CHA COMPUTATION PAD

		PROJECT	PHASE	ORG
COMPLETED BY:	KWB	74567	0	0

CHECKED BY:	JPL	**SHEET #:** 1 OF 39

PROJECT NAME: ODOT D6, UNI-33-17.95 PID 115685   **DATE:** 9/20/2023

PROJECT LOCATION: Beecher Gamble Rd. Over U.S. 33   **SUBJECT:** Quantity Summary Report

ITEM	DESCRIPTION	QUANTITY	UNIT	TYPE
202E11201	PORTIONS OF STRUCTURE REMOVED, AS PER PLAN	1.00	LS	S
202E11202	PORTIONS OF STRUCTURE REMOVED, OVER 20 FOOT SPAN	1.00	LS	S
202E22900	APPROACH SLAB REMOVED	146.00	SY	S
503E21100	UNCLASSIFIED EXCAVATION	205.00	CY	S
509E10000	EPOXY COATED REINFORCING STEEL	91,691.00	LB	M
509E30020	NO. 4 DEFORMED GFRP REINFORCEMENT	7,563.00	FT	U
510E10000	DOWEL HOLES WITH NONSHRINK, NONMETALLIC GROUT	374.00	EACH	M
511E33501	SEMI-INTEGRAL DIAPHRAGM GUIDE, AS PER PLAN	2.00	EACH	M
511E34446	CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK	248.00	CY	R
511E34450	CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK (PARAPET)	79.00	CY	U
511E43210	CLASS QC1 CONCRETE, PIER	13.00	CY	S
511E46010	CLASS QC1 CONCRETE, RETAINING/WINGWALL NOT INCLUDING FOOTING	29.00	CY	S
512E10100	SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)	865.00	SY	S
512E10600	CONCRETE REPAIR BY EPOXY INJECTION	37.00	FT	S
512E33000	TYPE 2 WATERPROOFING	17.00	SY	S
513E10240	STRUCTURAL STEEL MEMBERS, LEVEL 2	187,405.00	LB	U
513E20000	WELDED STUD SHEAR CONNECTORS	4,008.00	EACH	S
514E00060	FIELD PAINTING STRUCTURAL STEEL, INTERMEDIATE COAT	8,622.00	SF	U
514E00066	FIELD PAINTING STRUCTURAL STEEL, FINISH COAT	8,622.00	SF	U
514E10000	FINAL INSPECTION REPAIR	16.00	EACH	U
516E10010	ARMORLESS PREFORMED JOINT SEAL	56.00	FT	U
516E13600	1" PREFORMED EXPANSION JOINT FILLER	17.00	SF	S
516E13900	2" PREFORMED EXPANSION JOINT FILLER	117.00	SF	S
516E14020	SEMI-INTEGRAL ABUTMENT EXPANSION JOINT SEAL	79.00	FT	S
516E44100	ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE)	20.00	EACH	R
518E21200	POROUS BACKFILL WITH GEOTEXTILE FABRIC	46.00	CY	S
518E40000	6" PERFORATED CORRUGATED PLASTIC PIPE	72.00	FT	S
518E40010	6" NON-PERFORATED CORRUGATED PLASTIC PIPE, INCLUDING SPECIALS	80.00	FT	S
519E00100	SPECIAL - COMPOSITE FIBER WRAP SYSTEM	1,230.00	SF	S
519E11101	PATCHING CONCRETE STRUCTURE, AS PER PLAN	403.00	SF	S
526E15000	REINFORCED CONCRETE APPROACH SLABS (T=13")	132.00	SY	S
526E90030	TYPE C INSTALLATION	56.00	FT	S
607E39900	VANDAL PROTECTION FENCE, 6' STRAIGHT, COATED FABRIC	320.00	FT	S
625E33000	STRUCTURE GROUNDING SYSTEM	1.00	EACH	U

CHA COMPUTATION PAD

COMPLETED BY: KWB

CHECKED BY: JPL

PROJECT NAME: ODOT D6, UNI-33-17.95 PID 115685

PROJECT LOCATION: Beecher Gamble Rd. Over U.S. 33

PROJECT	PHASE	ORG
74567	0	0

SHEET #: 2 **OF** 39

DATE: 9/20/2023

SUBJECT: Quantity Calculations

202E11201	PORTIONS OF STRUCTURE REMOVED, AS PER PLAN		TOTAL:	1.00	LS

Volume of Concrete to be Removed (Substructure)

Wingwalls

Width = 1.5 ft

Length = 12.667 ft

Height = 3.77 ft

Volume = 71.65 ft^3 x 4 wingwalls = 286.58 ft^3 = 10.614 yd^3

Abutments

Width = 1.75 ft

Length = 29.667 ft

Height = 3.83 ft

Volume = 198.84 ft^3 x 2 abutments = 397.68 ft^3 = 14.729 yd^3

Total Volume of Concrete to be Removed (Substructure) = Wingwall Volume + Abutment Volume

= 684.27 ft^3

= 25.34 yd^3

Amount = 25.34 yd^3 x $315.78 $/yd^3 = $ 8002.86

CHA COMPUTATION PAD

COMPLETED BY: KWB	
CHECKED BY: JPL	
PROJECT NAME: ODOT D6, UNI-33-17.95 PID 115685	
PROJECT LOCATION: Beecher Gamble Rd. Over U.S. 33	

PROJECT	PHASE	ORG
74567	0	0

SHEET #: 3 **OF** 39

DATE: 9/20/2023

SUBJECT: Quantity Calculations

202E11202	PORTIONS OF STRUCTURE REMOVED, OVER 20 FOOT SPAN	TOTAL:	1.00	LS

Volume of Concrete to be Removed

*Superstructure Deck = 217 cys

Amount = 217.00 cys x $ 500.00 $/cys = $ 108,500.0

Weight of Structural Steel to be Removed

*Structural Steel = 146200 lbs

Amount = 146200.00 lbs x $ 0.75 $/lbs = $ 109,650.0

Length of Parapet/Transition to be Removed

*Parapet and Transition Length = 250.917 ft x 2 = 502 ft

Amount = 501.83 ft x $ 50.38 $/ft = $ 25,282.4

Total Amount = $ 243,432

*Quantity obtained from existing drawing

CHA COMPUTATION PAD

COMPLETED BY: KWB	**PROJECT** 74567 **PHASE** 0 **ORG** 0
CHECKED BY: JPL	**SHEET #:** 4 **OF** 39
PROJECT NAME: ODOT D6, UNI-33-17.95 PID 115685	**DATE:** 9/20/2023
PROJECT LOCATION: Beecher Gamble Rd. Over U.S. 33	**SUBJECT:** Quantity Calculations

| 202E22900 APPROACH SLAB REMOVED	**TOTAL:**	145.80	SY

*Approach Slab = [145.8] yd^2

*Quantity obtained from existing drawing

CHA COMPUTATION PAD

COMPLETED BY: KWB	
CHECKED BY: JPL	
PROJECT NAME: ODOT D6, UNI-33-17.95 PID 115685	
PROJECT LOCATION: Beecher Gamble Rd. Over U.S. 33	

