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 =	45.58	ft (from existing plans)		
Length =	25.00	ft (from existing plans)		
Area =	(45.5833 ft x 25 ft) / 9 =		126.6	syd

Forward Approach Slab

Width =	41.35	ft (from existing plans)		
Length =	25.00	ft (from existing plans)		
Area =	(41.349 ft x 25 ft) / 9 =		114.9	syd

Total = 126.6 ft + 114.9 ft = **242** **syd**

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

Rear Approach Slab

Width =	45.58	ft (from existing plans)		
Length =	25.00	ft (from existing plans)		
Area =	(45.5833 ft x 25 ft) / 9 =		126.6	syd

Forward Approach Slab

Width =	41.35	ft (from existing plans)		
Length =	25.00	ft (from existing plans)		
Area =	(41.349 ft x 25 ft) / 9 =		114.9	syd

Total = 126.6 ft + 114.9 ft = **242** **syd**

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

Lump Sum

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

Rear Abutment Depth =	95.00	ft	Number =	18.00
Forward Abutment Depth =	100.00	ft	Number =	18.00

Length = (95 x 18) + (100 x 18) = **3510 ft**

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

Rear Abutment Depth =	90.00	ft	Number =	18.00
Forward Abutment Depth =	95.00	ft	Number =	18.00

Length = (90 x 18) + (95 x 18) = **3330 ft**

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

Rear Diaphragm Middle				
Area =	807.41	sft (measured in CAD)		
Width =	3.67	ft (measured in CAD)		
Volume =	(807.41 sft x 3.67 ft) / 27 =		109.7	cyd
Subtract Approach slab portion				
Area =	141.26	sft (measured in CAD)		
Width =	0.50	ft (measured in CAD)		
Volume =	- (141.26 sft x 0.5 ft) / 27 =		-2.6	cyd
Rear Diaphragm Ends				
Area Left =	18.07	sft (measured in CAD)		
Area Right =	19.54	sft (measured in CAD)		
Width =	3.67	ft (measured in CAD)		
Volume =	(18.07 sft + 19.54 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 =	13.00			
Volume =	- (7.43 sft x 2.67 ft) / 27 x 13 beams =		-9.6	cyd
Rear Total Volume =	**109.7 cyd + -2.6 cyd + 5.1 cyd + -9.6 cyd =**		**103**	**cyd**
Forward Diaphragm Middle				
Area =	807.72	sft (measured in CAD)		
Width =	3.67	ft (measured in CAD)		
Volume =	(807.72 sft x 3.67 ft) / 27 =		109.8	cyd
Subtract Approach slab portion				
Area =	133.67	sft (measured in CAD)		
Width =	0.50	ft (measured in CAD)		
Volume =	- (133.67 sft x 0.5 ft) / 27 =		-2.5	cyd
Forward Diaphragm Ends				
Area Left =	19.55	sft (measured in CAD)		
Area Right =	18.08	sft (measured in CAD)		
Width =	3.67	ft (measured in CAD)		
Volume =	(19.55 sft + 18.08 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 =	13.00			
Volume =	- (7.43 sft x 2.67 ft) / 27 x 13 beams =		-9.6	cyd
Forward Total Volume =	**109.8 cyd + -2.5 cyd + 5.1 cyd + -9.6 cyd =**		**103**	**cyd**

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

Pier Diaphragm Bays

Face Area =	36.7859	sft (measured in CAD)	Face Area Between Beams		
Width =	2.0000	ft			
No. of Bays =	12.0000				
Volume =	(36.7859 sft + 2 ft) x 12 bays) / 27 * 2 piers=			65.4	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 =	13.00				
Volume =	(7.43 sft + 0.5 ft) x 13 beam) / 27 * 2 piers =			3.6	cyd

Pier Dia. Total Volume = 65.4 cyd + 3.6 cyd = 69 cyd

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

Deck

Main Deck Sect. =	79.25	sft (measured in CAD)			
Length =	235.33	ft (measured in CAD)			
Volume =	(79.25 sft x 235.33 ft) / 27 =			690.7	cyd
			Haunches see right	154.0	cyd

Rear Abutment Deck Taper

Area =	0.98	sft (measured in CAD)			
Length =	110.33	ft (measured in CAD)			
Volume =	(0.98 sft x 110.33 ft) / 27 =			4.0	cyd

Rear Abutment Deck Taper Subtract Beam

Area =	1.40	sft (measured in CAD)			
Depth =	0.69	ft (measured in CAD)			
No. of Beam =	13.00				
Volume =	- (1.4 sft x 0.69 ft) / 27 x 13 beams =			-0.5	cyd

Forward Abutment Deck Taper

Area =	0.98	sft (measured in CAD)			
Length =	110.33	ft (measured in CAD)			
Volume =	(0.98 sft x 110.33 ft) / 27 =			4.0	cyd

Forward Abutment Deck Taper Subtract Beam

Area =	1.40	sft (measured in CAD)			
Depth =	0.69	ft (measured in CAD)			
No. of Beam =	13.00				
Volume =	- (1.4 sft x 0.69 ft) / 27 x 13 beams =			-0.5	cyd

