COLORADO DEPARTMENT OF TRANSPORTATION
OFF-SYSTEM BRIDGE INSPECTION PROGRAM
ESSENTIAL BRIDGE REPAIRS DOCUMENTATION FORM

Structure Number: 083000N01.80016 (MTZ-016)

Feature Intersected: Alkali Canyon **County:** Montezuma

Road on Bridge: County Road N **City/Town:** N/A

Description of Essential Bridge Repairs:

Replace or repair heavily corroded corrugated metal cribbing at the east abutment and northwest and northeast wingwalls.

Consider encasing the piles at the east abutment in concrete to mitigate further deterioration.

Color Code Suggested by Inspector (see Item 6 on reverse): Green

Definition of Essential Bridge Repairs: Repairs necessary to ensure the safe and continued service of off-system major bridge structures. Immediate and potentially critical problems with structures should be reported to the designated local agency contact/maintenance personnel as appropriate. Examples of essential repair needs include: a girder severely damaged by an over-height vehicle; a bridge foundation undermined by scour; and advanced deterioration of a primary structure member that has undermined its load-carrying capacity. They also include less time sensitive items such as a bridge rail damaged by an errant vehicle; a plugged drain resulting in embankment erosion; and active corrosion that could undermine a bridge's load-carrying capacity before the next inspection.

Inspector: Mina Sass **Date of Inspection:** 11/2/16
Short Elliott Hendrickson, Inc

To be filled out during Office Review:

Senior Inspection Engineer: Jan Tjutt
Short Elliott Hendrickson, Inc

By signing here, I have determined that the above description of Essential Bridge Repairs meets the established criteria set forth by CDOT Staff Bridge and that the repair is essential. Color code prioritization has been determined and notification of the above findings has been sent to the local agencies' public works or road and bridge departments.

Date of Office Review: 11/10/16

Color Code Assigned by Senior Inspection Engineer (see Item 6 on reverse): GREEN

Date Local Agency was Notified: 11/10/16

Cc: FHWA Division Bridge Engineer, Staff Bridge Branch Manager, Staff Bridge Asset Management Engineer, Staff Bridge Inspection Program Manager, Staff Bridge Quality Assurance Inspector and Consultant's File

The process for identification, notification, and tracking of Off-System essential bridge repairs is as follows:

I. An essential repair need is discovered by the bridge inspector during bridge inspection.

2. The essential repair finding is categorized using maintenance activity numbers as described in Appendix C of the Colorado Pontis Coding Guide.

3. The bridge inspector assigns a double asterisk to the essential repair finding. Example: **354.01 is an essential repair finding due to collision damage sustained by the bridge's girders or truss members.

4. The essential repair finding is evaluated by the consultant's senior inspection engineer.

5. If the consultant's senior inspection engineer determines that the identified finding is not essential, that engineer documents why in writing on the report. The engineer then signs and dates the report before returning the structure folder back to the inspector.

6. If the consultant's senior inspection engineer determines the repair is essential, the engineer classifies the repair and notifies the local agency. The color coded prioritization described in the following table is used for classification:

Orange	Accomplish repairs within the timeframe specified by the memo or within 30 days maximum.
Yellow	Recommend accomplishing repairs within the next 90 days.
Green	Recommend accomplishing repairs within the next year or as funding allows.
Blue	Monitoring by maintenance in lieu of repairs. The type and frequency of monitoring as specified by the repair notice.

Notifications are sent by e-mail to the local agencies' public works or road and bridge departments. Those copied on the notification include other local agency contacts as determined by the consulting firm, the FHWA Division Bridge Engineer, the Staff Bridge Branch Manager, the Staff Bridge Asset Management Engineer, the Staff Bridge Inspection Program Manager and the Staff Bridge Quality Assurance Inspector.

7. The Staff Bridge Quality Assurance Inspector will maintain a tracking spreadsheet of all the essential repair notices that are issued by the consultants. Entries in the sheet shall record the structure number, the date notification was sent to the local agency, the local agency, the road carried by the structure, the structural problem, the color coded prioritization, the date that the repair finding was addressed by the local agency, and the date the consultant's senior inspection engineer confirmed the repair had been completed.

8. When the local agency completes the repairs, they shall notify the consulting firm. The consulting firm shall forward the notification via e-mail to the Staff Bridge Quality Assurance Inspector to be used in updating the tracking spreadsheet by filling in the date the finding was reported as repaired.

9. Essential repair findings reported to be completed are confirmed by bridge inspectors during regularly-scheduled inspections. The Quality Assurance Inspector may request the consultant to conduct a special follow-up inspection. The consulting firm assigned to the section may recommend a special inspection for follow-up. Any special inspections paid for with off-system inspection project funds must be pre-approved by the Staff Bridge Quality Assurance Inspector.

