Appendix D

Structural Design Memorandum and Cross Sections

SARGENT

September 15, 2023

DRAFT

WARREN AVENUE BRIDGE
SIDEWALK WIDENING ALTERNATIVE STUDY

INTRODUCTION

The Warren Avenue Bridge is a 1,721-foot long bridge over the Port Washington Narrows in Bremerton, Washington. It is composed of three types of construction: cast-in-place reinforced concrete tee girders, cast-in-place reinforced concrete box girders, and steel girders. From south to north, there is one span of reinforced concrete tee girder, three spans of reinforced concrete box girder, three spans of steel girders, three spans of reinforced concrete box girders, and five spans of reinforced concrete tee girders.

The bridge is part of State Route 303 and carries four lanes of traffic with small shoulders and two sidewalks. The sidewalks are less than four feet wide. The purpose of this study is to determine how wider sidewalks could be added to the bridge.

SCOPE OF STUDY

The scope of this study includes:

> The Consultant will prepare conceptual framing designs to support alternatives for bridge structure improvements. The bridge improvement concepts will be evaluated to determine if seismic retrofit or live load rating reduction thresholds will be exceeded. Conceptual structural cross sections will be prepared showing how the concepts would be configured across the three different span types of the Warren Avenue Bridge (concrete tee beam, concrete box girder, and steel plate girder). Planning level cost estimates for the bridge improvements will be developed, and the results of the structural feasibility study will be summarized in a brief technical memo.

WSDOT REQUIREMENTS

The Washington Department of Transportation (WSDOT) prepared the following requirements in placing a wider sidewalk on the bridge in an email from Richard Zeldenrust (December 22, 2021):

1. *Allowable Materials for Sidewalk Widening*
   WSDOT would consider the use of FRP products for the sidewalks, in order to save weight. This is with the understanding that vehicles (Sweepers, UBIT Trucks, Emergency Vehicles) would not be allowed on the sidewalks. In the interest of avoiding corrosion in this marine environment due to dissimilar metals, WSDOT would not allow use of aluminum support or decking elements. I cannot speak to the potential for impacts regarding historical appearance.

2. *Allowable Weight Increase (Load Rating)*
   The bridge is over 60 years old, and will need remedial steel and concrete work in the not-too-distant future. WSDOT posts bridges when Operating Load Rating Factors for Legal Loads fall below 1.0. WSDOT will need to retain a safety margin with the Operating Load Rating Factors, so that slight degradation (or added weight due to future repair) will not result in posting of the bridge. WSDOT considers 10% to be a reasonable safety margin requirement. Operating Load Rating Factors for Legal Loads will need to remain at 1.10 or greater.

3. *Classification of Bridge*
   This bridge is not on a lifeline highway, as currently defined. The bridge is over 60 years old. There is another (modern) bridge over the same waterway about one mile away. WSDOT would classify the Warren Avenue Bridge as "Ordinary".

4. *Access to Previous Seismic Retrofit Calculations*
   The seismic retrofit on this project was designed almost 30 years ago, by a Consulting Firm that no longer exists. I am not sure if the calculations exist or are retrievable. This would require a search through WSDOT Archives. I am not aware of any more recent seismic analysis for this bridge.

5. *Steel Spans; Existing Lightweight Concrete Deck Condition*
   As stated in the attachment, the deck is degrading, and is classified as "Fair" with about 1% of deck area currently repaired or requiring repair. Classification moves from "Fair" to "Poor" at the 2% level. This deck is currently Priority #79 in the 10 Year Plan, with a projected "Poor" condition year of 2030. See attached Bridge Asset Form. It is likely that expansion joint work would happen concurrently with deck repair/overlay removal & replacement work.

6. *Steel Spans; Existing Paint Condition*
   Attached is a Steel Bridge Paint Form for the Warren Avenue structure. Age of current paint is 17 years. To my knowledge, no painting project is currently programmed in Olympic Region for this bridge.

7. *Deck Drainage System*
   To my knowledge, no project is currently programmed in Olympic Region to restore the deck drainage system on this bridge.

Note on UBIT Trucks:

Aspen supplies UBIT Trucks for WSDOT. Aspen started manufacturing a new Truck type, the A-62T, about three years ago. This truck has a telescoping Boom #1 that would allow reaching out over a sidewalk up to about 17 feet. Aspen has sold about a dozen of these trucks nationwide in the last three years. I do not know where these trucks are located.

- *Purchase Price: Roughly $900,000.00*
- *Yearly maintenance cost: Up to $50K per year for the first five years, and then up to $100K per year for the next five years.*
- *Mandatory Overhaul/Refurbishment by ASPEN factory at 10 years. Cost unknown.*
- *Most trucks are refurbished once at 10 years, but few trucks last long enough to be refurbished again at 20 years. This is due to the truck chassis wearing out from high mileages, and parts for the older trucks becoming more difficult/expensive/slow to obtain.*

WSDOT currently owns and operates two A-62's (non-telescoping Boom #1, with about 11' max reach over a sidewalk), with no needs (or budget) to acquire any more.

The WSDOT Bridge Design Manual (Section 4.3) gives requirements for bridge widening projects. If the widening does not modify the substructure and the added weight of the superstructure is less than 10-percent of the existing weight, then a seismic evaluation and retrofit are not required.

AVAILABLE CAPACITY BASED ON LOAD CARRYING ABILITY

The load rating for each span type was adjusted by adding weight to the bridge until the load rating for the legal loads was a minimum of 1.10. The added weight that can be placed on each span type is:

Span Type	Added Weight
Reinforced Concrete Tee Beam	2,770 pounds per foot
Reinforced Concrete Box Girder	8,570 pounds per foot
Steel Girder	4,210 pounds per foot

AVAILABLE CAPACITY BASED ON SEISMIC RETROFIT LIMITATION

It is not desirable to seismically evaluate or retrofit the bridge. The previous retrofit tied the pieces of the bridge together. However, the columns and other vulnerable elements of the bridge were not retrofitted. If we were to retrofit these other elements, it would be very costly. Therefore, the project will need to limit the added weight to 10-percent of the existing weight of the bridge superstructure. The permissible added weight based on this criterion is:

Span Type	Added Weight
Reinforced Concrete Tee Beam	1,340 pounds per foot
Reinforced Concrete Box Girder	1,810 pounds per foot
Steel Girder	774 pounds per foot

The 774 pounds per foot for the steel spans controls the permitted added weight for the sidewalks.

ALTERNATIVES

Eleven alternatives were developed for adding wider sidewalks. They include:

Alternative 1: An eight-foot sidewalk on each side of the bridge.
Alternative 2: A 10-foot sidewalk on each side of the bridge.
Alternative 3: A 12-foot sidewalk on each side of the bridge.
Alternative 4a: A 16-foot sidewalk on the west side of the bridge.
Alternative 4b: A 16-foot sidewalk on the east side of the bridge.
Alternative 5: A 14-foot sidewalk on both sides of the bridge.
Alternative 6: An at-grade bike lane with a six-foot sidewalk on each side of the bridge.
Alternative 7: A 12-foot sidewalk on the east side of the bridge, five-foot sidewalk on the west side.
Alternative 7a: A 12-foot sidewalk on the east side of the bridge.
Alternative 8: A 14-foot sidewalk on the east side of the bridge, five-foot sidewalk on the west side.
Alternative 8a: A 14-foot sidewalk on the east side of the bridge.

Of these alternatives, framing layouts were developed for Alternative 1, Alternative 2, Alternative 3, Alternative 4a, Alternative 4b, Alternative 7, Alternative 7a, Alternative 8, and Alternative 8a to study the potential widening schemes for the bridge.

ALTERNATIVE 1

Alternative 1 places an eight-foot sidewalk on each side of the bridge. Up to four 16-foot wide lookouts are installed to allow for gathering areas along the railing. The lookouts are about 24-feet long. In order to meet the added weight limitation, the alternative is constructed as follows:

- The existing sidewalk panels, center curb, and barriers are removed.
- A lightweight concrete center barrier is attached to the deck.
- A lightweight concrete barrier is constructed at each edge of the traveled way.
- Beams are mounted under the tee girder and box girder spans to support the wider deck.
- Columns are set on the beams to support a new longitudinal beam.
- Diagonal braces are installed on the steel girder span.
- A longitudinal beam is installed to support the edge of the deck.
- Sidewalk decking is installed over the new steel framing and supported from the existing bridge deck. The sidewalk decking is composed of steel or FRP decking.
- New baluster-type pedestrian barriers are installed along the edges of the new sidewalks.

The attached figure shows the details of construction. The construction cost will be approximately $9.9M for modification of the bridge. This does not include mobilization, contingency, engineering or construction administration costs, which are included in the overall project cost estimate being prepared by SCJ Alliance.

This alternative allows for WSDOT to access the bridge with their current under bridge inspection trucks, and is light enough that it does not trigger seismic retrofit or truck weight restrictions.

ALTERNATIVE 2

Alternative 2 places a 10-foot sidewalk on each side of the bridge. Up to four 16-foot wide lookouts are installed to allow for gathering areas along the railing. The lookouts are about 24-feet long. In order to meet the added weight limitation, the alternative is constructed as follows:

- The existing sidewalk panels, center curb, and barriers are removed.
- A lightweight concrete center barrier is attached to the deck.
- A lightweight concrete barrier is constructed at each edge of the traveled way.
- Beams are mounted under the tee girder and box girder spans to support the wider deck.
- Columns are set on the beams to support a new longitudinal beam.
- Diagonal braces are installed on the steel girder span.
- A longitudinal beam is installed to support the edge of the deck.
- Sidewalk decking is installed over the new steel framing and supported from the existing bridge deck. The sidewalk decking is composed of steel or FRP decking.

- New baluster-type pedestrian barriers are installed along the edges of the new sidewalks.

The attached figure shows the details of construction. The construction cost will be approximately $11.0M for modification of the bridge. This does not include mobilization, contingency, engineering or construction administration costs, which are included in the overall project cost estimate being prepared by SCJ Alliance.

This alternative allows for WSDOT to access the bridge with their current under bridge inspection trucks, and is light enough that it does not trigger seismic retrofit or truck weight restrictions.

ALTERNATIVE 3

Alternative 3 places a 12-foot sidewalk on each side of the bridge. In order to meet the added weight limitations, the alternative is constructed as follows:

- The existing sidewalk panels, center curb, and barriers are removed.
- A lightweight concrete center barrier is attached to the deck.
- A lightweight concrete barrier is constructed at each edge of the traveled way.
- Beams are mounted under the tee girder and box girder spans to support the wider deck.
- Columns are set on the beams to support a new longitudinal beam.
- Diagonal braces are installed on the steel girder span.
- A longitudinal beam is installed to support the edge of the deck.
- Sidewalk decking is installed over the new steel framing and supported from the existing bridge deck. The sidewalk decking is composed of steel or FRP decking.
- New baluster-type pedestrian barriers are installed along the edges of the new sidewalks.

The attached figure shows the details of construction. The construction cost will be approximately $12.2M for modification of the bridge. This does not include mobilization, contingency, engineering or construction administration costs, which are included in the overall project cost estimate being prepared by SCJ Alliance.

This alternative does not allow for WSDOT to access the bridge with their current under bridge inspection trucks. However, this alternative could be accessed with an Aspen A62T under bridge inspection truck. This alternative is light enough that it does not trigger seismic retrofit or truck weight restrictions.

ALTERNATIVES 4A AND 4B

Alternatives 4a and 4b place a 16-foot sidewalk on one side of the bridge (4a - west side, 4b - east side). In order to meet the added weight limitations, the alternatives are constructed as follows:

- The existing center curb and one side of sidewalk panels and barriers are removed.
- A lightweight concrete center barrier is attached to the deck.
- A lightweight concrete barrier is constructed at the edge of the traveled way on the widened side of the bridge.
- Beams are mounted under the tee girder and box girder spans to support the wider deck.

- Columns are set on the beams to support a new longitudinal beam.
- Diagonal braces are installed on the steel girder span.
- A longitudinal beam is installed to support the edge of the deck.
- Sidewalk decking is installed over the new steel framing and supported from the existing bridge deck. The sidewalk decking is composed of steel or FRP decking.
- A new baluster-type pedestrian barrier is installed along the edge of the new sidewalk.

The attached figures show the details of construction. There is currently no under bridge inspection truck that will reach over this width of sidewalk. These alternatives are light enough that they do not trigger seismic retrofit or truck weight restrictions.

ALTERNATIVE 5

Alternative 5 places a 14-foot sidewalk on each side of the bridge. This alternative exceeds the weight limitation for triggering seismic retrofit, so no framing figure or cost estimate was developed for this alternative.

