ms consultants, inc.
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Job no:	08326		
Design:	DBL	Date:	08/22/19
Check:	ELP	Date:	09/17/19
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	STRUCTURE REMOVED		

ITEM	EXTENSION
202	11003

STRUCTURE REMOVED, OVER 20 FOOT SPAN, AS PER PLAN

Type	Length	Avg. Width	Total Area	Cost	Total Cost
	FT	FT	SF	$/SF	$
	1551	102	158202	$40.00	$6,328,080

Total Cost * (1.15) Inflation Factor = $7,277,292

TOTAL	$7,300,000	LS

ms consultants, inc.
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Job no:	08326		
Design:	DBL	Date:	08/22/19
Check:	ELP	Date:	09/17/19
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	APPROACH SLAB REMOVED		

ITEM EXTENSION
202 22900
APPROACH SLAB REMOVED

*Refer to Existing 1987 Rehab Plans for SUM-8

Type	Length	Width	Surface Area	Surface Area
	FT	FT	SF	SY
SUM-8-0199L/R				
REAR (SOUTH)	25.00	83.00	2075.00	230.56
FORWARD (NORTH)	25.00	102.25	2556.25	284.03
FORWARD EXTRA AREA	25.00	4.54	113.54	6.31

SB TOTAL = 257
NB TOTAL = 264

TOTAL 521 SY

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Job no:	08326		
Design:	ATM	Date:	03/23/23
Check:	DEA	Date:	03/24/23
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	EMBANKMENT		

ITEM 203 EXTENSION 20001

EMBANKMENT, AS PER PLAN

SUM-8-0199L (SB)

Location			Length	End Area	Fill Volume	
			FT	SF	CF	CY
Rear Abutment	STA.	223+92.34	-	1980	-	-
	STA.	224+00.00	7.66	2175	15914	589
	STA.	224+50.00	50.00	3027	130050	4817
	STA.	224+62.64	12.64	3061	38476	1425
	STA.	224+92.34	29.70	2697	85506	3167
Forward Abutment	STA.	241+11.84	-	1087	-	-
	STA.	241+41.84	30.00	920	30105	1115
	STA.	242+00.00	58.16	540	42457	1572
	STA.	242+11.84	11.84	549	6447	239

SB TOTAL	12924	CY

SUM-8-0199R (NB)

Location			Length	End Area	Fill Volume	
			FT	SF	CF	CY
Rear Abutment	STA.	523+79.89	-	62	-	-
	STA.	524+00.00	20.11	152	2152	80
	STA.	524+20.64	20.64	276	4417	164
	STA.	524+50.00	29.36	267	7971	295
	STA.	524+89.81	39.81	299	11266	417
	STA.	525+11.89	22.08	558	9461	350
Forward Abutment	STA.	540+99.89	-	11	-	-
	STA.	541+29.89	30.00	164	2625	97
	STA.	541+50.00	20.11	162	3278	121
	STA.	541+99.89	49.89	52	5338	198

NB TOTAL	1722	CY

TOTAL	14646	CY

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Job no:	08326		
Design:	ATM	Date:	09/01/21
Check:	DEA	Date:	10/29/21
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	COFFERDAMS, APP		

ITEM	EXTENSION
503	11101

****see PDF sheets 58-61 for Pier Calculations**

COFFERDAMS AND EXCAVATION BRACING, AS PER PLAN

Type		**Total $**
PIERS 1 to 5 **	GF TOTAL	**$387,500**

Subtotal =	$387,500
Subtotal * (1.15) Inflation Factor =	$445,625
TOTAL =	**$450,000 LS**

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engineers, architects, planners

Job no:	08326		
Design:	ATM	Date:	09/02/21
Check:	DEA	Date:	10/29/21
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	UNCLASSIFIED EXCAVATION		

ITEM	EXTENSION
503	21101

****see PDF sheets 58-61 for Pier Calculations**

UNCLASSIFIED EXCAVATION, AS PER PLAN

Type					Volume
					CY
SUM-8-0199L					
Piers 1 to 5**				GF TOTAL =	2491.00
SUM-8-0199R					
Piers 1 to 5**				GF TOTAL =	1821.00

	Length	Width	T/Ex. Gr.	B/Ftg.	Volume
	FT	FT	EL	EL	CY
SUM-8-0199L					
RA	18.17	204.66	1015.63	1001.00	2014.56

	Length	Width	T/Ex. Gr.	B/Ftg.	Volume
	FT	FT	EL	EL	CY
SUM-8-0199R					
RA	18.17	204.66	1027.92	1004.00	3293.80
FA	17.42	211.54	1029.76	1011.00	2559.94

SB TOTAL =	**4506**	**CY**
NB TOTAL =	**7675**	**CY**

TOTAL = 12,181 CY

ms consultants, inc.
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Job no:	08326		
Design:	ATM	Date:	08/31/21
Check:	DEA	Date:	10/29/21
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	ROCK EXCAVATION		

ITEM	EXTENSION
503	31100

ROCK EXCAVATION

****see PDF sheets 58-61 for Pier Calculations**

Boring #	T/Rock EL
B-005-1-16	1014.60
B-006-0-15	1002.00
B-005-2-16	996.80

B/Footing	1001.00	**FT**
Length	283.59	**FT**

Slope	0.063

**line drawn connecting ends of Ftg. @ T/Rock Elevs.*

SUM-8-0199L/R

Type	TRIANGULAR AREA Length FT	Height FT	Area SF	Width FT	Volume CF	Volume CY
NB REAR ABUTMENT	216.68	14.60	1473.39	12.17	17926.29	663.94

PIER 1 (GF QUANTITY) **

	Length FT	Height FT	Width FT	Volume CF	Volume CF
NB	41.50	3.00	23.50	2925.75	165.00
GF TOTAL =	1900		70.37		

SB TOTAL =	**0**	**CY**
NB TOTAL =	**829**	**CY**

TOTAL =	**829**	**CY**

ms consultants, inc.
engineers, architects, planners

Job no:	08326		
Design:	DEA	Date:	04/26/21
Check:	ATM	Date:	09/01/21
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	LAUNCHING PIT EXCAVATION		

ITEM	EXTENSION
503	31500

STRUCTURAL EXCAVATION, MISC.: LAUNCHING PIT

*Does not include quantity at abutment for Unclassified Excavation

Earthwork

	Length*	Width	Depth	Volume	Unit Cost	Total Cost
	FT	FT	FT	CY	$/CY	$
Excavation Stage 1	367.50	100.00	10.00	6806	$20	$136,111
Excavation Stage 2	367.50	119.25	12.00	19478	$20	$389,550

Sheet Pile and Soldier Pile Walls

	Length	Avg. Height	Area	Unit Cost	Total Cost
	FT	FT	SF	$/SF	$
Sheet Pile	284.17	31.57	8971	$50	$448,557.08
Solider Pile Lagging Wall	41.67	20.00	833	$70	$58,334

Subtotal = $1,032,552

Subtotal * (1.15) Inflation Factor = $1,187,435

TOTAL = $1,190,000 LS

ms consultants, inc.
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Job no:	08326		
Design:	ATM	Date:	09/02/21
Check:	DEA	Date:	10/29/21
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	RECEIVING PIT EXCAVATION		

ITEM	EXTENSION
503	31500

STRUCTURAL EXCAVATION, MISC.: RECEIVING PIT

*Does not include quantity at abutment for Unclassified Excavation

Earthwork

	Length*	Width	Depth	Volume	Unit Cost	Total Cost
	FT	FT	FT	CY	$/CY	$
Excavation Stage 1	137.50	27.50	14.00	980	$20	$19,606
Excavation Stage 2	137.50	118.75	15.00	9071	$20	$181,424

Soldier Pile Walls

	Length	Avg Height	Area	Unit Cost	Total Cost
	FT	FT	SF	$/SF	$
Stage 1 Soldier Pile			**5734**	**$70**	**$401,384**
Section 1	50.00	11.00	550		
Section 2	130.00	22.00	2860		
Section 3	40.00	33.00	1320		
Section 4	13.44	39.00	524		
Section 5	24.00	20.00	480		
Stage 2 Soldier Pile	160.00	20.00	3200	$70	$224,000

Subtotal =	$826,414
Subtotal * (1.15) Inflation Factor =	$950,377
TOTAL =	**$960,000 LS**

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Job no:	08326		
Design:	ATM	Date:	04/26/21
Check:	DEA	Date:	10/29/21
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	PILE DRIVING EQ. MOBILIZATION		

ITEM	EXTENSION
505	11100

PILE DRIVING EQUIPMENT MOBILIZATION

Type	Location	Pile Type	Cost per Type
SUM-8-0199L/R			
	Forward Abutment	14" CIP	$15,000.00
	Pier 5	16" CIP	$15,000.00
		SB TOTAL =	$15,000.00
		NB TOTAL =	$15,000.00
		Subtotal =	$30,000
		Subtotal * (1.15) Inflation Factor =	$34,500
		TOTAL =	**$34,500 LS**

ms consultants, inc.
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Job no:	08326		
Design:	DBL	Date:	08/22/19
Check:	ELP	Date:	09/17/19
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	CIP PILES		

ITEM EXTENSION
507 00600
14" CAST-IN-PLACE REINFORCED CONCRETE PILES, DRIVEN

Type	Piles	Length	Total Length
FA	#	FT	FT
SUM-8-0199L/R			
NB	53	35.00	1855
SB	40	55.00	2200

SB TOTAL =	**2200**	**CY**
NB TOTAL =	**1855**	**CY**

TOTAL = 4,055 FT

ITEM EXTENSION
507 00650
14" CAST-IN-PLACE REINFORCED CONCRETE PILES, FURNISHED

Type	Piles	Length	Total Length
FA	#	FT	FT
SUM-8-0199L/R			
NB	53	40.00	2120
SB	40	60.00	2400

SB TOTAL =	**2400**	**CY**
NB TOTAL =	**2120**	**CY**

TOTAL = 4,520 FT

ms consultants, inc.
engineers, architects, planners

Job no:	08326		
Design:	DBL	Date:	08/22/19
Check:	ELP	Date:	09/17/19
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	16" CIP PILES		

ITEM 507 EXTENSION 00700

****see PDF sheets 58-61 for Pier Calculations**

16" CAST-IN-PLACE REINFORCED CONCRETE PILES, DRIVEN

Type	Piles #	Length FT	Total Length FT
SUM-8-0199L			
RA			
Pier 1			0
Pier 2			0
Pier 3			0
Pier 4			0
Pier 5	46	85	3910
FA			0
SUM-8-0199R			
RA			
Pier 1			0
Pier 2			0
Pier 3			0
Pier 4			0
Pier 5	46	75	3450
FA			0

SB TOTAL =	**3910**	**CY**
NB TOTAL =	**3450**	**CY**

TOTAL = 7,360 FT

ms consultants, inc.
engineers, architects, planners

Job no:	08326		
Design:	DBL	Date:	08/22/19
Check:	ELP	Date:	09/17/19
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	16" CIP PILES		

ITEM 507 EXTENSION 00750

****see PDF sheets 59-62 for Pier Calculations**

16" CAST-IN-PLACE REINFORCED CONCRETE PILES, FURNISHED

Type	Piles #	Length FT	Total Length FT
SUM-8-0199L			
RA	-	-	0
Pier 1	-	-	0
Pier 2	-	-	0
Pier 3	-	-	0
Pier 4	-	-	0
Pier 5	46	90	4140
FA	-	-	0
SUM-8-0199R			
RA	-	-	0
Pier 1	-	-	0
Pier 2	-	-	0
Pier 3	-	-	0
Pier 4	-	-	0
Pier 5	46	80	3680
FA	-	-	0

SB TOTAL = 4140 CY
NB TOTAL = 3680 CY

TOTAL = 7,820 FT

ms consultants, inc.
engineers, architects, planners

Job no:	08326		
Design:	DBL	Date:	08/22/19
Check:	ELP	Date:	09/17/19
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	REINFORCING STEEL		

ITEM	EXTENSION
509	10000

****see PDF sheets 58-61 for Pier Calculations**

EPOXY COATED STEEL REINFORCEMENT

	Location	Weight LB	
SUM-8-0199L			
	Deck	1,521,628	
	Parapet	38,460	
	Piers**	1,245,219	(GF total)
	Rear Abutment	124,549	
	Rear Abutment Monument	11,017	
	Forward Abutment	46,968	
	Rear Abutment Trough	8,305	
	Forward Abutment Trough	10,312	
	SB TOTAL =	**3,006,458**	**CY**

	Location	Weight LB	
SUM-8-0199R			
	Deck	1,507,217	
	Parapet	36,452	
	Piers**	1,236,580	(GF total)
	Rear Abutment	158,109	
	Forward Abutment	56,025	
	Rear Abutment Trough	12,602	
	Forward Abutment Trough	9,142	
	NB TOTAL =	**3,016,127**	**CY**

TOTAL = 6,022,585 LB

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Job no:	08326		
Design:	DBL	Date:	08/22/19
Check:	ATM	Date:	10/29/21
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	GFRP BARS		

ITEM EXTENSION
509 30020
NO. 4 DEFORMED GFRP REINFORCEMENT

Location	Length (FT)		Total
	SUM-8-0199L	UM-8-0199	FT
Parapets	53,782	53,366	107,148

SB TOTAL = 53782 FT
NB TOTAL = 53366 FT

TOTAL = 107,148 FT

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Job no:	08326		
Design:	DBL	Date:	08/22/19
Check:	ELP	Date:	09/17/19
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	DOWEL HOLES		

ITEM	EXTENSION
510	10000

****see PDF sheets 58-61 for Pier Calculations**

DOWEL HOLES WITH NONSHRINK, NONMETALLIC GROUT

Location	Total Each	
SUM-8-0199L		
Pier 5**	220	
SB TOTAL =	**220**	**EACH**

Location	Total Each	
SUM-8-0199R		
Pier 5**	220	
NB TOTAL =	**220**	**EACH**

TOTAL = 440 EACH

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Job no:	08326		
Design:	ATM	Date:	08/31/21
Check:	DEA	Date:	10/29/21
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	BRIDGE DECK		

