

# Estimated Quantities

User Input

Yellow Highlight

Checks

Light-Blue Highlight

Results

Boxed

**Objective:** Determine estimated quantities in order to generate a cost estimate.

**Assumptions:** As stated throughout the calculation file.

**Note:** " := " Defines a variable  
 " = " Recalls a variable

## Item 202E11203 - Portions of Structure Removed, Over 20 ft Span, APP

Total Item Quantity:

$$Q_{202\_str} := \text{“LS”}$$

## Item 509E20001 - Concrete Reinforcement, Replacement of Existing Concrete Reinforcement, APP

Ex. Top Transverse Bar Weight (#6):

$$wt_{ex\_top\_t} := 1.502 \text{ plf}$$

Number of Ex. Top Transverse Bars:

$$n_{ex\_top\_t} := 5 \quad (2.75' \text{ repair} / 7"\text{spa})$$

Ex. Bottom Transverse Bar Weight (#6):

$$wt_{ex\_bot\_t} := 1.502 \text{ plf}$$

Number of Ex. Bottom Transverse Bars:

$$n_{ex\_bot\_t} := 4 \quad (2.75' \text{ repair} / 9"\text{spa})$$

Length of Bars to be Salvaged:

$$L_{salv\_t} := 1 \text{ ft} + 8 \text{ in}$$

Ex. Top Longitudinal Bar Weight (#4):

$$wt_{ex\_top\_l} := 0.668 \text{ plf}$$

Number of Ex. Top Longitudinal Bars:

$$n_{ex\_top\_l} := 3$$

Ex. Bottom Longitudinal Bar Weight (#5):

$$wt_{ex\_bot\_l} := 1.043 \text{ plf}$$

Number of Ex. Bottom Longitudinal Bars:

$$n_{ex\_bot\_l} := 1$$

Length of Bars to be Salvaged:

$$L_{salv\_l} := 2 \text{ ft} + 9 \text{ in}$$

Weight of Deck Resteel to be Salvaged:

$$WT_{salv\_deck} := (L_{salv\_t} \cdot (n_{ex\_top\_t} \cdot wt_{ex\_top\_t} + n_{ex\_bot\_t} \cdot wt_{ex\_bot\_t})) + (L_{salv\_l} \cdot (n_{ex\_top\_l} \cdot wt_{ex\_top\_l} + n_{ex\_bot\_l} \cdot wt_{ex\_bot\_l})) = 30.909 \text{ lbf}$$

Ex. Top long. & Trans. Railing Bars Weight (#5):

$$wt_{ex\_top\_r} := 1.043 \text{ plf}$$

Number of Ex. Top Long. Bars:

$$n_{ex\_top\_r} := 4$$

Ex. Bottom Long. Railing Bar Weight (#4):

$$wt_{ex\_bot\_r} := 0.668 \text{ plf}$$

Number of Ex. Bottom Long. Bars:

$$n_{ex\_bot\_r} := 5$$

Number of Ex. Trans. Bars:

$$n_{ex\_r\_t} := 14$$

(20' repair / 1.5'spa)

## Item 509E20001 - Concrete Reinforcement, Replacement of Existing Concrete Reinforcement, APP (Continued)

Length of Long. Bars to be Salvaged:  $L_{salv\_r\_l} := 20 \text{ ft} + 0 \text{ in}$

Length of Trans. Bars to be Salvaged:  $L_{salv\_r\_t} := 12 \text{ ft} + 2 \text{ in}$  (Assume X501 thru X504 bar lengths)

Assumed % of Replacement Reinforcing:  $per_{salv} := 10\%$

Weight of Railing Resteel to be Salvaged:  $WT_{salv\_rail} := (L_{salv\_r\_l} \cdot (n_{ex\_top\_r} \cdot wt_{ex\_top\_r} + n_{ex\_bot\_r} \cdot wt_{ex\_bot\_r})) + (L_{salv\_r\_t} \cdot n_{ex\_r\_t} \cdot wt_{ex\_top\_r}) \downarrow = 327.898 \text{ lbf}$

