



E.L. ROBINSON
ENGINEERING

Computation for: **ESTIMATED QUANTITIES**

SFN: **5707080**

Structure: **MOT-75-1078**

PID: **91606**

Design: **GMW** Date **July 16, 2017**

Check: **LAH** Date **July 17, 2017**

Update: _____ Date _____

Recheck: _____ Date _____

File Names

Comments



E.L. ROBINSON
ENGINEERING

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

DESIGN: GMW DATE: 7/16/17 UPDATE: _____ DATE: _____
CHECK: LAH DATE: 7/17/17 RECHECK: _____ DATE: _____
STRUCTURE: MOT-75-1078 SFN: 5707080 PID: 91606

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



DESIGN: GMW DATE: 7/16/17 UPDATE: _____ DATE: _____
 CHECK: LAH DATE: 7/17/17 RECHECK: _____ DATE: _____
 STRUCTURE: MOT-75-1078 SFN: 5707080 PID: 91606

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

ITEM: 202E22900 PAY UNIT: SY
 SUBJECT: ESTIMATED QUANTITIES

DESCRIPTION: APPROACH SLAB REMOVED

SUPPLEMENTAL DESCRIPTION: _____

				SUBTOTAL	TOTAL
<u>Southeast Approach Slab:</u>					
Area measured in Microstation	=	1438.79 ft ²	=	159.87 SY	
				160	160
<u>Southwest Approach Slab:</u>					
Area measured in Microstation	=	1440.51 ft ²	=	160.06 SY	
				161	321
<u>Northeast Approach Slab:</u>					
Area measured in Microstation	=	1438.99 ft ²	=	159.89 SY	
				160	481
<u>Northwest Approach Slab:</u>					
Area measured in Microstation	=	1440.19 ft ²	=	160.02 SY	
				161	642
SPECIAL INSTRUCTIONS:				TOTAL	642



E.L. ROBINSON
ENGINEERING

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

DESIGN: GMW DATE: 7/16/17 UPDATE: _____ DATE: _____
CHECK: LAH DATE: 7/17/17 RECHECK: _____ DATE: _____
STRUCTURE: MOT-75-1078 SFN: 5707080 PID: 91606

ITEM: 503E11100 PAY UNIT: LS
SUBJECT: ESTIMATED QUANTITIES

DESCRIPTION: COFFERDAMS AND EXCAVATION BRACING

SUPPLEMENTAL DESCRIPTION: _____

	SUBTOTAL	TOTAL
SPECIAL INSTRUCTIONS:	TOTAL	LS



E.L. ROBINSON
ENGINEERING

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

DESIGN: GMW DATE: 7/16/17 UPDATE: _____ DATE: _____
CHECK: LAH DATE: 7/17/17 RECHECK: _____ DATE: _____
STRUCTURE: MOT-75-1078 SFN: 5707080 PID: 91606

ITEM: 503E21300 PAY UNIT: LS
SUBJECT: ESTIMATED QUANTITIES

DESCRIPTION: UNCLASSIFIED EXCAVATION

SUPPLEMENTAL DESCRIPTION: _____

	SUBTOTAL	TOTAL
SPECIAL INSTRUCTIONS: CHECK UNIT OF MEASURE	TOTAL	LS



E.L. ROBINSON
ENGINEERING

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

DESIGN: GMW DATE: 7/16/17 UPDATE: _____ DATE: _____
CHECK: LAH DATE: 7/17/17 RECHECK: _____ DATE: _____
STRUCTURE: MOT-75-1078 SFN: 5707080 PID: 91606

ITEM: 505E11100 PAY UNIT: LS
SUBJECT: ESTIMATED QUANTITIES

DESCRIPTION: PILE DRIVING EQUIPMENT MOBILIZATION

SUPPLEMENTAL DESCRIPTION: _____

	SUBTOTAL	TOTAL
SPECIAL INSTRUCTIONS:	TOTAL	LS



DESIGN: GMW DATE: 7/16/17 UPDATE: _____ DATE: _____
 CHECK: LAH DATE: 7/17/17 RECHECK: _____ DATE: _____
 STRUCTURE: MOT-75-1078 SFN: 5707080 PID: 91606

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

ITEM: 507E00500 PAY UNIT: FT
 SUBJECT: ESTIMATED QUANTITIES

DESCRIPTION: 12" CAST-IN-PLACE REINFORCED CONCRETE PILES, DRIVEN

SUPPLEMENTAL DESCRIPTION: _____

	SUBTOTAL	TOTAL
<u>Rear Abutment:</u>		
# Piles = 4 ea		
Estimated Length = 40 ft/Pile		
 Total Driven Length of Rear Abutment Piles = 40 ft/pile * 4 piles = 160 ft	160	160
<u>Forward Abutment:</u>		
# Piles = 4 ea		
Estimated Length = 40 FT		
 Total Driven Length of FWD Abutment Piles = 40 ft/pile * 4 piles = 160 ft	160	320
SPECIAL INSTRUCTIONS:		
	TOTAL	320



DESIGN: GMW DATE: 7/16/17 UPDATE: _____ DATE: _____
 CHECK: LAH DATE: 7/17/17 RECHECK: _____ DATE: _____
 STRUCTURE: MOT-75-1078 SFN: 5707080 PID: 91606

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

ITEM: 507E00550 PAY UNIT: FT
 SUBJECT: ESTIMATED QUANTITIES

DESCRIPTION: 12" CAST-IN-PLACE REINFORCED CONCRETE PILES, FURNISHED

SUPPLEMENTAL DESCRIPTION: _____

				SUBTOTAL	TOTAL
<u>Rear Abutment:</u>					
# Piles =	4	ea			
Estimated Length =	40	ft/Pile			
Total Furnished Length of Rear Abutment Piles =			(40 + 5) ft/pile * 4 piles =	180 ft	180 180
<u>Forward Abutment:</u>					
# Piles =	4	ea			
Estimated Length =	40	FT			
Total Furnished Length of FWD Abutment Piles =			(40 + 5) ft/pile * 4 piles =	180 ft	180 360
SPECIAL INSTRUCTIONS:				TOTAL	360



DESIGN: GMW DATE: 7/16/17 UPDATE: _____ DATE: _____
 CHECK: LAH DATE: 7/17/17 RECHECK: _____ DATE: _____
 STRUCTURE: MOT-75-1078 SFN: 5707080 PID: 91606

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

ITEM: 509E10000 PAY UNIT: LB
 SUBJECT: ESTIMATED QUANTITIES

DESCRIPTION: EPOXY COATED REINFORCING STEEL

SUPPLEMENTAL DESCRIPTION: _____

		SUBTOTAL	TOTAL
Deck	150367 lb	150,367	150,367
Diaphragm	17289 lb	17,289	167,656
Barrier			
Superstructure:	21792 lb	21,792	189,448
Approach Slab:	5366 lb	5,366	194,814
Pier Above Footingss	4970 lb	4,970	199,784
Abutment including Footings	10154 lb	10,154	209,938
SPECIAL INSTRUCTIONS:		TOTAL	209,938



DESIGN: GMW DATE: 7/16/17 UPDATE: _____ DATE: _____
 CHECK: LAH DATE: 7/17/17 RECHECK: _____ DATE: _____
 STRUCTURE: MOT-75-1078 SFN: 5707080 PID: 91606

