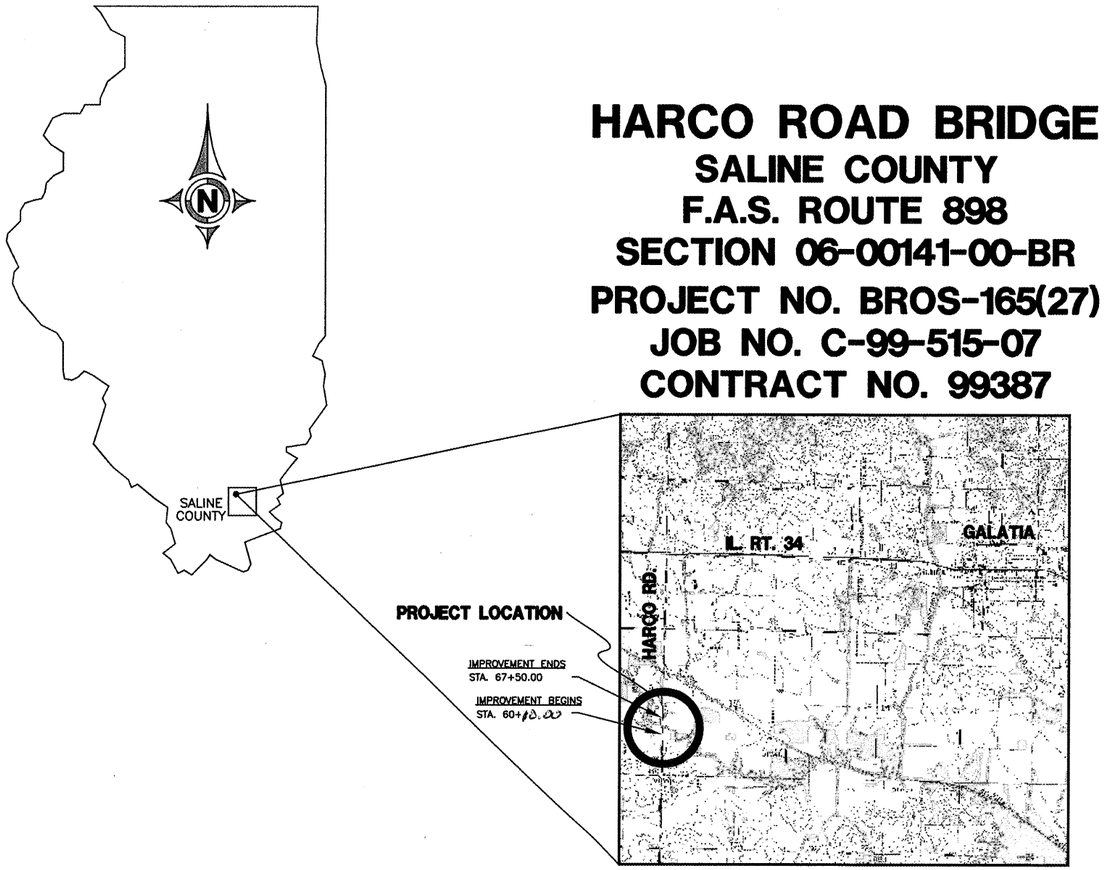
6-12-09 Letting, Item 162

Set No.

# STATE OF ILLINOIS
# DEPARTMENT OF TRANSPORTATION
# DIVISION OF HIGHWAYS
## PLANS FOR PROPOSED

**FUNCTIONAL CLASS: Collector**
**ADT (09): 1500**
**DESIGN SPEED: 50 MPH**

# HARCO ROAD BRIDGE
## SALINE COUNTY
## F.A.S. ROUTE 898
## SECTION 06-00141-00-BR
## PROJECT NO. BROS-165(27)
## JOB NO. C-99-515-07
## CONTRACT NO. 99387




**LOCATION MAP**

0 2500 5000 10000

TOTAL/NET LENGTH
PROJECT LENGTH = 740.00 FT. (0.14 MILES)

## INDEX OF SHEETS



STANDARDS

| | |
|---|---|
| 280001–04 | TEMPORARY EROSION CONTROL |
| 420401–07 | BRIDGE APPROACH PAVEMENT |
| 515001–03 | NAME PLATE |
| 630001–08 | STEEL PLATE BEAM GUARDRAIL |
| 631006–06 | TRAFFIC BARRIER TERM TY 1B |
| 701901–01 | TRAFFIC CONTROL |
| BLR 21–8 | TRAFFIC CONTROL |

ALL EXISTING UTILITIES AND LOCATIONS TO BE CONFIRMED BY J.U.L.I.E. 800–892–0123

Jim W. Brown as President of
Illinois Professional Design Firm
Land Survey & Prof. Eng. Corp
Number 184-002518
Expires April 30, 2011

J.W. BROWN PRESIDENT 184-002518 REGISTERED PROFESSIONAL ENGINEER CORPORATION

April 14, 2009

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTAION

APPROVED 04-15-09
JEFFREY W. JONES, COUNTY ENGINEER

PASSED 4/16/2009
DISTRICT 9 ENGINEER OF LOCAL ROADS & STREETS

RELEASING FOR BID BASED ON LIMITED REVIEW 4/17/09
MARY C. LAMIE, P.E.
DEPUTY DIRECTOR OF HIGHWAYS
REGION FIVE ENGINEER

**BRI JOB 07020**

SHARED\01-\01019\AC\COVER.DWG

| ROUTE | SECTION | COUNTY | TOTAL SHEETS | SHEET NO. |
|---|---|---|---|---|
| 898 | 06-001141-000-BR | SALINE | 16 | 2 |
| SALINE COUNTY | | HARCO ROAD | | |

**CONTRACT NO. 99387**
**PROJECT NO. BROS-165(27)**

# SUMMARY OF QUANTITIES

X081-2A

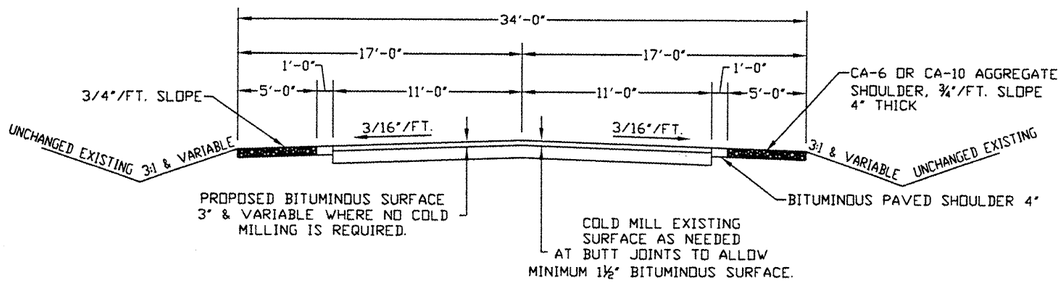
| CODE NO. | PAY ITEM | UNIT | QUANTITY |
|---|---|---|---|
| 20100500 | TREE REMOVAL, ACRES | ACRE | 0.2 |
| Δ 20200100 | EARTH EXCAVATION | CU YD | 140 |
| Δ 25001000 | SEEDING, CLASS 2 (SPECIAL) | ACRE | 0.3 |
| Δ 28100807 | STONE DUMPED RIPRAP, CLASS A4 | TON | 260 |
| Δ 40603320 | HOT-MIX ASPHALT SURFACE COURSE, MIX "C", N90 | TON | 150 |
| 42001165 | BRIDGE APPROACH PAVEMENT | SQ YD | 146.6 |
| Δ 44000080 | HOT-MIX ASPHALT SURFACE REMOVAL (COLD MILLING) | SQ YD | 490 |
| 48101200 | AGGREGATE SHOULDERS, TYPE B | TON | 100 |
| Δ 50100200 | REMOVAL OF EXISTING STRUCTURES | L SUM | 1 |
| 50105220 | PIPE CULVERT REMOVAL | FOOT | 50 |
| 50300225 | CONCRETE STRUCTURES | CU YD | 27.2 |
| 50300280 | CONCRETE ENCASEMENT | CU YD | 4.0 |
| 50400605 | PRECAST PRESTRESSED CONCRETE DECK BEAMS (33" DEPTH) | SQ FT | 2250 |
| 50800105 | REINFORCEMENT BARS | POUND | 3220 |
| 50800205 | REINFORCEMENT BARS, EPOXY COATED | POUND | 11174 |
| * 50901050 | STEEL RAILING, TYPE SM | FOOT | 150 |
| 51201600 | FURNISHING STEEL PILES HP12X53 | FOOT | 756 |
| 51202305 | DRIVING PILES | FOOT | 756 |
| 51500100 | NAME PLATES | EACH | 1 |
| 54200439 | PIPE CULVERTS, TYPE 1 RCCP 24" | FOOT | 170 |
| 58100200 | WATERPROOFING MEMBRANE SYSTEM | SQ YD | 250 |
| 58300100 | PORTLAND CEMENT MORTAR FAIRING COURSE | FOOT | 675 |
| * 63000001 | STEEL PLATE BEAM GUARDRAIL, TYPE A, 6 FOOT POSTS | FOOT | 230 |
| * 63000005 | STEEL PLATE BEAM GUARDRAIL, TYPE B | FOOT | 100 |
| * 63100041 | TRAFFIC BARRIER TERMINAL, TYPE 1B | EACH | 4 |
| 67100100 | MOBILIZATION | L SUM | 1 |
| * 78001110 | PAINT PAVEMENT MARKING - LINE 4" | FOOT | 675 |

