ATL JOB NO.: 188269

November 29, 1988

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REPORT OF

GEOTECHNICAL INVESTIGATION

FOR

BURGESS & NIPLE, INC.

FLOOD CONTROL DISTRICT
RECEIVED
DEC 07 1988
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DEP
ADMIN
FINANCE
C & C
ENG
REMARKS

PROJECT

BELL ROAD IMPROVEMENT PROJECT
NEW RIVER BRIDGE
MARICOPA COUNTY, ARIZONA

REVIEWED BY:

Registered Professional Engineer (Chemical)
CERTIFICATE NO. 10108
ROGER E. PALMENBERG
Date Signed 11-29-88
ARIZONA, U.S.A.

REGISTERED PROFESSIONAL ENGINEER (CIVIL)
CERTIFICATE NO. 21916
MARK DODDS
Date Signed 11-29-88
ARIZONA, U.S.A.

PARSONS BRINCKERHOFF QUADE & DOUGLAS, INC.
1232 East Broadway, Suite 120
Tempe, Arizona 85282
(602) 966-8295

LETTER OF TRANSMITTAL

DATE 12/7/88 | JOB NO. 22460205
ATTENTION: Nick Karan, P.E.
RE: Bell Road - New River Bridge Widening

TO Flood Control District of Maricopa County
3335 W. Durango St.
Phoenix AZ 85009

FLOOD CONTROL DISTRICT RECEIVED DEC 07 1988 P & PM HYDRO CONST FILE

GENTLEMEN:

WE ARE SENDING YOU ☐ Attached ☐ Under separate cover via _____ the following items:

☐ Shop drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications

☐ Copy of letter ☐ Change order ☐ _____

COPIES	DATE	NO.	DESCRIPTION
1	—	-	Bridge inspection reports: 6/2/83; 2/12/85; 6/6/88 (+ cover letter)
1	Nov 29, '88	-	Geotechnical Report
1	1964		As-built dwgs original bridge S-396(5) sheets 2-10
1	1976		As-built dwgs - widening TQM-304-3(3) sheets 1-13

THESE ARE TRANSMITTED as checked below:

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☑ For review and comment ☐ _____

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REMARKS _____

COPY TO File 205-4
205-5

SIGNED: David Healy

If enclosures are not as noted, kindly notify us at once.

ATL TESTING LABORATORIES
GEOTECHNICAL AND MATERIALS CONSULTANTS

November 29, 1988

Burgess & Niple, Inc.
5025 E. Washington Street
Suite 212
Phoenix, Arizona 85034

Attention: Mr. James E. Mischler, P.E.

Subject: Geotechnical Investigation
Bell Road Improvement Project
New River Bridge
Maricopa County Project No. 68545
ATL Job No.: 188269

Gentlemen:

This report presents the results of a geotechnical investigation of the subject site. Presented are the results of our field exploration, laboratory tests, and geotechnical engineering analysis. Our work was done in accordance with ATL Proposal Number P88237.

Plate 1, presents the guidelines in the use and interpretation of this report. We have appreciated the opportunity to be of service to you on this project and look forward to a continued association on this and future projects. Should any questions arise, please do not hesitate to contact us at your earliest convenience.

Very truly yours,
ATL TESTING LABORATORIES

Mark Dodds

Mark K. Dodds, P.E.
Senior Geotechnical Engineer

MKD/bs

2922 WEST CLARENDON • PHOENIX, ARIZONA 85017 • TELEPHONE (602) 241-1097
A DIVISION OF R & D ENGINEERING ASSOCIATES, AN ARIZONA CORPORATION

ATL JOB NO.: 188269 November 29, 1988

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PLATE 1 GUIDELINES IN THE US AND INTERPRETATION OF THIS REPORT

PLATE 2 VICINITY MAP

PLATE 3 SITE PLAN

APPENDIX NO. 1 LOGS OF BORINGS

APPENDIX NO. 2 TABULATION OF TEST RESULTS

REVIEWED BY:

Registered Professional Engineer (Civil) CERTIFICATE NO. 10108 ROGER E. PALMENBERG Date Signed 11-29-88 ARIZONA, U.S.A.

REGISTERED PROFESSIONAL ENGINEER (CIVIL) CERTIFICATE NO. 21916 MARK DOODS Date Signed 11-29-88 ARIZONA, U.S.A.

ATL JOB NO.: 188269 Novemeber 29, 1988

REPORT OF

GEOTECHNICAL INVESTIGATION

FOR

BURGESS & NIPLE. INC.

PROJECT

BELL ROAD IMPROVEMENT PROJECT
NEW RIVER BRIDGE
MARICOPA COUNTY PROJECT NO. 68545
MARICOPA COUNTY, ARIZONA

PROJECT DESCRIPTION

The Bell Road General Improvement Project, approximately 24.5 miles in length, begins at Grand Avenue and ends at Scottsdale road. The Maricopa County Highway Department (MCHD) is the lead agency for overall control and coordination. The general purpose of the project is to improve Bell Road by widening it to a six lane divided arterial street.

The New River Bridge project consists of widening the existing Bell Road bridge over New River.

The existing bridge is bearing on spread footings. According to our information, the abutments bear near elevation 1188.0 while the center piers bear at approximately 1184.5. At the time the bridge was built, the

LOCATION AND SITE DESCRIPTION

The site is located along Bell Road over New River. This location is near the 83rd Avenue right-of-way.

There are minor shrubs in the channel and along the banks. The surface soils in the channel vary from loose sands to cobbles.

FIELD TESTING

At six locations, eight-inch-diameter test borings were drilled with a Mobile B-50 drill rig using continuous flight auger. Borings were extended to a maximum depth of 40 feet below existing grades.

Twenty-three Standard Penetration Tests (SPT) were performed at selected depths and locations in accordance with ASTM Test Designation D-1586. One split-spoon ring-lined sampler test was performed in Boring No. 4 at fifteen feet below grade. The SPT and ring-lined samplers were driven with a 140 pound hammer falling thirty inches. Our field representative logged the borings and sampled the different soils encountered. The locations of the six borings are shown on the Site Plan, Plate 3. The field information is summarized on the boring logs presented in Appendix No. 1.

LABORATORY TESTING

Soil samples were returned to our laboratory for further examination. Visual classifications were supplemented by index tests as sieve analyses and Atterberg Limits on representative samples. Moisture tests were also performed. Results of the sieve analyses, Atterberg Limits, and moisture tests are presented in Appendix No. 2.

SUMMARY SUBSURFACE CONDITIONS

Our borings revealed that the top five to fourteen feet of the subsurface consisted of a light brown medium dense sand, gravel, and cobbles. Below this layer, all borings encountered an orangish-brown dense clayey sand and gravel with a variable percentage of cobbles. The contact between these two layers is most probably the depth of scour within recent geologic time. The appended boring logs present a detailed description of the subsurface conditions at each location explored.

The following data should be used in scour analysis. This data was derived from a combination of laboratory tests and field observations.

Depth (ft)	D_{50}	Percent Cobbles (>6-in.)
0 - 10	12.70 mm	30%
10 - 15	2.36 mm	30%

DISCUSSIONS & RECOMMENDATIONS

A) Scour

Scour is a major consideration in the design of bridge foundations. River scour around bridges depends upon the channel flow, the gradation of the river bed sediments, and how the bridge restricts and modifies the channel flow.

The current theory is that scour estimates around bridges can be computed by evaluating and combining three aspect of river scour. These are called: 1) general or regime scour, 2) contractual scour, and 3) local scour.

General or regime scour is defined as the amount of scour the river will experience due to the flow of water in the channel. The Blench Equation for "zero bed factor"[1] was used to estimate regime scour for this project. The formula is:

$$d_{fo} = \frac{q_f^{\,2/3}}{F_{bo}^{\,1/3}}$$

where:

d_{fo} = Depth for zero bed sediment transport, ft

q_f = Design flood discharge per unit width, ft^3/s per ft = 50.0

F_{bo} = Blench's "zero bed factor" in ft/s^2 = 3.4

Contractual scour is defined as the amount of scour around bridges due to the channelization and restriction of the water flow by the abutments.

The Long Contraction Equation was used to estimate contraction scour around the bridges. The formula is:

$$\frac{Y_2}{Y_1} = \left(\frac{B_1}{B_2}\right)^{9/14}$$

where:

B_1 = upstream channel width = 325 feet
B_2 = width of channel at bridge = 275 feet
Y_1 = upstream channel depth = 6.7 feet
Y_2 = depth of channel at bridge

$Y_2 - Y_1$ = contractual scour

Local scour is defined as the amount of scour that will take place around piers and caissons placed in the channel.

The Jain Rational Equation was used to estimate local scour[1]. The formula is:

$$\frac{d_s}{b} = 1.84\left(\frac{d}{b}\right)^{0.3} (F_c)^{0.25}$$

where:

d_s = depth of scour

b = pier width = 15 feet

F_c = Threshold Froude Number = 0.39

d = Depth of flow at bridge = 6.5 feet

The New River has a design discharge of 16,240 cubic feet per second at the bridge. The results of our computations are summarized below:

Regime Scour (ft)	Contractual Scour (ft)	Local Scour (ft)	Total Scour (ft)
9.1	0.7	17.0	26.8

B) **Foundations**

The bridge widening can either be founded on shallow or deep foundations. Deep foundations such as drilled piers can extend through the scour zone. Shallow foundations will require protection from scour to prevent undermining and failure of the bridge.

An important consideration when widening an existing structure is differential settlements between the new and old foundation elements. The following construction procedures and design recommendations will minimize differential settlements.

Shallow Spread Footings

Providing that scour is controlled, the bridge widening can be founded on shallow spread footings. However, the new footings should not bear above the elevation of the existing footings.

If shallow spread footings bearing at or below elevation 1184.5 are chosen for the bridge widening foundation, then these footings should bear on dense native sand, gravel, and cobbles. A bearing pressure of 5000 pounds per square foot (psf) may be used in design. The following table summarizes the data which applies for the shallow spread footings:

Item	Value
Foundation Type	Spread Footing
Load	27.0 kips/ft along abutment 22.5 kips/ft along pier
Minimum Founding Elevation	1184.5
Founding Soil	Dense native sand, gravel, and cobbles *
Allowable Bearing Pressure	5000 psf
Anticipated Ultimate Settlement	0.5 inch
Minimum Footing Width	6.0 feet

* Footing excavations should be inspected immediately prior to the placement of concrete to ensure design criteria are met.

Drilled Piers

Drilled piers should extend into the soils below the computed scour zone. The piers should extend a minimum of ten feet below the scour zone. Our engineering analysis indicates, the pier tips will bear at or above elevation 1154.6. Piers should be founded on the dense to very dense orangish-brown clayey sand and gravel.

The following table summarizes the data which applies for the drilled piers:

Item	Value
Foundation Type	Drilled Pier
Load	27.0 kips/ft along abutment 22.5 kips/ft along pier
Minimum Founding Level	Ten feet below scour depth or elevation 1168.0, whichever is deeper
Founding Soil	Native undisturbed orangish brown clayey sand and gravel
Minimum Pier Diameter	3.0 feet

The following table presents allowable pier capacity verses depth for 3-ft diameter piers:

Depth Below Scour Depth (ft)	Allowable Pier Capacity (kips)*	Anticipated Ultimate Settlement (in.)
10	225	0.5
15	245	0.5
20	265	0.5
25	290	0.5

* To achieve full capacity, piers should be no closer than 3 piers diameters, center to center.

C) Earth Pressures

The pressure behind bridge abutment walls can be approximated by the following equivalent fluid pressures (EFP).

Type of Earth Pressure	EFP Value
Active	38 pcf
At-Rest	52 pcf
Passive	400 pcf

Equivalent fluid pressure analysis is adequate for rigid, drained walls less than fifteen feet high. If higher walls are proposed, the corresponding wall details should be reviewed to determine the adequacy of the design to withstand the anticipated loads.

Guidelines in the Use and Interpretation of This Geotechnical Report

ATL Job No.: 188269

Our professional services were performed, our findings obtained, and our recommendations prepared in accordance with generally accepted engineering principles and practices. This warranty is in lieu of all other warranties, either expressed or implied.

The geotechnical report was prepared for the use of the Owner in the design of the subject facility and should be made available to potential contractors and/or the Contractor for information on factual data only. This report should not be used for contractual purposes as a warranty of interpreted subsurface conditions such as those indicated by the interpretive boring and test pit logs, cross sections, or discussion of subsurface conditions contained herein.

The analyses, conclusions and recommendations contained in the report are based on site conditions as they presently exist and assume that the exploratory borings, test pits, and/or probes are representative of the subsurface conditions of the site. If, during construction, subsurface conditions are found which are significantly different from those observed in the exploratory borings and test pits, or assumed to exist in the excavations, we should be advised at once so that we can review these conditions and reconsider our recommendations where necessary. If there is a substantial lapse of time between the submission of this report and the start of work at the site, or if conditions have changed due to natural causes or construction operations at or adjacent to the site, this report should be reviewed to determine the applicability of the conclusions and recommendations considering the changed conditions and time lapse.

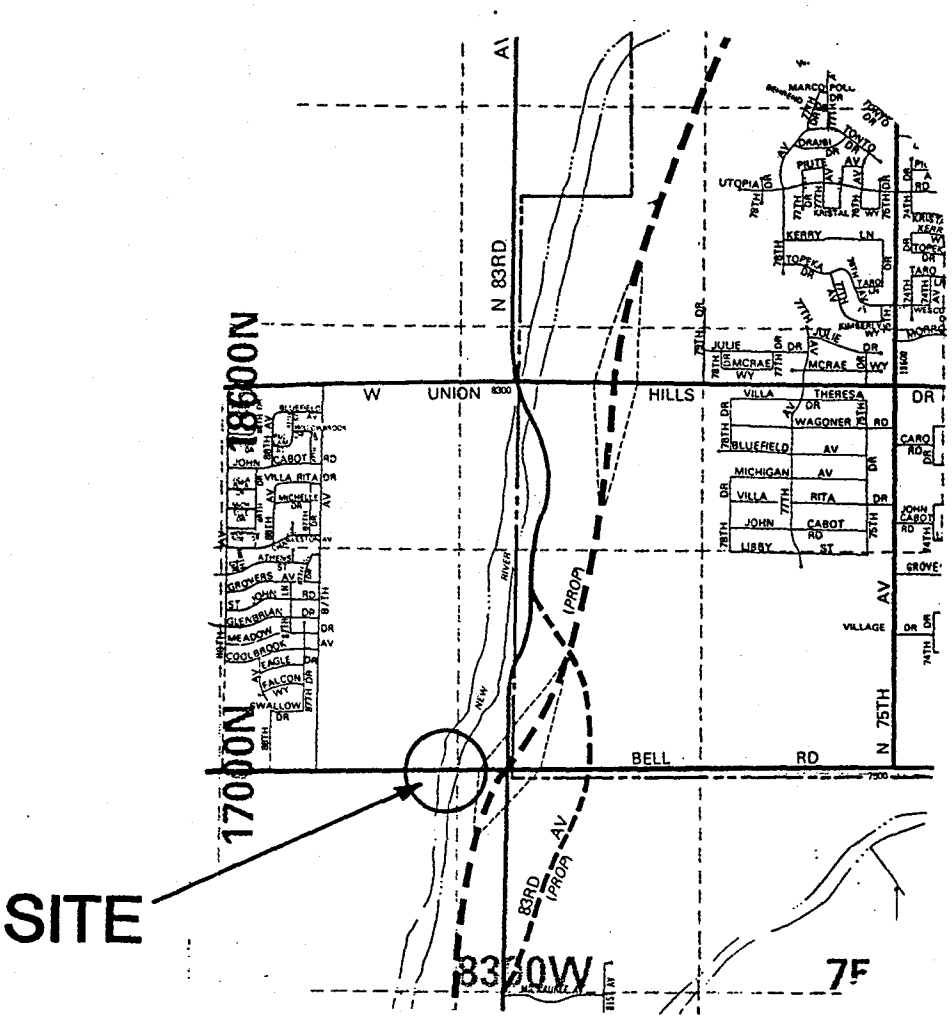
The Summary Boring Logs are our opinion of the subsurface conditions revealed by periodic sampling of the ground as the borings progressed. The soil descriptions and interfaces between strata are interpretive and actual changes may be gradual.

The boring logs and related information depict subsurface conditions only at these specific locations and at the particular time designated on the logs. Soil conditions at other locations may differ from conditions occurring at these boring locations. Also, the passage of time may result in a change in the soil conditions at these boring locations.

Groundwater levels often vary seasonally. Groundwater levels reported on the boring logs or in the body of the report are factual data only for the dates shown.

Unanticipated soil conditions are commonly encountered on construction sites and cannot be fully anticipated by merely taking soil samples, borings or test pits. Such unexpected conditions frequently require that additional expenditures be made to attain a properly constructed project. It is recommended that the Owner consider providing a contingency fund to accommodate such potential extra costs.

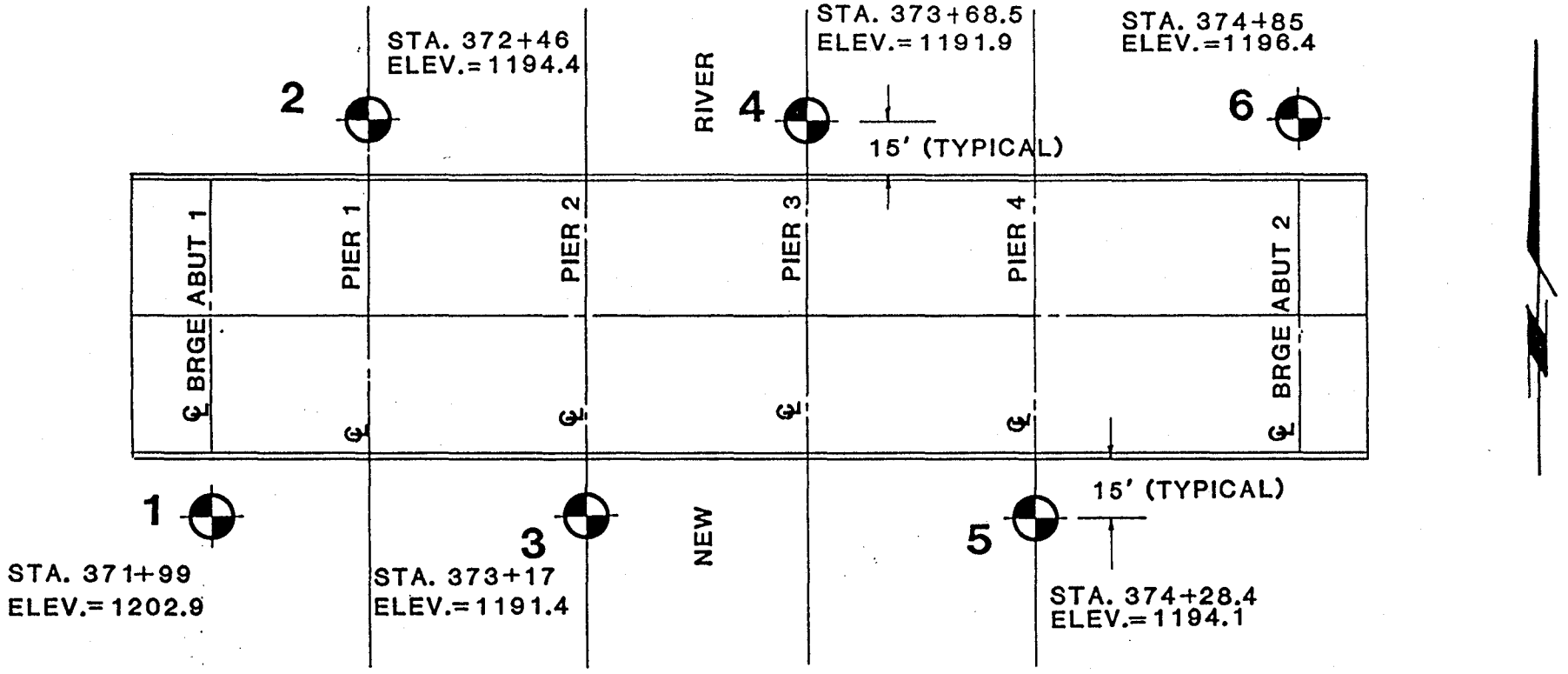
This firm cannot be responsible for any deviation from the intent of this report including, but not restricted to, any changes to the scheduled time of construction, the nature of the project or the specific construction methods or means indicated in this report; nor can our firm be responsible for any construction activity on sites other than the specific site referred to in this report.



ATL Testing Laboratories

VICINITY MAP

JOB NO. 188269



NOT TO SCALE

BORING LOCATION

ATL Testing Laboratories

SITE PLAN
NEW RIVER BRIDGE

ATL JOB NO. 188269

ATL TESTING LABORATORIES

PLATE 3

APPENDIX NO. 1

LOGS OF BORINGS

ATL JOB NAME:

New River Bridge

ATL Testing Laboratories
Geotechnical and Materials Consultants

BORING NUMBER: 1

BORING LOCATION:
Sta. 371+99, 9¼' south of eastbound extention C/L

DATE OF BORING: 8-4-88

ELEVATION OF BORING: 1202.9

DRILLING EQUIPMENT: Mobile B-50 with 4" dia. flight auger

DRILLER: T. Kulik

FIELD ENGINEER: R. Smith

REVIEWED BY: M. Dodds

ATL JOB NUMBER: 188269

GRAPHICAL LOG	ELEVATION (Feet)	SOIL DESCRIPTION	BULLNOSE	SPT #	RING #	WATER CONTENT %	DRY DENSITY (PCF)
		LIGHT BROWN SAND, GRAVEL, AND COBBLES WITH TRACE OF SILT; (GP), SLIGHTLY MOIST, MEDIUM DENSE					
	5						
	10						
	13	LIGHT ORANGE BROWN CLAYEY SAND, GRAVEL AND COBBLES, (GC), SLIGHTLY MOIST, VERY DENSE					
	15			80 100/ 4"			

BORING STOPPED AT 40 FEET BELOW EXISTING GRADES

GROUNDWATER		
DEPTH	HOUR	RATE
	NONE	

—THE ABOVE DATA FOR DESIGN PURPOSES ONLY

ATL JOB NAME:

New River Bridge

ATL Testing Laboratories
Geotechnical and Materials Consultants

BORING NUMBER: 1

BORING LOCATION:
Sta. 371+99, 9¼' south of eastbound extention C/L

DATE OF BORING: 8-4-88

ELEVATION OF BORING: 1202.9

DRILLING EQUIPMENT: Mobile B-50 with 4" dia. flight auger

DRILLER: T. Kulik

FIELD ENGINEER: R. Smith

REVIEWED BY: M. Dodds

ATL JOB NUMBER: 188269

GRAPHICAL LOG	ELEVATION (Feet)	SOIL DESCRIPTION	BULLNOSE	SPT #	RING #	WATER CONTENT %	DRY DENSITY (PCF)
	25	LIGHT ORANGE BROWN CLAYEY SAND AND GRAVEL WITH SOME COBBLES, (SC), SLIGHTLY MOIST, VERY DENSE		35 35 43 50/ 2"			
	30			70 53 55			
	35			35 45 50/ 4"			
	40			100/ 4"			

BORING STOPPED AT 40 FEET BELOW EXISTING GRADES

GROUNDWATER		
DEPTH	HOUR	RATE
	NONE	

—THE ABOVE DATA FOR DESIGN PURPOSES ONLY

ATL JOB NAME:

New River Bridge

ATL Testing Laboratories
Geotechnical and Materials Consultants

BORING NUMBER: 2

BORING LOCATION:
Sta. 372+46, 8½' north of westbound extention C/L

DATE OF BORING: 8-5-88

ELEVATION OF BORING: 1194.4

DRILLING EQUIPMENT: Mobile B-50 with 4" dia. flight auger

DRILLER: T. Kulik

FIELD ENGINEER: R. Smith

REVIEWED BY: M. Dodds

ATL JOB NUMBER: 188269

GRAPHICAL LOG	ELEVATION (Feet)	SOIL DESCRIPTION	BULLNOSE	SPT #	RING #	WATER CONTENT %	DRY DENSITY (PCF)
		LIGHT BROWN SAND, GRAVEL, AND COBBLES WITH TRACE OF SILT; (GP), SLIGHTLY MOIST, MEDIUM DENSE					
	5	LIGHT ORANGE BROWN CLAYEY SAND, GRAVEL, AND COBBLES; (GC), SLIGHTLY MOIST, VERY DENSE					
	10						
	15			100/5"			

BORING STOPPED AT 30.5 FEET BELOW EXISTING GRADES

GROUNDWATER		
DEPTH	HOUR	RATE
	NONE	

—THE ABOVE DATA FOR DESIGN PURPOSES ONLY

ATL JOB NAME:

New River Bridge

ATL Testing Laboratories
Geotechnical and Materials Consultants

BORING NUMBER: 2

BORING LOCATION:
Sta. 372+46, 8½' north of westbound extention C/L

DATE OF BORING: 8-5-88

ELEVATION OF BORING: 1194.4

DRILLING EQUIPMENT: Mobile B-50 with 4" dia. flight auger

DRILLER: T. Kulik

FIELD ENGINEER: R. Smith

REVIEWED BY: M. Dodds

ATL JOB NUMBER: 188269

GRAPHICAL LOG	ELEVATION (Feet)	SOIL DESCRIPTION	BULLNOSE	SPT #	RING #	WATER CONTENT %	DRY DENSITY (PCF)
	25						
	30	END OF BORING		83 50/ 1"			

BORING STOPPED AT 30.5 FEET BELOW EXISTING GRADES

GROUNDWATER		
DEPTH	HOUR	RATE
	NONE	

—THE ABOVE DATA FOR DESIGN PURPOSES ONLY

ATL JOB NAME:

New River Bridge

ATL Testing Laboratories
Geotechnical and Materials Consultants

BORING NUMBER: 3

BORING LOCATION:
Sta. 373+17, eastbound extention C/L

DATE OF BORING: 8-11-88

ELEVATION OF BORING: 1191.4

DRILLING EQUIPMENT: Mobile B-50 with 4" dia. flight auger

DRILLER: T. Kulik

FIELD ENGINEER: R. Smith

REVIEWED BY: M. Dodds

ATL JOB NUMBER: 188269

GRAPHICAL LOG	ELEVATION (Feet)	SOIL DESCRIPTION	BULLNOSE	SPT #	RING #	WATER CONTENT %	DRY DENSITY (PCF)
		LIGHT BROWN SAND, GRAVEL, AND COBBLES WITH TRACE OF SILT, (GP), SLIGHTLY MOIST, MEDIUM DENSE					
	5						
	10						
	15	LIGHT ORANGE BROWN CLAYEY SAND, GRAVEL, AND COBBLES; (GC), SLIGHTLY MOIST, VERY DENSE		58 63			

BORING STOPPED AT 30.5 FEET BELOW EXISTING GRADES

GROUNDWATER		
DEPTH	HOUR	RATE
	NONE	

—THE ABOVE DATA FOR DESIGN PURPOSES ONLY

ATL JOB NAME:

New River Bridge

ATL Testing Laboratories
Geotechnical and Materials Consultants

BORING NUMBER: 3

BORING LOCATION:
Sta. 373+17, eastbound extention C/L

DATE OF BORING: 8-11-88

ELEVATION OF BORING: 1191.4

DRILLING EQUIPMENT: Mobile B-50 with 4" dia. flight auger

DRILLER: T. Kulik

FIELD ENGINEER: R. Smith

REVIEWED BY: M. Dodds

ATL JOB NUMBER: 188269

GRAPHICAL LOG	ELEVATION (Feet)	SOIL DESCRIPTION	BULLNOSE	SPT #	RING #	WATER CONTENT %	DRY DENSITY (PCF)
	25						
	30	END OF BORING		63 100/4"			

BORING STOPPED AT 30.5 FEET BELOW EXISTING GRADES

GROUNDWATER		
DEPTH	HOUR	RATE
	NONE	

—THE ABOVE DATA FOR DESIGN PURPOSES ONLY

ATL JOB NAME:

New River Bridge

ATL Testing Laboratories
Geotechnical and Materials Consultants

BORING NUMBER: 4

BORING LOCATION:
Sta. 373+68.5, westbound extention C/L

DATE OF BORING: 8-3-88

ELEVATION OF BORING: 1191.9

DRILLING EQUIPMENT: Mobile B-50 with 4" dia. flight auger

DRILLER: T. Kulik

FIELD ENGINEER: R. Smith

REVIEWED BY: M. Dodds

ATL JOB NUMBER: 188269

GRAPHICAL LOG	ELEVATION (Feet)	SOIL DESCRIPTION	BULLNOSE	SPT #	RING #	WATER CONTENT %	DRY DENSITY (PCF)
		LIGHT BROWN SAND, GRAVEL, AND COBBLES WITH A TRACE OF SILT, (GP), SLIGHTLY MOIST, MEDIUM DENSE					
	5	LIGHT ORANGE BROWN CLAYEY SAND, GRAVEL, AND COBBLES, (GC), SLIGHTLY MOIST, VERY DENSE		31 49 50/2½"			
	10			23 17 55			
	15			40 50/4"	49 90		

BORING STOPPED AT 30 FEET BELOW EXISTING GRADES

GROUNDWATER		
DEPTH	HOUR	RATE
	NONE	

—THE ABOVE DATA FOR DESIGN PURPOSES ONLY

ATL JOB NAME:

New River Bridge

ATL Testing Laboratories
Geotechnical and Materials Consultants

BORING NUMBER: 4

BORING LOCATION:
Sta. 373+68.5, westbound extention C/L

DATE OF BORING: 8-3-88

ELEVATION OF BORING: 1191.9

DRILLING EQUIPMENT: Mobile B-50 with 4" dia. flight auger

DRILLER: T. Kulik

FIELD ENGINEER: R. Smith

REVIEWED BY: M. Dodds

ATL JOB NUMBER: 188269

GRAPHICAL LOG	ELEVATION (Feet)	SOIL DESCRIPTION	BULLNOSE	SPT #	RING #	WATER CONTENT %	DRY DENSITY (PCF)
				36 42 50/ 4"			
	25	LIGHT ORANGE BROWN CLAYEY SAND, GRAVEL, AND SOME COBBLES, (SC), SLIGHTLY MOIST, VERY DENSE		100/ 4½"			
	30			100/ 4"			
		END OF BORING					

BORING STOPPED AT 30 FEET BELOW EXISTING GRADES

GROUNDWATER		
DEPTH	HOUR	RATE
	NONE	

—THE ABOVE DATA FOR DESIGN PURPOSES ONLY

ATL JOB NAME:

New River Bridge

ATL Testing Laboratories
Geotechnical and Materials Consultants

BORING NUMBER: 5

BORING LOCATION:
Sta. 374+28.4, 5' south of eastbound extention C/L

DATE OF BORING: 8-11-88

ELEVATION OF BORING: 1194.1

DRILLING EQUIPMENT: Mobile B-50 with 4" dia. flight auger

DRILLER: T. Kulik

FIELD ENGINEER: R. Smith

REVIEWED BY: M. Dodds

ATL JOB NUMBER: 188269

GRAPHICAL LOG	ELEVATION (Feet)	SOIL DESCRIPTION	BULLNOSE	SPT #	RING #	WATER CONTENT %	DRY DENSITY (PCF)
		LIGHT BROWN SAND, GRAVEL, AND COBBLES, WITH TRACE OF SILT, (GP), SLIGHTLY MOIST, MEDIUM DENSE					
	5						
		LIGHT ORANGE BROWN SAND, GRAVEL, AND COBBLES WITH SOME CLAY, (GC), SLIGHTLY MOIST, DENSE					
	10						
	15	LIGHT ORANGE BROWN CLAYEY SAND, GRAVEL, AND COBBLES, (GC), SLIGHTLY MOIST, VERY DENSE		100/1½"			

BORING STOPPED AT 30.5 FEET BELOW EXISTING GRADES

GROUNDWATER		
DEPTH	HOUR	RATE
	NONE	

—THE ABOVE DATA FOR DESIGN PURPOSES ONLY

ATL JOB NAME:

New River Bridge

ATL Testing Laboratories
Geotechnical and Materials Consultants

BORING NUMBER: 5

BORING LOCATION:
Sta. 374+28.4, 5' south of eastbound extention C/L

DATE OF BORING: 8-11-88

ELEVATION OF BORING: 1194.1

DRILLING EQUIPMENT: Mobile B-50 with 4" dia. flight auger

DRILLER: T. Kulik

FIELD ENGINEER: R. Smith

REVIEWED BY: M. Dodds

ATL JOB NUMBER: 188269

GRAPHICAL LOG	ELEVATION (Feet)	SOIL DESCRIPTION	BULLNOSE	SPT #	RING #	WATER CONTENT %	DRY DENSITY (PCF)
				50			
				40			
				80			
	25						
				100			
	30	END OF BORING					

BORING STOPPED AT 30.5 FEET BELOW EXISTING GRADES

GROUNDWATER		
DEPTH	HOUR	RATE
	NONE	

—THE ABOVE DATA FOR DESIGN PURPOSES ONLY

ATL JOB NAME:

New River Bridge

ATL Testing Laboratories
Geotechnical and Materials Consultants

BORING NUMBER: 6

BORING LOCATION:
Sta. 374+85, westbound extention C/L

DATE OF BORING: 8-4-88

ELEVATION OF BORING: 1196.4

DRILLING EQUIPMENT: Mobile B-50 with 4" dia. flight auger

DRILLER: T. Kulik

FIELD ENGINEER: R. Smith

REVIEWED BY: M. Dodds

ATL JOB NUMBER: 188269

GRAPHICAL LOG	ELEVATION (Feet)	SOIL DESCRIPTION	BULLNOSE	SPT #	RING #	WATER CONTENT %	DRY DENSITY (PCF)
		LIGHT BROWN SAND, GRAVEL, AND COBBLES WITH TRACE OF SILT, (GP), SLIGHTLY MOIST, MEDIUM DENSE					
	5	LIGHT ORANGE BROWN CLAYEY SAND, GRAVEL, AND COBBLES, (GC), SLIGHTLY MOIST, VERY DENSE					
	10						
	15			65 100/ 4½"			

BORING STOPPED AT 36 FEET BELOW EXISTING GRADES

GROUNDWATER		
DEPTH	HOUR	RATE
	NONE	

—THE ABOVE DATA FOR DESIGN PURPOSES ONLY

ATL JOB NAME:

New River Bridge

ATL Testing Laboratories
Geotechnical and Materials Consultants

BORING NUMBER: 6

BORING LOCATION:
Sta. 374+85, westbound extention C/L

DATE OF BORING: 8-4-88

ELEVATION OF BORING: 1196.4

DRILLING EQUIPMENT: Mobile B-50 with 4" dia. flight auger

DRILLER: T. Kulik

FIELD ENGINEER: R. Smith

REVIEWED BY: M. Dodds

ATL JOB NUMBER: 188269

GRAPHICAL LOG	ELEVATION (Feet)	SOIL DESCRIPTION	BULLNOSE	SPT #	RING #	WATER CONTENT %	DRY DENSITY (PCF)
				60 25/ 0			
	25	LIGHT ORANGE BROWN CLAYEY SAND WITH SOME GRAVEL, (SC), SLIGHTLY MOIST		16 29 34 50			
		LIGHT ORANGE BROWN CLAYEY SAND, GRAVEL, AND COBBLES, (SC), SLIGHTLY MOIST					
	30			18 30 44 50/ 4½"			
	35	END OF BORING		57 88			

BORING STOPPED AT 36 FEET BELOW EXISTING GRADES

GROUNDWATER		
DEPTH	HOUR	RATE
	NONE	

—THE ABOVE DATA FOR DESIGN PURPOSES ONLY

APPENDIX NO. 2

TABULATION OF TEST RESULTS

ATL TESTING LABORATORIES

ATL
TESTING LABORATORIES

PROJECT: New River Bridge DATE: 8-25-88

LOCATION: Phoenix, Arizona

MATERIAL: Drill soil DATE OF SAMPLE: 8-15-88

REQUESTED BY: ATL/M. Dodds

LOG	DEPTH	MOISTURE	USCS	LL	PI	SIEVE ANALYSIS-PERCENT PASSING														
						200	100	50	40	30	16	10	8	4	1/4	3/8	1/2	3/4	1	1 1/2
3	10-14'	4.2	SC	32	17	20	23	29	34	41	55	64	87	78	85	94	98	100	---	---
4	0-5'	1.1	GP-GM		NP	8.8	11	15	18	23	32	36	37	40	43	47	51	60	68	77
4	5-10'	2.3	GC	29	16	19.4	22	26	28	31	37	42	44	51	56	61	71	77	83	92
5	25-30'	9.8	SC	45	30	44	49	56	60	65	74	80	82	87	90	95	98	100	---	---

PLATE

Bell Road - New River Bridge

Original Structure

FED. ROAD DIV. NO.	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
7	ARIZ.	S-396(5)		10	Not built 5-4-66

BELL ROAD
83rd AVENUE 59th AVENUE
MARICOPA COUNTY

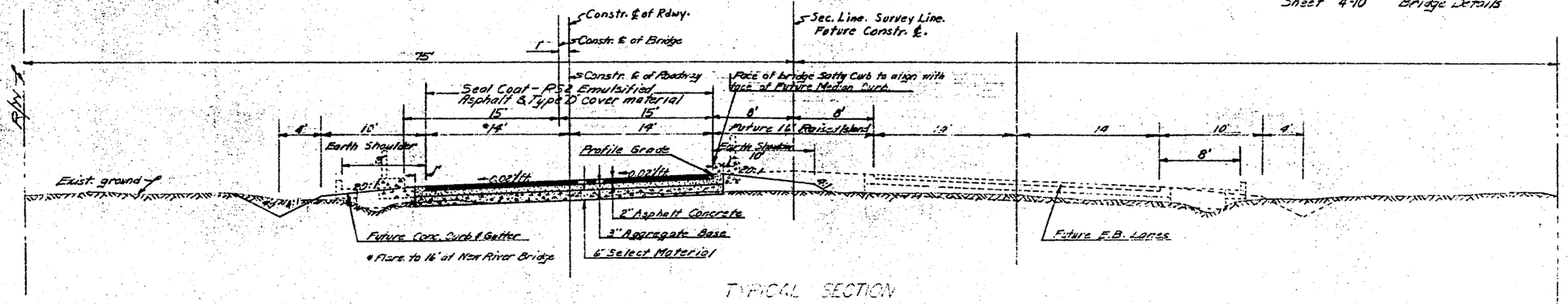
LENGTH OF PROJECT

Sta 97+00.33 to Sta 99+75.33 = 275.00 ft.

Total Net Length = 0.0521 miles

INDEX OF SHEETS

Sheet 1 Face Sheet
Sheet 2 Typical Section of Roadway
Sheet 3 Roadway Plan Profile
Sheet 4-10 Bridge Details



TYPICAL SECTION

FLOOD CONTROL DISTRICT
RECEIVED
DEC 07 1988

BELL ROAD
83rd AVENUE - 59th AVENUE
MARICOPA COUNTY

N

Sec. 34 T4N R1E

Sta. 96+81.75 to Sta. 97+00.33 & Sta. 99+75.33 to Sta. 99+93
Class "X" concrete bridge approach slabs. For dimensions and details see sheet 5 in Project S-396(6)
21 cu. yd. Class A Conc. 3432# Bank shel. 458# Stk. steel.
NOT A PART OF THIS CONTRACT

Exist. pvmt. curb, and conc. aprons to be removed on Project S-396(6)

New R/W

Exist dirt road

Exist Conc. Aprons

℄ Bridge

Rwy. Constr. ℄

Survey ℄ Section Line

Sta. 97+00.33 to Sta. 99+75.33
New 2 span Reinforced Concrete Bridge 30' clear Rdwy. See Sheets 4-10

℄ New R/W

NOT A PART OF THIS CONTRACT

Begin Project S-396(5)
Station 97+00.33
Begin Exception to S-396(6)

BEGIN PROJECT S 396 (6)
STATION 92+00.0

Sec. 3 T3N R1E

Sta. 97+00.33

Sta. 97+00.33 - Sta. 99+75.33
New River Bridge S-396(5)

Sta. 99+75.33

NOT A PART OF THIS CONTRACT

End Exception to S-396(6)
End Project S-396(5)
Station 99+75.33

Exist 36" C.M.P. & hdwl. to remain in place

Note Rt Sta. 92+00 to Sta. 105+00
All exist. irrig. facilities Rt of Section line shall remain in place except as noted.

BM #10 - 65' Lt Sta. 90+00
Top ½" Pipe Elev. 1204.94

BM #10A - 80' Lt Sta. 96+00
Top ½" Pipe Elev. 1205.46

B.M. Brass Cap Curb 16' Rt
Sta. 97+00 Elev. 1208.51

BM #11 - 85' Lt Sta. 100+06
Top ½" Pipe Elev. 1200.23

B.M. Brass Cap. Curb. 16' Rt.
Sta. 99+75 Elev. 1208.52

28' Pavement
Crown Slope Lt 0.03 ft/ft

Pvmt Flare
Crown Transition

30' Roadway
Crown Slope Lt 0.015 ft/ft

Pvmt Taper Lt
Crown Transition

Pavement Flare Rt
Crown Slope Lt 0.02 ft/ft

40' Pavement
Crown Transition

El. 1204.99
El. 1204.55
Corr. +0.26

El. 1195.00
El. 1196.80
Corr. -0.37

Sta. 97+104.33 - Sta. 99+75.33
New River Bridge S-396(5)
Reduction clear to conc. 1146# Pvmt. shel. 229# Stk. steel

El. 1197.40
El. 1198.40
Corr. -0.37

El. 1205.46

Finished Grade ℄ of Section Line

+0.7375%

Level

-0.7375%

-0.0022%

Grade dirt road from end of pavement to match existing roadway at Sta. 88+00

400' V.C.

400' V.C.
SD₂ = 1187

400' V.C.
SD₂ = 1187

℄ Exist 36" CMP
El. 1199.92 Ft.

400' V.C.

Not part of this contract

Not part of this contract

Earthwork will be a part of Roadway Project S-396(6)

Project S-396(5)

Exc.	584 cu. yd.
Emb.	307
20% Sh.	71
Gr. Comp.	200

Exc.	5 cu. yd.
Emb.	2304
20% Sh.	575
Gr. Comp.	1116
Borrow	2916

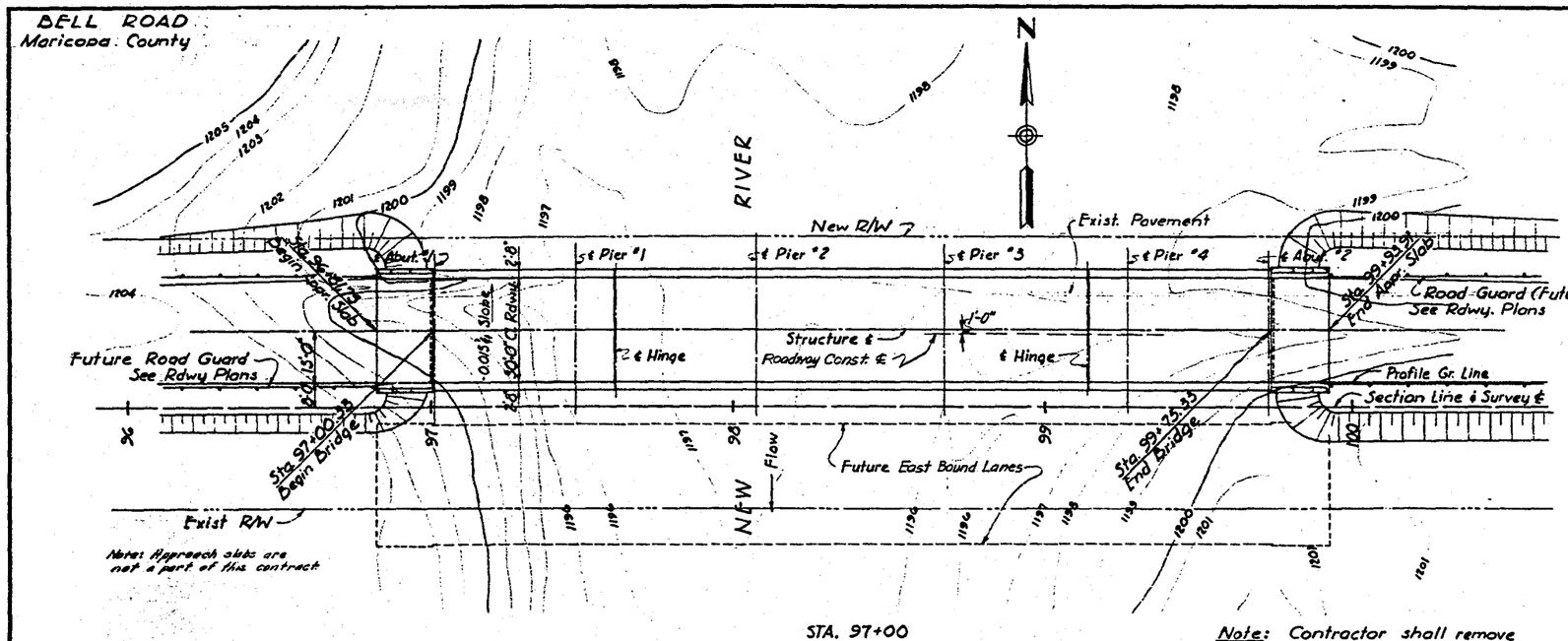
Exc.	146 cu. yd.
Emb.	5941
20% Sh.	1335
Gr. Comp.	199
Borrow	6319

92 93 94 95 96 97 98 99 100 101 102 103 104 105

S-396(5)

COUNTY	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
MARICOPA	ARIZ.	S-396(5)	4	10	S-396-4

BELL ROAD
Maricopa County



B.M. #10 A - 80' Lt. Sta. 96+00
Top ¾" Pipe El. 1205.46

B.M. #10 F - 16' Rt. Sta. 97+00
Brass Cap - Top of Curb
El. 1208.51

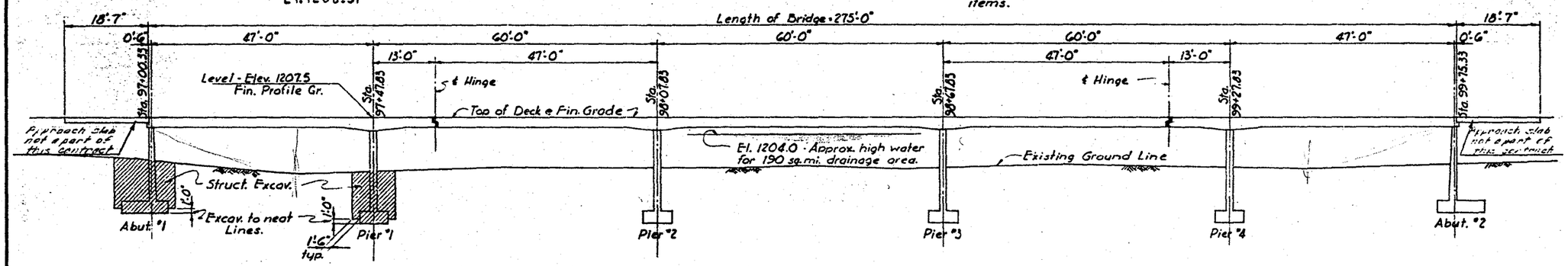
STA. 97+00
New 5 Span R.C. Slab Bridge
30'-0" Clear Roadway
Scale 1"=20'

Note: Contractor shall remove exist. obstructions as necessary to complete new construction. Cost of this work to be included in the unit bid prices of contract items.

B.M. #10 E - 16' Rt. Sta. 99+75.33
Brass Cap - Top of Curb
El. 1208.52
B.M. #11 - 85' Lt. Sta. 100+06
Top ¾" Pipe El. 1200.23

GENERAL NOTES

Construction - Standard Specs. Ariz. Highway Dept. Edition of 1960.
Design - A.A.S.H.O. Specs. 1961 revised to date
Loading Class H 20 S16-1944
Allowable Stresses:
Class "D" Conc.: f_s=20,000 psi; f_c=1200 psi; n=10
Class "A" Conc.: f_s=20,000 psi; f_c=1000 psi; n=12
Reinforcing steel shall be intermediate grade conforming to A.S.T.M. A-15 and A.S.T.M. A-305 (high bond).
Structural steel shall conform to A.S.T.M. A-373
All welding shall conform to American Welding Society Specs for Welded Highway and Railway Bridges.
Paint & painting shall conform to Std. Specs. Contact surfaces shall not be painted. Shop paint - one coat #1A or #1B.
Payment for the structural steel items shall be included in the unit bid prices for the contract items.
All dimensions for reinforcing steel shall be from the surface of the conc. to the ctr. of the bar unless otherwise noted on the Plans.
Slab forms shall be struck before curbs are poured.



SECTION ON ℄ ROADWAY
Scale 1"=10'

APPROXIMATE QUANTITIES

Item	Std. No.	Sht. No.	Struct. Excav. C.Y.	Spec. Comp. C.Y.	Concrete C.Y. Class "A"	Concrete C.Y. Class "D"	Reinf. Steel lbs.	Spec. Hdrl. Lin. Ft.
Deck						588.37	166,355	552.33
4 Piers			300		125.77		11,800	
2 Abutments		1012.5	580		198.89	324.64	20,240	
Totals - this Contract			1880		324.66	588.37	198,395	552.33
* 2 Appr. Slabs					41.29		3,600	

201,831

* FUTURE

NOTE: Special Hdrl. to be furnished by the Maricopa County Highway Dept. and installed by the County
Roadguard & appr. slabs to be included in future construction.

DECK SLAB CONCRETE - CLASS "D"
ALL OTHER CONCRETE - CLASS "A"

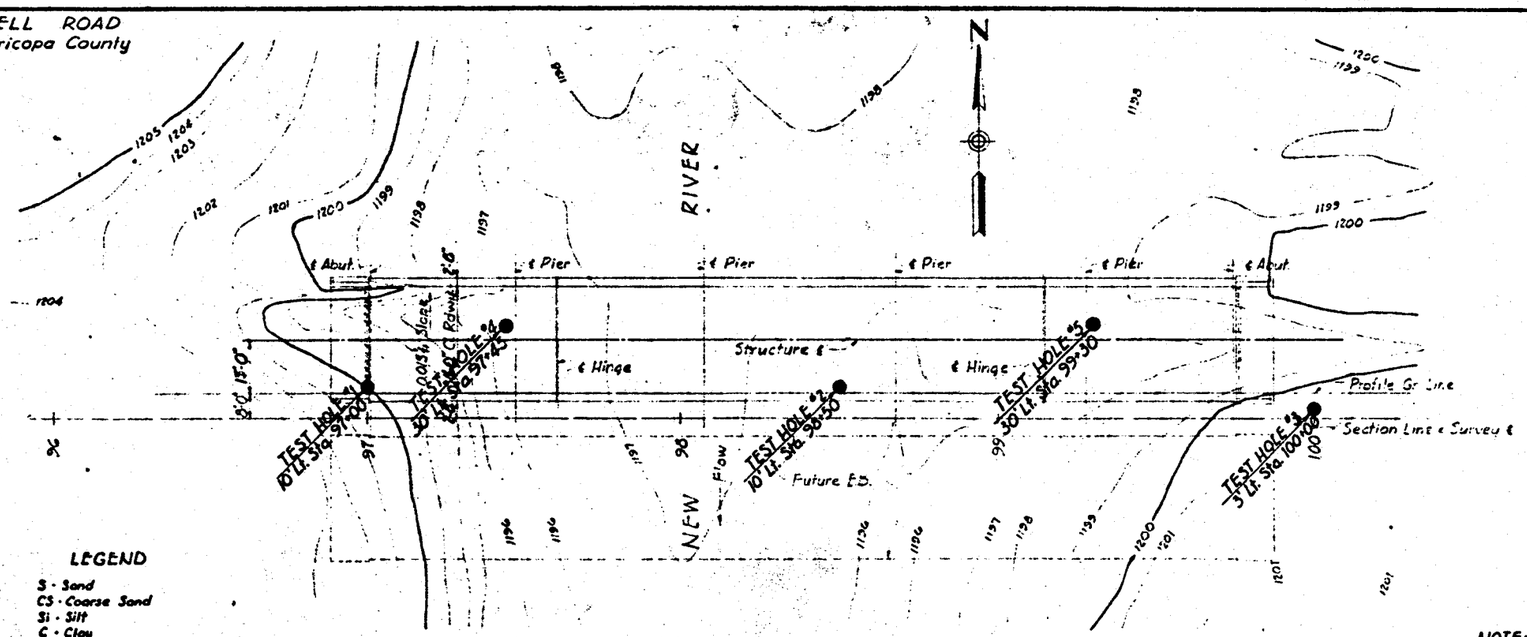
MARICOPA COUNTY HIGHWAY DEPARTMENT
SCALE NOTED | LOCATION PLAN | DRAWN BY NTS
DATE 10-10-68 | REVISED
STA 97+ BELL ROAD
BRIDGE OVER NEW RIVER
HOFFMAN-MILLER ENGINEERS
PHOENIX, ARIZONA
DRAWING NUMBER 1 of 7

Registered Professional Engineer (Civil) Certificate Expires Dec. 31, 1969 Arizona, U.S.A.

S 396 (5)

COUNTY	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
MARICOPA	ARIZ.	S-396(5)	5	10	8-5-64 JRP

BELL ROAD
Maricopa County



NOTES

Information contained on this sheet is made available to prospective bidders for informational purposes only and is not to be considered a part of the contract papers. The information is developed as accurately as possible by the methods utilized, however, the state accepts no responsibility for any conditions encountered which may be at variance from information contained herein. Classification of earth materials is based upon field inspection and is not to be construed to imply mechanical analysis.
NX Casing and 2" penetrometer is driven with 140 lb. hammer, 30" free fall, no cushion.