ALTERNATIVE 6

Alternative 6 widens the vehicular travelway to add a 6-foot bike lane on each side, and adds a 6-foot sidewalk on each side of the bridge. Because the bike lanes are included with the vehicular travelway, the framing to support the bike lanes would need to be capable of supporting full vehicular loading. Because of this, Alternative 6 exceeds the weight limitation for triggering seismic retrofit, so no framing figure or cost estimate was developed for this alternative.

ALTERNATIVE 7

Alternative 7 places a 12-foot sidewalk on the east side of the bridge, and modifies the existing barrier and sidewalk on the west side of the bridge to provide a 5-foot sidewalk width. In order to meet the added weight limitations, the alternative is constructed as follows:

- The existing center curb and east-side sidewalk panels and barriers are removed.
- The existing concrete barrier on the west sidewalk is removed.
- The existing west-side sidewalk panels are repaired and resurfaced.
- A lightweight concrete center barrier is attached to the deck.
- A lightweight concrete barrier is constructed at each edge of the traveled way.
- Beams are mounted under the tee girder and box girder spans to support the wider deck.
- Columns are set on the beams to support a new longitudinal beam.
- Diagonal braces are installed on the steel girder span.
- A longitudinal beam is installed to support the edge of the deck.
- Sidewalk decking is installed over the new steel framing and supported from the existing bridge deck. The sidewalk decking is composed of steel or FRP decking.
- A new baluster-type pedestrian barrier is installed along the edge of the new sidewalk.

The attached figure shows the details of construction. The construction cost will be approximately $9.2M for modification of the bridge. This does not include mobilization, contingency, engineering or construction administration costs, which are included in the overall project cost estimate being prepared by SCJ Alliance.

This alternative does not allow for WSDOT to access the bridge with their current under bridge inspection trucks. However, this alternative could be accessed with an Aspen A62T under bridge inspection truck. This alternative is light enough that it does not trigger seismic retrofit or truck weight restrictions.

ALTERNATIVE 7A

Alternative 7a places a 12-foot sidewalk on the east side of the bridge. In order to meet the added weight limitations, the alternative is constructed as follows:

- The existing center curb and east-side sidewalk panels and barriers are removed.
- A lightweight concrete center barrier is attached to the deck.
- A lightweight concrete barrier is constructed at the east edge of the traveled way.
- Beams are mounted under the tee girder and box girder spans to support the wider deck.
- Columns are set on the beams to support a new longitudinal beam.
- Diagonal braces are installed on the steel girder span.
- A longitudinal beam is installed to support the edge of the deck.
- Sidewalk decking is installed over the new steel framing and supported from the existing bridge deck. The sidewalk decking is composed of steel or FRP decking.
- A new baluster-type pedestrian barrier is installed along the edge of the new sidewalk.

The attached figure shows the details of construction. The construction cost will be approximately $6.4M for modification of the bridge. This does not include mobilization, contingency, engineering or construction administration costs, which are included in the overall project cost estimate being prepared by SCJ Alliance.

This alternative does not allow for WSDOT to access the bridge with their current under bridge inspection trucks. However, this alternative could be accessed with an Aspen A62T under bridge inspection truck. This alternative is light enough that it does not trigger seismic retrofit or truck weight restrictions.

ALTERNATIVE 8

Alternative 8 places a 14-foot sidewalk on the east side of the bridge, and modifies the existing barrier and sidewalk on the west side of the bridge to provide a 5-foot sidewalk width. In order to meet the added weight limitations, the alternative is constructed as follows:

- The existing center curb and east-side sidewalk panels and barriers are removed.
- The existing concrete barrier on the west sidewalk is removed.
- The existing west-side sidewalk panels are repaired and resurfaced.
- A lightweight concrete center barrier is attached to the deck.
- A lightweight concrete barrier is constructed at each edge of the traveled way.

- Beams are mounted under the tee girder and box girder spans to support the wider deck.
- Columns are set on the beams to support a new longitudinal beam.
- Diagonal braces are installed on the steel girder span.
- A longitudinal beam is installed to support the edge of the deck.
- Sidewalk decking is installed over the new steel framing and supported from the existing bridge deck. The sidewalk decking is composed of steel or FRP decking.
- A new baluster-type pedestrian barrier is installed along the edge of the new sidewalk.

The attached figure shows the details of construction. The construction cost will be approximately $10.5M for modification of the bridge. This does not include mobilization, contingency, engineering or construction administration costs, which are included in the overall project cost estimate being prepared by SCJ Alliance.

This alternative does not allow for WSDOT to access the bridge with their current under bridge inspection trucks. However, this alternative could be accessed with an Aspen A62T under bridge inspection truck. This alternative is light enough that it does not trigger seismic retrofit or truck weight restrictions.

ALTERNATIVE 8A

Alternative 8a places a 14-foot sidewalk on the east side of the bridge. In order to meet the added weight limitations, the alternative is constructed as follows:

- The existing center curb and east-side sidewalk panels and barriers are removed.
- A lightweight concrete center barrier is attached to the deck.
- A lightweight concrete barrier is constructed at the east edge of the traveled way.
- Beams are mounted under the tee girder and box girder spans to support the wider deck.
- Columns are set on the beams to support a new longitudinal beam.
- Diagonal braces are installed on the steel girder span.
- A longitudinal beam is installed to support the edge of the deck.
- Sidewalk decking is installed over the new steel framing and supported from the existing bridge deck. The sidewalk decking is composed of steel or FRP decking.
- A new baluster-type pedestrian barrier is installed along the edge of the new sidewalk.

The attached figure shows the details of construction. The construction cost will be approximately $7.7M for modification of the bridge. This does not include mobilization, contingency, engineering or construction administration costs, which are included in the overall project cost estimate being prepared by SCJ Alliance.

This alternative does not allow for WSDOT to access the bridge with their current under bridge inspection trucks. However, this alternative could be accessed with an Aspen A62T under bridge inspection truck. This alternative is light enough that it does not trigger seismic retrofit or truck weight restrictions.

CONCLUSION

The following conclusions can be derived from this study:

- Sidewalk widths up to 12-feet can be added to both sides of the bridge without exceeding weight limitations.
- Sidewalk widths greater than 12-feet can only be added to one side of the bridge without exceeding added weight limitations.
- A sidewalk more than 10-feet wide on one or both sides of the bridge will preclude the use of WSDOT's current under bridge inspection trucks for access of the bridge.
- A sidewalk more than 14-feet wide on one or both sides of the bridge will preclude the use of an under bridge inspection truck to access the bridge.
- All alternatives will require the use of a steel or fiber reinforced polymer deck to meet weight limitations. The deck will be coated with a paint and grit to provide skid resistance.
- Steel framing will support the sidewalk decking. The steel framing on the steel spans will be braces supported on the existing steel girders. The steel framing on the concrete spans will be steel beams attached to the bottom of the girders.
- All new concrete barriers on the bridge will need to be constructed out of lightweight concrete to meet weight limitations.

SARGENT

September 15, 2023

WSDOT CORRESPONDENCE: BRIDGE DESIGN PARAMETERS

SARGENT

Jessica Soward <jessicas@sargentengineers.com>

RE: Warren Ave Bridge - Design Parameters

Zeldenrust, Richard <ZeldenR@wsdot.wa.gov> Wed, Dec 22, 2021 at 2:03 PM
To: Aaron Knight <aaron.knight@scjalliance.com>, "Larson, Andy" <LarsonA@wsdot.wa.gov>, "Rochon, Mathew" <RochonM@wsdot.wa.gov>, "vicki.grover@ci.bremerton.wa.us" <vicki.grover@ci.bremerton.wa.us>, Jessica Soward <jessicas@sargentengineers.com>
Cc: "Al-Salman, Mohamad" <AlSalM@wsdot.wa.gov>, "Rochon, Mathew" <RochonM@wsdot.wa.gov>

All,

I will attempt to address the structural questions described in the Bridge Meeting Minutes attachment above, in the same order.

1. Allowable Materials for Sidewalk Widening
    a. WSDOT would consider the use of FRP products for the sidewalks, in order to save weight. This is with the understanding that vehicles (Sweepers, UBIT Trucks, Emergency Vehicles) would not be allowed on the sidewalks. In the interest of avoiding corrosion in this marine environment due to dissimilar metals, WSDOT would not allow use of aluminum support or decking elements. I cannot speak to the potential for impacts regarding historical appearance.

2. Allowable Weight Increase (Load Rating)
    a. The bridge is over 60 years old, and will need remedial steel and concrete work in the not-too-distant future. WSDOT posts bridges when Operating Load Rating Factors for Legal Loads fall below 1.0. WSDOT will need to retain a safety margin with the Operating Load Rating Factors, so that slight degradation (or added weight due to future repair) will not result in posting of the bridge. WSDOT considers 10% to be a reasonable safety margin requirement. Operating Load Rating Factors for Legal Loads will need to remain at 1.10 or greater.

3. Classification of Bridge
    a. This bridge is not on a lifeline highway, as currently-defined. The bridge is over 60 years old. There is another (modern) bridge over the same waterway about 1 mile away. WSDOT would classify the Warren Avenue bridge as “Ordinary”.

4. Access to Previous Seismic Retrofit Calculations
    a. The seismic retrofit on this project was designed almost 30 years ago, by a Consulting Firm that no longer exists. I am not sure if the calculations exist or are retrievable. This would require a search through WSDOT Archives. I am not aware of any more recent seismic analysis for this bridge.

5. Steel Spans; Existing Lightweight Concrete Deck Condition
    a. As stated in the attachment, the deck is degrading, and is classified as “Fair” with about 1% of deck area currently repaired or requiring repair. Classification moves from “Fair” to “Poor” at the 2% level. This deck is currently Priority #79 in the 10 Year Plan, with a projected “Poor” condition year of 2030. See attached Bridge Asset Form. It is likely that expansion joint work would happen concurrently with deck repair/overlay removal & replacement work.

6. Steel Spans; Existing Paint Condition
    a. Attached is a Steel Bridge Paint Form for the Warren Avenue structure. Age of current paint is 17 years. To my knowledge, no painting project is currently programmed in Olympic Region for this bridge.

7. Deck Drainage System
    a. To my knowledge, no project is currently programmed in Olympic Region to restore the deck drainage system on this bridge.

Note on UBIT Trucks:

Aspen supplies UBIT Trucks for WSDOT. Aspen started manufacturing a new Truck type, the A-62T, about three years ago. This truck has a telescoping Boom #1 that would allow reaching out over a sidewalk up to about 17 feet. Aspen has sold about a dozen of these trucks nationwide in the last three years. I do not know where these trucks are located.

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Richard Zeldenrust P.E. S.E.

Structural Design Unit Supervisor

WSDOT Bridge and Structures Office

7345 Linderson Way SW

Tumwater, WA 98501

Desk: 360.705.7196

From: Aaron Knight <aaron.knight@scjalliance.com>
Sent: Friday, December 17, 2021 3:52 PM
To: Larson, Andy <LarsonA@wsdot.wa.gov>; Zeldenrust, Richard <ZeldenR@wsdot.wa.gov>; Rochon, Mathew <RochonM@wsdot.wa.gov>; vicki.grover@ci.bremerton.wa.us; Jessica Soward <jessicas@sargentengineers.com>
Subject: [EXTERNAL] RE: Warren Ave Bridge - Design Parameters

Good Afternoon,

[Quoted text hidden]

3 attachments

2021-1214 Warren Ave_WSDOT Bridge_Meeting Minutes.pdf
684K

303_12 Bridge Asset Form 2-16-2021.pdf
986K

303_12 Bridge Painting Form 9-21-2021.pdf
3524K

Steel Bridge Paint Form

Structure ID:	Bridge No:	Bridge Name:	Milepost:	Region:
0005565A	303/12	PORT WASHINGTON CS1840	0.73	OL

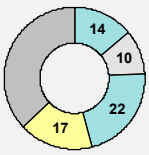
Year Built	Bridge Type:	Steel Span Length:	Width (curb-curb):	Steel Tonnage:	Paint Color: 26307
1958	SG CBOX CTB	606 ft.	54 ft.	1,032	Light Gray

Paint Age:	Steel Surf. Area:	Element ID	Total Qty	CS1	CS2	CS3	CS4
17	113,520 SF	902	113,520	103,020	0	4,000	6,500

Next Paint Year:	OK/Due/Past Due	CPMS Ad date:	Paint Pin Number:	Future $/SF	Future Paint Cost:
	Past Due			$65	$7,378,800

Current Year	Years	Cycle
	2021	17
	2004	22
	1982	10
	1972	14
	1958	

Painting Cycle



= Current Paint Age

There were approximately four to six 100 ft+ sections of the bottom flanges that had rusting due to the salt water and guano from birds.

