

Johnson, Mirmiran, & Thompson

Calculated:	PPA	Date:	12/13/2019	Stage Submission:	Final Tracings
Checked:	NCM	Date:	12/17/2019	PID/Job No.:	102858 / 17-10221-001
Concurred:	PPA	Date:	12/18/2019		
Back Checked:	NCM	Date:	12/19/2019		
Released:	PPA/NCM	Date:	12/19/2019		
Project:	POR-76-(16.58)/(21.18)			Bridge No.:	POR-76-2118
Subject:	ESTIMATED QUANTITIES FOR CR-73 (MILTON NEWTON ROAD OVER IR 76)			SFN:	6703216

POR-76-2118 Replacement of Deck and pier caps (4 Span Continuous Steel Beam With Reinforced Concrete Deck And Substructure)

ESTIMATED QUANTITIES						CALCULATED BY:		PPA	DATE:	12/13/2019
						CHECKED BY:		NCM	DATE:	12/17/2019
ITEM	EXT.	PARTICIPATION 01/IMS/BR	TOTAL	UNIT	DESCRIPTION	ABUT.	PIERS	SUPER.	GEN.	SHT. REF.
202	11203	LS	LS		PORTIONS OF STRUCTURE REMOVED, OVER 20 FOOT SPAN, AS PER PLAN				LS	2
202	22900	112	112	SY	APPROACH SLAB REMOVED				112	
202	38601	48	48	FT	BRIDGE RAILING REMOVED FOR STORAGE, AS PER PLAN				48	2
503	11100	LS	LS		COFFERDAMS AND EXCAVATION BRACING				LS	
503	21100	177	177	CY	UNCLASSIFIED EXCAVATION	177				
509	10000	86,185	86,185	LB	EPOXY COATED REINFORCING STEEL	4,963	7,083	74,139		
510	10000	280	280	EACH	DOWEL HOLES WITH NONSHRINK, NONMETALLIC GROUT	280				
511	21522	247	247	CY	CLASS QC2 CONCRETE WITH QC/QA, SUPERSTRUCTURE			247		2
511	33501	2	2	EACH	SEMI-INTEGRAL DIAPHRAGM GUIDE, AS PER PLAN	2				2
511	34450	54	54	CY	CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK (PARAPET)			54		
511	41010	41	41	CY	CLASS QC1 CONCRETE, PIER ABOVE FOOTINGS		41			
511	43510	35	35	CY	CLASS QC1 CONCRETE, ABUTMENT INCLUDING FOOTING	35				
512	10100	745	745	SY	SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)	42	238	465		
512	33000	8	8	SY	TYPE 2 WATERPROOFING	8				
512	74000	140	140	SY	REMOVAL OF EXISTING COATINGS FROM CONCRETE SURFACES	11	129			
513	20000	2,312	2,312	EACH	WELDED STUD SHEAR CONNECTORS			2,312		
514	00050	2,736	2,736	SF	SURFACE PREPARATION OF EXISTING STRUCTURAL STEEL			2,736		
514	00056	2,736	2,736	SF	FIELD PAINTING OF EXISTING STRUCTURAL STEEL, PRIME COAT			2,736		
514	00060	2,736	2,736	SF	FIELD PAINTING STRUCTURAL STEEL, INTERMEDIATE COAT			2,736		
514	00067	2,736	2,736	SF	FIELD PAINTING STRUCTURAL STEEL, FINISH COAT, AS PER PLAN			2,736		2
514	00504	6	6	MNHR	GRINDING FINS, TEARS, SLIVERS ON EXISTING STRUCTURAL STEEL			6		
514	10000	3	3	EACH	FINAL INSPECTION REPAIR			3		
516	10010	58	58	FT	ARMORLESS PREFORMED JOINT SEAL				58	
516	13600	8	8	SF	1" PREFORMED EXPANSION JOINT FILLER			8		
516	13900	56	56	SF	2" PREFORMED EXPANSION JOINT FILLER			56		
516	14020	75	75	FT	SEMI-INTEGRAL ABUTMENT EXPANSION JOINT SEAL	75				
516	44100	12	12	EACH	14" X 18" X 2 5/8" ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (15" X 19" X 2") (NEOPRENE)		12			
516	44200	8	8	EACH	13" X 16" X 3 3/16" ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (14" X 17" X 2") (NEOPRENE)	8				
516	47001	LS	LS		JACKING AND TEMPORARY SUPPORT OF SUPERSTRUCTURE, AS PER PLAN					2
518	21201	29	29	CY	POROUS BACKFILL WITH GEOTEXTILE FABRIC, AS PER PLAN	29				4
518	40012	64	64	FT	6" NON-PERFORATED CORRUGATED PLASTIC PIPE	64				
519	11101	153	153	SF	PATCHING CONCRETE STRUCTURE, AS PER PLAN		153			2
526	25010	166	166	SY	REINFORCED CONCRETE APPROACH SLABS WITH QA/QC (T=15")				166	
526	90030	58	58	FT	TYPE C INSTALLATION				58	
601	20000	326	326	SY	CRUSHED AGGREGATE SLOPE PROTECTION	326				
601	21050	3.56	3.56	SY	TIED CONCRETE BLOCK MAT WITH TYPE 1 UNDERLAYMENT	3.56				
607	39900	320	320	FT	VANDAL PROTECTION FENCE, 6' STRAIGHT, COATED FABRIC				320	
611	99710	2	2	EACH	PRECAST REINFORCED CONCRETE OUTLET	2				