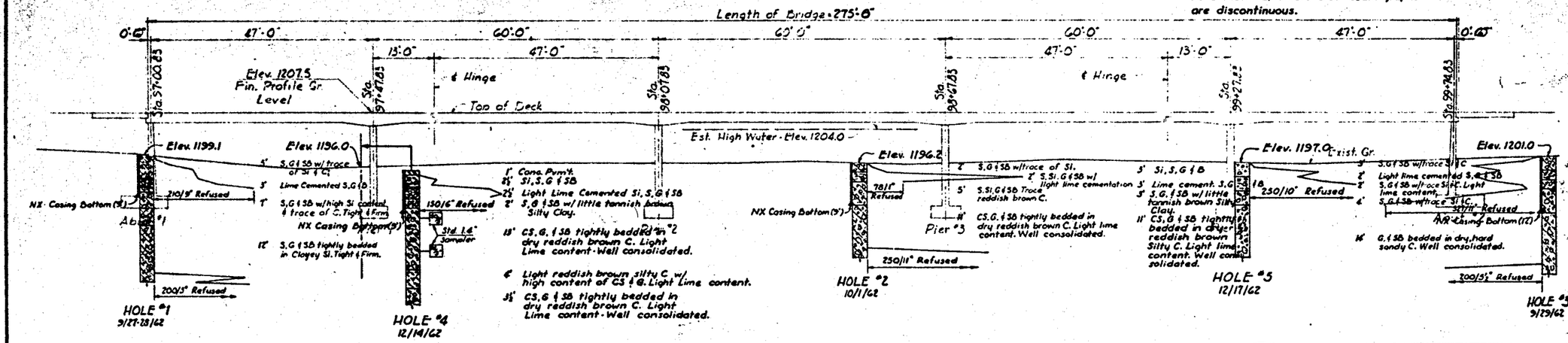
LEGEND

S - Sand
CS - Coarse Sand
Si - Silt
C - Clay
G - Gravel
SB - Small Boulders
B - Boulders

STA. 97+00
New 5 Span R.C. Slab Bridge
30'-0" Clear Roadway
Scale 1"=20'

NOTE:

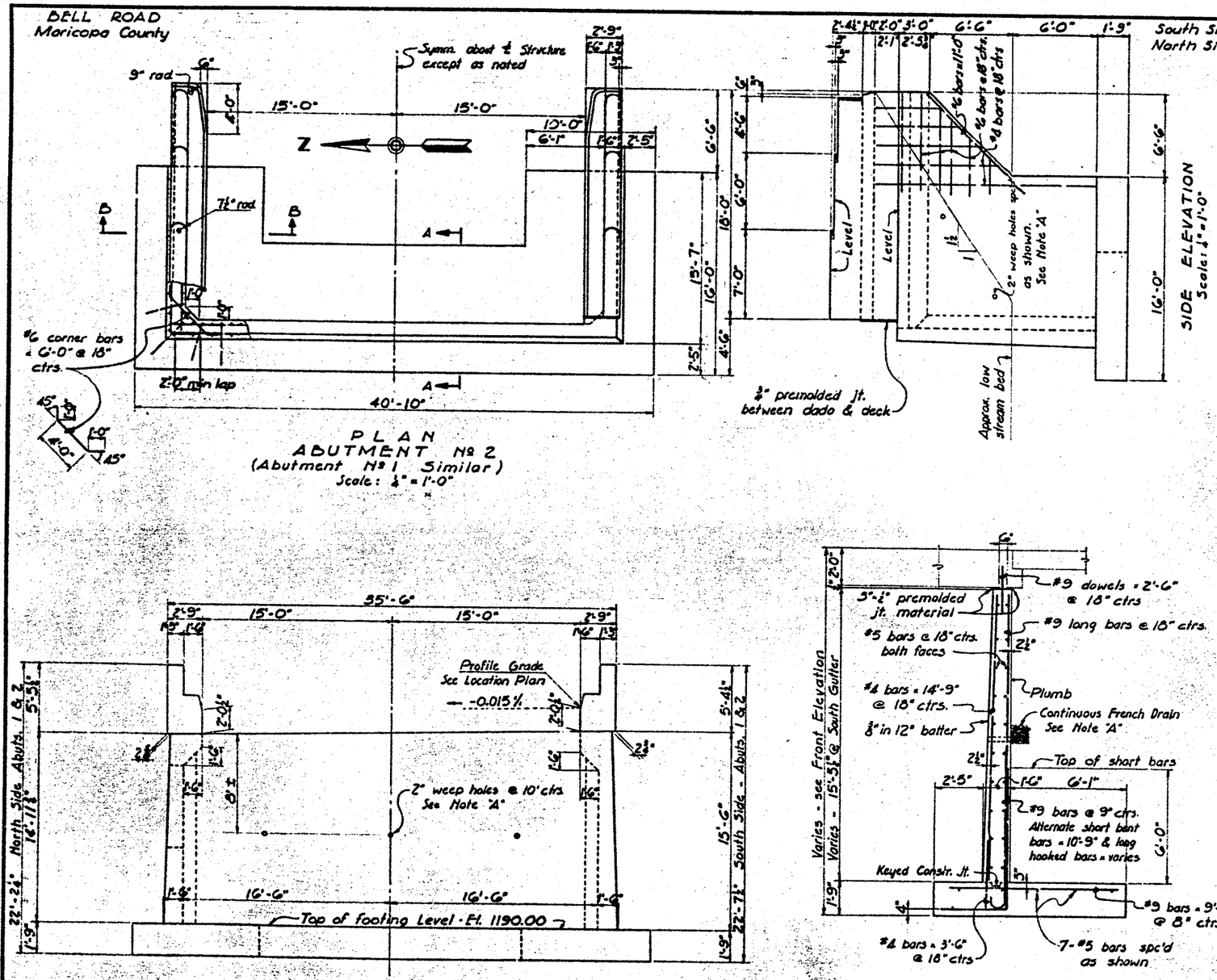
Blow count graphs for 2" Bullnose Penetrometer are drawn to a scale of 1"=100 blows horizontally.
Penetrometer holes were drilled through hard material where blow count graphs are discontinuous.



MARICOPA COUNTY HIGHWAY DEPARTMENT
FOUNDATION DATA
STA 97+ BELL ROAD BRIDGE OVER NEW RIVER
HOFFMAN-MILLER ENGINEERS PHOENIX, ARIZONA
2 of 7

S 396 (5)

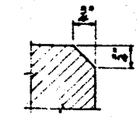
BELL ROAD
Maricopa County



PLAN
ABUTMENT Nº 2
(Abutment Nº 1 Similar)
Scale: ¼" = 1'-0"

South Side - Abuts. 1 & 2
North Side - Abuts. 1 & 2

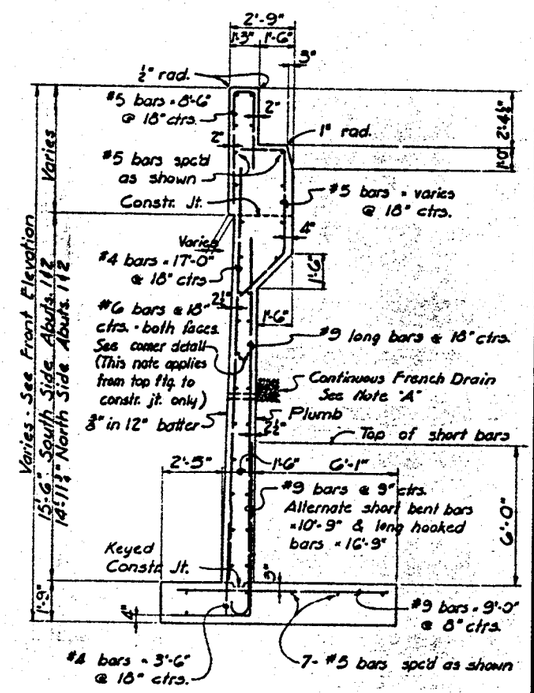
COUNTY	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
MARICOPA	ARIZ.	S 396(5)	6	10	JRP



Chamfer all exposed edges thus unless otherwise noted
Typical All Sheets

FRONT ELEVATION
Scale: ¼" = 1'-0"

SECTION A-A
Scale: ¼" = 1'-0"



SECTION B-B
Scale: ¼" = 1'-0"

NOTE "A": -
Filter material for continuous French drain shall be 1 cu. ft. of gravel per lin. ft. of wall. Wing French drain to intersect front wall drain.

ALL CONCRETE CLASS "A"

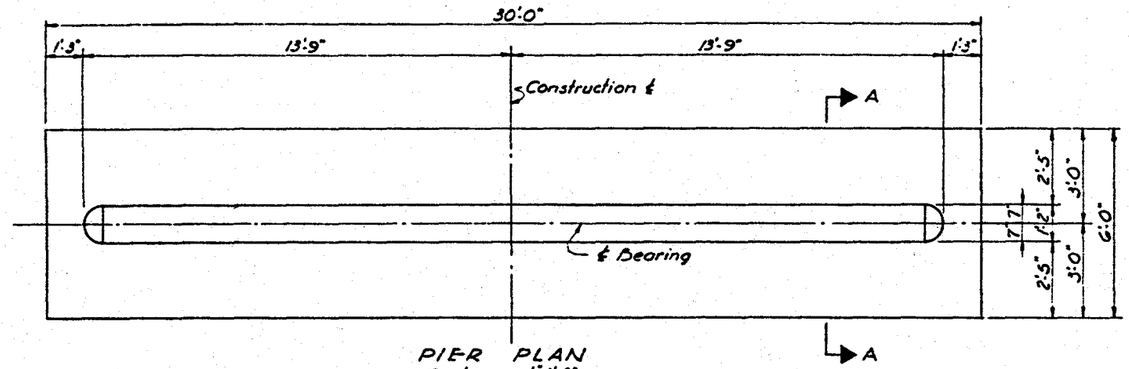
MARICOPA COUNTY HIGHWAY DEPARTMENT

DRAWN NOTBD DATE 2/20/63	ABUTMENT DETAILS	DRAWN BY WLM
STA. 97+ BELL ROAD BRIDGE OVER NEW RIVER		
HOFFMAN-MILLER ENGINEERS PHOENIX, ARIZONA		3 of 7

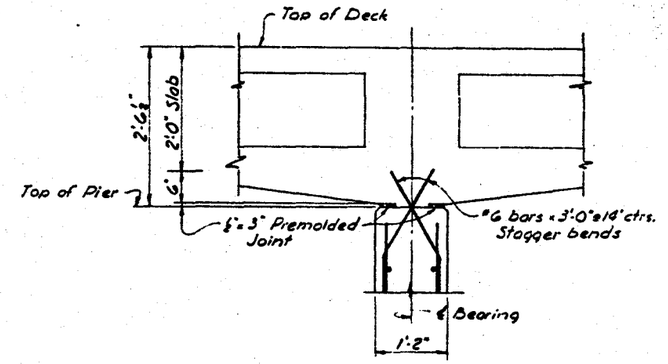
S 396 (5)

BELL ROAD
Maricopa County

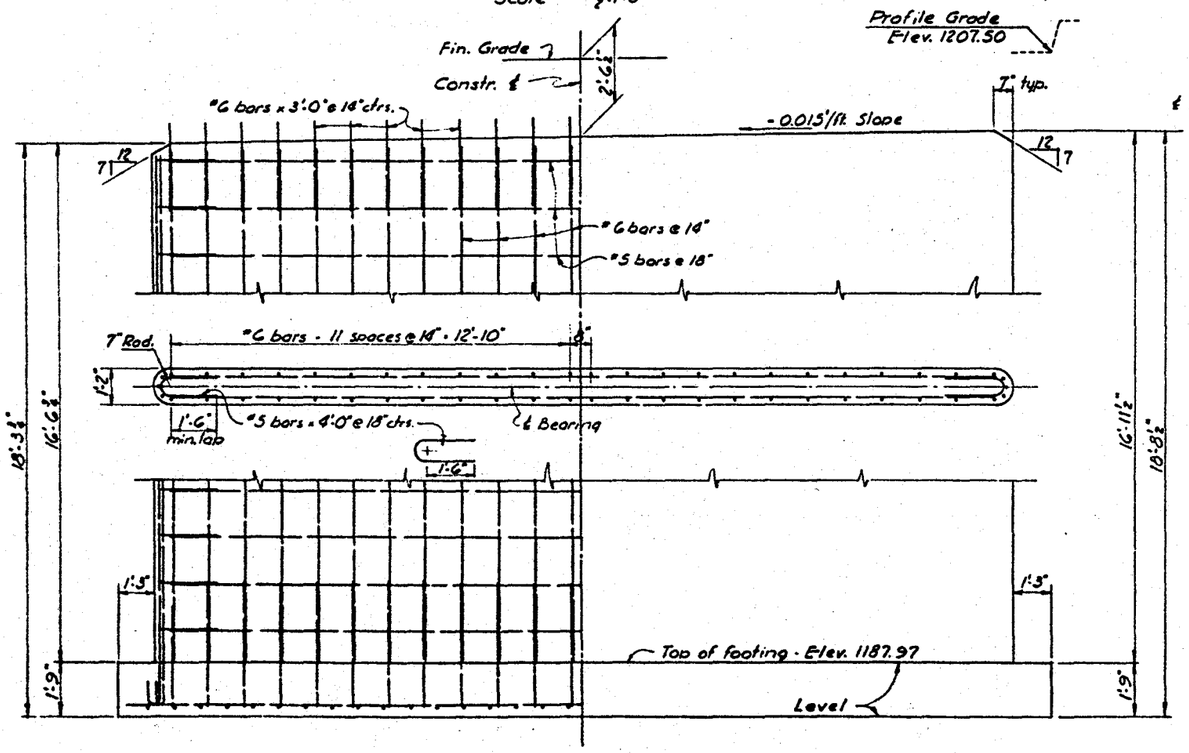
COUNTY	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
MARICOPA	ARIZ.	S-396(5)	7	10	3-25-64 JEF



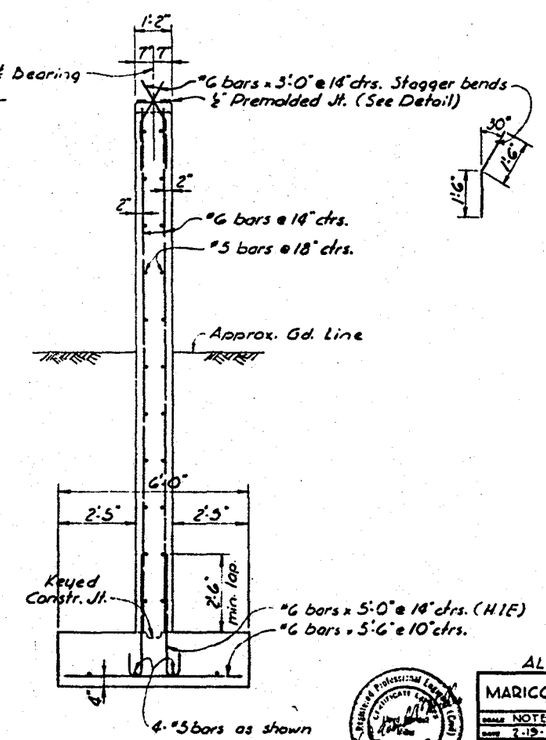
PIER PLAN
Scale 1/4"=1'-0"



BEARING DETAIL
Scale 1"=1'-0"



ELEVATION



SECTION A-A

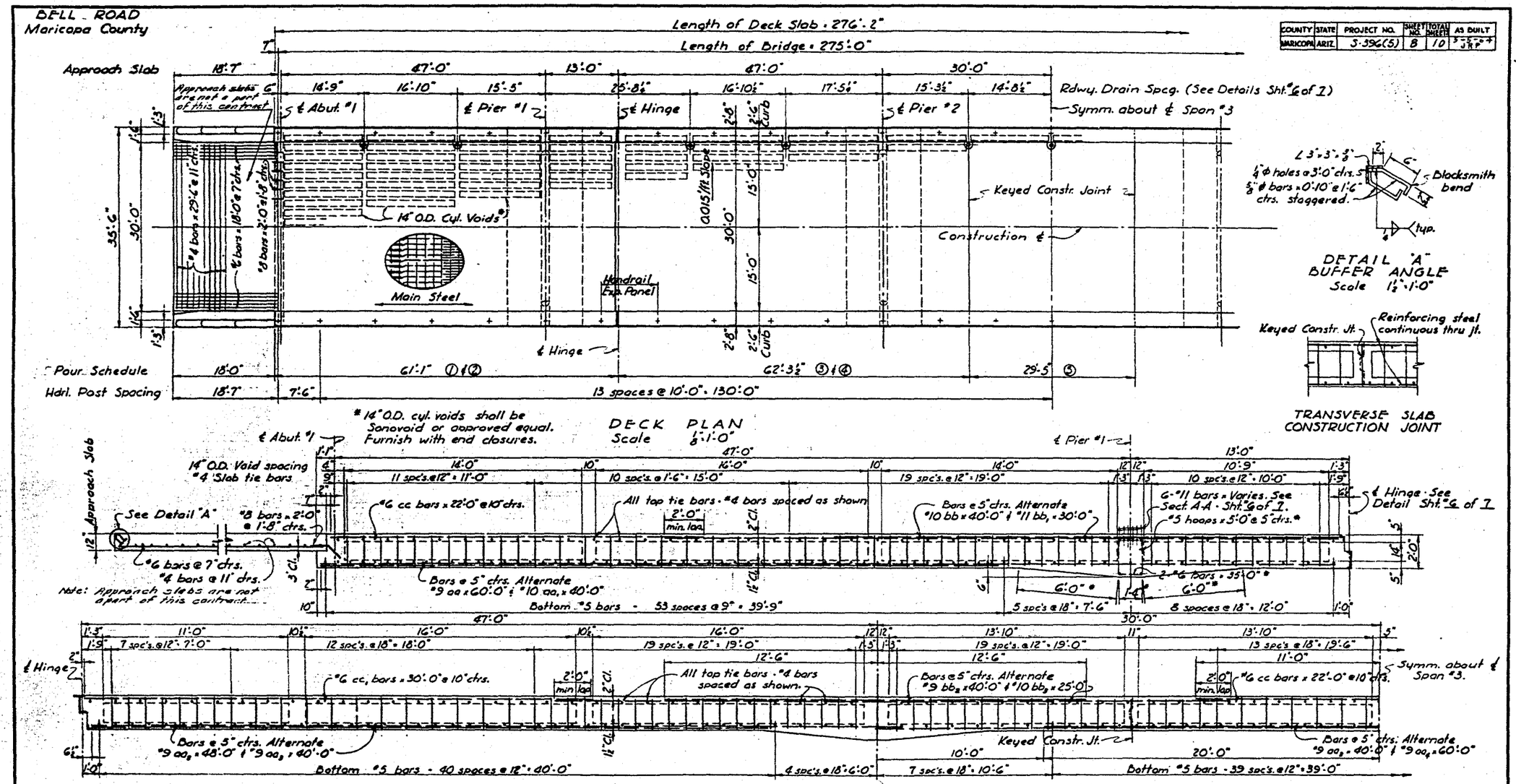
ALL CONCRETE CLASS "A"

MARICOPA COUNTY HIGHWAY DEPT.	
SCALE NOTED / DATE 2-19-63	PIER DETAILS / DRAWN BY NTS / REVISED
STA. 97+ BELL ROAD BRIDGE OVER NEW RIVER	
HOFFMAN-MILLER ENGINEERS PHOENIX, ARIZONA	DRAWING NUMBER 4 of 7

S 396 (5)

BELL ROAD
Maricopa County

COUNTY	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
MARICOPA	ARIZ.	S-396(5)	8	10	



DECK SLAB & CURB - CLASS "D" CONC.
APPROACH SLAB - CLASS "A" CONC.

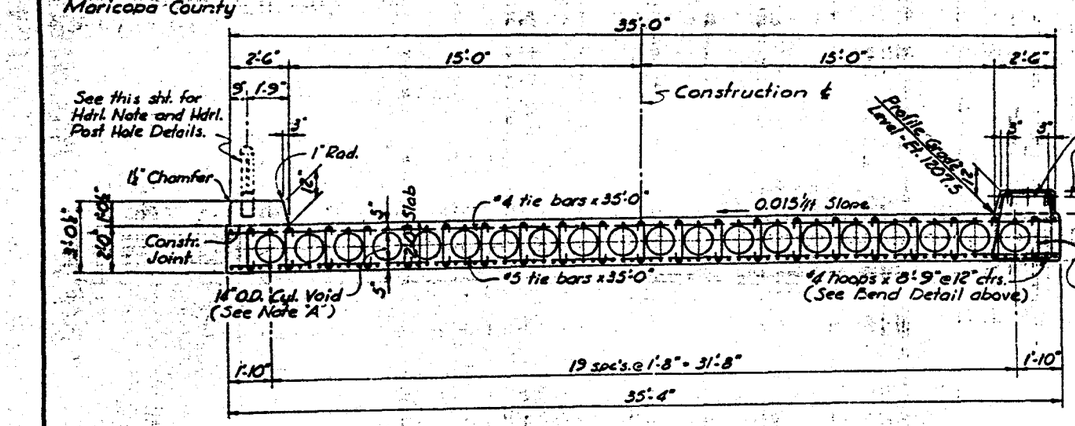
MARICOPA COUNTY HIGHWAY DEPT.

SCALE NOTED	DECK DETAILS	DRAWN BY NTS
DATE 3-19-63		APPROVED
STA. 97+ BELL ROAD BRIDGE OVER NEW RIVER		
HOFFMAN-MILLER ENGINEERS PHOENIX, ARIZONA		5 of 7

S 396 (5)

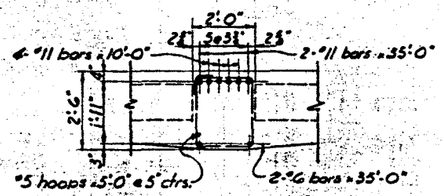
BELL ROAD
Maricopa County

COUNTY	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
MARICOPA	ARIZ.	S-396(5)	9	10	

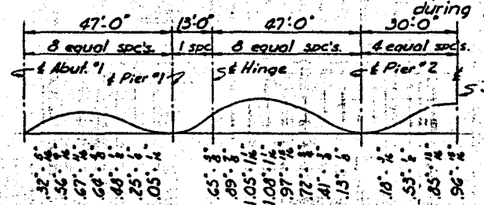


TYPICAL DECK SECTION AT MIDSPAN
Scale 3/8" = 1'-0"

NOTE "A": Adequate tie down of voids to formwork shall be provided to prevent displacement of voids during placing of conc.

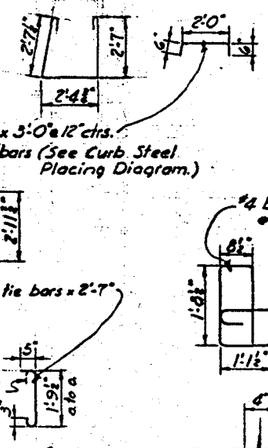


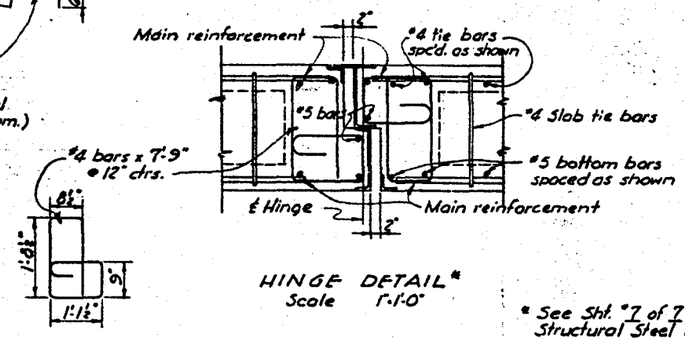
SECTION A-A
Scale 1/2" = 1'-0"



SLAB CAMBER DIAGRAM
No Scale

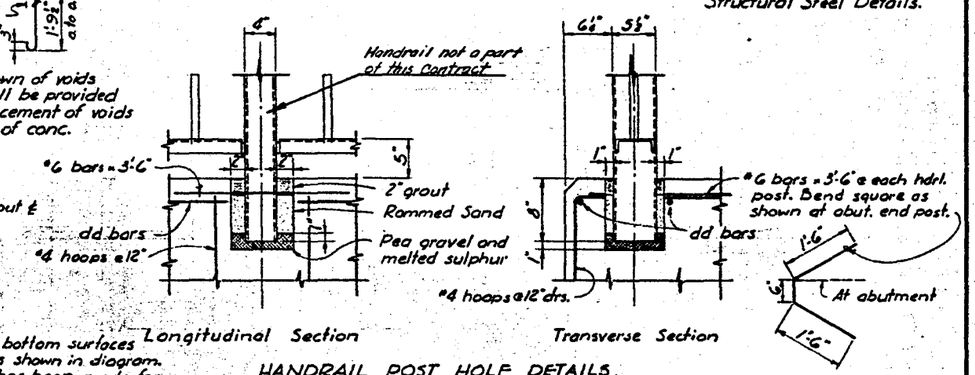
Camber top & bottom surfaces of conc. slab as shown in diagram. No allowance has been made for form deflection or falsework deflection.





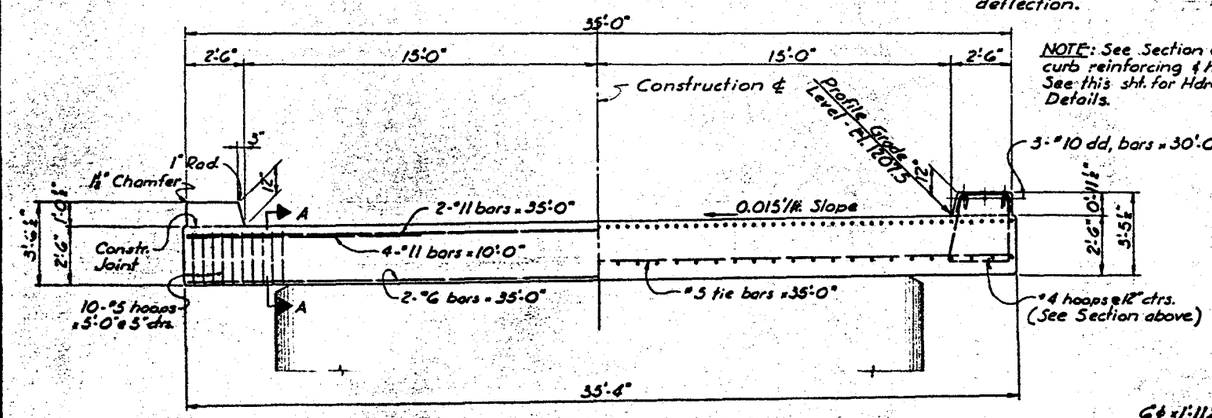
HINGE DETAIL*
Scale 1" = 1'-0"

* See Sht. #7 of 7 for Structural Steel Details.



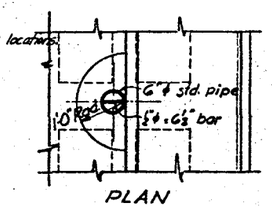
Longitudinal Section
Transverse Section

HANDRAIL POST HOLE DETAILS
Scale 1 1/2" = 1'-0"



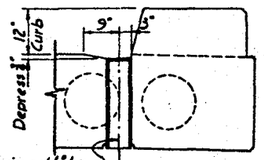
TYPICAL DECK SECTION AT PIERS
Scale 3/8" = 1'-0"

NOTE: See Section above for curb reinforcing & handrail post locations. See this sht. for Hdrl. Post Hole Details.



PLAN

HANDRAIL NOTE:
Handrail will be furnished and installed by Maricopa County Highway Dept



ROADWAY DRAIN DETAILS
Scale 3/4" = 1'-0"

6" ϕ x 1'-11 1/2" std. pipe drain w/ 5/8" ϕ x 6 1/2" bar. Notch 6" ϕ pipe and weld 5/8" ϕ bar w/ 3/8" fillet weld each end. Galvanize after fabrication.

SECTION ON ℄ PIPE

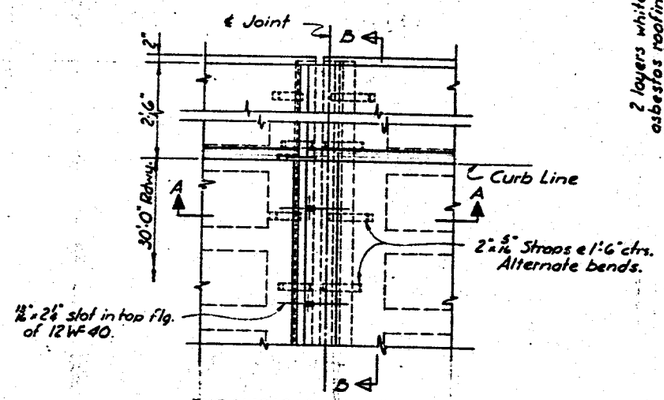
DECK SLAB & CURB - CLASS "D" CONC.
APPROACH SLAB - CLASS "A" CONC.

MARICOPA COUNTY HIGHWAY DEPT.		
SCALE NOTED	DECK DETAILS	DRAWN BY NTS
DATE 2-65		REVISED
STA. 97+ BELL ROAD BRIDGE OVER NEW RIVER		
HOFFMAN-MILLER ENGINEERS PHOENIX, ARIZONA		6 of 7

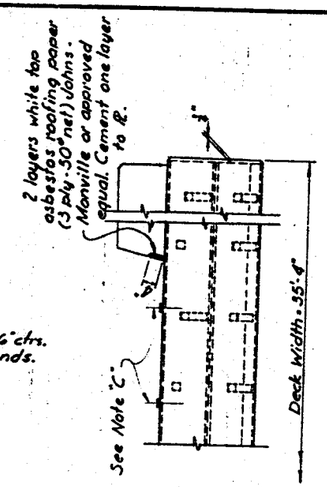
S 396 (5)

BELL ROAD
Maricopa County

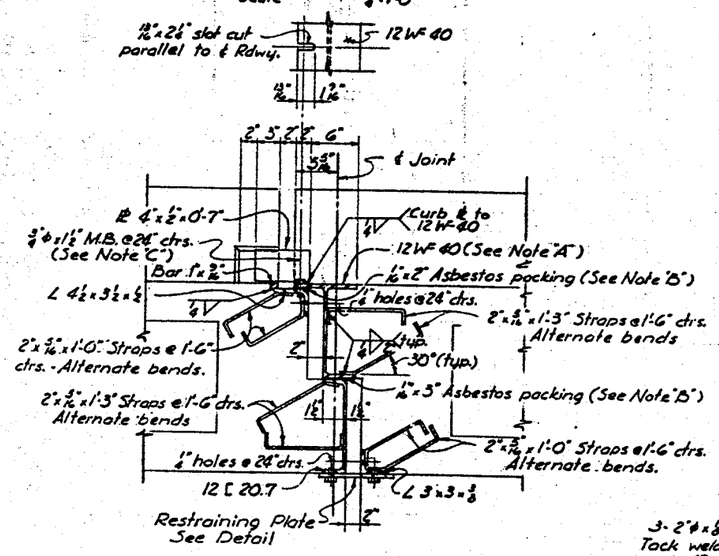
COUNTY	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
MARICOPA	ARIZ.	S-396(5)	10	10	8-5-64 JRP



EXPANSION JOINT - PLAN
Scale 3/8"=1'-0"



SECTION B-B

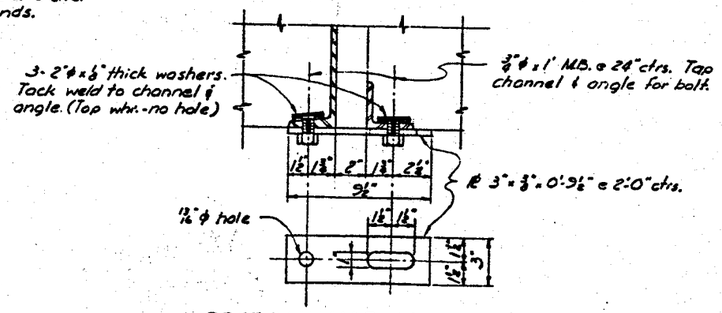


SECTION A-A
Scale 1 1/2"=1'-0"

NOTE "A":
Burn off one flange of 12WF40 flush with web face.

