

# STRUCTURE ESTIMATED QUANTITIES

**Bridge No. FRA-70-1321A  
Over The Scioto River**

**FRA-70/71-12.68/14.86  
PID No. 105523**

**Franklin County, Ohio**

**Prepared For:**

**The Ohio Department of Transportation  
District 6**



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**May 31, 2019**

Project: FRANKLIN COUNTY - 1321A Design: RFV  
Subject: Estimated Quantities - Stage 3 Design Check: TJW  
Date: 5/31/2019

**ITEM 503 - COFFERDAMS AND EXCAVATION BRACING, AS PER PLAN**

**Lump Sum**

**ITEM 503 - UNCLASSIFIED EXCAVATION**

Forward Abutment:  
area = 1182.00 sf  
avg. top elevation = 733.00 ft  
bot. elevation = 715.50 ft  
  
Total = 767 cy

**ITEM 503 - PILE DRIVING EQUIPMENT MOBILIZATION**

**Lump Sum**

**ITEM 505 - STEEL PILES HP10X42, FURNISHED**

Forward Abutment = 27.00 piles  
Length = 65.00 ft  
Furnished Length = 5.00 ft  
  
Total = 1890 ft

**ITEM 505 - STEEL PILES HP10X42, DRIVEN**

Total = 1755 ft

**ITEM 507 - STEEL POINTS OR SHOES**

Total = 27 each

**ITEM 509 - EPOXY COATED REINFORCING STEEL**

Slab = 560,087 lbs  
Deck End = 7,871 lbs  
Deck Railing = 54,747 lbs  
Abutments = 23,737 lbs  
Pier = 222,123 lbs  
  
Total = 868,565 lbs

**ITEM 511 - CLASS QC2 CONCRETE, BRIDGE DECK, AS PER PLAN**

**Deck:**  
thickness = 9.5 in  
area = 67999.0 sf, cadd area  
deck volume = 53833 cf

**End Haunch:**  
*Pier A*  
x-sectional area = 6.78 sf, below main deck thickness  
length = 121.87 ft

*Forward Abutment*

x-sectional area = 6.16 sf, below main deck thickness  
length = 92.03 ft

*End Haunch Volume = 1393 cf*

**Girder Haunch:**

top/deck to top/web= 13.5 in 0.806 sf gross interior haunch area incl. top flange  
t/flange width = 20 in 1.646 sf gross exterior haunch area incl. top flange  
haunch thick. = 2 in  
avg. t/flange thick. = 1.36 in 4143.3 cf gross interior haunch  
total length int. beams 5143.36 ft 3388.6 cf gross exterior haunch  
total length ext. beams 2058.90 ft 1360.4 cf embedded top flange plates  
overhang width = 3.73 ft 17.9 cf embedded top flange splice plates  
**6153.5 cf total net girder haunch volume**

**Total = 2,274 cy**

**ITEM 511 - CLASS QC2 CONCRETE, BRIDGE DECK (PARAPET)**

	area (sf)	length (ft)	total (cf)
left parapet	4.08	1036.00	4226.88
right parapet	4.08	1026.33	4187.44
gore sloped	4.08	25.23	102.94
gore non-sloped	5.25	12.34	64.79

sign support 94.17 cf  
pilasters 119.47 cf

**Total = 326 cy**

**ITEM 511 - CLASS QC1 CONCRETE, ABUTMENT INCLUDING FOOTING**

Skew angle = 52.07 degrees

**Forward Abutment**

*Beam Seat*

beam seat area (plan) = 648.45 sf (cad)  
avg. beam seat height = 3.41 ft  
footing key = 42.70 cf  
*Beam Seat Volume = 2168.15 cf*

*Backwall*

backwall area = 794.89 sf (cad) \*average between front and back  
backwall thickness = 2.25 ft  
approach slab thickness = 1.42 ft  
approach slab length = 86.62 ft  
utility opening = 10.94 cf  
*Back Wall Volume = 1716.22 cf*

*Left Forward Wingwall*

face area = 206.47 sf \*average between front and back  
thickness = 1.50 ft  
footing key = 1.71 cf  
extension length = 6.98 ft \*average between front and back  
extension height = 6.40 ft  
extension thickness = 0.83 ft  
parapet transition volume = 49.14 cf  
parapet area = 4.08 sf  
parapet length = 7.00 ft  
*Left Forward WW Volume = 422.91 cf*

*Rigth Forward Wingwall*

face area =	175.92 sf	*average between front and back
thickness =	1.50 ft	
footing key =	1.53 cf	
extension length =	5.35 ft	*average between front and back
extension height =	6.44 ft	
extension thickness =	0.83 ft	
parapet transition volume =	49.14 cf	
parapet area =	4.08 sf	
parapet length =	7.00 ft	
<i>Right Forward WW Volume =</i>	<i>368.77 cf</i>	

*Footing*

plan area =	942.63 sf
height =	3.00 ft
footing key =	2.25 sf
key length =	133.72 ft
<i>Footing Volume =</i>	<i>3128.75 cf</i>

**Total = 289 cy**

**ITEM 511 - CLASS QC4 MASS CONCRETE, SUBSTRUCTURE WITH QC/QA**

**Pier A:**

front face area =	1204.98 sf	33.7 sf at	3.25 ft
width =	4.25 ft	200.3 sf at	4.25 ft
back face area =	1040.48 sf	1003.5 sf at	7.50 ft
width =	3.25 ft		
no. columns =	6	8487.05 cf cap	
column diameter =	5.00 ft	2250.17 cf col's	
column length =	19.1 ft	16.65 cf ped's	
volume of pedestal =	8.32 cf		
no. pedestals =	2		
<i>Pier A Volume =</i>	<i>10769.56 cf</i>	10753.86 cf	same !

