

BRIDGE SELECTION STUDY

NORTHERN AVENUE BRIDGE OVER THE NEW RIVER

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Phoenix, AZ 85009

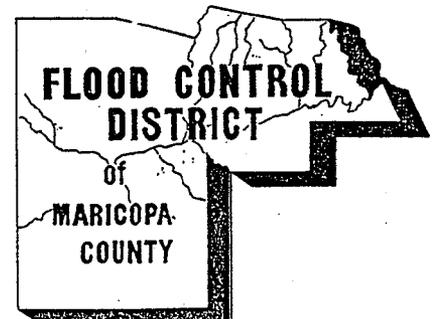
CONTRACT NO. FCD 89-04



BRW, INC.
2700 NORTH CENTRAL AVENUE, SUITE 1000, PHOENIX, AZ 85004

PLANNING
TRANSPORTATION
ENGINEERING
URBAN DESIGN

FLOOD CONTROL DISTRICT RECEIVED		
OCT 10 1989		
CH ENG	P & PM	
DEP	HYDRO	
ADMIN	LMGT	
FINANCE	FILE	
C & O		1 RWS
ENGR		
REMARKS		





PLANNING
TRANSPORTATION
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URBAN DESIGN

BRW, INC.

2700 NORTH CENTRAL AVENUE

SUITE 1000

PHOENIX, ARIZONA 85004

PHONE: 602/234-1591 FAX: 602/230-9189

10 October 1989

Mr. Nicholas P. Karen, P.E.
Chief, Engineering Division
Flood Control District of Maricopa County
3335 West Durango Street
Phoenix, Arizona 85009

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Re: Contract FCD 89-04
Northern Avenue Bridge at New River -
Preliminary Estimate, Bridge Type Selection,
and First Draft Engineering Plans

Dear Mr. Karen:

Three copies of our preliminary budget estimate and Bridge Type Selection on this project are enclosed for your review.

Summary sheets containing the cost estimate, pertinent considerations and our recommended structure type are included along with the criteria used for the study.

The estimates for each alternative were developed from preliminary designs completed to the accuracy and extent to optimize the structure type and configuration at the site.

Four copies of the full-size preliminary bridge plan and profile, bridge cross-section, foundation data sheet, roadway plan and profile, roadway typical section and soil-cement bank protection plan are included as a part of this 30 percent completion submittal. Three copies of survey notes and drawings, draft geotechnical report and draft scour analysis are also included for review by District.

Please advise if further information or additional information is required.

Sincerely,
BRW, Inc.

Lee O. Arnold
Project Manager

Enclosure

LCA/lb
DONALD W. RINGROSE
DONALD E. HUNT

RICHARD P. WOLSFELD
JOHN B. McNAMARA

PETER E. JARVIS
RICHARD D. PILGRIM

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CRAIG A. AMUNDSEN
RALPH C. BLUM

PHOENIX

TUCSON

MINNEAPOLIS

DENVER

ST. PETERSBURG

**Northern Avenue Bridge Selection Study
Design and Estimating Criteria**

- * Preliminary structural design performed for both alternates.
- * Cost estimates computed from estimated quantities X units prices.
- * Scour Depth assumed to be 20 feet, scour analysis is not completed at time of this study.
- * Depth of drilled shafts determined from preliminary end bearing values in conjunction with geotechnical investigation. Minimum elevations for base of drilled shafts as follows:
 - 4 Space Configuration:
 - Abutments: Elevation 1,003
 - Piers : Elevation 998
 - 3 Span Configuration:
 - Abutments: Elevation 998
 - Piers : Elevation 993
- * Unit prices used as determined for ADOT Project, East Papago Freeway Design segment 3 designed by BRW, Inc.
- * The cost of utility relocation and New River channelization are independent of the type of bridge and are not included in this study.
- * The profile grade for each alternative determined according to AASHTO design criteria with a design speed of 55 mph.

Northern Avenue Bridge
Over the New River
MCFCD Contract No. FCD 89-04

Summary

Bridge Selection Study

<u>Type/Configuration</u>	<u>Depth</u>	<u>Cost Estimate</u>	<u>%</u>
4 Spans @ 97'-0" AASHTO Modified Type V Prestressed Girders	6'-2"	\$1,369,623.00	-
3 Spans @ 129'-4" AASHTO Modified Type VI Prestressed Girders	6'-11"	\$1,482,404.00	+8%

Considerations

4 Span

less costly

3 Span

-

Recommendations: 4 - Span: AASHTO Modified Type V Girders.

Estimate of Probable Construction Costs
Northern Avenue
Over the New River

AASHTO Modified Type V Girders
4-97 Feet Spans

Item No	Item Description	Approx. Quantity	Unit	Unit Price	Total Cost
1	Structural Concrete $f'_c = 4,500$ (D.N.I. Girders)	1,610	CY	\$200.00	\$ 322,000
2	Structural Concrete $f'_c = 4,000$ (D.N.I. Shafts)	92	CY	\$180.00	\$ 16,560
3	Structural Concrete $f'_c = 3,000$	161	CY	\$180.00	\$ 28,980
4	AASHTO Modified Type V Girders	3,465	LF	\$ 95.00	\$ 329,175
5	Drilled Shafts (72 inches)	924	LF	\$275.00	\$ 254,100
6	Reinforcing Steel (D.N.I. Girders)	546,880	LB	\$ 0.35	\$ 191,408
7	Earthwork	19,350	CY	\$ 4.00	\$ 77,400
8	Approach Roadway	3,350	SY	\$ 32.00	\$ 107,200
9	Pedestrian Railing	856	LF	\$ 50.00	\$ 42,800
	Total				\$1,369,623

Does not include:

- New River Channelization
- Utility Relocation
- Mobilization
- Engineering
- Contingencies
- Bearings
- Expansion Joints
- Structure Backfill

Deck Area = 31,899 square feet
Cost = \$42.94/square foot

Estimate of Probable Construction Costs
Northern Avenue
Over the New River

AASHTO Modified Type VI Girders
3-129' - 4" Spans

Item No	Item Description	Approx. Quantity	Unit	Unit Price	Total Cost
1	Structural Concrete $f'_c = 4,500$ (D.N.I. Girders)	1,510	CY	\$200.00	\$ 302,000
2	Structural Concrete $f'_c = 4,000$ (D.N.I. Shafts)	82	CY	\$180.00	\$ 14,760
3	Structural Concrete $f'_c = 3,000$	161	CY	\$180.00	\$ 28,980
4	AASHTO Modified Type VI Girders	4,248	LF	\$100.00	\$ 424,800
5	Drilled Shafts (72 inches)	934	LF	\$275.00	\$ 256,850
6	Reinforcing Steel (D.N.I. Girders)	537,240	LB	\$ 0.35	\$ 188,034
7	Earthwork	25,525	CY	\$ 4.00	\$ 102,100
8	Approach Roadway	3,815	SY	\$ 32.00	\$ 122,080
9	Pedestrian Railing	856	LF	\$ 50.00	\$ 42,800
	Total				\$1,482,404

Does not include:

- New River Channelization
- Utility Relocation
- Mobilization
- Engineering
- Contingencies
- Bearings
- Expansion Joints
- Structure Backfill

Deck Area = 31,899 square feet
Cost = \$46.47/square foot