

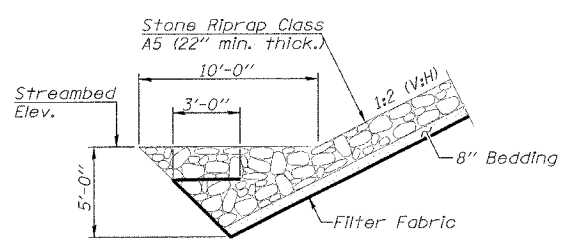
| | | | | |
|---------------------|----------|------------------|--------------|--------------------------|
| ROUTE NO. | SECTION | COUNTY | TOTAL SHEETS | SHEET NO. |
| F.A.P. 731 | * | GREENE | 30 | 6 |
| FED. ROAD DIST. NO. | ILLINOIS | FED. AID PROJECT | | |
| FEDERAL AID PROJECT | | | | |
| * 01-00071-00-BR | | | | |
| CONTRACT NO. 97289 | | | | Sheet No. 2 of 23 Sheets |

GENERAL NOTES

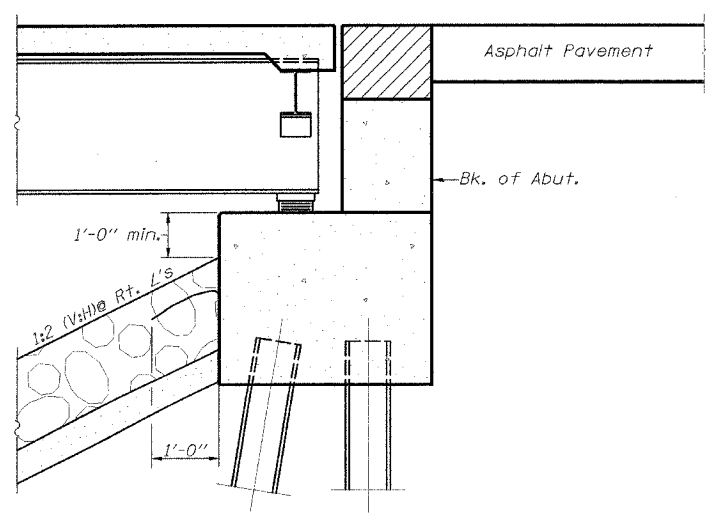
Fasteners shall be high strength bolts A.A.S.H.T.O. M 164, Type 3 in unpainted areas and mechanically galvanized A.A.S.H.T.O. M 164, Type 1 or 2 in painted areas. Bolts 1/2" Ø, open holes 5/8" Ø, unless otherwise noted. Calculated weight of structural steel = 15,247.70 Pounds (M 270 Grade 50W). All structural steel shall be A.A.S.H.T.O. M 270 Grade 50W except expansion joint plates and attached bars which shall be A.A.S.H.T.O. M 270 Grade 50. Field welding of construction accessories will not be permitted to beams. Anchor bolts shall be set before bolting diaphragms over supports. The structural steel bearing plates of the Elastomeric Bearing Assembly shall conform to the requirements of A.A.S.H.T.O. M 270, Grade 50W. The main load carrying member components subject to tensile stress shall conform to the Supplemental Requirements for Notch Toughness Zone 2. These components are the wide flange beams and all splice plate material except fill plates. Reinforcement bars shall conform to the requirements of A.A.S.H.T.O. M31 or M322, Grade 60. Layout of the slope protection system may be varied in the field to suit ground conditions as directed by the engineer. Bearing seat surfaces shall be constructed or adjusted to the designated elevations within a tolerance of 1/8" inch. Adjustment shall be made either by grinding the surface or by shimming the bearing. Two 1/8" adjusting shims, of the dimensions of the bottom bearing plate, shall be provided for each bearing in addition to all other plates or shims. The Contractor shall drive one test pile in a permanent location at each substructure unit as directed by the Engineer before ordering the remainder of piles. When the deck pour is stopped for the day at one or more of the Transverse Bonded Construction Joints in the deck Pouring Sequence as shown, the next pour shall not be made until both of the following requirements are met:

1. At least 72 hours shall have elapsed from the end of the previous pour.
2. The concrete strength shall have attained a minimum flexural strength of 650 psi or a minimum compressive strength of 3500 psi.

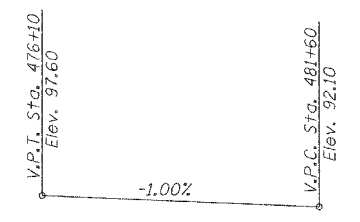
The existing structural steel coating contains lead. The Contractor shall take appropriate precautions to deal with the presence of lead on this project. All construction joints shall be bonded. The contractor shall obtain a construction permit from the Illinois Department of Natural Resources (I.D.N.R.), Office of Water Resources for any temporary construction activity placed in the water except cofferdams. This shall include the placement of material for run-arounds, causeways, etc. Any permit application by the Contractor shall refer to the I.D.N.R. permit number D52004161 which was issued for the permanent construction. Expansion joint plates and attached bars shall be shop painted with the inorganic zinc rich primer. Concrete Sealer shall be applied to the seat area of the abutments. A.A.S.H.T.O. M 270 Grade 50W structural steel shall only be painted, for a distance of three times the depth of the beams (but not exceeding 10 feet) each way from the deck joints. All structural steel shall be cleaned as specified in the special provision for "Surface Preparation and Painting Requirements for Weathering Steel".