**Pier 1:**

front face area =	786.38 sf
width =	5.50 ft
no. columns =	4
column diameter =	5.00 ft
column length =	32.21 ft
<i>Pier 1 Volume =</i>	<i>6854.87 cf</i>

**Pier 2:**

front face area =	685.93 sf
width =	5.50 ft
no. columns =	4
column diameter =	5.00 ft
column length =	23.22 ft
<i>Pier 2 Volume =</i>	<i>5596.31 cf</i>

**Pier 3:**

front face area =	674.92 sf
width =	5.50 ft
no. columns =	4
column diameter =	5.00 ft
column length =	18.3 ft
<i>Pier 3 Volume =</i>	<i>5149.31 cf</i>

**Pier 4:**  
front face area = 727.05 sf  
width = 5.50 ft  
no. columns = 4  
column diameter = 5.50 ft  
column length = 10.57 ft  
Pier 4 Volume = 5003.29 cf

**Total = 1237 cy**

**ITEM 512 - SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)**

**Pier A:**  
front face perimeter = 276.91 ft 1238.0 sf cap elev.  
width = 4.25 ft 30 sf cap north end elev.  
front face area = 1204.98 sf 61.19 sf cap north end elev.  
back face perimeter = 267.58 ft 943.0469 sf cap top  
width = 3.25 sf 825.2372 sf cap bottom  
back face area = 1040.48 sf  
cap area = 4174.17 sf 4335.474 sf total cap 103.9% say Ok  
no. columns = 6  
column diameter = 5 ft  
column length = 17.1 ft  
column area = 1611.64 sf  
Pier A Area = 5785.80 sf

**Pier 1:**  
cap perimeter 195.92 ft  
width = 5.50 ft  
face area = 786.38 sf  
cap area = 2571.80 sf  
no. columns = 4  
column diameter = 5.00 ft  
column length = 32.21 ft  
column area = 2023.814 sf  
Pier 1 Area = 4595.62 sf

**Pier 2:**  
cap perimeter 178.98 ft  
width = 5.50 ft  
face area = 685.93 sf  
cap area = 2277.73 sf  
no. columns = 4  
column diameter = 5.00 ft  
column length = 23.22 ft  
column area = 1458.956 sf  
Pier 2 Area = 3736.69 sf

**Pier 3:**  
cap perimeter 184.72 ft  
width = 5.50 ft  
face area = 685.93 sf  
cap area = 2309.29 sf  
no. columns = 4  
column diameter = 5.00 ft  
column length = 18.30 ft  
column area = 1149.823 sf  
Pier 3 Area = 3459.11 sf

**Pier 4:**

cap perimeter = 205.02 ft  
width = 5.50 ft  
face area = 727.05 sf  
cap area = 2486.70 sf  
no. columns = 4  
column diameter = 5.50 ft  
column length = 10.57 ft  
column area = 730.546 sf  
Pier 4 Area = 3217.25 sf

**Forward Abutment:**

backwall area = 989.68 sf \*includes end face of parapet  
beam seat area = 443.21 sf  
left forward ww area = 188.39 sf  
end face extension area = 13.39 sf  
parapet area = 90.41 sf  
right forward ww area = 168.31 sf  
end face extension area = 10.59 sf  
parapet area = 90.41 sf  
Forward Abutment Area = 1994.37 sf

**Superstructure:**

Parapet/Deck sealed perimeter = 9.64 ft  
Left Parapet Lenth = 1036.00 ft  
Right Parapet Lenth = 1026.33 ft  
  
Sloped gore parapet perimeter = 7.89 ft  
Sloped gore parapet length = 25.23 ft  
Straight gore parapet perimeter = 8.50 ft  
Straight gore parapet length = 12.34 ft  
Superstructure Area = 20191.03 sf

Abutment = [222 sy](#)  
Pier = [2311 sy](#)  
Super. = [2244 sy](#)

**ITEM 513 - STRUCTURAL STEEL MEMBERS, LEVEL 5**

From Steel Spreadsheet Total = [2,352,904 lbs](#)

**ITEM 513 - STRUCTURAL STEEL MEMBERS, HYBRID GIRDER, LEVEL 6 FABRICATION, AS PER PLAN**

From Steel Spreadsheet Total = [1,495,251 lbs](#)

**ITEM 513 - STRUCTURAL STEEL MEMBERS, MODULAR EXPANSION JOINT, LEVEL UF, AS PER PLAN**

forward abutment = 89.54 ft  
ramp A5 = 38.95 ft  
ramp C5 = 33.69 ft

Total = [163 ft](#)

**ITEM 513 - WELDED STUD SHEAR CONNECTORS**

From Stud Spreadsheet Total = [27,788 each](#)

**ITEM 513 - STRUCTURAL STEEL, MISC.: PARAPET SLIDING PLATE JOINT**

pier a = 4 ea Future ramp sliding plates (2 each) not included, for reference only  
forward abutment = 2 ea  
**Total = 6 each**

