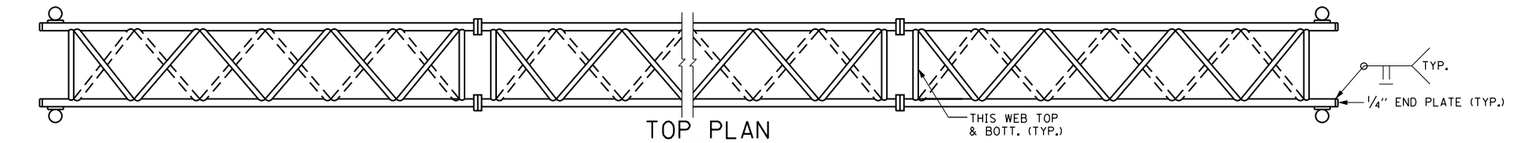
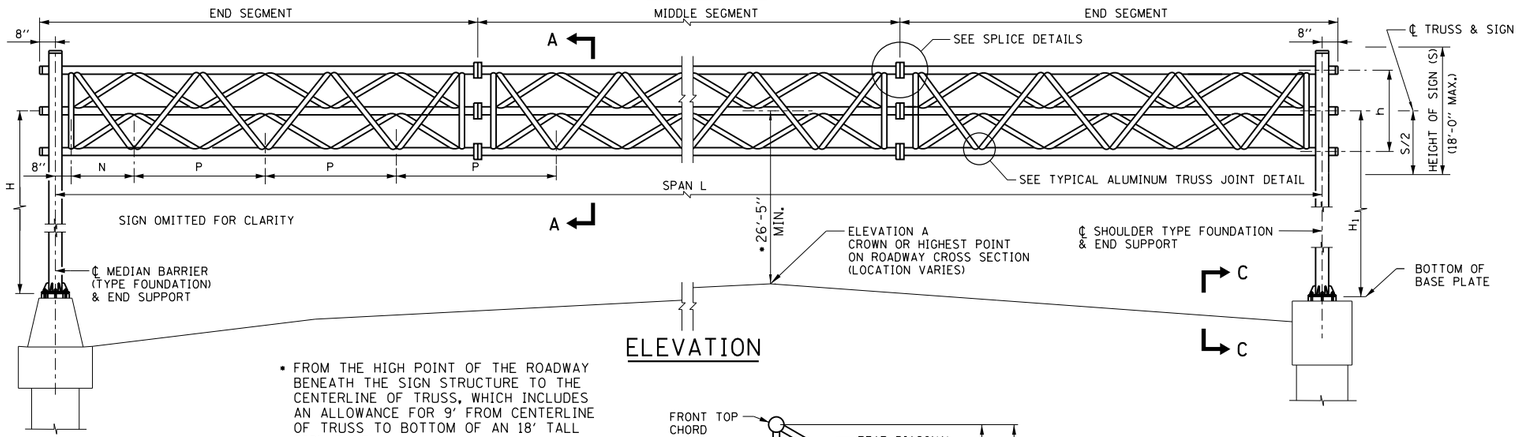
**Illinois Tollway Standard Drawings Revisions**

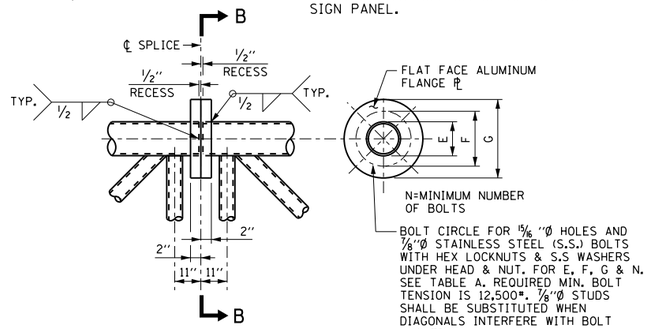
| Section F | Sign Structure | |
|---|---|---|
| | **Drawing** | **Modification Summary** **Effective: 03-01-2019** |
| | | |
| | **F1** | **OVERHEAD SIGN STRUCTURE SPAN TYPE STRUCUTRE DETAILS** |
| | Sheet 1 | Update barrier shape to constant slope. |
| | Sheet 3 | Revised anchor bolt length for taller barrier. Update X values "Design Table for Drilled Shafts in Cohesive Soils" and added Qu > 1.25 Ton/Sq. Ft. to the drilled shaft design table. |
| | Sheet 4 | Update barrier shape, details and quantities for constant slope. Update X values "Design Table for Drilled Shafts in Cohesive Soils" and added Qu > 1.25 Ton/Sq. Ft. to the drilled shaft design table. Revised callout and quantities for grade beam to be class SI concrete. |
| | Sheet 5 | Revised shape of t1(E) bar in Bar List table and updated barrier shape, details and quantities for constant slope. Update X values "Design Table for Drilled Shafts in Cohesive Soils" and added Qu > 1.25 Ton/Sq. Ft. to the drilled shaft design table. Revised callout and quantities for grade beam to be class SI concrete. |
| | | |
| | **F4** | **OVERHEAD SIGN STRUCTURE CANTILEVER TYPE STRUCTURE DETAILS** |
| | Sheet 7 | Update barrier shape to constant slope |
| | | |
| | **F8** | **OVERHEAD SIGN STRUCTURE SIGN AND LUMINAIRE SUPPORTS** |
| | Sheet 1 | Revised Note 2 reference to designer |
| | | |
| | **F9** | **BREAKAWAY SIGN SUPPORT DETAILS** |
| | Sheet 1 | Clarified the design stress for soil pressure and separated into a new category 'Foundation' |
| | | |
| | **F11** | **MILEPOST MARKER** |
| | Sheet 2 | Removed 'WALL' from Barrier Wall Mount Detail title |
| | | |
| | ~~**F12**~~ | **MOUNTING DETAILS FOR RETROFITING NEW EXIT SIGN PANELS** |
| | Sheet 1 | This sheet has been removed from to Standard to the 720 OHS Base Sheets |
| | | |
| | **F13** | **OVERHEAD SIGN STRUCTURE MONOTUBE TYPE (STEEL) MAINLINE STRUCTURE DETAILS** |
| | Sheet 1 | Update barrier shape to constant slope. Revised dimension note for minimum clearance. |
| | Sheet 2 | Update barrier shape to constant slope. Revised dimension note for minimum clearance. |
| | Sheet 3 | Update barrier shape to constant slope. |
| | Sheet 6 | Update barrier shape and reinforcing details for constant slope. |
| | Sheet 7 | Update barrier shape and reinforcing details for constant slope. |
| | Sheet 8 | Update barrier shape and reinforcing details for constant slope. |
| | | |
| | **F14** | **OVERHEAD SIGN STRUCTURE BUTTERFLY TYPE STRUCTURE DETAILS** |
| | Sheet 5 | Revised Note 2 for protective coat to include the perimeter of the column |
| | Sheet 6 | Update barrier shape to constant slope. |
| | | |
| | **F15** | **OVERHEAD SIGN STRUCTURE MONOTUBE TYPE (STEEL) STRUCTURE DETAILS FOR AET RAMP** |
| | Sheet 1 | Update barrier shape to constant slope. Updated Elevation and table to indicate "I-Pass or Pay Online Sign" |
| | Sheet 2 | Update barrier shape to constant slope. Revised elevation to show square bar continuous. Updated dimension note for minimum clearance. |
| | Sheet 3 | Update barrier shape to constant slope. Updated dimension note for minimum clearance. |
| | Sheet 5 | Section H-H dimensions are updated. |
| | Sheet 6 | Update barrier shape and reinforcing details for constant slope. |
| | Sheet 7 | Update barrier shape and reinforcing details for constant slope. |
| | | |
| | **F16** | **OVERHEAD SIGN STRUCTURE MONOTUBE TYPE (STEEL) STRUCTURE DETAILS FOR CASH-IPO RAMP** |
| | Sheet 1 | Update barrier shape to constant slope. |
| | Sheet 2 | Update barrier shape to constant slope. Updated dimension note for minimum clearance. |
| | Sheet 5 | Update barrier shape and reinforcing details for constant slope. |
| | Sheet 6 | Update barrier shape and reinforcing details for constant slope. |
| | | |
| | **F17** | **OVERHEAD SIGN STRUCTURE SPAN STYPE (STEEL) STRUCTURE DETAILS** |
| | Sheet 8 | Update barrier shape to constant slope and revised transition length from 10'-0" to 21'-3". |
| | Sheet 9 | Update barrier shape to constant slope and revised transition length from 10'-0" to 21'-3". |

New Sheet  Retired Standard



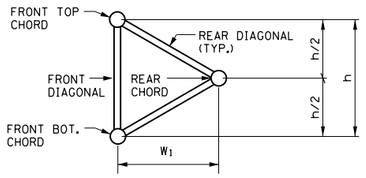

• FROM THE HIGH POINT OF THE ROADWAY BENEATH THE SIGN STRUCTURE TO THE CENTERLINE OF TRUSS, WHICH INCLUDES AN ALLOWANCE FOR 9' FROM CENTERLINE OF TRUSS TO BOTTOM OF AN 18' TALL SIGN PANEL.



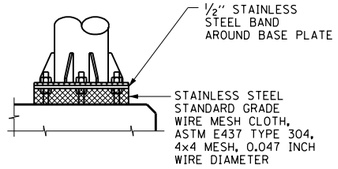

ELEVATION

SECTION B-B

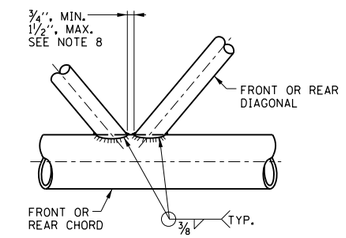
SPLICE DETAILS




SECTION A-A




VIEW C-C




TYPICAL ALUMINUM TRUSS
JOINT DETAIL

## GENERAL NOTES:

1. WORK THIS SHEET WITH OVERHEAD SIGN STRUCTURES SPAN TYPE SUMMARY AND TOTAL BILL OF MATERIAL.
2. AFTER ADJUSTMENTS TO LEVEL TRUSS AND ENSURE ADEQUATE VERTICAL CLEARANCE, ALL TOP AND LEVELING NUTS SHALL BE TIGHTENED AGAINST THE BASE PLATE WITH A MINIMUM TORQUE OF 200 LB.-FT. STAINLESS STEEL MESH SHALL THEN BE PLACED AROUND THE PERIMETER OF THE BASE PLATE. SECURE TO BASE PLATE WITH STAINLESS STEEL BANDING.
3. SIGN SUPPORT STRUCTURES MAY BE SUBJECT TO DAMAGING VIBRATIONS AND OSCILLATIONS WHEN SIGN PANELS ARE NOT IN PLACE DURING ERECTION OR MAINTENANCE OF THE STRUCTURE. TO AVOID THESE, ATTACH TEMPORARY BLANK SIGN PANELS OR OTHER BRACING TO THE STRUCTURE UNTIL PERMANENT SIGNS ARE INSTALLED.
4. TRUSS SEGMENTS SHALL BE SHIPPED INDIVIDUALLY WITH ADEQUATE PROVISION TO PREVENT DETRIMENTAL MOTION DURING TRANSPORT. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING THE CONFIGURATION AND PROTECTION OF THE TRUSSES.
5. ONLY SIGN PANELS ARE PERMITTED TO BE MOUNTED ON THIS TRUSS.

## DESIGN SPECIFICATIONS:

1. 2013 AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS, 6TH EDITION.

## CONSTRUCTION SPECIFICATIONS:

1. ALL MATERIALS, EXCEPT AS SHOWN, FABRICATION, ERECTION AND CONSTRUCTION REQUIREMENTS SHALL BE IN ACCORDANCE WITH SECTION 733 OF THE LATEST ILLINOIS TOLLWAY SUPPLEMENTAL SPECIFICATIONS.

## LOADING:

1. BOTH END SUPPORTS ARE DESIGNED FOR 60% OF THE TOTAL LOAD.
2. WIND LOADING SHALL BE A MINIMUM OF 35 PSF ON SIGN PANELS AND 10 PSF ON GROSS AREAS DEFINED BY THE PERIMETER OF TRUSS MEMBERS NOT COVERED BY SIGN PANEL AREAS.
3. THE AASHTO GROUP II AND III ALLOWABLE STRESS SHALL BE 133% (ALLOWABLE STRESS DESIGN).

## FABRICATION NOTES:

1. NO SPLICES SHALL BE LOCATED WITHIN 0.1xL OF THE CENTERLINE OF THE SPAN.
2. MATERIALS: ALUMINUM SHALL CONFORM TO ASTM B221, ALLOY 6061 TEMPER T6. ALL STRUCTURAL STEEL PIPE SHALL BE ASTM A53 GRADE B OR A106 GRADE B. ALL STRUCTURAL STEEL PLATES AND SHAPES SHALL CONFORM TO AASHTO M270 GR. 36 OR GR. 50. STAINLESS STEEL FOR SHIMS, SLEEVES AND HANDHOLE COVERS SHALL BE ASTM A240, TYPE 302 OR 304, OR ANOTHER ALLOY SUITABLE FOR EXTERIOR EXPOSURE AND ACCEPTABLE TO THE ENGINEER. THE STEEL PIPE AND STIFFENING RIBS AT THE BASE PLATE FOR THE COLUMN SHALL HAVE A MINIMUM LONGITUDINAL CHARPY V-NOTCH (CVN) ENERGY OF 15 LB.-FT. AT 40° F. (ZONE 2) BEFORE GALVANIZING.
3. WELDING: ALL WELDS TO BE CONTINUOUS UNLESS OTHERWISE SHOWN. ALL WELDING TO BE DONE IN ACCORDANCE WITH CURRENT AWS D1.1 AND D1.2 STRUCTURAL WELDING CODES (STEEL AND ALUMINUM) AND THE IDOT STANDARD SPECIFICATIONS. ALUMINUM WELD FILLER SHALL BE ALLOY 5556.
4. FASTENERS FOR ALUMINUM TRUSSES: HIGH STRENGTH BOLTS SHALL SATISFY THE REQUIREMENTS OF AASHTO M164 (ASTM A325), OR APPROVED ALTERNATE, AND SHALL HAVE MATCHING LOCK NUTS. THREADED STUDS FOR SPLICES (IF MEMBERS INTERFERE) SHALL SATISFY THE REQUIREMENTS OF ASTM A449, ASTM A193, GRADE B7, OR APPROVED ALTERNATE, AND SHALL HAVE MATCHING LOCK NUTS. BOLTS AND LOCK NUTS NOT REQUIRED TO BE HIGH STRENGTH SHALL SATISFY THE REQUIREMENTS OF ASTM A307. ALL BOLTS AND LOCK NUTS SHALL BE HOT DIP GALVANIZED PER AASHTO M232, EXCEPT STAINLESS STEEL FASTENERS, NUTS AND WASHERS. THE LOCK NUTS SHALL HAVE NYLON OR STEEL INSERTS. A STAINLESS STEEL FLAT WASHER CONFORMING TO ASTM A240 TYPE 302 OR 304, IS REQUIRED UNDER BOTH HEAD AND NUT OR UNDER BOTH NUTS WHERE THREADED STUDS ARE USED. HIGH STRENGTH BOLT INSTALLATION SHALL CONFORM TO ARTICLE 505.04 (F) (2)D OF THE IDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION. ROTATIONAL CAPACITY ("ROCAP") TESTING OF BOLTS WILL NOT BE REQUIRED.
5. U-BOLTS: U-BOLTS SHALL BE PRODUCED FROM ASTM A276 TYPE 304, 304L, 316 OR 316L, CONDITION A, COLD FINISHED STAINLESS STEEL, OR AN EQUIVALENT MATERIAL ACCEPTABLE TO THE ENGINEER. ALL NUTS FOR U-BOLTS SHALL BE LOCK NUTS EQUIVALENT TO ASTM A307 WITH NYLON OR STEEL INSERTS AND HOT DIP GALVANIZED PER AASHTO M232. A STAINLESS STEEL FLAT WASHER CONFORMING TO ASTM A240, TYPE 302 OR 304, IS REQUIRED UNDER EACH U-BOLT LOCK NUT.
6. GALVANIZING: ALL STEEL GRATING, PLATES, SHAPES AND PIPE SHALL BE HOT DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH AASHTO M111. PAINTING IS NOT PERMITTED.
7. SEE TABLE "SIGN STRUCTURE MEMBER SCHEDULE" FOR "W" AND "$W_1$".
8. DIAGONALS SHALL BE DETAILED TO MINIMIZE OFFSET FOR THEORETICAL PANEL POINT AND PROVIDE ¾ TO 1½ INCH CLEARANCE BETWEEN DIAGONALS AND PROVIDE CLEARANCE FOR U-BOLT CONNECTIONS OF SIGNS OR WALKWAY BRACKETS.

## SIGN STRUCTURE MEMBER SCHEDULE

| TRUSS NO. | DIMENSIONS | | | | | ALUMINUM TRUSS* | | | | | | STEEL END SUPPORT | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TRUSS SPAN L | P | N | h | $W_1$ | MAXIMUM ALLOWABLE SIGN PANEL AREA | DL (TRUSS) DEFLECTION | MIDDLE SEGMENT OR END SEGMENT | | | | W | PIPE COLUMN (NOMINAL DIAMETER) | |
| | | | | | | | | CHORD (O.D.) | | DIAGONAL (O.D.) | | | 10" X.X.S. (104.13#/FT.) | 12" X.X.S. (125.49#/FT.) |
| | | | | | | | | FRONT | REAR | FRONT | REAR | | H OR $H_1$ | H OR $H_1$ |
| T-80 | 80'-0" | 9'-0" | 3'-4" | 4'-6" | 3'-10¾" | 900 S.F. | 1" | 5½"Ø x½" | 5½"Ø x½" | 2½"Ø x¼" | 2½"Ø x¼" | 5'-9" | 32'-0" (MAX) | 38'-0" (MAX) |
| T-85 | 85'-0" | 9'-6" | 3'-10" | 4'-9" | 4'-1⅜" | 955 S.F. | 1 1/16" | 6⅞"Ø x½" | 6⅞"Ø x½" | 3"Ø x¼" | 3"Ø x¼" | 6'-7" | 31'-0" (MAX) | 38'-0" (MAX) |
| T-90 | 90'-0" | 10'-0" | 4'-4" | 5'-0" | 4'-4" | 1010 S.F. | 1⅛" | 6⅞"Ø x½" | 6⅞"Ø x½" | 3"Ø x¼" | 3"Ø x¼" | 6'-7" | 31'-0" (MAX) | 38'-0" (MAX) |
| T-95 | 95'-0" | 10'-6" | 4'-10" | 5'-3" | 4'-6⅝" | 1065 S.F. | 1 3/16" | 6⅞"Ø x½" | 6⅞"Ø x½" | 3"Ø x¼" | 3"Ø x¼" | 6'-7" | 31'-0" (MAX) | 38'-0" (MAX) |
| T-100 | 100'-0" | 11'-4" | 4'-0" | 5'-8" | 4'-10⅞" | 1125 S.F. | 1¼" | 7"Ø x½" | 7"Ø x½" | 3½"Ø x¼" | 3½"Ø x¼" | 7'-5" | 31'-0" (MAX) | 38'-0" (MAX) |
| T-105 | 105'-0" | 12'-0" | 3'-10" | 6'-0" | 5'-2⅜" | 1180 S.F. | 1 5/16" | 7"Ø x½" | 7"Ø x½" | 3½"Ø x¼" | 3½"Ø x¼" | 7'-5" | 31'-0" (MAX) | 38'-0" (MAX) |
| T-110 | 110'-0" | 12'-6" | 4'-4" | 6'-3" | 5'-5" | 1200 S.F. | 1⅜" | 7"Ø x½" | 7"Ø x½" | 3½"Ø x¼" | 3½"Ø x¼" | 7'-5" | 31'-0" (MAX) | 38'-0" (MAX) |
| T-115 | 115'-0" | 13'-0" | 4'-10" | 6'-6" | 5'-7⅝" | 1200 S.F. | 1½" | 7½"Ø x½" | 7½"Ø x½" | 3½"Ø x¼" | 3½"Ø x¼" | 10'-2" | 34'-0" (MAX) | 40'-0" (MAX) |
| T-120 | 120'-0" | 13'-8" | 4'-8" | 6'-10" | 5'-11" | 1200 S.F. | 1 7/16" | 7½"Ø x½" | 7½"Ø x½" | 3½"Ø x¼" | 3½"Ø x¼" | 10'-2" | 34'-0" (MAX) | 40'-0" (MAX) |
| T-130 | 130'-0" | 15'-0" | 4'-4" | 7'-6" | 6'-5⅞" | 1200 S.F. | 1 7/16" | 9"Ø x½" | 9"Ø x½" | 4"Ø x¼" | 4"Ø x¼" | 10'-2" | NOT APPLICABLE | 40'-0" (MAX) |
| T-140 | 140'-0" | 16'-3" | 4'-4" | 8'-2" | 7'-0⅞" | 1200 S.F. | 1 11/16" | 10"Ø x½" | 10"Ø x½" | 4"Ø x¼" | 4"Ø x¼" | 10'-2" | NOT APPLICABLE | 40'-0" (MAX) |
| T-150 | 150'-0" | 17'-6" | 4'-4" | 8'-10" | 7'-7¾" | 1200 S.F. | 1 13/16" | 11"Ø x½" | 11"Ø x½" | 4½"Ø x¼" | 4½"Ø x¼" | 10'-2" | NOT APPLICABLE | 40'-0" (MAX) |

* SUBSTITUTION OF LARGER TRUSS SIZE IS ACCEPTABLE.

## CAMBER

| SPAN IN FEET | CAMBER IN INCHES |
|---|---|
| 80 THRU 95 | 1½" |
| 96 THRU 110 | 1⅝" |
| 111 THRU 120 | 1⅞" |
| 121 THRU 130 | 1⅞" |
| 131 THRU 140 | 2" |
| 141 THRU 150 | 2⅛" |

PROVIDE THE ABOVE CAMBER AT MIDDLE OF SPAN OF STRUCTURES

## TABLE A

| CHORD O.D. E | F | G | N |
|---|---|---|---|
| 5½"Ø | 10" | 13" | 8 |
| 6⅞"Ø & 7"Ø | 11½" | 14½" | 10 |
| 7½"Ø | 12½" | 15½" | 12 |
| 9"Ø | 13½" | 16½" | 14 |
| 10"Ø | 15½" | 18½" | 16 |
| 11"Ø | 17½" | 20½" | 18 |

## NOTES:

1. XXS DENOTES DOUBLE EXTRA STRONG PIPE.
2. A PAIR OF MAIN PIPE COLUMN SIZES FOR EACH SUPPORT SHALL BE SELECTED INDEPENDENTLY BASED ON SPECIFIC NEEDS.

Paul Kovacs
APPROVED. . . . . DATE 2-7-2012
CHIEF ENGINEERING OFFICER

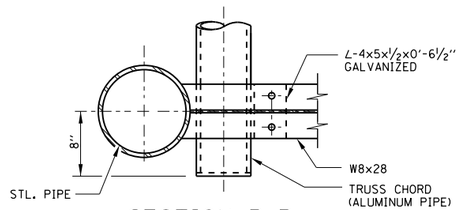
| DATE | REVISIONS |
|---|---|
| 2-07-2012 | REVISED FOUNDATIONS AND REVISED NOTES. |
| 2-01-2013 | REVISED TABLES, ELEVATION, AND NOTES. |
| 12-12-2013 | REVISED TABLES AND NOTES. |
| 3-31-2014 | REVISED SIGN STRUCTURE DETAILS. |
| 7-01-2014 | REVISED FOUNDATION CONCRETE. |
| 3-11-2015 | REVISED NOTES. |
| 3-31-2016 | REVISED FOUNDATION NOTE AND REVISED BASE PLATE DIMENSIONS. |
| 3-31-2017 | COLUMN MEMBER ADJUSTMENTS AND FOUNDATION REINFORCEMENT. |
| 3-01-2018 | REVISED VER. CLEARANCE, AND ADDED NOTE |
| 3-01-2019 | UPDATE BARRIER SHAPE. CHANGED GRADE BEAM TO CLASS SI CONCRETE. REVISED †1(E) BAR IN BAR LIST |



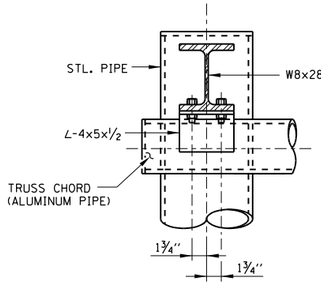
Illinois Tollway

OVERHEAD SIGN STRUCTURE
SPAN TYPE
STRUCTURE DETAILS

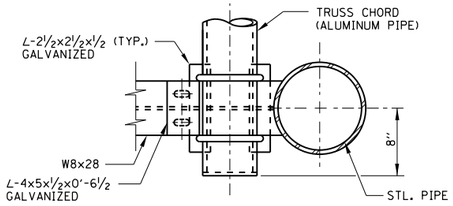
STANDARD F1-09



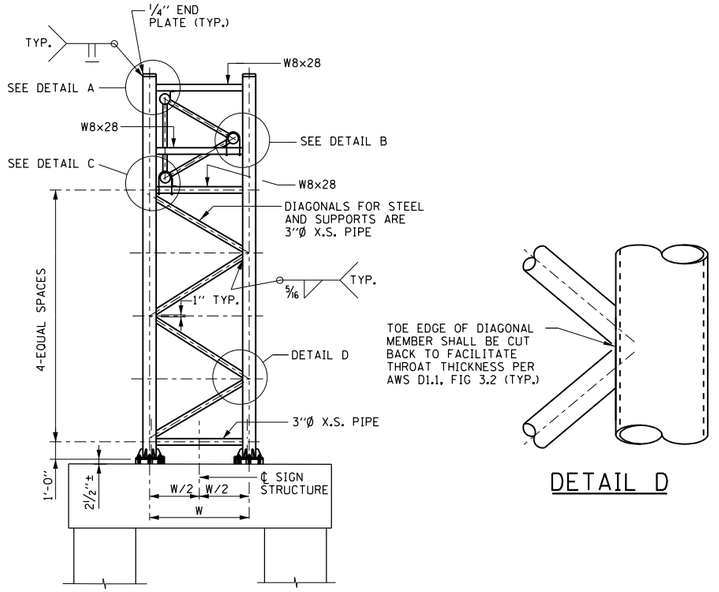

SECTION B-B




SECTION A-A

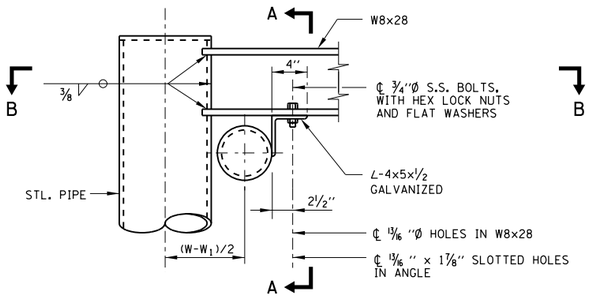



SECTION D-D

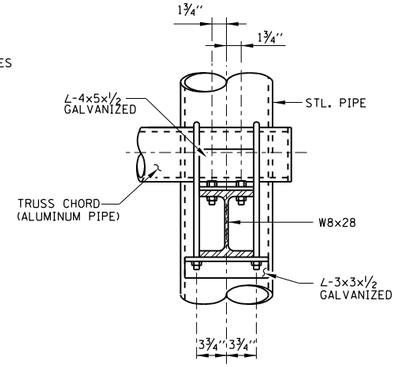



TYPICAL END SUPPORT ELEVATION

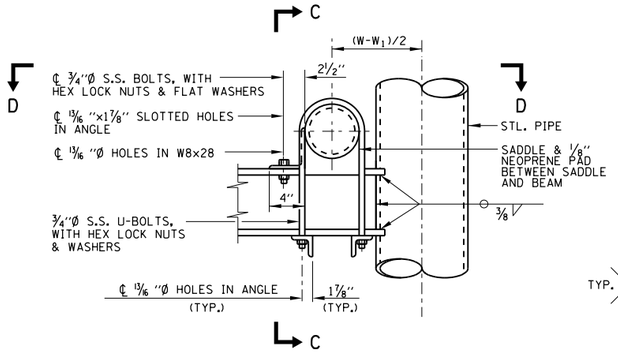
DETAIL D



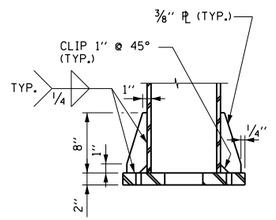

DETAIL A



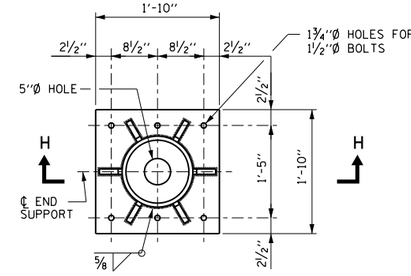

SECTION C-C



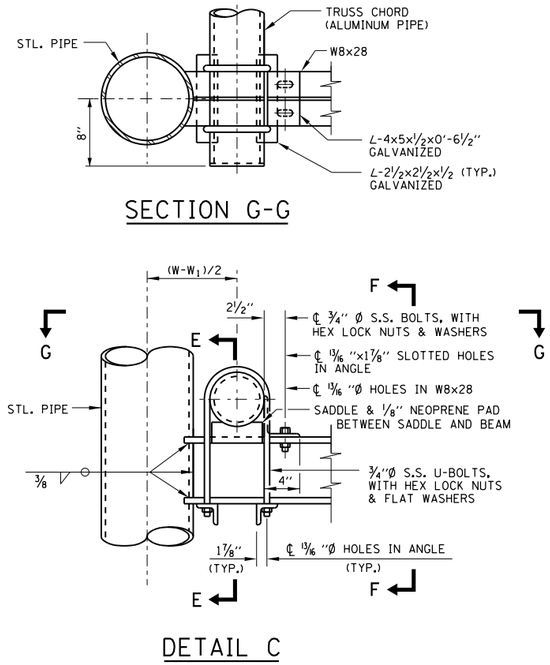

DETAIL B




SECTION H-H



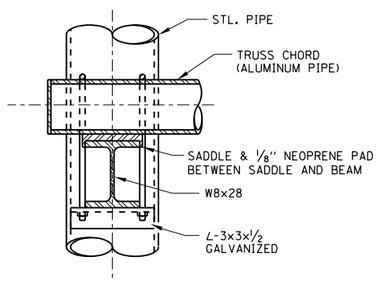

BASE PLATE PLAN



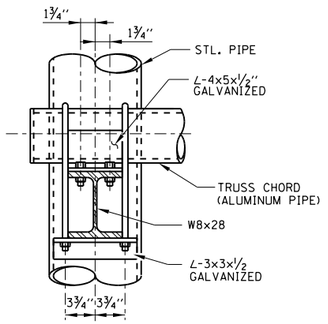

SECTION G-G



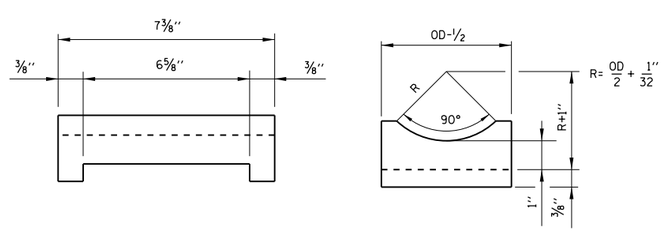

DETAIL C




SECTION E-E




SECTION F-F




SADDLE (SHIM) DETAIL (ALUMINUM)

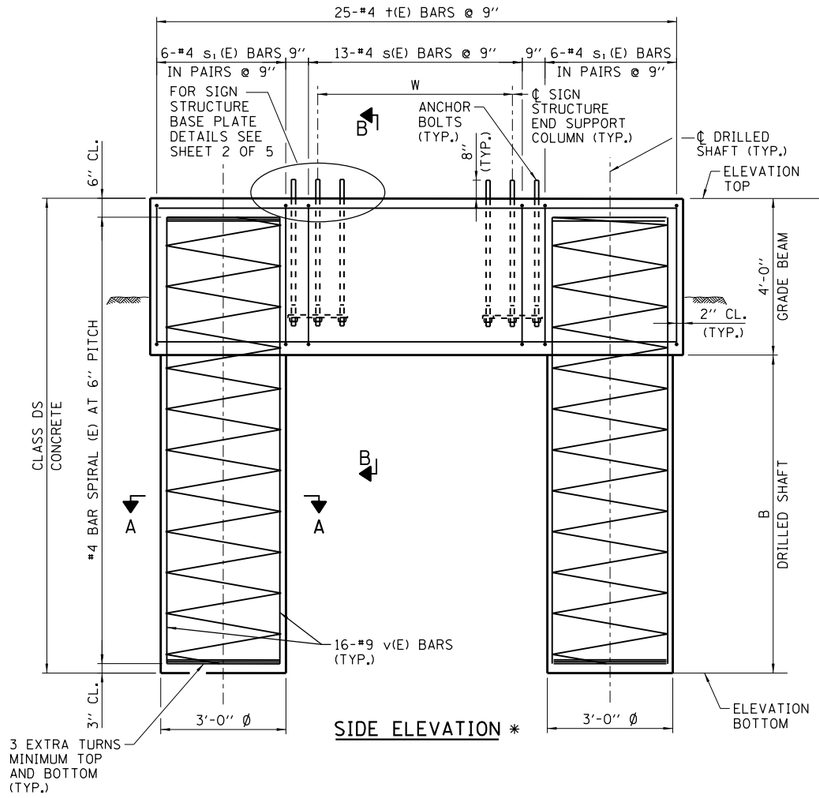
SHEET 2 OF 5

Illinois Tollway

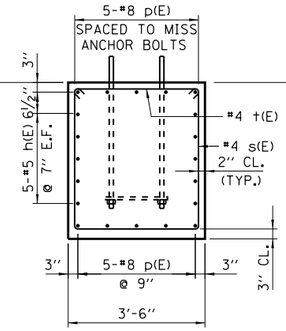
OVERHEAD SIGN STRUCTURE
SPAN TYPE
STRUCTURE DETAILS

STANDARD F1-09

Paul Kovacs
APPROVED ..... DATE 2-7-2012
CHIEF ENGINEERING OFFICER

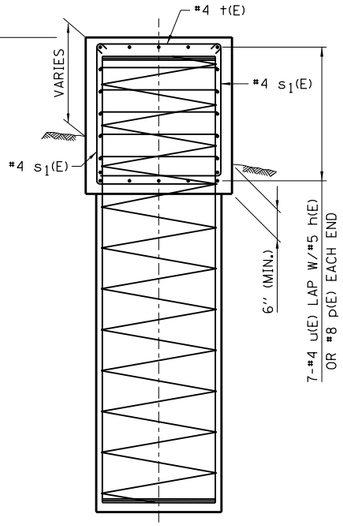



SIDE ELEVATION *

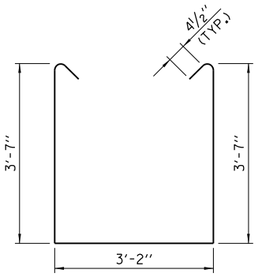



SECTION B-B

* REINFORCEMENT IN GRADE BEAM NOT SHOWN FOR CLARITY




END VIEW

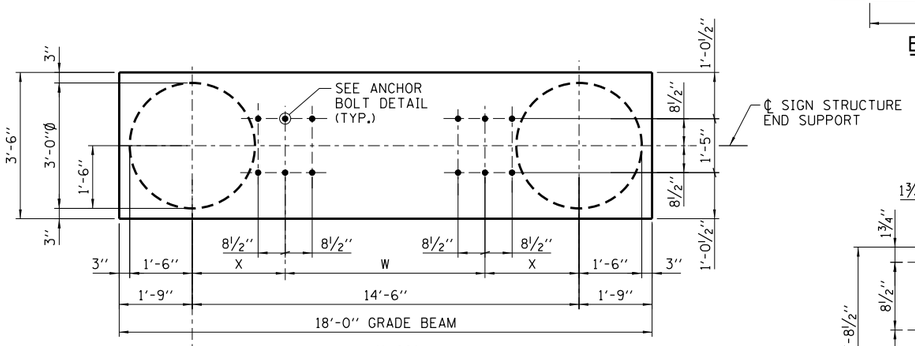



BAR s(E)

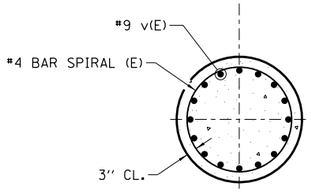
| DESIGN TABLE FOR DRILLED SHAFTS IN COHESIVE SOILS (QU > 1.25 TON/SQ. FT.) | | | | | |
|---|---|---|---|---|---|
| TRUSS No. | W | X | B | CLASS DS CONC. CY | REINF. BARS POUND |
| T-80 | 5'-9'' | 4'-4½'' | 40'-0'' | 30.3 | 6650 |
| T-85 | 6'-7'' | 3'-11½'' | 50'-0'' | 35.5 | 7940 |
| T-90 | 6'-7'' | 3'-11½'' | 50'-0'' | 35.5 | 7940 |
| T-95 | 6'-7'' | 3'-11½'' | 50'-0'' | 35.5 | 7940 |
| T-100 | 7'-5'' | 3'-6½'' | 50'-0'' | 35.5 | 7940 |
| T-105 | 7'-5'' | 3'-6½'' | 50'-0'' | 35.5 | 7940 |
| T-110 | 7'-5'' | 3'-6½'' | 50'-0'' | 35.5 | 7940 |
| T-115 | 10'-2'' | 2'-2'' | 50'-0'' | 35.5 | 7940 |
| T-120 | 10'-2'' | 2'-2'' | 50'-0'' | 35.5 | 7940 |
| T-130 | 10'-2'' | 2'-2'' | 55'-0'' | 38.1 | 8590 |
| T-140 | 10'-2'' | 2'-2'' | 55'-0'' | 38.1 | 8590 |
| T-150 | 10'-2'' | 2'-2'' | 55'-0'' | 38.1 | 8590 |

## NOTES:

1. THE FOUNDATION DETAILS SHOWN ARE BASED ON THE PRESENCE OF MOSTLY COMMON COHESIVE SOIL CONDITIONS (SILTY OR SANDY CLAY), WITH AN AVERAGE UNCONFINED COMPRESSIVE STRENGTH (QU) > 1.25 TON/SQ. FT. WHICH SHALL BE DETERMINED BY PREVIOUS SOIL INVESTIGATIONS AT THE JOBSITE. WHEN OTHER CONDITIONS ARE INDICATED, THE FOUNDATION DIMENSIONS SHOWN SHALL BE INCLUDED IN THE PLANS AND THE FOUNDATION DIMENSIONS SHOWN SHALL BE THE RESULT OF SITE SPECIFIC DESIGNS. IF CONDITIONS ENCOUNTERED IN THE FIELD ARE DIFFERENT THAN THOSE INDICATED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER TO DETERMINE IF THE FOUNDATION DIMENSIONS NEED TO BE MODIFIED.
2. ANCHOR BOLTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M314 OR ASTM F1554 GRADE 55, WITH A MINIMUM TENSILE STRENGTH OF 75,000 PSI. ALL OTHER MATERIAL, FABRICATION, AND CONSTRUCTION REQUIREMENTS SHALL BE IN ACCORDANCE WITH SECTION 734 OF THE ILLINOIS TOLLWAY SUPPLEMENTAL SPECIFICATIONS.
3. CONCRETE SHALL BE PLACED MONOLITHICALLY, WITHOUT CONSTRUCTION JOINTS UNLESS NOTED OTHERWISE.
4. BACKFILL SHALL BE PLACED PER SECTION 502 OF THE IDOT STANDARD SPECIFICATION AND PRIOR TO ERECTION OF SUPPORT COLUMN.
5. A NORMAL SURFACE FINISH FOLLOWED BY A CONCRETE SEALER APPLICATION WILL BE REQUIRED ON CONCRETE SURFACES ABOVE THE LOWEST ELEVATION 6'' BELOW FINISHED GROUND LINE.
6. ALL REBAR DESIGNATED (E) SHALL BE EPOXY COATED. REBAR SHALL BE POSITIONED SO THAT THERE WILL BE NO INTERFERENCE BETWEEN VERTICAL REINFORCEMENT AND ANCHOR BOLTS.
7. SITE GROUNDING ELECTRODE SYSTEM TO BE PROVIDED AS INDICATED ON THE PLANS.
8. NO SONOTUBES OR DECOMPOSABLE FORMS SHALL BE USED 6'' BELOW THE FINISHED GROUND LINE. PERMANENT METAL FORMS OR OTHER SHIELDING SHALL NOT BE LEFT IN PLACE BELOW THE ELEVATION WITHOUT THE ENGINEER'S WRITTEN PERMISSION. EXCAVATIONS SHALL BE DEWATERED BEFORE CONCRETE PLACEMENT IF DIRECTED BY THE ENGINEER AT NO ADDITIONAL COST.
9. IF NECESSARY TO INCREASE STEEL END SUPPORT HEIGHT ABOVE THE LIMITATIONS SHOWN IN SIGN STRUCTURE MEMBER SCHEDULE ON SHEET 1 OF THIS SERIES, GRADE BEAM DEPTH SHALL BE INCREASED UP TO 6'-0'' WITHOUT CHANGES TO THE DRILLED SHAFT DESIGN. GRADE BEAM REINFORCEMENT, CONCRETE VOLUME AND LENGTH OF ANCHOR BOLTS SHALL BE REVISED ACCORDINGLY.

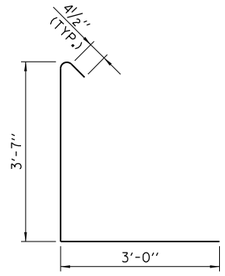



PLAN *

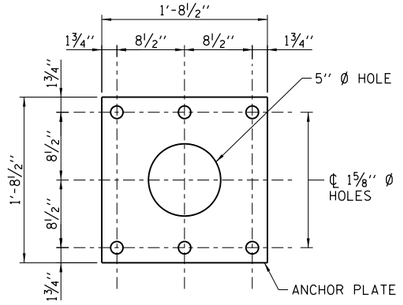



(TYPICAL BOTH SHAFTS)

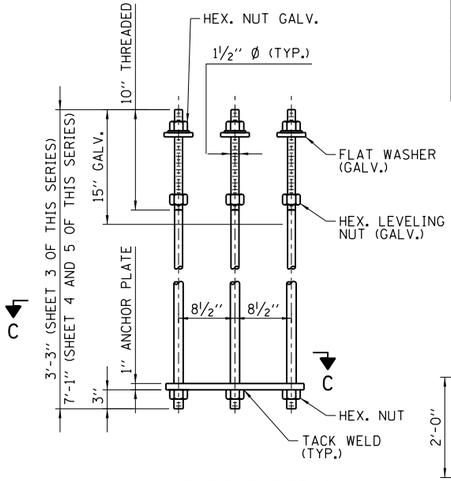
SECTION A-A



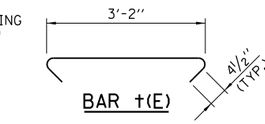

BAR s1(E)



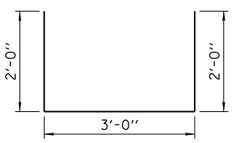

SECTION C-C




ANCHOR BOLT DETAIL
(TYP. FOR ALL FOUNDATIONS)




BAR t(E)




BAR u(E)

## BAR LIST - EACH FOUNDATION
(2 SHAFT AND 1 GRADE BEAM)

| BAR | NUMBER | SIZE | LENGTH | SHAPE |
|---|---|---|---|---|
| h(E) | 10 | #5 | 17'-8'' | |
| p(E) | 10 | #8 | 17'-8'' | |
| s(E) | 13 | #4 | 11'-1'' | |
| s1(E) | 24 | #4 | 6'-11½'' | |
| t(E) | 25 | #4 | 3'-11'' | |
| u(E) | 14 | #4 | 7'-0'' | |
| v(E) | 32 | #9 | B ADD 3'-3'' | |
| #4 BAR SPIRAL (E) - SEE SIDE ELEVATION | | | | |

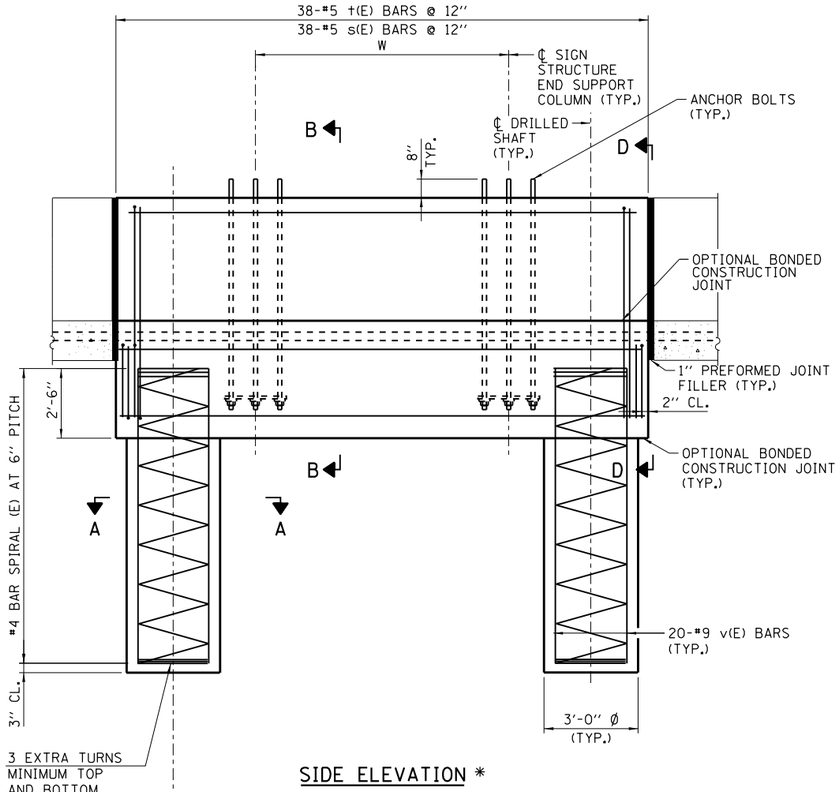
Paul Kovacs
APPROVED . . . . . DATE 2-7-2012
CHIEF ENGINEERING OFFICER



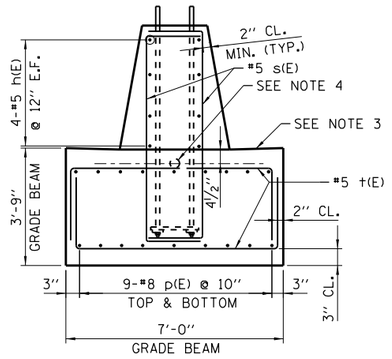
Illinois Tollway

OVERHEAD SIGN STRUCTURE
SPAN TYPE
STRUCTURE DETAILS

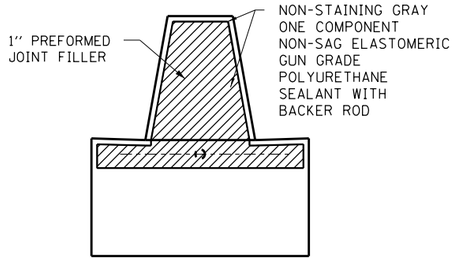
STANDARD F1-09



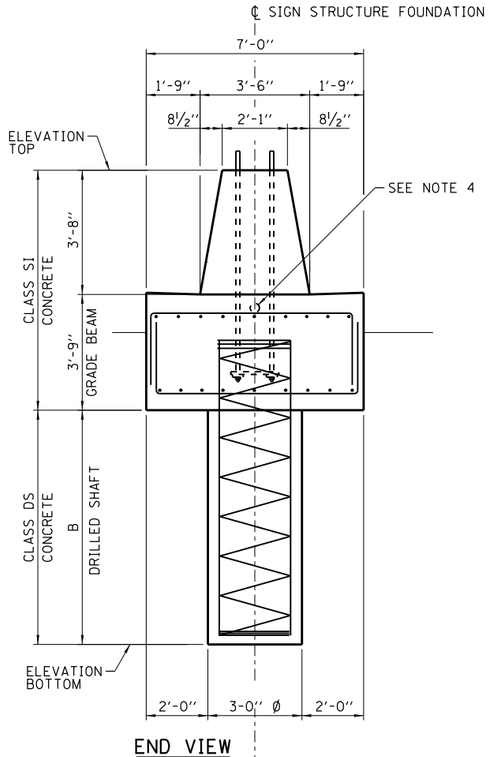

SIDE ELEVATION *



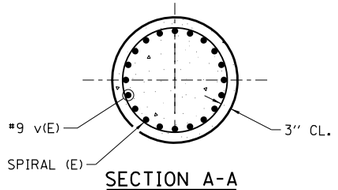

SECTION B-B




SECTION D-D



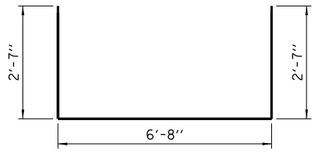

END VIEW



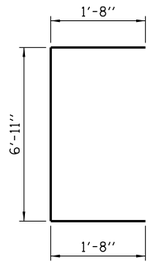

SECTION A-A
(TYPICAL BOTH SHAFTS)

## BAR LIST - EACH FOUNDATION

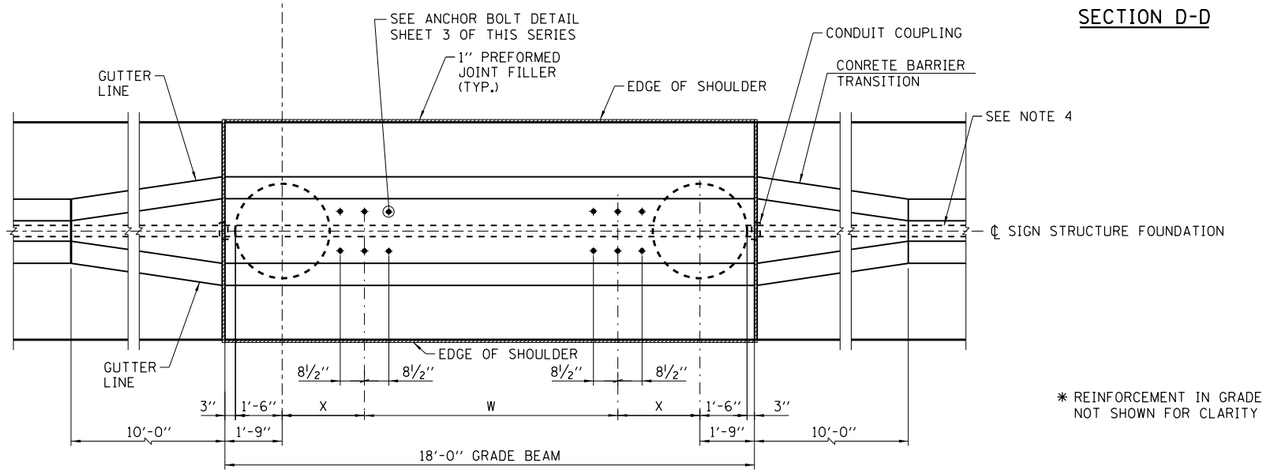
| BAR | NUMBER | SIZE | LENGTH | SHAPE |
|---|---|---|---|---|
| h(E) | 8 | #5 | 17'-8'' | —— |
| p(E) | 18 | #8 | 17'-8'' | —— |
| s(E) | 38 | #5 | 10'-3'' | C |
| †(E) | 38 | #5 | 11'-10'' | U |
| v(E) | 40 | #9 | B ADD 2'-3'' | —— |
| #4 BAR SPIRAL (E) - SEE SIDE ELEVATION | | | | |




BAR †(E)




BAR s(E)




PLAN *

(REINFORCEMENT NOT SHOWN FOR CLARITY)

* REINFORCEMENT IN GRADE BEAM NOT SHOWN FOR CLARITY

**DESIGN TABLE FOR DRILLED SHAFTS IN COHESIVE SOILS (QU > 1.25 TON/SQ. FT.)**

| TRUSS No. | W | X | B | CLASS DS CONC. CU. YD. | CLASS SI CONC. CU. YD. | REINF. BARS POUND | PROTECTIVE COAT SQ. YD. |
|---|---|---|---|---|---|---|---|
| T-80 | 5'-9'' | 4'-4½'' | 50'-0'' | 43.7 | 6.8 | 10110 | 26.1 |
| T-85 | 6'-7'' | 3'-11½'' | 55'-0'' | 46.3 | 6.8 | 10890 | 26.1 |
| T-90 | 6'-7'' | 3'-11½'' | 55'-0'' | 46.3 | 6.8 | 10890 | 26.1 |
| T-95 | 6'-7'' | 3'-11½'' | 55'-0'' | 46.3 | 6.8 | 10890 | 26.1 |
| T-100 | 7'-5'' | 3'-6½'' | 55'-0'' | 46.3 | 6.8 | 10890 | 26.1 |
| T-105 | 7'-5'' | 3'-6½'' | 55'-0'' | 46.3 | 6.8 | 10890 | 26.1 |
| T-110 | 7'-5'' | 3'-6½'' | 55'-0'' | 46.3 | 6.8 | 10890 | 26.1 |
| T-115 | 10'-2'' | 2'-2'' | 55'-0'' | 46.3 | 6.8 | 10890 | 26.1 |
| T-120 | 10'-2'' | 2'-2'' | 55'-0'' | 46.3 | 6.8 | 10890 | 26.1 |
| T-130 | 10'-2'' | 2'-2'' | 55'-0'' | 46.3 | 6.8 | 10890 | 26.1 |
| T-140 | 10'-2'' | 2'-2'' | 55'-0'' | 46.3 | 6.8 | 10890 | 26.1 |
| T-150 | 10'-2'' | 2'-2'' | 55'-0'' | 46.3 | 6.8 | 10890 | 26.1 |



## NOTES:

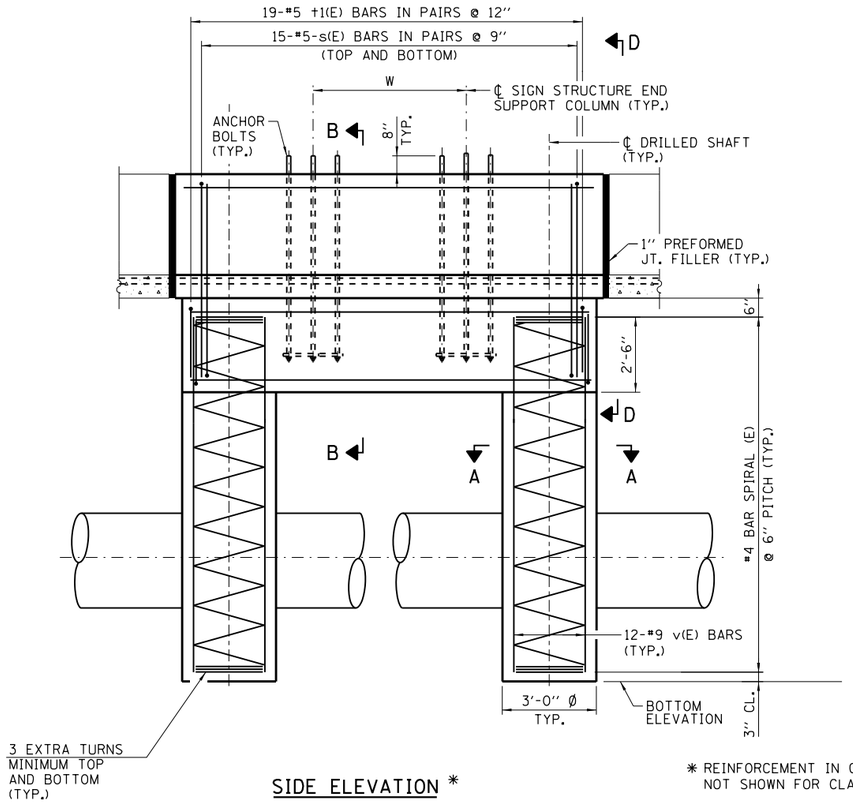
1. SEE SHEET 3 OF THIS SERIES FOR GENERAL NOTES AND DESIGN CRITERIA.
2. FOR SIGN STRUCTURE BASE PLATE DETAIL, SEE SHEET 2 OF THIS SERIES.
3. REFERENCE ILLINOIS TOLLWAY STANDARD DRAWING C5 FOR GUTTER SLOPE.
4. COORDINATE CONDUIT SIZE, LOCATION AND QUANTITY WITH ELECTRICAL PLANS. CONDUITS SHALL BE PLACED TO MISS REINFORCEMENT BARS, DO NOT CUT REINFORCEMENT BARS.
5. PROTECTIVE COAT SHALL BE APPLIED TO THE TRAFFIC AND TOP FACES OF THE BARRIER AND TOP FACE OF GUTTER.

Paul Kovacs
APPROVED ..... DATE 2-7-2012
CHIEF ENGINEERING OFFICER

Illinois Tollway

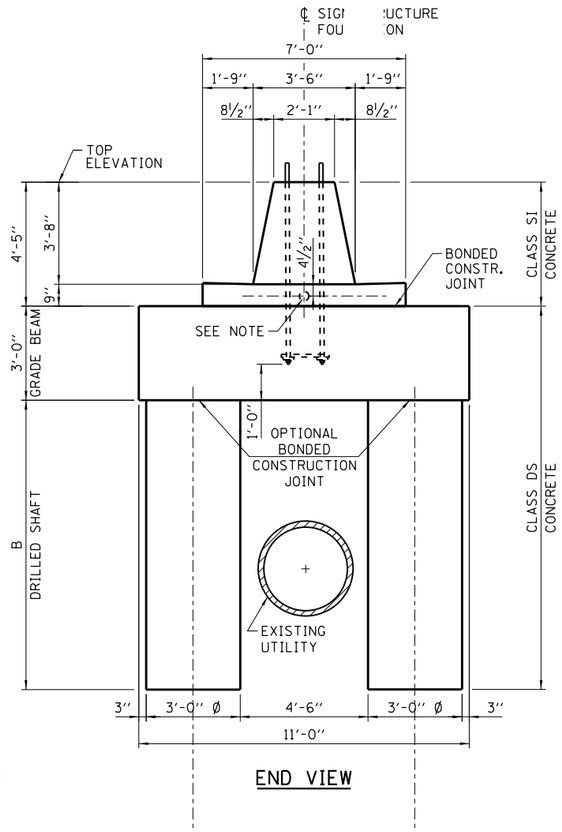
OVERHEAD SIGN STRUCTURE
SPAN TYPE
STRUCTURE DETAILS

STANDARD F1-09




SIDE ELEVATION *

* REINFORCEMENT IN GRADE BEAM NOT SHOWN FOR CLARITY



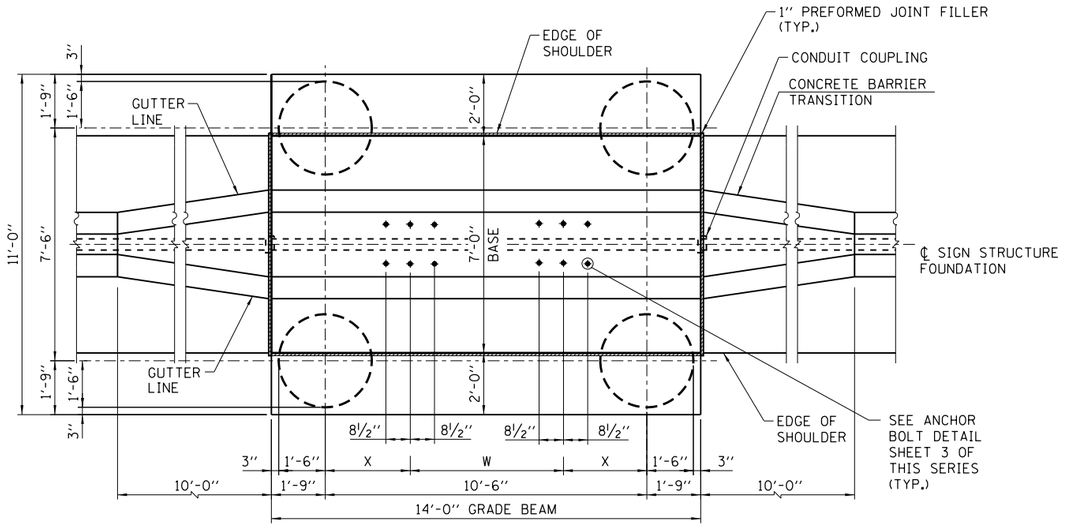

END VIEW

## BAR LIST - EACH FOUNDATION

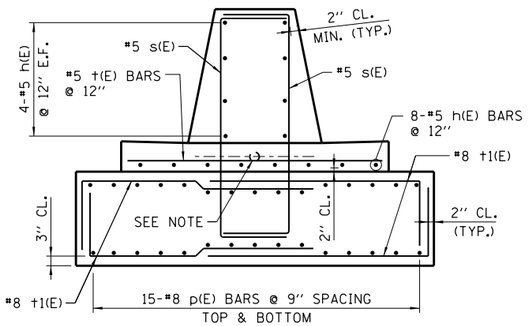
| BAR | NUMBER | SIZE | LENGTH | SHAPE |
|---|---|---|---|---|
| h(E) | 16 | #5 | 13'-8" | |
| p(E) | 30 | #8 | 13'-8" | |
| s(E) | 38 | #5 | 10'-3" | ⊏ |
| †(E) | 15 | #5 | 6'-8" | |
| †1(E) | 60 | #8 | 12'-7" | ⌊ |
| v(E) | 48 | #9 | B ADD 2'-3" | |
| #4 BAR SPIRAL (E) - SEE SIDE ELEVATION | | | | |

DESIGN TABLE FOR DRILLED SHAFTS IN COHESIVE SOILS (QU > 1.25 TON/SQ. FT.)

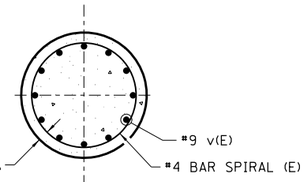
| TRUSS No. | W | X | B | CLASS DS CONC. CU. YD. | CLASS SI CONC. CU. YD. | REINF. BARS POUND | PROTECTIVE COAT SQ. YD. |
|---|---|---|---|---|---|---|---|
| T-80 | 5'-9" | 2'-4½" | 25'-0" | 43.3 | 8.0 | 9950 | 20.3 |
| T-85 | 6'-7" | 1'-11½" | 25'-0" | 43.3 | 8.0 | 9950 | 20.3 |
| T-90 | 6'-7" | 1'-11½" | 25'-0" | 43.3 | 8.0 | 9950 | 20.3 |
| T-95 | 6'-7" | 1'-11½" | 25'-0" | 43.3 | 8.0 | 9950 | 20.3 |
| T-100 | 7'-5" | 1'-6½" | 25'-0" | 43.3 | 8.0 | 9950 | 20.3 |
| T-105 | 7'-5" | 1'-6½" | 30'-0" | 48.5 | 8.0 | 10980 | 20.3 |
| T-110 | 7'-5" | 1'-6½" | 30'-0" | 48.5 | 8.0 | 10980 | 20.3 |
| T-115 | 10'-2" | 0'-2" | 30'-0" | 48.5 | 8.0 | 10980 | 20.3 |
| T-120 | 10'-2" | 0'-2" | 30'-0" | 48.5 | 8.0 | 10980 | 20.3 |
| T-130 | 10'-2" | 0'-2" | 30'-0" | 48.5 | 8.0 | 10980 | 20.3 |
| T-140 | 10'-2" | 0'-2" | 30'-0" | 48.5 | 8.0 | 10980 | 20.3 |
| T-150 | 10'-2" | 0'-2" | 30'-0" | 48.5 | 8.0 | 10980 | 20.3 |



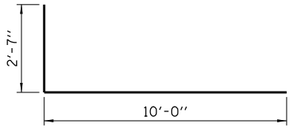

PLAN *



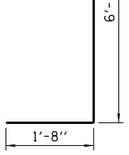

SECTION B-B



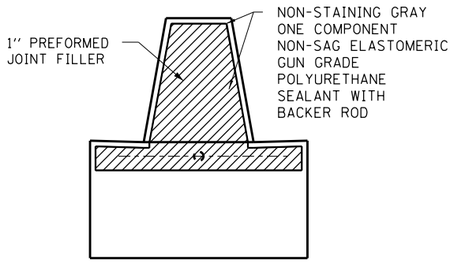

SECTION A-A
(TYPICAL FOR 4 SHAFTS)




BAR †1(E)




BAR s(E)




SECTION D-D

**NOTE:**

1. SEE NOTES ON SHEET 4 OF THIS SERIES.

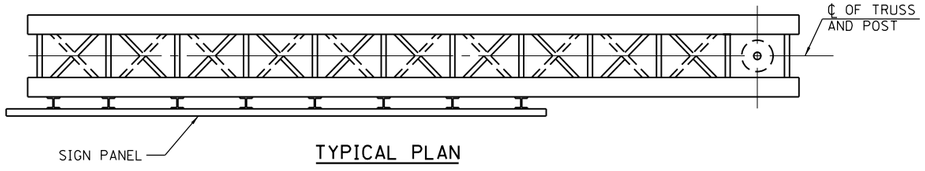
Paul Kovacs
APPROVED . . . . . DATE 2-7-2012
CHIEF ENGINEERING OFFICER



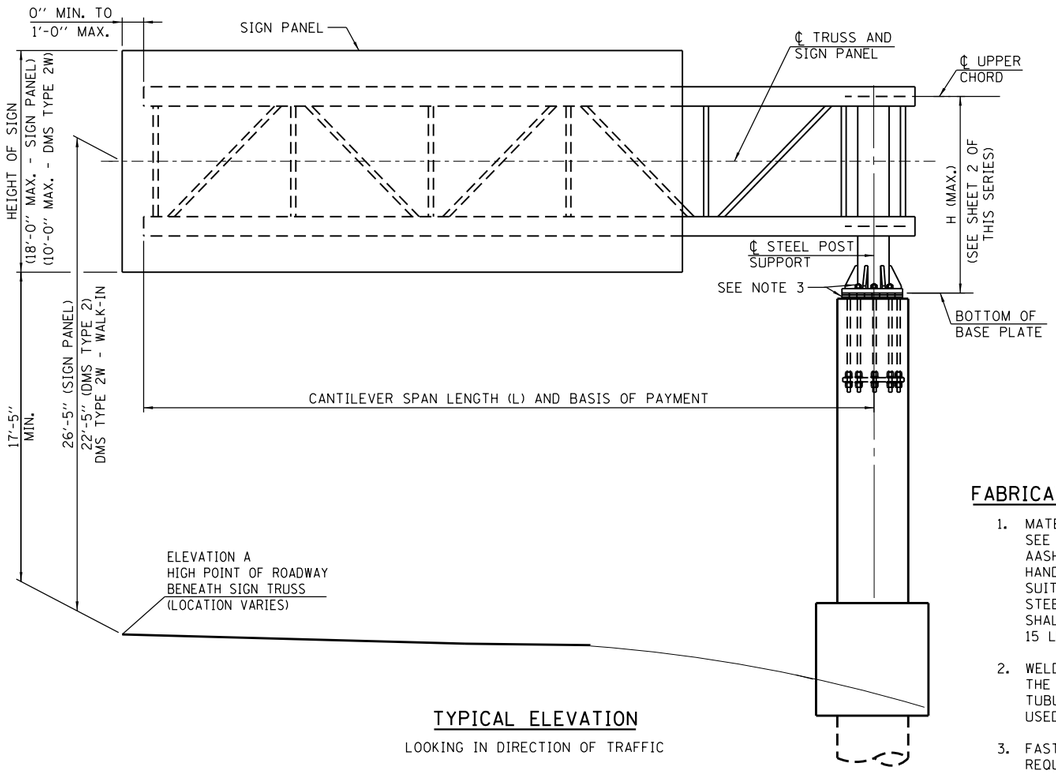
Illinois Tollway

OVERHEAD SIGN STRUCTURE
SPAN TYPE
STRUCTURE DETAILS

STANDARD F1-09




TYPICAL PLAN

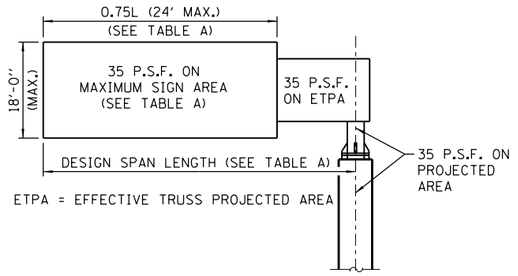



TYPICAL ELEVATION

LOOKING IN DIRECTION OF TRAFFIC

## TABLE A: MAXIMUM LIMITS FOR SIGNS

| TRUSS TYPE | DESIGN SPAN LENGTH (FT.) | MAXIMUM SIGN AREA (SQ. FT.) | MAXIMUM SIGN LENGTH (FT.) |
|---|---|---|---|
| 20-D | 20 | 270 | 15 |
| 25-D | 25 | 338 | 18.75 |
| 30-D | 30 | 405 | 22.5 |
| 35-D | 35 | 432 | 24 |
| 40-D | 40 | 432 | 24 |
| 45-D | 45 | 432 | 24 |
| 50-D | 50 | 432 | 24 |




DESIGN WIND LOADING DIAGRAM

## GENERAL NOTES:

1. WORK THIS SHEET WITH OVERHEAD SIGN STRUCTURE CANTILEVER TYPE SUMMARY AND TOTAL BILL OF MATERIAL SHEET.
2. AFTER ADJUSTMENTS TO LEVEL TRUSS AND ENSURE ADEQUATE VERTICAL CLEARANCE, ALL TOP AND LEVELING NUTS SHALL BE TIGHTENED AGAINST THE BASE PLATE WITH A MINIMUM TORQUE OF 200 LB.-FT. STAINLESS STEEL MESH SHALL THEN BE PLACED AROUND THE PERIMETER OF THE BASE PLATE. SECURE TO BASE PLATE WITH STAINLESS STEEL BANDING.
3. SIGN SUPPORT STRUCTURES MAY BE SUBJECT TO DAMAGING VIBRATIONS AND OSCILLATIONS WHEN SIGN PANELS ARE NOT IN PLACE DURING ERECTION OR MAINTENANCE OF THE STRUCTURE. TO AVOID THESE, ATTACH TEMPORARY BLANK SIGN PANELS OR OTHER BRACING TO THE STRUCTURE UNTIL PERMANENT SIGNS ARE INSTALLED.
4. TRUSSES SHALL BE SHIPPED INDIVIDUALLY WITH ADEQUATE PROVISION TO PREVENT DETRIMENTAL MOTION DURING TRANSPORT. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING THE CONFIGURATION AND PROTECTION OF THE TRUSSES.
5. ALL WELDS SHALL BE CONTINUOUS UNLESS OTHERWISE SHOWN. ALL WELDING SHALL BE DONE IN ACCORDANCE WITH CURRENT AWS D1.1 STRUCTURE WELDING CODE AND THE STANDARD SPECIFICATIONS.
6. ALL STEEL PLATES, SHAPES AND PIPE SHALL BE HOT DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH AASHTO M111.
7. PROVIDE RUBBED SURFACE FINISH FOLLOWED BY CONCRETE SEALER APPLICATION ON ENTIRE SURFACE OF CONCRETE COLUMN AND NORMAL SURFACE FINISH ON GRADE BEAM, EXCEPT BOTTOM SURFACE.
8. REINFORCEMENT BARS DESIGNATED (E) SHALL BE EPOXY COATED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
9. DMS TYPE 2W - WALK-IN IS PERMITTED TO BE INSTALLED ON CANTILEVER TRUSS. DO NOT INSTALL SIGN PANEL IN CONJUNCTION WITH DMS TYPE 2W - WALK-IN. SEE SHEET 9 OF THIS SERIES FOR PERMISSIBLE SIGN SIZE AND WEIGHT.