PROJECT	PHASE	ORG
74567	0	0

SHEET #: 5 **OF** 39

DATE: 9/20/2023

SUBJECT: Quantity Calculations

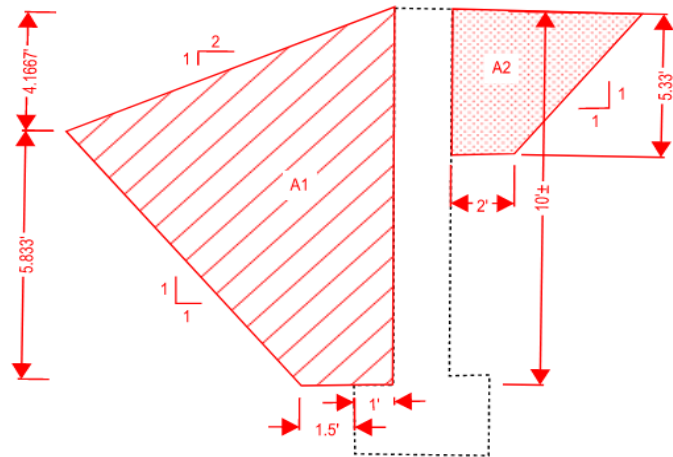| 503E21100	UNCLASSIFIED EXCAVATION	TOTAL:	204.25	CY

a. Behind Abutment

Area of Hatched Section = 24.87 sft

Length of excavation = 26.667 ft

Volume = 663.2 cft
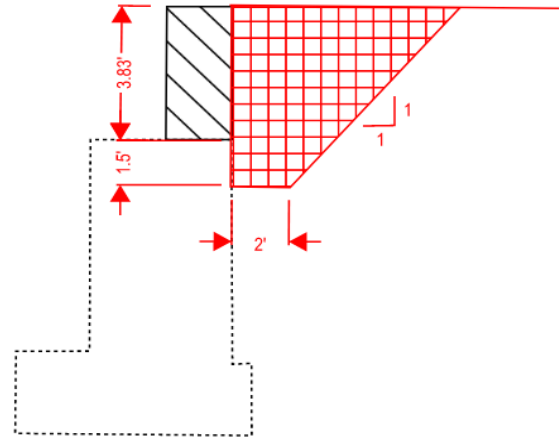
b. Infront of wingwall

Area of Hatched Section A1 = 48.96 sft

Length of excavation = 15.333 ft

Area of Hatched Section A2 = 24.88 sft

Length of excavation = 11.913 ft

Wingwalls per Abutment = 2

Volume = 2094.2 cft

Total Volume = (663.2 cft + 2094.2 cft) x 2 Abutments

= 204.25 cys

CHA COMPUTATION PAD

				PROJECT	PHASE	ORG
COMPLETED BY:	KWB			74567	0	0
CHECKED BY:	JPL		**SHEET #:** 6 **OF** 39			
PROJECT NAME:	ODOT D6, UNI-33-17.95 PID 115685		**DATE:** 9/20/2023			
PROJECT LOCATION:	Beecher Gamble Rd. Over U.S. 33		**SUBJECT:** Quantity Calculations			

509E10000   EPOXY COATED REINFORCING STEEL   TOTAL: 100,238.24   LB

Superstructure	=	250	lb/cys	x	247.00	cys	=	61750.48	lbs
Pier Cap	=	250	lb/cys	x	12.67	cys	=	3166.40	lbs
Deck Parapet	=	210	lb/cys	x	78.06	cys	=	16392.13	lbs
Wingwall	=	200	lb/cys	x	28.79	cys	=	5758.85	lbs
Approach Slab	=	100	lb/sys	x	131.70	sys	=	13170.37	lbs
						Total	=	100238.24	lbs

Edit 5/18: 91377 lbs Total

    73083 Super

    11853 Railing

    3658 Abutment

    2783 Piers

    (Copied to Summary)

Edit 7/13: 91691

    73083 Super

    12167 Railing

    3658 Abutment

    2783 Piers

    (Copied to Summary)

CHA COMPUTATION PAD

COMPLETED BY: KWB

CHECKED BY:

PROJECT NAME: ODOT D6, UNI-33-17.95

PROJECT LOCATION:

PROJECT	PHASE	ORG

SHEET #: 7 **OF** 39

DATE: 9/20/2023

SUBJECT: Quantity Calculations

509E30020	NO. 4 DEFORMED GFRP REINFORCEMENT		TOTAL:	7,563.00	FT

No. 4 Deformed GFRP Reinforcement   (In SBR-1-20 Bridge Railing)

10' Panels

		Length		# Bars				
R405	=	9.583 ft	x	11	bars	=	105.41	ft
R406	=	10 ft	x	4	bars	=	40	ft
				Total =	145.41 ft	x	42 panels	=	**6107.3 ft**

12' Panels

		Length		# Bars				
R404	=	11.583 ft	x	11	bars	=	127.41	ft
R407	=	12 ft	x	4	bars	=	48	ft
				Total =	175.41 ft	x	4 panels	=	**701.65 ft**

Transitions

		Length		# Bars				
R401	=	10 ft	x	12	bars	=	120	ft
R402	=	6.3333 ft	x	6	bars	=	38	ft
R403	=	5.0833 ft	x	6	bars	=	30.5	ft
				Total =	188.5 ft	x	4 transitions	=	**754 ft**

Total Length of GFRP in SBR-1-20 Bridge Railing =   10' panels length + 12' panels length + transitions length

= **7563** ft

CHA COMPUTATION PAD

	PROJECT	PHASE	ORG
	74567	0	0

COMPLETED BY: KWB

CHECKED BY: JPL **SHEET #:** 8 **OF** 39

PROJECT NAME: ODOT D6, UNI-33-17.95 PID 115685 **DATE:** 9/20/2023

PROJECT LOCATION: Beecher Gamble Rd. Over U.S. 33 **SUBJECT:** Quantity Calculations

510E10000	DOWEL HOLES WITH NONSHRINK, NONMETALLIC GROUT	TOTAL:	374.00	EACH

<u>Dowel Holes with Nonshrink, Nonmetallic Grout</u>

Wingwalls

Wingwall A = 56 ea.

