

BRIDGE: TRU-00082-18.05C

SFN: 7804653



CALCULATED BY: MTJ  
CHECKED BY: BWR

DATE: 10/12/22  
DATE: 10/12/22

**ESTIMATED QUANTITIES**

**GENERAL INPUT:**

Skew = 0.00 degrees

Bridge limits = 246.00 ft

	<u>REAR ABUTMENT</u>	<u>FORWARD ABUTMENT</u>
Deck width =	82.15 ft	82.15 ft
Average deck width =	82.15 ft	

**ABUTMENTS:**

	<u>REAR ABUTMENT</u>	<u>FORWARD ABUTMENT</u>
Length of diaphragm =	82.15 ft	82.15 ft
Thickness of diaphragm =	3.00 ft	3.00 ft

**Top of diaphragm elevations at bridge limits:**

Left side =	965.66 ft	975.46 ft
Crown elevation =	966.29 ft	976.09 ft
Right side =	965.66 ft	975.46 ft
Average top of diaphragm elevation =	965.87 ft	975.67 ft

Approach slab thickness =	1.08 ft	1.08 ft
Average approach slab elevation =	964.79 ft	974.59 ft

	<u>Wingwall 1 Side</u>	<u>Wingwall 2 Side</u>	<u>Wingwall 3 Side</u>	<u>Wingwall 4 Side</u>
Beam seat elevation (construction joint elevation) =	961.25	961.25	970.97	970.97
Crown seat elevation =	961.79		971.51	
Average beam seat elevation =	961.43		971.15	
Top construction joint elevation at breastwall =	961.25	961.25	970.97	970.97
Bottom of footing elevation =	956.00		965.80	
Top of footing elevation =	959.00		968.80	
Top of slope elevation =	960.75		970.50	

ITEM	ITEM EXT.	DESCRIPTION
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202E11003		STRUCTURE REMOVED, OVER 20 FOOT SPAN, AS PER PLAN
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SF of deck removed = 12390.08 ft<sup>2</sup>  
Price/SF = \$20

Scuppers unplugged = 12 each  
Cost/scupper = \$100

Scuppers drilled = 9 each  
Cost/scupper = \$100

Total Removal Cost = \$250,000

Quantity = LS

202E22900		APPROACH SLAB REMOVED
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Rear approach slab plan area = 1040.00 ft<sup>2</sup>  
Forward approach slab plan area = 1040.00 ft<sup>2</sup>

Total Quantity = 232 SY

503E11101 COFFERDAMS AND EXCAVATION BRACING, AS PER PLAN			
		<u>REAR ABUTMENT</u>	<u>FORWARD ABUTMENT</u>
CAD measured area of temporary sheeting =		729.99 ft <sup>2</sup>	1235.52 ft <sup>2</sup>
Cost/SF =		\$20	\$20
Sheeting cost =		\$14,600	\$24,710
Total cost (crossover) =		\$40,000	
Quantity =		LS	
503E21100 UNCLASSIFIED EXCAVATION			
		<u>REAR ABUTMENT</u>	<u>FORWARD ABUTMENT</u>
Average ground elevation =		964.00	973.00
Bottom of footing =		956.00	965.80
Width of footing =		3.00 ft	3.00 ft
Additional width (each side)=		1.00 ft	1.00 ft
Length of footing =		100.67 ft	100.67 ft
Quantity =		4106.67 ft <sup>3</sup>	3696.00 ft <sup>3</sup>
Total =		289 CY	
505E11100 PILE DRIVING EQUIPMENT MOBILIZATION			
Number of setups =		4 each	
Cost/setup =		\$15,000	
Total cost =		\$60,000	
Total Quantity =		LS	
507E00100 STEEL PILES HP10X42, FURNISHED			
		<u>R.A.</u>	<u>F.A.</u>
Number of piles =		14 each	14 each
Estimated length + 5'		35.00 ft	35.00 ft
Total Length =		980.00 ft	
Total Quantity =		980 FT	
507E00150 STEEL PILES HP10X42, DRIVEN			
		<u>R.A.</u>	<u>F.A.</u>
Number of abutment piles =		14 each	14 each
Bottom of footing elevation =		956.00	965.80
Top of Rock/Tip elevation =		930.00	940.00
Length into pier cap =		2.00 ft	2.00 ft
Unrounded length =		28.00 ft	27.80 ft
Length of pile =		30.00 ft	30.00 ft
Total Quantity =		840 FT	
509E10000 EPOXY COATED STEEL REINFORCEMENT			
Abutment =		17,020#	
Pier =		45,522#	
Superstructure =		189,039#	
Total Quantity =		251,581 LB	