## FABRICATION NOTES:

1. MATERIALS: FOR MATERIAL SPECIFICATIONS FOR CANTILEVER SIGN STRUCTURES, SEE TABLE B. ALL STRUCTURAL STEEL PLATES AND SHAPES SHALL CONFORM TO AASHTO M270 GR. 50. STAINLESS STEEL FOR SHIMS, SLEEVES AND HANDHOLE COVERS SHALL BE ASTM A240, TYPE 302 OR 304 OR ANOTHER ALLOY SUITABLE FOR EXTERIOR EXPOSURE AND ACCEPTABLE TO THE ENGINEER. THE STEEL PIPE AND STIFFENING RIBS AT THE BASE PLATE FOR THE STEEL POST SHALL HAVE A MINIMUM LONGITUDINAL CHARPY V-NOTCH (CVN) ENERGY OF 15 LB.-FT. AT 40° F (ZONE 2) BEFORE GALVANIZING.
2. WELDING: ALL MATERIALS, WELDING PROCEDURES AND INSPECTION USED FOR THE CANTILEVER OVERHEAD SIGN STRUCTURE SHALL CONFORM TO AWS D1.1-10 FOR TUBULAR, CYCLICALLY LOADED STRUCTURES. ADDITIONALLY, ALL WELDED MATERIALS USED SHALL BE PREQUALIFIED FOR USE WITH WPS AS PER AWS D1.1-10, TABLE 3.1.
3. FASTENERS FOR STEEL TRUSSES: HIGH STRENGTH BOLTS SHALL SATISFY THE REQUIREMENTS OF AASHTO M164 (ASTM A325), OR APPROVED ALTERNATE, AND SHALL HAVE MATCHING LOCKNUTS. THREADED STUDS FOR SPLICES (IF MEMBERS INTERFERE) SHALL SATISFY THE REQUIREMENTS OF ASTM A449. ASTM A193 GRADE B7, OR APPROVED ALTERNATE, AND SHALL HAVE MATCHING LOCKNUTS. BOLTS AND LOCKNUTS NOT REQUIRED TO BE HIGH STRENGTH SHALL SATISFY THE REQUIREMENTS OF ASTM A307. ALL BOLTS AND LOCKNUTS SHALL BE HOT DIP GALVANIZED PER AASHTO M232, EXCEPT STAINLESS STEEL FASTENERS, NUTS AND WASHERS. THE LOCKNUTS SHALL HAVE NYLON OR STEEL INSERTS. A STAINLESS STEEL FLAT WASHER CONFORMING TO ASTM A240 TYPE 302 OR 304, IS REQUIRED UNDER BOTH HEAD AND NUT OR UNDER BOTH NUTS WHERE THREADED STUDS ARE USED. HIGH STRENGTH BOLT INSTALLATION SHALL CONFORM TO ARTICLE 505.04(f)(2)d OF THE IDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION. ROTATIONAL CAPACITY ("ROCAP") TESTING OF BOLTS WILL NOT BE REQUIRED.
4. U-BOLTS: U-BOLTS SHALL BE PRODUCED FROM ASTM A276 TYPE 304, 304L, 316 OR 316L, CONDITION A, COLD FINISHED STAINLESS STEEL, OR AN EQUIVALENT MATERIAL ACCEPTABLE TO THE ENGINEER. ALL NUTS FOR U-BOLTS SHALL BE LOCKNUTS EQUIVALENT TO ASTM A307 WITH NYLON OR STEEL INSERTS AND HOT DIP GALVANIZED PER AASHTO M232. A STAINLESS STEEL FLAT WASHER CONFORMING TO ASTM A240, TYPE 302 OR 304, IS REQUIRED UNDER EACH U-BOLT LOCKNUT.
5. GALVANIZING: ALL PLATES, SHAPES AND PIPE SHALL BE HOT DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH AASHTO M111. PAINTING IS NOT PERMITTED. ALL FASTENERS SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111 OR M232 AS APPROPRIATE FOR THE PRODUCT (EXCEPT STAINLESS STEEL FASTENERS).

## CONSTRUCTION SPECIFICATIONS:

1. ALL MATERIALS, EXCEPT AS SHOWN, FABRICATION, ERECTION AND CONSTRUCTION REQUIREMENTS SHALL BE IN ACCORDANCE WITH SECTION 733 OF THE LATEST ILLINOIS TOLLWAY SUPPLEMENTAL SPECIFICATIONS.

## LOADING:

1. ALL CANTILEVER TRUSSES ARE DESIGNED FOR AN 18'-0'' DEEP SIGN PANEL OVER 75% OF THE ARM LENGTH, WITH A MAXIMUM PANEL WIDTH OF 24'-0''.
2. ALL CANTILEVER TRUSSES ARE DESIGNED FOR 35 PSF WIND PRESSURE ON TRUSS MEMBERS AND SIGN PANEL.
3. THE AASHTO GROUP II AND III ALLOWABLE STRESS SHALL BE 133% (ALLOWABLE STRESS DESIGN).

## DESIGN SPECIFICATIONS:

THESE STRUCTURES ARE DESIGNED TO SATISFY THE 2013 AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS, SIXTH EDITION.

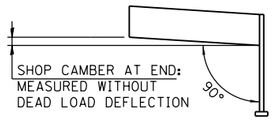
CONCRETE COLUMN, GRADE BEAM AND DRILLED SHAFT ARE DESIGNED IN ACCORDANCE WITH THE 2012 EDITION OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS (INCLUDING THE 2013 INTERIM REVISIONS).

## DESIGN UNIT STRESSES FOR REINFORCED CONCRETE:

CLASS SI CONCRETE _____ f'c = 3,500 P.S.I.
CLASS DS CONCRETE _____ f'c = 4,000 P.S.I.
REINFORCING STEEL _____ fy = 60,000 P.S.I.

## SHOP CAMBER TABLE

| CANTILEVER LENGTH (L) | SHOP CAMBER AT END |
|---|---|
| 20' | 1½'' |
| 25' | 1½'' |
| 30' | 2'' |
| 35' | 2½'' |
| 40' | 2½'' |
| 45' | 3'' |
| 50' | 3½'' |




CAMBER DIAGRAM

(FOR FABRICATION ONLY)

## TABLE B: MATERIAL SPECIFICATIONS FOR STRUCTURAL STEEL AND FASTENERS

| ELEMENT OF STRUCTURE | SPECIFICATION | MINIMUM YIELD STRENGTH (K.S.I.) | MINIMUM ULTIMATE STRENGTH (K.S.I.) |
|---|---|---|---|
| STRUCTURAL STEEL TUBE | ASTM A500 GRADE B | 46 | 58 |
| STRUCTURAL STEEL POST AND PIPE | API 5L GRADE B OR X42 OR X52 | 35 | 52 |
| | ASTM A106 GRADE B | 35 | 60 |
| | ASTM A53, TYPE E OR S, GRADE B | 35 | 60 |
| STEEL BAR AND STEEL PLATES | ASTM A572 GRADE 50 | 50 | 65 |
| STAINLESS STEEL BOLTS | ASTM A193, CLASS 1, GRADE B8 | 30 | 75 |
| STRUCTURAL STEEL BOLTS | ASTM 325 TYPE 1 | -- | 105 |
| STAINLESS STEEL LOCKNUTS | ASTM A194 GRADE 8F ASTM A194 GRADE 2H | -- | -- |
| NUTS | ASTM A563 GRADE DH | -- | -- |
| STEEL WASHERS | ASTM F436 | -- | -- |
| STAINLESS STEEL WASHERS | ASTM A240, TYPE 302 | -- | -- |
| STEEL ANCHOR BOLTS | AASHTO M314 OR ASTM F1554 | 55 | 75 |

Paul Kovacs
APPROVED. . . . . DATE 3-31-2014
CHIEF ENGINEERING OFFICER

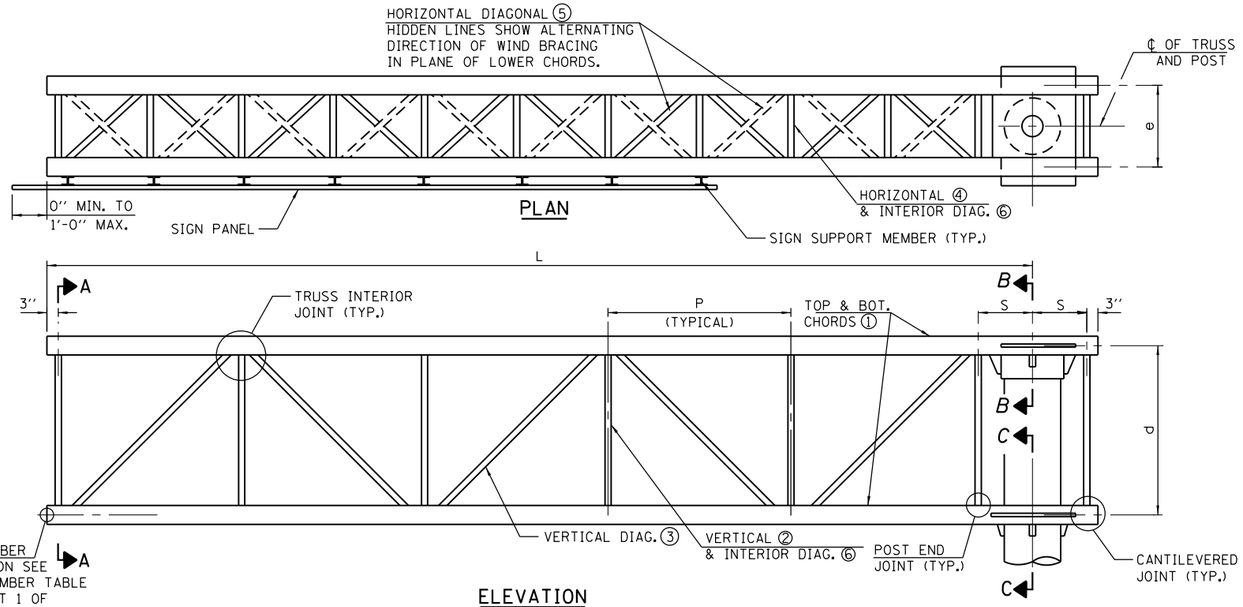
SHEET 1 OF 12

| DATE | REVISIONS |
|---|---|
| 12-12-2013 | REVISED TABLES AND NOTES |
| 2-07-2014 | REVISED STEEL POST TO CONCRETE |
| 3-31-2014 | ADDED DMS TYPE II |
| 7-01-2014 | ADDED DIMENSIONS AND REVISED NOTES |
| 3-11-2015 | ADDED DIMENSIONS AND REVISED NOTES |
| 3-31-2016 | REVISED FOUNDATION NOTE |
| 3-31-2017 | ADDED WALKWAY GRATING DETAILS |
| 3-01-2018 | ADDED VERTICAL CLEARANCE |
| 3-01-2019 | UPDATED BARRIER SHAPE |
| | |
| | |

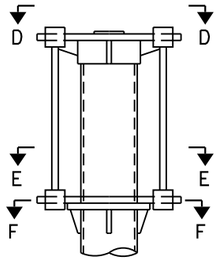
Illinois Tollway

OVERHEAD SIGN STRUCTURE CANTILEVER TYPE STRUCTURE DETAILS

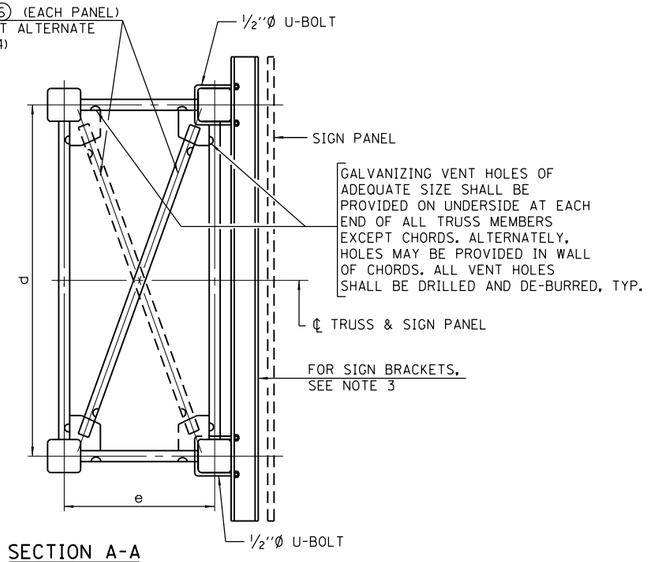
STANDARD F4-10




## ELEVATION
(SIGN OMITTED FOR CLARITY)
(SEE NOTE 2)

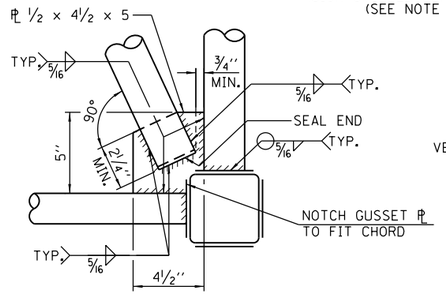



## ELEVATION
(END VIEW)
(SEE NOTE 2)

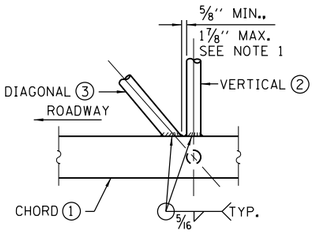



## SECTION A-A

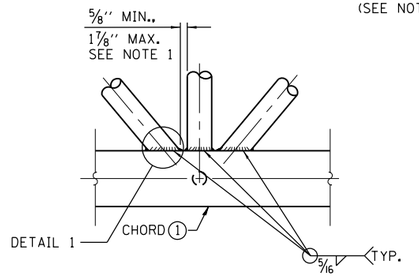
** CONTRACTOR SHALL USE STANDARD DRIVE-FIT CAP TO CLOSE ENDS. AFTER GALVANIZING, DRIVE-FIT CAP SHALL HAVE ½'' Ø DRAIN HOLES AT LOW EDGE.



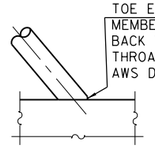

## GUSSET ℄ FOR INTERIOR DIAG. DETAIL



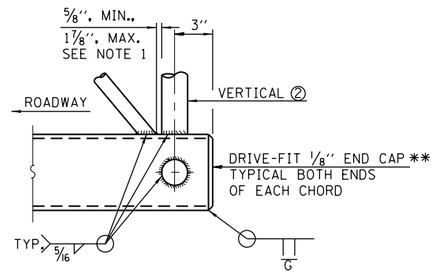

## POST END JOINT DETAIL




## TRUSS INTERIOR JOINT DETAIL




## DETAIL 1




## CANTILEVER END JOINT DETAIL

## TABLE C: TRUSS AND POST DETAILS FOR 18'-0'' (MAX.) SIGN HEIGHT

| DESIGN SPAN LENGTH (L) | TRUSS TYPE | TRUSS SIZE | | ACTUAL SPAN LENGTH | MAXIMUM SIGN LENGTH | STEEL SUPPORT POST (COLUMN) | | | | TRUSS MEMBERS AND DETAILS | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | DIAMETER | WEIGHT | * WALL THICKNESS | H (MAX.) | TOP & BOTTOM CHORD ① | VERTICAL ② | | VERTICAL DIAG. ③ | | HORIZONTAL ④ | | HORIZONTAL DIAG. ⑤ | | INTERIOR DIAG. ⑥ | | PANELS | | |
| | | e | d | | | | | | | | PIPE | WALL | PIPE | WALL | PIPE | WALL | PIPE | WALL | PIPE | WALL | NO. | P | S |
| 20' | 20-D | 2'-6'' | 5'-6'' | 20'-1'' | 15'-0'' | 18'' | 138.30 (#/FT) | 1'' | 12'-0'' | HSS 5x5x¼ | 2½''Ø X.S | 0.276'' | 3''Ø X.X.S | 0.600'' | 1½''Ø X.S | 0.200'' | 2½''Ø X.S | 0.276'' | 1½''Ø X.S | 0.200'' | 4 | 4'-7'' | 1'-6'' |
| 25' | 25-D | 3'-6'' | 5'-6'' | 24'-11'' | 18'-9'' | 18'' | 181.73 (#/FT) | 1'' | 12'-0'' | HSS 5x5x¼ | 2½''Ø X.S | 0.276'' | 3''Ø X.X.S | 0.600'' | 2''Ø X.S | 0.218'' | 2½''Ø X.S | 0.276'' | 2''Ø X.S | 0.218'' | 5 | 4'-7'' | 1'-9'' |
| 30' | 30-D | 3'-6'' | 7'-0'' | 30'-2'' | 22'-6'' | 18'' | 181.73 (#/FT) | 1'' | 12'-0'' | HSS 6x6x¼ | 3''Ø X.S | 0.300'' | 4''Ø X.X.S | 0.674'' | 2''Ø X.S | 0.218'' | 2½''Ø X.S | 0.276'' | 2''Ø X.S | 0.218'' | 5 | 5'-7'' | 2'-0'' |
| 35' | 35-D | 4'-0'' | 7'-0'' | 35'-0'' | 24'-0'' | 24'' | 186.41 (#/FT) | 1'' | 12'-0'' | HSS 6x6x¼ | 3''Ø X.S | 0.300'' | 4''Ø X.X.S | 0.674'' | 2''Ø X.S | 0.218'' | 2½''Ø X.S | 0.276'' | 2''Ø X.S | 0.218'' | 5 | 6'-6'' | 2'-3'' |
| 40' | 40-D | 4'-0'' | 7'-0'' | 40'-0'' | 24'-0'' | 24'' | 186.41 (#/FT) | 1'' | 12'-0'' | HSS 6x6x¼ | 3''Ø X.S | 0.300'' | 4''Ø X.X.S | 0.674'' | 2''Ø X.S | 0.218'' | 2½''Ø X.S | 0.276'' | 2''Ø X.S | 0.218'' | 6 | 6'-3'' | 2'-3'' |
| 45' | 45-D | 4'-6'' | 7'-0'' | 45'-0½'' | 24'-0'' | 24'' | 245.87 (#/FT) | 1'' | 12'-0'' | HSS 6x6x¼ | 3''Ø X.S | 0.300'' | 4''Ø X.X.S | 0.674'' | 2''Ø X.S | 0.218'' | 2½''Ø X.S | 0.276'' | 2''Ø X.S | 0.218'' | 7 | 6'-0½'' | 2'-6'' |
| 50' | 50-D | 4'-6'' | 7'-0'' | 50'-1'' | 24'-0'' | 24'' | 245.87 (#/FT) | 1'' | 12'-0'' | HSS 6x6x¼ | 3''Ø X.S | 0.300'' | 4''Ø X.X.S | 0.674'' | 2''Ø X.S | 0.218'' | 2½''Ø X.S | 0.276'' | 2''Ø X.S | 0.218'' | 8 | 5'-11'' | 2'-6'' |

* NOMINAL WALL THICKNESS SHOWN. THICKER WALL IS PERMITTED UPON ENGINEER'S APPROVAL.

## NOTES:

1. TRUSS MEMBERS SHALL BE SPACED A MINIMUM OF 3 TIMES THE WALL THICKNESS OF THE LARGEST CONNECTING MEMBERS TO ENSURE PROPER WELD SPACING.
2. FOR SECTIONS B-B, C-C, D-D, E-E AND F-F SEE SHEET 3 OF THIS SERIES.
3. FOR SIGN SUPPORT DETAILS, SEE ILLINOIS TOLLWAY STANDARD DRAWING F8, FOR DMS TYPE 2W - WALK-IN SIGN SUPPORT DETAILS, SEE SHEET 9 OF THIS SERIES.
4. DIRECTION OF INTERIOR DIAGONALS SHOWN IN SECTION A-A CORRECTLY DEPICTS TRUSSES HAVING AN ODD NUMBER OF PANELS. TRUSSES WITH AN EVEN NUMBER OF PANELS WILL HAVE DIAGONALS IN A REVERSED DIRECTION THAN AS SHOWN.
5. FOR ANY DESIGN SPAN LENGTH THAT FALLS BETWEEN TWO CONSECUTIVE SPANS, PROVIDED IN COLUMN 1 OF TABLE C, THE LARGER DESIGN SPAN LENGTH SHALL BE USED (I.E. FOR A 32' SPAN LENGTH FALLING BETWEEN 30' AND 35' DESIGN SPAN LENGTHS IN TABLE C, THE 35' DESIGN SPAN LENGTH TRUSS AND POST DETAILS SHALL BE USED).

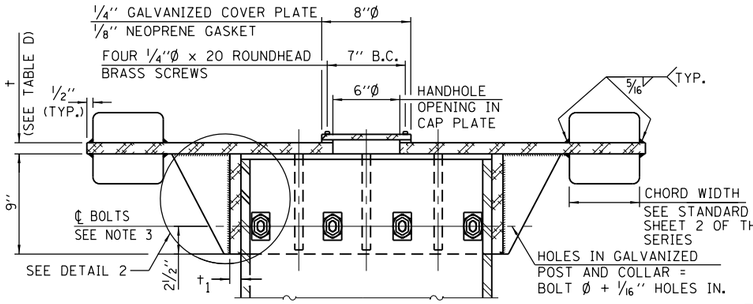
Paul Kovacs
APPROVED..... DATE 3-31-2014
CHIEF ENGINEERING OFFICER



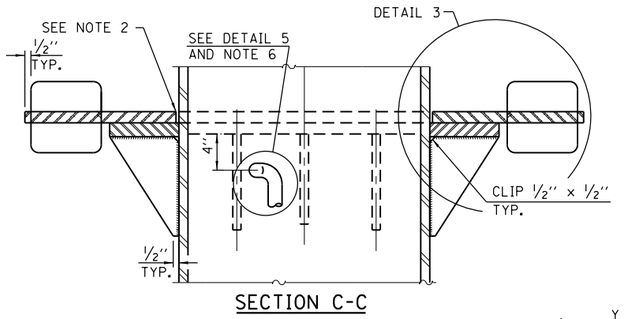
Illinois Tollway

OVERHEAD SIGN STRUCTURE
CANTILEVER TYPE
STRUCTURE DETAILS

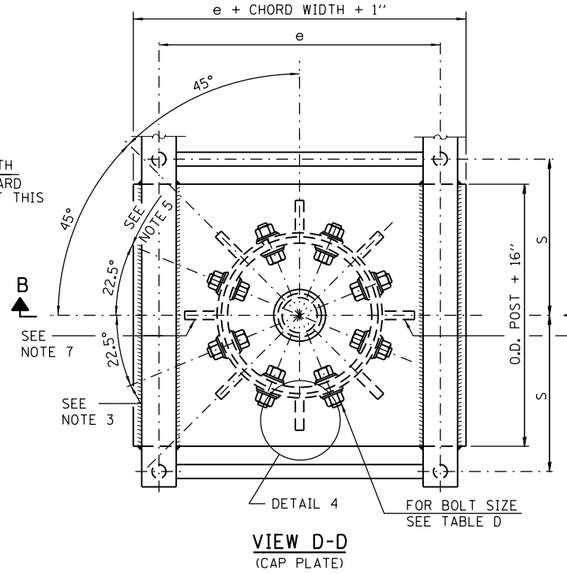
STANDARD F4-10



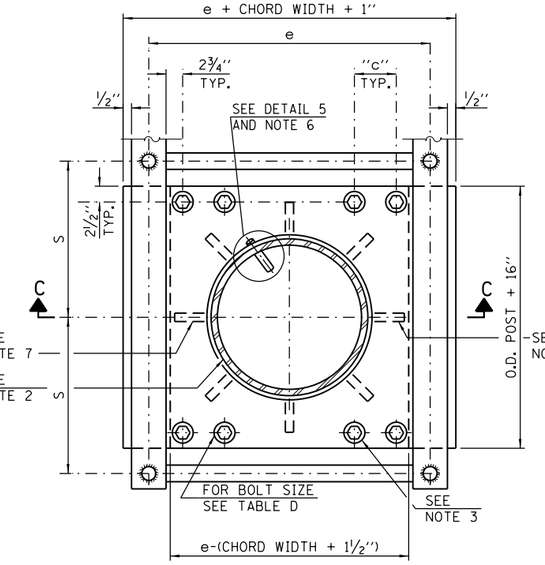

SECTION B-B



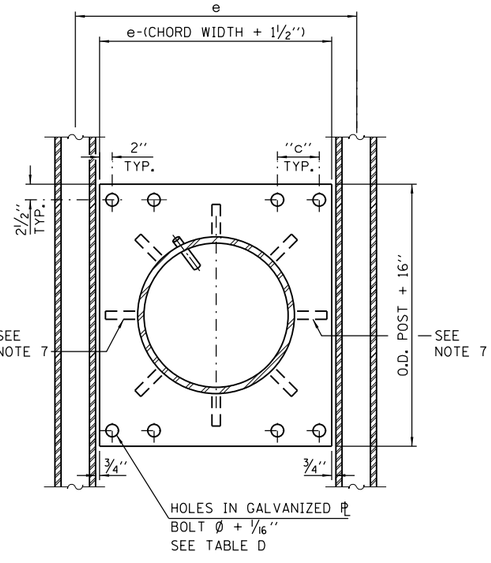

SECTION C-C



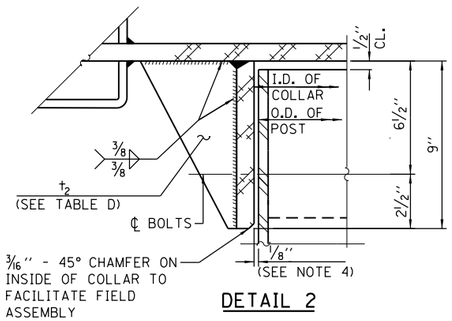

VIEW D-D
(CAP PLATE)



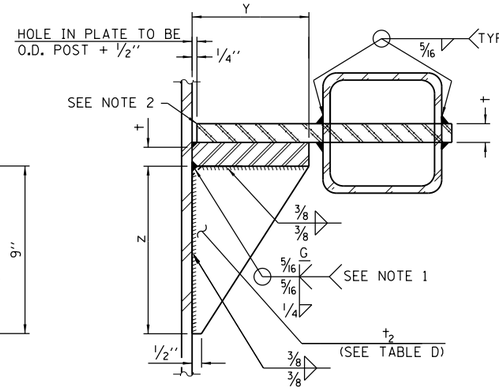

SECTION E-E
(JUNCTURE PLATE)



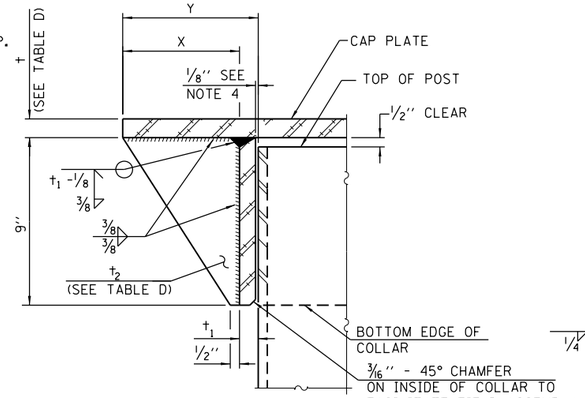

SECTION F-F
(SETTING PLATE)



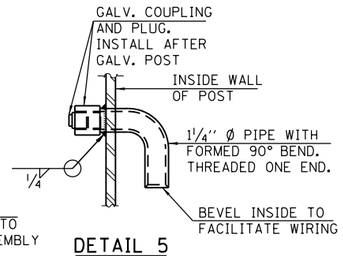

DETAIL 2



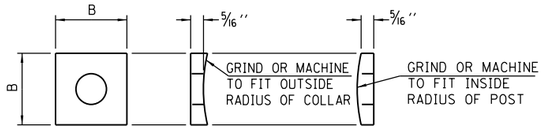

DETAIL 3




DETAIL 4




DETAIL 5




| BOLT SIZE | CONTOURED WASHERS | |
|---|---|---|
| | HOLE DIA. | B |
| 1 1/8''Ø | 1 1/4''Ø | 2 1/4'' |
| 1 1/4''Ø | 1 3/8''Ø | 2 1/4'' |
| 1 1/2''Ø | 1 5/8''Ø | 2 1/4'' |

CONTOURED WASHERS
(ASTM A240, TYPE 304)

## NOTES:

1. GRIND TOP IF REQUIRED TO FULLY SEAT PLATE. REPAIR DAMAGED GALVANIZING BEFORE ASSEMBLY.
2. AFTER TIGHTENING LOWER CONNECTION BOLTS, FILL GAP WITH NON-HARDENING SILICONE CAULK SUITABLE FOR EXTERIOR EXPOSURE AND ACCEPTABLE TO THE ENGINEER.
3. CONNECTION BOLTS IN COLLAR AND BOLTS AT LOWER CHORD CONNECTION SHALL BE HIGH STRENGTH WITH MATCHING LOCKNUTS. LOWER CONNECTION BOLTS SHALL HAVE 2 FLAT WASHERS EACH.
4. AFTER GALVANIZING, COLLAR I.D. SHALL EQUAL O.D. OF GALVANIZED POST PLUS 1/8'' (±1/16'') MAXIMUM GAP BETWEEN POST AND COLLAR AT ANY LOCATION SHALL BE 1/8'' BEFORE TIGHTENING BOLTS.
5. OPTIONAL FULL PENETRATION WELD IN COLLAR. (TWO LOCATIONS MAXIMUM (180° APART) X-RAY OR UT 100%) ALL BOLTS SHOWN ARE HIGH STRENGTH.
6. ORIENT PIPE TOWARD SIGN PANEL SIDE. HOLE IN POST = O.D. PIPE + 1/8''.
7. OMIT INDICATED STIFFENER IN TRUSS TYPE 20-D.

## TABLE D: BOLT SCHEDULE

| SPAN LENGTH | POST OUTSIDE DIAMETER | JUNCTURE & COLLAR CONNECTION BOLT DIAMETER | LOWER JUNCTURE BOLT SPACING DIMENSION ''C'' | PLATE THICKNESS | | STIFFENER THICKNESS | NO. OF STIFFENERS | STIFFENERS | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | (t) | ($t_1$) | ($t_2$) | | x | y | z |
| < = 20' | 18'' | 1 1/8'' | 3 1/8'' | 1'' | 3/4'' | 1/2'' | 6 | 5'' | 6'' | 8'' |
| 21'-30' | 18'' | 1 1/2'' | 3 3/4'' | 1 1/8'' | 7/8'' | 3/4'' | 8 | 5'' | 6'' | 8'' |
| 31'-40' | 24'' | 1 1/2'' | 4 1/2'' | 1 1/4'' | 1'' | 3/4'' | 8 | 7'' | 8'' | 10 1/2'' |
| 41'-50' | 24'' | 1 1/2'' | 4 1/2'' | 1 1/4'' | 1'' | 3/4'' | 8 | 7'' | 8'' | 10 1/2'' |

Paul Kovacs
APPROVED..... DATE 3-31-2014
CHIEF ENGINEERING OFFICER

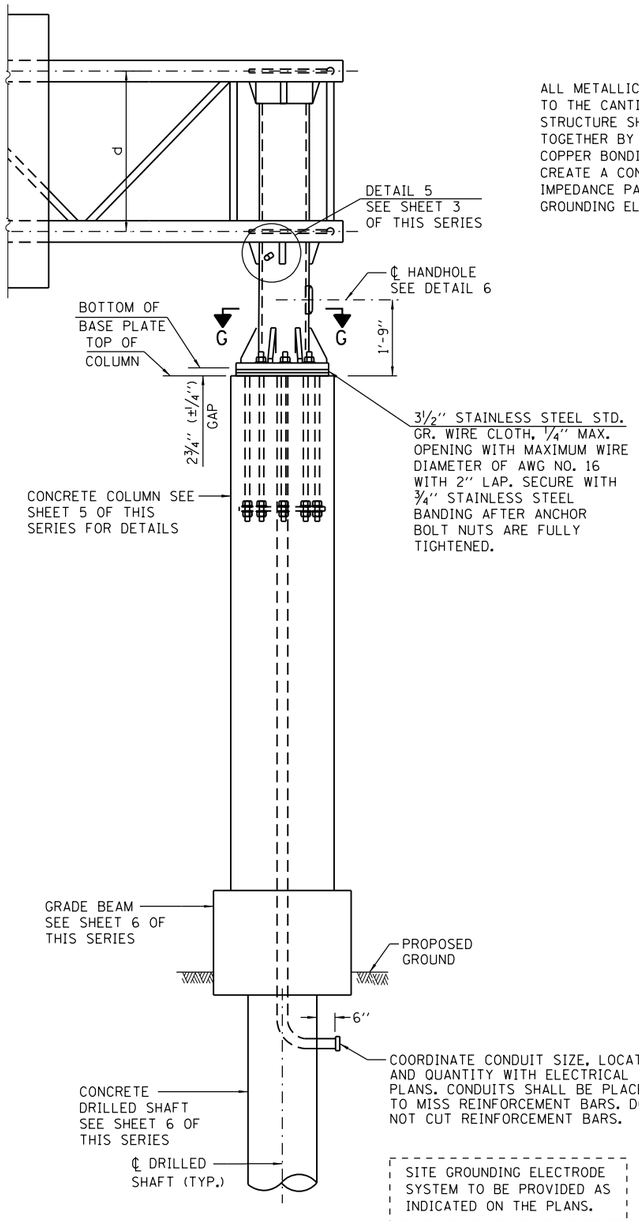
B.C. = BOLT CIRCLE



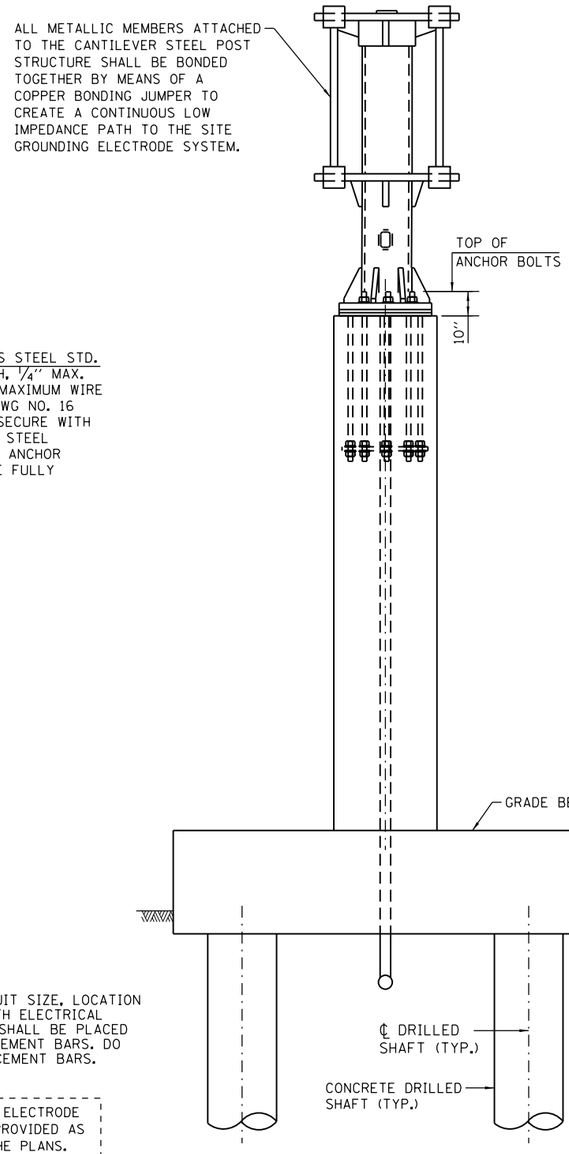
Illinois Tollway

OVERHEAD SIGN STRUCTURE
CANTILEVER TYPE
STRUCTURE DETAILS

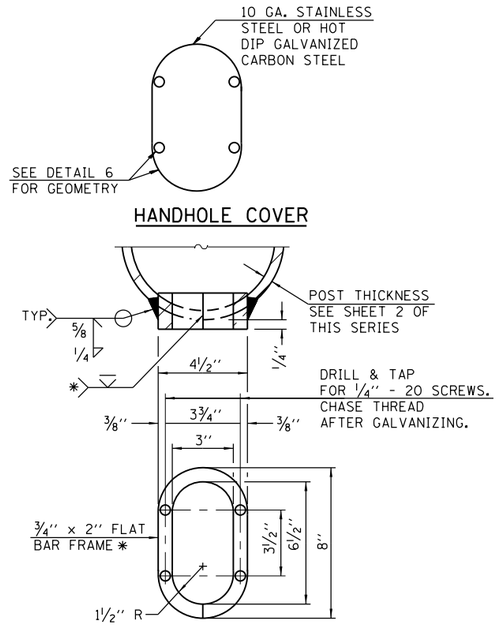
STANDARD F4-10




FRONT ELEVATION




SIDE ELEVATION



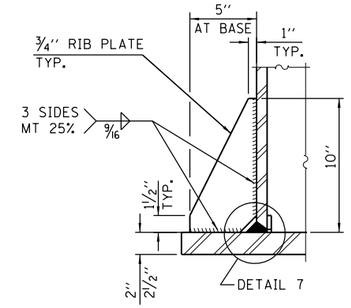

HANDHOLE COVER

PROVIDE 8" x 4½" COVER.
OUTSIDE CORNERS = 2¼" RADIUS.
PROVIDE 4-5⁄16" Ø HOLES IN COVER FOR ¼" - 20 ROUND HEAD HOT DIP GALVANIZED OR STAINLESS STEEL MACHINE SCREWS.
(SEE COVER DETAILS.)

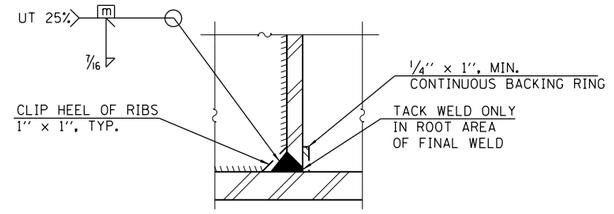
DETAIL 6

* BENT BARS MAY BE BUTT WELDED TOP AND BOTTOM OR BOTTOM ONLY. IN LIEU OF FABRICATED HANDHOLE FRAME AS SHOWN, MAY CUT FROM 2" PLATE (ROLLING DIRECTION VERTICAL). ALL CUT FACES TO BE GROUND TO ANSI ROUGHNESS OF 500 μIN OR LESS.

** 18" IS MINIMUM TO BE GALVANZIED. ENTIRE BOLT MAY BE GALVANIZED AT CONTRACTOR'S OPTION.



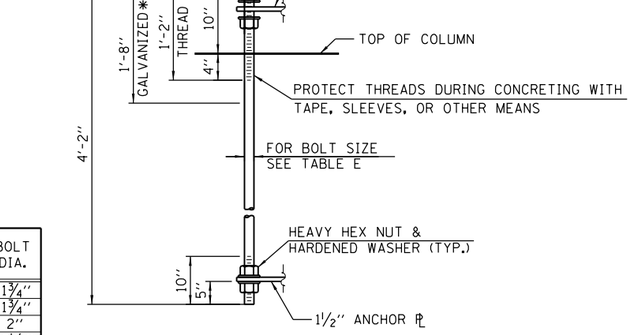

SECTION H-H



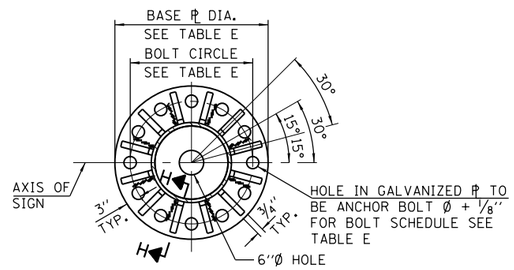

DETAIL 7
(TYPICAL RIB)

TABLE E: BASE PLATE DETAIL

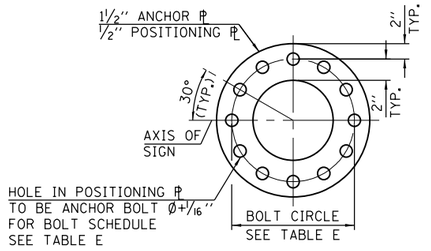
| SPAN LENGTH (L) | POST OUTSIDE DIAMETER | BASE PLATE | | BOLT CIRCLE | BOLT DIA. |
|---|---|---|---|---|---|
| | | DIAMETER | THICKNESS | | |
| < = 20' | 18" | 30" | 2" | 24" | 1¾" |
| 21'-30' | 18" | 30" | 2" | 24" | 1¾" |
| 31'-40' | 24" | 36" | 2½" | 30" | 2" |
| 41'-50' | 24" | 36" | 2½" | 30" | 2¼" |




ANCHOR BOLT DETAIL




SECTION G-G




POSITIONING ℄ / ANCHOR ℄

## NOTE:

ANCHOR BOLTS SHALL CONFORM TO AASHTO M314 OR ASTM F1554 AND MEET CHARPY V-NOTCH (CVN) ENERGY OF 15 LB.-FT. AT 10° F. BEFORE GALVANIZING. GALVANIZE THE UPPER 18" (MINIMUM **) AND ASSOCIATED M291, GRADE A, C OR DH HEAVY HEX NUTS AND HARDENED WASHERS PER AASHTO M293. NO WELDING SHALL BE PERMITTED ON BOLTS. PROVIDE AN UNFINISHED NUT AT BOTTOM, A HEXAGON LOCKNUT AND WASHER ABOVE BASE PLATE AND A LEVELING NUT AND WASHER BELOW BASE PLATE. NUTS SHALL EACH BE TIGHTENED WITH 200 LB.-FT. MINIMUM TORQUE AGAINST BASE PLATE. BEFORE OR AFTER THREADING, BUT BEFORE GALVANIZING, EACH ANCHOR BOLT SHALL BE ULTRASONICALLY TESTED (UT) BY A LEVEL II OR III INSPECTOR, QUALIFIED IN ACCORDANCE WITH ANSI GUIDELINES, USING A STRAIGHT BEAM, ½" Ø 3.5 MHZ. TRANSDUCER, TO ENSURE NO REJECTABLE FLAWS EXIST IN THE UPPER 18" (TENSION CRITERIA).

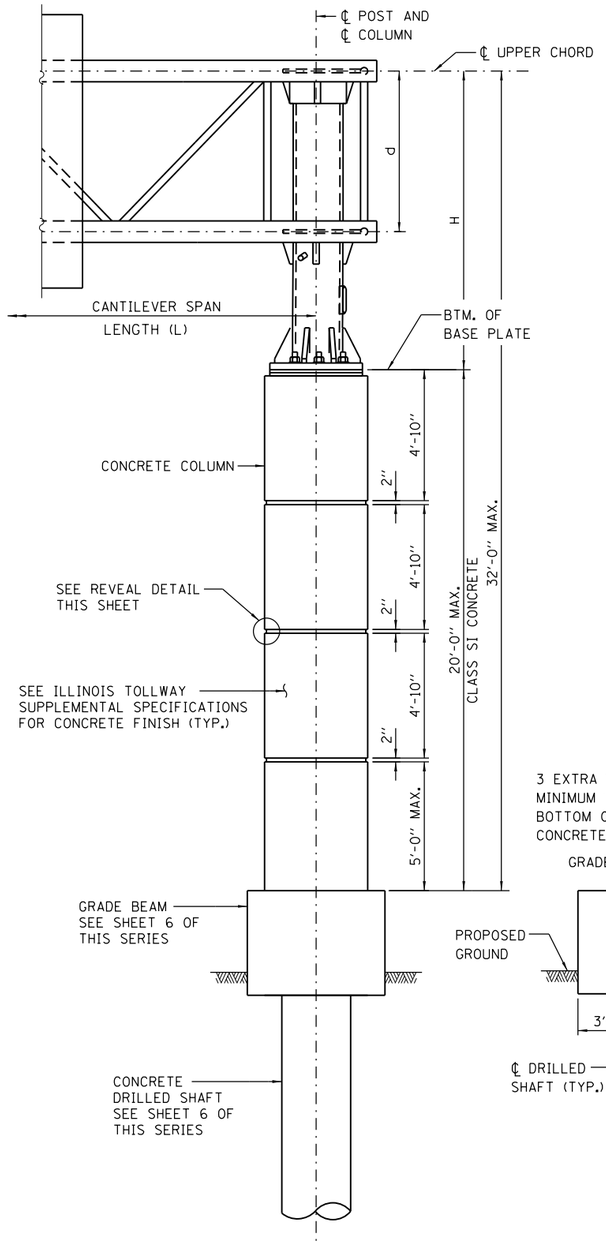
Paul Kovacs
APPROVED ..... DATE 3-31-2014
CHIEF ENGINEERING OFFICER



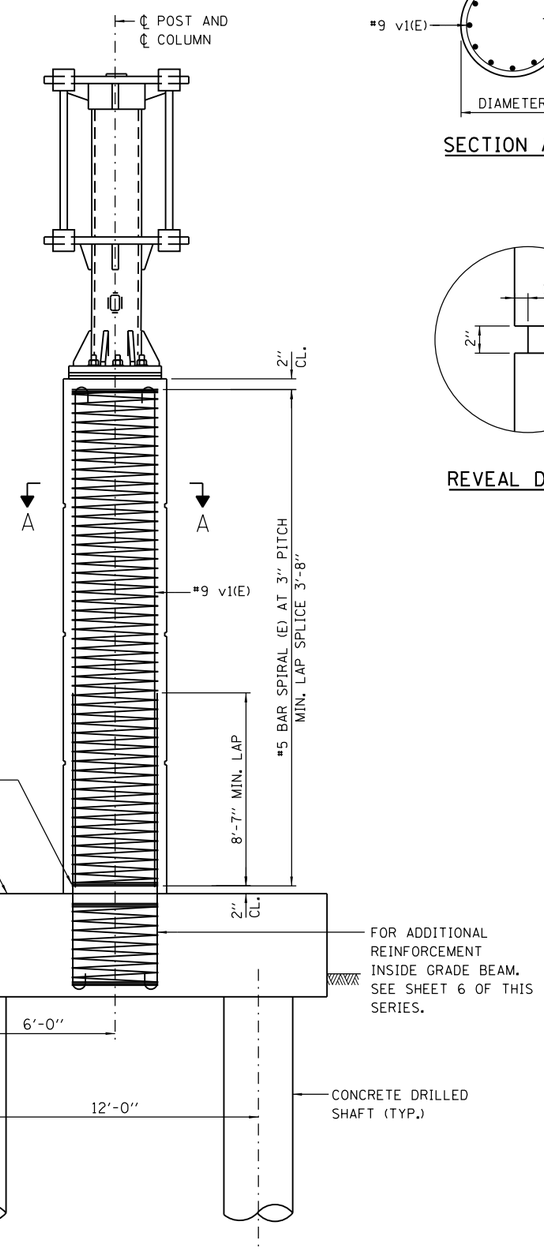
Illinois Tollway

OVERHEAD SIGN STRUCTURE
CANTILEVER TYPE
STRUCTURE DETAILS

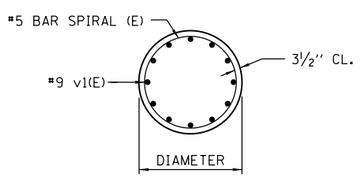
STANDARD F4-10



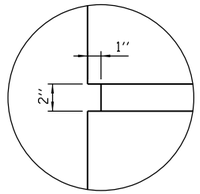

FRONT ELEVATION



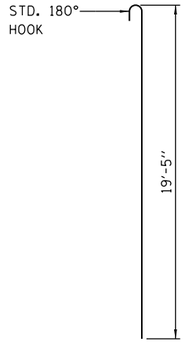

SIDE ELEVATION




SECTION A-A




REVEAL DETAIL




BAR v1(E)

## TABLE F: CONCRETE COLUMN DESIGN TABLE

| SPAN LENGTH (L) | STEEL POST DIAMETER | CONCRETE COLUMN | | | |
|---|---|---|---|---|---|
| | | DIAMETER | VERTICAL BAR v1(E) | CLASS SI CONC. CU. YD.* | REINF. BARS POUND * |
| < = 20' | 18'' | 3'-6'' | 16-#9 | 7.1 | 1,910 |
| 21'-30' | 18'' | 3'-6'' | 16-#9 | 7.1 | 1,910 |
| 31'-40' | 24'' | 4'-0'' | 20-#9 | 9.2 | 2,330 |
| 41'-50' | 24'' | 4'-0'' | 20-#9 | 9.2 | 2,330 |

* CONCRETE VOLUME AND REBAR WEIGHT ARE DETERMINED FOR 20'-0'' CONCRETE COLUMN HEIGHT. ADJUST CONCRETE VOLUME AND REBAR WEIGHT ACCORDINGLY IF CONCRETE COLUMN HEIGHT IS LESS THAN 20'-0''.

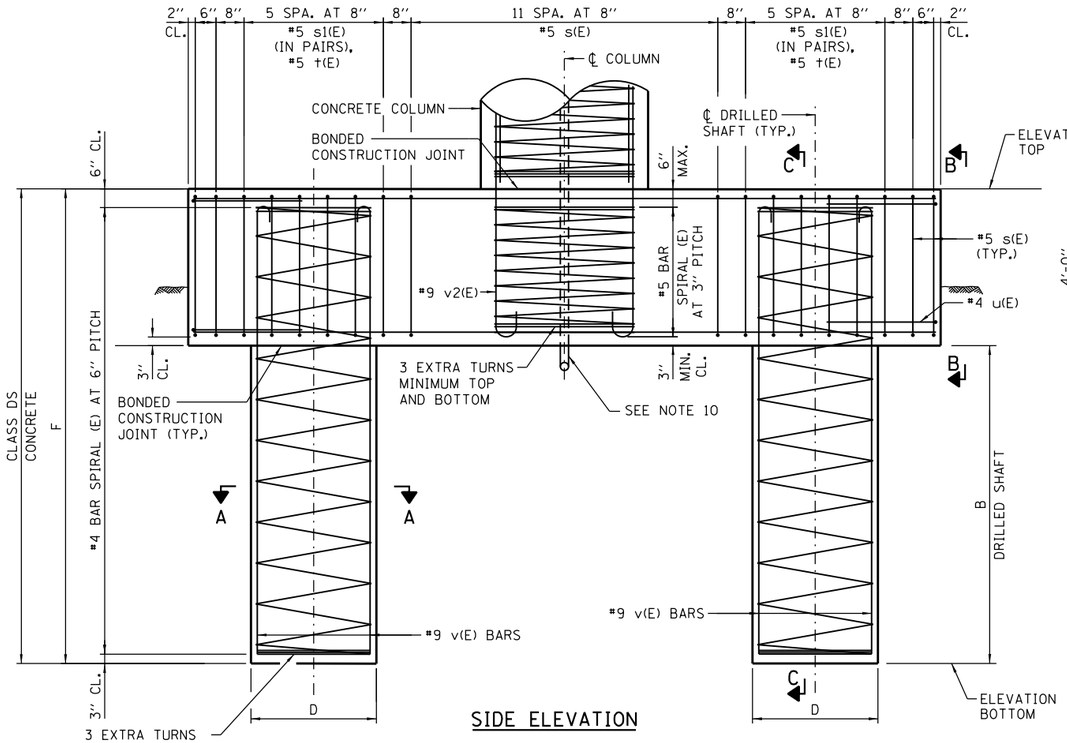
Paul Kovacs
APPROVED..... DATE 3-31-2014
CHIEF ENGINEERING OFFICER

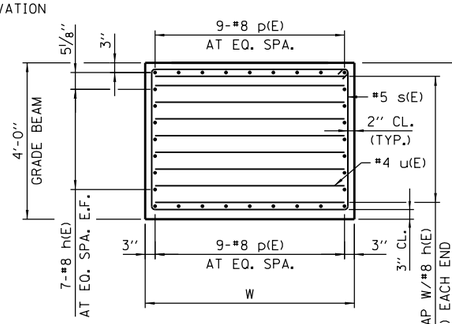


Illinois Tollway

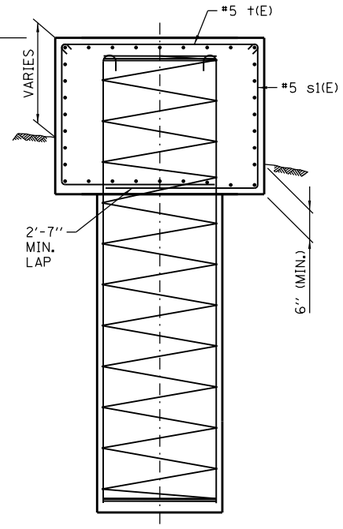
OVERHEAD SIGN STRUCTURE
CANTILEVER TYPE
STRUCTURE DETAILS

STANDARD F4-10

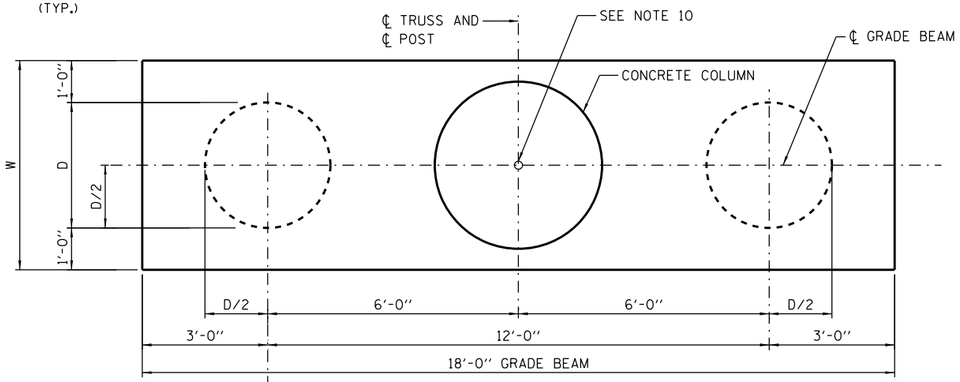


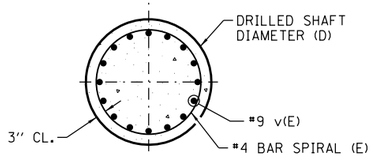

VIEW B-B




SECTION C-C




PLAN *




SECTION A-A
(TYPICAL BOTH SHAFTS)

NOTE:

* REINFORCEMENT IN GRADE BEAM NOT SHOWN FOR CLARITY.

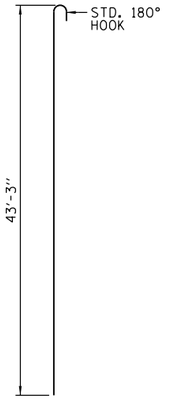
** FOR GRADE BEAM ONLY.

| BAR SPIRAL LAP SPLICE | |
|---|---|
| BAR | MIN. LAP |
| #4 | 2'-11'' |
| #5 | 3'-8'' |

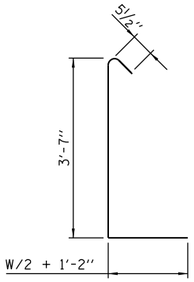
## BAR LIST - EACH FOUNDATION

(2 SHAFT AND 1 GRADE BEAM)

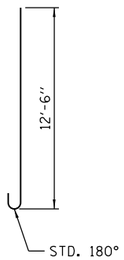
| BAR | NUMBER | SIZE | LENGTH D = 3'-0'' | LENGTH D = 4'-0'' | SHAPE |
|---|---|---|---|---|---|
| h(E) | 14 | #8 | 17'-8'' | 17'-8'' | |
| p(E) | 18 | #8 | 17'-8'' | 17'-8'' | |
| s(E) | 16 | #5 | 17'-5'' | 19'-5'' | |
| s1(E) | 24 | #5 | 7'-8½'' | 8'-2½'' | |
| †(E) | 12 | #5 | 5'-7'' | 6'-7'' | |
| υ(E) | 18 | #4 | 8'-7'' | 9'-7'' | |
| v(E) | SEE TABLE G | #9 | 44'-6'' | 44'-6'' | |
| v2(E) | SEE TABLE G | #9 | 13'-9'' | 13'-9'' | |
| #4 BAR SPIRAL (E) - SEE SIDE ELEVATION | | | | | |
| #5 BAR SPIRAL (E) - SEE SIDE ELEVATION | | | | | |



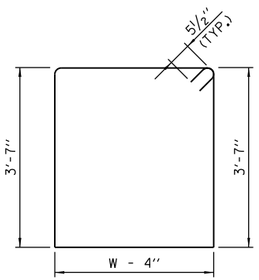

BAR v(E)



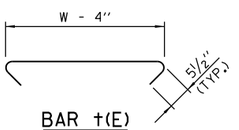

BAR s1(E)



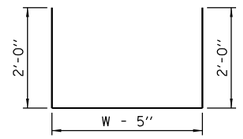

BAR v2(E)




BAR s(E)




BAR †(E)




BAR υ(E)

## NOTES:

1. THE FOUNDATION DETAILS SHOWN ARE BASED ON THE PRESENCE OF MOSTLY COHESIVE SOIL CONDITIONS (SILTY OR SANDY CLAY), WITH AN AVERAGE UNCONFINED COMPRESSIVE STRENGTH (QU) > 1.25 TON/SQ. FT. WHICH SHALL BE DETERMINED BY PREVIOUS SOIL INVESTIGATIONS AT THE JOBSITE. WHEN OTHER CONDITIONS ARE INDICATED, THE BORING DATA SHALL BE INCLUDED IN THE PLANS AND THE FOUNDATION DIMENSIONS SHOWN SHALL BE THE RESULT OF SITE SPECIFIC DESIGNS. IF CONDITIONS ENCOUNTERED IN THE FIELD ARE DIFFERENT THAN THOSE INDICATED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER TO DETERMINE IF THE FOUNDATION DIMENSIONS NEED TO BE MODIFIED.
2. ALL MATERIAL, FABRICATION, AND CONSTRUCTION REQUIREMENTS SHALL BE IN ACCORDANCE WITH SECTION 734 OF THE ILLINOIS TOLLWAY SUPPLEMENTAL SPECIFICATIONS.
3. CONCRETE SHALL BE PLACED MONOLITHICALLY, WITHOUT CONSTRUCTION JOINTS UNLESS NOTED OTHERWISE.
4. BACKFILL SHALL BE PLACED PER SECTION 502 OF THE STANDARD SPECIFICATION AND PRIOR TO ERECTION OF CONCRETE COLUMN.
5. PROVIDE RUBBED SURFACE FINISH FOLLOWED BY CONCRETE SEALER APPLICATION ON ENTIRE SURFACE OF CONCRETE COLUMN AND NORMAL SURFACE FINISH ON GRADE BEAM, EXCEPT BOTTOM SURFACE. COST IS INCLUDED IN THE COST OF "FOUNDATION FOR OVERHEAD SIGN STRUCTURE, CANTILEVER TYPE".
6. ALL REBAR DESIGNATED (E) SHALL BE EPOXY COATED. REBAR SHALL BE POSITIONED SO THAT THERE WILL BE NO INTERFERENCE BETWEEN VERTICAL REINFORCEMENT AND STIRRUPS.
7. NO SONOTUBES OR DECOMPOSABLE FORMS SHALL BE USED 6" BELOW THE FINISHED GROUND LINE. PERMANENT METAL FORMS OR OTHER SHIELDING SHALL NOT BE LEFT IN PLACE BELOW THE ELEVATION WITHOUT THE ENGINEER'S WRITTEN PERMISSION. EXCAVATIONS SHALL BE DEWATERED BEFORE CONCRETE PLACEMENT IF DIRECTED BY THE ENGINEER AT NO ADDITIONAL COST.
8. FOR SIZE AND NUMBER OF PVC COATED STEEL CONDUITS, SEE ELECTRICAL CONSTRUCTION DRAWINGS.
9. TYPICAL SIGN STRUCTURE FOUNDATION IS SHOWN ON THIS SHEET. SEE SHEET 7 OF THIS SERIES FOR FOUNDATION LOCATED IN ROADWAY MEDIAN.
10. COORDINATE CONDUIT SIZE, LOCATION AND QUANTITY WITH ELECTRICAL PLANS. CONDUITS SHALL BE PLACED TO MISS REINFORCEMENT BARS. DO NOT CUT REINFORCEMENT BARS.

## TABLE G: DESIGN TABLE FOR DRILLED SHAFTS IN COHESIVE SOILS

| SPAN LENGTH (L) | W | D | B | F | VERTICAL BAR v(E) SHAFT 1 | VERTICAL BAR v(E) SHAFT 2 | VERTICAL BAR v2(E) | CLASS DS CONC. CU. YD.** | CLASS DS CONC. CU. YD. | REINF. BARS POUND |
|---|---|---|---|---|---|---|---|---|---|---|
| < = 20' | 5'-0'' | 3'-0'' | 40' | 44' | 12-#9 | 12-#9 | 16-#9 | 13.4 | 21 | 7,700 |
| 21'-30' | 5'-0'' | 3'-0'' | 40' | 44' | 12-#9 | 12-#9 | 16-#9 | 13.4 | 21 | 7,700 |
| 31'-40' | 6'-0'' | 4'-0'' | 40' | 44' | 20-#9 | 20-#9 | 20-#9 | 16 | 37.3 | 10,800 |
| 41'-50' | 6'-0'' | 4'-0'' | 40' | 44' | 20-#9 | 20-#9 | 20-#9 | 16 | 37.3 | 10,800 |

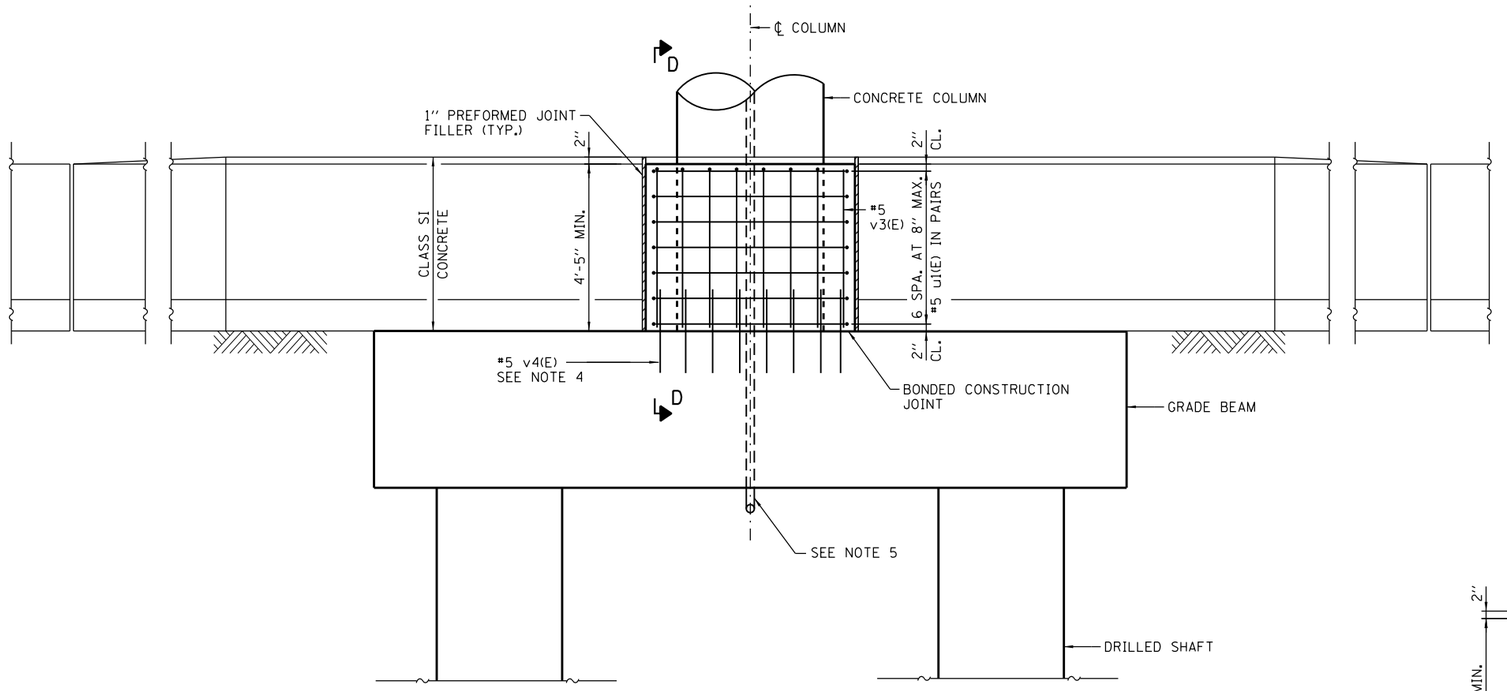
Paul Kovacs
APPROVED..... DATE 3-31-2014
CHIEF ENGINEERING OFFICER

SHEET 6 OF 12

Illinois Tollway

OVERHEAD SIGN STRUCTURE CANTILEVER TYPE STRUCTURE DETAILS

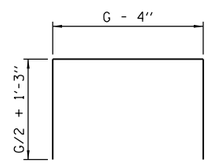
STANDARD F4-10



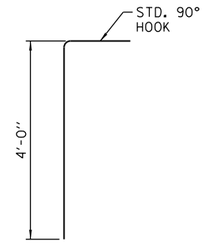

SIDE ELEVATION

## BAR LIST - CRASHWALL

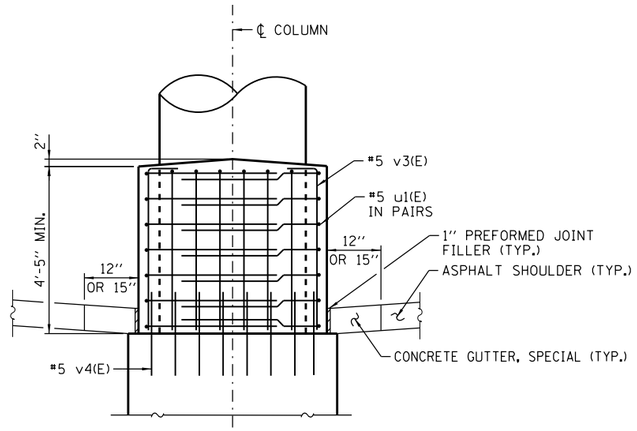
| BAR | SIZE | G = 4'-6" | | G = 5'-0" | | SHAPE |
|---|---|---|---|---|---|---|
| | | NUMBER | LENGTH | NUMBER | LENGTH | |
| u1(E) | #5 | 14 | 11'-2" | 14 | 12'-2" | ⊐ |
| v3(E) | #5 | 24 | 4'-10" | 28 | 4'-10" | ⊐ |
| v4(E) | #5 | 24 | 2'-0" | 28 | 2'-0" | — |



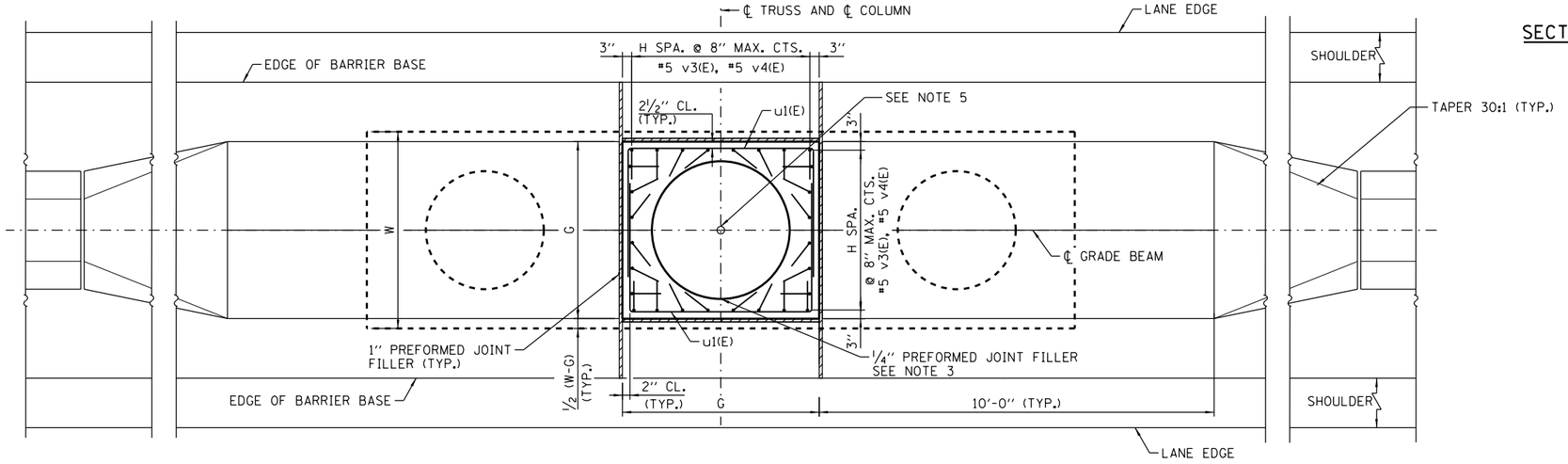

BAR u1(E)




BAR v3(E)




SECTION D-D




PLAN

## NOTES:

1. SEE SHEET 6 OF THIS SERIES FOR ADDITIONAL NOTES.
2. GRADE BEAM AND DRILLED SHAFT DIMENSIONS, DETAILS, QUANTITIES AND BAR LIST ARE SHOWN ON SHEET 6 OF THIS SERIES.
3. SEAL EXPOSED SURFACE OF ¼" PREFORMED JOINT FILLER WITH BACKER ROD AND SILICONE SEALER (1" DEEP AND HOLD ⅛" BELOW SURFACE OF CONCRETE).
4. #5 DRILLED ANCHOR BARS WILL BE EPOXY GROUTED AASHTO M31, GRADE 60 REBAR. PROVIDE 12" MINIMUM EMBEDMENT. INSTALL ANCHORS ACCORDING TO STANDARD SPECIFICATIONS SECTION 584. LOCATE GRADE BEAM REBAR PRIOR TO DRILLING. DO NOT DAMAGE GRADE BEAM REBARDURING INSTALLATION.
5. COORDINATE CONDUIT SIZE, LOCATION AND QUANTITY WITH ELECTRICAL PLANS. CONDUITS SHALL BE PLACED TO MISS REINFORCEMENT BARS. DO NOT CUT REINFORCEMENT BARS.
6. PROTECTIVE COAT SHALL BE APPLIED TO TRAFFIC AND TOP FACES OF CRASHWALL.