Wingwall B = 56 ea.

Wingwall C = 56 ea.

Wingwall D = 56 ea.

Total = 224 dowel holes

Piers

Pier 1 = 25 ea. x 2 sets = 50 dowel holes

Pier 2 = 25 ea. x 2 sets = 50 dowel holes

Pier 3 = 25 ea. x 2 sets = 50 dowel holes

Total = 150 dowel holes

Total Number of Dowel Holes with Nonshrink, Nonmetallic Grout = Wingwall Total + Pier Total

= 374 dowel holes

CHA COMPUTATION PAD

COMPLETED BY: KWB	
CHECKED BY: JPL	
PROJECT NAME: ODOT D6, UNI-33-17.95 PID 115685	
PROJECT LOCATION: Beecher Gamble Rd. Over U.S. 33	

PROJECT	PHASE	ORG
74567	0	0

SHEET #: 9 **OF** 39

DATE: 9/20/2023

SUBJECT: Quantity Calculations

511E33501	SEMI-INTEGRAL DIAPHRAGM GUIDE, AS PER PLAN	TOTAL:	2.00	EACH

Semi-Integral Diaphragm Guide, As Per Plan

Number of Abutments = 2 (Rear and Forward)

Number of Diaphragm Guides per Abutment = 1 ea.

Total = 2 Diaphragm Guides

CHA COMPUTATION PAD

COMPLETED BY: KWB	**PROJECT** 74567 **PHASE** 0 **ORG** 0
CHECKED BY: JPL	**SHEET #:** 10 **OF** 39
PROJECT NAME: ODOT D6, UNI-33-17.95 PID 115685	**DATE:** 9/20/2023
PROJECT LOCATION: Beecher Gamble Rd. Over U.S. 33	**SUBJECT:** Quantity Calculations

511E34446   CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK   TOTAL: 247.00   CY

Interior Deck

Deck Thck	=	8.50 in	= 0.71 ft
Deck Width	=	24.00 ft	
Deck Length	=	234.00 ft	

Total   =   234.00   x   24.00   x   0.708   =   3977.88   cft

Overhang Deck

OH Thck	=	11.625 in	= 0.97 ft
OH Width	=	6.33 ft	
OH Length	=	234.00 ft	

Total   =   234.00   x   6.33   x   0.97   =   1435.84   cft

Fillets

Average Fillet Thickness	=	2.625 in	= 0.22 ft
Fillet Width	=	12.60 in	= 1.05 ft
Span 1 Beam Length	=	48.625 ft	
Span 2 Beam Length	=	67.50 ft	
Span 3 Beam Length	=	67.50 ft	
Span 4 Beam Length	=	48.625 ft	
Total Length	=	232.250 ft	
No. of Beams per Span	=	4.00	

Total   =   232.25   x   1.05   x   0.22   x   4.00   =   213.38   cft

Concrete Diaphragm

Diaphragm Width	=	3.75 ft
Diaphragm Height	=	4.58 ft
Diaphragm Length	=	30.33 ft

Total   =   520.98   cft   x   2   Abutments

=   1041.95   cft

Total Volume of Superstructure Concrete   =   Interior Deck + Overhang Deck + Fillets + Concrete Diaphragm

=   6669.05   cft

=   247.00   cy

CHA COMPUTATION PAD

COMPLETED BY: KWB

CHECKED BY: JPL

PROJECT NAME: ODOT D6, UNI-33-17.95 PID 115685

PROJECT LOCATION: Beecher Gamble Rd. Over U.S. 33

PROJECT	PHASE	ORG
74567	0	0

SHEET #: 11 OF 39

DATE: 9/20/2023

SUBJECT: Quantity Calculations

511E34450	CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK (PARAPET)	TOTAL:	78.06	CY

SBR-1 Concrete Rail (Bridge Mounted Railing)

Rail Height	=	3.50	ft			
Rail Top Width	=	10.00	in	0.83	ft	
Rail Bottom Width	=	18.00	in	1.50	ft	
Rail Area	=	4.0833	ft^2			

Rail Length
- Left Rail = 234.00 ft
- Right Rail = 234.00 ft
- Total = 468.00 ft

Bridge Mounted Railing Total Volume = Railing Area x Rail Length

Total = 1911.00 ft^3 = 70.78 yd^3

SBR-1 Concrete Rail (Parapet Transition)

Transition Volume = 1.82 yd^3 (From standard drawing SBR-1-20)

No. of Transition Sections
- Left Rail = 2.00 ea.
- Right Rail = 2.00 ea.
- Total = 4.00 ea.

Parapet Transition Total Volume = Transition Volume x No. of Transition Sections

Total = 7.28 yd^3

SBR-1 Total Railing Volume = Bridge Mounted Railing Volume + Parapet Transition Volume

Total = 78.06 yd^3

COMPLETED BY:	VS		PROJECT	PHASE	ORG
			74567	0	0

CHECKED BY:	JPL	SHEET #:	12	OF	39

PROJECT NAME:	ODOT D6, UNI-33-17.95 PID 115685	DATE:	9/20/2023

PROJECT LOCATION:	Beecher Gamble Rd. Over U.S. 33	SUBJECT:	Quantity Calculations

511E43210	CLASS QC1 CONCRETE, PIER		TOTAL:	12.67	CY

Additional concrete on pier cap due to profile raise:

Increased height (Pier no. 1)	=	1.37	ft
Increased height (Pier no. 2)	=	1.59	ft
Increased height (Pier no. 3)	=	1.37	ft
Pier column diameter	=	3.00	ft
Distance between fascia columns	=	24.00	ft
Plan area of pier cap	=	79.07	sf
Total additional volume	=	341.97	cf
	=	12.67	cy

