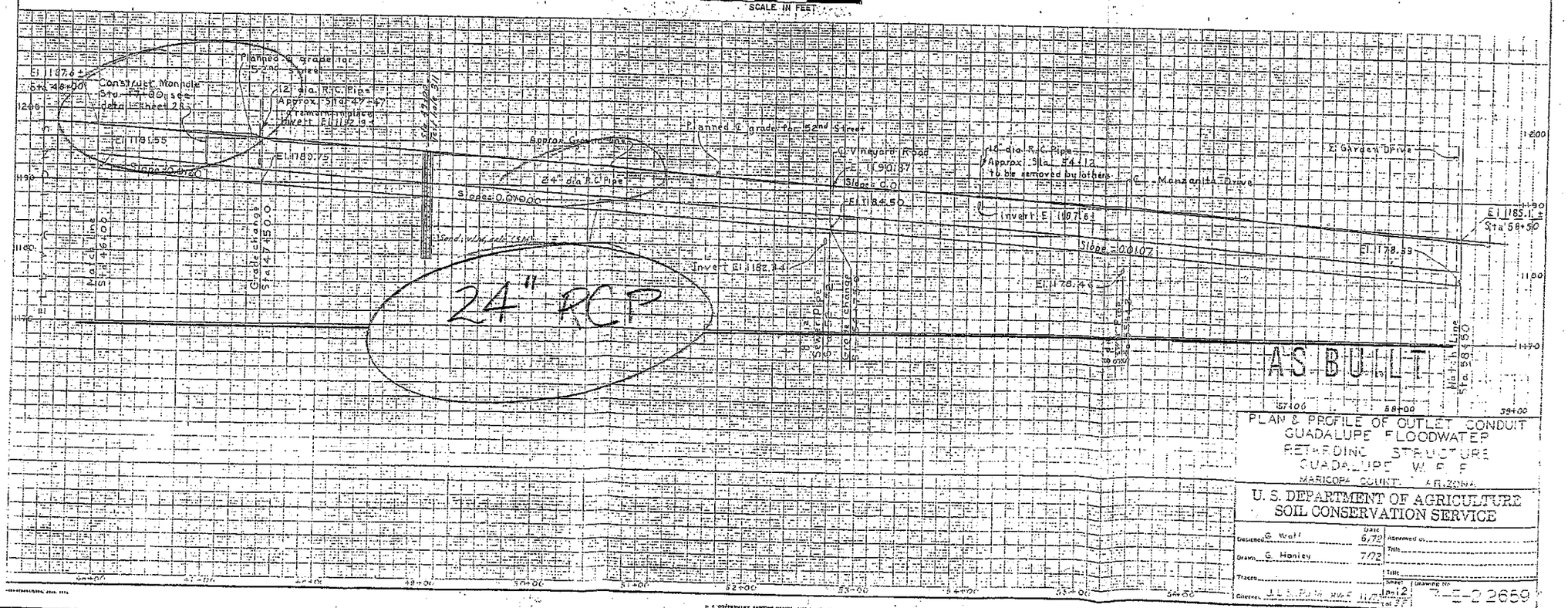
Designed G. WATT	Date 6/72	Approved by
Drawn G. HANLEY	7/72	Title
Traced		Title
Checked J.L.S. RJM. NWF	11/73	Sheet No. 11 of 38 · Drawing No. 7-E-22659



PLAN

0 50 100 150

SCALE IN FEET



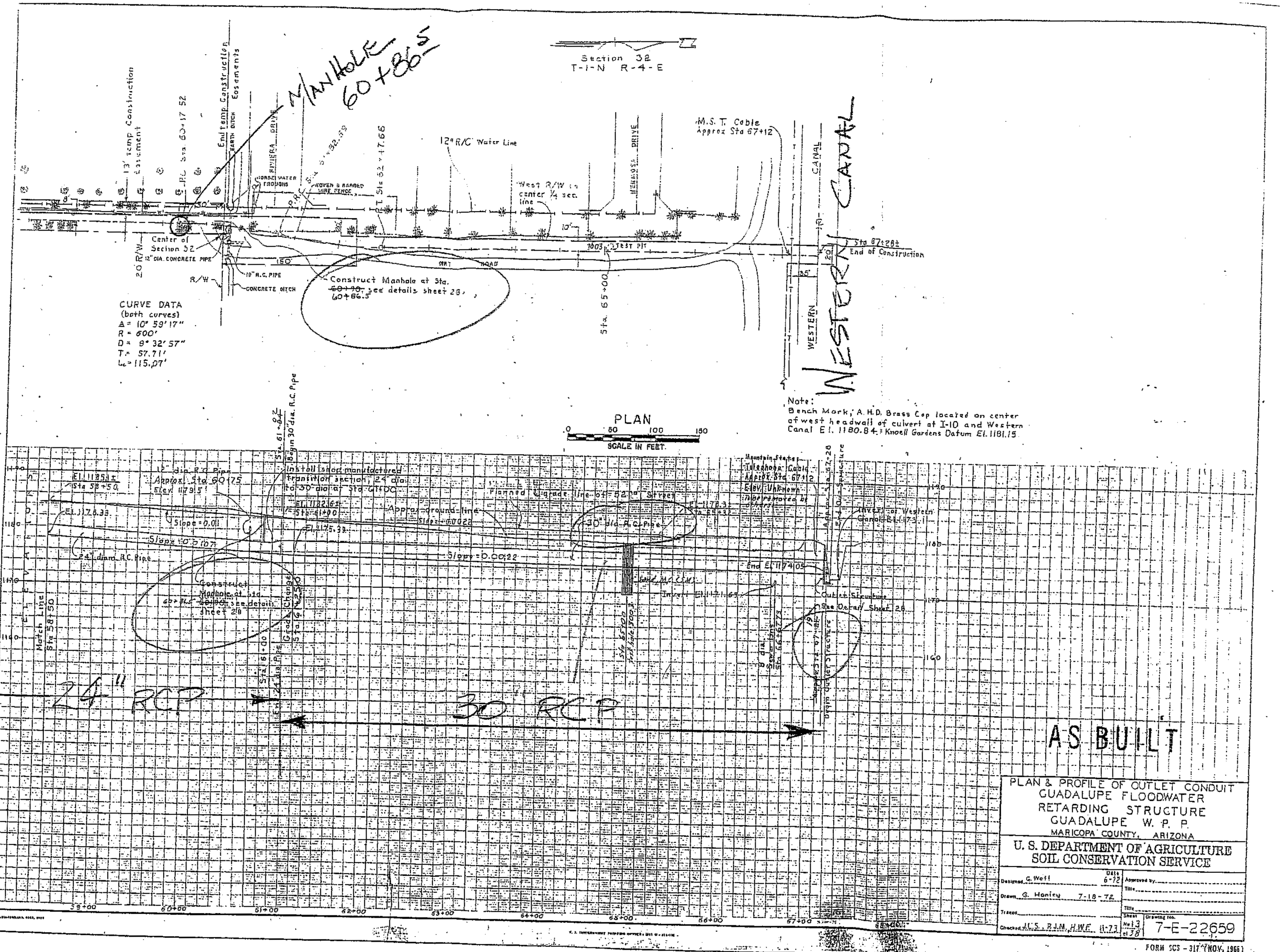
PLAN & PROFILE OF OUTLET CONDUIT
GUADALUPE FLOODWATER
RETARDING STRUCTURE
GUADALUPE W.R.S.
MARICOPA COUNTY, ARIZONA

