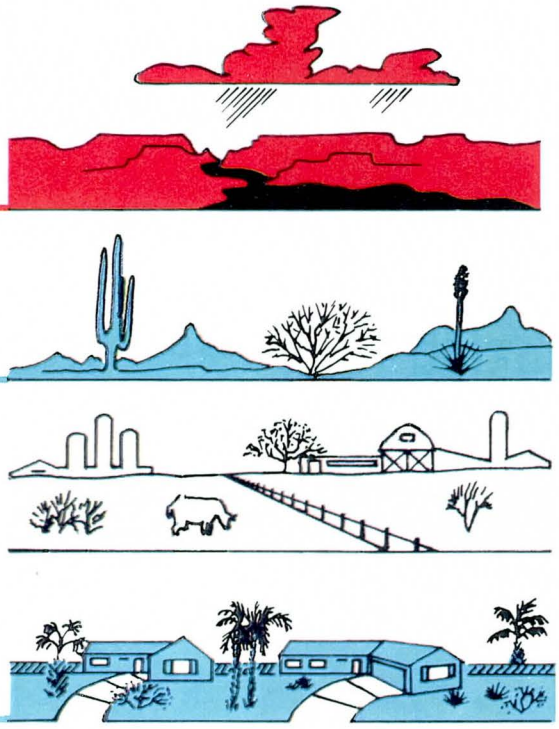


FLOOD CONTROL
DISTRICT OF
MARICOPA COUNTY

LAVEEN AREA CONVEYANCE CHANNEL IMPROVEMENTS

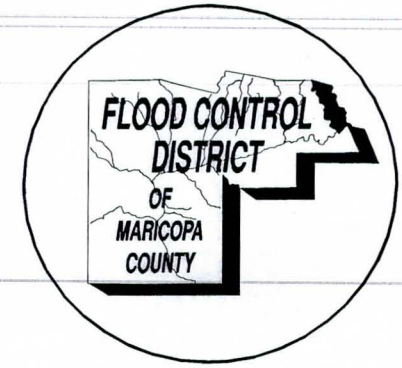
60% Design Report

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

LAVEEN AREA CONVEYANCE
CHANNEL IMPROVEMENTS
60% Design Report
June., 2001

LAVEEN AREA CONVEYANCE CHANNEL IMPROVEMENTS

60% DESIGN REPORT



June, 2001

Prepared For:

Flood Control District of Maricopa County

Chief Engineer & General Manager

Prepared by:

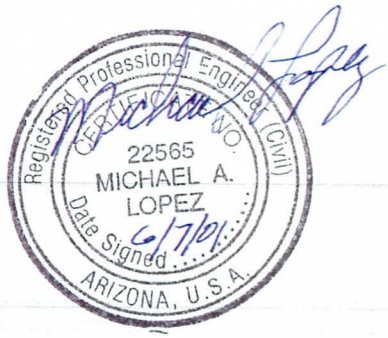
Engineering Division

Flood Control District of Maricopa County

FCD Project No. 117-08-31

LAVEEN AREA CONVEYANCE CHANNEL IMPROVEMENTS

FCD PROJECT NO. 117-08-31



DESIGN REPORT

TABLE OF CONTENTS

Section	Page
1.0 PROJECT DESCRIPTION	1
1.1 Purpose	1
1.2 Location	1
1.3 Field Conditions	2
1.4 Rights-of-Way	3
1.5 Utilities	4
2.0 ALIGNMENT ALTERNATIVES	6
2.1 Alternative 1 – No Action Alternative	7
2.2 Alternative 2 – Parallel (North) Alignment	7
2.3 Alternative 3 - Concurrent Alignment	7
2.4 Alternative 4 - Independent Alignment	7
2.5 Alternative 5 - Combination Alignment (abandon existing Maricopa Drain)	8
2.6 Alternative 6 - Combination Alignment (Existing Maricopa Drain remains)	8
2.7 Preferred Alternative	8
3.0 EXISTING MARICOPA DRAIN	8
4.0 CHANNEL LINING ALTERNATIVES	13
4.1 Alternative 1 – Rectangular Concrete Section	13
4.2 Alternative 2 – Trapezoidal Concrete Section	14
4.3 Alternative 3 – Unlined Natural Section	14
4.4 Alternative 4 – Grass Lined Trapezoidal Section	14
4.5 Alternative 5 – Rip Rap Lined Trapezoidal Channel	14
4.6 Selected Alternative	14
4.7 Equestrian Crossings	15
5.0 ENVIRONMENTAL CONSIDERATIONS	17
6.0 HYDRAULIC ANALYSIS	17
6.1 Existing Channel Hydraulics	17
6.2 Proposed Channel Hydraulics	17
7.0 HYDROLOGIC ANALYSIS	21
8.0 CONSTRUCTION COST ESTIMATE	22

LIST OF FIGURES

FIGURE NO.	DESCRIPTION	PAGE
FIGURE 1	-EXISTING MARICOPA DRAIN ALIGNMENT	1
FIGURE 2	- PROPOSED LACC ALIGNMENT	4
FIGURE 3	- EXISTING SECTIONS TO BE FILLED	9
FIGURE 4	- EXISTING SECTIONS TO BE FILLED	13
FIGURE 5	- TYPICAL EQUESTRIAN CELL IN BOX CULVERT CROSSING	15
FIGURE 6	- NATURAL SECTION, UPPER REACH	16
FIGURE 7	- NATURAL SECTION, LOWER REACH	16
FIGURE 8	- UNOFFICIAL FLOODPLAIN, LAVEEN AREA	17
FIGURE 9	- CONCENTRATION POINT MAP	21

LIST OF TABLES

TABLE NO.	DESCRIPTION	PAGE
TABLE 1	Laveen ADMP Update	23

LIST OF APPENDICES

APPENDIX A	HEC1 OUTPUT
APPENDIX B	HECRAS OUTPUT
APPENDIX C	CONSTRUCTION COST ESTIMATE
APPENDIX D	CONSTRUCTION SPECIAL PROVISIONS
APPENDIX E	60% CONSTRUCTION DRAWINGS

LIST OF PHOTOS

PHOTO NO.	DESCRIPTION	PAGE
PHOTO 1	Agricultural Tail Water Ditch	2
PHOTO 2	Tail Water Outlet into Maricopa Drain	2
PHOTO 3	Maricopa Drain at 43rd Avenue Looking West	2
PHOTO 4	Maricopa Drain at Salt River Looking Upstream	3
PHOTO 5	Maricopa Drain at Salt River Looking Downstream	3
PHOTO 6	Overhead Power on East Bank Looking South	4
PHOTO 7	Overhead Power on East Bank Looking North	5
PHOTO 8	Weir on Maricopa Drain Looking North	8
PHOTO 9	Segment of Maricopa Drain to be Tiled Looking South	9
PHOTO 10	Intersection of 51st Ave & Baseline Road	10
PHOTO 11	Intersection of 51st Ave & Baseline	10
PHOTO 12	Pipe Underneath Baseline	10
PHOTO 13	Pipe Underneath Baseline	10
PHOTO 14	Culvert underneath Baseline Rd W of 59th Ave (north)	11
PHOTO 15	SRP Booster Pump Adjacent to Maricopa Drain	11
PHOTO 16	Weir on Existing Maricopa Drain Looking South	12

1.0 PROJECT DESCRIPTION

1.1 Purpose

The purpose of this project is to develop final construction drawings, construction special provisions, and an engineer's estimate for the construction of channel improvements for the Laveen Area Conveyance Channel (LACC). The LACC improvements will eliminate and/or significantly reduce the potential for flood damage that could be caused by events less than or equal to the 100-year event.

The District is currently negotiating an Intergovernmental Agreement (IGA FCD – 99-010) with the City of Phoenix (COP), Maricopa County Department of Transportation (MCDOT), and Salt River Project (SRP) to identify cost-sharing, operation, and maintenance responsibilities. The LACC improvements between 43rd Avenue and the Salt River west of 75th Avenue are currently being designed in-house based upon the preferred grade and alignment of the project partners.

1.2 Location

The project is located in southwest Phoenix in the following Township, Range and Sections of the Gila and Salt River Base and Meridian.

1. Sections 31, 32, and 33, Township 1 North, Range 2 East.
2. Sections 5 and 6, Township 1 South, Range 2 East.
3. Section 1, Township 1 South, Range 1 East.
4. Section 35, Township 1 North, Range 1 East.

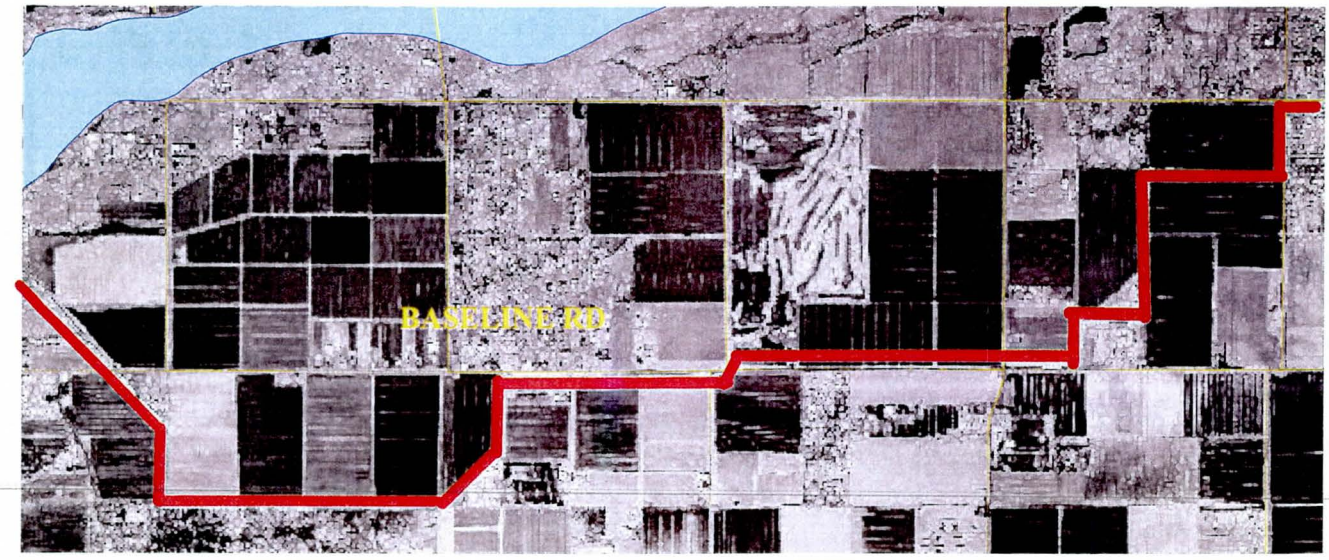


Figure 1 -Existing Maricopa Drain Alignment

This Project is located between 43rd and 83rd Avenues and between Dobbins Road and Southern Avenue (See Figure 1). The project begins on the West Side of 43rd Avenue approximately 1200 feet south of Southern Avenue and ends at the Salt River approximately 4000 feet west of 75th Avenue.

1.3 Field Conditions

The area surrounding the Maricopa Drain is mostly agricultural fields. The drain conveys tail water and rainfall runoff to the Salt River. A typical tail water ditch is shown in Photo 1, and a typical tail water outlet into the Maricopa Drain is shown in Photo 2. The direction of flow of the drain is from the east to the west. The general slope of the ground south of the drain is from the south to the northwest and north of the drain is from north to southwest.

Photo 1 - Agricultural Tail Water Ditch

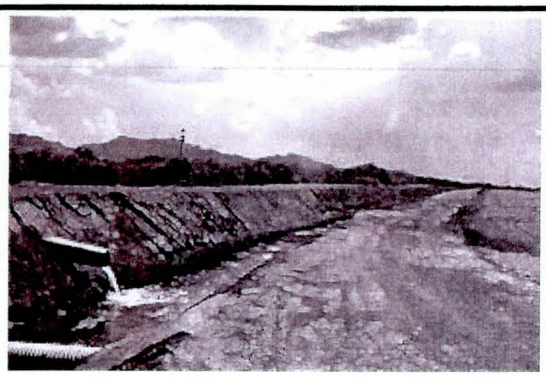


Photo 2 – Tail Water Outlet into the Maricopa Drain

The section of the Maricopa Drain that is being modified with this project begins on the West Side of 43rd Avenue approximately 1,200 feet south of Southern Avenue. Photo 3 shows the existing Maricopa Drain looking west at 43rd Avenue.

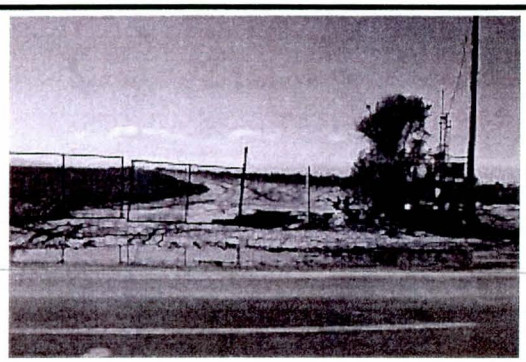


Photo 3 – Maricopa Drain at 43rd Avenue Looking West

The section of the Maricopa Drain that is being modified with this project ends at the Salt River approximately 4,000 feet west of 75th Avenue. Photo 4 shows the existing Maricopa Drain at the Salt River looking upstream. Photo 5 shows the existing Maricopa Drain at the Salt River looking downstream.

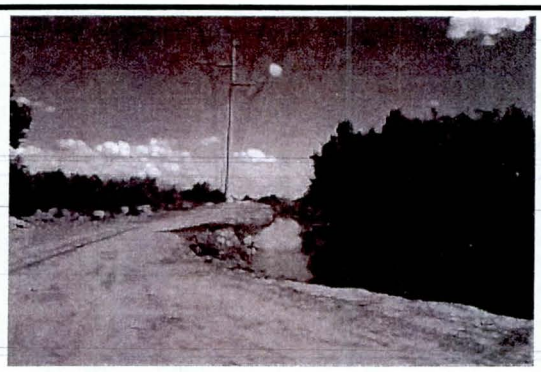


Photo 4 – Maricopa Drain at Salt River Looking Upstream

Photo 5 – Maricopa Drain at Salt River Looking Downstream

1.4 Rights-of-Way

There is no dedicated right-of-way along the Maricopa Drain from 43rd Avenue to the Salt River. The drain is held as private property. Currently, the Maricopa Drain is being managed by SRP as a tail water ditch for farming in the area and also as a delivery ditch to the Gila River Indian Community (GRIC). The width of the existing drain varies from 20- 45 feet.

Additional rights-of-way are necessary for all of the alternatives considered except for the no action, but most of the landowners throughout the reach of this project have agreed to dedicate rights-of-way for the new channel alignment as long as it fits with the Master Plan for the area. The combined alternative was developed from input from the local landowners. Therefore, right-of-way for those developing now or those that are planning to develop in the near future will be dedicated for the proposed alternative. (See Figure 2). In exchange for dedicating right of way for the project, the City of Phoenix is offering a credit of $42,500 per acre of dedicated land towards development impact fees. The Project is funding the filling in and/or tiling of the existing Maricopa Drain and providing excess spoil material generated by the Project and at no cost to the property owners.

There are a few parcels west of 63rd Avenue (See Figure x) where there is no plan to develop now or in the near future where project rights of way will need to be acquired.

Temporary Construction Easements are required to construct the Project and to stockpile excess material as mentioned above for future use by the landowners dedicating right-of-way for the LACC.

Permanent and temporary construction easements are required to tile and/or backfill those segments of the existing Maricopa Drain that are separate from the LACC alignment. In areas where the proposed LACC is downstream of the existing Maricopa Drain, filling in the existing Maricopa Drain will reduce existing flood protection to the properties between the existing drain and the LACC. In these areas where the property owner is requesting that the drain be filled, the property owners will be required to sign a waiver accepting this liability. Should the owner not sign a waiver, the Project will provide the material for the existing drain to be filled but it will be up to the owner to fill in the drain. This is because the Project can be constructed as designed without filling in the existing drain.

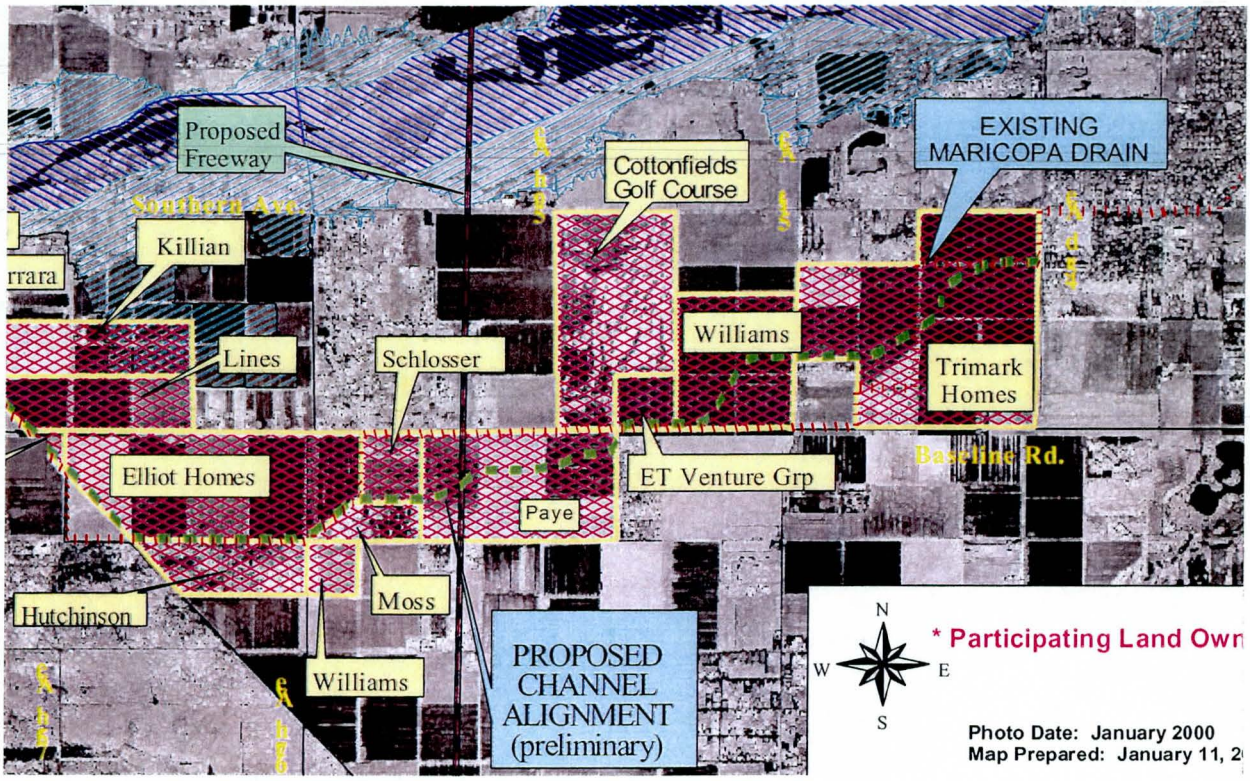


Figure 2 - Proposed LACC Alignment

1.5 Utilities

There are existing utilities throughout this project, but they are limited to the roadway crossings except for some overhead power lines owned by SRP and Western Area Power Authority (WAPA) that parallel portions and cross portions of the project. Photos 6 and 7 show overhead power on the east bank of the existing Maricopa Drain near the outlet at the Salt River.

Photo 6 – Overhead Power on East Bank Looking South

Photo 7 – Overhead Power on East Bank Looking North

Retaining walls are planned to protect the existing power poles poles along the GRIC Boundary in-place. SRP has agreed to the concept of allowing retaining walls within 10 feet of the power poles on the channel side and 25 and 75 feet from the upstream side to the down stream side of the retaining walls respectively.

The utilities in the project area in addition to overhead power lines are City of Phoenix sewer and water lines, Southwest Gas lines, El Paso Natural Gas lines, Kinder Morgan petroleum pipelines, irrigation lines, telephone lines and private waterlines. Underground utilities are limited to the area of the roadway crossings. Utility relocations of some of the utilities will be required.

47th Avenue Crossing

At 47th Avenue, the LACC crosses an existing 12-inch El Paso Natural Gas line. El Paso is constructing a 24-inch line in 43rd Avenue and upon completion will abandon and remove this existing pipe in 47th Avenue. The 47th Avenue pipe is scheduled to be removed before construction begins on the LACC and therefore will not conflict with proposed improvements.

51st Avenue Crossing

At 51st Avenue, the LACC will be crossing a proposed City of Phoenix sanitary sewer. This sanitary sewer will be constructed below the LACC and there will be no conflict.

Southwest Gas has existing lines in 51st Avenue and has some new lines proposed. The existing Southwest Gas line will be potholed and may need to be lowered. The new gas line will be constructed below the LACC.

Kinder Morgan has two petroleum pipelines in 51st Avenue. The Kinder Morgan petroleum pipelines will also need to be potholed and may need to be lowered.

Baseline Road at 57th Avenue Crossing

At this location, the LACC crosses two City of Phoenix water lines. There is an existing 12-inch water line and a new 54-inch water line. The new 54-inch line just constructed is below the proposed LACC and there will be no conflict. The existing 12-inch line will need to be lowered as a part of this project.

Qwest has three underground telephone lines at this location on the south side of Baseline Road. These lines will be potholed and will likely need to be relocated to avoid conflict with the LACC.

On the south side of Baseline Road, SRP has a 230 KV overhead power line. The LACC does not conflict with this line but one large power pole may need to be braced during construction. The plans reflect that bracing is all that is needed at this time. On the north side of Baseline Road, SRP has a 12 KV overhead power line on a wood pole. The LACC conflicts with this wood power pole and it will need to be relocated.

59th Avenue Crossing

At this location, the LACC crosses an irrigation ditch on the West Side of 59th Avenue and a tail water ditch on the East Side of 59th Avenue. A siphon pipe will need to be constructed under the LACC for the irrigation ditch and connections into the LACC will be needed to handle the tailwater connections.

63rd Avenue Crossing

At this location, the LACC crosses an irrigation ditch on the West Side of 63rd Avenue. This irrigation ditch will not need to be siphoned underneath the LACC because it terminates at this location, but the adjacent property owner stated that there is a private waterline and cable line underneath the roadway. These lines do not appear on any utility maps that were researched. Additional underground investigation will be required to locate these lines.

2.0 ALIGNMENT ALTERNATIVES

Six Alignment alternatives were investigated for this project. These alignments are as follows:

1. No-Action.
2. Alignment immediately north or east of existing Maricopa Drain.
3. Alignment incorporated with the Maricopa Drain.
4. Alignment completely independent of the existing Maricopa Drain.
5. Alignment partially incorporated and partially independent eliminating (filling in) the existing Maricopa Drain.
6. Alignment 5 previously mentioned with the exception that the existing Maricopa Drain is left in its present condition to continue to operate as a tail water ditch.

2.1 Alternative 1 – No Action Alternative

This alternative is as stated leaving the existing conditions of the Maricopa Drain untouched and providing no additional flood protection to the area. The existing Maricopa Drain does not have the capacity to convey the 100-year runoff.

Pros	Cons
Zero cost	Limited flood protection
Requires no additional land	Existing drain hard to maintain
	Existing drain susceptible to bank erosion

2.2 Alternative 2 – Parallel (North) Alignment

This alternative places the new alignment parallel to and north of the existing alignment.

Pros	Cons
Provides 100-year protection	Highest cost, Existing drain hard to maintain
Does not disturb existing drain	Requires more land

2.3 Alternative 3 - Concurrent Alignment

This alternative places the alignment in the same location as the existing drain.

Pros	Cons
Provides 100-year protection	Does not fit Master Plan of the area
Utilizes existing channel rights-of-way	
Requires least land	
Least amount of excavation	

2.4 Alternative 4 - Independent Alignment

This alternative places the alignment totally independent and separate from the existing alignment.

Pros	Cons
Provides 100-year protection	Does not take advantage of existing channel
	Does not fit Master Plan of the area
	Existing drain hard to maintain
	Existing drain susceptible to bank erosion

2.5 Alternative 5 - Combination Alignment (abandon existing Maricopa Drain)

This alternative places the alignment concurrent with the existing Maricopa Drain throughout most of the alignment. To fit the Master Plan for the area, portions of the alignment are independent of the existing alignment. In these locations, the plan is to relocate the existing drain to the new alignment so that the sections are still combined.

Pros	Cons
Provides 100-year protection	Disturbs portions of the Maricopa Drain
Fits the Master Plan for the area	
Moves the drain away from Baseline Road	
Adjacent landowners will dedicate right-of-way	

2.6 Alternative 6 - Combination Alignment (Existing Maricopa Drain remains)

This alternative places the alignment adjacent to the existing Maricopa Drain throughout most of the alignment except where it is independent to fit the Master Plan for the area. In this alternative, the plan is to leave the existing unchanged and allow it to continue to function as a tail water ditch until the time that there is no tail water in the area. This alternative will be sized to convey all the runoff assuming that the Maricopa Drain is not in place.

Pros	Cons
Provides 100-year protection	Disturbs portions of the Maricopa Drain
Fits the Master Plan for the area	
Moves the drain away from Baseline Road	

2.7 Preferred Alternative

Alternative No. 5 is the recommended alternative. Right-of-way dedication by adjacent landowners makes this the least expensive alternative. This alternative also enables the LACC to be a City of Phoenix Park/Trail.

3.0 EXISTING MARICOPA DRAIN

The Maricopa Drain is a dirt ditch that conveys delivery and tail water and some drainage runoff to the Salt River. In addition, SRP delivers water to GRIC in the drain, using a weir to back up water for pumping.

Photo 8 shows this weir. The LACC must preserve and maintain these functions of the existing Maricopa

Photo 8 – Weir on Existing Maricopa Drain Looking North

Photo 9 – Segment of Maricopa Drain to be Tiled Looking South

Drain.

The recommended alternative bypasses several segments of the existing Maricopa Drain that need to continue collecting tail water. These segments will be tiled with RGRCP that will carry the tail water to the new LACC. Photo 9 shows a segment of the drain that will be tiled.

Some segments of the drain that will no longer collect tail water after the LACC is constructed will be backfilled.

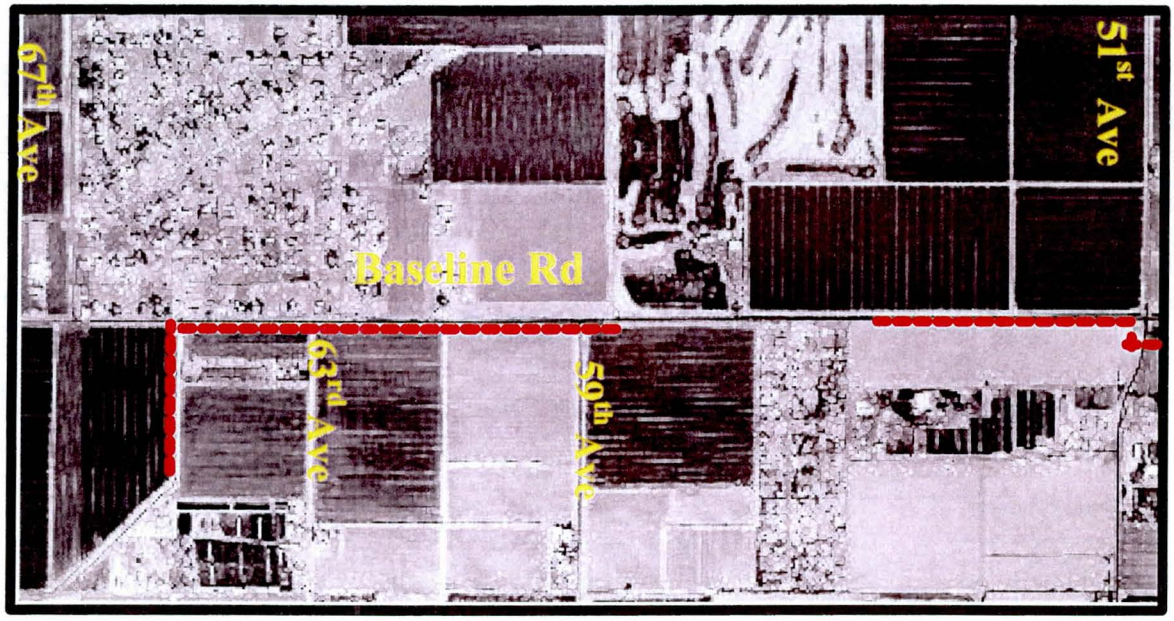


Figure 3 - Existing Sections To Be Tiled

Most of the existing Maricopa Drain is to be abandoned and filled in except for a portion that will be tiled as part of this Project (See Fig 3). The portion that is to be tiled is to accommodate future roadway improvements along Baseline Road that will be constructed by the City of Phoenix and or MCDOT without interfering with the tail water drain. The portion of the channel that runs north and south (approximately 65th Avenue alignment) from Baseline Road south is part of the agreement with the

adjacent landowners in exchange for rights-of-way to construct the new channel on their property (See Photo 9).

The tiled sections will begin with open headwalls. One headwall being constructed in the northwest corner of the 51st Avenue and Baseline Road intersection. Future improvements to Baseline Road by MCDOT planned in the year 2005 or later may necessitate some modifications to the location of this headwall structure.

Photo 10 & 11 is the beginning (most upstream reach) location of tailwater that ultimately enters the tiled section that runs from 51st Avenue west to the LACC alignment. In addition to capturing tailwater at the NW corner of 51st Avenue, the tiled section will have intermediate connections to capture runoff that comes from culverts that cross underneath Baseline Road between 51st Avenue and the LACC (See Photo 12 & 13)

Photo 10 – INTERSECTION OF 51ST AVE & BASELINE RD (Looking Northwest)

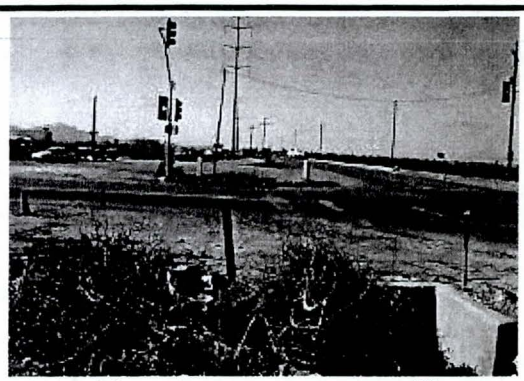


Photo 11- INTERSECTION OF 51ST AVE & BASELINE RD (LOOKING WEST)

Photo 12 – Pipe draining into the Maricopa Drain (Looking south approx. 1/4 mile west of 51st Ave)

Photo 13 – Pipe draining into the Maricopa Drain (Looking south approx, 1/2 mile west of 51st Ave)

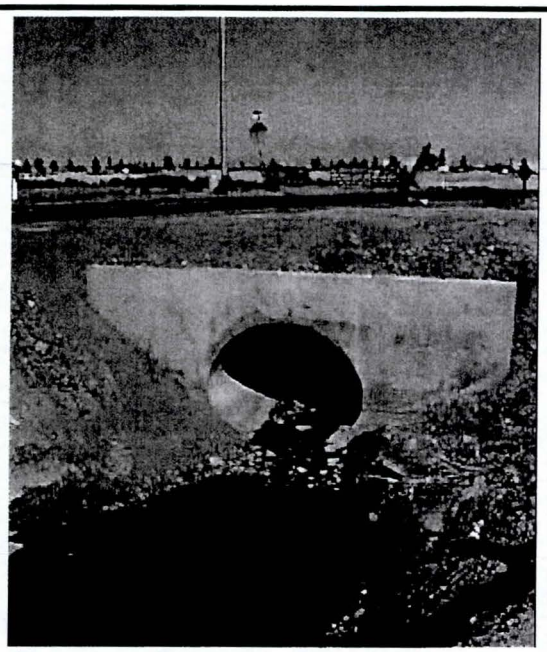


Photo 14 – Culvert underneath Baseline Road west of 59th Avenue (north) - (Looking Northeast)

The beginning of the tiled section west of the LACC begins immediately downstream of the culvert in Baseline Road west of the intersection of Baseline Road and 59the Avenue to the north (See Photo 14). An open headwall with a trashrack will be constructed to capture all of the flows coming from the culvert.

The portion of the existing Maricopa Drain between the above location and the alignment of the LACC crosses land that is not one of the project partners, therefore nothing will be done to that portion of the existing drain. Although, the tiled portion will be able to capture all of the flows that enter the drain from the north side of Baseline Road. At this time, there are no plans by the COP or MCDOT to improve this section of Baseline Road.

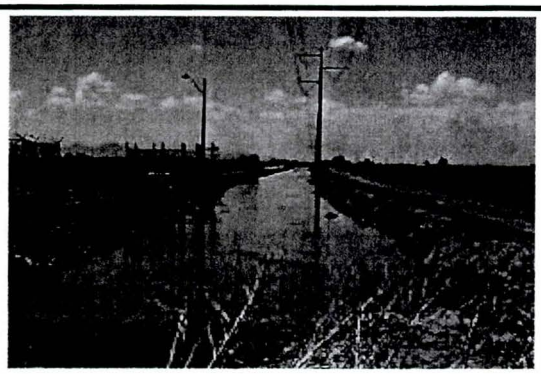


Photo 15 – SRP Booster Pump Adjacent to Maricopa Drain (Looking South)

SRP will be maintaining the tiled tail water pipes as well as the concrete low-flow channel that is part of the LACC. The low-flow channel was sized to convey 30 cfs and will be constructed mainly to convey tailwater and SRP's delivery obligations to the GRIC.

SRP is using tail water in the existing Maricopa Drain to help meets its delivery obligation of 10 cfs to the Gila River Indian Community. Whatever amount of tail water short of 10cfs is supplemented with a deep well pump that is adjacent to the Maricopa Drain. Photo 15 shows the booster pump.

In addition to using the Maricopa Drain as a delivery system, SRP is currently backing water up inside the existing Maricopa Drain and using the Drain as a storage bay/wet-well. A weir is located downstream of the pump that backs the water up for storage (See Photo 16). The setup of this pump and storage bay will be impacted by the new channel because the weir be removed with the project and the existing drain filled in.

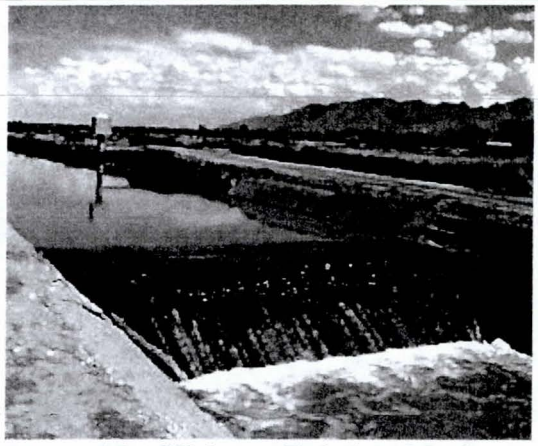


Photo 16 - Weir on Existing Maricopa Drain (Looking South)

SRP will be providing the design for a new wet well and any necessary modifications to the existing pump. Their has been discussions with SRP regarding leaving a portion of the existing drain in place immediately downstream of the pump and pump water from the new low-flow channel up into the remaining section, but they have not yet decided how to handle this modification. One problem with leaving a section of the existing drain in-place is that then the only access to the power lines will be from the invert of the new channel. The current design provides SRP continuous all-weather access from the west bank; maintenance access for SRP is now on the east bank of the Maricopa Drain.

Retaining walls are planned to protect the existing power poles in-place. SRP has agreed to the concept of allowing retaining walls within 10 feet of the power poles on the channel side and 25 and 50 feet from the upstream side to the down stream side of the retaining walls respectively.

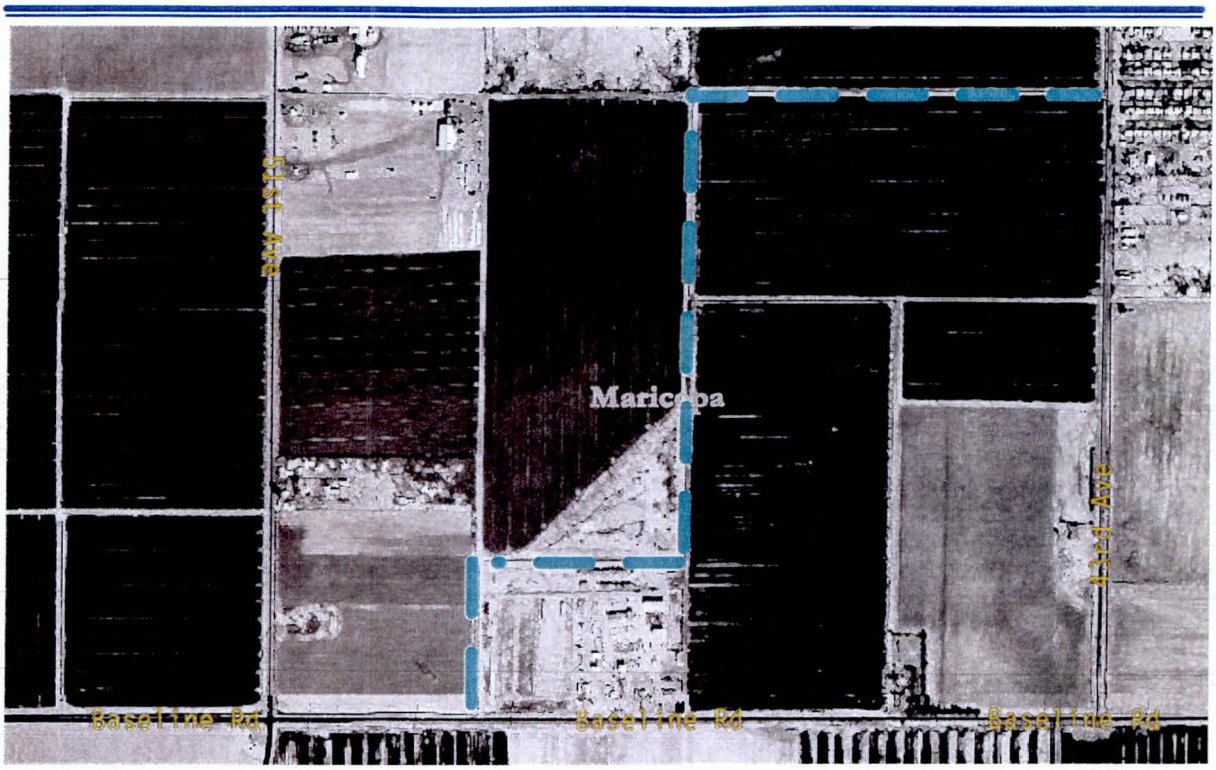


Figure 4 - Existing Sections To Be Filled

4.0 CHANNEL LINING ALTERNATIVES

Five channel lining alternatives were investigated for this report. The alternatives are as follows:

Rectangular concrete section, Concrete trapezoidal section, Unlined Natural section, Grass lined trapezoidal section, and Riprap lined trapezoidal section.

4.1 Alternative 1 – Rectangular Concrete Section

This alternative is to construct the channel as using a rectangular concrete section.

Pros	Cons
Minimizes right-of-way required	Highest Cost
Minimal maintenance cost	No multi-use potential

4.2 Alternative 2 – Trapezoidal Concrete Section

This alternative is to construct the channel using a trapezoidal concrete section.

Pros	Cons
Minimal maintenance cost	High Cost, No multi-use potential

4.3 Alternative 3 – Unlined Natural Section

This alternative is to construct the channel using an unlined natural section.

Pros	Cons
Multi-use potential	High maintenance Cost
	Unstable channel

4.4 Alternative 4 – Grass Lined Trapezoidal Section

This alternative is to construct the channel using a grass lined trapezoidal channel.

Pros	Cons
Multi-use potential	High construction cost
Right-of-way dedication at no	High Maintenance cost

4.5 Alternative 5 – Rip Rap Lined Trapezoidal Channel

This alternative is to construct the channel using a riprap lined trapezoidal channel.

Pros	Cons
Stable channel	Aesthetically unpleasing
	No multi-use potential

4.6 Selected Alternative

Alternative 4 is the recommended alternative. The multi-use potential and landowner dedicated right-of-way make this the preferred alternative. Right-of-way dedication by landowners makes this a much less expensive alternative. A concrete low-flow channel will be incorporated in the channel bottom to convey the tail water from the exiting Maricopa Drain.

A cross section for Reach 1 (43rd Avenue to 63rd Avenue) is shown in Figure 3. A cross section for Reach 2 (63rd Avenue to the Salt River) is shown in Figure 4.

4.7 Equestrian Crossings

The City of Phoenix Parks Department (Parks) requested that equestrian crossings be incorporated into the culvert crossings on Baseline Road, 63rd, 59th, 51st. This will be done by lowering the floor of one of the outside cells such that there will be 10 feet of clearance between the invert and the ceiling. The reason that the floors will be lowered instead of raising the ceiling is because there is not adequate cover for the box culverts to pass underneath the major streets; major improvements would have to be made to the roadways to accommodate raising the ceilings.

The direction at this time from Parks is to construct the equestrian crossing with this project and fill in the portion of the cell that is below the channel invert with aggregate base course. Lowering the cells does provide obstacles whenever the trail system is ultimately completed in the Project because the equestrian cells will not gravity drain. Power will have to be brought to each culvert to power electric pumps to drain the cells. At some future date, the City will make the necessary modifications to drain and light the equestrian cells. Figure 5 shows a typical equestrian cell in the box culvert crossings.

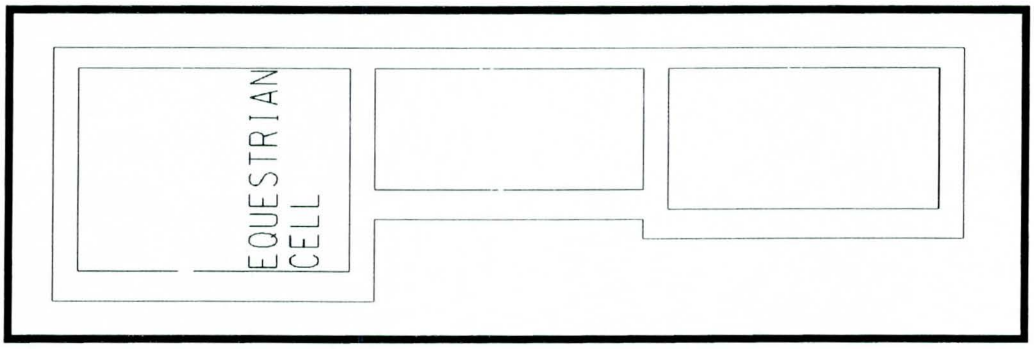


Figure 5 - Typical Equestrian Cell in Box Culvert Crossing

Figure 6 - Natural Section, Upper Reach

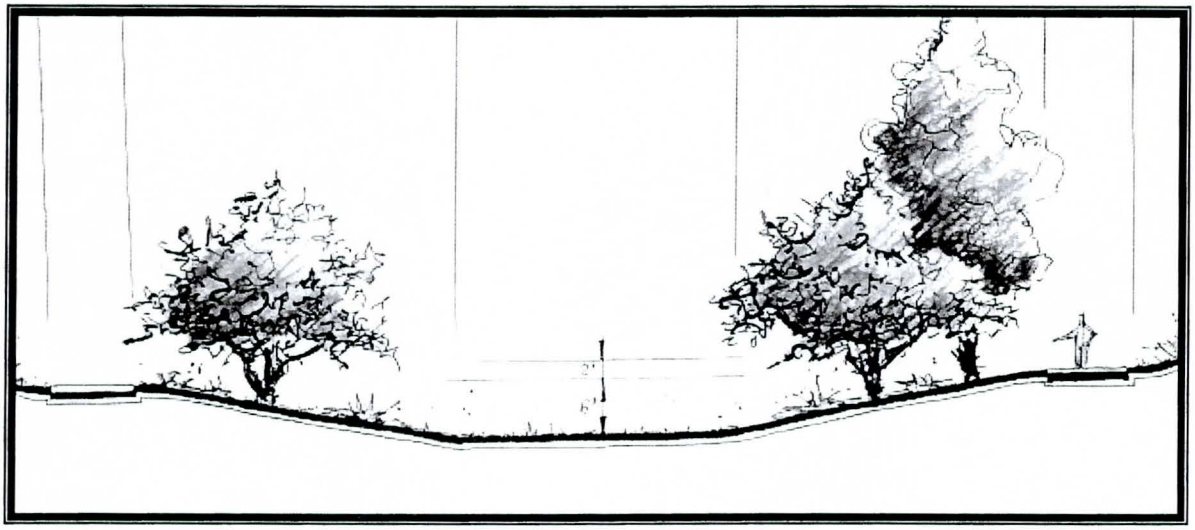


Figure 7 - Natural Section, Lower Reach

5.0 ENVIRONMENTAL CONSIDERATIONS

A separate report to address environmental issues was prepared by URS.

6.0 HYDRAULIC ANALYSIS

6.1 Existing Channel Hydraulics

The District retained the firm of WEST CONSULTNANTS to determine what the limits of a floodplain would be in the Laveen area if an official delineation study was performed. The study analyzed the capacity of the existing Maricopa Drain and determined that its capacity is much less than the 100-Year event. A plan delineating the (unofficial) limits of the 100-yr floodplain is shown in Figure 8. Considerable area would have to be elevated above this floodplain to allow development in the area.

The existing Maricopa Drain does very little to contain and convey the runoff generated for the regulatory 100-yr amount as evidenced by Figure 8.

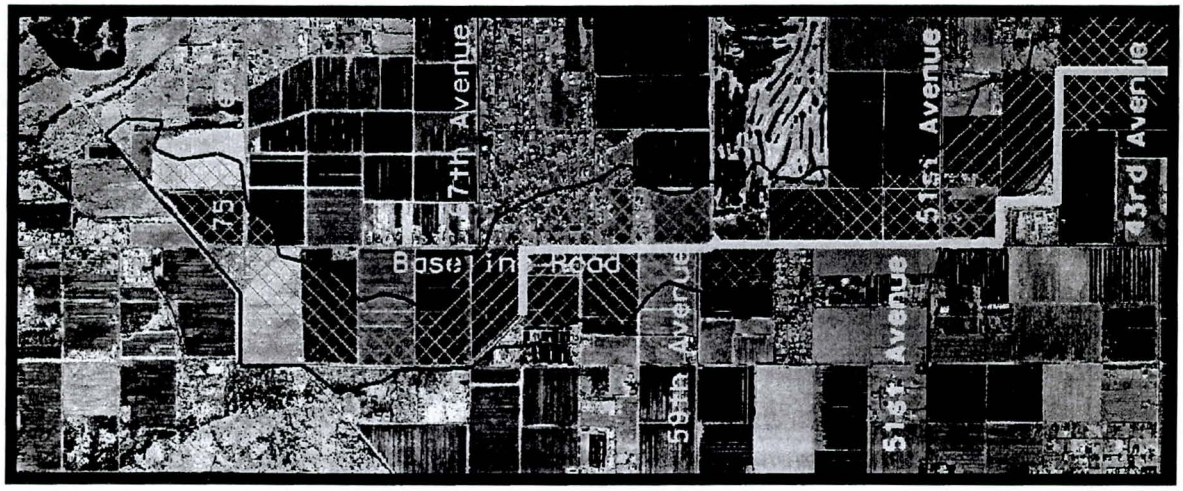


Figure 8 - 1 -Unofficial Floodplain Delineation, Laveen Area

6.2 Proposed Channel Hydraulics

The proposed channel type is a trapezoidal natural earthen (unlined) channel. It is proposed that the entire incised channel section will be grass lined except for the low-flow channel and the maintenance roads

adjacent to the low-flow channel. The grassed section will be irrigated and manicured. In the future, at various some locations trees and or shrubs may be planted. For all trees that are planted, their canopies must be kept above the 100-year water surface elevation. The proposed sections were analyzed using the US Army Corps backwater computer program, HEC-RAS.

Mannings' n Values

A roughness coefficient of 0.030 was used for the entire channel. The 'n' value will likely change throughout the life of this project, but maintenance should be used to control channel roughness not to exceed the design Mannings' n value. The Phase 1 finished section will be grassed lined without any other vegetation which will have an 'n' value lower than 0.030, but the channel must have the capacity for additional vegetation and landscaping that will come in subsequent phases. As upstream flood control improvements are constructed that will reduce the discharges in the LACC, the "n" value can be increased.

Design Discharge

The controlling discharge used for the design is the 100yr-24hr hydrology assuming that the 43rd and Southern Avenue detention basin is in place (See Table 1). The design discharges ranged from 990 cfs at the upstream end of the channel up to 2800 cfs at the outfall. Freeboard was not required for this scenario because as future developments and other planned CIP drainage improvements are constructed, the runoff will decrease.

Channel Geometry

The channel horizontal alignment is generally straight with six curves. The radii of the curves are long and range from 450 feet to 1500 feet. The large radius curves eliminates the need for additional freeboard for superelevation of flows.

The channel sections were determined to keep velocities to levels acceptable for unlined channel and also keep water surface elevations below existing ground; this will prevent the design of berms or levees and

also permit access to future storm drains and channels as the area becomes developed. However, to minimize earthworks, some fill conditions occur at a few locations but these were very minor and are not considered to be berms or levees.

To achieve low velocities, the channel bed slope was adjusted to .0011 feet per foot and this required the use of drop structures at several locations. Channel top width ranges from about 100 feet to slightly above 130 feet and bottom width ranges from 40 feet to 90 feet. The side slopes are not steeper than 5:1 except at the downstream reach where vertical concrete protection is designed around electrical transmission towers on one side of the channel

Sub-critical flow regime is maintained except at drop structure locations where flow goes through critical depth over the crest of the drops.

Drop Structures

There were six low drops along the channel with drop heights of between 1 to 2 feet. These were designed as sloping drops and the velocities along the slopes were low enough so that protection against channel bed scour is not required. Reinforced concrete walls will be located at the crest and toe of the drops.
Other criteria used to develop the proposed cross section were based upon multi-use capabilities.

Sedimentation

Upstream sedimentation was not included in the analysis because the contributing area is cultivated agricultural fields that are being replaced by urban development. Sedimentation will therefore become insignificant.

Road Crossings

There are five roadway crossings along the channel and these were designed as reinforced concrete box culverts with wing walls. The largest culvert has seven openings of ten feet span by seven feet height each and the smallest has three openings of ten feet by six feet. These culverts are modified to

accommodate equestrian passage by lowering one cell so that the height is ten feet. (The roadways over the culvert crossings did not allow room to raise the ceiling of the equestrian cell. The City of Phoenix will add pumps and other necessary improvements to the equestrian cells in the future.) Also, the middle cell of each culvert crossing is depressed two feet to provide for low flow drainage. These modifications were however not included in the hydraulic modeling and are not expected to significantly affect the results.

Low-Flow Channel

A low-flow channel will serve two purposes, first as a conveyance system for SRP irrigation flows, and secondly to drain nuisance flows. The low-flow channel is unlined, two feet deep and has bottom width of eight feet and with side slopes of 2:1. The low flow channel was not modeled as part of the channel cross section.

A complete HECRAS backwater analysis is included in Appendix II of this report.

7.0 HYDROLOGIC ANALYSIS

The hydrologic analysis for this project will be presented in a separate report.

The HEC1 input and output files are included in Appendix I of this report.

TABLE 1

LACC HYDROLOGY (100yr-2hr) Maricopa Drain Alternatives w/Proposed Channel							
Study	**@ 43rd Ave.** (43SDW)	**@ 47th Ave.** (CVR47C)	**@51st Ave.** (CB51C)	**@ 59th Ave.** (CB59)	**@63rd Ave.** (CB163C)	**@75th Ave.** (CCD2C2)	**@ Salt River** (CPCD3C)
Existing Land Use	1900	1900	2120	2980	3250	3400	3400
* Existing w/43rd Basin	990	990	1350	2190	2490	2760	2770
** Future w/relaxed ret	0	160	280	1640	1700	2190	2190

* D

** D

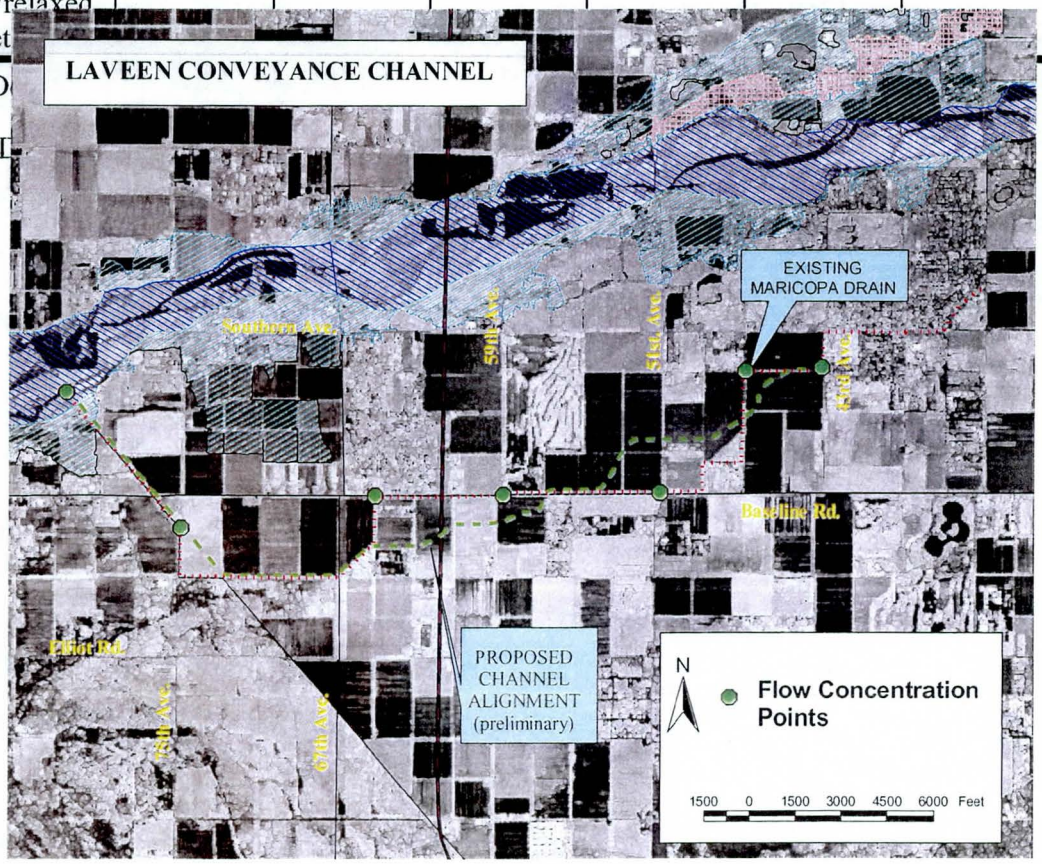


Figure 8 - Concentration Point Map

8.0 CONSTRUCTION COST ESTIMATE

The complete estimate is shown in Appendix D.

```
ID  LAVEEN ADMS (FINAL HEC-1) 100-YR 24-HR STORM          CBA FILE # 40916-02-30
ID  HIDDEN VALLEY WATERSHED/CHAMPION DRAIN WATERSHED
ID                                                      DATE: SEPTEMBER 12,2000
ID
ID  24-HOUR SCS TYPE II RAINFALL
ID
ID  REVISED SCHEMATIC TO INCLUDE FLOWS IN BOTH 43RD AVE. BASINS
ID
ID
ID  ********************************************************************************
ID  FLOOD INSURANCE STUDY UPDATE
ID  INCLUDE PHYSICAL CHANGES IN THE WATERSHED AS OF MARCH 2000
ID  INCLUDED THE FOLLOWING FACILITIES:
ID    UPSTREAM OF 43RD AVE.  - EXISTING LANDUSE
ID       1- 43RD AVENUE STORM DRAIN, 1000 FT NORTH OF BASELINE TO SALT RIVER
ID       2- CESAR CHAVEZ GOLF COURSE, 35TH AVENUE AND DOBBINS
ID       3- BASELINE STORMDRAIN, FROM 7TH AVE TO 43RD AVE.
ID       4- 43RD AVE DETENTION BASIN AT SOUTHERN AVE.
ID
ID    DOWNSTREAM OF 43RD AVE. - EXISTING LANDUSE
ID       PLAN 2 - PROPOSED CHANNEL
ID
ID  CHANGES BY H&H BRANCH, FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ID  9/27/00   INPUT FILE NAME LB2D.DAT
*DIAGRAM
IT     5                    500
IO     5       0
KK IR62B
KM SUB-BASIN  IR62B -LAND USE - AGRICULTURE;MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .97
BA  .550
IN    30
KM RAINFALL DEPTH OF 4.20 WAS SPACIALLY REDUCED AS SHOWN ON THE PB RECORD
PB 4.074
KM THE FOLLOWING PC RECORDS REPRESENT A 24-HR SCS TYPE II STORM
PC  .000    .005    .011    .016    .022    .028    .035    .041    .048    .056
PC  .068    .071    .080    .089    .098    .109    .120    .133    .147    .163
PC  .181    .204    .235    .283    .663    .735    .772    .799    .820    .838
PC  .854    .868    .880    .891    .902    .912    .921    .929    .937    .945
PC  .952    .959    .965    .972    .978    .984    .989    .995   1.000
LG  .500    .000   5.000    .371    .000
UC  .850    .594
UA     0       3       9      18      28      42      59      73      87      92
UA   100
*
KK DR43C
KM SUB-BASIN DR43C -LAND USE- AGRICULTURE, DESERT HILLS; MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .940
IN    30
KM RAINFALL DEPTH OF 4.2 WAS SPACIALLY REDUCED AS SHOWN ON THE PB RECORD
PB 3.780
KM THE FOLLOWING PC RECORDS REPRESENTS A 24-HR SCS TYPE II STORM
PC  .000    .005    .011    .016    .022    .028    .035    .041    .048    .056
PC  .068    .071    .080    .089    .098    .109    .120    .133    .147    .163
PC  .181    .204    .235    .283    .663    .735    .772    .799    .820    .838
PC  .854    .868    .880    .891    .902    .912    .921    .929    .937    .945
PC  .952    .959    .965    .972    .978    .984    .989    .995   1.000
```

```
LG  .360    .053   4.450    .391  20.000
UC  .617    .325
UA     0       3       5       8      12      20      43      75      90      96
UA   100
*
KKDDR43C
KM SPLIT FLOW.RESULTANT HYDROGRAPH IS THE ESTIMATED FLOW THAT DRAINS THE TO WEST
KM 0F THE SOUTHWEST CORNER OF 43RD AVENUE AND DOBBINS ROAD
DTRDR43C
DI     0      50     100     119     300     500     600     800     900
DQ     0      50     100     119     181     381     481     681     781
*
KKROA51B
KM ROUTE SPLIT FLOW FROM SUB-BASIN DR43B TO COMPUTATION POINT COA51B (1ST REACH)
RS    10    ELEV    1041
RC  0.07    0.07    0.07    2790  0.0042
RX     0     300     440     480     560     590     615     640
RY  1042    1041    1041    1041    1041    1041    1041    1042
*
KKROA51B
KM ROUTE SPLIT FLOW FROM SUB-BASIN DR43B TO COMPUTATION POINT COA51B (2ND REACH)
RS    24    ELEV      -1
RC 0.065   0.065   0.065    3600  0.0017
RX     0      90     320     490     690    1060    1950    1960
RY  1038  1037.8  1037.4    1037    1037  1037.1  1037.8    1038
*
KK OA51B
KM SUB-BASIN  OA51B-LAND USE - AGRICULTURE, RURAL DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .97
BA 1.370
IN    30
KM RAINFALL DEPTH OF 4.2 WAS SPACIALLY REDUCED AS SHOWN ON THE PB RECORD
PB 4.074
PC  .000    .005    .011    .016    .022    .028    .035    .041    .048    .056
PC  .068    .071    .080    .089    .098    .109    .120    .133    .147    .163
PC  .181    .204    .235    .283    .663    .735    .772    .799    .820    .838
PC  .854    .868    .880    .891    .902    .912    .921    .929    .937    .945
PC  .952    .959    .965    .972    .978    .984    .989    .995   1.000
LG  .360    .098   5.300    .312    10.0
UC 0.883    .320
UA     0       3       9      18      28      42      59      73      87      92
UA   100
*
KKCOA51B
KM  COMBINE ROUTED SPLIT FLOW FROM SUB-BASIN DR43C TO RUNOFF FROM SUB-BASIN
KM  OA51B
HC     2
*
KKDFO51B
KM  RATE CHANNEL CROSS-SECTION AT CONCENTRATION POINT OA51B FOR SPLIT FLOW.
KM  DIVERTED FLOW IS ROUTED THROUGH CHAMPION DRAIN WATERSHED
DTDOA55C
DI     0       8      24      93     219     461     852    1384
DQ     0       4      11      43     102     262     479     735
*
KK RE55B
KM  ROUTE SPLIT FLOW FROM SUB-BASIN OA51B TO COMPUTATION POINT CRE55B
RS    18    ELEV      -1
RC  0.07    0.07    0.07    3840  0.0013
```

```
RX      0      30     370     530     680     860    1120    1260
RY   1032    1030  1029.7  1029.4  1029.2    1029  1028.8    1031
*
KK ER55B
KM SUB-BASIN ER55B-LAND USE - AGRICULTURE;MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .97
BA   .250
LG   .500    .000   7.800    .150    .000
UC   .983    .669
UA      0       3       9      18      28      42      59      73      87      92
UA    100
*
KKCER55B
KM COMBINE ROUTED DIVERTED FLOW FROM SUB-BASIN OA51B TO RUNOFF FROM SUBASIN
KM ER55B
HC      2
*
KK RE59B
KM ROUTE FLOW FROM COMPUTATION POINT CRE55B TO COMPUTATION POINT CER59B
RS      7    ELEV      -1
RC   0.07    0.07    0.07    2600   0.002
RX      0      30      50      90     180     270     360     860
RY1026.5    1024    1024    1024    1025  1025.3  1025.5  1026.5
*
KK ER59B
KM SUB-BASIN ER59B-LAND USE - AGRICULTURE;MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .97
BA   .280
LG   .500    .000   3.790    .454    .000
UC   .933    .586
UA      0       3       9      18      28      42      59      73      87      92
UA    100
*
KKCER59B
KM COMBINE ROUTED FLOW FROM COMPUTATION POINT CRE55B TO RUNOFF FROM SUBASIN
KM ER59B
HC      2
*
KKRIR63B
KM ROUTE FLOW FROM COMPUTATION POINT CER59B TO COMPUTATION POINT CIR63B. NOTE
KM END POINTS OF CROSSECTION WERE ADJUSTED SO THAT FLOW WOULD BE CONTAINED
KM WITHIN THE GIVEN ROUTING REACH
RS      7    ELEV      -1
RC   0.07    0.07    0.07    3100   0.002
RX      0      40      80     120     160     210     290     360
RY1022.7    1020  1019.7  1019.7    1020  1020.2  1020.9  1022.7
*
KK IR63B
KM SUB-BASIN IR63B-LAND USE - AGRICULTURE;MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .97
BA   .130
LG   .500    .000   3.500    .470    .000
UC   .767    .647
UA      0       3       9      18      28      42      59      73      87      92
UA    100
*
KKCIR63B
```

```
KM  COMBINE ROUTED FLOW FROM COMPUTATION POINT CER59B AND RUNOFF OF SUB-BASINS
KM  IR63B AND IR62B
HC     3
*
KKDIR63B
KM  COMPUTATION POINT CIR63B IS LOCATED ON THE WESTERN EDGE OF THE STUDY AREA
KM  WHICH IS BOUNDED BY A CONCRETE IRRIGATION CANAL AND EARTHEN ROADWAY. THE
KM  EARTHEN ROADWAY HAS A CAPACITY OF APPROXIMATELY 45 CFS BEFORE THE
KM  IRRIGATION  CANAL IS OVERTOPPED AND FLOW CONTINUES ITS NATURAL FLOW
KM  PATH TO THE WEST. THE DIVERTED FLOW OF APPROXIMATELY 45 CFS IS ROUTED
KM  TO THE CHAMPION DRAIN WATERSHED
DTRIR63B
DI     0      45     100     200     400     600     800
DQ     0      45      45      45      45      45      45
*
KK SA19C
KM  !!!!!!! START CHAMPION DRAIN WATERSHED  !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
KM SUB-BASIN SA19C-LAND USE- URBAN,AGRICULTURE
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .480
IN    30
KM RAINFALL DEPTH OF 4.20 WAS SPACIALLY REDUCED AS SHOWN BY THE PB RECORD
PB 3.780
KM THE FOLLOWING PC RECORD USED A 24-HOUR SCS TYPE II STORM
PC  .000    .005    .011    .016    .022    .028    .035    .041    .048    .056
PC  .068    .071    .080    .089    .098    .109    .120    .133    .147    .163
PC  .181    .204    .235    .283    .663    .735    .772    .799    .820    .838
PC  .854    .868    .880    .891    .902    .912    .921    .929    .937    .945
PC  .952    .959    .965    .972    .978    .984    .989    .995   1.000
LG  .400    .093   3.750    .484   5.800
UC  .700    .599
UA     0       3       9      18      28      42      59      73      87      92
UA   100
*
KKDSA19C
KM DIVERT CAPACITY OF STORMDRAIN AT CONCENTRARION POINT
DT SA19C
DI    10      30      70     100     200     300
DQ    10      30      70      70      70      70
*
KKRR23C1
KM ROUTE FLOW FROM SUB-BASIN SA19C TO COMPUTATION POINT CPC23C ( 1ST REACH )
RS     4    ELEV      -1
RC 0.035   0.035   0.035    1200  0.0083    1076
RX     0      50     120     220    1020    1080    1180    1250
RY  1076  1075.8  1075.8  1075.8  1075.8  1075.8  1075.8    1076
*
KKRR23C2
KM ROUTE FLOW FROM SUB-BASIN SA19C TO COMPUTATION POINT CPC23C ( 2ND REACH )
RS     8    ELEV      -1
RC 0.100   0.100   0.100    1600  0.0088    1066
RX     0     150     560     820    1230    1470    1700    1870
RY  1066    1064    1064  1063.6  1063.5    1064    1064    1066
*
KKRR23C3
KM ROUTE FLOW FROM SUB-BASIN SA19C TO COMPUTATION POINT CPC23C ( 3RD REACH )
RS    10    ELEV      -1
RC 0.070   0.070   0.070    1900  0.0053    1056
RX     0      40     110     590    1210    1490    1770    2040
```

```
RY  1058    1054    1054  1052.8  1052.8    1054  1054.8    1056
*
KK CR23C
KM SUB-BASIN CR23C-LAND USE- URBAN,AGRICULTURE
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .580
LG  .320    .114   5.550    .234   3.300
UC  .433    .214
UA     0       3       9      18      28      42      59      73      87      92
UA   100
*
KKCPC23C
KM  COMBINE ROUTED FLOW FROM SUB-BASIN SA19C TO RUNOFF FROM SUB-BASIN CR23C
HC     2
*
KK RF27C
KM ROUTE FLOW FROM COMPUTATION POINT CPC23C TO COMPUTATION POINT CPR27C
RS    11    ELEV      -1
RC 0.070   0.070   0.070    3000  0.0020    1049
RX     0     200     460     680     880     985    1220    2110
RY  1049  1048.2    1048    1047    1047    1048    1048    1049
*
KK RR27C
KM SUB-BASIN RR27C-LAND USE- URBAN,AGRICULTURE
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .480
LG  .460    .036   3.780    .432    .000
UC  .633    .314
UA     0       3       9      18      28      42      59      73      87      92
UA   100
*
KKCPR27C
KM COMBINE ROUTED FLOW FROM COMPUTATION POINT CPC23C WITH RUNOFF FROM SUB-
KM BASIN RR27C
HC     2
*
KKRR35C1
KM ROUTE FLOW FROM COMPUTATION POINT CPR27C TO COMPUTATION POINT CPR35C
RS    18    ELEV      -1
RC 0.070   0.070   0.070    5320  0.0030    1140
RX     0     270     540     630     790     870    1260    1300
RY  1140    1138    1137    1137    1137    1137    1138    1140
*
KK  CBDE
KM BASIN EAST OF CENTRAL 7th AVE FROM BASELINE TO NORTH OF DOBBINS
BA  0.17
LG   .35     .25     4.3     .33       9
UC   .65     .65
UA     0       3       9      18      28      42      59      73      87      92
UA   100
*
KK  OVL7
KM DIVERT FLOWS IN BASELINE STORMDRAIN
DT BLSD7
DI     0     250    1000   10000
DQ     0     250     250     250
*
* WITHOUT 7TH AVE STORMDRAIN THERE ALL THE FLOWS FROM CBDE WILL ENTER INTO
```

```
*  BASELINE STORMDRAIN. THEREFORE THERE IS NO OVERLAND ROUTING NEEDED.
*
* KK ROVL7
* KM      Route overland flows in roadside ditch to BR19C (BASELINE & 19TH AVE)
* RD  5200   0.008   0.030            TRAP    10.0    20.0
*
KK BR19C
KM SUB-BASIN BR19C-LAND USE - AGRICULTURE;MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .390
LG  .430    .027   4.050    .619   3.300
UC  .517    .319
UA     0       3       9      18      28      42      59      73      87      92
UA   100
*
KK OVL19
KM THE CAPACITY OF THE BASELINE STORMDRAIN IS 300 CFS, 250 CFS IS ALREADY IN THE
KM THE STORMDRAIN FROM 7TH AVE, THEREFORE THERE IS ONLY ROOM FOR AN EXTRA 50 CFS
DTBLSD19
DI     0       50    1000
DQ     0       50      50
*
KKCOVL19
KM COMBINE THE OVERLAND FLOWS FROM 19TH AVE AND 7TH AVE
HC     2
*
KKROVL19
KM ROUTE FLOW FROM SUB-BASIN BR19C TO COMPUTATION POINT CPS27C
RS    33    ELEV      -1
RC 0.070   0.070   0.070    7400  0.0077    1086
RX     0     730    1080    1340    1710    2380    2850    3350
RY  1086  1085.9  1085.7  1085.5    1085  1085.6  1085.6    1086
*
KK SA27C
KM SUB-BASIN SA27C-LAND USE - AGRICULTURE;MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .623
LG  .500    .000   3.520    .476    .000
UC  .683    .444
UA     0       3       9      18      28      42      59      73      87      92
UA   100
*
KKCPS27C
KM  COMBINE ROUTED FLOW FROM SUB-BASIN BR19C TO RUNOFF FROM SUB-BASIN SA27C
HC     2
*
KKRR35C3
KM ROUTE FLOW FROM CONCENTRATION POINT CPS27C TO CONCENTRATION POINT CPR35C
RS     8    ELEV      -1
RC   .07     .07     .07    3400   .0072    1042
RX     0     200     420     520     630     750    1120    1360
RY  1042  1041.5    1041  1040.8  1040.9    1041  1041.5    1042
*
KKCPR35A
KM COMBINE ROUTED FLOW FROM  COMPUTATION POINTS CPR27C AND CPS27C
HC     2
*
KK  SM5C
```

```
KM SUB-BASIN SM5C-LAND USE-URBAN
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .200
LG  .200    .349   4.300    .555  18.000
UC  .383    .355
UA    0       5      16      30      65      77      84      90      94      97
UA  100
*
KK  RSM7
KM ROUTE FLOW FROM SUB-BASIN SM5C TO COMPUTATION POINT CPS15C
RS    10    ELEV      -1
RC 0.070   0.070   0.070    4000  0.0145
RX     0     110     180     270     330     420     510     600
RY  1180    1179  1178.5    1178    1178  1178.5    1179    1180
KKSMA15C
KM SUB-BASIN SMA15C-LAND USE- URBAN,AGRICULTURE
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .360
LG  .400    .045   3.700    .547    .000
UC  .417    .292
UA    0       3       9      18      28      42      59      73      87      92
UA  100
KKCPS15C
KM COMBINE ROUTED FLOW FROM SUB-BASIN SM5C WITH RUNOFF FROM SUB-BASIN SMA15C
HC    2
KKRSM19C
KM ROUTE FLOW FROM SUB-BASIN SA15C TO COMPUTATION POINT CPS19C
RS    4    ELEV
RC 0.070   0.070   0.070    2030    0.01    1140
RX     0      50     110     160     210     260     350     430
RY  1140  1139.5  1139.2  1139.2  1139.2  1139.2  1139.5    1140
KKSMA19C
KM SUB-BASIN SMA19C-LAND USE - AGRICULTURE;MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .156
LG  .500    .000   4.200    .777    .000
UC  .833   1.212
UA    0       3       9      18      28      42      59      73      87      92
UA  100
KKCPS19C
KM COMBINE ROUTED FLOW FROM SUB-BASIN SMA15C TO RUNOFF FROM SUB-BASIN SMA19C
HC    2
KKRRB27C
KM ROUTE FLOW FROM COMPUTATION POINT CPS19C TO COMPUTATION POINT CPB27C
RS   22    ELEV      -1
RC 0.070   0.070   0.070    7400  0.0090    1110
RX     0     260     550     770     920    1170    1320    1500
RY  1110    1109    1109    1108    1108  1107.8    1108    1110
KK  SM1C
KM SUB-BASIN SM1C-LAND USE- NATURAL DESERT(MOUNTAIN)
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA 1.840
LG  .150    .346   3.800    .623  50.000
UC  .450    .220
UA    0       3       5       8      12      20      43      75      90      96
UA  100
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KK SM1AC
KM SUB-BASIN SM1AC-LAND USE- NATURAL DESERT(MOUNTAIN)
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .280
LG  .150    .343   4.050    .528  10.000
UC  .367    .288
UA    0       3       5       8      12      20      43      75      90      96
UA  100
KK  CSM1
KM COMBINE FLOW FROM SUB-BASIN SM1C WITH SM1AC AT COMPUTATOIN
KM POINT CSM1
HC    2
KK  RSM1
KM ROUTE FLOW FROM COMPUTATION POINT CSM1  TO COMPUTATION POINT CSM2
RS    2    ELEV      -1
RC 0.035   0.035   0.035    4300   0.017
RX    0      90     160     230     310     380     490     590
RY 1390    1380    1377  1375.5    1377    1380    1383    1390
KK  SM2C
KM SUB-BASIN SM2C-LAND USE- NATURAL DESERT(MOUNTAIN)
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
* KO     1       2
BA 2.190
LG  .150    .350   3.310    .820  86.000
UC  .383    .134
UA    0       3       5       8      12      20      43      75      90      96
UA  100
KK  CSM2
KM COMBINE RUNOFF FROM SUB-BASIN SM2C TO ROUTED FLOW FROM COMPUTATION
KM POINT CSM1
HC    2
KK RDENT
KM ROUTE INFLOW HYDROGRAPH THROUGH SOUTH MOUNTAIN DETENTION BASIN
RS    1    ELEV      -1
SA 2.30    7.80   15.91   19.96   24.08   28.27   30.45   31.91
SE 1292    1294    1300    1305    1310    1315    1318    1320
SL 1298    7.06    0.58     0.5
SS 1318     200     2.7     1.5
KK  RSM2
KM ROUTE FLOW FROM COMPUTATOIN POINT CSM2 TO COMPUTATOIN POINT CSM3
RS   12    ELEV      -1
RC 0.040   0.040   0.040    6600   0.019    1228
RX    0      70     100     140     160     190     240     320
RY 1228  1227.5    1227    1226    1228  1228.5    1229    1230
KK  SM3C
KM SUB-BASIN SM3C-LAND USE- NATURAL DESERT(HILLSLOPE,MOUNTAIN),MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .480
LG  .160    .348   3.850    .607   1.500
UC  .333    .159
UA    0       3       5       8      12      20      43      75      90      96
UA  100
KK  CSM3
KM COMBINE RUNOFF FROM SUB-BASIN SM3C TO ROUTED FLOW FROM COMPUTATION
KM POINT CSM2
HC    2
KK  RSM3
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KM ROUTE FLOW FROM COMPUTATION POINT CSM3 TO COMPUTATION POINT CSM4
RS     4    ELEV      -1
RC 0.040   0.040   0.040    3000  0.0095
RX     0     120     190     270     330     400     470     530
RY  1178  1177.5    1177    1176    1176    1177  1177.5    1178
KK  SM4C
KM SUB-BASIN SM4C-LAND USE-URBAN
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .240
LG  .260    .350   4.600    .592  14.400
UC  .417    .387
UA     0       5      16      30      65      77      84      90      94      97
UA   100
KK  RSM4
KM ROUTE FLOW FROM SUB-BASIN SM4C TO COMPUTATION POINT CSM4
RS     2    ELEV      -1
RC 0.035   0.035   0.035    1200   0.012
RX     0      50      80     110     130     160     180     200
RY  1170  1169.5    1169  1168.5    1168  1168.5    1169    1170
KK DRW2C
KM SUB-BASIN DRW2C-LAND USE- NATURAL DESERT(HILLSLOPE,MOUNTAIN)
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .530
LG  .150    .340   3.250    .859  30.000
UC  .517    .377
UA     0       3       5       8      12      20      43      75      90      96
UA   100
KKDRWC1C
KM SUB-BASIN DRWC1C-LAND USE-AGRICULTURE
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA .120
LG .500    .000   4.250    .727    .000
UC .600    .720
UA     0       3       9      18      28      42      59      73      87      92
UA   100
KK  CSM4
KM COMBINE RUNOFF FROM SUB-BASINS DRW2C AND DRWC1C WITH ROUTED FLOW FROM SM4C
KM AND COMPUTATION POINT CSM3
HC     4
KK  RSM5
KM ROUTE FLOW FROM COMPUTATION POINT CSM4 TO COMPUTATION POINT CSM5
RS     1    ELEV      -1
RC 0.045   0.045   0.045    1800  0.0078
RX     0      80     130     160     180     190     220     260
RY  1160    1159  1158.5    1158    1156    1156    1158    1160
KK  DR1C
KM SUB-BASIN DR1C-LAND USE-NATURAL DESERT(HILLSLOPE)
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .160
LG  .150    .265   5.300    .198    .000
UC  .417    .442
UA     0       3       5       8      12      20      43      75      90      96
UA   100
*
KK  WC1A
KM SUB-BASIN WC1A-LAND USE- NATURAL DESERT(HILLSLOPE)
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KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .250
LG  .150    .264   4.680    .217    40.0
UC  .400    .404
UA     0       3       5       8      12      20      43      75      90      96
UA   100
*
KK  RSM6
KM ROUTE FLOW FROM SUB-BASIN WC1A TO COMPUTATION POINT CPDR2C
RS     1    ELEV     -1
RC 0.045   0.045   0.045    1150   0.012    1150
RX     0      30      50      70      90     110     130     170
RY  1152    1151    1150    1148    1146    1146    1148    1150
*
KK  DR2C
KM SUB-BASIN DR2C-LAND USE- NATURAL DESERT(HILLSLOPE),AGRICULTURAL
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .050
LG  .150    .325   4.255   .423    .000
UC  .350    .318
UA     0       3       5       8      12      20      43      75      90      96
UA   100
*
KKCPDR2C
KM COMBINE FLOW FROM SUB-BASINS DR2C AND DR1C TO ROUTED FLOW FROM SUB-BASIN WC1A
KM AND COMPUTATION POINT CSM4 (JUST WEST OF 27TH AVE.)
HC     4
*
KKRRB27C
KM ROUTE FLOW FROM COMPUTATION POINT CPDR2C TO COMPUTATION POINT CPB27C
RS    15    ELEV      -1
RC 0.070   0.070   0.070    7400   0.009    1110
RX     0     260     550     770     920    1170    1320    1500
RY  1110    1109    1109    1108    1108  1107.8    1108    1110
*
KK BR27C
KM SUB-BASIN BR27C-LAND USE - AGRICULTURE;MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .780
LG  .500    .000   4.150    .695    .000
UC  .700    .416
UA     0       3       9      18      28      42      59      73      87      92
UA   100
*
KK BLSD7
KM RETRIEVE BASELINE STORMDRAIN FROM 7TH AVE.
DR BLSD7
*
KKRBLSD7
KM ROUTE HYDROGRAPH THROUGH BASELINE STORMDRAIN TO OUTLET OF BR19C
RD  5750   .0080    .013            CIRC     5.5
*
KKBLSD19
KM RETRIEVE BASELINE STORMDRAIN AT 19TH AVE.
DRBLSD19
*
KK CSD19
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KM COMBINE STORMDRAIN FLOWS FROM 7TH AVE AND 19TH AVE.
HC     2
*
KK RSD19
KM ROUTE STORMDRAIN FROM 19TH AVE TO 27TH AVE
RD  5280     .004     .013             CIRC       8
*
KK OVL27
KM BASELINE STORMDRAIN DOWNSIZES TO FORCE FLOWS INTO A FUTURE BASIN.  MAXIMUM
KM CAPACITY IS 156 CFS
KM DIVERT BASELINE STORMDRAIN FLOWS
DTBLSD27
DI     0      156     1000    10000
DQ     0      156      156      156
*
KKCPB27C
KM COMBINE ROUTED FLOW FROM COMPUTATION POINT CPS19C TO RUNOFF FROM SUB-BASIN
KM BR27C
HC     4
*
KKOVL27C
KM DIVERT FLOWS INTO BASELINE STORMDRAIN AT 27TH AVE.
DTBLSD27
DI     0      156    10000
DQ     0      156      156
*
KKRR35C3
KM ROUTE FLOW FROM COMPUTATION POINT CPS27C TO COMPUTATION POINT CPR35C
RS     8     ELEV      -1
RC 0.070    0.070    0.070     3400  0.0072     1042
RX     0      200      420      520      630      750     1120     1360
RY  1042   1041.5     1041   1040.8   1040.9     1041   1041.5     1042
*
KKRR35C2
KM ROUTE FLOW FROM COMPUTATION POINT CPR27C TO COMPUTATION POINT CPR35C
RS    20     ELEV      -1
RC 0.070    0.070    0.070     8800  0.0065   1058.5
RX     0      230      480      580      680      770      910     1600
RY1058.5     1057     1057     1057     1057     1057     1057   1059.3
*
KK RR35C
KM SUB-BASIN RR35C-LAND USE - AGRICULTURE;MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA 1.890
LG  .500     .000    5.500     .348     .000
UC  .983     .310
UA     0        3        9       18       28       42       59       73       87       92
UA   100
*
KKCPR35B
KM  COMBINE ROUTED FLOW FROM COMPUTATION POINT CPB27C TO RUNOFF FROM SUB-BASIN
KM  RR35C
HC     3
*
KKRRS37C
KM ROUTE FLOW FROM COMPUTATION POINT CPR35C TO COMPUTATION POINT CPS37C
RS     8     ELEV      -1
RC  0.10     0.10     0.10     2400  0.0025
RX     0      280      470      630      700      840     1390     1860
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RY  1028    1026    1026    1025    1025    1025    1026    1028
*
KK SA37C
KM SUB-BASIN SA37C-LAND USE- URBAN, AGRICULTURE
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .590
LG  .320    .130   4.900    .323  15.000
UC  .750    .337
UA     0       5      16      30      65      77      84      90      94      97
UA   100
*
KKCPS37C
KM  COMBINE ROUTED FLOW FROM COMPUTATION POINT CPS37C WITH RUNOFF FROM SUB-
KM  BASIN SA37C
HC     2
*
KKRAV431
KM ROUTE FLOW FROM COMPUTATION POINT CPS37C TO COMPUTATION POINT CAV43C
RS    15    ELEV     -1
RC  0.10    0.10    0.10    3200  0.0012
RX     0     380     620     980    1320    1560    1700    2200
RY1022.8    1021  1020.6  1020.9  1021.4  1021.6  1021.8  1022.8
KK  WC2A
*
KM SUB-BASIN WC2A -LAND USE- NATURAL DESERT HILLSLOPES; MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .080
LG  .150    .251   8.600    .070    .000
UC  .383    .530
UA     0       3       5       8      12      20      43      75      90      96
UA   100
*
KKRD27.1
KM ROUTE FLOW FROM SUB-BASIN WC2A  TO COMPUTATION POINT CD27.1
RS     1    ELEV      -1
RC 0.035   0.035   0.035     960   0.016    1150
RX     0      30      40      55      70      85     105     130
RY  1150    1150    1148    1147    1148    1149    1150    1151
*
KKWC2.1A
KM SUB-BASIN WC2.1A-LAND USE- NATURAL DESERT HILLSLOPES; MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .080
LG  .150    .290   4.000    .520    .000
UC  .350    .310
UA     0       3       5       8      12      20      43      75      90      96
UA   100
*
KKRD27.2
KM ROUTE FLOW FROM SUB-BASIN WC2.1A TO COMPUTATION POINT CD27.1
RS     1    ELEV      -1
RC 0.035   0.035   0.035    1000   0.015    1153
RX     0      35      75     100     135     145     165     195
RY  1153    1152    1150    1149    1148    1150    1152    1154
*
KKCD27.1
KM COMBINE ROUTED FLOW FROM SUB-BASINS WC2A AND WC2.1A
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KM ROUTE FLOWS IN BASELINE STORMDRAIN FROM 27TH AVE TO 35TH AVE.
RD  5500    .0042     .013              CIRC        6
*
KK  35-2
KM COMBINE FLOWS AT 35TH AVE FROM STORMDRAIN AND OVERLAND FLOWS
HC      2
*
KKOV35-2
KM DIVERT FLOWS TO STORMDRAIN AT 35TH AVE.
DTBLSD35
DI      0      284    10000
DQ      0      284      284
*
KKRAV432
KM ROUTE FLOW FROM COMPUTATION POINT CPB352 TO COMPUTATION POINT CAV43C( 1ST.
KM REACH )
RS      9     ELEV       -1
RC   0.07     0.07     0.07     3400   0.0056
RX      0       90       91      360      640     1015     1016     1475
RY   1044     1042     1042   1041.2   1041.2     1042     1042     1044
KKRAV433
KM ROUTE FLOW FROM COMPUTATION POINT CPB352 TO COMPUTATION POINT CAV43C (2ND.
KM REACH )
RS      8     ELEV       -1
RC   0.07     0.07     0.07     3000   0.0060
RX      0      300      301      570      630     1220     1400     1650
RY   1030     1029     1029     1028     1028     1029     1029     1030
*
KK  WC5A
KM SUB-BASIN WC5A -LAND USE- DESERT HILLS; MINOR DEVELOMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
* KO      1        2
BA   .420
LG   .150     .346    2.880    1.050   28.000
UC   .500     .359
UA      0        3        5        8       12       20       43       75       90       96
UA    100
*
KKRD35.1
KM ROUTE RUNOFF FROM SUB-BASIN WC5A TO COMPUTATION POINT CD35.1
RS     10     ELEV       -1
RC 0.040    0.055    0.035     4800    0.012
RX      0      130      270      330      400      460      530      625
RY   1126   1125.9   1125.7   1125.5     1125   1125.5   1125.7     1126
*
KK  WC6A
KM SUB-BASIN WC6A -LAND USE- NATURAL DESERT HILLSLOPES; MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA   .014
LG   .150     .270    3.750     .293     .000
UC   .233     .259
UA      0        3        5        8       12       20       43       75       90       96
UA    100
*
KKRD35.2
KM ROUTE RUNOFF FROM SUB-BASIN WC6A TO COMPUTATION POINT CD35.1
RS     13     ELEV       -1
RC 0.070    0.070    0.070     3800    0.015
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RX     0     130     240     280     340     440     530     655
RY  1122    1120    1118  1117.8    1118    1119    1120    1122
*
KKCD35.1
KM COMBINE ROUTED FLOW FROM SUB-BASINS WC5A AND WC6A
HC     2
*
KKRD35.3
KM ROUTE FLOW FROM COMPUTATION POINT CD35.1 TO COMPUTATION POINT CD35.2
RS     6    ELEV      -1
RC 0.035   0.035   0.035    2480   0.005  1090.5
RX     0     100     200     350     435     480     500     525
RY  1092    1091    1090  1089.8  1089.7  1089.6    1090  1090.5
*
KK  WC7A
KM SUB-BASIN WC7A -LAND USE- NATURAL DESERT HILLSLOPES; MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .050
LG  .150    .270   7.000    .141    .000
UC  .317    .332
UA     0       3       5       8      12      20      43      75      90      96
UA   100
*
KKRD35.4
KM ROUTE RUNOFF FROM SUB-BASIN WC7A TO COMPUTATION POINT CD35.3
RS     4    ELEV      -1
RC 0.035   0.035   0.035    2800   0.018  1128.5
RX     0     100     170     240     250     260     330     360
RY  1129    1128    1127    1126  1125.8    1126    1128  1128.5
*
KK  WC8A
KM SUB-BASIN WC8A -LAND USE- DESERT MOUNTAIN, DESERT HILLS; MINOR DEVELOMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .350
LG  .150    .321   3.700    .651  30.000
UC  .433    .366
UA     0       3       5       8      12      20      43      75      90      96
UA   100
*
KKRD35.5
KM ROUTE FLOW FROM SUB-BASIN WC8A TO COMPUTATION POINT CD35.3
RS     2    ELEV      -1
RC 0.030   0.030   0.030    2200   0.022    1139
RX     0      50     125     190     240     370     400     450
RY  1139    1138  1137.5    1137  1137.5    1138    1140    1141
*
KKCD35.3
KM COMBINE ROUTED FLOW FROM SUB-BASINS WC7A AND WC8A
HC     2
*
KKRD35.6
KM ROUTE FLOW FROM COMPUTATION POINT CD35.3 TO COMPUTATION POINT CD35.4
RS     1    ELEV      -1
RC 0.030   0.035   0.035     700   0.011
RX     0      30      60     110     140     180     240     350
RY  1103  1101.8  1101.6  1101.4    1101  1101.4  1101.7    1103
*
KK  WC9A
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KM SUB-BASIN WC9A -LAND USE- NATURAL DESERT HILLSLOPES; MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .025
LG  .150    .250   8.600    .066    .000
UC  .300    .420
UA    0       3       5       8      12      20      43      75      90      96
UA  100
*
KKRD35.7
KM ROUTE RUNOFF FROM SUB-BASIN WC9A TO COMPUTATION POINT CD35.5
RS    1    ELEV      -1
RC 0.035   0.035   0.035    1000   0.025    1130
RX    0      30      40      60      70      90     120     140
RY 1130    1130    1129    1128  1128.5    1129    1130  1130.5
*
KK WC10A
KM SUB-BASIN WC10A -LAND USE- NATURAL DESERT HILLSLOPES; MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .020
LG  .150    .260   5.800    .059    .000
UC  .233    .289
UA    0       3       5       8      12      20      43      75      90      96
UA  100
*
KKRD35.8
KM ROUTE RUNOFF FROM SUB-BASIN WC10A TO COMPUTATION POINT CD35.5
RS    1    ELEV      -1
RC 0.035   0.035   0.035    1000   0.025
RX    0      30      50      70     100     140     210     260
RY 1134    1134    1133    1132    1132    1133  1133.5    1134
*
KKCD35.5
KM COMBINE ROUTED FLOW FROM SUB-BASINS WC9A AND WC10A
HC    2
*
KKRD35.9
KM ROUTE FLOW FROM COMPUTATION POINT CD35.5 TO COMPUTATION POINT CD35.6
RS    2    ELEV      -1
RC 0.030   0.030   0.030    1200   0.015
RX    0      60     110     170     210     240     330     370
RY 1116  1115.8  1115.5    1115  1114.8    1115  1115.8    1116
*
KK WC11A
KM SUB-BASIN WC11A -LAND USE- DESERT MOUNTAINS, DESERT HILLS; MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .290
LG  .150    .335   3.600    .703  53.000
UC  .367    .357
UA    0       3       5       8      12      20      43      75      90      96
UA  100
*
KKRD3510
KM ROUTE RUNOFF FROM SUB-BASIN WC11A TO COMPUTATION POINT CD35.7
RS    1    ELEV      -1
RC 0.050   0.050   0.050    1100   0.024
RX    0      50     170     180     225     260     380     460
RY 1132  1131.8  1131.6  1131.5    1131  1131.5  1131.8    1132
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*
KK WC12A
KM SUB-BASIN WC12A -LAND USE- DESERT MOUNTAIN, DESERT HILLS; MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .260
LG  .150    .320   3.800    .632  28.000
UC  .333    .217
UA    0       3       5       8      12      20      43      75      90      96
UA  100
*
KKRD3511
KM ROUTE RUNOFF FROM SUB-BASIN WC12A TO COMPUTATION POINT CD35.7
RS     1    ELEV      -1
RC 0.040   0.040   0.040    1200   0.022    1144
RX     0      10      25      45      70     120     235     290
RY1144.5    1144  1143.5    1143  1143.5  1143.7  1143.8    1144
*
KKCD35.7
KM COMBINE ROUTED FLOWS FROM SUB-BASINS WC11A AND WC12A
HC     2
*
KKRD3512
KM ROUTE FLOW FROM COMPUTATION POINT CD35.7 TO COMPUTATION POINT CD35.6
RS     2    ELEV      -1
RC 0.055   0.055   0.055    1080   0.006
RX     0      20      50      70     130     180     400     460
RY1122.5    1122    1121  1120.5    1121  1121.5    1122  1122.5
*
KKCD35.6
KM COMBINE ROUTED FLOW FROM COMPUTATION POINTS CD35.5 AND CD35.7
HC     2
*
KKRD3513
KM ROUTE FLOW FROM COMPUTATION POINT CD35.6 TO COMPUTATION POINT CD35.4
RS     1    ELEV      -1
RC 0.040   0.035   0.030    1000   0.012
RX     0      40     130     210     280     340     570     615
RY1102.5    1102  1101.8  1101.5    1101  1101.5    1102  1102.5
*
KKCD35.4
KM COMBINE ROUTED FLOW FROM COMPUTATION POINTS CD35.3 AND CD35.6
HC     2
*
KKRD3514
KM ROUTE FLOW FROM COMPUTATION POINT CD35.4 TO COMPUTATION POINT CD35.2
RS     3    ELEV      -1
RC 0.070   0.070   0.070    1400   0.006    1194
RX     0     120     200     300     400     470     560     660
RY  1194  1193.0  1192.8  1192.5  1192.5  1192.8    1193    1194
*
KK WC15A
KM SUB-BASIN WC15A -LAND USE- DESERT MOUNTAIN, DESERT HILLS; MINOR DEVELOMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
* KO     1       2
BA  .360
LG  .150    .320   3.350    .784  50.000
UC  .317    .245
UA    0       3       5       8      12      20      43      75      90      96
```

