

LEVEL 2 LOAD RATING (VIRTIS)

MILEPOST: 238.22 BIN: 5009929
REGION: 2 COUNTY: ONEIDA
FEATURE CARRIED: 90IX
FEATURE CROSSED: ORISKANY BOULEVARD (NY ROUTE 69)

LEVEL 2 LOAD RATING REVIEW

VIRTIS RUN DATE: 11/30/2016

CHANGES TO INPUT DATA: Revised deck thickness, and updated web section
loss. See list of changes on page 2 of VIRTIS
load rating in BIN folder.

LOADING	INVENTORY RATING (TONS)	OPERATING RATING (TONS)
HS-20	22.9 (HS-12)	45.0 (HS-25)
H-20	16.5 (H-16)	31.4 (H-31)

* ANALYSIS METHOD: LOAD FACTOR

** Lane loading controls the H20 rating. Truck loading controls the HS20 rating.

CONTROLLING MEMBER FOR RATING

LOCATION: SPANS 3 - WESTBOUND
COMPONENT: MEDIAN FASCIA GIRDER G8
FAILURE TYPE: SERVICEABILITY AT MIDSPAN

EFFECTIVE SPAN LENGTH: 33'
H EQUIVALENT OF LEGAL LOAD H25
PRIMARY MEMBER RATING: 4
SAFE LOAD CAPACITY: H26

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

REVIEWED BY

KENNETH SWEENEY

AMODH NIRALA

PE # 086434

LOAD RATING ENGINEER

Bridge

Bridge Id: 5009929

Description: Original analysis by DiDonato Associates - 8/2007, 8/2008, 8/2009, 7/2011. Reviewed by CHA - 8/2013, 12/2015. Reviewed by WSA Group PE-PC - 11/2016. Bridge is a three span simply supported multi girder with a concrete deck. Bridge built under contract MT 53-7 and rehabilitated under contracts TAS 82-28B & 92-74B. Original plans indicate a modified design loading of H20-S16-44. Bridge is oriented SouthWest. 2008 Notes: - Section loss to web of G-14, Span 3 @ Pier 2 added. 2009 Notes: - Web section loss for G-14, Span 3 WB updated. 2011 Notes: - Rating engine changed to VIRTIS LFD. - Span 3, G-14 at Pier 2 support web loss updated. 2013 Notes: - Concrete strength revised per MBE. - Railing loads revised. Separate 4 rail with fence defined for Span 2. - Typical sections revised to account for sidewalk overhang and gap between bridges. - Sidewalk thickness revised, weighted average used. - Wearing surface unit weight revised. - Wearing surface thickness revised, weighted average used. - Spans 1 & 3 DC2 loads revised to use tributary distribution. - Diaphragm conn. plates added as partial height stiffeners. - Member load added to G1/G14 for additional deck concrete along the sidewalk keyway. - G7 shear dist. factor revised. All G8 dist. factors revised, 1st wheel load placed 1' from edge. - Composite deck thickness revised in Span 2 for G2, G7, G9, G14 due to spalling. - Section loss updated for Span 3 - G14 at Pier 2. Section loss added to Span 1 - G14 @ Pier 1, Span 2 - G1 @ Pier 1, Span 3 - G1 @ Pier 2. 2015 Notes: - Rating engine changed to AASHTO LFD. - Web section loss added to ends of all girders at the pier & G1 at begin. 10% loss assumed where d-meters not taken. - Composite deck thickness revised due to spalling in span 2. See member alt. descriptions for more info. 2016 Notes: - Revised deck thickness. - Web section loss updated based on 2016 Inspection Report.

Facility Carried: 90IX

Feature Intersected: Oriskany Blvd.- RTE 69

Structure Number: 5009929

Location: Whitesboro

Length: 150.00

ft

Route Number:

System Of Units: US Customary

Year Built: 1954

Name: MP 238.22 - 90IX over Oriskany Blvd.

District:

County:

LOAD RATING SUMMARY

Member Rating Results

System of Units

☒ US Customary ☐ SI / Metric

Lane/Impact Loading Type

☒ As Requested ☐ Detailed

Display Format

☐ Multiple 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 Capacity (Ton)	Permit Inventory Capacity	Permit Operating Capacity	Permit Capacity (Ton)	Inventory Location (ft)	Operating Location (ft)
5009929	Eastbound - Span 1	G1	H 20-44	2.557	4.270						51.13	85.39					15.13	15.13
5009929	Eastbound - Span 1	G2	H 20-44	1.388	2.318						27.76	46.37					15.13	15.13
5009929	Eastbound - Span 1	G7	H 20-44	1.422	2.375						28.44	47.50					15.13	15.13
5009929	Eastbound - Span 2	G1	H 20-44	1.733	2.894						34.66	57.88					42.75	42.75
5009929	Eastbound - Span 2	G2	H 20-44	1.216	2.031						24.33	40.63					42.75	42.75
5009929	Eastbound - Span 2	G7	H 20-44	1.205	2.012						24.10	40.24					42.75	42.75
5009929	Eastbound - Span 3	G1	H 20-44	2.228	3.720						44.55	74.40					16.50	16.50
5009929	Eastbound - Span 3	G2	H 20-44	1.431	2.390						28.62	47.80					16.50	16.50
5009929	Eastbound - Span 3	G7	H 20-44	1.220	2.037						24.39	40.73					16.50	16.50
5009929	Westbound - Span 1	G8	H 20-44	1.097	1.832						21.94	36.64					15.13	15.13
5009929	Westbound - Span 1	G9	H 20-44	1.388	2.318						27.76	46.37					15.13	15.13
5009929	Westbound - Span 1	G14	H 20-44	2.557	4.270						51.13	85.39					15.13	15.13
5009929	Westbound - Span 2	G8	H 20-44	1.415	2.363						28.30	47.26					42.75	42.75
5009929	Westbound - Span 2	G9	H 20-44	1.218	2.035						24.37	40.70					42.75	42.75
5009929	Westbound - Span 2	G14	H 20-44	0.828	1.625						16.56	32.49					42.75	42.75
5009929	Westbound - Span 3	G8	H 20-44	0.942	1.573						18.84	31.46					16.50	16.50
5009929	Westbound - Span 3	G9	H 20-44	1.431	2.390						28.62	47.80					16.50	16.50
5009929	Westbound - Span 3	G14	H 20-44	2.228	3.720						44.55	74.40					16.50	16.50
5009929	Eastbound - Span 1	G1	HS 20-44	2.222	3.711						80.01	133.61					18.15	18.15
5009929	Eastbound - Span 1	G2	HS 20-44	1.211	2.023						43.60	72.81					12.10	12.10
5009929	Eastbound - Span 1	G7	HS 20-44	1.240	2.071						44.65	74.57					12.10	12.10
5009929	Eastbound - Span 2	G1	HS 20-44	1.335	2.229						48.05	80.24					42.75	42.75
5009929	Eastbound - Span 2	G2	HS 20-44	0.838	1.564						30.16	56.32					42.75	42.75
5009929	Eastbound - Span 2	G7	HS 20-44	0.928	1.549						33.40	55.78					42.75	42.75
5009929	Eastbound - Span 3	G1	HS 20-44	1.878	3.136						67.60	112.90					19.80	19.80
5009929	Eastbound - Span 3	G2	HS 20-44	1.210	2.020						43.55	72.72					13.20	13.20
5009929	Eastbound - Span 3	G7	HS 20-44	1.032	1.724						37.16	62.06					13.20	13.20
5009929	Westbound - Span 1	G8	HS 20-44	0.956	1.597						34.43	57.50					12.10	12.10
5009929	Westbound - Span 1	G9	HS 20-44	1.211	2.023						43.60	72.81					12.10	12.10
5009929	Westbound - Span 1	G14	HS 20-44	2.222	3.711						80.01	133.61					12.10	12.10
5009929	Westbound - Span 2	G8	HS 20-44	1.090	1.820						39.23	65.52					42.75	42.75
5009929	Westbound - Span 2	G9	HS 20-44	0.840	1.567						30.23	56.41					42.75	42.75
5009929	Westbound - Span 2	G14	HS 20-44	0.638	1.251						22.96	45.04					42.75	42.75
5009929	Westbound - Span 3	G8	HS 20-44	0.797	1.331						28.69	47.92					13.20	13.20
5009929	Westbound - Span 3	G9	HS 20-44	1.210	2.020						43.55	72.72					13.20	13.20
5009929	Westbound - Span 3	G14	HS 20-44	1.878	3.136						67.60	112.90					13.20	13.20

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☒ Show up-to-date results only

Print

Close

Bridge Name: MP 238.22 - 90IX over Oriskany Blvd.

NBI Structure ID: 5009929

Bridge ID: 5009929

Analyzed By: BrR

Analyze Date: Tuesday, January 24, 2017 10:35:22

Analysis Engine: AASHTO LFR Engine Version 6.7.0.3001

Analysis Preference Setting: None

Report By: BrR

Report Date: Tuesday, January 24, 2017 10:35:44

Structure Definition Name: Westbound - Span 2

Member Name: G14

Member Alternative Name: G-14

Individual Vehicle Load Factor Rating Summary

Live Load	Vehicle Rating				Capacity	Location				
	Type	Factor	Controls	(Ton)	Span	(ft)	Percent	Impact	Lane	
H 20-44	Inventory	Lane	0.828	Design Flexure - Steel	16.56	1	42.75	50.0	As Requested	As Requested
H 20-44	Operating	Lane	1.625	Design Flexure - Steel	32.49	1	42.75	50.0	As Requested	As Requested
H 20-44	Inventory	Lane	0.828	Design Flexure - Steel	16.56	1	42.75	50.0	With Impact	Single Lane
H 20-44	Operating	Lane	1.625	Design Flexure - Steel	32.49	1	42.75	50.0	With Impact	Single Lane
H 20-44	Inventory	Lane	0.828	Design Flexure - Steel	16.56	1	42.75	50.0	With Impact	Multi-Lane
H 20-44	Operating	Lane	1.625	Design Flexure - Steel	32.49	1	42.75	50.0	With Impact	Multi-Lane
H 20-44	Inventory	Lane	1.204	Design Flexure - Steel	24.08	1	42.75	50.0	Without Impact	Single Lane
H 20-44	Operating	Lane	2.011	Design Flexure - Steel	40.21	1	42.75	50.0	Without Impact	Single Lane
H 20-44	Inventory	Lane	1.204		24.08	1	42.75	50.0	Without Impact	Multi-Lane

				Design Flexure - Steel						
H 20-44	Operating	Lane	2.011	Design Flexure - Steel	40.21	1	42.75	50.0	Without Impact	Multi- Lane
H 20-44	Inventory	Axle Load	1.181	Design Flexure - Steel	23.61	1	42.75	50.0	As Requested	As Requested
H 20-44	Operating	Axle Load	1.971	Design Flexure - Steel	39.43	1	42.75	50.0	As Requested	As Requested
H 20-44	Inventory	Axle Load	1.181	Design Flexure - Steel	23.61	1	42.75	50.0	With Impact	Single Lane
H 20-44	Operating	Axle Load	1.971	Design Flexure - Steel	39.43	1	42.75	50.0	With Impact	Single Lane
H 20-44	Inventory	Axle Load	1.181	Design Flexure - Steel	23.61	1	42.75	50.0	With Impact	Multi- Lane
H 20-44	Operating	Axle Load	1.971	Design Flexure - Steel	39.43	1	42.75	50.0	With Impact	Multi- Lane
H 20-44	Inventory	Axle Load	1.461	Design Flexure - Steel	29.22	1	42.75	50.0	Without Impact	Single Lane
H 20-44	Operating	Axle Load	2.440	Design Flexure - Steel	48.79	1	42.75	50.0	Without Impact	Single Lane
H 20-44	Inventory	Axle Load	1.461	Design Flexure - Steel	29.22	1	42.75	50.0	Without Impact	Multi- Lane
H 20-44	Operating	Axle Load	2.440	Design Flexure - Steel	48.79	1	42.75	50.0	Without Impact	Multi- Lane

Note:

"N/A" indicates not applicable

*** indicates not available

Individual Vehicle Load Factor Rating Summary

Live Load	Vehicle Rating			Capacity		Location		Impact	Lane
	Type	Factor	Controls	(Ton)	Span	(ft)	Percent		
	Inventory	Lane	0.828		29.82	1	42.75	50.0	

HS 20- 44				Design Flexure - Steel					As Requested	As Requested
HS 20- 44	Operating	Lane	1.625	Design Flexure - Steel	58.49	1	42.75	50.0	As Requested	As Requested
HS 20- 44	Inventory	Lane	0.828	Design Flexure - Steel	29.82	1	42.75	50.0	With Impact	Single Lane
HS 20- 44	Operating	Lane	1.625	Design Flexure - Steel	58.49	1	42.75	50.0	With Impact	Single Lane
HS 20- 44	Inventory	Lane	0.828	Design Flexure - Steel	29.82	1	42.75	50.0	With Impact	Multi- Lane
HS 20- 44	Operating	Lane	1.625	Design Flexure - Steel	58.49	1	42.75	50.0	With Impact	Multi- Lane
HS 20- 44	Inventory	Lane	1.204	Design Flexure - Steel	43.34	1	42.75	50.0	Without Impact	Single Lane
HS 20- 44	Operating	Lane	2.011	Design Flexure - Steel	72.38	1	42.75	50.0	Without Impact	Single Lane
HS 20- 44	Inventory	Lane	1.204	Design Flexure - Steel	43.34	1	42.75	50.0	Without Impact	Multi- Lane
HS 20- 44	Operating	Lane	2.011	Design Flexure - Steel	72.38	1	42.75	50.0	Without Impact	Multi- Lane
HS 20- 44	Inventory	Axle Load	0.638	Design Flexure - Steel	22.96	1	42.75	50.0	As Requested	As Requested
HS 20- 44	Operating	Axle Load	1.251	Design Flexure - Steel	45.04	1	42.75	50.0	As Requested	As Requested
HS 20- 44	Inventory	Axle Load	0.638	Design Flexure - Steel	22.96	1	42.75	50.0	With Impact	Single Lane
HS 20- 44	Operating	Axle Load	1.251	Design Flexure - Steel	45.04	1	42.75	50.0	With Impact	Single Lane
HS 20- 44	Inventory	Axle Load	0.638	Design Flexure - Steel	22.96	1	42.75	50.0	With Impact	Multi- Lane
	Operating		1.251		45.04	1	42.75	50.0		

HS 20- 44		Axle Load		Design Flexure - Steel					With Impact	Multi- Lane
HS 20- 44	Inventory	Axle Load	0.789	Design Flexure - Steel	28.42	1	42.75	50.0	Without Impact	Single Lane
HS 20- 44	Operating	Axle Load	1.548	Design Flexure - Steel	55.74	1	42.75	50.0	Without Impact	Single Lane
HS 20- 44	Inventory	Axle Load	0.789	Design Flexure - Steel	28.42	1	42.75	50.0	Without Impact	Multi- Lane
HS 20- 44	Operating	Axle Load	1.548	Design Flexure - Steel	55.74	1	42.75	50.0	Without Impact	Multi- Lane

Note:

"N/A" indicates not applicable

*** indicates not available

Bridge Name: MP 238.22 - 90IX over Oriskany Blvd.

NBI Structure ID: 5009929

Bridge ID: 5009929

Analyzed By: BrR

Analyze Date: Tuesday, January 24, 2017 10:34:24

Analysis Engine: AASHTO LFR Engine Version 6.7.0.3001

Analysis Preference Setting: None

Report By: BrR

Report Date: Tuesday, January 24, 2017 10:34:35

Structure Definition Name: Westbound - Span 3

Member Name: G8

Member Alternative Name: G-8

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	1.129	Service - Steel	22.58	1	16.50	50.0	As Requested	As Requested
H 20-44	Operating	Lane	1.885	Service - Steel	37.71	1	16.50	50.0	As Requested	As Requested
H 20-44	Inventory	Lane	1.129	Service - Steel	22.58	1	16.50	50.0	With Impact	Single Lane
H 20-44	Operating	Lane	1.885	Service - Steel	37.71	1	16.50	50.0	With Impact	Single Lane
H 20-44	Inventory	Lane	1.095	Service - Steel	21.91	1	16.50	50.0	With Impact	Multi-Lane
H 20-44	Operating	Lane	1.829	Service - Steel	36.58	1	16.50	50.0	With Impact	Multi-Lane
H 20-44	Inventory	Lane	1.468	Service - Steel	29.35	1	16.50	50.0	Without Impact	Single Lane
H 20-44	Operating	Lane	2.451	Service - Steel	49.02	1	16.50	50.0	Without Impact	Single Lane
H 20-44	Inventory	Lane	1.424	Service - Steel	28.48	1	16.50	50.0	Without Impact	Multi-Lane
H 20-44	Operating	Lane	2.378	Service - Steel	47.56	1	16.50	50.0	Without Impact	Multi-Lane
H 20-44	Inventory	Axle Load	0.971	Service - Steel	19.42	1	16.50	50.0	As Requested	As Requested
H 20-44	Operating	Axle Load	1.621	Service - Steel	32.43	1	16.50	50.0	As Requested	As Requested
	Inventory		0.971		19.42	1	16.50	50.0		

H 20-44		Axle Load		Service - Steel					With Impact	Single Lane
H 20-44	Operating	Axle Load	1.621	Service - Steel	32.43	1	16.50	50.0	With Impact	Single Lane
H 20-44	Inventory	Axle Load	0.942	Service - Steel	18.84	1	16.50	50.0	With Impact	Multi-Lane
H 20-44	Operating	Axle Load	1.573	Service - Steel	31.46	1	16.50	50.0	With Impact	Multi-Lane
H 20-44	Inventory	Axle Load	1.262	Service - Steel	25.24	1	16.50	50.0	Without Impact	Single Lane
H 20-44	Operating	Axle Load	2.108	Service - Steel	42.16	1	16.50	50.0	Without Impact	Single Lane
H 20-44	Inventory	Axle Load	1.224	Service - Steel	24.49	1	16.50	50.0	Without Impact	Multi-Lane
H 20-44	Operating	Axle Load	2.045	Service - Steel	40.90	1	16.50	50.0	Without Impact	Multi-Lane

Note:

