LEVEL 2 LOAD RATING (VIRTIS)

MILEPOST: 225.49 BIN: 5516071

REGION: 2 COUNTY: HERKIMER

FEATURE CARRIED: 90IX - WESTBOUND

FEATURE CROSSED: MILLERS GROVE RD (CR 53)

LEVEL 2 LOAD RATING REVIEW

VIRTIS RUN DATE: 7/11/2017

CHANGES TO INPUT DATA: Added 0.5 klf temporary barrier loading to the model.

LOADING	INVENTORY RATING (TONS)	OPERATING RATING (TONS)
HS-20	34.6 (HS-19)	57.8 (HS-32)
H-20	22.3 (H-22)	37.3 (H-37)
EV-2	-	48.5
EV-3	-	47.6

* ANALYSIS METHOD: LOAD FACTOR

** Truck loading controls the rating.

CONTROLLING MEMBER FOR RATING

LOCATION: MIDSPAN

COMPONENT: H20: INT. GIRDERS G2-G6 HS20: FAS. GIRDERS G1 & G7

FAILURE TYPE: STEEL SERVICEABILITY

EFFECTIVE SPAN LENGTH: 32'

H EQUIVALENT OF LEGAL LOAD H22

PRIMARY MEMBER RATING: 5

SAFE LOAD CAPACITY: H31

SLC COMPUTATION USED (IN BOLD)				
0.60 HOR	0.70 HOR	0.80 HOR	***0.85 HOR***	HOR

ACTION TAKEN: NONE REQUIRED X

RECOMMEND LEVEL 1

UNRATABLE

COMPLETED BY

KENNETH SWEENEY

REVIEWED BY

AMODH NIRALA

PE # 086434

LOAD RATING ENGINEER

Bridge

Bridge Id:	5516071	
Description:	Original analysis by Hardesty & Hanover, LLP - January 2005. Reviewed by Clark Patterson Associates - March 2005. Reviewed by DiDonato Associates - May 2007. Reviewed by DiDonato Associates - July 2009. Reviewed by DiDonato Associates - January 2012. Reviewed by CHA - May 2013. Reviewed by CHA - June 2015. Reviewed by WSA Group PE-PC - July 2017. Original construction under Contract MT 52-7. Rehabilitation under Contract TAS 92-74B. One simple span; rolled multi-girder. 7 girder cross-section. Structural deck thickness = 7.5 inches. Original concrete wearing surface = 4.0 inches. Additional asphalt overlay = 2.5 inches. Bridge skew = 1.66 degrees. Bridge oriented southeast. 2007 Notes: - Added self load for diaphragms. - Updated wearing surface thickness based on 2007 insp.. - Corrected wearing surface density. - All stiffener references removed, actually just connection plates. - Corrected rail type /load. 2009 Notes: - None. 2011 Notes: - Rating engine changed from BRASS LFD to VIRTIS LFD. - Section loss (5%) for web of fascia girders at supports entered per 2011 inspection report. 2013 Notes: - Concrete strength revised based on year built, per MBE. - Beam section properties revised to match AISC 5th Edition. - Railing load revised. - Sidewalk thickness revised. - Wearing surface unit weight revised. - Diaphragm connection angles added as equivalent partial height plates. - G2 shear distribution factor at the supports revised. - Haunches revised. - G1/G7 web loss at supports revised per 2013 inspection report. 10% web loss used since section loss seems mostly confined to lower web between the connection angle & girder end (not critical shear section). 2015 Notes: - Changed rating engine to AASHTO LFD. - Fascia girder web loss at supports revised. Web loss away from supports added. 2017 Notes: - Added temporary barrier loading.	
Facility Carried:	90 IX (WB)	
Feature Intersected:	Millers Grove Road	
Structure Number:	5516071	
Location:	Schuyler	
Length:	32.25	ft
Route Number:		
System Of Units:	US Customary	
Year Built:	1954	
Name:	MP 225.49 - 90 IX (WB) over Millers Grove Road	
District:		
County:		

LOAD RATING SUMMARY

Member Rating Results

System of Units: (•) US Customary ( ) SI / Metric

Lane/Impact Loading Type: (•) As Requested ( ) Detailed

Display Format: Mutiple rating levels per row

Bridge Id	Structure	Member	Vehicle	Inventory Rating Factor	Operating Rating Factor	Legal Operating Rating Factor	Legal Rating Factor	Permit Inventory Rating Factor	Permit Operating Rating Factor	Permit Rating Factor	Inventory Capacity (Ton)	Operating Capacity (Ton)	Legal Operating Capacity (Ton)	Legal Capacity (Ton)	Permit Inventory Capacity (Ton)	Permit Operating Capacity (Ton)	Permit Capacity (Ton)	Inventory Location (ft)	Operating Location (ft)
5516071	Location 1	G1	H 20-44	1.123	1.876						22.47	37.52						16.13	16.13
5516071	Location 1	G2	H 20-44	1.119	1.869						22.38	37.38						16.13	16.13
5516071	Location 1	G1	HS 20-44	0.962	1.606						34.63	57.82						12.90	12.90
5516071	Location 1	G2	HS 20-44	0.964	1.611						34.72	57.98						12.90	12.90

[x] Show up-to-date results only

Print Close

Member Rating Results

System of Units: (•) US Customary ( ) SI / Metric

Lane/Impact Loading Type: (•) As Requested ( ) Detailed

Display Format: Mutiple rating levels per row

Bridge Id	Structure	Member	Vehicle	Inventory Rating Factor	Operating Rating Factor	Legal Operating Rating Factor	Legal Rating Factor	Permit Inventory Rating Factor	Permit Operating Rating Factor	Permit Rating Factor	Inventory Capacity (Ton)	Operating Capacity (Ton)	Legal Operating Capacity (Ton)	Legal Capacity (Ton)	Permit Inventory Capacity (Ton)	Permit Operating Capacity (Ton)	Permit Capacity (Ton)	Inventory Location (ft)	Operating Location (ft)
5516071	Location 1	G1	Type EV2		1.687							48.50							12.90
5516071	Location 1	G2	Type EV2		2.153							61.90							12.90
5516071	Location 1	G1	Type EV3		1.108							47.62							16.13
5516071	Location 1	G2	Type EV3		1.404							60.39							16.13

[✓] Show up-to-date results only

Print Close

Bridge Name: MP 225.49 - 90 IX (WB) over Millers Grove Road
NBI Structure ID: 5516071
Bridge ID: 5516071