Weight of Replacement Reinforcing:  $resteel_{rep} := \text{Ceil} (per_{salv} \cdot (WT_{salv\_deck} + WT_{salv\_rail}), 10 \text{ lbf}) = 40 \text{ lbf}$

Total Item Quantity:  $Q_{509} := resteel_{rep} = 40 \text{ lbf}$

$Q_{509} = 40 \text{ lbf}$

## Item 510E10001 - Dowel Holes with Nonshrink, Nonmetallic Grout, As Per Plan

Bridge Railing Reinforcing:  $NO_{dowels} := 8 \cdot 4 = 32$

Total Item Quantity:  $Q_{510\_Dowels} := NO_{dowels}$

$Q_{510\_Dowels} = 32$

## Item 511E34445 - Class QC2 Concrete, Bridge Deck, As Per Plan

Proposed Deck Repair Width:  $W_{deck} := 1 \text{ ft} + 8 \text{ in}$

Proposed Deck Repair Length:  $L_{deck} := 2 \text{ ft} + 9 \text{ in}$

Proposed Deck Thickness:  $t_{deck} := 9.1875 \text{ in}$

Note: no proposed haunch is provided above beams to match the existing beams.

Number of Repairs:  $N_{deck\_repairs} := 2$

Total Item Quantity:  $Q_{511\_deck} := \text{Ceil} (L_{deck} \cdot W_{deck} \cdot t_{deck} \cdot N_{deck\_repairs}, 0.5 \text{ yd}^3) = 13.50 \text{ ft}^3$

$Q_{511\_deck} = 0.5 \text{ yd}^3$

## Item 511E34448 - Class QC2 Concrete, Bridge Deck (Parapet)

Existing Railing Area:  $A_{railing} := 465 \text{ in}^2 = 3.229 \text{ ft}^2$  (See Existing Plans)

Proposed Repair Length:  $L_{railing} := 10 \text{ ft}$  (Per repair)

Number of Railing Repairs:  $N_{railing\_repairs} := 2$

Total Item Quantity:  $Q_{511\_rail} := \text{Ceil} (A_{railing} \cdot L_{railing} \cdot N_{railing\_repairs}, 1 \text{ yd}^3) = 81.00 \text{ ft}^3$   
 $Q_{511\_rail} = 3 \text{ yd}^3$

## Item 512E10101 - Sealing of Concrete Surfaces (Epoxy-Urethane), As Per Plan

Determine area of concrete surface sealing along the bridge railings based on information detailed in the plans:

Railing Sealing Perimeter:  $P_{rail} := 2 \text{ in} + \sqrt{(13 \text{ in})^2 + (9 \text{ in})^2} + \sqrt{(17 \text{ in})^2 + (3 \text{ in})^2} + 9 \text{ in} + 32 \text{ in} + 2 \text{ in} + 2 \cdot \text{in} = 6.673 \text{ ft}$

Proposed Deck Length:  $L_{railing} = 10 \text{ ft}$

Number of Railing Repairs:  $N_{railing\_repairs} = 2$

Total Sealing Area of Bridge Railings:  $A_{seal\_rail} := N_{railing\_repairs} \cdot L_{railing} \cdot P_{rail} = 133.46 \text{ ft}^2$

Additional Percentage Allowance:  $per_{inc} := 5\%$  (To account for field deviation)

Total Item Quantity:  $Q_{512\_seal} := \text{Ceil} ((1 + per_{inc}) \cdot (A_{seal\_rail}), 5 \text{ yd}^2) = 180.00 \text{ ft}^2$

$$Q_{512\_seal} = 20 \text{ yd}^2$$

## Item 512E10600 - Concrete Repair By Epoxy Injection

This is only limits of epoxy crack injection. Epoxy grout is included with Item 511:

Lengths of existing beams receiving injection:  $L_{epoxy\_inj.} := 19.25 \text{ ft} + 37.25 \text{ ft} + 89 \text{ ft} = 145.5 \text{ ft}$

Number of Sides with Epoxy Injection:  $S_{epoxy\_inj.} := 2$

Additional Percentage Allowance:  $per_{inc} := 5\%$  (To account for field deviation)

Total Item Quantity:  $Q_{512\_epoxy\_inj} := \text{Ceil} ((1 + per_{inc}) \cdot (L_{epoxy\_inj.}) \cdot (S_{epoxy\_inj.}), 1 \text{ ft}) = 306.00 \text{ ft}$

$$Q_{512\_epoxy\_inj} = 306 \text{ ft}$$

## Item 513E10261 - Structural Steel Members, Level 3, As Per Plan

Number of Proposed Beams:

$$N_{beam} := 1$$

Length of Proposed Beams:

$$L_{beam} := 54 \text{ ft} = 54 \text{ ft}$$

Unit Weight of Beams:

$$uw_{beam} := 263 \text{ plf} \quad (\text{W33x263})$$

Total Beam Weight:

$$WT_{beam} := N_{beam} \cdot L_{beam} \cdot uw_{beam} = 14202.00 \text{ lbf}$$

Number of Intermediate Crossframes:

$$N_{int\_xframe} := 6$$

Length of Crossframe Horizontal:

$$L_{int\_horiz} := 8 \text{ ft} + 6 \text{ in} \quad (\text{Conservative})$$

Length of Crossframe Diagonal:

$$L_{int\_diag} := \sqrt{(L_{int\_horiz})^2 + (21 \text{ in})^2} = 8.678 \text{ ft} \quad (\text{Conservative})$$

Unit Weight of Crossframe Members:

$$uw_{int\_xframe} := 6.1 \text{ plf} \quad (\text{L3x3x5/16})$$

Weight of Connection Plate:

$$wt_{conn\_pl} := 490 \text{ pcf} \cdot 0.375 \text{ in} \cdot 6.5 \text{ in} \cdot 34 \text{ in} = 23.5 \text{ lbf} \quad (\text{Conservative})$$

Total Intermediate X-frame Weight:

$$WT_{int\_xframe} := N_{int\_xframe} \cdot ((L_{int\_horiz} + 2 \cdot L_{int\_diag}) \cdot uw_{int\_xframe} + 2 \cdot wt_{conn\_pl}) = 1228.36 \text{ lbf}$$

Number of Field Splices 2A:

$$N_{splice\_2A} := 1 \quad \text{Field Splice 2A}$$

Weight of Web Splice Plate:

$$wt_{web\_spl\_2A} := 490 \text{ pcf} \cdot 0.5 \text{ in} \cdot 14.25 \text{ in} \cdot 26.5 \text{ in} = 53.541 \text{ lbf}$$

Weight of Outer Flange Splice Plate:

$$wt_{of\_spl\_2A} := 490 \text{ pcf} \cdot 0.625 \text{ in} \cdot 15.75 \text{ in} \cdot 26.25 \text{ in} = 73.273 \text{ lbf}$$

Weight of Inner Flange Splice Plate:

$$wt_{if\_spl\_2A} := 490 \text{ pcf} \cdot 1.0 \text{ in} \cdot 6.25 \text{ in} \cdot 26.25 \text{ in} = 46.522 \text{ lbf}$$

Weight of Web Filler Plate:

$$wt_{web\_fill\_2A} := 490 \text{ pcf} \cdot 0.125 \text{ in} \cdot 7.0 \text{ in} \cdot 26.5 \text{ in} = 6.575 \text{ lbf}$$

Weight of Outer Flange Filler Plate:

$$wt_{of\_fill\_2A} := 490 \text{ pcf} \cdot 0.6875 \text{ in} \cdot 15.75 \text{ in} \cdot 13.0 \text{ in} = 39.916 \text{ lbf}$$

