STRUCTURE ESTIMATED QUANTITIES

Bridge No. FRA-70-1390C

RAMP C5 OVER I70/71

FRA-70/71-12.68/14.86
PID No. 105523

Franklin County, Ohio

Prepared For:

The Ohio Department of Transportation
District 6

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ESTIMATED QUANTITIES

ITEM 503 - COFFERDAMS AND EXCAVATION BRACING, AS PER PLAN

LUMP SUM

ITEM 503 - UNCLASSIFIED EXCAVATION

PLAN AREA MICROSTATION AVG. DEPTH

REAR ABUTMENT - (9747 SF)(13.8 FT)(1/27) = 4,981.8 CY

PIER - (4492 SF)(11.0 FT)(1/27) = 1,830.1 CY

FRWD ABUT - (2600 SF)(9.3 FT)(1/27) = 895.6 CY

TOTAL = 7,707.5 CY

∴ USE 7,708 CY

ITEM 509 - EPOXY COATED REINFORCING STEEL

1,528,633 LBS

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ITEM 511 - CLASS QC2 CONCRETE WITH QC/QA, SUPERSTRUCTURE

DIAPHRAGMS

- REAR ABUTMENT

ELEVATION AREA MICROSTATION THICKNESS # OF BEAMS X-SEC AREA OF BEAM BEAM EMBEDMENT

B22-B13 - [(907.7 SF)(3.3 FT) - (10)(7.6 SF)(2.3 FT) +

SLOPED TOP AREA LENGTH TOP LOAD PL VOLUME BOT. LOAD PL VOLUME HP SHAPE VOLUME

(0.13 SF)(142.5 FT) - (10)(0.59 CF + 0.40 CF + 0.05 CF)] (1/27)

= 104.8 CY

PLAN AREA @ TRANSITION BIT B11 & B12 AVG HEIGHT SLOPED TOP AREA LENGTH ELEVATION AREA B11-B1 AVG WEIGHTED THICKNESS

B12-B1 - [(53.0 SF)(6.45 FT) + (0.13 SF)(19.0 FT) + (908.8 SF)(3.43 FT)

OF BEAMS X-SEC AREA BEAM EMBEDMENT X-SEC BEAM AREA EMBED.

- (3)(7.6 SF)(2.3 FT) - (9)(7.43 SF)(2.3 FT)

TOP LOAD PL VOLUME BOT. LOAD PL VOLUME HP SHAPE VOLUME

- (12)(0.59 CF + 0.40 CF + 0.05 CF)] (1/27) = 120.0 CY

- PIER

ELEV. AREA MICROSTATION THICKNESS # OF BEAMS X-SEC AREA OF BEAM EMBEDMENT

B1-B12 - [(1063.2 SF)(3.0 FT) - (12)(7.6 SF)(2.33 FT) +

SLOPED TOP AREA LENGTH TOP LOAD PL VOLUME BOT LOAD PL VOLUME HP SHAPE VOLUME

(0.11 SF)(165.1 FT) - (12)(0.59 CF)(0.40 CF)(0.05 CF)] (1/27)

= 110.5 CY

PLAN AREA @ TRANSITION BIT B13-B14 AVG HEIGHT PLAN AREA UNDER DECK B14-B32 AVG HEIGHT

B13-B33 - [(55.9 SF)(6.48 FT) + (615.7 SF)(6.47 FT) +

PLAN AREA BIT B32-B33 AVG HEIGHT SLOPED TOP AREA LENGTH

(68.9 SF)(6.52 FT) + (0.17 SF)(12.2 FT + 13.3 FT) -

X-SEC AREA OF BEAM EMBEDMENT

(2)(7.6 SF)(2.83 FT) - (3)(7.43 SF)(2.83 FT) -

(8)(7.43 SF)(1.75 FT)(2) - (13)(0.59 CF + 0.4 CF + 0.05 CF)] (1/27)

= 165.6 CY

ELEVATION AREA MICR. THICKNESS SLOPED TOP AREA

B34-B45 - [(440.0 SF)(3.0 FT) + (651.1 SF)(3.5 FT) + (0.13 SF)(68.9 FT) +

(0.15 SF)(101.1 FT) - (5)(7.6 SF)(2.33 FT) - (7)(7.6 SF)(2.35 FT)

- (12)(0.59 CF + 0.4 CF + 0.05 CF)] (1/27) = 125.8 CY

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ITEM 511 - CLASS QC2 CONCRETE WITH QC/QA, SUPERSTRUCTURE

DIAPHRAGMS CONT.

