New York State Thruway Authority

TAN 16-32B, D214503

North Grand Island Bridges

Northbound - MP N20.35 - BIN 5045752
Southbound - MP N21.12 - BIN 5045751
Robert Moses off-ramp - MP 421.11 - BIN 504575A

PS&E Engineers Estimate of Quantities

Prepared by:

CHA Consulting Inc.
August 24, 2016

TAN 16-32B **CHA**
D214503
NGIB (NB) - OVERLAY
PS&E QUANTITIES

CALC. BY: SEK DATE: 7/29/2016
CHECKED BY: MK DATE: 8/16/2016

SHEET 1 OF 76

ITEM 203.02 UNCLASSIFIED EXCAVATION AND DISPOSAL (CY)

Begin Approach slab	length	21	
Beg Sta. 905+00.47	width	26	= 12" Approach Slab + 12"
End Sta. 905+20.47	depth	2	Subbase.

	40	CY
Wrong Way Deterrent Signs	2	CY
TOTAL - INCLUDES 10%	**47**	**CY**

TAN 16-32B **CHA**
D214503
NGIB (NB) - OVERLAY
PS&E QUANTITIES

CALC. BY: SEK DATE: 7/29/2016
CHECKED BY: MK DATE: 8/16/2016

SHEET 2 OF 76

ITEM 304.15 SUBBASE COURSE, OPTIONAL IV (CY)

Begin Approach slab	length	21	ft
Beg Sta. 905+00.47	width	26	ft
End Sta. 905+20.47	Depth	1	ft
		20	CY
Wrong Way Deterrent Signs		**1**	

TOTAL - INCLUDES 10%	**24**	**CY**

ITEM 402.000013 - PLANT PRODUCTION QUALITY ADJUSTMENT TO HMA ITEMS (QA)

Top Course & Binder Course Quantity from Item 402.128203 Tab and 402.198903

From 402.128203 & 402.198903 = 192 **Tons**

Adjustment conversion = 0.05

Quantity Adjustment =	**10**	**Tons**

TAN 16-32B **CHA**
D214503
NGIB (NB) - OVERLAY
PS&E QUANTITIES

CALC. BY: SEK DATE: 7/29/2016
CHECKED BY: MK DATE: 8/16/2016

SHEET 3 OF 76

ITEM 402.128203 - 12.5 TOP COURSE HMA, 80 SERIES COMPACTION (T)

1. Begin Approach

Begin Station 904+00.47
End Station 905+00.47

112 lbs/sy/in

AREAS

	1	2	3	4	5
	travel way	Lt Shldr	Lt Shldr	Rt Shldr	Rt Shldr
Length	100	24	40	78	15
Width	24	10	6	5	2.5
Totals =	2400	240	240	390	37.5

Total = 3307.5 **sf**

	Area	
	3307.5	sf
÷	9	sf/sy
	367.5	sy

	sy		depth (in)		weight		lbs/ton		
Tonnage =	367.5	x	1.5	x	112	/	2000	=	**30.9 tons**

2. End Approach

Begin Station 946+08.08
End Station 947+08.08

112 lbs/sy/in

AREAS

	1	2	3
	travel way	Lt Shldr	Rt Shldr
Length	100	100	100
Width	24	1	4.5
Totals =	2400	100	450

Total = 2950 **sf**

	Area	
	2950	sf
÷	9	sf/sy
	327.77778	sy

	sy		depth (in)		weight		lbs/ton		
Tonnage =	327.7778	x	1.5	x	112	/	2000	=	**27.5 tons**

3. Off-Ramp

Begin Station B14+19.26
End Station B15+29.26

112 lbs/sy/in

AREAS

	1	2	3
	Press. Rel.	Lt Shldr	Lt Shldr
Length	10	40	70
Width	24	4	5
Totals =	240	160	350

Total = 750 **sf**

ITEM 402.128203 - 12.5 TOP COURSE HMA, 80 SERIES COMPACTION (T)

	Area	
	750	sf
÷	9	sf/sy
	83.333333	sy

	sy		depth (in)		weight		lbs/ton		
Tonnage =	83.33333	x	1.5	x	112	/	2000	=	**7.0 tons**

Total =	**65.4**	**tons**

Total with 10% increase =	**72**	**tons**

ITEM 402.198903 - 19 F9 BINDER COURSE HMA, 80 SERIES COMPACTION (T)

1. Begin Approach

AREAS

			1	2	3	4	5
Begin Station	904+00.47		travel way	Lt Shldr	Lt Shldr	Rt Shldr	Rt Shldr
End Station	905+00.47	Length	100	24	40	78	15
		Width	24	10	6	5	2.5
112 lbs/sy/in		Totals =	2400	240	240	390	37.5

Total = 3307.5 **sf**

	Area	
	3307.5	sf
÷	9	sf/sy
	367.5	sy

	sy		depth (in)		weight		lbs/ton		
Tonnage =	367.5	x	2.5	x	112	/	2000	=	**51.5** tons

2. End Approach

AREAS

			1	2	3
Begin Station	946+08.08		travel way	Lt Shldr	Rt Shldr
End Station	947+08.08	Length	100	100	100
		Width	24	1	4.5
112 lbs/sy/in		Totals =	2400	100	450

Total = 2950 **sf**

	Area	
	2950	sf
÷	9	sf/sy
	327.77778	sy

	sy		depth (in)		weight		lbs/ton		
Tonage =	327.7778	x	2.5	x	112	/	2000	=	**45.9** **tons**

3. Off-Ramp

AREAS

			1	2	3
Begin Station	B14+19.26		Press. Rel.	Lt Shldr	Lt Shldr
End Station	B15+29.26	Length	10	40	70
		Width	24	4	5
112 lbs/sy/in		Totals =	240	160	350

Total = 750 **sf**

ITEM 402.198903 - 19 F9 BINDER COURSE HMA, 80 SERIES COMPACTION (T)

	Area	
	750	sf
÷	9	sf/sy
	83.333333	sy

	sy		depth (in)		weight		lbs/ton		
Tonnage =	83.33333	x	2.5	x	112	/	2000	=	**11.7 tons**

