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Calculation	Bridge Quantities: LIC-ThwdX-0010
Description	Final Tracings Quantities

GF Job No:	Bridge SFN	Calculated	Checked	Updated	Verified	Level 2 Review
058677	4560100	•RSN 11/12/2021	•SAT 11/15/2021	•SAT 2/23/2023	MTO 2/23/2023	•MTO 2/23/2023

This calculation will use ODOT Bid Elements.

INPUT: Superstructure

General and Existing Data

Minimum Concrete Deck Thickness:	8.750 in	Outside Parapet Area:	4.14 sf
Total Number of Girder Lines:	8 Girders	Median Parapet Area:	0.00 sf
Length of Bridge Limits:	423.99 ft		
		Outside Parapet/Deck Ovhg Perimeter:	9.81 ft
		Median Parapet/Deck Ovhg Perimeter:	0.00 ft
		Left Parapet Length (not include App Slabs):	424 ft
		Right Parapet Length (not include App Slabs):	424 ft
		Left Parapet Length (include Approaches):	484 ft
		Right Parapet Length (include Approaches):	484 ft
Existing Supestructure Steel:			
Existing Rear Abutment:			
Existing Bridge Deck Area:			
Existing Piers:			
Existing Approach Slabs:			

CIP Deck Reinforcing Ratio:	270 lb/cy	Abutment & W.W. Reinforcing Ratio:	120 lb/cy
Pier Cap Reinforcing Ratio:	200 lb/cy	Footing Reinforcing Ratio:	140 lb/cy
Pier Wall & Abutment Backwall Reinforcing Ratio:	300 lb/cy	Parapet/Curb Reinforcing Ratio:	170 lb/cy

Superstructure Specific Data

Design Girder Length:	422.00 ft	C/C Bearing	Deck Width, Out-Out:	71.33 ft	normal to align.
Girder Projection Length after BRG (Total):	1.50 ft		Skew:	8.750 deg	*0.15272 rad*
Intermediate Dprm Connx Plate Height:	60.000 in				
Intermediate Dprm Connx Plate Thickness:	0.500 in		Girder Flange Width:	20.000 in	Weathering
Intermediate Dprm Connx Plate Width:	8.000 in		Girder Flange Thickness:	1.129 in	Steel
Typical Stiffener Clip Area:	0.000 SqIn		Girder Web Depth:	60.000 in	
Intermediate Dprm Connx Plate Paint Area:	1020 SqIn		Girder Web Thickness:	0.688 in	
# of Intermediate Dprm Connx Plates:	0		Girder Paint Perimeter:	180.9 in	See Detailed Calcs
			Girder Weight:	NA	
Concrete Deck CAD Area:	30,245 sf		Number of Int Diaphragms:	175	
Concrete Haunch Area:	0.43 sf		Number of End Diaphragms:	0	
Overhang CAD Area:	0.56 sf				
End Area above Diaphragm:	1 sf				
APP Slab CAD Area:	4,280 sf	RA & FA			

INPUT: Substructure

Rear Abutment

Stem Thickness:	3.00 ft	Wingwall Thickness:	2.50 ft
Diaph Thickness:	3.00 ft	Wingwall CAD Area:	308 sf
Footing Width:	6.00 ft		
RA Stem CAD Area:	265 sf		
RA Diaph CAD Area:	390 sf		
RA Footing CAD Area (includinh wingwall):	318 sf		

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Forward Abutment

Stem Thickness:	3.00 ft		
Diaph Thickness:	3.00 ft		
Footing Thickness:	6.00 ft	Wingwall CAD Area:	266 sf
		Wingwall Thickness	2.50 ft
FA Stem CAD Area	266 sf		
FA Diaph CAD Area	384 sf		
FA Footing CAD Area	318 sf		

Pier 1

Cap thickness	4.00 ft		
Cap CAD Area:	969.20 sf	Footing Face CAD Area:	150.50 sf
Cap Length:	72.50 ft	Foundation Width:	10.00 ft
Wall Face CAD Area:	580 sf		
Wall Thickness:	4.00 ft		

Pier 2

Cap thickness	4.00 ft		
Cap CAD Area:	968.70 sf	Footing Face CAD Area:	147.00 sf
Cap Length:	72.50 ft	Foundation Width:	10.00 ft
Wall Face CAD Area:	303 sf		
Wall Thickness:	4.00 ft		