## TABLE H: DESIGN TABLE FOR CRASHWALL

| SPAN LENGTH (L) | W | G | H | CLASS SI CONCRETE CU. YD. | REINF. BARS POUND | PROTECTIVE COAT SQ. YD. |
|---|---|---|---|---|---|---|
| < = 20' | 5'-0" | 4'-6" | 6 | 1.7 | 340 | 6.0 |
| 21'-30' | 5'-0" | 4'-6" | 6 | 1.7 | 340 | 6.0 |
| 31'-40' | 6'-0" | 5'-0" | 7 | 2.0 | 380 | 7.0 |
| 41'-50' | 6'-0" | 5'-0" | 7 | 2.0 | 380 | 7.0 |

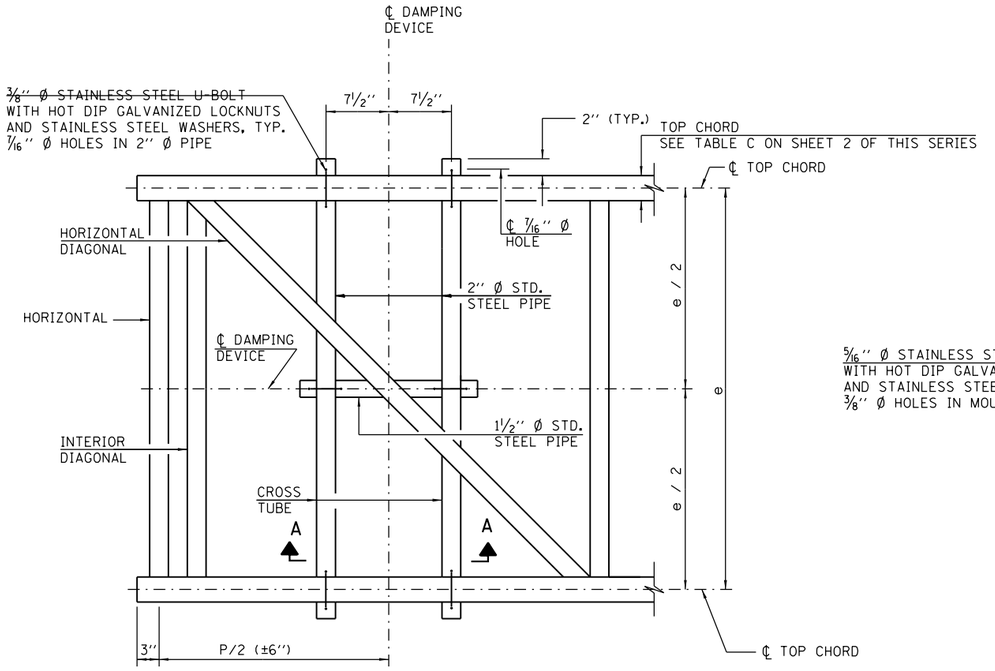
Paul Kovacs
APPROVED..... DATE 3-31-2014
CHIEF ENGINEERING OFFICER



Illinois Tollway

OVERHEAD SIGN STRUCTURE
CANTILEVER TYPE
STRUCTURE DETAILS

STANDARD F4-10



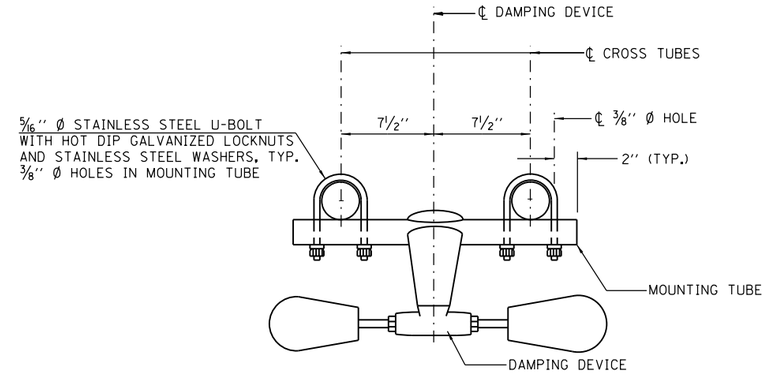

PLAN DETAIL



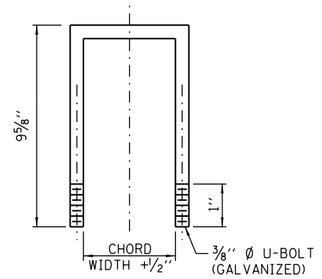

SECTION A-A



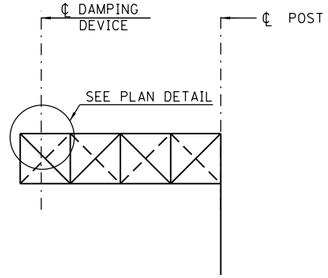

DAMPING DEVICE MOUNTING TUBE U-BOLT DETAIL
(TYPICAL)




TRUSS DAMPING DEVICE CONNECTION DETAIL




TOP CHORD TO CROSS TUBE U-BOLT DETAIL
(TYPICAL)




ELEVATION

**NOTE:**

DAMPER: ONE DAMPER PER TRUSS. (31 LBS. STOCKBRIDGE-TYPE 29'' MINIMUM BETWEEN ENDS OF WEIGHTS.

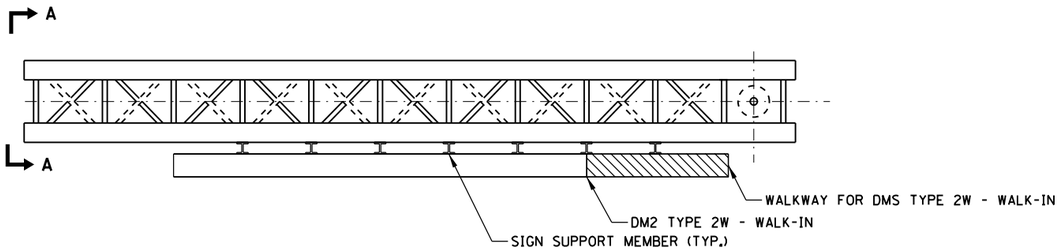
Paul Kovacs
APPROVED ..... DATE 3-31-2014
CHIEF ENGINEERING OFFICER



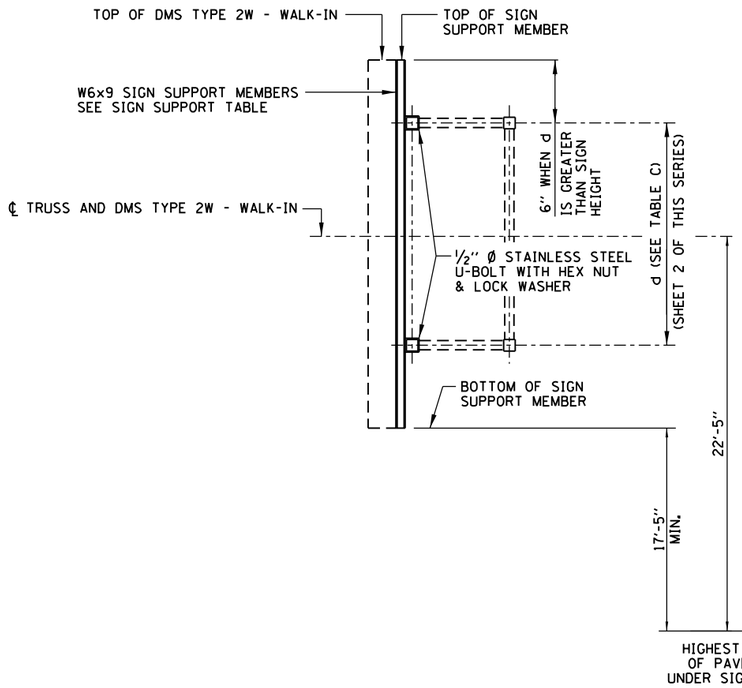
Illinois Tollway

OVERHEAD SIGN STRUCTURE
CANTILEVER TYPE
STRUCTURE DETAILS

STANDARD F4-10




PLAN




SECTION A-A

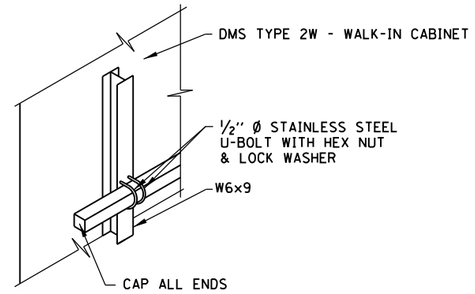
DMS TYPE 2W - WALK-IN SUPPORT DETAIL

TABLE I: SIGN SUPPORT TABLE

| W6x9 | | |
|---|---|---|
| SIGN WIDTH | | NUMBER OF SIGN SUPPORTS REQUIRED |
| GREATER THAN | LESS THAN OR EQUAL TO | |
| | 8'-0'' | 2 |
| 8'-0'' | 14'-0'' | 3 |
| 14'-0'' | 20'-0'' | 4 |
| 20'-0'' | 26'-0'' | 5 |
| 26'-0'' | 32'-0'' | 6 |

TABLE J: DMS TYPE 2W - WALK-IN TABLE

| MAXIMUM TRUSS LENGTH | | | | MAXIMUM WEIGHT |
|---|---|---|---|---|
| | HEIGHT | WIDTH | DEPTH | |
| 40 FEET | 8'-0'' | 26'-6'' | 3'-4½'' | 4200 LBS. |




STAINLESS STEEL U-BOLT DETAIL

NOTES:

1. DMS TYPE 2W - WALK-IN SHALL BE ATTACHED TO TRUSS AS CLOSE TO PANEL JOINTS AS POSSIBLE.
2. VERIFY SIGN SUPPORT MEMBER LENGTH PRIOR TO FABRICATION.
3. DMS TYPE 2W - WALK-IN MANUFACTURER SHALL DESIGN, PROVIDE AND INSTALL HORIZONTAL MOUNTING MEMBERS. VERTICAL SPACING OF HORIZONTAL MEMBERS SHALL BE DESIGNED BY DMS TYPE 2W - WALK-IN MANUFACTURER. VERIFY VERTICAL SPACING WITH HOLES FOR STAINLESS STEEL U-BOLT.

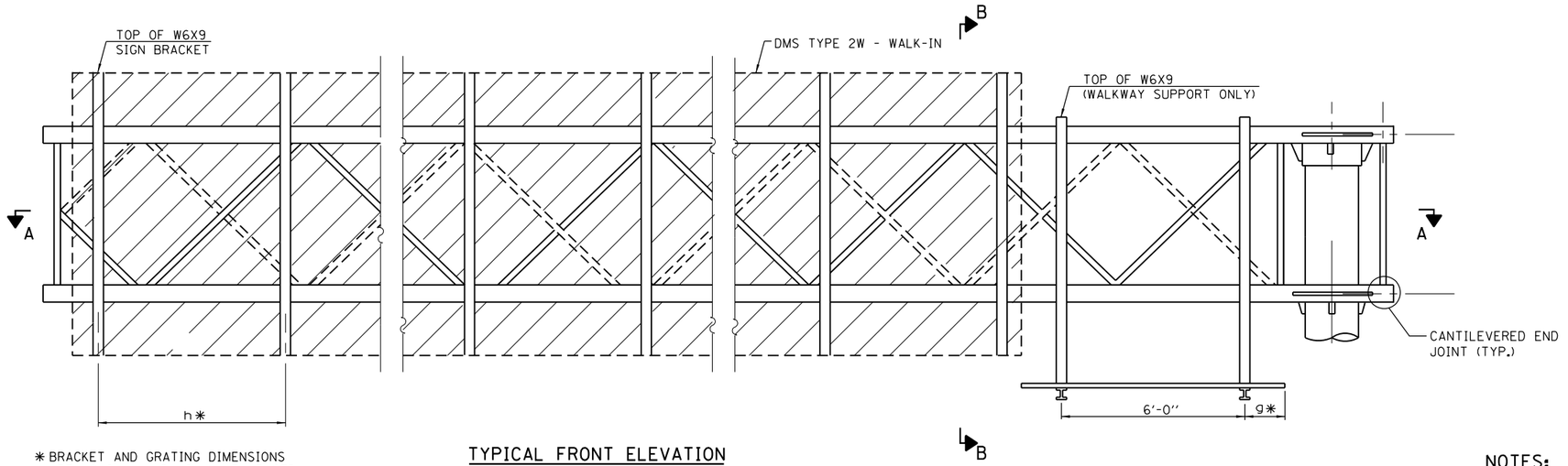
Paul Kovacs
APPROVED..... DATE 3-31-2014
CHIEF ENGINEERING OFFICER



Illinois Tollway

OVERHEAD SIGN STRUCTURE
CANTILEVER TYPE
STRUCTURE DETAILS

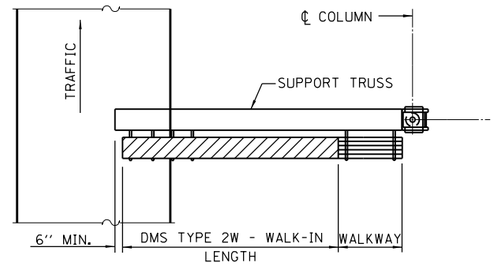
STANDARD F4-10




* BRACKET AND GRATING DIMENSIONS ARE NOMINAL AND WILL VARY BASED ON ACTUAL DMS TYPE 2W - WALK-IN DIMENSIONS PLUS MANUFACTURER'S MOUNTING DEVICES.

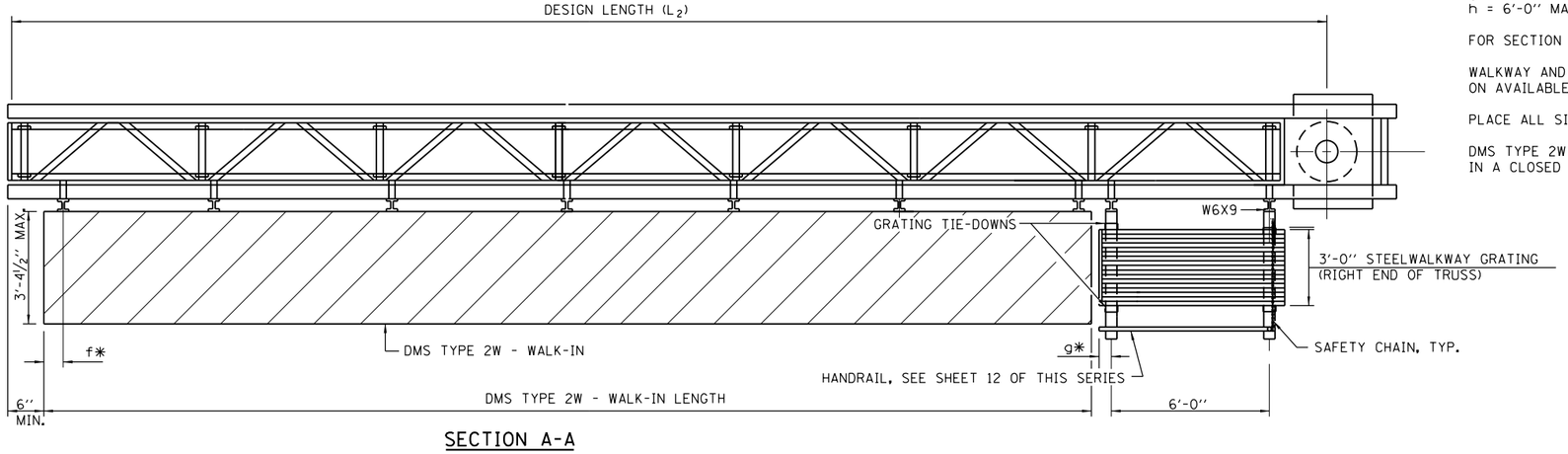
## TYPICAL FRONT ELEVATION

WITH HANDRAIL OMITTED FOR CLARITY.
FOR SECTION B-B, SEE SHEET 11 OF THIS SERIES.




## PLAN
## WALKWAY AND HANDRAIL SKETCH

(ROAD PLAN BENEATH TRUSS VARIES)
WALKWAY MAY BE LOCATED AT RIGHT OR LEFT END OF TRUSS.




## SECTION A-A

PLACE ALL SIGN AND WALKWAY BRACKETS AS CLOSE TO PANEL POINTS AS PRACTICAL.

## NOTES:

SPACE WALKWAY BRACKETS AND SIGN BRACKETS W6X9 FOR EFFICIENCY AND WITHIN LIMITS SHOWN:

f = 12" MAXIMUM, 4" MINIMUM (END OF SIGN TO ℄ OF NEAREST BRACKET)
g = 12" MAXIMUM, 4" MINIMUM (END OF WALKWAY GRATING TO ℄ OF NEAREST SUPPORT BRACKET)
h = 6'-0" MAXIMUM (℄ TO ℄ SIGN AND/OR WALKWAY SUPPORT BRACKETS, W6X9)

FOR SECTION B-B, SEE SHEET 11 OF THIS SERIES.

WALKWAY AND TRUSS GRATING WIDTH DIMENSIONS ARE NOMINAL AND MAY VARY ± ½" BASED ON AVAILABLE STANDARD WIDTH.

PLACE ALL SIGN AND WALKWAY BRACKETS AS CLOSE TO PANEL POINTS AS PRACTICAL.

DMS TYPE 2W - WALK-IN SHALL HAVE THE DOOR AT THE END, OPPOSITE THE WALKWAY SECURED IN A CLOSED POSITION.

## BRACKET TABLE

| W6X9 | | |
|---|---|---|
| SIGN WIDTH | | NUMBER OF BRACKETS REQUIRED |
| GREATER THAN | LESS THAN OR EQUAL TO | |
| | 8'-0" | 2 |
| 8'-0" | 14'-0" | 3 |
| 14'-0" | 20'-0" | 4 |
| 20'-0" | 26'-0" | 5 |
| 26'-0" | 32'-0" | 6 |

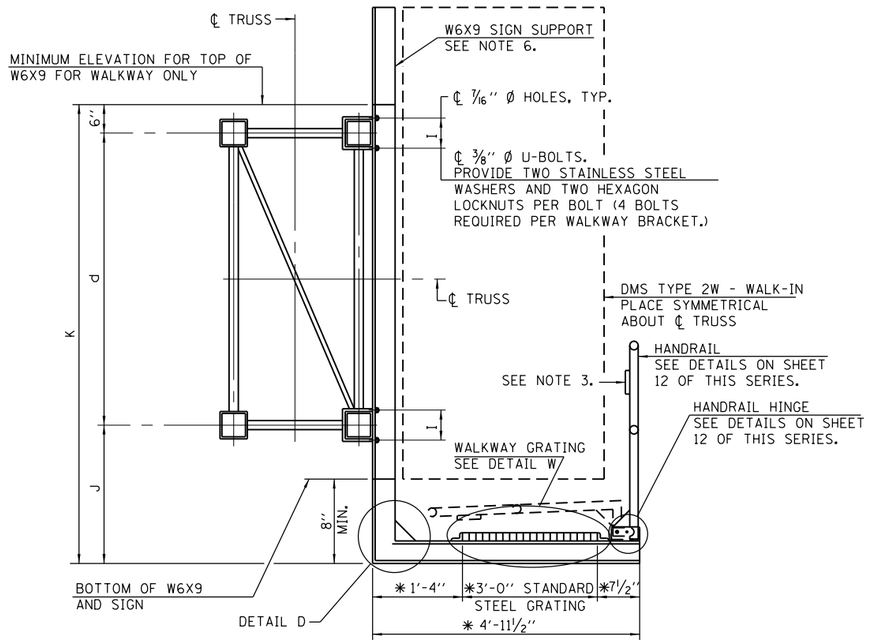


Paul Kovacs
APPROVED ..... DATE 3-31-2014
CHIEF ENGINEERING OFFICER

Illinois Tollway

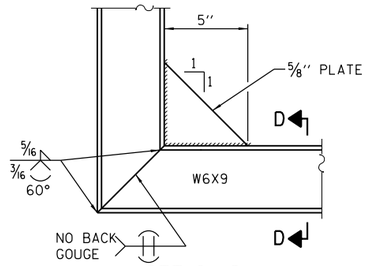
OVERHEAD SIGN STRUCTURE
CANTILEVER TYPE
STRUCTURE DETAILS

STANDARD F4-10

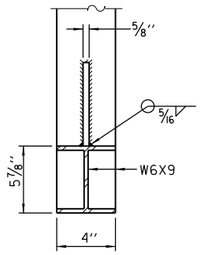



SECTION B-B

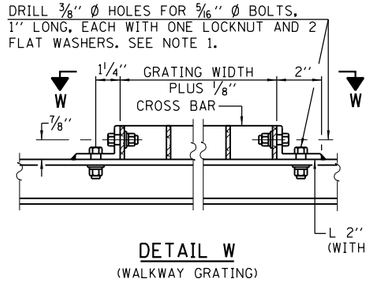
*BRACKET AND GRATING DIMENSIONS ARE NOMINAL AND WILL VARY BASED ON ACTUAL DMS TYPE 2W - WALK-IN DIMENSIONS PLUS MANUFACTURERS MOUNTING DEVICE.



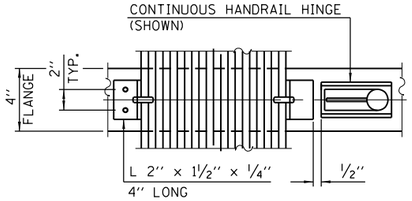

DETAIL D




SECTION D-D




DETAIL W
(WALKWAY GRATING)




(CONTINUOUS WALKWAY GRATING)

SECTION W-W

## NOTES:

1. DRILLING HOLES IN GRATING MAY BE DONE IN SHOP OR FIELD, BASED ON CONTRACTOR'S PREFERENCE AND SUBJECT TO ACCURATE ALIGNMENT.
2. IF HANDRAIL JOINT PRESENT, WELD ANGLE TO W6X9 AND 1/4" EXTENSION BARS. SEE SHEET 12 OF THIS SERIES.
3. PL 1/8" x 1/2" X 2" WELDED TO HANDRAIL POSTS TO PROTECT LOCATIONS THAT CONTACT GRATING.
4. DMS TYPE 2W - WALK-IN MANUFACTURER SHALL DESIGN AND SUPPLY HARDWARE FOR CONNECTION TO W6X9. BOLTS SHALL BE STAINLESS STEEL OR HOT DIP GALVANIZED HIGH STRENGTH PER IDOT SPECIFICATIONS.

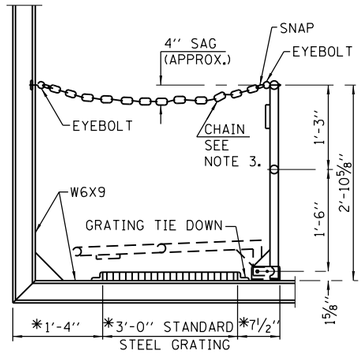
Paul Kovacs
APPROVED ..... DATE 3-31-2014
CHIEF ENGINEERING OFFICER



Illinois Tollway

OVERHEAD SIGN STRUCTURE
CANTILEVER TYPE
STRUCTURE DETAILS

STANDARD F4-10

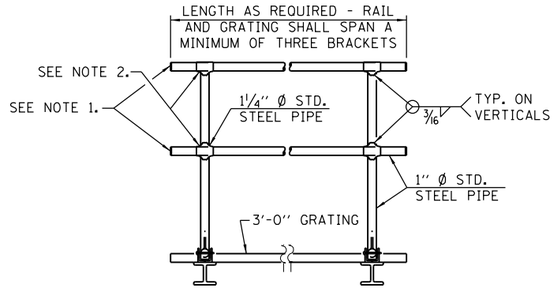



SIDE ELEVATION

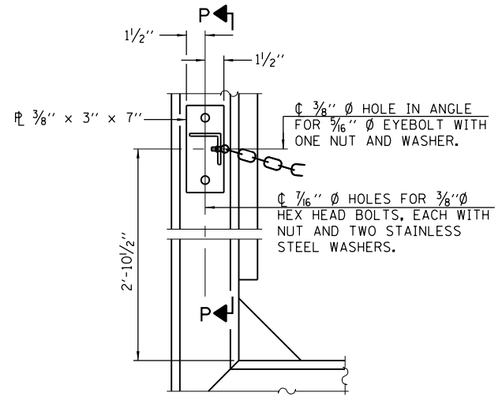
(SHOWING SAFETY CHAIN W/O SIGN)

* BRACKET AND GRATING DIMENSIONS ARE NOMINAL AND WILL VARY BASED ON ACTUAL DMS TYPE 2W - WALK-IN DIMENSIONS PLUS MANUFACTURERS MOUNTING DEVICE.

HANDRAIL DETAILS

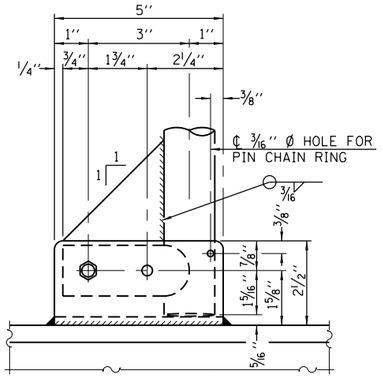



FRONT ELEVATION

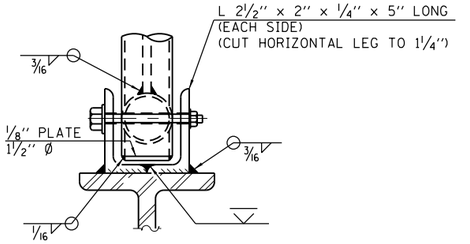



ALTERNATE SAFETY CHAIN ATTACHMENT

ITEMS NOT SHOWN SAME AS ''SIDE ELEVATION'' OF ''HANDRAIL DETAILS''

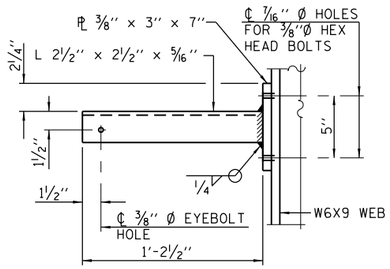



SIDE ELEVATION

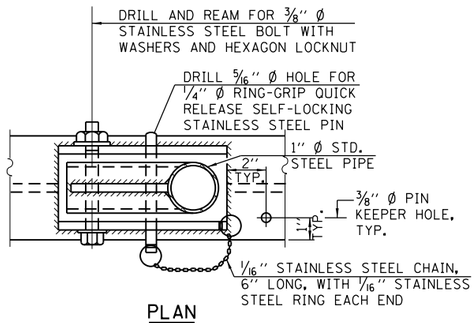



FRONT ELEVATION

DETAILS NOT SHOWN SAME AS ''ELEVATION'' AT RIGHT.

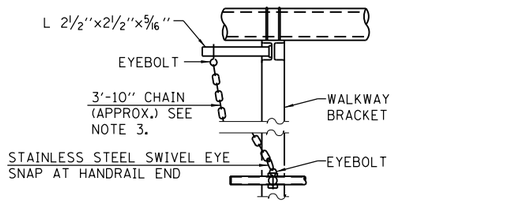



SECTION P-P




PLAN

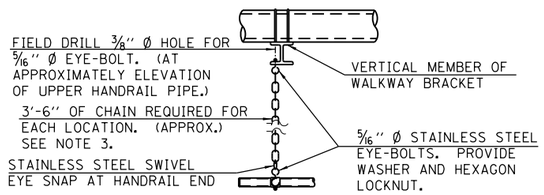
DETAIL E HANDRAIL HINGE




ALTERNATE SAFETY CHAIN ATTACHMENT

DETAILS NOT SHOWN SIMILAR TO ''SAFETY CHAIN'' DETAILS

(WALKWAY OMITTED FOR CLARITY)




SAFETY CHAIN

ONE REQUIRED FOR EACH END OF WALKWAY.

NOTES:

1. INSTALL STANDARD FORCE-FIT END CAPS OR WELD ⅛'' END PLATES WITH ⅛'' C.F.W. AND GRIND SMOOTH. (ALL RAIL ENDS)
2. HORIZONTAL HANDRAIL MEMBER SHALL BE CONTINUOUS THRU 1¼'' Ø PIPE. PROVIDE 7/16'' Ø HOLE IN 1¼'' Ø PIPE FOR ⅜'' Ø BOLT. FIELD DRILL 7/16'' Ø HOLE IN HORIZONTAL RAIL MEMBER. PROVIDE LOCKNUT AND TWO STAINLESS STEEL WASHERS FOR BOLT. (USE 5/16'' EYEBOLTS IN 7/16'' Ø HOLES ON TOP RAIL AT ENDS ONLY.)
3. 3/16'' TYPE 304L STAINLESS STEEL CHAIN, APPROXIMATELY 12 LINKS PER FOOT.

Paul Kovacs

APPROVED..... DATE 3-31-2014

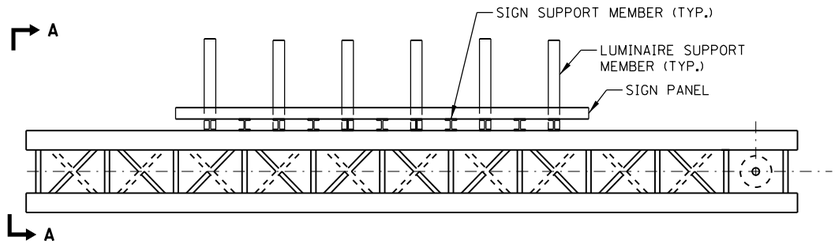
CHIEF ENGINEERING OFFICER

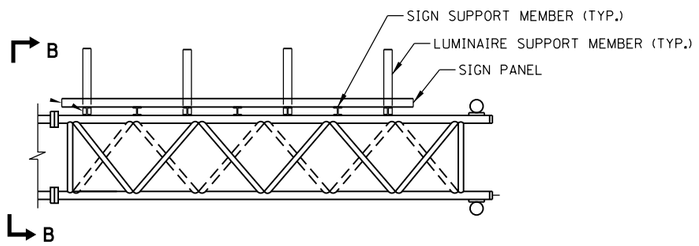


Illinois Tollway

OVERHEAD SIGN STRUCTURE
CANTILEVER TYPE
STRUCTURE DETAILS

STANDARD F4-10



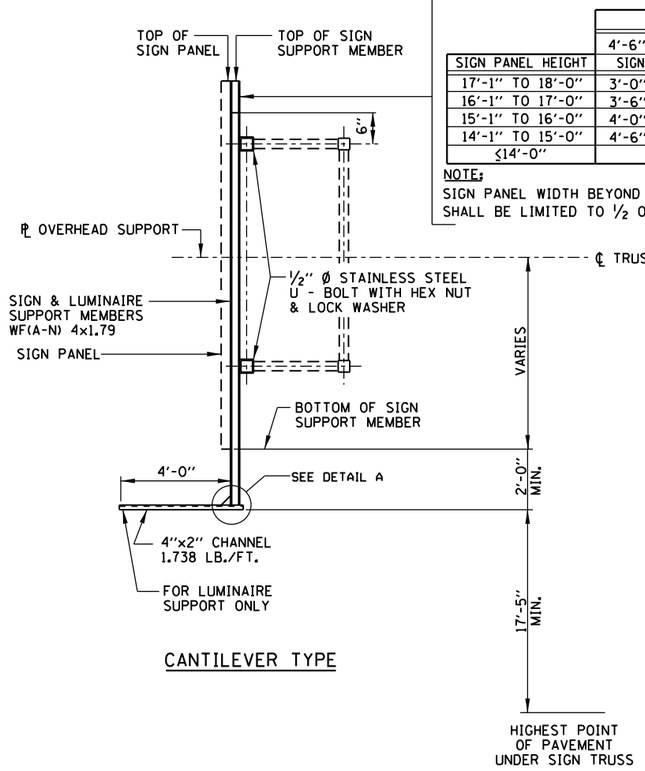




PLAN

SIGN SUPPORT MEMBERS-WF(A-N) 4x1.79

| | TRUSS DEPTH | | | | |
|---|---|---|---|---|---|
| | 4'-6" | 5'-6" | 7'-0" | 8'-2" | 8'-10" |
| SIGN PANEL HEIGHT | SIGN SUPPORT MEMBER MAX. SPACING | | | | |
| 17'-1" TO 18'-0" | 3'-0" | 3'-0" | 4'-6" | 5'-6" | 6'-0" |
| 16'-1" TO 17'-0" | 3'-6" | 4'-0" | 5'-0" | 6'-0" | |
| 15'-1" TO 16'-0" | 4'-0" | 4'-6" | 6'-0" | | |
| 14'-1" TO 15'-0" | 4'-6" | 6'-0" | | | |
| ≤14'-0" | 6'-0" | | | | |

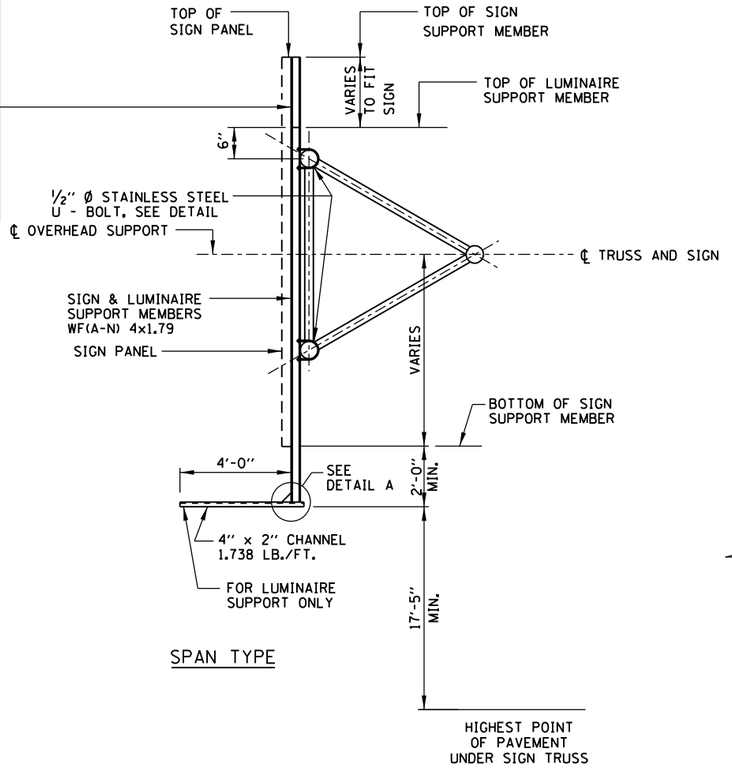
NOTE:
SIGN PANEL WIDTH BEYOND THE OUTSIDE VERTICAL MEMBER SHALL BE LIMITED TO ½ OF THE MAXIMUM SPACING




CANTILEVER TYPE

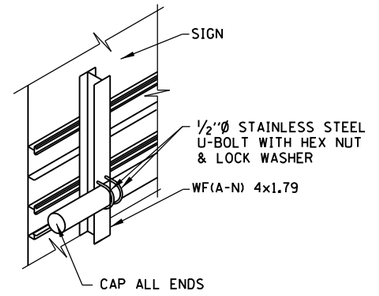
SECTION A-A

PLAN

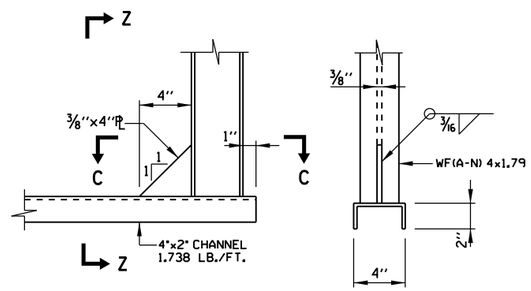



SPAN TYPE

SECTION B-B

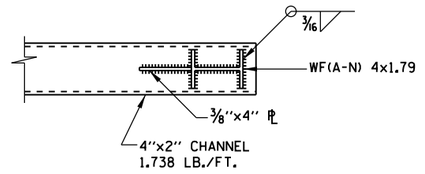



STAINLESS STEEL U-BOLT DETAIL




DETAIL A

SECTION Z-Z




SECTION C-C

SIGN AND LUMINAIRE SUPPORT DETAIL

NOTES:

1. SIGN PANEL SHALL BE ATTACHED TO TRUSS AS CLOSE TO PANEL JOINTS AS POSSIBLE.
2. LUMINAIRE SUPPORT MEMBERS TO BE INSTALLED ONLY WHEN SIGN STRUCTURE IS TO BE ILLUMINATED.

NOTES:

ALL MATERIAL IS ALUMINUM (UNLESS OTHERWISE NOTED).

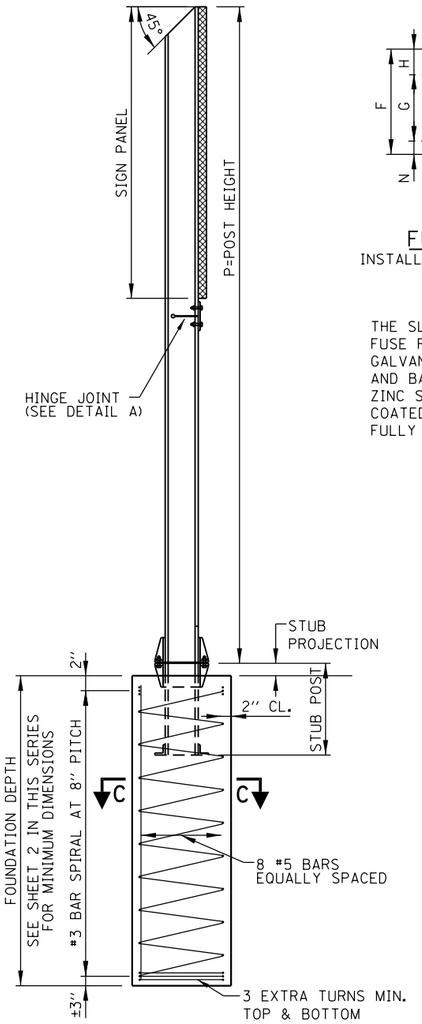
Paul Kovacs
APPROVED . . . . . DATE 2-7-2012
CHIEF ENGINEERING OFFICER

| DATE | REVISIONS |
|---|---|
| 1-1-2009 | ADDED PLAN VIEWS FOR SIGN STRUCTURES |
| 2-7-2012 | REVISED OVERHEAD SIGN STRUCTURE CANTILEVER DIAGONALS |
| 2-1-2013 | REMOVED VERTICAL CLEARANCE. |
| 3-31-2014 | REVISED SIGN SUPPORT MEMBERS |
| 3-11-2015 | REVISED VERTICAL CL. AND SIGN SUPPORT |
| 3-01-2018 | ADDED VERTICAL CLEARANCE |
| 3-01-2019 | REVISED NOTE 2 |

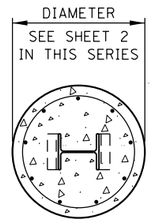
Illinois Tollway

OVERHEAD SIGN STRUCTURE SIGN AND LUMINAIRE SUPPORTS

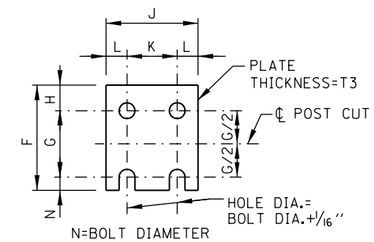
STANDARD F8-07




## SIDE ELEVATION
## POST & FOUNDATION




## SEC. C-C

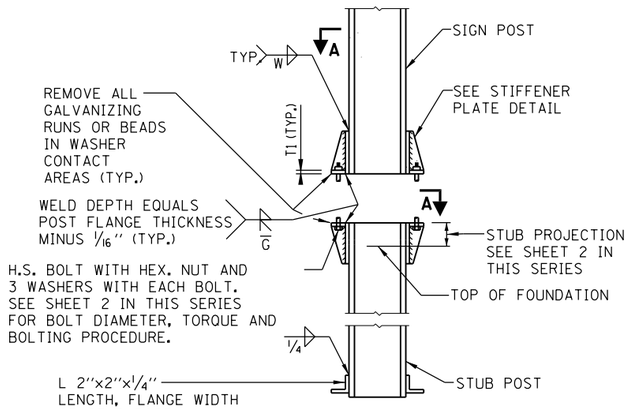



## FUSE PLATE DETAIL
INSTALL WITH NOTCHES TOWARDS BASE

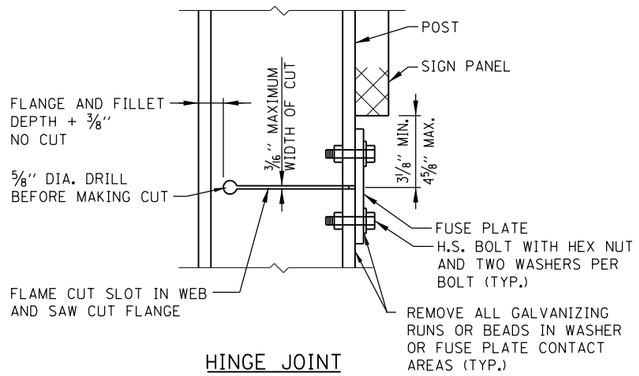
| G & H DIM. TABLE | | |
|---|---|---|
| BOLT DIA. | G | H |
| 1/2" | 2" | 1 1/8" |
| 5/8" | 2 1/4" | 1 1/4" |
| 3/4" | 2 1/2" | 1 3/8" |
| 7/8" | 2 3/4" | 1 1/2" |
| 1" | 3" | 1 5/8" |
| 1 1/8" | 3 1/4" | 1 3/4" |
| 1 1/4" | 3 1/2" | 1 7/8" |

## FABRICATORS NOTES

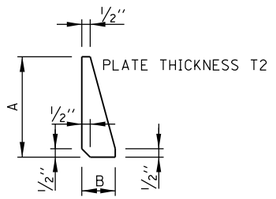
THE SLOT AND THE 5/8" DIA. HOLE IN THE WEB AND THE FUSE PLATE BOLT HOLES IN THE FLANGE SHALL BE MADE BEFORE GALVANIZING. POST FLANGE SHALL BE SAW CUT AFTER GALVANIZING AND BARE METAL SURFACES SHALL BE COATED WITH AN APPROVED ZINC SOLDER OR ZINC-RICH PAINT. THESE SURFACES SHALL NOT BE COATED UNTIL THE FUSE PLATE IS INSTALLED AND BOLTS FULLY TIGHTENED.




## ELEVATION
## SIGN POST & STUB POST




## HINGE JOINT
## DETAIL A

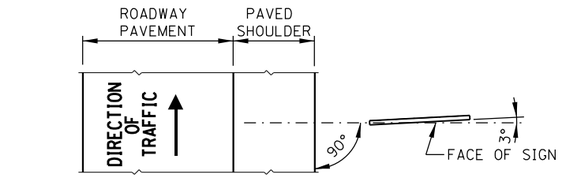



## STIFFENER PLATE
## DETAIL

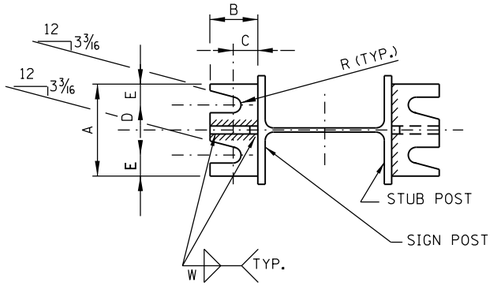
SEE SHEET 2 IN THIS SERIES FOR DIMENSIONS


## SHIM DETAIL

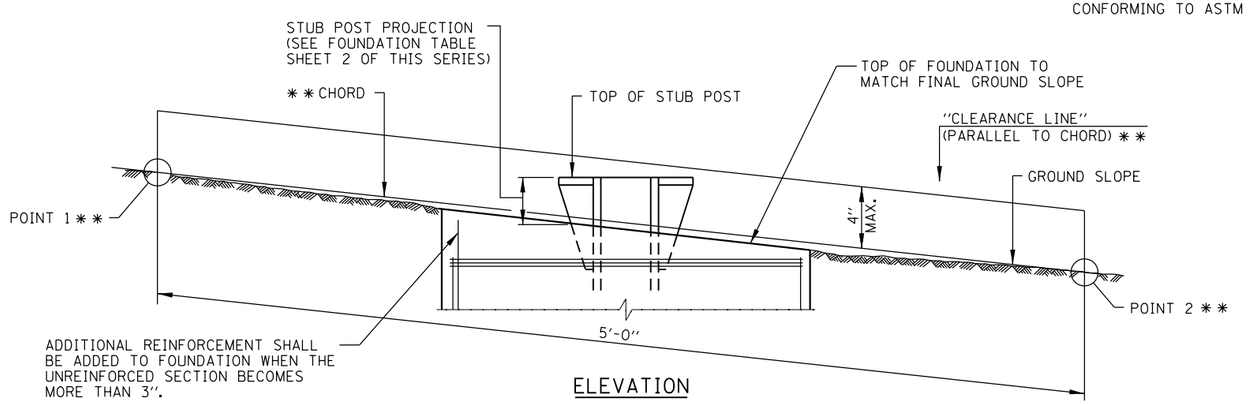
FURNISH 2-.012" THICK AND 2-.032" THICK SHIMS PER POST. SHIMS SHALL BE FABRICATED FROM BRASS SHIM STOCK CONFORMING TO ASTM B36.




## LOCATION SKETCH




## SEC. A-A




## ELEVATION
## GROUND LINE & STUB POST

* * FOR ALL "POINT 1" AND "POINT 2"LOCATIONS, "CLEARANCE LINE" MUST BE AT OR ABOVE TOP OF STUB POST.

## GENERAL NOTES

**DESIGN:** THE LATEST EDITION OF THE "AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRE AND TRAFFIC SIGNALS".

**CONSTRUCTION:** STANDARD SPECIFICATIONS AND THE SPECIAL PROVISIONS.

**LOADING:** FOR 80 MPH WIND VELOCITY PLUS 30% GUST FACTOR NORMAL TO SIGN.

**DESIGN STRESSES:**
STRUCTURAL STEEL - PER AASHTO 20,000 P.S.I.
REINFORCING STEEL - 24,000 P.S.I.
CLASS SI CONCRETE - 1,400 P.S.I.

**FOUNDATION:**
MINIMUM UNCONFINED COMPRESSIVE STRENGTH, Qu FOR ALL LAYERS FOR COHESIVE SOILS (CLAYS) SHALL BE 1.25 TON/SQ.FT.

**WELDING:** ALL WELDING TO BE CONTINUOUS UNLESS OTHERWISE SHOWN. ALL WELDING TO BE DONE IN ACCORDANCE WITH CURRENT AWS SPECIFICATIONS, AND STANDARD SPECIFICATIONS.

**MATERIALS:** ALL STRUCTURAL STEEL SHALL CONFORM TO ASTM A36 AND LRFD SPECIFICATIONS.

ALL HIGH STRENGTH STEEL BOLTS, NUTS AND WASHERS SHALL CONFORM TO STANDARD SPECIFICATIONS.

HIGH STRENGTH STEEL BOLTS, NUTS AND HARDENED WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M232.

HIGH STRENGTH BOLTS IN BASE PLATES SHALL BE TIGHTENED TO THE TORQUE SHOWN ON SHEET 2 IN THIS SERIES.

AFTER FABRICATION, THE POST, FUSE PLATE, BASE PLATE AND UPPER 6" OF STUB POST SHALL BE HOT-DIP GALVANIZED ACCORDING TO ASTM M111, EXCEPT AS NOTED UNDER FABRICATOR NOTES.



Paul Kovacs
APPROVED ..... DATE 1-1-2010 .....
CHIEF ENGINEER

| DATE | REVISIONS |
|---|---|
| 2-7-2012 | ADDED STUB POST CLEARANCE DIMENSIONS, REVISED SIGN INSTALLATION CLEARANCE DIMENSIONS |
| 11-1-2012 | REVISED NOTES, MODIFIED SLOPE REQUIREMENTS FOR BREAKAWAY SUPPORTS |
| 3-01-2019 | CLARIFIED DESIGN STRESS FOR SOIL PRESSURE |

Illinois Tollway

BREAKAWAY SIGN SUPPORT DETAILS

STANDARD F9-05

| POST | FOUNDATION TABLE | | | | | | | | | | | | BASE CONNECTION DATA TABLE | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FOUNDATION | | | REINFORCEMENT | | | | | | STUB POST | | | BOLT SIZE AND TORQUE | A | B | C | D | E | T1 | T2 | W | R |
| | DIA. | MIN. DEPTH | CY.* CONC. | VERTICAL BARS NO. | VERTICAL BARS SIZE | VERTICAL BARS LGTH. | BAR SPIRALS SIZE | BAR SPIRALS O.D. | BAR SPIRALS LGTH. | LBS.** | STUB LGTH. | STUB PROJECTION | LBS.*** | | | | | | | | | | |
| W6x9 | 2'-0" | 6'-0" | .70 | 8 | #5 | 5'-9" | #3 | 20½" | 79' | 78 | 2'-3" | 3" | 44 | ⅝" Ø x 3¼" LG. TORQUE = 450" # | 6" | 2¼" | 1¼" | 3½" | 1¼" | ¾" | ½" | ¼" | 11/32 " |
| W6x15 | 2'-0" | 6'-0" | .70 | 8 | #5 | 5'-9" | #3 | 20½" | 79' | 78 | 2'-6" | 3" | 71 | | | | | | | | | | |
| W8x18 | 2'-0" | 6'-0" | .70 | 8 | #5 | 5'-9" | #3 | 20½" | 79' | 78 | 2'-6" | 3" | 85 | ¾" Ø x 3¾" LG. TORQUE = 750" # | 6" | 2½" | 1⅜" | 3¼" | 1⅜" | 1" | ½" | 5/16 " | 13/32 " |
| W10x22 | 2'-6" | 6'-6" | 1.18 | 8 | #5 | 6'-3" | #3 | 26½" | 105' | 92 | 3'-0" | 2½" | 110 | | | | | | | | | | |
| W10x26 | 2'-6" | 7'-0" | 1.27 | 8 | #5 | 6'-9" | #3 | 26½" | 112' | 98 | 3'-0" | 2½" | 137 | ⅞" Ø x 4" LG. TORQUE = 950" # | 7" | 2¾" | 1½" | 4" | 1½" | 1" | ¾" | ⅜" | 15/32 " |
| W12x26 | 2'-6" | 7'-9" | 1.41 | 8 | #5 | 7'-6" | #3 | 26½" | 119' | 107 | 3'-0" | 2½" | 140 | | | | | | | | | | |
| W14x30 | 3'-0" | 7'-3" | 1.90 | 8 | #5 | 7'-0" | #3 | 32½" | 145' | 113 | 3'-0" | 2½" | 150 | | | | | | | | | | |
| W14x38 | 3'-0" | 8'-0" | 2.09 | 8 | #5 | 7'-9" | #3 | 32½" | 153' | 122 | 3'-6" | 2½" | 208 | 1" Ø x 4½" LG. TORQUE = 1100" # | 7½" | 3" | 1¾" | 4" | 1¾" | 1¼" | ¾" | ⅜" | 17/32 " |
| W16x45 | 3'-0" | 8'-6" | 2.23 | 8 | #5 | 8'-3" | #3 | 32½" | 162' | 130 | 3'-6" | 2½" | 233 | | | | | | | | | | |

• QUANTITY OF CLASS SI CONCRETE CONSISTS OF ALL CONCRETE NECESSARY FOR ONE FOUNDATION. (CUBIC YARDS)

•• THIS INCLUDES REINFORCEMENT BARS AND SPIRAL HOOPING REQUIRED FOR ONE FOUNDATION.

••• INCLUDES WEIGHT OF STUB POST WITH ANGLES, GUSSETS, BASE PLATES, BOLTS, NUTS, WASHERS, PLUS BASE PLATES AND GUSSETS ON MAIN POST, PLUS FUSE PLATE (IF ANY) WITH BOLTS, NUTS AND WASHERS. (ONE POST)

## EQUIVALENT TORQUE VALUES

450" # = 37.5' #
750" # = 62.5' #
950" # = 79.2' #
1100" # = 91.7' #

## PROCEDURE FOR ASSEMBLY OF BASE CONNECTION:

1. ASSEMBLE POST TO STUB WITH H.S. BOLTS AND ONE OF THE THREE FLAT WASHERS ON EACH BOLT BETWEEN PLATES AS SHOWN.
2. SHIMS MAY BE USED BETWEEN PLATES TO LEVEL POST.
3. TIGHTEN BOLTS IN BASE PLATE IN A SYSTEMATIC ORDER TO THE REQUIRED TORQUE.
4. LOOSEN EACH BOLT AND RETIGHTEN TO THE REQUIRED TORQUE IN SAME ORDER AS INITIAL TIGHTENING.
5. BURR OR CENTER PUNCH THREADS AT JUNCTURE OF BOLT AND NUT TO PREVENT NUT FROM LOOSENING.

| POST | FUSE PLATE DATA TABLE | | | | FUSE PLATE BOLT SIZE TABLE SIGN DEPTH | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | J | K | L | T3 | 4' | 5' | 6' | 7' | 8' | 9' | 10' | 11' | 12' | 13' | 14' |
| W6x9 | 4" | 2¼" | ⅞" | ¼" | ½"Ø x 1½" | ½"Ø x 1½" | ½"Ø x 1½" | ⅝"Ø x 1¾" | ⅝"Ø x 1¾" | ⅝"Ø x 1¾" | --- | --- | --- | --- | --- |
| W6x15 | 6" | 3½" | 1¼" | ⅜" | ½"Ø x 1¾" | ½"Ø x 1¾" | ⅝"Ø x 2" | ⅝"Ø x 2" | ¾"Ø x 2" | ¾"Ø x 2" | ¾"Ø x 2" | ¾"Ø x 2" | ⅞"Ø x 2" | ⅞"Ø x 2" | --- |
| W8x18 | 5¼" | 2¾" | 1¼" | ⅜" | ½"Ø x 1¾" | ½"Ø x 1¾" | ½"Ø x 1¾" | ⅝"Ø x 2" | ⅝"Ø x 2" | ¾"Ø x 2" | ¾"Ø x 2" | ⅞"Ø x 2¼" | ⅞"Ø x 2¼" | ⅞"Ø x 2¼" | ⅞"Ø x 2¼" |
| W10x22 | 5¾" | 2¾" | 1½" | ½" | ½"Ø x 2" | ½"Ø x 2" | ½"Ø x 2" | ⅝"Ø x 2" | ⅝"Ø x 2" | ¾"Ø x 2¼" | ¾"Ø x 2¼" | ⅞"Ø x 2¼" | ¾"Ø x 2¼" | ⅞"Ø x 2½" | 1"Ø x 2½" |
| W10x26 | 5¾" | 2¾" | 1½" | ⅝" | ½"Ø x 2" | ½"Ø x 2" | ½"Ø x 2" | ⅝"Ø x 2¼" | ⅝"Ø x 2¼" | ¾"Ø x 2½" | ¾"Ø x 2½" | ⅞"Ø x 2½" | ⅞"Ø x 2½" | 1"Ø x 2¾" | 1"Ø x 2¾" |
| W12x26 | 6½" | 3½" | 1½" | ⅝" | --- | --- | --- | --- | --- | ⅝"Ø x 2¼" | --- | --- | ⅞"Ø x 2½" | ⅞"Ø x 2½" | 1"Ø x 2½" |
| W14x30 | 6¾" | 3½" | 1⅝" | ½" | ½"Ø x 2" | ½"Ø x 2" | ½"Ø x 2" | ½"Ø x 2" | ½"Ø x 2" | ⅝"Ø x 2" | ⅝"Ø x 2¼" | ¾"Ø x 2¼" | ¾"Ø x 2¼" | ⅞"Ø x 2½" | 1"Ø x 2½" |
| W14x38 | 6¾" | 3½" | 1⅝" | ½" | --- | ½"Ø x 2" | ½"Ø x 2" | ½"Ø x 2" | ½"Ø x 2" | ⅝"Ø x 2¼" | ⅝"Ø x 2¼" | ¾"Ø x 2½" | ¾"Ø x 2½" | ⅞"Ø x 2½" | ⅞"Ø x 2½" |
| W16x45 | 7" | 3½" | 1¾" | ½" | --- | --- | --- | ½"Ø x 2" | ½"Ø x 2" | ⅝"Ø x 2¼" | ⅝"Ø x 2¼" | ⅝"Ø x 2¼" | ¾"Ø x 2½" | ¾"Ø x 2½" | ⅞"Ø x 2½" |

| POST | FUSE PLATE DATA TABLE | | | | FUSE PLATE BOLT SIZE TABLE SIGN DEPTH | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | J | K | L | T3 | 15' | 16' | 17' | 18' | 19' | 20' | 21' | 22' | 23' | 24' | --- |
| W6x9 | 4" | 2¼" | ⅞" | ¼" | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| W6x15 | 6" | 3½" | 1¼" | ⅜" | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| W8x18 | 5¼" | 2¾" | 1¼" | ⅜" | ⅞"Ø x 2¼" | ⅞"Ø x 2¼" | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| W10x22 | 5¾" | 2¾" | 1½" | ½" | 1"Ø x 2¾" | 1"Ø x 2¾" | 1"Ø x 2¾" | 1"Ø x 2¾" | 1"Ø x 2¾" | 1"Ø x 2¾" | --- | --- | --- | --- | --- |
| W10x26 | 5¾" | 2¾" | 1½" | ⅝" | 1"Ø x 2¾" | 1⅛"Ø x 3" | 1⅛"Ø x 3" | 1¼"Ø x 3" | 1¼"Ø x 3" | 1¼"Ø x 3" | 1¼"Ø x 3" | 1¼"Ø x 3" | 1¼"Ø x 3" | 1¼"Ø x 3" | --- |
| W12x26 | 6½" | 3½" | 1½" | ⅝" | 1"Ø x 2¾" | 1"Ø x 2¾" | 1⅛"Ø x 3" | 1¼"Ø x 3" | 1¼"Ø x 3" | 1¼"Ø x 3" | 1¼"Ø x 3" | 1¼"Ø x 3" | 1¼"Ø x 3" | 1¼"Ø x 3" | --- |
| W14x30 | 6¾" | 3½" | 1⅝" | ½" | 1"Ø x 2¾" | 1"Ø x 2¾" | 1¼"Ø x 3" | 1¼"Ø x 3" | 1¼"Ø x 3" | 1¼"Ø x 3" | 1¼"Ø x 3" | 1¼"Ø x 3" | 1¼"Ø x 3" | 1¼"Ø x 3" | --- |
| W14x38 | 6¾" | 3½" | 1⅝" | ½" | 1"Ø x 2½" | 1"Ø x 2¾" | 1¼"Ø x 3" | 1¼"Ø x 3" | 1¼"Ø x 3" | 1¼"Ø x 3" | 1¼"Ø x 3" | 1¼"Ø x 3" | 1¼"Ø x 3" | 1¼"Ø x 3" | --- |
| W16x45 | 7" | 3½" | 1¾" | ½" | ⅞"Ø x 2½" | 1"Ø x 2¾" | 1"Ø x 2¾" | 1⅛"Ø x 3" | 1¼"Ø x 3" | 1¼"Ø x 3" | 1¼"Ø x 3" | 1¼"Ø x 3" | 1¼"Ø x 3" | 1¼"Ø x 3" | --- |

## PROCEDURE FOR FUSE PLATE BOLT TIGHTENING:

ALL FRICTION FUSE BOLTS SHALL BE TIGHTENED IN THE SHOP AS APPROVED BY THE ENGINEER ACCORDING TO ONE OF THE FOLLOWING METHODS:

1. TURN-OF-NUT TIGHTENING,
2. TIGHTENING BY USE OF A DIRECT TENSION INDICATOR.

THE ABOVE METHODS OF INSTALLATION AND TIGHTENING SHALL CONFORM TO THE LATEST ISSUE OF THE SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A-325 OR A-490 BOLTS, FOR SLIP-CRITICAL CONNECTIONS AS ISSUED BY THE RESEARCH COUNCIL ON RIVETED AND BOLTED STRUCTURAL JOINTS OF THE ENGINEERING FOUNDATION.

TIGHTENING SHALL BE TO SUCH A DEGREE AS TO OBTAIN THE FOLLOWING MINIMUM RESIDUAL TENSION IN EACH BOLT.

| BOLT DIA. | MIN. RESIDUAL BOLT TENSION | BOLT DIA. | MIN. RESIDUAL BOLT TENSION | BOLT DIA. | MIN. RESIDUAL BOLT TENSION |
|---|---|---|---|---|---|
| ½" | 12,050 | ⅞" | 39,250 | 1¼" | 71,700 |
| ⅝" | 19,200 | 1" | 51,500 | | |
| ¾" | 28,400 | 1⅛" | 56,450 | | |

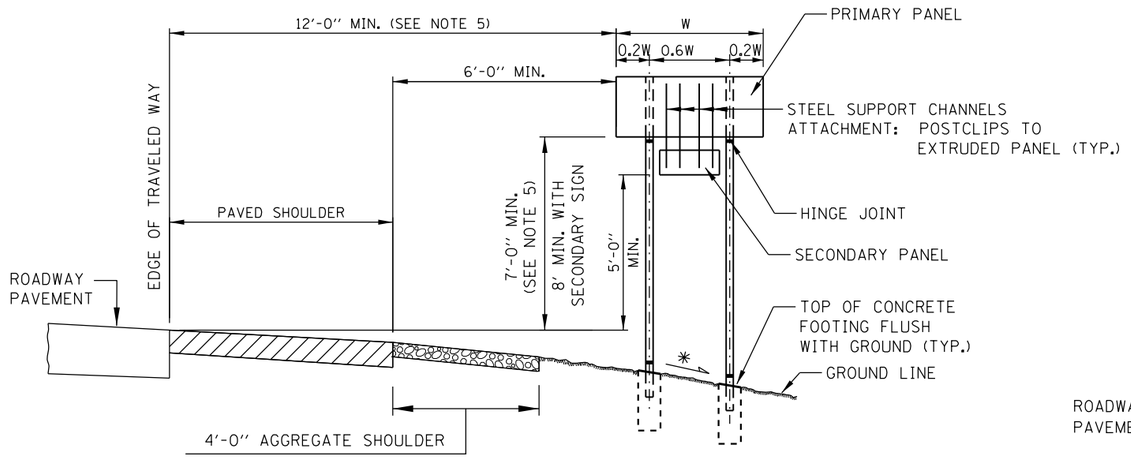
Paul Kovacs
APPROVED ..... CHIEF ENGINEER
DATE 1-1-2010



Illinois Tollway

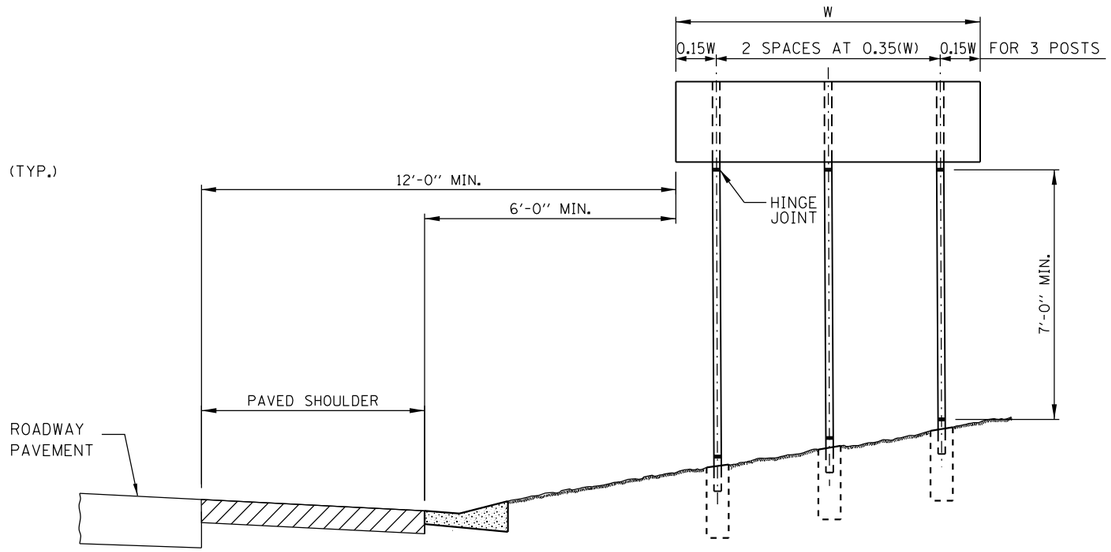
BREAKAWAY SIGN SUPPORT DETAILS

STANDARD F9-05

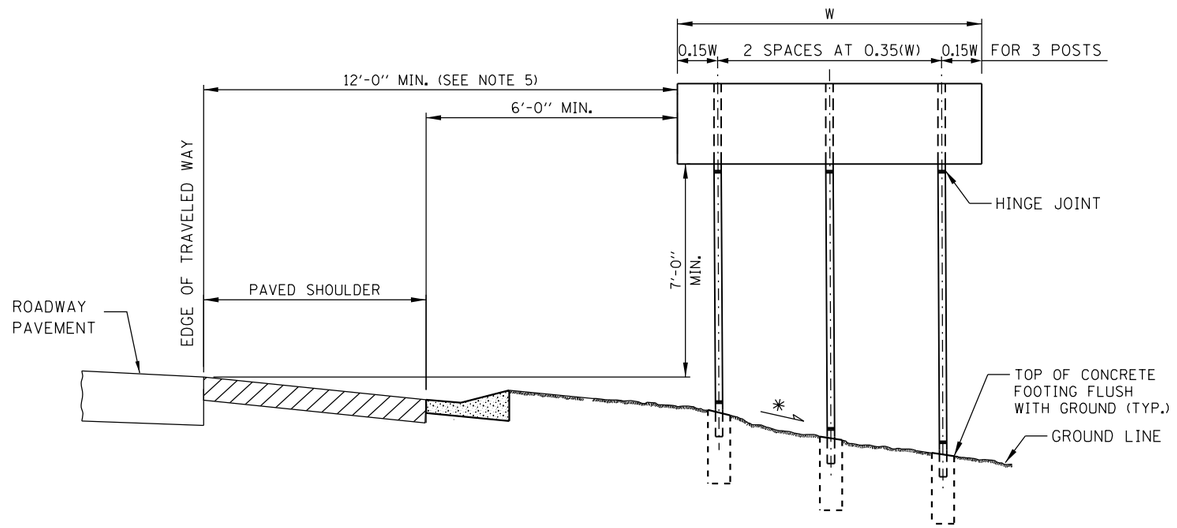



CONDITION 1 - SIGN INSTALLATION

(*) FORESLOPE 1:6 (V:H) OR FLATTER




CONDITION 3 - SIGN INSTALLATION




CONDITION 2 - SIGN INSTALLATION

(*) FORESLOPE 1:6 (V:H) OR FLATTER

## NOTES:

1. SEE SIGN INSTALLATION SCHEDULE IN CONTRACT PLANS FOR DIMENSIONS.
2. THE DIMENSIONS OF ALL POSTS FOR GROUND MOUNTED SIGNS ARE BASED ON DESIGN CROSS SECTIONS. THE CONTRACTOR SHALL VERIFY REQUIRED POST LENGTHS IN THE FIELD, PRIOR TO SUBMITTING SHOP DRAWINGS AND POST FABRICATION TO MAINTAIN THE CLEARANCES SHOWN.
3. SIGN FOUNDATION ELEVATIONS TO BE BASED ON FINISHED SLOPES.
4. ANY ADDITIONAL SIGN TO BE ADDED LATER MUST BE SUPPORTED BY THE EXISTING SIGN PANEL AND NOT THE SIGN POST. MINIMUM CLEARANCES SHALL BE MAINTAINED.
5. SIGNS THAT ARE PLACED WELL OUTSIDE THE CLEAR ZONE MAY BE INSTALLED WITH A MINIMUM HEIGHT OF 5 FEET, MEASURED VERTICALLY FROM THE BOTTOM OF THE SIGN TO THE HORIZONTAL ELEVATION OF THE NEAR EDGE OF TRAVELED ROADWAY.
6. MINIMUM HEIGHT OF LOWEST POST SHALL BE 7'-0'' MEASURED BETWEEN STUB PROJECTION AND HINGE JOINT.
7. FOR TWO POSTS SPACED LESS THAN 7 FEET APART, EACH POST SHALL HAVE A MASS LESS THAN 18 lb/ft.
8. WHEN THE TOTAL COMBINED WEIGHT OF THE TWO POSTS LOCATED WITHIN 7 FEET OF EACH OTHER EXCEEDS 600 lbs., THE SIGN SHALL BE PLACED WELL OUTSIDE THE CLEAR ZONE OR BE SHIELDED FROM VEHICULAR IMPACT.