* SPECIALTY ITEMS

Δ SEE SPECIAL PROVISION

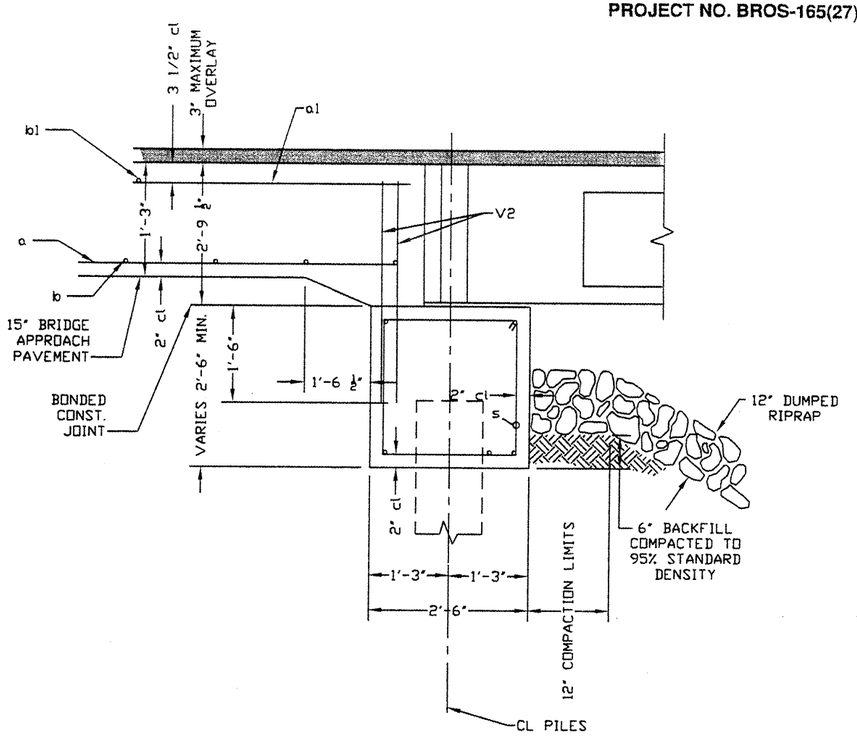
## HOT MIX ASPHALT SURFACE REMOVAL

STATION 60+50 TO 61+50
STATION 63+00 TO 64+00




## TYPICAL SECTION

NO SCALE




## SECTION THRU ABUTMENT

(AT RIGHT ANGLES)
SECTION B-B
NO SCALE

## BAR LIST FOR ONE APPROACH PAVEMENT

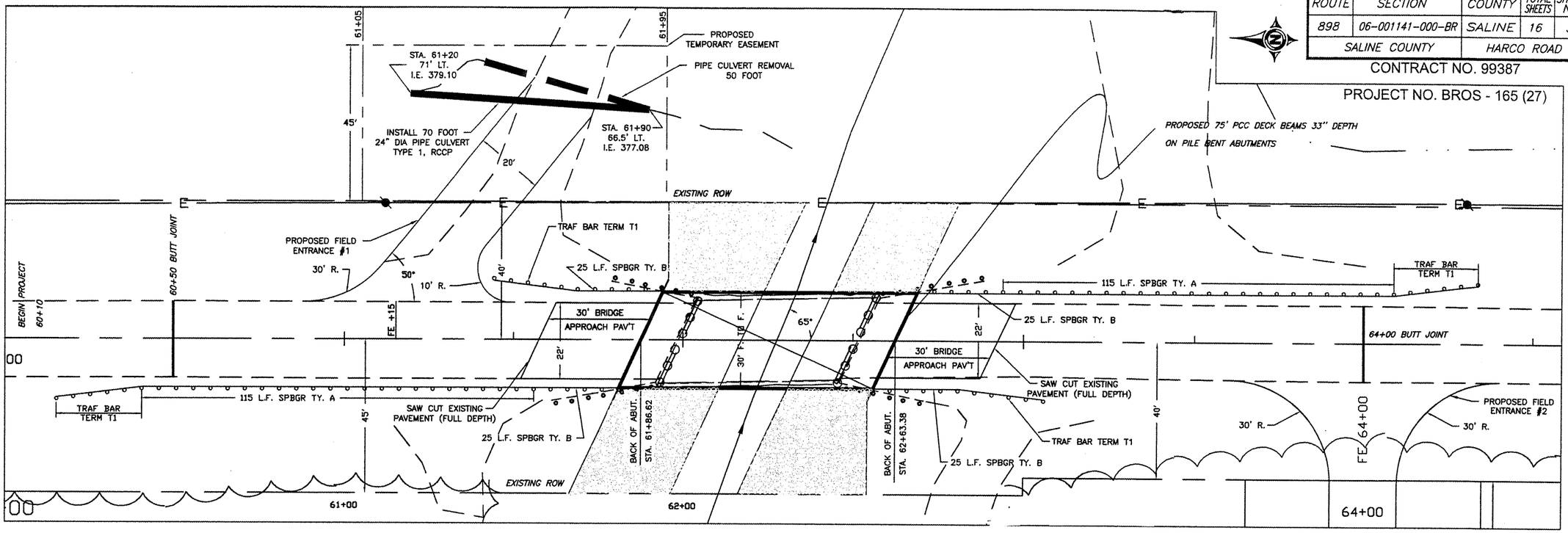
| BAR | NO. | SIZE | LENGTH | SHAPE |
|---|---|---|---|---|
| a | 44 | #9 | 29'-6" | ⌒ |
| a1 | 18 | #4 | 29'-6" | ——— |
| | | | | |
| b | 29 | #5 | 23'-0" | ——— |
| b1 | 8 | #4 | 23'-0" | ——— |

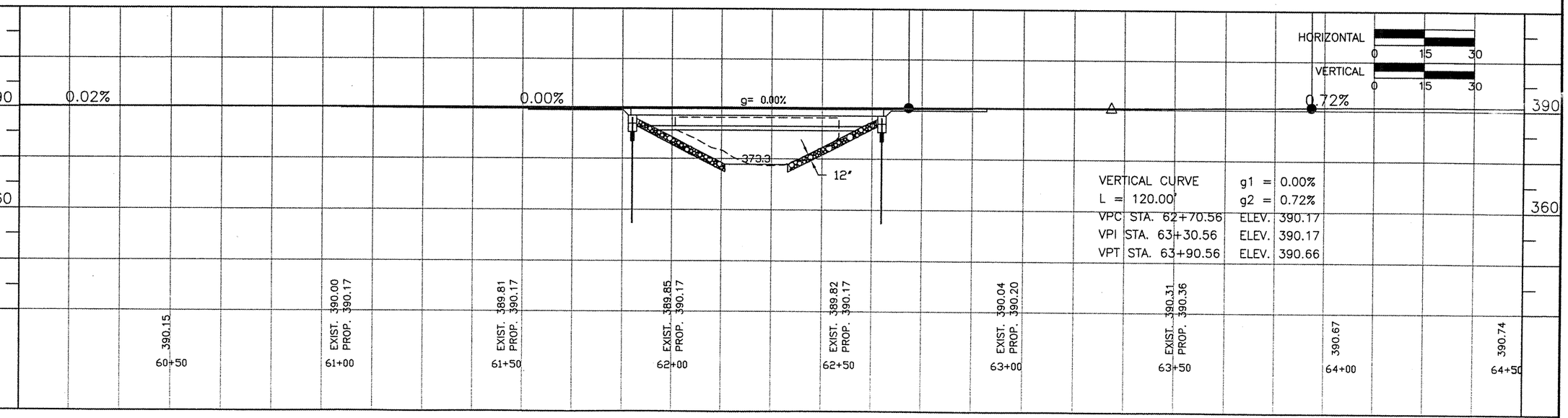
TOTAL REINFORCEMENT BARS, EPOXY COATED = 11174 LBS.

| ROUTE | SECTION | COUNTY | TOTAL SHEETS | SHEET NO. |
|---|---|---|---|---|
| 898 | 06-001141-000-BR | SALINE | 16 | 3 |
| SALINE COUNTY | | HARCO ROAD | | |

CONTRACT NO. 99387

PROJECT NO. BROS - 165 (27)