Quantities

503E 11100 COFFERDAMS AND EXCAVATION BRACING — (LS) = 1 ()

503E 21100 UNCLASSIFIED EXCAVATION — (CY) = 436 (CHECK UNIT OF MEASURE)

Pier 1:	12.00 ft (Width)	X	45.00 ft (Length)	11.50 ft (Avg Depth)	/(27 cf/cy)=	230.0 cy
Pier 2:	12.00 ft (Width)	X	44.00 ft (Length)	10.50 ft (Avg Depth)	/(27 cf/cy)=	205.3 cy
FA+wingwall:	8.00 ft (Width)	X	108.00 ft (Length)	0.00 ft (Avg Depth)	/(27 cf/cy)=	.0 cy
RA+wingwall:	8.00 ft (Width)	X	108.00 ft (Length)	0.00 ft (Avg Depth)	/(27 cf/cy)=	.0 cy

507E 00651 14" CAST-IN-PLACE REINFORCED CONCRETE PILES, FURNISHED, AS PER PLAN — (FT) = 3,360 ()

FA:	32 (Number of Piles)	X	50 ft (Length)	Long	=	1,600 ft
RA:	32 (Number of Piles)	X	55 ft (Length)	Long	=	1,760 ft

507E 00600 14" CAST-IN-PLACE REINFORCED CONCRETE PILES, DRIVEN — (FT) = 3,040 ()

FA:	32 (Number of Piles)	X	45 ft (Length)	Long	=	1,440 ft
RA:	32 (Number of Piles)	X	50 ft (Length)	Long	=	1,600 ft

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507E 00651	**14" CAST-IN-PLACE REINFORCED CONCRETE PILES, FURNISHED, AS PER PLAN**						**(FT) =**	**3,270**	0
Pier 1:	30	X	55 ft	**Long**			=	**1,650** *ft*	
Pier 2:	27	X	60 ft	**Long**			=	**1,620** *ft*	
	Number of Piles		Length						
507E 00600	**14" CAST-IN-PLACE REINFORCED CONCRETE PILES, DRIVEN**						**(FT) =**	**2,985**	0
Pier 1:	30	X	50 ft	**Long**			=	**1,500** *ft*	
Pier 2:	27	X	55 ft	**Long**			=	**1,485** *ft*	
	Number of Piles		Length						
507E 92200	**PREBORED HOLES**						**(FT) =**	**864**	0
RA	32	X	27 ft	**Long**			=	**864** *ft*	
505E 11100	**PILE DRIVING EQUIPMENT MOBILIZATION**						**(LS) =**	**1**	0
All Piles:	Lump Sum								
509E 10000	**EPOXY COATED REINFORCING STEEL**						**(LB) =**	**390,167**	0
Deck:							=	**243,599 lb**	
Parapets:							=	**22,548 lb**	
Diaphragms							=	**12,311 lb**	
A, FA & Wingwalls (Above Footings):							=	**7,766 lb**	
RA, FA & Wingwalls Footings:							=	**14,337 lb**	
Piers (Above Footings):							=	**78,414 lb**	
Pier Footings:							=	**11,192 lb**	
509E 30020	**NO. 4 GFRP DEFORMED BARS**						**(FT)**	**14,945**	
GFRP Bars	14945 ft	No. 4 GFRP bars for parapets							
511E 33500	**SEMI-INTEGRAL DIAPHRAGM GUIDE**						**(EACH) =**	**2**	0
Rear Abutment:	1 each						=	**1 each**	
Forward Abutment:	1 each						=	**1 each**	
511E 34446	**CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK**						**(CY) =**	**981**	*(CHECK UNIT OF MEASURE)*
Deck - Above Haunch:			30,245 sf	X	8.75 in		/(27 cf/cy)=	**817** *cy*	
			CAD Area		Thickness				
Deck - Haunch:	423.50 ft	X	0.43 sf	X	8		/(27 cf/cy)=	**54.4** *cy*	
	Length		Area		# of Haunches				
Deck - Overhang:	423.50 ft	X	0.56 sf	X	2		/(27 cf/cy)=	**17.6** *cy*	
	Length		Area		# of Haunches				
Deck - Ends above Diaphragm:	71.33 ft	X	1.00 sf	X	2		/(27 cf/cy)=	**5.3** *cy*	
	Length		Area		Rear and Forward				
RA, Diaph:	390.30 sf	X	3.00 ft				/(27 cf/cy)=	**43.4** *cy*	
	CAD Area		Thickness						
FA, Diaph:	384.00 sf	X	3.00 ft				/(27 cf/cy)=	**42.7** *cy*	
	CAD Area		Thickness						
511E 34451	**CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK (PARAPET), AS PER PLAN**						**(CY) =**	**149**	*(CHECK UNIT OF MEASURE)*
Curb/Parapet:	967.98 ft	X	4.14 sf				/(27 cf/cy)=	**148.4** *cy*	
511E 40512	**CLASS QC1 CONCRETE WITH QC/QA, PIER ABOVE FOOTINGS**						**(CY) =**	**418**	*(WALLS)*
Pier Cap 1:	4.00 ft	X	969.20 sf				/(27 cf/cy)=	**143.6** *cy*	
	WIDTH		CAD Area						
Pier Wall 1:	4.00 ft	X	579.92 sf				/(27 cf/cy)=	**85.9** *cy*	
	Width		CAD Area						
Pier Cap 2:	4.00 ft	X	968.70 sf				/(27 cf/cy)=	**143.5** *cy*	
	WIDTH		CAD Area						
Pier Wall 2:	4.00 ft	X	303.00 sf				/(27 cf/cy)=	**44.9** *cy*	
	Width		CAD Area						

