

EXHIBIT A

UNDERWATER INSPECTION OF ON-SYSTEM AND OFF-SYSTEM BRIDGES

SCOPE OF WORK

I. Introduction

This statement of work describes the work necessary for the underwater inspection of the structures listed herein. It also provides schedules for the various tasks, and other contractual obligations of the Consultant and the Colorado Department of Transportation (CDOT).

This draft scope of work has been reviewed by CDOT and reflects a plan of approach based on the known goals. One factor determining the selection of a Consultant is the ability of the consultant to analyze the project goals, evaluate the work elements, and formulate a work plan. The process may produce new approaches or modification to the project work elements. Because of that, all Consultants should be aware that the Final Scope of Work for the project will be produced with the input of the selected Consultant.

II. Project

Underwater Bridge Inspection for approximately 43* On-System bridges, statewide.

* Two, and possibly three bridges require an on-site recompression chamber.

Underwater Bridge Inspection for approximately 49 Off-System bridges, statewide.

Special and emergency underwater inspections as required between July of 2010 through June of 2014.

III. Location and Description

The On-System portion of the project consists of approximately 43 bridges, listed on the attached Exhibit A1, located on State Highways throughout the State. These bridges are owned and maintained by the State.

The Off-System portion of the project consists of approximately 49 bridges, listed on attached Exhibits A2 and A3, located in Counties and Cities throughout the State. These bridges are owned and maintained by the local entities.

IV. Scope of Work

All work performed under this contract shall be in accordance with the National Bridge Inspection Standards and the Manual for Maintenance Inspection of Bridges issued by AASHTO. All diving operations shall be conducted in conformance with the requirements of Subpart T, Commercial Diving Operations, Occupational Safety and Health Administration Standards and any other requirements governing such activities. The Consultant shall supply all equipment, labor, licenses, permits, and insurance necessary for the completion of the work.

A. The Contract Administrator for this project is:

Jeff Anderson
Bridge Inspection Engineer
4201 E. Arkansas Ave, Room 107
Denver, CO 80222
(303) 757-9188

Active day-to-day administration of the contract will be delegated to the Project Manager:

Karen Mondragon
Bridge Inspection Coordinator
4201 E. Arkansas Ave, Room 107
Denver, CO 80222
(303) 757-9470

B. Coordination may be required with the following:

Cities
Counties
Railroads
Regional Transportation District
Corps of Engineers
Urban Drainage & Flood Control District (UD & FCD)
Federal Emergency Management Agency (FEMA)

V. Underwater Inspection

A. The Consultant shall perform a thorough visual and tactile inspection of those piers and abutments more than 3' below the waterline, as authorized by the CDOT representative, of each structure listed on Exhibits A1, A2, and A3 and Strs. K-07-A, K-07-B, and K-08-C. The Consultant shall identify the substructure and foundation deficiencies, and the need for any in-depth inspections that may be required as a result of suspected deficiencies that cannot be identified by visual/tactile inspection.

Ten percent of the structure elements shall be well cleaned of any marine growth or other material obstructing detailed inspection to facilitate the inspection. Piles shall be cleaned in bands approximately one foot wide at the waterline, mud line and mid-height. Piers and abutments shall have one foot square areas cleaned at the nose, sides and tail at the waterline, mud line and mid-height. In-depth investigations are not part of this contract. Once identified, a separate contract may be developed to address these needs.

B. The inspection of substructure and foundation elements shall extend from the waterline to the mud line and include, but not be limited to the following:

1. Concrete Pile and/or solid Piers: Check all concrete for erosion, wear, abrasion, scaling, spalling, exposure and deterioration of any exposed reinforcing steel, and all cracking.
2. Steel Pile and/or Steel Encased Piers: Check all steel for corrosion, misalignment, and loss of section.
3. Timber Pile: Check all timber for vermin such as marine borer, shipworm attack, termites, and powder-post beetles, etc.; for evidence of fungus decay; for damage by collision or over stressing; and for excessive weathering. All timber shall be sounded and probed with a heavy-duty 6 inch (min.) blade ice pick or awl.
4. Blue Mesa Reservoir Bridges, Strs. K-06-A and K-07-B: Inspect all concrete surfaces for cracks, discoloration, deformation, scaling and delamination, which could affect structural soundness. Inspect submerged riprap, fills, and foundations for signs of displacement or erosion. See Attachment 1 for additional information concerning these bridges.