STONE RIPRAP ANCHOR DETAIL



SECTION THRU PILE BENT ABUTMENT
(Horiz. dim. @ Rt. L's)



PROFILE GRADE

TOTAL BILL OF MATERIAL

| Item | Super | Sub | Total | |
|--|---------|--------|-------|--------|
| Channel Excavation | Cu. Yd. | | 821 | |
| Stone Riprap, Class A5 | Ton | 1166 | 1166 | |
| Filter Fabric | Sq. Yd. | 890 | 890 | |
| Removal of Existing Structures | Each | | 1 | |
| Structure Excavation | Cu. Yd. | 427 | 427 | |
| Preformed Joint Strip Seal | Foot | 60 | 60 | |
| Concrete Structures | Cu. Yd. | 298.6 | 298.6 | |
| Concrete Superstructure | Cu. Yd. | 409.7 | 409.7 | |
| Bridge Deck Grooving | Sq. Yd. | 1639 | 1639 | |
| Protective Coat | Sq. Yd. | 1639 | 1639 | |
| Elastomeric Bearing Assembly, Type II | Each | 10 | 10 | |
| Elastomeric Bearing Assembly, Type III | Each | 10 | 10 | |
| Furnishing and Erecting Structural Steel | L. Sum | 1 | 1 | |
| Stud Shear Connectors | Each | 4935 | 4935 | |
| Reinforcement Bars (Epoxy Coated) | Pound | 101230 | 39900 | 141130 |
| Steel Rolling Type SM | Foot | 992 | 992 | |
| Furnishing Steel Piles HP10x42 | Foot | 810 | 810 | |
| Furnishing Steel Piles HP12x53 | Foot | 1880 | 1880 | |
| Driving Piles | Foot | 2690 | 2690 | |
| Test Pile, Steel HP10x42 | Each | 2 | 2 | |
| Test Pile, Steel HP12x53 | Each | 4 | 4 | |
| Name Plates | Each | 1 | 1 | |
| Concrete Sealer | Sq. Ft. | 195 | 195 | |
| Underwater Structure Excavation Protection - Location 1 (Pier 1) | Each | 1 | 1 | |
| Underwater Structure Excavation Protection - Location 2 (Pier 4) | Each | 1 | 1 | |
| Cofferdam (Pier No. 2) | Each | 1 | 1 | |
| Cofferdam (Pier No. 3) | Each | 1 | 1 | |
| Cofferdam Excavation | Cu. Yd. | 607 | 607 | |
| Seal Coat Concrete | Cu. Yd. | 82.6 | 82.6 | |

WATERWAY INFORMATION

Drainage Area = 146.5 Sq. Miles Low Grade Elev. = 91.55 @ Sta. 482+60

| Flood | Freq. Yr. | C.F.S. | Opening Sq. Ft. | | Nat. H.W.E. | Head-Ft. | | Headwater El. | |
|---------------------------------------|-----------|--------|-----------------|-------|-------------|----------|-------|---------------|-------|
| | | | Exist. | Prop. | | Exist. | Prop. | Exist. | Prop. |
| Design | 25 | 14,158 | 2,983 | 2,991 | 87.5 | 0.3 | 0.3 | 87.8 | 87.8 |
| Base | 100 | 18,936 | 3,603 | 3,653 | 88.9 | 0.5 | 0.4 | 89.4 | 89.3 |
| Exist. Overtop Greater than 500 Years | | | | | | | | | |
| Prop. Overtop Greater than 500 Years | | | | | | | | | |
| Max. Calc. | 500 | 24,622 | 4,114 | 4,221 | 90.4 | 0.8 | 0.8 | 91.2 | 91.2 |

DESIGN STRESSES
FIELD UNITS

f'c = 3500 psi
fy = 60,000 psi (Reinf.)
Fy = 50,000 psi (Structural Steel) (M270 Grade 50W)

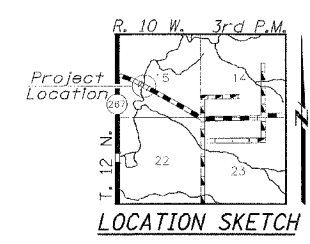
DESIGN SPECIFICATIONS
2002 A.A.S.H.T.O. Specifications.

LOADING HS 20-44

Allow 50#/sq. ft. for future wearing surface.

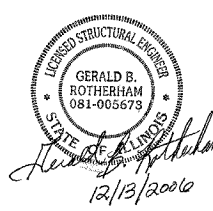
APPLE CREEK
BUILT 200 BY
ATHENSVILLE TOWNSHIP
GREENE COUNTY
SECTION 01-00071-00-BR
STA. 478+65.75
STR. NO. 031-3144 LOADING HS20

NAME PLATE
(Standard 515001)



LOCATION SKETCH

I certify that to the best of my knowledge, information and belief, this bridge design is structurally adequate for the design loading shown on the plans. The design is an economical one for the style of structure and complies with requirements of the current "A.A.S.H.T.O. Standard Specifications for Highway Bridges".
Gerald B. Rotherham
Expiration Date 11/30/2008

