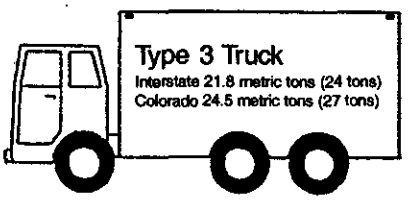
COLORADO DEPARTMENT OF TRANSPORTATION

LOAD FACTOR RATING SUMMARY

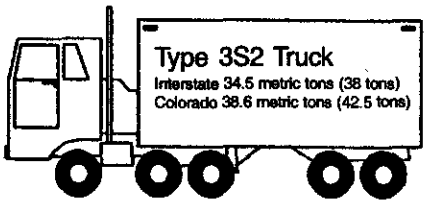
Structure #	K-18-AX
State highway #	25
Batch I.D.	561
Structure type	CIC
Parallel structure #	K-18-AY (Not Twin)

Rated using
Asphalt thickness: 127 mm (5 in.)
- ☐ Colorado legal loads
- ☐ Interstate legal loads

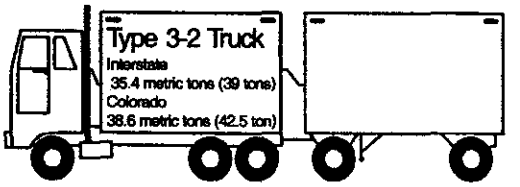
Structural member	G02 Interior Girder	G01 Exterior Girder W/ Damage	Slab	
	Metric tons (Tons)			
Inventory	31.3 (34.5)	33.2 (36.6)	21.2 (23.4)	( )
Operating	52.2 (57.6)	55.5 (61.1)	35.4 (39.0)	( )
Type 3 truck	( )	( )	( )	( )
Type 3S2 truck	( )	( )	( )	( )
Type 3-2 truck	( )	( )	( )	( )
Permit truck Single Lane D.F.	102.3 (112.8)	85.5 (94.3)	( )	( )



_____ (_____)
Metric tons Tons



_____ (_____)
Metric tons Tons



_____ (_____)
Metric tons Tons

Comments

Control Girder:	G02
Rating Control Point:	Span 3 @ mid span (50%)
Control Mode:	"+" Moment
Controlling Live Load:	HS 20-44
Girder Operating Load Capacity:	57.6 Tons
Color Code:	"White"

Exterior girder rated for 27% width section loss on bottom flange due impact damage

Rated by	Date	Checked by	Date
[signature]	10/21/2005	Andy Pott	10/25/05

Previous editions are obsolete and may not be used

CDOT Form #1187a 1/95

Slab Rating Version 2 Date: 10/21/20^^

Structure NO. K-18-AX Rater: JWG State HWY NO. = 25
Batch ID= 561 Description:

LOAD FACTOR RATING-COMP STEEL NOT USED

INPUT DATA

Bituminous Overlay(in)=	5.000		
Eff. Span(ft)=	7.228	Slab Thickness(in)=	7.370
Top Reinf. (sq.in)=	0.50	Eff. Depth(in) =	5.558
Bottom Area(sq.in)=	0.50	Bottom Dist.(in)=	1.31
Conc. Strength(PSI) Inv =	3000	Oper. =	3000
Steel Yield (PSI) Inv =	40000	Oper. =	40000
Modular Ratio =	9		

Dead Load Moment 0.79 K-Ft
LL+I Moment 4.80 K-Ft
Gross Weight 36.0 Tons

		Inventory	Operating
Actual Concrete Stress	(PSI)	861.45	1319.09
Actual Reinf. Steel Stress	(PSI)	19237.76	29457.59
Actual Comp. Steel Stress	(PSI)	2753.71	4216.59
Member Capacity	(K-Ft)	7.79	7.79
Member Capacity (LL+I)	(K-Ft)	6.75	6.75
Rating	(Tons)	23.39	38.98

JWG
10-31-2005

Rating Results Summary Report

Name: -1
Struct-Def: Girder 1

Bridge ID: K-18-AX
Member: G01

NBI: K-18-AX
Member Alt:G02 (Interior)