10. The bridge inspectors will document in their inspection report whether or not any essential repairs previously identified have been addressed and forward the report to the consultant's senior inspection engineer for evaluation. If the inspection engineer concurs that the essential repair has been addressed, the engineer notifies the Quality Assurance Inspector who then updates the tracking spreadsheet accordingly. If the inspection engineer determines that the repair has not been addressed, the engineer will issue a follow-up repair notice to the local agency.

Colorado Department of Transportation

Highway Number (ON) 5D: N.00 V
Mile Post (ON) 11: 1.800 mi

Structure Inspection and Inventory Report (English Units)

Bridge Key: 083000N01.80016 Inspection Date: 11/02/2016 Sufficiency Rating: 48 SD

NBI Reporting ID:	083000N01.80016	Hist Signif 37:	5			UW Inspection Date 93B:	
Rgn/Sect 2E/2M:	53	Posting status 41:	A			SI Date 93C:	
Tran Region 2T:	10	Service on/un 42A/B:	1	5		Bridge Cost 94:	$220500
County Code 3:	083	Main Mat/Desgn 43A/B:	3	02		Roadway Cost 95:	$22050
MONTEZUMA		Appr Mat/Desgn 44A/B:	0	0		Total Cost 96:	$330750
Place Code 4:	00000	Main Spans Unit 45:	1			Year of Cost Estimate 97:	2016
non-city		Approach Spans 46:	0			Brdr Brdg Code/% 98A/B:	
Rte.(On/Under) 5A:	1	Horiz Clr 47:	22.01 ft			Border Bridge Number 99:	
Signing Prefix 5B:	4	Max Span 48:	27.8 ft			Defense Highway 100:	0
Level of Service 5C:	1	Str Length 49:	30.4 ft			Parallel Structure 101:	N
Direction Suffix 5E:	0	Curb Width L/R 50A/B:	0.0 ft	0.0 ft		Direction of Traffic 102:	2
Feature Intersected 6:		Width Curb to Curb 51:	22.01 ft			Temporary Structure 103	I
ALKALI CANYON		Width Out to Out 52:	23.9 ft			Highway Systems 104:	0
Facility Carried 7:		Deck Area:	732			Fed Lands Hiway 105:	0
COUNTY ROAD N		Min Clr Ovr Brdg 53:	99.99			Year Reconstructed 106:	
Alias Str No.8A:		Min Undrclr Ref 54A:	N			Deck Type 107:	6
MTZ-016		Min Undrclr 54B:	0.0 ft			Wearing Surface 108A:	8
Prll Str No. 8P:		Min Lat Clrnce Ref R 55A:	N			Membrane 108B:	0
N/A		Min Lat Undrclr R 55B:	0.0 ft			Deck Protection 108C:	0
Location 9:		Min Lat Undrclr L 56:	0.0 ft			Truck ADT 109:	2.00 %
1.5 MI W OF SH 491		Deck 58:	6			Trk Net 110:	0
Max Clr 10:	99.99	Super 59:	6			Pier Protection 111:	1
BaseHiway Net12:	0	Sub 60:	4			NBIS Length 112:	Y
IrsinvRout 13A:	0000000000	Channel/Protection 61:	6			Scour Critical 113:	5
IrssubRout No13B:	00	Culvert 62:	N			Scour Watch 113M:	N
Latitude 16:	37d 23' 51.47"	Oprtng Rtg Method 63:	1 LF Load Factc			Future ADT 114:	410
Longitude 17:	108d 38' 58.40"	Operating Rating 64:	41.7			Year of Future ADT 115:	2034
Range 18A:	N	Inv Rtng Method 65:	1 LF Load Factc			CDOT Str Type 120A:	SSM
Township 18B:	N	Inventory Rating 66:	25.0			CDOT Constr Type 120B:	00
Section 18C:	N	Asph/Fill Thick 66T:	16.0 in			Inspection Indic 122A:	_
Detour Length 19:	2 mi	Str. Evaluation 67:	4			Inspection Trip 122AA:	Unknown
Toll Facility 20:	3	Deck Geometry 68:	4			Scheduling Status 122B:	_
Custodian 21:	02	Undrclr Vert/Hor 69:	N			Maintenance Patrol 123:	0
Owner 22:	02	Posting 70:	5			Expansion Dev/Type 124:	O
Functional Class 26:	09	Waterway Adequacy 71:	8			Brdg Rail Type/Mod 125A/B:	XX	0
Year Built 27:	1970	Approach Alignment 72:	6			Posting Trucks 129A/B/C:	0.0	0.0	0.0
Lanes on 28A:	2	Type Of Work 75A:	31			Str Rating Date 130:	09/30/2002
Lanes Under 28B:	0	Work Done By 75B:	I			Special Equip 133:	Unknown
ADT 29:	265	Length of Improvment 76:	42			Vert Clr N/E 134A/B/C:	X	-1.00	-1.00
Year of ADT 30:	2014	Insp Team Indicator 90B:	SEH			Vert Clr S/W 135A/B/C:	X	-1.00	-1.00
Design Load 31:	0	Inspector Name 90C:	SASSN			Vertical Clr Date:	01/01/1901
Apr Rdwy Width 32:	23.01 ft	Frequency 91:	24 months			Weight Limit Color 139:	0
Median 33:	0	FC Frequency 92A:				Str Billing Type:	IIB
Skew 34:	0 °	UW Frequency 92B:				Userkey 1 - System:	OFFSYS
Structure Flared 35:	0	SI Frequency 92C:				Userkey 4 - OffSys Sched:	South FY ODD
Sfty Rail 36a/b/c/d:	0 0 0 0	FC Inspection Date 93A:				Userkey 5 :	
Rail ht36h:	39.0 in					Userkey 7 - Update Ind.:	
						BridgeGroup	-1

