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**PIMA OUTFALL CHANNEL**

*PROJECT NO. 93E130*

**DRAINAGE REPORT**

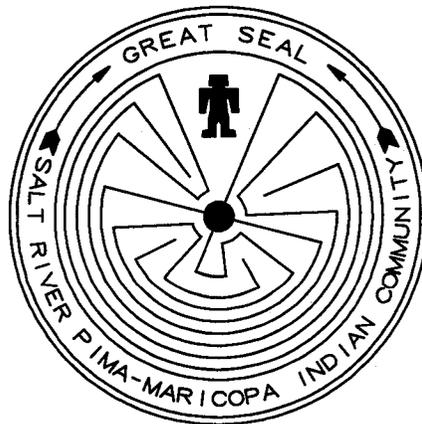
*Volume I*

# PIMA OUTFALL CHANNEL

PROJECT NO. 93E130

## DRAINAGE REPORT

*Volume I*



**Salt River Pima-Maricopa Indian Community**  
**ENGINEERING & CONSTRUCTION SERVICES**  
**DESIGN DIVISION**

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January 7, 1998

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## **I. INTRODUCTION**

### **A. *Project Location.***

The Salt River Pima-Maricopa Indian Community (Community) is located in the eastern part of Maricopa County, Arizona, in a rural community setting. The Community is bounded by the City of Scottsdale on the west and a portion of the City of Scottsdale, Fountain Hills, and the Fort McDowell Indian Community on the north. The cities of Tempe and Mesa bound the south side of the Community.

In the late 1980's and early 1990's, the Community and the Arizona Department of Transportation (ADOT) reached an agreement to construct the Pima Freeway across Indian lands. The freeway is currently under construction and crosses the reservation in a northerly direction near the western border.

As a result of this new transportation corridor and the related development opportunities near the new freeway, the Community retained Evans, Kuhn & Associates to prepare a master drainage plan for the northwest area of the Community. This report was completed in March of 1992 and recommended three new drainage features: 96<sup>th</sup> Street Storm Drain, Pima Freeway Drainage system, and the Pima Outfall Channel.

In November 1993, ADOT and the Community negotiated an intergovernmental agreement for the Community to design and construct the Pima Outfall Channel for ADOT. The Community desired to design and construct the channel in order to save ADOT money and to promote self-sufficiency and professional development of the Community's technical staff. ADOT will assume maintenance responsibilities upon completion of the Pima Freeway.

### **B. *Concept Of Plan***

The concept of the drainage improvements follows:

#### **1) 96th Street Storm Drain**

This project intercepts overland flow northeast of the Pima Freeway. It is composed of two main components: a storm drain beneath 96<sup>th</sup> Street and an outfall channel paralleling the Arizona Canal. Due to right-of-way constraints, the Community divided the construction of this project into two major phases.

In 1993, the Community constructed the storm drain infrastructure beneath the 96<sup>th</sup> Street alignment; however, the outfall channel is not in place. When finished, the project will intercept storm water that naturally flows in a south-westerly direction across the desert. The storm drain will intercept the water and carry it southerly to the outfall channel, which will carry it westerly to the Pima Outfall Channel, which is discussed below.

The storm drain system consists of approximately 1 mile of open channel which feeds into 1.5 miles of 10-foot diameter cast-in-place concrete pipe(s). It extends

from the northern boundary of the Community to the northern bank of the Arizona Canal. The storm drain system feeds into a 16-foot by 14-foot concrete box culvert north of the Arizona Canal. The box feeds into the proposed outfall channel, which extends approximately ½ mile towards the Pima Freeway. The channel feeds into the Pima Outfall Channel, which outlets into the Indian Bend Wash Interceptor Channel (IBWIC), located just west of Pima Road. The IBWIC empties into Indian Bend Wash and ultimately into the Salt River.

In the vicinity of this project, the 96<sup>th</sup> Street Storm Drain channel is reinforced concrete with a bottom width of 30-feet and side-slopes of 1.5:1.

## 2) Pima Freeway Drainage Channel

ADOT will construct the Pima Freeway Drainage Channel as part of the McDonald to Shea Boulevard freeway contract. They will construct the channel before January 1999. The freeway drainage channel will convey water along the eastern side of the freeway in a southerly direction to the Pima Outfall Channel. The proposed Pima Outfall Channel will convey this water and the flows from the 96<sup>th</sup> Storm Drain system to the IBWIC.

In the vicinity of this project, ADOT will construct the freeway drainage channel with reinforced concrete, with a bottom width of 20-feet and side-slopes on the east of 2:1, and on the west of 4:1.

## 3) Pima Outfall Channel

**(Also known as Arizona Canal Conveyance Channel)**

ADOT signed an intergovernmental agreement in November 1993, with the Community to design and construct the Pima Outfall Channel improvements along the north bank of the Arizona Canal to convey storm water from the Pima Freeway westerly to the Indian Bend Wash Interceptor Channel. The Pima Outfall Channel carries flows from the Pima Freeway channel, the 96<sup>th</sup> Street Storm Drain, and intercepts overland flow from the area bounded by the Pima Freeway and Pima Road.

The proposed Pima Outfall Channel is located in Section 7, Range 5 East, Township 2 North in Maricopa County, Arizona. The channel is ¼ mile in length, is reinforced concrete lined, has a bottom width of 100-feet, and side slopes varying from 1:1 to 2:1. The Pima Outfall Channel outlets through a pre-cast reinforced box culvert into a straight-drop dissipator west of Pima Road into the IBW Interceptor Channel. The combined flow between the Arizona Canal and the Pima Outfall Channel will not exceed 8,000 cfs; Robert Ward, P.E. calculates the combined 100-year flow as ~~7,719 cfs~~ (Using the HEC-1, 1991 version 4.0.1E and model PF4.7I.) The Flood Control District of Maricopa County, the Corps of Engineers, and City of Scottsdale concur with Robert Ward's PF4.7I model and agree it is reasonable to use it as documentation that the Pima Freeway drainage system will not cause the 8,000 cfs limit to be exceeded at Pima Road.

*where from  
not standards table  
model*

The drainage improvements associated with the proposed outfall channel are necessary because of the Pima Freeway (under construction) and anticipated commercial development of the one-mile corridor along the freeway alignment. The Community anticipates that further development of the Pima Freeway corridor (the area between Pima Road and Alma School) will lessen peak discharges into IBWIC because of increased focus on detention/retention issues.

**C. Discussion Of Drainage Investigations Performed By Consultant**

Evans Kuhn & Associates conducted and prepared a Preliminary Study for the Master Drainage Plan - Northwest Area, dated April 25, 1991. They published the Master Drainage Plan on March 9, 1992. Robert L. Ward prepared the Concept Design Memorandum dated February 27, 1992 and revised it on April 27, 1992, which depicted an upstream impoundment area east of the Pima Freeway.

Based on input from the Community, Robert Ward prepared a memorandum titled, "Hydrologic & Hydraulic Analysis of Arizona Canal Drainage Channel With No Upstream Berm" on September 11, 1992 for Parsons DeLeuw Inc. Based on comments from the affected agencies, Robert Ward published the preliminary draft of the Design Summary Report for the project on May 17, 1993. The Community assumed design and construction responsibilities from ADOT on November 5, 1993.

The last document prepared by Robert Ward is the Updated Hydrologic Analysis for the Arizona Canal Drainage Channel, dated August 20, 1996. This report accounts for the new Community golf course at Indian Bend and 96th Streets and for growth along the Community's northern border. The primary purpose of this report was to prove that the combined flows in the Indian Bend Wash Interceptor Channel (IBWIC) and the Arizona Canal, west of Pima Road, will not exceed 8,000 cubic feet per second (cfs).

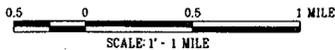
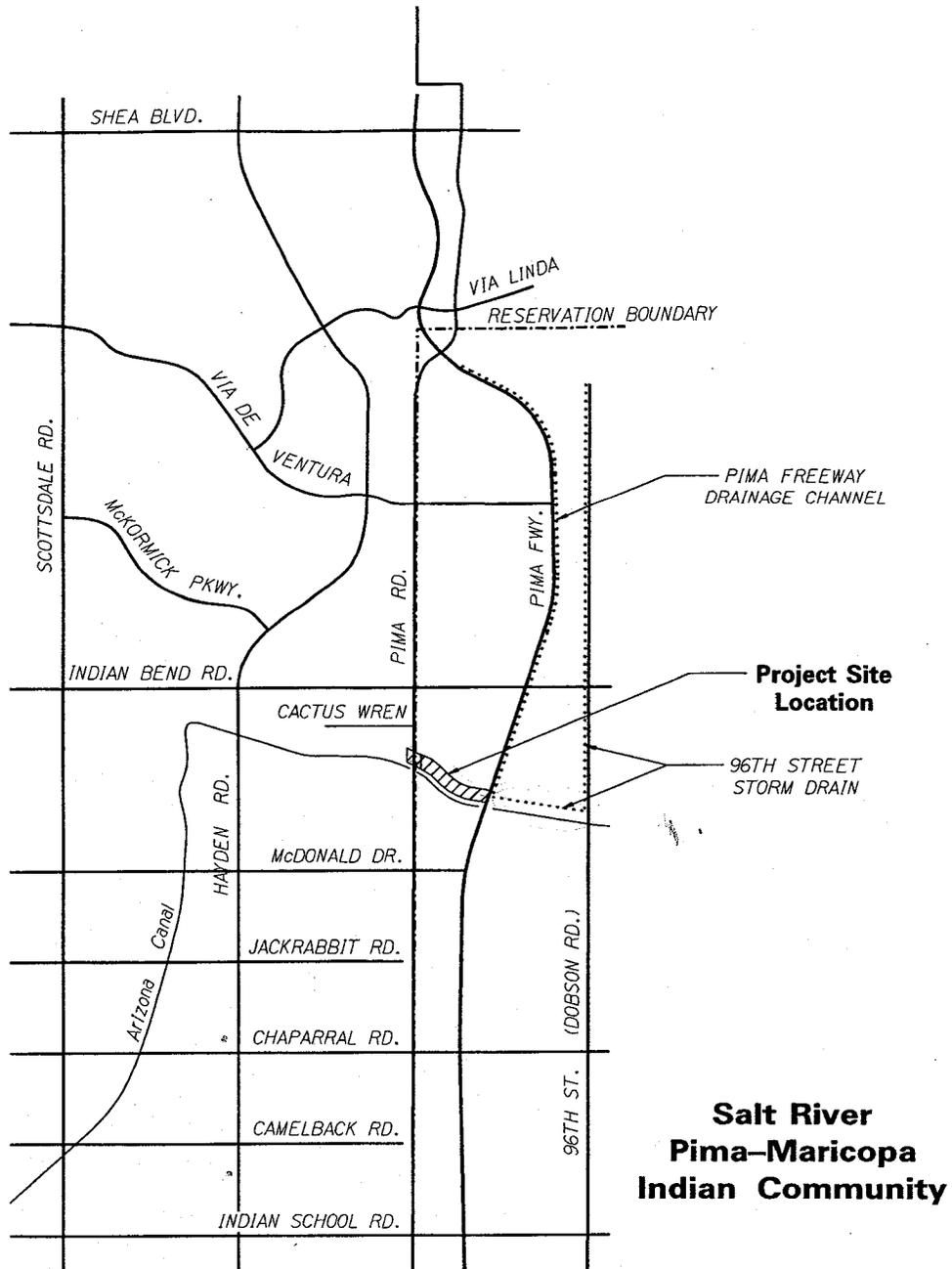
**D. Approval Of Plans By ADOT**

The Community forwarded 90% Plans to ADOT, City of Scottsdale, Salt River Project, and Flood Control District of Maricopa County for review and comment on August 13, 1997. The Community is incorporating and addressing any comments or concerns into the project specifications and plans, at this time. The attached plans incorporate any comments received from the 90% submittal, but have not been proofed by Community plan reviewers.

**E. Exhibits**

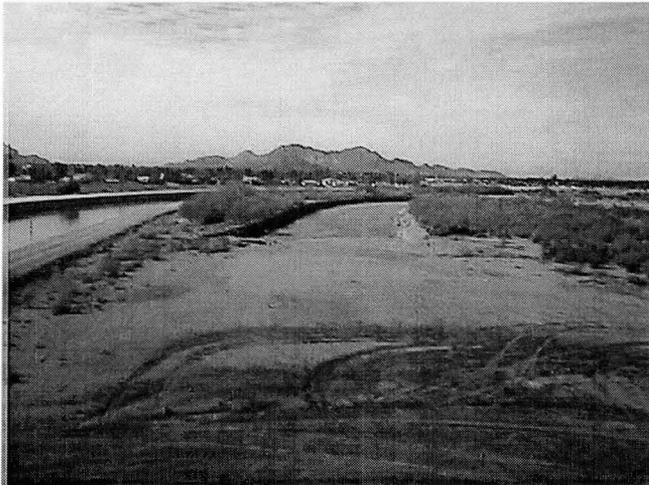
1. Area Map
2. Site Photographs

City of  
Scottsdale



PIMA OUTFALL CHANNEL (93E130)	
AREA MAP	
JANUARY 1998	EXHIBIT I-E

EXHIBIT I - E - 2 (SITE PHOTOGRAPHS)



**Figure 1**

Looking West towards Scottsdale from Pima Freeway at Arizona Canal. Future Site of Pima Outfall Channel. ADOT previously excavated some of the channel material for bridge embankments and construction fill. Arizona Canal is visible in photo left. Camelback Mountain is visible on the horizon.



**Figure 2**

Looking West towards Scottsdale from Pima Road at Arizona Canal. Future site of Pima Outfall Channel outlet into Indian Bend Wash Interceptor Channel. Arizona Canal side-spillway is visible in photo left. Combined flow between Arizona Canal and Pima Outfall outlet will not exceed 8,000 cfs.



**Figure 3**

Looking East towards Salt River Indian Community from Pima Road and Arizona Canal. Future site of Pima Outfall Channel. Freeway bridge over canal and channel is visible in distance.



**Figure 4**

Looking East towards Salt River Indian Community from Pima Freeway at the Arizona Canal. Future site of outfall channel from the Community 96<sup>th</sup> Street Storm Drain Project.

EXHIBIT I - E - 2 (SITE PHOTOGRAPHS)



**Figure 5**

Looking North towards Reservation boundary from Arizona Canal bridge. Future site of Pima Freeway Drainage Channel; drainage channel will flow along visible fence line. Pima Freeway and the Pavilions Shopping Center are visible on photo left.



**Figure 6**

Looking South-Westerly towards future junction of ADOT Pima Freeway Drainage Channel, the Community 96<sup>th</sup> Street Storm Drain channel, and the ADOT Pima Outfall Channel. The Pima Freeway bridge over the Arizona Canal is shown, in the background.



**Figure 7**

Looking East at existing box culvert beneath Pima Road at the Arizona Canal. Pima Outfall Channel will replace existing structure with 7-10'x8'x170' Pre-Cast Box Culvert.



**Figure 8**

Looking North Easterly at the Drainage Area from Pima Road and the Arizona Canal. McDowell Mountains, Pavilions Shopping Center and Pima Freeway are visible. Vegetation is typical to undisturbed native lands.

## II. DRAINAGE AREA AND HYDROLOGY

### A. *General Discussion*

The 19.5 square mile drainage area contains land between Via Linda and the Arizona Canal and between Pima Road and Stapley Drive. The hydraulic design of the Pima Outfall Channel is conservative; the Community took the conservative approach of using the HEC-1 peak discharges, as opposed to designing based upon peak discharge timing differentials. This conservative methodology is consistent with recommendations from Robert Ward.

The drainage area was thoroughly modeled by Robert Ward and Evans Kuhn & Associates. There are several hydrologic reports discussing the details. Refer to the references for a more complete overview.

### B. *Drainage Area Characteristics.*

The drainage area is predominately native desert range-land. However, the northern region is populated with residential subdivisions. The eastern portion of the drainage area is mostly agricultural land; the western portion is becoming commercially developed. As commercial development of the Pima Freeway corridor on the Community continues, the peak discharge from the drainage area should decrease due to the adoption and enforcement of the Community's new Floodplain and Drainage ordinance, which is consistent with the Flood Control District of Maricopa County's guidelines for development.

The drainage area is bounded by the McDowell Mountains and the Central Arizona Project on the north. The land generally slopes south-westerly at 1% or less.

### C. *Hydrology As Received From Management Consultant*

The Community designed the Pima Outfall Channel based upon the hydrologic reports prepared by Robert Ward. The primary design reference was the Concept Design Summary, Arizona Canal Drainage Channel - Pima Freeway, dated May 18, 1993. The report contains both the 100-year and 2-year HEC-1 peak discharge values determined from the HEC-1 model OL1J.12I and OL2J.12I, an in-depth split flow analysis of flows carried in the canal versus the channel east of Pima Road, and a preliminary HEC-2 model for the Pima Outfall Channel based upon MK Centennial's initial design.

The Community began the design phase in earnest in late-1995 and realized that the current land-use conditions were different than when Robert Ward conducted his last hydrologic analysis in 1993. The City of Scottsdale had constructed residential areas with storm drainage and detention areas, as had the Community with the Pavilions Shopping Center at Indian Bend and Pima Road. Therefore, the Community retained Robert Ward to update his hydrologic model.

Robert Ward updated his 100-year HEC-1 model and renamed it as PF2.12I. The updated model showed that the combined discharge, west of Pima Road and carried between the IBWIC and the Arizona Canal, decreased as a result of the developments over the last decade, by approximately 6% to about 7,903 cfs. (The Corps of Engineers has mandated a maximum combined flow of 8,000 cfs in this region.) *From which model?*

### D. *Additional Studies by Consultant*

As mentioned above, the Community hired Robert Ward in mid-1996 to update his OL1J.12I HEC-1 hydrologic model to account for new growth along the northern border of the Community

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and the new Talking Stick Golf course at Indian Bend and 96<sup>th</sup> Street. Mr. Ward also addressed the Flood Control District of Maricopa County's concern regarding his use of the 12-hour event versus the Corps of Engineers' use of a 7-hour event. Robert Ward prepared a report titled, Updated Hydrology Analysis - Arizona Canal Discharge Channel, dated August 20, 1996. The 100-year peak discharges were less than the original values calculated in 1993 and used for channel design, for the 12-hour event. Mr. Ward prepared model PF4.7I to conclusively prove that the proposed peak discharge will not exceed 8,000 cfs west of Pima Road, using the Corps of Engineers' methodology.

The Community decided to continue using the 100-year HEC-1 model OL1J.12I as the basis of design because the channel design was substantially complete and the 100-year peak discharge values were less than the 1993 values, by about 5%. The Community decided re-running Mr. Ward's split-flow analysis using the new PF2I.12I model was not worth the effort or time due to only a slight decrease in the peak discharges. The OL1J.12I design model shows the flow-split between the Arizona Canal and IBWIC as 2,229 vs. 6,153 cfs, for a total of 8,342 cfs. The PF2I.12I model shows the flow-split between the Arizona Canal and IBWIC as 2,247 vs. 5,656 cfs for a total of 7,903 cfs, or 5% less than the design basis. Therefore, the channel design is conservative.

**E. Exhibits**

Drainage Area Map

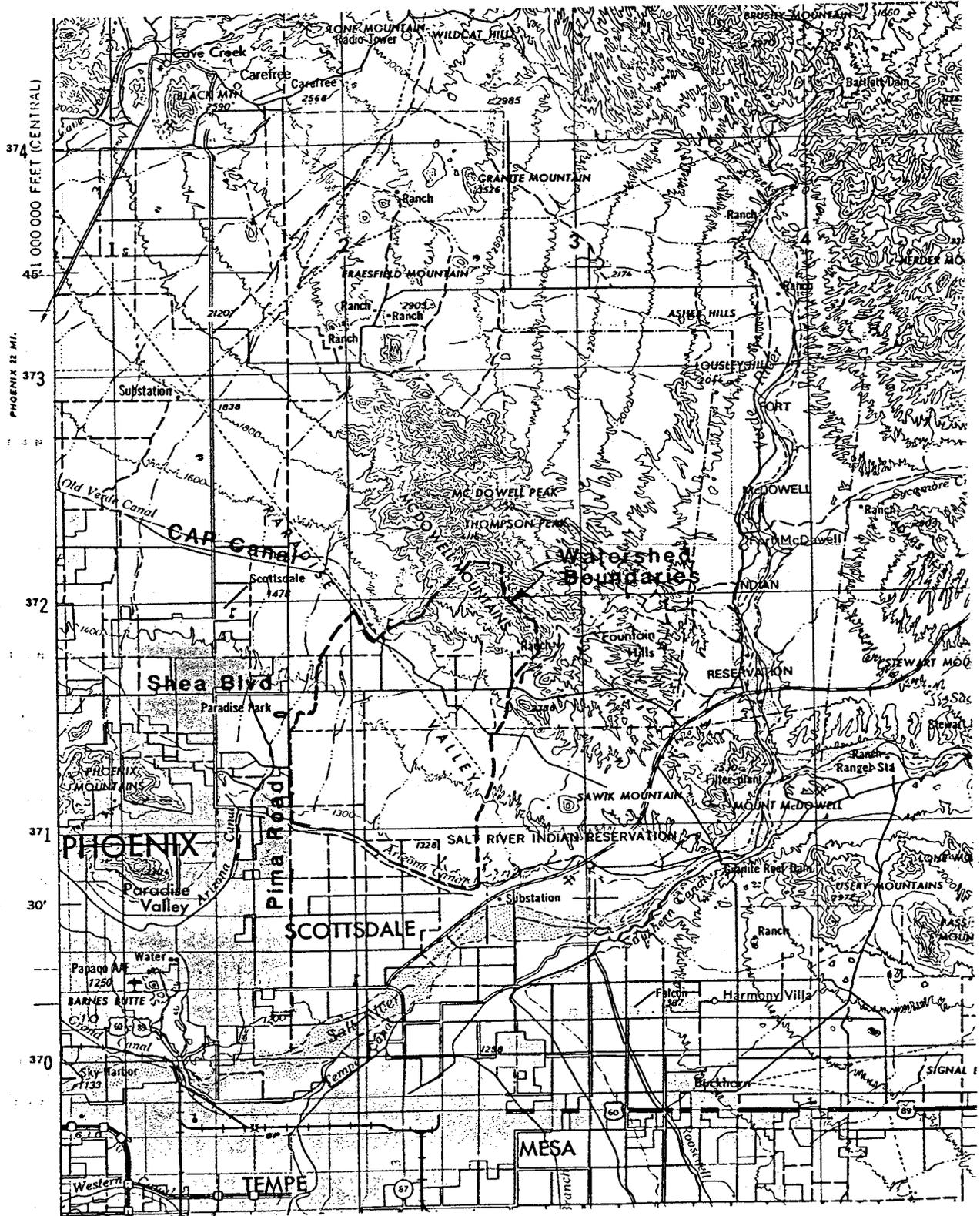
HEC-1 Routing Schematic, from the 1996 Updated Hydrologic Analysis, prepared by Robert Ward

***(See Volume II - Detailed Calculations)***

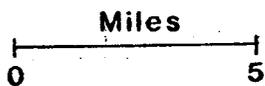
HEC-1 Models OL1J.12I, OL2J.12I (Copies of HEC-1 Models PF2.12I and PF4.7I are available upon request, but not included in this report. They were issued as part of Robert Ward's "Updated Hydrology Analysis" from August 1996.)