Live Load	Live Load Type	Design Method	Inventory Load Rating (Ton)	Operating Load Rating (Ton)	Inventory Rating Factor	Operating Rating Factor	Inventory Location (ft)	Inventory Location Span-(%)	Operating Location (ft)	Operating Location Span-(%)	Inventory Limit State	Operating Limit State	Impact	Lane
HS 20-44	Axle	LFD	34.49	57.60	0.958	1.600	149.00	3 - (50.	149.00	3 - (50.0)	SERVICEABI	SERVICEABILITY	As Request	As Requeste
HS 20-44	Axle	LFD	43.92	73.35	1.220	2.037	149.00	3 - (50.	149.00	3 - (50.0)	SERVICEABI	SERVICEABILITY	With Impact	Single Lane
HS 20-44	Axle	LFD	55.42	92.55	1.539	2.571	149.00	3 - (50.	149.00	3 - (50.0)	SERVICEABI	SERVICEABILITY	Without Imp	Single Lane
HS 20-44	Axle	LFD	34.49	57.60	0.958	1.600	149.00	3 - (50.	149.00	3 - (50.0)	SERVICEABI	SERVICEABILITY	With Impact	Multi-Lane
HS 20-44	Axle	LFD	43.52	72.68	1.209	2.019	149.00	3 - (50.	149.00	3 - (50.0)	SERVICEABI	SERVICEABILITY	Without Imp	Multi-Lane
HS 20-44	Lane	LFD	38.39	64.11	1.066	1.781	116.00	2 - (100.	116.00	2 - (100.0	FLEXURAL -	FLEXURAL - STE	As Request	As Requeste
HS 20-44	Lane	LFD	48.88	81.64	1.358	2.268	116.00	2 - (100.	116.00	2 - (100.0	FLEXURAL -	FLEXURAL - STE	With Impact	Single Lane
HS 20-44	Lane	LFD	61.68	103.01	1.713	2.861	116.00	2 - (100.	116.00	2 - (100.0	FLEXURAL -	FLEXURAL - STE	Without Imp	Single Lane
HS 20-44	Lane	LFD	38.39	64.11	1.066	1.781	116.00	2 - (100.	116.00	2 - (100.0	FLEXURAL -	FLEXURAL - STE	With Impact	Multi-Lane
HS 20-44	Lane	LFD	48.44	80.89	1.346	2.247	116.00	2 - (100.	116.00	2 - (100.0	FLEXURAL -	FLEXURAL - STE	Without Imp	Multi-Lane
Colorado Permit Vehicle	Axle	LFD		88.60		0.923			116.00	2 - (100.0		FLEXURAL - STE	As Request	As Requeste
Colorado Permit Vehicle	Axle	LFD		112.83		1.175			116.00	2 - (100.0		FLEXURAL - STE	With Impact	Single Lane
Colorado Permit Vehicle	Axle	LFD		142.36		1.483			116.00	2 - (100.0		FLEXURAL - STE	Without Imp	Single Lane
Colorado Permit Vehicle	Axle	LFD		88.60		0.923			116.00	2 - (100.0		FLEXURAL - STE	With Impact	Multi-Lane
Colorado Permit Vehicle	Axle	LFD		111.80		1.165			116.00	2 - (100.0		FLEXURAL - STE	Without Imp	Multi-Lane
Modified Tandem	Axle	LFD		58.65		1.173			149.00	3 - (50.0)		SERVICEABILITY	As Request	As Requeste
Modified Tandem	Axle	LFD		74.69		1.494			149.00	3 - (50.0)		SERVICEABILITY	With Impact	Single Lane
Modified Tandem	Axle	LFD		94.24		1.885			149.00	3 - (50.0)		SERVICEABILITY	Without Imp	Single Lane
Modified Tandem	Axle	LFD		58.65		1.173			149.00	3 - (50.0)		SERVICEABILITY	With Impact	Multi-Lane
Modified Tandem	Axle	LFD		74.01		1.480			149.00	3 - (50.0)		SERVICEABILITY	Without Imp	Multi-Lane