Inspection of rock bolt area and integrity testing of bolts (one location only at Str. K-07-B, Pier 7). The rock bolts shall be tested by striking the bolt end and retainer plate with a hammer. Other methods may be considered, but must be approved by the engineer. At least 25 percent of the rock bolts shall be tested from a representative sample of the 55 foot vertical by 60 foot horizontal rock bolted area. The plans for Str. K-07-B indicate that 5,000 linear feet of rock bolts of an unknown length were installed in a 48'V x 34'H area. The bolt pattern is irregular.

Provisions shall be made to accommodate CDOT and Federal Highway Administration (FHWA) personnel during the inspections. No underwater diving provisions need to be made for CDOT or FHWA personnel.

THESE TWO BRIDGES REQUIRE AN ON-SITE RECOMPRESSION CHAMBER

5. The Engineer in charge of the inspection shall supply a Daily Diving Report consisting of all the bridge units inspected for that day.

C. The inspection shall include depth soundings around each pier, along the fascia, and at 100' and 200' intervals upstream and downstream. Soundings shall be obtained using a continuous reading strip chart fathometer unless water conditions preclude use of a boat, in which case sounding poles or lead lines may be utilized. Elevations shall be referenced to the brass cap located on the bridge or other point of known elevation, such as a bridge seat if a brass cap is not present.

The channel bottom, particularly around piers and abutments, shall be probed and the presence, size and condition of any riprap shall be noted.

D. Digital color photography shall be utilized to document underwater conditions. A "clear water" box shall be available on site for use if needed to secure photographs.

E. If a dangerous or critical situation exists, in the opinion of the Inspection Team Leader, the on-site CDOT representative and the Bridge Management Engineer shall immediately be notified of the situation and follow up with an accurate written report.

F. Underwater sonar imaging and 3-D laser scanning techniques shall be applied at the Blue Mesa Reservoir structures and as required by the project manager.

VI. Schedule

The Consultant shall submit a proposed schedule of inspections to the CDOT at least five days prior to commencement of inspection work. The Consultant shall also inform the State of any changes to the proposed schedule. Schedules will be as specified in the individual task orders.

VII. Personnel

Qualifications of inspection personnel shall conform to the requirements of the NBIS and to the following:

A. The Engineer in charge of the inspection and preparation of the inspection report must possess the following:

1. A Colorado Professional Engineer license.

B. The manager in charge of the divers must possess the following:

1. Have a minimum of five years experience in underwater structure inspection assignments in a responsible capacity.
2. Be a certified diver by a recognized commercial diving school.

C. The diver(s) who will perform the underwater inspection shall meet the qualifications as a bridge inspector in accordance with the NBIS requirements and be a certified diver with at least two years experience in underwater bridge inspection.

The firm shall submit for approval a detailed resume of each inspection team member.

VIII. Report

A separate report shall be prepared for each bridge inspected. The report shall include a description of the condition of the bridge units inspected and the adjacent channel bottom. Recommendations for repairs or further investigations shall be included as appropriate. These reports shall be developed in the latest version of Pontis as specified by the project manager.

The report shall include plots of the channel bottom elevations and original color photographs of any deterioration or critical condition, clearly labeled with the Structure No., Unit No., Date, and description of the photo contents. Two copies of the report shall be submitted, signed by the registered professional engineer responsible for the inspection. In addition, all materials shall be submitted in an electronic format as

The inspection team shall also complete appropriate sections of bridge rating forms furnished by CDOT. Other forms may need to be filled out as required by the Project Manager.

IX. Insurance

Before starting work, the Firm shall submit evidence of the required insurance coverages as specified in the contract.

X. Method of Payment

The work items and units are as follows:

A. Site Visit Cost Plus Fixed Fee

The listing of bridges eligible for payment as site visits is provided in Exhibits A1, A2, and A3, except Strs. K-07-A, K-07-B, and K-08-C. The Project Manager may add or delete bridges from those lists. Travel to bridges which do not require inspection shall be paid as a site visit for those bridges.

B. Abutment or Pier Inspection

Payment shall be made as follows:

Category I (all locations other than Blue Mesa Reservoir) Cost Plus Fixed Fee
Payment for Category I inspections will be made for the abutments and piers inspected as evidenced by a complete report for each bridge accepted by the Project Manager and approved by the Contract Administrator.

Category II (Blue Mesa Reservoir bridges) Cost Plus Fixed Fee
Payment shall be authorized once a complete report for each bridge has been accepted by the Project Manager and approved by the Contract Administrator.