Contract 6496 was awarded on February 24, 2003 and completed in 2004. The Project Office and Region Biologist had a meeting with a US Fish and Wildlife rep to discuss the Comorant birds on the bridge. The Comorants nest from March to October. In July there were over 200 active nests on the bridge. The US Fish and Wildlife Rep would not allow the bridge painting to begin with the Comorants using the bridge.

Olympic Region Maintenance has done some spot painting.

A future project will require full removal of the existing paint system.

WSDOT Bridge Asset Management Form

Bridge Number: 0005565A	Bridge Name:	Milepost:	County: / Region:
303 / 12	PORT WASHINGTON CS1840	0.73	Kitsap / Olympic

Year Built / YR Widened:	Bridge Type:	Number of Main/Appr span	Overall Bridge Condition
1958	SG CBOX CTB	3 / 12	Fair

Bridge Width (curb-curb):	Bridge Length:	Deck Area:
54.0 ft	1,717 ft	92,718 SF

Average Daily Traffic:	Truck%	# Trucks:	# Lanes:	Detour:
40,478	3%	1,214	4	5

Overlay Type:	Overlay Year:	Deck Thickness:
Polyester Overla	1991	6.5 in.

Load Restricted Bridge? ☐ 10yr Closure Risk:

Pin Number: CPMS Ad Date

Project Name

Bridge Inspection Information

Date Inspected: 10/13/2020

Superstr Code: 5 Deck Code: 5

Substr Code: 6 Scour: 3

Year "POOR"	Year fixed	"POOR" Projected
		2030

Problem Deck Deterioration

Cure Deck Repair and Overlay

Status unfunded

Preservation Cost $9,271,800

Bridge Deck View

Bridge Profile View

This bridge is classified in "FAIR" condition due to the DECK CODE.

The October 2020 bridge inspection noted 240 SF of patching (CS2) and 3 SF of spalling (CS3) in the Concrete deck and 708 SF of patching (CS2) and 6 SF of spalling (CS3) in the Concrete deck for a total of 1.0%. The NBI deck code is a "5" based on the patching and chain drag results exceeding 1%.

The concrete deck original design thickness is 6.5 inches with 1.5 inches of concrete cover over the top mat of deck reinforcing. The deck over the steel spans contains lightweight concrete.

A future deck rehabilitation project will remove and replace the existing polyester overlay.

This bridge preservation need is unfunded.

SARGENT

CONSTRUCTION COST ESTIMATES

SARGENT
Sargent Engineers, Inc.
320 Ronlee Lane NW
Olympia, WA 98502
Tel 360-867-9284

CONSTRUCTION COST ESTIMATE

ITEM NO.	ITEM DESCRIPTION	UNIT	QTY	UNIT COST	COST
	PREPARATION				
0061	REMOVING PORTION OF EXISTING BRIDGE	L.S.	1	$ 1,202,000.00	$ 1,202,000
	STRUCTURE				
4235	STRUCTURAL LOW ALLOY STEEL	L.S.	1	$ 4,800,000.00	$ 4,800,000
4360	BRIDGE RAILING TYPE BP - SUPERSTR.	L.F.	6868	$ 150.00	$ 1,030,000
4365	TRAFFIC BARRIER - SUPERSTR.	L.F.	5151	$ 200.00	$ 1,030,000
4468	CLEANING AND PAINTING	L.S.	1	$ 1,600,000.00	$ 1,600,000
	OTHER				
7725	REIMBURSEMENT FOR THIRD PARTY DAMAGE	EST.	1	$ 50,000.00	$ 50,000
---	ASBESTOS REMOVAL AND DISPOSAL	L.S.	1	$ 162,000.00	$ 162,000
				SUBTOTAL	$ 9,874,000

BREAKDOWN OF LUMP SUM ITEMS

0061	REMOVING PORTION OF EXISTING BRIDGE				
	CENTER CURB	L.F.	1717	$ 140.00	$ 240,000
	EDGE BARRIER	L.F.	3434	$ 140.00	$ 481,000
	SIDEWALK	L.F.	3434	$ 140.00	$ 481,000
					$ 1,202,000
4235	STRUCTURAL LOW ALLOY STEEL	LB	1200000	$ 4.00	$ 4,800,000
4468	CLEANING AND PAINTING	SF	32000	$ 50.00	$ 1,600,000
---	ASBESTOS REMOVAL AND DISPOSAL				
	CONDUIT PIPE	L.F.	10800	$ 15.00	$ 162,000

SARGENT
Sargent Engineers, Inc.
320 Ronlee Lane NW
Olympia, WA 98502
Tel 360-867-9284

CONSTRUCTION COST ESTIMATE

ITEM NO.	ITEM DESCRIPTION	UNIT	QTY	UNIT COST	COST
	PREPARATION				
0061	REMOVING PORTION OF EXISTING BRIDGE	L.S.	1	$ 1,202,000.00	$ 1,202,000
	STRUCTURE				
4235	STRUCTURAL LOW ALLOY STEEL	L.S.	1	$ 5,600,000.00	$ 5,600,000
4360	BRIDGE RAILING TYPE BP - SUPERSTR.	L.F.	6868	$ 150.00	$ 1,030,000
4365	TRAFFIC BARRIER - SUPERSTR.	L.F.	5151	$ 200.00	$ 1,030,000
4468	CLEANING AND PAINTING	L.S.	1	$ 1,950,000.00	$ 1,950,000
	OTHER				
7725	REIMBURSEMENT FOR THIRD PARTY DAMAGE	EST.	1	$ 50,000.00	$ 50,000
---	ASBESTOS REMOVAL AND DISPOSAL	L.S.	1	$ 162,000.00	$ 162,000
				SUBTOTAL	$ 11,024,000

BREAKDOWN OF LUMP SUM ITEMS

0061	REMOVING PORTION OF EXISTING BRIDGE				
	CENTER CURB	L.F.	1717	$ 140.00	$ 240,000
	EDGE BARRIER	L.F.	3434	$ 140.00	$ 481,000
	SIDEWALK	L.F.	3434	$ 140.00	$ 481,000
					$ 1,202,000
4235	STRUCTURAL LOW ALLOY STEEL	LB	1400000	$ 4.00	$ 5,600,000
4468	CLEANING AND PAINTING	SF	39000	$ 50.00	$ 1,950,000
---	ASBESTOS REMOVAL AND DISPOSAL				
	CONDUIT PIPE	L.F.	10800	$ 15.00	$ 162,000

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CONSTRUCTION COST ESTIMATE

ITEM NO.	ITEM DESCRIPTION	UNIT	QTY	UNIT COST	COST
	PREPARATION				
0061	REMOVING PORTION OF EXISTING BRIDGE	L.S.	1	$ 1,202,000.00	$ 1,202,000
	STRUCTURE				
4235	STRUCTURAL LOW ALLOY STEEL	L.S.	1	$ 6,480,000.00	$ 6,480,000
4360	BRIDGE RAILING TYPE BP - SUPERSTR.	L.F.	6868	$ 150.00	$ 1,030,000
4365	TRAFFIC BARRIER - SUPERSTR.	L.F.	5151	$ 200.00	$ 1,030,000
4468	CLEANING AND PAINTING	L.S.	1	$ 2,250,000.00	$ 2,250,000
	OTHER				
7725	REIMBURSEMENT FOR THIRD PARTY DAMAGE	EST.	1	$ 50,000.00	$ 50,000
---	ASBESTOS REMOVAL AND DISPOSAL	L.S.	1	$ 162,000.00	$ 162,000
				SUBTOTAL	$ 12,204,000

BREAKDOWN OF LUMP SUM ITEMS

0061	REMOVING PORTION OF EXISTING BRIDGE				
	CENTER CURB	L.F.	1717	$ 140.00	$ 240,000
	EDGE BARRIER	L.F.	3434	$ 140.00	$ 481,000
	SIDEWALK	L.F.	3434	$ 140.00	$ 481,000
					$ 1,202,000
4235	STRUCTURAL LOW ALLOY STEEL	LB	1620000	$ 4.00	$ 6,480,000
4468	CLEANING AND PAINTING	SF	45000	$ 50.00	$ 2,250,000
---	ASBESTOS REMOVAL AND DISPOSAL				
	CONDUIT PIPE	L.F.	10800	$ 15.00	$ 162,000

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320 Ronlee Lane NW
Olympia, WA 98502
Tel 360-867-9284

CONSTRUCTION COST ESTIMATE

ITEM NO.	ITEM DESCRIPTION	UNIT	QTY	UNIT COST	COST
	PREPARATION				
0061	REMOVING PORTION OF EXISTING BRIDGE	L.S.	1	$ 961,000.00	$ 961,000
	STRUCTURE				
4235	STRUCTURAL LOW ALLOY STEEL	L.S.	1	$ 3,240,000.00	$ 3,240,000
4360	BRIDGE RAILING TYPE BP - SUPERSTR.	L.F.	6868	$ 150.00	$ 1,030,000
4365	TRAFFIC BARRIER - SUPERSTR.	L.F.	5151	$ 200.00	$ 1,030,000
---	SIDEWALK REPAIR & OVERLAY	S.F.	8585	$ 200.00	$ 1,717,000
4468	CLEANING AND PAINTING	L.S.	1	$ 1,125,000.00	$ 1,125,000
	OTHER				
7725	REIMBURSEMENT FOR THIRD PARTY DAMAGE	EST.	1	$ 50,000.00	$ 50,000
				SUBTOTAL	$ 9,153,000

BREAKDOWN OF LUMP SUM ITEMS

0061	REMOVING PORTION OF EXISTING BRIDGE				
	CENTER CURB	L.F.	1717	$ 140.00	$ 240,000
	EDGE BARRIER	L.F.	3434	$ 140.00	$ 481,000
	SIDEWALK	L.F.	1717	$ 140.00	$ 240,000
					$ 961,000
4235	STRUCTURAL LOW ALLOY STEEL	LB	810000	$ 4.00	$ 3,240,000
4468	CLEANING AND PAINTING	SF	22500	$ 50.00	$ 1,125,000

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320 Ronlee Lane NW
Olympia, WA 98502
Tel 360-867-9284

CONSTRUCTION COST ESTIMATE

ITEM NO.	ITEM DESCRIPTION	UNIT	QTY	UNIT COST	COST
	PREPARATION				
0061	REMOVING PORTION OF EXISTING BRIDGE	L.S.	1	$ 720,000.00	$ 720,000
	STRUCTURE				
4235	STRUCTURAL LOW ALLOY STEEL	L.S.	1	$ 3,240,000.00	$ 3,240,000
4360	BRIDGE RAILING TYPE BP - SUPERSTR.	L.F.	3434	$ 150.00	$ 515,000
4365	TRAFFIC BARRIER - SUPERSTR.	L.F.	3434	$ 200.00	$ 687,000
4468	CLEANING AND PAINTING	L.S.	1	$ 1,125,000.00	$ 1,125,000
	OTHER				
7725	REIMBURSEMENT FOR THIRD PARTY DAMAGE	EST.	1	$ 50,000.00	$ 50,000
				SUBTOTAL	$ 6,337,000

BREAKDOWN OF LUMP SUM ITEMS

0061	REMOVING PORTION OF EXISTING BRIDGE				
	CENTER CURB	L.F.	1717	$ 140.00	$ 240,000
	EDGE BARRIER	L.F.	1717	$ 140.00	$ 240,000
	SIDEWALK	L.F.	1717	$ 140.00	$ 240,000
					$ 720,000
4235	STRUCTURAL LOW ALLOY STEEL	LB	810000	$ 4.00	$ 3,240,000
4468	CLEANING AND PAINTING	SF	22500	$ 50.00	$ 1,125,000

SARGENT
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320 Ronlee Lane NW
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CONSTRUCTION COST ESTIMATE

