RIVERFRONT PARK BRIDGES

INSPECTION AND ANALYSIS

WASHINGTON STREET NORTH BRIDGE

NOVEMBER 14, 2014 | Final Report

kpff Consulting Engineers

WASHINGTON STREET NORTH BRIDGE

November 14, 2014

Prepared for

City of Spokane
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1. BRIDGE DESCRIPTION

The Washington Street North Bridge was built in 1985. It carries vehicular and pedestrian traffic over the north channel of the Spokane River. The primary structural components that are two cast-in-places post-tensioned arched box girders. The three span bridge has lengths of 80 feet, 160 feet, and 80 feet.

Our primary objective for this bridge is to investigate the feasibility of widening the sidewalk on the north side of the bridge to accommodate additional bike and pedestrian capacity.

Figure 1: Aerial view of the Washington Street North Channel Bridge

2. DOCUMENT REVIEW

In preparation for this evaluation, Kpff reviewed the following documents related to the Washington Street North Bridge:

- Drawings 1 – 37
- Previous routine inspection report
- BRIDG Load Rating (dated September 2014)

3. EVALUATION PROCEDURES

A limited inspection of the bridge was performed because the primary objective was to determine the feasibility and potential options to widen the bridge in order to increase pedestrian/bike capacity.

ROUTINE BRIDGE INSPECTION

A visual inspection of the sidewalks, railings, and overhangs was performed. These components were accessed by foot.

STRUCTURAL ANALYSIS

A load rating structural analysis was not performed by Kpff as part of this evaluation.

4. EVALUATION FINDINGS

BRIDGE INSPECTION

The sidewalk, overhang deck soffit, and railings appear to be in good condition. The soffit has transverse hairline leaching cracks.

There are several challenges or constraints, as gleaned from a site visit, which will need to be addressed in order to widen this bridge. They are summarized as follows:

1. A determination must be made as to what the minimum widening goals are?
2. A decision must be made regarding the curb bridge rail, luminary base and planters. With the exception of the bridge rail, are they desirable to keep and maintain or can they be removed in order to increase the available space for a widened sidewalk by 3.5 feet? Can smaller and lighter planters and luminary bases be used? Removing these items creates the most space for the least costs (by a long shot).
3. Would it be acceptable to replace the existing bridge rail with a lighter steel rail?
4. How should the sidewalk / stair interface be handled? What are the goals? *(not a small item)*
5. Steel braces anchored into the piers are technically possible but are more complicated then they appear. First the Pier end is not square. Issues such as how wide of deck can the brace support remain unsettled. What is the manner it will be connected and how will the contractor achieve access? Steel superstructures are much lighter and easier to handle than the concrete superstructures but alter the visual perspective of the bridge somewhat dramatically. In addition concrete may be too much for the braces to handle in terms of dead load.
6. Is it possible to reduce the lane width or shy distance by one or two feet?

The bridge inspection reports, element numbering system, and photographs are included in Appendix A.

STRUCTURAL ANALYSIS

Based on the BRIDG load rating (performed by others), the inventory moment near the middle of Span 2 was the controlling rating with a RF = 1.83. Based on this rating value, the superstructure should have enough reserve capacity to support some additional dead load resulting from a widened sidewalk slab spliced into the existing sidewalk slab. For purposes of this project we limited the widened slab to three feet.

5. CONCLUSIONS AND RECOMMENDATIONS

It appears structurally feasible to explore viable ways to widen this bridge for the purpose of adding additional pedestrian and bicycle capacity. However, answers to the questions posed above will likely need to be answered in order to appropriately progress the design.

Furthermore the bridge's structural condition appears to be in very good shape and capable of adopting additional capacity. This includes the pier. There are limits which eventually will need to be explored in detail.

Below we discuss several options we arrived at with minimal analysis as "concepts" which could be furthered explored to meet future widening goals. Concept level plans depicting each option is included in a Appendix B.

METAL RAILING

The horizontal steel cables in the metal railing should be tightened so the cables do not sag.

ADDITIONAL PEDESTRIAN AND BIKE CAPACITY OPTIONS

Typical cross sections of the options to increase bicycle and pedestrian capacity on the Washington Street North Bridge are included in Appendix B, along with a detailed cost estimate of the bridge improvements. The approximate cost of the bridge widening varies between $340,000 and $1.8 million depending on which design alternative is selected. A summary of the options are listed below.

- OPTION No. 1 – Barrier, Planter, and Luminaire Removal

  A 10.0-foot wide combined bicycle and pedestrian path can be achieved by removing the concrete barriers, luminaires, planters, and benches. Replace the steel barriers and new luminaire attachments. Note - this option reduces the existing shoulder width and one traffic lane by 1 foot. Alternatively, the shoulder and traffic lanes could remain the same, which would result in a combined bicycle and pedestrian path width of 8 feet 6 inches.