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed	C. Wolf	Date 6/72	Approved by
Drawn	G. Hanley	7/72	Title
Traced			Title
Checked	J. L. Pyle		Sheet 12 of 12 sheets

Drawing No. 7-E-2669

FORM SCS - 317 (NOV. 1968)



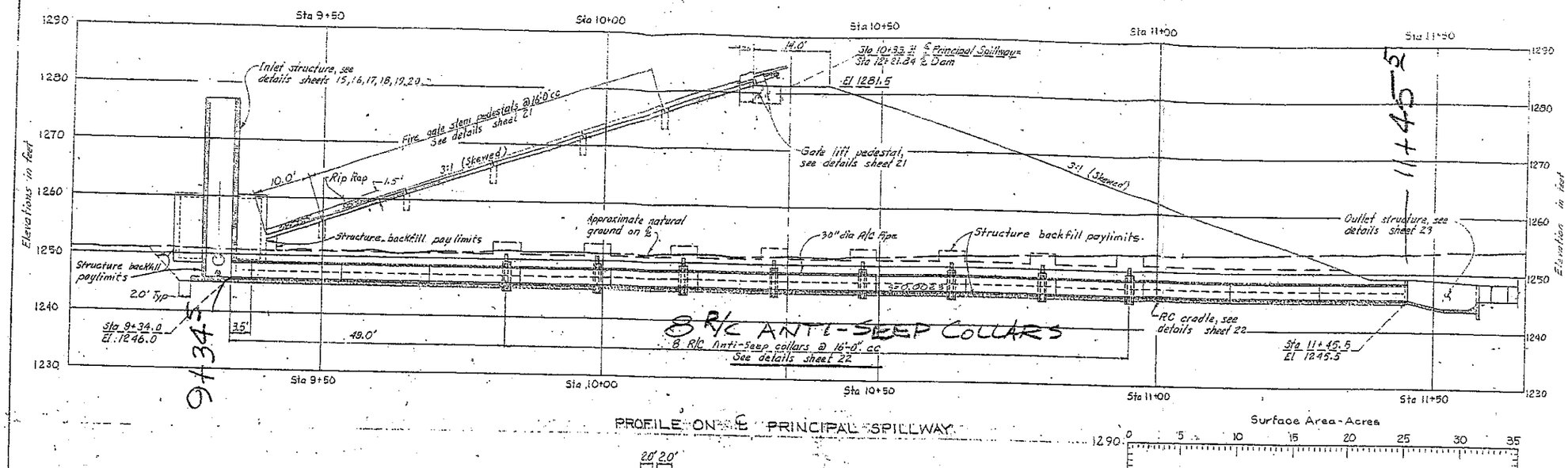
MANHOLE 60+86.5
Section 32
T-1-N R-4-E
13' temp Construction Easement
End temp Construction Easements
12" R/C Water Line
M.S.T. Cable
Approx Sta 67+12
West R/W is center 1/4 sec. line
Center of Section 32
12" DIA. CONCRETE PIPE
18" R.C. PIPE
CONCRETE DITCH
Construct Manhole at Sta. 60+86.5 see details sheet 28
Sta 65+00
Sta 67+28±
End of Construction
WESTERN CANAL
CURVE DATA
(both curves)
Δ = 10° 59' 17"
R = 600'
D = 9° 32' 57"
T = 57.71'
L = 115.07'
PLAN
SCALE IN FEET
Note:
Bench Mark, A.H.D. Brass Cap located on center of west headwall of culvert at I-10 and Western Canal El. 1180.84± Knoell Gardens Datum El. 1181.15
24" dia. R.C. Pipe
Slope = 0.0107
Slope = 0.0022
30" dia. R.C. Pipe
Approx ground line
Planned grade line of 52nd Street
Construct Manhole at sta. 60+86.5 see detail sheet 28
Outlet Structure See Detail Sheet 28
Match Line Sta 58+50
24" RCP
30" RCP
AS BUILT

PLAN & PROFILE OF OUTLET CONDUIT
GUADALUPE FLOODWATER
RETARDING STRUCTURE
GUADALUPE W. P. P.
MARICOPA COUNTY, ARIZONA

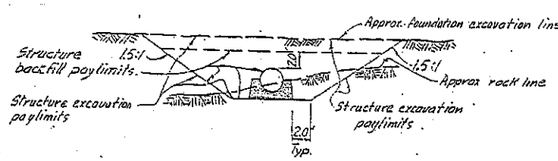
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed G. Wolf 6-72
Drawn G. Hanley 7-18-72
Checked J.C.S., R.J.M., H.W.F. 11-73
Sheet 13 of 38
Drawing No. 7-E-22659

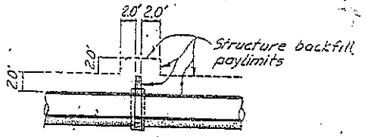
FORM SCS-317 (NOV. 1966)



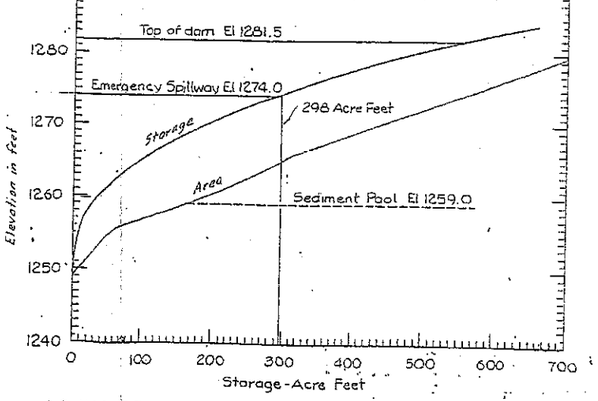
PROFILE ON ℄ PRINCIPAL SPILLWAY



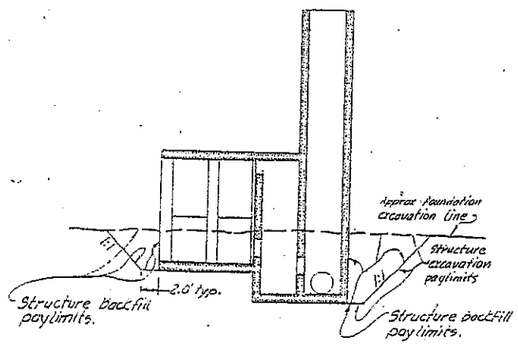
TYPICAL CRADLE



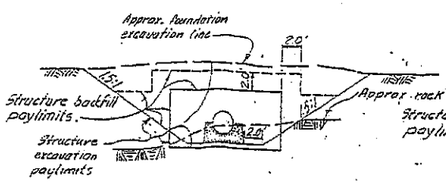
PROFILE CUTOFF COLLAR



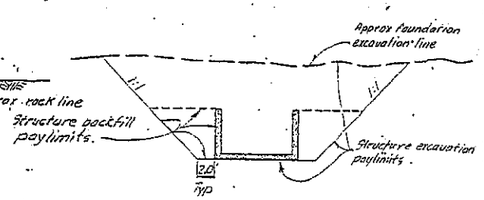
ADJUSTED SURFACE AREA & STORAGE CURVES



INLET STRUCTURE



CROSS SECTION CUTOFF COLLAR



PRINCIPAL SPILLWAY OUTLET STRUCTURE

EXCAVATION AND STRUCTURE BACKFILL PAYLIMITS

SCALE 10 5 0 10 20 IN FEET

AS BUILT

PROFILE ON ℄ PRINCIPAL SPILLWAY AND PAYLIMITS
GUADALUPE FLOODWATER RETARDING STRUCTURE
GUADALUPE W.P.P.
MARICOPA COUNTY, ARIZONA

