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Subject HAM-562-0004 (Ramp M)
Bridge Quantities

Date 6/10/21 Job No. 20110903

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Computed by RMW Checked by RJE

Item 202E11003, Structure Removed over 20 ft Span, As Per Plan

- removal of concrete deck ($20/sf)
  CAD Area = 6487.09 ft²
  cost = 6487.09 ft² x $20/sf = $129741.80
  Say $130000

- removal of structural steel ($250/ton)
  per original plans, structural steel = 276000 lbs
  cost = 276,000 lbs x (1 ton / 2000 lbs) x $250/ton = $34500
  Say $35000

- abutment and pier removal ($200/cy)
  per original plans, volume = 89 cy + 174 cy + 76 cy = 339 cy
  cost = 339 cy x $200/cy = $67800
  Say $68,000

Total Removal Cost = $130,000 + $35,000 + $68,000 = $233,000

Item 202F22900, Approach Slab Removed

Area = (488.50 ft² + 488.48 ft²) / 3² = 108.55 SY

Say 109 SY

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Subject HAM-562-0004 (Ramp M) Bridge Quantities

Date 6/10/21 Job No. 20180903

Computed by RMW Checked by RJE

Item 503E21300, Unclassified Excavation

Rear Pier

Excavated Plan Area (includes 1' offset) = (24+2')(13'+2') = 390 ft²

Existing Average Ground Elev =

(531.22 + 526.98 + 525.18 + 523.37 + 521.55 + 519.75 + ...
... + 517.90 + 519.66 + 521.43 + 523.2 + 524.97 + 526.85)/12

= 523.50

This is lower than the bottom of footing El 525.94, therefore assume excavation is zero for cost estimating purposes.

Fwd Pier

Excavated Plan Area (includes 1' offset) = (25.5'+2')(16'+2') = 495 ft²

Existing Average Ground Elev =

(532.12 + 535.89 + 538.22 + 540.75 + 543.45 + 541.58 + ...
... + 537.27 + 534.88)/8

= 538.02

Volume = 495 ft² (538.02 - 509) = 14364.9 ft³/27

= 532.03 CY

Rear Abutment and Wingwalls

Bottom of Footing Elev = 544.25

Avg Existing Ground Elev = 549.00

Excavated CAD Area = 402.66 ft²

Volume = (549.00 - 544.25)(402.66 ft²) = 1912.64 ft³/27

= 70.84 CY

Calculations cont'd. on next page

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Subject HAM-562-0004 (Ramp M)
Bridge Quantities
Date 6/10/21 Job No. 2016903
Computed by RMW Checked by RJE

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Item 503E21300, Unclass. Ex. Excavation, Contd.

Forward Abutment

Wingwall Section C-C

Excavation Plan Area (CAD) = 29.25 ft² Avg Bot of Footing Elev = 551.53
Avg Ex Ground Elev = (555.46 + 555.74 + 555.65 + 555.37)/4 = 555.56
Volume = 29.25 ft² (555.56 - 551.53) = 117.73 ft³/27 = 4.36 CY

Wingwall Section D-D

Excavation Plan Area (CAD) = 142 ft² Bot of Footing Elev = 542.25
Avg Ex Ground Elev = (555.58 + 555.41 + 555.23 + 554.2 + 553.62 + 553.91)/6
= 554.66
Volume = 142 ft² (554.66 - 542.25) = 1762.22 ft³/27 = 65.27 CY

Abutment Section E-E 1

Excavation Plan Area (CAD) = 168.625 ft² Bot of footing Elev = 539.25
Avg Ex Ground Elev = (553.47 + 554.73 + 553.91 + 553.62 + 554.2 + 544.1 + 553.19 + ...
+ ... 553.33)/8 = 553.82
Volume = 168.625 ft² (553.82 - 539.25) = 2456.87 ft³/27 = 90.99 CY

Abutment Section E-E 2

Excavation Plan Area (CAD) = 168.625 ft² Bot of footing Elev = 536.25
Avg Ex Ground Elev = (550.43 + 551.95 + 553.47 + 553.33 + 553.19 + 551.67 + ...
+ ... 550.21 + 550.29)/8 = 551.82
Volume = 168.625 ft² (551.82 - 536.25) = 2625.49 ft³/27 = 97.24 CY