ITEM NO.	ITEM DESCRIPTION	UNIT	QTY	UNIT COST	COST
	PREPARATION				
0061	REMOVING PORTION OF EXISTING BRIDGE	L.S.	1	$ 961,000.00	$ 961,000
	STRUCTURE				
4235	STRUCTURAL LOW ALLOY STEEL	L.S.	1	$ 4,440,000.00	$ 4,440,000
4360	BRIDGE RAILING TYPE BP - SUPERSTR.	L.F.	6868	$ 150.00	$ 1,030,000
4365	TRAFFIC BARRIER - SUPERSTR.	L.F.	5151	$ 200.00	$ 1,030,000
---	SIDEWALK REPAIR & OVERLAY	S.F.	8585	$ 200.00	$ 1,717,000
4468	CLEANING AND PAINTING	L.S.	1	$ 1,245,000.00	$ 1,245,000
	OTHER				
7725	REIMBURSEMENT FOR THIRD PARTY DAMAGE	EST.	1	$ 50,000.00	$ 50,000
				SUBTOTAL	$ 10,473,000

BREAKDOWN OF LUMP SUM ITEMS

0061	REMOVING PORTION OF EXISTING BRIDGE				
	CENTER CURB	L.F.	1717	$ 140.00	$ 240,000
	EDGE BARRIER	L.F.	3434	$ 140.00	$ 481,000
	SIDEWALK	L.F.	1717	$ 140.00	$ 240,000
					$ 961,000
4235	STRUCTURAL LOW ALLOY STEEL	LB	1110000	$ 4.00	$ 4,440,000
4468	CLEANING AND PAINTING	SF	24900	$ 50.00	$ 1,245,000

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Tel 360-867-9284

CONSTRUCTION COST ESTIMATE

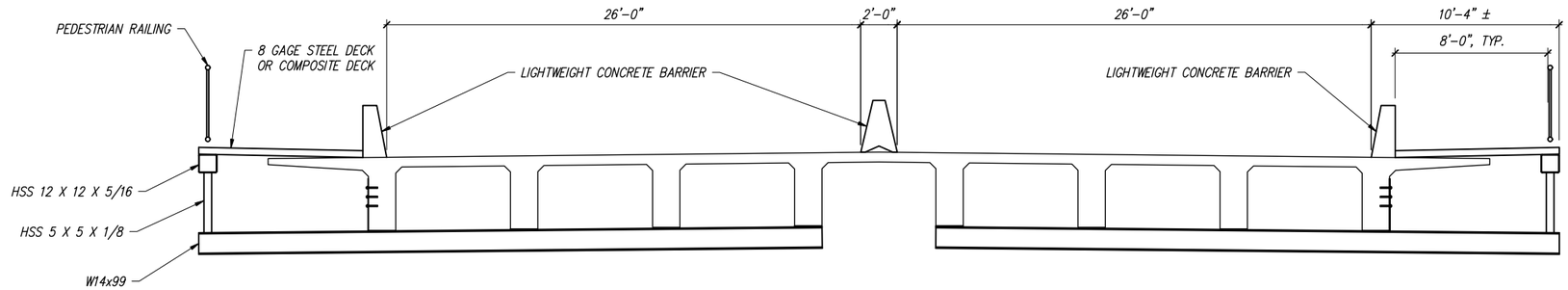
ITEM NO.	ITEM DESCRIPTION	UNIT	QTY	UNIT COST	COST
	PREPARATION				
0061	REMOVING PORTION OF EXISTING BRIDGE	L.S.	1	$ 720,000.00	$ 720,000
	STRUCTURE				
4235	STRUCTURAL LOW ALLOY STEEL	L.S.	1	$ 4,440,000.00	$ 4,440,000
4360	BRIDGE RAILING TYPE BP - SUPERSTR.	L.F.	3434	$ 150.00	$ 515,000
4365	TRAFFIC BARRIER - SUPERSTR.	L.F.	3434	$ 200.00	$ 687,000
4468	CLEANING AND PAINTING	L.S.	1	$ 1,245,000.00	$ 1,245,000
	OTHER				
7725	REIMBURSEMENT FOR THIRD PARTY DAMAGE	EST.	1	$ 50,000.00	$ 50,000
				SUBTOTAL	$ 7,657,000

BREAKDOWN OF LUMP SUM ITEMS

0061	REMOVING PORTION OF EXISTING BRIDGE				
	CENTER CURB	L.F.	1717	$ 140.00	$ 240,000
	EDGE BARRIER	L.F.	1717	$ 140.00	$ 240,000
	SIDEWALK	L.F.	1717	$ 140.00	$ 240,000
					$ 720,000
4235	STRUCTURAL LOW ALLOY STEEL	LB	1110000	$ 4.00	$ 4,440,000
4468	CLEANING AND PAINTING	SF	24900	$ 50.00	$ 1,245,000

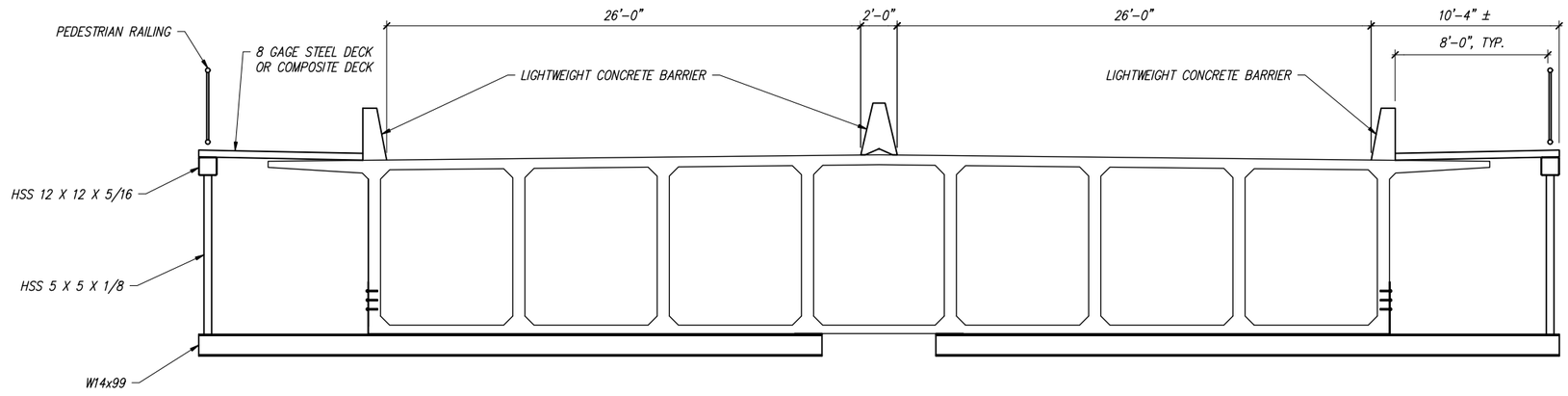
SARGENT

CONCEPTUAL STRUCTURAL SECTIONS



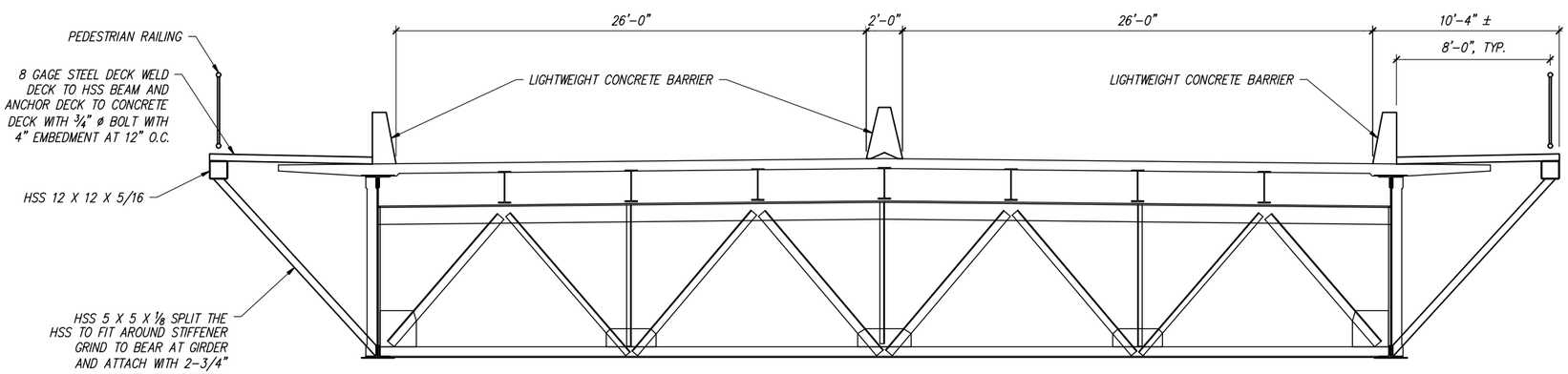
SECTION AT TEE BEAM SPANS

BEAMS LOCATED AT DIAPHRAGMS WHICH ARE SPACED ~ 24 FEET O.C.



SECTION AT BOX GIRDER SPANS

BEAMS LOCATED AT DIAPHRAGMS WHICH ARE SPACED AT 21'-4" O.C.



SECTION AT STEEL GIRDER SPANS

SUPPORTS LOCATED AT FLOOR BEAMS WHICH ARE SPACED AT 22'-3" O.C.

NOTE: THERE WOULD ALSO BE TWO OVERLOOKS ON EACH SIDE OF THE BRIDGE THAT WILL PROVIDE AN ADDITIONAL EIGHT FEET OF WIDTH. THESE OVERLOOKS WILL BE FRAMED AS SHOWN ON ALTERNATIVE 4a/b,AND WILL BE APPROXIMATELY 24-FEET LONG.

PLAN CHECK	DATE				
DESIGNED BY: R.W. Larsen					
CHECKED BY: J.S. Soward					
PRJ DRAFTER: R.W. Larsen					
DETAILED BY: .					
DETAILED BY: .					
		.	.	.	.
ISSUED:	9/15/2023	DATE	NO.	REVISION	BY

FEDERAL AID PROJECT NO. .

C.R.P. NO. .

JESSICA S SOWARD — STATE OF WASHINGTON — 25272 — STRUCTURAL ENGINEER — PROFESSIONAL ENGINEER

PRELIMINARY

SARGENT
SARGENT ENGINEERS, INC.
320 Ronlee Lane NW • Olympia, WA 98502
Tel. 360 867-9284 • sargentengineers.com

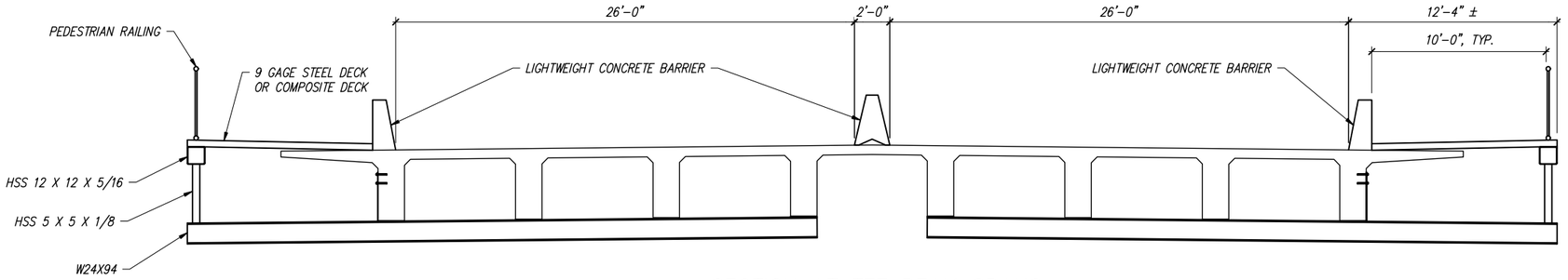
CITY OF BREMERTON
PUBLIC WORKS & UTILITIES