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

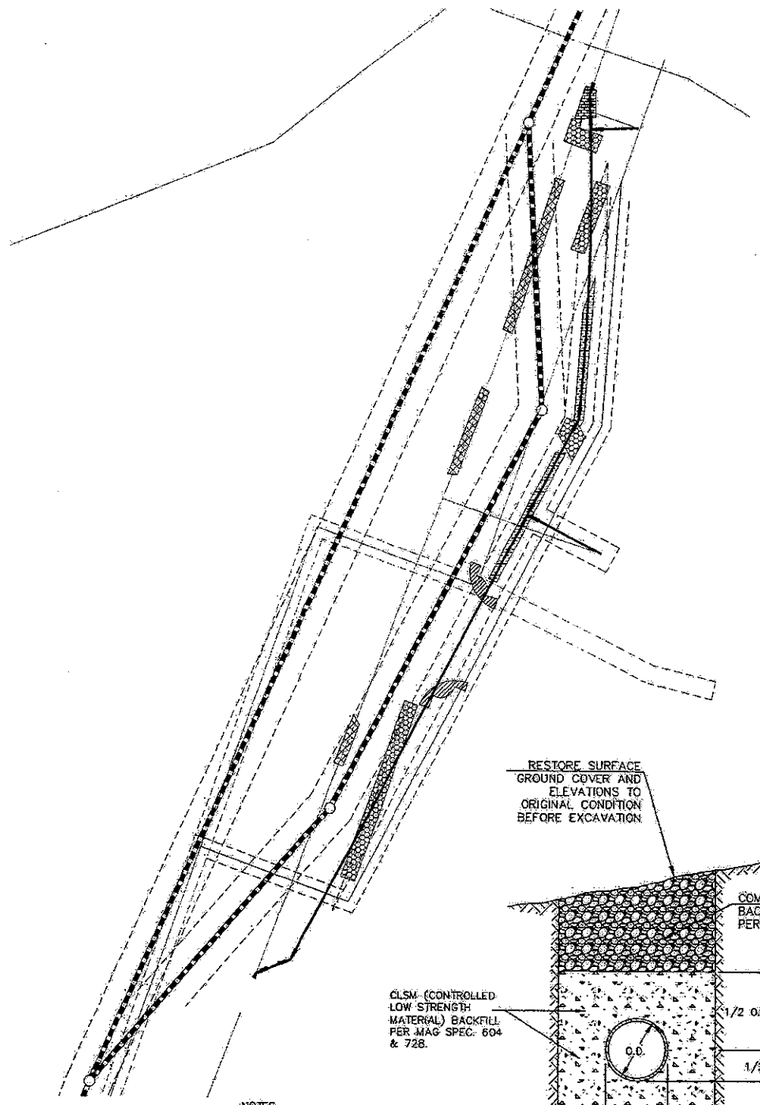
	Date		
Designed W.H. ERION	2-73	Approved by	
Drawn J.D. LAND	10-73	Title	
Traced		Title	
Checked H.W.F.	5-74	Sheet No. 14 of 52	Drawing No. 7-E-22659

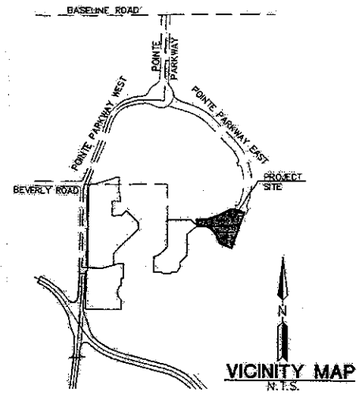
SCS-ENG. 111-1 Rev. 7-69

GUADALUPE DAM OUTLET STORM DRAIN PLAN FOR

LOBBY AT POINTE SOUTH MOUNTAIN

A PORTION OF THE NORTH HALF OF SECTION 5, TOWNSHIP 1 SOUTH, RANGE 4 EAST, OF THE GILA AND SALT RIVER MERIDIAN, MARICOPA COUNTY, ARIZONA





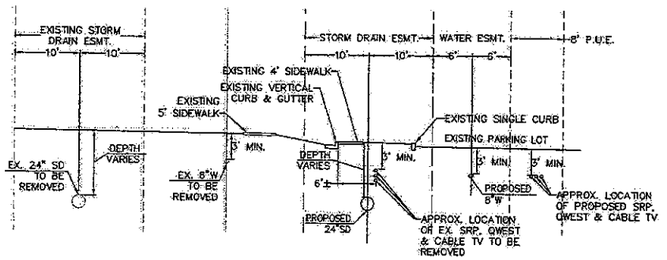
VICINITY MAP
N.T.S.

GENERAL CONSTRUCTION NOTES

1. A PRECONSTRUCTION MEETING WILL BE HELD PRIOR TO THE START OF ANY WORK ON THE DAM OUTLET STRUCTURE. FCDMC AND ADWR SHALL BE INVITED TO SUCH MEETING.
2. ADWR AND THE FCDMC WILL BE GIVEN OPPORTUNITY TO CONDUCT INSPECTIONS AT THE FOLLOWING PHASES OF CONSTRUCTION:
   a) TRENCH INSPECTION PRIOR TO PLACEMENT OF PIPE.
   b) AFTER PLACEMENT OF PIPE BUT BEFORE PLACEMENT OF CLSM.
   c) DURING THE PIPE LEAKAGE TESTING.
   d) DURING PLACEMENT OF CLSM BACKFILL.
   e) DURING SOIL BACKFILLING.
   f) DURING FINAL TIE-IN AND REMOVAL OF EXISTING PIPE.
3. NOTIFY THE DISTRICT'S CONSTRUCTION AND MAINTENANCE DIVISION AT (602) 506-1501 AT LEAST 48 HOURS PRIOR TO ANY WORK TO BE PERFORMED IN THE DISTRICTS RIGHT-OF-WAY.
4. CONCRETE AND SOILS TESTING WILL BE REPORTED WEEKLY TO FCDMC AND ADWR.
5. ACCESS OF FCDMC MAINTENANCE STAFF WILL NOT BE BLOCKED FOR MORE THAN 24 HOURS. IN THE EVENT OF A FLOOD EMERGENCY, THE CONTRACTOR MUST RESTORE ACCESS IMMEDIATELY.
6. ALL CONSTRUCTION WITHIN DISTRICT RIGHTS-OF-WAY AND/OR JURISDICTION SHALL CONFORM TO THE LATEST MAG SPECIFICATIONS.
7. CONTRACTOR PERFORMING EXCAVATION OPERATIONS IS RESPONSIBLE FOR LOCATING AND PROTECTING ALL UNDERGROUND FACILITIES.
8. ALL COMPACTION AND BACKFILL WITHIN DISTRICT RIGHT-OF-WAY SHALL CONFORM TO THE LATEST MAG SPECIFICATIONS UNLESS STIPULATED OTHERWISE IN THE DISTRICT'S PERMIT.
9. ANY DAMAGE TO FCD STRUCTURES, EQUIPMENT, MATERIALS, VEGETATION AND/OR PROPERTY SHALL BE REPLACED AND/OR REPAIRED IN-KIND TO THE SATISFACTION OF THE FLOOD CONTROL DISTRICT OF MARICOPA COUNTY.
10. OTHER UTILITIES ENCOUNTERED DURING EXCAVATION WILL BE CAREFULLY EXPOSED REBURIED IF POSSIBLE. DAMAGED UTILITIES WILL BE REPAIRED, REROUTED OR REPLACED AS NECESARY AND REBURIED. IN THE EVENT THE MITIGATION OF ANOTHER UTILITY IS WITHIN THE DAM, FCDMC AND ADWR APPROVAL MUST BE OBTAINED FOR THAT WORK.