Weight of Inner Flange Filler Plate:

$$wt_{if\_fill\_2A} := 490 \text{ pcf} \cdot 1.0 \text{ in} \cdot 6.25 \text{ in} \cdot 13.0 \text{ in} = 23.04 \text{ lbf}$$

Total Field Splice 2A Weight:

$$WT_{splice\_2A} := N_{splice\_2A} \cdot \left( 2 \cdot wt_{web\_spl\_2A} + 2 \cdot wt_{of\_spl\_2A} + 4 \cdot wt_{if\_spl\_2A} + wt_{web\_fill\_2A} + 2 \cdot wt_{of\_fill\_2A} + 4 \cdot wt_{if\_fill\_2A} \right) = 618.28 \text{ lbf}$$

Number of Field Splice 3:

$$N_{splice\_3} := 1 \quad \text{Field Splice 3}$$

Weight of Web Splice Plate:

$$wt_{web\_spl\_3} := 490 \text{ pcf} \cdot 0.5 \text{ in} \cdot 14.0 \text{ in} \cdot 25.0 \text{ in} = 49.624 \text{ lbf}$$

Weight of Outer Flange Splice Plate:

$$wt_{of\_spl\_3} := 490 \text{ pcf} \cdot 0.5 \text{ in} \cdot 11 \text{ in} \cdot 29 \text{ in} = 45.229 \text{ lbf}$$

Weight of Inner Flange Splice Plate:

$$wt_{if\_spl\_3} := 490 \text{ pcf} \cdot 0.625 \text{ in} \cdot 4.0 \text{ in} \cdot 29 \text{ in} = 20.558 \text{ lbf}$$

Weight of Web Filler Plate:

$$wt_{web\_fill\_3} := 490 \text{ pcf} \cdot 0.125 \text{ in} \cdot 7.0 \text{ in} \cdot 25.0 \text{ in} = 6.203 \text{ lbf}$$

Weight of Outer Flange Filler Plate:

$$wt_{of\_fill\_3} := 490 \text{ pcf} \cdot 0.5 \text{ in} \cdot 11.0 \text{ in} \cdot 14.375 \text{ in} = 22.419 \text{ lbf}$$

Weight of Inner Flange Filler Plate:

$$wt_{if\_fill\_3} := 490 \text{ pcf} \cdot 1.3125 \text{ in} \cdot 4.0 \text{ in} \cdot 14.5 \text{ in} = 21.586 \text{ lbf}$$

## Item 513E10261 - Structural Steel Members, Level 3, As Per Plan (Continued)

Total Field Splice 3 Weight:

$$WT_{splice\_3} := N_{splice\_3} \cdot \left( 2 \cdot wt_{web\_spl\_3} + 2 \cdot wt_{of\_spl\_3} + 4 \cdot wt_{if\_spl\_3} + 2 \cdot wt_{web\_fill\_3} + 2 \cdot wt_{of\_fill\_3} + 4 \cdot wt_{if\_fill\_3} \right) = 415.53 \text{ lbf}$$

Additional Weight Allowance:

$$add_{per} := 10\% \quad (\text{To account for misc. items and web tear})$$

Total Item Quantity:

$$Q_{513\_L3} := \text{Ceil} \left( (1 + add_{per}) \cdot (WT_{beam} + WT_{int\_xframe} + WT_{splice\_2A} + WT_{splice\_3}) , 100 \text{ lbf} \right)$$

$$Q_{513\_L3} = 18200 \text{ lbf}$$

## Item 514E00050 - Surface Preparation of Existing Structural Steel

Crossframe connection plate repair

Depth of Existing Beam Webs:

$$d_{web} := 35.55 \text{ in} - 2 \cdot 0.794 \text{ in} = 33.962 \text{ in} \quad (\text{W36x135 for max web depth})$$