UNSHIELDED SLOPE

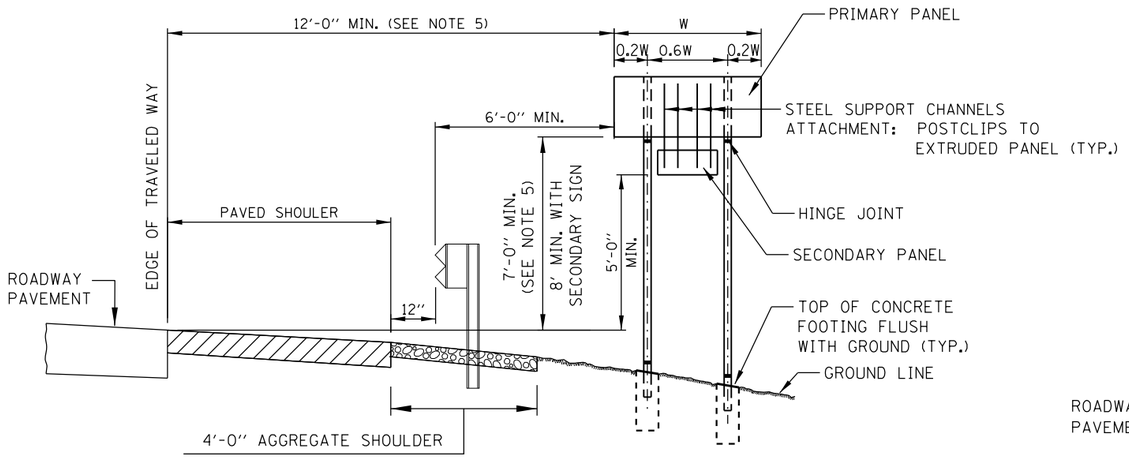


Paul Kovacs
APPROVED..... DATE 1-1-2010
CHIEF ENGINEER

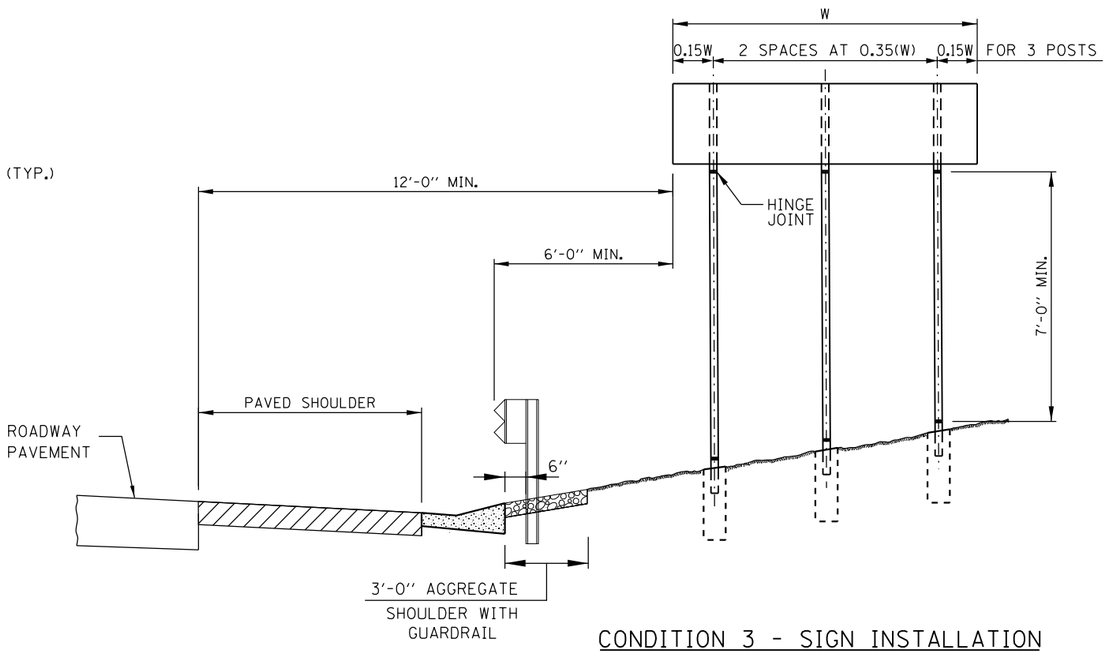
Illinois Tollway

BREAKAWAY SIGN SUPPORT DETAILS

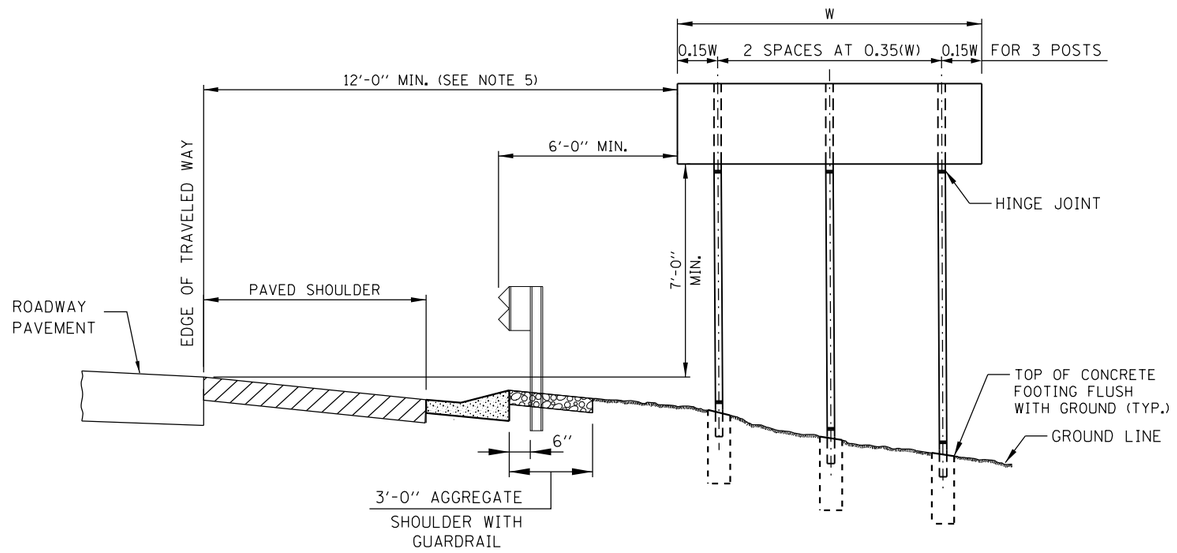
STANDARD F9-05




CONDITION 1 - SIGN INSTALLATION




CONDITION 3 - SIGN INSTALLATION




CONDITION 2 - SIGN INSTALLATION

## NOTES:

1. SEE SIGN INSTALLATION SCHEDULE IN CONTRACT PLANS FOR DIMENSIONS.
2. THE DIMENSIONS OF ALL POSTS FOR GROUND MOUNTED SIGNS ARE BASED ON DESIGN CROSS SECTIONS. THE CONTRACTOR SHALL VERIFY REQUIRED POST LENGTHS IN THE FIELD, PRIOR TO SUBMITTING SHOP DRAWINGS AND POST FABRICATION TO MAINTAIN THE CLEARANCES SHOWN.
3. SIGN FOUNDATION ELEVATIONS TO BE BASED ON FINISHED SLOPES.
4. ANY ADDITIONAL SIGN TO BE ADDED LATER MUST BE SUPPORTED BY THE EXISTING SIGN PANEL AND NOT THE SIGN POST. MINIMUM CLEARANCES SHALL BE MAINTAINED.
5. SIGNS THAT ARE PLACED WELL OUTSIDE THE CLEAR ZONE MAY BE INSTALLED WITH A MINIMUM HEIGHT OF 5 FEET, MEASURED VERTICALLY FROM THE BOTTOM OF THE SIGN TO THE HORIZONTAL ELEVATION OF THE NEAR EDGE OF TRAVELED ROADWAY.
6. MINIMUM HEIGHT OF LOWEST POST SHALL BE 7'-0'' MEASURED BETWEEN STUB PROJECTION AND HINGE JOINT.
7. FOR TWO POSTS SPACED LESS THAN 7 FEET APART, EACH POST SHALL HAVE A MASS LESS THAN 18 lb/ft.
8. WHEN THE TOTAL COMBINED WEIGHT OF THE TWO POSTS LOCATED WITHIN 7 FEET OF EACH OTHER EXCEEDS 600 lbs., THE SIGN SHALL BE PLACED WELL OUTSIDE THE CLEAR ZONE OR BE SHIELDED FROM VEHICULAR IMPACT.

SHIELDED SLOPE

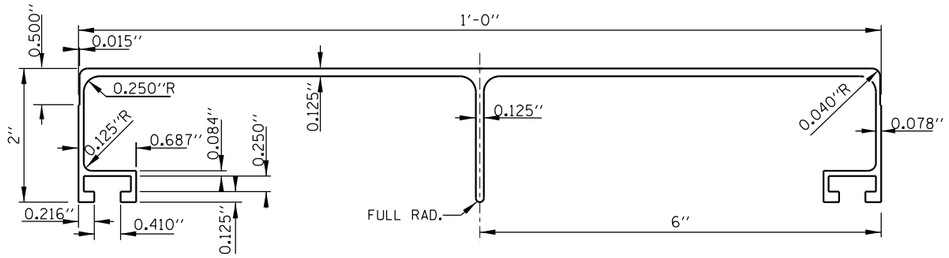
Paul Kovacs
APPROVED ..... CHIEF ENGINEER
DATE 1-1-2010



Illinois Tollway

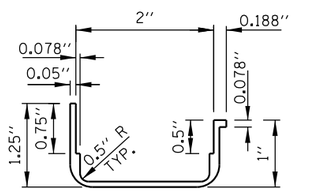
BREAKAWAY SIGN SUPPORT DETAILS

STANDARD F9-05

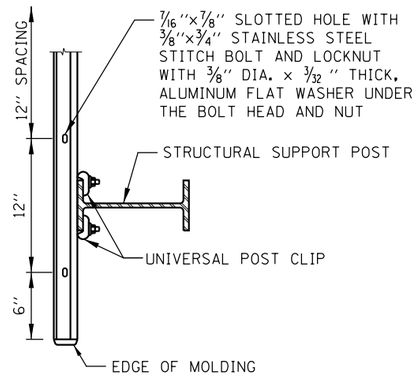



12'' PANEL

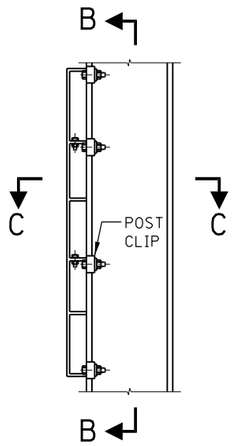
## TYPE B SIGN PANEL EXTRUSIONS



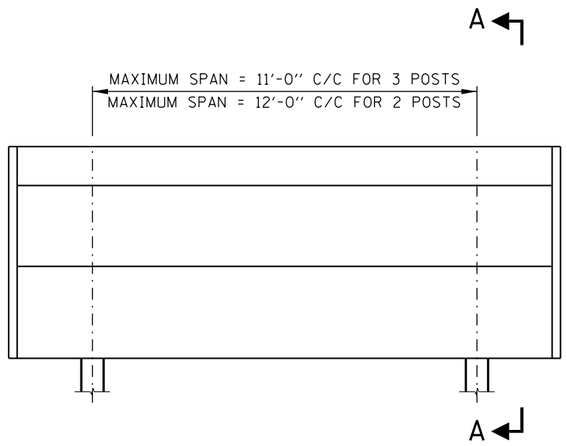

## EDGE MOLDING SECTION FOR SIGN PANEL



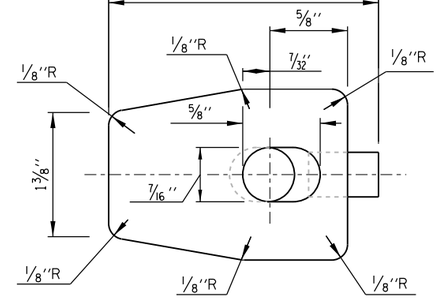

## SECTION C-C



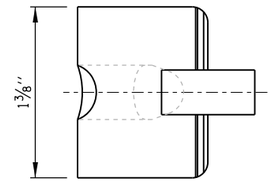

## SECTION A-A



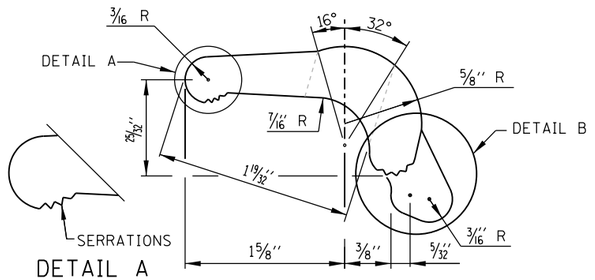

## FACE OF SIGN PANEL



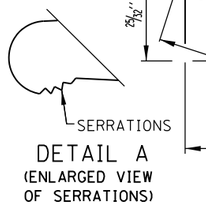

## PLAN VIEW



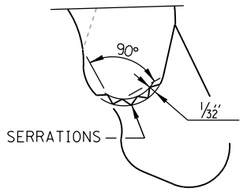

## END VIEW




## ELEVATION VIEW

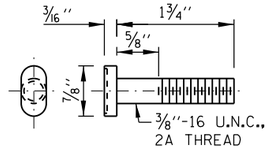



## DETAIL A
(ENLARGED VIEW OF SERRATIONS)

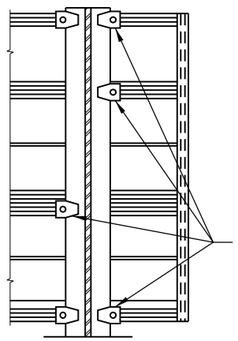



## DETAIL B
(ENLARGED DETAIL OF SERRATIONS)

## ALUMINUM CLIP DETAIL




## POST CLIP BOLT STAINLESS STEEL



PROVIDE TWO (2) POST CLIPS AT TOP AND BOTTOM. ALTERNATE INTERIOR POST CLIPS ON SIGNS UNDER 24 FEET LONG AND OVER HEAD MOUNTED SIGNS. DO NOT ALTERNATE INTERIOR CLIPS ON OTHER SIGNS. A 3/8'' DIA. x 3/32'' THICK, ALUMINUM FLAT WASHER SHALL BE USED UNDER EACH NUT TO PREVENT GOUGING OF THE CLIP.

## SECTION B-B

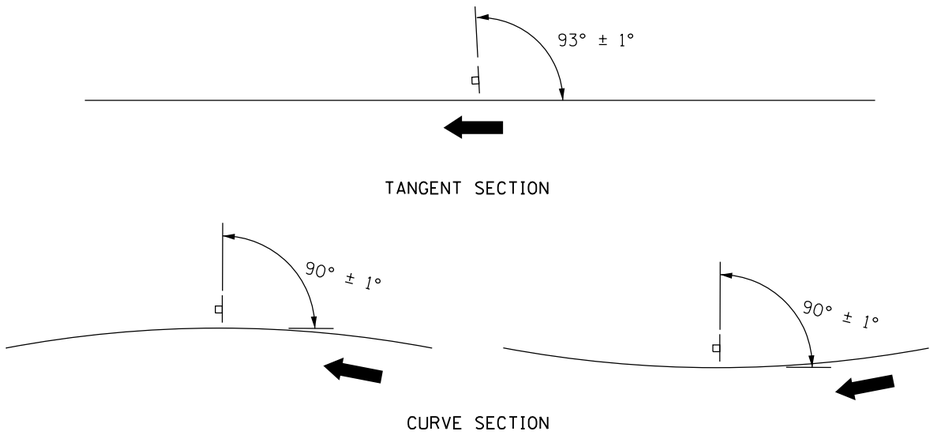
Paul Kovacs
APPROVED ..... CHIEF ENGINEER
DATE 2-7-2012

Illinois Tollway

| DATE | REVISIONS |
|---|---|
| 1-1-2009 | MODIFIED TYPE B SIGN PANEL DIM. |
| | MODIFIED POST CLIP DETAIL |
| 2-7-2012 | REMOVED DETAIL FOR MOUNTING 2 PANEL SIGN |
| 3-11-2015 | ADDED WASHERS TO CONNECTION DETAILS |

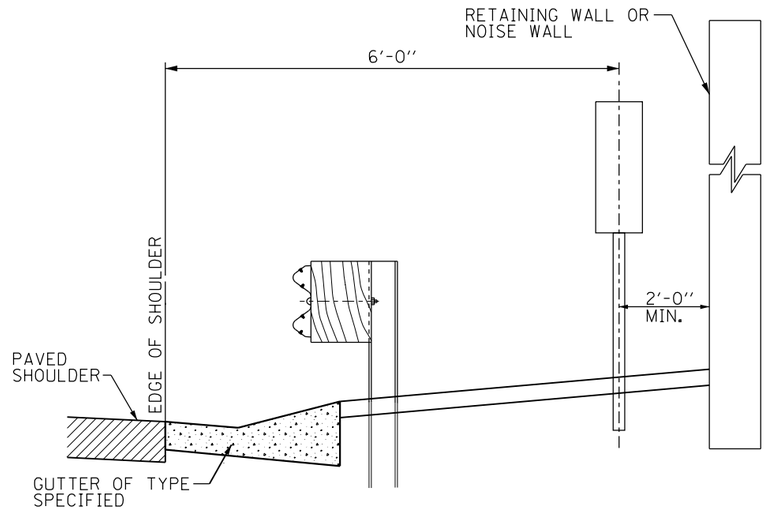
MISCELLANEOUS DETAILS AND ALUMINUM SIGN PANELS

STANDARD F10-03



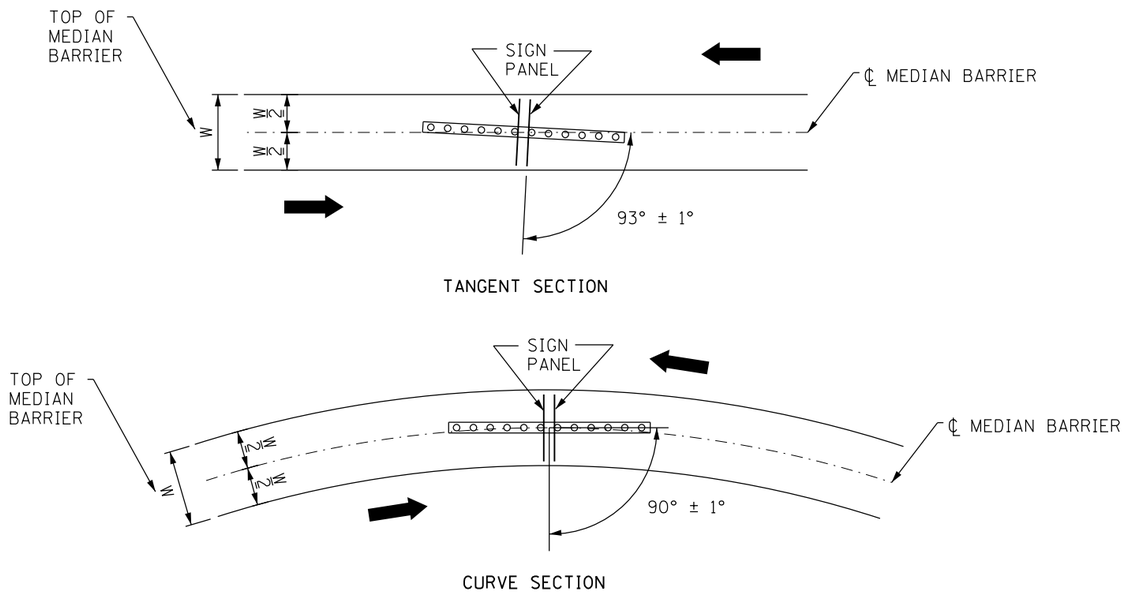

## GROUND MOUNT SIGN POSITIONING

NOT TO SCALE



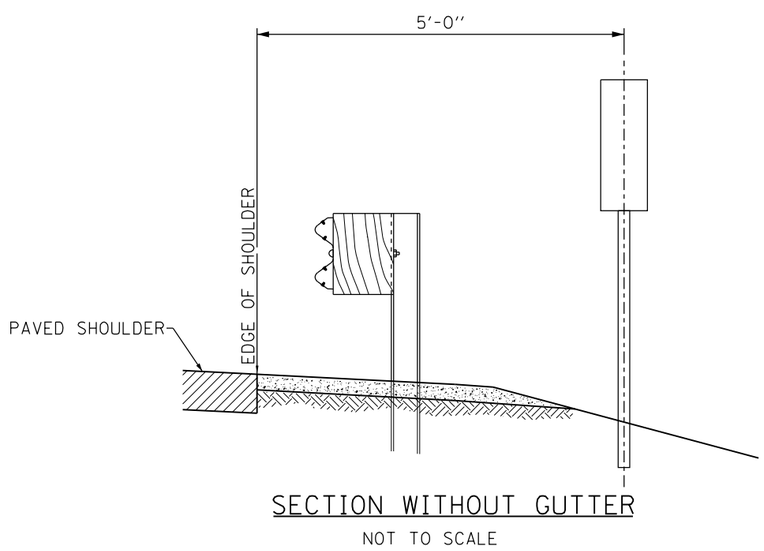

## SECTION WITH GUTTER

NOT TO SCALE




## MEDIAN BARRIER SIGN POSITIONING

NOT TO SCALE




## SECTION WITHOUT GUTTER

NOT TO SCALE

DIRECTION OF TRAFFIC

SHEET 1 OF 2

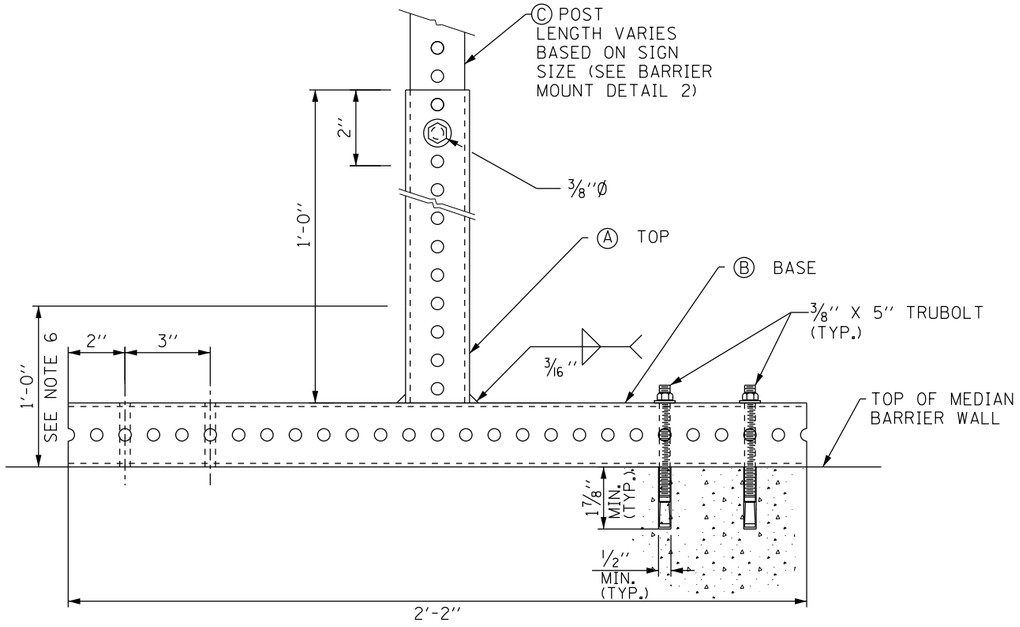
Paul Kovacs
APPROVED ..... DATE 4-6-2009
CHIEF ENGINEER

Illinois Tollway

| DATE | REVISIONS |
|---|---|
| 5-8-2009 | POSITIONING DETAILS |
| 8-1-2009 | REVISED BARRIER WALL MOUNT |
| 3-1-2013 | REMOVED MILE POST SIGNS |
| 3-31-2016 | REVISED BOLT NOTE |
| 3-01-2019 | REMOVED "LIGHT POLE/SIGN STRUCTURE MOUNT DETAIL" |

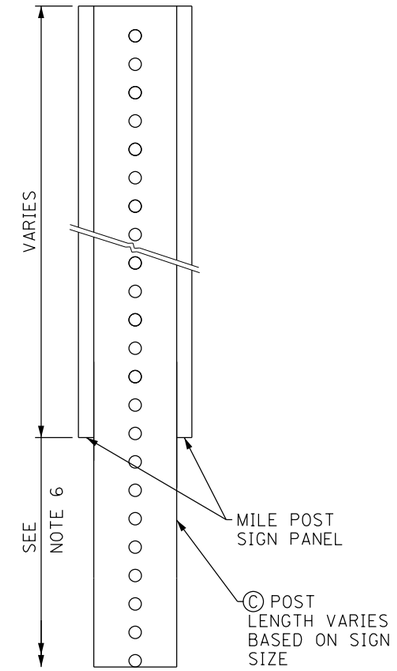
MILEPOST MARKER

STANDARD F11-05



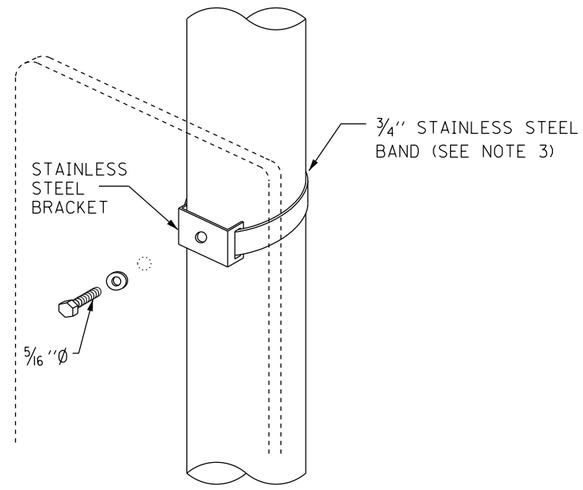

## BARRIER MOUNT DETAIL

NOT TO SCALE



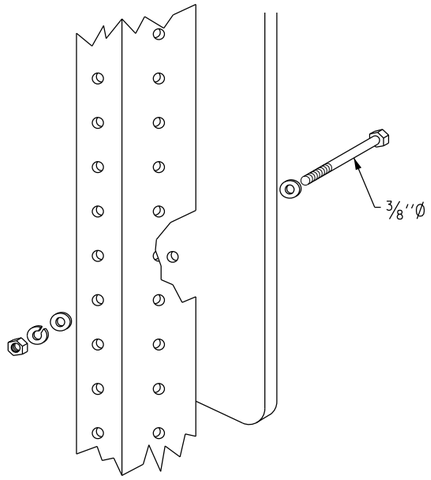

## BARRIER MOUNT DETAIL 2

NOT TO SCALE



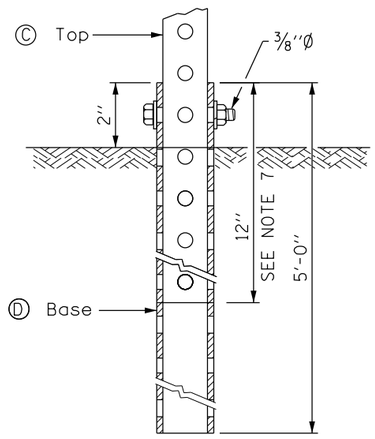

## LIGHT POLE/SIGN STRUCTURE MOUNT DETAIL

NOT TO SCALE




## TELESCOPING STEEL POSTS

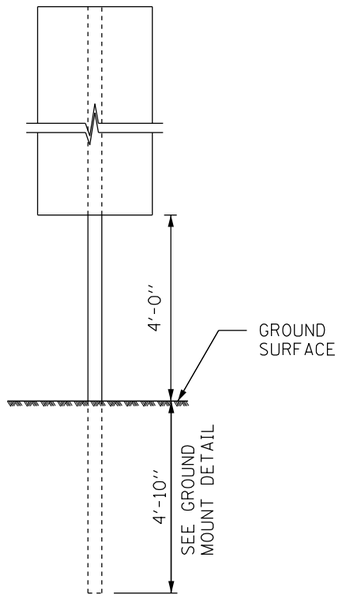
NOT TO SCALE




## GROUND MOUNT DETAIL

NOT TO SCALE

| | |
|---|---|
| Ⓐ | 2 1/4'' x 2 1/4'' x 1'-0'' (12 GA.) |
| Ⓑ | 2 1/4'' x 2 1/4'' x 2'-2'' (12 GA.) |
| Ⓒ | 2'' x 2'' x VARIES (12 GA.) |
| Ⓓ | 2 1/2'' x 2 1/2'' x 5'-0'' (12 GA.) |




## ONE POST INSTALLATION

NOT TO SCALE

GENERAL NOTES:

1. ALL ANCHOR BOLTS FOR MEDIAN BARRIER MOUNT DETAIL SHALL BE 3/8'' DIA. RED HEAD "TRUBOLT" OR APPROVED EQUAL.
2. ALL DIMENSIONS ARE IN INCHES UNLESS SHOWN OTHERWISE.
3. FOLLOWING ARE THE STEPS FOR FASTENING THE MILEPOST MARKER SIGN PANEL. ALL MOUNTING DETAILS SHOWN ON THIS SHEET APPLY:
   a. CENTER ALL FASTENERS ON THE SIGN PANEL.
   b. START AND FINISH THE FASTENER SPACING USING A MINIMUM OF 3'' TO A MAXIMUM OF 6'' FROM THE TOP AND BOTTOM EDGE OF THE SIGN PANEL.
   c. THE DISTANCE BETWEEN SUCCESSIVE FASTENERS SHALL NOT EXCEED 2'-0''.
4. CENTER THE 5/16'' DIA. BOLT IN THE MIDDLE OF THE SIGN.
5. USE THE SAME ATTACHMENT FOR BACK TO BACK MILEPOST MARKER SIGN.
6. DISTANCE FROM THE GROUND TO THE BOTTOM OF THE MILEPOST MARKER SIGN SHALL HAVE A MINIMUM OF 4'-0'' REGARDLESS OF BARRIER TYPE.
7. THE TOP SECTION SHALL BE TELESCOPED INTO THE BASE SECTION 12 INCHES AND FASTENED TOGETHER.
8. FOR ATTACHMENT TO BRIDGE PARAPET USE BARRIER WALL MOUNT DETAIL. ONLY ONE PANEL REQUIRED WHEN ATTACHED TO PARAPET ALONG OUTSIDE SHOULDER.

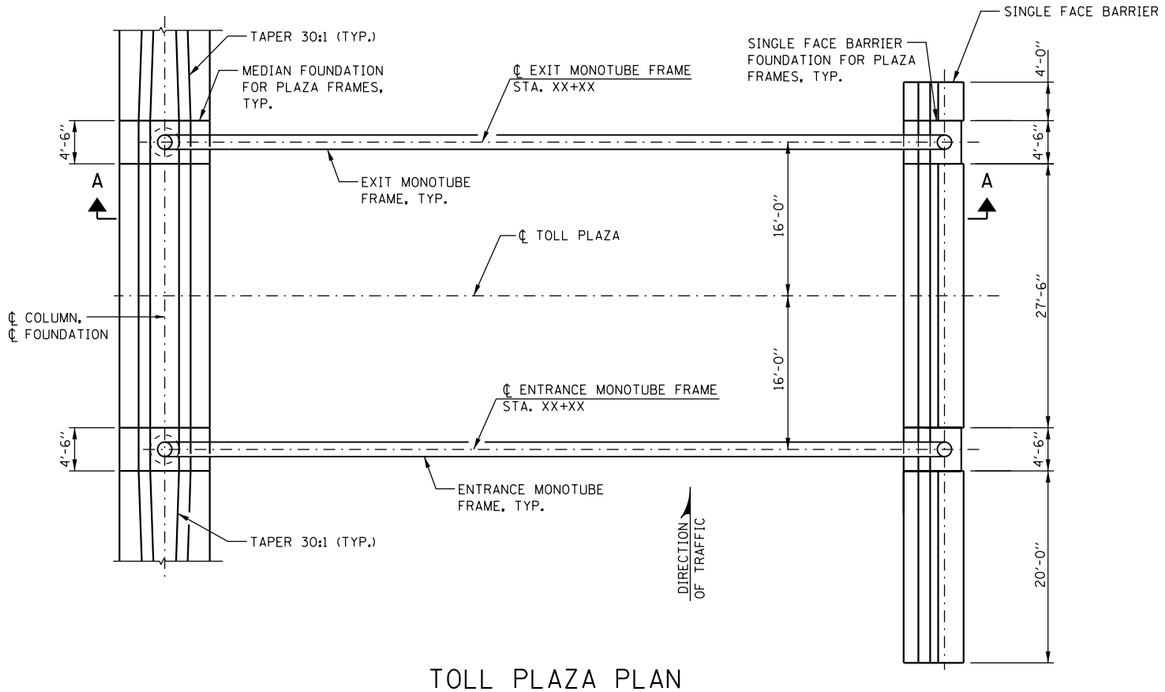


Paul Kovacs
APPROVED ..... DATE 4-6-2009
CHIEF ENGINEER

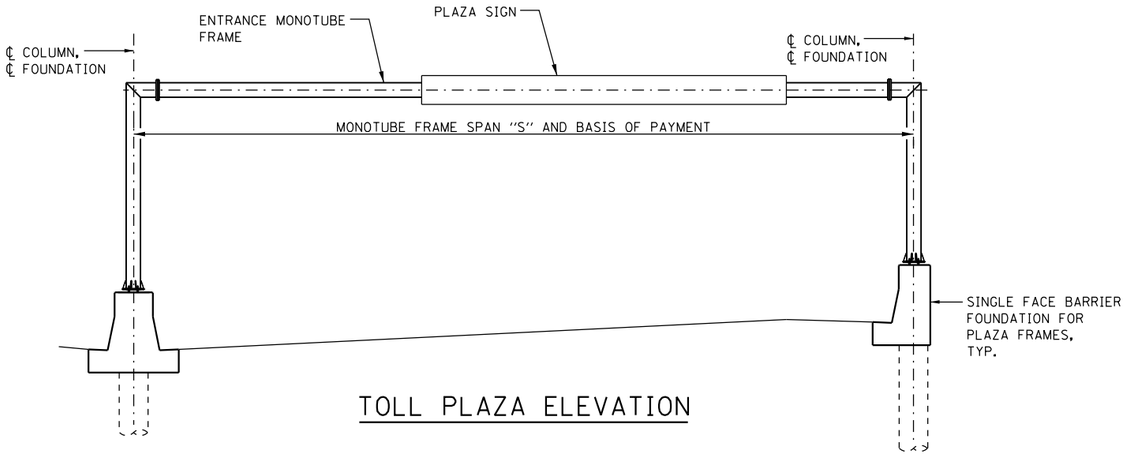
Illinois Tollway

MILEPOST MARKER

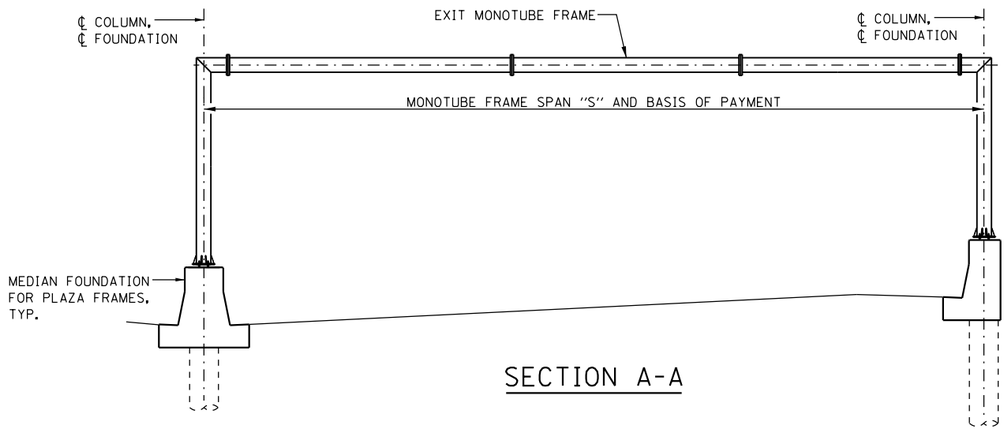
STANDARD F11-05




TOLL PLAZA PLAN




TOLL PLAZA ELEVATION




SECTION A-A

## NOTES:

1. SEE PLANS FOR SIGN SIZE AND LOCATION.
2. MAXIMUM PLAZA SIGN AREA IS 108 SQ. FT.
   MAXIMUM PLAZA SIGN LENGTH IS 36 FT.

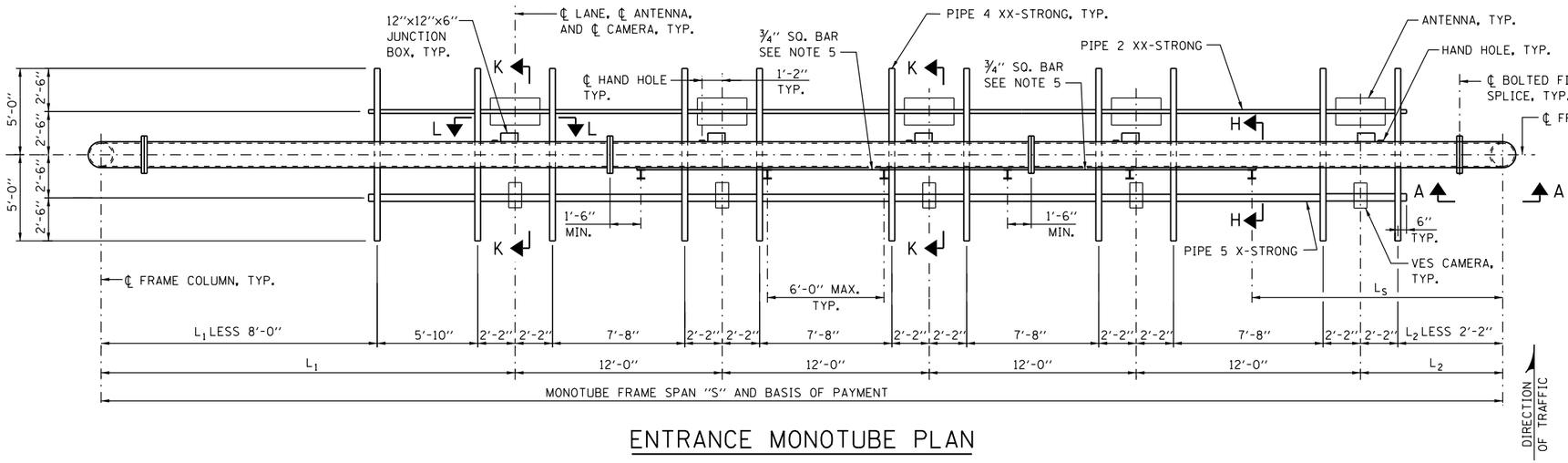
Paul Kovacs
APPROVED ..... DATE 3-31-2014
CHIEF ENGINEERING OFFICER

| DATE | REVISIONS |
|---|---|
| 7-01-2014 | ADDED GROUNDING DETAILS. |
| 3-11-2015 | ADDED MEDIAN AND NOTES. |
| 3-31-2016 | REVISED FOUNDATION NOTE. |
| 3-01-2018 | REVISED SIGN STRUCTURE |
| 3-01-2019 | UPDATED CONSTANT SLOPE BARRIER, REINFORCING DETAILS AND QUANTITIES |

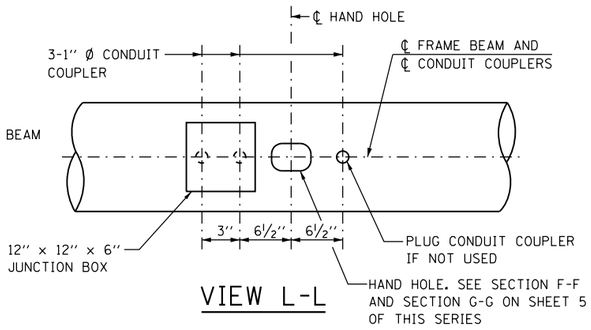
Illinois Tollway

OVERHEAD SIGN STRUCTURE
MONOTUBE TYPE (STEEL)
MAINLINE STRUCTURE DETAILS

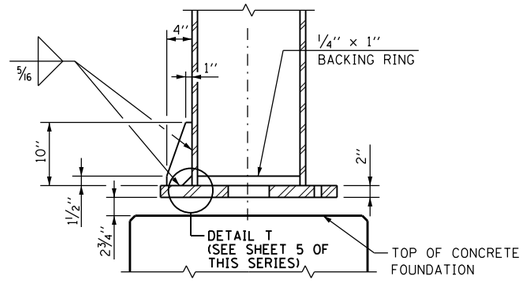
STANDARD F13-04



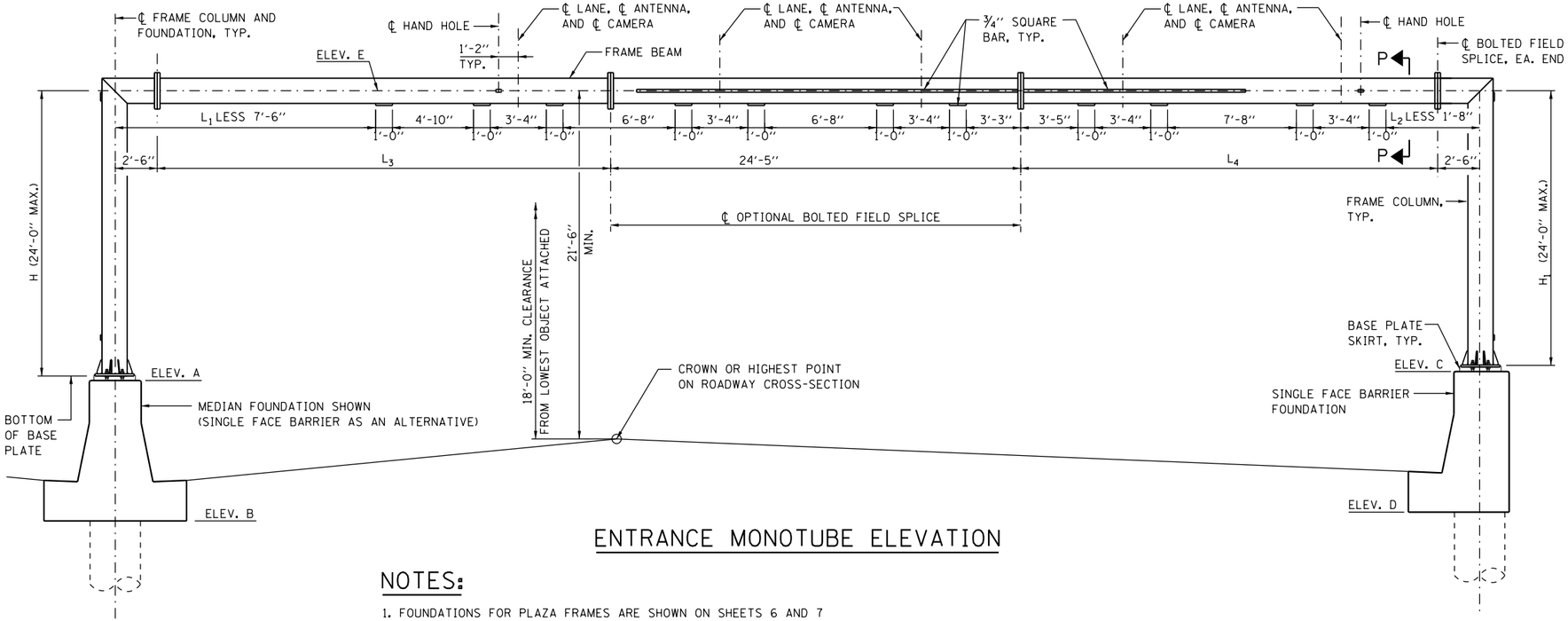

## ENTRANCE MONOTUBE PLAN



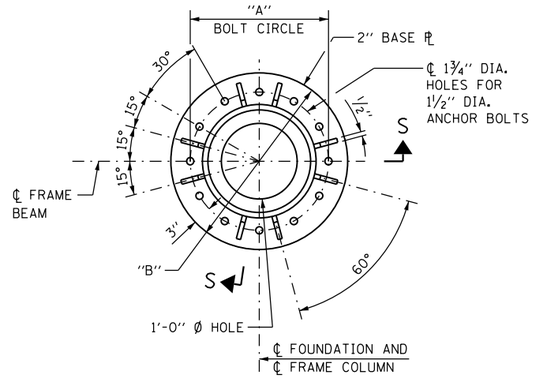

## VIEW L-L




## SECTION S-S




## ENTRANCE MONOTUBE ELEVATION




## BASE PLATE PLAN MONOTUBE FRAMES

## NOTES:

1. FOUNDATIONS FOR PLAZA FRAMES ARE SHOWN ON SHEETS 6 AND 7 OF THIS SERIES.
2. FOR SECTIONS A-A, H-H, K-K, BASE PLATE SKIRT AND HAND HOLE DETAILS, SEE SHEET 5 OF THIS SERIES.
3. FOR SECTION P-P SEE SHEET 4 OF THIS SERIES.
4. PROVIDE CAMBER AT MIDSPAN OF STRUCTURE.
5. DISCONTINUE ¾" SQUARE BAR TO ALLOW ½" Ø U-BOLT INSTALLATION.
6. WORK THIS SHEET WITH, OVERHEAD SIGN STRUCTURES ENTRANCE MONOTUBE TYPE (STEEL) MAINLINE SUMMARY AND TOTAL BILL OF MATERIAL SHEET.

## MONOTUBE FRAME TABLE

| TYPE | SPAN "S" | FRAME COLUMN | FRAME BEAM | CAMBER | "A" | "B" |
|---|---|---|---|---|---|---|
| I | ≤70' | HSS 16x0.500 | HSS 16x0.500 | 2¾" | 1'-8" | 2'-2" |
| II | 71'-80' | HSS 18x0.500 | HSS 18x0.500 | 4" | 1'-10" | 2'-4" |
| III | 81'-90' | HSS 18x0.500 | HSS 18x0.500 | 4½" | 1'-10" | 2'-4" |

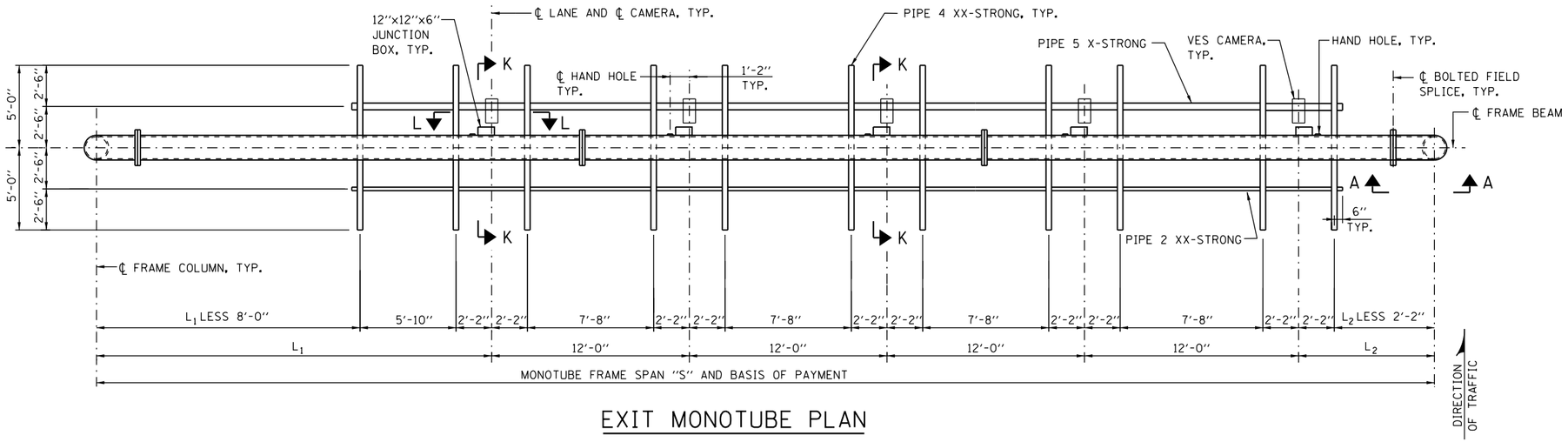
Paul Kovacs
APPROVED. . . . . DATE 3-31-2014
CHIEF ENGINEERING OFFICER



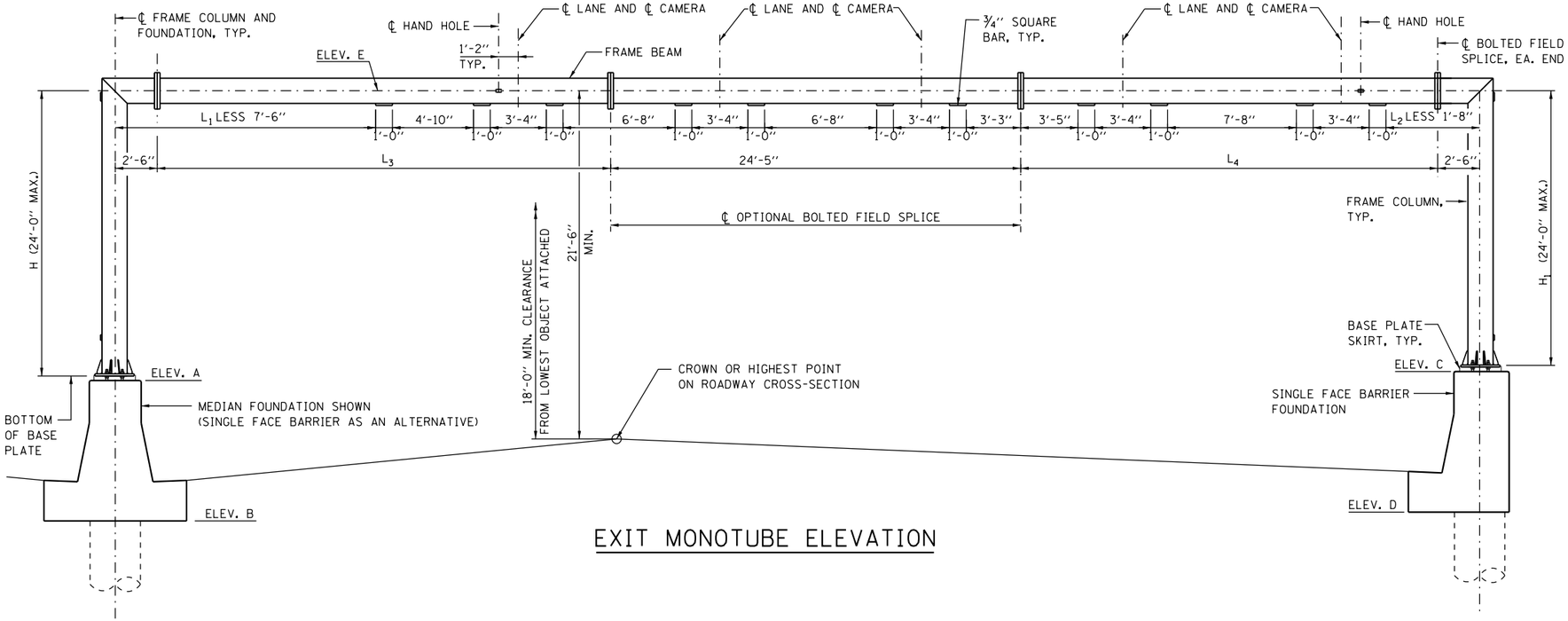
Illinois Tollway

OVERHEAD SIGN STRUCTURE
MONOTUBE TYPE (STEEL)
MAINLINE STRUCTURE DETAILS

STANDARD F13-04




## EXIT MONOTUBE PLAN




## EXIT MONOTUBE ELEVATION

## NOTES:

1. SEE SHEET 2 OF THIS SERIES FOR MONOTUBE FRAME TABLE, VIEW L-L, BASE PLATE DETAIL, AND ADDITIONAL NOTES.
2. WORK THIS SHEET WITH, OVERHEAD SIGN STRUCTURES EXIT MONOTUBE TYPE (STEEL) SUMMARY AND TOTAL BILL OF MATERIAL SHEET.

Paul Kovacs
APPROVED..... DATE 3-31-2014
CHIEF ENGINEERING OFFICER



Illinois Tollway

OVERHEAD SIGN STRUCTURE
MONOTUBE TYPE (STEEL)
MAINLINE STRUCTURE DETAILS

STANDARD F13-04

## GENERAL NOTES:

1. SEE THE ILLINOIS TOLLWAY STRUCTURE DESIGN MANUAL FOR MINIMUM VERTICAL CLEARANCE.

2. AFTER ADJUSTMENTS TO LEVEL FRAME BEAM AND ENSURE ADEQUATE VERTICAL CLEARANCE, TIGHTEN ALL TOP AND LEVELING NUTS AGAINST THE BASE PLATE WITH A MINIMUM TORQUE OF 200 LB.-FT. THEN PLACE STAINLESS STEEL MESH AROUND THE PERIMETER OF THE BASE PLATE. SECURE TO BASE PLATE WITH STAINLESS STEEL BANDING.

3. REINFORCEMENT BARS DESIGNATED "(E)" SHALL BE EPOXY COATED.

## STRUCTURAL STEEL:

1. MATERIAL FOR THE MONOTUBE FRAME SHALL CONFORM TO THE REQUIREMENT OF ASTM A500 GRADE B. OTHER STRUCTURAL STEEL SHAPES AND PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A36, UNLESS NOTED OTHERWISE.

2. PIPES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A53 GRADE B.

3. ANCHOR BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F1554 (AASHTO M314) GRADE 55, WITH A MINIMUM TENSILE STRENGTH OF 75,000 PSI. THEY SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 (AASHTO M232). SEE SHEET 6 OF THIS SERIES FOR GALVANIZED LENGTH.

4. U-BOLTS SHALL BE STAINLESS STEEL AND SHALL CONFORM TO ASTM 193, CLASS I, GRADE B8 (AISI TYPE 304). WASHERS FOR U-BOLTS SHALL CONFORM TO ASTM A240, TYPE 302. NUTS FOR U-BOLTS SHALL CONFORM TO ASTM A194 (AASHTO M292), GRADE 8F (AISI TYPE 303).

5. BOLTS (EXCLUDING ANCHOR BOLTS AND U-BOLTS) SHALL BE HIGH STRENGTH AND SHALL CONFORM TO THE REQUIREMENTS OF ASTM A325 (AASHTO M164). THEY SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 (AASHTO M232).

6. NUTS SHALL CONFORM TO ASTM A563 GRADE DH AND GALVANIZED ACCORDING TO ASTM A153 (AASHTO M232).

7. HARDENED STEEL WASHERS SHALL CONFORM TO ASTM F436 AND GALVANIZED ACCORDING TO ASTM A153 (AASHTO M232).

8. TUBES FOR MONOTUBE FRAME, PIPES, STRUCTURAL STEEL SHAPES AND PLATES SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123 AFTER FABRICATION.

8. THE MONOTUBE FRAME BEAM, COLUMNS, BASE PLATE MATERIAL, AND SPLICES ARE CONSIDERED TENSION MEMBERS AND SHALL CONFORM TO THE IMPACT TESTING REQUIREMENT, ZONE 2.

10. WELDING SHALL BE PERFORMED BY CERTIFIED WELDERS USING E70-XX ELECTRODES, AND SHALL CONFORM TO AWS D1.1-08 "STRUCTURAL WELDING CODE - STEEL". ALL WELDS ON ARCHITECTURAL EXPOSED STEEL (AES) MEMBERS ARE TO BE GROUND SMOOTH AND FILLED.

## DESIGN LOADING:

WIND LOAD CRITERIA
BASIC WIND SPEED = 90 MPH
G = 1.14
$I_r$ = 1.00 (50 YR. RECURRANCE INTERVAL)

## EQUIPMENT LOADS:

| | |
|---|---|
| CAMERA ASSEMBLY | 8 LB. |
| ANTENNA | 20 LB. |

## DESIGN STRESSES FOR REINFORCED CONCRETE:

| | |
|---|---|
| f'c = COMPRESSIVE STRENGTH OF CONCRETE AT 14 DAYS (CLASS SI) | = 3,500 P.S.I. |
| f'c = COMPRESSIVE STRENGTH OF CONCRETE AT 14 DAYS (CLASS DS) | = 4,000 P.S.I. |
| fy = YIELD STRENGTH OF REINFORCEMENT BARS (GRADE 60) | = 60,000 P.S.I. |

## FOUNDATION:

MINIMUM UNCONFINED COMPRESSIVE STRENGTH, Qu FOR ALL LAYERS OF COHESIVE SOILS (CLAYS) SHALL BE 1.25 TON/SQ.FT. AT PLAZA FRAMES.

## DESIGN SPECIFICATIONS:

1. ILLINOIS TOLLWAY STRUCTURE DESIGN MANUAL, LATEST EDITION.

2. AASHTO STANDARD SPECIFICATION FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS, 6TH EDITION.

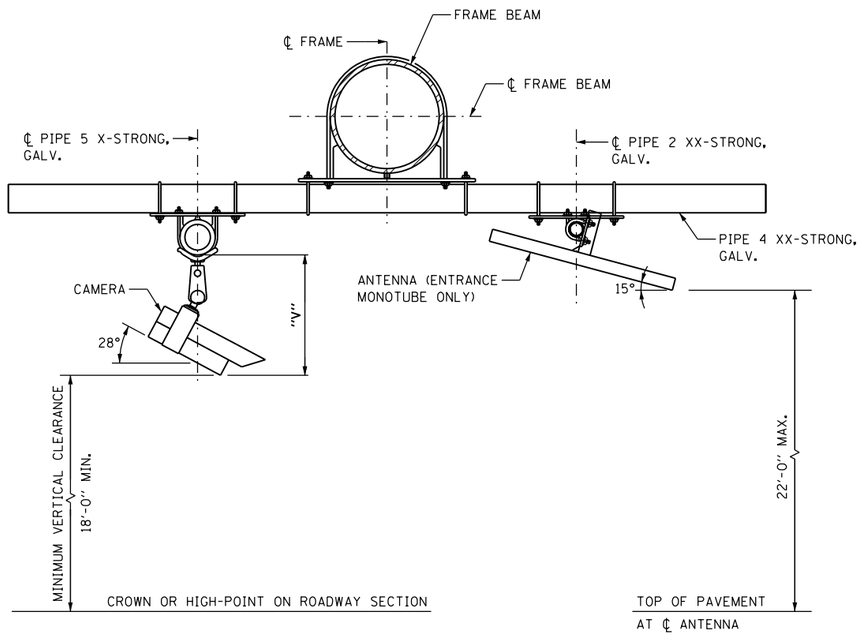
3. AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 6TH EDITION DATED FEBRUARY 2012.

4. ILLINOIS DEPARTMENT OF TRANSPORTATION BRIDGE MANUAL, JANUARY 2012

## CONSTRUCTION SPECIFICATIONS:

1. ILLINOIS TOLLWAY SUPPLEMENTAL SPECIFICATIONS TO THE ILLINOIS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION.

2. ILLINOIS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION.




SECTION P-P

**NOTE:**
VERIFY DIMENSION "V" WITH CAMERA MANUFACTURER.

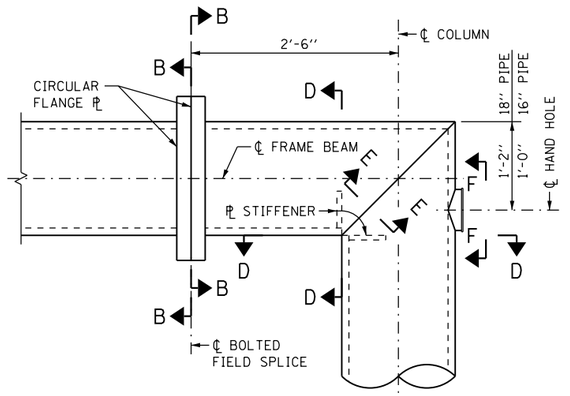
Paul Kovacs
APPROVED ..... DATE 3-31-2014
CHIEF ENGINEERING OFFICER



Illinois Tollway

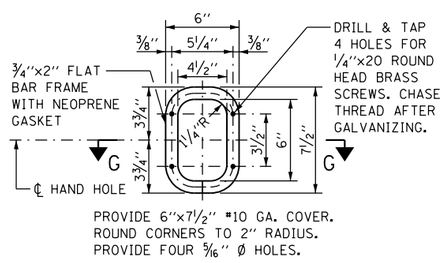
OVERHEAD SIGN STRUCTURE
MONOTUBE TYPE (STEEL)
MAINLINE STRUCTURE DETAILS

STANDARD F13-04

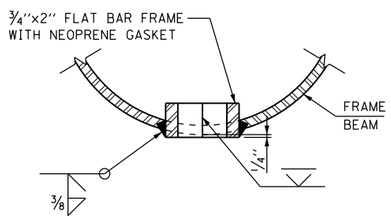



## SECTION A-A

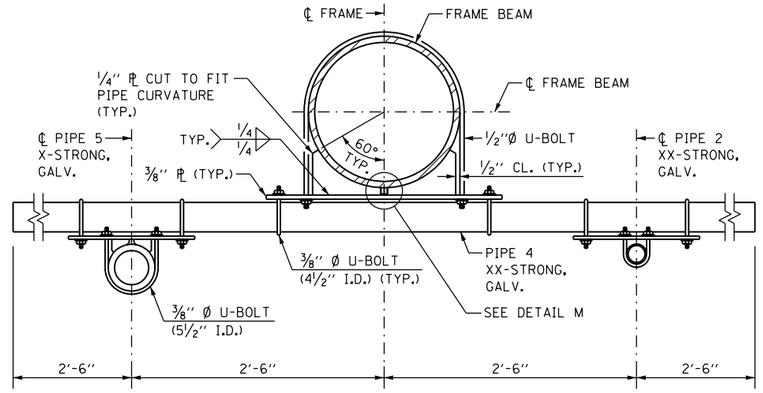
(SEE SHEET 1 OF THIS SERIES FOR LOCATION)



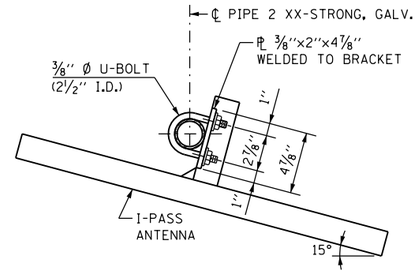

## SECTION F-F



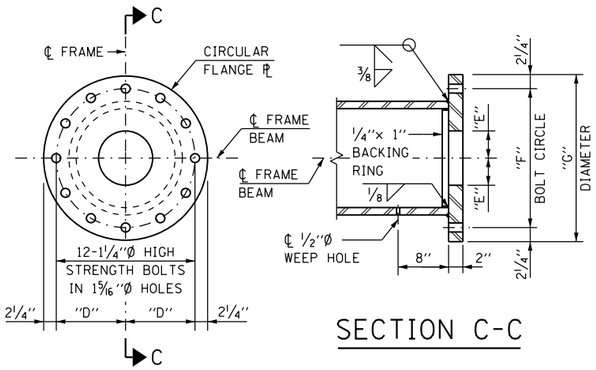

## SECTION G-G




## SECTION K-K




## ANTENNA HANGER

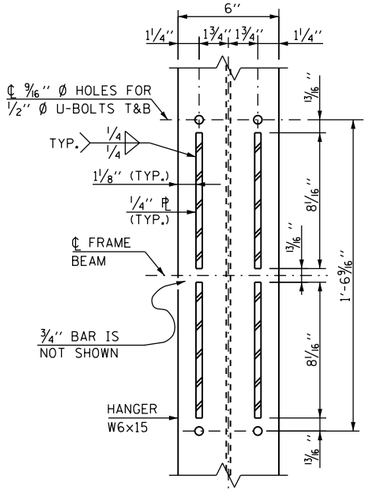



## SECTION B-B

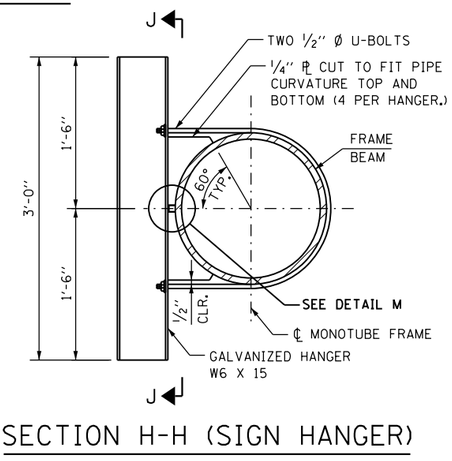



## SECTION C-C

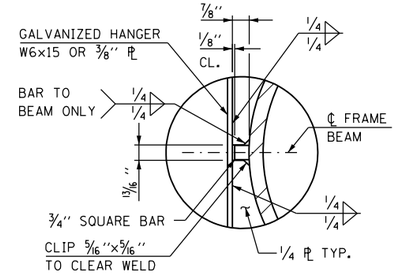
| FRAME BEAM | "D" | "E" | "F" | "G" |
|---|---|---|---|---|
| HSS 16x0.500 | 10" | 6" | 1'-8" | 2'-0 1/2" |
| HSS 18x0.500 | 11" | 6" | 1'-10" | 2'-2 1/2" |



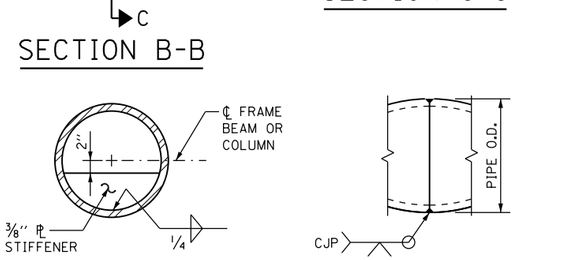

## SECTION J-J




## SECTION H-H (SIGN HANGER)

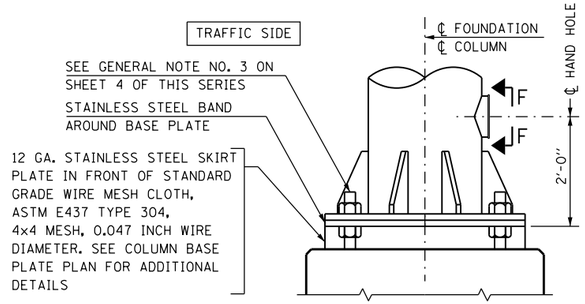



## DETAIL M

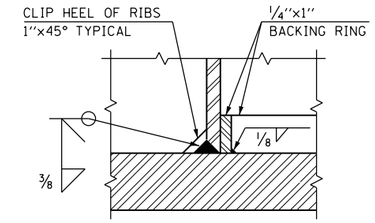



## SECTION D-D

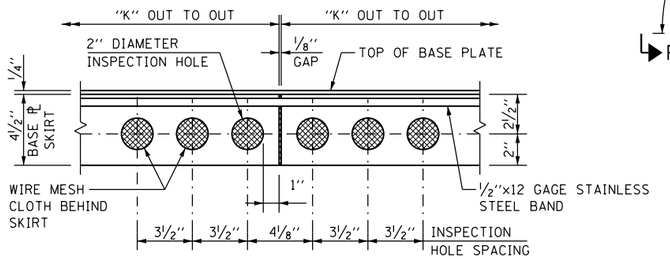
## SECTION E-E



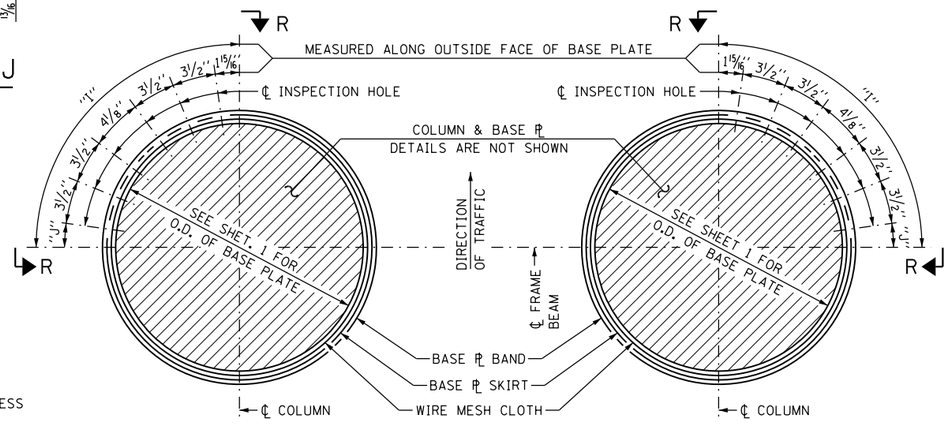

## COLUMN BASE




## DETAIL T




## VIEW R-R (BASE PLATE SKIRT)




## LEFT BASE PLATE

## RIGHT BASE PLATE

## COLUMN BASE PLATE PLAN

| FRAME COLUMN | "I" | "J" | "K" |
|---|---|---|---|
| HSS 16x0.500 | 1'-8 1/16" | 3/8" | 6'-9 9/16" |
| HSS 18x0.500 | 1'-10" | 1 15/16" | 7'-3 7/8" |

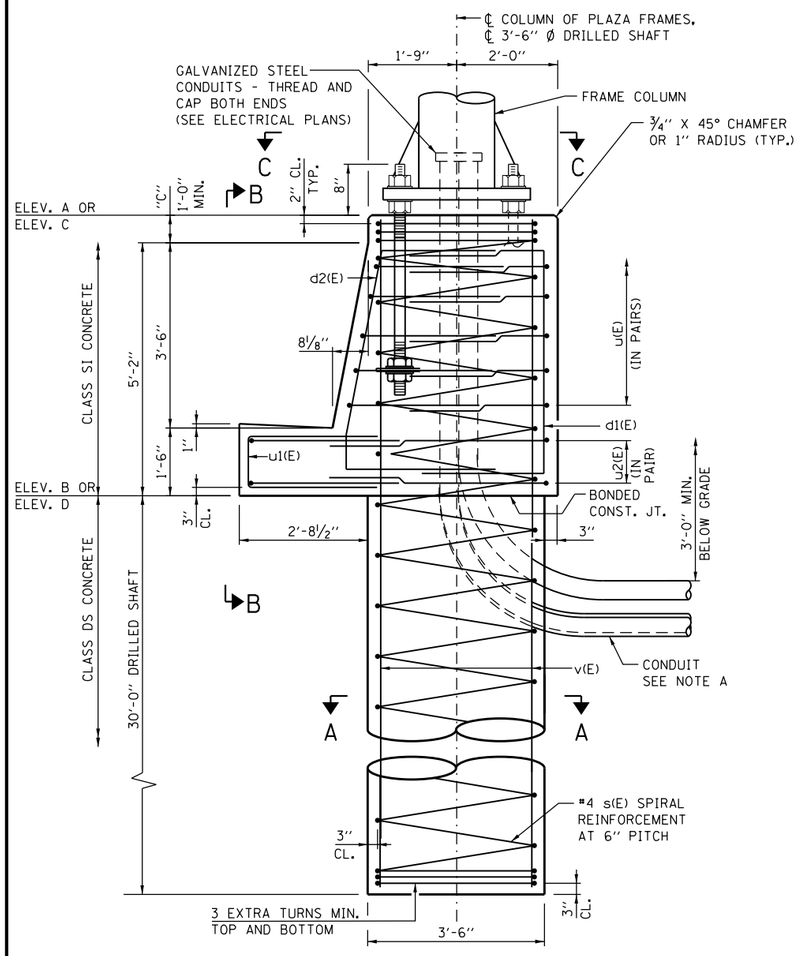
SHEET 5 OF 8

Paul Kovacs
APPROVED ..... DATE 3-31-2014
CHIEF ENGINEERING OFFICER

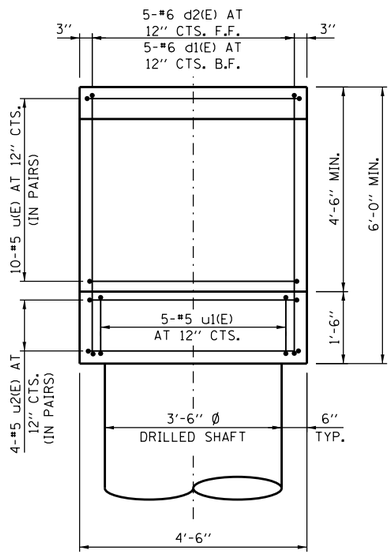
Illinois Tollway

OVERHEAD SIGN STRUCTURE
MONOTUBE TYPE (STEEL)
MAINLINE STRUCTURE DETAILS

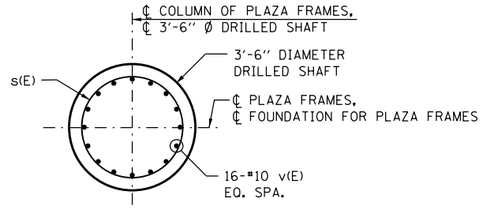
STANDARD F13-04



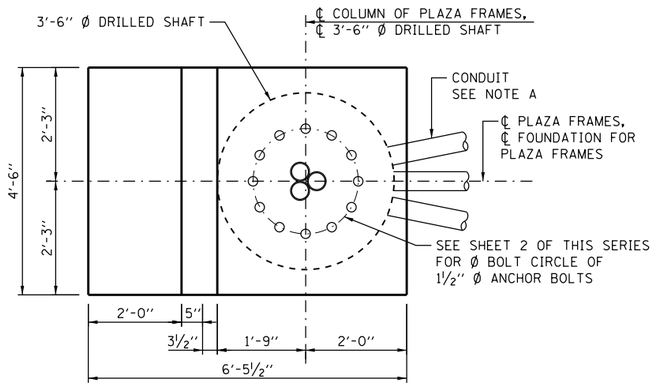

SIDE ELEVATION




VIEW B-B

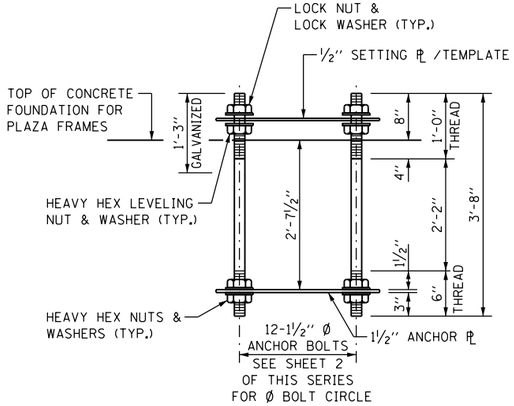



SECTION A-A

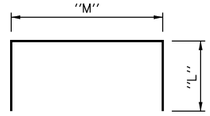



VIEW C-C

# SINGLE FACE BARRIER FOUNDATION FOR PLAZA FRAMES

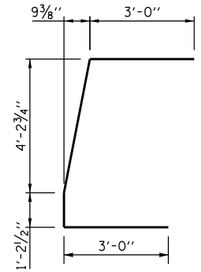



## ANCHOR BOLT ASSEMBLY



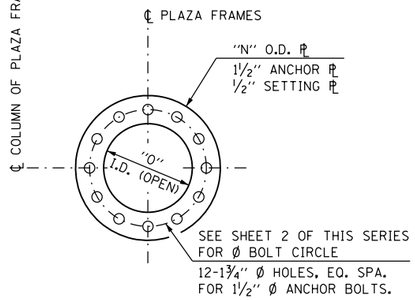

| BAR | "L" | "M" | |
|---|---|---|---|
| d1(E) | 3'-0" | 5'-7" | ** |
| u(E) | 3'-0" | 4'-2" | |
| u1(E) | 3'-6" | 1'-1" | |
| u2(E) | 4'-1" | 4'-2" | |
| u3(E) | 5'-10" | 4'-2" | |

## BARS d1(E), u(E), u1(E), u2(E) AND u3(E)




## BAR d2(E)

| FRAME COLUMN | "N" | "O" |
|---|---|---|
| HSS 16x0.500 | 2'-0" | 1'-4" |
| HSS 18x0.500 | 2'-2" | 1'-6" |




## ANCHOR ℄ / SETTING ℄ BAR LIST-ONE FOUNDATION

| | BAR | NO. SINGLE FACE BARRIER FDN. | NO. MEDIAN BARRIER FDN. | SIZE | LENGTH | SHAPE |
|---|---|---|---|---|---|---|
| ** | d1(E) | 5 | 10 | #6 | 11'-7" | |
| ** | d2(E) | 5 | 10 | #6 | 11'-7" | |
| | | | | | | |
| * | s(E) | 1 | | #4 | 35'-7" | |
| | | | | | | |
| * | s1(E) | | 1 | #4 | 35'-7" | |
| | | | | | | |
| | v(E) | 16 | | #10 | 35'-7" | |
| | | | | | | |
| | v1(E) | | 16 | #10 | 35'-7" | |
| | | | | | | |
| | u(E) | 10 | 10 | #5 | 10'-2" | |
| | u1(E) | 5 | 10 | #5 | 8'-1" | |
| | u2(E) | 4 | | #5 | 12'-4" | |
| | u3(E) | | 4 | #5 | 15'-10" | |
| | | | | | | |

* THE LENGTH OF SPIRAL SHOWN IS THE HEIGHT OF SPIRAL, COMPUTED USING "C" = 10". ADJUST LENGTH ACCORDINGLY IF "C" IS GREATER THAN 1'-0".