STORM DRAIN QUANTITIES

INSTALL 24" RGRCP CLASS IV.	478	LF
INSTALL 42" STORM DRAIN MANHOLE PER MAG STD. DETAIL 520 & 522.	3	EA
REMOVE EXISTING 24" STORM DRAIN PIPE.	457	LF
REMOVE AND RELOCATE EXISTING TREES AWAY FROM EXCAVATION.	6	EA
SAWCUT, REMOVE AND REPLACE CONCRETE TO MATCH IN KIND.	147	SY
REMOVE EXISTING STRUCTURE/LANDSCAPE FEATURE.		
STORM DRAIN CONNECTION TO EXISTING MANHOLE.	1	EA



A SECTION A
SCALE: 1"=10'

NOTES
1) WATER CONSOLIDATION WILL NOT BE ALLOWED FOR BACKFILL MATERIAL.
2) 1/2 SACK MIX WILL BE SATISFACTORY FOR CLSM.
3) THE PIPE SHALL BE SET ON CONCRETE BLOCKS OR PLASTIC PIPE SUPPORTS TO LINE AND GRADE.

TRENCH BEDDING AND BACKFILL DETAIL FOR STORM DRAIN
N.T.S.

ENGINEER

CMX, L.L.C.
7740 NORTH 16TH STREET, SUITE 100
PHOENIX, ARIZONA 85020
PHONE: (602) 567-1900
FAX: (602) 567-1901
PROJECT ENGINEER: GREGORY B. SMITH, PE/PS
AZ. REG. NO. 13085

OWNER/DEVELOPER

POINTE AT SOUTH MOUNTAIN RESORT, L.L.C.
3101 N. CENTRAL AVENUE, SUITE 1390
PHOENIX, AZ 85012
PHONE: (602) 385-3511
CONTACT: STANLEY GRAY
EMAIL: SGRAY@GROSSMANCOMPANY.COM

AS-BUILT CERTIFICATION

I HEREBY CERTIFY THAT THE "RECORD DRAWING" MESUREMENTS AS SHOWN HEREON WERE MADE UNDER MY SUPERVISION OR AS NOTED AND ARE CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF."

REGISTERED ENGINEER/ LAND SURVEYOR — DATE

REGISTRATION NUMBER

ADWR APPROVAL:

BENCHMARK

BRASS CAP IN HAND HOLE
LOCATED AT THE INTERSECTION
OF 48TH STREET AND BASELINE ROAD;
ELEVATION= 1211.286'
COP DATUM (NAVD 29)

LEGAL DESCRIPTION

LOT 4 OF "VILLAS AT POINTE SOUTH MOUNTAIN" AS RECORDED IN BOOK 897, PAGE 38, M.C.R.

CALL TWO WORKING DAYS BEFORE YOU DIG
602-263-1100
1-800-STAKE-IT
(ARIZONA BLUE STAKE, INC.)

SHEET INDEX

CMX
PHOENIX OFFICE
7740 NORTH 16TH STREET, SUITE 100
PHOENIX, ARIZONA 85020
PH (602) 567-1900
FAX (602) 567-1901
WWW.CMXLTD.COM
CIVIL ENGINEERING • CONSTRUCTION MANAGEMENT • PLANNING • SURVEY • SPORTS • WATER RESOURCES

