202E11203 **PORTIONS OF STRUCTURE REMOVED, OVER 20 FOOT SPAN, AS PER PLAN** **UNITS = LS**

Lump Sum estimate cost using square footage of the existing deck.

202E22900 **APPROACH SLAB REMOVED** **UNITS = SY**

Rear Approach Slab

Width =	51.65	ft (from existing plans)		
Length =	25.00	ft (from existing plans)		
Area =	(51.651 ft x 25 ft) / 9 =		143.5	syd

Forward Approach Slab

Width =	43.81	ft (from existing plans)		
Length =	25.00	ft (from existing plans)		
Area =	(43.8125 ft x 25 ft) / 9 =		121.7	syd

Total = 143.5 ft + 121.7 ft = **266** **syd**

202E23500 **WEARING COURSE REMOVED** **UNITS = SY**

Rear Approach Slab

Width =	51.65	ft (from existing plans)		
Length =	25.00	ft (from existing plans)		
Area =	(51.651 ft x 25 ft) / 9 =		143.5	syd

Forward Approach Slab

Width =	43.81	ft (from existing plans)		
Length =	25.00	ft (from existing plans)		
Area =	(43.8125 ft x 25 ft) / 9 =		121.7	syd

Total = 143.5 ft + 121.7 ft = **266** **syd**

505E11100 **PILE DRIVING EQUIPMENT MOBILIZATION** **UNITS = LS**

Lump Sum

507E00200 **STEEL PILES HP12X53, FURNISHED** **UNITS = FT**

Rear Abutment Depth =	95.00	ft	Number =	17.00
Forward Abutment Depth =	100.00	ft	Number =	17.00

Length = (95 x 17) + (100 x 17) = **3315 ft**

507E00250 **STEEL PILES HP12X53, DRIVEN** **UNITS = FT**

Rear Abutment Depth =	90.00	ft	Number =	17.00
Forward Abutment Depth =	95.00	ft	Number =	17.00

Length = (90 x 17) + (95 x 17) = **3145 ft**

511E33418 **CLASS QC2 CONCRETE WITH QC/QA, SUPERSTRUCTURE** **UNITS = CY**

Rear Diaphragm Middle

Area =	715.00	sft (measured in CAD)		
Width =	3.67	ft (measured in CAD)		
Volume =	(715 sft x 3.67 ft) / 27 =		97.2	cyd

Subtract Approach slab portion

Area =	140.61	sft (measured in CAD)		
Width =	0.50	ft (measured in CAD)		
Volume =	- (140.61 sft x 0.5 ft) / 27 =		-2.6	cyd

Rear Diaphragm Ends

Area Left =	19.03	sft (measured in CAD)		
Area Right =	18.01	sft (measured in CAD)		
Width =	3.67	ft (measured in CAD)		
Volume =	(19.03 sft + 18.01 sft) x 3.67 ft) / 27 =		5.0	cyd

Beam Penetration Subtraction

Area =	7.43	sft (measured in CAD)		
Depth =	2.67	ft (measured in CAD)		
No. of Beam =	12.00			
Volume =	- (7.43 sft x 2.67 ft) / 27 x 12 beams =		-8.8	cyd
Rear Total Volume =	**97.2 cyd + -2.6 cyd + 5 cyd + -8.8 cyd =**		**91**	**cyd**

Forward Diaphragm Middle

Area =	719.43	sft (measured in CAD)		
Width =	3.67	ft (measured in CAD)		
Volume =	(719.43 sft x 3.67 ft) / 27 =		97.8	cyd

Subtract Approach slab portion

Area =	140.62	sft (measured in CAD)		
Width =	0.50	ft (measured in CAD)		
Volume =	- (140.62 sft x 0.5 ft) / 27 =		-2.6	cyd

Forward Diaphragm Ends

Area Left =	18.13	sft (measured in CAD)		
Area Right =	19.15	sft (measured in CAD)		
Width =	3.67	ft (measured in CAD)		
Volume =	(18.13 sft + 19.15 sft) x 3.67 ft) / 27 =		5.1	cyd

Beam Penetration Subtraction

Area =	7.43	sft (measured in CAD)		
Depth =	2.67	ft (measured in CAD)		
No. of Beam =	12.00			
Volume =	- (7.43 sft x 2.67 ft) / 27 x 12 beams =		-8.8	cyd
Forward Total Volume =	**97.8 cyd + -2.6 cyd + 5.1 cyd + -8.8 cyd =**		**92**	**cyd**

511E33418 CLASS QC2 CONCRETE WITH QC/QA, SUPERSTRUCTURE (CONTINUED) UNITS = CY

Pier Diaphragm Bays

Face Area =	35.9283	sft (measured in CAD)	Face Area Between Beams		
Width =	2.0000	ft			
No. of Bays =	11.0000				
Volume =	(35.9283 sft + 2 ft) x 11 bays) / 27 * 2 piers=			58.6	cyd