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UA   100
*
KKRD3515
KM ROUTE RUNOFF FROM SUB-BASIN WC15A TO COMPUTATION POINT CD35.8
RS     1    ELEV      -1
RC 0.030   0.035   0.030    1250   0.014    1136
RX     0      30      50      70      85     100     140     200
RY  1140    1138    1136    1134    1132    1134    1135    1136
*
KK  PM2A
KM SUB-BASIN PM2A -LAND USE- DESERT MOUNTAIN, DESERT HILLS; MINOR DEVELOMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .070
LG  .150    .332   4.100    .502  15.000
UC  .300    .282
UA     0       3       5       8      12      20      43      75      90      96
UA   100
*
KKCD35.8
KM COMBINE ROUTED FLOW FROM SUB-BASIN WC15A TO SUB-BASIN PM2A
HC     2
*
KKRD3516
KM ROUTE FLOW FROM COMPUTATION POINT CD35.8 TO COMPUTATION POINT CD35.9
RS     1    ELEV      -1
RC 0.035   0.040   0.030    1400   0.008    1126
RX     0      25      35      50     130     150     200     260
RY  1130    1126    1124    1122    1122    1124    1125    1126
*
KK WC13A
KM SUB-BASIN WC13A -LAND USE- NATURAL DESERT HILLSLOPES; MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .013
LG  .150    .250   8.600    .066    .000
UC  .250    .341
UA     0       3       5       8      12      20      43      75      90      96
UA   100
*
KKRD3517
KM ROUTE RUNOFF FROM SUB-BASIN WC13A TO COMPUTATION POINT CD35.9
RS     3    ELEV      -1
RC 0.035   0.035   0.035    1280   0.023
RX     0     115     180     225     270     350     435     530
RY  1132  1131.5  1131.2    1131  1131.2  1131.5  1131.8    1132
*
KK WC14A
KM SUB-BASIN WC14A -LAND USE- NATURAL DESERT HILLSLOPES; MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .050
LG  .150    .290   4.000    .520    .000
UC  .367    .427
UA     0       3       5       8      12      20      43      75      90      96
UA   100
*
KKRD3518
KM ROUTE RUNOFF FROM SUB-BASIN WC14A TO COMPUTATION POINT CD35.9
RS     6    ELEV      -1
```

```
RC 0.040   0.045   0.040    2000   0.013
RX     0      60     150     220     250     280     310     360
RY  1134  1133.9  1133.7  1133.4  1133.7  1133.8  1133.9    1134
*
KK  PM1A
KM SUB-BASIN PM1A -LAND USE- AGRICULTURE, DESERT HILLS; MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .070
LG  .380    .097   4.210    .697    2.00
UC  .383    .279
UA     0       3       5       8      12      20      43      75      90      96
UA   100
*
KKCD35.9
KM COMBINE ROUTED FLOWS FROM SUB-BASINS WC13A AND WC14A, COMPUTATION POINT
KM CD35.8 WITH RUNOFF FROM SUB-BASIN PM1A
HC     4
*
KKRD3519
KM ROUTE FLOW FROM COMPUTATION POINT CD35.9 TO COMPUTATION POINT CD35.2
RS     1    ELEV      -1
RC 0.040   0.045   0.040     288   0.012
RX     0      80     190     270     310     335     440     480
RY1102.5    1102  1101.7  1101.5    1101  1101.5    1102  1102.5
*
KK DR35C
KM SUB-BASIN DR35C -LAND USE- AGRICULTURE; MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FATOR OF .90
BA  .600
LG  .360    .221   4.200    .454    .000
UC  .717    .443
UA     0       3       5       8      12      20      43      75      90      96
UA   100
*
KKCD35.2
KM COMBINE ROUTED FLOWS FROM COMPUTATION POINTS CD35.1, CD35.4 AND CD35.9 WITH
KM RUNOFF FROM SUB-BASIN DR35C
HC     4
*
*
* TEST BY JUST DIVERTING OUT THE REQUIRED VOLUME FROM THE GOLG COURSE.
*
* KK    GC
* KM  DIVERT STORAGE FROM AGUILA GOLF COURSE
* DT  STGC     135
* DI     0      50     100    1000   10000
* DQ     0      50     100    1000   10000
* *
* KK GCOUT
* KM  DIVERT FLOWS IN EXCESS OF 50 CFS
* DTGCOVLN
* DI     0      50     100    1000   10000
* DQ     0       0      50     950    9950
*
*
*
* START HEC-1 MODEL MODIFICATION FOR CESAR CHAVEZ DETENTION BASIN
*
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*
*
*
KKDI35TH
KM      SPLIT FLOW OPERATION AT THE INTERSECTION OF 35TH AVE AND DOBBINS ROAD
DT DIDOB
DI     0      40     836    1575
DQ     0      10     335     630
*
KK RDI35
KM      ROUTE DIVERSION FLOW WEST ACROSS 35TH AVE TO DET. STORAGE AT SRCC1
RS     1    FLOW      -1
RC   .03    .025     .03     700    .005
RX     0      80     190     270     310     335     440     480
RY  1083  1082.5    1082    1081    1081    1082  1082.5    1083
*
KK   CC1
KM      RUNOFF HYDROGRAPH FROM GC WATERSHED CC1
BA  .022
LG  .400     .15   6.350    .259    .000
UC  .213    .235
UA     0       3       9      18      28      42      59      73      87
UA   100
*
KK CPCC1
KM      COMBINE HYDROGRAPHS AT CPCC1
HC     2
*
KK SRCC1
KM       STORAGE ROUTE THROUGH FIRST DET. BASIN IN CC1
RS     1    STOR       0
SV     0   1.576   4.110   7.819  13.036  16.318  20.104  24.633  29.653  35.9
SQ     0       0       9      14      16      17      18     242     696     12
SE  1060    1062    1064    1066    1068    1069    1070    1071    1072     10
*
KK DICC5
KM      SPLIT FLOW OPERATION AT BASIN CC1 - REMAINDER TO SRCC2
DT DICC2
DI     0       9      14      17      18     242     696    1264
DQ     0       0       0       0       0      84     254     467
*
KK  RCC5
KM      ROUTE OVERFLOW FROM SRCC1 TO CPCC5
RS     1    FLOW      -1
RC   .03    .025     .03     550    .005
RX     0      40      90     100     140     150     200     240
RY  1072    1068    1062    1060    1060    1062    1068    1072
*
KK   CC5
KM      RUNOFF HYDROGRAPH FROM GOLF COURSE WATERSHED CC5
BA  .026
LG  .400     .15   6.350    .259    .000
UC  .204    .118
UA     0       3       9      18      28      42      59      73      87
UA   100
*
KK CPCC5
KM      COMBINE HYDROGRAPHS AT CPCC5
HC     2
*
```

```
KK SRCC5
KM        STORAGE ROUTE THROUGH DET. BASIN SRCC5 IN GOLF COURSE
RS      1     STOR       -1
SV      0     1.15     3.18     6.08    10.23    16.23    20.57    26.49    33.71    41.
SQ      0        0        9       13       16       19       21      105      276     4
SE   1056     1058     1060     1062     1064     1066     1067     1068     1069    10
*
KK  RCC6
KM       ROUTE OVERFLOW FROM SRCC5 TO CPCC6
RS      1     FLOW       -1
RC    .03     .025      .03      450     .005
RX      0       40       90      100      140      150      200      240
RY   1072     1068     1062     1060     1060     1062     1068     1072
*
KK   CC6
KM       RUNOFF HYDROGRAPH FROM GOLF COURSE WATERSHED CC6
BA   .025
LG   .400      .15    6.350     .259     .000
UC   .117     .059
*
KK CPCC6
KM       COMBINE HYDROGRAPHS AT CPCC6
HC      2
*
KK SRCC6
KM       STORAGE ROUTE THROUGH DET. BASIN SRCC6 IN GOLF COURSE
RS      1     STOR       -1
SV      0     0.34     1.02     2.15     3.87     6.54    10.95    17.51    21.94    27.
SV  34.94    42.41
SQ      0        0        9       11       13       14       15       16       17     1
SQ    272      485
SE   1044     1046     1048     1050     1052     1054     1056     1058     1059    10
SE   1061     1062
*
KK  RCC7
KM       ROUTE OVERFLOW FROM SRCC6 TO CPCC7
RS      1     FLOW       -1
RC    .03     .025      .03      800     .005
RX      0       40       90      100      140      150      200      240
RY   1072     1068     1062     1060     1060     1062     1068     1072
*
KK   CC7
KM       RUNOFF HYDROGRAPH FROM GOLF COURSE WATERSHED CC7
BA   .044
LG   .400      .15    6.350     .259     .000
UC   .196     .110
*
KKICPCC7
KM       COMBINE INTERMEDIATE HYDROGRAPHS AT CPCC7
HC      2
*
KK DIDOB
KM       RETURN DIVERSION FLOW NORTH ACROSS DOBBINS ROAD
DR DIDOB
*
KKRDIDOB
KM       ROUTE DIVERSION FLOW NORTH ACROSS DOBBINS TO DET. STORAGE AT SRCC2
RS      1     FLOW       -1
RC    .03     .025      .03      700     .005
RX      0       80      190      270      310      335      440      480
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```
RY  1083  1082.5    1082    1081    1081    1082  1082.5    1083
*
KK   CC2
KM      RUNOFF HYDROGRAPH FROM GOLF COURSE WATERSHED CC2
BA  .015
LG  .400     .15   6.350    .259    .000
UC  .158    .123
*
KKICPCC2
KM      COMBINE HYDROGRAPHS AT CPCC2
HC     2
*
KK DICC2
KM      RETURN DIVERSION FLOW NORTH TO DET BASIN SRCC2
DR DICC2
*
KK CPCC2
KM      COMBINE HYDROGRAPHS AT CPCC2
HC     2
*
KK SRCC2
KM      STORAGE ROUTE THROUGH DET. BASIN SRCC2 IN GOLF COURSE
RS     1    STOR       -1
SV     0    0.44    1.41    3.11    4.32    5.71    7.69   10.16  11.622
SQ     0       0       9      10      12     153     437     792     995
SE  1062    1064    1066    1068    1069    1070    1071    1072  1072.5
*
KK  RCC3
KM      ROUTE OVERFLOW FROM SRCC2 TO CPCC3
RS     1    FLOW       -1
RC   .03    .025     .03     750    .005
RX     0      40      90     100     140     150     200     240
RY  1072    1068    1062    1060    1060    1062    1068    1072
*
KK   CC3
KM      RUNOFF HYDROGRAPH FROM GOLF COURSE WATERSHED CC3
BA  .069
LG  .400     .15   6.350    .259    .000
UC  .233    .110
*
KK CPCC3
KM      COMBINE HYDROGRAPHS AT CPCC3
HC     2
*
KK SRCC3
KM      STORAGE ROUTE THROUGH DET. BASIN SRCC3 IN GOLF COURSE
RS     1    STOR        0
SV     0    2.61    9.40   23.16   33.72   48.15   67.11   86.06
SQ     0      10      20      23      26     110     281     494
SE  1058    1060    1062    1064    1065    1066    1067    1068
*
KK  RCC4
KM      ROUTE OVERFLOW FROM SRCC3 TO CPCC4
RS     1    FLOW        0
RC   .03    .025     .03    1100    .005
RX     0      40      90     100     140     150     200     240
RY  1072    1068    1062    1060    1060    1062    1068    1072
*
KK   CC4
KM      RUNOFF HYDROGRAPH FROM GOLF COURSE WATERSHED CC4
```

```
BA  .066
LG  .400      .15   6.350     .259     .000
UC  .204     .091
UA     0        3        9       18       28       42       59       73       87
UA   100
*
KK CPCC4
KM       COMBINE HYDROGRAPHS AT CPCC4
HC      2
*
KK SRCC4
KM       STORAGE ROUTE THROUGH DET. BASIN SRCC3 IN GOLF COURSE
RS      1    STOR        0
SV      0    0.91     3.43     8.89    18.90    26.34    35.88    47.79    60.36
SQ      0       0        9       16       17       18      102      273      486
SE   1052    1054     1056     1058     1060     1061     1062     1063     1064
*
KK  RCC7
KM       ROUTE OVERFLOW FROM SRCC4 TO CPCC7
RS      1    FLOW        0
RC    .03    .025      .03     1100     .005
RX      0      40       90      100      140      150      200      240
RY   1072    1068     1062     1060     1060     1062     1068     1072
*
KK CPCC7
KM       COMBINE ALL HYDROGRAPHS AT CPCC7
HC      2
*
KK SRCC7
KM       STORAGE ROUTE THROUGH DET. BASIN SRCC7 IN GOLF COURSE
RS      1    STOR        0
SV      0    0.77     2.10     4.03     6.73    10.47    15.75    17.32    20.45
SV 21.08   22.65
SQ      0       0       12     35.7     35.7     35.7     35.7     35.7     35.7
SQ   35.7     234
SE   1042    1044     1046     1048     1050     1052     1054   1054.5     1055
SE1055.7  1056.2
*
KK DICC7
KM   SPLIT FLOW OPERATION AT BASIN CC7 - REMAINDER TO RPB352
DTGCOVLD
DI      0      12       30     35.7      234
DQ      0       0        0        0      198
*
KKRPC352
KM   ROUTE DISCHARGE FROM CCP7 TO 39TH & BASELINE
RD   2640    .004     .012             CIRC       3
*
KKBLSD35
KM RETRIEVE STORMDRAIN FLOWS FROM 35TH AVE.
DRBLSD35
*
KKRDS35
KM ROUTE BASELINE STORMDRAIN FLOWS FROM 35TH AVE TO 39TH AVE
RD   2600   .0062     .013             CIRC       7
*
KK  CG39
KM  COMBINE HYDROGRAPHS FROM GOLF COURSE STORM DRAIN & RPB352 IN HDR MODEL
KM    AT BASELINE ROAD
HC      2
```

```
*
KKRBSD43
KM  ROUTE COMBINED STORMDRAIN FROM 29TH AVE TO 43RD & BASELINE
RD  2640   0.028    .012            CIRC      10
*
KK   CC8
KM      RUNOFF HYDROGRAPH FROM GOLF COURSE WATERSHED CC8
BA  .033
LG  .400     .15   6.350    .259    .000
UC  .188    .115
UA     0       3       9      18      28      42      59      73      87
UA   100
*
KKGCOVLD
KM RETRIEVE THE OVERLAND FLOWS THAT DO NOT MAKE IT INTO THE GOLF COURSE
KM OUTLET.
DRGCOVLD
*
KK  GCOL
KM COMBINE FLOWS FROM GOLF COURSE
HC     2
*
KK RGCOL
KM ROUTE FLOWS TO CBR43C
RS     1    ELEV      -1
RC  .035     .07     .07    3730    .003  1044.2
RX     0       1      55      56      65      70      90     120
RY1044.2  1043.2  1043.2  1044.1  1043.5  1043.7  1043.8  1044.2
*
KKSMA43C
KM SUB-BASIN SMA43C-LAND USE - AGRICULTURE;MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .130
LG  .500    .000   6.960    .244    .000
UC  .400    .261
UA     0       3       9      18      28      42      59      73      87      92
UA   100
*
KKRB43C2
KM ROUTE RUNOFF FROM SUB-BASIN SMA43C TO COMPUTATION POINT CBR43C
RS     3    ELEV      -1
RC  0.07    0.07    0.07    2600   0.003  1044.2
RX     0       1      55      56      65      70      90     120
RY1044.2  1043.2  1043.2  1044.1  1043.5  1043.7  1043.8  1044.2
*
KK BR43C
KM SUB-BASIN BR43C-LAND USE - AGRICULTURE;MINOR DEVELOPMENT-LAND USE
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA   .35
LG  .500    .000   6.350    .259    .000
UC  .883    .538
UA     0       3       9      18      28      42      59      73      87      92
UA   100
*
KKCBR43C
KM COMBINE ROUTED FLOWS FROM COMPUTATION POINT CD35.2 AND SUB-BASIN SMA43C
HC     2
*
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KK   C43
KM COMBINE FLOWS BEFORE ENTERING BASELINE BASIN
HC     3
*
KK 43BAS
KM DETENTION BASIN AT 43RD AVE AND BASELINE ROAD
RS     1    STOR
SQ     0      26      80     115     175     210     240     265
SV     0      12    25.2    39.6    55.3    72.3    90.6   110.4
SE  1022    1024    1026    1028    1030    1032    1034    1036
*
KK43OVLD
KM DIVERTS FLOWS INTO 43RD AVE STORMDRAIN
KM  43RD AVENUE STORM DRAIN UNDER CONSTRUCTION
KM  THE STORM DRAIN BEGINS NORTH OF BASELINE, DIVERTS FLOWS TO SALT RIVER
KM  EVEN THOUGH TOTAL CAPACITY IS 294 CFS, THE BASELINE STORMDRAIN WILL
KM  DISCHARGE TO A CHANNEL JUST EAST OF THE INTERSECTION (WHICH WILL
KM  EVENTUALLY BECOME A DETENTION BASIN) THEN ENTER INTO THE 43RD AVE
KM  STORMDRAIN.
DT  43SD
DI     0     265   10000
DQ     0     265     265
*
KKR43OVL
KM ROUTE THE OVERLAND FLOWS TO THE LOW SPOT IN 43RD AVE (MARICOPA DRAIN)
RS     6    FLOW      -1
RC  .035     .07    .035    3750   .0043
RX     0       1      55      56      65      70      90     120
RY  1036  1035.5    1035    1033    1033    1035  1035.5    1036
*
*
*  CONTINUE EXISTING HEC1 MODEL PREPARED FOR THE LAVEEN AREA DRAINAGE MADY
*
*
KKAVR43C
KM SUB-BASIN AVR43C -LAND USE- URBAN, AGRICULTURE
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA 1.030
LG  .430    .059   4.000    .396   6.250
UC  .717    .321
UA     0       5      16      30      65      77      84      90      94      97
UA   100
*
KK DIVMD
KM DIVERT FLOWS THAT WILL GO TO THE SOUTHERN AVE BASIN, THE REMAINDER FLOWS WILL
KM GO TO THE MARICOPA DRAIN NORTH OF THE BASIN.
KM THE FLOWS TO THE MARICOPA DRAIN ARE APPROXIMATELY 38% OF THE AREA,
KM THEREFORE, AN ESTIMATE OF 38% OF THE FLOW WILL FLOW TO THE MARICOPA DRAIN.
DT   43C
DI     0     625    1000   10000
DQ     0     625     625     625
*
KK   MDA
KM  OVERLAND FLOWS THAT CONCENTRATE AT THE LOW SPOT ON 43RD AVE
HC     3
*
KK DUMMY
KM DIVERT THE NORTH FLOWS TO TEMPORARILY GET RID OF THE HYGDROGRAPH
DT  DMDA
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DI     0     100    1000   10000
DQ     0     100    1000   10000
*
KK   43C
KM RETREIVE THE FLOWS FROM SUBBASIN AVR43C
DR   43C
*
KK  SBAS
KM COMBINE FLOWS FROM THE EAST AND AVR43C TO ENTER INTO THE SOUTHERN AVE &
KM 43RD AVE DETENTION BASIN.
HC     3
*
KKSTOR43
KM PROPOSED BASIN AT THE CORNER OF 43RD AVE AND SOUTHERN
KM DATA  RELECTS TWO 1018 3-36" OPENINGS
RS     1    STOR
SV     0     .01    12.1    45.6    65.6    38.4   111.1   133.9   146.5
SQ     0       0       0       0       0       0    56.3     340
SE  1002    1003    1006    1012    1014    1016    1018    1020    1021
*
KK   43W
KM DIVERT THE ADDITIONAL FLOWS INTO 43RD AVE STORMDRAIN TO THE SALT RIVER
DT 43SDS
DI     0      29     100    1000
DQ     0      29      29      29
*
*
* ***** BEGINNING OF CHAMPION DRAIN WEST OF 43RD AVE *****
*
*
KK  DMDA
KM RETRIEVE FLOWS AT LOW SPOT ON 43RD AVE (MARICOPA DRAIN)
DR  DMDA
*
KK  MD43
KM COMBINE THE FLOWS IN THE MARICOPA DRAIN AT 43RD AVE SOUTH OF BASIN.
HC     2
*
KK RMD43
KM ROUTE FLOWS IN MARICOPA DRAIN FROM 43RD AVE TO 47TH AVE.
RS     3    ELEV      -1
RC  .030    .030    .030    3750   .0011
RX     0      10      20      45     105     130     140     150
RY1015.2  1015.1    1015    1010    1010    1015  1015.1  1015.2
*
KK VR47C
KM SUB-BASIN VR47C-LAND USE - AGRICULTURE;MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .890
LG  .500    .000   4.950    .385    .000
UC  .933    .407
UA     0       3       9      18      28      42      59      73      87      92
UA   100
*
KKCVR47C
KM COMBINE ROUTED FLOW FROM COMPUTATION POINTS CAV43C AND CBR43C WITH RUNOFF
KM FROM SUB-BASIN VR47C
HC     2
*
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KKRBR511
KM ROUTE FLOW FROM COMPUTATION POINT CVR47C TO COMPUTATION POINT CB51C
KM MARICOPA DRAIN FROM 47TH AVE TO 51ST AVE.
RS     2    ELEV      -1
RC  .030    .030    .030    3200   .0011
RX     0      10      20      45     115     140     150     160
RY1008.2  1008.1    1008    1003    1003    1008  1008.1  1008.2
*
KKAVR51C
KM SUB-BASIN AVR51C-LAND USE - AGRICULTURE;MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .280
LG  .500    .000   6.200    .304    .000
UC  .767    .457
UA     0       3       9      18      28      42      59      73      87      92
UA   100
*
KKRBR512
KM  ROUTE FLOW FROM SUB-BASIN AVR51C TO COMPUTATION POINT CB51C
RS    24    ELEV      -1
RC  0.07    0.07    0.07    3600   0.001  1010.5
RX     0     120     240     380     570     640     670     740
RY1010.5  1009.7  1009.5  1009.4  1009.1  1009.1    1009  1010.5
*
KK BR51C
KM SUB-BASIN BR51C-LAND USE - AGRICULTURE;MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .700
LG  .500    .000   3.650    .459    .000
UC 0.900    .324
UA     0       3       9      18      28      42      59      73      87      92
UA   100
*
KK  CB51
KM INTERMEDIATE HYDROGRAPH
HC     2
*
KK CB51C
KM  COMBINE ROUTED FLOW FROM COMPUTATION POINT CVR47C AND SUB-BASIN AVR51C
KM  WITH RUNOFF FROM SUB-BASIN BR51C
KM  CP AT 51ST AVE AND BASELINE RD.
HC     2
*
KKRB1591
KM  ROUTE FLOW FROM 51ST AVE (CB51C) TO 59TH AVE. (CB159C)
KM  MARICOPA DRAIN FROM 51ST AVE TO 59TH AVE.
RS     3    ELEV      -1
RC  .030    .030    .030    5200   .0011
RX     0      10      20      45     125     150     160     170
RY1000.2  1000.1    1000     995     995    1000  1000.1  1000.2
*
KKAVR55C
KM SUB-BASIN AVR55C-LAND USE - AGRICULTURE;MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .230
LG  .500    .000   6.330    .295    .000
UC  .917    .623
```

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UA     0       3       9      18      28      42      59      73      87      92
UA   100
*
KKRB1592
KM  ROUTE FLOW FROM SUBASIN AVR55C TO COMPUTATION POINT CB159C
RS    28    ELEV      -1
RC  .070    .070    .070    3720   .0018    1004
RX     0     170     340     540     750     940    1120    1320
RY  1004    1003    1003  1003.5  1003.5  1003.7  1008.8    1004
*
KKBR159C
KM SUB-BASIN BR159C-LAND USE - AGRICULTURE;MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .680
LG  .500    .000   3.750    .462    .000
UC  .983    .527
UA     0       3       9      18      28      42      59      73      87      92
UA   100
*
KK VR59C
KM SUB-BASIN VR59C-LAND USE - AGRICULTURE;MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .250
LG  .500    .000   6.470    .298    .000
UC  .967    .630
UA     0       3       9      18      28      42      59      73      87      92
UA   100
*
KKRB1593
KM ROUTE FLOW FROM SUB-BASIN VR59C TO COMPUTATION POINT CB159C
RS    22    ELEV      -1
RC  0.07    0.07    0.07    3000  0.0015    1002
RX     0     280     660     840    1020    1120    1220    1250
RY  1002  1001.3  1001.4  1001.4  1001.5  1001.5  1001.6    1002
*
KKCB159N
KM   COMBINE ROUTED FLOWS FROM COMPUTATION POINT CB51C AND SUB-BASINS AVR51C
KM   AND VR59C WITH RUNOFF FROM SUB-BASIN BR159C
KM  CP (NORTH FLOWS) AT 59TH AVE AND BASELINE RD.
HC     4
*
KKRET43C
KM  RETRIEVE SPLIT FLOW FROM DIVERSION POINT DDR43C
DRRDR43C
*
KK RS51C
KM  ROUTE SPLIT FLOW FROM SUB-BASIN DR43C TO COMPUTATION POINT CS51C
RS    20    ELEV      -1
RC  0.07    0.07    0.07    6000  0.0026
RX     0     240     420     580     760     890    1030    1150
RY  1041  1039.2  1039.3  1039.5  1039.2    1039  1039.4    1041
*
KK SM51C
KM SUB-BASIN SM51C-LAND USE - AGRICULTURE;MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .500
LG  .500    .000   5.850    .330    .000
```

```
UC 1.017    .599
UA     0       3       9      18      28      42      59      73      87      92
UA   100
*
KK CS51C
KM COMBINE ROUTED FLOW FROM SUB-BASIN DR43C TO RUNOFF FROM SUB-BASIN SM51C
HC     2
*
KKRB2591
KM ROUTE FLOW FROM COMPUTATION POINT CS51C TO COMPUTATION POINT CB259C
KM FIRST REACH
RS    13    ELEV      -1
RC  0.07    0.07    0.07    4200  0.0036
RX     0     612    1085    1155    1595    1670    1765    2130
RY1029.6    1029    1028  1027.5  1027.5    1028    1028  1029.6
*
KKRB2592
KM ROUTE FLOW FROM COMPUTATION POINT CS51C TO COMPUTATION POINT CB259C
KM 2ND REACH
RS    10    ELEV      -1
RC  0.07    0.07    0.07    3000  0.0063
RX     0      50     140     335    1120    1770    1825    1870
RY  1006    1004    1003    1002    1001    1001    1002  1002.5
*
KKBR259C
KM SUB-BASIN BR259C-LAND USE - AGRICULTURE;MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA 1.000
LG  .500    .000   3.550    .475    .000
UC  .967    .506
UA     0       3       9      18      28      42      59      73      87      92
UA   100
*
KKCB259A
KM  COMBINE ROUTED FLOW FROM COMPUTATION POINT CS51C AND RUNOFF FROM SUB-
KM  BASIN BR259C
HC     2
*
KKDOA55C
KM RETRIEVE FLOW FROM HIDDEN VALLEY WATERSHED AT SUB-BASIN OA51B
DRDOA55C
*
KK RO55C
KM ROUTE SPLIT FLOW FROM SUB-BASIN OA51B ( HIDDEN VALLEY WATERSHED ) TO
KM COMPUTATION POINT CPO55C
RS     9    ELEV      -1
RC 0.065   0.065   0.065    2600  0.0014
RX     0      90     190     260     350     450     580     910
RY1033.8  1031.8  1031.5  1031.5  1031.5  1031.5  1031.5  1033.8
*
KK OA55C
KM SUB-BASIN OA55C -LAND USE- RUAL DEVELEMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .250
LG  .500    .000   3.550    .466    .000
UC  .800    .468
UA     0       3       9      18      28      42      59      73      87      92
UA   100
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*
KKCPO55C
KM  COMBINE ROUTED DIVERTED FLOW FROM SUB-BASIN OA51B TO RUNOFF FROM SUB-
KM  BASIN OA55C
HC     2
*
KK RD57C
KM ROUTE FLOW FROM COMPUTATION POINT CPO55C TO COMPUTAION CDR57C
RS    12    ELEV      -1
RC  0.07    0.07    0.07    2920   0.001
RX     0     230     370     520     720     870     990    1230
RY  1030  1028.6  1028.4  1028.6  1028.6  1028.8  1028.9    1030
*
KK DR57C
KM SUB-BASIN DR57C-LAND USE - AGRICULTURE;MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .120
LG  .500    .000   3.500    .470    .000
UC  .950    .704
UA     0       3       9      18      28      42      59      73      87      92
UA   100
*
KKCDR57C
KM COMBINE ROUTED FLOW FROM COMPUTATION POINT CPO55C TO RUNOFF FROM SUB-BASIN
KM DR57C
HC     2
*
KK RD59C
KM ROUTE FLOW FROM COMPUTATION POINT CDR57C TO COMPUTATION POINT CDR59C
RS     3    ELEV      -1
RC  0.07    0.07    0.07    1200  0.0025
RX     0     130     250     360     480     600     700     740
RY1027.2    1027    1027    1026  1025.5  1025.5    1026  1027.2
*
KK DR59C
KM SUB-BASIN DR59C-LAND USE - AGRICULTURE;MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .110
LG  .500    .000   3.500    .470    .000
UC  .817    .626
UA     0       3       9      18      28      42      59      73      87      92
UA   100
*
KKCDR59C
KM COMBINE ROUTED FLOW FROM COMPUTATION POINT CDR57C TO RUNOFF FROM SUB-BASIN
KM DR59C
HC     2
*
KK RB259
KM ROUTE FLOW FROM COMPUTATION POINT CDR59C TO COMPUTATION POINT CB259C
RS     6    ELEV      -1
RC  0.07    0.02    0.07    5280  0.0046
RX     0      10      20      35      70      80     120     180
RY  1019  1017.7  1017.2  1017.2  1017.2  1017.7    1018    1019
*
KKCB259S
KM COMBINE ROUTED FLOW FROM COMPUTATION POINT CDR59C TO PREVIOUSLY
KM COMPUTED FLOW AT COMPUTATION POINT CB1592
```

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KM CP (SOUTH SIDE) 59TH AVE AND BASELINE RD.
HC     2
*
KK  CB59
KM COMBINE FLOWS AT 59TH AVE & BASELINE RD
KM COMBINED BOTH NORTH AND SOUTH FLOWS
HC     2
*
KKRB1631
KM ROUTE FLOW FROM 59TH AVE (CB259C) TO 63RD AVE. (CB163C)
KM MODIFY SLOPE TO INDICATE A REALISTIC VELOCITY OF LESS THAN 5 FT/SEC
KM ADJUST SLOPE FROM .0011 TO .0005
RS     2    ELEV      -1
RC 0.030    .030    .030    2640    .0009
RX     0      10      20      45     135     160     170     180
RY 997.8   997.7   997.6   992.6   992.6   997.6   997.7   997.8
*
KKBR263C
KM SUB-BASIN BR263C-LAND USE - AGRICULTURE;MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .500
LG  .500    .000   3.500    .463    .000
UC  .933    .639
UA     0       3       9      18      28      42      59      73      87      92
UA   100
*
KK   63S
KM FLOWS GENERATED FROM THE SOUTHSIDE OF BASELINE RD.
HC     2
*
KKBR163C
KM SUB-BASIN BR163C-LAND USE - AGRICULTURE;MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .260
LG  .500    .000   4.700    .411    .000
UC  .967    .642
UA     0       3       9      18      28      42      59      73      87      92
UA   100
*
KKCB163C
KM COMBINE ROUTED FLOW FROM COMPUTATION POINT CB159C WITH RUNOFF FROM SUB-BASINS
KM BR163C AND BR263C AND ROUTED FLOW FROM COMPUTATION POINT  CB259C
HC     2
*
KK RCD1C
KM ROUTE FLOW FROM COMPUTATION POINT CB163C TO COMPUTATION POINT CPCD1C
KM MARICOPA DRAIN FROM 63RD AVE TO 67TH AVE.
RS     2    ELEV      -1
RC 0.030    .030    .030    2640    .0011
RX     0      10      20      45     135     160     170     180
RY 996.2   996.1     996     991     991     996   996.1   996.2
*
KK BR67C
KM SUB-BASIN BR67C-LAND USE - RURAL DEVELEMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .130
LG  .500    .220   6.200    .305    15.0
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UC  .667     .454
UA      0        3        9       18       28       42       59       73       87       92
UA    100
*
KKRCD1C2
KM  ROUTE FLOW FROM SUBASIN BR67C TO COMPUTATION POINT CPCD1C
RS     17     ELEV       -1
RC  0.07     0.07     0.07     2100  0.0014
RX      0       75      260      490      670      830     1000     1130
RY    994    993.5    993.5      993      993      993      993      994
*
KK  CD1C
KM SUB-BASIN CD1C -LAND USE - AGRICULTURE;MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .470
LG  .500     .000    5.320     .351     .000
UC  .933     .369
UA      0        3        9       18       28       42       59       73       87       92
UA    100
*
KKCPCD1C
KM  COMBINE ROUTED FLOWS FROM COMPUTATION POINT CB163C AND SUB-BASIN BR67C
KM  WITH RUNOFF FROM SUB-BASIN CD1C
HC      3
*
KKRCD2C1
KM  ROUTE FLOW FROM COMPUTATION POINT CPCD1C TO COMPUTATION POINT CCD2C
KM  MARICOPA DRAIN FROM 67TH AVE TO 75TH AVE.
RS      3     ELEV       -1
RC 0.030     .030     .030     4600    .0011
RX      0       10       20       45      155      180      190      200
RY 990.2    990.1      990      985      985      990    990.1    990.2
*
KK  CD2C
KM SUB-BASIN CD2C -LAND USE - AGRICULTURE;MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .580
LG  .500     .000    6.500     .277     .000
UC  .867     .451
UA      0        3        9       18       28       42       59       73       87       92
UA    100
*
KKCCD2C1
KM  COMBINE ROUTED FLOW FROM COMPUTATION POINT CPCD1C TO RUNOFF FROM SUB-BASIN
KM  CD2C
HC      2
*
KKRIR63B
KM RETRIEVE SPLIT FLOW FROM COMPUTATION POINT CIR63B
DRRIR63B
*
KKRIR65C
KM  ROUTE RETRIEVED FLOW FROM SUB-BASIN IR63B TO COMPUTATION POINT CIR65C
RS      7     ELEV       -1
RC 0.030    0.030    0.030     3300  0.0010
RX      0        1       11       21       26       31       41       46
RY      6        5      4.7      4.7        5      5.5      5.5      6.2
*
```

```
KK IR65C
KM SUB-BASIN IR65C -LAND USE - AGRICULTURE;MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM 6-HOUR RAINFALL, PATTERN NO. 3.35 WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .170
LG  .500    .000   3.500    .470    .000
UC  .933    .873
UA     0       3       9      18      28      42      59      73      87      92
UA   100
*
KKCIR65C
KM COMBINE RETRIEVED ROUTED FLOW FROM SUB-BASIN IR63B TO RUNOFF FROM SUB-BASIN
KM IR65C
HC     2
*
KK RIRDC
KM ROUTE FLOW FROM COMPUTATION POINT CIR65C TO COMPUTATION POINT CIRDC
RS     4    ELEV      -1
RC  0.03    0.03    0.03    3200  0.0018
RX     0       1      10      20      30      40      50      51
RY1014.5    1013    1013    1013    1013    1013    1013  1014.5
*
KKDIIRDC
KM  ROUTED FLOW FROM COMPUTATION POINT CIR65C IS SPLIT AT COMPUTATION POINT
KM  CIRDC
DTRIR65C
DI     0      16      34      51      71      80     100     120     150
DQ     0      16      25      32      40      49      69      89     119
*
KK  IRDC
KM SUB-BASIN IRDC-LAND USE - AGRICULTURE;MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .520
LG  .500    .000   3.500    .470    .000
UC 1.333    .968
UA     0       3       9      18      28      42      59      73      87      92
UA   100
*
KK CIRDC
KM  COMBINE ROUTED FLOW FROM COMPUTATION POINT CIR65C TO RUNOFF FROM SUB-BASIN
KM  IRDC
HC     2
*
KKRIRSMC
KM  ROUTE FLOW COMPUTATION POINT CIRDC TO COMPUTATION POINT CIRSMC
RS    11    ELEV      -1
RC  0.07    0.07    0.07    3400  0.0058
RX     0     160     240     470     530     780     900    1000
RY1006.2  1005.7  1005.7  1005.7  1005.6  1005.5  1005.7  1006.2
*
KK IRSMC
KM SUB-BASIN IRSMC-LAND USE - AGRICULTURE;MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .250
LG  .290    .177   3.890    .488    .000
UC  .650    .469
UA     0       3       9      18      28      42      59      73      87      92
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UA   100
*
KKCIRSMC
KM
HC     2
*
KKRCD2C2
KM  ROUTE FLOW FROM COMPUTATION POINT CIRSMC TO COMPUTATION POINT CCD2C
RS     4    ELEV      -1
RC  0.07    0.07    0.07    1000  0.0040
RX     0     100     300     400     560     620     750     870
RY   989   987.6   987.6   987.6   987.6   987.6   987.6     989
*
KKCCD2C2
KM COMBINE ROUTED FLOW FROM COMPUTATION POINT CIRSMC TO PREVIOUSLY COMPUTED
KM FLOW AT COMPUTATION POINT CCD2C
KM MARICOPA DRAIN AT 75TH AVE.
HC     2
*
KKRCD3C1
KM ROUTE FLOW FROM DIVERSION POINT AT BASELINE ROAD (75TH AVE) TO COMPUTATION
KM POINT CPCD3C (SALT RIVER)
KM ADJUST SLOPE FROM .0011 TO REFLECT A VELOCITY OF LESS THAN 5 FT/SEC
RS     2    ELEV      -1
RC  0.03    .030    .030    3700   .0011
RX     0      10      20      45     165     190     200     210
RY 986.2   986.1     986     981     981     986   986.1   986.2
*
KK A67AC
KM SUB-BASIN 67AC-LAND USE - AGRICULTURE, RURAL
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .610
LG  .500    .000   4.400    .416    .000
UC 1.100    .631
UA     0       3       9      18      28      42      59      73      87      92
UA   100
*
KKRCD4C1
KM ROUTE FLOW FROM SUB-BASIN 67AC CPCD4C TO COMPUTATION POINT CPCD4C
RS    11    ELEV      -1
RC  0.07    0.07    0.07    2600  0.0024
RX     0      80     230     340     590     730     850     920
RY   988     984     984     984     984     984     984   987.8
*
KK  CD4C
KM SUB-BASIN CD4C-LAND USE - AGRICULTURE;MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .190
LG  .500    .000   3.800    .451    .000
UC  .967    .553
UA     0       3       9      18      28      42      59      73      87      92
UA   100
*
KKCPCD4C
KM  COMBINE ROUTED FLOW FROM SUB-BASIN 67AC TO RUNOFF FROM SUB-BASIN CD4C
HC     2
*
KKRCD3C2
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```
KM ROUTE FLOW FROM COMPUTATION POINT CPCD4C TO COMPUTATION POINT CPCD3C
RS    22    ELEV      -1
RC  0.07    0.07    0.07    5200  0.0024
RX     0      80     230     340     590     730     850     920
RY   988     984     984     984     984     984     984   987.8
*
KK  CD3C
KM SUB-BASIN CD3C-LAND USE - AGRICULTURE;MINOR DEVELOPMENT
KM 24-HOUR TYPE II RAINFALL WAS USED TO FIND TC & R FOR THIS BASIN
KM THIS BASIN USED RAINFALL REDUCTION FACTOR OF .90
BA  .480
LG  .500    .000   4.800    .350    .000
UC 0.983    .578
UA     0       3       9      18      28      42      59      73      87      92
UA   100
*
KKCPCD3C
KM COMBINE ROUTED FLOW FROM COMPUTATION POINT CPCD4C, ROUTED FLOW FROM DIVERSION
KM POINT AT BASELINE ROAD WITH RUNOFF FROM SUB-BASIN CD3C
HC     3
ZZ
```

HEC-RAS September 1998 Version 2.2
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

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X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X       X   X     X  X    X
X     X  X        X            X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X            X  X     X    X        X
X     X  X        X    X       X   X    X    X        X
X     X  XXXXXX    XXXX        X    X   X    X   XXXXX
```

PROJECT DATA
Project Title: Laveen Area Conveyance Corridor
Project File : LVN.prj
Run Date and Time: 6/5/01 10:27:54 AM

Project in English units

Project Description:
Narrower section

GEOMETRY DATA

Geometry Title: 60% subm
Geometry File : s:\ENG\Laveen\Hydraulics\LVN.g01

CROSS SECTION RIVER: Maricopa Drain
REACH: Reach 1 RS: 31700

INPUT
Description: End Channel, 6' depth
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-40	1018.61	0	1012.62	40	1012.62	70	1018.61	107	1018.61

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-40	.035	-40	.03	70	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-40	70	1500	1500	1500	.1	.3

CROSS SECTION RIVER: Maricopa Drain
REACH: Reach 1 RS: 30240

INPUT
Description: Top of drop
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-30	1016.96	0	1010.97	40	1010.97	70	1016.96	107	1016.96

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-30	.035	-30	.03	70	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-30	70	40.9	40.9	40.9	.1	.3

CROSS SECTION RIVER: Maricopa Drain
REACH: Reach 1 RS: 30200

INPUT
Description: Bottom of Drop

```
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -40 1016.96       0 1008.96      40 1008.96      80 1016.96     107 1016.96

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -40    .035     -40     .03      80    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           -40      80              100     100     100             .1       .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 30100

INPUT
Description:  6' depth
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -30 1014.85       0 1008.85      40 1008.85      70 1014.85     107 1014.85

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -30    .035     -30     .03      70    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           -30      70            1550    1550  549.94             .1       .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 28550

INPUT
Description: Top of drop, 6' depth
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -30 1013.15       0 1007.15      40 1007.15      70 1013.15     107 1013.15

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -30    .035     -30     .03      70    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           -30      70              50      50      50             .1       .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 28500

INPUT
Description: Top of drop, 6' depth
Station Elevation Data    num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -30 1013.09       0 1007.09      45 1007.09      75 1013.09

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -30    .035     -30     .03      75    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           -30      75              500     500     500             .1       .3

CULVERT                RIVER: Maricopa Drain
REACH: Reach 1            RS: 28430

INPUT
Description: Culvert through Trimark
Distance from Upstream XS =       5
Deck/Roadway Width        =      32
Weir Coefficient          =     2.6
Bridge Deck/Roadway Skew  =
Upstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    -100    1015            100    1015

Upstream Bridge Cross Section Data
Station Elevation Data    num=       4
```

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -30 1013.09       0 1007.09      45 1007.09      75 1013.09

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
     -30    .035      -30     .03       75    .035

Bank Sta: Left   Right    Coeff Contr.   Expan.
          -30      75             .1        .3

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
    -100    1014              100    1014

Downstream Bridge Cross Section Data
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -30 1012.54       0 1006.54      40 1006.54      70 1012.54     107 1012.54

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
     -30    .035      -30     .03       70    .035

Bank Sta: Left   Right    Coeff Contr.   Expan.
          -30      70             .1        .3

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1           Box       6      10
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    n Value   Entrance Loss Coef   Exit Loss Coef
                70     342       .013                  .2                1
Number of Barrels =  3
Upstream   Elevation =  1007.01
Centerline Stations
    Sta.    Sta.    Sta.
      11      22      33
Downstream Elevation =  1006.68
Centerline Stations
    Sta.    Sta.    Sta.
      11      22      33

CULVERT OUTPUT    Profile #PF 1
Culvert ID : Culvert #1

  Culv Q (cfs)             990.00   Culv Vel In (ft/s)        7.23
  # Barrels                   3     Culv Vel Out (ft/s)       7.55
  Q Barrel (cfs)           330.00   Culv Inv El Up (ft)    1007.01
  E.G. US. (ft)           1012.55   Culv Inv El Dn (ft)    1006.68
  W.S. US. (ft)           1012.45   Culv Frctn Ls (ft)        0.45
  Delta EG (ft)              1.31   Culv Ext Lss (ft)         0.69
  Delta WS (ft)              1.40   Culv Ent Lss (ft)         0.16
  E.G. IC (ft)            1012.21   Q Weir (cfs)
  E.G. OC (ft)            1012.55   Weir Sta Lft (ft)
  Culvert Control          Outlet   Weir Sta Rgt (ft)
  Culv WS In (ft)         1011.58   Weir Submerg
  Culv WS Out (ft)        1011.05   Weir Max Depth (ft)
  Culv Nml Depth (ft)        5.03   Weir Avg Depth (ft)
  Culv Crt Depth (ft)        3.23   Wr Flw Area (sq ft)
  Culv Ful Lngh (ft)                Min Top Rd (ft)        1015.00


CROSS SECTION          RIVER: Maricopa Drain
```

```
REACH: Reach 1            RS: 28000

INPUT
Description: DS of Trimark Culvert
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -30 1012.54       0 1006.54      40 1006.54      70 1012.54     107 1012.54

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -30    .035     -30     .03      70    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          -30      70             1600    1600    1600             .1       .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 26480

INPUT
Description: US of drop, 6' depth, ss=5:1
Station Elevation Data    num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -48 1010.82     -30 1010.82       0 1004.86      40 1004.86      70 1010.82
     107 1010.82

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -48    .035     -30     .03      70    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          -30      70             40.9    40.9    40.9             .1       .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 26440

INPUT
Description: Top of drop, 6' depth
Station Elevation Data    num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -48 1010.78   -42.5 1010.78       0 1004.82      40 1004.82    82.5 1010.82
     107 1010.82

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -48    .035   -42.5     .03    82.5    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -42.5    82.5             40.9    40.9    40.9             .1       .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 26400

INPUT
Description: 8' depth @ bottom of drop
Station Elevation Data    num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -44 1010.78   -42.5 1010.78       0 1002.78      40 1002.78    82.5 1010.78
     107 1010.78

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -44    .035   -42.5     .03    82.5    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        -42.5    82.5              100     100     100             .1       .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 26300

INPUT
Description: 6.5' depth @ US of CBC, BW=40'
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   -43.5 1009.17   -39.5 1009.17   -32.5 1009.17       0 1002.67      40 1002.67
    72.5 1009.17     107 1009.17
```

```
Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
   -43.5    .035   -43.5     .03     72.5    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
         -43.5    72.5               500     500     500              .1       .3

CROSS SECTION           RIVER: Maricopa Drain
REACH: Reach 1             RS: 25800

INPUT
Description: 6.5' depth @ US of CBC, BW=40'
Station Elevation Data     num=        7
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
   -43.5 1008.63    -39.5 1008.63    -32.5 1008.63       0 1002.13      40 1002.13
    72.5 1008.63      107 1008.63

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
   -43.5    .035   -43.5     .03     72.5    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
         -43.5    72.5               150     150     150              .1       .3

CROSS SECTION           RIVER: Maricopa Drain
REACH: Reach 1             RS: 25650

INPUT
Description: 6.5' depth @ DS of CBC
Station Elevation Data     num=        7
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
   -43.5 1008.45    -39.5 1008.45    -32.5 1008.45       0 1001.95      45 1001.95
    77.5 1008.45      107 1008.45

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
   -43.5    .035   -43.5     .03     77.5    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
         -43.5    77.5                50      50      50              .1       .3

CULVERT                 RIVER: Maricopa Drain
REACH: Reach 1             RS: 25550

INPUT
Description: Culvert @ 51st Ave
Distance from Upstream XS =        5
Deck/Roadway Width        =       32
Weir Coefficient          =      2.6
Bridge Deck/Roadway Skew  =
Upstream  Deck/Roadway Coordinates
    num=        2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
    -100     1010              100     1010

Upstream Bridge Cross Section Data
Station Elevation Data     num=        7
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
   -43.5 1008.45    -39.5 1008.45    -32.5 1008.45       0 1001.95      45 1001.95
    77.5 1008.45      107 1008.45

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
   -43.5    .035   -43.5     .03     77.5    .035

Bank Sta: Left   Right    Coeff Contr.    Expan.
         -43.5    77.5              .1       .3

Downstream  Deck/Roadway Coordinates
    num=        2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
    -100     1010              100     1010

Downstream Bridge Cross Section Data
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```
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   -43.5 1008.23   -39.5 1008.23   -32.5 1008.23       0 1001.73      45 1001.73
    77.5 1008.23     107 1008.23

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
   -43.5    .035   -43.5     .03     77.5    .035

Bank Sta: Left   Right    Coeff Contr.   Expan.
         -43.5    77.5             .1       .3

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1           Box       6      10
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    n Value   Entrance Loss Coef   Exit Loss Coef
                50     100       .013                  .2                 1
Number of Barrels =  3
Upstream   Elevation =  1001.75
Centerline Stations
    Sta.    Sta.    Sta.
      11      22      33
Downstream Elevation =  1001.64
Centerline Stations
    Sta.    Sta.    Sta.
      11      22      33

CULVERT OUTPUT    Profile #PF 1
Culvert ID : Culvert #1

  Culv Q (cfs)           1350.00   Culv Vel In (ft/s)        8.80
  # Barrels                 3      Culv Vel Out (ft/s)       9.04
  Q Barrel (cfs)          450.00   Culv Inv El Up (ft)    1001.75
  E.G. US. (ft)          1008.31   Culv Inv El Dn (ft)    1001.64
  W.S. US. (ft)          1008.18   Culv Frctn Ls (ft)        0.18
  Delta EG (ft)             1.44   Culv Ext Lss (ft)         1.02
  Delta WS (ft)             1.56   Culv Ent Lss (ft)         0.24
  E.G. IC (ft)           1008.19   Q Weir (cfs)
  E.G. OC (ft)           1008.31   Weir Sta Lft (ft)
  Culvert Control         Outlet   Weir Sta Rgt (ft)
  Culv WS In (ft)        1006.86   Weir Submerg
  Culv WS Out (ft)       1006.62   Weir Max Depth (ft)
  Culv Nml Depth (ft)       6.00   Weir Avg Depth (ft)
  Culv Crt Depth (ft)       3.98   Wr Flw Area (sq ft)
  Culv Ful Lngh (ft)               Min Top Rd (ft)        1008.45


Note:    The normal depth exceeds the height of the culvert.  The program assumes that the normal
         depth is equal to the height of the culvert.

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 25450

INPUT
Description: 6.5' depth @ DS of CBC
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   -43.5 1008.23   -39.5 1008.23   -32.5 1008.23       0 1001.73      45 1001.73
    77.5 1008.23     107 1008.23

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
   -43.5    .035   -43.5     .03     77.5    .035
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
         -43.5    77.5              50      50      50             .1       .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 25400

INPUT
Description: 6.5' depth @ DS of CBC
Station Elevation Data    num=       7
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
   -43.5 1008.18    -39.5 1008.18    -32.5 1008.18       0 1001.68      45 1001.68
    77.5 1008.18      107 1008.18

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
   -43.5    .035    -43.5     .03     77.5    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
         -43.5    77.5           1120.1  1120.1  1120.1             .1       .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 24280

INPUT
Description: Bgn 5:1 SS, 6.5' depth US of Drop
Station Elevation Data    num=       7
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
   -43.5 1006.87    -39.5 1006.87    -32.5 1006.87       0 1000.37      45 1000.37
    77.5 1006.87      107 1006.87

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
   -43.5    .035    -32.5     .03     77.5    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
         -32.5    77.5              40      40      40             .1       .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 24240

INPUT
Description: Bgn 6.5' depth @ Top of Drop
Station Elevation Data    num=       7
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
   -53.5 1006.87    -49.5 1006.87    -42.5 1006.87       0 1000.37      45 1000.37
    87.5 1006.87      107 1006.87

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
   -53.5    .035    -42.5     .03     87.5    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
         -42.5    87.5            40.86   40.86   40.86             .1       .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 24200

INPUT
Description: Bottom of Drop, D=8.5'
Station Elevation Data    num=       7
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
   -53.5 1006.87    -49.5 1006.87    -42.5 1006.87       0  998.37      45  998.37
    87.5 1006.87      107 1006.87

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
   -53.5    .035    -42.5     .03     87.5    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
         -42.5    87.5              50      50      50             .1       .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 24150
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```
INPUT
Description: End 6.5' depth
Station Elevation Data    num=       7
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
   -43.5   1004.8    -39.5   1004.8    -32.5   1004.8       0    998.3       45    998.3
    77.5   1004.8      107   1004.8

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
   -43.5     .035    -43.5      .03     77.5     .035

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
          -43.5    77.5                50      50      50              .1       .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 24100

INPUT
Description: End 6.5' depth
Station Elevation Data    num=       7
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
   -43.5 1004.75    -39.5 1003.75    -27.5 1003.75       0  998.25       45  998.25
    77.5 1004.75      107 1004.75

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
   -43.5     .035    -43.5      .03     77.5     .035

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
          -43.5    77.5              2100    2100    2100              .1       .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 22000

INPUT
Description: Above  Drop, Bgn 5:1 SS
Station Elevation Data    num=       7
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
   -43.5   1002.4    -39.5   1001.4    -27.5   1001.4       0    995.9       45    995.9
    77.5   1002.4     82.5   1002.4

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
   -43.5     .035    -43.5      .03     77.5     .035

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
          -43.5    77.5               200     200     200              .1       .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 21800

INPUT
Description:
Station Elevation Data    num=       7
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
   -43.5 1002.18    -39.5 1001.18    -27.5 1001.18       0  995.68       45  995.68
    77.5 1002.18      107 1002.18

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
   -43.5     .035    -43.5      .03     77.5     .035

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
          -43.5    77.5            609.96  609.96  609.96              .1       .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 21190

INPUT
Description: Above  Drop, Bgn 5:1 SS
Station Elevation Data    num=       7
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
   -43.5 1001.55    -39.5 1000.55    -27.5 1000.55       0  995.05       45  995.05
    77.5 1001.55      107 1001.55
```

```
Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
   -43.5    .035   -43.5      .03     77.5    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
          -43.5    77.5               20      20      20             .1       .3

CROSS SECTION           RIVER: Maricopa Drain
REACH: Reach 1             RS: 21170

INPUT
Description: Top of Drop, Bgn6.5' depth
Station Elevation Data     num=        7
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
   -48.5 1001.53    -44.5 1000.53    -32.5 1000.53       0  995.03       45  995.03
    82.5 1001.53      107 1001.53

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
   -48.5    .035   -48.5      .03     82.5    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
          -48.5    82.5             20.55   20.55   20.55             .1       .3

CROSS SECTION           RIVER: Maricopa Drain
REACH: Reach 1             RS: 21150

INPUT
Description: 7.5  depth Bottom of Drop
Station Elevation Data     num=        6
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
   -48.5  1001.5    -44.5  1000.5    -32.5  1000.5       0     994       45     994
    82.5  1001.5

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
   -48.5    .035   -48.5      .03     82.5    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
          -48.5    82.5               150     150     150             .1       .3

CROSS SECTION           RIVER: Maricopa Drain
REACH: Reach 1             RS: 21050

INPUT
Description: 7.5  depth
Station Elevation Data     num=        7
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
   -48.5  1001.4    -44.5  1000.4    -32.5  1000.4       0   993.9       45   993.9
    82.5  1001.4      107  1001.4

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
   -48.5    .035   -48.5      .03     82.5    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
          -48.5    82.5               350     350     350             .1       .3

CULVERT                 RIVER: Maricopa Drain
REACH: Reach 1             RS: 20825

INPUT
Description: Culvert @ Baseline Rd
Distance from Upstream XS =        5
Deck/Roadway Width        =       32
Weir Coefficient          =      2.6
Bridge Deck/Roadway Skew  =
Upstream  Deck/Roadway Coordinates
    num=        2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
    -100     1004              100     1004

Upstream Bridge Cross Section Data
Station Elevation Data     num=        7
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
```

```
   -48.5  1001.4   -44.5  1000.4   -32.5  1000.4       0   993.9      45   993.9
    82.5  1001.4     107  1001.4

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   -48.5    .035   -48.5     .03    82.5    .035

Bank Sta: Left   Right    Coeff Contr.   Expan.
         -48.5    82.5             .1       .3

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    -100    1004             100    1004

Downstream Bridge Cross Section Data
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   -48.5 1001.02   -44.5 1000.02   -32.5 1000.02       0  993.52      45  993.52
    82.5 1001.02     107 1001.02

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   -48.5    .035   -48.5     .03    82.5    .035

Bank Sta: Left   Right    Coeff Contr.   Expan.
         -48.5    82.5             .1       .3

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1           Box       6      10
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    n Value   Entrance Loss Coef   Exit Loss Coef
                34   181.5       .013                  .2                1
Number of Barrels =  3
Upstream   Elevation =  993.85
Centerline Stations
    Sta.    Sta.    Sta.
      11      22      33
Downstream Elevation =  993.65
Centerline Stations
    Sta.    Sta.    Sta.
      11      22      33

CULVERT OUTPUT    Profile #PF 1
Culvert ID : Culvert #1

  Culv Q (cfs)           1350.00   Culv Vel In (ft/s)        7.52
  # Barrels                    3   Culv Vel Out (ft/s)       7.53
  Q Barrel (cfs)          450.00   Culv Inv El Up (ft)     993.85
  E.G. US. (ft)          1000.89   Culv Inv El Dn (ft)     993.65
  W.S. US. (ft)          1000.79   Culv Frctn Ls (ft)        0.21
  Delta EG (ft)             1.13   Culv Ext Lss (ft)         0.75
  Delta WS (ft)             1.17   Culv Ent Lss (ft)         0.18
  E.G. IC (ft)           1000.29   Q Weir (cfs)
  E.G. OC (ft)           1000.89   Weir Sta Lft (ft)
  Culvert Control         Outlet   Weir Sta Rgt (ft)
  Culv WS In (ft)         999.83   Weir Submerg
  Culv WS Out (ft)        999.62   Weir Max Depth (ft)
  Culv Nml Depth (ft)       6.00   Weir Avg Depth (ft)
  Culv Crt Depth (ft)       3.98   Wr Flw Area (sq ft)
  Culv Ful Lngh (ft)               Min Top Rd (ft)        1001.40
```

Note: The normal depth exceeds the height of the culvert. The program assumes that the normal depth is equal to the height of the culvert.

```
CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 20700

INPUT
Description: 7.5  depth
Station Elevation Data    num=       7
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
   -48.5 1001.02    -44.5 1000.02    -32.5 1000.02       0  993.52      45  993.52
    82.5 1001.02      107 1001.02

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
   -48.5    .035   -48.5     .03     82.5    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
          -48.5    82.5              1200    1200    1200              .1       .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 19500

INPUT
Description: 7.5' depth, BW=54' -
Station Elevation Data    num=       7
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
   -48.5   999.7    -44.5   998.7    -32.5   998.7       0   992.2      45   992.2
    82.5   999.7      107   999.7

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
   -48.5    .035   -48.5     .03     82.5    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
          -48.5    82.5               600     600     600              .1       .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 19000

INPUT
Description: 7.5' depth, BW=45' - US of Culvert at 59th Ave
Station Elevation Data    num=       7
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
   -48.5  999.15    -44.5  998.15    -32.5  998.15       0  991.65      45  991.65
    82.5  999.15      107  999.15

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
   -48.5    .035   -48.5     .03     82.5    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
          -48.5    82.5               200     200     200              .1       .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 18860

INPUT
Description: 7.5' depth, BW=45' - US of Culvert at 59th Ave
Station Elevation Data    num=       6
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
   -48.5  998.97    -44.5  997.97    -32.5  997.97       0  991.47      45  991.47
    82.5  998.97

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
   -48.5    .035   -48.5     .03     82.5    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
          -48.5    82.5               110     110     110              .1       .3

CULVERT                RIVER: Maricopa Drain
REACH: Reach 1            RS: 18802

INPUT
```

```
Description: Culvert @ 59th Ave
Distance from Upstream XS =       5
Deck/Roadway Width        =      32
Weir Coefficient          =     2.6
Bridge Deck/Roadway Skew  =
Upstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
    -100    1001             100    1001

Upstream Bridge Cross Section Data
Station Elevation Data    num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   -48.5  998.97   -44.5  997.97   -32.5  997.97       0  991.47      45  991.47
    82.5  998.97

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   -48.5    .035   -48.5     .03    82.5    .035

Bank Sta: Left   Right    Coeff Contr.   Expan.
         -48.5    82.5             .1       .3

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
    -100   999.5             100   999.5

Downstream Bridge Cross Section Data
Station Elevation Data    num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
   -48.5  998.88   -44.5  997.88   -32.5  997.88       0  991.38      45  991.38
    82.5  998.88

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
   -48.5    .035   -48.5     .03    82.5    .035

Bank Sta: Left   Right    Coeff Contr.   Expan.
         -48.5    82.5             .1       .3

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1           Box       7      10
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    n Value   Entrance Loss Coef   Exit Loss Coef
                40      48       .013                   .2                1
Number of Barrels =  4
Upstream   Elevation =  991.43
Centerline Stations
    Sta.    Sta.    Sta.    Sta.
       5      16      27      38
Downstream Elevation =  991.38
Centerline Stations
    Sta.    Sta.    Sta.    Sta.
       5      16      27      38

CULVERT OUTPUT    Profile #PF 1
Culvert ID : Culvert #1

  Culv Q (cfs)           1350.00   Culv Vel In (ft/s)        4.82
  # Barrels                 4      Culv Vel Out (ft/s)       4.82
  Q Barrel (cfs)          337.50   Culv Inv El Up (ft)     991.43
  E.G. US. (ft)           999.04   Culv Inv El Dn (ft)     991.38
```

W.S. US. (ft)	998.97	Culv Frctn Ls (ft)	0.03
Delta EG (ft)	0.38	Culv Ext Lss (ft)	0.28
Delta WS (ft)	0.39	Culv Ent Lss (ft)	0.07
E.G. IC (ft)	996.68	Q Weir (cfs)	
E.G. OC (ft)	999.04	Weir Sta Lft (ft)	
Culvert Control	Outlet	Weir Sta Rgt (ft)	
Culv WS In (ft)	998.43	Weir Submerg	
Culv WS Out (ft)	998.38	Weir Max Depth (ft)	
Culv Nml Depth (ft)		Weir Avg Depth (ft)	
Culv Crt Depth (ft)	3.28	Wr Flw Area (sq ft)	
Culv Ful Lngh (ft)	48.00	Min Top Rd (ft)	1001.00

CROSS SECTION RIVER: Maricopa Drain
REACH: Reach 1 RS: 18750

INPUT
Description: 7.5' depth, BW=45' - Downstream of Culvert at 59th Ave
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-48.5	998.88	-44.5	997.88	-32.5	997.88	0	991.38	45	991.38
82.5	998.88								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-48.5	.035	-48.5	.03	82.5	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-48.5	82.5	50	50	.1	.3

CROSS SECTION RIVER: Maricopa Drain
REACH: Reach 1 RS: 18700

INPUT
Description: 7.5' depth, BW=45' -
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-48.5	998.82	-44.5	997.82	-32.5	997.82	0	991.32	45	991.32
82.5	998.82								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-48.5	.035	-48.5	.03	82.5	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-48.5	82.5	2000	2000	.1	.3

CROSS SECTION RIVER: Maricopa Drain
REACH: Reach 1 RS: 16700

INPUT
Description: Begn7.5' depth, BW=45'
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-49.5	996.61	-44.5	995.61	-32.5	995.61	0	989.11	45	989.11
82.5	996.61								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
-49.5	.035	-49.5	.03	82.5	.035

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
-49.5	82.5	380	380	.1	.3

CROSS SECTION RIVER: Maricopa Drain
REACH: Reach 1 RS: 16320

INPUT
Description: U/S of Drop Structure
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
-50.5	995.59	-46.5	994.59	-34.5	994.59	0	988.69	45	988.69
84.5	995.59								

Manning's n Values num= 3

```
     Sta    n Val      Sta    n Val      Sta    n Val
   -50.5     .035   -50.5      .03     84.5     .035

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
         -50.5    84.5              20.36   20.36   20.36              .1        .3

CROSS SECTION           RIVER: Maricopa Drain
REACH: Reach 1             RS: 16300

INPUT
Description: D/S of Drop Structure
Station Elevation Data    num=       6
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
   -50.5   995.57    -46.5   994.57    -34.5   994.57         0   987.67        45   987.67
    84.5   995.57

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
   -50.5     .035   -50.5      .03     84.5     .035

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
         -50.5    84.5               250     250     250              .1        .3

CROSS SECTION           RIVER: Maricopa Drain
REACH: Reach 1             RS: 16250

INPUT
Description: US 63rd Av Culvert
Station Elevation Data    num=       6
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
   -49.5   995.12    -44.5   994.12    -32.5   994.12         0   987.62        54   987.62
    91.5   995.12

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
   -49.5     .035   -49.5      .03     91.5     .035

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
         -49.5    91.5               200     200     200              .1        .3

CROSS SECTION           RIVER: Maricopa Drain
REACH: Reach 1             RS: 16050

INPUT
Description: US 63rd Av Culvert
Station Elevation Data    num=       6
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
   -49.5    994.9    -44.5    993.9    -32.5    993.9         0    987.4        54    987.4
    91.5    994.9

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
   -49.5     .035   -49.5      .03     91.5     .035

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
         -49.5    91.5               150     150     150              .1        .3

CULVERT                 RIVER: Maricopa Drain
REACH: Reach 1             RS: 15976

INPUT
Description: Culvert @ 63rd Ave
Distance from Upstream XS =        5
Deck/Roadway Width        =       20
Weir Coefficient          =      2.6
Bridge Deck/Roadway Skew  =
Upstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
    -100    998.5              100    998.5

Upstream Bridge Cross Section Data
Station Elevation Data    num=       6
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
   -49.5    994.9    -44.5    993.9    -32.5    993.9         0    987.4        54    987.4
```

```
    91.5   994.9

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
   -49.5    .035   -49.5     .03     91.5    .035

Bank Sta: Left   Right    Coeff Contr.   Expan.
         -49.5    91.5             .1       .3

Downstream  Deck/Roadway Coordinates
    num=        2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
    -100     998              100     998

Downstream Bridge Cross Section Data
Station Elevation Data     num=        6
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
   -49.5   994.73    -44.5   993.73    -32.5   993.73       0   987.23      54   987.23
    91.5   994.73

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
   -49.5     .03    -49.5     .03     91.5     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
         -49.5    91.5             .1       .3

Upstream Embankment side slope                =       0 horiz. to 1.0 vertical
Downstream Embankment side slope              =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =      .95
Elevation at which weir flow begins           =
Energy head used in spillway design           =
Spillway height used in design                =
Weir crest shape                              = Broad Crested

Number of Culverts =  1

Culvert Name      Shape      Rise    Span
Culvert #1            Box       7      10
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    n Value   Entrance Loss Coef   Exit Loss Coef
                 59      32       .013                  .2                1
Number of Barrels =  5
Upstream   Elevation =  987.33
Centerline Stations
    Sta.    Sta.    Sta.    Sta.    Sta.
       6      17      28      39      50
Downstream Elevation =  987.3
Centerline Stations
    Sta.    Sta.    Sta.    Sta.    Sta.
       6      17      28      39      50

CULVERT OUTPUT    Profile #PF 1
Culvert ID : Culvert #1

  Culv Q (cfs)           2800.00   Culv Vel In (ft/s)        8.90
  # Barrels                    5   Culv Vel Out (ft/s)       8.94
  Q Barrel (cfs)          560.00   Culv Inv El Up (ft)     987.33
  E.G. US. (ft)           995.10   Culv Inv El Dn (ft)     987.30
  W.S. US. (ft)           994.83   Culv Frctn Ls (ft)        0.05
  Delta EG (ft)             1.12   Culv Ext Lss (ft)         0.83
  Delta WS (ft)             1.27   Culv Ent Lss (ft)         0.25
  E.G. IC (ft)            994.78   Q Weir (cfs)
  E.G. OC (ft)            995.10   Weir Sta Lft (ft)
  Culvert Control         Outlet   Weir Sta Rgt (ft)
  Culv WS In (ft)         993.62   Weir Submerg
  Culv WS Out (ft)        993.56   Weir Max Depth (ft)
  Culv Nml Depth (ft)       7.00   Weir Avg Depth (ft)
  Culv Crt Depth (ft)       4.60   Wr Flw Area (sq ft)
  Culv Ful Lngh (ft)               Min Top Rd (ft)         998.50


Note:     The normal depth exceeds the height of the culvert.  The program assumes that the normal
```

depth is equal to the height of the culvert.