POINTE SOUTH MOUNTAIN
LOBBY
PHOENIX, ARIZONA

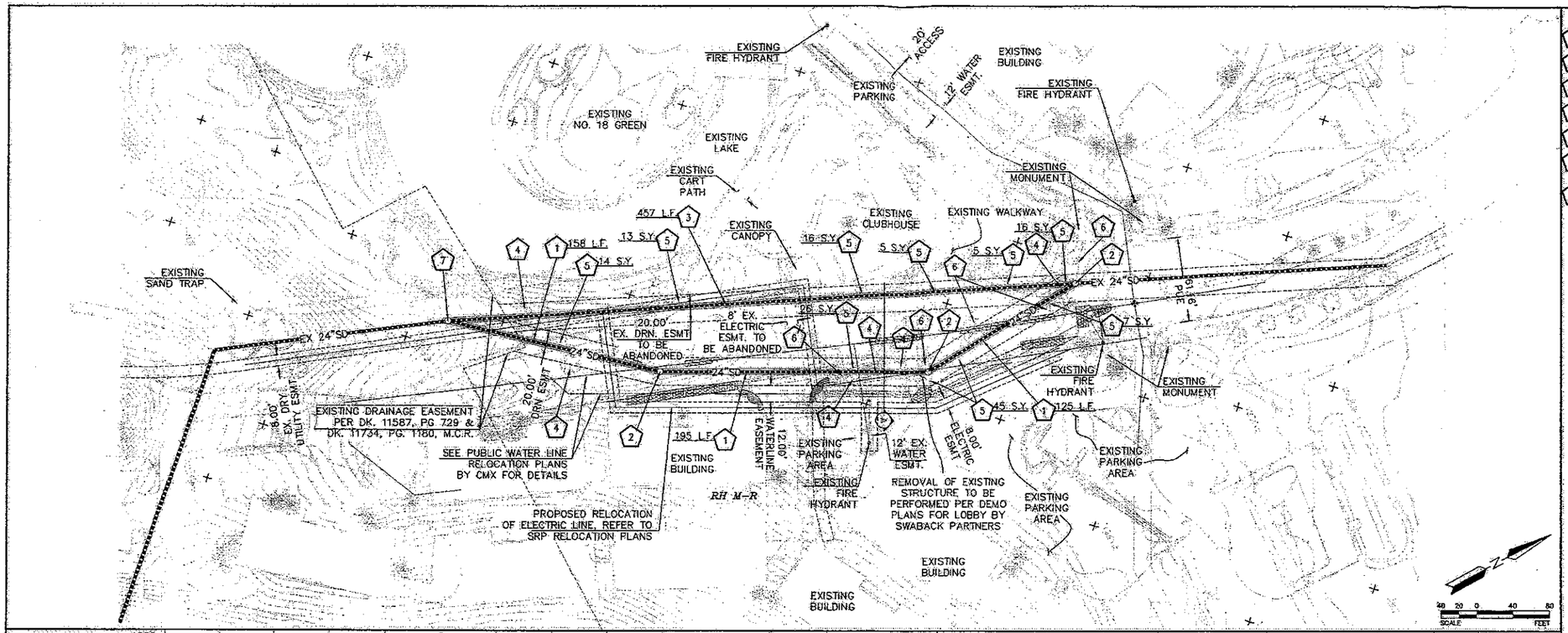
OUTLET STORM DRAIN COVER SHEET

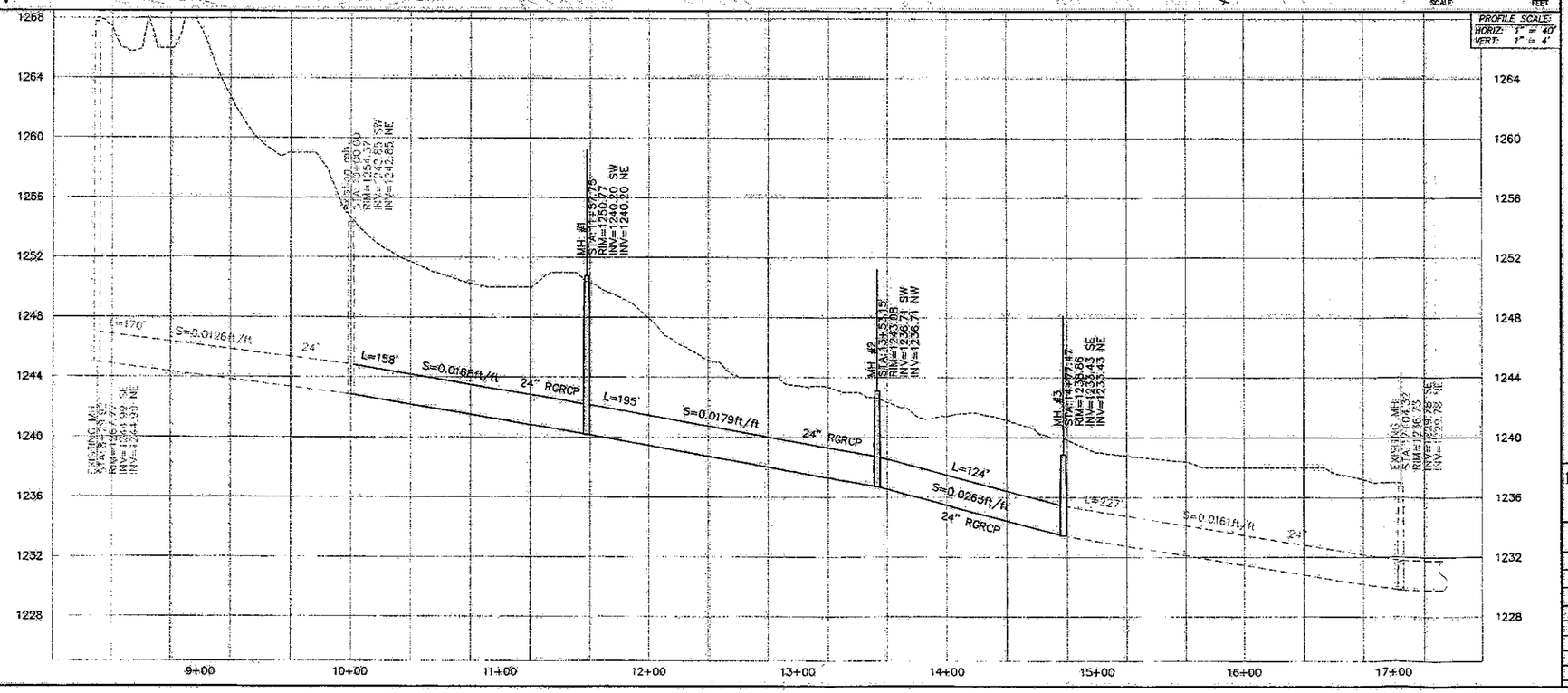
CMX PROJ: 7434	DATE: MAY 2007
DESIGNED: JP	DRAWN: JAL
REV:	APPROVED: GBS

SCALE: N.T.S.

DWG. NO. SD01

SHT. 1 OF 2





STORM DRAIN NOTES

1	INSTALL 24" RGRCP CLASS IV.	478	LF
2	INSTALL 42" STORM DRAIN MANHOLE PER MAG STD. DETAIL 520 & 522.	3	EA
3	REMOVE EXISTING 24" STORM DRAIN PIPE	457	LF
4	REMOVE AND RELOCATE EXISTING TREES AWAY FROM EXCAVATION.	6	EA
5	SAWCUT, REMOVE AND REPLACE CONCRETE TO MATCH IN KIND.	147	SY
6	REMOVE EXISTING STRUCTURE/LANDSCAPE FEATURE.		
7	STORM DRAIN CONNECTION TO EXISTING MANHOLE.	1	EA

NOTE TO CONTRACTOR

NO WORK ON THESE PLANS SHOULD BE PERFORMED IN FIELD BEFORE THE COMPLETION/INSTALLATION OF DRY UTILITIES AND 8" WATERLINE RELOCATION.

CONTRACTOR TO COORDINATE THE STORM DRAIN CHANGE OVER CONNECTION WITH FCDMC & CMX. DISRUPTION OF OUTLET OPERATION DURING CONNECTION TO BE MINIMIZED IN ORDER TO AVOID ANY FLOOD HAZARD.

CONTRACTOR TO ENSURE THAT THE PUBLIC ACCESS TO THE CONSTRUCTION AREA IS RESTRICTED.

CONSTRUCTION SEQUENCE

1. PRECONSTRUCTION MEETING TO BE HELD PRIOR TO THE START OF STORM DRAIN RELOCATION WORK. FCDMC AND ADWR SHALL BE INVITED TO THE MEETING.
2. DEMOLISH EXISTING STRUCTURES, CLEAR AND GRUB DISTURBANCE AREA.
3. RELOCATE DRY UTILITIES PER SRP RELOCATION PLANS.
4. RELOCATE 8" WATERLINE PER CMX WATERLINE RELOCATION PLANS.
5. EXCAVATE STORM DRAIN TRENCH.
6. FCDMC/ADWR INSPECTION BEFORE THE INSTALLATION OF PIPE.
7. INSTALL STORM DRAIN PIPE. PIPE SHALL BE SET ON CONCRETE BLOCKS OR PLASTIC PIPE SUPPORTS TO LINE AND GRADE.
8. FCDMC/ADWR INSPECTION AFTER THE INSTALLATION OF PIPE BUT BEFORE BACKFILLING.
9. PEFROM LEAKAGE TEST ON STORM DRAIN. FCDMC/ADWR SHALL BE PRESENT DURING THE TEST.
10. INSTALL MANHOLES & CONNECT TO EXISTING PIPE/MANHOLE. FCDMC/ADWR SHALL BE INVITED DURING FINAL TIE-IN.
11. FCDMC/ADWR INSPECTION DURING CLSM PLACEMENT.
12. FCDMC/ADWR INSPECTION DURING SOIL BACKFILLING/COMPACTION.
13. REMOVE EXISTING STORM DRAIN. FCDMC/ADWR SHALL BE INVITED DURING REMOVAL.
14. RESTORE GROUND SURFACE AND CONCRETE WALKS.
15. REPLACE LANDSCAPING.
16. FINAL INSPECTION BY FCDMC/ADWR.

