E.L. ROBINSON
ENGINEERING

Computation for: **ESTIMATED QUANTITIES**

SFN: **1500369**

Structure: **COL-7-26.34**

PID: **99646**

Design:	**MRV**	Date	**March 29, 2019**
Check:	**DFT**	Date	**April 1, 2019**
Update:	**MRV**	Date	**June 17, 2019**
Recheck:	**DFT**	Date	**July 29, 2019**

File Names

Comments

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614-586-0642 • Fax 614-586-0648

DESIGN:	MRV	**DATE:**	3/29/19	**UPDATE:**	MRV	**DATE:**	6/17/19
CHECK:	DFT	**DATE:**	4/1/19	**RECHECK:**	DFT	**DATE:**	7/29/19
STRUCTURE:	COL-7-26.34			**SFN:**	1500369	**PID:**	99646

ITEM: 202E11203 **PAY UNIT:** LS
SUBJECT: ESTIMATED QUANTITIES
DESCRIPTION: PORTIONS OF STRUCTURE REMOVED, OVER 20 FOOT SPAN, AS PER PLAN
SUPPLEMENTAL DESCRIPTION:

	SUBTOTAL	TOTAL
Quantity = 1 ea Cost = $ 101,000 from historical bid prices Need to detail for stage 3		

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1801 Watermark Drive, Suite 310 • Columbus, Ohio 43215
614-586-0642 • Fax 614-586-0648

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CHECK:	DFT	**DATE:**	4/1/19	**RECHECK:**	DFT	**DATE:**	7/29/19
STRUCTURE:	COL-7-26.34			**SFN:**	1500369	**PID:**	99646

ITEM: 202E11203 **PAY UNIT:** LS
SUBJECT: ESTIMATED QUANTITIES
DESCRIPTION: PORTIONS OF STRUCTURE REMOVED, OVER 20 FOOT SPAN, AS PER PLAN
SUPPLEMENTAL DESCRIPTION:

	SUBTOTAL	TOTAL
SPECIAL INSTRUCTIONS:	**TOTAL**	**LS**

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614-586-0642 • Fax 614-586-0648

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STRUCTURE:	COL-7-26.34			**SFN:**	1500369	**PID:**	99646

ITEM: 202E22900 **PAY UNIT:** SY
SUBJECT: ESTIMATED QUANTITIES
DESCRIPTION: APPROACH SLAB REMOVED
SUPPLEMENTAL DESCRIPTION:

			SUBTOTAL	TOTAL
Rear Abutment MS Area =	440	sf		
Forward Abutment MS Area =	440	sf		
Area =	98	sy	98	98
SPECIAL INSTRUCTIONS:			**TOTAL**	**98**

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CHECK:	DFT	**DATE:**	4/1/19	**RECHECK:**	DFT	**DATE:**	7/29/19
STRUCTURE:	COL-7-26.34			**SFN:**	1500369	**PID:**	99646

ITEM: 202E23500 **PAY UNIT:** SY
SUBJECT: ESTIMATED QUANTITIES
DESCRIPTION: WEARING COURSE REMOVED
SUPPLEMENTAL DESCRIPTION:

			SUBTOTAL	TOTAL
Rear Abutment MS Area =	440	sf		
Forward Abutment MS Area =	440	sf		
Area =	98	sy	98	98
SPECIAL INSTRUCTIONS:			**TOTAL**	**98**

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DESIGN: MRV **DATE:** 3/29/19 **UPDATE:** MRV **DATE:** 6/17/19
CHECK: DFT **DATE:** 4/1/19 **RECHECK:** DFT **DATE:** 7/29/19
STRUCTURE: COL-7-26.34 **SFN:** 1500369 **PID:** 99646

ITEM: 203E98000 **PAY UNIT:** CY
SUBJECT: ESTIMATED QUANTITIES
DESCRIPTION: ROADWAY, MISC.:
SUPPLEMENTAL DESCRIPTION: EPS GEOFOAM FILL

Layer	Length	Width	Thickness	Volume		SUBTOTAL	TOTAL
1	13.75	46.16667	2	47.0216			
2	16.75	46.16667	2	57.28086			
3	19.75	46.16667	2	67.54012			
4	22.75	46.16667	2	77.79938			
5	42	46.16667	2	143.6296			
6	42	46.16667	2	143.6296			
7	42	46.16667	2	143.6296			
8	42	46.16667	2	143.6296			
Additional	11	1.5	2	1.222222			
			Total	825	cy	825	825

SPECIAL INSTRUCTIONS: ADD SUPPLEMENTAL DESCRIPTION **TOTAL** **825**

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STRUCTURE:	COL-7-26.34			**SFN:**	1500369	**PID:**	99646

ITEM: 503E11100 **PAY UNIT:** LS
SUBJECT: ESTIMATED QUANTITIES
DESCRIPTION: COFFERDAMS AND EXCAVATION BRACING
SUPPLEMENTAL DESCRIPTION:

	SUBTOTAL	TOTAL
Quantity = 1 ea Cost = $ 30,700 ea Taken from ODOT Historical Data for Single Bridge Replacement		
SPECIAL INSTRUCTIONS:	**TOTAL**	**LS**

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STRUCTURE:	COL-7-26.34			**SFN:**	1500369	**PID:**	99646

ITEM: 503E21100 **PAY UNIT:** CY
SUBJECT: ESTIMATED QUANTITIES
DESCRIPTION: UNCLASSIFIED EXCAVATION
SUPPLEMENTAL DESCRIPTION:

	SUBTOTAL	TOTAL
Rear Abutment		
Rear Abutment Area in Microstation = 131.1244 sf		
Width = 56.5 ft		
Volume = 7408.53 cf		
measured in BF003.dgn - unclassified excavation model		
Forward Abutment		
Forward Abutment Area in Microstation = 234.5369 sf		
Width = 56.5 ft		
Volume = 13251.33 cf		
Total Volume = 766 cy	766	766
measured in BF003.dgn - unclassified excavation model		
SPECIAL INSTRUCTIONS: CHECK UNIT OF MEASURE	**TOTAL**	**766**

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STRUCTURE:	COL-7-26.34			**SFN:**	1500369	**PID:**	99646

ITEM: 505E11100 **PAY UNIT:** LS
SUBJECT: ESTIMATED QUANTITIES
DESCRIPTION: PILE DRIVING EQUIPMENT MOBILIZATION
SUPPLEMENTAL DESCRIPTION:

	SUBTOTAL	TOTAL
Quantity = 2 ea stage Avg. Cost = $ 23,729 Cost = $ 47,458		
SPECIAL INSTRUCTIONS:	**TOTAL**	**LS**

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STRUCTURE:	COL-7-26.34			**SFN:**	1500369	**PID:**	99646

ITEM: 507E00360 **PAY UNIT:** FT
SUBJECT: ESTIMATED QUANTITIES
DESCRIPTION: STEEL PILES HP14X89, FURNISHED
SUPPLEMENTAL DESCRIPTION:

Rear Abutment Rock EL. B-003-0-17 = 1056.5 Pile Length into Foundation = 1 ft

Pile #	Qty	Est. Length (ft)	Order Length (ft)	Total Order Length (ft)
1	1	60	65	65
2	1	60	65	65
3	1	55	60	60
4	1	50	55	55
5 to 9	5	50	55	275
10	1	50	55	55
11	1	50	55	55
12	1	55	60	60
13	1	60	65	65
14 to 20	7	50	55	385
21	1	50	55	55
22	1	55	60	60
23	1	55	60	60
24	1	60	65	65
			Total =	1380

	SUBTOTAL	TOTAL
	1,380	1,380
SPECIAL INSTRUCTIONS:	**TOTAL**	**1,380**

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STRUCTURE:	COL-7-26.34			**SFN:**	1500369	**PID:**	99646

ITEM: 507E00364 **PAY UNIT:** FT
SUBJECT: ESTIMATED QUANTITIES
DESCRIPTION: STEEL PILES HP14X89, DRIVEN
SUPPLEMENTAL DESCRIPTION:

	SUBTOTAL	TOTAL
Rear Abutment		

Rock EL. B-003-0-17 = 1056.5 Pile Length into Foundation = 1 ft

Pile #	Qty	Est. Length (ft)	Total Est. Length (ft)
1	1	60	60
2	1	60	60
3	1	55	55
4	1	50	50
5 to 9	5	50	250
10	1	50	50
11	1	50	50
12	1	55	55
13	1	60	60
14 to 20	7	50	350
21	1	50	50
22	1	55	55
23	1	55	55
24	1	60	60
		Total =	1260

	SUBTOTAL	TOTAL
	1,260	1,260
SPECIAL INSTRUCTIONS:	**TOTAL**	**1,260**

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DESIGN: MRV **DATE:** 3/29/19 **UPDATE:** MRV **DATE:** 6/17/19
CHECK: DFT **DATE:** 4/1/19 **RECHECK:** DFT **DATE:** 7/29/19
STRUCTURE: COL-7-26.34 **SFN:** 1500369 **PID:** 99646

ITEM: 507E00700 **PAY UNIT:** FT
SUBJECT: ESTIMATED QUANTITIES
DESCRIPTION: 16" CAST-IN-PLACE REINFORCED CONCRETE PILES, DRIVEN
SUPPLEMENTAL DESCRIPTION:

Forward Abutment

Pile #	Qty	Est. Length (ft)	Total Est. Length (ft)
30-31	2	45	90
32	1	55	55
33-37	5	50	250
38	1	55	55
39-40	2	45	90
41-45	5	50	250
46	1	55	55
47-48	2	45	90
		Total =	935

	SUBTOTAL	TOTAL
	935	935
SPECIAL INSTRUCTIONS:	**TOTAL**	**935**

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DESIGN: MRV **DATE:** 3/29/19 **UPDATE:** MRV **DATE:** 6/17/19
CHECK: DFT **DATE:** 4/1/19 **RECHECK:** DFT **DATE:** 7/29/19
STRUCTURE: COL-7-26.34 **SFN:** 1500369 **PID:** 99646

ITEM: 507E00750 **PAY UNIT:** FT
SUBJECT: ESTIMATED QUANTITIES
DESCRIPTION: 16" CAST-IN-PLACE REINFORCED CONCRETE PILES, FURNISHED
SUPPLEMENTAL DESCRIPTION:

Forward Abutment

Pile #	Qty	Est. Length (ft)	Order Length (ft)	Total Est. Length (ft)
30-31	2	45	50	100
32	1	55	60	60
33-37	5	50	55	275
38	1	55	60	60
39-40	2	45	50	100
41-45	5	50	55	275
46	1	55	60	60
47-48	2	45	50	100
			Total =	1030

	SUBTOTAL	TOTAL
	1,030	1,030
SPECIAL INSTRUCTIONS:	**TOTAL**	**1,030**

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STRUCTURE:	COL-7-26.34			**SFN:**	1500369	**PID:**	99646

ITEM: 507E92201 **PAY UNIT:** FT
SUBJECT: ESTIMATED QUANTITIES
DESCRIPTION: PREBORED HOLES, AS PER PLAN
SUPPLEMENTAL DESCRIPTION:

			SUBTOTAL	TOTAL
Forward Abutment Abutment				
Bottom of Footing EL. =	1098.50			
Bottom of Prebore EL. =	1085.97			
Prebore Length =	12.53	ft		
Est. No. of Piles Prebored =	10			
Total Pre-bore length =	126	ft		
Left Wingwall				
Bottom of Footing EL. =	1104.95			
Bottom of Prebore EL. =	1085.97			
Prebore Length =	18.98	ft		
Est. No. of Piles Prebored =	1			
Total Pre-bore length =	19	ft	145	145
Right Wingwall				
Bottom of Footing EL. =	1103.95			
Bottom of Prebore EL. =	1085.97			
Prebore Length =	17.98	ft		
Est. No. of Piles Prebored =	1			
Total Pre-bore length =	18	ft		
Counterfort				
Bottom of Footing EL. =	1103.64			
Bottom of Prebore EL. =	1085.97			
Prebore Length =	17.67	ft		
Est. No. of Piles Prebored =	1			
Total Pre-bore length =	18	ft	36	181
Bottom of Footing EL. =	1112.63			
Bottom of Prebore EL. =	1076.71			
Prebore Length =	35.92	ft		
Est. No. of Piles Prebored =	1			
Total Pre-bore length =	36	ft	36	217
SPECIAL INSTRUCTIONS:			**TOTAL**	**217**

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STRUCTURE:	COL-7-26.34			**SFN:**	1500369	**PID:**	99646