***(See Volume II - Detailed Calculations)***

EXHIBIT II - E - 1 (DRAINAGE AREA MAP)



Location Map



PIMA OUTFALL CHANNEL (93E130)

DRAINAGE AREA MAP

JANUARY 1998

EXHIBIT II-E

### **III. ON-SITE DRAINAGE**

#### **A. General Discussion**

On-site drainage on the south-side of the channel is not an issue because the channel so closely follows the southern right-of-way alignment. Any runoff generated from this area will be retained in the Salt River Project drainage ditch paralleling the Arizona Canal. On-site drainage of the area north of the channel is provided via four 24-inch storm sewers and ADOT Standard Detail C-15.80 catch basins. Runoff will flow northward towards the right-of-way alignment and be intercepted by 12"-inch grader ditches, which flow parallel to the north right-of-way alignment. The grader ditches empty into the four catch basins, which empty into the 100-year outfall channel via 24"-inch reinforced concrete pipes.

#### **B. Inlet/Catch Basin (CB) Spacing Design**

The Community spaced the inlet catch-basins no more than 500-feet apart and located them to effectively drain the detention area. The four catch-basins will handle the on-site runoff plus the minimal off-site runoff flowing southwesterly overland between the freeway and Pima Road, approximately 97 cfs for the 100-year event. The four catch-basins have the capacity to convey a maximum of approximately 110 cfs to the channel invert.

The Community will install an ADOT Standard B-12.10 reinforced concrete headwall and 36" reinforced concrete pipe within the Pima Road right-of-way to intercept and convey any runoff flowing within the Pima Road easement from the eastern edge of the easement. The catch basin outlets directly into the pre-cast box culvert. This catch basin will convey a maximum of approximately 130 cfs to the channel.

#### **C. Storm Sewer Design**

Each of the catch basins independently outlet directly to the channel. The Community designed the connecting pipes to minimize sedimentation by providing adequate slopes. The storm sewer pipes are of standard reinforced-concrete pipe design and strong enough to support the fill condition each experiences.

#### **D. Main Storm Sewers (Not applicable.)**

#### **E. Outlet Design**

Each of the storm drains empty directly into the Pima Outfall Channel through ADOT Standard Detail C-13.75 outlets. The outlet grates will prevent small animals and children from entering the storm pipes. The invert of each storm drain outlets 6" above the finished floor of the channel.

**F. Pump Station Design (Not applicable.)**

**G. Special Problems (Not applicable.)**

**H. Exhibits**

Drainage Plan Showing Inlet/CB and Storm Sewer Locations

**(See Attached 95% Plan Set)**

Special Details

**(See ADOT Standard Detail C-15.80 Catch Basin, Median Flush)**

**(See ADOT Standard Detail B-11.11 Inlet & Outlet Headwalls (18" - 42" Pipes))**

**(See ADOT Standard Detail C-13.75 Storm Drain Outlet Details)**

## **IV. OFF-SITE DRAINAGE**

### **A. General Discussion**

The primary purpose of this project is to provide 100-year drainage of the drainage area north of the Arizona Canal between Stapley Drives and Pima Road.

### **B. Coordination with Adjacent Design Sections and Local Agencies**

The Community coordinated with the City of Scottsdale, ADOT, and Flood Control District of Maricopa County during the planning and design phases of the project. Project correspondence extends back almost a decade. In mid-1996, the Community retained professional services from Robert Ward to re-analyze and update the drainage area hydrology since his work is respected by the local agencies.

In 1994, the Community adopted a Floodplain and Drainage Ordinance (SRO 185-95) that will greatly benefit the effected drainage area because all new developments on the Salt River Indian Community are required to equal or reduce existing runoffs through use of detention and retention. The ordinance is enforced by the Community Building Official and has already contributed to the 10% reduction in peak discharges, as verified when Robert Ward updated his hydrology report. The Pavilions Shopping Center and the new Talking Stick Golf Resort are detaining more runoff than they are generating. The adoption and enforcement of the drainage ordinance is important because it will further attenuate peak discharges into the Indian Bend Wash.

### **C. Channel Design**

When the Community assumed design responsibilities in November 1993, ADOT and MK Centennial Inc. recommended the use of a reinforced concrete-lined channel following the tentative alignment along the north bank of the Arizona Canal. ADOT had already acquired the channel right-of-way as part of the Pima Freeway acquisition. Therefore, the Community was constrained by the right-of-way easement into using steeper side-slopes and a rigid channel lining. The Community did not consider any other alternative channel linings or alignments.

Based upon review of the preliminary design work by MK Centennial Inc., the design flow volumes, soils investigations conducted by the Community, and constraining inverts of the Pima Freeway Drainage Channel, the 96<sup>th</sup> Street Storm Drain, and the channel outlet, the Community decided to make only small refinements to the channel geometry. The channel is directly connected to the Pima Freeway Drainage Channel and the 96<sup>th</sup> Street Storm Drain; there is no detention capacity in the system. Prior to assuming design and construction responsibilities, the Community negotiated with ADOT to eliminate the detention capacity east of the Pima Freeway, as was initially proposed. From the Community's perspective, it was not acceptable to increase the width of the 100-year floodplain across Allotted lands, north of the Arizona Canal.

The Community designed the channel using the Standard Step methodologies and the HEC-2 software program. The Community used HEC-2 computer program, Version 4.6.2; dated May 1991, for the standard-step calculations. As mentioned previously, the Community used the peak 100-year discharge values from Robert Ward's 1993 HEC-1 model as the basis for design discharges. The Community did not attempt to re-calculate Robert Ward's split-flow analysis of the channel and canal flows using the 1996 hydrology, due to the extreme complexity of the task. Due to using peak discharges with no consideration of peak attenuation, the Community's planned development of the area under the Floodplain and Drainage ordinance, and the 1993

hydrology report, the channel design is very conservative, and the Community expects to never exceed the Corps of Engineer's 100-year limit of 8,000 cfs.

The Community used Robert Ward's HEC-2 model, Finch4bm.in, as the base model. The Community refined Mr. Ward's 1993 model to reflect the Community's alignment and channel variables to accurately reflect the proposed channel.

**D. Detention Basin Design (Not applicable.)**

**E. Outfall Design**

The Pima Outfall Channel empties into the IBWIC. The Flood District of Maricopa County has responsibility from the Corps of Engineers to ensure the wash does not receive more than 8,000 cfs.

Robert Ward's August 1996, Updated Hydrology Report predicts a peak 100-year flow of 7,886 cfs, using the PF2.12I HEC-1 model. Both the City of Scottsdale and the Flood Control District of Maricopa County concurred with Robert Ward's assessment in Fall of 1996. (Note that Robert Ward recommended the Community use model PF2.12I as the basis of the Pima Freeway drainage system and using PF4.7I as documentation that the proposed Pima Freeway drainage system will not violate the 8,000 cfs limit at Pima Road.)

Not found where from

**F. Box Culvert Selection**

The Community initially sized and designed a seven barrel box culvert to conform with ADOT Standard Detail B-02.65. After discussions with City of Scottsdale about the heavy traffic volumes on Pima Road and lack of suitable surface streets for a full-closure of Pima Road, the Community decided to use a pre-fabricated, reinforced box culvert. The Community will require a full-closure of Pima Road for a period of five-days and will detour traffic into Scottsdale.

The Community will install a reinforced box culvert with 7 barrels, interior horizontal spans of 10-feet each, vertical interior spans of 8-feet each, and measuring 170-feet in length (7-10'x8'x170') that conforms to ASTM 789. The culvert is skewed to the Pima Road centerline at an angle of 21.5°, Right. The Community will order the pre-cast box culvert barrels from the pre-cast vendor with exposed rebar on the end-sections to facilitate tie-in into the Cast-in-Place headwalls and inlet/outlet transitions.

No barrel in 2010 57

**G. Drop Structure Design**

Robert Ward, P.E. recommended an energy dissipator be used at the culvert outlet to prevent scour and erosion from low-flows transitioning from the fully lined channel section to the natural earth-lined IBWIC. Flows of the 100-year magnitude are of little concern because the culvert outlet will be submerged by the IBWIC backwater, and exit velocities and risk of scour are very low. During more frequent events, Mr. Ward concluded that backwater events in IBWIC will be less severe and that exit velocities from the Pima Outfall Channel could cause scouring.

The Community selected and designed a Straight-Drop Dissipator in accordance with the US Department of Transportation Federal Highway Administration's Hydraulic Design of Energy Dissipators for Culverts and Channels, Hydraulic Engineering Circular No. 14, September 1983.

In general, the energy dissipator's key features are: a one-foot drop from the channel invert, fifteen 2 ½-foot by 2 ½-foot by 4 1/3-foot high stilling blocks, and measures 24-feet by 75 ½-feet. The dissipator outlet is protected by grouted rip-rap.

## **H. Concrete Channel Lining Design**

Western Technology recommended a rigid channel-lining based on analysis of the grain size distribution, plasticity index, and the direct shear test results. The Community designed the channel lining in accordance with the ADOT Urban Highways Channel Design Guidelines (February 1989).

In general, the Community selected a 6-inch continuously reinforced concrete lining with #4 rebar at 12-inch spacing, each way. The channel side slopes are protected by continuous 24-inch cut-off walls. The channel's two ends are protected by traversing, continuous 24-inch cut-off walls.

## **I. Special Problems**

The invert of the Pima Outfall Channel is governed by three parameters: invert of the 96<sup>th</sup> Street Storm Drain channel, the invert of the Pima Freeway Drainage channel, and the invert of the IBW Interceptor Channel. During design of the Pima Outfall Channel, the Community determined that there was a 0.65-foot difference between the invert of the ADOT N-S Pima Freeway channel and the Pima Outfall Channel. The difference was compensated by changing the N-S channel slope from 0.0038 feet per feet to 0.0031 feet per feet over the course of the transition from the ADOT N-S channel to the Pima Outfall Channel. The slope increase did not significantly effect the Froude number and the flows remains sub-critical.

To prevent scouring at the outlet of the dissipator, the Community proposes to place enough grouted rip rap to protect the outlet and the outlet wing-walls. The Community followed the grouted rip-rap design procedures in the Flood Control District of Maricopa County's Hydraulic Design manual. The Community proposes to place 6" to 12" angular rip rap material, with full penetration of the grout, to a depth of 2-feet across the entire width of the channel outlet.

The intersection of the 96<sup>th</sup> Street Storm Drain outfall channel, the Pima Freeway drainage channel, and the Pima Outfall Channel proposes a unique challenge to accurately model the energy grade line. The Community constructed the HEC-2 model, ADOT\_N\_S.IN, to compute the water surface elevations for the Pima Freeway drainage channel through the transition, based on the Standard Step method. The Community did not attempt to model the 3-dimensional flow effects, but is confident that the proposed interchange is conservative. The Community allowed ample freeboard to contain any hydraulic jump as flows from the Pima Freeway drainage channel join the Pima Outfall Channel; all flows are sub-critical and pose no health/safety risks.

**J. Exhibits**

Drainage Plan

*(See Attached 95% Plan Set)*

Typical Sections

*(See Attached 95% Plan Set)*

Special Details

*(See Attached 95% Plan Set)*

Plan of Outfall Structures

*(See Attached 95% Plan Set)*

Plan of Box Culvert Structures

*(See Attached 95% Plan Set)*

Profile of Channel Showing Original Ground Surface

*(See Attached 95% Plan Set)*

Design of Channel Bed and Water Surface Elevations

*(See Attached 95% Plan Set)*

HEC-2 Output Files (FINCH4BM.OUT and ADOT\_N\_S.OUT)

*(See Volume II - Calculations)*

Hand Calculations for Grouted Rip-Rap, Energy Dissipator, Steel Reinforcement

*(See Volume II - Calculations)*

**V. MAJOR STREAM CROSSING (Not Applicable.)**

**VI. PUMP STATION (Not Applicable.)**

## REFERENCES:

Updated Hydrology Analysis, Arizona Canal Drainage Channel, Pima Freeway (Via Linda Drive to Arizona Canal), Maricopa County Arizona, prepared by Robert L. Ward, August 20, 1996.

Conceptual Design Summary, Arizona Canal Drainage Channel, Pima Freeway, prepared by Robert L. Ward, May 18, 1993.

Master Drainage Plan, Salt River Pima-Maricopa Indian Community, Northwest Area, prepared by Evans, Kuhn & Associates Inc, March 9, 1992.

Geotechnical Evaluation, Pima Outfall Channel, Between Pima Freeway and Pima Road, Scottsdale Arizona, Job No. 2126JG142, prepared by Western Technologies Inc., May 29, 1996.

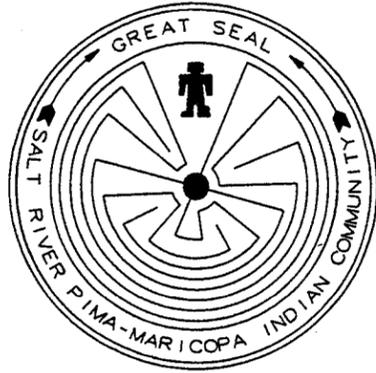
Hydrologic and Hydraulic Analysis of Arizona Canal Drainage Channel with No Upstream Berm, prepared by Robert L. Ward P.E., September 11, 1992.

96th Street Storm Drain Plans and Specifications, prepared by Evans, Kuhn & Associates, June 1992.

Gila River Basin, Arizona, Indian Bend Wash, Design Memorandum No. 4, Feature Design for Interceptor Channel, Project Design for Indian Bend Wash, prepared by US Army Corps of Engineers, Los Angeles District, January 1980.

Gila River Basin, Arizona, Indian Bend Wash, General Design Memorandum, Phase I for Indian Bend Wash, prepared by US Army Corps of Engineers, Los Angeles District, October 1973.

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	93E130	1	26	

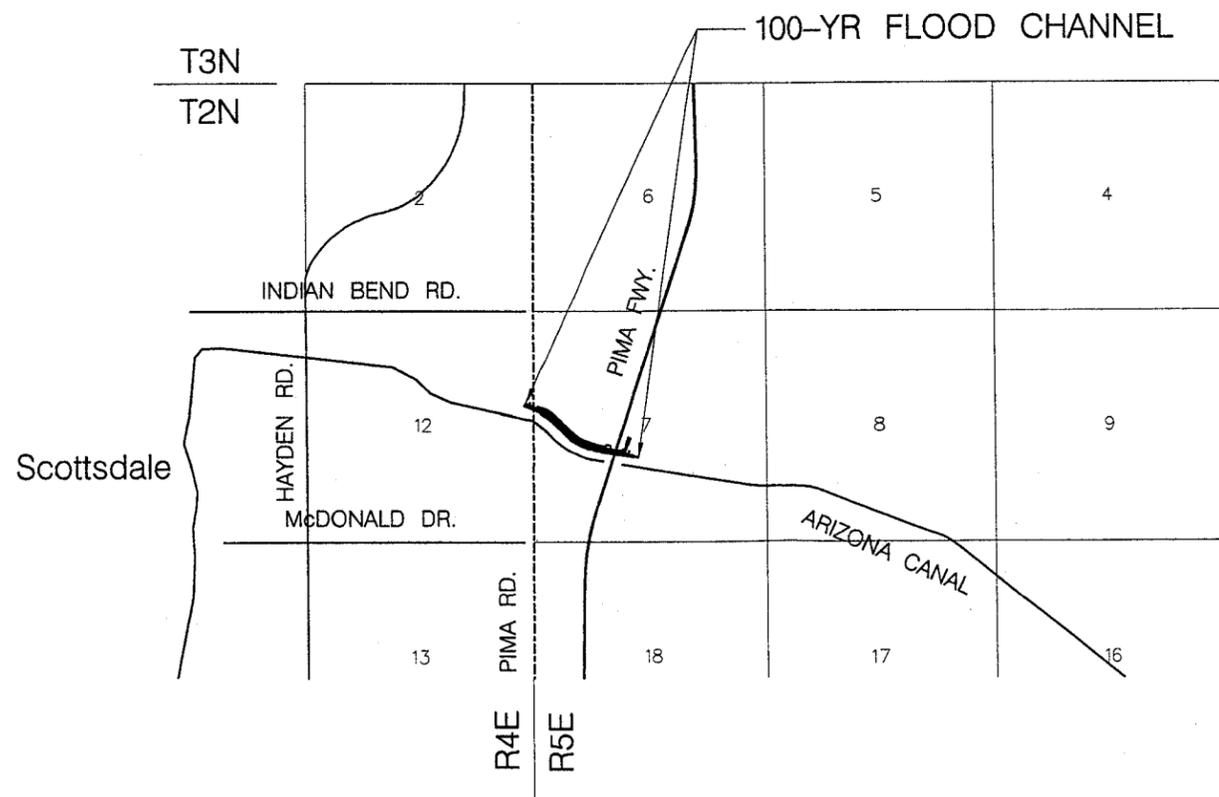
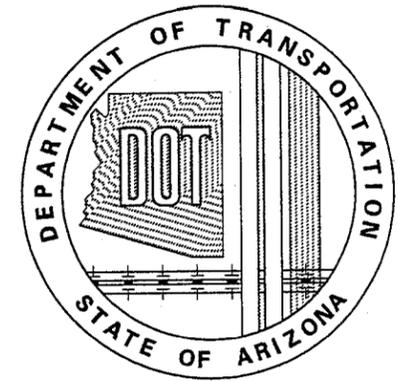


STATE OF ARIZONA  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

PLAN AND PROFILE OF PROPOSED

PIMA OUTFALL CHANNEL

93E130



PIMA FREEWAY - INDIAN BEND WASH  
INTERCEPTOR CHANNEL

ARIZONA DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
APPROVED: THOMAS G. SCHMITT

APPROVED \_\_\_\_\_ DATE \_\_\_\_\_  
ASSISTANT STATE ENGINEER

SALT RIVER PIMA-MARICOPA  
INDIAN COMMUNITY  
ENGINEERING & CONSTRUCTION SERVICES

APPROVED \_\_\_\_\_ DATE \_\_\_\_\_  
DEPARTMENT DIRECTOR

DATE	LOCATION	REVISIONS	FINISHED PLANS	SURVEY NO.

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARZ.	93E130	2	26	

# PIMA OUTFALL CHANNEL (93E130)

## SALT RIVER PIMA-MARICOPA INDIAN COMMUNITY

SHEET	DRAWING	SHEET NAME
1	G-0.0	FACE SHEET
2	G-1.1	INDEX OF SHEETS
3	G-2.1	DESIGN DATA / GENERAL NOTES
4	G-2.2	SOIL BORING LOGS
5	G-3.1	TYPICAL SECTIONS
6	G-3.2	TYPICAL SECTIONS
7	G-3.3	TYPICAL SECTIONS
8	G-4.1	REINFORCED CONCRETE BOX CULVERT SUMMARY SHEET
9	G-5.1	CATCH BASIN AND CONNECTOR PIPE SUMMARY SHEET
10	G-6.1	SPECIAL DETAILS - CHANNEL REINFORCEMENT
11	G-6.2	SPECIAL DETAILS - METAL HANDRAIL
12	C-1.1	GEOMETRIC LAYOUT
13	C-1.2	GEOMETRIC DATA SUMMARY
14	C-1.3	GEOMETRIC DATA SUMMARY
15	D-1.1	CHANNEL PLAN & PROFILE (STA 168+61.79 to 181+00.00)
16	D-1.2	CHANNEL PLAN & PROFILE (STA 181+00.00 to STA 196+00.00)
17	D-1.3	CHANNEL PLAN & PROFILE (JUNCTION N-S FREEWAY CHANNEL & PIMA OUTFALL CHANNEL)
18	D-2.1	REINFORCED CONCRETE BOX CULVERT SECTION & DETAILS
19	D-3.1	CHANNEL OUTLET SECTION & DETAILS
20	D-4.1	MAINTENANCE RAMP DETAILS
21	T-1.1	TRAFFIC CONTROL PLAN GENERAL NOTES & QUANTITIES
22	T-1.2	TRAFFIC CONTROL PLAN GENERAL NOTES & QUANTITIES
23	T-1.3	TRAFFIC CONTROL PLAN LEGEND
24	T-2.1	TRAFFIC CONTROL PLAN
25	T-2.2	TRAFFIC CONTROL PLAN
26	T-2.3	TRAFFIC CONTROL PLAN

DESIGN	H. Jones	DATE	11/97	ARIZONA DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION HIGHWAY PLANS SERVICES
DRAWN	K. Andrews	DATE	11/97	
CHECKED	B. Meyers	DATE	11/97	
SALT RIVER PIMA-MARICOPA INDIAN COMMUNITY ENGINEERING & CONSTRUCTION SERVICES 5000 East McDowell Road Suite 100, Phoenix, Arizona 85028-1722 Phone: 602-994-8100				INDEX OF SHEETS
ROUTE	LOCATION			DWG NO G-1.1

TRACS NO.

2 OF 26

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARZ.	93E130	3	26	

**GENERAL NOTES:**

1. DESIGNED IN ACCORDANCE WITH ADOT URBAN HIGHWAYS, CHANNEL LINING DESIGN GUIDELINES (1989) AND ADOT CONSTRUCTION STANDARD DRAWINGS (1991) AND STRUCTURES STANDARD DRAWINGS (1992).

2. REFERENCES: SRPMIC 96th STREET STORM DRAIN PLANS, DATED 7-1-92, BY EVANS KUHN & ASSOC. ADOT PIMA (SHEA BLVD. TO McDONALD DRIVE) FREEWAY PLANS, PROJECT NUMBER RAM-600-1-542, DATED DEC '96, BY MK CENTENNIAL INC. GEOTECHNICAL EVALUATION, PIMA OUTFALL CHANNEL, DATED 5-29-96, BY WESTERN TECHNOLOGIES INC. UPDATED HYDROLOGY ANALYSIS, ARIZONA CANAL DRAINAGE CHANNEL, PIMA FREEWAY (VIA LINDA TO ARIZONA CANAL), DATED 8-20-96, BY ROBERT LWARD.

3. THE CONTRACTOR IS RESPONSIBLE FOR ALL WORK AND MATERIALS RELATING TO DESIGN, CONSTRUCTION, ERECTION METHODS, BRACING, SHORING, RIGGING, GUYS, SCAFFOLDING, FORMWORK, AND OTHER WORK AIDS REQUIRED TO SAFELY PERFORM THE WORK SHOWN.

4. "STANDARD DETAILS", AS SHOWN, ARE INTENDED TO BE TYPICAL AND SHALL APPLY TO ALL SIMILAR SITUATIONS OCCURRING ON THE PROJECT, WHETHER OR NOT THEY ARE KEYPED IN EACH LOCATION. CONSULT THE ENGINEER FOR REVIEW PRIOR TO CONSTRUCTION.

5. VISITS TO THE JOB SITE BY THE ENGINEER TO OBSERVE THE CONSTRUCTION DO NOT IN ANY WAY MEAN THAT THEY ARE GUARANTORS OF THE CONSTRUCTOR'S WORK, NOR RESPONSIBLE FOR COMPREHENSIVE OR SPECIAL INSPECTIONS, COORDINATION, SUPERVISION, NOR SAFETY AT THE JOB SITE.