CHA COMPUTATION PAD

COMPLETED BY: KWB

CHECKED BY: JPL

PROJECT NAME: ODOT D6, UNI-33-17.95 PID 115685

PROJECT LOCATION: Beecher Gamble Rd. Over U.S. 33

PROJECT	PHASE	ORG
74567	0	0

SHEET #: 13 **OF** 39

DATE: 9/20/2023

SUBJECT: Quantity Calculations

511E46010	CLASS QC1 CONCRETE, RETAINING/WINGWALL NOT INCLUDING FOOTING	TOTAL:	28.79	CY

Wingwall

Area 1

Height	=	4.42	ft
Length	=	15.33	ft
Total	=	67.72	ft^2
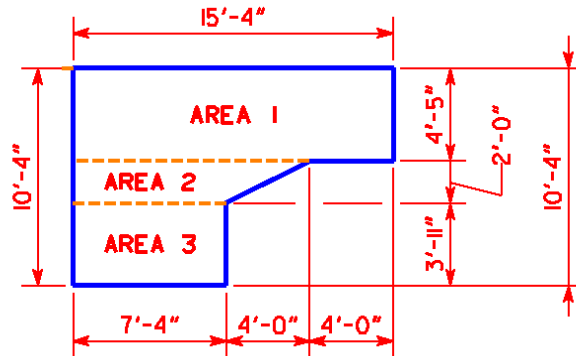
Area 2

Height	=	2.00	ft
Top Length	=	11.33	ft
Bottom Length	=	7.33	ft
Total	=	18.67	ft^2

Area 3

Height	=	3.92	ft
Length	=	7.33	ft
Total	=	28.72	ft^2

2' Wide Area

Height	=	5.92	ft
Length	=	7.33	ft
Total	=	43.39	ft^2

Total Wingwall Area = Area 1 + Area 2 + Area 3

= 115.11 ft^2

Wingwall Volume = Total Area x Wingwall Width

= 115.11 ft^2 x 1.50 ft + 43.39 ft x 0.5 ft

= 194.36 ft^3

= 7.20 yd^3

Total Wingwall Volume = 7.20 yd^3 x 4 Wingwalls

= 28.79 yd^3

(Diagram: Wingwall cross-section showing AREA 1, AREA 2, AREA 3)
Dimensions: 15'-4", 10'-4", 4'-5", 2'-0", 3'-11", 10'-4", 7'-4", 4'-0", 4'-0"

CHA COMPUTATION PAD

![CHA logo]

COMPLETED BY: KWB

CHECKED BY: JPL

PROJECT NAME: ODOT D6, UNI-33-17.95 PID 115685

PROJECT LOCATION: Beecher Gamble Rd. Over U.S. 33

PROJECT	PHASE	ORG
74567	0	0

SHEET #: 14 **OF** 39

DATE: 9/20/2023

SUBJECT: Quantity Calculations

512E10100	SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)	TOTAL:	864.97	SY

Sealing of Concrete Surfaces (Epoxy-Urethane)

Wingwalls

	Length		Width					
Top of Wingwall =	15.333 ft	x	1.5 ft	x	4	wingwalls	=	92 ft^2
Edge of Wingwall =	10.333 ft	x	2 ft	x	4	wingwalls	=	82.667 ft^2

	Area					
Face of Wingwall =	48 ft^2	x	4	wingwalls	=	192 ft^2

Total Wingwall Surface Area   =   366.67 ft^2

=   **40.741** yd^2

Abutment & Diaphragm

Abutment

Length   =   30.667 ft

Height   =   2 ft

Total   =   61.333 ft^2 x   2   abutments   =   122.67 ft^2

Diaphragm

Length   =   30.333 ft

Height   =   3.8 ft

Total   =   115.27 ft^2 x   2   abutments   =   230.53 ft^2

Total Abutment + Diaphragm Area   =   Abutment Area + Diaphragm Area

=   353.2 ft^2

=   **39.244** yd^2

512E10100

CHA COMPUTATION PAD

COMPLETED BY:	KWB
CHECKED BY:	JPL
PROJECT NAME:	ODOT D6, UNI-33-17.95 PID 115685
PROJECT LOCATION:	Beecher Gamble Rd. Over U.S. 33

PROJECT	PHASE	ORG
74567	0	0

SHEET #: **15** OF **39**

DATE: **9/20/2023**

SUBJECT: **Quantity Calculations**

512E10100	SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)	TOTAL:	864.97	SY

Piers

Cap

Width	=	3	ft
Length	=	24	ft
Height	=	4.5	ft
Radius	=	1.5	ft
Circumference	=	9.4248	ft

Top Cap Area = Length x Width + (3.14x1.5'x1.5') = 79.069 ft^2

Bottom Cap Area = Length Between Columns x Width = 58.54 ft^2

Cap Face Area = Length x Ht. = 108 ft^2 x 2 faces = 216 ft^2

Cap Side Area = (Circumference/2) x Ht. = 21.206 ft^2 x 2 faces = 42.412 ft^2

Total Cap Surface Area = 396.02 ft^2

Column

Diameter	=	3	ft
Height	=	12	ft

Column Surface Area = Circumference x Height

= 113.0973 ft^2 x 3 columns = 339.29 ft^2

Total Pier Surface Area = Cap Surface Area + Column Surface Area

= 735.3169 ft^2

= 81.7019 yd^2 x 3 piers = **245.11** yd^2

Bridge Railing (SBR-1-20)

Bridge Railing Length = 234 ft

Barrier Perimeter = 10 in + 42 in + 42.76 in = 94.76 in = 7.8967 ft

Overhang Perimeter = Overhang width + 2" deck edge + Overhang Deck thickness

= 11.625 in + 2 in + 6 in = 19.625 in = 1.6354 ft

Surface Area of Bridge Railing = Railing Length x (Barrier Perimeter + Overhang Perimeter)

= 2230.51 ft^2

= 247.83 yd^2 x 2 sides = **495.67** yd^2

PROJECT NO.: 115685

512E10100

CHA COMPUTATION PAD

512E10100	SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)	TOTAL:	864.97	SY

Bridge Railing Transition

A-A to B-B

Section A-A Perimeter = 94.76 in = 7.8967 ft

Section B-B Perimeter = 79.815 in = 6.6513 ft

Average Perimeter = 87.288 in = 7.274 ft

A-A to B-B Length = 10 ft

Average Surface Area from A-A to B-B = Length x Average Perimeter

$$= 72.74 \ ft^2$$

B-B to C-C

Section B-B/C-C Perimeter = 79.815 in = 6.6513 ft   (Section B-B and C-C are similar)

