STRUCTURE ESTIMATED QUANTITIES

Bridge No. FRA-70-1395C

S. Front Street over I-70/71

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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REVISED November 29, 2021

Project:	**Bridge No. FRA-70-1395C**	Design:	RFV
Subject:	Estimated Quantities - FINAL	Check:	DJC
Date:	########		

ITEM 202 - STRUCTURE REMOVED, OVER 20 FOOT SPAN

area =	11616.79	sf
unit cost =	$18.00	per sf

Lump sum = **$209,102**

ITEM 202 - APPROACH SLAB REMOVED

length =	25	ft
width =	60	ft

Total = **334 sy**
(+ Sidewalk Curves) = **336 sy**

ITEM 202 - WEARING COURSE REMOVED

length =	190.52	ft
width =	60	ft

Total = **1271 sy**

ITEM 503 - COFFERDAMS AND EXCAVATION BRACING, AS PER PLAN

ITEM 503 - UNCLASSIFIED EXCAVATION

Rear Abutment:

length =	156.94	ft
width =	27	ft
depth =	20.75	ft

Note:
Excavation for abutments will be taken up when the exist. abutments are removed

Forward Abutment:

length =	151.77	ft
width =	22	ft
depth =	28.5	ft

Abutment Subtotal = **6781 cy**

Piers:

length =	148	ft
width =	17	ft
depth =	11	ft
no. of ftgs per pier =	1	
no. of piers =	1	

Pier Subtotal = **1025 cy**

Total = **7806 cy**

ITEM 509 - EPOXY COATED REINFORCING STEEL

Totals below are from the reinforcing steel lists in the plans

Slab (parapets) =	17,953	lbs
Slab (bridge) =	185,742	lbs
Slab (east cap) =	98,649	lbs
Sidewalk =	10,564	lbs
Superstructure subtotal =	**312,908**	**lbs**
Rear Abutment =	25,027	lbs
Frwd. Abutment =	23,630	lbs
Abutment subtotal =	**48,657**	**lbs**
Pier & Footing =	110,481	lbs
Pier subtotal =	**110,481**	**lbs**
Approach slabs =	112,668	lbs
Approach slab subtotal =	**112,668**	**lbs**
Total =	**584,714**	**lbs**

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ITEM 511 - CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK

BRIDGE

Deck:

thickness =	9.25	in
edge of deck to bridge limits =	1.25	ft
total sum of spans =	196.25	ft
total length =	198.82	
O/O of deck width =	103.25	ft
Deck Volume =	**586**	**cy**

Haunch:

t/flange width =	18	in
t/deck to t/web =	13	in
haunch thick. =	2.5	in
t/flange thick. (avg) =	1.25	in
total no. of beams =	10	
Haunch Volume (Interior Beams) =		**32 cy**
Haunch Volume (Exterior Beams) =		**6 cy**

Cantilever:

cantilever length (right) =	2.88	ft
cantilever length (left) =	2.88	ft
Cantilever Volume =	**10**	**cy**

Signal Pole Diaphragms (Bridge):

length =	10.83	ft
thickness =	3.00	ft
height =	2.80	ft
number =	3.00	each
Diaph. Volume =	**10**	**cy**
BRIDGE TOTAL =	**644**	**cy**

CAP

Deck:

area =	7941.214	sf
avg. thickness =	8.5	in (avg.)
beam length =	198.75	ft
Deck volume =	**208**	**cy**

Haunch:

t/flange width =	18	in
t/deck to t/web =	12.25	in
haunch thick. (avg) =	2.4375	in
t/flange thick. (avg) =	1.3125	in
total no. of beams =	5	
haunch length =	198.75	ft
Haunch Volume (Interior Beams) =	*12*	*cy*
Haunch Volume (Exterior Beams) =	*6*	*cy*

Cantilever:

cantilever length (right) =	2.00	ft
cantilever length (left) =	2.00	ft
Cantilever Volume =	**6**	**cy**

Signal Pole Diaphragms (East Cap):

length =	9.00	ft
thickness =	3.00	ft
height =	2.80	ft
number =	1.00	each
Diaph. Volume =	**3**	**cy**

CAP TOTAL =	**217**	**cy**

Total = 861 cy

ITEM 511 - CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK (PARAPET), AS PER PLAN

area (west) =	4.42	sf
area (east) =	4.42	sf
length (west) =	132.60	ft
length (east) =	144.89	ft
west pylon (rear end) =	248.55	cf
west pylon (frwd. end) =	209.34	cf
east pylon (rear end) =	231.00	cf
east pylon (frwd. end) =	220.17	cf