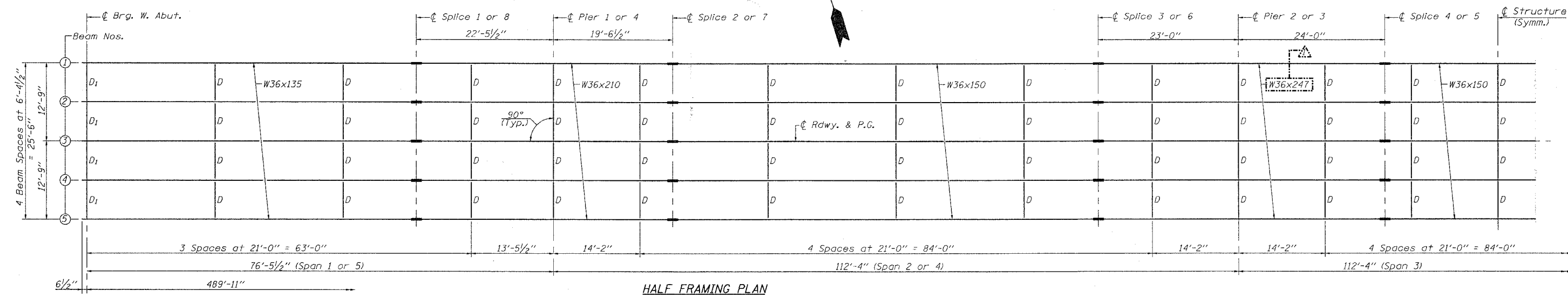


GENERAL PLAN & ELEVATION
F.A.S. 731 - C.H. 2
OVER APPLE CREEK
SECTION 01-00071-00-BR
GREENE COUNTY

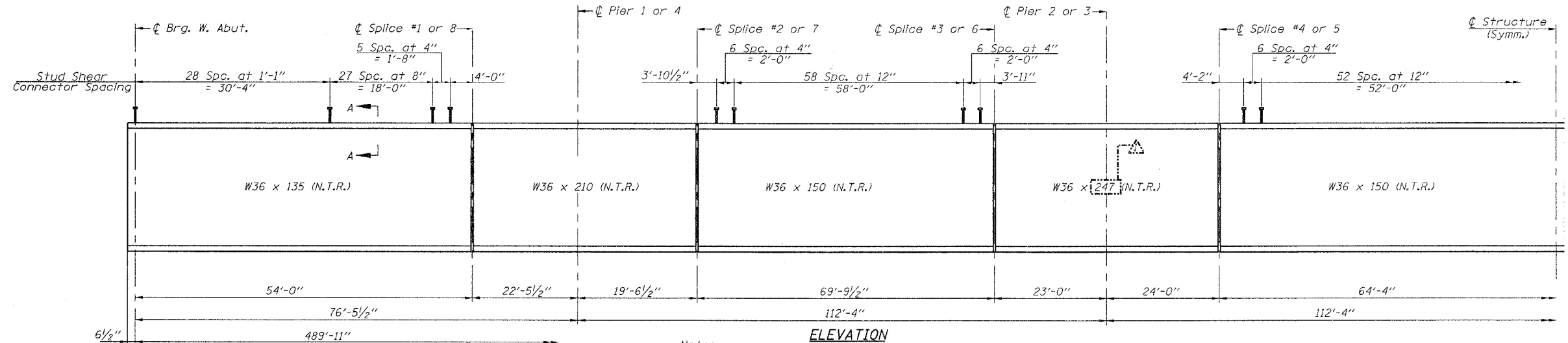
Designed: _____
Checked: _____
Drawn: _____
Checked: _____

| | | | | |
|---------------------|----------|------------------|--------------|-----------|
| ROUTE NO. | SECTION | COUNTY | TOTAL SHEETS | SHEET NO. |
| F.A.P. 731 | * | GREENE | 30 | 13 |
| FED. ROAD DIST. NO. | ILLINOIS | FED. AID PROJECT | | |
| FEDERAL AID PROJECT | | | | |

* 01-00071-00-BR
CONTRACT NO. 97289 Sheet No. 9 of 23 Sheets



HALF FRAMING PLAN



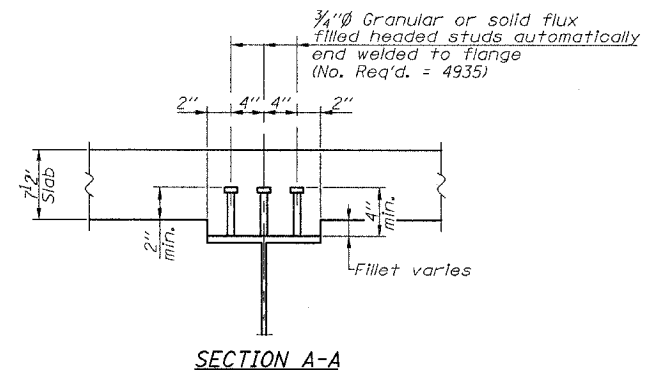
ELEVATION

Notes:
 N.T.R. denotes beams to which Notch Toughness requirements are applicable.
 All structural steel shall be A.A.S.H.T.O. M 270, Grade 50W.

TOP OF BEAM ELEVATIONS

| LOCATION | Beam #1 | Beam #2 | Beam #3 | Beam #4 | Beam #5 |
|---------------|---------|---------|---------|---------|---------|
| W. Abut. Brg. | 96.626 | 96.726 | 96.826 | 96.726 | 96.626 |
| Splice #1 (W) | 95.965 | 96.065 | 96.165 | 96.065 | 95.965 |
| Splice #1 (E) | 96.013 | 96.113 | 96.213 | 96.113 | 96.013 |
| Pier #1 | 95.783 | 95.883 | 95.983 | 95.883 | 95.783 |
| Splice #2 (W) | 95.583 | 95.683 | 95.783 | 95.683 | 95.583 |
| Splice #2 (E) | 95.548 | 95.648 | 95.748 | 95.648 | 95.548 |
| Splice #3 (W) | 94.852 | 94.952 | 95.052 | 94.952 | 94.852 |
| Splice #3 (E) | 94.885 | 94.985 | 95.085 | 94.985 | 94.885 |
| Pier #2 | 94.655 | 94.755 | 94.855 | 94.755 | 94.655 |
| Splice #4 (W) | 94.415 | 94.515 | 94.615 | 94.515 | 94.415 |
| Splice #4 (E) | 94.382 | 94.482 | 94.582 | 94.482 | 94.382 |
| Splice #5 (W) | 93.739 | 93.839 | 93.939 | 93.839 | 93.739 |
| Splice #5 (E) | 93.772 | 93.872 | 93.971 | 93.872 | 93.772 |
| Pier #3 | 93.532 | 93.632 | 93.731 | 93.632 | 93.532 |
| Splice #6 (W) | 93.302 | 93.402 | 93.501 | 93.402 | 93.302 |
| Splice #6 (E) | 93.269 | 93.369 | 93.468 | 93.369 | 93.269 |
| Splice #7 (W) | 92.569 | 92.669 | 92.769 | 92.669 | 92.569 |
| Splice #7 (E) | 92.604 | 92.704 | 92.804 | 92.704 | 92.604 |
| Pier #4 | 92.413 | 92.513 | 92.613 | 92.513 | 92.413 |
| Splice #8 (W) | 92.194 | 92.294 | 92.394 | 92.294 | 92.194 |
| Splice #8 (E) | 92.146 | 92.246 | 92.346 | 92.246 | 92.146 |
| E. Abut. Brg. | 91.727 | 91.827 | 91.926 | 91.827 | 91.727 |

Revised 1-5-08



SECTION A-A

Notes:
 Top of beam elevations are for fabrication only and do not include dead load deflections.