- FRWD ABUTMENT

ELEVATION AREA MICRO

B23-B38 - [(702.3 SF)(3.33 FT) + (458.5 SF)(3.33 FT) +

SLOPED TOP AREA LENGTH

(229.8 SF)(3.33 FT) + (0.14 SF)(217.2 FT) -

X-SEC AREA BEAM EMBEDMENT TOP LOAD R VOLUME BOT LOAD R VOL. HP SHAPE VOL.

(16)(7.6 SF)(2.33 FT) - (16)(0.59 CF + 0.4 CF + 0.05 CF)] (1/27)

= 161.7 CY

ELEVATION AREA MICROSTATION THICKNESS # X-SEC AREA BEAM AVG EMBEDMENT

B39-B45 - [(469.8 SF)(5.1 FT) - (7)(7.6 SF)(3.44 FT) -

(7)(0.59 CF + 0.4 CF + 0.05 CF)] (1/27) = 81.7 CY

- TOTAL

REAR ABUT = 224.8 CY
PIER = 401.9 CY
FRWD ABUT = 243.4 CY

870.1 CY

∴ USE 871 CY

ITEM 511 - SEMI-INTEGRAL DIAPHRAGM GUIDE

REAR ABUTMENT - 3 EACH
PIER - 0 EACH
FRWD ABUTMENT - 4 EACH

7 EACH

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

AVERAGE HAUNCH THICKNESS = 5.95 IN (FROM DECK ELEVATIONS SPREADSHEET)
DECK THICKNESS = 10 IN
AVERAGE HAUNCH LENGTH = 59.0 FT
HAUNCH WIDTH = 4.08 FT
DECK PLAN AREA = 30,219.74 SF

DECK = (10 IN/12 IN/FT)(30,219.74 SF)(1/27) = 932.7 CY

HAUNCHES = (5.95 IN/12 IN/FT)(59.0 FT)(4.08 FT)(37 # OF HAUNCHES)(1/27) = 163.7 CY

TOTAL = 1096.4 CY

∴ USE 1097 CY

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

LEFT PARAPET - (460.1 FT LENGTH)(4.08 SF X-SEC AREA)(1/27) = 69.5 CY

LEFT SIGN SUPPORT PILASTER - (13.5 SF PLAN AREA)(3.5 FT HEIGHT)(1/27) = 1.75 CY

LIGHT POLE PILASTER - (3 #)(4.9 SF PLAN AREA)(3.5 FT)(1/27) = 1.9 CY

RIGHT PARAPET - (418.2 FT)(4.08 SF)(1/27) = 63.2 CY

RIGHT SIGN SUPPORT PILASTER - (13.4 SF)(3.5 FT)(1/27) = 1.74 CY

TOTAL = 138.09

∴ USE 139 CY

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ITEM 511 - CLASS QC1 CONCRETE WITH QC/QA, PIER ABOVE FOOTING

ELEVATION AREA, WIDTH, # AVG AREA OF RECESS, WIDTH

SEGMENT 1 - [(3,311.5 SF)(3FT) + (9)(83.9 SF)(2 FT)](1/27) = 423.9 CY

CAP ELEV. AREA

SEGMENT 2 - [(2163.8 SF)(3FT) + (8)(56.8 SF)(2FT) + (422.3 SF)(4FT)](1/27)

= 336.6 CY

SEGMENT 3 - [(2083.8 SF)(3FT) + (6)(52.9 SF)(2FT)](1/27) = 255.0 CY

SEGMENT 4 - [(1444.2 SF)(3FT) + (5)(59.7 SF)(2FT) + (303.3 SF)(3.5FT)](1/27)