Total = 80 cy

ITEM 511 - CLASS QC1 CONCRETE WITH QC/QA, PIER ABOVE FOOTINGS

wall area =	3238.52	sf
thickness =	3.00	ft
window area =	436.90	sf
window thickness =	2.00	ft
pedestals =	32.32	cf

Total = 393 cy

ITEM 511 - CLASS QC1 CONCRETE WITH QC/QA, ABUTMENT NOT INCLUDING FOOTING, AS PER PLAN

Skew angle =	12.97	degrees

Rear Abutment:

Beam Seat		
beam seat area (above paneling)	634.99	sf (cad)
beam seat width =	6.75	ft
lower beam seat area =	156.94	sf (cad)
lower beam seat width =	5.50	ft
Beam Seat Volume =	*5149.34*	*cf*
Backwall		
backwall area =	682.99	sf (cad)
backwall thickness =	1.75	ft
approach slab thickness =	1.25	ft
abutment length =	156.94	ft
Back Wall Volume =	*1097.14*	*cf*
Additonal Volume		
pedestals =	16.92	cf
end wall volumes =	191.79	cf
Rear Abutment Subtotal	**239**	**cy**

Forward Abutment:

Beam Seat		
beam seat area (above paneling)	527.19	sf (cad)
beam seat width =	6.75	ft
lower beam seat area =	151.77	
lower beam seat width =	5.50	ft
Beam Seat Volume =	*4393.27*	*cf*
Backwall		
backwall area =	673.50	sf (cad)
backwall thickness =	1.75	ft
approach slab thickness =	1.25	ft
abutment length =	151.77	ft
Back Wall Volume =	*1083.77*	*cf*
Additonal Volume		
pedestals =	16.92	cf
end wall volumes =	105.26	cf
Forward Abutment Subtotal =	**207**	**cy**

Total = 446 cy

ITEM 511 - CLASS QC1 CONCRETE WITH QC/QA, FOOTING, AS PER PLAN

Pier:

height =	3	ft
width =	15	ft
length =	147.66	ft

Panel Footing:

area =	5.33	sf
length =	308.71	ft

Total = 308 cy

ITEM 511 - CLASS QC2 CONCRETE WITH QC/QA, SIDEWALK, AS PER PLAN

Sidewalk on BRIDGE:

area =	4957.46	sf
avg. thickness =	8.50	in
Sidewalk Volume =	**130**	**cy**

Sidewalk on CAP:

cadd area =	4106.78	sf
avg. thickness =	10.56	in
Sidewalk Volume =	**134**	**cy**

Total = 264 cy

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

Rear Abutment:	Face	2967.00	sf
	Top	863.17	sf
Forward Abutment :	Face	4546.72	sf
	Top	1012.00	sf
Pier :	Face	2649.34	sf

Total = 1,338 sy

ITEM 512 - TYPE 2 WATERPROOFING

Rear Abutment =	9.68	ft
Forward Abutment =	8.47	ft

Total = 7 **sy**

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

west parapet =	906.90	sf	
east parapet =	1155.07	sf	
pylons =	451.87	sf	
west sidewalk =	2906.80	sf	(includes small area of sidewalk on SW abutment)
east sidewalk =	2388.40	sf	
east cap =	3539.28	sf	=====> cap total = 394 sy

Total = 1261 **sy**

ITEM 513 - STRUCTURAL STEEL MEMBERS, LEVEL 1

W30x173 in Drilled Shafts

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Rear Abutment:			**Cap Rear:**		
length =	49.95	ft	length =	49.95	ft
no. of columns =	22		no. of columns =	9	

Forward Abutment:			**Cap Forward:**		
length =	53.85	ft	length =	53.85	ft
no. of columns =	21		no. of columns =	9	

Bridge Total =	2,230	ft	**Cap Total =**	934	ft
Bridge Weight =	385,790	**lb**	**Cap Weight =**	161,582	**lb**

Total = 547,372 **lb**

ITEM 513 - STRUCTURAL STEEL MEMBERS, LEVEL 4

BRIDGE

Girders:

Section 1

length =	65.50	ft
weight =	225.43	lbs/ft

Section 2

volume =	43.53	cf
unit weight steel =	21327.4	lbs

Section 3

length =	67.25	ft
weight =	225.43	lbs/ft

Detail factor = 1.0

No. of beams = 10

Beam Subtotal = 512,600 lbs

Splices:	# of plates	length (in)	width (in)	thick (in)
Top Flange				
outside plates =	1	37	18	0.625
inside plates =	2	37	8	0.625
fill plates =	1	18.5	18	0.75
Bottom Flange				
outside plates =	1	44	18	0.75
inside plates =	2	44	8	0.75
fill plates =	1	22	18	0.5
Web				
plates =	2	29	22.5	0.5

Plate weight/splice = 853 lbs

Splice Bolts	# of bolts	length (in)	bolt wt.	washer wt.
Top Flange =	40	1.5	148	11.3
Bot. Flange =	48	1.5	148	11.3
Web =	48	1.5	148	11.3

* from steel manual
* washer weight is per 100 ct.