- OPTION No. 2 – Top Slab Cantilever

  Remove planters, benches, curb, and pedestrian railing. Splice an additional cantilever section to the top outside face of the deck slab. For purposes of this project we analyzed for an additional 3.0 feet. Reuse existing pedestrian railing and attach to new curb. The combined bicycle and pedestrian path would be nearly 11 feet wide except at the two luminaire locations. The path would be reduced to 9 feet 3 inches wide at the luminaire locations at each end of the bridge. The luminaire bases would need to be modified to prevent a blunt impact surface for bicyclist safety.

- OPTION No. 3 – New Steel Plate Girders

  Construct new abutment and stairs at southwest corner of existing bridge and expand abutment at northwest corner of existing bridge. Install steel brackets at Piers 2 and 3 to support new steel plate girders with cast in place deck. Remove and reuse existing pedestrian railing. Variable depth steel plate girders can mimic the shape of the existing concrete box girder bridge.

  A comprehensive preliminary design is required to verify constructability and to review impacts of the additional weight on the existing in water pier foundations.

- OPTION No. 4 – New Prestressed Concrete Tub Girders

  Construct new abutment and stairs at southwest corner of existing bridge and expand abutment at northwest corner of existing bridge. Install steel brackets at Piers 2 and 3 to support new prestressed concrete tub girder with cast in place deck. Remove and reuse existing pedestrian railing.

  A comprehensive preliminary design is required to verify constructability and to review impacts of the additional weight on the existing in water pier foundations.

- OPTION No. 5 – New Post-Tensioned Concrete Box Girder

  Construct new abutment and stairs at southwest corner of existing bridge and expand abutment at northwest corner of existing bridge. Install steel brackets at Piers 2 and 3 to support new concrete post-tensioned concrete box girder with cast in place deck. Remove and reuse pedestrian railing. The variable depth post-tensioned girders will mimic the shape of the existing box girder bridge.

  A comprehensive preliminary design is required to verify constructability and to review impacts of the additional weight on the existing in water pier foundations.

6. PERMITS AND CULTURAL RESOURCE REQUIREMENTS

PERMITS

An environmental permit matrix was prepared by SWCA Environmental Consultants for the Riverfront Park Bridges. The proposed bridge improvement work may require the following permits or approvals:

- Section 404 Nationwide Permit 14 (NWP 14) – Linear transportation projects from US Army Corps of Engineers
- Section 7 Endangered Species Act consultation from US Fish and Wildlife Service
- National Historic Preservation Act – Section 106 consultation from Washington Department of Archaeology and Historic Preservation and potentially affected tribes
- Executive Order 05-05 from Washington Department of Archaeology and Historic Preservation
- Hydraulic Project Approval permit from the Washington Department of Fish and Wildlife.
- Construction Stormwater General Permit from Washington Department of Ecology
- State Environmental Policy Act Threshold Determination from the City of Spokane
- Critical Areas Review from the City of Spokane
- Shoreline Substantial Development Permit from the City of Spokane

CULTURAL RESOURCE STUDY

This bridge is not listed on the National Register of Historic Places (NRHP). If the selected bridge alternative requires construction of new abutments, an archeological survey would be required due to the excavation.

For more detailed information on the permits and cultural resource requirements please see the full report prepared by SWCA Environmental Consultants.

APPENDIX A

LIST OF PHOTOGRAPHS

CITY OF SPOKANE

PEDESTRIAN BRIDGE INSPECTION FORM

				Bridge No.	393000809
Bridge Name	Washington St. North Channel		**Bridge Location**	0.85 miles north of I-90 over Spokane River	
Inspection Date	9/5/2014	**Inspector(s)**	M. Frymoyer	**Agency**	KPFF
Access Method	no special equipment required			**Weather**	sunny \ warm
Load Rating Date	Sept. 2014	**Live Load**	**Pedestrian**	**Vehicle**	
			-	FHWA HS-20	
Load Rating Factor(s)	**Ped.** / **Veh.**	**Controlling Component**	**Pedestrian**	**Vehicle**	
	- / 1.83		-	Middle Span 2 - Flexure	

Description of Bridge

The Washington Street North Channel Bridge was built in 1985, replacing the original bridge that was built in 1908. The three-span bridge consists of two post-tensioned box girders. There are sidewalks and stairs on both sides of the bridge and a walkway below the end spans. The total bridge length is 326 ft with span lengths of 80 ft, 160 ft, and 80 ft.

