

GEA -87-3.18 BRIDGE QUANTITY CALCULATIONS

DATED : 09/10/26

BY: LI

CHECKED BY: JC

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

STA. 167+ 51.27 to STA. 168+ 56.77 = 105.50'

LUMP SUM

LS

ITEM 202 WEARING COURSE REMOVED

STA. 167+ 51.27 to STA. 168+ 56.77 = 105.50'

= 105.50' x 38.5'

= 4,061.75 SF x 1/9

= 451.31 SY

451 SY

ITEM 503 COFFERDAMS AND EXCAVATION BRACING

LUMP SUM

LS

ITEM 503 UNCLASSIFIED EXCAVATION

SEE ATTACHED SHEET

REAR ABUTMENT (CADD)

403.62 SF x 5.33'

= 2,151.29 CF

FWD ABUTMENT (CADD)

284.73 SF x 5.33'

= 1,517.61 CF

= 2,151.29 CF + 1,517.61 CF

= 3,668.90 CF X 1/27

= 135.89 CY

136 CY

ITEM 505 PILE DRIVING EQUIPMENT MOBILIZATION

LUMP SUM

LS

ITEM 507 STEEL PILES HP 10x42, FURNISHED.

REAR ABUTMENT PILE LENGTH = 80' EST. + 5'

= 85' x 11 PILES

= 935'

FWD ABUTMENT PILE LENGTH = 85' EST. + 5'

= 90' x 11 PILES

= 990'

= 935' + 990'

= 1,925 LF

1,925 LF

ITEM 507 STEEL PILES HP 10x42, DRIVEN.

REAR ABUTMENT PILE LENGTH = 80' EST.

= 80' x 11 PILES

= 880'

FWD ABUTMENT PILE LENGTH = 85' EST.

= 85' x 11 PILES

= 935'

= 880' + 935'

= 1,815 LF

1,815 LF

ITEM 509 EPOXY COATED STEEL REINFORCEMENT

SEE PLAN SHEET 41/53

REAR ABUTMENT (ECSR) + FWD ABUTMENT (ECSR)

= 5,747 LBS. + 5,529 LBS.

= 11,276 LBS

SUPERSTRUCTURE (ECSR)

= 37,085 LBS

PARAPET WALLS (ECSR)

= 2,963 LBS.

= (11,276 + 37,085 + 2,963 LBS.)

= 51,324 LBS.

51,324 LBS.

ITEM 509 NO.4 DEFORMED GFRP REINFORCEMENT

SEE PLAN SHEET 41/53

PARAPET WALL (GFRP)

= 2,284 LF

2,284 LF

ITEM 511 CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK

DECK THICKNESS:

= (8.5"/12) x 82.33' x 43.33'

= 2,526.88 CF

(+) HAUNCHES:

= "USING THE AVG HAUNCH THICKNESS" $\left[\left(\frac{4" + 2"}{2}\right)/12\right] \times (41.167' - 2.883') \times 4.083' \times 6 \text{ BEAMS} \times 2 \text{ ENDS.}$

= 468.94 CF

(+) THICKNESS PER DIAPHRAGM:

= $\left[\left(\frac{\text{EL. 1039.48} + \text{EL. 1039.82}}{2} - 1034.13\right) \times 3.33' \times 43.33'\right]$

= 796.47 CF

MINUS APPROACH SLAB SEAT (6"/12) x 1.083' x 43.33'

= -23.46 CF

MINUS END AREA OF BEAMS [6 BEAMS x ("BEAM AREA" 878.3 SQ. INCHES/144) x (2.833' "BEAM EMBEDDMENT")]

= -103.68 CF

MINUS PORTIONS CALC PREVIOUSLY W/THE DECK THICKNESS $\left[(8.5"/12) \times 2.833' \times 43.33'\right]$

= -86.95 CF

CONCRETE DIAPHRAGM TOTAL FOR BOTH ABUTMENTS (CF)