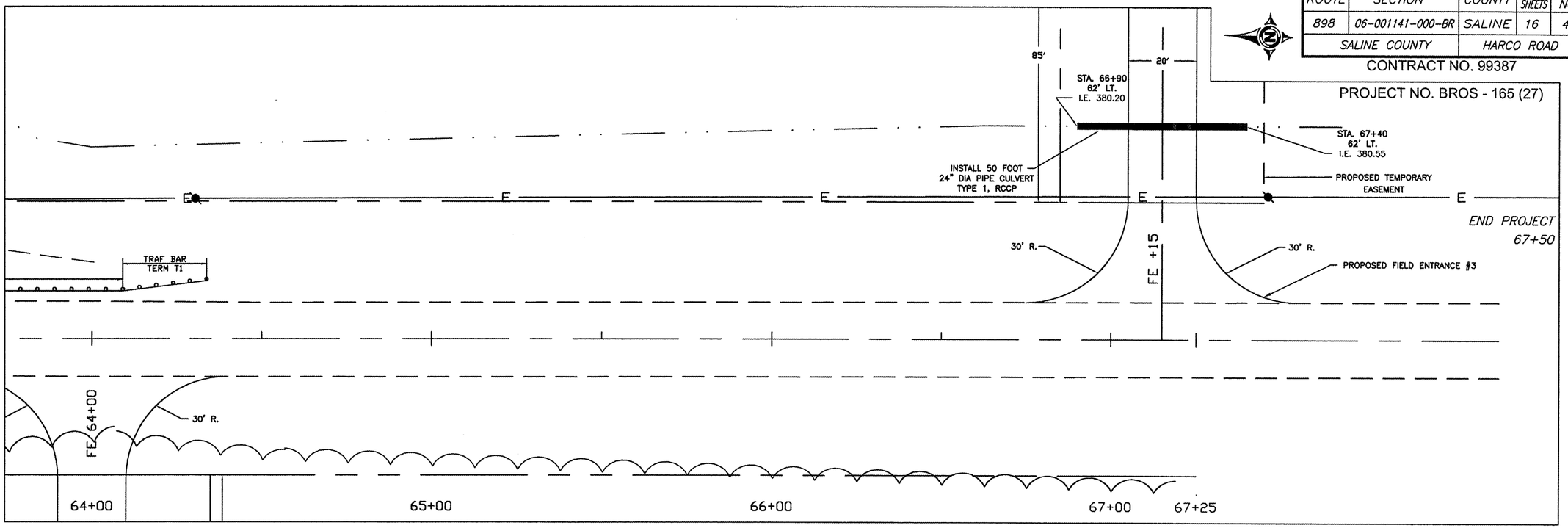


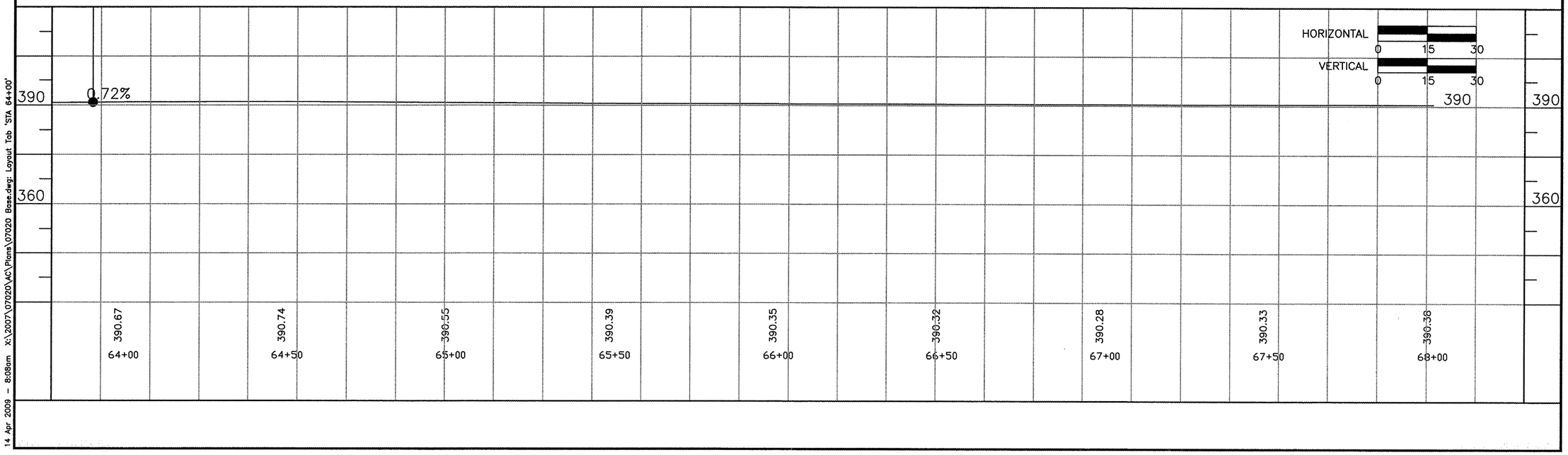



| ROUTE | SECTION | COUNTY | TOTAL SHEETS | SHEET NO. |
|---|---|---|---|---|
| 898 | 06-001141-000-BR | SALINE | 16 | 4 |
| SALINE COUNTY | | HARCO ROAD | | |

CONTRACT NO. 99387

PROJECT NO. BROS - 165 (27)



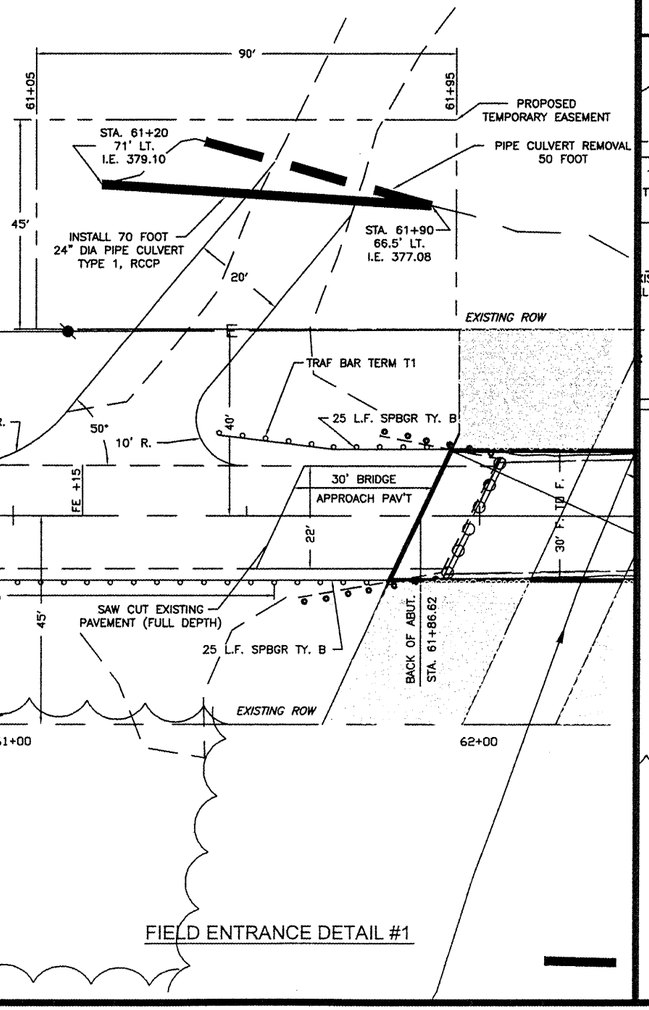

14 Apr 2009 - 8:08am X:\2007\07020\AC\Plans\07020 Base.dwg: Layout Tab 'STA 64+00'

| ROUTE | SECTION | COUNTY | TOTAL SHEETS | SHEET NO. |
|---|---|---|---|---|
| 898 | 06-001141-000-BR | SALINE | 16 | 5 |
| SALINE COUNTY | | HARCO ROAD | | |

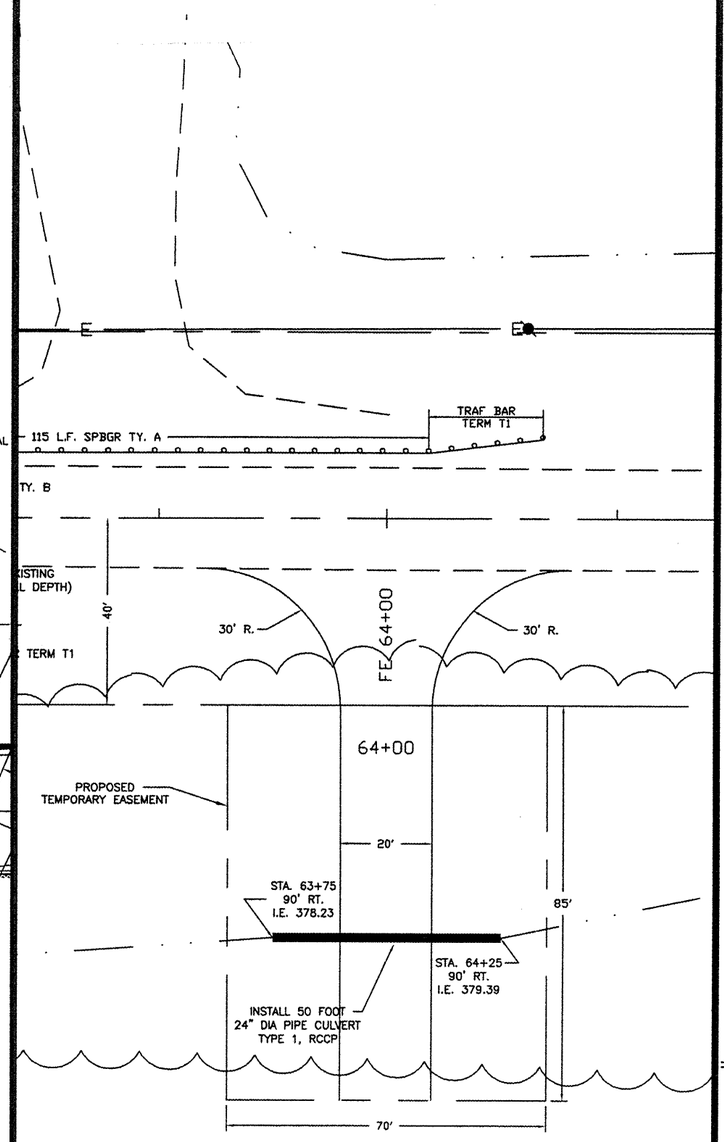
CONTRACT NO. 99387

PROJECT NO. BROS - 165 (27)