WARREN AVENUE BRIDGE
MULTIMODAL PROJECT

BREMERTON, WASHINGTON

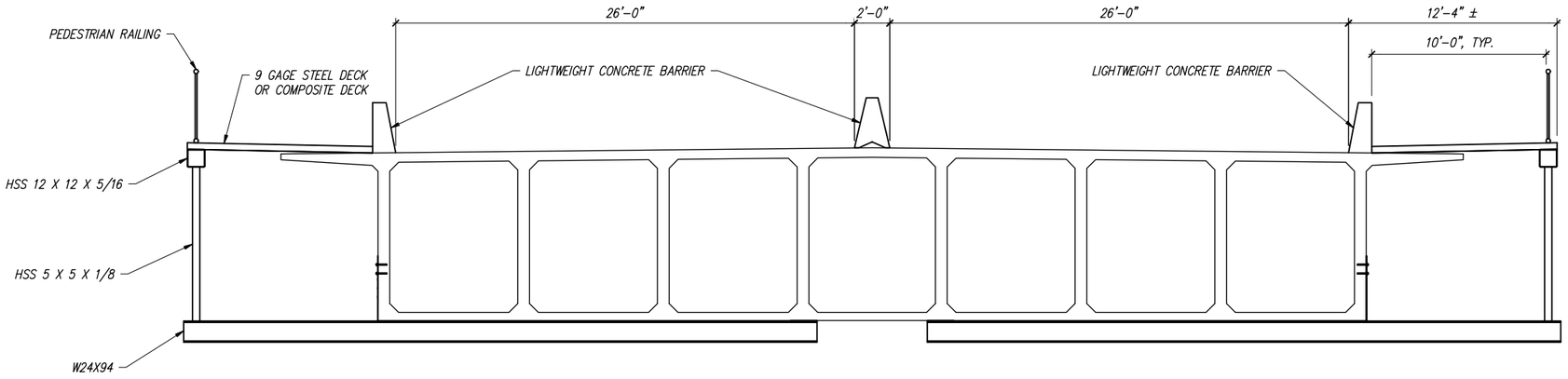
ALTERNATIVE 1

SHEET 1 OF 9 SHEETS
SEI REF NO. A21137.00



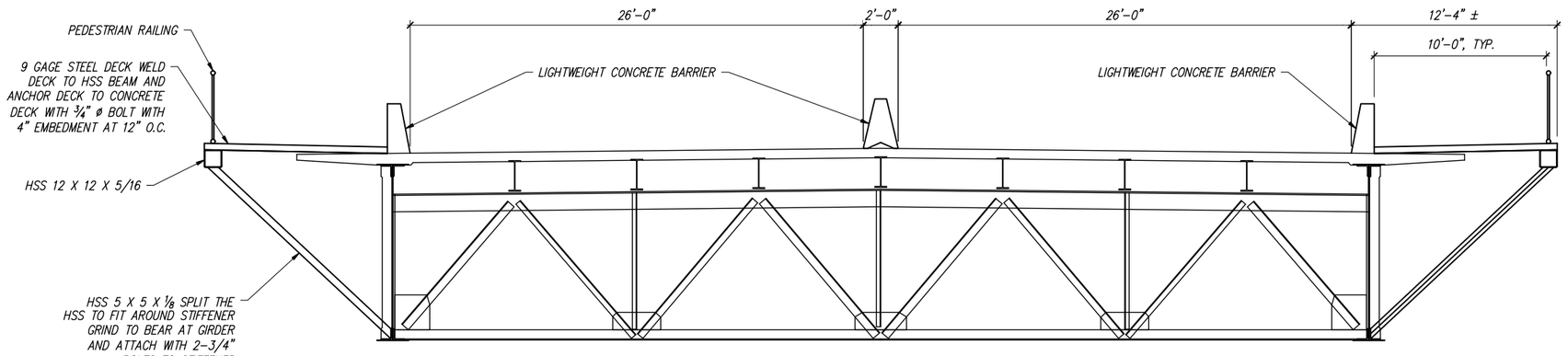
SECTION AT TEE BEAM SPANS

BEAMS LOCATED AT DIAPHRAGMS WHICH ARE SPACED ~ 24 FEET O.C.



SECTION AT BOX GIRDER SPANS

BEAMS LOCATED AT DIAPHRAGMS WHICH ARE SPACED AT 21'-4" O.C.



SECTION AT STEEL GIRDER SPANS

SUPPORTS LOCATED AT FLOOR BEAMS WHICH ARE SPACED AT 22'-3" O.C.

NOTE: THERE WOULD ALSO BE TWO OVERLOOKS ON EACH SIDE OF THE BRIDGE THAT WILL PROVIDE AN ADDITIONAL SIX FEET OF WIDTH. THESE OVERLOOKS WILL BE FRAMED AS SHOWN ON ALTERNATIVE 4a/b,AND WILL BE APPROXIMATELY 24-FEET LONG.

PLAN CHECK	DATE				
DESIGNED BY: R.W. Larsen					
CHECKED BY: J.S. Soward					
PRJ DRAFTER: R.W. Larsen					
DETAILED BY: .					
DETAILED BY: .					
		.	.	.	.
ISSUED:	9/15/2023	DATE	NO.	REVISION	BY

FEDERAL AID PROJECT NO. .

C.R.P. NO. .

JESSICA S SOWARD — STATE OF WASHINGTON — 25272 — STRUCTURAL ENGINEER — PROFESSIONAL ENGINEER

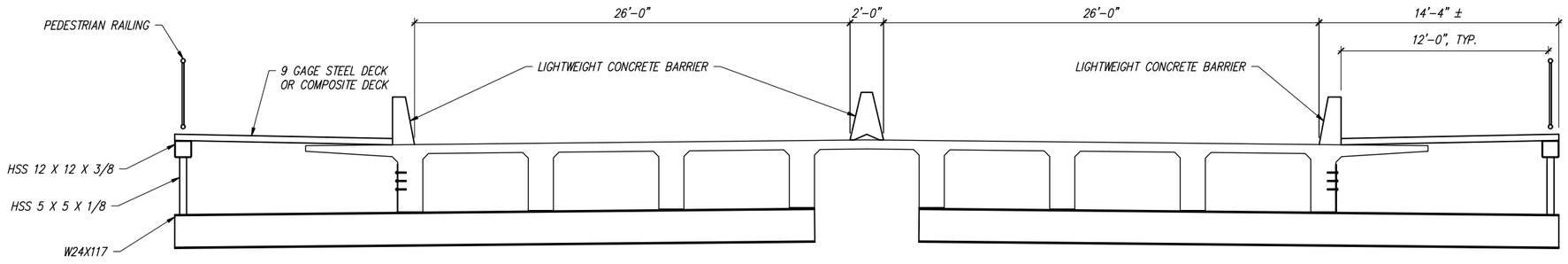
PRELIMINARY

SARGENT
SARGENT ENGINEERS, INC.
320 Ronlee Lane NW • Olympia, WA 98502
Tel. 360 867-9284 • sargentengineers.com

CITY OF BREMERTON
PUBLIC WORKS & UTILITIES

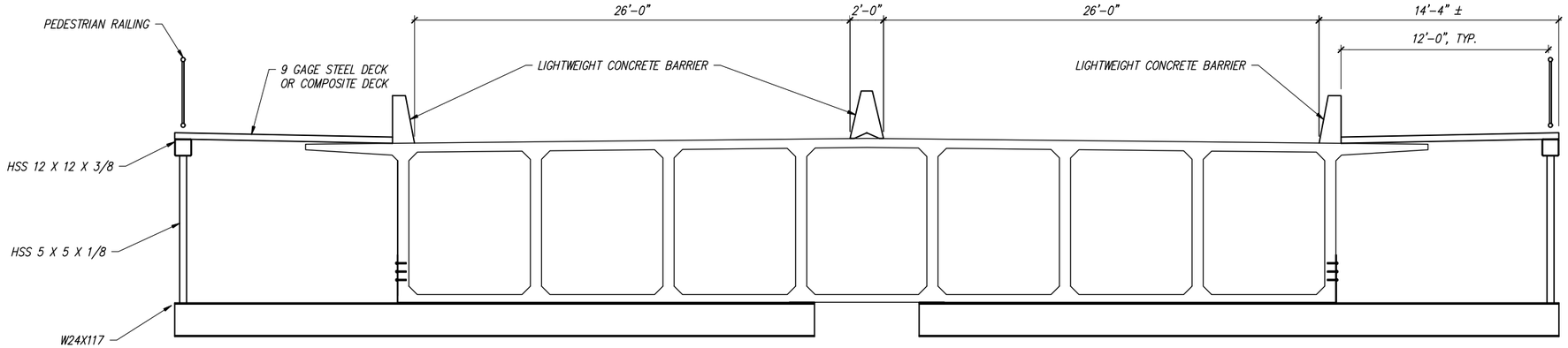
WARREN AVENUE BRIDGE
MULTIMODAL PROJECT
BREMERTON, WASHINGTON
ALTERNATIVE 2

SHEET 2 OF 9 SHEETS
SEI REF NO. A21137.00



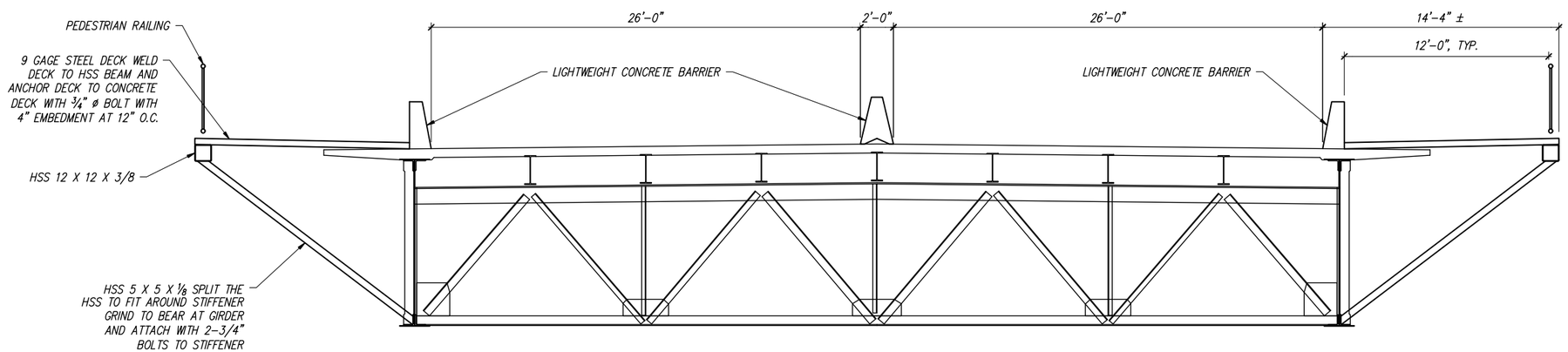
SECTION AT TEE BEAM SPANS

BEAMS LOCATED AT DIAPHRAGMS WHICH ARE SPACED ~ 24 FEET O.C.



SECTION AT BOX GIRDER SPANS

BEAMS LOCATED AT DIAPHRAGMS WHICH ARE SPACED AT 21'-4" O.C.



SECTION AT STEEL GIRDER SPANS

SUPPORTS LOCATED AT FLOOR BEAMS WHICH ARE SPACED AT 22'-3" O.C.

PLAN CHECK	DATE				
DESIGNED BY: R.W. Larsen					
CHECKED BY: J.S. Soward					
PRJ DRAFTER: R.W. Larsen					
DETAILED BY: .					
DETAILED BY: .					
		.	.	.	.
ISSUED:	9/15/2023	DATE	NO.	REVISION	BY

FEDERAL AID PROJECT NO.
.
C.R.P. NO.
.

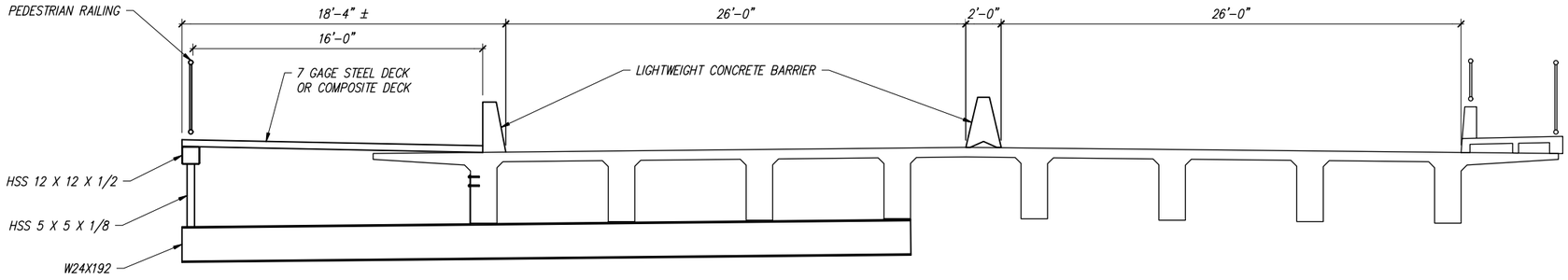
JESSICA S SOWARD — STATE OF WASHINGTON — 15272 — REGISTERED PROFESSIONAL ENGINEER — PRELIMINARY

SARGENT ENGINEERS, INC.
320 Ronlee Lane NW • Olympia, WA 98502
Tel. 360 867-9284 • sargentengineers.com