```
CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 15900

INPUT
Description: DS of 63rd Av Culvert
Station Elevation Data    num=       6
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
   -49.5   994.73    -44.5   993.73    -32.5   993.73       0   987.23      54   987.23
    91.5   994.73

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
   -49.5      .03    -49.5      .03     91.5      .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
          -49.5    91.5          1169.76 1169.76 1169.76              .1        .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 14730

INPUT
Description: US of Drop
Station Elevation Data    num=       6
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
     -46   991.44      -42   990.44      -30   990.44       0   985.94      54   985.94
      89   991.49

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
     -46      .03      -46      .03       89      .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
            -46      89                30      30      30              .1        .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 14700

INPUT
Description: DS Drop #1
Station Elevation Data    num=       6
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
     -47    991.4      -42    990.4      -30    990.4       0    984.4      54    984.4
      89    994.4

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
     -47      .03      -47      .03       89      .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
            -47      89               200     200     200              .1        .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 14500

INPUT
Description: End Rt Bank Trans
Station Elevation Data    num=       6
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
     -47   991.18      -42   990.18      -30   990.18       0   984.18      54   984.18
      89   994.18

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
     -47      .03      -47      .03       89      .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
            -47      89                50      50      50              .1        .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 14450

INPUT
Description: Bgn Rt Bank Trans
```

```
Station Elevation Data    num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -47  991.13     -42  990.13     -30  990.13       0  984.13      54  984.13
     104  994.13

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -47     .03     -47     .03     104     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           -47     104             4300    4300    4300             .1       .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 10150

INPUT
Description: BW = 54, End Rt Bank Trans
Station Elevation Data    num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -47   986.4     -42   985.4     -30   985.4       0  979.4      54  979.4
     104   989.4

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -47     .03     -47     .03     104     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           -47     104               50      50      50             .1       .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 10100

INPUT
Description: Bgn Rt Bank Trans
Station Elevation Data    num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -47  986.35     -42  985.35     -30  985.35       0  979.35      58  979.35
      93  986.35

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -47     .03     -47     .03      93     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           -47      93              150     150     150             .1       .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 9950

INPUT
Description: End Bw = 70' , D= 7ft'
Station Elevation Data    num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -47  986.18     -42  985.18     -30  985.18       0  979.18      70  979.18
     105  986.18

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -47     .03     -47     .03     105     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           -47     105          577.92  577.92  577.92             .1       .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 9372

INPUT
Description:   End RT Wall No. 8
Station Elevation Data    num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -47  985.54     -42  984.54     -30  984.54       0  978.54      70  978.54
     105  985.54

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
```

```
     -47      .03      -47      .03      105      .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           -47     105              48      48      48             .1       .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 9324

INPUT
Description:    RT Wall No. 8
Station Elevation Data    num=       6
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
     -47  985.48      -42  984.48      -30  984.48        0  978.48       70  978.48
    70.1  985.48

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
     -47     .03      -47     .03     70.1     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           -47    70.1              100     100     100             .1       .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 9224

INPUT
Description:    RT Wall No. 8
Station Elevation Data    num=       6
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
     -47  985.37      -42  984.37      -30  984.37        0  978.37       70  978.37
    70.1  985.37

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
     -47     .03      -47     .03     70.1     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           -47    70.1               30      30      30             .1       .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 9194

INPUT
Description: Bgn  RT Wall No. 8
Station Elevation Data    num=       6
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
     -47  985.34      -42  984.34      -30  984.34        0  978.34       70  978.34
     105  985.34

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
     -47     .03      -47     .03     105      .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           -47     105           875.88  875.88  875.88             .1       .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 8318

INPUT
Description: End  RT Wall No. 7
Station Elevation Data    num=       6
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
     -47  984.38      -42  983.38      -30  983.38        0  977.38       70  977.38
     105  984.38

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
     -47     .03      -47     .03     105      .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           -47     105              63      63      63             .1       .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 8255
```

```
INPUT
Description:  RT Wall No. 7
Station Elevation Data    num=       6
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
     -47  984.31      -42  983.31      -30  983.31        0  977.31       70  977.31
    70.1  984.31

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
     -47     .03      -47     .03     70.1     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
           -47    70.1               100     100     100              .1      .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 8155

INPUT
Description:  RT Wall No. 7
Station Elevation Data    num=       6
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
     -47   984.2      -42   983.2      -30   983.2        0   977.2       70   977.2
    70.1   984.2

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
     -47     .03      -47     .03     70.1     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
           -47    70.1                38      38      38              .1      .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 8117

INPUT
Description: Bgn RT Wall No. 7
Station Elevation Data    num=       6
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
     -47  984.16      -42  983.16      -30  983.16        0  977.16       70  977.16
     105  984.16

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
     -47     .03      -47     .03     105     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
           -47     105           716.85  716.85  716.85              .1      .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 7400

INPUT
Description: Bank Ht Trans
Station Elevation Data    num=       6
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
     -47  983.37      -42  982.37      -30  982.37        0  976.37       70  976.37
     105  983.37

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
     -47     .03      -47     .03     105     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
           -47     105               120     120     120              .1      .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 7280

INPUT
Description: End  RT Wall 6
Station Elevation Data    num=       6
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
     -47  983.23      -42  982.23      -30  982.23        0  976.23       70  976.23
     125  987.23
```

```
Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
     -47     .03      -47     .03      125     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
           -47     125                 95      95      95             .1       .3

CROSS SECTION           RIVER: Maricopa Drain
REACH: Reach 1             RS: 7185

INPUT
Description:  RT Wall 6
Station Elevation Data     num=        6
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
     -47  983.13      -42  982.13      -30  982.13        0  976.13       70  976.13
    70.1  987.13

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
     -47     .03      -47     .03     70.1     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
           -47    70.1                100     100     100             .1       .3

CROSS SECTION           RIVER: Maricopa Drain
REACH: Reach 1             RS: 7085

INPUT
Description: Bgn RT Wall 6
Station Elevation Data     num=        6
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
     -47  983.02      -42  982.02      -30  982.02        0  976.02       70  976.02
    70.1  987.02

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
     -47     .03      -47     .03     70.1     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
           -47    70.1                 55      55      55             .1       .3

CROSS SECTION           RIVER: Maricopa Drain
REACH: Reach 1             RS: 7030

INPUT
Description: Bgn RT Wall 6
Station Elevation Data     num=        6
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
     -47  982.97      -42  981.97      -30  981.97        0  975.97       70  975.97
     125  986.97

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
     -47     .03      -47     .03      125     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
           -47     125              778.88  778.88  778.88             .1       .3

CROSS SECTION           RIVER: Maricopa Drain
REACH: Reach 1             RS: 6251

INPUT
Description: Bgn RT Wall 6
Station Elevation Data     num=        6
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
     -47  982.01      -42  981.01      -30  981.01        0  975.01       70  975.01
     125  986.01

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
     -47     .03      -47     .03      125     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
           -47     125                 96      96      96             .1       .3
```

```
CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 6155

INPUT
Description: RT Wall 5, BW = 70'
Station Elevation Data    num=       7
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
     -47  982.01      -42  981.01      -30  981.01        0  975.01       70  975.01
    70.1  982.01      116  983.01

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
     -47     .03      -47     .03     70.1     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           -47    70.1              105     105     105             .1       .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 6050

INPUT
Description: US Culvert 1
Station Elevation Data    num=       8
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
     -46  982.89      -45  981.89      -42  981.89      -40  981.89        0  974.89
      76  974.89     76.1  981.89      121  982.89

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
     -46     .03      -40     .03     76.1     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           -40    76.1              138     138     138             .1       .3

CULVERT                RIVER: Maricopa Drain
REACH: Reach 1            RS: 6012

INPUT
Description: Culvert @ Baseline  west of 75th Ave
Distance from Upstream XS =       0
Deck/Roadway Width        =      80
Weir Coefficient          =     2.6
Bridge Deck/Roadway Skew  =
Upstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
    -100      984             150      984

Upstream Bridge Cross Section Data
Station Elevation Data    num=       8
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
     -46  982.89      -45  981.89      -42  981.89      -40  981.89        0  974.89
      76  974.89     76.1  981.89      121  982.89

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
     -46     .03      -40     .03     76.1     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
           -40    76.1             .1       .3

Downstream  Deck/Roadway Coordinates
    num=       2
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
    -100      984             150      984

Downstream Bridge Cross Section Data
Station Elevation Data    num=       8
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
     -46  982.73      -45  981.48      -42  981.73      -40  981.73        0  974.73
      76  974.73     76.1  981.73      121  982.73

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
```

```
     -46      .03      -40      .03     76.1      .03

Bank Sta: Left   Right     Coeff Contr.    Expan.
          -40    76.1              .1        .3

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1         Box        7      10
FHWA Chart # 9 - flared wingwalls and Inlet top edge bevel
FHWA Scale # 1 - Wingwall flared 45 deg.; inlet top edge bevel=0.43D
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    n Value   Entrance Loss Coef   Exit Loss Coef
                 57      68       .013                   .2                1
Number of Barrels =  7
Upstream   Elevation =  974.84
Centerline Stations
    Sta.    Sta.    Sta.    Sta.    Sta.    Sta.    Sta.
     5.5    16.5    27.5    38.5    49.5    60.5    71.5
Downstream Elevation =  974.77
Centerline Stations
    Sta.    Sta.    Sta.    Sta.    Sta.    Sta.    Sta.
     5.5    16.5    27.5    38.5    49.5    60.5    71.5

CULVERT OUTPUT    Profile #PF 1
Culvert ID : Culvert #1

  Culv Q (cfs)           2800.00   Culv Vel In (ft/s)        6.55
  # Barrels                    7   Culv Vel Out (ft/s)       6.53
  Q Barrel (cfs)          400.00   Culv Inv El Up (ft)     974.84
  E.G. US. (ft)           981.75   Culv Inv El Dn (ft)     974.77
  W.S. US. (ft)           981.43   Culv Frctn Ls (ft)        0.06
  Delta EG (ft)             0.49   Culv Ext Lss (ft)         0.30
  Delta WS (ft)             0.54   Culv Ent Lss (ft)         0.13
  E.G. IC (ft)            980.81   Q Weir (cfs)
  E.G. OC (ft)            981.75   Weir Sta Lft (ft)
  Culvert Control         Outlet   Weir Sta Rgt (ft)
  Culv WS In (ft)         980.95   Weir Submerg
  Culv WS Out (ft)        980.89   Weir Max Depth (ft)
  Culv Nml Depth (ft)       5.68   Weir Avg Depth (ft)
  Culv Crt Depth (ft)       3.68   Wr Flw Area (sq ft)
  Culv Ful Lngh (ft)               Min Top Rd (ft)         984.00


CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 5912

INPUT
Description: DS Culvert 1
Station Elevation Data    num=       8
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -46  982.73     -45  981.48     -42  981.73     -40  981.73       0  974.73
      76  974.73    76.1  981.73     121  982.73

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -46     .03     -40     .03    76.1     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.    Expan.
          -40    76.1                62      62      62              .1        .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 5850

INPUT
Description: Bgn 76' BW
Station Elevation Data    num=       6
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```
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
     -47  981.63      -42  979.93      -30  980.63        0  974.63       76  974.63
     121  982.93

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
     -47     .03      -47     .03      121     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
           -47     121                 40      40      40              .1       .3

CROSS SECTION           RIVER: Maricopa Drain
REACH: Reach 1             RS: 5810

INPUT
Description: End 70' BW
Station Elevation Data    num=        6
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
     -47  981.63      -42  979.93      -30  980.63        0  974.63       70  974.63
     115  982.93

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
     -47     .03      -47     .03      115     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
           -47     115           606.97  606.97  606.97              .1       .3

CROSS SECTION           RIVER: Maricopa Drain
REACH: Reach 1             RS: 5203

INPUT
Description: 70' BW, end rt wall 4
Station Elevation Data    num=        6
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
     -47  980.96      -42  979.26      -30  979.96        0  973.96       70  973.96
     115  982.26

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
     -47     .03      -47     .03      115     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
           -47     115                 78      78      78              .1       .3

CROSS SECTION           RIVER: Maricopa Drain
REACH: Reach 1             RS: 5125

INPUT
Description: 70' BW, rt wall 4
Station Elevation Data    num=        6
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
     -47  980.87      -42  979.17      -30  979.87        0  973.87       70  973.87
    70.1  982.17

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
     -47     .03      -47     .03     70.1     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
           -47    70.1                100     100     100              .1       .3

CROSS SECTION           RIVER: Maricopa Drain
REACH: Reach 1             RS: 5025

INPUT
Description: 70' BW, rt wall 4
Station Elevation Data    num=        6
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
     -47  980.76      -42  979.06      -30  979.76        0  973.76       70  973.76
    70.1  982.06

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
     -47     .03      -47     .03     70.1     .03
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
          -47    70.1               45      45      45             .1       .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 4980

INPUT
Description: 70' BW, bgn rt wall 4
Station Elevation Data    num=       6
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
     -47  980.71      -42  979.01      -30  979.71        0  973.71       70  973.71
     115  982.01

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
     -47     .03      -47     .03      115     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
          -47     115           820.08  820.08  820.08             .1       .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 4160

INPUT
Description: 70' BW, End rt wall 3
Station Elevation Data    num=       6
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
     -47  979.81      -42  978.11      -30  978.81        0  972.81       70  972.81
     115  981.11

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
     -47     .03      -47     .03      115     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
          -47     115              85      85      85             .1       .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 4075

INPUT
Description: Ret Wall No. 3, 7' depth
Station Elevation Data    num=       7
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
     -47  979.47      -42  977.72      -30  977.72        0  972.72     81.4  972.72
    81.5  981.72      102  978.72

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
     -47     .03      -47     .03     81.5     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
          -47    81.5              100     100     100             .1       .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 3975

INPUT
Description: Ret Wall No. 3, 7' depth
Station Elevation Data    num=       7
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
     -41  979.36      -37  977.61      -25  977.61        0  972.61     81.4  972.61
    81.5  981.61      102  978.61

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
     -41     .03      -41     .03     81.5     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
          -41    81.5              43      43      43             .1       .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 3932
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```
INPUT
Description: 90' BW, bgn rt wall 3
Station Elevation Data    num=       6
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
   -42.5   978.52    -38.5   977.82      -25   977.52        0   972.52     85.7   972.52
   130.7   981.82

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
   -42.5      .03    -42.5      .03    130.7      .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
          -42.5   130.7                 32      32       32              .1       .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 3900

INPUT
Description: 90' BW, End 6' Ht Lt
Station Elevation Data    num=       6
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
     -41   978.52      -37   977.52      -25   977.52        0   972.52      89   972.52
     134   981.52

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
     -41      .03      -41      .03      134      .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
            -41     134                 11      11       11              .1       .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 3889

INPUT
Description: 90' BW, 6' Ht, Bgn BW Taper
Station Elevation Data    num=       6
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
     -41   978.52      -37   977.52      -25   977.52        0   972.52      90   972.52
     135   981.52

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
     -41      .03      -41      .03      135      .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
            -41     135              689.08  689.08   689.08              .1       .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 3200

INPUT
Description: 90' BW, 6' Ht
Station Elevation Data    num=       6
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
     -41   977.76      -37   976.76      -25   976.76        0   971.76      90   971.76
     135   980.76

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
     -41      .03      -41      .03      135      .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
            -41     135                 50      50       50              .1       .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 3150

INPUT
Description: 90' BW, 6' Ht
Station Elevation Data    num=       6
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
     -41    977.7      -37    976.7      -25    976.7        0    971.7      90    971.7
     120    977.7
```

```
Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
     -41     .03      -41     .03      120     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
           -41     120             72.98   72.98   72.98              .1        .3

CROSS SECTION           RIVER: Maricopa Drain
REACH: Reach 1             RS: 3077

INPUT
Description: 90' BW, 6' Ht
Station Elevation Data     num=        6
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
     -41  977.62      -37  976.62      -25  976.62        0  971.62       90  971.62
     120  977.62

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
     -41     .03      -41     .03      120     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
           -41     120                 52      52      52              .1        .3

CROSS SECTION           RIVER: Maricopa Drain
REACH: Reach 1             RS: 3025

INPUT
Description: Ret Wall No. 2, 6' depth
Station Elevation Data     num=        7
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
     -41  977.56      -37  976.56      -25  976.56        0  971.56       90  971.56
    90.1  977.56      102  977.56

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
     -41     .03      -41     .03     90.1     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
           -41    90.1                100     100     100              .1        .3

CROSS SECTION           RIVER: Maricopa Drain
REACH: Reach 1             RS: 2925

INPUT
Description: Ret Wall No. 2, 6' depth
Station Elevation Data     num=        7
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
     -41  977.46      -37  976.46      -25  976.46        0  971.46       90  971.46
    90.1  977.46      102  977.46

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
     -41     .03      -41     .03     90.1     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
           -41    90.1                 30      30      30              .1        .3

CROSS SECTION           RIVER: Maricopa Drain
REACH: Reach 1             RS: 2895

INPUT
Description: 90 BW, 6' Ht
Station Elevation Data     num=        6
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
     -41  977.42      -37  976.42      -25  976.42        0  971.42       90  971.42
     120  977.42

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
     -41     .03      -41     .03      120     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
           -41     120           867.96  867.96  867.96              .1        .3
```

```
CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 2027

INPUT
Description: 90' BW, 6 Ht
Station Elevation Data    num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -41  976.68     -37  975.68     -25  975.68       0  970.68      90  970.68
     120  976.68

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -41     .03     -41     .03     120     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           -41     120               52      52      52             .1       .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 1975

INPUT
Description: Ret Wall No. 1, 6' depth
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -41  976.41     -37  975.41     -25  975.41       0  970.41      90  970.41
    90.1  976.41     102  976.41

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -41     .03     -41     .03    90.1     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           -41    90.1              100     100     100             .1       .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 1875

INPUT
Description: Ret Wall No. 1, 6' depth
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -41   976.3     -37   975.3     -25   975.3       0   970.3      90   970.3
    90.1   976.3     102   976.3

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -41     .03     -41     .03    90.1     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           -41    90.1               31      31      31             .1       .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 1844

INPUT
Description: 90' BW, 6' Ht
Station Elevation Data    num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
     -41  976.27     -37  975.27     -25  975.27       0  970.27      90  970.27
     120  976.27

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
     -41     .03     -41     .03     120     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
           -41     120              244     244     244             .1       .3

CROSS SECTION          RIVER: Maricopa Drain
REACH: Reach 1            RS: 1600

INPUT
Description: Outfall into the SR
Station Elevation Data    num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
```

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     -41      976      -37      975      -25      975        0      970       90      970
     120      976

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
     -41     .03      -41     .03      120     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.    Expan.
          -41     120                  0        0        0              .1       .3
```

Profile Output Table - Standard Table 1

Reach	River Sta	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach 1	1600	2800.00	970.00	975.54	972.93	975.82	0.001100	4.25	658.20	156.85	0.37
Reach 1	1844	2800.00	970.27	975.81		976.09	0.001101	4.26	657.95	156.83	0.37
Reach 1	1875	2800.00	970.30	975.78		976.15	0.001402	4.87	574.75	129.03	0.41
Reach 1	1975	2800.00	970.41	975.93		976.29	0.001368	4.83	579.23	129.17	0.40
Reach 1	2027	2800.00	970.68	976.06		976.37	0.001233	4.42	633.80	155.44	0.39
Reach 1	2895	2800.00	971.42	977.07		977.34	0.001016	4.14	675.97	157.87	0.35
Reach 1	2925	2800.00	971.46	977.05		977.40	0.001307	4.76	587.87	129.44	0.39
Reach 1	3025	2800.00	971.56	977.18		977.53	0.001276	4.73	592.41	129.58	0.39
Reach 1	3077	2800.00	971.62	977.34		977.59	0.000971	4.08	686.11	158.44	0.35
Reach 1	3150	2800.00	971.70	977.41		977.67	0.000977	4.09	684.66	158.36	0.35
Reach 1	3200	2800.00	971.76	977.46		977.72	0.000985	4.10	682.81	158.26	0.35
Reach 1	3889	2800.00	972.52	978.14		978.41	0.001035	4.17	671.70	157.62	0.36
Reach 1	3900	2800.00	972.52	978.15		978.43	0.001049	4.20	667.38	156.70	0.36
Reach 1	3932	2800.00	972.52	978.18		978.47	0.001126	4.32	648.13	153.60	0.37
Reach 1	3975	2800.00	972.61	978.14		978.57	0.001648	5.26	532.22	119.66	0.44
Reach 1	4075	2800.00	972.72	978.34		978.73	0.001485	5.01	558.70	125.22	0.42
Reach 1	4160	2800.00	972.81	978.47		978.85	0.001522	4.96	564.80	136.30	0.43
Reach 1	4980	2800.00	973.71	979.68		980.01	0.001299	4.60	608.42	145.73	0.40
Reach 1	5025	2800.00	973.76	979.64		980.13	0.001834	5.58	501.95	111.19	0.46
Reach 1	5125	2800.00	973.87	979.84		980.31	0.001762	5.47	512.14	113.47	0.45
Reach 1	5203	2800.00	973.96	980.13		980.43	0.001132	4.39	638.19	148.05	0.37
Reach 1	5810	2800.00	974.63	980.82		981.12	0.001119	4.37	640.55	148.18	0.37
Reach 1	5850	2800.00	974.63	980.91		981.16	0.000922	4.05	691.07	154.90	0.34
Reach 1	5912	2800.00	974.73	980.89		981.26	0.001154	4.85	577.20	111.31	0.38
Reach 1	6012	Culvert									
Reach 1	6050	2800.00	974.89	981.43	978.21	981.75	0.000938	4.52	619.51	113.46	0.34
Reach 1	6155	2800.00	975.01	981.50		981.88	0.001285	4.95	565.79	114.54	0.39
Reach 1	6251	2800.00	975.01	981.75		981.99	0.000812	3.96	707.47	149.38	0.32
Reach 1	7030	2800.00	975.97	982.42		982.69	0.000975	4.21	664.44	146.47	0.35
Reach 1	7085	2800.00	976.02	982.39		982.79	0.001381	5.07	552.40	113.93	0.41
Reach 1	7185	2800.00	976.13	982.54		982.93	0.001353	5.03	556.11	114.09	0.40
Reach 1	7280	2800.00	976.23	982.78		983.05	0.000910	4.12	680.28	147.55	0.34
Reach 1	7400	2800.00	976.37	982.89		983.16	0.000929	4.14	675.53	147.22	0.34
Reach 1	8117	2800.00	977.16	983.57		983.85	0.000997	4.25	659.47	146.13	0.35
Reach 1	8155	2800.00	977.20	983.53		983.94	0.001419	5.11	547.42	113.74	0.41
Reach 1	8255	2800.00	977.31	983.68		984.08	0.001387	5.08	551.65	113.92	0.41
Reach 1	8318	2800.00	977.38	983.89		984.16	0.000935	4.15	674.12	147.13	0.34
Reach 1	9194	2800.00	978.34	984.73		985.02	0.001009	4.26	656.61	145.93	0.35
Reach 1	9224	2800.00	978.37	984.68		985.09	0.001436	5.14	545.26	113.64	0.41
Reach 1	9324	2800.00	978.48	984.83		985.23	0.001401	5.09	549.71	113.84	0.41
Reach 1	9372	2800.00	978.54	985.03		985.30	0.000949	4.17	670.72	146.90	0.34
Reach 1	9950	2800.00	979.18	985.59		985.87	0.001001	4.25	658.42	146.06	0.35
Reach 1	10100	2800.00	979.35	985.70		986.07	0.001404	4.88	574.16	133.50	0.41
Reach 1	10150	2800.00	979.40	985.75		986.15	0.001568	5.10	548.70	129.50	0.44
Reach 1	14450	2800.00	984.13	991.18		991.47	0.000997	4.36	641.61	136.24	0.35
Reach 1	14500	2800.00	984.18	991.20		991.54	0.001116	4.66	601.16	125.58	0.38
Reach 1	14700	2800.00	984.40	991.43		991.76	0.001114	4.65	601.56	125.59	0.37
Reach 1	14730	2800.00	985.94	991.36		991.86	0.002334	5.68	492.86	133.84	0.52
Reach 1	15900	2800.00	987.23	993.56		993.97	0.001432	5.16	542.22	117.31	0.42
Reach 1	15976	Culvert									
Reach 1	16050	2800.00	987.40	994.83	991.24	995.09	0.000818	4.06	688.88	140.33	0.32
Reach 1	16250	2800.00	987.62	995.00		995.26	0.000847	4.11	680.79	139.76	0.33
Reach 1	16300	2800.00	987.67	995.20		995.50	0.001018	4.45	629.16	131.63	0.36
Reach 1	16320	2800.00	988.69	995.14		995.56	0.001695	5.21	537.68	130.65	0.45
Reach 1	16700	2800.00	989.11	995.78		996.22	0.001719	5.34	524.21	123.67	0.46
Reach 1	18700	2190.00	991.32	998.39		998.61	0.000804	3.81	574.64	127.12	0.32
Reach 1	18750	1350.00	991.38	998.57		998.65	0.000282	2.29	590.47	128.24	0.19
Reach 1	18802	Culvert									
Reach 1	18860	1350.00	991.47	998.97	994.19	999.04	0.000234	2.14	629.87	130.97	0.17
Reach 1	19000	1350.00	991.65	999.01		999.09	0.000254	2.20	612.38	129.77	0.18
Reach 1	19500	1350.00	992.20	999.17		999.26	0.000325	2.40	562.70	126.27	0.20
Reach 1	20700	1350.00	993.52	999.62		999.76	0.000501	2.93	460.87	106.03	0.25
Reach 1	20825	Culvert									
Reach 1	21050	1350.00	993.90	1000.79	996.62	1000.89	0.000343	2.44	552.39	125.54	0.21
Reach 1	21150	1350.00	994.00	1000.84		1000.94	0.000354	2.47	546.23	125.09	0.21
Reach 1	21170	1350.00	995.03	1000.83		1000.96	0.000617	2.93	460.48	124.13	0.27
Reach 1	21190	1350.00	995.05	1000.83		1000.98	0.000697	3.14	430.01	114.48	0.29
Reach 1	21800	1350.00	995.68	1001.27		1001.44	0.000807	3.30	409.08	112.83	0.31
Reach 1	22000	1350.00	995.90	1001.43		1001.61	0.000847	3.35	402.49	112.30	0.31
Reach 1	24100	1350.00	998.25	1003.34		1003.56	0.001010	3.77	358.56	95.90	0.34
Reach 1	24150	1350.00	998.30	1003.39		1003.61	0.001009	3.76	358.61	95.90	0.34
Reach 1	24200	1350.00	998.37	1003.44		1003.66	0.001025	3.79	356.66	95.70	0.35
Reach 1	24240	1350.00	1000.37	1003.01	1003.01	1004.06	0.010494	8.21	164.48	79.54	1.01
Reach 1	24280	1350.00	1000.37	1003.70		1004.37	0.004933	6.58	205.25	78.29	0.72
Reach 1	25400	1350.00	1001.68	1006.56		1006.81	0.001186	3.99	338.58	93.79	0.37
Reach 1	25450	1350.00	1001.73	1006.62		1006.86	0.001178	3.98	339.45	93.88	0.37
Reach 1	25550	Culvert									
Reach 1	25650	1350.00	1001.95	1008.18	1004.67	1008.30	0.000462	2.85	474.19	107.28	0.24
Reach 1	25800	990.00	1002.13	1008.29		1008.37	0.000307	2.27	435.71	101.56	0.19
Reach 1	26300	990.00	1002.67	1008.45		1008.54	0.000394	2.49	398.04	97.78	0.22
Reach 1	26400	990.00	1002.78	1008.49		1008.58	0.000397	2.47	401.54	100.66	0.22
Reach 1	26440	990.00	1004.82	1008.39		1008.67	0.002093	4.24	233.55	90.77	0.47
Reach 1	26480	990.00	1004.86	1008.43		1008.79	0.002476	4.78	207.08	75.96	0.51
Reach 1	28000	990.00	1006.54	1011.05		1011.24	0.001031	3.51	282.01	85.09	0.34
Reach 1	28430	Culvert									
Reach 1	28500	990.00	1007.09	1012.45	1009.34	1012.55	0.000447	2.58	384.37	98.55	0.23
Reach 1	28550	990.00	1007.15	1012.46		1012.58	0.000550	2.80	353.05	93.06	0.25
Reach 1	30100	990.00	1008.85	1013.50		1013.68	0.000915	3.36	294.23	86.51	0.32
Reach 1	30200	990.00	1008.96	1013.59		1013.77	0.000930	3.38	292.59	86.32	0.32
Reach 1	30240	990.00	1010.97	1013.36	1013.36	1014.35	0.010748	7.96	124.37	63.96	1.01
Reach 1	31700	990.00	1012.62	1017.30		1017.45	0.000821	3.14	314.88	94.65	0.30

60 PERCENT ESTIMATE

PCN 117-08-31

LAVEEN AREA CONVEYANCE CHANNEL

ITEM NO.	DESCRIPTION	UNIT	APPROXIMATE QUANTITY	UNIT COST NUMBERS	EXTENDED AMOUNT
105 - 1	Partnering	LS	1	$ 15,000.00	$ 15,000.00
107 - 1	NPDES / SWPPP Permits	LS	1	$ 10,000.00	$ 10,000.00
107 - 2	Project Signs Allowance	LS	1	$ 10,000.00	$ 10,000.00
107 - 3	Ground Breaking Ceremony Allowance	LS	1	$ 5,000.00	$ 5,000.00
107 - 4	Public Information and Notification Allowance	LS	1	$ 5,000.00	$ 5,000.00
201 - 1	Clearing and Grubbing (Project Corridor)	LS	1	$ 70,000.00	$ 70,000.00
202 - 1	Mobilization	LS	1	$ 150,000.00	$ 150,000.00
211 - 1	Fill Existing Maricopa Drain	LS	1	$ 1,000,000.00	$ 1,000,000.00
215 - 1	Channel Excavation	CY	772,649	$ 3.75	$ 2,897,433.75
220 - 1	Grouted Riprap (12" Thick)	SY	1,870	$ 85.00	$ 158,950.00
310 - 1	Aggregate Base Course (Maintenance Roads)	SY	160,000	$ 3.70	$ 592,000.00
340 - 1	Concrete Single Curb, MAG DET 222 (Mow Strip)	LF	120,000	$ 9.50	$ 1,140,000.00
350 - 1	Miscellaneous Removal	LS	1	$ 100,000.00	$ 100,000.00
350 - 2	Remove Structures and Dwelling Units	LS	1	$ 75,000.00	$ 75,000.00
350 - 3	Remove Septic Tank	LS	1	$ 20,000.00	$ 20,000.00
401 - 1	Traffic Control	LS	1	$ 150,000.00	$ 150,000.00
401 - 2	Off-Duty Uniformed Officer	HR			$ -
421 - 1	4 Strand Smooth Wire Fence	LF	1,799	$ 16.00	$ 28,784.00
430 - 1	Grass for Channel	AC	140	$ 6,000.00	$ 840,000.00
430 - 2	Irrigation for Channel	AC	140	$ 10,000.00	$ 1,400,000.00
505 - 1	Modified 7 - 10' x 7' Concrete Box Culvert (Baseline Road)	EA	1	$ 246,000.00	$ 246,000.00
505 - 2	Modified 5 - 10' x 7' Concrete Box Culvert (63rd Avenue)	EA	1	$ 115,000.00	$ 115,000.00
505 - 3	Modified 4 - 10' x 6' Concrete Box Culvert (59th Avenue)	EA	1	$ 137,000.00	$ 137,000.00
505 - 4	Modified 3 - 10' x 6' Concrete Box Culvert (Baseline Road)	EA	1	$ 122,000.00	$ 122,000.00
505 - 5	Modified 3 - 10' x 6' Concrete Box Culvert (51st Avenue)	EA	1	$ 259,000.00	$ 259,000.00
505 - 6	Concrete Outlet (Special Detail D3)	CY	29	$ 400.00	$ 11,600.00
505 - 7	Concrete Low-Flow Transition Sections	CY	115	$ 180.00	$ 20,700.00
505 - 8	Concrete Retaining Wall	CY	1,311	$ 375.00	$ 491,625.00
505 - 9	Concrete Drop Structure Walls	CY	202	$ 350.00	$ 70,700.00
505 - 10	Concrete Headwall, MAG DET 501-4	EA	2	$ 2,500.00	$ 5,000.00
505 - 11	Siphon Manhole Structures	CY	156	$ 300.00	$ 46,800.00
505 - 12	Concrete Lined Irrigation Ditch	CY	100	$ 160.00	$ 16,000.00
510 - 1	6' Masonry Fence	LF	1,900	$ 24.00	$ 45,600.00
610 - 1	12 Inch Waterline Relocation	LS	1	$ 200,000.00	$ 200,000.00
610 - 2	12 Inch Water Valve (Contingent Item)	EA	2	$ 2,500.00	$ 5,000.00
618 - 1	30 RGRCP	LF	7,555	$ 100.00	$ 755,500.00
618 - 2	30 Inch DIP (Siphon Pipes)	LF	1,223	$ 165.00	$ 201,795.00
618 - 3	30 Inch Side Drain Pipes	LF	2,405	$ 100.00	$ 240,500.00
618 - 4	Pipe Plug, MAG DET 427	EA	6	$ 250.00	$ 1,500.00
619 - 1	Pump & Weir Relocation	EA	1	$ 250,000.00	$ 250,000.00
625 - 1	Storm Drain Manhole, MAG DET 520 AND 522	EA	19	$ 4,000.00	$ 76,000.00
	Construct 43rd Avenue and Southern Avenue Basin (Without Landscaping)	LS	1	$ 1,900,000.00	$ 1,900,000.00
	Construct 43rd Avenue and Southern Avenue Basin Landscaping	LS	1	$ 660,000.00	$ 660,000.00
	Contingency	%	10%	$ 14,544,487.75	$ 1,454,449.00
	Construction Management	%	12%	$ 14,544,487.75	$ 1,745,339.00

Total Estimate Amount — Total = $ 17,744,275.75

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

LAVEEN AREA CONVEYANCE CHANNEL

CONTRACT NO. FCD 01-xx

PROJECT CONTROL NO. 1170831

SPECIAL PROVISIONS – 60%

TABLE OF CONTENTS

SECTION 201 - CLEARING AND GRUBBING 2

SECTION 202 - MOBILIZATION 2

SECTION 206 - STRUCTURE EXCAVATION AND BACKFILL 3

SECTION 211 - FILL CONSTRUCTION 4

SECTION 215 - EARTHWORK FOR OPEN CHANNELS 5

SECTION 220 - RIPRAP CONSTRUCTION 6

SECTION 225 - WATERING 7

SECTION 301 - SUBGRADE PREPARATION 8

SECTION 310 - UNTREATED BASE 8

SECTION 336 - PAVEMENT MATCHING AND SURFACING REPLACEMENT 9

SECTION 340 - CONCRETE SINGLE CURB 9

SECTION 350 - REMOVAL OF EXISTING IMPROVEMENTS 10

SECTION 401 - TRAFFIC CONTROL 10

SECTION 421 - WIRE FENCES 12

SECTION 505 - CONCRETE STRUCTURES 14

SECTION 510 - CONCRETE BLOCK MASONRY 18

SECTION 520 - STEEL HANDRAILS 18

SECTION 601 - TRENCH EXCAVATION, BACKFILLING AND COMPACTION 18

SECTION 610 - WATERLINE CONSTRUCTION 19

SECTION 618 – STORM DRAIN CONSTRUCTION 20

SECTION 625 - MANHOLE CONSTRUCTION 21

SECTION 703 – RIPRAP 21

SECTION 725 - PORTLAND CEMENT CONCRETE 21

SECTION 201 - CLEARING AND GRUBBING

Clearing and grubbing shall conform to Section 201 of the MAG Uniform Standard Specifications and COP Supplement except as modified herein.

Subsection 201.1 - Description

Add the following to this subsection:

The work consists of the removal and disposal of all vegetation including shrubs, trees of all sizes, farm field vegetation, and other plants and objectionable material within the channel right-of-way unless directed otherwise by the engineer. Clearing and grubbing of the spoil site areas is not required. Prior to starting this work, the Contractor must verify the location of existing utilities that might be damaged by this work.

Subsection 201.5 – Payment, Clearing and Grubbing

Replace this subsection with the following:

No measurement or payment will be made for any clearing and/or grubbing outside of the permanent Project Rights-of-Way. The cost thereof shall be considered incidental to the item that said clearing and grubbing is incidental or appurtenant.

No measurement for the clearing and grubbing of the Project Corridor will be made on the basis of acres cleared and grubbed. Payment for said clearing and grubbing shall be made on the basis of the lump sum bid and shall be full compensation for said operation including but not limited to the hauling and proper disposal of all material cleared and grubbed.

ITEM 201-1 - CLEARING AND GRUBBING (Project Corridor)

Subsection 201.6 – Measurement, Removal and Disposal of Trees

Replace this subsection with the following:

No measurement will be made for the removal or disposal of trees regardless of size.

Subsection 201.7 – Payment, Removal and Disposal of Trees

Replace this subsection with the following:

No payment will be made for the removal or disposal of trees regardless of size. The cost thereof shall be considered incidental to the item that said removal and disposal is incidental or appurtenant.

SECTION 202 - MOBILIZATION

Add this section in its entirety to the MAG Uniform Standard Specifications

Subsection 202.1 - Description

Add the following subsection:

The work under this section shall consist of preparatory work and operations, including but not limited to, the movement of personnel, equipment, supplies and incidentals to the project site; the establishment of all offices, buildings and other facilities necessary for work on the project, and for all other work and operations that must be performed and costs incurred prior to beginning work on various items on the project site.

Field Office:

This work shall consist of providing and maintaining a furnished Field Office for the exclusive use of and occupancy by the Engineer and the Engineer's staff.

The office shall be a building or mobile trailer erected at a location convenient to the project. The office shall not be in the same building or mobile trailer as office space of the Contractor.

The Contractor shall obtain written approval from the property owner upon site selection of the field office. The Contractor may furnish equivalent facilities in an existing building provided such facilities and building are located to provide convenient service.

The field office shall be an approved and weatherproof building or mobile trailer providing a minimum of 500 square feet of clear floor space, not including the toilet area. The structure shall have a minimum ceiling height of seven (7) feet and shall be provided with weatherproof doors equipped with adequate locking devices. Windows shall also be provided with adequate locking devices. The Contractor shall also provide the following:

a. Lighting - Electric light, non-glare type luminaries to provide a minimum illumination level at desk height level.

b. Heating & Cooling - Adequate electrically powered equipment to maintain an ambient air temperature of 72 degrees F plus or minus 8 degrees.

c. Telephone, answering, and FAX machine - A telephone with an outside line for the exclusive use of the Engineer. The Contractor will pay for the cost of the line and local calling charges. The District will pay for long distance charges made on this line.

d. Toilet - A commode and wash sink in a separately enclosed room within the building or mobile trailer, properly ventilated and complying with applicable sanitary codes. Contractor shall provide water service.

e. Maintenance - The contractor shall maintain all facilities and furnished equipment in good working condition.

f. Fire Extinguisher - Two non-toxic, dry chemical, fire extinguishers meeting Underwriters Laboratories, Inc. approval for Class A, Class B, and Class C fires with a minimum rating of 2A: 2B: 10C.

g. Electricity - Contractor shall provide electric power and pay for all electric services.

h. Furnishings - Two office desks with drawers, two office chairs (padded, swivel type), one drafting table (adjustable height 3 feet by 6 feet), one 8 foot conference table, eight folding chairs, one draftsman's stool, and a four drawer legal file cabinet.

i. Copier - Copier for 8 ½ inch by 11 inch and 11 inch by 17 inch paper with minimum 10 copy capacity.

j. Potable Water Supply – Contractor shall provide a potable water supply and pay for all water service.

The office shall be fully equipped and made available for the Engineer's use and occupancy prior to the start of any Contract work and not later than 10 days after the date of notice to proceed. The Engineer will notify the Contractor, in writing, of the acceptability of the Field Office provided. The Contractor shall maintain the field office in operating condition until seven (7) days after acceptance of the Contract work.

All facilities shall be maintained in good operating condition and appearance by the Contractor for the designated period, after which all portable buildings or trailers, fencing, surfacing, and utilities shall be removed from the site, the areas cleaned and seeded if required and left in a neat and acceptable condition.

Subsection 202.1 - Payment

Add the following subsection:

Payment shall be made on the basis of the lump sum price bid. This price shall be full compensation for supplying and furnishing all materials, facilities, and services and performing all work involved as specified herein. The lump sum price bid shall not exceed three (3) percent of the total project bid amount exclusive of mobilization. No additional payment will be made for occupancy and services during periods of contract extension of time due to engineering changes.

ITEM 202-1 - MOBILIZATION

SECTION 206 - STRUCTURE EXCAVATION AND BACKFILL

Structure excavation and backfill shall conform to Section 206 of the MAG Uniform Standard Specifications and COP Supplement except as modified herein.

Subsection 206.2 - Foundation Material Treatment
Add the following to this subsection:
Foundation bearing surfaces shall be free of debris and water softened materials prior to placing concrete and reinforcing steel. Any loose or disturbed zones should be removed and replaced with compacted fill or lean concrete.

Subsection 206.4 - Structure Backfill
Add the following to this subsection:
Compaction of structure backfill soils against embedded footings, walls, and headwall structures shall be accomplished to a minimum 95 percent of the maximum ASTM D698 density.

Compaction against wing walls, or channel lining within 3 feet of the walls or lining shall be accomplished using non-wheeled, hand operated compaction equipment only.

Backfill behind subsurface walls designed to support utilities, pavement, channels, or other facilities should be compacted to density criteria from Section 211. Backfill shall consist of free draining granular soils that exhibit low expansive potentials. The material shall be free of vegetation, debris, organic contaminants, and fragments larger than 4 inches in size.

Compaction operations shall be accomplished by mechanical methods. Water settling or jetting shall not be permitted.

On-site soils may be used in structural fills or backfill except for high plasticity on-site soils (P.I. > 12) which may not be used in structure fills or backfill. Imported soil used for fills under pavements, or channels, backfill around structures should be granular soils conforming to the following requirements:

Sieve Size	Percent Passing
3"	100
3/4"	60-80
#8	35-80
#200	0-12

(Arizona Test Method 201)

Note: Maximum size may be reduced at the Engineer's direction to satisfy trenching and landscape requirements, etc.

Subsection 206.5 - Payment
Replace this subsection with the following:
No payment will be made for structure excavation and backfill as such. The cost thereof shall be included in the bid price for the construction or installation of the items to which such excavation and backfill is incidental or appurtenant.

SECTION 211 - FILL CONSTRUCTION
Fill construction shall conform to Section 211 of the MAG Uniform Standard Specifications and COP Supplement except as modified herein.

Subsection 211.1 - Description
Add the following to this subsection:
Work under this item shall consist of filling in the existing Maricopa Drain to the limits as shown on the plans. The material excavated from the channel construction is suitable material for this operation.

Subsection 211.3 - Compacting
Add the following to this subsection:
Compaction of exposed site soil, backfill, fill, and base course materials shall be accomplished to the following density criteria:

Material	Minimum Percent Compaction (ASTM D698)
Subgrade Soil:	
Below structural elements	95
Below Pavement	95
Within three (3) feet of existing perimeter walls	85
Backfill:	
Restoration of channel bank	95
Against structures	95

On site undisturbed soils or compacted soils subsequently disturbed or removed by construction operations shall be replaced with materials compacted as specified above. Saturated soil shall be removed and replaced with materials compacted as specified above.

Subsection 211.5 - Measurement
Replace this Subsection with the following:
No measurement for fill material will be made.

Subsection 211.6 - Payment
Replace this Subsection with the following:
No payment will be made for fill necessary to construct the new channel; the cost thereof shall be included in channel excavation to which such work is considered incidental.

Payment for fill construction of the existing Maricopa Drain outside the limits of the channel as shown in the construction plans will be made on the basis of the lump sum price bid. Payment shall include hauling, placing, compacting, and all other miscellaneous items necessary to accomplish the work in conformance with the plans.
ITEM 211-1 - FILL EXISTING MARICOPA DRAIN

SECTION 215 - EARTHWORK FOR OPEN CHANNELS
Earthwork for open channels shall conform to Section 215 of the MAG Uniform Standard Specifications and COP Supplement except as modified herein.

Subsection 215.1 - Description
Replace this subsection with the following:
The work in this section consists of excavation, fill, grading, and disposal of excavated and removed material for the construction of the Laveen Area Conveyance Channel.

All material excavated and not used as fill elsewhere on the project will be the property of the Contractor except for approximately 430,000 CY of excess material that shall remain on the designated spoil sites as shown in the plans. All spoil sites will be left in a neat fashion with the top of all stockpiles knocked down and with the height of each stockpile not to exceed 6' in height and with side slopes not to exceed 2' horizontal to 1' vertical. The Contractor is not responsible for the material once it is placed on the spoil site. This material and the responsibility of handling, storing, etc. then becomes that of the spoil site owner.

Owners of the stockpiles have expressed an interest in obtaining additional material.

Subsection 215.3 - Excavation
Add the following to this subsection:

The Contractor is encouraged to review the soil boring logs included in Appendix A of these Special Provisions and the geotechnical report as discussed in Subsection 102.4.

Subsection 215.7 - Measurement
Replace this subsection with the following:
Measurement for excavation material on site for the channel will be made according to the quantity of material excavated from natural ground to the finished grades shown on the plans. No measurement will be made for fill construction, imported material, or disposal of excess material. The Engineer will verify the quantities of excavation by a method that in his opinion is best suited to obtain an accurate determination.

Subsection 215.8 - Payment
Replace this subsection with the following:
Payment for excavation of material for the channel will be made on the basis of the price bid per cubic yard of excavation. Payment shall include excavation, fill, backfill, compaction, grading, hauling, removal, disposal of excess material, and all other miscellaneous items necessary to accomplish the work in conformance with the plans.
ITEM 215-1 - CHANNEL EXCAVATION

SECTION 220 - RIPRAP CONSTRUCTION
Riprap Construction shall conform to Section 220 of the MAG Uniform Standard Specifications and COP Supplement except as modified herein.

Subsection 220.1 - Description
Add the following to this subsection:
The construction of grouted riprap shall consist of furnishing and placing stone and grout as shown on the plans and specified in the special provisions.

Subsection 220.5 - Grouted Riprap
Add the following to this subsection:
The grout shall be colored desert tan. The contractor shall submit a color for the grout for review and approval by the District. The grout shall fully penetrate the entire depth of the riprap. The finished surface shall have no more than 4 inches of stone protruding above the grout. However, in areas where the grouted riprap is to provide a smooth driving surface no more than 1 inch of stone shall protrude above the grout.

Excavate for placement of grouted riprap as indicated. Placement methods will minimize disturbance of the subgrade. Place stones in position following the details. Wash the stones free of fines or soil that would affect the grout bond. Placement of grouted riprap through water will not be permitted. The concrete grout shall be placed by injection methods by pumping under low pressure, positive displacement methods, through a 2-inch maximum diameter hose to ensure complete penetration of the grout into the stone layer.

The operator shall be able to stop the flow of grout and will place grout in the voids and not on the surface of the stone. Clean and wash any spillage before the grout sets. A "pencil" vibrator will be used to make sure all voids are filled between and under rock. The intent is to fill all voids from the subgrade level through the stone layer. In all cases, grout must penetrate to subgrade. The pencil vibrator may be used to smooth the appearance of the surface.

The stone for riprap shall have a size as specified in Section 703 of these Special Provisions. When a construction note does not specify the type of grouted riprap the contractor shall use Type I stone. Grouted riprap shall have a minimum thickness as listed in Table 220-1 when measured perpendicular to the surface on which it is placed. Grouted riprap shall be placed in a single layer.

Table 220-1

Riprap Type	Minimum Thickness

Type I	1'-0"

The Contractor shall provide a ten foot (10') by ten foot (10') square sample of grouted riprap for inspection and approval by the District, a minimum of two (2) weeks before beginning placement of the grouted riprap. The Contractor shall use Type II or Type III stone for the sample and shall demonstrate the techniques used to achieve full penetration grouting. The Contractor shall also submit a mix design for the grout indicating the type of color used and the quantity. The grout shall have a slump of no less than 7 inches and no more than 9 inches and shall contain a plasticizer.

After completion of any area of grouted riprap, no workman or other load shall be permitted on the grouted riprap for a period of 24 hours. Vehicles shall be kept off of the grouted riprap for a period of 7 days after the grout has been placed. The grouted surface shall be protected from injurious action of the sun; shall be protected from rain, flowing water, and mechanical injury; and shall be moist cured or membrane cured at the Contractor's option. The grout shall be cured for a period of 7 days following placement. Grouted riprap damaged before the project has been completed shall be removed and replaced at the direction of the Engineer.

Subsection 220.7 - Measurement
Add the following to this subsection:
Grouted riprap shall be measured by the square yard of the finished exposed surface as shown on the plans. The measurement shall be to the neat line as delineated on the plans to the nearest square yard and shall not include toe down areas.

Subsection 220.8 - Payment
Add the following to this subsection:
Payment for grouted riprap shall be by the square yard in place; within the limits of dimensions shown on the plans. Payment shall include labor, preparation of ground surfaces, excavation, riprap, grout, color, curing, replacement of damaged areas, samples provided for the Engineer's approval and all other miscellaneous items required for grouted riprap construction.
ITEM 220-1 - GROUTED RIPRAP (12" Thick)

SECTION 225 - WATERING
Watering shall conform to Section 225 of the MAG Uniform Standard Specifications except as modified herein.

Subsection 225.1 - Description
Add the following to this subsection:
Pre-soaking prior to excavation may be used on this project. Continuous dust control efforts will be required during construction. The Contractor will maintain adequate dust control during loading and transport operations to minimize dust.

The Contractor shall obtain the necessary permits under the County Air Pollution Statutes. It shall be the responsibility of the Contractor to keep the construction site moistened to prevent dust pollution to the air and adjacent properties.

Subsection 225.2 - Water Supply
Replace this subsection with the following:
The Contractor is to use City of Phoenix water. The Contractor shall use only those hydrants designated by the City of Phoenix Water Services Department and in strict accordance with its requirements for hydrant use.

The Contractor shall contact the Water Services Department, Technical Support Group at 495-5601 to obtain a "Permit to Use Water from Fire Hydrant" and pay the required fees, which include both monthly services charges, plus the cost of the water per 100 cu. Ft units used.

Subsection 225.5 - Payment
Replace this subsection with the following:
No payment will be made for the cost of watering. The cost thereof shall be included in the price for the construction or installation of the items to which such water is incidental or appurtenant.

SECTION 301 - SUBGRADE PREPARATION
Subgrade preparation shall conform to Section 301 of the MAG uniform Standard Specifications and COP Supplement except as modified herein.

Subsection 301.8 - Payment
Replace this subsection with the following:
No separate payment for subgrade preparation will be made as such. The cost thereof shall be included in the price for the construction or installation of the items to which such subgrade preparation is incidental or appurtenant.

SECTION 310 - UNTREATED BASE
Replace Section 310 of the Standard Specifications with the following:

Subsection 310.1- Description
Replace this subsection with the following:
Aggregate base course, also referred to as ABC, shall be placed for the maintenance roads, where shown on the construction plans.

Subsection 310.2 - Placement
Replace this subsection with the following:
The ABC may be placed and compacted in a single layer. After distributing, the base material shall first be watered and then immediately bladed to a uniform layer that will net, after rolling, the required thickness. If the materials deposited are not uniformly blended together, the blading operation shall be continued to such extent as may be necessary to eliminate segregation. The quantity of water applied shall be that amount which will assure proper compaction resulting in a relative density of not less than 100 percent as determined under Section 301 of the Standard Specifications. Care shall be exercised in connection with watering operations to avoid wetting the subgrade or any lower base course to detrimental extent.

Upon completion, the base surface shall be true, even and uniform, conforming to the grade and cross-section shown on the design plans.

ABC may vary not more than 1/2 inch above or below required grade and cross-section.

Subsection 310.3 - Measurement
Replace this subsection with the following:
Quantities of ABC shown on the design plans are measured by the square yard, based upon the actual dimensions shown. No allowance is made for spalling or waste beyond those limits.

Subsection 310.4 - Payment
Replace this subsection with the following:
Payment for aggregate base course used for the maintenance road shall be by the square yard in place, to the dimensions shown on the design plans. Such payment shall be compensation in full for materials, transportation, miscellaneous earthwork, labor, equipment, placement, watering, and roller compaction.
ITEM 310-1 – AGGREGATE BASE COURSE (MAINTENANCE ROADS)

SECTION 336 - PAVEMENT MATCHING AND SURFACING REPLACEMENT

Pavement matching and surfacing replacement shall conform to Section 336 of the MAG Uniform Standard Specifications and COP Supplement except as modified herein.

Subsection 336.1 – Description

Add the following to this subsection.

This item is for the re-construction of the pavement cuts in Baseline Road, 59th and 51st Avenues for the construction of the concrete box culverts, storm drain pipe, and any other project improvements in the roadway.

Subsection 336.2.2 -Pavement to be Removed

Add the following to this subsection.

All pavement to be removed shall first be sawcut.

Subsection 336.3 - Types and Locations of Pavement and Surfacing Replacement

Add the following to this subsection.

The pavement replacement shall consist of at least two layers of asphalt pavement over 12" of aggregate base course.

Baseline Road, 51st Avenue, and 59th Avenue

The pavement replacement shall be 8" compacted thickness. The base courses of the asphalt pavement shall be lifts not exceeding 3" when compacted of C-3/4 and the surface course shall be 2" of D-1/2 and shall match the grades of the existing pavement.

The materials shall conform to MAG Sections 702 and 710, and the following:

Asphaltic Concrete Type	C-3/4, D-1/2
Mineral Filler	Portland Cement (1-1/2% by weight)
Asphalt Cement	AC-20

Subsection 336.4 - Measurement

Replace this subsection with the following:

No measurement will be made for pavement replacement.

Subsection 336.5 - Payment

Replace this subsection with the following:

No payment will be made for pavement matching and surfacing replacement, the cost thereof shall be included in the price for the construction or installation of the items to which such pavement replacement is incidental or appurtenant.

SECTION 340 - CONCRETE SINGLE CURB

Concrete single curb shall conform to Section 340 of the MAG Uniform Standard Specifications and COP Supplement except as modified herein.

Subsection 340.1 - Description

Add the following to this subsection:

The work shall include the construction of a concrete single curb mow strip adjacent to the maintenance road in the channel.

Subsection 340.6 - Payment

Replace this subsection with the following:

Payment for concrete single curb shall be made on the basis of the price bid per linear foot. This price shall be considered full compensation for the item complete including all construction equipment, labor, materials, pavement removal and replacement if necessary, and all incidentals items necessary to accomplish the work in conformance to the plans including construction of the curb transitions.

ITEM 340-1 - CONCRETE SINGLE CURB, MAG DET 222 (MOW STRIP)

SECTION 350 - REMOVAL OF EXISTING IMPROVEMENTS

Removal of existing improvements shall conform to Section 350 of the MAG Uniform Standard Specifications and COP Supplement except as modified herein.

Subsection 350.1 - Description

Add the following to this subsection:

The work includes the removal and disposal of any obstacle to construction, unless it is specifically called out on the plans to be removed and salvaged or protected in place. Holes, cavities and trenches resulting from the removal of structures shall be backfilled if necessary in accordance with Sections 206 and 211. The disposal of all waste material removed under this item shall be the responsibility of the Contractor. The disposal site shall be approved by the Engineer prior to disposal.

If a Maricopa County landfill is selected for the disposal of waste materials and/or debris, a Maricopa County Landfill Use Permit will be required. Application for permit can be made at the Maricopa County Landfill Office, located at 2801 West Durango Street, Phoenix, Arizona 85009 (telephone (602) 269-2661). Charges will be levied on a volume basis for each load delivered to the landfill in accordance with the current fee schedule.

Subsection 350.4 – Payment

Replace this subsection with the following:

Payment for miscellaneous removals shall be made on the basis of the lump sum price bid. This price shall be full compensation for all construction equipment, labor, materials, pavement removal and disposal, and all incidentals necessary to accomplish the work in conformance to the plans.

ITEM 350-1 - MISCELLANEOUS REMOVAL
ITEM 350-2 – REMOVE STRUCTURES AND DWELLING UNITS
ITEM 350-3 – REMOVE SEPTIC TANK

SECTION 401 - TRAFFIC CONTROL

Traffic control shall conform to Section 401 of the MAG Uniform Standard Specifications and COP Supplement to MAG except as modified herein.

Subsection 401.1 – Description

Replace this subsection with the following:

This work shall consist of traffic control devices and flagmen or pilot cars in accordance with Section 401 of the COP Supplement and the City of Phoenix Traffic Barricade Manual, latest revision.

a. Traffic Control Devices
   All traffic and/or traffic control devices on this project shall be provided, maintained and/or controlled as specified in the City of Phoenix Traffic Barricade Manual, latest revision.

b. Street Closure Permits
   Permission to restrict city streets, sidewalks and alleys (street closure permits) shall be requested as specified in Section III of the City of Phoenix Traffic Barricade Manual.

c. Traffic Manual
   Unless otherwise provided for in the following "General Traffic Regulations," all traffic on this project shall be regulated as specified in Section IV of the City of Phoenix Traffic Barricade Manual.

d. Prior Approval
   No deviation to the "General Traffic Regulation" will be allowed or implemented unless submitted to the Engineer for review and approval two weeks prior to the proposed work.

Subsection 401.5 – General Traffic Regulations

Add the following to this subsection:

a. Local Access Requirements

The Contractor shall maintain local access to all side streets, access roads, driveways, alleys, and parking lots at all times and shall notify residents 72 hours in advance of any restrictions which will affect their access. The Contractor shall restore the access as soon as possible. If the primary access cannot be restored in a timely manner, the Contractor shall provide an alternative, which shall be predetermined with the residents prior to imposing any restrictions. Any local street restrictions imposed shall be such that local area traffic circulation is maintained unless specified to be closed herein or as shown on the detour plans.

b. Flagging of Traffic

Intermittent flagging of traffic in both directions will be allowed during daylight hours to facilitate construction and access for heavy construction equipment.

c. Traffic Control Plan

The Contractor shall submit a Traffic Control Plan (TCP) for approval, showing placement of all traffic control devices, including all conflicting signs to be covered/removed or relocated, or other features that may conflict with the placement of temporary signage. This plan shall be professionally drawn on a 24" x 36" reproducible medium, and shall be submitted to the Engineer at the Pre-Construction Conference meeting.

d. Business Access Requirements

Access shall be maintained to adjacent businesses at all times during their hours of operation. Access may be maintained by such measures as constructing driveways in half sections, or by providing bridging over new concrete. Properties having more than one point of access shall not have more than one access restricted for more than fourteen (14) calendar days at any given time. Access to adjacent driveways shall be provided during all non-working hours. Any business restrictions shall be coordinated with the affected business in writing at least seven (7) days prior to imposing restrictions.

e. Pedestrian Access Requirements

The Contractor shall ensure that all sidewalks on this project remain open and safely usable at all times. Such measures as backfilling or ramping to existing sidewalks, or providing alternate sidewalk areas adjacent to existing sidewalks may be used. In high pedestrian use areas, the Engineer may request temporary hard-surface walkways, such as plywood sheets to be installed at no additional cost to the District.

f. Bus Stops

The Contractor shall maintain all existing bus stop locations on this project in a safe manner, or provide alternate bus stop locations as required by the Engineer.

g. Sanitation Pickup

The Contractor shall provide sanitation pickup for affected residents by relocating trash containers, or by providing alternative measures acceptable to the Sanitation Division of the City of Phoenix Public Works Department.

h. Traffic Control and Safety

At the time of the Pre-Construction Conference, the Contractor shall designate an employee, other than the Project Superintendent, who is well qualified and experienced in construction traffic and safety, to be available on the project site during all periods of construction to coordinate and maintain safe barricading whenever construction restricts traffic.

i. Coordination with COP Construction Traffic Control

The Contractor shall contact Tony Arviso at 262-6565 or John Perez at 495-6934 at Construction Traffic Control, City of Phoenix.

Subsection 401.5.1 – Special Traffic Regulations
Replace this subsection with the following:

a. For night time work or on weekends the Contractor shall minimize noise disturbance to the surrounding residential areas by disengaging "back-up beepers" and utilizing back-up strobe lights with spotters, and by increasing the muffler capacities of all equipment.

b. Prior to excavation, the Contractor shall:
   1. Develop a haul route plan and obtain a no fee permit from COP Development Services Department
   2. Obtain COP Street Transportation Department approval of haul route, truck volumes and operating hours.
   3. Obtain COP Development Services Department grading permit, including Floodplain Section if applicable, for the proposed spoil location
   4. Street Transportation Department Permit does not release Contractor from MAG Subsection 108.5 requirements.

Subsection 401.7 - Payment
Replace this subsection with the following:
Payment for traffic control, including all mobilization, signage, materials, and maintenance shall be made on the basis of the lump sum price bid. This price shall be full compensation for all construction equipment, labor, materials, and all incidentals necessary to accomplish the work in conformance to the plans.
ITEM 401-1 - TRAFFIC CONTROL

Payment for off-duty City of Phoenix uniformed officers as mandated by the City of Phoenix will be on an as-used basis as determined by the Engineer. The Contractor shall submit documentation as required by the Engineer to support payment for this item. Payment for off-duty uniformed officers shall be made on the basis of the contract unit price bid per hour.
ITEM 401-2 - OFF-DUTY UNIFORMED OFFICER

SECTION 421 - WIRE FENCES
Add this section in its entirety to the MAG Uniform Standard Specifications

Subsection 421.1 - Description
Add the following subsection:
The work under this section shall consist of furnishing all materials and constructing plain wire fence at the location and in accordance with the details shown on the plans. Fence shall be of the type and size shown on the plans and shall be constructed in accordance with the requirements of these specifications.
Subsection 421.2 - Materials
Add the following subsection:
Plain wire shall be 12-1/2 gauge steel wire and shall be either zinc-coated or aluminum coated. Zinc-coated steel wire shall conforms to the requirements of ASTM A 121, Class 1 coating. Aluminum-coated steel wire shall conform to the requirements of ASTM A 585, Type 1, Class 1 coating.

Posts, rails, braces, and bars shall conform to the requirements of Section 725.

Portland cement concrete shall conform to the requirements of Section 725.

Subsection 421.3 - Construction
Add the following subsection:
The Contractor shall clear the fence lines of all earth trees, brush, and other obstructions which interfere with the proper construction of the fences. Clearing the fence line shall be along and within the project right-of-way. Disposal of removed material shall be in accordance with the requirements of Section 201.

Fence shall be constructed as shown on the plans.

Fence posts shall be spaced at the intervals and set to the depths shown on the plans.

In determining the post spacing, measurements shall be made parallel to the ground slope, and all posts shall be placed in a vertical position, except in unusual locations where the Engineer may direct that the posts be set perpendicular to the ground surface.

Line posts may be driven into undisturbed earth provided driving does not injure the posts. All voids around the post shall be backfilled and the material thoroughly tamped.

End, corner, pull, posts, and braces shall be set in concrete footings and crowned at the top to shed water.

Any high points which interfere with the placing of fence wire shall be excavated to provide the clearance shown on the plans.

Changes in the horizontal alignment of the fence line where the angle of deflection is fifteen (15) degrees or more shall be considered as corners and a corner post assembly shall be installed. Changes in fence alignment where the angle of deflection is less than fifteen (15) degrees, but more than five (5) degrees shall be considered as alignment angles and diagonal tension wires shall be installed. The diagonal tension wires shall consist of two (2) twisted steel wires and shall be attached to the adjacent posts.

Intermediate post assemblies shall be installed at not more than five hundred (500) foot intervals between other braced posts. After post assemblies have been placed, the wire shall be pulled taut to the satisfaction of the Engineer, and each longitudinal wire shall be cut and securely fastened to the braced post with devices suited for the purpose. Wire shall not be carried past a post assembly, but shall be cut and fastened to the post independently of the adjacent spans. A maximum of two (2) splices of wire will be permitted between post assemblies, but not on the same wire. No splice shall be placed closer than one hundred (100) feet to any post assembly.

After the tensioning of the wire between the post assemblies, all longitudinal wires shall be attached to each intervening line post at the height and spacing as shown on the plans. The distance from the bottom wire to the ground may vary at one point from that shown on the plans four (4) inches plus or minus. Where abrupt changes occur in the fence line grade, intermediate line posts may be required to maintain proper distances between the bottom wire and the ground.

Spacing of the twisted vertical wire stays shall be as shown on the plans for each type of fence. The vertical wire stays shall be woven into every horizontal wire.

At all grade depressions where stresses tend to pull the posts from the ground, the affected fence posts shall be anchored in concrete or the fence wires shall be weighted with concrete sag weights.
The volume of concrete required to anchor the posts shall be not less than one (1) cubic foot. Fence sag weights shall weigh not less than one hundred (100) pounds and shall be made with a wire loop hanger embedded in the concrete. A double strand of wire shall be attached to each horizontal line of wire and tied to the wire loop hanger of the sag weight.

Subsection 421.4 - Measurement
Add the following subsection:
Wire fence shall be measured on the fence line along the top of the completed fence from center of end posts.

Subsection 421.5 - Payment
Add the following subsection:
Payment for wire fence shall be made on the basis of the price bid per lineal foot. This price shall be considered full compensation for furnishing and installing the wire fence as specified, including removal of obstructions and all incidental costs not specifically covered in other items.
ITEM 421-1 – 4 STRAND SMOOTH WIRE FENCE

SECTION 505 - CONCRETE STRUCTURES

Concrete structures shall conform to Section 505 of the MAG Uniform Standard Specifications except as modified herein.

Subsection 505.1 - Description

Add the following to this subsection:

The work under this section shall consist of furnishing all labor, materials and equipment for the construction of all cast-in-place and other concrete structures including the concrete box culverts, wing walls, and retaining walls as located and indicated on the plans.

Concrete shall conform to the requirements of Section 725 of the MAG Uniform Standard Specifications, and mix designs shall additionally meet the requirements of Chapter 5, Section 5.3 of ACI STANDARD 318-89. The Contractor shall submit mix designs and certifications of conformance with the above requirements for the written approval of the Engineer.

Class "A" Concrete, f'c = 3,000 psi, shall be used for all concrete structures.

The use of Class F fly ash will be permitted in all concrete mixes, subject to approval of mix design by Engineer.

Transit Concrete mixes used on the project must carry current certification from ADOT or Arizona Rock Products Association.

The reinforcing steel shall conform to Section 727, Grade 60, of the MAG Uniform Standard Specifications.

Shop Drawings shall be submitted for the following:

- Product Data: Admixtures and patching materials.
- Placement Drawings:
  a. Concrete, identifying location of each type of construction joint.
  b. Reinforcing steel.
- Plastic Type Water Stops: Details of splices to be used and method of securing water stop in the forms and supporting water stop so as to maintain proper orientation and location during concrete placement.

Do not backfill against walls until concrete has obtained 28-day compressive strength. Place backfill simultaneously on both sides of wall, where required, to prevent differential pressures.

Subsection 505.6 - Placing Concrete

Add the following to this subsection:

Place concrete in accordance with ACI 301-89. Prior to placing concrete, remove loose soil and water from excavation and subgrade and debris and foreign material from forms. Obtain Engineer's approval of subgrade before placing reinforcing steel. Check reinforcing steel for proper placement and correct discrepancies. Before depositing new concrete on old concrete, clean surface using sandblast or bushhammer or other mechanical means to obtain a 1/4-inch rough profile. Maximum vertical drop to final placement shall be 6 feet, when not guided with chutes or other devices to prevent segregation caused by impact with reinforcing. Do not use aluminum pipe or aluminum conveying devices.

Steps performed in preparation for placing concrete shall meet requirements and recommendations of ACI 304R-89 and ACI 301-89, except as modified herein. Ends of chutes, piping, hopper gates, and other points of concrete discharge throughout the conveying, hoisting, pumping, and placing system shall be designed and arranged for concrete to pass without becoming segregated. Do not use chutes longer than 50 feet. The minimum slopes of chutes shall be angled to allow concrete to readily flow without segregation. Conveyor belts shall be approved by Engineer, wiped clean with a device that does not allow mortar to adhere to belt, and conveyor belts and chutes covered. Provide standby pump, conveyor system, crane and concrete bucket, or other system onsite during placing, for adequate redundancy to ensure completion of concrete placement without cold joints in case of a primary placing equipment breakdown. Minimum pump hose (conduit) diameter shall be 4 inches. Replace pumping equipment and hoses (conduits) that are not functioning properly.

Limit size of each placement to allow for strength gain and volume change caused by shrinkage. Minimum time between adjacent placements for construction of the spillway floor slab shall be seven (7) days.

Consolidate concrete with internal vibrators with minimum frequency of 8,000 cycles per minute and amplitude required to consolidate concrete in section being placed. Provide at least one standby vibrator in operable condition at placement site prior to placing concrete. Consolidation equipment and methods shall conform to the requirements of ACI 309R-87. Provide sufficient windows in forms or limit form height to allow for concrete placement through windows and for visual observation of concrete. Vibration consolidation shall not exceed a distance of 5 feet from point of placement. Vibrate concrete in vicinity of joints to obtain impervious concrete there.

When vibrating concrete, apply approved vibrator at points spaced not farther apart than vibrator's effective radius. Apply close enough to forms to vibrate surface effectively but not damage form surfaces. Vibrate until concrete becomes uniformly plastic. Vibrator must penetrate fresh placed concrete and into previous layer of fresh concrete below.

Subsection 505.6.1 - Joints
Add the following to this subsection:
Construction joints shall be constructed as straight joints and made either vertical or horizontal. Concrete placement shall commence after the joint preparation is complete.

For construction joints, prior to placement of abutting concrete, clean contact surface by removing laitance and spillage from reinforcing steel and dowels. Then roughen surface to a minimum of 1/4-inch amplitude by either sandblasting after the concrete has fully cured, water blasting after the concrete has partially cured, or if the concrete is green, cutting the fresh concrete with high pressure water and hand tools. Perform cleaning so as not to damage water stop, if one is present.

Subsection 505.8 - Curing
Add the following to this subsection:
Use one of the following methods as approved by Engineer.

Walls shall have only water curing procedures used. Method 1: Leave concrete forms in place and keep entire surfaces of forms and concrete wet for 10 days. Method 2: Continuously sprinkle with water 100 percent of exposed surfaces for 10 days starting immediately after removal of forms.

Slabs shall use one of the following methods: Method 1: Protect surface by water ponding for 10 days; Method 2: Cover with burlap or cotton mats and keep continuously wet for 10 days; Method 3: Cover with 1-inch layer of wet sand, earth, or sawdust, and keep continuously wet for 10 days; or Method 4: Continuously sprinkle exposed surface for 10 days. Other agreed-upon methods that will keep moisture present and uniform at all times on surface of slabs. Do not use curing compounds.

Subsection 505.9 - Finishing Concrete
Add the following to this subsection:
All exposed concrete structures including the concrete box culverts, retaining walls, and wing walls shall be colored using a "light brown" admixture. The color shall conform to Davis Color "Flag Stone Brown #64" as manufactured by Davis Colors, or an approved equal, with respect to hue, value, and chroma. A test panel shall be made and the Engineer prior to use shall approve the concrete color. The color shall be added at the rate of 2 pounds per 94-pound sack of cement. The cost of the coloring is incidental to the cost of the concrete.

A clear protective water based coating shall be applied to all exposed concrete structure surface areas. The coating shall be Graffiti Protector #J-44, produced by Dayton Superior, or approved equal. The coating shall be clear and contain no coloring. The cost of the coating is incidental to the cost of the concrete.

Form liner shall be used for the full height on the inside and outside face of all exposed walls, including concrete box culvert and outlet structure wingwalls, power pole retaining walls, etc. The form liner shall be VA D.O.T. Trapezoid design, No. 304, uni-cast and/or multi-cast sheets as manufactured by Greenstreak, or approved equal. Form liners will be prepared, placed and stripped per the manufacturer's requirements, recommendations and specifications. The form liner shall not infringe on or reduce the required thickness of the walls as detailed in the plans. A test panel shall be made of the form liner and shall be approved by the Engineer prior to use. The test panel shall be 5' by 5' in size and shall remain on the project site until the completion of project. The cost of the form liner is incidental to the cost of the item for which the form liner is incidental or appurtenant.

Prior to starting patching work, obtain quantities of color-matched patching material and manufacturer's detailed instructions for use to provide a structural patch with finish to match adjacent surface. Develop patching techniques with epoxy manufacturer on mockup panel. Dress surface of patches that will remain exposed to view to match color and texture of adjacent surfaces. Patching of concrete shall provide a structurally sound surface finish, uniform in appearance or upgrade finish by other means until acceptable to Engineer.

For tops of walls, screed surfaces to true level planes. After initial water has been absorbed, float with wood float and trowel with steel trowel to smooth finish free from trowel marks.

Spray evaporation retardant onto surface of fresh flatwork concrete immediately after screeding to react with surface moisture. Reapply as needed to ensure a continuous moist surface until final finishing is completed.

Subsection 505.9.6 - Finishing and Patching Surfaces
Add the following subsection:

When patching *defective* areas, remove *defective* concrete to a depth of sound concrete. Small shallow holes caused by air entrapment at surface of forms shall not be considered *defective* unless amount is greater than 3/4 inch in diameter or as stipulated by the Engineer. Obtain Engineer's approval of chipping work.

Cut out honeycombed and *defective* areas. Cut edges perpendicular to surface at least 1 inch deep. Do not feather edges. Soak area with water for 24 hours. Patch with non-shrink grout as specified in Section 776. Finish surfaces to match adjacent concrete. Keep patches damp for minimum 7 days or spray with curing compound to minimize shrinking.

To patch form tie holes, fill with Category I grout as specified in Section 776. Use only enough water to dry pack. Compact grout using steel hammer and steel tool to drive grout to high density. Cure grout with water. Make sure color of patch after curing matches color of adjacent concrete.

Subsection 505.10 - Payment
Add the following to this subsection:
Payment for concrete box culverts shall be made on the basis of the unit price bid for each. This price shall be full compensation for all labor, materials, reinforcing steel, equipment, excavation and backfill, color admixture, protective coating, and all other items necessary and incidental to construct the structures complete in place according to the plans and these Special Provisions. The concrete floor and ABC backfill on the culverts with an equestrian cell shall be considered as incidental to the price for the box culvert and no additional payment shall be made.
ITEM 505-1 - Modified 7- 10' x 7' CONCRETE BOX CULVERT (BASELINE ROAD)
ITEM 505-2 - Modified 5- 10' x 7' CONCRETE BOX CULVERT (63RD AVENUE)
ITEM 505-3 - Modified 4- 10' x 6' CONCRETE BOX CULVERT (59TH AVENUE)
ITEM 505-4 - Modified 3- 10' x 6' CONCRETE BOX CULVERT (BASELINE ROAD)
ITEM 505-5 - Modified 3- 10' x 6' CONCRETE BOX CULVERT (51ST AVENUE)

Payment for the concrete outlet shall be made on the basis of the price bid cubic yard of concrete. This price shall be full compensation for all labor, materials, reinforcing steel, equipment, excavation and backfill, color admixture,

protective coating, and all other items necessary and incidental to construct the structures complete in place according to the plans and these Special Provisions.

ITEM 505-6 - CONCRETE OUTLET (SPECIAL DETAIL D3)

Payment for concrete low-flow transition sections walls shall be made on the basis of the price bid cubic yard of concrete. This price shall be full compensation for all labor, materials, reinforcing steel, equipment, excavation and backfill, color admixture, protective coating, and all other items necessary and incidental to construct the structures complete in place according to the plans and these Special Provisions.

ITEM 505-7 - CONCRETE LOW-FLOW TRANSITION SECTIONS

Payment for concrete retaining walls shall be made on the basis of the price bid cubic yard of concrete. This price shall be full compensation for all labor, materials, reinforcing steel, equipment, excavation and backfill, color admixture, protective coating, and all other items necessary and incidental to construct the structures complete in place according to the plans and these Special Provisions including handrails.

ITEM 505-8 - RETAINING WALL

Payment for concrete drop structure walls shall be made on the basis of the price bid cubic yard of concrete. This price shall be full compensation for all labor, materials, reinforcing steel, equipment, excavation and backfill, color admixture, protective coating, and all other items necessary and incidental to construct the structures complete in place according to the plans and these Special Provisions.

ITEM 505-9 - CONCRETE DROP STRUCTURE WALLS

Payment for concrete headwalls shall be made on the basis of the unit price bid for each. This price shall be full compensation for all labor, materials, reinforcing steel, equipment, excavation and backfill, color admixture, protective coating, and all other items necessary and incidental to construct the structures complete in place according to the plans and these Special Provisions.

ITEM 505-10 - CONCRETE HEADWALL, MAG DET 501-4

Payment for siphon manhole structures shall be made on the basis of the price bid cubic yard of concrete. This price shall be full compensation for all labor, materials, reinforcing steel, equipment, excavation and backfill, color admixture, protective coating, and all other items necessary and incidental to construct the structures complete in place according to the plans and these Special Provisions.

ITEM 505-11 - SIPHON MANHOLE STRUCTURES

Payment for concrete lined irrigation ditch shall be made on the basis of the price bid cubic yard of concrete. This price shall be full compensation for all labor, materials, reinforcing steel, equipment, excavation and backfill, color admixture, protective coating, and all other items necessary and incidental to construct the structures complete in place according to the plans and these Special Provisions.

ITEM 505-12 - CONCRETE LINED IRRIGATION DITCH

SECTION 510 - CONCRETE BLOCK MASONRY

Concrete Block Masonry shall conform to Section 510 of the MAG Uniform Standard Specifications and COP Supplement except as modified herein.

Subsection 510.2 - Construction

Add the following to this subsection:

The work shall include the construction of the concrete block masonry fence including all footings, joints, corners, step-downs, and pilasters matching existing wall type and dimensions, and all other work required to complete the installation of the walls or fences as specified on the plans and in the Special Provisions.

Surfaces of concrete block masonry shall be prepared for the application of paint as specified on the plans and in Section 530 of the MAG Uniform Standard Specifications.

Subsection 510.6 - Payment

Replace this subsection with the following:

Measurement and payment for concrete block masonry fence shall be made on the basis of the price bid per linear foot. This price shall be full compensation for furnishing all labor, materials, tools, and equipment, and doing all the work involved in constructing the fence complete in place as specified on the plans and in the Special Provisions.
ITEM 510 - 1 – 6' MASONRY FENCE

SECTION 520 - STEEL HANDRAILS
Steel handrails shall conform to Section 520 of the MAG Uniform Standard Specifications and COP Supplement except as modified herein.

Subsection 520.1 - Description
Add the following to this subsection:
The work under this section shall include providing and erecting steel handrails as shown in the plans.

All steel handrails shall be painted in accordance with MAG Section 790. The paint color shall be a light brown color as approved by the Engineer.

Subsection 520.4 – Measurement
Replace this subsection with the following:
No measurement will be made for handrails.

Subsection 520.5 - Payment
Replace this subsection with the following:
No payment will be made for handrails, the cost thereof shall be included in the price for the construction or installation of the items to which such handrails are incidental or appurtenant.

SECTION 601 - TRENCH EXCAVATION, BACKFILLING AND COMPACTION
Trench excavation, backfilling and compaction shall conform to Section 601 of the MAG Uniform Standard Specifications and COP Supplement except as modified herein.

Subsection 601.4.2 – Bedding
Add the following to this subsection:
Bedding material may be 1/2 sack CLSM and shall conform to the requirements set forth in MAG Section 728. CLSM shall have a slump of 7 +/- 1 inch and have a minimum of 50 psi compressive strength and a maximum of 100 psi based on a 28-day test.

CLSM bedding material shall be placed in a uniform manner that will prevent voids in, or segregation of, the bedding material, and will not float or shift the pipe. CLSM bedding material shall be placed from bottom of pipe to pipe springline. No backfilling above the CLSM shall be commenced until 24 hours after the cement-treated slurry has been placed.

Bedding material above the springline of the pipe shall be granular material containing no pieces larger than 1-½ inches and free of broken concrete, broken pavement, wood or other deleterious material.

No water consolidation will be permitted.

Where mechanical compaction is used, the moisture content shall be such that the specified compaction can be obtained. Bedding lifts shall not exceed 12 inches loose and extreme care will be taken to prevent damage to or movement of the conduit by the compaction equipment.

The Contractor may opt to use cement-treated slurry from the pipe springline to the within one foot from the top of the pipe.

Subsection 601.6 - Payment
Add the following to this subsection:
No payment will be included in the proposal, nor direct payment made for trench excavation, foundation, bedding, backfilling, compaction, or placement of temporary pavement, the cost thereof shall be included in the price for the construction or installation of the items to which such trenching is incidental or appurtenant.

SECTION 610 - WATERLINE CONSTRUCTION

Waterline construction shall conform to Section 610 of the MAG Uniform Standard Specifications and COP Supplement except as modified herein.

Subsection 610.1 - Description
Add the following to this subsection:
Except where noted otherwise, the Contractor is responsible for protecting all water lines in place and for maintaining all waterlines in service for the duration of the project. If the Contractor elects to temporarily shut down a water main for a period of time that exceeds eight hours, the Contractor shall provide a temporary bypass waterline at no additional cost, which is approved by the City of Phoenix, depending on location.

The City of Phoenix requires 72 hours written notice prior to shutdowns on waterlines. The City Fire Department must be notified at least 24 hours in advance of any shutdowns for waterlines serving fire hydrants.

The Contractor is responsible for maintaining access to water valves within the construction area. Failure to do so may result in delays to a scheduled or emergency water shutdown. Only City of Phoenix utility personnel are permitted to operate valves.

The Contractor shall provide all materials and labor necessary to complete all waterline work. City of Phoenix personnel will not provide materials, labor, or equipment for work related to this project.

Subsection 610.18 - Measurement and Payment
Add the following to this subsection:
Payment for ductile iron water pipe shall be made at the contract lump sum price bid. Such payment shall be full compensation for furnishing and installing the pipe complete in place, as specified, including fittings, labor, excavation, backfilling, compaction, removal of obstructions, shoring, bracing, testing, and all other work not specifically covered that is incidental.