SCALE 0 15 30

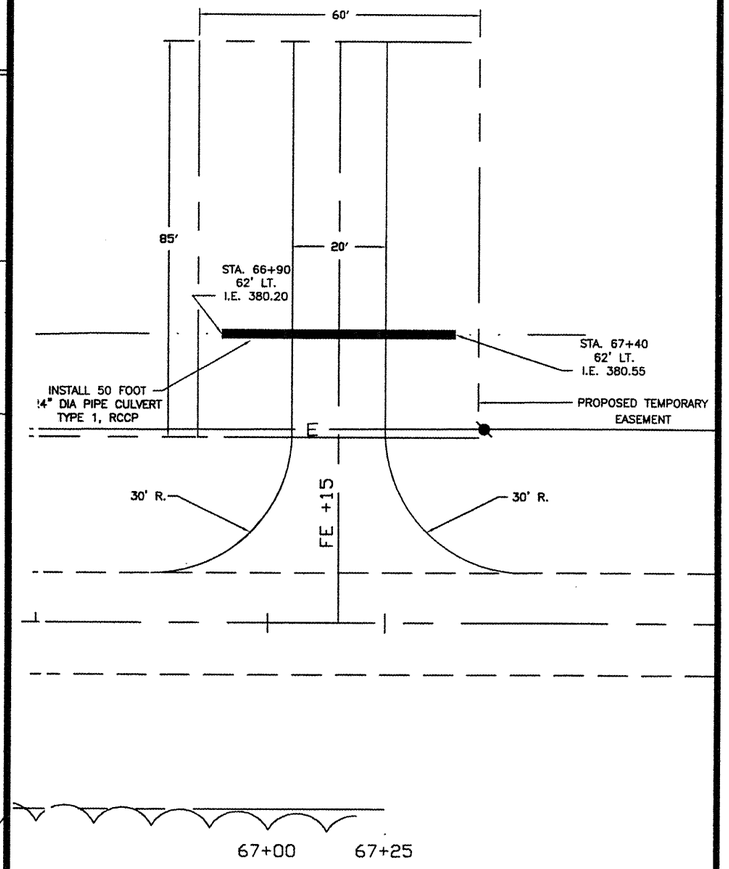



FIELD ENTRANCE DETAIL #1




TREE REMOVAL 63+65 RT TO 64+35 RT 0.2 AC.

FIELD ENTRANCE DETAIL #2



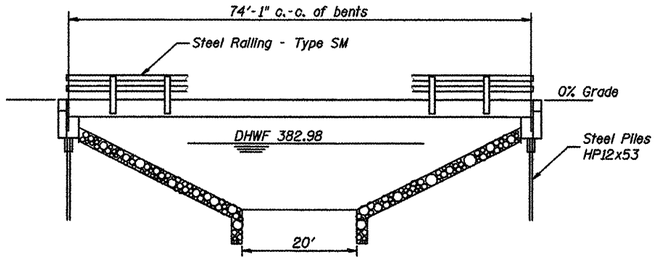

FIELD ENTRANCE DETAIL #3

B.M.-

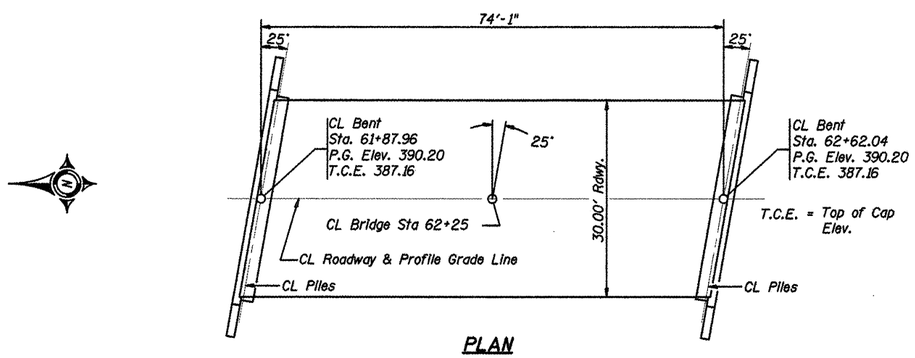
Existing Structure-

Salvage-






## ELEVATION




## PLAN

## GENERAL NOTES

1. The Contractor shall drive 0 test pile, as specified, in a permanent location as directed by the Engineer before ordering the remaining piles.
2. See Special Provisions for boring logs.
3. A Corrosion Inhibitor, as covered in the Special Provisions, shall be used in the concrete for precast prestressed concrete deck beams.
4. The Steel H-piles shall be according to AASHTO M270 Grade 50.

## TOTAL BILL OF MATERIAL

| Item | Unit | Super | Sub. | | Total |
|---|---|---|---|---|---|
| | | | Piers | Abuts. | |
| Removal of Existing Structures | Each | | | | 1 |
| HMA Surface Course | Ton | 35 | | | 35 |
| Waterproofing Membrane System | Sq. Yd. | 250 | | | 250 |
| Concrete Structures | Cu. Yd. | | | 27.2 | 27.2 |
| Precast Prestressed Concrete Deck Beams (33" Depth) | Sq. Ft. | 2250 | | | 2250 |
| Steel Bridge Rail, Type SM | Foot | 150 | | | 150 |
| | | | | | |
| Reinforcement Bars | Pound | | | 3220 | 3220 |
| Furnishing Steel Piles HP12x53 | Foot | | | 756 | 756 |
| Driving Steel Piles | Foot | | | 756 | 756 |
| | | | | | |
| Name Plates | Each | | | 1 | 1 |
| Concrete Encasement | Cu. Yd. | | | 4.0 | 4.0 |
| | | | | | |
| | | | | | |

## DESIGN SPECIFICATIONS

2007 AASHTO LRFD
HL 93 Loading. Load Factor Design.

## LOADING HS20-44

Allow 25#/sq. ft. for future wearing surface.

## SEISMIC DATA

Seismic Performance Category (SPC) = Bedrock Acceleration Coefficient (A) = Site Coefficient (S) =

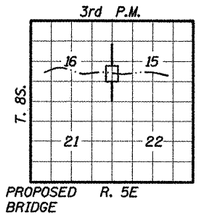
## PILE DATA (2-ABUTS.)

| | |
|---|---|
| Type | HP 12X53 |
| Nominal Require Beams | 418 KIPS |
| Allowable Resistance Available | 139 KIPS |
| Capacity | Tons |
| Estimated Length | Feet 63 |
| Number Required | 12 |

STATION 62+25
UNNAMED CREEK
SEC. 06-00141-00-BR BUILT 2009
SALINE COUNTY
LOADING ~~HL~~ 93
STR. NO. 083-3234

## LETTERING FOR NAME PLATE

Locate Name Plate at Northwest Corner of Bridge




## LOCATION SKETCH

## WATERWAY INFORMATION

Drainage Area = 8.29 S.M. Low Grade Elev. = 389.9 @ Sta. 55+30

| Flood | Freq. Yr. | Q C.F.S. | Opening Sq. Ft. Exist. | Opening Sq. Ft. Prop. | Nat. H.W.E. | Head - Ft. Exist. | Head - Ft. Prop. | Headwater El. Exist. | Headwater El. Prop. |
|---|---|---|---|---|---|---|---|---|---|
| Design | 20 | 1539 | 162 | 166 | 382.98 | 0.85 | 0.85 | 383.83 | 383.83 |
| Base | 100 | 2172 | 196 | 203 | 384.25 | 1.65 | 1.59 | 385.90 | 385.84 |
| Overtopping | | | | | | | | | |
| Max. Calc. | 500 | 2749 | 229 | 243 | 385.36 | 2.45 | 2.32 | 387.81 | 387.68 |

I certify that to the best of 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 AASHTO Standard Specifications for Highway Bridges.

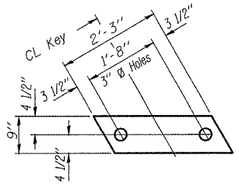
4/14/09

Illinois Structural No. 4745

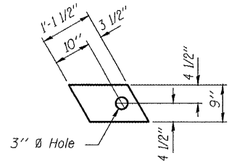
Expires 11/30/2010

LICENSED STRUCTURAL ENGINEER
ZEYN UZMAN
4745
STATE OF ILLINOIS

**GENERAL PLAN & ELEVATION**
**F.A.S. ROUTE 898**
**OVER TRIB TO MFSR**
**SECTION 06-00141-00-BR**
**SALINE COUNTY**
**STATION 62+25**

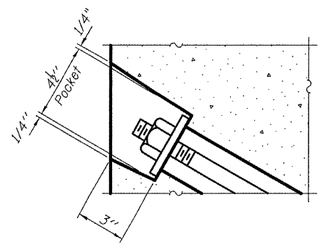



FABRIC BEARING PAD
(Interior)

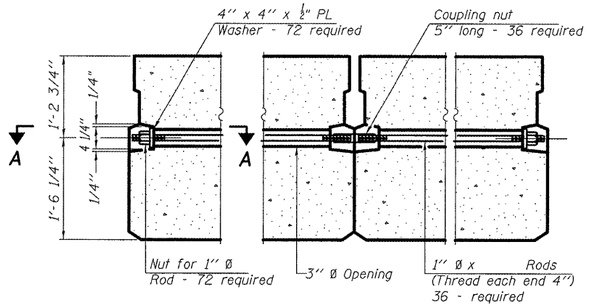



FABRIC BEARING PAD
(Exterior)

