


WOOLPERT			
Project Number:	105113		
Client:	ODOT	Page	
Project:	BRO-221-5.47		
Computed by:	CAG	Checked by:	ms

All lengths are CADD measured

Item 626 - Barrier Reflector, Type 3

REAR OF BRIDGE

#	Station to Station (Side)	Total Barrier with Dc < 5° (FT)	Total Barrier with Dc >= 5° (FT)
LT		3	
RT		4	

Item 626 - Barrier Reflector, Type 3

FORWARD OF BRIDGE

#	Station to Station (Side)	Total Barrier with Dc < 5° (FT)	Total Barrier with Dc >= 5° (FT)
LT			5
RT			4

* Minimum amount of reflectors must be 3 per CMS § 626.03 ∴

Total Barrier Reflectors = 15 EA



Seeding and Mulching Calculations

Road:

Project Name:

Manucipality:

Revised:

The calculations shown below are as described in the ODOT Seeding and Mulching designer note.
Enter Area to be Seeded and Mulched

ITEM 659 SEEDING AND MULCHING

ITEM 659 TOPSOIL (NOT USED)

111 CY PER 1000 SY OF PERMANENT SEEDING

111 X /1000=

ITEM 659 SOIL ANALYSIS TEST (NOT USED)

ONE TEST PER 10000 CY TOPSOIL, WITH A MINIMUM OF TWO

ITEM 659 COMMERCIAL FERTILIZER

30 LBS PER 1000 SF OF PERMANENT SEEDING

30 X X 9 / 1000 / 2000 = 0.92

20 LBS PER 1000 SF OF INTER SEEDING

20 X X 9 / 1000 / 2000 = 0.03

TOTAL COMMERCIAL FERTILIZER =

ITEM 659 WATER

2 APPLICATIONS AT 300 GALLONS PER 1000 SF (PERMANENT)

X 9 / 1000 X (2 X 300) / 1000 = 37 MGAL

1 APPLICATIONS AT 300 GALLONS PER 1000 SF (INTER SEEDING)

X 9 / 1000 X 300 / 1000 = 1 MGAL

TOTAL WATER =

ITEM 659 INTER SEEDING

5% OF PERMANENT SEEDING AND MULCHING

5% X =

ITEM 659 LIME

X 9 / 43560 =

ITEM 659 REPAIR SEEDING AND MULCHING (NOT USED)

5% OF PERMANENT SEEDING AND MULCHING

5% X =

ITEM 659 MOWING (NOT USED)

25% of PERMANENT SEEDING AREA

25% X * 9 / 1000=

Seeding & Mulching		Station	Earthwork				
End Width	AREA		End Area		Volume		
Total			Cut	Fill	Cut	Fill	
0		388+50.00					
	38				17	1	
17		388+90.00	23	1			
	21				10	0	
20		389+00.00	29	1			
	131				67	2	
27		389+50.00	43	1			
	219				122	1	
52		390+00.00	89	0			
	409				216	4	

TOTALS= 3869 3694 114

Seeding & Mulching		Station	Earthwork				
End Width	AREA		End Area		Volume		
Total			Cut	Fill	Cut	Fill	
52		390+00.00	89	0			
	289				266	0	
52		390+50.00	198	0			
	314				443	0	
61		391+00.00	280	0			
	464				644	0	
106		391+50.00	416	0			
	606				815	0	
112		392+00.00	464	0			
	628				813	1	
114		392+50.00	414	1			
	2301				2981	1	

SHEET 2 TOTALS

Seeding & Mulching		Station	Earthwork				
End Width	AREA		End Area		Volume		
Total			Cut	Fill	Cut	Fill	
114		392+50.00	414	1			
	115				96	2	
98		392+59.79	114	9			
	257				63	49	
56		392+89.79	0	80			
	372				159	51	

after bridge

Seeding & Mulching		Station	Earthwork				
End Width	AREA		End Area		Volume		
Total			Cut	Fill	Cut	Fill	
56		395+16.91	104	38			
	237				137	29	
86		395+46.91	143	14			
	33				17	1	
106		395+50.00	146	11			
	517				184	28	
80		396+00.00	53	19			
	787				338	58	

SHEET 4 TOTALS

Seeding & Mulching		Station	Earthwork				
End Width	AREA		End Area		Volume		
Total			Cut	Fill	Cut	Fill	
80		396+00.00	53	19			
	403				87	27	
65		396+50.00	41	10			
	353				67	19	
62		397+00.00	31	10			
	126				14	5	
29		397+25.00	0	0			
	48				0	0	
0		397+55.00	0	0			
	0						
	930				168	51	

SHEET 5 TOTALS

#REF!	TOTALS FOR ALL SHEETS	3862	165
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SHEET	LOCATION	EARTHWORK VOLUME		SEEDING & MULCHING (SY)
		EXCAVATION (CY)	EMBANKMENT (CY)	
		18		
19		387	1	508
20		443	0	314
21		644	0	464
22		1,627	1	1,234
23		159	51	372
24		338	58	787
25		169	49	882
26		0	0	48
	MISC AREAS NOT SHOWN IN CROSS SECTION FROM CADD	10	44	1,994
	TOTALS TO GEN. SUM.	3,871	207	6,793