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511E 46512 CLASS QC1 CONCRETE WITH QC/QA, FOOTING — (CY) = 252 ()

Pier 1 Footing:	10.00 ft (Width)	X	150.50 sf (CAD Area)	/(27 cf/cy)=	**55.7** *cy*
Pier 2 Footing:	10.00 ft (Width)	X	147.00 sf (CAD Area)	/(27 cf/cy)=	**54.4** *cy*
FA Footing:	318.00 sf (CAD Area)	X	6.00 ft (Thickness)	/(27 cf/cy)=	**70.7** *cy*
RA, Footing:	318.00 sf (CAD Area)	X	6.00 ft (Thickness)	/(27 cf/cy)=	**70.7** *cy*

511E 44112 CLASS QC1 CONCRETE WITH QC/QA, ABUTMENT NOT INCLUDING FOOTING — (CY) = 113 ()

RA, Stem:	265.10 sf (CAD Area)	X	3.00 ft (Thickness)	/(27 cf/cy)=	**29.5** *cy*
RA,Wingwall:	308.00 sf (CAD Area)	X	2.50 ft (Thickness)	/(27 cf/cy)=	**28.5** *cy*
FA, Stem:	266.20 sf (CAD Area)	X	3.00 ft (Thickness)		**29.6** *cy*
FA,Wingwall	265.57 sf (CAD Area)	X	2.50 ft (Thickness)	/(27 cf/cy)=	**24.6** *cy*

512E 10100 SEALING OF CONCRETE SURFACES (EPOXY-URETHANE) — (SY) = 753 ()

RA, Stem + Diaph:	500 sf	.	/(9 sf/sy)=	**56 sy**
RA, WingWall:	200 sf	.	/(9 sf/sy)=	**22.2 sy**
RA, Wingwall top + sides + back:	118 sf (CAD Area)	.	/(9 sf/sy)=	**13 sy**
FA Stem + Diaphragm:	491 sf		/(9 sf/sy)=	**55 sy**
FA, WingWall:	177 sf		/(9 sf/sy)=	**20 sy**
FA, Wingwall top + sides + back:	115 sf (CAD Area)		/(9 sf/sy)=	**13 sy**
Pier 1 - Wall:	635 sf		/(9 sf/sy)=	**71 sy**
Pier 1 - Cap:	2,217 sf (CAD Area)		/(9 sf/sy)=	**246 sy**
Pier 2 - Wall:	105 sf		/(9 sf/sy)=	**12 sy**
Pier 2 - Cap:	2,212 sf (CAD Area)		/(9 sf/sy)=	**246 sy**

512E 10050 SEALING OF CONCRETE SURFACES (NON-EPOXY) — (SY) = 1,056 ()