= (796.47 - 23.46 - 103.68 CF - 86.95 CF) x 2 END DIAPHRAGMS

= 1,164.76 CF

TOTAL ITEM 511 CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK QUANTITY

= (2,526.88 CF + 468.94 CF + 1,164.76 CF) X 1/27

= 154.10 CY

155 CY

ITEM 511 CLASS QC2 CONCRETE WITH QC/QA, BRIDGE DECK (PARAPET)

AREA OF PARAPET SECTION B-B

= $\left[(1.5' \times 3.5') - \left(\frac{8"}{12} \times 3.5'\right)/2\right] = [5.25 \text{ SF} - 1.1667 \text{ SF}] = 4.083 \text{ SF}$

AREA OF PARAPET SECTION C-C

= $\left[(1.5' \times 3.5') - \left(\frac{8"}{12} \times 3.5'\right)/2\right] = [5.25 \text{ SF} - 1.1667 \text{ SF}] = 4.083 \text{ SF}$

AREA OF PARAPET SECTION D-D

= $\left[(1' - 2 \frac{1}{2}" \times 2.67') + \left(\frac{4" \times 3 \frac{1}{2}"}{144/2}\right)\right] = [3.226 \text{ SF} + 0.0486 \text{ SF}] = 3.275 \text{ SF}$

AREA OF PARAPET SECTION E-E

= $\left[(1' - 2 \frac{1}{2}" \times 2.67') + \left(\frac{4" \times 3 \frac{1}{2}"}{144/2}\right)\right] = [3.226 \text{ SF} + 0.0486 \text{ SF}] = 3.275 \text{ SF}$

AREA OF PARAPET SECTION F-F

= $\left[\left(\frac{10"}{12} \times 2.67'\right) + \left(\frac{4" \times 8"}{144}\right)\right] = [2.225 \text{ SF} + 0.2222 \text{ SF}] = 2.447 \text{ SF}$

PARAPET WALL QUANTITY:

$$\begin{aligned} &= 2 \text{ SIDES} \times [(4.083 \text{ SF} \times 30') + (4.083 \text{ SF} \times 25.33') + \{[(3.275 \text{ SF} + 3.275 \text{ SF})/2] \times 20'\} + (3.275 \text{ SF} \times 5') + \\ &\quad (2.447 \text{ SF} \times 3')] \\ &= 2 \text{ SIDES} \times [122.49 \text{ CF} + 103.42 \text{ CF} + 65.50 \text{ CF} + 16.375 \text{ CF} + 7.341 \text{ CF}] \\ &= 2 \text{ SIDES} \times [315.13 \text{ CF}] \times 1/27 \\ &= 23.34 \text{ CY} \\ &= 24 \text{ CY} \end{aligned}$$

24 CY

ITEM 511 CLASS QC2 CONCRETE ABUTMENT INCLUDING FOOTING

REAR ABUTMENT WALL:

$$\begin{aligned} &= [\text{EL. } 1042.65 - \text{EL. } 1038.23] \times 10' / 2] \times 2.5' \times 2 \text{ SIDES} \\ &+ [\text{EL. } 1038.23 - \text{EL. } 1037.36] \times 10' \times 2.5' \times 2 \text{ SIDES} \\ &+ \{[(\text{EL. } 1042.70 + \text{EL. } 1042.65)/2] - \text{EL. } 1037.36\} \times 3' \times 2.5' \times 2 \text{ SIDES} \\ &= (110.50 \text{ CF} + 43.5 \text{ CF} + 79.725 \text{ CF}) \\ &= 233.73 \text{ CF} \end{aligned}$$

(+) FWD FOOTING:

$$\begin{aligned} &= (\text{EL. } 1037.36 - \text{EL. } 1030.60) \times 3.33' \times 69.33' \\ &= 1,560.67 \text{ CF} \end{aligned}$$

(-) REAR PILES:

$$\begin{aligned} &= (12.4 \text{ SQ. INCHES} / 144) \times 2' \times 11 \text{ PILES} \\ &= 1.89 \text{ CF} \\ &= (233.73 \text{ CF} + 1,560.67 \text{ CF} - 1.89 \text{ CF}) \\ &= 1,792.15 \text{ CF} \times 1/27 \\ &= 66.37 \text{ CY} \end{aligned}$$