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

ITEM: 510E10000 PAY UNIT: EACH
 SUBJECT: ESTIMATED QUANTITIES

DESCRIPTION: DOWEL HOLES WITH NONSHRINK, NONMETALLIC GROUT

SUPPLEMENTAL DESCRIPTION: _____

	SUBTOTAL	TOTAL
Southeast Abutment:		
# of dowels into top of stem =	76	
# of dowels into east side of stem =	9	
# of dowels into east side of footing =	8	
SUM =	93	93
Southwest Abutment:		
# of dowels into top of stem =	84	
# of dowels into west side of stem =	9	
# of dowels into west side of footing =	8	
SUM =	101	194
Northwest Abutment:		
# of dowels into top of stem =	78	
# of dowels into west side of stem =	9	
# of dowels into west side of footing =	8	
SUM =	95	289
Northeast Abutment:		
# of dowels into top of stem =	84	
# of dowels into east side of stem =	9	
# of dowels into east side of footing =	8	
SUM =	101	390
Pier 1 - Left Bridge:		
# of dowels in left phase =	42	
# of dowels in right phase =	40	
SUM =	82	472
Pier 1 - Right Bridge:		
# of dowels in left phase =	44	
# of dowels in right phase =	36	
SUM =	80	552
Pier 2 - Left Bridge:		
# of dowels in left phase =	42	
# of dowels in right phase =	40	
SUM =	82	634
Pier 2 - Right Bridge:		
# of dowels in left phase =	44	
# of dowels in right phase =	38	
SUM =	82	716
SPECIAL INSTRUCTIONS:		TOTAL
		716



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

DESIGN: GMW DATE: 7/16/17 UPDATE: _____ DATE: _____
 CHECK: LAH DATE: 7/17/17 RECHECK: _____ DATE: _____
 STRUCTURE: MOT-75-1078 SFN: 5707080 PID: 91606

ITEM: 511E33501 PAY UNIT: EACH
 SUBJECT: ESTIMATED QUANTITIES

DESCRIPTION: SEMI-INTEGRAL DIAPHRAGM GUIDE, AS PER PLAN

SUPPLEMENTAL DESCRIPTION: _____

	SUBTOTAL	TOTAL
Southeast Abutment = 1		
Southwest Abutment = 1		
Northeast Abutment = 1		
Northwest Abutment = 1		
SUM = 4	4	4
SPECIAL INSTRUCTIONS:	TOTAL	4



DESIGN: GMW DATE: 7/16/17 UPDATE: _____ DATE: _____
 CHECK: LAH DATE: 7/17/17 RECHECK: _____ DATE: _____
 STRUCTURE: MOT-75-1078 SFN: 5707080 PID: 91606

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

ITEM: 511E34446 PAY UNIT: CY
 SUBJECT: ESTIMATED QUANTITIES

DESCRIPTION: CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK

SUPPLEMENTAL DESCRIPTION: _____

	SUBTOTAL	TOTAL
Left Bridge - Slab:		
Beam Spacing = 6.5 ft		
Number of Beams = 9 beams		
Slab Thickness = 8.5 in		
Haunch Width = 9 in		
Haunch Depth = 2 in		
		*Measured from top of beam
Top Flange Thickn. = 1.07 in		
b _f top flange = 15 in		
Avg. Ovrhng (LEOD) = 2.60 ft		
		*Measured from CL girder
Avg. Overhang Thickness = 11.32 in		
Avg. Ovrhng (REOD) = 3.02 ft		
		*Measured from CL girder
Ovg. Overhang Thick. (REOD) = 10.96 in		
Bridge Length = 206.63 ft		
Int. Deck Concrete = 8.5 in * 1/12 in/ft * 6.5 ft/bay * 8 bays =	36.83 ft ²	
Left Ovrhng. Conc. = 1.97 ft * (11.32 / 12) ft + 0.63 ft * ((11.32 - 1.07) / 12) ft =	2.40 ft ²	
Right Ovrhng. Conc. = 2.39 ft * (10.96 / 12) ft + 0.63 ft * ((10.96 - 1.07) / 12) ft =	2.70 ft ²	
Haunch Concrete = .5 * (9 * (2 + 1.07)) in ² * 16 haunch triangles + 1.25 ft * (2 / 12) ft * 8 bms =	3.20 ft ²	
Left Bridge Total Superstructure Concrete = (36.83 + 2.4 + 2.7 + 3.2) ft ² * 206.63 ft =	9,325.4 ft ³	
	= 345.4 CY	
	346	346
Right Bridge - Slab:		
Beam Spacing = 6.5 ft		
Number of Beams = 9 beams		
Slab Thickness = 8.5 in		
Haunch Width = 9 in		
Haunch Depth = 2 in		
		*Measured from top of beam
Top Flange Thickn. = 1.07 in		
b _f top flange = 15 in		
Avg. Ovrhng (LEOD) = 2.48 ft		
		*Measured from CL girder
Avg. Overhang Thickness = 11.38 in		
Avg. Ovrhng (REOD) = 3.08 ft		
		*Measured from CL girder
Ovg. Overhang Thick. (REOD) = 10.89 in		
Bridge Length = 206.63 ft		
Int. Deck Concrete = 8.5 in * 1/12 in/ft * 6.5 ft/bay * 8 bays =	36.83 ft ²	
Left Ovrhng. Conc. = 1.86 ft * (11.38 / 12) ft + 0.63 ft * ((11.38 - 1.07) / 12) ft =	2.30 ft ²	
Right Ovrhng. Conc. = 2.45 ft * (10.89 / 12) ft + 0.63 ft * ((10.89 - 1.07) / 12) ft =	2.74 ft ²	
Haunch Concrete = .5 * (9 * (2 + 1.07)) in ² * 16 haunch triangles + 1.25 ft * (2 / 12) ft * 8 bms =	3.20 ft ²	
Left Bridge Total Superstructure Concrete = (36.83 + 2.3 + 2.74 + 3.2) ft ² * 206.63 ft =	9,312.8 ft ³	
	= 344.9 CY	
	345	691



DESIGN: GMW DATE: 7/16/17 UPDATE: _____ DATE: _____
 CHECK: LAH DATE: 7/17/17 RECHECK: _____ DATE: _____
 STRUCTURE: MOT-75-1078 SFN: 5707080 PID: 91606

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

ITEM: 511E34446 PAY UNIT: CY
 SUBJECT: ESTIMATED QUANTITIES

DESCRIPTION: CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK

SUPPLEMENTAL DESCRIPTION: _____

	SUBTOTAL	TOTAL
<u>Diaphragms:</u>		
Southeast:		
Plan Area =	227.05 ft ²	
Average Height =	2.91 ft	
Diaphragm Guide Plan Area =	12.56 ft ²	
Average Height =	2.41 ft	
Add'l Conc. Above C.J. Plan Area =	196.84 ft ²	
Height =	1.13 ft	
Triangle along F.F. of Dia. Elev. Area =	0.21 ft ²	
Dia. Length =	60.58 ft	
Southeast Diaphragm Subtotal = (227.05 * 2.91) ft ³ - (12.56 * 2.41) ft ³ + (196.84 * 1.13) ft ³ + (0.21 * 60.58) ft ³		
	= 864.13 ft ³	
Southwest:		
Plan Area =	227.39 ft ²	
Average Height =	2.90 ft	
Diaphragm Guide Plan Area =	12.50 ft ²	
Average Height =	2.49 ft	
Add'l Conc. Above C.J. Plan Area =	197.15 ft ²	
Height =	1.13 ft	
Triangle along F.F. of Dia. Elev. Area =	0.21 ft ²	
Dia. Length =	60.64 ft	
Southwest Diaphragm Subtotal = (227.39 * 2.9) ft ³ - (12.5 * 2.49) ft ³ + (197.15 * 1.13) ft ³ + (0.21 * 60.64) ft ³		
	= 862.72 ft ³	
*North abutment diaphragms continued on the next page.		