Flange Widths of Existing Beams:

$$b_{f\_ex} := 16.471 \text{ in} \quad (\text{W36x230 for max flange width})$$

# of Typical Paint Repair Locations:

$$N_{repair\_1} := 6 \quad (\text{at intermediate crossframe connection})$$

Length of Typical Paint Repair:

$$L_{repair\_1} := 4 \text{ ft} + 0 \text{ in}$$

Heat Straightening repair

Depth of Existing Beam:

$$d_{beam} := 35.88 \text{ in} \quad (\text{W36x230 for max beam depth})$$

Flange Widths of Existing Beams:

$$b_{f\_ex} := 16.471 \text{ in} \quad (\text{W36x230 for max flange width})$$

# of Typical Paint Repair Locations:

$$N_{repair\_2} := 2$$

Length of Paint Repair:

$$L_{repair\_2} := 12 \text{ ft} + 6 \text{ in}$$

Total Item Quantity:

$$Q_{514\_prep} := \text{Ceil} \left( N_{repair\_1} \cdot (d_{web} + b_{f\_ex}) \cdot L_{repair\_1} + N_{repair\_2} \cdot (2 \cdot d_{beam} + 3 \cdot b_{f\_ex}) \cdot L_{repair\_2} , 10 \text{ ft}^2 \right) = 360.00 \text{ ft}^2$$

$$Q_{514\_prep} = 360 \text{ ft}^2$$

## Item 514E00056 - Field Painting of Existing Structural Steel, Prime Coat

Additional SF Allowance:

$$add_{per} := 7\% \quad (\text{To account for misc. & field welded connection plates that may not be shop primed})$$

Total Item Quantity:

$$Q_{514\_prime} := Q_{514\_prep} \cdot (1 + add_{per}) = 385.20 \text{ ft}^2$$

$$Q_{514\_prime} = 385 \text{ ft}^2$$

(Plans allow for not priming behind the field splices but are left in calc to be conservative)

## Item 514E00060 - Field Painting Structural Steel, Intermediate Coat

Increase area by 10% to account for overspray etc.

(C&MS 514.23)

Number of Proposed Beams:  $N_{beam} = 1$

Length of Proposed Beams:  $L_{beam} = 54 \text{ ft}$

Total Depth of Proposed Beams:  $d_{beam} := 34.5 \text{ in}$  (W33x263)

Flange Widths of Proposed Beams:  $b_f := 15.8 \text{ in}$  (W33x263)

Total Beam Quantity:  $Q_{514\_beam} := (N_{beam} \cdot L_{beam} \cdot (2 \cdot d_{beam} + 3 \cdot b_f) + Q_{514\_prime}) = 909.00 \text{ ft}^2$

Beam 1 Web Depth:  $d_{web\_1} := 31.375 \text{ in}$  (W33x263)

Beam 2 Web Depth:  $d_{web\_2} := 33.5 \text{ in}$  (36WF230)

Area of 1 side of connection plate A:  $A_{plate\_A} := 6.5 \text{ in} \cdot d_{web\_1} - (2.5 \text{ in} \cdot 1.5 \text{ in}) = 1.39 \text{ ft}^2$

Area of 1 side of connection plate B:  $A_{plate\_B} := 6.5 \text{ in} \cdot d_{web\_2} - (2.5 \text{ in} \cdot 1.5 \text{ in}) = 1.486 \text{ ft}^2$

Connection Plate Sides:  $N_{con\_sides} := 2$

Number of Connection Plates:  $N_{con\_plates} := 6$  (Per Beam)

Connection Plate Thickness:  $T_{con\_plates} := \frac{3}{8} \text{ in}$

Total Connection Plate Quantity:  $Q_{514\_con\_plate} := (A_{plate\_A} \cdot N_{con\_sides} \cdot N_{con\_plates}) \downarrow + (A_{plate\_B} \cdot N_{con\_sides} \cdot N_{con\_plates}) \downarrow + T_{con\_plates} \cdot (d_{web\_1} + d_{web\_2}) \cdot N_{con\_plates} = 35.53 \text{ ft}^2$