94 3

PAVEMENT CALC SHEET 1

ITEM_CODE 204E10000 204E13000 204E30000 301E46000 304E20000 407E10000 441E50000 526E25000 301E46000
 ADDITIONAL DESCRIPTION (2 lifts)
 TYPICAL SECTION LEGEND NUMBER 5 12.00 12.00 2 3 6 1 4
 RATE / THICKNESS / ETC 204 204 204 301 304 0.06 3.00 15.00
 (TAPERING TO 17')

STATION RANGE	TYPICAL SECTION	SIDE	DISTANCE (D)	AVERAGE WIDTH (W)	SURFACE AREA (A) A=D*W/9	CADD GENERATED AREA	204	204	204	301	304	0.06	3.00	4	301					
							SUBGRADE COMPACTION	EXCAVATION OF SUBGRADE	GRANULAR MATERIAL, TYPE A	ASPHALT CONCRETE BASE, PG64-22	AGGREGATE BASE	TACK COAT (2 lifts)	ASPHALT CONCRETE SURFACE COURSE, TYPE 1, (448), PG64-22	REINFORCED CONCRETE APPROACH SLABS (T=15')	ASPHALT CONCRETE BASE, PG64-22 (TAPERING TO 17')					
			FT	FT	SQ YD	SQ YD	SY	CY	CY	CY	CY	GAL	CY	SY	CY					
388+90.00	TO																			
			389+61.00																	
		LEFT	71.00	11.58	91.37		91.37	30.46	30.46	10.15	15.23	10.96	7.61							
				0.33	2.63		2.63	0.88	0.88	0.29	0.44									
				0.50	3.94		3.94	1.31	1.31		0.66									
				0.67	5.26		5.26	1.75	1.75											
389+90.00		RIGHT	86.40	11.27	108.21		108.21	36.07	36.07	12.02	18.04	12.99	9.02							
				0.33	3.20		3.20	1.07	1.07	0.36	0.53									
				0.50	4.80		4.80	1.60	1.60		0.80									
				0.67	6.40		6.40	2.13	2.13											
389+61.00		LEFT	227.46	13.00	328.55		328.55	109.52	109.52	36.51	54.76	39.43	27.38							
				0.33	8.42		8.42	2.81	2.81	0.94	1.40									
				0.50	12.64		12.64	4.21	4.21		2.11									
				0.67	16.85		16.85	5.62	5.62											
389+76.40		RIGHT	201.16	13.00	290.56		290.56	96.85	96.85	32.28	48.43	34.87	24.21							
				0.33	7.45		7.45	2.48	2.48	0.83	1.24									
				0.50	11.18		11.18	3.73	3.73		1.86									
				0.67	14.90		14.90	4.97	4.97											
391+77.56		RIGHT	76.77	14.33	122.23		122.23	40.74	40.74	13.58	20.37	14.67	10.19							
				0.33	2.84		2.84	0.95	0.95	0.32	0.47									
				0.50	4.27		4.27	1.42	1.42		0.71									
				0.67	5.69		5.69	1.90	1.90											
392+54.33		RIGHT				4.55	4.55	1.52	1.52	0.51	0.76	0.55	0.38							
391+88.46		LEFT	71.33	14.33	113.57		113.57	37.86	37.86	12.62	18.93	13.63	9.46							
				0.33	2.64		2.64	0.88	0.88	0.29	0.44									
				0.50	3.96		3.96	1.32	1.32		0.66									
				0.67	5.28		5.28	1.76	1.76											
392+59.79		LEFT				4.48	4.48	1.49	1.49	0.50	0.75	0.54	0.37							
				4.46	0.33	0.17	0.17	0.06	0.06	0.02	0.03									
				4.46	0.50	0.25	0.25	0.08	0.08		0.04									
				4.46	0.67	0.33	0.33	0.11	0.11											
392+59.79		LEFT	30.00	16.70	55.67		55.67	18.56	18.56		9.28			55.67						
392+59.79		RIGHT	30.00	16.70	55.67		55.67	18.56	18.56		9.28			55.67						
301 Thickness tapering to App. Slab (REAR)		LT & RT	20.00	30.00	66.67														7.41	
301 Thickness tapering to App. Slab (FWD)		LT & RT	20.00	30.00	66.67														7.41	
301 Thickness tapering to App. Slab (REAR)		LT & RT	20.00	30.00	66.67														7.41	
301 Thickness tapering to App. Slab (FWD)		LT & RT	20.00	30.00	66.67														7.41	
395+16.91		LEFT	30.00	16.70	55.67		55.67				9.28			55.67						
				0.50	1.67		1.67				0.28									
				1.00	3.33		3.33													
395+16.91		RIGHT	30.00	16.70	55.67		55.67				9.28			55.67						
				0.50	1.67		1.67				0.28									
				1.00	3.33		3.33													
SUBTOTALS							1419.31	432.66	432.66	121.21	226.32	127.63	88.63	222.67	29.63					
TOTALS CARRIED TO GENERAL SUMMARY							1420	433	433	122	227	128	89	223	30					