"N/A" indicates not applicable

*** indicates not available

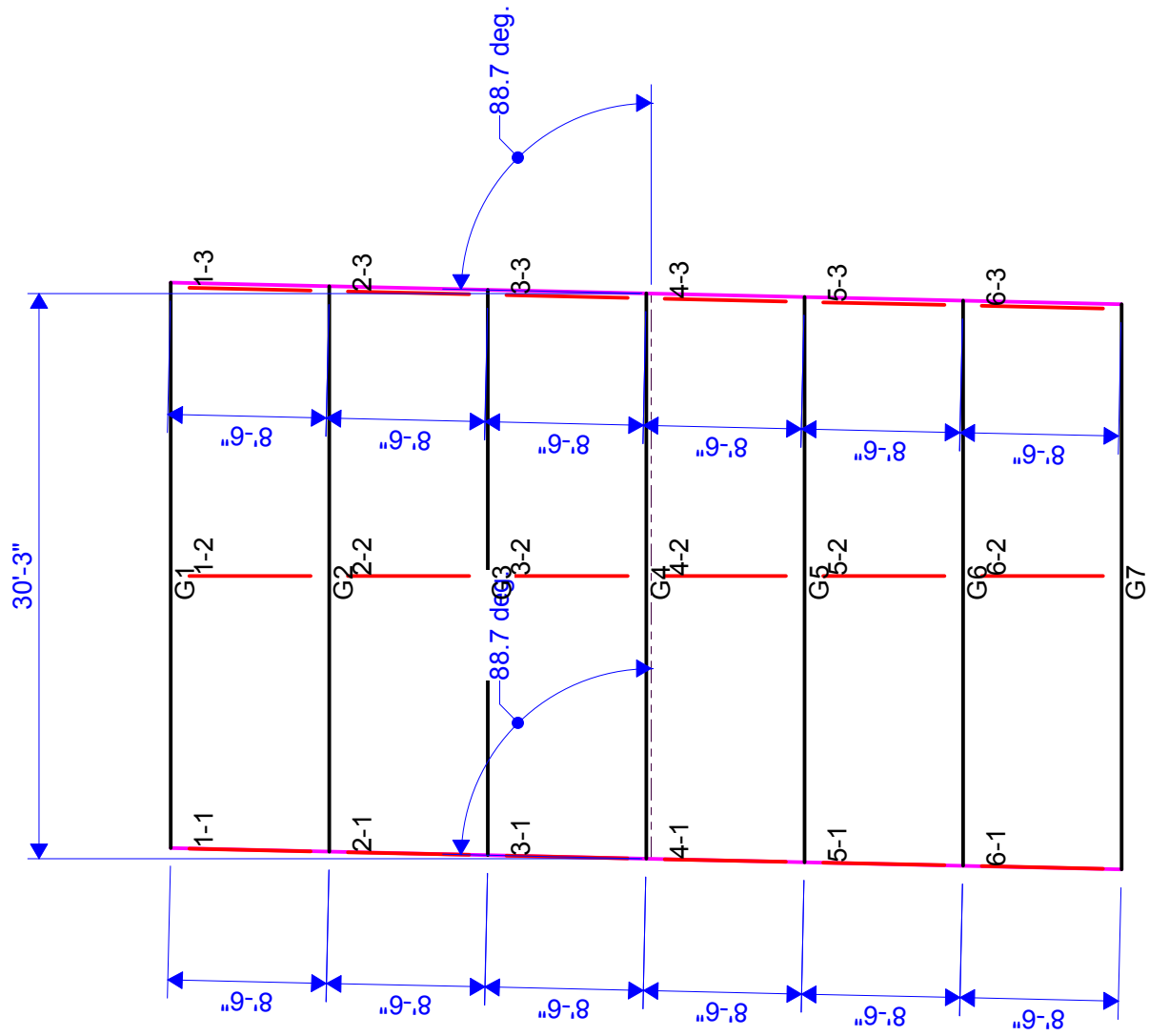
SCHEMATIC DRAWINGS

5009929

MP 238.22 - 90IX over Oriskany Blvd. - Eastbound - Span 1

90IX / Oriskany Blvd.- RTE 69

11/30/16

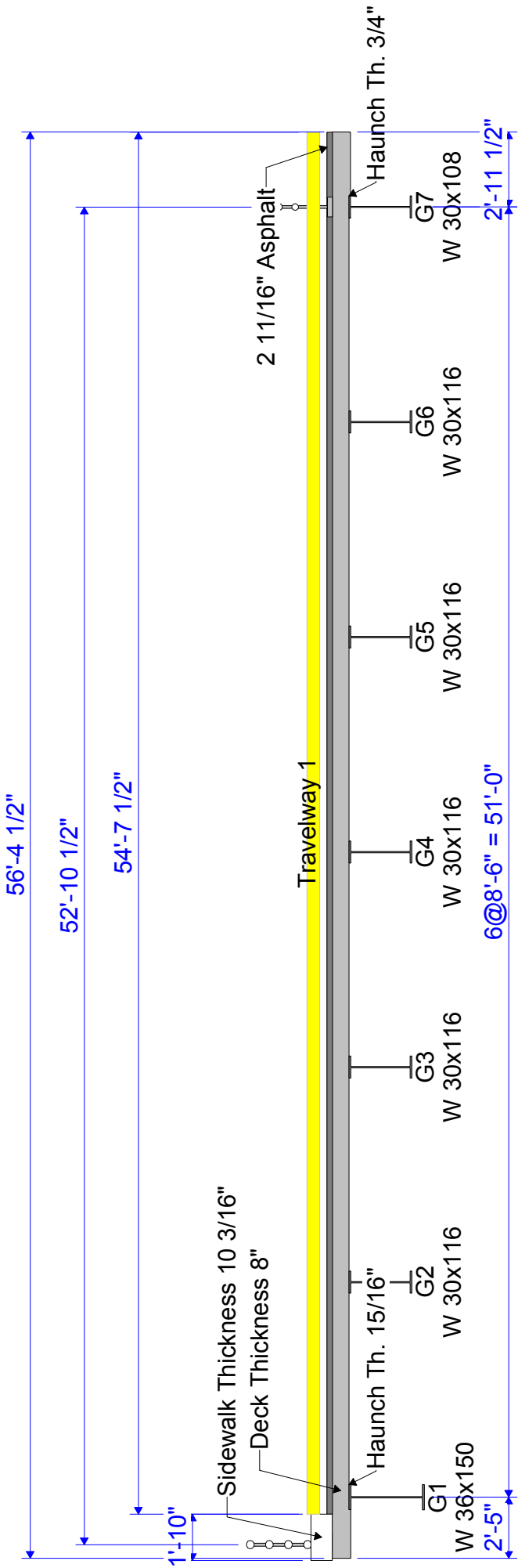


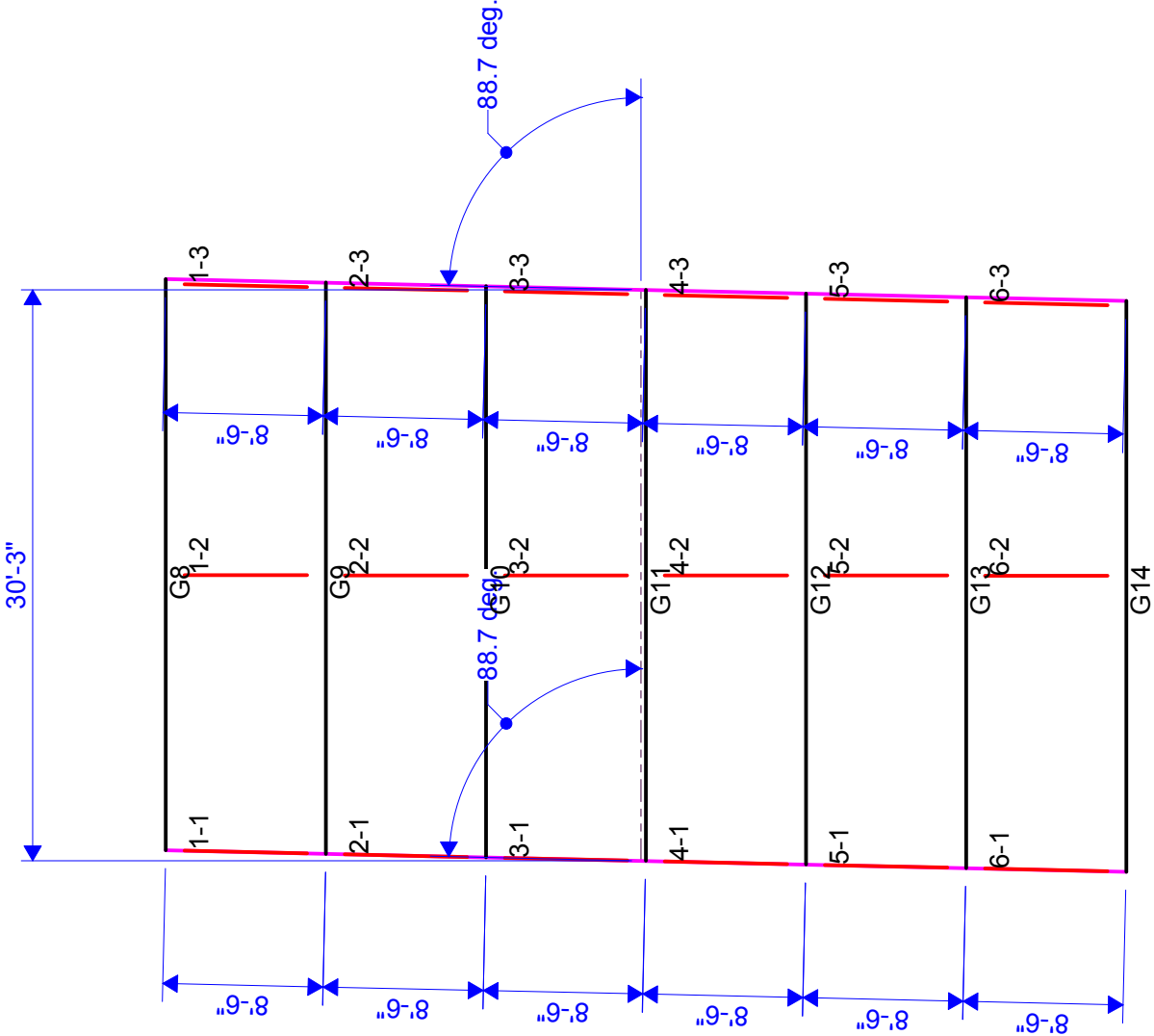
5009929

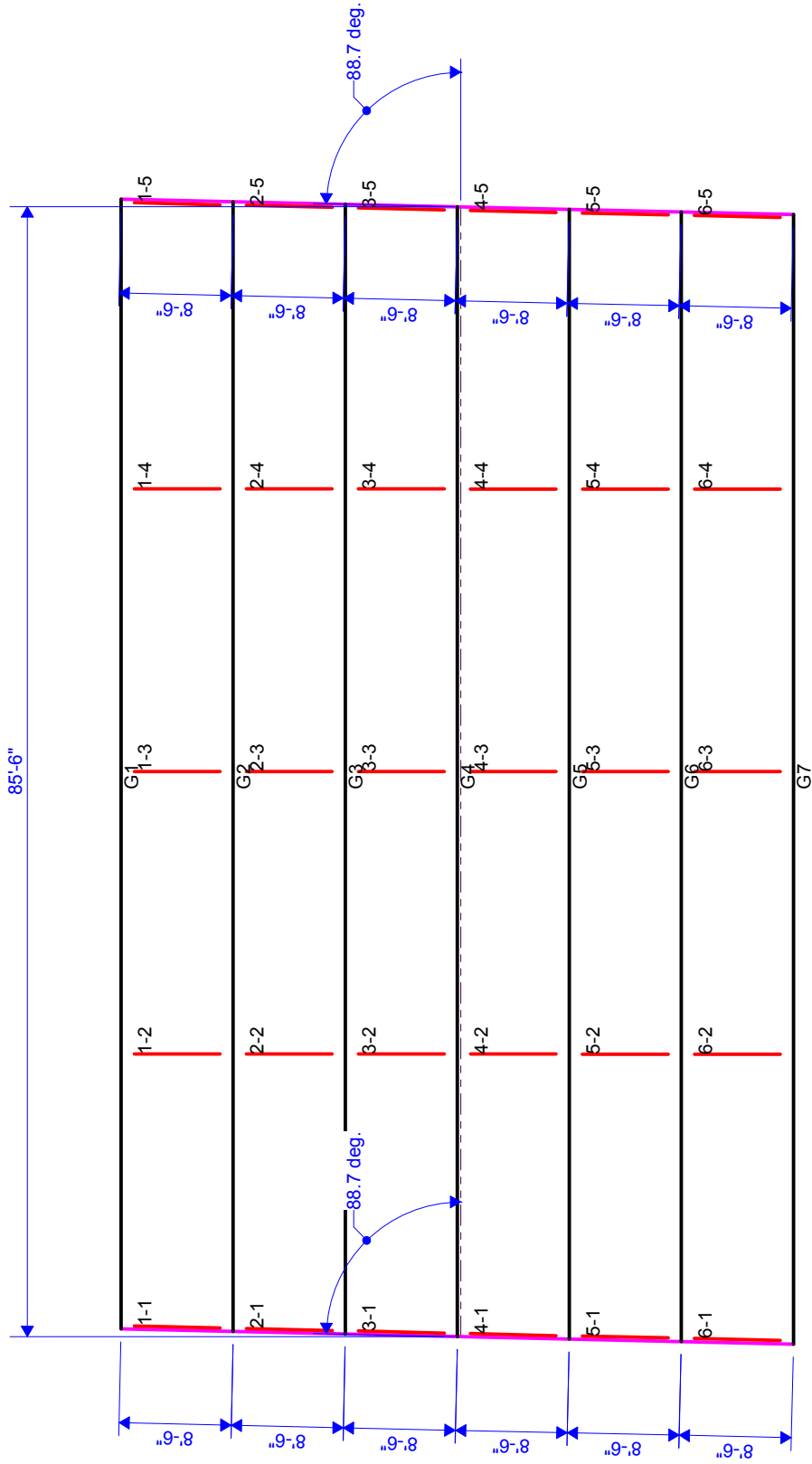
MP 238.22 - 90IX over Oriskany Blvd. - Eastbound - Span 1

90IX / Oriskany Blvd.- RTE 69

11/30/16





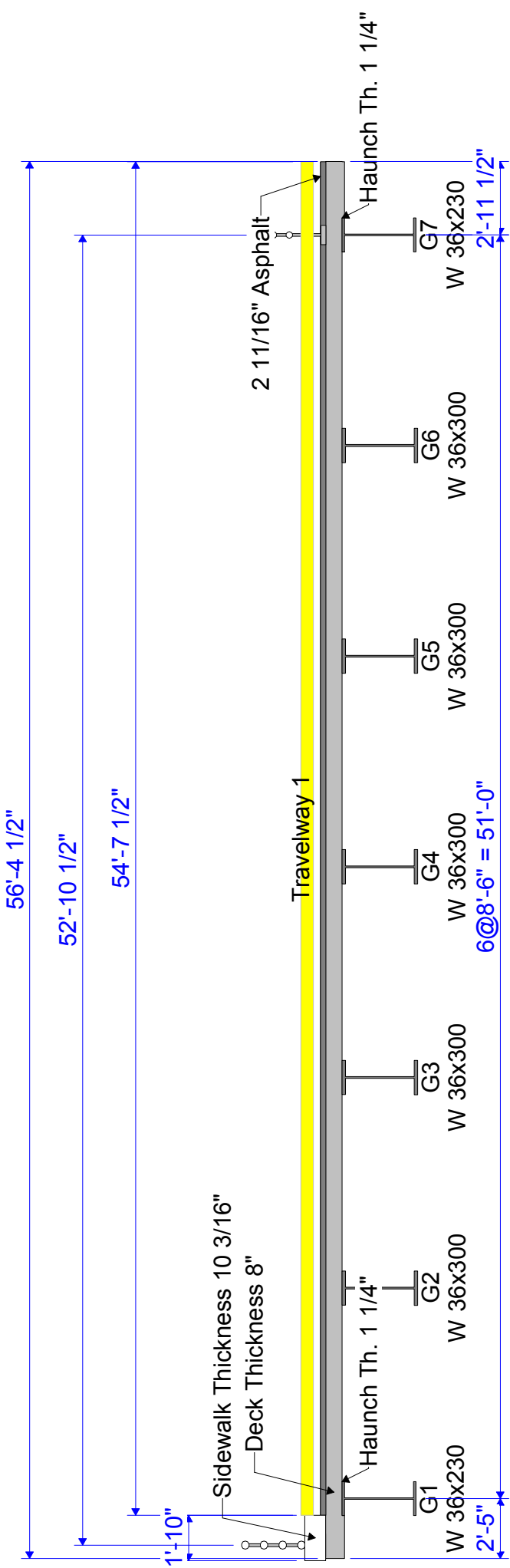


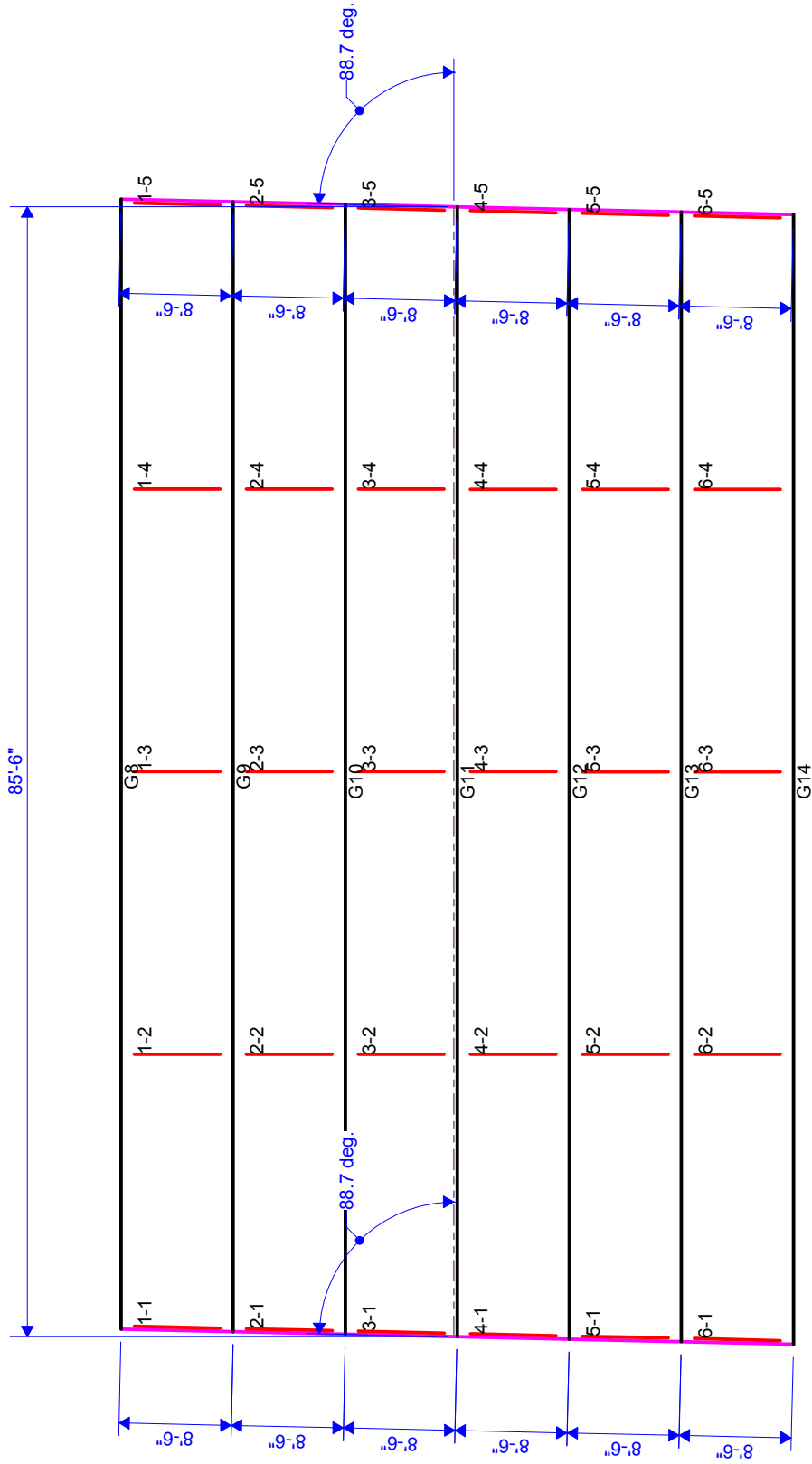
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MP 238.22 - 90IX over Oriskany Blvd. - Eastbound - Span 2