Abutment Section E-E 3

Excavation Plan Area (CAD) = 484.57 ft² Bot of footing Elev = 533.25
Avg Ex Ground Elev = (544.07 + 544.04 + 543.99 + 543.94 + 544.02 + 546.12 +
... + 548.34 + 548.96 + 548.98 + 550.21 + 550.29 + 550.43 +
... + 548.83 + 547.24 + 545.64)/15 = 547.01
Volume = 484.57 ft² (547.01 - 533.25) = 6666.07 ft³/27 = 246.89 CY

Calculations contd. on next page

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Subject HAM-562-0004 (Ramp M)
Bridge Quantities
Date 6/10/21 Job No. 20110903
Computed by RMW Checked by RSE

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Item 503E21300, Unclassified Excavation, Contd.

WW Section G-G 1

Excavation Plan Area (CAD) = 137.75 ft² Bot of Footing Elev = 546.43
Avg Exist Ground Elev = (543.88 + 546.13 + 548.34 + 548.27 + 546.37 + ... + 545.55)/6 = 546.43
Volume = 137.75 ft² (546.43 - 536.25) = 1402.30 ft³/27 = 51.93 CY

WW Section G-G 2

Excavation Plan Area (CAD) = 194.24 ft² Bot of Footing Elev = 539.25
Avg Exist Ground Elev = (545.55 + 545.59 + 545.57 + 547.64 + 549.4 + ... + 548.23 + 548.27 + 546.37)/8 = 547.08
Volume = 194.24 ft² (547.08 - 539.25) = 1520.9 ft³/27 = 56.32 CY

WW Section G-G 3

Excavation Plan Area (CAD) = 231.25 ft² Bot of Footing Elev = 542.25
Avg Exist Ground Elev = (549.26 + 548.87 + 545.38 + 545.57)/4 = 547.27
Volume = 231.25 ft² (547.27 - 542.25) = 1160.88 ft³/27 = 43 CY

Total Fwd Abutment and Wingwall Volume:

V = 4.36 CY + 65.27 CY + 90.99 CY + 97.24 CY + 246.89 CY + ... + 51.93 CY + 56.32 CY + 43 CY

= 656 CY

Total Excavation Volume = [illegible] + 532.03 CY + 70.84 CY + 656 CY

= 1258.87

say 1259 CY

Cost = 1259 CY x $40.00/CY (From Estimate) = $50,360

say $55,000

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Subject HAM-562-0004 (Ramp M)
Bridge Quantities
Date 6/10/21 Job No. 2011903
Computed by RMW Checked by RJE

Item 507E00700, 16" Cast-in-Place Reinforced Concrete Piles, Driven

Rear Pier
Estimated Length = 526.94 - 446.8 = 80.14'
Length @ battered = 80.14'/cos(14.036) = 82.61' ⇒ use 85' @ all piles

Driven Length = 85' x 28 piles = 2380 ft

Forward Pier
Estimated Length = 510.00 - 447.00 = 63'
Length @ batter = 63'/cos(14.036) = 64.95' ⇒ use 70' @ all piles

Driven Length = 70' x 24 piles = 1680 ft

Rear Abutment
Estimated Length = 545.25 - 467.00 = 78.25' ⇒ use 80' @ all piles
(no battered piles)

Driven length = 80' x 14 piles = 1120 ft

Fwd Abutment
Max Embedment depth = 543.3 - 478.3 = 65'
Length @ batter = 65'/cos(14.036) = 68.51' ⇒ use 70' @ all piles

Driven Length = 70' x 53 piles = 3710 ft

Total = 2380 ft + 1680 ft + 1120 ft + 3710 ft = 8890 ft

Item 507E00750, 16" Cast-In-Place Reinforced Concrete Piles, Furnished

Rear Pier Length = (85' + 5') x 28 piles = 2520 ft
Fwd Pier Length = (70' + 5') x 24 piles = 1800 ft
Rear Abut Length = (80' + 5') x 14 piles = 1190 ft
Fwd Abut Length = (70' + 5') x 53 piles = 3975 ft