ITEM 610-1 - 12 INCH WATER LINE RELOCATION

Payment for water valves shall be made at the contract unit price bid per each. Such payment shall be full compensation for furnishing and installing the valve, box, and cover complete in place, as specified, including labor, excavation, backfilling, compaction, removal of obstructions, shoring, bracing, testing, and all other work not specifically covered that is incidental.

ITEM 610-2 - 12 INCH WATER VALVE (CONTINGENT ITEM)

SECTION 618 – STORM DRAIN CONSTRUCTION

The work under this section shall conform to Section 618 of the MAG Uniform Standard Specifications except as modified herein.

Subsection 618.1 – Description
Add the following to this subsection:
The work under this section shall consist of furnishing and installing Rubber Gasket Reinforced Concrete Pipe (RGRCP) at the locations and to the grades and slopes indicated on the plans.

Subsection 618.2 – Materials
Add the following to this subsection:

Concrete pipe, joints, gaskets, and testing shall be according to MAG Section 735.

Subsection 618.6 – Payment
Replace this subsection with the following:
Payment for storm drain construction shall be made at the unit price bid per linear foot. This price shall be full compensation for furnishing and installing the pipe and fittings complete in place, as specified, including excavation, backfilling, compaction, shoring, sheeting and bracing, testing and all incidental work not specifically covered in other pay items.
ITEM 618-1 - 30 INCH RGRCP

Payment for siphon pipes shall be made at the unit price bid per linear foot. This price shall be full compensation for furnishing and installing the pipe and fittings complete in place, as specified, including excavation, backfilling, compaction, shoring, sheeting and bracing, testing and all incidental work not specifically covered in other pay items.
ITEM 618-2 - 30 INCH DIP (SIPHON PIPES)

Payment for side drain pipes shall be made at the unit price bid per each. This price shall be full compensation for furnishing and installing the pipe and fittings complete in place, as specified, including excavation, backfilling, compaction, shoring, sheeting and bracing, testing and all incidental work not specifically covered in other pay items.
ITEM 618-3 - 30 INCH SIDE DRAIN PIPES

Payment for the installing pipe plugs shall be at the contract unit price for each plug larger than 24 inch. No payment will be made for plugs less than 24 inch, the cost thereof shall be considered incidental to the item for which such plug is appurtenant.
ITEM 618-4 - PIPE PLUG, MAG DET 427

Payment for storm drain connector pipe shall be made at the unit price bid per linear foot. This price shall be full compensation for furnishing and installing the pipe and fittings complete in place, as specified, including excavation, cutting and removing existing pipe & plugging existing pipe, placing pipe collars as needed per MAG DET 505, backfilling, compaction, shoring, sheeting and bracing, testing and all incidental work not specifically covered in other pay items.
ITEM 618-5 - 24 INCH CATCH BASIN CONNECTOR PIPE
ITEM 618-6 - 30 INCH CATCH BASIN CONNECTOR PIPE

Payment for the prefabricated tees shall be at the contract unit price for each. This price shall be for the cost of fabrication only. The cost of installation is covered under item 618-1 of the Bid Schedule.
ITEM 618-7 - 30" x 30" x 24" PREFABRICATED TEE
ITEM 618-8 - 30" x 30" x 30" PREFABRICATED TEE

SECTION 625 - MANHOLE CONSTRUCTION
Manhole construction shall conform to Section 625 of the MAG Uniform Standard Specifications and the City of Phoenix Supplemental Specifications except as modified herein.

Subsection 625.1 - Description
Add the following to this subsection:
The work includes the installation of the manhole structures for the storm drains in accordance with the plans.

Subsection 625.5 - Payment
Add the following to this subsection:
Payment for manhole construction shall be made at the unit price bid per each. This price shall include all labor, materials, and equipment necessary to install manholes including excavation, bedding, backfill, compaction, embedments, rims, and covers, and all incidental work.
ITEM 625-1 – STORM DRAIN MANHOLE, MAG DET 520 AND 522

SECTION 703 – RIPRAP

Riprap shall conform to Section 703 of the MAG Uniform Standard Specifications and COP Supplement except as modified herein.

Subsection 703.1 - Stone

Add the following to this subsection:

In addition to the requirements of section 703.1, stone for riprap shall have a minimum apparent specific gravity of 2.4 per ASTM C-127.

Waste concrete shall not be used for riprap.

Subsection 703.2 – Size of Stone

Replace this subsection with the following:

The following requirements as listed in Table 703-1 that shall apply for grouted riprap Types I, II and III.

Table 703-1

Design Gradation for Specified Classes of Grouted Riprap					
	Percent Passing	Down Drain	Type		
			I	II	III
D Max	90 - 85	12"	16"	18"	24"
	85 - 65	9"	12"	14"	18"
D Min	0	6"	8"	9"	12"

SECTION 725 - PORTLAND CEMENT CONCRETE

Portland cement concrete shall conform to Section 725 of the MAG Uniform Standard Specifications and COP Supplement except as modified herein.

Subsection 725.2 - Portland Cement

Add the following to this subsection:

Cement shall be Portland Cement, conforming to the requirements of ASTM C-150, Type II, unless noted otherwise on the plans or in the specifications.

Subsection 725.6 - Admixtures

Add the following to this subsection:

When an air-entraining agent is authorized, the amount used will be limited to the extent that the amount of air by volume shall not be less than 4 percent nor more than 6 percent. Air-entraining agents complying with AASHTO M-154 or ASTM C-260 will be permitted as long as strength requirements are met. Any admixture shall be measured accurately by mechanical means into each batch by equipment and in a method approved by the Engineer.

City of Mesa (1/8/01)

Winter Season (October 2000-March 2001)

Demand= Required # operable WQ samplers	**Output=** # Operable WQ samplers	**Results=** % Operable samplers	**Output=** Total # samples possible	**Output=** Total # samples collected	**Results=** % Possible samples collected
5	1	20	10	5	(50%)
Demand= Required # Rep. storm samples per season	**Output=** Cumulative sample total for the season	**Output=** Cumulative Rep. sample total for the season	**Output=** Total # Rep. samples possible	**Output=** Total # Rep. samples collected	**Results=** % Rep. samples collected
10	(#)	4	6	4	(66%)

	Grabs	Composites	Representative	Lab	Comments
Horne & Sixth	Yes	No	Yes	Yes	Grab
Broadway & Lindsay	Yes	No	Yes	Yes	Grab
Falcon Field	No	No	No	No	(none)
Horne & Grandview	Yes	Yes	Yes	Yes	G + C
Broadway & Dobson	Yes	No	No	No	Grab

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

IN COOPERATION WITH MCDOT, CITY OF PHOENIX, AND SALT RIVER PROJECT

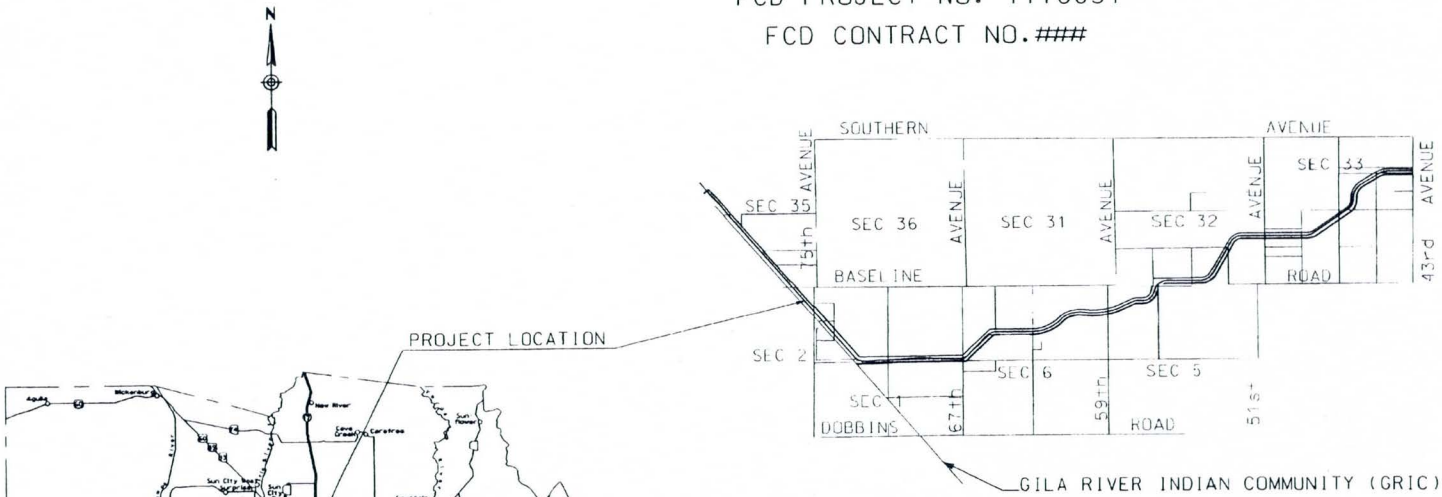
PLANS FOR THE CONSTRUCTION OF

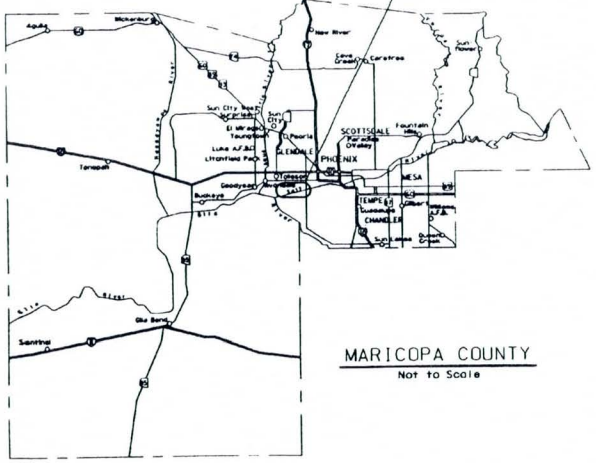
LAVEEN AREA CONVEYANCE CHANNEL

43RD AVENUE TO SALT RIVER

FCD PROJECT NO. 1170831

FCD CONTRACT NO. ####





MARICOPA COUNTY
Not to Scale

VICINITY MAP
Not to Scale

60% SUBMITTAL

TWO WORKING DAYS BEFORE YOU DIG, CALL 263-1100 BLUE STAKE

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

ISSUED FOR PUBLIC BIDDING BY:

CHIEF ENGINEER AND GENERAL MANAGER

BOARD OF DIRECTORS OF THE FLOOD CONTROL DISTRICT

JAN BREWER - CHAIRMAN

DISTRICT 1	FULTON BROCK
DISTRICT 2	DON STAPLEY
DISTRICT 3	ANDY KUNASEK
DISTRICT 4	JAN BREWER
DISTRICT 5	MARY ROSE WILCOX

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LEGEND

Symbol	Description
▲	BENCHMARK
	EXIST. SURVEY MONUMENT - BC FLUSH
	EXIST. SURVEY MONUMENT - BC IN HH
	EXIST. & PROPOSED COMBINED CURB & GUTTER - MAG DET. 220 TYPE "A"
	EXIST. CONCRETE SIDEWALK - COP STD. DET. P-1230
	EXISTING DITCH
IRR	EXISTING IRRIGATION LINE (NOTE - PRIVATE, SALT RIVER OR R.I.D.)
	EXISTING IRRIGATION STRUCTURE
	EXISTING IRRIGATION STANDPIPE
---12" W---	EXISTING WATER LINE / SIZE
	EXISTING WATER METER & BOX
	EXISTING FIRE HYDRANT
	NEW OR RELOCATED FIRE HYDRANT BY CONTRACTOR
	EXISTING WATER VALVE OPERATING NUT ELEVATION
---24" S---	EXISTING SEWER LINE / SIZE
	EXISTING MANHOLE
	NEW MANHOLE
	CATCH BASIN, GUTTER INLET (LENGTH TO SCALE)
	CATCH BASIN, CURB INLET (LENGTH TO SCALE)
	CATCH BASIN, CURB & GUTTER INLET (LENGTH TO SCALE)
--78" SD--	EXISTING STORM DRAIN / SIZE
	NEW PIPE FOR STORM DRAIN OR IRRIGATION LINE
---CATV---	EXISTING UNDERGROUND CABLE TELEVISION
---UGE---	EXISTING UNDERGROUND ELECTRIC
---4D---	EXISTING UNDERGROUND TELEPHONE DUCTS (SPECIFY NUMBER)
---2" G---	EXISTING GAS LINE / SIZE
---UGT---	EXISTING UNDERGROUND TELEPHONE CABLE
	EXISTING STREET SIGN
	EXISTING TRAFFIC SIGN
PP	EXISTING UTILITY POLE
	EXISTING WIRE FENCE
	EXISTING WOOD FENCE
	EXISTING CHAIN LINK FENCE
	DOWN ANCHOR
	STREET LIGHT
	EASEMENT LINE
	EXISTING OR NEW R/W LINE
	PAVEMENT CENTER LINE AND/OR MOUNUMENT LINE (C AND / OR M) L
2	BORING HOLE / NUMBER (SEE SPECIAL PROVISIONS)
	TELEPHONE RISER
WM	WATER SERVICE BOX
MST	MID SPAN TAP (OH UTILITIES)
WV	WATER VALVE
D	STORM MANHOLE
TS	TRAFFIC SIGNAL
	TREE
STOP	STOP SIGN
	GATE W/POSTS
SM	SAWCUT & MATCH
	EDGE OF PAVEMENT(W/O C&G)

ABREVIATIONS

CLD	CONCRETE LINED DITCH
CST	CONSTRUCTION
DESC	DESCRIPTION
DTL	DETAIL
EQ	EQUAL
FOC	FIBER OPTIC CABLE
G	GUTTER ELEVATION
OHE	OVERHEAD ELECTRIC
P	PAVEMENT ELEVATION
PG	PAGE
P/L	PROPERTY LINE
PRV	PRIVATE
SPG	SPACING
UGT	UNDERGROUND TELE CABLE
TBM	TEMPORARY BENCHMARK
TC	TOP OF CURB ELEVATION
TW	TOP OF WALL ELEVATION
TG	TOP OF GRATE ELEVATION

STRUCTURAL NOTES:

1. ALL CONSTRUCTION SHALL CONFORM TO MAG STANDARD DETAILS, AND SPECIFICATIONS, DATED 1998, INCLUDING ALL REVISIONS THRU 2000.
2. DESIGN IS IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, DIVISION 1, 16TH EDITION, 1996.
3. REINFORCING STEEL SHALL CONFORM TO ASTM SPECIFICATION A615, GRADE 60.
4. STRESSES - fs = 24,000 PSI - GRADE 60 REINFORCING STEEL.
5. ALL REINFORCING STEEL PLACEMENT DIMENSIONS SHALL BE TO CENTER OF BARS UNLESS OTHERWISE NOTED.
6. ALL REINFORCING STEEL SHALL HAVE 2" CLEAR COVER UNLESS OTHERWISE NOTED.
7. STRUCTURAL STEEL SHALL CONFORM TO ASTM SPECIFICATION A36.
8. ALL WELDING SHALL CONFORM TO THE REQUIREMENTS OF THE AMERICAN WELDING SOCIETY, STRUCTURAL WELDING CODE, REVISED 1996.
9. DIMENSIONS SHALL NOT BE SCALED FROM DRAWINGS.
10. CHAMFER ALL EXPOSED CORNERS 3/4" UNLESS OTHERWISE NOTED.
11. CONCRETE COMPRESSIVE STRENGTH SHALL BE 3,000 PSI MAG, CLASS A.

INDEX OF SHEETS

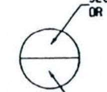
DRAWING NO.	TITLE	SHEET NO.
G1	COVER SHEET & VICINITY MAP	
G2	GENERAL NOTES	
G3	HORIZONTAL & RIGHT OF WAY CONTROL	
G4-G7	GEOMETRIC LAYOUT	
G8 -GX	TYPICAL SECTIONS	
QS1-QSX	QUANTITY SUMMARY SHEETS	
PS1	PIPE SUMMARY SHEET	
AP1	ALTERNATE PIPE SHEET	
D1- D5	DETAIL SHEETS	
SP1-SP2	SPOIL SITES SHEETS	
C1-C32	CHANNEL PLAN & PROFILE SHEETS	
B1-B5	BRIDGE PLANS	
P1-P11	PIPE PLAN & PROFILE SHEETS	
PWR	POWER POLE PROTECTION	
CWE	CANTILEVER RETAINING WALL ELEVATIONS	
IR1-IR5	IRRIGATION SIPHON PLAN & PROFILE SHEETS	
W1	WATERLINE RELOCATION	
I1-I10	IRRIGATION PLAN SHEETS (not included)	
LS1-LSX	LANDSCAPING PLANS (not included)	
XS1-XSX	CROSS SECTION SHEETS	
CP1-CPX	CONNECTOR PIPE PROFILE SHEETS (not included)	

UTILITY NOTIFICATION

COMPANY	CONTACT NAME	PHONE NUMBER
CITY OF PHOENIX (WATER)		
CITY OF PHOENIX (SEWER)		
SOUTHWEST GAS		
U.S. WEST		
SALT RIVER PROJECT (POWER)		
WESTERN AREA POWER AUTHORITY (POWER)		

GENERAL NOTES:

1. ALL CONSTRUCTION TO BE PERFORMED ACCORDING TO APPLICABLE MAG STANDARD DETAILS AND MAG SPECIFICATIONS, DATED 1998 , INCLUDING ALL REVISIONS THROUGH 1998 AND THE CITY OF PHOENIX ADDITIONS AND DELETIONS THROUGH 1996.
2. FACILITIES WHICH ARE NOT SPECIFICALLY LOCATED WITH ACTUAL HORIZONTAL AND VERTICAL CONTROLS ARE APPROXIMATE AND TO THE BEST AVAILABLE INFORMATION.
3. EXISTING UTILITIES AND OTHER FACILITIES HAVE BEEN PLACED ON THE PLANS FROM FIELD SURVEYS, EXISTING MAPS AND OTHER CURRENT PLANS WITHIN THE AREA OF THIS PROJECT. THE CONTRACTOR WILL DETERMINE THE EXACT LOCATION AND/OR ELEVATION OF EXISTING UTILITIES WHICH PERTAIN TO AND AFFECT THE CONSTRUCTION OF THIS PROJECT.
4. TWO (2) WORKING DAYS PRIOR TO EXCAVATING, THE CONTRACTOR SHALL CALL FOR BLUE STAKES AT THE BLUE STAKE CENTER (PHONE: 602-263-1100).
5. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS PRIOR TO CONSTRUCTION.
6. THE FLOOD CONTROL DISTRICT OR CITY OF PHOENIX IS NOT RESPONSIBLE FOR LIABILITY ACCRUED DUE TO DELAYS AND/OR DAMAGE TO UTILITIES IN CONJUNCTION WITH THIS CONSTRUCTION.
7. ANY WORK PERFORMED WITHOUT THE APPROVAL OF THE FLOOD CONTROL DISTRICT AND/OR THE ENGINEER AND ALL WORK AND MATERIALS NOT IN CONFORMANCE WITH THE SPECIFICATIONS IS SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTOR'S EXPENSE.
8. THE ENGINEER WILL DETERMINE THE NUMBER AND LOCATION OF THE REQUIRED COMPACTION TESTS FOR STRUCTURE BACKFILL.
9. TRAFFIC CONTROL SHALL BE MAINTAINED IN ACCORDANCE WITH M.A.G. SPECIFICATION 401, PART VI OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (1988 EDITION INCLUDING REVISION 3 DATED SEPTEMBER 3, 1993).
10. EXACT POINT OF MATCHING TERMINATION AND OVERLAY, IF ANY, WILL BE DETERMINED IN THE FIELD BY THE ENGINEER.
11. NO JOB WILL BE CONSIDERED COMPLETED UNTIL CURBS, PAVEMENT AND SIDEWALKS HAVE BEEN SWEPT CLEAN OF ALL DIRT AND DEBRIS.
12. PRIOR TO FINAL APPROVAL AND ACCEPTANCE OF THE WORK, THE CONTRACTOR WILL BE REQUIRED TO CLEAN ADJACENT (OFF-PROJECT) ROADWAYS USED DURING THE COURSE OF CONSTRUCTION.



PROJECT BENCHMARKS:

FD BC IN HH
@ INTERSECTION OF 59TH AVE(N) & BASELINE RD
EL 1001.34

FD BC IN HH
@ INTERSECTION OF 67TH AVE & SOUTHERN AVE
EL 995.98

5/8" REBAR
@ E 1/4 COR. SEC6
T1S, R2E
EL 1016.99

60% SUBMITTAL

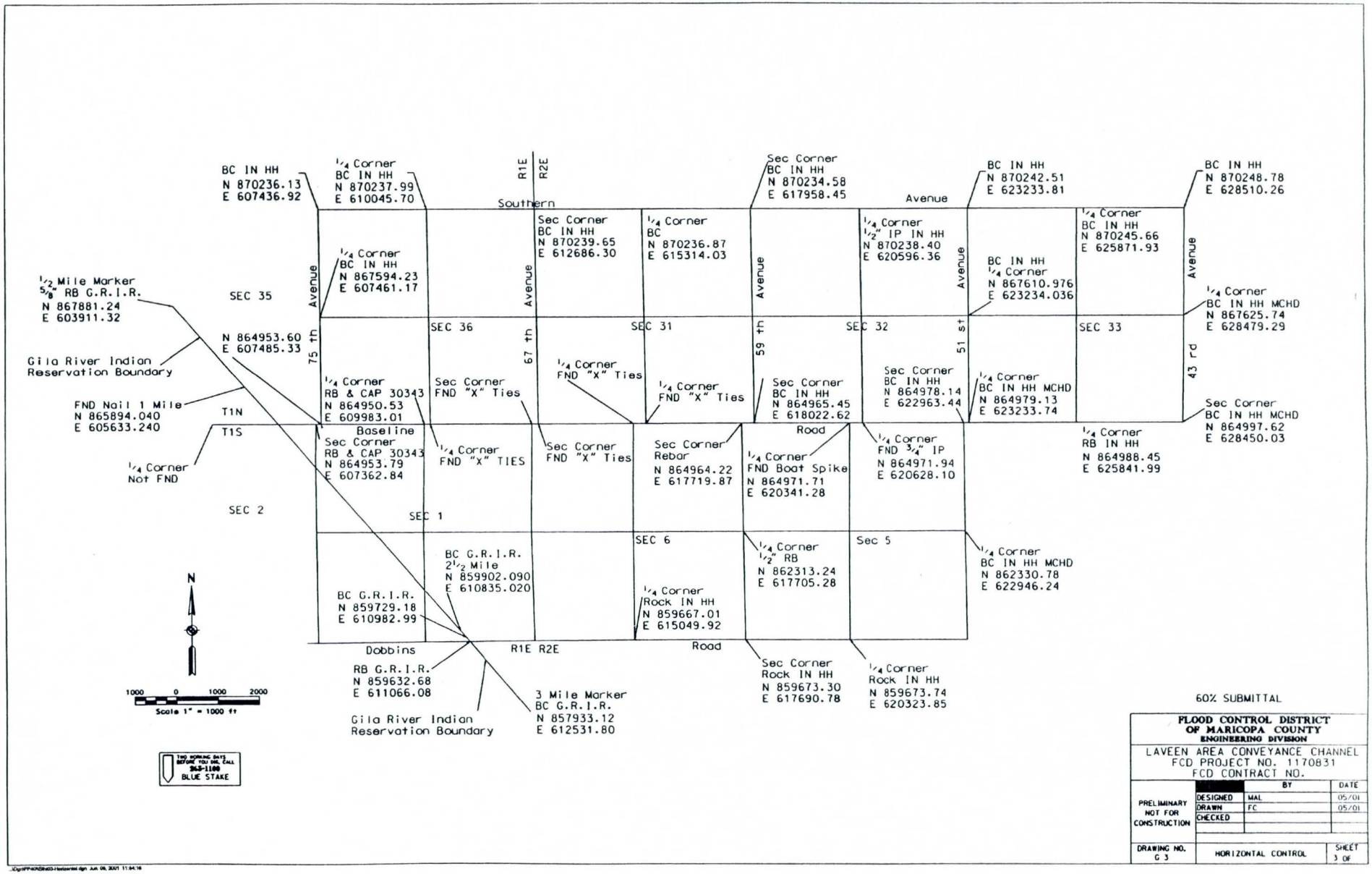
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

		BY	DATE
PRELIMINARY NOT FOR CONSTRUCTION	DESIGNED	MAL	05/01
	DRAWN	FC	05/01
	CHECKED		

DRAWING NO.		SHEET
G2	GENERAL NOTES & INDEX	2 OF

..\Dgn\PP40\Sht02-Notes.dgn Jun. 06, 2001 11:53:36



60% SUBMITTAL

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

		BY	DATE
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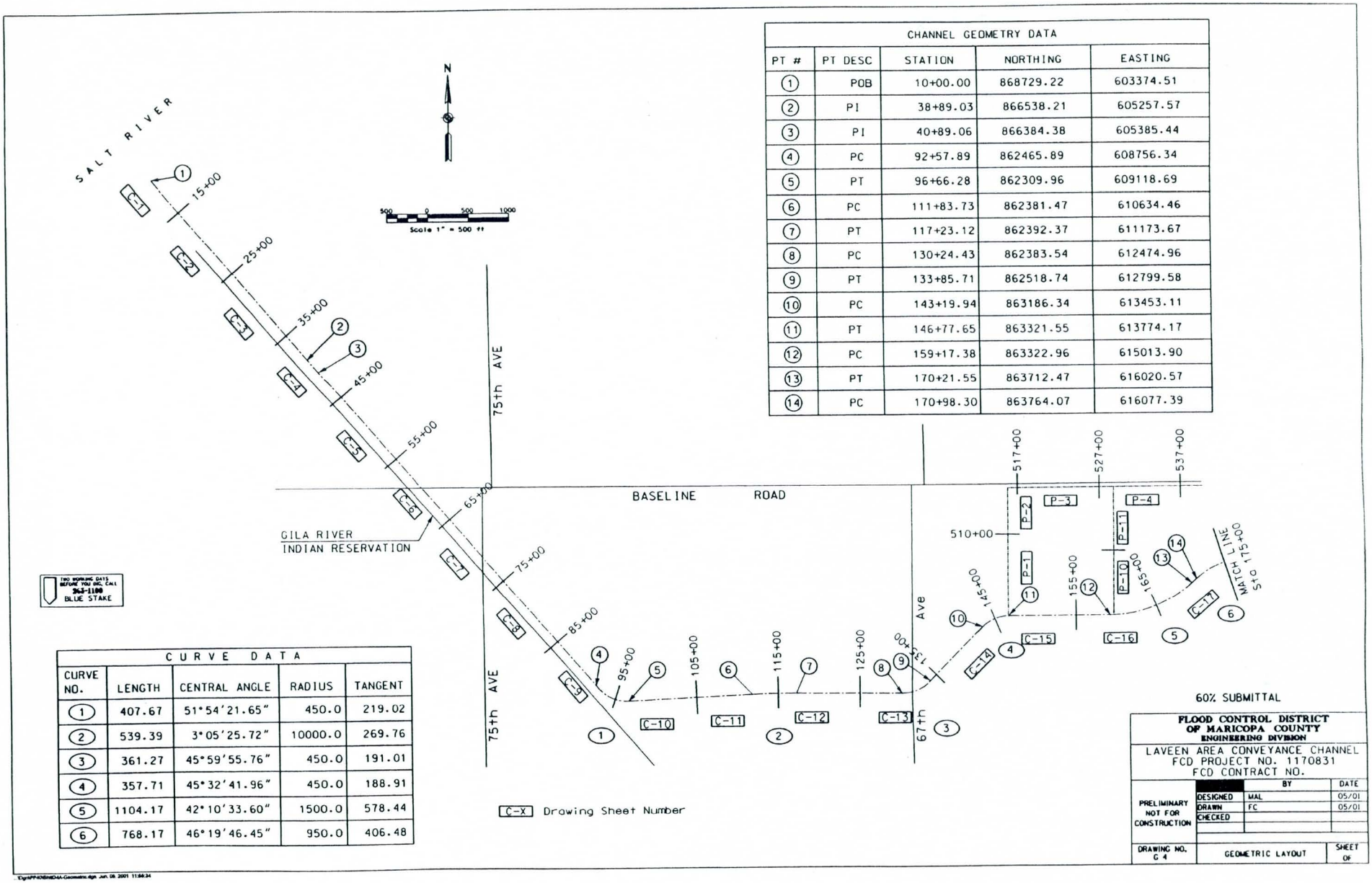
	CHECKED		

DRAWING NO. G 3 — HORIZONTAL CONTROL — SHEET 3 OF



CHANNEL GEOMETRY DATA				
PT #	PT DESC	STATION	NORTHING	EASTING
1	POB	10+00.00	868729.22	603374.51
2	PI	38+89.03	866538.21	605257.57
3	PI	40+89.06	866384.38	605385.44
4	PC	92+57.89	862465.89	608756.34
5	PT	96+66.28	862309.96	609118.69
6	PC	111+83.73	862381.47	610634.46
7	PT	117+23.12	862392.37	611173.67
8	PC	130+24.43	862383.54	612474.96
9	PT	133+85.71	862518.74	612799.58
10	PC	143+19.94	863186.34	613453.11
11	PT	146+77.65	863321.55	613774.17
12	PC	159+17.38	863322.96	615013.90
13	PT	170+21.55	863712.47	616020.57
14	PC	170+98.30	863764.07	616077.39

CURVE DATA				
CURVE NO.	LENGTH	CENTRAL ANGLE	RADIUS	TANGENT
1	407.67	51°54'21.65"	450.0	219.02
2	539.39	3°05'25.72"	10000.0	269.76
3	361.27	45°59'55.76"	450.0	191.01
4	357.71	45°32'41.96"	450.0	188.91
5	1104.17	42°10'33.60"	1500.0	578.44
6	768.17	46°19'46.45"	950.0	406.48

C-X Drawing Sheet Number

60% SUBMITTAL

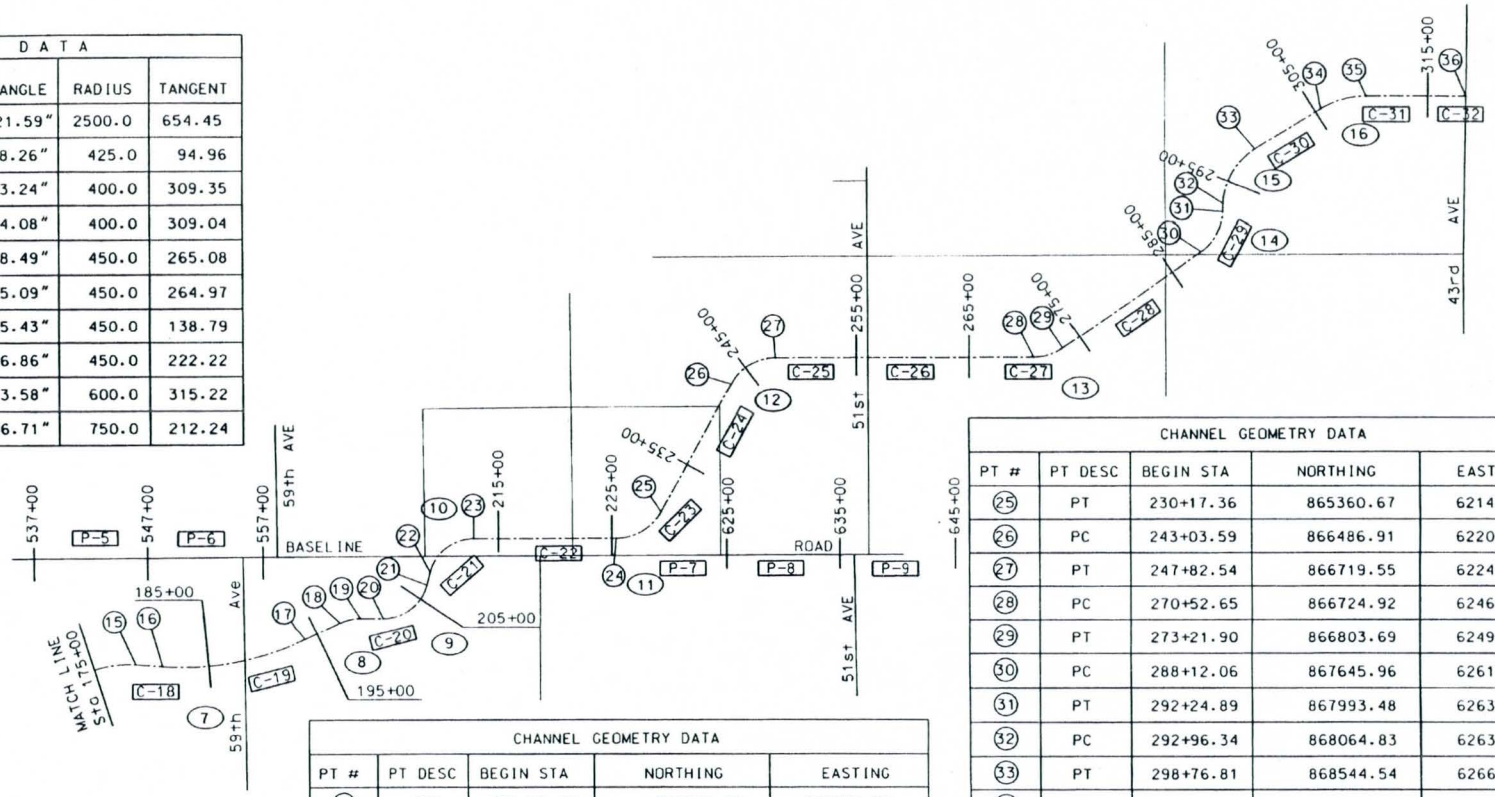
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

PRELIMINARY NOT FOR CONSTRUCTION		BY	DATE
	DESIGNED	MAL	05/01
	DRAWN	FC	05/01
	CHECKED		

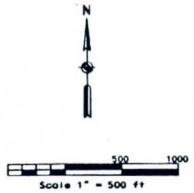
DRAWING NO. C 4 — GEOMETRIC LAYOUT — SHEET OF

CURVE DATA				
CURVE NO.	LENGTH	CENTRAL ANGLE	RADIUS	TANGENT
(7)	1280.17	29°20'21.59"	2500.0	654.45
(8)	186.86	25°11'28.26"	425.0	94.96
(9)	526.63	75°26'03.24"	400.0	309.35
(10)	526.24	75°22'44.08"	400.0	309.04
(11)	479.11	61°00'08.49"	450.0	265.08
(12)	478.95	60°58'55.09"	450.0	264.97
(13)	269.25	34°16'55.43"	450.0	138.79
(14)	412.83	52°33'46.86"	450.0	222.22
(15)	580.48	55°25'53.58"	600.0	315.22
(16)	413.67	31°36'06.71"	750.0	212.24



CHANNEL GEOMETRY DATA				
PT #	PT DESC	BEGIN STA	NORTHING	EASTING
(15)	PT	178+66.47	864008.35	616783.76
(16)	PC	181+03.55	863991.44	617020.24
(17)	PT	193+83.72	864223.96	618264.94
(18)	PC	197+24.57	864369.34	618573.21
(19)	PT	199+11.42	864409.97	618754.07
(20)	PC	201+10.65	864410.18	618953.29
(21)	PT	206+37.28	864709.98	619340.12
(22)	PC	207+56.81	864825.71	619370.06
(23)	PT	212+83.05	865125.51	619756.51
(24)	PC	225+38.25	865128.03	621011.70

CHANNEL GEOMETRY DATA				
PT #	PT DESC	BEGIN STA	NORTHING	EASTING
(25)	PT	230+17.36	865360.67	621404.82
(26)	PC	243+03.59	866486.91	622026.09
(27)	PT	247+82.54	866719.55	622419.06
(28)	PC	270+52.65	866724.92	624689.15
(29)	PT	273+21.90	866803.69	624942.44
(30)	PC	288+12.06	867645.96	626171.73
(31)	PT	292+24.89	867993.48	626366.76
(32)	PC	292+96.34	868064.83	626370.52
(33)	PT	298+76.81	868544.54	626655.75
(34)	PC	305+53.21	868898.45	627232.18
(35)	PT	309+66.88	869009.30	627625.29
(36)	POE	318+72.21	869008.50	628495.62



[C-X] Drawing Sheet Number

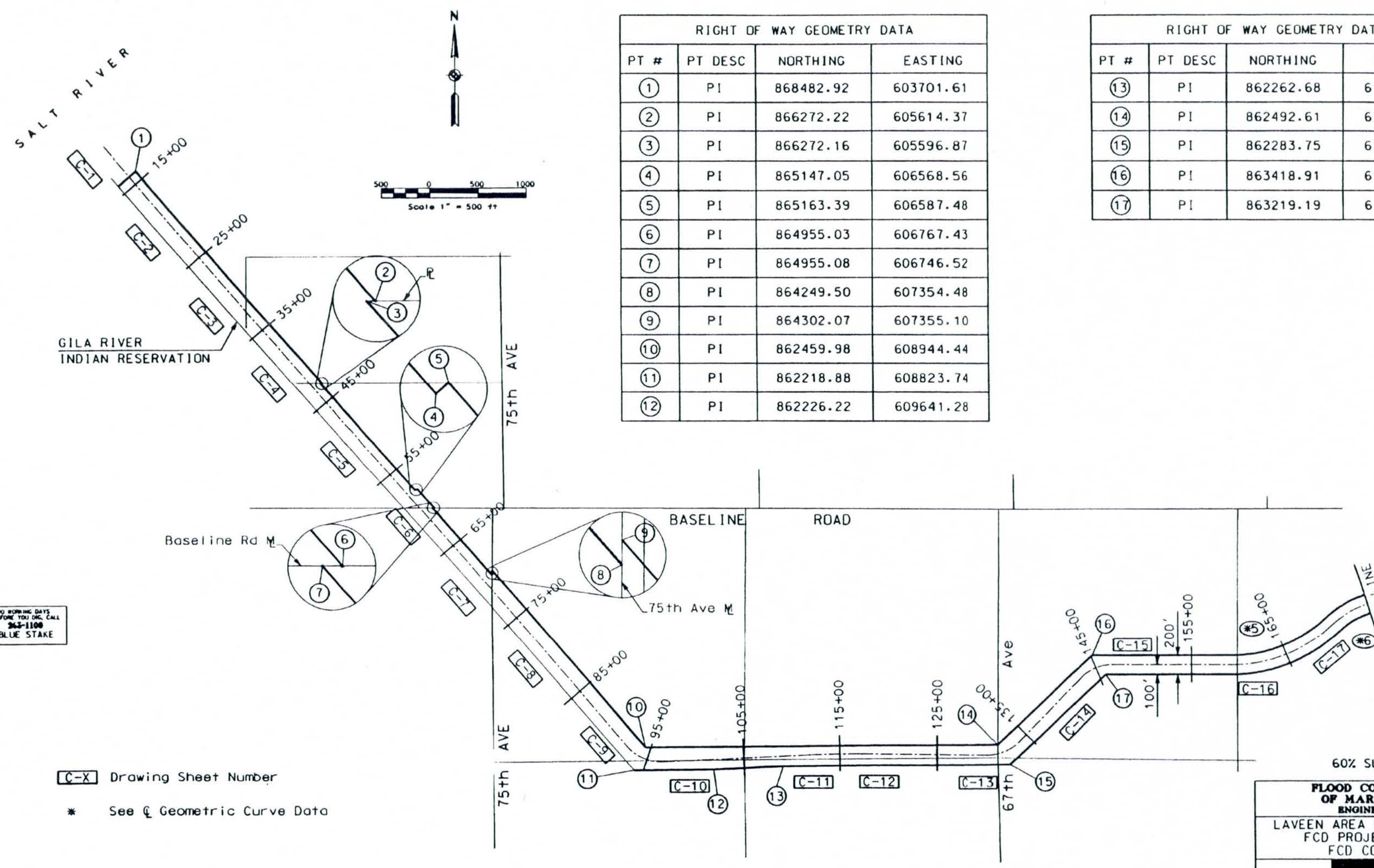
60% SUBMITTAL

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

		BY	DATE
PRELIMINARY NOT FOR CONSTRUCTION	DESIGNED	MAL	05/01
	DRAWN	FC	05/01
	CHECKED		

DRAWING NO. G 5 | GEOMETRIC LAYOUT | SHEET OF



RIGHT OF WAY GEOMETRY DATA

PT #	PT DESC	NORTHING	EASTING
1	PI	868482.92	603701.61
2	PI	866272.22	605614.37
3	PI	866272.16	605596.87
4	PI	865147.05	606568.56
5	PI	865163.39	606587.48
6	PI	864955.03	606767.43
7	PI	864955.08	606746.52
8	PI	864249.50	607354.48
9	PI	864302.07	607355.10
10	PI	862459.98	608944.44
11	PI	862218.88	608823.74
12	PI	862226.22	609641.28

RIGHT OF WAY GEOMETRY DATA

PT #	PT DESC	NORTHING	EASTING
13	PI	862262.68	610360.74
14	PI	862492.61	612580.48
15	PI	862283.75	612708.76
16	PI	863418.91	613564.29
17	PI	863219.19	613702.27

60% SUBMITTAL

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

PRELIMINARY NOT FOR CONSTRUCTION		BY	DATE
	DESIGNED	MAL	05/01
	DRAWN	FC	05/01
	CHECKED		

DRAWING NO. G 7	RIGHT OF WAY	SHEET OF

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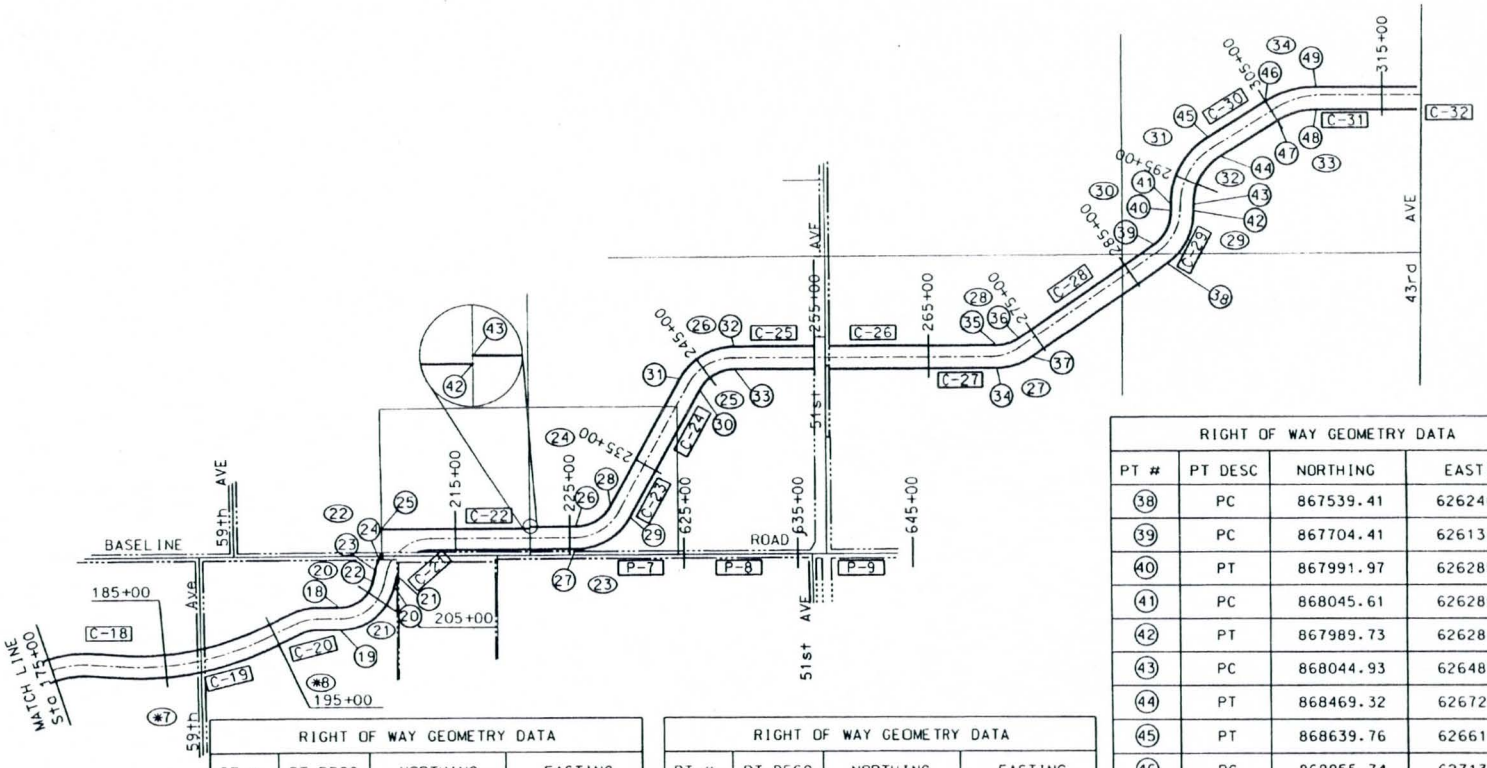
CURVE DATA	
CURVE NO.	RADIUS
⑳	300.00
㉑	500.00
㉒	300.00
㉓	550.00
㉔	350.00
㉕	350.00
㉖	550.00
㉗	550.00
㉘	350.00
㉙	550.00
㉚	350.00
㉛	700.00
㉜	500.00
㉝	650.00
㉞	850.00



RIGHT OF WAY GEOMETRY DATA			
PT #	PT DESC	NORTHING	EASTING
⑱	PC	864510.17	618948.18
⑲	PC	864310.17	618948.39
⑳	PT	864692.48	619433.82
㉑	PI	864795.88	619458.86
㉒	PT	864739.55	619239.44
㉓	PC	864482.44	619264.35
㉔	POC	864945.92	619301.88
㉕	PI	865208.69	619323.19
㉖	PC	865227.93	621025.33
㉗	PC	865027.93	621025.82

RIGHT OF WAY GEOMETRY DATA			
PT #	PT DESC	NORTHING	EASTING
㉘	PT	865408.87	621330.91
㉙	PT	865312.26	621506.03
㉚	PC	866438.65	622127.42
㉛	PC	866535.26	621952.31
㉜	PT	866819.58	622432.58
㉝	PT	866619.58	622433.06
㉞	PC	866625.04	624742.70
㉟	PC	866825.04	624742.22
㊱	PT	866886.29	624939.18
㊲	PT	866721.28	625052.20

RIGHT OF WAY GEOMETRY DATA			
PT #	PT DESC	NORTHING	EASTING
㊳	PC	867539.41	626246.61
㊴	PC	867704.41	626133.59
㊵	PT	867991.97	626285.80
㊶	PC	868045.61	626285.99
㊷	PT	867989.73	626284.24
㊸	PC	868044.93	626485.99
㊹	PT	868469.32	626724.37
㊺	PT	868639.76	626619.72
㊻	PC	868955.74	627134.37
㊼	PC	868785.30	627239.01
㊽	PT	868881.38	627579.65
㊾	PT	869081.38	627579.90

N

Scale 1" = 500 ft

C-X Drawing Sheet Number

* See ℄ Geometric Curve Data

TWO WORKING DAYS BEFORE YOU DIG, CALL 263-1100 BLUE STAKE

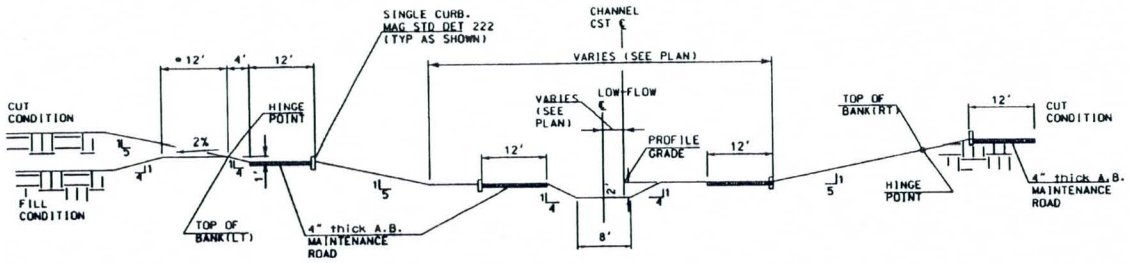
60% SUBMITTAL

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

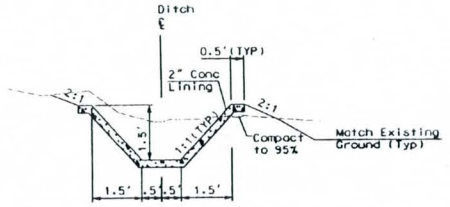
	BY	DATE
PRELIMINARY NOT FOR CONSTRUCTION	DESIGNED MAL	05/01
	DRAWN FC	05/01
	CHECKED	

DRAWING NO. G 8 | RIGHT OF WAY | SHEET OF



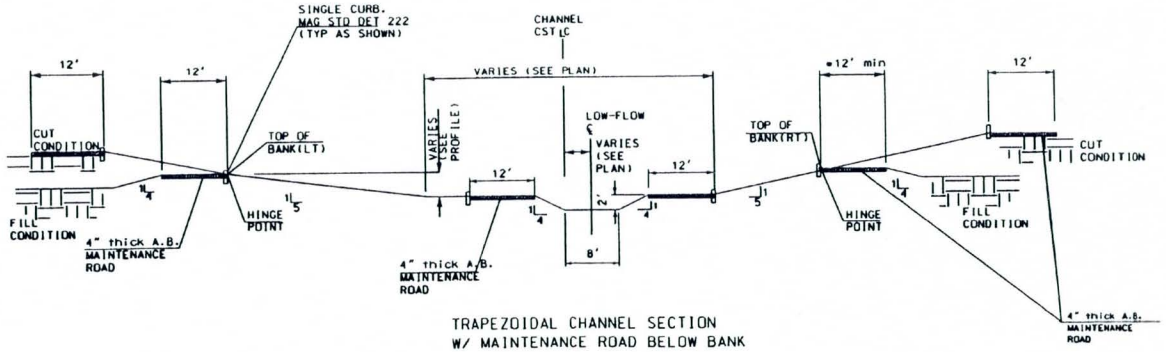
TRAPEZOIDAL CHANNEL SECTION
W/ MAINTENANCE ROAD BELOW BANK

SECTION A1



DEEP CONCRETE LINED DITCH

SECTION B1



TRAPEZOIDAL CHANNEL SECTION
W/ MAINTENANCE ROAD BELOW BANK

SECTION A2

* Varies (See Plan -12' minimum)

60% SUBMITTAL

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

		BY	DATE
PRELIMINARY NOT FOR CONSTRUCTION	DESIGNED	MAL	05/01
	DRAWN	FC	05/01
	CHECKED		

DRAWING NO.		SHEET
G6	TYPICAL CROSS SECTION	6 OF

QUANTITY SUMMARY
LAVEEN AREA CONVEYANCE CHANNEL
43RD AVENUE TO SALT RIVER

ITEM NO.	ITEM DESCRIPTION	UNIT	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	TOTAL QUANTITY
			SHEET NUMBERS																									
201-1	Clearing and Grubbing																											
202-1	Mobilization	LS																										
211-1	Maricopa Drain Fill	LS																										
215-1	Channel Excavation	CY																										
220-1	Grouted Rip Rap (12")	CY																										
310-1	Aggregate Base Course (4")	SY																										
340-1	Concrete Single Curb (MAG STD DTL 222)	SY																										
350-1	Miscellaneous Removals	LF																										
350-2	Remove Structures	LS																										
350-3	Remove Septic Tank	LS																										
420-1	4 Strand Smooth Wire Fence	LS																										
420-2	6' Masonry Fence	LF																										
430-1	Bermuda Landscaping	LF																										
440-1	Sprinkler Irrigation System	LS																										
505-1	Culvert No.1	LS																										
505-2	Culvert No.2	CY																										
505-3	Culvert No.3	CY																										
505-4	Culvert No.4	CY																										
505-5	Culvert No.5	CY																										
505-6	Concrete Outlet (30")	CY																										
505-7	Rectangular Concrete Low-Flow Transition Sections	EA																										
505-8	Concrete Retaining Walls No.1-No.8	CY																										
505-9	Drop Structure Walls	CY																										
505-10	Concrete Inlet Headwall	CY																										
505-11	Siphon No. 1 Manhole Structure	CY																										
505-12	Siphon No. 2 Manhole Structure	CY																										
505-13	Siphon No. 3 Manhole Structure	CY																										
505-14	Siphon No. 4 Manhole Structure	CY																										
505-15	Siphon No. 5 Manhole Structure	CY																										
610-1	12" Waterline Relocation	CY																										
618-1	30" Pipe	LS																										
618-2	30" Ductile Iron Pipes	LF																										
625-1	Concrete Lined Ditch	LF																										
625-2	STORM DRAIN MANHOLE,MAG DET 520	CY																										
		EA																										
	Contingency																											

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

	[redacted]	BY	DATE
PRELIMINARY NOT FOR CONSTRUCTION	DESIGNED	MAL	05/01
	DRAWN	FC	05/01
	CHECKED		

60% SUBMITTAL

DRAWING NO.		SHEET
QS1	QUANTITY SUMMARY	7 OF

ALTERNATE PIPE MATERIALS

LAVEEN AREA STORM DRAIN
LAVEEN AREA CONVEYANCE CHANNEL TO 51ST AVENUE

MAIN LINE PIPE

NO.	STATION	QUANTITY	PIPE DIAMETER		DEPTH TO TOP OF PIPE		MAX TRENCH WIDTH AT TOP OF PIPE	REINFORCED CONCRETE PIPE CLASS*	N.R.C.P.* ASTM C14 CLASS	CAST-IN-PLACE CONCRETE PIPE	CONCRETE LINED CORRUGATED METAL PIPE			
											SLURRY BEDDING TO SPRING LINE		SLURRY BEDDING TO 1' OVER TOP OF PIPE	
			RCP (I.D.) IN.	CIP (I.D.) IN.	MIN. (FT.)	MAX. (FT.)	RCP FT.			MINIMUM WALL THICKNESS IN.	2 2/3"X1/2" CORR. TYPE "F" MIN. GAGE	3"X1" CORR. TYPE "F" MIN. GAGE	2 2/3"X1/2" CORR. TYPE "F" MIN. GAGE	3"X1" CORR. TYPE "F" MIN. GAGE
		10	36	N/A			7.17	IV	N/A	N/A	N/A	N/A	N/A	10

CONNECTOR PIPE

LOCATION STATION (LT. OR RT.)	QUANTITY LF.	DEPTH TO TOP OF PIPE		PIPE DIAMETER NRCP RCP (I.D.) IN	RCP CLASS	PIPE DIAMETER CIP (I.D.) IN.	CMP 2 2/3"X1/2" CORR. TYPE "A" MIN. GAGE	NRCP * ASTM C-14 CLASS
		MIN. (FT.)	MAX. (FT.)					
56+30 RT	80			72	IV	N/A	N/A	N/A

MAIN LINE PIPE

1- ONLY PIPE MATERIAL SPECIFIED ON THIS SHEET ARE ACCEPTABLE FOR THIS PROJECT.

2- WHERE MAXIMUM TRENCH WIDTH IS NOTED AS "UNRESTRICTED". PIPE STRENGTHS ARE SPECIFIED FOR A POSITIVE PROJECTING OR EMBANKMENT LOADING CONDITION. TRENCH WIDTH RESTRICTIONS FOR THE CAST IN PLACE CONCRETE OPERATION. SHALL COMPLY WITH SECTION 620.

* RUBBER GASKET PIPE IS REQUIRED.

60% Submittal

NO.	REVISION	BY	DATE
2			
1			

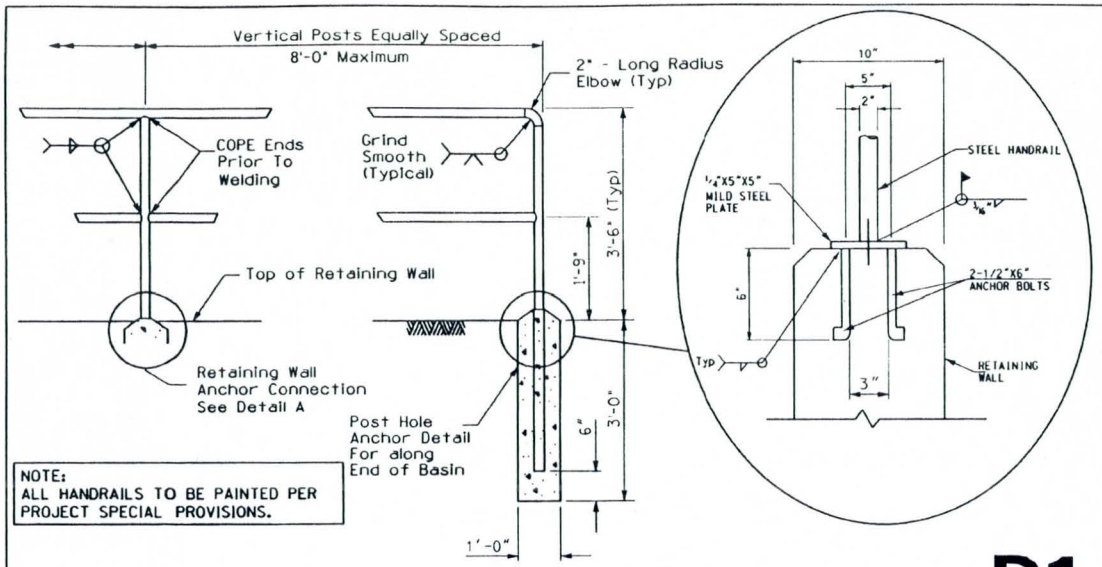
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

		BY	DATE
PRELIMINARY NOT FOR CONSTRUCTION	DESIGNED	MAL	2/01
	DRAWN	FC	2/01
	CHECKED		

DRAWING NO. PIPE SUMMARY SHEET SHEET OF

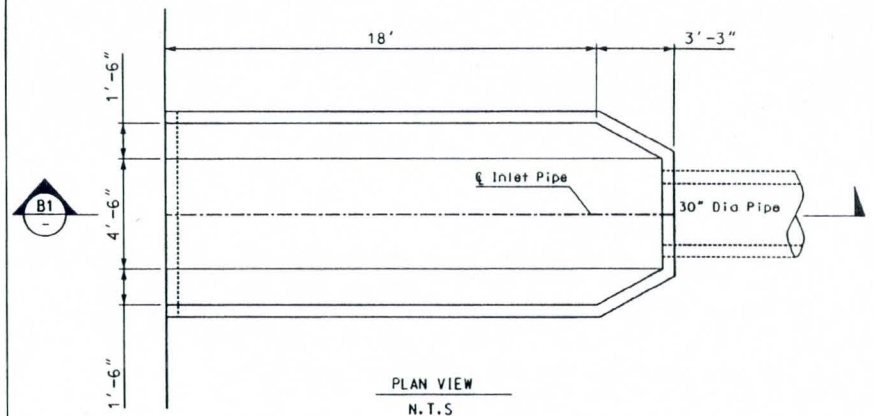
L:\Laveen\Dgn\PP-60\PIPESUM.DGN Jun. 01, 2001 16:49:37



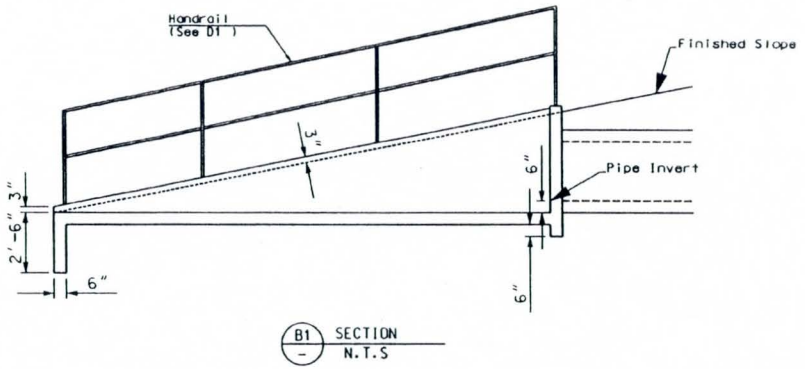
NOTE:
ALL HANDRAILS TO BE PAINTED PER PROJECT SPECIAL PROVISIONS.

HANDRAIL ELEVATION
N.T.S.

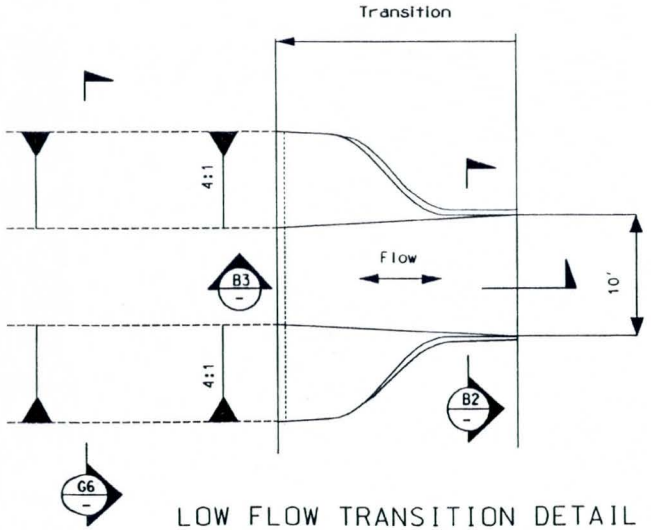
DETAIL D1

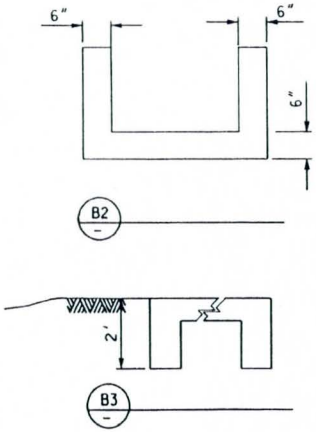


PLAN VIEW
N.T.S



SIDE OUTLET DETAIL
N.T.S.





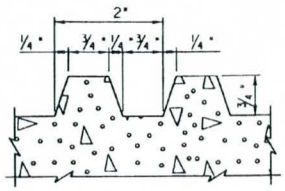
LOW FLOW TRANSITION DETAIL
N.T.S.

DETAIL D2

DETAIL D3

60% SUBMITTAL

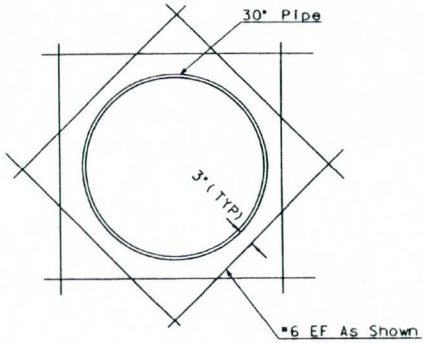
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY ENGINEERING DIVISION			
LAVEEN AREA CONVEYANCE CHANNEL FCD PROJECT NO. 1170831 FCD CONTRACT NO.			
		BY	DATE
PRELIMINARY NOT FOR CONSTRUCTION	DESIGNED	MAL	05/01
	DRAWN	FC	05/01
	CHECKED		
DRAWING NO. D1	DETAIL D1-D3		SHEET OF



FORMLINER RUSTICATION DETAIL
N. T. S.

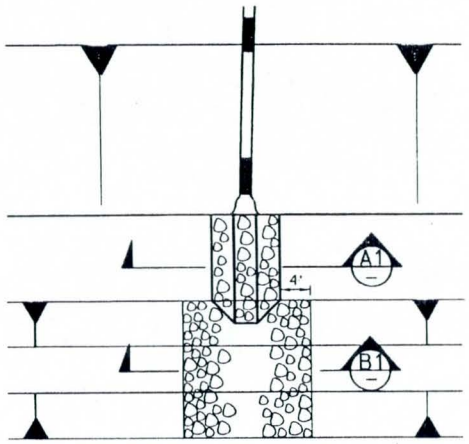
Typical both faces of Exposed walls .2" bar cover shall be measured from deepest part of rustication.

DETAIL D4

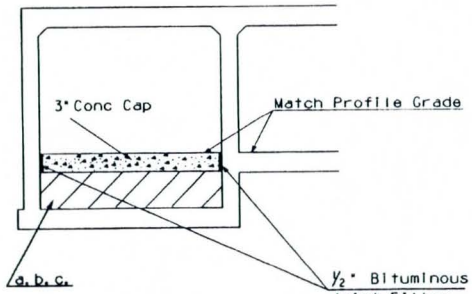


TYPICAL REINFORCEMENT DETAIL FOR PIPES THROUGH CULVERTS

DETAIL D6

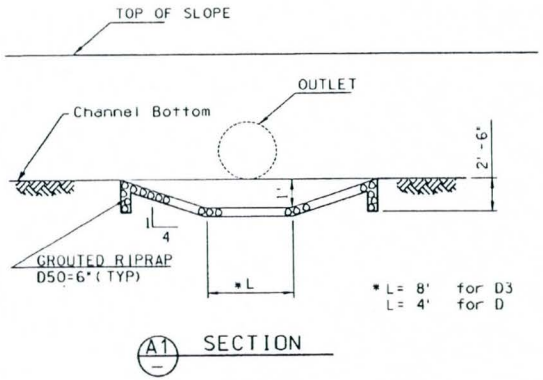


Future
Equestrian
Cell



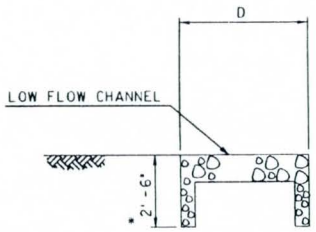
CONCRETE CAP DETAIL
N. T. S.

DETAIL D5



* L= 8' for D3
L= 4' for D

A1 SECTION



B1 SECTION
N.T.S.

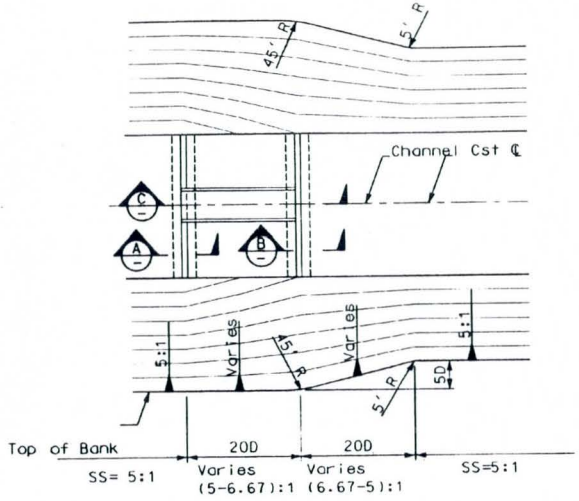
* TOE DOWN ALL SIDES

SIDE DRAIN SWALE DETAIL
N. T. S.

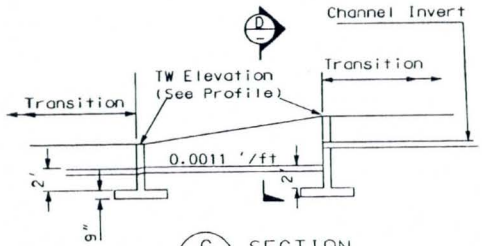
DETAIL D7

60% SUBMITTAL

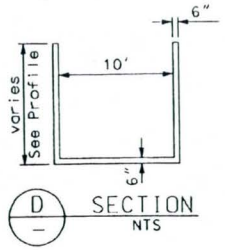
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY ENGINEERING DIVISION			
LAVEEN AREA CONVEYANCE CHANNEL FCD PROJECT NO. 1170831 FCD CONTRACT NO.			
PRELIMINARY NOT FOR CONSTRUCTION		BY	DATE
	DESIGNED	MAL	05/01
	DRAWN	FC	05/01
	CHECKED		
DRAWING NO. D2	DETAIL D4-D7		SHEET OF



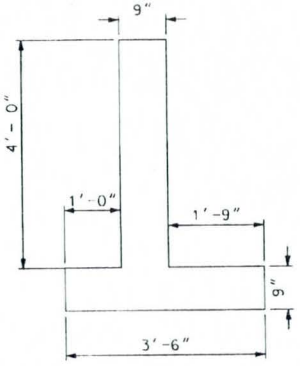
PLAN VIEW
NTS



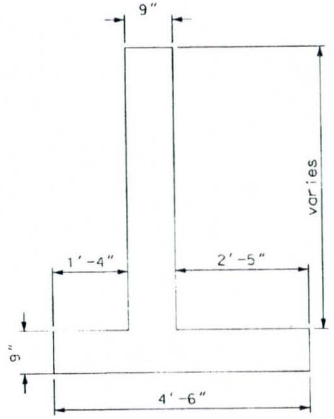
C SECTION
NTS



D SECTION
NTS



A SECTION

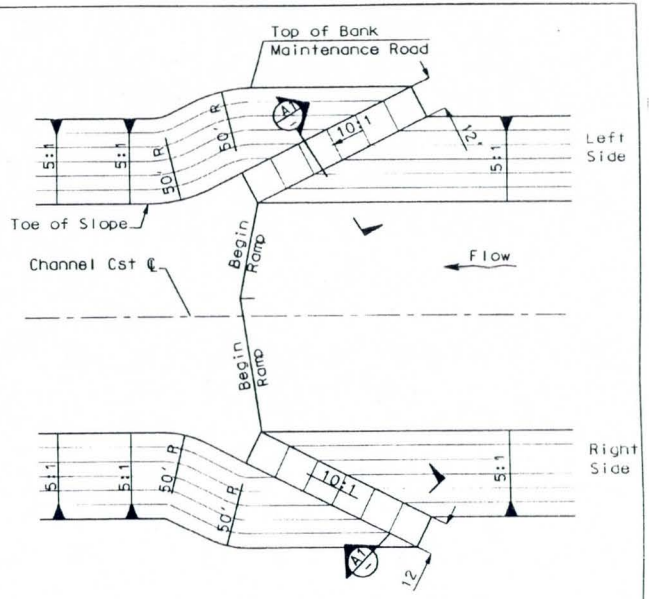


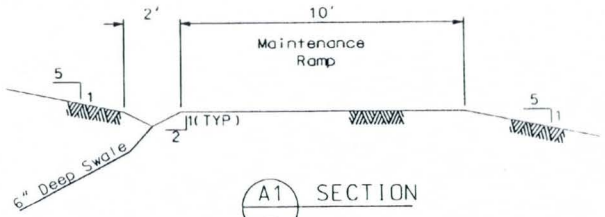
B SECTION

CHANNEL DROP STRUCTURE
NTS

DETAIL D8

ACCESS RAMP LOCATIONS		
NO.	BEGIN STATION	SIDE
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		





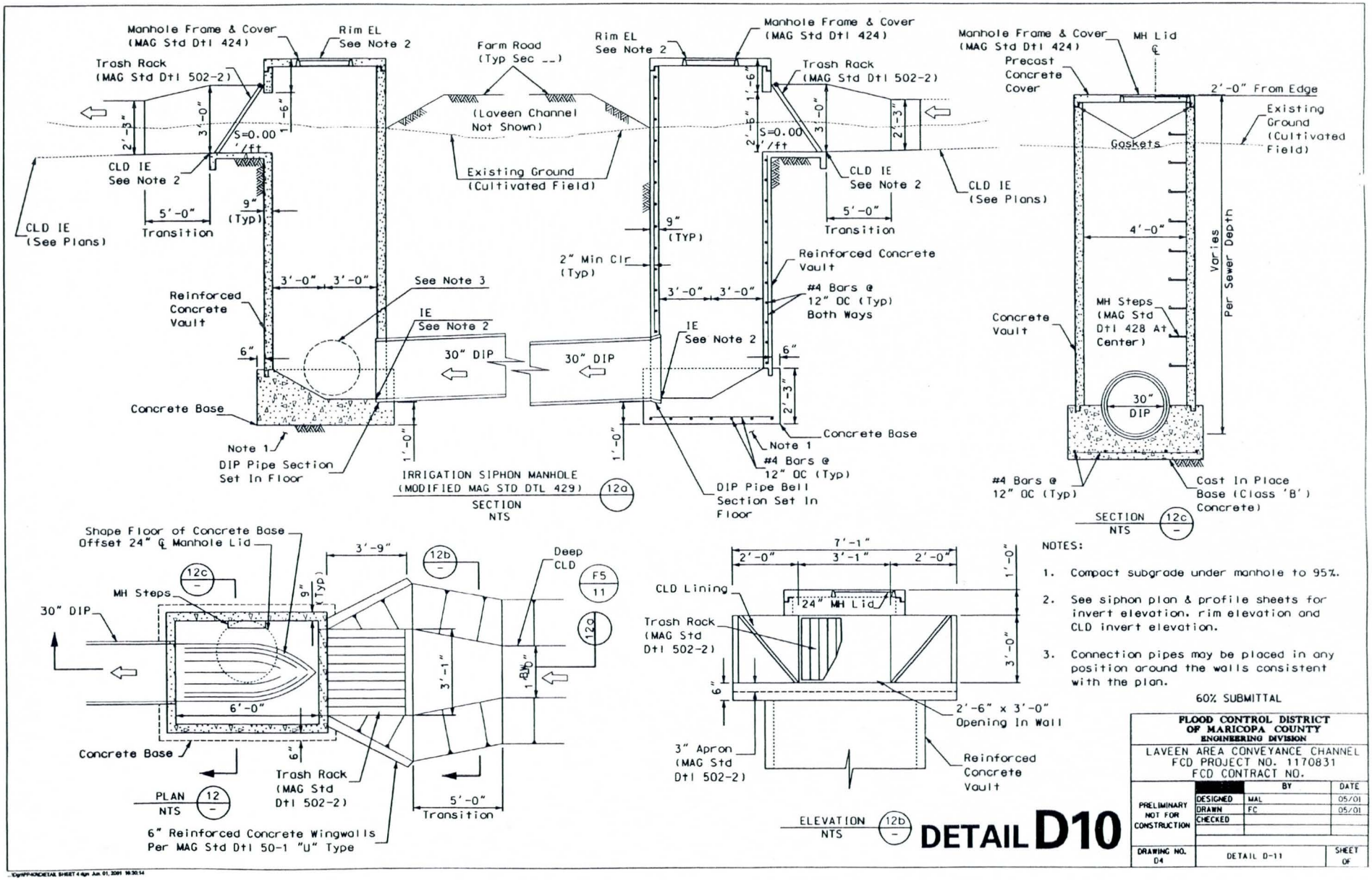
A1 SECTION

MAINTENANCE RAMP
NTS

DETAIL D9

60% SUBMITTAL

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY ENGINEERING DIVISION			
LAVEEN AREA CONVEYANCE CHANNEL FCD PROJECT NO. 1170831 FCD CONTRACT NO.			
PRELIMINARY NOT FOR CONSTRUCTION		BY	DATE
	DESIGNED	MAL , SKH	05/01
	DRAWN	FC	05/01
	CHECKED		
DRAWING NO. D3	DETAIL D8-D9		SHEET OF



DETAIL D10

NOTES:

1. Compact subgrade under manhole to 95%.
2. See siphon plan & profile sheets for invert elevation, rim elevation and CLD invert elevation.
3. Connection pipes may be placed in any position around the walls consistent with the plan.