90IX / Oriskany Blvd.- RTE 69

11/30/16



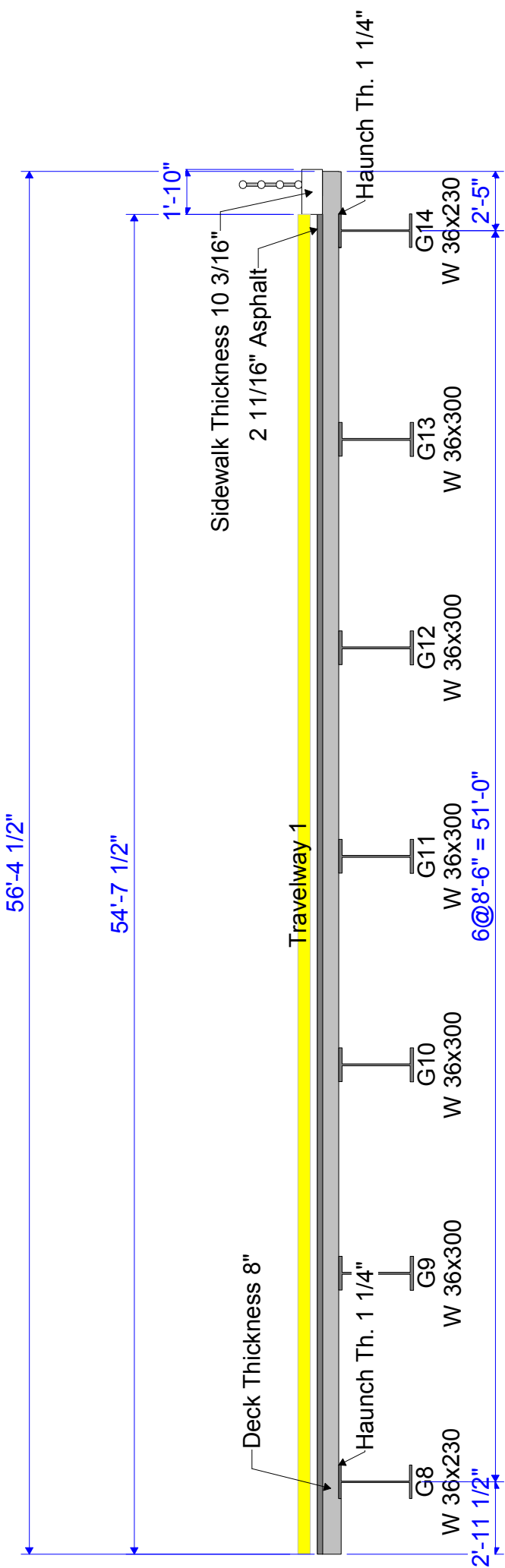


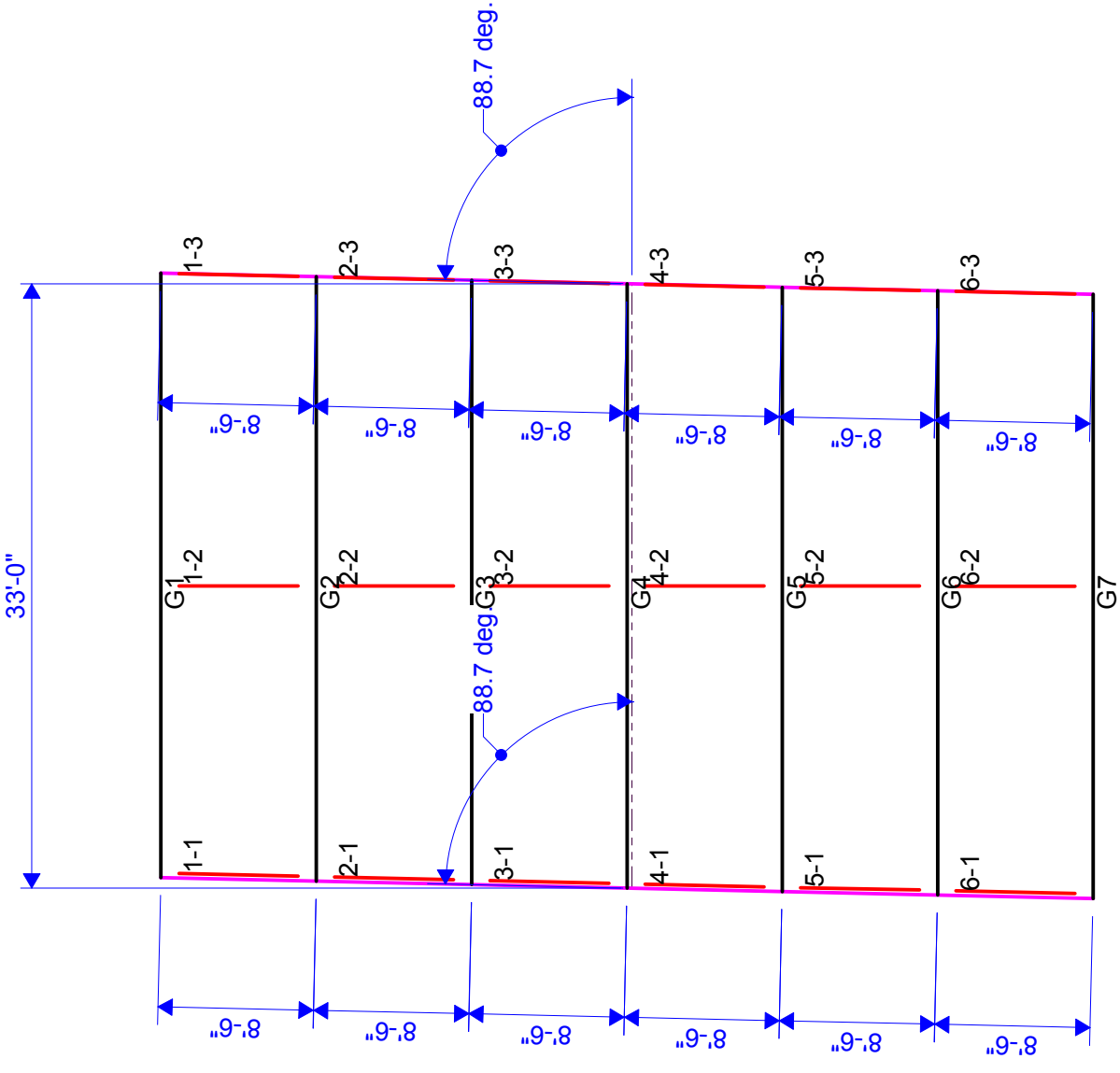
5009929

MP 238.22 - 90IX over Oriskany Blvd. - Westbound - Span 2

90IX / Oriskany Blvd.- RTE 69

11/30/16



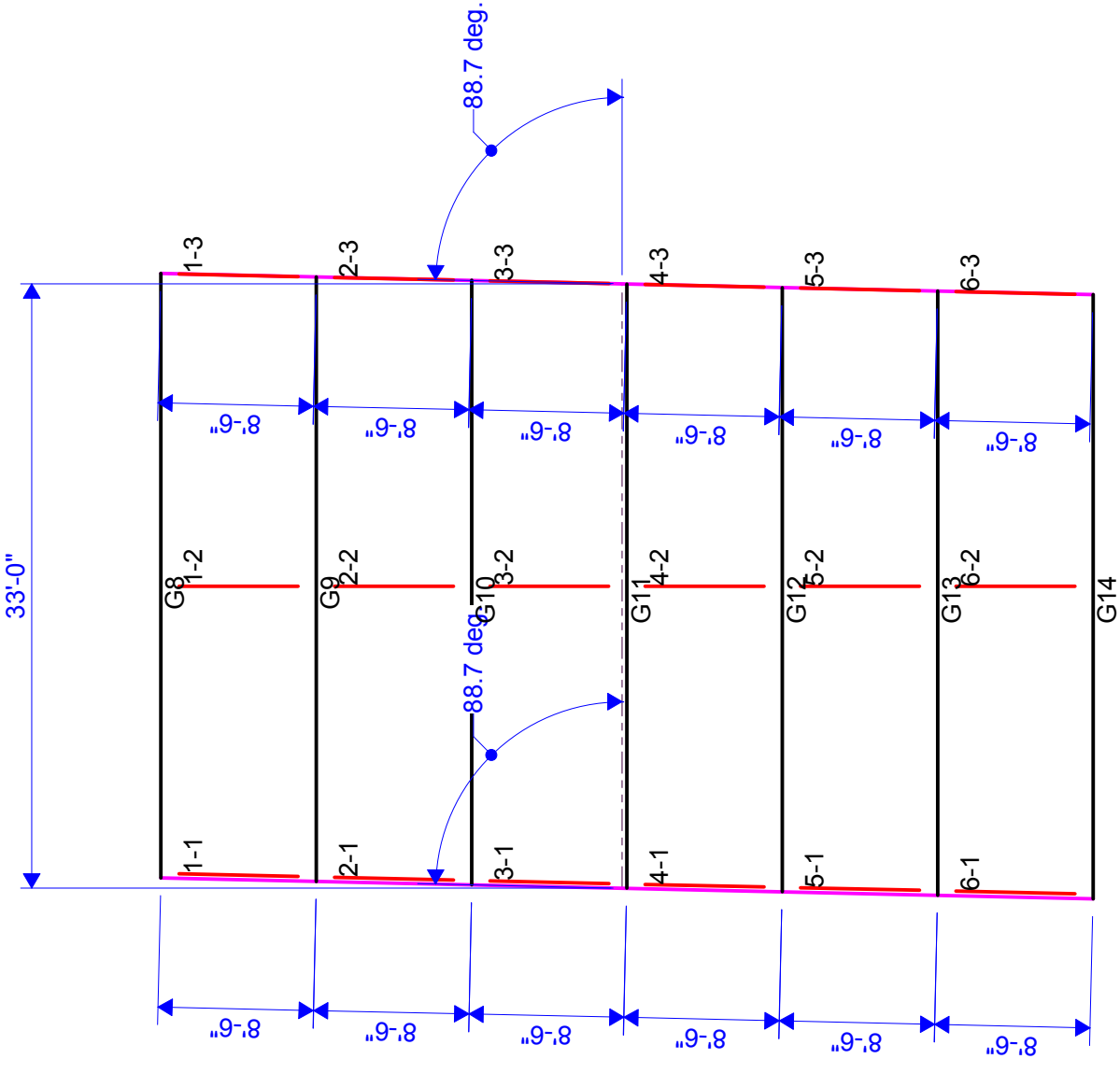


MP 238.22 - 90IX over Oriskany Blvd. - Eastbound - Span 3

90IX / Oriskany Blvd.- RTE 69

The diagram illustrates the cross-section of a bridge deck with the following components and dimensions:

- Overall Width:** 56'-4 1/2"
- Travelway Width:** 52'-10 1/2"
- Deck Thickness:** 8"
- Sidewalk Thickness:** 10 3/16"
- Travelway 1:** 54'-7 1/2"
- Asphalt Layer:** 2 11/16"
- Haunch Thickness:** 15/16"
- Deck Thickness:** 8"
- Dimensions from Left Edge:**
 - 1'-10"
 - 2'-5"
- Dimensions from Right Edge:**
 - 2'-11 1/2"
- Dimensions from Centerline:**
 - 6@8'-6" = 51'-0"
- Components:**
 - G1: W 36x150
 - G2: W 30x132
 - G3: W 30x132
 - G4: W 30x132
 - G5: W 30x132
 - G6: W 30x132
 - G7: W 30x108

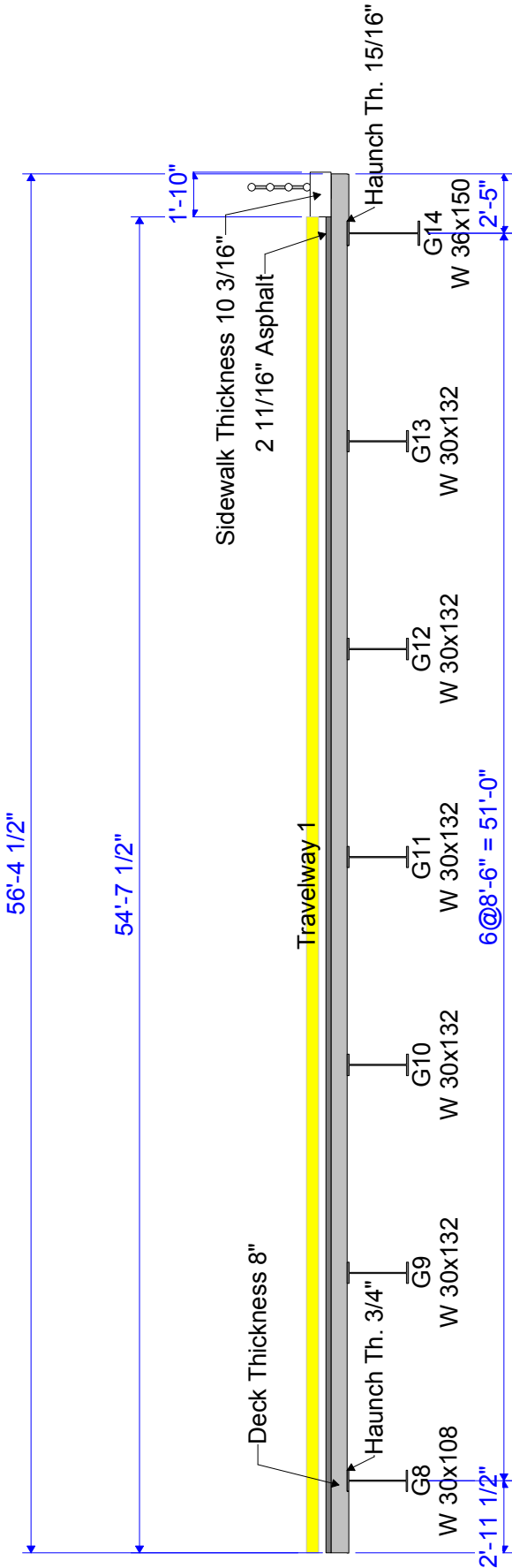


5009929

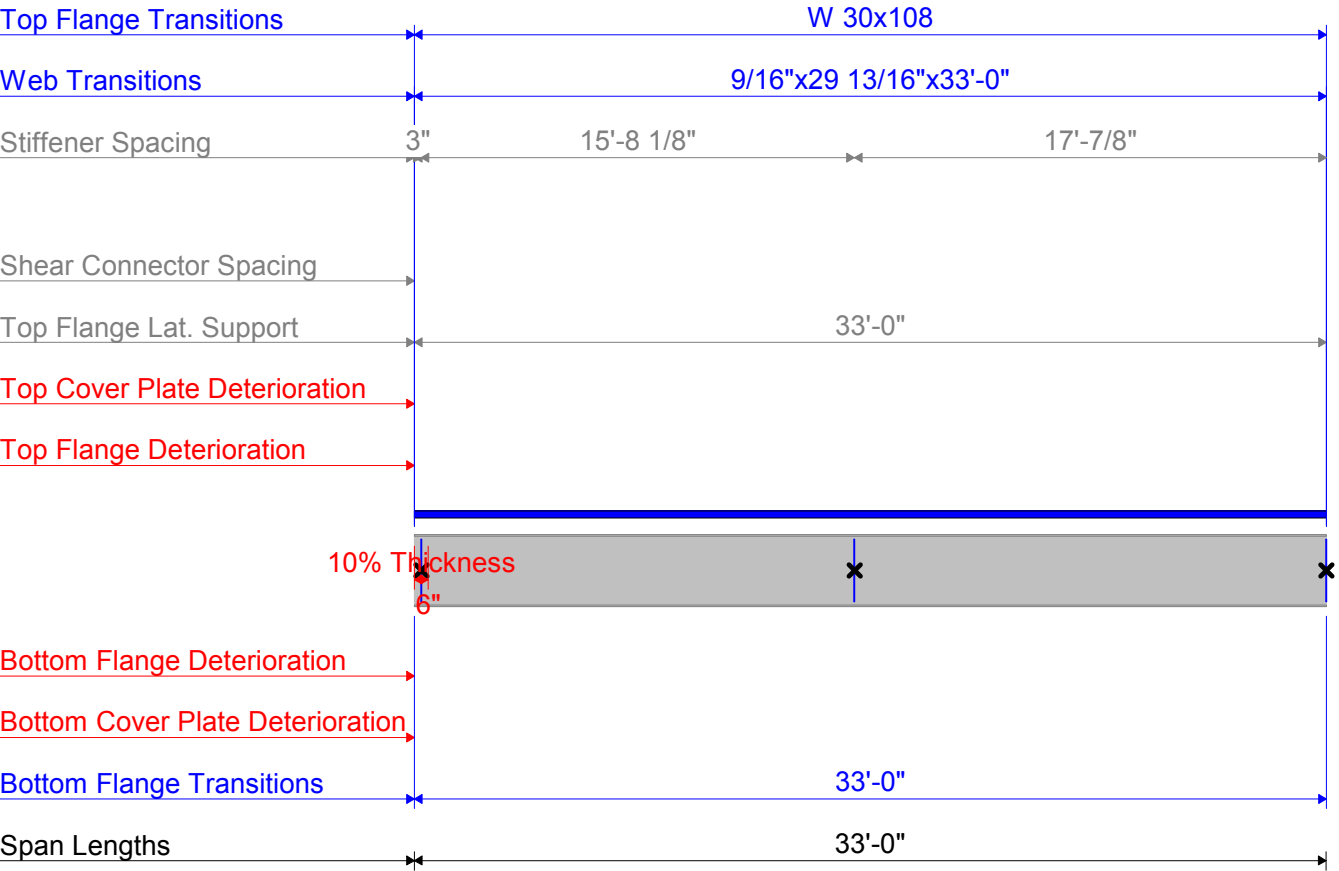
MP 238.22 - 90IX over Oriskany Blvd. - Westbound - Span 3

90IX / Oriskany Blvd.- RTE 69

11/30/16



5009929
MP 238.22 - 90IX over Oriskany Blvd. - Westbound - Span 3 - G8
90IX / Oriskany Blvd.- RTE 69
11/30/16



- 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, January 19, 2017 08:53:18

Bridge ID 5009929 MP 238.22 - 90IX over Oriskany Blvd.

NBI Structure ID (8): 5009929

Description: Original analysis by DiDonato Associates - 8/2007, 8/2008, 8/2009, 7/2011.

Reviewed by CHA - 8/2013, 12/2015.

Reviewed by WSA Group PE-PC - 11/2016.

Bridge is a three span simply supported multi girder with a concrete deck.

Bridge built under contract MT 53-7 and rehabilitated under contracts TAS 82-28B & 92-74B.

Original plans indicate a modified design loading of H20-S16-44.

Bridge is oriented SouthWest.

2008 Notes:

- Section loss to web of G-14, Span 3 @ Pier 2 added.

2009 Notes:

- Web section loss for G-14, Span 3 WB updated.

2011 Notes:

- Rating engine changed to VIRTIS LFD.
- Span 3, G-14 at Pier 2 support web loss updated.

2013 Notes:

- Concrete strength revised per MBE.
- Railing loads revised. Separate 4 rail with fence defined for Span 2.
- Typical sections revised to account for sidewalk overhang and gap between bridges.
- Sidewalk thickness revised, weighted average used.
- Wearing surface unit weight revised.
- Wearing surface thickness revised, weighted average used.
- Spans 1 & 3 DC2 loads revised to use tributary distribution.
- Diaphragm conn. plates added as partial height stiffeners.
- Member load added to G1/G14 for additional deck concrete along the sidewalk keyway.
- G7 shear dist. factor revised. All G8 dist. factors revised, 1st wheel load placed 1' from edge.
- Composite deck thickness revised in Span 2 for G2, G7, G9, G14 due to spalling.
- Section loss updated for Span 3 - G14 at Pier 2. Section loss added to Span 1 - G14 @ Pier 1, Span 2 - G1 @ Pier 1, Span 3 - G1 @ Pier 2.

2015 Notes:

- Rating engine changed to AASHTO LFD.
- Web section loss added to ends of all girders at the pier & G1 at begin. 10% loss assumed where d-meters not taken.
- Composite deck thickness revised due to spalling in span 2. See member alt. descriptions for more info.

2016 Notes:

- Revised deck thickness.
- Web section loss updated based on 2016 Inspection Report.

Description

Location: Whitesboro
Total Length: 150.00 *(ft)*
Facility Carried: 90IX
Route Number:
Feature Intersected: Oriskany Blvd.- RTE 69
Mi Post: 238.22 *(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: $F_y = 33 \text{ ksi}$
Specified minimum yield strength (F_y): 33.000 *(ksi)*
Specified minimum tensile strength (F_u): 60.000 *(ksi)*
Coefficient of thermal expansion: *(1/F)*
Density: 0.4900 *(kcf)*
Modulus of elasticity (E): 29000.00 *(ksi)*

Name: **ASTM A36**
Description: ASTM A 36
Specified minimum yield strength (F_y): 36.000 *(ksi)*
Specified minimum tensile strength (F_u): 58.000 *(ksi)*
Coefficient of thermal expansion: 0.0000065000 *(1/F)*
Density: 0.4900 *(kcf)*
Modulus of elasticity (E): 29000.00 *(ksi)*

Concrete

Name: **Unknown strength concrete prior to 1959**
Description: $f'_c = 2500 \text{ psi}$
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 30x116

Description: W 30x116 from AISC 5th Edition Tables (1946-1962)

Depth (d):	30.0000 (in)
Flange width (bf):	10.5000 (in)
Flange thickness (tf):	0.8500 (in)
Web thickness (tw):	0.5640 (in)
k:	1.5625 (in)
k1:	1.0000 (in)
Cross sectional area:	34.130 (in ²)
Nominal load:	116.000 (lb/ft)
Ixx:	4919.100 (in ⁴)
Iyy:	153.200 (in ⁴)
Zx:	378.000 (in ³)
Zy:	49.200 (in ³)
Nominal Depth:	30.0000 (in)
Type:	W Shape

Name: **W 30x132**

Description: W 30x132 from AISC 5th Edition Tables (1946-1962)

Depth (d):	30.3000 (in)
Flange width (bf):	10.5510 (in)
Flange thickness (tf):	1.0000 (in)
Web thickness (tw):	0.6150 (in)
k:	1.6875 (in)
k1:	1.0000 (in)
Cross sectional area:	38.830 (in ²)
Nominal load:	132.000 (lb/ft)
Ixx:	5753.100 (in ⁴)
Iyy:	185.000 (in ⁴)
Zx:	437.000 (in ³)
Zy:	58.400 (in ³)
Nominal Depth:	30.0000 (in)
Type:	W Shape

Name: **W 36x230**

Description: W 36x230 from AISC 5th Edition Tables (1946-1962)

Depth (d):	35.8800 (in)
Flange width (bf):	16.4750 (in)
Flange thickness (tf):	1.2600 (in)
Web thickness (tw):	0.7650 (in)
k:	2.3750 (in)
k1:	1.3750 (in)
Cross sectional area:	67.730 (in ²)
Nominal load:	230.000 (lb/ft)
Ixx:	14988.400 (in ⁴)
Iyy:	870.900 (in ⁴)
Zx:	943.000 (in ³)
Zy:	176.000 (in ³)
Nominal Depth:	36.0000 (in)
Type:	W Shape

Name: **W 36x150**

Description: W 36x150 from AISC 5th Edition Tables (1946-1962)

Depth (d):	35.8400 (in)
Flange width (bf):	11.9720 (in)
Flange thickness (tf):	0.9400 (in)
Web thickness (tw):	0.6250 (in)
k:	1.8125 (in)
k1:	1.1250 (in)
Cross sectional area:	44.160 (in ²)
Nominal load:	150.000 (lb/ft)
Ixx:	9012.100 (in ⁴)
Iyy:	250.400 (in ⁴)
Zx:	581.000 (in ³)
Zy:	70.900 (in ³)
Nominal Depth:	36.0000 (in)
Type:	W Shape
Name:	W 36x300
Description:	W 36x300 from AISC 5th Edition Tables (1946-1962)
Depth (d):	36.7200 (in)
Flange width (bf):	16.6550 (in)
Flange thickness (tf):	1.6800 (in)
Web thickness (tw):	0.9450 (in)
k:	2.8125 (in)
k1:	1.5000 (in)
Cross sectional area:	88.170 (in ²)
Nominal load:	300.000 (lb/ft)
Ixx:	20290.200 (in ⁴)
Iyy:	1225.200 (in ⁴)
Zx:	1260.000 (in ³)
Zy:	241.000 (in ³)
Nominal Depth:	36.0000 (in)
Type:	W Shape
No steel structural tee shapes.	