B-B to C-C Length = 2.5 ft

Surface Area from B-B to C-C = Length x Perimeter

$$= 16.628 \ ft^2$$

C-C to D-D

Section C-C Perimeter = 79.815 in = 6.6513 ft

Section D-D Perimeter = 82 in = 6.8333 ft

Average Perimeter = 80.908 in = 6.7423 ft

C-C to D-D Length = 1.5 ft

Surface Area from C-C to D-D = Length x Perimeter

$$= 10.113 \ ft^2$$

Total Surface Area of Bridge Railing Transition = (A-A to B-B) + (B-B to C-C) + (C-C to D-D)

$$= 99.481 \ ft^2$$

$$= 11.053 \ yd^2 \ x \ 4 \ transitions \ = \ \boxed{44.214} \ yd^2$$

Total Area of Sealed Concrete Surfaces = Bridge Railing + Bridge Transition + Piers + Abutments + Wingwalls

$$= 864.97 \ yd^2$$

CHA COMPUTATION PAD

	PROJECT	**PHASE**	**ORG**
COMPLETED BY: KWB	**74567**	**0**	**0**
CHECKED BY: JPL	**SHEET #:** 17 **OF** 39		
PROJECT NAME: ODOT D6, UNI-33-17.95 PID 115685	**DATE:** 9/20/2023		
PROJECT LOCATION: Beecher Gamble Rd. Over U.S. 33	**SUBJECT:** Quantity Calculations		

512E10600 **CONCRETE REPAIR BY EPOXY INJECTION**	**TOTAL:**	**36.50**	**FT**

Concrete Repair By Epoxy Injection

Cracks in Abutments:

Rear Abutment	=	7.50	ft
Forward Abutment	=	4	ft
Total	=	11.50	ft

Cracks in Piers:

Pier No.1	=	8.00	ft
Pier No.2	=	8.75	ft
Pier No.3	=	8.25	ft
Total	=	25.00	ft

Total Length of Cracks:

Total	=	Abutment total + Pier total
	=	36.50 ft

CHA COMPUTATION PAD

COMPLETED BY: KWB	
CHECKED BY: JPL	
PROJECT NAME: ODOT D6, UNI-33-17.95 PID 115685	
PROJECT LOCATION: Beecher Gamble Rd. Over U.S. 33	

PROJECT	PHASE	ORG
74567	0	0

SHEET #: 18 **OF** 39

DATE: 9/20/2023

SUBJECT: Quantity Calculations

512E33000 TYPE 2 WATERPROOFING		**TOTAL:**	16.02	SY

<u>Type 2 Waterproofing</u>

		Length		Width				
Area of Bottom Portion of Wingwall	=	3.9167 ft	x	3.5 ft	=	13.708	ft^2
Area of Top Portion of Wingwall	=	5.5833 ft	x	4 ft	=	22.333	ft^2

Total Area of Waterproofing at Wingwalls   =   (Bottom Area + Top Area) x No. Wingwalls

$$= \quad 36.042 \ \text{ft}^2 \quad x \quad 4 \quad \text{Wingwalls} \quad = \quad 144.17 \ \text{ft}^2$$

$$= \quad 16.019 \ \text{yd}^2$$

CHA COMPUTATION PAD

COMPLETED BY: KWB

CHECKED BY: JPL

PROJECT NAME: ODOT D6, UNI-33-17.95 PID 115685

PROJECT LOCATION: Beecher Gamble Rd. Over U.S. 33

PROJECT	PHASE	ORG
74567	0	0

SHEET #: 19 OF 39

DATE: 9/20/2023

SUBJECT: Quantity Calculations

513E10240	STRUCTURAL STEEL MEMBERS, LEVEL 2	TOTAL:	187,404.34	LB

Beam W21x201

Weight per linear foot	=	201	lb/ft
Span 1 Beam Length	=	0.00	ft
Span 2 Beam Length	=	15.75	ft
Span 3 Beam Length	=	15.75	ft
Span 4 Beam Length	=	0.00	ft
Total Length	=	31.500	ft
No. of Beams per Span	=	4.00	

Weight of Steel Beam = 31.500 ft x 201.00 lb/ft x 4.00

= 25326.0 lb

Beam W21x166

Weight per linear foot	=	166	lb/ft
Span 1 Beam Length	=	61.830	ft	60.5
Span 2 Beam Length	=	39.50	ft
Span 3 Beam Length	=	65.75	ft
Span 4 Beam Length	=	34.250	ft
Total Length	=	201.330	ft
No. of Beams per Span	=	4.00	

Weight of Steel Beam = 201.330 ft x 166.00 lb/ft x 4.00

= 133683.1 lb

Cross Frame

Steel Section	=	MC18x42.7	
Weight per linear foot	=	42.7	lb/ft
Length of Cross Frames	=	8.000	ft
Total Number of Cross Frames	=	57.000	

Weight of Cross Frames = 8.000 ft x 42.70 lb/ft x 57.00

= 19471.2 lb

Adding 5% for connections and splice

Total weight = 187,404.34 lb

PROJECT NO.: 74567

513E10240

CHA COMPUTATION PAD

COMPLETED BY:	KWB	

PROJECT	PHASE	ORG
74567	0	0

CHECKED BY:	JPL	

SHEET #: **20** OF **39**

PROJECT NAME: ODOT D6, UNI-33-17.95 PID 115685

DATE: 9/20/2023

PROJECT LOCATION: Beecher Gamble Rd. Over U.S. 33

SUBJECT: Quantity Calculations

513E20000	WELDED STUD SHEAR CONNECTORS	TOTAL:	4,008.00	EACH

Welded Stud Shear Connectors

Half Each Beam	=	501	ea.
Each Beam	=	1002	ea.
# of Beams	=	4	beams
Total	=	4008	ea. shear connectors

CHA COMPUTATION PAD

COMPLETED BY: KWB	
CHECKED BY: JPL	
PROJECT NAME: ODOT D6, UNI-33-17.95 PID 115685	
PROJECT LOCATION: Beecher Gamble Rd. Over U.S. 33	