STRUCTURAL STEEL DETAILS
 F.A.S. 731 - C.H. 2
 OVER APPLE CREEK
 SECTION 01-00071-00-BR
 GREENE COUNTY

| | | | | |
|---------------------|---------|----------|------------------|-----------|
| ROUTE NO. | SECTION | COUNTY | TOTAL SHEETS | SHEET NO. |
| F.A.P. 731 | | GREENE | 30 | 14 |
| FED. ROAD DIST. NO. | | ILLINOIS | FED. AID PROJECT | |
| FEDERAL AID PROJECT | | | | |

CONTRACT NO. 97289
 01-00071-00-BR
 Sheet No. 10 of 23 Sheets

INTERIOR BEAM MOMENT TABLE

| | | 0.4 Span 1 or 0.6 Span 5 | Pier #1 or Pier #4 | 0.5 Span 2 or 0.5 Span 4 | Pier #2 or Pier #3 | 0.5 Span 3 |
|-----------------------|--------------------|-----------------------------|-----------------------|-----------------------------|-----------------------|------------|
| Is | (in ⁴) | 7800 | 13200 | 9040 | 16700 | 9040 |
| Ic (n) | (in ⁴) | 18590 | - | 20523 | - | 20523 |
| Ic (3n) | (in ⁴) | 13811 | - | 15259 | - | 15259 |
| Ss | (in ³) | 439 | 720 | 504 | 913 | 504 |
| Sc (n) | (in ³) | 610 | - | 682 | - | 682 |
| Sc (3n) | (in ³) | 554 | - | 621 | - | 621 |
| Q | (K/ft) | 0.77 | 1.18 | 0.79 | 1.22 | 0.79 |
| M Q | (ft-k) | 237.5 | 1092.4 | 399.5 | 1358.2 | 322.7 |
| S Q | (K/ft) | 0.32 | - | 0.32 | - | 0.32 |
| Ms Q | (ft-k) | 113.4 | - | 190.4 | - | 154.5 |
| M L | (ft-k) | 530.4 | 522.4 | 680.4 | 660.6 | 674.6 |
| M (Imp) | (ft-k) | 131.6 | 119.6 | 143.6 | 139.4 | 142.4 |
| 5s(M L + M (Imp)) | (ft-k) | 1103.3 | 1070.0 | 1373.3 | 1333.3 | 1361.7 |
| Ma | (ft-k) | 1890.5 | 2811.1 | 2552.2 | 3499.0 | 2390.6 |
| fs Q non-comp k.s.i. | | 6.49 | 18.21 | 9.50 | 17.85 | 7.68 |
| fs Q (comp) k.s.i. | | 2.46 | - | 3.68 | - | 2.99 |
| fs 5s(L + Imp) k.s.i. | | 21.73 | 17.83 | 24.17 | 17.52 | 23.97 |
| fs (Overload) k.s.i. | | 30.68 | 36.04 | 37.35 | 35.37 | 34.64 |
| fs (Total) k.s.i. | | 39.88 | 46.85 | 48.56 | 45.98 | 45.03 |
| VR | (k) | 56 | - | 58 | - | 57 |

EXTERIOR BEAM MOMENT TABLE

| | | 0.4 Span 1 or 0.6 Span 5 | Pier #1 or Pier #4 | 0.5 Span 2 or 0.5 Span 4 | Pier #2 or Pier #3 | 0.5 Span 3 |
|-----------------------|--------------------|-----------------------------|-----------------------|-----------------------------|-----------------------|------------|
| Is | (in ⁴) | 7800 | 13200 | 9040 | 16700 | 9040 |
| Ic (n) | (in ⁴) | 17885 | - | 19728 | - | 19728 |
| Ic (3n) | (in ⁴) | 13191 | - | 14595 | - | 14595 |
| Ss | (in ³) | 439 | 720 | 504 | 913 | 504 |
| Sc (n) | (in ³) | 602 | - | 674 | - | 674 |
| Sc (3n) | (in ³) | 545 | - | 611 | - | 611 |
| Q | (K/ft) | 0.86 | 1.273 | 0.88 | 1.32 | 0.88 |
| M Q | (ft-k) | 265.1 | 1185.2 | 443.1 | 1469.2 | 357.2 |
| S Q | (K/ft) | 0.32 | - | 0.32 | - | 0.32 |
| Ms Q | (ft-k) | 112.2 | - | 187.5 | - | 151.7 |
| M L | (ft-k) | 520.4 | 531.3 | 664.7 | 672.2 | 659.8 |
| M (Imp) | (ft-k) | 129.6 | 121.7 | 140.3 | 141.8 | 139.2 |
| 5s(M L + M (Imp)) | (ft-k) | 1083.3 | 1088.3 | 1341.7 | 1356.7 | 1331.7 |
| Ma | (ft-k) | 1898.8 | 2955.6 | 2564.0 | 3673.7 | 2392.8 |
| fs Q non-comp k.s.i. | | 7.25 | 19.72 | 10.54 | 19.31 | 8.50 |
| fs Q (comp) k.s.i. | | 2.47 | - | 3.68 | - | 2.98 |
| fs 5s(L + Imp) k.s.i. | | 21.58 | 18.15 | 23.88 | 17.83 | 23.70 |
| fs (Overload) k.s.i. | | 31.30 | 37.87 | 38.10 | 37.14 | 35.20 |
| fs (Total) k.s.i. | | 40.69 | 49.23 | 49.50 | 48.28 | 45.76 |
| VR | (k) | 49 | - | 51 | - | 51 |

INTERIOR BEAM REACTION TABLE

| | | Abuts. | Piers 1 & 4 | Piers 2 & 3 |
|-----------|-----|--------|-------------|-------------|
| R Q | (k) | 28.7 | 119.5 | 132.4 |
| R L | (k) | 40.0 | 56.8 | 62.3 |
| Imp. | (k) | 10.0 | 13.0 | 13.1 |
| R (Total) | (k) | 78.7 | 189.3 | 207.8 |