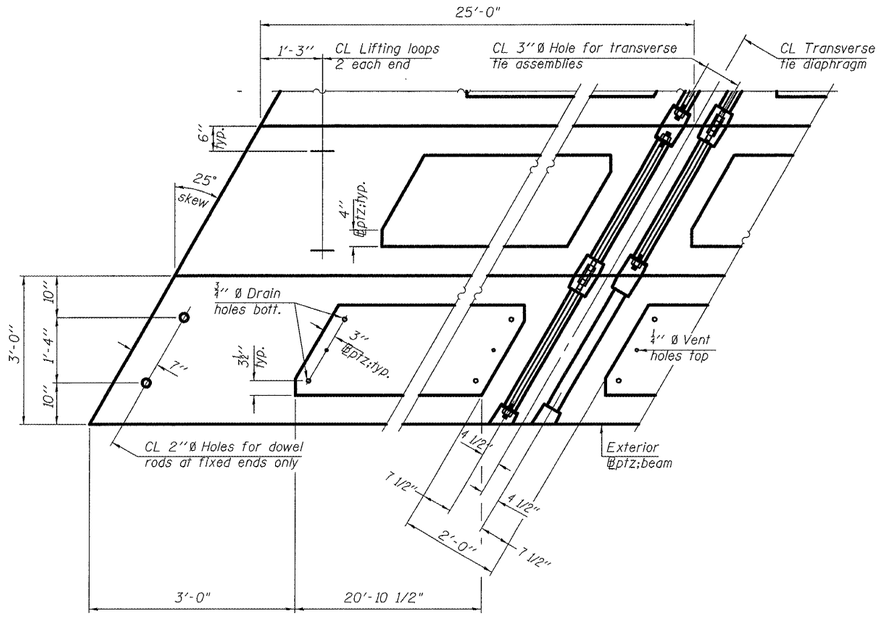
FIXED




SECTION A-A




TYPICAL TRANSVERSE TIE ASSEMBLY




PLAN VIEW

Note: Connect beams in pairs with the transverse tie configuration shown.

## NOTES

Prestressing steel shall be uncoated high strength, low relaxation 7-wire strand, Grade 270. The nominal diameter shall be $\frac{1}{2}$" and the nominal cross-sectional area shall be 0.153 sq. in.

The 1" Ø rods in the transverse tie assembly shall be tightened to a snug fit and the threads set. Pockets on exterior faces of bridge shall be filled with grout after transverse tie assembly is in place.

Reinforcement bars shall conform to ASTM A 706, Grade 60. (See Special Provisions).

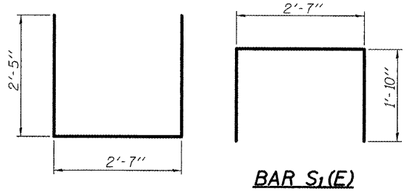
Two $\frac{1}{8}$" fabric adjusting shims of the dimensions of the exterior bearing pad shall be provided for each bearing pad location.

A minimum 2$\frac{1}{2}$" Ø lifting pin shall be used to engage the lifting loops during handling.

Corrosion Inhibitor, per Article 1020.05(b)(12) and 1021.06 of the Standard Specifications, shall be used in the concrete for precast prestressed concrete deck beams.

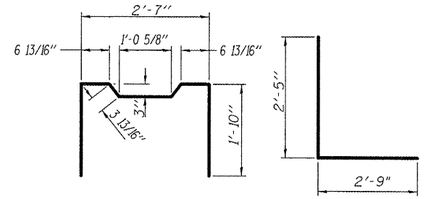
Compressive strength of prestressed concrete, f'c, shall be 6000 psi.

Compressive strength of prestressed concrete at release, f'ci, shall be 5000 psi.



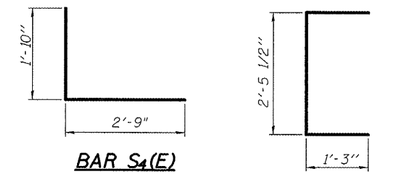

BAR S1(E)

BAR S(E)



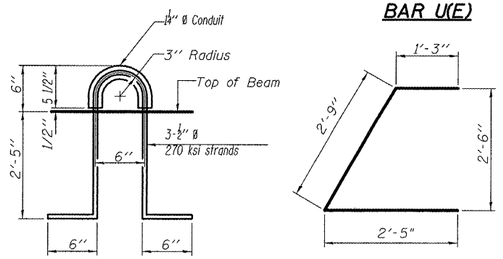

BAR S2(E)

BAR S3(E)




BAR S4(E)

BAR U(E)




LIFTING LOOP DETAIL

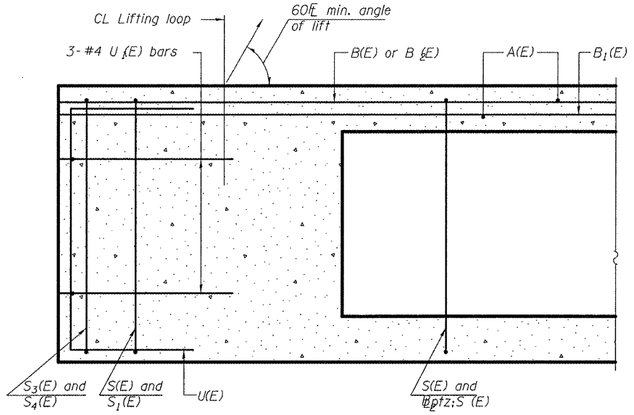
BAR U1(E)

## BILL OF MATERIAL

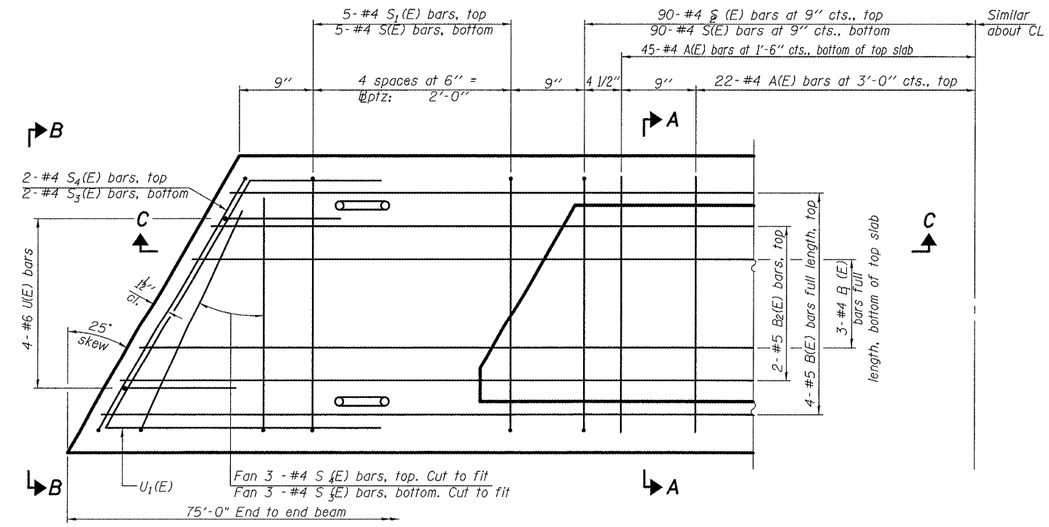
| | | |
|---|---|---|
| Precast Prestressed Conc. Deck Bms. (33" depth) | Sq. Ft. | 2250 |

PD-3336-LD 10-1-08

33" X 36" PPC DECK BEAM DETAILS
STRUCTURE NO. 083-3234

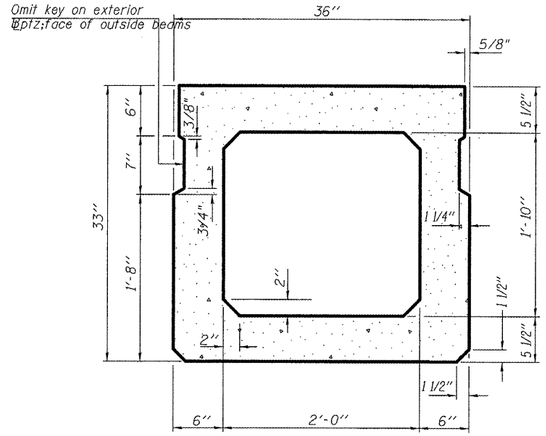



## SECTION C-C



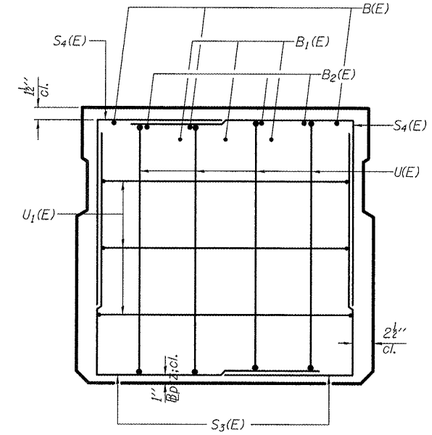

## PLAN VIEW

Note: Spacing of S(E) and $S_2$(E) bars may be adjusted up to 4" in the immediate area of the transverse tie diaphragms to miss the block outs for the transverse ties.