Inspector Name: SASSN

Colorado Department of Transportation

Structure Inspection and Inventory Report (English Units)

Element Inspection Report

Elm/Env	Description	Unit	Total Qty	% in 1	Qty. St. 1	% in 2	Qty. St. 2	% in 3	Qty. St. 3	% in 4	Qty. St. 4
30/1	**Steel Deck - Orthotropic**	**sq.ft**	727	45%	327	55%	400	0%	0	0%	0
	Painted corrugated metal decking. R1 to heavy R1 rusting at joints. Surface: 16 inch average gravel above corrugations.										
510/1	Wearing Surfaces	sq.ft	727	0%	0	100%	727	0%	0	0%	0
515/1	Steel Protective Coating	sq.ft	727	45%	327	55%	400	0%	0	0%	0
107/1	**Steel Opn Girder/Beam**	**ft**	334	0%	0	100%	334	0%	0	0%	0
	(9) Steel wide flange beams at interior (Girders B-J) with channel welded between top flanges and across bottom flanges at midspan. R1 to heavy R1 rusting on Girders B-J. Painted steel wide flange beams at exterior with channel welded between top flanges and across bottom flanges at midspan. Painted green. R1 rusting on Girders K and A.										
515/1	Steel Protective Coating	sq.ft	60	0%	0	0%	0	100%	60	0%	0
202/1	**Steel Column**	**each**	12	0%	0	50%	6	25%	3	25%	3
	Steel H-piles at east abutment (A2), unpainted except northeast corner. Flaking and R2 at piles 2B and 2C. Painted steel H-piles at west abutment (A1) and at northeast corner. R2 rusting at northeast corner. R1 rusting at base of Piles 1D-1F. Light R1 rusting at Piles 1A-1C. A structural review has been completed and it has been determined that the defects do not impact the strength or serviceability of the element or bridge. The quantity has been left in CS 4 and this note added as a flag to future inspectors that a structural review was completed. Future inspectors should reassess whether the defects impact the strength or serviceability of the element or bridge as appropriate.										
515/1	Steel Protective Coating	sq.ft	7	100%	7	0%	0	0%	0	0%	0
1000/1	Corrosion	each	3	0%	0	0%	0	0%	0	100%	3
	Heavy R3 rusting with up to 29% section loss at waterline of Piles 2D-2F (7/16 inch normal flange and now 5/16 inch).										
219/1	**Stl Abutment**	**ft**	48	19%	9	31%	15	19%	9	31%	15
	Painted corrugated metal cribbing. R2 rusting at ground in between Piles A and C. Light R1 rusting at A1 between Piles A-C. R1 to heavy R1 rusting at A1 between Piles C-F. A structural review has been completed and it has been determined that the defects do not impact the strength or serviceability of the element or bridge. The quantity has been left in CS 4 and this note added as a flag to future inspectors that a structural review was completed. Future inspectors should reassess whether the defects impact the strength or serviceability of the element or bridge as appropriate.										
515/1	Steel Protective Coating	sq.ft	48	0%	0	0%	0	100%	48	0%	0
1000/1	Corrosion	ft	15	0%	0	0%	0	0%	0	100%	15
	R4 rusting near ground line and holes at east abutment (A2) between Piles C and F.										