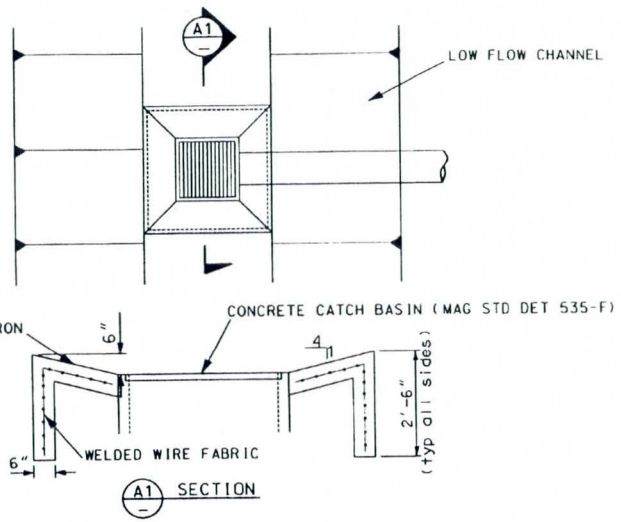
60% SUBMITTAL

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

		BY	DATE
PRELIMINARY NOT FOR CONSTRUCTION	DESIGNED	MAL	05/01
	DRAWN	FC	05/01
	CHECKED		

DRAWING NO. D4 | DETAIL D-11 | SHEET OF



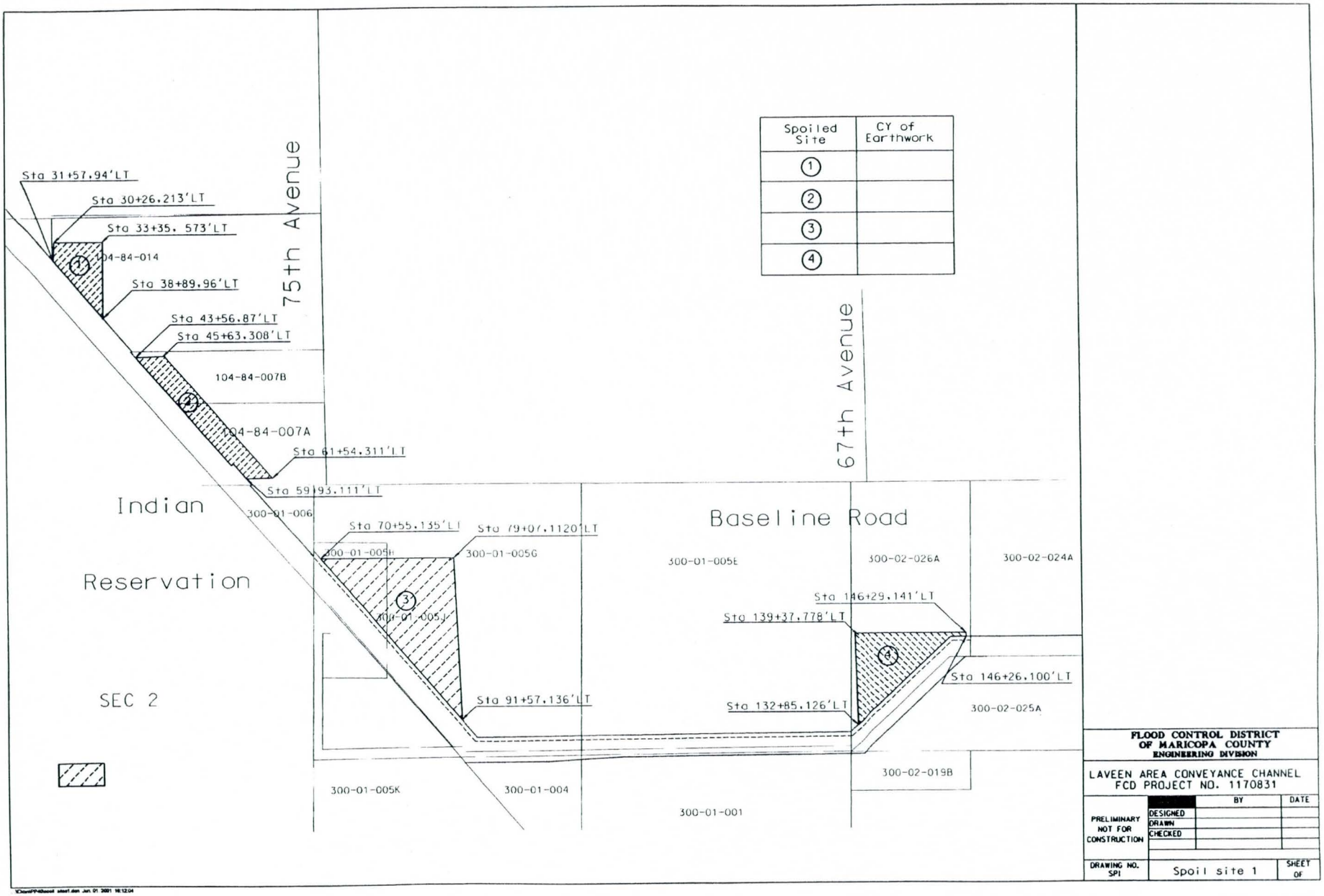
CATCH BASIN DETAILS

DETAIL D11

DETAIL D

60% SUBMITTAL

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY ENGINEERING DIVISION			
LAVEEN AREA CONVEYANCE CHANNEL FCD PROJECT NO. 1170831 FCD CONTRACT NO.			
PRELIMINARY NOT FOR CONSTRUCTION		BY	DATE
	DESIGNED	MAL	05/01
	DRAWN	FC	05/01
	CHECKED		
DRAWING NO. D5	DETAIL D12-D		SHEET OF



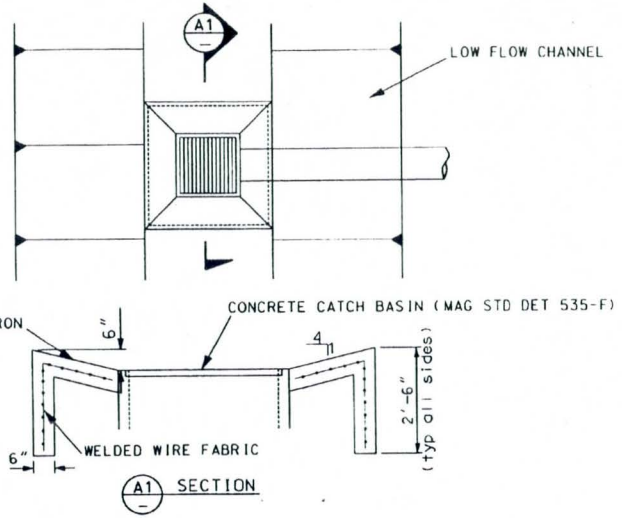
Spoiled Site	CY of Earthwork
①	
②	
③	
④	

FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831

		BY	DATE
PRELIMINARY NOT FOR CONSTRUCTION	DESIGNED		
	DRAWN		
	CHECKED		

DRAWING NO. SPI | Spoil site 1 | SHEET OF



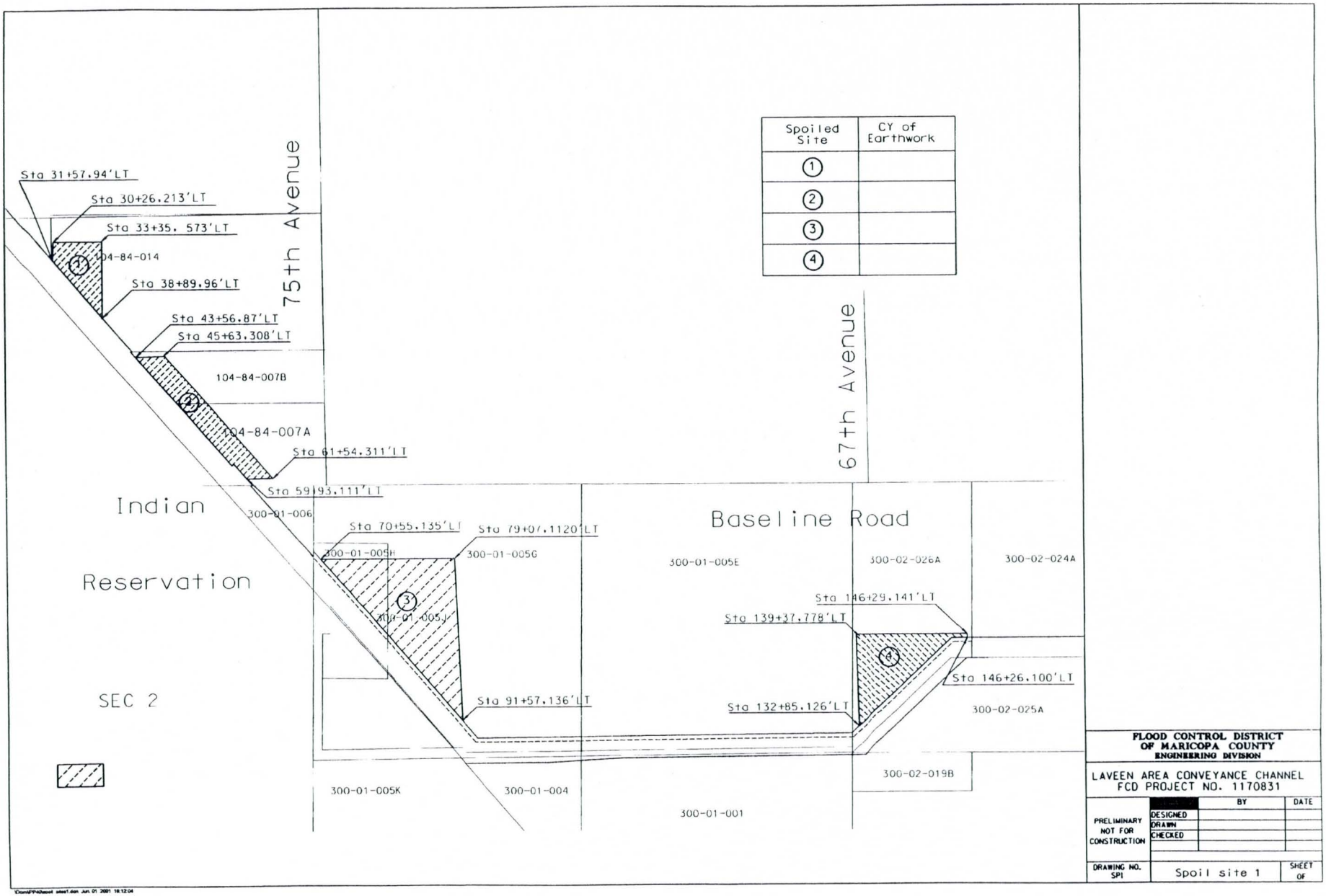
CATCH BASIN DETAILS

DETAIL D11

DETAIL D

60% SUBMITTAL

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY ENGINEERING DIVISION			
LAVEEN AREA CONVEYANCE CHANNEL FCD PROJECT NO. 1170831 FCD CONTRACT NO.			
PRELIMINARY NOT FOR CONSTRUCTION		BY	DATE
	DESIGNED	MAL	05/01
	DRAWN	FC	05/01
	CHECKED		
DRAWING NO. D5	DETAIL D12-D		SHEET OF



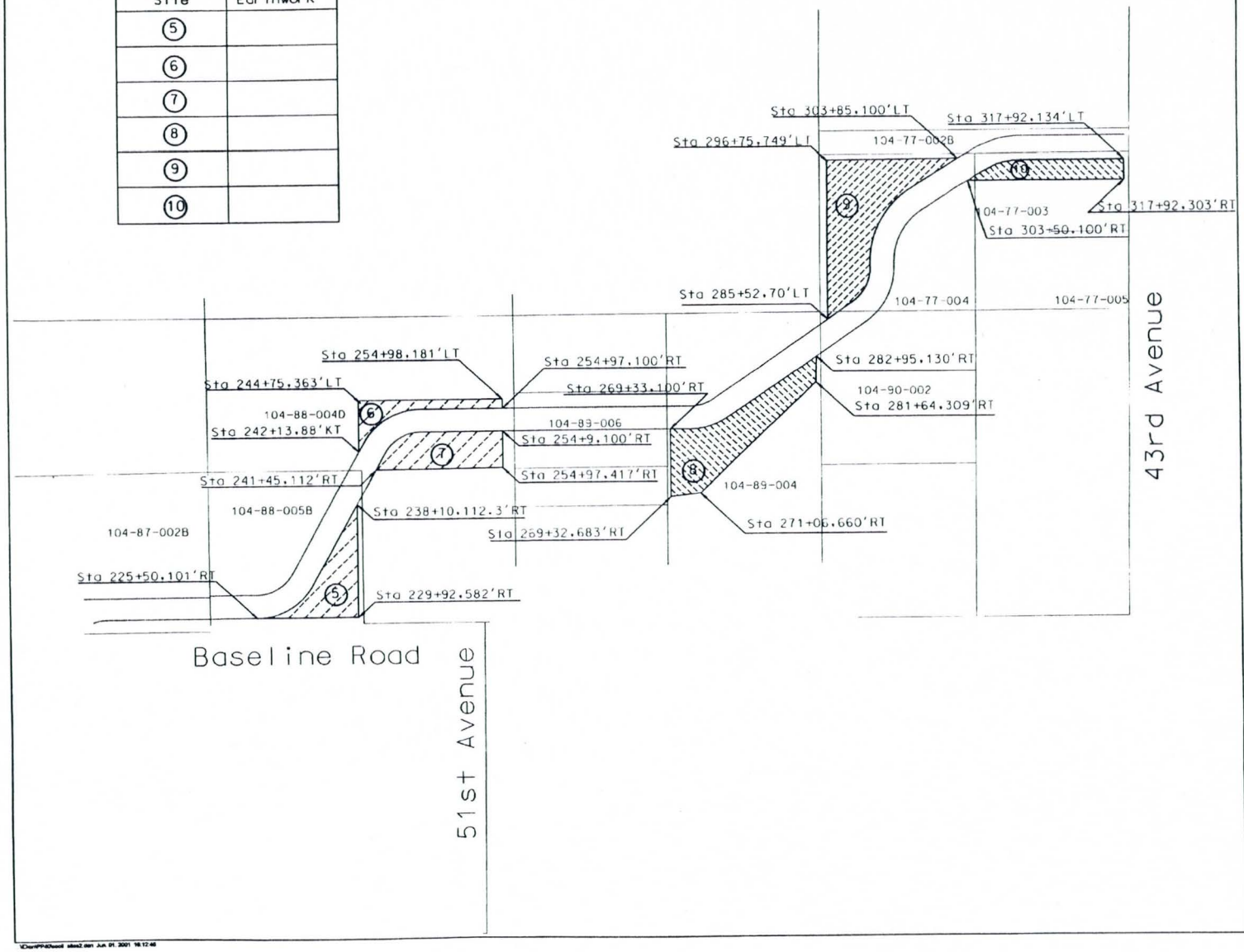
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831

PRELIMINARY NOT FOR CONSTRUCTION		BY	DATE
	DESIGNED		
	DRAWN		
	CHECKED		

DRAWING NO. SP1	Spoil site 1	SHEET OF

Spoiled Site	CY of Earthwork
⑤	
⑥	
⑦	
⑧	
⑨	
⑩	

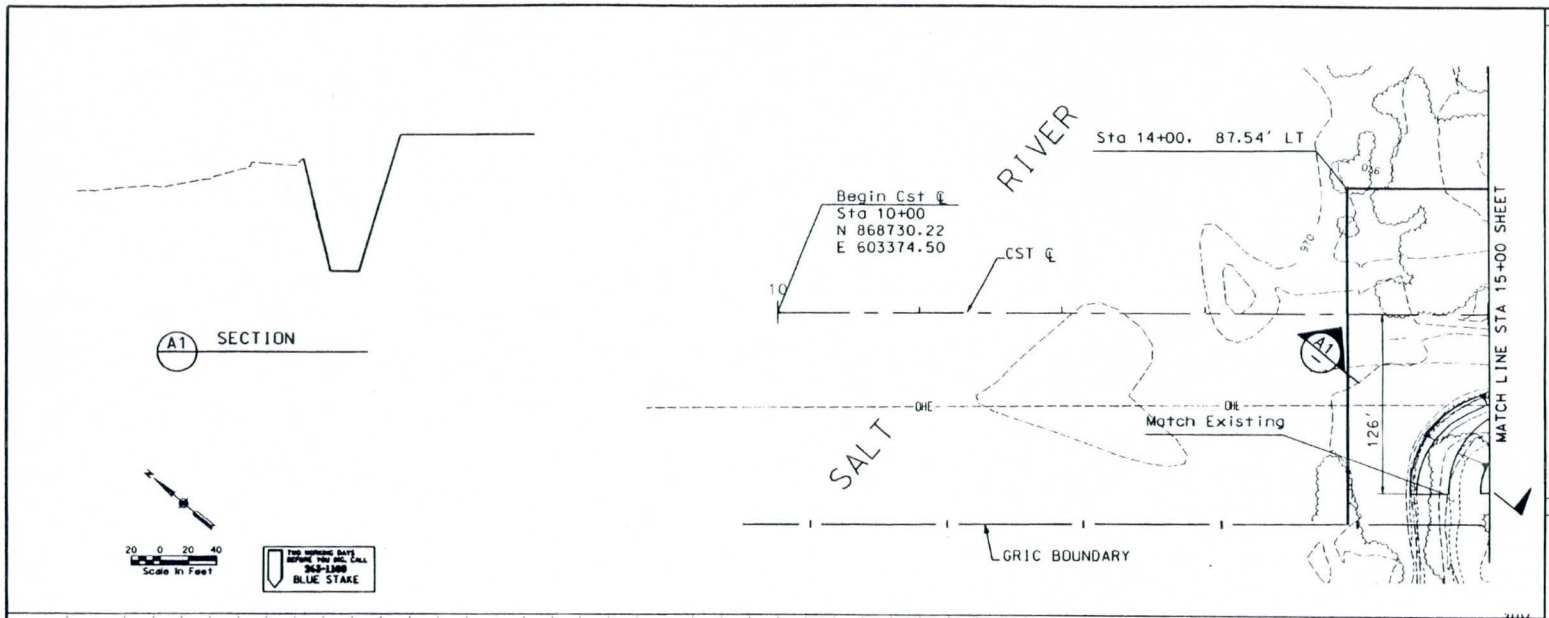


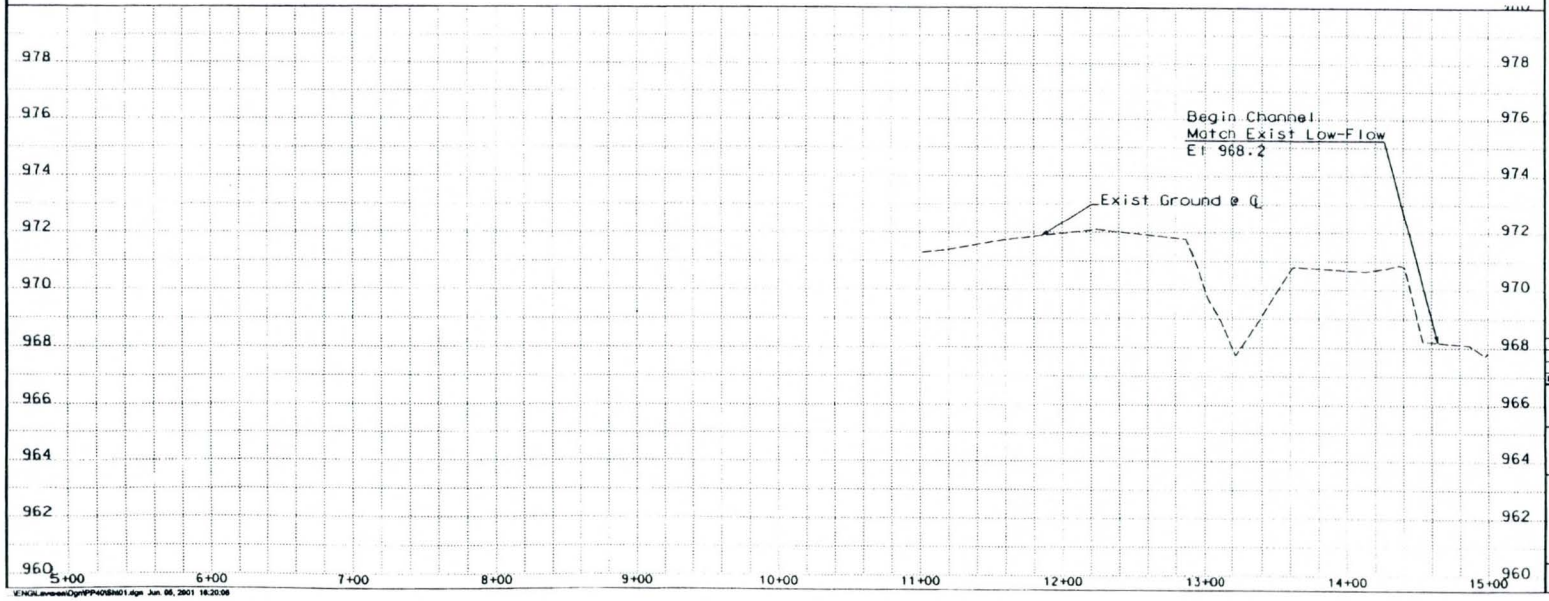
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831

PRELIMINARY NOT FOR CONSTRUCTION		BY	DATE
	DESIGNED		
	DRAWN		
	CHECKED		

DRAWING NO.		SHEET OF
SP2	Spoil Site 2	





REMOVE

CONSTRUCT

60% SUBMITTAL

NO.	REVISION	BY	DATE
3			
2			
1			

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

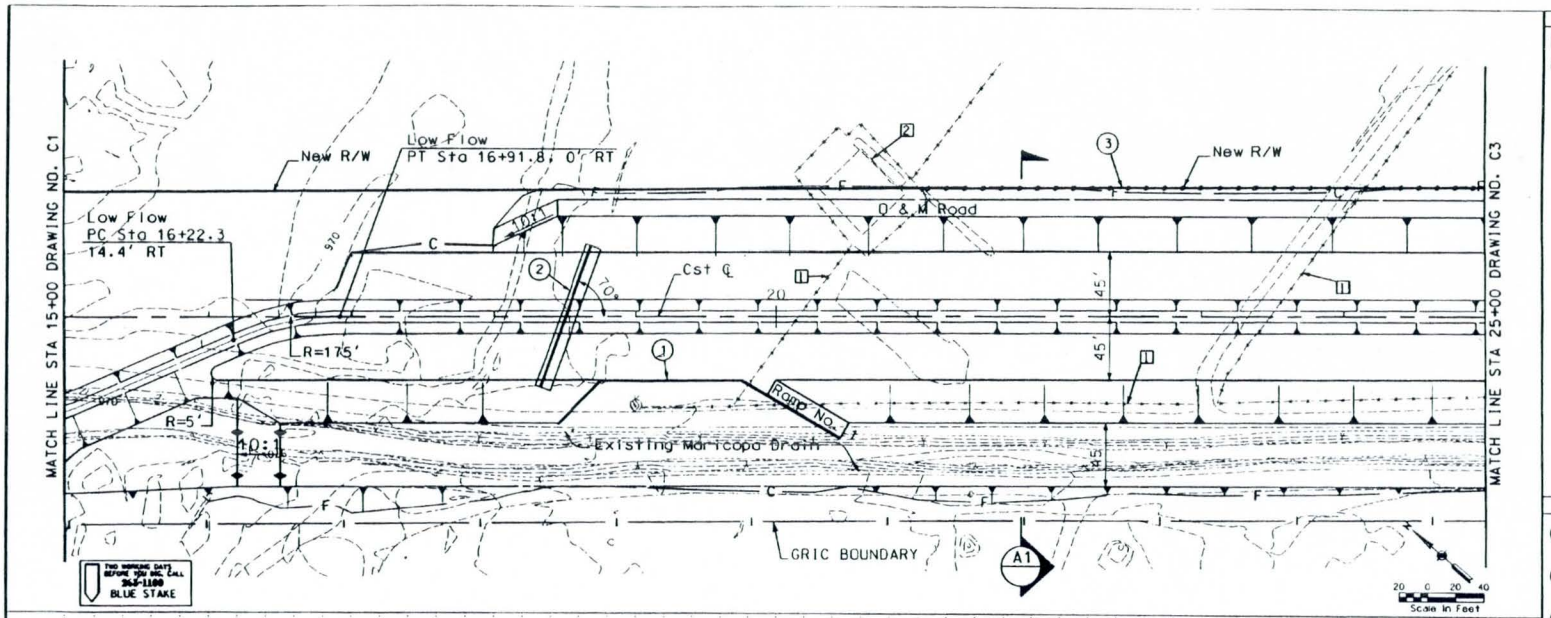
PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING

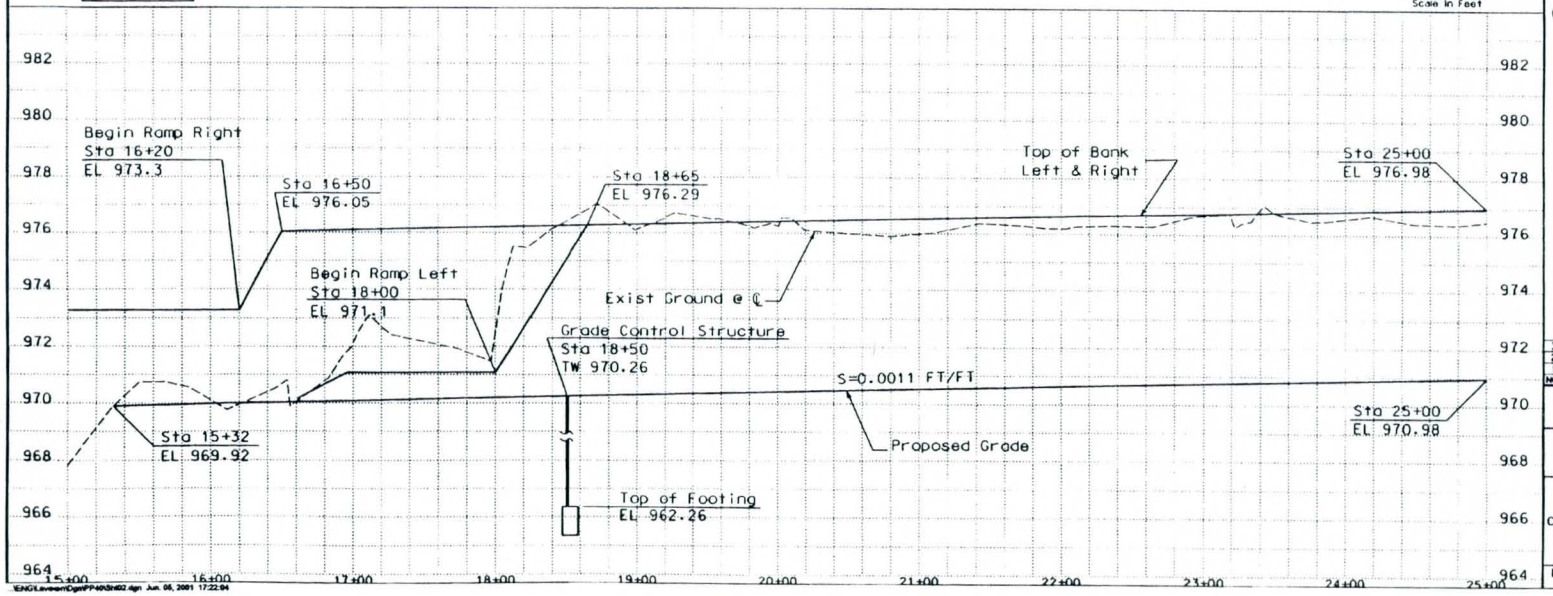
	BY	DATE
DESIGNED	MAL	05/01
DRAWN	FC	05/01
CHECKED		

DRAWING NO. C1

PLAN AND PROFILE
STA 10+00 TO STA 320+00

SHEET OF 1 100





REMOVE

[1] REMOVE FENCE (NPI).

[2] REMOVE SHED (NPI).

CONSTRUCT

(1) CONSTRUCT CONCRETE RETAINING WALL NO.1. SEE DRAWING -- -- CY

(2) CONSTRUCT GRADE CONTROL STRUCTURE STA 18+50. SEE DRAWING -- -- CY

(3) INSTALL NEW 4 WIRE (SMOOTH) FENCE STA 21+01 TO STA 25+00 399 LF

60% SUBMITTAL

NO.	REVISION	BY	DATE
3			
2			
1			

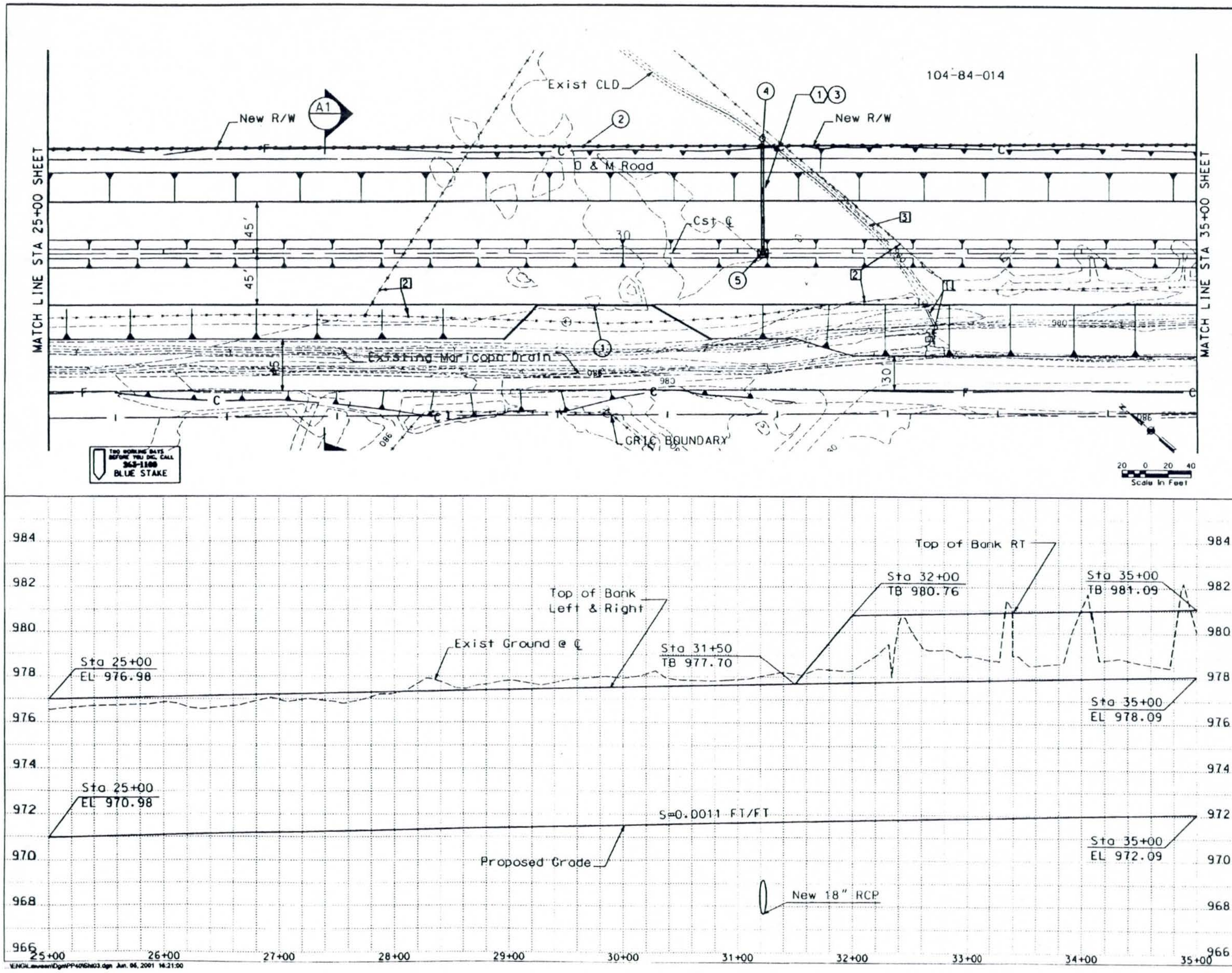
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

		BY	DATE
PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING	DESIGNED	MAL	05/01
	DRAWN	FC	05/01
	CHECKED		

DRAWING NO. C2 — PLAN AND PROFILE STA 15+00 TO STA 25+00 — SHEET OF

ENG\Laveen\Dgn\PP40Sht02.dgn Jun. 06, 2001 17:22:04



REMOVE

1. REMOVE PIPE & HEADWALLS.
2. REMOVE FENCE (NPI).
3. REMOVE CLD (NPI).

CONSTRUCT

1. CONSTRUCT CONCRETE RETAINING WALL NO. 2. SEE DRAWING __ — __ CY
2. INSTALL NEW 4 WIRE (SMOOTH) FENCE STA 25+00 TO STA 35+00 — 1000 LF
3. INSTALL 18" PIPE — __ LF
4. CONSTRUCT CONCRETE MANHOLE PER MAG STD DTL 520 — 1 EA
5. CONSTRUCT CATCH BASIN W/APPRON MAG STD DTL 535 & DTL D11 — 1 EA

FOR CONNECTOR PIPE PROFILE SEE SHEET __

60% SUBMITTAL

NO.	REVISION	BY	DATE
3			
2			
1			

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

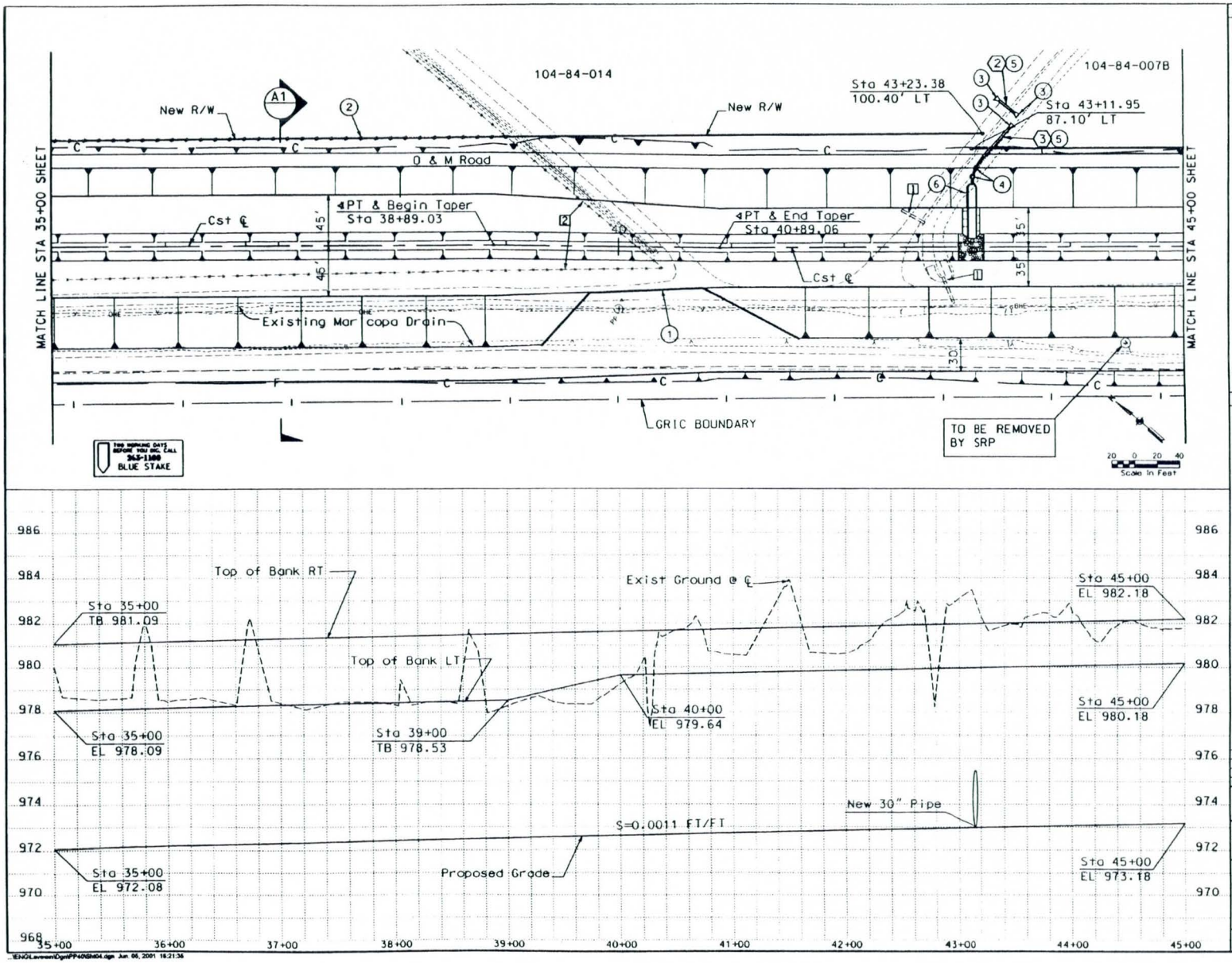
LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING

	BY	DATE
DESIGNED	MAL	05/01
DRAWN	FC	05/01
CHECKED		

DRAWING NO. C3 | PLAN AND PROFILE STA 25+00 TO STA 35+00 | SHEET OF

V:\NGL\aveen\Dgn\PP40\Sht03.dgn Jun. 06, 2001 14:21:00



REMOVE

[1] REMOVE PIPE & HEADWALLS (NPI).
[2] REMOVE FENCE (NPI).

CONSTRUCT

(1) CONSTRUCT CONCRETE RETAINING WALL NO. 3. SEE DRAWING __ -- CY
(2) INSTALL NEW 4 WIRE (SMOOTH) FENCE STA 35+00 TO STA 39+00 400 LF
(3) INSTALL END SECTION MAG STD DTL 545 3 EA
(4) CONSTRUCT PIPE COLLAR MAG STD DTL 505 2 EA
(5) INSTALL 30" PIPE -- LF
(6) CONSTRUCT SPECIAL OUTLET SEE DTL D3 1 EA

⬡ FOR CONNECTOR PIPE PROFILE SEE SHEET __

60% SUBMITTAL

NO.	REVISION	BY	DATE
3			
2			
1			

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

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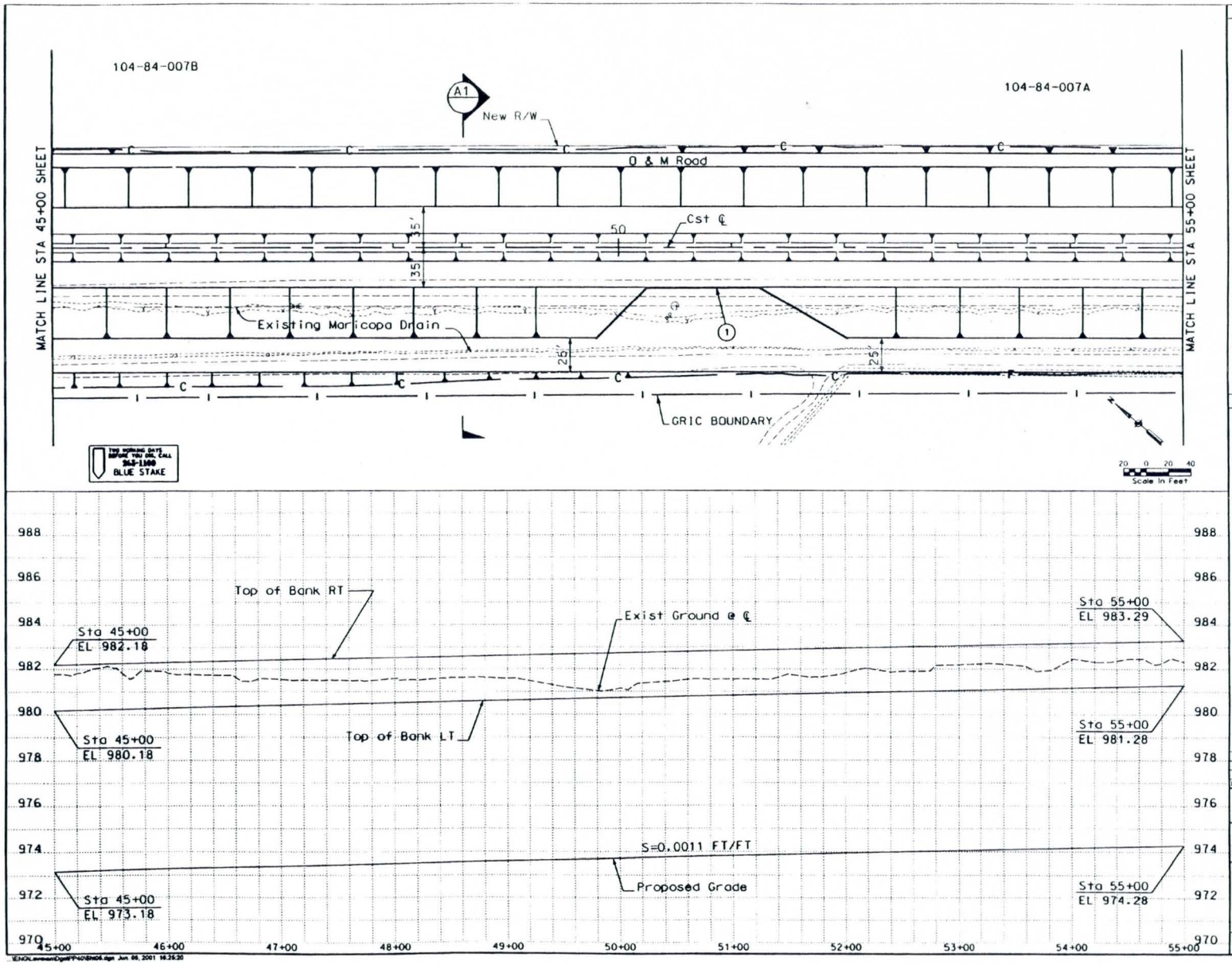
	BY	DATE
DESIGNED	MAL	05/01
DRAWN	FC	05/01
CHECKED		

DRAWING NO. C4

PLAN AND PROFILE
STA 35+00 TO STA 45+00

SHEET OF



REMOVE

CONSTRUCT

(1) CONSTRUCT CONCRETE RETAINING WALL NO. 4. SEE DRAWING -- -- CY

60% SUBMITTAL

NO.	REVISION	BY	DATE
3			
2			
1			

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

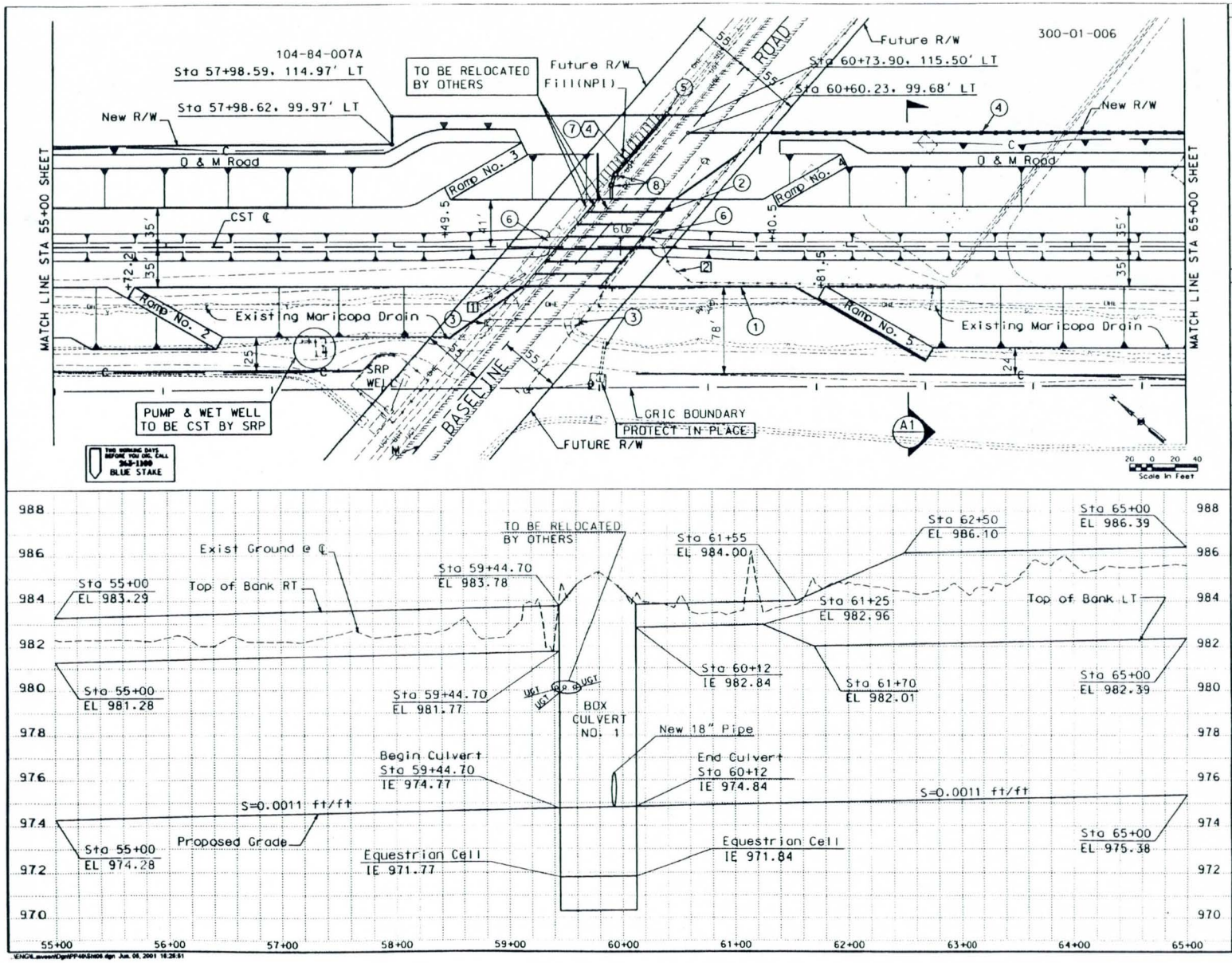
LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING		BY	DATE
	DESIGNED	MAL	05/01
	DRAWN	FC	05/01
	CHECKED		

DRAWING NO. C5

PLAN AND PROFILE
STA 45+00 TO STA 55+00

SHEET OF



☐ REMOVE ☐

[1] REMOVE PIPE & HEADWALLS (NPI).
[2] REMOVE FENCE (NPI).

○ CONSTRUCT ○

(1) CONSTRUCT CONCRETE RETAINING WALL NO.5. SEE DRAWING -- -- CY
(2) CONSTRUCT CONCRETE BOX CULVERT NO.1. SEE DRAWING B1 -- CY
(3) PLUG CULVERT PIPE PER MAG STD DTL 427 3 EA
(4) CONSTRUCT MASONRY FENCE STA 61+34 TO STA 65+00 366 LF
(5) INSTALL END SECTION PER MAG STD DTL 545 1 EA
(6) CONSTRUCT CONCRETE LOW FLOW TRANSITION - SEE DTL D2 2 EA
(7) INSTALL 30" PIPE -- LF
(8) CONSTRUCT PIPE COLLAR PER MAG STD DTL 505 2 EA

⬡ FOR CONNECTOR PIPE PROFILE SEE SHEET --

60% SUBMITTAL

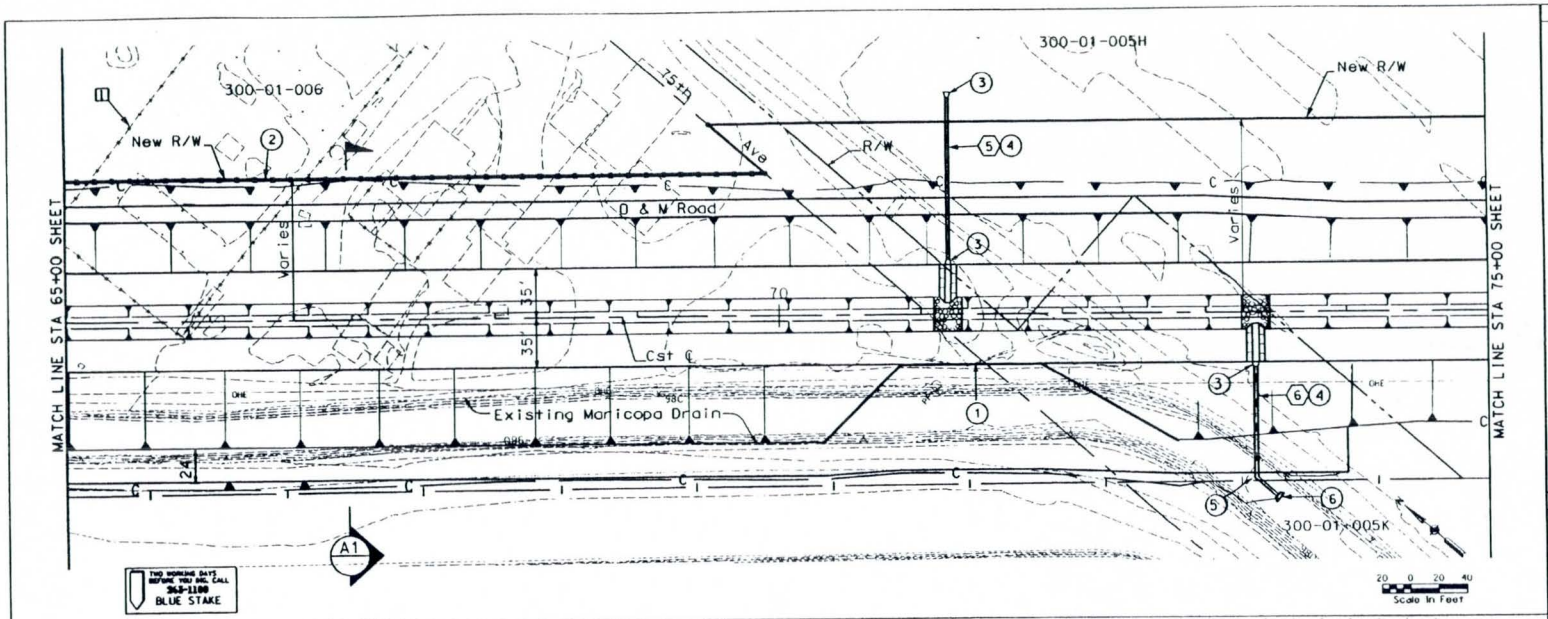
NO.	REVISION	BY	DATE
3			
2			
1			

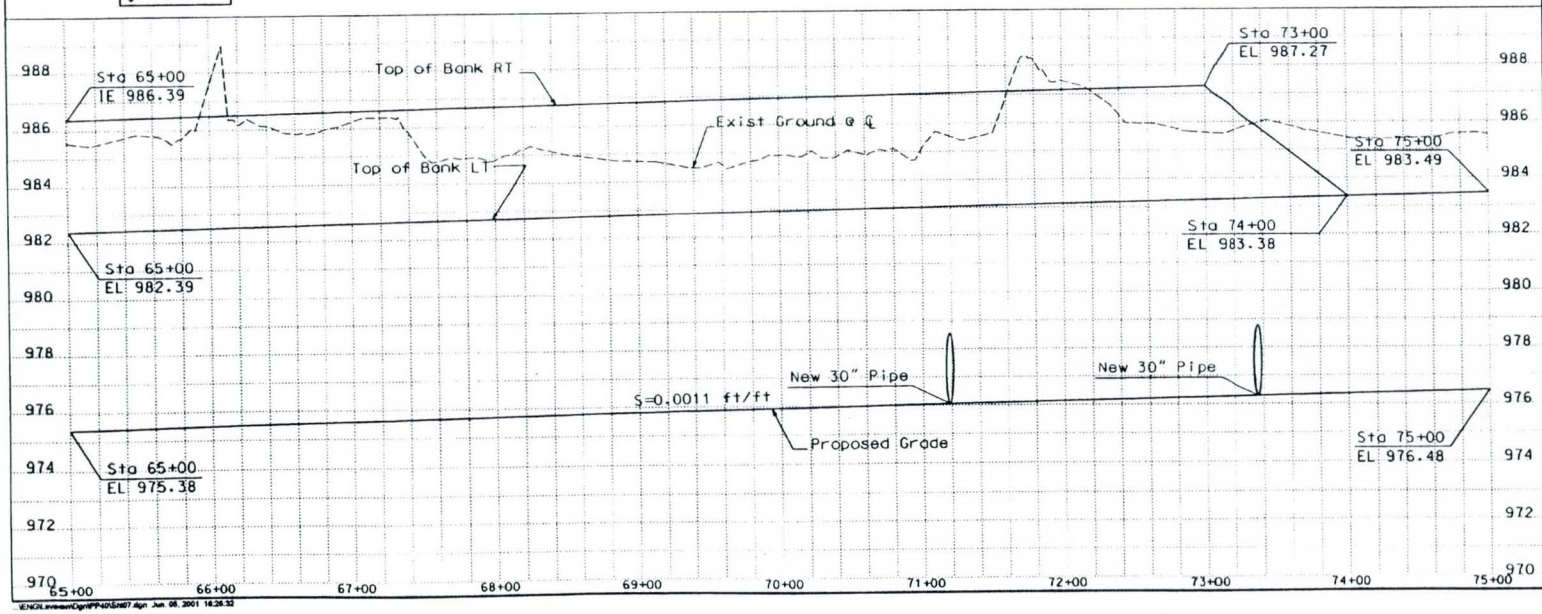
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 117083I
FCD CONTRACT NO.

PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING		BY	DATE
	DESIGNED	MAL	05/01
	DRAWN	FC	05/01
	CHECKED		

DRAWING NO.	PLAN AND PROFILE STA 55+00 TO STA 65+00	SHEET OF
C6		





REMOVE

REMOVE FENCE (NPI).

CONSTRUCT

1. CONSTRUCT CONCRETE RETAINING WALL NO.6. SEE DRAWING __ -- CY
2. CONSTRUCT MASONRY FENCE STA 65+00 TO STA 69+92.50 492 LF
3. INSTALL END SECTION PER MAG STD DTL 545 3 EA
4. INSTALL 30" PIPE -- LF
5. CONSTRUCT PIPE COLLAR PER MAG STD DTL 505 1 EA
6. CONSTRUCT CONC INLET PER MAG STD DTL 501-4 1 EA

FOR CONNECTOR PIPE PROFILE SEE SHEET __

60% SUBMITTAL

NO.	REVISION	BY	DATE
3			
2			
1			

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

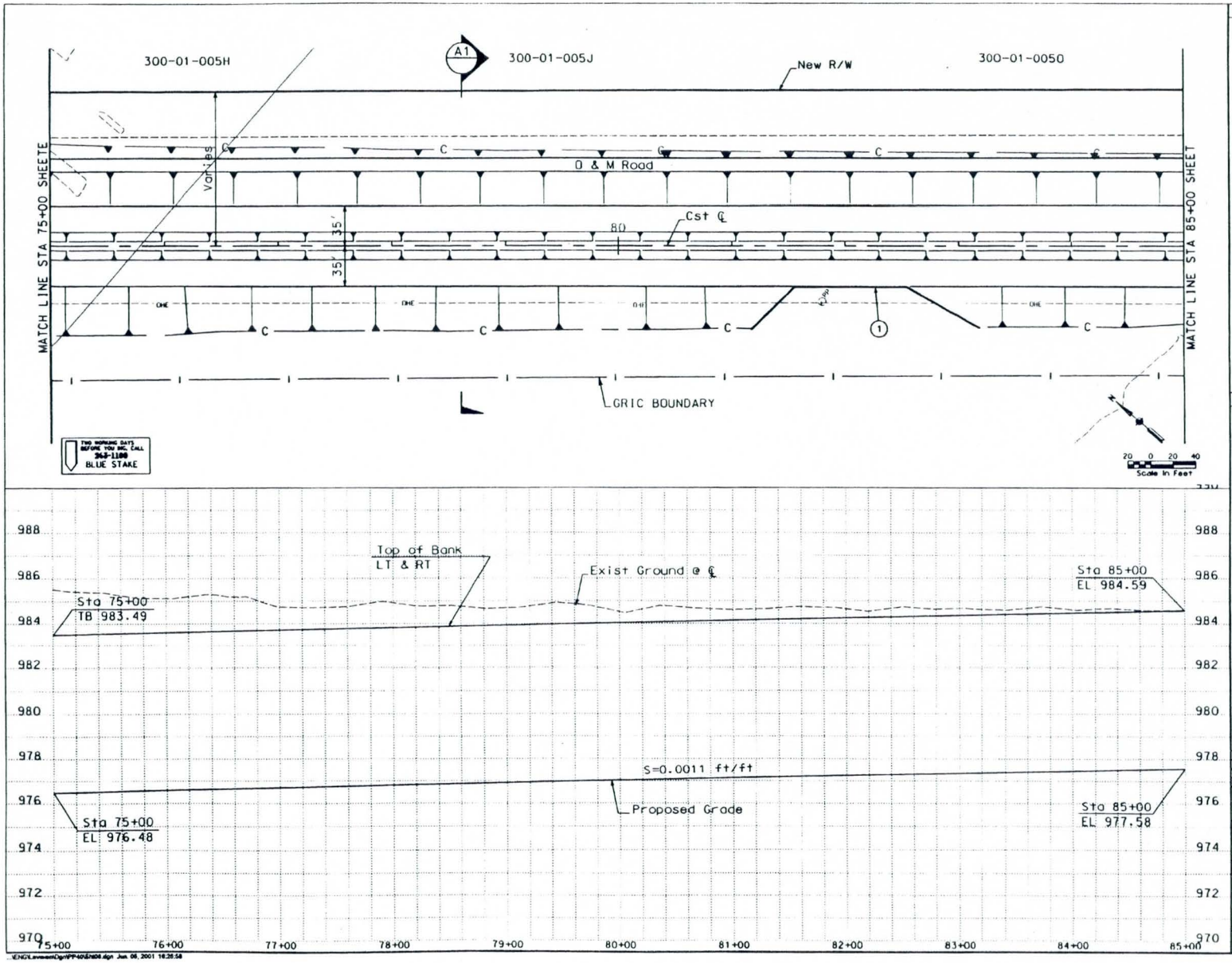
PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING

	BY	DATE
DESIGNED	MAL	05/01
DRAWN	FC	05/01
CHECKED		

DRAWING NO. C7

PLAN AND PROFILE STA 65+00 TO STA 75+00

SHEET OF



REMOVE

CONSTRUCT

1 CONSTRUCT CONCRETE RETAINING WALL NO. 7. SEE DRAWING __ __ CY

60% SUBMITTAL

NO.	REVISION	BY	DATE
3			
2			
1			

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 170831
FCD CONTRACT NO.

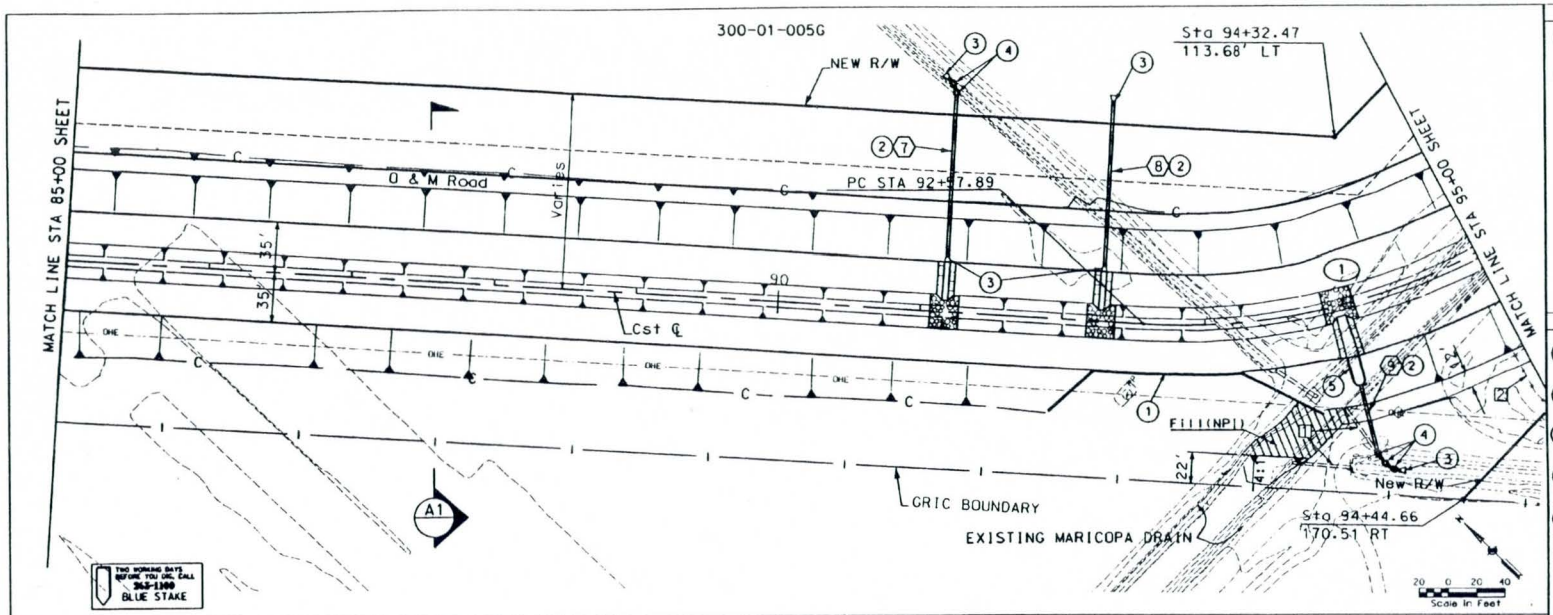
PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING

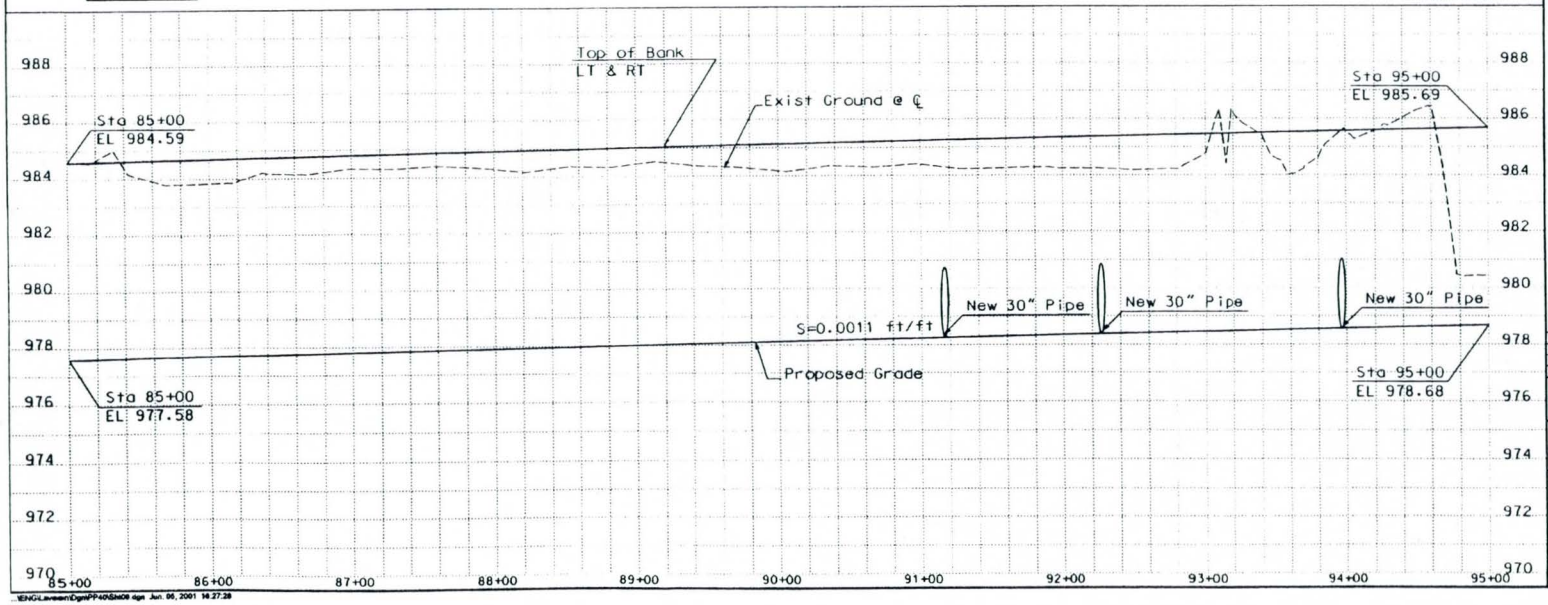
	BY	DATE
DESIGNED	MAL	05/01
DRAWN	FC	05/01
CHECKED		

DRAWING NO. C8

PLAN AND PROFILE
STA 75+00 TO STA 85+00

SHEET OF





REMOVE

[1] REMOVE PIPE.(NPI)

[2] REMOVE FENCE(NPI)

CONSTRUCT

(1) CONSTRUCT CONCRETE RETAINING WALL NO. 8. SEE DRAWING -- -- CY

(2) INSTALL 30" PIPE -- LF

(3) INSTALL END SECTION PER MAG STD DTL 545 5 EA

(4) CONSTRUCT PIPE COLLAR PER MAG STD DTL 505 5 EA

(5) CONSTRUCT CONCRETE OUTLET SEE DTL D3 1 EA

⬡ FOR CONNECTOR PIPE DETAIL SEE SHEET --

60% SUBMITTAL

NO.	REVISION	BY	DATE
3			
2			
1			

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING		BY	DATE
	DESIGNED	MAL	05/01
	DRAWN	FC	05/01
	CHECKED		

DRAWING NO.		SHEET OF
C9	PLAN AND PROFILE STA 85+00 TO STA 95+00	

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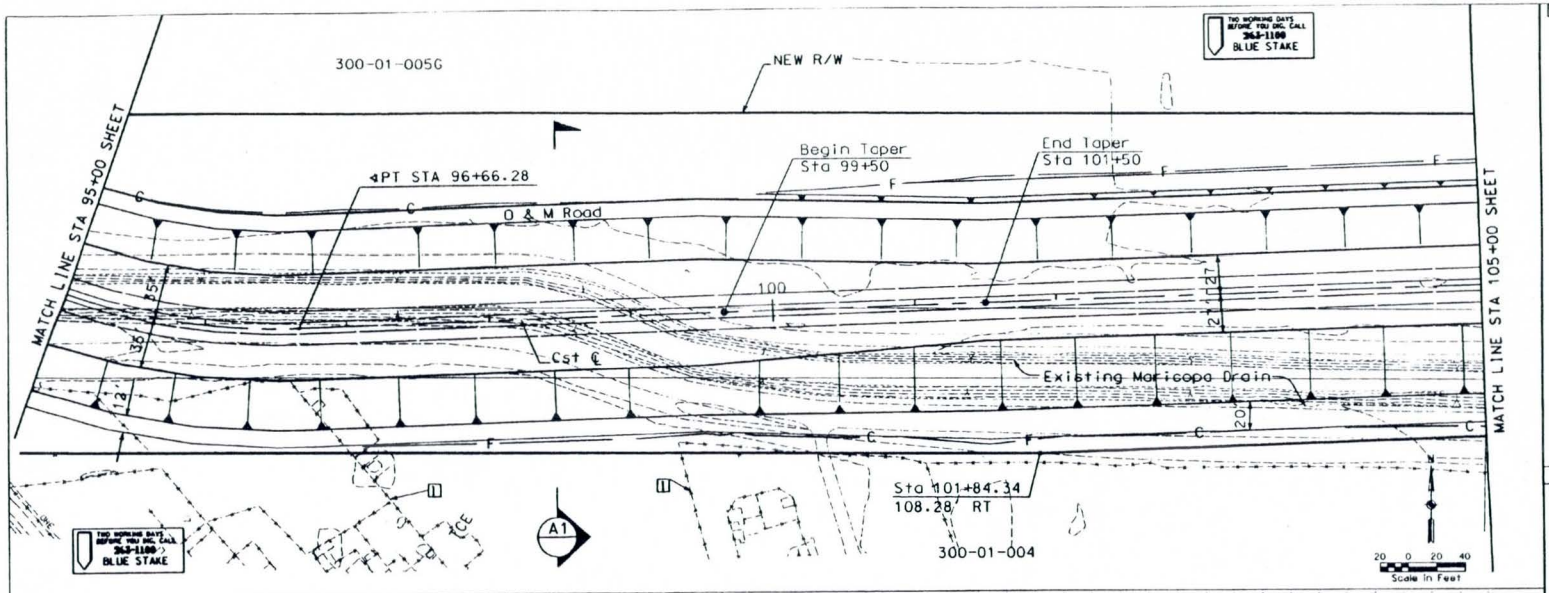

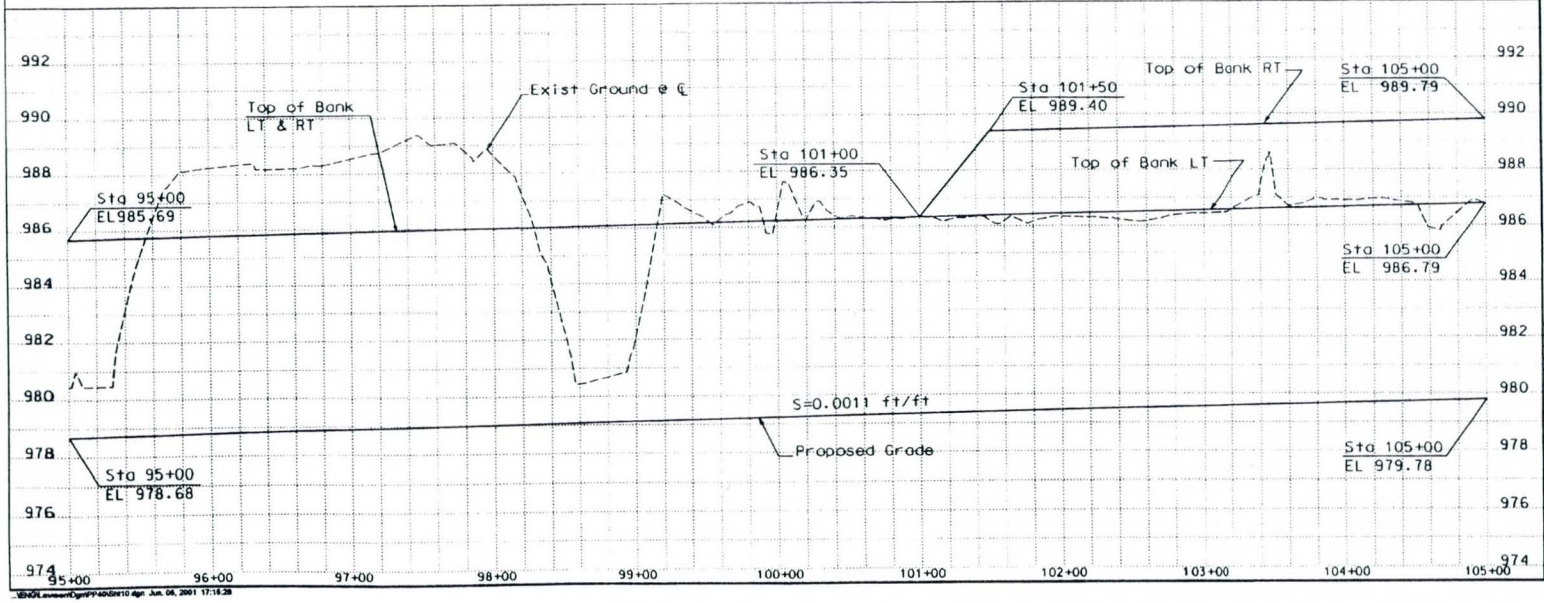

[1] REMOVE FENCE (NPI).

CONSTRUCT

60% SUBMITTAL

NO.	REVISION	BY	DATE
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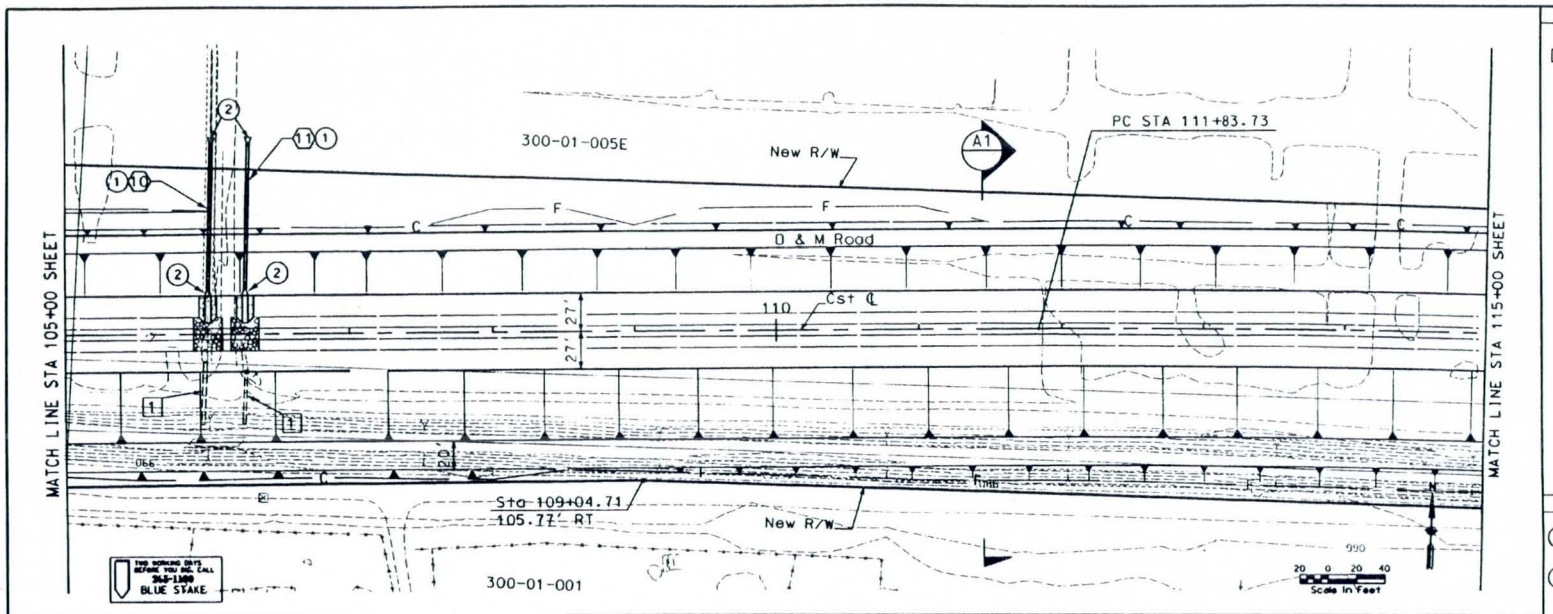
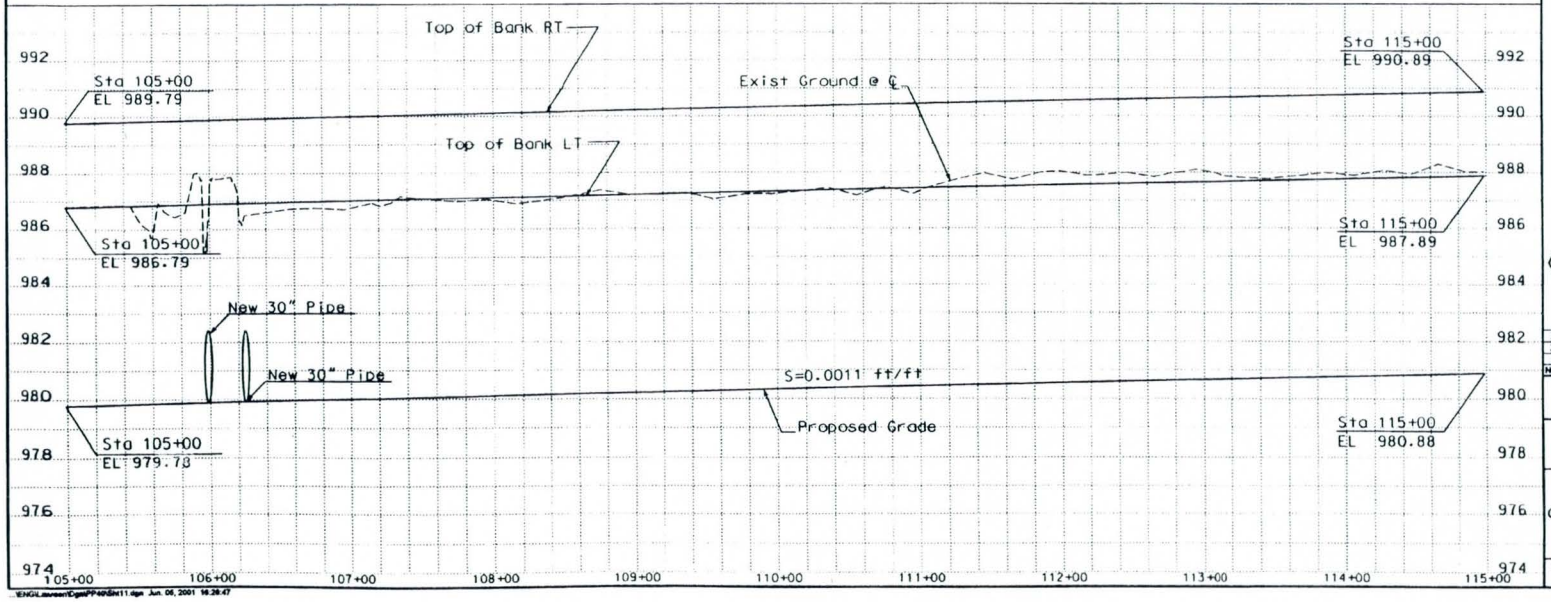
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING		BY	DATE
	DESIGNED	MAL	05/01
	DRAWN	FC	05/01
	CHECKED		

DRAWING NO.		SHEET OF
C10	PLAN AND PROFILE STA 95+00 TO STA 105+00	





REMOVE

[1] REMOVE PIPE AND HEADWALLS (NP1)

CONSTRUCT

(1) INSTALL 30" PIPE -- LF

(2) INSTALL END SECTION PER MAG STD DTL 545 4 EA

⬡ FOR CONNECTOR PIPE PROFILE SEE SHEET --

60% SUBMITTAL

NO.	REVISION	BY	DATE
3			
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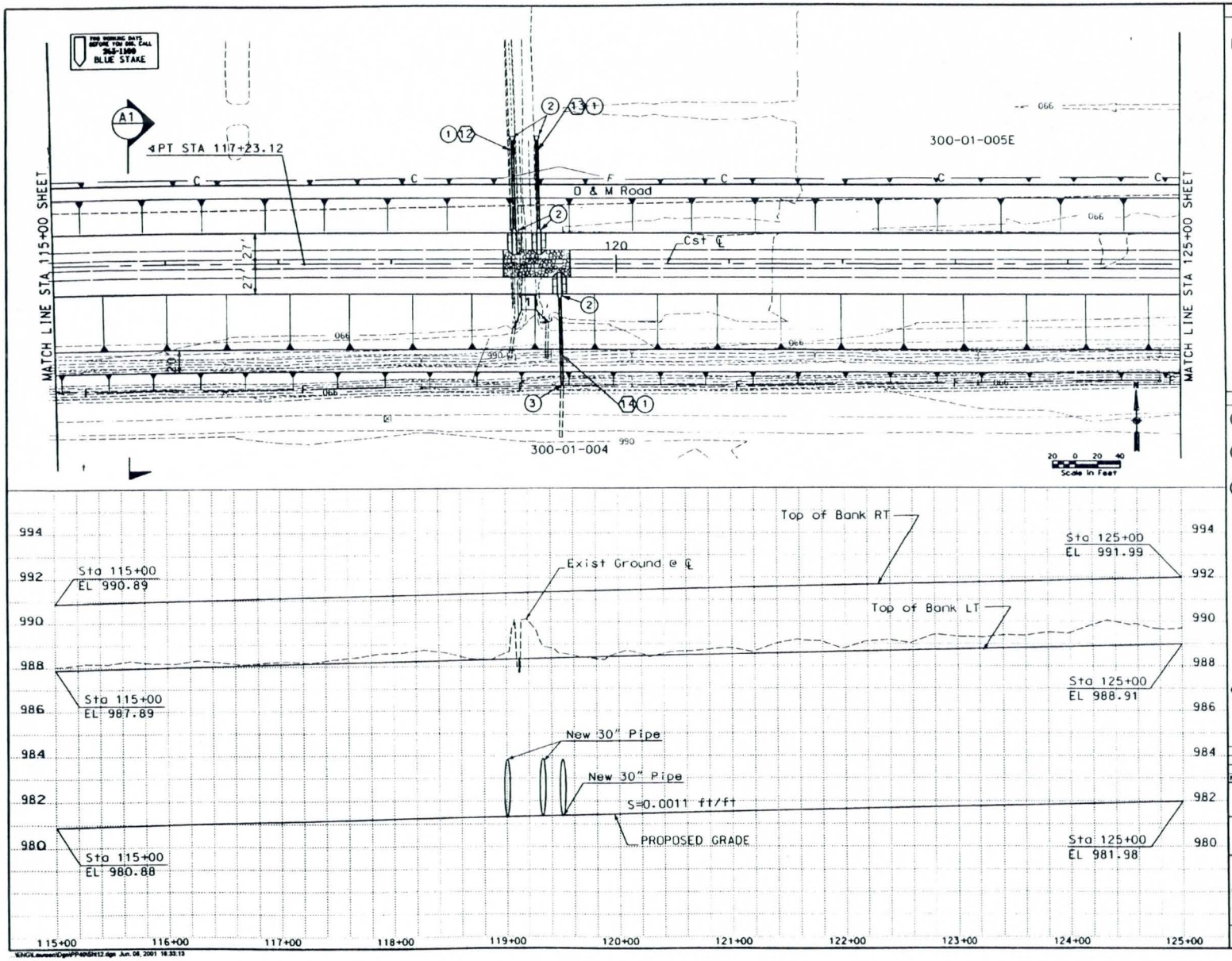
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING		BY	DATE
	DESIGNED	MAL	05/01
	DRAWN	FC	05/01
	CHECKED		

DRAWING NO.		SHEET OF
C11	PLAN AND PROFILE STA 105+00 TO STA 115+00	1 100



REMOVE

[1] REMOVE PIPE AND HEADWALLS (NPI)

CONSTRUCT

(1) INSTALL 30" PIPE -- LF

(2) INSTALL END SECTION PER MAG STD DTL 545 5 EA

(3) CONSTRUCT PIPE COLLAR PER MAG STD DTL 505 1 EA

⬡ FOR CONNECTOR PIPE PROFILE SEE SHEET --

60% SUBMITTAL

NO.	REVISION	BY	DATE
3			
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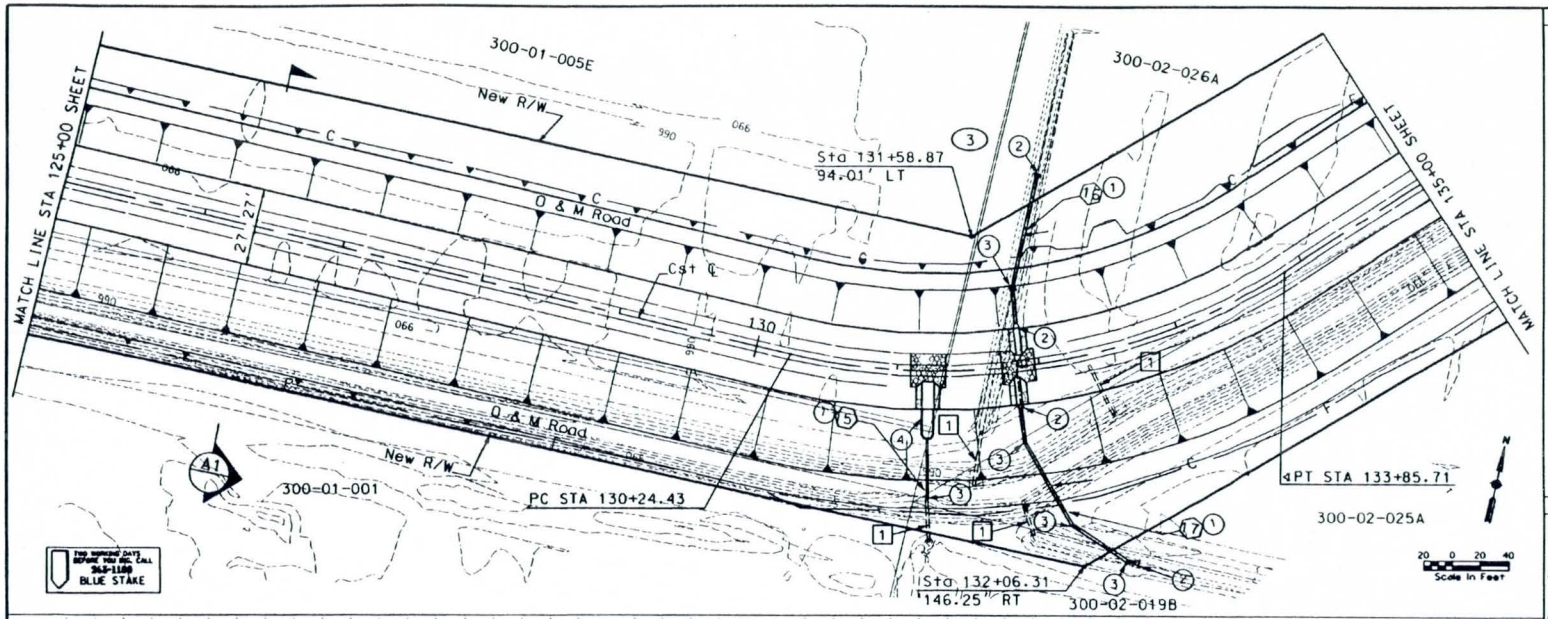
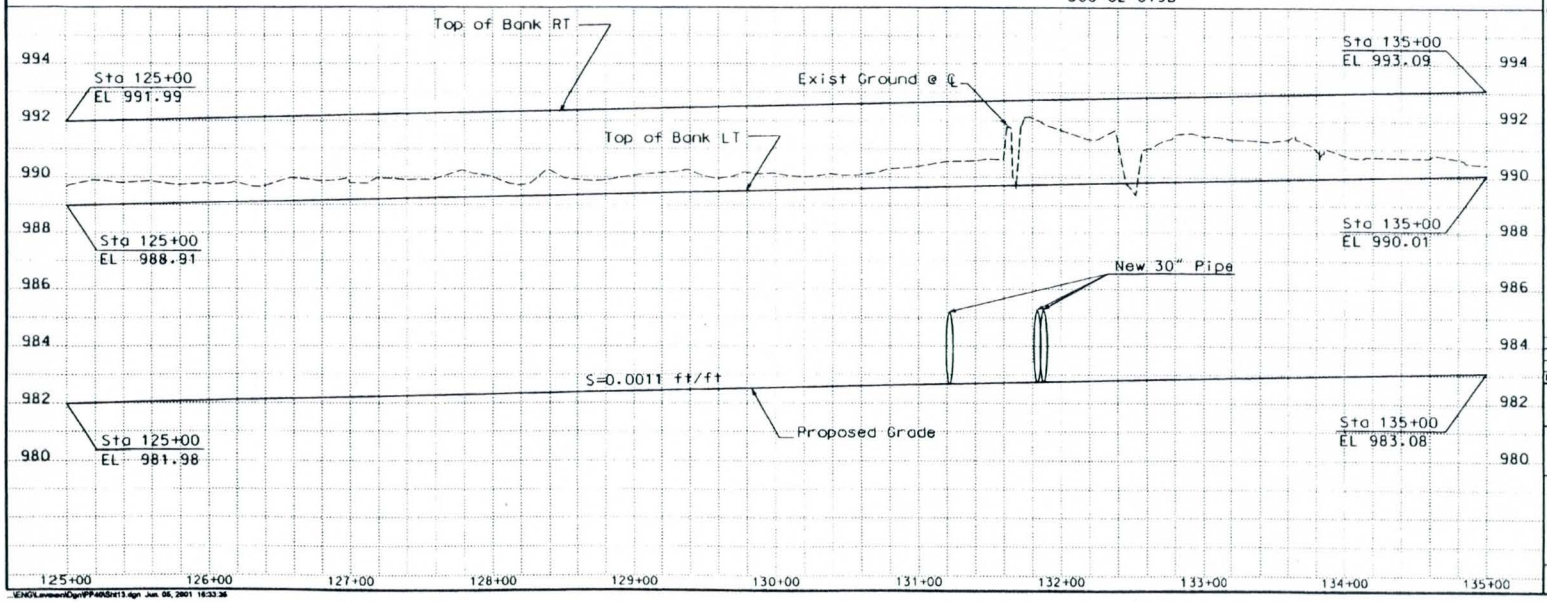
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING		BY	DATE
	DESIGNED	MAL	05/01
	DRAWN	FC	05/01
	CHECKED		

DRAWING NO.		SHEET OF
C12	PLAN AND PROFILE STA 115+00 TO 125+00	1 100





REMOVE

[1] REMOVE CULVERT AND HEADWALLS (NP1)

CONSTRUCT

(1) INSTALL 30" PIPE -- LF

(2) INSTALL END SECTION PER MAG STD DTL 545 4 EA

(3) CONSTRUCT PIPE COLLAR PER MAG STD DTL 505 5 EA

(4) CONSTRUCT SPECIAL OUTLET SEE DTL D3 1 EA

⬡ FOR CONNECTOR PIPE PROFILE SEE SHEET --

60% SUBMITTAL

NO.	REVISION	BY	DATE
3			
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FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

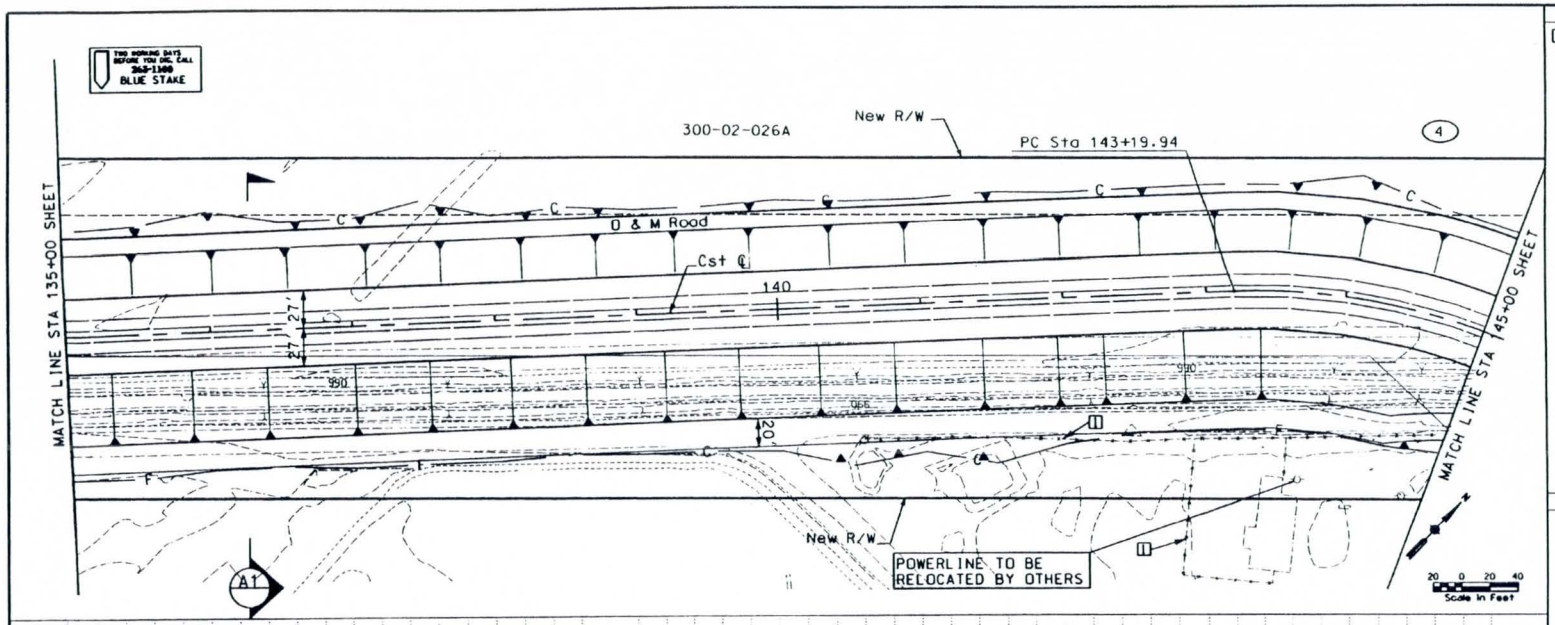
LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

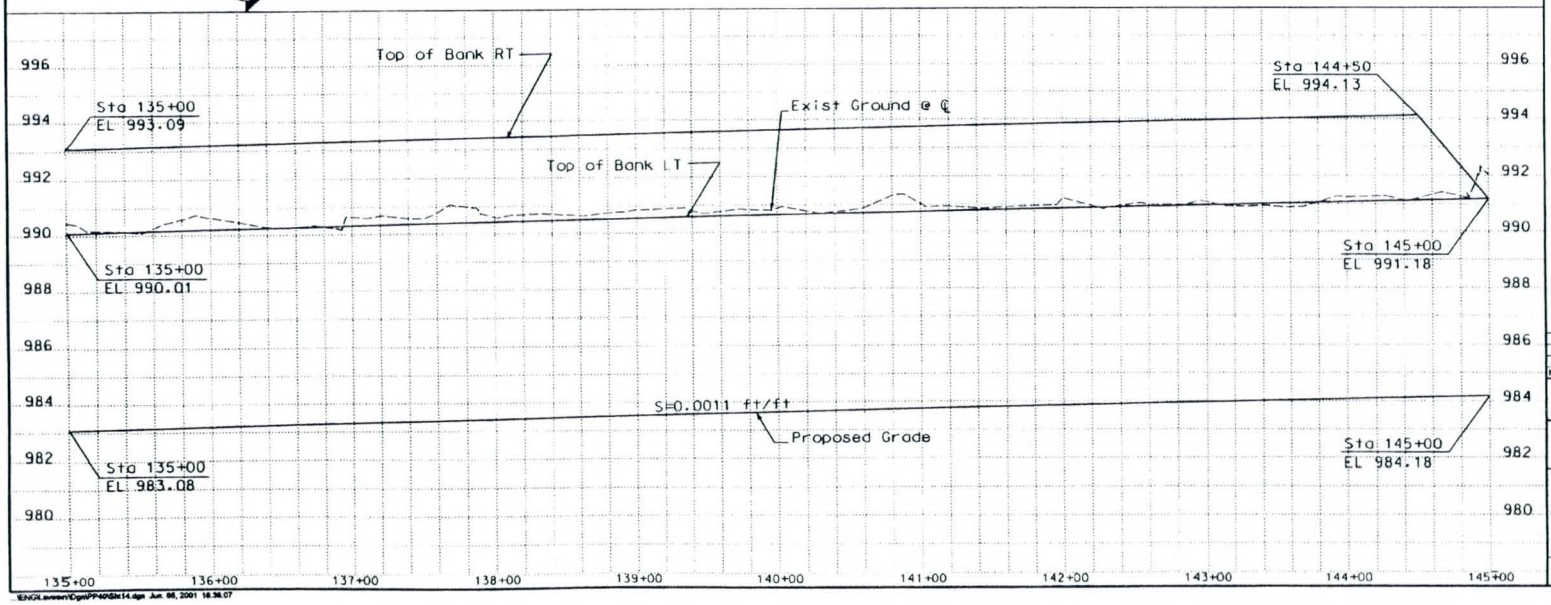
PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING		BY	DATE
	DESIGNED	MAL	05/01
	DRAWN	FC	05/01
	CHECKED		

DRAWING NO. C13

PLAN AND PROFILE
STA 125+00 TO STA 135+00

SHEET OF





REMOVE

REMOVE FENCE (NPI).