Deck Volume = 690.7 cyd + 4 cyd + -0.5 cyd + 4 cyd + -0.5 cyd = 852 cyd

Total Volume = 103 cyd + 103 cyd + 852 cyd = 1058 cyd

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

Rear Railing

Area =	588.00	sin (from standard)		
Total Length =	216.67	ft (measured in CAD)		
Transition =	1.82	cyd (from standard)		
Volume =	(588 sin / 144 sin / sft) x 216.67 ft / 27) + (2 x 1.82 cyd) =		36.4	cyd

Forward Railing

Area =	588.00	sin (from standard)		
Total Length =	216.67	ft (measured in CAD)		
Transition =	1.82	cyd (from standard)		
Volume =	(588 sin / 144 sin / sft) x 216.67 ft / 27) + (2 x 1.82 cyd) =		36.4	cyd

Total Volume = 36.4 cyd + 36.4 cyd = 73 cyd

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

Pier 1 Pier Cap

Area =	504.81	sft (measured in CAD)		
Width =	4.00	ft (measured in CAD)		
Volume =	(504.8117 sft x 4 ft) / 27 =		74.8	cyd

Pier 2 Pier Cap

Area =	504.81	sft (measured in CAD)		
Width =	4.00	ft (measured in CAD)		
Volume =	(504.8117 sft x 4 ft) / 27 =		74.8	cyd

Pier 1 Depth =	21.84 ft	Number =	7.00	Area =	9.60
Pier 2 Depth =	21.42 ft	Number =	7.00		

Volume = {[(21.84 x 7) + (21.84 x 7)] x9.6 sf} / 27 = 107.7 cyd

Total Volume = 74.8 cyd + 74.8 cyd + 107.7 cyd = 258 cyd

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

Rear Left Wingwall

Area =	54.73	sft (measured in CAD)		
Width =	2.50	ft (measured in CAD)		
Volume =	(54.7333 sft x 2.5 ft) / 27 =		5.1	cyd

Forward Left Wingwall

Area =	70.19	sft (measured in CAD)		
Width =	2.50	ft (measured in CAD)		
Volume =	(70.1885 sft x 2.5 ft) / 27 =		6.5	cyd

Rear Right Wingwall

Area =	69.95	sft (measured in CAD)		
Width =	2.50	ft (measured in CAD)		
Volume =	(69.95 sft x 2.5 ft) / 27 =		6.5	cyd

Forward Right Wingwall

Area =	55.01	sft (measured in CAD)		
Width =	2.50	ft (measured in CAD)		
Volume =	(55.0138 sft x 2.5 ft) / 27 =		5.1	cyd

Total Volume = 5.1 cyd + 6.5 cyd + 6.5 cyd + 5.1 cyd = 24 cyd

Rear Footing

Length =	138.25	ft (measured in CAD)		
Width =	4.90	ft (measured in CAD)		
Height =	3.67	ft (measured in CAD)		
Volume =	(138.25 ft x 4.9 ft x 3.67 ft) / 27 =		92.1	cyd

Forward Footing

Length =	138.25	ft (measured in CAD)		
Width =	4.90	ft (measured in CAD)		
Height =	3.67	ft (measured in CAD)		
Volume =	(4.9 sft x 3.67 ft) / 27 =		92.1	cyd

Total Volume = 92.1 cyd + 92.1 cyd = 185 cyd **209**

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

Rear Abutment

Right Wingwall	Face	55.02	sft	Left Wingwall	Face	70.19	sft
	Back	5.83	sft6		Back	7.96	sft6
	Top	34.25	sft		Top	45.14	sft
	Footing Face	5.83	sft		Footing Face	7.96	sft
	Footing Top	14.12	sft		Footing Top	19.26	sft
	Total	**115.06**	**sft**		**Total**	**150.51**	**sft**
Diaphragm	Face	**797.71**	**sft**				

Forward Abutment

Right Wingwall	Face	69.95	sft	Left Wingwall	Face	54.73	sft
	Back	7.96	sft6		Back	5.83	sft6
	Top	45.11	sft		Top	34.25	sft
	Footing Face	7.96	sft		Footing Face	5.83	sft
	Footing Top	19.26	sft		Footing Top	14.12	sft
	Total	**150.24**	**sft**		**Total**	**114.77**	**sft**
Diaphragm	Face	**794.90**	**sft**				

Piers

Pier 1	Face	1003.30	sft	Pier 1	Face	1003.30	sft
	Bottom	418.19	sft		Bottom	418.19	sft
	Columns	1379.50	sft		Columns	1379.50	sft
	Total	**2800.99**	**sft**		**Total**	**2800.99**	**sft**

Superstructure

	Fascia	21.6667	ft
	Length	237.333	ft 10284.446
	Railing	7.8333	ft
	Length	3.6667	ft 114.88944
Abutment Total:		236	SYD
Pier Total:		623	SYD
Superstructure Total:		1156	SYD