Total =	**109.0**	**tons**

Total with 10% increase =	**120**	**tons**

TAN 16-32B **CHA**
D214503
NGIB (NB) - OVERLAY
PS&E QUANTITIES

CALC. BY: SEK DATE: 7/29/2016
CHECKED BY: MK DATE: 8/16/2016

SHEET 8 OF 76

ITEM 407.0102 DILUTED TACK COAT (GAL)

0.1 G/SY	South Approach	904+00.00		
for tack coat on milled surface	South Appr. End	905+00.00	100	ft
	North Approach	946+08.08		
	North Appr. End	947+08.08	100	ft
	RM off-ramp B	014+19.26		
	RM End off ramp B	014+29.26	10	ft
	Total Approach Pavement Length = Length of tack coat application		210	ft
	Ave. Approach Width = Width of Tack coat Application		30	ft
	Area from Asphalt items		7007.5	SF
	Conversion =		9	SF/SY
	Area of tack =		778.6	SY
	Application Rate =		0.1	G/SY
	Tack Coat Quantity =		77.86	Gallons

0.06 G/SY	South Approach	904+00.00		
for tack coat between surfaces	South Approach End	905+00.00	100	ft
	North Approach	946+08.08		
	North Approach End	947+08.08	100	ft
	RM off-ramp B	014+19.26		
	RM End off ramp B	014+29.26	10	ft
	Total Approach Pavement Length = Length of tack coat application		210	ft
	Ave. Approach Width = Width of Tack coat Application		30	ft
	Area =		7007.5	SF
	Conversion =		9	SF/SY
	Area of tack =		778.6	SY
	Application Rate =		0.06	G/SY
	Tack Coat Quantity =		46.7	Gallons

Total with 10% increase = 137 Gallons

TAN 16-32B **CHA**
D214503
NGIB (NB) - OVERLAY
PS&E QUANTITIES

CALC. BY: SEK DATE: 7/29/2016
CHECKED BY: MK DATE: 8/16/2016

SHEET 9 OF 76

ITEM 25490.1701 - PRODUCTION COLD MICRO-MILLING (SY)

Area at the Robert Mosses off ramp approach

Begin Station	B14+29.26	
End Station	B15+29.26	
Length =	100	ft
Width =	24	ft
Total =	2400	SF
Conversior	9	SF to SY
Total =	267	SY
Total plus 5% =	**280**	**SY**

TAN 16-32B **CHA**
D214503
NGIB (NB) - OVERLAY
PS&E QUANTITIES

CALC. BY: SEK DATE: 7/29/2016
CHECKED BY: MK DATE: 8/16/2016

SHEET 10 OF 76

ITEM 490.30 - MISCELLANEOUS COLD MILLING OF BITUMINOUS CONCRETE (SY)

SHOULD BE THE SAME PLAN AREA AS THE TOP AND BINDER COURSE

REFER TO ITEM 402.128203 FOR AREAS TO USE

From Asphalt top course item =	7007.5	SF
Conversion =	9	SF to SY
Total =	779	SY
Total plus 10% =	**857**	**SY**

ITEM 502.3201--18 : DRILL AND GROUT DOWELS FOR FULL DEPTH PORTLAND CEMENT PAVEMENT REPAIRS (EA)

North End of Concrete approach slab - south approach
Station 905+20.47

Slab Width	300	in	
edge distance =	9	in	<-- dowel embedment…. Use this as the minimum edge distance
spacing	12	in	
dowel spacing length	282	in	
# of dowel jts	23.5	ea - therefore use 1'-0" spacing	

Total =	**24**	**Each**

ITEM 502.92 - SEALING TRANSVERSE JOINTS (LF)

1. South Approach

2 locations full width of road

905+00	25	ft
905+20	25	ft

2. North Approach

2 locations full width of road

945+68	25	ft
946+08	25	ft

3. Off-Ramp Approach

9 locations full width of transverse cuts in road

B13+79	25	ft
B14+19	25	ft
B14+29	25	ft
B14+45+/-	25	ft
B14+60+/-	25	ft
B14+85+/-	25	ft
B15+00+/-	25	ft
B15+15+/-	25	ft
B15+30+/-	25	ft

1 location of longitudinal cut in road

Begin Station	14+29.26
End Station	15+29.26
Length	100

Total = 425 LF

ITEM 25555.0103 - RAPID SETTING CONCRETE (CY)

1. Header Pours at Joints

a) For Modular joints at U16, U22, U40, U46, U104, U110, U128 & U134

Width	4	ft
Opening	0.96	ft
length	26.67	ft
# of Joints	8	ea
Average depth	1.5	ft
Volume	**36.0**	CY

b) For Modular joints at U70 & U80

Width	4	ft
Opening	0.96	ft
length	26.67	ft
# of Joints	2	ea
Average depth	1.08	ft
Volume	**6.5**	CY

c) For Modular joints at U04 and U146

	U04			U146	
Width	4.17	ft	Width	4.17	ft
Opening	0.96	ft	Opening	0.96	ft
length	26.67	ft	length	29.79	ft
Average depth	1.5	ft	Average depth	1.5	ft
Volume	**4.8**	CY	Volume	**5.3**	CY

d) For Modular joint at off-ramp (Pier 15)

	off-ramp (mainline side)			off-ramp (ramp side)	
Width	1.67	ft	Width	1.5	ft
length	26.17	ft	length	26.17	ft
Average depth	1.92	ft	Average depth	1.58	ft
Volume	**3.1**	CY	Volume	**2.3**	CY

ITEM 25555.0103 - RAPID SETTING CONCRETE (CY)

e) For joints at Pier 1, Pier 2, Pier 3, Begin Abutment, End Abutment and off--ramp Abutment

Piers			Abutments		
Width	2	ft	Width	2	ft
length	25.33	ft	length	25.33	ft
# of Joints	3	ea	# of Joints	3	ea
Average depth	0.50	ft	Average depth	0.50	ft
Volume	**2.8**	CY	Volume	**2.8**	CY

2. Concrete closure pours for curbs at modular joints

a) Curbs for Modular joints at U16, U22, U40, U46, U70, U80, U104, U110, U128, U134 & off-ramp

length	4	ft
Opening	0.96	ft
Width	1.33	ft
# of Joints	11	ea
Average depth	1.17	ft
Volume	**1.9**	CY

a) Curbs for Modular joints at U4 & U146

length	4.17	ft
Opening	0.96	ft
Width	1.33	ft
# of Joints	2	ea
Average depth	1.17	ft
Volume	**0.4**	CY