231/1	Steel Pier Cap	ft	48	0%	0	100%	48	0%	0	0%	0
	Girders welded to unpainted steel channel cap at east abutment (A2). R1 rusting. Debris on cap. Girders welded to painted steel channel cap at west abutment (A1). Light R1 to R1 rusting.										
515/1	Steel Protective Coating	sq.ft	24	0%	0	0%	0	100%	24	0%	0
330/1	Metal Bridge Railing	ft	61	0%	0	100%	61	0%	0	0%	0
	Painted W beam rail on steel wide flange and channel posts welded to top and bottom flanges of exterior girders. Rail lapped in wrong direction on both sides and snagged near midspan of south rail. Inadequate post and welded connections. Light R1 rusting on rail posts.										
515/1	Steel Protective Coating	sq.ft	61	0%	0	0%	0	100%	61	0%	0
	Paint mostly gone.										
9326/1	Bridge Wingwalls	(EA)	4	25%	1	25%	1	0%	0	50%	2
	Steel piles with horizontal waler and painted corrugated metal cribbing. Wingwalls are low. Moderate erosion at northeast, minor erosion at others. R3/R4 rusting at joints of northeast and northwest. R2 rusting at southwest and R1 rusting at southeast wingwall. Sagebrush growing through cribbing at joints (typical).										
9501/1	Channel Cond	(EA)	1	100%	1	0%	0	0%	0	0%	0
	Silty. Channel turns horizontally through structure, apex at east abutment (A2). High flows potentially attack bank beyond the northeast wingwall.										
9502/1	ChannProtMatCond	(EA)	1	100%	1	0%	0	0%	0	0%	0
	Large rock riprap at northeast corner. Provides partial protection.										
9504/1	BankCond	(EA)	1	100%	1	0%	0	0%	0	0%	0
	Steep to vertical banks, grassy.										
9505/1	Debris Smart Flag	(EA)	1	100%	1	0%	0	0%	0	0%	0
	Minor vegetation debris caught on barbed wire fence mid channel.										
9520/1	AppRdAlign	(EA)	1	100%	1	0%	0	0%	0	0%	0
	Bridge at apex of vertical sag and horizontal curve. Washboard gravel. Shoulders: Minor sloughing into roadway at corners of bridge. Sloughing at northwest and northeast due to roadway drainage is encroaching into roadway up to 2 feet and causing erosion in channel below at base of piles and wingwall.										
9530/1	Approach Guardrail A	(EA)	1	100%	1	0%	0	0%	0	0%	0
	Painted W beam rail on steel wide flange posts, blocked out, flared end sections. Too short, not gradually stiffened, end sections not shielded and breakaway. Inadequate transition section. Not double nested. Low rail height (typical).										
9600/1	Genl Remarks	(EA)	1	100%	1	0%	0	0%	0	0%	0
	Object markers at ends of approch rails.										

Maintenance Activity Summary

MMS Activity	Description	Recommended	Status	Target Year	Est Cost

**358.99	Substructure-Rehab	10/14/2008	1	2020	25000

Replace backwall at the east abutment (A2) and north and east wingwalls. Alternatively, encase piles and backwall at A2 in concrete for 2 feet below existing groundline and 4 feet above existing waterline.

260.01	Misc-Remove Vegetation	9/12/2002	1	2020	100

Cut brush on approach roadway at northeast corner on inside of curve to improve sight distance.

306.04	Substruct-Cln Abutment/Pier Seat	11/18/2014	1	2020	300

Remove debris from pier cap at A2.

306.07	Bridge Rail-Replace	11/6/2012	-1	2020	7930

Replace bridge rail to meet current AASHTO/CDOT standards.

306.08	Approach Railing	11/6/2012	1	2020	31000

Replace transitions, approach rails and rail ends to meet current AASHTO/CDOT standards.

306.09	Bridge Rail-Repair	9/12/2002	1	2020	400

Loosen bridge rail on both sides of bridge and lap in proper direction.

352.20	Deck-Resurface	10/14/2008	1	2020	1000

Remove excess dirt/gravel from bridge deck to maintain load carrying capacity and improve drainage.

358.04	Channel-Remove Debris	11/7/2012	1	2020	120

Remove debris and fence from under structure in the channel.

358.99	Drainage-Repair Washouts/Erosion	10/14/2008	1	2020	1500

Raise tops of wingwalls 2 feet at all corners to retain fill and mitigate erosion encroaching into roadway.

360.03	Substructure-Rip Rap	9/12/2002	1	2020	1400

Place riprap in front of east abutment (A2).

399.00	Bridge-Replacement	11/18/2014	1	2020	330750

Consider replacing structure due to heavy deterioration in substructure.

Bridge Notes

Keep bridge on 24 month cycle until further distress in substructure is observed.