**ITEM 514 - FIELD PAINTING STRUCTURAL STEEL, INTERMEDIATE COAT**  
**ITEM 514 - FIELD PAINTING STRUCTURAL STEEL, FINISH COAT**

girder perimeter 237.00 in use 2 x beam depth + 3 x flange width per CMS  
length = 10.00 ft  
no. of girders ends = 16  
crossframe factor = 1.10  
**Total = 3,476 sf**

**ITEM 514 - FINAL INSPECTION REPAIR**

Painted length of beam/flange 160.00 ft  
No. of painted x-frames 22.00 each  
**Total = 3 each**

**ITEM 516 - ELASTOMERIC BEARING WITH INTERNAL LAMINATES & LOAD PLATE (NEOPRENE)  
AS PER PLAN (1'-5" DIA.) (PTFE)**

pier a = 10 ea  
**Total = 10 each**

**ITEM 516 - ELASTOMERIC BEARING WITH INTERNAL LAMINATES & LOAD PLATE (NEOPRENE)  
AS PER PLAN (1'-6.5" DIA.) (PTFE)**

forward abutment = 6 ea  
**Total = 6 each**

**ITEM 518 - SCUPPER, INCLUDING SUPPORTS, AS PER PLAN**

**Total = 8 each**

**ITEM 518 - POROUS BACKFILL WITH GEOTEXTILE FABRIC**

**Forward Abutment:**  
avg. top of backwall = 730.73  
top of footing = 718.50  
height = 10.31 ft  
length = 106.00 ft  
thickness = 2.00 ft  
**Forward Abutment Subtotal = 2,186 cf**  
**Total = 81 cy**

**ITEM 518 - 6" PERFORATED CORRUGATED PLASTIC PIPE**

length = 100.00 ft  
**Total = 100 ft**

**ITEM 518 - 6" NON-PERFORATED CORRUGATED PLASTIC PIPE**

length = 30 ft  
Total = 30 ft

**ITEM 518 - PIPE DOWNSPOUT, INCLUDING SPECIALS, AS PER PLAN**

length = 60 ft  
Total = 60 ft

**ITEM 518 - PIPE HORIZONTAL CONDUCTOR, AS PER PLAN**

length = 15 ft  
Total = 15 ft

**ITEM 524 - DRILLED SHAFTS, 60" DIAMETER, INTO BEDROCK**

pier A socket length = 9 ft  
no. of sockets = 6  
pier 2 socket length = 4.25 ft  
no. of sockets = 4  
pier 3 socket length = 9 ft  
no. of sockets = 4  
Total = 107 ft

**ITEM 524 - DRILLED SHAFTS, 66" DIAMETER, ABOVE BEDROCK, AS PER PLAN, PIER 4**

pier 4 shaft length = 58.7 ft  
no. of shafts = 4  
Total = 235 ft

**ITEM 524 - DRILLED SHAFTS, 66" DIAMETER, ABOVE BEDROCK, AS PER PLAN**

pier a shaft length = 66.7 ft  
no. of shafts = 6  
pier 2 shaft length = 49.8 ft  
no. of shafts = 4  
pier 3 shaft length = 53.4 ft  
no. of shafts = 4  
Total = 814 ft

**ITEM 524 - DRILLED SHAFTS, 66" DIAMETER, INTO BEDROCK**

pier 1 socket length = 9 ft  
no. of sockets = 4 ft  
Total = 36 ft

**ITEM 524 - DRILLED SHAFTS, 72" DIAMETER, ABOVE BEDROCK**

pier 1 shaft length = 45.5 ft  
no. of drilled shafts = 4  
Total = 182 ft



**ITEM 526 - REINFORCED CONCRETE APPROACH SLAB, T=17", AS PER PLAN**

area = 1674.38 sf

Total = 187 sy

**ITEM 526 - TYPE A INSTALLATION**

length = 84.81 ft

Total = 85 ft

**ITEM 601 - CONCRETE SLOPE PROTECTION**

forward abutment area = 7674.00 sf (measured to 3' outside and parallel to both deck edges)

slope factor = 1.02

Total = 870 sy

**ITEM 601 - ROCK CHANNEL PROTECTION, TYPE B WITH GEOTEXTILE FILTER**

pier a area = 9890.3 sf

pier 4 area = 2344.0 sf (measured to 3' outside and parallel to both deck edges)