PROJECT	PHASE	ORG
74567	0	0

SHEET #: 21 **OF** 39

DATE: 9/20/2023

SUBJECT: Quantity Calculations

514E00060	FIELD PAINTING STRUCTURAL STEEL, INTERMEDIATE COAT	TOTAL:	8,621.31	SF

Beam W21x201

h	=	23.00	in
w	=	12.60	in
tw	=	0.91	in
tf	=	1.63	in

Painting region = 6.83 ft (top flange width not considered for painting)

Span 1 Beam Length	=	0.00	ft
Span 2 Beam Length	=	15.75	ft
Span 3 Beam Length	=	15.75	ft
Span 4 Beam Length	=	0.00	ft
Total Length	=	31.500	ft
No. of Beams per Span	=	4.00	

Surface Area	=	6.83	ft	x	31.50	ft	x	4.00
	=	860.8	sf				

Beam W21x166

h	=	22.50	in
w	=	12.40	in
tw	=	0.75	in
tf	=	1.36	in

Painting region = 6.73 ft (top flange width not considered for painting)

Span 1 Beam Length	=	61.830	ft
Span 2 Beam Length	=	39.50	ft
Span 3 Beam Length	=	65.75	ft
Span 4 Beam Length	=	34.250	ft
Total Length	=	201.330	ft
No. of Beams per Span	=	4.00	

Surface Area	=	6.73	ft	x	201.33	ft	x	4.00
	=	5415.8	sf				

COMPLETED BY:	KWB		PROJECT	PHASE	ORG
			74567	0	0

CHECKED BY:	JPL	SHEET #:	22	OF	39

PROJECT NAME:	ODOT D6, UNI-33-17.95 PID 115685	DATE:	9/20/2023

PROJECT LOCATION:	Beecher Gamble Rd. Over U.S. 33	SUBJECT:	Quantity Calculations

514E00060	FIELD PAINTING STRUCTURAL STEEL, INTERMEDIATE COAT	TOTAL:	8,621.31	SF

Cross Frame

Assume MC18x42.7

h	=	18.0	in
w	=	3.95	in
tw	=	0.45	in
tf	=	0.625	in

Painting region = 4.24 ft

Length of Cross Frames = 8.000 ft

Total Number of Cross Frames = 57.000

Surface Area = 4.24 ft x 8.00 ft x 57.00

= 1934.2 sf

Adding 5% for connections

Total Surface Area = 8,621.31 sf

CHA COMPUTATION PAD

COMPLETED BY: KWB	
CHECKED BY: JPL	
PROJECT NAME: ODOT D6, UNI-33-17.95 PID 115685	
PROJECT LOCATION: Beecher Gamble Rd. Over U.S. 33	

PROJECT	PHASE	ORG
74567	0	0

SHEET #: 23 **OF** 39

DATE: 9/20/2023

SUBJECT: Quantity Calculations

514E00066	FIELD PAINTING STRUCTURAL STEEL, FINISH COAT	**TOTAL:**	8,621.31	SF

Beam W21x201

h	=	23.00	in
w	=	12.60	in
tw	=	0.91	in
tf	=	1.63	in

Painting region = 6.83 ft (top flange width not considered for painting)

Span 1 Beam Length	=	0.00	ft
Span 2 Beam Length	=	15.75	ft
Span 3 Beam Length	=	15.75	ft
Span 4 Beam Length	=	0.00	ft
Total Length	=	31.500	ft
No. of Beams per Span	=	4.00	

Surface Area = 6.83 ft x 31.50 ft x 4.00

= 860.8 sf

Beam W21x166

h	=	22.50	in
w	=	12.40	in
tw	=	0.75	in
tf	=	1.36	in

Painting region = 6.73 ft (top flange width not considered for painting)

Span 1 Beam Length	=	61.830	ft
Span 2 Beam Length	=	39.50	ft
Span 3 Beam Length	=	65.75	ft
Span 4 Beam Length	=	34.250	ft
Total Length	=	201.330	ft
No. of Beams per Span	=	4.00	

Surface Area = 6.73 ft x 201.33 ft x 4.00

= 5415.8 sf

PROJECT NO.: 115685

514E00066

COMPLETED BY:	KWB		**PROJECT**	**PHASE**	**ORG**
			74567	0	0
CHECKED BY:	JPL		**SHEET #:** 24 **OF** 39		
PROJECT NAME:	ODOT D6, UNI-33-17.95 PID 115685		**DATE:** 9/20/2023		
PROJECT LOCATION:	Beecher Gamble Rd. Over U.S. 33		**SUBJECT:** Quantity Calculations		

514E00066	FIELD PAINTING STRUCTURAL STEEL, FINISH COAT	**TOTAL:** 8,621.31	**SF**

Cross Frame

Assume MC18x42.7

h = 18.0 in

w = 3.95 in

t_w = 0.45 in

t_f = 0.625 in

Painting region = 4.24 ft

Length of Cross Frames = 8.000 ft

Total Number of Cross Frames = 57.000

Surface Area = 4.24 ft x 8.00 ft x 57.00

= 1934.2 sf

Adding 5% for connections

Total Surface Area = 8,621.31 sf

CHA COMPUTATION PAD

COMPLETED BY: KWB

CHECKED BY: JPL

PROJECT NAME: ODOT D6, UNI-33-17.95 PID 115685

PROJECT LOCATION: Beecher Gamble Rd. Over U.S. 33

PROJECT	PHASE	ORG
74567	0	0

SHEET #: 25 **OF** 39

DATE: 9/20/2023

SUBJECT: Quantity Calculations

514E10000	FINAL INSPECTION REPAIR	TOTAL:	16.00	EACH

Final Inspection Repair

Length of Beam = 231.5 ft

No. of Beams = 4 beams

No. of Beam Surfaces = 5 surfaces

Total Inspection Length = 4630 ft

Number of Inspection Points = Total Inspection Length/300 ft

= 15.4333 ea.

= 16 ea.

