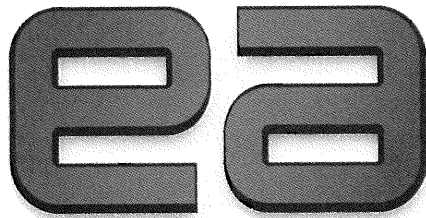


STRUCTURE ESTIMATED QUANTITY CALCULATIONS

**BRIDGE NO. RIC-30-1074
OVER S.R. 39**

STRUCTURE FILE NO. 7001119

RIC-30-9.26



PREPARED BY

ENGINEERING ASSOCIATES, INC.

SEPTEMBER 2019

INDEX TO STRUCTURE ESTIMATED QUANTITY CALCULATIONS
BRIDGE NO. RIC-30-1074 OVER S.R. 39

ITEM NO.	DESCRIPTION	SHEET
202-11203	PORTIONS OF STRUCTURE REMOVED, OVER 20 FOOT SPAN, AS PER PLAN	1
202-22900	APPROACH SLAB REMOVED	1
202-23500	WEARING COURSE REMOVED	1
202-98200	REMOVAL MISC.: STEEL PILE (HP12x53)	1
503-11100	COFFERDAMS AND EXCAVATION BRACING, AS PER PLAN	1
503-21100	UNCLASSIFIED EXCAVATION	2
505-11100	PILE DRIVING EQUIPMENT MOBILIZATION	3
507-00101	STEEL PILE HP10x42, FURNISHED, AS PER PLAN	3
507-00151	STEEL PILE HP10x42, DRIVEN, AS PER PLAN	3
509-10000	EPOXY COATED REINFORCING STEEL	4
511-21523	CLASS QC2 CONCRETE WITH QC/QA, SUPERSTRUCTURE, AS PER PLAN	5
511-33500	SEMI-INTEGRAL DIAPHRAGM GUIDE	6
511-41012	CLASS QC1 CONCRETE WITH QC/QA, PIER ABOVE FOOTINGS	6-7
511-44112	CLASS QC1 CONCRETE WITH QC/QA, ABUTMENT NOT INCLUDING FOOTING	8-9
511-46512	CLASS QC1 CONCRETE WITH QC/QA, FOOTING	9
512-10100	SEALING OF CONCRETE SURFACES (EPOXY URETHANE)	10-13
512-10300	SEALING CONCRETE BRIDGE DECKS WITH HMWM RESIN	13
511-33000	TYPE 2 WATERPROOFING	13
513-10260	STRUCTURAL STEEL MEMBERS, LEVEL 3 AISC CATEGORY Mbr	14-15
513-20000	WELDED STUD SHEAR CONNECTORS	16
514-10000	FINAL INSPECTION REPAIR	16
514-80011	SHOP PAINTING AND FIELD TOUCH-UP OF STRUCTURAL STEEL, AS PER PLAN	16
516-10010	ARMORLESS PREFORMED JOINT SEAL	16
516-13600	1" PREFORMED EXPANSION JOINT FILLER	17
516-13900	2" PREFORMED EXPANSION JOINT FILLER	17
516-14020	SEMI-INTEGRAL ABUTMENT EXPANSION JOINT SEAL	18
516-44101	ELASTOMERIC BEARING PAD WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE), AS PER PLAN, 2 13/16" x 1'-2 1/2" x 1'-5" W/t x 1'-3 1/2" x 1'-6" BEVELED LOAD PLATE	18

INDEX TO STRUCTURE ESTIMATED QUANTITY CALCULATIONS
BRIDGE NO. RIC-30-1074 OVER S.R. 39

ITEM NO.	DESCRIPTION	SHEET
516-44101	ELASTOMERIC BEARING PAD WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE), AS PER PLAN, 2 15/16" x 1'-0" x 1'-1" W/ 1 5/8" x 1'-1" x 1'-2" BEVELED LOAD PLATE	18
518-21200	POROUS BACKFILL WITH GEOTEXTILE FABRIC	19
518-40000	6" PERFORATED CORRUGATED PLASTIC PIPE	19
518-40010	6" NON-PERFORATED CORRUGATED PLASTIC PIPE, INCLUDING SPECIALS	19
526-25001	REINFORCED CONCRETE APPROACH SLABS (T=15"), AS PER PLAN	20
526-90030	TYPE C INSTALLATION	20
601-21000	CONCRETE SLOPE PROTECTION	20
607-40000	SPECIAL – VANDAL PROTECTION FENCE-6 FT STRAIGHT, COATED FABRIC	20

**ENGINEERING ASSOCIATES, INC.
CONSULTING ENGINEERS**

1935 EAGLE PASS - WOOSTER, OHIO 44691
TELEPHONE: (330) 345-6556
FAX: (330) 345-8077

PROJECT: RIC-30-9.26 PROJ. NO.: 15074 PG.: 1 OF 20
COMP. BY: TAC DATE: 5/7/19 CHKD. BY: RLE DATE: 5/21/19
SUBJECT: BRIDGE NO. RIC-30-1074 OVER S.R. 39
ESTIMATED QUANTITIES SFN: 7001119

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

LUMP SUM

ITEM 202 22900 APPROACH SLAB REMOVED

20' L x 70' W x 2 x 1/9 =

311 S.Y.

ITEM 202 23500 WEARING COURSE REMOVED

20' L x 70' W x 2 x 1/9 =

311 S.Y.

ITEM 202 98200 REMOVAL MISC.: STEEL PILE (HP12x53)

REAR ABUTMENT : 0

PIER NO. 1 : (2 x 27') = 54 FT.

FORWARD ABUTMENT: (2 x 35') = 70 FT.

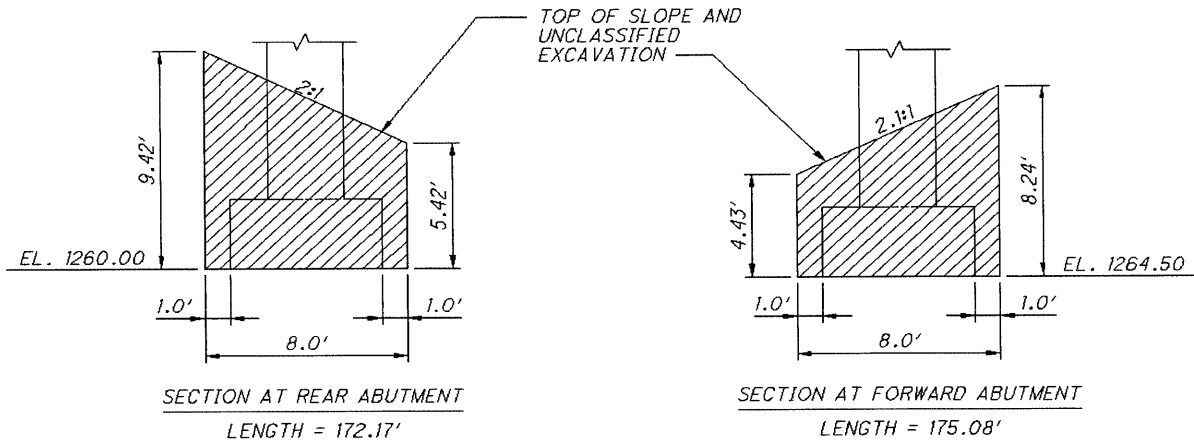
TOTAL 124 FT.

124 FT.

ITEM 503 11101 COFFERDAMS AND EXCAVATION BRACING, AS PER PLAN

LUMP SUM

ITEM 503 21100 UNCLASSIFIED EXCAVATION



VOLUME AT REAR ABUTMENT:

$$\frac{(9.42' + 5.42')}{2} \times 8.0' \times 174.17' \times 1/27 = 382.916 \text{ C.Y.}$$

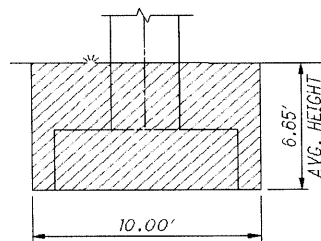
VOLUME AT FORWARD ABUTMENT:

$$\frac{(8.24' + 5.62')}{2} \times 8.0' \times 177.08' \times 1/27 = 363.604 \text{ C.Y.}$$

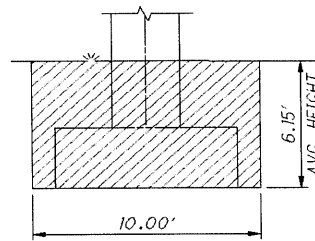
TOTAL = 746.52 C.Y.