Any abutment or pier which has a water depth less than three feet will be inspected by CDOT inspectors and is not eligible for payment.

XI. Duration of Work

Work will not commence until a written notice to proceed is received by the Consultant. It is anticipated that three task orders will be written for the work. Two task orders will be written for the fall months of fiscal year 2011, one for the off-system bridges and the second for the on-system structures. A third task order will be written for the spring months of fiscal year 2011 to inspect the Blue Mesa Reservoir bridges. Special and emergency underwater inspections will be conducted under separate task orders, when and if needed, through June of 2014.

EXHIBIT A1
 COLORADO DEPARTMENT OF TRANSPORTATION
 UNDERWATER BRIDGE INSPECTION
 ON-SYSTEM

<u>HWY</u>	<u>M.P.</u>	<u>STR. #</u>	<u>COUNTY</u>	<u>FEATURE</u>	<u>SSU Insp in 2005</u>	<u>MAX/ MIN DPTH</u>	<u>Tot # SSU's</u>
6	43.26	H-03-E	MESA	COLO RIV	2, 3	5'4'	6
7	76.54	E-17-AR	ADAMS	S. PLATTE RIV	2	5'3.5'	7
13	0.18	F-05-R	GARFIELD	COLO RIV	2, 3, 4	10'4'	6
13	85.84	C-06-D	MOFFAT	YAMPA RIV	none	0'4'	3
34	90.98	C-16-DH	LARIMER	BARNES CANAL	none	6'3'	4
(perform complete inspection for the this structure)							
34	90.98	C-16-W	LARIMER	BARNES CANAL	none	6'3'	2
(perform complete inspection for this structure)							
40	105.47	C-07-A	ROUTT	YAMPA RIV	2, 3	10'5'	5
40	113.40	C-08-W	ROUTT	YAMPA RIV	Deleted 1995		5
50	70.52	I-04-K	DELTA	GUNNISON RIV	none	6'2'	4
50	32.42	H-02-CA	MESA	COLO RIV	5, 6, 7	11'4'	9
50	32.43	H-02-DZ	MESA	COLO RIV	5, 6, 7	11'4'	9
53	1.33	E-17-IR	ADAMS	CLEAR CREEK	none	4'1'	1
70	16.76	H-01-AE	MESA	N. CHAN COLO R.	S.V.	10'6'	4
70	16.77	H-01-AD	MESA	N. CHAN COLO R.	S.V.	6'4'	4
70	17.33	H-01-AB	MESA	N. CHAN COLO R.	2	6'2'	4
70	17.34	H-01-AC	MESA	N. CHAN COLO R.	2	6'2'	4
92	21.01	I-06-A	DELTA	N. FK. GUNNISON	0	4'2'	2
70	50.51	H-03-BP	MESA	COLO RIV	2	6'2'	3
70	56.99	G-03-P	MESA	COLO RIV	2, 3	6'3.5'	5
70	58.06	G-04-BA	MESA	COLO RIV	2	12'6'	5
70	62.89	G-04-AA	MESA	COLO RIV	2, 3, 4	8'3'	5
70	66.90	G-04-AB	MESA	COLO RIV	3, 4	8'3.5	5
70	88.57	F-05-K	GARFIELD	COLO RIV	2, 4	7'4'	6
70	88.58	F-05-L	GARFIELD	COLO RIV	3, 4, 5	13'4'	6
70	96.35	F-06-Y	GARFIELD	COLO RIV	2, 3	7'3'	6
70	96.36	F-06-Z	GARFIELD	COLO RIV	2	7'3'	6
70	126.94	F-08-BD	GARFIELD	COLO RIV	none	5'0'	4
70	121.13	F-08-AA	GARFIELD	GRIZZLY CK	none	4'0'	2
70	121.09	F-08-AB	GARFIELD	GRIZZLY CK	none	4'0'	1
70	125.79	F-08-AS	GARFIELD	COLO RIV	none	6'2'	2
76	7.65	E-17-GM	DENVER	S. PLATTE RIV	3, 4, 5, 6	5'2'	8
76	7.66	E-17-GL	DENVER	S. PLATTE RIV	3, 4, 5, 6	5'2'	8
92	6.42	I-05-V	DELTA	GUNNISON RIV	2, 3	8'4'	4
141	153.65	I-03-A	MESA	GUNNISON RIV	none	5'9'	4