CONSTRUCT

60% SUBMITTAL

NO.	REVISION	BY	DATE
3			
2			
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FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

		BY	DATE
PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING	DESIGNED	MAL	05/01
	DRAWN	FC	05/01
	CHECKED		

DRAWING NO. C14

PLAN AND PROFILE
STA 135+00 TO STA 145+00

SHEET OF

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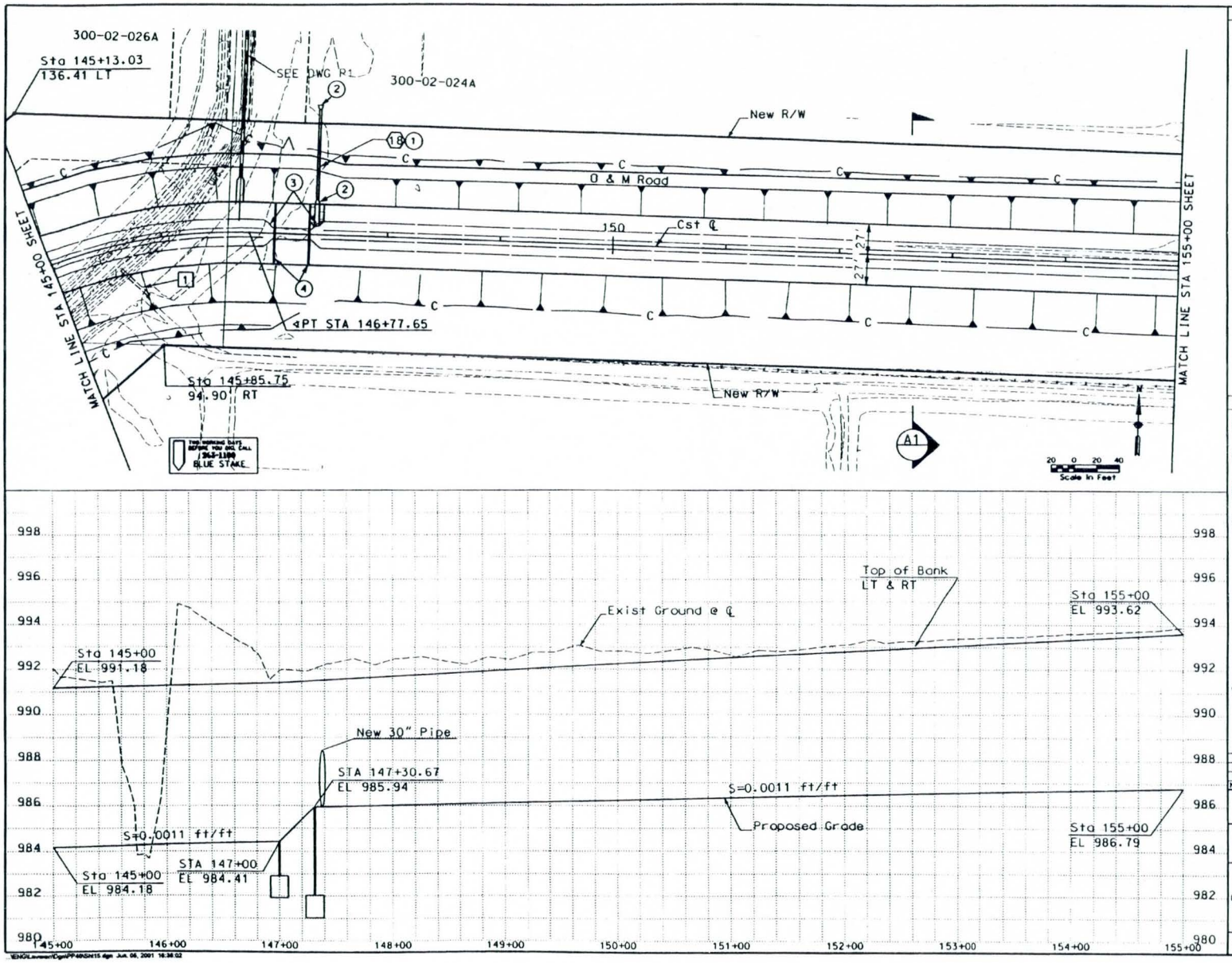

REMOVE

[1] REMOVE PIPE AND HEADWALL (NP1)

CONSTRUCT

(1) INSTALL 30" PIPE -- LF

(2) INSTALL END SECTION MAG STD DTL 545 2 EA

(3) CONSTRUCT CONCRETE LOW FLOW TRANSITION - SEE DTL D2 -- CY

(4) CONSTRUCT DROP STRUCTURE NO.1 SEE DTL D8 -- CY

⬡ FOR CONNECTOR PIPE PROFILE SEE SHEET --

60% SUBMITTAL

NO.	REVISION	BY	DATE
3			
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FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

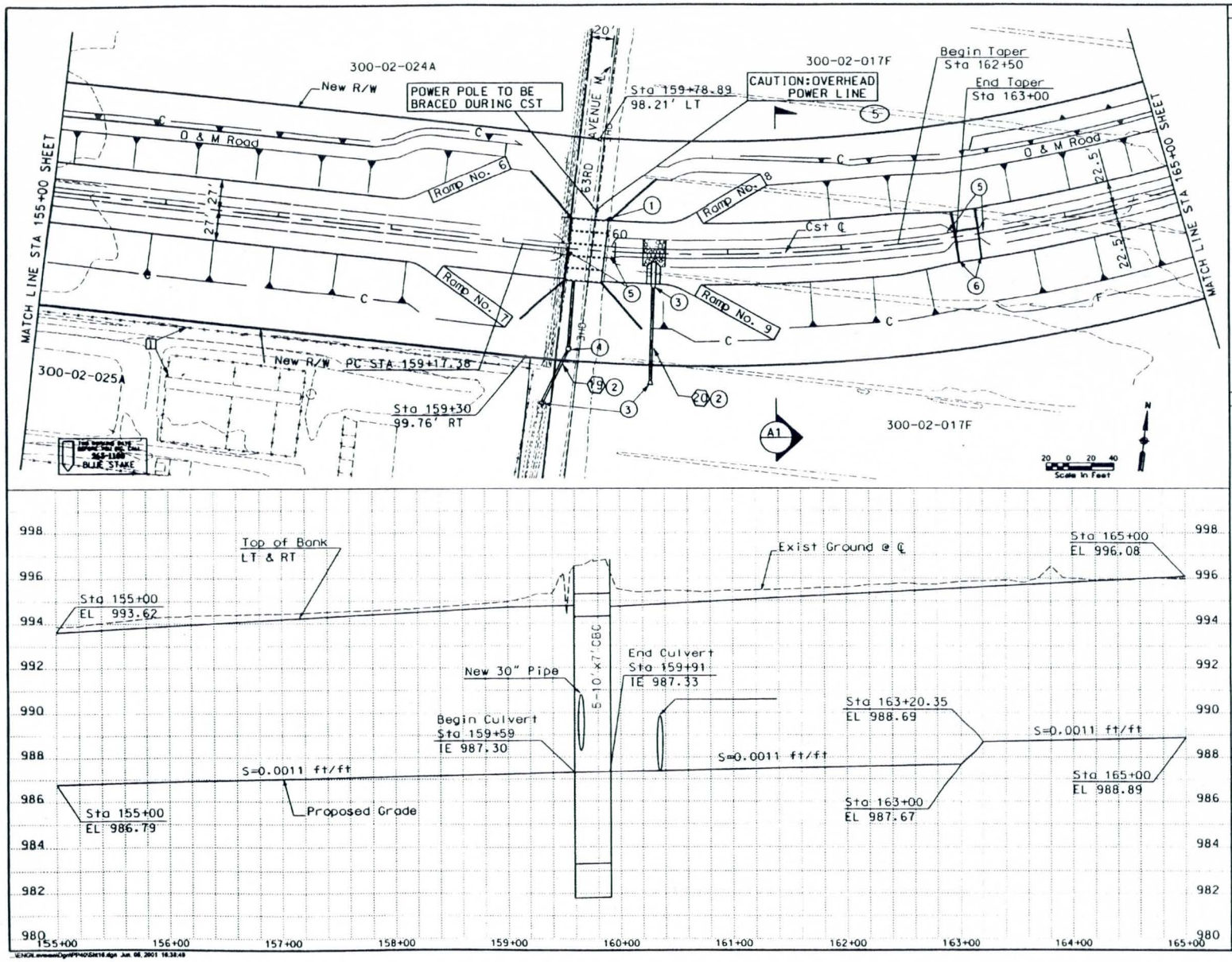
PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING

	BY	DATE
DESIGNED	MAL	05/01
DRAWN	FC	05/01
CHECKED		

DRAWING NO. C15

PLAN AND PROFILE
STA 145+00 TO STA 155+00

SHEET OF



REMOVE

1. REMOVE FENCE (NPI).
2.

CONSTRUCT

1. CONSTRUCT CONCRETE BOX CULVERT NO.2. SEE DRAWING B1 -- CY
2. INSTALL 30" PIPE -- LF
3. INSTALL END SECTION PER MAG STD DTL 545 3 EA
4. CONSTRUCT PIPE COLLAR PER MAG STD DTL 505 1 EA
5. CONSTRUCT CONCRETE LOW FLOW TRANSITION - SEE DTL D2 -- CY
6. CONSTRUCT DROP STRUCTURE NO.2 SEE DTL D8 -- CY

FOR CONNECTOR PIPE PROFILE SEE SHEET --

60% SUBMITTAL

NO.	REVISION	BY	DATE
3			
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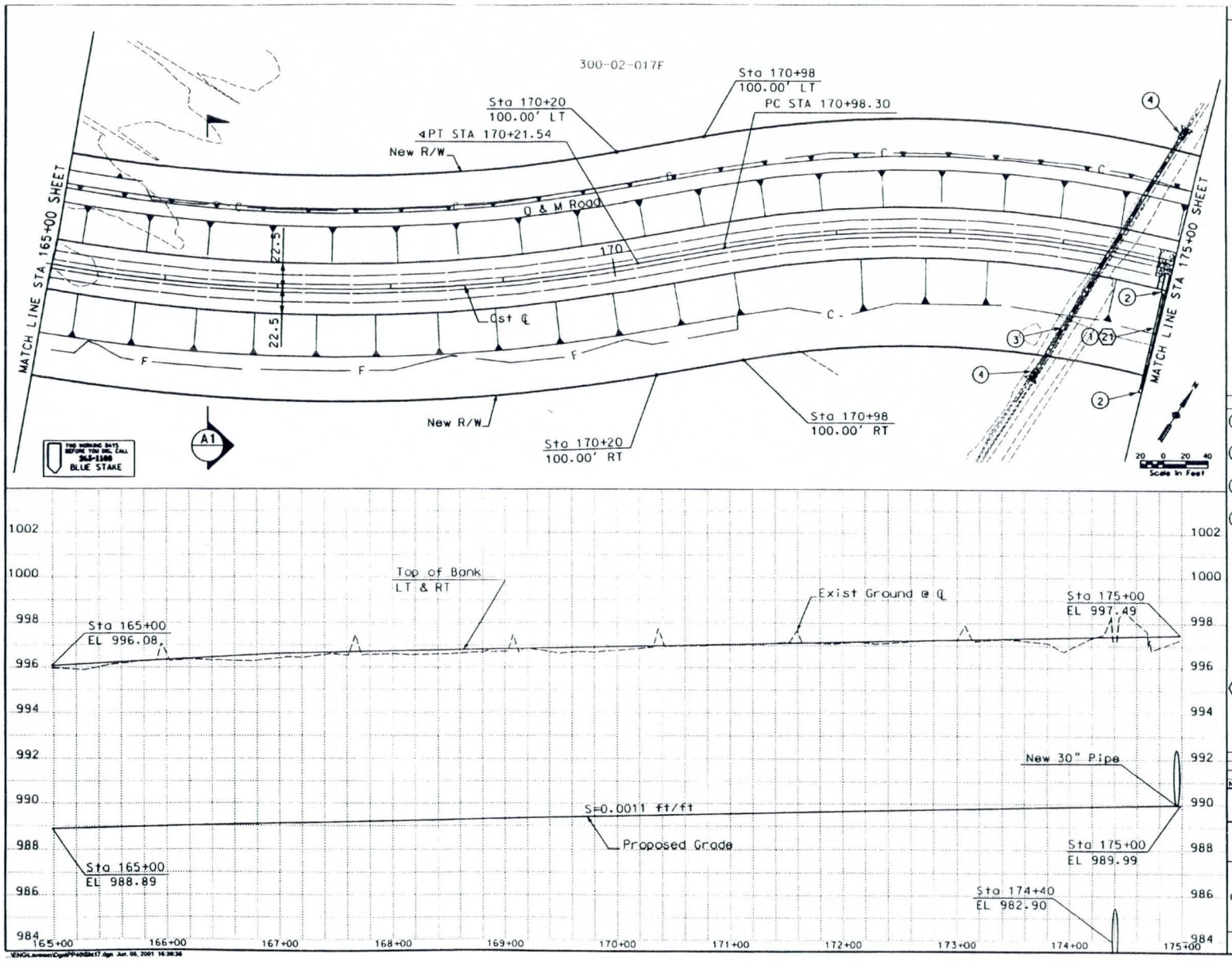
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING		BY	DATE
	DESIGNED	MAL	05/01
	DRAWN	FC	05/01
	CHECKED		

DRAWING NO.		SHEET OF
C16	PLAN AND PROFILE STA 155+00 TO STA 165+00	



REMOVE

CONSTRUCT

1. INSTALL 30" PIPE -- LF
2. INSTALL END SECTION PER MAG STD DTL 545 2 EA
3. INSTALL 30" DIP SEE DWG IR1 242 LF
4. CONSTRUCT SIPHON MANHOLE SEE DTL D10 -- CY

FOR CONNECTOR PIPE PROFILE SEE SHEET --

60% SUBMITTAL

NO.	REVISION	BY	DATE
3			
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FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

		BY	DATE
PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING	DESIGNED	MAL	05/01
	DRAWN	FC	05/01
	CHECKED		

DRAWING NO. C17 — PLAN AND PROFILE STA 165+00 TO STA 175+00 — SHEET OF

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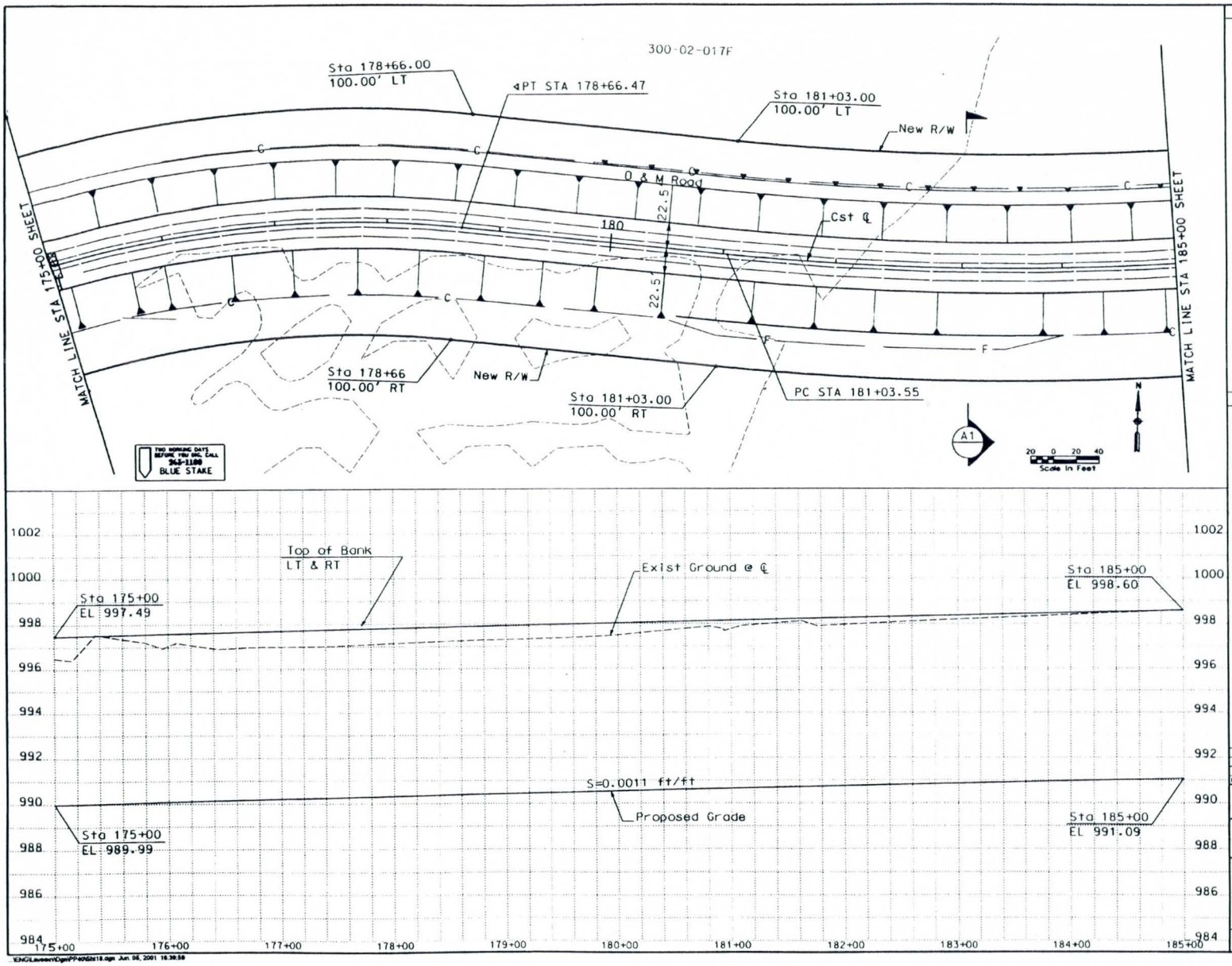

REMOVE

CONSTRUCT

60% SUBMITTAL

NO.	REVISION	BY	DATE
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FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

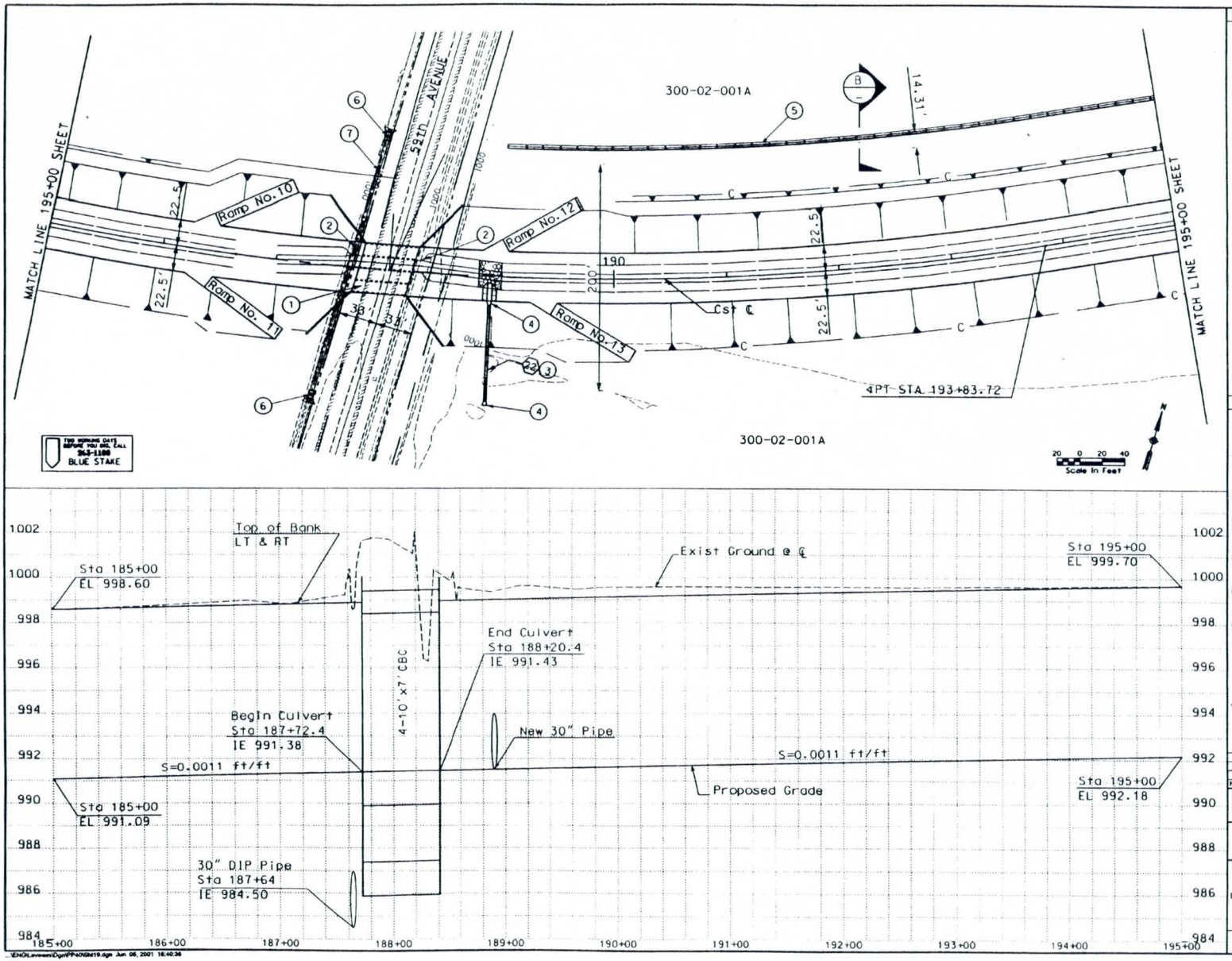
PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING		BY	DATE
	DESIGNED	MAL	05/01
	DRAWN	FC	05/01
	CHECKED		

DRAWING NO. C18

PLAN AND PROFILE
STA 175+00 TO STA 185+00

SHEET OF

\ENG\Laveen\Dgn\PP40Sht18.dgn Jun. 06, 2001 16:39:58



REMOVE

CONSTRUCT

1. CONSTRUCT CONCRETE BOX CULVERT NO.3. SEE DWG B3 -- CY
2. CONSTRUCT CONCRETE LOW FLOW TRANSITION - SEE DTL D2 -- CY
3. INSTALL 30" PIPE -- LF
4. INSTALL END SECTION PER MAG STD DTL 545 2 EA
5. CONSTRUCT CONCRETE LINED DITCH -- CY
6. CONSTRUCT SIPHON MANHOLE SEE DTL D10 -- CY
7. INSTALL 30" DIP SEE DWG IR2 233 LF

⬡ FOR CONNECTOR PIPE PROFILE SEE SHEET --

60% SUBMITTAL

NO.	REVISION	BY	DATE
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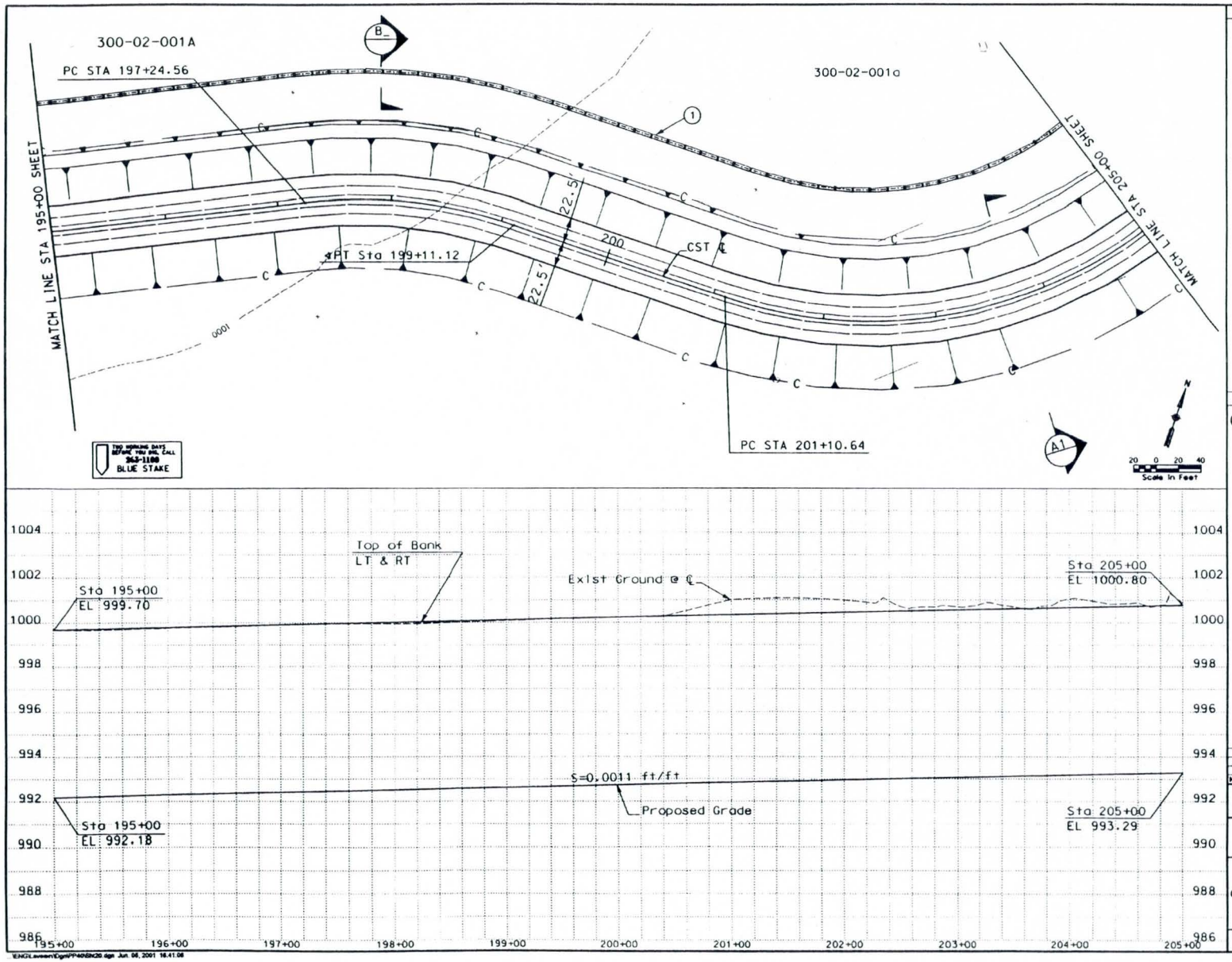
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING		BY	DATE
	DESIGNED	MAL	05/01
	DRAWN	FC	05/01
	CHECKED		

DRAWING NO.	PLAN AND PROFILE STA 185+00 TO STA 195+00	SHEET OF
C19		



REMOVE

CONSTRUCT

(1) CONSTRUCT CONCRETE LINED DITCH
-- CY

60% SUBMITTAL

NO.	REVISION	BY	DATE
3			
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FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING		BY	DATE
	DESIGNED	MAL	05/01
	DRAWN	FC	05/01
	CHECKED		

DRAWING NO.	PLAN AND PROFILE STA 195+00 TO STA 205+00	SHEET OF
C20		

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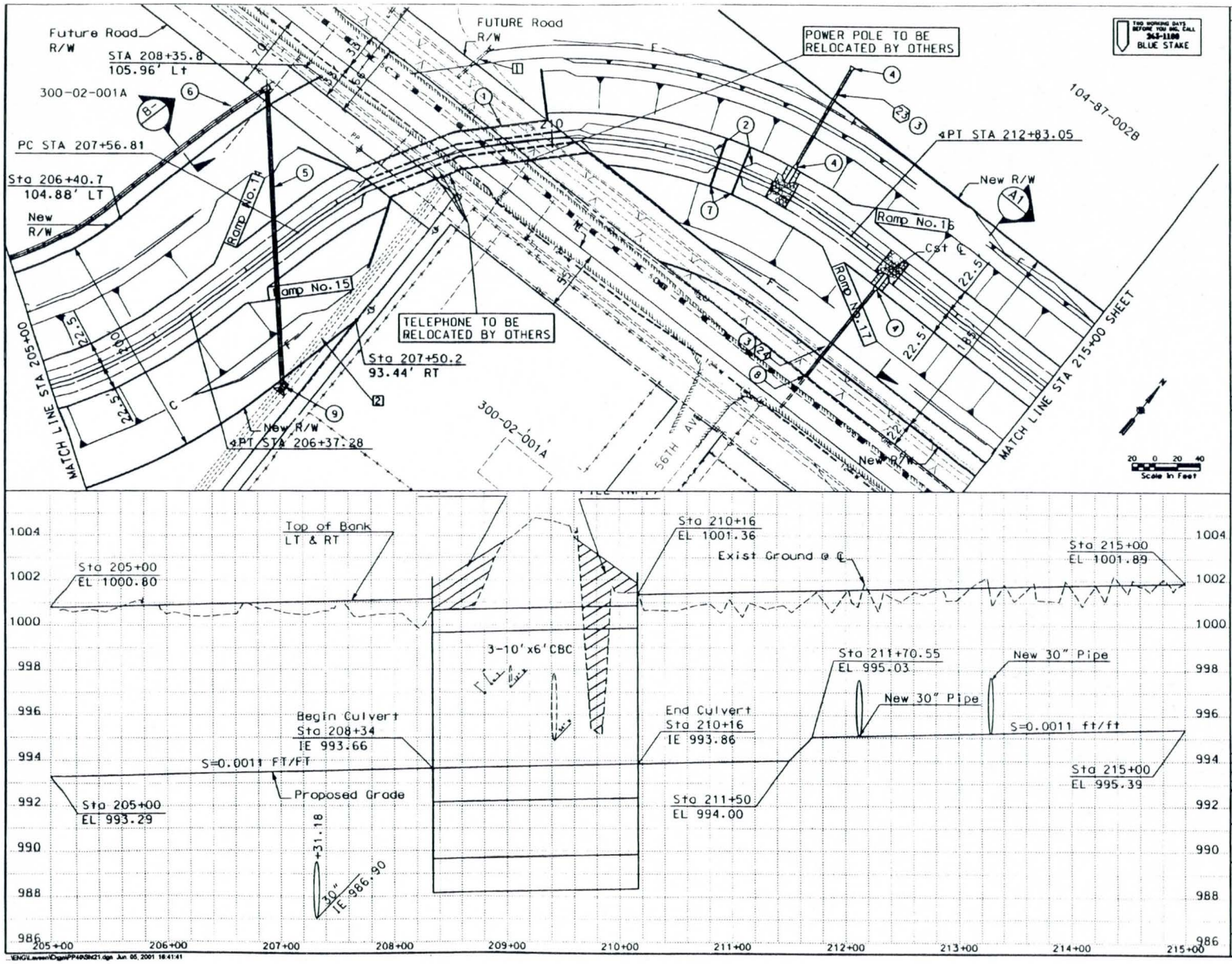

REMOVE

[1] REMOVE PIPE & HEADWALLS (NPI).

[2] REMOVE CONCRETE LINED DITCH (NPI).

CONSTRUCT

(1) CONSTRUCT CONCRETE BOX CULVERT NO.4. SEE DRAWING B4 -- CY

(2) CONSTRUCT CONCRETE LOW FLOW TRANSITION - SEE DTL D2 -- CY

(3) INSTALL 30" PIPE -- LF

(4) INSTALL END SECTION PER MAG STD DTL 545 3 EA

(5) INSTALL 30" DIP SEE DWG IR3 260 LF

(6) CONSTRUCT CONCRETE LINED DITCH -- CY

(7) CONSTRUCT DROP STRUCTURE NO.3 SEE DTL D8 -- CY

(8) CONSTRUCT PIPE COLLAR PER MAG STD DTL 505 1 EA

(9) CONSTRUCT SIPHON MANHOLE SEE DTL D10 -- CY

60% SUBMITTAL

NO.	REVISION	BY	DATE
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FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING

	BY	DATE
DESIGNED	MAL	05/01
DRAWN	FC	05/01
CHECKED		

DRAWING NO. C21

PLAN AND PROFILE
STA 205+00 TO STA 215+00

SHEET OF

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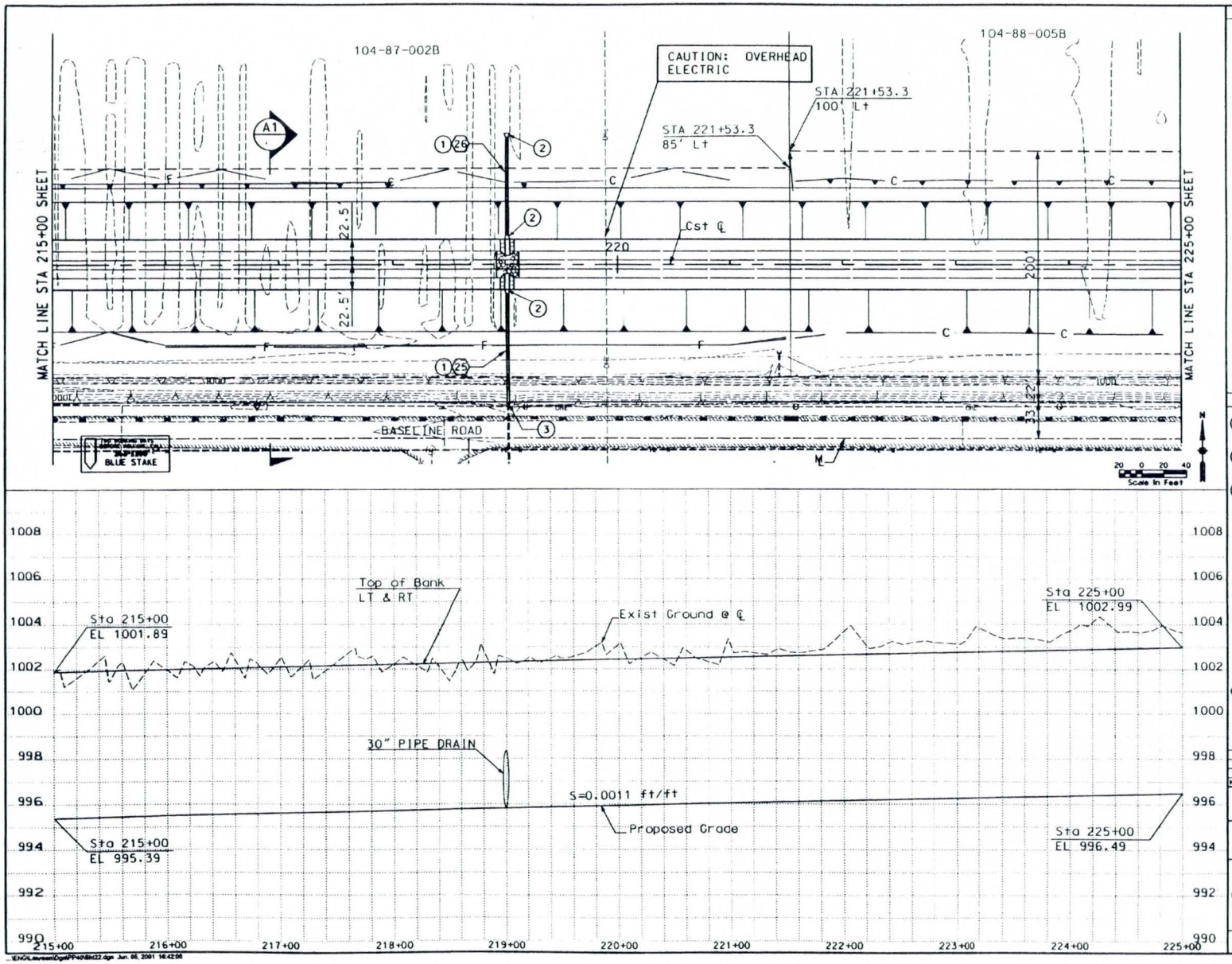

REMOVE

CONSTRUCT

(1) INSTALL 30" PIPE -- LF

(2) INSTALL END SECTION
SEE DWG -- 3 EA

(3) CONSTRUCT PIPE COLLAR PER
MAG STD DTL 505 1 EA

FOR CONNECTOR PIPE PROFILE
SEE SHEET --

60% SUBMITTAL

NO.	REVISION	BY	DATE
3			
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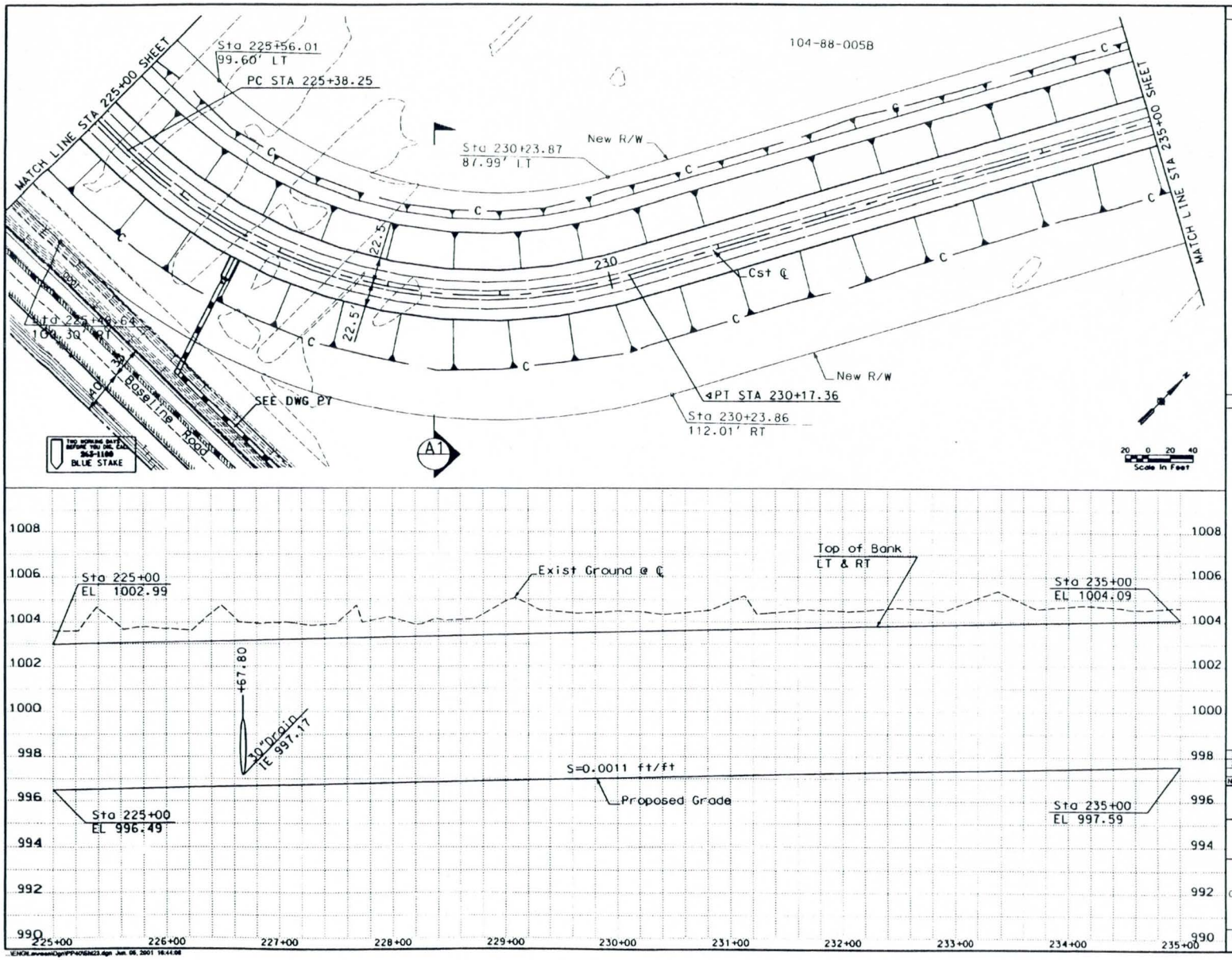
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

	DESIGN FUNCTION	BY	DATE
PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING	DESIGNED	MAL	05/01
	DRAWN	FC	05/01
	CHECKED		

DRAWING NO. C22 — PLAN AND PROFILE STA 215+00 TO STA 225+00 — SHEET OF



REMOVE

CONSTRUCT

60% SUBMITTAL

NO.	REVISION	BY	DATE
3			
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FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 117083I
FCD CONTRACT NO.

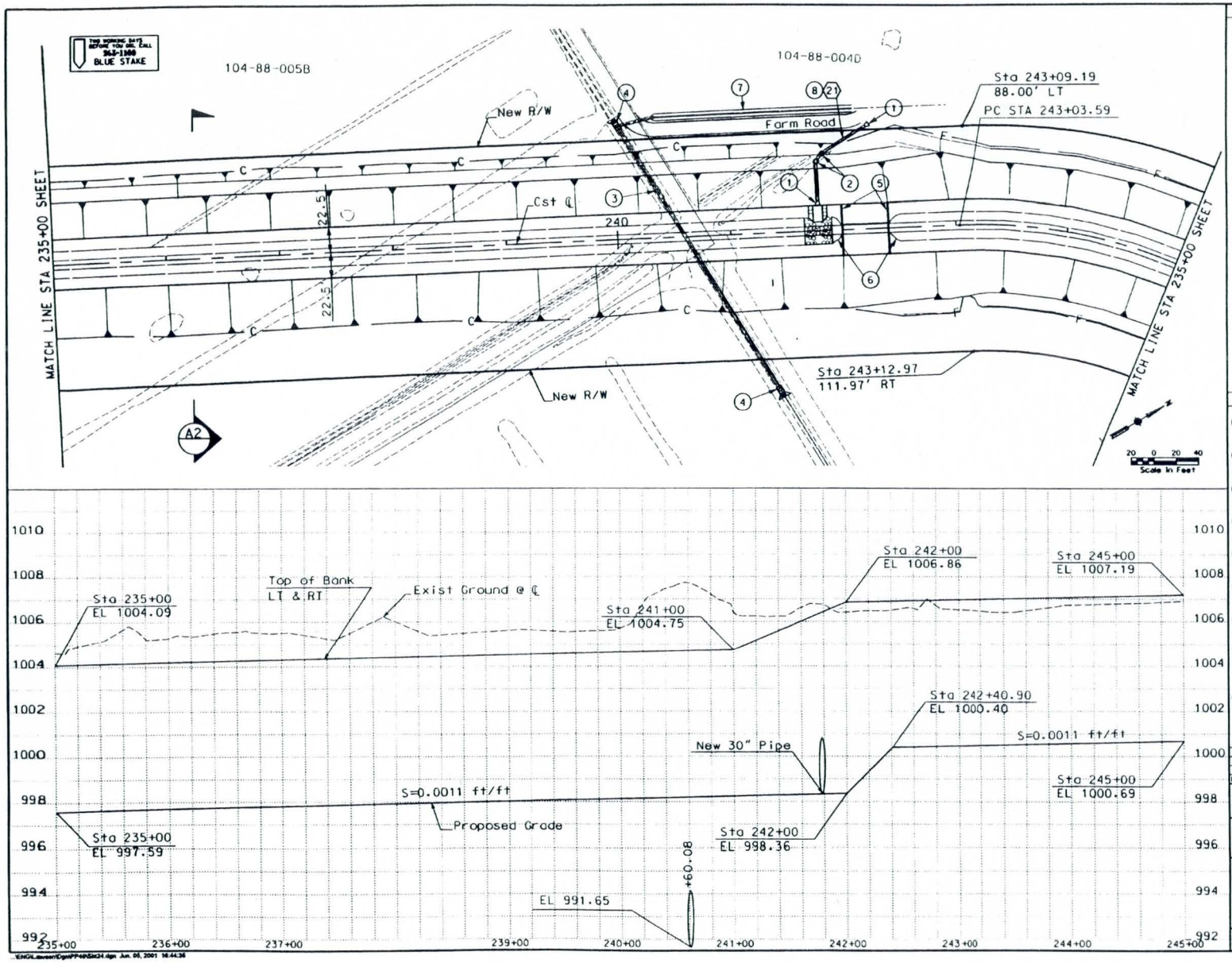
PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING

	BY	DATE
DESIGNED	MAL	05/01
DRAWN	FC	05/01
CHECKED		

DRAWING NO. C23

PLAN AND PROFILE
STA 225+00 TO STA 235+00

SHEET OF



REMOVE

CONSTRUCT

1. INSTALL END SECTION PER MAG STD DTL 545 — 2 EA
2. CONSTRUCT PIPE COLLAR PER MAG STD DTL 505 — 2 EA
3. INSTALL 30" DIP — 270 LF
4. CONSTRUCT SIPHON MANHOLE SEE DTL D10 — -- CY
5. CONSTRUCT DROP STRUCTURE NO.4 SEE DWG -- — -- CY
6. CONSTRUCT CONCRETE LOW FLOW TRANSITION - SEE DTL 2 — -- CY
7. CONSTRUCT CONCRETE LINED DITCH — -- CY
8. INSTALL 30" PIPE — -- LF

FOR CONNECTOR PIPE PROFILE SEE SHEET --

60% SUBMITTAL

NO.	REVISION	BY	DATE
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FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

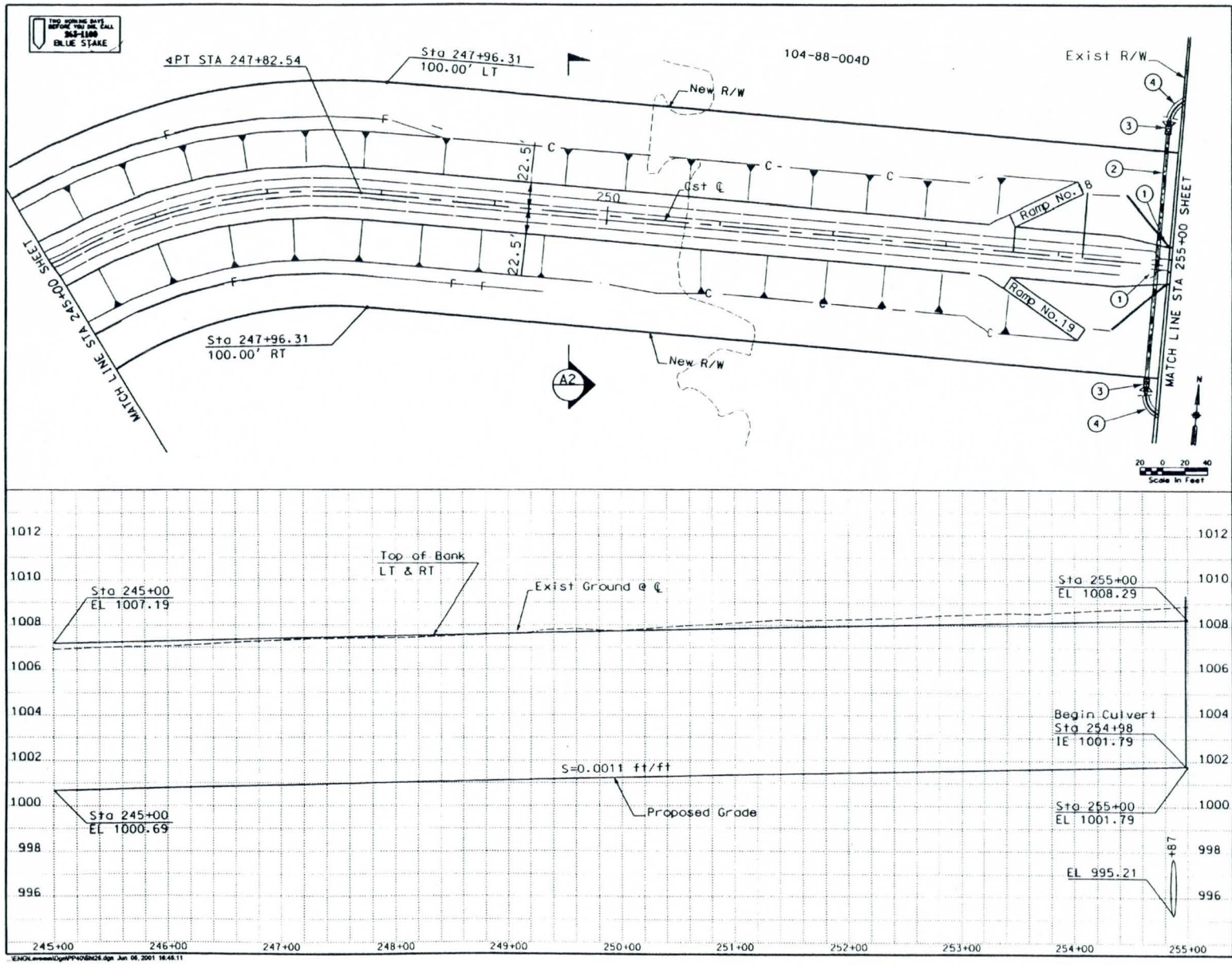
PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING

	BY	DATE
DESIGNED	MAL	05/01
DRAWN	FC	05/01
CHECKED		

DRAWING NO. C24

PLAN AND PROFILE
STA 235+00 TO STA 245+00

SHEET OF



REMOVE

CONSTRUCT

1. CONSTRUCT CONCRETE LOW FLOW TRANSITION - SEE DTL D2 -- CY
2. INSTALL 30" DIP SEE DWG IR5 218 LF
3. CONSTRUCT SIPHON MANHOLE SEE DTL D10 -- CY
4. CONSTRUCT CONCRETE LINE DITCH -- CY

60% SUBMITTAL

NO.	REVISION	BY	DATE
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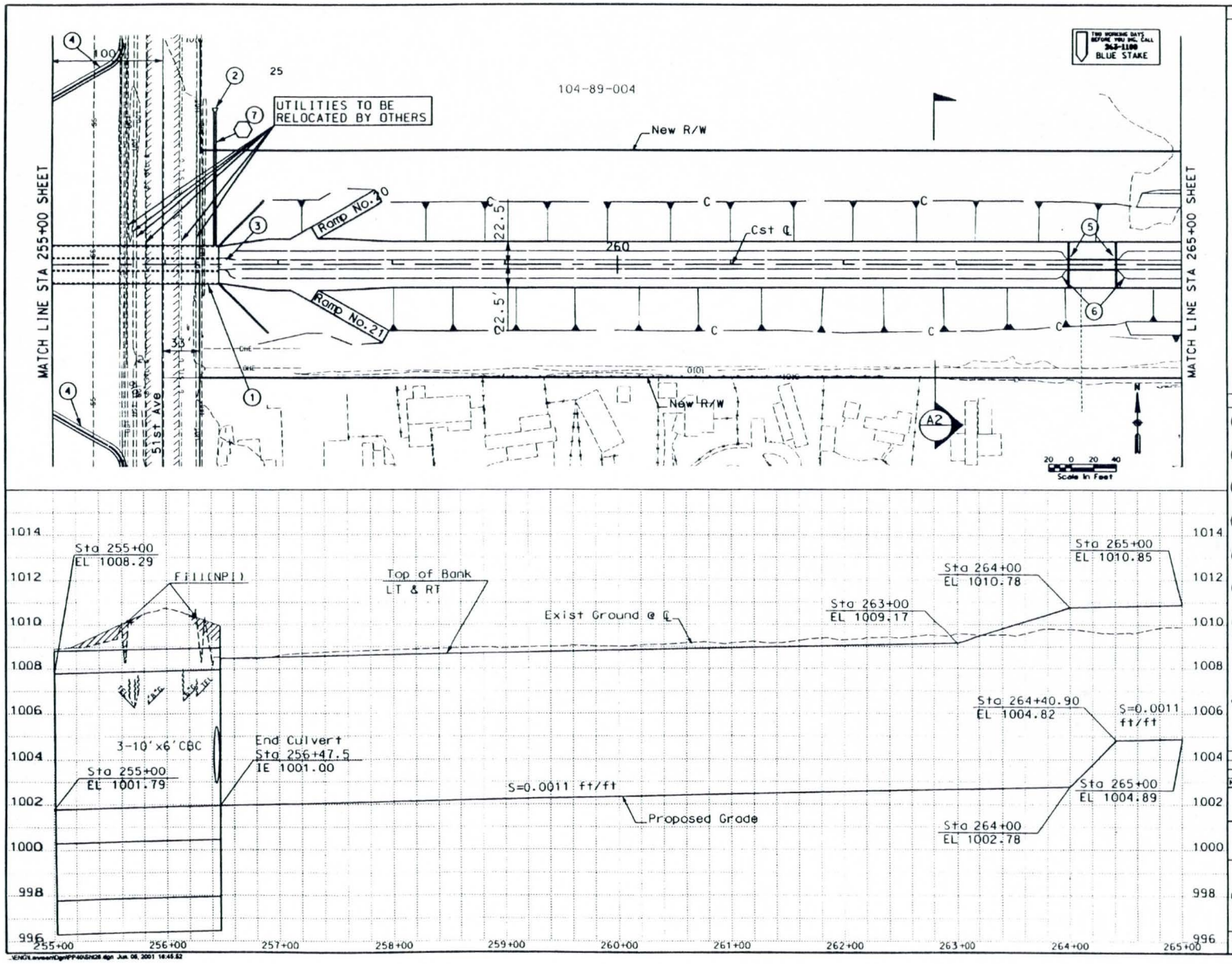
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING		BY	DATE
	DESIGNED	MAL	05/01
	DRAWN	FC	05/01
	CHECKED		

DRAWING NO.		SHEET OF
C25	PLAN AND PROFILE STA 245+00 TO STA 255+00	



REMOVE

CONSTRUCT

1. CONSTRUCT CONCRETE BOX CULVERT NO.5. SEE DRAWING B5 -- CY
2. INSTALL END SECTION PER MAG STD DTL 545 1 EA
3. CONSTRUCT CONCRETE LOW FLOW TRANSITION - SEE DTL -- -- CY
4. CONSTRUCT CONCRETE LINED DITCH -- CY
5. CONSTRUCT DROP STRUCTURE NO.5 SEE DWG -- -- CY
6. CONSTRUCT CONCRETE LOW FLOW TRANSITION - SEE DTL -- -- CY
7. INSTALL 30" PIPE -- LF

⬡ FOR CONNECTOR PIPE PROFILE SEE SHEET --

60% SUBMITTAL

NO.	REVISION	BY	DATE
3			
2			
1			

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

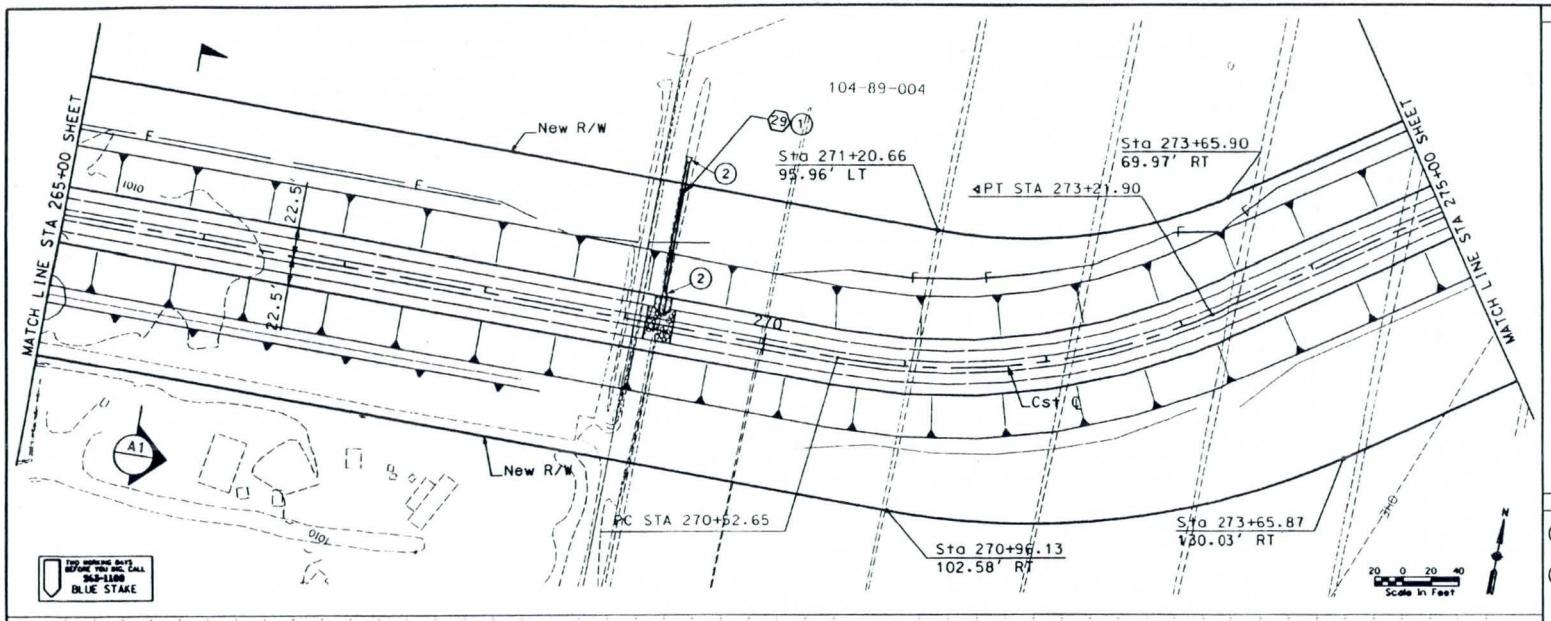
PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING

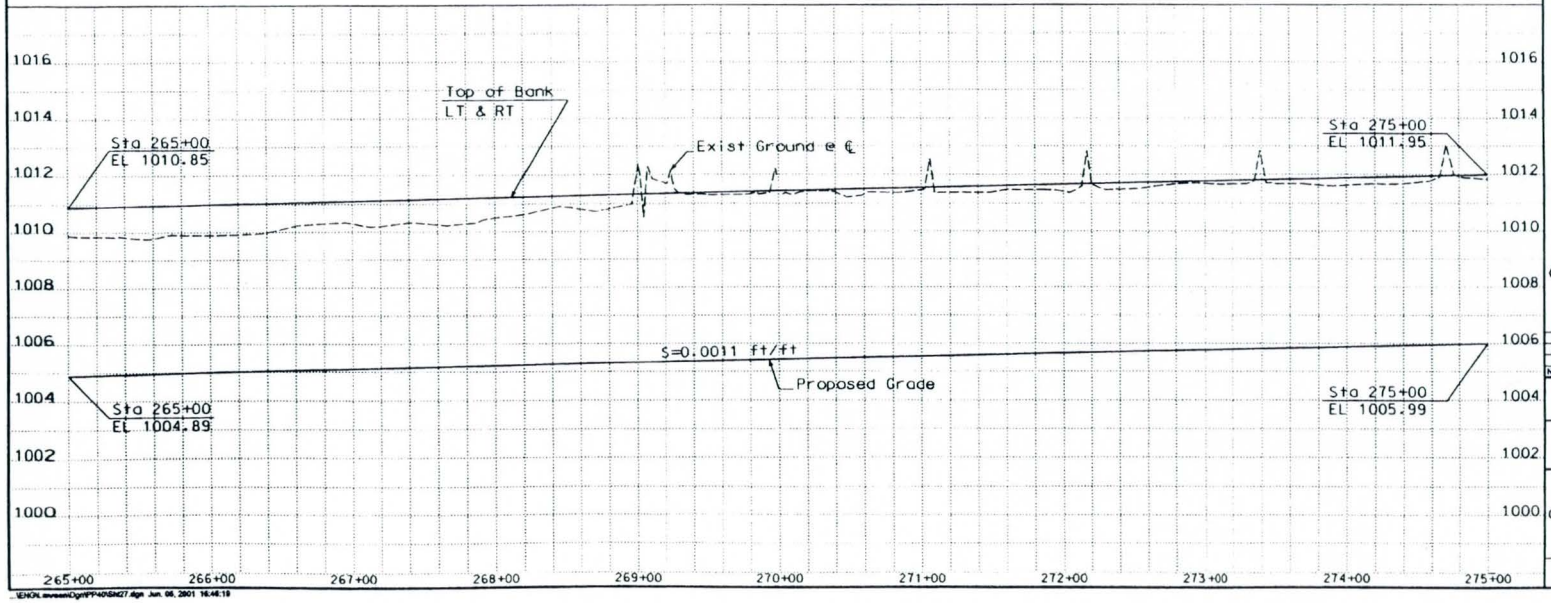
	BY	DATE
DESIGNED	MAL	05/01
DRAWN	FC	05/01
CHECKED		

DRAWING NO. C26

PLAN AND PROFILE
STA 255+00 TO STA 265+00

SHEET OF





REMOVE

CONSTRUCT

(1) INSTALL 30" PIPE -- LF

(2) INSTALL END SECTION PER MAG STD DTL 545 2 EA

⬡ FOR CONNECTOR PIPE SEE SHEET --

60% SUBMITTAL

NO.	REVISION	BY	DATE
3			
2			
1			

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

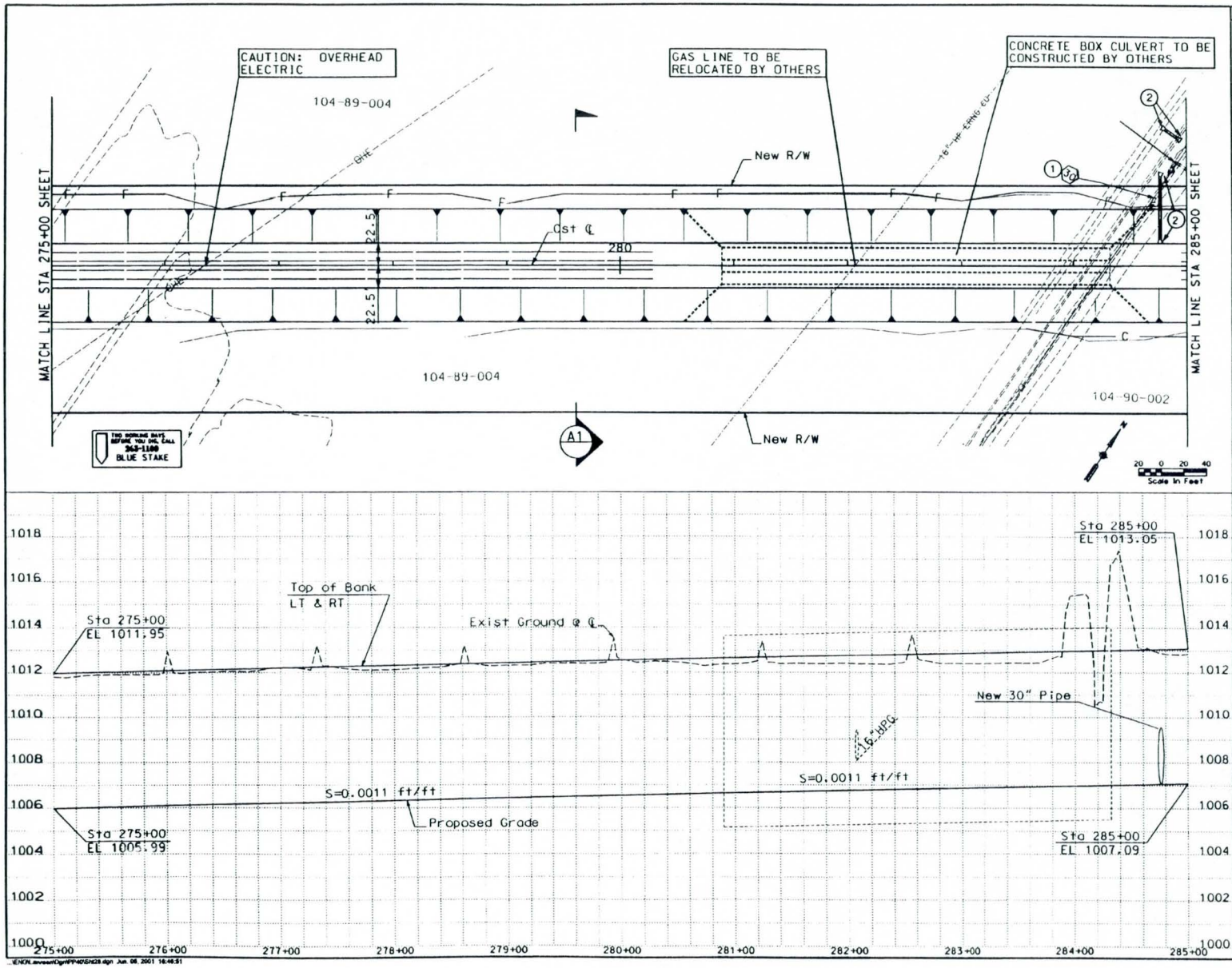
LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING		BY	DATE
	DESIGNED	MAL	05/01
	DRAWN	FC	05/01
	CHECKED		

DRAWING NO. C27

PLAN AND PROFILE
STA 265+00 TO STA 275+00

SHEET OF



REMOVE

CONSTRUCT

(1) INSTALL 30" PIPE -- LF

(2) INSTALL END SECTION PER MAG STD DTL 545 -- EA

⬡ FOR CONNECTOR PIPE SEE SHEET --

60% SUBMITTAL

NO.	REVISION	BY	DATE
3			
2			
1			

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 117083I
FCD CONTRACT NO.