Analyzed By: BrR
Analyze Date: Tuesday, July 11, 2017 17:53:35
Analysis Engine: AASHTO LFR Engine Version 6.7.0.3001
Analysis Preference Setting: None

Report By: BrR
Report Date: Tuesday, July 11, 2017 17:53:55

Structure Definition Name: Single Span Multi Girder
Member Name: G2
Member Alternative Name: G-2

Individual Vehicle Load Factor Rating Summary

		Vehicle Rating			Capacity	Location				
Live Load		Type	Factor	Controls	(Ton)	Span	(ft)	Percent	Impact	Lane
H 20-44	Inventory	Lane	1.663	Service - Steel	33.25	1	16.13	50.0	As Requested	As Requested
H 20-44	Operating	Lane	2.776	Service - Steel	55.53	1	16.13	50.0	As Requested	As Requested
H 20-44	Inventory	Lane	1.663	Service - Steel	33.25	1	16.13	50.0	With Impact	Single Lane
H 20-44	Operating	Lane	2.776	Service - Steel	55.53	1	16.13	50.0	With Impact	Single Lane
H 20-44	Inventory	Lane	1.306	Service - Steel	26.13	1	16.13	50.0	With Impact	Multi-Lane
H 20-44	Operating	Lane	2.181	Service - Steel	43.63	1	16.13	50.0	With Impact	Multi-Lane
H 20-44	Inventory	Lane	2.161	Service - Steel	43.23	1	16.13	50.0	Without Impact	Single Lane
H 20-44	Operating	Lane	3.609	Service - Steel	72.19	1	16.13	50.0	Without Impact	Single Lane
H 20-44	Inventory	Lane	1.698	Service - Steel	33.96	1	16.13	50.0	Without Impact	Multi-Lane
H 20-44	Operating	Lane	2.836	Service - Steel	56.72	1	16.13	50.0	Without Impact	Multi-Lane
H 20-44	Inventory	Axle Load	1.424	Service - Steel	28.49	1	16.13	50.0	As Requested	As Requested
H 20-44	Operating	Axle Load	2.379	Service - Steel	47.58	1	16.13	50.0	As Requested	As Requested
	Inventory		1.424		28.49	1	16.13	50.0		

H 20-44		Axle Load		Service - Steel					With Impact	Single Lane
H 20-44	Operating	Axle Load	2.379	Service - Steel	47.58	1	16.13	50.0	With Impact	Single Lane
H 20-44	Inventory	Axle Load	1.119	Service - Steel	22.38	1	16.13	50.0	With Impact	Multi-Lane
H 20-44	Operating	Axle Load	1.869	Service - Steel	37.38	1	16.13	50.0	With Impact	Multi-Lane
H 20-44	Inventory	Axle Load	1.852	Service - Steel	37.03	1	16.13	50.0	Without Impact	Single Lane
H 20-44	Operating	Axle Load	3.092	Service - Steel	61.85	1	16.13	50.0	Without Impact	Single Lane
H 20-44	Inventory	Axle Load	1.455	Service - Steel	29.10	1	16.13	50.0	Without Impact	Multi-Lane
H 20-44	Operating	Axle Load	2.430	Service - Steel	48.60	1	16.13	50.0	Without Impact	Multi-Lane

Note:
"N/A" indicates not applicable
"**" indicates not available

Bridge Name: MP 225.49 - 90 IX (WB) over Millers Grove Road
NBI Structure ID: 5516071
Bridge ID: 5516071

Analyzed By: BrR
Analyze Date: Tuesday, July 11, 2017 17:52:07
Analysis Engine: AASHTO LFR Engine Version 6.7.0.3001
Analysis Preference Setting: None

Report By: BrR
Report Date: Tuesday, July 11, 2017 17:52:34

Structure Definition Name: Single Span Multi Girder
Member Name: G1
Member Alternative Name: G-1

