

Construction in the Yard Cost Study



4th Street Bridge over the Arkansas River
 SH96A Pueblo Colorado
 Project Number BR-0961-008 (13141)

CONSTRUCTION SCHEDULE

Match Existing Railroad With Modified River Spans
 Option: Precast Spliced Bulb-T

Element	Time Frame	<u>QUANTITY</u> <u>Of Elements</u>	<u>Days</u>	<u>Unit Cost</u>	<u>Cost</u>
Flagger Costs					
<i>In Yard</i>					
Drilled Shafts	1 Drilled Shaft per Day	20	20.00	\$1,000	\$20,000
Footings	1 Week per Footing	10	50.00	\$1,000	\$50,000
Entire Portal Frame	1 Month per Bent	5	150.00	\$1,000	\$150,000
Girders	4 Pieces of Girder per Day	66	16.50	\$1,000	\$16,500
		Total	236.50		
<i>Above Yard</i>					
Deck	140' Span Cast per Week	556	20.00	\$1,000	\$20,000
		Total	256.50		
				Total	\$256,500

R.R. Crossing Costs	<u>QUANTITY</u>	<u>Unit Cost</u>	<u>Cost</u>
Temporary Crossings Required	21	\$15,000	\$315,000
Improved Crossings Required	9	\$10,000	\$90,000
Additional Temporary Crossings Required (for Crane Movement)	48	\$15,000	\$720,000
		Total	\$1,125,000

Track Block Days	<u>Tracks Blocked</u>	<u>Days</u>	<u>Unit Cost</u>	<u>Cost</u>
Stage 1: Substructure Construction				
Drilled Shafts	7	4	\$3,000	\$84,000
Footings	7	10	\$3,000	\$210,000
Entire Portal Frame	7	30	\$3,000	\$630,000
			Subtotal	\$924,000
Superstructure Erection				
Stage 2	16	2.75	\$3,000	\$132,000
Stage 3	13	2.75	\$3,000	\$107,250
Stage 4	14	2.75	\$3,000	\$115,500
Stage 5	4	1.00	\$3,000	\$12,000
Stage 6	4	2.75	\$3,000	\$33,000
Stage 7	2	2.75	\$3,000	\$16,500
			Subtotal	\$416,250
			Total	\$1,340,250
			TOTAL COST	\$2,721,750



4th Street Bridge over the Arkansas River
 SH96A Pueblo Colorado
 Project Number BR-0961-008 (13141)