Summary of Condition and Critical Findings

An abbreviated routine inspection of the overhangs and railings was performed to determine the feasibility of widening the existing structure. No significant defects were found. Railing cables are slightly loose.

Summary of Recommendations

Tighten horizontal steel cables in railing.

Summary of Bridge Condition

	Bridge Component	No. of Compon.	% of **	Condition Rating* 8 – 7 Good	6 – 5 Fair	4 – 3 Poor	Comments
1	Metal Railing	2	length	100%	0%	0%	Horizontal steel cables are loose/sagging
2	Deck (at Sidewalk)	1	area	100%	0%	0%	Concrete curb is cracked/delaminated
3	Soffit (at overhangs)	1	area	100%	0%	0%	Hairline transverse leaching cracks.
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							

*See Page 2 for detailed descriptions **Condition rating percentages are based on the % of area, length, or each of the bridge components inspected.

GENERAL NOTES

DESCRIPTION OF CONDITION OF BRIDGE COMPONENT		
Condition Value	**Material**	**Description**
8 – 7 Very good → Good 2 yr. insp. Cycle No repairs.	Steel	Like new, surface rust, minor pitting, no material loss. Connections are good. No damage.
	Concrete	No to minor/ insignificant defects includes: cracks, spalls, chips, consolidation, efflorescence.
	Timber	Beams: Minor splits, checks, or defects (one side), no decay or insects – sounds solid. Posts: Splits or cracks less than ⅜" (one side), no decay or insects – sounds solid.
	Paint	No defects, no sign of rust including no freckled rust, no peeling, no exposed steel.
	Scour / Erosion	None or minor.
6 – 5 Satisfactory → Fair 1 – 2 yr insp. cycle Monitor for repairs Paint: Max 10 year life estimate	Steel	Moderate corrosion, pitting, flaking, pack rust. Material loss is evident but barely measurable. Connections have up to moderate corrosion but remain fully functional. No cracks.
	Concrete	Some spalling but exposed rebar (if any) is insignificant or exhibits some surface rust; delamination is evident with or without evidence of rebar corrosion. Shear zone cracks are tight, barely measureable, and low density. Flexure zone cracks are measurable but less than .035 inch and low density. Concrete may exhibit: efflorescence (moderate to heavy), surface rust, heavy map cracking, very poor consolidation. Settlement cracks in foundations and wall are stable and less than ¼" wide.
	Timber	Beams: Less than ⅜" splits – two sides or greater than ⅜" on one side. Some decay (max 10% by volume), some softness but sounds solid – no insects. Posts: More than ½ "splits – two sides or greater than ¾" on one side. Decay is evident (greater than 20% by volume), timber may have extensive wetness and softness.
	Paint	Freckled rust, small areas of exposed steel, some peeling, oxidized.
	Scour / Erosion	Evidence of scour, exposed footing, no undermining. Banks are sloughing, protection, if any, needs repair.
4 – 3 Poor → Critical 3 mo – 1 yr. insp. cycle (as needed) Repairs needed. (ASAP or one year) Re - paint	Steel	Heavy to severe: corrosion, pitting, pack rust. Measurable material loss. Connections are heavily corroded, missing, and questionable functionality. Fatigue cracks.
	Concrete	Large spalls, deep w/ exposed and corroded rebar w/ material loss evident. Cracks are wider, closely spaced, clearly structural in nature both in shear and flexure zone. Concrete quality appears poor w/ heavy scaling, stagilites, efflorescence, map cracking, extensive surface rust and delamination, and very poor consolidation of concrete. Settlement cracks are significant.
	Timber	Beams: Greater than ⅜" on two sides. Moderate decay up to 20%, surface softness, do not sound solid – may have insects. Posts: Less than ½ "splits – two sides or greater than ½" on one side. Decay is evident (20%), wetness and soft.
	Paint	Extensive freckled rust, larger areas of exposed steel, heavily oxidized, extensive peeling.
	Scour / Erosion	Undermining or threatens undermining in a manner that could impact structure stability. Banks are heavily eroded, protection if any is non-functional.