FWD ABUTMENT WALL:

$$\begin{aligned} &= \{[(\text{EL. } 1039.43 - \text{EL. } 1035.00) \times 10'] / 2\} \times 2.5' \times 2 \text{ SIDES} \\ &+ \{[(\text{EL. } 1035.00 - \text{EL. } 1034.13) \times 10'] \times 2.5'\} \times 2 \text{ SIDES} \\ &+ \{[(\text{EL. } 1039.48 + \text{EL. } 1039.43)/2] - \text{EL. } 1034.13\} \times 3' \times 2.5' \times 2 \text{ SIDES} \\ &= (110.75 \text{ CF} + 43.5 \text{ CF} + 79.875 \text{ CF}) \\ &= 234.13 \text{ CF} \end{aligned}$$

(+) FWD FOOTING:

$$\begin{aligned} &= (\text{EL. } 1034.13 - \text{EL. } 1028.0) \times 3.33' \times 69.33' \\ &= 1,415.29 \text{ CF} \end{aligned}$$

(-) FWD PILES:

$$\begin{aligned} &= (12.4 \text{ SQ. INCHES} / 144) \times 2' \times 11 \text{ PILES} \\ &= 1.89 \text{ CF} \\ &= (234.13 \text{ CF} + 1,415.29 \text{ CF} - 1.89 \text{ CF}) \\ &= 1,647.53 \text{ CF} \times 1/27 \\ &= 61.02 \text{ CY} \end{aligned}$$

$$\text{TOTAL} = 66.37 \text{ CY} + 61.02 \text{ CY}$$

$$= 127.39 \text{ CY}$$

127 CY

ITEM 512 SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)

PARAPET WALL ONLY

EXPOSE PARAPET SURFACE FOR SECTION B-B

$$= (3.56' + 0.667' + 3.5') = 7.727'$$

EXPOSE PARAPET SURFACE FOR SECTION C-C

$$= (3.56' + 0.667' + 3.5') = 7.727'$$

EXPOSE PARAPET SURFACE FOR SECTION D-D

$$= (5.32' / 12) + 2.33' + 1.208' + 2.667' = 6.648'$$

EXPOSE PARAPET SURFACE FOR SECTION E-E

$$=(5.32''/12) + 2.33' + 1.208' + 2.667') = 6.648'$$

EXPOSE PARAPET SURFACE FOR SECTION F-F

$$= [(8''/12) + (4''/12) + 2.33' + (10''/12) + 2.67'] = 6.833'$$

TOTAL EXPOSED PARAPET

$$= 2 \text{ SIDES} \times [(7.727' \times 30') + (7.727' \times 25.33') + [(6.648' + 6.648')/2] \times 20'] + (6.648' \times 5') + (6.833' \times 3') \\ = 2 \text{ SIDES} \times [231.81 \text{ SF} + 195.73 \text{ SF} + 132.96 \text{ SF} + 33.24 \text{ SF} + 20.499 \text{ SF}] \\ = 1,228.48 \text{ SF}$$

EXPOSED SURFACE OF FASCIA BEAM WF36-49 & DECK EDGE

$$= 2 \text{ SIDES} \times [(10.5''/12) + (5''/12) + 1.479' + 0.35' + (10.5''/12) + 0.235' + 1.304' + (5.5''/12) + 3.33' + \\ (5.5''/12)] \times 82.33' \\ = 2 \text{ SIDES} \times [0.875' + 0.4167' + 1.479' + 0.35' + 0.875' + 0.235' + 1.304' + 0.458' + 3.33' + 0.458'] \times 82.33' \\ = 2 \text{ SIDES} \times 9.78' \times 82.33' \\ = 1,610.49 \text{ SF}$$

