City of Rockville
Department of Public Works
Parks and Facilities Division

2018 BRIDGE INSPECTION REPORT
October 2, 2018

BRIDGE NO. PB-065

DAWSON FARM PARK PEDESTRIAN BRIDGE

OVER

TRIBUTARY TO CABIN JOHN CREEK

Prepared by

EBA ENGINEERING

CITY OF ROCKVILLE
Department of Public Works
Parks and Facilities Division

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DAWSON FARM PARK

OVER

TRIBUTARY TO CABIN JOHN CREEK

Prepared by

EBA ENGINEERING

Jennifer Callaghan

Inspection Team Leader: Jennifer Callaghan, P.E. — 11/16/18 Date

Cara Johnson

Quality Assurance: Cara I. Johnson, P.E. — 11/29/18 Date

STATE OF MARYLAND
JEFFERY M R EVANS
No. 29902
PROFESSIONAL ENGINEER

11-30-18

Professional Engineer: Jeffery M.R. Evans, P.E. — Date

Professional Certification - I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland, License No. 29902, Expiration Date: January 8, 2020.

CITY OF ROCKVILLE
Department of Public Works
Parks and Facilities Division
2018 BRIDGE INSPECTION REPORT

BRIDGE NO. PB-065

DAWSON FARM PARK OVER TRIBUTARY TO CABIN JOHN CREEK

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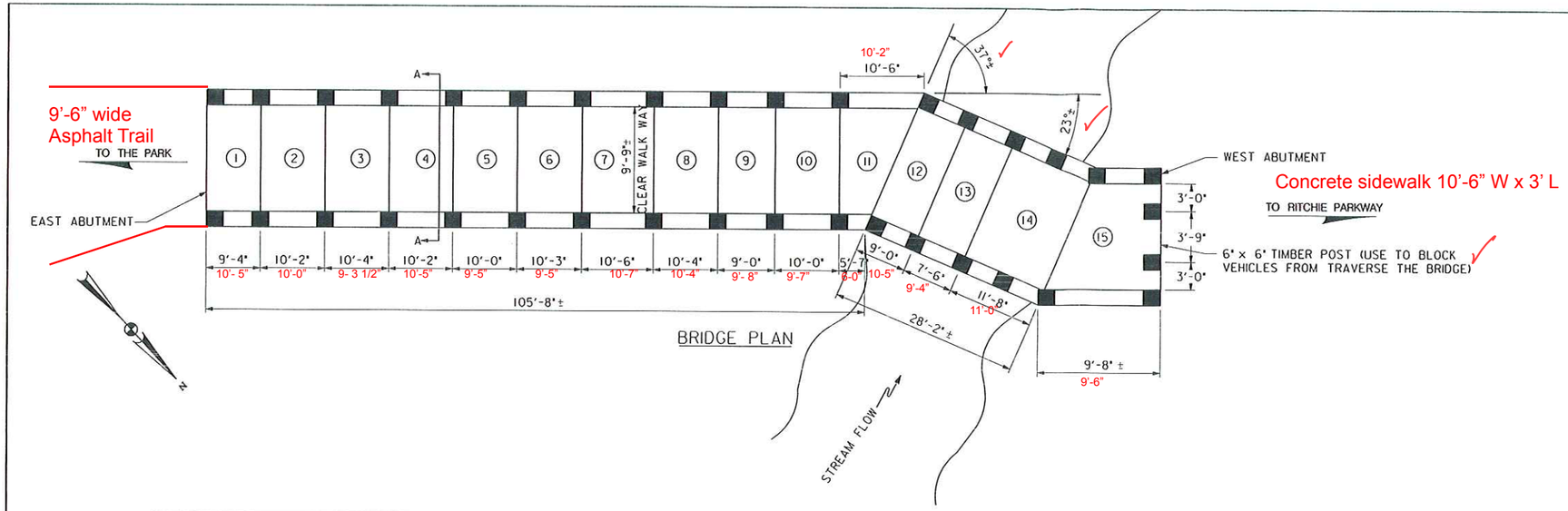
Structure No. PB-065
Dawson Farm Park
Pedestrian Bridge over
Tributary to
Cabin John Creek

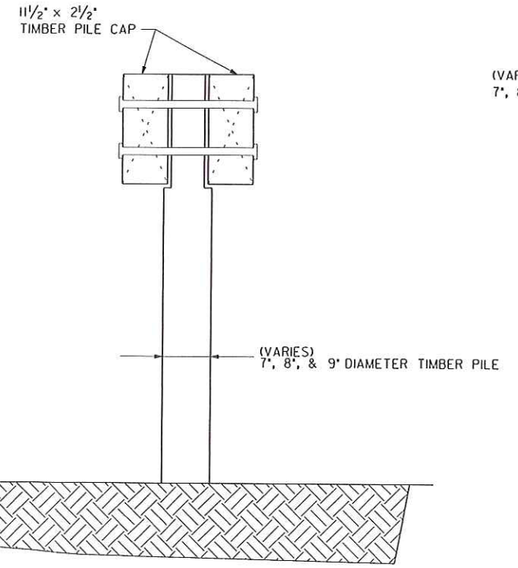
Permitted Use Number 21002203
ADC Street Atlas Grid Location: 29-D8

LOCATION MAP

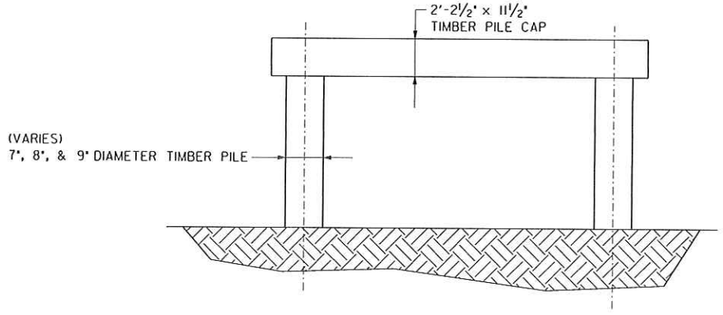
SCALE: 1" = 2000'



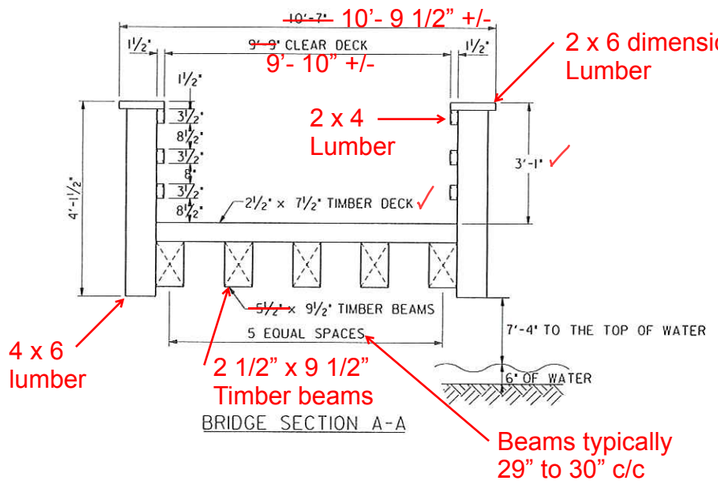
SCHEDULE OF MEMBER SIZES	
TIMBER PLANK	2½" x 7½"
TIMBER BEAMS	2 1/2" ~~5½"~~ x 9½"
TIMBER PILE CAP	2½" x 11½"
TIMBER PILE	7", 8", & 9" DIAMETER
TIMBER RAIL POST	5½" x 3½"



SECTION B-B THROUGH TIMBER PILE BENT



SECTION C-C TYPICAL PILE BENT



BRIDGE SECTION A-A

REVISIONS NOTE: EBA Engineering field measured many components of the bridge during the 2018 inspection to accurately model the bridge for load rating analysis. The dimensions as marked in red indicate EBA's measurements.

IMPORTANT change in timber Beam size is only 2 1/2" x 9 1/2"

CITY OF ROCKVILLE
MONTGOMERY COUNTY

BRIDGE NUMBER MRP – 65
DAWSON FARM PARK PEDESTRAIN BRIDGE
AT RITCHIE PARKWAY
AND CROTHERS LANE
TOTAL BRIDGE LENGTH = 143'-6"± X 9'-9"± WIDE CLEAR WALKWAY

BRIDGE INSPECTIONS

SCALE N.T.S. DATE DEC. 2007 CONTRACT NO.

DESIGNED BY — COUNTY
DRAWN BY BJC — LOGMILE
CHECKED BY WWM — T.I.M.S. NO.
F.A.P. NO. — TOD NO.

DRAWING NO. OF SHEET NO. OF

REVISIONS

CENTURY ENGINEERING
CONSULTING ENGINEERS – PLANNERS
10710 GILROY RD.
HUNT VALLEY, MD 21031

PLOTTED: TUESDAY, DECEMBER 04, 2007 AT 03:31 PM
FILE: O:\SERVER\PROJECTS\MARYLAND\BILL\MD PEDESTRAIN BRIDGES\PPS-65.DGN

SURVEY BOOK NO.

BY: CUNNINGHAM

2018 BRIDGE INSPECTION REPORT

BRIDGE DESCRIPTION SUMMARY

Roadway	Dawson Farm Park
Bridge Orientation	East-West
Crossing	Tributary to Cabin John Creek
Crossing Orientation	North-South
Inspection Date	10/02/2018
Inspected By	EBA Engineering, Inc.
Spans	15
Type	Multi-Span Timber Pedestrian Bridge
Structure Organization	Numbering from North and West
Deck	2 1/2" x 7 1/2" Timber Planks
Railing	4x6 Timber Posts with a 2x6 Hand Cap and Rail
Abutments	Timber
Wing Walls	N/A
Piers	Timber Pile and Cap Bent
Overall Length	145'-0"±
Clear Roadway	9'-10" ±
No. of Lanes	None
Out-to-Out Width	10'-9 1/2"±
Year Built	2007
Year Reconstructed	N/A
Approach Section	3'-0" long x 10'-6"± wide Concrete Walkway at West Approach, 9'-5"± wide Asphalt Walkway at East Approach
Shoulders	None
Alignment	Bends several times during its length
Profile	Slight vertical incline
Guardrail	N/A
Current Postings	None - Pedestrian Bridge
Overall Condition	Satisfactory
Remarks	The structure is load rated for pedestrian use and can sustain a uniform loading of 91 psf.