DESIGN: GMW DATE: 7/16/17 UPDATE: _____ DATE: _____
 CHECK: LAH DATE: 7/17/17 RECHECK: _____ DATE: _____
 STRUCTURE: MOT-75-1078 SFN: 5707080 PID: 91606

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

ITEM: 511E34446 PAY UNIT: CY
 SUBJECT: ESTIMATED QUANTITIES

DESCRIPTION: CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK

SUPPLEMENTAL DESCRIPTION: _____

	SUBTOTAL	TOTAL
Diaphragms (Continued):		
Northwest:		
Plan Area =	224.81 ft ²	
Average Height =	2.91 ft	
Diaphragm Guide Plan Area =	12.50 ft ²	
Average Height =	2.51 ft	
Add'l Conc. Above C.J. Plan Area =	194.90 ft ²	
Height =	1.13 ft	
Triangle along F.F. of Dia. Elev. Area =	0.21 ft ²	
Dia. Length =	59.98 ft	
Northwest Diaphragm Subtotal = (224.81 * 2.91) ft ³ - (12.5 * 2.51) ft ³ + (194.9 * 1.13) ft ³ + (0.21 * 59.98) ft ³		
= 854.88 ft ³		
Northeast:		
Plan Area =	224.71 ft ²	
Average Height =	2.92 ft	
Diaphragm Guide Plan Area =	12.50 ft ²	
Average Height =	2.46 ft	
Add'l Conc. Above C.J. Plan Area =	194.83 ft ²	
Height =	1.13 ft	
Triangle along F.F. of Dia. Elev. Area =	0.21 ft ²	
Dia. Length =	59.93 ft	
Northeast Diaphragm Subtotal = (224.71 * 2.92) ft ³ - (12.5 * 2.46) ft ³ + (194.83 * 1.13) ft ³ + (0.21 * 59.93) ft ³		
= 856.62 ft ³		
DIAPHRAGM SUBTOTAL = (864.13 + 862.72 + 854.88 + 856.62) ft ³ = 3438.3 ft ³		
= 127.3 CY		
	128	819
SPECIAL INSTRUCTIONS: CHECK UNIT OF MEASURE		
	TOTAL	819



DESIGN: GMW DATE: 7/16/17 UPDATE: _____ DATE: _____
 CHECK: LAH DATE: 7/17/17 RECHECK: _____ DATE: _____
 STRUCTURE: MOT-75-1078 SFN: 5707080 PID: 91606

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

ITEM: 511E34450 PAY UNIT: CY
 SUBJECT: ESTIMATED QUANTITIES

DESCRIPTION: CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK (PARAPET)

SUPPLEMENTAL DESCRIPTION: _____

SUBTOTAL TOTAL

Superstructure: Volume of Railing with Full Cross-Sectional Area (from RA002.dgn):

SBR-1-13 Parapet Cross-Sectional Area* = 4.0582 ft² (outside barriers)
 SBR-2-13 Parapet Cross-Sectional Area* = 6.1533 ft² (inside barriers)
 *areas measured in Microstation

Railing Lengths (ft.)

Section #	Left Bridge		Right Bridge	
	Ext.	Int.	Int.	Ext.
1	13.41	13.34	13.32	13.24
2	15.00	15.00	15.00	15.00
3	15.00	15.00	15.00	15.00
4	7.50	7.50	7.50	7.50
5	7.50	7.50	7.50	7.50
6	7.50	7.50	7.50	7.50
7	7.50	7.50	7.50	7.50
8	15.00	15.00	15.00	15.00
9	15.00	15.00	15.00	15.00
10	15.00	15.00	15.00	15.00
11	15.00	15.00	15.00	15.00
12	7.50	7.50	7.50	7.50
13	7.50	7.50	7.50	7.50
14	7.50	7.50	7.50	7.50
15	7.50	7.50	7.50	7.50
16	15.00	15.00	15.00	15.00
17	15.00	15.00	15.00	15.00
18	13.41	13.34	13.28	13.24
SUM	206.81	206.69	206.60	206.48

Volume of barriers excluding transition region = 4.06 ft² * (206.81 + 206.48) ft + 6.15 ft² * (206.69 + 206.6)
 = 4220.328 ft³
 = 156.31 CY

157 157

Approach Slab: Volume of Railing with Full Cross-Sectional Area (from RA002.dgn):

SBR-1-13 Parapet Cross-Sectional Area* = 5.8290 ft² (outside barriers)
 SBR-2-13 Parapet Cross-Sectional Area* = 8.0127 ft² (inside barriers)
 *areas measured in Microstation

Railing Lengths (ft.)

Section #	Left Bridge		Right Bridge	
	Ext.	Int.	Int.	Ext.
1	10.94	24.93	24.91	10.90
2	10.94	24.93	24.91	10.90
SUM	21.88	49.85	49.81	21.79

Volume of barriers excluding transition region = 5.83 ft² * (21.88 + 21.79) ft + 8.01 ft² * (49.85 + 49.81)
 = 1053.131 ft³
 = 39.00 CY

40 197

Volume of 14'-0" Transition Region on Approach Slab

of transition regions = 4
 Volume of each transition region = 2.74 CY (from SBR-1-13 Std. Drawing + pedestal volume)

Total Volume of Parapet Transitions = 4 * 2.74 CY = 10.95 CY

11 208



E.L. ROBINSON
ENGINEERING

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

DESIGN: GMW DATE: 7/16/17 UPDATE: _____ DATE: _____
CHECK: LAH DATE: 7/17/17 RECHECK: _____ DATE: _____
STRUCTURE: MOT-75-1078 SFN: 5707080 PID: 91606

ITEM: 511E34450 PAY UNIT: CY
SUBJECT: ESTIMATED QUANTITIES

DESCRIPTION: CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK (PARAPET)

SUPPLEMENTAL DESCRIPTION: _____

	SUBTOTAL	TOTAL
SPECIAL INSTRUCTIONS: CHECK UNIT OF MEASURE	TOTAL	208



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

DESIGN: GMW DATE: 7/16/17 UPDATE: _____ DATE: _____
CHECK: LAH DATE: 7/17/17 RECHECK: _____ DATE: _____
STRUCTURE: MOT-75-1078 SFN: 5707080 PID: 91606

ITEM: 511E43510 PAY UNIT: CY
SUBJECT: ESTIMATED QUANTITIES

DESCRIPTION: CLASS QC1 CONCRETE, ABUTMENT INCLUDING FOOTING

SUPPLEMENTAL DESCRIPTION: _____

	SUBTOTAL	TOTAL
Southeast Abutment:		
Footing:		
Front of Footing Height = 3.25 ft		
Front Plan View Area = 50.02 ft ²		
Back of Footing Height = 3.00 ft		
Back Plan View Area = 46.18 ft ²		
Footing Subtotal = (3.25 * 50.02) ft ³ + (3 * 46.18) ft ³ =	301.10 ft ³	
Stem:		
	Plan Area (ft ²)	Height (ft)
Full Section - F.F. under beam seat =	5.69	3.88
Full Section - B.F. under beam seat =	10.29	4.13
Full Section - F.F. under slope =	1.90	3.93
Full Section - B.F. under slope =	3.79	4.18
	x	=
		Volume (ft ³)
		22.06
		42.48
		7.44
		15.84
	SUM =	
		87.83
Stem Cap Plan View Area =	206.07 ft ²	
Average Height =	1.62 ft	
Cap Volume = 206.07 ft ² * 1.62 ft =		333.10 ft ³
Stem Subtotal = 87.83 ft ³ + 333.10 ft ³ =		420.93 ft ³
Wingwall:		
	Plan Area (ft ²)	Height (ft)
Constant Height Section =	8.09	8.25
Sloped Section =	16.31	6.69
	x	=
		Volume (ft ³)
		66.77
		109.11
	SUM =	
		175.88
SOUTHEAST ABUTMENT SUBTOTAL = (301.1 + 420.93 + 175.88) ft ³ =		897.91 ft ³
		= 33.26 CY
	34	34