Additional Comments by Component Number

Bridge Comp. No.	**Comments**

Photo 1 – Washington Street North Bridge Deck (Looking South)

Photo 2 – Washington Street North Bridge Elevation (Looking Southeast)

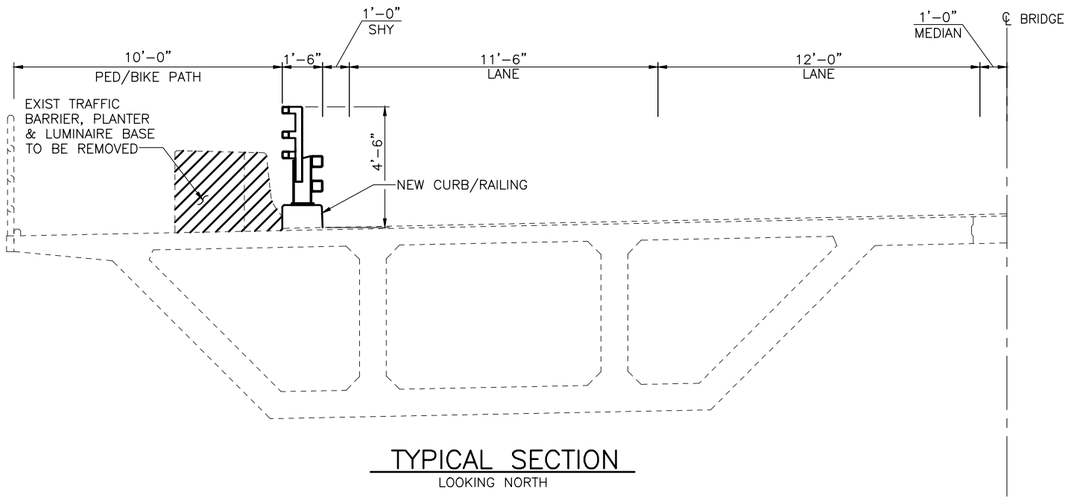
Photo 3 – Existing Sidewalk to be Widened

Photo 4 – Stairs at Southwest Corner of Bridge and Location for New Abutment

APPENDIX B

IMPROVEMENT DETAILS
COST ESTIMATES

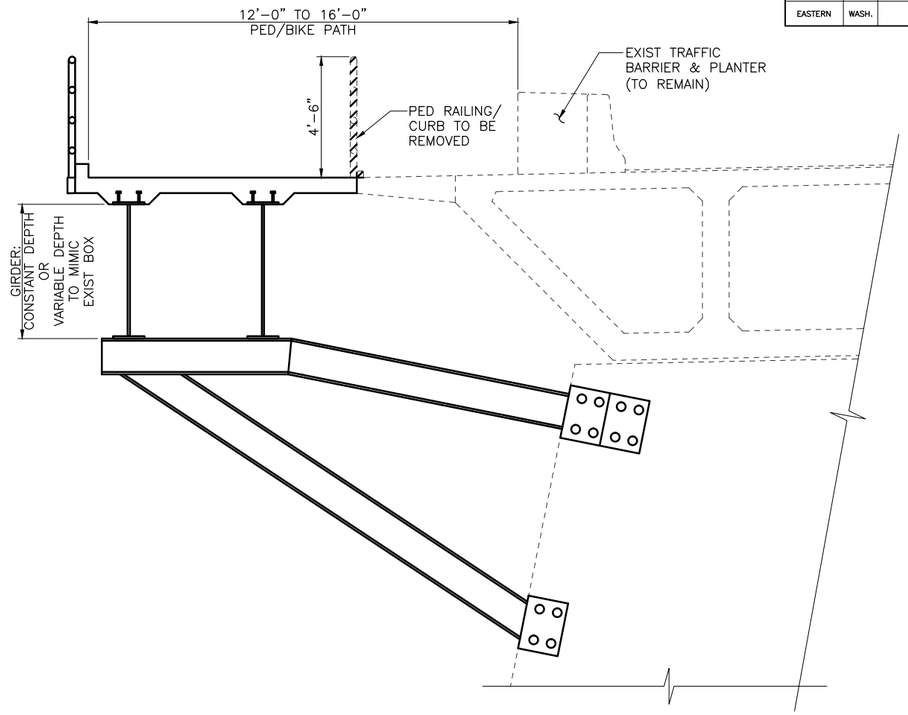
REGION NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.
EASTERN	WASH.	---	



