



OHIO DEPARTMENT OF TRANSPORTATION
PLANNING & ENGINEERING DEPARTMENT, DISTRICT 4



Project _____
Desc Concrete Sealing Calculations

Calc By CLB Date 2/13/24
Chk By MSA Date 3/22/24
PID/PROJ 113086

SUM-76-5.790:

Knowns:

1. Seal all patched areas on the parapets.

Calculations:

The total quantity of patching = 10 SF,

$$\frac{10 \text{ SF}}{9 \text{ SY}} \approx \underline{\underline{2 \text{ SY}}}$$



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Project _____
 Desc Concrete Sealing Calculations

Calc By CLB Date 2/13/14
 Chk By MJA Date 3/22/24
 PID/PROJ 113086

SUM-76-5.910:

Knowns:

1. Seal all of the concrete parapets.
2. Remove Sealant from Median and left parapets only.

Calculations:

- Approximate height of parapets = 4.0'
- Top width of parapets = 1'-0"
- Parapet Length = ±377'-0"
- Left, Right and Median parapet

$$\Rightarrow \frac{(3 \text{ parapets}) \times [(2 \text{ sides} \times 4.0') + (1'-0'')] \times (377')}{9}$$

$$\approx \underline{\underline{1,131 \text{ SY}}} \text{ (Proposed Sealing)}$$

Sealing Removal:

$$\Rightarrow \text{Total Removal} = \frac{(2 \text{ parapets}) \times [(2 \text{ sides} \times 4.0') + (1'-0'')] \times (377')}{9}$$

$$\approx \underline{\underline{754 \text{ SY}}}$$



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SUM-76-6.474R:

Knowns:

1. Seal backwall repaired area along the face of abutment and patched concrete on the piers.

Calculations:

Backwall:

$$1.0' \times 75.69' = \frac{75.69 \text{ ft}^2}{9 \text{ SY}} = 8.41 \times 2 \text{ Abutments} = \underline{\underline{17 \text{ SY}}}$$

Patched Areas on Piers and Abutments:

$$\frac{173 \text{ ft}^2}{9 \text{ SY}} = 19.22 = \underline{\underline{20 \text{ SY}}}$$



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Calc By CLG Date 2/13/24
Chk By MTA Date 3/20/24
PID/PROJ 113086

SUM-76-6.843:

Knowns:

1. Seal backwall repaired area along the face of abutment.

Calculations:

Backwalls:

$$1.0' \times 80' = \frac{80 \text{ ft}^2}{9 \text{ SY}} = 8.89 \times 2 \text{ Abutments} \approx \underline{\underline{18 \text{ SY}}}$$



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Calc By CLG Date 2/13/24
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SUM-76-6.999:

Knowns:

1. Seal backwall repaired area along the face of abutment.

Calculations:

Backwalls:

$$1.0' \times 84' = \frac{84 \text{ ft}^2}{9 \text{ SY}} = 9.33 \times 2 \text{ Abutments} \approx \underline{\underline{19 \text{ SY}}}$$



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Calc By CLG Date 2/13/24

Desc Concrete Sealing Calculations

Chk By MJA Date 3/22/24

PID/PROJ 113086

SUM-76-7.366:

Knowns:

1. Seal backwall repaired area along the face of abutment.

Calculations:

BACKWALLS :

$$1.0' \times 72' = \frac{72 \text{ ft}^2}{9.54} = \underline{\underline{8 \text{ SY}}}$$



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Calc By CLB Date 2/13/24
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SUM-76-8.237L:

Knowns:

1. Seal backwall repaired area along the face of abutment.

Calculations:

Backwalls:

$$1.0' \times 50' \times 2 \text{ abutments} = \frac{100 \text{ ft}^2}{9 \text{ SY}} = 11.11 \approx \underline{\underline{12 \text{ SY}}}$$



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Calc By CLB Date 2/13/24
Chk By MJA Date 3/22/24
PID/PROJ 113086