** BAR LENGTH IS COMPUTED USING "C" = 1'-0". ADJUST BAR LENGTH ACCORDINGLY IF "C" IS GREATER THAN 1'-0".

## ESTIMATED QUANTITY

| ITEM | UNIT | SINGLE FACE BARRIER FDN. | MEDIAN BARRIER FDN. |
|---|---|---|---|
| CLASS SI CONCRETE | CU. YD. | 4.7 | 4.8 |
| CLASS DS CONCRETE | CU. YD. | 10.7 | 10.7 |
| REINFORCEMENT BARS EPOXY COATED | POUND | 2,850 | 3,080 |
| PROTECTIVE COAT | SQ. YD. | 5.2 | 7.4 |

### NOTE A:

COORDINATE CONDUIT SIZE, LOCATION AND QUANTITY WITH ELECTRICAL PLANS. CONDUITS SHALL BE PLACED TO MISS REINFORCEMENT. CUTTING OF REINFORCEMENT SHALL NOT BE ALLOWED.

### FOUNDATIONS:

THE FOUNDATION DETAILS SHOWN ARE BASED ON THE PRESENCE OF MOSTLY COMMON COHESIVE SOIL CONDITIONS (SILTY OR SANDY CLAY), WITH AN AVERAGE UNCONFINED COMPRESSIVE STRENGTH (QU) > 1.25 TON/SQ. FT. WHICH MUST BE DETERMINED BY PREVIOUS SOIL INVESTIGATIONS AT THE JOBSITE. WHEN OTHER CONDITIONS ARE INDICATED, THE BORING DATA SHALL BE INCLUDED IN THE PLANS AND THE FOUNDATION DIMENSIONS SHOWN SHALL BE THE RESULT OF SITE SPECIFIC DESIGNS. IF CONDITIONS ENCOUNTERED IN THE FIELD ARE DIFFERENT THAN THOSE INDICATED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER TO DETERMINE IF THE FOUNDATION DIMENSIONS NEED TO BE MODIFIED.

### LEGEND:

F.F. - FRONT FACE
B.F. - BACK FACE
CTS. - CENTERS

### NOTES:

1. QUANTITIES FOR SINGLE FACE BARRIER FOUNDATION ARE DETERMINED USING "C" = 1'-0". IF DIMENSION "C" IS GREATER THAN 1'-0", ADJUST QUANTITIES ACCORDINGLY.
2. SITE GROUNDING ELECTRODE SYSTEM TO BE PROVIDED AS INDICATED ON THE PLANS.
3. PROTECTIVE COAT SHALL BE APPLIED TO THE TRAFFIC AND TOP FACES OF THE BARRIER AND TOP OF GUTTER.

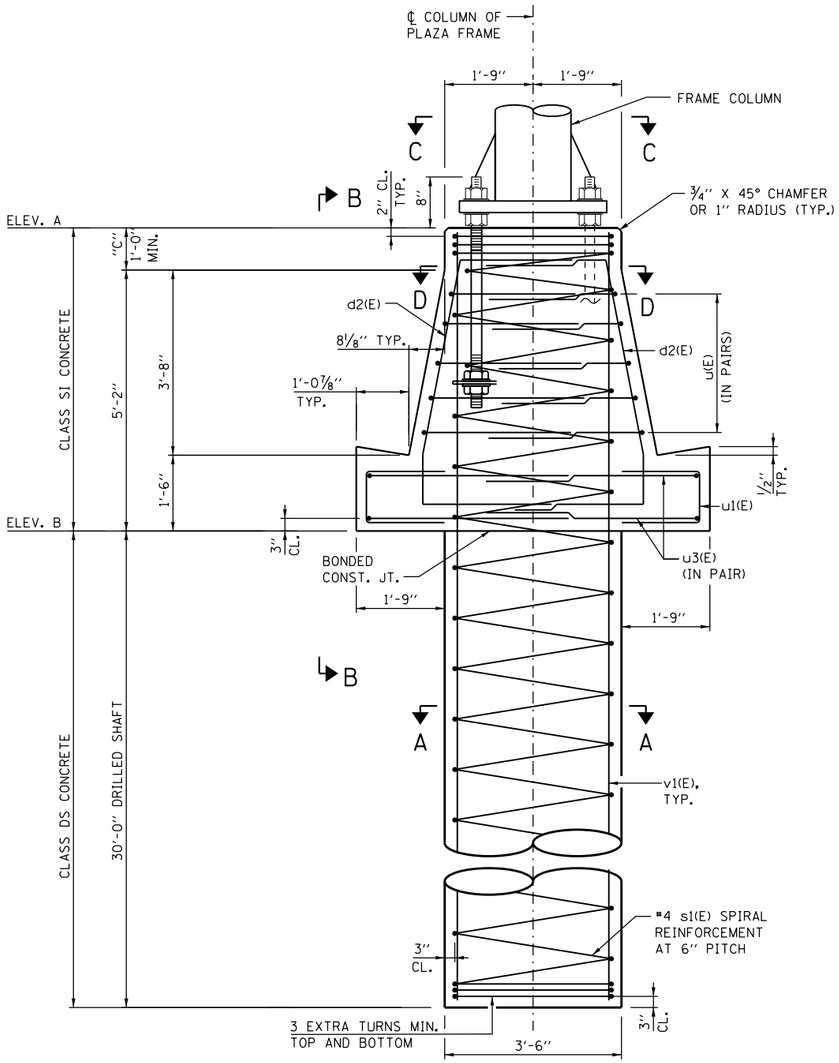
Paul Kovacs
APPROVED ..... DATE 3-31-2014
CHIEF ENGINEERING OFFICER



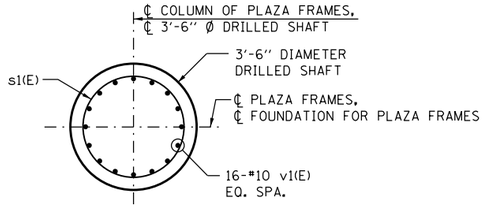
Illinois Tollway

OVERHEAD SIGN STRUCTURE
MONOTUBE TYPE (STEEL)
MAINLINE STRUCTURE DETAILS

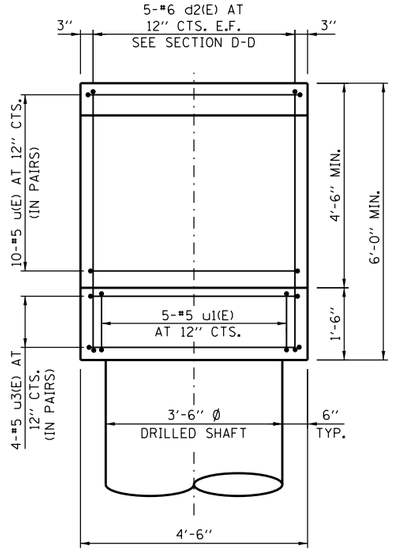
STANDARD F13-04



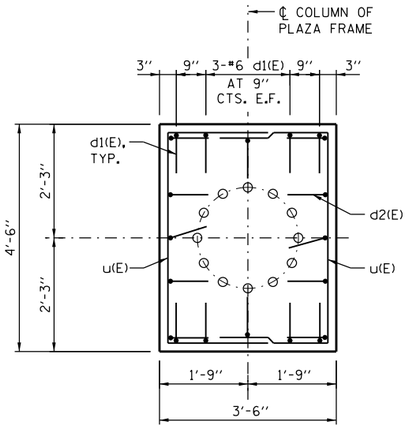

MEDIAN FOUNDATION FOR PLAZA FRAMES



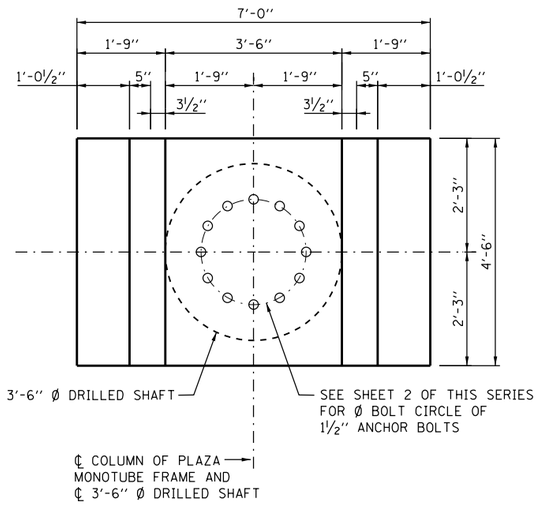

SECTION A-A




VIEW B-B




SECTION D-D




VIEW C-C

## NOTES:

1. ANCHOR BOLT ASSEMBLY DETAIL, ANCHOR PLATE DETAIL AND BAR BENDING DIAGRAMS AND QUANTITIES ARE SHOWN ON SHEET 6 OF THIS SERIES.
2. SEE SHEET 6 OF THIS SERIES FOR ADDITIONAL NOTES.
3. SITE GROUNDING ELECTRODE SYSTEM TO BE PROVIDED AS INDICATED ON THE PLANS.

## LEGEND:

E.F. - EACH FACE
CTS. - CENTERS

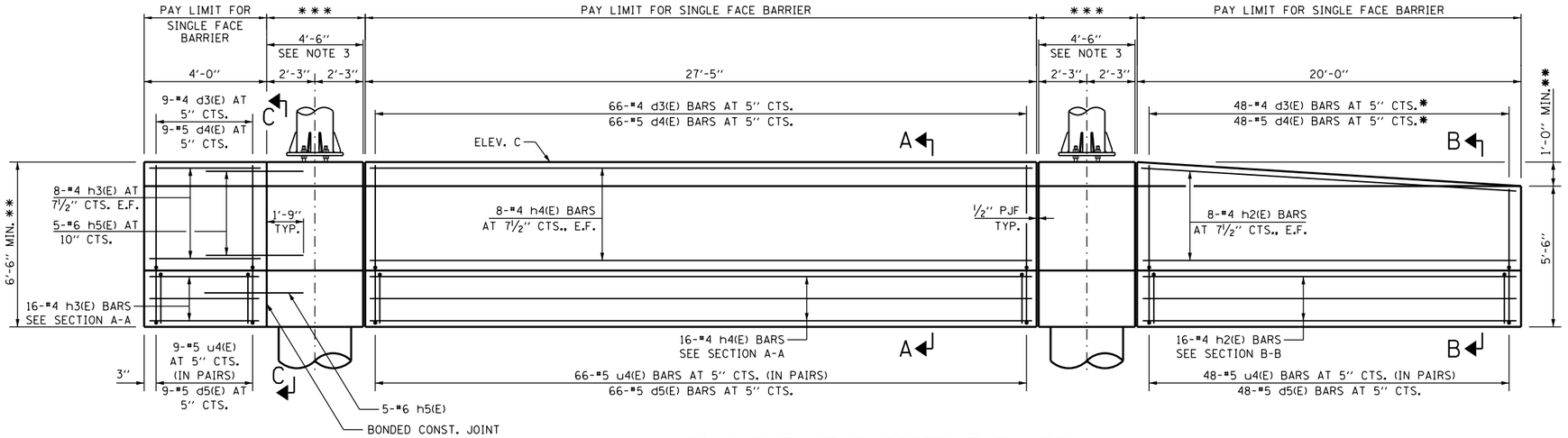


Paul Kovacs
APPROVED. . . . . DATE 3-31-2014
CHIEF ENGINEERING OFFICER

Illinois Tollway

OVERHEAD SIGN STRUCTURE
MONOTUBE TYPE (STEEL)
MAINLINE STRUCTURE DETAILS

STANDARD F13-04




## SINGLE FACE BARRIER ELEVATION

INSIDE FACE BARRIER IS SHOWN

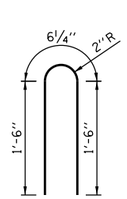
* CUT IN FIELD AS REQUIRED TO FIT TAPER

** BASED ON DIMENSION "C" = 1'-0"

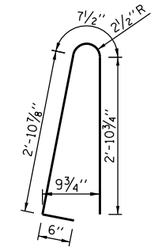
*** PAY LIMIT FOR FOUNDATION FOR OVERHEAD SIGN STRUCTURE

## BAR LIST - ONE BARRIER

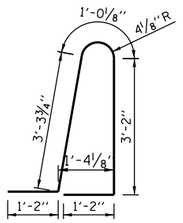
| BAR | NO. | SIZE | LENGTH | SHAPE |
|---|---|---|---|---|
| d3(E) | 123 | #4 | 3'-7" | |
| d4(E) | 123 | #5 | 7'-0" | |
| d5(E) | 123 | #5 | 9'-10" | |
| | | | | |
| h2(E) | 28 | #4 | 19'-7" | |
| h3(E) | 28 | #4 | 2'-8" | |
| h4(E) | 28 | #4 | 27'-1" | |
| h5(E) | 10 | #6 | 3'-9" | |
| | | | | |
| u4(E) | 246 | #5 | 9'-3" | |
| | | | | |



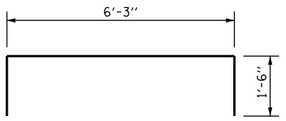

BAR d3(E)




BAR d4(E)




BAR d5(E)




BAR u4(E)




## SECTION A-A




## SECTION B-B




## SECTION C-C

## ESTIMATED QUANTITY

(FOR ONE SINGLE FACE BARRIER)

| ITEM | UNIT | TOTAL |
|---|---|---|
| CONCRETE STRUCTURES | CU. YD. | 32.4 |
| REINFORCMENT BARS, EPOXY COATED | POUND | 5,810 |
| PROTECTIVE COAT | SQ. YD. | 40.7 |

## NOTES:

1. PROTECTIVE COAT SHALL BE APPLIED TO THE TRAFFIC AND TOP FACES OF THE BARRIER, TOP FACE OF THE GUTTER AND TO THE ENTRANCE SIDE FACE (AT THE BEGINNING OF THE PLAZA PAVEMENT) FOR THE FULL HEIGHT OF THE BARRIER.
2. FOR LOCATION OF ELECTRICAL JUNCTION BOXES ON THE WALL, SEE ELECTRICAL DETAIL SHEETS.
3. FOR SINGLE FACE BARRIER FOUNDATION DETAILS FOR PLAZA FRAMES SEE SHEET 6 OF THIS SERIES.
4. QUANTITIES FOR SINGLE FACE BARRIER ARE DETERMINED USING "C" = 1'-0". IF DIMENSION "C" IS GREATER THAN 1'-0", ADJUST QUANTITIES ACCORDINGLY.

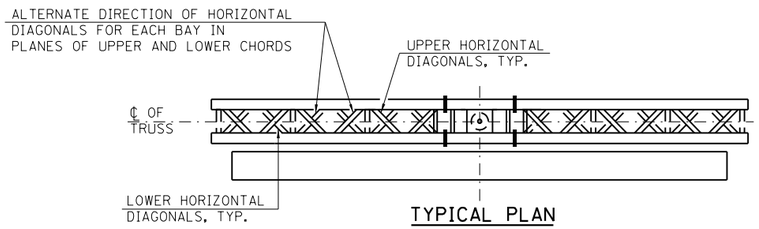
Paul Kovacs
APPROVED..... DATE 3-31-2014
CHIEF ENGINEERING OFFICER



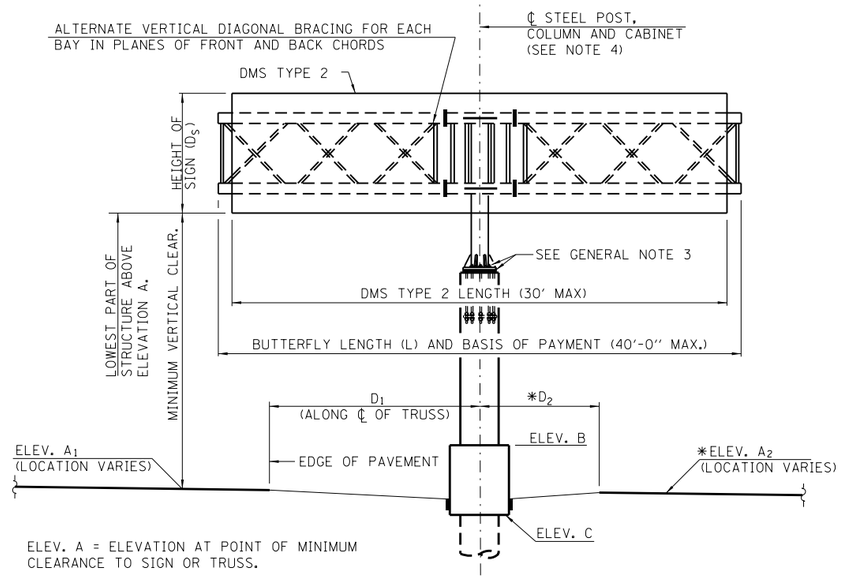
Illinois Tollway

OVERHEAD SIGN STRUCTURE
MONOTUBE TYPE (STEEL)
MAINLINE STRUCTURE DETAILS

STANDARD F13-04




TYPICAL PLAN



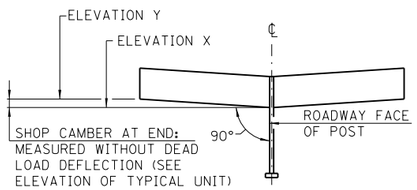

ELEV. A = ELEVATION AT POINT OF MINIMUM CLEARANCE TO SIGN OR TRUSS.

* ELEVATION $A_2$ AND DIMENSION $D_2$ NOT USED WHEN BUTTERFLY STRUCTURE IS MOUNTED ON RIGHT SIDE OF THE SHOULDER.

TYPICAL ELEVATION
LOOKING IN DIRECTION OF TRAFFIC

## SHOP CAMBER TABLE

| UNIT LENGTH $L_1$ OR $L_2$ | SHOP CAMBER AT END |
|---|---|
| 15' | 1/4'' |
| 20' | 1/2'' |
| 25' | 3/4'' |

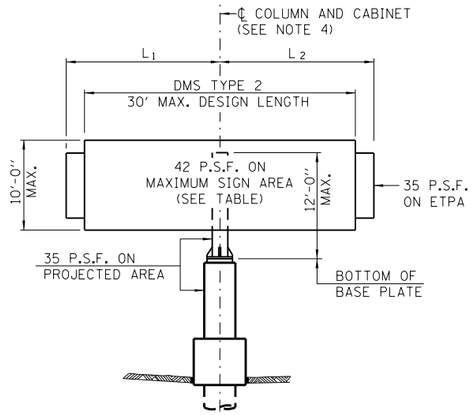



CAMBER DIAGRAM
(FOR FABRICATION ONLY)

Paul Kovacs
APPROVED ..... DATE 3-31-2014
CHIEF ENGINEERING OFFICER

## DMS TYPE 2 TABLE

| TRUSS MOUNTING | MAXIMUM TOTAL AREA | MAXIMUM ALLOWABLE WEIGHT |
|---|---|---|
| ONE FACE | 300 SQ. FT. | 5000 LB. - CENTERED ON STRUCTURE |
| TWO FACE | 300 SQ. FT. | 6000 LB. - CENTERED ON STRUCTURE |




DESIGN WIND LOADING DIAGRAM
ETPA = EFFECTIVE TRUSS PROJECTED AREA

## FABRICATION NOTES:

1. MATERIALS: ALL STRUCTURAL STEEL PIPE SHALL BE ASTM A53 GRADE B OR ASTM A106 GRADE B OR API 5L GRADE X42 OR API 5L GRADE X52. ALL STRUCTURAL STEEL TUBE SHALL CONFORM TO ASTM A500 GRADE B. ALL STRUCTURAL STEEL PLATES AND SHAPE SHALL CONFORM TO AASHTO M270 GRADE 50 (M183 OR M223 GRADE 50). STAINLESS STEEL FOR SHIMS, SLEEVES AND HANDHOLE COVERS SHALL BE ASTM A240, TYPE 302 OR 304, OR ANOTHER ALLOY SUITABLE FOR EXTERIOR EXPOSURE AND ACCEPTABLE TO THE ENGINEER. THE STEEL PIPE AND STIFFENING RIBS AT THE BASE PLATE FOR THE COLUMN SHALL HAVE A MINIMUM LONGITUDINAL CHARPY V-NOTCH (CVN) ENERGY OF 15 LB.-FT. AT 40° F (ZONE 2) BEFORE GALVANIZING.

2. WELDING: ALL WELDS TO BE CONTINUOUS UNLESS OTHERWISE SHOWN. ALL WELDING TO BE DONE IN ACCORDANCE WITH CURRENT AWS D1.1 STRUCTURAL WELDING CODE AND THE STANDARD SPECIFICATIONS.

3. FASTENERS: HIGH STRENGTH BOLTS SHALL SATISFY THE REQUIREMENTS OF AASHTO M164 (ASTM A325), OR APPROVED ALTERNATE, AND SHALL HAVE MATCHING LOCKNUTS. THREADED STUDS FOR SPLICES (IF MEMBERS INTERFERE) SHALL SATISFY THE REQUIREMENTS OF ASTM A449, ASTM A193, GRADE B7, OR APPROVED ALTERNATE, AND SHALL HAVE MATCHING LOCKNUTS. BOLTS AND LOCKNUTS NOT REQUIRED TO BE HIGH STRENGTH SHALL SATISFY THE REQUIREMENTS OF ASTM A307. ALL BOLTS AND LOCKNUTS SHALL BE HOT DIP GALVANIZED PER AASHTO M232, EXCEPT STAINLESS STEEL FASTENERS, NUTS AND WASHERS. THE LOCKNUTS SHALL HAVE NYLON OR STEEL INSERTS. A STAINLESS STEEL FLAT WASHER CONFORMING TO ASTM A240 TYPE 302 OR 304, IS REQUIRED UNDER BOTH HEAD AND NUT OR UNDER BOTH NUTS WHERE THREADED STUDS ARE USED. HIGH STRENGTH BOLT INSTALLATION SHALL CONFORM TO ARTICLE 505.04(f)(2)d OF THE IDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION. ROTATIONAL CAPACITY (''ROCAP'') TESTING OF BOLTS WILL NOT BE REQUIRED.

4. U-BOLTS & EYEBOLTS: U-BOLTS AND EYEBOLTS SHALL BE PRODUCED FROM ASTM A276 TYPE 304, 304L, 316 OR 316L, CONDITION A, COLD FINISHED STAINLESS STEEL, OR AN EQUIVALENT MATERIAL ACCEPTABLE TO THE ENGINEER. ALL NUTS FOR U-BOLTS AND EYEBOLTS SHALL BE LOCK NUTS EQUIVALENT TO ASTM A307 WITH NYLON OR STEEL INSERTS AND HOT DIP GALVANIZED PER AASHTO M232. A STAINLESS STEEL FLAT WASHER CONFORMING TO ASTM A240, TYPE 302 OR 304, IS REQUIRED UNDER EACH U-BOLT AND EYEBOLT LOCKNUT.

5. GALVANIZING: ALL STEEL PLATES, SHAPES AND PIPE SHALL BE HOT DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH AASHTO M111. PAINTING IS NOT PERMITTED.

6. ANCHOR BOLTS: SHALL CONFORM TO AASHTO M314 OR ASTM F1554 GRADE 55.

## GENERAL NOTES:

1. WORK THIS SHEET WITH OVERHEAD SIGN STRUCTURE BUTTERFLY TYPE (STEEL) SUMMARY AND TOTAL BILL OF MATERIAL SHEET.

2. AFTER ADJUSTMENTS TO LEVEL TRUSS AND ENSURE ADEQUATE VERTICAL CLEARANCE, ALL TOP AND BOTTOM LEVELING NUTS SHALL BE TIGHTENED AGAINST THE BASE PLATE WITH A MINIMUM TORQUE OF 200 LB.-FT. STAINLESS STEEL MESH SHALL THEN BE PLACED AROUND THE PERIMETER OF THE BASE PLATE. SECURE TO BASE PLATE WITH STAINLESS STEEL BANDING.

3. CENTERLINE DMS TYPE 2 SHALL BE LOCATED AT CENTERLINE OF COLUMN.

4. SIGN SUPPORT STRUCTURES MAY BE SUBJECT TO DAMAGING VIBRATIONS AND OSCILLATIONS WHEN DMS ARE NOT IN PLACE DURING ERECTION OR MAINTENANCE OF THE STRUCTURE. TO AVOID THESE VIBRATIONS AND OSCILLATIONS, CONSIDERATION SHOULD BE GIVEN TO ATTACHING TEMPORARY BLANK SIGN PANELS TO THE STRUCTURE.

5. TRUSSES SHALL BE SHIPPED INDIVIDUALLY WITH ADEQUATE PROVISION TO PREVENT DETRIMENTAL MOTION DURING TRANSPORT. THIS MAY REQUIRE ROPES BETWEEN HORIZONTALS AND DIAGONALS OR ENERGY DISSIPATING (ELASTIC) TIES TO THE VEHICLE. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING THE CONFIGURATION AND PROTECTION OF THE TRUSSES.

6. PROVIDE RUBBED SURFACE FINISH FOLLOWED BY CONCRETE SEALER APPLICATION ON ENTIRE SURFACE OF CONCRETE COLUMN AND ALL SURFACES OF CRASHWALL, EXCEPT BOTTOM SURFACE.

7. REINFORCEMENT BARS: REINFORCEMENT BARS DESIGNATED (E) SHALL BE EPOXY COATED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

8. PARAMETERS SHOWN ARE BASIS FOR THIS STANDARD. INSTALLATION NOT WITHIN DIMENSIONAL LIMITS SHOWN REQUIRE SPECIAL ANALYSIS FOR ALL COMPONENTS.

9. IT IS PERMISSIBLE TO MOUNT TWO DMS TYPE 2 ON THE BUTTERFLY TRUSS, ONE ON EACH FACE OF THE TRUSS. THE TOTAL COMBINED DEPTH OF DMS TYPE 2 SHALL NOT EXCEED 4'-4'' AND THE TOTAL COMBINED WEIGHT SHALL NOT EXCEED 6000 LB. CENTER THE DMS TYPE 2 ON ℄ STEEL POST. DO NOT INSTALL SIGN PANEL IN CONJUNCTION WITH DMS TYPE 2 SIGN CABINETS ON ONE FACE OF THE TRUSS. A SIGN PANEL ON ONE FACE AND DMS TYPE 2 ON THE OTHER IS PERMITTED.

## CONSTRUCTION SPECIFICATIONS:

1. ALL MATERIALS, EXCEPT AS SHOWN, FABRICATION, ERECTION AND CONSTRUCTION REQUIREMENTS SHALL BE IN ACCORDANCE WITH SECTION 733 AND 734 OF THE LATEST ILLINOIS TOLLWAY SUPPLEMENTAL SPECIFICATIONS.

## LOADING:

1. 90 M.P.H. WIND VELOCITY. WIND LOADING: 42 P.S.F. NORMAL TO DMS TYPE 2 CABINET AREA AND 35 P.S.F. NORMAL TO TRUSS ELEMENTS NOT BEHIND SIGN LOADING DIAGRAM.

2. THE AASHTO GROUP II AND III ALLOWABLE STRESS SHALL BE 133% (ALLOWABLE STRESS DESIGN).

## DESIGN SPECIFICATIONS:

THESE STRUCTURES ARE DESIGNED TO SATISFY THE 2013 AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS, SIXTH EDITION.

CONCRETE COLUMN, CRASHWALL AND DRILLED SHAFT ARE DESIGNED IN ACCORDANCE WITH THE 2012 EDITION OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS (INCLUDING THE 2013 INTERIM REVISIONS).

## DESIGN UNIT STRESSES FOR REINFORCED CONCRETE:

CLASS SI CONCRETE: f'c = 3,500 P.S.I.
CLASS DS CONCRETE: f'c = 4,000 P.S.I.
REINFORCING STEEL: fy = 60,000 P.S.I.

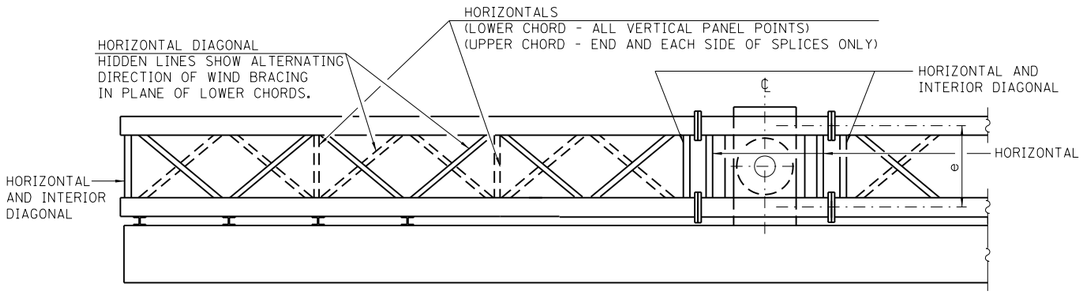


| DATE | REVISIONS |
|---|---|
| 7-01-2014 | REVISED NOTES |
| 3-11-2015 | REVISED NOTES |
| 3-31-2016 | ADDED FOUNDATION NOTE AND REMOVED WALKWAY GRATING |
| 3-01-2018 | REVISED SIGN STRUCTURE |
| 3-01-2019 | REVISED NOTE TO APPLY PROTECTIVE COAT TO THE PERIMATER OF THE COLUMN |

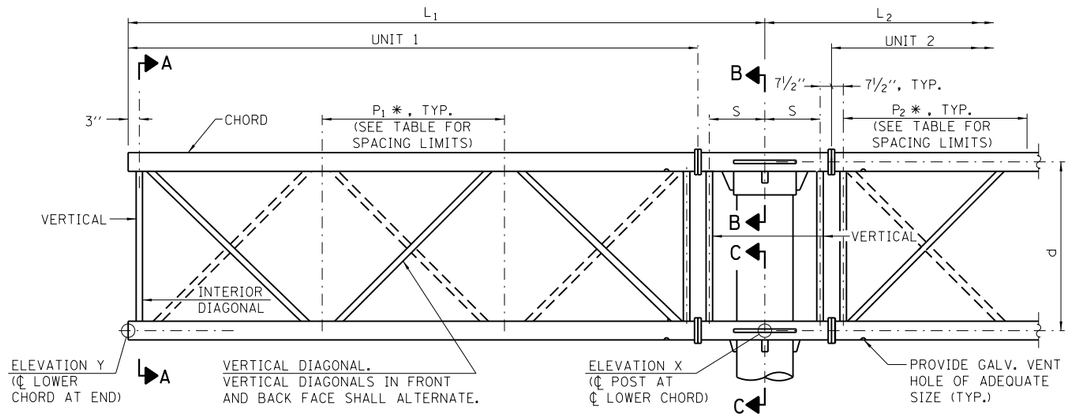
Illinois Tollway

OVERHEAD SIGN STRUCTURE BUTTERFLY TYPE STRUCTURE DETAILS

STANDARD F14-04




PLAN

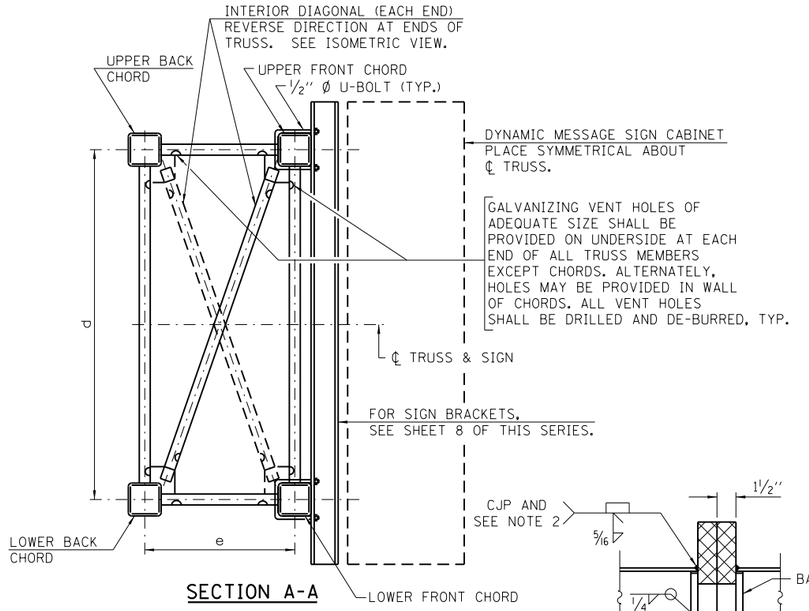



ELEVATION

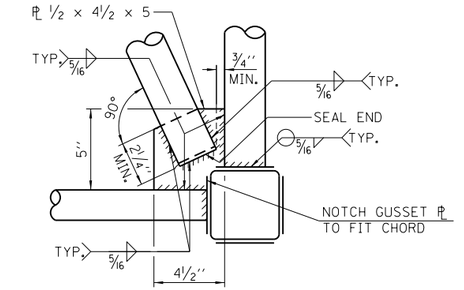
(SIGN OMITTED FOR CLARITY)

## TYPICAL TRUSS UNIT

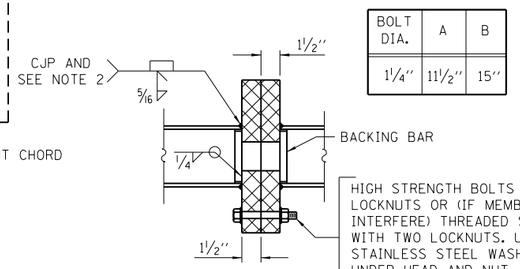
FOR SECTION B-B AND SECTION C-C, SEE SHEET 3 OF THIS SERIES




SECTION A-A

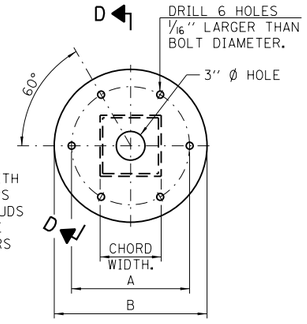



GUSSET ℄ FOR INTERIOR DIAG. DETAIL

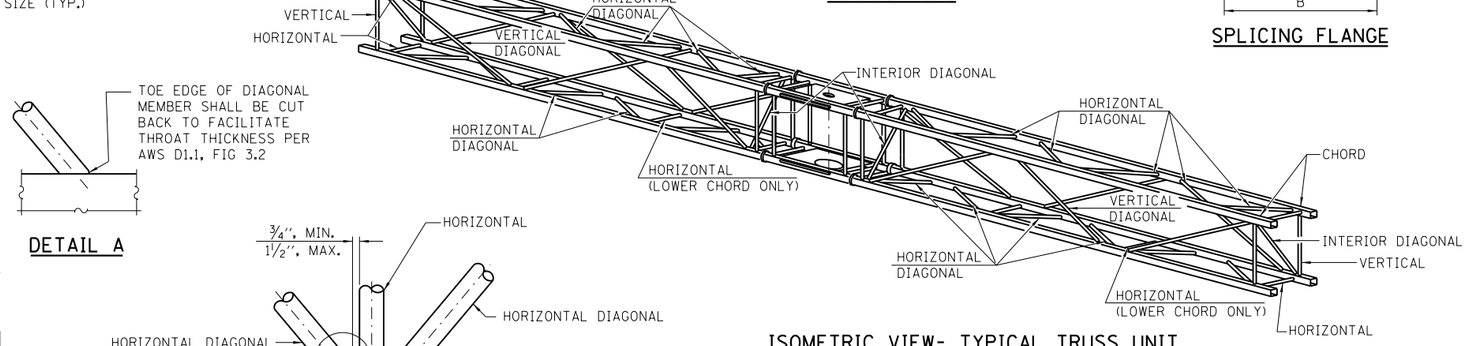



| BOLT DIA. | A | B |
|---|---|---|
| 1¼″ | 11½″ | 15″ |

SECTION D-D



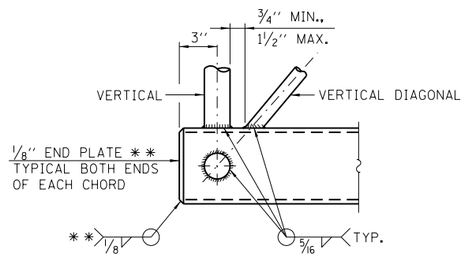

SPLICING FLANGE




ISOMETRIC VIEW- TYPICAL TRUSS UNIT

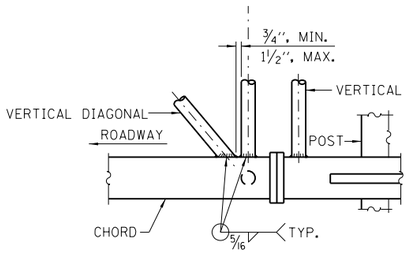



DETAIL A

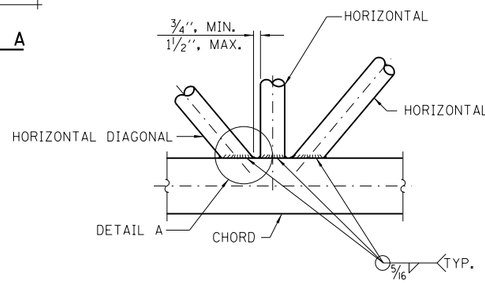



BUTTERFLY END JOINT DETAIL

✱✱ CONTRACTOR MAY ALTERNATIVELY USE STANDARD STEEL DRIVE-FIT CAP TO CLOSE ENDS. ½″ Ø DRAIN HOLE IN END PLATE / DRIVE-FIT CAP.




POST END JOINT DETAIL




TRUSS INTERIOR JOINT DETAIL

## NOTES:

1. THERE ARE TWICE AS MANY HORIZONTAL DIAGONALS AS THERE ARE VERTICAL DIAGONALS.
2. SPLICING FLANGES SHALL BE ATTACHED TO EACH TRUSS UNIT WITH THE TRUSS SHOP ASSEMBLED TO CAMBER SHOWN ON SHEET 1 OF THIS SERIES. TRUSS UNITS SHALL BE IN PROPER ALIGNMENT AND FLANGE SURFACES SHALL BE SHOP BOLTED INTO FULL CONTACT BEFORE WELDING. SUFFICIENT EXTERNAL WELDS OR TACKS SHALL BE MADE TO SECURE FLANGES UNTIL REMAINING WELDS ARE MADE AFTER DISASSEMBLY. ADJACENT FLANGES SHALL BE "MATCH MARKED" TO INSURE PROPER FIELD ASSEMBLY.
3. NOMINAL WALL THICKNESS SHOWN. THICKER WALL IS PERMITTED UPON ENGINEER'S APPROVAL.

## TRUSS UNIT TABLE

| TRUSS SIZE | | MAXIMUM DMS TYPE 2 SIGN LENGTH | STEEL SUPPORT POST (COLUMN) | | | | TRUSS MEMBERS AND DETAILS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| e | d | | DIAMETER | WEIGHT | WALL THICKNESS (SEE NOTE 3) | H (MAX.) | TOP & BOTTOM CHORD | VERTICAL PIPE | VERTICAL DIAG. PIPE | HORIZONTAL PIPE | HORIZONTAL DIAG. PIPE | INTERIOR DIAG. PIPE | LIMITS FOR PANEL SPACING (P) ✱ | DIMENSION S |
| 3′-9″ | 7′-0″ | 30′-0″ | 24″ | 125.61 (#/FT) | ½″ | 12′-0″ | HSS 6×6×5/16 | 3″Ø X.S | 4″Ø X.X.S | 2″Ø X.S | 2½″Ø X.S | 2″Ø X.S | 48″ MIN. TO 66″ MAX. | 1′-9″ |
| | | | | | | | | | | | | | | |

✱ P = L-S-1′-6″ / # PANELS

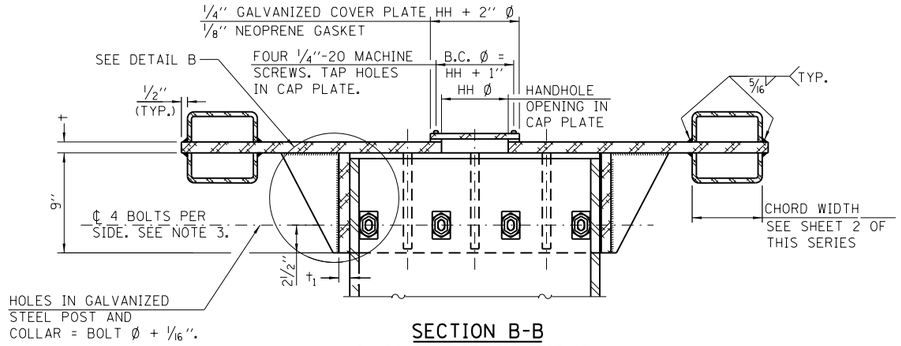
Paul Kovacs
APPROVED. . . . . DATE 3-31-2014.
CHIEF ENGINEERING OFFICER



Illinois Tollway

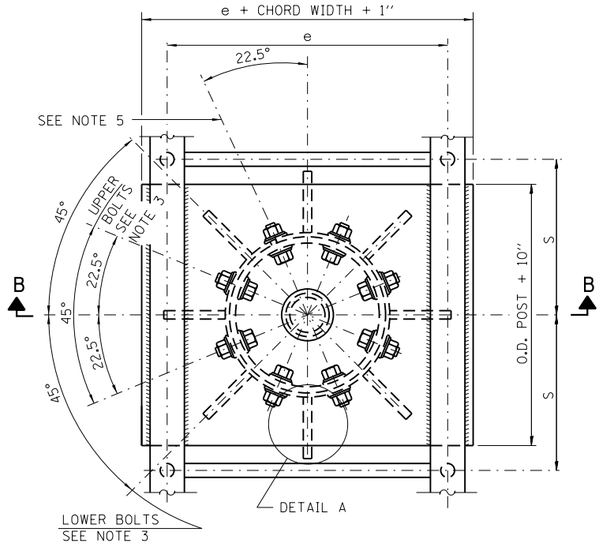
OVERHEAD SIGN STRUCTURE
BUTTERFLY TYPE
STRUCTURE DETAILS

STANDARD F14-04

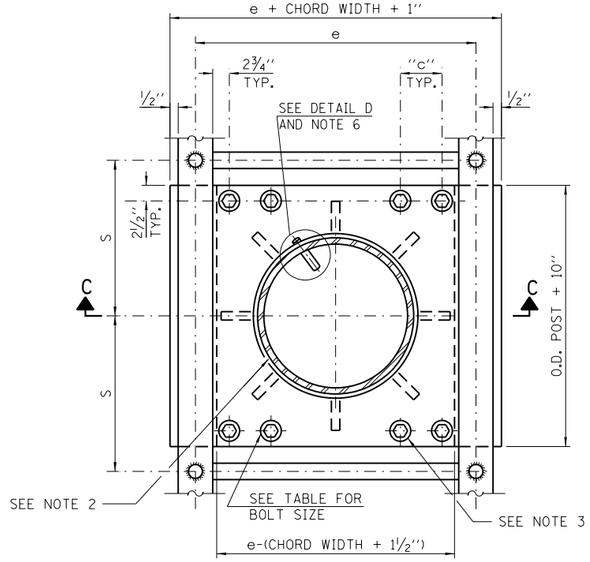



## SECTION B-B

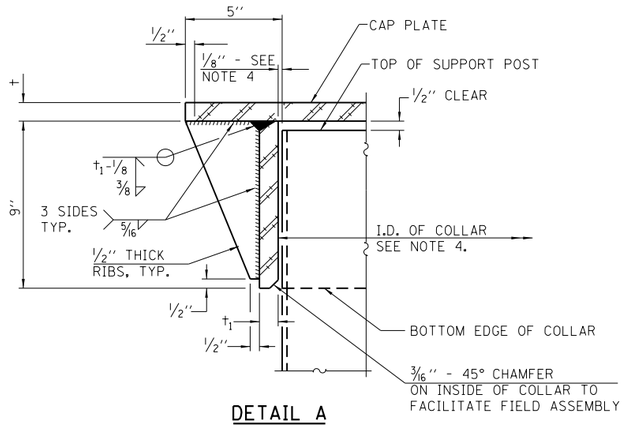
BOLTS SHALL BE HIGH STRENGTH WASHERS (INCLUDING CONTOURED WASHERS), AND LOCKNUTS SHALL BE STAINLESS STEEL.



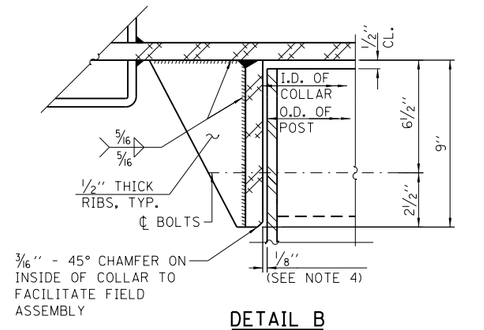

## PLAN VIEW - TOP OF COLUMN




## SECTION THRU POST ABOVE LOWER CHORDS

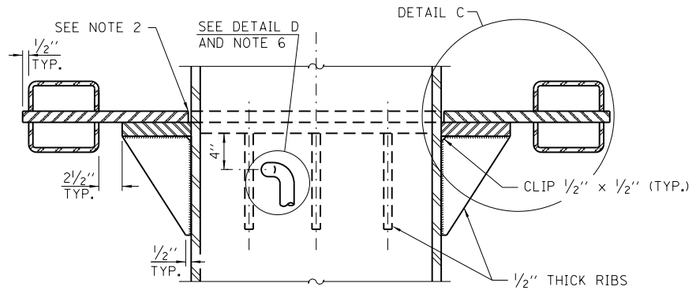



## DETAIL A

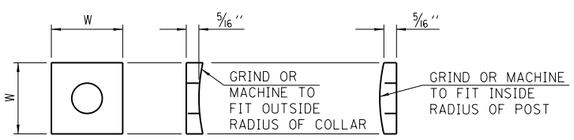



## DETAIL B

(FOR DETAILS NOT SHOWN, SEE DETAIL C)



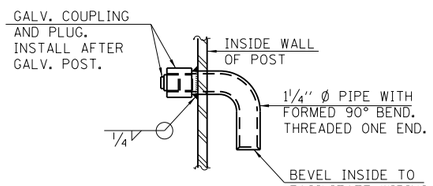

## SECTION C-C



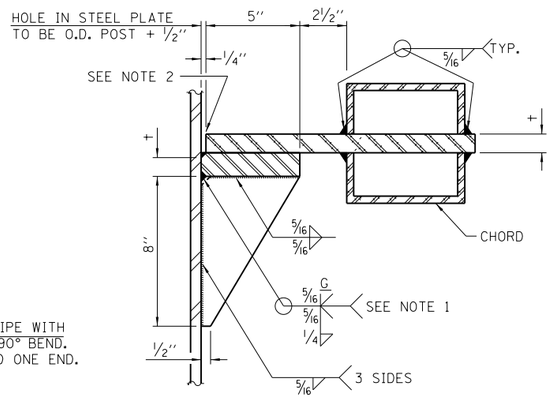

## CONTOURED WASHERS

| BOLT SIZE | CONTOURED WASHERS | |
|---|---|---|
| | HOLE DIA. | W |
| 7/8" | 1" | 2 1/2" |
| 1" | 1 1/8" | 3" |
| 1 1/4" | 1 3/8" | 3 1/4" |

(ASTM A240, TYPE 304)




## DETAIL D




## DETAIL C

## NOTES:

1. GRIND TOP IF REQUIRED TO FULLY SEAT PLATE. REPAIR DAMAGED GALVANIZING BEFORE ASSEMBLY.
2. AFTER TIGHTENING LOWER CONNECTION BOLTS, FILL GAP WITH NON-HARDENING, SILICONE CAULK SUITABLE FOR EXTERIOR EXPOSURE AND ACCEPTABLE TO THE ENGINEER.
3. CONNECTION BOLTS IN COLLAR AND BOLTS AT LOWER CHORD CONNECTION SHALL BE HIGH STRENGTH WITH MATCHING LOCKNUTS. CONNECTION BOLTS SHALL HAVE TWO STAINLESS STEEL FLAT WASHERS EACH.
4. COLLAR I.D. SHALL BE MANUFACTURED TO CORRESPOND TO O.D. OF ACTUAL GALVANIZED POST PLUS 1/8" (± 1/16"). MAXIMUM GAP BETWEEN POST AND COLLAR AT ANY LOCATION EQUALS 1/8" BEFORE TIGHTENING BOLTS.
5. OPTIONAL FULL PENETRATION WELD IN COLLAR. (TWO LOCATIONS MAXIMUM (180° APART) X-RAY OR UT 100%)
6. ORIENT PIPE TOWARD WALKWAY SIDE. HOLE IN POST = O.D. PIPE + 1/8".

## CONNECTION TABLE

| POST OUTSIDE DIAMETER | UPPER & LOWER CONNECTION BOLT DIAMETER (SEE NOTE 3) | LOWER JUNCTURE BOLT SPACING DIMENSION "c" (SEE NOTE 3) | OPENING IN CAP PLATE "HH" | PLATE THICKNESS (t) | COLLAR THICKNESS ($t_1$) |
|---|---|---|---|---|---|
| 24" | 1 1/4" | 3 1/2" | 6" | 1" | 7/8" |

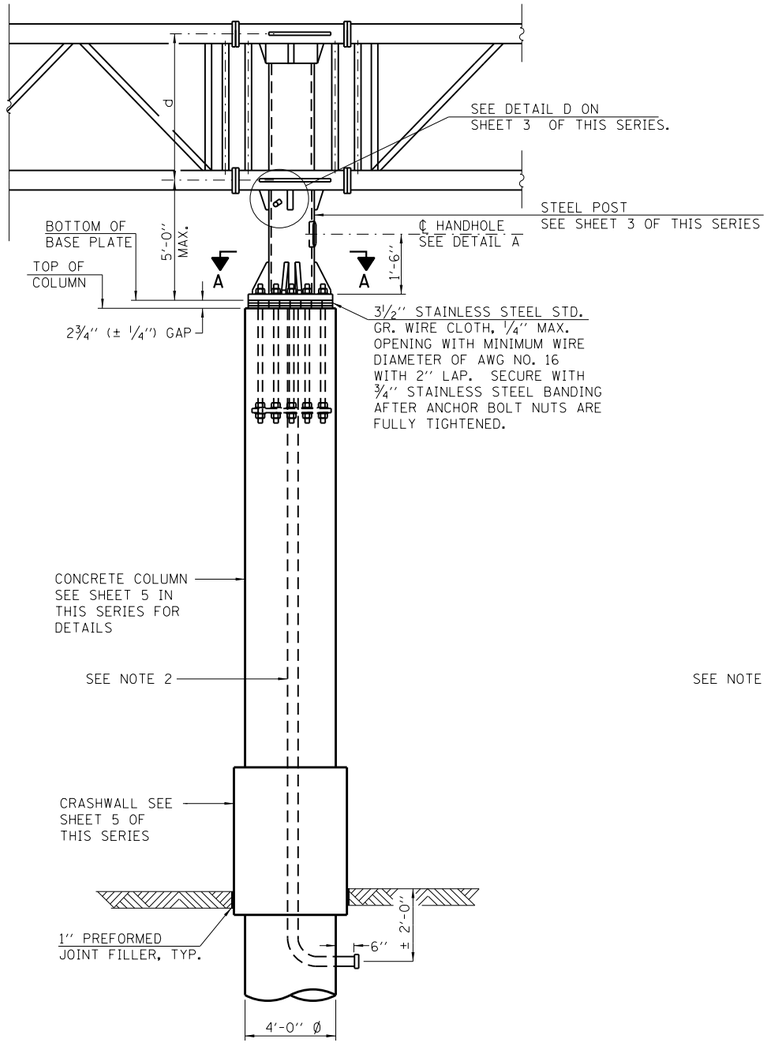
Paul Kovacs
APPROVED..... DATE 3-31-2014
CHIEF ENGINEERING OFFICER



Illinois Tollway

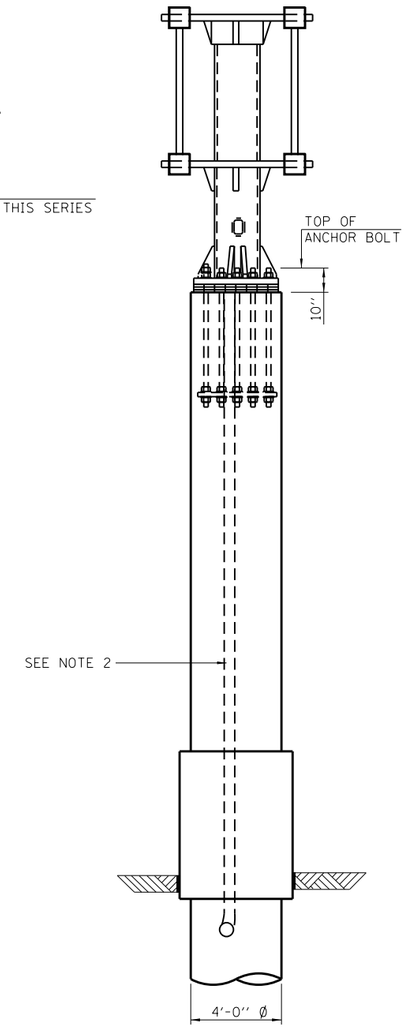
OVERHEAD SIGN STRUCTURE
BUTTERFLY TYPE
STRUCTURE DETAILS

STANDARD F14-04

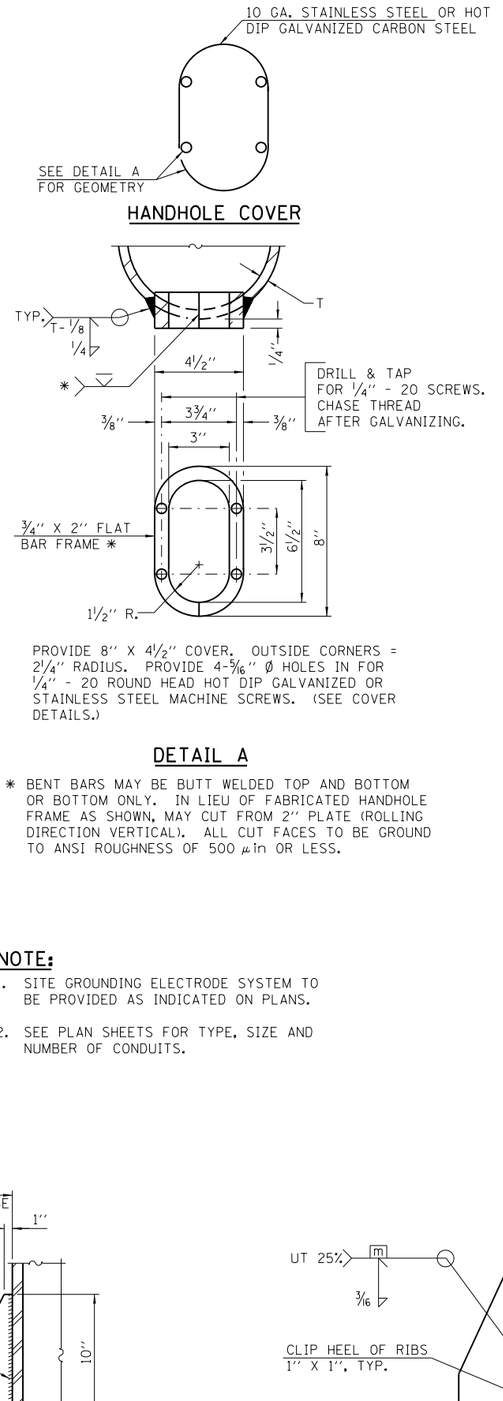



## FRONT ELEVATION

SEE SHEET 5 OF THIS SERIES FOR FOUNDATION DETAILS.
(DMS TYPE 2 SIGN CABINET NOT SHOWN FOR CLARITY)




## SIDE ELEVATION



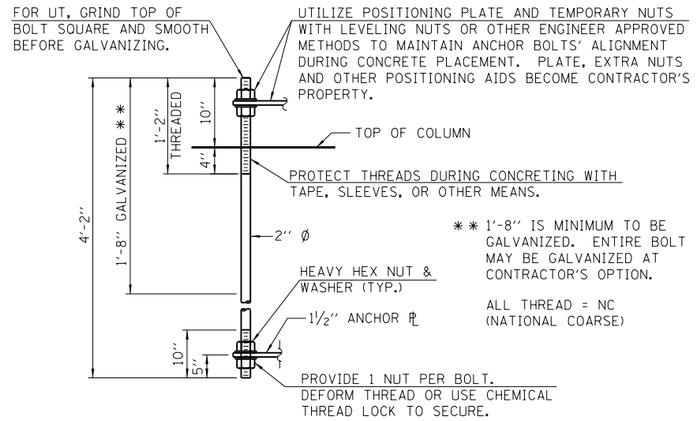

PROVIDE 8" X 4½" COVER. OUTSIDE CORNERS = 2¼" RADIUS. PROVIDE 4-5⁄16" Ø HOLES IN FOR ¼" - 20 ROUND HEAD HOT DIP GALVANIZED OR STAINLESS STEEL MACHINE SCREWS. (SEE COVER DETAILS.)

## DETAIL A

* BENT BARS MAY BE BUTT WELDED TOP AND BOTTOM OR BOTTOM ONLY. IN LIEU OF FABRICATED HANDHOLE FRAME AS SHOWN, MAY CUT FROM 2" PLATE (ROLLING DIRECTION VERTICAL). ALL CUT FACES TO BE GROUND TO ANSI ROUGHNESS OF 500 μin OR LESS.

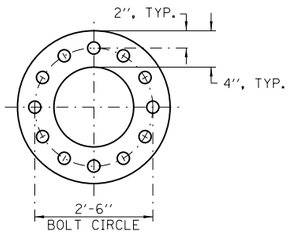
**NOTE:**

1. SITE GROUNDING ELECTRODE SYSTEM TO BE PROVIDED AS INDICATED ON PLANS.
2. SEE PLAN SHEETS FOR TYPE, SIZE AND NUMBER OF CONDUITS.

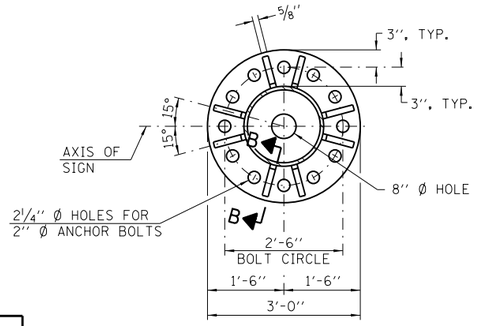



## ANCHOR BOLT DETAIL

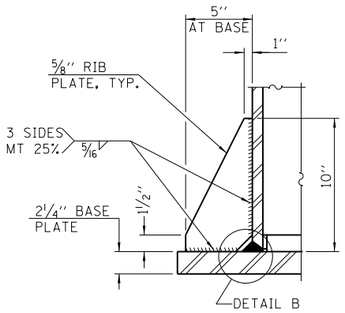
ANCHOR BOLTS SHALL CONFORM TO AASHTO M314 OR ASTM F1554 GRADE 55. GALVANIZE THE UPPER 1'-8" (MINIMUM (**) AND ASSOCIATED AASHTO M291, GRADE A, C OR DH HEAVY HEX NUTS AND HARDENED WASHERS PER AASHTO M232. NO WELDING SHALL BE PERMITTED ON BOLTS. PROVIDE A NUT AT BOTTOM, A HEXAGON LOCKNUT AND WASHER ABOVE BASE PLATE AND A LEVELING NUT AND WASHER BELOW BASE PLATE. NUTS SHALL EACH BE TIGHTENED WITH 200 LB.-FT. MINIMUM TORQUE AGAINST BASE PLATE. BEFORE OR AFTER THREADING, BUT BEFORE GALVANIZING, EACH ANCHOR BOLT SHALL BE ULTRASONICALLY TESTED (UT) BY A LEVEL II OR III INSPECTOR, QUALIFIED IN ACCORD WITH ANSI GUIDELINES, TO ENSURE NO REJECTABLE FLAWS EXIST IN THE UPPER 18" (TENSION CRITERIA).



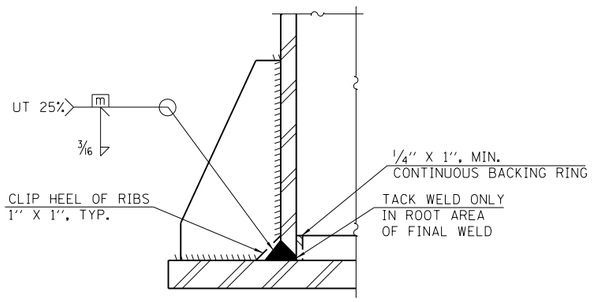

## POSITIONING PLATE/ANCHOR PL




## SECTION A-A




## SECTION B-B




## DETAIL B
(TYPICAL RIB)

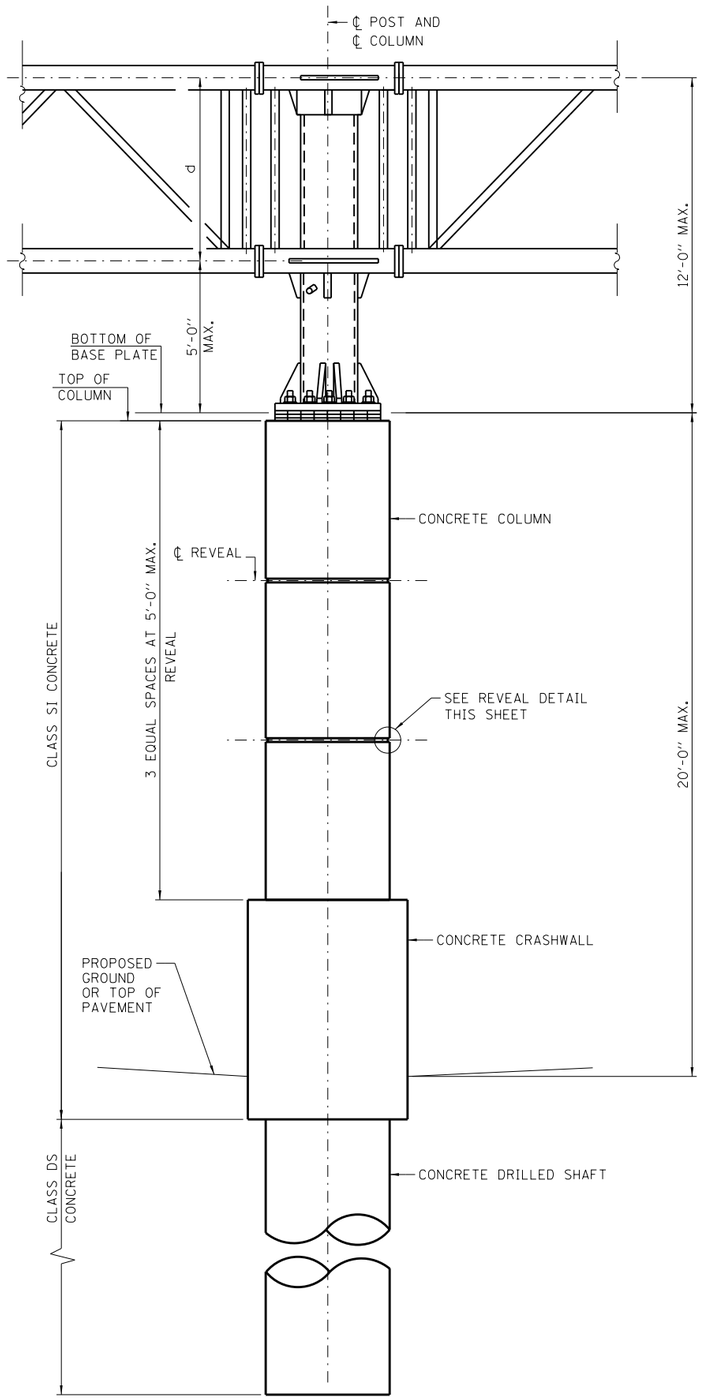
Paul Kovacs
APPROVED..... DATE 3-31-2014
CHIEF ENGINEERING OFFICER



Illinois Tollway

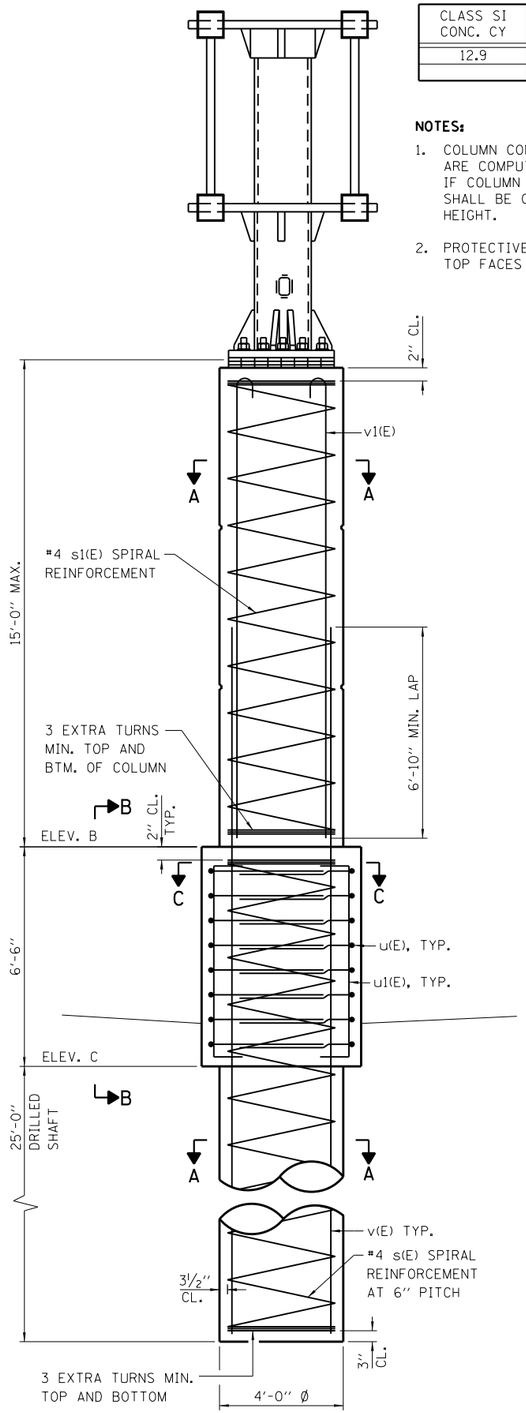
OVERHEAD SIGN STRUCTURE
BUTTERFLY TYPE
STRUCTURE DETAILS

STANDARD F14-04




## FRONT ELEVATION

DMS TYPE 2 NOT SHOWN
FOR CLARITY




## SIDE ELEVATION

## BILL OF MATERIAL-EACH FOUNDATION

| CLASS SI CONC. CY | CLASS DS CONC. CY | REBAR POUNDS | PROTECTIVE COAT SQ. YD. |
|---|---|---|---|
| 12.9 | 11.7 | 4,790 | 6.0 |
| | | | |

**NOTES:**

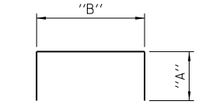
1. COLUMN CONCRETE VOLUME AND BAR s1(E) LENGTH ARE COMPUTED BASED ON 15'-0" COLUMN HEIGHT. IF COLUMN HEIGHT IS NOT EQUAL 15'-0", QUANTITIES SHALL BE CALCULATED BASED ON ACTUAL COLUMN HEIGHT.
2. PROTECTIVE COAT SHALL BE APPLIED TO TRAFFIC AND TOP FACES OF CRASHWALL AND PERIMETER OF THE COLUMN.