thickness = 2.50 ft

slope factor = 1.05

Total = 1190 cy

**ITEM 869 - HIGH LOAD MULTI-ROTATIONAL (HLMR) BEARINGS, AS PER PLAN**

pier 1 = 9 ea

pier 2 = 7 ea

pier 3 = 6 ea

pier 4 = 6 ea

Total = 28 each



Girder 5	Web							Top Flange							Bottom Flange							GR. 50W Steel Weight (lbs)	GR. 70W Steel Weight (lbs)
	Depth (in)	Thickness (in)	Area (in <sup>2</sup> )	Weight (plf)	Length (ft)	Qty.	Weight (lbs)	Width (in)	Thickness (in)	Area (in <sup>2</sup> )	Weight (plf)	Length (ft)	Qty.	Weight (lbs)	Width (in)	Thickness (in)	Area (in <sup>2</sup> )	Weight (plf)	Length (ft)	Qty.	Weight (lbs)		
Pier A to FS No. 1	87	0.6875	59.81	203.53	132.59	1	26,985.57	20	1	20.00	68.06	132.59	1	9,023.39	20	1.5	30.00	102.08	132.59	1	13,535.08	49,544.03	0.00
FS No. 1 to FS No. 2	87	0.6875	59.81	203.53	100.20	1	20,393.15	20	1.875	37.50	127.60	100.20	1	12,785.67	27	1.875	50.63	172.27	100.20	1	17,260.66	0.00	50,439.47
FS No. 2 to FS No. 3	87	0.6875	59.81	203.53	103.80	1	21,125.64	20	1	20.00	68.06	103.80	1	7,063.95	20	1.375	27.50	93.58	103.80	1	9,712.94	37,902.53	0.00
FS No. 3 to FS No. 4	87	0.6875	59.81	203.53	109.73	1	22,334.09	20	1.875	37.50	127.60	109.73	1	14,002.56	27	1.875	50.63	172.27	109.73	1	18,903.46	0.00	55,240.11
FS No. 4 to FS No. 5	87	0.6875	59.81	203.53	124.28	1	25,293.73	20	1	20.00	68.06	124.28	1	8,457.68	20	1.5	30.00	102.08	124.28	1	12,686.51	46,437.92	0.00
FS No. 5 to FS No. 6	87	0.6875	59.81	203.53	113.33	1	23,065.52	20	1.875	37.50	127.60	113.33	1	14,461.14	29	1.875	54.38	185.03	113.33	1	20,968.65	0.00	58,495.32
FS No. 6 to FS No. 7	87	0.6875	59.81	203.53	107.16	1	21,809.37	20	1	20.00	68.06	107.16	1	7,292.58	20	1.375	27.50	93.58	107.16	1	10,027.29	39,129.24	0.00
FS No. 7 to FS No. 8	87	0.6875	59.81	203.53	106.46	1	21,668.38	20	1.875	37.50	127.60	106.46	1	13,585.19	29	1.875	54.38	185.03	106.46	1	19,698.53	0.00	54,952.10
FS No. 8 to Frwd. Abutment	87	0.6875	59.81	203.53	133.99	1	27,270.72	20	1	20.00	68.06	133.99	1	9,118.74	20	1.5	30.00	102.08	133.99	1	13,678.10	50,067.56	0.00

Girder 6	Web							Top Flange							Bottom Flange							GR. 50W Steel Weight (lbs)	GR. 70W Steel Weight (lbs)
	Depth (in)	Thickness (in)	Area (in <sup>2</sup> )	Weight (plf)	Length (ft)	Qty.	Weight (lbs)	Width (in)	Thickness (in)	Area (in <sup>2</sup> )	Weight (plf)	Length (ft)	Qty.	Weight (lbs)	Width (in)	Thickness (in)	Area (in <sup>2</sup> )	Weight (plf)	Length (ft)	Qty.	Weight (lbs)		
Pier A to FS No. 1	87	0.6875	59.81	203.53	131.79	1	26,823.38	20	1	20.00	68.06	131.79	1	8,969.16	20	1.5	30.00	102.08	131.79	1	13,453.73	49,246.27	0.00
FS No. 1 to FS No. 2	87	0.6875	59.81	203.53	100.34	1	20,422.83	20	1.875	37.50	127.60	100.34	1	12,804.28	27	1.875	50.63	172.27	100.34	1	17,285.78	0.00	50,512.89
FS No. 2 to FS No. 3	87	0.6875	59.81	203.53	98.81	1	20,111.17	20	1	20.00	68.06	98.81	1	6,724.74	20	1.375	27.50	93.58	98.81	1	9,246.52	36,082.43	0.00
FS No. 3 to FS No. 4	87	0.6875	59.81	203.53	112.98	1	22,995.56	20	1.875	37.50	127.60	112.98	1	14,417.28	27	1.875	50.63	172.27	112.98	1	19,463.32	0.00	56,876.16
FS No. 4 to FS No. 5	87	0.6875	59.81	203.53	118.70	1	24,158.43	20	1	20.00	68.06	118.70	1	8,078.05	20	1.5	30.00	102.08	118.70	1	12,117.08	44,353.56	0.00
FS No. 5 to FS No. 6	87	0.6875	59.81	203.53	121.41	1	24,710.71	20	1.875	37.50	127.60	121.41	1	15,492.61	29	1.875	54.38	185.03	121.41	1	22,464.28	0.00	62,667.60
FS No. 6 to FS No. 7	87	0.6875	59.81	203.53	100.47	1	20,449.33	20	1	20.00	68.06	100.47	1	6,837.81	20	1.375	27.50	93.58	100.47	1	9,401.99	36,689.13	0.00
FS No. 7 to FS No. 8	87	0.6875	59.81	203.53	106.46	1	21,668.38	20	1.875	37.50	127.60	106.46	1	13,585.19	29	1.875	54.38	185.03	106.46	1	19,698.53	0.00	54,952.10
FS No. 8 to Frwd. Abutment	87	0.6875	59.81	203.53	134.48	1	27,370.36	20	1	20.00	68.06	134.48	1	9,152.05	20	1.5	30.00	102.08	134.48	1	13,728.08	50,250.50	0.00