<u>HWY</u>	<u>M.P.</u>	<u>STR. #</u>	<u>COUNTY</u>	<u>FEATURE</u>	<u>SSU Insp in 2005</u>	<u>MAX/ MIN</u>	<u>Tot # SSU's</u>
141	159.44	H-03-BL	MESA	COLO RIV	2, 3	6'4'	4
160	84.32	O-05-AQ	LA PLATA	LAS ANIMAS RIV	none	4'1'	1
227	0.44	L-18-R	PUEBLO	ARKANSAS RIV	S.V.	7'2.3'	13
233	0.90	K-18-BN	PUEBLO	ARKANSAS RIV	4,5	8'3.8'	7
291	2.35	J-12-AK	CHAFFEE	ARKANSAS RIV	none	3'1'	1
318	54.86	B-04-D	MOFFAT	YAMPA RIV	none	6'3'	3
340	1.43	H-02-GA	MESA	COLO RIV	2, 3, 4, 5, 6	8'4.5'	7
340	12.60	H-02-S	MESA	COLO RIV	7, 8, 9	8'4'	10
340	12.61	<u>H-02-GC</u>	MESA	<u>COLO RIV</u>	<u>7, 8, 9</u>	<u>8'3.5'</u>	<u>10</u>
43 Bridges			No. of Category I SSU = 93				

(S.V. = Site Visit Only)

EXHIBIT A2

COLORADO DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION
OFF-SYSTEM COUNTY BRIDGES

<u>STR. #</u>	<u>COUNTY</u>	<u>FEATURE</u>	<u>10/95</u>	SSU Insp in	<u>DPTH</u>	MAX/ MIN SSU's	Tot #
DEL2200R-120-44	DELTA	GUNNISON RIV		S.V.		6'4'	6
CHA191-01.57	CHAFFEE	ARKANSAS RIV	none		4'2'	1	
EAG-301-08.2	EAGLE	COLO RIV		1, 2, 3		6'4'	5
EAG-301-15.6	EAGLE	COLO RIV		2, 3, 4, 5		4'2'	5
EAG-301-23.5	EAGLE	COLO RIV		3		6'4'	7
EAG-301-27.7	EAGLE	COLO RIV		3, 4		8'3.5'	4
EAG-028-03.6A	EAGLE	COLO RIV		2		4.5'	3
GAR323-01.43	GARFIELD	COLO RIV	2		10'8'	3	
GAR301-00.71	GARFIELD	COLO RIV	2, 3		13'3.5'	4	
GAR300-00.80	GARFIELD	COLO RIV	2		8'7'	3	
GAR108-01.59	GARFIELD	CRYSTAL RIV2		6'3'	3		
GAR109-01.44	GARFIELD	ROARING FK RIV	2			3	
GAR311-12.69	GARFIELD	COLO RIV	2		9'8'	3	
049001100.1005A	GRAND	COLO RIV		2		4'2.5'	4
057006W01.30004	JACKSON	MICHIGAN RIV		Deleted 1995			5
057012E00.90010	JACKSON	MICHIGAN RIV		Deleted 1995			2
LR19-1.1-48	LARIMER	POUDRE RIV		2, 3		6'3.5'	4
LR5-0.9-36	LARIMER	POUDRE RIV		S.V.		4'	1
LR13E-0.3-24E	LARIMER	LOVE CANAL	none	8'4'	3		
(perform complete inspection for this structure)							
LR901-SO.4-S392	LARIMER	POUDRE RIV		Deleted 1995			3
LOG7.4-36.8-1	LOGAN	PAWNEE CREEK	S.V.		5'1.5'	4	
MESA-G.8-39.1	MESA	COLO RIV		3, 4		7'3.5'	6
MESA-V.5-45.3	MESA	COLO RIV		2		6'3'	7
MESA-I.9-39.4A	MESA	COLO RIV		3		6'3'	5
MESA-23.08-E.76	MESA	COLO RIV		2, 3, 4		11'4'	7
MGW.7-0.0-32	MORGAN	INLET CANAL	none		6'0'	3	
MOF19-01.19	MOFFAT	YAMPA RIV		3, 4, 5		5'3.5'	3
RIOB-02A-00.21	RIO BLANCO	WHITE RIV	3		8'7'	4	
RIOB-057-00.14	RIO BLANCO	WHITE RIV	none		6'2'	1	
RGDN05-05.00W	RIO GRANDE	RIO GRAND RIV	1, 2, 3		9'0'	3	
107040Z00.30902	ROUTT	YAMPA RIV		4, 5		8'2'	6
107017900.80903	ROUTT	YAMPA RIV		2		5'3.5'	4
WEL 035.0-062.0A	WELD	POUDRE RIV		1, 2		6'0'	3
<u>WEL 029.0-062.0B</u>	WELD	<u>POUDRE RIV</u>		<u>2</u>		<u>5'2'</u>	<u>3</u>
34 Bridges		No. of Category I SSU = 45					