SUM-277-0.898:

Knowns:

1. Seal all patched concrete on the concrete railing and abutments.

Calculations:

The sealing quantity matches the patching quantity and is converted to square yards.

$$\Rightarrow \frac{300 \text{ SF Patching}}{9 \text{ SF}} \approx \underline{\underline{34 \text{ SY}}}$$



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Calc By CLG Date 2/13/24

Chk By MJA Date 3/22/24

PID/PROJ 113086

SUM-277-1.129:

Knowns:

1. Seal all patched concrete on the railings, pier caps and deck underside.

Calculations:

The Sealing quantity matches the patching quantity and is converted to square yards.

$$\Rightarrow \frac{250 \text{ SF Patching}}{9 \text{ SY}} \approx \underline{\underline{28 \text{ SY}}} \text{ (concrete rail and Pier caps)}$$

$$\Rightarrow \frac{30 \text{ SF Patching}}{9 \text{ SY}} \approx \underline{\underline{4 \text{ SY}}} \text{ (deck underside)}$$



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Calc By CLG Date 2/13/24
 Chk By MJA Date 3/22/24
 PID/PROJ 113080

SUM-277-1.687:

Knowns:

- 1. Seal abutments and piers with Anti-Graffiti Sealant.

Calculations:

Item S12 - Sealing of Concrete Surfaces, As per Plan,
 (permanent graffiti protection)

Piers

- 2 Piers
- 4 column/pier

Columns :
$$\frac{(4 \times 2) \text{ pier Columns} \times (2\pi(1.5') \times 15')}{9}$$

Approx. height from ground level.

$$\approx \underline{\underline{126 \text{ SY}}}$$

Abutments

- Abutment rounded width = $\overset{\text{North}}{\underbrace{60'}} + \overset{\text{south}}{\underbrace{56'}} = 116'$
- Abutment rounded height (ground level to top) = $\pm 5'-0''$

$$\Rightarrow \frac{116' \times 5'-0''}{9} = \underline{\underline{65 \text{ SY}}}$$

$$\Sigma = 126 + 65 = \underline{\underline{191 \text{ SY}}}$$



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Calc By CLG Date 2/13/24
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SUM-277-2.341:

Knowns:

1. Seal all patched concrete on the piers.

Calculations:

The sealing quantity matches the patching quantity and is converted to square yards.

$$\Rightarrow \frac{250 \text{ SF Patching}}{9 \text{ SY}} \approx \frac{28 \text{ SY}}{1}$$



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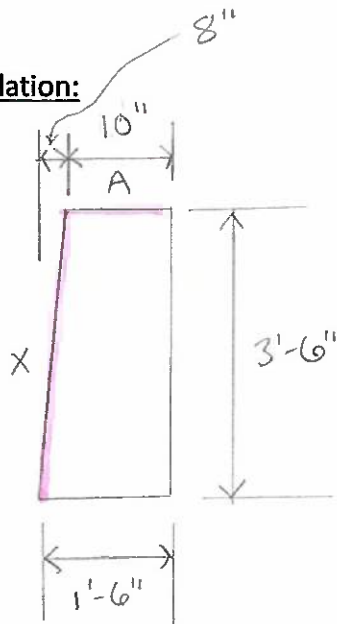
SUM-77-9.580L

Knowns:

1. Remove and Reseal the top and inside surface of the concrete parapets.
2. The existing parapet rails are single slope as per ~~Standard Bridge Drawing SBR-3-20~~. There is a left and right rail.

Existing plans.