ITEM: 507E93300 **PAY UNIT:** EACH
SUBJECT: ESTIMATED QUANTITIES
DESCRIPTION: STEEL POINTS OR SHOES
SUPPLEMENTAL DESCRIPTION:

	SUBTOTAL	TOTAL
Rear Abutment		
Est. No. of Piles = 24 ea		
Total No. of Steel Points = 24 ea	24	24
SPECIAL INSTRUCTIONS:	**TOTAL**	**24**

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CHECK:	DFT	**DATE:**	4/1/19	**RECHECK:**	DFT	**DATE:**	7/29/19
STRUCTURE:	COL-7-26.34			**SFN:**	1500369	**PID:**	99646

ITEM: 509E10000 **PAY UNIT:** LB
SUBJECT: ESTIMATED QUANTITIES
DESCRIPTION: EPOXY COATED REINFORCING STEEL
SUPPLEMENTAL DESCRIPTION:

			SUBTOTAL	TOTAL
Deck Phase 1 =	15199	lbs		
Deck Phase 2 =	20355	lbs	35,554	35,554
Rebar Volume =	35554	lbs		
RA Diaphragm Phase 1 =	1555	lbs		
RA Diaphragm Phase 2 =	2028	lbs		
FA Diaphragm Phase 1 =	1555	lbs		
FA Diaphragm Phase 2 =	2028	lbs		
Rebar Volume =	7166	lbs	7,166	42,720
Barrier Phase 1 =	3902	lbs		
Barrier Phase 2 =	3902	lbs		
Rebar Volume =	7804	lbs	7,804	50,524
Rear Abutment Phase 1 =	30715	lbs		
Rear Abutment Phase 2 =	22358	lbs		
Forward Abutment Phase 1 =	25166	lbs		
Forward Abutment Phase 2 =	17631	lbs		
Rebar Volume =	95870	lbs	95,870	146,394
SPECIAL INSTRUCTIONS:			**TOTAL**	**146,394**

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STRUCTURE:	COL-7-26.34			**SFN:**	1500369	**PID:**	99646

ITEM: 511E33501 **PAY UNIT:** EACH
SUBJECT: ESTIMATED QUANTITIES
DESCRIPTION: SEMI-INTEGRAL DIAPHRAGM GUIDE, AS PER PLAN
SUPPLEMENTAL DESCRIPTION:

	SUBTOTAL	TOTAL
Diaphragm Guides = 2 ea	2	2
SPECIAL INSTRUCTIONS:	**TOTAL**	**2**

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DESIGN:	DTA	**DATE:**	11/26/18	**UPDATE:**	MRV	**DATE:**	6/17/19
CHECK:	DFT	**DATE:**	4/1/19	**RECHECK:**	DFT	**DATE:**	7/29/19
STRUCTURE:	COL-7-26.34			**SFN:**	1500369	**PID:**	99646

ITEM: 511E34446 **PAY UNIT:** CY
SUBJECT: ESTIMATED QUANTITIES
DESCRIPTION: CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK
SUPPLEMENTAL DESCRIPTION:

			SUBTOTAL	TOTAL
Deck				
Microstation Area =	36.008	sf		
Length =	105.1354	ft		
Deck Concrete Volume =	141	cy	141	141
Rear Diaphragm				
Microstation Area =	218	sf		
Thickness =	3	ft		
Rear Diaphragm Conc. Volume =	25	cy		
Forward Diaphragm				
Microstation Area =	218	sf		
Thickness =	3	ft		
Rear Diaphragm Conc. Volume =	25	cy		
Total Diaphragm Conc. Volume =	50	cy	50	191
SPECIAL INSTRUCTIONS: CHECK UNIT OF MEASURE			**TOTAL**	**191**

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CHECK:	DFT	**DATE:**	4/1/19	**RECHECK:**	DFT	**DATE:**	7/29/19
STRUCTURE:	COL-7-26.34			**SFN:**	1500369	**PID:**	99646

ITEM: 511E34450 **PAY UNIT:** CY
SUBJECT: ESTIMATED QUANTITIES
DESCRIPTION: CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK (PARAPET)
SUPPLEMENTAL DESCRIPTION:

			SUBTOTAL	TOTAL
Barrier Microstation Area =	4.0975	sf		
Length =	165.1361	ft		
Quantity =	2	ea		
Volume =	51	cy	51	51
SPECIAL INSTRUCTIONS: CHECK UNIT OF MEASURE			**TOTAL**	**51**

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DESIGN:	DTA	**DATE:**	11/27/18	**UPDATE:**	MRV	**DATE:**	6/17/19
CHECK:	DFT	**DATE:**	4/1/19	**RECHECK:**	DFT	**DATE:**	7/29/19
STRUCTURE:	COL-7-26.34			**SFN:**	1500369	**PID:**	99646

ITEM: 511E43512 **PAY UNIT:** CY
SUBJECT: ESTIMATED QUANTITIES
DESCRIPTION: CLASS QC1 CONCRETE WITH QC/QA, ABUTMENT INCLUDING FOOTING
SUPPLEMENTAL DESCRIPTION:

						SUBTOTAL	TOTAL
Rear Abutment			**Forward Abutment**				
Footing							
MS Footing Plan Area =	282.8852	sf	MS Footing Plan Area =	278.7253	sf		
Thickness =	3	ft	Thickness =	3	ft		
Volume =	31.44	cy	Volume =	30.97	cy		
MS Left WW Ftg Elev. Area =	88.7645	sf	MS Left WW Ftg Elev. Area =	114.6312	sf		
Width =	3.333333	ft	Width =	3.333333	ft		
Volume =	10.96	cy	Volume =	14.16	cy		
MS Right WW Ftg Elev. Area =	97.4628	sf	MS Right WW Ftg Elev. Area =	89.1999	sf		
Width =	3.333333	ft	Width =	3.333333	ft		
Volume =	12.04	cy	Volume =	11.02	cy		
MS Counterfort Ftg Elev. Area =	76.709	sf	MS Counterfort Ftg Elev. Area =	95.6049	sf		
Width =	3.333333	ft	Width =	3.333333	ft		
Volume =	9.48	cy	Volume =	11.81	cy		
Total Footing Concrete =	63.92	cy	Total Footing Concrete =	67.96	cy	132	132
Beam Seat							
MS Stem Elev. Area =	893.6741	sf	MS Stem Plan Area =	981.8895	sf		
Width =	3	ft	MS Height from Profile =	3	ft		
Volume =	99.3	cy	Volume =	109.1	cy		
MS Left Chamfer Plan Area =	6.8573	sf	MS Left Chamfer Plan Area =	5.6408	sf		
Height =	17.39	ft	Height =	19.07	ft		
Volume =	4.42	cy	Volume =	3.99	cy		
MS Right Chamfer Plan Area =	5.6408	sf	MS Right Chamfer Plan Area =	6.8572	sf		
Height =	17.44	ft	Height =	19.22	ft		
Volume =	3.65	cy	Volume =	4.89	cy		
Total Beam Seat Concrete =	107.37	cy	Total Beam Seat Concrete =	117.98	cy	225	357
Wingwalls							
MS Left WW Elevation Area =	660.9244	sf	MS Left WW Elevation Area =	684.7304	sf		
Width =	2	ft	Width =	2	ft		
Volume =	48.96	cy	Volume =	50.73	cy		
MS Right WW Elevation Area =	611.3012	sf	MS Right WW Elevation Area =	720.5419	sf		
Width =	2	ft	Width =	2	ft		
Volume =	45.29	cy	Volume =	53.38	cy		
Total Wingwall Concrete =	94.25	cy	Total Wingwall Concrete =	104.11	cy	198	556
Counterforts							
MS Counterfort Elevation Area =	345.8454	sf	MS Counterfort Elevation Area =	470.2077	sf		
Width =	1.5	ft	Width =	1.5	ft		
MS Counterfort Plan Area =	8.6501	sf	MS Counterfort Plan Area =	8.6501	sf		
Height =	17.56	ft	Height =	19.43	ft		
Volume =	24.84	cy	Volume =	32.35	cy	57	613
SPECIAL INSTRUCTIONS:						**TOTAL**	**613**

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STRUCTURE:	COL-7-26.34			**SFN:**	1500369	**PID:**	99646

ITEM: 512E10100 **PAY UNIT:** SY
SUBJECT: ESTIMATED QUANTITIES
DESCRIPTION: SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)
SUPPLEMENTAL DESCRIPTION:

				SUBTOTAL	TOTAL
Approach Slab Barrier					
Perimeter =	7.885	ft			
Length =	30	ft			
Quantity =	4	ea			
Area =	106	sy		106	106
Superstructure					
Perimeter =	11.2503	ft			
Length =	105.1361	ft			
Quantity =	2	ea			
Area =	263	sy		263	369
Rear Abut. Diaphragm Area measured in Microstation =	24	sy		24	393
Fwd. Abut. Diaphragm Area measured in Microstation =	24	sy		24	417
Rear Abutment					
Stem Area =	910.09	sf	measured in Microstation		
Left Wingwall Top Area =	82.0061	sf	measured in Microstation		
Left Wingwall Face Area =	437.8876	sf	measured in Microstation		
Right Wingwall Top Area =	82.7504	sf	measured in Microstation		
Right Wingwall Face Area =	452.3457	sf	measured in Microstation		
Total Area (w/ 5% Contingency) =	230	sy		230	647
Forward Abutment					
Stem Area =	952.0697	sf	measured in Microstation		
Left Wingwall Top Area =	80.7504	sf	measured in Microstation		
Left Wingwall Face Area =	478.747	sf	measured in Microstation		
Right Wingwall Top Area =	86	sf	measured in Microstation		
Right Wingwall Face Area =	483.5235	sf	measured in Microstation		
Total Area (w/ 5% Contingency) =	243	sy		243	890
SPECIAL INSTRUCTIONS:				**TOTAL**	**890**

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DESIGN:	MRV	**DATE:**	3/29/19	**UPDATE:**	MRV	**DATE:**	6/17/19
CHECK:	DFT	**DATE:**	4/1/19	**RECHECK:**	DFT	**DATE:**	7/29/19
STRUCTURE:	COL-7-26.34			**SFN:**	1500369	**PID:**	99646

ITEM: 512E10300 **PAY UNIT:** SY
SUBJECT: ESTIMATED QUANTITIES
DESCRIPTION: SEALING CONCRETE BRIDGE DECKS WITH HMWM RESIN
SUPPLEMENTAL DESCRIPTION:

			SUBTOTAL	TOTAL
No. Deck Joints =	2	ea		
Length =	105.1361	ft		
Width =	2	ft		
Area =	47	sy	47	47
SPECIAL INSTRUCTIONS:			**TOTAL**	**47**

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STRUCTURE:	COL-7-26.34			**SFN:**	1500369	**PID:**	99646

ITEM: 512E33000 **PAY UNIT:** SY
SUBJECT: ESTIMATED QUANTITIES
DESCRIPTION: TYPE 2 WATERPROOFING
SUPPLEMENTAL DESCRIPTION:

			SUBTOTAL	TOTAL
Rear Abutment Diaphragm				
Right Closure Pour =	3.75	ft		
Left Closure Pour =	3.75	ft		
Width =	3	ft		
Area =	3	sy	3	3
Left Abutment Diaphragm				
Right Closure Pour =	3.75	ft		
Left Closure Pour =	3.75	ft		
Width =	3	ft		
Area =	3	sy	3	6
Rear Abutment				
Left WW Closure Beam Seat EL. =	1121.29			
Phase Construction Joint Closure Beam Seat EL. =	1121.59			
Right WW Closure Beam Seat EL. =	1121.34			
Top of Footing EL. =	1103.9			
Width =	3	ft		
Area =	18	sy	18	24
Forward Abutment				
Left WW Closure Beam Seat EL. =	1120.57			
Phase Construction Joint Closure Beam Seat EL. =	1120.93			
Right WW Closure Beam Seat EL. =	1120.72			
Top of Footing EL. =	1101.5			
Width =	3	ft		
Area =	20	sy	20	44
SPECIAL INSTRUCTIONS: CHECK UNIT OF MEASURE			**TOTAL**	**44**

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STRUCTURE:	COL-7-26.34			**SFN:**	1500369	**PID:**	99646

ITEM: 513E10280 **PAY UNIT:** LB
SUBJECT: ESTIMATED QUANTITIES
DESCRIPTION: STRUCTURAL STEEL MEMBERS, LEVEL 4
SUPPLEMENTAL DESCRIPTION:

				SUBTOTAL	TOTAL
Web Length =	104.0625	ft			
Web Thickness =	0.5	in			
Height =	40	in			
Total Web Volume =	24975	cu. In.			
Top Flange Length =	104.0625	ft			
Width =	16	in			
Thickness =	1	in			
Total Top Flange Volume =	19980	cu. In.			
Bottom Flange Seg. 1 Length =	23.5313	ft			
Bottom Flange Seg. 1 Thickness =	1	in			
Bottom Flange Seg. 1 Width =	16	in			
Bottom Flange Seg. 1 Volume =	4518.01	cu. In.			
Bottom Flange Seg. 2 Length =	57	ft			
Bottom Flange Seg. 2 Thickness =	1.875	in			
Bottom Flange Seg. 2 Width =	16	in			
Bottom Flange Seg. 2 Volume =	20520	cu. In.			
Bottom Flange Seg. 3 Length =	23.5313	ft			
Bottom Flange Seg. 3 Thickness =	1	in			
Bottom Flange Seg. 3 Width =	16	in			
Bottom Flange Seg. 3 Volume =	4518.01	cu. In.			
Total Bottom Flange Volume =	29556.02	cu. In.			
Volume =	43.12	cf/beam			
Number of Beams =	6	ea			
Detail Factor =	7%				
Density =	490	pcf			
Weight =	136,000	lbs	rounded to nearest 1000 - MRV 1/8/18	136,000	136,000
			3		

SPECIAL INSTRUCTIONS: CHECK UNIT OF MEASURE **TOTAL** **136,000**

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DESIGN:	DTA	**DATE:**	11/27/18	**UPDATE:**	MRV	**DATE:**	6/17/19
CHECK:	DFT	**DATE:**	4/1/19	**RECHECK:**	DFT	**DATE:**	7/29/19
STRUCTURE:	COL-7-26.34			**SFN:**	1500369	**PID:**	99646

ITEM: 513E20000 **PAY UNIT:** EACH
SUBJECT: ESTIMATED QUANTITIES
DESCRIPTION: WELDED STUD SHEAR CONNECTORS
SUPPLEMENTAL DESCRIPTION:

			SUBTOTAL	TOTAL
No. Beams =	6	ea		
# Stud Rows / Beam =	143	ea		
No. Studs/Row =	3	ea		
No. Studs =	2574	ea	2,574	2,574

SPECIAL INSTRUCTIONS: **TOTAL** **2,574**

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STRUCTURE:	COL-7-26.34			**SFN:**	1500369	**PID:**	99646

ITEM: 516E13600 **PAY UNIT:** SF
SUBJECT: ESTIMATED QUANTITIES
DESCRIPTION: 1" PREFORMED EXPANSION JOINT FILLER
SUPPLEMENTAL DESCRIPTION:

			SUBTOTAL	TOTAL
Barrier Area =	4.0967	sf		
Quantity =	4	ea		
Area =	17	sf	17	17
SPECIAL INSTRUCTIONS:			**TOTAL**	**17**

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DESIGN:	DTA	**DATE:**	11/27/18	**UPDATE:**	MRV	**DATE:**	6/17/19
CHECK:	DFT	**DATE:**	4/1/19	**RECHECK:**	DFT	**DATE:**	7/29/19
STRUCTURE:	COL-7-26.34			**SFN:**	1500369	**PID:**	99646

ITEM: 516E13900 **PAY UNIT:** SF
SUBJECT: ESTIMATED QUANTITIES
DESCRIPTION: 2" PREFORMED EXPANSION JOINT FILLER
SUPPLEMENTAL DESCRIPTION:

			SUBTOTAL	TOTAL
Rear Abutment				
Diaphragm Left Side Width =	3.83	ft		
Diaphragm Left Side Height =	5.25	ft		
Area =	20.11	sf		
Along Approach Slab				
Left Side Length =	30	ft		
Left Side Height =	1.416667	ft		
Area =	42.5	sf		
Right Side Width =	2.579	ft		
Right Side Height =	5.26	ft		
Area =	13.57	sf		
Along Approach Slab				
Right Side Length =	30	ft		
Right Side Height =	1.416667	ft		
Area =	42.5	sf		
Total Area =	119	sf	119	119
Forward Abutment				
Left Side Width =	2.579	ft		
Left Side Height =	5.24	ft		
Area =	13.52	sf		
Along Approach Slab				
Left Side Length =	30	ft		
Left Side Height =	1.416667	ft		
Area =	42.5	sf		
Right Side Width =	3.83	ft		
Right Side Height =	5.26	ft		
Area =	20.15	sf		
Along Approach Slab				
Right Side Length =	30	ft		
Right Side Height =	1.416667	ft		
Area =	42.5	sf		
Total Area =	119	sf	119	238
SPECIAL INSTRUCTIONS:			**TOTAL**	**238**

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STRUCTURE:	COL-7-26.34			**SFN:**	1500369	**PID:**	99646

ITEM: 516E14020 **PAY UNIT:** FT
SUBJECT: ESTIMATED QUANTITIES
DESCRIPTION: SEMI-INTEGRAL ABUTMENT EXPANSION JOINT SEAL
SUPPLEMENTAL DESCRIPTION:

			SUBTOTAL	TOTAL
Rear Abutment =	50.9118	ft		
Left Side Height =	3.833333	ft		
Right Side Height =	3.843333	ft		
Total =	59		59	59
Forward Abutment =	50.3286	ft		
Left Side Height =	3.823333	ft		
Right Side Height =	3.843333	ft		
Total =	58	ft	58	117

SPECIAL INSTRUCTIONS: **TOTAL** **117**

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STRUCTURE:	COL-7-26.34			**SFN:**	1500369	**PID:**	99646

ITEM: 516E31010 **PAY UNIT:** FT
SUBJECT: ESTIMATED QUANTITIES
DESCRIPTION: 2" DEEP JOINT SEALER
SUPPLEMENTAL DESCRIPTION:

				SUBTOTAL	TOTAL
Rear Abutment =	50.3286	ft	Measured from Microstation		
Forward Abutment =	50.3286	ft	Measured form Microstation		
Total =	101	ft		101	101

SPECIAL INSTRUCTIONS: **TOTAL** **101**

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STRUCTURE:	COL-7-26.34			**SFN:**	1500369	**PID:**	99646