Girder End Diaphragms	Web							Top Flange							Bottom Flange							GR. 50W Steel Weight (lbs)
	Depth (in)	Thickness (in)	Area (in <sup>2</sup> )	Weight (plf)	Length (ft)	Qty.	Weight (lbs)	Width (in)	Thickness (in)	Area (in <sup>2</sup> )	Weight (plf)	Length (ft)	Qty.	Weight (lbs)	Width (in)	Thickness (in)	Area (in <sup>2</sup> )	Weight (plf)	Length (ft)	Qty.	Weight (lbs)	
Girder 3A	87	0.6875	59.81	203.53	11.83	1	2,408.42	18	1	18.00	61.25	10.83	1	663.54	18	1	18.00	61.25	10.83	1	663.54	3,735.51
Girder 3B	87	0.6875	59.81	203.53	10.89	1	2,215.49	18	1	18.00	61.25	9.89	1	605.48	18	1	18.00	61.25	9.89	1	605.48	3,426.46
Girder 3C	87	0.6875	59.81	203.53	10.96	1	2,230.33	18	1	18.00	61.25	9.96	1	609.95	18	1	18.00	61.25	9.96	1	609.95	3,450.23
Girder 4A	87	0.6875	59.81	203.53	10.65	1	2,166.73	18	1	18.00	61.25	9.65	1	590.81	18	1	18.00	61.25	9.65	1	590.81	3,348.35

Girder End Diaphragm Connection Material	Qty.	Unit	Weight / Unit	No. per End Diaphragm	No. of End Diaphragms	Weight (lbs)
L 5x5x1/2", 7'-1" Long	7.08	ft	16.2	2	4	918.00
PL 3/4"x7"x7'-3"	0.26	ft <sup>2</sup>	490	3	4	1,547.84
1" Dia. Bolts/Washers/Nuts	1	Each	1.09	107	4	466.52

Note: Bolt weight is based upon 1.5" long, 1" Dia. High Strength Bolts per AISC Table 7-18. Grip subtracted, since bolt hole areas weren't removed from plates

Welds	Fillet Weld Size (in)	Weight (plf)	Total Girder Length (ft)	Total Weight (lbs)
All Girder Welds	0.3125	0.66	7,206.26	4,789.32

Bearing Stiffeners	Depth (in)	Thickness (in)	Width (in)	Area (in <sup>2</sup> )	Clip Deduct (in <sup>2</sup> )	Qty.	Volume (in <sup>3</sup> )	Weight (lbs)
Pier A	87	1	Avg. = 9.65	839.55	2.50	20	837.05	4,747.16
Pier 1	87	1.125	10.50	913.50	2.50	18	1024.88	5,231.13
Pier 2	87	1.125	10.50	913.50	2.50	14	1024.88	4,068.66
Pier 3	87	1.125	10.50	913.50	2.50	12	1024.88	3,487.42
Pier 4	87	1.125	10.50	913.50	2.50	12	1024.88	3,487.42
Forward Abutment	87	0.875	9.00	783.00	2.50	12	682.94	2,323.88

Jacking Stiffeners	Depth (in)	Thickness (in)	Width (in)	Area (in <sup>2</sup> )	Clip Deduct (in <sup>2</sup> )	Qty.	Volume (in <sup>3</sup> )	Weight (lbs)
				0.00			0.00	0.00
Pier 1	87	1.00	9.00	783.00	2.50	36	780.50	7,967.60
Pier 2	87	1.00	9.00	783.00	2.50	28	780.50	6,197.03
Pier 3	87	1.00	9.00	783.00	2.50	24	780.50	5,311.74
Pier 4	87	1.00	9.00	783.00	2.50	24	780.50	5,311.74
				0.00			0.00	0.00

Intermediate Stiffeners	Depth (in)	Thickness (in)	Width (in)	Area (in <sup>2</sup> )	Clip Deduct (in <sup>2</sup> )	Qty.	Volume (in <sup>3</sup> )	Weight (lbs)
Interior	87	0.625	8.00	696.00	2.50	145	433.44	17,821.61
Exterior	87	0.625	8.50	739.50	2.50	47	460.63	6,139.00

Splice Plates	Width (in)	Thickness (in)	Area (in <sup>2</sup> )	Weight (plf)	Length (ft)	Qty.	Weight (lbs)
Top Flange Splice Plate - Top	19	0.625	11.88	40.41	4.10	53	8,789.58
Top Flange Splice Plate - Bottom	8.5	0.6875	5.84	19.88	4.10	53	4,325.40
Web Plates	17.25	0.6875	11.86	40.35	6.73	53	14,392.38
Bottom Flange Plates - Top	8.5	1	8.50	28.92	4.10	53	6,291.49
Bottom Flange Plates - Bottom	19	0.875	16.63	56.57	4.10	53	12,305.41
Fill Plates - Top Flange	19	Avg. = 0.88	16.63	56.57	2.04	53	6,121.47
Fill Plate - Bottom Flange	19	Avg. = 0.69	13.06	44.45	2.04	53	4,809.73

For Concrete Deck Quantity	
Top Flange Splice Plate Volume =	17.94 CF

Splice Bolts	Qty.	Unit	Weight / Unit	No. per Splice	No. of Splices	Weight (lbs)
1 1/8" Dia. Bolts/Washers/Nuts	1	Each	1.54	180	53	14,691.60

Note: Bolt weight is based upon 1.75" long, 1.125" Dia. High Strength Bolts per AISC Table 7-18. Grip subtracted, since bolt hole areas weren't removed from plates

End Cross Frames	Qty.	Unit	Weight / Unit	No. per End Cross	No. of End Cross Frames	Weight (lbs)
MC12X45	Avg. = 13.84	ft	45	1	14	8,719.20
L 6X6X3/8" - Diagonal	Avg. = 6.62	ft	14.9	4	14	5,523.73
L 6X6X3/8" - Vertical	Avg. = 4.21	ft	14.9	1	13	815.48
WT6X17.5	Avg. = 13.84	ft	17.5	1	14	3,390.80
Connection Plates	Avg. = 0.12	ft <sup>3</sup>	490	8	14	6,585.60