Calculation:

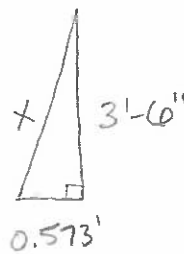


Typical Parapet
(Looking at side)

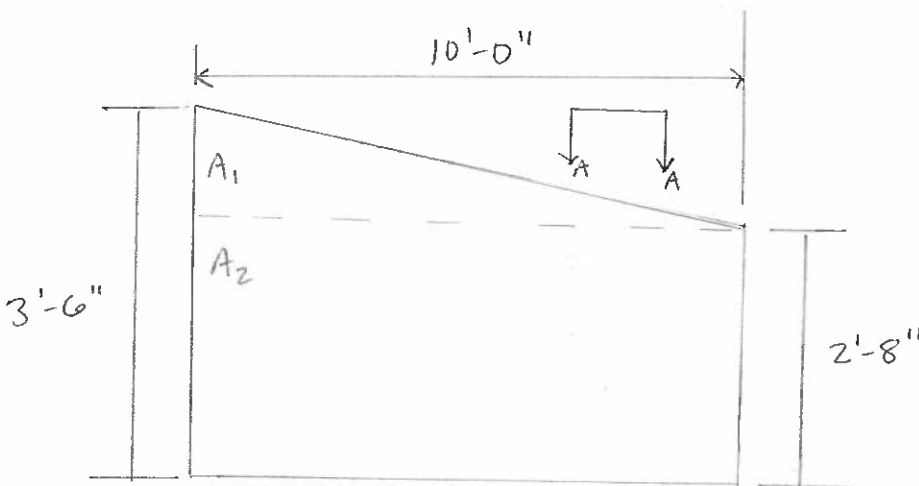
Remove Seal + Re-seal Face and tops -

Length 'A' = 10" = 0.833'

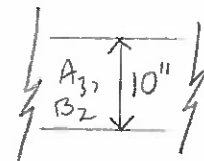
Length 'X' = $\sqrt{(0.573')^2 + (3.5')^2}$
= 3.55'



Length 'A' + 'X' = 4.38'



Parapet Transition
(looking at Face)



A-A
(Looking at Top)

$A_1 = \frac{1}{2}(10')(0.83') = 4.15 \text{ ft}^2$

$A_2 = 10' \times 2.67' = 26.7 \text{ ft}^2$

$A_3 = \frac{10''}{12} \times 10' = 8.33 \text{ ft}^2$



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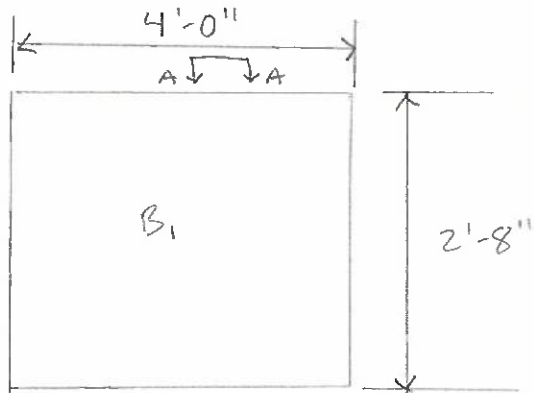


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SUM-77-9.580L

Calculations (Cont.):



$$B_1 = 4' \times 2.67' = 10.68 \text{ ft}^2$$

$$B_2 = \frac{10''}{12} \times 4' = 3.33 \text{ ft}^2$$

Parapet ENDS

(Looking at Face)

Length of "Typical parapet", Left = 231.68'

" " " " , Right = 215.78'

Surface Area of "Typical Parapet", Left = 231.68' x 4.38' = 1014.76 ft²

" " " " " , Right = 215.78' x 4.38' = 945.12 ft²

TOTALS

$$\text{Sealing Quantity (SY)} = 1014.76 \text{ ft}^2 + 945.12 \text{ ft}^2 + 10.68 \text{ ft}^2 + 3.33 \text{ ft}^2 +$$

$$4.15 \text{ ft}^2 + 26.7 \text{ ft}^2 + 8.33 \text{ ft}^2$$

$$= 223.67 \text{ SY}$$

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= 224 SY