Prestressed Shapes

No prestressed shapes.

Timber Shapes

No timber shapes.

Appurtenances

No concrete railings.

Railings

Name: **4-Rail Bridge Railing w/ Thrie Beam**

Description: English - NYSDOT Old Standard
Effective Wind Height: 39.0000 (in)
Railing Load: 0.065 (kip/ft)
Distance From Edge to Centroid: 6.0000 (in)
Width: 11.0000 (in)

Name: **Double w-section median rail**

Description:
Effective Wind Height: 33.0000 (in)
Railing Load: 0.025 (kip/ft)
Distance From Edge to Centroid: 4.7500 (in)
Width: 9.5000 (in)

Name: **4-Rail w/ Thrie Beam & fence**

Description:
Effective Wind Height: 39.0000 (in)
Railing Load: 0.070 (kip/ft)
Distance From Edge to Centroid: 6.0000 (in)
Width: 11.0000 (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 Alt 1

Reference Line

Reference Line Length: 0.00 (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: Eastbound - Span 1

Description:

Structure Alternatives

Name: EB - Span 1

Description:

Superstructure Definition: Eastbound - Span 1

Structures

Name: Eastbound - Span 2

Description:

Structure Alternatives

Name: EB-Span 2

Description:

Superstructure Definition: Eastbound - Span 2

Structures

Name: Eastbound - Span 3

Description:

Structure Alternatives

Name: EB - Span 3

Description:

Superstructure Definition: Eastbound - Span 3

Structures

Name: Westbound - Span 1

Description:

Structure Alternatives

Name: WB - Span 1

Description:

Superstructure Definition: Westbound - Span 1

Structures

Name: Westbound - Span 2

Description:

Structure Alternatives

Name: WB - Span 2

Description:

Superstructure Definition: Westbound - Span 2

Structures

Name: Westbound - Span 3

Description:

Structure Alternatives

Name: WB - Span 3

Description:

Superstructure Definition: Westbound - Span 3

Superstructure Definition Eastbound - Span 1

Definition

Units: US Customary

Number of spans: 1

Number of girders: 7

Length

Span (ft)

1 30.2500

Frame Structure Simplified Definition:

Support Frame Connection

1

2

Girder Spacing Display Type: Perpendicular

Average Humidity: 90.000 (%)

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

Skew

Support (Degrees)

1 1.3000

2 1.3000

Girder Spacing Orientation: Perpendicular

Girder **Girder Spacing**

Bay	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	
14.56	14.75	0.00	1	
30.00	30.00	0.00	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	
14.75	14.94	0.00	1	
30.00	30.00	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	
14.94	15.13	0.00	1	
30.00	30.00	0.00	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
15.13	15.32	0.00	1
30.00	30.00	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	
15.32	15.51	0.00	1	
30.00	30.00	0.00	1	

Girder Bay 6

Distance Left Girder (ft)	Distance Right Girder (ft)	Diaphragm Spacing (ft)	Number of Spaces	Diaphragm Weight (kip)
0.00	0.00	0.00	1	
15.51	15.70	0.00	1	
30.00	30.00	0.00	1	

Structure Typical Section

Deck

Left start width:	28.19 (ft)
Left end width:	28.19 (ft)
Right start width:	28.19 (ft)
Right end width:	28.19 (ft)
Left start overhang:	2.42 (ft)
Left end overhang:	2.42 (ft)

Deck (Cont'd)

Deck concrete:	Unknown strength concrete prior to 1959
Total deck thickness:	8.0000 (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
4-Rail Br...	DC2		Left Ed...	1.00	1.00	Right
Double w-...	DC2		Right E...	3.35	3.35	Left

Sidewalk

Width	Thickness At End	Material	Load Case	Measure to	Measured From	At Start
22.0000	10.2000	Unknown...	DC2		Left Ed...	-0.08 ...

Lane Position

Offset Left Start:	-26.44 (ft)
Offset Left End:	-26.44 (ft)
Offset Right Start:	28.19 (ft)
Offset Right End:	28.19 (ft)

Wearing Surface

Wearing surface material:	Asphalt
Description:	
Wearing surface thickness:	2.6600 (in)

Wearing surface density: 150.000 *(pcf)*
Load case: DW

Load Case Description

Load Case Name	Description	Stage	Type	Time <i>(Days)</i>
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
Sidewalk Keyway	Weight of additional ...	Non-composite (Sta...		D,DC

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: dia. conn. (single)

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: dia. conn. (pair)

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	30.250000

Support	Frame Connection
1	
2	

Pedestrian load: (lb/ft)

Member Loads

Distributed Loads

Distance (ft)	Length (ft)	Start (kip/ft)	End (kip/ft)	Load Case Name
0.00	30.25	0.062	0.062	Sidewalk K...

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: 5.0000 (in)
Right end X: 5.0000 (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: BrR Dist Fact
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
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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	Shear	Shear at Supports	Moment	Deflection
Loaded				
1 Lane	1.388	0.980	1.388	0.286
Multi-Lane	1.388	0.980	1.388	0.857

Girder Profile

Shape

Shape:	W 36x150
Distance:	0.00 (ft)
Length:	30.25 (ft)
Material:	ASTM A7

Deck Profile

Haunch Profile

Haunch Type:	Flange edges
Embedded flange:	TRUE

Distance	Length	Z1	Z2	Z3	Z4	Y1	Y2
(ft)	(ft)	(in)	(in)	(in)	(in)	(in)	(in)

0.00	30.25	23.0100	23.0100	0.0000	0.0000
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Bracing Ranges

Lateral Support

Distance	Length
(ft)	(ft)
0.00	30.25

Stiffener Ranges

Transverse Stiffener Ranges (Location)

Name	Distance (ft)	Number	Spacing (in)
dia. conn. (single...	0.00	1	0.0000
dia. conn. (single...	14.56	1	0.0000
dia. conn. (single...	30.00	1	0.0000

Bearing Stiffener Locations

Points of Interest

Distance from left most support: 0.10 (ft)
Side: Right

Transverse Stiffeners

Override Schedule: FALSE
Stiffener spacing: (in)
Stiffener width: (in)
Stiffener thickness: (in)
Material: ASTM A7
Stiffener number: Single
Stiffener type: Plate

Other Stiffeners

Bearing Stiffener

Override Schedule: FALSE
Stiffener width: (in)
Stiffener thickness: (in)
Material: ASTM A7
Clip: (in)
Number of pairs:
Pair spacing: (in)
Attachment Type: Welds

Longitudinal Stiffener

Override Schedule: FALSE
Stiffener width: (in)
Stiffener thickness: (in)
Material: ASTM A7
Distance from flange to stiffener: (in)
Distance measured from: Top Flange

Fatigue

Number of cycles: 0

Bracing

Deck provides lateral support:	
Override diaphragm schedule:	FALSE
Distance to left diaphragm:	(ft)
Distance to right diaphragm:	(ft)
Diaphragm at this location:	FALSE
<u>ASD</u>	
Compression flange unsupported length:	(ft)
Tension Field Action	Ignore combined shear and bending
<i>Riveted Section</i>	
Net moment of inertia:	(in ⁴)
Distance to centroid:	(in)
Net area of web:	(in ²)
Top plate allowable shear:	(ksi)
Bottom plate allowable shear:	(ksi)
Percent area top flange:	(%)
Percent area bottom flange:	(%)
Distance from left most support:	30.15 (ft)
Side:	Right
<u>Transverse Stiffeners</u>	
Override Schedule:	FALSE
Stiffener spacing:	(in)
Stiffener width:	(in)
Stiffener thickness:	(in)
Material:	ASTM A7
Stiffener number:	Single
Stiffener type:	Plate
<u>Other Stiffeners</u>	
<i>Bearing Stiffener</i>	
Override Schedule:	FALSE
Stiffener width:	(in)
Stiffener thickness:	(in)
Material:	ASTM A7
Clip:	(in)
Number of pairs:	
Pair spacing:	(in)
Attachment Type:	Welds
<i>Longitudinal Stiffener</i>	
Override Schedule:	FALSE
Stiffener width:	(in)
Stiffener thickness:	(in)
Material:	ASTM A7
Distance from flange to stiffener:	(in)
Distance measured from:	Top Flange
<u>Fatigue</u>	
Number of cycles:	0
<u>Bracing</u>	
Deck provides lateral support:	
Override diaphragm schedule:	FALSE
Distance to left diaphragm:	(ft)

Distance to right diaphragm: (ft)
 Diaphragm at this location: FALSE
ASD
 Compression flange unsupported length: (ft)
 Tension Field Action Ignore combined shear and bending
Riveted Section
 Net moment of inertia: (in⁴)
 Distance to centroid: (in)
 Net area of web: (in²)
 Top plate allowable shear: (ksi)
 Bottom plate allowable shear: (ksi)
 Percent area top flange: (%)
 Percent area bottom flange: (%)

Web Deterioration

Thickness	Start	Length
Loss	Distance	
(%)	(ft)	(ft)
10.0	0.00	4.00
10.0	29.75	0.50

Member G2

Link with: None

Description:

Existing: G-2 - Additional self load is for the diaphragms.

Section Loss (G5):

Use 2015 d-meter reading "D" (0.337") for 3.25" height, reading "H" (0.454") for 3.5" height, reading "L" (0.497") for remaining height. Weighted average thickness = 0.475". Average loss is 15.8%, say 15%.

Current: G-2 - Additional self load is for the diaphragms.

Section Loss (G5):

Use 2015 d-meter reading "D" (0.337") for 3.25" height, reading "H" (0.454") for 3.5" height, reading "L" (0.497") for remaining height. Weighted average thickness = 0.475". Average loss is 15.8%, say 15%.

Number of Spans: 1

Span	Span Length
Number	(ft)
1	30.250000

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.

Section Loss (G5):

Use 2015 d-meter reading "D" (0.337") for 3.25" height, reading "H" (0.454") for 3.5" height, reading "L" (0.497") for remaining height. Weighted average thickness = 0.475". Average loss is 15.8%, say 15%.

Description

Material Type: Steel
Girder Type: Rolled
Member units: US Customary
Girder property input method: Schedule based
Left end X: 5.0000 (in)
Right end X: 5.0000 (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: BrR Dist Fact
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	Shear at

Loaded	Shear	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 30x116
Distance: 0.00 *(ft)*
Length: 30.25 *(ft)*
Material: ASTM A7

Deck Profile

Bracing Ranges

Lateral Support

Distance	Length
<i>(ft)</i>	<i>(ft)</i>
0.00	30.25

Stiffener Ranges

Transverse Stiffener Ranges (Location)

Name	Distance <i>(ft)</i>	Number	Spacing <i>(in)</i>
dia. conn. (pair)	0.00	1	0.0000
dia. conn. (pair)	14.75	1	0.0000
dia. conn. (pair)	30.00	1	0.0000

Bearing Stiffener Locations

Points of Interest

Distance from left most support: 30.15 *(ft)*
Side: Right

Transverse Stiffeners

Override Schedule: FALSE
Stiffener spacing: *(in)*
Stiffener width: *(in)*
Stiffener thickness: *(in)*
Material: ASTM A7
Stiffener number: Single
Stiffener type: Plate

Other Stiffeners

Bearing Stiffener

Override Schedule: FALSE
Stiffener width: *(in)*
Stiffener thickness: *(in)*
Material: ASTM A7
Clip: *(in)*
Number of pairs:

Pair spacing: (in)
 Attachment Type: Welds
Longitudinal Stiffener
 Override Schedule: FALSE
 Stiffener width: (in)
 Stiffener thickness: (in)
 Material: ASTM A7
 Distance from flange to stiffener: (in)
 Distance measured from: Top Flange
Fatigue
 Number of cycles: 0
Bracing
 Deck provides lateral support:
 Override diaphragm schedule: FALSE
 Distance to left diaphragm: (ft)
 Distance to right diaphragm: (ft)
 Diaphragm at this location: FALSE
ASD
 Compression flange unsupported length: (ft)
 Tension Field Action Ignore combined shear and bending
Riveted Section
 Net moment of inertia: (in⁴)
 Distance to centroid: (in)
 Net area of web: (in²)
 Top plate allowable shear: (ksi)
 Bottom plate allowable shear: (ksi)
 Percent area top flange: (%)
 Percent area bottom flange: (%)

Web Deterioration

Thickness	Start	Length
Loss	Distance	
(%)	(ft)	(ft)
15.0	26.25	4.00

Member G3

Link with: G2

Description:

Existing:

Current:

Number of Spans: 1

Span	Span Length
Number	(ft)
1	30.250000

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 <i>(ft)</i>
1	30.250000

Support	Frame Connection
1	
2	

Pedestrian load: *(lb/ft)*

Member G5

Link with: G2

Description:

Existing: G-5 -

Current: G-5 -

Number of Spans: 1

Span Number	Span Length <i>(ft)</i>
1	30.250000

Support	Frame Connection
1	
2	

Pedestrian load: *(lb/ft)*

Member G6

Link with: G2

Description:

Existing:

Current:

Number of Spans: 1

Span	Span Length
------	-------------

Number (ft)
1 30.250000

Support Frame Connection
1
2

Pedestrian load: (lb/ft)

Member G7

Link with: None

Description:

Existing: G-7 - Additional self load is for the diaphragms.

Current: G-7 - Additional self load is for the diaphragms.

Number of Spans: 1

Span Span Length
Number (ft)
1 30.250000

Support Frame Connection
1
2

Pedestrian load: (lb/ft)

Member Loads

Member Loads - Settlement

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

Support Constraints

General

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

Elastic

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

Member Alternative G-7

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: 5.0000 (in)
Right end X: 5.0000 (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: BrR Dist Fact
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	Shear	Shear at Supports	Moment	Deflection
Loaded				
1 Lane	1.388	0.735	1.388	0.286
Multi-Lane	1.388	0.735	1.388	0.857

Girder Profile

Shape

Shape: W 30x108

Distance: 0.00 (ft)

Length: 30.25 (ft)

Material: ASTM A7

Deck Profile

Haunch Profile

Haunch Type: Flange edges

Embedded flange: TRUE

Distance	Length	Z1	Z2	Z3	Z4	Y1	Y2
(ft)	(ft)	(in)	(in)	(in)	(in)	(in)	(in)
0.00	30.25			30.2600	30.2600	0.0000	0.0000

Bracing Ranges

Lateral Support

Distance Length

(ft) (ft)

0.00 30.25

Stiffener Ranges

Transverse Stiffener Ranges (Location)

Name	Distance (ft)	Number	Spacing (in)
dia. conn. (single...	0.00	1	0.0000
dia. conn. (single...	15.70	1	0.0000
dia. conn. (single...	30.00	1	0.0000

Bearing Stiffener Locations

Points of Interest

Distance from left most support: 30.15 (ft)

Side: Right

Transverse Stiffeners

Override Schedule: FALSE

Stiffener spacing: (in)

Stiffener width: (in)

Stiffener thickness: (in)

Material: ASTM A7

Stiffener number: Single

Stiffener type: Plate

Other Stiffeners

Bearing Stiffener

Override Schedule: FALSE

Stiffener width: (in)

Stiffener thickness: (in)

Material: ASTM A7

Clip: (in)

Number of pairs:

Pair spacing: (in)

Attachment Type: Welds

Longitudinal Stiffener

Override Schedule: FALSE

Stiffener width: (in)

Stiffener thickness: (in)

Material: ASTM A7

Distance from flange to stiffener: (in)

Distance measured from: Top Flange

Fatigue

Number of cycles: 0

Bracing

Deck provides lateral support:

Override diaphragm schedule: FALSE

Distance to left diaphragm: (ft)

Distance to right diaphragm: (ft)

Diaphragm at this location: FALSE

ASD

Compression flange unsupported length: (ft)

Tension Field Action Ignore combined shear and bending

Riveted Section

Net moment of inertia:	(in ⁴)
Distance to centroid:	(in)
Net area of web:	(in ²)
Top plate allowable shear:	(ksi)
Bottom plate allowable shear:	(ksi)
Percent area top flange:	(%)
Percent area bottom flange:	(%)

Web Deterioration

Thickness Loss (%)	Start Distance (ft)	Length (ft)
10.0	26.25	4.00

Superstructure Definition Eastbound - Span 2

Definition

Units: US Customary

Number of spans: 1

Number of girders: 7

Span	Length (ft)
1	85.5000

Frame Structure Simplified Definition:

Support Frame Connection

1

2

Girder Spacing Display Type: Perpendicular

Average Humidity: 90.000 (%)

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	1.3000
2	1.3000

Girder Spacing Orientation: Perpendicular

Girder Bay	Girder Spacing Start	End
	(ft)	(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	Distance Right Girder	Diaphragm Spacing	Number of Spaces	Diaphragm Weight
(ft)	(ft)	(ft)		(kip)
0.25	0.25	0.00	1	
20.81	21.00	0.00	1	
20.81	21.00	21.38	2	
85.25	85.25	0.00	1	

Girder Bay 2

Distance Left Girder	Distance Right Girder	Diaphragm Spacing	Number of Spaces	Diaphragm Weight
(ft)	(ft)	(ft)		(kip)
0.25	0.25	0.00	1	
21.00	21.19	0.00	1	

21.00	21.19	21.38	2	
85.25	85.25	0.00	1	
<i>Girder Bay 3</i>				
Distance	Distance	Diaphragm	Number of	Diaphragm
Left Girder	Right Girder	Spacing	Spaces	Weight
(ft)	(ft)	(ft)		(kip)
0.25	0.25	0.00	1	
21.19	21.38	21.38	2	
21.19	21.38	0.00	1	
85.25	85.25	0.00	1	
<i>Girder Bay 4</i>				
Distance	Distance	Diaphragm	Number of	Diaphragm
Left Girder	Right Girder	Spacing	Spaces	Weight
(ft)	(ft)	(ft)		(kip)
0.25	0.25	0.00	1	
21.38	21.57	0.00	1	
21.38	21.57	21.38	2	
85.25	85.25	0.00	1	
<i>Girder Bay 5</i>				
Distance	Distance	Diaphragm	Number of	Diaphragm
Left Girder	Right Girder	Spacing	Spaces	Weight
(ft)	(ft)	(ft)		(kip)
0.25	0.25	0.00	1	
21.57	21.76	0.00	1	
21.57	21.76	21.38	2	
85.25	85.25	0.00	1	
<i>Girder Bay 6</i>				
Distance	Distance	Diaphragm	Number of	Diaphragm
Left Girder	Right Girder	Spacing	Spaces	Weight
(ft)	(ft)	(ft)		(kip)
0.25	0.25	0.00	1	
21.76	21.95	0.00	1	
21.76	21.95	21.38	2	
85.25	85.25	0.00	1	

Structure Typical Section

Deck

Left start width:	28.19 (ft)
Left end width:	28.19 (ft)
Right start width:	28.19 (ft)
Right end width:	28.19 (ft)
Left start overhang:	2.42 (ft)
Left end overhang:	2.42 (ft)

Deck (Cont'd)

Deck concrete:	Unknown strength concrete prior to 1959
Total deck thickness:	8.0000 (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
4-Rail w/...	DC2		Left Ed...	1.00	1.00	Right
Double w-...	DC2		Right E...	3.35	3.35	Left
<u>Sidewalk</u>						
Width	Thickness At End	Material	Load Case	Measure to	Measured From	At Start
22.0000	10.2000	Unknown...	DC2		Left Ed...	-0.08 ...