Cross Frame Angle Perimeter:  $P_{cross\_frame} := 3 \text{ in} \cdot 2 + 3 \text{ in} \cdot 2 = 1 \text{ ft}$  (L3x3x5/16)

Horz. Cross Frame Length:  $L_{Horz\_Cross\_frame} := 8 \text{ ft} + 6 \text{ in} - 1 \text{ in} \cdot 2 = 8.333 \text{ ft}$

Diagonal. Cross Frame Length:  $L_{Diag\_Cross\_frame} := \left( (8 \text{ ft} + 6 \text{ in} - 1 \text{ in} \cdot 2)^2 \downarrow + (d_{web\_2} - 2 \cdot \text{in} - 3 \text{ in} - 2 \text{ in} - 2 \text{ in})^2 \right)^{.5} = 8.58 \text{ ft}$

Number of Diagonal. Angles:  $N_{Diag\_Cross\_frame} := 2 \cdot 6 = 12$

Number of Horz. Angles:  $N_{Horz\_Cross\_frame} := 6$

Total Item Quantity:  $Q_{514\_cross\_frame} := P_{cross\_frame} \cdot (L_{Horz\_Cross\_frame} \cdot N_{Horz\_Cross\_frame} \downarrow + L_{Diag\_Cross\_frame} \cdot N_{Diag\_Cross\_frame}) = 152.96 \text{ ft}^2$

Total Item Quantity:  $Q_{514\_int} := \text{Ceil} (1.10 \cdot (Q_{514\_beam} + Q_{514\_con\_plate} + Q_{514\_cross\_frame}), 10 \text{ ft}^2) = 1210.00 \text{ ft}^2$

$Q_{514\_int} = 1210 \text{ ft}^2$

## Item 514E00067 - Field Painting Structural Steel, Finish Coat, APP

Total Item Quantity:  $Q_{514\_finish} := Q_{514\_int} = 1210.00 \text{ ft}^2$

$$Q_{514\_finish} = 1210 \text{ ft}^2$$

## Item 514E00504 - Grinding Fins, Tears, Slivers on Existing Structural Steel

Length of Surface Prep:  $L_{prep} := N_{repair\_1} \cdot L_{repair\_1} + N_{repair\_2} \cdot L_{repair\_2} = 49 \text{ ft}$

Estimated Grinding Time:  $Grind := 1 \text{ min/ft}$  (Per ODOT BDM, Section 404.1.11)

Total Item Quantity:  $Q_{514\_grind} := \text{Ceil} \left( \left( \frac{L_{prep}}{\text{ft}} \right) \cdot Grind \cdot \frac{1}{60}, 1 \right)$   $Q_{514\_grind} = 1 \text{ MNHR}$

## Item 514E10000 - Final Inspection Repair

Number of Proposed Beams:  $N_{beam} = 1$

Length of Proposed Beams:  $L_{beam} = 54 \text{ ft}$

When determining number of final inspection locations along the beam, consider the 300 foot increment presented in the C&MS to be per each side of beam. Therefore, divide the 300 foot increment by two.

Inspection per Lineal Ft of Beam:  $n_{inspect} := 150 \text{ ft}$  (Per ODOT C&MS, Section 514.21)

Number of Proposed Cross-frames:  $N_{x\_frame} := 6$

% of Cross-frames to be Inspected:  $per_{inspect} := 2.5\%$  (Per ODOT C&MS, Section 514.21)

Total Item Quantity:  $Q_{514\_ins} := \text{Ceil} \left( \left( N_{beam} \cdot L_{beam} \right) \div n_{inspect}, 1 \right) + \text{Ceil} \left( N_{x\_frame} \cdot per_{inspect}, 1 \right)$   $Q_{514\_ins} = 2 \text{ EA}$