2. Repairs at the Abutments below the Joints (If needed)

From table on CDR-6 in Plans 9 CY

Total Volume = 75 CY

Total Plus 10% = 83 CY

ITEM 556.0203 GALVANIZED BAR REINFORCEMENT FOR CONCRETE STRUCTURES (LB)

I. - Reinforcement at the South Approach Slab

# of bars		South Approach Slab				
		5HG1		5HG2		
		240		300		
		-6		-6		
		234		294		
	1 Mat	21		38		
Total	X2	42		76	top & Bottom	
STR	Length	24'-6"	24.5	19'-6"	19.5	ft
	Wt per ft for #5		1.043	lbs/ft		
		5HG1	1073	LBS		
		5HG2	1546	LBS		
	Total for S. Appr Slab =		2619	LBS		

II. Reinforcement at all the Joints

1: Rebar for Modular Joint Headers

a - U16, U22, U40, U46, U104, U110, U128 & U134

Assume 2.5" cover on top and bottom	5	in	
Deck with overlay	10.5	in	
Haunch at crown	6	in	
Haunch at Curb/Fascia	4.5		
Depth of header over floorbeam and diaphragm	16.5	Crown	
	15	curb	
Depth of stirrup	11.5	crown	use 12 and 10 inches
	10	curb	

ITEM 556.0203 GALVANIZED BAR REINFORCEMENT FOR CONCRETE STRUCTURES (LB)

	Width of stirrup		
Distance from center of joint to edge of box out	25	in	FB side
	23	in	Dia side
Distance from center of joint to edge of plate	6	in	
Width of concrete	19	in	FB side
	17	in	Dia side
Subtract out for cover concrete	5	in	
Width of bar	14	in	FB side
	12	in	Dia side
Use	**13**	**in**	**Width**

Straight bars

A total of 6 in section on either side making a total of 12 bars

8 bars can be full length		26'-8"	Length of joint	
	minus 8" for cover	8"		
	Length of bar	26	ft	
	# of bars			
	8			5SG1
The other str bars 2' and 3' in length	# of bars			
	24	2	ft	5SG2
	8	3	ft	5SG3
Stirrups	14	13 x 11		5SG4
	28	13 x 12		5SG5
	20	13 x 10		5SG6
Cub Bars	6	5.9	ft	4SG7
	8	1.9	ft	4SG8

A & G are 6"

			# of bars fc	length		total wt
Times 8 joints	8	5SG1	64	26		1736
		5SG2	192	2		401
		5SG3	64	3		200
		5SG4	112	2'-0"	2	234
		5SG5	224	5'-3"	5.25	1227
		5SG6	160	4'-11"	4.92	821
		4SG7	48	5.9		190
		4SG8	64	1.9		82

Wt per ft for #5	1.043	lbs/ft	**Total**	**4889**	**LBS**
Wt per ft for #4	0.668	lbs/ft			

ITEM 556.0203 GALVANIZED BAR REINFORCEMENT FOR CONCRETE STRUCTURES (LB)

b - U70 & U80

Assume 2.5" cover on top and bottom	5	in		
Deck with overlay	10.5	in		
Haunch at crown	2	in		
Haunch at Curb/Fascia	0			
Depth of header over floorbeam and diaphragm	12.5	Crown		
	10.5	curb		
Depth of stirrup	7.5	crown	use 8 and 6 inches	
	5.5	curb		
Width of stirrup				
Distance from center of joint to edge of box out	25	in	FB side	
	23	in	Dia side	
Distance from center of joint to edge of plate	6	in		
Width of concrete	19	in	FB side	
	17	in	Dia side	
Subtract out for cover concrete	5	in		
Width of bar	14	in	FB side	
	12	in	Dia side	
Use	13	in	Width	
Straight bars				
A total of 6 in section on either side making a total of 12 bars				
8 bars can be full length	26'-8"	Length of joint		
minus 8" for cover	8"			
Length of bar	26	ft		
# of bars				
8			5SG1	
The other str bars are 2' and 3' in length # of bars				
24	2	ft	5SG2	
8	3	ft	5SG3	
Stirrups				
14	13 x 8		5SG4	
28	13 x 8		5SG5	A & G are 6"
20	13 x 6		5SG6	
Cub Bars 6	5.9	ft	4SG7	
8	1.9	ft	4SG8	

ITEM 556.0203 GALVANIZED BAR REINFORCEMENT FOR CONCRETE STRUCTURES (LB)

SHEET 18 OF 76

			# of bars for eigh	length		total wt
Times 2 joints	2	5SG1	16	26		434
		5SG2	48	2		100
		5SG3	16	3		50
		5SG4	28	1'-9"	1.75	51
		5SG5	56	4'-7"	4.58	268
		5SG6	40	4'-3"	4.25	177
		4SG7	12	5.9		47
		4SG8	16	1.9		20

Wt per ft for #5	1.043	lbs/ft	**Total**	**1148**	**LBS.**
Wt per ft for #4	0.668	lbs/ft			

c - U4

Assume 2.5" cover on top and bottom	5	in	
Deck with overlay	10.5	in	
Haunch at crown	7	in	
Haunch at Curb/Fascia	5.5		
Depth of header over floorbeam and diaphragm	17.5	Crown	
	16	curb	
Depth of stirrup	12.5	crown	use 13 and 11 inches
	11	curb	
Width of stirrup			
Distance from center of joint to edge of box out	26	in	FB side
	24	in	Dia side
Distance from center of joint to edge of plate	6	in	
Width of concrete	20	in	FB side
	18	in	Dia side
Subtract out for cover concrete	5	in	
Width of bar	15	in	FB side
	13	in	Dia side
Use	14	in	Width

ITEM 556.0203 GALVANIZED BAR REINFORCEMENT FOR CONCRETE STRUCTURES (LB)