509E30020 NO. 4 DEFORMED GFRP REINFORCEMENT

Barrier = 8019 FT

Total Quantity = 8019 FT

511E34447 CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK, AS PER PLAN

	<u>REAR ABUTMENT</u>	<u>FORWARD ABUTMENT</u>
<u>Diaphragm concrete:</u>		
Diaphragm thickness =	3.00 ft	3.00 ft
Length of diaphragm =	82.15 ft	82.15 ft
Average diaphragm height (up to bottom of appr. Slab) =	3.36 ft	3.44 ft
Thickness above approach slab seat =	1.08 ft	1.08 ft
Depth of approach slab seat =	0.50 ft	0.50 ft
Total diaphragm volume =	1049.69 ft <sup>3</sup>	1069.40 ft <sup>3</sup>

Beam deductions for diaphragm:  
 Beam cross sectional area = 69.20 in<sup>2</sup>  
 Area per beam to be deducted = 0.48 ft<sup>2</sup>  
 Face of diaphragm to beam end = 2.00 ft  
 Number of beams = 10 each  
 Total deduction for all beams = 19.22 ft<sup>3</sup>

Total net diaphragm volume = 2099.87 ft<sup>3</sup>

Deck concrete:  
 Total deck area (from MicroStation) = 19797.25 ft<sup>2</sup>  
 Thickness of deck = 0.71 ft  
 Deck volume = 14023.05 ft<sup>3</sup>

Total deck volume = 14023.05 ft<sup>3</sup>

Additional concrete in haunch:  
 Average haunch thickness = 2.00 in  
 Flange thickness = 1.50 in  
 Haunch width = top flange width = 1.26 ft  
 Average haunch area per beam = 0.21 ft<sup>2</sup>  
 Face/face of diaphragm = 241.00 ft  
 No. of beams haunch considered = 9 each ← Includes 1/2 of each fascia beam  
 Total haunch volume = 454.89 ft<sup>3</sup>

Additional concrete in overhangs:  
 Overhang thickness = 12.49 in  
 Left overhang from center of beam = 3.20 ft  
 Right overhang from center of beam = 3.20 ft  
 Total width of both overhangs from edge = 6.40 ft  
 Face/face of diaphragm = 241.00 ft  
 Total volume in overhangs = 512.53 ft<sup>3</sup>

Total Quantity = 633 CY

511E34451 CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK (PARAPET), AS PER PLAN

Area of median parapet = 9.05 ft<sup>2</sup>  
 Total length of median parapet = 291.08 ft  
 Area of outside parapet = 4.08 ft<sup>2</sup>  
 Total length of outside parapet = 494.00 ft  
 Total parapet volume = 4649.43 ft<sup>3</sup>

Total Quantity = 173 CY

511E41012 CLASS QC1 CONCRETE WITH QC/QA, PIER ABOVE FOOTINGS

<u>Cap</u>	<u>PIER 1</u>	<u>PIER 2</u>	<u>PIER 3</u>
Average height of cap =	4.27 ft	4.27 ft	4.27 ft
Cap length =	36.67 ft	36.67 ft	36.67 ft
Cap width =	3.00 ft	3.00 ft	3.00 ft
Number of caps =	2 each	2 each	2 each
Volume of cap =	939.58 ft <sup>3</sup>	939.58 ft <sup>3</sup>	939.58 ft <sup>3</sup>

Columns

	<u>PIER 1</u>	<u>PIER 2</u>	<u>PIER 3</u>
Column height =	11.79 ft	16.45 ft	17.10 ft
Column diameter =	3.00 ft	3.00 ft	3.00 ft
Number of columns =	6 each	6 each	6 each
Volume of columns =	500.03 ft <sup>3</sup>	697.67 ft <sup>3</sup>	725.24 ft <sup>3</sup>