Total = 2520 ft + 1800 ft + 1190 ft + 3975 ft = 9485 ft

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Subject HAM-562-0004 (Ramp M)
Bridge Quantities
Date 6/10/21 Job No. 20110903
Computed by RMW Checked by RJE

Item 505E11100 Pile Driving Equipment

Lump = $20,000

Item 511E53014, Class QC3 Concrete, Misc.: Concrete with QC/QA, Bridge Deck, As Per Plan

CAD Area (beyond Splice #2) = 27.84 Ft²
Volume = 27.84 Ft² × (328.125' + 351.042')/2 = 9454 ft³

Less Additional Flange @ Beams 1-3 Volume = (2.25" - 1")/12 × 2' × (195.82' + 188.62' + 181.39')
= 117.88 ft³

Total Volume = 9454 ft³ - 117.88 Ft³ = 9336.12 ft³/27 = 345.8 CY

Say 346 CY

Item 511E53014, Class QC3 Concrete Misc.: Concrete with QC/QA, Bridge Deck (Parapet), As Per Plan

Parapet Type 1: Area = 6.04 Ft²
Parapet Type 2: Area = 5.17 Ft²

Volume = 47(1.682' × 6.04 Ft² + 5.75' × 5.17 Ft²) + 44(1.672' × 6.04 Ft² + 5.75' × 5.17 Ft²) + ...
+ 6.04 Ft²(1.724' + 1.5625') = 3650.01 ft³/27 = 135.19 CY

Say 136 CY

Item 511E53014, Class QC3 Concrete Misc.: Pier Above Footings, As Per Plan

Rear Pier
Volume = 239.86 Ft² × 3Ft (column) + 376.97 Ft³ × 3.5 Ft (cap) + 7 Ft³ × 11.375"/12 × 4 (seism & pedestals)
= 2065.52 Ft³/27 = 76.50 CY

Fwd Pier
Volume = 721.06 Ft² × 3.5' = 2523.71 Ft³/27 = 93.47 CY

Total = 93.47 CY + 76.50 CY = 169.97 CY Say 170 CY

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Subject HAM-562-0004 (Ramp M)
Bridge Quantities
Date 6/10/21 Job No. 20110903
Computed by RMW Checked by RJE

Item 511E53014, Class QC3 Concrete, Misc.: Abutment Not Including Footing, As Per Plan

Rear Abutment

Wingwall, Volume = 1.75 × 162.60 = 284.55 ft³

Abutment, Volume = 3.75' × 181.64 ft² + 1.75' × 172.06 ft² + 1.25' × 50.60 = 1045.51 ft³

Volume = (284.55 ft³ + 1045.51 ft³)/27 = 49.26 CY

Forward Abutment

North Wingwall, Volume = 61.61 ft² × 1.75' + 120.37 ft² × 2.5' = 408.74 ft³

Abutment, Volume = 541.64 ft² × 3.75' + 174.50 ft² × 1.75' + 58.08 ft² × 1.25' + ...
+ 6.13 ft² (Fillet) × 23.37' = 2552.38 ft³

Turnback WW, Volume = 712.83 ft² × 3' + 407.29 ft² × 1.5' + 4.0725 ft³ × 64.29'
= 3011.25 ft³

Volume = (408.74 ft³ + 2552.38 ft³ + 3011.25 ft³)/27 = 221.2 CY

Total Volume = 49.26 CY + 221.2 CY = 270.46 CY

Say 271 CY

Item 511E46512, Class QC1 Concrete with QC/QA Footing

Rear Pier Footing Volume = 23' × 4.25 × 13' = 1270.75 ft³/27 = 47.06 CY

Forward Pier Footing Volume = 25.5' × 4.75' × 16' = 1938 ft³/27 = 71.78 CY

Rear Abutment Footing Volume = 20.80 ft² × 41' = 853.29 ft³/27 = 31.60 CY

Fwd Abutmt Turnback WW Volume = 75.83 ft² × 3.25' + 94.89 ft² × 12.5' + ...
... + 77.8 ft² × 10.5' = 2249.47 ft³/27 = 83.3 CY

Fwd Abutmt Footing Volume = 177.57 ft² × 15.75' = 2796.73 ft³/27 = 103.58 CY

Total = 47.06 CY + 71.78 CY + 31.60 CY + 83.3 CY + 103.58 CY = 337.32 Say 338 CY

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Subject HAM-562-0004 (Ramp M)
Bridge Quantities
Date 6/10/21 Job No. 2.0110903
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Item 509E10000, Epoxy Coated Steel Reinforcement