BRO-221-0554 Bridge Estimated Quantities

Calculated By: PES Date: 10/8/2020 Job No.:
Checked By: TML Date: 1/11/2021 Bridge No.: BRO-221-05.54
Project: BRO-221-05.47 SFN:

ESTIMATED QUANTITIES					CALC BY: PES/JYM	DATE: 1/8/2021
					CHECK BY: TML	DATE: 1/11/2021
ITEM	EXT	QUANTITY	UNIT	DESCRIPTION		
202	11003	1	LS	STRUCTURE REMOVED, OVER 20 FOOT SPAN, AS PER PLAN		
202	22900	82	SY	APPROACH SLAB REMOVED		
203	10000	1641.00	CY	EXCAVATION		
503	11101	1	LS	COFFERDAMS AND EXCAVATION BRACING, AS PER PLAN		
503	21301	1	LS	UNCLASSIFIED EXCAVATION, AS PER PLAN		
503	31120	2,325	CY	SHALE EXCAVATION		
509	10000	107,367	LB	EPOXY COATED REINFORCING STEEL		
509	30020	7,439	FT	NO. 4 GFRP DEFORMED BARS		
511	33500	2	EACH	SEMI-INTEGRAL DIAPHRAGM GUIDE		
511	34447	291	CY	CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK, AS PER PLAN		
511	34450	86	CY	CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK (PARAPET)		
511	44112	99	CY	CLASS QC1 CONCRETE WITH QC/QA, ABUTMENT NOT INCLUDING FOOTING		
511	46512	83	CY	CLASS QC1 CONCRETE WITH QC/QA, FOOTING		
512	10100	855	SY	SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)		
513	10280	36,372	LB	STRUCTURAL STEEL MEMBERS, LEVEL 4		
513	10401	439,543	LB	STRUCTURAL STEEL MEMBERS, HYBRID GIRDER, LEVEL SIX (6) FABRICATION, AS PER PLAN		
513	20000	1,596	EACH	WELDED STUD SHEAR CONNECTORS		
516	13600	21	SF	1" PREFORMED EXPANSION JOINT FILLER		
516	13900	188	SF	2" PREFORMED EXPANSION JOINT FILLER		
516	14000	215	SF	PREFORMED EXPANSION JOINT FILLER, MISC.: 3.25" THICK		
516	14020	72	FT	SEMI-INTEGRAL ABUTMENT EXPANSION JOINT SEAL		
516	44100	8	EACH	ELASTOMERIC BEARINGS WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE), (16"x24"x3.25")		
518	21050	141	CY	POROUS BACKFILL WITH GEOTEXTILE FABRIC		
518	40000	139	FT	6" PERFORATED CORRUGATED PLASTIC PIPE		
518	40010	50	FT	6" NON-PERFORATED CORRUGATED PLASTIC PIPE, INCLUDING SPECIALS		
524	94804	95	FT	DRILLED SHAFTS, 42" DIAMETER, INTO BEDROCK		
524	94904	199	FT	DRILLED SHAFTS, 48" DIAMETER, INTO BEDROCK		
526	30010	223	SY	REINFORCED CONCRETE APPROACH SLABS WITH QC/QA (T=17")		
526	90010	71	FT	TYPE A INSTALLATION		
601	12000	630	SY	RIPRAP, WITH GROUT		
613	41200	810	CY	LOW STRENGTH MORTAR BACKFILL		
894	10000	4	EA	THERMAL INTEGRITY PROFILING (TIP) TEST		

BRO-221-0554 Bridge Estimated Quantities

Calculated By:	PES	Date:	10/8/2020	Job No.:	
Checked By:	TML	Date:	1/11/2021	Bridge No.:	BRO-221-05.54
Project:	BRO-221-05.47			SFN:	

Item	Quantity	Unit	Description
202 22900 82 SY APPROACH SLAB REMOVED			
	359.10	sq ft	area at rear
	374.73	sq ft	area at fwd
	733.83	sq ft	total
	82.00	sq yd	total
203 10000 1641.00 CY EXCAVATION			
	245.23	sq ft	area at rear
	324.41	sq ft	area at fwd
	65.00	ft	length rear abutment
	75.00	ft	length fwd abutment
	40270.55	cu ft	subtotal volume
	10.00	%	additional for ends
	44297.61	cu ft	total
	1641.00	cu yd	total
503 31120 2325.00 CY SHALE EXCAVATION			
	220.63	sq ft	area at rear abut
	65.00	ft	length
	14340.63	cu ft	volume rear
	569.46	sq ft	area at fwd abut
	75.00	ft	length
	42709.50	cu ft	volume fwd
	57050.13	cu ft	subtotal volume
	10.00	%	additional for ends
	62755.14	cu ft	total
	2325.00	cu yd	total
509 10000 107,367 LB EPOXY COATED REINFORCING STEEL			
	12313.00	lb	rear abutment
	11881.00	lb	forward abutment
	65478.00	lb	superstructure
	17695.00	lb	parapets
	107367.00	lb	total
509 30020 7439.00 FT NO. 4 GFRP DEFORMED BARS			
on deck	232.58	ft	X4XX length (straight bars from SBR-1-20)
	11.00	ea	number of X4XX
	10.00	ft	Y401 length (from SBR-1-20)
	40.00	ea	number of Y401
	13.33	ft	Y402 length (from SBR-1-20)
	4.00	ea	number of Y402
rear transition	32	ft	length bars
	11	ea	number bars
fwd transition	32.317	ft	length bars
	11	ea	number bars
	3719.198	ft	subtotal
	2.00	ea	number of sides
	7438.40	ft	total