COMPARATIVE EVALUATION SUMMARY TABLE

PONTIS ELEMENT	STATUS	CONDITION	REMARKS
Approach Walkways	⟷	Good	
Deck	↓	Fair	Several planks exhibiting checks, warping, and signs of decay with up to 1" pick penetrations.
Superstructure	⟷	Good	
Substructure	↓	Satisfactory	Some minor deterioration.
Channel and Channel Protection	⟷	Satisfactory	
Overall	⟷	Satisfactory	Timber structure was painted after the 2013 inspection.

↑ = Condition Improved ⟷ = Condition Unchanged ↓ = Condition Worse

CONDITION SUMMARY

Approach Walkways

The approach walkways are in good condition overall (see Photographs 3 and 4). A 3'-0"± long x approximately 10'-6" wide concrete walkway runs to the structure at the West Approach, and a 9'-5" wide asphalt walkway runs to the structure at the East Approach. There is minor accumulation of debris on the ADA ramp at the west approach, however it is in good condition. At the East Approach walkway, there is an 8'-0" long x up to 1/4 in. open crack in the south edge of the walkway (see Photograph 7).

Deck

The timber deck is in generally fair condition (see Photograph 8). Since the previous 2013 Bridge Inspection the structure was painted. In general, the paint system is not performing well and is peeling and missing throughout. Typically, there are several planks exhibiting checks, warping, and signs of decay (see Photographs 9-21). There are heavier areas of wear and decay in Span 3 (see Photographs 12 and 13) with 3/4" pick penetrations. The maximum pick penetration throughout the deck is 1"± (see Photograph 10, 19, and 21). Some nails are popping out of the planks (see Photograph 18).

The timber railings on each side of the bridge are generally in satisfactory condition but are not plumb with the deck. Typically, the railings and posts exhibit checks, and vertical splits running full height (see Photograph 22). There are missing washers and splitting of the bridge railing Post 1, Span 9 at the south railing (see Photograph 23). Post 1 is loose and the bolts have slightly corroded. At the post, there are typical splintering at the fascia of the stringers and typical open checks at the post connections (see Photograph 25). At the north railing of Span 1, there is splintering at the bottom rail (see Photograph 26). There are multiple rails that are also bent and warped (see Photograph 24). There is a name plaque on the south bridge railing (see Photograph 27). There is typically, up to 1/8" open checks in the top cap of railing (see Photograph 28). At the South Railing in Span 4, there is a 4' -0" long section of the top cap missing (see Photograph 29). The remaining portion of the missing top cap exhibits a significant section of rot/decay. There is a misaligned bridge railing at the north railing of Span 7 of the bridge (see Photograph 30). The warped/misaligned top cap is up to 1" misaligned.

The underside of the deck exhibits minor decay and deterioration. The most severely deteriorated planks are in Span 3 (see Photographs 31 and 32).

AASHTO standards indicate that the minimum height of a pedestrian railing shall be 3'-6" measured from the top of the walkway and the clear opening between elements shall be such that a 6" diameter sphere shall not pass through. The height of the railing is approximately 3'-1"; therefore, the minimum height criteria is not met. There is approximately 8 1/2" between the longitudinal members of the railing; therefore, the 6" diameter sphere criteria is not met.

Superstructure

The timber beams are in satisfactory condition overall (see Photograph 31). Typically, the timber beams and diaphragms exhibit horizontal splits, checks, and shakes. The fasciae exhibit typical checking. There is typical heavy corrosion of the connection plates between the beams and pile caps (see Photograph 33). At some locations, the connection plates are missing.

CONDITION SUMMARY

Substructure

The timber abutments appear to be in good condition with typical horizontal splits. Most of the width of each abutment is buried and cannot be seen. The maximum ice pick penetration is up to 3/4"±.

The timber piers are in satisfactory condition. Typically, the timber piers exhibit horizontal splits, shakes, and checks up to 1/16" in the pile caps (see Photograph 38). At Bent 2, there is up to 3/4" pick penetration at the base of the south pile (see Photograph 39). Bent 3 exhibits two areas of decay approximately 8" high with 1/2" of pick penetration (see Photograph 40). Similarly, the South Pile of Bent 7 and 9 exhibits areas of decay from 6" up to 1'-0" high with up to 3/4" of pick penetration (see Photographs 41 and 42). The pile caps exhibit typical checking throughout. There are typically moderate to heavy corrosion in the washers and bolts in the bent caps (see Photographs 34-36). Some of the washers have completely rusted out while others exhibit heavy section loss. The west side timber pile cap at the south end at Pier 11, there is a 1" open check (see Photograph 37). The maximum ice pick penetration in the caps and piles is up to 3/4"±.

Channel and Channel Protection

The channel is in satisfactory condition. The stream alignment appears to be in good condition. The streambed consists of rocks, sand, and silt. The stream flows from north to south between Spans 12 and 13. There is erosion at the west slope approximately 6'-0" in diameter x up to 3'-0" deep (see Photograph 43). There is a photograph in the previous 2013 Inspection Report of the west slope erosion, however the erosion was not quantified with measurements. The erosion appears to have increased since 2013. At both the upstream and downstream of the bridge, there is accumulated debris (see Photographs 5 and 6).

Overall

Bridge No. PB-065 was inspected by EBA Engineering, Inc. on October 2, 2018. All structure elements were inspected hands-on. The structure is in overall satisfactory condition.

The approaches, abutments and embankments are designated West and East. The numbering convention for reporting purposes is from the north and west (see Photographs 1-6).

City of Rockville Load Rating Summary Sheet

Bridge No.: PB-065 on Dawson Farm Park over Tributary to Cabin John Creek

Date of Rating: 10/10/2018 **LARS Program:** Yes ☐ No ☒ Program Used: Hand Calculations (Spreadsheet)

Rating Method: LRFR ☐ LFR ☐ ASR ☒ Engineering Judgment ☐ Load Testing ☐ **HMA Wearing Surface?** N/A

Rating Type: As-Built ☐ As Inspected ☒ **Condition Report Date:** 10/2/2018

Deterioration Reduced Capacity: No/Negligible Section Loss ☒ Reduced Section Used for Rating ☐

*All legal and permit vehicles must be completed, regardless of the rating method. The HL-93 is only rated for LRFR.

**For LRFR there is no Inventory Rating for Legal and Permit Loads. Enter the Operating Limit State in the Inventory column for Legal Loads, set Inventory to zero for Permit Loads.

***LRFR Design/Load Rating Vehicle (Limit States are Strength I for all materials, Service II for Steel only, or Service III for prestressed concrete Inventory only)**

Truck/ Axle/ Tons	Rating Details	Inventory	Operating
	Controlling Member	Limit State	Limit State
	Controlling Stress (Moment, Shear, Service)	Rating Factor	Rating Factor
HL-93/3/36 Tons	enter controlling member (i.e. Sp. 1, Ext. Beam)	Limit State	Limit State
	Select the Controlling Stress	0	0

MD Legal Loads (For LRFR the Limit States are Strength I for all materials or Service II for steel only)

If rating in LRFR, enter Oper. Limit State.

Truck/Axles/Tons	Controlling Member	**Inventory or Limit State	Operating
	Controlling Stress (Moment, Shear, Service)	Tons (XX.X)	Tons (XX.X)
H-15 / 2 / 15	Timber Beam Superstructure	N/A	N/A
	Moment		
T-3 / 3 / 33	Timber Beam Superstructure	N/A	N/A
	Moment		
T-4 / 4/ 35	Timber Beam Superstructure	N/A	N/A
	Moment		
HS-20 / 3 / 36	Timber Beam Superstructure	N/A	N/A
	Moment		
3S2 / 5 / 40	Timber Beam Superstructure	N/A	N/A
	Moment		

Pedestrian / Trail Structure Typical Loads (if applicable based on access / deck width)

Type/Axles/Pounds	Controlling Member	**Inventory	Operating
	Controlling Stress (Moment, Shear, Service)	Pounds (X,XXX)	Pounds (X,XXX)
Point Load/1/Max	Timber Deck Planks	1260	1260
	Moment		
Pedestrian /s.f./ 85 psf or 90 psf *	Timber Beam Superstructure	91	91
	Moment		
H-5 / 2 / 10,000	Timber Beam Superstructure	6546	6546
	Moment		
H-10 / 2 / 20,000	Timber Beam Superstructure	N/A	N/A
	Moment		
Golf Cart / 2 / 2,000	Timber Beam Superstructure	6304	6304
	Moment		
Utility / 2 / 3,000	Timber Beam Superstructure	5201	5201
	Moment		

Enter Pedestrian / Trail Loading Values in pounds

* Pedestrian Load Note: The Design Load using LFD or ASD methods is 85 psf; design load using LRFD method is 90 psf.

City of Rockville Load Rating Summary Sheet (continued)

LOAD POSTING RECOMMENDED: Yes ☐ No ☒ ***Not applicable for Pedestrian Bridge***
Single Unit Truck: lbs. Combination Truck: lbs.

Bridge Information Used: None, Field Measurements ☒ Previous Load Rate Calcs ☐ Drawings ☒

Drawing and/or Previous Rating Details: Construction drawings were available and provided to indicate the dimensions, details, and field measurements for the structure. The structure was not previously load rated. This load rating analysis is based on approximate field measurements and guidance from AASHTO's Manual for Bridge Evaluation (MBE) regarding material property assumptions to use when specific information is not available.

Comments/Defects/Assumptions: Bridge No. PB-065 consists of a 15-span timber bridge with a timber plank deck bearing on timber stringers supported by timber pier caps bearing on round timber piles. The timber beam superstructure consists of five 2.5"x9.5" sawn lumber stringers.

As material type and properties were not available for the load rating of this timber structure, it was assumed that the bridge is built of Select Structural Grade Spruce-Pine-Fir. This is a reasonable, conservative assumption for a structure located in Maryland. In our analysis, the base bending and shear strengths for this material were multiplied by several modifying factors to account for the specific conditions and configuration of this structure. Where specific information was not available (such as the moisture content of the timber), the lowest reasonable value of the modifying factor was selected. Due to the conservative nature of this approach, it is possible that the capacity of the structure has been underestimated in this analysis. However, detailed material data would be required to refine these assumptions.