ITEM: 516E44101 **PAY UNIT:** EACH
SUBJECT: ESTIMATED QUANTITIES
DESCRIPTION: ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE), AS PER PLAN
SUPPLEMENTAL DESCRIPTION: 13"x19"x2.037" PAD W/ STEEL LOAD PLATES AND HP12x53 PEDESTAL

			SUBTOTAL	TOTAL
No. Beams =	6	ea		
No. Abutments =	2	ea		
No. Bearings =	12	ea	12	12

SPECIAL INSTRUCTIONS: 2"-3" TK, SPECIFY DIMENSIONS

TOTAL 12

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CHECK:	DFT	DATE:	4/1/19	RECHECK:	DFT	DATE:	7/29/19
STRUCTURE:	COL-7-26.34			SFN:	1500369	PID:	99646

ITEM: 518E21200 PAY UNIT: CY
SUBJECT: ESTIMATED QUANTITIES
DESCRIPTION: POROUS BACKFILL WITH GEOTEXTILE FABRIC
SUPPLEMENTAL DESCRIPTION:

						SUBTOTAL	TOTAL
Rear Abutment							
MS Stem Area 1 =	41.1905	sf	MS Stem Area 2 =	58.7519	sf		
Height =	20.72333	ft	Height =	20.72333	ft		
			Volume =	77	cy	77	77
MS Left WW Area 1 =	8.2311	sf	MS Left WW Area 6 =	5.3333	sf		
Height =	20.75853	ft	Height =	12.66293	ft		
MS Left WW Area 2 =	5.3333	sf	MS Left WW Area 7 =	6.6667	sf		
Height =	18.71263	ft	Height =	11.31853	ft		
MS Left WW Area 3 =	6.6667	sf	MS Left WW Area 8 =	5.3333	sf		
Height =	17.36823	ft	Height =	9.638133	ft		
MS Left WW Area 4 =	5.3333	sf	MS Left WW Area 9 =	6.6667	sf		
Height =	15.68783	ft	Height =	8.293833	ft		
MS Left WW Area 5 =	6.6667		Volume =	30	cy	30	107
Height =	14.34343						
MS Right WW Area 1 =	5.3367	sf	MS Right WW Area 6 =	6.6667	sf		
Height =	20.69643	ft	Height =	13.32373	ft		
MS Right WW Area 2 =	6.6667	sf	MS Right WW Area 7 =	5.3333	sf		
Height =	19.35593	ft	Height =	11.64813	ft		
MS Right WW Area 3 =	5.3333	sf	MS Right WW Area 8 =	6.6667	sf		
Height =	17.68033	ft	Height =	10.30763	ft		
MS Right WW Area 4 =	6.6667	sf	Volume =	27	cy	27	134
Height =	14.98689	ft					
MS Right WW Area 5 =	5.3333	sf					
Height =	14.66423	ft					
MS Counterfort Area 1 =	3.0534	sf	MS Counterfort Area 5 =	5.3333	sf		
Avg. Height =	17.56	ft	Height =	12.1641	ft		
MS Counterfort Area 2 =	6.6667	sf	MS Counterfort Area 6 =	6.6667	sf		
Height =	16.8307	ft	Height =	10.8307	ft		
MS Counterfort Area 3 =	5.3333	sf	MS Counterfort Area 7 =	5.3333	sf		
Avg. Height =	15.1641	ft	Height =	9.1641	ft		
MS Counterfort Area 4 =	6.6667	sf	MS Counterfort Area 8 =	5.6667	sf		
Height =	13.8307	ft	Height =	7.8307	ft		
			Volume =	42	cy	42	176

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CHECK:	DFT	**DATE:**	4/1/19	**RECHECK:**	DFT	**DATE:**	7/29/19
STRUCTURE:	COL-7-26.34			**SFN:**	1500369	**PID:**	99646

ITEM: 518E21200 **PAY UNIT:** CY
SUBJECT: ESTIMATED QUANTITIES
DESCRIPTION: POROUS BACKFILL WITH GEOTEXTILE FABRIC
SUPPLEMENTAL DESCRIPTION:

				SUBTOTAL	TOTAL
Forward Abutment					
Left WW Height =	2	ft			
Left WW Width =	1	ft			
Left Wingwall Length =	31.583	ft	measured in Microstation		
Volume =	2	cy		2	178
Right WW Height =	2	ft			
Right WW Width =	1	ft			
Right Wingwall Length =	30.3458	ft	measured in Microstation		
Volume =	2	cy		2	180
Counterfort WW Height =	2	ft			
Counterfort WW Width =	1	ft			
Counterfort Wingwall Length =	33.3412	ft	measured in Microstation		
Sides =	2	ea			
Volume =	5	cy		5	185
Stem Height =	2	ft			
Stem Width =	1	ft			
Stem 1 Length =	30.642	ft			
Stem 2 Length =	21.8144	ft			
Volume =	4	cy		4	189
Diaphragm Height =	3	ft			
Diaphragm Width =	2	ft			
Diaphragm Length =	50	ft			
Volume =	11	cy		11	200
5% Contingency =	10	cy		10	210
SPECIAL INSTRUCTIONS: CHECK UNIT OF MEASURE				**TOTAL**	**210**

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STRUCTURE:	COL-7-26.34			**SFN:**	1500369	**PID:**	99646

ITEM: 518E40000 **PAY UNIT:** FT
SUBJECT: ESTIMATED QUANTITIES
DESCRIPTION: 6" PERFORATED CORRUGATED PLASTIC PIPE
SUPPLEMENTAL DESCRIPTION:

				SUBTOTAL	TOTAL
Rear Abutment					
Left WW =	30	ft	Measured in Microstation		
Stem 1 =	35	ft	Measured in Microstation		
Stem 2 =	30	ft	Measured in Microstation		
Right WW =	30	ft	Measured in Microstation		
Counterfort =	80	ft	Measured in Microstation		
Total =	205	ft			
Forward Abutment					
Left WW =	25	ft	Measured in Microstation		
Stem 1 =	35	ft	Measured in Microstation		
Stem 2 =	30	ft	Measured in Microstation		
Right WW =	30	ft	Measured in Microstation		
Counterfort =	60	ft	Measured in Microstation		
Total =	180	ft			
Total =	385	ft		385	385
5% Contingency =	20	ft		20	405
SPECIAL INSTRUCTIONS:				**TOTAL**	**405**

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STRUCTURE:	COL-7-26.34			**SFN:**	1500369	**PID:**	99646