Inspection Notes

Date - 11/2/2016
Temp: 58 degrees Time: 11:20 AM Weather: Clear, breeze

Colorado Department of Transportation

Structure Inspection and Inventory Report (English Units)

Highway Number (ON) 5D: N.00 V
Mile Post (ON) 11: 1.800 mi

Scope:

☑ NBI ☑ Element ☐ Underwater ☐ Fracture Critical ☐ Other Type: Regular NBI

Team Leader Inspection Check-off:

☐ FCM's
☐ Posting Signs
☐ Essential Repair Verification
☐ Vertical Clearance
☐ Stream Bed Profile

Inspection Team: SEH

Inspection Date: 11/02/2016

Inspector: Nina Sass

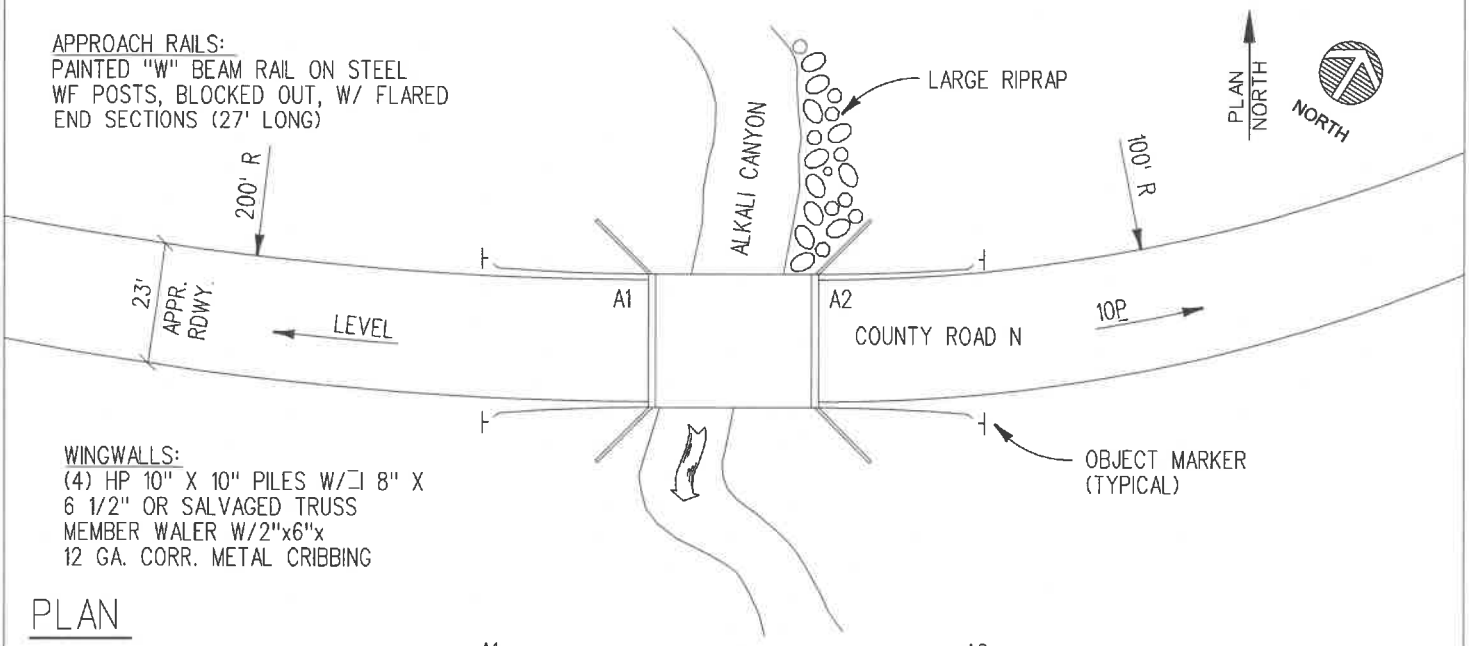
Nina Sass

Inspector (Team Leader): NINA SASS

Ø83ØØØN01.8ØØ16

NOV. 2, 2016

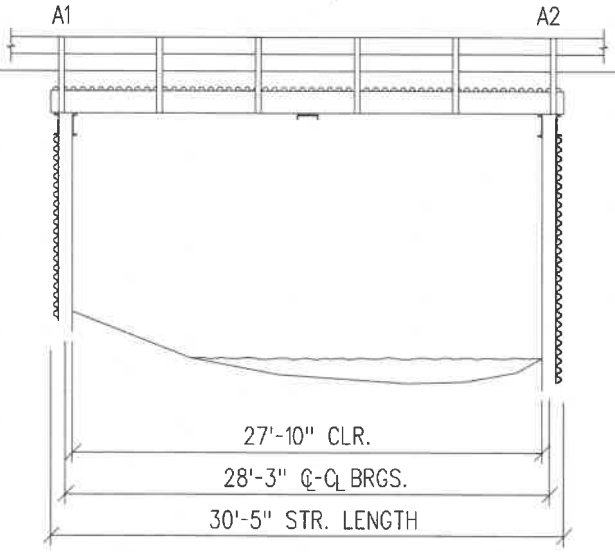
APPROACH RAILS:
PAINTED "W" BEAM RAIL ON STEEL
WF POSTS, BLOCKED OUT, W/ FLARED
END SECTIONS (27' LONG)