CONSTRUCTION SCHEDULE

Match Existing Railroad With Modified River Spans

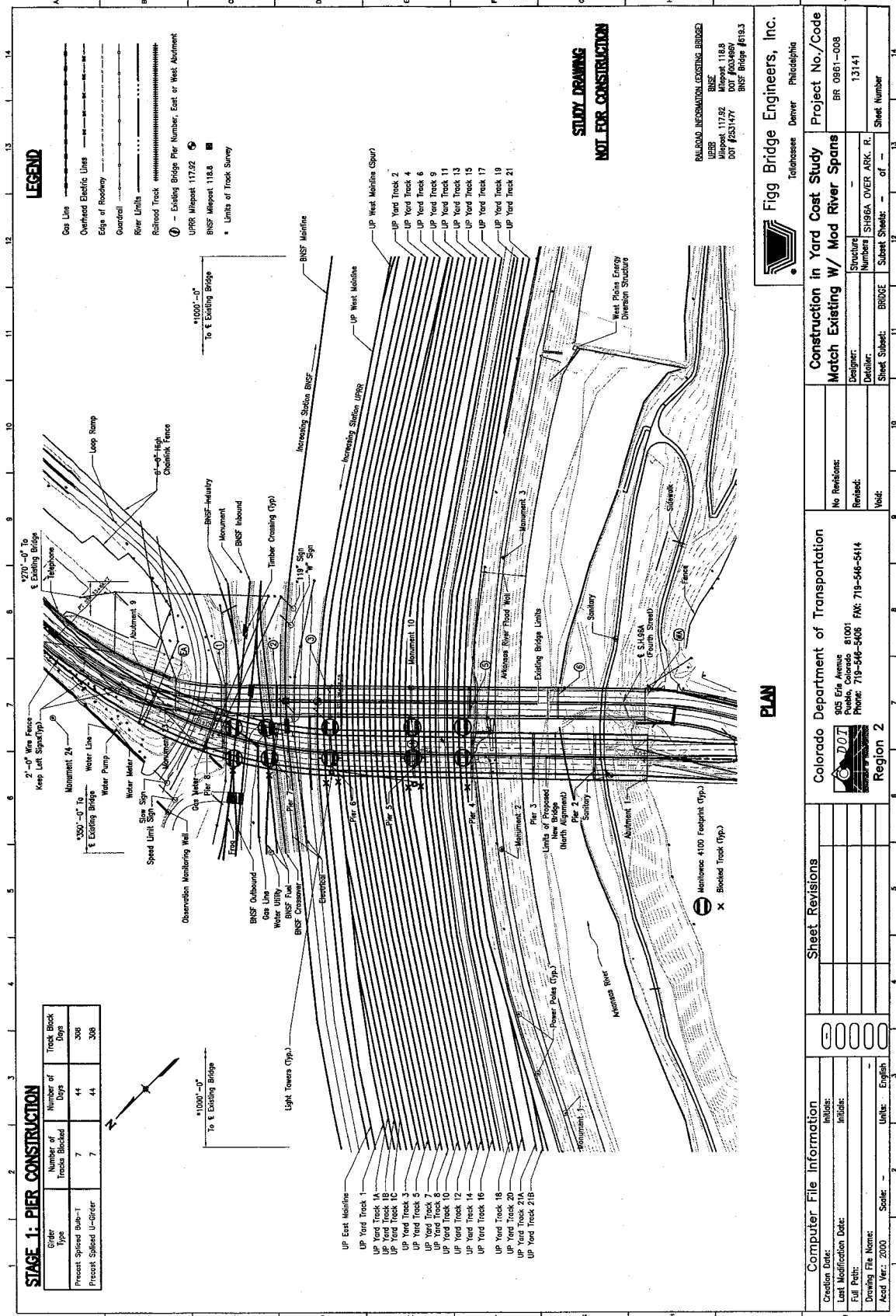
Option: Precast Spliced U-Girder

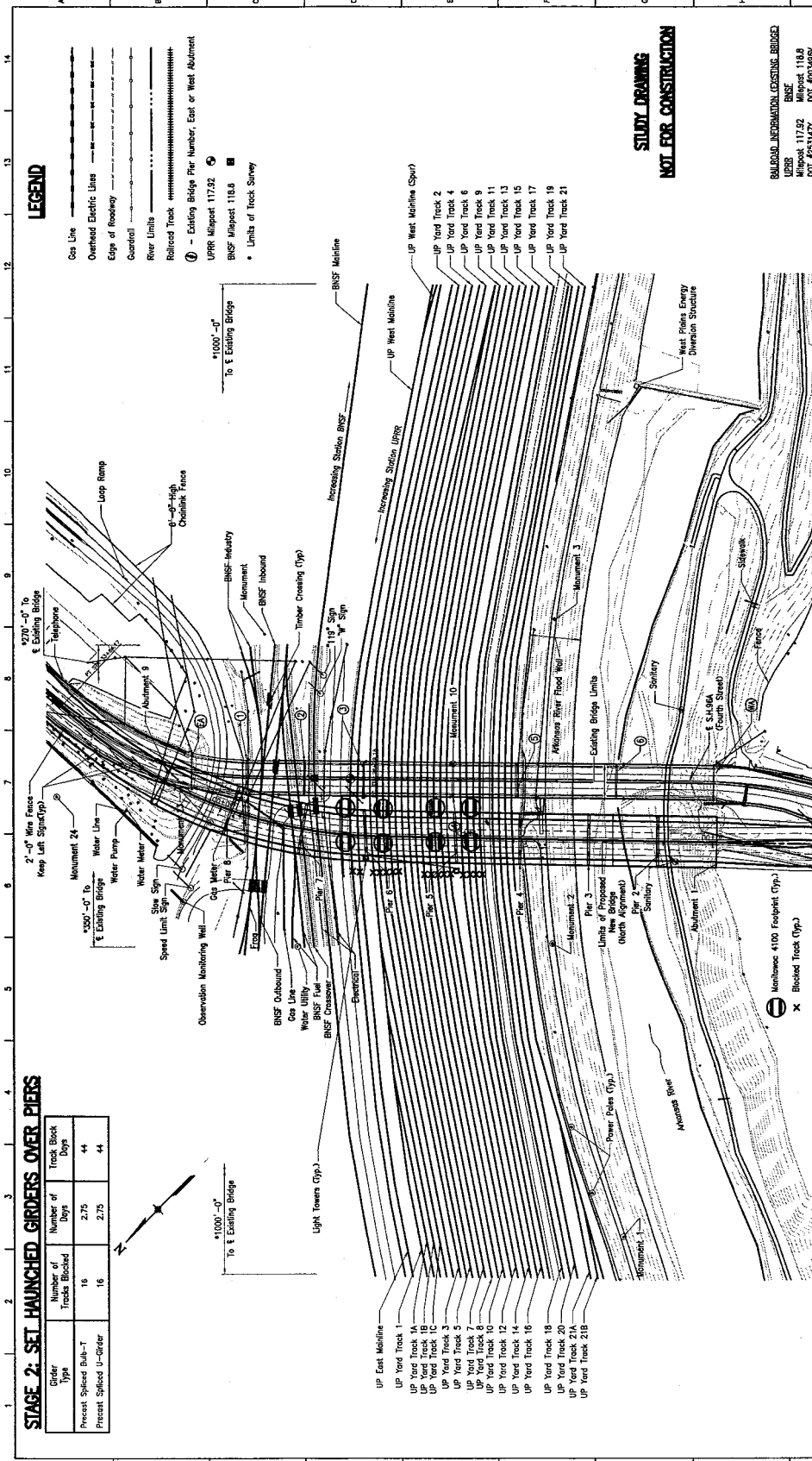
Element	Time Frame	<u>QUANTITY Of Elements</u>	<u>Days</u>	<u>Unit Cost</u>	<u>Cost</u>
Flagger Costs					
<i>In Yard</i>					
Drilled Shafts	1 Drilled Shaft per Day	20	20.00	\$1,000	\$20,000
Footings	1 Week per Footing	10	50.00	\$1,000	\$50,000
Entire Portal Frame	1 Month per Bent	5	150.00	\$1,000	\$150,000
Girders	4 Pieces of Girder per Day	36	9.00	\$1,000	\$9,000
		Total	229.00		
<i>Above Yard</i>					
Deck	140' Span Cast per Week	556	20.00	\$1,000	\$20,000
		Total	249.00		
				Total	\$249,000

R.R. Crossing Costs	<u>QUANTITY</u>	<u>Unit Cost</u>	<u>Cost</u>
Temporary Crossings Required	21	\$15,000	\$315,000
Improved Crossings Required	9	\$10,000	\$90,000
Additional Temporary Crossings Required (for Crane Movement)	48	\$15,000	\$720,000
		Total	\$1,125,000

Track Block Days	<u>Tracks Blocked</u>	<u>Days</u>	<u>Unit Cost</u>	<u>Cost</u>
Stage 1: Substructure Construction				
Drilled Shafts	7	4	\$3,000	\$84,000
Footings	7	10	\$3,000	\$210,000
Entire Portal Frame	7	30	\$3,000	\$630,000
			Subtotal	\$924,000
Superstructure Erection				
Stage 2	16	2.75	\$3,000	\$132,000
Stage 3	13	2.75	\$3,000	\$107,250
Stage 4	14	2.75	\$3,000	\$115,500
Stage 5	4	1.00	\$3,000	\$12,000
Stage 6	4	2.75	\$3,000	\$33,000
Stage 7	2	2.75	\$3,000	\$16,500
			Subtotal	\$416,250
			Total	\$1,340,250
			TOTAL COST	\$2,714,250







Figg Bridge Engineers, Inc.
Tallahassee Denver Philadelphia

Colorado Department of Transportation
855 E 4th Avenue
Denver, Colorado 80001
Phone: 719-546-5408 FAX: 719-546-5414