Abutment:	Weight	=	47,299 lb
Pier:	Weight	=	47,207 lb
	Total	=	94,506 lb

Item 509E28001, Stainless Steel Reinforcement, As Per Plan

Total = 112,426 lb

Item 509E30020, No. 4 Deformed GFRP Reinforcement

Abutment:	Weight	=	1,174
Superstructure:	Weight	=	12,133
General:	Weight	=	1,528
	Total	=	14,835 lb

Item 509E30030, No. 5 Deformed GFRP Reinforcement

Abutment:	Weight	=	148
Superstructure:	Weight	=	1501
General:	Weight	=	123
	Total	=	1772 lb

Item 512E10100, Sealing of Concrete Surfaces (Epoxy-Urethane)

Parapets on Bridge:

Perimeter 1 = 10.92 ft Perimeter 2 = 10.91 ft

Area = 10.92 ft × 357.04 ft + 10.91 ft × 328.125 ft = 7413.02 ft² / 9
= 823.67 SY

Approach Slab Parapets:

Area = 2(14' × 7.83 ft) + 2×3(1.07 × 9.54 + 9.67 + 4.75) + 29.25 × 7.83 = 785.11 ft² / 9
(14' × 7.83 ft: avg transition perimeter)
= 87.2 SY

Note: right approach parapet sealing included in formed Abutment

Calculations contd. on next page

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Subject HAM-562-0004 (Ramp M)
Bridge Quantities
Date 6/10/21 Job No. 20110407
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Item 512E10100, Sealing of Concrete Surfaces (Epoxy-Urethane), Contd.

Rear Pier

Front Face Area (CAD) = 488.22 ft² × 2 faces = 976.44 ft²

Side Face Area (CAD) = 6.67' × 3' × 2 faces + (18.6 + 17.72) × 3.5' = 167.14 ft²

Total Area = 976.44 ft² + 167.14 ft² = 1143.58 ft² / 9
= 127.06 SY

Fwd Pier

Front Face Area (CAD) = 645.65 ft² × 2 faces = 1291.3 ft²

Side face Area (CAD) = 3.5' (41.21' + 44.56') = 300.25 ft²

Total Area = 1291.3 ft² + 300.2 ft² = 1591.5 ft² / 9
= 176.83 SY

Rear Abutment

Front Face Area (CAD):

stem = 221.81 ft²
beam set = 176.56 ft²
top = 28' × 2 + 4.9166' × 33.5' = 240.71 ft²

Total Area = 221.81 ft² + 176.56 ft² + 240.71 ft² = 639.08 ft² / 9
= 71.01 SY

Northwest Wingwall

Total Area = 92.49 ft² (CAD) + 1.75' × 16.15' + .25' × 16.15' = 124.78 ft² / 9
= 13.86 SY

Northeast Wingwall

Total Area = (0.5' + 1.5') × 14.85 + 85.11 ft² = 114.81 ft² / 9 = 12.76 SY

calculations contd. on next page

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Subject HAM-562-0004 (Ramp M)
Bridge Quantities
Date 6/10/21 Job No. 2011090 3
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Item 512E10100, Sealing of Concrete Surfaces (Epoxy-Urethane), Contd

Southeast Wingwall

Total Area = 704.84 ft² (CAD) + 9.42' × 66 = 1326.56 ft²/9 = 147.4 SY

Formed Abutment

Front Face (CAD):

stem = 218.35 ft²
beam seat = 325.13 ft² (to proposed ground)
top = 2' × 36.6 = 73.2 ft²

Total Area = 218.35 ft² + 325.13 ft² + 73.2 ft² = 617.18 ft²/9
= 68.57 SY

Total Sealing Area = 823.7 SY + 87.2 SY + 127.1 SY + 176.8 SY + 71.1 SY + 13.9 SY + ...
... + 12.8 SY + 147.4 SY + 68.6 SY = 1528.6 SY