Parapet & Deck Underside:	968.0 ft (Length)	Including App Slabs	X	9.81 ft (Premiter)	/(9 sf/sy)=	**1,055 sy**

512E 10001 SEALING OF CONCRETE SURFACES, AS PER PLAN — (SY) = 575 *(PERMANENT GRAFFITI PROTECTION)*

Pier 1 - Wall:	635 sf	/(9 sf/sy)=	**71 sy**
Pier 1 - Cap:	2,217 sf	/(9 sf/sy)=	**246 sy**
Pier 2 - Wall:	105 sf	/(9 sf/sy)=	**12 sy**
Pier 2 - Cap:	2,212 sf	/(9 sf/sy)=	**246 sy**

512E 33000 TYPE 2 WATERPROOFING — (SY) = 22 *(CHECK UNIT OF MEASURE)*

Rear Wingwall:	95.00 sf	=	**10.6** *SY*
Forward Wingwall:	95.00 sf	=	**10.6** *SY*

513E 10281 STRUCTURAL STEEL MEMBERS, LEVEL 4, AS PER PLAN — (LB) = 1,211,925 *(CHECK UNIT OF MEASURE)*

Girder Weight:	Length		Area	
section 1,5,9	276 ft	X	0.5816 sf	**78,513**
Section 2,4	43 ft	X	0.7378 sf	**15,366**
Section 3	32 ft	X	0.9115 sf	**14,292**
Section 6,8	42 ft	X	0.6858 sf	**14,113**
Section 7	30 ft	X	0.8420 sf	**12,378**

Total Girder Weight (8 Girders) = 1,077,285

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Int Xframes:	30.7 ft (Total Length/ Bay)	X	11.3 lb/ft	X	175 (Numbers)			**60,630**
Int Xframe Connection Plate:	0.14 cf (Volume)		X 490 lb/cf	X	350 (Numbers)			**23,819**
Pier Xframes:	30.7 ft (Total Length/ Bay)	X	11.3 lb/ft	X	14 (Numbers)			**4,860**
Pier Brg Stiffeners:	0.31 cf (Volume)		X 490 lb/cf	X	32 (numbers)			**4,900**
Splice Weight:	63.41 cf (Volume/all)		X 490 lb/cf					**31,069.35**
Abut Brg Stiffeners:	0.31 cf (Volume)		X 490 lb/cf	X	32 (numbers)			**4,900**
Splice Bolts:	124 (count)		32 (splices)	X	X 104 lb/100			**4,127**
Crossframe Bolts:	6 (count)		189 (crossframes)	X	X 29 lb/100			**333**

513E 20000 WELDED STUD SHEAR CONNECTORS (EACH) = 11,520 ()

G1:	480 (Rows of studs)	X	3 (Studs per Row)			**1,440** Each
G2:	480	X	3			**1,440** Each
G3:	480	X	3			**1,440** Each
G4:	480	X	3			**1,440** Each
G5:	480	X	3			**1,440** Each
G6:	480	X	3			**1,440** Each
G7:	480	X	3			**1,440** Each
G8:	480	X	3			**1,440** Each

516E 14600 STRUCTURAL JOINT OR JOINT SEALER, MISC.: (FT) = 70 *EMSEAL WITH SLEEPER SLAB 4" WIDTH*

Rear Sleeper Slab:	70 ft (Length)			=	**70.0** *ft*

516E 14600 STRUCTURAL JOINT OR JOINT SEALER, MISC.: (FT) = 70 *EMSEAL WITH SLEEPER SLAB 3" WIDTH*

Forward Sleeper Slab:	70 ft			=	**70.0** *ft*

516E 13600 1" PREFORMED EXPANSION JOINT FILLER (SF) = 17 ()

App Slab Parapets:	4.14 sf (CAD Area)	X	4 (Number of Joints)	=	**16.6** *sf*

516E 13900 2" PREFORMED EXPANSION JOINT FILLER (SF) = 132 ()

RA Wingwall::	67.00 sf	Including diaph guide		=	**67.0** *sf*
FA Wingwall:	65.00 sf	Including diaph guide		=	**65.0** *sf*

516E 44200 ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE) (EACH) = 8 *(25'x20"x3.81" BEARING WITH 26"x21" BEVELED LOAD PLATE)*