Region 2

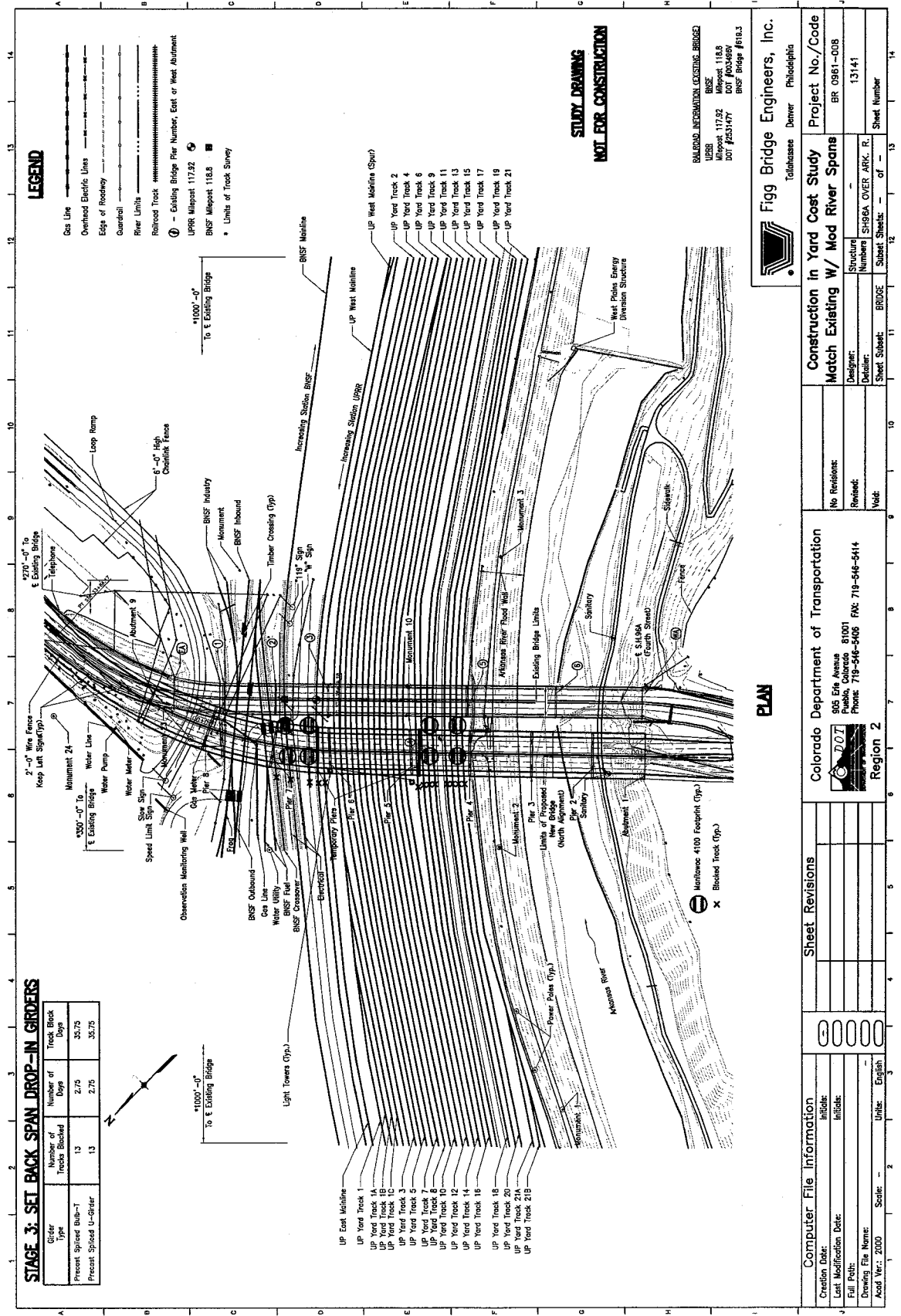
Computer File Information

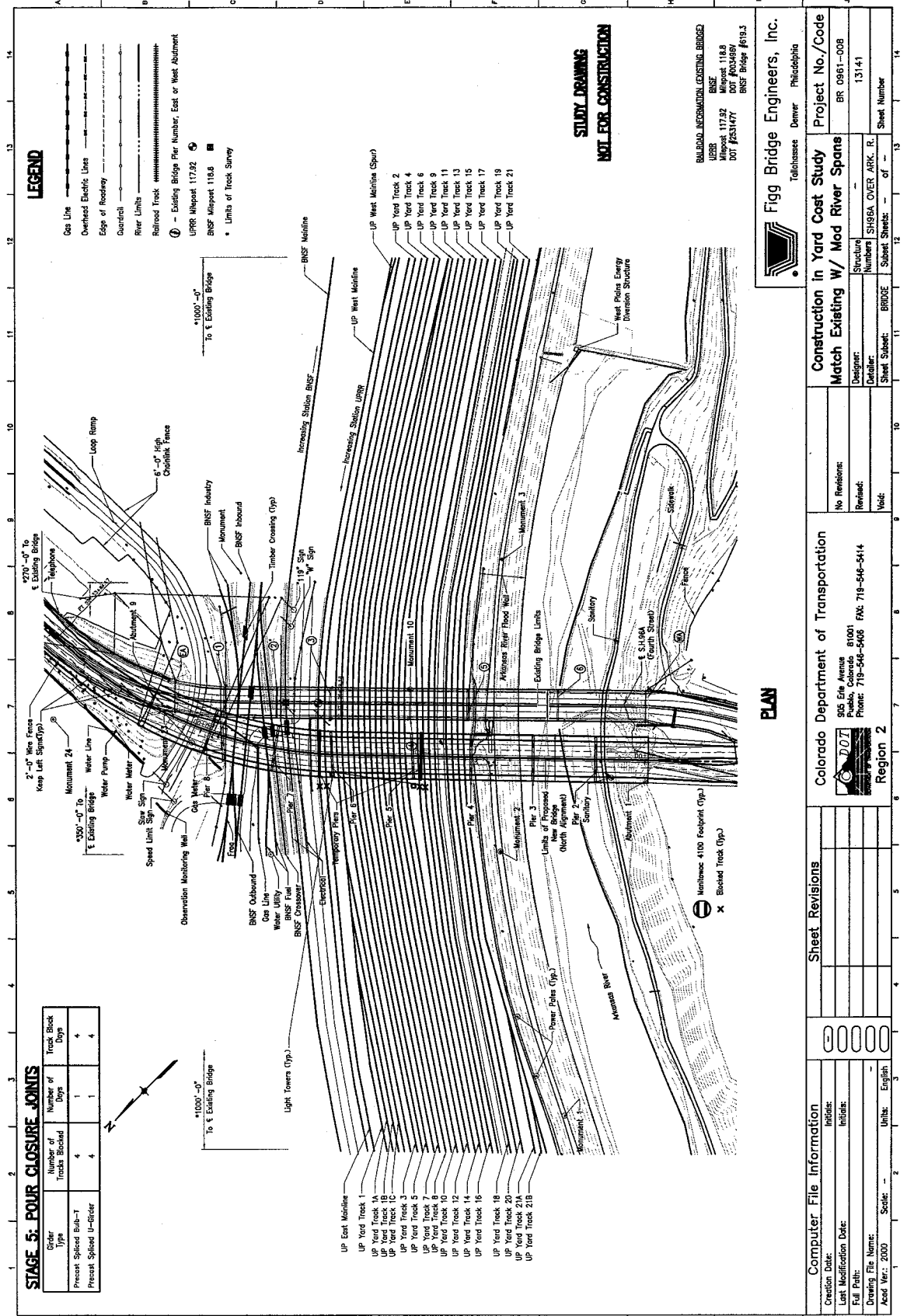
Sheet Revisions

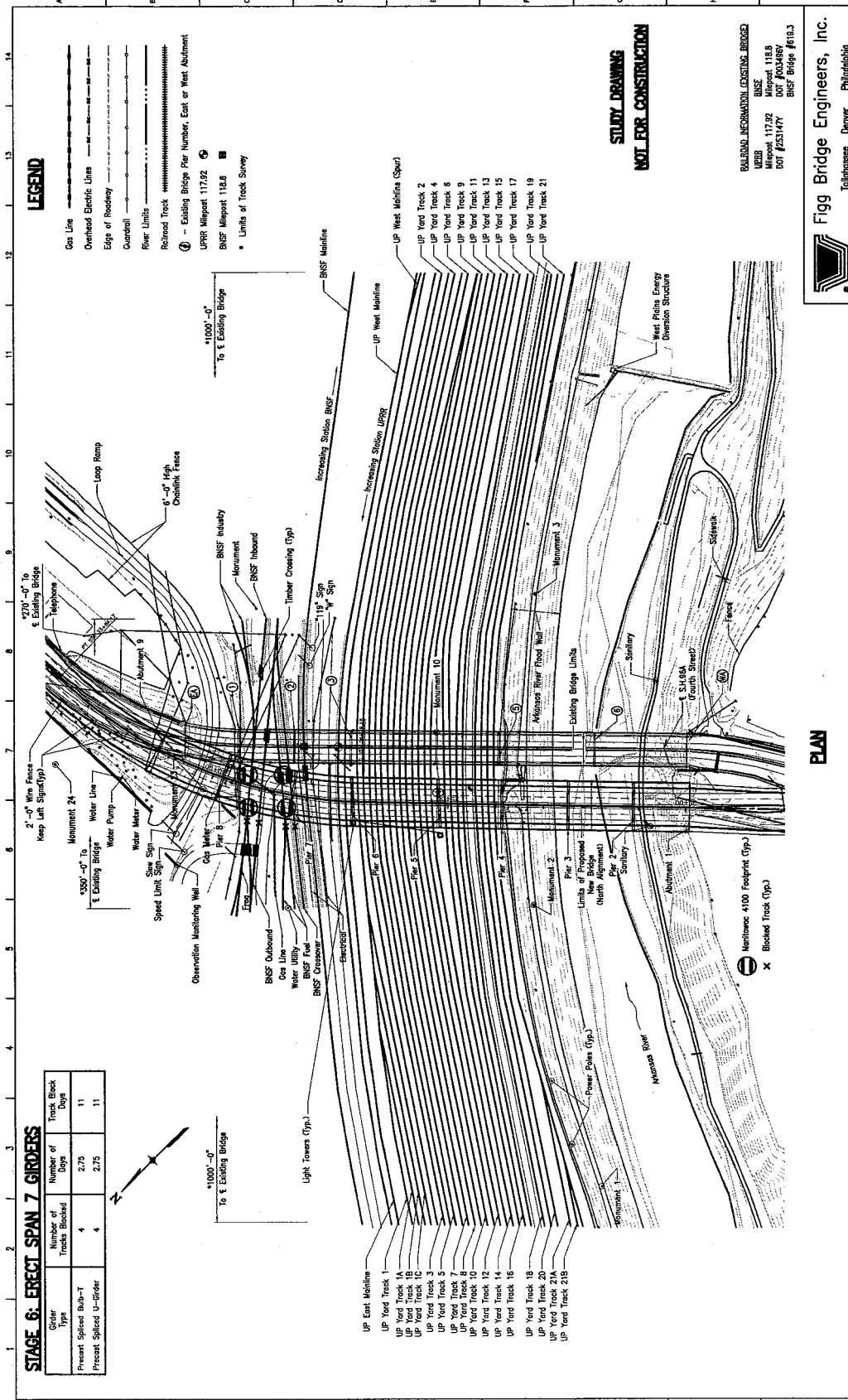
Construction in Yard Cost Study
Match Existing w/ Mod River Spans