Lane Position

Offset Left Start: -26.44 (ft)
Offset Left End: -26.44 (ft)
Offset Right Start: 28.19 (ft)
Offset Right End: 28.19 (ft)

Wearing Surface

Wearing surface material: Asphalt
Description:
Wearing surface thickness: 2.6600 (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
Sidewalk Keyway	Weight of additional ...	Non-composite (Sta...		D,DC

Superstructure Loads

DL Distribution

Stage 1 Dead Load Distribution: Tributary Area
Stage 2 Dead Load Distribution: Uniformly to All Girders

Stiffener Definitions

Transverse Stiffeners

Name: dia. conn. (single)
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: dia. conn. (pair)
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.

Section loss: Use 2015 inspection reading "D" (0.476") for 3.25" height, reading "H" (0.492") for 3.5" height, reading "L" (0.542") for remaining web height. Weighted average is 30.6%, say 30%.

Current: G-1 - Additional self load is for the diaphragms.

Section loss: Use 2015 inspection reading "D" (0.476") for 3.25" height, reading "H" (0.492") for 3.5" height, reading "L" (0.542") for remaining web height. Weighted average is 30.6%, say 30%.

Number of Spans: 1

Span Number	Span Length (ft)
1	85.500000

Support	Frame Connection
1	
2	

Pedestrian load: (lb/ft)

Member Loads

Distributed Loads				
Distance (ft)	Length (ft)	Start (kip/ft)	End (kip/ft)	Load Case Name
0.00	85.50	0.062	0.062	Sidewalk K...

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.

Section loss: Use 2015 inspection reading "D" (0.476") for 3.25" height, reading "H" (0.492") for 3.5" height, reading "L" (0.542") for remaining web height. Weighted average is 30.6%, say 30%.

Description

Material Type: Steel
Girder Type: Rolled
Member units: US Customary
Girder property input method: Schedule based
Left end X: 5.0000 (in)
Right end X: 5.0000 (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: BrR Dist Fact
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	Shear	Shear at Supports	Moment	Deflection
Loaded				
1 Lane	1.388	0.980	1.388	0.286
Multi-Lane	1.388	0.980	1.388	0.857

Girder Profile

Shape

Shape: W 36x230
Distance: 0.00 (ft)
Length: 85.50 (ft)
Material: ASTM A7

Flange Cover Plates

Plate	Begin Width (in)	End Width (in)	Thickness (in)	Distance (ft)	Length (ft)	Material
1 (Bot...		18.000...	18.000...	1.0000	10.75	64.00 ASTM A7

Deck Profile

Deck Concrete

Material (LRFD)	Distance n (ft)	Length (ft)	Total Thickness (in)	Structural Thickness (in)	Effective Width (Std) (in)	Effective Width (in)
Unknown stren...	0.00	85.50		7.5000	74.0004	80.0004
	10.1...					

Shear Connectors

Start Distance (ft)	Length (ft)	Connector Name	Number per Row	Number of Spaces	Transverse Spacing (in)
0.00	85.50	Composite			

Haunch Profile

Haunch Type: Flange edges
Embedded flange: TRUE

Distance (ft)	Length (ft)	Z1 (in)	Z2 (in)	Z3 (in)	Z4 (in)	Y1 (in)	Y2 (in)
0.00	85.50			20.7600	20.7600	0.0000	0.0000

Bracing Ranges

Lateral Support

Distance (ft)	Length (ft)
0.00	85.50

Stiffener Ranges

Transverse Stiffener Ranges (Location)

Name	Distance (ft)	Number	Spacing (in)
dia. conn. (single...	0.25	1	0.0000
dia. conn. (single...	20.81	2	256.5000
dia. conn. (single...	20.81	1	0.0000

dia. conn. (single...	85.25	1	0.0000
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Bearing Stiffener Locations

Points of Interest

Distance from left most support: 0.10 (ft)

Side: Right

Transverse Stiffeners

Override Schedule: FALSE

Stiffener spacing: (in)

Stiffener width: (in)

Stiffener thickness: (in)

Material: ASTM A7

Stiffener number: Single

Stiffener type: Plate

Other Stiffeners

Bearing Stiffener

Override Schedule: FALSE

Stiffener width: (in)

Stiffener thickness: (in)

Material: ASTM A7

Clip: (in)

Number of pairs:

Pair spacing: (in)

Attachment Type: Welds

Longitudinal Stiffener

Override Schedule: FALSE

Stiffener width: (in)

Stiffener thickness: (in)

Material: ASTM A7

Distance from flange to stiffener: (in)

Distance measured from: Top Flange

Fatigue

Number of cycles: 0

Bracing

Deck provides lateral support:

Override diaphragm schedule: FALSE

Distance to left diaphragm: (ft)

Distance to right diaphragm: (ft)

Diaphragm at this location: TRUE

ASD

Compression flange unsupported length: (ft)

Tension Field Action Ignore combined shear and bending

Riveted Section

Net moment of inertia: (in⁴)

Distance to centroid: (in)

Net area of web: (in²)

Top plate allowable shear: (ksi)

Bottom plate allowable shear: (ksi)

Percent area top flange: (%)

Percent area bottom flange:	(%)
Distance from left most support:	85.40 (ft)
Side:	Right
<u>Transverse Stiffeners</u>	
Override Schedule:	FALSE
Stiffener spacing:	(in)
Stiffener width:	(in)
Stiffener thickness:	(in)
Material:	ASTM A7
Stiffener number:	Single
Stiffener type:	Plate
<u>Other Stiffeners</u>	
<i>Bearing Stiffener</i>	
Override Schedule:	FALSE
Stiffener width:	(in)
Stiffener thickness:	(in)
Material:	ASTM A7
Clip:	(in)
Number of pairs:	
Pair spacing:	(in)
Attachment Type:	Welds
<i>Longitudinal Stiffener</i>	
Override Schedule:	FALSE
Stiffener width:	(in)
Stiffener thickness:	(in)
Material:	ASTM A7
Distance from flange to stiffener:	(in)
Distance measured from:	Top Flange
<u>Fatigue</u>	
Number of cycles:	0
<u>Bracing</u>	
Deck provides lateral support:	
Override diaphragm schedule:	FALSE
Distance to left diaphragm:	(ft)
Distance to right diaphragm:	(ft)
Diaphragm at this location:	FALSE
<u>ASD</u>	
Compression flange unsupported length:	(ft)
Tension Field Action	Ignore combined shear and bending
<i>Riveted Section</i>	
Net moment of inertia:	(in ⁴)
Distance to centroid:	(in)
Net area of web:	(in ²)
Top plate allowable shear:	(ksi)
Bottom plate allowable shear:	(ksi)
Percent area top flange:	(%)
Percent area bottom flange:	(%)

Web Deterioration

Thickness Loss (%)	Start Distance (ft)	Length (ft)
30.0	0.00	1.00
10.0	85.00	0.50

Member G2

Link with: None

Description:

Existing: G-2 - Additional self load is for the diaphragms.

Deck Spalling 2015:

The Span 2 Deck is severely spalled. The worst spalling is the effective width x 4" deep. The revised composite deck thickness is $7.5" - 4" = 3.5"$.

Current: G-2 - Additional self load is for the diaphragms.

Deck Spalling 2015:

The Span 2 Deck is severely spalled. The worst spalling is the effective width x 4" deep. The revised composite deck thickness is $7.5" - 4" = 3.5"$.

Number of Spans: 1

Span Number	Span Length (ft)
1	85.500000

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	X Translation	Y Translation	Z Rotation	Override Computed
---------	---------------	---------------	------------	-------------------

Number	(kip/ft)	(kip/ft)	(kip-in/rad)	Z Rotation
1				
2				

Member Alternative G-2

Description: Additional self load is for the diaphragms.

Deck Spalling 2015:

The Span 2 Deck is severely spalled. The worst spalling is the effective width x 4" deep. The revised composite deck thickness is 7.5" - 4" = 3.5".

Description

Material Type: Steel
 Girder Type: Rolled
 Member units: US Customary
 Girder property input method: Schedule based
 Left end X: 5.0000 (in)
 Right end X: 5.0000 (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: BrR Dist Fact
 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
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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	Shear	Shear at Supports	Moment	Deflection
Loaded				
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 36x300
Distance:	0.00 (ft)
Length:	85.50 (ft)
Material:	ASTM A7

Flange Cover Plates

Plate	Begin Width (in)	End Width (in)	Thickness (in)	Distance (ft)	Length (ft)	Material
1 (Bot...		18.000...	18.000...	1.2500	13.75	58.00 ASTM A7

Deck Profile

Deck Concrete

Material (LRFD)	Distance n (ft)	Length (ft)	Total Thickness (in)	Structural Thickness (in)	Effective Width (Std) (in)	Effective Width (in)
Unknown stren...	0.00	85.50		3.5000	42.0000	102.0000
	10.1...					

Shear Connectors

Start Distance (ft)	Length (ft)	Connector Name	Number per Row	Number of Spaces	Transverse Spacing (in)
0.00	85.50	Composite			

Bracing Ranges

Lateral Support

Distance (ft)	Length (ft)
0.00	85.50

Stiffener Ranges

Transverse Stiffener Ranges (Location)

Name	Distance (ft)	Number	Spacing (in)
dia. conn. (pair)	0.25	1	0.0000
dia. conn. (pair)	21.00	2	256.5000
dia. conn. (pair)	21.00	1	0.0000
dia. conn. (pair)	85.25	1	0.0000

Bearing Stiffener Locations

Points of Interest

Distance from left most support: 0.10 (ft)
Side: Right

Transverse Stiffeners

Override Schedule: FALSE
Stiffener spacing: (in)
Stiffener width: (in)
Stiffener thickness: (in)
Material: ASTM A7
Stiffener number: Single
Stiffener type: Plate

Other Stiffeners

Bearing Stiffener
Override Schedule: FALSE
Stiffener width: (in)
Stiffener thickness: (in)
Material: ASTM A7

Clip:	(in)
Number of pairs:	
Pair spacing:	(in)
Attachment Type:	Welds
<i>Longitudinal Stiffener</i>	
Override Schedule:	FALSE
Stiffener width:	(in)
Stiffener thickness:	(in)
Material:	ASTM A7
Distance from flange to stiffener:	(in)
Distance measured from:	Top Flange
<u>Fatigue</u>	
Number of cycles:	0
<u>Bracing</u>	
Deck provides lateral support:	
Override diaphragm schedule:	FALSE
Distance to left diaphragm:	(ft)
Distance to right diaphragm:	(ft)
Diaphragm at this location:	FALSE
<u>ASD</u>	
Compression flange unsupported length:	(ft)
Tension Field Action	Ignore combined shear and bending
<i>Riveted Section</i>	
Net moment of inertia:	(in ⁴)
Distance to centroid:	(in)
Net area of web:	(in ²)
Top plate allowable shear:	(ksi)
Bottom plate allowable shear:	(ksi)
Percent area top flange:	(%)
Percent area bottom flange:	(%)
Distance from left most support:	85.40 (ft)
Side:	Right
<u>Transverse Stiffeners</u>	
Override Schedule:	FALSE
Stiffener spacing:	(in)
Stiffener width:	(in)
Stiffener thickness:	(in)
Material:	ASTM A7
Stiffener number:	Single
Stiffener type:	Plate
<u>Other Stiffeners</u>	
<i>Bearing Stiffener</i>	
Override Schedule:	FALSE
Stiffener width:	(in)
Stiffener thickness:	(in)
Material:	ASTM A7
Clip:	(in)
Number of pairs:	
Pair spacing:	(in)

Attachment Type: Welds
Longitudinal Stiffener
 Override Schedule: FALSE
 Stiffener width: (in)
 Stiffener thickness: (in)
 Material: ASTM A7
 Distance from flange to stiffener: (in)
 Distance measured from: Top Flange

Fatigue
 Number of cycles: 0

Bracing
 Deck provides lateral support:
 Override diaphragm schedule: FALSE
 Distance to left diaphragm: (ft)
 Distance to right diaphragm: (ft)
 Diaphragm at this location: FALSE

ASD
 Compression flange unsupported length: (ft)
 Tension Field Action Ignore combined shear and bending

Riveted Section
 Net moment of inertia: (in^4)
 Distance to centroid: (in)
 Net area of web: (in^2)
 Top plate allowable shear: (ksi)
 Bottom plate allowable shear: (ksi)
 Percent area top flange: (%)
 Percent area bottom flange: (%)

Web Deterioration

Thickness	Start	Length
Loss	Distance	
(%)	(ft)	(ft)
10.0	0.00	4.00
10.0	85.00	0.50

Member G3

Link with: G2

Description:

Existing:

Current:

Number of Spans: 1

Span	Span Length
Number	(ft)
1	85.500000

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 <i>(ft)</i>
1	85.500000

Support	Frame Connection
1	
2	

Pedestrian load: *(lb/ft)*

Member G5

Link with: G2

Description:

Existing: G-5 -

Current: G-5 -

Number of Spans: 1

Span Number	Span Length <i>(ft)</i>
1	85.500000

Support	Frame Connection
1	
2	

Pedestrian load: *(lb/ft)*

Member G6

Link with: G2

Description:

Existing:

Current:

Number of Spans: 1

Span	Span Length
------	-------------

Number (ft)
1 85.500000

Support Frame Connection
1
2

Pedestrian load: (lb/ft)

Member G7

Link with: None

Description:

Existing: G-7 - Additional self load is for the diaphragms.

Deck Spalling 2015:

The Span 2 Deck is severely spalled. Say the worst spalling in bay 6 is the effective width x 4" deep. The computed average spall depth is $(4.25' \times 4") / (86.5" \text{ effective width}) = 2.36"$, say 2.375". The revised composite deck thickness is $7.5" - 2.375" = 5.125"$.

Current: G-7 - Additional self load is for the diaphragms.

Deck Spalling 2015:

The Span 2 Deck is severely spalled. Say the worst spalling in bay 6 is the effective width x 4" deep. The computed average spall depth is $(4.25' \times 4") / (86.5" \text{ effective width}) = 2.36"$, say 2.375". The revised composite deck thickness is $7.5" - 2.375" = 5.125"$.

Number of Spans: 1

Span Span Length
Number (ft)
1 85.500000

Support Frame Connection
1
2

Pedestrian load: (lb/ft)

Member Loads

Member Loads - Settlement

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

Support Constraints

General

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

2	Roller	Free	Fixed	Free
<u>Elastic</u>				
Support	X Translation	Y Translation	Z Rotation	Override Computed
Number	(kip/ft)	(kip/ft)	(kip-in/rad)	Z Rotation
1				
2				

Member Alternative G-7

Description: Additional self load is for the diaphragms.

Deck Spalling 2015:

The Span 2 Deck is severely spalled. Say the worst spalling in bay 6 is the effective width x 4" deep. The computed average spall depth is $(4.25' \times 4") / (86.5" \text{ effective width}) = 2.36"$, say 2.375". The revised composite deck thickness is $7.5" - 2.375" = 5.125"$.

Description

Material Type: Steel
 Girder Type: Rolled
 Member units: US Customary
 Girder property input method: Schedule based
 Left end X: 5.0000 (in)
 Right end X: 5.0000 (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: BrR Dist Fact
 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	Shear	Shear at Supports	Moment	Deflection
Loaded				
1 Lane	1.388	0.735	1.388	0.286
Multi-Lane	1.388	0.735	1.388	0.857

Girder Profile

Shape

Shape:	W 36x230
--------	----------

Distance:	0.00 (ft)
-----------	-----------

Length:	85.50 (ft)
---------	------------

Material:	ASTM A7
-----------	---------

Flange Cover Plates

Plate	Begin Width (in)	End Width (in)	Thickness (in)	Distance (ft)	Length (ft)	Material
1 (Bot...		18.000...	18.000...	1.0000	10.75	64.00 ASTM A7

Deck Profile

Deck Concrete

Material (LRFD)	Distance n (ft)	Length (ft)	Total Thickness (in)	Structural Thickness (in)	Effective Width (Std) (in)	Effective Width (in)
Unknown stren...	0.00 10.1...	85.50		5.1250	61.5000	86.4996

Shear Connectors

Start Distance (ft)	Length (ft)	Connector Name	Number per Row	Number of Spaces	Transverse Spacing (in)
0.00	85.50	Composite			

Haunch Profile

Haunch Type:

Flange edges

Embedded flange:

TRUE

Distance (ft)	Length (ft)	Z1 (in)	Z2 (in)	Z3 (in)	Z4 (in)	Y1 (in)	Y2 (in)
0.00	85.50			27.2600	27.2600	0.0000	0.0000

Bracing Ranges

Lateral Support

Distance (ft)	Length (ft)
0.00	85.50

Stiffener Ranges

Transverse Stiffener Ranges (Location)

Name	Distance (ft)	Number	Spacing (in)
dia. conn. (single...	0.25	1	0.0000
dia. conn. (single...	21.95	2	256.5000
dia. conn. (single...	21.95	1	0.0000
dia. conn. (single...	85.25	1	0.0000

Bearing Stiffener Locations

Points of Interest

Distance from left most support: 0.10 (ft)

Side: Right

Transverse Stiffeners

Override Schedule: FALSE

Stiffener spacing: (in)

Stiffener width:	(in)
Stiffener thickness:	(in)
Material:	ASTM A7
Stiffener number:	Single
Stiffener type:	Plate
<u>Other Stiffeners</u>	
<i>Bearing Stiffener</i>	
Override Schedule:	FALSE
Stiffener width:	(in)
Stiffener thickness:	(in)
Material:	ASTM A7
Clip:	(in)
Number of pairs:	
Pair spacing:	(in)
Attachment Type:	Welds
<i>Longitudinal Stiffener</i>	
Override Schedule:	FALSE
Stiffener width:	(in)
Stiffener thickness:	(in)
Material:	ASTM A7
Distance from flange to stiffener:	(in)
Distance measured from:	Top Flange
<u>Fatigue</u>	
Number of cycles:	0
<u>Bracing</u>	
Deck provides lateral support:	
Override diaphragm schedule:	FALSE
Distance to left diaphragm:	(ft)
Distance to right diaphragm:	(ft)
Diaphragm at this location:	FALSE
<u>ASD</u>	
Compression flange unsupported length:	(ft)
Tension Field Action	Ignore combined shear and bending
<i>Riveted Section</i>	
Net moment of inertia:	(in ⁴)
Distance to centroid:	(in)
Net area of web:	(in ²)
Top plate allowable shear:	(ksi)
Bottom plate allowable shear:	(ksi)
Percent area top flange:	(%)
Percent area bottom flange:	(%)
Distance from left most support:	85.40 (ft)
Side:	Right
<u>Transverse Stiffeners</u>	
Override Schedule:	FALSE
Stiffener spacing:	(in)
Stiffener width:	(in)
Stiffener thickness:	(in)
Material:	ASTM A7

Stiffener number:	Single
Stiffener type:	Plate
<u>Other Stiffeners</u>	
<i>Bearing Stiffener</i>	
Override Schedule:	FALSE
Stiffener width:	(in)
Stiffener thickness:	(in)
Material:	ASTM A7
Clip:	(in)
Number of pairs:	
Pair spacing:	(in)
Attachment Type:	Welds
<i>Longitudinal Stiffener</i>	
Override Schedule:	FALSE
Stiffener width:	(in)
Stiffener thickness:	(in)
Material:	ASTM A7
Distance from flange to stiffener:	(in)
Distance measured from:	Top Flange
<u>Fatigue</u>	
Number of cycles:	0
<u>Bracing</u>	
Deck provides lateral support:	
Override diaphragm schedule:	FALSE
Distance to left diaphragm:	(ft)
Distance to right diaphragm:	(ft)
Diaphragm at this location:	FALSE
<u>ASD</u>	
Compression flange unsupported length:	(ft)
Tension Field Action	Ignore combined shear and bending
<i>Riveted Section</i>	
Net moment of inertia:	(in ⁴)
Distance to centroid:	(in)
Net area of web:	(in ²)
Top plate allowable shear:	(ksi)
Bottom plate allowable shear:	(ksi)
Percent area top flange:	(%)
Percent area bottom flange:	(%)

Web Deterioration

Thickness	Start	Length
Loss	Distance	
(%)	(ft)	(ft)
10.0	0.00	0.50
10.0	85.00	0.50

Superstructure Definition Eastbound - Span 3

Definition

Units: US Customary

Number of spans: 1
Number of girders: 7

Length
Span (ft)
1 33.0000

Frame Structure Simplified Definition:

Support Frame Connection
1
2

Girder Spacing Display Type: Perpendicular

Average Humidity: 90.000 (%)

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

Skew

Support

(Degrees)

1

1.3000

2

1.3000

Girder Spacing Orientation:

Perpendicular

Girder

Girder Spacing

Bay

Start

End

(ft)

(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

Distance

Diaphragm

Number of

Diaphragm

Left Girder

Right Girder

Spacing

Spaces

Weight

(ft)

(ft)

(ft)

(kip)

0.25

0.25

0.00

1

15.93

16.12

0.00

1

33.00

33.00

0.00

1

Girder Bay 2

Distance

Distance

Diaphragm

Number of

Diaphragm

Left Girder

Right Girder

Spacing

Spaces

Weight

(ft)

(ft)

(ft)

(kip)

0.25

0.25

0.00

1

16.12

16.31

0.00

1

33.00

33.00

0.00

1

Girder Bay 3

Distance

Distance

Diaphragm

Number of

Diaphragm

Left Girder

Right Girder

Spacing

Spaces

Weight

(ft)

(ft)

(ft)

(kip)

0.25

0.25

0.00

1

16.31

16.50

0.00

1

33.00

33.00

0.00

1

Girder Bay 4

Distance

Distance

Diaphragm

Number of

Diaphragm

Left Girder

Right Girder

Spacing

Spaces

Weight

(ft)

(ft)

(ft)

(kip)

0.25

0.25

0.00

1

16.50

16.69

0.00

1

33.00

33.00

0.00

1

Girder Bay 5

Distance

Distance

Diaphragm

Number of

Diaphragm

Left Girder

Right Girder

Spacing

Spaces

Weight

(ft)

(ft)

(ft)

(kip)

0.25

0.25

0.00

1

16.69	16.88	0.00	1	
33.00	33.00	0.00	1	
<i>Girder Bay 6</i>				
Distance	Distance	Diaphragm	Number of	Diaphragm
Left Girder	Right Girder	Spacing	Spaces	Weight
(ft)	(ft)	(ft)		(kip)
0.25	0.25	0.00	1	
16.88	17.07	0.00	1	
33.00	33.00	0.00	1	

Structure Typical Section

Deck

Left start width:	28.19 (ft)
Left end width:	28.19 (ft)
Right start width:	28.19 (ft)
Right end width:	28.19 (ft)
Left start overhang:	2.42 (ft)
Left end overhang:	2.42 (ft)

Deck (Cont'd)

Deck concrete:	Unknown strength concrete prior to 1959
Total deck thickness:	8.0000 (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
4-Rail Br...	DC2		Left Ed...	1.00	1.00	Right
Double w-...	DC2		Right E...	3.35	3.35	Left

Sidewalk

Width	Thickness At End	Material	Load Case	Measure to	Measured From	At Start
22.0000	10.2000	Unknown...	DC2		Left Ed...	-0.08 ...