DESIGN: GMW DATE: 7/16/17 UPDATE: _____ DATE: _____
 CHECK: LAH DATE: 7/17/17 RECHECK: _____ DATE: _____
 STRUCTURE: MOT-75-1078 SFN: 5707080 PID: 91606

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

ITEM: 511E43510 PAY UNIT: CY
 SUBJECT: ESTIMATED QUANTITIES

DESCRIPTION: CLASS QC1 CONCRETE, ABUTMENT INCLUDING FOOTING

SUPPLEMENTAL DESCRIPTION: _____

	SUBTOTAL	TOTAL
Southwest Abutment:		
Footing:		
Front of Footing Height = 3.25 ft		
Front Plan View Area = 38.23 ft ²		
Back of Footing Height = 3.00 ft		
Back Plan View Area = 32.16 ft ²		
Footing Subtotal = (3.25 * 38.23) ft ³ + (3 * 32.16) ft ³ =	220.73	
Stem:		
	Plan Area (ft ²)	Height (ft)
Full Section - F.F. under beam seat =	1.16	4.24
Full Section - B.F. under beam seat =	2.76	4.49
Full Section - F.F. under slope =	0.00	0.00
Full Section - B.F. under slope =	0.00	0.00
	SUM =	
		17.32
Stem Cap Plan View Area = 224.35 ft ²		
Average Height = 1.57 ft		
Cap Volume = 224.35 ft ² * 1.57 ft =		352.37
Stem Subtotal = 17.32 ft ³ + 352.37 ft ³ =		369.70
Wingwall:		
	Plan Area (ft ²)	Height (ft)
Constant Height Section =	10.04	8.59
Sloped Section =	16.85	7.04
	SUM =	
		204.81
SOUTHWEST ABUTMENT SUBTOTAL = (220.73 + 369.7 + 204.81) ft ³ =		795.24
		= 29.45 CY
	30	64



DESIGN: GMW DATE: 7/16/17 UPDATE: _____ DATE: _____
 CHECK: LAH DATE: 7/17/17 RECHECK: _____ DATE: _____
 STRUCTURE: MOT-75-1078 SFN: 5707080 PID: 91606

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

ITEM: 511E43510 PAY UNIT: CY
 SUBJECT: ESTIMATED QUANTITIES

DESCRIPTION: CLASS QC1 CONCRETE, ABUTMENT INCLUDING FOOTING

SUPPLEMENTAL DESCRIPTION: _____

	SUBTOTAL	TOTAL
Northwest Abutment:		
Footing:		
Front of Footing Height =	3.25 ft	
Front Plan View Area =	51.74 ft ²	
Back of Footing Height =	3.00 ft	
Back Plan View Area =	47.76 ft ²	
Footing Subtotal = (3.25 * 51.74) ft ³ + (3 * 47.76) ft ³ =		311.41 ft ³
Stem:		
	Plan Area (ft ²)	Height (ft)
Full Section - F.F. under beam seat =	5.81	4.06
Full Section - B.F. under beam seat =	10.68	4.31
Full Section - F.F. under slope =	2.14	4.09
Full Section - B.F. under slope =	4.29	4.34
	x	=
		Volume (ft ³)
		23.58
		46.02
		8.77
		18.61
		SUM = 96.98
Stem Cap Plan View Area = 204.19 ft ²		
Average Height = 1.50 ft		
Cap Volume = 204.19 ft ² * 1.5 ft =		305.58 ft ³
Stem Subtotal = 96.98 ft ³ + 305.58 ft ³ =		402.56 ft ³
Wingwall:		
	Plan Area (ft ²)	Height (ft)
Constant Height Section =	9.64	8.43
Sloped Section =	15.19	6.84
	x	=
		Volume (ft ³)
		81.28
		103.84
		SUM = 185.11
NORTHWEST ABUTMENT SUBTOTAL = (311.41 + 402.56 + 185.11) ft ³ =		899.09 ft ³
		= 33.30 CY
	34	98



DESIGN: GMW DATE: 7/16/17 UPDATE: _____ DATE: _____
 CHECK: LAH DATE: 7/17/17 RECHECK: _____ DATE: _____
 STRUCTURE: MOT-75-1078 SFN: 5707080 PID: 91606

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

ITEM: 511E43510 PAY UNIT: CY
 SUBJECT: ESTIMATED QUANTITIES

DESCRIPTION: CLASS QC1 CONCRETE, ABUTMENT INCLUDING FOOTING

SUPPLEMENTAL DESCRIPTION: _____

	SUBTOTAL	TOTAL
Northeast Abutment:		
Footing:		
Front of Footing Height =	3.25 ft	
Front Plan View Area =	36.03 ft ²	
Back of Footing Height =	3.00 ft	
Back Plan View Area =	30.61 ft ²	
Footing Subtotal = (3.25 * 36.03) ft ³ + (3 * 30.61) ft ³ =		208.94 ft ³
Stem:		
	Plan Area (ft ²)	Height (ft)
Full Section - F.F. under beam seat =	0.60	3.85
Full Section - B.F. under beam seat =	1.65	4.10
Full Section - F.F. under slope =	0.00	0.00
Full Section - B.F. under slope =	0.00	0.00
	SUM =	
		9.09
Stem Cap Plan View Area =		221.65 ft ²
Average Height =		1.55 ft
Cap Volume = 221.65 ft ² * 1.55 ft =		343.04 ft ³
Stem Subtotal = 9.09 ft ³ + 343.04 ft ³ =		352.14 ft ³
Wingwall:		
	Plan Area (ft ²)	Height (ft)
Constant Height Section =	8.00	8.23
Sloped Section =	18.64	6.67
	SUM =	
		190.01
NORTHEAST ABUTMENT SUBTOTAL = (208.94 + 352.14 + 190.01) ft ³ =		751.08 ft ³
		= 27.82 CY
	28	126
SPECIAL INSTRUCTIONS:	TOTAL	126



DESIGN: GMW DATE: 7/16/17 UPDATE: _____ DATE: _____
 CHECK: LAH DATE: 7/17/17 RECHECK: _____ DATE: _____
 STRUCTURE: MOT-75-1078 SFN: 5707080 PID: 91606

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

ITEM: 512E10100 PAY UNIT: SY
 SUBJECT: ESTIMATED QUANTITIES

DESCRIPTION: SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)