Straight bars

A total of 6 in section on either side making a total of 12 bars

8 bars can be full length		26'-8"	Length of joint		
	minus 8" for cover	8"			
	Length of bar	26	ft		
	# of bars				
	8			5SG1	
The other str bars are 2' and 3' in length	# of bars				
	24	2	ft	5SG2	
	8	3	ft	5SG4	
Stirrups					
	14	14 x 12		5SG4	
	28	14 x 13		5SG5	A & G are 6"
	20	14 x 11		5SG6	
Cub Bars	6	5.9	ft	4SG7	
	8	1.9	ft	4SG8	

			# of bars	fc length		total wt
Times 8 joints	1	5SG1	8	26		217
		5SG2	24	2		50
		5SG3	8	3		25
		5SG4	14	2'-2"	2.167	32
		5SG5	28	5'-7"	5.58	163
		5SG6	20	5'-3"	5.25	110
		4SG7	6	5.9		24
		4SG8	8	1.9		10

Wt per ft for #5	1.043	lbs/ft	**Total**	**630**	**LBS**
Wt per ft for #4	0.668	lbs/ft			

d - U146

Assume 2.5" cover on top and bottom	5	in	
Deck with overlay	10.5	in	
Haunch at crown	7	in	
Haunch at Curb/Fascia	5.5		
Depth of header over floorbeam and diaphragm	17.5	Crown	
	16	curb	
Depth of stirrup	12.5	crown	use 13 and 11 inches
	11	curb	
Width of stirrup			
Distance from center of joint to edge of box out	26	in	FB side
	24	in	Dia side

ITEM 556.0203 GALVANIZED BAR REINFORCEMENT FOR CONCRETE STRUCTURES (LB)

Distance from center of joint to edge of plate	6	in	
Width of concrete	20	in	FB side
	18	in	Dia side
Subtract out for cover concrete	5	in	
Width of bar	15	in	FB side
	13	in	Dia side
Use	14	in	Width

Straight bars

A total of 6 in section on either side making a total of 12 bars

8 bars can be full length		27'-4"	Length of joint		
	minus 8" for cover	4"			
	Length of bar	27	ft		
	# of bars				
	8			5SG1	
The other str bars are 2' and 3' in length	# of bars				
	24	2	ft	5SG2	
	8	3	ft	5SG3	
Stirrups					
	14	14 x 12		5SG4	
	28	14 x 13		5SG5	A & G are 6"
	22	14 x 11		5SG6	
Cub Bars	6	5.9	ft	4SG7	
	8	1.9	ft	4SG8	

			# of bars for eight	length		total wt
Times 1 joints	1	5SG1	8	27		225
		5SG2	24	2		50
		5SG3	8	3		25
		5SG4	14	2'-2"	2.167	32
		5SG5	28	5'-7"	5.58	163
		5SG6	22	5'-3"	5.25	120
		4SG7	6	5.9		24
		4SG8	8	1.9		10

Wt per ft for #5	1.043	lbs/ft	**Total**	**649**	**LBS**
Wt per ft for #4	0.668	lbs/ft			

ITEM 556.0203 GALVANIZED BAR REINFORCEMENT FOR CONCRETE STRUCTURES (LB)

e - Off-Ramp **Channel Side**

Assume 2.5" cover on top and bottom	5	in		
Deck with overlay	10.5	in	Channel Side	
Haunch at crown	12.5	in		
Haunch at Curb/Fascia	9.5			
Depth of header over channel	23	Crown		
	20	curb		
Depth of stirrup	18	crown	use 18 and 15 inches	
	15	curb		
Width of stirrup				
Distance from center of joint to edge of box out	25	in	Channel Side	
	23	in	FB side	
Distance from center of joint to edge of plate	6	in		
Width of concrete	19	in	Channel Side	
	17	in	FB side	
Subtract out for cover concrete	5	in		
Width of bar	14	in	Channel Side	
	12	in	FB side	
Use	14	in	Width	

Straight bars

A total of 8 in section on either side (8 in this section)

4 bars can be full length		26'-4"	Length of joint		
	minus 8" for cover	4"			
	Length of bar	26	ft		
	# of bars				
	4			5SG1	
The other str bars are 2' and 3' in length	# of bars				
	12	2	ft	5SG2	
	4	3	ft	5SG3	
Stirrups					
	7	14 x 16		5SG4	
	14	14 x 18		5SG5	A & G are 6"
	10	14 x 15		5SG6	
Curb Bars	6	5.9	ft	4SG9	
	8	1.9	ft	4SG10	

ITEM 556.0203 GALVANIZED BAR REINFORCEMENT FOR CONCRETE STRUCTURES (LB)

SHEET 22 OF 76

			# of bars for eighl	length		total wt
Times 1 joints	1	5SG1	4	26		108
		5SG2	12	2		25
		5SG3	4	3		13
		5SG4	7	2'-8"	2.67	19
		5SG5	14	6'-4"	6.33	92
		5SG6	10	5"-10"	5.83	61
		4SG9	6	5.92		24
		4SG10	8	1.92		10

Wt per ft for #5	1.043	lbs/ft	Total	353	LBS
Wt per ft for #4	0.668	lbs/ft			

Floorbeam Side

Assume 2.5" cover on top and bottom	5	in	
Deck with overlay	10.5	in	FB Side
Haunch at crown	8.5	in	
Haunch at Curb/Fascia	5.5		
Depth of header over floorbeam and diaphragm	19	Crown	
	16	curb	
Depth of stirrup	14	crown	use 14 and 11 inches
	11	curb	
Width of stirrup			
Distance from center of joint to edge of box out	25	in	Channel Side
	23	in	FB side
Distance from center of joint to edge of plate	6	in	
Width of concrete	19	in	Channel Side
	17	in	FB side
Subtract out for cover concrete	5	in	
Width of bar	14	in	Channel Side
	12	in	FB side
Use	12	in	Width

ITEM 556.0203 GALVANIZED BAR REINFORCEMENT FOR CONCRETE STRUCTURES (LB)

Straight bars

A total of 6 in section on either side (6 in this section)

2 bars can be full length		26'-4"	Length of joint		
	minus 8" for cover	4"			
	Length of bar	26	ft		
	# of bars				
	4			5SG1	
The other str bars are 2' and 3' in length	# of bars				
	12	2	ft	5SG3	
	4	3	ft	5SG4	
Stirrups					
	7	12 x 12		5SG4A	
	14	12 x 14		5SG7	A & G are
	10	12 x 11		5SG8	6"
	6	5.9	ft	4SG9	
	8	1.9	ft	4SG10	