ITEM	EXTENSION
511	34447

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

Type	Area	Thickness	Volume
	SF	IN	CY
SUM-8-0199L			
Deck	128,237	10.5	4156
Haunch			269

	Volume	Volume	Number	Total
	CF	CY	#	CY
Light Pilaster	16.16	0.60	11	7
			SB TOTAL =	**4,432** **CY**

SUM-8-0199R				
Deck	125,927	10.5	4081	
Haunch			278	

	Volume	Volume	Number	Total
	CF	CY	#	CY
Light Pilaster	16.16	0.60	11	7
TRUSS PILASTER	16.16	0.6	4	2
			NB TOTAL =	**4,368** **CY**

TOTAL = 8,800 CY

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Job no:	08326		
Design:	ATM	Date:	08/15/19
Check:	ELP	Date:	09/17/19
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	DECK PARAPET		

ITEM	EXTENSION
511	34450

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

	Area	Length		Volume
Type	SF	FT		CY
SUM-8-0199L				
Left RA	4.08	32.25		4.88
Left Bridge Deck	4.08	1611.46		243.71
Left FA	4.08	32.25		4.88
Right RA	4.08	32.35		4.89
Right Bridge Deck	4.08	1611.55		243.72
Right FA	4.08	32.25		4.88
Light Pilaster				6.58
			Gen. Sub=	20.00
			Super. Sub =	495.00
			SB TOTAL =	**515**
SUM-8-0199R				
Left RA	4.08	32.25		4.88
Left Bridge Deck	4.08	1579.95		238.94
Left FA	4.08	32.25		4.88
Right RA	4.08	32.25		4.88
Right Bridge Deck	4.08	1579.95		238.94
Right FA	4.08	32.25		4.88
Truss Pilaster				1.20
Light Pilaster				6.58
			Gen. Sub=	20.00
			Super. Sub =	486.00
			NB TOTAL =	**506**

TOTAL = 1021 CY

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Job no:	08326		
Design:	ATM	Date:	09/10/19
Check:	ELP	Date:	09/17/19
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	PIER ABOVE FOOTINGS		

ITEM 511 EXTENSION 42012

****see PDF sheets 58-61 for Pier Calculations**

CLASS QC1 CONCRETE WITH QC/QA, PIER ABOVE FOOTINGS

Type		Column Volume CY	
SUM-8-0199L			
Piers 1-5	GF TOTAL =	1570.00	
	SB TOTAL =	**1570**	**CY**
SUM-8-0199R			
Piers 1-5	GF TOTAL =	1649.00	
	NB TOTAL =	**1649**	**CY**
	TOTAL =	**3219**	**CY**

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Job no: 08326
Design: ATM Date: 09/10/19
Check: ELP Date: 09/17/19
Office: Columbus
Project: SUM-8-0199L/R
Element: ABUTMENT NOT INCLUDING FOOTING

ITEM EXTENSION
511 44112

CLASS QC1 CONCRETE WITH QC/QA, ABUTMENT NOT INCLUDING FOOTING

Type	Avg. Beam Seat	Avg. T/ Backwall	B/Ftg.	Ftg. Thickness	Length	Backwall Thickness	Stem Thickness	Volume
	EL	EL	EL	FT	FT	FT	FT	CY
SUM-8-0199L								
RA Backwall	1027.8	1037.64	1001.00	3.75	84.50	2.25	7.33	70.0
FA Backwall	1018.42	1027.97	1011.00	3.00	80.42	2.25	7.16	64.0
FA Stem	1018.42	-	1011.00	3.00	80.42	-	7.16	94.3

	Length	Beginning Height	Ending Height	Backwall Width	Volume of Trough Backwall	Avg. Area	Length	Volume of Trough	Total Volume
	FT	FT	FT	FT	CY	SF	FT	CY	CY
RA Trough	87.48	0.41	2.10	2.75	11.19	3.31	87.48	10.73	21.93
FA Trough	80.43	3.74	2.19	2.75	24.29	2.76	80.43	8.22	32.51

	Width (FT)	Length (FT)	Height (FT)	Number	Volume (CY)
RA Support Pedestal	5.75	1.50	31.50	13.00	130.81
FA Support Pedestal	5.25	1.50	13.93	13.00	52.82
				SB TOTAL =	**466.32**

	Avg. Beam Seat	Avg. T/ Backwall	B/Ftg.	Ftg. Thickness	Length	Backwall Thickness	Stem Thickness	Volume
	EL	EL	EL	FT	FT	FT	FT	CY
SUM-8-0199R								
RA Backwall	1027.49	1037.66	1001.00	3.75	85.17	2.25	7.33	73.0
FA Backwall	1018.38	1028.55	1011.00	3.00	80.42	2.25	7.16	69.0
FA Stem	1018.38	-	1011.00	3.00	80.42	-	7.16	93.4

	Length	Beginning Height	Ending Height	Backwall Width	Volume of Trough Backwall	Avg. Area	Length	Volume of Trough	Total Volume
	FT	FT	FT	FT	CY	SF	FT	CY	CY
RA Trough	82.52	2.08	0.49	2.75	10.81	3.31	82.52	10.12	20.93
FA Trough	80.43	3.76	2.21	2.75	24.45	2.76	80.43	8.22	32.68

	Width (FT)	Length (FT)	Height (FT)	Number	Volume (CY)
RA Support Pedestal	5.75	1.50	31.50	13.00	130.81
FA Support Pedestal	5.25	1.50	13.93	13.00	52.82
				NB TOTAL =	**472.64**

Rear Abutment

	Length	Height	Thickness		Volume	Volume
	FT	FT	FT		CF	CY
West CHEWALL	4.00	12.50	10.21		510.50	18.91
East CHEWALL	4.00	30.00	10.00		1200.00	44.44
West CURWALL	1.00	34.50	7.33		252.99	9.37
East CURWALL	1.00	34.60	7.33		253.62	9.39
					SUB =	**82.12**

SB ABUT TOTAL =	**495**	**CY**
NB ABUT TOTAL =	**526**	**CY**
TOTAL =	**1021**	**CY**

ms consultants, inc.
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Job no:	08326		
Design:	ATM	Date:	09/10/19
Check:	ELP	Date:	09/17/19
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	MASS CONCRETE		

ITEM 511 EXTENSION 45602

****see PDF sheets 58-61 for Pier Calculations**

CLASS QC4 MASS CONCRETE, SUBSTRUCTURE WITH QC/QA

Type	Avg. Beam Seat	B/Ftg.	Ftg. Thickness	Length	Stem Thickness	Volume
	EL	EL	FT	FT	FT	CY
SUM-8-0199L						
RA Stem	1027.80	1001.00	3.75	84.50	7.33	529
SUM-8-0199R						
RA Stem	1027.49	1001.00	3.75	85.17	7.33	526

SUM-8-0199L	**PIER FOOTINGS**	**GF TOTALS**
PIER 1		216.8
PIER 2		252.8
PIER 3		252.8
PIER 4		346.7
PIER 5		475.9
	GF TOTAL =	1545.00

SUM-8-0199R	**PIER FOOTINGS**	**GF TOTALS**
PIER 1		216.8
PIER 2		252.8
PIER 3		252.8
PIER 4		346.7
PIER 5		475.9
	GF TOTAL =	1545.00

SB ABUT TOTAL =	**529**	**CY**
SB PIER TOTAL =	**1545**	**CY**
NB ABUT TOTAL =	**526**	**CY**
NB PIER TOTAL =	**1545**	**CY**

TOTAL = 4145 CY

ms consultants, inc.
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Job no:	08326		
Design:	ATM	Date:	09/10/19
Check:	ELP	Date:	09/17/19
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	MASS CONCRETE, APP		

ITEM EXTENSION ****see PDF sheets 58-61 for Pier Calculations**
511 45603
CLASS QC4 MASS CONCRETE, SUBSTRUCTURE WITH QC/QA, AS PER PLAN

Type	Volume CY
SUM-8-0199L	
GF TOTAL =	4999.00
SUM-8-0199R	
GF TOTAL =	4854.00

SB PIER TOTAL = 4999 CY
NB PIER TOTAL = 4854 CY

TOTAL = 9853 CY

ms consultants, inc.
engineers, architects, planners

Job no:	08326		
Design:	ATM	Date:	08/22/19
Check:	ELP	Date:	09/17/19
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	WINGWALLS		

ITEM 511 EXTENSION 46012

CLASS QC1 CONCRETE WITH QC/QA, RETAINING/WINGWALL NOT INCLUDING FOOTING

Type	Length	Average Height		Avg. Area	Thickness	Volume	Volume
	FT	FT	FT	SF	FT	CF	CY
RA		Left	Right				
		Looking @ abut.					
East WW (NB)							
Section B-B (top)	14.67	12.62	18.23	226.23	2.25	509.03	18.9
Section B-B (bot)	14.67	16.50	16.50	242.00	3.75	907.50	33.6
Section D-D	14.33	21.95	29.12	365.99	2.25	823.48	30.5
Section E-E	8.00	17.70	21.95	158.60	2.25	356.85	13.2
Center WW (NB)							
Section B-B (top)	46.25	17.98	18.04	832.96	2.25	1874.17	69.4
Section B-B (bot)	46.25	16.50	16.50	763.13	3.75	2861.72	106.0
Section C-C monument pedestals	10.58	29.76	29.76	314.96	2.25	708.66	52.5
West WW (SB)							
Section B-B (top)	14.83	12.89	19.82	242.54	2.25	545.73	20.2
Section B-B (bot)	14.83	16.50	16.50	244.70	3.75	917.61	34.0
Section D-D	14.49	22.25	29.39	374.13	2.25	841.80	31.2
Section E-E	12.68	18.36	22.25	257.47	2.25	579.30	21.5

	Length	Height		Avg. Area	Thickness	Volume	Volume
	FT	FT	FT	SF	FT	CF	CY
FA		Left	Right				
		Looking @ abut.					
West WW (SB)	25.75	7.50	15.44	295.35	2.25	664.54	24.61
Center WW (NB)	39.42	16.08	16.11	634.41	2.25	1427.43	52.87
East WW (NB)	28.00	17.18	7.75	349.02	2.25	785.30	29.09

SB ABUT TOTAL = 131

(NB includes center portion of wingwalls) **NB ABUT TOTAL = 406**

TOTAL = 537 CY

ms consultants, inc.
engineers, architects, planners

Job no:	08326		
Design:	ATM	Date:	08/22/19
Check:	ELP	Date:	09/17/19
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	FOOTING		

ITEM EXTENSION
511 46512
CLASS QC1 CONCRETE WITH QC/QA, FOOTING

Type	DEPTH	WIDTH	Footing Thickness	Volume
	FT	FT	FT	CY
SUM-8-0199L (SB)				
FA	12.67	87.98	3.00	123.82
	2.75	87.98	3.25	29.12
WEST WW	12.42	22.38	3.25	33.44
	3.00	22.38	3.00	7.46
RA	12.17	89.14	3.75	150.62
	4.00	89.14	4.00	52.82
WEST WW	12.17	35.52	3.75	60.03
	4.00	35.52	4.00	21.05
SUM-8-0199R (NB)				
FA	12.67	123.56	3.00	173.90
	2.75	123.56	3.25	40.90
EAST WW	12.42	24.85	3.25	37.14
	3.00	24.85	3.00	8.28
RA	12.17	115.52	3.75	195.21
	4.00	115.52	4.00	68.46
EAST WW	16.17	44.55	3.75	100.03

SB TOTAL = 479 CY
NB TOTAL = 624 CY

TOTAL = 1103 CY

ms consultants, inc.
engineers, architects, planners

Job no:	08326		
Design:	ATM	Date:	09/01/21
Check:	DEA	Date:	10/29/21
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	FILL CONCRETE		

ITEM EXTENSION
511 53010
CLASS QC1 CONCRETE, MISC.: FILL CONCRETE

BELOW REAR ABUTMENT FOOTING

	Length	Width	Avg. Depth	Volume
	FT	FT	FT	CY
SUM-8-0199L				
	169.25	18.17	1.00	113.88
SUM-8-0199R				
	0.00	0.00	0.00	0.00

SB TOTAL = 114 CY
NB TOTAL = 0 CY

TOTAL = 114 CY

ms consultants, inc.
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Job no:	08326		
Design:	ATM	Date:	08/31/21
Check:	DEA	Date:	10/29/21
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	MONUMENT		

ITEM EXTENSION
511 53010
CLASS QC1 CONCRETE, MISC.: MONUMENT

Location: Southbound Rear Abutment				
STEP #	HEIGHT FT	AREA SF	VOLUME CF	VOLUME CY
1	39.00	22.76	887.72	32.88
2	20.00	24.79	495.76	18.36
3	15.50	7.03	108.93	4.03
4	16.50	5.86	96.71	3.58
5	30.00	9.21	276.24	10.23
6	22.00	17.75	390.46	14.46
7	8.00	6.44	51.55	1.91
8	18.00	2.74	49.30	1.83
9	4.83	13.41	64.81	2.40
10	15.00	10.50	157.50	5.83
11	17.17	7.35	126.12	4.67
12	20.00	6.79	135.84	5.03
13	27.00	20.00	540.00	20.00
14	3.00	195.79	587.36	21.75

TOTAL 147 CY

ms consultants, inc.
engineers, architects, planners

Job no:	08326		
Design:	ATM	Date:	08/31/21
Check:	DEA	Date:	10/29/21
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	FOOTING APRON		

ITEM EXTENSION

511 53010

**see PDF sheets 58-61 for Pier Calculations

CLASS QC1 CONCRETE, MISC.: FOOTING APRON

SUM-8-0199L (SB)