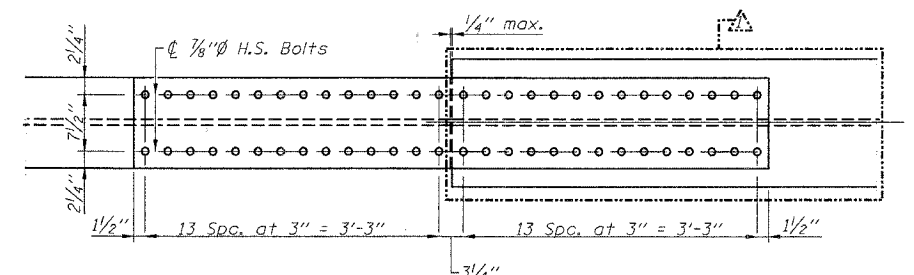
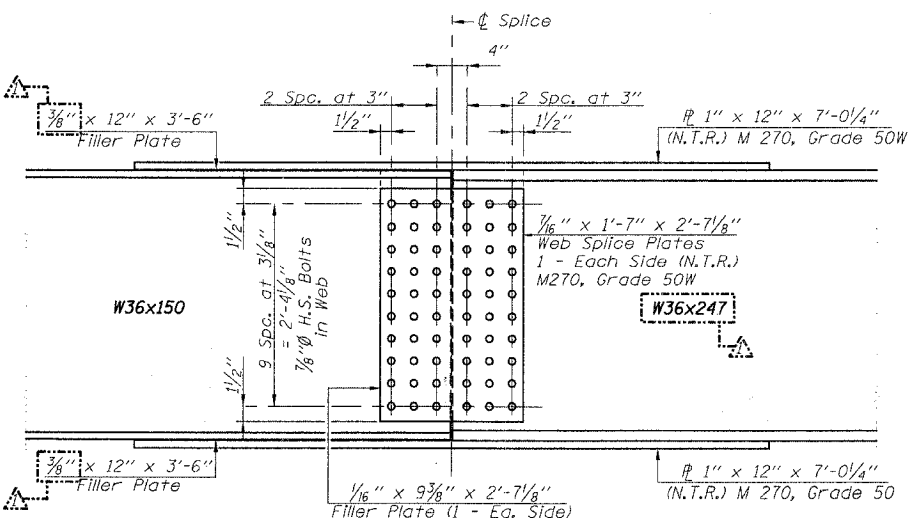
Note: Reactions are not factored

EXTERIOR BEAM REACTION TABLE

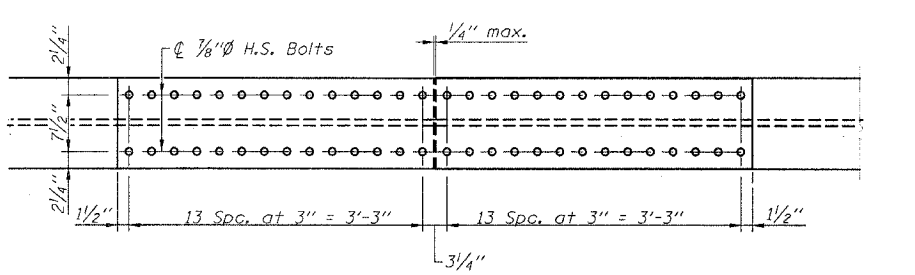
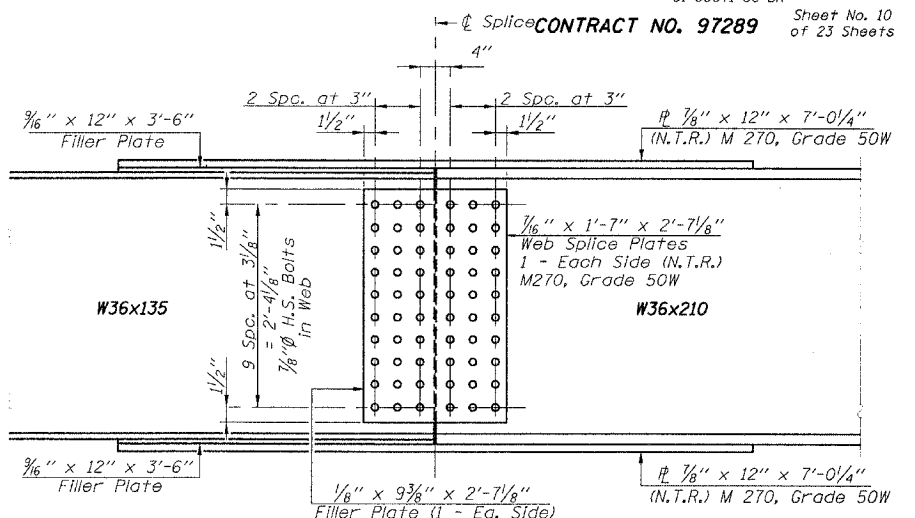
| | | Abuts. | Piers 1 & 4 | Piers 2 & 3 |
|-----------|-----|--------|-------------|-------------|
| R Q | (k) | 30.9 | 129.1 | 142.7 |
| R L | (k) | 35.1 | 57.3 | 62.8 |
| Imp. | (k) | 8.7 | 13.1 | 13.3 |
| R (Total) | (k) | 74.7 | 199.5 | 218.7 |