## BAR LIST-EACH FOUNDATION

(COLUMN, CRASHWALL AND DRILLED SHAFT)

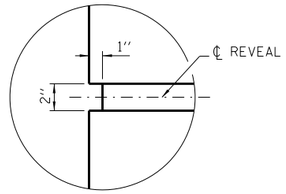
| | BAR | NUMBER | SIZE | LENGTH | SHAPE |
|---|---|---|---|---|---|
| | v(E) | 20 | #9 | 38'-3" | |
| | v1(E) | 20 | #9 | 15'-8" | |
| * | s(E) | 1 | #4 | 31'-1" | |
| * | s1(E) | 1 | #4 | 14'-5" | |
| | u(E) | 12 | #5 | 12'-2" | |
| | u1(E) | 18 | #5 | 8'-7" | |
| | | | | | |

* THE LENGTH OF SPIRAL SHOWN IS THE HEIGHT OF SPIRAL

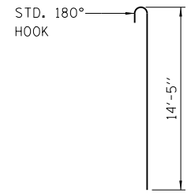



| BAR | "A" | "B" |
|---|---|---|
| u(E) | 3'-9" | 4'-8" |
| u1(E) | 1'-3" | 6'-1" |

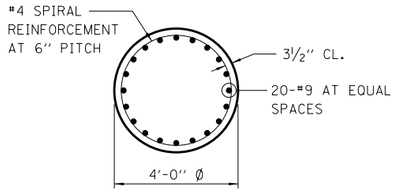
## BAR u(E), u1(E)



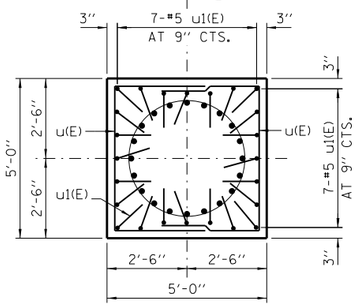

## REVEAL DETAIL



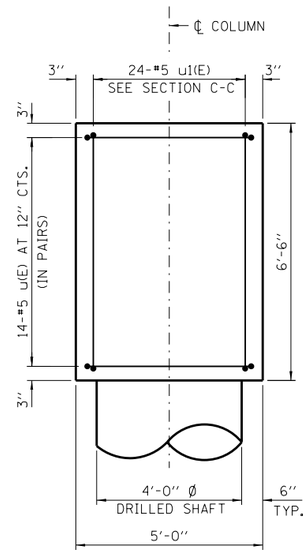

## BAR v1(E)




## SECTION A-A




## SECTION C-C




## SECTION B-B

## FOUNDATIONS:

THE FOUNDATION DETAILS SHOWN ARE BASED ON THE PRESENCE OF MOSTLY COMMON COHESIVE SOIL CONDITIONS (SILTY OR SANDY CLAY), WITH AN AVERAGE UNCONFINED COMPRESSIVE STRENGTH (QU) > 1.25 TON/SQ. FT. WHICH SHALL BE DETERMINED BY PREVIOUS SOIL INVESTIGATIONS AT THE JOBSITE. WHEN OTHER CONDITIONS ARE INDICATED, THE BORING DATA SHALL BE INCLUDED IN THE PLANS AND THE FOUNDATION DIMENSIONS SHOWN SHALL BE THE RESULT OF SITE SPECIFIC DESIGNS. IF CONDITIONS ENCOUNTERED IN THE FIELD ARE DIFFERENT THAN THOSE INDICATED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER TO DETERMINE IF THE FOUNDATION DIMENSIONS NEED TO BE MODIFIED.

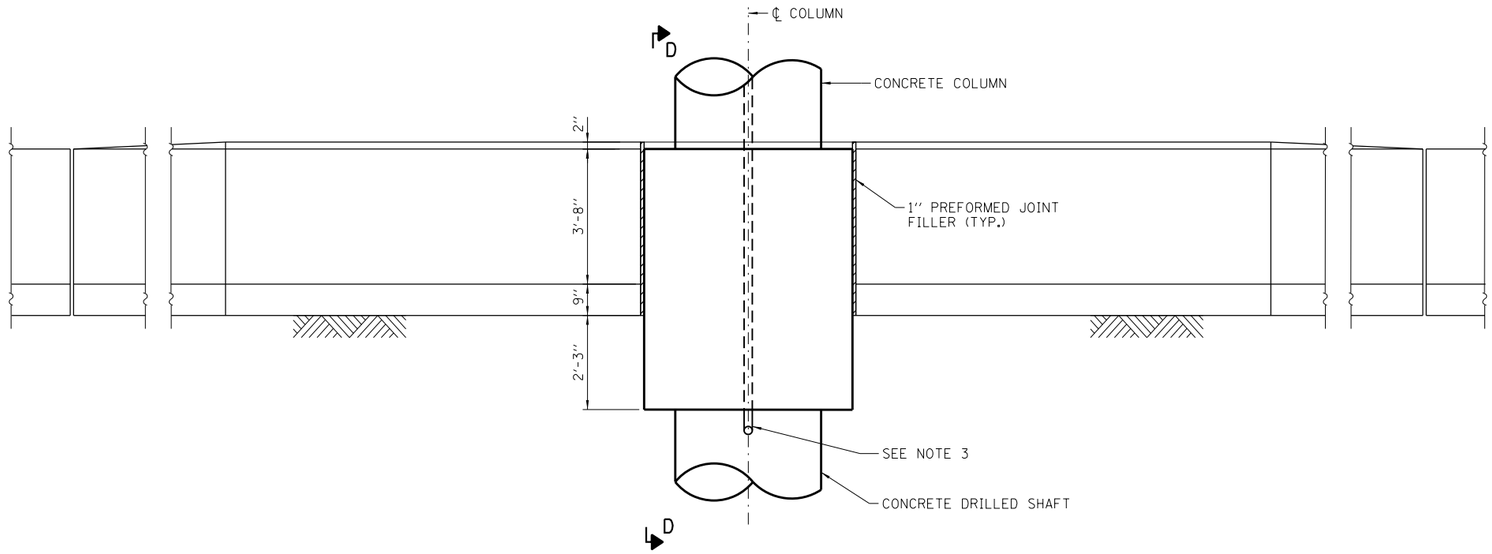
Paul Kovacs
APPROVED..... DATE 3-31-2014
CHIEF ENGINEERING OFFICER



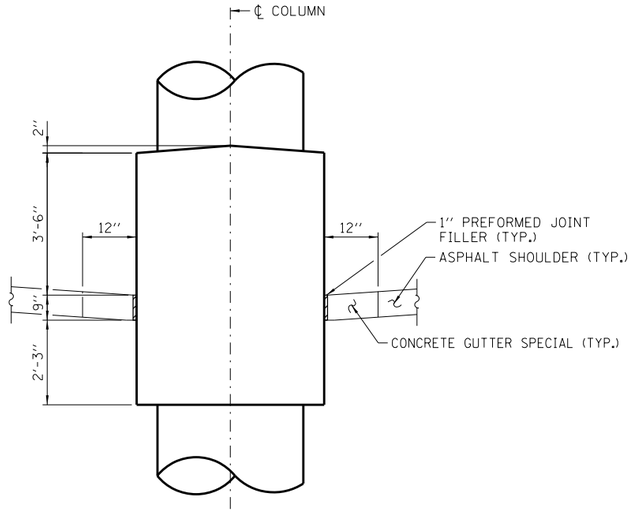
Illinois Tollway

OVERHEAD SIGN STRUCTURE
BUTTERFLY TYPE
STRUCTURE DETAILS

STANDARD F14-04

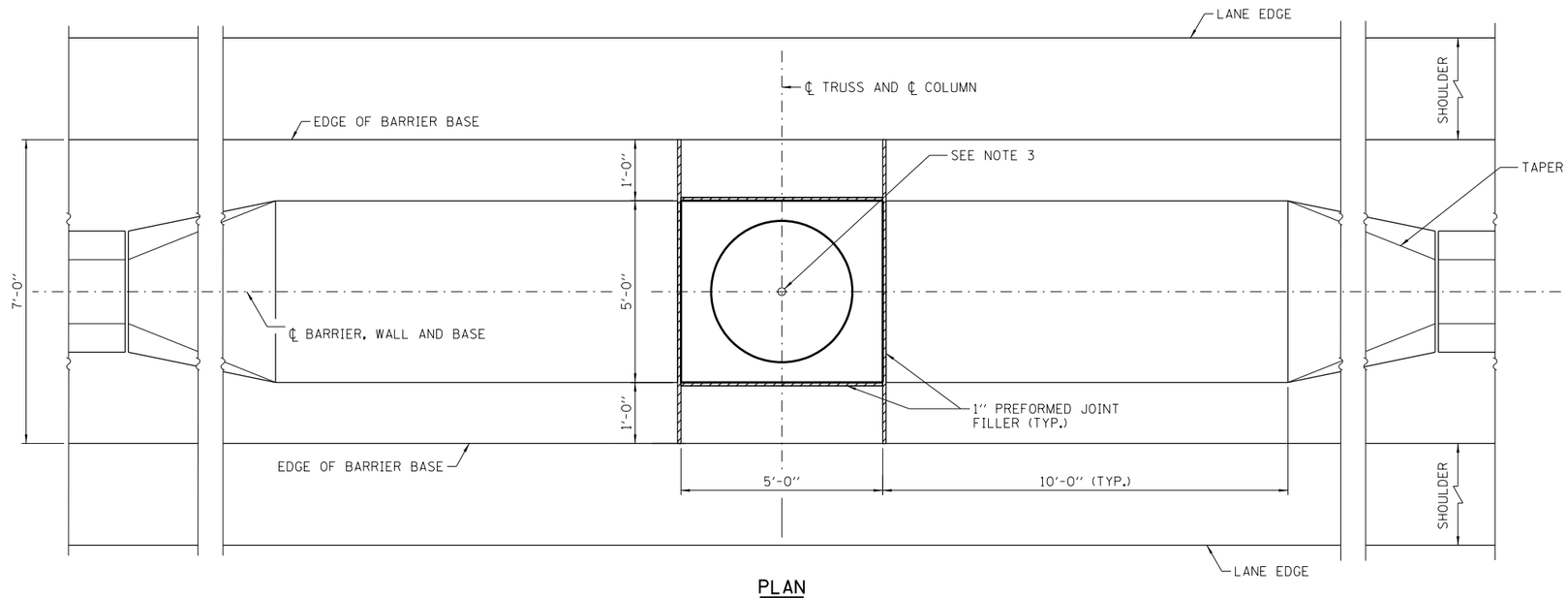



SIDE ELEVATION

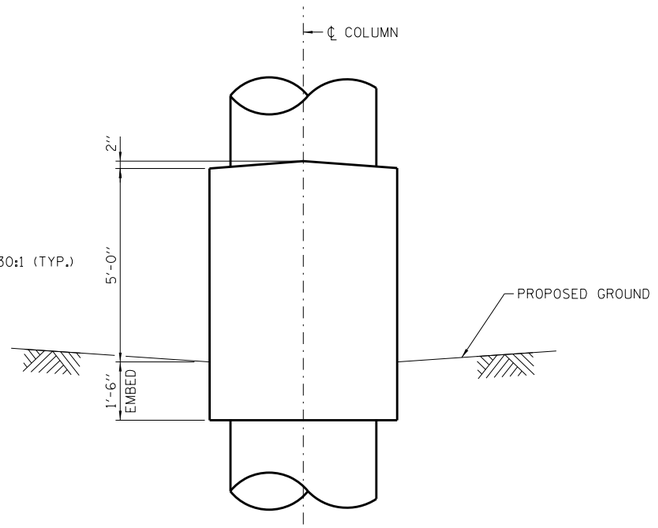



SECTION D-D

FOUNDATION LOCATED IN PAVED ROADWAY MEDIAN




PLAN




SECTION D-D

FOUNDATION LOCATED IN UNPAVED ROADWAY MEDIAN



## NOTES:

1. SIDE ELEVATION AND PLAN VIEW ARE SHOWN FOR FOUNDATION LOCATED IN PAVED MEDIAN.
2. SEE SHEET 5 OF THIS SERIES FOR REINFORCEMENT DETAILS.
3. COORDINATE CONDUIT SIZE, LOCATION AND QUANTITY WITH ELECTRICAL PLANS. CONDUITS SHALL BE PLACED TO MISS REINFORCEMENT BARS. DO NOT CUT REINFORCEMENT BARS.

Paul Kovacs

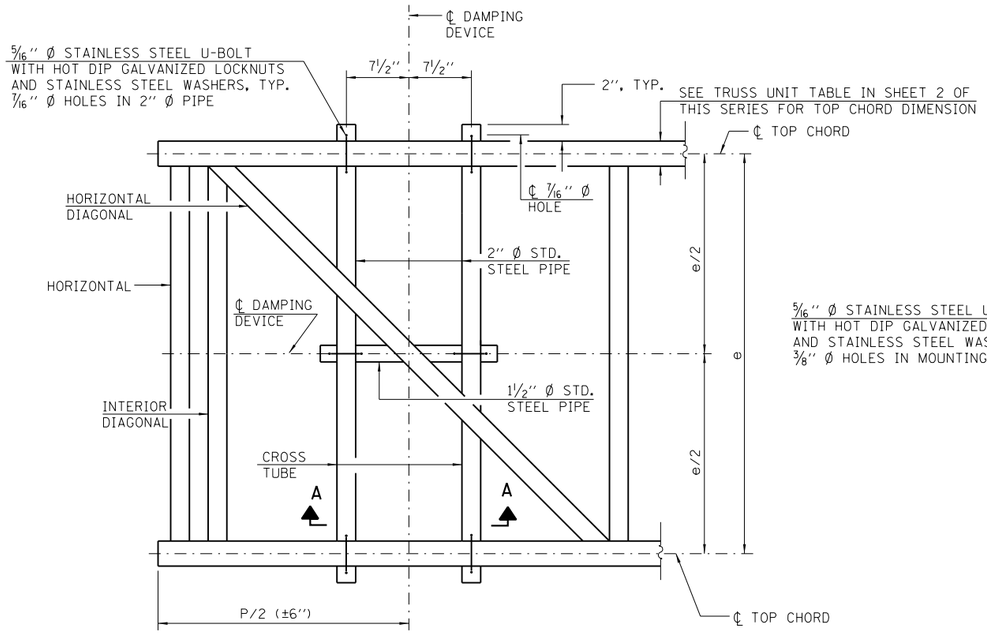
APPROVED ..... DATE 3-31-2014

CHIEF ENGINEERING OFFICER

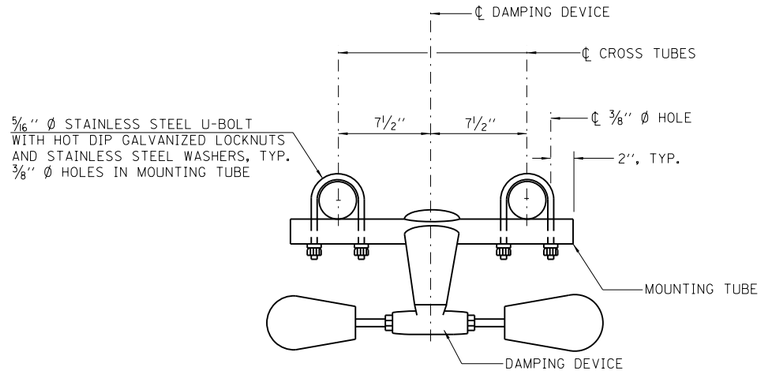
Illinois Tollway

OVERHEAD SIGN STRUCTURE
BUTTERFLY TYPE
STRUCTURE DETAILS

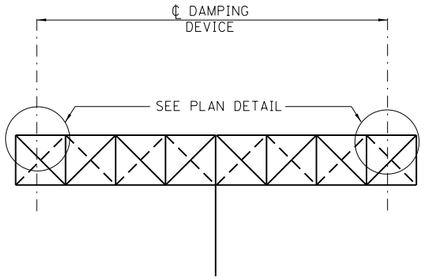
STANDARD F14-04




PLAN DETAIL

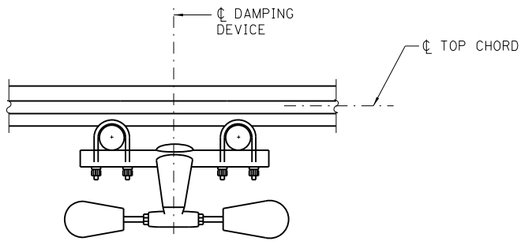



TRUSS DAMPING DEVICE CONNECTION DETAIL

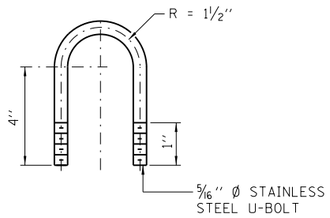



ELEVATION

STEEL BUTTERFLY SIGN STRUCTURE

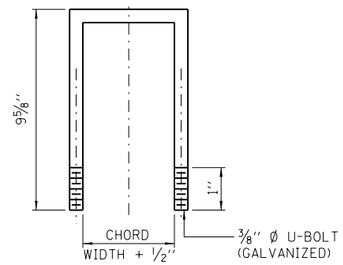



SECTION A-A




DAMPING DEVICE MOUNTING TUBE U-BOLT DETAIL

(TYPICAL)




TOP CHORD TO CROSS TUBE U-BOLT DETAIL

(TYPICAL)

**NOTE:**

DAMPER: ONE DAMPER PER TRUSS. (31 LBS. STOCKBRIDGE-TYPE 29" MINIMUM BETWEEN ENDS OF WEIGHTS).

Paul Kovacs

APPROVED ..... DATE 3-31-2014

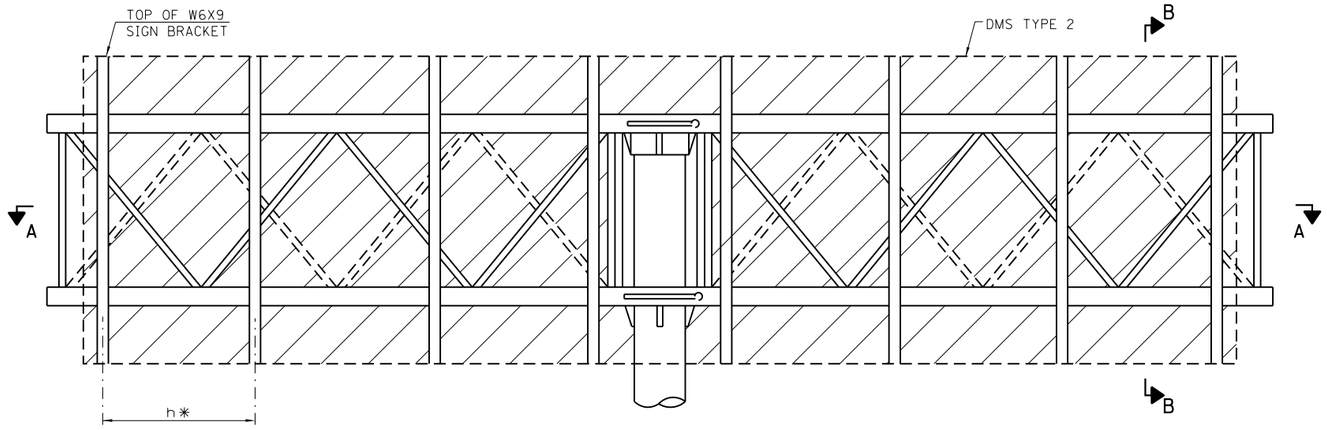
CHIEF ENGINEERING OFFICER



Illinois Tollway

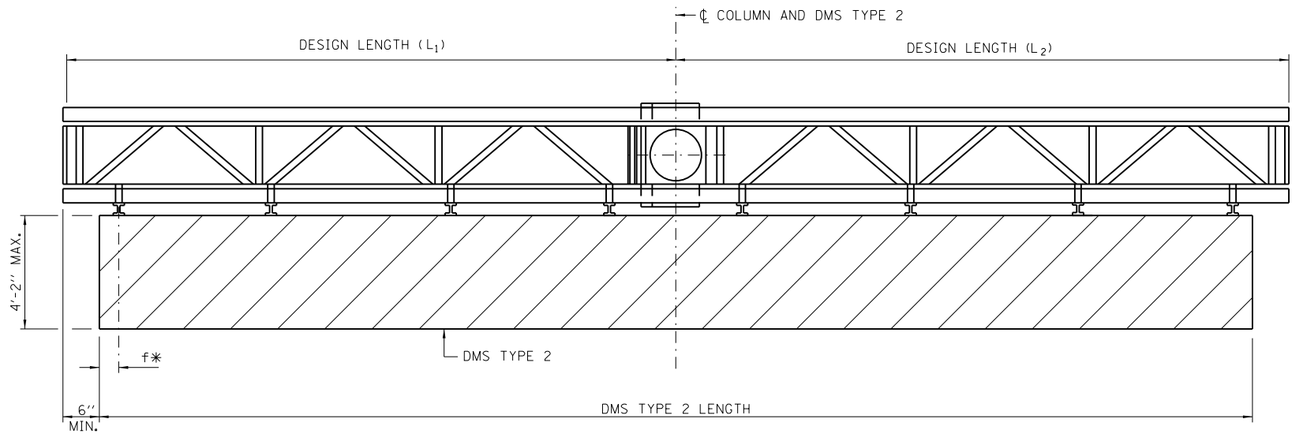
OVERHEAD SIGN STRUCTURE
BUTTERFLY TYPE
STRUCTURE DETAILS

STANDARD F14-04




* BRACKET DIMENSIONS ARE NOMINAL AND WILL VARY BASED ON ACTUAL DMS TYPE 2 DIMENSIONS PLUS MANUFACTURER'S MOUNTING DEVICES.

## TYPICAL FRONT ELEVATION



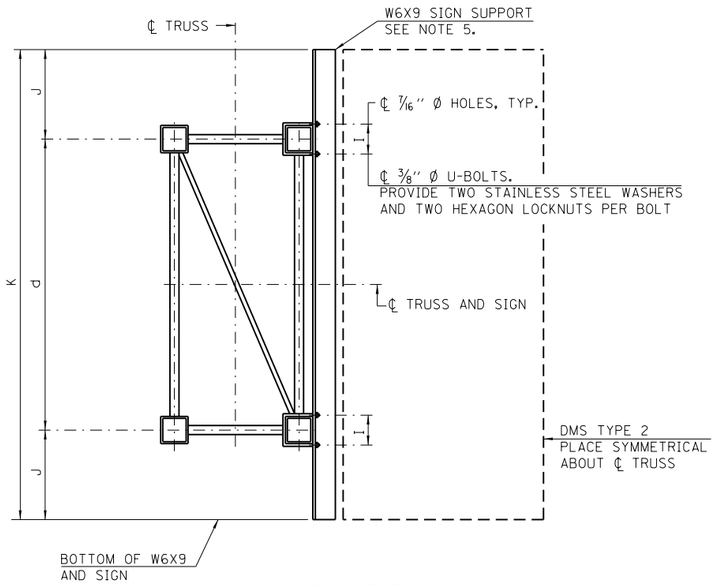

## SECTION A-A

PLACE ALL SIGN BRACKETS AS CLOSE TO PANEL POINTS AS PRACTICAL.

(ROAD PLAN BENEATH TRUSS VARIES)
BUTTERFLY MAY BE LOCATED IN SHOULDER AREA.

## NOTES:

1. SPACE SIGN BRACKETS W6X9 FOR EFFICIENCY AND WITHIN LIMITS SHOWN:
2. f = 12'' MAXIMUM, 4'' MINIMUM (END OF SIGN TO ℄ OF NEAREST BRACKET)
   h = 6'-0'' MAXIMUM (℄ TO ℄ SIGN SUPPORT BRACKETS, W6X9)
3. MAXIMUM DMS TYPE 2 WEIGHT = 5000 LBS.
4. 4'-2'' MAXIMUM DEPTH INCLUDES DEPTH OF DMS TYPE 2 PLUS CONNECTION TO W6X9.
5. DMS TYPE 2 MANUFACTURER SHALL DESIGN AND SUPPLY HARDWARE FOR CONNECTION TO W6X9. BOLTS SHALL BE STAINLESS STEEL OR HOT DIP GALVANIZED HIGH STRENGTH PER THE STANDARD SPECIFICATION.




## SECTION B-B

## BRACKET TABLE

| W6X9 | | |
|---|---|---|
| SIGN WIDTH | | NUMBER OF BRACKETS REQUIRED |
| GREATER THAN | LESS THAN OR EQUAL TO | |
| | 8'-0'' | 2 |
| 8'-0'' | 14'-0'' | 3 |
| 14'-0'' | 20'-0'' | 4 |
| 20'-0'' | 26'-0'' | 5 |
| 26'-0'' | 32'-0'' | 6 |

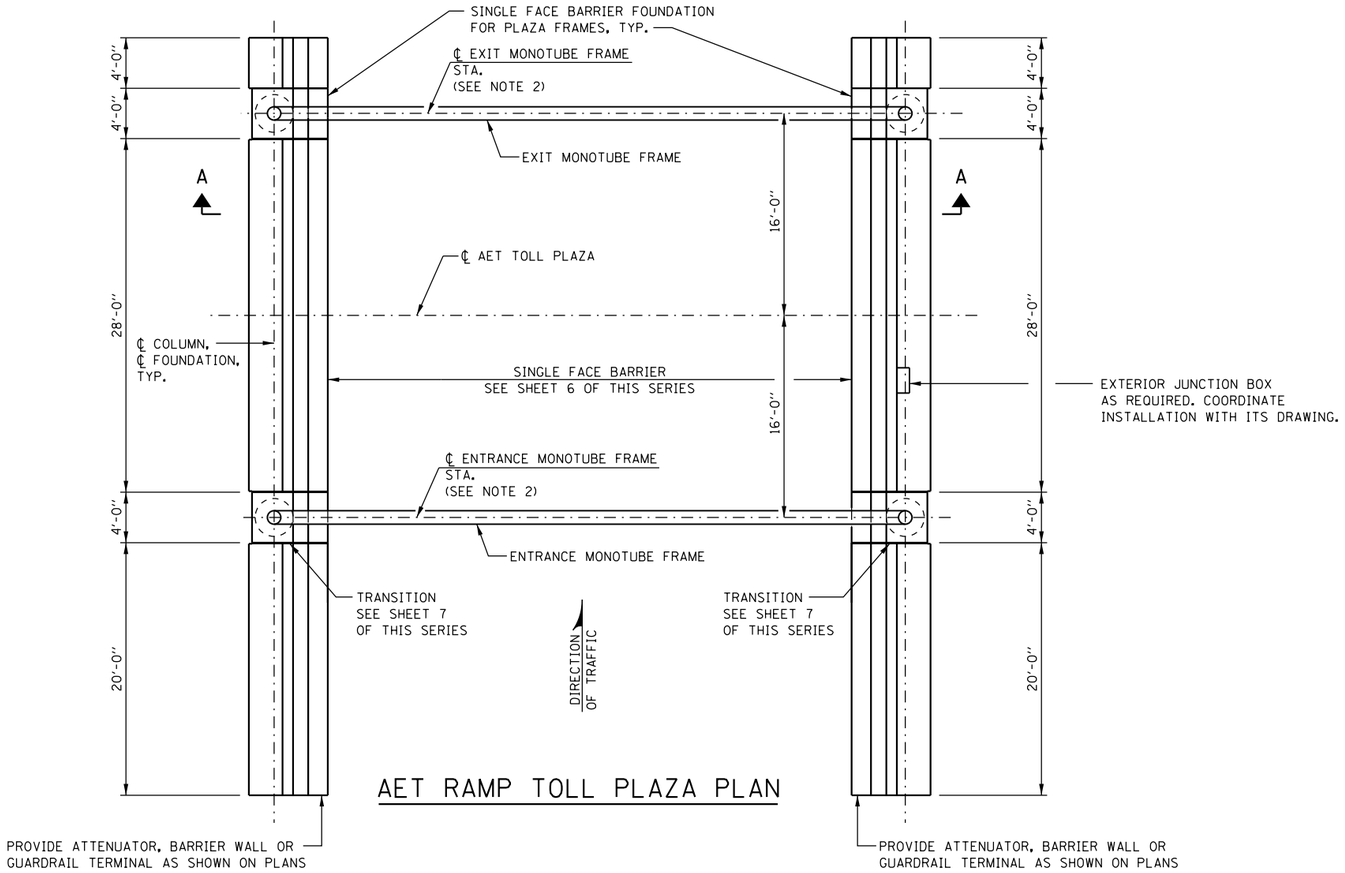


Paul Kovacs
APPROVED ..... DATE 3-31-2014
CHIEF ENGINEERING OFFICER

Illinois Tollway

OVERHEAD SIGN STRUCTURE
BUTTERFLY TYPE
STRUCTURE DETAILS

STANDARD F14-04



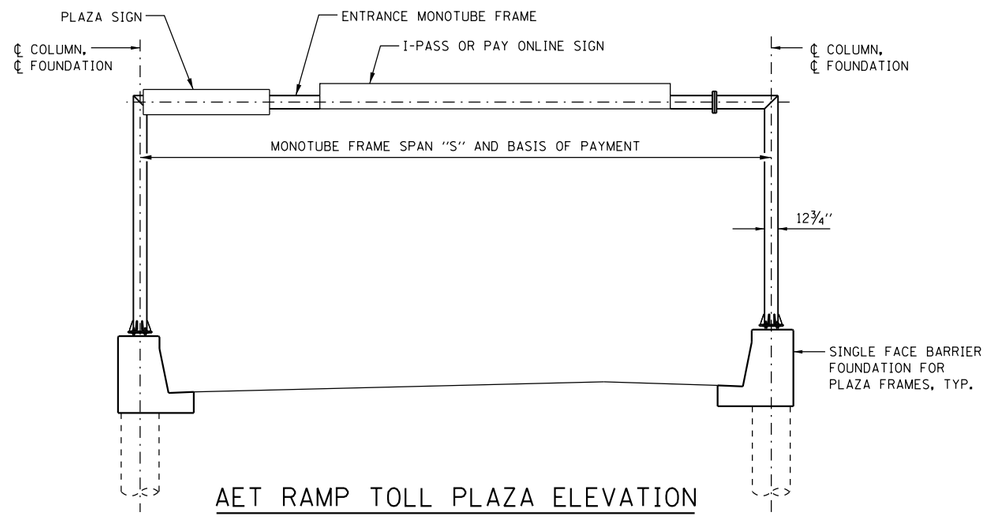

AET RAMP TOLL PLAZA PLAN

## SIGN TABLE

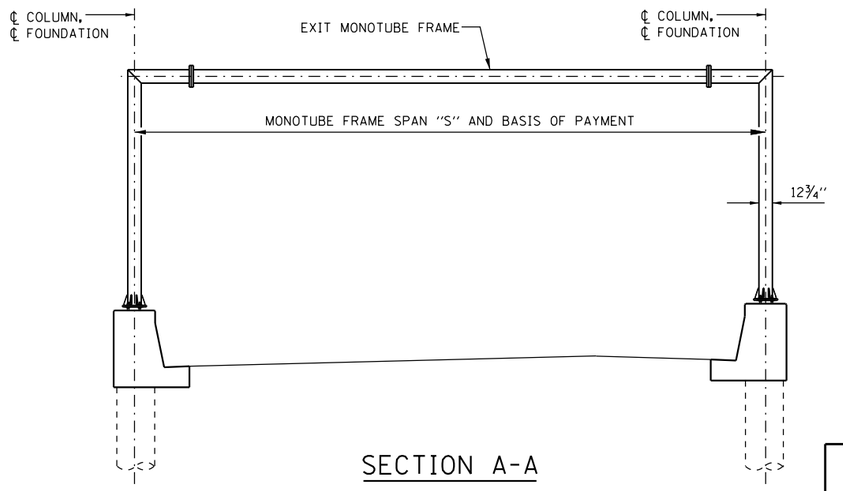
| SIGN | MAXIMUM AREA | MAXIMUM LENGTH |
|---|---|---|
| PLAZA SIGN | 24 S.F. | 8'-0" |
| I-PASS OR PAY ONLINE SIGN | 60 S.F. | 20'-0" |

## NOTE:

1. SEE CONTRACT PLANS FOR SIGN SIZE AND LOCATION.
2. PROVIDE ENTRANCE AND EXIT MONOTUBE FRAME STATIONS IN CONTRACT PLANS.




AET RAMP TOLL PLAZA ELEVATION




SECTION A-A

Paul Kovacs
APPROVED ..... CHIEF ENGINEER
DATE 10-14-2014

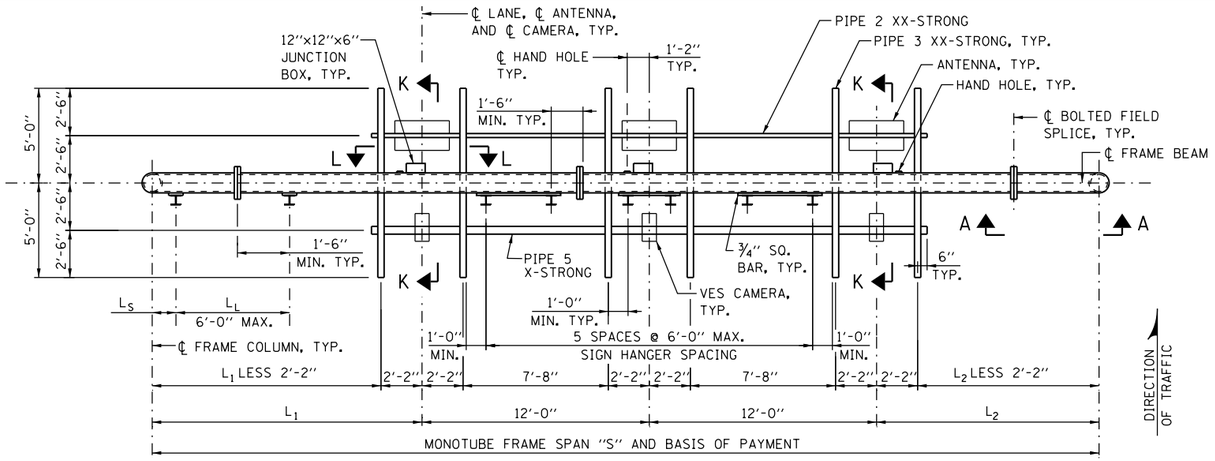
| DATE | REVISIONS |
|---|---|
| 3-31-2016 | REVISED FOUNDATION NOTE |
| 3-31-2017 | REVISED I-PASS ONLY SIGN |
| 3-01-2019 | UPDATED CONSTANT SLOPE |
| | BARRIER, REINFORCING |
| | DETAILS AND QUANTITIES |

SHEET 1 OF 7

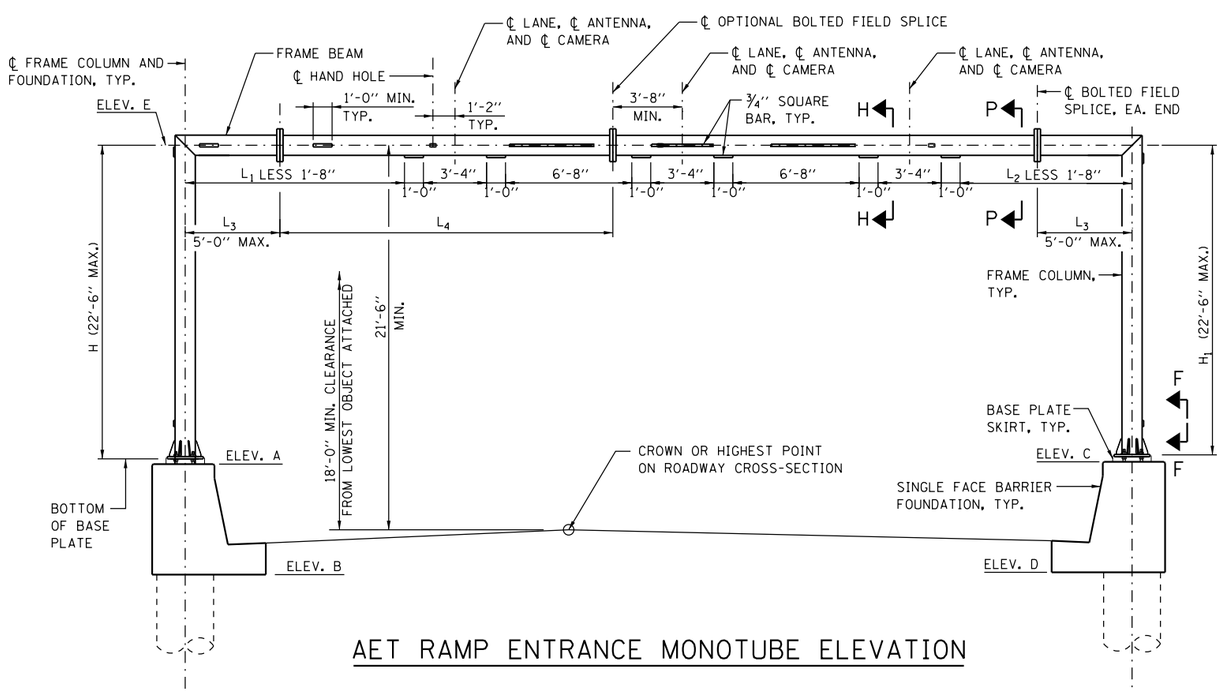
Illinois Tollway

OVERHEAD SIGN STRUCTURE
MONOTUBE TYPE (STEEL)
STRUCTURE DETAILS
FOR AET RAMP

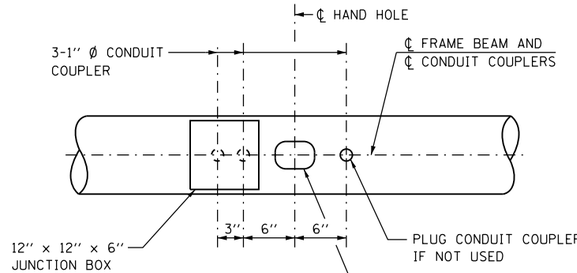
STANDARD F15-03



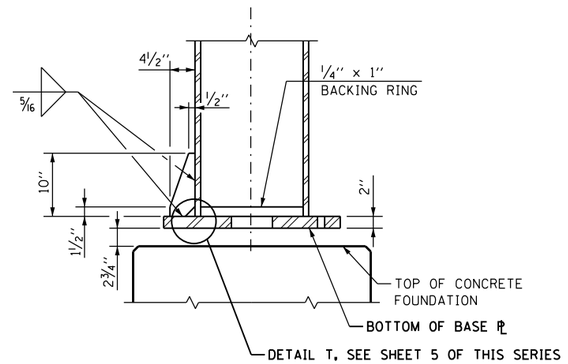

## AET RAMP ENTRANCE MONOTUBE PLAN



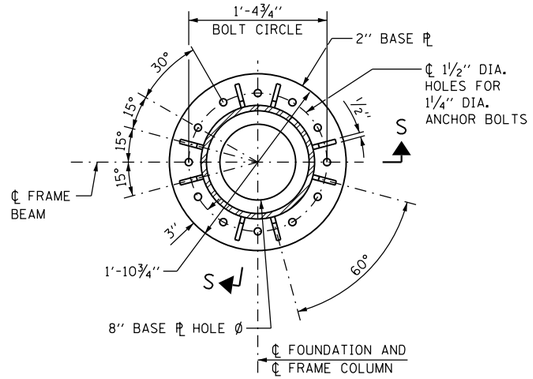

## AET RAMP ENTRANCE MONOTUBE ELEVATION




## VIEW L-L




## SECTION S-S




## BASE PLATE PLAN
## ENTRANCE AND EXIT MONOTUBE

## NOTES:

1. FOUNDATIONS FOR MONOTUBE FRAMES ARE SHOWN ON SHEET 6 OF THIS SERIES.
2. SEE SHEET 5 OF THIS SERIES FOR SECTIONS A-A, G-G, H-H, K-K, VIEW F-F AND BASE PLATE SKIRT.
3. SEE SHEET 4 OF THIS SERIES FOR SECTION P-P.
4. PROVIDE CAMBER AT MIDSPAN OF STRUCTURE.
5. LOCATE OPTIONAL BOLTED FIELD SPLICE NEAR MIDSPAN.
6. WORK THIS SHEET WITH, OVERHEAD SIGN STRUCTURE ENTRANCE MONOTUBE TYPE (STEEL) AET RAMP SUMMARY AND TOTAL BILL OF MATERIAL SHEET.

## ENTRANCE MONOTUBE FRAME TABLE

| SPAN "S" | FRAME COLUMN | FRAME BEAM | CAMBER |
|---|---|---|---|
| 50' MAX. | HSS 12.75x0.500 | HSS 12.75x0.500 | 1¾" |

SEE ILLINOIS TOLLWAY STANDARD DRAWING F13 FOR SPANS GREATER THAN 50'.

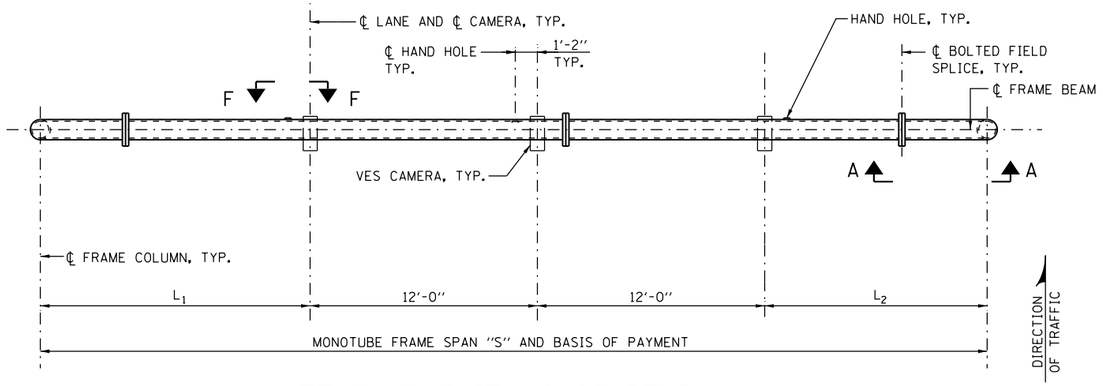
APPROVED Paul Kovacs CHIEF ENGINEER DATE 10-14-2014



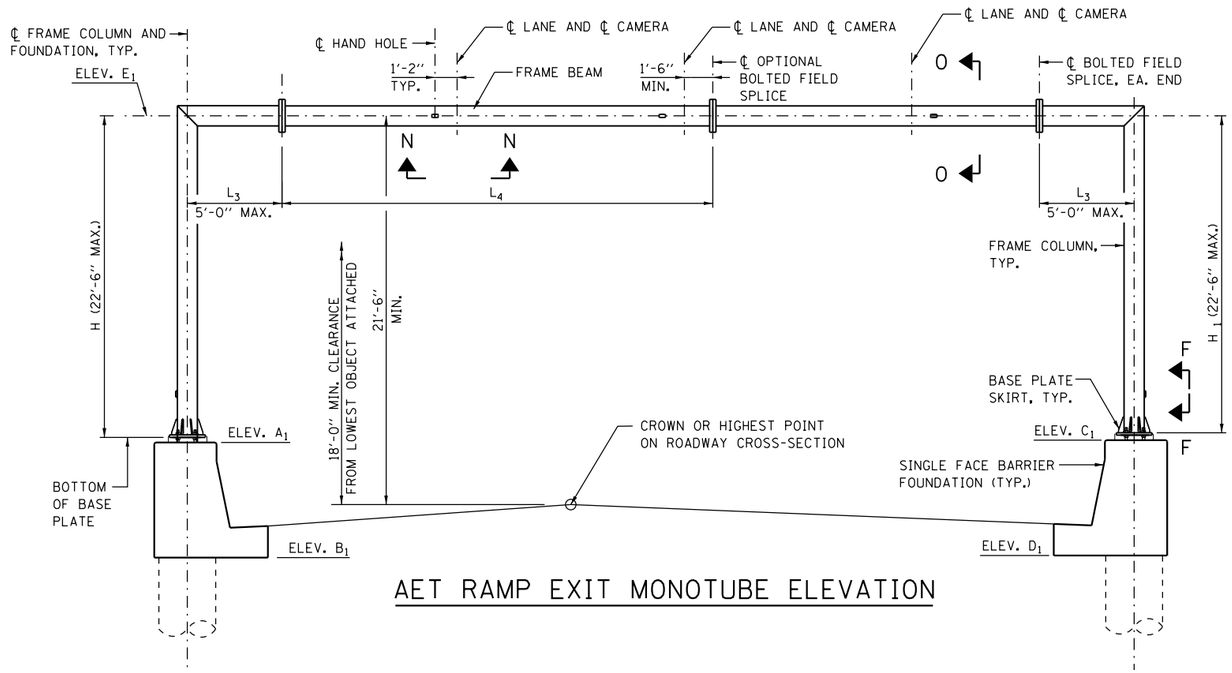
Illinois Tollway

OVERHEAD SIGN STRUCTURE
MONOTUBE TYPE (STEEL)
STRUCTURE DETAILS
FOR AET RAMP

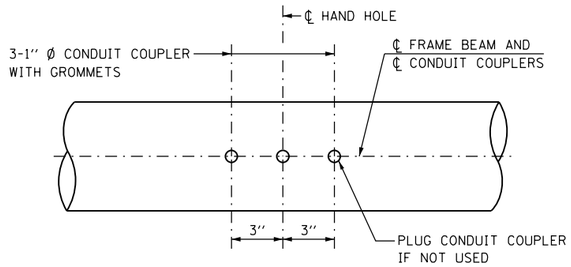
STANDARD F15-03




## AET RAMP EXIT MONOTUBE PLAN




## AET RAMP EXIT MONOTUBE ELEVATION




## VIEW N-N (CONDUIT COUPLER DETAIL)

## EXIT MONOTUBE FRAME TABLE

| SPAN "S" | FRAME COLUMN | FRAME BEAM | CAMBER |
|---|---|---|---|
| 50' MAX. | HSS 12.75x0.500 | HSS 12.75x0.500 | 1¾" |

SEE STANDARD F13 FOR SPANS GREATER THAN 50'.

**NOTES:**

1. SEE SHEET 2 OF THIS SERIES FOR SECTION S-S, BASE ℄ PLAN AND ADDITIONAL NOTES.
2. SEE SHEET 4 OF THIS SERIES FOR SECTION O-O.
3. SEE SHEET 5 OF THIS SERIES FOR SECTIONS A-A AND G-G, AND BASE PLATE SKIRT.
4. WORK THIS SHEET WITH, OVERHEAD SIGN STRUCTURE EXIT MONOTUBE TYPE (STEEL) AET RAMP SUMMARY AND TOTAL BILL OF MATERIAL SHEET.

Paul Kovacs
APPROVED..... DATE 10-14-2014
CHIEF ENGINEER



Illinois Tollway

OVERHEAD SIGN STRUCTURE
MONOTUBE TYPE (STEEL)
STRUCTURE DETAILS
FOR AET RAMP

STANDARD F15-03

## GENERAL NOTES:

1. AFTER ADJUSTMENTS TO LEVEL FRAME BEAM AND ENSURE ADEQUATE VERTICAL CLEARANCE, TIGHTEN ALL TOP AND LEVELING NUTS AGAINST THE BASE PLATE WITH A MINIMUM TORQUE OF 200 LB.-FT. THEN PLACE STAINLESS STEEL MESH AROUND THE PERIMETER OF THE BASE PLATE. SECURE TO BASE PLATE WITH STAINLESS STEEL BANDING.

2. REINFORCEMENT BARS DESIGNATED "(E)" SHALL BE EPOXY COATED.

## STRUCTURAL STEEL:

1. MATERIAL FOR THE MONOTUBE FRAME SHALL CONFORM TO THE REQUIREMENTS OF ASTM A500 GRADE B. BASE PLATE AND STIFFENER PLATE SHALL CONFORM TO ASTM A709 GRADE 50. OTHER STRUCTURAL STEEL SHAPES AND PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A36, UNLESS NOTED OTHERWISE.

2. PIPES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A53 GRADE B.

3. ANCHOR BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F1554 (AASHTO M314) GRADE 55, WITH A MINIMUM TENSILE STRENGTH OF 75,000 PSI. THEY SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 (AASHTO M232). SEE SHEET 6 OF THIS SERIES FOR GALVANIZED LENGTH.

4. U-BOLTS SHALL BE STAINLESS STEEL. PROVIDE STAINLESS STEEL WASHERS AND NUTS FOR U-BOLTS.

5. BOLTS (EXCLUDING ANCHOR BOLTS AND U-BOLTS) SHALL BE HIGH STRENGTH STEEL BOLTS.

6. TUBES FOR MONOTUBE FRAME, PIPES, STRUCTURAL STEEL SHAPES AND PLATES SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123 AFTER FABRICATION.

7. THE MONOTUBE FRAME BEAM, COLUMNS, BASE PLATE MATERIAL, AND SPLICES ARE CONSIDERED TENSION MEMBERS AND SHALL CONFORM TO THE IMPACT TESTING REQUIREMENT, ZONE 2.

## DESIGN LOADING:

WIND LOAD CRITERIA

| | |
|---|---|
| SIGN PANEL | 35 P.S.F. |
| COLUMN/BEAM | 35 P.S.F. |

## EQUIPMENT LOADS:

| | |
|---|---|
| CAMERA ASSEMBLY | 8 LB. |
| ANTENNA | 20 LB. |

## DESIGN STRESSES FOR REINFORCED CONCRETE:

f'c = COMPRESSIVE STRENGTH OF CONCRETE (CLASS SI) = 3,500 P.S.I.
f'c = COMPRESSIVE STRENGTH OF CONCRETE (CLASS DS) = 4,000 P.S.I.
fy = YIELD STRENGTH OF REINFORCEMENT BARS (GRADE 60) = 60,000 P.S.I.

## FOUNDATION:

MINIMUM UNCONFINED COMPRESSIVE STRENGTH, Qu FOR ALL LAYERS OF COHESIVE SOILS (CLAYS) SHALL BE 1.25 TON/SQ.FT. AT MONOTUBE FRAMES.

## DESIGN SPECIFICATIONS:

1. ILLINOIS TOLLWAY STRUCTURE DESIGN MANUAL, LATEST EDITION.

2. AASHTO STANDARD SPECIFICATION FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS, 6TH EDITION.

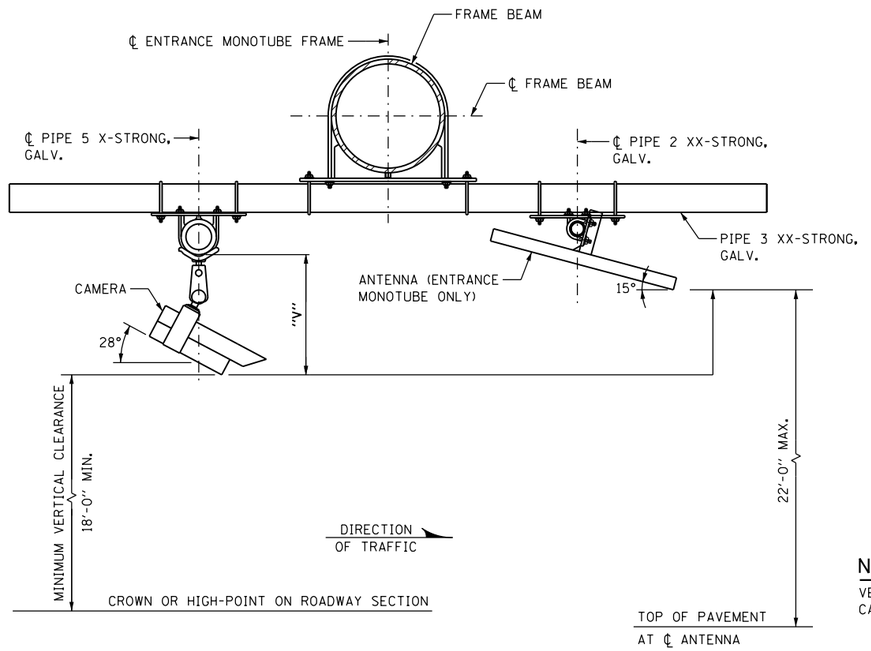
3. AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 6TH EDITION DATED FEBRUARY 2012.

4. ILLINOIS DEPARTMENT OF TRANSPORTATION BRIDGE MANUAL, JANUARY 2012

## CONSTRUCTION SPECIFICATIONS:

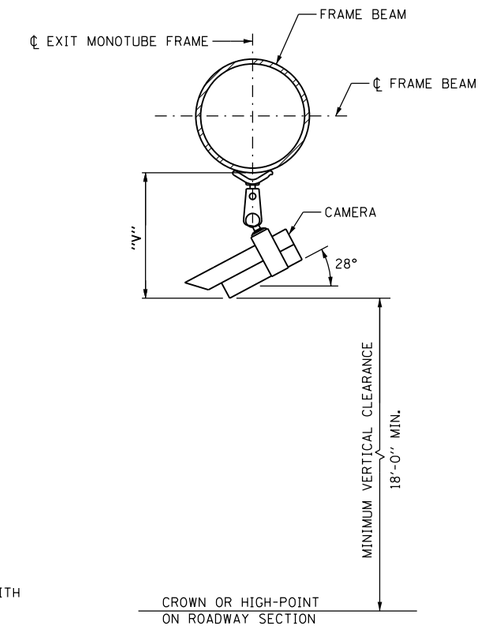
1. ILLINOIS TOLLWAY SUPPLEMENTAL SPECIFICATIONS TO THE ILLINOIS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION.

2. ILLINOIS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION.




SECTION P-P

**NOTE:**
VERIFY DIMENSION "V" WITH CAMERA MANUFACTURER.




SECTION O-O

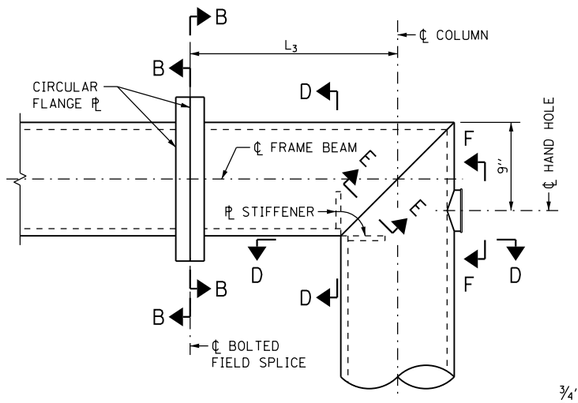
Paul Kovacs
APPROVED..... DATE 10-14-2014
CHIEF ENGINEER



Illinois Tollway

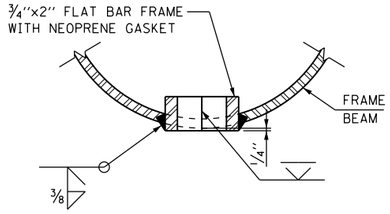
OVERHEAD SIGN STRUCTURE
MONOTUBE TYPE (STEEL)
STRUCTURE DETAILS
FOR AET RAMP

STANDARD F15-03

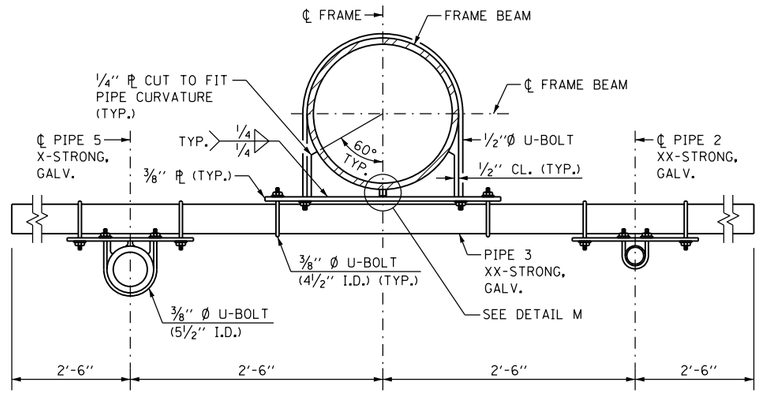



## SECTION A-A

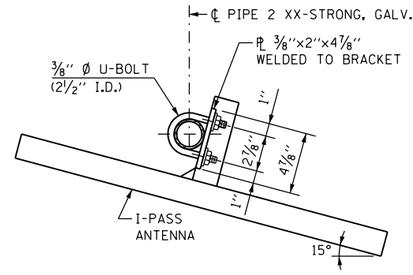
(SEE SHEETS 2 AND 3 OF THIS SERIES FOR LOCATION)



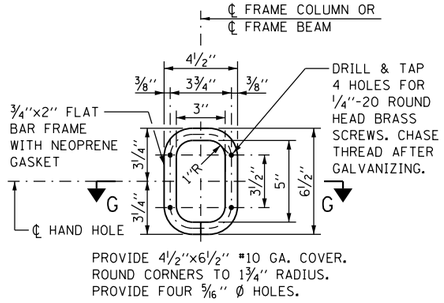

## SECTION G-G



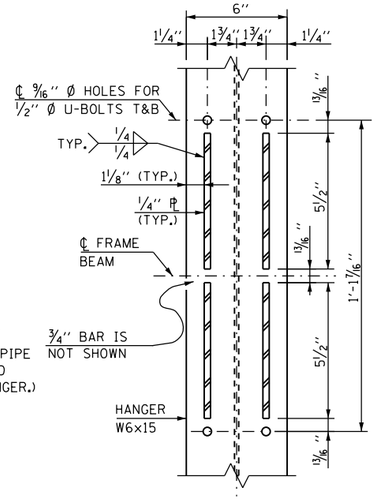

## SECTION K-K



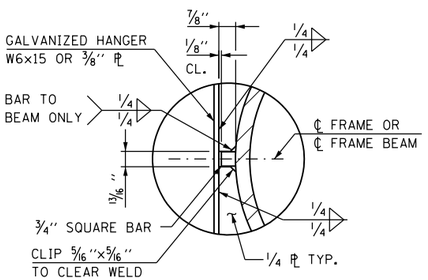

## ANTENNA HANGER



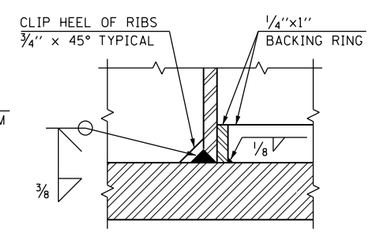

## VIEW F-F



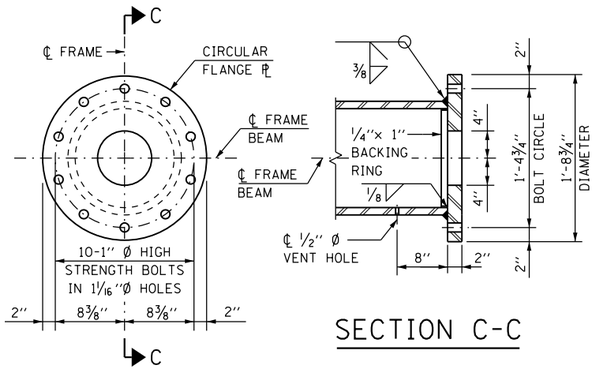

## SECTION J-J




## DETAIL M



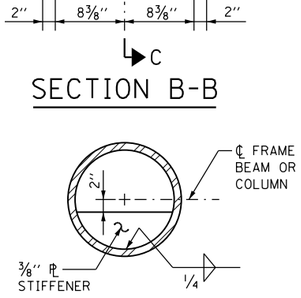

## DETAIL T



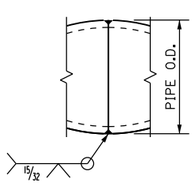

## SECTION B-B



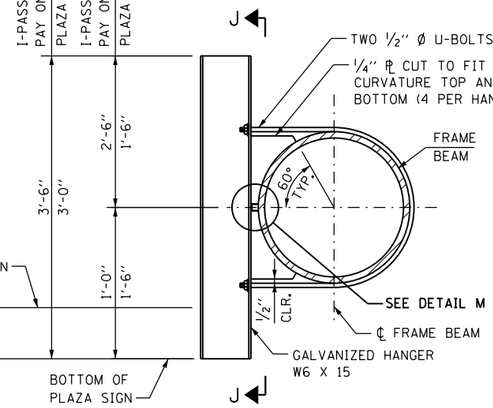

## SECTION C-C



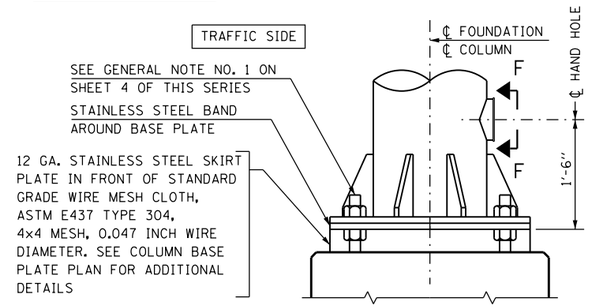

## SECTION D-D



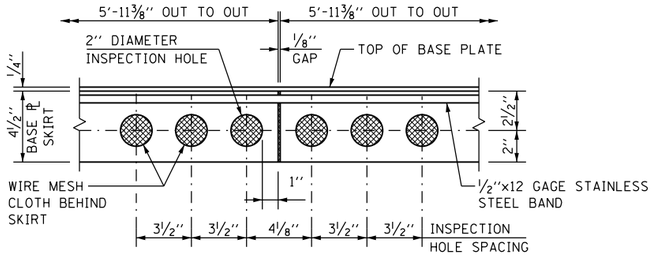

## SECTION E-E



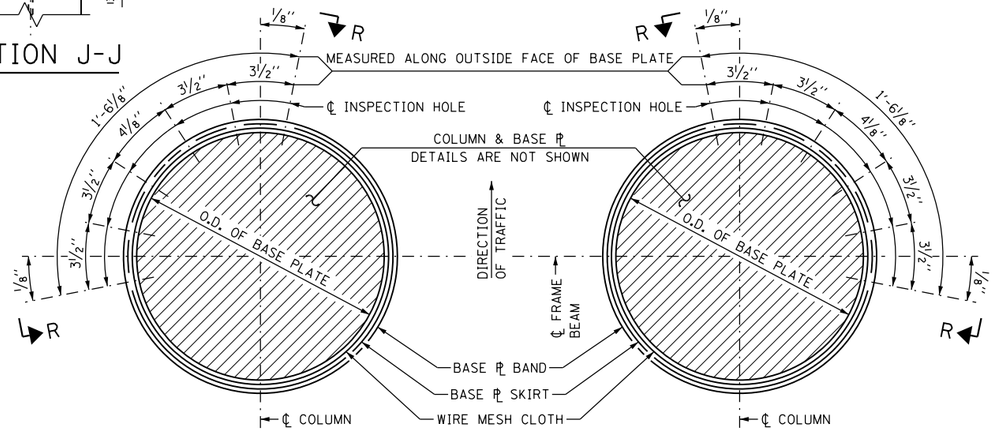

## SECTION H-H (SIGN HANGER)




## COLUMN BASE




## VIEW R-R (BASE PLATE SKIRT)




## LEFT BASE PLATE

## RIGHT BASE PLATE

## COLUMN BASE PLATE PLAN

**NOTE:**

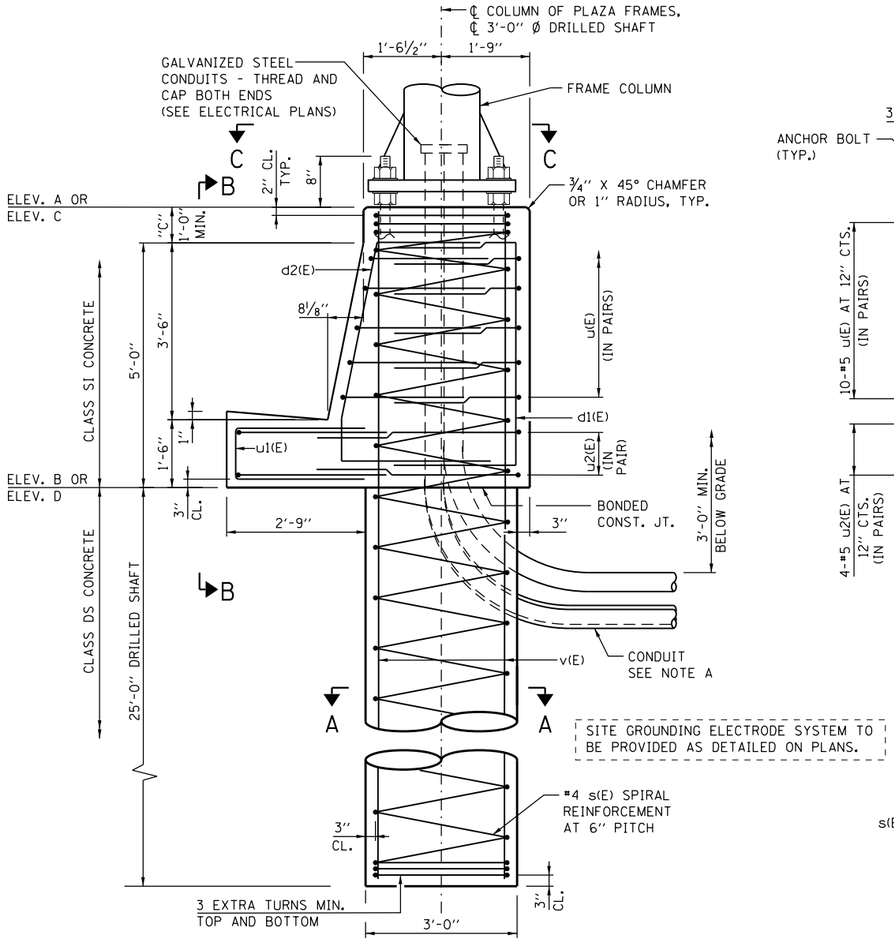
SEE SHEET 2 OF THIS SERIES FOR BASE PLATE OUTSIDE DIAMETER.

APPROVED Paul Kovacs CHIEF ENGINEER DATE 10-14-2014

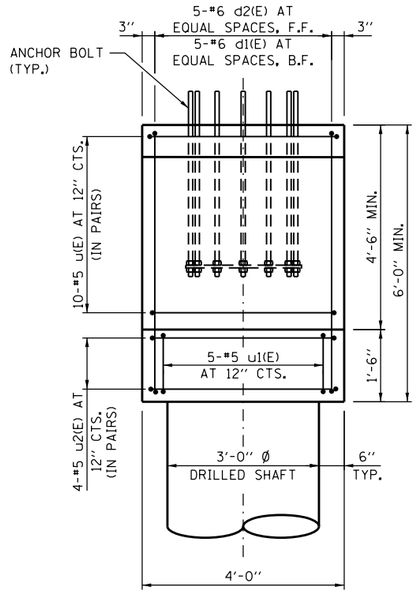
Illinois Tollway

OVERHEAD SIGN STRUCTURE
MONOTUBE TYPE (STEEL)
STRUCTURE DETAILS
FOR AET RAMP

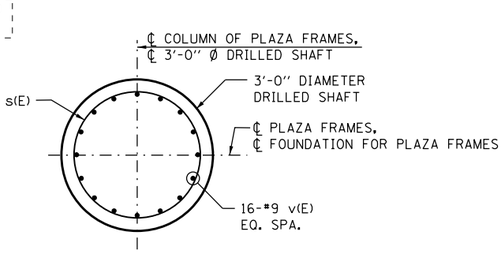
STANDARD F15-03



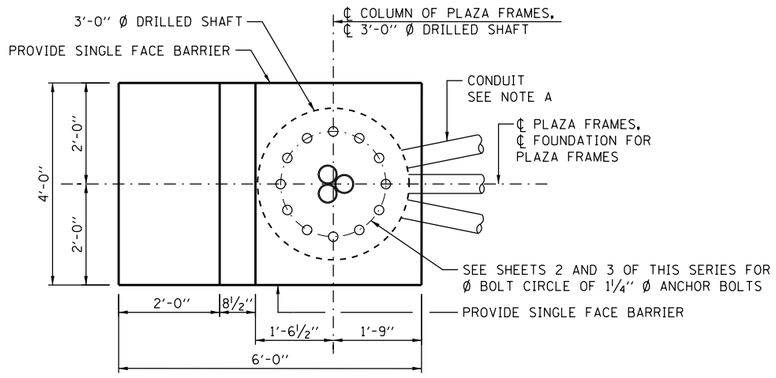

SIDE ELEVATION




VIEW B-B




SECTION A-A




VIEW C-C

## SINGLE FACE BARRIER FOUNDATION FOR PLAZA FRAMES

### NOTE A:

1. COORDINATE CONDUIT SIZE, LOCATION AND QUANTITY WITH ELECTRICAL PLANS. PROVIDE CONDUIT COUPLERS AS REQUIRED.
2. CONDUITS SHALL BE PLACED TO MISS REINFORCEMENT. CUTTING OF REINFORCEMENT SHALL NOT BE ALLOWED.

