



PID 116920, SHE-119-0360: QUANTITY CALCULATIONS

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Revised by:

Roadway, Pavement, Traffic Control SHE-119

1. Item 202 Clearing and Grubbing
 - a. LS
2. Item 202 Wearing Course Removed
 - a. PV-1: All paving areas except full depth = 6070 SF - 900 SF = 5170 SF/9 = 575 SY
 - b. PV-2: All paving areas except full depth = 6160 SF - 900 SF = 5260 SF/9 = 585 SY
 - c. Bridge deck asphalt removed 2387 SF/9 = 265 SY Placed under Bridge items
3. Item 202 Pavement Removed
 - a. PV-1: 900 SF from Microstation = 900 SF/9 = 100 SY
 - b. PV-2: 900 SF from Microstation = 900 SF/9 = 100 SY
 - i. Total: 200 SY
4. Item 202 Guardrail Removed, APP
 - a. GR-1: 175 FT
 - b. GR-2: 170 FT
 - c. GR-3: 140 FT
 - d. GR-4: 140 FT
5. Item 202 Removal Misc. Removal of Bridge ID sign and Reerection
 - a. 1 EACH NE sign in good condition
6. Item 204 Subgrade Compaction
 - a. PV-1: 975 SF/9 = 108 SY
 - b. PV-2: 975 SF/9 = 108 SY
 - i. Total: 216 SY
7. Item 209 Linear grading
 - a. Asphalt transition at all 4 quads. 200' x 4 - 800' or 8 STA.
8. Item 301 Asphalt Concrete Base, PG64-22, (449)
 - a. PV-1: $(24.667' + 42')/2 \times 25' = 833 \text{ SF} \times .75 = 625 \text{ CF}/27 = 23 \text{ CY}$
 - b. PV-2: $(24.667' + 42')/2 \times 25' = 833 \text{ SF} \times .75 = 625 \text{ CF}/27 = 23 \text{ CY}$
 - i. Total: = 46 CY
9. Item 304 Aggregate Base
 - a. PV-1: $(25.667' + 43')/2 \times 25' = 858 \text{ SF} \times .5 = 429 \text{ CF}/27 = 16 \text{ CY}$
 - b. PV-2: $(25.667' + 43')/2 \times 25' = 858 \text{ SF} \times .5 = 429 \text{ CF}/27 = 16 \text{ CY}$
 - i. Total: 16 + 16 = 32 CY