NOTE "B":
A continuous strip of asbestos sheet packing, style #60 Johns-Manville or approved equal - 1/16" thick, shall be cemented on down face of bearing flanges. Bearing faces of flanges shall be ground smooth after drilling and tapping.

NOTE "C":
Temporary bolts 3/4"φ x 1 1/2" long @ 2'-0" ctrs. Tap long leg of L 4 1/2"x 3 1/2"x 1/2 for bolt. Bolts shall be removed within 4 hours after concrete has been poured.

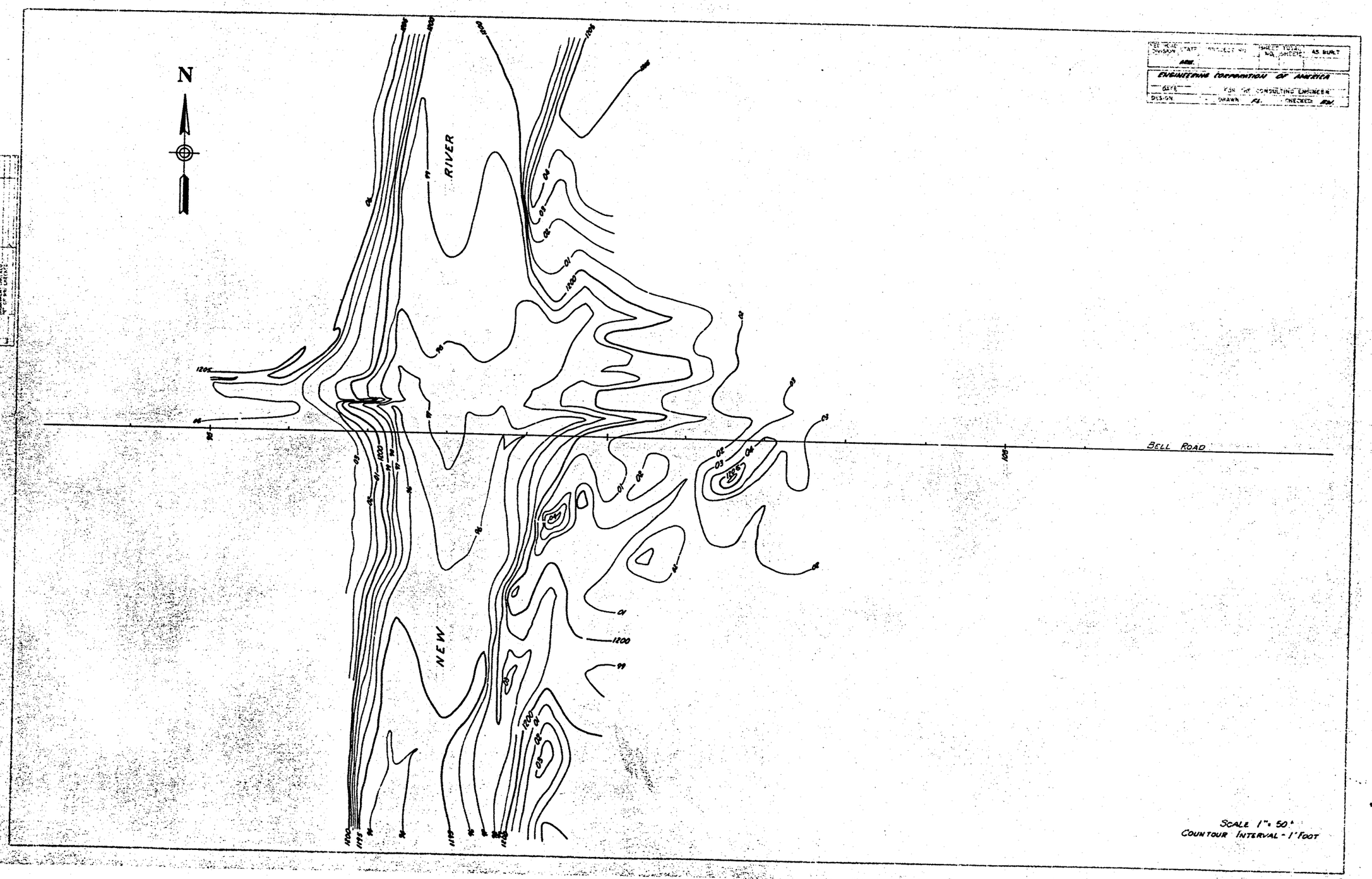


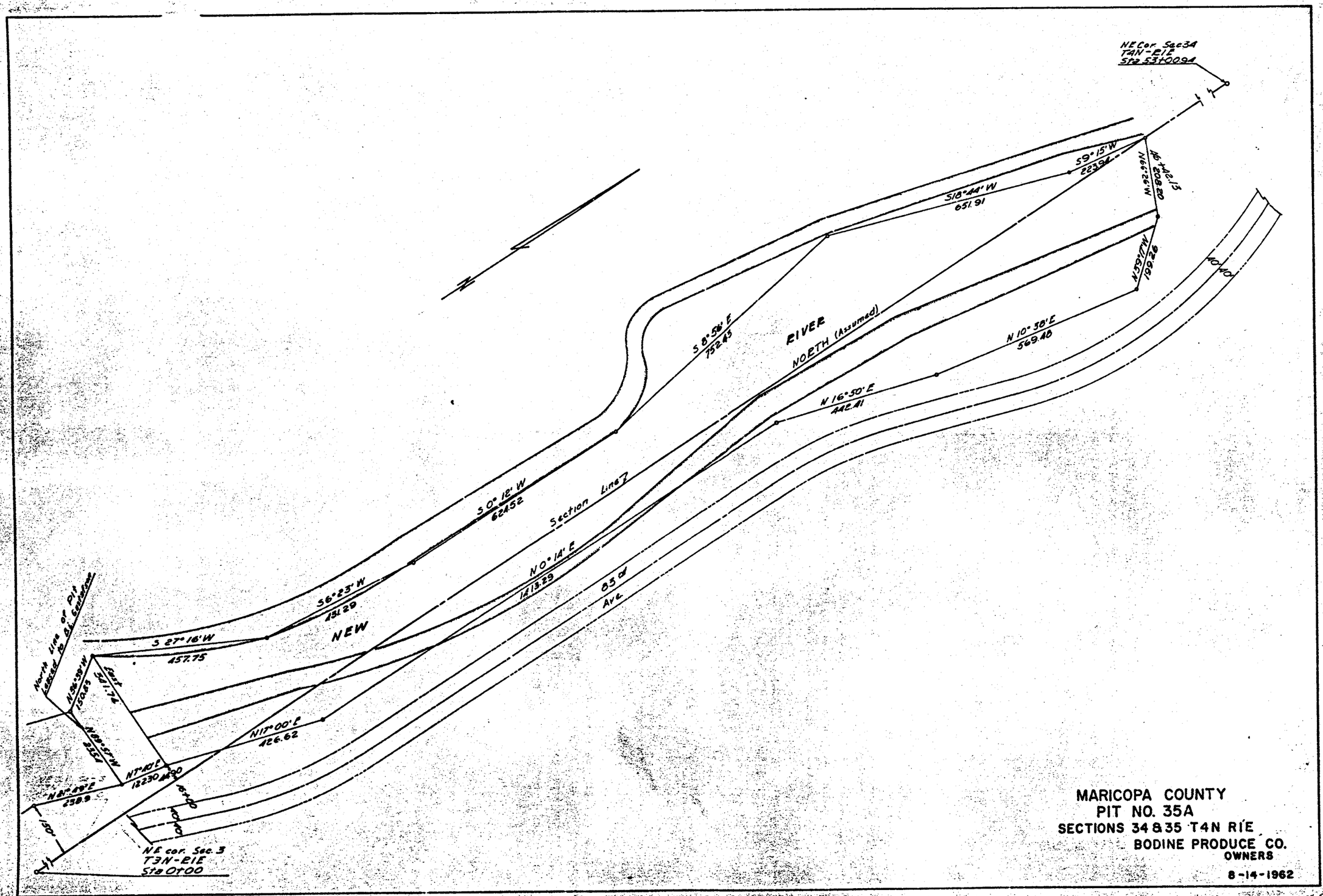
RESTRAINING PLATE DETAIL
Scale 3"=1'-0"

MARICOPA COUNTY HIGHWAY DEPT.

SCALE NOTED DATE 2-65	STRUCTURAL STEEL DETAILS	DRAWN BY NTS
STA. 97 + BELL ROAD BRIDGE OVER NEW RIVER		
HOFFMAN-MILLER ENGINEERS PHOENIX, ARIZONA		SHEET 7 of 7

S 396 (5)


N
RIVER
NEW
BELL ROAD
1200
1205
1195
SCALE 1" = 50'
COUNTOUR INTERVAL - 1' FOOT
ENGINEERING CORPORATION OF AMERICA
AS BUILT

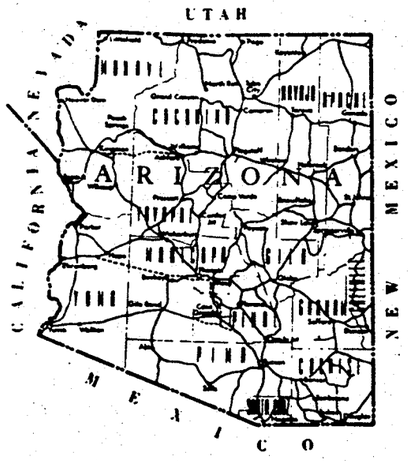


MARICOPA COUNTY
PIT NO. 35A
SECTIONS 34 & 35 T4N R1E
BODINE PRODUCE CO.
OWNERS
8-14-1962

Bell Road Bridge @ New River

Widening

03

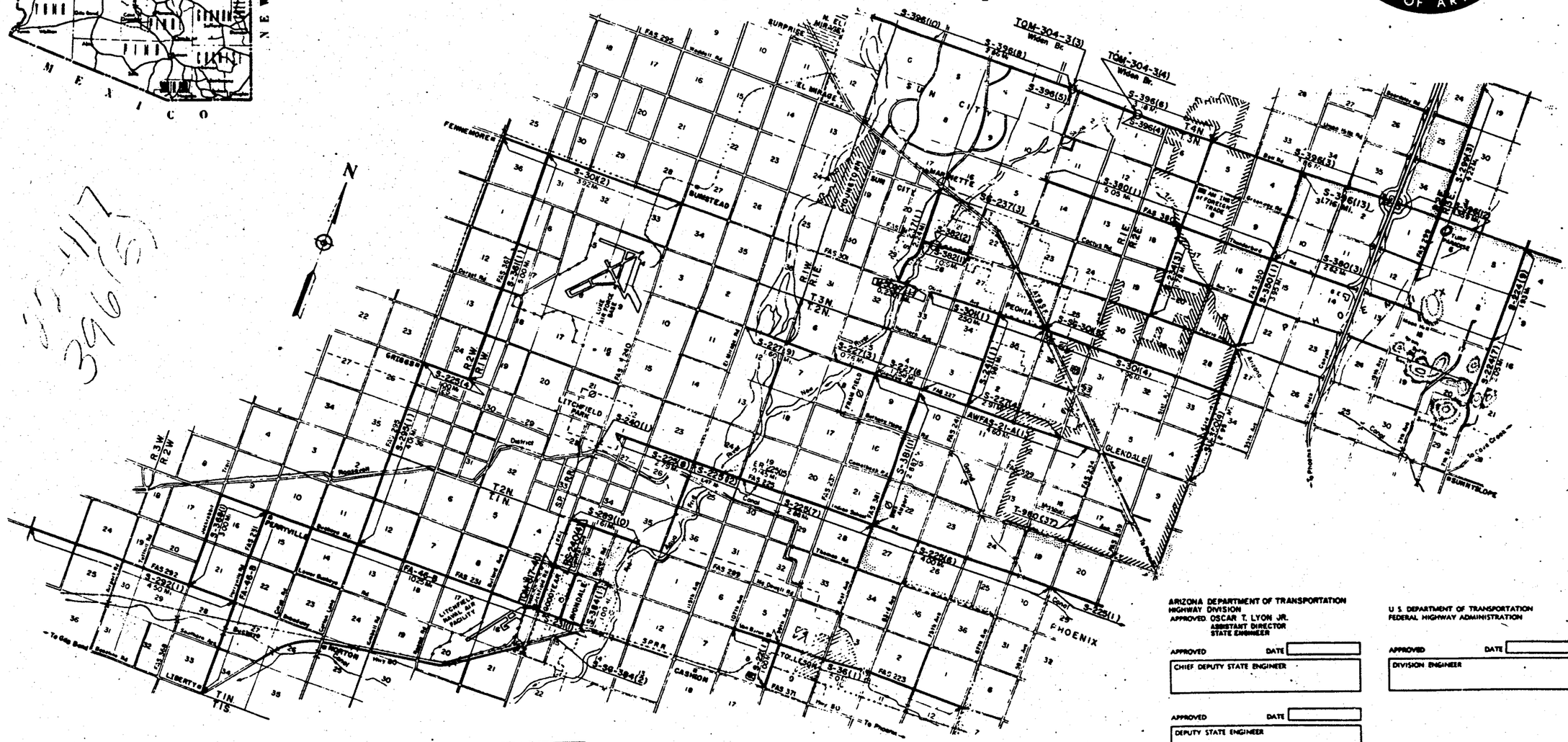


STATE OF ARIZONA
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PLAN AND PROFILE OF PROPOSED

COUNTY HIGHWAY

MARICOPA COUNTY TQM-304-3(3)



REDUCED SIZE
DO NOT SCALE

ARIZONA DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION
APPROVED OSCAR T. LYON JR.
ASSISTANT DIRECTOR
STATE ENGINEER

APPROVED DATE
CHIEF DEPUTY STATE ENGINEER

APPROVED DATE
DEPUTY STATE ENGINEER

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED DATE
DIVISION ENGINEER

117
396

3

BELL ROAD - NEW RIVER BRIDGE WIDENING

MARICOPA COUNTY

FHWA REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	72M-304-3(3)	2	13	

DESIGN DATA

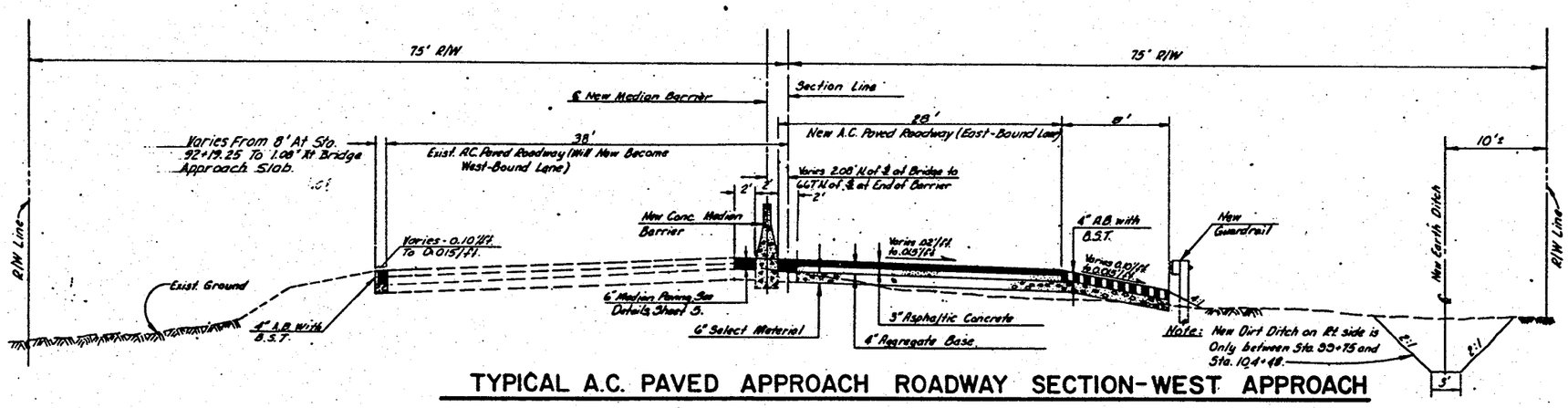
1976 A.D.T. 11,100
1986 A.D.T. 14,550
1996 A.D.T. 18,000
Design Speed = 60 m.p.h.

LENGTH OF PROJECT

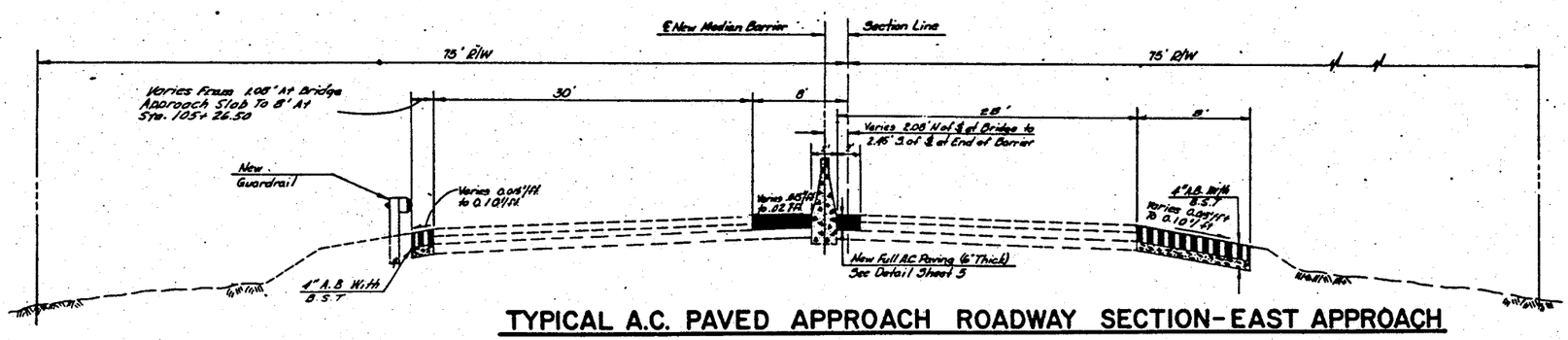
Total - Sta. 96+50 to Sta. 100+00 = 370' = 0.0701 Miles

INDEX OF DRAWINGS

SHEET NO.	SHEET TITLE
2	Typical Section & Summary Sheet
2A & 2B	List of Standard Sheets
3	Structural Summary Sheet
4	Plan & Profile
5-13	Bridge Plans & Details



TYPICAL A.C. PAVED APPROACH ROADWAY SECTION-WEST APPROACH



TYPICAL A.C. PAVED APPROACH ROADWAY SECTION-EAST APPROACH

GENERAL NOTES

1. All work shall conform to 1976 Uniform Standard Specifications and Construction Standards with current revisions to same as shown on Sheets 2A & 2B.
2. All Right of Way encroachments will be removed or relocated by MCHD. Unless otherwise noted.
3. Utilities interfering with construction will be reset or relocated by the Interested Owner.
4. Disposal of all waste material, broken concrete, asphaltic concrete Pavement, etc., shall be the responsibility of the Contractor
5. All Stationing is Section Line stationing unless otherwise noted.
6. All Call-Out distances, Lt. and Rt. are from Section Line, unless otherwise noted.
7. All Right of Way Provisions shall be complied with before job Acceptance.

SUMMARY OF QUANTITIES

NEW CONC. MEDIAN BARRIER

550 L.F. Median Barrier
37 L.F. Median Barrier (Single Face)

GUARDRAIL Std 610 Series

250 L.F. Guard Rail
2 Ea. Rub Rail
2 Ea. Guard Rail Break Away Cable Terminals

REDUCED SIZE DO NOT SCALE

BELL ROAD-NEW RIVER BRIDGE WIDENING

MARICOPA COUNTY

A.D.O.T. STANDARD DRAWINGS - CONSTRUCTION DETAILS

FHWA REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ	T(QM-304-3(3)	2A	13	

PREVIOUS REVISION DATE	CURRENT REVISION DATE	STANDARD NO.	SUBJECT
6/74	11/74	C-1.01	Plans Symbols, Exist. Topog.
		C-1.02	Plans Symbols, New Construction
8/76	12/76	C-2.01	Slopes, Interstate & Class A-A Roadways
8/76	12/76	C-2.02	Slopes, Class A & B Roadways
8/76	12/76	C-2.03	Slopes, Class C & D Roadways
	12/68	C-2.04	Pavement Crown, Parabolic
5/72	6/74	C-3.01	Ditches and Dykes
		C-3.02	Channels & Dykes, Typ. Parallel Installations
5/72	6/74	C-4.01	Spillway, Embankment
5/72	6/74	C-4.02	Downdrain, Embankment
3/71	5/72	C-4.03	Spillway, Embankment, Length Table
3/71	6/74	C-4.04	Downdrain, Embankment, Length Table
	6/74	C-5.01	Curb, Gutter, Sidewalk, & Driveway Details
		C-5.02	Geometrics, Street Intersection
6/74	11/74	C-6.01	Turnout and Driveway Layout
5/72	6/74	C-6.02	Geometrics, Detour
6/74	11/74	C-7.01	Pavement, Concrete, Transverse Joints
6/74	11/74	C-7.02	Pavement, Concrete, Longitudinal Joints
5/72	6/74	C-7.03	Pavement, Cut & Replacement
6/74	7/75	C-8.01	Geometrics, Exit Ramp
6/74	7/75	C-8.02	Geometrics, Entrance Ramp
6/74	11/74	C-10.01	Guard Rail Single Face Details
		C-10.01.1	Guard Rail, Emb. Curb & Pvmt. Widening Details-Section
		C-10.01.2	Guard Rail, Emb. Curb & Pvmt. Widening Details-Plan
2/73	6/74	C-10.02	Guard Rail, Misc. Details
4/73	6/74	C-10.03	Guard Rail, Approach End Treatment
4/73	6/74	C-10.04	Guard Rail-Steel Bridge Approach Details
4/73	6/74	C-10.05	Guard Rail Flare To Median
5/72	6/74	C-10.06	Guard Rail Typical Installations

PREVIOUS REVISION DATE	CURRENT REVISION DATE	STANDARD NO.	SUBJECT
5/72	6/74	C-10.08	Barrier, Median, Cast In Place Concrete
	6/74	C-10.09	Barrier, Median, C.I.P. Conc., Transition Details
2/73	6/74	C-10.10	Glare Screen, Double Face Guard Rail
		C-10.10.1	Glare Screen, Type "P", Conc. Median Barrier
		C-10.10.2	Glare Screen, Type "O", Conc. Median Barrier
	3/71	C-10.11	Barrier, Fence, Chain Link & Cable
	12/76	C-10.12	Breakaway Cable Terminal, Installation Details
	12/76	C-10.13	Breakaway Cable Terminal, Hardware Details
6/74	11/74	C-11.01	Cattle Guard, Roadway
6/74	11/74	C-11.03	Cattle Guard, Railroad
	12/68	C-11.04	Cattle Guard, Drainage
6/74	11/74	C-12.01	Fence & Gates, Line, Steel Posts
5/72	6/74	C-12.02	Fence, Line, Supplementary Details
5/72	7/75	C-12.03	Fence & Gate, Chain Link
3/71	5/72	C-12.04	Fence & Gate, Indust. Type, Fab. Wire
5/72	6/74	C-12.05	Fence, Barrier, Wood Posts
3/71	6/74	C-13.01	Pipe Culvert Installation
2/73	6/74	C-13.02	Pipe Culvert Placement
		C-13.03	Pipe, Reinf. Conc., Fill Heights
		C-13.03.1	Pipe, Non-Reinforced, Fill Heights
		C-13.04	Pipe, Reinf. Conc. End Section
4/70	6/74	C-13.05	Pipe, Corr. Metal, End Section
2/73	4/73	C-13.06	Pipe, Corr. Metal, Fill Heights
	12/68	C-13.07	Pipe, Corr. Metal, Fill Height Design Data
	1/71	C-13.08	Pipe, Corr. Metal Arch, Fill Heights
	12/68	C-13.09	Pipe, Corr. Metal Arch, Fill Height Design Data
6/74	11/74	C-13.10	Pipe & Pipe Arch, Corr. Metal, Conc. Inv. Paving
5/72	6/74	C-13.11	Struc. Exc. Payment Limits Pipes, Culverts & Headwalls
		C-13.12	Struc. Exc. Payment Limits Spec. Backfill Placement
5/72	2/73	C-13.13	Special Backfill Placement Pipes, Culverts & Headwalls

Revised by M. Tardy, Checked by T. Schoch, Date 6-8-78 Revised by M. Tardy 12-78

BELL ROAD-NEW RIVER BRIDGE WIDENING
MARICOPA COUNTY

A.D.O.T. STANDARD DRAWINGS - CONSTRUCTION DETAILS

FHWA REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ	TQM-304-3(3)	28	13	

PREVIOUS REVISION DATE	CURRENT REVISION DATE	STANDARD NO.	SUBJECT
5/72	6/74	C-13.14	Special Backfill Measurement Limit
		C-13.15	Pipe, Cast In Place, Non-Reinforced
		C-13.16	Pipe, Cast In Place, Non-Reinf., Dimensions
		C-13.17	Pipe, Cast In Place, Non-Reinf., Fill Heights
		C-13.18	Pipe, Cattle-Vehicle Pass, Mitered End Treatment
6/74	11/74	C-14.01	Headwall, Pipe, Straight & "L" Types
6/74	9/74	C-14.02	Headwall, Normal To Pipe 42"-84" Pipe
		C-14.02.1	Headwalls, 42"-84" Pipe Skewed
3/71	6/74	C-14.03	Headwall, Drop Inlet
3/71	6/74	C-15.01	Catch Basin, Type 1
3/71	6/74	C-15.03	Catch Basin, Type 3
3/71	6/74	C-15.04	Catch Basin, Type 4
3/71	6/74	C-15.05	Catch Basin, Type 5
12/68	6/74	C-15.06	Catch Basin, Grates, Longitudinal Bars
12/68	6/74	C-15.07	Catch Basin, Grates, Transverse Bars
5/72	6/74	C-15.08	Catch Basin Misc. Details
11/68	10/70	C-15.09	Catch Basin, Median, Flush
5/72	6/74	C-15.10	Catch Basin, Median Dyke
		C-15.10.1	Catch Basin, Median Dyke, Precast
		C-16.01	Irrigation Headwalls "18" To "60" Diameter Pipes
	6/74	C-16.02	Irrigation Standpipes
		C-16.03	Irrigation Valve & Gate
3/71	6/74	C-17.01	Bank Protection Types 1, 2 & 3
2/73	6/74	C-17.02	Bank Protection Types 4, 5 & 6
	6/74	C-18.01	Manhole Details
	7/75	C-18.02	Manhole Frame & Cover
3/71	6/74	C-19.01	Ford- Concrete Walls
12/68	6/74	C-19.02	Fords, Types 1 & 2
	5/72	C-20.01	Railroad Crossing Signs