SPECIAL INSPECTION (OWNER FURNISHED) IS REQUIRED IN ACCORDANCE WITH UBC, SECTION 306, OF THE FOLLOWING:

- CONCRETE
- CONCRETE ANCHORS
- EPOXY ANCHORS
- REINFORCING STEEL
- STRUCTURAL WELDING

6. THE AVERAGE PROJECT ELEVATION IS 1,280 FEET.

7. CONTRACTOR SHALL CONTACT BLUE STAKE (602-263-1100) A MINIMUM OF TWO (2) WORKING DAYS PRIOR TO THE START OF DIGGING TO LOCATE AND FLAG ALL UNDERGROUND UTILITIES. IT SHALL FURTHER BE THE CONTRACTOR'S RESPONSIBILITY TO CONTACT BLUE STAKE IN SUFFICIENT TIME TO ALLOW FLAGGING TO BE COMPLETED SO AS TO NOT IMPEDE CONSTRUCTION.

8. EXISTING UTILITIES ARE SHOWN IN APPROXIMATE LOCATION ONLY AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR BEFORE COMMENCING WORK OPERATIONS AT ANY PROJECT LOCATION.

**FOUNDATIONS:**

1. REFER TO GEOTECHNICAL REPORT TITLED "GEOTECHNICAL REPORT FOR THE PIMA OUTFALL CHANNEL", DATED MAY 29, 1996, AND PREPARED BY WESTERN TECHNOLOGIES INC.

2. NET ALLOWABLE BEARING FOR FOOTINGS = 3000 PSF FOR DEAD PLUS LIVE LOADS; 4000 PSF FOR LOADS WHICH INCLUDE EARTHQUAKES.

**CONCRETE:**

1. ALL CAST-IN-PLACE AND STRUCTURAL CONCRETE SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 3,000 PSI, EXCEPT THAT CONCRETE SPECIFICALLY DETAILED AS CONCRETE FILL SHALL HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 2,500 PSI. 3/4" CHAMFER AT ALL EXPOSED CORNERS. SEE ADOT SPECIFICATION 1006-3 FOR ADDITIONAL REQUIREMENTS.

2. REINFORCING STEEL FOR CONCRETE SHALL CONFORM TO ASTM A615, GRADE 60 DEFORMED BARS. FURNISH AND ERECT IN ACCORDANCE WITH ACI MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES, ACI 315.

3. UNLESS OTHERWISE INDICATED, THE MINIMUM REINFORCING FOR ALL CONCRETE WALLS AND SLABS IS:

WALL OR SLAB THICKNESS	REINF EACH WAY	LOCATION
6"	*4@12"	CENTERED
8"	*5@12"	CENTERED
10"	*4@12"	EACH FACE
12"	*5@12"	EACH FACE

4. PROVIDE LARGER SIZES AND MORE REINFORCING IN ALL SECTIONS OF CONCRETE WHERE REQUIRED BY THE DETAILS ON THE DRAWINGS OR SPECIFICATIONS.

5. CLEARANCE FOR REINFORCEMENT BARS, UNLESS SHOWN OTHERWISE, IS:  
 WHEN PLACED ON GROUND: 3"  
 EXPOSED TO WATER, WEATHER BACKFILL, OR CONDENSATION:  
 \*5 OR SMALLER: 1/2"  
 \*6 OR LARGER: 2"

6. ALL BENDS, UNLESS OTHERWISE SHOWN, SHALL BE 90 DEGREE STANDARD HOOK, AS DEFINED IN THE LATEST VERSION OF ACI 318.

7. ALL WALL CORNER AND INTERSECTION REINFORCING BARS SHALL BE CONTINUOUS AROUND CORNERS AND THROUGH COLUMNS OR PILASTERS. REINFORCEMENT SHALL BE EXTENDED INTO CONNECTING WALLS AND HOOKED/LAPPED ON THE OPPOSITE FACE OF THE CONNECTING WALL. IN GENERAL, TYPICAL HORIZONTAL REINFORCING IS SHOWN ON EACH FACILITY DRAWING.

8. VERTICAL WALL BARS SHALL BE LAPPED WITH DOWELS FROM BASE SLABS AND EXTENDED INTO THE TOP OF WALLS.

9. ALL REINFORCEMENT BENDS AND LAPS, UNLESS OTHERWISE NOTED, SHALL SATISFY THE FOLLOWING MINIMUM REQUIREMENTS: (FOR 3,000 PSI CONCRETE AND 60K REBAR)

BAR	*6 OR SMALLER	*7
TOP BAR	44 dia. (Min 2'-0")	3'-6"
OTHER BAR	33 dia. (Min 1'-6")	2'-6"

TOP BARS SHALL BE DEFINED AS ANY HORIZONTAL BARS PLACED SUCH THAT MORE THAN 12" OF FRESH CONCRETE IS CAST IN THE MEMBER BELOW THE BAR, IN ANY SINGLE POUR. HORIZONTAL WALL BARS ARE CONSIDERED TOP BARS.

10. ALL CONCRETE CHANNEL LINING TO BE COLORED AND TINE-FINISHED PER PROJECT SPECIFICATIONS.

LENGTH OF PROJECT  
 STA 168+61.79 TO STA 195+89.14 = 2727.4 FT

MIDPOINT OF PROJECT  
 CENTRAL ZONE, STATE PLANE COORDINATES  
 N = 920,596.981  
 E = 508,810.491

DESIGN FLOWS  
 Q<sub>100</sub> = 5468 cfs (OUTLET)

EARTHWORK QUANTITIES	
DRAINAGE EXCAVATION	59,845 C.Y.
STRUCTURAL EXCAVATION	10,690 C.Y.
STRUCTURAL BACKFILL	2,835 C.Y.
EMBANKMENT *	8,300 C.Y.
WASTE	38,025 C.Y.

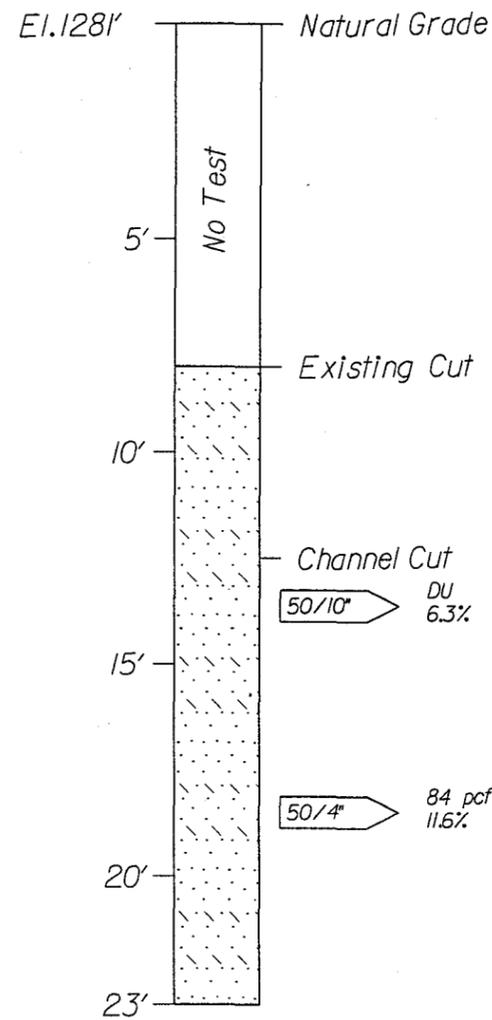
\* Shrinkage Losses Not Included

DESIGN	H. Jones	11/97	ARIZONA DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION HIGHWAY PLANS SERVICES
DRAWN	H. Jones	11/97	
CHECKED	B. Meyers	11/97	
SALT RIVER PIMA-INDIENNA RIVER CORRIDOR CONCRETE & CHANNEL Lining 9300 East Street, Suite 200 Phoenix, Arizona 85028-2022 Phone: 480-841-4700			GENERAL NOTES & DESIGN DATA
ROUTE	LOCATION		

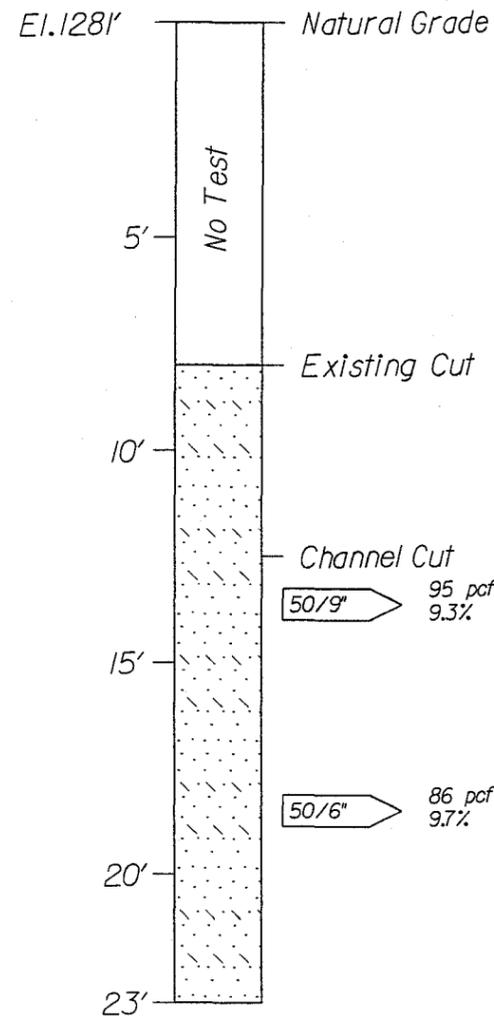
TRACS NO.

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	93E130	4	26	

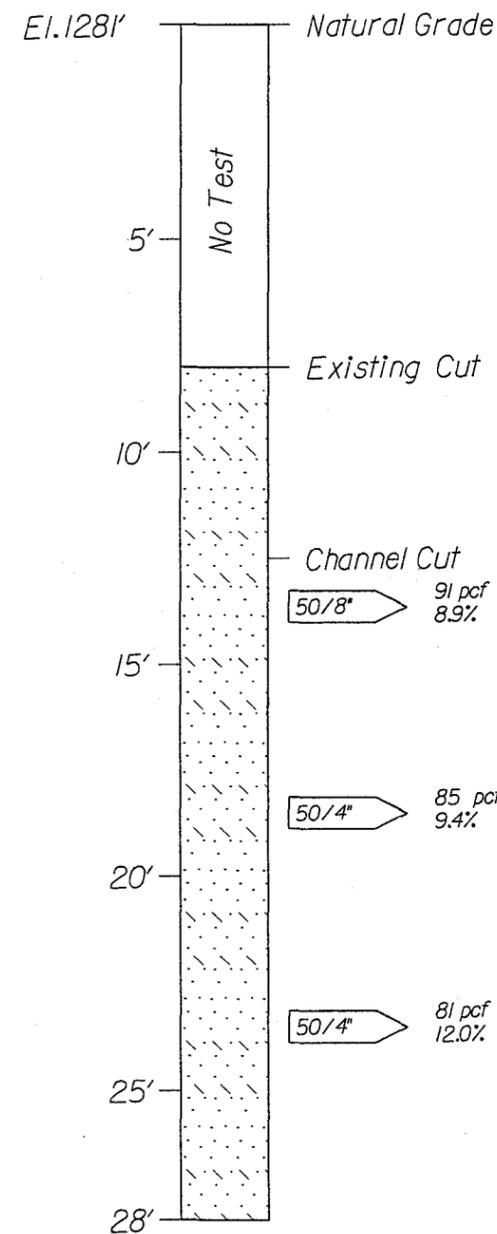
**Sta. 178 + 00  
TB-C1**



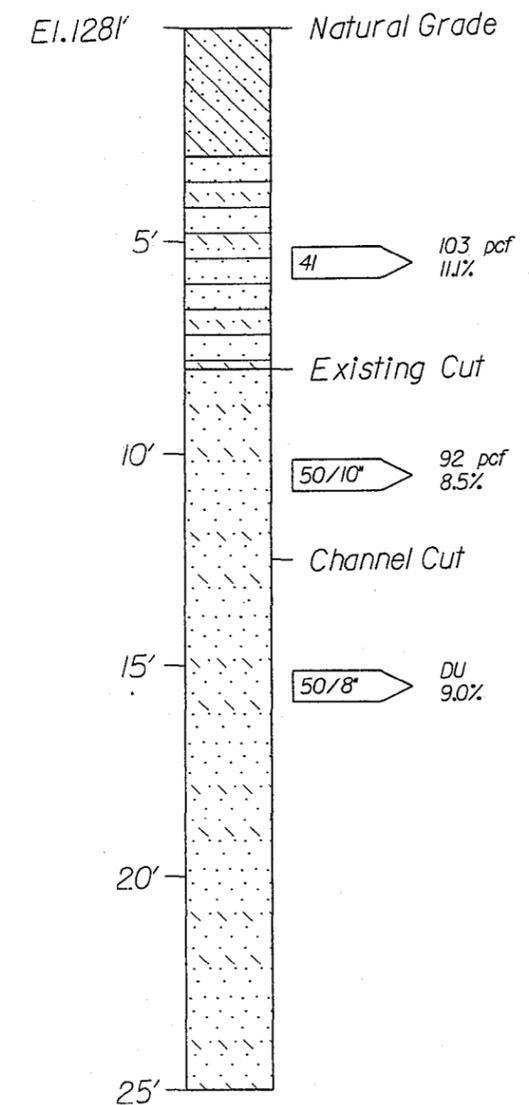
**Sta. 183 + 00  
TB-C2**



**Sta. 186 + 00  
TB-C3**



**Sta. 189 + 00  
TB-C4**



**LEGEND**

- Clayey Sand (SC)
- Sandy Clay (CL)
- Silty/Clayey Sand (SM-SC)

Tested by Western Technologies, 4-30-96

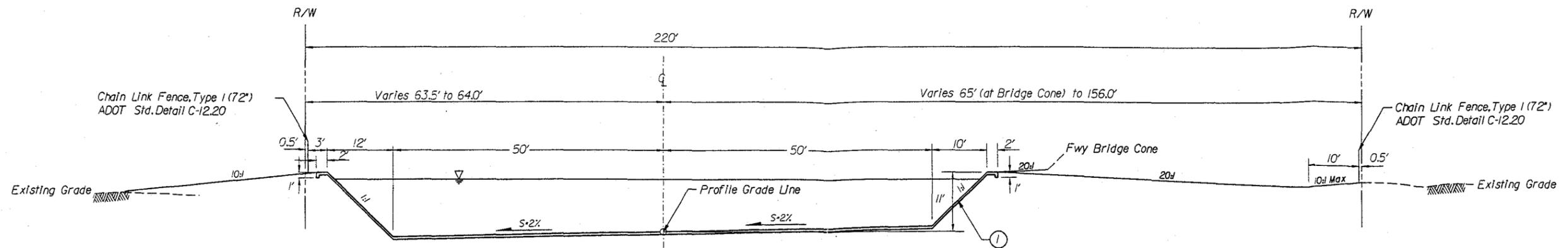
DESIGN	NAME	DATE	ARIZONA DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION HIGHWAY PLANS SERVICES
DRAWN	H. Jones	11/97	
CHECKED	K. Andrews	11/97	
	B. Meyers	11/97	SOIL BORING LOGS
ROUTE	LOCATION		

93e130c90.r0a  
ccccSYSTIMEcccc

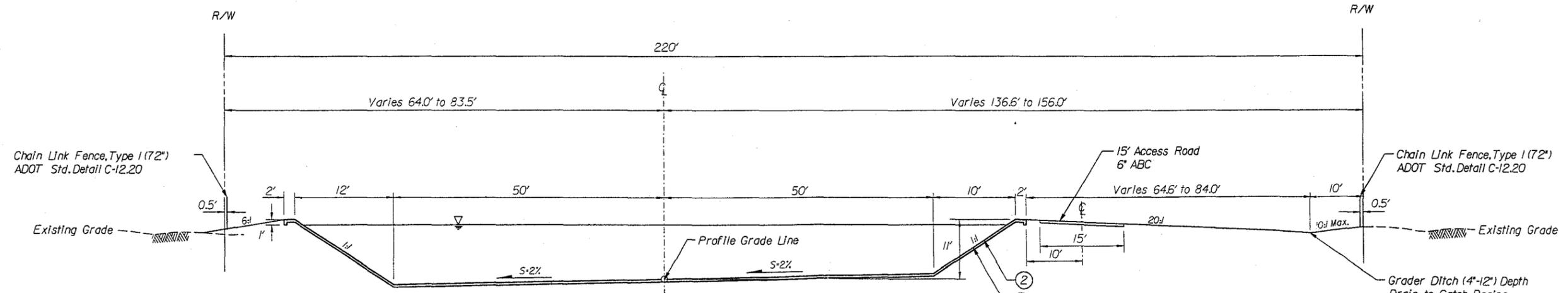
TRACS NO.

DWG NO G-2.2  
4 OF 26

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	93E130	5	26	



**TYPICAL SECTION**  
Sta 171+00.00 to Sta 174+00



**TYPICAL SECTION**  
Sta 174+00.00 to Sta 177+00.00

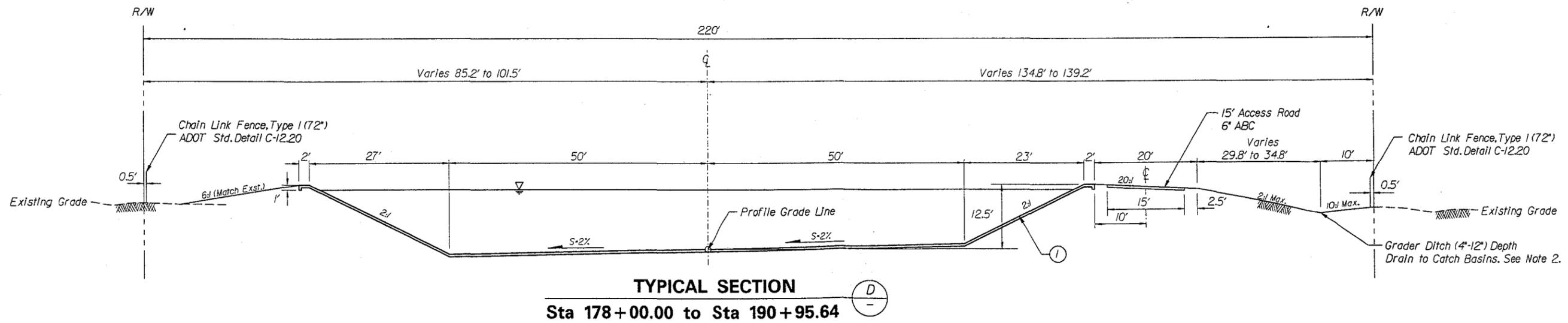
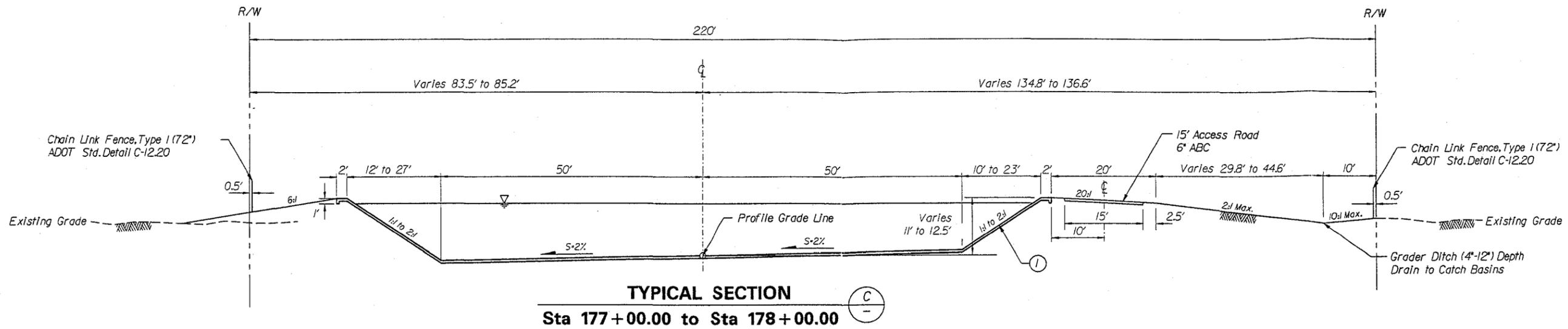
**NOTES:**

- ① See Detail A, Sheet G-6J for Channel Reinforcement Detail.
- ② Maintenance Ramp not shown, for clarity. See Cross-Section, Dwg. G-7.2 & D-4J.
- ③ Typical Section Sta 168+61.70 to Sta 171+00.00 not shown. See Cross-Section, Dwg. G-7J.

DESIGN	H. Jones	11/97	ARIZONA DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION HIGHWAY PLANS SERVICES
DRAWN	K. Andrews	11/97	
CHECKED	B. Meyers	11/97	
SUT BYER PIMA-ARIZONA ROAD COMPANY CONSULTING & CONSTRUCTION SERVICES 4400 East Chino Road San Diego, CA 92124-4122 Phone: 619-571-7100			TYPICAL SECTIONS Sta 171+00.00 to Sta 177+00.00
ROUTE	LOCATION		DWG NO. G-3.1

TRACS NO.

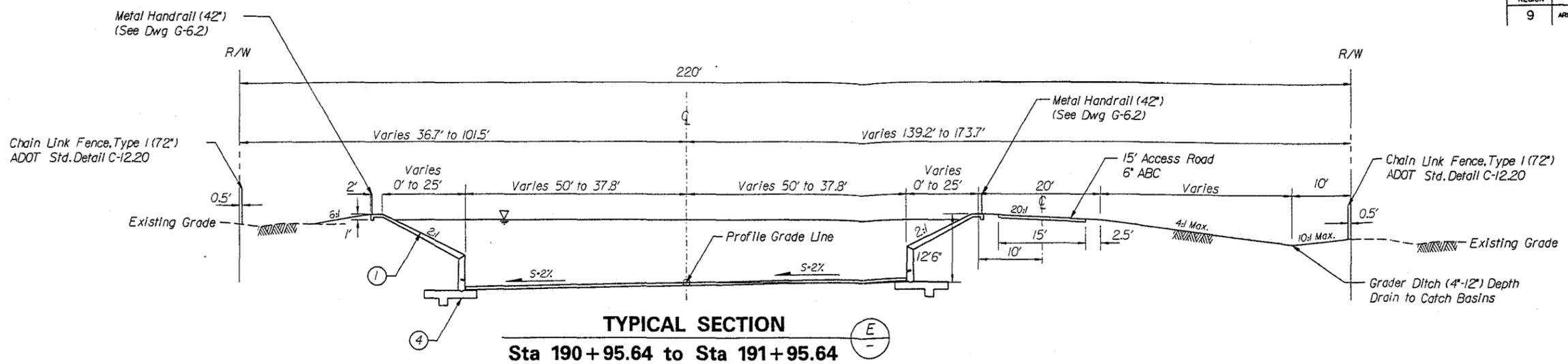
F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	93E130	6	26	



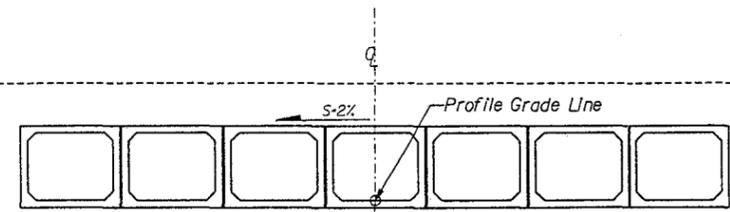
- NOTES:
- ① See Detail A, Sheet G-6J for Channel Reinforcement Detail.
  - ② No Grader Ditch from Sta 184+00 to Sta 188+00, Channel Rt.