SUPPLEMENTAL DESCRIPTION: _____

	SUBTOTAL	TOTAL
Northwest Abutment, Diaphragm, & Wingwall:		
Length along breastwall =	62.47 ft	
Average Height of Sealing (Breastwall) =	3.84 ft	
Breastwall & Diaphragm Subtotal =	62.47 ft * 3.84 ft =	239.76 ft ²
F.F. Wingwall Sealing =	37.58 ft ²	*Measured in Microstation
Outside Face of Wingwall Sealing =	2.19 ft ²	
Top of Wingwall Sealing =	26.80 ft ²	
Back Face of Wingwall Length =	10.30 ft	
Assumed Height of Sealing along B.F. =	0.50 ft	
Wingwall Subtotal =	37.58 ft ² + 2.19 ft ² + 26.8 ft ² + (10.3 * 0.5) ft ² =	71.72 ft ²
Northwest Abutment Subtotal =	239.76 ft ² + 71.72 ft ² =	311.47 ft ²
Northeast Abutment, Diaphragm, & Wingwall:		
Length along breastwall =	60.53 ft	
Average Height of Sealing (Breastwall) =	4.01 ft	
Breastwall & Diaphragm Subtotal =	60.53 ft * 4.01 ft =	242.74 ft ²
F.F. Wingwall Sealing =	42.07 ft ²	*Measured in Microstation
Outside Face of Wingwall Sealing =	2.19 ft ²	
Top of Wingwall Sealing =	28.21 ft ²	
Back Face of Wingwall Length =	10.29 ft	
Assumed Height of Sealing along B.F. =	0.50 ft	
Wingwall Subtotal =	42.07 ft ² + 2.19 ft ² + 28.21 ft ² + (10.29 * 0.5) ft ² =	77.61 ft ²
Northeast Abutment Subtotal =	242.74 ft ² + 77.61 ft ² =	320.34 ft ²
ABUTMENT SUBTOTAL = (292.23 + 311.81 + 311.47 + 320.34) ft ² =	1235.86 ft ²	
	=	137.3 SY
	138	1,109
Pier Sealing:		
Pier 1:		
Left Bridge - Elevation Pier Cap =	285.25 ft ²	
Left Bridge Top Face =	176.37 ft ²	
4-3' columns, total x-section area =	28.27 ft ²	
Left Bridge Bottom Face =	148.10 ft ²	
Avg. 4 column height =	14.53 ft	
Column area to seal total =	547.75 ft ²	
Left Face of Pier Cap =	22.85 ft ²	
Total Left Pier Cap & Columns =	1465.57 ft ²	
Right Bridge - Elevation Pier Cap =	275.78 ft ²	
Right Bridge Top Face =	172.71 ft ²	
4-3' Columns, total x-section area =	28.27 ft ²	
Right Bridge Bottom Face =	144.44 ft ²	
Avg. 4 column height =	15.72 ft	
Column Area to seal =	592.6126 ft ²	
Right Face of Pier Cap =	21.01664	
Total Right Pier Cap & Columns =	1482.335	



DESIGN: GMW DATE: 7/16/17 UPDATE: _____ DATE: _____
 CHECK: LAH DATE: 7/17/17 RECHECK: _____ DATE: _____
 STRUCTURE: MOT-75-1078 SFN: 5707080 PID: 91606

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

ITEM: 512E10100 PAY UNIT: SY
 SUBJECT: ESTIMATED QUANTITIES

DESCRIPTION: SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)

SUPPLEMENTAL DESCRIPTION: _____

		SUBTOTAL	TOTAL
Pier 1 Subtotal =	2947.91 ft ²		
Pier 2:			
Left Bridge - Elevation Pier Cap =	271.03 ft ²		
Left Bridge Top Face =	176.49 ft ²		
4-3' columns, total x-section area =	28.27 ft ²		
Left Bridge Bottom Face =	148.22 ft ²		
Avg. 4 column height =	13.62 ft		
Column area to seal total =	513.3525 ft ²		
Left Face of Pier Cap =	21.68 ft ²		
Total Left Pier Cap & Columns =	1401.80 ft ²		
Right Bridge - Elevation Pier Cap =	262.41 ft ²		
Right Bridge Top Face =	172.71 ft ²		
4-3' Columns, total x-section area =	28.27 ft ²		
Right Bridge Bottom Face =	144.44 ft ²		
Avg. 4 column height =	14.7475 ft		
Column Area to seal =	555.9513 ft ²		
Right Face of Pier Cap =	19.89 ft ²		
Total Right Pier Cap & Columns =	1417.803 ft ²		
Pier 2 Subtotal =	2819.60 ft ²		
Total Piers	640.834 sy	641	1,750
SPECIAL INSTRUCTIONS:		TOTAL	1,750



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

DESIGN: GMW DATE: 7/16/17 UPDATE: _____ DATE: _____
 CHECK: LAH DATE: 7/17/17 RECHECK: _____ DATE: _____
 STRUCTURE: MOT-75-1078 SFN: 5707080 PID: 91606

ITEM: 513E10260 PAY UNIT: LB
 SUBJECT: ESTIMATED QUANTITIES

DESCRIPTION: STRUCTURAL STEEL MEMBERS, LEVEL 3

SUPPLEMENTAL DESCRIPTION: _____

		SUBTOTAL	TOTAL
Total =	631.65 lb		
	Total =	38,913	904,967
Bolts, nuts, etc.	5% Contingency		
904,967	lb x 5.00% =	45,249	950,216
SPECIAL INSTRUCTIONS: CHECK UNIT OF MEASURE		TOTAL	950,216



E.L. ROBINSON
ENGINEERING

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

DESIGN: GMW DATE: 7/16/17 UPDATE: _____ DATE: _____
CHECK: LAH DATE: 7/17/17 RECHECK: _____ DATE: _____
STRUCTURE: MOT-75-1078 SFN: 5707080 PID: 91606

ITEM: 513E20000 PAY UNIT: EACH
SUBJECT: ESTIMATED QUANTITIES

DESCRIPTION: WELDED STUD SHEAR CONNECTORS

SUPPLEMENTAL DESCRIPTION: _____

	SUBTOTAL	TOTAL
# shear studs per beam = 590 # beams = 18		
Total # of shear studs = 590 studs/beam * 18 beams = 10,620 shear studs	10,620	10,620
SPECIAL INSTRUCTIONS:	TOTAL	10,620



DESIGN: GMW DATE: 7/16/17 UPDATE: _____ DATE: _____
 CHECK: LAH DATE: 7/17/17 RECHECK: _____ DATE: _____
 STRUCTURE: MOT-75-1078 SFN: 5707080 PID: 91606

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

ITEM: 514E00060 PAY UNIT: SF
 SUBJECT: ESTIMATED QUANTITIES

DESCRIPTION: FIELD PAINTING STRUCTURAL STEEL, INTERMEDIATE COAT

SUPPLEMENTAL DESCRIPTION: _____

							SUBTOTAL	TOTAL																		
<table border="1" style="margin: auto; border-collapse: collapse;"> <thead> <tr> <th colspan="2">Flange (in)</th> <th colspan="2">Web (in)</th> <th rowspan="2">Length (ft)</th> <th rowspan="2">Quantity (ea)</th> <th rowspan="2">Detail Factor (%)</th> </tr> <tr> <th>b_f</th> <th>t_f</th> <th>d</th> <th>t_w</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">15</td> <td style="text-align: center;">1.07</td> <td style="text-align: center;">28.26</td> <td style="text-align: center;">0.655</td> <td style="text-align: center;">202.9635</td> <td style="text-align: center;">18</td> <td style="text-align: center;">15</td> </tr> </tbody> </table>							Flange (in)		Web (in)		Length (ft)	Quantity (ea)	Detail Factor (%)	b _f	t _f	d	t _w	15	1.07	28.26	0.655	202.9635	18	15		
Flange (in)		Web (in)		Length (ft)	Quantity (ea)	Detail Factor (%)																				
b _f	t _f	d	t _w																							
15	1.07	28.26	0.655	202.9635	18	15																				
Perimeter for Painting = (15 - 0.655) + (2 * 28.26) + (15 - 0.655) + (2 * 1.07) + 15 =							102.35 in																			
							= 8.53 ft																			
Area for Painting = 8.53 ft * 202.96 ft * 18 beams * 1.15 detail factor =							35,834.0 SF	35,834																		
SPECIAL INSTRUCTIONS:							TOTAL	35,834																		