2118 Input

Bridge Limits	227.5
Span 1	46.5
Span 2	65
Span 3	65
Span 4	46.5
C/C Bearings	223
Deck Width	24.00 btw. Fascia beams
O/O Width	31.34
# Beams	4
Bm Spacing	8.00
Lt Rail Area	2.94
Rt Rail Area	2.94
Skew	0.00
Deck Area	7129.85
Prop. Deck	31.33

202	11203	LS		PORTIONS OF STRUCTURE REMOVED, OVER 20 FOOT SPAN, AS PER PLAN
	deck removal	\$ 106,948.00		use \$15 / sf of deck area
	pier cap removal	\$ 6,300.00		use \$200 / cy, each cap has approximately 10.5 cy
	abut. Removal	\$ 6,000.00		use \$200 / cy, each abutment and 2 wingwalls are approximately 15 cy
	misc.	\$ 5,000.00		various incidentals such as end cross frames, scuppers,etc
		\$ 124,248.00		total
		\$125,000.00		
202	22900	112	SY	APPROACH SLAB REMOVED
		20.00	ft	width (approximate)
		25.00	ft	length
		2	each	# of approach slabs
		111.11	sy	total
202	38601	48	FT	BRIDGE RAILING REMOVED FOR STORAGE, AS PER PLAN
		12	ft	existing parapet length
		4	each	locations
		48	ft	total
503	11100	LS		COFFERDAMS AND EXCAVATION BRACING
		\$ 5,000.00		no traffic to maintain, so it should be very straightforward
503	21100	177	CY	UNCLASSIFIED EXCAVATION
abutments	end area	32	ft	length
	(trapezoid)	36	sf	6' deep, 3 feet wide at bottom, 6' under AS, assumes 1:1 layback
		2	each	number of abutments
		2304	cf	subtotal
WW	end area-1	13	ft	length
	(trapezoid)	25	sf	6' deep, 1 feet wide at bottom, 6' under AS, assumes 1:1 layback to excavate for upper section
	end area-2	36	sf	approximately 6' x 6 to excavate for footing extension
	(trapezoid)	8	ft	length
		4	each	number of wingwalls
		2452.00	cf	subtotal
		177	cy	total