BRO-221-0554 Bridge Estimated Quantities

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Checked By:	TML	Date:	1/11/2021	Bridge No.:	BRO-221-05.54

Project:	BRO-221-05.47	SFN:	
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511	34447	291	CY	CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK, AS PER PLAN
deck + haunch	8.75	in		deck thickness
	227.13	ft		length
	33.33	ft		width
	2.00	in		haunch thickness
	18.00	in		haunch ave width
	3.00	ea		haunches
	5520.67	cu ft		deck portion of diaphragm
edges	1.25	in		avg flange thickness
	3.25	in		total overhang extra depth
	2.67	ft		overhang width
	18.00	in		flange width
	2.00	ea		sides
	318.50	cu ft		edges total
rear diaphragm	9.29	ft		avg diaphragm height
	3.00	ft		width
	35.37	ft		length
	985.68	cu ft		total per end
fwd diaphragm	9.68	ft		avg diaphragm height
	3.00	ft		width
	35.37	ft		length
	1027.06	cu ft		total per end
		7851.91	cu ft	total volume
		291.00	cu yd	total volume

511	34450	86	CY	CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK (PARAPET)
full height	454.250	ft		length on deck (both sides)
	31.833	ft		rear approach length (both sides)
	16.927	ft		fwd left approach length
	15.375	ft		fwd right approach length
	4.083	sq ft		cross sectional area
	2116.74	cu ft		volume full height parapet
transition	10.00	ft		transition length
	4.083	sq ft		cross sectional area 1
	2.92	sq ft		cross sectional area 2
	3.50	sq ft		transition avg area
	4.00	ea		sides
	140.00	cu ft		volume transition
low height	4.00	ft		transition length
	2.92	sq ft		cross sectional area 1
	2.17	sq ft		cross sectional area 2
	2.54	sq ft		avg area
	4.00	ea		sides
	40.67	cu ft		volume low height
		2297.41	cu ft	total volume
		85.09	cu yd	total volume

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Checked By:	TML	Date:	1/11/2021	Bridge No.:	BRO-221-05.54

Project:	BRO-221-05.47	SFN:	
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511	44112	99	CY	CLASS QC1 CONCRETE WITH QC/QA, ABUTMENT NOT INCLUDING FOOTING
rear abut		3.47	ft	average height
		35.81	ft	length under diaphragm
		3.00	ft	thickness
		372.74	cu ft	subtotal
fwd abut		3.51	ft	average height
		35.81	ft	length under diaphragm
		3.00	ft	thickness
		377.04	cu ft	subtotal
rear wings		1.50	ft	thickness
		12.60	ft	full height
		18.98	ft	length full height
		29.56	sq ft	additional overhang area
		403.04	cu ft	rear wing subtotal
		2.00	ea	wingwalls
		806.09	cu ft	rear wingwall volume
fwd left wing		2.50	ft	thickness
		13.73	ft	height
		2.81	sq ft	area corner section
		38.61	cu ft	full height subtotal
		8.50	ft	min height
		13.73	ft	max height
		11.12	ft	ave height (intermediate section)
		23.33	ft	length intermediate
		648.28	cu ft	intermediate subtotal
		686.89	cu ft	fwd left wingwall subtotal
fwd right wing		2.50	ft	thickness
		14.19	ft	height
		3.45	ft	avg length full height
		122.39	cu ft	full height subtotal
		9.00	ft	min height
		14.19	ft	max height
		11.60	ft	ave height (intermediate section)
		10.00	ft	length intermediate
		289.88	cu ft	intermediate subtotal
		412.26	cu ft	fwd right wingwall subtotal
		2655.02	cu ft	total volume
		98.33	cu yd	total volume
511	46512	83	CY	CLASS QC1 CONCRETE WITH QC/QA, FOOTING
		370.90	sq ft	rear area
		369.36	sq ft	fwd area
		3.00	ft	thickness
		2220.78	cu ft	total volume
		83.00	cu yd	total volume

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Project:	BRO-221-05.47	SFN:	
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512	10100	855	SY	SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)
parapet	10.67	ft		perimeter - faced parapet and deck - 1 side
	2.00	ea		sides
	21.33	ft		total perimeter
	286.50	ft		length
	6112.19	sq ft		total
rear abut	10.90	ft		height
	39.00	ft		length
	424.91	sq ft		area in front of abut
	321.00	sq ft		area on wingwalls (x 2 wings)
fwd abut	11.13	ft		height
	40.50	ft		length
	450.56	sq ft		area in front of abut
	252.50	sq ft		left wingwall area
	133.00	sq ft		right wingwall area
	7694.16	sq ft		total
	854.91	sq yd		total