Project No./Code
BR 0981-008

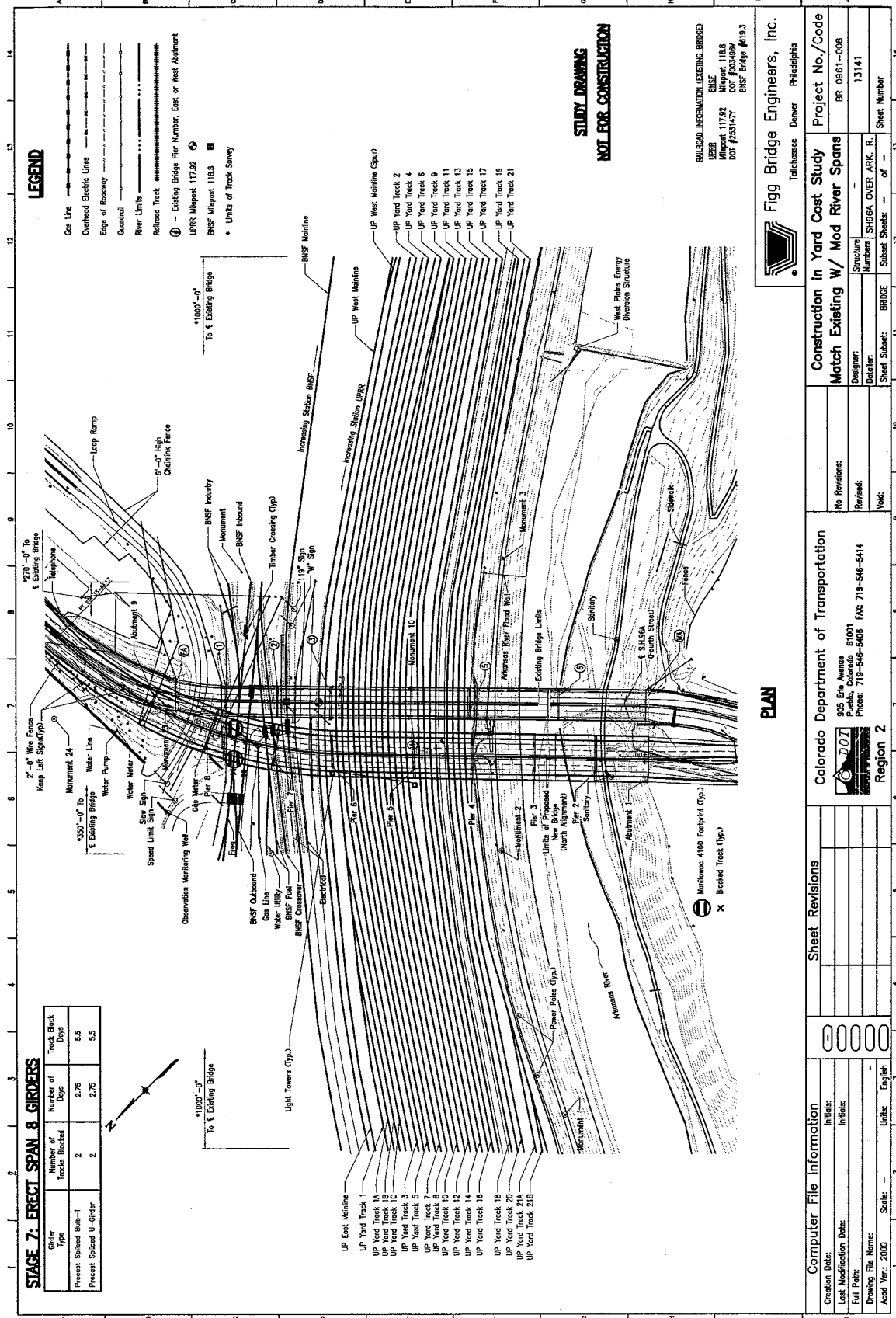
Design: 13141
Structure Number: SH88A OVER ARK. R.
Detailer: -
Sheet Subject: BRIDGE
Subst Sheets: - of -
Sheet Number







Computer File Information		Sheet Revisions		Colorado Department of Transportation		Construction in Yard Cost Study	
Creation Date:	Initials:			305 E. 9th Avenue, Suite 81001, Denver, CO 80202		Project No./Code	
Last Modification Date:	Initials:			Phone: 719-546-5008 FAX: 719-546-5014		BR 0981-008	
Full Path:				Region 2		Structure Number	
Drawing File Name:						SHSBA OVER ARK. R. 13141	
Acad Ver.: 2000	Scale: - 2					Sheet Subst: BRIDGE	
						Sheet Number	
						of -	
						13	
						14	




STAGE 7: ERECT SPAN & GIRDERS

Girder Type	Number of Trusses Blocked	Number of Days	Track Block Days
Present Spread Blw-1	2	2.75	5.5
Present Spread U-Girder	2	2.75	5.5

Computer File Information	
Creation Date:	Inch: -
Last Modification Date:	Inch: -
Full Path:	-
Drawing File Name:	Unit: English
Acad Ver.: 2000	Scale: -

Sheet Revisions	

Colorado Department of Transportation
 905 E. Ave. Ave. #1001
 Phone: 719-546-5408 FAX: 719-546-5414

Region 2

Construction in Yard Cost Study	
Match Existing w/ Mod River Spans	Project No./Code
	BR 0961-008
	13141
	SH96A OVER ARK. R.
	Sheet No. of
	Sheet No. of

Figg Bridge Engineers, Inc.
 Tallahassee Denver Philadelphia
STUDY DRAWING
NOT FOR CONSTRUCTION
 RAILROAD INFORMATION EXISTING BRIDGE
 UPRR Milepost 117.92
 BNSF Milepost 118.8
 DOT #0034889
 DOT #231477
 BNSF Bridge #619.3

4th Street Bridge over the Arkansas River
 SH96A Pueblo Colorado
 Project Number BR-0961-008 (13141)

CONSTRUCTION SCHEDULE

Moderate Span Layout 2
 Option: Steel Plate Girder

Element	Time Frame	<u>QUANTITY</u> <u>Of Elements</u>	<u>Days</u>	<u>Unit Cost</u>	<u>Cost</u>
Flagger Costs					
<i>In Yard</i>					
Drilled Shafts	1 Drilled Shaft per Day	16	16.00	\$1,000	\$16,000
Footings	1 Week per Footing	8	40.00	\$1,000	\$40,000
Entire Portal Frame	1 Month per Bent	4	120.00	\$1,000	\$120,000
Girders	4 Pieces of Girder per Day	60	15.00	\$1,000	\$15,000
		Total	191.00		
<i>Above Yard</i>					
Deck	140' Span Cast per Week	579	21.00	\$1,000	\$21,000
		Total	212.00		

Total \$212,000

R.R. Crossing Costs

	<u>QUANTITY</u>	<u>Unit Cost</u>	<u>Cost</u>
Temporary Crossings Required	17	\$15,000	\$255,000
Improved Crossings Required	7	\$10,000	\$70,000
Additional Temporary Crossings Required (for Crane Movement)	36	\$15,000	\$540,000
	Total		\$865,000

Track Block Days

	<u>Tracks Blocked</u>	<u>Days</u>	<u>Unit Cost</u>	<u>Cost</u>
Stage 1: Substructure Construction				
Drilled Shafts	4	4	\$3,000	\$48,000
Footings	4	10	\$3,000	\$120,000
Entire Portal Frame	4	30	\$3,000	\$360,000
			Subtotal	\$528,000
Superstructure Erection				
Stage 2	6	2.75	\$3,000	\$49,500
Stage 3	19	2.75	\$3,000	\$156,750
Stage 4	17	2.75	\$3,000	\$140,250
			Subtotal	\$346,500
			Total	\$874,500

TOTAL COST \$1,951,500



4th Street Bridge over the Arkansas River
 SH96A Pueblo Colorado
 Project Number BR-0961-008 (13141)