Total Quantity = 176 CY

**511E43512 CLASS QC1 CONCRETE WITH QC/QA, ABUTMENT INCLUDING FOOTING**

	<u>REAR ABUTMENT</u>	<u>FORWARD ABUTMENT</u>		
<u>Footing:</u>				
Bottom of footing elev. =	956.00	965.80		
Construction joint elev. =	959.00	968.80		
Average Height to Seat =	5.25 ft	5.00 ft		
Footing area from MicroStation =	302.00 ft <sup>2</sup>	316.00 ft <sup>2</sup>		
Volume of footing =	1585.50 ft <sup>3</sup>	1580.00 ft <sup>3</sup>		
	<u>Wingwall 1</u>	<u>Wingwall 2</u>	<u>Wingwall 3</u>	<u>Wingwall 4</u>
Thickness of wingwall =	2.50 ft	2.50 ft	2.50 ft	2.50 ft
Top of wingwall elev =	965.66	965.66	975.46	975.46
End of wingwall elev. =	962.75	962.75	972.50	972.5
Top of footing elev. =	959.00	959.00	968.80	968.80
Height of wingwall at beginning =	6.66 ft	6.66 ft	6.66 ft	6.66 ft
Height of wingwall at end =	3.75 ft	3.75 ft	3.70 ft	3.70 ft
Length of straight wingwall =	9.36 ft	9.36 ft	9.36 ft	9.36 ft
Length of flat spot =	2.00 ft	2.00 ft	2.00 ft	2.00 ft
Volume of wingwall =	129.07 ft <sup>3</sup>	129.07 ft <sup>3</sup>	128.61 ft <sup>3</sup>	128.61 ft <sup>3</sup>
Total Rear Abutment =	1843.64 ft <sup>3</sup>			
Total Forward Abutment =	1837.22 ft <sup>3</sup>			
Total Quantity =	137 CY			

**512E33000 TYPE 2 WATERPROOFING**

	<u>REAR ABUTMENT</u>	<u>FORWARD ABUTMENT</u>
Distance from top of concrete to stop seal =	1.58 ft	1.58 ft
Additional length for lap =	1.50 ft	1.50 ft
Crown elevation =	966.29	976.09
Bottom of footing elevation =	956.00	965.80
Seat elevation =	961.95	971.68
Height of phase line construction joint =	10.21 ft	10.21 ft
Height of closure pour construction joint =	4.26 ft	4.33 ft
Total Length =	14.46 ft	14.53 ft
Width of waterproofing =	3.00 ft	3.00 ft
Area =	43.39 ft <sup>2</sup>	43.60 ft <sup>2</sup>
Total Quantity =	10 SY	

**512E75500 SPECIAL - SEALING, SEALING OF CONCRETE SURFACES**

	<u>REAR ABUTMENT</u>	<u>FORWARD ABUTMENT</u>
<u>Superstructure:</u>		
Average approach slab seat elevation =	964.79	974.59
Average beam seat elevation =	961.43	971.15
Average exposed height =	3.36 ft	3.44 ft
Length of diaphragm =	82.15 ft	82.15 ft
Area for diaphragm =	275.74 ft <sup>2</sup>	282.31 ft <sup>2</sup>
	<u>left side</u>	<u>right side</u>
Face/face of diaphragm =	241.00 ft	241.00 ft
Outside barrier perimeter sealed =	7.90 ft	
Median barrier perimeter sealed =	10.67 ft	
Area of sealing (face/face diaphragm) =	6846.97 ft <sup>2</sup>	
Total area for superstructure =	7405.01 ft <sup>2</sup>	

<u>Substructure:</u>				
	<u>Wingwall 1</u>	<u>Wingwall 2</u>	<u>Wingwall 3</u>	<u>Wingwall 4</u>
Exposed height of wingwall at beginning =	4.66 ft	4.66 ft	4.71 ft	4.71 ft
Exposed height of wingwall at end =	2.00 ft	2.00 ft	2.00 ft	2.00 ft
Exposed length of wingwall =	9.36 ft	9.36 ft	9.36 ft	9.36 ft
Length of flat spot =	2.00 ft	2.00 ft	2.00 ft	2.00 ft
Area of wingwall face =	33.83 ft <sup>2</sup>	33.83 ft <sup>2</sup>	34.11 ft <sup>2</sup>	34.11 ft <sup>2</sup>
Wingwall Thickness =	2.50 ft	2.50 ft	2.50 ft	2.50 ft
Exposed back side height of wingwall =	0.50 ft	0.50 ft	0.50 ft	0.50 ft
Exposed wingwall area =	44.99 ft <sup>2</sup>	44.99 ft <sup>2</sup>	45.14 ft <sup>2</sup>	45.14 ft <sup>2</sup>
Length of breastwall =	82.15 ft		82.15 ft	
Average exposed height from top of slope to beam seat =	1.51 ft		1.48 ft	
Area of breastwall =	124.31 ft <sup>2</sup>		121.85 ft <sup>2</sup>	
Total area per abutment =	214.30 ft <sup>2</sup>		212.12 ft <sup>2</sup>	
<u>Piers:</u>				
	<u>Pier 1</u>	<u>Pier 2</u>	<u>Pier 3</u>	
Length of pier cap =	36.67 ft	36.67 ft	36.67 ft	
Width of cap =	3.00 ft	3.00 ft	3.00 ft	
Average height of cap ends =	4.27 ft	4.27 ft	4.27 ft	
Number of caps =	2 each	2 each	2 each	
Diameter of column =	3.00 ft	3.00 ft	3.00 ft	
Number of columns =	6 each	6 each	6 each	
Area for cap =	855.23 ft <sup>2</sup>	855.23 ft <sup>2</sup>	855.23 ft <sup>2</sup>	
Exposed height of column =	10.79 ft	15.45 ft	16.10 ft	
Area for columns =	610.16 ft <sup>2</sup>	873.68 ft <sup>2</sup>	910.43 ft <sup>2</sup>	
Total area per pier =	1465.39 ft <sup>2</sup>	1728.90 ft <sup>2</sup>	1765.66 ft <sup>2</sup>	
Quantity for substructure =	48 SY			
Quantity for pier =	552 SY			
Quantity for superstructure =	823 SY			
Total Quantity =	1423 SY			