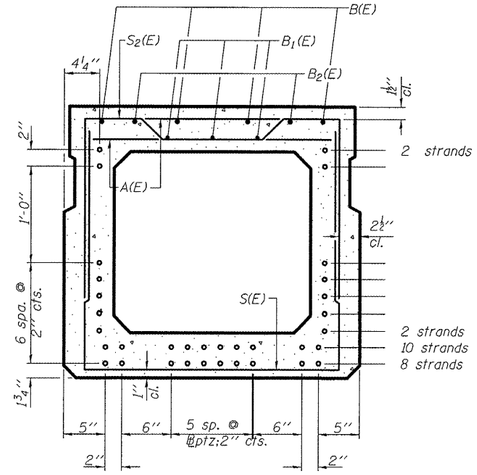



## SECTION A-A

(Showing dimensions)




## VIEW B-B




## SECTION A-A

(Showing reinforcement and permissible strand locations)

Note: Place the number of strands specified in each row symmetrically about the centerline of beam in the permissible strand locations shown.

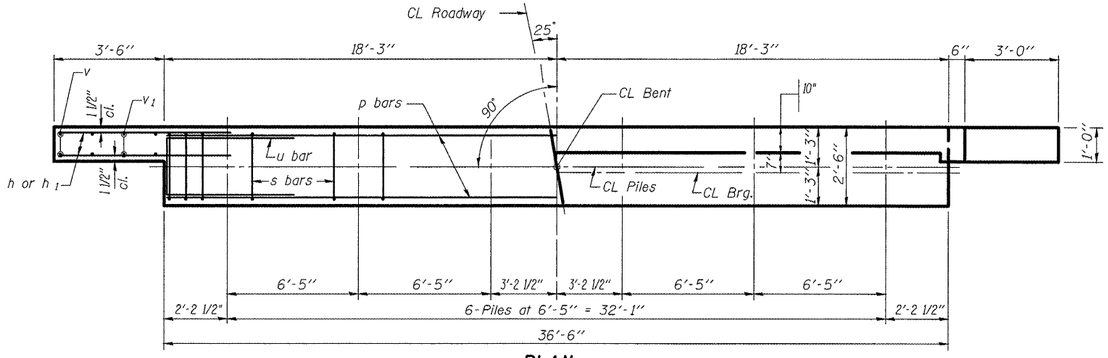
## BAR LIST
## @ptz;ONE BEAM ONLY

(For information only)

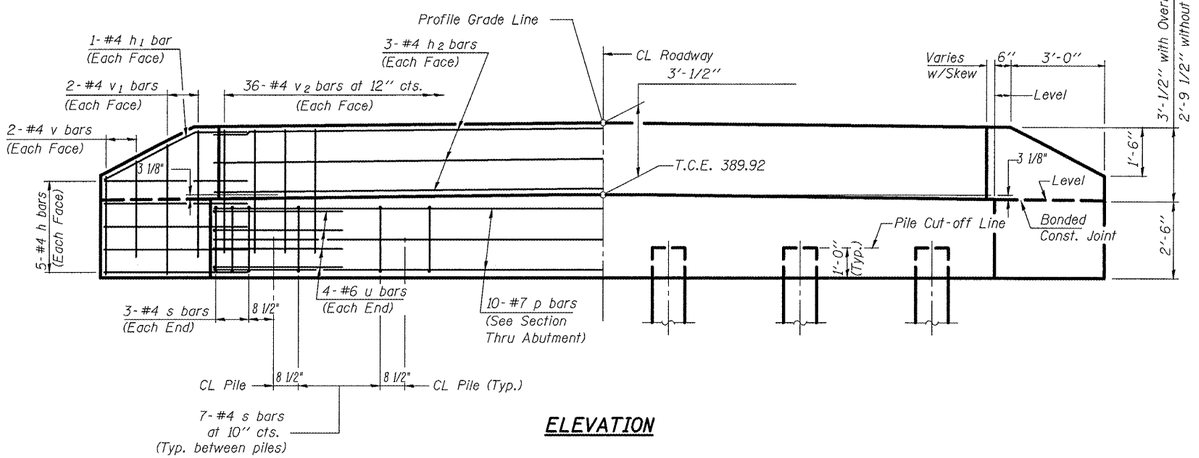
| Bar | No. | Size | Length | Shape |
|---|---|---|---|---|
| A(E) | 67 | #4 | 2'-7" | — |
| B(E) | 12 | #5 | 26'-8" | — |
| $B_1$(E) | 9 | #4 | 26'-8" | — |
| $B_2$(E) | 6 | #5 | 26'-8" | — |
| S(E) | 100 | #4 | 7'-5" | — |
| $S_1$(E) | 10 | #4 | 6'-3" | ⌐ 3" ⌐ |
| $S_2$(E) | 90 | #4 | 6'-6" | ⌐ 3" ⌐ |
| $S_3$(E) | 10 | #4 | 5'-2" | — |
| $S_4$(E) | 10 | #4 | 4'-7" | — |
| U(E) | 8 | #6 | 5'-0" | ⌐ 2" ⌐ |
| $U_1$(E) | 6 | #4 | 6'-5" | ⌐ 2" ⌐ |

Note: See sheet 9 of 16 for additional details and Bill of Material.

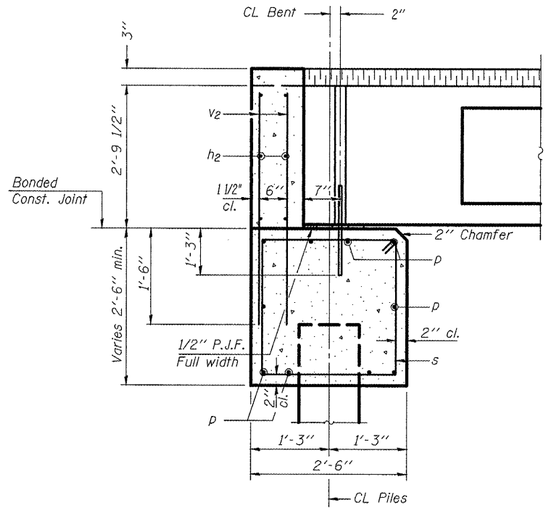
33" x 36" PPC DECK BEAM
STRUCTURE NO. 083-3234



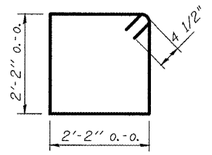

**PLAN**



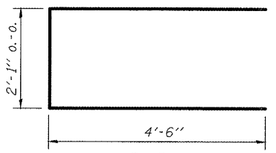

**ELEVATION**



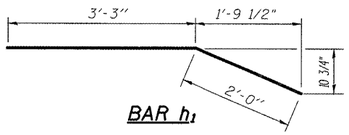

**SECTION THRU ABUTMENT**
(At Right Angles)




**BAR s**




**BAR u**




**BAR h1**

## NOTES

1. The Backwall and the portion of the Wingwalls above the bonded construction joint shall be cast against the in-place beam.
2. Reinforcement bars shall conform to the requirements of A.A.S.H.T.O. M-31 or M-322, Grade 60.
3. Space reinforcement in cap to miss anchor bolts.

## BILL OF MATERIAL FOR ONE ABUTMENT

| Bar | No. | Size | Length | Shape |
|---|---|---|---|---|
| h | 20 | #4 | 5'-0" | |
| h1 | 4 | #4 | 5'-3" | |
| h2 | 6 | #4 | 36'-2" | |
| p | 10 | #7 | 36'-2" | |
| s | 41 | #4 | 9'-5" | |
| u | 8 | #6 | 11'-1" | |
| v | 8 | #4 | 3'-8" | |
| v1 | 8 | #4 | 4'-8" | |
| v2 | 72 | #4 | 4'-5" | |
| Concrete Structures | | | 13.6 Cu. Yds. | |
| Reinforcement Bars | | | 1610 Lb. | |

## MAXIMUM PILE LOADS

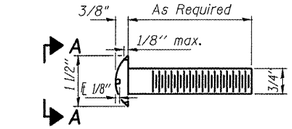
| SPAN | TONS |
|---|---|
| 60' | 35 |
| 70' | 39 |
| 75' | 41 |

## DESIGN STRESSES

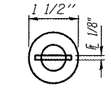
f'c = 3,500 psi
fy = 60,000 psi

# P.P.C. DECK BEAMS
# PILE BENT ABUTMENT

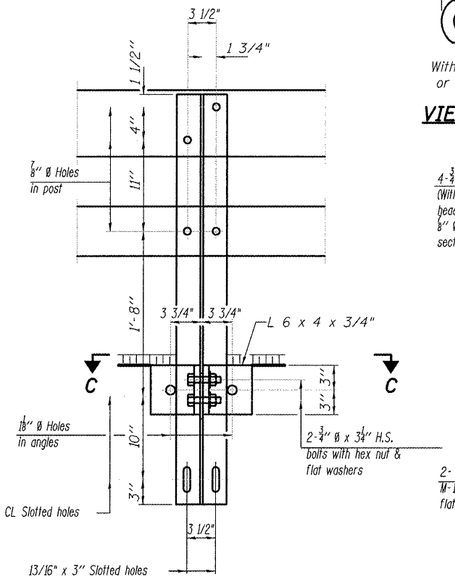
| 30' RDWY. | 33" BMS. | 'D'=25° OR 30° |
|---|---|---|