WINGWALLS:
(4) HP 10" X 10" PILES W/ ⊐I 8" X
6 1/2" OR SALVAGED TRUSS
MEMBER WALER W/2"x6"x
12 GA. CORR. METAL CRIBBING

PLAN

GRADE



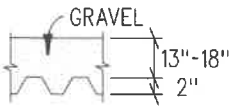
ABUTMENTS:
(2) C 15" x 3 1/2" ON
(6) HP 10" X 10" PILES
W/2" X 6" X 12 GA. PAINTED
CORR. METAL CRIBBING

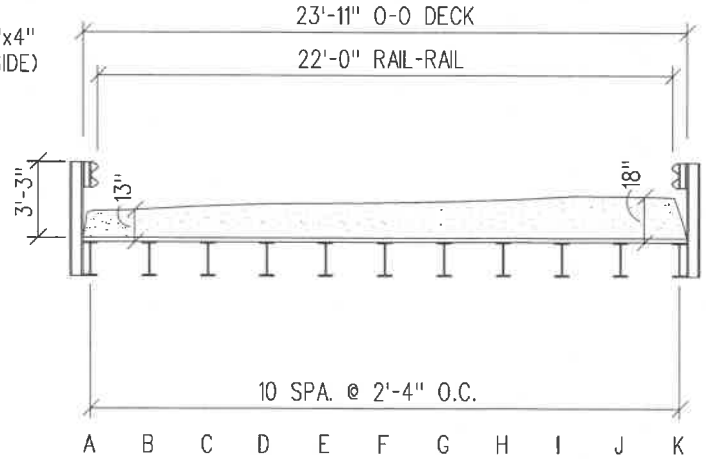
ELEVATION

LOOKING NORTH

BRIDGE RAILINGS:
PAINTED "W" BEAM RAIL ON
6"x4" WF AND 8" CHANNEL
POSTS @ 6'-3" O.C. W/ 8"x4"
BLOCKS AT "W" BEAM (6/SIDE)