**513E10261 STRUCTURAL STEEL MEMBERS, LEVEL 3, AS PER PLAN**

Weight of beam = 235 lb/ft  
 Total length of beam = 245.00 ft  
 Number of beams = 10 each  
 Total weight of beams = 575750.00 lb  
 additional for connections = 79741.38 lb  
 Total Quantity = 655,492 LB

**513E20000 WELDED STUD SHEAR CONNECTORS**

Number of studs per row = 3 each  
 Number of rows per beam line = 481 each  
 Number of beams = 10 each  
 Total weight of beams = 14430 each  
 Total Quantity = 14430 EACH

516E10010		ARMORLESS PREFORMED JOINT SEAL			
		<u>REAR ABUTMENT</u>		<u>FORWARD ABUTMENT</u>	
Length along approach slab =		79.81 ft		79.81 ft	
Quantity =		80.00 ft		80.00 ft	
Total Quantity = 160 FT					
516E13200		1/2" PREFORMED EXPANSION JOINT FILLER			
		<u>REAR ABUTMENT</u>		<u>FORWARD ABUTMENT</u>	
Length of diaphragm =		82.48 ft		82.48 ft	
Width of PEJF =		0.83 ft		0.83 ft	
Quantity =		68.73 ft <sup>2</sup>		68.73 ft <sup>2</sup>	
Total Quantity = 138 SF					
516E13600		1" PREFORMED EXPANSION JOINT FILLER			
		<u>REAR ABUTMENT</u>		<u>FORWARD ABUTMENT</u>	
Length of diaphragm =		82.48 ft		82.48 ft	
Width of PEJF =		0.83 ft		0.83 ft	
Median barrier area =		9.05 ft <sup>2</sup>		9.05 ft <sup>2</sup>	
Quantity =		77.79 ft <sup>2</sup>		77.79 ft <sup>2</sup>	
Total Quantity = 156 SF					
516E13900		2" PREFORMED EXPANSION JOINT FILLER			
		<u>REAR ABUTMENT</u>		<u>FORWARD ABUTMENT</u>	
		<u>Left</u>	<u>Right</u>	<u>Left</u>	<u>Right</u>
Height of Diaphragm =		4.41 ft	4.41 ft	4.49 ft	4.49 ft
Length along skew =		2.50 ft	2.50 ft	2.50 ft	2.50 ft
Approach slab thickness =		1.08 ft		1.08 ft	
Quantity =		22.05 ft <sup>2</sup>		22.45 ft <sup>2</sup>	
Total Quantity = 45 SF					
516E14014		INTEGRAL ABUTMENT EXPANSION JOINT SEAL			
		<u>REAR ABUTMENT</u>		<u>FORWARD ABUTMENT</u>	
Length of diaphragm =		82.15 ft		82.15 ft	
Additional Length for lap =		1.50 ft		1.50 ft	
		<u>Wingwall 1</u>	<u>Wingwall 2</u>	<u>Wingwall 3</u>	<u>Wingwall 4</u>
Construction joint elevation =		961.25	961.25	970.97	970.97
Top of wingwall elevation at vertical joint =		965.66	965.66	975.46	975.46
Height of vertical joint =		4.41 ft	4.41 ft	4.49 ft	4.49 ft
Distance from top of concrete to stop seal =		1.58 ft	1.58 ft	1.58 ft	1.58 ft
Additional length for lap =		1.50 ft	1.50 ft	1.50 ft	1.50 ft
Total Length =		92.30 ft		92.46 ft	
Total Quantity = 185 FT					