= 221.9 CY

∴ USE 1238 CY

TOTAL = 1237.4 CY

ITEM 511 - CLASS QC1 CONCRETE WITH QC/QA, ABUTMENT NOT INCLUDING FOOTING

REAR ABUTMENT

ELEVATION AREA, WIDTH

① [(4132.3 SF + 474.6 SF)(3.3 FT) + (4.7 SF)(1.33 FT)](1/27) = 563.3 CY

PLAN AREA, APP. SLAB THICKNESS, PLAN AREA, AVG HEIGHT

② BACKWALL - [(140.8 SF)(1.417 FT) + (195.3 SF)(6.13 FT)](1/27) = 51.7 CY

ELEVATION AREA, WIDTH, WIDTH, HEIGHT, LENGTH

② STEM - [(753.3 SF)(1.083 FT) + (1/2)(1.083 FT)(1.083 FT)(191.4 FT) +

PLAN AREA, AVG WEIGHTED HEIGHT

(948.5 SF)(26.7 FT)](1/27) = 972.3 CY

UNDER APP. SLAB EL. AREA, WIDTH, CAP PLAN AREA, THICKNESS, PLAN AREA 2" PROJECTION, THICKNESS, X-SEC PARAPET AREA, LENGTH

③ [(137.1 SF)(0.5 FT) + (786.2 SF)(3 FT) + (14.7 SF)(1.0 FT) + (4.08 SF)(88.4 FT)](1/27)

= 103.8 CY

X-SEC PARAPET AREA, LENGTH, ELEVATION AREA, WIDTH, ELEVATION AREA, WIDTH

④ [(4.08 SF)(105.3 FT) + (3071.7 SF)(1.5 FT) + (1/2)(3093.2 SF)(2.5 FT) +

BUMPOUT PLAN AREA, HEIGHT, 2' COPING X-SEC AREA, LENGTH

(1.2 SF)(32.6 FT) + (0.83 SF)(95 FT)](1/27) = 334.1 CY

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ITEM 511 - CLASS QCI CONCRETE WITH QC/QA, ABUTMENT NOT INCLUDING FOOTING

FORWARD ABUTMENT

ELEVATION AREA WIDTH PLAN AREA TAPERED BACKWALL HEIGHT

[(2205.4 SF + 1456.0 SF + 806.6 SF)(3.3 FT) + (12.2 SF)(6.67 FT) +

BACKWALL PLAN AREA AVG HEIGHT APP SLAB SEAT PLAN AREA HEIGHT BEAM SEAT ELEV AREA WIDTH

(132.7 SF)(7.4 FT) - (28.9 SF)(1.4167 FT) + (336.8 SF)(6.0 FT) +

ELEV. AREA ABOVE PANELS WIDTH TRANSITION ELEV AREA WIDTH PARAPET PLAN AREA HEIGHT

(260.1 SF)(1.25 FT) + (30.3 SF)(6.67 FT) + (26.3 SF)(3.5 FT) +

SLOPED PARAPET PLAN AREA HEIGHT

(1/2)(4.35 SF)(3.5 FT)](1/27) = 687.5 CY

ABUTMENT TOTAL = 2712.7 CY

∴ USE 2713 CY

ITEM 511 - CLASS QCI CONCRETE WITH QC/QA, FOOTING

REAR ABUTMENT

ELEV. AREA WIDTH ABUT. PLAN AREA WINGWALL PLAN AREA THICKNESS PLAN AREA THICKNESS

[(680.6 SF)(6 FT) + (3365.9 SF + 931.3 SF)(4.0 FT) + (3483.2 SF)(3.75 FT)](1/27)

= 1271.6 CY

PIER

SEG. 1 PLAN AREA SEG 2 PLAN AREA SEG 3 PLAN AREA SEG. 4 PLAN AREA

[(825.4 SF + 703.8 SF + 1161.5 SF + 505.2 SF)(3 FT)](1/27) = 355.1 CY

FORWARD ABUTMENT

SEG 1 PLAN AREA SEG 2 PLAN AREA THICKNESS SEG 3 TOE PLAN AREA THICKNESS SEG 3 HEEL PLAN AREA THICKNESS

[(654.7 SF + 429.8 SF)(4 FT) + (446.8 SF)(4 FT) + (338.5 SF)(3.75 FT) +

SEG 4 X-SEC AREA LENGTH

(7.34 SF)(76.0 FT)](1/27) = 294.5 CY

TOTAL = 1921.2 CY

∴ USE 1922 CY

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ITEM 512 - SEALING OF CONCRETE SURFACES (EPOXY-URETHANE), LIGHT NEUTRAL