Bolt + Washer weight		
Top Flange =	64	lbs
Bot. Flange =	76	lbs
Web =	76	lbs
Total weight/splice =	1070	lbs
No. of splices =	20	

Splice + Bolts Subtotal = 21,395 lbs

Intermediate Crossframes:

Length of Diagonals =	10.67	ft (weighted avg.)
No. of Diagonals =	2	
Length of Horiz. =	10.62	ft (weighted avg.)
No. of Horiz. =	1	
Angle weight / ft. =	9.80	lbs/ft
Crossframe weight =	313	lbs ==> per x-frame assembly
x-frame stiffeners?	y	y or n
Length =	34.000	in ==> web depth
Width =	5.000	in
Thickness =	0.375	in
Stiffener weight =	36	lbs ==> per x-frame assembly
Total Intermediate Crossframe		
Assembly Weight =	349	lbs. ==> per x-frame assembly
No. of assemblies =	143	

End Crossframes:

Length of Diagonals =	10.85	ft (weighted avg.)
No. of Diagonals =	2	
Length of Horiz. =	10.78	ft (weighted avg.)
No. of Horiz. =	1	
Angle weight / ft. =	9.80	lbs/ft
Crossframe weight =	318	lbs. ==> per x-frame assembly

x-frame stiffeners?	y	y or n
Length =	5.000	in ==> web depth
Width =	34.000	in
Thickness =	0.375	in
Stiffener weight =	36	lbs ==> per x-frame assembly
Total x-frame End Assembly Weight =	354	lbs ==> per x-frame assembly
No. of assemblies =	18	
Crossframe Subtotal =	**56,339**	**lbs**

Signal Support Diaphragm:

Embedded steel plate (20"x20"x1.75") =	198	lbs
Support angles (L6x4x1/2) - Length =	10.833	ft
Support angle weight per ft =	16.2	lb/ft
No. of support angles =	2	ea
No. of signal support diaphragms =	3	ea
Signal support subtotal =	**1,648**	**lbs**
BRIDGE STRUCTURAL STEEL =	**591,983**	**lbs**

CAP

Girders:

Section 1		
length =	65.50	ft
weight =	202.47	lbs/ft
Section 2		
web cadd area =	243.79	sf
web volume =	12.70	cf
top flange volume =	14.44	cf
bot. flange volume =	16.56	cf
volume =	43.70	cf
unit weight steel =	21411.72	lbs
Section 3		
length =	67.25	ft
weight =	202.47	lbs/ft
Detail factor =	1.0	
No. of beams =	5	
Beam subtotal =	**241,500**	**lbs**

Splices:	# of plates	length (in)	width (in)	thick (in)
Top Flange				
outside plates =	1	37	18	0.625
inside plates =	2	37	8	0.625
fill plates =	1	18.5	18	0.875
Bottom Flange				
outside plates =	1	44	18	0.75
inside plates =	2	44	8	0.75
fill plates =	1	22	18	0.75
Web				
plates =	2	29	22.5	0.5

Plate weight/splice = 893 lbs

Splices Bolts	# of bolts	length (in)	bolt wt.	washer wt.
Top Flange =	40	1.5	148	11.3
Bot. Flange =	48	1.5	148	11.3
Web =	48	1.5	148	11.3

* from steel manual
* washer weight is per 100 ct.

Bolt + Washer weight		
Top Flange =	64	lbs
Bot. Flange =	76	lbs
Web =	76	lbs
Total weight/splice =	1110	lbs
No. of splices =	10	

Splice subtotal = 11,096 lbs ==> plates + bolts

Intermediate Crossframes:

Length of Diagonals =	8.91	ft (weighted avg.)
No. of Diagonals =	2	
Length of Horiz. =	8.82	ft (weighted avg.)
No. of Horiz. =	1	
Angle weight / ft. =	9.80	lbs/ft
Crossframe weight =	261	lbs ==> per x-frame assembly
x-frame stiffeners?	y	y or n
Length =	34.000	in ==> web depth
Width =	5.000	in
Thickness =	0.375	in
Stiffener weight =	36	lbs ==> per x-frame assembly
Total x-frame assembly weight =	297	lbs ==> per x-frame assembly
No. of assemblies =	64	