CONSTRUCTION SCHEDULE

Moderate Span Layout 2
 Option: Steel Box Girder

Element	Time Frame	<u>QUANTITY</u> <u>Of Elements</u>	<u>Days</u>	<u>Unit Cost</u>	<u>Cost</u>
Flagger Costs					
<i>In Yard</i>					
Drilled Shafts	1 Drilled Shaft per Day	16	16.00	\$1,000	\$16,000
Footings	1 Week per Footing	8	40.00	\$1,000	\$40,000
Entire Portal Frame	1 Month per Bent	4	120.00	\$1,000	\$120,000
Girders	4 Pieces of Girder per Day	30	7.50	\$1,000	\$7,500
		Total	183.50		
<i>Above Yard</i>					
Deck	140' Span Cast per Week	579	21.00	\$1,000	\$21,000
		Total	204.50		

Total \$204,500

R.R. Crossing Costs

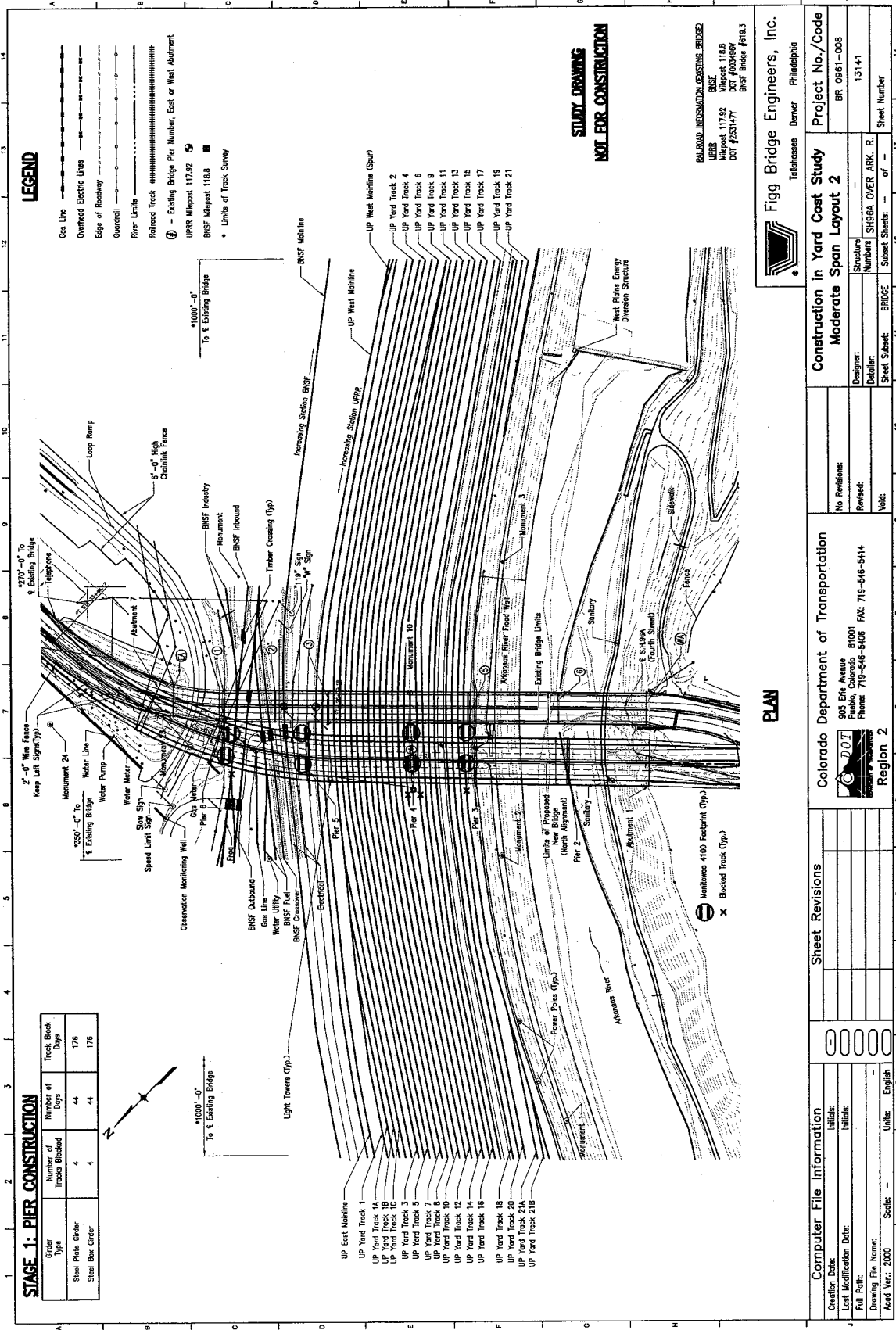
	<u>QUANTITY</u>	<u>Unit Cost</u>	<u>Cost</u>
Temporary Crossings Required	17	\$15,000	\$255,000
Improved Crossings Required	7	\$10,000	\$70,000
Additional Temporary Crossings Required (for Crane Movement)	36	\$15,000	\$540,000
		Total	\$865,000

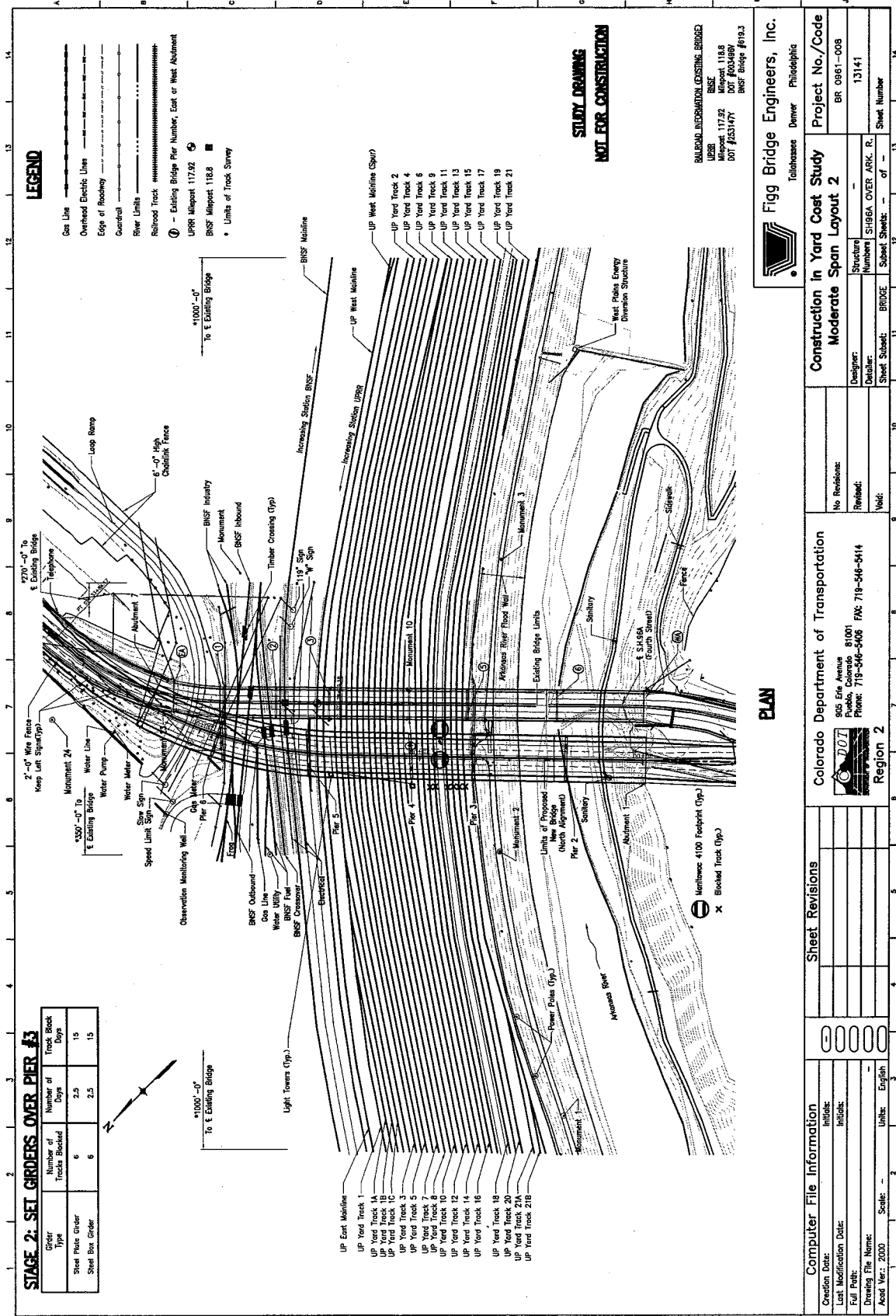
Track Block Days

	<u>Tracks Blocked</u>	<u>Days</u>	<u>Unit Cost</u>	<u>Cost</u>
Stage 1: Substructure Construction				
Drilled Shafts	4	4	\$3,000	\$48,000
Footings	4	10	\$3,000	\$120,000
Entire Portal Frame	4	30	\$3,000	\$360,000
			Subtotal	\$528,000
Superstructure Erection				
Stage 2	6	2.75	\$3,000	\$49,500
Stage 3	19	2.75	\$3,000	\$156,750
Stage 4	17	2.75	\$3,000	\$140,250
			Subtotal	\$346,500
			Total	\$874,500