EXPOSED FACE OF REAR ABUMENT & WINGWALLS

$$= [(EL. 1042.73 + EL. 1043.01 + EL. 1042.73)/3] - EL. 1037.36] - 1.0833'] \times 43.33' \\ + 2 \text{ SIDES} \times [(3' \times 5.46') + [(5.46' \times 10')/2]] + (3.83' \times 13.93')] \\ = (189.79 \text{ SF}) + 2 \text{ SIDES} \times [16.38 \text{ SF} + 27.3 \text{ SF} + 53.47 \text{ SF}] \\ = 384.09 \text{ SF}$$

EXPOSED FACE OF FWD ABUMENT & WINGWALLS

$$= [(EL. 1039.48 + EL. 1039.82 + EL. 1039.48)/3] - EL. 1034.13] - 1.0833'] \times 43.33' \\ + 2 \text{ SIDES} \times [(3' \times 5.46') + [(5.46' \times 10')/2]] + (3.83' \times 13.93')] \\ = (189.79 \text{ SF}) + 2 \text{ SIDES} \times [16.38 \text{ SF} + 27.3 \text{ SF} + 53.47 \text{ SF}] \\ = 384.09 \text{ SF}$$

TOTAL QUANTITY FOR SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)

$$= (1,228.48 \text{ SF} + 1,610.49 \text{ SF} + 384.09 \text{ SF} + 384.09 \text{ SF}) \times 1/9 \\ = 400.8 \text{ SY} \\ = 401 \text{ SY}$$

401 SY

ITEM 512 TYPE 2 WATERPROOFING

REAR ABUTMENT

$$= [(EL. 1043.01 - EL. 1030.60) + (6''/12)] \times 3' \\ = 38.73 \text{ SF} \times 1/9 \\ = 4.30 \text{ SY} \\ = 4.0 \text{ SY}$$

FWD ABUTMENT

$$= [(EL. 1039.82 - EL. 1028.00) + (6''/12)] \times 3' \\ = 36.96 \text{ SF} \times 1/9 \\ = 4.10 \text{ SY} \\ = 4.0 \text{ SY}$$

$$\text{TOTAL} = 4.0 \text{ SY} + 4.0 \text{ SY}$$

$$= 8.0 \text{ SY}$$

8.0 SY

ITEM 515 DRAPED STRAND PRESTRESSED CONCRETE BRIDGE I-BEAM MEMBERS, LEVEL 3, TYPE WF36-49 (LENGTH = 81'-4")

SEE PLAN SHEET 35/53

SUPERSTRUCTURE

TOTAL = 6 BEAMS

6 EACH

ITEM 515 INTERMEDIATE DIAPHRAGMS

SEE PLAN SHEET 35/53

SUPERSTRUCTURE

= 3 DIAPHRAGMS WITH 5 EACH PER DIAPHRAGM
= 15 EACH

15 EACH

ITEM 516 ½" PERFORMED EXPANSION JOINT FILLER

REAR ABUTMENT

= 1.02' x 43.33'

= 44.2 SF

= 44 SF

FWD ABUTMENT

= 1.02' x 43.33'

= 44.2 SF

= 44 SF

= 44 SF + 44 SF

= 88 SF

88 SF

ITEM 516 1" PERFORMED EXPANSION JOINT FILLER

REAR ABUTMENT

= 1.02' x 43.33'

= 44.2 SF

= 44 SF

FWD ABUTMENT

= 1.02' x 43.33'

= 44.2 SF

= 44 SF

= 44 SF + 44 SF

= 88 SF

88 SF

ITEM 516 2" PERFORMED EXPANSION JOINT FILLER

REAR ABUTMENT

= (EL. 1042.70 - EL. 1037.36) x 2.5' x 2 EDGES

= 26.7 SF

= 27 SF

FWD ABUTMENT

= (EL. 1039.48 - EL. 1034.13) x 2.5' x 2 EDGES

= 26.75 SF

= 27 SF

TOTAL = 27 SF + 27 SF

= 54 SF

54 SF

ITEM 516 NYLON REINFORCED NEOPRENE SHEETING

REAR ABUTMENT

= 69.33' x 3'

= 207.99 SF

= 208 SF

FWD ABUTMENT

= 69.33' x 3'