PREVIOUS REVISION DATE	CURRENT REVISION DATE	STANDARD NO.	SUBJECT
5/72	11/74	C-21.01	Survey Monument, Frame and Cover, Right of Way Marker
9/72	11/74	C-21.02	Standard Marker
		C-22.01	Utility Line, Protective Concrete Slab
		4-M-3.01	Object Marker Details
		4-M-4.01	Delineation Details
		4-M-4.02	Delineator Details
		4-M-6.01	Marker Installation Details
		4-M-7.01	Mainline Roadway Delineator Spacing
		4-M-7.02	Interchange Delineator Spacing
		4-M-7.03	Off-Mainline Reference Marker Placement Details
		4-M-7.04	Transition Delineation
		4-M-8.01	Delineator Post and Mounting Details
		4-M-9.01	Delineator Spacing Table and Snow Marker Place.
		4-M-10.01	Marker and Installation Details for Barrier and Bridge Delineators
3/75	6/76	4-C-1.01	Sand Barrel Crash Cushion
3/75	6/76	4-C-1.02	Sand Barrel Crash Cushion Typical Installations
3/75	6/76	4-C-1.03	Sand Barrel Crash Cushion Module Components
3/75	6/76	4-C-1.04	Sand Barrel Crash Cushion Concrete Barrier

Revised by M. Tardy, Checked by T. Schoch, Date 9-15-78

BELL ROAD... NEW RIVER BRIDGE WIDENING
MARICOPA COUNTY

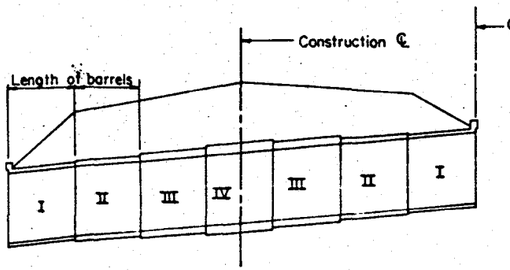
FEDERAL AID PROJECT NO.	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	---	70M-304-3(3)	3	13	

REINFORCED CONCRETE BOX CULVERTS

SPAN	STATION	DESCRIPTION	DRAWINGS REQUIRED: Special Sheet Nos.	DRAWINGS REQUIRED: STANDARDS	LENGTH OF BARRELS: Left of ℄ ** I	II	III	IV	V	Right of ℄ ** V	IV	III	II	I	APPROXIMATE QUANTITIES: Struct. Excav. Cu. Yds.	Class A Concrete Cu. Yds.	Reinforcing Steel Lbs.	Special Backfill Cu. Yds.	Remove Str. Conc. Cu. Yds.	Place Dowels Each	Drainage Excav. Cu. Yds.		STANDARDS LIST
20' CLEAR SPAN* OR LESS																							
OVER 20' CLEAR SPAN*																							

BRIDGES AND MISCELLANEOUS STRUCTURES ***

STATION BEGINNING & ENDING ON ℄	ROUTE	COUNTY	STRUCTURE NO.	DESCRIPTION	SPECIAL SHEET NUMBERS	STANDARDS
97+00.33 ; 99+75.33		MARICOPA		5-span reinforced concrete slab bridge widening		B-13.01
						C-10.04
						C-10.08



℄ Median if culverts are connected through median

* Clear span denotes distance along ℄ of roadway between inside face of exterior walls

** Construction ℄ (Looking Ahead).

*** See Structure Plans for quantities.

		DATE
LAYOUT		
DESIGN		
DESIGN CK'D		
DRAWN		
DWG CK'D		
APPROVED		

ARIZONA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STRUCTURES SECTION

STRUCTURE SUMMARY SHEET

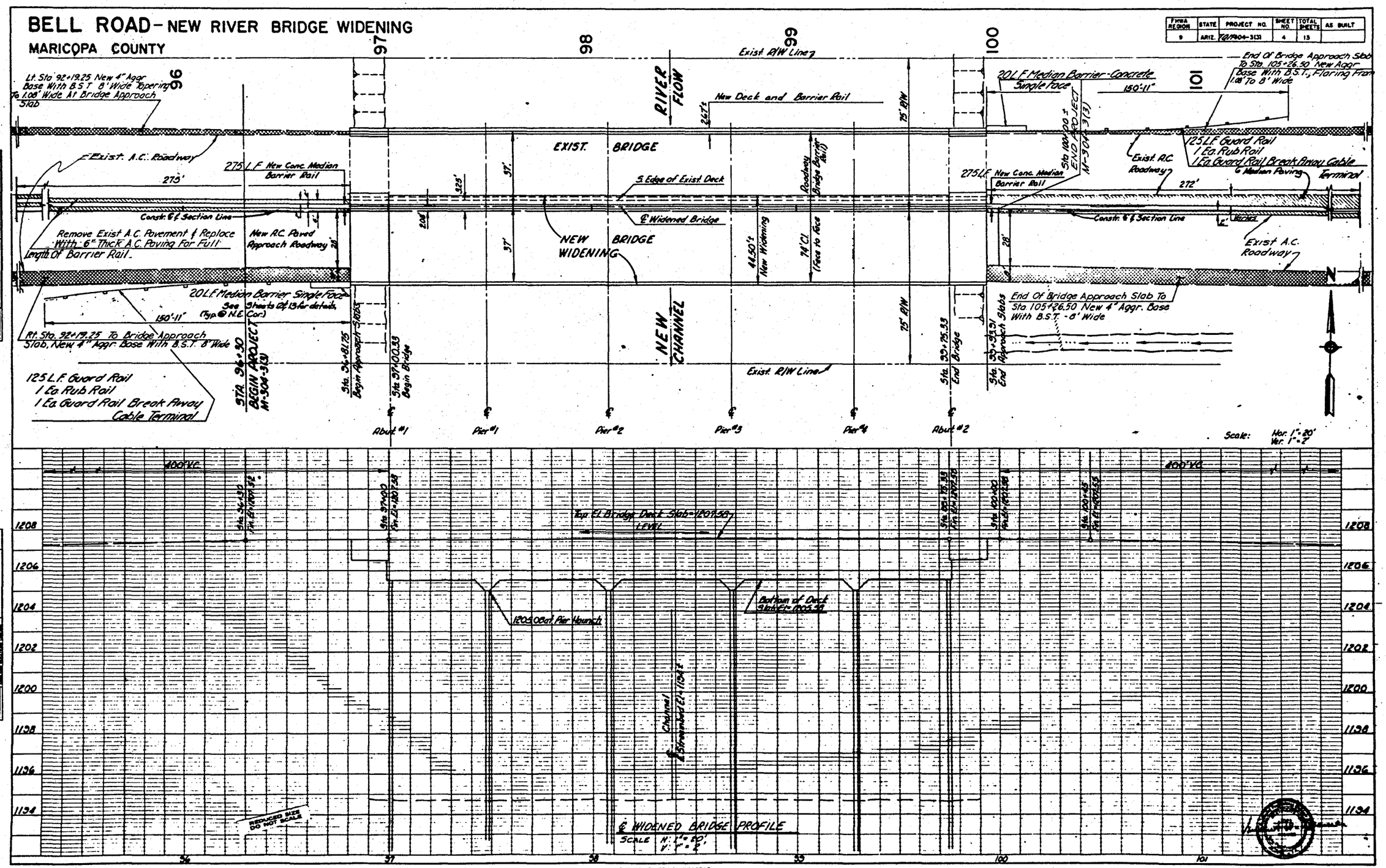
SHEET NO. 3 OF 13 | ROUTE | COUNTY | M-304-3(3) PROJECT NUMBER | BRIDGE ENGINEER

MASTER

BELL ROAD - NEW RIVER BRIDGE WIDENING

MARICOPA COUNTY

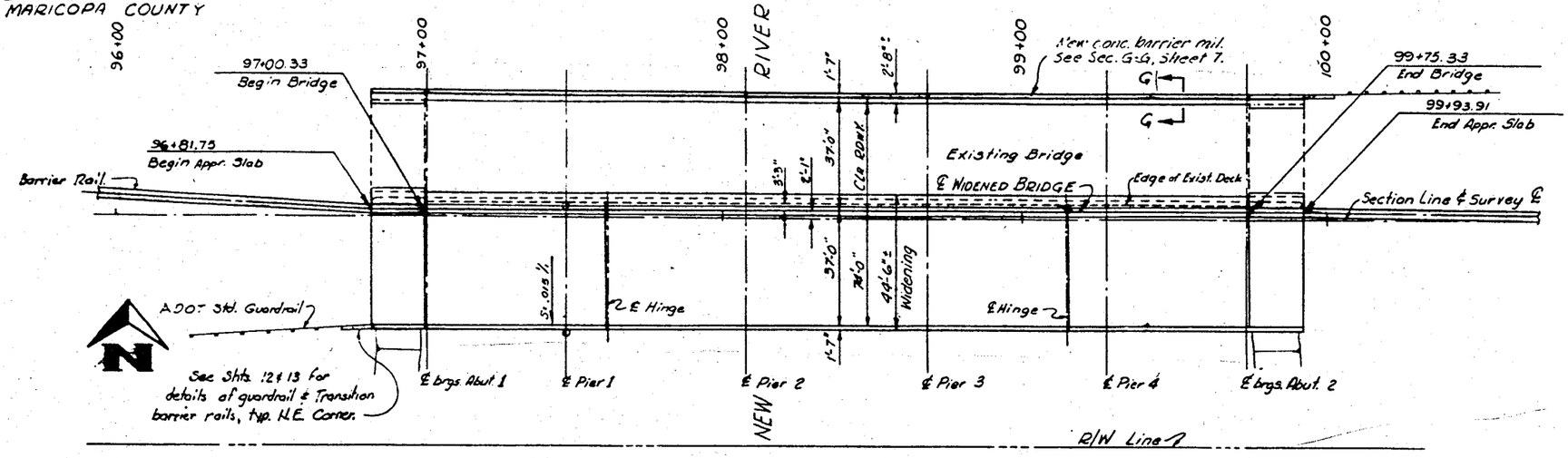
FHWA REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	M-904-3(3)	4	13	



K+E PLATE 1, PLAN-PROFILE

FEDERAL AID PROJECT	STATE	PROJECT NO	SHEET No.	TOTAL SHEETS	AS BUILT
9	ARIZONA	FGM-330-3(3)	5	13	

BELL ROAD. NEW RIVER BRIDGE WIDENING.
MARICOPA COUNTY

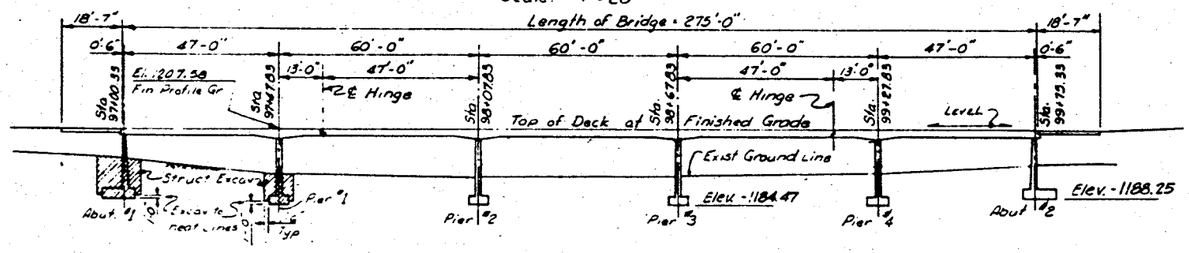


B.M. #10F - Sta. 97+00
Brass Cap - Top of South Curb
Elev 1208.51

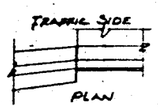
STA. 97+00
5 Span R.C. Slab Bridge Widening

Scale. 1" = 20'

B.M. #10E - Sta. 99+75.33
Brass Cap - Top of South Curb. Elev. 1208.52



SECTION ON ℄ WIDENED BRIDGE
Scale 1" = 20'



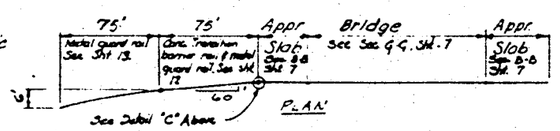
DETAIL "C"

GENERAL NOTES

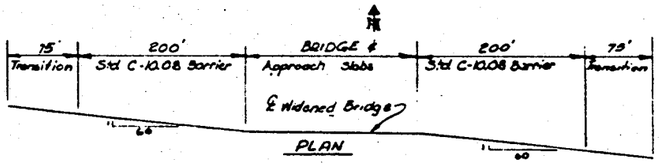
Construction: Std. Specs. Arizona Highway Dept, Edition of 1969, revised to date.
Design AASHO Std Specs for Highway Bridges 1961.
Loading Class: HS20-44
Stresses:
Class A concrete: $f_c' = 2500$ psi, $f_c = 1000$ psi; $n = 12$
Class D concrete: $f_c' = 3000$ psi, $f_c = 1200$ psi; $n = 10$
Reinforcing Steel: $f_s = 20{,}000$ psi
Structural Steel: $f_s = 20{,}000$ psi
Reinforcing steel shall conform to ASTM Spec. A615 Grade 40.
Structural steel shall conform to ASTM Spec. A36.
Welding shall conform to AWS Specs for Welded Highway & Railway Bridges.
Paint & painting shall conform to Std Specs. Contact Surfaces shall not be painted. Structural steel - Shop - 1 coat paint #12 or #18, #3 & #10. No field paint required.
All reinforcing steel dimensions shall be to center of bars unless noted otherwise.
Deck forms shall be struck before curbs are poured.
Chamfer exposed corners 3/4" unless noted otherwise.
Existing bridge rails remain the property of M.C.H.D. They shall be carefully removed by the contractor and stock piled at the site for removal by M.C.H.D. forces.
All concrete removal shall be preceeded by a 1" deep sawcut along the removal boundary.
Reinforcing steel shall have 2" clear cover unless noted otherwise.

	Q50 39,000 cfs	Q100 53,000 cfs
Normal W.S. ELEV.	1203.4	1205.0
Bridge B.W.	1.3'	2.1'
D.H.W. ELEV.	1204.7	1207.1
Drainage Area = 203 sq. mi.		

Existing New River Bridge built in 1964 by Maricopa County Highway Dept. under Project # S-330(5)



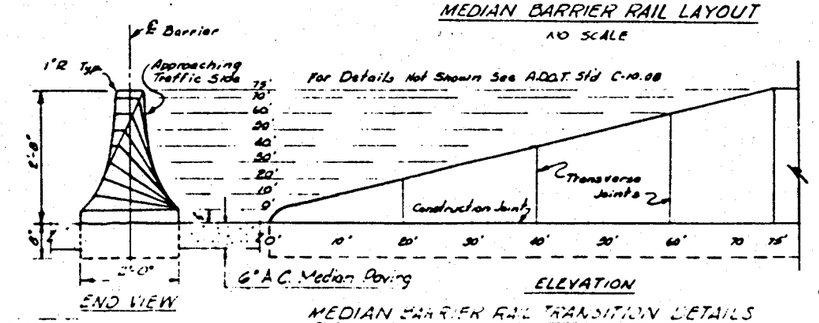
TYPICAL BRIDGE & SHOULDER RAIL LAYOUT
NO SCALE



MEDIAN BARRIER RAIL LAYOUT
NO SCALE

APPROXIMATE QUANTITIES (for informational purposes only)

Item	Struct Excav. CY	Concrete CY Class A	Concrete CY Class D	Reinf. Steel Lbs.	Struct Steel Lbs	Conc. Removal CY	Spec. Backfill CY
Deck & Rails	—	90	718	213,650	8570	143	
4 Piers	462	205		19,035		4	423
2 Abutments	562	158		22,230		19	531
2 Approach Slabs	—	62		9645		1	345
Totals	1024	515	718	263,660	8570	167	1299



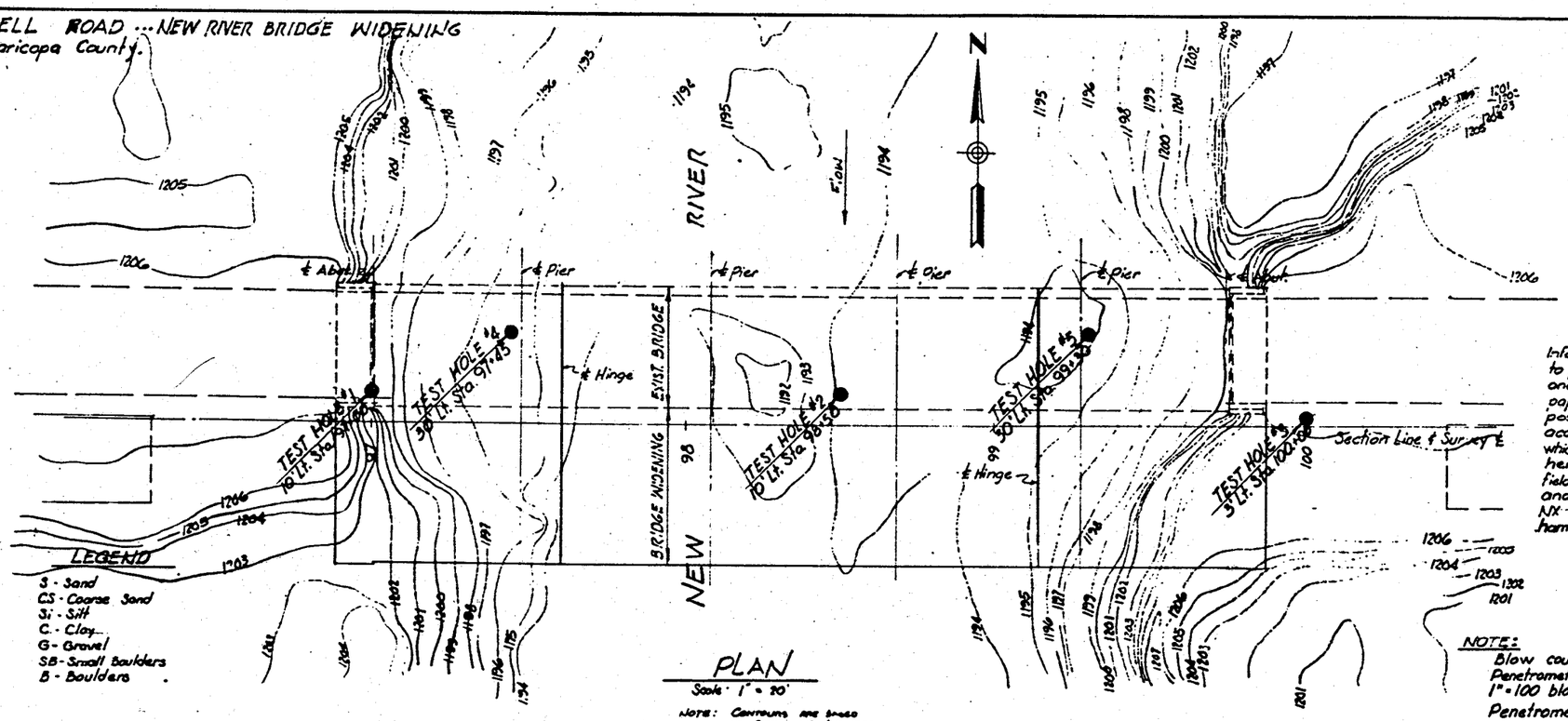
MEDIAN BARRIER RAIL TRANSITION DETAILS
1/4" = 1'-0"

REDUCED SIZE DO NOT SCALE

MARICOPA COUNTY HIGHWAY DEPARTMENT
SCALE 1" = 20' | DATE JUNE, 1970 | LOCATION PLAN | DRAWN BY E.L.G. | CHECKED Y.M.
STA 96+ BELL ROAD BRIDGE WIDENING OVER NEW RIVER
MCHD Project No. 42900 | DRAWING NUMBER 5

BELL ROAD ... NEW RIVER BRIDGE WIDENING
Maricopa County.

FEDERAL AID SECTION	STATE	PROJECT NO	SHEET NO	TOTAL SHEETS	NO SHEET
9	ARIZONA	70M-304-3(3)	6	13	



PLAN

Scale: 1" = 20'

NOTE: Contours are based on Survey of Aug. 1976

LEGEND

S - Sand
CS - Coarse Sand
Si - Silt
C - Clay
G - Gravel
SB - Small Boulders
B - Boulders

NOTES

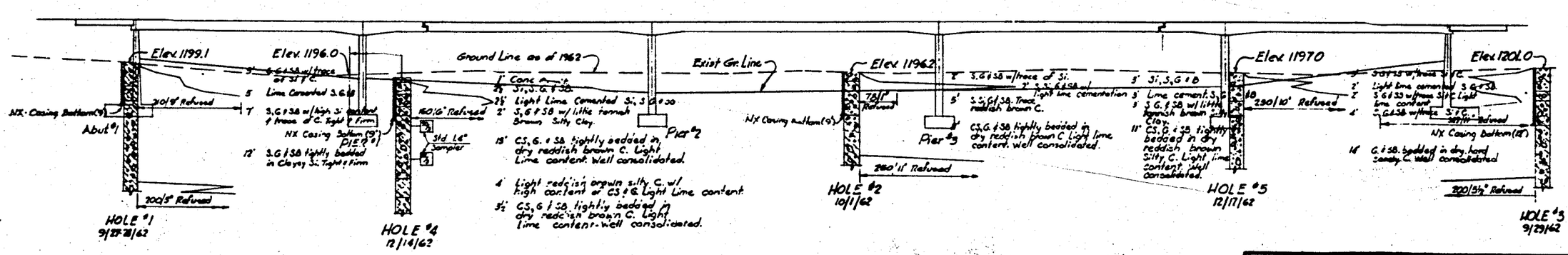
Information contained on this sheet is made available to prospective bidders for informational purposes only, and is not to be considered a part of the contract papers. The information is developed as accurately as possible by the methods utilized, however, the County accepts no responsibility for any conditions encountered which may be at variance from information contained herein. Classification of earth materials is based upon field inspection and is not to be construed to imply mechanical analysis.

NX Casings and 2" penetrometer is driven with 140 lb. hammer, 30" free fall, no cushion.

NOTE:

Blow count graphs for 2" Bullnose Penetrometer are drawn to a scale of 1" = 100 blows horizontally.

Penetrometer holes were drilled through hard material where blow count graphs are discontinuous.



ELEVATION

Scale: 1" = 20'

REDUCED SIZE DO NOT SCALE

MARICOPA COUNTY HIGHWAY DEPARTMENT

FOUNDATION DATA

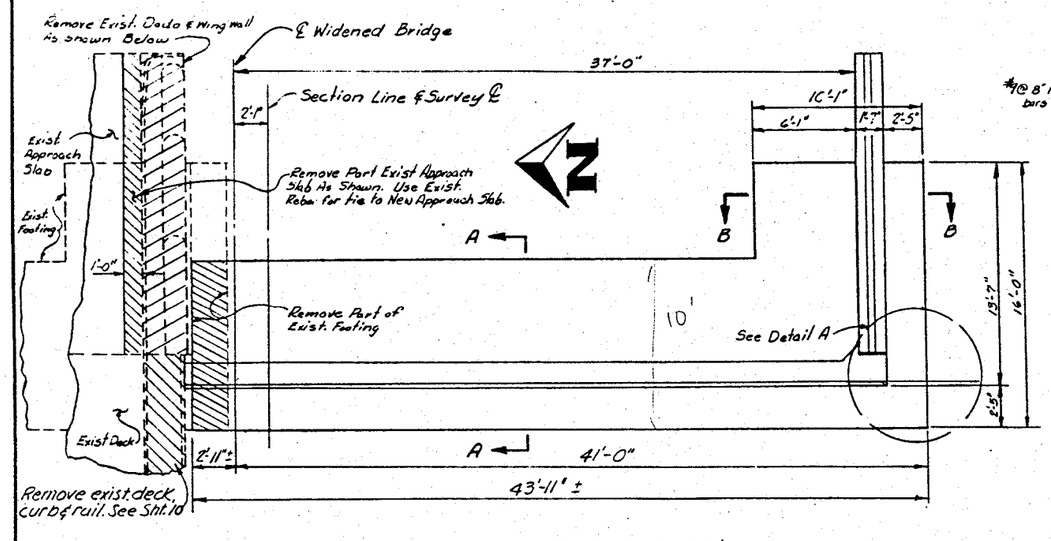
Sta. 98+ BELL Rd. BRIDGE WIDENING OVER NEW RIVER

MCHD Project No. 42900

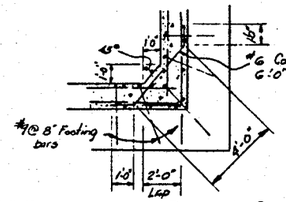
Drawing Number 6

BELL ROAD ... RIVER BRIDGE WIDENING
MARICOPA COUNTY

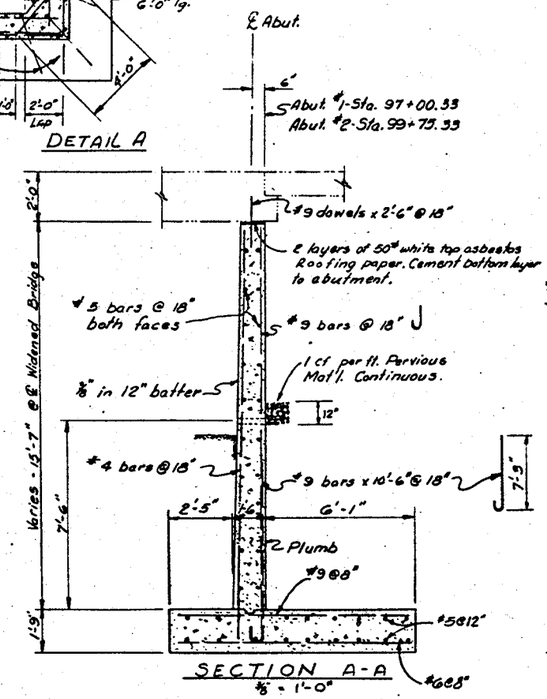
FEDERAL REGION	STATE	PROJECT NO	SHEET NO	TOTAL SHEETS	AS BUILT
9	ARIZONA	FAM-304-3(3)	7	13	



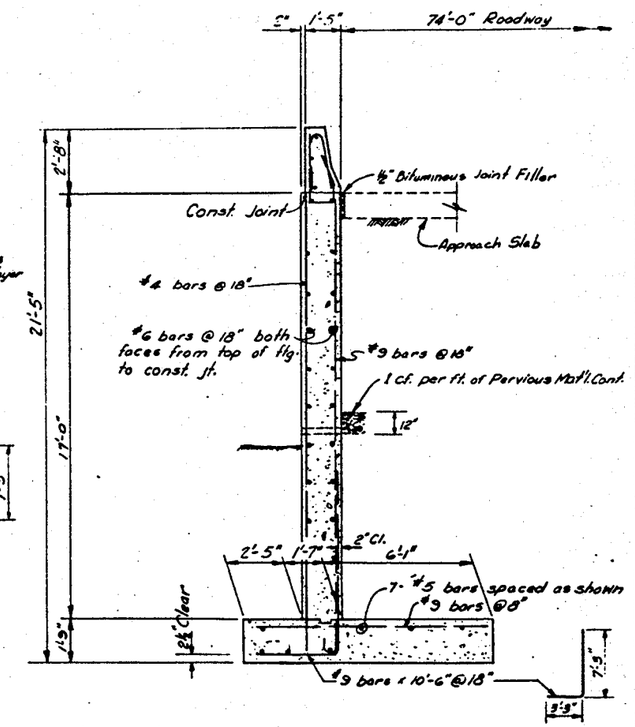
PLAN VIEW
ABUTMENT No. 2 SHOWN
ABUTMENT No. 1 SIMILAR
1/4" = 1'-0"



