

# Quantity Estimate

Bridge No.: HAM-42-1198

Prestressed Concrete Box Beam (CB17-48)

Date: 8/14/2019

Calc.: JH

Check: YSJ

ITEM	EXT.	QTY.	UNIT	DESCRIPTION	ABUT	SUPER	GEN.
202	11203	LUMP		PORTIONS OF STRUCTURE REMOVED, OVER 20 FOOT SPAN, AS PER PLAN			LUMP
202	22900	214	SY	APPROACH SLAB REMOVED			214
202	23500	454	SY	WEARING COURSE REMOVED			454
503	11100	LUMP		COFFERDAMS AND EXCAVATION BRACING			LUMP
503	21300	LUMP		UNCLASSIFIED EXCAVATION			LUMP
509	10000	16635	LB	EPOXY COATED REINFORCING STEEL	141	16494	
510	10000	46	EACH	DOWEL HOLES WITH NONSHRINK, NONMETALLIC GROUT	46		
511	44110	1	CY	CLASS QC1 CONCRETE, ABUTMENT NOT INCLUDING FOOTING	1		
511	53014	108	CY	CLASS QC3 CONCRETE, MISC.: CLASS QC3 CONCRETE WITH QC/QA, SUPERSTRUCTURE, AS PER PLAN		95	13
512	10050	121	SY	SEALING OF CONCRETE SURFACES (NON-EPOXY)		66	55
512	10100	456	SY	SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)	372	84	
512	10601	116	FT	CONCRETE REPAIR BY EPOXY INJECTION, AS PER PLAN	116		
515	12030	15	EACH	PRESTRESSED CONCRETE COMPOSITE BOX BEAM BRIDGE MEMBERS, LEVEL 1, CB17-48 (43'-0" O/O BEAM)		15	
516	13600	31	SF	1" PREFORMED EXPANSION JOINT FILLER		31	
516	13900	28	SF	2" PREFORMED EXPANSION JOINT FILLER	28		
516	14020	149	FT	SEMI-INTEGRAL ABUTMENT EXPANSION JOINT SEAL	149		
516	41100	30	EACH	1/8" PREFORMED BEARING PAD	30		
516	42600	124	FT	ELASTOMERIC BEARING PAD, MISC.: 6" x 1.25"	124		
516	43201	60	EACH	ELASTOMERIC BEARING WITH INTERNAL LAMINATES ONLY (NEOPRENE), AS PER PLAN	60		
517	73101	82	FT	TEMPORARY BRIDGE RAILING, AS PER PLAN		82	
517	75121	158	FT	RAILING (CONCRETE PARAPET WITH TWIN STEEL TUBE RAILING), AS PER PLAN		90	68
518	21200	20	CY	POROUS BACKFILL WITH GEOTEXTILE FABRIC	20		
519	11101	278	SF	PATCHING CONCRETE STRUCTURE, AS PER PLAN	278		
526	15001	275	SY	REINFORCED CONCRETE APPROACH SLABS (T=13"), AS PER PLAN			275
526	90010	126	FT	TYPE A INSTALLATION			126

Quantity Calculations:

ITEM 202 11203, PORTIONS OF STRUCTURE REMOVED, OVER 20 FOOT SPAN, AS PER PLAN

**Use      Lump**

ITEM 202 22900, APPROACH SLAB REMOVED:

Existing approach length =	20	ft
Existing approach width =	48	ft
Removal area =	960	sf
No. of approach slabs =	2	ea
Total removal area =	1920	sf
=	213.33	sy
<b>Use</b>	<b>214</b>	<b>sy</b>

ITEM 202 23500, WEARING COURSE REMOVED:

Wearing course length =	85	ft	(including approach slabs)
Wearing course width =	48	ft	
Total area =	4080	sf	
=	453.3	sy	
<b>Use</b>	<b>454</b>	<b>sy</b>	

ITEM 503 11100, COFFERDAMS AND EXCAVATION BRACING:

**Use      Lump**

ITEM 503 21320, UNCLASSIFIED EXCAVATION, INCLUDING ROCK:

**Use      Lump**

ITEM 509 10000, EPOXY COATED REINFORCING STEEL:

Substructure =	141	lb
Superstructure =	16513	lb
Total reinforcement weight =	16654	lb
<b>Use</b>	<b>16654</b>	<b>lb</b>

ITEM 510 10000, DOWEL HOLES WITH NONSHRINK, NONMETALLIC GROUT:

Wingwalls:

For forward abutment & rear right wingwall: (detail 1)

No. of vertical dowels =	3	ea
No. of horizontal dowels =	8	ea
Total per location =	11	ea
No. of locations =	3	ea

Sub-total = 33 ea

For rear left wingwall: (detail 2)

No. of vertical dowels = 5 ea  
No. of horizontal dowels = 8 ea  
Total per location = 13 ea  
No. of locations = 1 ea  
Sub-total = 13 ea

Total number of dowels = 46 ea

**Use 46 ea**

ITEM 511 44110, CLASS QC1 CONCRETE, ABUTMENT NOT INCLUDING FOOTING:

Rear Abutment:

Right wingwall plan area = 1.72 sf  
Bottom elevation = 574.17  
Top elevation = 577.47  
Height = 3.30 ft  
Volume = 5.68 cf

Left wingwall plan area = 2.57 sf  
Bottom elevation = 574.17  
Top elevation = 577.47  
Height = 3.30 ft  
Volume = 8.48 cf

Forward Abutment:

Right wingwall plan area = 1.72 sf  
Bottom elevation = 574.55  
Top elevation = 577.92  
Height = 3.37 ft  
Volume = 5.80 cf

Left wingwall plan area = 1.72 sf  
Bottom elevation = 574.55  
Top elevation = 577.92  
Height = 3.37 ft  
Volume = 5.80 cf

Total abutment concrete volume = 25.75 cf  
= 0.95 cy

**Use 1.0 cy**

ITEM 511 53014, CLASS QC3 CONCRETE, MISC.: CLASS QC3 CONCRETE WITH QC/QA, SUPERSTRUCTURE, AS PER PLAN

Deck:

Deck width = 62.00 ft

Average deck thickness (including haunch) =	0.6458	ft
Deck length (beam o/o) =	43.00	ft
Deck concrete volume =	1721.79	cf

Abutment Diaphragms:

Average diaphragm cross section area =	2.61	sf
Diaphragm width =	62.3333	ft
Volume =	162.69	cf
Additional diaphragm end width =	0.875	ft
Additional diaphragm end depth =	1.5	ft
Average depth =	3.34	ft
No. of locations =	2	ea
Volume =	8.75	cf
Sub-total =	171.44	cf
No. of diaphragms =	2.00	ea
Total diaphragm concrete volume =	342.89	cf

Total deck concrete volume =	2064.68	cf
=	<u>76.47</u>	cy
<u>Use</u>	<u>77</u>	<u>cy</u>

Sidewalks on deck:

Left sidewalk cross section area =	4.61	sf
Length =	45.0	ft
Concrete volume =	207.45	cf
Right sidewalk cross section area =	5.64	sf
Length =	45.0	ft
Concrete volume =	253.80	cf
Total concrete volume on deck =	461.25	cf
=	17.08	cy
<u>Use</u>	<u>18</u>	<u>cy</u>

Sidewalks on approaches:

Forward left corner:

Sidewalk plan area =	119.80	sf
Average thickness (with 0.02 slope and transition from 8" to 6") =	8.25	in
Volume =	82.36	cf

Rear left corner:

Sidewalk plan area =	81.8	sf
Average thickness (with 0.02 slope and transition from 8" to 6") =	8.25	in

Volume = 56.2 cf

Right approach sidewalk:

Sidewalk plan area = 139.40 sf  
Average thickness (with 0.02 slope and transition from 8" to 6") = 8.25 in  
No. of locations = 2.0 ea  
Volume = 191.68 cf

Total concrete volume on approaches = 330.28 cf  
= 12.23 cy

Use 13.00 cy

Total super structure volume = 108.00 cy

**Use 108 cy**

#### ITEM 512 10050, SEALING OF CONCRETE SURFACES (NON-EPOXY):

Sidewalks on deck:

Sidewalk sealing perimeter (top and front) = 6.60 ft  
Left sidewalk length = 45 ft  
Right sidewalk length = 45 ft  
Total sealing area on deck = 594.0 sf  
= 66.00 sy  
Use 66.0 sy

Sidewalks on approaches:

Right side and forward left corner:

Sidewalk plan area = 120.0 sf  
Average front area (transition from 8" to 6") = 11.7 sf  
Sealing area = 131.7 sf

Total area at these 3 locations = 395.00 sf

At rear left side:

Sidewalk plan area = 81.8 sf  
Average front area (transition from 8" to 6") = 10.85 sf  
Sealing area = 92.7 sf

Total sealing area on approaches = 487.65 sf  
= 54.18 sy  
Use 55.0 sy

Total sealing area = 121 sy

**Use 121 sy**

#### ITEM 512 10100, SEALING OF CONCRETE SURFACES (EPOXY-URETHANE):

Deck, parapets & Exterior Beams:

BR-2-15 parapet sealing perimeter = 4.93 ft  
 Coping perimeter = 1.160 ft  
 Average deck thickness & overhang = 1.42 ft

Beam height = 1.417 ft  
 Beam bottom sealing width = 0.5 ft  
 Sealing perimeter = 9.42 ft

Sealing length (between diaphragms) = 40.00 ft  
 Sealing surface area (both sides) = 753.87 sf  
 = 83.76 sy

Total superstructure sealing area = 83.76 sy

**Use 84 sy**

Rear Abutment:

Front:

Abutment stem front face sealing area (below seat & above EL 560) = 1090.0 sf

Left wingwall:

Wingwall front face sealing area (above soil) = 316.94 sf  
 Wingwall top width = 1.50 ft  
 Wingwall back side sealing height = 0.50 ft  
 Top & back side sealing width = 2.00 ft  
 Wingwall top and end length = 33.81 ft  
 Top & back side sealing area = 67.63 sf  
  
 Left wingwall sealing area = 384.57 sf

Right wingwall:

Wingwall front face sealing area (above soil) = 198.95 sf  
 Wingwall top width = 1.50 ft  
 Wingwall back side sealing height = 0.50 ft  
 Top & back side sealing width = 2.00 ft  
 Wingwall top and end length = 26.72 ft  
 Top & back side sealing area = 53.4492 sf  
  
 Right wingwall sealing area = 252.40 sf

Rear abutment sealing area = 1726.97 sf

Forward Abutment:

Front:

Abutment stem front face sealing area (below seat & above EL 560) = 1085 sf

Left wingwall:

Wingwall front face sealing area (above soil) =	212.10	sf
Wingwall top width =	1.50	ft
Wingwall back side sealing height =	0.50	ft
Top & back side sealing width =	2.00	ft
Wingwall top and end length =	26.65	ft
Top & back side sealing area =	53.31	sf
Left wingwall sealing area =	<u>265.41</u>	sf

Righth wingwall:

Wingwall front face sealing area (above soil) =	212.10	sf
Wingwall top width =	1.50	ft
Wingwall back side sealing height =	0.50	ft
Top & back side sealing width =	2.00	ft
Wingwall top and end length =	26.65	ft
Top & back side sealing area =	53.31	sf
Right wingwall sealing area =	<u>265.41</u>	sf
Forward abutment sealing area =	<u>1615.82</u>	sf
Total abutment sealing area =	<u>3342.78</u>	sf
=	<u>371.42</u>	sy
<b>Use</b>	<b>372</b>	<b>sy</b>

ITEM 512 10601, CONCRETE REPAIR BY EPOXY INJECTION, AS PER PLAN:

Estimated injection length =	96	ft
Contingency for future deterioration =	20	%
Total =	115	ft
<b>Use</b>	<b>116</b>	<b>ft</b>

ITEM 515 12051, PRESTRESSED CONCRETE COMPOSITE BOX BEAM BRIDGE MEMBERS, LEVEL 1, CB21-48, AS PER PLAN:

No. of beams =	15	ea
<b>Use</b>	<b>15</b>	<b>ea</b>

ITEM 516 13600, 1" PREFORMED EXPANSION JOINT FILLER:

1" P.E.J.F. in sidewalk at approach slab joint:

Area =	7.7	sf
No. of locations =	4	ea
Total =	30.80	ea
<b>Use</b>	<b>31</b>	<b>ea</b>

ITEM 516 13900, 2" PREFORMED EXPANSION JOINT FILLER:

2" P.E.J.F. at both ends of each abutment diaphragm:

Filler width =	2	ft
Filler height =	3.50	ft
Locations =	4	ea
Filler area =	<u>28.00</u>	sf
Total filler area =	<u>28.00</u>	sf
<b>Use</b>	<b>28</b>	<b>sf</b>

ITEM 516 14020, SEMI-INTEGRAL ABUTMENT EXPANSION JOINT SEAL:

Sealing length over horizontal joint = (including 1.5' extension at both ends)	65.00	ft
Sealing length over vertical joint = (including 1.5' extension at bottom)	4.67	ft
Sealing length = (2 vertical and 1 horizontal joints)	74.33	ft
Total sealing length (both abutments) =	148.66	ft
<b>Use</b>	<b>149</b>	<b>ft</b>

ITEM 516 41100, 1/8" PREFORMED BEARING PAD

No. of beams =	15	ea
No. of pad per beam =	2	ea
Total =	30	ea
<b>Use</b>	<b>30</b>	<b>ea</b>

ITEM 516 42600, ELASTOMERIC BEARING PAD, MISC.:

Rear abutment pad length =	62.00	ft
forward abutment pad length =	62.00	ft
Total =	124	ft
<b>Use</b>	<b>124</b>	<b>ft</b>

ITEM 516 43201, ELASTOMERIC BEARING WITH INTERNAL LAMINATES ONLY (NEOPRENE), AS PER PLAN:

No. of pad per beam =	4	ea
No. of beams =	15	ea



Total number of pads = 60 ea

**Use 60 ea**

ITEM 517 73101, TEMPORARY BRIDGE RAILING, AS PER PLAN

Length of temporary railing = 82 ft

**Use 82 ft**

ITEM 517 75120, RAILING (CONCRETE PARAPET WITH TWIN STEEL TUBE RAILING):

On deck:

Left railing length = 45 ft

Right railing length = 45 ft

Total length = 90 ft

**Use 90 ft**

On approaches:

Left rear end length = 7.5 ft

Left forward end length = 20 ft

Righth rear end length = 20 ft

Right forward end length = 20.0 ft

Total length = 67.5 ft

**Use 68 ft**

ITEM 518 21200, POROUS BACKFILL WITH FILTER FABRIC:

Rear Abutment:

Approximate top of backfill (1.5' below finish) EL. = 575.43 ft

Bottom of backfill EL. (1.5' below seat) = 573.3 ft

Approximate filling plan area = 125.0 sf

Filling volume = 268.7 cf

Forward Abutment:

Approximate top of backfill (1.5' below finish) = 575.87 ft

Bottom of backfill = 573.8 ft

Approximate filling plan area = 125.0 sf

Filling volume = 258.75 cf

Total volume = 527.50 cf

= 19.5 cy

**Use 20 cy**

ITEM 519 11101, PATCHING CONCRETE STRUCTURE, AS PER PLAN:

Estimated patching area RA =	153	sf
Estimated patching area FA =	78	sf
Contingency for future deterioration =	20	%
Total =	277.2	
<b>Use</b>	<b>278</b>	<b>cy</b>

ITEM 526 15001, REINFORCED CONCRETE APPROACH SLABS (T=13"), AS PER PLAN:

Rear approach slab plan area =	1231.5	sf
Forward approach slab plan area =	1240	sf
Total =	2471.5	sf
=	274.61	sy
<b>Use</b>	<b>275</b>	<b>sy</b>

ITEM 526 90010, TYPE A INSTALLATION:

Rear approach slab installation length =	63.5	ft
Forward approach slab installation length =	62	ft
Total =	125.5	ft
<b>Use</b>	<b>126</b>	<b>ft</b>