Pier Diaphragm B sft (measured in CAD)

Area =	7.43	ft (measured in CAD)			
Depth =	0.50	ft (measured in CAD)			
No. of Beam =	12.00				
Volume =	(7.43 sft + 0.5 ft) x 12 beam) / 27 * 2 piers =			3.4	cyd

Pier Dia. Total Volume = 58.6 cyd + 3.4 cyd = 62 cyd

511E34446 CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK UNITS = CY

Deck

Main Deck Sect. =	71.74	sft (measured in CAD)			
Length =	228.33	ft (measured in CAD)			
Volume =	(71.74 sft x 228.33 ft) / 27 =			606.7	cyd
			Haunches see right	102.56	cyd

Rear Abutment Deck Taper

Area =	0.98	sft (measured in CAD)			
Length =	99.75	ft (measured in CAD)			
Volume =	(0.98 sft x 99.75 ft) / 27 =			3.6	cyd

Rear Abutment Deck Taper Subtract Beam

Area =	1.40	sft (measured in CAD)			
Depth =	0.69	ft (measured in CAD)			
No. of Beam =	12.00				
Volume =	- (1.4 sft x 0.69 ft) / 27 x 12 beams =			-0.4	cyd

Forward Abutment Deck Taper

Area =	0.98	sft (measured in CAD)			
Length =	99.75	ft (measured in CAD)			
Volume =	(0.98 sft x 99.75 ft) / 27 =			3.6	cyd

Forward Abutment Deck Taper Subtract Beam

Area =	1.40	sft (measured in CAD)			
Depth =	0.69	ft (measured in CAD)			
No. of Beam =	12.00				
Volume =	- (1.4 sft x 0.69 ft) / 27 x 12 beams =			-0.4	cyd

Deck Volume = 606.7 cyd + 3.6 cyd + -0.4 cyd + 3.6 cyd + -0.4 cyd = 716 cyd

Total Volume = 91 cyd + 92 cyd + 716 cyd = 899 cyd

511E34450 **CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK (PARAPET)** **UNITS = CY**

Rear Railing

Area =	588.00	sin (from standard)			
Total Length =	209.67	ft (measured in CAD)			
Transition =	1.82	cyd (from standard)			
Volume =	(588 sin / 144 sin / sft) x 209.67 ft / 27) + (2 x 1.82 cyd) =		35.3	cyd	

Forward Railing

Area =	588.00	sin (from standard)			
Total Length =	209.67	ft (measured in CAD)			
Transition =	1.82	cyd (from standard)			
Volume =	(588 sin / 144 sin / sft) x 209.67 ft / 27) + (2 x 1.82 cyd) =		35.3	cyd	

Total Volume = 35.3 cyd + 35.3 cyd = 71 cyd

511E41012 **CLASS QC1 CONCRETE WITH QC/QA, PIER ABOVE FOOTINGS** **UNITS = CY**

Pier 1 Pier Cap

Area =	447.35	sft (measured in CAD)			
Width =	4.00	ft (measured in CAD)			
Volume =	(447.3464 sft x 4 ft) / 27 =		66.3	cyd	

Pier 2 Pier Cap

Area =	447.30	sft (measured in CAD)			
Width =	4.00	ft (measured in CAD)			
Volume =	(447.2958 sft x 4 ft) / 27 =		66.3	cyd	

Pier 1 Depth =	21.92	ft	Number =	6.00	Area =	9.60
Pier 2 Depth =	22.33	ft	Number =	6.00		

Volume = {[(21.92 x 6) + (22.33 x 6)] x9.6 sf} / 27 = 94.4 cyd

Total Volume = 66.3 cyd + 66.3 cyd + 94.4 cyd = 227 cyd

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

Rear Left Wingwall

Area =	67.38	sft (measured in CAD)		
Width =	2.50	ft (measured in CAD)		
Volume =	(67.3796 sft x 2.5 ft) / 27 =		6.2	cyd

Forward Left Wingwall

Area =	67.58	sft (measured in CAD)		
Width =	2.50	ft (measured in CAD)		
Volume =	(67.5841 sft x 2.5 ft) / 27 =		6.3	cyd

Rear Right Wingwall

Area =	68.70	sft (measured in CAD)		
Width =	2.50	ft (measured in CAD)		
Volume =	(68.6958 sft x 2.5 ft) / 27 =		6.4	cyd

Forward Right Wingwall

Area =	68.84	sft (measured in CAD)		
Width =	2.50	ft (measured in CAD)		
Volume =	(68.8395 sft x 2.5 ft) / 27 =		6.4	cyd