Total # required:	8 (pers)	**each**	Pier 1

516E 44200 ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE) (EACH) = 8 *(25'x20"x3.81" BEARING WITH 37"x21" BEVELED LOAD PLATE)*

Total # required:	8 (pers)	**each**	Pier 2

516E 44300 ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE) (EACH) = 16 *(18.50"x15.50"x5.00" BEARING WITH LOAD PLATES AND W12x65 PEDESTAL)*

Total # required:	16 (abutments)	**each**	abutments

516E 14020 SEMI-INTEGRAL ABUTMENT EXPANSION JOINT SEAL (FT) = 178 ()

RA Abutment:	89 ft
FA Abutment:	89 ft

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518E 21200	**POROUS BACKFILL WITH GEOTEXTILE FABRIC**						**(CY) =**	**74**	*(CHECK UNIT OF MEASURE)*
Rear Abutment:	228 sf (CAD Area)	X	2.0 ft (width)				**/(27 cf/cy)=**		**16.9** *cy*
Rear Wingwall:	290 sf (CAD Area)	X	2.0 ft (width)				**/(27 cf/cy)=**		**21.5** *cy*
Forward Abutment:	228 sf (CAD Area)	X	2.0 ft (width)				**/(27 cf/cy)=**		**16.9** *cy*
Forward Wingwall:	252 sf (CAD Area)	X	2.0 ft (Width)				**/(27 cf/cy)=**		**18.7** *cy*
518E 40000	**6" PERFORATED CORRUGATED PLASTIC PIPE**						**(FT) =**	**212**	*()*
FA+Wingwall:	106 ft								**106** *ft*
RA+Wingwall:	106 ft								**106** *ft*
518E 40010	**6" NON-PERFORATED CORRUGATED PLASTIC PIPE, INCLUDING SPECIALS**						**(FT) =**	**60**	*()*
RA Wingwall:	30 ft								**30** *ft*
FA Wingwall:	30 ft								**30** *ft*
523E 20000	**DYNAMIC LOAD TESTING**						**(EACH) =**	**4**	*()*
RA:	1								**1** *each*
Pier 1:	1								**1** *each*
Pier 2:	1								**1** *each*
FA:	1								**1** *each*
526E 30011	**REINFORCED CONCRETE APPROACH SLABS WITH QC/QA (T=17"), AS PER PLAN**						**(SY) =**	**476**	*()*
App Slabs:	4,280.00 sf						**/(9 sf/sy)=**		**475.6** *sy*
530E 00600	**SPECIAL - STRUCTURES**		**AESTHETIC TREATMENT**				**(SF) =**	**2,784**	*(ADD SUPPLEMENTAL DESCRIPTION)*
Length of Parapet x Treatment Height:	2,783 sf								**2,783** *sf*
601E 32104	**ROCK CHANNEL PROTECTION, TYPE B WITH GEOTEXTILE FABRIC**						**(CY) =**	**822**	*()*
RA + Wingwall:	5,607 sf (CAD Ara)	X	2.5 ft (Thickness)				**/(27 cf/cy)=**		**519.2** *cy*
FA + Wingwall:	3,262 sf (CAD Ara)	X	2.5 ft (Thickness)				**/(27 cf/cy)=**		**302.0** *cy*

613E 41201	**LOW STRENGTH MORTAR BACKFILL, AS PER PLAN**						**(CY) =**	**856**	*()*
Rear	22.893 ft (width)	73.76 ft (length)	X	5.905 ft (HEIGHT)	**/ (27 cf/cy)) =**				**369.3** *CU YD*
	5.857 ft (width)	73.76 ft (length)	X	1.952 ft (HEIGHT)	**/ (27 cf/cy)) =**				**31.2** *CU YD*
	5.857 ft (width)	73.76 ft (length)	X	2.000 ft (HEIGHT)	**/ (27 cf/cy)) =**				**32.0** *CU YD*
Forward	23.181 ft (width)	74.20 ft (length)	X	5.712 ft (HEIGHT)	**/ (27 cf/cy)) =**				**363.9** *CU YD*
	5.569 ft (width)	74.20 ft (length)	X	1.856 ft (HEIGHT)	**/ (27 cf/cy)) =**				**28.4** *CU YD*
	5.569 ft (width)	74.20 ft (length)	X	2.000 ft (HEIGHT)	**/ (27 cf/cy)) =**				**30.6** *CU YD*