Say 1530 SY

Item 513E10200, Structural Steel Members, Level 5

Girder Section 1 = 1.067 ft² × 490 lbs/ft³ = 522.83 lbs/Ft
Girder Section 2 = 0.651 ft² × 490 lbs/ft³ = 318.99 lbs/Ft

Girder Line 1, W = 522.83 lbs/Ft × (125.71' + 69.36' + .75') + 318.99 lbs/Ft (60.16' + 92.83' + .75') = 151,422.1 lbs
Girder Line 2, W = 522.83 lbs/Ft × (117.96' + 69.91' + .75') + 318.99 lbs/Ft (63.56' + 91.81' + .75') = 148,416.9 lbs
Girder Line 3, W = 522.83 lbs/Ft (110.15' + 70.49' + .75') + 318.99 lbs/Ft (66.99' + 90.79' + .75') = 145,406.6 lbs
Girder Line 4, W = 318.99 lbs/Ft (62.27' + 71.11' + .75') + 318.99 lbs/Ft (70.45' + 89.77' + .75') = 106,893.5 lbs
Girder Line 5, W = 318.99 lbs/Ft (94.31' + 71.78' + .75') + 318.99 lbs/Ft (73.91' + 88.75' + .75') = 105,556 lbs

Total Girder Weight = 151422 lbs + 148417 lbs + 145406 lbs + 106893 lbs + 105356 lbs
= 657,494 lbs

Calculations contd on next page

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Subject HAM-562-0004 (Ramp M)
Bridge Quantity
Date 6/10/21 Job No. 2011903
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Item 513 B10300, Structural Steel Members, Level 5 contd.

Intermediate Cross Frames

L 6x6x 1/2 = 19.6 lbs/ft
L 5x5x 3/8 = 12.3 lbs/ft

Weight per bay = 19.6 lbs/ft × 6.8'×2 + 12.3 lbs/ft × 7.53'×2 = 451.80 lbs

Total Weight = 451.80 lbs × (4×18 bays + 12) = 37,951.2 lbs

End Cross Frames

L 4x4x3/8 = 9.8 lbs/ft

Angles = 9.8 lbs/ft (7.01' + 5.26'×2) × 4×2 = 1377.50 lbs
plates = 15" × 15" × 1/2" / 12³ × 490 pcf × 4×2 = 255.21 lbs

Total Weight = 1377.50 lbs + 255.21 lbs = 1632.74 lbs

Intermediate Cross Frame Stiffeners

stiffener unit weight = 5/8" × 11.5" × 61" / 12³ × 490 pcf = 124.33 lbs

Total Weight = 124.33 lbs × (8×17 bays + 12×2) = 19,892.8 lbs

Bearing Stiffeners

unit weight = 1 1/2" × 11.5" × 61" / 12³ × 490 pcf = 298.36 lbs

Total Weight = 298.36 lbs × 10 × 4 = 11933.2 lbs

Pier Diaphragm

Additional Stiffeners = 124.33 lbs × 4 = 497.32 lbs
Rect Plates = (1' + 1.166') × 0.5" / 12 × 58" / 12 = 0.436 ft² × 490 pcf = 213.8 lbs × 4 = 855.2 lbs
L 5x5x 1/2" = 4 × 16.2 lbs/ft (2×5.66 + 2 × √(5.66² + 4.83²) = 1696.10 lbs
Total Weight = 497.32 lbs + 855.2 lbs + 1698.10 lbs = 3050.62

calculations contd. on next page

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Subject HAR-562-0004 (Ramp M)
Bridge Quantities
Date 6/16/21 Job No. 2011907
Computed by RMW Checked by RSE

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Item 513E10300 Structural Steel Members, Level 5 contd.