End Crossframes:

Length of Diagonals =	9.00	ft (weighted avg.)
No. of Diagonals =	2	
Length of Horiz. =	8.90	ft (weighted avg.)
No. of Horiz. =	1	
Angle weight / ft. =	9.80	lbs/ft
Crossframe weight =	264	lbs ==> per x-frame assembly
x-frame stiffeners?	y	y or n
Length =	34.000	in ==> web depth
Width =	5.000	in
Thickness =	0.375	in
Stiffener weight =	36	lbs ==> per x-frame assembly
Total x-frame assembly weight =	300	lbs ==> per x-frame assembly
No. of assemblies =	8	

Crossframe Subtotal = 21,418 lbs

Signal Support Diaphragm:		
Embedded steel plate (20"x20"x1.75") =	198	lbs
Support angles (L6x4x1/2) - Length =	10.000	ft
Support angle weight per ft =	16.2	lb/ft
No. of support angles =	2	ea
No. of signal support diaphragms =	1	ea
Signal support subtotal =	**522**	**lbs**
CAP STRUCTURAL STEEL =	**274,536**	**lbs**

Total = 866,519 lbs

ITEM 513 - WELDED STUD SHEAR CONNECTORS

Bridge	No. rows per beam =	259	
	No. per row =	3	
	No. of beams =	10	
	Number per signal support =		50
	Number of signal supports =		3
	Bridge Total =	**7920**	**ea**
Cap	No. rows per beam =	321	
	No. per row =	3	
	No. of beams =	5	
	Number per signal support =		50
	Number of signal supports =		1
	Cap Total =	**4865**	**ea**

Total = 12,785 ea

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

Bridge	web area =	1208.53	sf
	section 1 flange area =	315.22	sf
	section 2 flange area =	334.06	sf
	section 3 flange area =	323.64	sf
	No. of beams =	10	
	Crossframes =	6873.23	sf
	Stiffeners =	817.30	sf
	Utility Supports =	1089.18	sf
	Bridge Subtotal =	**30,594**	**sf**
Cap	web area =	1208.53	sf
	section 1 flange area =	311.13	sf
	section 2 flange area =	332.67	sf
	section 3 flange area =	319.44	sf
	No. of beams =	5	
	Crossframes =	2559.79	sf
	Stiffeners =	365.50	sf
	Cap Subtotal =	**13,784**	**sf**

Total = 44,378 sf

ITEM 514 - FINAL INSPECTION REPAIR

Length =	198.75	ft
No. Girders =	15	ea
No. Crossframes =	233	ea

Total = 32 ea

ITEM 516 -STRUCTURAL EXPANSION JOINT INCLUDING ELASTOMERIC STRIP SEAL, AS PER PLAN (4")

RA SW Corner =	5.04	ft	(Bridge)
RA Length =	106.38	ft	(Bridge)
RA Length =	41.47	ft	(Cap)
RA SE Corner =	23.08	ft	(Cap)
RA Backwall - 4W1 =	4.92	ft	(Cap)
Bridge - Cap =	198.93	ft	(Cap)
FA Length =	106.05	ft	(Bridge)
FA Length =	41.47	ft	(Cap)
FA NE Corner =	19.84	ft	(Cap)
FA Backwall - 4W2 =	2.96	ft	(Cap)

Bridge Total = 218 ft
Cap Total = 333 ft
Total = 551 ft

ITEM 516 - 1" PREFORMED EXPANSION JOINT FILLER

Rear Abutment:

beam seat height =	5.33	ft
beam seat width =	6.75	ft
beam seat length =	156.94	ft
wall height =	17.65	ft
wall width =	0.92	ft
backwall height =	4.31	ft
backwall width =	1.75	ft

Forward Abutment:

beam seat height =	4.02	ft
beam seat width =	6.75	ft
beam seat length =	151.77	ft
wall height =	20.55	ft
wall width =	0.92	ft
backwall height =	4.44	ft
backwall width =	1.75	ft

Total = 397 sf

ITEM 516 - 2" PREFORMED EXPANSION JOINT FILLER

Pier:

height = 27.85 ft

Total = 84 sf

ITEM 516 - ELASTOMERIC BEARING WITH INTERNAL LAMINATES & LOAD PLATE (NEOPRENE) 10.5" x 1'-4" x 2.45" PAD WITH 11.5" x 1'-10" BEVELED PLATE, AS PER PLAN