Note: Reactions are not factored

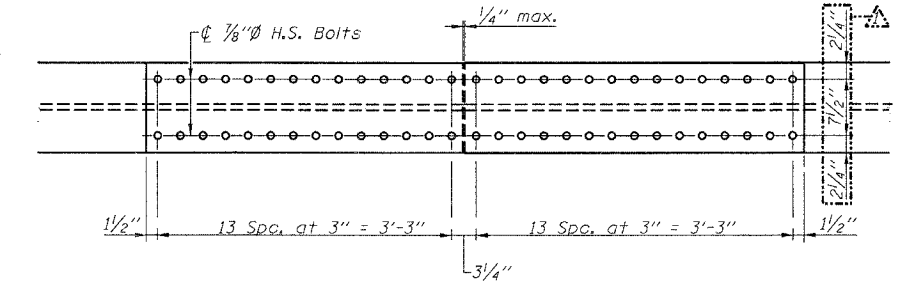
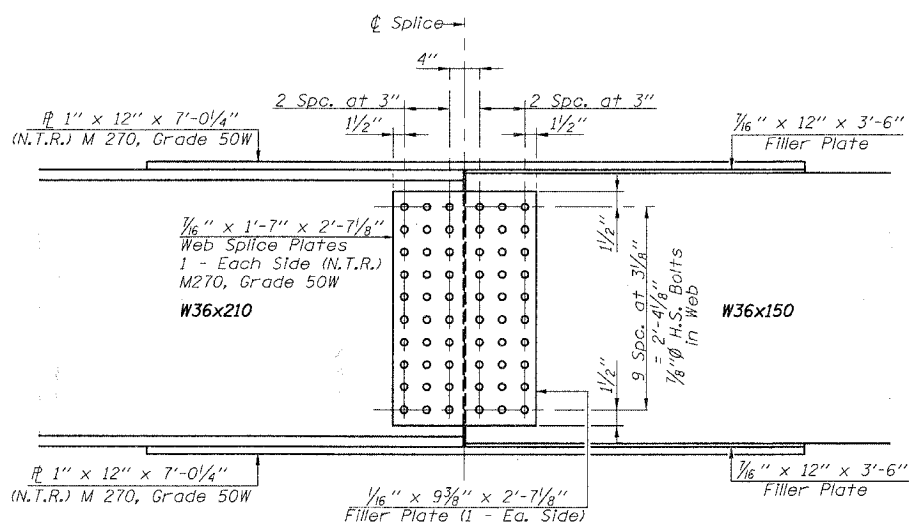
Is and Ss are the moment of inertia and section modulus of the steel section used in computing fs (Total & Overload).
 Ic(n) and Sc(n) are the moment of inertia and section modulus of the composite section used in computing stresses due to Live Load.
 Ic(3n) and Sc(3n) are the moment of inertia and section modulus of the composite section used in computing stresses due to superimposed dead loads. (See AASHTO 10.38).
 VR is the maximum Live Load + Impact shear range in span.
 Ma (Applied Moment) = 1.3 [M Q + Ms Q + 5s(M L + M (Imp))]]
 fs (Overload) is the sum of the stresses due to M Q + Ms Q + 5s(M L + M (Imp)).
 fs (Total) (Non-compact section) is the sum of the stresses due to 1.3[M Q + Ms Q + 5s(M L + M (Imp))].



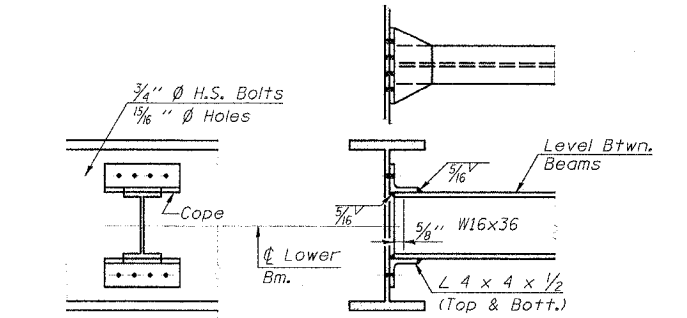
SPLICE NOS. 3, 4, 5 & 6



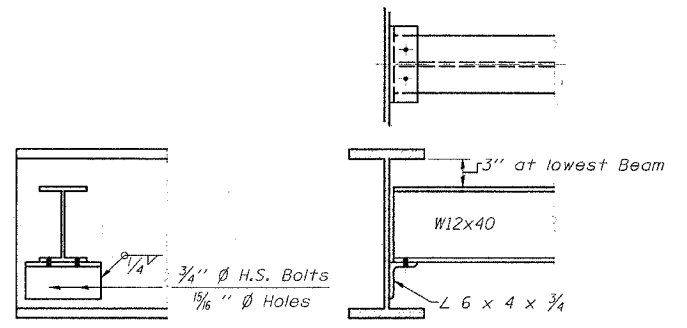
SPLICE NOS. 1 & 8



SPLICE NOS. 2 & 7



DIAPHRAGM D
(100 Required)



DIAPHRAGM D1
(18 Required)

STRUCTURAL STEEL DETAILS
 F.A.S. 731 - C.H. 2
 OVER APPLE CREEK
 SECTION 01-00071-00-BR
 GREENE COUNTY

Revised 1-5-07

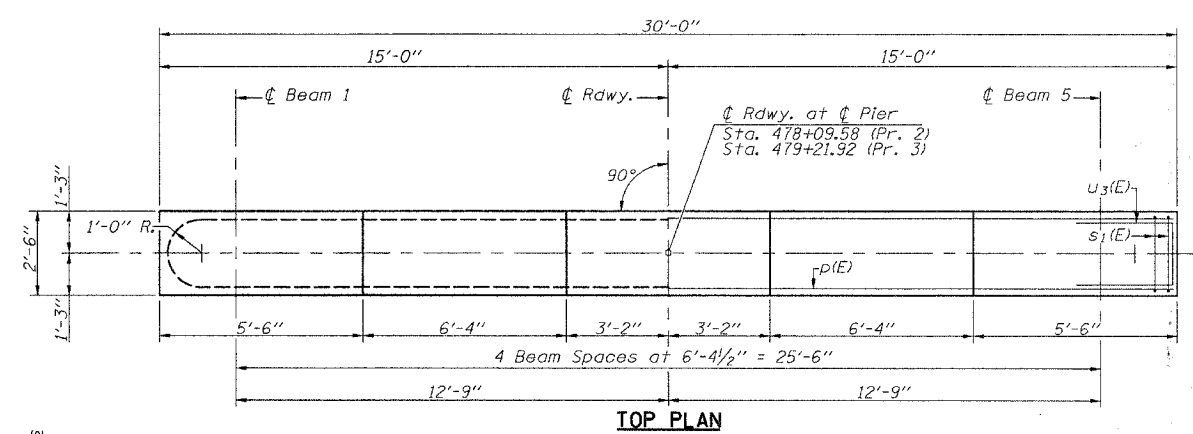
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|---------------------|---------|----------|------------------|-----------|
| ROUTE NO. | SECTION | COUNTY | TOTAL SHEETS | SHEET NO. |
| F.A.P. 731 | | GREENE | 30 | 22 |
| FED. ROAD DIST. NO. | | ILLINOIS | FED. AID PROJECT | |
| FEDERAL AID PROJECT | | | | |

CONTRACT NO. 97289
 01-00071-00-BR
 Sheet No. 18
 of 23 Sheets

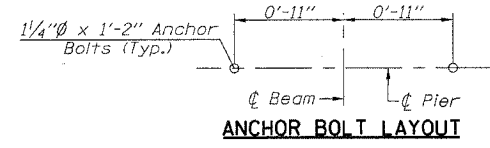
PILE DATA

Pier No. 2 Pier No. 3
 Steel HP 10x42 Steel HP 10x42
 Nominal Required Bearing: 335 kips 335 kips
 Allowable Resistance Available: Driven to refusal Driven to refusal
 Estimated Pile Length: 28' 26'
 Number of Production: 15 15
 Number of Test Piles: 1 1

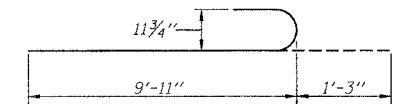
Note: The Steel H-piles shall be according to AASHTO M 270, Grade 50.
 The Test Piles shall be driven to 110 percent of the nominal required bearing indicated in the pile data information.