TYPICAL SECTION
LOOKING NORTH

BARRIER REPLACEMENT – OPTION 1

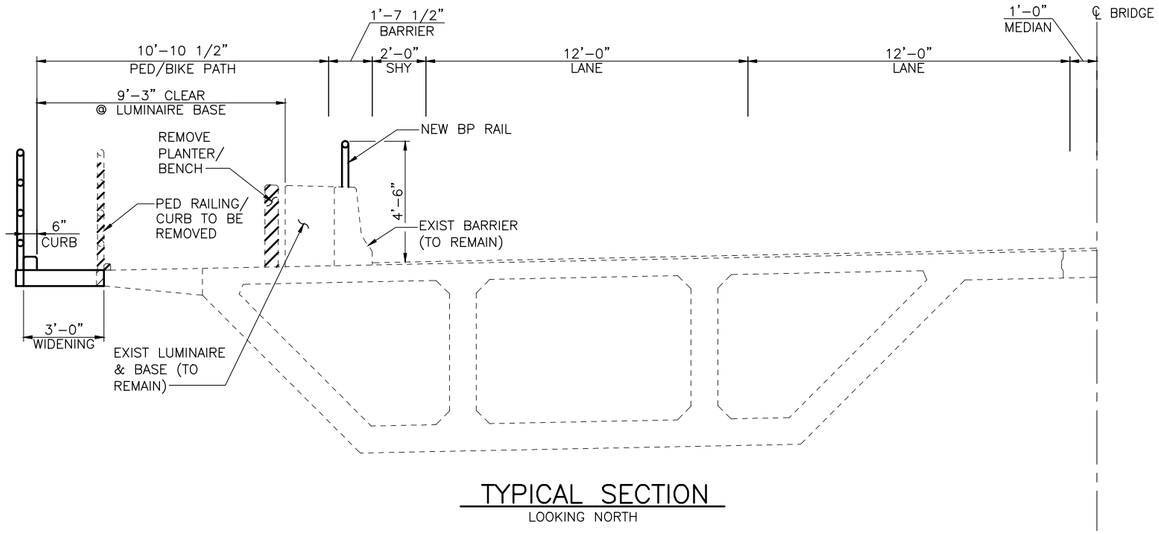
(SIMPLEST APPPROACH)



TYPICAL SECTION AT PIERS
LOOKING NORTH

NEW STEEL GIRDERS – OPTION 3

(ADD NEW BRACKET SUPPORTED GIRDERS)



TYPICAL SECTION
LOOKING NORTH

WIDENING EXISTING BOX GIRDER – OPTION 2

(EXTEND EXISTING OVERHANG)

DATE	BY	PROJ.	DESCRIPTION
-/-/-	--		
			REVISIONS

DATE	BY	PROJ.	E.F.N.	U.S.N.	FROM	TO

AS BUILT — COUNCIL ACCEPT DATE

FROM	TO	ORD. NO.	DATE	FILE NO.

GRADE ORDINANCE LIST

NAVD88 = (OLD CRM ELEV.) - (13.13) — AS OF JANUARY, 2000 USE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)

BENCH MARK LOCATION: -
-

NAVD88 ELEV.: -

CRM NO.: -

NAVD88 DATUM

BAR IS ONE INCH ON ORIGINAL DRAWING
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

HORIZONTAL PLAN/PROFILE: AS SHOWN
VERTICAL PROFILE ONLY:

SCALE

CURRENT C.O.S. DRAFTING STANDARDS ADOPTED FEB.2007

	BY	DATES
DRAWN:	HT	11/14
REVISED:	MLF	11/14
CHECKED:	TW	11/14
APPROVED:	MLF	11/14

CITY OF SPOKANE, WASHINGTON
DEPARTMENT OF ENGINEERING SERVICES
808 WEST SPOKANE FALLS BLVD.
SPOKANE, WASHINGTON 99201-3343
(509) 625-6700