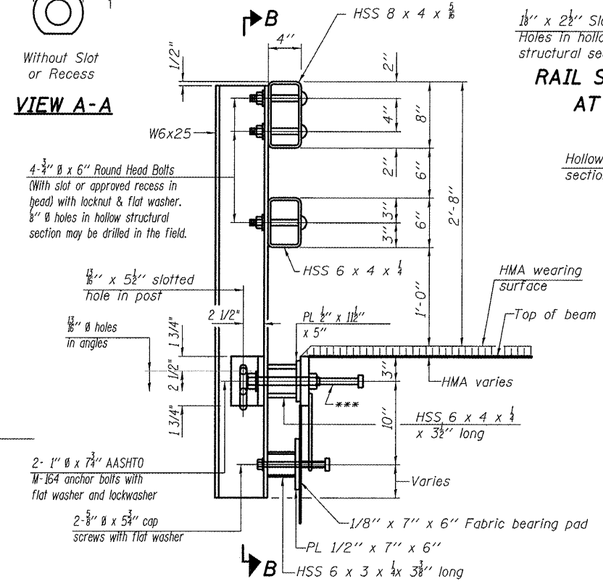

## DETAIL OF 3/4" Ø ROUND HEAD BOLT



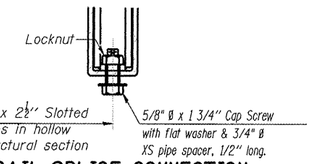

## VIEW A-A



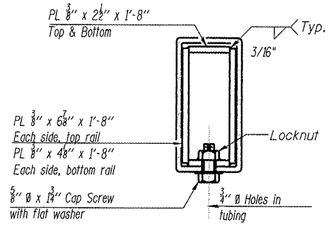

## SECTION B-B



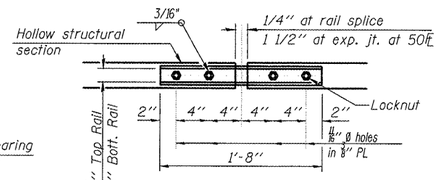

## SECTION AT RAIL POST



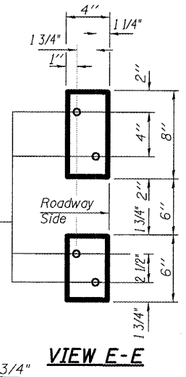

## RAIL SPLICE CONNECTION AT EXPANSION JT.



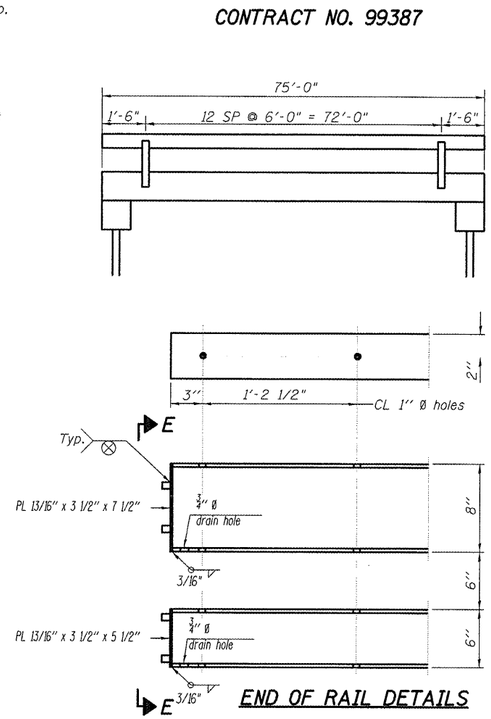

## SECTION AT RAIL SPLICE



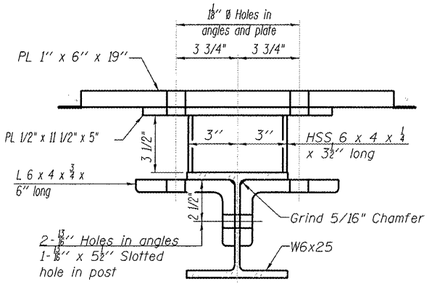

## PLAN-BOTT. SPLICE PL TYPICAL



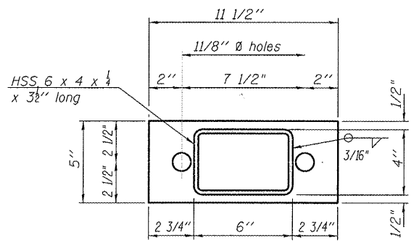

## VIEW E-E



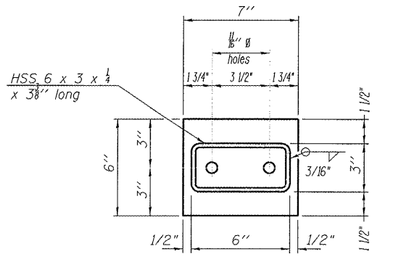

## END OF RAIL DETAILS



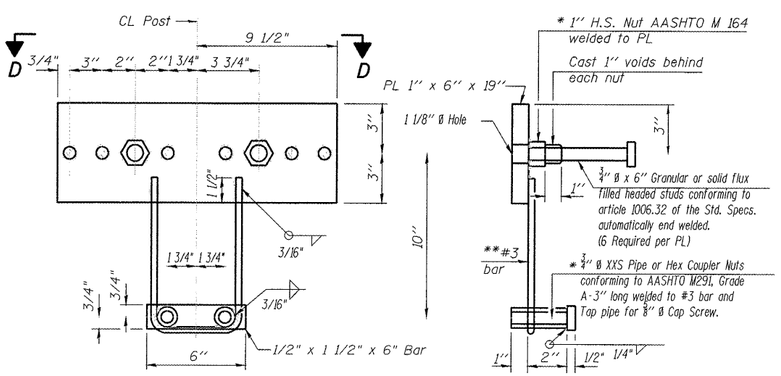

## SECTION C-C



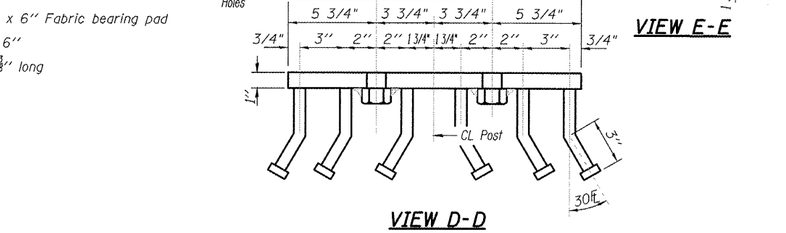

## PL 1/2" x 11 1/2" x 5"




## PL 1/2" x 7" x 6"




## ANCHOR DEVICE




## VIEW D-D

*Threaded areas shall be plugged or blocked off during casting of beam. Galvanized after fabrication.

Notes:

All field drilled holes shall be coated with an approved zinc rich paint before erection.

For multi-span bridges, sufficient 1/4" x 6" x 1'-2" galvanized steel shims shall be provided to align rail between adjacent spans. Cost included with Steel Railing, Type SM.

All steel rail members shall be galvanized according to Article 509.05 of the Standard Specifications.

*** The studs of the anchor devices shall be placed below the top reinforcement bars and the outermost longitudinal reinforcement bar shall be placed directly above the studs of the rail post anchor device.

** Whenever the lower insert assemblies interfere with strand locations, the #3 bars shall be cut and adjusted in order to allow raising or lowering of the lower inserts. Maximum adjustment not to exceed 2".

## BILL OF MATERIAL

| Item | Unit | Quantity |
|---|---|---|
| Steel Railing, Type SM | Foot | 150 |

# STEEL RAILING, TYPE SM WITH HOT-MIX ASPHALT WEARING SURFACE STRUCTURE NO. 083-3234

R-34HMAWS 10-1-08 (6'-3" Maximum Post Spacing) (1 1/4" minimum to 3 1/8" maximum HMA thickness)

## QUANTITIES/LIN. FT. OF ENCASEMENT

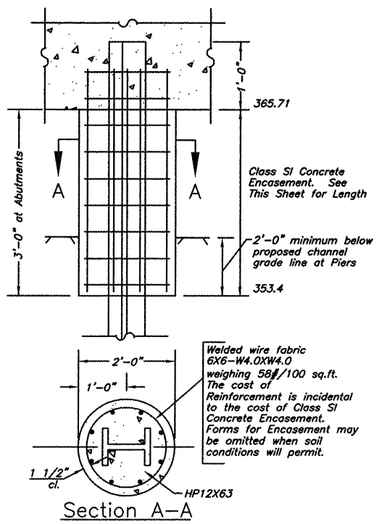
(STEEL PILES)

| Pile Size | ITEM | Quantity |
|---|---|---|
| *HP8* | Concrete Encasement | 0.063 C.Y. |
| *HP10* | Concrete Encasement | 0.086 C.Y. |
| *HP12* | Concrete Encasement | 0.112 C.Y. |

(METAL SHELL PILES)

| Pile Size | ITEM | Quantity |
|---|---|---|
| *12" Dia.* | Concrete Encasement | 0.087 C.Y. |

## DETAIL OF HP PILE ENCASEMENT




Section A–A

PILE DETAILS

*STANDARD CX–1*

CONTRACT NO. 99387

| ROUTE | SECTION | COUNTY | TOTAL SHEETS | SHEET NO. |
|---|---|---|---|---|
| FAS 898 | 06-00141-00-BR | SALINE | 16 | 12 |
| PROJECT BROS-165(27) | | HARCO ROAD | | |

HORIZONTAL
0 5' 10'

VERTICAL
0 5' 10'