Lane Position

Offset Left Start:	-26.44 (ft)
Offset Left End:	-26.44 (ft)
Offset Right Start:	28.19 (ft)
Offset Right End:	28.19 (ft)

Wearing Surface

Wearing surface material:	Asphalt
Description:	
Wearing surface thickness:	2.6600 (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
Sidewalk Keyway

DW acting on long-ter...
Weight of additional ...

Composite (long te...
Non-composite (Sta...

D,DW
D,DC

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: dia. conn. (single)

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: dia. conn. (pair)

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.

Section loss: Use 2013 inspection reading "C" (0.428") for 3.25" height, reading "F" (0.508") for 3.5" height, reading "I" (0.514") for remaining web height. Weighted average is 19.2%, say 20%.

Current: G-1 - Additional self load is for the diaphragms.

Section loss: Use 2013 inspection reading "C" (0.428") for 3.25" height, reading "F" (0.508") for 3.5" height, reading "I" (0.514") for remaining web height. Weighted average is 19.2%, say 20%.

Number of Spans: 1

Span Number	Span Length (ft)
1	33.000000

Support	Frame Connection
1	
2	

Pedestrian load: (lb/ft)

Member Loads

Distributed Loads

Distance (ft)	Length (ft)	Start (kip/ft)	End (kip/ft)	Load Case Name
0.00	33.00	0.062	0.062	Sidewalk K...

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	Roller	Free	Fixed	Free
2	Pinned	Fixed	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.

Section loss: Use 2013 inspection reading "C" (0.428") for 3.25" height, reading "F" (0.508") for 3.5" height, reading "I" (0.514") for remaining web height. Weighted average is 19.2%, say 20%.

Description

Material Type: Steel
 Girder Type: Rolled
 Member units: US Customary
 Girder property input method: Schedule based
 Left end X: 5.0000 (in)
 Right end X: 5.0000 (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: BrR Dist Fact
 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	Shear	Shear at Supports	Moment	Deflection
Loaded				
1 Lane	1.388	0.980	1.388	0.286
Multi-Lane	1.388	0.980	1.388	0.857

Girder Profile

Shape

Shape: W 36x150

Distance: 0.00 (ft)

Length: 33.00 (ft)

Material: ASTM A7

Deck Profile

Haunch Profile

Haunch Type: Flange edges

Embedded flange: TRUE

Distance (ft)	Length (ft)	Z1 (in)	Z2 (in)	Z3 (in)	Z4 (in)	Y1 (in)	Y2 (in)
0.00	33.00			23.0100	23.0100	0.0000	0.0000

Bracing Ranges

Lateral Support

Distance (ft)	Length (ft)
0.00	33.00

Stiffener Ranges

Transverse Stiffener Ranges (Location)

Name	Distance (ft)	Number	Spacing (in)
dia. conn. (single...	0.25	1	0.0000
dia. conn. (single...	15.93	1	0.0000
dia. conn. (single...	33.00	1	0.0000

Bearing Stiffener Locations

Points of Interest

Distance from left most support: 0.10 (ft)

Side: Right

Transverse Stiffeners

Override Schedule: FALSE
 Stiffener spacing: (in)
 Stiffener width: (in)
 Stiffener thickness: (in)
 Material: ASTM A7
 Stiffener number: Single
 Stiffener type: Plate

Other Stiffeners

Bearing Stiffener

Override Schedule: FALSE
 Stiffener width: (in)
 Stiffener thickness: (in)
 Material: ASTM A7
 Clip: (in)
 Number of pairs:
 Pair spacing: (in)
 Attachment Type: Welds

Longitudinal Stiffener

Override Schedule: FALSE
 Stiffener width: (in)
 Stiffener thickness: (in)
 Material: ASTM A7
 Distance from flange to stiffener: (in)
 Distance measured from: Top Flange

Fatigue

Number of cycles: 0
Bracing
 Deck provides lateral support:
 Override diaphragm schedule: FALSE
 Distance to left diaphragm: (ft)
 Distance to right diaphragm: (ft)
 Diaphragm at this location: TRUE
ASD
 Compression flange unsupported length: (ft)
 Tension Field Action Ignore combined shear and bending
Riveted Section
 Net moment of inertia: (in⁴)
 Distance to centroid: (in)
 Net area of web: (in²)
 Top plate allowable shear: (ksi)
 Bottom plate allowable shear: (ksi)
 Percent area top flange: (%)
 Percent area bottom flange: (%)

Web Deterioration

Thickness	Start	Length
Loss	Distance	
(%)	(ft)	(ft)
20.0	0.00	1.00

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	Span Length
Number	(ft)
1	33.000000

Support	Frame Connection
1	
2	

Pedestrian load: 0.000 (lb/ft)

Member Loads

Member Loads - Settlement

Support	Horizontal	Vertical	Rotational	Load Case Name
---------	------------	----------	------------	----------------

Number	(in)	(in)	(Radians)
1			
2			

Support Constraints

General

Support Number	Support Type	X Translation	Y Translation	Z Rotation
1	Roller	Free	Fixed	Free
2	Pinned	Fixed	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: 5.0000 (in)
 Right end X: 5.0000 (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: BrR Dist Fact
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		Shear at		
Loaded	Shear	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 30x132

Distance: 0.00 *(ft)*
Length: 33.00 *(ft)*
Material: ASTM A7

Deck Profile

Bracing Ranges

Lateral Support

Distance	Length
<i>(ft)</i>	<i>(ft)</i>
0.00	33.00

Stiffener Ranges

Transverse Stiffener Ranges (Location)

Name	Distance <i>(ft)</i>	Number	Spacing <i>(in)</i>
dia. conn. (pair)	0.25	1	0.0000
dia. conn. (pair)	16.12	1	0.0000
dia. conn. (pair)	33.00	1	0.0000

Bearing Stiffener Locations

Points of Interest

Distance from left most support: 0.10 *(ft)*
Side: Right

Transverse Stiffeners

Override Schedule: FALSE
Stiffener spacing: *(in)*
Stiffener width: *(in)*
Stiffener thickness: *(in)*
Material: ASTM A7
Stiffener number: Single
Stiffener type: Plate

Other Stiffeners

Bearing Stiffener

Override Schedule: FALSE
Stiffener width: *(in)*
Stiffener thickness: *(in)*
Material: ASTM A7
Clip: *(in)*
Number of pairs:
Pair spacing: *(in)*
Attachment Type: Welds

Longitudinal Stiffener

Override Schedule: FALSE
Stiffener width: *(in)*
Stiffener thickness: *(in)*
Material: ASTM A7
Distance from flange to stiffener: *(in)*

Distance measured from: Top Flange
Fatigue
 Number of cycles: 0
Bracing
 Deck provides lateral support:
 Override diaphragm schedule: FALSE
 Distance to left diaphragm: (ft)
 Distance to right diaphragm: (ft)
 Diaphragm at this location: FALSE
ASD
 Compression flange unsupported length: (ft)
 Tension Field Action Ignore combined shear and bending
Riveted Section
 Net moment of inertia: (in⁴)
 Distance to centroid: (in)
 Net area of web: (in²)
 Top plate allowable shear: (ksi)
 Bottom plate allowable shear: (ksi)
 Percent area top flange: (%)
 Percent area bottom flange: (%)

Web Deterioration

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

Member G3

Link with: G2

Description:

Existing:

Current:

Number of Spans: 1

Span	Span Length
------	-------------

Number	(ft)
1	33.000000

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	33.000000

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	33.000000

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	33.000000

Support	Frame Connection
1	
2	

Pedestrian load: (lb/ft)

Member G7

Link with: None

Description:

Existing: G-7 - Additional self load is for the diaphragms.

Current: G-7 - Additional self load is for the diaphragms.

Number of Spans: 1

Span Number	Span Length (ft)
1	33.000000

Support	Frame Connection
1	
2	

Pedestrian load: (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	Roller	Free	Fixed	Free
2	Pinned	Fixed	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-7

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: 5.0000 (in)
Right end X: 5.0000 (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: BrR Dist Fact
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	Shear	Shear at Supports	Moment	Deflection
Loaded				
1 Lane	1.388	0.735	1.388	0.286
Multi-Lane	1.388	0.735	1.388	0.857

Girder Profile

Shape

Shape: W 30x108

Distance: 0.00 (ft)

Length: 33.00 (ft)

Material: ASTM A7

Deck Profile

Haunch Profile

Haunch Type: Flange edges

Embedded flange: TRUE

Distance	Length	Z1	Z2	Z3	Z4	Y1	Y2
(ft)	(ft)	(in)	(in)	(in)	(in)	(in)	(in)
0.00	33.00			30.2600	30.2600	0.0000	0.0000

Bracing Ranges

Lateral Support

Distance Length

(ft) (ft)
0.00 33.00

Stiffener Ranges

Transverse Stiffener Ranges (Location)

Name	Distance	Number	Spacing
	(ft)		(in)
dia. conn. (single...	0.25	1	0.0000

dia. conn. (single...	17.07	1	0.0000
dia. conn. (single...	33.00	1	0.0000

Bearing Stiffener Locations

Points of Interest

Distance from left most support: 0.10 *(ft)*
Side: Right

Transverse Stiffeners

Override Schedule: FALSE
Stiffener spacing: *(in)*
Stiffener width: *(in)*
Stiffener thickness: *(in)*
Material: ASTM A7
Stiffener number: Single
Stiffener type: Plate

Other Stiffeners

Bearing Stiffener

Override Schedule: FALSE
Stiffener width: *(in)*
Stiffener thickness: *(in)*
Material: ASTM A7
Clip: *(in)*
Number of pairs:
Pair spacing: *(in)*
Attachment Type: Welds

Longitudinal Stiffener

Override Schedule: FALSE
Stiffener width: *(in)*
Stiffener thickness: *(in)*
Material: ASTM A7
Distance from flange to stiffener: *(in)*
Distance measured from: Top Flange

Fatigue

Number of cycles: 0

Bracing

Deck provides lateral support:
Override diaphragm schedule: FALSE
Distance to left diaphragm: *(ft)*
Distance to right diaphragm: *(ft)*
Diaphragm at this location: FALSE

ASD

Compression flange unsupported length: *(ft)*
Tension Field Action Ignore combined shear and bending

Riveted Section

Net moment of inertia: *(in^4)*
Distance to centroid: *(in)*
Net area of web: *(in^2)*
Top plate allowable shear: *(ksi)*
Bottom plate allowable shear: *(ksi)*

Percent area top flange: (%)
Percent area bottom flange: (%)

Web Deterioration

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

Superstructure Definition Westbound - Span 1

Definition

Units: US Customary
Number of spans: 1
Number of girders: 7

Length
Span (ft)
1 30.2500

Frame Structure Simplified Definition:

Support Frame Connection
1
2

Girder Spacing Display Type: Perpendicular
Average Humidity: 90.000 (%)

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	1.3000
2	1.3000

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	
14.56	14.75	0.00	1	
30.00	30.00	0.00	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	
14.75	14.94	0.00	1	
30.00	30.00	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	

14.94	15.13	0.00	1	
30.00	30.00	0.00	1	
<i>Girder Bay 4</i>				
Distance	Distance	Diaphragm	Number of	Diaphragm
Left Girder	Right Girder	Spacing	Spaces	Weight
(ft)	(ft)	(ft)		(kip)
0.00	0.00	0.00	1	
15.13	15.32	0.00	1	
30.00	30.00	0.00	1	
<i>Girder Bay 5</i>				
Distance	Distance	Diaphragm	Number of	Diaphragm
Left Girder	Right Girder	Spacing	Spaces	Weight
(ft)	(ft)	(ft)		(kip)
0.00	0.00	0.00	1	
15.32	15.51	0.00	1	
30.00	30.00	0.00	1	
<i>Girder Bay 6</i>				
Distance	Distance	Diaphragm	Number of	Diaphragm
Left Girder	Right Girder	Spacing	Spaces	Weight
(ft)	(ft)	(ft)		(kip)
0.00	0.00	0.00	1	
15.51	15.70	0.00	1	
30.00	30.00	0.00	1	

Structure Typical Section

Deck

Left start width:	28.19 (ft)
Left end width:	28.19 (ft)
Right start width:	28.19 (ft)
Right end width:	28.19 (ft)
Left start overhang:	2.96 (ft)
Left end overhang:	2.96 (ft)

Deck (Cont'd)

Deck concrete:	Unknown strength concrete prior to 1959
Total deck thickness:	8.0000 (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
4-Rail Br...	DC2		Right E...	1.00	1.00	Left

Sidewalk

Width	Thickness At End	Material	Load Case	Measure to	Measured From	At Start
22.0000	10.2000	Unknown...	DC2		Right E...	-0.08 ...

Lane Position

Offset Left Start:	-28.19 (ft)
Offset Left End:	-28.19 (ft)
Offset Right Start:	26.44 (ft)

Offset Right End: 26.44 *(ft)*
Wearing Surface
Wearing surface material: Asphalt
Description:
Wearing surface thickness: 2.6600 *(in)*
Wearing surface density: 150.000 *(pcf)*
Load case: DW

Load Case Description

Load Case Name	Description	Stage	Type	Time <i>(Days)</i>
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
Sidewalk Keyway	Weight of additional ...	Non-composite (Sta...		D,DC

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: dia. conn. (single)
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: dia. conn. (pair)

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 G8

Link with: None

Description:

Existing: G-8 - Additional self load is for the diaphragms.

Current: G-8 - Additional self load is for the diaphragms.

Number of Spans: 1

Span Number	Span Length (ft)
1	30.250000

Support	Frame Connection
1	
2	

Pedestrian load: (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-8

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: 5.0000 (in)
Right end X: 5.0000 (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: BrR Dist Fact
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	Shear	Shear at Supports	Moment	Deflection
Loaded				
1 Lane	1.755	1.755	1.755	0.286
Multi-Lane	1.809	1.809	1.809	0.857

Girder Profile

Shape

Shape:	W 30x108
Distance:	0.00 (ft)
Length:	30.25 (ft)
Material:	ASTM A7

Deck Profile

Haunch Profile

Haunch Type:	Flange edges
Embedded flange:	TRUE

Distance	Length	Z1	Z2	Z3	Z4	Y1	Y2
(ft)	(ft)	(in)	(in)	(in)	(in)	(in)	(in)

0.00	30.25	30.2600	30.2600	0.0000	0.0000
------	-------	---------	---------	--------	--------

Bracing Ranges

Lateral Support

Distance	Length
(ft)	(ft)
0.00	30.25

Stiffener Ranges

Transverse Stiffener Ranges (Location)

Name	Distance (ft)	Number	Spacing (in)
dia. conn. (single...	0.00	1	0.0000
dia. conn. (single...	14.56	1	0.0000
dia. conn. (single...	30.00	1	0.0000

Bearing Stiffener Locations

Points of Interest

Distance from left most support: 30.15 (ft)
Side: Right

Transverse Stiffeners

Override Schedule: FALSE
Stiffener spacing: (in)
Stiffener width: (in)
Stiffener thickness: (in)
Material: ASTM A7
Stiffener number: Single
Stiffener type: Plate

Other Stiffeners

Bearing Stiffener

Override Schedule: FALSE
Stiffener width: (in)
Stiffener thickness: (in)
Material: ASTM A7
Clip: (in)
Number of pairs:
Pair spacing: (in)
Attachment Type: Welds

Longitudinal Stiffener

Override Schedule: FALSE
Stiffener width: (in)
Stiffener thickness: (in)
Material: ASTM A7
Distance from flange to stiffener: (in)
Distance measured from: Top Flange

Fatigue

Number of cycles: 0

Bracing

Deck provides lateral support: FALSE
 Override diaphragm schedule: FALSE
 Distance to left diaphragm: (ft)
 Distance to right diaphragm: (ft)
 Diaphragm at this location: FALSE

ASD

Compression flange unsupported length: (ft)
 Tension Field Action Ignore combined shear and bending

Riveted Section

Net moment of inertia: (in⁴)
 Distance to centroid: (in)
 Net area of web: (in²)
 Top plate allowable shear: (ksi)
 Bottom plate allowable shear: (ksi)
 Percent area top flange: (%)
 Percent area bottom flange: (%)

Web Deterioration

Thickness	Start	Length
Loss	Distance	
(%)	(ft)	(ft)
5.0	29.75	0.50

Member G9

Link with: None

Description:

Existing: G-9 - Additional self load is for the diaphragms.

Current: G-9 - Additional self load is for the diaphragms.

Number of Spans: 1

Span	Span Length
Number	(ft)
1	30.250000

Support	Frame Connection
1	
2	

Pedestrian load: 0.000 (lb/ft)

Member Loads

Member Loads - Settlement

Support	Horizontal	Vertical	Rotational	Load Case Name
Number	(in)	(in)	(Radians)	
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-9

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: 5.0000 (in)
Right end X: 5.0000 (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: BrR Dist Fact
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	Shear	Shear at Supports	Moment	Deflection
Loaded				
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 30x116
--------	----------

Distance:	0.00 (ft)
-----------	-----------

Length:	30.25 (ft)
---------	------------

Material:	ASTM A7
-----------	---------

Deck Profile

Bracing Ranges

Lateral Support

Distance	Length
(ft)	(ft)
0.00	30.25

Stiffener Ranges

Transverse Stiffener Ranges (Location)

Name	Distance	Number	Spacing
	(ft)		(in)
dia. conn. (pair)	0.00	1	0.0000
dia. conn. (pair)	14.75	1	0.0000
dia. conn. (pair)	30.00	1	0.0000

Bearing Stiffener Locations

Points of Interest

Distance from left most support: 30.15 (ft)

Side: Right

Transverse Stiffeners

Override Schedule: FALSE

Stiffener spacing: (in)

Stiffener width: (in)

Stiffener thickness: (in)

Material: ASTM A7

Stiffener number: Single

Stiffener type: Plate

Other Stiffeners

Bearing Stiffener

Override Schedule: FALSE

Stiffener width: (in)

Stiffener thickness: (in)

Material: ASTM A7

Clip: (in)

Number of pairs:

Pair spacing: (in)

Attachment Type: Welds

Longitudinal Stiffener

Override Schedule: FALSE

Stiffener width: (in)

Stiffener thickness: (in)

Material: ASTM A7

Distance from flange to stiffener: (in)

Distance measured from: Top Flange

Fatigue

Number of cycles: 0

Bracing

Deck provides lateral support:

Override diaphragm schedule: FALSE
Distance to left diaphragm: (ft)
Distance to right diaphragm: (ft)
Diaphragm at this location: FALSE

ASD

Compression flange unsupported length: (ft)
Tension Field Action Ignore combined shear and bending

Riveted Section

Net moment of inertia: (in⁴)
Distance to centroid: (in)
Net area of web: (in²)
Top plate allowable shear: (ksi)
Bottom plate allowable shear: (ksi)
Percent area top flange: (%)
Percent area bottom flange: (%)

Web Deterioration

Thickness	Start	Length
Loss	Distance	
(%)	(ft)	(ft)
10.0	26.25	4.00

Member G10

Link with: G9

Description:

Existing:

Current:

Number of Spans: 1

Span	Span Length
Number	(ft)
1	30.250000

Support	Frame Connection
1	
2	

Pedestrian load: (lb/ft)

Member G11

Link with: G9

Description:

Existing:

Current:

Number of Spans: 1

Span	Span Length
------	-------------

Number *(ft)*
1 30.250000

Support Frame Connection
1
2

Pedestrian load: *(lb/ft)*

Member G12

Link with: G9

Description:

Existing:

Current:

Number of Spans: 1

Span Span Length
Number *(ft)*
1 30.250000

Support Frame Connection
1
2

Pedestrian load: *(lb/ft)*

Member G13

Link with: G9

Description:

Existing:

Current:

Number of Spans: 1

Span Span Length
Number *(ft)*
1 30.250000

Support Frame Connection
1
2

Pedestrian load: *(lb/ft)*

Member G14

Link with: None

Description:

Existing: G-14 - Additional self load is for the diaphragms.