PROJECT NAME: RIVERFRONT PARK BRIDGES

BRIDGE NAME: WASHINGTON STREET NORTH
PEDESTRIAN/BICYCLE PATH/BRIDGE WIDENING

TYPICAL SECTIONS

TYPE OF IMPROVEMENT: BRIDGE

CITY PROJECT NUMBER: 2013186

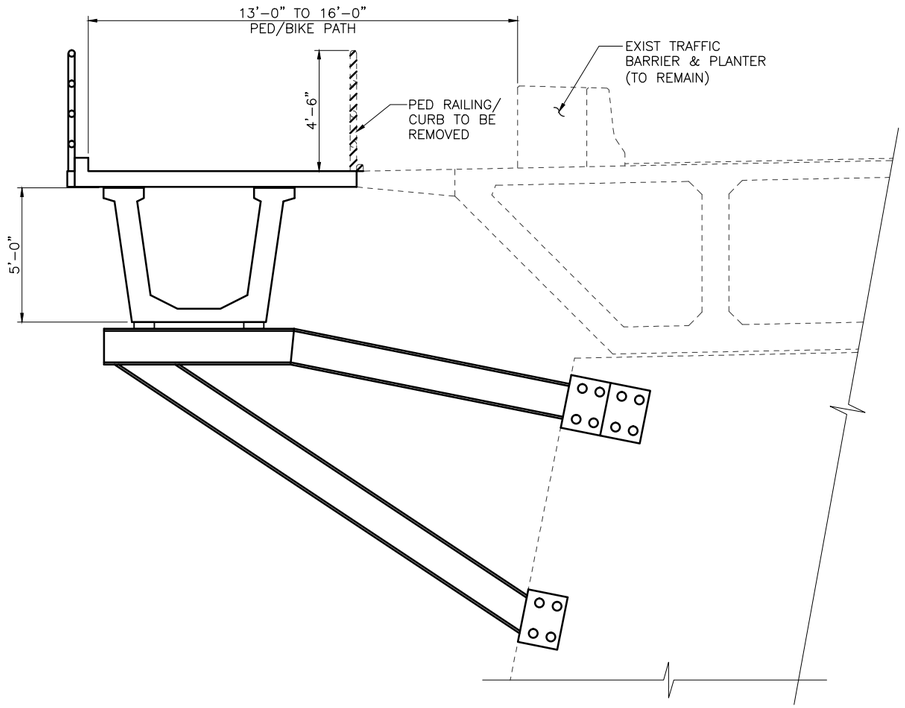
PLAN NUMBER: 1 of 2

DPW: --

CALL BEFORE YOU DIG 1-800-424-5555

Name: TaunieA Date: Nov 11, 2014-11:04:15am File: V:\114176 (Spokane River Front Bridges)\Washinton St. North Bridge\Design\WSN-S01.dwg

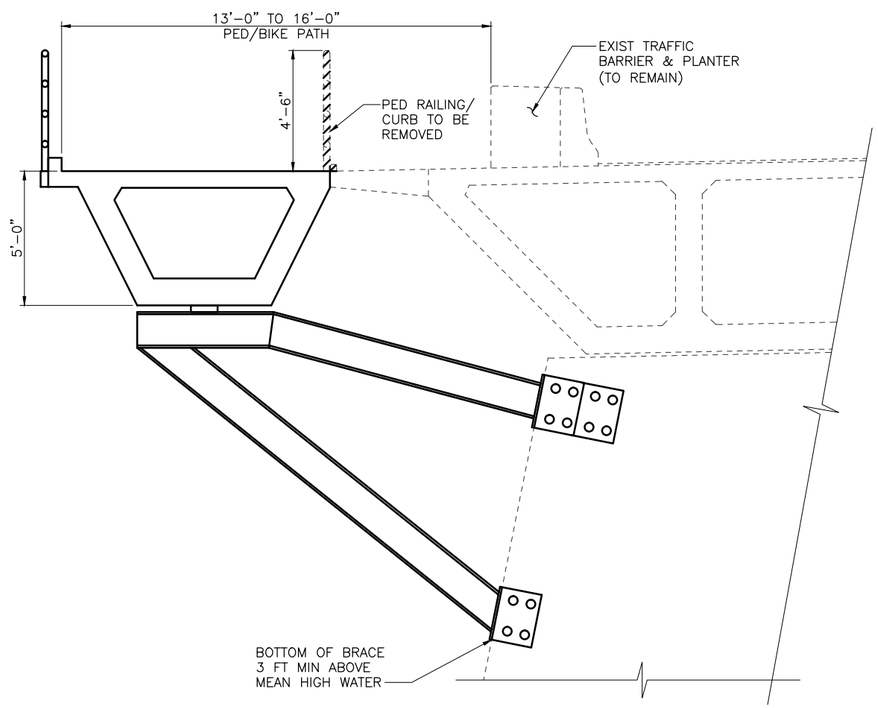
REGION NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.
EASTERN	WASH.	---	



TYPICAL SECTION AT PIERS
LOOKING NORTH

NEW PS TUB GIRDERS – OPTION 4

(SEPARATE C.I.P. DECK)



TYPICAL SECTION AT PIERS
LOOKING NORTH

NEW PT BOX GIRDERS – OPTION 5

(DECK COMPOSITE WITH GIRDER)

DATE	BY	PROJ.	DESCRIPTION
-/-/-	--	---	

REVISIONS

DATE	BY	PROJ.	E.F.N.	U.S.N.	FROM	TO	COUNCIL ACCEPT DATE

AS BUILT

FROM	TO	ORD. NO.	DATE	FILE NO.