Individual Vehicle Load Factor Rating Summary

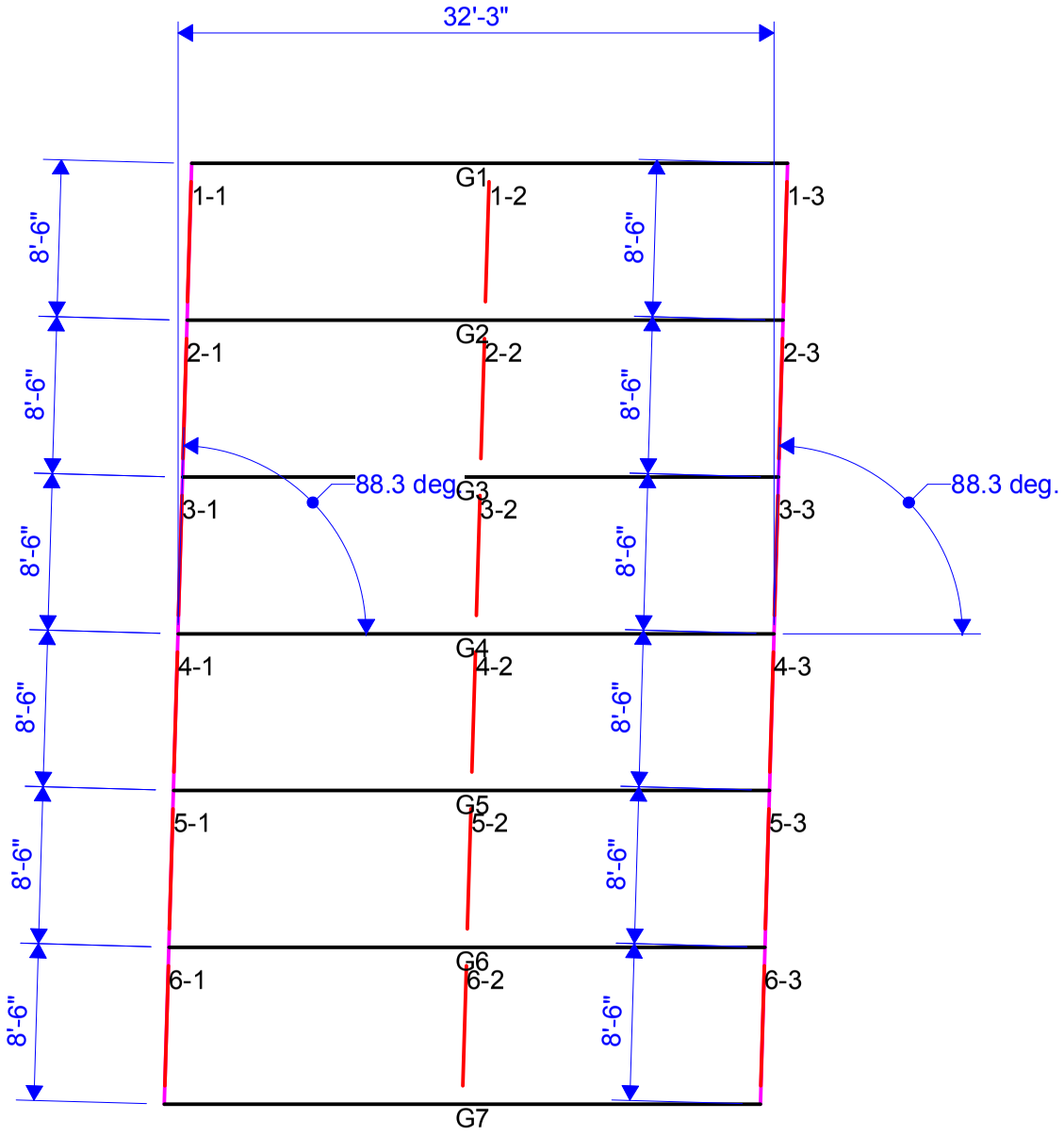
	Vehicle Rating			Capacity		Location			
Live Load	**Type**	**Factor**	**Controls**	**(Ton)**	**Span**	**(ft)**	**Percent**	**Impact**	**Lane**
HS 20-44	Inventory	Lane	1.311	Service - Steel	47.20	1	16.12	50.0	As Requested	As Requested
HS 20-44	Operating	Lane	2.189	Service - Steel	78.82	1	16.12	50.0	As Requested	As Requested
HS 20-44	Inventory	Lane	1.311	Service - Steel	47.20	1	16.12	50.0	With Impact	Single Lane
HS 20-44	Operating	Lane	2.189	Service - Steel	78.82	1	16.12	50.0	With Impact	Single Lane
HS 20-44	Inventory	Lane	1.311	Service - Steel	47.20	1	16.12	50.0	With Impact	Multi-Lane
HS 20-44	Operating	Lane	2.189	Service - Steel	78.82	1	16.12	50.0	With Impact	Multi-Lane
HS 20-44	Inventory	Lane	1.704	Service - Steel	61.35	1	16.12	50.0	Without Impact	Single Lane
HS 20-44	Operating	Lane	2.846	Service - Steel	102.46	1	16.12	50.0	Without Impact	Single Lane
	Inventory	Lane	1.704	Service - Steel	61.35	1	16.12	50.0	Without Impact	Multi-Lane

HS 20-44										
HS 20-44	Operating	Lane	2.846	Service - Steel	102.46	1	16.12	50.0	Without Impact	Multi-Lane
HS 20-44	Inventory	Axle Load	0.962	Service - Steel	34.63	1	12.90	40.0	As Requested	As Requested
HS 20-44	Operating	Axle Load	1.606	Service - Steel	57.82	1	12.90	40.0	As Requested	As Requested
HS 20-44	Inventory	Axle Load	0.962	Service - Steel	34.63	1	12.90	40.0	With Impact	Single Lane
HS 20-44	Operating	Axle Load	1.606	Service - Steel	57.82	1	12.90	40.0	With Impact	Single Lane
HS 20-44	Inventory	Axle Load	0.962	Service - Steel	34.63	1	12.90	40.0	With Impact	Multi-Lane
HS 20-44	Operating	Axle Load	1.606	Service - Steel	57.82	1	12.90	40.0	With Impact	Multi-Lane
HS 20-44	Inventory	Axle Load	1.250	Service - Steel	45.01	1	12.90	40.0	Without Impact	Single Lane
HS 20-44	Operating	Axle Load	2.088	Service - Steel	75.17	1	12.90	40.0	Without Impact	Single Lane
HS 20-44	Inventory	Axle Load	1.250	Service - Steel	45.01	1	12.90	40.0	Without Impact	Multi-Lane
HS 20-44	Operating	Axle Load	2.088	Service - Steel	75.17	1	12.90	40.0	Without Impact	Multi-Lane

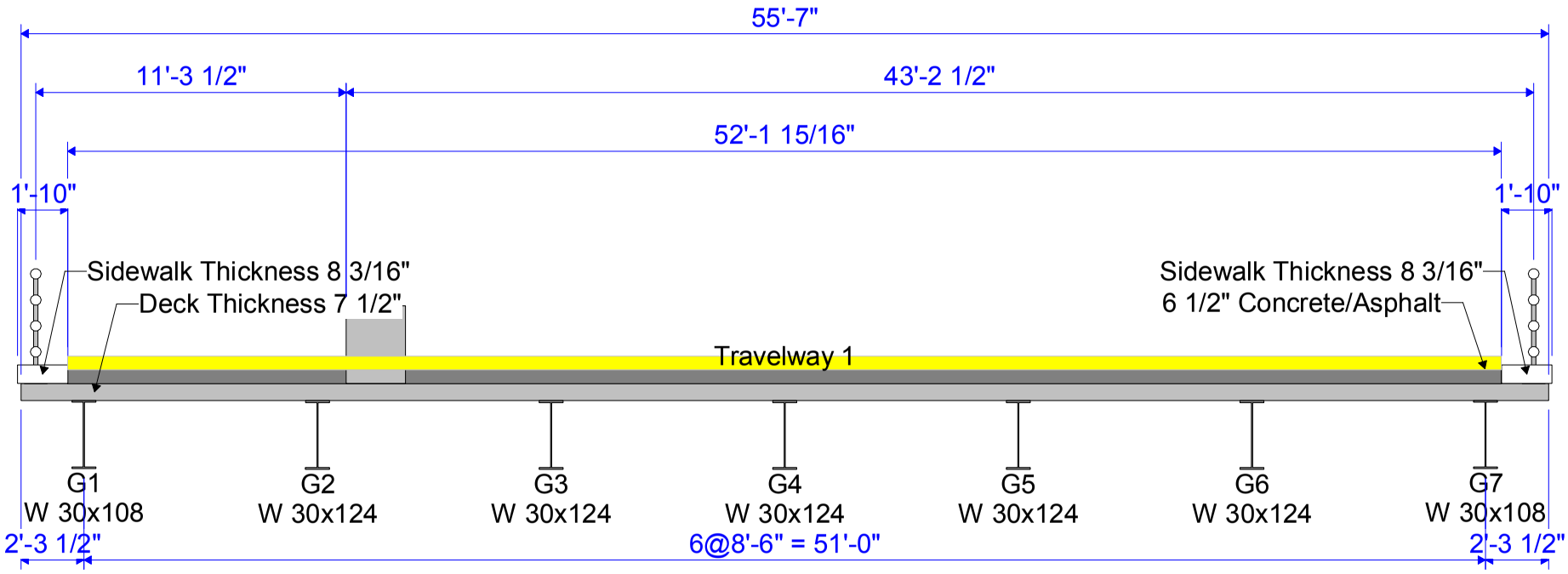
Note:
"N/A" indicates not applicable
"**" indicates not available