10. Item 407 Tack Coat (0.055 GAL/SY New asphalt, 0.085 GAL/SY Milled asphalt)
 - a. PV-1: $900\text{SF}/9 = 100\text{SY} \times 0.055\text{GAL/SY} \times 3 \text{ applications} + 6070\text{SF}/9 = 675\text{SY} \times 0.085\text{GAL/SY} = 17+57$
 - b. PV-2: $900\text{SF}/9 = 100\text{SY} \times 0.055\text{GAL/SY} \times 3 \text{ applications} + 6160\text{SF}/9 = 685 \text{ SY} \times 0.085 \text{ GAL/SY} = 17+58$
 - i. Total: $74 + 75 = 149 \text{ GAL}$
11. Item 441 Asphalt Concrete Surface Course, Type 1, (449), PG70-22M
 - a. PV-1: $6070 \text{ SF} \times 1.5/12 = 758.75 \text{ CF}/27 = 28.10 \text{ CY}$
 - b. PV-1: $900 \text{ SF} \times 1.5/12 = 112.5 \text{ CF}/27 = 4 \text{ CY}$
 - c. PV-2: $6160 \text{ SF} \times 1.5/12 = 770 \text{ CF}/27 = 28.52 \text{ CY}$
 - d. PV-2: $900 \text{ SF} \times 1.5/12 = 112.5 \text{ CF}/27 = 4 \text{ CY}$
 - i. Total = $28 + 4 + 29 + 4 = 65\text{CY}$
12. Item 606 Guardrail, Type MGS
 - a. GR-1: 50 FT
 - b. GR-2: 50 FT
 - c. GR-3: 50 FT
 - d. GR-4: 50 FT
 - i. Transition GR to tie bridge terminal assemblies to end anchors or existing guardrail.
13. Item 606 Anchor Assembly, MGS, Type E
 - a. GR-1: 1 EACH
 - b. GR-2: 1 EACH
 - c. GR-3: 1 EACH
 - d. GR-4: 1 EACH
14. Item 606 MGS Bridge Terminal Assembly, Type TST-2
 - a. GR-1: 1 EACH
 - b. GR-2: 1 EACH
 - c. GR-3: 1 EACH
 - d. GR-4: 1 EACH
 - i. Each GR run needs this bridge terminal assembly. Pay length is almost 27 Feet per SCD.
15. Item 617 Compacted Aggregate
 - a. SR-1: $L 200' W 6' (5/12)'' \times \text{average D approx. } 2'' \text{ (profile change varies from 0 to 5.5'')} = 214 \text{ CF}$
 - b. SR-2: $L 200' W 5' (7/12)'' \times \text{average D approx. } 2'' \text{ (profile change varies from 0 to 5.5'')} = 186 \text{ CF}$
 - c. SR-3: $L 200' W 6' (0/12)'' \times \text{average D approx. } 2'' \text{ (profile change varies from 0 to 5.5'')} = 200 \text{ CF}$
 - d. SR-4: $L 200' W 6' (2/12)'' \times \text{average D approx. } 2'' \text{ (profile change varies from 0 to 5.5'')} = 206 \text{ CF}$
 - i. Total = $806 \text{ CF}/27 = 30 \text{ CY}$
16. Item 621 Raised Pavement Marker removed
 - a. 5 EACH
17. Item 626 Barrier Reflector, Type 2 Bi-Directional
 - a. Need reflectors on all new GR. 300' GR runs. 100 foot spacing per CMS 626.03. $300/100 = 4$ Reflectors per side. 8 total. Make 8 for symmetry (2 each quad) can be less than 100 foot spacing. Easier to pay for.
18. Item 630 Sign, flat sheet, as per plan
 - a. Each sign is 24" x 4" round to 1 SF per sign. 1 sign so 1 SF. Need new sign for SW
19. Item 646 Edge Line
 - a. EL-1: 0.09 Miles. CALC: $\text{STA. } 192+28.88 - \text{STA. } 187+71.13 = 457.75 \text{ FT}/5280 \text{ FT/MILE} = 0.0867 \text{ MILE}$
 - b. EL-2: 0.09 Miles.
 - i. Total = 0.18 MILE
20. Item 646 CenterLine (dashed)
 - a. CL-1: 0.09 MILE

Erosion Control

1. Item 832 Erosion Control
 - a. 5000 EACH
2. Item 659 Seeding and Mulching
 - a. **SHE-119-0360**
 - i. Rear approach cross sections: 332 SY
 - ii. Forward approach cross sections: 346 SY
 1. Total Seeding and Mulching: $332+346 = 678$ SY
3. Item 659 Repair Seeding and Mulching
 - a. 5% of seeding and mulching: $0.05 \times 678 = 34$ SY
4. Item 659 Commercial Fertilizer
 - a. $(1 \text{ TON}/7410\text{SY permanent}) \times 678 + (1 \text{ TON}/11,111 \text{ SY interseeding}) \times 34 = 0.09 \text{ TON}$
5. Item 659 Water
 - a. $(2 \times 0.0027 \text{ M. GAL/SY}) \times 678 + (0.0027 \text{ M. GAL/SY}) \times 34 = 4 \text{ M. GAL}$