The clear space between the timber railings for this bridge is 9'-10". However, there are posts standing in the vehicular deck to prevent vehicular traffic from accessing the bridge. The bridge does not accommodate any Maryland legal trucks. Therefore, the structure was rated for a maximum point load placed at the center of the longest span, a distributed pedestrian load, a golf cart, utility vehicle, and H-5 truck. AASHTO standards indicate that timber pedestrian bridges should be designed for an 85 psf pedestrian distributed load. The results of our analysis indicate that the structure can only accommodate a 91 psf pedestrian load safely. Therefore, it is recommended that either the structure be replaced, loads be limited on the structure, or that material property information be obtained for the structure that would allow for a refinement of this load rating.

During the 2018 Bridge Inspection, the structure was observed to be in satisfactory condition (SI&A Item 59 = 6) with no signs of structural distress due to loading.

This load rating was developed in accordance with recommendations and guidance found in AASHTO's Manual for Bridge Evaluation (MBE).

BRIDGE INSPECTION NOTES

VISUAL INSPECTION NOTE

The condition ratings and evaluations presented herein are based upon visual inspection of accessible portions of the existing structure. No responsibility is assumed by EBA Engineering, Inc. for the presence of any latent structure defects which cannot be detected by such visual inspection.

BRIDGE SKETCHES NOTE

The bridge sketches included in this report were previously prepared by others and are reproduced herein from materials furnished by the City of Rockville. EBA did update or "mark-up" the sketches to indicate the field measurements we collected during our inspection for performing the load rating analysis. The marked or updated sketch has been included in this report. No responsibility is assumed by EBA Engineering, Inc. for the accuracy of the sketches and the correctness of any detail dimensions.

INSPECTION ACCESS NOTE

Waders were used to access Bridge No. PB-065.

BRIDGE NO. PB-065 - Dawson Farm Park OVER Tributary to Cabin John Creek

3. West Approach Looking East

4. East Approach Looking West

BRIDGE NO. PB-065 - Dawson Farm Park OVER Tributary to Cabin John Creek

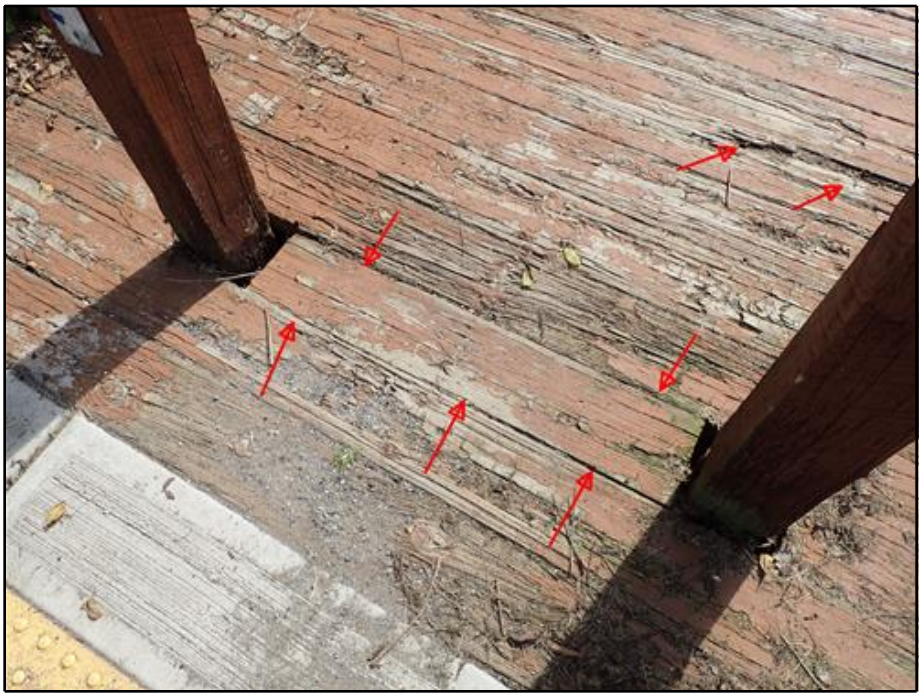
5. Upstream (Looking North)

6. Downstream (Looking South)

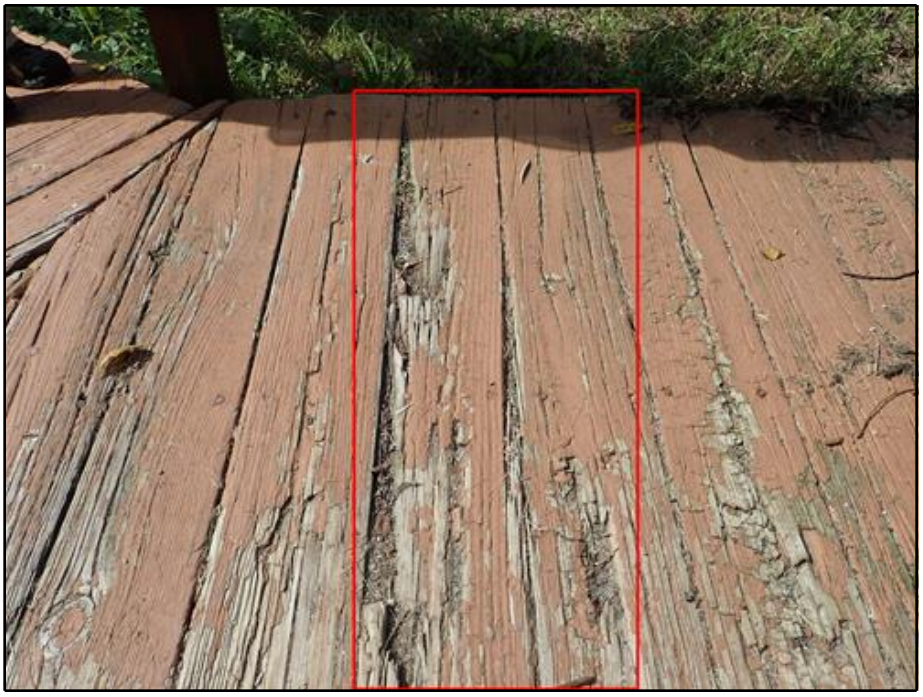
BRIDGE NO. PB-065 - Dawson Farm Park OVER Tributary to Cabin John Creek