			# of bars fo	length		total wt
Times 1 joints	1	5SG1	4	26		108
		5SG2	12	2		25
		5SG3	4	3		13
		5SG4	7	2'-0"	2	15
		5SG7	14	5'-4"	5.33	78
		5SG8	10	4'-10"	4.83	50

Wt per ft for #5	1.043	lbs/ft	Total	289	LBS
Wt per ft for #4	0.668	lbs/ft			

ITEM 556.0203 GALVANIZED BAR REINFORCEMENT FOR CONCRETE STRUCTURES (LB)

2: Pier and Abutment Joint Header Reinforcement

Reinforcement in travel lanes only

a - S. Abutment, N. Abutment and Off Ramp (R. Mosses)

2 bar types at each joint (type 17 - 4SG1 and straight - 5SG2)

4SG1	26	ea joint	b = 10 in	c = 6"	length	1.33	ft
5SG2	2	ea joint	o = 25 ft		length	25	ft

Times # of joints	3	4SG1	78	3 joints
		5SG2	6	3 joints

Wt per ft for #4	0.668	lbs/ft
Wt per ft for #5	1.043	lbs/ft

Weight of bars

4SG1	69	LBS.
5SG2	156	LBS.

Total =	**226**	**LBS.**

a - Piers 1, 2 & 3

2 bar types at each joint (type 17 - 4SG1 and straight - 5SG2)

4SG1	26	ea joint	b = 10 in	c = 6"	length	1.33	ft
5SG2	2	ea joint	o = 25 ft		length	25	ft

Times # of	3	4SG1	78	3 joints
		5SG2	6	3 joints

Wt per ft for #4	0.668	lbs/ft
Wt per ft for #5	1.043	lbs/ft

Weight of bars

4SG1	69	LBS.
5SG2	156	LBS.

Total =	**226**	**LBS.**

Total Rebar for Joints and Approach Slab

Total from Above	11029	lbs	This matches STR-8 from plans

10% for overrun	**12132**	**LBS**

ITEM 557.22 STRUCTURAL APPROACH SLAB WITH SEPARATE WEARING SURFACE (SY)

1. Approach Slab - South Approach

Begin Station	905+00.47
End Station	905+20.47

Width	25	ft
Length	20	ft

Area =	**56**	**SY**

ITEM 25557.2600 CRACK SEALING USING HIGH MOLECULAR WEIGHT METHACRYLATE - FLOODING (SF)

1. West Fascia full length of the Bridge

Begin Station	905+40.00	
End Station	945+66.12	
length	4026.12	ft
depth	1.25	ft
Sub-total =	4808	SF

Take out posts (225 SF)

2. Joint Headers

Piers & Abutments

Width	2	ft
length	26	ft
# of Joints	6	ea
Sub-total =	312	SF

Modular - U4 - U134

Width	3.4	ft
Length	26.67	ft
# of Joints	11	ea
Sub-total =	990.0	SF

Modular at U146

width	3.54	
Length	28.76	
Sub-total =	101.9	SF

Modular at off-ramp

width	3.4	
Length	26	
Sub-total	87.8	SF
Total	6300	SF
Total + 5% =	**6615**	**SF**

ITEM 559.18960118 PROTECTIVE SEALING OF STRUCTURAL CONCRETE ON NEW BRIDGE DECKS AND DECK OVERLAYS (SF)

I. New Deck Overlay

1. Width at 25.32' (Mainline)

Begin Station	90500
End Station	94173
length	3673
Width	25.33
Area 1 =	93037 SF

meant to seal bridge deck overlay

2. Width at 29'-9-1/2" (Mainline)

Begin Station	94173
End Station	94608
length	435
Width	29.79
Area 2 =	12959 SF

3 Width varies from 0' to 27' (Off Ramp B)

Begin Station	B 1000
End Station	B 1245
length	245
Average Width	13.50
Area 3 =	3308 SF

3 Width 25" (Off Ramp B)

Begin Station	B 1245
End Station	B 1419
length	174
Width	25.00
Area 4 =	4350 SF

Sub Total 113654 SF

II. Sidewalk Curbs and Edge of Deck both fascias

ITEM 559.18960118 PROTECTIVE SEALING OF STRUCTURAL CONCRETE ON NEW BRIDGE DECKS AND DECK OVERLAYS (SF)

1. Top of sidewalk (mainline)

Begin Station	905+00.00
End Station	941+73.00
length	3673
Width	6.0
Area 1 =	22191 SF

2. Top of Sidewalk (off-ramp)

Begin Station	10+00.00
End Station	14+20.00
length	420
Width	6.0
Area 2 =	2522 SF

3 Face of curb (Mainline)

Begin Station	905+00.00
End Station	941+73.00
length	3673
Height	1.2
Area 3 =	4285 SF

4 Face of curb (Off-ramp)

Begin Station	10+00.00
End Station	14+20.00
length	420
Width	1.2
Area 4 =	490 SF

5 Below sidewalk (Mainline)

Begin Station	905+00.00
End Station	941+73.00
length	3673
Height	2.3
Area 5 =	8264 SF

ITEM 559.18960118 PROTECTIVE SEALING OF STRUCTURAL CONCRETE ON NEW BRIDGE DECKS AND DECK OVERLAYS (SF)

6. Edge of Deck (West Fascia)

Begin Station	905+35.00
End Station	945+65.00
length	4030
Height	1.3

Area 6 =	5038	SF

Sub Total	**42790**	SF

GRAND TOTAL	**156444**	**SF**

ITEM 564.70001 - STRUCTURAL STEEL REPLACEMENT (EACH)

For Spindles Median Side

See Table on Dwg STR-4 in Plans

From Tables =	5	ea
Contingency form Tables =	5	ea
Total from table =	**10**	**Ea**

ITEM 564.70002 - STRUCTURAL STEEL REPLACEMENT (EACH)

-

For Structural Retrofit of Lights

See Table on Dwg STR-1 in Plans

Total from table =	**24**	**Ea**

ITEM 564.70003 - STRUCTURAL STEEL REPLACEMENT (EACH)