	VOLUME
LOCATION	**CY**
PIER 5**	250

SUM-8-0199R (NB)

	VOLUME
LOCATION	**CY**
PIER 5**	250

TOTAL	**500**	**CY**

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Job no:	08326		
Design:	ATM	Date:	10/22/21
Check:	DEA	Date:	10/29/21
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	SEALING (NON-EPOXY)		

ITEM EXTENSION
512 10050
SEALING OF CONCRETE SURFACES (NON-EPOXY)

			Average Elevations TOP	Elevations BOT	Length FT	Width FT	Area SY	
FORWARD ABUTMENT								
BACKWALLS								
SB	FA		1028.60	1018.40	80.42		91.10	
NB	FA		1028.51	1018.66	80.42		88.04	
BRIDGE SEAT								
SB	FA		1018.40	1015.43	80.42	4.92	70.47	
NB	FA		1018.66	1015.43	80.42	4.92	72.80	
WINGWALLS								
SB	FA		-	-	-	-	29.31	(CAD measured areas)
NB	FA		-	-	-	-	35.19	(CAD measured areas)
MEDIAN WALL								
NB	FA		1030.08	1015.67	39.42		63.12	

PARAPET			Length FT	Surface FT	Area SY
	SB	Inside of deck/parapet	3352.11	4.41	1644
	NB	Inside of deck/parapet	3288.90	4.41	1613

SB total =	**1835**	SY	**NB total =**	**1872**	SY

TOTAL = 3707 SY

ms consultants, inc.
engineers, architects, planners

Job no:	08326		
Design:	ATM	Date:	10/22/21
Check:	DEA	Date:	10/29/21
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	SEALING (NON-EPOXY), APP		

ITEM EXTENSION
512 10051

****see PDF sheets 58-61 for Pier Calculations**

SEALING OF CONCRETE SURFACES (NON-EPOXY), AS PER PLAN

Parapet Surface (ft) = 7.92

Type	Deck Thick.	Dist. to Edge NB	SB	Additional
	1.417	0.25	0.25	0.5

SUM-8-0199L (SB)

	Length	Surface	Area
	FT	FT	SY
Outside of deck/parapet	3352.11	5.67	2110.59

	Average Elevations TOP	Elevations BOT	Width FT	Area SY	
RA Backwall	1037.60	1027.63	82.00	90.79	
RA Bridge Seat	1027.63	1005.75	82.00	199.38	
RA Wingwalls	-	-	-	129.51	(CAD measured area)

GF PIER TOTAL** = 4810

SUM-8-0199R (NB)

	Length	Surface	Area
	FT	FT	SY
Outside of deck/parapet	3288.90	5.67	2070.79

	Average Elevations TOP	Elevations BOT	Width FT	Area SY	
RA Backwall	1037.66	1027.63	82.00	91.35	
RA Bridge Seat	1027.63	1005.75	82.00	199.38	
RA Wingwalls	-	-	-	106.19	(CAD measured area)
Median Wall	1039.26	1005.75	46.25	172.20	

REAR ABUTMENT MONUMENT				
Section	View	CAD Areas SF	Sides #	Area SY
Section A-A	Front view	670	2	148.89
Section C-C	Side view	385	2	85.56
	Top View	196	1	21.75
			Subtotal =	256.20

GF PIER TOTAL** = 4770

SB ABUT	420	SY
SB PIERS	4810	SY
SB SUPER	2111	SY
SB TOTAL =	7341	SY

NB ABUT	825	SY
NB PIERS	4770	SY
NB SUPER	2071	SY
NB TOTAL =	7666	SY

TOTAL = 15007 SY

ms consultants, inc.
engineers, architects, planners

Job no:	08326		
Design:	ATM	Date:	10/22/21
Check:	DEA	Date:	10/29/21
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	SEALING, APP		

ITEM EXTENSION

512 10001

**see PDF sheets 58-61 for Pier Calculations

SEALING OF CONCRETE SURFACES, AS PER PLAN

SUM-8-0199L (SB)

	Elevations TOP	Elevations BOT	Width FT	Area SY
RA Backwall	1037.60	1027.63	82.00	90.79
RA Bridge Seat	1027.63	1005.75	82.00	199.38
RA Wingwalls	-	-	-	129.51
			GF PIER TOTAL** =	1388.00

SUM-8-0199R (NB)

	Elevations TOP	Elevations BOT	Width FT	Area SY
RA Backwall	1037.66	1027.63	82.00	91.35
RA Bridge Seat	1027.63	1005.75	82.00	199.38
RA Wingwalls	-	-	-	106.19
Median Wall	1039.26	1005.75	46.25	172.20
			GF PIER TOTAL** =	1388.00

SB ABUT	**420**	SY	**NB ABUT**	**569**	SY
SB PIERS	**1388**	SY	**NB PIERS**	**1388**	SY
SB total =	**1808**	SY	**NB total =**	**1957**	SY

TOTAL = 3765 SY

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Job no: 08326
Design: DBL Date: 08/22/19
Check: ELP Date: 09/17/19
Office: Columbus
Project: SUM-8-0199L/R
Element: TYPE 2 WATERPROOFING

ITEM EXTENSION
512 33000
TYPE 2 WATERPROOFING

Type

			Width	Height	Area	
			FT	FT	SY	
SUM-8-0199R (NB)						
	NB	1	3.00	33.33	11.11	
	NB	2	3.00	33.083	11.03	
	NB	3	3.00	33.13	11.04	
	NB	1	3.00	14.00	4.67	
	NB	2	3.00	14.42	4.81	
	NB	3	3.00	14.71	4.90	
	RA		3.00	82.50	55.00	(2 sets of WTR. PRF.)
	FA		3.00	80.42	53.61	(2 sets of WTR. PRF.)
SUM-8-0199L (SB)						
	SB	4	3.00	15.75	5.25	
	SB	4	3.00	34.63	11.54	
	RA		3.00	87.47	58.31	(2 sets of WTR. PRF.)
	FA		3.00	80.42	53.61	(2 sets of WTR. PRF.)

SB TOTAL = 129
NB TOTAL = 156

TOTAL = 285 SY

ms consultants, inc.
engineers, architects, planners

Job no:	08326		
Design:	ATM	Date:	08/27/19
Check:	ELP	Date:	09/17/19
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	STRUCTURAL STEEL		

ITEM	EXTENSION
513	10401

STRUCTURAL STEEL MEMBERS, HYBRID GIRDER, LEVEL SIX (6) FABRICATION, AS PER PLAN

See Structural Steel Worksheet (PDF Sheets 62 to 72) for detailed calculations)

TOTAL = 15,852,754 LB

ms consultants, inc.
engineers, architects, planners

Job no:	08326		
Design:	ATM	Date:	09/02/21
Check:	DEA	Date:	10/29/21
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	STUD SHEAR CONNECTORS		

ITEM	EXTENSION
513	20000

WELDED STUD SHEAR CONNECTORS

Shear stud quantities along girders from following spreadsheets:

SUM-8-0199L

	# rows of Shear studs	Shear studs/row	# Shear Studs
Girder 6	1016	3	3048
Girder 5	1322	3	3966
Girder 4	1318	3	3954
Girder 3	1318	3	3954
Girder 2	1322	3	3966
Girder 1	990	3	2970
Joint Support Beam (SUM8-0199L only)			21
SB SUPER SUBTOTAL =			**21879** **EACH**

SUM-8-0199R

	# rows of Shear studs	Shear studs/row	# Shear Studs
Girder 12	988	3	2964
Girder 11	1324	3	3972
Girder 10	1324	3	3972
Girder 9	1324	3	3972
Girder 8	1324	3	3972
Girder 7	985	3	2955
NB SUPER SUBTOTAL =			**21807** **EACH**

SUM-8-0199L

# of studs/row = **2.00** From: RA/FA sheets > Section G-G/F-F > "DELTA" in Legend

	Max. Spacing FT	Backwall Length FT	# shear studs	
RA	2	84.381	**84**	Bottom Plate
	2	79.333	**79**	
FA	2	84.381	**84**	Top Plate
	2	79.333	**79**	
SB ABUT SUBTOTAL =			**326**	**EACH**

SUM-8-0199R

	Max. Spacing FT	Backwall Length FT	# shear studs	
RA	2	79.333	**79**	Bottom
	2	79.333	**79**	Plate
FA	2	79.333	**79**	Top Plate
	2	79.333	**79**	
NB ABUT SUBTOTAL =			**316**	**EACH**

SUM-8-0199L/R

	Length of Top Chord (ft)	Edge Distance (ft)	Spacing (ft)	# of Xframes/bridge	Shear studs/row	# of Shear studs/bridge
RA End Xframes	11.34	0.50	0.58	5	3	270
FA End Xframes	12.74	0.50	0.58	5	3	315
RA Overhang					3	270
FA Overhang					3	270
					SB SUBTOTAL =	**1125** **EACH**
					NB SUBTOTAL =	**1125** **EACH**

SB ABUT TOTAL =	**326**	**EACH**
SB SUPER TOTAL =	**23004**	**EACH**
NB ABUT TOTAL =	**316**	**EACH**
NB SUPER TOTAL -	**22932**	**EACH**

TOTAL = 46578 EACH

ms consultants, inc.
engineers, architects, planners

Job no:	08326		
Design:	DBL	Date:	12/17/20
Check:	ATM	Date:	10/29/21
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	STR. STEEL: MONUMENT		

ITEM	EXTENSION	UNIT
513	90000	LB

STRUCTURAL STEEL, MISC.: MONUMENT

Plate Girder

Plates

Amount	Height	Width	Thick.	Volume	Unit Weight	Weight	
#	ft	ft	ft	ft^3	lb/ft^3	lb	
1	49.00	2.79	0.07	9.97	490.00	4887.45	
2	49.00	4.63	0.07	16.52	490.00	16194.24	
1	49.00	3.33	0.07	11.91	490.00	5835.76	
1	4.81	3.33	0.07	1.17	490.00	573.16	COVER PLATE
1	4.81	3.33	0.07	1.17	490.00	573.16	BASE PLATE
					Subtotal	28063.77	

Angles

Amount	Height	Leg 1	Leg 2	Thick.	Volume	Unit Weight	Weight
#	ft	ft	ft	ft	ft^3	lb/ft^3	lb
8	0.71	0.25	0.21	0.04	0.01	490.00	6.63
2	49.00	0.25	0.21	0.04	0.94	490.00	458.52
						Subtotal	465.15

Rolled Beams

Shape	Height	Unit Weight	Weight
#	ft	lb/ft	lb
W36x135	36.00	135.00	4860.00
W24x90	28.00	90.00	2520.00
		Subtotal	7380.00

TOTAL	**35,909**	**LB**

ms consultants, inc.
engineers, architects, planners

Job no:	08326		
Design:	ATM	Date:	04/26/21
Check:	DEA	Date:	10/29/21
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	STR. STEEL: ERECTION		

ITEM	EXTENSION	UNIT
513	95020	LUMP

STRUCTURAL STEEL, MISC.: STRUCTURAL STEEL ERECTION EQUIPMENT

*per GLG EMAIL

SUM-8-0199L/R

Structural Steel =	15,852,754	LB
Cost =	$0.28	$/LB
Subtotal =	$4,438,771	
Subtotal * (1.15) Inflation Factor =	$5,104,587	
TOTAL	**$5,110,000**	**LS**

ms consultants, inc.
engineers, architects, planners

Job no:	08326		
Design:	ATM	Date:	09/02/21
Check:	DEA	Date:	10/29/21
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	FIELD PAINT, INT. COAT		

ITEM 514 EXTENSION 00060

FIELD PAINTING STRUCTURAL STEEL, INTERMEDIATE COAT

SUM-8-0199L @ RA

	Length	Width	Area
	FT	FT	SF
*Girder 1	10	27.82	278.18
Girder 2	10	27.73	277.28
Girder 3	10	25.67	256.67
Girder 4	10	25.67	256.67
Girder 5	10	25.67	256.67
*Girder 6	10	25.67	256.67

	Width	Perimeter	Area	Total	
	FT	FT	SF	SF	
WT8x33.5	52.34	2.53	132.25	661.23	*5 BAYS
WT12x73	13.34	3.11	41.47	207.33	
Stiffeners	0.833	9.83	16.39	81.94	
				1045.55	*Conting.
			SUB =	2628	

SUM-8-0199R @ RA

	Length	Width	Area
	FT	FT	SF
*Girder 7	10	25.67	256.67
Girder 8	10	25.66	256.58
Girder 9	10	25.56	255.58
Girder 10	10	25.51	255.08
Girder 11	10	25.51	255.08
*Girder 12	10	25.51	255.08

	Width	Perimeter	Area	Total	
	FT	FT	SF	SF	
WT8x33.5	52.34	2.53	132.25	661.23	*5 BAYS
WT12x73	13.34	3.11	41.47	207.33	
Stiffeners	0.833	9.83	16.39	81.94	
				1045.55	*Conting.
			SUB =	2580	

SUM-8-0199L @ FA

	Length	Width	Area
	FT	FT	SF
*Girder 1	10	27.82	278.18
Girder 2	10	27.73	277.28
Girder 3	10	25.67	256.67
Girder 4	10	25.67	256.67
Girder 5	10	25.67	256.67
*Girder 6	10	25.67	256.67

	Width	Perimeter	Area	Total	
	FT	FT	SF	SF	
WT8x33.5	52.34	2.53	132.25	661.23	*5 BAYS
WT12x73	13.34	3.11	41.47	207.33	
Stiffeners	0.833	9.83	16.39	81.94	
				1045.55	*Conting.
			SUB =	2628	

SUM-8-0199R @ FA

	Length	Width	Area
	FT	FT	SF
*Girder 7	10	25.67	256.67
Girder 8	10	25.66	256.58
Girder 9	10	25.56	255.58
Girder 10	10	25.51	255.08
Girder 11	10	25.51	255.08
*Girder 12	10	25.51	255.08

	Width	Perimeter	Area	Total	
	FT	FT	SF	SF	
WT8x33.5	52.34	2.53	132.25	661.23	*5 BAYS
WT12x73	13.34	3.11	41.47	207.33	
Stiffeners	0.833	9.83	16.39	81.94	
				1045.55	*Conting.
			SUB =	2580	

SUM-8-0199L @ Piers

	Length	Width	Area
	FT	FT	SF
*Girder 1	200	25.67	5133.33
Girder 2	200	25.67	5133.33
Girder 3	200	25.67	5133.33
Girder 4	200	25.67	5133.33
Girder 5	200	25.67	5133.33
*Girder 6	200	25.67	5133.33
		SUB =	30800

INTER. XFRAMES	Width	Perimeter	Area	Total	
	FT	FT	SF	SF	*2 SIDES
WT8x33.5	52.34	2.53	132.25	1322.46	*5 BAYS
Stiffeners	0.833	9.83	16.39	163.89	
				1634.98	*Conting.