Type 1A Cross Frames	Qty.	Unit	Weight / Unit	No. per Cross	No. of Cross Frames	Weight (lbs)
WT6X17.5 - Horizontal	Avg. = 10.16	ft	17.5	2	245	87,122.00
WT6X17.5 - Diagonal	Avg. = 7.98	ft	17.5	2	245	68,400.82
Stiffener Plates	0.28	ft <sup>3</sup>	490	2	245	67,228.00
Connection Plates	Avg. = 0.08	ft <sup>3</sup>	490	5	245	48,020.00
1" Dia. Bolts/Washers/Nuts	1	Each	1.09	32	245	8,545.60

Type 1B Cross Frames	Qty.	Unit	Weight / Unit	No. per Cross	No. of Cross Frames	Weight (lbs)
WT6X17.5 - Horizontal	Avg. = 10.37	ft	17.5	1	61	11,069.98
2-L 8X8X1" - Horizontal	Avg. = 10.37	ft	102.6	1	61	64,901.68
WT9X35.5 - Diagonal	Avg. = 7.63	ft	35.5	2	61	33,053.28
Stiffener Plates	0.28	ft <sup>3</sup>	490	2	61	16,738.40
Connection Plates	Avg. = 0.13	ft <sup>3</sup>	490	5	61	19,428.50
1" Dia. Bolts/Washers/Nuts	1	Each	1.09	52	61	3,457.48

Type 1A Utility Cross Frames	Qty.	Unit	Weight / Unit	No. per Cross	No. of Cross Frames	Weight (lbs)
WT6X25 - Top Horizontal	Avg. = 10.37	ft	25	1	55	14,258.75
WT6X17.5 - Horizontal	Avg. = 10.37	ft	17.5	1	55	19,962.25
WT6X17.5 - Diagonal	Avg. = 10.37	ft	17.5	2	55	19,962.25
L6X4X1/2" LLH Utility	2.50	ft	16	1	55	2,200.00
Stiffener Plates	0.28	ft <sup>3</sup>	490	2	55	15,092.00
Connection Plates	Avg. = 0.08	ft <sup>3</sup>	490	5	55	10,780.00
1" Dia. Bolts/Washers/Nuts	1	Each	1.09	32	55	1,918.40

Type 1B Utility Cross Frames	Qty.	Unit	Weight / Unit	No. per Cross	No. of Cross Frames	Weight (lbs)
WT6X25 - Horizontal	Avg. = 10.38	ft	25	1	9	2,335.50
2-L 8X8X1" - Horizontal	Avg. = 10.38	ft	102.6	1	9	9,584.89
WT9X35.5 - Diagonal	Avg. = 7.64	ft	35.5	2	9	4,878.89
L6X4X1/2" LLH Utility	2.50	ft	16	1	9	360.00
Stiffener Plates	0.28	ft <sup>3</sup>	490	2	9	2,469.60
Connection Plates	Avg. = 0.13	ft <sup>3</sup>	490	5	9	2,866.50
1" Dia. Bolts/Washers/Nuts	1	Each	1.09	52	9	510.12

Type 2A Cross Frames	Qty.	Unit	Weight / Unit	No. per End Cross	No. of Cross Frames	Weight (lbs)
WT6X17.5 - Horizontal	Avg. = 6.23	ft	17.5	2	32	6,977.60
WT6X17.5 - Diagonal	Avg. = 6.89	ft	17.5	2	32	7,721.16
Stiffener Plates	0.28	ft <sup>3</sup>	490	2	32	8,780.80
Connection Plates	Avg. = 0.10	ft <sup>3</sup>	490	4	32	6,272.00
1" Dia. Bolts/Washers/Nuts	1	Each	1.09	44	32	1,534.72

Type 2B Cross Frames	Qty.	Unit	Weight / Unit	No. per Cross	No. of Cross Frames	Weight (lbs)
WT6X17.5 - Horizontal	Avg. = 6.37	ft	17.5	1	21	2,340.98
2- L6X6X5/8" - Horizontal	Avg. = 6.37	ft	48.6	1	21	6,501.22
WT6X17.5 - Diagonal	Avg. = 6.93	ft	17.5	2	21	5,090.46
Stiffener Plates	0.28	ft <sup>3</sup>	490	2	21	5,762.40
Connection Plates	Avg. = 0.10	ft <sup>3</sup>	490	4	21	4,116.00
1" Dia. Bolts/Washers/Nuts	1	Each	1.09	44	21	1,007.16

Additional	Qty.	Unit	Weight / Unit	No. per Location	No. Locations	Weight (lbs)
Supplemental DOP WT6X25	10.38	ft	25	1	1	259.38
DOP Pullbox Support (2)WT6X25	Avg. = 10.38	ft	25	2	1	519.00
Drain. Hanger Stiff. (2)5/8x8.75"	0.28	ft <sup>3</sup>	490	2	1	274.40