-

For Stringer Repairs on Southbound Bridge

See Table on Dwg STR-7 in Plans

Total from table =	7	Ea

TAN 16-32B **CHA**
D214503
NGIB (NB) - OVERLAY
PS&E QUANTITIES

CALC. BY: SEK DATE: 8/1/2016
CHECKED BY: MK DATE: 8/18/2016

ITEM 564.700004 - STRUCTURAL STEEL (Each)

For Temporary Road Plates at All joints

There are 19 joints being replaced
Assume qty of 1 per location'

unit weight of steel	490	pcf		
armored joints	6	ea		
plate width	2	ft		
plate length	25	ft		
plate thick	1	in		
1 plate vol	4.166667	cf	x	6
total vol	25	cf		
wt	12250	lbs		
mod joints	13	ea		
plate width	5	ft		
plate length	25	ft		
plate thick	1.25	in		
1 plate vol	13.02083	cf	x	13
total vol	169.2708	cf		
wt	82942.71	lbs		
total	95192.71	lbs		
add 5% for curb plates	99952.34	lbs		
use	**100000**	**lbs.**		

for info only….

For information only - items covers providing steel plate at ea joint regardless of how many times the plate is set or reset

Total = 19 Ea

ITEM 564.700005 - STRUCTURAL STEEL (EACH)

For Deck support at following Modular Joints - Diaphragm side

unit weight of steel	490	pcf
Weight of angle per ft	19.6	lbs
6"x6x1/2" angles	4	at each Modular Joint
Truss and Stringer Spacing		
CL of truss to S1	5.75	ft
CL S1 to S2	5.25	ft
CL S2 to S3	5.25	ft
CL S3 to CL truss	5.75	ft
Width of Truss & gussets - 1'-10"	1.83	ft
Width of Stringer Flanges - 10"	0.83	ft
CL of truss to edge of angle	0.92	ft
CL of Stringer to edge of Angle	0.42	ft
Length of Angles		
- Truss to S1	4.42	ft
- S1 to S2	4.42	ft
- S2 to S3	4.42	ft
- S3 to Truss	4.42	ft

U16, U22, U40, U46, U70, U80, U104, U110, U128 & U134

mod joints	10	ea
4 angles per joint	4	ea

Total number of angles	**40**	**ea**

TAN 16-32B **CHA**
D214503
NGIB (NB) - OVERLAY
PS&E QUANTITIES

CALC. BY: SEK DATE: 8/1/2016
CHECKED BY: MK DATE: 8/18/2016

SHEET 35 OF 76

ITEM 25566.03 - MODULAR EXPANSION JOINT SYSTEM - THREE CELL (LF)

Location	Deck width
U4	26.67
U16	26.67
U22	26.67
U40	26.67
U46	26.67
U70	26.67
U80	26.67
U104	26.67
U110	26.67
U128	26.67
U134	26.67
U146	28.79
Pier 15 Ramp B	26.17

TOTAL = 349.00 LF

ITEM 566.3003--25 - REATTACH EXISTING DOWNSPOUTS (EA)

From Table on Drawing SD-3

From Table =	5	ea
Contingency =	5	ea
TOTAL =	**10**	**EA**

TAN 16-32B **CHA**
D214503
NGIB (NB) - OVERLAY
PS&E QUANTITIES

CALC. BY: SEK DATE: 8/1/2016
CHECKED BY: MK DATE: 8/18/2016

SHEET 37 OF 76

ITEM 25567.31 - ARMORED EXPANSION JOINT SYSTEM - TYPE A1 (LF)

	Pier 1	Pier 3	North Abut	Abut - off Ramp
lanes	24	24	24	24.47
offsets	1.33	1.33	2.75	1.46
Totals	25.3	25.3	26.7	25.9

Total =	**104**	**ft**

TAN 16-32B **CHA**
D214503
NGIB (NB) - OVERLAY
PS&E QUANTITIES

CALC. BY: SEK DATE: 8/1/2016
CHECKED BY: MK DATE: 8/18/2016

SHEET 38 OF 76

ITEM 567.32--25 - ARMORED EXPANSION JOINT SYSTEM - TYPE A2 (LF)

South Abutment

	S. Abut
lanes	24
offset	1.33

Total = 25.3 ft

ITEM 25567.37 - ARMORED EXPANSION JOINT SYSTEM - TYPE A7 (LF)

Pier 2	lanes	24.0
	offset	1.3

Total = 25.3 ft

TAN 16-32B **CHA**
D214503
NGIB (NB) - OVERLAY
PS&E QUANTITIES

CALC. BY: SEK DATE: 8/2/2016
CHECKED BY: MK DATE: 8/18/2016

ITEM 567.6100--25 : REMOVAL OF EXISTING BRIDGE DECK JOINTS (LF)

Location	Deck width
U4	26.67
U16	26.67
U22	26.67
U40	26.67
U46	26.67
U70	26.67
U80	26.67
U104	26.67
U110	26.67
U128	26.67
U134	26.67
U146	28.80
Off-Ramp Pier 15	26.17
S Abut	25.33
N Abut	28.79
Off-Ramp	26.93
Piers 1-3	75.99

TOTAL = 506.00 LF

ITEM 568.75010001 - BRIDGE RAIL TUBE REPLACEMENT, TYPE 1 (LF)

From STR-6 - Bridge Railing Table from Drawings

From table = 701.5

Contingency from table = 83.5

TOTAL = 785.00 LF

ITEM 568.75020001 - BRIDGE RAIL TUBE REPLACEMENT, TYPE 2 (LF)

From STR-6- Misc. Bridge Railing Table from Drawings

From table =	840
Contingency from table =	175

TOTAL = 1015 LF

ITEM 568.75030001 - BRIDGE RAIL TUBE REPLACEMENT, TYPE 3 (LF)

From STR-4- Bridge Railing Table from Drawings

From table =	26
Contingency from table =	18

TOTAL = 44 LF

ITEM 574.0300001 - STRUCTURAL STEEL PAINTING LOCALIZED (SF)

1. Gusset Plates From Table STR-3 930 SF

2. Angles at Modular Joints

# of Modular Joints =	10	ea
Length of Angle =	4.42	ft
# of angles per joint	4	ea
surface width =	1	ft
Sub Total =	177	SF

Total = 1107 SF

ITEM 576.02 - SCUPPERS (EA)