PIER XFRAMES	Width	Perimeter	Area	Total	
	FT	FT	SF	SF	*5 BAYS
WT8x33.5	63.84	2.53	161.30	806.51	
WT12x73	13.34	3.11	41.47	207.33	
Stiffeners	0.833	9.83	16.39	81.94	
				1205.36	*Conting.

LAT BRACING	Width	Perimeter	Area	Total	
	FT	FT	SF	SF	
WT8x38.5	20.5	2.53	51.80	207.19	
				227.91	*Conting.
			SUB =	3068	

SUM-8-0199R @ Piers

	Length	Width	Area
	FT	FT	SF
*Girder 7	200	25.67	5133.33
Girder 8	200	25.67	5133.33
Girder 9	200	25.67	5133.33
Girder 10	200	25.67	5133.33
Girder 11	200	25.67	5133.33
*Girder 12	200	25.67	5133.33
		SUB =	30800

INTER. XFRAMES	Width	Perimeter	Area	Total	
	FT	FT	SF	SF	*2 SIDES
WT8x33.5	52.34	2.53	132.25	1322.46	*5 BAYS
Stiffeners	0.833	9.83	16.39	163.89	
				1634.98	*Conting.

PIER XFRAMES	Width	Perimeter	Area	Total	
	FT	FT	SF	SF	*5 BAYS
WT8x33.5	63.84	2.53	161.30	806.51	
WT12x73	13.34	3.11	41.47	207.33	
Stiffeners	0.833	9.83	16.39	81.94	
				1205.36	*Conting.

LAT BRACING	Width	Perimeter	Area	Total	
	FT	FT	SF	SF	
WT8x38.5	20.5	2.53	51.80	207.19	
				227.91	*Conting.
			SUB =	3068	

SB SUPER TOTAL = 39124 SF
NB SUPER TOTAL = 39028 SF

TOTAL = 78152 SF

ms consultants, inc.
engineers, architects, planners

Job no:	08326		
Design:	ATM	Date:	09/02/21
Check:	DEA	Date:	10/29/21
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	FIELD PAINT, FINISH COAT		

ITEM EXTENSION
514 00066
FIELD PAINTING STRUCTURAL STEEL, FINISH COAT

SUM-8-0199L @ RA

	Length	Width	Area
	FT	FT	SF
*Girder 1	10	27.82	278.18
Girder 2	10	27.73	277.28
Girder 3	10	25.67	256.67
Girder 4	10	25.67	256.67
Girder 5	10	25.67	256.67
*Girder 6	10	25.67	256.67

	Width	Perimeter	Area	Total	*5 BAYS
	FT	FT	SF	SF	
WT8x33.5	52.34	2.53	132.25	661.23	
WT12x73	13.34	3.11	41.47	207.33	
Stiffeners	0.833	9.83	16.39	81.94	
				1045.55	*Conting.
			SUB =	2628	

SUM-8-0199R @ RA

	Shear studs	Weight	Area
	FT	FT	SF
*Girder 7	10	25.67	256.67
Girder 8	10	25.66	256.58
Girder 9	10	25.56	255.58
Girder 10	10	25.51	255.08
Girder 11	10	25.51	255.08
*Girder 12	10	25.51	255.08

	Width	Perimeter	Area	Total	*5 BAYS
	FT	FT	SF	SF	
WT8x33.5	52.34	2.53	132.25	661.23	
WT12x73	13.34	3.11	41.47	207.33	
Stiffeners	0.833	9.83	16.39	81.94	
				1045.55	*Conting.
			SUB =	2580	

SUM-8-0199L @ FA

	Length	Width	Area
	FT	FT	SF
*Girder 1	10	27.82	278.18
Girder 2	10	27.73	277.28
Girder 3	10	25.67	256.67
Girder 4	10	25.67	256.67
Girder 5	10	25.67	256.67
*Girder 6	10	25.67	256.67

	Width	Perimeter	Area	Total	*5 BAYS
	FT	FT	SF	SF	
WT8x33.5	52.34	2.53	132.25	661.23	
WT12x73	13.34	3.11	41.47	207.33	
Stiffeners	0.833	9.83	16.39	81.94	
				1045.55	*Conting.
			SUB =	2628	

SUM-8-0199R @ FA

	Shear studs	Weight	Area
	FT	FT	SF
*Girder 7	10	25.67	256.67
Girder 8	10	25.66	256.58
Girder 9	10	25.56	255.58
Girder 10	10	25.51	255.08
Girder 11	10	25.51	255.08
*Girder 12	10	25.51	255.08

	Width	Perimeter	Area	Total	*5 BAYS
	FT	FT	SF	SF	
WT8x33.5	52.34	2.53	132.25	661.23	
WT12x73	13.34	3.11	41.47	207.33	
Stiffeners	0.833	9.83	16.39	81.94	
				1045.55	*Conting.
			SUB =	2580	

SUM-8-0199L @ Piers

	Length	Width	Area
	FT	FT	SF
*Girder 1	200	25.67	5133.33
Girder 2	200	25.67	5133.33
Girder 3	200	25.67	5133.33
Girder 4	200	25.67	5133.33
Girder 5	200	25.67	5133.33
*Girder 6	200	25.67	5133.33
		SUB =	30800

INTER. XFRAMES	Width	Perimeter	Area	Total	*5 BAYS
	FT	FT	SF	SF	*2 SIDES
WT8x33.5	52.34	2.53	132.25	1322.46	
Stiffeners	0.833	9.83	16.39	163.89	
				1634.98	*Conting.

PIER XFRAMES	Width	Perimeter	Area	Total	*5 BAYS
	FT	FT	SF	SF	
WT8x33.5	63.84	2.53	161.30	806.51	
WT12x73	13.34	3.11	41.47	207.33	
Stiffeners	0.833	9.83	16.39	81.94	
				1205.36	*Conting.

LAT BRACING	Width	Perimeter	Area	Total	
	FT	FT	SF	SF	
WT8x38.5	20.5	2.53	51.80	207.19	
				227.91	*Conting.
			SUB =	3068	

SUM-8-0199R @ Piers

	Length	Width	Area
	FT	FT	SF
*Girder 7	200	25.67	5133.33
Girder 8	200	25.67	5133.33
Girder 9	200	25.67	5133.33
Girder 10	200	25.67	5133.33
Girder 11	200	25.67	5133.33
*Girder 12	200	25.67	5133.33
		SUB =	30800

INTER. XFRAMES	Width	Perimeter	Area	Total	*5 BAYS
	FT	FT	SF	SF	*2 SIDES
WT8x33.5	52.34	2.53	132.25	1322.46	
Stiffeners	0.833	9.83	16.39	163.89	
				1634.98	*Conting.

PIER XFRAMES	Width	Perimeter	Area	Total	*5 BAYS
	FT	FT	SF	SF	
WT8x33.5	63.84	2.53	161.30	806.51	
WT12x73	13.34	3.11	41.47	207.33	
Stiffeners	0.833	9.83	16.39	81.94	
				1205.36	*Conting.

LAT BRACING	Width	Perimeter	Area	Total	
	FT	FT	SF	SF	
WT8x38.5	20.5	2.53	51.80	207.19	
				227.91	*Conting.
			SUB =	3068	

SB SUPER TOTAL = 39124 SF
NB SUPER TOTAL = 39028 SF

TOTAL = 78152 SF

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Job no:	08326		
Design:	ATM	Date:	01/10/23
Check:	DEA	Date:	01/10/23
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	FIELD PAINT, MISC.		

ITEM EXTENSION
514 27700

FIELD PAINTING, MISC.: MONUMENT DECORATIVE STEEL

Element	Length	Painted Surface	# of plates	Area
	FT	FT	#	SF
Box girder web plates	49	9.32	2	913.65
Box girder Front plate	49	5.73	1	280.77
Box girder Back plate	49	1.94	1	94.96
Cap / base plate	3.33	4.81	2	32.08
W36x135	36	9.75	1	351.00
S24x90	28	6.81	1	190.68

Intermediate Coat	1863	SF
Finish Coat	1863	SF

NB SUPER TOTAL =	**3727**	**SF**
UNIT COST =	**$6.00**	**$/SF**

TOTAL =	**3727**	**SF**

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Job no:	08326		
Design:	ATM	Date:	08/16/19
Check:	ELP	Date:	09/17/19
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	EXPANSION JOINT, APP		

ITEM	EXTENSION
516	12400

SPECIAL - MODULAR EXPANSION JOINT

Type	Length FT	
SUM-8-0199L		
RA	83.31	
FA	78.33	
SB TOTAL =	**162**	**FT**
SUM-8-0199R		
RA	78.33	
FA	78.33	
NB TOTAL =	**157**	**FT**
TOTAL =	**319**	**FT**

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Job no:	08326		
Design:	ATM	Date:	08/16/19
Check:	ELP	Date:	09/17/19
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	1" P.E.J.F		

ITEM	EXTENSION
516	13600

****see PDF sheets 58-61 for Pier Calculations**

1" PREFORMED EXPANSION JOINT FILLER

Type	Side	Height FT	Width FT	Area SF
SUM-8-0199L				
RA	Left	16.50	3.75	61.88
		19.79	2.25	44.53
	Right	15.44	2.25	34.74
			SB PIER SUBTOTAL =	129
			SB ABUT SUBTOTAL =	142
			SB TOTAL =	**271** **FT**
SUM-8-0199R				
RA	Right	16.50	3.75	61.88
		18.23	2.25	41.02
FA	Right	17.18	2.25	38.66
	Left	16.11	2.25	36.25
FA	Right	16.10	2.25	36.23
			NB PIER SUBTOTAL =	129
			NB ABUT SUBTOTAL =	215
			NB TOTAL =	**344** **FT**
			TOTAL =	**615** **SF**

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Job no:	08326		
Design:	ATM	Date:	08/16/19
Check:	ELP	Date:	09/17/19
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	2" P.E.J.F		

ITEM	EXTENSION
516	13900

2" PREFORMED EXPANSION JOINT FILLER

	Location	Height FT	Width FT	Area SF	
SUM-8-0199R					
RA	Middle Wall	17.73	2.25	39.89	
		16.50	3.75	61.88	
			NB TOTAL =	**102**	**SF**
SUM-8-0199L					
RA	Middle Wall	17.72	2.25	39.87	
		16.50	3.75	61.88	
			SB TOTAL =	**102**	**SF**
			TOTAL =	**204**	**SF**

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Job no:	08326		
Design:	DBL	Date:	08/22/19
Check:	ELP	Date:	09/17/19
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	VANDAL FENCE		

ITEM EXTENSION
517 75000
RAILING, ALUMINUM

****see PDF sheets 58-61 for Pier Calculations**

Type		Length FT
SUM-8-0199L		
	PIER 5	107.00
	SB TOTAL =	**107**
SUM-8-0199R		
	PIER 5	109.00
	NB TOTAL =	**109**

TOTAL = 216 FT

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Job no:	08326		
Design:	DBL	Date:	08/22/19
Check:	ELP	Date:	09/17/19
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	RAILING WITH FENCE		

ITEM	EXTENSION
517	76300

RAILING, MISC.: DECORATIVE RAILING WITH CHAIN LINK FENCE, AS PER PLAN

Type	Length FT
SUM-8-0199L	
Left Bridge Deck	1608.96
Right Bridge Deck	1609.05
SB TOTAL =	**3218**
SUM-8-0199R	
Left Bridge Deck	1577.45
Right Bridge Deck	1577.45
NB TOTAL =	**3155**

TOTAL = 6373 FT

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Job no:	08326		
Design:	DBL	Date:	08/22/19
Check:	ELP	Date:	09/17/19
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	SCUPPERS/DOWNSPOUTS		

ITEM 518 EXTENSION 12200
SCUPPERS, INCLUDING SUPPORTS

Type	Station	Side	Number
SUM-8-0199L			
	226+88	LT	1
	227+63	LT	1
	229+35	LT	1
	230+96	LT	1
	232+65	LT	1
	234+50	LT	1
	236+35	LT	1
	238+20	LT	1
	239+50	LT	1
	240+80	LT	1
	225+73	RT	1
	226+88	RT	1
	227+63	RT	1
	229+35	RT	1
	230+96	RT	1
	232+65	RT	1
	234+50	RT	1
	236+35	RT	1
	238+20	RT	1
	239+50	RT	1
	240+80	RT	1

TOTAL = 21 EACH

ITEM 518 EXTENSION 51101 ****see PDF sheets 58-61 for Pier Calculations**
8" PIPE DOWNSPOUT, INCLUDING SPECIALS, AS PER PLAN

Location	Side	Length FT
SUM-8-0199L		
PIER 1	L	142
		252
PIER 2	L	297
		297
PIER 3	L	160
		160

TOTAL = 1308 FT

ms consultants, inc.
engineers, architects, planners

Job no:	08326		
Design:	DBL	Date:	01/03/20
Check:	ATM	Date:	09/01/21
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	POROUS BACKFILL		

