

**Structure Quantities**Proj.: **BEL-148-3.13**PID: **120773**Calc'd By: MJHDate: 1/17/2025Chk'd By: MVCDate: 1/27/2025Sht: 1 of 3202 E 11203 PORTIONS OF STRUCTURE REMOVED, OVER 20 FOOT SPAN, AS PER PLAN**LUMP SUM**202 E 98000 REMOVAL MISC.: OEPA NOTIFICATION OF DEMOLITION**LUMP SUM**503 E 21101 UNCLASSIFIED EXCAVATION, AS PER PLAN**Estimated Excavation Dimensions Behind Diaphragm Repair**

Depth = 25in.

Width = 30in.

Flat Bottom Length = 24in.

Slope Upwards = 1:1

Flat Portion (V1)

$$V1 = (25 \times 30 \times 24) / (1728 \text{ in}^3/\text{ft}^3) / (27 \text{ ft}^3/\text{yd}^3) = 0.4 \text{ CY}$$

Sloped Portion (V2)

$$\text{Sloped Width} = 1 * 25 = 25 \text{ in}^2$$

$$\text{Sloped Length} = 30 + 24 = 54 \text{ in.}$$

$$V2 = (0.5) * (54 * 25 * 25) / (1728 \text{ in}^3/\text{ft}^3) / (27 \text{ ft}^3/\text{yd}^3) = 0.4 \text{ CY}$$

$$V = V1 + V2$$

$$V = 0.4 + 0.4 = 0.8 \text{ CY}$$

Use 1 CY509 E 10000 EPOXY COATED STEEL REINFORCEMENT

Abutments = 11 lbs

Use 11 lbs509 E 20001 CONCRETE REINFORCEMENT, REPLACEMENT OF EXISTING CONCRETE REINFORCEMENT, AS PER PLAN**Use 25 LBS**510 E 10000 DOWEL HOLES WITH NONSHRINK, NONMETALLIC GROUT

Bar Mark	No.
AD501	2
Subtotal	2

Use 2 Each

**Structure Quantities****Proj.: BEL-148-3.13****PID: 120773**Calc'd By: MJHDate: 1/17/2025Chk'd By: MVCDate: 1/27/2025Sht: 2 of 3511 E 34445 CLASS QC2 CONCRETE, BRIDGE DECK, AS PER PLAN

Deck Edge Repair (V1) Dimensions

Length = 11 ft

Width = 1 ft

Depth = 17in. = 1.42 ft

$$V1 = (11 * 1 * 1.42) / (27 \text{ ft}^3/\text{yd}^3) = 0.6 \text{ CY}$$

Diaphragm Repair (V2) Dimensions

Length = 2.26 ft

Width = 1.5 ft

Depth = 17in. = 1.42 ft

$$V2 = (2.26 * 1.5 * 1.42) / (27 \text{ ft}^3/\text{yd}^3) = 0.2 \text{ CY}$$

Approach Slab Repair (V3) Dimensions

Length = 0.5 ft

Width = 0.5 ft

Depth = 1.58 ft

$$V3 = (0.5 * 0.5 * 1.58) / (27 \text{ ft}^3/\text{yd}^3) = 0.01 \text{ CY}$$

$$V = V1 + V2 + V3$$

$$V = 0.6 + 0.2 + 0.01 = 0.81 \text{ CY}$$

Use 1 CY512 E 10100 SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)*Deck Edge Repair (A1)*

$$\text{Length} = 11 \text{ ft (deck edge repair)} + 0.5 \text{ ft (overlap)} = 11.5 \text{ ft}$$

$$\text{Width} = (6 \text{ in. (Deck Bottom)} + 17 \text{ in. (Deck Thickness)} + 9 \text{ in. (Deck Top)}) / 12 \text{ in/ft} = 2.67 \text{ ft}$$

$$A1 = 11.5 * 2.67 = 30.71 \text{ SF}$$

Diaphragm Repair (A2)

$$\text{Front Area} = (1.5 \text{ ft} * 2.08) \text{ ft} = 3.12 \text{ SF}$$

$$\text{Back Area} = (1.5 \text{ ft} * 0.5) \text{ ft} = 0.75 \text{ SF}$$

$$A2 = (3.12 + 0.75) = 3.87 \text{ SF}$$

Pier 2 End Repair (P2)

$$\text{Height} = 2.5 \text{ ft (patch repair)} + 0.5 \text{ ft (overlap)} = 3 \text{ ft}$$

$$\text{Width} = (0.5 \text{ ft (overlap)} + 1.5 \text{ ft (overlap)} + 0.5 \text{ ft (overlap)}) = 2.5 \text{ ft}$$

$$P2 = 3 * 2.5 = 7.5 \text{ SF}$$

$$\text{Total Area} = A1 + A2 + P2 = (30.71 + 3.87 + 7.5) / (9 \text{ ft}^2/\text{yd}^2) = 4.68 \text{ SY}$$

Use 5 SY512 E 10300 SEALING OF CONCRETE BRIDGE DECKS WITH HMWM RESIN

$$A = L \text{ deck} * W = 99.63 \text{ ft} * 34.5 \text{ ft wide} = 3437.2 \text{ sq ft} * (1/9) = 381.9 \text{ sq yd}$$

Use 382 sq yd

**Structure Quantities****Proj.: BEL-148-3.13****PID: 120773**Calc'd By: MJHDate: 1/17/2025Chk'd By: MVCDate: 1/27/2025Sht: 3 of 3516 E 13600 1" PREFORMED EXPANSION JOINT FILLER*Deck Edge Repair (A1)*

$$A1 = L \times D = 0.5 \text{ ft} \times 1.42 \text{ ft deep} = 0.71 \text{ sq ft}$$

Diaphragm Repair (A2)

$$A2 = L \times D = 2.26 \text{ ft} \times 1.42 \text{ ft deep} = 3.21 \text{ sq ft}$$

$$A = A1 + A2 = 0.71 \text{ sq ft} + 3.21 \text{ sq ft} = 2.28 \text{ sq ft}$$

Use 3 sq ft517 E 70001 RAILING (TWIN STEEL TUBE), AS PER PLAN

Length to Furthest Tube Joint = 22 ft.

Use 22 ft.519 E 11101 PATCHING CONCRETE STRUCTURES, AS PER PLAN*Pier 2 End Repair*

$$A = L \times D = 2.5 \text{ ft} \times 1.5 \text{ ft deep} = 3.75 \text{ sq ft}$$

Use 4 sq ft625 E 33000 STRUCTURE GROUNDING SYSTEM**Use 1 Each**