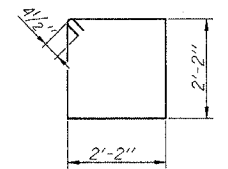
TOP PLAN



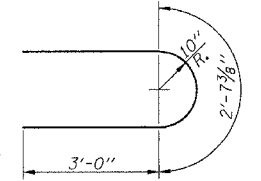
ANCHOR BOLT LAYOUT



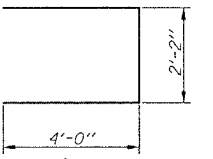
BAR n(E)



BAR s1(E)



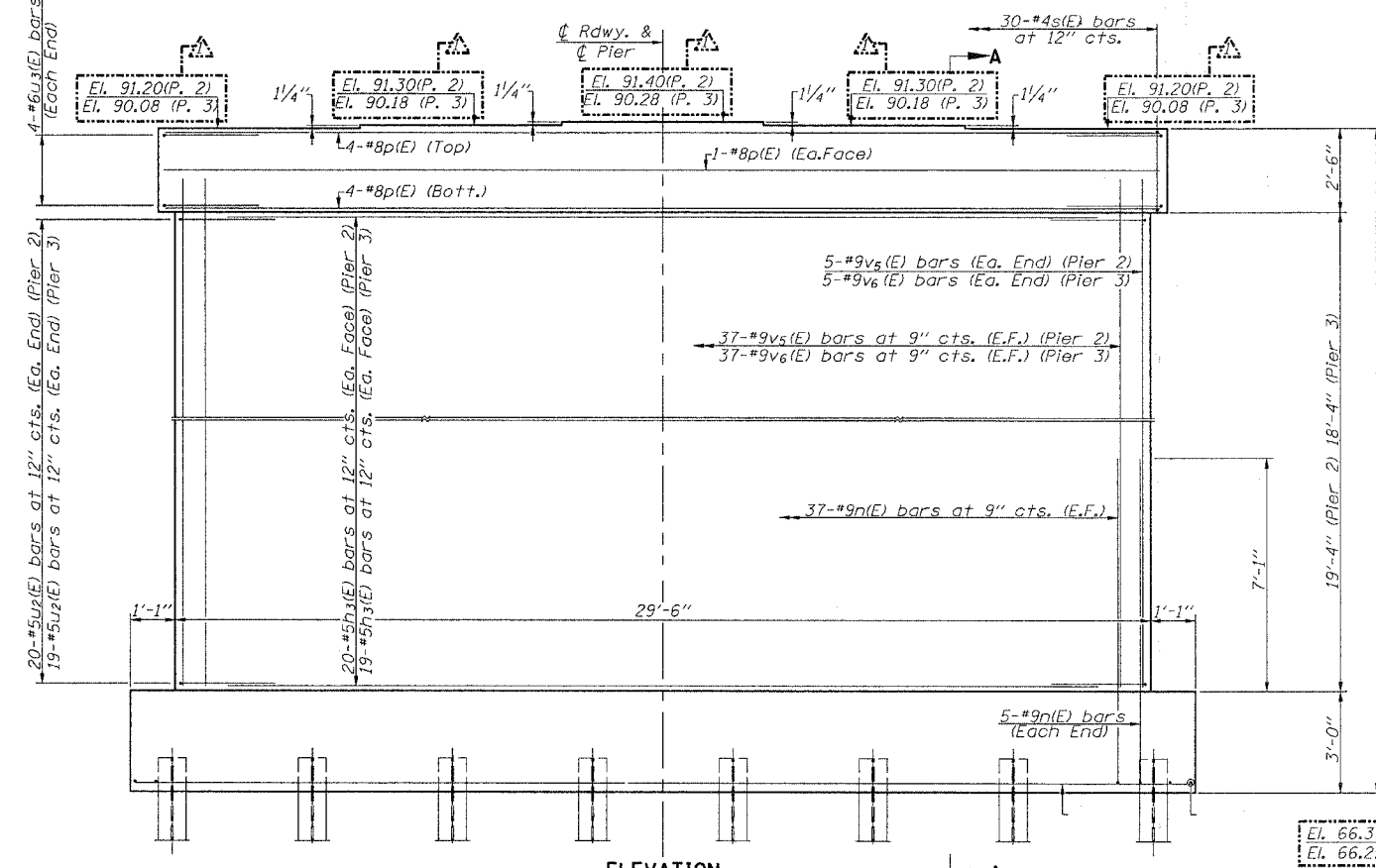
BAR u2(E)