REAR ABUTMENT

SEG 1 FRONT ELEV AREA; SEG 1 BACK ELEV. AREA; SEG 2 FRONT ELEV AREA; SEG 2 BACK ELEV AREA; SEG 2 BEAM SEAT AREA; SEG 3 FRONT AREA

[(2970.4 SF + 1883.7 SF + 3036.4 SF + 293.1 SF + 452.4 SF + 1558.6 SF +

SEG 1 FRONT DIAPHRAGM AREA; FRONT & BACK; DIAPHRAGM TOP WIDTH; LENGTH; SEG 2 FRONT DIAPH. AREA; SEG 2 BACK DIAPH. AREA; SEG 2 TOP WIDTH; LENGTH

907.7 SF (2) + 3.34 FT (142.5 FT) + 1031.5 SF + 332.2 SF + (3.34 FT)(12.7 FT)

SEG 2 TOP WIDTH OVERSLAB; LENGTH; # BEAMS; BEAM X-SEC AREA; # OF ENDS; X-SEC AREA

+ (3.5 FT)(30.0 FT) - (13)(7.6 SF) - (9)(7.43 SF) + (4)(21.6 SF)] (1/9) = 1546.4 SY

PIER

FRONT AREA; AREA OF RECESSES; FRONT & BACK; TOTAL LENGTH OF RECESSES; RECESS DEPTH; FRONT & BACK

SEGMENT 1 - [(1763.3 SF + 755.4 SF (2) + 279.9 FT (0.5 FT)(2) +

LENGTH OF TOP ARCH OPENINGS; WIDTH; LENGTH OF BOT. ARCH OPENINGS; WIDTH; END HEIGHT; WIDTH; ASSUMED REAR AREA

(34.0 FT)(3 FT) + (18.2 FT)(2 FT) + (14.4 FT)(3 FT) + 2,000 SF] (1/9)

= 637.3 SY

FRONT AREA; ASSUMED REAR AREA; AREA OF RECESSES; FRONT & BACK; TOP CAP RECESS LENGTH; WIDTH; FRONT & BACK

SEGMENT 2 - [(1563.2 SF + 1800 SF + 453.9 SF (2) + (140.8 FT)(0.5')(2) +

TOTAL LOWER RECESS LENGTH; RECESS DEPTH; FRONT & BACK; BOT. OF ARCH OPENING LENGTH; # OF ARCHES; WIDTH

(172.6 FT)(0.5 FT)(2) + (9.087 FT)(8)(2 FT) +

TOTAL ARCH LENGTH; WIDTH

(161.4 FT)(3 FT)] (1/9) = 579.3 SY

FRONT AREA; ASSUMED REAR AREA; AREA OF RECESSES; FRONT & BACK; TOTAL LENGTH OF RECESSES; RECESS DEPTH; FRONT & BACK

SEGMENT 3 - [(1326.4 SF + 1300 SF + 317.6 SF (2) + (24.4 SF)(0.5 FT)(2)

BOT ARCH OPENING LENGTH; # OF ARCHES; WIDTH; TOTAL TOP ARCH LENGTH; WIDTH

+ (9.087 FT)(6)(2 FT) + (132.4 FT)(3 FT)] (1/9) = 432.5 SY

FRONT AREA; ASSUMED REAR AREA; LENGTH OF TOP CAP RECESS; RECESS DEPTH; AREA OF RECESSES; FRONT & BACK

SEGMENT 4 - [(1132.3 SF + 1100 SF + (101.1 FT)(0.5 FT) + (298.5 SF)(2) +

TOTAL LOWER RECESS LENGTH; RECESS DEPTH; FRONT & BACK; BOT ARCH OPENING LENGTH; # OF ARCHES; WIDTH; TOTAL TOP ARCH LENGTH; WIDTH

(109.5 FT)(0.5 FT)(2) + (10.25 FT)(5)(2 FT) + (109.2 FT)(3 FT)

END LENGTH; WIDTH; CAP LENGTH; WIDTH

+ (14.7 FT)(3 FT) + (3 FT)(3.5 FT)] (1/9) = 386.0 SY

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ITEM 512 - SEALING OF CONCRETE SURFACES (EPOXY-URETHANE), LIGHT NEUTRAL