ITEM	EXTENSION
518	21200

POROUS BACKFILL WITH GEOTEXTILE FABRIC

NorthBound

RA Wingwall

	Length	Width	Height (Avg)	Volume (CY)
Above 1'-6" seat	14.67	1.50	13.84	11.28
Behind abutment seat	37.00	2.00	24.76	67.86
Vertical	2.00	9.33	34.73	24.01
			TOTAL	**103**

Rear Abutment

	Length	Width	Height (Avg)	Volume (CY)
Cheekwall	4.00	2.00	34.73	10.29
Pedestal Faces to Backfill Limit	80.51	2.00	31.10	185.50
Pedestal Bays (5.5')	55.00	5.75	31.10	364.33
Pedestal Bays (3.0')	6.00	5.75	31.10	39.75
			TOTAL	**600**

Forward Abutment

	Length	Width	Height (Avg)	Volume (CY)
Pedestal Faces to Backfill Limit	80.42	2.00	10.54	62.80
Pedestal Bays (5.5')	55.00	5.25	10.54	112.75
Pedestal Bays (3.0')	6.00	5.25	10.54	12.30
			TOTAL	**188**

FA Wingwall

	Length	Width	Height (Avg)	Volume (CY)
WW	28.00	2.00	12.47	**25.85**

TOTAL	**916.72**	**CY**

Median Wall

Rear Abutment

	Length	Width	Height	Volume (CY)
Horiz. by NB Joint	0.55	6.04	34.54	4.21
Angled Portion	33.54	2.00	34.54	85.81
Horiz. by SB Joint	2.00	11.83	34.54	30.27
			TOTAL	**120**

Forward Abutment

	Length	Width	Height	Volume (CY)
Wall	39.42	2.50	16.11	**58.80**

TOTAL	**179.09**	**CY**

SouthBound

RA Wingwall

	Length	Width	Height (Avg)	Volume (CY)
Above 1'-6" seat	14.83	1.50	18.92	15.59
Behind abutment seat	42.00	2.00	28.82	89.67
			TOTAL	**105**

Rear Abutment

	Length	Width	Height (Avg)	Volume (CY)
Horiz. Cheekwall	4.00	2.00	36.05	10.68
Angled Cheekwall	8.08	2.00	35.89	21.49
Pedestal Faces to Backfill Limit	85.56	2.00	30.57	193.72
Pedestal Bays	66.00	5.75	30.57	429.63
			TOTAL	**656**

Forward Abutment

	Length	Width	Height (Avg)	Volume (CY)
Pedestal Faces to Backfill Limit	80.42	2.00	10.01	59.63
Pedestal Bays (5.5')	55.00	5.25	10.01	107.05
Pedestal Bays(3.0')	6.00	5.25	10.01	11.68
			TOTAL	**167**

FA Wingwall

	Length	Width	Height (Avg)	Volume (CY)
WW	25.75	2.00	11.47	**21.88**

TOTAL	**949.34**	**CY**

SB Total	**949**	**CY**
NB Total	**1096**	**CY**
Grand Total	**2045**	**CY**

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Job no:	08326		
Design:	DBL	Date:	08/22/19
Check:	ELP	Date:	09/17/19
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	10" P.C.P.P.		

ITEM EXTENSION
518 42000
8" PERFORATED CORRUGATED PLASTIC PIPE

		Length FT	
SUM-8-0199L			
	RA	132.87	
	FA	107.93	
	SB TOTAL =	**241**	**FT**
SUM-8-0199R			
	RA	173.43	
	FA	145.51	
	NB TOTAL =	**319**	**FT**
	TOTAL =	**560**	**FT**

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Job no:	08326		
Design:	DBL	Date:	08/22/19
Check:	ELP	Date:	09/17/19
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	10" N.P.C.P.P.		

ITEM	EXTENSION
518	42010

8" NON-PERFORATED CORRUGATED PLASTIC PIPE, INCLUDING SPECIALS

			Length	Length to Outlet
			FT	FT
SUM-8-0199L				
	SB	RA	35	
	SB	FA	146.00	21.00
		SB TOTAL =	**202**	
SUM-8-0199R				
	NB	FA		56.99
	NB	RA	221.67	38.35
		NB TOTAL =	**317**	
			TOTAL =	**519 FT**

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Job no:	08326		
Design:	ATM	Date:	09/10/19
Check:	ELP	Date:	09/17/19
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	DRILLED SHAFTS, 48" DIA.		

ITEM 524 EXTENSION 94904

****see PDF sheets 58-61 for Pier Calculations**

DRILLED SHAFTS, 48" DIAMETER, INTO BEDROCK

Type		Total Length FT	
SUM-8-0199L			
	GF TOTAL =	304	
	SB TOTAL =	**304**	**FT**
SUM-8-0199R			
	GF TOTAL =	328	
	NB TOTAL =	**328**	**FT**
	TOTAL =	**632**	**FT**

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Job no:	08326		
Design:	ATM	Date:	09/10/19
Check:	ELP	Date:	09/17/19
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	DRILLED SHAFTS, 54" DIA.		

ITEM	EXTENSION
524	94906

****see PDF sheets 58-61 for Pier Calculations**

DRILLED SHAFTS, 54" DIAMETER, ABOVE BEDROCK

Type		Total Length FT	
SUM-8-0199L			
	GF TOTAL =	856	
	SB TOTAL =	**856**	**FT**
SUM-8-0199R			
	GF TOTAL =	528	
	NB TOTAL =	**528**	**FT**
	TOTAL =	**1,384**	**FT**

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Job no:	08326		
Design:	DBL	Date:	08/22/19
Check:	ELP	Date:	09/17/19
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	APPROACH SLABS		

ITEM	EXTENSION
526	30010

REINFORCED CONCRETE APPROACH SLABS WITH QC/QA (T=17")

Type	LENGTH	AVG WIDTH	AREA	
	FT	FT	SY	
SUM-8-0199L				
Rear	30	84.97	283.23	
Forward	30	79.33	264.44	
		SB TOTAL =	**548**	**FT**
SUM-8-0199R				
Rear	30	79.77	265.90	
Forward	30	79.33	264.43	
		NB TOTAL =	**530**	**FT**

TOTAL = 1078 SY

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engineers, architects, planners

Job no:	08326		
Design:	DBL	Date:	08/22/19
Check:	ELP	Date:	09/17/19
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	TYPE A INSTALLATION		

ITEM 526 EXTENSION 90010
TYPE A INSTALLATION

Type	Length FT	
SUM-8-0199L		
Rear	87.03	
Forward	79.33	
SB TOTAL =	**167**	**FT**
SUM-8-0199R		
Rear	79.78	
Forward	79.33	
NB TOTAL =	**159**	**FT**
TOTAL =	**326**	**FT**

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Job no:	08326		
Design:	DBL	Date:	01/10/20
Check:	ATM	Date:	10/29/21
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	SPECIAL - FORMLINER		

ITEM	EXTENSION
530	13000

SPECIAL - FORM LINER

****see PDF sheets 58-61 for Pier Calculations**

SUM-8-0199R (NB)

Rear Abutment

Location	Beam Seat	T/Ftg. Elev.	CLR. From T/Wall	Height	Length	Area
Girder #	ELEV.	ELEV.	FT	FT	FT	SF
G12	1027.16	1004.75	1.48	20.93	15.13	316.58
G11	1027.53	1004.75	1.48	21.30	15.08	321.28
G10/G9	1027.77	1004.75	1.48	21.54	19.08	411.06
G8	1027.53	1004.75	1.48	21.30	15.08	321.28
G7	1027.16	1004.75	1.48	20.93	15.13	316.58
					Sub Tot.	**1686.78**

Median Wall

Start WW	End WW	T/Ftg.	CLR. From B/Wall	Avg. Height	Width	Area
ELEV.	ELEV.	EL.	FT	FT	FT	SF
1039.23	1039.29	1005.00	0.00	34.26	44.55	1526.35
					Sub Tot.	**1526.35**

Piers**	16443	SF

Parapet

SPAN	HEIGHT	LENGTH	AREA (1 SIDE)	TOT. AREA
#	FT	FT	SF	SF
1	2.50	200.00	500.00	1000.00
2	2.50	200.00	500.00	1000.00
3	2.50	200.00	500.00	1000.00
4	2.50	200.00	500.00	1000.00
5	2.50	200.00	500.00	1000.00
6	2.50	160.00	400.00	800.00
			Sub Tot.	**5800.00**

NB TOTAL	**25456**	**SF**

SUM-8-0199L (SB)

Rear Abutment

Location	Beam Seat	T/Ftg. Elev.	CLR. From T/Wall	Height	Length	Area
Girder #	ELEV.	ELEV.	FT	FT	FT	SF
G6	1027.44	1004.75	1.48	21.21	20.09	426.19
G5	1027.83	1004.75	1.48	21.60	15.08	325.80
G4/G3	1028.07	1004.75	1.48	21.84	19.08	416.79
G2	1027.83	1004.75	1.48	21.60	15.08	325.80
G1	1027.44	1004.75	1.48	21.21	15.13	320.81
					Sub Tot.	**1815.40**

Piers**	16460	SF

Parapet

SPAN	HEIGHT	LENGTH	AREA (1 SIDE)	TOT. AREA
#	FT	FT	SF	SF
1	2.50	200.00	500.00	1000.00
2	2.50	280.00	700.00	1400.00
3	2.50	280.00	700.00	1400.00
4	2.50	200.00	500.00	1000.00
5	2.50	200.00	500.00	1000.00
6	2.50	160.00	400.00	800.00
			Sub Tot.	**6600.00**

SB TOTAL	**24875**	**SF**

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engineers, architects, planners

Job no:	08326		
Design:	ATM	Date:	04/26/21
Check:	DEA	Date:	10/29/21
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	BRIDGE MONITORING		

ITEM	EXTENSION
530	00200

STRUCTURE, MISC.: BRIDGE CONSTRUCTION MONITORING

PER GLG: The monitoring was based on an estimate based on monitoring from Ironton-Russell Bridge, but it's so different that it was really just feel. I-R bridge had a cost based on a certain number of gages, inclinometers, etc. and we kind of

Subtotal = $250,000

Subtotal * (1.15) Inflation Factor = $287,500

TOTAL = $287,500 LS

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Job no:	08326		
Design:	ATM	Date:	04/26/21
Check:	DEA	Date:	10/29/21
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	AESTHETIC LIGHTING		

ITEM	EXTENSION
530	00200

STRUCTURE, MISC.: AESTHETIC LIGHTING

The additional cost information from HLB is included with the submission. The amount in the estimate was increased by approximately 20% for the color changing lighting for the bridge monument.

Subtotal = $2,000,000

Subtotal * (1.15) Inflation Factor = $2,300,000

TOTAL = $2,300,000 LS

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Job no:	08326		
Design:	ATM	Date:	04/26/21
Check:	DEA	Date:	10/29/21
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	VIBRATION MONITORING		

ITEM	EXTENSION
530	00200

STRUCTURAL SURVEY AND MONITORING OF VIBRATION

Cost taken from District 6, 6A project with similar details.

Subtotal = $10,000

Subtotal * (1.15) Inflation Factor = $11,500

TOTAL = $11,500 LS

ms consultants, inc.
engineers, architects, planners

Job no:	08326		
Design:	ATM	Date:	08/15/19
Check:	ELP	Date:	09/17/19
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	CRUSHED AGG. SLOPE PROT.		

ITEM	EXTENSION
601	20010

CRUSHED AGGREGATE SLOPE PROTECTION

	Thickness (FT)	Length (FT)	Width (FT)	Total (CF)	Total (CY)
FORWARD ABUT.					
SB	1.0	95.95	108.386	10399.42	385
NB	1.0	121.95	108.524	13234.94	490

SB TOTAL =	**385**
NB TOTAL =	**490**

TOTAL = 875 CY

ms consultants, inc.
engineers, architects, planners

Job no:	08326		
Design:	ATM	Date:	09/02/21
Check:	DEA	Date:	
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	TEMP MSE WALL		

ITEM	EXTENSION
867	00100

TEMPORARY WIRE FACED MECHANICALLY STABILIZED EARTH WALL

Rear Abutment

	Length	Max Height	Area	Unit Cost	Cost
	FT	FT	SF	$ /SF	$
MSE	44	34	1484.78	$120	$178,173.60
				SB TOTAL =	**$179,000**

Forward Abutment

	Length	Max Height	Area	Unit Cost	Cost
	FT	FT	SF	$ /SF	$
MSE	15	19	285.00	$120	$34,200.00
				NB TOTAL =	**$35,000**

Subtotal = $214,000

Subtotal * (1.15) Inflation Factor = $246,100

TOTAL COST = $250,000

ms consultants, inc.
engineers, architects, planners

Job no:	08326		
Design:	DBL	Date:	08/22/19
Check:	ELP	Date:	09/17/19
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	BEARINGS		

ITEM	EXTENSION
869	00101

HIGH LOAD MULTI-ROTATIONAL (HLMR) BEARING, AS PER PLAN

Type	Number EACH
SUM-8-0199L	
REAR	6
PIER 1	6
PIER 2	6
PIER 3	6
PIER 4	6
PIER 5	6
FORWARD	6
SUM-8-0199R	
REAR	6
PIER 1	6
PIER 2	6
PIER 3	6
PIER 4	6
PIER 5	6
FORWARD	6

SB TOTAL = 42
NB TOTAL = 42

TOTAL = 84 EACH

Gannett Fleming Engineers and Architects, P.C.
Excellence Delivered As Promised

Calculation	**Pier Quantities:**
Description	*SUM-8-1.75 (NB & SB Bridges)*

GF Job No:	Bridge SFN	Calculated	Checked	Updated	Verified	Level 2 Review	Compliance Update
•062368	•7700370/7700371	•AH, 8/16/19	•RSN, 9/9/2019	•AH, 9/9/2019	•RSN, 9/9/2019	•CTM, 9/12/2019	•EFD, 10/20/2021

Reinforcing quantities are based on Stage 3 reinforcing calculations.