DESIGN	H. Jones	11/97	ARIZONA DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION HIGHWAY PLANS SERVICES
DRAWN	K. Andrews	11/97	
CHECKED	B. Meyers	11/97	
S&I ENGINEERING & CONSULTING SERVICES 10100 East McDowell Road Scottsdale, Arizona 85258-9722 Phone 480-271-0100			TYPICAL SECTIONS Sta 177+00.00 to Sta 190+95.64
ROUTE	LOCATION		
DWG NO G-3.2			

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARZ.	93E130	7	26	



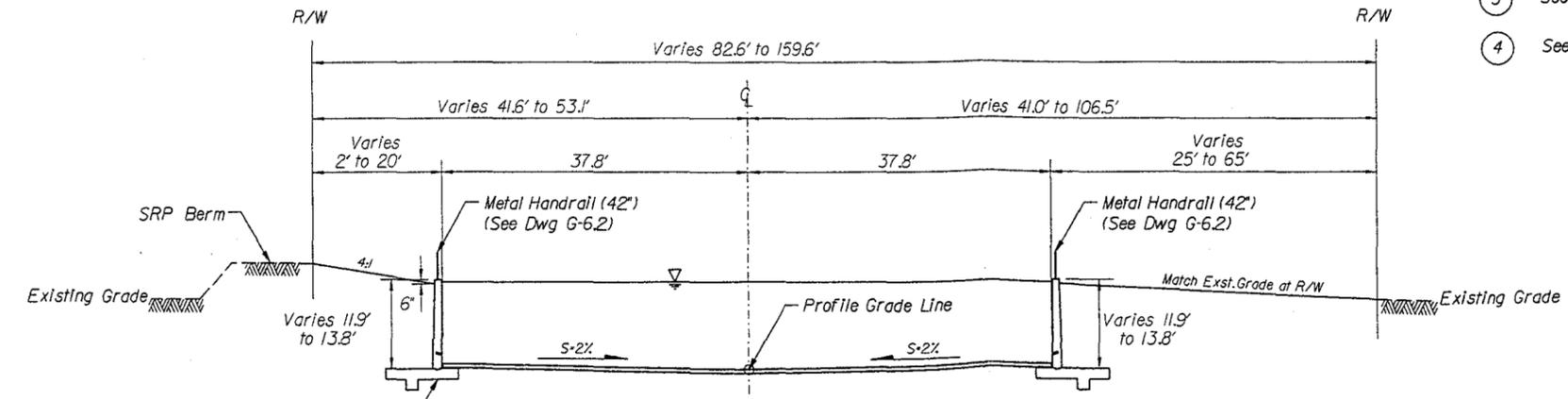
**TYPICAL SECTION E**  
Sta 190+95.64 to Sta 191+95.64



**TYPICAL SECTION F**  
Sta 191+95.64 to Sta 193+65.64

**NOTES:**

- ① See Detail A, Sheet G-6.1 for Channel Reinforcement Detail.
- ② Typical Section Sta 195+50 to Sta 195+89.14 not shown. See Dwg. D-3.1.
- ③ See Dwg. D-2.1 for Box Culvert Details.
- ④ See Dwg. D-2.1 for Retaining Wall Details.



**TYPICAL SECTION G**  
Sta 193+65.64 to Sta 195+50.00

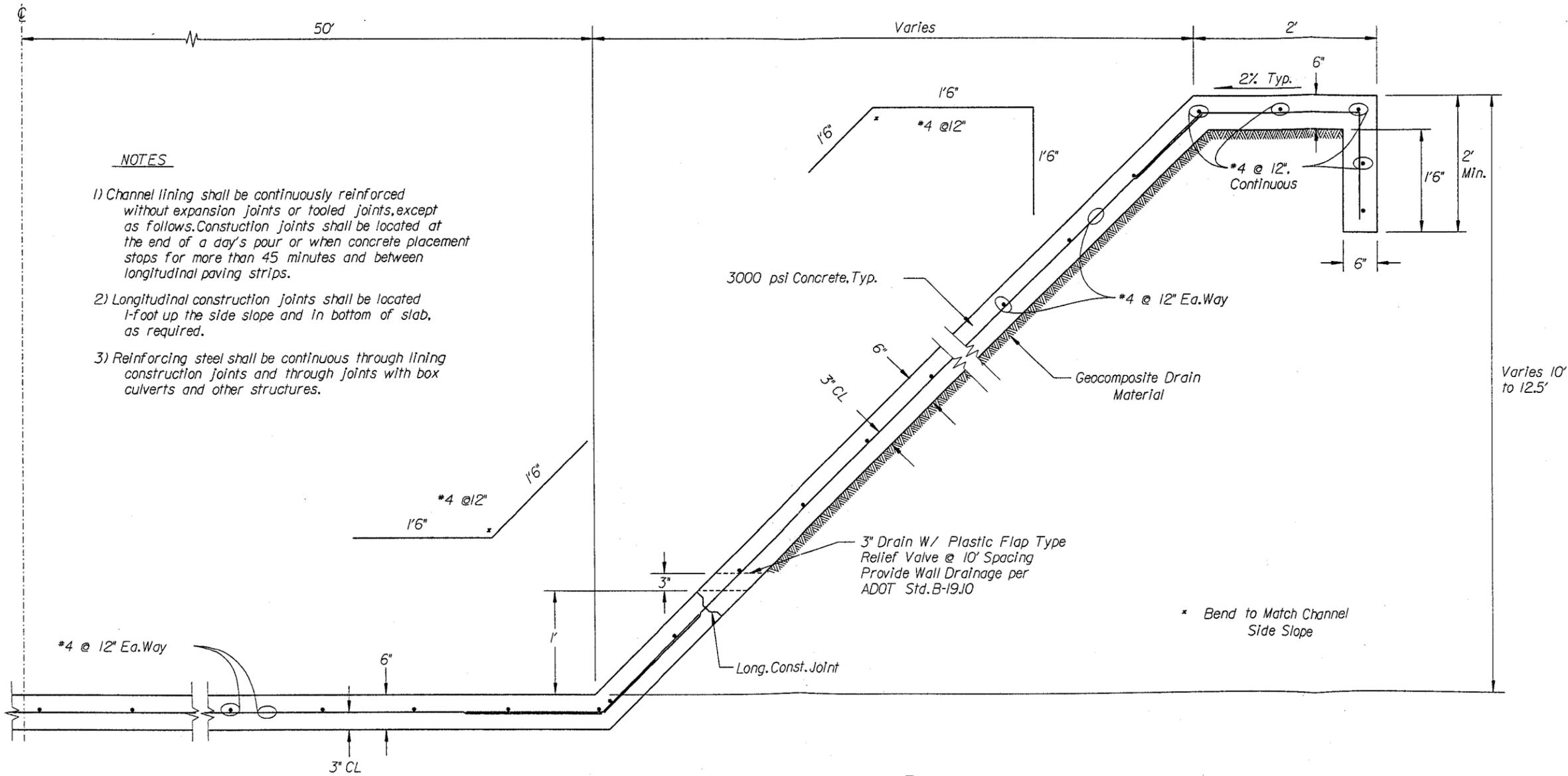
DESIGN	H. Jones	11/97	ARIZONA DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION HIGHWAY PLANS SERVICES
DRAWN	K. Andrews	11/97	
CHECKED	B. Meyers	11/97	
SALT OVER PASS-INDICATOR SIGN COMMENT CHECKING & CONSTRUCTION SERVICES <small>1800 Salt Over Pass Sign          Standard, Model: 8020-1722          Price: \$100.00/250</small>			TYPICAL SECTIONS Sta 190+95.64 to Sta 195+50.0
ROUTE	LOCATION		DWG NO. G-3.3

DATE	LOCATION	REVISIONS	FINISHED PLANS	SURVEY NO.





F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	93E130	10	26	



- NOTES**
- 1) Channel lining shall be continuously reinforced without expansion joints or tooled joints, except as follows. Construction joints shall be located at the end of a day's pour or when concrete placement stops for more than 45 minutes and between longitudinal paving strips.
  - 2) Longitudinal construction joints shall be located 1-foot up the side slope and in bottom of slab, as required.
  - 3) Reinforcing steel shall be continuous through lining construction joints and through joints with box culverts and other structures.

**REINFORCEMENT DETAIL  
TYPICAL SECTION**

A  
G-3J-  
3.3

\* Bend to Match Channel Side Slope

DESIGN	H. Jones	DATE	11/97	ARIZONA DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION HIGHWAY PLANS SERVICES
DRAWN	K. Andrews	DATE	11/97	
CHECKED	B. Meyers	DATE	11/97	
SALT RIVER PIMA-MARICOPA WATER COMMUNITY CONCRETE & CONSTRUCTION SERVICES 1400 East Greenway Tempe, Arizona 85284-4722 Phone: 480-344-2500				SPECIAL DETAILS CHANNEL REINFORCEMENT DETAIL
ROUTE	LOCATION			

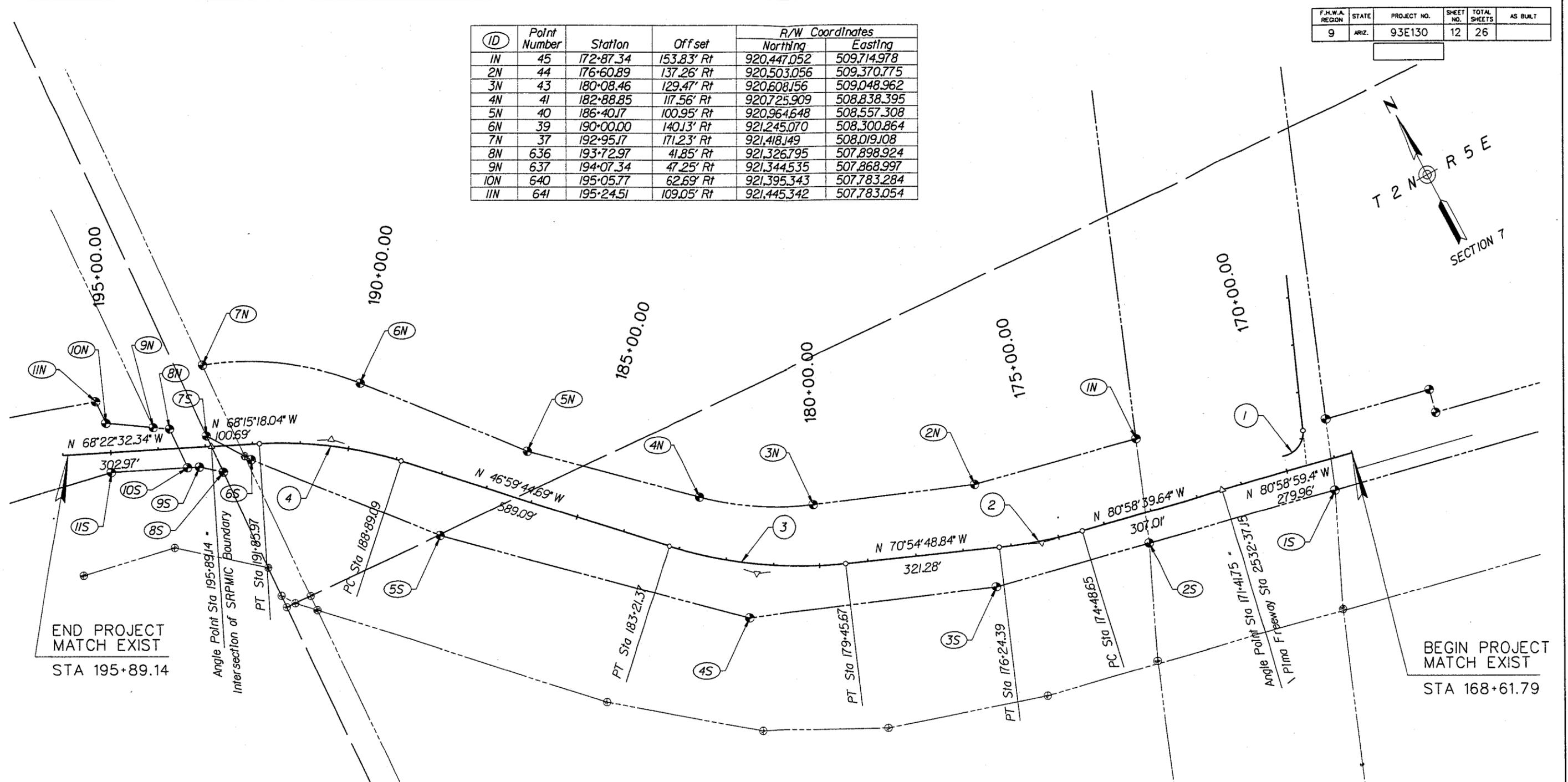
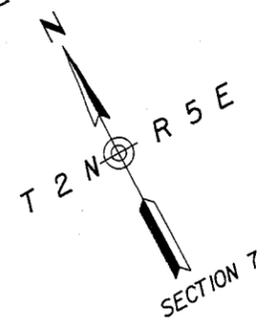
TRACS NO.

DWG NO G-6.1



F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	93E130	12	26	

ID	Point Number	Station	Offset	R/W Coordinates	
				Northing	Easting
1N	45	172+87.34	153.83' Rt	920,447,052	509,714,978
2N	44	176+60.89	137.26' Rt	920,503,056	509,370,775
3N	43	180+08.46	129.47' Rt	920,608,156	509,048,962
4N	41	182+88.85	117.56' Rt	920,725,909	508,838,395
5N	40	186+40.17	100.95' Rt	920,964,648	508,557,308
6N	39	190+00.00	140.13' Rt	921,245,070	508,300,864
7N	37	192+95.17	171.23' Rt	921,418,149	508,019,108
8N	636	193+72.97	41.85' Rt	921,326,795	507,898,924
9N	637	194+07.34	47.25' Rt	921,344,535	507,868,997
10N	640	195+05.77	62.69' Rt	921,395,343	507,783,284
11N	641	195+24.51	109.05' Rt	921,445,342	507,783,054



ID	Point Number	Station	Offset	R/W Coordinates	
				Northing	Easting
1S	63	169+17.63	65.88' Lt	920,170,503	510,044,782
2S	32	173+22.69	64.29' Lt	920,235,553	509,644,979
3S	31	176+40.05	82.41' Lt	920,288,651	509,318,641
4S	30	181+38.77	114.79' Lt	920,450,634	508,822,652
5S	29	187+63.14	125.01' Lt	920,883,277	508,313,268
6S	28	192+04.38	35.53' Lt	921,195,254	508,027,967
7S	26	192+95.81	22.70' Rt	921,280,425	507,963,496
8S	656	192+64.81	55.37' Lt	921,196,425	507,963,376
9S	655	193+14.53	41.85' Lt	921,227,402	507,922,196
10S	643	193+40.00	41.85' Lt	921,236,836	507,898,538
11S	644	195+00.91	41.85' Lt	921,296,438	507,749,073

DESIGN	H. Jones	11/97	ARIZONA DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION HIGHWAY PLANS SERVICES
DRAWN	T. Auger	11/97	
CHECKED	B. Meyers	11/97	
SALT RIVER PIMA-WAPAIKA INDIAN COMMUNITY ENGINEERING & CONSTRUCTION SERVICES 6200 East Sahara Road Scottsdale, Arizona 85254-9122 Phone 1602-874-2160			GEOMETRIC LAYOUT
ROUTE	LOCATION		DWG NO C-1.1

DATE	LOCATION	REVISIONS

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	93E130	13	26	

LOCATION	REF. NO.	REFERENCE DATA			CURVE										DATA						
		STATION	N	E	TOTAL PI		TOTAL CURVE			SPIRAL CURVE				CIRC. CURVE PI		CIRCULAR CURVE					
					N	E	Δ	T	EXT.	Δ <sub>s</sub>	L <sub>s</sub>	t	"o"	N	E	Δ	D	R	L	T	EXT.
REFERENCE POINTS																					
NW COR SEC 7 T2N R5E	20	N/A	923,530.480	507,973.380																	
W1/4 COR SEC 7 T2N R5E	21	N/A	920,882.588	507,961.751																	
SW COR SEC 7 T2N R5E	22	N/A	918,235.610	507,950.020																	
CTR SEC 7 T2N R5E	23	N/A	920,901.405	510,644.298																	
PIMA OUTFALL CHANNEL CENTERLINE																					
START PROJECT	50	168+61.79	920,226.818	510,110.258																	
CL PIMA FWY (FWY STA 2532+37.15)	51	171+41.75	920,270.695	509,833.755																	
PC CURVE 2	52	174+48.65	920,318.840	509,530.544																	
PI CURVE 2	53	175+36.75	920,332.684	509,443.677										920,332.684	509,443.677	10° 04' 09"	05° 43' 46"	1,000	175.74	88.10	3.87
PT CURVE 2	54	176+24.39	920,361.407	509,360.393																	
PC CURVE 3	55	179+45.67	920,466.464	509,056.774																	
PI CURVE 3	56	181+36.30	920,528.799	508,876.619										920,528.799	508,876.619	23° 55' 03"	06° 21' 58"	900	375.70	190.63	19.97
PT CURVE 3	57	183+21.37	920,658.813	508,737.223																	
PC CURVE 4	58	189+10.46	921,060.604	508,306.419																	
PI CURVE 4	59	190+60.62	921,162.996	508,196.584										921,162.996	508,196.584	21° 15' 44"	07° 09' 43"	800	296.88	150.16	13.97
PT CURVE 4	60	192+07.33	921,218.648	508,057.117																	
SRPMIC BOUNDARY	61	192+86.21	921,256.048	507,963.335																	
END PROJECT	62	195+89.14	921,367.606	507,681.934																	
N-S ADOT FWY CHANNEL CENTERLINE (ALL STATIONING BASED ON MK CENTENNIAL STATION. SEE DWG. D-1.7, RAM-600-1-515, SHEET 160)																					
PT (FWY CST CL 2527+99.99 195.00 LT)	80	165+52.82	920,621.602	510,150.070																	
STATION 167+00 MATCHLINE	81	167+00.00	920,482.883	510,100.873																	
PC CURVE 1	82	168+81.35	920,311.967	510,040.255																	
PI CURVE 1	83	169+22.93	920,267.221	510,024.386										920,267.221	510,024.386	87° 01' 54"	114° 35' 27"	50	75.95	47.47	18.95
PT CURVE 1 - END N-S CHANNEL	84	169+44.54	920,280.753	509,978.880																	

DATE	LOCATION	REVISIONS	DESIGNED BY	CHECKED BY	DATE

DESIGN	H. Jones	11/97	ARIZONA DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION HIGHWAY PLANS SERVICES GEOMETRIC LAYOUT GEOMETRIC DATA SUMMARY
DRAWN	K. Andrews	11/97	
CHECKED	B. Meyers	11/97	
SALT RIVER PIMA-INDIANA TRUCK COMPANY CONTRACTORS & CONSTRUCTION SERVICES 14300 East Street Road Mesa, Arizona 85204-4727 Phone: 480-974-9100			
ROUTE	LOCATION		

prj/93e130/93e130c28.r0e  
 cccccSYTIMEccccc

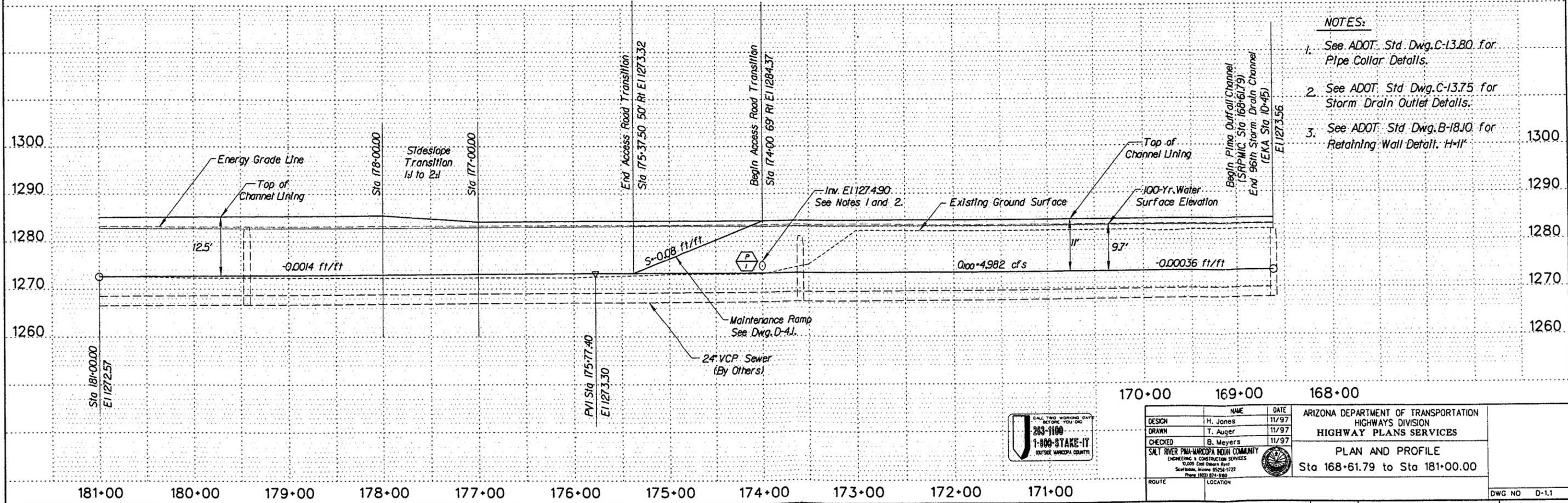
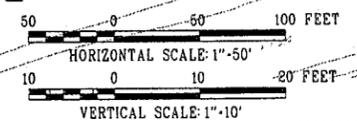
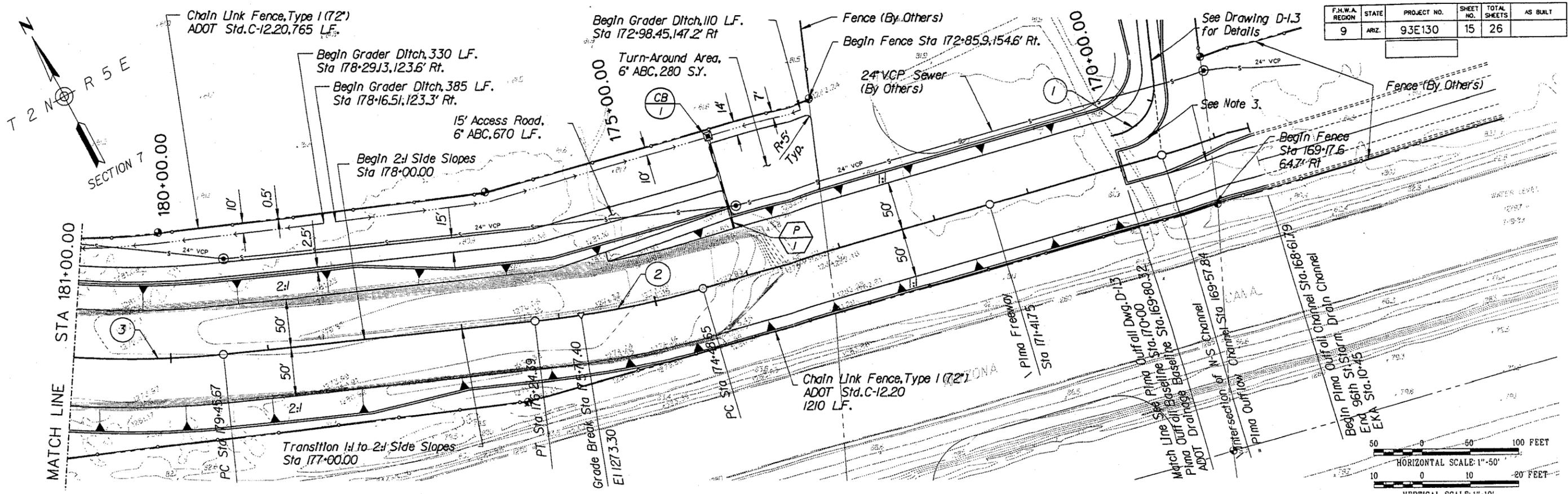
TRACS NO.