GRADE ORDINANCE LIST

NAVD88 = (OLD CRM ELEV.) - (13.13)

AS OF JANUARY, 2000 USE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)

BENCH MARK LOCATION: -
-

NAVD88 ELEV: -

CRM NO: -

NAVD88 DATUM

IMAGE IS ONE INCH ON ORIGINAL DRAWING

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

HORIZONTAL: PLAN/PROFILE AS SHOWN
VERTICAL: PROFILE ONLY

SCALE

CURRENT C.O.S. DRAFTING STANDARDS ADOPTED FEB. 2007

	BY	DATES
DRAWN:	HT	11/14
REVISED:	MLF	11/14
CHECKED:	TW	11/14
APPROVED:	MLF	11/14

CITY OF SPOKANE, WASHINGTON
DEPARTMENT OF ENGINEERING SERVICES
808 WEST SPOKANE FALLS BLVD.
SPOKANE, WASHINGTON 99201-3343
(509) 625-6700

PROJECT NAME: RIVERFRONT PARK BRIDGES

BRIDGE NAME: WASHINGTON STREET NORTH
PEDESTRIAN/BICYCLE PATH/BRIDGE WIDENING

TYPICAL SECTIONS

TYPE OF IMPROVEMENT: BRIDGE

CITY PROJECT NUMBER: 2013186

PLAN NUMBER: 2 of 2

EFN: --

CALL BEFORE YOU DIG 1-800-424-5555

Name: TauniekA Date: Nov 11, 2014-11:05:09am File: V:\114176 (Spokane River Front Bridges)\Washinton St. North Bridge\Design\WSN-S02.dwg

City of Spokane Pedestrian Bridges Nov-14

Cost Estimates for Bridge Improvements Based on the 2014 KPFF Inspection and Analysis Recommendations

Bridge Name: Washington Street Bridge Option 1

Sidewalk Length and Additional Width (feet) 320 4

Recommendations for Improvements - Include: Remove concrete planter, barrier and luminaire base - Westside only
Replace with metal bridge & bike rail

Item no	Item Description	Cost Unit	Quantity	Unit Cost		Item Cost
1	Removal Barrier/Planter	LF	320	100	$	32,000
2	New Curb, bridge rail, and ped. rail	LF	320	250	$	80,000
3	Luminaire attachments	EA	4	3000	$	12,000
4	Restripe shoulder line	LF	320	20	$	6,400
5	Misc	LS	1	50000	$	50,000
					$	-
	Total				$	180,400
6	Mobilization	10%			$	18,040
7	Design, Permits, Survey	20%			$	36,080
8	Construction Management	13%			$	22,550
9	Taxes	8%			$	14,432
10	Contingency	30%			$	54,120
11	Excalation (1 year)	3%			$	5,412
12	Agency Project Development & Mngmt.	5%			$	9,020
	Total				$	159,654
	Total Project Cost (2015)				**$**	**340,054**
	Square Foot Cost ($/SF)				$	266

City of Spokane Pedestrian Bridges Nov-14

Cost Estimates for Bridge Improvements Based on the 2014 KPFF Inspection and Analysis Recommendations

Bridge Name: Washington Street Bridge Option 2

Sidewalk Length and Additional Width (feet) 320 5

Recommendations for Improvements - Include: Remove Planter and widen existing sidewalk
(no additional supports)

Item no	Item Description	Cost Unit	Quantity	Unit Cost		Item Cost
1	Removal curb, railing and planter	LF	320	100	$	32,000
2	Widen Top Slab	CUYD	50	2000	$	100,000
3	Reuse railing, install	LF	320	50	$	16,000
4	BP Rail	LF	320	90	$	28,800
5	Luminaire base modifications	EA	4	4000	$	16,000
6	Misc	LS	1	50000	$	50,000
					$	-
	Total				$	242,800
7	Mobilization	10%			$	24,280
8	Design, Permits, Geotech, Survey	30%			$	72,840
9	Construction Management	13%			$	30,350
10	Taxes	8%			$	19,424
11	Contingency	30%			$	72,840
12	Excalation (1 year)	3%			$	7,284
13	Agency Project Development & Mngmt.	5%			$	12,140
	Total				$	239,158
	Total Project Cost (2015)				**$**	**481,958**
	Square Foot Cost ($/SF)				$	301

City of Spokane Pedestrian Bridges Nov-14

Cost Estimates for Bridge Improvements Based on the 2014 KPFF Inspection and Analysis Recommendations

Bridge Name: Washington Street Bridge Option 3
Sidewalk Length and Additional Width (feet) 300 10

Recommendations for Improvements - Include: Widen using new braces attached to piers - Steel option