USE

747 C.Y.



SECTION AT PIER NO. 1
 9 FOOTINGS



SECTION AT PIER NO. 2
 9 FOOTINGS

VOLUME AT PIER NO. 1:

$$(10' \times 10' \times 6.65') \times 9 \times 1/27 = 221.667 \text{ C.Y.}$$

VOLUME AT PIER NO. 2:

$$(10' \times 10' \times 6.15') \times 9 \times 1/27 = 205 \text{ C.Y.}$$

TOTAL = 426.667 C.Y.

USE

427 C.Y.

ITEM 505 11100 PILE DRIVING EQUIPMENT MOBILIZATION

LUMP SUM

ITEM 507 00101 STEEL PILES HP10x42, FURNISHED, AS PER PLAN

REAR ABUTMENT:

35 PILES x 45' ORDER LENGTH = 1575 L.F.

FORWARD ABUTMENT:

35 PILES x 45' ORDER LENGTH = 1575 L.F.

ABUTMENT TOTAL: **3150 L.F.**

PIER NO. 1

36 PILES x 35' ORDER LENGTH = 1260 L.F.

PIER NO. 2

36 PILES x 20' ORDER LENGTH = 720 L.F.

PIER TOTAL: **1980 L.F.**

TOTAL **5130 L.F.**

ITEM 507 00151 STEEL PILES HP10x42, DRIVEN, AS PER PLAN

REAR ABUTMENT:

35 PILES x 40 DRIVEN LENGTH = 1400

FORWARD ABUTMENT:

35 PILES x 40' DRIVEN LENGTH = 1400

ABUTMENT TOTAL: **2800 L.F.**

PIER NO. 1

36 PILES x 30' DRIVEN LENGTH = 1080

PIER NO. 2

36 PILES x 15' DRIVEN LENGTH = 540

PIER TOTAL: **1620 L.F.**

TOTAL **4420 L.F.**

ITEM 507 93300 STEEL POINTS OR SHOES

REAR ABUTMENT PILES: 35

PIER NO. 1 PILES: 36

PIER NO. 2 PILES: 36

FORWARD ABUTMENT PILES: 35

142 **142 EACH**

ENGINEERING ASSOCIATES, INC.
CONSULTING ENGINEERS

1935 EAGLE PASS - WOOSTER, OHIO 44691
TELEPHONE: (330) 345-6556
FAX: (330) 345-8077

PROJECT: RIC-30-9.26 PROJ. NO.: 15074 PG.: 4 OF 20
COMP. BY: TAC DATE: 5/7/19 CHKD. BY: RLE DATE: 5/21/19
SUBJECT: BRIDGE NO. RIC-30-1074 OVER S.R. 39
ESTIMATED QUANTITIES SFN: 7001119

ITEM 509 10000 EPOXY COATED REINFORCING STEEL

REAR ABUTMENT

CARRIED FROM PLAN SHEET 56/66 19,405 LB.

FORWARD ABUTMENT

CARRIED FROM PLAN SHEET 59/66 19,314 LB.

TOTAL ABUTMENTS: 38,719 LB.

PIERS

CARRIED FROM PLAN SHEET 61/66 67,518 LB.

TOTAL PIERS: 67,518 LB.

SLAB

CARRIED FROM PLAN SHEET 66/66 198,742 LB.

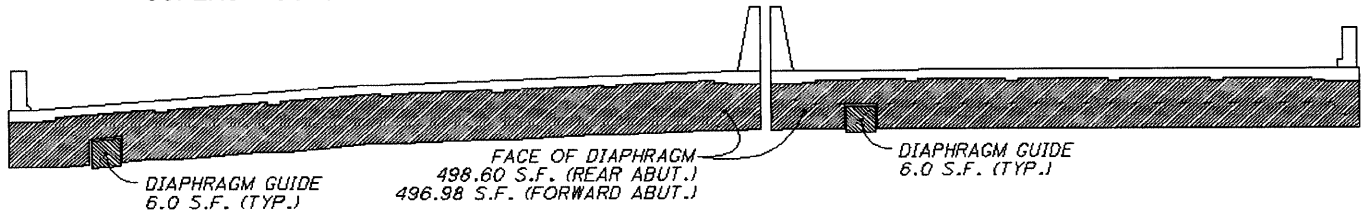
TOTAL SUPERSTRUCTURE: 198,742 LB.

TOTAL 304,979 LB.

ITEM 511 21523 CLASS QC2 CONCRETE WITH QC/QA, SUPERSTRUCTURE, AS PER PLAN

(DIAPHRAGM AREAS BY CADD)

SUPERSTRUCTURE:



DIAPHRAGM ELEVATION

DIAPHRAGMS:

REAR ABUTMENT DIAPHRAGM: 498.60 x 3.0 THK = 1,495.80 C.Y.

FORWARD ABUTMENT DIAPHRAGM: 496.60 x 3.0 THK = 1,489.80 C.Y.

DIAPHRAGM GUIDES 6.0 x 4 EACH = 24.00 C.Y.

TOTAL 3,009.60 C.Y.

3009.60 x 1/27 = 111.47 C.Y.

DECK SLAB OVER DIAPHRAGMS:

(139.11' L x 3.0' W x 1.42' H) = 592.609 C.F.

(134.57' Approach Slab L x 0.5' W x 1.42' H) = 95.54 C.F.

(592.61 - 95.54) x 2 Abutments x 1/27 = 36.82 C.Y.

DECK SLAB BETWEEN FACES OF DIAPHRAGMS:

(200.0' L x 102.15' W x 0.71' H) x 1/27 = 537.23 C.Y.

HAUNCHES OVER BEAMS:

(13 Haunches x 83.67' L x 1.33' W x 0.17' H) x 1/27 = 9.11 C.Y.

(13 Haunches x 114.48' L x 1.00' W x 0.17' H) x 1/27 = 9.37 C.Y.

ADDITIONAL SLAB "T" @ OUTSIDE FASCIAS:

((83.67' L x 2.44' W x 0.25' H) x 2) x 1/27 = 3.78 C.Y.

((114.48' L x 2.61' W x 0.25' H) x 2) x 1/27 = 5.53 C.Y.

ADDITIONAL SLAB "T" @ INSIDE FASCIAS:

((83.67' L x 2.40' W x 0.25' H) x 2) x 1/27 = 3.72 C.Y.

((114.48' L x 2.57' W x 0.25' H) x 2) x 1/27 = 5.45 C.Y.

MEDIAN BARRIER:

$\frac{[(0.84' + 1.75')]}{2} \times 4.75' H \times 206.81' L] \times 2 \times 1/27 = 94.23 C.Y.$

OUTSIDE RAILINGS:

$\frac{[(0.83' + 1.50')]}{2} \times 3.50' H \times 178.78' L] \times 2 \times 1/27 = 54.00 C.Y.$

RAILING TRANSITIONS:

4 TRANSITIONS x 1.82 C.Y. (PER STD. DWG. SBR-1-13) 7.28 C.Y.

TOTAL 877.99 C.Y.