513	10280	36372.00	LB	STRUCTURAL STEEL MEMBERS, LEVEL 4	
Crossframe A	7.65	ft		top length 5x5x5/16	
	9.65	ft		diagonals length 4x4x7/16	
	7.65	ft		bottom length 5x5x5/16	
	10.30	lbs		lbs/ft 5x5x5/16	
	11.30	lbs		lbs/ft 4x4x7/16	
	375.68	lb		weight angles	
	bolts	40.00	ea		bolts per cross frame
		2.00	lb/bolt		weight per bolt
		80.00	lb		weight of bolts
	Gusset	3.612	sq ft		area top plates
		3.612	sq ft		area bottom plates
		0.375	in		thickness
		110.62	lb		weight of Gussets
	Fill Plate	0.293	sq ft		area
		0.375	in		thickness
4.49		lb		weight of Gussets	
	570.78	lbs		Total Weight per Cross Frame	
	47.00	ea		Number of Crossframe A	
	26826.85	lbs		Total Weight of Crossframe A	
Crossframe B	7.65	ft		top length 5x5x5/16	
	9.65	ft		diagonals length 4x4x7/16	
	7.65	ft		bottom length 6x6x1/2	
	10.30	lbs		lbs/ft 5x5x5/16	
	11.30	lbs		lbs/ft 4x4x7/16	
	19.60	lbs		lbs/ft 6x6x1/2	
	446.83	lb		weight angles	
	bolts	40.00	ea		bolts per cross frame
		2.00	lb/bolt		weight per bolt
		80.00	lb		weight of bolts
	Gusset	3.612	ft2		area plates
		3.682	sq ft		area bottom plates
		0.500	in		thickness
		148.92	lb		weight of Gussets
	Fill Plate	0.293	sq ft		area
0.500		in		thickness	
5.98		lb		weight of Gussets	
	681.73	lbs		Total Weight per Cross Frame	
	14.00	ea		Number of Crossframe B	
	9544.17	lbs		Total Weight of Crossframe B	
	36371.02	lbs		TOTAL	

BRO-221-0554 Bridge Estimated Quantities

Calculated By:	PES	Date:	10/8/2020	Job No.:	
Checked By:	TML	Date:	1/11/2021	Bridge No.:	BRO-221-05.54

Project: BRO-221-05.47 SFN:

513	10401	439543.00	LB	STRUCTURAL STEEL MEMBERS, HYBRID GIRDER, LEVEL SIX (6) FABRICATION, AS PER PLAN
Section 1		141.50	ft	section length
		18.00	in	upper flange width
		1.00	in	upper flange thickness
		20.00	in	bottom flange width
		1.63	in	bottom flange thickness
		49.62	cu ft	volume
		490.00	pcf	steel unit weight
		24315.40	lb	total flange weight, girder section1
Section 2		85.00	ft	section length
		18.00	in	upper flange width
		1.50	in	upper flange thickness
		20.00	in	bottom flange width
		2.00	in	bottom flange thickness
		39.55	cu ft	volume
		490.00	pcf	steel unit weight
		19378.82	lb	total flange weight, girder section 2
Web		226.50	ft	length
		98.00	in	web depth
		0.75	in	web thickness
		115.61	cu ft	volume
		490.00	pcf	steel unit weight
		56648.59	lb	total web weight
		4.00	ea	number girders
		401371.25	lb	total girder weight
trans stiff		7.75	in	width
		98.00	in	height
		0.500	in	thickness
		107.68	lb	weight per stiffener
		2.00	ea	stiffeners per cross frame
		61.00	ea	number crossframes
		13137.42	lb	weight of stiffeners
bearing stiff		8.50	in	width
		98.00	in	height
		0.875	in	thickness
		206.68	lb	weight per stiffener
		2.00	ea	stiffeners per beam
		4.00	ea	beam count
		2.00	ea	substructure locations
		3306.93	lb	weight of stiffeners
Splices				
Top		43.50	in	outer plate length
		17.00	in	outer plate width
		0.875	in	outer plate thickness
		43.50	in	inner plate length
		15.50	in	inner plate width x 2
		1.000	in	inner plate thickness
		1321.31	cu in	volume top plates
		490.00	cu ft	steel unit weight
		56.00	ea	bolts
		2.00	lbs	weight/bolt
		486.68	lbs	weight top splice plates

BRO-221-0554 Bridge Estimated Quantities

Calculated By:	PES	Date:	10/8/2020	Job No.:	
Checked By:	TML	Date:	1/11/2021	Bridge No.:	BRO-221-05.54
Project:	BRO-221-05.47			SFN:	

Bottom	49.50	in	outer plate length
	19.00	in	outer plate width
	1.000	in	outer plate thickness
	49.50	in	inner plate length
	17.50	in	inner plate width x 2
	1.13	in	inner plate thickness
	1915.03	cu in	volume bottom plates
	490.00	pcf	steel unit weight
	64.00	ea	bolts
	2.00	lbs	weight/bolt
	671.04	lbs	weight bottom splice plates

Web	80.00	in	plate length
	44.00	in	plate width
	0.50	in	plate thickness
	1760.00	cu in	volume web plates
	2.00	ea	number web plates
	490.00	pcf	steel unit weight
	280.00	ea	bolts
	2.00	lbs	weight/bolt
	1558.15	lbs	weight web splice plates
	2715.86	lbs	weight per splice
	8.00	ea	number splices
	21726.89	lbs	total splice weight