509	10000	86,185	LB	EPOXY COATED REINFORCING STEEL
		4963	lb	abutments
		7083	lb	pier
		11459	lb	parapet
		58455	lb	deck
		4225	lb	diaphragm
	for info only	487	lb	diaphragm guides
	for info only	15850	lb	approach slab
	for info only	1354	lb	sleeper slab
		86185	lb	total
510	10000	280	EACH	DOWEL HOLES WITH NONSHRINK, NONMETALLIC GROUT
	RA	62	each	top of stem
		78	each	wingwall
		140	each	RA TOTAL
	FA	62	each	top of stem
		78	each	wingwall
		140	each	FA TOTAL
		280	each	total

511	21522	247		CY	CLASS QC2 CONCRETE WITH QC/QA, SUPERSTRUCTURE
diaphragm	RA	31.33		ft	length
		4.44		ft	avg. height (top of deck - btm diaphragm)
		3.75		ft	width
	subtract out	31.33		ft	length
	AS notch	2.04		ft	height [of approach slab at bridge limit]
		0.50		ft	width
		490.11		cf	RA TOTAL
	FA	32.17		ft	length
		4.49		ft	avg. height (top of deck - btm diaphragm)
		3.75		ft	width
	subtract out	29.0		ft	length
	AS notch	2.04		ft	height [of approach slab at bridge limit]
		0.50		ft	width
		511.60		cf	FA TOTAL
		37.1		cy	diaphragm subtotal
deck		24.00		ft	deck width between overhangs
		227.50		ft	deck length
		8.5		in	nominal deck thickness
		4		each	number of beams
		0.86		in	largest top flange thickness, to be conservative
		11.5		in	largest top flange width, to be conservative
		2.3		in	haunch thickness (average from TS table)
		11.50		in	haunch width
		3.67		ft	left overhang length
		3.67		ft	right overhang length
		11.66		in	overhang thickness
		3867.50		cf	nominal deck volume
		167.48		cf	haunch volume
		1409.16		cf	overhang volume
		2.04		ft	approach slab seat
		1.33		ft	height btw diaphragm and deck
		2.75		ft	avg. width of trapezoidal concrete between diaphragm and deck
		176.00		cf	volume of trapezoid between diaphragm and deck
		5620.14		cf	deck total
		209		cy	deck total
		247		cy	SUPER = diaphragm + deck concrete
511	33501	2		EACH	SEMI-INTEGRAL DIAPHRAGM GUIDE, AS PER PLAN
	RA	1		each	abutment
	FA	1		each	abutment
		2		each	total
511	34450	54		CY	CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK (PARAPET)
BR-1-13	Parapet	2.94		sf	parapet cross sectional area
		216.50		ft	total length main section on bridge + 3' on rear AS
		2		each	number of barriers
		44.01		cf	14'-0" transition integral barrier volume per std dwg
		4		each	number of transitions, 2 on bridge (FA), 2 on approach slabs (RA)
		1449.06		cf	total
		53.67		cy	total

511	41010	41		CY	CLASS QC1 CONCRETE, PIER ABOVE FOOTINGS
	cap on	4.70		ft	avg. cap height (avg all beam seats - avg all bot of cap)
	prop piers	24.00		ft	cap length (full width, center to center fascia columns)
		3		ft	cap width
		7.07		sf	nose area (both ends)
		371.56		cf	subtotal
		3		each	number of piers
		1114.67		cf	PROP CAP ON PIER TOTAL
		41.28		cy	total
511	43510	35		CY	CLASS QC1 CONCRETE, ABUTMENT INCLUDING FOOTING
RA	diaph	3.75		ft	length
	wing	1.00		ft	width
	extension	5.24		ft	height (top of deck to sawcut)
		19.7		cf	subtotal
	mid-wing	8.75		ft	length
	(btw beam	1.75		ft	width
	seat & ftg)	3.67		ft	avg. height (sawcut to top of ftg)
		56.2		cf	subtotal
	top wing (1)	5.00		ft	length
	rectangle-1	1.00		ft	width
		5.23		ft	height
		26.1		cf	subtotal
	top wing (2)	4.00		ft	length
	rectangle-2	1.00		ft	width
		3.00		ft	height
		12.0		cf	subtotal
	top wing (3)	4.00		ft	length
	triangle	1.00		ft	width
		2.23		ft	height
		4.5		cf	subtotal
	footing	9.75		ft	length
		1.50		ft	width
		3.25		ft	height
		47.5		cf	subtotal
		2		each	locations
		332.0		cf	subtotal
	beam seat	30.17		ft	length
		3.75		ft	width
		0.61		ft	height
		69.0		cf	subtotal
		14.9		cy	RA TOTAL