SUPERSTRUCTURE TOTAL

878 C.Y.

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PROJECT: RIC-30-9.26 PROJ. NO.: 15074 PG.: 6 OF 20
COMP. BY: TAC DATE: 5/7/09 CHKD. BY: RLE DATE: 5/21/19
SUBJECT: BRIDGE NO. RIC-30-1074 OVER S.R. 39
ESTIMATED QUANTITIES SFN: 7001119

ITEM 511 33500 SEMI-INTEGRAL DIAPHRAGM GUIDE

4 EACH

ITEM 511 41012 CLASS QC1 CONCRETE WITH QC/QA, PIER ABOVE FOOTINGS

PIER NO. 1 COLUMNS:

	<u>TOP ELEV.</u>	<u>BOT. ELEV.</u>	<u>COL. HT.</u>
WESTBOUND	1263.87	1247.50	16.37
	1264.40	1247.50	16.90
	1264.94	1247.50	17.44
	1265.48	1247.50	17.98
	1265.92	1247.50	18.42
EASTBOUND	1266.27	1247.50	18.77
	1266.27	1247.50	18.77
	1266.27	1247.50	18.77
	1266.27	1247.50	18.77

PIER NO. 2 COLUMNS:

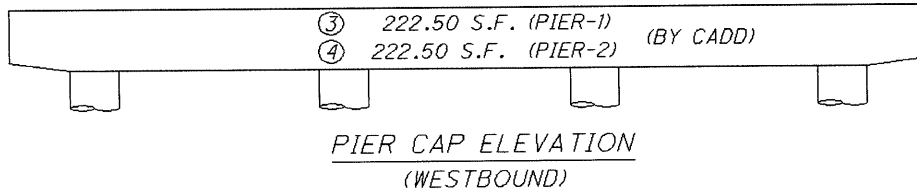
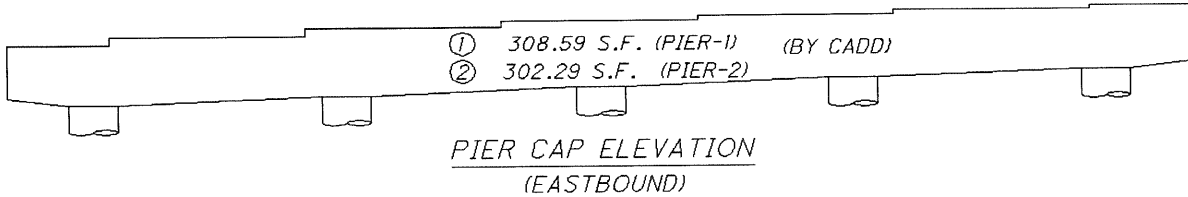
	<u>TOP ELEV.</u>	<u>BOT. ELEV.</u>	<u>COL. HT.</u>
WESTBOUND	1265.88	1247.50	18.38
	1266.17	1247.50	18.67
	1266.53	1247.50	19.03
	1266.90	1247.50	19.40
	1267.26	1247.50	19.76
EASTBOUND	1267.39	1247.50	19.89
	1267.39	1247.50	19.89
	1267.39	1247.50	19.89
	1267.39	1247.50	19.89

Total 336.99

COLUMN SUBTOTAL = $336.99 \times \pi \times 1.5^2 \times 1/27 =$ 88.22 C.Y.

(CONTINUED)

ITEM 511 41012 CLASS QC1 CONCRETE WITH QC/QA, PIER ABOVE FOOTINGS
 (CONTINUED)



VOLUMES:

1	308.59 S.F. x 3.0' THK x 1/27 =	34.29	C.Y.
2	302.29 S.F. x 3.0' THK x 1/27 =	33.59	C.Y.
3	222.50 S.F. x 3.0' THK x 1/27 =	24.72	C.Y.
4	222.50 S.F. x 3.0' THK x 1/27 =	24.72	C.Y.
<hr/>			
	PIER CAP TOTAL =	117.32	C.Y.
<hr/>			
	PIER COLUMN SUBTOTAL (CARRIED FROM SHEET 6) =	88.22	C.Y.
<hr/>			
	TOTAL	205.54	C.Y.

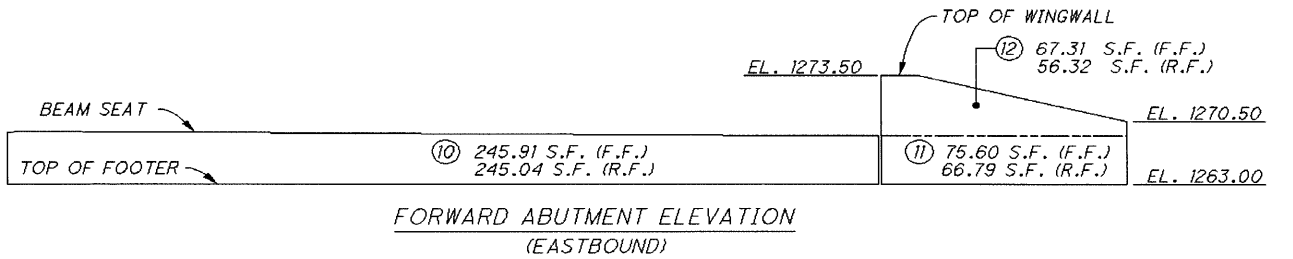
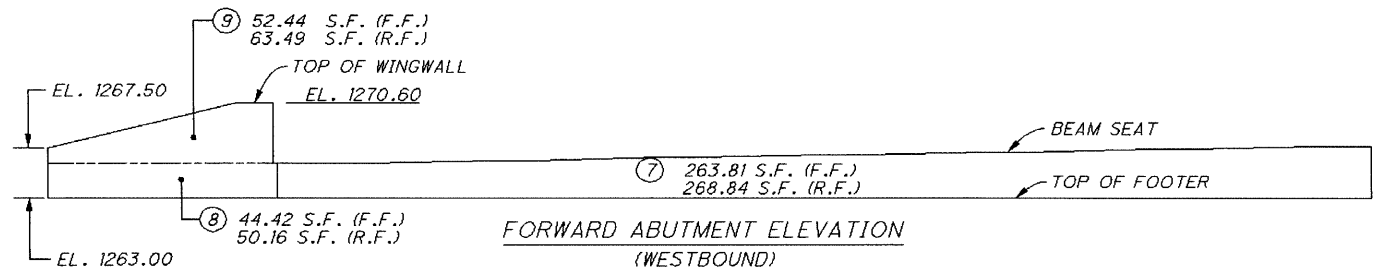
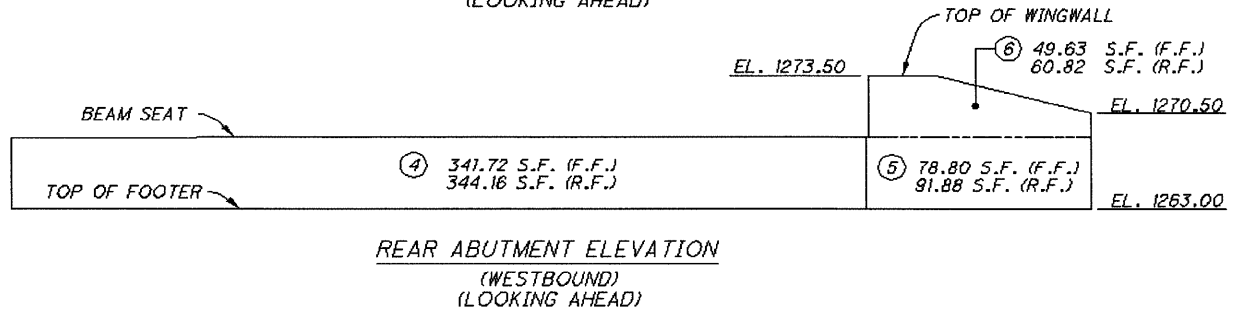
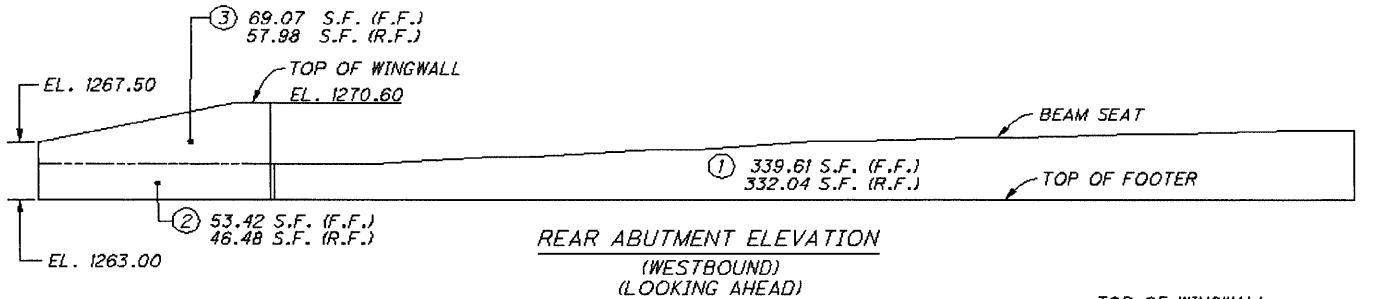
PIER TOTAL

206 C.Y.

ITEM 511 44112 CLASS QC1 CONCRETE WITH QC/QA, ABUTMENTS NOT INCLUDING FOOTINGS

(ALL AREAS BY CADD)

(CONTINUED)



(CONTINUED)

ENGINEERING ASSOCIATES, INC.
CONSULTING ENGINEERS

1935 EAGLE PASS - WOOSTER, OHIO 44691
TELEPHONE: (330) 345-6556
FAX: (330) 345-8077

PROJECT: RIC-30-9.26

PROJ. NO.: 15074 PG.: 9 OF 20

COMP. BY: TAC

DATE: 5/7/19

CHKD. BY: RLE

DATE: 5/21/19

SUBJECT: BRIDGE NO. RIC-30-1074 OVER S.R. 39

ESTIMATED QUANTITIES SFN: 7001119

ITEM 511 44112 CLASS QC1 CONCRETE WITH QC/QA, ABUTMENTS NOT INCLUDING FOOTINGS

(CONTINUED)

REAR ABUTMENT WESTBOUND:

①	(339.61+332.04) x 1/2 x 3.0' THK. =	1,007.48 C.F.
②	(53.42+46.48) x 1/2 x 2.5' THK. =	124.88 C.F.
③	(69.07+57.98) x 1/2 x 2.5' THK. =	158.81 C.F.