439542.49 lb total

513	20000	1596	EACH	WELDED STUD SHEAR CONNECTORS
Ext	3.00	ea	number Shear studs/row	
	133.00	in	number of studs from girder details	
	4.00	ea	number of girders	
	1596.00	ea	total	

516	13600	21.00	SF	1" PREFORMED EXPANSION JOINT FILLER
	4.083	sq ft	area parapet	
	2.0	ea	ea side	
	8.2	sq ft	subtotal	
	23.0	in	approach slab depth at abut	
	6.0	in	approach slab seat width	
	2.0	ea	sides	
	1.9	sq ft	subtotal	
	2.0	ea	bridge ends	
	20.1653	sq ft	total area	

BRO-221-0554 Bridge Estimated Quantities

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Checked By:	TML	Date:	1/11/2021	Bridge No.:	BRO-221-05.54
Project:	BRO-221-05.47			SFN:	

Item	Quantity	Unit	Description
2" PREFORMED EXPANSION JOINT FILLER			
fwd abut	2.66	ft	length
	9.95	ft	height
	2.00	ea	sides
	52.9	sq ft	subtotal
Btw RA & Rear Wing	3.250	ft	length
	10.25	ft	height
	2.00	ea	sides
	66.6	sq ft	subtotal
Btw Rear Wing & Approach	24.000	ft	avg length
	1.417	ft	approach slab thickness
	2.00	ea	sides
	68.0	sq ft	subtotal
	187.6	sq ft	total area
PREFORMED EXPANSION JOINT FILLER, MISC.: 3.25" THICK			
	35.8	ft	length at rear abut
	35.8	ft	length at fwd abut
	3.0	ft	beam seat width
	215.0	sq ft	total
SEMI-INTEGRAL ABUTMENT EXPANSION JOINT SEAL			
	35.83	ft	length at rear
	35.83	ft	length at forward
	71.66	sq ft	total
ELASTOMERIC BEARINGS WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE), (16"x24"x3.25")			
	4.00	ea	beams
	2.00	ea	abutments
	8.00	ea	total
POROUS BACKFILL WITH GEOTEXTILE FABRIC			
rear	11.16	ft	avg height above footing and below approach
	2.00	ft	width
	3.00	ft	footing height
	1.00	ft	width behind footing
	32.75	ft	length along inside of rear abutment
	829.45	cu ft	volume behind rear abut
rear wings	11.17	ft	avg height above footing and below approach
	2.75	ft	width behind wall
	3.00	ft	footing height
	1.00	ft	width behind footing
	16.58	ft	length along inside of rear wings
	2.00	ea	sides
	1118.30	cu ft	volume behind rear abut
fwd	12.41	ft	avg height above footing and below approach
	2.00	ft	width
	3.00	ft	footing height
	1.00	ft	width behind footing
	35.50	ft	length along inside of fwd abutment
	987.85	cu ft	volume behind fwd abut
fwd wings	9.87	ft	avg left height
	23.00	ft	length along inside of left wing
	10.60	ft	avg right height
	13.92	ft	length along inside of right wing
	2.00	ft	width
	3.00	ft	footing height
	1.00	ft	width behind footing
	859.43	cu ft	volume
	3795.03	cu ft	total
	141.00	cu yd	total

BRO-221-0554 Bridge Estimated Quantities

Calculated By:	PES	Date:	10/8/2020	Job No.:	
Checked By:	TML	Date:	1/11/2021	Bridge No.:	BRO-221-05.54
Project:	BRO-221-05.47			SFN:	
518	40000	139	FT	6" PERFORATED CORRUGATED PLASTIC PIPE	
		32.75	ft	length rear	
		33.17	ft	length rear wingwalls	
		35.50	ft	length fwd	
		36.92	ft	length fwd wingwalls	
		139.00	ft	total	
518	40010	50	FT	6" NON-PERFORATED CORRUGATED PLASTIC PIPE, INCLUDING SPECIALS	
		12.00	ft	rear left	
		12.00		rear right	
		13.00		fwd left	
		13.00		fwd right	
		50.00	ft	total	
524	94804	95.00	FT	DRILLED SHAFTS, 42" DIAMETER, INTO BEDROCK	
rear		577.00	ft	bottom of footing elevation	
		571.30	ft	scour elevation	
		10.00	ft	min. embedment below scour	
		15.70	ft	shaft length	
		6.00	ea	number of shafts	
		95.00	ft	total	
524	94904	199.00	FT	DRILLED SHAFTS, 48" DIAMETER, INTO BEDROCK	
fwd		577.00	ft	bottom of footing elevation	
		558.70	ft	scour elevation	
		10.00	ft	min. embedment below scour	
		28.30	ft	shaft length	
		7.00	ea	number of shafts	
		199.00	ft	total	
526	30010	223	SY	REINFORCED CONCRETE APPROACH SLABS WITH QC/QA (T=17")	
rear		999.90	sq ft	plan area from microstation	
forward		1002.90	sq ft	plan area from microstation	
		2002.80	sq ft	total	
		222.53	sq yd	total	
526	90010	71.00	FT	TYPE A INSTALLATION	
		33.33	ft	width approach	
		20.00	deg	skew	
		35.47	ft	length along skew	
		2.00	ea	sides	
		70.94	ft	total	
601	12000	630	SY	RIPRAP, WITH GROUT	
		2267.58	sq ft	area at rear	
		3394.00	sq ft	area at fwd	
		5661.58	sq ft	total area	
		629.06	sq yd	total	
613	41200	810.00	CY	LOW STRENGTH MORTAR BACKFILL	
		154.21	sq ft	area behind rear	
		185.93	sq ft	area behind fwd	
		55.00	ft	length rear abutment and wings	
		72.00	ft	length fwd abutment and wings	
		21868.45	cu ft	total	
		809.94	cu yd	total	