FA	diaph	3.75		ft	length
	wing	1.00		ft	width
	extension	5.30		ft	height (top of deck to sawcut)
		19.9		cf	subtotal
	mid-wing	8.75		ft	length
	(btw beam	3.17		ft	width
	seat & ftg)	3.64		ft	avg. height (sawcut to top of ftg)
		100.9		cf	subtotal
	top wing (1)	5.00		ft	length
	rectangle-1	1.00		ft	width
		5.27		ft	height
		26.4		cf	subtotal
	top wing (2)	4.00		ft	length
	rectangle-2	1.00		ft	width
		3.00		ft	height
		12.0		cf	subtotal
	top wing (3)	4.00		ft	length
	triangle	1.00		ft	width
		2.27		ft	height
		4.5		cf	subtotal
	footing	9.75		ft	length
		2.17		ft	width
		3.25		ft	height
		68.7		cf	subtotal
		2		each	locations
		464.6		cf	subtotal
	beam seat	30.17		ft	length
		3.75		ft	width
		0.62		ft	height
		70.1		cf	subtotal
		19.8		cy	FA TOTAL
		34.7		cy	total

512	10100	745		SY	SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)
RA	main	31.33		ft	length (use length of diaphragm, conservative)
		3.27		ft	height (deck elev - app slab seat - level sawcut elev)
		102.51		sf	subtotal
	WW	5		ft	length (str.)
		4.50		ft	estimated height (str.) (wingwall height + distance to ground line)
		4		ft	length (sloped)
		2.50		ft	estimated height (str.) (wingwall height + distance to ground line)
		9		ft	top of wingwall
		1		ft	thickness of wingwall
		2		each	number of wings
		83.00		sf	subtotal
FA	main	32.17		ft	length (use length of diaphragm, conservative)
		3.34		ft	height (deck elev - app slab seat - level sawcut elev)
		107.28		sf	subtotal
	WW	5		ft	length (str.)
		4.50		ft	estimated height (str.) (wingwall height + distance to ground line)
		4		ft	length (sloped)
		2.50		ft	estimated height (str.) (wingwall height + distance to ground line)
		9		ft	top of wingwall
		1		ft	thickness of wingwall
		2		each	number of wings
		83.00		sf	subtotal
		42.00		sy	ABUTMENT TOTAL
BR-1-13	main parapet	213.50		ft	total length
	btw	8.68		ft	perimeter (Section E)...overhang assumed as 1'
	transitions	2		each	number of barriers
		3705.76		sf	subtotal
	3' btw	3		ft	length
	RA deck &	7.01		ft	perimeter (Section D)
	RA transition	2		each	locations
		42.07		sf	subtotal
	RA	14		ft	length
	transitions	7.00		ft	avg. perimeter (section A-C similar, use section C)
		2		each	locations
		196.00		sf	subtotal
	FA	14		ft	length
	transitions	8.50		ft	avg. perimeter (section G-J similar, use section G) ... overhang assumed as 1'
		2		each	locations
		238.00		sf	subtotal
		465.00		sy	PARAPET/DECK TOTAL