LOCATION	REF NO.	REFERENCE DATA			CURVE									DATA							
		STATION	N	E	TOTAL PI		TOTAL CURVE			SPIRAL CURVE			CIRC. CURVE PI		CIRCULAR CURVE						
					N	E	Δ	T	EXT.	Δ <sub>s</sub>	L <sub>s</sub>	t	"o"	N	E	Δ	D	R	L	T	EXT.
PIMA OUTFALL RIGHT OF WAY																					
NORTH SIDE																					
BM 7	7	N/A	920,447.056	509,714.977																	
BM 8	8	N/A	920,503.060	509,370.774																	
BM 9	9	N/A	920,608.160	509,048.961																	
PI CURVE	N/A	N/A	920,646.320	508,932.096										920,646.320	508,932.096	22° 15' 23"	09° 10' 02"	625	242.78	122.94	11.98
BM 10	10	N/A	920,725.913	508,838.393																	
BM 11	11	N/A	920,964.652	508,557.307																	
BM 12	12	N/A	921,245.074	508,300.863																	
PI CURVE	N/A	N/A	921,372.090	508,184.816										921,372.090	508,184.816	31° 59' 36"	09° 32' 58"	600	335.00	171.99	24.17
BM 13	13	N/A	921,418.153	508,019.107																	
BM 636	636	N/A	921,326.795	507,898.924																	
BM 637	637	N/A	921,344.535	507,868.997																	
BM 640	640	N/A	921,395.343	507,783.284																	
BM 641	641	N/A	921,445.342	507,783.054																	
BM 642	642	N/A	921,549.667	507,389.083																	
SOUTH SIDE																					
BM 645	645	N/A	921,393.761	507,076.145																	
BM 644	644	N/A	921,296.438	507,749.073																	
BM 643	643	N/A	921,236.836	507,898.538																	
BM 655	655	N/A	921,227.402	507,922.196																	
BM 656	656	N/A	921,196.425	507,963.376																	
BM 17	17	N/A	921,280.425	507,963.496																	
BM 14	14	N/A	921,208.185	508,018.185																	
BM 3	3	N/A	920,883.279	508,313.280																	
BM 4	4	N/A	920,450.636	508,822.663																	
BM 5	5	N/A	920,288.652	509,318.653																	
BM 6	6	N/A	920,235.555	509,644.991																	

SURVEY NO. \_\_\_\_\_  
 FINISHED PLANS \_\_\_\_\_  
 REVISIONS \_\_\_\_\_  
 LOCATION \_\_\_\_\_  
 DATE \_\_\_\_\_

DESIGN	H. Jones	11/97	ARIZONA DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION <b>HIGHWAY PLANS SERVICES</b>  <b>GEOMETRIC LAYOUT          GEOMETRIC DATA SUMMARY</b>
DRAWN	K. Andrews	11/97	
CHECKED	B. Meyers	11/97	
SALT RIVER PIMA-INDIANA IRRAWI COMMUNITY <small>ENGINEERING &amp; CONSTRUCTION SERVICES          10000 East McDowell Road          Phoenix, Arizona 85026-1122          Phone: 480-944-1200</small>			
ROUTE	LOCATION		

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	93E130	15	26	



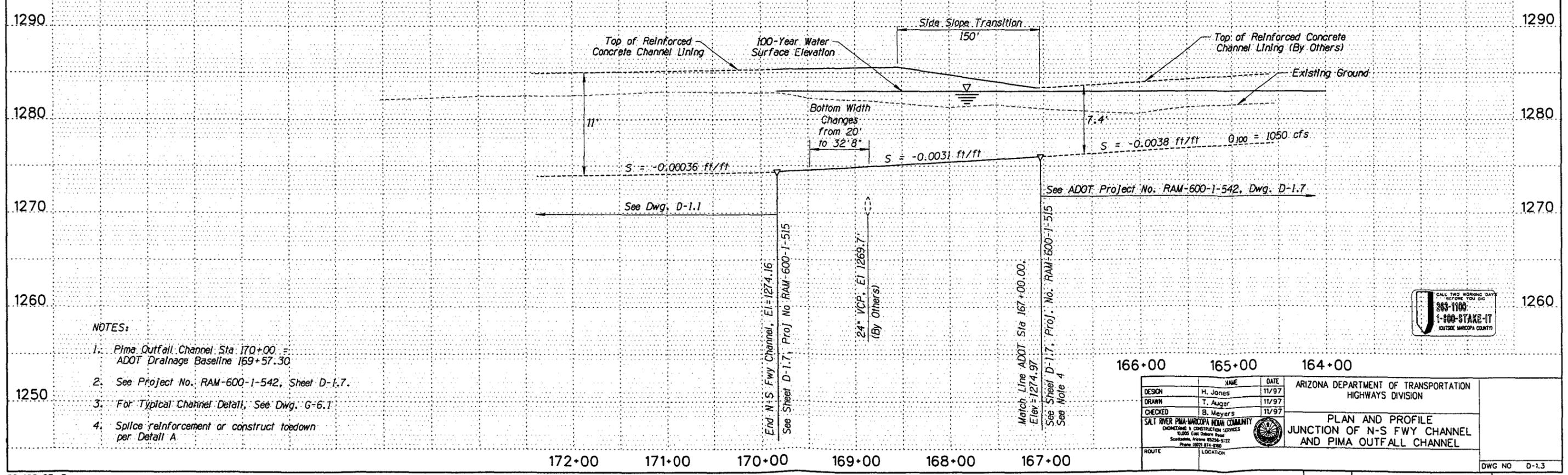
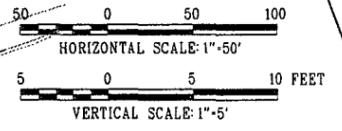
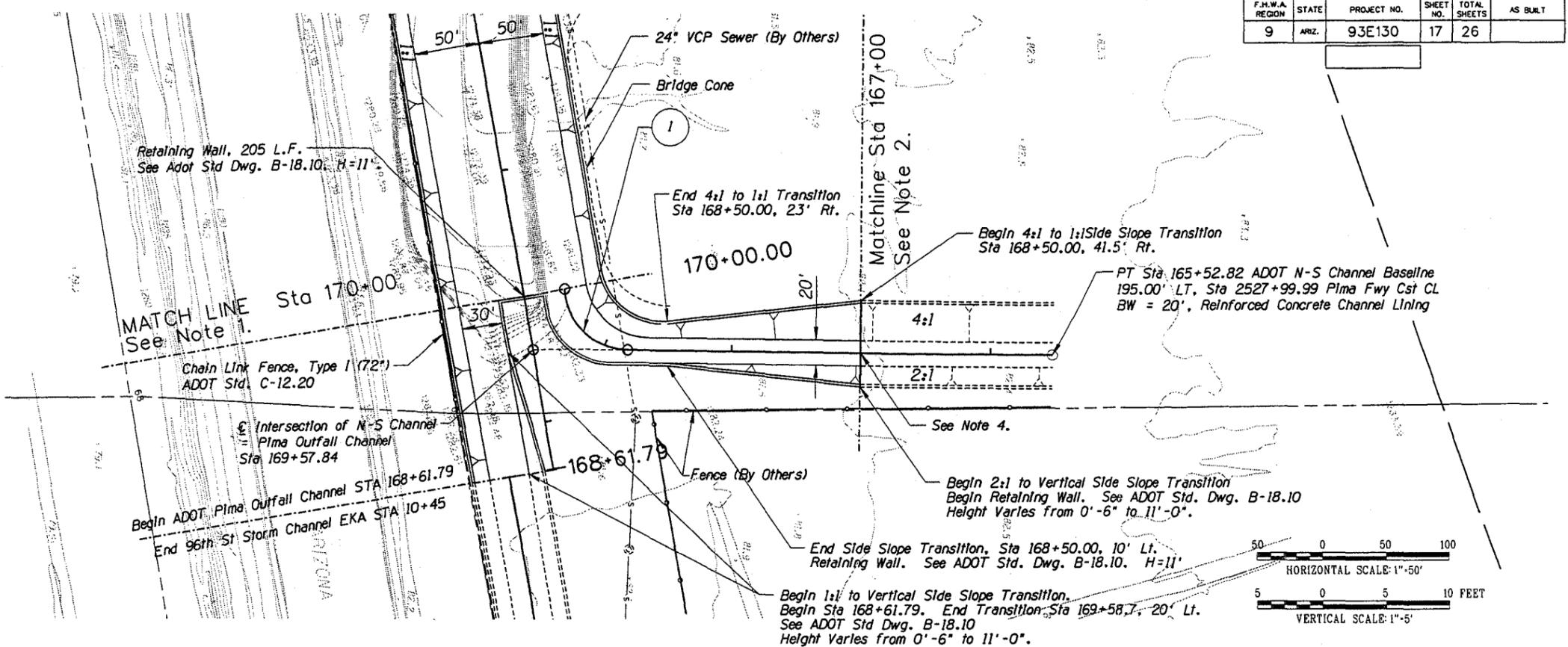
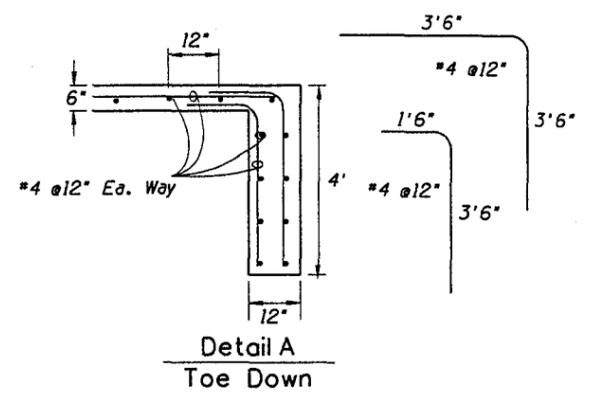
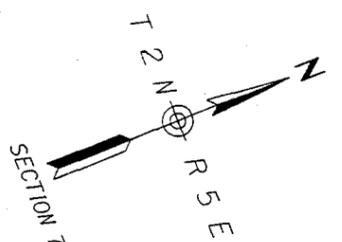
- NOTES:**
- See ADOT Std. Dwg. C-13.80 for Pipe Collar Details.
  - See ADOT Std. Dwg. C-13.75 for Storm Drain Outlet Details.
  - See ADOT Std. Dwg. B-18.10 for Retaining Wall Detail: H-11'



DESIGN	H. Jones	11/97
DRAWN	T. Auger	11/97
CHECKED	B. Meyers	11/97
SALT RIVER PIMA-MARICOPA INDIAN COMMUNITY ENGINEERING & CONSTRUCTION SERVICES 10,005 East Osborn Road Scottsdale, Arizona 85258-2122 Phone (480) 874-8300		
ROUTE	LOCATION	
ARIZONA DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION HIGHWAY PLANS SERVICES	PLAN AND PROFILE Sta 168+61.79 to Sta 181+00.00	



F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARZ.	93E130	17	26	



- NOTES:
- Pima Outfall Channel Sta 170+00 = ADOT Drainage Baseline 169+57.30
  - See Project No. RAM-600-1-542, Sheet D-1.7.
  - For Typical Channel Detail, See Dwg. G-6.1
  - Splice reinforcement or construct toedown per Detail A

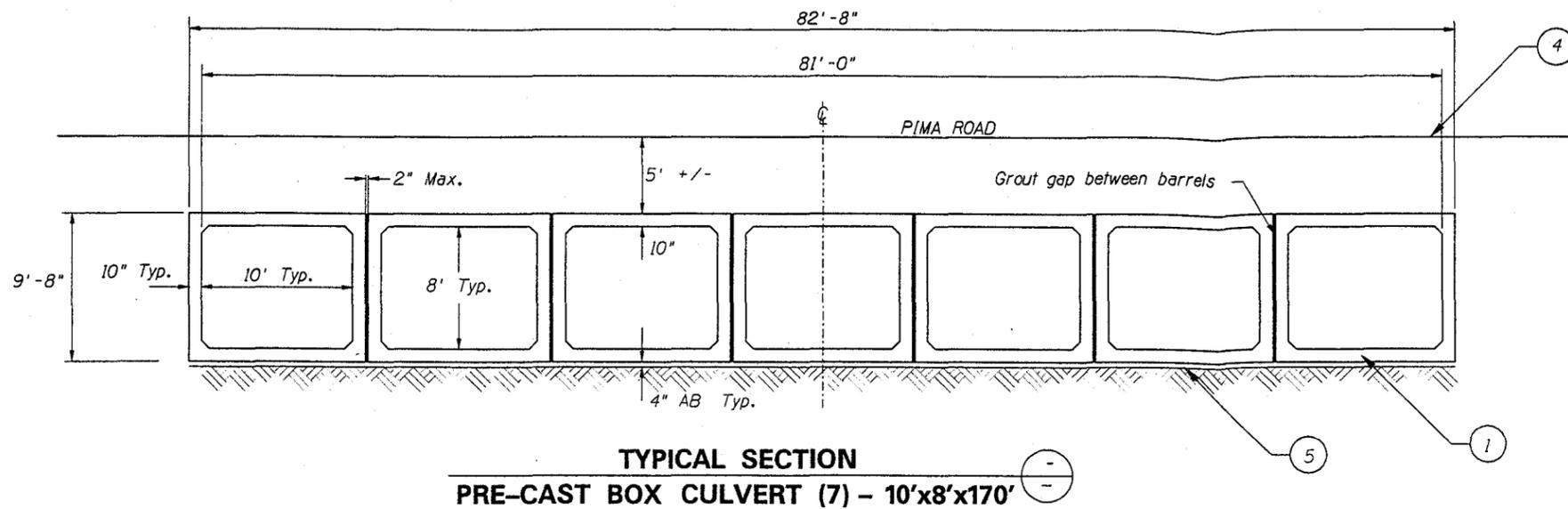
DESIGN	H. Jones	11/97
DRAWN	T. Auger	11/97
CHECKED	B. Meyers	11/97

ARIZONA DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

PLAN AND PROFILE  
JUNCTION OF N-S FWY CHANNEL  
AND PIMA OUTFALL CHANNEL

ROUTE LOCATION

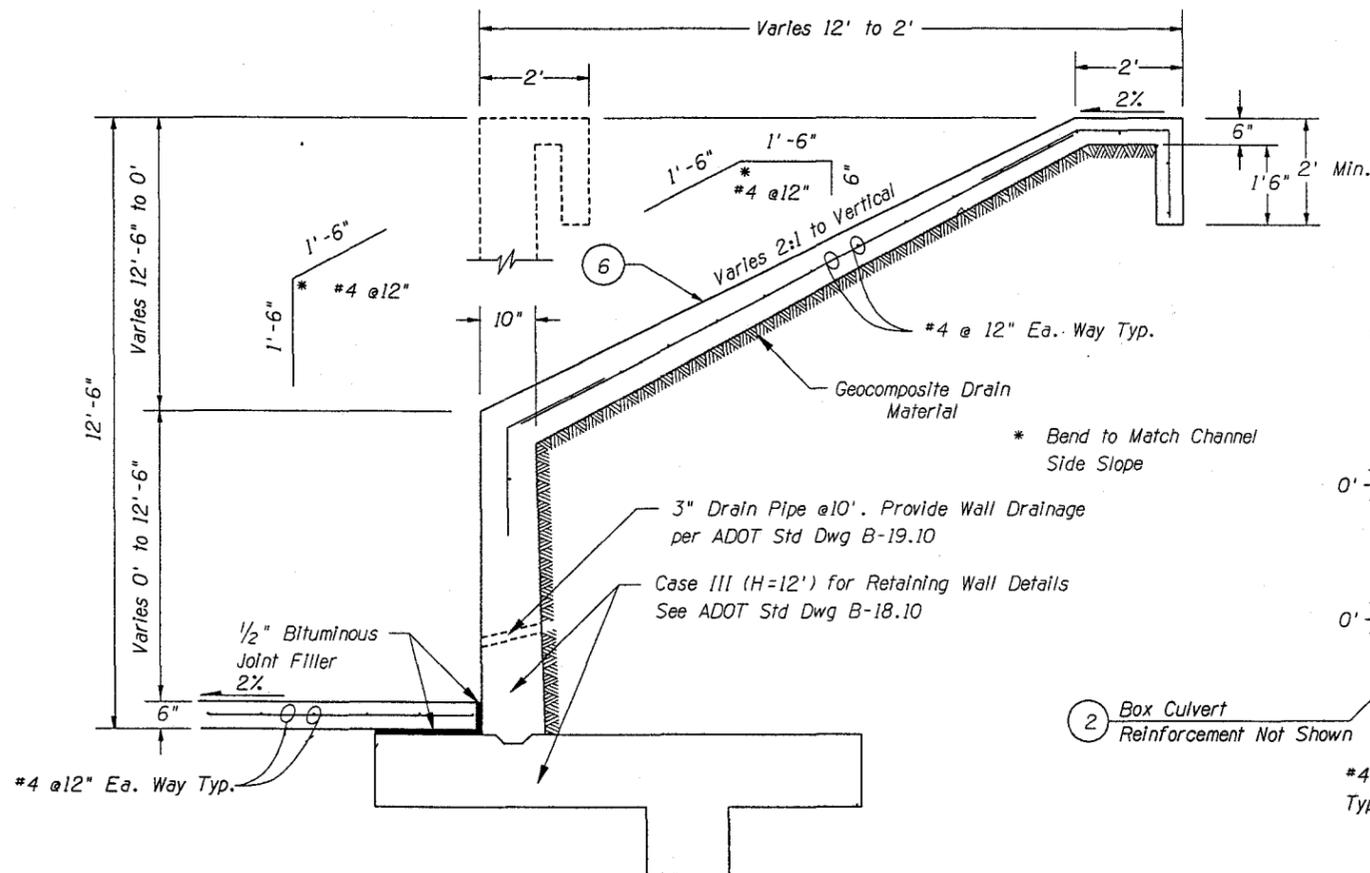
F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	93E130	18	26	



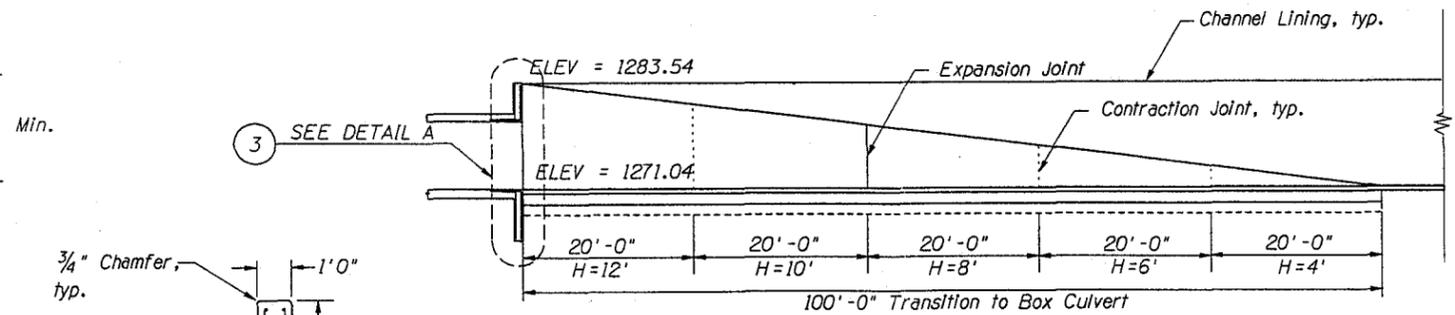
**TYPICAL SECTION**  
**PRE-CAST BOX CULVERT (7) - 10'x8'x170'**

**NOTES:**

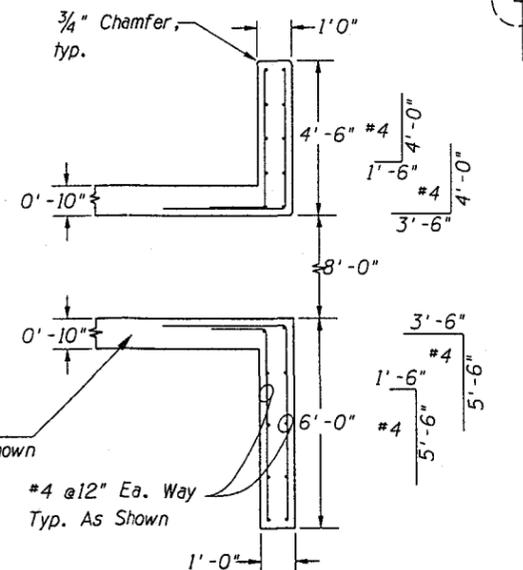
- ① Design box culvert in accordance with ASTM C789.
- ② Leave rebar exposed on pre-cast box culvert ends to facilitate tie-in to channel inlet and outlet headwalls.
- ③ Provide continuous reinforcement from inlet and outlet structures to the box culvert.
- ④ Remove and replace pavement, match existing pavement on Pima Road.
- ⑤ Bed pre-cast box culverts on 4" AB, compacted to 95% relative compaction, per ASTM D1557-91.
- ⑥ Taper wall thickness from 10" to 6".