Sign Support	Qty.	Unit	Weight / Unit	No. per Location	No. Locations	Weight (lbs)
WT15X86.5 - Horizontal	4.90	ft	86.5	1	4	1,693.99
L 6x6x1/2 - Diagonal	7.00	ft	19.6	1	4	548.80
Stiffener Plates	0.28	ft <sup>3</sup>	490	1	4	548.80
Connection Plates	0.10	ft <sup>3</sup>	490	1	4	193.06
1" Dia. Bolts/Washers/Nuts	1	Each	1.09	12	4	52.32

Note: Bolt weight is based upon 1.5" long, 1" Dia. High Strength Bolts per AISC Table 7-18. Grip subtracted, since bolt hole areas weren't removed from plates

61

Note: Bolt weight is based upon 1.5" long, 1" Dia. High Strength Bolts per AISC Table 7-18. Grip subtracted, since bolt hole areas weren't removed from plates

55

Note: Bolt weight is based upon 1.5" long, 1" Dia. High Strength Bolts per AISC Table 7-18. Grip subtracted, since bolt hole areas weren't removed from plates

9

Note: Bolt weight is based upon 1.5" long, 1" Dia. High Strength Bolts per AISC Table 7-18. Grip subtracted, since bolt hole area weren't removed from plates

32

Note: Bolt weight is based upon 1.5" long, 1" Dia. High Strength Bolts per AISC Table 7-18. Grip subtracted, since bolt hole areas weren't removed from plates

21

Note: Bolt weight is based upon 1.5" long, 1" Dia. High Strength Bolts per AISC Table 7-18. Grip subtracted, since bolt hole areas weren't removed from plates

Note: Bolt weight is based upon 1.5" long, 1" Dia. High Strength Bolts per AISC Table 7-18. Grip subtracted, since bolt hole areas weren't removed from plates

**Girder 1**

<b>Girder Segment</b>	<b>Feet</b>	<b>Inches</b>	<b>16ths</b>	<b>Total (ft)</b>	<b>Btwn. Splices (ft)</b>	
L1	1	0	11	1.06	126.30	L1+L2
L2	125	2	14	125.24	94.95	L3+L4
L3	42	8	9	42.71	107.20	L5
L4	52	2	13	52.23	105.17	L6+L7
L5	107	2	7	107.20	130.56	L8
L6	54	3	11	54.31	114.51	L9+L10
L7	50	10	6	50.86	116.88	L11
L8	130	6	12	130.56	106.43	L12+L13
L9	55	11	2	55.93	131.44	L14+L15
L10	58	6	15	58.58		
L11	116	10	9	116.88		
L12	56	5	9	56.46		
L13	49	11	10	49.97		
L14	129	5	3	129.43		
L15	2	0	2	2.01		

**Girder 2**

<b>Girder Segment</b>	<b>Feet</b>	<b>Inches</b>	<b>16ths</b>	<b>Total (ft)</b>	<b>Btwn. Splices (ft)</b>	
L1	1	0	11	1.06	124.83	L1+L2
L2	123	9	5	123.78	94.76	L3+L4
L3	42	7	5	42.61	105.61	L5
L4	52	1	13	52.15	104.96	L6+L7
L5	105	7	6	105.61	129.77	L8
L6	54	3	11	54.31	113.33	L9+L10
L7	50	7	14	50.66	114.45	L11
L8	129	9	4	129.77	106.46	L12+L13
L9	54	9	0	54.75	132.15	L14+L15
L10	58	6	15	58.58		
L11	114	5	6	114.45		
L12	56	5	9	56.46		
L13	50	0	0	50.00		
L14	130	1	8	130.13		
L15	2	0	4	2.02		

**Girder 3**

<b>Girder Segment</b>	<b>Feet</b>	<b>Inches</b>	<b>16ths</b>	<b>Total (ft)</b>	<b>Btwn. Splices (ft)</b>	
L1	1	0	12	1.06	123.40	L1+L2
L2	122	4	1	122.34	95.30	L3+L4
L3	42	11	0	42.92	104.03	L5
L4	52	4	10	52.39	104.77	L6+L7
L5	104	0	5	104.03	127.79	L8
L6	54	3	11	54.31	113.33	L9+L10
L7	50	5	9	50.46	112.02	L11
L8	127	9	7	127.79	106.46	L12+L13
L9	54	9	0	54.75	132.82	L14+L15
L10	58	6	15	58.58		
L11	112	0	3	112.02		
L12	56	5	9	56.46		
L13	50	0	0	50.00		
L14	130	9	8	130.79		
L15	2	0	6	2.03		

**Girder 3A**

<b>Girder Segment</b>	<b>Feet</b>	<b>Inches</b>	<b>16ths</b>	<b>Total (ft)</b>	<b>Btwn. Splices (ft)</b>	
L1	1	0	13	1.07	120.86	L1+L2
L2	119	9	9	119.80	91.70	L3+L4
L3	46	7	4	46.60		
L4	45	1	2	45.09		

**Girder 3B**

<b>Girder Segment</b>	<b>Feet</b>	<b>Inches</b>	<b>16ths</b>	<b>Total (ft)</b>	<b>Btwn. Splices (ft)</b>	
L1	1	1	4	1.10	125.17	L1+L2
L2	124	0	13	124.07	97.40	L3+L4
L3	44	0	1	44.01	104.61	L5
L4	53	4	11	53.39	99.02	L6+L7
L5	104	7	5	104.61		
L6	55	6	13	55.57		
L7	43	5	6	43.45		