CITY OF BREMERTON
PUBLIC WORKS & UTILITIES

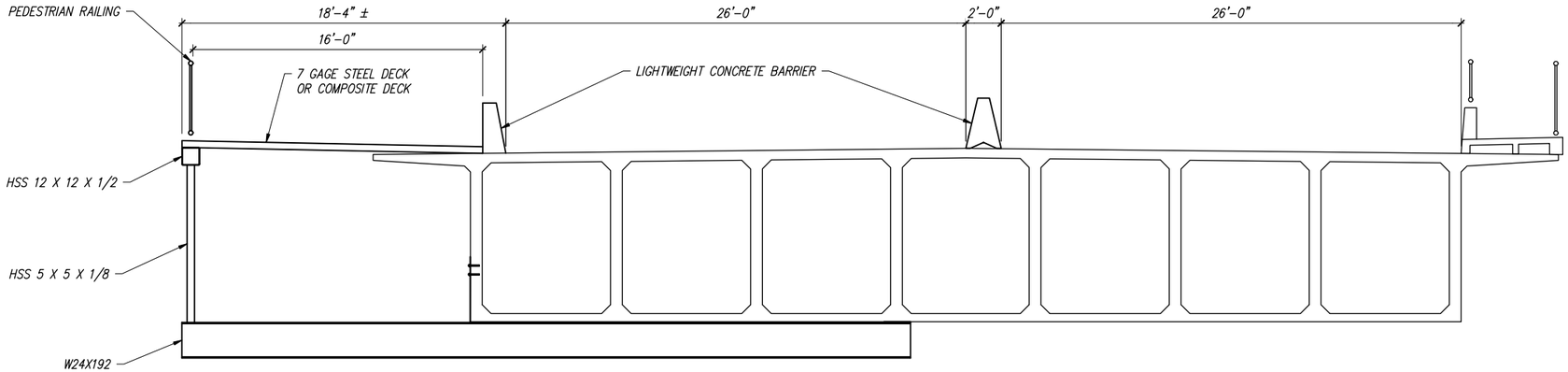
WARREN AVENUE BRIDGE
MULTIMODAL PROJECT
BREMERTON, WASHINGTON
ALTERNATIVE 3

SHEET 3 OF 9 SHEETS
SEI REF NO. A21137.00



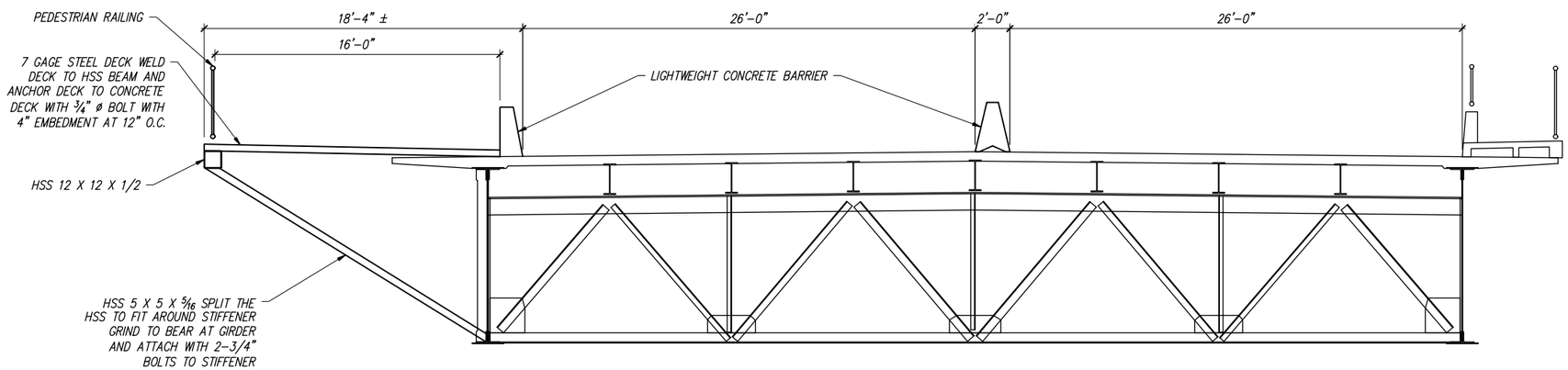
SECTION AT TEE BEAM SPANS

BEAMS LOCATED AT DIAPHRAGMS WHICH ARE SPACED ~ 24 FEET O.C.



SECTION AT BOX GIRDER SPANS

BEAMS LOCATED AT DIAPHRAGMS WHICH ARE SPACED AT 21'-4" O.C.



SECTION AT STEEL GIRDER SPANS

SUPPORTS LOCATED AT FLOOR BEAMS WHICH ARE SPACED AT 22'-3" O.C.

PLAN CHECK	DATE				
DESIGNED BY: R.W. Larsen					
CHECKED BY: J.S. Soward					
PRJ DRAFTER: R.W. Larsen					
DETAILED BY: .					
DETAILED BY: .					
		.	.	.	.
ISSUED:	9/15/2023	DATE	NO.	REVISION	BY

FEDERAL AID PROJECT NO.
.
C.R.P. NO.
.

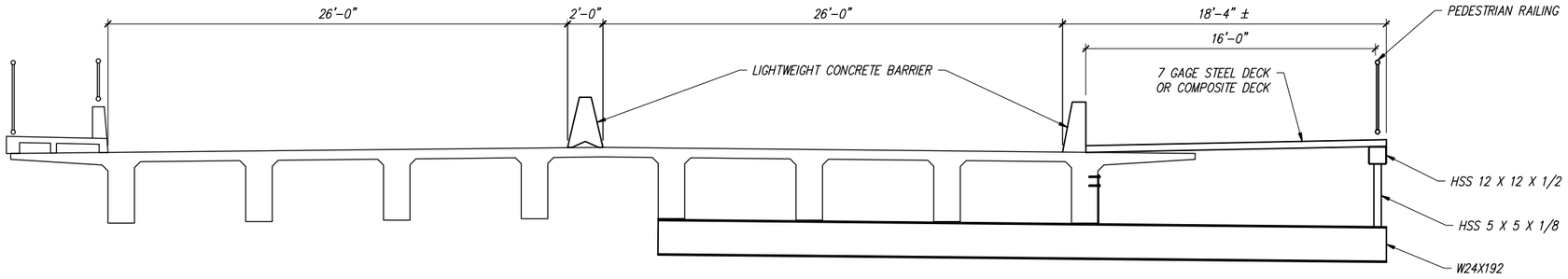
JESSICA S SOWARD — STATE OF WASHINGTON — 15272 — CIVIL — GENERAL ENGINEER — PROFESSIONAL ENGINEER
PRELIMINARY

SARGENT
SARGENT ENGINEERS, INC.
320 Ronlee Lane NW • Olympia, WA 98502
Tel. 360 867-9284 • sargentengineers.com

CITY OF BREMERTON
PUBLIC WORKS & UTILITIES

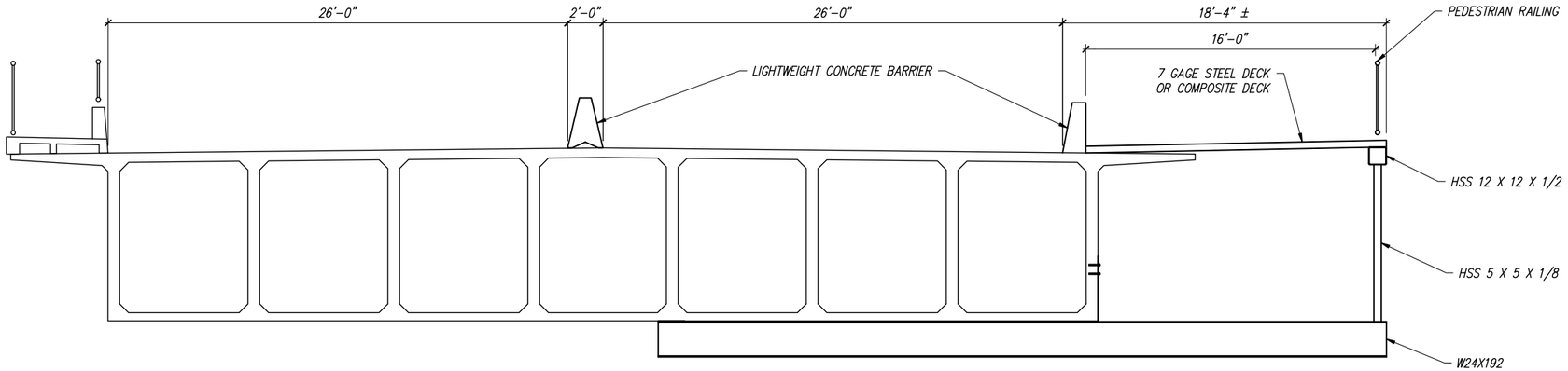
WARREN AVENUE BRIDGE
MULTIMODAL PROJECT
BREMERTON, WASHINGTON
ALTERNATIVE 4a

SHEET 4a
OF 9 SHEETS
SEI REF NO. A21137.00



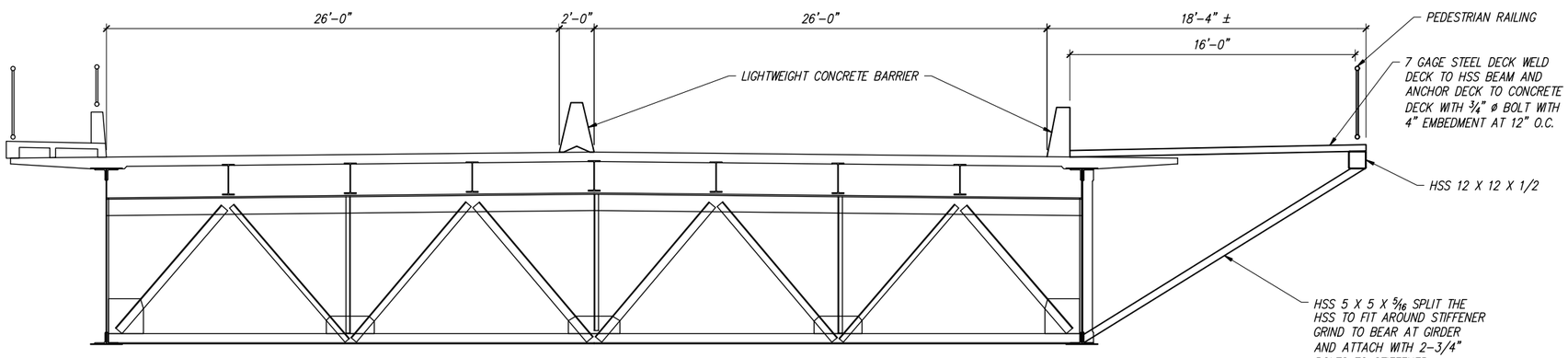
SECTION AT TEE BEAM SPANS

BEAMS LOCATED AT DIAPHRAGMS WHICH ARE SPACED ~ 24 FEET O.C.



SECTION AT BOX GIRDER SPANS

BEAMS LOCATED AT DIAPHRAGMS WHICH ARE SPACED AT 21'-4" O.C.



SECTION AT STEEL GIRDER SPANS

SUPPORTS LOCATED AT FLOOR BEAMS WHICH ARE SPACED AT 22'-3" O.C.

PLAN CHECK	DATE				
DESIGNED BY: R.W. Larsen					
CHECKED BY: J.S. Soward					
PRJ DRAFTER: R.W. Larsen					
DETAILED BY: .					
DETAILED BY: .					
		.	.	.	.
ISSUED:	9/15/2023	DATE	NO.	REVISION	BY

FEDERAL AID PROJECT NO. .

C.R.P. NO. .