## Item 516E47001 - Jacking and Temporary Support of Superstructure, As Per Plan

Total Item Quantity:  $Q_{516\_jack} := \text{“LS”}$

## Item 849E10000 - Damage Assessment

Total Item Quantity:  $Q_{849\_dmg} := \text{“LS”}$



Project: RIC-30-16.42  
Subject: Final Tracings  
Task: Estimated Quantities  
Job #: 10441140

Computed: JTW/GDS Date: 11/19/25  
Checked: NJH Date: 11/19/25  
Page: 8 of 9  
No.:

## Item 849E10600 - Repairing Damaged Members by Grinding

Number of Repairs:  $N_{repair\_2} = 2$

Length of Heat Straightening:  $L_{repair\_2} = 12.5 \text{ ft}$

Length of Repair:  $L_{grind} := N_{repair\_2} \cdot L_{repair\_2} = 25 \text{ ft}$

Estimated Grinding Time:  $Grind := .10 \text{ hr/ft}$  (Per Designer Comments in SS849)

Total Item Quantity:  $Q_{849\_grind} := \frac{L_{grind}}{ft} \cdot Grind = 2.50$

$Q_{849\_grind} = 2.5$  MNHR

## Item 849E10700 - Straightening Damaged Members

Total Item Quantity:  $Q_{849\_straight} := \text{"LS"}$



## Summary of Quantities:

	<u><b>Estimated Quantity</b></u>
Item 202E11203 - Portions of Structure Removed...	$Q_{202\_str} = \text{“LS”}$
Item 509E20001 - Concrete Reinforcement, Replacement of Existing Concrete...., APP	$Q_{509} = 40 \text{ lbf}$
Item 510E10001 - Dowel Holes with Nonshrink, Nonmetallic Grout, APP	$Q_{510\_Dowels} = 32$
Item 511E34445 - Class QC2 Concrete, Bridge Deck, APP	$Q_{511\_deck} = 1 \text{ yd}^3$
Item 511E34448 - Class QC2 Concrete, Bridge Deck (Parapet)	$Q_{511\_rail} = 3 \text{ yd}^3$
Item 512E10101 - Sealing of Concrete Surfaces (Epoxy-Urethane), APP	$Q_{512\_seal} = 20 \text{ yd}^2$
Item 512E10600 - Concrete Repair By Epoxy Injection	$Q_{512\_epoxy\_inj} = 306 \text{ ft}$
Item 513E10261 - Structural Steel Members, Level 3, APP	$Q_{513\_L3} = 18200 \text{ lbf}$
Item 514E00050 - Surface Preparation of Existing Structural Steel	$Q_{514\_prep} = 360 \text{ ft}^2$
Item 514E00056 - Field Painting of Existing Structural Steel, Prime Coat	$Q_{514\_prime} = 385 \text{ ft}^2$
Item 514E00060 - Field Painting Structural Steel, Intermediate Coat	$Q_{514\_int} = 1210 \text{ ft}^2$
Item 514E00067 - Field Painting Structural Steel, Finish Coat, APP	$Q_{514\_finish} = 1210 \text{ ft}^2$
Item 514E00504 - Grinding Fins, Tears, Slivers on Existing Structural Steel	$Q_{514\_grind} = 1 \text{ MNHR}$
Item 514E10000 - Final Inspection Repair	$Q_{514\_ins} = 2 \text{ EA}$
Item 516E47001 - Jack and Temporary Support of Superstructure, As Per Plan	$Q_{516\_jack} = \text{“LS”}$
Item 849E10000 - Damage Assessment	$Q_{849\_dmg} = \text{“LS”}$
Item 849E10600 - Repairing Damaged Members by Grinding	$Q_{849\_grind} = 2.5 \text{ MNHR}$
Item 849E10700 - Straightening Damaged Members	$Q_{849\_straight} = \text{“LS”}$