REAR ABUTMENT EASTBOUND:

④	(341.72+344.16) x 1/2 x 3.0' THK. =	1,028.82 C.F.
⑤	(78.80+91.88) x 1/2 x 2.5' THK. =	213.35 C.F.
⑥	(49.63+60.82) x 1/2 x 2.5' THK. =	138.06 C.F.

FORWARD ABUTMENT WESTBOUND:

⑦	(263.81+268.84) x 1/2 x 3.0' THK. =	798.98 C.F.
⑧	(44.42+50.16) x 1/2 x 2.5' THK. =	118.23 C.F.
⑨	(52.44+63.49) x 1/2 x 2.5' THK. =	144.91 C.F.

FORWARD ABUTMENT EASTBOUND:

⑩	(245.91+245.04) x 1/2 x 3.0' THK. =	736.43 C.F.
⑪	(75.60+66.79) x 1/2 x 2.5' THK. =	177.99 C.F.
⑫	(67.31+56.32) x 1/2 x 2.5' THK. =	154.54 C.F.
		<hr/>
		4,802.46 C.F.

4802.46 C.F. x 1/27 =

178 C.Y.

ITEM 511 46512 CLASS QC1 CONCRETE WITH QC/QA, FOOTING

REAR ABUTMENT:

172.17' L x 6.0' W x 3.0' H = 3,099.06 C.F.

FORWARD ABUTMENT:

175.08' L x 6.0' W x 3.0' H = 3,151.44 C.F.

TOTAL ABUTMENT: 6,250.50 x 1/27 =

232.00 C.Y.

PIER NO. 1:

(8.0' L x 8.0' W x 3.0' H) x 9 FOOTINGS = 1,728.00 C.F.

PIER NO. 2:

(8.0' L x 8.0' W x 3.0' H) x 9 FOOTINGS = 1,728.00 C.F.

TOTAL PIER: 3,456.00 x 1/27 =

128.00 C.Y.

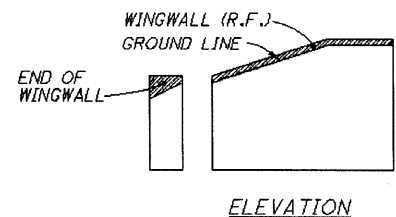
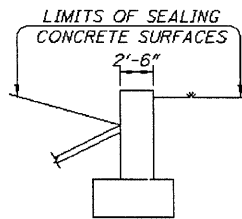
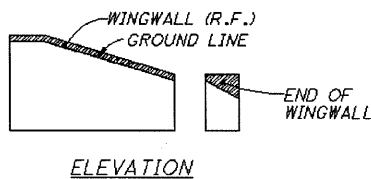
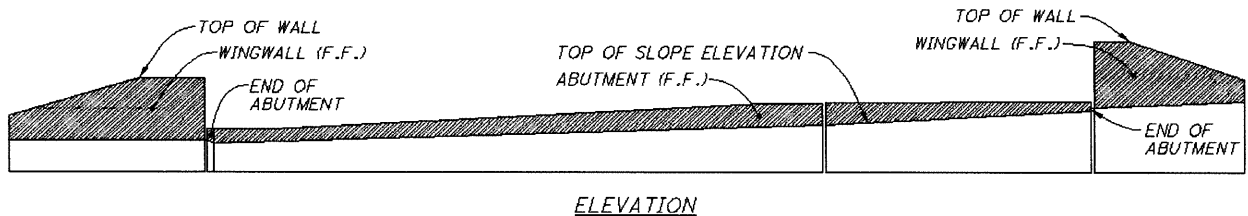
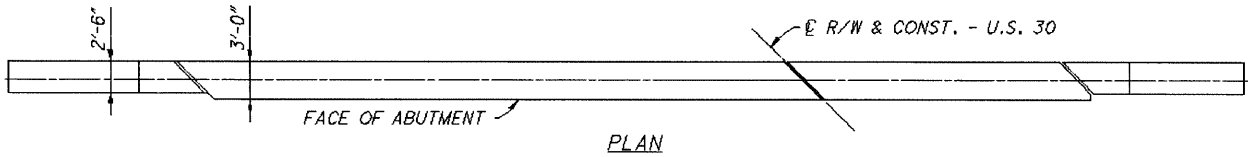
TOTAL:

360 C.Y.

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

(ALL AREAS BY CADD)

ABUTMENTS:



REAR ABUTMENT

ABUTMENT (F.F.)	180.09 S.F.
END OF ABUTMENT - LEFT	0.25 S.F.
WINGWALL (F.F.) - LEFT	74.01 S.F.
END OF WALL - LEFT	3.13 S.F.
WINGWALL (R.F.) - LEFT	8.62 S.F.
TOP OF WALL - LEFT	48.10 S.F.
END OF ABUTMENT - RIGHT	0.30 S.F.
WINGWALL (F.F.) - RIGHT	74.01 S.F.
END OF WALL - RIGHT	2.93 S.F.
WINGWALL (R.F.) - RIGHT	8.20 S.F.
TOP OF WALL - RIGHT	35.23 S.F.
TOTAL REAR ABUTMENT =	434.87 S.F.

FORWARD ABUTMENT

ABUTMENT (F.F.)	142.94 S.F.
END OF ABUTMENT - LEFT	0.19 S.F.
WINGWALL (F.F.) - LEFT	58.91 S.F.
END OF WALL - LEFT	2.86 S.F.
WINGWALL (R.F.) - LEFT	9.32 S.F.
TOP OF WALL - LEFT	40.85 S.F.
END OF ABUTMENT - RIGHT	0.60 S.F.
WINGWALL (F.F.) - RIGHT	80.06 S.F.
END OF WALL - RIGHT	2.85 S.F.
WINGWALL (R.F.) - RIGHT	8.94 S.F.
TOP OF WALL - RIGHT	50.20 S.F.
TOTAL FORWARD ABUTMENT =	397.72 S.F.

$434.87 + 397.72 \times 1/9 = 92.51 \text{ S.Y.}$

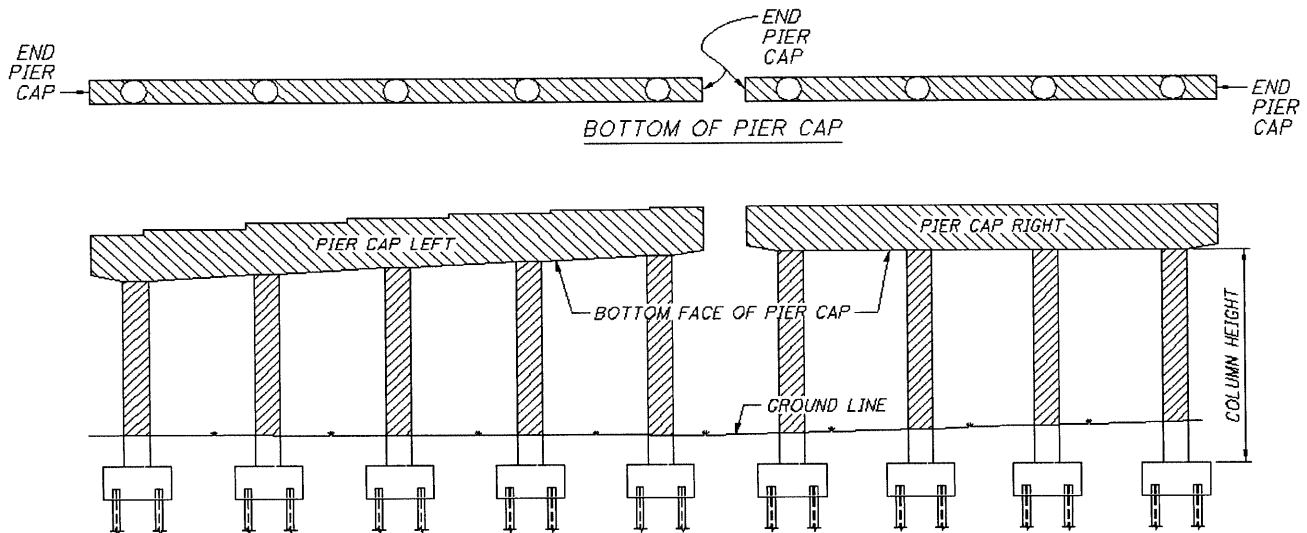
ABUTMENT TOTAL 93 S.Y.