PIER DIAPHRAGMS

AREA, FRONT & BACK, # OF BEAMS, BEAM AREA, TOP WIDTH, DIAPHRAGM LENGTH

SEGMENT 1 - [(1063.1 SF)(2) - (12)(7.6 SF) + (3.5 FT)(165.0 FT)] ('/9) = 290.3 SY

AREA, FRONT & BACK, # OF BEAMS, BEAM AREA, # OF BEAMS, BEAM AREA, TOP WIDTH, DIAPH. LENGTH

SEGMENT 2 - [(1198.7 SF)(2) - (2)(7.6 SF) - (19)(7.43 SF) + (4 FT)(31 FT)] ('/9) = 262.8 SY

AREA, FRONT & BACK, # OF BEAMS, BEAM AREA, TOP WIDTH, DIA LENGTH

SEGMENT 3 - [(444.0 SF)(2) - (5)(7.6 SF) + (3 FT)(68.9 FT)] ('/9) = 117.4 SY

AREA, FRONT & BACK, # OF BEAMS, BEAM AREA, TOP WIDTH, DIA. LENGTH, SEG 1 END AREA

SEGMENT 4 - [(651.1 SF)(2) - (7)(7.6 SF) + (3.5 FT)(101. FT) + (19.5 SF) + (22.7 SF)] ('/9) = 182.8 SY

FORWARD ABUTMENT

AREA BACK OF ABUT, AREA FRONT OF ABUT., END OF ABUT. HEIGHT, WIDTH

SEGMENT 1 - [(1111.9 SF) + (1519.0 SF) + (11.9 FT)(3.33 FT)] ('/9) = 296.7 SY

AREA BACK OF ABUT., AREA FRONT OF ABUT.

SEGMENT 2 - [(440.3 SF) + (1053.2 SF)] ('/9) = 165.9 SY

AREA BACK OF ABUT., AREA FRONT OF ABUT., WIDTH OF BUMPOUT, HEIGHT, WIDTH AT FACE OF BUMPOUT, HEIGHT

SEGMENT 3 - [(51.7 SF) + (578.0 SF) + (3.33 FT)(14.9 FT) + (1.5 FT)(14.9 FT) +

AREA TOP OF BUMPOUT, TOP AREA TAPERED WALL, PER TAPERED WALL, HEIGHT

(6.2 SF) + (12.2 SF) + (7.5 FT)(6.7 FT)] ('/9) = 85.6 SY

AREA FACE OF ABUT, BEAM SEAT AREA, BACKWALL AREA, BARRIER ON BACKWALL PLAN AREA, BARRIER END AREA

SEGMENT 4 - [(1108.3 SF) + (418.0 SF) + (561.6 SF) + (26.3 SF) + (6.7 SF) +

BARRIER BACK AREA, BARRIER TAPERED END AREA, BARRIER FRONT AREA, BEHIND ABUT.

(69.5 SF) + (4.1 SF) + (56.4 SF) + (12.5 SF)] ('/9) = 251.5 SY

FORWARD ABUTMENT DIAPHRAGMS

AREA, FRONT & BACK, # OF BEAMS, BEAM AREA, TOP WIDTH, DIAPHRAGM LENGTH

SEGMENT 1 - [(702.3 SF)(2) - (8)(7.6 SF) + (3.33 FT)(109.1 FT)] ('/9) = 189.7 SY

AREA, FRONT + BACK, # OF BEAMS, BEAM AREA, TOP WIDTH, DIA LENGTH

SEGMENT 2 - [(458.5 SF)(2) - (5)(7.6 SF) + (3.33 FT)(71.7 FT)] ('/9) = 124.2 SY

AREA, FRONT & BACK, # OF BEAMS, BEAM AREA, TOP WIDTH, DIA LENGTH

SEGMENT 3 - [(229.8 SF)(2) - (3)(7.6 SF) + (3.33 FT)(36.4 FT)] ('/9) = 62.0 SY

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ITEM 512 - SEALING OF CONCRETE SURFACES (EPOXY-URETHANE, LIGHT NEUTRAL