TOTAL COST \$1,944,000







STAGE 2: SET GIRDERS OVER PIER #3

Girder Type	Number of Tracks Blocked	Number of Days	Track Block Days
Steel Plate Girder	6	2.5	15
Steel Box Girder	6	2.5	15

Computer File Information

Creation Date: Initial: _____
 Last Modification Date: Initial: _____
 Full Path: _____
 Drawing File Name: _____
 Acad Ver.: 2000 Scale: -- 2 Units: English

Sheet Revisions

Colorado Department of Transportation

707
 805 East Avenue
 Pueblo, Colorado 81001
 Phone: 719-546-5008 FAX: 719-546-5414

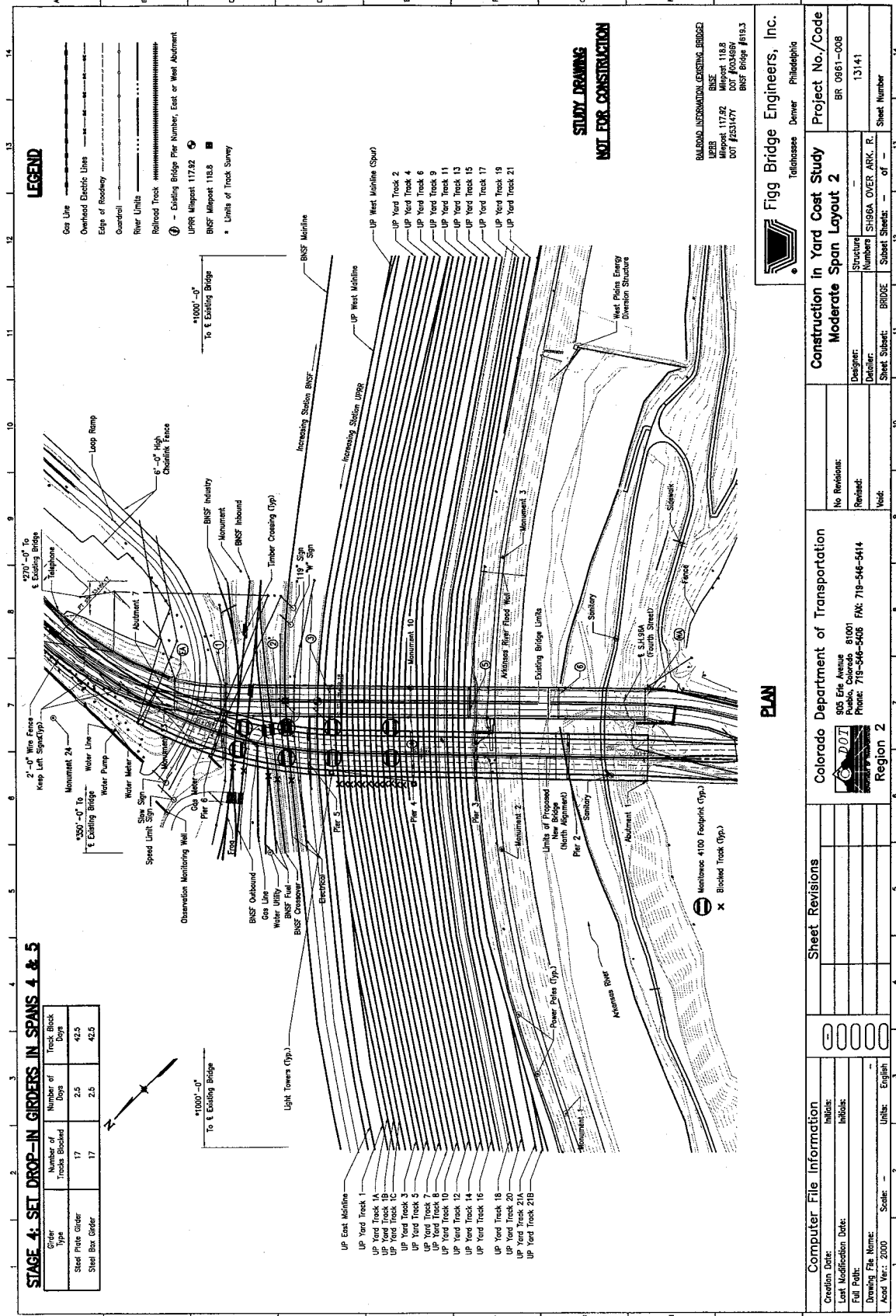
Region 2

Figg Bridge Engineers, Inc.
 Tallahassee Denver Philadelphia

Construction in Yard Cost Study
Moderate Span Layout 2

Project No./Code: BR 0981-008
 Designer: 13141
 Detailer: SHSBA OVER ARK. R.
 Sheet Subject: BRIDGE
 Sheet Sheets: -- of --
 Sheet Number





4th Street Bridge over the Arkansas River
 SH96A Pueblo Colorado
 Project Number BR-0961-008 (13141)

CONSTRUCTION SCHEDULE

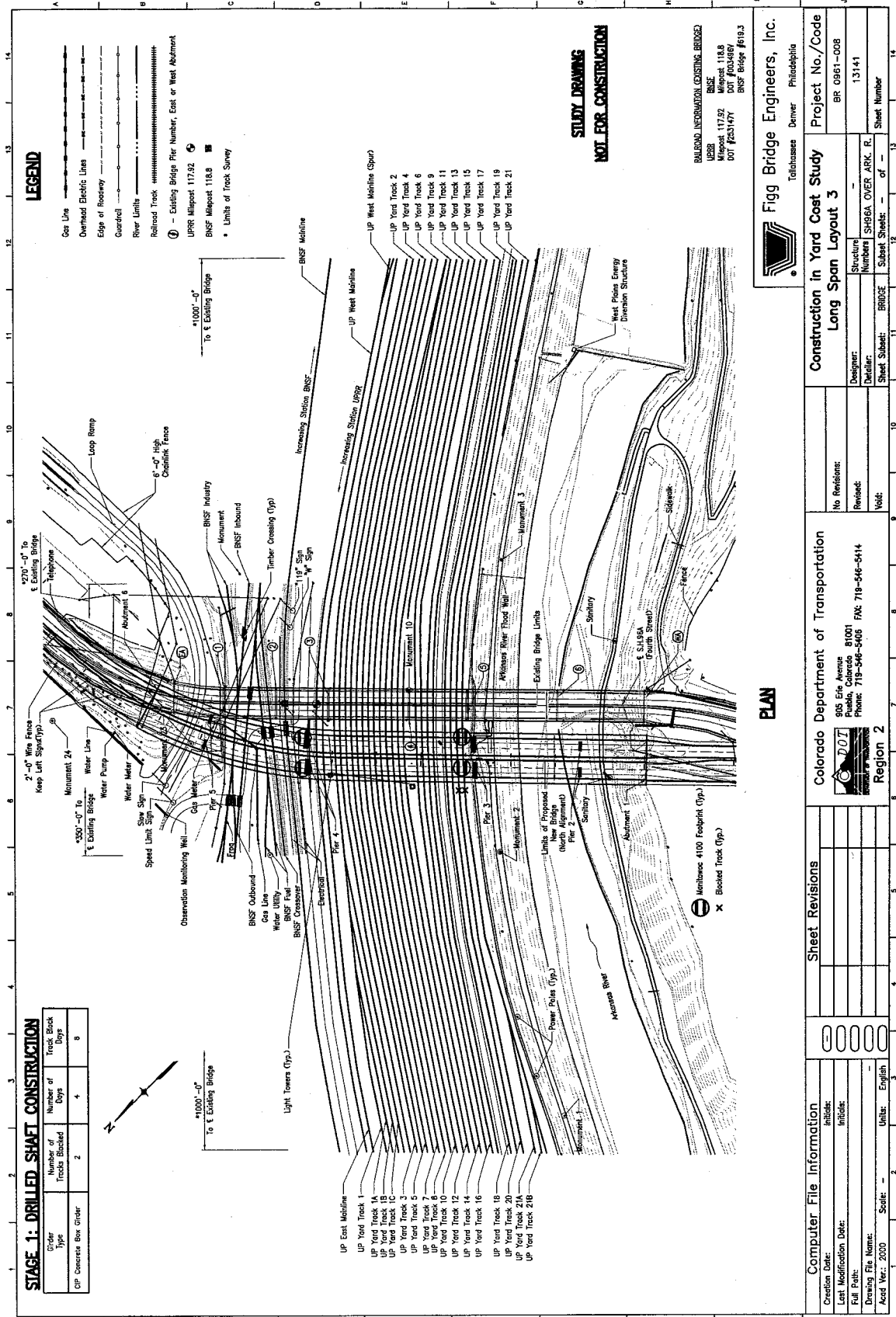
Long Span Layout 3
 Option: CIP Box Girder