JESSICA S SOWARD — STATE OF WASHINGTON — 15272 — CIVIL — PROFESSIONAL ENGINEER — PRELIMINARY

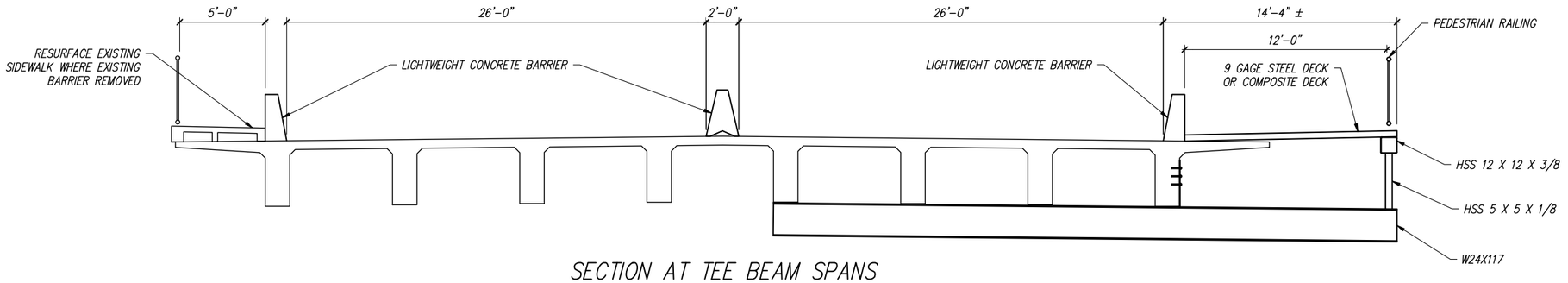
SARGENT ENGINEERS, INC.
320 Ronlee Lane NW • Olympia, WA 98502
Tel. 360 867-9284 • sargentengineers.com

CITY OF BREMERTON
PUBLIC WORKS & UTILITIES

WARREN AVENUE BRIDGE
MULTIMODAL PROJECT
BREMERTON, WASHINGTON
ALTERNATIVE 4b

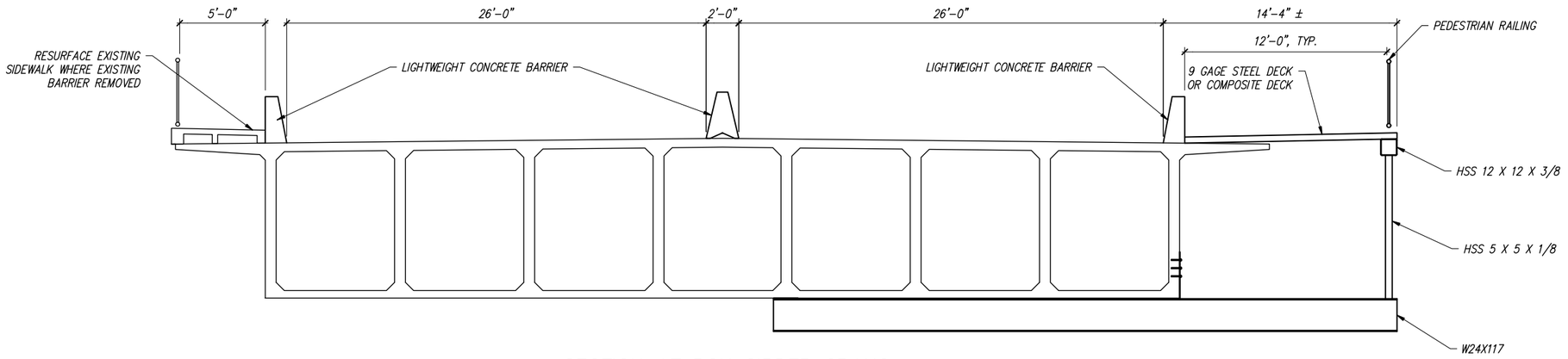
SHEET 5 OF 9 SHEETS
SEI REF NO. A21137.00

Plotted: Sep 15, 2023 - 14:09 JessicaS B:\21Files\A21137.00 SCJ - Warren Ave Improvements\Alternatives Study\Drawings\Warren Avenue Struc.Dwg Layout Name: Alternative 4b xrefs: titlesht



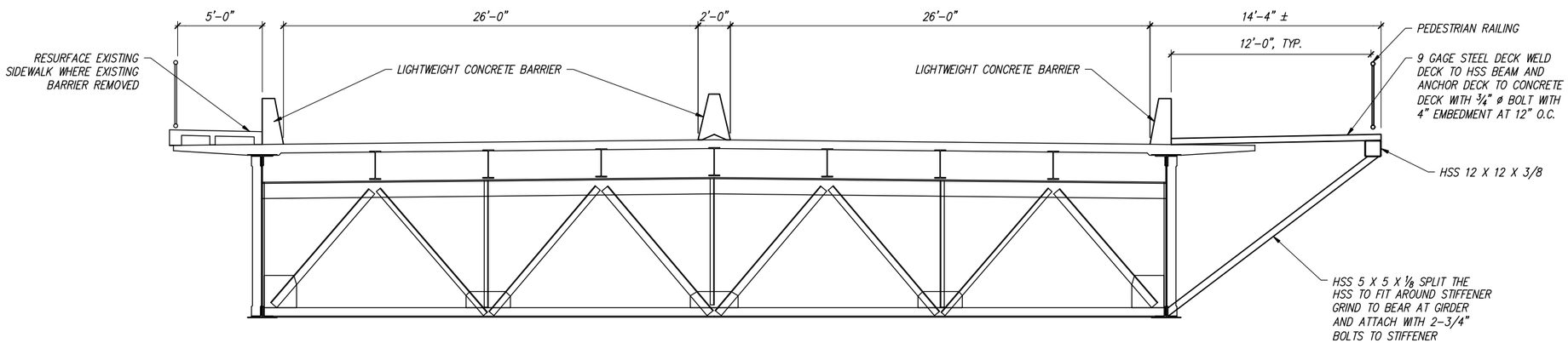
SECTION AT TEE BEAM SPANS

BEAMS LOCATED AT DIAPHRAGMS WHICH ARE SPACED ~ 24 FEET O.C.



SECTION AT BOX GIRDER SPANS

BEAMS LOCATED AT DIAPHRAGMS WHICH ARE SPACED AT 21'-4" O.C.



SECTION AT STEEL GIRDER SPANS

SUPPORTS LOCATED AT FLOOR BEAMS WHICH ARE SPACED AT 22'-3" O.C.

PLAN CHECK	DATE				
DESIGNED BY: R.W. Larsen					
CHECKED BY: J.S. Soward					
PRJ DRAFTER: R.W. Larsen					
DETAILED BY: .					
DETAILED BY: .					
		.	.	.	.
ISSUED:	9/15/2023	DATE	NO.	REVISION	BY

FEDERAL AID PROJECT NO. .

C.R.P. NO. .

JESSICA S SOWARD — STATE OF WASHINGTON — 25272 — STRUCTURAL ENGINEER — PROFESSIONAL ENGINEER

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CITY OF BREMERTON
PUBLIC WORKS & UTILITIES

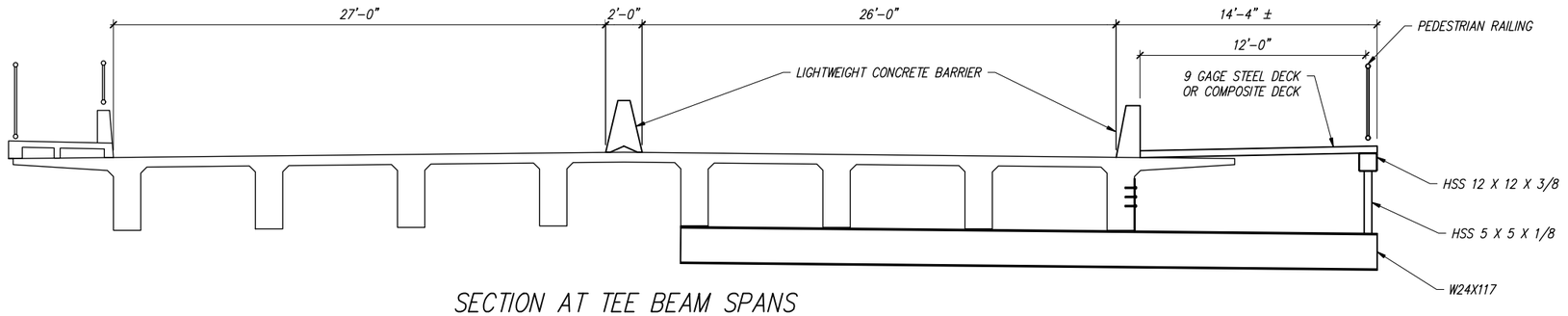
WARREN AVENUE BRIDGE
MULTIMODAL PROJECT

BREMERTON, WASHINGTON

ALTERNATIVE 7

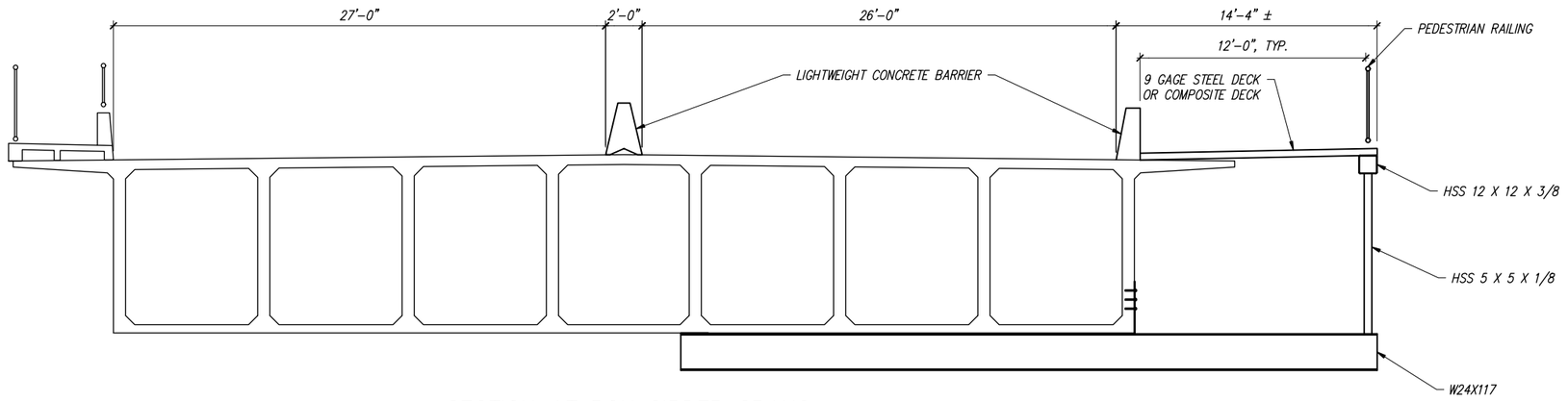
SHEET 6 OF 9 SHEETS

SEI REF NO. A21137.00



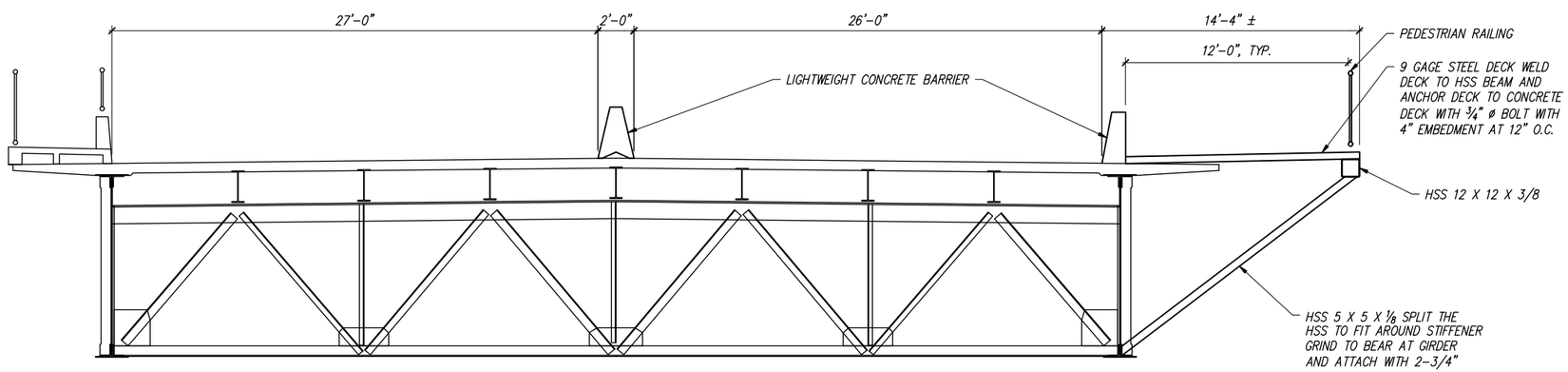
SECTION AT TEE BEAM SPANS

BEAMS LOCATED AT DIAPHRAGMS WHICH ARE SPACED ~ 24 FEET O.C.



SECTION AT BOX GIRDER SPANS

BEAMS LOCATED AT DIAPHRAGMS WHICH ARE SPACED AT 21'-4" O.C.



SECTION AT STEEL GIRDER SPANS

SUPPORTS LOCATED AT FLOOR BEAMS WHICH ARE SPACED AT 22'-3" O.C.

PLAN CHECK	DATE				
DESIGNED BY: R.W. Larsen					
CHECKED BY: J.S. Soward					
PRJ DRAFTER: R.W. Larsen					
DETAILED BY: .					
DETAILED BY: .					
		.	.	.	.
ISSUED:	9/15/2023	DATE	NO.	REVISION	BY

FEDERAL AID PROJECT NO.
.
C.R.P. NO.
.