CHA COMPUTATION PAD

COMPLETED BY: KWB		
CHECKED BY: JPL		
PROJECT NAME: ODOT D6, UNI-33-17.95 PID 115685		
PROJECT LOCATION: Beecher Gamble Rd. Over U.S. 33		

PROJECT	PHASE	ORG
74567	0	0

SHEET #: 26 **OF** 39

DATE: 9/20/2023

SUBJECT: Quantity Calculations

516E10010	ARMORLESS PREFORMED JOINT SEAL	TOTAL:	56.00	FT

Armorless Preformed Joint Seal

	Length		Total Length
East Approach	28.00	ft	28.00
West Approach	28.00	ft	28.00
	Total=	56.00	FT

CHA

COMPLETED BY:	KWB
CHECKED BY:	JPL
PROJECT NAME:	ODOT D6, UNI-33-17.95 PID 115685
PROJECT LOCATION:	Beecher Gamble Rd. Over U.S. 33

PROJECT	PHASE	ORG
74567	0	0

SHEET #:	27	**OF**	39	
DATE:	9/20/2023			
SUBJECT:	Quantity Calculations			

516E13600	1" PREFORMED EXPANSION JOINT FILLER	**TOTAL:**	16.33	**SF**

<u>1" Preformed Expansion Joint Filler</u>

Bridge Railing Transition

Area of SBR-1-20 Railing Section   =   4.0833 ft^2 x   4   transitions   =   16.333 ft^2

CHA COMPUTATION PAD

		PROJECT	PHASE	ORG
COMPLETED BY:	KWB	74567	0	0
CHECKED BY:	JPL	**SHEET #:** 28 **OF** 39		
PROJECT NAME:	ODOT D6, UNI-33-17.95 PID 115685	**DATE:** 9/20/2023		
PROJECT LOCATION:	Beecher Gamble Rd. Over U.S. 33	**SUBJECT:** Quantity Calculations		

516E13900	2" PREFORMED EXPANSION JOINT FILLER	**TOTAL:**	116.43	SF

2" Preformed Expansion Joint Filler

Joint Filler Width   =   2   in   =   0.1667 ft

Between Wingwall and Abutment

		Length			Height			
Wingwall A	=	3.75	ft	x	4.4167	ft	=	16.563 ft^2
Wingwall B	=	3.75	ft	x	4.4167	ft	=	16.563 ft^2
Wingwall C	=	3.75	ft	x	4.4167	ft	=	16.563 ft^2
Wingwall D	=	3.75	ft	x	4.4167	ft	=	16.563 ft^2
					Total	=	66.25	ft^2

Between Wingwall and Approach Slab

		Length			Height			
Wingwall A	=	11.58	ft	x	1.0833	ft	=	12.545 ft^2
Wingwall B	=	11.58	ft	x	1.0833	ft	=	12.545 ft^2
Wingwall C	=	11.58	ft	x	1.0833	ft	=	12.545 ft^2
Wingwall D	=	11.58	ft	x	1.0833	ft	=	12.545 ft^2
					Total	=	50.18	ft^2

Total Area of 1" PEJF   =   Total Area along Wingwalls

=   116.43   ft^2

CHA COMPUTATION PAD

516E14020   SEMI-INTEGRAL ABUTMENT EXPANSION JOINT SEAL   TOTAL: 79.00   FT

<u>Semi-Integral Abutment Expansion Joint Seal</u>

Abutments

		Length	
Rear Abutment	=	30.667	ft
Forward Abutment	=	30.667	ft
Length at Wingwall	=	4.4167 ft x 4 wingwalls =	17.667 ft

Total Length of Joint Seal   =   Rear Abutment + Forward Abutment + Total Length at Wingwalls

$$= \quad 79 \quad \text{ft}$$

COMPLETED BY:	KWB
CHECKED BY:	JPL
PROJECT NAME:	ODOT D6, UNI-33-17.95 PID 115685
PROJECT LOCATION:	Beecher Gamble Rd. Over U.S. 33

PROJECT	PHASE	ORG
74567	0	0

SHEET #: 30 **OF** 39

DATE: 9/20/2023

SUBJECT: Quantity Calculations

516E44100	ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE)	TOTAL:	20.00	EACH

Elastomeric Bearing with Internal Laminates and Load Plates (Neoprene)

Rear Abutment

(12"x12"x2.656")(15"x15"x1.5") = 4 bearings

Pier 1

(14"x14"x2.656")(16"x16"x1.5") = 4 bearings

Pier 2

(14"x14"x2.0625")(16"x16"x1.5") = 4 bearings

Pier 3

(14"x14"x2.656")(16"x16"x1.5") = 4 bearings

Forward Abutment

(12"x12"x2.656")(15"x15"x1.5") = 4 bearings

Total Elastomeric Bearings = Abutments + Piers

= 20 Elastomeric Bearings

COMPLETED BY:	KWB
CHECKED BY:	JPL
PROJECT NAME:	ODOT D6, UNI-33-17.95 PID 115685
PROJECT LOCATION:	Beecher Gamble Rd. Over U.S. 33

PROJECT	PHASE	ORG
74567	0	0

SHEET #: 31 **OF** 39

DATE: 9/20/2023

SUBJECT: Quantity Calculations

518E21200	POROUS BACKFILL WITH GEOTEXTILE FABRIC	TOTAL:	45.35	CY

Porous Backfill with Geotextile Fabric

Rear Abutment

Length	=	31.667	ft
Width	=	2	ft
Approach Slab Thickness	=	1.0833	ft
Effective Height	=	9.6667	ft	(w/o approach slab)
Total	=	612.22	ft^3

Forward Abutment

Length	=	31.667	ft
Width	=	2	ft
Approach Slab Thickness	=	1.0833	ft
Effective Height	=	9.6667	ft	(w/o approach slab)
Total	=	612.22	ft^3

Total Volume of Porous Backfill   = Rear Abutment + Forward Abutment

= 1224.4 ft^3

= 45.35 yd^3

CHA COMPUTATION PAD

COMPLETED BY: KWB	
CHECKED BY: JPL	
PROJECT NAME: ODOT D6, UNI-33-17.95 PID 115685	
PROJECT LOCATION: Beecher Gamble Rd. Over U.S. 33	

PROJECT	PHASE	ORG
74567	0	0

SHEET #: 32 **OF** 39

DATE: 9/20/2023

SUBJECT: Quantity Calculations

518E40000	6" PERFORATED CORRUGATED PLASTIC PIPE	TOTAL:	72.00	FT

6" Perforated Corrugated Plastic Pipe

Length Along Rear Abutment =	36	ft
Length Along Forward Abutment =	36	ft
Total =	72	ft