SCHEMATIC DRAWINGS

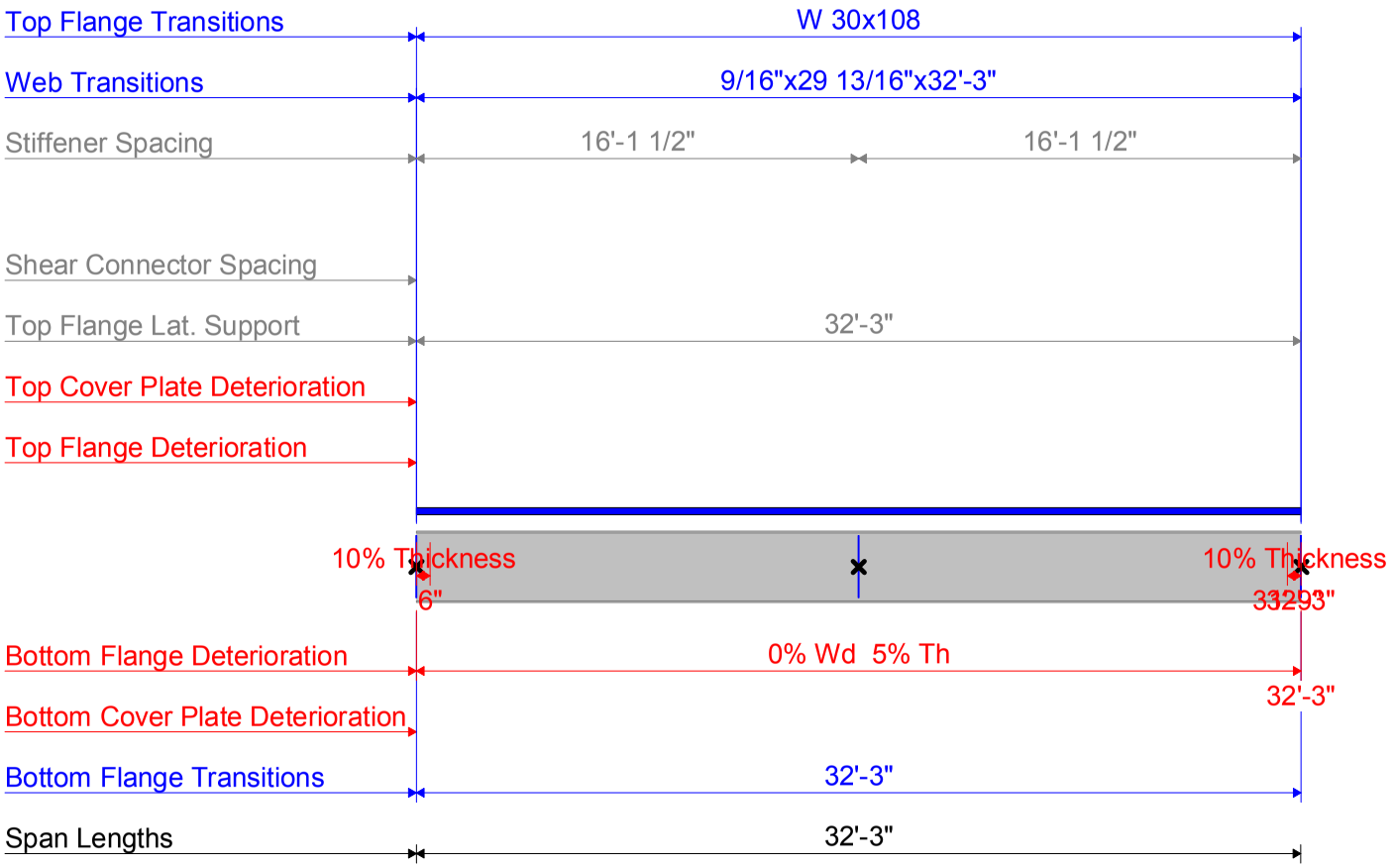
5516071
MP 225.49 - 90 IX (WB) over Millers Grove Road - Single Span Multi Girder
90 IX (WB) / Millers Grove Road
07/11/17



5516071
MP 225.49 - 90 IX (WB) over Millers Grove Road - Single Span Multi Girder
90 IX (WB) / Millers Grove Road
07/11/17