390.15 EXIST.
390.15 PROP.
390.16 EXIST.
390.16 PROP.
390.06 EXIST.
CL OF HARCO RD.

60 + 50
60 + 00
59 + 50

380
370
390

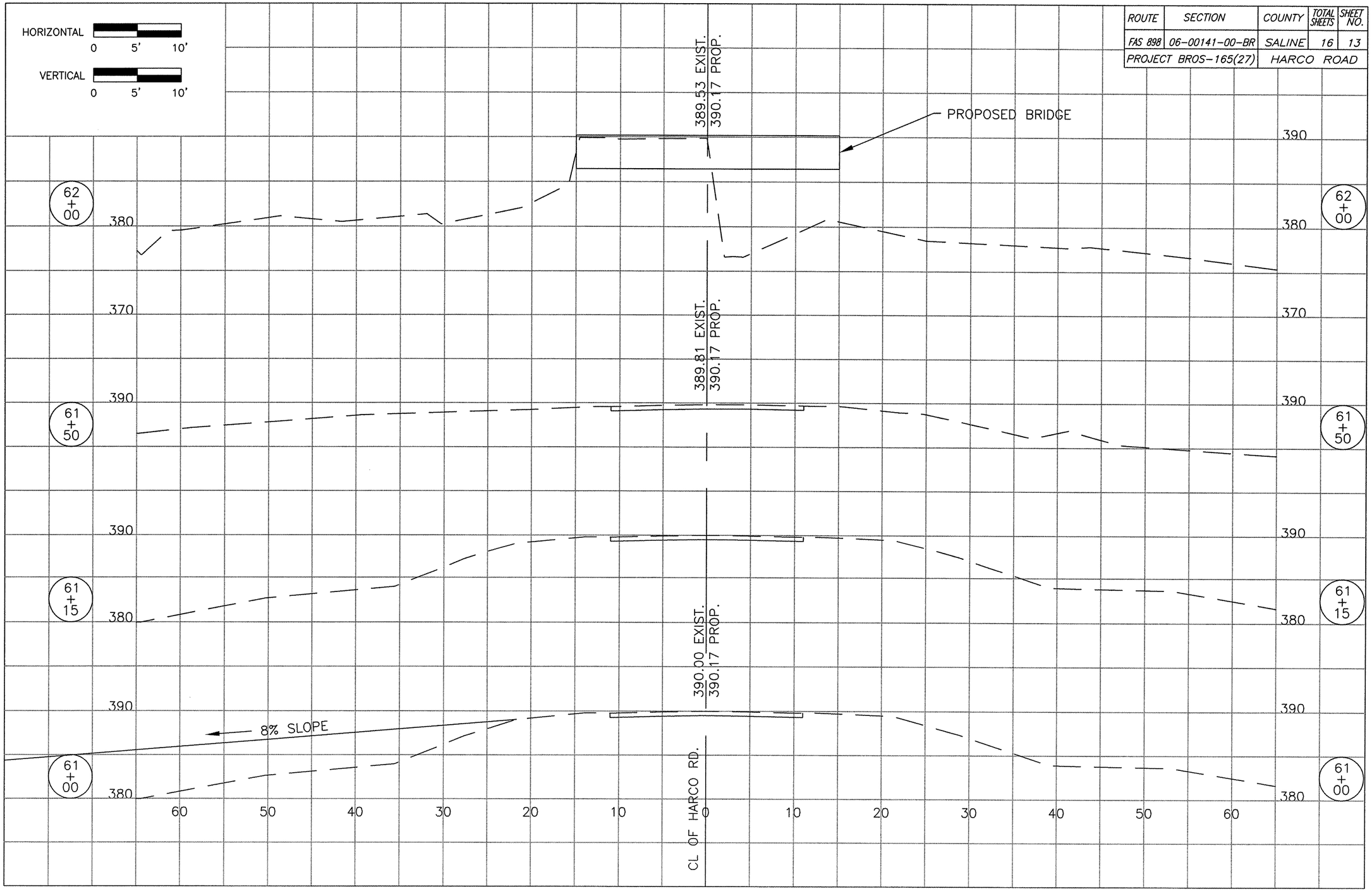
60 50 40 30 20 10 0 10 20 30 40 50 60

CONTRACT NO. 99387

| ROUTE | SECTION | COUNTY | TOTAL SHEETS | SHEET NO. |
|---|---|---|---|---|
| FAS 898 | 06-00141-00-BR | SALINE | 16 | 13 |
| PROJECT BROS-165(27) | HARCO ROAD | | | |

HORIZONTAL 0 5' 10'

VERTICAL 0 5' 10'

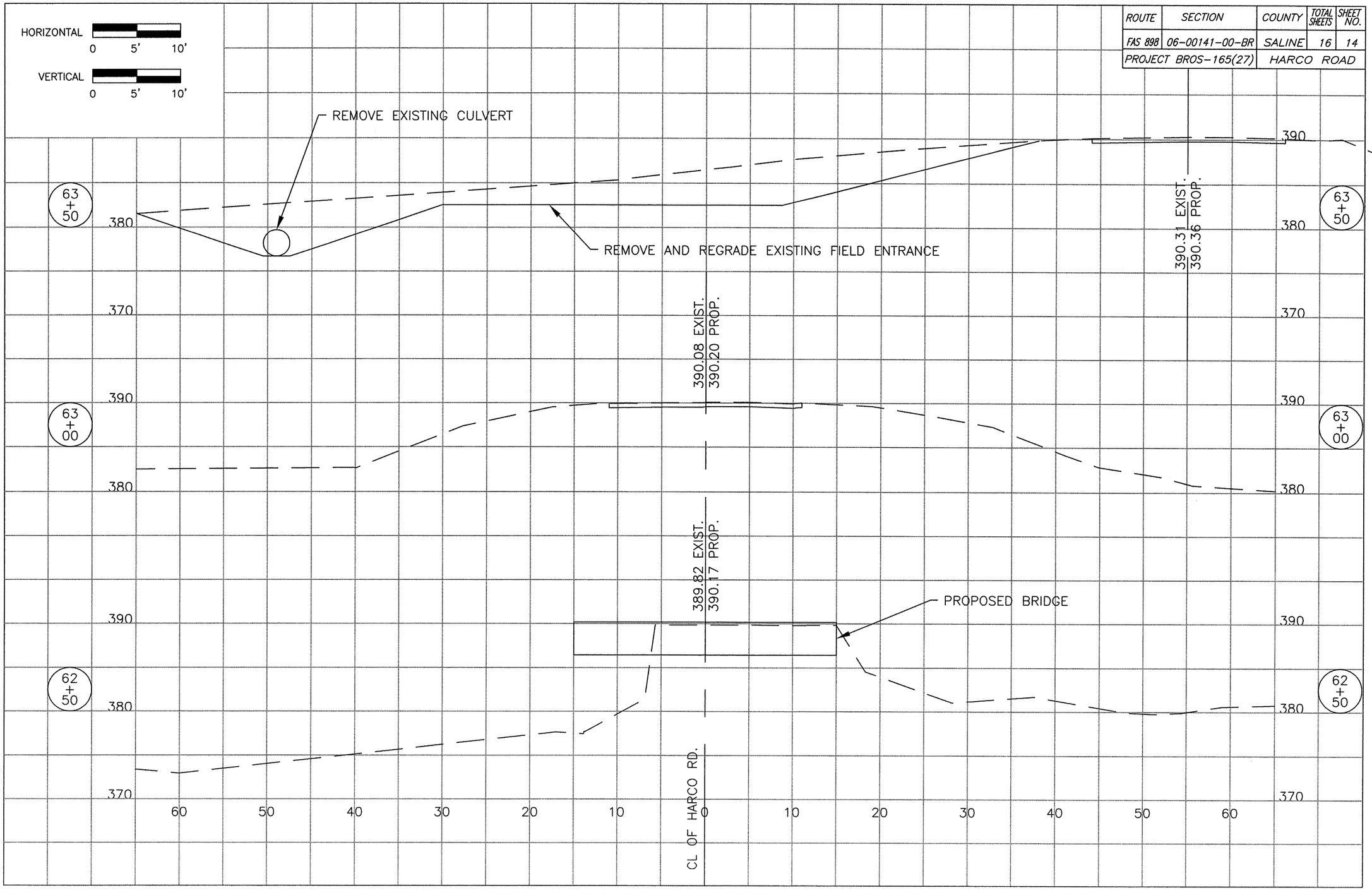


CONTRACT NO. 99387

| ROUTE | SECTION | COUNTY | TOTAL SHEETS | SHEET NO. |
|---|---|---|---|---|
| FAS 898 | 06-00141-00-BR | SALINE | 16 | 14 |
| PROJECT BROS-165(27) | | HARCO ROAD | | |

HORIZONTAL
0 5' 10'

VERTICAL
0 5' 10'



CONTRACT NO. 99387

| ROUTE | SECTION | COUNTY | TOTAL SHEETS | SHEET NO. |
|---|---|---|---|---|
| FAS 898 | 06-00141-00-BR | SALINE | 16 | 15 |
| PROJECT BROS-165(27) | | HARCO ROAD | | |

HORIZONTAL
0 5' 10'

VERTICAL
0 5' 10'

390.55 EXIST.

390.74 EXIST.

390.67 EXIST.
390.67 PROP.

CL OF HARCO RD.

CL OF HARCO RD.

65 + 00

64 + 50

64 + 00

390

380

60 50 40 30 20 10 0 10 20 30 40 50 60

0 10 20 30 40 50 60 70 80 90 100 110 120 130

8% SLOPE

PROPOSED 50', 24" DIA CULVERT

CONTRACT NO. 99387

| ROUTE | SECTION | COUNTY | TOTAL SHEETS | SHEET NO. |
|---|---|---|---|---|
| FAS 898 | 06-00141-00-BR | SALINE | 16 | 16 |
| PROJECT BROS-165(27) | | HARCO ROAD | | |

HORIZONTAL
0 5' 10'

VERTICAL
0 5' 10'