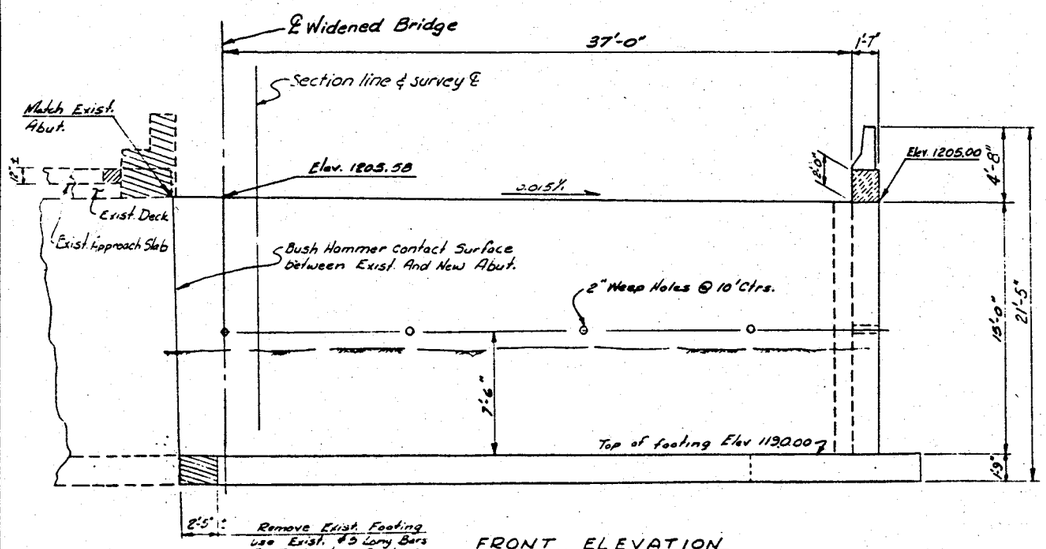
DETAIL A



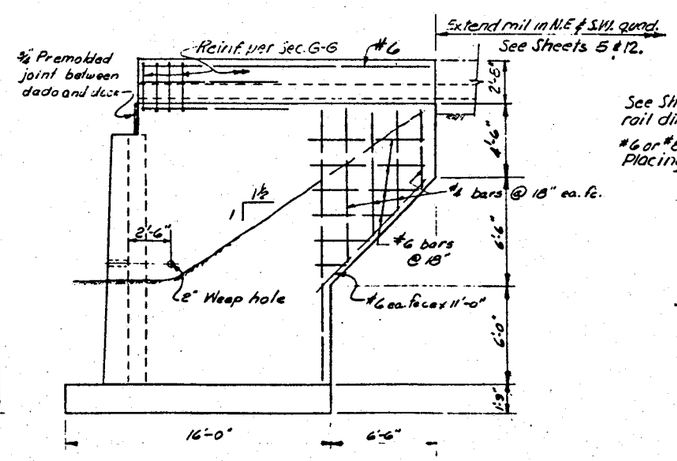
SECTION A-A
3/8" = 1'-0"



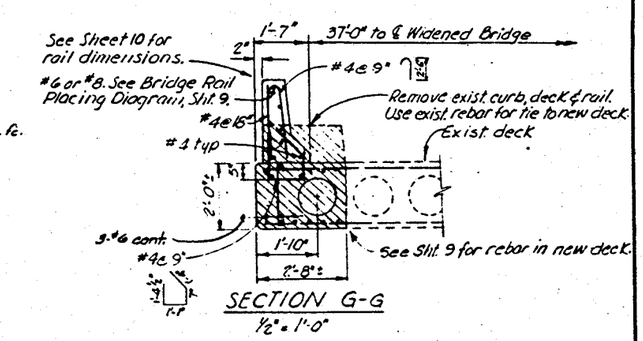
SECTION B-B
3/8" = 1'-0"



FRONT ELEVATION
3/8" = 1'-0"



SIDE ELEVATION
1/4" = 1'-0"



SECTION G-G
1/2" = 1'-0"

Use Class "A" Concrete for Abutments

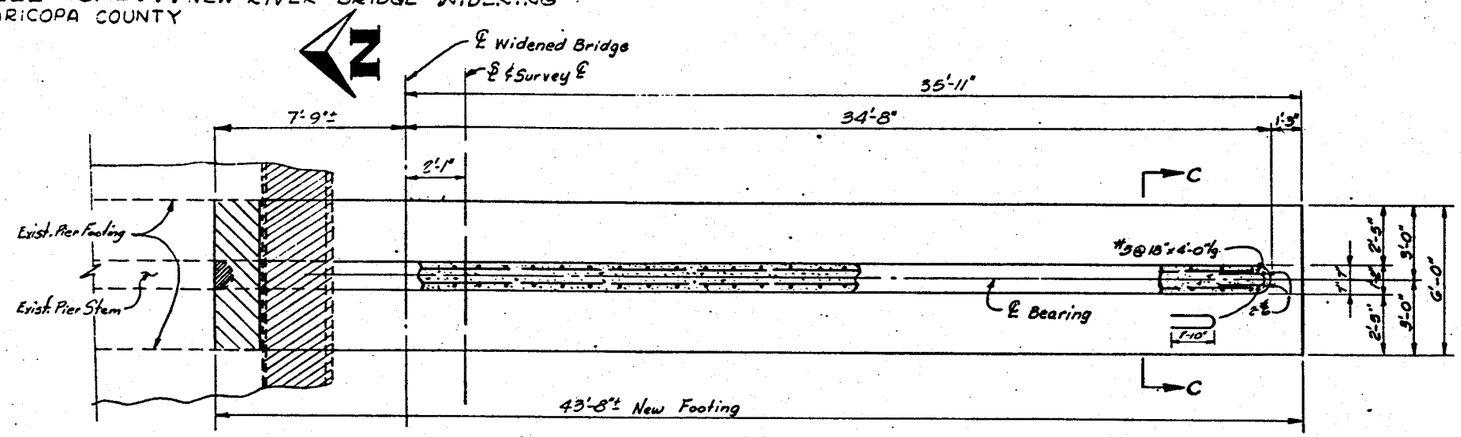
REDUCED SIZE DO NOT SCALE

MARICOPA COUNTY HIGHWAY DEPARTMENT

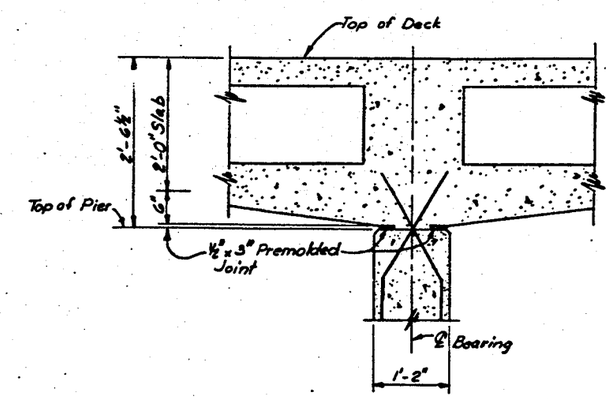
SCALE AS NOTED / DATE APRIL 1975	ABUTMENT	DRAWN BY E.J.L. / CHECKED BY N
	STA 94+ BELL ROAD BRIDGE WIDENING OVER NEW RIVER	
MCHD Project No. 42900		DRAWING NUMBER 7

BELL ROAD... NEW RIVER BRIDGE WIDENING
MARICOPA COUNTY

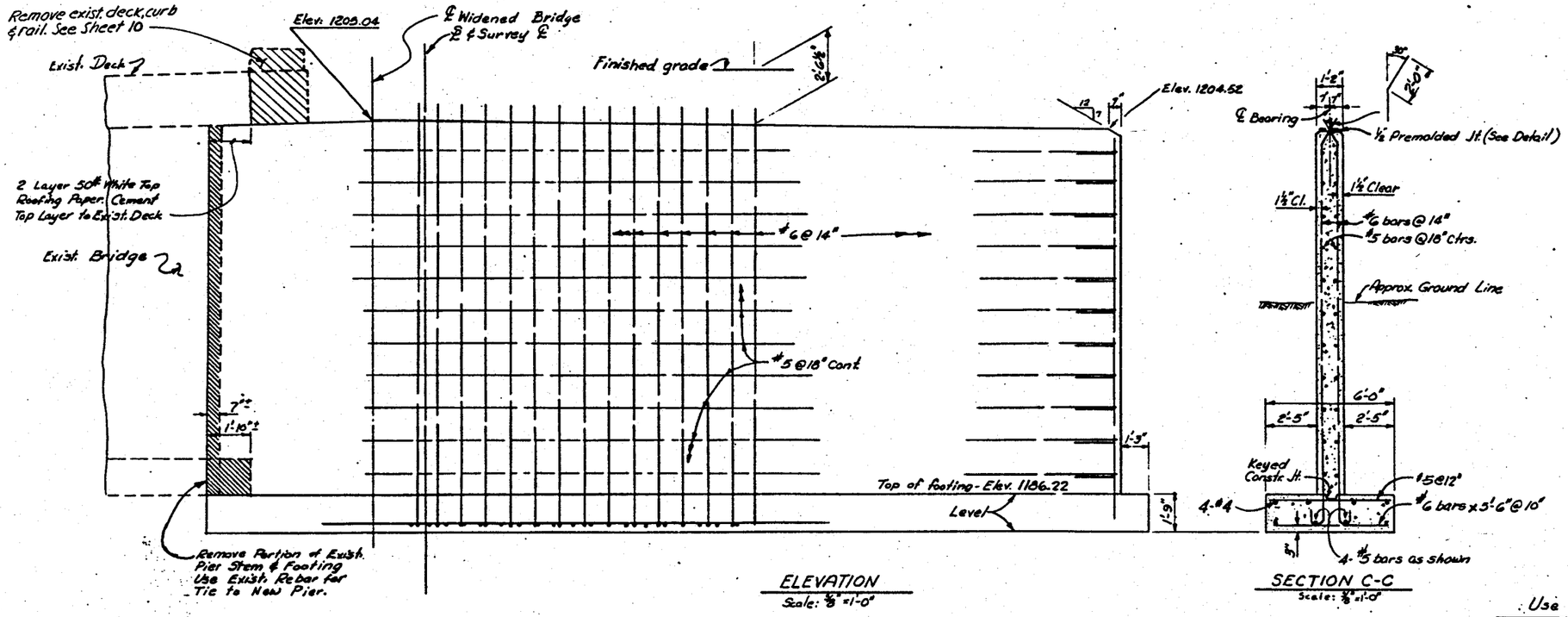
FEDERAL AID PROJECT NO.	STATE	PROJECT NO	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZONA	TON-304-3(3)	8	13	



PIER PLAN
Scale: 3/8" = 1'-0"



BEARING DETAIL
Scale: 1" = 1'-0"



ELEVATION
Scale: 3/8" = 1'-0"

SECTION C-C
Scale: 3/8" = 1'-0"

REDUCED SIZE DO NOT SCALE

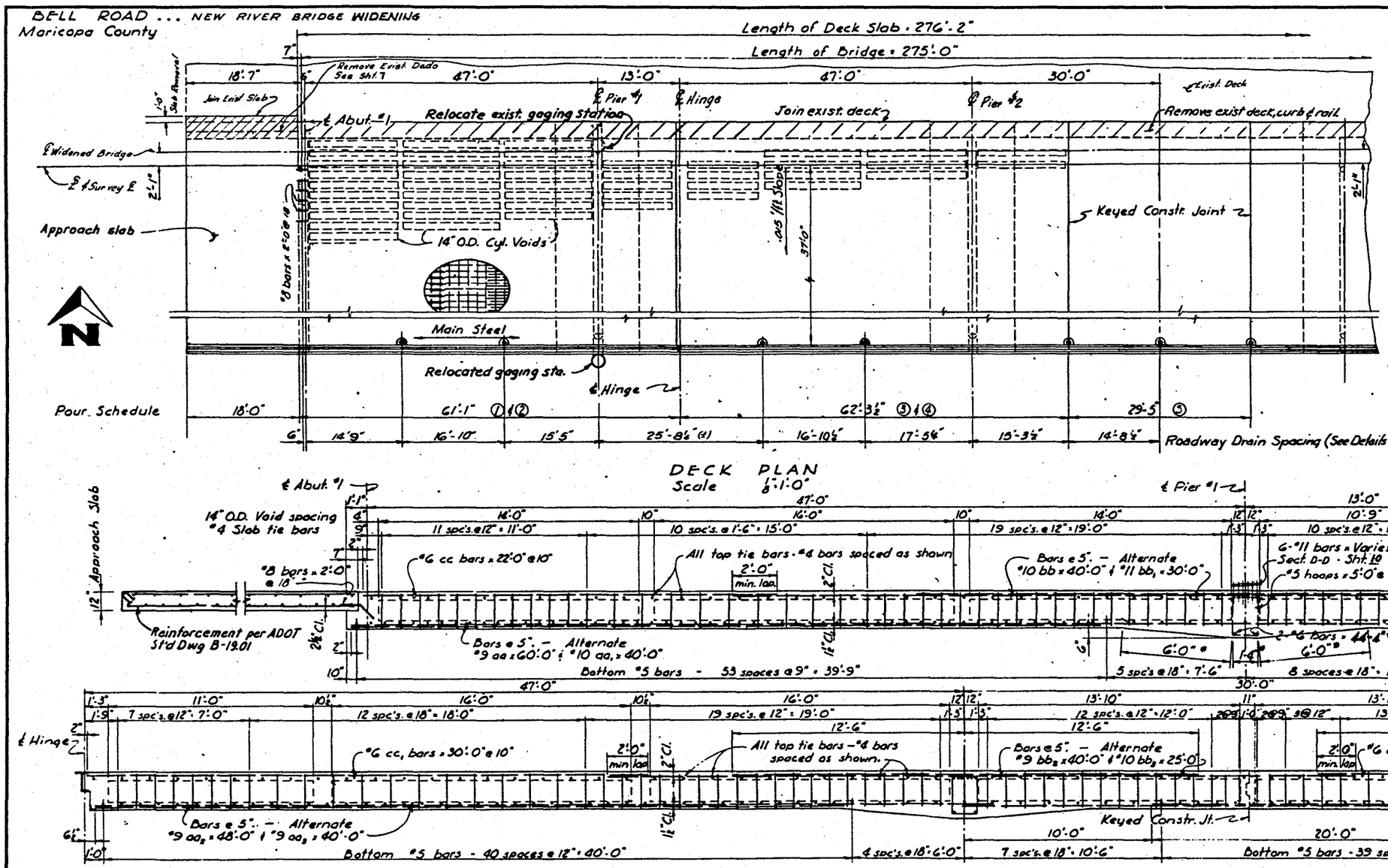
Use Class "A" Concrete for Piers.

MARICOPA COUNTY HIGHWAY DEPARTMENT

SCALE As Noted DATE April 1975	PIER STA 98+ BELL ROAD BRIDGE WIDENING OVER NEW RIVER	DRAWN BY Calif. CHECKED V.W.
M.C.H.D. Project No. 42900		DRAWING NUMBER 8

BELL ROAD ... NEW RIVER BRIDGE WIDENING
Maricopa County

FHWA REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	7011-304-3(3)	9	13	



DECK SLAB - CLASS "D" CONC.
APPROACH SLAB - CLASS "A" CONC.

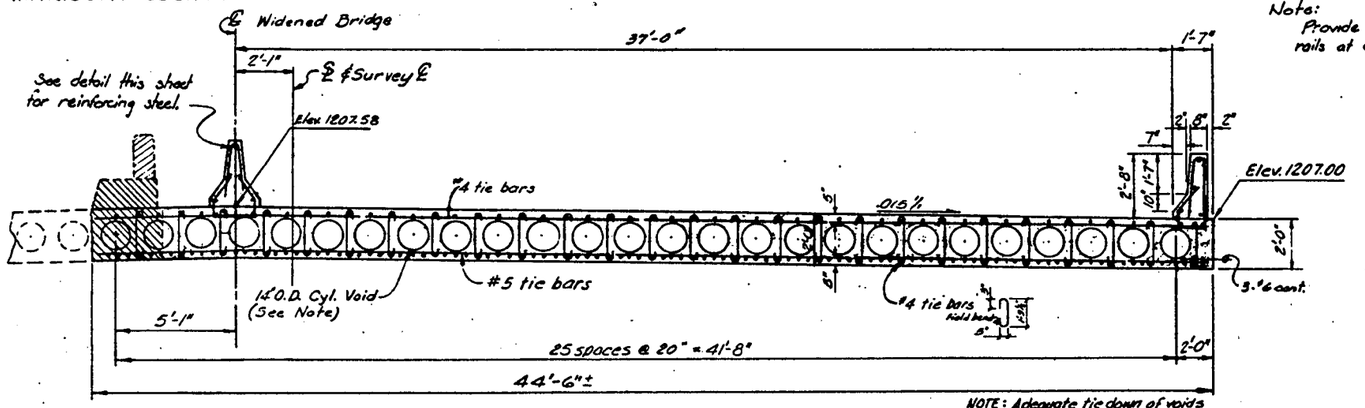
MARICOPA COUNTY HIGHWAY DEPT.

NOTED	DECK DETAILS	
STA. 98+ BELL ROAD BRIDGE WIDENING over NEW RIVER		
MCHD Project No. 42900		9

BELL ROAD... NEW RIVER BRIDGE WIDENING
MARICOPA COUNTY

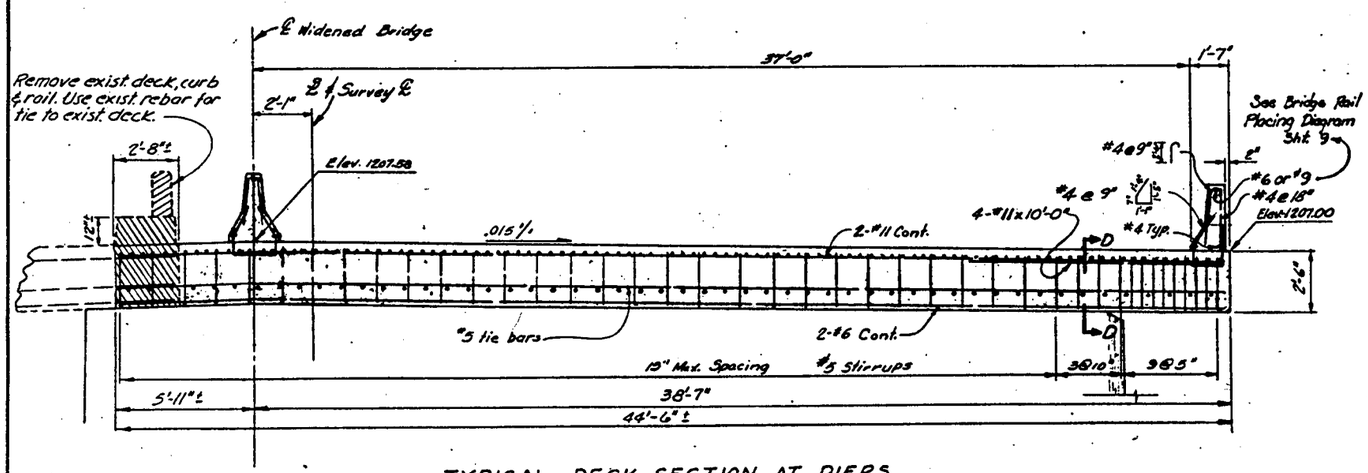
FEDERAL AID PROJECT	STATE	PROJECT NO	SHEET No	TOTAL SHEETS	AS BUILT
9	ARIZONA	FOR-900-3(2)	10	13	

Note:
Provide 2" open joints in barrier rails at deck hinges

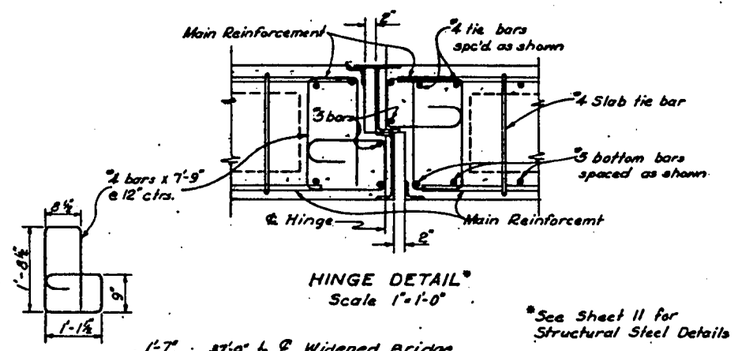


TYPICAL DECK SECTION AT MIDSPAN
Scale 3/8" = 1'-0"

NOTE: Adequate tie down of voids to formwork shall be provided to prevent displacement of voids during concrete placement.

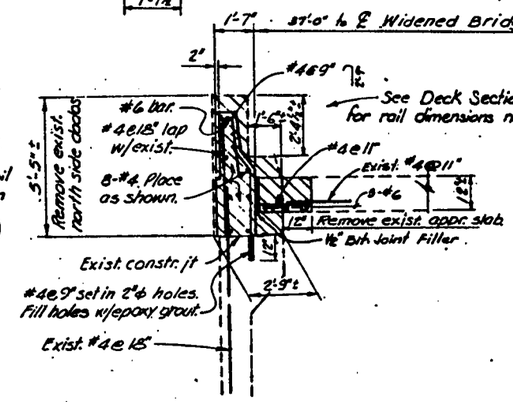


TYPICAL DECK SECTION AT PIERS
Scale 3/8" = 1'-0"

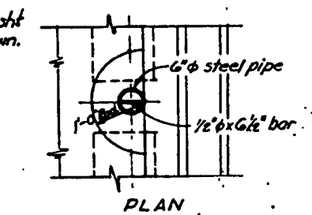


HINGE DETAIL*
Scale 1" = 1'-0"

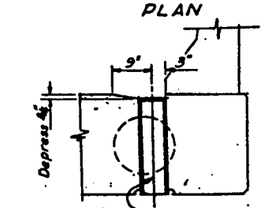
*See Sheet 11 for Structural Steel Details



NORTH SIDE DADO RECONSTRUCTION
Scale 3/8" = 1'-0"



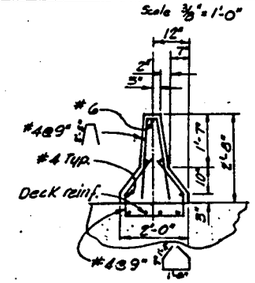
PLAN



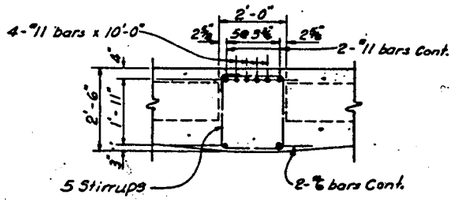
6" ϕ x 1'-11⅝" std. pipe drain w/ ½" ϕ x 6½" bar. Notch 6" ϕ pipe and weld ½" ϕ bar w/ ⅜" fillet weld each end. Galvanize after fabrication.

SECTION ON ℄ PIPE.

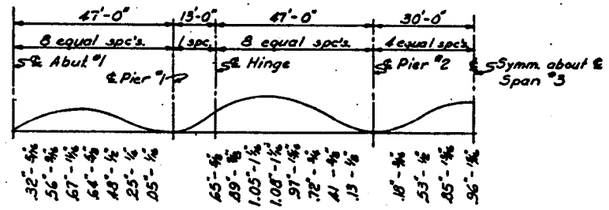
ROADWAY DRAIN DETAILS
Scale 3/4" = 1'-0"



MEDIAN BARRIER
1½" = 1'-0"



SECTION D-D
Scale ½" = 1'-0"



SLAB CAMBER DIAGRAM
No Scale

Camber top & bottom surfaces of conc. slab as shown in diagram. No allowance has been made for form deflection or falsework deflection.

REDUCED SIZE DO NOT SCALE

Use Class "A" Concrete for Barrier Rails.
Use Class "D" Concrete for Deck Slab.

MARICOPA COUNTY HIGHWAY DEPARTMENT

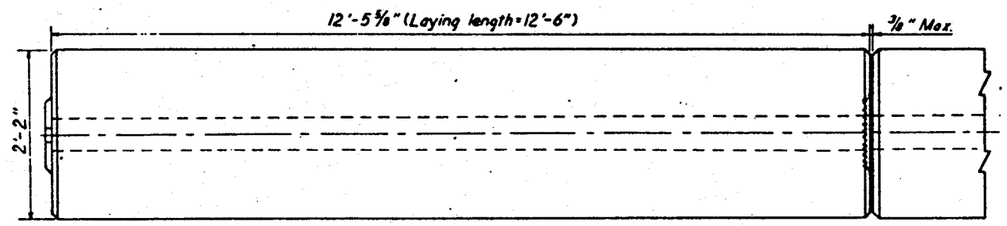
SCALE Noted	DECK	DRAWN BY R.L.
DATE		CHECKED L.A.
STA 98+ BELL ROAD BRIDGE WIDENING over NEW RIVER		
M.C.H.D. Project No. 42900		SHEET NUMBER 10

F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ	TQM-304-3(3)	10A		

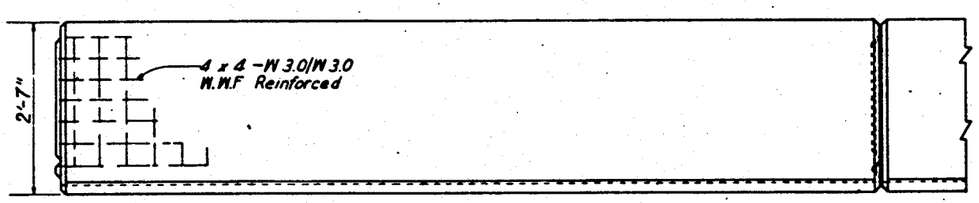
BELL ROAD - NEW RIVER BRIDGE WIDENING

MARICOPA COUNTY

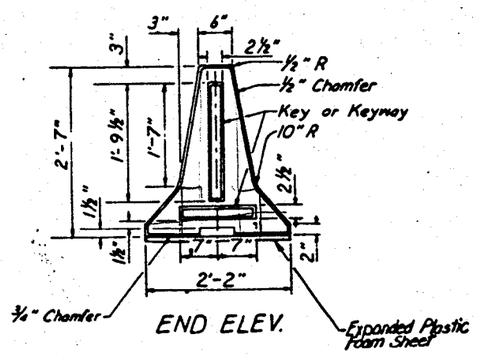
TEMPORARY POSITIVE BARRIER



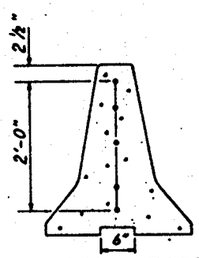
PLAN



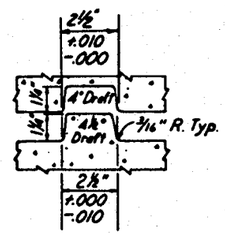
SIDE ELEVATION



END ELEV.



