202 E 11501 PORTIONS OF STRUCTURE REMOVED, AS PER PLAN (SECONDARY MEMBERS)

End X-Frames (Rear Abut.) = (5 angles + 1 plate per location) x 8 locations = 48 each

End X-Frames (Fwd. Abut.) = (5 angles + 1 plate per location) x 8 locations = 48 each

No of Int. X-Frames = 3 crossframe angles x 2 locations = 6 each

LUMP

512 E 10100 SEALING OF CONCRETE SURFACES (EPOXY-URETHANE) **SEE CALCULATION SHT. 4 OF 4**

512 E 10600 - CONCRETE REPAIR BY EPOXY INJECTION

Rear Abutment

Carried from Sheet 4|9 = 58.75 ft

Forward Abutment

Carried from Sheet 5|9 = 23.25 ft

Item Total

T = Rear Abutment + Forward Abutment
T = 58.75 ft + 23.25 ft = 82 ft ***USE 82 FT***

512 E 74000 REMOVAL OF EXISTING COATINGS FROM CONCRETE SURFACES **SEE CALCULATION SHT. 4 OF 4**

513 E 10201 STRUCTURAL STEEL MEMBERS, LEVEL UF, AS PER PLAN

Typical End X-Frame Assembly: 8 Rear Abutment Locations & 8 Forward Abutment Locations
End X-Frames (4x4x3/8) = A = 2.86 sq. in.
Vexf1 = Angles = (Total Length x A)
Vexf1 = (3.65 ft + 2.52 ft + 2.55 ft + 3.59 ft + 9.22 ft) x 2.86 sq. in. x (1 / 144) = 0.43 cu ft
Vexf2 = 1/2" thick plate = 1 ft x 1.5 ft x 0.5 in / 12 = 0.06 cu ft
Wexf = (Vexf1 + Vexf2) x Unit Weight of Steel x Total No. of Assemblies
Wexf = (0.43 cu ft + 0.06 cu ft) x 490 lbs / cu ft x 16 Assemblies) = 3841.6 lbs

Typical Intermediate X-Frame Assembly: 2 Locations
Int X-Frames (3x3x5/16) = A = 1.78 sq. in.
Vixf = Angles = (Total Length x A)
Vixf = (8.56 ft + 8.56 ft + 8.29 ft) x 1.78 sq. in. x (1 / 144) = 0.31 cu ft
Wixf = Vixf x Unit Weight of Steel x Total No. of Assemblies
Wixf = (0.31 cu ft) x 490 lbs / cu ft x 2 Assemblies) = 303.8 lbs

Item Total = Wexf + Wixf = 3841.6 + 303.8 = 4145.4 lbs

Use 4145 lbs

513 E 95000 STRUCTURAL STEEL, MISC.: REPAIR OF DAMAGED SECONDARY MEMBERS (FILLET WELDING)

Typical End X-Frame Assembly: 8 Rear Abutment Locations & 8 Forward Abutment Locations = 16 each
Given = 4 in. per leg; 5.44 in. per 45° convex welds; 10 in. per work line weld; 24 in. per plate weld
8 legs; 2 each 45° convex welds; 6 work line welds; 1 plate weld
End X-Frames Lexf = (4 in. x 8 legs) + (5.44 in. x 2 45° convex welds) + (10 in. x 6 work line welds) +
(24 in. x 1 plate welds) = 126.88 in. x (1 / 12) x 16 assemblies = 169.17 ft

Typical Intermediate X-Frame Assembly 2 Locations
Int X-Frames Lixf = 3 in. per leg x 2 legs x 3 angles x 2 ends x 2 locations = 72 in. x (1 / 12) = 6 ft

Item Total = Lexf + Lixf = 169.17 ft + 6 ft = 175.17 ft

Use 175 ft

514 E 00050 SURFACE PREPARATION OF EXISTING STRUCTURAL STEEL
514 E 00056 FIELD PAINTING OF EXISTING STRUCTURAL STEEL, PRIME COAT
514 E 00060 FIELD PAINTING STRUCTURAL STEEL, INTERMEDIATE COAT
514 E 00066 FIELD PAINTING STRUCTURAL STEEL, FINISH COAT