proposed	cap	24.0		ft	cap length (full width, center to center fascia columns)
piers		9.42		ft	nose circumference
		3		ft	width
		4.70		ft	avg. height
		269.85		sf	cap sides
		57.86		sf	cap bottom (total - column holes)
		327.71		sf	subtotal (1 cap only)
	columns	13.64		ft	avg height to existing ground
		3		ft	diameter
		3		each	number of columns
		385.63		sf	subtotal (3 columns per pier)
		3		each	locations
		2140.03		sf	subtotal (all piers)
		238.00		sy	PIER TOTAL
		745.00		sy	total
512	33000	8		SY	TYPE 2 WATERPROOFING
	both	6		ft	new wingwall / existing wingwall joint
	abuts	4		each	number of WW (2 at each abut)
		3		ft	width (minimum per 711.25)
		8		sy	total
512	74000	140		SY	REMOVAL OF EXISTING COATINGS FROM CONCRETE SURFACES
	abutments	30.17		ft	length
		1.5		ft	height (below removal line to existing grade)
		2		each	number of abutments
		90.50		sf	total for abutments
		11		sy	total for abutments
	piers	385.63		sf	area of column to be sealed
		3		each	number of piers
		1156.89		sf	total for piers
		129		sy	total for piers
		140		sy	total
513	20000	2312		EACH	WELDED STUD SHEAR CONNECTORS
		289		each	number of studs along beam
		2		each	studs per beam
		4		each	number of beams
		2312		each	total

514	00050	2736		SF	SURFACE PREPARATION OF EXISTING STRUCTURAL STEEL
field	existing	10		ft	beam length
	beam ends	8.14		ft	perimeter
	at abutments	8		each	number of beams (4 beams x 2 abutments)
		651.47		sf	subtotal
		0.05		%	assume additional 5% for flange sides
		684.04		sf	loaded subtotal
	existing	20		ft	beam length (10' EACH - 2 directions)
	beam ends	8		ft	perimeter
	at piers	12		each	number of beams (4 beams x 3 piers)
		1954.40		sf	subtotal
		0.05		%	assume additional 5% for flange sides
		2052.12		sf	loaded subtotal
		2736		sf	TOTAL
514	00056	2736		SF	FIELD PAINTING OF EXISTING STRUCTURAL STEEL, PRIME COAT
		2736		sf	TOTAL - match 514E00050
514	00060	2736		SF	FIELD PAINTING STRUCTURAL STEEL, INTERMEDIATE COAT
		2736		sf	TOTAL - match 514E00050
514	00067	2736		SF	FIELD PAINTING STRUCTURAL STEEL, FINISH COAT, AS PER PLAN
		2736		sf	TOTAL - match 514E00050
514	00504	6		MNHR	GRINDING FINS, TEARS, SLIVERS ON EXISTING STRUCTURAL STEEL
		320		ft	total length of existing beam on structure
		320		min	1 minute per linear foot of beam (in BDM)
		6		mnhr	conversion
514	10000	3		EACH	FINAL INSPECTION REPAIR
		320		ft	total length of existing beam on structure
		150		ft	1 inspection per every 150 feet of girder
		1		each	# of bridges
		3		each	final repair total
516	10010	58		FT	ARMORLESS PREFORMED JOINT SEAL
		29		ft	at sleeper slab
		2		each	locations
		58		ft	total
516	13600	8		SF	1" PREFORMED EXPANSION JOINT FILLER
RA	Interface	2.94		sf	area
BR-1-13	at deck/AS	2		each	locations
		5.9		sf	subtotal
	Interface	0.49		sf	flooded area (area of rail which is larger than curb, but so small say ok)
	at end	2		each	locations
	transiton/curb	1.0		sf	subtotal
FA	Interface	0.49		sf	flooded area (area of rail which is larger than curb, but so small say ok)
BR-1-13	at end	2		each	locations
	transiton/curb	1.0		sf	subtotal
		7.8		sf	total