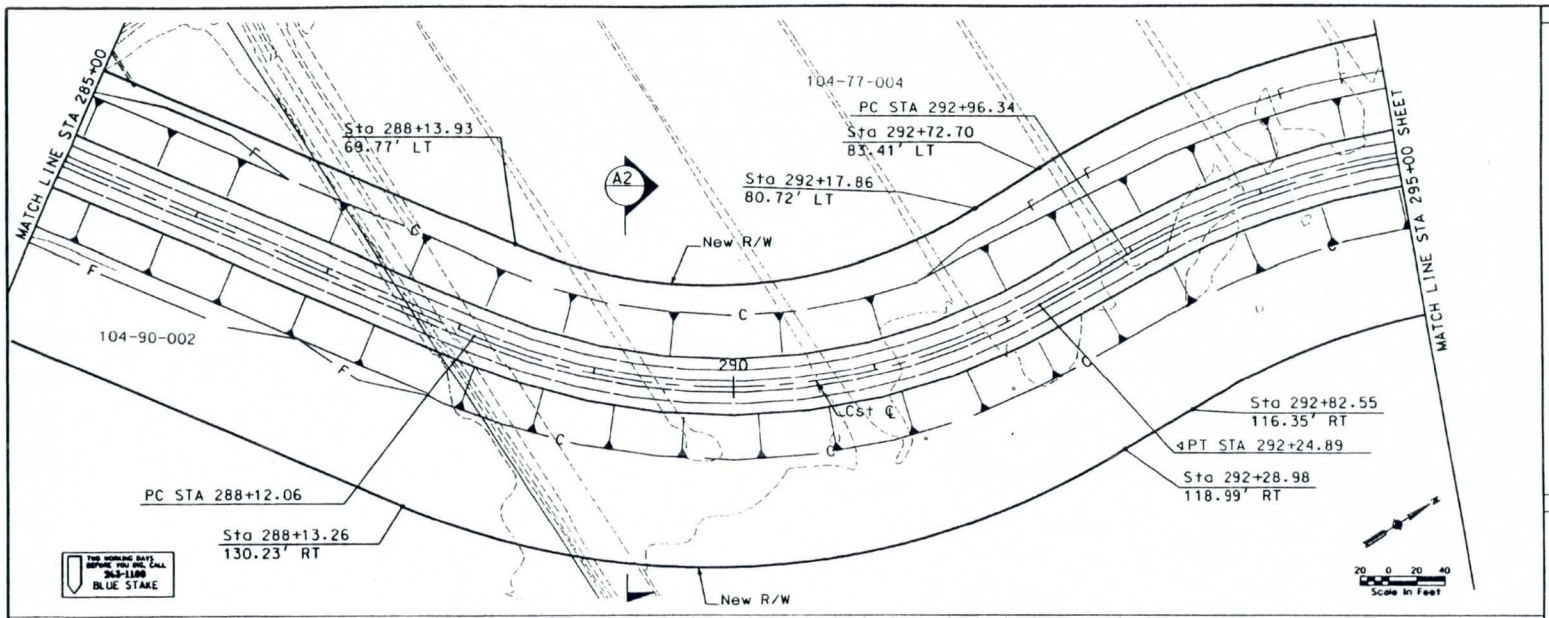
PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING

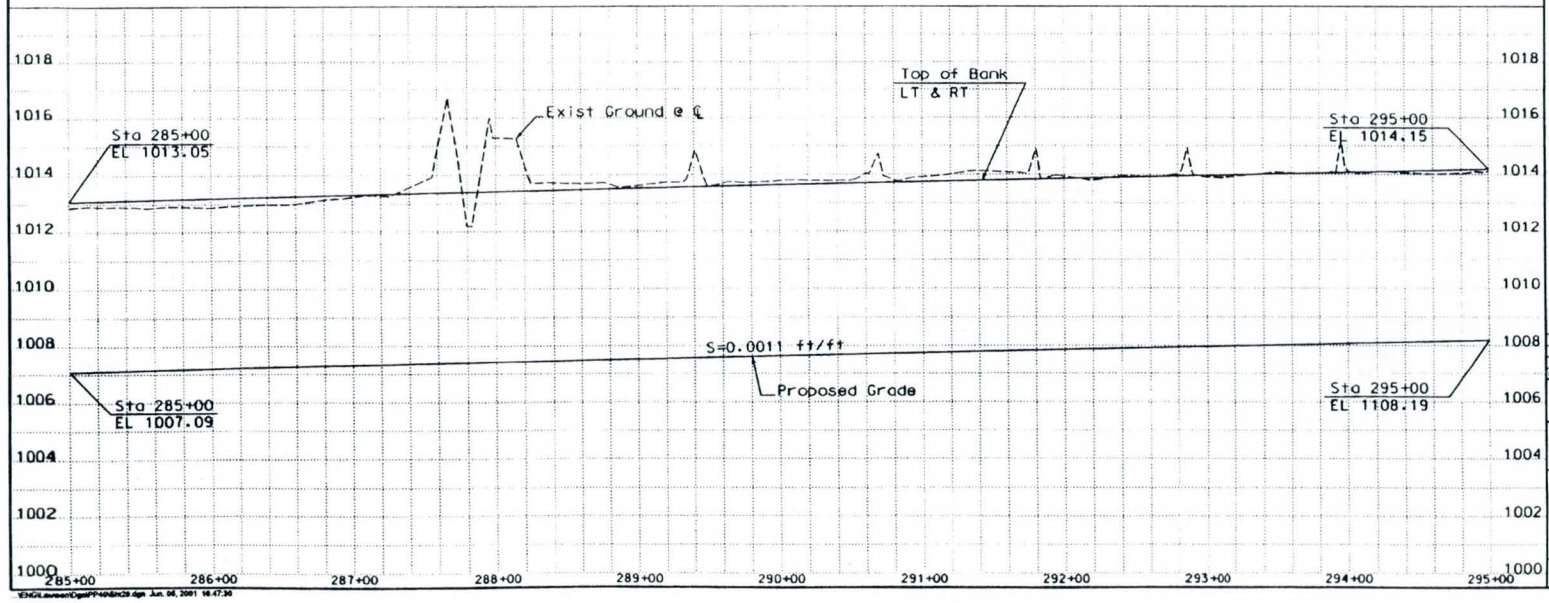
ORIGINALS	BY	DATE
DESIGNED	MAL	05/01
DRAWN	FC	05/01
CHECKED		

DRAWING NO. C2B

PLAN AND PROFILE
STA 275 TO STA 185

SHEET OF





REMOVE

CONSTRUCT

60% SUBMITTAL

NO.	REVISION	BY	DATE
3			
2			
1			

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

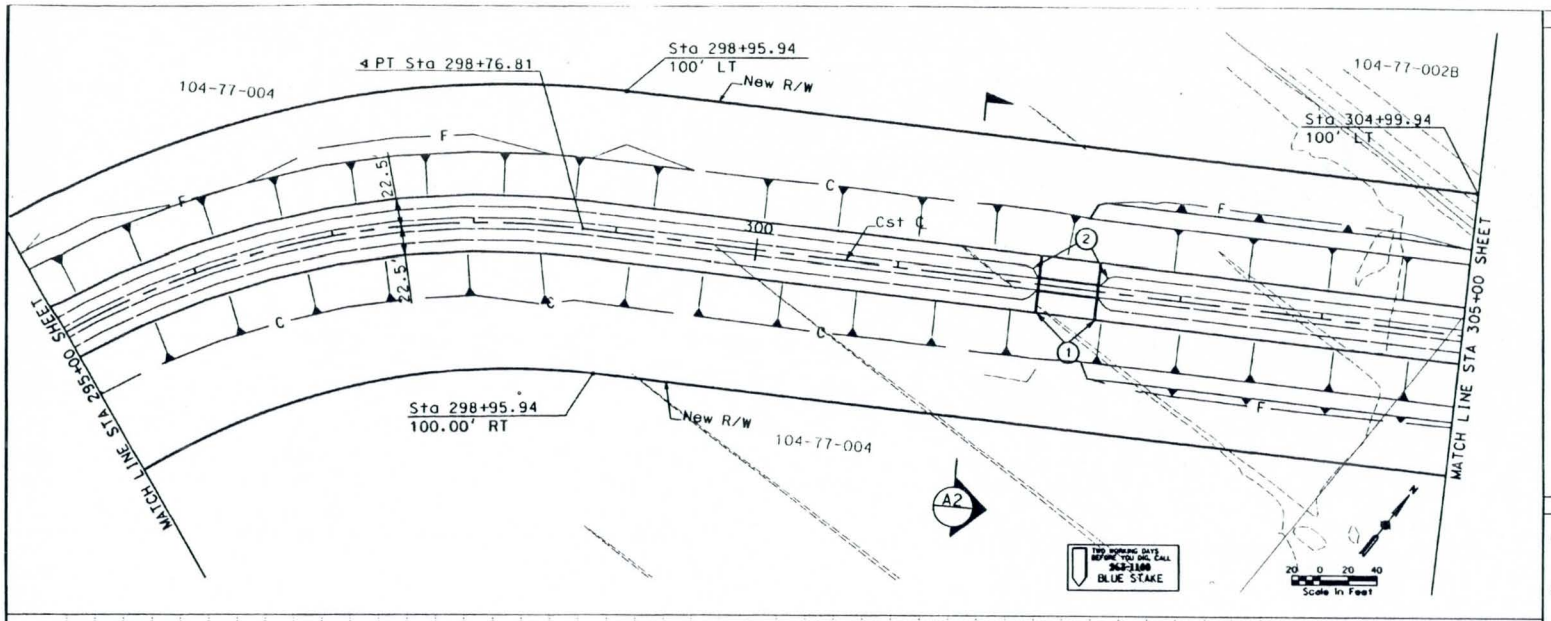
PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING

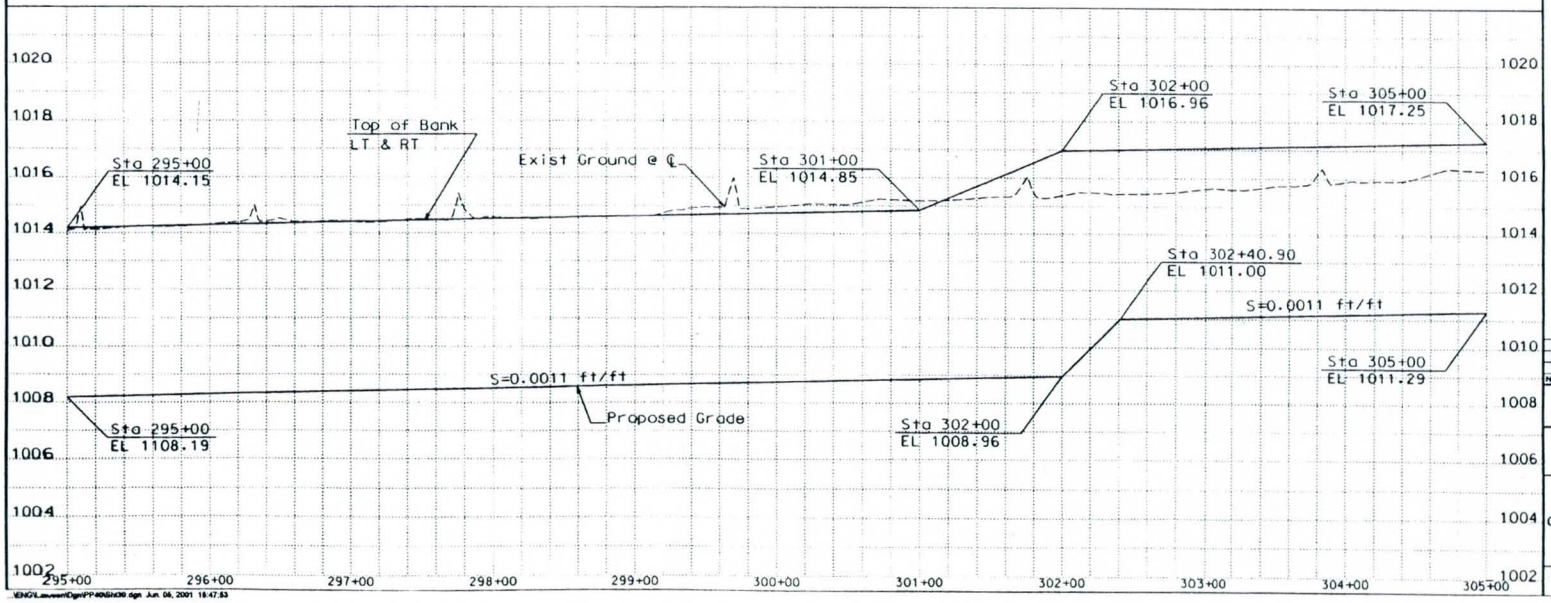
	BY	DATE
DESIGNED	MAL	05/01
DRAWN	FC	05/01
CHECKED		

DRAWING NO. C29

PLAN AND PROFILE
STA 285+00 STA 295+00

SHEET OF





REMOVE

CONSTRUCT

(1) CONSTRUCT DROP STRUCTURE NO.6
SEE DWG -- -- CY

(2) CONSTRUCT CONCRETE LOW FLOW
TRANSITION - SEE DTL -- -- CY

60% SUBMITTAL

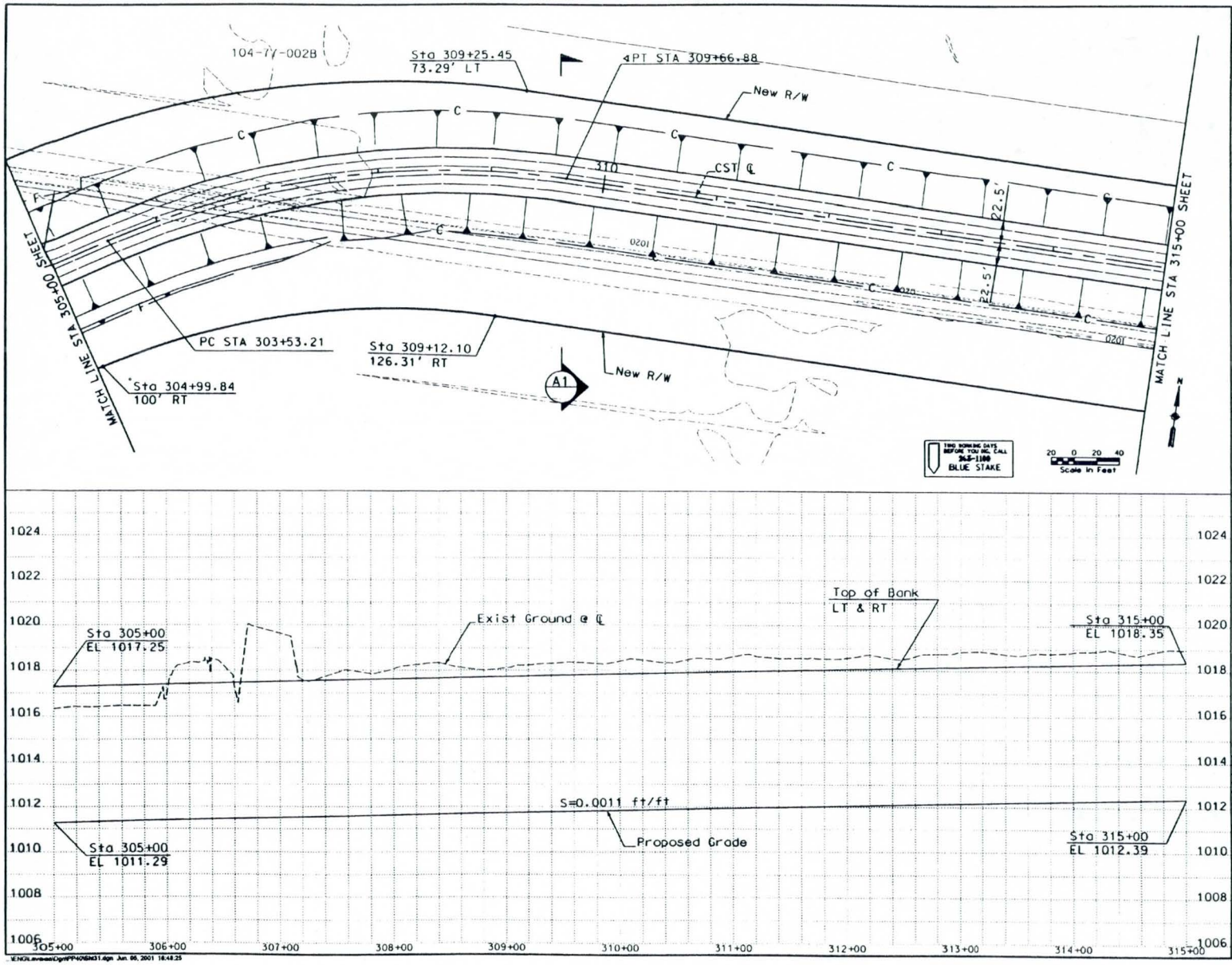
NO.	REVISION	BY	DATE
3			
2			
1			

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING		BY	DATE
	DESIGNED	MAL	05/01
	DRAWN	FC	05/01
	CHECKED		

DRAWING NO.		SHEET OF
C30	PLAN AND PROFILE STA 295+00 TO STA 305+00	



REMOVE

CONSTRUCT

60% SUBMITTAL

NO.	REVISION	BY	DATE
3			
2			
1			

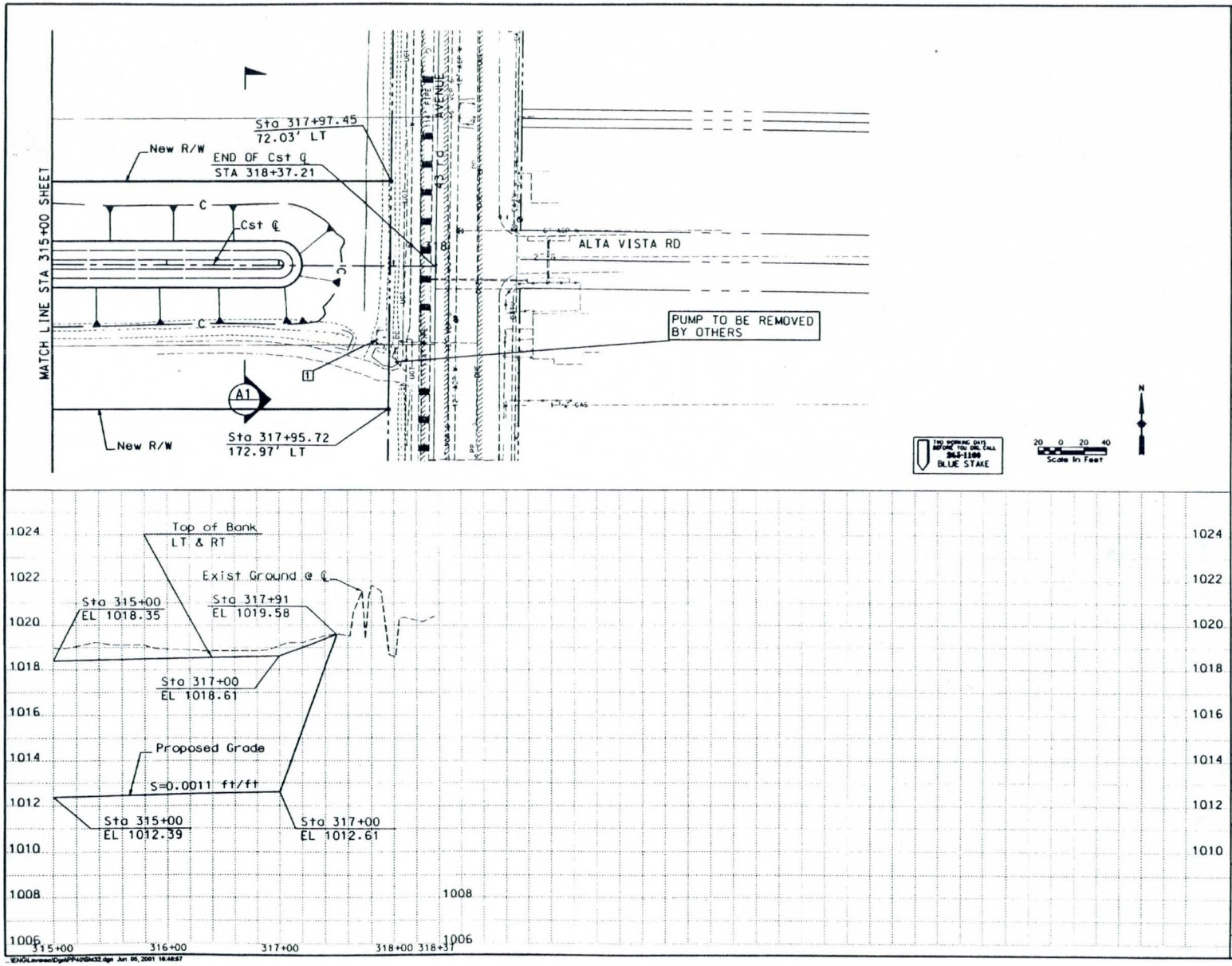
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING		BY	DATE
	DESIGNED	MAL	05/01
	DRAWN	FC	05/01
	CHECKED		

DRAWING NO.		SHEET OF
C31	PLAN AND PROFILE STA 305+00 TO STA 315+00	

\ENGL\Laveen\Dgn\PP405Sht31.dgn Jun. 06, 2001 16:48:25



REMOVE

1 REMOVE PIPE AND HDWL (NP)

CONSTRUCT

60% SUBMITTAL

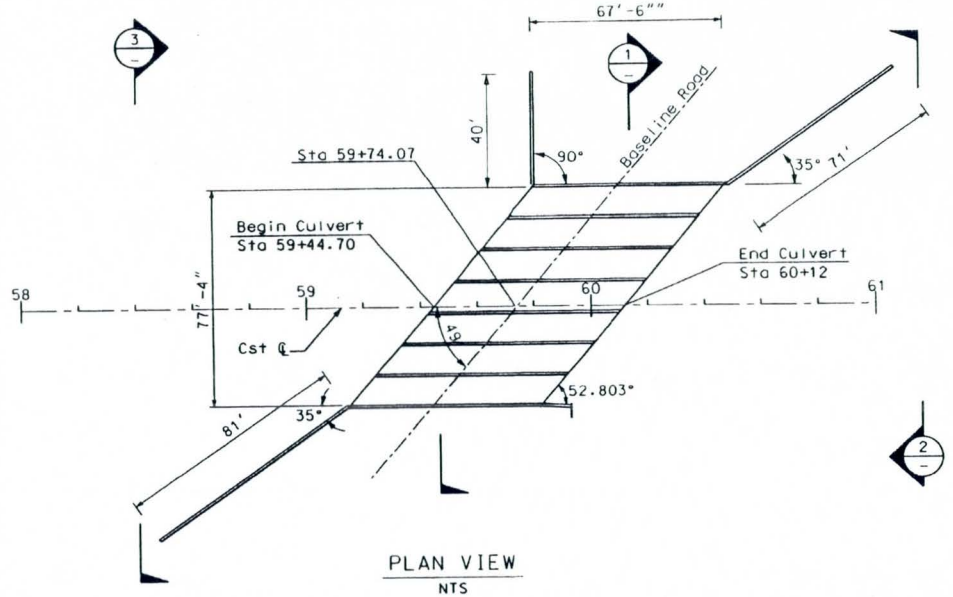
NO.	REVISION	BY	DATE
3			
2			
1			

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

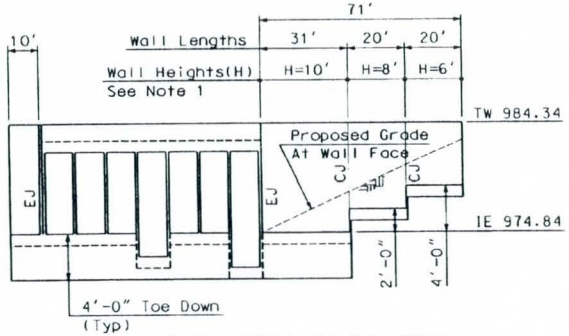
LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

PRELIMINARY NOT FOR CONSTRUCTION OR RECORDING		BY	DATE
	DESIGNED	MAL	05/01
	DRAWN	FC	05/01
	CHECKED		

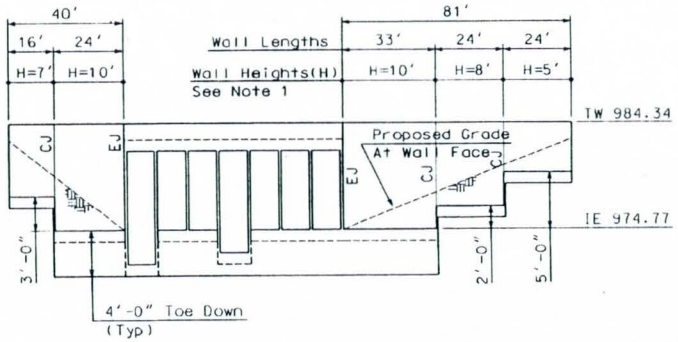
DRAWING NO.		SHEET OF
C32	PLAN AND PROFILE STA 315+00 TO STA 320+00	



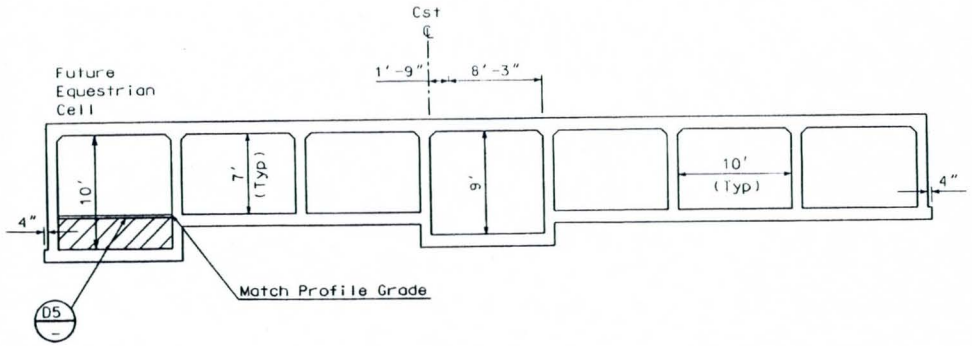
PLAN VIEW
NTS



ELEVATION INLET WING
Scale:
Horiz: 1"=20'
Vert: 1"=5'



ELEVATION OUTLET WING
Scale:
Horiz: 1"=20'
Vert: 1"=5'



SECTION
NTS

BOX CULVERT NO. 1

NOTE 1:

For typical dimensions and reinforcement details refer to Case II Level fill with 2' surcharge of ADOT B.18.20 and B.18.10 for specified wall heights. Actual wall height may vary and depends on top of wall elevations shown.

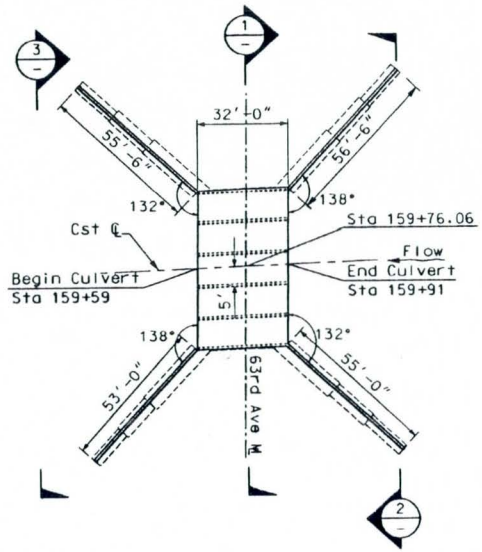
60% SUBMITTAL

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

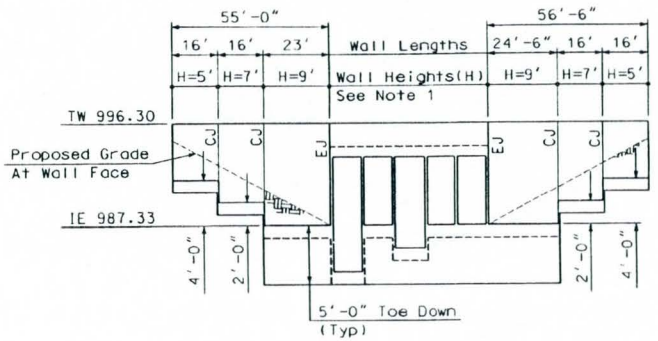
LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

		BY	DATE
PRELIMINARY NOT FOR CONSTRUCTION	DESIGNED	KVH	05/01
	DRAWN	FC	05/01
	CHECKED		

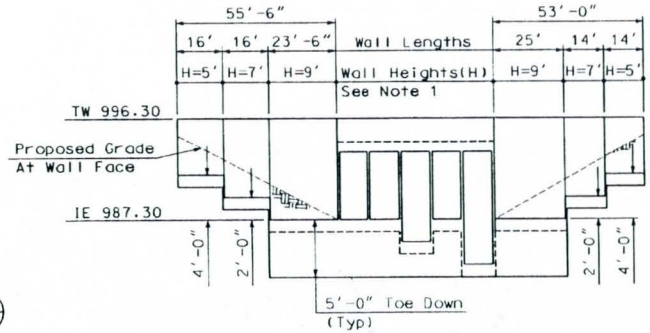
DRAWING NO.	BOX CULVERT NO. 1 DETAILS	SHEET OF
BI		



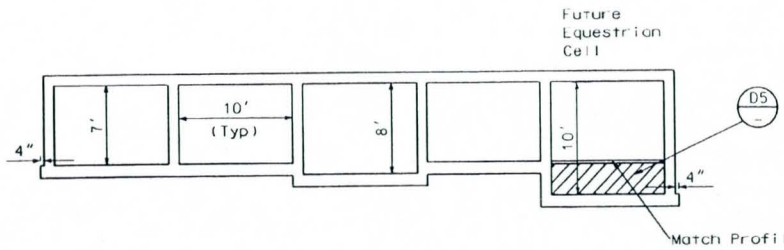
PLAN VIEW
NTS



2 ELEVATION INLET WING
Scale:
Horiz: 1"=20'
Vert: 1"=5'



3 ELEVATION OUTLET WING
Scale:
Horiz: 1"=20'
Vert: 1"=5'



1 SECTION
Scale:

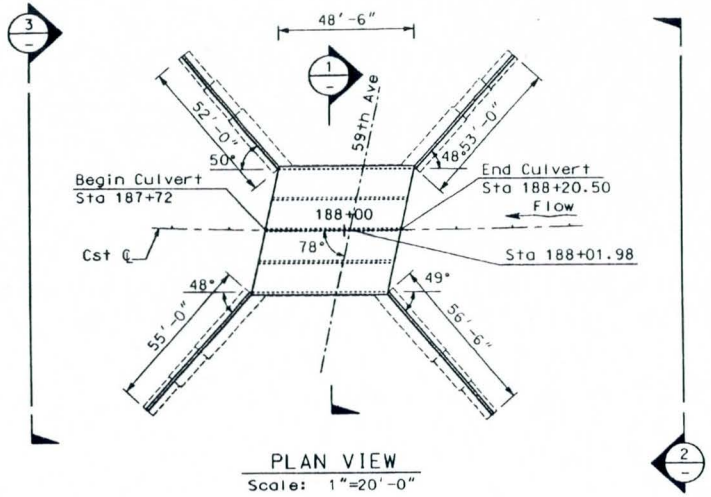
NOTE 1:

For typical dimensions and reinforcement details refer to Case II Level fill with 2' surcharge of ADOT B.18.20 and B.18.10 for specified wall heights. Actual wall height may vary and depends on top of wall elevations shown.

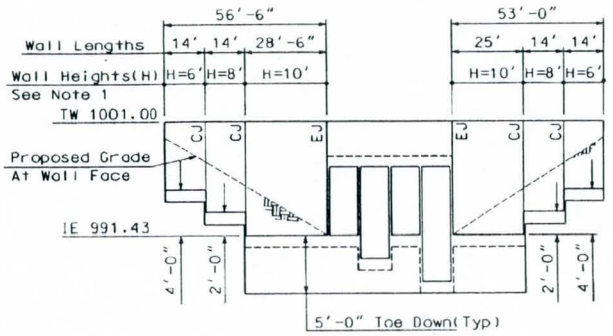
BOX CULVERT NO. 2

60% SUBMITTAL

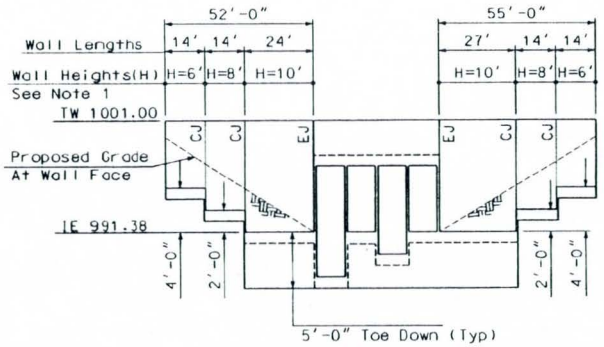
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY ENGINEERING DIVISION			
LAVEEN AREA CONVEYANCE CHANNEL FCD PROJECT NO. 1170831 FCD CONTRACT NO.			
PRELIMINARY NOT FOR CONSTRUCTION		BY	DATE
	DESIGNED	XVH	05/01
	DRAWN	FC	05/01
	CHECKED		
DRAWING NO. B2	BOX CULVERT DETAIL NO. 2		SHEET OF



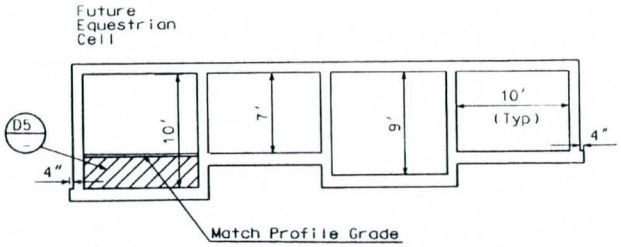
PLAN VIEW
Scale: 1"=20'-0"



ELEVATION INLET WING
Scale:
Horiz: 1"=20'
Vert: 1"=5'



ELEVATION OUTLET WING
Scale:
Horiz: 1"=20'
Vert: 1"=5'



SECTION
Scale: 1"=5'-0"

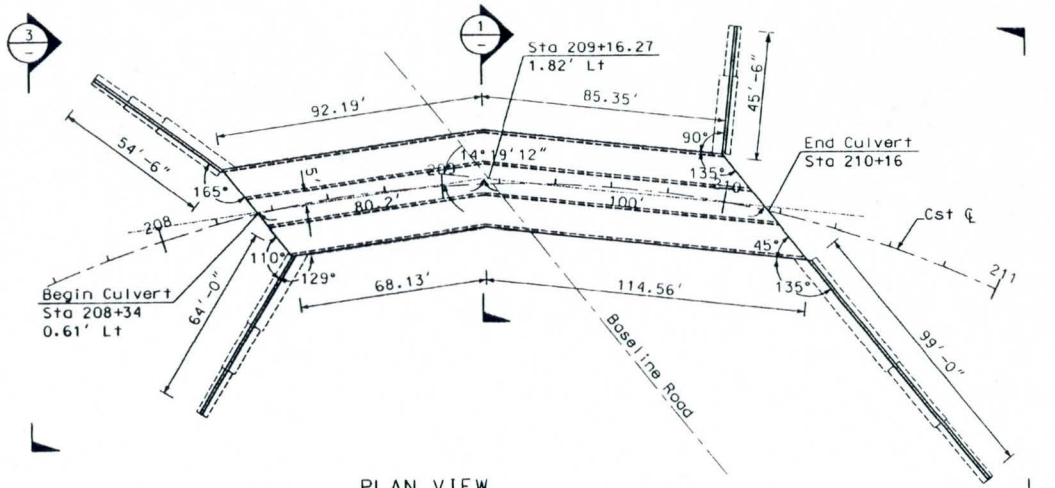
NOTE 1:

For typical dimensions and reinforcement details refer to Case II Level fill with 2' surcharge of ADOT B.18.20 and B.18.10 for specified wall heights. Actual wall height may vary and depends on top of wall elevations shown.

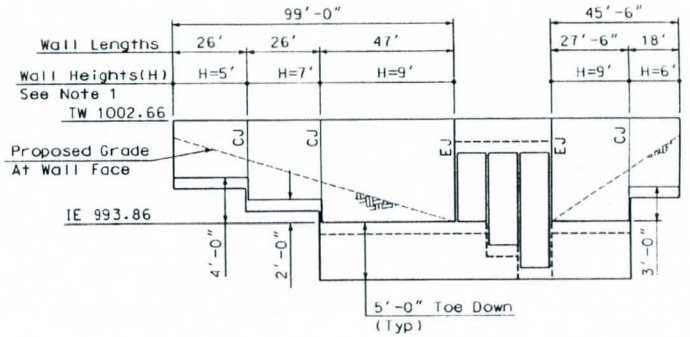
BOX CULVERT NO. 3

60% SUBMITTAL

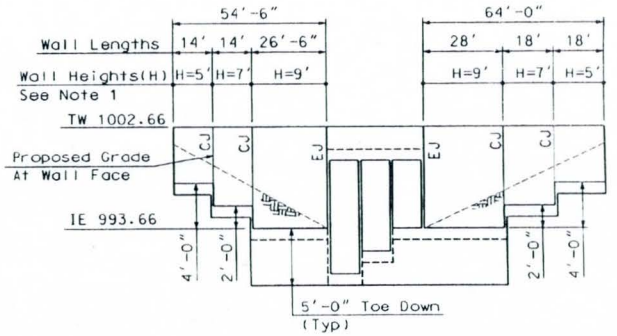
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY ENGINEERING DIVISION			
LAVEEN AREA CONVEYANCE CHANNEL FCD PROJECT NO. 1170831 FCD CONTRACT NO.			
		BY	DATE
PRELIMINARY NOT FOR CONSTRUCTION	DESIGNED	SKH	05/01
	DRAWN	FC	05/01
	CHECKED		
DRAWING NO. B3	BOX CULVERT NO. 3 DETAILS		SHEET OF



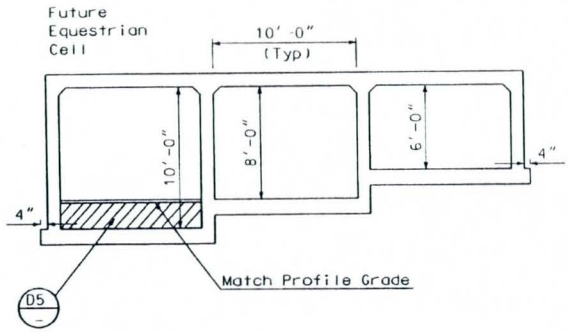
PLAN VIEW
NTS



2 ELEVATION INLET WING
Scale:
Horiz: 1"=20'
Vert: 1"=5'



3 ELEVATION OUTLET WING
Scale:
Horiz: 1"=20'
Vert: 1"=5'



1 SECTION
Scale: 1/4"= 1'

NOTE 1:

For typical dimensions and reinforcement details refer to Case II Level fill with 2' surcharge of ADOT B.18.20 and B.18.10 for specified wall heights. Actual wall height may vary and depends on top of wall elevations shown.

60% SUBMITTAL

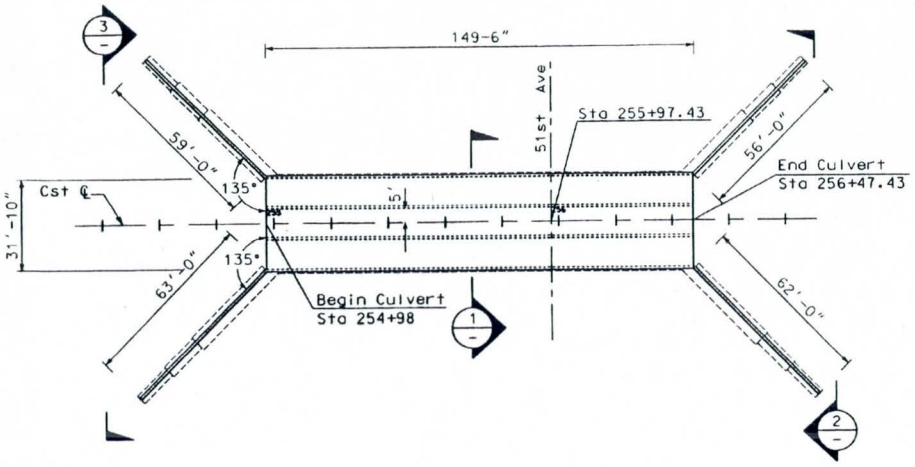
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

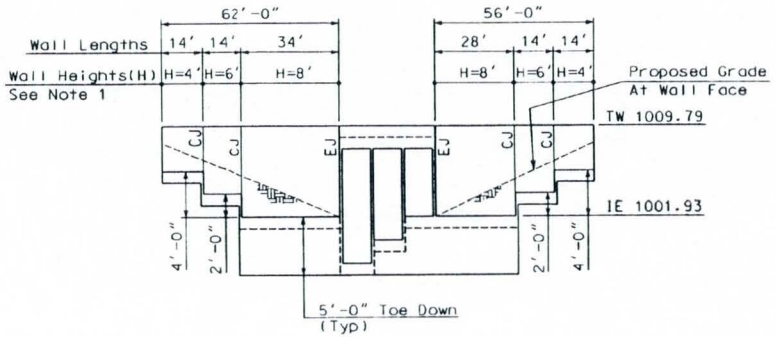
PRELIMINARY NOT FOR CONSTRUCTION		BY	DATE
	DESIGNED	SKH	05/01
	DRAWN	FC	05/01
	CHECKED		

DRAWING NO.		SHEET
B4	BOX CULVERT NO. 4 DETAILS	OF

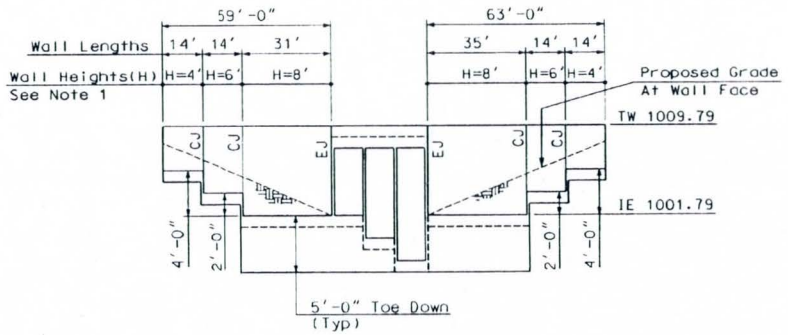
BOX CULVERT NO. 4



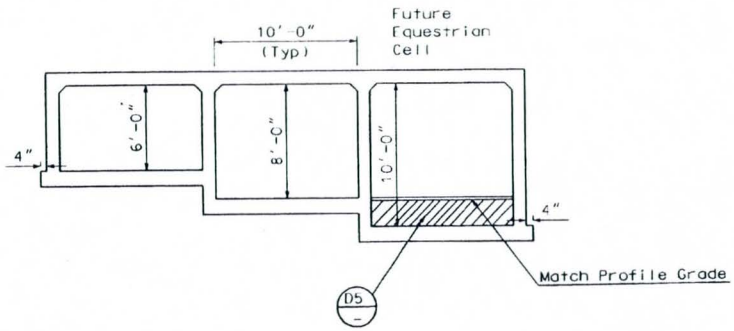
PLAN VIEW
NTS



2 ELEVATION INLET WING
Scale:
Horiz: 1"=20'
Vert: 1"=5'



3 ELEVATION OUTLET WING
Scale:
Horiz: 1"=20'
Vert: 1"=5'



1 SECTION
Scale: 1/4"= 1'

NOTE 1:

For typical dimensions and reinforcement details refer to Case II Level fill with 2' surcharge of ADOT B.18.20 and B.18.10 for specified wall heights. Actual wall height may vary and depends on top of wall elevations shown.

60% SUBMITTAL

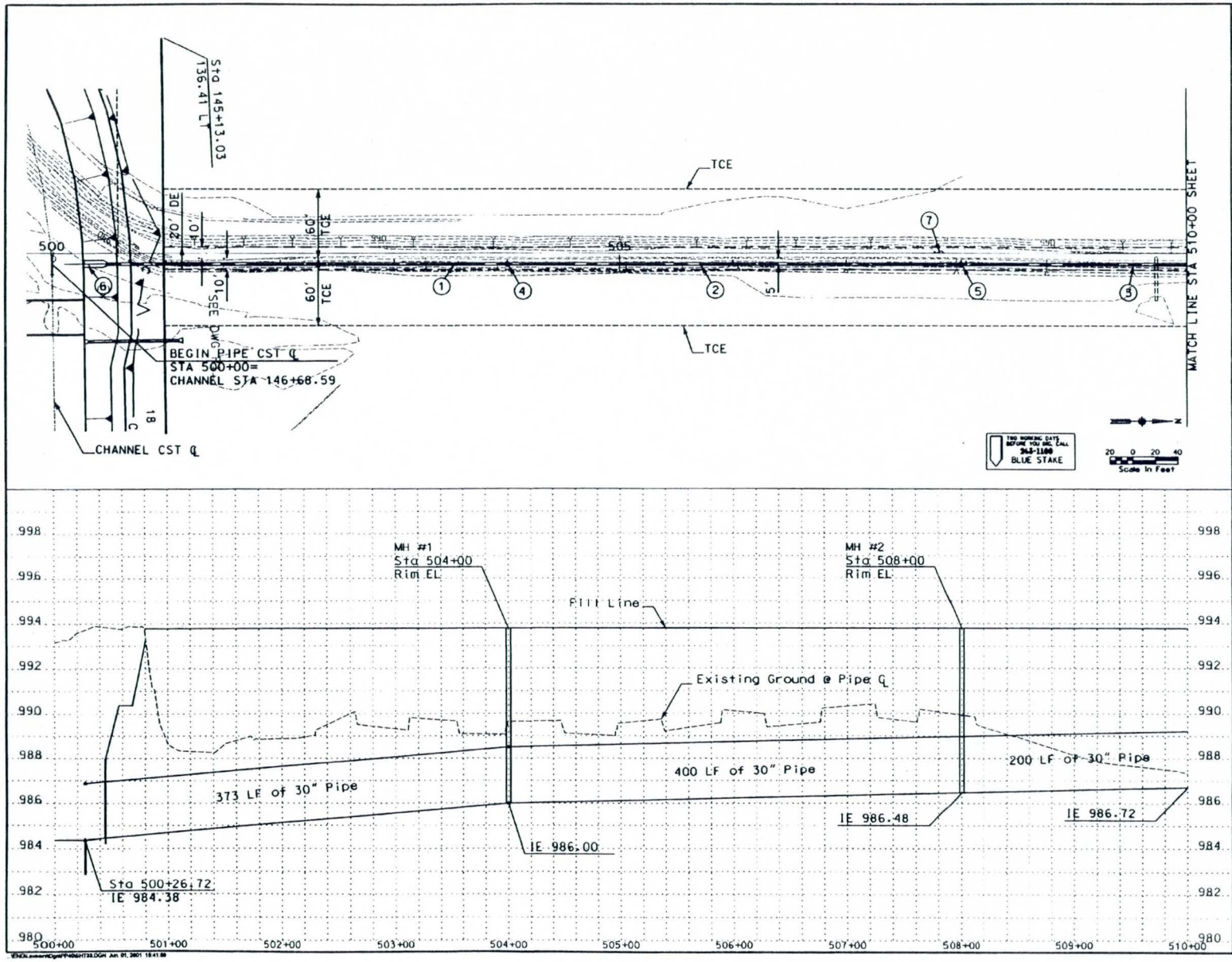
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

		BY	DATE
PRELIMINARY NOT FOR CONSTRUCTION	DESIGNED	KVH	05/01
	DRAWN	FC	05/01
	CHECKED		

DRAWING NO.		SHEET
B5	BOX CULVERT NO. 5 DETAILS	OF

BOX CULVERT NO. 5



☐ REMOVE ☐

○ CONSTRUCT ○

INSTALL NEW STORM DRAIN PIPE

NO.	STATION TO STATION	DIAMETER INCHES	LENGTH FEET
(1)	500+26.72 TO 504+00	30	373
(2)	504+00 TO 508+00	30	400
(3)	508+00 TO 510+00	30	200

INSTALL NEW STORM DRAIN MANHOLE

NO.	STATION	BASE DETAIL	SHAFT DETAIL	COVER DETAIL
(4)	504+00			
(5)	508+00			

(6) CONSTRUCT HEADWALL

(7) BACKFILL & COMPACT EXISTING DRAIN.

60% SUBMITTAL

NO.	REVISION	BY	DATE
3			
2			
1			

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

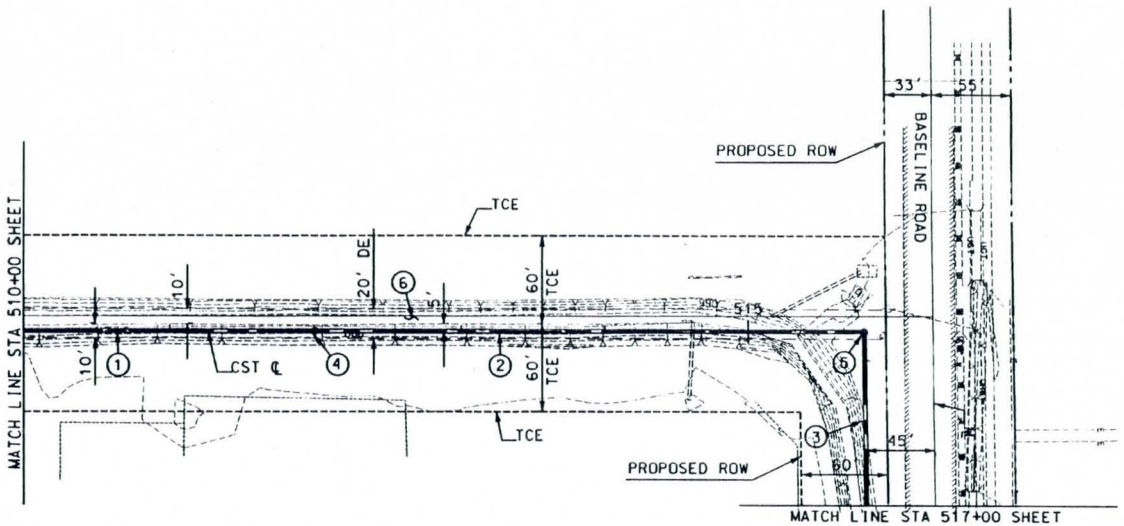
LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

	BY	DATE
DESIGNED	JRR	05/01
DRAWN	FC	05/01
CHECKED		

DRAWING NO. P1

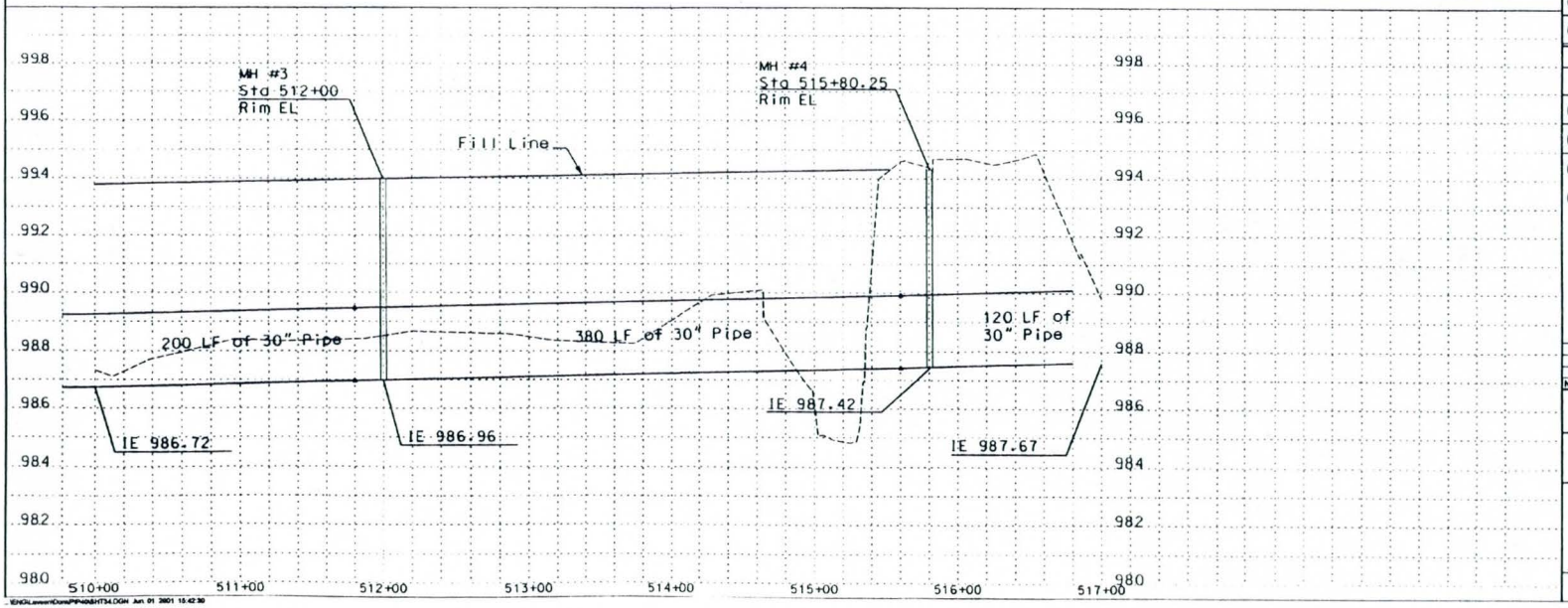
PLAN AND PROFILE
STA 10+00 TO STA 320+00

SHEET OF 1 100



TWO WORKING DAYS BEFORE YOU DIG CALL 263-1100 BLUE STAKE

20 0 20 40 Scale In Feet



☐ REMOVE ☐

○ CONSTRUCT ○

INSTALL NEW STORM DRAIN PIPE

NO.	STATION TO STATION	DIAMETER INCHES	LENGTH FEET
(1)	510+00 TO 512+00	30	200
(2)	512+00 TO 515+80.25	30	380
(3)	515+80.25 TO 517+00	30	120

INSTALL NEW STORM DRAIN MANHOLE

NO.	STATION	BASE DETAIL	SHAFT DETAIL	COVER DETAIL
(4)	512+00			
(5)	515+80.25			

(6) CONSTRUCT HEADWALL

(7)

60% SUBMITTAL

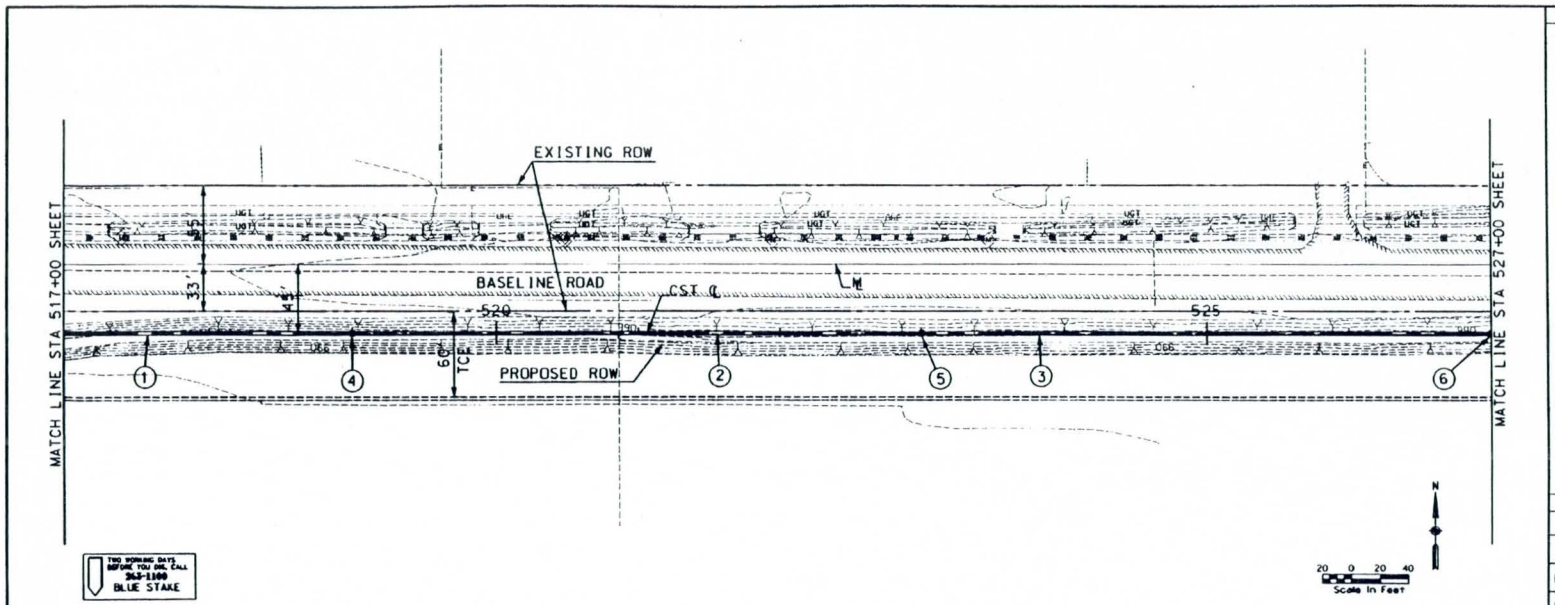
NO.	REVISION	BY	DATE
3			
2			
1			

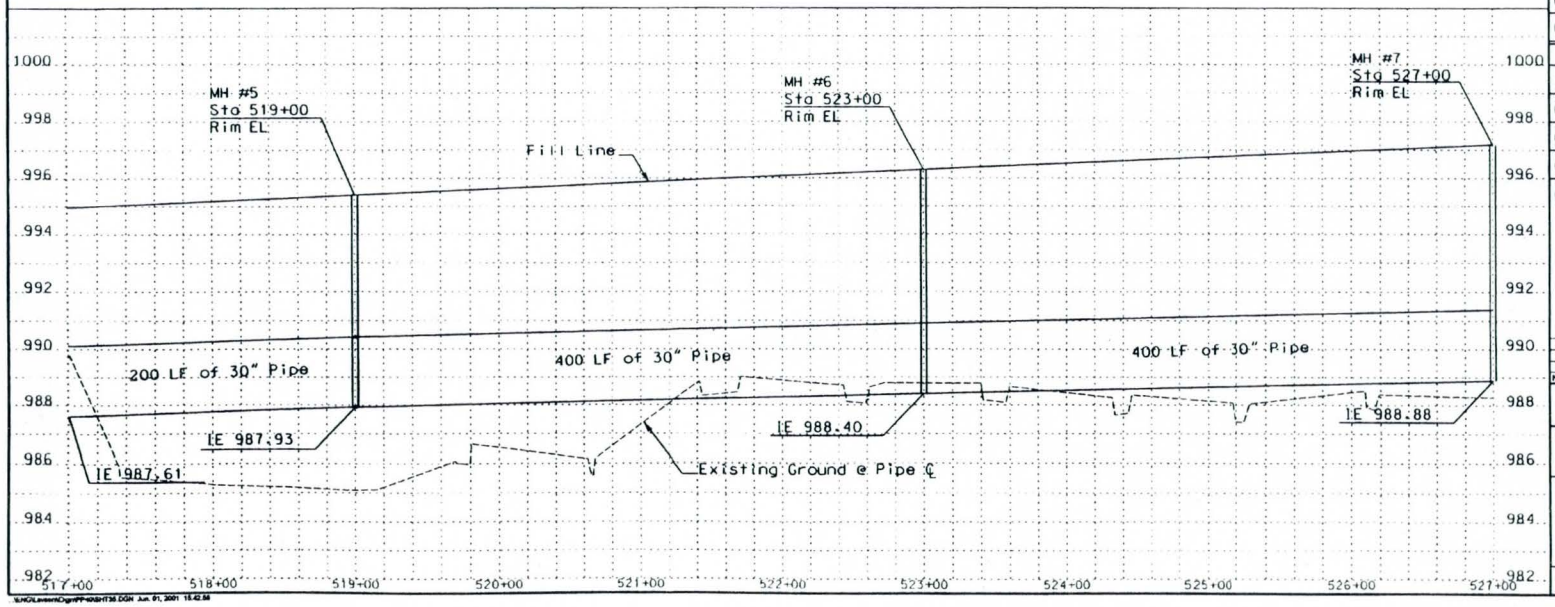
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

	BY	DATE
DESIGNED	JRR	05/01
DRAWN	FC	05/01
CHECKED		

DRAWING NO. P2 | PLAN AND PROFILE STA 10+00 TO STA 320+00 | SHEET OF 1 100





☐ REMOVE ☐

○ CONSTRUCT ○

INSTALL NEW STORM DRAIN PIPE

NO.	STATION TO STATION	DIAMETER INCHES	LENGTH FEET
1	517+00 TO 519+00	30	200
2	519+00 TO 523+00	30	400
3	523+00 TO 527+00	30	400

INSTALL NEW STORM DRAIN MANHOLE

NO.	STATION	BASE DETAIL	SHAFT DETAIL	COVER DETAIL
4	519+00			
5	523+00			
6	527+00			
7				

60% SUBMITTAL

NO.	REVISION	BY	DATE
3			
2			
1			

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

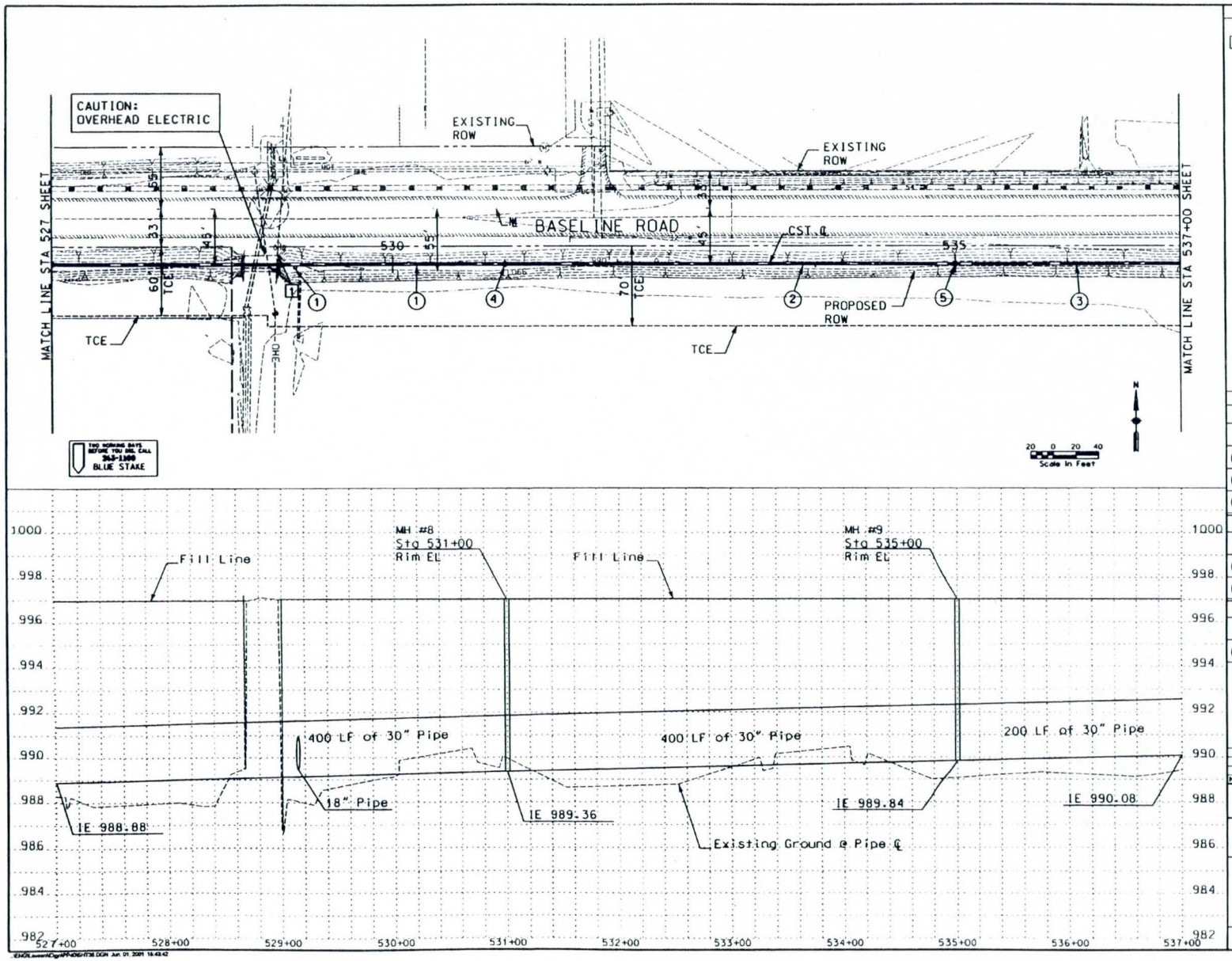
LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

	BY	DATE
DESIGNED	JRR	05/01
DRAWN	FC	05/01
CHECKED		

DRAWING NO. P3

PLAN AND PROFILE
STA 10+00 TO STA 320+00

SHEET OF 1 100



☐ REMOVE ☐

[1] REMOVE CULVERT AND HEADWALLS

◯ CONSTRUCT ◯

INSTALL NEW STORM DRAIN PIPE

NO.	STATION TO STATION	DIAMETER INCHES	LENGTH FEET
(1)	527+00 TO 531+00	30	400
(2)	531+00 TO 535+00	30	400
(3)	535+00 TO 537+00	30	400

INSTALL NEW STORM DRAIN MANHOLE

NO.	STATION	BASE DETAIL	SHAFT DETAIL	COVER DETAIL
(4)	531+00			
(5)	535+00			

INSTALL PREFAB FITTING

NO.	STATION	TYPE	SIZE
(6)	529+14	TEE	30" x 18"

60% SUBMITTAL

NO.	REVISION	BY	DATE
3			
2			
1			

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

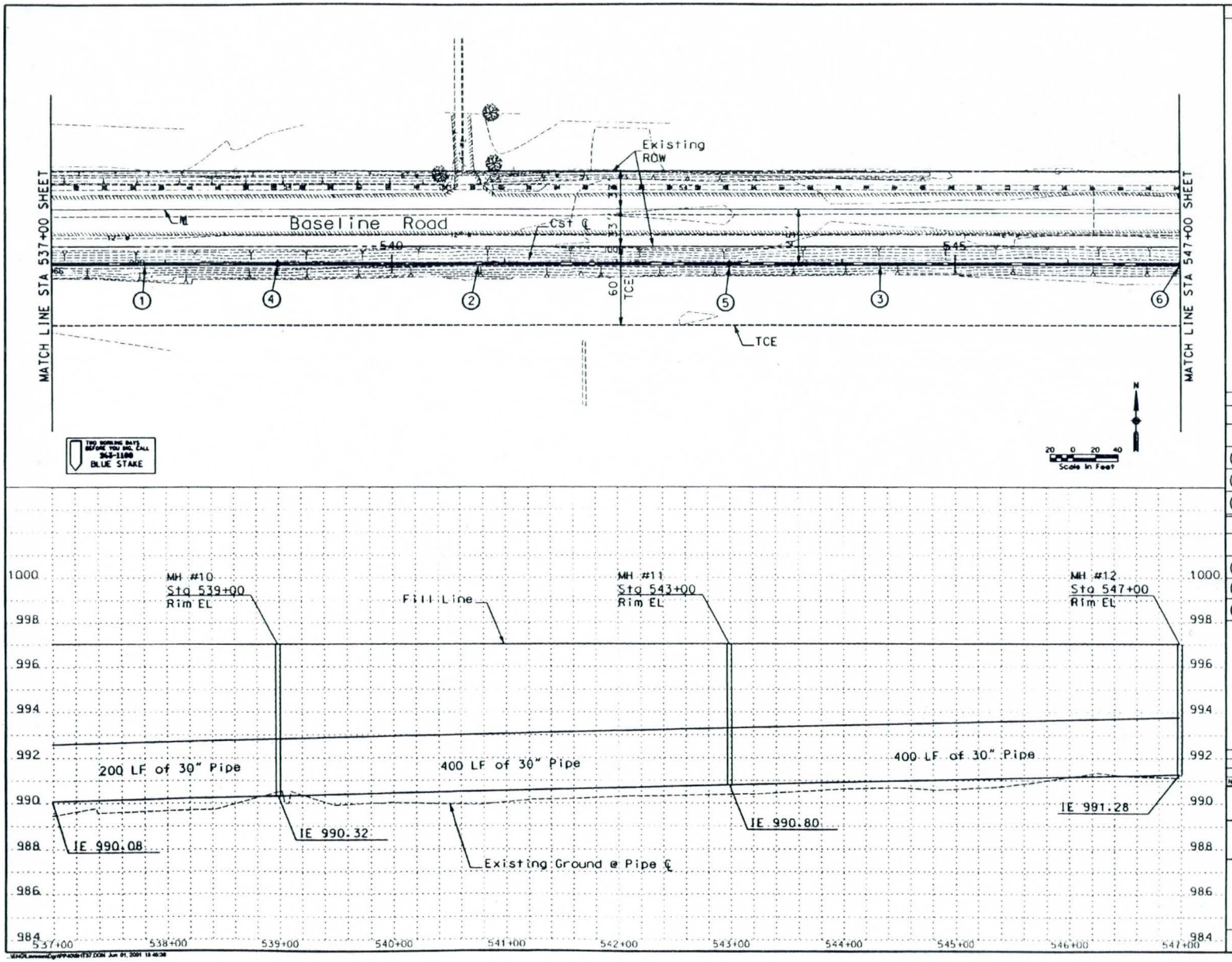
LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 170831
FCD CONTRACT NO.

	BY	DATE
DESIGNED	JRR	05/01
DRAWN	FC	05/01
CHECKED		

DRAWING NO. P4

PLAN AND PROFILE
STA 10+00 TO STA 320+00

SHEET OF 1 100



☐ REMOVE ☐

○ CONSTRUCT ○

INSTALL NEW STORM DRAIN PIPE

NO.	STATION TO STATION	DIAMETER INCHES	LENGTH FEET
1	537+00 TO 539+00	30	200
2	539+00 TO 543+00	30	400
3	543+00 TO 547+00	30	400

INSTALL NEW STORM DRAIN MANHOLE

NO.	STATION	BASE DETAIL	SHAFT DETAIL	COVER DETAIL
4	539+00			
5	543+00			
6	547+00			

60% SUBMITTAL

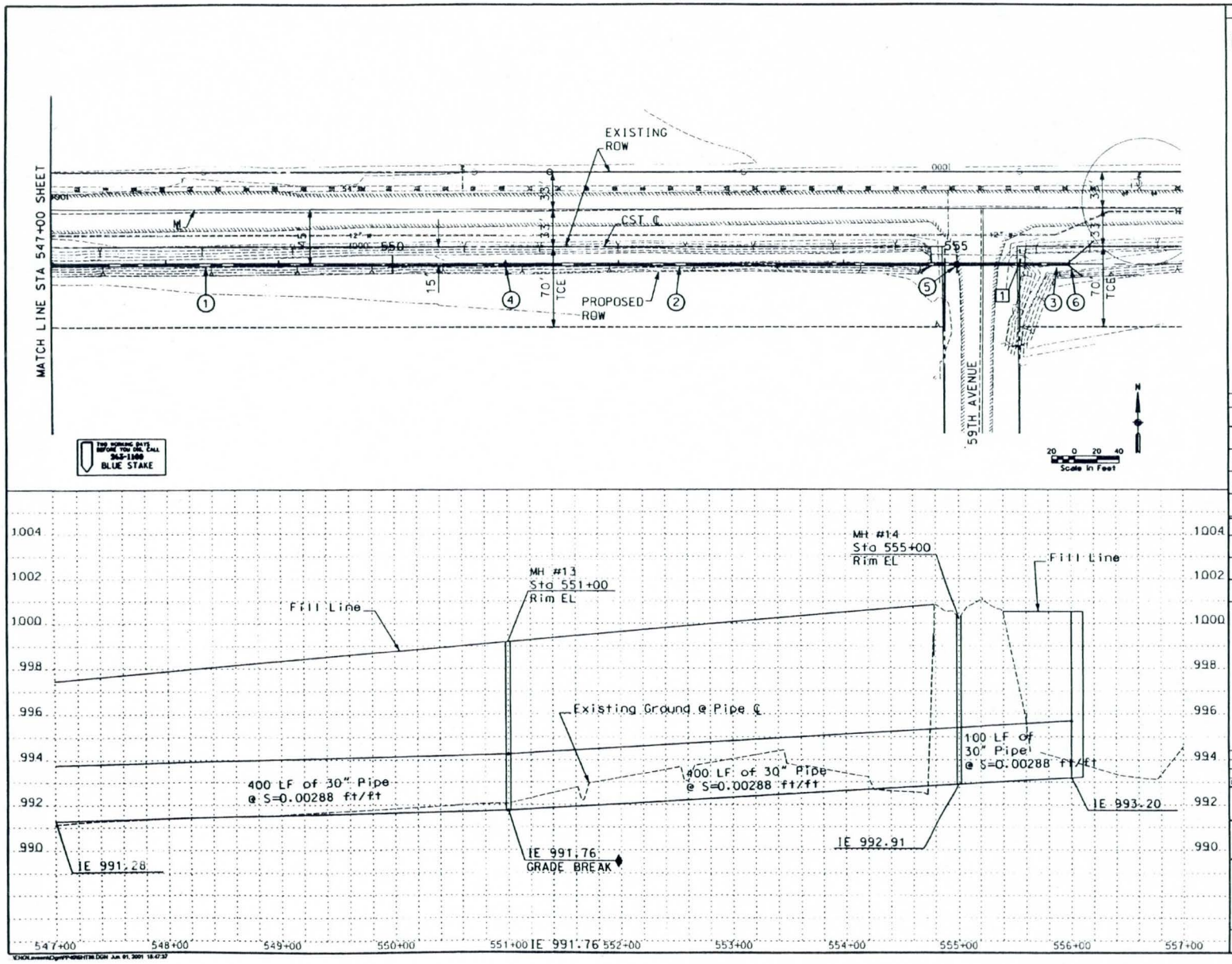
NO.	REVISION	BY	DATE
3			
2			
1			

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

	BY	DATE
DESIGNED	JRR	05/01
DRAWN	FC	05/01
CHECKED		

DRAWING NO.		SHEET OF
P5	PLAN AND PROFILE STA 10+00 TO STA 320+00	1 100



☐ REMOVE ☐

[1] REMOVE CULVERT AND HEADWALLS

○ CONSTRUCT ○

INSTALL NEW STORM DRAIN PIPE

NO.	STATION TO STATION	DIAMETER INCHES	LENGTH FEET
(1)	547+00 TO 551+00	30	400
(2)	551+00 TO 555+00	30	400
(3)	555+00 TO 556+00	30	100

INSTALL NEW STORM DRAIN MANHOLE

NO.	STATION	BASE DETAIL	SHAFT DETAIL	COVER DETAIL
(4)	551+00			
(5)	555+00			

(6) CONSTRUCT HEADWALL MAG DET 501-1

60% SUBMITTAL

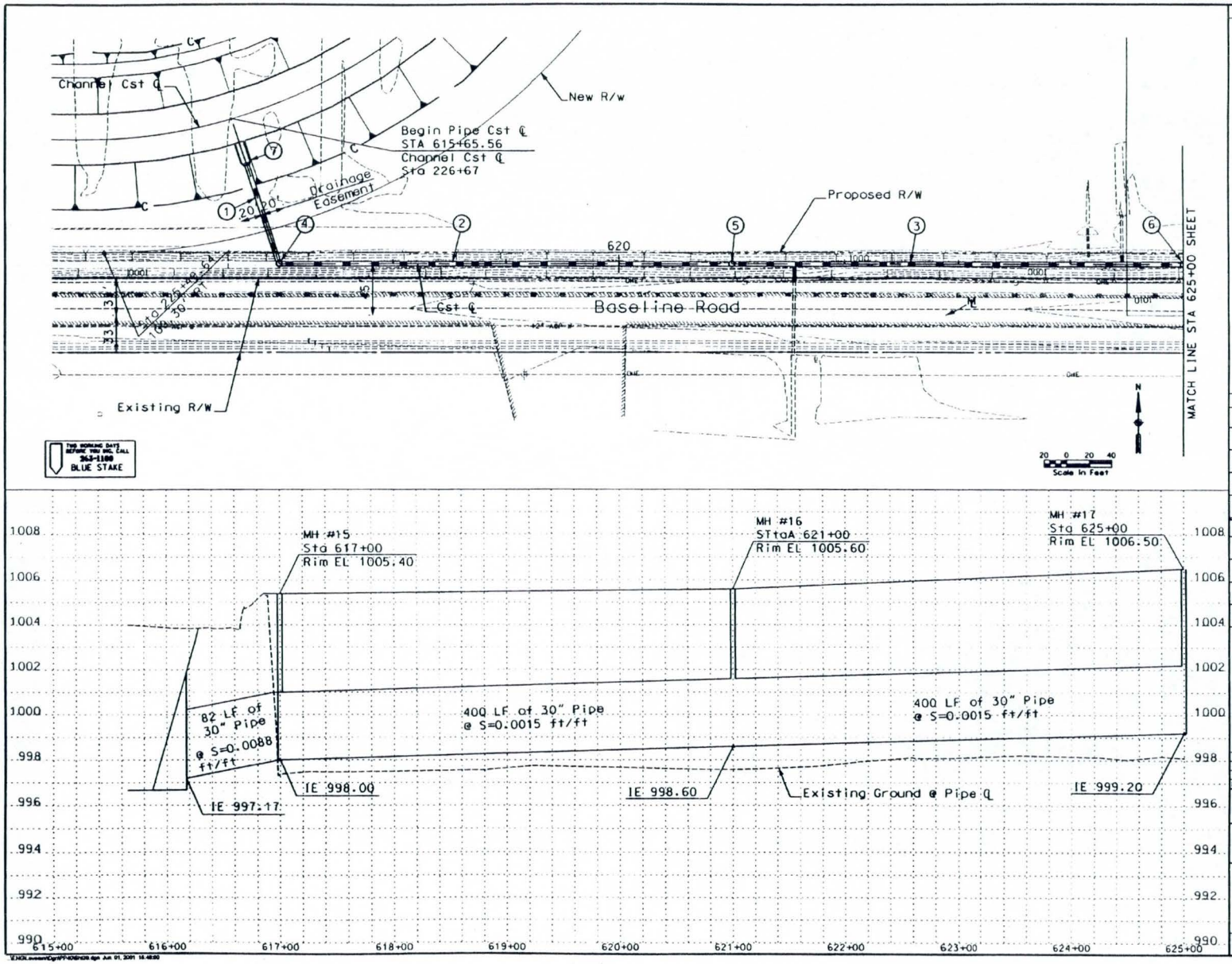
NO.	REVISION	BY	DATE
3			
2			
1			

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

	BY	DATE
DESIGNED	JRR	05/01
DRAWN	FC	05/01
CHECKED		

DRAWING NO.		SHEET OF
P6	PLAN AND PROFILE STA 10+00 TO STA 320+00	1 100



☐ REMOVE ☐

○ CONSTRUCT ○

INSTALL NEW STORM DRAIN PIPE

NO.	STATION TO STATION	DIAMETER INCHES	LENGTH FEET
(1)	616+18 TO 617+00	30	82
(2)	617+00 TO 621+00	30	400
(3)	621+00 TO 625+00	30	400

INSTALL NEW STORM DRAIN MANHOLE

NO.	STATION	BASE DETAIL	SHAFT DETAIL	COVER DETAIL
(4)	617+00			
(5)	621+00			
(6)	625+00			

(7) CONSTRUCT HEADWALL

60% SUBMITTAL

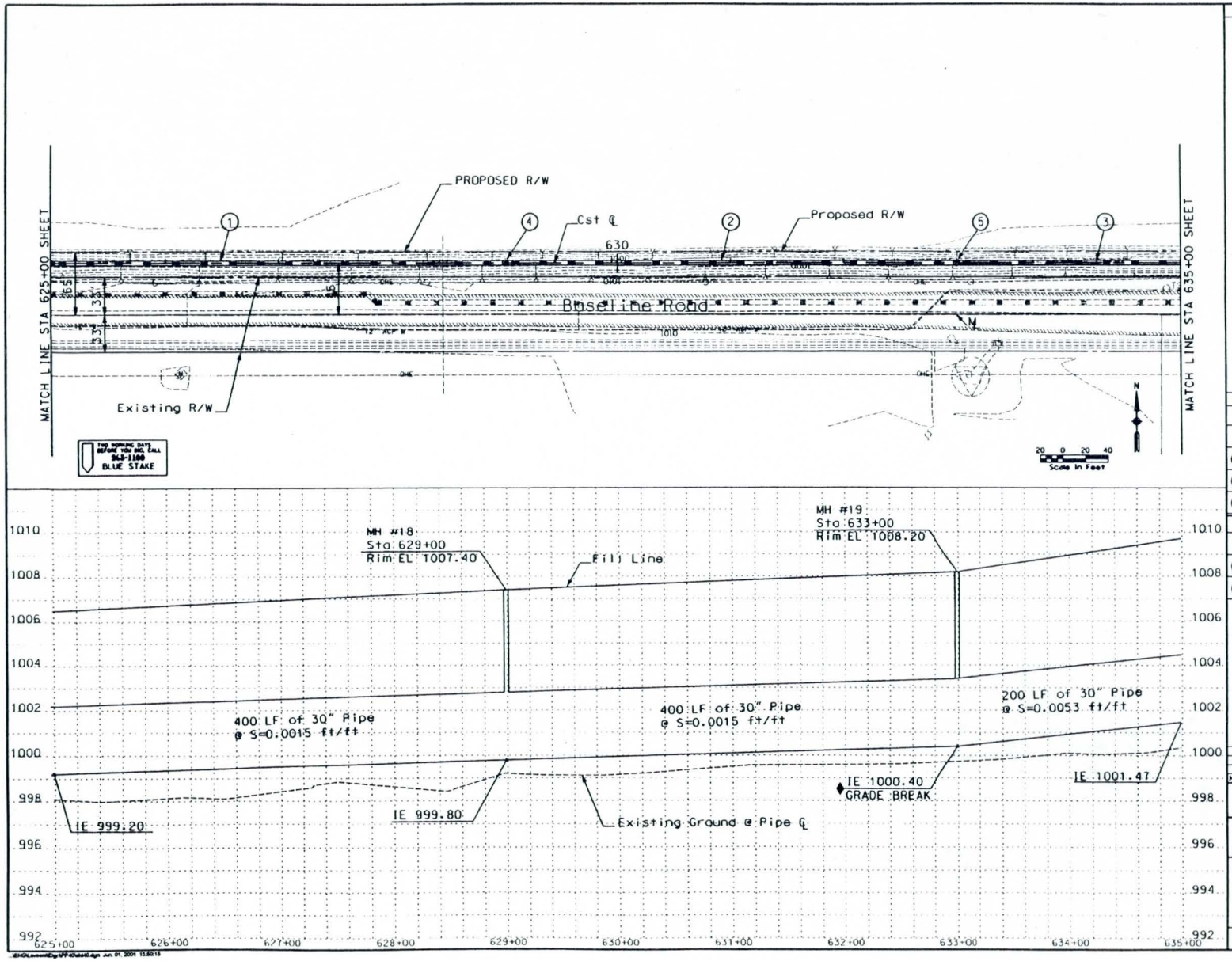
NO.	REVISION	BY	DATE
3			
2			
1			

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

	BY	DATE
DESIGNED	JRR	05/01
DRAWN	FC	05/01
CHECKED		

DRAWING NO. P7 | PLAN AND PROFILE STA 10+00 TO STA 320+00 | SHEET OF 1 100



☐ REMOVE ☐

○ CONSTRUCT ○

INSTALL NEW STORM DRAIN PIPE

NO.	STATION TO STATION	DIAMETER INCHES	LENGTH FEET
①	625+00 TO 629+00	30	400
②	629+00 TO 633+00	30	400
③	633+00 TO 635+00	30	200

INSTALL NEW STORM DRAIN MANHOLE

NO.	STATION	BASE DETAIL	SHAFT DETAIL	COVER DETAIL
④	629+00			
⑤	633+00			

60% SUBMITTAL

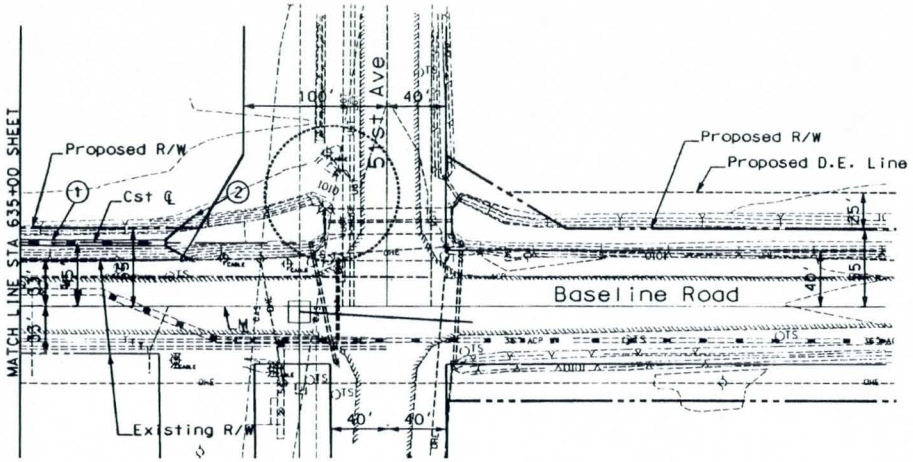
NO.	REVISION	BY	DATE
3			
2			
1			

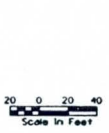
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

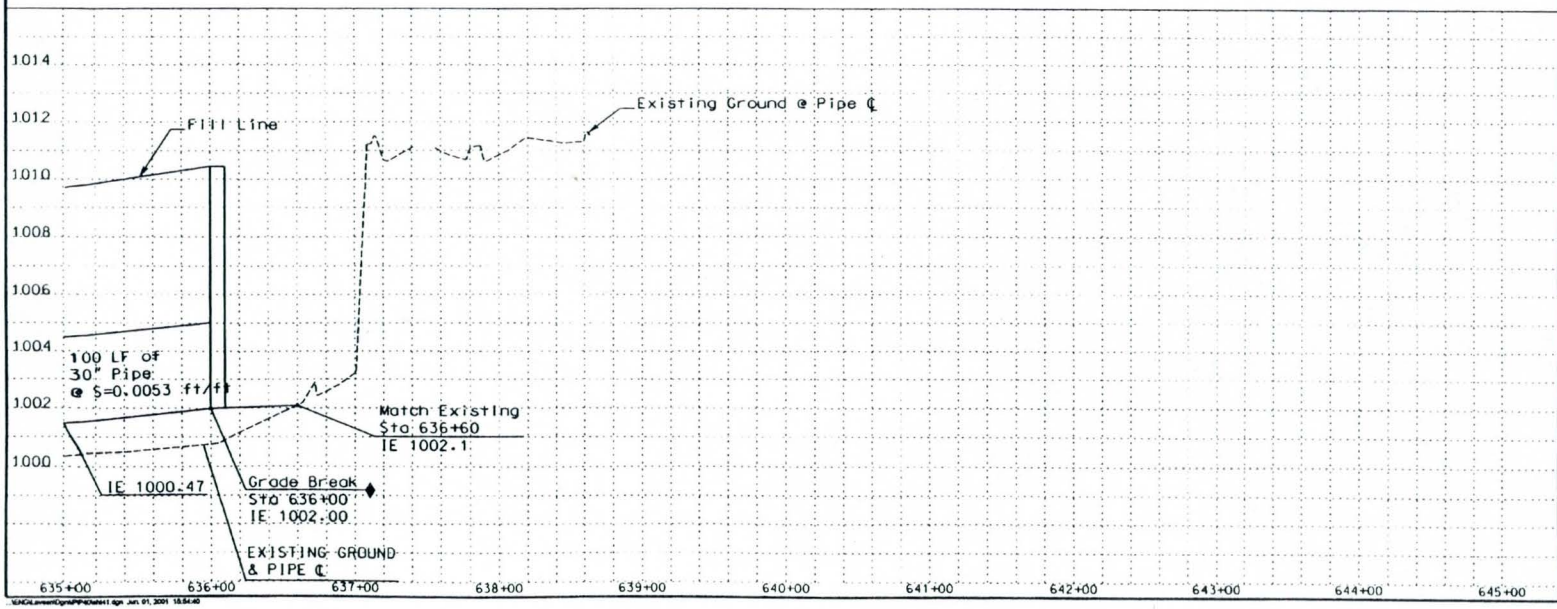
LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

	BY	DATE
DESIGNED	JRR	05/01
DRAWN	FC	05/01
CHECKED		

DRAWING NO. P8 | PLAN AND PROFILE STA 10+00 TO STA 320+00 | SHEET OF 1 100







☐ REMOVE ☐

○ CONSTRUCT ○

INSTALL NEW STORM DRAIN PIPE

NO.	STATION TO STATION	DIAMETER INCHES	LENGTH FEET
(1)	635+00 TO 636+00	30	100

(2) CONSTRUCT HEADWALL MAG DTL 501-4

60% SUBMITTAL

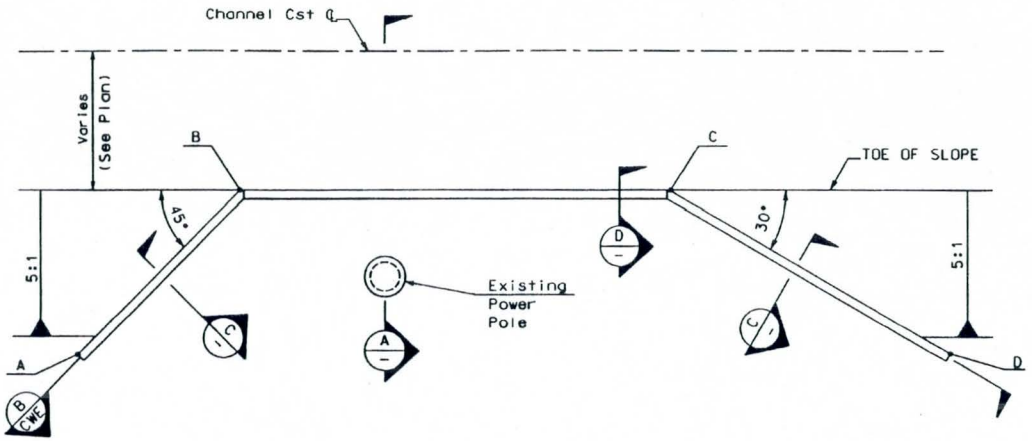
NO.	REVISION	BY	DATE
3			
2			
1			

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

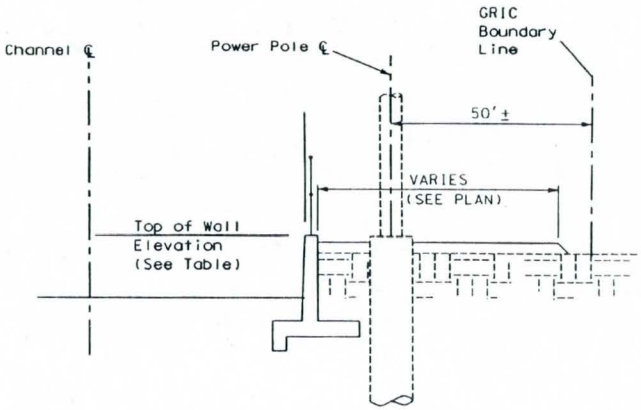
LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

	BY	DATE
DESIGNED	[redacted]	05/01
DRAWN	FC	05/01
CHECKED		

DRAWING NO.		SHEET OF
P9	PLAN AND PROFILE STA 10+00 TO STA 320+00	1 100

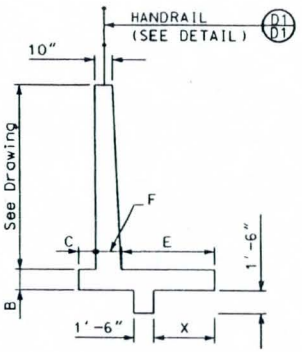


POWERLINE PROTECTION PLAN VIEW
NTS



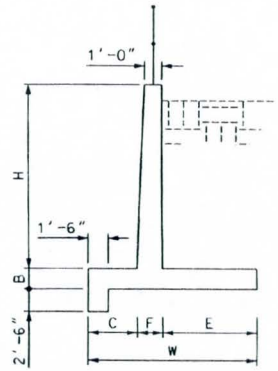
A SECTION
NTS

WALL NO.	WALL SECTION D DIMENSION (ft)					
	B	C	E	F	H	W
1,2	2.25	5.25	7.75	2.50	10.00	15.50
3	2.50	5.50	8.50	2.50	13.00	16.50
4,5	2.50	5.50	8.50	2.50	14.00	16.50
6	3.00	7.00	8.75	2.25	16.00	18.00
7,8	2.25	5.25	8.50	2.50	11.00	16.00



For steel reinforcement
& wall dimensions see ADOT
Standard Drawings B.18.10, B.18.20
for Case II cantilever retaining
walls on spreading footings.