Element	Time Frame	<u>QUANTITY Of Elements</u>	<u>Days</u>	<u>Unit Cost</u>	<u>Cost</u>
Flagger Costs					
<i>In Yard</i>					
Drilled Shafts	1 Drilled Shaft per Day	8	8.00	\$1,000	\$8,000
Footings	1 Week per Footing	4	20.00	\$1,000	\$20,000
Columns	2 Weeks per Column	4	60.00	\$1,000	\$60,000
Pier Tables	1 Month per Pier Table	4	120.00	\$1,000	\$120,000
		Total	208.00		
<i>Above Yard</i>					
Segments	1 Pair of Segments per Week	11	55.00	\$1,000	\$55,000
		Total	263.00		
				Total	\$263,000

R.R. Crossing Costs	<u>QUANTITY</u>	<u>Unit Cost</u>	<u>Cost</u>
New Crossings Required	4	\$15,000	\$60,000
Improved Crossings Required	6	\$10,000	\$60,000
Additional New Crossings Required (for Transverse Crane Movement)	8	\$15,000	\$120,000
		Total	\$240,000

Track Block Days	<u>Tracks Blocked</u>	<u>Days</u>	<u>Unit Cost</u>	<u>Cost</u>
Substructure Construction				
Stage 1: Drilled Shafts	2	4	\$3,000	\$24,000
Stage 2: Footings	1	10	\$3,000	\$30,000
Columns	1	30	\$3,000	\$90,000
Pier Tables	1	60	\$3,000	\$180,000
			Subtotal	\$324,000
Superstructure Erection	0	0.00	\$3,000	\$0
			Subtotal	\$0
			Total	\$324,000
			TOTAL COST	\$827,000



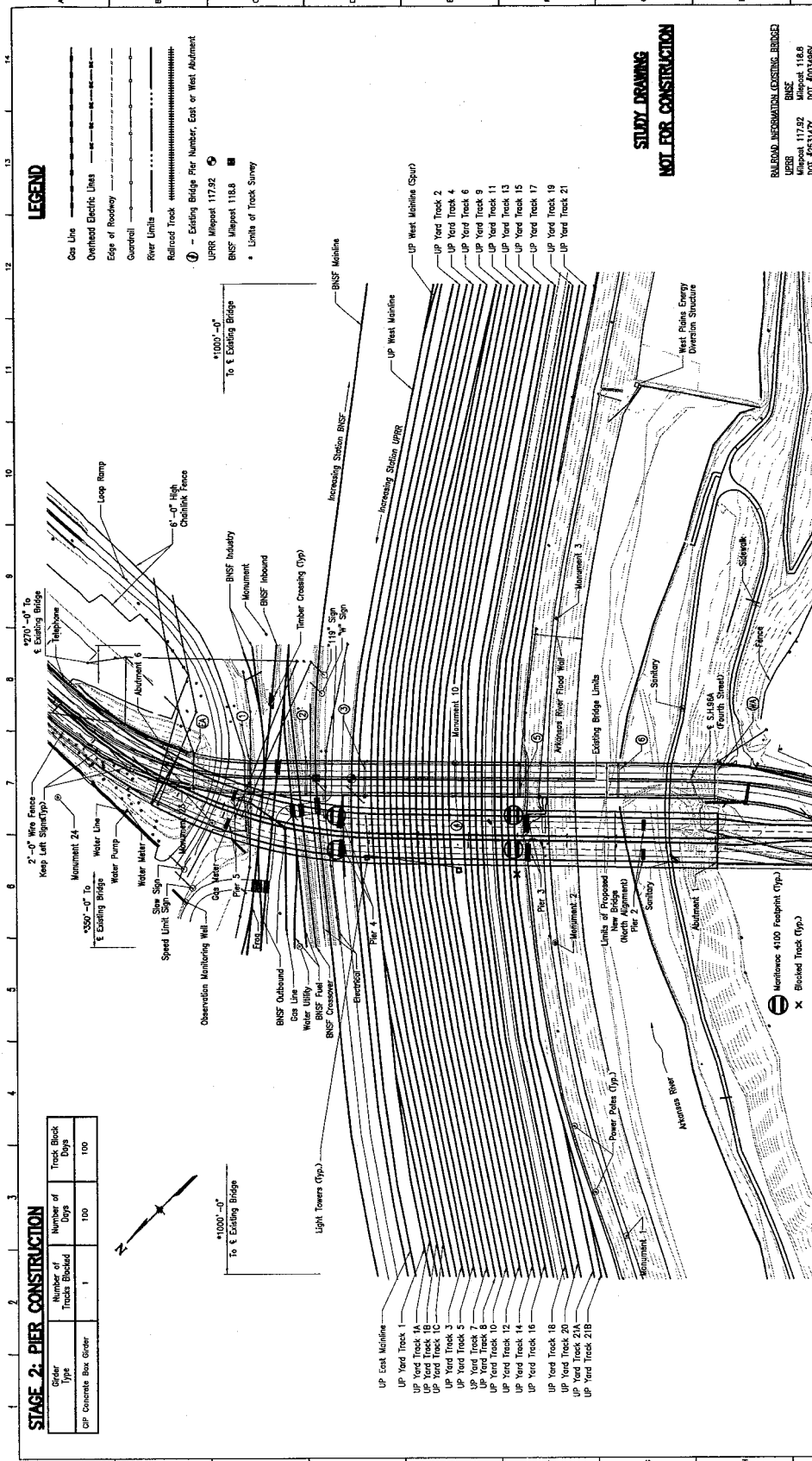


STAGE 1: DRILLED SHAFT CONSTRUCTION

Order Type	Number of Days	Track Blocked	Track Block Days
GP Concrete Box Girder	2	4	8

Computer File Information		Sheet Revisions		Colorado Department of Transportation		Construction in Yard Cost Study	
Creation Date:	Initiate:			805 E. Avenue		Project No./Code	
Last Modification Date:	Initiate:			Public Center		BR 0981-008	
Full Path:	Initiate:			Phone: 719-546-5405		Structure Number	
Drawing File Name:	Initiate:			Fax: 719-546-5414		13141	
Acad Ver.: 2000	Units: English			Region 2		SHRBA OVER ARK. R.	
	Scale: -- 2					Sheet Number	
						- of -	
						Sheet Number	
						- of -	





STAGE 2: PIER CONSTRUCTION

Order Type	Number of Tracks Blocked	Number of Days	Track Block Days
CP Concrete Box Girder	1	100	100

Computer File Information

Creation Date: _____

Last Modification Date: _____

Full Path: _____

Drawing File Name: _____

Acad Ver: 2000

Scale: _____

Units: English

Sheet Revisions

Colorado Department of Transportation

885 E. 4th Avenue
 Pueblo, Colorado 81001
 Phone: 719-546-5406 FAX: 719-546-5414

Region 2

Construction in Yard Cost Study

Long Span Layout 3

Project No./Code: BR 0961-008

Structure Number: 13141

Design: SH96A OVER ARK. R.