Total Wingwall Volume = 6.2 cyd + 6.3 cyd + 6.4 cyd + 6.4 cyd = 26 cyd

Rear Footing

Length =	131.17	ft (measured in CAD)		
Width =	5.05	ft (measured in CAD)		
Height =	3.67	ft (measured in CAD)		
Volume =	(131.17 ft x 5.05 ft x 3.67 ft) / 27 =		90.0	cyd

Forward Footing

Length =	131.17	ft (measured in CAD)		
Width =	5.05	ft (measured in CAD)		
Height =	3.67	ft (measured in CAD)		
Volume =	(5.05 sft x 3.67 ft) / 27 =		90.0	cyd

Total Footing Volume = 90 cyd + 90 cyd = 180 cyd

Total Footing Volume = 26 cyd + 180 cyd = 206 cyd

512E10050 **SEALING OF CONCRETE SURFACES (NON-EPOXY)** **UNITS = SY**

Rear Abutment

Right Wingwall	Face	67.38	sft	Left Wingwall	Face	68.70	sft
	Back	7.58	sft6		Back	7.96	sft6
	Top	42.39	sft		Top	44.95	sft
	Footing Face	7.58	sft		Footing Face	7.96	sft
	Footing Top	18.36	sft		Footing Top	19.26	sft
	Total	**143.29**	**sft**		**Total**	**148.83**	**sft**
Diaphragm	Face	**710.65**	**sft**				

Forward Abutment

Right Wingwall	Face	68.84	sft	Left Wingwall	Face	67.58	sft
	Back	7.96	sft6		Back	7.58	sft6
	Top	44.97	sft		Top	42.40	sft
	Footing Face	7.96	sft		Footing Face	7.58	sft
	Footing Top	19.26	sft		Footing Top	18.36	sft
	Total	**148.99**	**sft**		**Total**	**143.49**	**sft**
Diaphragm	Face	**712.28**	**sft**				

Piers

Pier 1	Face	888.32	sft	Pier 2	Face	888.32	sft
	Bottom	424.59	sft		Bottom	424.59	sft
	Columns	1179.61	sft		Columns	1202.79	sft
	Total	**2492.51**	**sft**		**Total**	**2515.70**	**sft**

Superstructure

	Fascia	21.6667	ft	
	Length	230.3333	ft	9981.125 sft
	Railing	7.8333	ft	
	Length	3.6667	ft	114.88944 sft

Abutment Total: **224 SYD**
Pier Total: **557 SYD**
Superstructure Total: **1122 SYD**

512E33000 **TYPE 2 WATERPROOFING** **UNITS = SY**

Width =	3.00	ft
Rear Rt Height =	7.38	ft
Rear Lt Height =	6.98	ft
Fwd Rt Height =	7.42	ft
Fwd Lt Height =	7.03	ft

Area = 3 ft x (7.375 ft + 6.9845 ft + 7.421 ft + 7.0304 ft) / 9 = **10 Syd**

515E15110 **DRAPED STRAND PRESTRESSED CONCRETE BRIDGE I-BEAM MEMBERS, LEVEL 3, T** **UNITS = EACH**

Span 1 Beams

Length =	60.58	ft
Beams =	12.00	ct

Span 3 Beams

Length =	60.58	ft
Beams =	12.00	ct

Total = 12 beams + 12 beams = **24 each**

515E15110 **DRAPED STRAND PRESTRESSED CONCRETE BRIDGE I-BEAM MEMBERS, LEVEL 3, T** **UNITS = EACH**

Span 2 Beams

Length =	113.50	ft
Beams =	12.00	ct

Total = 12 beams = **12 each**

516E13200 **1/2" PREFORMED EXPANSION JOINT FILLER** **UNITS = SF**

Width =	0.83	ft
Rear Length =	101.67	ft
Fwd Length =	101.67	ft

Area = 0.8333 ft x (101.6667 ft + 101.6667 ft) = **170 sft**

516E13600 **1" PREFORMED EXPANSION JOINT FILLER** **UNITS = SF**

Width =	0.83	ft
Rear Length =	101.67	ft
Fwd Length =	101.67	ft

Area = 0.8333 ft x (101.6667 ft + 101.6667 ft) = **170 sft**

516E13900 **2" PREFORMED EXPANSION JOINT FILLER** **UNITS = SF**

Width =	3.67	ft
Rear Rt Height =	7.25	ft
Rear Lt Height =	6.86	ft
Fwd Rt Height =	7.30	ft
Fwd Lt Height =	6.91	ft

Area = 3.6667 ft x (7.25 ft + 6.8595 ft + 7.296 ft + 6.9054 ft) = **104 sft**

516E14014 **INTEGRAL ABUTMENT EXPANSION JOINT SEAL** **UNITS = FT**

RA Length =	104.67	ft			
FA Length =	104.67	ft			
Rear Rt Height =	6.79	ft	26.49	79.4697	8.829967
Rear Lt Height =	6.40	ft			
Fwd Rt Height =	6.84	ft			
Fwd Lt Height =	6.46	ft			