**TYPICAL SECTION**  
**INLET TRANSITION**



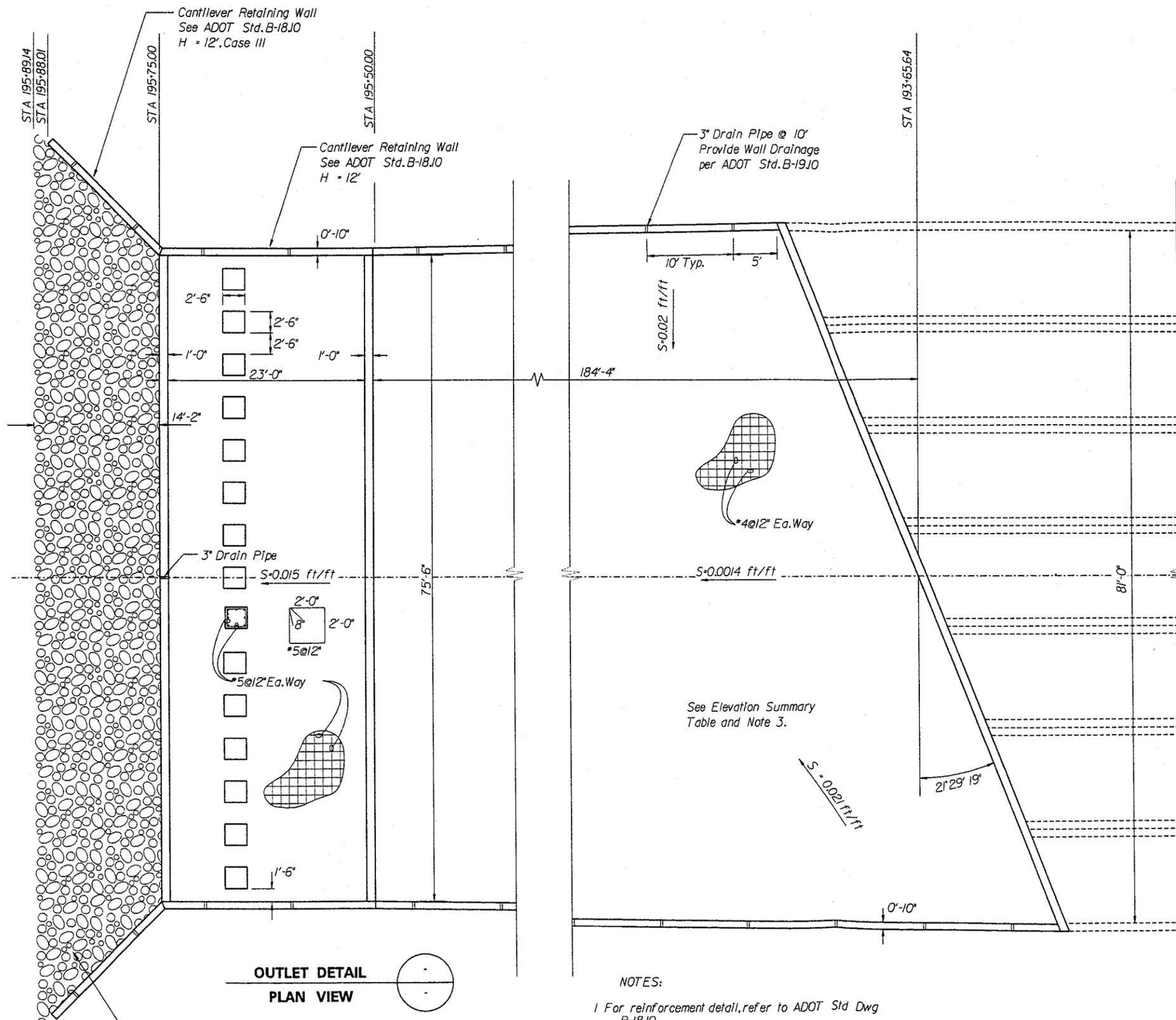
**TYPICAL ELEVATION**  
**INLET TRANSITION**



**DETAIL**  
**INLET AND OUTLET HEADWALL**

DESIGN	NAME	DATE	ARIZONA DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION HIGHWAY PLANS SERVICES
DRAWN	H. Jones	11/97	
CHECKED	B. Meyers	11/97	
SALT RIVER PIMA-WINDUPE INDIAN COMMUNITY P.O. Box 1000 Safford, Arizona 85347-1000 Phone: 928/547-1990			
ROUTE	LOCATION		REINFORCED CONCRETE BOX CULVERT

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARZ.	93E130	19	26	



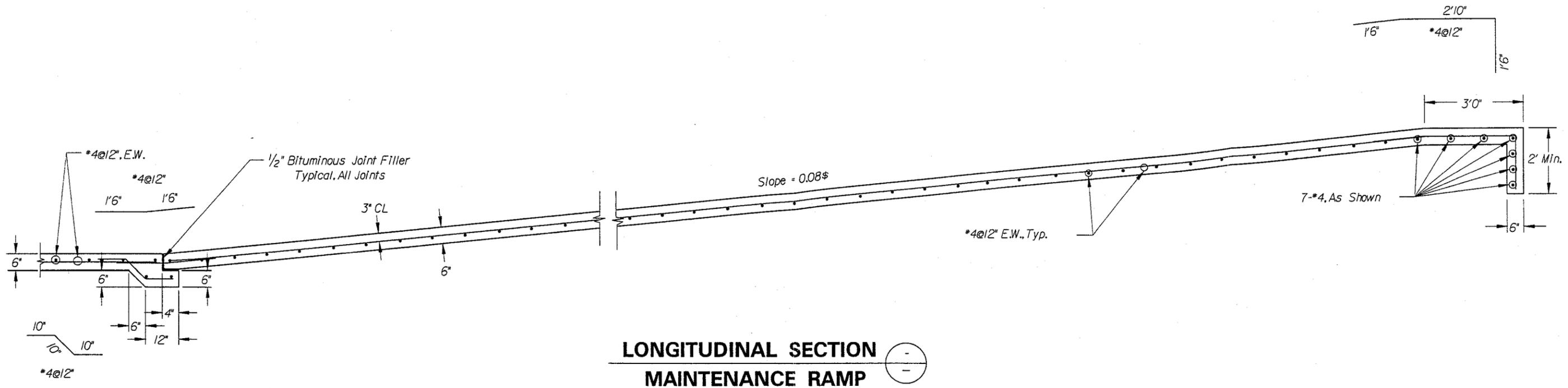
STATION	INVERT LT	INVERT PGL	INVERT RT	TOP WALL
193+65.64	1269.99'	1270.80'	1271.61'	1283.30'
194+00.00	1270.24'	1270.75'	1271.55'	1283.07'
194+50.00	1270.59'	1270.68'	1271.48'	1282.73'
195+00.00	1270.95'	1270.61'	1271.41'	1282.39'
195+50.00	1271.30'	1270.54'	1271.30'	1282.04'
195+75.00	1272.11'	1271.35'	1272.11'	1280.67'
195+88.01	1269.94'	1269.18'	1269.94'	1269.18'
195+89.14	1269.50'	1269.50'	1269.50'	N/A

**OUTLET DETAIL  
PLAN VIEW**

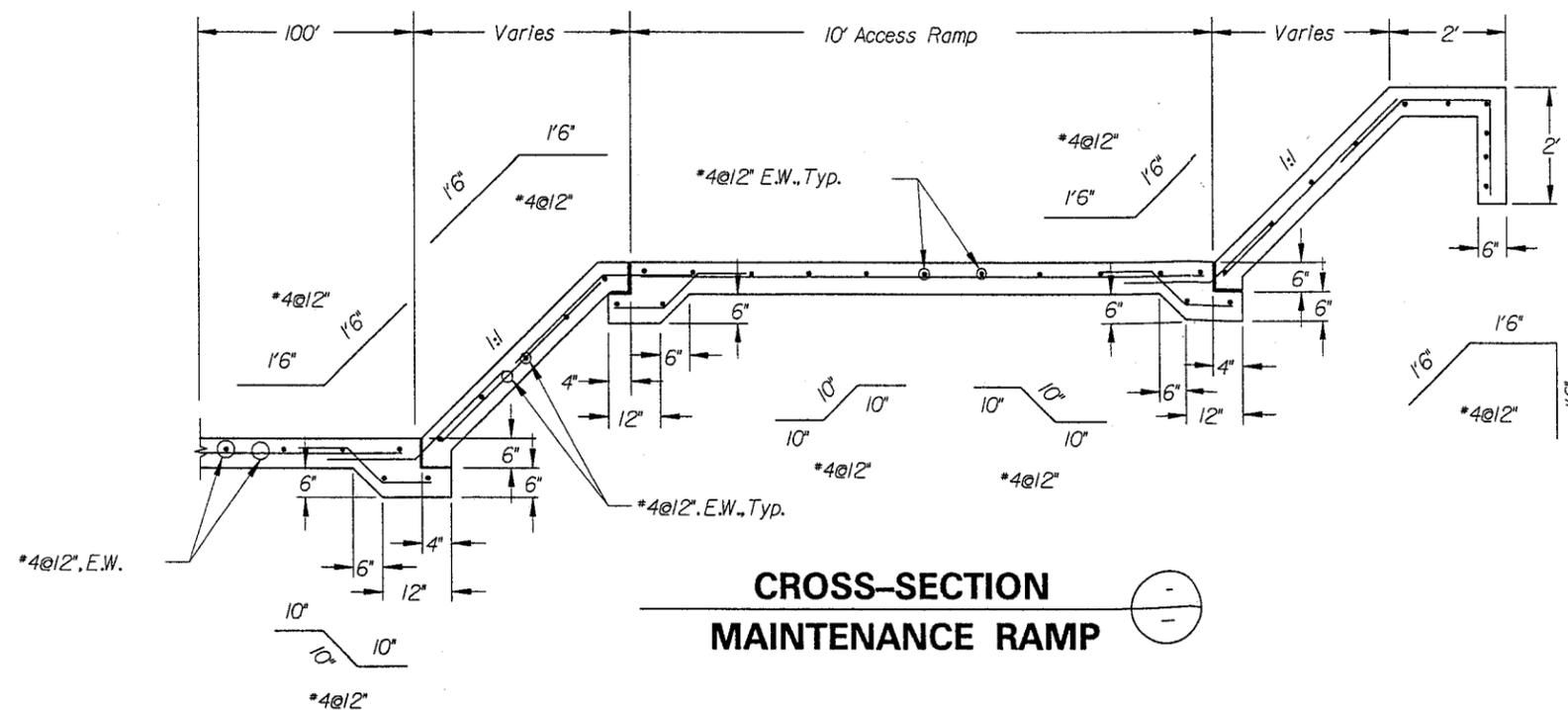
- NOTES:
- 1 For reinforcement detail, refer to ADOT Std Dwg B-18.J0.
  - 2 Provide Wall Drainage per ADOT Std Dwg. B-18.J0.
  - 3 Warp floor to move low-flow path to PGL.

DESIGN	H. Jones	11/97	ARIZONA DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION HIGHWAY PLANS SERVICES
DRAWN	K. Andrews	11/97	
CHECKED	B. Meyers	11/97	
SALT RIVER PIMA-MARICOPA WATERShed COMUNITY COUNCIL OF GOVERNMENTS 1400 East Sunset Road Tempe, Arizona 85282 Phone 480-871-2100			<b>OUTLET DETAILS STRAIGHT DROP DISSIPATOR</b>
ROUTE	LOCATION		DWG NO D-3.1

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARZ.	93E130	20	26	



**LONGITUDINAL SECTION**  
**MAINTENANCE RAMP**



**CROSS-SECTION**  
**MAINTENANCE RAMP**

DESIGN	H. Jones	11/97	ARIZONA DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION HIGHWAY PLANS SERVICES
DRAWN	H. Jones	11/97	
CHECKED	B. Meyers	11/97	
SALT RIVER PIMA-MARICOPA REGION COMMUNITY DEVELOPMENT & CONSTRUCTION SERVICES 1000 N. 15th St. Tempe, Arizona 85281-1122 Phone: 480-944-2000			MAINTENANCE RAMP Sta 174+00.00 to Sta 175+37.50
ROUTE	LOCATION		DWG NO. D-4.1

**GENERAL NOTES**

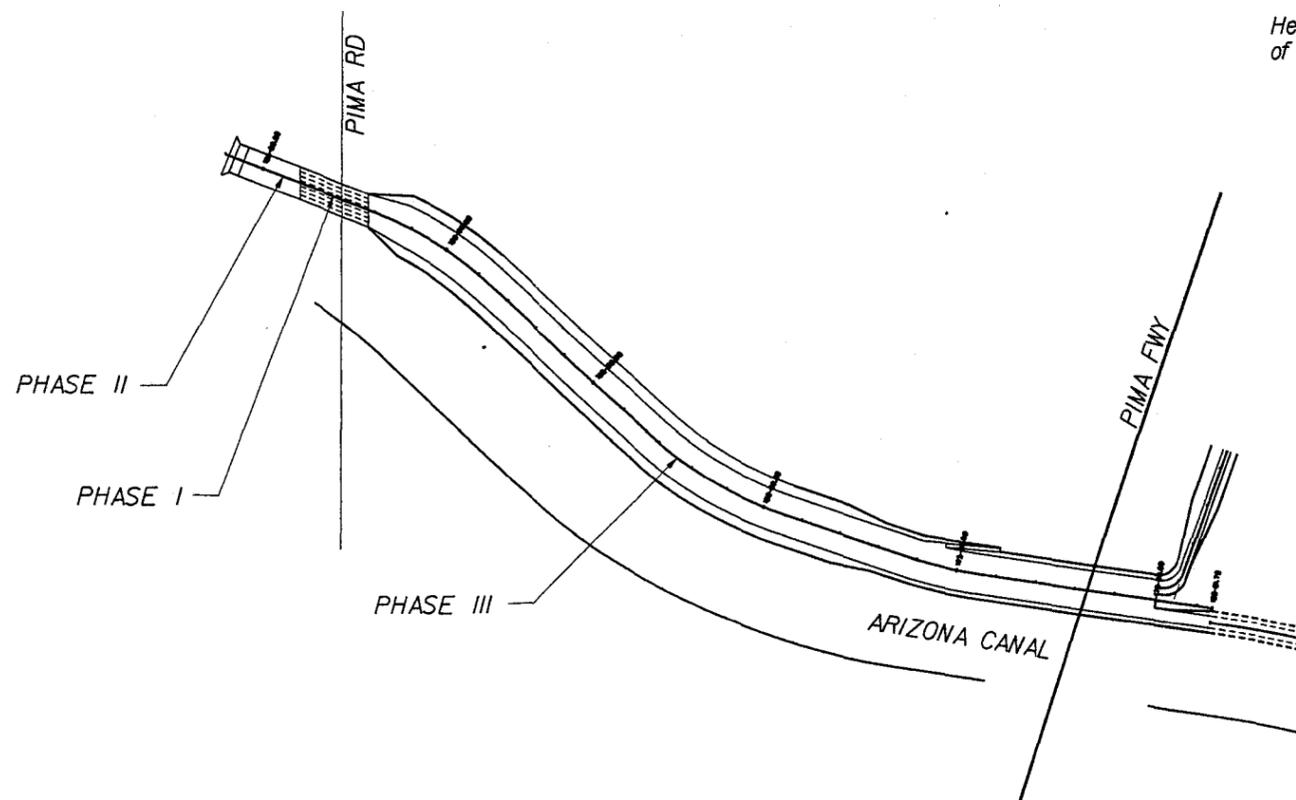
1. Contractor will phase construction of project into three major phases for the purpose of traffic control: Phase I (Pre-Cast Box Culvert), Phase II (Box Culvert Outlet and Energy Dissipator), and Phase III (Main Channel).
2. The Engineer developed Traffic Control Plans (TCPs) for each of the major construction activities. The Contractor shall submit a TCP in accordance with the 1989 ADOT Traffic Control Manual for specific construction activities not covered by the TCPs.
3. The Engineer may make adjustments to the details of these TCPs and requirements.
4. All existing signs in conflict with the construction signs shall be removed, relocated, or covered in place, as directed by the Engineer. The Contractor shall store and reinstall items which have been removed or relocated in a manner approved by the Engineer.
5. Sign mount height is a minimum seven feet, as measured from the bottom of the sign to the near edge of pavement.
6. All orange construction signs used at night shall have high intensity reflective sheeting. All daytime-only signs and white signs may have a standard intensity reflective sheeting.
7. Top-mounted flashing warning lights (Type A) and flags shall be used to call attention to all construction signs, except the "End Construction" signs.
8. All Temporary Traffic Control Signs shall have black letters on an orange background, except as otherwise noted.
9. Type II barricades shall be placed twenty feet o.c. along tapers and forty feet o.c. along tangents, unless shown otherwise on the plans.
10. A steady-burning yellow light (Type C) shall be mounted on every Type II barricade along tapers and on every other barricade along tangents.
11. Type III barricades shall be placed side-by-side, with a flashing warning light (Type A) mounted on each end of each barricade, in order to close the roadway.
12. Temporary concrete barriers shall remain in place until all work protected by the barrier has been completed in accordance with the requirements of that phase of construction and as approved by the Engineer.
13. For temporary concrete barrier details, see ADOT Standard Drawing 4-C-2.01, 4-C-2.02, and 4-C-2.03.
14. Barrier markers BM-1 (white) or BM-2 (yellow) shall be installed on temporary concrete barriers at the spacing identified in ADOT Standard Drawing 4-M-10.01 and 4-M-10.02. The installed price for marker shall be considered a part of the barrier cost.
15. For Type A sand barrel crash-cushion details, see ADOT Standard Drawing 4-C-1.01, 4-C-1.02, and 4-C-1.03.
16. Detour striping shall be Type II Pavement Marking Tape where the markings will be removed and painted where the pavement will be removed or overlaid. Pavement removal or removal of Type II tape does not constitute stripe obliteration.
17. Cost of obliteration and maintaining striping shall be included in the item "Maintenance and Protection of Traffic."
18. The speed limits or advisory speeds shown are preliminary and are based on design features and are subject to review and change by the Engineer to accommodate field conditions.
19. Traffic control construction signs shall not be displayed to traffic more than 24 hours prior to the actual start of construction. These signs may be installed sooner, but they must be covered or turned away from traffic. The cost for covering or turning them shall be considered part of the sign installation cost. No further compensation will be made. These signs shall be removed within 24 hours after the completion of the construction activities.
20. If standard reflectorized traffic paint is used as temporary striping on pavement which will not be removed or overlaid, the paint shall be obliterated by sandblasting or another approved method when the detour is complete.
21. All traffic drawings are schematic only and are not to scale.

**CONSTRUCTION NOTES**

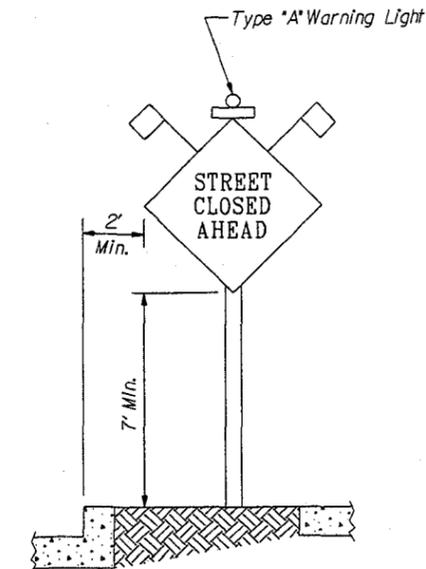
1. Contractor shall complete construction of Phase I activities and restore traffic to normal operation prior to starting construction of Phase II or Phase III.
2. Contractor shall notify City of Scottsdale and the Salt River Indian Community at least (7) seven days prior to all phases.
3. Portable Sign Stand (Spring-Type) shall not be used, except as authorized by the Engineer.
4. All signs shall be mounted on Embedded Posts, except those signs positioned in paved areas which shall be mounted on Portable Sign Stands.
5. Contractor shall notify City of Scottsdale when Traffic Control Signing and Pavement Marking is to be done west of Pima Road.

**TRAFFIC FLOW AND CONTROL**

1. The Contractor shall maintain Traffic flow on Pima Road during construction Phases II and III.
2. The Contractor shall close Pima Road during construction of Phase I, for no more than 7 days. Contractor shall coordinate closure with the Salt River Indian Community and the City of Scottsdale.
3. Contractor shall attempt to maintain a 2' buffer off of the traffic side and construction side of and barricades and a 2' buffer off of any Temporary Concrete Barriers.

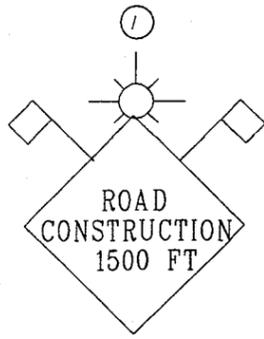


F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARZ.	93E130	21	26	

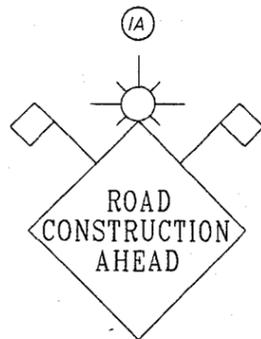


Height and Lateral Locations of Signs (Typical Installation)

NAME	DATE	ARIZONA DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION HIGHWAY PLANS SERVICES
DESIGN: H. Jones	11/97	TRAFFIC CONTROL PLAN GENERAL NOTES
DRAWN: K. Andrews	11/97	
CHECKED: B. Meyers	11/97	
SALT RIVER INDIAN COMMUNITY CONSULTING & CONSTRUCTION SERVICES 1000 East Valley Road Scottsdale, Arizona 85260-9722 Phone: 480-341-1900		
ROUTE	LOCATION	DWG NO. T-1.1



Sign No.W20-1  
(48" x 48")



Sign No.W20-1  
(48" x 48")



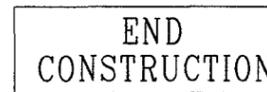
Sign No.R2-5A  
(36"x48")  
Black on White



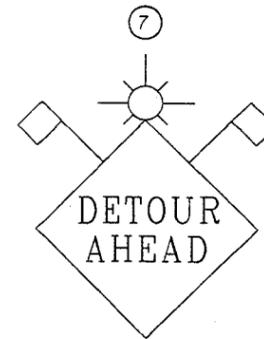
Sign No.W20-3  
(48" x 48")



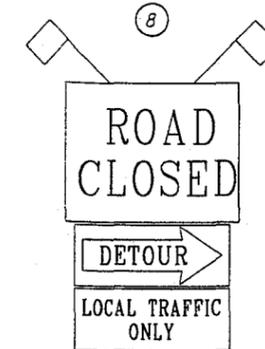
Sign No.W20-3  
(48" x 48")



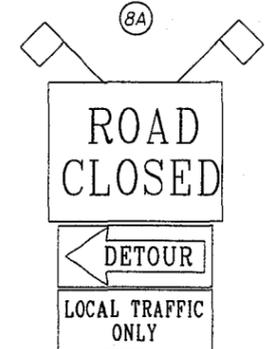
Sign No.G20-2  
(60" x 24")



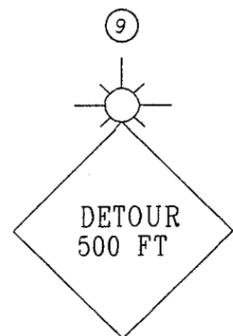
Sign No.W20-2  
(48" x 48")



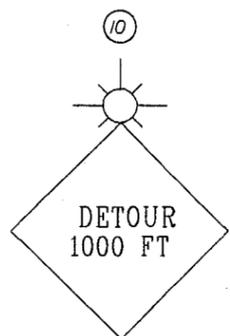
Sign No.R11-2  
(48" x 30")  
Black on White  
Sign No.M4-10L  
(48" x 18")