CALL TWO WORKING DAYS BEFORE YOU DIG 602-263-1100 1-800-STAKE-IT (OUTSIDE MARICOPA COUNTY)

POINTE SOUTH MOUNTAIN
THE LOBBY
PHOENIX, ARIZONA

GUADALUPE DAM OUTLET STORM DRAIN

CMX PROJ. 7434.02		
DATE: MAY. 2007		
SCALE: 1"=20'		
DESIGNED: JP	DRAWN: JAL	APPROVED: GBS
REV.		DWG. NO. SD02
		SHT. 2 OF 2

SPECIFICATIONS

GUADALUPE FLOODWATER RETARDING STRUCTURE

ALTERATION OF OUTLET STORM DRAIN PIPE

CONSTRUCTION SPECIFICATIONS

Prepared by:

CMX
7740 North 16th Street
Phoenix, AZ 85020

Prepared for:

Pointe at South Mountain Resort L.L.C.
3101 N. Central Avenue, Suite 1390
Phoenix, AZ 85012

And
Flood Control District
Of
Maricopa County

February 2007

Construction Specifications

1. CONSTRUCTION SPECIFICATIONS

All construction associated with outlet relocation should follow the latest MAG Specifications. Payment plan specified in each section is hereby void. Refer to the Construction Quality Assurance (CQA) Plan for the testing and monitoring procedures. In addition to the MAG Specification following Special Provisions apply to the project.

2. SPECIAL PROVISIONS

2.1 PRESSURE TESTING

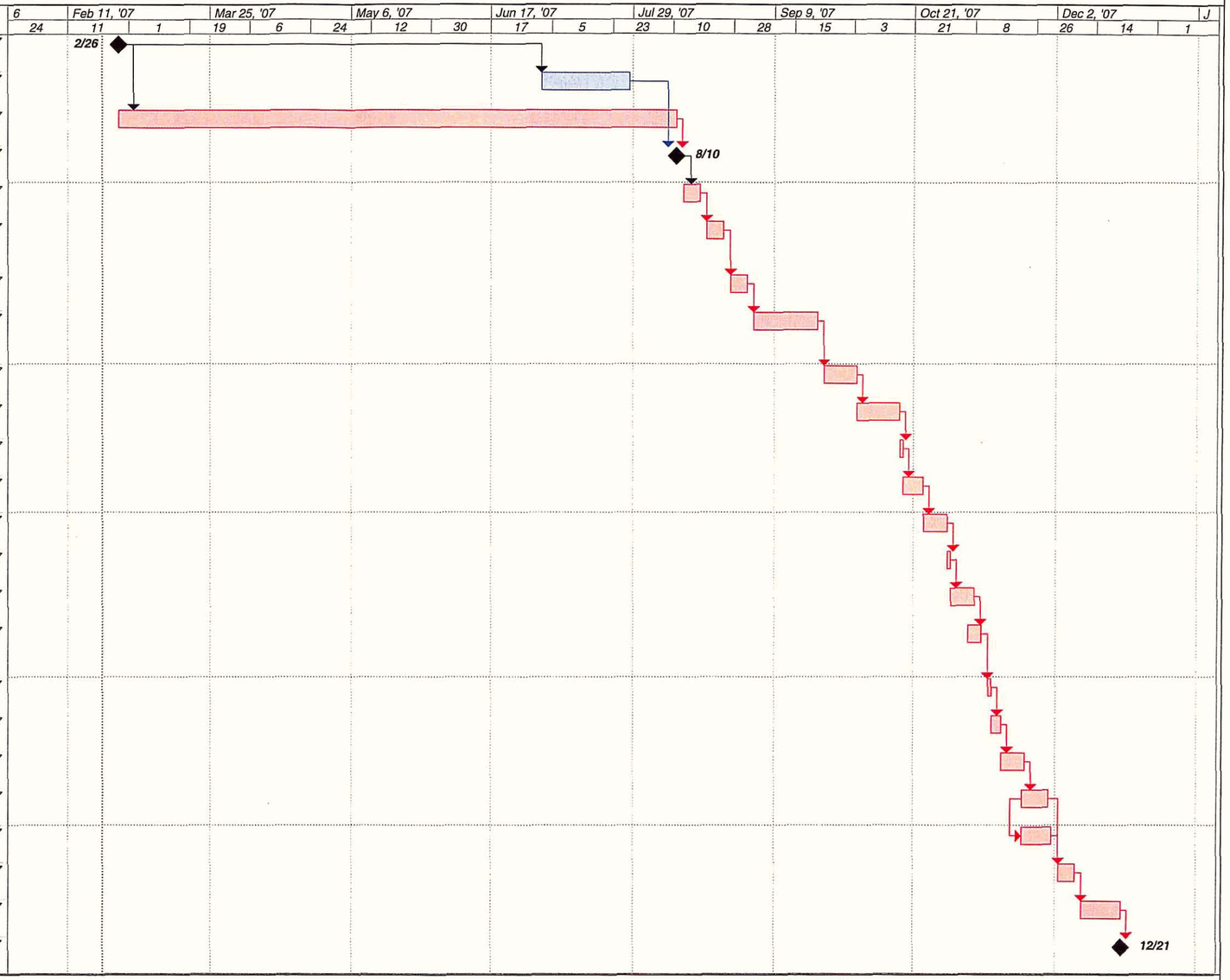
Before placing any concrete or earthfill around the conduit or filling the pipe joints, the conduit shall be tested for leaks in the following manner:

The ends of the conduits shall be plugged and a standpipe with a minimum diameter of 2 inches shall be attached to the upstream plug. The conduit shall be braced at each end to prevent slippage. The conduit and the standpipe shall be filled with water. The water level in the standpipe shall be maintained at least 10 feet above the invert of the upstream end of the conduit for at least 2 hours. Any leaks shall be repaired, and the conduit shall be tested again as described. The procedure shall be repeated until the conduit is watertight. The pipe joints shall show no leakage. Damp spots developing on the surface of the pipe are not considered as leakage.

PROPOSED CONSTRUCTION SCHEDULE

Pointe at South Mountain Preliminary Schedule

ID	Task Name	Duration	Start	Finish
1	Project Start	0 days	Mon 2/26/07	Mon 2/26/07
2	Bidding and Selection	20 days	Mon 7/2/07	Fri 7/27/07
3	Finalize Permits	120 days	Mon 2/26/07	Fri 8/10/07
4	Notice to Proceed	0 days	Fri 8/10/07	Fri 8/10/07
5	Mobilization	5 days	Mon 8/13/07	Fri 8/17/07
6	Demo. Existing Structures+Clear and Grub	5 days	Mon 8/20/07	Fri 8/24/07
7	Install Dry Utility Conduit	5 days	Mon 8/27/07	Fri 8/31/07
8	Connect to Existing Dry Utilities (By utility Company)	15 days	Mon 9/3/07	Fri 9/21/07
9	Remove Existing Dry Utilities	8 days	Mon 9/24/07	Wed 10/3/07
10	Install Waterline	9 days	Thu 10/4/07	Tue 10/16/07
11	Tap Into Existing Waterline	1 day	Wed 10/17/07	Wed 10/17/07
12	Remove Existing Waterline	4 days	Thu 10/18/07	Tue 10/23/07
13	Excavate Storm Drain Trench	5 days	Wed 10/24/07	Tue 10/30/07
14	FCD/ADWR Inspection	1 day	Wed 10/31/07	Wed 10/31/07
15	Install Storm Drain	5 days	Thu 11/1/07	Wed 11/7/07
16	Install Manholes & Connect to Existing	4 days	Tue 11/6/07	Fri 11/9/07
17	FCD/ADWR Inspection	1 day	Mon 11/12/07	Mon 11/12/07
18	Backfill/Compaction	3 days	Tue 11/13/07	Thu 11/15/07
19	Remove Existing Storm Drain	5 days	Fri 11/16/07	Thu 11/22/07
20	Replace Asphalt and Concrete	6 days	Thu 11/22/07	Thu 11/29/07
21	Replace Misc. Structures	7 days	Thu 11/22/07	Fri 11/30/07
22	Replace Landscaping	5 days	Mon 12/3/07	Fri 12/7/07
23	Punch List/Final Inspection	10 days	Mon 12/10/07	Fri 12/21/07
24	Project Finished	0 days	Fri 12/21/07	Fri 12/21/07