From Drawing - SD-2 and drawings DP-1 thru DP-9	**81**	EA

Total =	**81**	**EA**

ITEM 580.01 - REMOVAL OF STRUCTURAL CONCRETE - CY

From Dwg CDR-6: Tables in the Plans	**9**	CY

Total =	**9**	**CY**

ITEM 582.06 - REMOVAL OF STRUCTURAL CONCRETE - REPLACEMENT WITH CLASS D CONCRETE - SF

From Dwg CDR- 6: Tables in the Plans =	**490**	SF
Impact attenuator wall =	4	SF
Total =	**494**	**SF**

ITEM 25584.55 - PARTIAL DEPTH REMOVAL OF STRUCTURAL SLAB AND REPLACEMENT WITH RAPID HARDING CONCRETE (SF)

From Dwg CDR-6: Tables in the Plans	**900**	SF
	=	
Partial Depth on the deck =	782	sf
	+	
Contingency on the deck =	118	sf

TOTAL =	**900**	**SF**

ITEM 584.56--25 - FULL DEPTH REMOVAL OF STRUCTURAL SLAB AND REPLACEMENT WITH RAPID HARDING CONCRETE (SF)

From Dwg CDR-6: Tables in the Plans	**387**	SF
	=	
Repairs around post =	87	sf
	+	
contingency for repair on deck =	100	sf
	+	
contingency for repair at the joints =	200	sf

Total = 387 SF

ITEM 584.40000009 - POLYMER OVERLAY WEARING SURFACE FOR STRUCTURAL SLABS (PPC) (SY)

I. Mainline Bridge (Including Approach Slab)

1. From South Abutment to Robert Mosses off-ramp

Begin Station		905+00.00	
End Station		944+25.00	
	Length	3925	ft
Remove width of Joints			
	S. Abut, Piers 1, 2 & 3	8	ft
	11 modular joints at 4 ft	44	ft
	Length deducting joints	3873	ft
Width of Deck			
Driving lane		12.00	
Passing Lane		12.00	
Left offset		1.33	
	Width	25.33	
Total Mainline to off - ramp =		11048	SY

2. From Robert Mosses off-ramp to North Abutment

Begin Station		944+25.00	
End Station		946+00.08	
	Length	175	ft
Remove width of Joints			
	N. Abutment	2	ft
	1 modular joints at 4 ft	4	ft
	Length deducting joints	169	ft

ITEM 584.40000009 - POLYMER OVERLAY WEARING SURFACE FOR STRUCTURAL SLABS (PPC) (SY)

Width of Deck

Driving lane		12.00
Passing Lane		12.00
Left offset		1.33
Right offset		3.46
	Width	28.79

Total Mainline to off - ramp =	560	SY

3. Robert Mosses off ramp (Area 3)

Area of tapered section

				Mainline	Width	
Ramp begins	B	10+42	=	94215.5	0	ft
Ramp bullnose				94415.5	32	ft

Area Triangle =	B =	200	ft	
1/2xBxH	H =	32	ft	

Area 3 =	356	SY

Area of Ramp (Including approach slab)

Begin Station	B	12+45.19	
End Station	B	15+29.26	
total length		284.07	ft

Width of Deck

pressure relief asp.		10	ft	
length		274.07	ft	= total length - pressure relief asphalt
2 Ramp Lanes		24.00		
Left offset		2.42		
Width		26.42	ft	
Area of Ramp lanes =		804	SY	

Total Ramp =	1160	SY

Total Bridge =	**12769**	**SY**

ITEM 586.0201 - DRILLING AND GROUTING REINFORCEMENT BARS (EA)

1. At Armored Joints

Piers 1, 2 & 3

bars per side of joint	13	ea
# sides	2	ea
# of Piers	3	ea
Total =	78	ea

S. Abut, N. but and Off-ramp

bars per side of joint	13	ea
# sides	2	ea
# of Abut	3	ea
Total =	78	ea

2. At Modular Joints (Curbs)

13 modular joints

bars per side of joint	4	ea
# sides	2	ea
# joints	13	ea
Total =	104	ea

3. At Modular Joints (Deck)

13 modular joints

bars per side of joint	10	ea
# sides	2	ea
# joints	13	ea
Total =	260	ea

Total	**520**	**Ea**

ITEM 587.0501002 - STEEL BRIDGE RALING REPLACEMENT CLAMP (EA)

From Table on Drawing STR-6	**35**	EA
	=	
From Table =	25	ea
	+	
Contingency from Table =	10	ea
Total =	**35**	**EA**

TAN 16-32B **CHA**
D214503
NGIB (NB) - OVERLAY
PS&E QUANTITIES

CALC. BY: SEK DATE: 8/3/2016
CHECKED BY: MK DATE: 8/22/2016

ITEM 606.5348 - RESETTING BOX BEAM GUIDE RAILING (NEW POSTS) (LF)

1. Begin Right Approach - See Drawing A-1

Begin station	905+56
End Station	905+20

Length = 36 LF

Contingency = 18 LF

Total = 54 LF

ITEM 619.01 BASIC WORK ZONE TRAFFIC CONTROL (LS)

LUMP SUM

TAN 16-32B **CHA**
D214503
NGIB (NB) - OVERLAY
PS&E QUANTITIES

CALC. BY: VS DATE: 8/2/2016
CHECKED BY: MK DATE: 8/3/2016

SHEET 56 OF 76

ITEM 619.04 TYPE III CONSTRUCTION BARRICADES (EA)

DWG	NUMBER	DESCRIPTION
TCP-2	3	sidewalk closures
TCP-5	17	(10) South crossover closure, (7) NB closure
TCP-6	37	(4) ramp closure, (7) ramp closure, (7) NB closure, (10) North crossover closure, (9) longitudinal barrier along SB lane
SUM	57	+ 10 A.O.B.E

TOTAL	**67**	**EA**

TAN 16-32B **CHA**
D214503
NGIB (NB) - OVERLAY
PS&E QUANTITIES

CALC. BY: VS DATE: 8/2/2016
CHECKED BY: MK DATE: 8/3/2016

SHEET 57 OF 76

ITEM 619.08010125 - REMOVE PAVEMENT MARKING STRIPES, TRAFFIC PAINT (LF)