INPUT: Pier Data used in quantity calculation (yellow-cells indicate inputs)

Pier Capital =	26250.00	CF (CAD)	Vol: Door Deduction =	36.00	CF	Formliner (Column) =	14.33	FT
Area: Solid Pier Base =	314.00	SF	Pedestals (6 Total) =	150.00	SF	Formliner SF (Pier Capital) =	1790.00	SF
Area: Hollow Column =	181.00	SF	Height: Pier Capital =	53.00	FT			
Pier Capital (Pier 5 NB) =	23110.00	CF (CAD)	Perimeter: Column Sealing =	86.00	FT	Formliner SF (Pier 5 Capital NB) =	1505.00	SF
			Pier 5 Sealing =	121.00	FT			

EFD CHECK 3/23

Investigate Roundup to 0.1 EACH | A501 Bars ALL changed to doweled | Formliner Update | P5 Capital

		T/Cap EL.	T/Ftg EL.	B/Ftg EL.	Ftg Plan Area (SF)	No. of Shafts	54" Shaft Length (Avg, FT)	48" Socket Length (Avg, FT)	16" Pile Length (Driven., FT)	Form Liner Height (FT)	Shoring (SF)	Shoring Unit Cost	Rock Excavation Volume (CF)	Unclassified Excavation Volume (CF)	Height of Solid Capital Base (FT)	TOP OF ROCK (Per Geo)	Drilled Shaft Tip Elevation (Per Geo)	Min Rock Socket Length
Pier 1	NB	1022.57	960.25	954.25	975.25	8.000	0.00	6.00	0.000	9.320	0		4441	9151	9.320	958.8	948.25	6.00
	SB	1022.80	958.00	952.00	975.25	8.000	19.00	16.00	0.000	11.800	1200	$ 50.00	0	11093	11.800	933	917	16.00
Pier 2	NB	1020.79	885.25	878.75	1050.00	8.000	23.10	6.00	0.000	82.540	1400	$ 50.00	0	7406	0.000	855.7	849.7	6.00
	SB	1020.79	880.75	874.25	1050.00	8.000	11.60	8.00	0.000	87.040	1700	$ 50.00	0	10369	0.000	862.7	855.2	7.50
Pier 3	NB	1019.32	871.50	865.00	1050.00	8.000	20.40	8.00	0.000	94.820	0		0	9480	0.000	844.6	836.6	8.00
	SB	1018.85	873.25	866.75	1050.00	8.000	29.10	7.00	0.000	92.600	0		0	9776	0.000	837.7	831.2	6.50
Pier 4	NB	1017.64	880.00	872.50	1248.00	8.000	21.00	21.00	0.000	84.640	0		0	14637	0.000	851.5	830.5	21.00
	SB	1017.53	894.00	886.50	1248.00	8.000	45.40	7.00	0.000	70.530	0		0	23001	0.000	841.1	834.6	6.50
Pier 5	NB	1016.23	973.23	965.23	1606.00	46.000	0.00	0.00	75.000	0.000	2050	$ 25.00	0	8418	0.000			
	SB	1016.18	963.18	955.18	1606.00	46.000	0.00	0.00	85.000	0.000	3000	$ 40.00	0	12948	0.000			
										Total SF:	9350	$ 41.31						

Gannett Fleming Engineers and Architects, P.C.
Excellence Delivered As Promised

Calculation	Pier Quantities:
Description	SUM-8-1.75 (NB & SB Bridges)

GF Job No:	Bridge SFN	Calculated	Checked	Updated	Verified	Level 2 Review	Compliance Update
•062368	•7700370/7700371	•AH, 8/16/19	•RSN, 9/9/2019	•AH, 9/9/2019	•RSN, 9/9/2019	•CTM, 9/12/2019	•EFD, 10/20/2021

OUTPUT: Quantities carried to plans (yellow-cells indicate inputs)

		Pier Capital	*Pedestal*	*Hollow Column*	*Footing*	*Reinforcing*	*48' Shaft*	*54" Shaft*							
		Class QC4 Mass Concrete, Substructure with QC/QA (CY)	Class QC1 Concrete with QC/QA (CY)	Class QC1 Concrete with QC/QA, Pier above Footings (CY)	Class QC4 Mass Concrete, Substructure with QC/QA (CY)	Epoxy Coated Reinforcing Steel (LBS)	Drilled Shafts, 48" Dia, Into Bedrock (FT)	Drilled Shafts, 54" Dia, Above Bedrock (FT)	16" CIP Reinforced Concrete Piles, Driven (FT)	16" CIP Reinforced Concrete Piles, Furnished, APP (FT)	Special - Form Liner (SF)	Sealing of Concrete Surfaces, APP (SY)	Cofferdams and Excavation Bracing (LS)	Rock Excavation (CY)	Unclassified Excavation (CY)
		511E45602	**511E42512**	**511E42012**	**511E45602**	**509E10000**	**524E94904**	**524E94906**	**507E00700**	**507E00751**	**530E13000**	**512E10001**	**503E11100**	**503E31100**	**503E21100**
Pier 1	NB	1,080.7	18.1	0.0	216.8		48.00	0	0	0	2,057	263	$ -	165	339
	SB	1,109.5	18.1	0.0	216.8		128.00	152.00	0	0	2,128	263	$ 60,000	0	411
Pier 2	NB	972.3	18.1	517.4	252.8		48.00	184.80	0	0	4,156	263	$ 70,000	0	275
	SB	972.3	18.1	547.5	252.8		64.00	92.80	0	0	4,285	263	$ 85,000	0	385
Pier 3	NB	972.3	18.1	599.7	252.8		64.00	163.20	0	0	4,508	263	$ -	0	352
	SB	972.3	18.1	584.8	252.8		56.00	232.80	0	0	4,445	263	$ -	0	363
Pier 4	NB	972.3	18.1	531.5	346.7		168.00	168.00	0	0	4,216	263	$ -	0	543
	SB	972.3	18.1	436.9	346.7		56.00	363.20	0	0	3,812	263	$ -	0	852
Pier 5	NB	856.0	18.1	0.0	475.9		0	0	3,450	3,680	1,505	336	$ 52,500	0	312
	SB	972.3	18.1	0.0	475.9		0	0	3,910	4,140	1,790	336	$ 120,000	0	480
NB		4,854	91	1,649	1,545	See Reinf. Tables in Plans	328.00	516.00	3,450	3,680	16,443	1,388	$ 122,500	165	1,821
SB		4,999	91	1,570	1,545		304.00	841.00	3,910	4,140	16,460	1,388	$ 265,000	0	2,491
Total		**9,853.0**	**181.0**	**3,219.0**	**3,090.0**		**632.00**	**1,357.00**	**7,360**	**7,820**	**32,903**	**2,776**	**$ 387,500**	**165**	**4,312**

OUTPUT: Quantities carried to plans (yellow-cells indicate inputs or custom formulas)

		Special - Structure, Misc.: Access Door - Piers (LS)	Special - Structure, Misc.: Ladders and Platforms - Piers (LS)	Special - Structure, Misc.: Ladder Safety Device - Piers (LS)	Drilled Shafts, Misc.: Shaft Inspection Device (LS)	Drilled Shafts, Misc.: Thermal Integrity Profiling (Each)	Dowel Holes with Nonshrink, nonmetallic Grout (Each)	Sealing of Concrete Surfaces NON-EPOXY (SY)	Structure Drainage, Misc.: Pier Drainage and Ventilation (EACH)	1" PEJF (SF)	Low Strength Mortar Backfill (CY)	Class QC1 Concrete, Misc.: Footing Apron (CY)	Granular Material, Type B (CY)	Aggregate Base (CY)	Railing, Aluminum (FT)	Special - Structures, Misc.: Interior Lighting - Piers (LS)
		530E00200	**530E00200**	**530E00200**	**524E95200**	**524E95100**	**510E10000**	**512E10050**	**518E62100**	**516E13600**	**613E41200**	**511E53010**	**203E35110**	**304E20000**	**517E75000**	**530E00200**
Pier 1	NB				$ 1,000.00	8		572								
	SB				$ 1,000.00	8		597								
Pier 2	NB	$ 7,000.00	$ 40,000.00	$ 5,000.00	$ 1,000.00	8		1,245	1					40		$ 20,000
	SB	$ 7,000.00	$ 40,000.00	$ 5,000.00	$ 1,000.00	8		1,288	1					40		$ 20,000
Pier 3	NB	$ 7,000.00	$ 40,000.00	$ 5,000.00	$ 1,000.00	8		1,362	1					40		$ 20,000
	SB	$ 7,000.00	$ 40,000.00	$ 5,000.00	$ 1,000.00	8		1,341	1					40		$ 20,000
Pier 4	NB	$ 7,000.00	$ 40,000.00	$ 5,000.00	$ 1,000.00	8		1,265	1					50		$ 20,000
	SB	$ 7,000.00	$ 40,000.00	$ 5,000.00	$ 1,000.00	8		1,130	1					50		$ 20,000
Pier 5	NB						612	318		129	300	250	100		109	
	SB						612	449		129	400	250	100		107	
NB		$ 21,000.0	$ 120,000.0	$ 15,000.0	$ 4,000.0	32	612	4,770	3	129	300	250	100	130	109	$ 60,000.00
SB		$ 21,000.0	$ 120,000.0	$ 15,000.0	$ 4,000.0	32	612	4,810	3	129	400	250	100	130	107	$ 60,000.00
Total		**$ 42,000.0**	**$ 240,000.0**	**$ 30,000.0**	**$ 8,000.00**	**64**	**1,224**	**9,580**	**6**	**258**	**700**	**500**	**200**	**260**	**216**	**$ 120,000.00**

INFLATION FACTOR = $48,300

INFLATION FACTOR = $276,000

INFLATION FACTOR = $34,500

INFLATION FACTOR = $9,200

INFLATION FACTOR = $138,000

Gannett Fleming
Engineers and Architects, P.C.
Excellence Delivered As Promised

Calculation	**Pier Quantities:**
Description	*SUM-8-1.75 (NB & SB Bridges)*

GF Job No:	Bridge SFN	Calculated	Checked	Updated	Verified	Level 2 Review	Compliance Update
•062368	•7700370/7700371	•AH, 8/16/19	•RSN, 9/9/2019	•AH, 9/9/2019	•RSN, 9/9/2019	•CTM, 9/12/2019	•EFD, 10/20/2021

OUTPUT: Quantities carried to plans (yellow-cells indicate inputs)

		Pier Capital	*Pedestal*	*Hollow Column*	*Footing*	*Reinforcing*	*48' Shaft*	*54" Shaft*							
		Class QC4 Mass Concrete, Substructure with QC/QA (CY)	Class QC1 Concrete with QC/QA (CY)	Class QC1 Concrete with QC/QA, Pier above Footings (CY)	Class QC4 Mass Concrete, Substructure with QC/QA (CY)	Epoxy Coated Reinforcing Steel (LBS)	Drilled Shafts, 48" Dia, Into Bedrock (FT)	Drilled Shafts, 54" Dia, Above Bedrock (FT)	16" CIP Reinforced Concrete Piles, Driven (FT)	16" CIP Reinforced Concrete Piles, Furnished, APP (FT)	Special - Form Liner (SF)	Sealing of Concrete Surfaces, APP (SY)	Cofferdams and Excavation Bracing (LS)	Rock Excavation (CY)	Unclassified Excavation (CY)
		511E45602	**511E42512**	**511E42012**	**511E45602**	**509E10000**	**524E94904**	**524E94906**	**507E00700**	**507E00751**	**530E13000**	**512E10001**	**503E11100**	**503E31100**	**503E21100**
Pier 1	NB	1,080.7	18.1	0.0	216.8		48.00	0	0	0	2,057	263	$ -	165	339
	SB	1,109.5	18.1	0.0	216.8		128.00	152.00	0	0	2,128	263	$ 60,000	0	411
Pier 2	NB	972.3	18.1	517.4	252.8		48.00	184.80	0	0	4,156	263	$ 70,000	0	275
	SB	972.3	18.1	547.5	252.8		64.00	92.80	0	0	4,285	263	$ 85,000	0	385
Pier 3	NB	972.3	18.1	599.7	252.8		64.00	163.20	0	0	4,508	263	$ -	0	352
	SB	972.3	18.1	584.8	252.8		56.00	232.80	0	0	4,445	263	$ -	0	363
Pier 4	NB	972.3	18.1	531.5	346.7		168.00	168.00	0	0	4,216	263	$ -	0	543
	SB	972.3	18.1	436.9	346.7		56.00	363.20	0	0	3,812	263	$ -	0	852
Pier 5	NB	856.0	18.1	0.0	475.9		0	0	3,450	3,680	1,505	336	$ 52,500	0	312
	SB	972.3	18.1	0.0	475.9		0	0	3,910	4,140	1,790	336	$ 120,000	0	480
NB		4,854	91	1,649	1,545	See Reinf. Tables in Plans	328.00	516.00	3,450	3,680	16,443	1,388	$ 122,500	165	1,821
SB		4,999	91	1,570	1,545		304.00	841.00	3,910	4,140	16,460	1,388	$ 265,000	0	2,491
Total		**9,853.0**	**181.0**	**3,219.0**	**3,090.0**		**632.00**	**1,357.00**	**7,360**	**7,820**	**32,903**	**2,776**	**$ 387,500**	**165**	**4,312**

OUTPUT: Quantities carried to plans (yellow-cells indicate inputs or custom formulas)