FORWARD ABUTMENT DIAPHRAGMS CONTINUED

FRONT AREA, # OF BEAMS, BEAM AREA

SEGMENT 4 - [(460.8 SF) - (7)(7.43 SF)](1/9) = 45.4 SY

DECK + PARAPETS

AREA UNDER DECK - LEFT, AREA UNDER DECK - RIGHT, # OF BEAMS INTERSECTING, SKEWED WIDTH, SEALING LIMIT, DECK THICKNESS, OFFSET TO EDGE DECK, LEFT SIDE

[(225.1 SF) + (187.4 SF) - (53)(4.5 FT)(0.5 FT) + (10/12 FT + 2/12 FT)(459.8 FT

RIGHT SIDE, PARAPET PERIMETER, LEFT SIDE, RIGHT SIDE, SIGN PILASTER PERIMETER, LENGTH, #

+ 392.8 FT) + (7.8 FT)(437.5 FT + 403.9 FT) + (9.7 FT)(7.3 FT)(2) +

LIGHT POLE PILASTER PERIMETER, LENGTH, #, SIDE AREA SIGN PILASTER #, SIDE AREA LIGHT PILASTER #

(9.5 FT)(2.92 FT)(3) + (16 SF)(2) + (15.3 SF)(3)](1/9) = 890.2 SY

REAR ABUTMENT CONTINUED

AREA UNDER OVERHANG, PERIMETER FACE OF OVERHANG, LENGTH, TOP OF OVERHANG AREA, PARAPET PERIMETER, LENGTH

[(342.3 SF) + (3.16 FT)(88.4 FT) + (20.2 SF) + (7.83 FT)(88.4 FT)](1/9) = 148.2 SY

WINGWALL

LENGTH, AVG HEIGHT ABOVE GRADE, PARAPET PERIMETER, LENGTH

[(95.3 FT)(22.0 FT) + (7.83 FT)(94.9 FT)](1/9) = 315.5 SY

TOTAL = 7,009.7 SY

∴ USE 7,010 SY

ITEM 512 - SEALING OF CONCRETE SURFACES (EPOXY-URETHANE), BLACK

BEAM PERIMETER, LENGTH OF COMP. SEALING, BEAM PER., LENGTH OF PARTIAL SEALING

$[(21.59\text{ FT})(1998.1\text{ FT}) + (17.51\text{ FT})(2091.7\text{ FT})] = 8{,}862.7\text{ SY}$

∴ USE 8,863 SY

ITEM 512 - TYPE 2 WATERPROOFING

REAR ABUTMENT

WIDTH, LENGTH

$[(3\text{ FT})(11.7\text{ FT})](1/9) = 3.9\text{ SY}$

FORWARD ABUTMENT

WIDTH, LENGTH

$[(3\text{ FT})(12.7\text{ FT} + 16.8\text{ FT} + 24.4\text{ FT})](1/9) = 18.0\text{ SY}$

∴ USE 22 SY TOTAL = 21.9 SY

ITEM 513 - STRUCTURAL STEEL MEMBERS, LEVEL UF

L 4 x 3 1/2 x 3/8 UNIT WEIGHT = 9.10 PLF

$(9.10\text{ PLF})(62.8\text{ FT} + 61.3\text{ FT} + 59.5\text{ FT} + 57.8\text{ FT} + 56.0\text{ FT} + 27.2\text{ FT})$

$= 2953.9\text{ LBS}(1.10) = 3249.2\text{ LBS}$

∴ USE 3250 LBS

ITEM 515 - DRAPED STRAND PRESTRESSED CONCRETE BRIDGE I-BEAM MEMBERS, LEVEL 3, WF60-49

45 EACH

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ITEM 515 - INTERMEDIATE DIAPHRAGMS

SPAN 1

(3/BAY)(21 BAYS) = 63 EACH

SPAN 2

(3/BAY)(22 BAYS) = 66 EACH

TOTAL = 129 EACH

ITEM 516 - STRUCTURAL EXPANSION JOINT INCLUDING ELASTOMERIC STRIP SEAL, AS PER PLAN (4")