Splice Plates (24"×1"×2'-8", 11"×3/4"×2'-8", 22"×1½"×4'-8½")

$W = 5\times3\left[2\times\left(2'\times\tfrac{1}{2}\times2.\overline{66}'\right)+4\times\left(0.9\overline{16}\times0.625\times2.\overline{66}'\right)+2\times\left(1.8\overline{33}\times.6\overline{416}\times4.70\overline{83}'\right)\right]\times490\ldots$
$+\ 5\times2\left[2'\times.10\overline{416}''\times1.\overline{33}'\right]\times490\ \text{pcf} = 17621.09\ \text{lbs}$

Total weight = (657494 lbs + 37,951.82 + 1632.74 lbs + 19,892 lbs + 11975.2 lbs + 3050.63 lbs + 17621.1 lbs) × 1.01 (miscellaneous bolts, etc.) = 757,073.44 lbs

Say 757,074 lbs

Item 513F20000, Welded Stud Shear Connector

Total = 5436 each (See Beam Elevation)

Item 514E00061, Field Painting Structural Steel, Intermediate Coat, As Per Plan
Item 514E00067, Field Painting Structural Steel, Finish Coat, As Per Plan

* painting is applied to outside face and lower flange of fascia beams and 6" up inside face of web. Entire perimeter of end 10' is included for each beam

Partial Perimeters

Section 1 = ((11.625" + 61" + 11.625" + 2.25" + 24" + 2.25" + 11.625" + 6")/12 = 10.86'
Section 2 = ((11.625" + 61" + 11.625" + 1" + 24" + 1" + 11.625" + 6")/12 = 10.66'

Partial Girder Line 1 = 10.86'(125.71' + 69.36' + .75' - 10' end) + 10.66'(60.16' + 92.83' + .75' - 10' end)
= 3550.26 ft²

Partial Girder Line 5 = 10.66'(94.31' + 71.79' + .75' - 10') + 10.66'(73.9375 + 88.75 + .75' - 10')
= 3307.60 ft²

Stiffeners = 2 fascias × 4 Bearings × 61"/12 × (11.5" + 1.5" + 11.5")/12 = 83.05 ft²

calculations continued on next page

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Subject HAM-562-0004 (Ramp M)
Bridge Quantities
Date 6/10/21 Job No. 2011009
Computed by RMW Checked by RJE

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Item 514E000... Field Painting Structural Steel, ... contd.

End 10' of all beams at end Frames

Section 1 = (11.625" + 61" + 11.625" + 2.25" + 24" + 11.625" + 61" + 11.625")/12 = 16.417'
Section 2 = (11.625" + 61" + 11.625" + 1" + 24" + 1" + 11.625" + 61" + 11.625")/12 = 16.21'

Total Area = 10'(16.42' × 3 + 16.21 × 7) = 1627.3 sf

End Crossframes:

L4x4x3/8 = 1.33' × (7.01' + 5.28' × 2) × 4 bays × 2 abutments = 187.4
Plates = (1.25' × 1.25' + 1.25' × .5/12 + 1.25 × .5/12) × 2 faces/plate × 4 plates × 2 abutments = 26.67 ft²

Additional Cross Frames with 10' zone

Perimeter: L6x6x1/2 = 2' L5x5x7/8 = 1.67'
Angles = 4 bays × 1 locations × (3' × 2 × 6.8' + 1.67' × 2' × 7.53') = 209.4 ft²
Plates = (11.5" × 2 + .625")/12 × 61"/12 × 4 beams × 2 sides × 2 ends = 160.12 ft²

Total Painting = 3550.26 ft² + 3367.60 ft² + 89.03 ft² + 1627.3 ft² + 187.4 ft² + ...
+ 26.67 ft² + 209.4 ft² + 160.12 ft²

= 9151.6 ft²

Say 9152 ft²

Item 516E14201, Elastomeric Bearing with Internal Laminates and Steel Plates (Magnetic)

See Bearing Details

Item 516E11210 Structural Expansion Joint Including Elastomeric Strip Seal

L = 2(30.5' + 2 × 1.25') = 66 ft

Say 66 ft

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Subject HAM-562-0004 (Ramp M)
Bridge Quantities
Date 6/10/21 Job No. 2011903
Computed by RMW Checked by RJE

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Item SLBE136ea 1" Preformed Expansion Joint Filler