		Special - Structure, Misc.: Access Door - Piers (LS)	Special - Structure, Misc.: Ladders and Platforms - Piers (LS)	Special - Structure, Misc.: Ladder Safety Device - Piers (LS)	Drilled Shafts, Misc.: Shaft Inspection Device (LS)	Drilled Shafts, Misc.: Thermal Integrity Profiling (Each)	Dowel Holes with Nonshrink, nonmetallic Grout (Each)	Sealing of Concrete Surfaces NON-EPOXY (SY)	Structure Drainage, Misc.: Pier Drainage and Ventilation (EACH)	1" PEJF (SF)	Low Strength Mortar Backfill (CY)	Class QC1 Concrete, Misc.: Footing Apron (CY)	Granular Material, Type B (CY)	Aggregate Base (CY)	Railing, Aluminum (FT)	Special - Structures, Misc.: Interior Lighting - Piers (LS)
		530E00200	**530E00200**	**530E00200**	**524E95200**	**524E95100**	**510E10000**	**512E10050**	**518E62100**	**516E13600**	**613E41200**	**511E53010**	**203E35110**	**304E20000**	**517E75000**	**530E00200**
Pier 1	NB				$ 1,000.00	8		572								
	SB				$ 1,000.00	8		597								
Pier 2	NB	$ 7,000.00	$ 40,000.00	$ 5,000.00	$ 1,000.00	8		1,245	1					40		$ 20,000
	SB	$ 7,000.00	$ 40,000.00	$ 5,000.00	$ 1,000.00	8		1,288	1					40		$ 20,000
Pier 3	NB	$ 7,000.00	$ 40,000.00	$ 5,000.00	$ 1,000.00	8		1,362	1					40		$ 20,000
	SB	$ 7,000.00	$ 40,000.00	$ 5,000.00	$ 1,000.00	8		1,341	1					40		$ 20,000
Pier 4	NB	$ 7,000.00	$ 40,000.00	$ 5,000.00	$ 1,000.00	8		1,265	1					50		$ 20,000
	SB	$ 7,000.00	$ 40,000.00	$ 5,000.00	$ 1,000.00	8		1,130	1					50		$ 20,000
Pier 5	NB						220	318		129	300	250	100		109	
	SB						220	449		129	400	250	100		107	
NB		$ 21,000.0	$ 120,000.0	$ 15,000.0	$ 4,000.0	32	220	4,770	3	129	300	250	100	130	109	$ 60,000.00
SB		$ 21,000.0	$ 120,000.0	$ 15,000.0	$ 4,000.0	32	220	4,810	3	129	400	250	100	130	107	$ 60,000.00
Total		**$ 42,000.0**	**$ 240,000.0**	**$ 30,000.0**	**$ 8,000.00**	**64**	**440**	**9,580**	**6**	**258**	**700**	**500**	**200**	**260**	**216**	**$ 120,000.00**

INFLATION FACTOR = $48,300

INFLATION FACTOR = $276,000

INFLATION FACTOR = $34,500

INFLATION FACTOR = $9,200

INFLATION FACTOR = $138,000

AVERAGE PEDESTAL HEIGHT

SB PEDESTAL SEAT ELEVATION

	PIER					
GIRDER	1	2	3	4	5	
1	1025.45	1023.50	1021.32	1020.12	1018.99	
2	1025.68	1023.69	1021.69	1020.52	1019.27	
3	1025.92	1023.93	1021.93	1020.76	1019.51	
4	1025.92	1023.93	1021.93	1020.76	1019.51	
5	1025.68	1023.69	1021.69	1020.52	1019.27	
6	1025.45	1023.50	1021.32	1020.12	1018.99	
Average	1025.68	1023.71	1021.65	1020.47	1019.26	*1022.15*
Cap	1022.80	1020.79	1018.85	1017.53	1016.18	*1019.23*
PedHt	2.88	2.92	2.80	2.94	3.08	*2.92*

NB PEDESTAL SEAT ELEVATION

	PIER					
GIRDER	1	2	3	4	5	
1	1025.23	1023.45	1021.74	1020.06	1018.98	
2	1025.44	1023.70	1022.15	1020.43	1019.23	
3	1025.69	1023.94	1022.39	1020.67	1019.47	
4	1025.69	1023.94	1022.39	1020.67	1019.47	
5	1025.44	1023.70	1022.15	1020.43	1019.23	
6	1025.23	1023.45	1021.74	1020.06	1018.98	
Average	1025.45	1023.70	1022.09	1020.39	1019.23	*1022.17*
Cap	1022.57	1020.79	1019.32	1017.64	1016.23	*1019.31*
PedHt	2.88	2.91	2.77	2.75	3.00	*2.86*

assume 3.25 ft to be conservative and cover any cross slope

3.25

CONCRETE APON APPROXIMATE CONCRETE VOLUME

NB Apron Concrete

Footing area		1606	1611.25 cf
pier column area		317	
apron heigth		1.25	
Parapet	width	1.5	210.3 cf
	length	50.62	
	height	2.77	
East side	thickness	2.50	1125.0 cf
	area	450	
West side	thickness	2.50	1125.0 cf
	area	450	
South side	thickness	2.50	2150.0 cf
	area	860	
		Total	**6221.575** cf
			230.4287 CY

SB Apron Concrete

Footing area		1606	1611.25 cf
pier column area		317	
apron heigth		1.25	
Parapet	width	1.5	538.3 cf
	length	52.62	
	height	6.82	
East side	thickness	2.50	1025.0 cf
	area	410	
West side	thickness	2.50	1325.0 cf
	area	530	
South side	thickness	2.50	2250.0 cf
	area	900	
		Total	**6749.55** cf
			249.9834 CY

ms consultants, inc.
engineers, architects, planners

Job no:	08326		
Design:	ATM/DBL	Date:	08/22/19
Check:	ELP	Date:	09/13/19
Office:	Columbus		
Project:	SUM-8-0199L/R		
Element:	STRUCTURAL STEEL		

TOTAL POUNDS OF STRUCTURAL STEEL* = 16,032,153 LBS

*Based on weight of Structural Steel =	490	lbs/cf
SB total =	8,253,152	lbs
NB total =	7,779,001	lbs

SOUTHBOUND GIRDERS

Total Volume =	**13192.68**	**CF**
Total Weight =	**6464413**	**LBS**

*Per Girder, Total Volume and Weight Calculated for all girders

Top Flange

	Thickness (FT)	Width (FT)	Total Length (FT)	Volume (CF)
3.25	0.2708	2.50	50.00	33.85
1.75	0.1458	2.00	157.50	45.94
1.75	0.1458	2.50	130.00	47.40
1	0.0833	2.00	340.25	56.71
2.75	0.2292	2.50	40.00	22.92
2.5	0.2083	2.50	130.00	67.71
1.25	0.1042	2.00	685.63	142.84
1.5	0.1250	2.50	40.00	12.50
1.5	0.1250	2.00	60.00	15.00
			***Subtotal Volume =**	**436.25**

Bottom Flange

	Thickness (FT)	Width (FT)	Total Length (FT)	Volume (CF)
1.25	0.1042	2.50	1065.88	277.57
1.5	0.1250	2.50	147.50	46.09
1.75	0.1458	2.50	40.00	14.58
2.25	0.1875	2.50	130.00	60.94
2.75	0.2292	2.50	165.00	94.53
3	0.2500	2.50	40.00	25.00
3.5	0.2917	2.50	50.00	36.46
			***Subtotal Volume =**	**534.11**

Web

Thickness (FT)	Width (FT)	Avg. Total Length (FT)	Volume (CF)
0.0729	9.83	502.5	360.30
0.0729	10.05	82.125	60.16
0.0729	9.42	137.75	94.64
0.0833	9.83	791	648.18
0.0833	10.05	120	100.46
		***Subtotal Volume =**	**1228.42**

NORTHBOUND GIRDERS

Total Volume =	**12477.72**	**CF**
Total Weight =	**6114083**	**LBS**

*Per Girder, Total Volume and Weight Calculated for all girders

Top Flange

	Thickness (FT)	Width (FT)	Total Length (FT)	Volume (CF)
1	0.0833	2.00	236.00	39.33
1.25	0.1042	2.00	695.88	144.97
1.25	0.1042	2.50	80.00	20.83
1.5	0.1250	2.00	40.00	10.00
1.5	0.1250	2.50	70.00	21.88
1.75	0.1458	2.00	120.00	35.00
1.75	0.1458	2.50	120.00	43.75
2.5	0.2083	2.50	170.00	88.54
3.25	0.2708	2.50	40.00	27.08
			***Subtotal Volume =**	**432.64**

Bottom Flange

	Thickness (FT)	Width (FT)	Total Length (FT)	Volume (CF)
1.25	0.1042	2.50	847.75	220.77
1.5	0.1250	2.50	164.13	51.29
1.75	0.1458	2.50	110.00	40.10
2	0.1667	2.50	120.00	50.00
2.25	0.1875	2.50	120.00	56.25
2.75	0.2292	2.50	80.00	45.83
3	0.2500	2.50	90.00	56.25
3.5	0.2917	2.50	40.00	29.17
			***Subtotal Volume =**	**493.09**

Web

Thickness (FT)	Width (FT)	Avg. Total Length (FT)	Volume (CF)
0.0729	9.83	1020	731.35
0.0729	9.80	84.125	60.10
0.0729	10.05	147.75	108.24
0.0833	9.83	320	262.22
		***Subtotal Volume =**	**1153.89**

WELDS

Total Weight = 23612 LBS

SB total 12603.58 LBS
NB total 11008.39 LBS

SOUTHBOUND

Weld Location	Weld Length/Member (FT)	Weld Size	Volume (CF)	#/Members	Total Weight (LBS)
Girders (remaining)	5562.26	0.026	1.8861	6	5545.06
Girders Bot. Flange (RA to FS3)	644.24	0.042	0.5592	6	1644.15
Girders Bot. Flange (FS3 to FS5)	327.00	0.036	0.2173	6	638.94
Pier Bearing Stiffeners	24.17	0.026	0.0082	120	481.84
Jacking Stiffeners	19.67	0.026	0.0067	132	431.33
Intermediate Stiffeners	21.92	0.026	0.0074	6	21.85
Crossframe Connections	24.17	0.026	0.0082	516	2071.91
Abutment Stiffeners	24.17	0.026	0.0082	24	96.37
Intermediate Crossframes	16.93	0.026	0.0057	546	1536.17
Pier Crossframes	20.93	0.026	0.0071	25	86.95
RA Crossframes	30.00	0.026	0.0102	5	24.92
FA Crossframes	29.00	0.026	0.0098	5	24.09
				Subtotal =	**12603.58**

NORTHBOUND

Weld Location	Weld Length (FT)	Weld Size	Volume (CF)	#/Members	Total Weight (LBS)
Girders (remaining)	5279.25	0.026	1.7901	6	5262.92
Girders Bot. Flange (RA to FS3)	648.25	0.042	0.5627	6	1654.39
Girders Bot. Flange (FS3 to FS5)	360.00	0.036	0.2393	6	703.42
Pier Bearing Stiffeners	24.17	0.026	0.0082	120	481.84
Jacking Stiffeners	19.67	0.026	0.0067	132	431.33
Intermediate Stiffeners	21.92	0.026	0.0074	6	21.85
Crossframe Connections	24.17	0.026	0.0082	492	1975.54
Abutment Stiffeners	24.17	0.026	0.0082	24	96.37
Intermediate Crossframes	16.93	0.026	0.0057	87	244.77
Pier Crossframes	20.93	0.026	0.0071	25	86.95
RA Crossframes	30.00	0.026	0.0102	5	24.92
FA Crossframes	29.00	0.026	0.0098	5	24.09
				Subtotal =	**11008.39**

CROSSFRAMES

Total Weight = 1776817 LBS

SOUTHBOUND

Intermediate Crossframes (Pier Crossframes assumed to be similar)

	Unit Weight (LB/FT)(LB/FT^3)	Length (FT)/ Volume(FT^3)	Members/Frame	Number of Bays	# Frames/Bay	Total Weight (LBS)
Top Chord	33.5	13.25	1	5	91	201963.13
Diagonal	33.5	8.42	2	5	91	256805.64
Bottom Chord	33.5	13.33	1	5	91	203231.30
Gusset "A"	490	0.18	2	5	91	80262.00
Gusset "B"	490	0.11	2	5	91	50600.73
Welded conn.	490	0.37	1	5	91	82250.71
					Subtotal =	**875113.51**

End Crossframes

	Unit Weight (LBS/FT)	Length (FT)	Members/Frame	Number of Bays	# Frames/Bay	Total Weight (LBS)
Top Chord	73	12.74	1	5	2	9300.20
Diagonal	33.5	7.82	4	5	2	10484.16
Bottom Chord	33.5	12.94	1	5	2	4335.57
Vertical	33.5	7.21	1	5	2	2414.01
Gusset "C"	490	0.0619	2	5	2	606.18
Gusset "D"	490	0.1795	2	5	2	1759.49
Top outside welded conn.	490	0.2174	2	5	2	2130.23
Top middle welded conn.	490	0.0835	1	5	2	409.25
Bottom welded conn.	490	0.3668	1	5	2	1797.27
					Subtotal =	**33236.36**
					SB TOTAL (LBS) =	908349.87

NORTHBOUND

Intermediate Crossframes (Pier Crossframes assumed to be similar)

	Unit Weight (LBS/FT)	Weight (LBS)	Members/Frame	Number of Bays	# Frames/Bay	Total Weight (LBS)
Top Chord	33.5	13.25	1	5	87	193085.63
Diagonal	33.5	8.42	2	5	87	245400.90
Bottom Chord	33.5	13.33	1	5	87	194251.43
Gusset "A"	490	0.18	2	5	87	76734.00
Gusset "B"	490	0.11	2	5	87	46893.00
Welded conn.	490	0.37	1	5	87	78865.50
					Subtotal =	**835230.45**