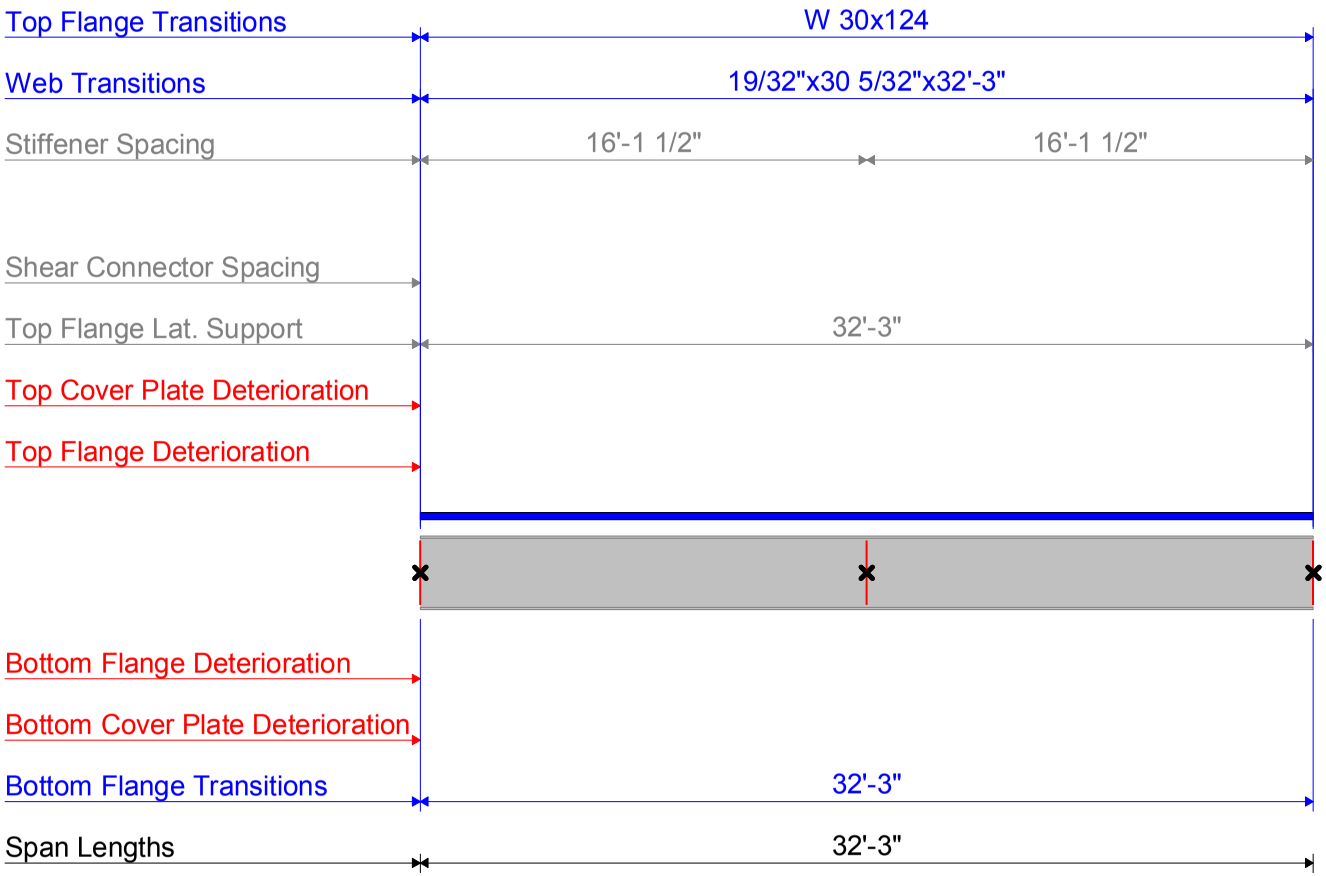


5516071
MP 225.49 - 90 IX (WB) over Millers Grove Road - Single Span Multi Girder - G1
90 IX (WB) / Millers Grove Road
07/11/17



Notes:
* All flange length dimensions are horiz. (length along flange may differ).
* Transverse stiffener pairs shown in red.
* Single transverse stiffener shown in blue.
* Bearing stiffeners shown in green.
* Dimensioning starts and ends at CL bearings.
* X denotes cross frame locations.

5516071
MP 225.49 - 90 IX (WB) over Millers Grove Road - Single Span Multi Girder - G2
90 IX (WB) / Millers Grove Road
07/11/17



Notes:
* All flange length dimensions are horiz. (length along flange may differ).
* Transverse stiffener pairs shown in red.
* Single transverse stiffener shown in blue.
* Bearing stiffeners shown in green.
* Dimensioning starts and ends at CL bearings.
* X denotes cross frame locations.

VIRTIS INPUT

Username: BrR
Date: Thursday, July 13, 2017 09:30:59

Bridge ID 5516071 MP 225.49 - 90 IX (WB) over Millers Grove Road

NBI Structure ID (8): 5516071
Description: Original analysis by Hardesty & Hanover, LLP - January 2005.
Reviewed by Clark Patterson Associates - March 2005.
Reviewed by DiDonato Associates - May 2007.
Reviewed by DiDonato Associates - July 2009.
Reviewed by DiDonato Associates - January 2012.
Reviewed by CHA - May 2013.
Reviewed by CHA - June 2015.
Reviewed by WSA Group PE-PC - July 2017.

Original construction under Contract MT 52-7.
Rehabilitation under Contract TAS 92-74B.
One simple span; rolled multi-girder.
7 girder cross-section.
Structural deck thickness = 7.5 inches.
Original concrete wearing surface = 4.0 inches.
Additional asphalt overlay = 2.5 inches.
Bridge skew = 1.66 degrees.
Bridge oriented southeast.

2007 Notes:
- Added self load for diaphragms.
- Updated wearing surface thickness based on 2007 insp..
- Corrected wearing surface density.
- All stiffener references removed, actually just connection plates.
- Corrected rail type /load.

2009 Notes:
- None.

2011 Notes:
- Rating engine changed from BRASS LFD to VIRTIS LFD.
- Section loss (5%) for web of fascia girders at supports entered per 2011 inspection report.

2013 Notes:
- Concrete strength revised based on year built, per MBE.
- Beam section properties revised to match AISC 5th Edition.
- Railing load revised.
- Sidewalk thickness revised.
- Wearing surface unit weight revised.
- Diaphragm connection angles added as equivalent partial height plates.
- G2 shear distribution factor at the supports revised.
- Haunches revised.
- G1/G7 web loss at supports revised per 2013 inspection report. 10% web loss used since section loss seems mostly confined to lower web between the connection angle & girder end (not critical

shear section).

2015 Notes:
- Changed rating engine to AASHTO LFD.
- Fascia girder web loss at supports revised. Web loss away from supports added.