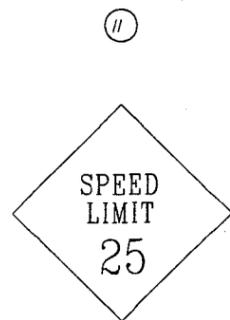
Sign No.R11-2  
(48" x 30")  
Black on White  
Sign No.M4-10R  
(48" x 18")



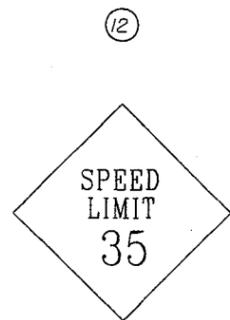
Sign No.W20-3  
(48" x 48")



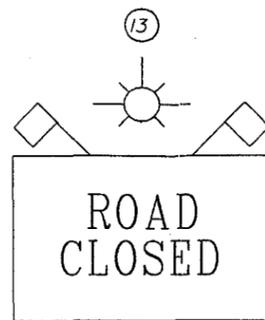
Sign No.W20-3  
(48" x 48")



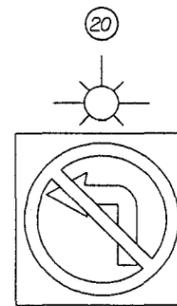
Sign No.R2-1  
(36" x 48")  
Black on White



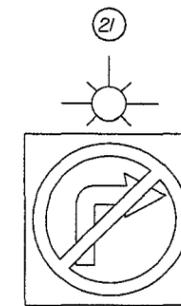
Sign No.R2-1  
(36" x 48")  
Black on White



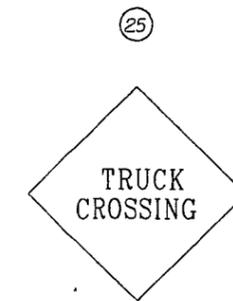
Sign No.R11-2  
(60" x 36")  
Black on White



Sign No.R3-2  
(24" x 24")  
Black and Red  
on White



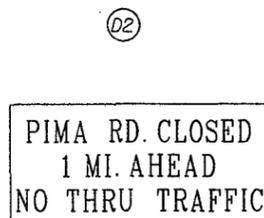
Sign No.R3-2  
(24" x 24")  
Black and Red  
on White



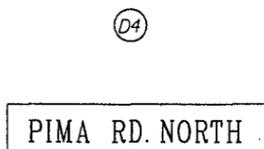
Sign No.W8-6  
(48" x 48")



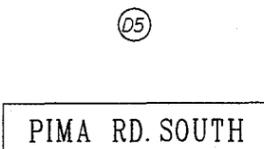
Sign No.W3-69  
(48" x 48")



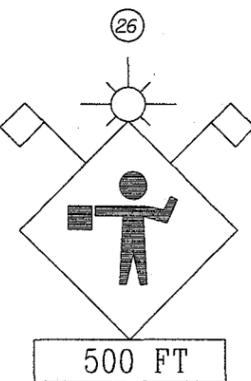
(72" x 30")



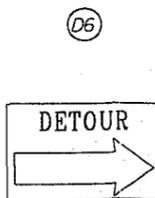
(Variable x 48")



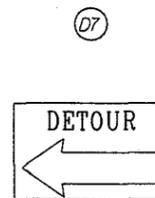
(Variable x 48")



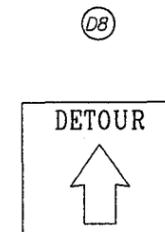
Sign No.W20-79  
(48" x 48")



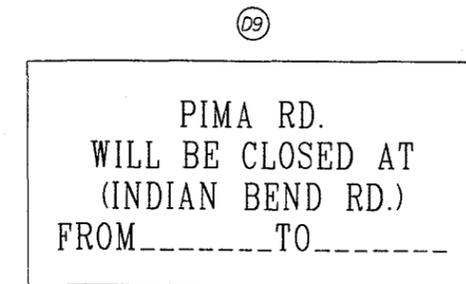
Sign No.M4-9R  
(30" x 24")



Sign No.M4-9L  
(30" x 24")

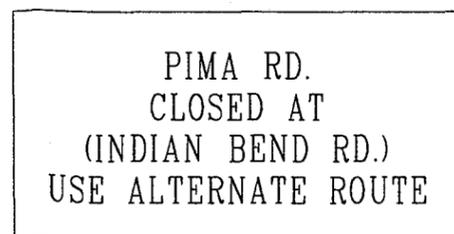


Sign No.M4-9  
(30" x 24")



(CHAPARRAL RD.)  
(72" x 48")

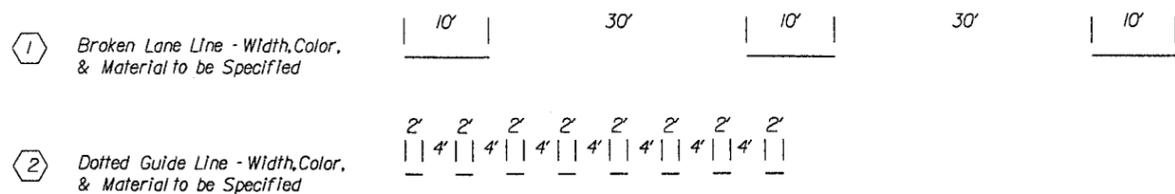
TO BE PLACED 7 DAYS PRIOR TO CLOSURE



(CHAPARRAL RD.)  
(72" x 48")

TO BE PLACED DURING CLOSURE

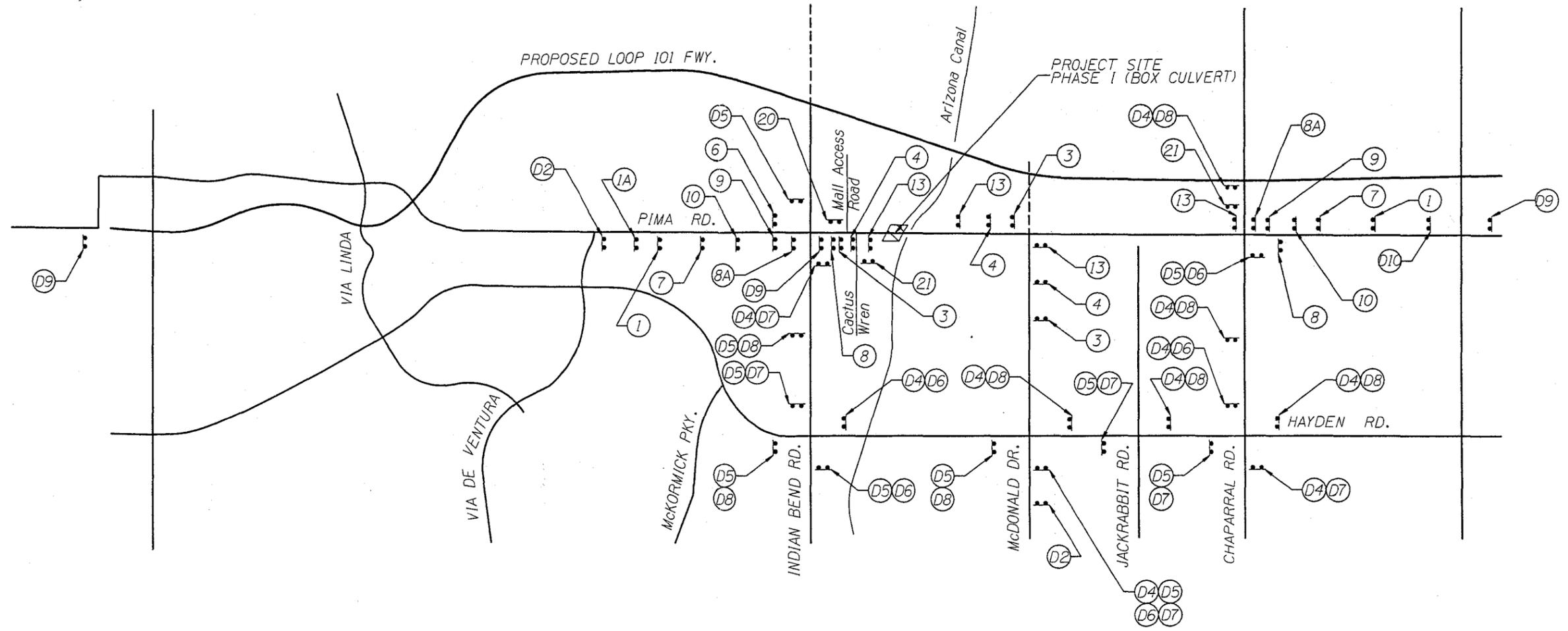
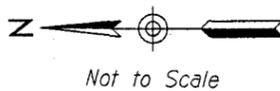
**PAVEMENT MARKINGS DETAILS**



DESIGN	H. Jones	11/97	ARIZONA DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION HIGHWAY PLANS SERVICES
DRAWN	K. Andrews	11/97	
CHECKED	B. Meyers	11/97	
SALT RIVER PIMA-INDIAN COMMUNITY CONSTRUCTION & MAINTENANCE SERVICES 1400 East Green Road Tucson, Arizona 85719 Phone: 480-511-0100			TRAFFIC CONTROL PLAN LEGEND
ROUTE	LOCATION		DWG NO G-3.1

TRACS NO.

F.A.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	93E130	24	26	



**NOTE:**  
Traffic Plan is schematic only. Contractor shall submit traffic control plan 7 days prior to beginning construction.

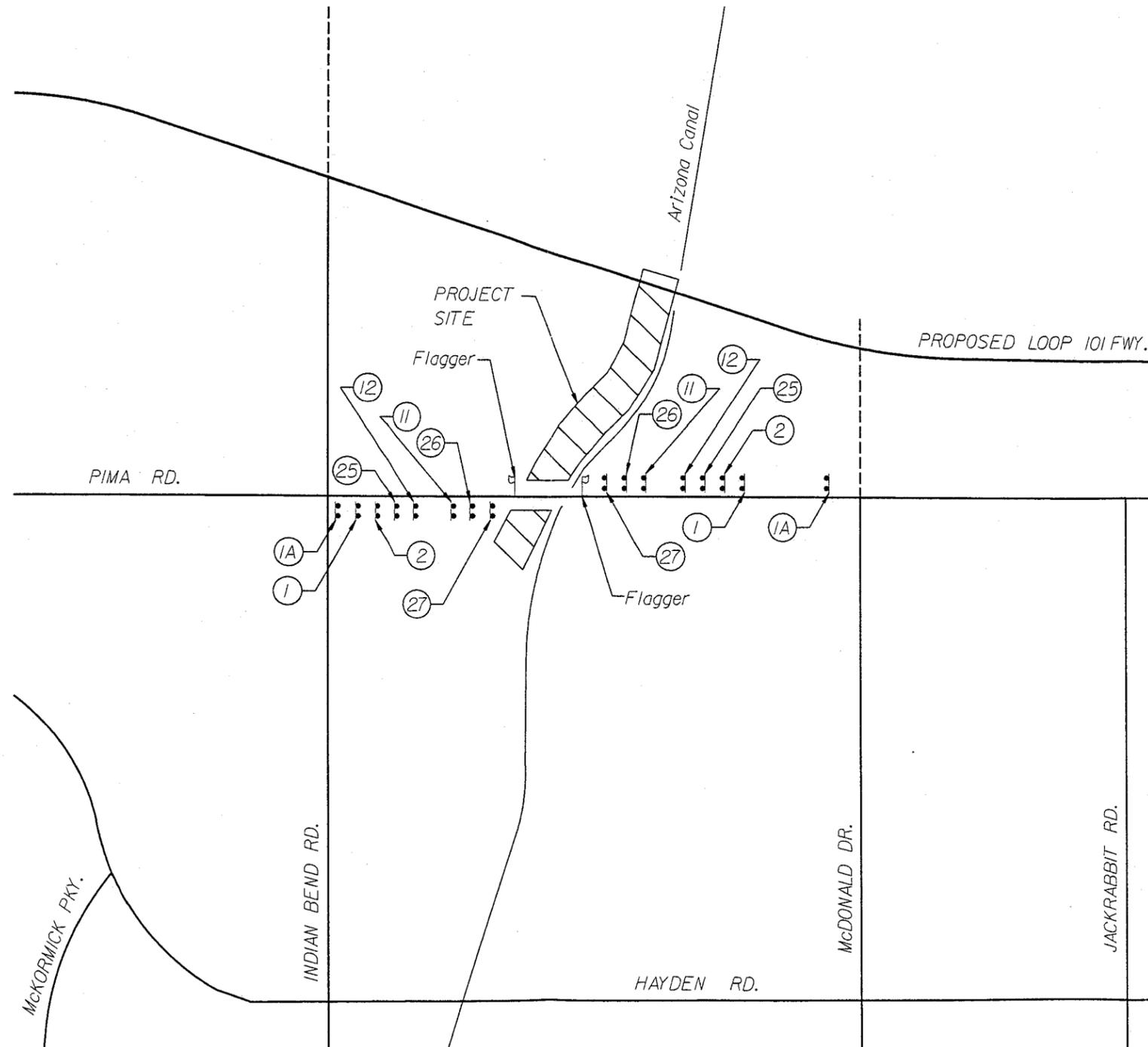
DATE	REVISIONS	LOCATION

DESIGN	H. Jones	11/97	ARIZONA DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION HIGHWAY PLANS SERVICES
DRAWN	K. Andrews	11/97	
CHECKED	B. Meyers	11/97	
SALT RIVER PIMA-ARIZONA TRAFFIC CONTROL PLAN PHASE I TRAFFIC CONTROL PLAN			DWC NO. T-2.1
ROUTE	LOCATION		

TRACS NO. 24 OF 26

93e130c101-r0e  
ccccSYSTEMEcccc

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARZ.	93E130	25	26	



**NOTE:**  
Traffic Plan is schematic only. Contractor shall submit traffic control plan 7 days prior to beginning construction of Phase II and III.

DESIGN	NAME	DATE	ARIZONA DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION HIGHWAY PLANS SERVICES
DRAWN	H. Jones	11/97	
CHECKED	K. Andrews	11/97	
	B. Meyers	11/97	
<small>SALT RIVER PIMA-MARICOPA NEIGH. COMMUNITY ENGINEERING &amp; CONSTRUCTION SERVICES 15200 East Valley Road Surprise, Arizona 85074-9172 Phone 480-371-4700</small>			
<b>PHASE II &amp; III TRAFFIC CONTROL PLAN</b>			
ROUTE	LOCATION		OWG NO T-2.1

DATE	LOCATION	REVISIONS	FINISHED PLANS	SURVEY NO.

93e130c100.r0e  
ccccSYTIMEcccc

TRACS NO.

25 OF 26

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARZ.	93E130	1	7	

# PIMA OUTFALL CHANNEL (93E130)

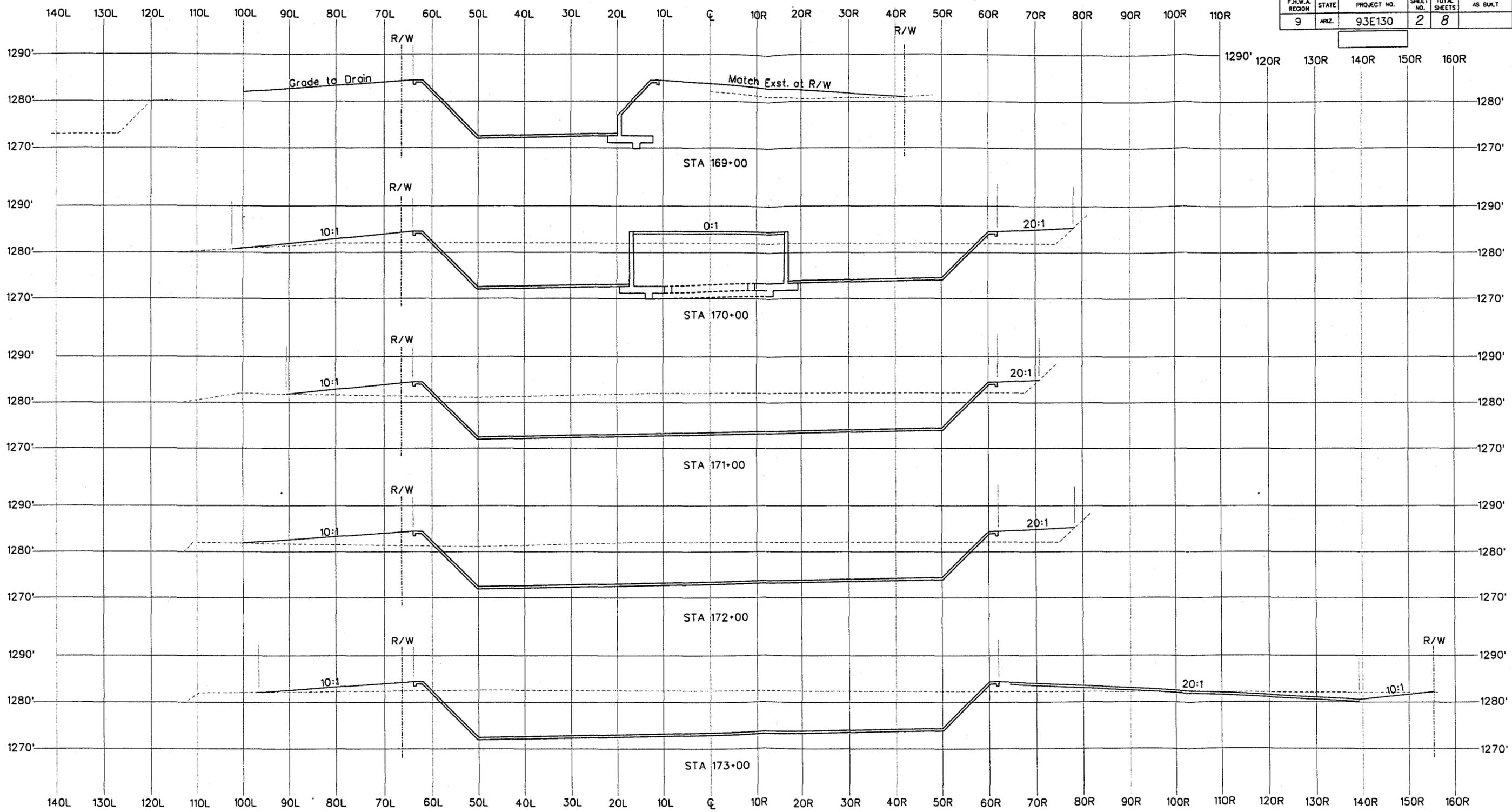
## CROSS SECTIONS

SHEET	DRAWING	SHEET NAME
1	G-7.0	INDEX OF SHEETS
2	G-7.1	STA 169+00 TO STA 173+00
3	G-7.2	STA 174+00 TO STA 178+00
4	G-7.3	STA 179+00 TO STA 183+00
5	G-7.4	STA 184+00 TO STA 188+00
6	G-7.5	STA 189+00 TO STA 193+00
7	G-7.6	STA 194+00 TO STA 195+00
8	G-7.7	ADOT BASELINE STA 167+00 TO STA 168+50

DATE	LOCATION	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY

DESIGN	H. Jones	05/97	ARIZONA DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION HIGHWAY PLANS SERVICES
DRAWN	K. Andrews	06/97	
CHECKED	B. Meyers	07/97	
SALT RIVER PIMA-WINDUP RIVER CORRIDOR LOCAL/STATE & FEDERAL PROJECTS 1400 East Green Street Tempe, Arizona 85281-2122 Phone 480-271-2900			 INDEX OF SHEETS CROSS SECTIONS
ROUTE	LOCATION		

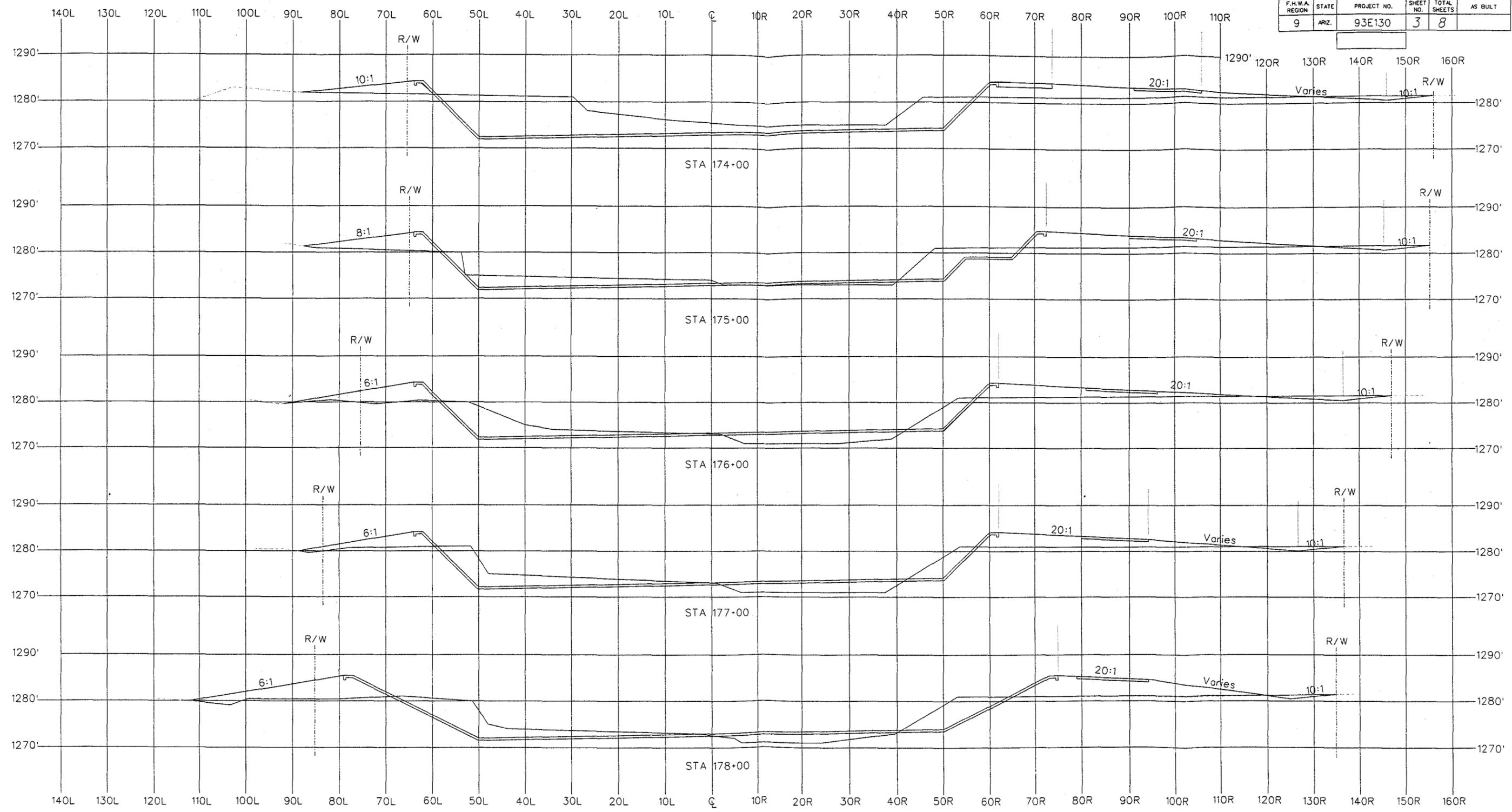
F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	93E130	2	8	



DATE	
LOCATION	
REVISIONS	
FINISHED PLANS	
SURVEY NO.	