### NOTE B:

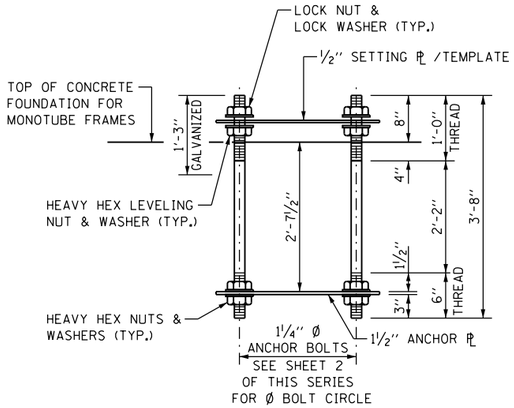
PROTECTIVE COAT SHALL BE APPLIED TO THE TRAFFIC AND TOP FACES OF THE BARRIER AND TOP OF GUTTER

### FOUNDATION NOTE:

THE FOUNDATION DETAILS SHOWN ARE BASED ON THE PRESENCE OF MOSTLY COMMON COHESIVE SOIL CONDITIONS (SILTY OR SANDY CLAY), WITH AN AVERAGE UNCONFINED COMPRESSIVE STRENGTH (QU) > 1.25 TON/SQ. FT. WHICH MUST BE DETERMINED BY PREVIOUS SOIL INVESTIGATIONS AT THE JOBSITE. WHEN OTHER CONDITIONS ARE INDICATED, THE BORING DATA SHALL BE INCLUDED IN THE PLANS AND THE FOUNDATION DIMENSIONS SHOWN SHALL BE THE RESULT OF SITE SPECIFIC DESIGNS. IF CONDITIONS ENCOUNTERED IN THE FIELD ARE DIFFERENT THAN THOSE INDICATED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER TO DETERMINE IF THE FOUNDATION DIMENSIONS NEED TO BE MODIFIED.

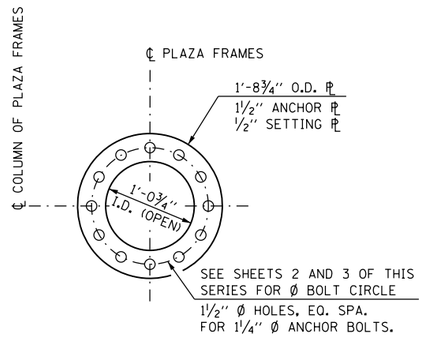
### LEGEND:

F.F. - FRONT FACE
B.F. - BACK FACE
CTS. - CENTERS

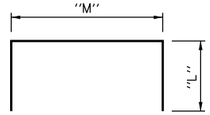



## ANCHOR BOLT ASSEMBLY

| FRAME COLUMN | ANCHOR BOLT |
|---|---|
| HSS 12.75x0.500 | 12 |

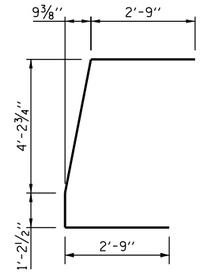



## ANCHOR PL / SETTING PL




| BAR | "L" | "M" | |
|---|---|---|---|
| d1(E) | 2'-9" | 5'-7" | ** |
| u(E) | 2'-9" | 3'-8" | |
| u1(E) | 3'-3" | 1'-1" | |
| u2(E) | 3'-10" | 3'-8" | |

## BARS d1(E), u(E), u1(E) AND u2(E)




## BAR d2(E)

## BAR LIST-ONE FOUNDATION

| | BAR | NO. | SIZE | LENGTH | SHAPE |
|---|---|---|---|---|---|
| ** | d1(E) | 5 | #6 | 11'-1" | |
| ** | d2(E) | 5 | #6 | 11'-1" | |
| | | | | | |
| * | s(E) | 1 | #4 | 30'-7" | |
| | | | | | |
| ** | v(E) | 16 | #9 | 30'-7" | |
| | | | | | |
| | u(E) | 10 | #5 | 9'-2" | |
| | u1(E) | 5 | #5 | 7'-7" | |
| | u2(E) | 4 | #5 | 11'-4" | |
| | | | | | |

* THE LENGTH OF SPIRAL SHOWN IS THE HEIGHT OF SPIRAL, COMPUTED USING "C" = 1'-0". ADJUST LENGTH ACCORDINGLY IF "C" IS GREATER THAN 1'-0".

** BAR LENGTH IS COMPUTED USING "C" = 1'-0". ADJUST BAR LENGTH ACCORDINGLY IF "C" IS GREATER THAN 1'-0".

## ESTIMATED QUANTITY

| ITEM | UNIT | SINGLE FACE BARRIER FDN. |
|---|---|---|
| CLASS SI CONCRETE | CU. YD. | 3.8 |
| CLASS DS CONCRETE | CU. YD. | 6.6 |
| REINFORCEMENT BARS, EPOXY COAT | POUND | 2,040 |
| PROTECTIVE COAT | SQ. YD. | 4.4 |

### NOTE:

QUANTITIES FOR SINGLE FACE BARRIER FOUNDATION ARE DETERMINED USING "C" = 1'-0". IF DIMENSION "C" IS GREATER THAN 1'-0", ADJUST QUANTITIES ACCORDINGLY.

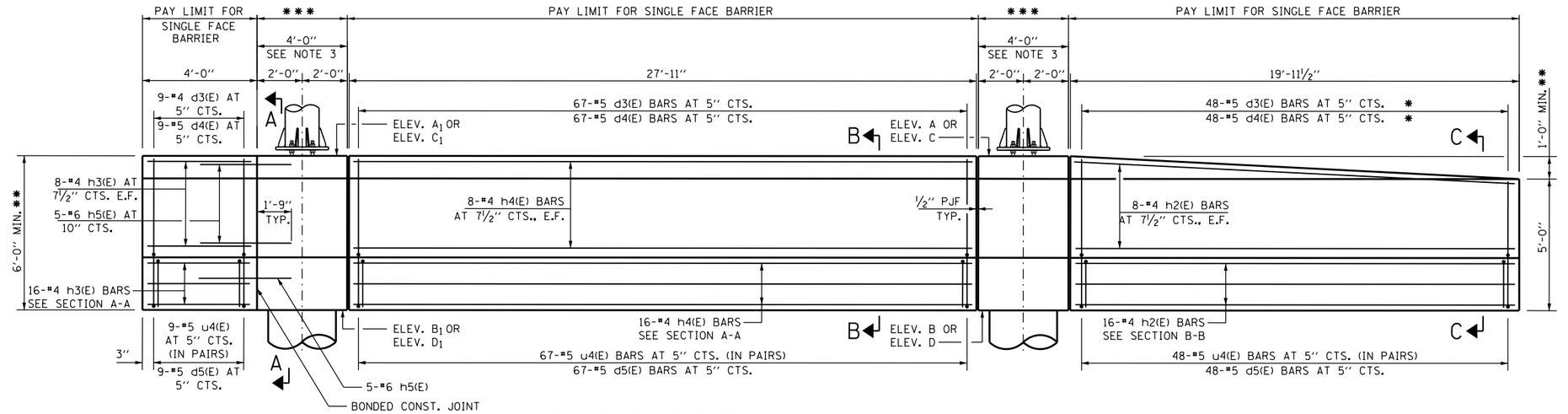


APPROVED Paul Kovacs CHIEF ENGINEER DATE 10-14-2014

Illinois Tollway

OVERHEAD SIGN STRUCTURE
MONOTUBE TYPE (STEEL)
STRUCTURE DETAILS
FOR AET RAMP

STANDARD F15-03



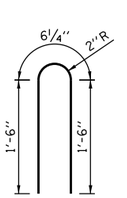

## SINGLE FACE BARRIER AND BARRIER BASE ELEVATION

INSIDE FACE OF RIGHT BARRIER IS SHOWN
(MIRROR ELEVATION OF LEFT BARRIER)

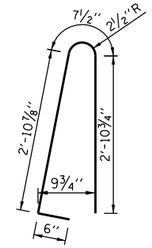
* CUT IN FIELD AS REQUIRED TO FIT TAPER
** BASED ON DIMENSION "C" = 1'-0"
*** PAY LIMIT FOR FOUNDATION FOR OVERHEAD SIGN STRUCTURE

## BAR LIST - FOR ONE BARRIER

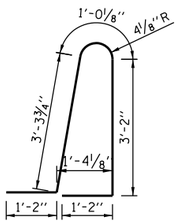
| BAR | NO. | SIZE | LENGTH | SHAPE |
|---|---|---|---|---|
| d3(E) | 124 | #4 | 3'-7" | |
| d4(E) | 124 | #5 | 7'-0" | |
| d5(E) | 124 | #5 | 9'-10" | |
| | | | | |
| h2(E) | 28 | #4 | 19'-7" | |
| h3(E) | 28 | #4 | 3'-8" | |
| h4(E) | 28 | #4 | 27'-7" | |
| h5(E) | 10 | #6 | 3'-9" | |
| | | | | |
| u4(E) | 247 | #5 | 9'-3" | |
| | | | | |



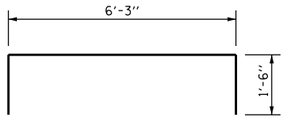

BAR d3(E)



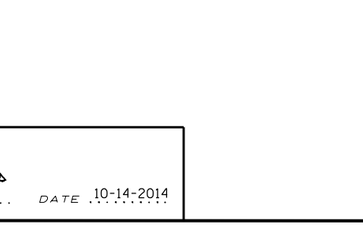

BAR d4(E)



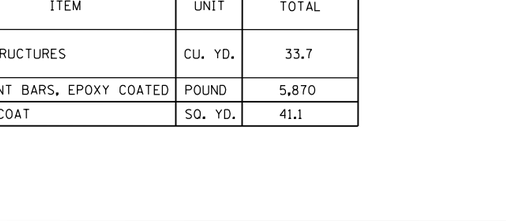

BAR d5(E)



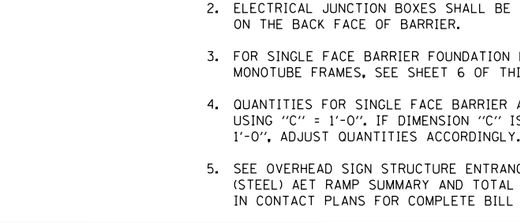

BAR u4(E)




SECTION A-A




SECTION B-B




SECTION C-C

## ESTIMATED QUANTITY

(FOR ONE SINGLE FACE BARRIER)

| ITEM | UNIT | TOTAL |
|---|---|---|
| CONCRETE STRUCTURES | CU. YD. | 33.7 |
| REINFORCEMENT BARS, EPOXY COATED | POUND | 5,870 |
| PROTECTIVE COAT | SQ. YD. | 41.1 |

## NOTES:

1. PROTECTIVE COAT SHALL BE APPLIED TO THE TRAFFIC AND TOP FACES OF THE BARRIER, GUTTER AND TO THE ENTRANCE SIDE FACE (AT THE BEGINNING OF THE RAMP PLAZA PAVEMENT) FOR THE FULL HEIGHT OF THE BARRIER.
2. ELECTRICAL JUNCTION BOXES SHALL BE EXTERIOR MOUNTED ON THE BACK FACE OF BARRIER.
3. FOR SINGLE FACE BARRIER FOUNDATION DETAILS FOR MONOTUBE FRAMES, SEE SHEET 6 OF THIS SERIES.
4. QUANTITIES FOR SINGLE FACE BARRIER ARE DETERMINED USING "C" = 1'-0". IF DIMENSION "C" IS GREATER THAN 1'-0", ADJUST QUANTITIES ACCORDINGLY.
5. SEE OVERHEAD SIGN STRUCTURE ENTRANCE MONOTUBE TYPE (STEEL) AET RAMP SUMMARY AND TOTAL BILL OF MATERIAL IN CONTACT PLANS FOR COMPLETE BILL OF MATERIAL.

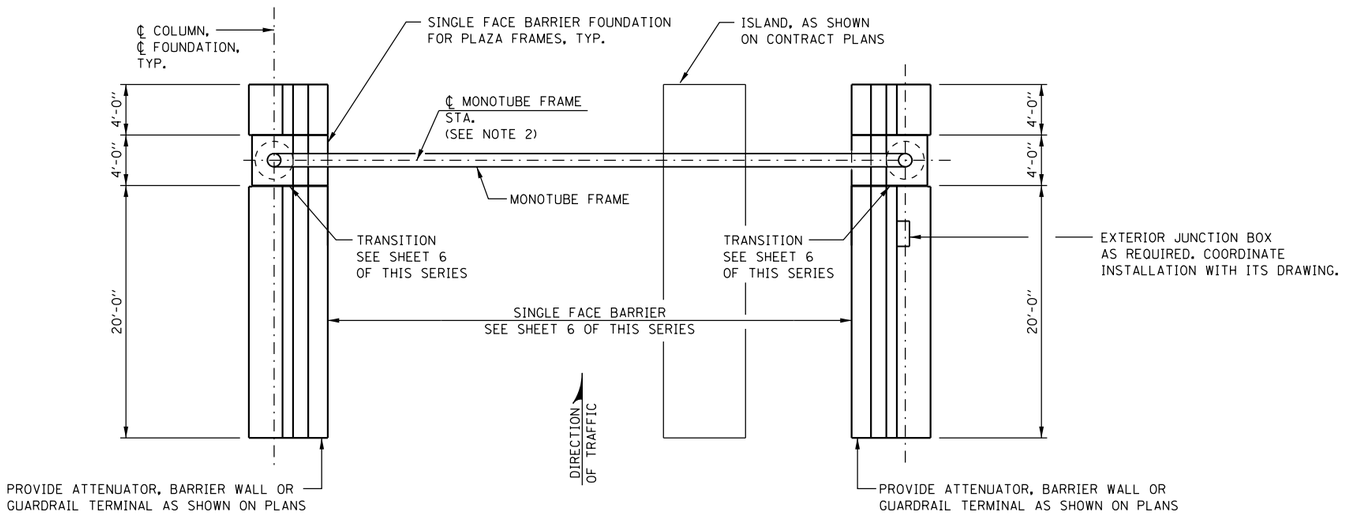
Paul Kovacs
APPROVED..... CHIEF ENGINEER
DATE 10-14-2014



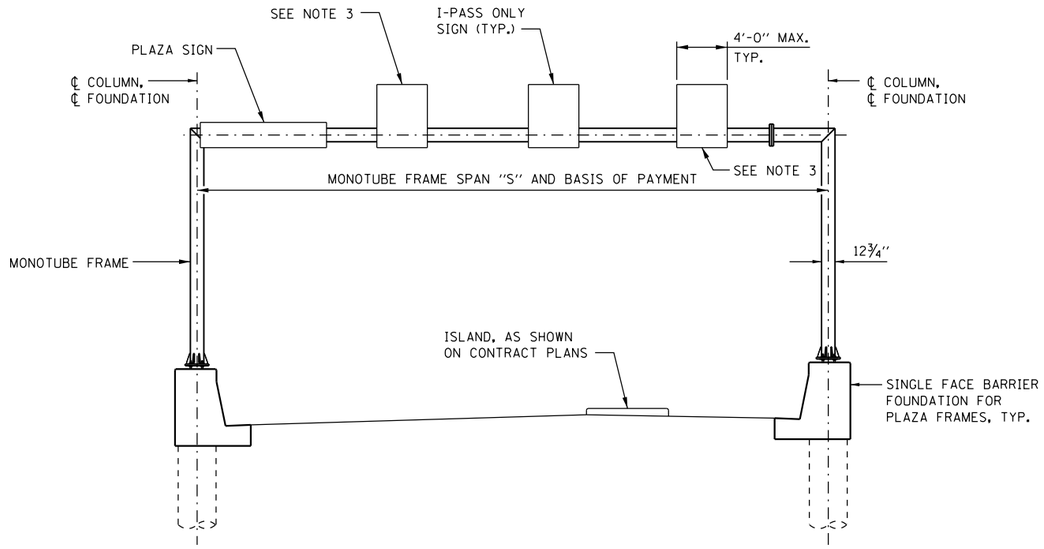
Illinois Tollway

OVERHEAD SIGN STRUCTURE
MONOTUBE TYPE (STEEL)
STRUCTURE DETAILS
FOR AET RAMP

STANDARD F15-03




## CASH-IPO RAMP TOLL PLAZA PLAN




## CASH-IPO RAMP TOLL PLAZA ELEVATION

## SIGN TABLE

| SIGN | MAXIMUM AREA | MAXIMUM LENGTH |
|---|---|---|
| PLAZA SIGN | 24 S.F. | 8'-0" |
| I-PASS ONLY SIGN | 20 S.F. | 4'-0" |
| CASH ONLY SIGN | 20 S.F. | 4'-0" |

## NOTE:

1. SEE CONTRACT PLANS FOR SIGN SIZE AND LOCATION.
2. PROVIDE MONOTUBE FRAME STATION IN CONTRACT PLANS.
3. CASH ONLY SIGN OR I-PASS ONLY SIGN. SEE CONTRACT PLANS FOR SIGN PLACEMENT.

Paul Kovacs
APPROVED. . . . . DATE 10-14-2014
CHIEF ENGINEER

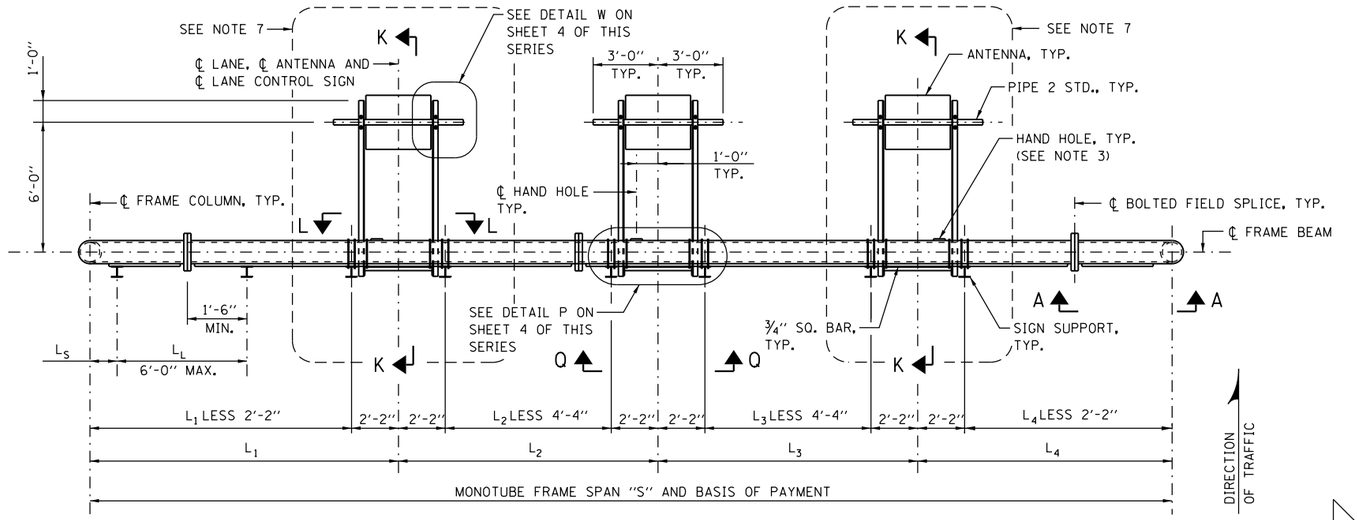
SHEET 1 OF 6

Illinois Tollway

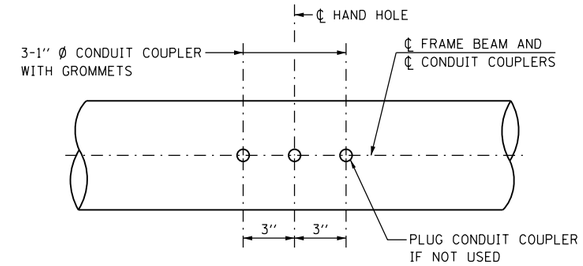
| DATE | REVISIONS |
|---|---|
| 3-31-2016 | REVISED FOUNDATION NOTE. |
| 3-01-2019 | UPDATED CONSTANT SLOPE |
| | BARRIER, REINFORCING |
| | DETAILS AND QUANTITIES |
| | |
| | |

OVERHEAD SIGN STRUCTURE
MONOTUBE TYPE (STEEL)
STRUCTURE DETAILS
FOR CASH-IPO RAMP

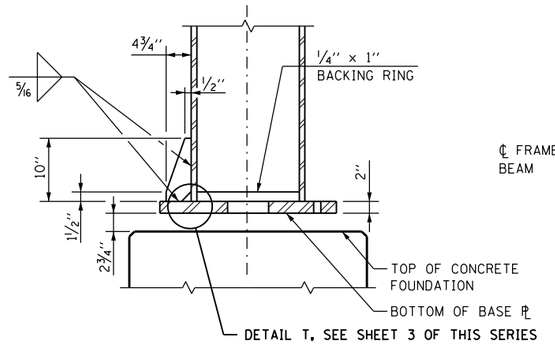
STANDARD F16-02



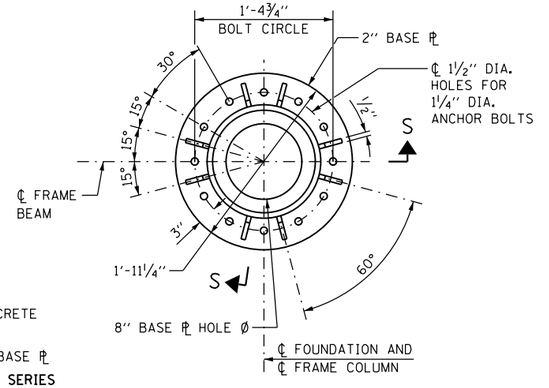

## CASH-IPO RAMP MONOTUBE PLAN



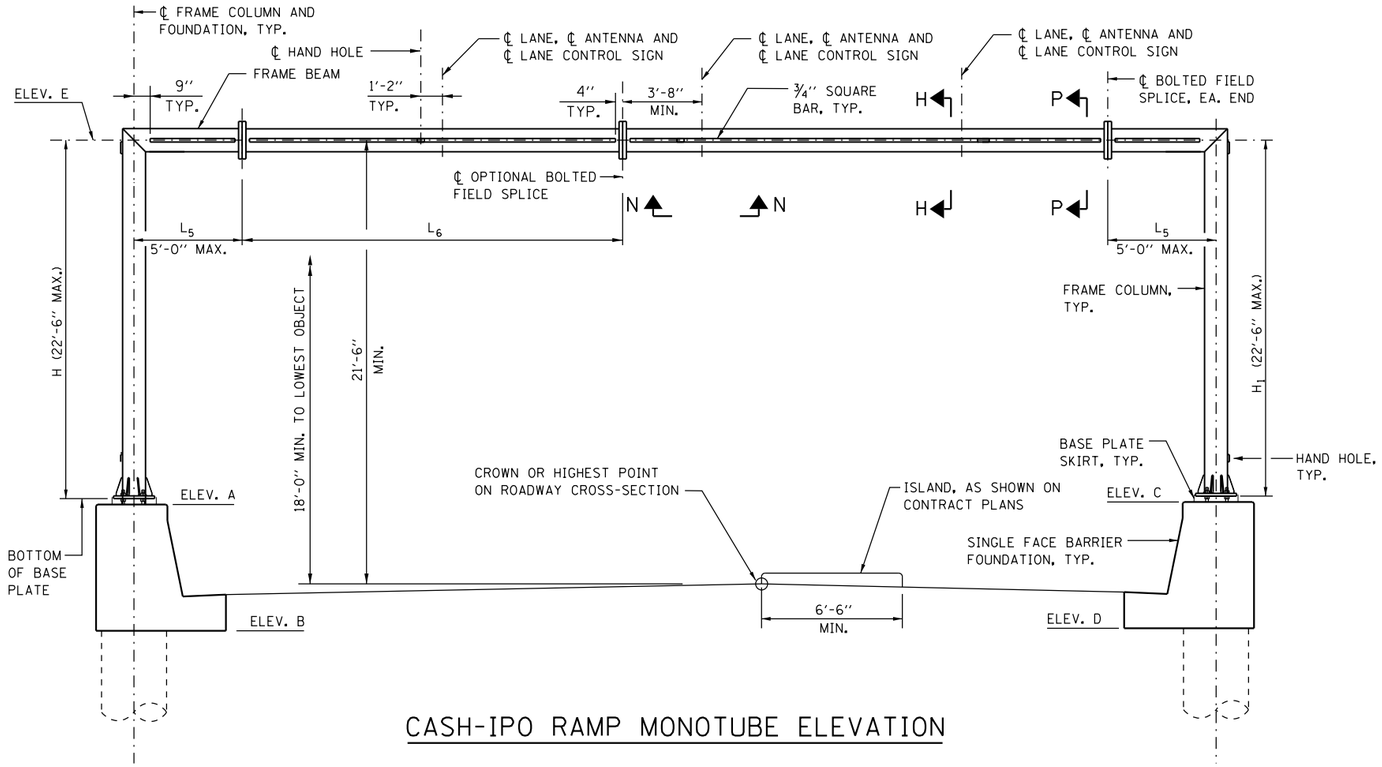

## VIEW N-N (CONDUIT COUPLER DETAIL)




## SECTION S-S




## BASE PLATE PLAN MONOTUBE FRAME




## CASH-IPO RAMP MONOTUBE ELEVATION

## MONOTUBE FRAME TABLE

| SPAN "S" | FRAME COLUMN | FRAME BEAM | CAMBER |
|---|---|---|---|
| 60' MAX. | HSS 12.75x0.500 | HSS 12.75x0.500 | 2½" |

SEE STANDARD F13 FOR SPANS GREATER THAN 60'

## NOTES:

1. WORK THIS SHEET WITH OVERHEAD SIGN STRUCTURE MONOTUBE TYPE (STEEL) CASH-IPO RAMP, SUMMARY AND TOTAL BILL OF MATERIAL SHEET.
2. FOUNDATION FOR MONOTUBE FRAME IS SHOWN ON SHEET 5 OF THIS SERIES.
3. SEE SHEET 4 OF THIS SERIES FOR SECTIONS G-G, H-H AND K-K, VIEWS A-A AND O-O, AND HAND HOLE DETAILS.
4. SEE SHEET 3 OF THIS SERIES FOR SECTION P-P AND BASE PLATE SKIRT.
5. PROVIDE CAMBER AT MIDSPAN OF STRUCTURE.
6. LOCATE OPTIONAL BOLTED FIELD SPLICE NEAR MIDSPAN.
7. OMIT ANTENNA AND ANTENNA MOUNTING ASSEMBLY ABOVE CASH ONLY LANE.



Paul Kovacs
APPROVED..... DATE 10-14-2014
CHIEF ENGINEER

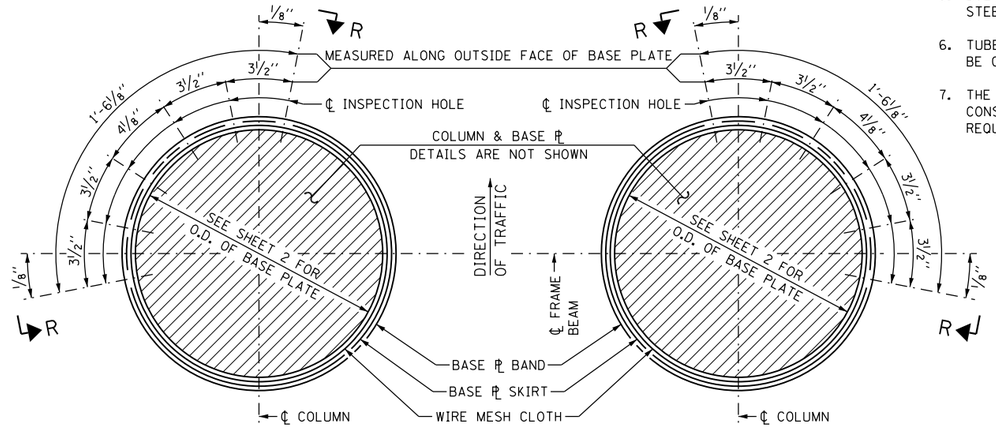
Illinois Tollway

OVERHEAD SIGN STRUCTURE
MONOTUBE TYPE (STEEL)
STRUCTURE DETAILS
FOR CASH-IPO RAMP

STANDARD F16-02

## GENERAL NOTES:

1. AFTER ADJUSTMENTS TO LEVEL FRAME BEAM AND ENSURE ADEQUATE VERTICAL CLEARANCE, TIGHTEN ALL TOP AND LEVELING NUTS AGAINST THE BASE PLATE WITH A MINIMUM TORQUE OF 200 LB.-FT. THEN PLACE STAINLESS STEEL MESH AROUND THE PERIMETER OF THE BASE PLATE. SECURE TO BASE PLATE WITH STAINLESS STEEL BANDING.
2. REINFORCEMENT BARS DESIGNATED "(E)" SHALL BE EPOXY COATED.
3. FINAL LOCATION OF I-PASS ANTENNAE SHALL BE AS DIRECTED BY THE ILLINOIS TOLLWAY.

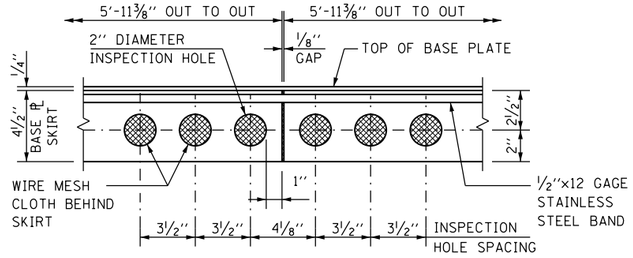



LEFT BASE PLATE — RIGHT BASE PLATE

## COLUMN BASE PLATE PLAN

## STRUCTURAL STEEL:

1. MATERIAL FOR THE MONOTUBE FRAME AND RECTANGULAR HSS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A500 GRADE B. BASE PLATE AND STIFFENER PLATE SHALL CONFORM TO ASTM A709 GRADE 50. OTHER STRUCTURAL STEEL SHAPES AND PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A36, UNLESS NOTED OTHERWISE.
2. PIPES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A53 GRADE B.
3. ANCHOR BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F1554 (AASHTO M314) GRADE 55, WITH A MINIMUM TENSILE STRENGTH OF 75,000 PSI. THEY SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 (AASHTO M232). SEE SHEET 6 OF THIS SERIES FOR GALVANIZED LENGTH.
4. U-BOLTS SHALL BE STAINLESS STEEL. PROVIDE STAINLESS STEEL WASHERS AND NUTS FOR U-BOLTS.
5. BOLTS (EXCLUDING ANCHOR BOLTS AND U-BOLTS) SHALL BE HIGH STRENGTH STEEL BOLTS.
6. TUBES FOR MONOTUBE FRAME, PIPES, STRUCTURAL STEEL SHAPES AND PLATES SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123 AFTER FABRICATION.
7. THE MONOTUBE FRAME BEAM, COLUMNS, BASE PLATE MATERIAL, AND SPLICES ARE CONSIDERED TENSION MEMBERS AND SHALL CONFORM TO THE IMPACT TESTING REQUIREMENT, ZONE 2.




## VIEW R-R (BASE PLATE SKIRT)

## DESIGN LOADING:

WIND LOAD CRITERIA
SIGN PANEL 35 P.S.F.
COLUMN/BEAM 35 P.S.F.

## EQUIPMENT LOADS:

| | |
|---|---|
| LED LANE CONTROL SIGN | 50 LB. |
| ANTENNA | 28 LB. |

## DESIGN STRESSES FOR REINFORCED CONCRETE:

f'c = COMPRESSIVE STRENGTH OF CONCRETE (CLASS SI) = 3,500 P.S.I.
f'c = COMPRESSIVE STRENGTH OF CONCRETE (CLASS DS) = 4,000 P.S.I.
fy = YIELD STRENGTH OF REINFORCEMENT BARS (GRADE 60) = 60,000 P.S.I.

## FOUNDATION:

MINIMUM UNCONFINED COMPRESSIVE STRENGTH, Qu FOR ALL LAYERS OF COHESIVE SOILS (CLAYS) SHALL BE 1.25 TON/SQ.FT. AT RAMP FRAMES.

## DESIGN SPECIFICATIONS:

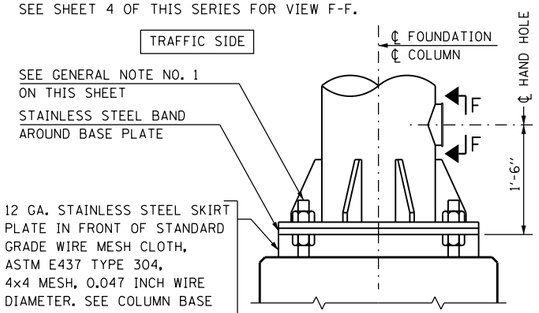
1. ILLINOIS TOLLWAY STRUCTURE DESIGN MANUAL, LATEST EDITION.
2. AASHTO STANDARD SPECIFICATION FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS, 6TH EDITION.
3. AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 6TH EDITION DATED FEBRUARY 2012.
4. ILLINOIS DEPARTMENT OF TRANSPORTATION BRIDGE MANUAL, JANUARY 2012

## CONSTRUCTION SPECIFICATIONS:

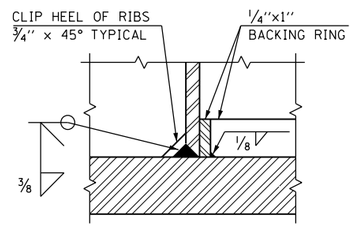
1. ILLINOIS TOLLWAY SUPPLEMENTAL SPECIFICATIONS TO THE ILLINOIS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION.
2. ILLINOIS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION.

## NOTE:

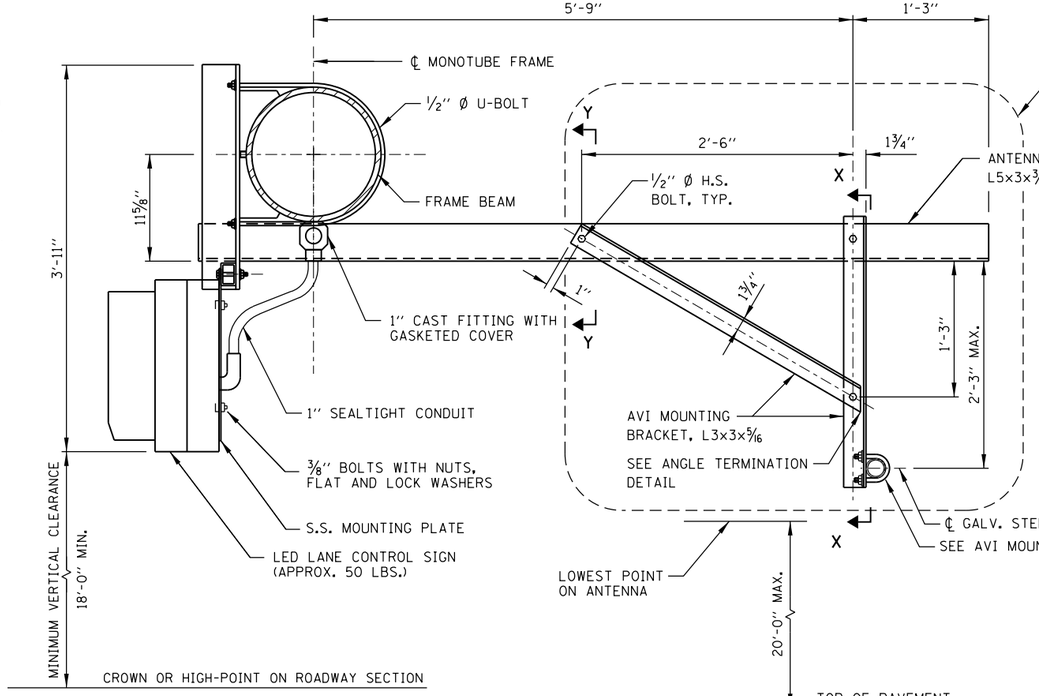
SEE SHEET 4 OF THIS SERIES FOR VIEW F-F.



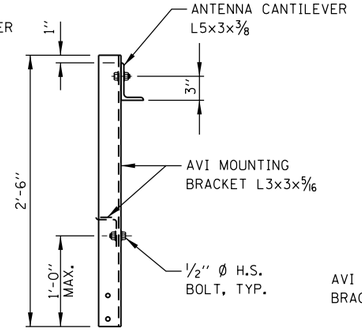

## COLUMN BASE



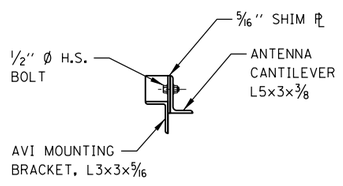

## DETAIL T



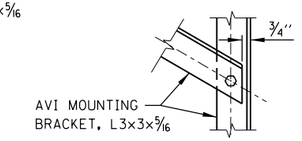

## SECTION P-P
(LED LANE CONTROL SIGNAL MOUNTING DETAIL)



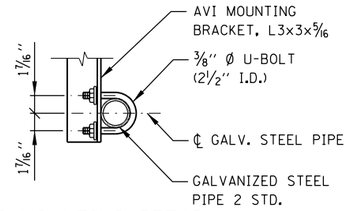

## SECTION X-X




## SECTION Y-Y




## ANGLE TERMINATION




## AVI MOUNTING DETAIL

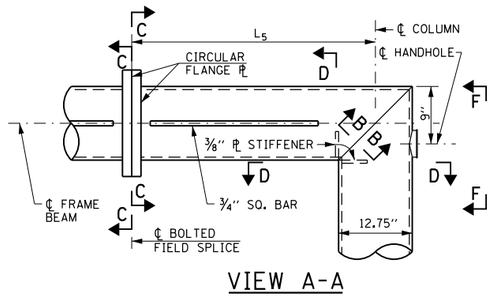
APPROVED Paul Kovacs, CHIEF ENGINEER DATE 10-14-2014

SHEET 3 OF 6

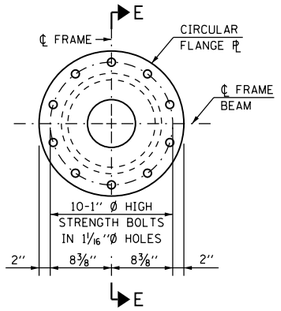
Illinois Tollway

OVERHEAD SIGN STRUCTURE
MONOTUBE TYPE (STEEL)
STRUCTURE DETAILS
FOR CASH-IPO RAMP

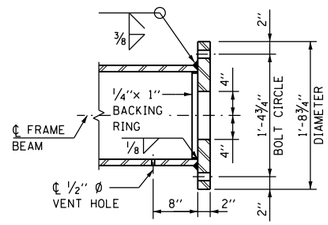
STANDARD F16-02



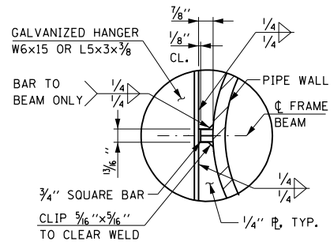

VIEW A-A




SECTION C-C

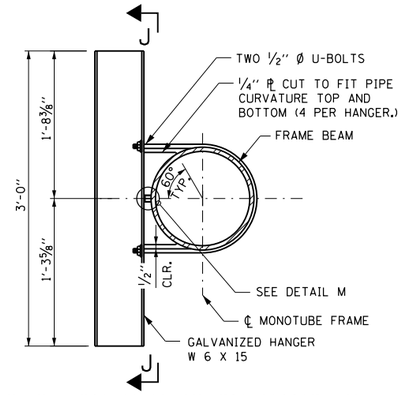



SECTION E-E

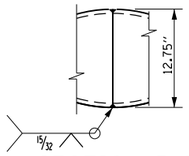



DETAIL M

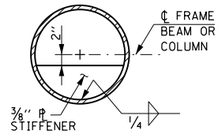
(AT SIGN HANGER AND ANTENNA HANGER)



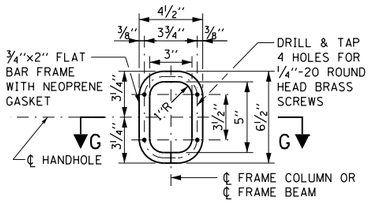

SECTION H-H (SIGN HANGER)




SECTION B-B



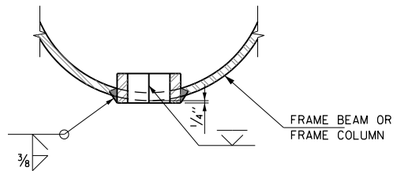

SECTION D-D



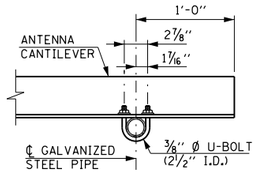

PROVIDE 6½"x4½" #10 GA. COVER.
ROUND CORNERS TO 1¾" RADIUS.
PROVIDE FOUR 5/16" Ø HOLES.

VIEW F-F

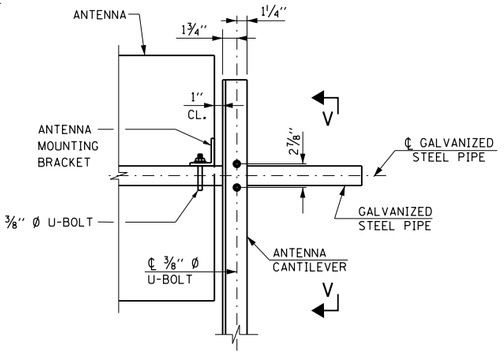
(HAND HOLE DETAIL)



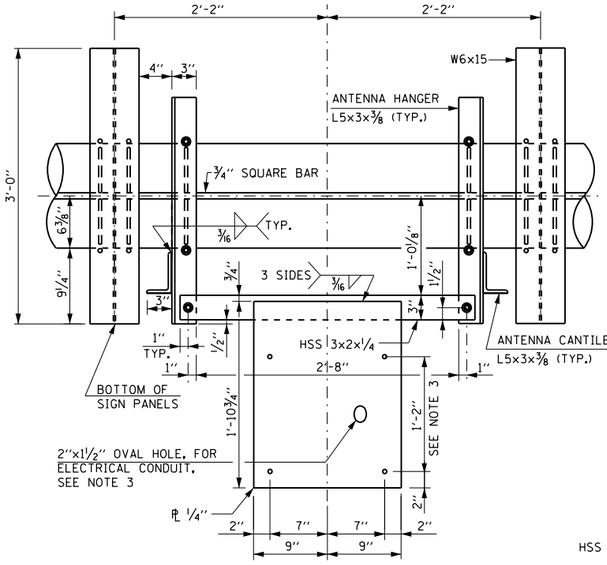

SECTION G-G



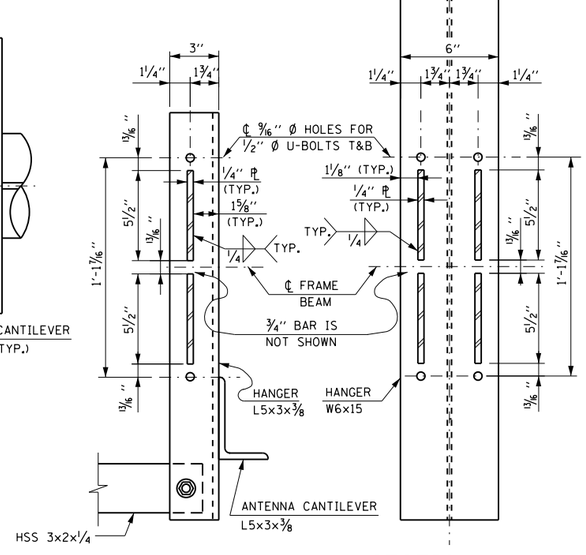

VIEW V-V



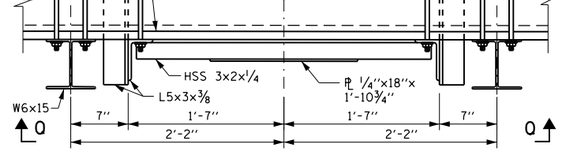

DETAIL W



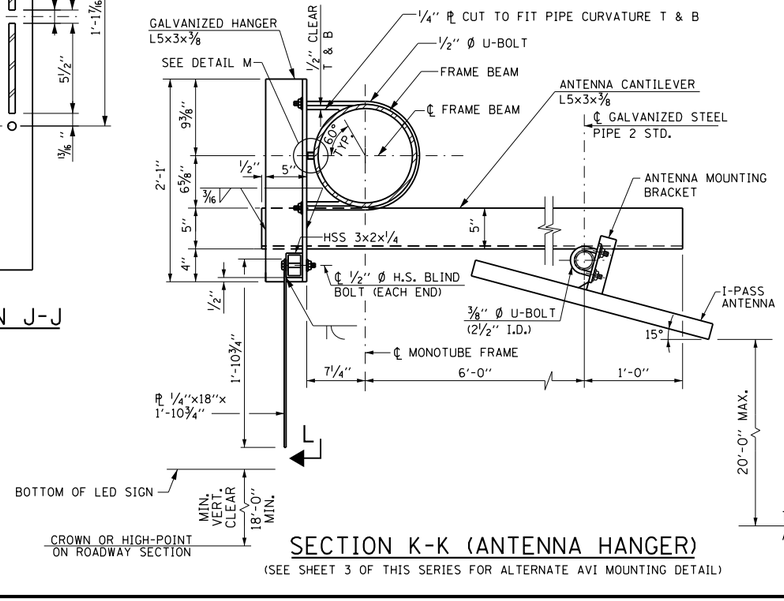

VIEW Q-Q




SECTION L-L SECTION J-J




DETAIL P




SECTION K-K (ANTENNA HANGER)

(SEE SHEET 3 OF THIS SERIES FOR ALTERNATE AVI MOUNTING DETAIL)

## NOTES:

1. SIGN AND SIGN HANGER ARE OMITTED FROM VIEW A-A FOR CLARITY.
2. FOR DETAILS OF ATTACHMENT BETWEEN HANGER AND SIGN PANELS, SEE ILLINOIS TOLLWAY STANDARD DRAWING F10.
3. CONTRACTOR SHALL VERIFY LOCATION AND SIZE OF HOLES WITH LANE CONTROL SIGNAL PRIOR TO FABRICATION OF ¼" PLATE.
4. T&B DENOTE TOP AND BOTTOM.
5. PROVIDE ANTENNA MOUNTING BRACKET ACCORDING TO ANTENNA MANUFACTURER'S RECOMMENDATION.
6. SEE SHEET 2 OF THIS SERIES FOR HANDHOLE LOCATIONS.

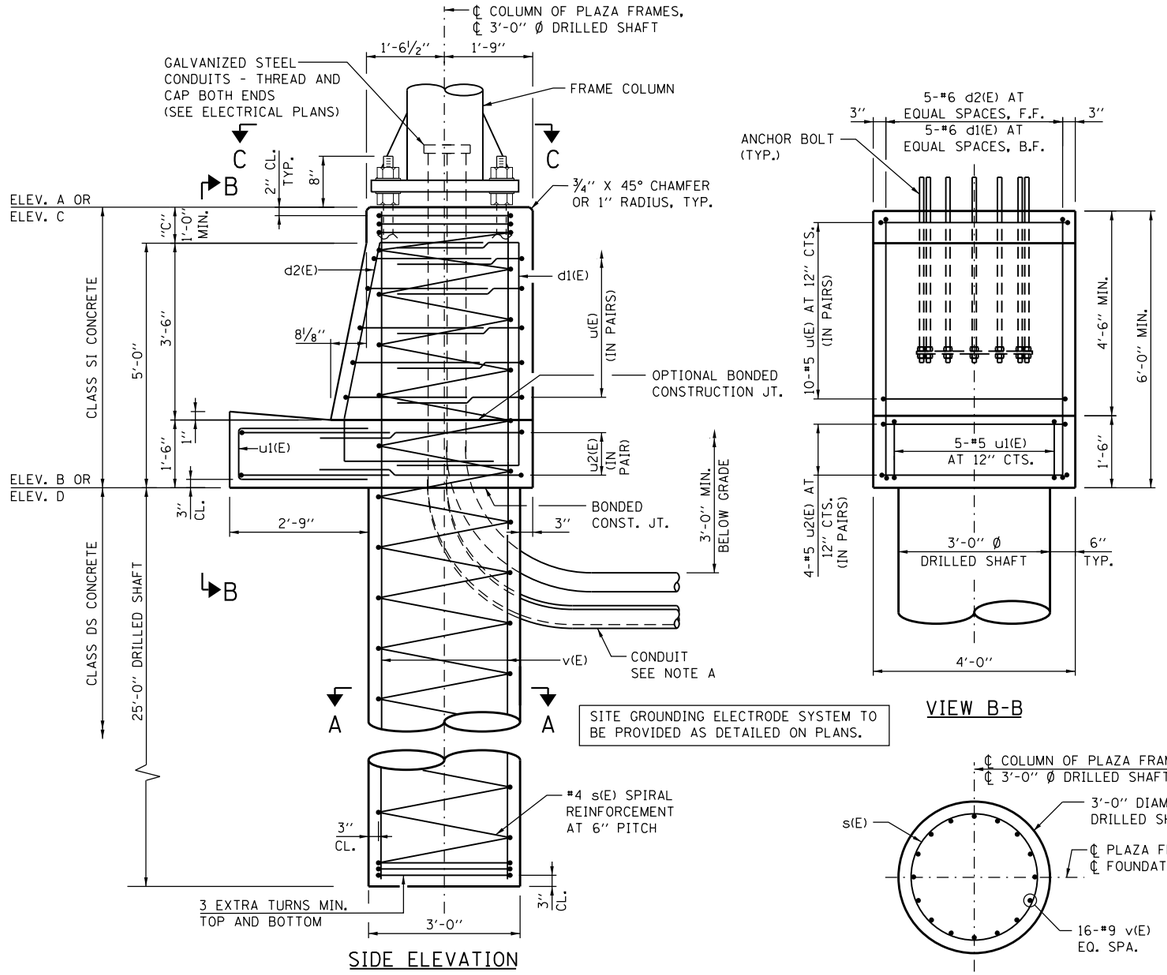


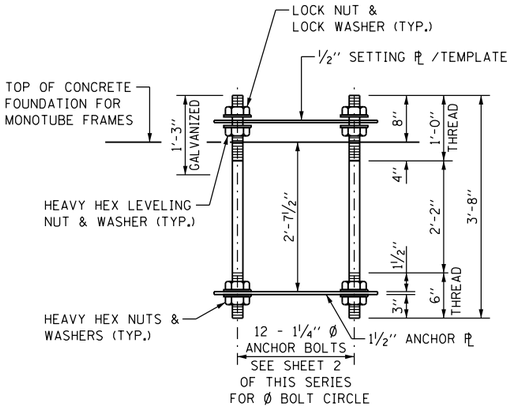
Paul Kovacs
APPROVED ..... DATE 10-14-2014
CHIEF ENGINEER

Illinois Tollway

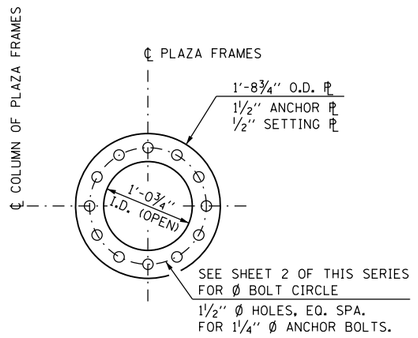
OVERHEAD SIGN STRUCTURE
MONOTUBE TYPE (STEEL)
STRUCTURE DETAILS
FOR CASH-IPO RAMP

STANDARD F16-02

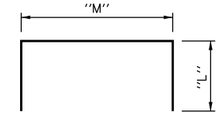



## ANCHOR BOLT ASSEMBLY

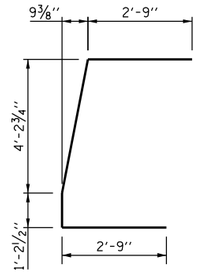



## ANCHOR PL / SETTING PL




| BAR | "L" | "M" | |
|---|---|---|---|
| d1(E) | 2'-9" | 5'-7" | ** |
| u(E) | 2'-9" | 3'-8" | |
| u1(E) | 3'-3" | 1'-1" | |
| u2(E) | 3'-10" | 3'-8" | |

## BARS d1(E), u(E), u1(E) AND u2(E)




## BAR d2(E)

## REINFORCEMENT BAR SCHEDULE

FOR ONE FOUNDATION

| | BAR | NO. | SIZE | LENGTH | SHAPE |
|---|---|---|---|---|---|
| ** | d1(E) | 5 | #6 | 11'-1" | |
| ** | d2(E) | 5 | #6 | 11'-1" | |
| | | | | | |
| * | s(E) | 1 | #4 | 30'-7" | |
| | | | | | |
| ** | v(E) | 16 | #9 | 30'-7" | |
| | | | | | |
| | u(E) | 10 | #5 | 9'-2" | |
| | u1(E) | 5 | #5 | 7'-7" | |
| | u2(E) | 4 | #5 | 11'-4" | |

* THE LENGTH OF SPIRAL SHOWN IS THE HEIGHT OF SPIRAL, COMPUTED USING "C" = 1'-0". ADJUST LENGTH ACCORDINGLY IF "C" IS GREATER THAN 1'-0".

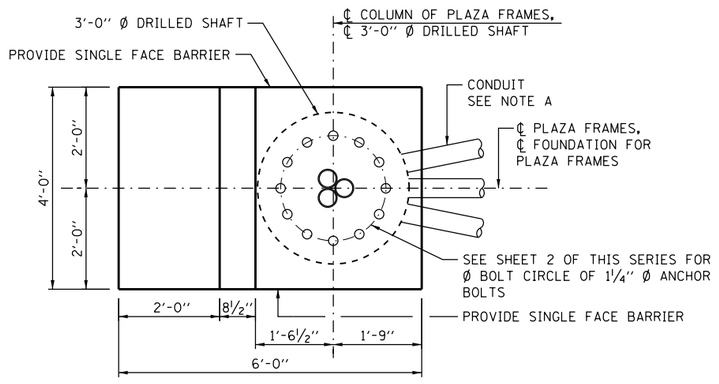
** BAR LENGTH IS COMPUTED USING "C" = 1'-0". ADJUST BAR LENGTH ACCORDINGLY IF "C" IS GREATER THAN 1'-0".

## ESTIMATED QUANTITY

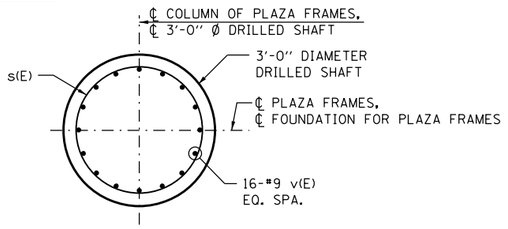
| ITEM | UNIT | SINGLE FACE BARRIER FDN. |
|---|---|---|
| CLASS SI CONCRETE | CU. YD. | 3.8 |
| CLASS DS CONCRETE | CU. YD. | 6.6 |
| REINFORCEMENT BARS, EPOXY COATED | POUND | 2,040 |
| PROTECTIVE COAT | SQ. YD. | 4.4 |

**NOTE:**

QUANTITIES FOR SINGLE FACE BARRIER FOUNDATION ARE DETERMINED USING "C" = 1'-0". IF DIMENSION "C" IS GREATER THAN 1'-0", ADJUST QUANTITIES ACCORDINGLY.




## VIEW C-C




## SECTION A-A

## NOTE A:

1. COORDINATE CONDUIT SIZE, LOCATION AND QUANTITY WITH ELECTRICAL PLANS. PROVIDE CONDUIT COUPLERS AS REQUIRED.
2. CONDUITS SHALL BE PLACED TO MISS REINFORCEMENT. CUTTING OF REINFORCEMENT SHALL NOT BE ALLOWED.
3. COST INCLUDED IN FOUNDATION FOR OVERHEAD SIGN STRUCTURE, RAMP MONOTUBE TYPE.
4. PROTECTIVE COAT SHALL BE APPLIED TO THE TRAFFIC AND TOP FACES OF BARRIER AND TOP OF GUTTER.

## FOUNDATIONS:

THE FOUNDATION DETAILS SHOWN ARE BASED ON THE PRESENCE OF MOSTLY COHESIVE SOIL CONDITIONS (SILTY OR SANDY CLAY), WITH AN AVERAGE UNCONFINED COMPRESSIVE STRENGTH (QU) > 1.25 TON/SQ. FT. WHICH SHALL BE DETERMINED BY PREVIOUS SOIL INVESTIGATIONS AT THE JOBSITE. WHEN OTHER CONDITIONS ARE INDICATED, THE BORING DATA SHALL BE INCLUDED IN THE PLANS AND THE FOUNDATION DIMENSIONS SHOWN SHALL BE THE RESULT OF SITE SPECIFIC DESIGNS. IF CONDITIONS ENCOUNTERED IN THE FIELD ARE DIFFERENT THAN THOSE INDICATED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER TO DETERMINE IF THE FOUNDATION DIMENSIONS NEED TO BE MODIFIED.

## LEGEND:

F.F. - FRONT FACE
B.F. - BACK FACE
CTS. - CENTERS

# SINGLE FACE BARRIER FOUNDATION FOR PLAZA FRAMES

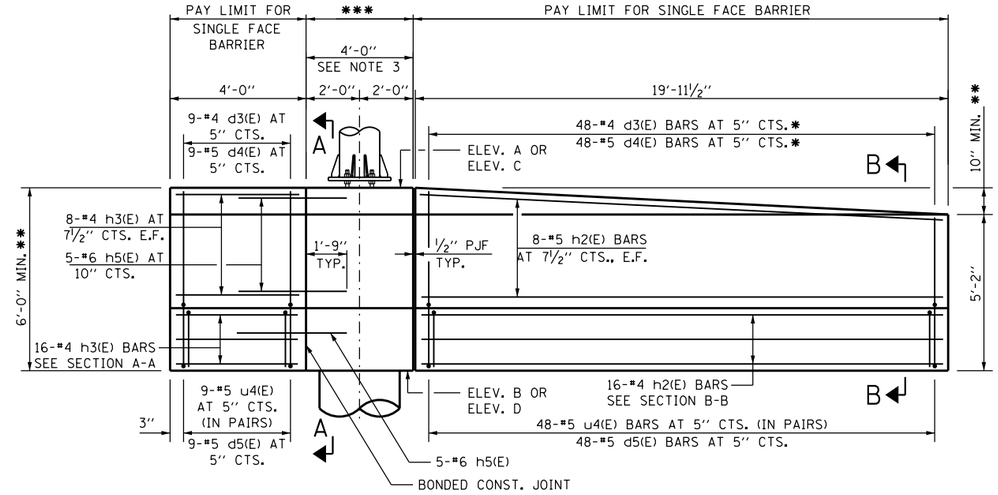
Paul Kovacs
APPROVED ..... DATE 10-14-2014
CHIEF ENGINEER



Illinois Tollway

OVERHEAD SIGN STRUCTURE
MONOTUBE TYPE (STEEL)
STRUCTURE DETAILS
FOR CASH-IPO RAMP

STANDARD F16-02



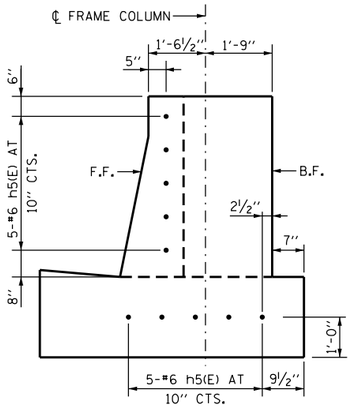

* CUT IN FIELD AS REQUIRED TO FIT TAPER
** BASED ON DIMENSION "C" = 1'-0"
*** PAY LIMIT FOR FOUNDATION FOR OVERHEAD SIGN STRUCTURE

## SINGLE FACE BARRIER ELEVATION

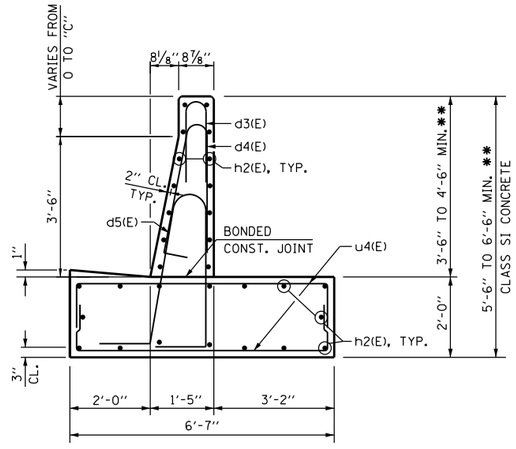
INSIDE FACE OF RIGHT BARRIER IS SHOWN
(MIRROR ELEVATION OF LEFT BARRIER)

## BAR LIST - ONE BARRIER

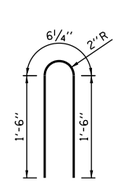
| BAR | NO. | SIZE | LENGTH | SHAPE |
|---|---|---|---|---|
| d3(E) | 57 | #4 | 3'-7" | |
| d4(E) | 57 | #5 | 7'-0" | |
| d5(E) | 57 | #5 | 9'-10" | |
| | | | | |
| h2(E) | 28 | #4 | 19'-7" | |
| h3(E) | 28 | #4 | 3'-8" | |
| h5(E) | 10 | #6 | 3'-9" | |
| | | | | |
| u4(E) | 114 | #5 | 9'-3" | |
| | | | | |
| | | | | |



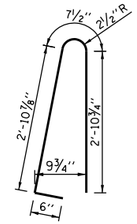

## SECTION A-A



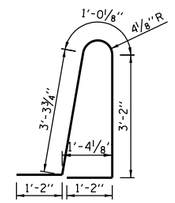

## SECTION B-B



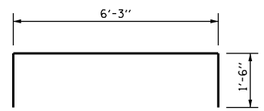

## BAR d3(E)




## BAR d4(E)




## BAR d5(E)




## BAR u4(E)

## ESTIMATED QUANTITY

(FOR ONE SINGLE FACE BARRIER)

| ITEM | UNIT | TOTAL |
|---|---|---|
| CONCRETE STRUCTURES | CU. YD. | 15.4 |
| REINFORCEMENT BARS, EPOXY COATED | POUND | 2,730 |
| PROTECTIVE COAT | SQ. YD. | 18.4 |

## NOTES:

1. PROTECTIVE COAT SHALL BE APPLIED TO THE TRAFFIC AND TOP FACES OF THE BARRIER, GUTTER AND TO THE ENTRANCE SIDE FACE (AT THE BEGINNING OF THE RAMP PLAZA PAVEMENT) FOR THE FULL HEIGHT OF THE BARRIER.
2. ELECTRICAL JUNCTION BOXES SHALL BE EXTERIOR MOUNTED ON THE BACK FACE OF BARRIER.
3. FOR SINGLE FACE BARRIER FOUNDATION DETAILS FOR MONOTUBE FRAMES, SEE SHEET 5 OF THIS SERIES.
4. QUANTITIES FOR SINGLE FACE BARRIER ARE DETERMINED USING "C" = 1'-0". IF DIMENSION "C" IS GREATER THAN 1'-0", ADJUST QUANTITIES ACCORDINGLY.
5. WORK THIS SHEET WITH, OVERHEAD SIGN STRUCTURE MONOTUBE TYPE (STEEL) CASH-IPO RAMP SUMMARY AND TOTAL BILL OF MATERIAL SHEET.

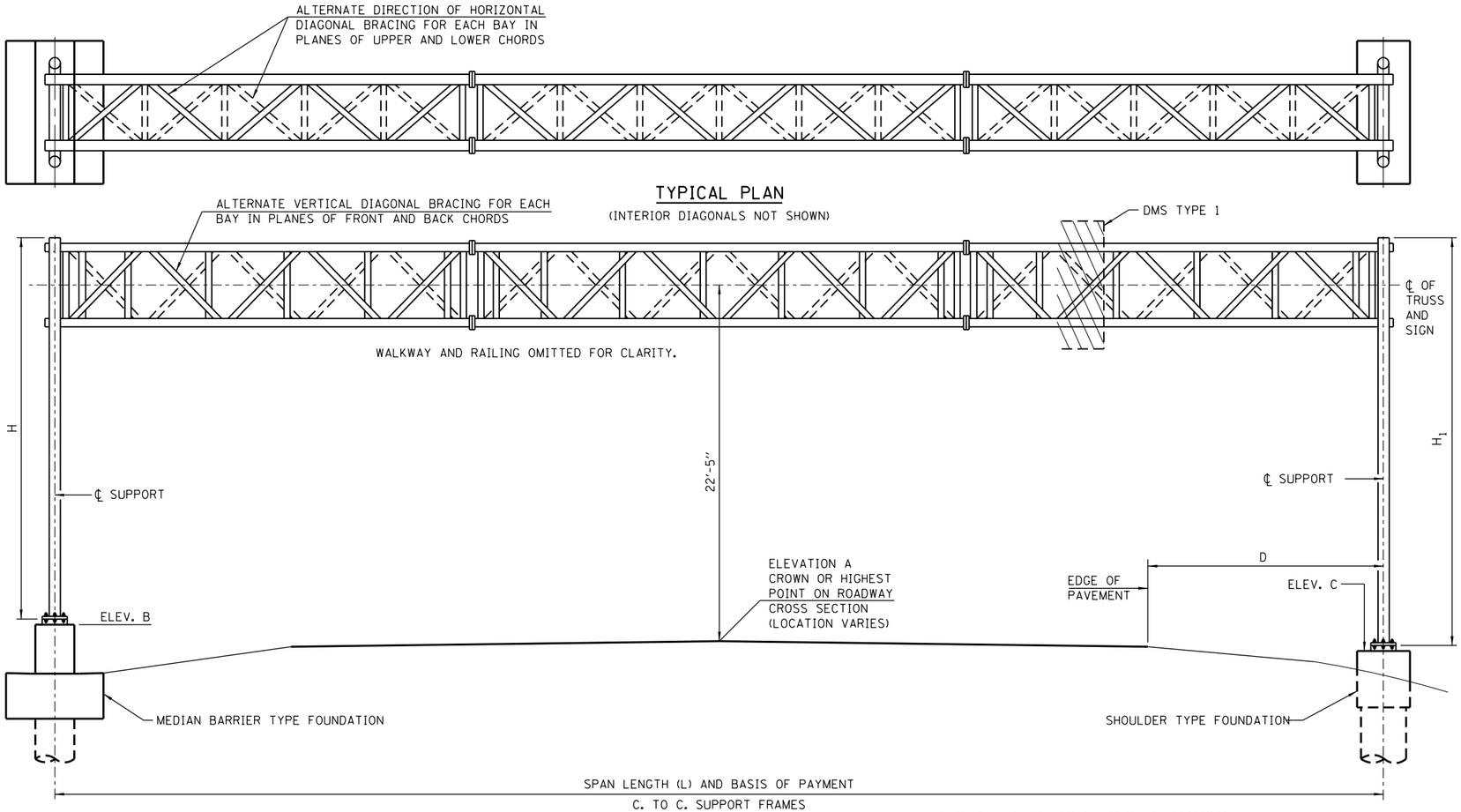
Paul Kovacs
APPROVED ..... CHIEF ENGINEER
DATE 10-14-2014



Illinois Tollway

OVERHEAD SIGN STRUCTURE
MONOTUBE TYPE (STEEL)
STRUCTURE DETAILS
FOR CASH-IPO RAMP

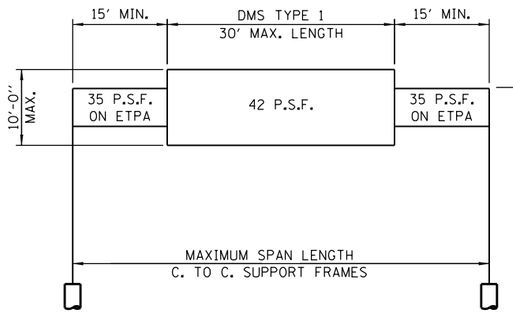
STANDARD F16-02




## TYPICAL PLAN

(INTERIOR DIAGONALS NOT SHOWN)

ELEV. A = ELEVATION AT POINT OF MINIMUM CLEARANCE TO DMS, WALKWAY SUPPORT OR TRUSS.




## TYPICAL ELEVATION

(LOOKING AT FACE OF SIGN)

## DESIGN WIND LOADING DIAGRAM

ETPA = EFFECTIVE TRUSS PROJECTED AREA.
MAXIMUM DMS WEIGHT = 5000 LBS.