2017 Notes:
- Added temporary barrier loading.

Description

Location:	Schuyler
Total Length:	32.25 *(ft)*
Facility Carried:	90 IX (WB)
Route Number:	
Feature Intersected:	Millers Grove Road
Mi Post:	225.49 *(mi)*
Units:	US Customary
Year Built:	1954
Recent ADTT:	0
District:	
County:	
Owner:	
National Highway System:	
Functional Class:	

Global Reference Point

X Coordinate:	0.000 *(ft)*
Y Coordinate:	0.000 *(ft)*
Elevation:	*(ft)*
Longitude:	*(Degrees)*
Latitude:	*(Degrees)*

Materials

Structural Steel

Name:	**ASTM A7**
Description:	Fy = 33 ksi

Specified minimum yield strength (Fy):	33.000 *(ksi)*
Specified minimum tensile strength (Fu):	60.000 *(ksi)*
Coefficient of thermal expansion:	*(1/F)*
Density:	0.4900 *(kcf)*
Modulus of elasticity (E):	29000.00 *(ksi)*

Concrete

Name:	**Unknown strength concrete prior to 1959**
Description:	f'c = 2500 psi

Specified compressive strength at 28 days (f'c):	2.500 *(ksi)*
Initial specified compressive strength (f'ci):	*(ksi)*
Coefficient of thermal expansion:	0.0000060000 *(1/F)*
Density (for dead loads):	0.150 *(kcf)*

Density (for modulus of elasticity):	0.145 *(kcf)*
Modulus of elasticity (Ec):	2880.95 *(ksi)*
Poisson's ratio:	0.200
Modulus of rupture:	0.379 *(ksi)*
Shear factor:	1.000
Composition of concrete:	Normal
Initial modulus of elasticity (Eci):	0.00 *(ksi)*

Reinforcing Steel

Name:	**Grade 40**
Description:	40 ksi reinforcing steel
Specified yield strength (Fy):	40.000 *(ksi)*
Modulus of elasticity (Es):	29000.00 *(ksi)*
Ultimate strength (Fu):	70.000 *(ksi)*
Type:	Plain

No prestressing strand materials.

No timber materials.

Beam Shapes

Steel Shapes

No steel angles.

No steel channels.

Steel I Shapes

Name:	**W 30x108**
Description:	W 30x108 from AISC 5th Edition Tables (1946-1962)
Depth (d):	29.8200 *(in)*
Flange width (bf):	10.4840 *(in)*
Flange thickness (tf):	0.7600 *(in)*
Web thickness (tw):	0.5480 *(in)*
k:	1.5000 *(in)*
k1:	1.0000 *(in)*
Cross sectional area:	31.770 *(in^2)*
Nominal load:	108.000 *(lb/ft)*
Ixx:	4461.000 *(in^4)*
Iyy:	135.100 *(in^4)*
Zx:	346.000 *(in^3)*
Zy:	43.900 *(in^3)*
Nominal Depth:	30.0000 *(in)*
Type:	W Shape

Name:	**W 30x124**
Description:	W 30x124 from AISC 5th Edition Tables (1946-1962)
Depth (d):	30.1600 *(in)*
Flange width (bf):	10.5210 *(in)*
Flange thickness (tf):	0.9300 *(in)*
Web thickness (tw):	0.5850 *(in)*
k:	1.6250 *(in)*
k1:	1.0000 *(in)*
Cross sectional area:	36.450 *(in^2)*
Nominal load:	124.000 *(lb/ft)*
Ixx:	5347.100 *(in^4)*
Iyy:	169.700 *(in^4)*
Zx:	408.000 *(in^3)*
Zy:	54.000 *(in^3)*
Nominal Depth:	30.0000 *(in)*
Type:	W Shape

No steel structural tee shapes.

Prestressed Shapes

No prestressed shapes.

Timber Shapes

No timber shapes.

Appurtenances

No concrete parapets.

No concrete medians.

Generics

Name:	**Temporary Concrete Barrier**
Description:	
Width:	26.0000 *(in)*
Effective Wind Height:	34.0000 *(in)*
Distance to Center of Gravity of Load:	13.0000 *(in)*
Barrier Load:	0.500 *(kip/ft)*

Railings

Name:	**Four Rail w/Thrie Beam**
Description:	
Effective Wind Height:	48.0000 *(in)*
Railing Load:	0.065 *(kip/ft)*
Distance From Edge to Centroid:	6.5000 *(in)*

Width: 10.0000 *(in)*

Impact

Standard Impact Factor

Type: Standard - AASHTO

LRFD Dynamic Load Allowance

Fatigue and fracture limit states: 15.0 *(%)*

All other limit states: 33.0 *(%)*

Factors

No LFD Factors specified.

No LRFD Factors specified.

Bridge Alternatives Location 1

Reference Line

Reference Line Length: *(ft)*

Starting Station: *(ft)*

Bearing: N 90^ 0' 0.00" E

Global Positioning

Distance: 0.000 *(ft)*

Offset: 0.000 *(ft)*

Elevation: *(ft)*

Structures

Name: Location 1

Description:

Structure Alternatives

Name: Inspection 2005

Description:

Superstructure Definition: Single Span Multi Girder

Superstructure Definition Single Span Multi Girder

Definition

Units: US Customary

Number of spans: 1

Number of girders: 7

Span	Length *(ft)*
1	32.2500

Frame Structure Simplified Definition:
Support Frame Connection
1
2
Girder Spacing Display Type: Perpendicular
Average Humidity: *(%)*
Analysis
Default Library Factors
Factor Override
Analysis Module
Analysis Method: ASD
Analysis Module:
Analysis Module Component:
Properties:

Analysis Method: LFD
Analysis Module:
Analysis Module Component:
Properties:

Analysis Method: LRFD
Analysis Module:
Analysis Module Component:
Properties:

Analysis Method: LRFR
Analysis Module:
Analysis Module Component:
Properties:

Analysis Method: Distribution Factors
Analysis Module:
Analysis Module Component:
Properties:

Default rating method: LFD

Impact
Standard Impact Factor
Type: Standard - AASHTO
LRFD Dynamic Load Allowance
Fatigue and fracture limit states: 15.0 *(%)*
All other limit states: 33.0 *(%)*

Structure Framing Plan Details
Layout

Support	Skew *(Degrees)*
1	1.6611
2	1.6611

Girder Spacing Orientation: Perpendicular

Girder Bay	Girder Spacing Start (ft)	End (ft)
1	8.5000	8.5000
2	8.5000	8.5000
3	8.5000	8.5000
4	8.5000	8.5000
5	8.5000	8.5000
6	8.5000	8.5000

Diaphragms

Girder Bay 1

Distance Left Girder (ft)	Distance Right Girder (ft)	Diaphragm Spacing (ft)	Number of Spaces	Diaphragm Weight (kip)
0.00	0.00	0.00	1	
16.13	16.13	0.00	1	
16.13	16.13	16.13	1	

Girder Bay 2

Distance Left Girder (ft)	Distance Right Girder (ft)	Diaphragm Spacing (ft)	Number of Spaces	Diaphragm Weight (kip)
0.00	0.00	0.00	1	
16.13	16.13	16.13	1	
16.13	16.13	0.00	1	