DESIGN	H. Jones	DATE	01/97	ARIZONA DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION HIGHWAY PLANS SERVICES
DRAWN	H. Jones			
CHECKED	B. Meyers			
SALT RIVER PIMA-SAGUPOI BOUND COMMUNITY ENGINEERS & CONSULTANTS SERVICES 1600 East Duane Street Tucson, Arizona 85706-9722 Phone: 903-814-2900				CROSS SECTIONS STA 169+00 to STA 173+00
ROUTE		LOCATION		
				DWG NO. G-7.1

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	93E130	3	8	



DESIGN	H. Jones	DATE	01/97
DRAWN	H. Jones		
CHECKED	B. Meyers		
SALT RIVER PIMA-WAPAI NAVAJO COMMUNITY CONSTRUCTION SERVICES 1400 East Green Road Salt River, Arizona 85207-9112 Phone 480-871-6100			
ROUTE	LOCATION		

ARIZONA DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
**HIGHWAY PLANS SERVICES**  
CROSS SECTIONS  
STA 174+00 to STA 178+00

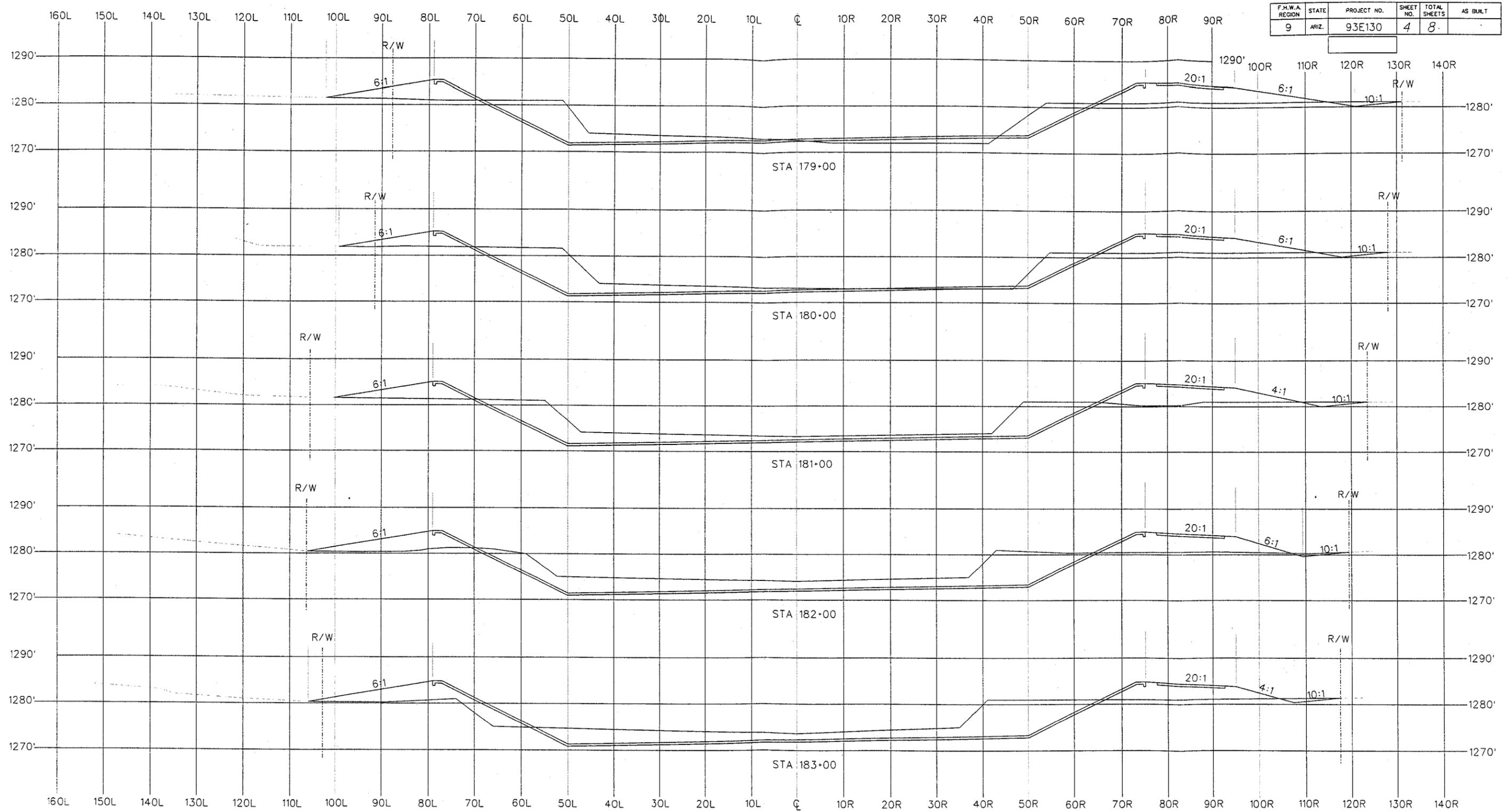
DWG NO G-7.2

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TRACS NO.

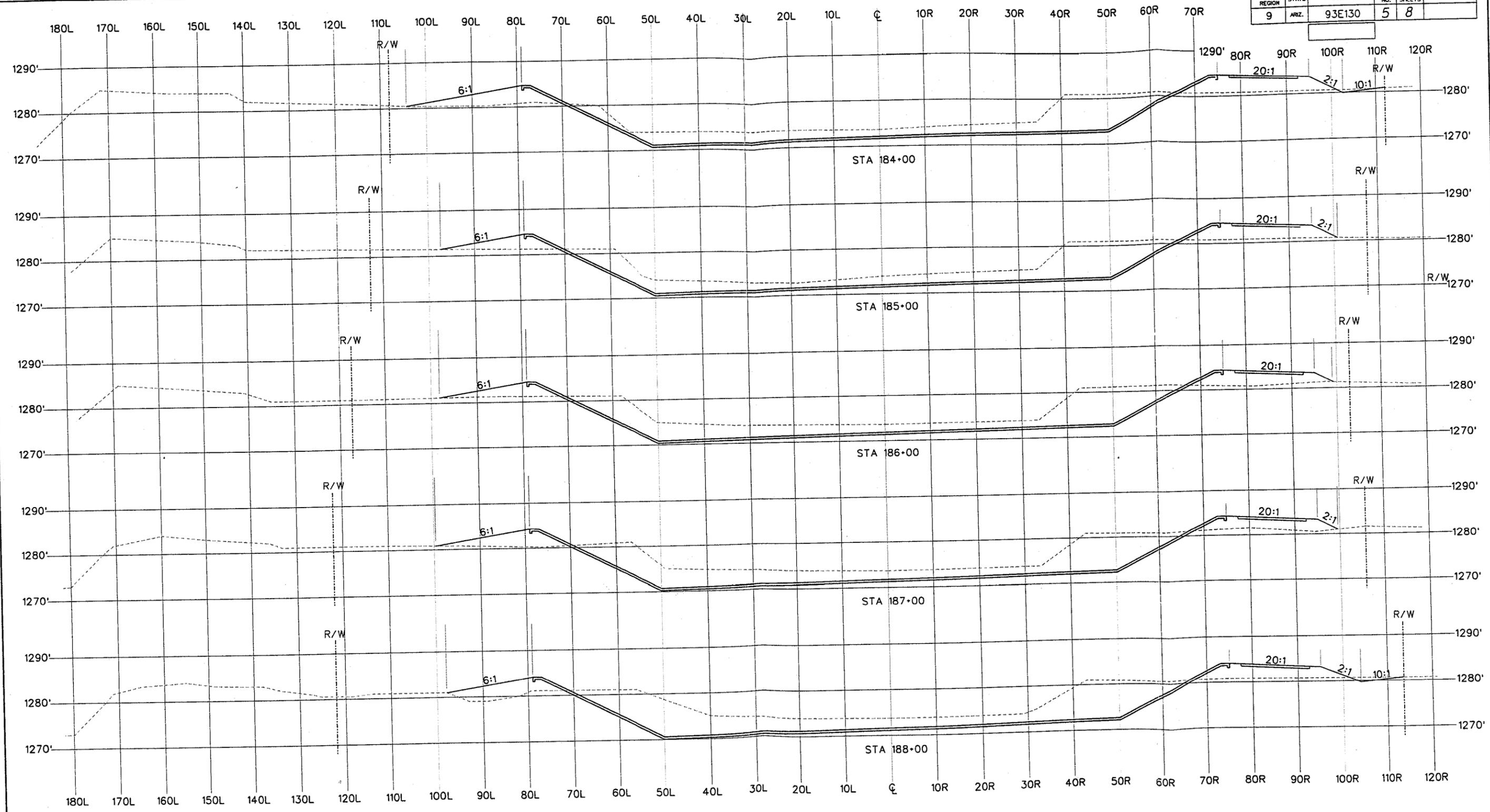
3 OF 8

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	93E130	4	8	



DESIGN	H. Jones	DATE	01/97	ARIZONA DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION <b>HIGHWAY PLANS SERVICES</b>
DRAWN	H. Jones			
CHECKED	B. Meyers			
SALT RIVER PIMA-MARICOPA NOUN COMMUNITY ENGINEERING & CONSTRUCTION SERVICES <small>10201 East McDowell Road Scottsdale, Arizona 85260-4772 Phone 480/341-4100</small>				 <b>CROSS SECTIONS</b> STA 179+00 TO STA 183+00
ROUTE	LOCATION			

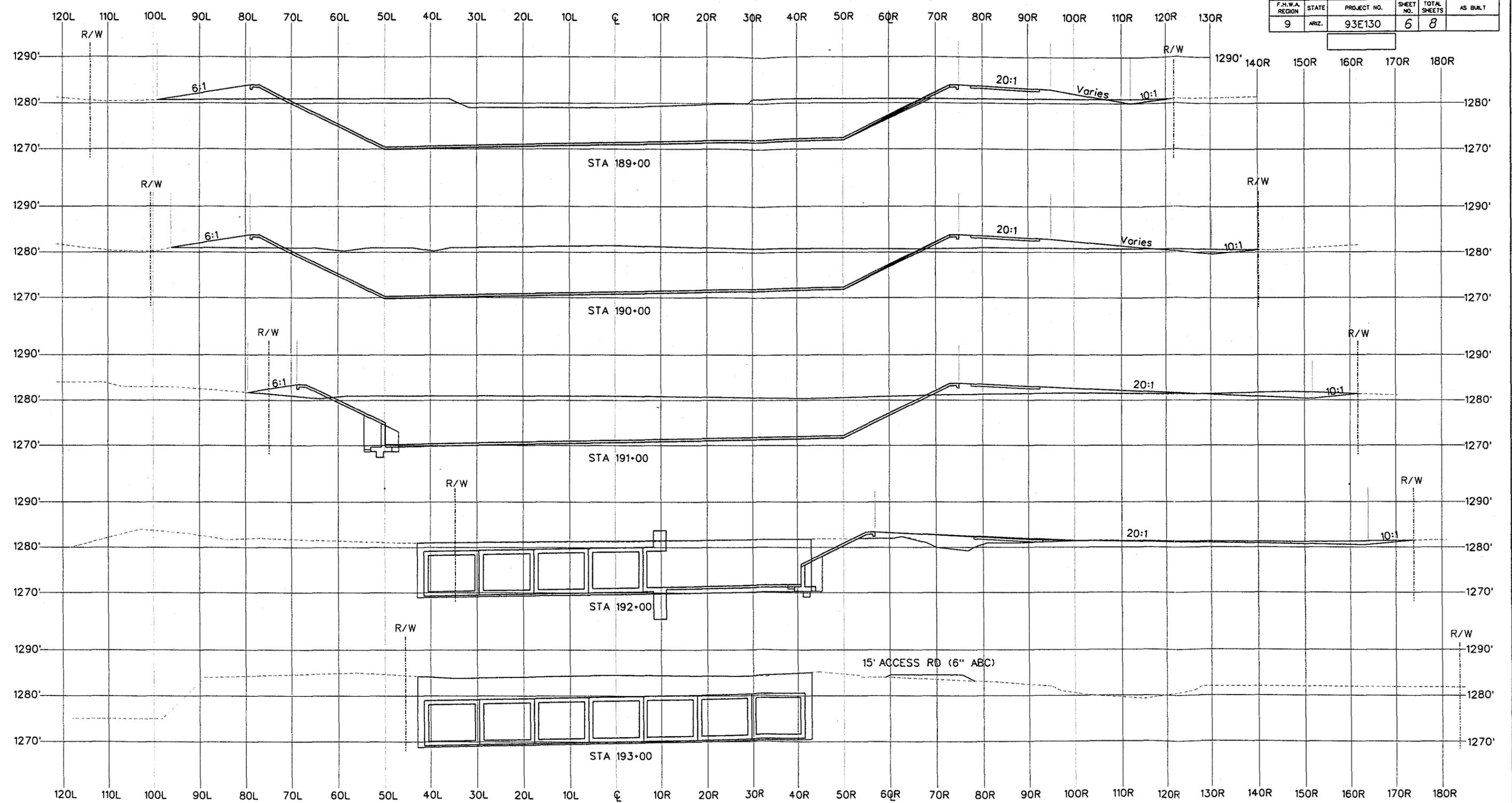
F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARZ.	93E130	5	8	



DESIGN	H. Jones	01/97	ARIZONA DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION HIGHWAY PLANS SERVICES
DRAWN	H. Jones	08/97	
CHECKED	B. Meyers	08/97	
S&I RIVER PRAIRIE/CHESAPEAKE COMMUNITY ENGINEERS & CONSTRUCTORS 1400 East Osborn Road Tempe, Arizona 85284-1000 Phone: (602) 814-1100			CROSS SECTIONS STA 184+00 TO STA 188+00
ROUTE	LOCATION		
DWG NO G-7.4			

TRACS NO. 5 OF 8

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	93E130	6	8	



DATE	LOCATION
REVISIONS	DATE
FINISHED PLANS	DATE
SURVEY NO.	DATE

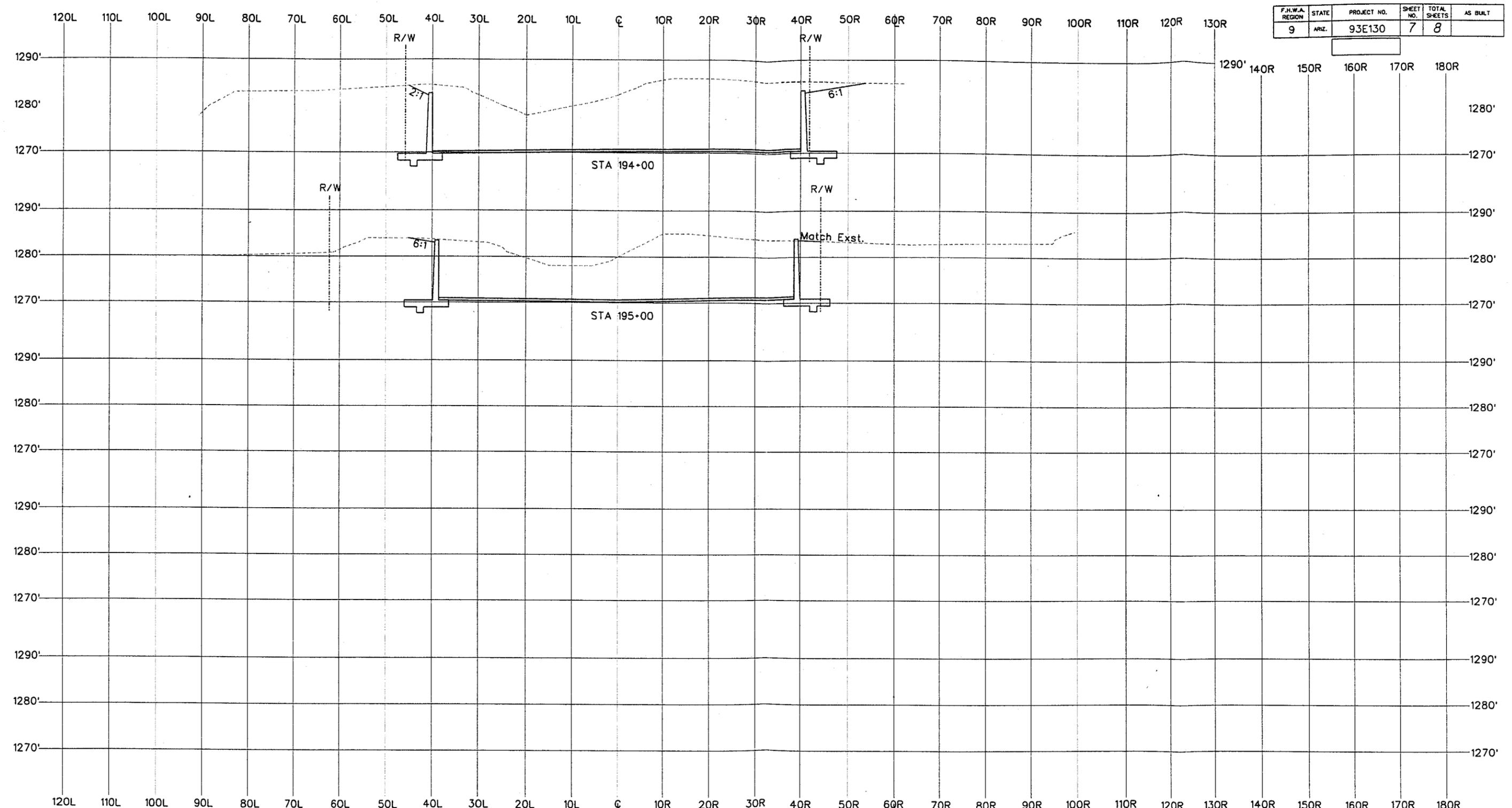
DESIGN	H. Jones	DATE	01/97	ARIZONA DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION HIGHWAY PLANS SERVICES
DRAWN	H. Jones			
CHECKED	B. Meyers			
S&T RIVER PUMP-PIPING AND CONCRETE CONCRETE & CONSTRUCTION SERVICES 10000 East Desert Road Scottsdale, Arizona 85258-1122 Phone: 480-341-1999				CROSS SECTIONS STA 189+00 TO STA 193+00
ROUTE	LOCATION			
DWG NO G-7.5				

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TRACS NO.

6 OF 8

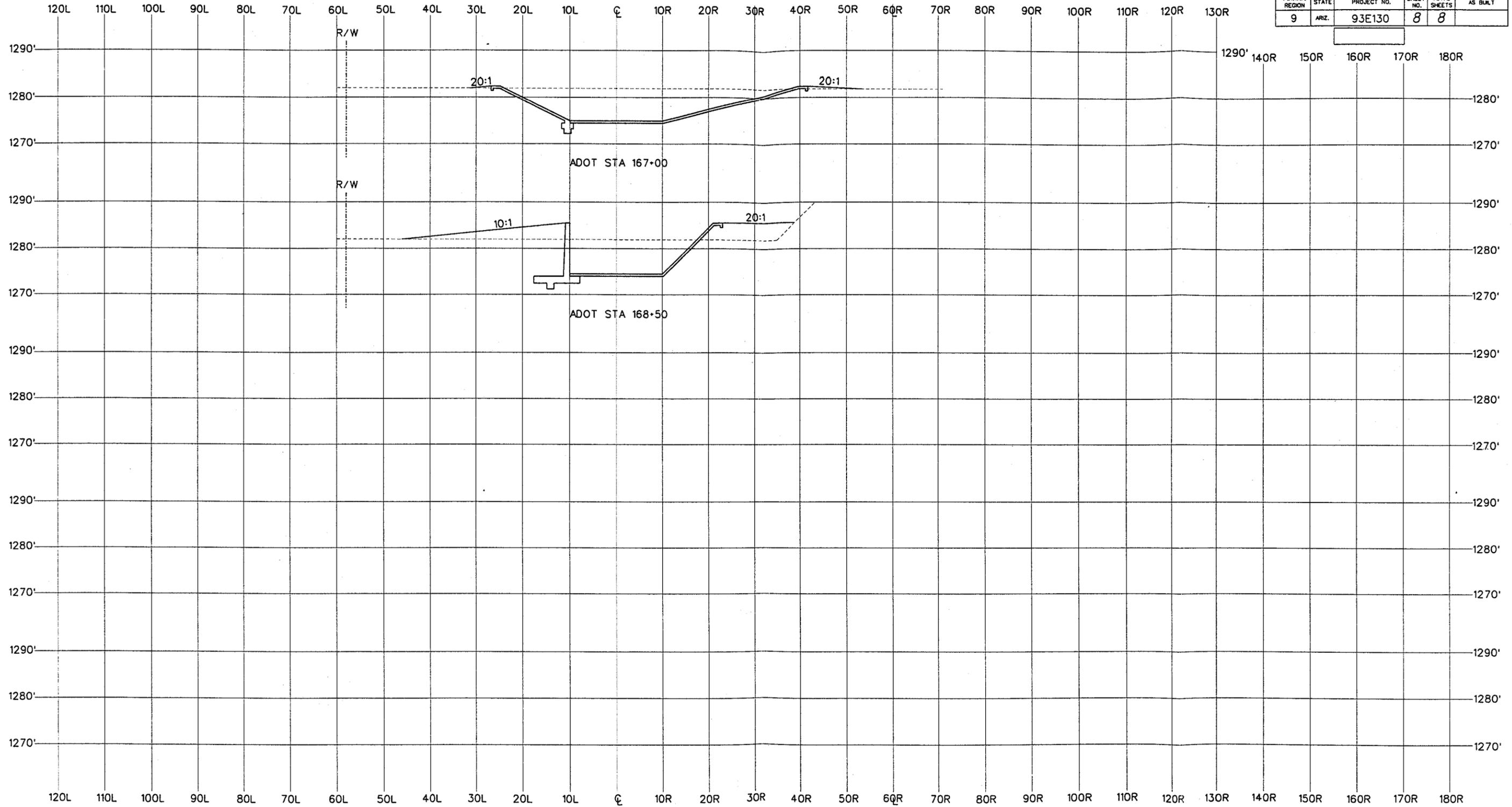
F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	93E130	7	8	



DATE	
LOCATION	
REVISIONS	
FINISHED PLANS	
SURVEY NO.	

DESIGN	H. Jones	DATE	01/97	ARIZONA DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION HIGHWAY PLANS SERVICES
DRAWN	H. Jones			
CHECKED	B. Meyers			
SALT RIVER PIMA-MARICOPA NEIGH. COMMUNITY ENGINEERING & CONSTRUCTION SERVICES 1400 East Green Road Mesa, Arizona 85206-9122 Phone 480-831-8788				CROSS SECTIONS STA 194+00 TO STA 195+00
ROUTE	LOCATION			
				DWG NO G-7.6

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARZ.	93E130	8	8	



SURV. NO.	DATE

DESIGN	H. Jones	DATE	01/97
DRAWN	H. Jones		
CHECKED	B. Meyers		
ARIZONA DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION HIGHWAY PLANS SERVICES <b>CROSS SECTIONS</b> Sta 167+00 to Sta 168+50 ADOT Drainage Baseline			
ROUTE	LOCATION		