JWG
10-21-2005

Analysis Time: 10/21/2005 13:24:48
Print Time: 10/21/2005 13:25:02

Analyzed By: gregoryj

Rating Results Summary Report

Name: -1
Struct-Def: Girder 1

Bridge ID: K-18-AX
Member: G01

NBI: K-18-AX
Member Alt:G01 (Exterior) W/ Damage

Live Load	Live Load Type	Design Method	Inventory Load Rating (Ton)	Operating Load Rating (Ton)	Inventory Rating Factor	Operating Rating Factor	Inventory Location (ft)	Inventory Location Span-(%)	Operating Location (ft)	Operating Location Span-(%)	Inventory Limit State	Operating Limit State	Impact	Lane
HS 20-44	Axle	LFD	36.61	61.14	1.017	1.698	149.00	3 - (50.	149.00	3 - (50.0)	SERVICEABI	SERVICEABILITY	As Request	As Requeste
HS 20-44	Axle	LFD	36.61	61.14	1.017	1.698	149.00	3 - (50.	149.00	3 - (50.0)	SERVICEABI	SERVICEABILITY	With Impact	Single Lane
HS 20-44	Axle	LFD	46.19	77.14	1.283	2.143	149.00	3 - (50.	149.00	3 - (50.0)	SERVICEABI	SERVICEABILITY	Without Imp	Single Lane
HS 20-44	Axle	LFD	36.61	61.14	1.017	1.698	149.00	3 - (50.	149.00	3 - (50.0)	SERVICEABI	SERVICEABILITY	With Impact	Multi-Lane
HS 20-44	Axle	LFD	46.19	77.14	1.283	2.143	149.00	3 - (50.	149.00	3 - (50.0)	SERVICEABI	SERVICEABILITY	Without Imp	Multi-Lane
HS 20-44	Lane	LFD	40.85	68.22	1.135	1.895	116.00	2 - (100.	116.00	2 - (100.0	FLEXURAL -	FLEXURAL - STE	As Request	As Requeste
HS 20-44	Lane	LFD	40.85	68.22	1.135	1.895	116.00	2 - (100.	116.00	2 - (100.0	FLEXURAL -	FLEXURAL - STE	With Impact	Single Lane
HS 20-44	Lane	LFD	51.55	86.08	1.432	2.391	116.00	2 - (100.	116.00	2 - (100.0	FLEXURAL -	FLEXURAL - STE	Without Imp	Single Lane
HS 20-44	Lane	LFD	40.85	68.22	1.135	1.895	116.00	2 - (100.	116.00	2 - (100.0	FLEXURAL -	FLEXURAL - STE	With Impact	Multi-Lane
HS 20-44	Lane	LFD	51.55	86.08	1.432	2.391	116.00	2 - (100.	116.00	2 - (100.0	FLEXURAL -	FLEXURAL - STE	Without Imp	Multi-Lane
Colorado Permit Vehicle	Axle	LFD		94.29		0.982			116.00	2 - (100.0		FLEXURAL - STE	As Request	As Requeste
Colorado Permit Vehicle	Axle	LFD		94.29		0.982			116.00	2 - (100.0		FLEXURAL - STE	With Impact	Single Lane
Colorado Permit Vehicle	Axle	LFD		118.97		1.239			116.00	2 - (100.0		FLEXURAL - STE	Without Imp	Single Lane
Colorado Permit Vehicle	Axle	LFD		94.29		0.982			116.00	2 - (100.0		FLEXURAL - STE	With Impact	Multi-Lane
Colorado Permit Vehicle	Axle	LFD		118.97		1.239			116.00	2 - (100.0		FLEXURAL - STE	Without Imp	Multi-Lane
Modified Tandem	Axle	LFD		62.26		1.245			149.00	3 - (50.0)		SERVICEABILITY	As Request	As Requeste
Modified Tandem	Axle	LFD		62.26		1.245			149.00	3 - (50.0)		SERVICEABILITY	With Impact	Single Lane
Modified Tandem	Axle	LFD		78.55		1.571			149.00	3 - (50.0)		SERVICEABILITY	Without Imp	Single Lane
Modified Tandem	Axle	LFD		62.26		1.245			149.00	3 - (50.0)		SERVICEABILITY	With Impact	Multi-Lane
Modified Tandem	Axle	LFD		78.55		1.571			149.00	3 - (50.0)		SERVICEABILITY	Without Imp	Multi-Lane