(S.V. = Site Visit Only)

EXHIBIT A3

COLORADO DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION
OFF-SYSTEM CITY BRIDGES

<u>STR. #</u>	<u>CITY</u>	<u>FEATURE</u>	<u>SSU Insp in 10/95</u>	<u>MAX/ MIN DPTH</u>	<u>Tot # SSU's</u>
BOLD-39-N63ST GLNWD-	BOULDER	FEEDER DITCH	1 - 7	4'4'	8
DEVEREUX	GARFIELD	COLO RIV	none	4'2'	2
THN-088CLD-PLR	THORTON	S. PLATTE RIV	Deleted 1995		5
D-02-PR-050	DENVER	S. PLATTE RIV	Deleted 1995		3
D-02-PR-090	DENVER	S. PLATTE RIV	Deleted 2000		8
D-02-PR-100	DENVER	S. PLATTE RIV	Deleted 2000		8
D-02-PR-120	DENVER	S. PLATTE RIV	2	4'1.5'	3
D-02-PR-130A	DENVER	S. PLATTE RIV	2, 3, 4	6'4'	4
D-02-PR-150	DENVER	S. PLATTE RIV	S.V.	5'3'	4
D-02-PR-250	DENVER	S. PLATTE RIV	Deleted 1995		3
GLWD-27TH ST	GLENWOOD SPG	ROARING FK RIV	2, 3	8'3'	4
MKR-TENTH ST	MEEKER	WHITE RIV	Deleted 1995		2
BRI-101-124	BRIGHTON	S. PLATTE RIV	2, 3, 4		
GTWN-04-0.03-01	GEORGETOWN	CLEAR CR	1,2		
SALOOF-00.95	CHAFFEE	ARKANSAS RIV	none	4'0'	1
15 Bridges		No. of Category I SSU = 25			

(S.V. = Site Visit Only)

ATTACHMENT 1

COLORADO DEPARTMENT OF TRANSPORTATION
 UNDERWATER BRIDGE INSPECTION
 BLUE MESA RESERVOIR
 WATER ELEVATIONS & MISC. INFORMATION

JANUARY 1, 2009	7490.00
FEBRUARY 1, 2009	7487.00
MARCH 1, 2009	7485.50
APRIL 1, 2009	7485.00
APRIL 15, 2009	7484.90 MAX. LOW WATER
MAY 1, 2009	7497.00
JUNE 1, 2009	7515.00
JULY 1, 2009	7519.40 MAX HIGH WATER
AUGUST 1, 2009	7513.00
SEPTEMBER 1, 2009	7505.00
OCTOBER 1, 2009	7497.00
NOVEMBER 1, 2009	7493.00
DECEMBER 1, 2009	7493.00

In May 1995, a total of 10 piers for these bridges required diving. The plans for the project which constructed the bridges, Project No. CC 40-0006-26, indicate the approximate groundline elevations of those piers to be as follows:

<u>Str. K-07-A</u>	<u>Str. K-07-B</u>	
Pier 3 7461		Pier 3 7461	Pier 6 7370
Pier 4 7375		Pier 4 7431	Pier 7 7437
Pier 5 7422		Pier 5 7409	Pier 8 7456
			Pier 9 7458

<u>Str. K-08-C</u>
Pier 3 7461
Pier 4 7461

The lowest elevation of the rock bolts at Pier 7 is approximately 7332+/-'. The maximum dive at low water is about 140'.

Ice is off the water about April 1st to the 15th of each year to allow access to the piers.

Strs. K-07-A and K-07-B re located in Gunnison County on US 50 at M.P. 132.72 and 136.19 respectively. K-07-A spans the Lake Fork of the Gunnison River and Str. K-07-B spans the Gunnison River. Structure K-08-C is located on S.H. 149 at M.P. 117.39 and spans the Gunnison River where it leaves Blue Mesa Reservoir.