DESIGN: GMW DATE: 7/16/17 UPDATE: _____ DATE: _____
 CHECK: LAH DATE: 7/17/17 RECHECK: _____ DATE: _____
 STRUCTURE: MOT-75-1078 SFN: 5707080 PID: 91606

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

ITEM: 514E00066 PAY UNIT: SF
 SUBJECT: ESTIMATED QUANTITIES

DESCRIPTION: FIELD PAINTING STRUCTURAL STEEL, FINISH COAT

SUPPLEMENTAL DESCRIPTION: _____

							SUBTOTAL	TOTAL																		
<table border="1" style="margin: auto; border-collapse: collapse;"> <thead> <tr> <th colspan="2">Flange (in)</th> <th colspan="2">Web (in)</th> <th rowspan="2">Length (ft)</th> <th rowspan="2">Quantity (ea)</th> <th rowspan="2">Detail Factor (%)</th> </tr> <tr> <th>b_f</th> <th>t_f</th> <th>d</th> <th>t_w</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">15</td> <td style="text-align: center;">1.07</td> <td style="text-align: center;">28.26</td> <td style="text-align: center;">0.655</td> <td style="text-align: center;">202.9635</td> <td style="text-align: center;">18</td> <td style="text-align: center;">15</td> </tr> </tbody> </table>							Flange (in)		Web (in)		Length (ft)	Quantity (ea)	Detail Factor (%)	b _f	t _f	d	t _w	15	1.07	28.26	0.655	202.9635	18	15		
Flange (in)		Web (in)		Length (ft)	Quantity (ea)	Detail Factor (%)																				
b _f	t _f	d	t _w																							
15	1.07	28.26	0.655	202.9635	18	15																				
Perimeter for Painting = (15 - 0.655) + (2 * 28.26) + (15 - 0.655) + (2 * 1.07) + 15 =							102.35 in																			
							= 8.53 ft																			
Area for Painting = 8.53 ft * 202.96 ft * 18 beams * 1.15 detail factor =							35,834.0 SF																			
							35,834	35,834																		
SPECIAL INSTRUCTIONS:							TOTAL	35,834																		



DESIGN: GMW DATE: 7/16/17 UPDATE: _____ DATE: _____
 CHECK: LAH DATE: 7/17/17 RECHECK: _____ DATE: _____
 STRUCTURE: MOT-75-1078 SFN: 5707080 PID: 91606

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

ITEM: 516E13200 PAY UNIT: SF
 SUBJECT: ESTIMATED QUANTITIES

DESCRIPTION: 1/2" PREFORMED EXPANSION JOINT FILLER

SUPPLEMENTAL DESCRIPTION: _____

	SUBTOTAL	TOTAL
<u>Rear Abutment:</u> Height = 4.20 ft Width = 3.75 ft Area = 4.2 ft * 3.75 ft = 15.75 ft ²	16	16
<u>Forward Abutment:</u> Height = 4.10 ft Width = 3.75 ft Area = 4.1 ft * 3.75 ft = 15.38 ft ²	16	32
SPECIAL INSTRUCTIONS:	TOTAL	32



DESIGN: GMW DATE: 7/16/17 UPDATE: _____ DATE: _____
 CHECK: LAH DATE: 7/17/17 RECHECK: _____ DATE: _____
 STRUCTURE: MOT-75-1078 SFN: 5707080 PID: 91606

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

ITEM: 516E13900 PAY UNIT: SF
 SUBJECT: ESTIMATED QUANTITIES

DESCRIPTION: 2" PREFORMED EXPANSION JOINT FILLER

SUPPLEMENTAL DESCRIPTION: _____

	SUBTOTAL	TOTAL
<u>Southeast Abutment:</u> Height = 4.41 ft Width = 2.63 ft Area = 4.41 ft * 2.63 ft = 11.60 ft ²	12	12
<u>Southwest Abutment:</u> Height = 4.33 ft Width = 2.63 ft Area = 4.33 ft * 2.63 ft = 11.39 ft ²	12	24
<u>Northwest Abutment:</u> Height = 4.38 ft Width = 2.63 ft Area = 4.38 ft * 2.63 ft = 11.52 ft ²	12	36
<u>Northeast Abutment:</u> Height = 4.39 ft Width = 2.63 ft Area = 4.39 ft * 2.63 ft = 11.55 ft ²	12	48
SPECIAL INSTRUCTIONS:	TOTAL	48



DESIGN: GMW DATE: 7/16/17 UPDATE: _____ DATE: _____
 CHECK: LAH DATE: 7/17/17 RECHECK: _____ DATE: _____
 STRUCTURE: MOT-75-1078 SFN: 5707080 PID: 91606

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

ITEM: 516E14020 PAY UNIT: FT
 SUBJECT: ESTIMATED QUANTITIES

DESCRIPTION: SEMI-INTEGRAL ABUTMENT EXPANSION JOINT SEAL

SUPPLEMENTAL DESCRIPTION: _____

	SUBTOTAL	TOTAL
Rear Abutment:		
Horizontal Joint = 125 ft *measured in Microstation		
Southeast Wingwall Joint = 5.91 ft		
Southwest Wingwall Joint = 5.83 ft		
SUM = 136.74 ft	137	137
Forward Abutment:		
Horizontal Joint = 124 ft *measured in Microstation		
Northeast Wingwall Joint = 5.89 ft		
Northwest Wingwall Joint = 5.88 ft		
SUM = 135.77 ft	136	273
SPECIAL INSTRUCTIONS:	TOTAL	273



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

DESIGN: GMW DATE: 7/16/17 UPDATE: _____ DATE: _____
 CHECK: LAH DATE: 7/17/17 RECHECK: _____ DATE: _____
 STRUCTURE: MOT-75-1078 SFN: 5707080 PID: 91606

ITEM: 516E44101 PAY UNIT: EACH
 SUBJECT: ESTIMATED QUANTITIES

DESCRIPTION: ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE), AS PER PLAN

SUPPLEMENTAL DESCRIPTION: 11" x 15" x 2.948" WITH 12" x 16" x 1.5" LOAD PLATE

	SUBTOTAL	TOTAL
Bearings per abutment = 18		
# abutments = 2		
Total Abutment Bearings = 18 bearings/abutment * 2 abutments = 36 bearings	36	36
SPECIAL INSTRUCTIONS: 2"-3" TK, SPECIFY DIMENSIONS		TOTAL 36



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

DESIGN: GMW DATE: 7/16/17 UPDATE: _____ DATE: _____
 CHECK: LAH DATE: 7/17/17 RECHECK: _____ DATE: _____
 STRUCTURE: MOT-75-1078 SFN: 5707080 PID: 91606

ITEM: 516E44201 PAY UNIT: EACH
 SUBJECT: ESTIMATED QUANTITIES

DESCRIPTION: ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE), AS PER PLAN

SUPPLEMENTAL DESCRIPTION: 13" x 19" x 3.398" WITH 14" x 20" x 1.5" LOAD PLATE

	SUBTOTAL	TOTAL
Bearings per pier = 18		
# piers = 2		
Total Abutment Bearings = 18 bearings/pier * 2 piers =	36 bearings	36
SPECIAL INSTRUCTIONS: 3"-4" TK, SPECIFY DIMENSIONS		TOTAL 36



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

DESIGN: GMW DATE: 7/16/17 UPDATE: _____ DATE: _____
 CHECK: LAH DATE: 7/17/17 RECHECK: _____ DATE: _____
 STRUCTURE: MOT-75-1078 SFN: 5707080 PID: 91606