(CONTINUED)

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

(CONTINUED, PIER CAP AREAS BY CADD)

PIERS:



PIER NO. 1:

COLUMN HEIGHT (LEFT)	12.87'+ 13.45'+ 14.02'+ 14.60'+ 15.08' =	70.02 S.F.
COLUMN HEIGHT (RIGHT)	15.30'+ 15.00'+ 15.69'+ 14.38' =	59.37 S.F.
TOTAL COLUMNS: $\pi \times 3.0' \text{ DIA.} \times (70.02' + 59.37') =$		1,219.47 S.F.
PIER CAP LEFT FRONT AND REAR FACE: $308.59 \times 2 =$		617.18 S.F.
PIER CAP LEFT BOTTOM:		185.16 S.F.
PIER CAP LEFT ENDS: $10.50 + 11.31 =$		21.81 S.F.
PIER CAP RIGHT FRONT AND REAR FACE: $222.50 \times 2 =$		445.00 S.F.
PIER CAP RIGHT BOTTOM:		139.98 S.F.
PIER CAP RIGHT ENDS: $10.50 + 10.50 =$		21.00 S.F.
TOTAL PIER NO. 1 =		2,649.60 S.F.

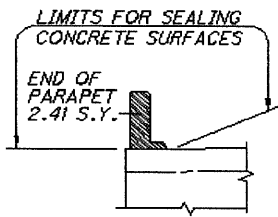
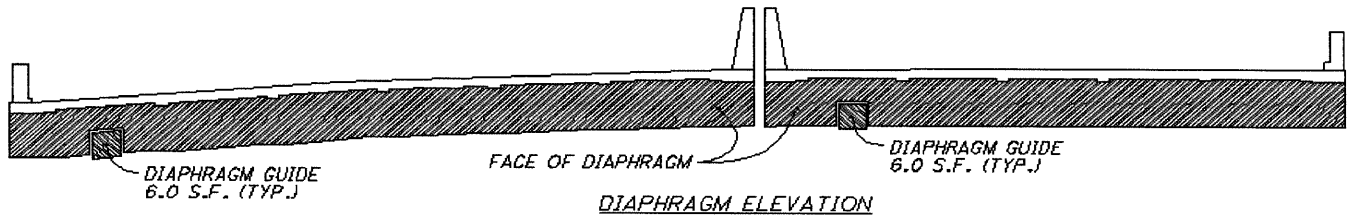
PIER NO. 2:

COLUMN HEIGHT (LEFT)	15.67'+ 15.90'+ 16.21'+ 16.49'+ 16.68' =	80.95 S.F.
COLUMN HEIGHT (RIGHT)	16.80'+ 16.57'+ 16.34'+ 16.12' =	65.83 S.F.
TOTAL COLUMNS: $\pi \times 3.0' \text{ DIA.} \times (80.95 + 65.83) =$		1,383.37 S.F.
PIER CAP LEFT FRONT AND REAR FACE: $302.30 \times 2 =$		604.60 S.F.
PIER CAP LEFT BOTTOM:		185.16 S.F.
PIER CAP LEFT ENDS: $10.50 \text{ S.F.} + 11.22 \text{ S.F.} =$		21.72 S.F.
PIER CAP RIGHT FRONT AND REAR FACE: $222.60 \times 2 =$		445.20 S.F.
PIER CAP RIGHT BOTTOM:		139.98 S.F.
PIER CAP RIGHT ENDS: $10.50 \text{ S.F.} + 10.50 \text{ S.F.} =$		21.00 S.F.
TOTAL PIER NO. 2 =		2,801.03 S.F.

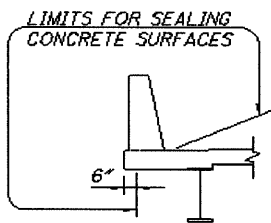
$[2649.60 \text{ (PIER 1)} + 2801.03 \text{ (PIER 2)}] / 9 = 605.63 \text{ S.Y.}$

PIER TOTAL: 606 S.Y.
 (CONTINUED)

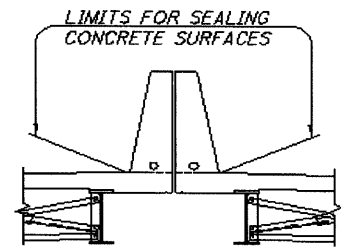
ITEM 512 10100 SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)
(CONTINUED, DIAPHRAGM AREAS BY CADD)
 SUPERSTRUCTURE:



PARAPET TRANSITION SECTION



PARAPET SECTION



MEDIAN BARRIER SECTION

DIAPHRAGMS:

REAR ABUTMENT DIAPHRAGM =	498.60 S.F.
FORWARD ABUTMENT DIAPHRAGM =	496.98 S.F.
4 DIAPHRAGM GUIDES x 6.0 S.F. =	24.00 S.F.

PARAPET AND DECK OVERHANG AT FACZIA:

PERIMETER PARAPET:	
(3.5'+0.83'+3.56') =	7.89'
SEALED PORTION OF DECK:	
(.017'+0.92'+0.5') =	1.44'
PERIMETER TO BE SEALED =	9.33'

(9.33' x 206.78' L) x 2 =	3858.51 S.F.
(ENDS OF PARAPET) 2.41 x 4 =	9.64 S.F.

MEDIAN BARRIERS:

((4.84' + 0.84') x 206.81) x 2 =	2349.3616 S.F.
TOTAL	7237.10 S.F.
7237.10 x 1/9 =	804.12 S.Y.

SUPERSTRUCTURE TOTAL: 804 S.Y.
 (CONTINUED)

**ENGINEERING ASSOCIATES, INC.
CONSULTING ENGINEERS**

1935 EAGLE PASS - WOOSTER, OHIO 44691

TELEPHONE: (330) 345-6556

FAX: (330) 345-8077

PROJECT: RIC-30-9.26 PROJ. NO.: 15074 PG.: 12a
 COMP. BY: TAC DATE: 5/7/19 CHKD. BY: RLE DATE: 5/21/19
 SUBJECT: BRIDGE NO. RIC-30-1074 OVER S.R. 39
ESTIMATED QUANTITIES SFN: 7001119

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

(CONTINUED, DIAPHRAGM AREAS BY CADD)

SUPERSTRUCTURE:

for comparison only

DIAPHRAGMS:

REAR ABUTMENT DIAPHRAGM =	498.60 S.F.
FORWARD ABUTMENT DIAPHRAGM =	496.98 S.F.
4 DIAPHRAGM GUIDES x 6.0 S.F. =	24.00 S.F.

PARAPET AND DECK OVERHANG AT FACSIA:

PERIMETER PARAPET: $(3.5'+0.83'+3.56')$ =	7.89'
SEALED PORTION OF DECK: $(.017'+0.92'+0.5')$ =	1.44'
<u>PERIMETER TO BE SEALED</u>	<u>9.33'</u>

PARAPET TRANSITION AND DECK OVERHANG AT FACSIA:

PERIMETER PARAPET: $(2.67'+1.5'+2.67') \times 4' L$ =	27.36'
PERIMETER PARAPET: $\frac{(2.67'+3.50')}{2} + 1.5 \times 10' L$ =	46.85'
SEALED PORTION OF DECK: $(.017'+0.92'+0.5') \times 14' L$ =	20.12'
<u>PARAPET TRANSITION TO BE SEALED</u>	<u>93.33'</u>

PARAPETS:	$(9.33' \times 178.78' L) \times 2$ Parapets =	3,336.03 S.F.
PARAPET TRANSITIONS:	93.33×4 Transitions =	373.32 S.F.
ENDS OF TRANSITIONS:	2.41×4 Ends =	9.64 S.F.