= 207.99 SF

= 208 SF

TOTAL = 208 SF + 208 SF

= 416 SF

416 SF

ITEM 516 ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE), AS PER PLAN

SEE PLAN SHEET 34/53

REAR ABUTMENT

= 6 EACH

FWD ABUTMENT

= 6 EACH

TOTAL = (6 EACH + 6 EACH)

= 12 EACH

12 EACH

ITEM 518 POROUS BACKFILL WITH GEOTEXTILE FABRIC

REAR ABUTMENT

= $\{(((\text{EL. } 1042.70 + \text{EL. } 1043.04 + \text{EL. } 1042.70)/3) - \text{EL. } 1030.60) - 1.083'\} \times 2' \times 43.33'$

+ $[\text{EL. } 1042.70 + \text{EL. } 1042.65)/2] - \text{EL. } 1030.60) - 1.5'\} \times 2' \times 33' \times 2 \text{ SIDES}$

+ $\{(((\text{EL. } 1042.65 + \text{EL. } 1038.23)/2) - \text{EL. } 1030.60) - 1.5'\} \times 2' \times 10' \times 2 \text{ SIDES}$

PROP. 6" DIAM. PIPE

$3.14 \times (0.25')^2 \times 43.33'$

= 964.55 CF + 126.9 CF + 333.6 CF - 8.51 CF

= 1,416.54 CF x 1/27

= 53 CY

FWD ABUTMENT

= $\{(((\text{EL. } 1039.48 + \text{EL. } 1039.82 + \text{EL. } 1039.48)/3) - \text{EL. } 1028.00) - 1.083'\} \times 2' \times 43.33'$

+ $\{(((\text{EL. } 1039.43 + \text{EL. } 1039.48)/2) - \text{EL. } 1028.00) - 1.5'\} \times 2' \times 3' \times 2 \text{ SIDES}$

+ $\{(((\text{EL. } 1035.00 + \text{EL. } 1039.43)/2) - \text{EL. } 1028.00) - 1.5'\} \times 2' \times 10' \times 2 \text{ SIDES}$

PROP. 6" DIAM. PIPE

$3.14 \times (0.25')^2 \times 43.33'$

= 910.89 CF + 119.46 CF + 308.6 CF - 8.51 CF

= 1,330.44 CF x 1/27

= 50 CY

TOTAL = 53 CY + 50 CY

= 103 CY

103 CY

ITEM 518 6" PERFORATED CORRUGATED PLASTIC PIPE

REAR ABUTMENT

= 70'

FWD ABUTMENT

= 70'

TOTAL = 70' + 70'

= 140 LF

140 LF

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

REAR ABUTMENT

= 12' x 2 SIDES

= 24'

FWD ABUTMENT

= 20' x 2 SIDES

= 40'

TOTAL = 24' + 40'

= 64 LF

64 LF

ITEM 526 REINFORCED CONCRETE APPROACH SLABS (T=13")

REAR ABUTMENT

= 40' x 20'

= 800 SF x 1/9

= 88.89 SY

= 89 SY

FWD ABUTMENT

= 40' x 20'

= 800 SF x 1/9

= 88.89 SY

= 89 SY

TOTAL = 89 SY + 89 SY

= 178 SY

178 SY

ITEM 526 TYPE A INSTALLATION

REAR ABUTMENT

= 40'

FWD ABUTMENT

= 40'

TOTAL = 40' + 40'

= 80 LF

80 LF

ITEM 846 POLYMER MODIFIED ASPHALT EXPANSION JOINT SYSTEM

REAR ABUTMENT

= (3"/12) x 1.67' x 40'

= 16.7 CF

= 17 CF

FWD ABUTMENT

= (3"/12) x 1.67' x 40'

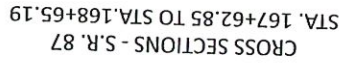
= 16.7 CF

= 17 CF

TOTAL 17 CF + 17 CF

= 34 CF

34 CF



ITEM 503 UNCLASSIFIED EXCAVATION