Jwg
10-21-2005

Analysis Time: 10/21/2005 13:24:04
Print Time: 10/21/2005 13:24:32

Analyzed By: gregoryj

STRUCTURE NUMBER F-16-AM

STRUCTURE TYPE CSGC

Description	Units	Value
Bridge Width Out to Out	ft	34.00
Bridge Width Curb to Curb	ft	30.00
Girder Spacing	ft	7.71
Number of Girders	ft	5.00
Web Thickness (WF 33x141)	ft	0.61
Flange Width	ft	11.54
Flange Thickness	ft	0.96
End Diaphragm L (W14x30)	in	13.11
Diaphragm Length (C15x33.9)	ft	7.10
Overhang Rt. (max.)	ft	1.58
OverHang Lt. (max.)	ft	1.58
Slab Thickness (Average)	in	7.37
Asphalt Fill Thickness	in	5.00
Curb Width	ft	2.00
Curb Height (average)	ft	0.92
Number of Curbs	ea	2.00
Span1 length	ft	50.00
Span2 length	ft	66.00
Span3 length	ft	66.00
Span4 length	ft	50.00
Structure Length Brg. To Brg.	ft	232.00
Skew Angle	deg.	36.03

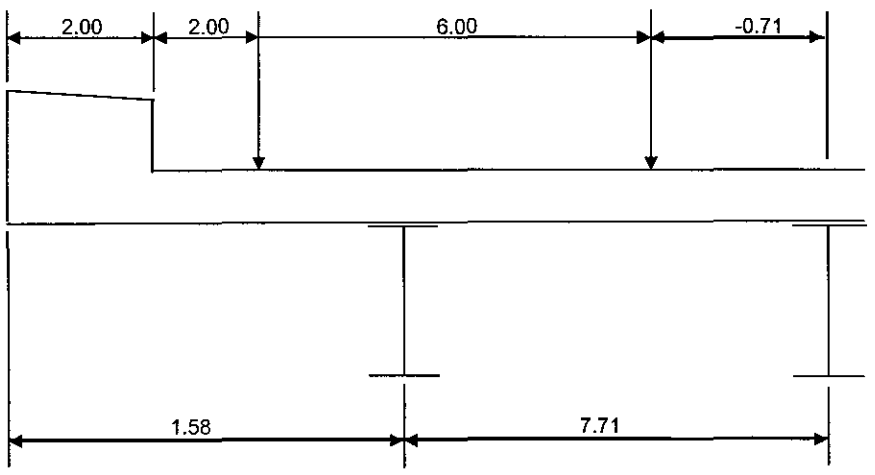
Interior Girder Effective Flange		
	units	Value
cl to cl	in	92.50
1/4 Span1	in	150.00
1/4 Span2	in	198.00
1/4 Span3	in	198.00
1/4 Span4	in	150.00
12t+b	in	95.70
Use min. (Span1)	in	92.50
Use min. (Span2)	in	92.50
Use min. (Span3)	in	92.50
Use min. (Span4)	in	92.50

Exterior Girder Effective Flange		
	units	Value
overhang + (cl to cl)/2	in	65.25
1/4 Span1	in	150.00
1/4 Span2	in	198.00
1/4 Span3	in	198.00
1/4 Span4	in	150.00
12t+b	in	95.70
Use min. (Span 1)	in	65.25
Use min. (Span 2)	in	65.25
Use min. (Span 3)	in	65.25
Use min. (Span 4)	in	65.25

Interior Girder Loads			
Description	Type	Unit Wt	Weight
Asphalt	Distributed	144.00	0.360
Type 10R Bridge Rail	Distributed	33.10	0.013
Curb	Distributed	150.00	0.110
Deck Concrete (non-monolithic	Distributed	150.00	0.626
Interior Diaphragm	Distributed	33.90	0.241
End Diaphragm	Distributed	30.00	0.394
			1.11

Live Load Distribution Factors		
Interior Girder (single lane)	S/7.0, if S>10 Level rule	1.101
Interior Girder (multi lane)	S/5.5 if S>14 Level rule	1.402
Exterior Girder	Lever rule or S/(4+0.25S)	1.301

Slab Parameters	
Description	Value
Reinf. Skew Angle	36.03
Effective Width	7.228
As (top) #5 @ 7.5"	0.496
As (bottom) #5 @ 7.5"	0.496
Slab Depth	7.370
Effective Depth	5.558
d1	1.313
Fy (Reinforcing)	40000
Fy (Structural Steel)	33000
F'c	3000



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10-21-2005