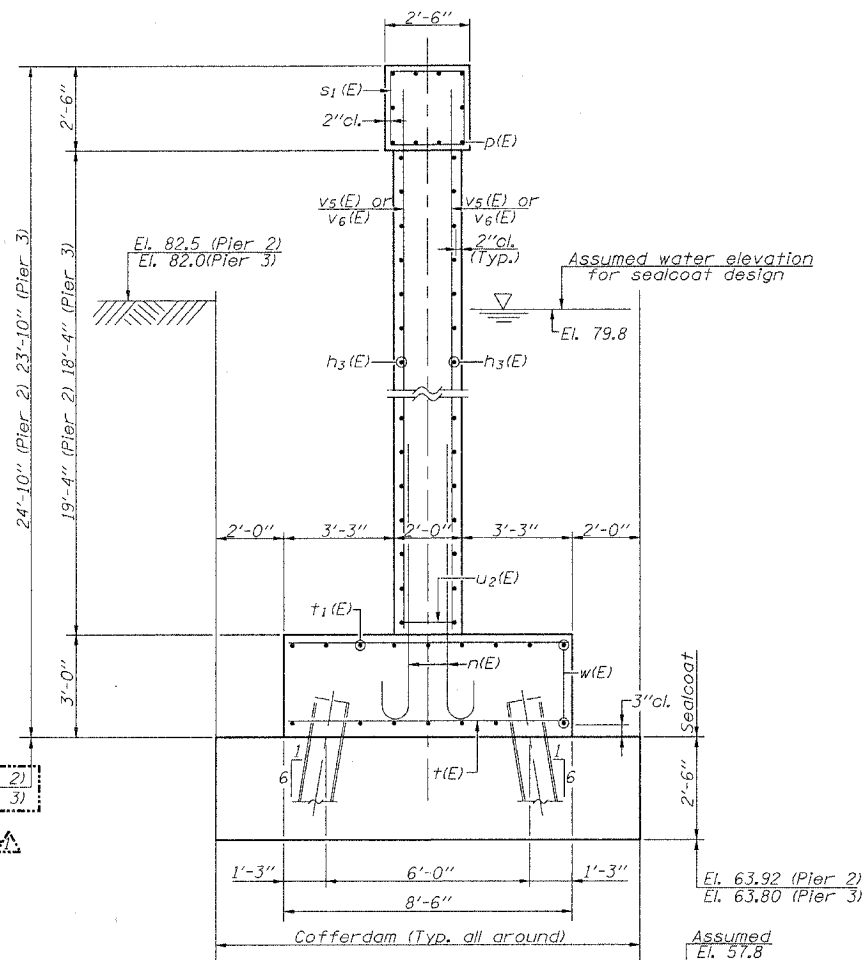
BAR u3(E)

**TWO PIERS
 BILL OF MATERIAL**

| BAR | NO. | SIZE | LENGTH | SHAPE |
|----------------------------------|-----|------|---------|-------|
| h3(E) | 78 | #5 | 27'-6" | — |
| n(E) | 168 | #9 | 11'-2" | U |
| p(E) | 20 | #8 | 29'-8" | — |
| s1(E) | 60 | #4 | 9'-5" | □ |
| t(E) | 92 | #8 | 8'-2" | — |
| t1(E) | 64 | #5 | 8'-2" | — |
| u2(E) | 156 | #5 | 8'-8" | U |
| u3(E) | 16 | #6 | 10'-2" | U |
| v5(E) | 84 | #9 | 21'-0" | — |
| v6(E) | 84 | #9 | 20'-0" | — |
| w(E) | 36 | #5 | 31'-4" | — |
| Concrete Structures | | | Cu. Yd. | 155.3 |
| Reinforcement Bars, Epoxy Coated | | | Pound | 27345 |
| Furnishing Steel Piles HP 10x42 | | | Foot | 810 |
| Driving Piles | | | Foot | 810 |
| Test Pile, Steel HP 10x42 | | | Each | 2 |
| Cofferdam Excavation | | | Cu. Yd. | 607 |
| Cofferdam (Pier No. 2) | | | Each | 1 |
| Cofferdam (Pier No. 3) | | | Each | 1 |
| Seal Coat Concrete | | | Cu. Yd. | 82.6 |



ELEVATION

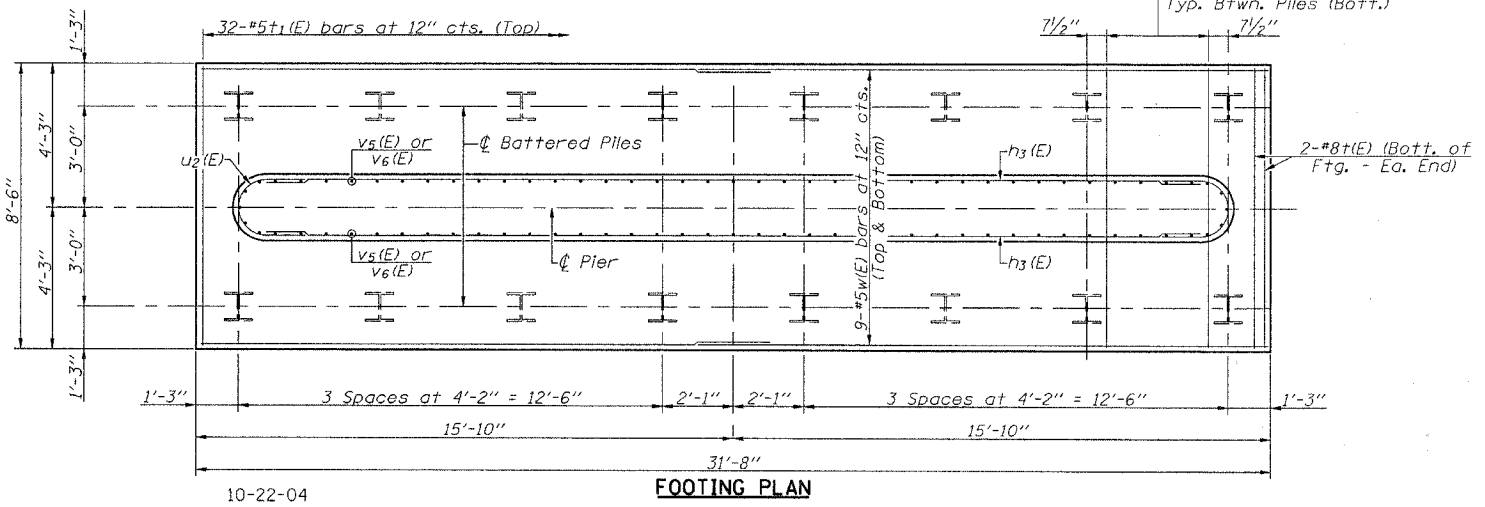


SECTION A-A

MIN. BAR LAPS

- #5 Bars = 2'-2"
- #6 Bars = 2'-6"
- #9 Bars = 6'-11"

Notes:
 Pour steps monolithically with pier.
 All edges shall have standard 3/4 inch chamfers except as noted.
 Reinforcement bars designated (E) shall be epoxy coated.



FOOTING PLAN

Revised
 1-5-07

**PIERS 2 & 3
 F.A.S. 731 - C.H. 2
 OVER APPLE CREEK
 SECTION 01-00071-00-BR
 GREENE COUNTY**