ITEM: 518E12301 PAY UNIT: EACH
 SUBJECT: ESTIMATED QUANTITIES

DESCRIPTION: SCUPPERS, INCLUDING SUPPORTS, AS PER PLAN

SUPPLEMENTAL DESCRIPTION: _____

			SUBTOTAL	TOTAL
Left Bridge =	5	scuppers		
Right Bridge =	6	scuppers		
Total =	11	scuppers	11	11
SPECIAL INSTRUCTIONS: GIRDER BRIDGES			TOTAL	11



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

DESIGN: GMW DATE: 7/16/17 UPDATE: _____ DATE: _____
 CHECK: LAH DATE: 7/17/17 RECHECK: _____ DATE: _____
 STRUCTURE: MOT-75-1078 SFN: 5707080 PID: 91606

ITEM: 518E21200 PAY UNIT: CY
 SUBJECT: ESTIMATED QUANTITIES

DESCRIPTION: POROUS BACKFILL WITH GEOTEXTILE FABRIC

SUPPLEMENTAL DESCRIPTION: _____

	SUBTOTAL	TOTAL
Rear Abutment:		
Breastwall:		
Plan View area behind footing =	177.68 ft ²	
Plan View area behind abut. stem =	243.55 ft ²	
Height of back face of footing =	3.00 ft	
Avg. Height of backfill above footing* =	7.75 ft	*measured from top of footing (at back face) to bottom of approach slab
Volume of porous backfill behind stem = (177.68 SF * 3 FT) + (243.55 SF * 7.75 FT) =	2420.5 ft ³	
	89.6 CY	
Southeast Wingwall:		
Plan View area behind footing =	15.25 ft ²	
Plan View area behind abut. stem =	20.33 ft ²	
Height of back face of footing =	3.00 ft	
Avg. Height of Backfill above Footing* =	7 ft	*measured from top of footing (at back face) to 6" below the top of wall
Vol. of porous backfill behind wingwall = (15.25 SF * 3 FT) + (20.33 SF * 7 FT) =	188.1 ft ³	
	7.0 CY	
Southwest Wingwall:		
Plan View area behind footing =	14.95 ft ²	
Plan View area behind abut. stem =	20.68 ft ²	
Height of back face of footing =	3.00 ft	
Avg. Height of Backfill above Footing* =	7.4 ft	*measured from top of footing (at back face) to 6" below the top of wall
Vol. of porous backfill behind wingwall = (14.95 SF * 3 FT) + (20.68 SF * 7.4 FT) =	197.8 ft ³	
	7.3 CY	
Rear Abutment Subtotal = 89.6 CY + 7 CY + 7.3 CY =	103.9 CY	104
		104

See next sheet for forward abutment calculation and total



DESIGN: GMW DATE: 7/16/17 UPDATE: _____ DATE: _____
 CHECK: LAH DATE: 7/17/17 RECHECK: _____ DATE: _____
 STRUCTURE: MOT-75-1078 SFN: 5707080 PID: 91606

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

ITEM: 518E21200 PAY UNIT: CY
 SUBJECT: ESTIMATED QUANTITIES

DESCRIPTION: POROUS BACKFILL WITH GEOTEXTILE FABRIC

SUPPLEMENTAL DESCRIPTION: _____

	SUBTOTAL	TOTAL
Forward Abutment:		
Breastwall:		
Plan View area behind footing =	176.25 ft ²	
Plan View area behind abut. stem =	240.83 ft ²	
Height of back face of footing =	3.00 ft	
Avg. Height of backfill above footing* =	7.7 ft	*measured from top of footing (at back face) to to bottom of approach slab
Volume of porous backfill behind stem = (176.25 SF * 3 FT) + (240.83 SF * 7.7 FT) =	2383.2 ft ³	
	88.3 CY	
Northwest Wingwall:		
Plan View area behind footing =	15.45 ft ²	
Plan View area behind abut. stem =	20.60 ft ²	
Height of back face of footing =	3.00 ft	
Avg. Height of Backfill above Footing* =	7.25 ft	*measured from top of footing (at back face) to to 6" below the top of wall
Vol. of porous backfill behind wingwall = (15.45 SF * 3 FT) + (20.6 SF * 7.25 FT) =	195.7 ft ³	
	7.2 CY	
Southeast Wingwall:		
Plan View area behind footing =	14.36 ft ²	
Plan View area behind abut. stem =	20.59 ft ²	
Height of back face of footing =	3.00 ft	
Avg. Height of Backfill above Footing* =	7 ft	*measured from top of footing (at back face) to to 6" below the top of wall
Vol. of porous backfill behind wingwall = (14.36 SF * 3 FT) + (20.59 SF * 7 FT) =	187.2 ft ³	
	6.9 CY	
Forward Abutment Subtotal = 88.3 CY + 7.2 CY + 6.9 CY =	102.4 CY	
	103	207
SPECIAL INSTRUCTIONS: CHECK UNIT OF MEASURE	TOTAL	207



DESIGN: GMW DATE: 7/16/17 UPDATE: _____ DATE: _____
 CHECK: LAH DATE: 7/17/17 RECHECK: _____ DATE: _____
 STRUCTURE: MOT-75-1078 SFN: 5707080 PID: 91606

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

ITEM: 518E40000 PAY UNIT: FT
 SUBJECT: ESTIMATED QUANTITIES

DESCRIPTION: 6" PERFORATED CORRUGATED PLASTIC PIPE

SUPPLEMENTAL DESCRIPTION: _____

	SUBTOTAL	TOTAL
Rear Abutment = 143 ft		
FWD Abutment = 142 ft		
SUM = 285 ft	285	285
SPECIAL INSTRUCTIONS:	TOTAL	285



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

DESIGN: GMW DATE: 7/16/17 UPDATE: _____ DATE: _____
 CHECK: LAH DATE: 7/17/17 RECHECK: _____ DATE: _____
 STRUCTURE: MOT-75-1078 SFN: 5707080 PID: 91606

ITEM: 518E40011 PAY UNIT: FT
 SUBJECT: ESTIMATED QUANTITIES

DESCRIPTION: 6" NON-PERFORATED CORRUGATED PLASTIC PIPE, INCLUDING SPECIALS, AS PER PLAN

SUPPLEMENTAL DESCRIPTION: _____

	SUBTOTAL	TOTAL
Southeast abutment = 18.3 ft		
Southwest abutment = 12.9 ft		
Northwest abutment = 18.5 ft		
Northeast abutment = 11.9 ft		
SUM = 61.5 ft	62	62
SPECIAL INSTRUCTIONS:	TOTAL	62



E.L. ROBINSON
ENGINEERING

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

DESIGN: GMW DATE: 7/16/17 UPDATE: _____ DATE: _____
CHECK: LAH DATE: 7/17/17 RECHECK: _____ DATE: _____
STRUCTURE: MOT-75-1078 SFN: 5707080 PID: 91606

ITEM: 523E20000 PAY UNIT: EACH
SUBJECT: ESTIMATED QUANTITIES

DESCRIPTION: DYNAMIC LOAD TESTING

SUPPLEMENTAL DESCRIPTION: _____

	SUBTOTAL	TOTAL
Per Peter's Recommendation	1	1
SPECIAL INSTRUCTIONS:	TOTAL	1



DESIGN: GMW DATE: 7/16/17 UPDATE: _____ DATE: _____
 CHECK: LAH DATE: 7/17/17 RECHECK: _____ DATE: _____
 STRUCTURE: MOT-75-1078 SFN: 5707080 PID: 91606