Rear Abutment =	15	ea
Forward Abutment =	15	ea

Total = 30 ea

ITEM 516 - ELASTOMERIC BEARING WITH INTERNAL LAMINATES & LOAD PLATE (NEOPRENE) 1'-6" x 2'-0" x 3.40" PAD WITH 1'-7" x 2'-9" BEVELED PLATE, AS PER PLAN

Pier =	15	ea
Total =	**15**	**ea**

ITEM 518 -SCUPPER, MISC.:

Total =	**2**	**ea**

ITEM 518 - POROUS BACKFILL WITH GEOTEXTILE FABRIC

Rear Abutment:

avg. top of backwall =	753.73		
top of drilled shaft =	744.45		
height =	7.53	ft	
length =	156.94	ft	
thickness =	2.00	ft	
area (panel footing) =	6.58	sf	
Rear Abutment Subtotal =			**3,397 cf**

Forward Abutment:

avg. top of backwall =	757.48		
top of drilled shaft =	748.35		
height =	7.38	ft	
length =	151.77	ft	
thickness =	2.00	ft	
area (panel footing) =	6.58	sf	
Forward Abutment Subtotal =			**3,238 cf**

Total =	**246**	**cy**

ITEM 518 - 6" PERFORATED CORRUGATED PLASTIC PIPE

Rear Abutment:

length =	313.88	ft	(inlcudes façade panel pipe)

Forward Abutment:

length =	303.54	ft	(inlcudes façade panel pipe)

Total =	**620**	**ft**

ITEM 518 - 6" NON-PERFORATED CORRUGATED PLASTIC PIPE

Rear Abutment:

length =	20	ft

Forward Abutment:

length =	27	ft
Total =	**50**	**ft**

ITEM 518 - STRUCTURE DRAINAGE, MISC.:

length 1 =	45.25	ft
length 2 =	53.75	ft
drop =	2.5	ft
Total =	**110**	**ft**

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ITEM 524 - DRILLED SHAFTS, 60" DIAMETER, ABOVE BEDROCK WITH QC/QA, AS PER PLAN

Rear Abutment:			**Cap Rear:**		
length =	54.45	ft	length =	54.45	ft
no. of columns =	22		no. of columns =	9	
Forward Abutment:			**Cap Forward:**		
length =	58.35	ft	length =	58.35	ft
no. of columns =	21		no. of columns =	9	

Abut. Total = 2,423 **ft** **Cap Total =** 1,015 **ft**

Total = 3,438 **ft**

ITEM 526 - REINFORCED CONCRETE APPROACH SLABS WITH QC/QA (T=15"), AS PER PLAN

Rear Approach Slab:
area = 3957.64 sf

Forward Approach Slab:
area = 4656.49 sf

Total = 958 **sy**

ITEM SPECIAL - STRUCTURE, MISC.: PERMANENT UTILITY SUPPORTS

Length of Horiz. =	10.78	ft (weighted avg.)
No. of Horiz. =	1	
Angle weight / ft. =	12.80	lbs/ft
utility support weight =	138	lbs ==> per assembly
Stiffeners?	y	y or n
Length =	5.000	in ==> web depth
Width =	34.000	in
Thickness =	0.375	in
Stiffener weight =	36	lbs ==> per x-frame assembly
Total utility support assembly weight =	174	lbs ==> per x-frame assembly
No. of assemblies =	56	
Total Weight =	9752	lbs

ITEM SPECIAL - STRUCTURE, MISC.: PRECAST FAÇADE PANELS

Rear Abutment:
area = 2769.95 sf

Forward Abutment:
area = 3261.59 sf

Total = 6,032 **sf**

ITEM 607 - FENCE, MISC.: WALL MOUNTED TYPE A (W/ VANDAL MESH)

Rear Abutment:
length = 4.5 ft ==> on SW knee wall extension

North end of west parapet:
length = 15.50 ft ==> north of NW end pilaster

Total = 20 **ft**

ITEM 625 - LIGHT POLE ANCHOR BOLTS, MISC.: COMBINATION SIGNAL POLE AND PEDESTRIAN POLE ANCHOR BOLT ASSEMBLIES EMBEDDED IN CONCRETE BRIDGE DECK

Total = 8 ea

ITEM 516 - ARMORLESS PREFORMED JOINT SEAL, AS PER PLAN

Bridge
length = 178 ft

East Cap
length = 53.00 ft

Total = 231 ft

ITEM 526 - TYPE C INSTALLATION, AS PER PLAN

Bridge
length = 178 ft

East Cap
length = 53.00 ft

Total = 231 ft

ITEM SPECIAL - 5" XHW FIBERGLASS CONDUIT

Length = 206.25 ft ==> thru backwall to couplers
Number = 8 ea

Total = 1,650 ft

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