7. East Approach - 8 ft. Long x Up to 1/4 in. Open Crack in South Edge of Pavement

8. Overall Deck Surface



9. Span 1 - 3'-11" Long Loose Board Between Posts Near West Approach

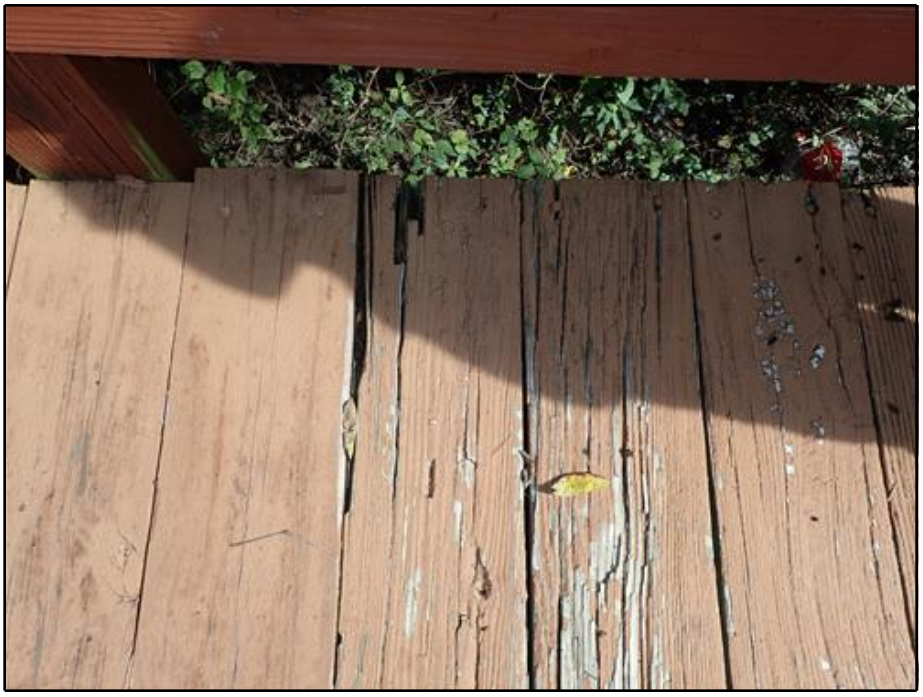


10. Span 1, Plank 7 - 6 ft. Long Area of Decay with Splintering and 1" Pick Penetrations

11. Span 2 - 1/16" Open Checks in Planks 8 and 10

12. Heavier Wear on Deck Surface in Span 3

13. Span 3, Plank 14 - Full Length of Decay with 3/4 in. Pick Penetrations; Plank is also Loose

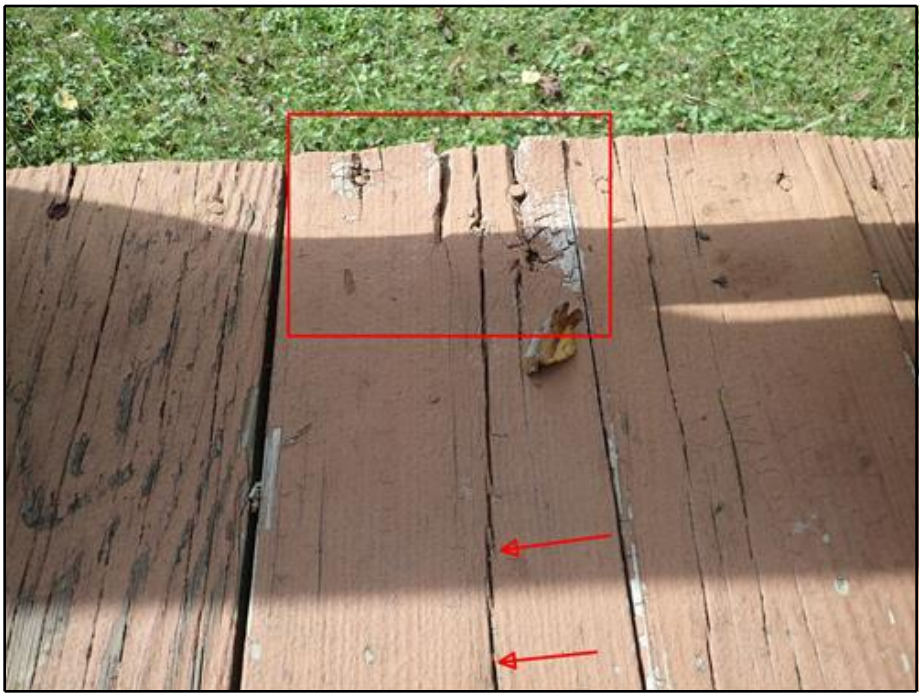


14. Span 5, Plank 2 - 1 ft. 4 in. Wide x 4 in. Long Area of Rot/Decay with 3/4 in. Pick Penetrations

BRIDGE NO. PB-065 - Dawson Farm Park OVER Tributary to Cabin John Creek

15. Span 10 - Decay in Planks 13 and 14 with 3/4" Pick Penetrations (Full Width)

16. Span 11, Plank 1 - 4 ft. Wide Rot/Decay with 3/4" Pick Penetration

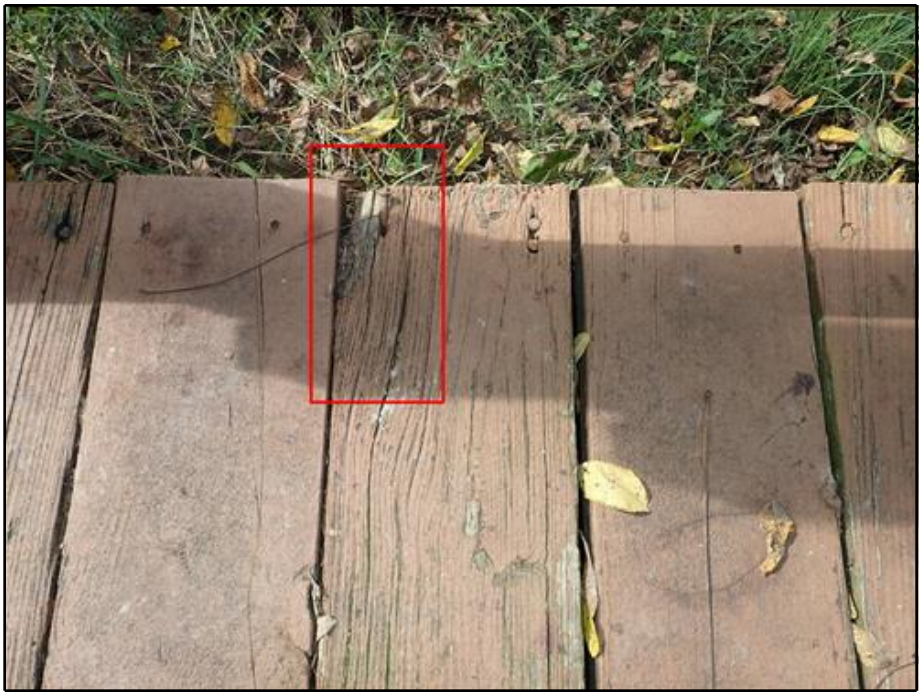


17. Span 12, Plank 3, South End - 3" Wide Area of Edge Splintering

18. Span 12, Plank 5 - Exposed and Raised Nail with Adjacent Splintering

BRIDGE NO. PB-065 - Dawson Farm Park OVER Tributary to Cabin John Creek

19. Spans 13 and 14, Decay in Planks with 1 in. Pick Penetration for a 3 ft. Width

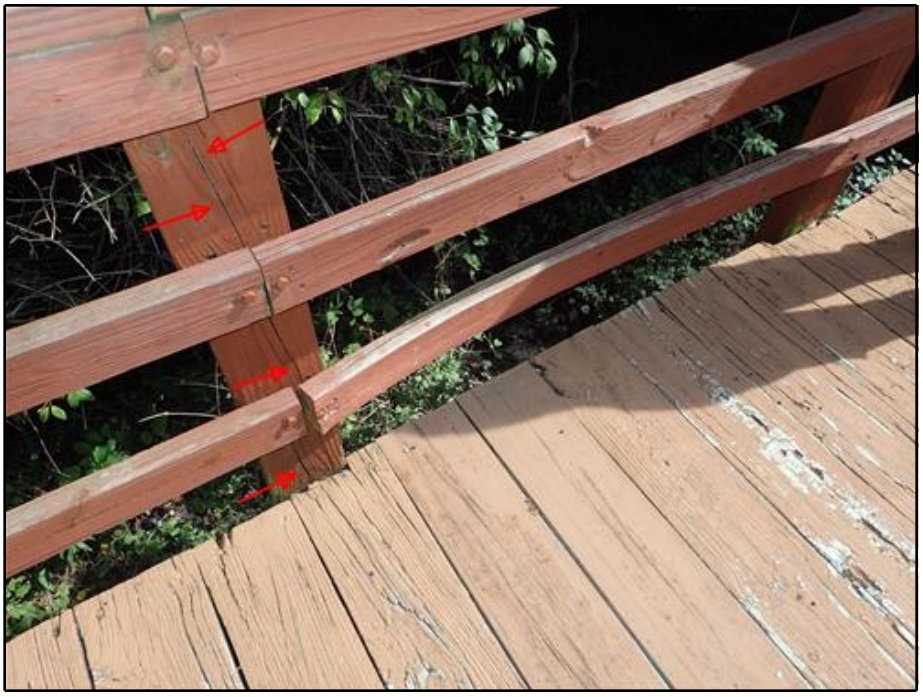


20. Span 14, Plank 13, South End - 3 in. Edge Splintering

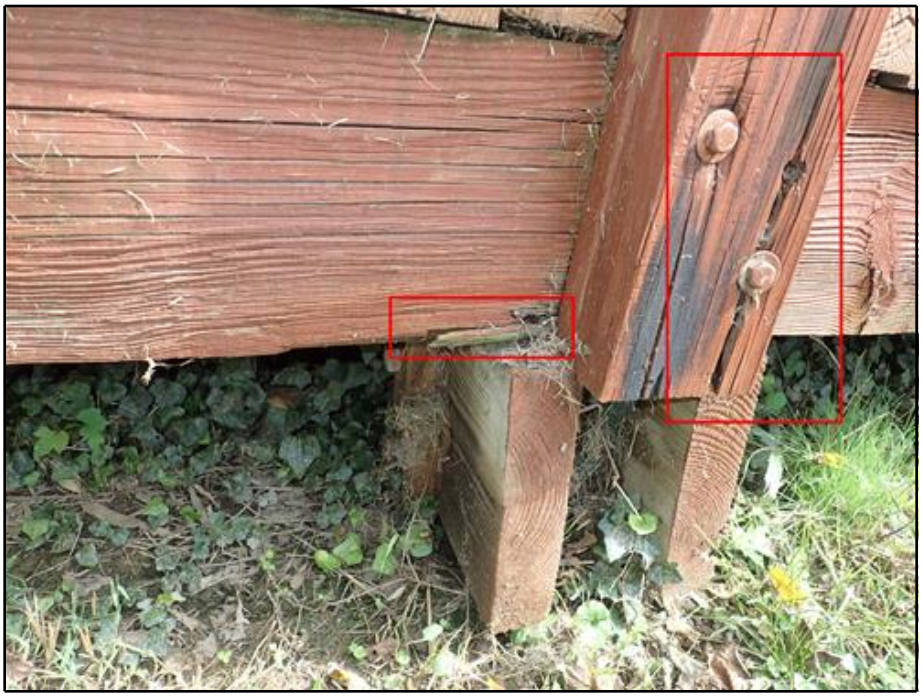
21. Span 14, Nine (9) Decayed Planks with Up to 1 in. Pick Penetrations

22. Typical Split at Post Connection - Span 3, Post 2

23. Typical Split in Railing (Span 9, Post 1, South Railing Shown)



24. Span 5 - Warped Lower Rail Member of North Railing; Vertical Check in Rail Post



25. Typical Splintering at Fascia Stringer (Pier 12, South Side Shown) and Typical Open Checks at Hardware Connections

26. Span 1, North Railing - Splintered Section of Bottom Rail

BRIDGE NO. PB-065 - Dawson Farm Park OVER Tributary to Cabin John Creek

27. Worn Stream Name Plaque at South Railing

28. Typical, Up to 1/8 in. Open Checks in Top Cap of Railing

BRIDGE NO. PB-065 - Dawson Farm Park OVER Tributary to Cabin John Creek

29. South Railing, Span 4 - 4 ft. Long Section of Top Cap Missing

30. Span 7, North Railing - Top of Railing Cap Warped and Misaligned by 1 in.

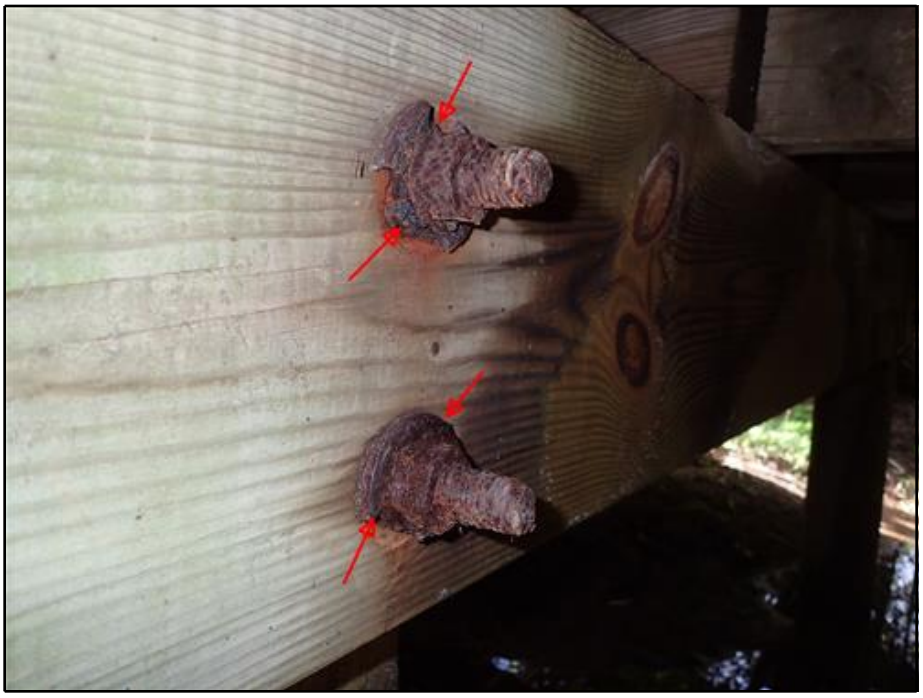
BRIDGE NO. PB-065 - Dawson Farm Park OVER Tributary to Cabin John Creek