Section loss: Use 2013 inspection reading "C" (0.532") for 3.25" height, reading "F" (0.554") for 3.5" height, reading "I" (0.571") for remaining web height. Weighted average is 9.5%, say 10%.

Current: G-14 - Additional self load is for the diaphragms.

Section loss: Use 2013 inspection reading "C" (0.532") for 3.25" height, reading "F" (0.554") for 3.5" height, reading "I" (0.571") for remaining web height. Weighted average is 9.5%, say 10%.

Number of Spans: 1

Span Number	Span Length (ft)
1	30.250000

Support Number	Frame Connection
1	
2	

Pedestrian load: (lb/ft)

Member Loads

Distributed Loads

Distance (ft)	Length (ft)	Start (kip/ft)	End (kip/ft)	Load Case Name
0.00	30.25	0.062	0.062	Sidewalk K...

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-14

Description: Additional self load is for the diaphragms.

Section loss: Use 2013 inspection reading "C" (0.532") for 3.25" height, reading "F" (0.554")

for 3.5" height, reading "I" (0.571") for remaining web height. Weighted average is 9.5%, say 10%.

Description

Material Type: Steel
Girder Type: Rolled
Member units: US Customary
Girder property input method: Schedule based
Left end X: 5.0000 (in)
Right end X: 5.0000 (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: BrR Dist Fact
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	Shear	Shear at Supports	Moment	Deflection
Loaded				
1 Lane	1.388	0.980	1.388	0.286
Multi-Lane	1.388	0.980	1.388	0.857

Girder Profile

Shape

Shape: W 36x150

Distance: 0.00 (ft)

Length: 30.25 (ft)

Material: ASTM A7

Deck Profile

Haunch Profile

Haunch Type: Flange edges

Embedded flange: TRUE

Distance (ft)	Length (ft)	Z1 (in)	Z2 (in)	Z3 (in)	Z4 (in)	Y1 (in)	Y2 (in)
0.00	30.25			23.0100	23.0100	0.0000	0.0000

Bracing Ranges

Lateral Support

Distance (ft)	Length (ft)
0.00	30.25

Stiffener Ranges

Transverse Stiffener Ranges (Location)

Name	Distance (ft)	Number	Spacing (in)
dia. conn. (single...	0.25	1	0.0000
dia. conn. (single...	15.70	1	0.0000
dia. conn. (single...	30.00	1	0.0000

Bearing Stiffener Locations

Points of Interest

Distance from left most support: 30.15 (ft)

Side: Right

Transverse Stiffeners

Override Schedule: FALSE

Stiffener spacing: (in)

Stiffener width: (in)

Stiffener thickness: (in)

Material: ASTM A7

Stiffener number: Single

Stiffener type: Plate

Other Stiffeners

Bearing Stiffener

Override Schedule: FALSE

Stiffener width: (in)

Stiffener thickness: (in)

Material: ASTM A7

Clip: (in)

Number of pairs:

Pair spacing: (in)

Attachment Type: Welds

Longitudinal Stiffener

Override Schedule: FALSE

Stiffener width: (in)

Stiffener thickness: (in)

Material: ASTM A7

Distance from flange to stiffener: (in)

Distance measured from: Top Flange

Fatigue

Number of cycles: 0

Bracing

Deck provides lateral support:

Override diaphragm schedule: FALSE

Distance to left diaphragm: (ft)

Distance to right diaphragm: (ft)

Diaphragm at this location: TRUE

ASD

Compression flange unsupported length: (ft)

Tension Field Action

Ignore combined shear and bending

Riveted Section

Net moment of inertia: (in⁴)

Distance to centroid: (in)

Net area of web: (in²)

Top plate allowable shear: (ksi)

Bottom plate allowable shear: (ksi)

Percent area top flange: (%)

Percent area bottom flange: (%)

Web Deterioration

Thickness Loss (%)	Start Distance (ft)	Length (ft)
10.0	26.25	4.00

Superstructure Definition Westbound - Span 2

Definition

Units: US Customary

Number of spans: 1

Number of girders: 7

Length

Span (ft)

1 85.5000

Frame Structure Simplified Definition:

Support Frame Connection

1

2

Girder Spacing Display Type: Perpendicular

Average Humidity: 90.000 (%)

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	1.3000
2	1.3000

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)
0.25	0.25	0.00	1	
20.81	21.00	0.00	1	
20.81	21.00	21.38	2	
85.25	85.25	0.00	1	

Girder Bay 2

Distance Left Girder (ft)	Distance Right Girder (ft)	Diaphragm Spacing (ft)	Number of Spaces	Diaphragm Weight (kip)
---------------------------------	----------------------------------	------------------------------	---------------------	------------------------------

0.25	0.25	0.00	1
21.00	21.19	0.00	1
21.00	21.19	21.38	2
85.25	85.25	0.00	1

Girder Bay 3

Distance Left Girder (ft)	Distance Right Girder (ft)	Diaphragm Spacing (ft)	Number of Spaces	Diaphragm Weight (kip)
0.25	0.25	0.00	1	
21.19	21.38	21.38	2	
21.19	21.38	0.00	1	
85.25	85.25	0.00	1	

Girder Bay 4

Distance Left Girder (ft)	Distance Right Girder (ft)	Diaphragm Spacing (ft)	Number of Spaces	Diaphragm Weight (kip)
0.25	0.25	0.00	1	
21.38	21.57	0.00	1	
21.38	21.57	21.38	2	
85.25	85.25	0.00	1	

Girder Bay 5

Distance Left Girder (ft)	Distance Right Girder (ft)	Diaphragm Spacing (ft)	Number of Spaces	Diaphragm Weight (kip)
0.25	0.25	0.00	1	
21.57	21.76	0.00	1	
21.57	21.76	21.38	2	
85.25	85.25	0.00	1	

Girder Bay 6

Distance Left Girder (ft)	Distance Right Girder (ft)	Diaphragm Spacing (ft)	Number of Spaces	Diaphragm Weight (kip)
0.25	0.25	0.00	1	
21.76	21.95	0.00	1	
21.76	21.95	21.38	2	
85.25	85.25	0.00	1	

Structure Typical Section

Deck

Left start width:	28.19 (ft)
Left end width:	28.19 (ft)
Right start width:	28.19 (ft)
Right end width:	28.19 (ft)
Left start overhang:	2.96 (ft)
Left end overhang:	2.96 (ft)

Deck (Cont'd)

Deck concrete:	Unknown strength concrete prior to 1959
Total deck thickness:	8.0000 (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
4-Rail w/...	DC2		Right E...	1.00	1.00	Left

Sidewalk

Width	Thickness At End	Material	Load Case	Measure to	Measured From	At Start
22.0000	10.2000	Unknown...	DC2		Right E...	-0.08 ...

Lane Position

Offset Left Start:	-28.19 (ft)
Offset Left End:	-28.19 (ft)
Offset Right Start:	26.44 (ft)
Offset Right End:	26.44 (ft)

Wearing Surface

Wearing surface material:	Asphalt
Description:	
Wearing surface thickness:	2.6600 (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
Sidewalk Keyway	Weight of additional ...	Non-composite (Sta...		D,DC

Superstructure Loads

DL Distribution

Stage 1 Dead Load Distribution: Tributary Area

Stage 2 Dead Load Distribution: Uniformly to All Girders

Stiffener Definitions

Transverse Stiffeners

Name:	dia. conn. (single)
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:	dia. conn. (pair)
-------	-------------------

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 G8

Link with: None

Description:

Existing: G-8 - Additional self load is for the diaphragms.

Current: G-8 - Additional self load is for the diaphragms.

Number of Spans: 1

Span Number	Span Length (ft)
1	85.500000

Support	Frame Connection
1	
2	

Pedestrian load: (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-8

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: 5.0000 (in)
 Right end X: 5.0000 (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: BrR Dist Fact
 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	Shear	Shear at Supports	Moment	Deflection
Loaded				
1 Lane	1.755	1.755	1.755	0.286
Multi-Lane	1.809	1.809	1.809	0.857

Girder Profile

Shape

Shape: W 36x230

Distance: 0.00 (ft)

Length: 85.50 (ft)

Material: ASTM A7

Flange Cover Plates

Plate	Begin	End	Thickness	Distance	Length	Material
	Width (in)	Width (in)				

1 (Bot... 18.000... 18.000... 1.0000 10.75 64.00 ASTM A7

Deck Profile

Deck Concrete

Material (LRFD)	Distance n	Length	Total Thickness	Structural Thickness	Effective Width (Std)	Effective Width
	(ft)	(ft)	(in)	(in)	(in)	(in)
Unknown stren...	0.00	85.50		7.5000	80.4996	86.4996
	10.1...					

Shear Connectors

Start Distance	Length	Connector Name	Number per Row	Number of Spaces	Transverse Spacing
(ft)	(ft)				(in)
0.00	85.50	Composite			

Haunch Profile

Haunch Type:	Flange edges						
Embedded flange:	TRUE						
Distance	Length	Z1	Z2	Z3	Z4	Y1	Y2
(ft)	(ft)	(in)	(in)	(in)	(in)	(in)	(in)
0.00	85.50			27.2600	27.2600	0.0000	0.0000

Bracing Ranges

Lateral Support

Distance	Length
(ft)	(ft)
0.00	85.50

Stiffener Ranges

Transverse Stiffener Ranges (Location)

Name	Distance	Number	Spacing
	(ft)		(in)
dia. conn. (single...	0.25	1	0.0000
dia. conn. (single...	20.81	2	256.5000
dia. conn. (single...	20.81	1	0.0000
dia. conn. (single...	85.25	1	0.0000

Bearing Stiffener Locations

Points of Interest

Distance from left most support: 0.10 (ft)

Side: Right

Transverse Stiffeners

Override Schedule: FALSE

Stiffener spacing: (in)

Stiffener width: (in)

Stiffener thickness: (in)

Material:	ASTM A7
Stiffener number:	Single
Stiffener type:	Plate
<u>Other Stiffeners</u>	
<i>Bearing Stiffener</i>	
Override Schedule:	FALSE
Stiffener width:	(in)
Stiffener thickness:	(in)
Material:	ASTM A7
Clip:	(in)
Number of pairs:	
Pair spacing:	(in)
Attachment Type:	Welds
<i>Longitudinal Stiffener</i>	
Override Schedule:	FALSE
Stiffener width:	(in)
Stiffener thickness:	(in)
Material:	ASTM A7
Distance from flange to stiffener:	(in)
Distance measured from:	Top Flange
<u>Fatigue</u>	
Number of cycles:	0
<u>Bracing</u>	
Deck provides lateral support:	
Override diaphragm schedule:	FALSE
Distance to left diaphragm:	(ft)
Distance to right diaphragm:	(ft)
Diaphragm at this location:	FALSE
<u>ASD</u>	
Compression flange unsupported length:	(ft)
Tension Field Action	Ignore combined shear and bending
<i>Riveted Section</i>	
Net moment of inertia:	(in ⁴)
Distance to centroid:	(in)
Net area of web:	(in ²)
Top plate allowable shear:	(ksi)
Bottom plate allowable shear:	(ksi)
Percent area top flange:	(%)
Percent area bottom flange:	(%)
Distance from left most support:	85.40 (ft)
Side:	Right
<u>Transverse Stiffeners</u>	
Override Schedule:	FALSE
Stiffener spacing:	(in)
Stiffener width:	(in)
Stiffener thickness:	(in)
Material:	ASTM A7
Stiffener number:	Single
Stiffener type:	Plate

Other Stiffeners

Bearing Stiffener

Override Schedule: FALSE
Stiffener width: (in)
Stiffener thickness: (in)
Material: ASTM A7
Clip: (in)
Number of pairs:
Pair spacing: (in)
Attachment Type: Welds

Longitudinal Stiffener

Override Schedule: FALSE
Stiffener width: (in)
Stiffener thickness: (in)
Material: ASTM A7
Distance from flange to stiffener: (in)
Distance measured from: Top Flange

Fatigue

Number of cycles: 0

Bracing

Deck provides lateral support:
Override diaphragm schedule: FALSE
Distance to left diaphragm: (ft)
Distance to right diaphragm: (ft)
Diaphragm at this location: FALSE

ASD

Compression flange unsupported length: (ft)
Tension Field Action Ignore combined shear and bending

Riveted Section

Net moment of inertia: (in⁴)
Distance to centroid: (in)
Net area of web: (in²)
Top plate allowable shear: (ksi)
Bottom plate allowable shear: (ksi)
Percent area top flange: (%)
Percent area bottom flange: (%)

Web Deterioration

Thickness	Start	Length
Loss	Distance	
(%)	(ft)	(ft)
10.0	0.00	0.50
10.0	85.00	0.50

Member G9

Link with: None

Description:

Existing: G-9 - Additional self load is for the diaphragms.

Deck Spalling 2015:

The Span 2 Deck is severely spalled. The worst spalling is in bays 10 and 11 and is 4" deep for the entire effective width. The revised composite deck thickness is $7.5" - 4" = 3.5"$.

Current: G-9 - Additional self load is for the diaphragms.

Deck Spalling 2015:

The Span 2 Deck is severely spalled. The worst spalling is in bays 10 and 11 and is 4" deep for the entire effective width. The revised composite deck thickness is $7.5" - 4" = 3.5"$.

Number of Spans: 1

Span Number	Span Length (ft)
1	85.500000

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-9

Description: Additional self load is for the diaphragms.

Deck Spalling 2015:

The Span 2 Deck is severely spalled. The worst spalling is in bays 10 and 11 and is 4" deep for the entire effective width. The revised composite deck thickness is $7.5" - 4" = 3.5"$.

Description

Material Type: Steel

Girder Type: Rolled
 Member units: US Customary
 Girder property input method: Schedule based
 Left end X: 5.0000 (in)
 Right end X: 5.0000 (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: BrR Dist Fact
 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	Shear	Shear at	Moment	Deflection
Loaded	Shear	Supports		
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 36x300

Distance: 0.00 (ft)

Length: 85.50 (ft)

Material: ASTM A7

Flange Cover Plates

	Begin	End					
Plate	Width	Width	Thickness	Distance	Length	Material	
	(in)	(in)	(in)	(ft)	(ft)		
1 (Bot...		18.000...	18.000...	1.2500	13.75	58.00	ASTM A7

Deck Profile

Deck Concrete

Material	Distance	Length	Total	Structural	Effective	Effective
(LRFD)	n		Thickness	Thickness	Width (Std)	Width
	(ft)	(ft)	(in)	(in)	(in)	(in)
Unknown stren...	0.00	85.50		3.5000	42.0000	102.0000
	10.1...					

Shear Connectors

Start		Connector	Number	Number of	Transverse
Distance	Length	Name	per Row	Spaces	Spacing

(ft)	(ft)		(in)
0.00	85.50	Composite	

Bracing Ranges

Lateral Support

Distance	Length
----------	--------

(ft)	(ft)
0.00	85.50

Stiffener Ranges

Transverse Stiffener Ranges (Location)

Name	Distance (ft)	Number	Spacing (in)
dia. conn. (pair)	0.25	1	0.0000
dia. conn. (pair)	21.00	2	256.5000
dia. conn. (pair)	21.00	1	0.0000
dia. conn. (pair)	85.25	1	0.0000

Bearing Stiffener Locations

Points of Interest

Distance from left most support: 0.10 (ft)

Side: Right

Transverse Stiffeners

Override Schedule:	FALSE
Stiffener spacing:	(in)
Stiffener width:	(in)
Stiffener thickness:	(in)
Material:	ASTM A7
Stiffener number:	Single
Stiffener type:	Plate

Other Stiffeners

Bearing Stiffener

Override Schedule:	FALSE
Stiffener width:	(in)
Stiffener thickness:	(in)
Material:	ASTM A7
Clip:	(in)
Number of pairs:	
Pair spacing:	(in)
Attachment Type:	Welds

Longitudinal Stiffener

Override Schedule:	FALSE
Stiffener width:	(in)
Stiffener thickness:	(in)
Material:	ASTM A7
Distance from flange to stiffener:	(in)
Distance measured from:	Top Flange

Fatigue

Number of cycles:	0
<u>Bracing</u>	
Deck provides lateral support:	
Override diaphragm schedule:	FALSE
Distance to left diaphragm:	(ft)
Distance to right diaphragm:	(ft)
Diaphragm at this location:	FALSE
<u>ASD</u>	
Compression flange unsupported length:	(ft)
Tension Field Action	Ignore combined shear and bending
<i>Riveted Section</i>	
Net moment of inertia:	(in ⁴)
Distance to centroid:	(in)
Net area of web:	(in ²)
Top plate allowable shear:	(ksi)
Bottom plate allowable shear:	(ksi)
Percent area top flange:	(%)
Percent area bottom flange:	(%)
Distance from left most support:	85.40 (ft)
Side:	Right
<u>Transverse Stiffeners</u>	
Override Schedule:	FALSE
Stiffener spacing:	(in)
Stiffener width:	(in)
Stiffener thickness:	(in)
Material:	ASTM A7
Stiffener number:	Single
Stiffener type:	Plate
<u>Other Stiffeners</u>	
<i>Bearing Stiffener</i>	
Override Schedule:	FALSE
Stiffener width:	(in)
Stiffener thickness:	(in)
Material:	ASTM A7
Clip:	(in)
Number of pairs:	
Pair spacing:	(in)
Attachment Type:	Welds
<i>Longitudinal Stiffener</i>	
Override Schedule:	FALSE
Stiffener width:	(in)
Stiffener thickness:	(in)
Material:	ASTM A7
Distance from flange to stiffener:	(in)
Distance measured from:	Top Flange
<u>Fatigue</u>	
Number of cycles:	0
<u>Bracing</u>	
Deck provides lateral support:	

Override diaphragm schedule: FALSE
 Distance to left diaphragm: (ft)
 Distance to right diaphragm: (ft)
 Diaphragm at this location: FALSE

ASD

Compression flange unsupported length: (ft)
 Tension Field Action Ignore combined shear and bending

Riveted Section

Net moment of inertia: (in⁴)
 Distance to centroid: (in)
 Net area of web: (in²)
 Top plate allowable shear: (ksi)
 Bottom plate allowable shear: (ksi)
 Percent area top flange: (%)
 Percent area bottom flange: (%)

Web Deterioration

Thickness	Start	Length
Loss	Distance	
(%)	(ft)	(ft)
10.0	0.00	0.50
10.0	85.00	0.50

Member G10

Link with: G9

Description:

Existing:

Current:

Number of Spans: 1

Span	Span Length
Number	(ft)
1	85.500000

Support	Frame Connection
1	
2	

Pedestrian load: (lb/ft)

Member G11

Link with: G9

Description:

Existing:

Current:

Number of Spans: 1

Span Number	Span Length (ft)
1	85.500000

Support	Frame Connection
1	
2	

Pedestrian load: (lb/ft)

Member G12

Link with: G9

Description:

Existing:

Current:

Number of Spans: 1

Span Number	Span Length (ft)
1	85.500000

Support	Frame Connection
1	
2	

Pedestrian load: (lb/ft)

Member G13

Link with: G9

Description:

Existing:

Current:

Number of Spans: 1

Span Number	Span Length (ft)
1	85.500000

Support	Frame Connection
1	
2	

Pedestrian load: (lb/ft)

Member G14

Link with: None

Description:

Existing: G-14 - Additional self load is for the diaphragms.