Structures: SHE-119-0360

1. Item 202 Portions of Structure Removed, Over 20 foot Span, APP
 - a. Lump Sum (LS)
2. Item 202 Wearing course removed
 - b. Existing asphalt on bridge deck: $2387 \text{ SF}/9 = 265 \text{ SY}$
3. Item 202 Bridge Railing Removed
 - a. 62.25 FT each side (Existing Plans) = 125 FT
4. Item 503 Unclassified Excavation
 - a. Lump Sum (LS)
5. Item 503 Cofferdams and Excavation Bracing
 - a. LS
6. Item 507 Special Pile Encasement
 - a. 7 piles per pier estimated at $10'$ per pile: $7 \times 2 \text{ piers} \times 10' = 140'$ encasement length
7. Item 509 Concrete Reinforcement, replacement of existing concrete reinforcement, as per plan
 - a. 50 lbs for contingency for both abutments and deck edges. 100 lb total.
8. Item 509 Uncoated Steel Reinforcement
 - a. See sheet 17. $458 + 3909 = 4367 \text{ LBS}$
9. Item 510 Dowel holes with nonshrink, nonmetallic grout
 - a. See sheet 17. 112 EACH
10. Item 511 Class QC2 Concrete, Superstructure
 - a. 1 Deck edge: 4.57 sf From Microstation, $4.57' \times 57.75' \times 2 \text{ deck edges} = 527.84 \text{ CF}/27 = 20 \text{ CY}$
11. Item 516 $\frac{1}{2}$ " PEJF
 - a. $40.36'$ distance between refacing and slab. 2 abutments refaced. $6/12$ " wide. $40.36' \times 0.5' \times 2 \text{ abutments} = 40.36 \text{ SF}$
12. Item 516 2" Deep Joint Sealer, APP
 - a. At interface between concrete and asphalt: $41.333'$ wide $\times 2 \text{ approaches} = 83 \text{ FT}$
13. Item 517 Railing (Three Steel Tube Bridge Railing)
 - a. See sheet 13: 64 FT each side $\times 2 \text{ sides} = 128 \text{ FT}$
14. Item 518 Steel Drip Strip
 - a. $[57.75 \text{ FT per side} + (7 \text{ posts} \times 2.0 \text{ FT})] \times 2 \text{ sides} = 143.50 \text{ FT}$
15. Item 519 Patching concrete structure
 - a. 2 SF on Fwd right abutment top wingwall
 - b. 10 SF total from 4 breastwall patches
 - i. Total = 12 SF
16. Item 530 Item special: abutment refacing with galvanic anode protection
 - a. See sheet 14.
17. Item 625 structure grounding system
 - a. 1 EACH
18. Item 844 Galvanic Anode Protection, as per plan
 - a. 56 anodes per deck edge. 112 EACH Deck edges. Approx. 10 for abutments.
19. Item 848 Superplasticized dense concrete overlay using hydrodemolition, $2 \frac{3}{4}$ "
 - a. $41.33' \times 57.75' = 2387 \text{ SF}/9 = 266 \text{ SY}$
20. Item 848 Surface preparation using hydrodemolition, as per plan
 - a. $41.33' \times 57.75' - (2 \times 3' \times 57.75') = 2040.50 \text{ SF}/9 = 227 \text{ SY}$
21. Item 848 Superplasticized Dense Concrete overlay (variable thickness), Material only
 - a. Asphalt on top of existing deck, must assume a percentage delaminated. 20%
 - i. 20% per BDM 403-3 table use 40%. $2040.50 \text{ SF} \times 2/12" \times 40\% = 136 \text{ CF}/27 = 5 \text{ CY}$ bump to 10 CY, 5 too small and conservative.
22. Item 848 Hand chipping
 - a. 10% of estimated variable thickness area per BDM 403.4.1. $0.4 \times 2040.50 \text{ SF} \times 0.1 = 81.62 \text{ SF}/9 = 10 \text{ SY}$
23. Item 848 Test slab
 - a. Lump Sum (LS)

Maintenance of Traffic

1. Item 614 Detour signing
 - a. Lump Sum (LS)

Incidentals

1. Item 614-Maintaining Traffic (LS)
2. Item 623-Construction Layout Stakes and Surveying (LS)
3. Item 624-Mobilization (LS)

END OF CALCULATIONS