31. Typical Underside

32. Underside Span 3 - Four Planks with Rot/Decay in a 3 ft. Width (Plank 1 is Worst)

33. Heavy Corrosion on Stringer to Pile Cap Hardware

34. Typical Corrosion on Bent Cap Hardware



35. Heavily Corroded Washer at Bent Cap Hardware (Bent 7, South End Shown)

36. Heavier Corrosion on Pile Cap Hardware at Bent 5

37. West Side Timber Pile Cap, 1 in. Open Check at South End at Pier 11

38. Typical 1/16 in. Open Checking in Pile (Bent 6 Shown)

39. South Pile at Bent 2 - Up to 3/4 in. Pick Penetration at Base

40. Bent 3, North Pile - Two (2) Areas of Decay with 1/2 in. Pick Penetrations up to 8 in. High

BRIDGE NO. PB-065 - Dawson Farm Park OVER Tributary to Cabin John Creek

41. Bent 7, South Pile - 6 in. Decay on East Face

42. Bent 9, South Pile - Decay up to 1 ft. High x 3/4 in. Deep

BRIDGE NO. PB-065 - Dawson Farm Park OVER Tributary to Cabin John Creek

43. Erosion at West Slope - 6 ft. Diameter x Up to 3 ft. Deep

2018 BRIDGE INSPECTION REPORT

Bridge No. PB-065 Inspection Crew JC/JD Date 10/02/2018

Name Dawson Farm Park Crossing Tributary to Cabin John Creek

Bridge Type Multi-Span Timber Pedestrian Bridge Year Built 2007

58 DECK

	CONDITION RATING	
1. Wearing Surface (302)	-	
2. Deck - Topside (301)	5	Wear, checks, splits, and decay in Timber Planks
3. Deck - Underside (301)	6	Some Rot in Timber Planks
4. Curbs (304)	-	
5. Median (304)	-	
6. Sidewalks (304)	-	
7. Parapets (303)	-	
8. Railing (303)	6	
9. Roadway Joints	-	
10. Drainage System (314)	-	
11. Lighting Standards	-	
12. Utilities	-	
13. Other	-	

Inspector's Condition Rating (58) 6

The timber deck is in generally fair condition.

58.2 Since the previous 2013 Bridge Inspection the structure was painted. In general, the paint system is not performing well and is peeling and missing throughout. Typically, there are several planks exhibiting checks, warping, and signs of decay. There are heavier areas of wear and decay in Span 3 with 3/4” pick penetrations. The maximum pick penetration throughout the deck is 1”±. Some nails are popping out of the planks.

58.3 The underside of the deck exhibits minor decay. The most severely deteriorated planks are in Span 3

58.8 The timber railings on each side of the bridge are generally in satisfactory condition but are not plumb with the deck. Typically, the railings and posts exhibit checks, and vertical splits running full height. There are missing washers and splitting of the bridge railing Post 1, Span 9 at the south railing. Post 1 is loose and the bolts have slightly corroded. At the post, there are typical splintering at the fascia of the stringers and typical open checks at the post connections. At the north railing of Span 1, there is splintering at the bottom rail. There are multiple rails that are also bent and warped. There is a name plaque on the south bridge railing. There is typically, up to 1/8" open checks in the top cap of railing. At the South Railing in Span 4, there is a 4’-0” long section of the top cap missing. The remaining portion of the missing top cap exhibits a significant section of rot/decay. There is a misaligned bridge railing at the north railing of Span 7 of the bridge. The warped/misaligned top cap is up to 1” misaligned.

2018 BRIDGE INSPECTION REPORT

Bridge No. PB-065 Inspection Crew JC/JD Date 10/02/2018

Name Dawson Farm Park Crossing Tributary to Cabin John Creek

Bridge Type Multi-Span Timber Pedestrian Bridge Year Built 2007

59 SUPERSTRUCTURE

Number of Spans 15

Type of Construction Timber Bridge

	CONDITION RATING	
1. Bearing Devices (311)	-	
2. Girders or Beams (312)	6	Timber
3. Stringers (312)	-	
4. Floor Beams (312)	-	
5. Diaphragms/Crossframes	6	Timber
6. Paint (313)	5	Timber painted after 2013 Inspection
7. Other	-	
8. Rivets or Bolts	6	
9. Welds - Cracks	-	
10. Rust	-	
11. Timber Decay	6	
12. Concrete Cracking	-	
13. Collision Damage	-	
14. Deflection Under Load	7	
15. Alignment of Members	7	
16. Vibrations Under Load	7	
17. Fracture Critical Members (325)	-	

Inspector's Condition Rating (59) 6

The timber beams are in satisfactory condition overall. Typically, the timber beams and diaphragms exhibit horizontal splits, checks, and shakes. The fasciae exhibit typical checking. There is typically heavy corrosion of the connection plates between the beams and pile caps. At some locations, the connection plates are missing.

2018 BRIDGE INSPECTION REPORT

Bridge No. PB-065 Inspection Crew JC/JD Date 10/02/2018

Name Dawson Farm Park Crossing Tributary to Cabin John Creek

Bridge Type Multi-Span Timber Pedestrian Bridge Year Built 2007

60 SUBSTRUCTURE

		CONDITION RATING	
1. Abutments	-Wingwalls	-	
	-Backwalls	7	
	-Stems	7	
	-Footings	-	Not Visible
	-Piles	-	Not Visible
	-Scour/Erosion	7	
	-Settlement	7	
Overall Abutment Rating (322)		7	Abutment Type Timber
2. Piers or Bents	-Caps	-	
	-Columns	-	
	-Footings	-	
	-Piles	-	
	-Scour/Erosion	-	
	-Settlement	-	
Overall Pier Rating		-	Pier Type
3. Pile Bents	-Caps	6	MInor deterioration
	-Piles (324)	6	
4. Concrete Cracking or Spalling		-	
5. Steel Corrosion		-	
6. Timber Decay		6	
7. Other		-	
8. Debris on Seats		7	
9. Paint		-	
10. Collision Damage		-	
11. Overall Undermining/Scour		7	

Inspector's Condition Rating (60) 7

The timber abutments appear to be in good condition with typical horizontal splits. Most of the width of each abutment is buried and cannot be seen. The maximum ice pick penetration is up to 3/4"±.

The timber piers are in satisfactory condition. Typically, the timber piers exhibit horizontal splits,

shakes, and checks up to 1/16” in the pile caps. At Bent 2, there is up to 3/4” pick penetration at the base of the south pile. Bent 3 exhibits two areas of decay approximately 8” high with 1/2” of pick penetration. Similarly, the South Pile of Bent 7 and 9 exhibits areas of decay from 6” up to 1’-0” high with up to 3/4” of pick penetration. The pile caps exhibit typical checking throughout. There are typically moderate to heavy corrosion in the washers and bolts in the bent caps. Some of the washers have completely rusted out while others exhibit heavy section loss. The west side timber pile cap at the south end at Pier 11, there is a 1” open check. The maximum ice pick penetration in the caps and piles is up to 3/4”±.

2018 BRIDGE INSPECTION REPORT

Bridge No. PB-065 Inspection Crew JC/JD Date 10/02/2018

Name Dawson Farm Park Crossing Tributary to Cabin John Creek

Bridge Type Multi-Span Timber Pedestrian Bridge Year Built 2007

61 CHANNEL AND CHANNEL PROTECTION

	CONDITION RATING
1. Channel Scour	7
2. Embankment Erosion	5
3. Drift/Debris	6
4. Vegetation	6
5. Channel Alignment	7
6. Fender System	-
7. Spur Dikes and Jetties	-
8. Riprap/Slope Protection	-

Inspector's Condition Rating (61) 6

The channel is in satisfactory condition. The stream alignment appears to be in good condition. The streambed consists of rocks, sand, and silt. The stream flows from north to south between Spans 12 and 13. There is erosion at the west slope approximately 6'-0" in diameter x up to 3'-0" deep. There is a photograph in the previous 2013 Inspection Report of the west slope erosion, however the erosion was not quantified with measurements. The erosion appears to have increased since 2013. At both the upstream and downstream of the bridge, there is accumulated debris.

2018 BRIDGE INSPECTION REPORT

Bridge No. PB-065 Inspection Crew JC/JD Date 10/02/2018

Name Dawson Farm Park Crossing Tributary to Cabin John Creek

Bridge Type Multi-Span Timber Pedestrian Bridge Year Built 2007

71 WATERWAY ADEQUACY

Opening	Good	Fair	Poor	
Alignment	Good	Fair	Poor	
Frequency of Overtopping	Remote	Slight	Occasional	Frequent

Inspector's Condition Rating (71) 7

2018 BRIDGE INSPECTION REPORT

Bridge No. PB-065 Inspection Crew JC/JD Date 10/02/2018

Name Dawson Farm Park Crossing Tributary to Cabin John Creek

Bridge Type Multi-Span Timber Pedestrian Bridge Year Built 2007

72 APPROACH ROADWAY ALIGNMENT APPRAISAL RATING

1. Vertical Alignment		[Good]	Fair	Poor
		[Good]	Fair	Poor
2. Horizontal Alignment	E	[Good]	Fair	Poor
	W	[Good]	Fair	Poor
3. Speed Limit Reduction		[None]	Minor	Substantial
4. Sight Distance		[Adequate]	Not Adequate	

Inspector's Condition Rating (72) [7]

APPROACH ROADWAY

	CONDITION RATING
5. Approach Guardrail	-
6. Approach Pavement	7
7. Approach Embankments	7
8. Approach Slabs	-
9. Relief Joints	-

10. Signing - Legibility and Visibility Good Fair Poor None

11. Posted Load Limits None Posted Bridge Speed Limit [N/A] MPH

Normal Roadway Speed Limit N/A MPH

12. Traffic Safety Features (36)

a. Bridge Railing	[0]	1	N
b. Transitions	0	1	[N]
c. Approach Traffic Barrier	0	1	[N]
d. Approach Traffic Barrier Ends	0	1	[N]

The approach walkways are in good condition overall. A 3'-0"± long x approximately 10’-6” wide concrete walkway runs to the structure at the West Approach, and a 9’-5” wide asphalt walkway runs to the structure at the East Approach. There is minor accumulation of debris on the ADA ramp at the west approach, however it is in good condition. At the East Approach walkway, there is an 8’-0” long x up to 1/4 in. open crack in the south edge of the walkway.