ITEM: 518E40011 **PAY UNIT:** FT
SUBJECT: ESTIMATED QUANTITIES
DESCRIPTION: 6" NON-PERFORATED CORRUGATED PLASTIC PIPE, INCLUDING SPECIALS, AS PER PLAN
SUPPLEMENTAL DESCRIPTION:

			SUBTOTAL	TOTAL
Rear Abutment Left Wingwall =	30	ft		
Rear Abutment Right Wingwall =	30	ft		
Forward Abutment Left Wingwall =	30	ft		
Forward Abutment Right Wingwall =	30	ft		
Total =	120	ft	120	120
SPECIAL INSTRUCTIONS:			**TOTAL**	**120**

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STRUCTURE:	COL-7-26.34			**SFN:**	1500369	**PID:**	99646

ITEM: 518E62600 **PAY UNIT:** SF
SUBJECT: ESTIMATED QUANTITIES
DESCRIPTION: STRUCTURE DRAINAGE, MISC.:
SUPPLEMENTAL DESCRIPTION: PREFABRICATED GEOCOMPOSITE DRAIN

			SUBTOTAL	TOTAL
Forward Abutment				
Left WW Area =	384.4205	sf	384	384
Left WW Chamfer Width =	5.7066	ft		
Left WW Chamfer Height =	20.116	ft		
Area =	115	sf	115	499
Right WW Area =	380.3254	sf	380	879
Right WW Chamfer Width =	4.3594	ft		
Right WW Chamfer Height =	20.3625	ft		
Area =	89	sf	89	968
Counterfort WW Area =	327.7382	sf		
Number of Sides =	2	ea		
Total =	655	sf	655	1,623
Left Counterfort Chamfer Width =	4.0501	ft		
Left Counterfort Chamfer Height =	17.43	ft		
Area =	71	sf	71	1,694
Right Counterfort Chamfer Width =	5.4063	ft		
Right Counterfort Chamfer Height =	17.43	ft		
Area =	94	sf	94	1,788
Stem 1 Width =	23.5867	ft		
Stem 1 Height =	16.5	ft		
Area =	389	sf	389	2,177
Stem 2 Width =	14.152	ft		
Stem 2 Height =	16.5	ft		
Area =	233.508	sf	234	2,411
5% Contingency =	121	cy	121	2,532

SPECIAL INSTRUCTIONS: ADD SUPPLEMENTAL DESCRIPTION **TOTAL** **2,532**

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STRUCTURE:	COL-7-26.34			**SFN:**	1500369	**PID:**	99646

ITEM: 523E20000 **PAY UNIT:** EACH
SUBJECT: ESTIMATED QUANTITIES
DESCRIPTION: DYNAMIC LOAD TESTING
SUPPLEMENTAL DESCRIPTION:

			SUBTOTAL	TOTAL
Rear Abutment =	0	ea		
Forward Abutment =	1	ea		
Total =	1	ea	1	1
SPECIAL INSTRUCTIONS:			**TOTAL**	**1**

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CHECK:	DFT	**DATE:**	4/1/19	**RECHECK:**	DFT	**DATE:**	7/29/19
STRUCTURE:	COL-7-26.34			**SFN:**	1500369	**PID:**	99646

ITEM: 526E30001 **PAY UNIT:** SY
SUBJECT: ESTIMATED QUANTITIES
DESCRIPTION: REINFORCED CONCRETE APPROACH SLABS (T=17"), AS PER PLAN
SUPPLEMENTAL DESCRIPTION:

				SUBTOTAL	TOTAL
Rear Abutment Area=	1420	sf	Measured in Microstation		
Forward Abutment Area =	1420	sf	Measured in Microstation		
Total =	316	sy		316	316
SPECIAL INSTRUCTIONS:				**TOTAL**	**316**

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STRUCTURE:	COL-7-26.34			**SFN:**	1500369	**PID:**	99646

ITEM: 526E90010 **PAY UNIT:** FT
SUBJECT: ESTIMATED QUANTITIES
DESCRIPTION: TYPE A INSTALLATION
SUPPLEMENTAL DESCRIPTION:

			SUBTOTAL	TOTAL
Rear Abutment =	50.3286	ft		
Forward Abutment =	50.3286	ft		
Total =	101	ft	101	101
SPECIAL INSTRUCTIONS:			**TOTAL**	**101**

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STRUCTURE:	COL-7-26.34			**SFN:**	1500369	**PID:**	99646

ITEM: 607E39900 **PAY UNIT:** FT
SUBJECT: ESTIMATED QUANTITIES
DESCRIPTION: VANDAL PROTECTION FENCE, 6' STRAIGHT, COATED FABRIC
SUPPLEMENTAL DESCRIPTION:

				SUBTOTAL	TOTAL
Length =	100	ft	Take-off from plans		
Quantity =	2	ea	Take-off from plans		
Volume =	200	ft		200	200
SPECIAL INSTRUCTIONS:				**TOTAL**	**200**

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CHECK:	DFT	**DATE:**	4/1/19	**RECHECK:**	DFT	**DATE:**	7/29/19
STRUCTURE:	COL-7-26.34			**SFN:**	1500369	**PID:**	99646

ITEM: 601E12000 **PAY UNIT:** SY
SUBJECT: ESTIMATED QUANTITIES
DESCRIPTION: RIPRAP, WITH GROUT
SUPPLEMENTAL DESCRIPTION:

			SUBTOTAL	TOTAL
Rear Abutment =	639.3142 sf	measured in Microstation		
Forward Abutment =	594.6208 sf	measured in Microstation		
Conversion =	1.118034			
Total =	153 sy		153	153
SPECIAL INSTRUCTIONS:			**TOTAL**	**153**

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DESIGN:	MRV	**DATE:**	3/29/19	**UPDATE:**	MRV	**DATE:**	6/17/19
CHECK:	DFT	**DATE:**	4/1/19	**RECHECK:**	DFT	**DATE:**	7/29/19
STRUCTURE:	COL-7-26.34			**SFN:**	1500369	**PID:**	99646

ITEM: 625E25601 **PAY UNIT:** FT
SUBJECT: ESTIMATED QUANTITIES
DESCRIPTION: CONDUIT, 4", 725.04, AS PER PLAN
SUPPLEMENTAL DESCRIPTION:

				SUBTOTAL	TOTAL
Temporary					
Length =	196	ft	Take-off from plans		
Quantity =	2	ea	Take-off from plans		
Total Length =	392	ft		392	392
Permanent					
Length =	235	ft	Take-off from plans		
Quantity =	2	ea	Take-off from plans		
Total Length =	470	ft		470	862
SPECIAL INSTRUCTIONS:				**TOTAL**	**862**

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614-586-0642 • Fax 614-586-0648

DESIGN:	MRV	**DATE:**	3/29/19	**UPDATE:**	MRV	**DATE:**	6/17/19
CHECK:	DFT	**DATE:**	4/1/19	**RECHECK:**	DFT	**DATE:**	7/29/19
STRUCTURE:	COL-7-26.34			**SFN:**	1500369	**PID:**	99646

ITEM: 846E00110 **PAY UNIT:** CF
SUBJECT: ESTIMATED QUANTITIES
DESCRIPTION: POLYMER MODIFIED ASPHALT EXPANSION JOINT SYSTEM
SUPPLEMENTAL DESCRIPTION:

			SUBTOTAL	TOTAL
Width =	20	in		
Depth	3	in		
Length =	50.2	ft		
Ends =	2	ea		
Volume =	42	cf	42	42

SPECIAL INSTRUCTIONS: **TOTAL** **42**

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DESIGN:	MRV	**DATE:**	3/29/19	**UPDATE:**	MRV	**DATE:**	6/17/19
CHECK:	DFT	**DATE:**	4/1/19	**RECHECK:**	DFT	**DATE:**	7/29/19
STRUCTURE:	COL-7-26.34			**SFN:**	1500369	**PID:**	99646

ITEM: 867E00100 **PAY UNIT:** LS
SUBJECT: ESTIMATED QUANTITIES
DESCRIPTION: TEMPORARY WIRE FACED MECHANICALLY STABILIZED EARTH WALL
SUPPLEMENTAL DESCRIPTION:

			SUBTOTAL	TOTAL
Quantity =	1	ea	1	1
RA Area =	349	sf		
FA Area =	169	sf		
Total Area =	518			
Unit Cost =	26	$/sf		
Cost =	$ 13,468			

SPECIAL INSTRUCTIONS: **TOTAL** **LS**

MADE BY: MRV DATE: 3/29/2019
CHECKED BY: DFT DATE: 7/31/2019

ESTIMATED QUANTITIES

STRUCTURAL FILE NUMBER: 1500369

ITEM	TOTAL	UNIT	DESCRIPTION	SUPERSTRUCTURE	ABUTMENTS	GENERAL	REFERENCE SHEET NO.
202	LUMP		PORTIONS OF STRUCTURE REMOVED, OVER 20 FOOT SPAN, AS PER PLAN			LUMP	3, 7, 9 OF 53
202	98	SY	APPROACH SLAB REMOVED			98	
202	98	SY	WEARING COURSE REMOVED			98	
203	825	CY	ROADWAY, MISC.: EPS GEOFOAM FILL		825		4 OF 53
503	LUMP		COFFERDAMS AND EXCAVATION BRACING			LUMP	
503	766	CY	UNCLASSIFIED EXCAVATION			766	
505	LUMP		PILE DRIVING EQUIPMENT MOBILIZATION		LUMP		
507	1,380	FT	STEEL PILES HP14X89, FURNISHED		1,380		
507	1,260	FT	STEEL PILES HP14X89, DRIVEN		1,260		
507	935	FT	16" CAST-IN-PLACE REINFORCED CONCRETE PILES, DRIVEN		935		
507	1,030	FT	16" CAST-IN-PLACE REINFORCED CONCRETE PILES, FURNISHED		1,030		
507	217	FT	PREBORED HOLES, AS PER PLAN		217		3 OF 53
507	24	EACH	STEEL POINTS OR SHOES		24		
509	146,394	LB	EPOXY COATED REINFORCING STEEL	50,524	95,870		
511	2	EACH	SEMI-INTEGRAL DIAPHRAGM GUIDE, AS PER PLAN		2		33,48, 50 OF 53
511	191	CY	CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK	191			
511	51	CY	CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK (PARAPET)	51			
511	613	CY	CLASS QC1 CONCRETE WITH QC/QA, ABUTMENT INCLUDING FOOTING		613		
512	890	SY	SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)	311	473	106	
512	47	SY	SEALING CONCRETE BRIDGE DECKS WITH HMWM RESIN	47			
512	44	SY	TYPE 2 WATERPROOFING	6	38		
513	136,000	LB	STRUCTURAL STEEL MEMBERS, LEVEL 4	136,000			
513	2,574	EACH	WELDED STUD SHEAR CONNECTORS	2,574			
516	17	SF	1" PREFORMED EXPANSION JOINT FILLER	17			
516	238	SF	2" PREFORMED EXPANSION JOINT FILLER		238		
516	117	FT	SEMI-INTEGRAL ABUTMENT EXPANSION JOINT SEAL			117	
516	101	FT	2" DEEP JOINT SEALER			101	
516	12	EACH	ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE), AS PER PLAN (13"x19"x2.037" PAD W/ STEEL LOAD PLATES AND HP12x53 PEDESTAL	12			34 OF 53
518	210	CY	POROUS BACKFILL WITH GEOTEXTILE FABRIC		210		
518	405	FT	6" PERFORATED CORRUGATED PLASTIC PIPE			405	
518	120	FT	6" NON-PERFORATED CORRUGATED PLASTIC PIPE, INCLUDING SPECIALS, AS PER PLAN			120	19 OF 53
518	2,532	SF	STRUCTURE DRAINAGE, MISC.: PREFABRICATED GEOCOMPOSITE DRAIN		2,532		3 OF 53
523	1	EACH	DYNAMIC LOAD TESTING		1		
526	316	SY	REINFORCED CONCRETE APPROACH SLABS (T=17"), AS PER PLAN			316	46 OF 53
526	101	FT	TYPE A INSTALLATION			101	
607	200	FT	VANDAL PROTECTION FENCE, 6' STRAIGHT, COATED FABRIC	200			
601	153	SY	RIPRAP, WITH GROUT			153	
625	862	FT	CONDUIT, 4", 725.04, AS PER PLAN			862	
846	42	CF	POLYMER MODIFIED ASPHALT EXPANSION JOINT SYSTEM			42	
867	LUMP		TEMPORARY WIRE FACED MECHANICALLY STABILIZED EARTH WALL		LUMP		