Girder Bay 3

Distance Left Girder (ft)	Distance Right Girder (ft)	Diaphragm Spacing (ft)	Number of Spaces	Diaphragm Weight (kip)
0.00	0.00	0.00	1	
16.13	16.13	0.00	1	
16.13	16.13	16.13	1	

Girder Bay 4

Distance Left Girder (ft)	Distance Right Girder (ft)	Diaphragm Spacing (ft)	Number of Spaces	Diaphragm Weight (kip)
0.00	0.00	0.00	1	
16.13	16.13	16.13	1	
16.13	16.13	0.00	1	

Girder Bay 5

Distance Left Girder (ft)	Distance Right Girder (ft)	Diaphragm Spacing (ft)	Number of Spaces	Diaphragm Weight (kip)
0.00	0.00	0.00	1	
16.13	16.13	16.13	1	
16.13	16.13	0.00	1	

Girder Bay 6

Distance Left Girder	Distance Right Girder	Diaphragm Spacing	Number of Spaces	Diaphragm Weight

(ft)	*(ft)*	*(ft)*		*(kip)*
0.00	0.00	0.00	1	
16.13	16.13	0.00	1	
16.13	16.13	16.13	1	

Structure Typical Section

Deck

Left start width: 27.79 *(ft)*
Left end width: 27.79 *(ft)*
Right start width: 27.79 *(ft)*
Right end width: 27.79 *(ft)*
Left start overhang: 2.29 *(ft)*
Left end overhang: 2.29 *(ft)*

Deck (Cont'd)

Deck concrete: Unknown strength concrete prior to 1959
Total deck thickness: 7.5000 *(in)*
Deck crack control parameter: *(kip/in)*
Sustained modular ratio factor: 3.000

Railing

Name	Load Case	Measure To	Measured From	Distance At Start	Distance At End	Front Face Orientation
Four Rail...	DC2		Left Ed...	0.13	0.13	Right
Four Rail...	DC2		Right E...	0.13	0.13	Left

Generic

Name	Load Case	Measure To	Measured From	Distance At Start	Distance At End	Front Face Orientation
Temporary...	DC2	Front	Left Ed...	14.00	14.00	Right

Sidewalk

Width	Thickness At End	Material	Load Case	Measure to	Measured From	At Start
22.0000	8.2000	Unknown...	DC2		Left Ed...	-0.13 ...
22.0000	8.2000	Unknown...	DC2		Right E...	-0.13 ...

Lane Position

Offset Left Start: -26.08 *(ft)*
Offset Left End: -26.08 *(ft)*
Offset Right Start: 26.08 *(ft)*
Offset Right End: 26.08 *(ft)*

Wearing Surface

Wearing surface material: Concrete/Asphalt
Description: Overlay
Wearing surface thickness: 6.5000 *(in)*
Wearing surface density: 150.000 *(pcf)*
Load case: DW

Load Case Description

Load Case Name	Description	Stage	Type	Time *(Days)*
DC1	DC acting on non-comp...	Non-composite (Sta...	D,DC	
DC2	DC acting on long-ter...	Composite (long te...	D,DC	

DW	DW acting on long-ter...	Composite (long te...	D,DW

Superstructure Loads

Uniform Temperature

Load Case:

Temperature rise: *(F)*

Temperature fall: *(F)*

Gradient Temperature

Load Case:

Temperature value T1: *(F)*

Temperature value T2: *(F)*

Temperature value T3: *(F)*

Wind

Load Case:

Design Pressure: *(psf)*

Wind Load Path: Truss action

DL Distribution

Stage 1 Dead Load Distribution: Tributary Area

Stage 2 Dead Load Distribution: Tributary Area

Stiffener Definitions

Transverse Stiffeners

Name: 1 sided dia. conn.
Stiffener number: Single
Plate Width: 7.0000 *(in)*
Plate Thickness: 0.4380 *(in)*
Material: ASTM A7
Top Gap: 1.2500 *(in)*
Bottom Gap: 1.2500 *(in)*
Top Weld:
Web Weld:
Bottom Weld:

Name: 2 sided dia. conn.
Stiffener number: Pair
Plate Width: 7.0000 *(in)*
Plate Thickness: 0.4380 *(in)*
Material: ASTM A7
Top Gap: 1.2500 *(in)*
Bottom Gap: 1.2500 *(in)*
Top Weld:
Web Weld:
Bottom Weld:

No prestress stress limits.

No prestress properties.

No vertical shear reinforcement definitions.

No horizontal shear reinforcement definitions.

Member G1

Link with: None
Description:

Existing: G-1 - Additional self load is for the diaphragms.
Current: G-1 - Additional self load is for the diaphragms.
Number of Spans: 1

Span Number	Span Length *(ft)*
1	32.250000

Support	Frame Connection
1	
2	

Pedestrian load: 0.000 *(lb/ft)*

Member Loads

Member Loads - Settlement

Support Number	Horizontal *(in)*	Vertical *(in)*	Rotational *(Radians)*	Load Case Name
1				
2				

Support Constraints

General

Support Number	Support Type	X Translation	Y Translation	Z Rotation
1	Pinned	Fixed	Fixed	Free
2	Roller	Free	Fixed	Free

Elastic

Support Number	X Translation *(kip/ft)*	Y Translation *(kip/ft)*	Z Rotation *(kip-in/rad)*	Override Computed Z Rotation
1				
2				

Member Alternative G-1

Description: Additional self load is for the diaphragms.
Description
Material Type: Steel
Girder Type: Rolled
Member units: US Customary
Girder property input method: Schedule based

Left end X: 6.0000 *(in)*
Right end X: 6.0000 *(in)*
Additional Self Load: 0.020 *(kip/ft)*
Additional Self Load %: *(%)*
Analysis Module
Analysis Method: ASD
Analysis Module: AASHTO ASD
Analysis Module Component:
Properties:

Analysis Method: LFD
Analysis Module: AASHTO LFD
Analysis Module Component:
Properties:

Analysis Method: LRFD
Analysis Module: AASHTO LRFD
Analysis Module Component:
Properties:

Analysis Method: LRFR
Analysis Module: AASHTO LRFR
Analysis Module Component:
Properties:

Analysis Method: Distribution Factors
Analysis Module:
Analysis Module Component:
Properties:

Default rating method: LFD

Factors
Factor Override
LRFD:
LFD:
ASD Factors

	Inventory	Operating
Structural steel		
Concrete		
PS Concrete Comp.		
PS Concrete Tens.		
PS Moment Cap.		
Reinforcement		
Bearing Stiffener		
Stirrup		
Timber	NA	

Default Materials

Structural steel:	ASTM A7
Deck concrete:	Unknown strength concrete prior to 1959
Deck reinforcement:	Grade 40
Welds:	
Bolts:	

Impact

Standard Impact Factor

Type:	Standard - AASHTO

LRFD Dynamic Load Allowance

Fatigue and fracture limit states:	15.0 *(%)*
All other limit states:	33.0 *(%)*

Live Load Distribution

Standard

Distribution Factor (Wheels)

Lanes Loaded	Shear	Shear at Supports	Moment	Deflection
1 Lane	1.388	0.961	1.388	0.286
Multi-Lane	1.388	0.961	1.388	0.857

Girder Profile

Shape

Shape:	W 30x108
Distance:	0.00 *(ft)*
Length:	32.25 *(ft)*
Material:	ASTM A7

Deck Profile

Bracing Ranges

Lateral Support

Distance *(ft)*	Length *(ft)*
0.00	32.25

Stiffener Ranges

Transverse Stiffener Ranges (Location)

Name	Distance *(ft)*	Number	Spacing *(in)*
1 sided dia. conn.	0.00	1	0.0000
1 sided dia. conn.	16.13	1	0.0000
1 sided dia. conn.	32.25	1	0.0000

Bearing Stiffener Locations

Top Flange Deterioration

Width	Thickness	Start	Length

Loss (%)	Loss (%)	Distance (ft)	(ft)

Bottom Flange Deterioration

Width Loss (%)	Thickness Loss (%)	Start Distance (ft)	Length (ft)
0.0	5.0	0.00	32.25

Web Deterioration

Thickness Loss (%)	Start Distance (ft)	Length (ft)
10.0	0.00	0.50
10.0	31.75	0.50

Member G2

Link with: None
Description:

Existing: G-2 - Additional self load is for the diaphragms.
Current: G-2 - Additional self load is for the diaphragms.
Number of Spans: 1

Span Number	Span Length (ft)
1	32.250000

Support	Frame Connection
1	
2	

Pedestrian load: 0.000 *(lb/ft)*

Member Loads

Member Loads - Settlement

Support Number	Horizontal (in)	Vertical (in)	Rotational (Radians)	Load Case Name
1				
2				

Support Constraints

General

Support Number	Support Type	X Translation	Y Translation	Z Rotation
1	Pinned	Fixed	Fixed	Free
2	Roller	Free	Fixed	Free

Elastic

Support Number	X Translation *(kip/ft)*	Y Translation *(kip/ft)*	Z Rotation *(kip-in/rad)*	Override Computed Z Rotation
1				
2				

Member Alternative G-2

Description: Additional self load is for the diaphragms.

Description

Material Type: Steel
Girder Type: Rolled
Member units: US Customary
Girder property input method: Schedule based
Left end X: 6.0000 *(in)*
Right end X: 6.0000 *(in)*
Additional Self Load: 0.040 *(kip/ft)*
Additional Self Load %: *(%)*

Analysis Module

Analysis Method: ASD
Analysis Module: AASHTO ASD
Analysis Module Component:
Properties:

Analysis Method: LFD
Analysis Module: AASHTO LFD
Analysis Module Component:
Properties:

Analysis Method: LRFD
Analysis Module: AASHTO LRFD
Analysis Module Component:
Properties:

Analysis Method: LRFR
Analysis Module: AASHTO LRFR
Analysis Module Component:
Properties:

Analysis Method: Distribution Factors
Analysis Module:
Analysis Module Component:
Properties:

Default rating method: LFD

Factors

Factor Override

LRFD:
LFD:

ASD Factors

	Inventory	Operating

Structural steel	
Concrete	
PS Concrete Comp.	
PS Concrete Tens.	
PS Moment Cap.	
Reinforcement	
Bearing Stiffener	
Stirrup	
Timber	NA

Default Materials

Structural steel:	ASTM A7
Deck concrete:	Unknown strength concrete prior to 1959
Deck reinforcement:	Grade 40
Welds:	
Bolts:	

Impact

Standard Impact Factor

Type:	Standard - AASHTO

LRFD Dynamic Load Allowance

Fatigue and fracture limit states:	15.0 *(%)*
All other limit states:	33.0 *(%)*

Live Load Distribution

Standard

D i s t r i b u t i o n F a c t o r (Wheels)

Lanes Loaded	Shear	Shear at Supports	Moment	Deflection
1 Lane	1.214	1.294	1.214	0.286
Multi-Lane	1.545	1.824	1.545	0.857

Girder Profile

Shape

Shape:	W 30x124
Distance:	0.00 *(ft)*
Length:	32.25 *(ft)*
Material:	ASTM A7

Deck Profile

Bracing Ranges

Lateral Support

Distance *(ft)*	Length *(ft)*
0.00	32.25

Stiffener Ranges

Transverse Stiffener Ranges (Location)

Name	Distance *(ft)*	Number	Spacing *(in)*
2 sided dia. conn.	0.00	1	0.0000
2 sided dia. conn.	16.13	1	0.0000
2 sided dia. conn.	32.25	1	0.0000

Bearing Stiffener Locations

Member G3

Link with: G2
Description:

Existing:
Current:
Number of Spans: 1

Span Number	Span Length *(ft)*
1	32.250000

Support	Frame Connection
1	
2	

Pedestrian load: *(lb/ft)*

Member G4

Link with: G2
Description:

Existing:
Current:
Number of Spans: 1

Span Number	Span Length *(ft)*
1	32.250000

Support	Frame Connection
1	
2	

Pedestrian load: *(lb/ft)*

Member G5

Link with: G2
Description:

Existing:
Current:
Number of Spans: 1

Span Number	Span Length *(ft)*
1	32.250000

Support	Frame Connection
1	
2	

Pedestrian load: *(lb/ft)*

Member G6

Link with: G2
Description:

Existing:
Current:
Number of Spans: 1

Span Number	Span Length *(ft)*
1	32.250000

Support	Frame Connection
1	
2	

Pedestrian load: *(lb/ft)*

Member G7

Link with: G1
Description:

Existing:
Current:
Number of Spans: 1

Span Number	Span Length *(ft)*
1	32.250000

Support	Frame Connection
1	
2	

Pedestrian load: 0.000 *(lb/ft)*