General Rating Codes

Condition ratings have been assigned to each of the structural elements based on the NBIS condition rating system as follows:

9 – Excellent Condition
8 – Very Good Condition – No problems noted.
7 – Good Condition – Some minor problems.
6 – Satisfactory Condition – Structural elements show some very minor deterioration.
5 – Fair Condition – All primary structural elements are sound, but may have minor deterioration.
4 – Poor Condition – Advanced section loss, deterioration, spalling or scour.
3 – Serious Condition – Loss of section, deterioration, spalling or scour have seriously affected the primary structural components.
2 – Critical Condition – Advanced deterioration of primary structural elements. Unless closely monitored it may be necessary to close the bridge until corrective action is taken.
1 – "Imminent" Failure Condition – Major deterioration or section loss present in critical structural components or obvious vertical or horizontal movement affecting the structure stability. Bridge is closed to traffic, but corrective action may put back in light service.
0 – Failed Condition – Out of service – beyond corrective action.
N – Not Applicable

Repair Time Frames

Priority Level	Time Frame
Critical (1)	Within 3 months
High (2)	Within 12 months
Medium (3)	Within 1-2 years
Monitor/Re-evaluation (4)	Assess during next inspection

Appendix A - Load Rating Calculations

CITY OF ROCKVILLE
Department of Public Works
Parks and Facilities Division

2018 *Load Rating Report*

BRIDGE NO. PB-065
Dawson Farm Park
OVER
Tributary to Cabin John Creek

EBA ENGINEERING

EBA Engineering Inc.
4813 Seton Drive
Baltimore, MD 21215

o 410.358.7171
f 410.358.7213
w www.ebaengineering.com

CITY OF ROCKVILLE
Department of Public Works
Parks and Facilities Division

2018 BRIDGE LOAD RATING ANALYSIS REPORT

Bridge No. PB-065

Dawson Farm Park over Tributary to Cabin John Creek

STATE OF MARYLAND
CARA I. JOHNSON
PROFESSIONAL ENGINEER

Cara I. Johnson, P.E.
(Load Rating Engineer)

10/23/2018
Date

Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland.

License No. 51083
Expiration Date: 6/7/2019

Load Rating Note:

This Live Load Rating Report was prepared under my supervision. The analysis was performed on main structural members of the bridge's superstructure or culvert's barrel only. The condition data, calculations, and analysis contained within this report are based on information contained within the most recent Bridge Inspection Report, which is based on a visual inspection of accessible portions of the structure. Structure details and dimensions were obtained from construction drawings and/or previous Load Rating Reports when available and provided by the City; if this information was not available, the bridge details and dimensions are based on approximate field measurements. No responsibility is accepted for the existence of latent defects which cannot be detected during visual inspection. The structure must be re-analyzed and the load rating values revised should the condition of the structure deteriorate or the anticipated loads on the structure change.

Load Rating Engineer: Cara Johnson — 10/23/18
Cara Johnson, P.E. — Date

QC Engineer: Jennifer Callaghan — 10/23/18
Jennifer Callaghan, P.E. — Date

EBA ENGINEERING
EBA Engineering Inc.
4813 Seton Drive
Baltimore, MD 21215
o 410.358.7171
f 410.358.7213
w www.ebaengineering.com

City of Rockville Load Rating Summary Sheet

Bridge No.: PB-065 on Dawson Farm Park over Tributary to Cabin John Creek

Date of Rating: 10/10/2018 **LARS Program:** Yes ☐ No ☒ Program Used: Hand Calculations (Spreadsheet)

Rating Method: LRFR ☐ LFR ☐ ASR ☒ Engineering Judgment ☐ Load Testing ☐ **HMA Wearing Surface?** N/A

Rating Type: As-Built ☐ As Inspected ☒ **Condition Report Date:** 10/2/2018

Deterioration Reduced Capacity: No/Negligible Section Loss ☒ Reduced Section Used for Rating ☐

*All legal and permit vehicles must be completed, regardless of the rating method. The HL-93 is only rated for LRFR.

**For LRFR there is no Inventory Rating for Legal and Permit Loads. Enter the Operating Limit State in the Inventory column for Legal Loads, set Inventory to zero for Permit Loads.

***LRFR Design/Load Rating Vehicle (Limit States are Strength I for all materials, Service II for Steel only, or Service III for prestressed concrete Inventory only)**

Truck/ Axle/ Tons	Rating Details	Inventory	Operating
	Controlling Member	Limit State	Limit State
	Controlling Stress (Moment, Shear, Service)	Rating Factor	Rating Factor
HL-93/3/36 Tons	enter controlling member (i.e. Sp. 1, Ext. Beam)	Limit State	Limit State
	Select the Controlling Stress	0	0

MD Legal Loads (For LRFR the Limit States are Strength I for all materials or Service II for steel only)

If rating in LRFR, enter Oper. Limit State.

Truck/Axles/Tons	Controlling Member	**Inventory or Limit State	Operating
	Controlling Stress (Moment, Shear, Service)	Tons (XX.X)	Tons (XX.X)
H-15 / 2 / 15	Timber Beam Superstructure	N/A	N/A
	Moment		
T-3 / 3 / 33	Timber Beam Superstructure	N/A	N/A
	Moment		
T-4 / 4/ 35	Timber Beam Superstructure	N/A	N/A
	Moment		
HS-20 / 3 / 36	Timber Beam Superstructure	N/A	N/A
	Moment		
3S2 / 5 / 40	Timber Beam Superstructure	N/A	N/A
	Moment		

Pedestrian / Trail Structure Typical Loads (if applicable based on access / deck width)

Type/Axles/Pounds	Controlling Member	**Inventory	Operating
	Controlling Stress (Moment, Shear, Service)	Pounds (X,XXX)	Pounds (X,XXX)
Point Load/1/Max	Timber Deck Planks	1260	1260
	Moment		
Pedestrian /s.f./ 85 psf or 90 psf *	Timber Beam Superstructure	91	91
	Moment		
H-5 / 2 / 10,000	Timber Beam Superstructure	6546	6546
	Moment		
H-10 / 2 / 20,000	Timber Beam Superstructure	N/A	N/A
	Moment		
Golf Cart / 2 / 2,000	Timber Beam Superstructure	6304	6304
	Moment		
Utility / 2 / 3,000	Timber Beam Superstructure	5201	5201
	Moment		

Enter Pedestrian / Trail Loading Values in pounds

* Pedestrian Load Note: The Design Load using LFD or ASD methods is 85 psf; design load using LRFD method is 90 psf.

City of Rockville Load Rating Summary Sheet (continued)

LOAD POSTING RECOMMENDED: Yes ☐ No ☒ ***Not applicable for Pedestrian Bridge***
Single Unit Truck: lbs. Combination Truck: lbs.

Bridge Information Used: None, Field Measurements ☒ Previous Load Rate Calcs ☐ Drawings ☒

Drawing and/or Previous Rating Details: Construction drawings were available and provided to indicate the dimensions, details, and field measurements for the structure. The structure was not previously load rated. This load rating analysis is based on approximate field measurements and guidance from AASHTO's Manual for Bridge Evaluation (MBE) regarding material property assumptions to use when specific information is not available.

Comments/Defects/Assumptions: Bridge No. PB-065 consists of a 15-span timber bridge with a timber plank deck bearing on timber stringers supported by timber pier caps bearing on round timber piles. The timber beam superstructure consists of five 2.5"x9.5" sawn lumber stringers.

As material type and properties were not available for the load rating of this timber structure, it was assumed that the bridge is built of Select Structural Grade Spruce-Pine-Fir. This is a reasonable, conservative assumption for a structure located in Maryland. In our analysis, the base bending and shear strengths for this material were multiplied by several modifying factors to account for the specific conditions and configuration of this structure. Where specific information was not available (such as the moisture content of the timber), the lowest reasonable value of the modifying factor was selected. Due to the conservative nature of this approach, it is possible that the capacity of the structure has been underestimated in this analysis. However, detailed material data would be required to refine these assumptions.

The clear space between the timber railings for this bridge is 9'-10". However, there are posts standing in the vehicular deck to prevent vehicular traffic from accessing the bridge. The bridge does not accommodate any Maryland legal trucks. Therefore, the structure was rated for a maximum point load placed at the center of the longest span, a distributed pedestrian load, a golf cart, utility vehicle, and H-5 truck. AASHTO standards indicate that timber pedestrian bridges should be designed for an 85 psf pedestrian distributed load. The results of our analysis indicate that the structure can only accommodate a 91 psf pedestrian load safely. Therefore, it is recommended that either the structure be replaced, loads be limited on the structure, or that material property information be obtained for the structure that would allow for a refinement of this load rating.

During the 2018 Bridge Inspection, the structure was observed to be in satisfactory condition (SI&A Item 59 = 6) with no signs of structural distress due to loading.

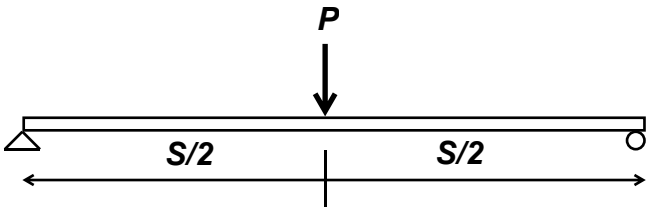
This load rating was developed in accordance with recommendations and guidance found in AASHTO's Manual for Bridge Evaluation (MBE).

PEDESTRIAN / TRAIL STRUCTURE DESIGN LOADS

CHECK BOX IF LOAD RATED

↓

Apply Maximum Point Load at Mid-span (worst case)



[X] ***Point Load at Mid-span***

[X] ***Pedestrian Load***

[ ] ***LRFR 90 psf***

[ ] ***LFR 85 psf***

[X] ***ASR 85 psf***

3.1—PEDESTRIAN LOADING (PL)

Pedestrian bridges shall be designed for a uniform pedestrian loading of 90 psf. This loading shall be patterned to produce the maximum load effects in accordance with *AASHTO LRFD* Article 3.4. Consideration of dynamic load allowance is not required with this loading.

LRFR use 90 psf
LFR use 85 psf
ASR use 85 psf

C3.1

The previous edition of these Guide Specifications used a base nominal loading of 85 psf, reducible to 65 psf based on influence area for the pedestrian load. With the LFD load factors, this results in factored loads of 2.17(85) = 184 psf and 2.17(65) = 141 psf. The Fourth Edition of *AASHTO LRFD* specified a constant 85 psf regardless of influence area. Multiplying by the load factor, this results in 1.75(85) = 149 psf. This falls within the range of the previous factored loading, albeit toward the lower end.