Detailer: _____

Sheet Subject: BRIDGE

Sheet Number: _____ of _____

RAILROAD INFORMATION EXISTING BRIDGES

UPRR Milepost 117.92

BNSF Milepost 118.8

DOT #251477

BNSF Bridge #193

Figg Bridge Engineers, Inc.

Tallahassee Denver Philadelphia

Permanent Yard Modification Cost Study



4th Street/Pueblo

Rail Yard Changes - Cost Analysis

Date: 4/22/2003

Engineer: CMK

Match Existing Span Layout

Replacement Tracks

Track	Track Length ft	Replace Cost/ft	Cost
UP Yard Track 2	3,585	\$200	\$717,000
UP Yard Track 13	3,432	\$200	\$686,400
UP Yard Track 14	3,432	\$200	\$686,400

Sum: \$2,089,800

Rerouted Tracks

Track	Track Length ft	Reroute Cost/ft	Cost
BNSF Fuel (North)	400	\$132	\$52,800
BNSF Fuel (South)	700	\$132	\$92,400
BNSF Crossover	1,000	\$132	\$132,000
UP West Mainline	2,000	\$200	\$400,000
UP East Mainline	2,000	\$200	\$400,000
UP Yard Track 1	700	\$132	\$92,400

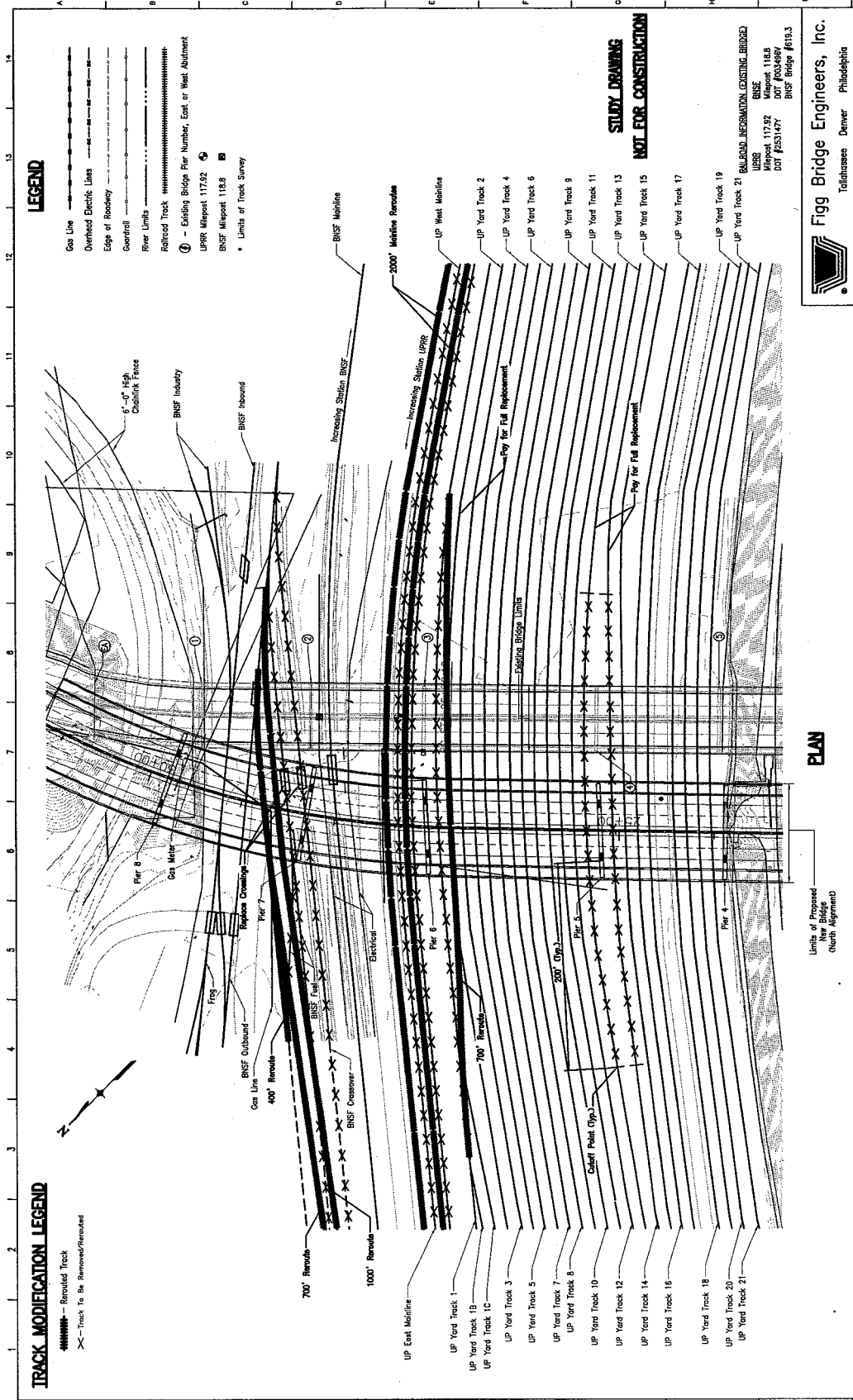
Sum: \$1,169,600

Rail Crossings

Track	Crossing Length ft	Cost/ft	Cost
BNSF Fuel (North)	32	\$1,000	\$32,000
BNSF Crossover	32	\$1,000	\$32,000

Sum: \$64,000

Total: \$3,323,400



TRACK MODIFICATION LEGEND - - - - - Rerouted Track X - - - - - Track To Be Removed/Rerouted		LEGEND Gas Line Overhead Electric Lines Edge of Roadway Control River Limits Railroad Track (1) - Existing Bridge Pier Number, East or West Abutment UPRR Milepost 117.92 BNSF Milepost 118.8 Limits of Track Survey	
Computer File Information Creation Date: Initial: Initial: Last Modification Date: Full Path: Drawing File Name: Acad Ver.: 2000 Scale: - 2 Units: English		Sheet Revisions 1 2 3 4 5 6 7 8 9 10 11 12 13 14	
Colorado Department of Transportation 605 E. 9th Avenue, 81001 Pueblo, Colorado Phone: 719-546-5408 FAX: 719-546-5414 Region 2		Yard Modification Cost Study Match Existing w/ Mod River Spans Designer: SHREKA OVER ARK. R. Detailer: Sheet Number: BRIDGE Subst. Sheet: - of - Sheet Number: 13141	
Colorado Department of Transportation 605 E. 9th Avenue, 81001 Pueblo, Colorado Phone: 719-546-5408 FAX: 719-546-5414 Region 2		Figg Bridge Engineers, Inc. Tallahassee Denver Philadelphia	
PLAN Limits of Proposed New Bridge North Alignment		STUDY DRAWING NOT FOR CONSTRUCTION BNSF UPRR Milepost 117.92 Milepost 118.8 DOT #030697 DOT #253477 BNSF Bridge #619.3 RAILROAD INFORMATION EXISTING BRIDGES	

4th Street/Pueblo

Rail Yard Changes - Cost Analysis

Date: 4/22/2003

Engineer: CMK

Moderate Span Layout 2

Replacement Tracks

Track #s	Track Length ft	Replace Cost/ft	Cost
UP Yard Track 13	3,432	\$200	\$686,400
UP Yard Track 14	3,432	\$200	\$686,400
	Sum		\$1,372,800

Total: \$1,372,800