C SECTION
NTS



D SECTION
NTS

WALL NO.	STATION OFFSET				ELEVATION
	A	B	C	D	
1	18+44.6, 75.4' RT	18+75, 45' RT	19+75, 45' RT	20+27.4, 85.7' RT	976.75
2	28+94.6, 75.4' RT	29+25, 45' RT	30+25, 45' RT	30+77.4, 73.3' RT	977.87
3	39+32.4, 88.2' RT	39+75, 47.7' RT	40+75, 35.5' RT	41+60, 80.2' RT	982.06
4	49+79.6, 80.4' RT	50+25, 35' RT	51+25, 35' RT	52+03.4, 80.3' RT	983.20
5	NA	59+92.73, 35' RT	61+55, 35' RT	62+70.2, 101.5' RT	*
6	70+29.7, 90.4' RT	70+85, 35' RT	71+85, 35' RT	72+80.7, 90.3' RT	987.48
7	81+16.6, 73.4' RT	81+55, 35' RT	82+55, 35' RT	83+18.4, 71.6' RT	984.62
8	91+93.7, 65.4' RT	92+24, 35' RT	93+24, 35.6' RT	93+71.5, 72.2' RT	985.78

* See Drawing __ For Elevation

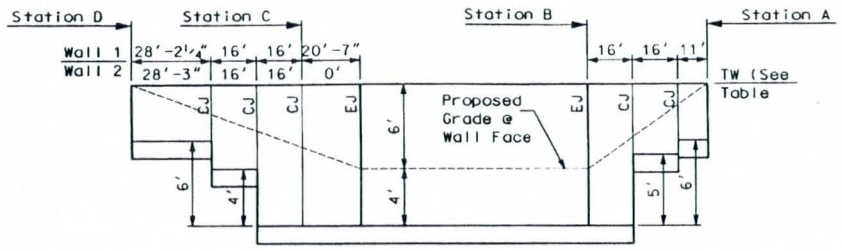
60% SUBMITTAL

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

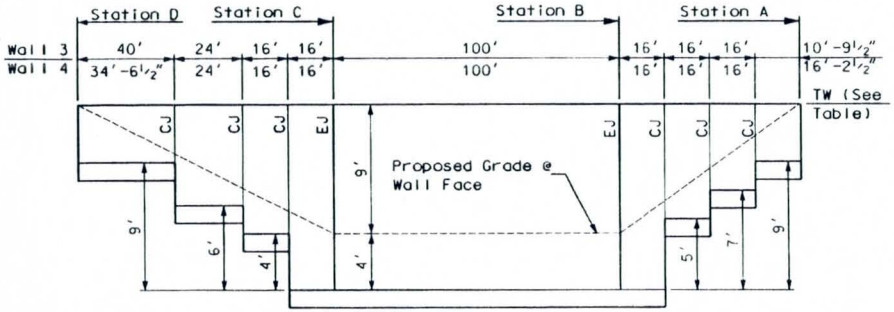
LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

		BY	DATE
PRELIMINARY NOT FOR CONSTRUCTION	DESIGNED	SKH, KVH	05/01
	DRAWN	FC	05/01
	CHECKED		

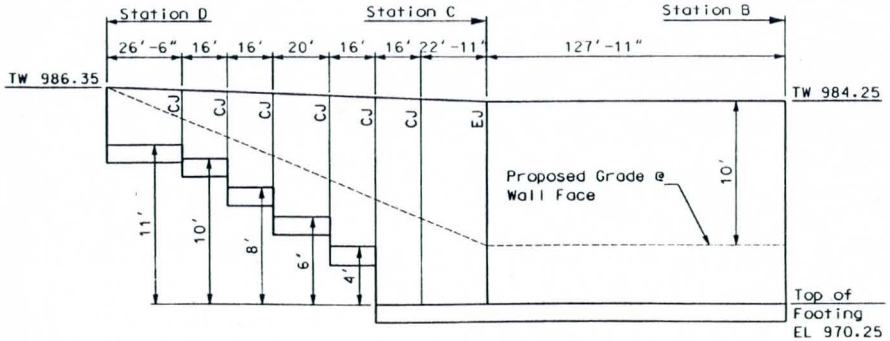
DRAWING NO. PWR | POWER POLE PROTECTION | SHEET OF



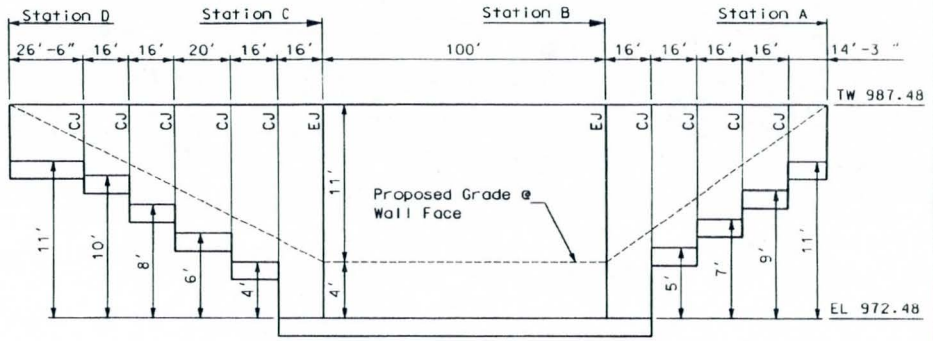
WALL 1 & 2
NTS



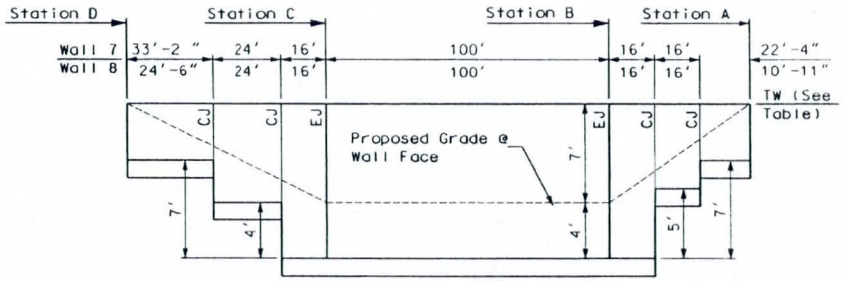
WALL 3 & 4
NTS



WALL 5
NTS



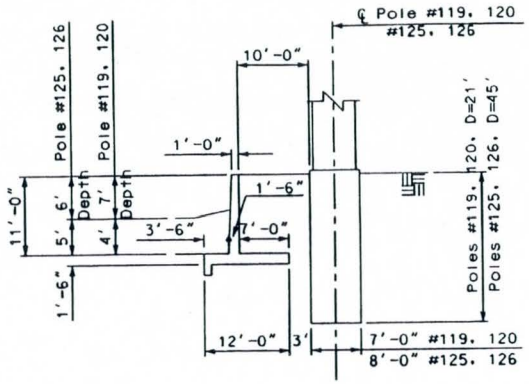
WALL 6
NTS



WALL 7 & 8
NTS

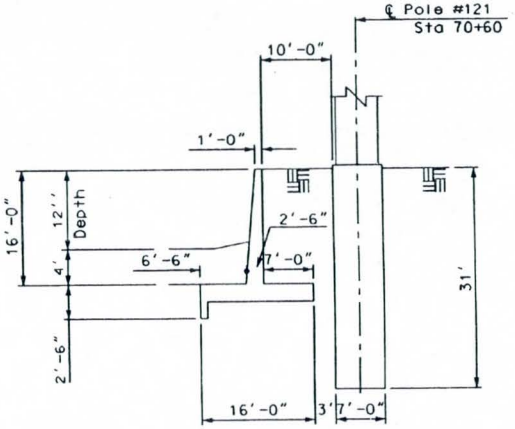
60% SUBMITTAL

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY ENGINEERING DIVISION			
LAVEEN AREA CONVEYANCE CHANNEL FCD PROJECT NO. 1170831 FCD CONTRACT NO.			
PRELIMINARY NOT FOR CONSTRUCTION		BY	DATE
	DESIGNED	MAL	05/01
	DRAWN	FC	05/01
	CHECKED		
DRAWING NO. CWE	CANTILVER RETAINING WALL ELEVATIONS		SHEET OF



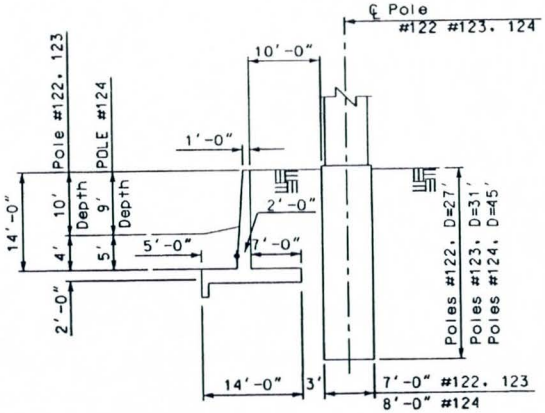
TYPE 1 WALL

Scale: 1/8" = 1'-0"



TYPE 3 WALL

Scale: 1/8" = 1'-0"

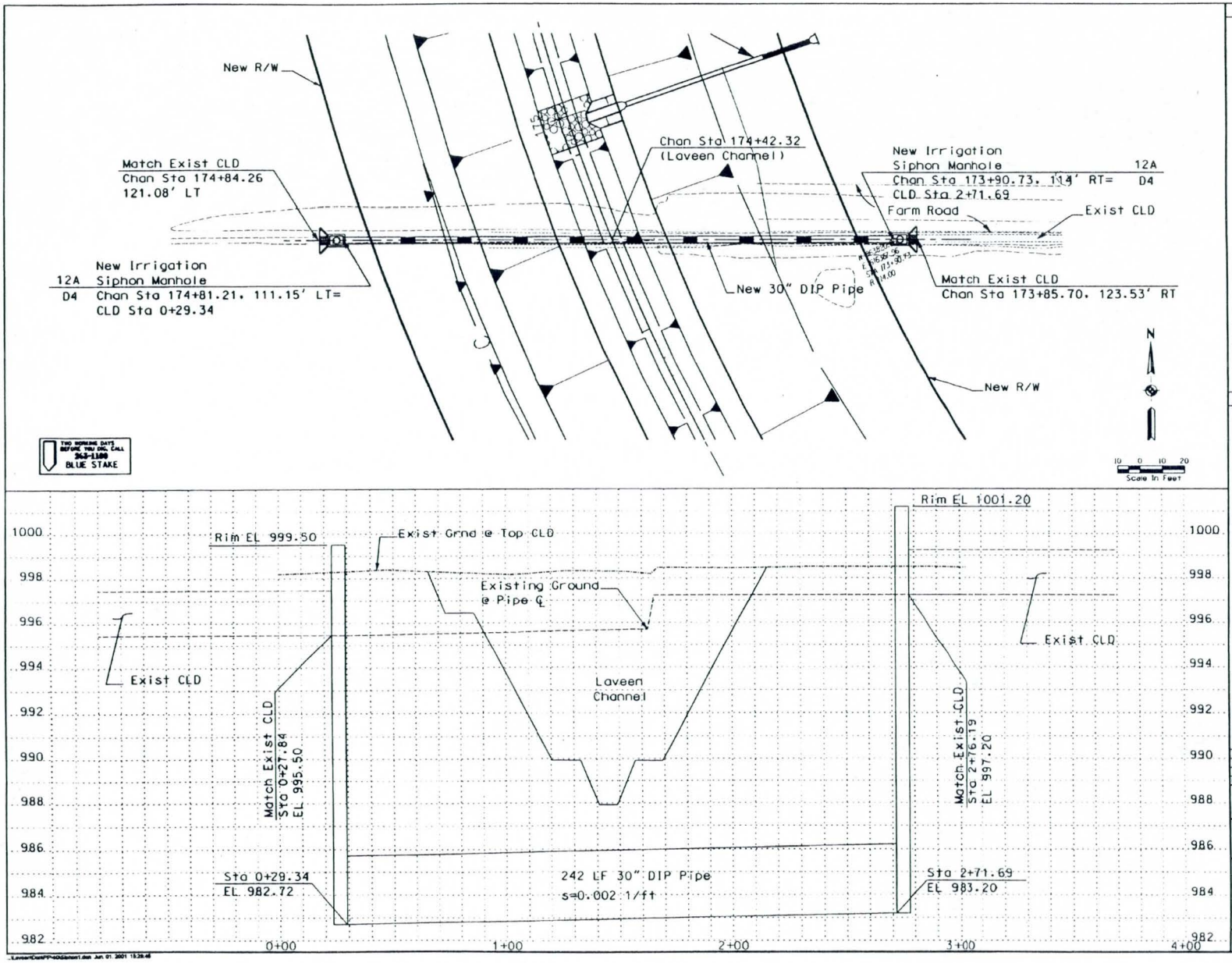


TYPE 2 WALL

Scale: 1/8" = 1'-0"

60% SUBMITTAL

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY ENGINEERING DIVISION			
LAVEEN AREA CONVEYANCE CHANNEL FCD PROJECT NO. 1170831 FCD CONTRACT NO.			
PRELIMINARY NOT FOR CONSTRUCTION		BY	DATE
	DESIGNED	KVH	05/01
	DRAWN	FC	05/01
	CHECKED		
DRAWING NO.	RETAINING WALL DETAILS		SHEET OF



REMOVE

CONSTRUCT

60% SUBMITTAL

NO.	REVISION	BY	DATE
3			
2			
1			

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

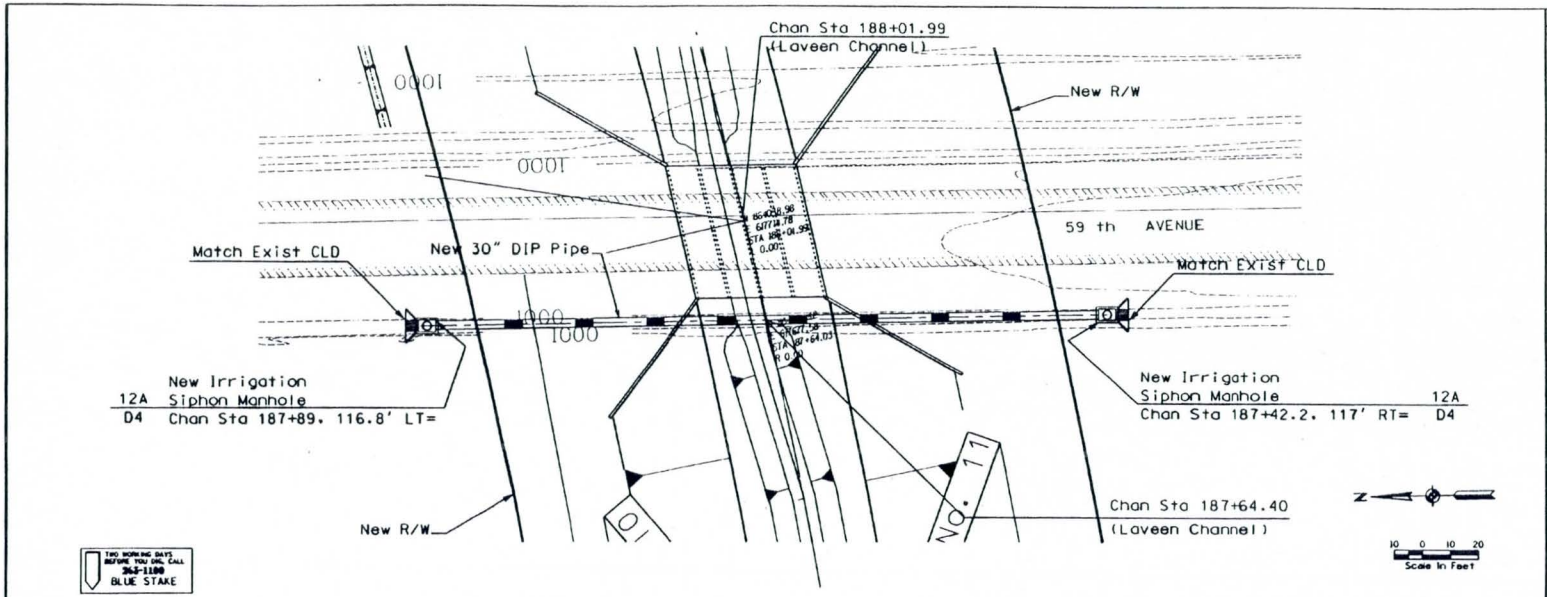
LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

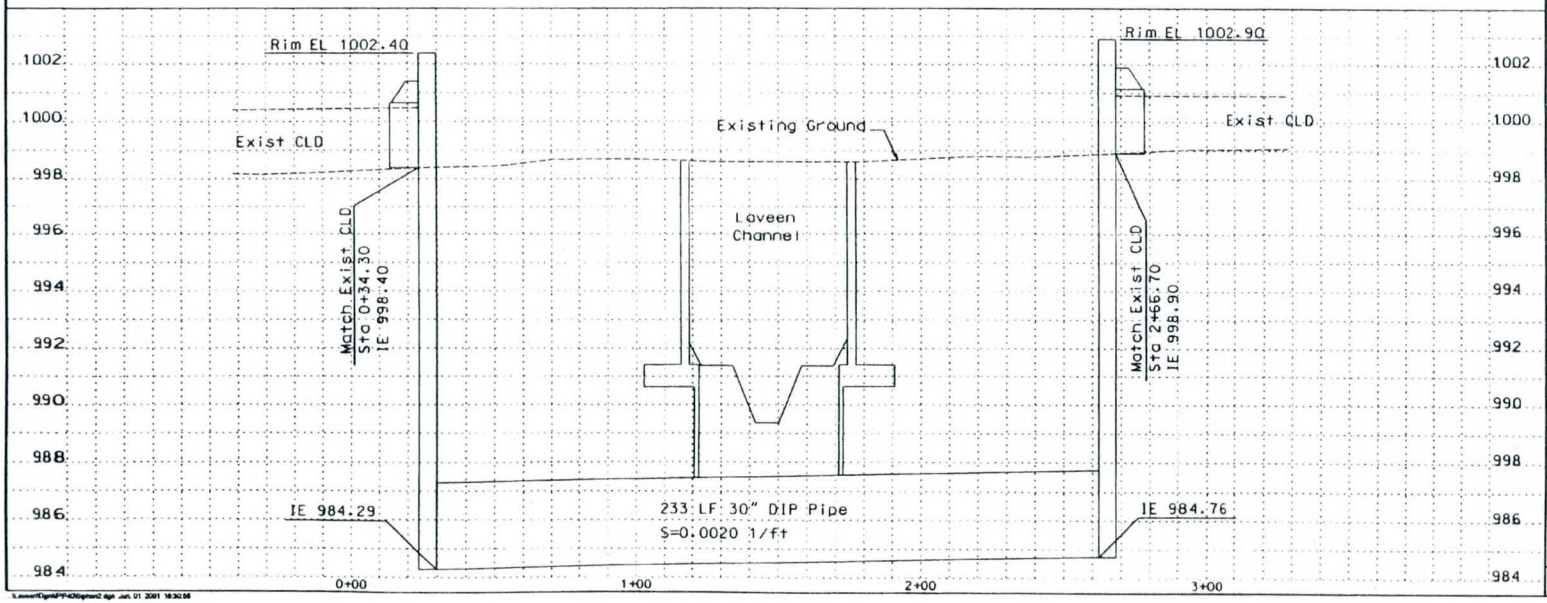
	BY	DATE
DESIGNED	MAL	05/01
DRAWN	FC	05/01
CHECKED		

DRAWING NO. IR1

IRRIGATION SIPHON NO. 1

SHEET OF





REMOVE

CONSTRUCT

60% SUBMITTAL

NO.	REVISION	BY	DATE
3			
2			
1			

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

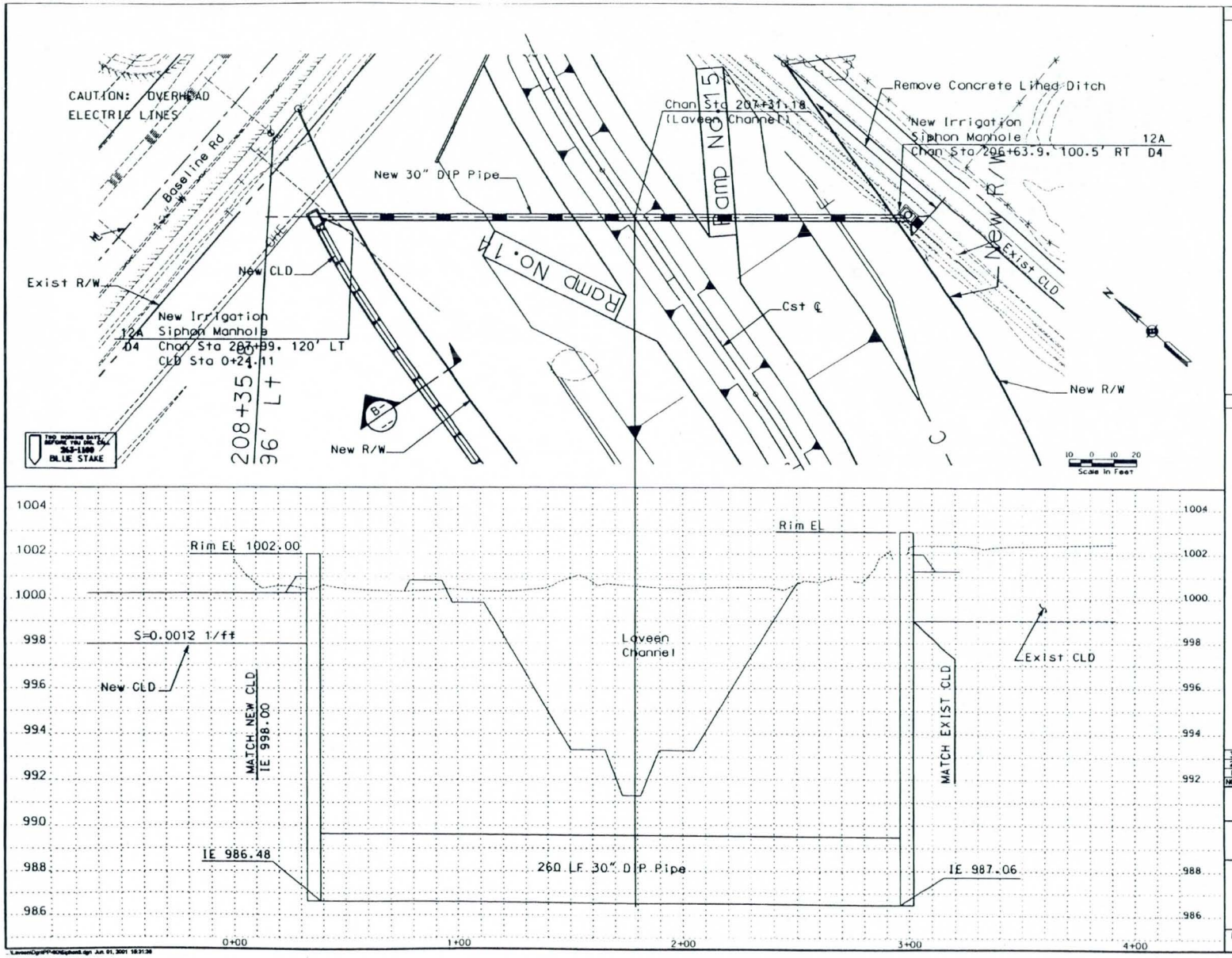
LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

	BY	DATE
DESIGNED	MAL	05/01
DRAWN	FC	05/01
CHECKED		

DRAWING NO. IR2

IRRIGATION SIPHON NO. 2

SHEET OF



REMOVE

CONSTRUCT

60% SUBMITTAL

NO.	REVISION	BY	DATE
3			
2			
1			

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

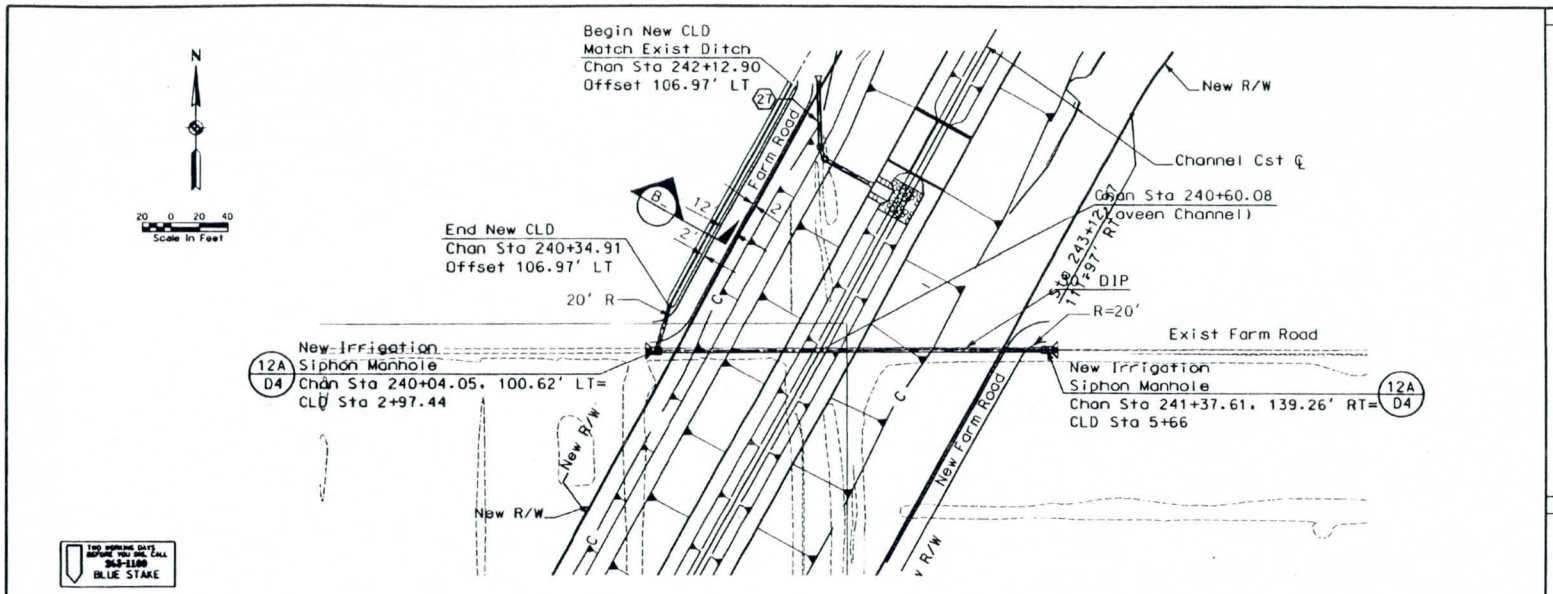
LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

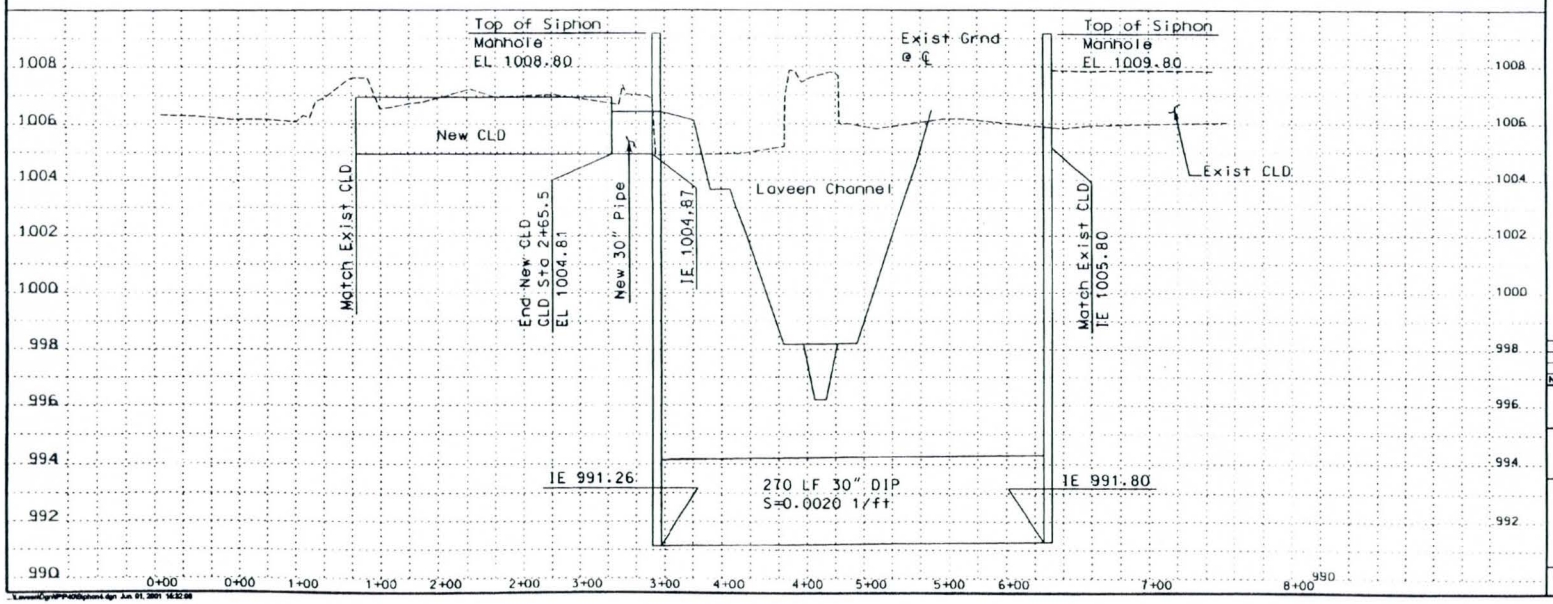
	BY	DATE
DESIGNED	MAL	05/01
DRAWN	FC	05/01
CHECKED		

DRAWING NO. IR3

IRRIGATION SIPHON NO. 3

SHEET OF





REMOVE

CONSTRUCT

60% SUBMITTAL

NO.	REVISION	BY	DATE
3			
2			
1			

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
ENGINEERING DIVISION

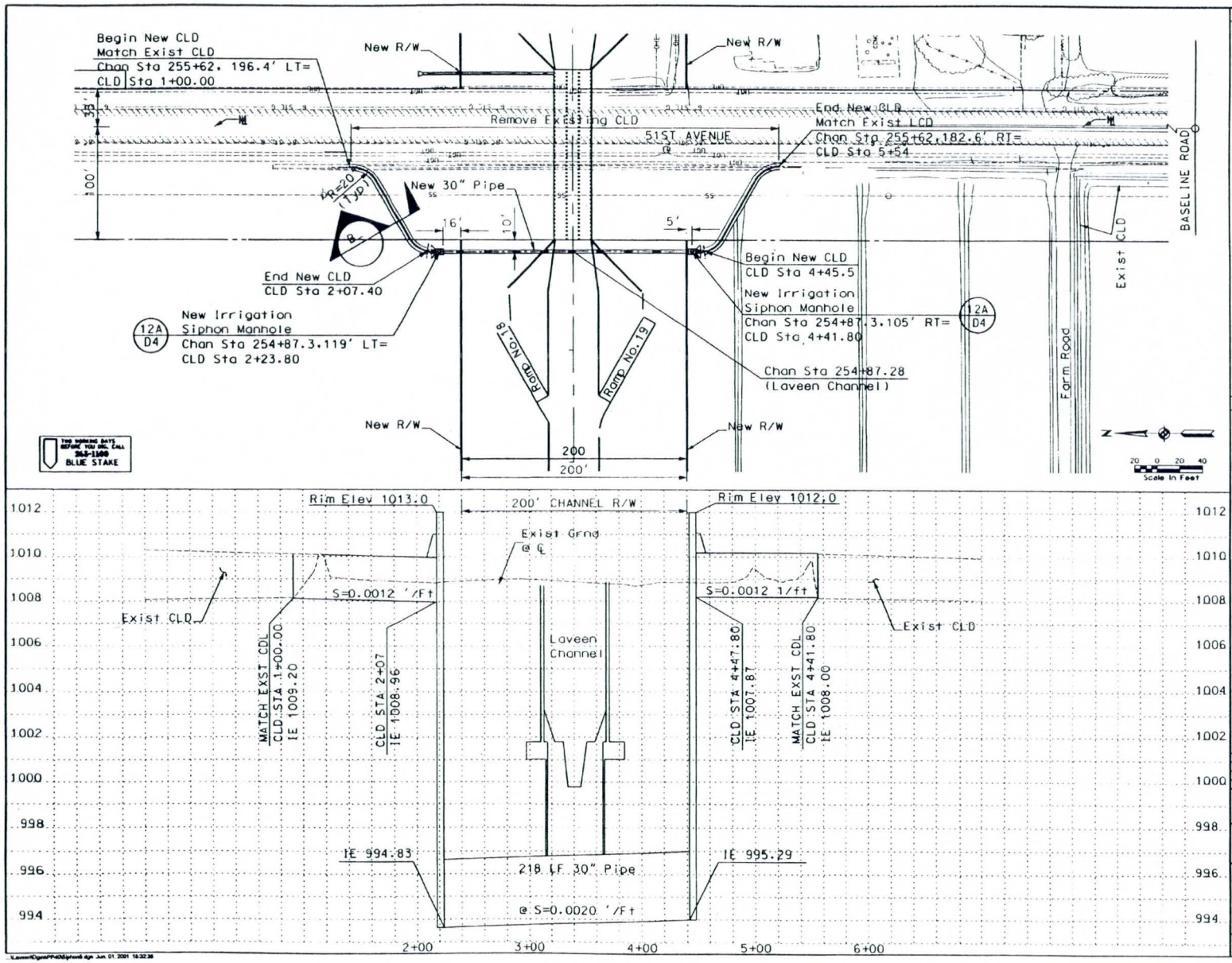
LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

	BY	DATE
DESIGNED	MAL	05/01
DRAWN	FC	05/01
CHECKED		

DRAWING NO. IR4

IRRIGATION SIPHON NO. 4

SHEET OF 1 100



REMOVE

CONSTRUCT

60% SUBMITTAL

NO.	REVISION	BY	DATE
3			
2			
1			

FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY
ENGINEERING DIVISION

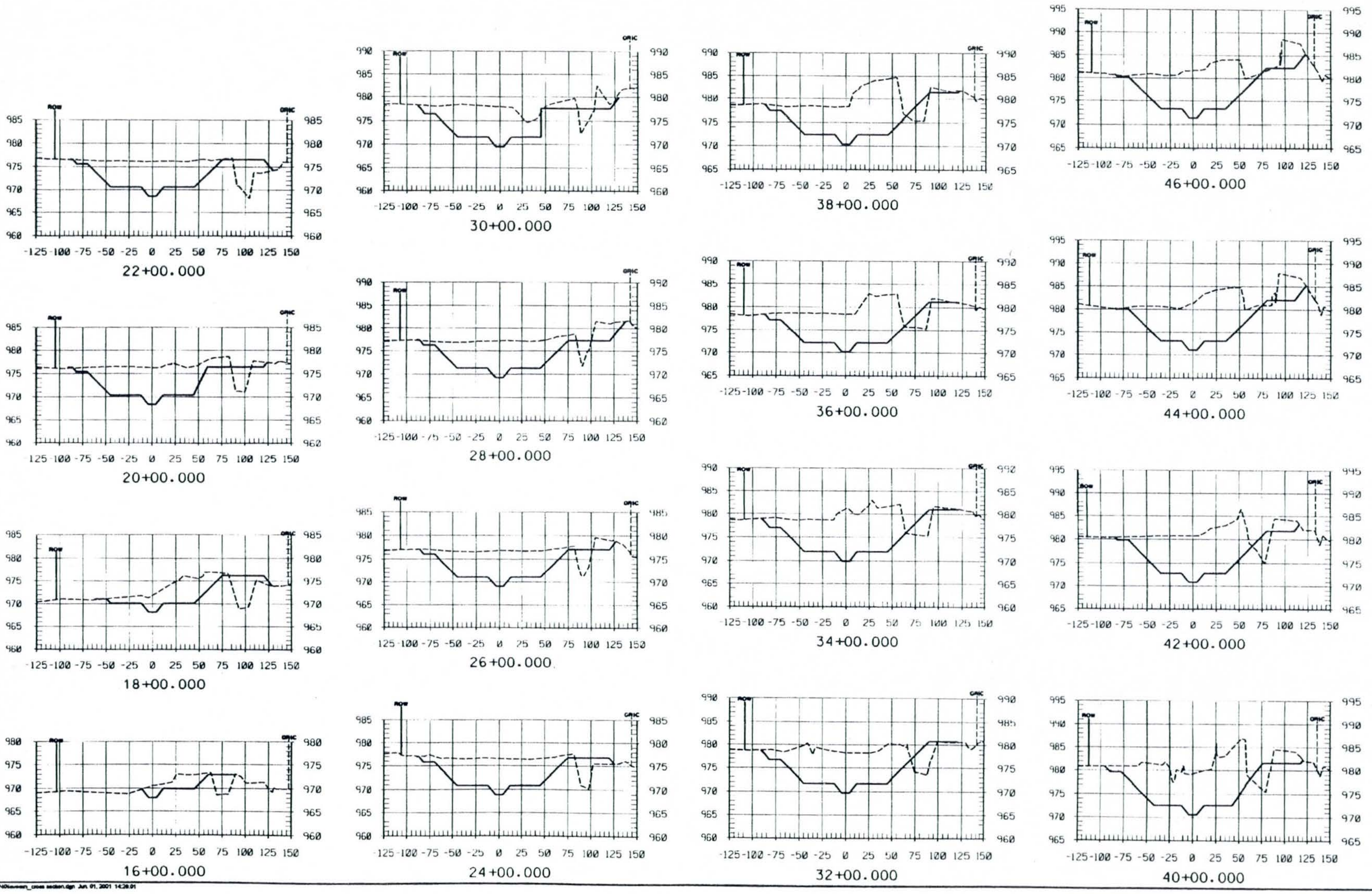
LAVEEN AREA CONVEYANCE CHANNEL
FCD PROJECT NO. 1170831
FCD CONTRACT NO.

	BY	DATE
DESIGNED	MAL	05/01
DRAWN	FC	05/01
CHECKED		

DRAWING NO. IR5

IRRIGATION SIPHON NO. 5

SHEET OF

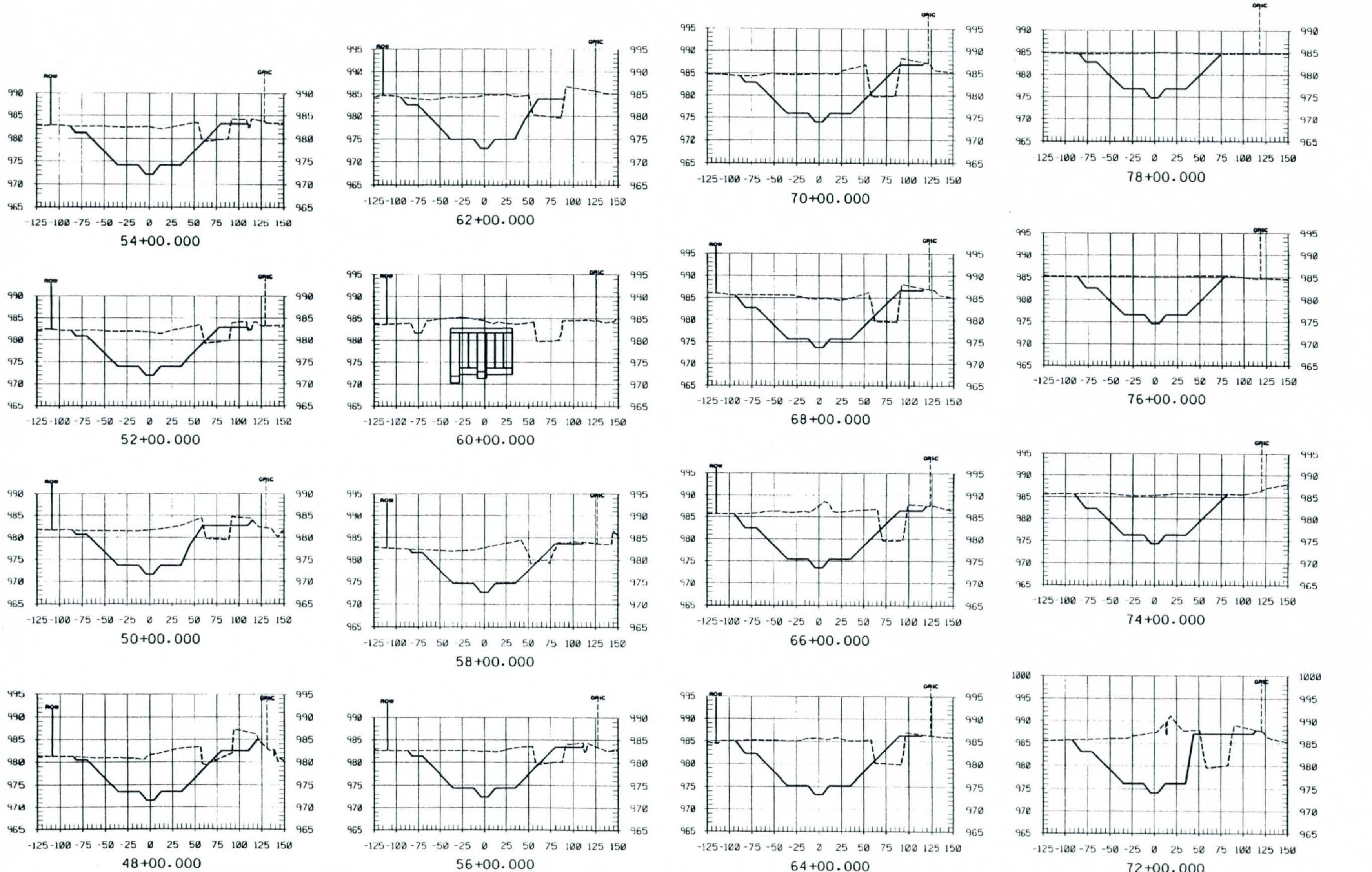


LAVEEN AREA CONVEYANCE CHANNEL

CROSS SECTIONS

DATE 6/01

SHEET OF

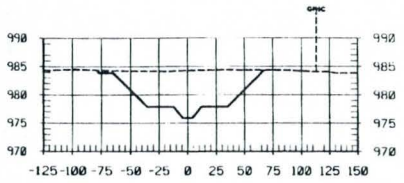


LAVEEN AREA CONVEYANCE CHANNEL

CROSS SECTIONS

SHEET OF XS2

DATE 6/01



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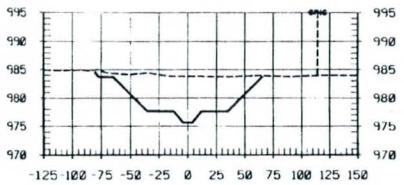

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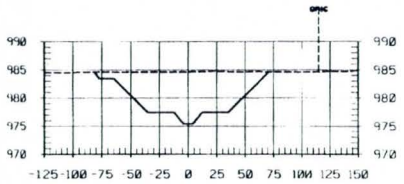

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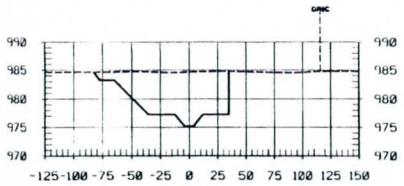

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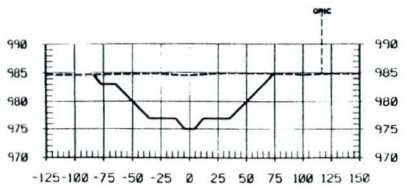

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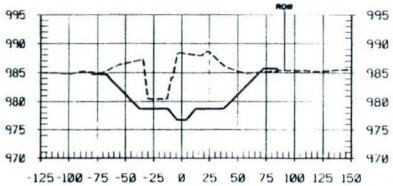

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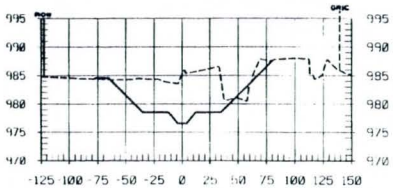

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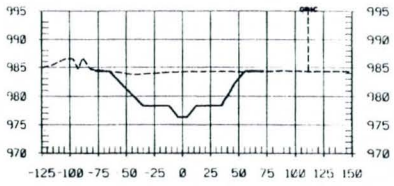

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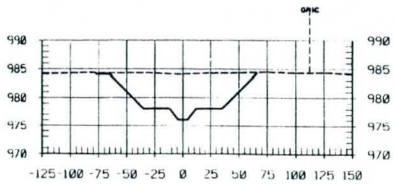

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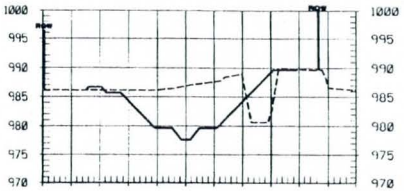

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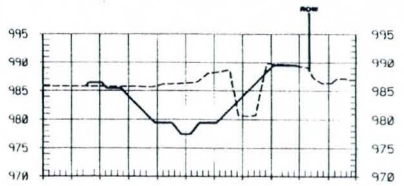

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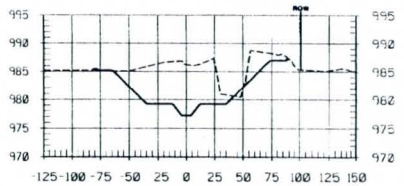

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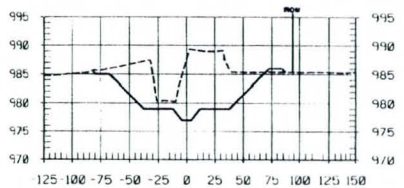

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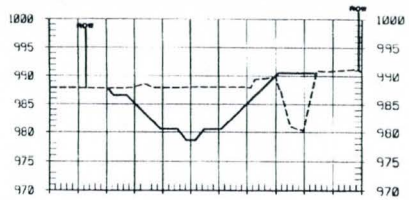

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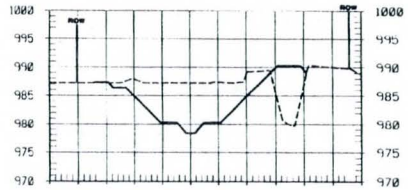

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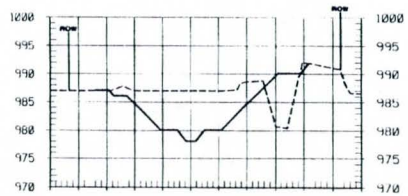

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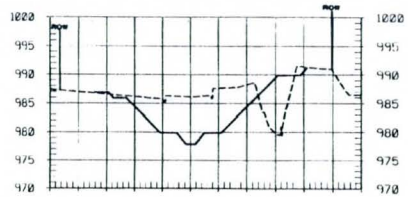

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LAVEEN AREA CONVEYANCE CHANNEL

CROSS SECTIONS

SHEET OF XS3

DATE 6/01

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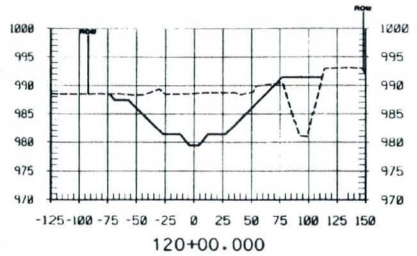
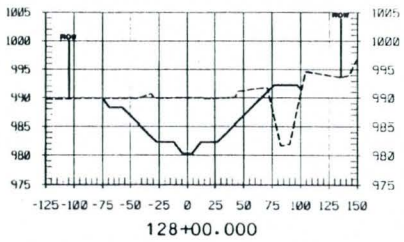
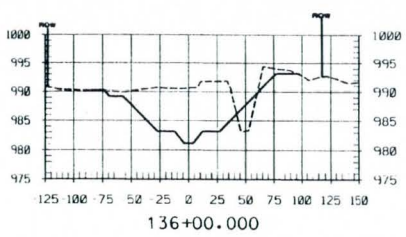
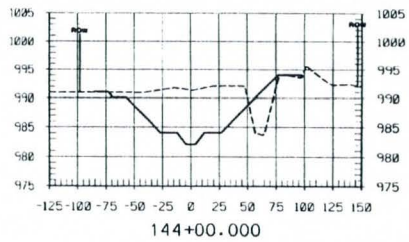
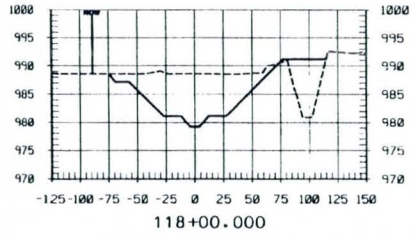
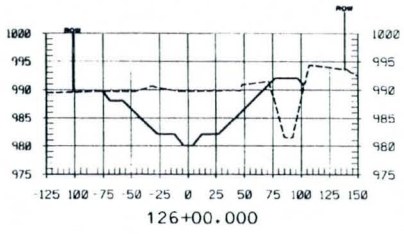


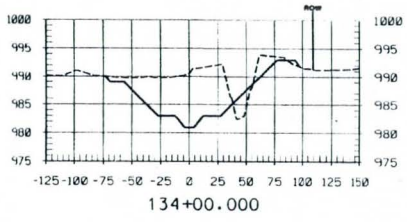


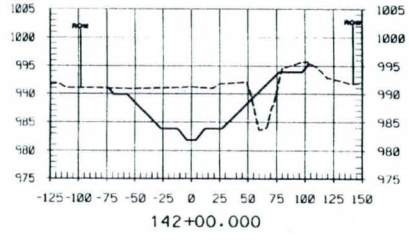


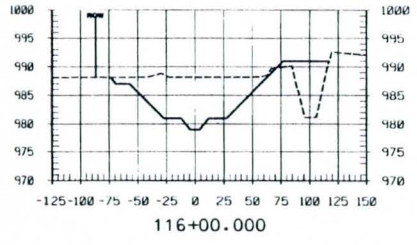


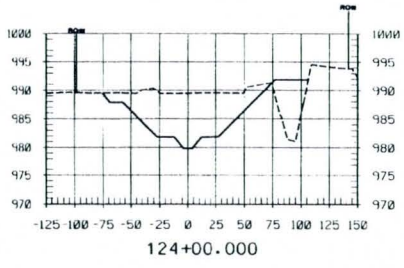


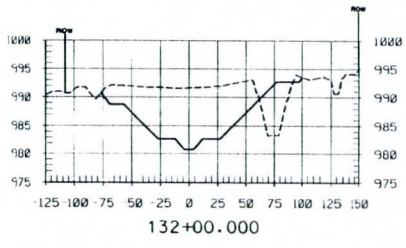


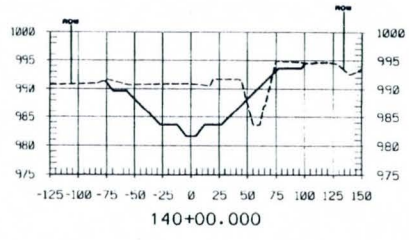


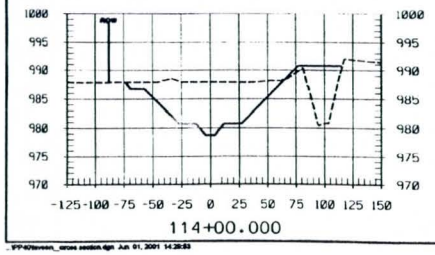


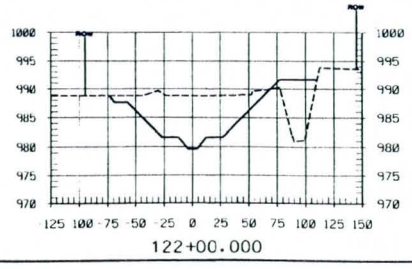


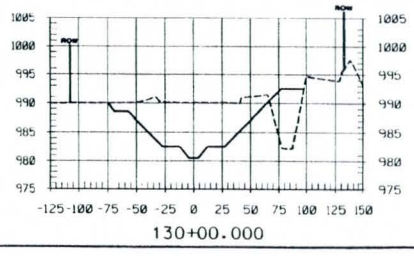


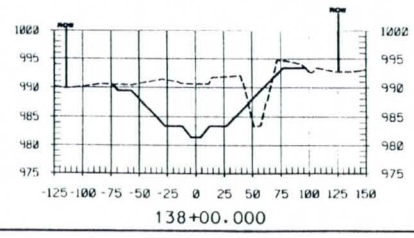




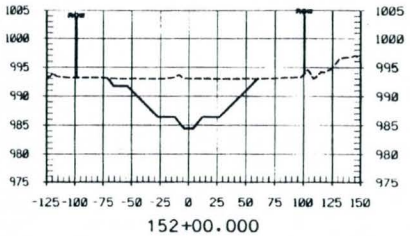


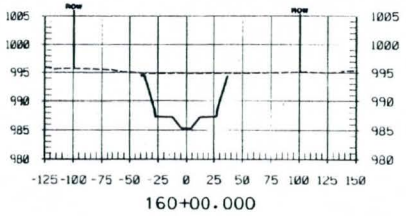


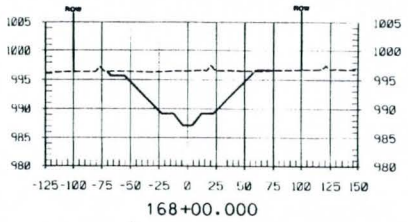


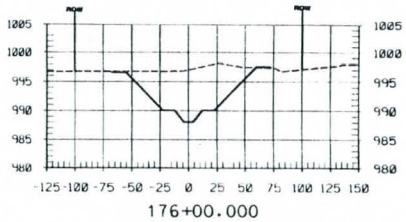


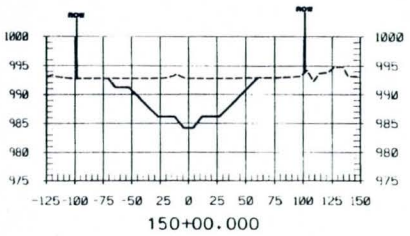
LAVEEN AREA CONVEYANCE CHANNEL
CROSS SECTIONS
SHEET OF
XS4
DATE 6/01

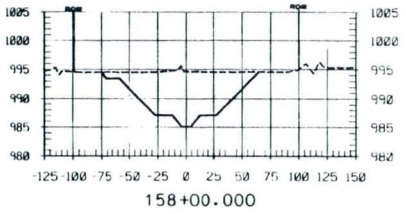


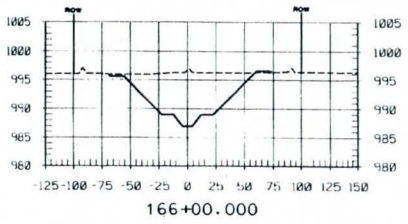


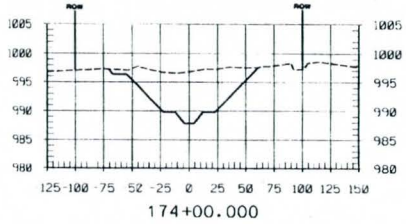


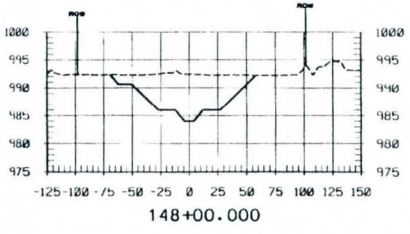


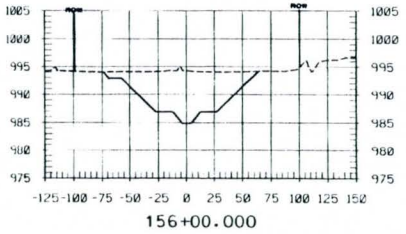


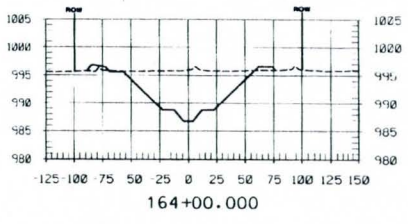


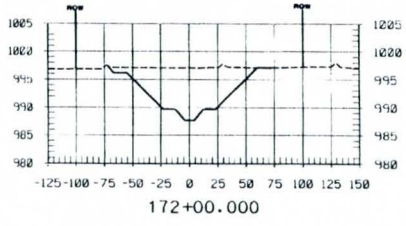


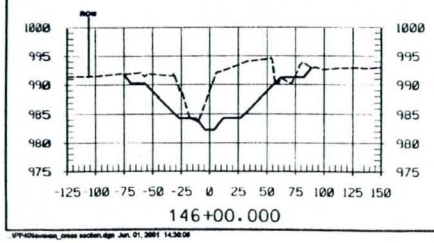


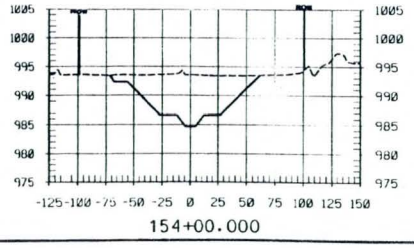


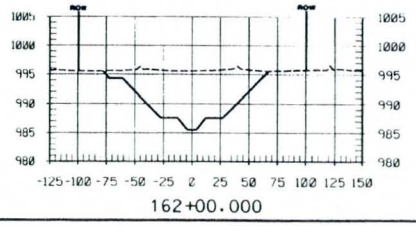


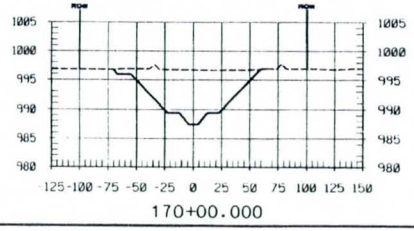










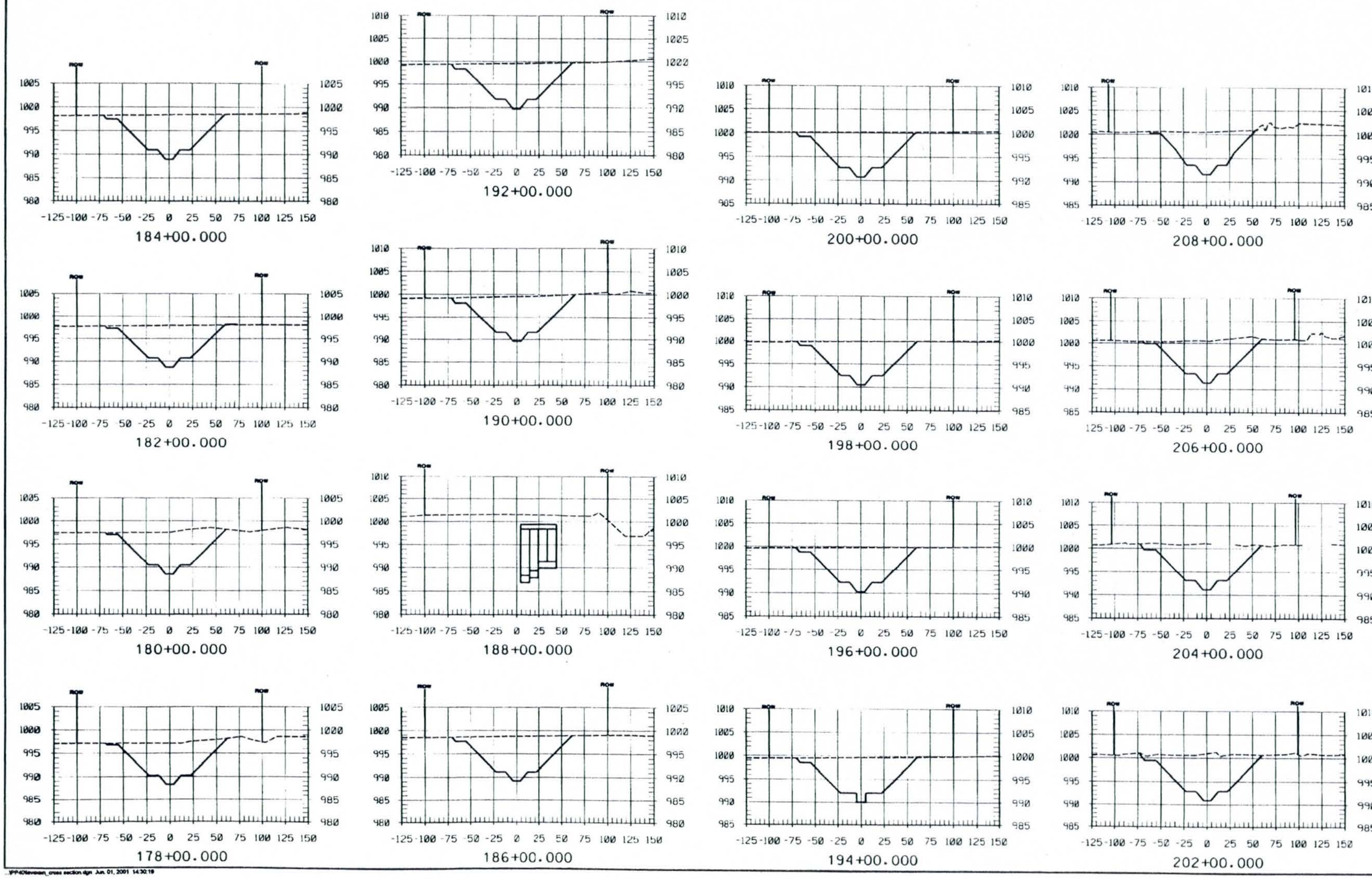


LAVEEN AREA CONVEYANCE CHANNEL

CROSS SECTIONS

SHEET OF XSS

DATE 6/01



LAVEEN AREA CONVEYANCE CHANNEL

CROSS SECTIONS

SHEET OF XS6

DATE 6/01

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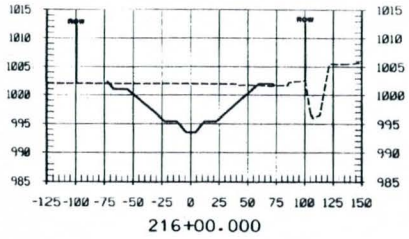

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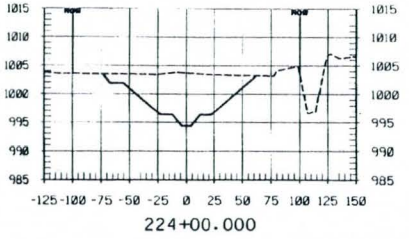

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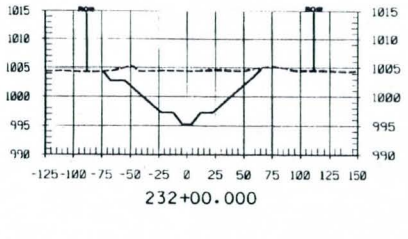

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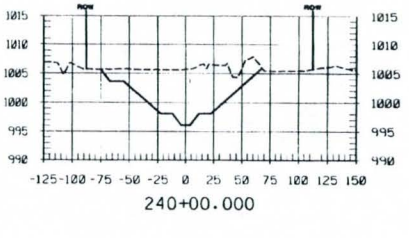

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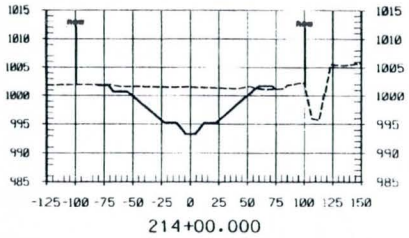

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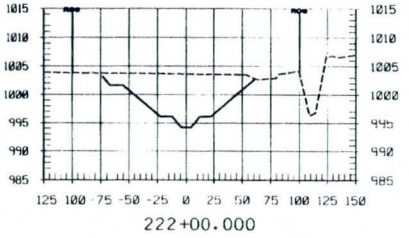

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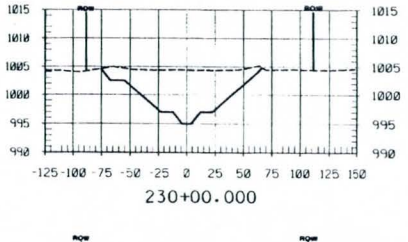

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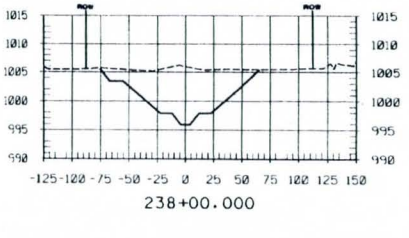

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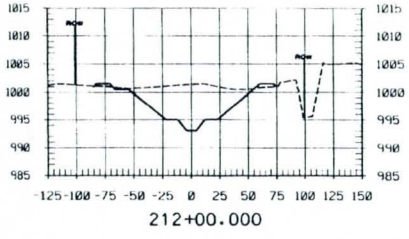

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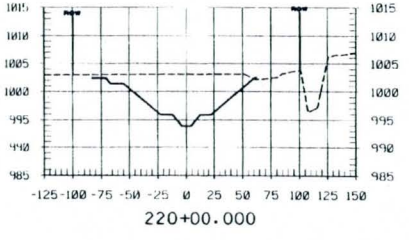

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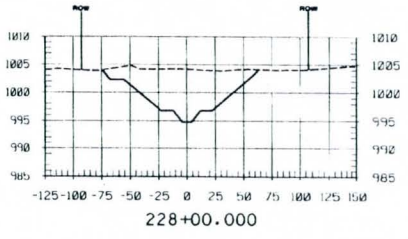

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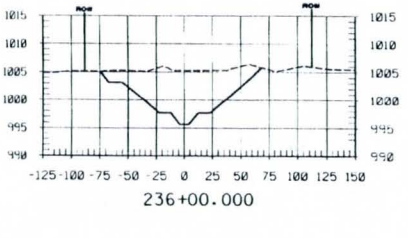

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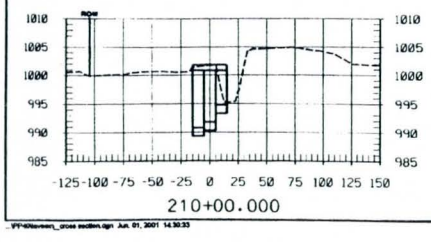

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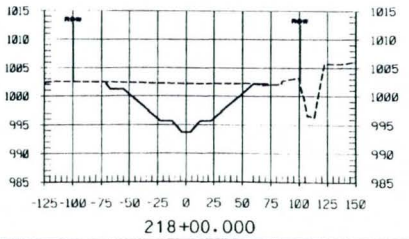

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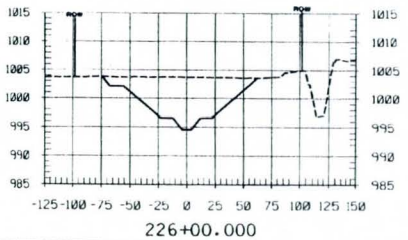

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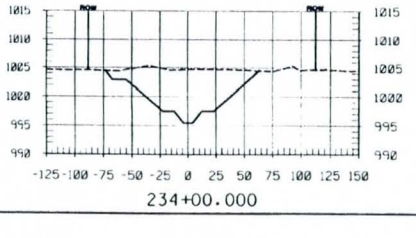
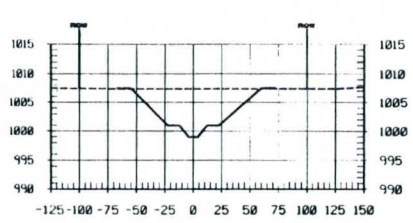


234+00.000

LAVEEN AREA CONVEYANCE CHANNEL
CROSS SECTIONS
SHEET OF XS1
DATE 6/01



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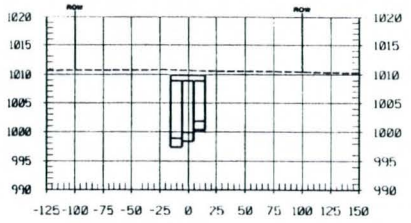

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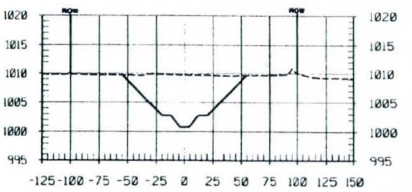

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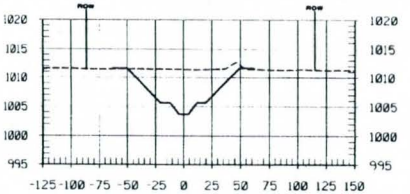

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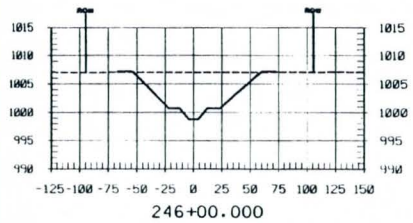

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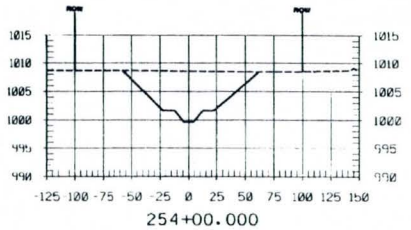

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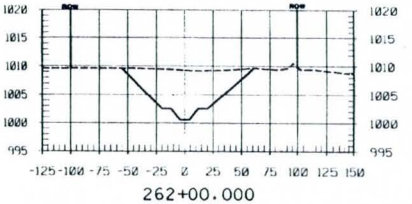

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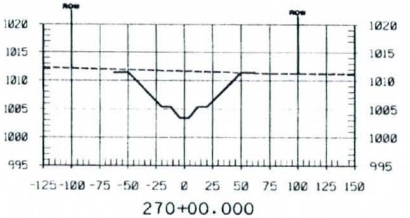

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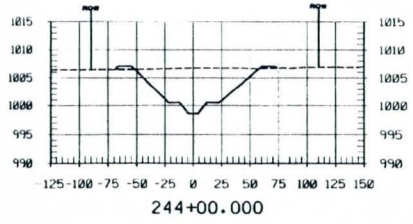

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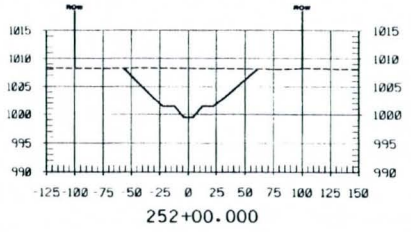
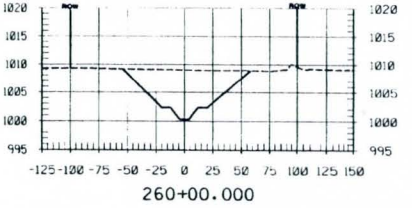


252+00.000



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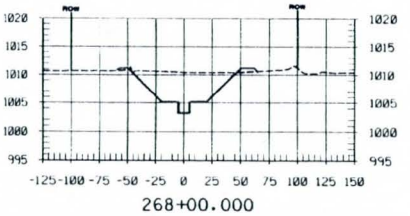

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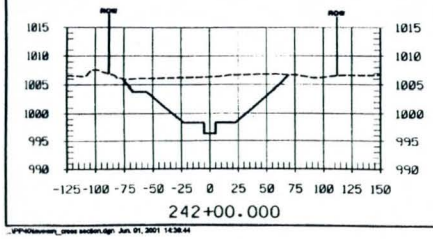

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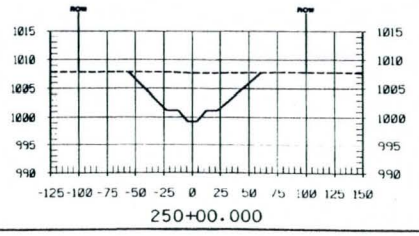

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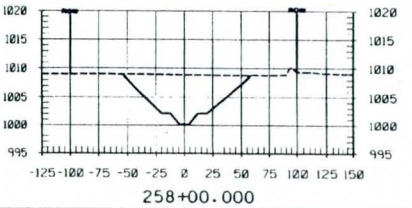

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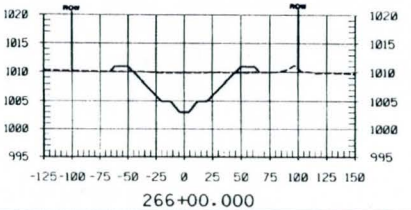


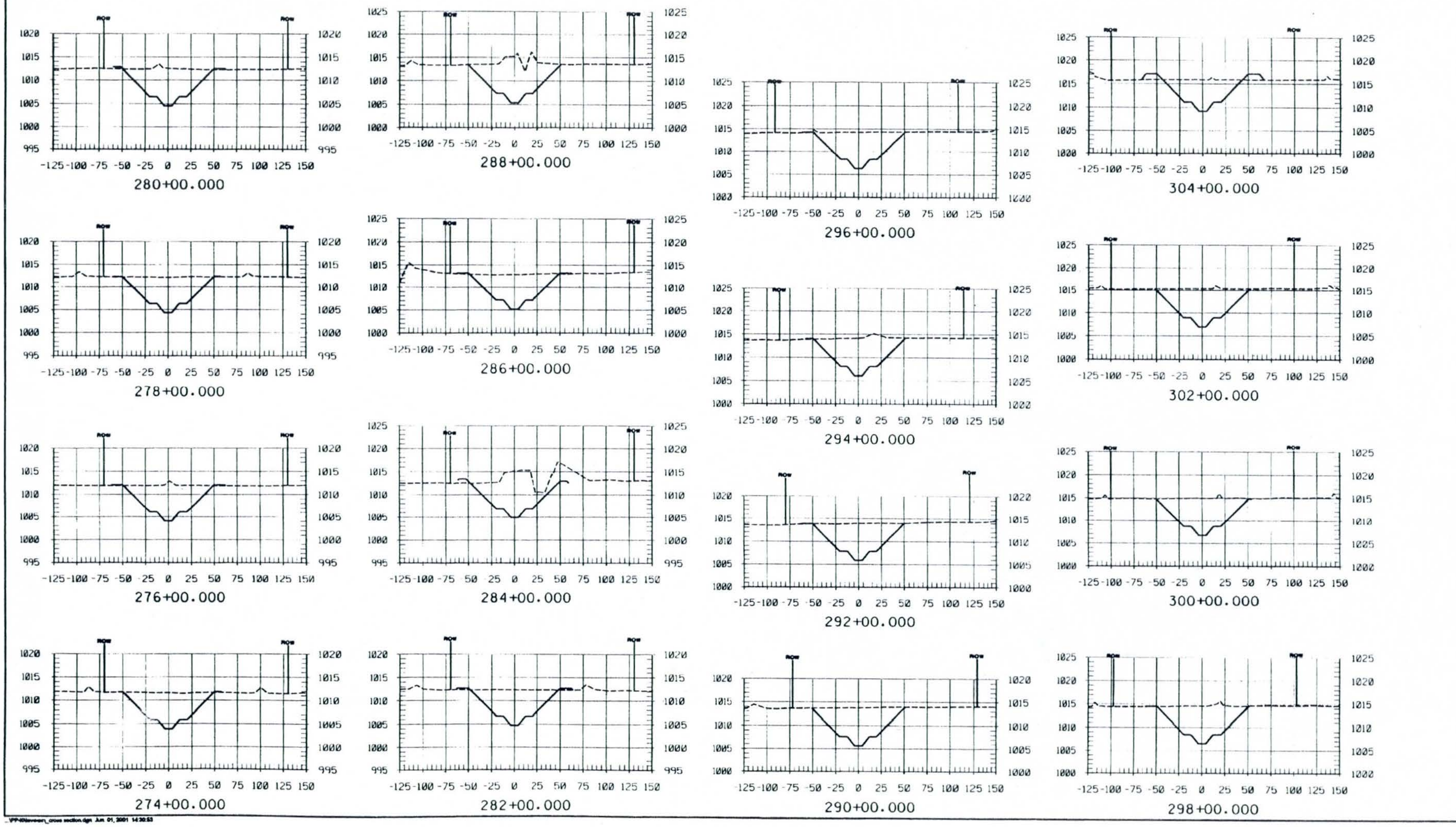
266+00.000

LAVEEN AREA CONVEYANCE CHANNEL

CROSS SECTIONS

SHEET OF XS8

DATE 6/01

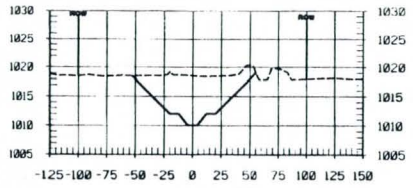


LAVEEN AREA CONVEYANCE CHANNEL

CROSS SECTIONS

SHEET OF X59

DATE 6/01



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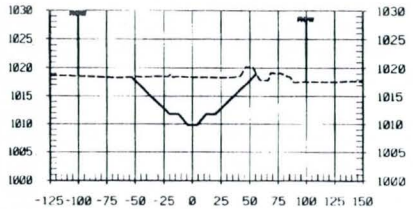

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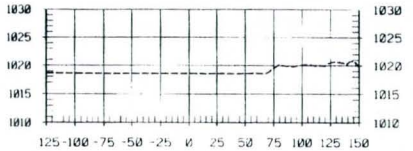

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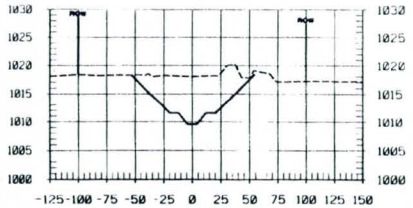
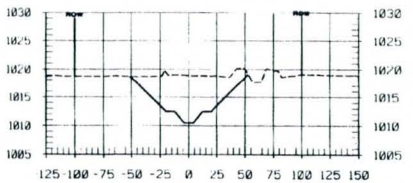


308+00.000



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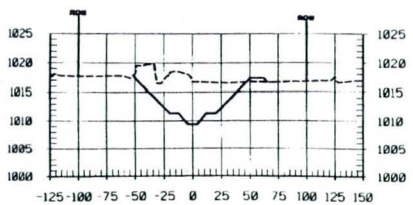

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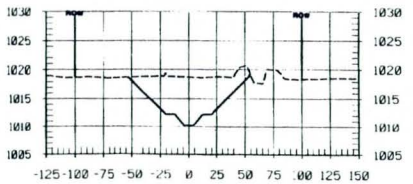

314+00.000

LAVEEN AREA CONVEYANCE CHANNEL

CROSS SECTIONS

SHEET OF XS10

DATE 6/01