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

ITEM: 526E25001 PAY UNIT: SY
 SUBJECT: ESTIMATED QUANTITIES

DESCRIPTION: REINFORCED CONCRETE APPROACH SLABS (T=15"), AS PER PLAN

SUPPLEMENTAL DESCRIPTION: _____

		SUBTOTAL	TOTAL
Southeast =	1,439 ft ²		
Southwest =	1,441 ft ²		
Northwest =	1,440 ft ²		
Northeast =	1,439 ft ²		
<u>SUM =</u>	<u>5,758 ft²</u>		
	=		
	639.8 SY	640	640
SPECIAL INSTRUCTIONS:		TOTAL	640



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

DESIGN: GMW DATE: 7/16/17 UPDATE: _____ DATE: _____
 CHECK: LAH DATE: 7/17/17 RECHECK: _____ DATE: _____
 STRUCTURE: MOT-75-1078 SFN: 5707080 PID: 91606

ITEM: 526E90020 PAY UNIT: SY
 SUBJECT: ESTIMATED QUANTITIES

DESCRIPTION: TYPE B INSTALLATION

SUPPLEMENTAL DESCRIPTION: _____

		SUBTOTAL	TOTAL
Southeast =	1,439 ft ²		
Southwest =	1,441 ft ²		
Northwest =	1,440 ft ²		
Northeast =	1,439 ft ²		
<u>SUM =</u>	<u>5,758 ft²</u>		
	=		
	639.8 SY	640	640
SPECIAL INSTRUCTIONS:		TOTAL	640



DESIGN: GMW DATE: 7/16/17 UPDATE: _____ DATE: _____
 CHECK: LAH DATE: 7/17/17 RECHECK: _____ DATE: _____
 STRUCTURE: MOT-75-1078 SFN: 5707080 PID: 91606

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

ITEM: 601E21000 PAY UNIT: SY
 SUBJECT: ESTIMATED QUANTITIES

DESCRIPTION: CONCRETE SLOPE PROTECTION

SUPPLEMENTAL DESCRIPTION: _____

	SUBTOTAL	TOTAL
<u>Forward Abutment:</u>		
Plan View Area = 3668 ft ²		
Angle of 2:1 Slope = 0.46 radians		
Area assuming 2:1 Slope = 4101 ft ² = 456 SY	456	456
<u>Rear Abutment:</u>		
Plan View Area = 5033 ft ²		
Angle of 2:1 Slope = 0.46 radians		
Area assuming 2:1 Slope = 5627 ft ² = 625 SY	625	1,081
SPECIAL INSTRUCTIONS:	TOTAL	1,081



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

DESIGN: GMW DATE: 7/16/17 UPDATE: _____ DATE: _____
 CHECK: LAH DATE: 7/17/17 RECHECK: _____ DATE: _____
 STRUCTURE: MOT-75-1078 SFN: 5707080 PID: 91606

ITEM: 607E39900 PAY UNIT: FT
 SUBJECT: ESTIMATED QUANTITIES

DESCRIPTION: VANDAL PROTECTION FENCE, 6' STRAIGHT, COATED FABRIC

SUPPLEMENTAL DESCRIPTION: _____

	SUBTOTAL	TOTAL
Length Along Left Barrier = 203 ft		
Length Along Right Barrier = 203 ft		
Total: 406 ft	406	406
SPECIAL INSTRUCTIONS:	TOTAL	406

MADE BY: GMW		DATE: 7/16/2017		ESTIMATED QUANTITIES					STRUCTURAL FILE NUMBER: 5707080	
CHECKED BY: LAH		DATE: 7/17/2017								
ITEM	EXTENSION	TOTAL	UNIT	DESCRIPTION	ABUT.	PIER	SUPER.	GEN.	REFERENCE SHEET NO.	
202	11203	LUMP		PORTIONS OF STRUCTURE REMOVED, OVER 20 FOOT SPAN, AS PER PLAN				LUMP	4, 15 TO 21, AND 31 TO 34 OF 57	
202	22900	642	SY	APPROACH SLAB REMOVED				642		
503	11100	LUMP		COFFERDAMS AND EXCAVATION BRACING	LUMP					
503	21300	LUMP		UNCLASSIFIED EXCAVATION	LUMP					
505	11100	LUMP		PILE DRIVING EQUIPMENT MOBILIZATION	LUMP					
507	00500	320	FT	12" CAST-IN-PLACE REINFORCED CONCRETE PILES, DRIVEN	320					
507	00550	360	FT	12" CAST-IN-PLACE REINFORCED CONCRETE PILES, FURNISHED	360					
509	10000	209,938	LB	EPOXY COATED REINFORCING STEEL	10,154	4,970	189,448	5,366		
510	10000	716	EACH	DOWEL HOLES WITH NONSHRINK, NONMETALLIC GROUT	390	326				
511	33501	4	EACH	SEMI-INTEGRAL DIAPHRAGM GUIDE, AS PER PLAN	4				\$\$1078CSDOF \$1078\$	
511	34446	819	CY	CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK			819			
511	34450	208	CY	CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK (PARAPET)			157	51		
511	41010	27	CY	CLASS QC1 CONCRETE, PIER ABOVE FOOTINGS		27				
511	43510	126	CY	CLASS QC1 CONCRETE, ABUTMENT INCLUDING FOOTING	126					
512	10100	1,750	SY	SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)	138	641	971			
512	33000	14	SY	TYPE 2 WATERPROOFING	14					
513	10260	950,216	LB	STRUCTURAL STEEL MEMBERS, LEVEL 3			950,216			
513	20000	10,620	EACH	WELDED STUD SHEAR CONNECTORS			10,620			
514	00060	35,834	SF	FIELD PAINTING STRUCTURAL STEEL, INTERMEDIATE COAT				35,834		
514	00066	35,834	SF	FIELD PAINTING STRUCTURAL STEEL, FINISH COAT				35,834		
516	13200	32	SF	1/2" PREFORMED EXPANSION JOINT FILLER	32					
516	13900	48	SF	2" PREFORMED EXPANSION JOINT FILLER	48					
516	14020	273	FT	SEMI-INTEGRAL ABUTMENT EXPANSION JOINT SEAL	273					
516	44101	36	EACH	ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE), AS PER PLAN (11" x 15" x 2.948" WITH 12" x 16" x 1.5" LOAD PLATE)			36		\$\$1078CBROF \$1078\$	
516	44201	36	EACH	ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE), AS PER PLAN (13" x 19" x 3.398" WITH 14" x 20" x 1.5" LOAD PLATE)			36		\$\$1078CBROF \$1078\$	
518	12301	11	EACH	SCUPPERS, INCLUDING SUPPORTS, AS PER PLAN			11		45 OF 57	
518	21200	207	CY	POROUS BACKFILL WITH GEOTEXTILE FABRIC	207					
518	40000	285	FT	6" PERFORATED CORRUGATED PLASTIC PIPE	285					
518	40011	62	FT	6" NON-PERFORATED CORRUGATED PLASTIC PIPE, INCLUDING SPECIALS, AS PER PLAN	62				25 AND 29 OF 57	
523	20000	1	EACH	DYNAMIC LOAD TESTING	1					
526	25001	640	SY	REINFORCED CONCRETE APPROACH SLABS (T=15"), AS PER PLAN				640	\$\$1078CASOF \$1078\$	
526	90020	640	SY	TYPE B INSTALLATION				640		
601	21000	1,081	SY	CONCRETE SLOPE PROTECTION				1,081		
607	39900	406	FT	VANDAL PROTECTION FENCE, 6' STRAIGHT, COATED FABRIC			406			