**Girder 3C**

<b>Girder Segment</b>	<b>Feet</b>	<b>Inches</b>	<b>16ths</b>	<b>Total (ft)</b>	<b>Btwn. Splices (ft)</b>	
L1	1	1	9	1.13	128.29	L1+L2
L2	127	1	15	127.16	87.84	L3+L4
L3	43	9	6	43.78		
L4	44	0	12	44.06		

**Girder 4**

<b>Girder Segment</b>	<b>Feet</b>	<b>Inches</b>	<b>16ths</b>	<b>Total (ft)</b>	<b>Btwn. Splices (ft)</b>	
L1	1	1	12	1.15	128.57	L1+L2
L2	127	5	2	127.43	99.83	L3+L4
L3	45	3	14	45.32	105.53	L5
L4	54	6	1	54.51	109.71	L6+L7
L5	105	6	6	105.53	126.04	L8
L6	56	11	15	56.99	113.33	L9+L10
L7	52	8	10	52.72	109.59	L11
L8	126	0	7	126.04	106.46	L12+L13
L9	54	9	0	54.75	133.43	L14+L15
L10	58	6	15	58.58		
L11	109	7	1	109.59		
L12	56	5	9	56.46		
L13	50	0	0	50.00		
L14	131	4	12	131.40		
L15	2	0	7	2.04		

**Girder 4A**

<b>Girder Segment</b>	<b>Feet</b>	<b>Inches</b>	<b>16ths</b>	<b>Total (ft)</b>	<b>Btwn. Splices (ft)</b>	
L1	1	2	1	1.17	137.88	L1+L2
L2	136	8	7	136.70		

**Girder 5**

<b>Girder Segment</b>	<b>Feet</b>	<b>Inches</b>	<b>16ths</b>	<b>Total (ft)</b>	<b>Btwn. Splices (ft)</b>	
L1	1	3	4	1.27	132.59	L1+L2
L2	131	3	13	131.32	100.20	L3+L4
L3	45	8	5	45.69	103.80	L5
L4	54	6	1	54.51	109.73	L6+L7
L5	103	9	9	103.80	124.28	L8
L6	56	11	15	56.99	113.33	L9+L10
L7	52	8	14	52.74	107.16	L11
L8	124	3	5	124.28	106.46	L12+L13
L9	54	9	0	54.75	133.99	L14+L15
L10	58	6	15	58.58		
L11	107	1	14	107.16		
L12	56	5	9	56.46		
L13	50	0	0	50.00		
L14	131	11	5	131.94		
L15	2	0	9	2.05		

**Girder 6**

<b>Girder Segment</b>	<b>Feet</b>	<b>Inches</b>	<b>16ths</b>	<b>Total (ft)</b>	<b>Btwn. Splices (ft)</b>	
L1	1	3	7	1.29	131.79	L1+L2
L2	130	6	1	130.51	100.34	L3+L4
L3	45	10	0	45.83	98.81	L5
L4	54	6	2	54.51	112.98	L6+L7
L5	98	9	12	98.81	118.70	L8
L6	60	2	15	60.24	121.41	L9+L10
L7	52	8	14	52.74	100.47	L11
L8	118	8	6	118.70	106.46	L12+L13
L9	58	7	0	58.58	134.48	L14+L15
L10	62	9	15	62.83		
L11	100	5	11	100.47		
L12	56	5	9	56.46		
L13	50	0	0	50.00		
L14	132	5	0	132.42		
L15	2	0	12	2.06		



**ODOT PID 77372 Franklin County  
Br. No FRA-70-1321A**

ITEM 513 - WELDED STUD SHEAR CONNECTORS

**Total = 27,788 Each**

Girder =	1	2	3	3A	3B	3C	4	4A	5	6
	79	79	78	78	79	82	81	83	83	83
	54	53	52	50	53	54	55	50	57	57
	1	1	1	1	1	1	1	19	1	1
	1	1	1	1	1	1	1	1	1	1
	1	1	1	1	1	7	1		1	7
	6	6	6	10	7	46	8		6	48
	45	45	45	45	45	57	46		49	67
	63	63	66	56	61	1	67		67	2
	4	4	1	3	8		3		3	1
	1	1	1	1	1		1		1	1
	135	132	131		128		132		127	123
	2	3	2		6		3		6	3
	1	1	1		1		1		1	1
	5	5	5		71		73		73	6
	65	65	65		62		74		74	72
	72	71	70		2		1		1	75
	1	2	3		1		1		1	1
	1	1	1				1		1	1
	186	187	184				180		178	170
	4	1	1				3		2	1
	1	1	1				1		1	1
	2	5	5				5		5	6
	79	75	75				75		75	80
	74	74	74				74		74	80
	1	1	1				1		1	1
	1	1	1				1		1	1
	147	145	142				139		135	126
	3	1	1				1		2	2
	1	1	1				1		1	1
	7	7	7				7		7	7
	66	66	66				66		66	66
	61	61	61				61		61	61
	3	3	3				3		3	3
	1	1	1				1		1	1
	2	3	4				5		7	1
	165	165	165				165		164	170
	1	1	1				1		1	1
Locations =	1,342	1,333	1,324	246	528	249	1,340	153	1,338	1,329
Per Beam =	4,026	3,999	3,972	738	1,584	747	4,020	459	4,014	3,987

End Cross Frames:           13 Avg. per End Cross Frame  
                                       14 End Cross Frames  
 Toatl = 182 Each

Sign Support Brackets:       15 per WT member  
                                       4 End Cross Frames  
 Toatl = 60 Each