DECK:
13" @ N, 18" @ S GRAVEL
ABOVE CORRUGATIONS
ON 2"x6"x 12 GA. PAINTED
CORR. METAL DECKING



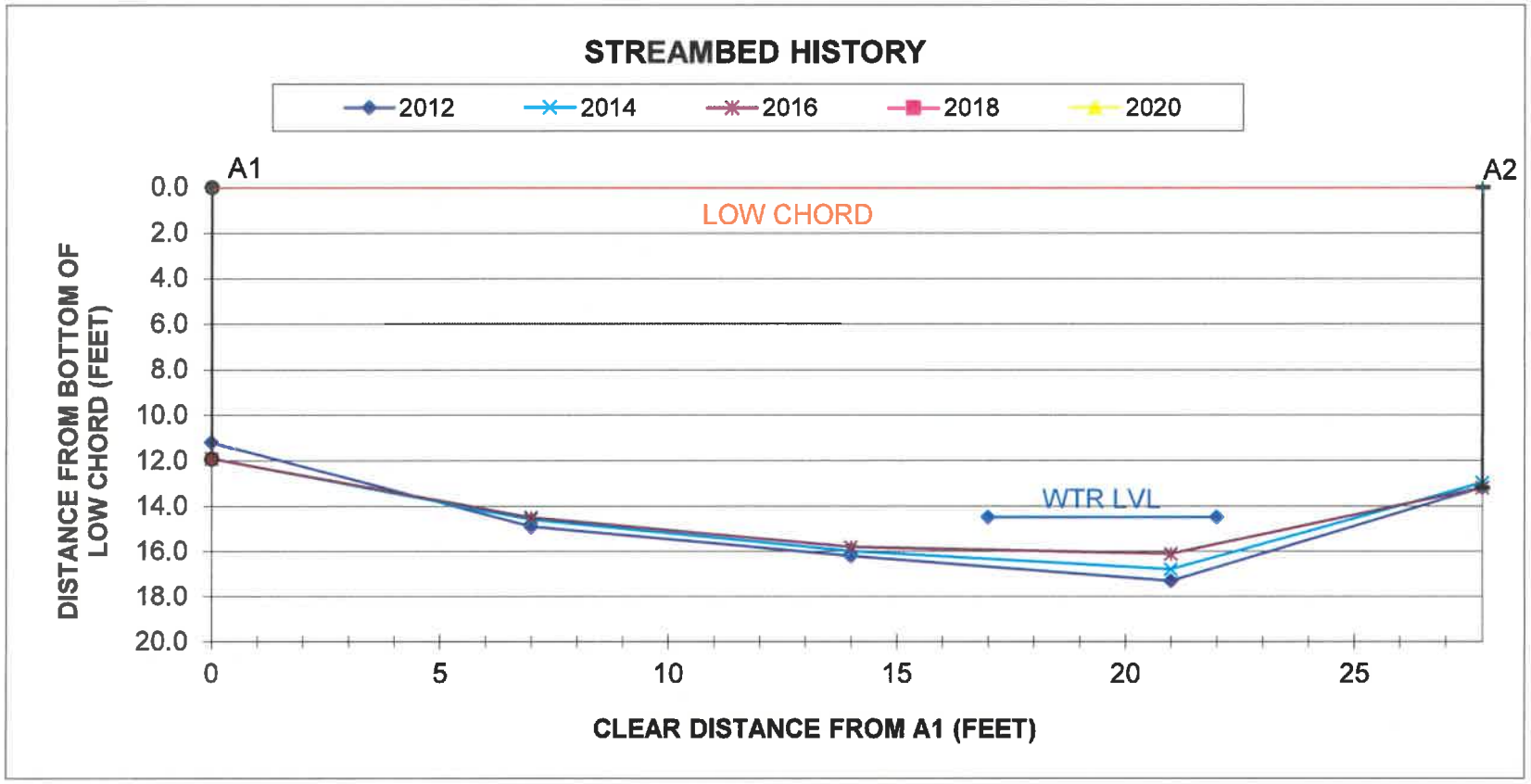


GIRDERS:
(11) W 16 X 45

DIAPHRAGMS:
8" CHANNELS TOP FLG.
BRACE AT ABUTS. &
MIDSPAN AND 8" CHANNEL
BOTTOM FLG. BRACE @
MIDSPAN

SECTION

LOOKING EAST



	0	7	14	21	27.8
2012	11.2	14.9	16.2	17.3	13.2
2014	11.9	14.6	16.0	16.8	13.0
2016	11.9	14.5	15.8	16.1	13.2
2018					
2020					

WTR LVL
15.3
15.2
14.5

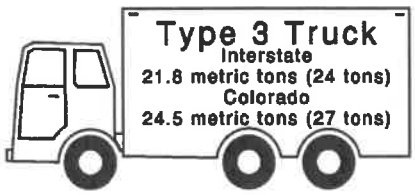
STRUCTURE NUMBER: 083000N01.80016
INSPECTION DATE: 11/2/2016

PERFORMED BY: NS/BI

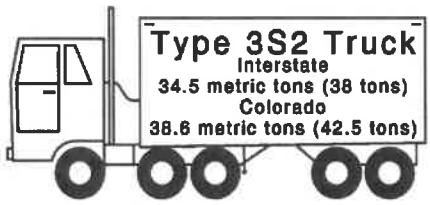
COLORADO DEPARTMENT OF TRANSPORTATION **LOAD FACTOR RATING SUMMARY**	Structure # 083000N01.80016
	Abbr. Str. # MTZ-016
Rated Using:	Road or Street # County Road N
Asphalt Thickness: -0- mm (-0- in.)	Batch I.D.
[X] Colorado Legal Loads	Structure Type SSM
[ ] Interstate Legal Loads	Parallel Structure # N/A

Structural Member	DECK		GIRDER					
	Metric Tons	(Tons)	Metric Tons	(Tons)	Metric Tons	(Tons)	Metric Tons	(Tons)
Inventory MS 18 (HS20)	22.6	(25.0)	30.7	(33.9)				
Operating MS 18 (HS20)	37.8	(41.7)	51.4	(56.7)				

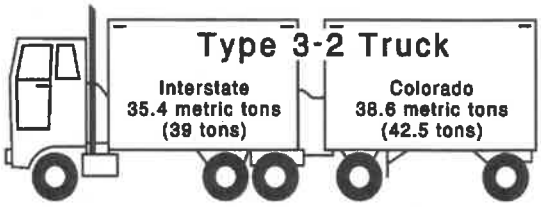
Type 3 Truck				
Type 3S2 Truck				
Type 3-2 Truck				
Permit Truck				



Metric Tons ( ) Tons



Metric Tons ( ) Tons



Metric Tons ( ) Tons

Comments:

18" (max.) fill above corrugations on 2" x 6" x 12 gage corrugated metal decking, F_y = 36,000 psi.

Girder rated is first interior from south W16x45, spanning 28'-3", spaced at 2'-4", F_y = 36,000 psi.