REAR ABUTMENT = 129.8 FT

FORWARD ABUTMENT = 123.9 FT

TOTAL = 253.7 FT

∴ USE 254 FT

ITEM 516 - 1" PREFORMED EXPANSION JOINT FILLER

REAR ABUTMENT WINGWALL

PARAPET X-SEC AREA, STRAIGHT WIDTH, HEIGHT, TAPERED WIDTH, HEIGHT

4.08 SF + (1.5 FT)(32.6 FT) + (1/2)(2.5 FT)(32.6 FT) = 93.6 SF

REAR ABUTMENT APPROACH SLAB

APP. SLAB THICKNESS, LENGTH

(1.417 FT)(98.9 FT) = 140.1 SF

PIER

MEASURED IN MICROSTATION

1823 SF

TOTAL = 2056.7 SF ∴ USE 2,057 SF

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ITEM 516 - 2" PREFORMED EXPANSION JOINT FILLER

REAR ABUTMENT

WIDTH HEIGHT WIDTH HEIGHT WIDTH HEIGHT WIDTH HEIGHT
(3.33FT)(15.8FT) + (4.67FT)(4FT) + (3.33FT)(25FT) + (6FT)(4FT) +
PARAPET X-SEC AREA — SLEEPER SLAB AREA AGAINST OVERHANG — WALL 4W16 OVERLAP — WIDTH HEIGHT — PARAPET X-SEC AREA
(4.08 SF) + (7.4SF) + (0.7253SF) + (0.375FT)(22.5FT) + (4.08SF) +
OVERLAP W.W. + WALL 4W16 — FOOTING OVERLAP
(3.9SF) + (5.0SF) = 212.3 SF

FORWARD ABUTMENT

WIDTH HEIGHT WIDTH HEIGHT WIDTH HEIGHT WIDTH HEIGHT
(3.33FT)(20.9FT) + (6FT)(2FT) + (3.33FT)(20.8FT) + (6FT)(2.42FT) +
WIDTH HEIGHT — FACADE PANEL WIDTH HEIGHT — SEGMENT 4 FOOTING AREA
(6.67FT)(12.3FT) + (0.92FT)(14.4FT) + (7.34SF) = 268.1 SF

PIER

WIDTH HEIGHT WIDTH HEIGHT WIDTH HEIGHT WIDTH HEIGHT
(3.0FT)(16.6FT) + (3.0FT)(26.0FT) + (5.0FT)(2.0FT) + (3.0FT)(25.9FT) +
WIDTH HEIGHT WIDTH HEIGHT WIDTH HEIGHT
(3.0FT)(24.6FT) + (3.0FT)(24.4FT) + (5.0FT)(0.8FT) = 366.5 SF

DIAPHRAGM GUIDES

WIDTH AVG LENGTH # WIDTH LENGTH WIDTH AVG LEN. #
(3.33FT)(7.43FT)(3) + (5.5FT)(7.46FT) + (3.33FT)(7.38FT)(2) +
WIDTH LENGTH
(3.83FT)(7.34FT) = 192.6 SF