18 W36 x 230 Beams
Ab1 = *[(2 x 34.63 in.) + (3 x 16.5 in.)] / 12 x 133.58 ft x 9 beams = 11897.97 sq ft*
9 W36 x 260 Beams
Ab2 = *[(2 x 34.81 in.) + (3 x 16.56 in.] / 12 x 32 ft x 9 beams = 2863.2 sq ft*

Ab = Ab1 + Ab2 = 11897.97 sq ft + 2863.2 sq ft = 14761.17 sq ft

Pay Quantity
A = Ab plus 25% for crossframes, bearings and plates = 14761.17 sq ft x 1.25 = 18451.46 sq ft

Use 18451 sq ft

514 E 00504 GRINDING FINS, TEARS, SLIVERS ON EXISTING STRUCTURAL STEEL

T = Length x No. beams x 1 min / ft = 165.58 ft x 9 beams x (1 hr / 60 min) = 25 hrs

Use 25 hrs

514 E 10000 FINAL INSPECTION REPAIR

N beams = 1 per 300 feet of beam = 165.58 ft / 300 ft per each = 0.5519 --> round up = 1 each x 9 beams = 9 each
N X-Frames = 1 per 2.5% of all cross frame locations = (2.5 / 100) x 113 X-Frames = 2.825 --> round up = 3 each

N total = *9 + 3 each = 12 each*

Use 12 each

516 E 47001 JACKING AND TEMPORARY SUPPORT OF SUPERSTRUCTURE, AS PER PLAN

LUMP

519 E 11101 - PATCHING CONCRETE STRUCTURE, AS PER PLAN

Forward Abutment

Carried from Sheet 5|9 = 27.8 sq ft

Use 28 Sq Ft

625 E 33000 STRUCTURE GROUNDING SYSTEM

Use 1 Each

844 E 20000 - GALVANIC ANODE PROTECTION

Forward Abutment

Carried from Sheet 5|9
Patch A1 = 6 each
Patch A4 = 12 each

Item Total

T = Patch A1+ Patch A4
T = 6 + 12 = 18each

Use *18* *Each*

849 E 10000 DAMAGE ASSESSMENT

LUMP

849 E 10500 SURFACE PREPARATION

LUMP

849 E 10600 REPAIRING DAMAGED MEMBERS BY GRINDING

T = 0.1 hrs / length repaired x (20 ft Beam 9) = 2 hrs

Use 2 hours

849 E 10700 STRAIGHTENING DAMAGED MEMBERS

LUMP

512 E 10100 SEALING OF CONCRETE SURFACES (EPOXY-URETHANE) ****CADD Measured Areas***

Abutments

Rear Abutment

*Arear = 498.52 sq ft

Forward Abutment

*Afwd = 580.73 sq ft

Item Total

Atotal = *Arear + *Afwd

Atotal = 498.52 sq ft + 580.73 sq ft = 1079.25 sq ft

Atotal = 1079.25 sq ft x (1 / 9) = 119.92 sq yd **Use 120 sq yd**

512 E 74000 REMOVAL OF EXISTING COATINGS FROM CONCRETE SURFACES ****CADD Measured Areas***

Abutments

Rear Abutment

*Arear = 498.52 sq ft

Deductions for 519 E 11101 PATCHING CONCRETE STRUCTURE, AS PER PLAN

Arear = *Arear - Apcs

Arear = 498.52 sq ft - 0 sq ft = 498.52 sq ft

Forward Abutment

*Afwd = 580.73 sq ft

Deductions for 519 E 11101 PATCHING CONCRETE STRUCTURE, AS PER PLAN

Afwd = *Afwd - Apcs

Afwd = 580.73 sq ft - 27.8 sq ft = 552.93 sq ft

Item Total

Aabut = Arear + Afwd

Aabut = 498.52 sq ft + 552.93 sq ft = 1051.45 sq ft

Aabut = 1051.45 sq ft / 9 = 116.83 sq yd **Use 117 sq yd**