CHA COMPUTATION PAD

COMPLETED BY:	KWB

	PROJECT	PHASE	ORG
	74567	0	0

CHECKED BY:	JPL

SHEET #: 33 **OF** 39

PROJECT NAME:	ODOT D6, UNI-33-17.95 PID 115685

DATE: 9/20/2023

PROJECT LOCATION:	Beecher Gamble Rd. Over U.S. 33

SUBJECT: Quantity Calculations

518E40010	6" NON-PERFORATED CORRUGATED PLASTIC PIPE, INCLUDING SPECIALS	TOTAL:	80.00	FT

6" Non-Perforated Corrugated Plastic Pipe, Including Specials

Rear Abutment

Left Length	=	20	ft
Right Length	=	20	ft
Total	=	40	ft

Forward Abutment

Left Length	=	20	ft
Right Length	=	20	ft
Total	=	40	ft

Total Length of 6" Non-Perforated Corrugated Plastic Pipe = Rear Abutment + Forward Abutment

= 80 ft

COMPLETED BY: KWB		
CHECKED BY: JPL		
PROJECT NAME: ODOT D6, UNI-33-17.95 PID 115685		
PROJECT LOCATION: Beecher Gamble Rd. Over U.S. 33		

PROJECT	PHASE	ORG
74567	0	0

SHEET #: 34 **OF** 39

DATE: 9/20/2023

SUBJECT: Quantity Calculations

519E00100	SPECIAL - COMPOSITE FIBER WRAP SYSTEM	TOTAL:	1,229.93	SF

Fiber wrap all columns that have defects. Conservatively wrap the entire column from cap to footing.

Column diameter	=	3	ft
Height of column to footing	=	14.5	ft
Curved surface area of column	=	136.659	sf
Number of defective columns	=	9	ea
Total area to be fiber wrapped	=	1229.934	sf

COMPLETED BY:	KWB
CHECKED BY:	JPL
PROJECT NAME:	ODOT D6, UNI-33-17.95 PID 115685
PROJECT LOCATION:	Beecher Gamble Rd. Over U.S. 33

PROJECT	PHASE	ORG
74567	0	0

SHEET #: 35 **OF** 39

DATE: 9/20/2023

SUBJECT: Quantity Calculations

519E11101 PATCHING CONCRETE STRUCTURE, AS PER PLAN	TOTAL:	403.00	SF

From repair area estimate clc

Patching Concrete Structure

Rear Abutment	=	30	ft
Pier 1	=	227	ft
Pier 2	=	0	ft
Pier 3	=	74	ft
Forward Abutment	=	72	ft
Total	=	403	ft

CHA COMPUTATION PAD

COMPLETED BY:	KWB		PROJECT	PHASE	ORG
			74567	0	0

CHECKED BY:	JPL		SHEET #:	36	OF	39

PROJECT NAME:	ODOT D6, UNI-33-17.95 PID 115685	DATE:	9/20/2023

PROJECT LOCATION:	Beecher Gamble Rd. Over U.S. 33	SUBJECT:	Quantity Calculations

| 526E15000	REINFORCED CONCRETE APPROACH SLABS (T=13")		TOTAL:	131.70	SY

Reinforced Bridge Approach Slab

		Length			Width		Area
East Approach	Area 1	6.00	ft	x	28.000	ft	18.67
	Area 2	14.00	ft	x	30.333	ft	47.19
				Total	=	65.85	yd²

		Length			Width		Area
West Approach	Area 1	6.00	ft	x	28.000	ft	18.67
	Area 2	14.00	ft	x	30.333	ft	47.19
				Total	=	65.85	yd²

Total Approach Slab Area   =   East Approach Area + West Approach Area

Total   =   131.70   yd²

PROJECT NO.: 74567

526E15000
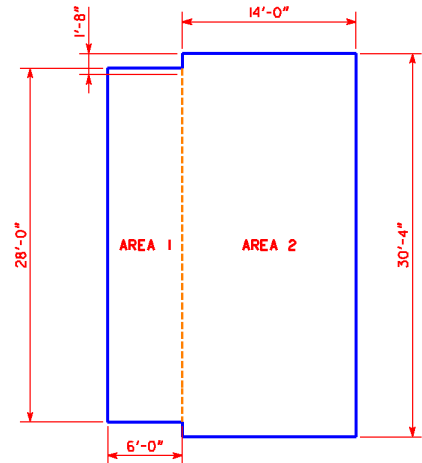
CHA COMPUTATION PAD

COMPLETED BY:	KWB	PROJECT	PHASE	ORG
		74567	0	0

CHECKED BY:	JPL

SHEET #: 37 OF 39

PROJECT NAME:	ODOT D6, UNI-33-17.95 PID 115685

DATE: 9/20/2023

PROJECT LOCATION:	Beecher Gamble Rd. Over U.S. 33

SUBJECT: Quantity Calculations

526E90030	TYPE C INSTALLATION		TOTAL:	56.00	FT

Type C Installation (Sleeper Slab)

	Length		Total Length
East Approach	28.00	ft	28.00
West Approach	28.00	ft	28.00
	Total=	56.00	FT

CHA COMPUTATION PAD

COMPLETED BY: KWB	
CHECKED BY: JPL	
PROJECT NAME: ODOT D6, UNI-33-17.95 PID 115685	
PROJECT LOCATION: Beecher Gamble Rd. Over U.S. 33	

PROJECT	PHASE	ORG
74567	0	0

SHEET #: 38 **OF** 39

DATE: 9/20/2023

SUBJECT: Quantity Calculations

607E39900	VANDAL PROTECTION FENCE, 6' STRAIGHT, COATED FABRIC	**TOTAL:**	320.00	FT

Length of Protection fence over North Railing	=	160	ft
Length of Protection fence over South Railing	=	160	ft
Total	=	320	ft

COMPLETED BY: KWB	**PROJECT** 74567 **PHASE** 0 **ORG** 0
CHECKED BY: JPL	**SHEET #:** 39 **OF** 39
PROJECT NAME: ODOT D6, UNI-33-17.95 PID 115685	**DATE:** 9/20/2023
PROJECT LOCATION: Beecher Gamble Rd. Over U.S. 33	**SUBJECT:** Quantity Calculations

625E33000 STRUCTURE GROUNDING SYSTEM	TOTAL: 1.00 EACH

Structure Grounding System

Number of Structure Grounding Systems on Bridge $=$ 1 ea.