Project: Pointe SM Schedule (Prelimir
Date: Wed 2/21/07

Task
Project Guide: Critical Task
Split
Progress
Milestone
Summary
Project Summary
External Tasks
External Milestone
Deadline

CONSTRUCTION QUALITY ASSURANCE PLAN

GUADALUPE FLOODWATER RETARDING STRUCTURE

ALTERATION OF OUTLET STORM DRAIN PIPE

CONSTRUCTION QUALITY ASSURANCE (CQA) PLAN

Prepared by:

CMX
7740 North 16th Street
Phoenix, AZ 85020

Prepared for:

Pointe at South Mountain Resort L.L.C.
3101 N. Central Avenue, Suite 1390
Phoenix, AZ 85012

And
Flood Control District
Of
Maricopa County

Revised: May 2007
February 2007

Construction Quality Assurance Plan

1. INTRODUCTION

This Construction Quality Assurance (CQA) Plan describes the procedures for monitoring the alteration of outlet storm drain pipe for the Guadalupe Floodwater Retarding Structure (GFRS). Preparation of this plan has been under the direction of a registered civil engineer. The CQA plan outlines the specific testing and monitoring procedures required to demonstrate that this project is constructed in accordance with approved plans and specifications. COQ Plan Sample by Ninyo & Moore was used for the preparation of this document.

2. PURPOSE AND SCOPE

This CQA plan details the following:

- Delineation of authority, responsibilities and qualifications
- Field and laboratory testing requirements
- Project meetings
- Construction inspection and testing activities
- Project tolerances and acceptance and rejection criteria
- Dam monitoring and documentation requirements
- Daily, monthly, acceptance and final documentation

This plan will assist in identifying problems that may occur during construction and provide procedures for solving these problems prior to construction completion. At completion of the work, a final certification will be prepared by the Engineer of Record documenting that the materials and construction processes complied with the approved Contract Documents.

3. DELINEATION OF AUTHORITY, RESPONSIBILITIES AND QUALIFICATIONS

3.1 Engineer of Record

The Engineer of Record will have formal academic training in engineering, engineering geology or a closely related discipline and will be a registered Professional Engineer in the State of Arizona. The Engineer of Record must be able to communicate effectively with the Design Engineer, the Contractor, and CQA inspection personnel to facilitate a clear understanding of the construction activities and CQA plan. The Engineer of Record will have direct knowledge of the design philosophies of the project.

3.2 Duties and Responsibilities of the Engineer of Record

- Review of all design plans, reports and specifications.
- Review and interpret data and reports prepared by CQA inspection personnel.
- Identify and recommend work that should be either accepted or rejected based on observations and/or test results.
- Request special testing and inspection of materials for approval in areas of questionable quality or deviation from the approved design.

The Engineer of Record will be Gregory B. Smith, PE/PS.

3.3 Design Engineer

The Design Engineer will have formal academic training in engineering, civil/sanitary system design or a closely related discipline and will be a registered Professional Engineer in the State of Arizona. The Design Engineer will have practical technical and managerial experience to properly implement the CQA plan. The Design Engineer must be able to communicate effectively with the Engineer of Record, the Contractor, and CQA inspection personnel to facilitate a clear understanding of the construction activities and the CQA plan. The Design Engineer will have direct knowledge of the design philosophies of the project. The Design Engineer will be responsible for monitoring the implementation of the plan and for inspection, construction observation, sampling, and testing, and shall assist the Engineer of Record in the implementation of the CQA plan.

3.4 Duties and Responsibilities of the Design Engineer

- Review all design plans, reports and specifications.
- Review and interpret data and reports prepared by CQA inspection personnel with the Engineer of Record.
- Educate CQA inspection personnel of CQA requirements and procedures.
- Prepare a schedule of CQA inspection activities with the Engineer of Record and coordinate necessary CQA personnel to conduct inspections.

The Design Engineer will be Gregory B. Smith, PE/PS.

3.5 Contractor

The Contractor shall conduct the work as shown on the Contract Drawings and as indicated in the Contract Specifications. The Contractor shall submit those items as set forth in the Specifications for review by the Engineer.

3.6 Independent Testing Laboratory

The Independent Testing Laboratory will conduct tests as specified by the Contract Documents and the Engineer. The Laboratory shall also furnish a written report of each test to the Engineer for review.

3.7 CQA Inspection Personnel

CQA inspection personnel shall have trailing and practical experience in inspection and testing work similar to this work including record keeping and inspection activities, preparing reports, and conducting field tests. CQA inspection personnel will work under the supervision of the Engineer. Construction practices shall be evaluated by field tests and visual inspections. CQA inspection personnel shall verify that all testing is conducted in accordance with American Society of Testing and Materials (ASTM) and other specified test methods and that the proper test equipment is used. CQA inspection personnel will immediately notify Engineer of failing tests or if poor construction practices are observed. The CQA inspection personnel include:

- Engineer of Record for Site Inspections, Bob Draper, P.E.
- Site Engineer, Chris Bird

- Western Technologies Inc. will perform work as Independent Testing Laboratory under the direction of the Engineer of Record or the Design Engineer.

3.8 Responsible Person

Gregory B. Smith, P.E. has the authority to make decisions on behalf of the owner and direct the work of the contractor.

4. FIELD AND LABORATORY TESTING REQUIREMENTS

4.1 All tests which require the services of a laboratory to determine compliance with the contract document shall be performed by an independent commercial testing laboratory acceptable to the Engineer, and be AASHTO certified. The laboratory shall be staffed with experienced technicians, properly equipped, and fully qualified to perform the tests in accordance with the specified standards.

4.2 The Engineer shall determine the exact time, location, and frequency of field sampling and testing, and may require such additional sampling and testing as necessary to determine that materials and equipments conform with data previously furnished by Contractor and to the Contract Documents, with minimum interference with construction operations. Unless otherwise specified, the Owner shall pay all

charges for initial quality control tests made in the field or laboratory on relative density tests for embankments, and fills during and after the incorporation in the Work. The Contractor shall be responsible for the payment of any additional quality control tests resulting from the failure of the initial tests. See the geotechnical report for the required densities.

4.3 Arrangements for delivery of samples and test specimens to the testing laboratory will be made by the Engineer. The testing laboratory shall perform all laboratory tests within a reasonable time consistent with the specified standards and shall furnish a written report of each test.

4.4 The Contractor shall furnish all sample materials and cooperate in the sampling and field testing activities, interrupting the work when necessary. When sampling or testing activities are performed in the field by the Engineer or testing laboratory personnel, the Contractor shall furnish personnel and facilities to assist in the activities.

4.5 The Contractor shall perform field tests as specified by the Engineer and provide labor, equipment, and incidentals required for testing. The testing shall be overseen and certified by the Engineer. The Contractor shall be able to produce evidence, when required, that each item of work has been constructed properly and in accordance with the drawing and specifications.

5. PROJECT MEETINGS

5.1 Preconstruction Meeting

A preconstruction meeting shall be held prior to the beginning of construction. The Engineer of Record, the Design Engineer, the Contractor, and CQA inspection personnel, shall attend this meeting. Representatives from the Arizona Department of Water Resources (ADWR), the Natural Resources Conservation Service (NRCS), and the Flood Control District of Maricopa County (FCDMC) shall also be invited. The purpose of this meeting is to familiarize the concerned entities with the administrative and construction procedures of the project. The Engineer shall record and distribute minutes of the meeting.