Deck Spalling 2015:

The Span 2 Deck is severely spalled, say 4" deep for the effective width. The revised composite deck thickness is $7.5" - 4" = 3.5"$.

Current: G-14 - Additional self load is for the diaphragms.

Deck Spalling 2015:

The Span 2 Deck is severely spalled, say 4" deep for the effective width. The revised composite deck thickness is $7.5" - 4" = 3.5"$.

Number of Spans: 1

Span Number	Span Length (ft)
1	85.500000

Support	Frame Connection
1	
2	

Pedestrian load: (lb/ft)

Member Loads

Distributed Loads

Distance (ft)	Length (ft)	Start (kip/ft)	End (kip/ft)	Load Case Name
0.00	85.50	0.062	0.062	Sidewalk K...

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-14

Description: Additional self load is for the diaphragms.

Deck Spalling 2015:

The Span 2 Deck is severely spalled, say 4" deep for the effective width. The revised composite deck thickness is $7.5" - 4" = 3.5"$.

Description

Material Type: Steel
Girder Type: Rolled
Member units: US Customary
Girder property input method: Schedule based
Left end X: 5.0000 (in)
Right end X: 5.0000 (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: BrR Dist Fact
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	Shear	Shear at Supports	Moment	Deflection
Loaded				
1 Lane	1.388	0.980	1.388	0.286
Multi-Lane	1.388	0.980	1.388	0.857

Girder Profile

Shape

Shape: W 36x230

Distance: 0.00 (ft)

Length: 85.50 (ft)

Material: ASTM A7

Flange Cover Plates

	Begin	End					
Plate	Width (in)	Width (in)	Thickness (in)	Distance (ft)	Length (ft)	Material	
1 (Bot...		18.000...	18.000...	1.0000	10.75	64.00	ASTM A7

Deck Profile

Deck Concrete

Material (LRFD)	Distance n (ft)	Length (ft)	Total Thickness (in)	Structural Thickness (in)	Effective Width (Std) (in)	Effective Width (in)
Unknown stren...	0.00	85.50		3.5000	42.0000	80.0004
	10.1...					

Shear Connectors

Start Distance (ft)	Length (ft)	Connector Name	Number per Row	Number of Spaces	Transverse Spacing (in)
0.00	85.50	Composite			

Haunch Profile

Haunch Type:		Flange edges					
Embedded flange:		TRUE					
Distance	Length	Z1	Z2	Z3	Z4	Y1	Y2
<i>(ft)</i>	<i>(ft)</i>	<i>(in)</i>	<i>(in)</i>	<i>(in)</i>	<i>(in)</i>	<i>(in)</i>	<i>(in)</i>
0.00	85.50			20.7600	20.7600	0.0000	0.0000

Bracing Ranges

Lateral Support

Distance (ft)	Length (ft)
0.00	85.50

Stiffener Ranges

Transverse Stiffener Ranges (Location)

Name	Distance (ft)	Number	Spacing (in)
dia. conn. (single...	0.25	1	0.0000
dia. conn. (single...	21.95	2	256.5000
dia. conn. (single...	21.95	1	0.0000
dia. conn. (single...	85.25	1	0.0000

Bearing Stiffener Locations

Points of Interest

Distance from left most support: 0.10 (ft)
Side: Right

Transverse Stiffeners

Override Schedule: FALSE
Stiffener spacing: (in)
Stiffener width: (in)
Stiffener thickness: (in)
Material: ASTM A7
Stiffener number: Single
Stiffener type: Plate

Other Stiffeners

Bearing Stiffener

Override Schedule: FALSE
Stiffener width: (in)
Stiffener thickness: (in)
Material: ASTM A7
Clip: (in)
Number of pairs:
Pair spacing: (in)
Attachment Type: Welds

Longitudinal Stiffener

Override Schedule: FALSE
Stiffener width: (in)
Stiffener thickness: (in)
Material: ASTM A7
Distance from flange to stiffener: (in)
Distance measured from: Top Flange

Fatigue

Number of cycles: 0

Bracing

Deck provides lateral support:
Override diaphragm schedule: FALSE
Distance to left diaphragm: (ft)
Distance to right diaphragm: (ft)
Diaphragm at this location: FALSE

ASD

Compression flange unsupported length: (ft)
Tension Field Action Ignore combined shear and bending

Riveted Section

Net moment of inertia: (in⁴)
Distance to centroid: (in)
Net area of web: (in²)
Top plate allowable shear: (ksi)
Bottom plate allowable shear: (ksi)
Percent area top flange: (%)
Percent area bottom flange: (%)

Distance from left most support: 85.40 (ft)
Side: Right

Transverse Stiffeners

Override Schedule: FALSE
Stiffener spacing: (in)
Stiffener width: (in)
Stiffener thickness: (in)
Material: ASTM A7
Stiffener number: Single
Stiffener type: Plate

Other Stiffeners

Bearing Stiffener

Override Schedule: FALSE
Stiffener width: (in)

Stiffener thickness: (in)
 Material: ASTM A7
 Clip: (in)
 Number of pairs:
 Pair spacing: (in)
 Attachment Type: Welds
Longitudinal Stiffener
 Override Schedule: FALSE
 Stiffener width: (in)
 Stiffener thickness: (in)
 Material: ASTM A7
 Distance from flange to stiffener: (in)
 Distance measured from: Top Flange
Fatigue
 Number of cycles: 0
Bracing
 Deck provides lateral support:
 Override diaphragm schedule: FALSE
 Distance to left diaphragm: (ft)
 Distance to right diaphragm: (ft)
 Diaphragm at this location: FALSE
ASD
 Compression flange unsupported length: (ft)
 Tension Field Action Ignore combined shear and bending
Riveted Section
 Net moment of inertia: (in⁴)
 Distance to centroid: (in)
 Net area of web: (in²)
 Top plate allowable shear: (ksi)
 Bottom plate allowable shear: (ksi)
 Percent area top flange: (%)
 Percent area bottom flange: (%)

Web Deterioration

Thickness	Start	Length
Loss	Distance	
(%)	(ft)	(ft)
10.0	0.00	0.50
10.0	85.00	0.50

Superstructure Definition Westbound - Span 3

Definition

Units: US Customary
 Number of spans: 1
 Number of girders: 7
 Length

Span (ft)
 1 33.0000

Frame Structure Simplified Definition:

Support Frame Connection

1

2

Girder Spacing Display Type: Perpendicular

Average Humidity: 90.000 (%)

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

Skew

Support (Degrees)

1

1.3000

2

1.3000

Girder Spacing Orientation: Perpendicular

Girder Bay	Girder Spacing	
	Start	End
	(ft)	(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	Distance	Diaphragm	Number of	Diaphragm
Left Girder	Right Girder	Spacing	Spaces	Weight
(ft)	(ft)	(ft)		(kip)
0.25	0.25	0.00	1	
15.93	16.12	0.00	1	
33.00	33.00	0.00	1	

Girder Bay 2

Distance	Distance	Diaphragm	Number of	Diaphragm
Left Girder	Right Girder	Spacing	Spaces	Weight
(ft)	(ft)	(ft)		(kip)
0.25	0.25	0.00	1	
16.12	16.31	0.00	1	
33.00	33.00	0.00	1	

Girder Bay 3

Distance	Distance	Diaphragm	Number of	Diaphragm
Left Girder	Right Girder	Spacing	Spaces	Weight
(ft)	(ft)	(ft)		(kip)
0.25	0.25	0.00	1	
16.31	16.50	0.00	1	
33.00	33.00	0.00	1	

Girder Bay 4

Distance	Distance	Diaphragm	Number of	Diaphragm
Left Girder	Right Girder	Spacing	Spaces	Weight
(ft)	(ft)	(ft)		(kip)
0.25	0.25	0.00	1	
16.50	16.69	0.00	1	
33.00	33.00	0.00	1	

Girder Bay 5

Distance	Distance	Diaphragm	Number of	Diaphragm
Left Girder	Right Girder	Spacing	Spaces	Weight
(ft)	(ft)	(ft)		(kip)
0.25	0.25	0.00	1	
16.69	16.88	0.00	1	
33.00	33.00	0.00	1	

Girder Bay 6

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

0.25	0.25	0.00	1
16.88	17.07	0.00	1
33.00	33.00	0.00	1

Structure Typical Section

Deck

Left start width:	28.19 (ft)
Left end width:	28.19 (ft)
Right start width:	28.19 (ft)
Right end width:	28.19 (ft)
Left start overhang:	2.96 (ft)
Left end overhang:	2.96 (ft)

Deck (Cont'd)

Deck concrete:	Unknown strength concrete prior to 1959
Total deck thickness:	8.0000 (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
4-Rail Br...	DC2		Right E...	1.00	1.00	Left

Sidewalk

Width	Thickness At End	Material	Load Case	Measure to	Measured From	At Start
22.0000	10.2000	Unknown...	DC2		Right E...	-0.08 ...

Lane Position

Offset Left Start:	-28.19 (ft)
Offset Left End:	-28.19 (ft)
Offset Right Start:	26.44 (ft)
Offset Right End:	26.44 (ft)

Wearing Surface

Wearing surface material:	Asphalt
Description:	
Wearing surface thickness:	2.6600 (in)
Wearing surface density:	150.000 (pcf)
Load case:	DW

Load Case Description

Load Case Name	Description	Stage	Type (Days)	Time
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
Sidewalk Keyway	Weight of additional ...	Non-composite (Sta...		D,DC

Superstructure Loads

Uniform Temperature

Load Case:

Temperature rise:	(F)
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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: dia. conn. (single)
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: dia. conn. (pair)
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:

Name: G14 Repair Stiffener
Stiffener number: Single
Plate Width: 4.0000 (in)
Plate Thickness: 0.5000 (in)
Material: ASTM A36
Top Gap: (in)
Bottom Gap: (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 G8

Link with: None

Description:

Existing: G-8 - Additional self load is for the diaphragms.

Current: G-8 - Additional self load is for the diaphragms.

Number of Spans: 1

Span Number	Span Length (ft)
1	33.000000

Support	Frame Connection
1	
2	

Pedestrian load: (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	Roller	Free	Fixed	Free
2	Pinned	Fixed	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-8

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: 5.0000 (in)
Right end X: 5.0000 (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: BrR Dist Fact
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	Shear	Shear at Supports	Moment	Deflection
Loaded				
1 Lane	1.755	1.755	1.755	0.286
Multi-Lane	1.809	1.809	1.809	0.857

Girder Profile

Shape

Shape: W 30x108

Distance: 0.00 (ft)

Length: 33.00 (ft)

Material: ASTM A7

Deck Profile

Haunch Profile

Haunch Type: Flange edges

Embedded flange: TRUE

Distance	Length	Z1	Z2	Z3	Z4	Y1	Y2
(ft)	(ft)	(in)	(in)	(in)	(in)	(in)	(in)
0.00	33.00			30.2600	30.2600	0.0000	0.0000

Bracing Ranges

Lateral Support

Distance Length

(ft) (ft)
0.00 33.00

Stiffener Ranges

Transverse Stiffener Ranges (Location)

Name	Distance (ft)	Number	Spacing (in)
dia. conn. (single...	0.25	1	0.0000
dia. conn. (single...	15.93	1	0.0000
dia. conn. (single...	33.00	1	0.0000

Bearing Stiffener Locations

Points of Interest

Distance from left most support: 0.10 (ft)
Side: Right

Transverse Stiffeners

Override Schedule: FALSE
Stiffener spacing: (in)
Stiffener width: (in)
Stiffener thickness: (in)
Material: ASTM A7
Stiffener number: Single
Stiffener type: Plate

Other Stiffeners

Bearing Stiffener

Override Schedule: FALSE
Stiffener width: (in)
Stiffener thickness: (in)
Material: ASTM A7
Clip: (in)
Number of pairs:
Pair spacing: (in)
Attachment Type: Welds

Longitudinal Stiffener

Override Schedule: FALSE
Stiffener width: (in)
Stiffener thickness: (in)
Material: ASTM A7
Distance from flange to stiffener: (in)
Distance measured from: Top Flange

Fatigue

Number of cycles: 0

Bracing

Deck provides lateral support:
Override diaphragm schedule: FALSE
Distance to left diaphragm: (ft)
Distance to right diaphragm: (ft)
Diaphragm at this location: FALSE

ASD

Compression flange unsupported length: (ft)

Tension Field Action

Ignore combined shear and bending

Riveted Section

Net moment of inertia: (in⁴)

Distance to centroid: (in)

Net area of web: (in²)

Top plate allowable shear: (ksi)

Bottom plate allowable shear: (ksi)

Percent area top flange: (%)

Percent area bottom flange: (%)

Web Deterioration

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

Member G9

Link with: None

Description:

Existing: G-9 - Additional self load is for the diaphragms.

Current: G-9 - Additional self load is for the diaphragms.

Number of Spans: 1

Span	Span Length
Number	(ft)
1	33.000000

Support	Frame Connection
1	
2	

Pedestrian load: 0.000 (lb/ft)

Member Loads

Member Loads - Settlement

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

Support Constraints

General

Support Support

Number	Type	X Translation	Y Translation	Z Rotation
1	Roller	Free	Fixed	Free
2	Pinned	Fixed	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-9

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: 5.0000 (in)
 Right end X: 5.0000 (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: BrR Dist Fact
 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	Shear	Shear at Supports	Moment	Deflection
Loaded				
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 30x132

Distance: 0.00 (ft)

Length: 33.00 (ft)

Material: ASTM A7

Deck Profile

Bracing Ranges

Lateral Support

Distance	Length
(ft)	(ft)
0.00	33.00

Stiffener Ranges

Transverse Stiffener Ranges (Location)

Name	Distance	Number	Spacing
	(ft)		(in)
dia. conn. (pair)	0.25	1	0.0000
dia. conn. (pair)	16.12	1	0.0000
dia. conn. (pair)	33.00	1	0.0000

Bearing Stiffener Locations

Points of Interest

Distance from left most support: 0.10 (ft)

Side: Right

Transverse Stiffeners

Override Schedule: FALSE

Stiffener spacing: (in)

Stiffener width: (in)

Stiffener thickness: (in)

Material: ASTM A7

Stiffener number: Single

Stiffener type: Plate

Other Stiffeners

Bearing Stiffener

Override Schedule: FALSE

Stiffener width: (in)

Stiffener thickness: (in)

Material: ASTM A7

Clip: (in)

Number of pairs:

Pair spacing: (in)

Attachment Type: Welds

Longitudinal Stiffener

Override Schedule: FALSE

Stiffener width: (in)

Stiffener thickness: (in)

Material: ASTM A7

Distance from flange to stiffener: (in)

Distance measured from: Top Flange

Fatigue

Number of cycles: 0

Bracing

Deck provides lateral support:

Override diaphragm schedule: FALSE

Distance to left diaphragm: (ft)

Distance to right diaphragm: *(ft)*
 Diaphragm at this location: FALSE
ASD
 Compression flange unsupported length: *(ft)*
 Tension Field Action Ignore combined shear and bending
Riveted Section
 Net moment of inertia: *(in^4)*
 Distance to centroid: *(in)*
 Net area of web: *(in^2)*
 Top plate allowable shear: *(ksi)*
 Bottom plate allowable shear: *(ksi)*
 Percent area top flange: *(%)*
 Percent area bottom flange: *(%)*

Web Deterioration

Thickness	Start	Length
Loss	Distance	
<i>(%)</i>	<i>(ft)</i>	<i>(ft)</i>
10.0	0.00	0.50

Member G10

Link with: G9

Description:

Existing:

Current:

Number of Spans: 1

Span	Span Length
Number	<i>(ft)</i>
1	33.000000

Support	Frame Connection
1	
2	

Pedestrian load: *(lb/ft)*

Member G11

Link with: G9

Description:

Existing:

Current:

Number of Spans: 1

Span	Span Length
Number	<i>(ft)</i>
1	33.000000

Support	Frame Connection
1	
2	

Pedestrian load: *(lb/ft)*

Member G12

Link with: G9

Description:

Existing:

Current:

Number of Spans: 1

Span Number	Span Length <i>(ft)</i>
1	33.000000

Support	Frame Connection
1	
2	

Pedestrian load: *(lb/ft)*

Member G13

Link with: G9

Description:

Existing:

Current:

Number of Spans: 1

Span Number	Span Length <i>(ft)</i>
1	33.000000

Support	Frame Connection
1	
2	

Pedestrian load: *(lb/ft)*

Member G14

Link with: None

Description:

Existing: G-14 - Additional self load is for the diaphragms.

Section loss: Use 2013 inspection reading "C" (0.343") for 3.25" height, reading "F" (0.446") for 3.5" height, reading "I" (0.463") for remaining web height. Weighted average is 27.9%, say 30%.

Current: G-14 - Additional self load is for the diaphragms.

Section loss: Use 2013 inspection reading "C" (0.343") for 3.25" height, reading "F" (0.446") for 3.5" height, reading "I" (0.463") for remaining web height. Weighted average is 27.9%, say 30%.

Number of Spans: 1

Span Number	Span Length (ft)
1	33.000000

Support Number	Frame Connection
1	
2	

Pedestrian load: (lb/ft)

Member Loads

Distributed Loads

Distance (ft)	Length (ft)	Start (kip/ft)	End (kip/ft)	Load Case Name
0.00	33.00	0.062	0.062	Sidewalk K...

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	Roller	Free	Fixed	Free
2	Pinned	Fixed	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-14

Description: Additional self load is for the diaphragms.

Section loss: Use 2013 inspection reading "C" (0.343") for 3.25" height, reading "F" (0.446") for 3.5" height, reading "I" (0.463") for remaining web height. Weighted average is 27.9%, say 30%.

Description

Material Type: Steel
Girder Type: Rolled
Member units: US Customary
Girder property input method: Schedule based
Left end X: 5.0000 (in)
Right end X: 5.0000 (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: BrR Dist Fact
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	Shear	Shear at Supports	Moment	Deflection
Loaded				
1 Lane	1.388	0.980	1.388	0.286
Multi-Lane	1.388	0.980	1.388	0.857

Girder Profile

Shape

Shape: W 36x150

Distance: 0.00 (ft)

Length: 33.00 (ft)

Material: ASTM A7

Deck Profile

Haunch Profile

Haunch Type: Flange edges

Embedded flange: TRUE

Distance (ft)	Length (ft)	Z1 (in)	Z2 (in)	Z3 (in)	Z4 (in)	Y1 (in)	Y2 (in)
0.00	33.00			23.0100	23.0100	0.0000	0.0000

Bracing Ranges

Lateral Support

Distance Length

(ft) (ft)

0.00 33.00

Stiffener Ranges

Transverse Stiffener Ranges (Location)

Name	Distance (ft)	Number	Spacing (in)
G14 Repair Stiffen...	0.00	1	0.0000
dia. conn. (single...	0.25	1	0.0000
dia. conn. (single...	17.07	1	0.0000
dia. conn. (single...	33.00	1	0.0000

Bearing Stiffener Locations

Points of Interest

Distance from left most support: 0.10 (ft)

Side: Right

Transverse Stiffeners

Override Schedule: FALSE

Stiffener spacing: (in)

Stiffener width: (in)

Stiffener thickness: (in)

Material: ASTM A7

Stiffener number: Single

Stiffener type: Plate

Other Stiffeners

Bearing Stiffener

Override Schedule: FALSE

Stiffener width: (in)

Stiffener thickness: (in)

Material: ASTM A7

Clip: (in)

Number of pairs:

Pair spacing: (in)

Attachment Type: Welds

Longitudinal Stiffener

Override Schedule: FALSE

Stiffener width: (in)

Stiffener thickness: (in)

Material: ASTM A7

Distance from flange to stiffener: (in)

Distance measured from: Top Flange

Fatigue

Number of cycles: 0

Bracing

Deck provides lateral support:

Override diaphragm schedule: FALSE

Distance to left diaphragm: (ft)

Distance to right diaphragm: (ft)

Diaphragm at this location: TRUE

ASD

Compression flange unsupported length: (ft)

Tension Field Action Ignore combined shear and bending

Riveted Section

Net moment of inertia: *(in⁴)*
Distance to centroid: *(in)*
Net area of web: *(in²)*
Top plate allowable shear: *(ksi)*
Bottom plate allowable shear: *(ksi)*
Percent area top flange: *(%)*
Percent area bottom flange: *(%)*

Web Deterioration

Thickness Loss	Start Distance	Length
<i>(%)</i> 30.0	<i>(ft)</i> 0.00	<i>(ft)</i> 1.00