Length = 104.6667 ft + 104.6667 ft + 6.7907 ft + 6.4012 ft + 6.8368 ft + 6.4612 ft = **236 ft**

516E44201 **ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRE** **UNITS = EACH**

Span 1 Beams
Bearings = 12.00 ct

Span 3 Beams
Bearings = 12.00 ct

Total = 12 bearings + 12 bearings = **24 each**

516E44201 **ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRE** **UNITS = EACH**

Span 2 Beams
Bearings = 24.00 ct

Total = 24 bearings * 2 piers = **48 each**

518E21200 **POROUS BACKFILL WITH GEOTEXTILE FABRIC** **UNITS = CY**

RA Area =	1339.25	sft (measured in CAD)	
Thickness =	2.00	ft	
Volume =	(1339.2549 sft x 2 ft) / 27 =		99 cyd
FA Area =	1344.59	sft (measured in CAD)	
Thickness =	2.00	ft	
Total =	(1344.5877 sft x 2 ft) / 27 =		100 cyd
Volume =	**99 cyd+ 100 cyd =**		**199 cyd**

518E40000 **6" PERFORATED CORRUGATED PLASTIC PIPE** **UNITS = FT**

RA Length =	131.17	ft	
FA Length =	131.17	ft	
Total =	**131.1667 ft + 131.1667 ft =**		**263 ft**

518E40010 **6" NON-PERFORATED CORRUGATED PLASTIC PIPE, INCLUDING SPECIALS** **UNITS = FT**

RA Length =	12.00	ft	
FA Length =	12.00	ft	
Total =	**12 ft + 12 ft =**		**24 ft**

524E94802 **DRILLED SHAFTS, 42" DIAMETER, ABOVE BEDROCK** **UNITS = FT**

Pier 1 Depth =	69.00 ft	Number =	6.00
Pier 2 Depth =	69.00 ft	Number =	6.00

Length = (69 x 6) + (69 x 6) = **828 ft**

524E94804 **DRILLED SHAFTS, 42" DIAMETER, INTO BEDROCK** **UNITS = FT**

Pier 1 Depth =	1.00 ft	Number =	6.00
Pier 2 Depth =	1.00 ft	Number =	6.00

Length = (1 x 6) + (1 x 6) = **12 ft**

526E25010 **REINFORCED CONCRETE APPROACH SLABS WITH QC/QA (T=15")** **UNITS = SY**

Rear Approach Slab
Width = 97.42 ft
Length = 25.00 ft
Area = (97.4167 ft x 25 ft) / 9 = 270.6 syd

Forward Approach Slab
Width = 97.42 ft
Length = 25.00 ft
Area = (97.4167 ft x 25 ft) / 9 = 270.6 syd

Total = 270.6 syd + 270.6 syd = **542** **syd**

526E90010 **TYPE A INSTALLATION** **UNITS = FT**

Rear Approach Slab
Width = 97.42 ft
Total = 97.4167 ft = 97.4 ft

Forward Approach Slab
Width = 97.42 ft
Area = 97.4167 ft = 97.4 ft

Total = 97.4 ft + 97.4 ft = **195** **ft**

601E20000 **CRUSHED AGGREGATE SLOPE PROTECTION** **UNITS = SY**

Rear Abutment

Vert =	1.00	
Horiz =	2.80	
Hyp =	2.97	
Ratio =	2.97 / 2.8 =	1.06

RA Area = 7238.76 sft (measured in CAD)
Adjusted Area = 1.06 x 7238.7565 sft = 7673.08 sft
Area = (7673.08 sft) / 9 = 852.6 syd

Fwd Abutment

Vert =	1.00	
Horiz =	2.50	
Hyp =	2.69	
Ratio =	2.69 / 2.5 =	1.08

FA Area = 6775.34 sft (measured in CAD)
Adjusted Area = 1.08 x 6775.3404 sft = 7317.37 sft
Area = (7317.37 sft) / 9 = 813 syd

Fwd Abutment Shelf Area

FA Area = 526.95 sft (measured in CAD)
Area = (526.9532 sft) / 9 = 58.6 syd

Total Area = 852.6 syd + 813 syd + 58.6 syd = 1725 syd

601E21060 **TIED CONCRETE BLOCK MAT WITH TYPE 2 UNDERLAYMENT** **UNITS = SY**

Fwd Abutment

Vert =	1.00	
Horiz =	2.00	
Hyp =	2.24	
Ratio =	2.24 / 2 =	1.12

FA Area = 685.03 sft (measured in CAD)
Adjusted Area = 1.12 x 685.0328 sft = 767.24 sft
Area = (767.24 sft) / 9 = **85.2 syd**