BRO-221-0554 Retaining Wall Estimated Quantities

Calculated By: JYM	Date: 1/7/2021	Job No.: 80339
Checked By: TML	Date: 1/11/2021	Bridge No.:
Project: BRO-221-05.47	SFN:	

ESTIMATED QUANTITIES

ITEM	EXT	QUANTITY	UNIT	DESCRIPTION
203	10000	7	CY	EXCAVATION
203	20000	49	CY	EMBANKMENT
503	31120	37	CY	SHALE EXCAVATION
507	00400	396	FT	STEEL PILES, MISC.: SOLDIER PILES, W12X72
507	00400	250	FT	STEEL PILES, MISC.: SOLDIER PILES W18x97
509	10000	16,502	LB	EPOXY COATED REINFORCING STEEL
511	46012	111	CY	CLASS QC1 CONCRETE WITH QC/QA, RETAINING WALL NOT INCLUDING FOOTING
512	10100	247	SY	SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)
512	33001	42	SY	TYPE 2 WATERPROOFING, AS PER PLAN
513	20000	944	EACH	WELDED SHEAR STUD CONNECTOR
516	13600	40	SF	1" PREFORMED EXPANSION JOINT FILLER
518	20000	331	SY	PREFABRICATED GEOCOMPOSITE DRAIN
518	21100	18	CY	POROUS BACKFILL
518	40000	240	FT	6" PERFORATED CORRUGATED PLASTIC PIPE
518	40012	10	FT	6" NON-PERFORATED CORRUGATED PLASTIC PIPE
524	94503	117	FT	DRILLED SHAFTS, 24" DIAMETER, ABOVE BEDROCK, AS PER PLAN
524	94505	289	FT	DRILLED SHAFTS, 24" DIAMETER, INTO BEDROCK, AS PER PLAN
524	94603	63	FT	DRILLED SHAFTS, 30" DIAMETER, ABOVE BEDROCK, AS PER PLAN
524	94605	192	FT	DRILLED SHAFTS, 30" DIAMETER, INTO BEDROCK, AS PER PLAN
530	13000	2,000	SF	SPECIAL - FORM LINER
601	32200	103	CY	ROCK CHANNEL PROTECTION, TYPE C WITH FILTER
610	50010	2,585	SF	RETAINING WALL, MISC.: TIMBER LAGGING
TOTAL				

BRO-221-0554 Retaining Wall Estimated Quantities

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Checked By:	TML	Date:	1/11/2021	Bridge No.:	
Project:			BRO-221-05.47	SFN:	

Item No.	Quantity	Unit	Description	Notes
203	10000	7	CY	EXCAVATION
	5.43	sq ft	area sta. 390+00	see WP001
	2.07	sq ft	area sta. 392+40	
	50.00	ft	distance between stations	
	40.00	ft	distance between stations	
	177.21	cu ft	average end area volume between station points	
	7.00	cu yd	total	
203	20000	49	CY	EMBANKMENT
	5.43	sq ft	area sta. 390+00	see WP001
	5.43	sq ft	area sta. 390+50	
	5.43	sq ft	area sta. 391+00	
	5.43	sq ft	area sta. 391+50	
	5.43	sq ft	area sta. 392+00	
	5.43	sq ft	area sta. 392+40	
	50.00	ft	distance between stations	
	40.00	ft	distance between stations	
	1302.96	cu ft	average end area volume between station points	
	49.00	cu yd	total	
503	31120	37	CY	SHALE EXCAVATION
	5.43	sq ft	area sta. 390+50	see WP001
	5.43	sq ft	area sta. 391+00	
	5.43	sq ft	area sta. 391+50	
	5.43	sq ft	area sta. 392+00	
	3.35	sq ft	area sta. 392+40	
	50.00	ft	distance between stations	
	40.00	ft	distance between stations	
	990.01	cu ft	average end area volume between station points	
	37.00	cu yd	total	
507	400	396	FT	STEEL PILES, MISC.: SOLDIER PILES, W12X72
	395.05	ft	total length W14x82 piles (see pile panel table)	
	396.00	ft	total	
507	400	250	FT	STEEL PILES, MISC.: SOLDIER PILES W18x97
	249.51	ft	total length W27x102 piles (see pile panel table)	
	250.00	ft	total	
509	10000	16,502	LB	EPOXY COATED REINFORCING STEEL
	9678.00	lb	A bars	
	6146.00	lb	B bars	
	678.00	lb	C bars	
	16502.00	lb	total weight	