MEDIAN BARRIERS:

$((4.84' + 0.84') \times 206.81) \times 2 =$	2,349.36 S.F.
<u>TOTAL</u>	<u>7,087.94 S.F.</u>

$7087.94 \times 1/9 =$ 787.55 S.Y.

SUPERSTRUCTURE TOTAL: 788.00 S.Y.

2% ALLOWANCE 15.76
 788+15.76 = 804.00 PAGE 12 OK

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

(CONTINUED)

GENERAL:

MEDIAN BARRIER ON APPROACH SLABS:

$((4.84' + 0.84') \times 34.19' L) \times 2 = 388.40 \text{ S.F.}$

$388.40 \text{ S.F.} \times 2 \times 1/9 = 86.31 \text{ S.Y.}$

GENERAL TOTAL: 87.00 S.Y.

ABUTMENT TOTAL (CARRIED FROM SHEET 10) 93.00 S.Y.

PIERS TOTAL (CARRIED FROM SHEET 11) 606.00 S.Y.

SUPERSTRUCTURE TOTAL (CARRIED FROM SHEET 12) 804.00 S.Y.

GENERAL: 87.00 S.Y.

TOTAL 1,590.00 S.Y.

USE 1,590 S.Y.

ITEM 512 10300 SEALING CONCRETE BRIDGE DECKS WITH HMWM RESIN

$5.33' \times 206.81' \times 1/9 = 122.477 \text{ S.Y.}$

$122.48 \text{ S.Y.} \times 3 \text{ CLOSURE POURS} = 367.44 \text{ S.Y.}$

$(30' \text{ APPR. SLAB} \times 2') \times 6 \times 1/9 = 40.00 \text{ S.Y.}$

TOTAL 407.44 S.Y.

USE 408 S.Y.

ITEM 512 33000 TYPE 2 WATERPROOFING

REAR ABUTMENT:

ABUTMENT CONST. JOINT: $7.12' \times 3.0' = 21.36 \text{ S.F.}$

ABUTMENT & DIAPHRAGM CONST. JOINT: $(8.59' \times 3.0') + (7.99' \times 3.0') = 49.74 \text{ S.F.}$

DIAPHRAGM CONST. JOINT: $4 \times (4.79' \times 3.0') = 57.48 \text{ S.F.}$

FORWARD ABUTMENT:

ABUTMENT CONST. JOINT:

$(6.77' \times 3.0') + (7.33' \times 3.0') + (7.23' \times 3.0') = 63.99 \text{ S.F.}$

DIAPHRAGM CONST. JOINT: $3 \times (4.74' \times 3.0') = 42.66 \text{ S.F.}$

TOTAL 235.23 S.F.

$235.23 \text{ S.F.} \times 1/9 = 26.14 \text{ S.Y.}$ USE 27 S.Y.

ENGINEERING ASSOCIATES, INC.
CONSULTING ENGINEERS

1935 EAGLE PASS - WOOSTER, OHIO 44691
 TELEPHONE: (330) 345-6556
 FAX: (330) 345-8077

PROJECT: RIC-30-9.26 PROJ. NO.: 15074 PG.: 14 OF 20

COMP. BY: TAC DATE: 5/7/19 CHKD. BY: RLE DATE: 5/21/19

SUBJECT: BRIDGE NO. RIC-30-1074 OVER S.R. 39

ESTIMATED QUANTITIES SFN: 7001119

ITEM 513 10260 STRUCTURAL STEEL MEMBERS, LEVEL 3 AISC CATEGORY Mbr.

BEAMS:

	<u>FROM</u>	<u>TO</u>	<u>LENGTH</u>	<u>NO.</u>	<u>WEIGHT</u>
W33x169	C.L. R.A. + 8 3/16"	C.L. SPLICE NO. 1	40.18'	13	88,280.49 LB.
	C.L. SPLICE NO. 4	C.L. F.A. + 8 3/16"	40.18'	13	88,280.49 LB.
W33x221	C.L. SPLICE NO. 1	C.L. SPLICE NO. 2	41.83'	7	64,711.01 LB.
	C.L. SPLICE NO. 3	C.L. SPLICE NO. 4	41.83'	7	64,711.01 LB.
W33x201	C.L. SPLICE NO. 1	C.L. SPLICE NO. 2	41.83'	6	50,446.98 LB.
	C.L. SPLICE NO. 3	C.L. SPLICE NO. 4	41.83'	6	50,446.98 LB.
W33x169	C.L. SPLICE NO. 2	C.L. SPLICE NO. 3	41.42'	13	90,999.74 LB.
BEAM SUBTOTAL					497,876.70 LB.

BOLTED FIELD SPLICES:

MATERIAL FOR SPLICES 1-4

2 PL's x (5/8" x 1'-10 1/2" x 2'-5 3/8")	@ (490/1728) LB/IN ³ =	234.27 LB.
2 PL's x (9/16" x 11" x 3'-1")	@ (490/1728) LB/IN ³ =	129.84 LB.
4 PL's x (11/16" x 4 1/2" x 3'-1")	@ (490/1728) LB/IN ³ =	129.84 LB.
48 ~ 1 1/8" DIA. WEB BOLTS WITH NUT & WASHER		
[48 BOLTS x (154 + 11.3)] x 1/100 =		79.34 LB.
40 ~ 1 1/8" DIA. FLANGE BOLTS WITH NUT AND WASHER		
[40 BOLTS x (154 + 11.3)] x 1/100 =		66.12 LB.
		<u>639.41 LB. EACH SPLICE</u>

CROSS-FRAME CONNECTION ANGLE

13.6 LB x 2'-5 3/8"L = 33.29 LB. EACH ANGLE

SPLICE NO. 1 ~ 13 SPLICES x 639.41 LB =	8312.33 LB.
SPLICE NO. 2 ~ 13 SPLICES x 639.41 LB =	8312.33 LB.
SPLICE NO. 3 ~ 13 SPLICES x 639.41 LB =	8312.33 LB.
SPLICE NO. 4 ~ 13 SPLICES x 639.41 LB =	8312.33 LB.
33.29 LB x 14 ANGLES =	466.06 LB.
SPLICE SUBTOTAL	33,715.38 LB.

(CONTINUED)

ENGINEERING ASSOCIATES, INC.
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1935 EAGLE PASS - WOOSTER, OHIO 44691
 TELEPHONE: (330) 345-6556
 FAX: (330) 345-8077

PROJECT: RIC-30-9.26 PROJ. NO.: 15074 PG.: 15 OF 20
 COMP. BY: TAC DATE: 5/7/19 CHKD. BY: RLE DATE: 5/21/19
 SUBJECT: BRIDGE NO. RIC-30-1074 OVER S.R. 39
ESTIMATED QUANTITIES SFN: 7001119

ITEM 513 10260 STRUCTURAL STEEL MEMBERS, LEVEL 3 AISC CATEGORY Mbr.
 (CONTINUED)

CROSS-FRAME CONNECTION PLATES:

<u>W33x169 TYPE B</u>		
182 PL's x (31 3/8" x 6" x 3/8")	@ (490/1728) LB/IN ³ =	3,643.26 LB.
<u>W33x169 TYPE C</u>		
22 PL's x (31 3/8" x 7 3/4" x 3/8")	@ (490/1728) LB/IN ³ =	568.84 LB.
<u>W33x221 TYPE B</u>		
98 PL's x (31 5/16" x 7 1/2" x 3/8")	@ (490/1728) LB/IN ³ =	2,449.46 LB.
<u>W33x221 TYPE C</u>		
18 PL's x (31 5/16" x 7 3/4" x 3/8")	@ (490/1728) LB/IN ³ =	464.90 LB.
<u>W33x201 TYPE B</u>		
116 PL's x (31 3/8" x 7 1/2" x 3/8")	@ (490/1728) LB/IN ³ =	2,902.60 LB.
<u>1188 ~ 5/8"DIA. BOLTS WITH NUT AND 2 WASHERS</u>		
[1188 x (31.1+(2x11.3))] x 1/100 =		637.96 LB.
<u>260 ~ 7/8"DIA. BOLTS WITH NUT AND 2 WASHERS</u>		
[260 x (78+(2x11.3))] x 1/100 =		362.16 LB.
<u>DEDUCT FOR CLIPS: (1"x 2 1/2" x 3/8") = 0.94 PER PLATE</u>		
0.94 x 436 PLATES @ (490/1728) LB/IN ³ =		DEDUCT 115.91 LB.
<u>(2 3/8"x 2 3/8"x 3/8") = 1.78 PER PLATE</u>		
1.78 x 18 PLATES @ (490/1728) LB/IN ³ =		DEDUCT 9.09 LB.