516	13900	56		SF	2" PREFORMED EXPANSION JOINT FILLER
RA	WW	9.0		ft	length
	at AS	1.25		ft	height
		2		each	locations
	WW	3.75		ft	length
	at diaph	4.37		ft	avg height (top deck - btm of diaphragm)
		2		each	locations
		56.0		sf	total
516	14020	75		FT	SEMI-INTEGRAL ABUTMENT EXPANSION JOINT SEAL
	RA	37.3		ft	length
	FA	37.3		ft	length
		74.7		ft	total
516	44100	12		EACH	14" X 18" X 2 5/8" ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (15" X 19" X 2") (NEOPRENE)
		0		each	abutments
		3		each	piers
		4		each	beamlines
		12		each	total
516	44200	8		EACH	13" X 16" X 3 3/16" ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (14" X 17" X 2") (NEOPRENE)
		2		each	abutments
		0		each	piers
		4		each	beamlines
		8		each	total
516	47000	LS			JACKING AND TEMPORARY SUPPORT OF SUPERSTRUCTURE
					(Estimate based on values used for PE Report)
		\$ 22,000.00			Support at piers will probably require shoring towers, use \$1500 per bearing at piers; \$500 per bearing at abutments
518	21201	29		CY	POROUS BACKFILL WITH GEOTEXTILE FABRIC, AS PER PLAN
	RA	31.33		ft	length (along entire diaphragm limits)
		6.12		ft	avg height (avg top deck - AS thick - beam seat + 1.5 (approx. height to mid weep) + 1.17 (1' below bot of weep))
		2		ft	thickness
		383.73		cf	RA PROP TOTAL
	FA	32.17		ft	length
		6.18		ft	avg height (avg top deck - AS thick - beam seat + 1.5 (approx. height to mid weep) + 1.17 (1' below bot of weep))
		2		ft	thickness
		397.37		cf	FA PROP TOTAL
		28.93		cy	total
					NOTE - item to include "retain and clean out existing weepholes for drainage"
518	40012	64		FT	6" NON-PERFORATED CORRUGATED PLASTIC PIPE
	FA	32		ft	drainage behind WW to outlet at tied concrete block mat (west WW)
	FA	32		ft	drainage behind WW to outlet at tied concrete block mat (east WW)
		64		ft	total
519	11101	153		SF	PATCHING CONCRETE STRUCTURE, AS PER PLAN
	P1	33		sf	Estimated area, from table on plans
	P2	45		sf	Estimated area, from table on plans
	P3	75		sf	Estimated area, from table on plans
		153		sf	total

526	25010	166		SY	REINFORCED CONCRETE APPROACH SLABS WITH QA/QC (T=15")
	RA-1	29		ft	width
		7.92		ft	length
	RA-2	31.33		ft	width
		17.08		ft	length
		764.86		sf	RA total
	FA	29		ft	width
		25		ft	length
		725		sf	FA total
		165.54		sy	total
526	90030	58		FT	TYPE C INSTALLATION
		29		ft	AS Width
		2		each	number of approach slabs
		58		ft	total
601	20000	326		SY	CRUSHED AGGREGATE SLOPE PROTECTION
	RA	37.50		ft	approx. length (not along slope)
		2			slope (X:1)
		41.93		ft	length along slope
		37.33		ft	width (bridge width/cos(skew) + 3' each end)
		1399.88		sf	subtotal
	FA	41.00		ft	approx. length (not along slope)
		2			slope (X:1)
		45.84		ft	length along slope
		37.33		ft	width (bridge width/cos(skew) + 3' each end)
		1530.53		sf	subtotal
		325.60		sy	total
601	21050	3.56		SY	TIED CONCRETE BLOCK MAT WITH TYPE 1 UNDERLAYMENT
	FA	1.78		sy	drainage behind west WW
	FA	1.78		sy	drainage behind east WW
		3.56		sy	total
607	39900	320		FT	VANDAL PROTECTION FENCE, 6' STRAIGHT, COATED FABRIC
		160		ft	length per parapet
		2		each	number of parapets
		320		ft	total
611	99710	2		EACH	PRECAST REINFORCED CONCRETE OUTLET
		1		each	drainage behind west WW
		1		each	drainage behind east WW
		2		each	total