If vehicles are not prevented (blocked) by physical methods, pedestrian bridges shall be designed for a maintenance vehicle load specified in Figure 1 and Table 1 for the Strength I Load Combination unless otherwise specified by the Owner. A single truck shall be placed to produce the maximum load effects and shall not be placed in combinations with the pedestrian load. The dynamic load allowance need not be considered for this loading.

Deck clear width 7 to 10 feet?

[X] ***H-5 MAINTENANCE TRUCK***

(AASHTO 5 Tons = 10 KIPS)

Table 3.2-1—Design Vehicle

Clear Deck With	Design Vehicle
7 to 10 feet	H5
Over 10 feet	H10

Deck clear width over 10 feet?

[ ] ***H-10 MAINTENANCE TRUCK***

(AASHTO 10 Tons = 20 KIPS)

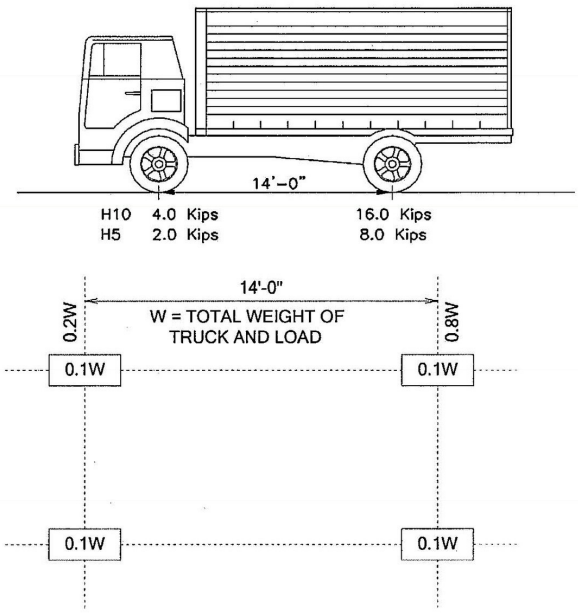


Figure 3.2-1—Maintenance Vehicle Configurations.

PEDESTRIAN / TRAIL STRUCTURE DESIGN LOADS

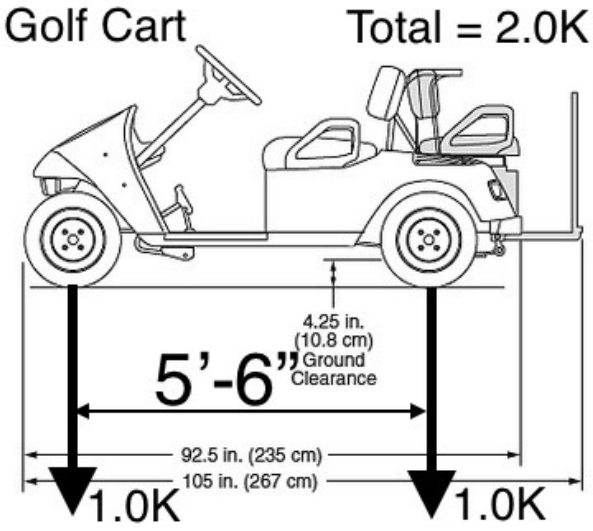
CHECK BOX IF LOAD RATED

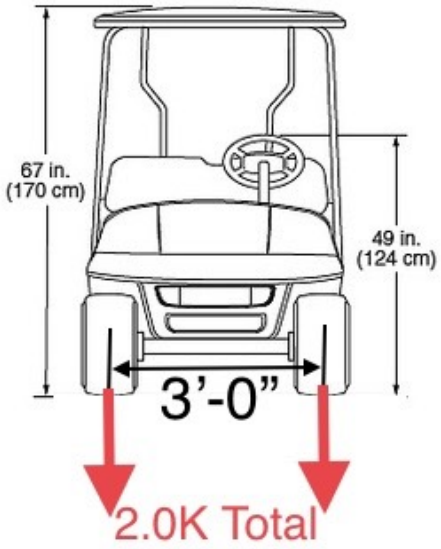
↓

Deck clear width over 4 feet?

[X] ***Golf Cart Load***

(1 Ton = 2.0 KIPS Total Load)

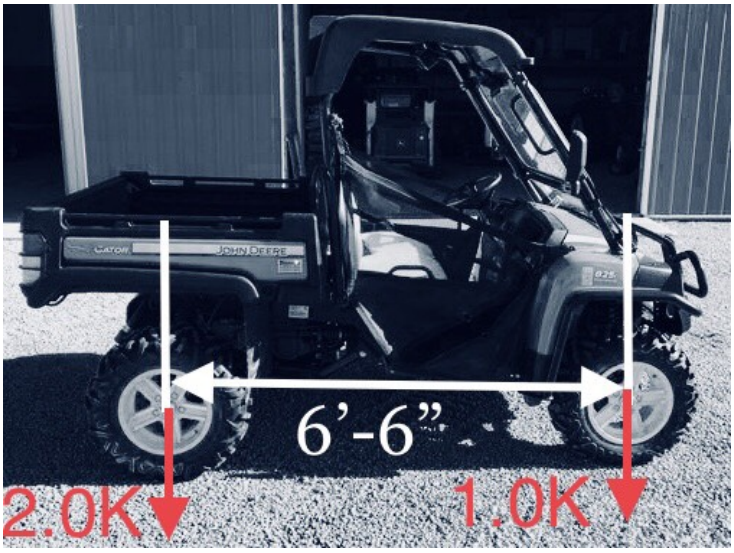




Deck clear width over 5 feet?

[X] ***UTILITY VEHICLE / GATOR***

(1.5 Tons = 3.0 KIPS Total Load)



Maryland SHA Vehicles for LOAD RATING

DESIGN VEHICLES: (Remember to Evaluate Lane Loading)

CHECK BOX IF LOAD RATED

↓

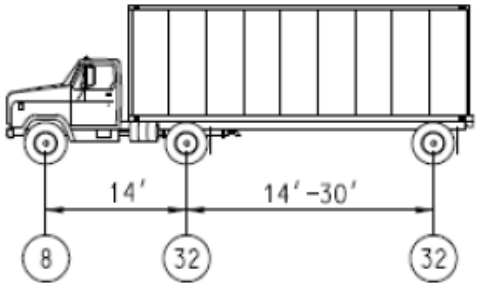
RATING VEHICLES

(All numbers in circles are axle loads in 1,000 lbs i.e. ⑧ – 8,000 lb axle load)

LRFR Design Vehicle (Non Permit Load rating):

Deck clear width over 10 feet?

☐ ***HL-93 (for LRFR only)***

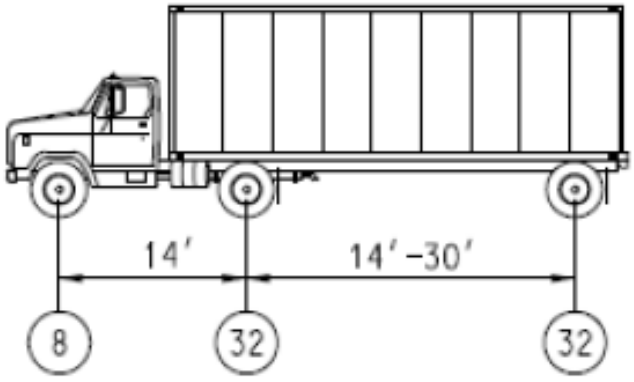


HL-93 (SIA Items 401 and 402)
72,000 pounds include AASHTO Lane Load and tandem where applicable
(If the LRFD method was used in the design of the structure)

Deck clear width over 10 feet?

☐ ***HS-20 TRUCK***

(for LFR and ASR)



HS-20 (items 409 and 410)
72,000 pounds
(Evaluation not required if HL-93 is rated)

AASHTO DEFINITIONS:

INVENTORY RATING: The Inventory rating level generally corresponds to the customary design level of stresses but reflects the existing bridge and material conditions with regard to deterioration and loss of section. Load ratings based on the Inventory level allow comparisons with the capacity for new structures and, therefore, results in a live load which can safely utilize an existing structure for an indefinite period of time.

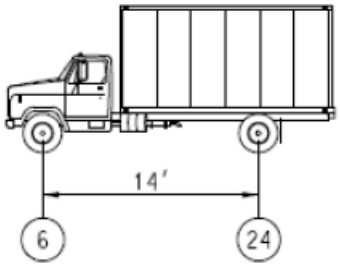
OPERATING RATING: Load ratings based on the Operating rating level generally describe the maximum permissible live load to which the structure may be subjected. Allowing unlimited numbers of vehicles to use the bridge at Operating level may shorten the life of the bridge.

CHECK BOX IF LOAD RATED

Maryland SHA Vehicles for LOAD RATING

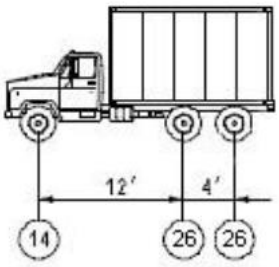
↓ **LEGAL VEHICLES:** ***Deck clear width over 10 feet?***

SINGLE UNIT TRUCKS:



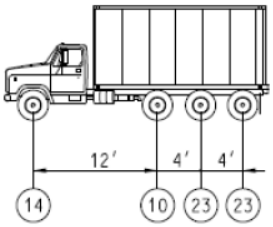
H-15 (SIA Items 403 and 404)
30,000 pounds

☐ ***H-15 SU TRUCK***



Type 3 (SIA Items 405 and 406)
66,000 pounds

☐ ***MD TYPE 3 SU TRUCK***

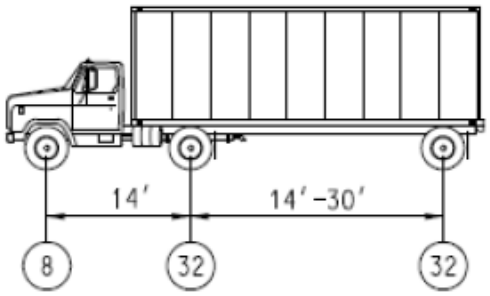


Type 4 – Reduced Lift Axle (10 kips maximum on lift) (SIA Items 407 and 408)
70,000 pounds

☐ ***MD TYPE 4 SU TRUCK***

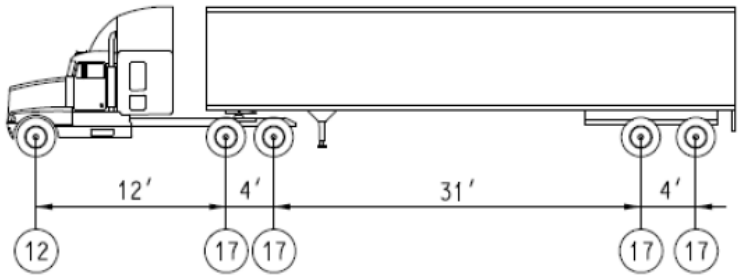
COMBINATION TRUCKS:

Deck clear width over 10 feet?