INTERMEDIATE CROSS-FRAME ANGLES:

<u>TYPE B CROSS-FRAMES IN 8'-6" BAYS</u>		
98 ANGLES x (8.28' x 11.3) =		9,169.27 LB.
196 ANGLES x (8.36' x 11.3) =		18,515.73 LB.
98 PL's x (1'-11 5/8" x 4 1/2" x 3/8") @ (490/1728) LB/IN ³ =		1,107.88 LB.
<u>TYPE C CROSS-FRAMES IN 8'-6" BAYS</u>		
20 ANGLES x (8.28' x 11.3) =		1,871.28 LB.
40 ANGLES x (8.36' x 11.3) =		3,778.72 LB.
20 PL's x (5" x 5" x 3/8") @ (490/1728) LB/IN ³ =		53.17 LB.
<u>TYPE B CROSS-FRAMES IN 7'-9 1/2" BAYS</u>		
100 ANGLES x (7.57' x 11.3) =		8,554.10 LB.
200 ANGLES x (7.67' x 11.3) =		17,334.20 LB.
100 PL's x (1'-9 3/4" x 4 1/2" x 3/8") @ (490/1728) LB/IN ³ =		1,040.77 LB.
	<u>CROSS-FRAME SUBTOTAL</u>	<u>72,329.29 LB.</u>

<u>BEAM TOTAL (CARRIED FROM SHEET 14)</u>	497,876.70 LB.
<u>BOLTED FIELD SPLICE TOTAL (CARRIED FROM SHEET 14)</u>	33,715.38 LB.
<u>CROSS-FRAME TOTAL</u>	<u>72,329.29 LB.</u>
	<u>603,921.37 LB.</u>

TOTAL 603,922 LB.

ENGINEERING ASSOCIATES, INC.
CONSULTING ENGINEERS

1935 EAGLE PASS - WOOSTER, OHIO 44691
TELEPHONE: (330) 345-6556
FAX: (330) 345-8077

PROJECT: RIC-30-9.26 PROJ. NO.: 15074 PG.: 16 OF 20
COMP. BY: TAC DATE: 5/7/19 CHKD. BY: RLE DATE: 5/21/19
SUBJECT: BRIDGE NO. RIC-30-1074 OVER S.R. 39
ESTIMATED QUANTITIES SFN: 7001119

ITEM 513 20000 WELDED STUD SHEAR CONNECTORES

294 STUDS SPACED ALONG BEAM x 3 ROWS = 882 STUDS PER BEAM
882 STUDS x 13 BEAMS = 11466 EACH

ITEM 514 10000 FINAL INSPECTION REPAIR

(13 BEAMS x 204.08'L) x 1/150 = 17.69
[(20 x 9) + (19 x 2)] x .05 = 10.90
TOTAL = 28.59 29 EACH

ITEM 514 80011 SHOP PAINTING AND FIELD TOUCH-UP OF STUCTURAL STEEL, AS PER PLAN

603,922 LB.

ITEM 516 10010 ARMORLESS PREFORMED JOINT SEAL

REAR ABUTMENT LEFT = 75.66'
REAR ABUTMENT RIGHT = 57.35'
FORWARD ABUTMENT LEFT = 73.71'
FORWARD ABUTMENT RIGHT = 57.11'
TOTAL = 263.83' USE 264 FT.

ENGINEERING ASSOCIATES, INC.
CONSULTING ENGINEERS

1935 EAGLE PASS - WOOSTER, OHIO 44691
TELEPHONE: (330) 345-6556
FAX: (330) 345-8077

PROJECT: RIC-30-9.26 PROJ. NO.: 15074 PG.: 16A

COMP. BY: TAC DATE: 5/7/19 CHKD. BY: RLE DATE: 5/21/19

SUBJECT: BRIDGE NO. RIC-30-1074 OVER S.R. 39

ESTIMATED QUANTITIES SFN: 7001119

PAINT IN S.F.

<u>BEAM</u>	<u>PERIMETER</u>		<u>LENGTH</u>		
33x169	8.347	x	116.34	=	971.09 S.F.
33x221	9.421	x	83.667	=	788.223 S.F.
33x201	9.362	x	83.667	=	783.287 S.F.
TOTAL PER BEAM					2542.60 S.F.
13 BEAMS x 2542.6				=	33,054 S.F.

CROSS-FRAMES:

33054 x 0.2 = 6,611 S.F.

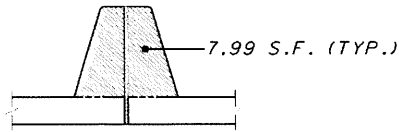
TOTAL PAINT 39,665 S.F.

ENGINEERING ASSOCIATES, INC.
CONSULTING ENGINEERS

1935 EAGLE PASS - WOOSTER, OHIO 44691
 TELEPHONE: (330) 345-6556
 FAX: (330) 345-8077

PROJECT: RIC-30-9.26 PROJ. NO.: 15074 PG.: 17 OF 20
 COMP. BY: TAC DATE: 5/7/19 CHKD. BY: RLE DATE: 5/21/19
 SUBJECT: BRIDGE NO. RIC-30-1074 OVER S.R. 39
ESTIMATED QUANTITIES SFN: 7001119

ITEM 516 13600 1" PREFORMED EXPANSION JOINT FILLER



MEDIAN BARRIER AT ABUTMENTS
 (ALONG SKEW)

$7.99 \times 4 = 31.96 \text{ S.F.}$

USE 32 S.F.

ITEM 516 13900 2" PREFORMED EXPANSION JOINT FILLER
(REAR ABUTMENT)

END OF MEDIAN BARRIER AT TRANSITION: $(1'-10\frac{1}{4}''+3'-8'') \times 4.75' H = 13.11 \text{ S.F.}$

REAR FACE MEDIAN BARRIER ON
 APPROACH SLAB: $33.74' L \times (4'-9''+1'-5'') = 208.06 \text{ S.F.}$

(FORWARD ABUTMENT)

END OF MEDIAN BARRIER AT TRANSITION: $(1'-10\frac{1}{4}''+3'-8'') \times 4.75' H = 13.11 \text{ S.F.}$

REAR FACE MEDIAN BARRIER ON
 APPROACH SLAB: $33.74' L \times (4'-9''+1'-5'') = 208.06 \text{ S.F.}$

TOTAL = 442.34 S.F.

GENERAL TOTAL: 443.00 S.F.

(REAR ABUTMENT)

END OF DIAPHRAGM AT WINGWALL (LEFT): $3.40' W \times 4.80' H = 16.32 \text{ S.F.}$

REAR FACE MEDIAN BARRIER AT ABUTMENT
 TOP OF BARRIER TO TOP OF FOOTER: $4.09' W \times 14.68' H = 60.04 \text{ S.F.}$

END OF DIAPHRAGM AT WINGWALL (RIGHT): $3.40' W \times 4.85' H = 16.49 \text{ S.F.}$

(FORWARD ABUTMENT)

END OF DIAPHRAGM AT WINGWALL (LEFT): $3.40' W \times 4.78' H = 16.25 \text{ S.F.}$

REAR FACE MEDIAN BARRIER AT ABUTMENT
 TOP OF BARRIER TO TOP OF FOOTER: $4.09' W \times 13.59' H = 55.58 \text{ S.F.}$

END OF DIAPHRAGM AT WINGWALL (RIGHT): $3.40' W \times 4.8' H = 16.32 \text{ S.F.}$

TOTAL = 181.00 S.F.

SUPERSTRUCTURE TOTAL: 181.00 S.F.

TOTAL 624 S.F.