TOTAL = 1,039.5 SF

∴ USE 1,040 SF

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ITEM 516 - SEMI-INTEGRAL ABUTMENT EXPANSION JOINT SEAL

FORWARD ABUTMENT

HORIZONTAL LENGTH + VERTICAL LENGTH

17.42 FT + 5.0 FT = 22.42 FT ∴ USE 23 FT

ITEM 516 - ELASTOMERIC BEARING WITH INTERNAL LAMINATES AND LOAD PLATE (NEOPRENE) (1'-1" x 1'-1" x 2.70"), AS PER PLAN

REAR ABUTMENT

22 EACH

PIER

45 EACH

FORWARD ABUTMENT

23 EACH

∴ 90 EACH

ITEM 518 - SCUPPERS, INCLUDING SUPPORTS

4 EACH

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ITEM 518 - POROUS BACKFILL WITH GEOTEXTILE FABRIC

REAR ABUTMENT

SEG 1 & 2 MEASURED IN MICROSTATION; SEG 2 FROM WINGWALL AREA MICROSTATION; MICROSTATION WIDTH

$[(2015.2\,SF + 4880.4\,SF + 2475.6\,SF)(2\,FT)]('/27) = 694.2\ CY$

FORWARD ABUTMENT

BEHIND ABUT. FROM MICROSTATION; WIDTH; X-SEC AREA IN FRONT OF SHAFTS; LENGTH

$[(2862.4\,SF)(2\,FT) + (5.3\,SF)(76.0\,FT)]('/27) = 227.0\ CY$

∴ USE 922 CY TOTAL = 921.2 CY

ITEM 518 - 6" PERFORATED CORRUGATED PLASTIC PIPE

REAR ABUTMENT

SEG 1+2; SEG 2+ WINGWALL

188.8 FT + 273.9 FT = 462.7 FT

FORWARD ABUTMENT

SEG 1+2; SEG 3 BEHIND ABUT; SEG 3 IN FRONT OF SHAFTS

220.9 FT + 75.6 FT + 75.6 FT = 372.1 FT

∴ USE 835 FT TOTAL = 834.8 FT

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

REAR ABUTMENT

6 FT + 6 FT = 12 FT

∴ USE 44 FT

FORWARD ABUTMENT

19.5 FT + 12 FT = 31.5 FT TOTAL = 43.5 FT

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ITEM 518 - 8" PIPE DOWNSPOUT, INCLUDING SPECIALS

PORTION CAST IN PIER + PORTION TO MANHOLE + CLEANOUT + COMBO LATERAL

23.5 FT + 7.25 FT + 2 FT + 2.25 FT = 35 FT ∴ USE 35 FT

ITEM 518 - PIPE HORIZONTAL CONDUCTOR

DOWNSPOUT 1 + DOWNSPOUT 2 + DOWNSPOUT 3 + DOWNSPOUT 4 + # SCUPPERS (ELBOW FROM SCUPPER + CLEANOUT + ELBOW & PIPE TO REDUCER) + PIPE & ELBOW TO MAIN CONDUCTOR + MAIN CONDUCTOR ON PIER

38.5 FT + 42.0 FT + 46.0 FT + 49.5 FT + (4)(1.9 FT + 2 FT + 4 FT + 4 FT) + 47.5 FT = 271.1 FT ∴ USE 272 FT

ITEM 524 - DRILLED SHAFTS, 42" DIAMETER, ABOVE BEDROCK WITH QC/QA

(SHAFT LENGTH)

(7)(33.42 FT) = 233.94 FT ∴ USE 234 FT

ITEM 524 - DRILLED SHAFTS, 48" DIAMETER, ABOVE BEDROCK WITH QC/QA

(SHAFT LENGTH)

(8)(40.0 FT) = 320 FT
(12)(40.0 FT) = 480 FT
(13)(52.0 FT) = 676 FT
(6)(35.0 FT) = 210 FT

TOTAL = 1686 FT

∴ USE 1,686 FT

ITEM 524 - DRILLED SHAFTS, 60" DIAMETER, ABOVE BEDROCK WITH QC/QA

AS PER PLAN

(SHAFT LENGTH)

(22)(50.6 FT) = 1113.2 FT
(9)(58.6 FT) = 527.4 FT
(12)(55.6 FT) = 667.2 FT
(7)(50.0 FT) = 350.0 FT
(5)(48.0 FT) = 240.0 FT
(15)(56.86 FT) = 852.9 FT

TOTAL = 3,750.7 FT

∴ USE 3,751 FT

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ITEM 526 - REINFORCED CONCRETE APPROACH SLABS WITH QC/QA (T=17"), AS PER PLAN

REAR APPROACH SLAB

5,947.6 SF (1/9) = 660.8 SY ∴ USE 661 SY

ITEM SPECIAL - STRUCTURE, MISC.: PRECAST FACADE PANELS

FORWARD ABUTMENT
MICROSTATION AREA
1199.4 SF ∴ USE 1,200 SF

ITEM SPECIAL - SPECIAL - FORM LINER
(ALL AREAS MEASURED IN MICROSTATION)

REAR RIGHT WINGWALL = 2,484 SF
REAR BREAST WALL = 2,346 SF
DIAPHRAGMS & SUPERSTRUCTURE = 1,230 SF

TOTAL = 6,060 SF

∴ USE 6,060 SF

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ITEM 513 – STRUCTURAL STEEL MEMBERS, LEVEL 1

NO. BEAMS IN SHAFTS = 15

LENGTH = 746.87 + 25' − 697.00 = 52.37'

TOTAL: 15 × 52.37 = 785.55 FT SAY 786'

786' × 173 PLF = 135,978 LB