Rear Abutment

Area = 6.4 ft^2 + 4.08 ft^2 = 10.48 ft^2

Forward Abutment

Area = 6.04 ft^2 + .5' x 1.42' + (34.08' + 32.08') x 1.4116' = 100.39 ft^2

Total = 10.48 ft^2 + 100.39 ft^2 = 110.87 ft^2

Say 111 ft^2

Item SLBE212ea Porous Backfill with Geotextile Fabric

* All CAD areas incorporate a 1' offset from top surface

Forward Abutment Volume = 647.81 ft^2 x 2' = 1295.62 ft^3/27 = 47.99 CY

Northeast WW Volume = 165.96 ft^2 x 2' = 331.92 ft^3/27 = 12.29 CY

Southeast WW Volume = 1010.93 ft^2 x 2' = 2020.86 ft^3/27 = 74.85 CY

Total = 47.99 CY + 12.29 CY + 74.85 CY

= 135.13 CY

Say 136 CY

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Subject H&M-562-0004 (Ramp M)
Bridge Quantities
Date 6/10/21 Job No. 2.0110903
Computed by RMW Checked by RJE

Item 518E40000, 6" Perforated Corrugated Plastic Pipe

Forward Abutment = 94'

Say 94 ft

Item 518E40011 6" Non Perforated Corrugated Plastic Pipe, Industry Spec'd, As Per Plan

Rear Abutment = 0 (will be included with MSE wall drawings)

Fwd Abutment = 21'

Say 21 ft

Item 523E20000, Dynamic Load Test

2 per each substructure per field testing comments

Say 8 each

Item 523E20500, Restrike
(one for each structure unit)

Say 8 each

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Subject HAM-562-0004 (RAMP M)
Bridge Quantity
Date 6/10/21 Job No. 2410503
Computed by RMW Checked by RJE

16/17

Item 526E30001, Reinforced Concrete Approach Slab (T=17"), As Per Plan

Area = 30' x 33.5' x 2 = 2010 Ft² / 9 = 223.3 SY

Say 223.4 SY

Item 526E90010, Type A Installation

length = 33 Ft (Forward End)

Say 33 Ft

Item 526E90030, Type C Installation

length = 34 Ft (Rear end)

Say 34 Ft

Item 601E20000, Crushed Aggregate Slope Protection

Rear Abutment: Area = 657.34 SF (Cad)
To account for 2:1 slope, divide by cos 26.565°
Area = 657.34 / cos 26.565 = 734.93 SF

Forward Abutment: Area = 3113.23 SF (Cad)
To account for 2:1 slope, divide by cos 26.565°
Area = 3113.23 / cos 26.565 = 3480.70 SF

Total Area = 734.93 + 3480.70 = 4215.63 SF
= 4215.63 / 9 = 468.40, say 469 SY

Item 516E10010 Armoiless Preformed Joint Seal
Length = 34 Ft

say 34 Ft

EMH&T
Evans, Mechwart, Hambleton & Tilton, Inc.
Engineers, Surveyors, Planners, Scientists

17/17

Subject HAM-562-0004 (Ramp M)
Bridge Quantities
Date 4/11/23 Job No. 2011-0903
Computed by RJE Checked by TDA

Item 503E11101 - Cofferdams & Excavation Bracing, As Per Plan (Wall G)

Pile Number	Top of Soldier Pile Elevation	Top of Drilled Shaft Elevation	Wall Height Above Grade	Drilled Shaft Length (Below Grade)
1	522.29	516.66	25'	5.63'
2	524.6	516.66	25'	7.94'
3	527.13	516.66	25'	10.47'
4	529.29	516.66	25'	12.63'
5	531.11	516.66	25'	14.45'
6	532.61	516.66	25'	15.95'
7	533.64	515.28	25'	18.36'
8	532.50	510.83	25'	21.67'
9	528.50	509.00	25'	19.5'
10	524.50	509.00	25'	15.5'
11	520.50	509.00	25'	11.5'
12	516.50	509.00	25'	7.5'
13	514.00	509.00	25'	5.0'
			325'	166.1

Total length of soldier piles and drilled shaft (above and below grade)
= 325' + 166.1 = 491.1'

Assumed Unit Cost of W24x131 = $150/ft
Cost of W24x131 = 491.1' x $150 = $73,665
Assumed Unit Cost of 36" Drilled Shaft = $175/ft
Cost of 36" Drilled Shaft = 491.1 x $175 = $85,942.50
Timber Lagging Area = 1186.52 SF
Unit Cost = $15/SF
Timber Lagging Cost = 1186.52 x $15 = $17,797.80

Total Shoring Cost = $73,665 + $85,942.50 + $17,797.80
= $177,405.30, say $178,000