516E44200	ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE) (15" X 18" X 3.124" WITH A 16" X 19" X VARIES LOAD PLATE)				
	Quantity =	<u>Pier 1</u> 10 each	<u>Pier 2</u> 10 each	<u>Pier 3</u> 10 each	
	Total Quantity = 30 EACH				
516E44200	ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE) (11.5" X 11.5" X 3.75" WITH A 12.5" X 12.5" X 1.5" LOAD PLATE)				
	Quantity =	<u>Rear Abutment</u> 10 each	<u>Forward Abutment</u> 10 each		
	Total Quantity = 20 EACH				
518E21200	POROUS BACKFILL WITH GEOTEXTILE FABRIC				
		<u>REAR ABUTMENT</u>	2.00 ft	<u>FORWARD ABUTMENT</u>	
	Thickness of porous backfill =				
	Depth from bottom of full depth pavement to bottom of porous backfill =	8.79 ft		8.79 ft	
	Length of breastwall =	82.15 ft		82.15 ft	
	Volume of porous backfill behind breastwall only =	1443.58 ft <sup>3</sup>		1443.58 ft <sup>3</sup>	
		<u>Wingwall 1</u>	<u>Wingwall 2</u>	<u>Wingwall 3</u>	<u>Wingwall 4</u>
	Average top of wingwall elevation =	964.21	964.21	973.98	973.98
	Average height of backfill behind wingwall =	8.20 ft	8.20 ft	8.18 ft	8.18 ft
	Length behind wingwall =	9.36 ft	9.36 ft	9.36 ft	9.36 ft
	Wingwall Quantity =	153.60 ft <sup>3</sup>	153.60 ft <sup>3</sup>	153.13 ft <sup>3</sup>	153.13 ft <sup>3</sup>
	Total Abutment =	1750.77 ft <sup>3</sup>		1749.84 ft <sup>3</sup>	
	Total Quantity = 130 CY				
518E40000	6" PERFORATED CORRUGATED PLASTIC PIPE				
		<u>REAR ABUTMENT</u>		<u>FORWARD ABUTMENT</u>	
	Length of pipe =	100.67 ft		100.67 ft	
	Quantity =	101.00 ft		101.00 ft	
	Total Quantity = 202 FT				
518E40010	6" NON-PERFORATED CORRUGATED PLASTIC PIPE, INCLUDING SPECIALS				
		<u>REAR ABUTMENT</u>		<u>FORWARD ABUTMENT</u>	
	Length of pipe to daylight =	12.75 ft		12.75 ft	
	No. of locations for item =	2		2	
	Length =	25.50 ft		25.50 ft	
	Quantity for rear abutment =	26 ft			
	Quantity for forward abutment =	26 ft			
	Total Quantity = 52 FT				
524E94704	DRILLED SHAFTS, 36" DIAMETER, INTO BEDROCK				
		<u>Pier 1</u>	<u>Pier 2</u>	<u>Pier 3</u>	
	Number of shafts =	6 each	6 each	6 each	
	Shaft length =	15.50 ft	15.50 ft	15.50 ft	
	Length of shafts =	93.00 ft	93.00 ft	93.00 ft	
	Total Quantity = 279 FT				
524E94802	DRILLED SHAFTS, 42" DIAMETER, ABOVE BEDROCK				
		<u>Pier 1</u>	<u>Pier 2</u>	<u>Pier 3</u>	
	Number of shafts =	6 each	6 each	6 each	
	Shaft length =	14.67 ft	10.08 ft	6.58 ft	
	Length of shafts =	90.00 ft	66.00 ft	42.00 ft	
	Total Quantity = 198 FT				

524E95000	DRILLED SHAFTS, MISC.: DEMONSTRATION DRILLED SHAFT	
	Shaft length =	14.59 ft
	Socket Length =	15.50 ft
	Total Quantity = 31 FT	
526E15010	REINFORCED CONCRETE APPROACH SLABS WITH QC/QA (T=13")	
	Rear approach plan area =	1596.25 ft <sup>2</sup>
	Forward approach plan area =	1596.25 ft <sup>2</sup>
	Total Quantity = 355 SY	
526E90030	TYPE C INSTALLATION	
	Length along approach slab =	<u>REAR ABUTMENT</u> <u>FORWARD ABUTMENT</u>
	Quantity =	79.81 ft                                      79.81 ft
		80.00 ft                                      80.00 ft
	Total Quantity = 160 FT	
894E10000	THERMAL INTEGRITY PROFILING (T.I.P.) TEST	
	Total Quantity = 4 EACH	