TCP-8	South Cross Over	180
TCP-9	North Cross Over	220

TOTAL	**400**	**LF**

TAN 16-32B **CHA**
D214503
NGIB (NB) - OVERLAY
PS&E QUANTITIES

CALC. BY: VS DATE: 8/2/2016
CHECKED BY: MK DATE: 8/18/2016

SHEET 58 OF 76

ITEM 619.10010125 - INTERIM PAVEMENT MARKINGS (LF)

* broken lane line is 25% of full stripe length

Length of work zone ~ 4,100 feet

	Calculation	
6" White Edge Line	4100	
6" Yellow Edge Line	4100	
6" Double Broken Lane Line	* 4100 / 4 * 2	2050

Crossover Paint

South	1312
North	605

SUM 12167 + 10% FOR MARKINGS REMOVED BY CONSTRUCTION

TOTAL	13384	LF

CHA

CALC. BY: VS DATE: 8/2/2016
CHECKED BY: SEK DATE: 8/3/2016

ITEM 619.110712 - PORTABLE VARIABLE MESSAGE SIGN (PVMS) LARGE SIZE - FULL MATRIX (LED) NO OPTIONAL EQUIPMENT SPEC, CELLULAR COMMUN (EA)

TCP-4	2
TCP-10	4

TOTAL	**6**	**EA**

CHA

CALC. BY: VS DATE: 8/2/2016
CHECKED BY: SEK DATE: 8/3/2016

ITEM 619.1701 - TEMPORARY CONCRETE BARRIER (UNPINNED)

Concrete Barrier is not needed but a contingency of 100 ft has been added to contract if required

AOBE	100	LF

ITEM 619.24 - NIGHTTIME OPERATIONS (LS)

LUMP SUM

ITEM 619.25 - TRAFFIC CONTROL SUPERVISOR (MNTHS)

Assume 1 season and a 9 month construction season

Total =	9	Mnths

ITEM 25619.8001 - TOW TRUCK SERVICE (LIGHT) (HOUR)

Estimated Hours =	1500	Hours

ITEM 25619.8002 - TOW TRUCK SERVICE (HEAVY) (HOUR)

Estimated Hours =	1500	Hours

ITEM 25619.96 - SPEED DISPLAY TRAILER

Total	2	Each

ITEM 625.01 - SURVEY OPERATIONS (LS)

LUMP SUM

ITEM 627.50140008 - CUTTING PAVEMENT

1. Begin (South) Approach

a. Cut at limit of mill and overlay

Station	904+00	39	LF

b. West and South side of approach slab

Station	905+00	25	LF
Begin Station	905+00		
to			
End Station	905+20	20	LF
	Sub Total =	84	LF

2. End (North) Approach

a. Cut at limit of mill and overlay

Station	947+08	32	LF
	Sub Total =	32	LF

3. End of the Robert Mosses Off-Ramp

a. Cut at limit of mill and overlay

Station (B)	15+30	29	LF
	Sub Total =	29	LF

TOTAL = 145 LF

ITEM 25637.14 - ENGINEER'S FIELD OFFICE - TYPE 4 (MNTH)

Job will be let in Fall. Based upon scope of work, will likely be a 1 year job.

Conservatively assume 18 months

Total =	18	Months

ITEM 25645.6100 - OVERHEAD SIGNS SUPPLIED BY THE AUTHORITY (SF)

1. " Obey Lane Signals" signs to be installed overhead on the LDS gantries both SB and NB Bridges

# of LDS gantries on Southbound bridge	6	ea
# of LDS gantries on Northbound bridge	6	ea
Signs/gantry	2	ea
Total Signs	24	ea
Size of sign		
width	5	ft
height	4	ft
Sub-Total Area	480	SF

2. " Obey Lane Signals" signs to be installed on Right posts of LDS gantries both SB and NB Bridges

# of LDS gantries on Southbound bridge	0	ea
# of LDS gantries on Northbound bridge	6	ea
Signs/gantry	1	ea
Total Signs	6	ea
Size of sign		
width	3	ft
height	4	ft
Sub-Total Area	72	SF

3. " Stay In Lane" signs to be installed on left posts of LDS gantries both SB and NB Bridges

# of LDS gantries on Southbound bridge	4	ea
# of LDS gantries on Northbound bridge	6	ea
Signs/gantry	1	ea
Total Signs	10	ea

Size of sign

width	3	ft
height	4	ft

Sub-Total Area	120	SF

Total =	**672**	**SF**

TAN 16-32B **CHA**
D214503
NGIB (NB) - OVERLAY
PS&E QUANTITIES

CALC. BY: SEK DATE: 8/2/2016
CHECKED BY: MK DATE: 8/22/2016

SHEET 71 OF 76

ITEM 25685.1106 - WHITE EPOXY REFLECTORIZED PAVEMENT STRIPES 6" X 20 MILS (LF)

From Plans	4759	LF
10 %Contingency	475.9	

Total = 5235 LF

TAN 16-32B **CHA**
D214503
NGIB (NB) - OVERLAY
PS&E QUANTITIES

CALC. BY: SEK DATE: 8/2/2016
CHECKED BY: MK DATE: 8/22/2016

SHEET 72 OF 76

ITEM 25685.1206 - YELLOW EPOXY REFLECTORIZED PAVEMENT STRIPES 6" X 20 MILS (LF)

From Plans	7205	LF
10 %Contingency =	720.5	
Total =	**7926**	**LF**

TAN 16-32B **CHA**
D214503
NGIB (NB) - OVERLAY
PS&E QUANTITIES

CALC. BY: SEK DATE: 8/2/2016
CHECKED BY: MK DATE: 8/22/2016

SHEET 73 OF 76

ITEM 25685.15 - BLACK EPOXY PAVEMENT MARKINGS (LF)

From Plans	127	LF
10 %Contingency	12.7	
Total =	**140**	**LF**

ITEM 25697.0203 FIELD CHANGE ORDER (THRUWAY) (DC)

SEE BID TABS

This sheet is Blank

ITEM 25699.04 MOBILIZATION (LS)

LUMP SUM