ENGINEERING ASSOCIATES, INC.
CONSULTING ENGINEERS

1935 EAGLE PASS - WOOSTER, OHIO 44691
TELEPHONE: (330) 345-6556
FAX: (330) 345-8077

PROJECT: RIC-30-9.26 PROJ. NO.: 15074 PG.: 18 OF 20
COMP. BY: TAC DATE: 5/7/19 CHKD. BY: RLE DATE: 5/21/19
SUBJECT: BRIDGE NO. RIC-30-1074 OVER S.R. 39
ESTIMATED QUANTITIES SFN: 7001119

ITEM 516 14020 SEMI-INTEGRAL ABUTMENT EXPANSION JOINT SEAL

(REAR ABUTMENT)

NEOPRENE @ CENTERLINE: 8.78 FT.
NEOPRENE ALONG BEAM SEAT (LEFT): 77.84 FT.
NEOPRENE @ WINGWALL (LEFT): 6.05 FT.
NEOPRENE @ DIAPHRAGM GUIDE (LEFT): 4.63 FT.
NEOPRENE @ DIAPHRAGM GUIDE (RIGHT): 4.82 FT.
NEOPRENE @ WINGWALL (RIGHT): 6.09 FT.
NEOPRENE ALONG BEAM SEAT (RIGHT): 61.50 FT.

(FORWARD ABUTMENT)

NEOPRENE @ CENTERLINE: 7.37 FT.
NEOPRENE ALONG BEAM SEAT (LEFT): 79.34 FT.
NEOPRENE @ WINGWALL (LEFT): 6.05 FT.
NEOPRENE @ DIAPHRAGM GUIDE (LEFT): 4.72 FT.
NEOPRENE @ DIAPHRAGM GUIDE (RIGHT): 4.76 FT.
NEOPRENE @ WINGWALL (RIGHT): 6.09 FT.
NEOPRENE ALONG BEAM SEAT (RIGHT): 63.00 FT.

TOTAL 332.26 FT.

USE

333 FT.

ITEM 516-44101 ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE).
AS PER PLAN, 2 13/16"x1'-2 1/2"x1'-5" W/ t x1'-3 1/2"x1'-6" BEVELED LOAD PLATE

PIER NO. 1: 13
PIER NO. 2: 13

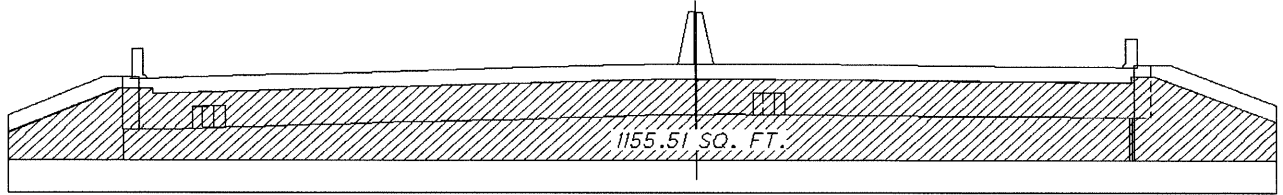
26 EACH

ITEM 516-44101 ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE).
AS PER PLAN, 2 15/16"x1'-0"x1'-1" W/ 1 5/8"x1'-1"x1'-2" BEVELED LOAD PLATE

REAR ABUTMENT: 13
FORWARD ABUTMENT: 13

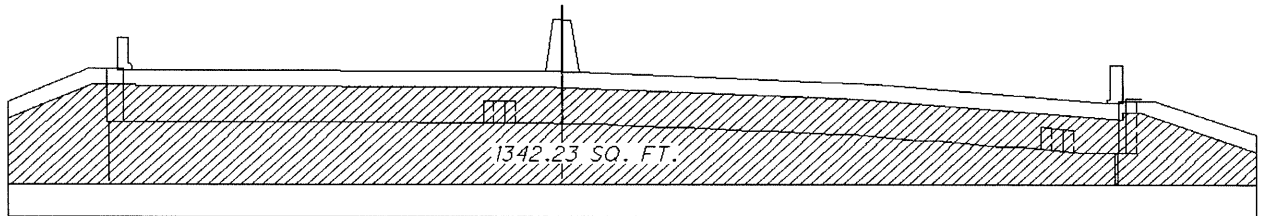
26 EACH

ITEM 518 21200 POROUS BACKFILL WITH GEOTEXTILE FABRIC



REAR ABUTMENT ELEVATION

POROUS BACKFILL @ REAR ABUTMENT: 1155.51 SQ. FT. x 2.0' THK = 2311.02 C.F.
 2311.02 C.F. x 1/27 = 85.59 C.Y.



FORWARD ABUTMENT ELEVATION

POROUS BACKFILL @ REAR ABUTMENT: 1342.23 SQ. FT. x 2.0' THK = 2684.46 C.F.
 2684.46 C.F. x 1/27 = 99.42 C.Y.

85.59 + 99.42 = 185.02 C.Y.

USE 185 C.Y.

ITEM 518 40000 6" PERFORATED CORRUGATED PLASTIC PIPE

REAR ABUTMENT: 172.17 FT.
 FORWARD ABUTMENT: 175.08 FT.
TOTAL 347.25 FT.

USE 348 FT.

ITEM 518 40010 6" NON-PERFORATED CORRUGATED PLASTIC PIPE, INCLUDING SPECIALS

REAR ABUTMENT: 12.5' + 22.5' = 35.00 FT.
 FORWARD ABUTMENT: 11.5' + 15.5' = 27.00 FT.
TOTAL 62.00 FT.

USE 62 FT.

ITEM 526 25001 REINFORCED CONCRETE APPROACH SLAB (T=15"), AS PER PLAN

REAR ABUTMENT: $\frac{(101.23 + 99.81)}{2} \times 30.0' L = 3015.60 \text{ S.F.}$

FORWARD ABUTMENT: $99.31' W \times 30.0' L = 2979.30 \text{ S.F.}$

TOTAL 5994.90 S.F.

5994.9 S.F. x 1/9 = 666.10 S.Y. USE 666 S.Y.

ITEM 526 90030 TYPE C INSTALLATION

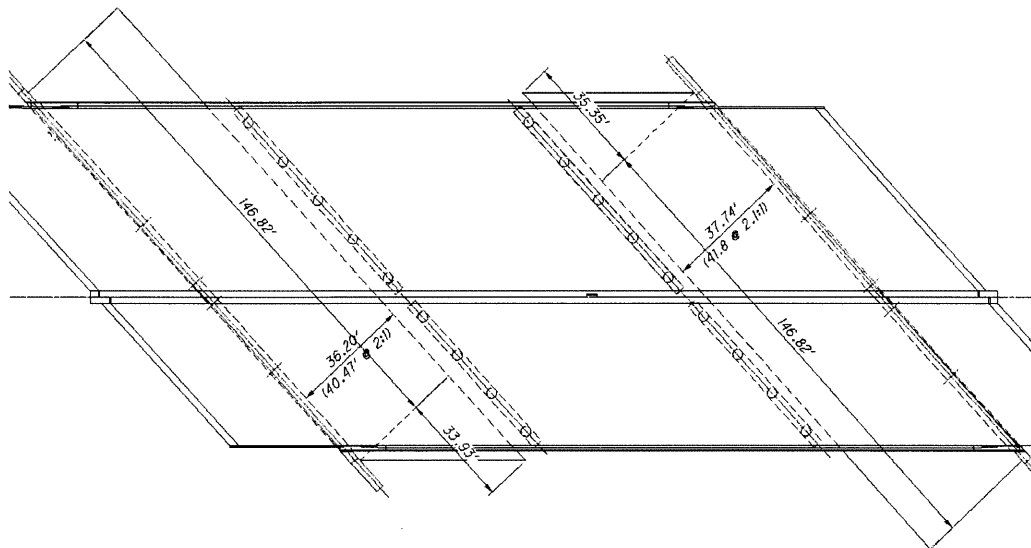
REAR ABUTMENT: 137.90 FT.

FORWARD ABUTMENT: 135.25 FT.

TOTAL 273.15 FT.

USE 274 FT.

ITEM 601 21000 CONCRETE SLOPE PROTECTION



REAR ABUTMENT

146.82 x 40.47 = 5941.81

$(33.93 \times 40.47) \times 1/2 = 686.57$

6628.38

FORWARD ABUTMENT

146.82 x 41.8 = 6137.076

$(35.35 \times 41.8) \times 1/2 = 738.82$

6875.89

6628.38 x 1/9 = 736.49 SY

6875.89 x 1/9 = 763.99 SY

736.49 + 763.99 = 1500.47 SY USE 1501 S.Y.

ITEM SPECIAL 60740000 VANDAL PROTECTION FENCE 6 FT. STRAIGHT, COATED FABRIC

176.78 x 2 = 353.60 USE 354 FT.