Items of discussion at the Preconstruction Meeting will likely include:

- The CQA plan shall be reviewed to ensure conformance with plans and specifications.
- Responsibilities of each party shall be reviewed and discussed with lines of communication clearly identified.
- Protocol for field observations and field tests shall be explained.
- Protocol for document reporting, handling, distribution and storage during construction shall be explained.

- Protocol for monitoring the soil plug at the end of the carrier pipe during the installation along with the protocol for the removal of obstructions from the carrier pipe shall be explained.
- All aspects of the work, materials testing, and re-testing shall be explained.

5.2 Progress Meeting

Progress meetings shall be held weekly to discuss present and future work, and to discuss any current or potential problems. These meetings shall be attended by the Engineer, Contractor and CQA inspection personnel. Representatives from ADWR, NRCS and FCDMC shall be invited to attend the weekly meetings. The Engineer shall record and distribute minutes of the meetings. Items of discussion will likely include:

- Construction schedule status.
- Critical submittals.
- Coordination issues.
- Change Orders.
- Inspection and QA/QC testing.
- Safety issues.

5.3 Problem or Work Deficiency Meeting

A special meeting may be held if a problem is occurring or appears likely to occur. The Engineer, the Contractor, CQA inspection personnel, and concerned entities shall attend this meeting. Representatives from ADWR, NRCS and FCDMC shall be invited to attend. The Engineer shall record and distribute minutes of the meeting.

6. CONSTRUCTION INSPECTION AND TESTING ACTIVITIES

6.1 General Requirements

6.1.1 Inspection activities shall be performed by the CQA team throughout the construction portion of the project. The Engineer shall conduct preconstruction training and information sessions with the CQA personnel to review the design and inspection policies and procedures.

6.1.2 The Design Engineer, Engineer of Record, a representative of FCDMC, and a representative of ADWR shall make a visual inspection, of the Dam within 50 feet of the centerline of pipe alignment prior to construction. If there are any anomalies identified (cracks, depressions, slides, displacements, etc.), the Contractor must not begin the work until approval to proceed is obtained from ADWR. The Engineer shall provide FCDMC and ADWR with a

written report of the findings and recommendations for the repair of any anomalies, if required. The Engineer/Owner/Contractor shall not be responsible for the cost of any repairs.

6.1.3 CQA inspection personnel shall make a daily visual inspection of the Dam within 50 feet of the centerline of the pipe alignment beginning when the Contractor initiates construction and extends until all construction work (including backfilling of the trench) has been completed. If any of the above-mentioned anomalies are discovered, the Contractor shall stop all work. The Engineer shall evaluate the condition and immediately inform the FCDMC and ADWR of the situation. The Engineer shall provide the FCDMC and ADWR with a written report of the findings and recommendations for the repair of any anomalies, if required. The Contractor must not proceed until ADWR approves the recommendations for repairs, if required and provides approval to proceed with the work.

6.1.4 CQA inspection personnel must be on site full time whenever the Contractor shall be engaged in construction.

6.2 Quality Control for Pipe Installation

6.2.1 The Contractor shall establish and maintain quality control for operations under this section to assure compliance with the contract requirements and maintain records of quality control for materials, equipment, and construction operations including, but not limited to, the following:

6.2.2 Preparatory Inspection

Specific inspections that are to be conducted prior to commencing work include:

- Check pipe for conformance to approved certified tests.
- Check to make sure that there are no mid-seam welds (any mid-seam welds must be certified)
- Check pipe for proper storage and handling.
- Discuss and review pipe installation procedures with the Engineer, including the placement of the pipe, joint preparation and application of each pipe used.

6.2.3 Initial Inspection

Specific inspections that are to be conducted after a representative sample of the work is complete include:

- Check for proper depth and grade of the pipe.

- Check the method of joining segments of pipe.
- Check the pipe for proper alignment.

6.2.4 Final Inspection

Specific inspections that are to be conducted following the storm drain pipe installation include:

- Check the final pipe alignment and grade.
- Perform as-built surveying.
- Perform Leakage Testing.
- Perform final visual inspection.

6.3 Quality Control for Sewer Installation

The MAG Standard Specification Section 105 and 106 shall govern all aspects of quality control work.

6.4 Testing Frequencies for Controlled Low Strength Material (CLSM)

The supplier will need to provide the test data for the compressive strength of CLSM per 50 cubic yard of material supplied for the project.

The contractor will need to perform the compressive strength test on one set of four cylinders per shift of CLSM placement.

6.5 Utility Trench Backfill Compaction Testing

The contractor will need to perform one compaction test per 250 feet per lift.

7. PROJECT TOLERANCES AND ACCEPTANCE AND REJECTION CRITERIA

7.1 General Criteria

The Contractor shall meet the limits and tolerance in the performance of the work as specified in MAG Standard Specification 618.

7.2 Passing Tests

A passing test shall demonstrate that construction meets the requirements set forth in the project specifications. All passing tests shall be reported to the Design Engineer in the form of a written report furnished by the Independent Testing Laboratory to the Design Engineer.

7.3 Failing Tests

If a test result indicates that construction did not conform to the requirements set forth in the project specifications, it shall be deemed as a failing test. All failing tests shall be immediately reported by CQA inspection personnel to the Design Engineer, who shall review the data and determine the extent of the material affected by the failing test. The Design Engineer may require that the failing test be repeated or that the Contractor remove material from the affected area.

8. DAILY, MONTHLY, ACCEPTANCE, AND FINAL DOCUMENTATION

8.1 General

The Contractor shall keep and maintain at the construction site a complete set of field drawings for recording as built conditions. It shall have marked or noted thereon all field information, data, and record the as-built conditions. This set of field drawings shall be kept up to date. Upon completion of this project, these drawings will be stamped and signed by the Engineer as "Record Drawings"

The Contractor shall submit a log of the Construction operations. The Engineer of Record shall verify the completeness of the log. As a minimum, the log shall consist of the following:

- The position of the pipe in relation to the design line and grade.
- The date, starting time and finish time.

8.2 Daily Activity Reports

CQA inspection staff will record daily activity reports. The daily activity reports will be recorded on standard daily report forms. The daily activity reports will record and document all pertinent information including; dates, times, weather conditions, contractor's operations, approved sections of work, observations of geologic conditions, soil logs from pipe excavations via visual observations, construction problems and remedies, communications between individuals, CQA testing, etc. FCDMC shall be copied on all reports on a weekly basis.

8.3 On Site Records

One of the major responsibilities of the CQA inspection personnel will be to observe actual site conditions during the progress of construction work to determine whether design changes are necessary to accommodate unforeseen site conditions. Changes in the work that deviate from the approved contract documents, whether initiated by t he Owner, the Engineer, or the Contractor and that have a substantive impact on the design of facilities that are jurisdictional to ADWR, must be reviewed and approved by FCDMC, NRCS and ADWR prior to implementation of the change orders construction work. The Design Engineer will notify the FCDMC and ADWR of forthcoming change orders by phone or facsimile prior to formal submittal of the change order request.

8.4 Reporting to ADWR

Copies of daily inspection report will be forwarded to FCDMC, NRCS and ADWR at the end of each week or upon request.