HS-20 (items 409 and 410)
72,000 pounds
(Evaluation not required if HL-93 is rated)

☐ ***HS-20 AASHTO COMBINATION TRUCK***



3S2 (SIA Items 411 and 412)
80,000 pounds

☐ ***MD TYPE 3S2 SEMI-TRUCK (COMBINATION)***

↑

CHECK BOX IF LOAD RATED

Structure Rated: PB-065 Dawson Farm Park over Tributary to Cabin John Creek

Bridge Geometry:

15 span timber bridge with simply supported square girders.

Overall Length:	145	ft
Span Length:	11	ft
Deck Width:	10.08	ft
Deck Plank Width:	7.5	in
Deck Plank Depth:	2.5	in
Deck Plank Moment of Inertia:	9.77	in^4
Clear Path Width:	9.83	ft
Beam Depth:	9.5	in
Beam Width:	2.5	in
Beam Moment of Inertia:	178.62	in^4

Material: Assume Select Structural Grade Spruce-Pine-Fir

Superimposed Dead Loads:

Load Name	Unit Weight (pcf)	Distributed Load (plf)	
Timber Deck	50	6.51	along deck span
Timber Deck	50	26.26	along beams span
Timber Superstructure	50	8.25	one beam

Deck Bending Moment due to Dead Loads:

M_{dead} =	4.21	lb-ft
$F_{b,dead}$ =	6.47	psi

Deck Shear due to Dead Loads:

V_{dead} =	9.72	lbs
$F_{b,dead}$ =	0.78	psi

Superstructure Bending Moment due to Dead Loads:

M_{dead} =	323.31	lb-ft
$F_{b,dead}$ =	103.17	psi

Superstructure Shear due to Dead Loads:

V_{dead} =	146.96	lbs
$F_{b,dead}$ =	9.28	psi

Deck Design Capacity:

Bending Moment Capacity:

$$F'_b = F_b C_F C_r C_i C_D C_M C_t C_{fu} C_L$$

Coefficient	Value	Source
C_F	1.2	NDS Supp. Tables 4A, 4B, and 4F
C_r	1.15	NDS Sec. 4.3.9
C_i	1	NDS Sec. 4.3.8
C_D	0.9	NDS Table 2.3.2
C_M	0.85	NDS Supp. Tables 4A-F
C_t	1	NDS Table 2.3.3
C_{fu}	1.15	NDS Sec. 4.3.7
C_L	1	NDS Sec. 3.3.3

F_b = 1250 psi (NDS Supp. Table 4A)

F'_b = 1517.57 psi

Shear Capacity:

$$F'_v = F_v C_i C_D C_M C_t$$

Coefficient	Value	Source
C_i	1	NDS Sec. 4.3.8
C_D	0.9	NDS Table 2.3.2
C_M	0.97	NDS Supp. Tables 4A-F
C_t	1	NDS Table 2.3.3

F_b = 135 psi (NDS Supp. Table 4A)

F'_b = 117.86 psi

Superstructure Design Capacity:

Bending Moment Capacity:

$$F'_b = F_b C_F C_r C_i C_D C_M C_t C_{fu} C_L$$

Coefficient	Value	Source
C_F	1.1	NDS Supp. Tables 4A, 4B, and 4F
C_r	1.15	NDS Sec. 4.3.9
C_i	1	NDS Sec. 4.3.8
C_D	0.9	NDS Table 2.3.2
C_M	0.85	NDS Supp. Tables 4A-F
C_t	1	NDS Table 2.3.3
C_{fu}	1	NDS Sec. 4.3.7
C_L	1	NDS Sec. 3.3.3

F_b = 1250 psi (NDS Supp. Table 4A)

F'_b = 1209.66 psi

Shear Capacity:

$$F'_v = F_v C_i C_D C_M C_t$$

Coefficient	Value	Source
C_i	1	NDS Sec. 4.3.8
C_D	0.9	NDS Table 2.3.2
C_M	0.97	NDS Supp. Tables 4A-F
C_t	1	NDS Table 2.3.3

F_b = 135 psi (NDS Supp. Table 4A)

F'_b = 117.855 psi

Pedestrian Live Loads:

Uniform Distributed Load:

1 psf

Deck Bending Moment due to Distributed Pedestrian Load:

M_{ped} = 4.85 lb-in

$F_{b,ped}$ = 0.62 psi

Deck Shear due to Distributed Pedestrian Load:

V_{ped} = 3.73 lb

$F_{b,ped}$ = 0.30 psi

Beam Bending Moment due to Distributed Pedestrian Load:

M_{ped} =	453.75	lb-in
$F_{b,ped}$ =	12.07	psi

Beam Shear due to Distributed Pedestrian Load:

V_{ped} =	13.75	lb
$F_{b,ped}$ =	0.87	psi

Point Load: 1 lb

Deck Bending Moment due to Pedestrian Point Load:

M_{ped} =	5.90	lb-in
$F_{b,ped}$ =	0.76	psi

Deck Shear due to Pedestrian Point Load:

V_{ped} =	0.50	lb
$F_{b,ped}$ =	0.04	psi

Beam Bending Moment due to Pedestrian Point Load:

M_{ped} =	33.00	lb-in
$F_{b,ped}$ =	0.88	psi

Beam Shear due to Pedestrian Point Load:

V_{ped} =	0.50	lb
$F_{b,ped}$ =	0.032	psi

Vehicle Live Loads:

Golf Cart:

Deck Bending Moment due to Golf Cart:

M_{GC} =	200.00	lb-ft
$F_{b,GC}$ =	307.20	psi

Deck Shear due to Golf Cart:

V_{GC} =	400.00	lb
$F_{b,GC}$ =	21.33	psi

Beam Bending Moment due to Golf Cart:

M_{ped} =	13200.00	lb-in
$F_{b,ped}$ =	351.02	psi

Beam Shear due to Golf Cart:

V_{ped} =	400.00	lb
$F_{b,ped}$ =	25.263	psi

Utility Vehicle:

Deck Bending Moment due to Utility Vehicle:

M_{GC} =	400.00	lb-ft
$F_{b,GC}$ =	614.40	psi

Deck Shear due to Utility Vehicle:

V_{GC} =	800.00	lb
$F_{b,GC}$ =	42.67	psi

Beam Bending Moment due to Utility Vehicle:

M_{ped} =	24000.00	lb-in
$F_{b,ped}$ =	638.23	psi

Beam Shear due to Utility Vehicle:

V_{ped} =	836.36	lb
$F_{b,ped}$ =	52.823	psi

H-5 Truck:

Deck Bending Moment due to H-5 Truck:

M_{H-5} =	1502.73	lb-ft
$F_{b,H-5}$ =	2308.20	psi

Deck Shear due to H-5 Truck:

V_{H-5} =	819.67	lb
$F_{b,H-5}$ =	43.72	psi

Beam Bending Moment due to H-5 Truck:

M_{H-5} =	27049.18	lb-in
$F_{b,H-5}$ =	719.31	psi

Beam Shear due to H-5 Truck:

V_{H-5} =	409.84	lb
$F_{b,H-5}$ =	25.884	psi

Deck Load Ratings:

Load Type	Allow Bending Stress - DL Bending Stress (psi)	LL Bending Stress (psi)	Moment Factor
Distributed	1511.10	0.62	2434.21
Point	1511.10	0.76	2000.93
Golf Cart	1511.10	307.20	4.92
Utility Vehicle	1511.10	614.40	2.46
H-5 Truck	1511.10	2308.20	0.65

Load Type	Allow Shear Stress - DL Shear Stress (psi)	LL Shear Stress (psi)	Shear Factor
Distributed	117.08	0.30	392.20
Point	117.08	0.04	2926.94
Golf Cart	117.08	21.33	5.49
Utility Vehicle	117.08	42.67	2.74
H-5 Truck	117.08	43.72	2.68

Load Type	Moment Load Rating	Shear Load Rating	Deck Load Rating	
Distributed	2434.21	392.20	**392.20**	**psf**
Point	2000.93	2926.94	**2000.93**	**lb**
Golf Cart	9837.91	10976.03	**9837.91**	**lb**
Utility Vehicle	7378.43	8232.02	**7378.43**	**lb**
H-5 Truck	6546.68	26781.51	**6546.68**	**lb**

Superstructure Load Ratings:

Load Type	Allow Bending Stress - DL Bending Stress (psi)	LL Bending Stress (psi)	Moment Factor
Distributed	1106.48	12.07	91.70
Point	1106.48	0.88	1260.86
Golf Cart	1106.48	351.02	3.15
Utility Vehicle	1106.48	638.23	1.73
H-5 Truck	1106.48	719.31	1.54

Load Type	Allow Shear Stress - DL Shear Stress (psi)	LL Shear Stress (psi)	Shear Factor
Distributed	108.57	0.87	125.02
Point	108.57	0.03	3438.16
Golf Cart	108.57	25.26	4.30
Utility Vehicle	108.57	52.82	2.06
H-5 Truck	108.57	25.88	4.19

Load Type	Moment Load Rating	Shear Load Rating	Load Rating	
Distributed	91.70	125.02	**91.70**	**psf**
Point	1260.86	3438.16	**1260.86**	**lb**
Golf Cart	6304.30	8595.39	**6304.30**	**lb**
Utility Vehicle	5201.05	6166.26	**5201.05**	**lb**
H-5 Truck	15382.50	41945.51	**15382.50**	**lb**

Load Rating Summary:

Load	Load Rating	Load Rating Factor	Controlling Member
85 PSF Pedestrian Load	91.70	1.08	Beams (Moment)
Point Load (lb)	1260.86	1.26	Beams (Moment)
Golf Cart (lb)	6304.30	3.15	Beams (Moment)
Utility Vehicle (lb)	5201.05	1.73	Beams (Moment)
H-5 Truck (lb)	6546.68	0.65	Deck (Moment)

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