Item no	Item Description	Cost Unit	Quantity	Unit Cost		Item Cost
1	Removal curb and railing	LF	300	60	$	18,000
2	Widen Top Slab	CUYD	60	1000	$	60,000
3	Reuse railing, install	LF	300	50	$	15,000
4	Steel Plate HP Weathering Steel Girder	LB	140000	3	$	420,000
5	Abutment and New Stairs @ South Abutment	LS	1	150000	$	150,000
6	Steel Braces & Anchor System	EA	2	35000	$	70,000
7	Misc	LS	1	50000	$	50,000
	Total				$	783,000
8	Mobilization	12%			$	93,960
9	Design, Permits, Geotech, Survey	30%			$	234,900
10	Construction Management	13%			$	97,875
11	Taxes	8%			$	62,640
12	Contingency	30%			$	234,900
13	Excalation (1 year)	3%			$	23,490
14	Agency Project Development & Mngmt.	5%			$	39,150
	Total				$	786,915
	Total Project Cost (2015)				**$**	**1,569,915**
	Square Foot Cost ($/SF)				$	523

* Constructability and foundation review was not perfomred. A comprehensive preliminary design is required to perform a constructabilty analysis and review the impacts of the additional weight on the existing pier foundations.

City of Spokane Pedestrian Bridges Nov-14

Cost Estimates for Bridge Improvements Based on the 2014 KPFF Inspection and Analysis Recommendations

Bridge Name: Washington Street Bridge Option 4 & 5
Sidewalk Length and Width (feet) 300 10

Recommendations for Improvements - Include: Widen using new braces attached to piers - Precast Girders

Item no	Item Description	Cost Unit	Quantity	Unit Cost		Item Cost
1	Removal curb and railing	LF	300	60	$	18,000
2	Widen Top Slab	CUYD	60	1000	$	60,000
3	Reuse railing, install	LF	300	50	$	15,000
4	Precast Tub girder (UF60G5)	LF	300	1200	$	360,000
5	Abutment and New Stairs @ South Abutment	LS	1	150000	$	150,000
6	Steel Braces & Anchor System	EA	2	70000	$	140,000
7	Misc	LS	1	50000	$	50,000
	Total				$	793,000
8	Mobilization	12%			$	95,160
9	Design, Permits, Geotech, Survey	30%			$	237,900
10	Construction Management	13%			$	99,125
11	Taxes	8%			$	63,440
12	Contingency	30%			$	237,900
13	Excalation (1 year)	3%			$	23,790
14	Agency Project Development & Mngmt.	5%			$	39,650
	Total				$	796,965
	Total Project Cost (2015)				**$**	**1,589,965**
	Square Foot Cost ($/SF)				$	530

* Constructability and foundation review was not perfomred. A comprehensive preliminary design is required to perform a constructabilty analysis and review the impacts of the additional weight on the existing pier foundations.

APPENDIX C

PHOTOGRAPH LOG
PHOTOGRAPH CONTACT SHEET

kpff Consulting Engineers
1601 Fifth Avenue, Suite 1600 Seattle, WA 98101
(206) 622-5822 fax (206) 622-8130

Project	Riverfront Park Bridges Inspection	By	MLF	Sheet No.
Location	Spokane	Date	9/5/2014	1 OF 1
Client	City of Spokane			Job No.
Inspection Photo Log				114176.12

Bridge Name: Washington Street North

Date of Inspection: 9/5/2014

Photo No.	Location	Notes	By
460	SE Abutment	Railing, curb connection, cracks in top of curb	MF
461	SE Abutment	Railing, curb connection, cracks in top of curb	MF
462	SE Abutment	Stairs to walkway under bridge	MF
463	SE Abutment	Sidewalk, looking north	MF
464	SE Abutment	Spalls in top of curb	MF
465	SE Abutment	Spalls in top of curb	MF
466	General	Railing	MF
467	General	Overhang soffit	MF
468	NE Abutment	Stairs to walkway under bridge	MF
469	General	Overhang soffit	MF
470	General	Overhang soffit	MF
471	NE Abutment	Stairs to walkway under bridge	MF
472	Abutment	Rock faced wingwall	MF
473	General	Overhang soffit	MF
474	NW Abutment	Wingwall, soffit	MF
475	General	Partial elevation	MF
476	General	Outside view of railing	MF
477	General	Partial elevation	MF
478	NW Abutment	Sidewalk, looking south	MF
479	NW Abutment	Sidewalk, looking south	MF
480	NW Abutment	Cracks in curb	MF
481	General	Spalls in top of deck	MF
482	SW Abutment	Sidewalk, looking south	MF
483	General	Railing	MF
484	SW Abutment	Stairs to walkway under bridge	MF
485	General	Soffit	MF
486	General	Soffit, stairs	MF
487	SW Abutment	Rock wall	MF
488	SE Abutment	Stairs to walkway under bridge	MF
489	General	Soffit- hairline leaching cracks, stairs	MF
490	SW Abutment	Spalls, cracks bottom of staris	MF

Washington Street North Bridge Photographs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