NO POSTING REQUIRED

BRIDGE REINSPECTED BUT NOT RERATED BY ALFRED BENESCH & COMPANY 2014

BRIDGE RE-INSPECTED BUT NOT RE-RATED BY ALFRED BENESCH & CO. 2012

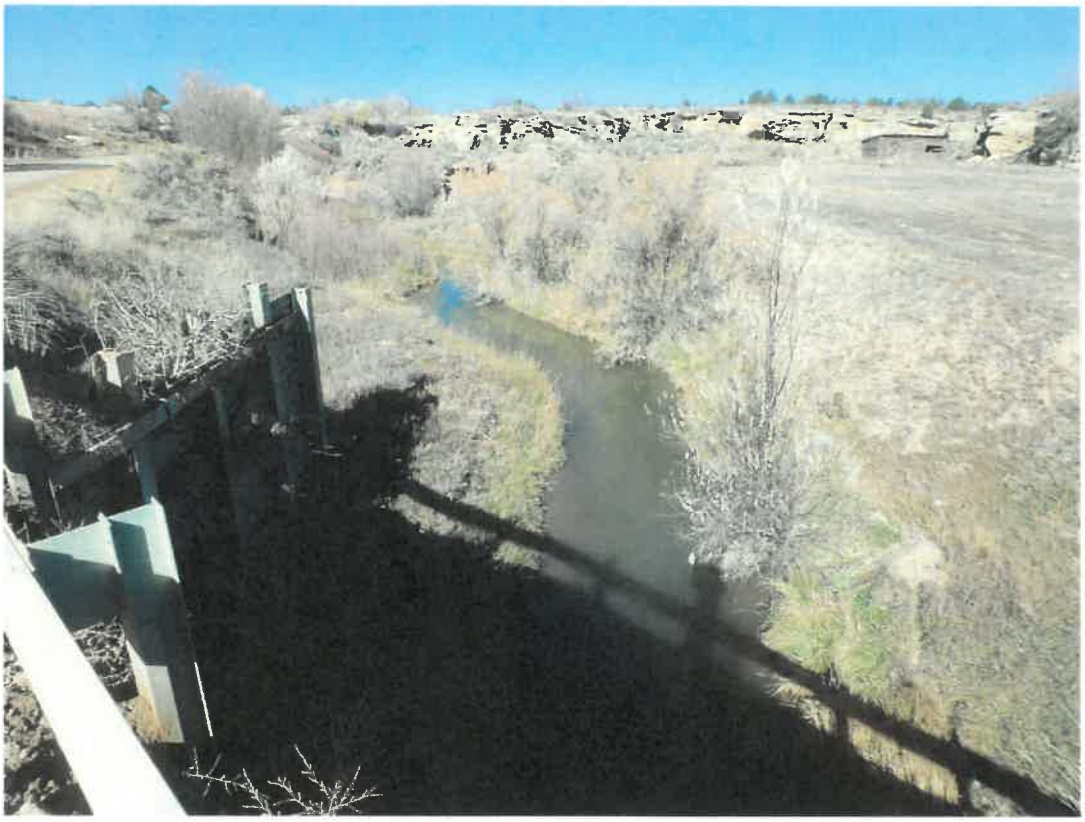
Rated By:	Date:	Checked By:	Date:
Jason Triplett	9/30/02	Jim Inglis	10/08/02
INSPECTED BUT NOT RATED STANTEC CONSULTING 2010		By:	Date:

Structure No. **083000N01.80016** Date: 11/2/16

View of Bridge Side Elevation Looking Upstream

View Down Centerline Bridge Roadway Looking Upstation (East)

Structure No. **083000N01.80016** Date: 11/2/16



View Looking Upstream, Left Bank

View Looking Upstream, Right Bank

Structure No. **083000N01.80016** Date: 11/2/16

View Looking Downstream, Left Bank

View Looking Downstream, Right Bank

W-Beam Lapped in Wrong Direction and Perforated End - Various Occurrences

Vegetation Growing in Front of Low Northeast Approach Rail

Structure No. **083000N01.80016** Date: 11/2/16

Erosion at Northwest Corner of Deck beginning to Encroach on Roadway – Similar at Northeast

Erosion Trough at North End of West Abutment - Correlated to Erosion at Corner of Deck Above

Vegetation Growing out of Northeast Wingwall - Similar at All Others

Bulging of East Abutment Cribbing where Not Rusted Through

R4 Rust with Holes in East Abutment Backwall - Between Piles 2D and 2E Shown

R4 Rust with Holes, Voids and Vegetation Growing in East Abutment Backwall – Between Piles 2E and 2F Shown

Flaking Layers of R3 Rust on Pile 2D - Section Loss Evident

Flaking Layers of R3 Rust on Pile 2E - Section Loss Evident

Structure No. **083000N01.80016** Date: 11/2/16

R4 Rust with Holes, Voids and Vegetation Growing in Southeast Wingwall Cribbing

General View of Underside of Bridge Looking Upstation (East)