JESSICA S SOWARD — STATE OF WASHINGTON — 45272 — STRUCTURAL ENGINEER — PROFESSIONAL ENGINEER
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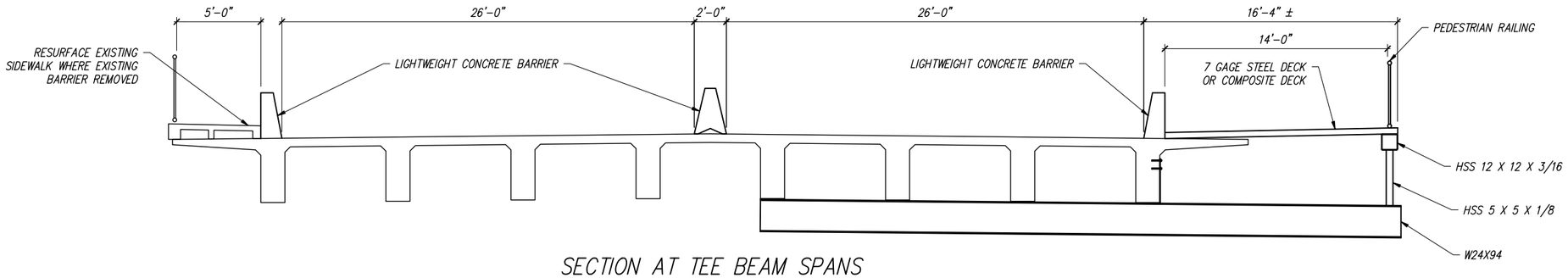
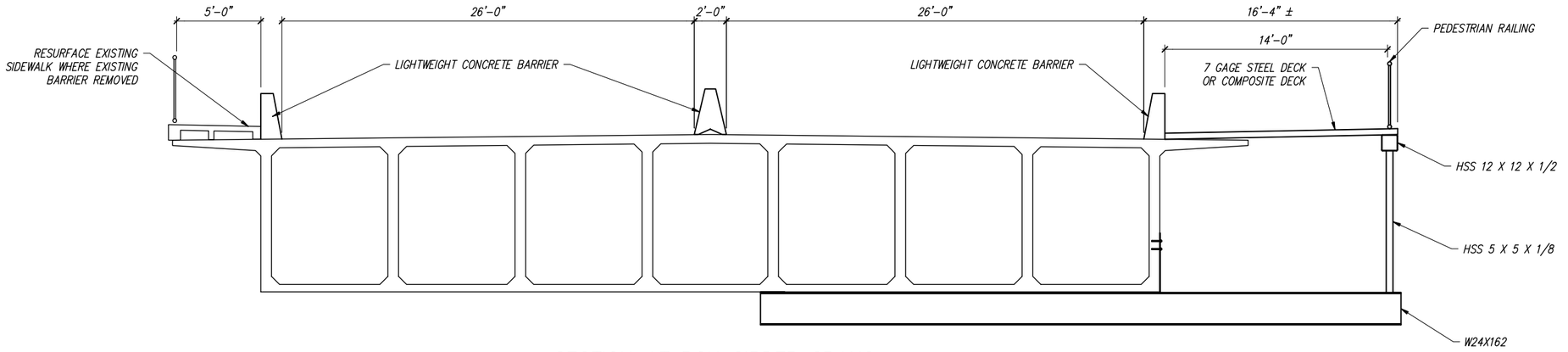
WARREN AVENUE BRIDGE
MULTIMODAL PROJECT
BREMERTON, WASHINGTON
ALTERNATIVE 7a

SHEET 7 OF 9 SHEETS
SEI REF NO. A21137.00



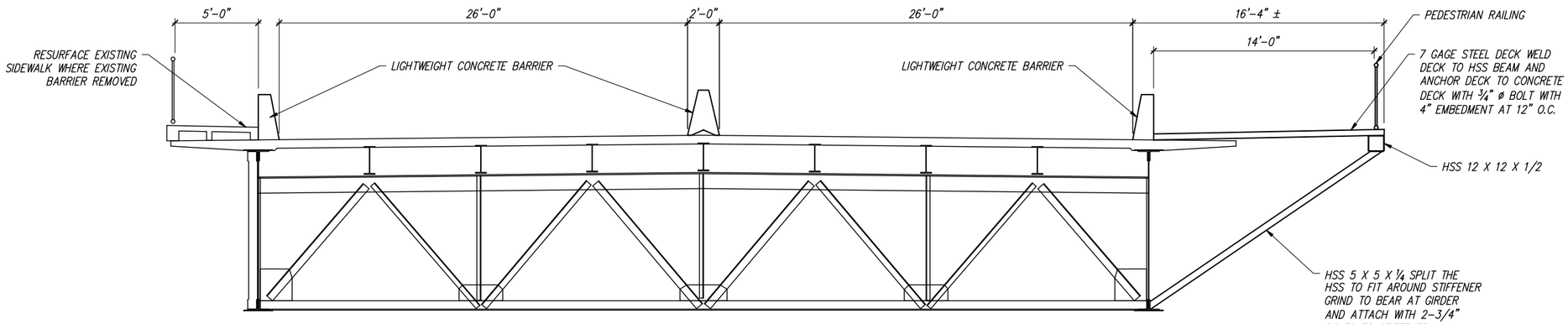
SECTION AT TEE BEAM SPANS

BEAMS LOCATED AT 12 FEET O.C.



SECTION AT BOX GIRDER SPANS

BEAMS LOCATED AT DIAPHRAGMS WHICH ARE SPACED AT 21'-4" O.C.



SECTION AT STEEL GIRDER SPANS

SUPPORTS LOCATED AT FLOOR BEAMS WHICH ARE SPACED AT 22'-3" O.C.

PLAN CHECK	DATE				
DESIGNED BY: R.W. Larsen					
CHECKED BY: J.S. Soward					
PRJ DRAFTER: R.W. Larsen					
DETAILED BY: .					
DETAILED BY: .					
		.	.	.	.
ISSUED:	9/15/2023	DATE	NO.	REVISION	BY

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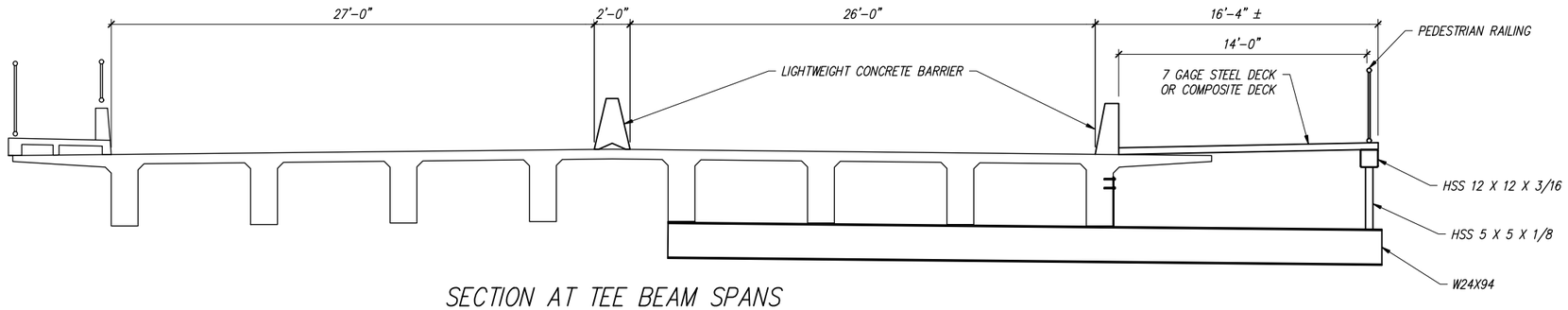
ALTERNATIVE 8

SHEET 8 OF 9 SHEETS
SEI REF NO. A21137.00

Plotted: Sep 15, 2023 - 14:09 JessicaS B:\21Files\A21137.00 SCJ - Warren Ave Improvements\Alternatives Study\Drawings\Warren Avenue Struc.Dwg Layout Name: Alternative 8 xrefs: titlesht



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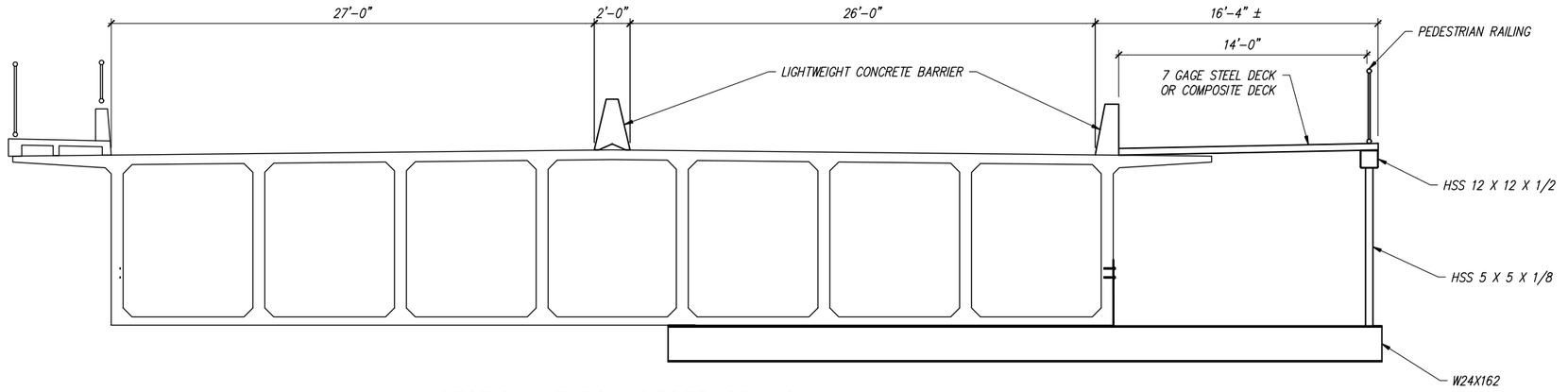
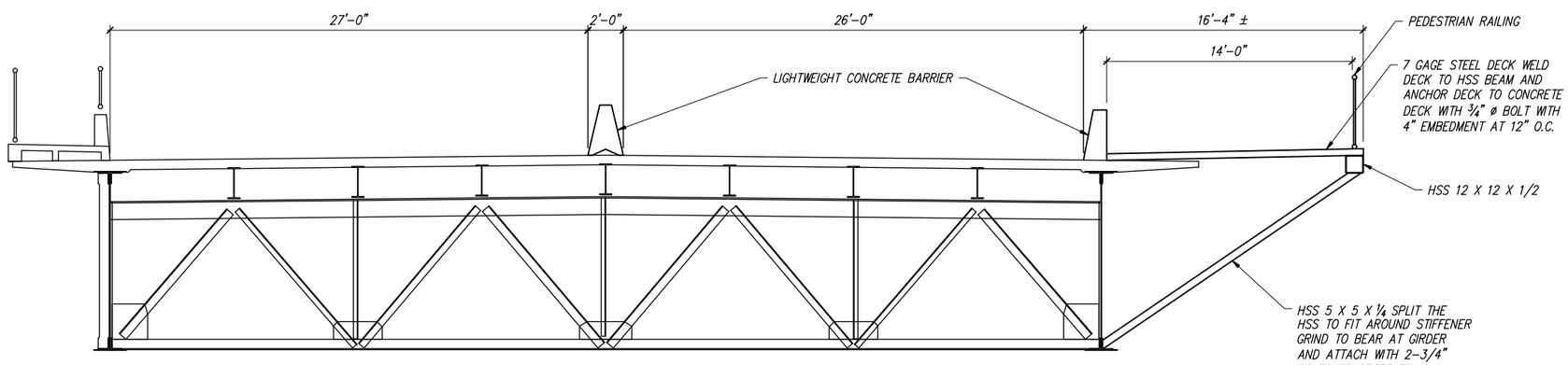
BEAMS LOCATED AT 12 FEET O.C.



SECTION AT BOX GIRDER SPANS

BEAMS LOCATED AT DIAPHRAGMS WHICH ARE SPACED AT 21'-4" O.C.



SECTION AT STEEL GIRDER SPANS

SUPPORTS LOCATED AT FLOOR BEAMS WHICH ARE SPACED AT 22'-3" O.C.

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ALTERNATIVE 8a

SHEET 9 OF 9 SHEETS
SEI REF NO. A21137.00