End Crossframes

	Unit Weight (LBS/FT)	Length (FT)	Members/Frame	Number of Bays	# Frames/Bay	Total Weight (LBS)
Top Chord	73	12.74	1	5	2	9300.20
Diagonal	33.5	7.82	4	5	2	10484.16
Bottom Chord	33.5	12.94	1	5	2	4335.57
Vertical	33.5	7.21	1	5	2	2414.01
Gusset "C"	490	0.0619	2	5	2	606.18
Gusset "D"	490	0.1795	2	5	2	1759.49
Top outside welded conn.	490	0.2174	2	5	2	2130.23
Top middle welded conn.	490	0.0835	1	5	2	409.25
Bottom welded conn.	490	0.3668	1	5	2	1797.27
					Subtotal =	**33236.36**
					NB TOTAL (LBS) =	868466.81

CROSSFRAME BOLTS

Total Number =	**43960**	**BOLTS**
Total Weight =	**71215**	**LBS**

SB TOTAL BOLTS	**22420**	
SB TOTAL WEIGHT	**36320**	LBS
NB TOTAL BOLTS	**21540**	
NB TOTAL WEIGHT	**34895**	LBS

SOUTHBOUND

Crossframe Type	Number of Bolts/crossframe	Number of Crossframes/Bay	# of Bays	Total Number of Bolts
Intermediate	44	91	5	20020
Pier	44	5	5	1100
Rear Abutment	216	1	5	1080
Forward Abutment	44	1	5	220
			Subtotal =	**22420**

NORTHBOUND

Crossframe Type	Number of Bolts/crossframe	Number of Crossframes/Bay	# of Bays	Total Number of Bolts
Intermediate	44	87	5	19140
Pier	44	5	5	1100
Rear Abutment	216	1	5	1080
Forward Abutment	44	1	5	220
			Subtotal =	**21540**

STIFFENERS

Total Weight = 490366 LBS

*** At exterior girders**

SOUTHBOUND

Type/Location	Volume (CF)	Stiffeners/Girder	Number of Girders	Total Stiffeners	Total Weight (LBS)
Abutment Bearing	1.02	4	6	24	12045.83
Jacking	1.02	22	6	132	66252.08
Inter. Transverse	0.43	1	6	6	1254.77
Crossframe Conn.	0.43	86	6	516	107910.59
Pier Bearing	1.02	20	6	120	60229.17
				Subtotal =	**247692.45**

NORTHBOUND

Type/Location	Volume (CF)	Stiffeners/Girder	Number of Girders	Total Stiffeners	Total Weight (LBS)
Abutment Bearing	1.02	4	6	24	12045.83
Jacking	1.02	22	6	132	66252.08
Inter. Transverse	0.43	1	6	6	1254.77
Crossframe Conn.	0.43	82	6	492	102891.49
Pier Bearing	1.02	20	6	120	60229.17
				Subtotal =	**242673.35**

LATERAL BRACING

Total Weight =	329063	LBS
SB TOTAL		LBS
NB TOTAL		LBS

SOUTHBOUND

	Crossframe Spacing (FT)	Weight (LBS/FT)	Lateral Members Length (FT)	Total Lateral Members	Total Weight (LBS)
	13.75	38.50	15.96	57	35017.42
	15.00	38.50	18.45	4	2841.55
	21.25	38.50	22.38	5	4308.15
	22.19	38.50	23.20	11	9825.79
	23.50	38.50	24.36	6	5627.00
	24.17	38.50	24.79	6	5725.66
	25.00	38.50	28.50	7	7680.75
Temporary Bracing					
Top	15.00	44.50	21.27	16	15144.24
Bottom	15.00	44.50	21.27	20	18930.30
Top	24.17	44.50	28.49	24	30427.32
Bottom	24.17	44.50	28.49	30	38034.15
				Subtotal =	173562.32

NORTHBOUND

	Crossframe Spacing (FT)	Weight (LBS/FT)	Lateral Members Length (FT)	Total Lateral Members	Total Weight (LBS)
	13.75	38.50	15.96	42	25802.31
	15.00	38.50	18.45	8	5683.09
	21.25	38.50	22.38	7	6031.41
	22.67	38.50	23.62	6	5456.91
	23.50	38.50	24.36	5	4689.17
	23.75	38.50	24.58	11	10410.05
	24.17	38.50	24.79	8	7634.21
Temporary Bracing					
Top	24.17	44.50	24.79	24	26471.88
Bottom	24.17	44.50	24.79	30	33089.84
				Subtotal =	125268.87

SOUTHBOUND — **Gusset Plates**

Connection Type	Area (SF)	Thickness (FT)	Volume (CF)	# of Gusset Plates	Total Weight (LBS)
Type "A"	2.958	0.052	0.154	77	5813
Type "B"	2.279	0.052	0.119	97	5640
Abutment	2.550	0.052	0.133	12	781
				Subtotal =	**12234.90**

NORTHBOUND — **Gusset Plates**

Connection Type	Area (SF)	Thickness (FT)	Volume (CF)	# of Gusset Plates	Total Weight (LBS)
Type "A"	2.958	0.052	0.1540781	79	5964
Type "B"	2.279	0.052	0.1186719	50	2907
Abutment	2.550	0.052	0.1328333	12	781
				Subtotal =	**9652.89**

SOUTHBOUND — **Bolted Connections**

Connection Type	# of Bolts/Gusset Plate	# of Gusset Plates	Total Weight (LBS)
Type "A"	18.00	77	2024
Type "B"	17.00	97	2408
Abutment	17.00	12	298
		Subtotal =	**4728.94**

NORTHBOUND — **Bolted Connections**

Connection Type	# of Bolts/Gusset Plate	# of Gusset Plates	Total Weight (LBS)
Type "A"	18.00	79	2076
Type "B"	17.00	50	1241
Abutment	17.00	12	298
		Subtotal =	**3614.96**

FIELD SPLICES

Total Volume =	**1006.04**	**CF**
Total Weight =	**492958**	**LBS**

SOUTHBOUND

Top Flange	Volume (CF)	Number of Field Splices	Number of Splices/Field Splice Location	Total Volume (CF)
Outer	0.5642	17	6	57.55
Inner	0.5924	17	6	60.43
			SUB =	**117.98**

Bottom Flange	Volume (CF)	Number of Field Splices	Number of Splices/Field Splice Location	Total Volume (CF)
Outer	1.6168	17	6	164.91
Inner	1.7461	17	6	178.10
			SUB =	**343.01**

Web	Volume (CF)	Number of Field Splices	Number of Splices/Field Splice Location	Total Volume (CF)
Typical	0.5454	17	6	55.63
SB#17	0.5290	1	6	3.17
SB#6-7	0.7711	2	6	9.25
			SUB =	**58.81**
			SB TOTAL (LBS) =	**254702.05**

NORTHBOUND

Top Flange	Volume (CF)	Number of Field Splices	Number of Splices/Field Splice Location	Total Volume (CF)
Outer	0.5642	16	6	54.17
Inner	0.5924	16	6	56.88
			SUB =	**111.04**

Bottom Flange	Volume (CF)	Number of Field Splices	Number of Splices/Field Splice Location	Total Volume (CF)
Outer	1.6168	16	6	155.21
Inner	1.7461	16	6	167.63
			SUB =	**322.83**

Web	Volume (CF)	Number of Field Splices	Number of Splices/Field Splice Location	Total Volume (CF)
Typical	0.5454	16	6	52.36
			SUB =	**52.36**
			NB TOTAL (LBS) =	**238255.69**

FIELD SPLICE BOLTS

Total Number =	**94224**	**BOLTS**
Total Weight =	**152643**	**LBS**

SB TOTAL BOLTS	**49296**	
SB TOTAL WEIGHT	**79860**	LBS
NB TOTAL BOLTS	**44928**	
NB TOTAL WEIGHT	**72783**	LBS

SOUTHBOUND

Web	Number of Bolts/Field Splice	Number of Splices/Field Splice Location	# of Splices	Total Number of Bolts
Typical	132	6	15	11880
FS #6 and #7	198	6	2	2376
FS #17	128	6	1	768
			Subtotal =	**15024**

Top Splice	Number of Bolts/Field Splice	Number of Splices/Field Splice Location	# of Splices	Total Number of Bolts
Outer	60	6	17	6120
Inner	60	6	17	6120
			Subtotal =	**12240**

Bottom Splice	Number of Bolts/Field Splice	Number of Splices/Field Splice Location	# of Splices	Total Number of Bolts
Outer	108	6	17	11016
Inner	108	6	17	11016
			Subtotal =	**22032**

NORTHBOUND

Web	Number of Bolts/Field Splice	Number of Splices/Field Splice Location	# of Splices	Total Number of Bolts
Typical	132	6	16	12672
			Subtotal =	**12672**

Top Splice	Number of Bolts/Field Splice	Number of Splices/Field Splice Location	# of Splices	Total Number of Bolts
Outer	60	6	16	5760
Inner	60	6	16	5760
			Subtotal =	**11520**

Bottom Splice	Number of Bolts/Field Splice	Number of Splices/Field Splice Location	# of Splices	Total Number of Bolts
Outer	108	6	16	10368
Inner	108	6	16	10368
			Subtotal =	**20736**

FIELD SPLICE FILL PLATES

Total Volume =	60.58	CF
Total Weight =	29686	LBS

SOUTHBOUND

Top Flange

	Thickness (in)	Width (in)	Length (in)	Number	Volume (CF)
FS1	0.5000	24.0000	16.0000	6.00	0.67
FS4	0.5000	24.0000	16.0000	6.00	0.67
FS6	1.2500	24.0000	16.0000	6.00	1.67
FS7	1.2500	24.0000	16.0000	6.00	1.67
FS10	0.2500	24.0000	16.0000	6.00	0.33
FS11	0.2500	24.0000	16.0000	6.00	0.33
FS12	0.7500	24.0000	16.0000	6.00	1.00
FS13	0.2500	24.0000	16.0000	6.00	0.33
FS14	0.2500	24.0000	16.0000	6.00	0.33
FS15	0.2500	24.0000	16.0000	6.00	0.33
FS16	0.2500	24.0000	16.0000	6.00	0.33
				Subtotal Volume =	7.67

Bottom Flange

	Thickness (in)	Width (in)	Length (in)	Number	Volume (CF)
FS2	1.0000	30.0000	37.0000	6.00	3.85
FS4	1.0000	30.0000	37.0000	6.00	3.85
FS5	0.2500	30.0000	37.0000	6.00	0.96
FS6	1.2500	30.0000	37.0000	6.00	4.82
FS7	1.2500	30.0000	37.0000	6.00	4.82
FS10	0.5000	30.0000	37.0000	6.00	1.93
FS11	0.2500	30.0000	37.0000	6.00	0.96
FS12	0.2500	30.0000	37.0000	6.00	0.96
				Subtotal Volume =	22.16
				TOTAL (LBS) =	14615.78125

NORTHBOUND

Top Flange

	Thickness (in)	Width (in)	Length (in)	Number	Volume (CF)
FS1	0.5000	24.0000	16.0000	6.00	0.67
FS3	0.5000	24.0000	16.0000	6.00	0.67
FS5	1.2500	24.0000	16.0000	6.00	1.67
FS6	1.2500	24.0000	16.0000	6.00	1.67
FS11	0.2500	24.0000	16.0000	6.00	0.33
FS12	0.5000	24.0000	16.0000	6.00	0.67
FS14	0.2500	24.0000	16.0000	6.00	0.33
FS15	0.2500	24.0000	16.0000	6.00	0.33
FS16	0.2500	24.0000	16.0000	6.00	0.33
				Subtotal Volume =	6.67

Bottom Flange

	Thickness (in)	Width (in)	Length (in)	Number	Volume (CF)
FS1	0.5000	30.0000	37.0000	6.00	1.93
FS2	0.2500	30.0000	37.0000	6.00	0.96
FS3	1.0000	30.0000	37.0000	6.00	3.85
FS5	1.5000	30.0000	37.0000	6.00	5.78
FS6	1.5000	30.0000	37.0000	6.00	5.78
FS8	0.2500	30.0000	37.0000	6.00	0.96
FS9	0.2500	30.0000	37.0000	6.00	0.96
FS11	0.5000	30.0000	37.0000	6.00	1.93
FS12	0.5000	30.0000	37.0000	6.00	1.93
				Subtotal Volume =	24.09
				TOTAL (LBS) =	15070.05208

MISCELLANEOUS STEEL COMPONENTS

Total Weight = 87298 LBS

SOUTHBOUND — **Bumper Attachment**

Type	Length (FT)	Volume (CF)	#/Girder	# of Girders	Total Weight (LBS)
Bumper (L8X6X1)	0.92	-	2	6	486.20
8" x 1/2" Stiffener	0.58	0.0162	4	6	190.56
				Subtotal =	**676.76**

NORTHBOUND — **Bumper Attachment**

Type	Length (FT)	Weight (LBS)	#/Girder	# of Girders	Total Weight (LBS)
Bumper (L8X6X1)	0.92	-	2	6	486.20
8" x 1/2" Stiffener	0.58	0.0162	4	6	190.56
				Subtotal =	**676.76**

SOUTHBOUND — **Aesthetic Lighting Attachment**

Type	Length (FT)	Volume (CF)	#/Girder	# of Girders	Total Weight (LBS)
Lighting (L6X6X1/2)	1.167	-	5	6.00	686.20
				Subtotal =	**686.20**

NORTHBOUND — **Aesthetic Lighting Attachment**

Type	Length (FT)	Volume (CF)	#/Girder	# of Girders	Total Weight (LBS)
Lighting (L6X6X1/2)	1.167	-	5	6.00	686.20
				Subtotal =	**686.20**

SOUTHBOUND — **Handhold Bar**

Type	Length (FT)	Weight (LBS/FT)	# of runs		Total Weight (LBS)
1" dia. Handhold bar	1599.500	2.67	10		42706.65
				Subtotal =	**42706.65**

NORTHBOUND — **Handhold Bar**

Type	Length (FT)	Weight (LBS/FT)	#/Girder		Total Weight (LBS)
1" dia. Handhold bar	1568.000	2.67	10		41865.60
				Subtotal =	**41865.60**