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

Width =	3.00	ft
Rear Rt Height =	7.01	ft
Rear Lt Height =	7.57	ft
Fwd Rt Height =	7.01	ft
Fwd Lt Height =	7.57	ft

Area = 3 ft x (7.0087 ft + 7.5687 ft + 7.0116 ft + 7.5716 ft) / 9 = **10 Syd**

515E14110 **STRAIGHT STRAND PRESTRESSED CONCRETE BRIDGE I-BEAM MEMBERS, LEVEL 2,** **UNITS = EACH**

Span 1 Beams

Length =	60.58	ft
Beams =	13.00	ct

Span 3 Beams

Length =	60.58	ft
Beams =	13.00	ct

Total = 13 beams + 13 beams = **26 each**

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

Span 2 Beams

Length =	120.50	ft
Beams =	13.00	ct

Total = 13 beams = **13 each**

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

Width =	0.83	ft
Rear Length =	112.25	ft
Fwd Length =	112.25	ft

Area = 0.8333 ft x (112.25 ft + 112.25 ft) = **188 sft**

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

Width =	0.83	ft
Rear Length =	112.25	ft
Fwd Length =	112.25	ft

Area = 0.8333 ft x (112.25 ft + 112.25 ft) = **188 sft**

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

Width =	3.67	ft
Rear Rt Height =	6.88	ft
Rear Lt Height =	7.44	ft
Fwd Rt Height =	6.89	ft
Fwd Lt Height =	7.45	ft

Area = 3.6667 ft x (6.8837 ft + 7.4437 ft + 6.8866 ft + 7.4466 ft) = **106 sft**

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

RA Length =	115.25	ft			
FA Length =	115.25	ft			
Rear Rt Height =	6.56	ft	27.52	82.5645	9.173833
Rear Lt Height =	7.12	ft			
Fwd Rt Height =	6.64	ft			
Fwd Lt Height =	7.20	ft	230.50		

Length = 115.25 ft + 115.25 ft + 6.5647 ft + 7.1219 ft + 6.636 ft + 7.1989 ft = **259 ft**

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

Span 1 Beams
Bearings = 13.00 ct

Span 3 Beams
Bearings = 13.00 ct

Total = 13 bearings + 13 bearings = **26 each**

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

Span 2 Beams
Bearings = 26.00 ct

Total = 26 bearings * 2 piers = **52 each**

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

RA Area =	1440.98 sft (measured in CAD)		
Thickness =	2.00 ft		
Volume =	(1440.975 sft x 2 ft) / 27 =	107	cyd
FA Area =	1448.86 sft (measured in CAD)		
Thickness =	2.00 ft		
Total =	(1448.8587 sft x 2 ft) / 27 =	107	cyd
Volume =	**107 cyd + 107 cyd =**	**214**	**cyd**

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

RA Length =	138.25 ft		
FA Length =	138.25 ft		
Total =	**138.25 ft + 138.25 ft =**	**277**	**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 =	7.00
Pier 2 Depth =	69.00	ft	Number =	7.00

Length = (69 x 7) + (69 x 7) = **966 ft**

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

Pier 1 Depth =	1.00	ft	Number =	7.00
Pier 2 Depth =	1.00	ft	Number =	7.00

Length = (1 x 7) + (1 x 7) = **14 ft**

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

Rear Approach Slab			
Width = 108.00 ft			
Length = 25.00 ft			
Area = (108 ft x 25 ft) / 9 =		300.0	syd
Forward Approach Slab			
Width = 108.00 ft			
Length = 25.00 ft			
Area = (108 ft x 25 ft) / 9 =		300.0	syd
Total = 300 syd + 300 syd =		**600**	**syd**

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

Rear Approach Slab			
Width = 108.00 ft			
Total = 108 ft =		108.0	ft
Forward Approach Slab			
Width = 108.00 ft			
Area = 108 ft =		108.0	ft
Total = 108 ft + 108 ft =		**216**	**ft**

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

Rear Abutment

Vert =	1.00	
Horiz =	2.30	
Hyp =	2.51	
Ratio =	2.51 / 2.3 =	1.09

RA Area = 6300.50 sft (measured in CAD)
Adjusted Area = 1.09 x 6300.5001 sft = 6867.55 sft
Area = (6867.55 sft) / 9 = 763.1 syd

Fwd Abutment

Vert =	1.00	
Horiz =	2.90	
Hyp =	3.07	
Ratio =	3.07 / 2.9 =	1.06

FA Area = 7762.76 sft (measured in CAD)
Adjusted Area = 1.06 x 7762.7637 sft = 8228.53 sft
Area = (8228.53 sft) / 9 = 914.3 syd

Rear Abutment Shelf Area

RA Area = 1520.75 sft (measured in CAD)
Area = (1520.7499 sft) / 9 = 169 syd

Total Area = 763.1 syd + 914.3 syd + 169 syd = 1847 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 = 512.35 sft (measured in CAD)
Adjusted Area = 1.12 x 512.348 sft = 573.83 sft
Area = (573.83 sft) / 9 = 63.8 syd