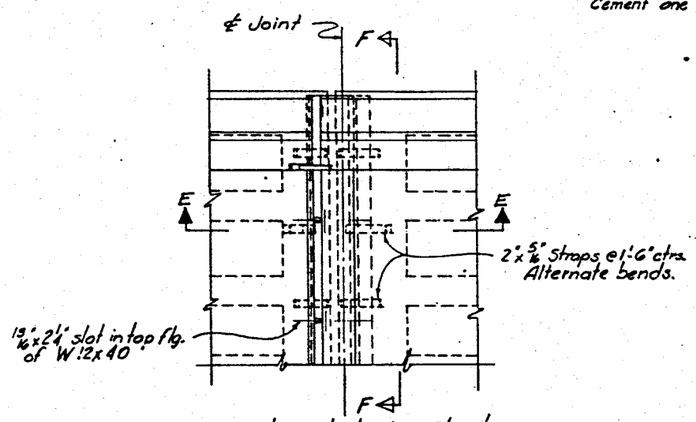
TRANSVERSE SECTION



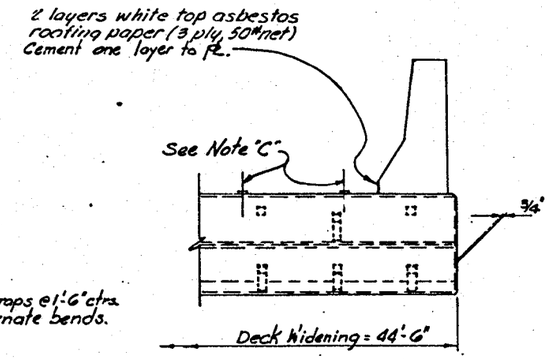
REDUCED SIZE DO NOT SCALE

BELL ROAD ... NEW RIVER BRIDGE WIDENING
Maricopa County

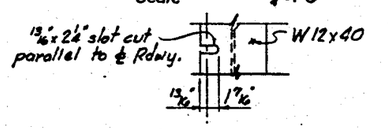
FHWA REGIONAL	STATE	PROJECT NO	SHEET NO	TOTAL SHEETS	AS BUILT
9	ARIZONA	70M-30d-3(3)	11	13	

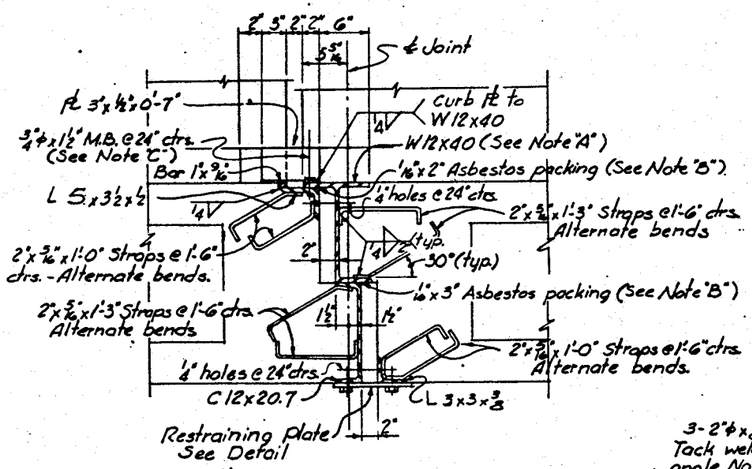


EXPANSION JOINT - PLAN
Scale 3/8"=1'-0"



SECTION F-F



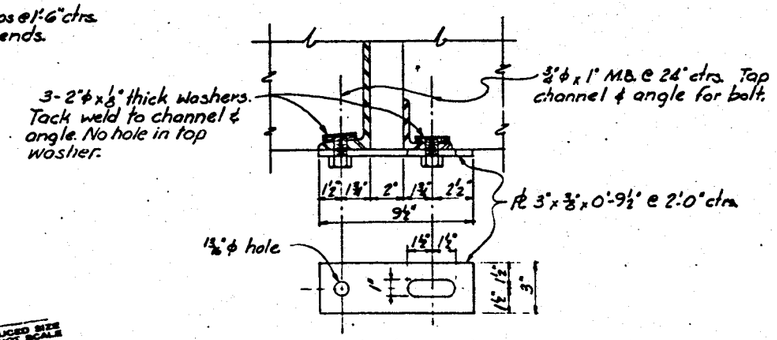


SECTION E-E
Scale 1½"=1'-0"

NOTE "A"
Burn off one flange of W12x40 Flush with web face.

NOTE "B":
A continuous strip of asbestos sheet packing, 1/16" thick, shall be cemented on down face of bearing flanges. Bearing faces of flanges shall be ground smooth after drilling and tapping.

NOTE "C":
Temporary bolts ¾"φ x 1½" long @ 2'-0" ctrs. Top long leg of L 4½x3½x½ for bolt. Bolts shall be removed within 4 hours after concrete has been poured.



RESTRAINING PLATE DETAIL
Scale 3"=1'-0"

REDUCED SIZE DO NOT SCALE

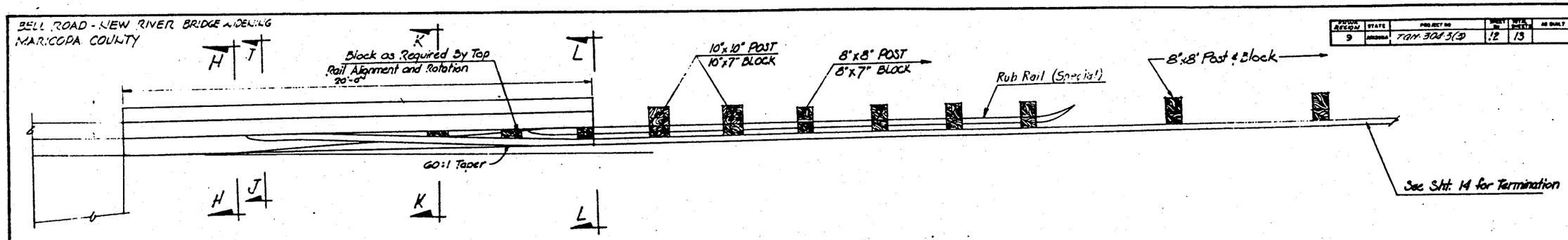
Vincent W. Wilson

MARICOPA COUNTY HIGHWAY DEPARTMENT

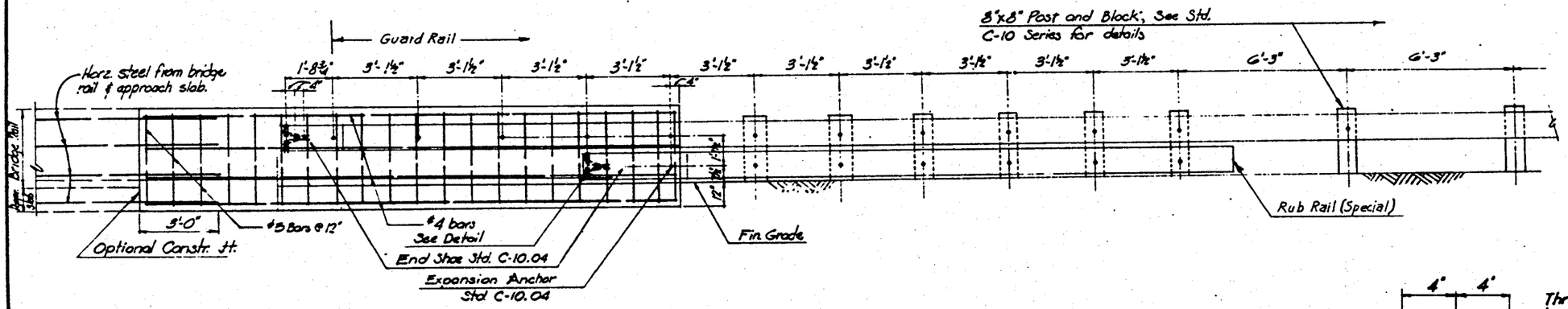
SCALE Listed	STRUCTURAL STEEL DETAILS	DRAWN BY C. Clay
DATE 9-12-75		CHECKED F.W.T.
STA. 98+ BELL ROAD BRIDGE WIDENING OVER NEW RIVER		
M.C.H.D. Project No. No. 4900		DRAWING NUMBER 11

BELL ROAD - NEW RIVER BRIDGE WIDENING
MARICOPA COUNTY

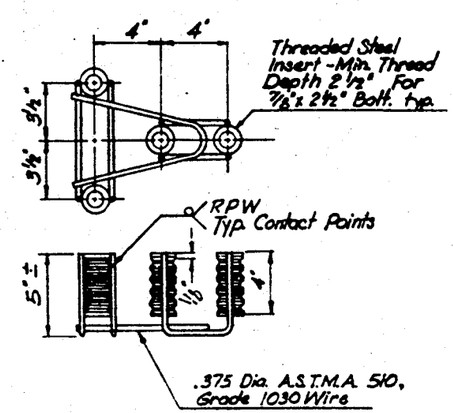
FEDERAL REGION	STATE	PROJECT NO	SHEET No.	TOTAL SHEETS	AS BUILT
9	ARIZONA	FAM 300-3(3)	12	13	



PLAN
Scale: 1/2" = 1'-0"

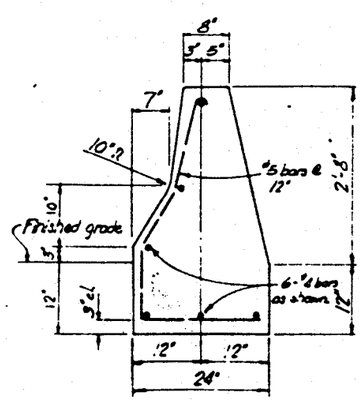


ELEVATION
Scale: 1/2" = 1'-0"

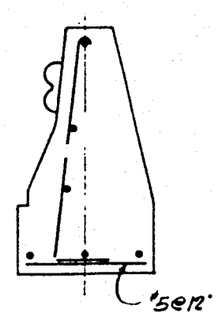


ANCHOR ASSEMBLY DETAIL

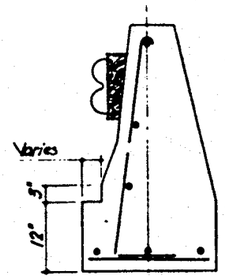
ALL CONCRETE Shall be class A.
Transition barrier shall be poured monolithically.



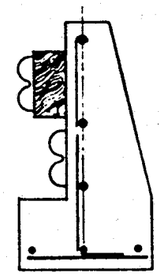
SECTION H-H



SECTION J-J



SECTION K-K



SECTION L-L

REDUCED SIZE DO NOT SCALE

MARICOPA COUNTY HIGHWAY DEPARTMENT

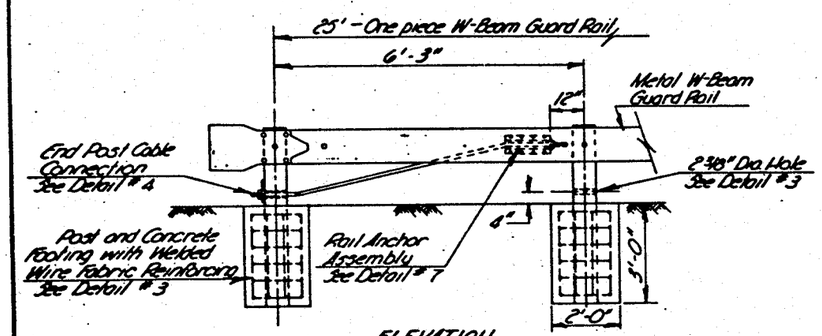
TRANSITION BARRIER RAIL
BELL RD BRIDGE WIDENING OVER NEW RIVER

MCHD Project No. 42900

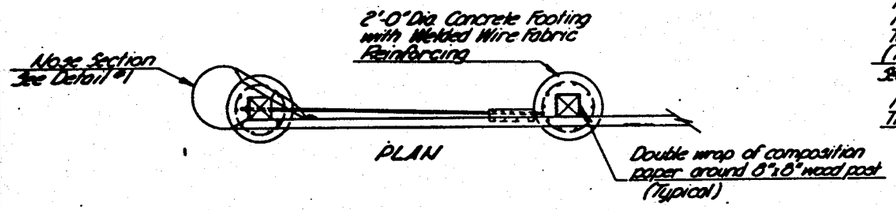
SHEET 12

BELL ROAD - NEW RIVER BRIDGE WIDENING
MARICOPA COUNTY

F H W A REGION	STATE	PROJECT NO	SHEET NO	TOTAL SHEETS	AS BUILT
9	ARIZ	RAM-304-3(3)	13	13	

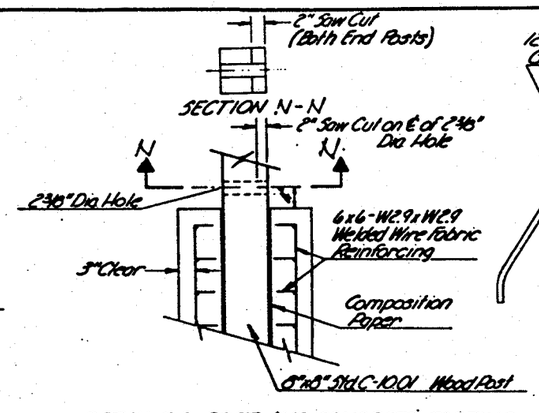


ELEVATION

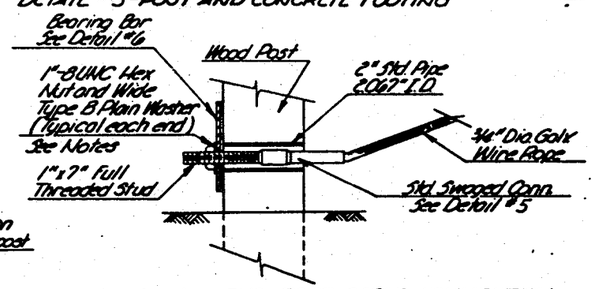


PLAN

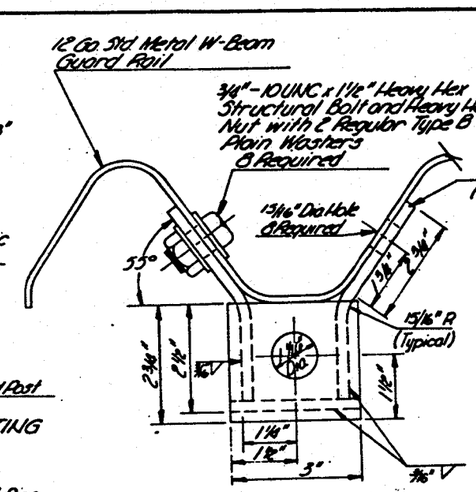
BREAKAWAY CABLE TERMINAL



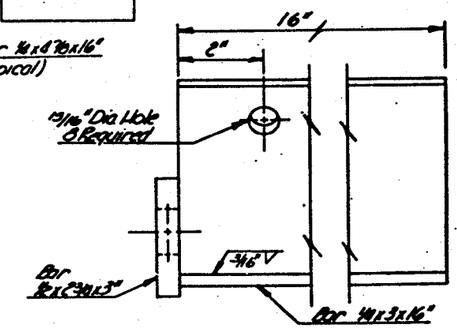
DETAIL #3-POST AND CONCRETE FOOTING



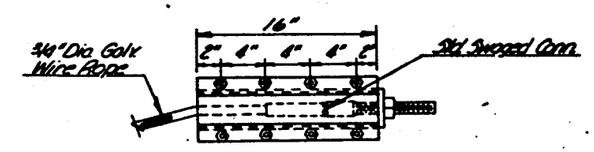
DETAIL #4-END POST CABLE CONNECTION



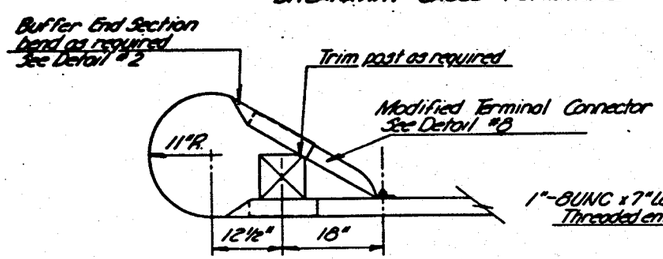
RAIL ANCHOR END VIEW



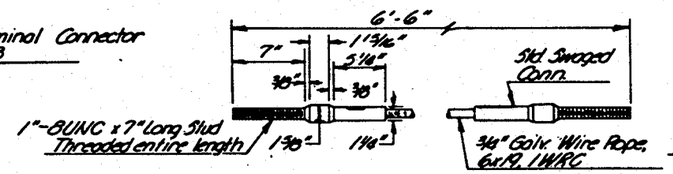
RAIL ANCHOR SIDE VIEW



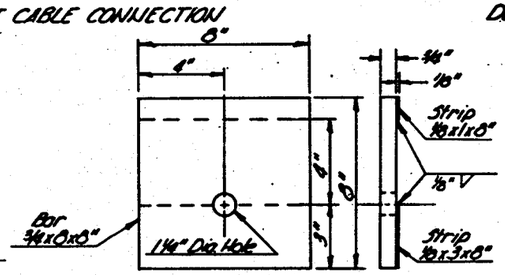
DETAIL #7-RAIL ANCHOR ASSEMBLY



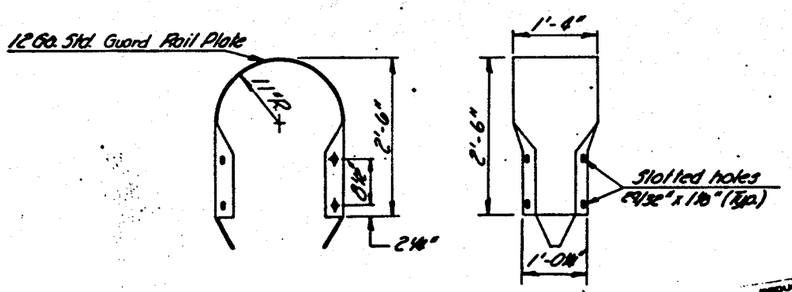
DETAIL #1—NOSE SECTION



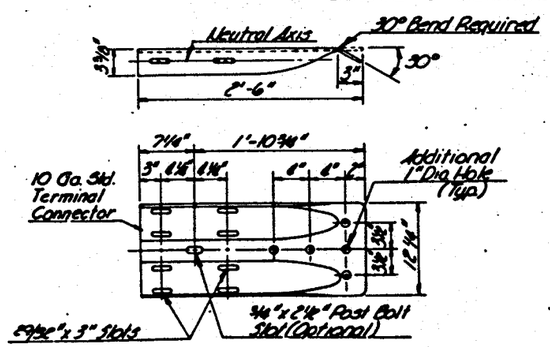
DETAIL #5—STANDARD SWAGED CONNECTION



DETAIL #6-BEARING BAR



DETAIL #2—BUFFER END SECTION



DETAIL #8—MODIFIED TERMINAL CONNECTOR

GENERAL NOTES

For data not shown, see C-10 Series Standards.

The 2'-0" dia. concrete footings shall be cast-in-place and shall be Class A.

The Galv. W-Corrugated Sheet Steel Beam, ARBA Std. HM-TF-13/RE-3-73, and Galv. Buffer End Section, ARBA Std. HM-TF-13/RE-7-70, shall conform to AASHTO M 180, Class A, Type I.

The Galv. Terminal Connector, ARBA Std. HM-TF-13/RE-8-73, shall conform to AASHTO M 180, Class B, Type I.

A double wrap of composition paper or approved equal around end posts before concrete placement shall be required to facilitate future replacement of damaged posts.

The 3/4" Galv. Wire Rope shall conform to AASHTO M 30, Class B, Type II.

Bolts, nuts and washers for the Rail Anchor Assembly shall conform to ASTM A 325 and galvanized in accordance with ASTM A 153. Torqued connections shall be as specified in AASHTO Standard Specifications for Highway Bridges, latest edition.

Nuts and washers for Standard Swaged Connection shall conform to ASTM A 563, Grade B, and ASTM A 325, respectively. Galvanizing shall be in accordance with ASTM A 153.

Galvanized swaged fitting and threaded stud shall conform to AISI C-1035 and ASTM A449.

All structural steel shapes and products fabricated from them, bars, strips, etc. shall conform to ASTM A 36 and galvanized in accordance with ASTM A 123.

Drilling or cutting necessary for special connections permitted in the field shall be painted with ADOT Paint Number 13 (Zinc).

MARICOPA COUNTY HIGHWAY DEPARTMENT
TRADITIONAL BRIDGE DIV.
STR. 9/4" BELL ROAD BRIDGE
NEW RIVER
FEDERAL AID PROJECT NO. 41-2960
13

DO NOT SCALE

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ARIZONA DEPARTMENT OF TRANSPORTATION
STRUCTURES SECTION

BRIDGE INSPECTION REPORT

8 STRUCTURE NUMBER 9125 PAGE 1 OF 2

90 DATE 060283 108 INSPECTION NO. 6 INSPECTED BY Hogsett - Sweeney (City)

109 STRUCTURE NAME NEW RIVER BRIDGE PRINCIPAL RTE & MP FAU 3043 Bell Road 5.90

2 DISTRICT 01 103 ORG ___ 110 SPECIAL INSPECTION ___ NEXT INSP. DUE - QTR. 2 YR. 85

REVISE SI&A: YES [X] NO [ ] 3 COUNTY Maricopa 013 4 CITY Peoria 0255

112 REPAIR PRIORITY 4	113 PROPOSED MAINTENANCE: TYPE	114 EST. COST $	CONDITION	SEE NOTE NO.
	115 DATE COMPLETED: MO., YR.,	116 ACT. COST $		

DECK CONDITION: (58) 8		
Deck and/or wearing surface Concrete, minor to medium longit. cracks, neg. moment pattern cr.	8	
Walks, curbs, median NA	N	
Expansion devices Hinges in spans #2 & #4 - good	8	
SUPERSTRUCTURE CONDITION: (59) 8		
Main Members-truss, girders, box girder, frame, slab etc. Cont. conc. voided slab - good on bottom	8	
Secondary Members-floor beams, bracing, diaphrams, etc. NA	N	
Bearing Devices-rockers, rollers, pads, etc. NA	N	
Paint on structural steel NA	N	
SUBSTRUCTURE CONDITION: (60) 6		
Abutments Full height concrete - on spread footings	6	
Piers, ~~Pile bents,~~ pier walls, ~~etc.~~ Solid concrete wall on spread footings	6	1
Wings, dadoes, retaining walls NA		
WATERWAY CONDITION: (61) 6		
Bank protection None	N	
Channel	6	1
ROADWAY - SAFETY CONDITION: (65) 8		
Approaches AC appr rdwy - OK. N.W. appr. slab settled & overlaid	8	
Fills Good	8	
Bridge ~~rail, parapet~~, barrier Std conc. barrier on both sides & thru median - good	8	
Approach guardrail Good	8	
Lighting NA	N	
Signing B & W diagonal stripe markers at opp. corners of approaches	8	

REMARKS, NOTES, RECOMMENDATIONS:

1 There is a large scour hole along the downstream half of Pier #3 (see photos & profile sheet). The new footing was stepped down on the widened (downstream) portion, but there is now only 2'2" of cover over the top of footing & footing is only 1'-9" thick. This pier has potential for scour related problems. Pier #1 has only 4' to 6' of cover.

Recommend scour protection for footings of this bridge similar to ones that ADOT has installed. A copy of the project @ US 60 is enclosed ---

29 ADT ON 14200 30 YR 83 29 ADT UNDER ___ 30 YR ___ 63 EST. REMAIN LIFE 30 111 POSTED LIMIT ___

64-4502 C R12-82

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ARIZONA DEPARTMENT OF TRANSPORTATION
STRUCTURES SECTION

†● 64-4402 R3/83

STRUCTURE INVENTORY & APPRAISAL RECORD

	By	Date
Transfer of Data	GDH	6-83
Inspection	GDH	6-2-83
Cost Estimate		
General Review	FDD	6-15-83
90 Maint. Insp.	06028	3
108 Insp. Number		06

109 Str. Name: NEW RIVER BRIDGE

107 Inspection Quarter: 6

IDENTIFICATION

1 State: 04 9
2 Hwy District: 01
3 County: Maricopa 013
4 City/Town: Peoria 0255
6 Features intersected: NEW RIVER
7 Facility Carried by Str.: BELL ROAD
8 Structure No.: 9125
9 Location: 7.8 MI E OF JCT US 60
5 Inventory Route On: 1500304 30
100 Principal Route Under:
5 Inventory Route Under: 2

	ROUTE UNDER	ROUTE ON
10 Min. Vert Clearance, (ft.;in.)		9999
11 Milepoint		0059.0
12 Road Section No.		0000
13 Defense Bridge Description		00
14 Defense Milepoint		00.00
15 Defense Section Length		00.00

16 Latitude: 3338.3
17 Longitude: 11212.6
18 Physical Vulnerability: 2
19 By-pass, Detour Length: 08
20 Toll Bridge ☐ On Toll Road ☐ On Free Road ☒: 3
21 Custodian: City of Peoria 4
22 Owner: City of Peoria 4
23 F.A.P. No.:
24 Highway System: 14
25 Administrative Jurisdiction: 4
26 Functional Classification: 43
29 ADT: 14200
30 Year of ADT: 83
47 Total Horiz. Clearance: 360

APPRAISAL

64 Operating Rating: 236
66 Inventory Rating: 236
67 Structural Condition: 8
68 Deck Geometry: 8
69 Under clearance-Vertical &Lateral: N
70 Safe Load Capacity: 8
71 Waterway Adequacy: 8
72 Approach Roadway Alignment: 8

REVISION PROJECT INFORMATION

DATE	PROJECT NO.	PLANS	REMARKS
1964	S-396 (5)	BMB	ORIGINAL CONSTRUCTION
1977	TQM-304-3 (3)	BMB	Widen

STRUCTURE DATA

27 Year Built 1964 Year Reconstructed 1977: 6477
28 Lanes on Str. 4 under: 0400
31 Design Load: 5
32 Appr. Rdwy. Width w/Sh'ld: 74
33 Br. Median ☐ None ☐ Open ☒ Closed: 2
34 Skew: 00
35 Structure Flared ☐ Yes ☒ No: 0
36 Traffic Features: 1111
37 Historical Significance: 5
38 Navigation Control ☐ Yes ☒ No: 0
39 -Vertical ___ ft.: 000
40 -Horizontal ___ ft.: 0000
41 Open ☒ Posted ☐ Closed ☐: A
42 Type Service: 15
43 Structure Type-Main: 201
44 Structure Type-Approach: 000
45 No. of Spans-Main: 005
46 No. of Spans-Approach: 0000
48 Max. Span Length: 0060
49 Structure Length: 00027 5
50 Sidewalk ___ Lt. ___ Rt.: 00.8 00.8
51 Br. Roadway Width (curb-curb): 074.0
52 Deck Width (out-out): 077.2
53 Vert. Clearance over Deck, (ft.,in.): 9999
54 Underclearance-Vertical, (ft.,in.): 0000
55 -Lateral-Right: 99.9
56 -Lateral-Left: 00.0
57 Wearing Surface Type: Concrete 1
101 Wearing Surface Thickness (in.):
102 Foundation Type: 11
103 Organization Code:
104 Orig. Proj. No.: S-396 (5)
105 Station-Principal Route: 97003 3
106 Bridge Rail Type: Std. conc. barrier 9

PROPOSED IMPROVEMENTS

73 Year Needed:
74 Type of Service:
75 Type of Work:
76 Improvement Length:
77 Design Loading:
78 Roadway Width:
79 Number of Lanes:
80 ADT:
81 Year:
82 Prop. Rdwy Improvement-Year:
83 Prop. Rdwy Improvement-Type:

COST OF IMPROVEMENTS

84 Total cost (other than maint.):
85 Preliminary Engineering Cost:
86 Demolition Cost:
87 Substructure Cost:
88 Superstructure Cost:

IA DEPARTMENT OF TRANSPORTATION

STRUCTURES SECTION

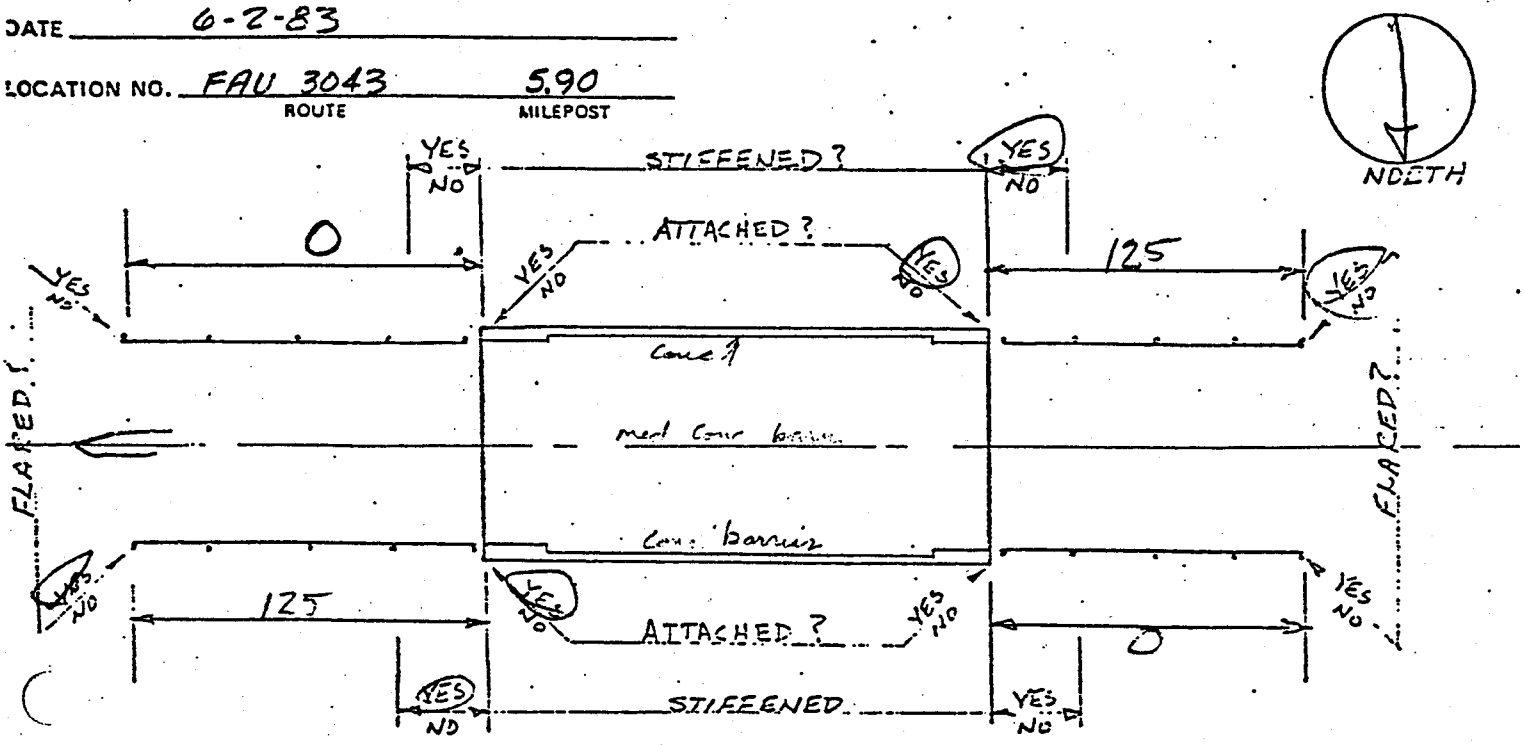
SUPPLEMENTAL PAGE TO BRIDGE INSPECTION REPORT

BRIDGE AND APPROACH RAILING

STRUC NO. 9125 NAME OF STRUCTURE New River Bridge - Bell Road

DATE 6-2-83

LOCATION NO. FAU 3043 (ROUTE) 5.90 (MILEPOST)



BRIDGE RAIL TYPE Conc. barrier

POST SPACING NA

APPROACH RAIL TYPE C-10.01 B

POST SPACING 6'-2" & 3'-1

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STRUCTURES SECTION

SUPPLEMENTAL PAGE TO INSPECTION REPORT

8 STRUCTURE NUMBER 9125

90 DATE 060283 108 INSPECTION NO. 6

① (cont'd.) for reference.