BRO-221-0554 Retaining Wall Estimated Quantities

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Project:			BRO-221-05.47	SFN:	

511	46012	111	CY	CLASS QC1 CONCRETE WITH QC/QA, RETAINING WALL NOT INCLUDING FOOTING
		12.00	in	panel thickness
		174.74	sq ft	surface area panel 1
		224.83	sq ft	surface area panel 2
		270.00	sq ft	surface area panel 3
		298.17	sq ft	surface area panel 4
		322.50	sq ft	surface area panel 5
		364.00	sq ft	surface area panel 6
		412.46	sq ft	surface area panel 7
		382.96	sq ft	surface area panel 8
		315.00	sq ft	surface area panel 9
		209.70	sq ft	surface area panel 10
		2974.36	sq ft	total surface area
		2974.36	cu ft	volume
		111.00	cu yd	total
512	10100	247	SY	SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)
		2974.36	sq ft	total surface area front of wall (see above)
		4.65	ft	approx. height grade in front of wall
		240.00	ft	length of wall
		1114.80	sq ft	subtract surface area below ground
		1859.56	sq ft	surface area exposed front of wall
		12.00	in	panel thickness
		6.00	in	exposed height behind wall
		360.00	sq ft	surface area top and behind wall
		2219.56	sq ft	total exposed surface area
		247.00	sq yd	total
512	33001	42	SY	TYPE 2 WATERPROOFING, AS PER PLAN
		3.00	ft	width
		9.67	ft	height end panel 1
		10.5	ft	height end panel 2
		12	ft	height end panel 3
		12.67	ft	height end panel 4
		13.67	ft	height end panel 5
		16.67	ft	height end panel 6
		17.33	ft	height end panel 7
		16.58	ft	height end panel 8
		15	ft	height end panel 9
		124.09	ft	total height
		372.27	sq ft	total area behind panel joints
		42.00	sq yd	total

BRO-221-0554 Retaining Wall Estimated Quantities

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Project:			BRO-221-05.47	SFN:	

513	20000	944	EACH	WELDED SHEAR STUD CONNECTOR
		644.56	ft	total steel pile length (pile panel table)
		300	ft	total shaft length (pile panel table)
		344.56	ft	total pile length above encasement
		472	ea	number of shear studs per side (8" spacing)
		944	ea	total
516	13600	40	SF	1" PREFORMED EXPANSION JOINT FILLER
		12.00	ft	expansion joint end of panel 3
		16.67	ft	expansion joint end of panel 6
		11.25	ft	expansion joint end of panel 9
		12.00	in	panel thickness
		40.00	sq ft	total
518	20000	331	SY	PREFABRICATED GEOCOMPOSITE DRAIN
		2974.36	sq ft	surface area of wall (see above)
		331.00	sq yd	total
518	21100	18	CY	POROUS BACKFILL
		1	ft	width
		2	ft	height
		240.00	ft	length of wall
		480	cu ft	total volume
		18	cu yd	total
518	40000	240	FT	6" PERFORATED CORRUGATED PLASTIC PIPE
		240.00	ft	total length of wall
518	40012	10	FT	6" NON-PERFORATED CORRUGATED PLASTIC PIPE
		4.00	ft	begin wall
		5.25	ft	end wall
		10.00	ft	total
524	94503	117	FT	DRILLED SHAFTS, 24" DIAMETER, ABOVE BEDROCK, AS PER PLAN
		116.57	ft	total shaft length (CADD)
		117.00	ft	total
524	94505	289	FT	DRILLED SHAFTS, 24" DIAMETER, INTO BEDROCK, AS PER PLAN
		288.49	ft	total shaft length (CADD)
		289.00	ft	total
524	94603	63	FT	DRILLED SHAFTS, 30" DIAMETER, ABOVE BEDROCK, AS PER PLAN
		62.54	ft	total shaft length (CADD)
		63.00	ft	total
524	94605	192	FT	DRILLED SHAFTS, 30" DIAMETER, INTO BEDROCK, AS PER PLAN
		191.97	ft	total shaft length (CADD)
		192.00	ft	total

BRO-221-0554 Retaining Wall Estimated Quantities

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530	13000	2000	SF	SPECIAL - FORM LINER
		1877.75	sq ft	CAD - proposed in front of wall to top
		240.00	ft	length of wall
		0.50	ft	depth below grade
		2000.00	sq ft	total
601	32200	103	CY	ROCK CHANNEL PROTECTION, TYPE C WITH FILTER
		5.00	ft	width
		240.00	ft	length of wall
		2.00	ft	thickness
		2400.00	cu ft	volume behind wall
		100.29	sq ft	area RCP channel at begin of wall
		81.79	sq ft	area RCP channel at end of wall
		2.00	ft	thickness
		364.16	cu ft	volume RCP from wall to ditch
		2764.16	sq ft	total volume
		103.00	cu yd	total
610	50010	2585	SF	RETAINING WALL, MISC.: TIMBER LAGGING
		344.56	ft	total height of soldier piles above encasement
		7.50	ft	timber width between piles
		2584.20	sq ft	total area
		2585.00	sq ft	total