Also, there is a borrow pit in operation downstream from this bridge near the confluence with Skunk Creek. A sign indicates that it may belong to Maricopa County (Maricopa Co. Materials Pit #279). This mining activity will only increase the scour problems.

The City might try to persuade the County to cease excavation here.

If the proposed New River flood control dam is constructed approx. 7 mi. North of this bridge then extensive scour protection may not be necessary, however, at the present time dumped rock might be placed around the pier for interim protection.

Gerald Hagott CEI

Joint openings: East hinge = $1\frac{5}{8}$" - $2\frac{3}{16}$", West hinge = $1\frac{1}{2}$" - $1\frac{7}{8}$"

ARIZONA DEPARTMENT OF TRANSPORTATION
STRUCTURES SECTION
SUPPLEMENTAL PAGE TO BRIDGE INSPECTION REPORT

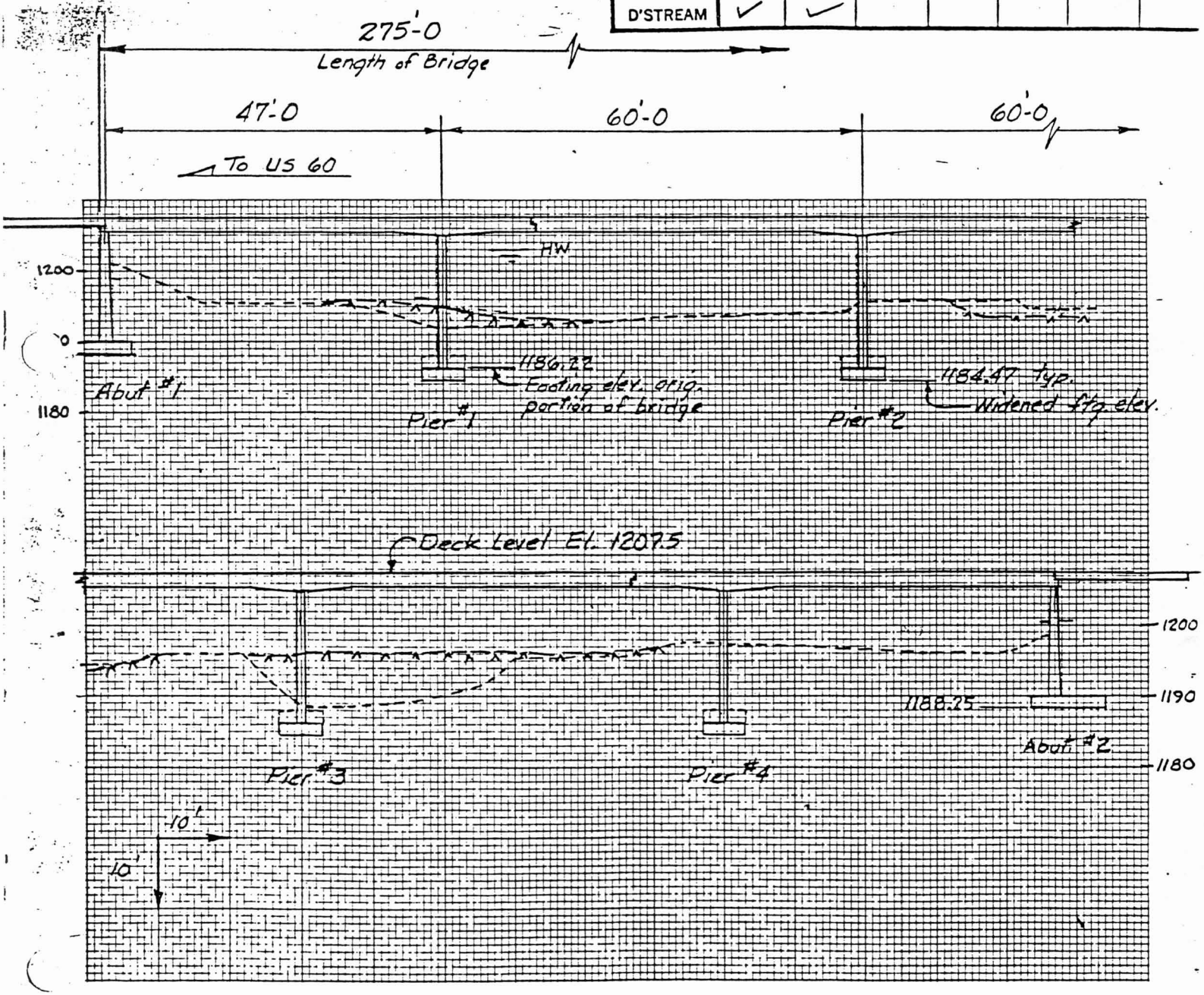
STRUCT NO. 9125

DATE 6-2-83

LOCATION NO. FAU 3043 (ROUTE) 5.90 (MILEPOST)

NAME OF STRUCTURE New River Bridge

INSP. NO.	6	7					
DATE	6-2-83	2-12-85					
INITIAL	GDH	MAR HGR					
SYMBOL	----	—^—^					
UPSTREAM							
D'STREAM	✓	✓					



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STRUCTURES SECTION

BRIDGE INSPECTION REPORT

RECEIVED
DEC 08 1986
PARSONS BRINCKERHOFF

8 STRUCTURE NUMBER 1125 PAGE 1 OF 1

90 DATE 021285 108 INSPECTION NO. 7 INSPECTED BY RUNNER-RUBIO-BUENING

109 STRUCTURE NAME NEW RIVER BRIDGE PRINCIPAL RTE & MP FAU3043 - BELL RD

2 DISTRICT 1 103 ORG AREA PHOENIX 110 SPEC INSP NEXT INSP. DUE - QTR 1 YR. 87

REVISE SI&A: YES ✓ NO 3 COUNTY MARICOPA 013 4 CITY PEORIA 0255

	CONDITION	SEE NOTE NO.
DECK CONDITION: (58) 7		
Deck and/or wearing surface Conc - Minor/medium longit. & pattern cracks - ok	8	
Walks, curbs, median NA	N	
Expansion devices Hinges in Spans #2 & #4 - Openings 1 7/8 & 2" @ ± & ± 70°F	7	①
SUPERSTRUCTURE CONDITION: (59) 8		
Main Members-truss, girders, box girder, frame, slab, etc. 5 spans Cont. void slab - bottom Good	8	
Secondary Members-floor beams, bracing, diaphrams, etc. NA	N	
Bearing Devices-rockers, rollers, pads, etc. NA	N	
Paint on structural steel NA	N	
SUBSTRUCTURE CONDITION: (60) 6		
Abutments Full height - spread ftg. - Good	6	①
Piers, Pile bents, pier walls, etc. On spread ftg. Good	6	②
Wings, dadoes, retaining walls NA	N	
WATERWAY CONDITION: (61) 6		
Bank protection None	N	
Channel Scour at pier #1 & #3 is not apparent this inspection	6	②
ROADWAY - SAFETY CONDITION: (65) 8		
Approaches Conc Approach slab - Overlaid at NW approach - approaches ok	8	
Fills Good	8	
Bridge rail; parapet, barrier Conc - Good	8	
Approach guardrail C10.01B - Good	8	
Lighting NA	8	
Signing Black/white alt. approaches	8	

REMARKS, NOTES, RECOMMENDATIONS:

① Hinges - Both hinges have a slight tilt (3/8"±) on the top plate. This causes a slight to medium impact as traffic rolls across the hinge - ok for now

② Material has either been pushed into the previous noted scour area or the channel has silted in. This does not negate potential problems from scour and its effect on the piers and abuts. It is true that a flood control dam is under construction above this site, however, water will still be released and mining still continues downstream. - Continued p. 3

112 REPAIR PRIORITY 3

Registered Professional Engineer (Civil) CERTIFICATE NO. 5813 HAROLD A. RUNNER Date Signed 2-13-85 ARIZONA, U.S.A.

P.E. SEAL

29 ADT ON 14500 30 YR 85 29 ADT UNDER 30 YR 63 EST. REMAIN LIFE 30 111 POSTED LIMIT

64-4502 C R9/83

8 STRUCTURE NUMBER 9125

108 INSPECTION NO. 7

ITEM 67 - STRUCTURAL CONDITION	ITEM 68 - DECK GEOMETRY
Comments:	Comments: 36' Approach 36' ctoc 14500/2 = 7250 ADT
Appraisal = 8	Appraisal = 8
ITEM 69 - UNDERCLEARANCE	**ITEM 70 - SAFE LOAD CAPACITY**
NA	INV = 23C
Appraisal = N	Appraisal = 8
ITEM 71 - WATERWAY ADEQUACY	**ITEM 72 - APPROACH RDWY ALIGNMENT**
Scour Potential - Spread ftgs. & Mining operation below structure	Tangent
Appraisal = 5	Appraisal = 8

APPRAISAL CODE:

N - NOT APPLICABLE
9 - SUPERIOR TO DESIRABLE CRITERIA
8 - EQUAL TO DESIRABLE CRITERIA
7 - BETTER THAN MIN. CRITERIA
6 - EQUAL TO MIN. CRITERIA
5 - SLIGHTLY BETTER THAN ADEQUATE AS IS
4 - MIN. ADEQUACY TO LEAVE IN SERVICE
3 - BASICALLY INTOLERABLE-HIGH REPAIR PRIORITY
2 - BASICALLY INTOLERABLE-HIGH REPLACEMENT PRIORITY
1 - REPAIR NEEDED TO RESTORE SERVICE
0 - REPLACEMENT NEEDED TO RESTORE SERVICE.

REMARKS:

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STRUCTURES SECTION

SUPPLEMENTAL PAGE TO INSPECTION REPORT

8 STRUCTURE NUMBER 9125

90 DATE 021285 108 INSPECTION NO. 7

(2) Continued.

It is therefore recommended that scour protection be installed at this site. Consideration should be given to the type protection installed on New River at US 60. (Copy enclosed)

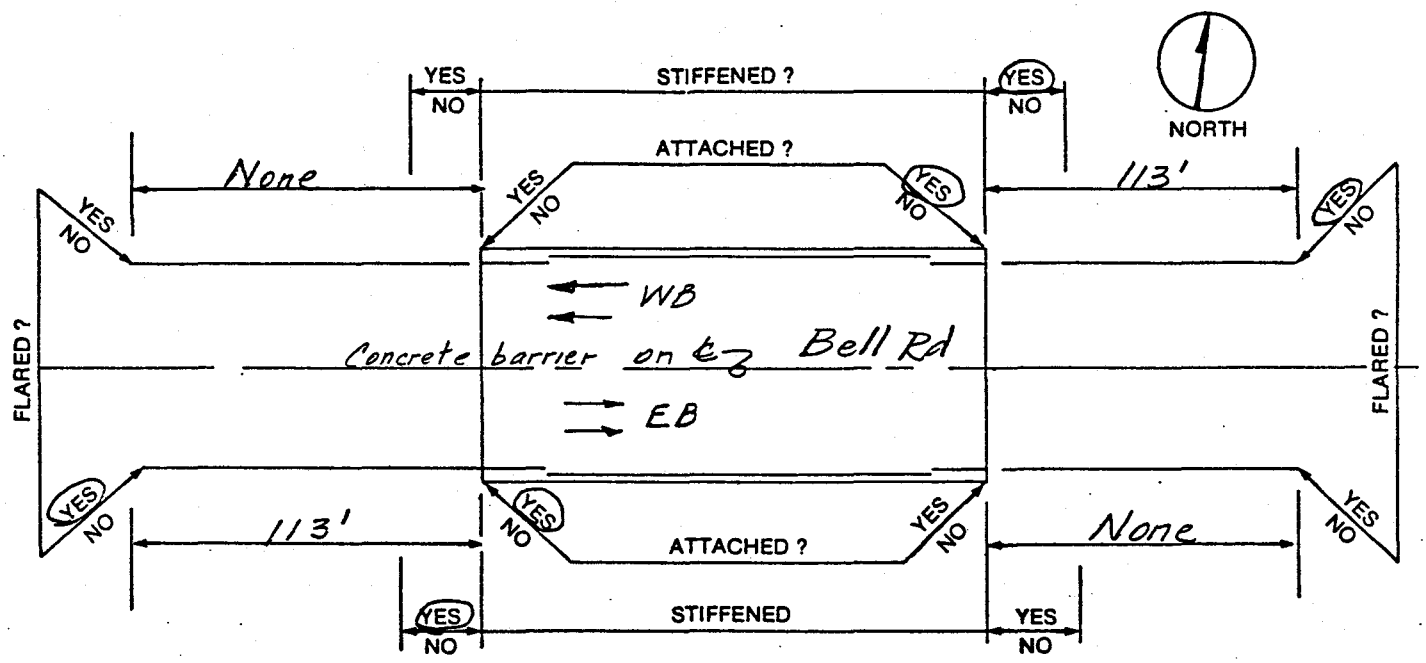
ARIZONA DEPARTMENT OF TRANSPORTATION
STRUCTURES SECTION

SUPPLEMENTAL PAGE TO BRIDGE INSPECTION REPORT
TRAFFIC SAFETY FEATURES - ITEM 36

8 STRUCTURE NUMBER 9125

90 DATE 021285 108 INSPECTION NO. 7 INSPECTED BY Rubio-Runner-Burning

109 STRUCTURE NAME New River Bridge PRINCIPAL RTE & MP FAU3043-Bell Rd



APPRAISAL RATING

0 _____ Feature does not meet currently acceptable standards

1 _____ Feature meets currently acceptable standards

BRIDGE RAILING

Type Conc. barrier

Feature Rating - 1

TRANSITIONS

Stiffened Yes

Attached Yes

Feature Rating - 1

APPROACH GUARDRAIL

Type C10.01B

Feature Rating - 1

APPROACH GUARDRAIL TERMINAL

Flared Yes

Feature Rating - 1

64-0402 10-83

Burgess & Niple, Inc.
Engineers and Architects
5025 East Washington Street • Suite 212 • Phoenix, AZ 85034 • (602) 244-8100

RECEIVED
JUL 28 1988
PARSONS BRINCKERHOFF

July 26, 1988 7069

Mr. David Healey, P.E.
Parsons, Brinkerhoff, Quade and Douglas
1232 East Broadway, Suite 120
Tempe, AZ 85282

Re: Project No. 68545
Bell Road Bridge Widening

Dear Mr. Healey:

This letter report describes the inspection we performed on the Bell Road bridge over New River. We offer the following narrative to supplement the attached bridge inspection report.

1. DECK - Overall condition of the deck is fair.

   The deck and monolithic concrete wearing surface are in good condition. There is minor surface cracking, particularly transverse negative moment cracks over all piers in the original northern portion of the bridge. None of the cracks are structurally significant.

   Expansion devices are in generally fair condition. Haunches forming expansion hinges have up to 1/16-inch wide by 12-inch long cracks at a 30-40 degree angle emanating from reentrant corners at the west hinge between piers 1 and 2. Previous reports do not mention these cracks; however, subsequent queries turned up knowledge of their existence as early as December, 1984. This pattern indicates shear cracks due to an overload at some time in the past, possibly by differential settlement of piers, and results in a load capacity of less than the original design. Our research has led us to believe that no significant change in the crack has occurred since before December 1984. This would indicate that the apparent cause has ceased. We recommend that this area be watched for future changes and that the hinges be evaluated during the widening project for strengthening as may be required to meet current AASHTO specifications.

   End dams for sliding plate expansions joints have debonded from the concrete. We recommend that the end dams be resecured to the concrete by epoxy injection as part of the bridge widening project.

2. **SUPERSTRUCTURE** - The superstructure is in good condition. It has minor transverse negative moment cracks in the top of the deck, but none of structural significance. The bottom of the deck is good.

3. **SUBSTRUCTURE** - The substructure is in generally fair condition due to scour and scour potential.

   Amount of earth that has been disturbed makes it difficult to evaluate the scour problem at this inspection that was noted in previous inspection reports. Scour protection for spread footings is necessary due to stream bed degradation.

   Concrete is generally good with evidence of a minor problem at the northwest abutment bridge seat. A prior repair of the area has failed. We recommend that this area be repaired with the bridge widening project.

4. **WATERWAY** - The waterway is in fair condition due to past and potential scour problems. Some brush is growing in the wide channel, but not to the extent of causing significant flow limitations.

5. **ROADWAY SAFETY** - Roadway safety is in good condition. A few minor gouges in the concrete barriers are noted.

If you have any questions, please call me.

Sincerely,

BURGESS & NIPLE, INC.

James E. Mischler

James E. Mischler, P.E.
Project Manager

JEM:dk

Attachments

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ARIZONA DEPARTMENT OF TRANSPORTATION
STRUCTURES SECTION

BRIDGE INSPECTION REPORT

8 STRUCTURE NUMBER 9125 PAGE 1 OF 3

90 DATE 060688 108 INSPECTED BY FLOYD OLIVER, JR., P.E.

109 STRUCTURE NAME NEW RIVER BRIDGE PRINCIPAL RTE. & MP. BELL RD.

2 DISTRICT 01 103 ORG AREA PHOENIX 110 SPEC. INSP. NEXT INSP. DUE - QTR. YR.

3 COUNTY MARICOPA 013 4 CITY PEORIA 0255

CONDITION	COND. RTG.	SEE NOTE
DECK: GOOD (58) 6		
Deck and/or wearing surface CONC. - MINOR RANDOM LONG. & TRANSVERSE CRACKS	8	
Sidewalks, curbs, median N/A	N/A	
Expansion joints HINGES IN SPANS 2 & 4 - OPNGS. 2.3" & 1.1" @ 100°F	5	(1)
SUPERSTRUCTURE: (59) 8		
Main members 5-SPAN CONT. VOID. SLAB. BOTTOM GOOD	8	
Bracing, diaphragms, etc. N/A	N/A	
Bearing devices PADS SEEM OK	N/A	
SUBSTRUCTURE: (60) 5		
Abutments FULL HT. ON SPREAD FTGS. - GOOD. Some Cracking NW Corner	5	(2)(3)
Piers PIER WALLS ON SPREAD FTGS. - GOOD	5	(2)
Wingwalls, Dadoes, Retaining Walls, etc. GOOD	8	
WATERWAY: (61) 6		
Bank Protection NONE		
Channel SCOUR AT PIER #1 AND PIER #3 AS REPORTED IN 1983 NOT NOW APPARENT -	6	(2)
ROADWAY - SAFETY: (65) 8		
Approaches CONC. APPROACHES ARE OVERLAYED - OK	8	
Fills GOOD	8	
Bridge rail, Parapet, Barrier CONC. RAIL - GOUGE IN NW END, OK REST & MEDIAN - GOUGE IN EAST END, OK OTHERWISE	8	
Approach guardrail / barrier GOOD	8	
Lighting N/A		
Signing BLACK & WHITE DIAG. - GOOD	8	

REMARKS, NOTES, RECOMMENDATIONS:

(1) WEST HINGE - has shear crack (apparently inactive) at reentrant corner 12" long, 1/16" ± wide, north side, hairline on south side. Should continue to monitor. Some stains below crack. (See SK-1)

(2) Material has been placed over footings so actual erosion or scour is difficult to determine. Scour is still potential problem. Scour protection still needed.

(3) Shear cracking at NW Corner. Cosmetic repair has failed. Crack has come thru. See SK-2

112 REPAIR PRIORITY 1

21296 FLOYD L. OLIVER JR. DATE SIGNED 7/7/88 ARIZONA U.S.A.

Floyd Oliver P.E. SEAL

29 ADT ON 14500 30 YR 85 29 ADT UNDER 30 YR 63 EST. REMAIN LIFE 30 111 POSTED LIMIT

64-4502 C R6 87

F.L.D., P.E.

8 STRUCTURE NO. 9125 108 INSPECTION NO. ____

APPRAISAL

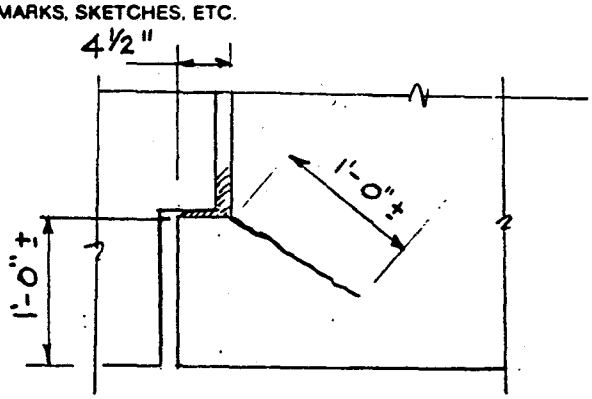
STRUCTURAL CONDITION	DECK GEOMETRY	UNDERCLEARANCES
67 [7] Shear crack at west hinge.	68 [8]	69 [N/A] N/A
SAFE LOAD CAPACITY	**WATERWAY ADEQUACY**	**APPROACH RDWY. ALIGNMENT**
70 [7] Shear crack in west hinge.	71 [5] Scour potential has not been corrected yet. Correct during bridge widening project.	72 [8] Tangent

APPRAISAL CODE:

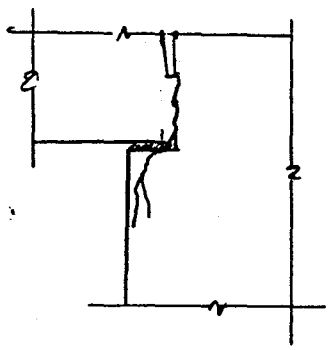
N - NOT APPLICABLE
9 - SUPERIOR TO DESIRABLE CRITERIA
8 - EQUAL TO DESIRABLE CRITERIA
7 - BETTER THAN MIN CRITERIA
6 - EQUAL TO MIN CRITERIA
5 - SLIGHTLY BETTER THAN ADEQUATE AS IS
4 - MIN. ADEQUACY TO LEAVE IN SERVICE
3 - BASICALLY INTOLERABLE-HIGH REPAIR PRIORITY
2 - BASICALLY INTOLERABLE-HIGH REPLACEMENT PRIORITY
1 - REPAIR NEEDED TO RESTORE SERVICE
0 - REPLACEMENT NEEDED TO RESTORE SERVICE

APPRAISAL REMARKS:

REMARKS, SKETCHES, ETC.



SK-1
WEST HINGE



SK-2
NORTHWEST CORNER

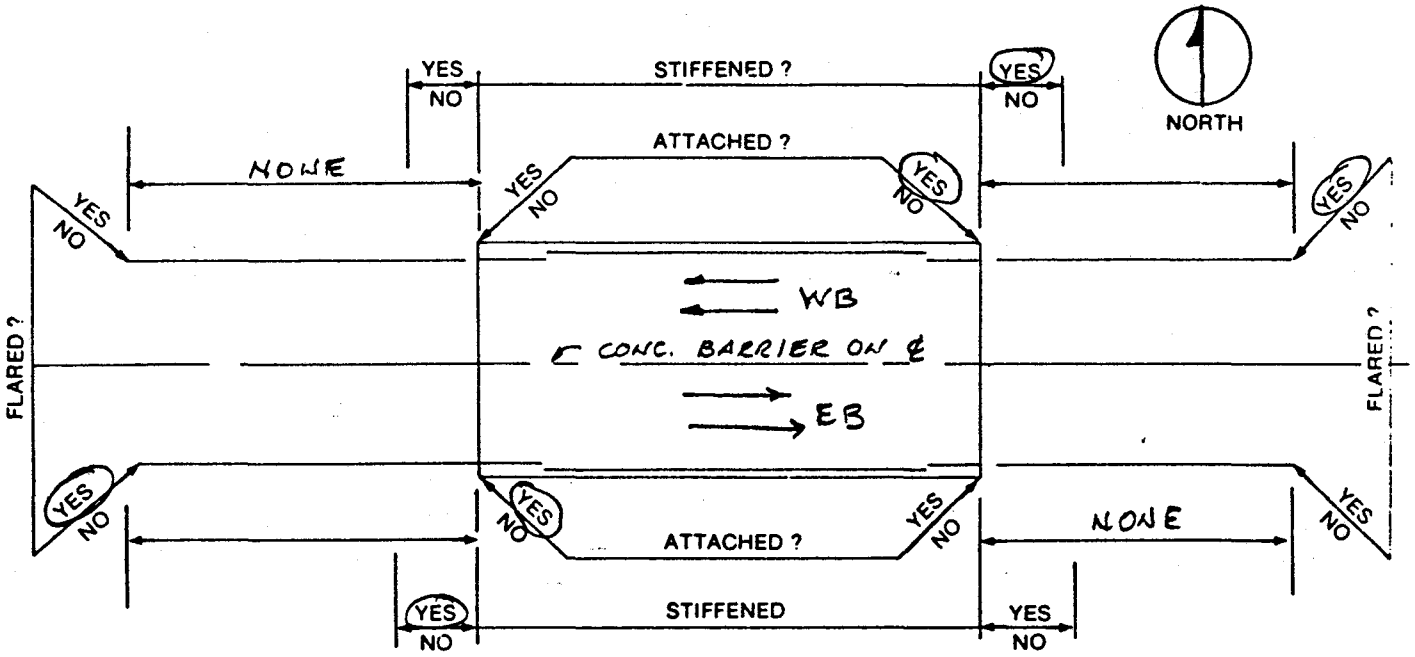
ARIZONA DEPARTMENT OF TRANSPORTATION
STRUCTURES SECTION

SUPPLEMENTAL PAGE TO BRIDGE INSPECTION REPORT
TRAFFIC SAFETY FEATURES - ITEM 36

8 STRUCTURE NUMBER 9125

90 DATE 060688 108 INSPECTION NO. INSPECTED BY FLOYD OLIVER

109 STRUCTURE NAME NEW RIVER BRIDGE PRINCIPAL RTE & MP BELL RD.



APPRAISAL RATING

0 _____ Feature does not meet currently acceptable standards

1 _____ Feature meets currently acceptable standards

BRIDGE RAILING

Type CONC. SAFETY SHAPE

Feature Rating - 1

TRANSITIONS

Stiffened YES

Attached YES

Feature Rating - 1

APPROACH GUARDRAIL

Type C10.01B

Feature Rating - 1

APPROACH GUARDRAIL TERMINAL

Flared YES

Feature Rating - 1