## MATERIAL SPECIFICATIONS TABLE FOR STRUCTURAL STEEL AND FASTENERS

| ELEMENT OF STRUCTURE | SPECIFICATION | MINIMUM YIELD STRENGTH (K.S.I.) | MINIMUM ULTIMATE STRENGTH (K.S.I.) |
|---|---|---|---|
| HOLLOW STRUCTURAL SECTIONS (HSS) | ASTM A500 GRADE B | 42 | 58 |
| STRUCTURAL STEEL PIPE | ASTM A53, TYPE E OR S, GRADE B | 35 | 60 |
| STRUCTURAL STEEL BAR, PLATES AND SHAPES | ASTM A572 GRADE 50 | 50 | 65 |
| STAINLESS STEEL BOLTS | ASTM A193 GRADE B8 OR B8M | 30 | 75 |
| STRUCTURAL STEEL BOLTS | ASTM 325, TYPE 1 | -- | 105 |
| STAINLESS STEEL LOCKNUTS | ASTM A194 GRADE 8F<br>ASTM A194 GRADE 2H | -- | -- |
| NUTS | ASTM A563 GRADE DH | -- | -- |
| STEEL WASHERS | ASTM F436 | -- | -- |
| STAINLESS STEEL WASHERS | ASTM A240, TYPE 302 | -- | -- |
| STEEL ANCHOR BOLTS | AASHTO M314 OR ASTM F1554 | 105 | 125 |

## GENERAL NOTES:

1. WORK THIS SHEET WITH, OVERHEAD SIGN STRUCTURE SPAN TYPE (STEEL) SUMMARY AND BILL OF MATERIAL SHEET.
2. AFTER ADJUSTMENTS TO LEVEL TRUSS AND ENSURE ADEQUATE VERTICAL CLEARANCE, ALL TOP AND LEVELING NUTS SHALL BE TIGHTENED AGAINST THE BASE PLATE WITH A MINIMUM TORQUE OF 200 LB.-FT. STAINLESS STEEL MESH SHALL THEN BE PLACED AROUND THE PERIMETER OF THE BASE PLATE. SECURE TO BASE PLATE WITH STAINLESS STEEL BANDING.
3. SIGN SUPPORT STRUCTURES MAY BE SUBJECT TO DAMAGING VIBRATIONS AND OSCILLATIONS WHEN DMS IS NOT IN PLACE DURING ERECTION OR MAINTENANCE OF THE STRUCTURE. TO AVOID THESE, ATTACH TEMPORARY BLANK SIGN PANELS OR OTHER BRACING TO THE STRUCTURE UNTIL DMS IS INSTALLED.
4. TRUSS UNITS SHALL BE SHIPPED INDIVIDUALLY WITH ADEQUATE PROVISION TO PREVENT DETRIMENTAL MOTION DURING TRANSPORT. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING THE CONFIGURATION AND PROTECTION OF THE TRUSS UNITS.
5. ALL WELDS SHALL BE CONTINUOUS UNLESS OTHERWISE SHOWN. ALL WELDING SHALL BE DONE IN ACCORDANCE WITH CURRENT AWS D1.1 STRUCTURE WELDING CODE AND THE STANDARD SPECIFICATIONS.
6. INSTALLATIONS NOT WITHIN DIMENSIONAL LIMITS SHOWN REQUIRE SPECIAL ANALYSIS FOR ALL COMPONENTS.
7. ONE DMS TYPE 1 IS PERMITTED TO BE MOUNTED ON A SPAN TRUSS. DO NOT MOUNT SIGN PANELS ON THIS TRUSS.

## FABRICATION NOTES:

1. MATERIALS: SEE MATERIAL SPECIFICATIONS TABLE FOR MATERIAL SPECIFICATIONS FOR OVERHEAD SIGN STRUCTURE SPAN TYPE (STEEL). STAINLESS STEEL FOR SHIMS, SLEEVES AND HANDHOLE COVERS SHALL BE ASTM A240, TYPE 302 OR 304 OR ANOTHER ALLOY SUITABLE FOR EXTERIOR EXPOSURE AND ACCEPTABLE TO THE ENGINEER. THE STEEL PIPE AND STIFFENING RIBS AT THE BASE PLATE FOR THE STEEL POST SHALL HAVE A MINIMUM LONGITUDINAL CHARPY V-NOTCH (CVN) ENERGY OF 15 LB.-FT. AT 40°F (ZONE 2) BEFORE GALVANIZING.
2. WELDING: ALL MATERIALS, WELDING PROCEDURES AND INSPECTION USED FOR THE SPAN TYPE OVERHEAD SIGN STRUCTURE SHALL CONFORM TO AWS D1.1-10 FOR TUBULAR, CYCLICALLY LOADED STRUCTURES. ADDITIONALLY, ALL WELDED MATERIALS USED SHALL BE PREQUALIFIED FOR USE WITH WPS PER AWS D1.1-10, TABLE 3.1.
3. FASTENERS FOR STEEL TRUSSES: HIGH STRENGTH BOLTS SHALL SATISFY THE REQUIREMENTS OF AASHTO M164 (ASTM A325), OR APPROVED ALTERNATE, AND SHALL HAVE MATCHING LOCKNUTS. THREADED STUDS FOR SPLICES (IF MEMBERS INTERFERE) SHALL SATISFY THE REQUIREMENTS OF ASTM A449, ASTM A193 GRADE B7, OR APPROVED ALTERNATE, AND SHALL HAVE MATCHING LOCKNUTS. BOLTS AND LOCKNUTS NOT REQUIRED TO BE HIGH STRENGTH SHALL SATISFY THE REQUIREMENTS OF ASTM A307. ALL BOLTS AND LOCKNUTS SHALL BE HOT DIP GALVANIZED PER AASHTO M232, EXCEPT STAINLESS STEEL FASTENERS, NUTS AND WASHERS. THE LOCKNUTS SHALL HAVE NYLON OR STEEL INSERTS. A STAINLESS STEEL FLAT WASHER CONFORMING TO ASTM A240 TYPE 302 OR 304, IS REQUIRED UNDER BOTH HEAD AND NUT OR UNDER BOTH NUTS WHERE THREADED STUDS ARE USED. HIGH STRENGTH BOLT INSTALLATION SHALL CONFORM TO ARTICLE 505.04(f)(2)d OF THE IDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION. ROTATIONAL CAPACITY ("ROCAP") TESTING OF BOLTS WILL NOT BE REQUIRED.
4. U-BOLTS: U-BOLTS SHALL BE PRODUCED FROM ASTM A193 GRADE B8 OR B8M, OR AN EQUIVALENT MATERIAL ACCEPTABLE TO THE ENGINEER. ALL NUTS FOR U-BOLTS SHALL BE LOCKNUTS EQUIVALENT TO ASTM A307 WITH NYLON OR STEEL INSERTS AND HOT DIP GALVANIZED PER AASHTO M232. A STAINLESS STEEL FLAT WASHER CONFORMING TO ASTM A240, TYPE 302 OR 304, IS REQUIRED UNDER EACH U-BOLT LOCKNUT.
5. STEEL GRATING: STEEL BARS FOR GRATING ELEMENTS SHALL CONFORM TO ASTM A36 OR AN EQUIVALENT MATERIAL ACCEPTABLE TO THE ENGINEER.
6. GALVANIZING: ALL PLATES, SHAPES AND PIPE SHALL BE HOT DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH AASHTO M111. PAINTING IS NOT PERMITTED. ALL FASTENERS SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111 OR M232 AS APPROPRIATE FOR THE PRODUCT (EXCEPT STAINLESS STEEL FASTENERS).

## CONSTRUCTION SPECIFICATIONS:

1. ALL MATERIALS, EXCEPT AS SHOWN, FABRICATION, ERECTION AND CONSTRUCTION REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE LATEST STANDARD SPECIFICATIONS.

## LOADING:

1. SPAN TYPE (STEEL) TRUSS ARE DESIGNED FOR A 10'-0" DEEP DMS, WITH A MAXIMUM LENGTH OF 30'-0" AND A MAXIMUM THICKNESS OF 4'-2".
2. SPAN TYPE (STEEL) TRUSS ARE DESIGNED FOR 40 PSF WIND PRESSURE ON TRUSS MEMBERS AND 56 PSF ON DMS.
3. WALKWAY LOADING SHALL INCLUDE DEAD LOAD PLUS 500 LBS. CONCENTRATED LIVE LOAD.

## DESIGN SPECIFICATIONS:

THESE STRUCTURES ARE DESIGNED TO SATISFY THE 2015 AASHTO LRFD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS, FIRST EDITION WITH INTERIMS.

Paul Kovacs
APPROVED..... DATE 5-20-2014
CHIEF ENGINEERING OFFICER

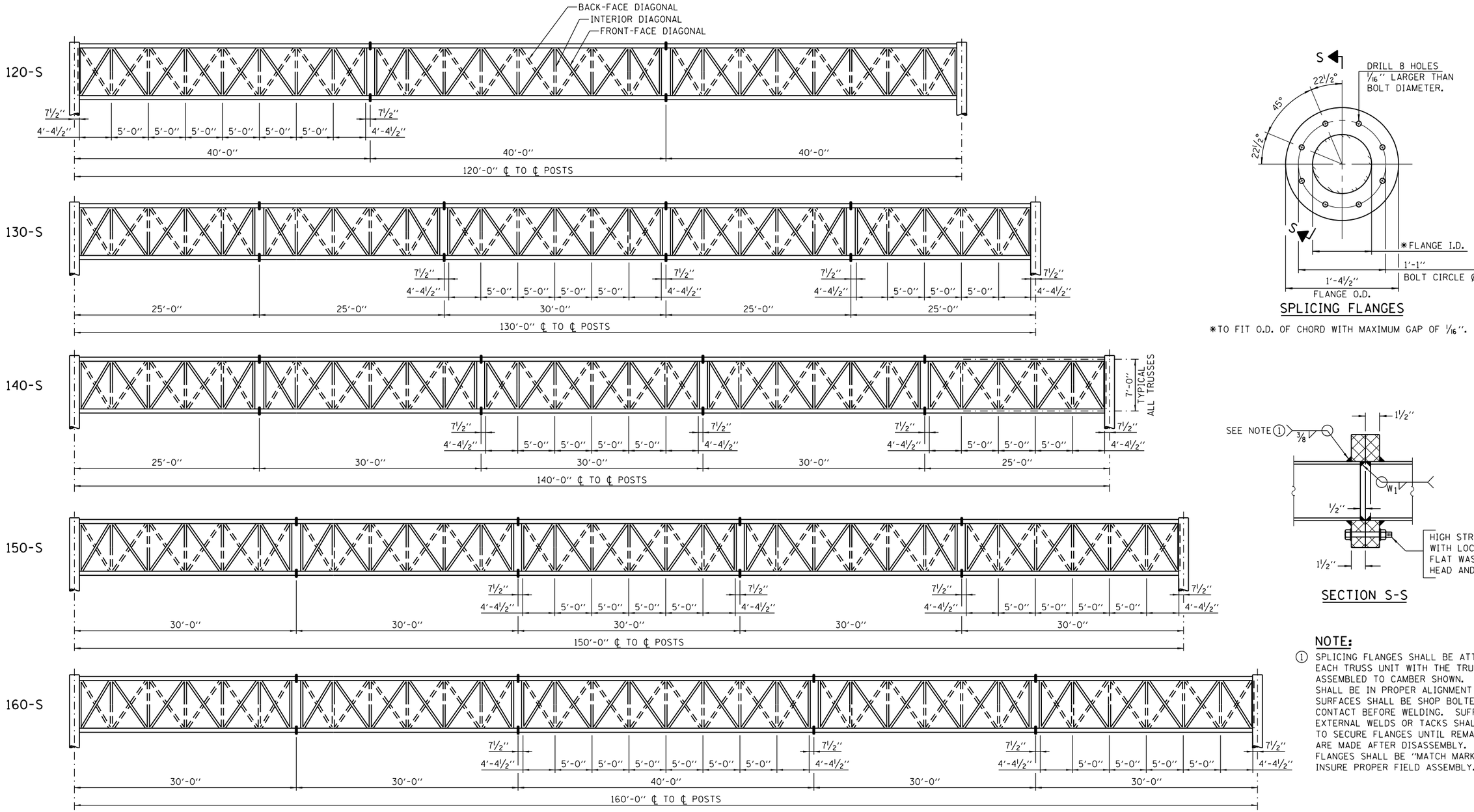


| DATE | REVISIONS |
|---|---|
| 3-31-2016 | REVISED FOUNDATION NOTE. |
| 3-31-2017 | FOUNDATION REINFORCEMENT UPDATE |
| 3-01-2018 | REVISED SIGN STRUCTURE |
| 3-01-2019 | UPDATE BARRIER SHAPE, HEIGHT AND TRANSITION LENGTH |

Illinois Tollway

OVERHEAD SIGN STRUCTURE SPAN TYPE (STEEL) STRUCTURE DETAILS

STANDARD F17-04

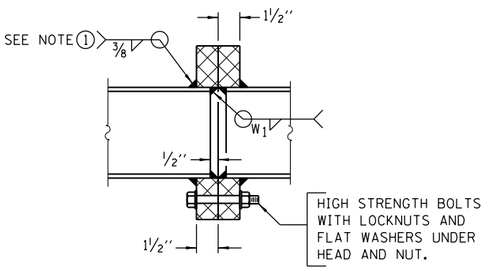



PART ELEVATION VIEWS




SPLICING FLANGES

*TO FIT O.D. OF CHORD WITH MAXIMUM GAP OF 1/16''.

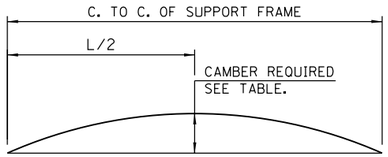



SECTION S-S

**NOTE:**

1. SPLICING FLANGES SHALL BE ATTACHED TO EACH TRUSS UNIT WITH THE TRUSS SHOP ASSEMBLED TO CAMBER SHOWN. TRUSS UNITS SHALL BE IN PROPER ALIGNMENT AND FLANGE SURFACES SHALL BE SHOP BOLTED INTO FULL CONTACT BEFORE WELDING. SUFFICIENT EXTERNAL WELDS OR TACKS SHALL BE MADE TO SECURE FLANGES UNTIL REMAINING WELDS ARE MADE AFTER DISASSEMBLY. ADJACENT FLANGES SHALL BE "MATCH MARKED" TO INSURE PROPER FIELD ASSEMBLY.

| SPAN LENGTH (L) | CAMBER |
|---|---|
| 120' | 2¾'' |
| 130' | 3¼'' |
| 140' | 4'' |
| 150' | 4¼'' |
| 160' | 5'' |




CAMBER DIAGRAM

NOTE:
1. FABRICATE TRUSS WITH CHORDS CURVED SMOOTHLY TO PROVIDE CAMBER.
2. DO NOT CAMBER BY SHIMMING AT TRUSS FIELD SPLICES OR CUTTING AND REWELDING CHORD.

TRUSS MEMBER SCHEDULE

| DESIGN TRUSS TYPE | SPAN | CHORDS | VERTICAL DIAGONALS, VERTICALS AND INTERIOR DIAGONALS | HORIZONTAL DIAGONALS | HORIZONTALS | SPLICING FLANGE | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | H.S. BOLTS | | WELD SIZE |
| | | | | | | NO./SPLICE | DIA. | $W_1$ |
| 120-S | 120' | HSS 8.625x0.322 | PIPE 3½ X-STRONG | PIPE 3 XX-STRONG | PIPE 3 X-STRONG | 8 | 1'' | ¼'' |
| 130-S | 130' | HSS 8.625x0.375 | PIPE 3½ X-STRONG | PIPE 3 XX-STRONG | PIPE 3 X-STRONG | 8 | 1'' | 5/16'' |
| 140-S | 140' | HSS 8.625x0.375 | PIPE 3½ X-STRONG | PIPE 3 XX-STRONG | PIPE 3 X-STRONG | 8 | 1'' | 5/16'' |
| 150-S | 150' | HSS 8.625x0.500 | PIPE 3½ X-STRONG | PIPE 3 XX-STRONG | PIPE 3 X-STRONG | 8 | 1'' | 7/16'' |
| 160-S | 160' | HSS 8.625x0.500 | PIPE 3½ X-STRONG | PIPE 3 XX-STRONG | PIPE 3 X-STRONG | 8 | 1¼'' | 7/16'' |

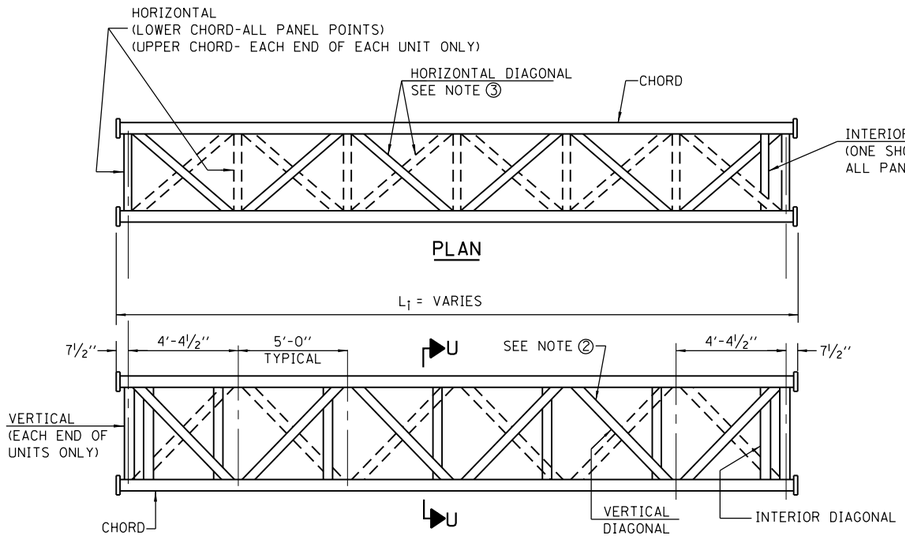
Paul Kovacs
APPROVED..... DATE 5-20-2014
CHIEF ENGINEERING OFFICER



Illinois Tollway

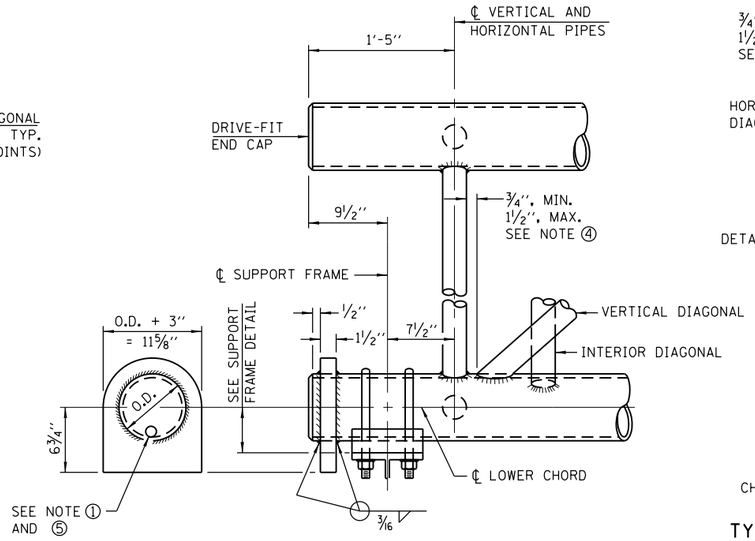
OVERHEAD SIGN STRUCTURE
SPAN TYPE (STEEL)
STRUCTURE DETAILS

STANDARD F17-04

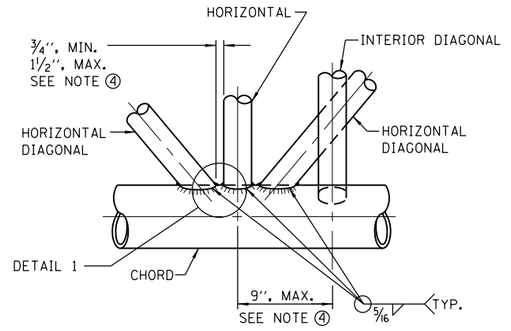


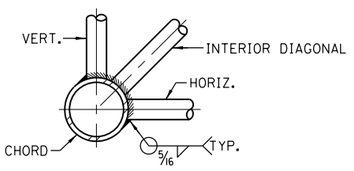

## ELEVATION
## TYPICAL INTERIOR UNIT

EVEN OR ODD NUMBER OF PANELS/EXTERIOR UNITS ALLOWED.

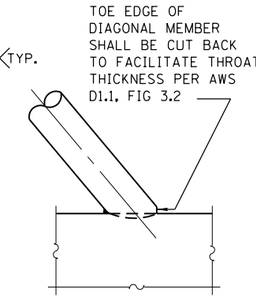



## SUPPORT END DETAIL FOR EXTERIOR UNIT

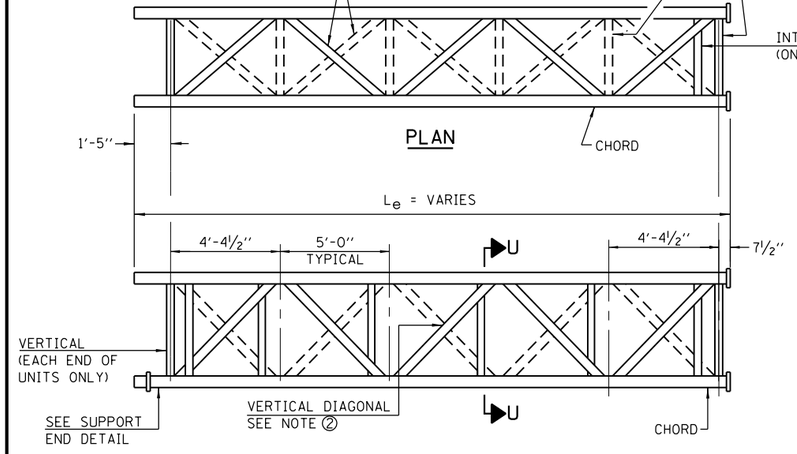



## TYPICAL JOINT DETAILS

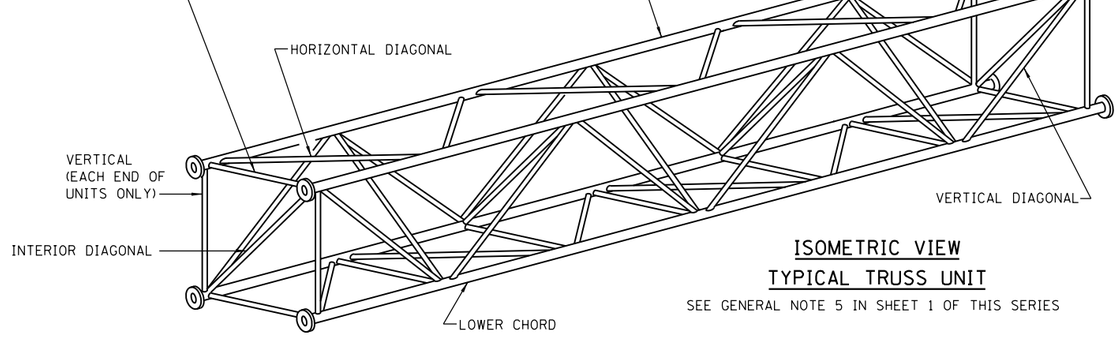



## DETAIL 1



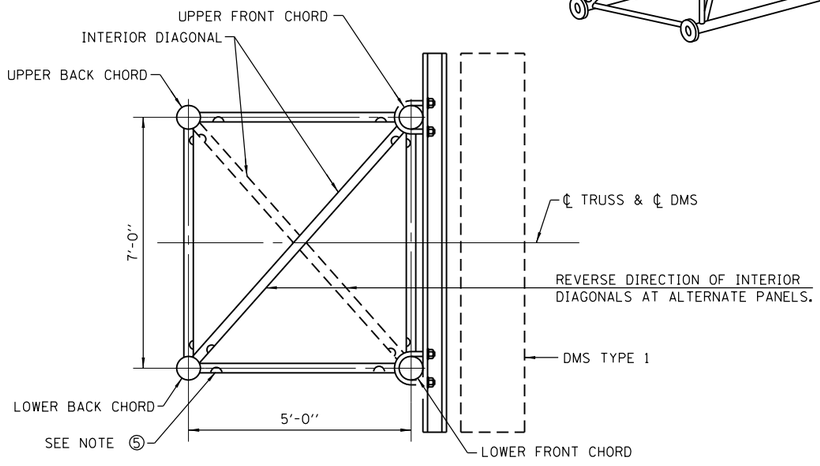

## ELEVATION
## TYPICAL EXTERIOR UNIT

EVEN OR ODD NUMBER OF PANELS/EXTERIOR UNITS ALLOWED.




## ISOMETRIC VIEW
## TYPICAL TRUSS UNIT

SEE GENERAL NOTE 5 IN SHEET 1 OF THIS SERIES




## SECTION U-U

(VERTICAL AND HORIZONTAL DIAGONALS NOT SHOWN)

## NOTES

① CONTRACTOR SHALL USE STANDARD DRIVE-FIT CAP TO CLOSE END. ½'' Ø DRAIN HOLE IN DRIVE-FIT CAP INSTALLED AFTER GALVANIZING. (TYP. AT NON-SPLICE ENDS OF CHORDS)

② VERTICAL DIAGONALS IN FRONT AND BACK FACE SHALL ALTERNATE INCLINATION.

③ HIDDEN LINES SHOW WIND BRACING ALTERNATES DIRECTION BETWEEN PLANES OF TOP AND BOTTOM CHORDS.

④ ALL DIAGONALS SHALL BE OFFSET FROM THE PANEL POINT BASED ON THE FOLLOWING: OFFSET SHALL PROVIDE A ¾'' MINIMUM TO 1½'' MAXIMUM CLEARANCE BETWEEN DIAGONAL AND ANY OTHER DIAGONAL, HORIZONTAL OR VERTICAL MEMBER, AND TO PROVIDE CLEARANCE FOR U-BOLT CONNECTIONS OF DMS TYPE 1 OR WALKWAY BRACKETS.

⑤ GALVANIZING VENT HOLES OF ADEQUATE SIZE SHALL BE PROVIDED ON UNDERSIDE AT EACH END OF TRUSS MEMBERS EXCEPT CHORDS. ALTERNATELY, HOLES MAY BE PROVIDED IN WALL OF CHORDS. ALL VENT HOLES SHALL BE DRILLED AND DE-BURRED, TYP.

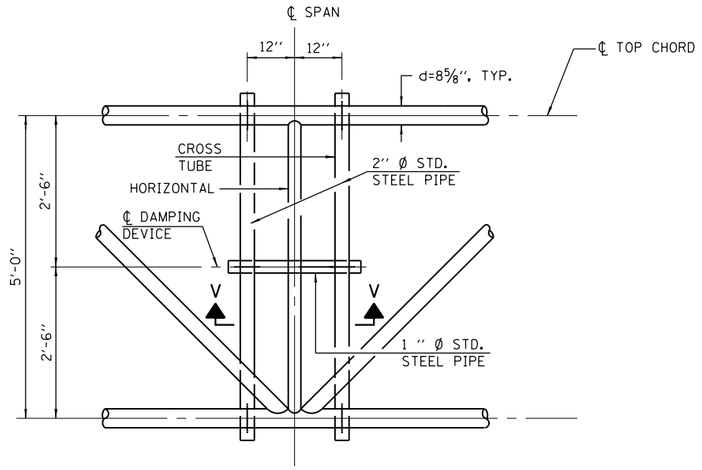


Paul Kovacs
APPROVED..... DATE 5-20-2014
CHIEF ENGINEERING OFFICER

Illinois Tollway

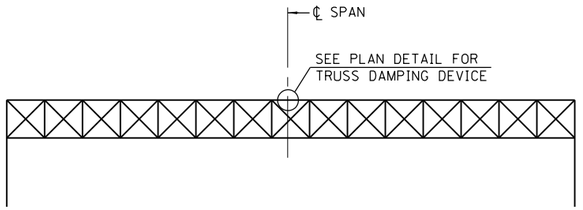
OVERHEAD SIGN STRUCTURE
SPAN TYPE (STEEL)
STRUCTURE DETAILS

STANDARD F17-04




PLAN DETAIL

℄ SPAN AT PANEL POINTS

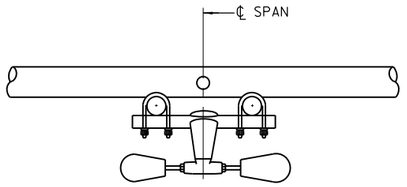



ELEVATION

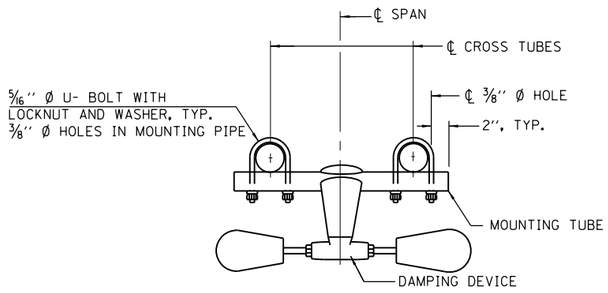
STEEL OVERHEAD SIGN TRUSS

**DAMPER NOTE:**

ONE DAMPER PER TRUSS. (31 LBS. STOCKBRIDGE-TYPE - 29'' MINIMUM BETWEEN ENDS OF WEIGHTS).

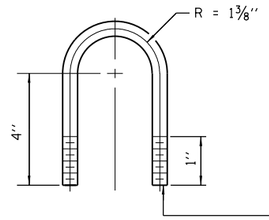



SECTION V-V



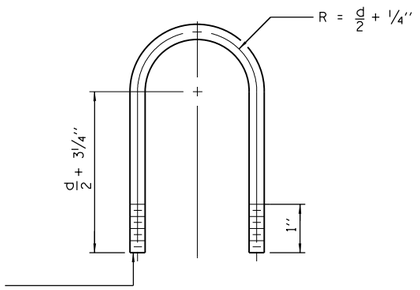

TRUSS DAMPING DEVICE CONNECTION DETAIL

(TYPICAL)




DAMPING DEVICE MOUNTING TUBE U-BOLT DETAIL

(TYPICAL)




TOP CHORD TO CROSS TUBE U-BOLT DETAIL

(TYPICAL)

Paul Kovacs

APPROVED..... DATE 5-20-2014

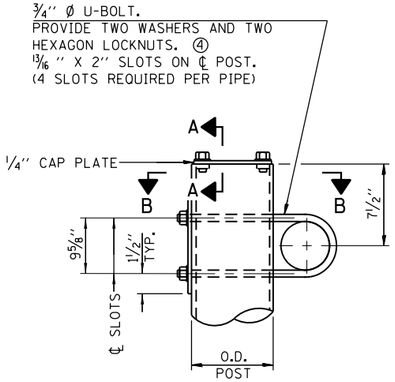
CHIEF ENGINEERING OFFICER



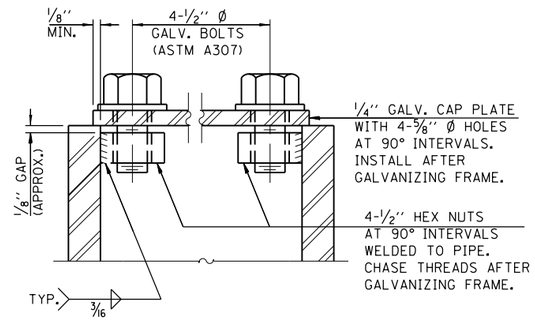
Illinois Tollway

OVERHEAD SIGN STRUCTURE
SPAN TYPE (STEEL)
STRUCTURE DETAILS

STANDARD F17-04

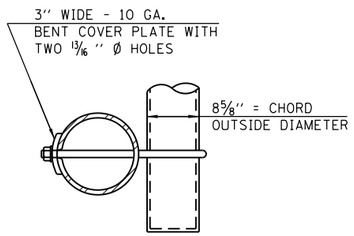



## DETAIL A




## SECTION A-A

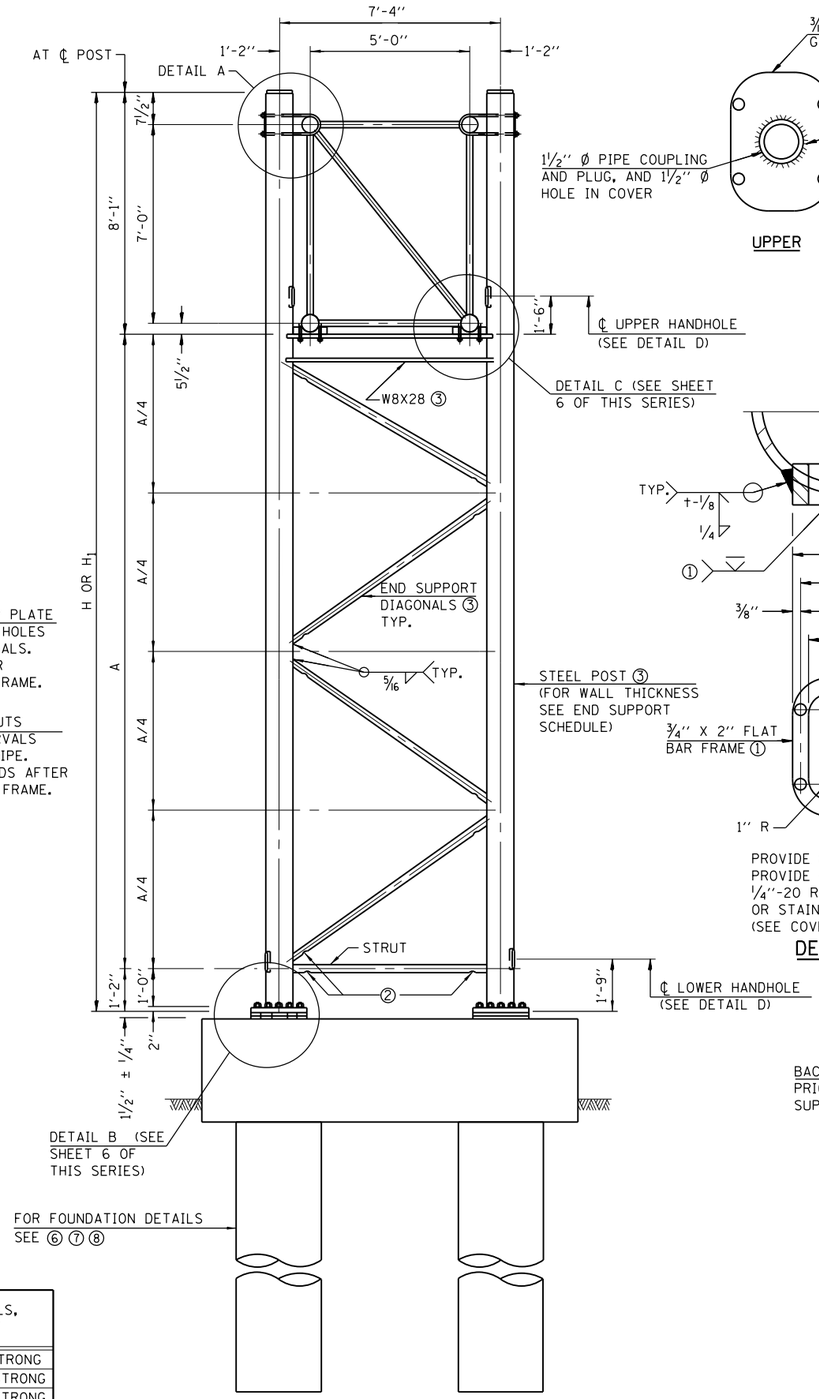
AS AN ALTERNATE TO BOLTS, MAY USE GALVANIZED DRIVE-FIT CAPS INSTALLED AFTER GALVANIZING FRAME.



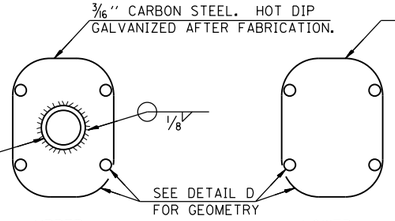

## SECTION B-B

## END SUPPORT SCHEDULE

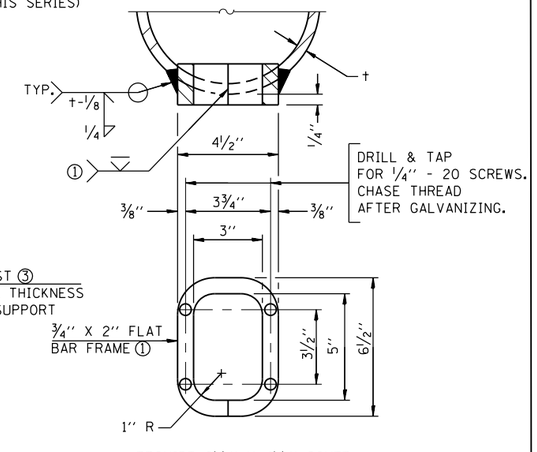
| DESIGN TRUSS TYPE | H OR $H_1$ | † | POSTS | DIAGONALS, STRUT |
|---|---|---|---|---|
| 120-S | 34' MAX. | ½'' | HSS 12.75x0.500 | PIPE 5 X-STRONG |
| 130-S | 34' MAX. | ½'' | HSS 14x0.500 | PIPE 5 XX-STRONG |
| 140-S | 34' MAX. | ½'' | HSS 14x0.500 | PIPE 5 XX-STRONG |
| 150-S | 36' MAX. | ½'' | HSS 16x0.500 | PIPE 5 XX-STRONG |
| 160-S | 36' MAX. | ½'' | HSS 16x0.500 | PIPE 5 XX-STRONG |




## SIDE ELEVATION

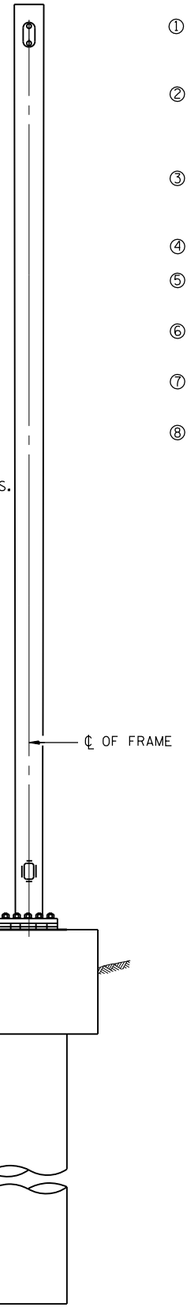



## HANDHOLE COVERS




PROVIDE 6½'' X 4½'' COVER.
PROVIDE 4-5/16'' Ø HOLES IN COVER FOR ¼''-20 ROUND HEAD HOT DIP GALVANIZED OR STAINLESS STEEL MACHINE SCREWS. (SEE COVER DETAILS)

## DETAIL D




## END ELEVATION

## END SUPPORT DETAILS

## NOTES:

① IN LIEU OF FABRICATED HANDHOLE FRAME AS SHOWN, MAY CUT FROM 2'' PLATE (ROLLING DIRECTION VERTICAL). ALL CUT FACES TO BE GROUND TO ANSI ROUGHNESS OF 500 μIN OR LESS.

② GALVANIZING VENT HOLES OF ADEQUATE SIZE SHALL BE PROVIDED ON UNDERSIDE AT EACH END OF BRACING PIPES. ALTERNATELY, HOLES MAY BE PROVIDED IN WALL OF PIPE COLUMN. ALL VENT HOLES SHALL BE DRILLED AND DE-BURRED, TYP.

③ STEEL PIPE, PLATE, CARBON STEEL HANDHOLE COVERS AND ROLLED SECTIONS SHALL BE HOT DIP GALVANIZED AFTER FABRICATION. PAINTING IS NOT PERMITTED. SEE SHEET 1 OF THIS SERIES.

④ SEE GENERAL NOTES FOR FASTENERS.

⑤ NONSTANDARD APPLICATIONS SHALL HAVE DIMENSIONS VERIFIED OR AMENDED AS APPROPRIATE.

⑥ SEE SHEET 7 OF THIS SERIES FOR SHOULDER TYPE FOUNDATION DETAILS.

⑦ SEE SHEET 8 OF THIS SERIES FOR MEDIAN BARRIER TYPE FOUNDATION DETAILS.

⑧ SEE SHEET 9 OF THIS SERIES FOR MEDIAN BARRIER TYPE FOUNDATION DETAILS WHEN EXISTING UTILITY IS PRESENT.

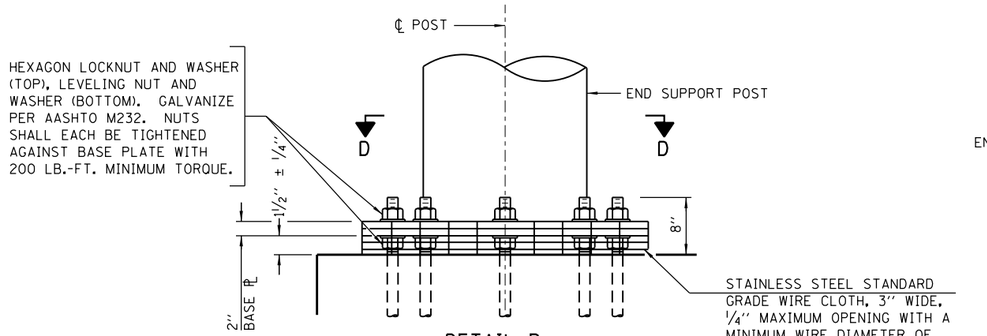
Paul Kovacs
APPROVED..... DATE 5-20-2014
CHIEF ENGINEERING OFFICER



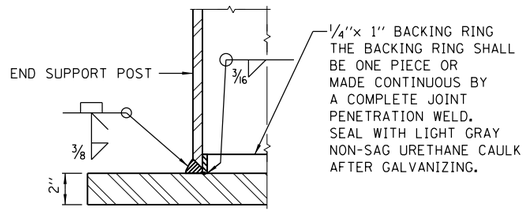
Illinois Tollway

OVERHEAD SIGN STRUCTURE
SPAN TYPE (STEEL)
STRUCTURE DETAILS

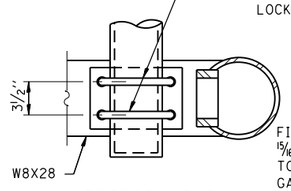
STANDARD F17-04



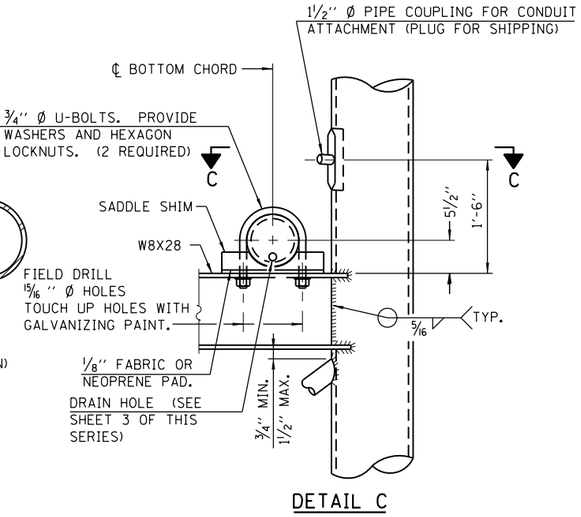

DETAIL B



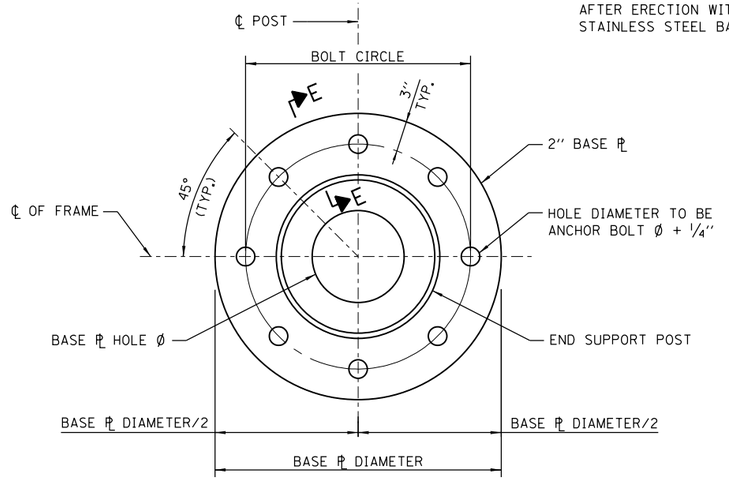

SECTION E-E



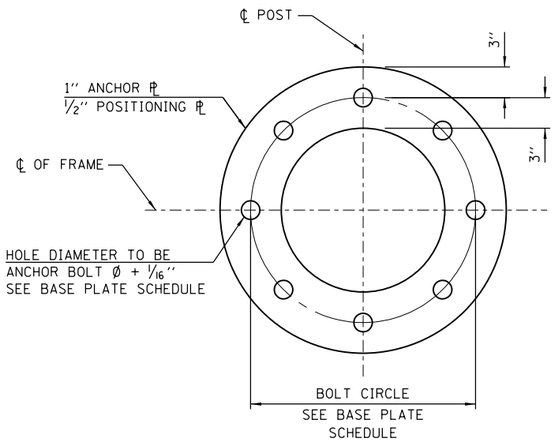

SECTION C-C
(HANDHOLE COVER NOT SHOWN)



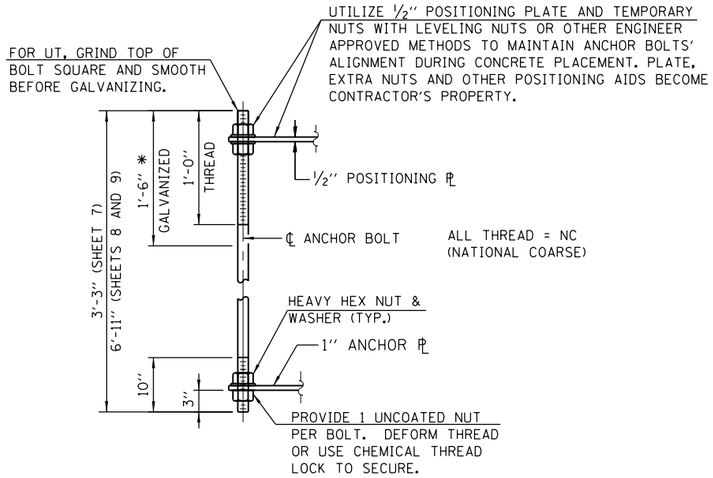

DETAIL C




SECTION D-D




POSITIONING PLATE AND ANCHOR PLATE




ANCHOR BOLT DETAIL

ANCHOR BOLTS SHALL CONFORM TO AASHTO M314 GRADE 105 AND MEET CHARPY V-NOTCH (CVN) ENERGY OF 15 LB.-FT. AT 40° F. GALVANIZE UPPER 18'' PER AASHTO M232. NO WELDING SHALL BE PERMITTED ON BOLTS.

* 18'' IS MINIMUM TO BE GALVANZIED. ENTIRE BOLT MAY BE GALVANIZED AT CONTRACTOR'S OPTION.




SADDLE SHIM DETAIL

BASE PLATE SCHEDULE

| DESIGN TRUSS TYPE | END SUPPORT POST OUTSIDE DIAMETER | BASE PLATE | | BOLT CIRCLE | ANCHOR BOLT DIA. |
|---|---|---|---|---|---|
| | | DIAMETER | HOLE Ø | | |
| 120-S | 1'-0¾'' | 2'-0¾'' | 6.75'' | 1'-6¾'' | 1½'' |
| 130-S | 14'' | 2'-2'' | 8'' | 1'-8'' | 1½'' |
| 140-S | 14'' | 2'-2'' | 8'' | 1'-8'' | 1½'' |
| 150-S | 16'' | 2'-4'' | 8'' | 1'-10'' | 1½'' |
| 160-S | 16'' | 2'-4'' | 8'' | 1'-10'' | 1¾'' |

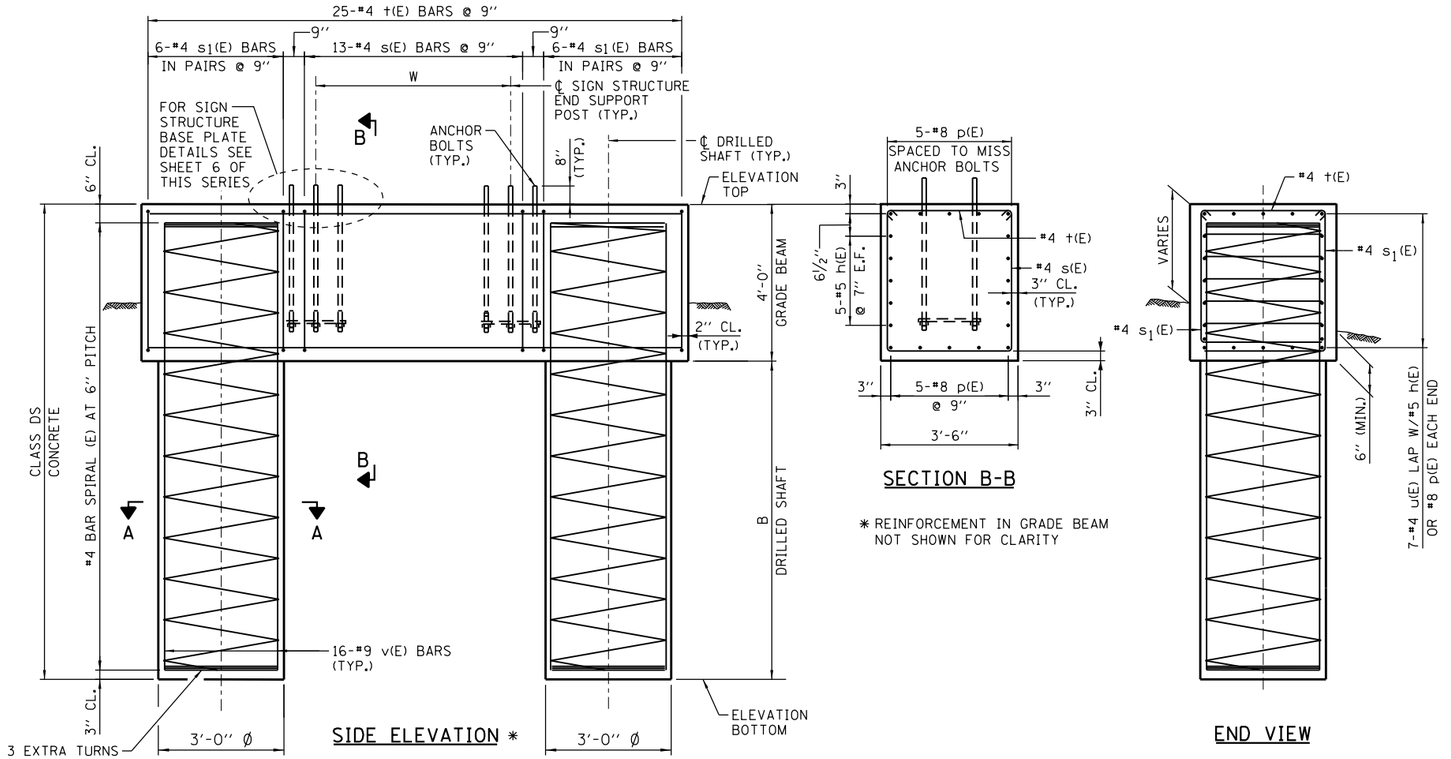
Paul Kovacs
APPROVED..... DATE 5-20-2014
CHIEF ENGINEERING OFFICER



Illinois Tollway

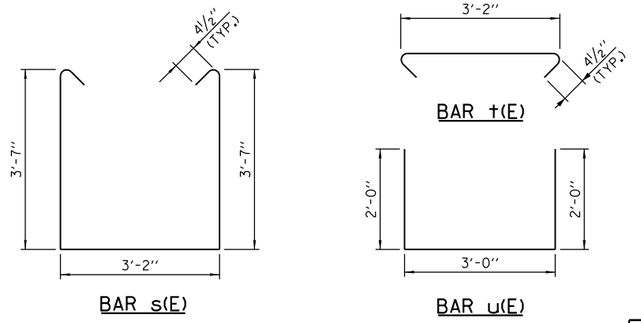
OVERHEAD SIGN STRUCTURE
SPAN TYPE (STEEL)
STRUCTURE DETAILS

STANDARD F17-04




## NOTES:

1. THE FOUNDATION DETAILS SHOWN ARE BASED ON THE PRESENCE OF MOSTLY COHESIVE SOIL CONDITIONS (SILTY OR SANDY CLAY), WITH AN AVERAGE UNCONFINED COMPRESSIVE STRENGTH (QU) > 1.25 TON/SQ. FT. WHICH SHALL BE DETERMINED BY PREVIOUS SOIL INVESTIGATIONS AT THE JOBSITE. WHEN OTHER CONDITIONS ARE INDICATED, THE BORING DATA SHALL BE INCLUDED IN THE PLANS AND THE FOUNDATION DIMENSIONS SHOWN SHALL BE THE RESULT OF SITE SPECIFIC DESIGNS. IF CONDITIONS ENCOUNTERED IN THE FIELD ARE DIFFERENT THAN THOSE INDICATED, THE CONTRACTOR SHALL NOTIFY THE ENGINEER TO DETERMINE IF THE FOUNDATION DIMENSIONS NEED TO BE MODIFIED.
2. ALL MATERIAL, FABRICATION, AND CONSTRUCTION REQUIREMENTS SHALL BE IN ACCORDANCE WITH SECTION 734 OF THE ILLINOIS TOLLWAY SUPPLEMENTAL SPECIFICATIONS.
3. CONCRETE SHALL BE PLACED MONOLITHICALLY, WITHOUT CONSTRUCTION JOINTS UNLESS NOTED OTHERWISE.
4. BACKFILL SHALL BE PLACED PER SECTION 502 OF THE IDOT STANDARD SPECIFICATION AND PRIOR TO ERECTION OF END SUPPORT POST.
5. PROVIDE NORMAL SURFACE FINISH, FOLLOWED BY CONCRETE SEALER APPLICATION ON ALL CONCRETE SURFACES EXCEPT BOTTOM OF GRADE BEAM AND DRILLED SHAFTS.
6. ALL REBAR DESIGNATED (E) SHALL BE EPOXY COATED. REBAR SHALL BE POSITIONED SO THAT THERE WILL BE NO INTERFERENCE BETWEEN VERTICAL REINFORCEMENT AND ANCHOR BOLTS.
7. NO SONOTUBES OR DECOMPOSABLE FORMS SHALL BE USED 6" BELOW THE FINISHED GROUND LINE. PERMANENT METAL FORMS OR OTHER SHIELDING SHALL NOT BE LEFT IN PLACE BELOW THE ELEVATION WITHOUT THE ENGINEER'S WRITTEN PERMISSION. EXCAVATIONS SHALL BE DEWATERED BEFORE CONCRETE PLACEMENT IF DIRECTED BY THE ENGINEER AT NO ADDITIONAL COST.
8. IF NECESSARY TO INCREASE STEEL END SUPPORT HEIGHT ABOVE THE LIMITATIONS SHOWN IN SIGN STRUCTURE MEMBER SCHEDULE ON SHEET 5 OF THIS SERIES, GRADE BEAM DEPTH ON THIS SHEET SHALL BE INCREASED UP TO 6'-0" WITHOUT CHANGES TO THE DRILLED SHAFT DESIGN. GRADE BEAM REINFORCEMENT, CONCRETE VOLUME AND LENGTH OF ANCHOR BOLTS SHALL BE REVISED ACCORDINGLY.




## BAR LIST - EACH FOUNDATION

(2 SHAFT AND 1 GRADE BEAM)

| BAR | NUMBER | SIZE | LENGTH | SHAPE |
|---|---|---|---|---|
| h(E) | 10 | #5 | 17'-8" | —— |
| p(E) | 10 | #8 | 17'-8" | —— |
| s(E) | 13 | #4 | 11'-1" | ⌴ |
| s1(E) | 24 | #4 | 6'-11½" | ⌞ |
| t(E) | 25 | #4 | 3'-11" | ⟷ |
| u(E) | 14 | #4 | 7'-0" | ⊐ |
| v(E) | 32 | #9 | B ADD 3'-3" | —— |
| #4 BAR SPIRAL (E) - SEE SIDE ELEVATION | | | | |

## SHOULDER FOUNDATION SCHEDULE

| DESIGN TRUSS TYPE | W | X | B | CLASS DS CONCRETE (CU YD) | REINFORCEMENT BARS (POUNDS) |
|---|---|---|---|---|---|
| 120-S | 7'-4" | 3'-7" | 50'-0" | 35.5 | 7960 |
| 130-S | 7'-4" | 3'-7" | 55'-0" | 38.1 | 8600 |
| 140-S | 7'-4" | 3'-7" | 55'-0" | 38.1 | 8600 |
| 150-S | 7'-4" | 3'-7" | 55'-0" | 38.1 | 8600 |
| 160-S | 7'-4" | 3'-7" | 55'-0" | 38.1 | 8600 |

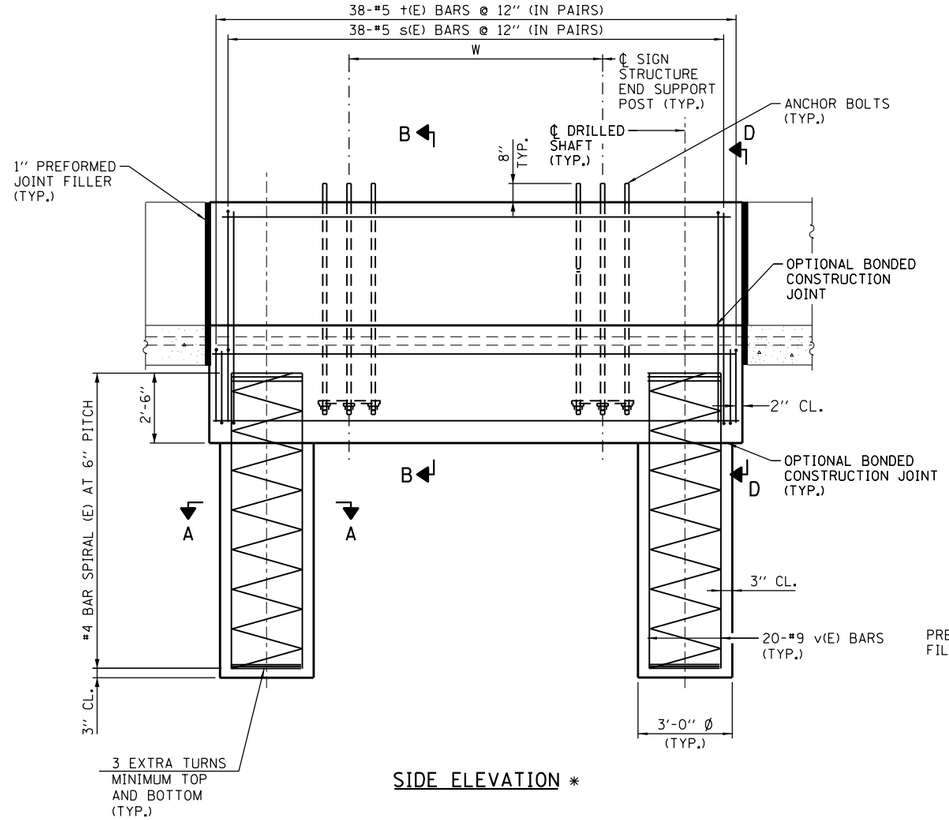
Paul Kovacs
APPROVED..... DATE 5-20-2014
CHIEF ENGINEERING OFFICER



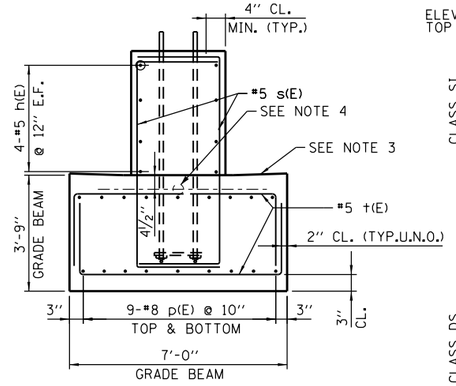
Illinois Tollway

OVERHEAD SIGN STRUCTURE
SPAN TYPE (STEEL)
STRUCTURE DETAILS

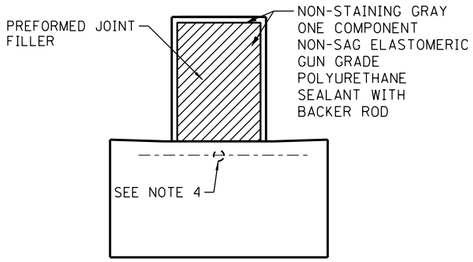
STANDARD F17-04



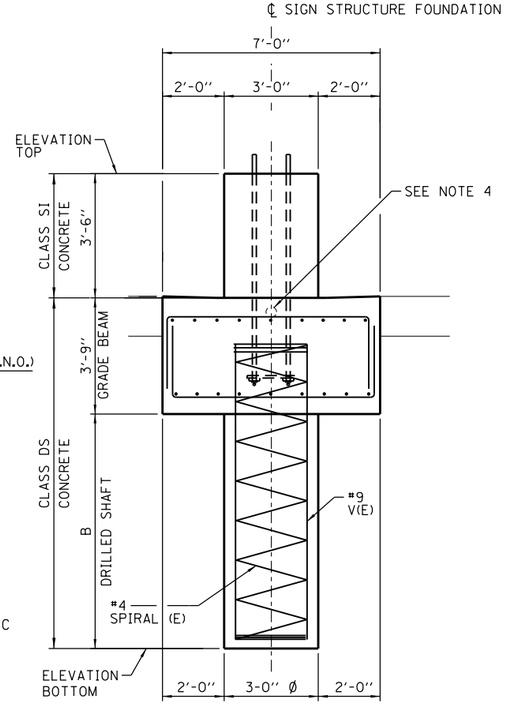

SIDE ELEVATION *



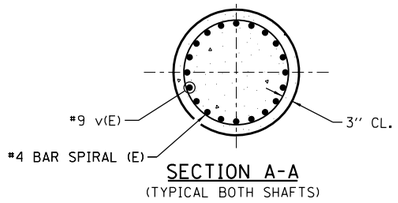

SECTION B-B




SECTION D-D



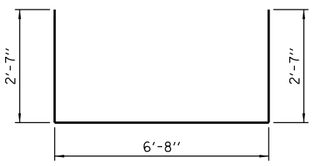

END VIEW



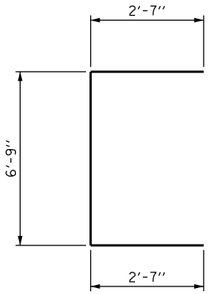

SECTION A-A
(TYPICAL BOTH SHAFTS)

## BAR LIST - EACH FOUNDATION

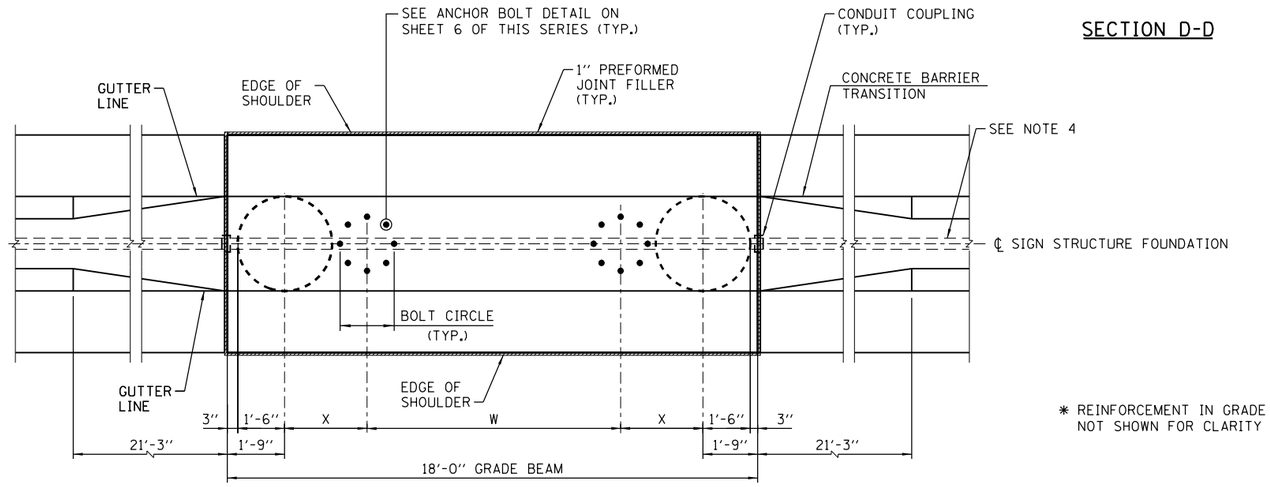
| BAR | NUMBER | SIZE | LENGTH | SHAPE |
|---|---|---|---|---|
| h(E) | 8 | #5 | 17'-8" | —— |
| p(E) | 18 | #8 | 17'-8" | —— |
| s(E) | 38 | #5 | 11'-3" | ⊏ |
| t(E) | 38 | #5 | 11'-10" | ⊔ |
| v(E) | 40 | #9 | B ADD 2'-3" | —— |
| #4 BAR SPIRAL (E) - SEE SIDE ELEVATION | | | | |




BAR t(E)




BAR s(E)




PLAN *

* REINFORCEMENT IN GRADE BEAM NOT SHOWN FOR CLARITY

## MEDIAN BARRIER FOUNDATION SCHEDULE

| DESIGN TRUSS TYPE | W | X | B | CLASS SI CONCRETE (CU YD) | CLASS DS CONCRETE (CU YD) | REINFORCEMENT BARS (POUNDS) | PROTECTIVE COAT (SQ YD) |
|---|---|---|---|---|---|---|---|
| 120-S | 7'-4" | 3'-7" | 55'-0" | 7.0 | 46.3 | 10970 | 28.0 |
| 130-S | 7'-4" | 3'-7" | 55'-0" | 7.0 | 46.3 | 10970 | 28.0 |
| 140-S | 7'-4" | 3'-7" | 60'-0" | 7.0 | 48.9 | 12850 | 28.0 |
| 150-S | 7'-4" | 3'-7" | 65'-0" | 7.0 | 51.5 | 13630 | 28.0 |
| 160-S | 7'-4" | 3'-7" | 65'-0" | 7.0 | 51.5 | 13630 | 28.0 |

## NOTES:

1. SEE SHEET 7 OF THIS SERIES FOR FOUNDATION NOTES AND DESIGN CRITERIA.
2. FOR SIGN STRUCTURE BASE PLATE DETAIL, SEE SHEET 6 OF THIS SERIES.
3. REFERENCE ILLINOIS TOLLWAY STANDARD DRAWING C5 FOR GUTTER SLOPE.
4. COORDINATE CONDUIT SIZE, LOCATION AND QUANTITY WITH ELECTRICAL PLANS. CONDUITS SHALL BE PLACED TO MISS REINFORCEMENT BARS. DO NOT CUT REINFORCEMENT BARS.
5. PROTECTIVE COAT SHALL BE APPLIED TO THE TRAFFIC AND TOP FACES OF BARRIER AND TOP FACE OF GUTTER.

SITE GROUNDING ELECTRODE SYSTEM TO BE PROVIDED AS DETAILED ON PLANS.

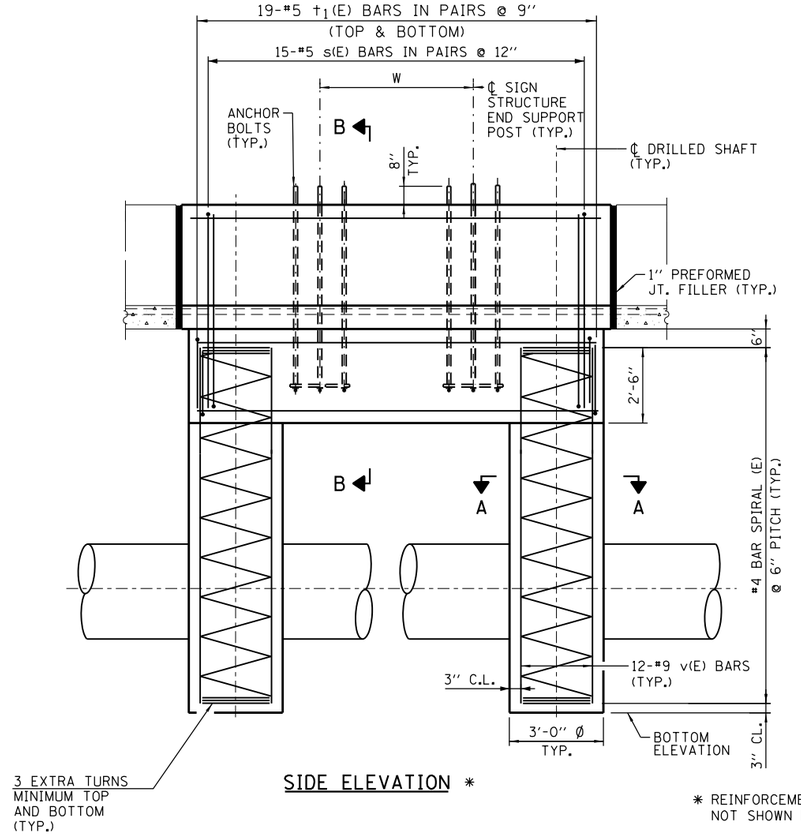
Paul Kovacs
APPROVED..... DATE 5-20-2014
CHIEF ENGINEERING OFFICER



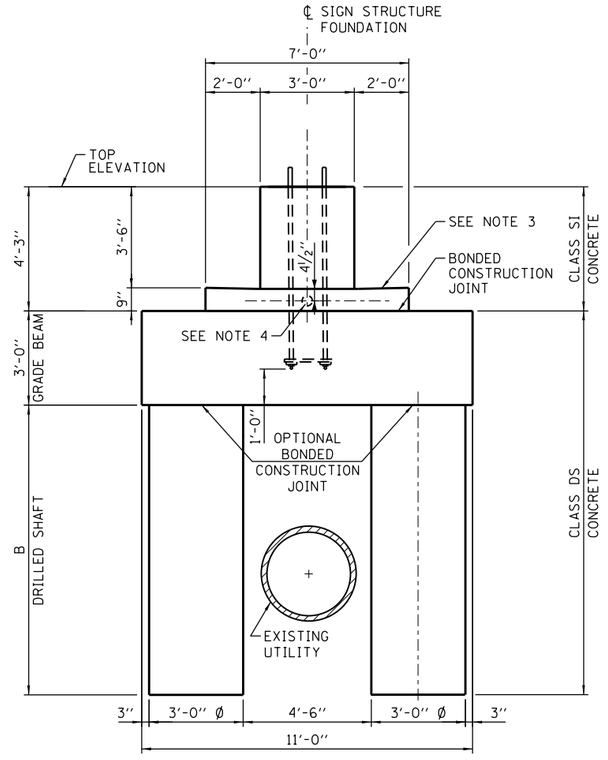
Illinois Tollway

OVERHEAD SIGN STRUCTURE
SPAN TYPE (STEEL)
STRUCTURE DETAILS

STANDARD F17-04




SIDE ELEVATION *




END VIEW

* REINFORCEMENT IN GRADE BEAM NOT SHOWN FOR CLARITY

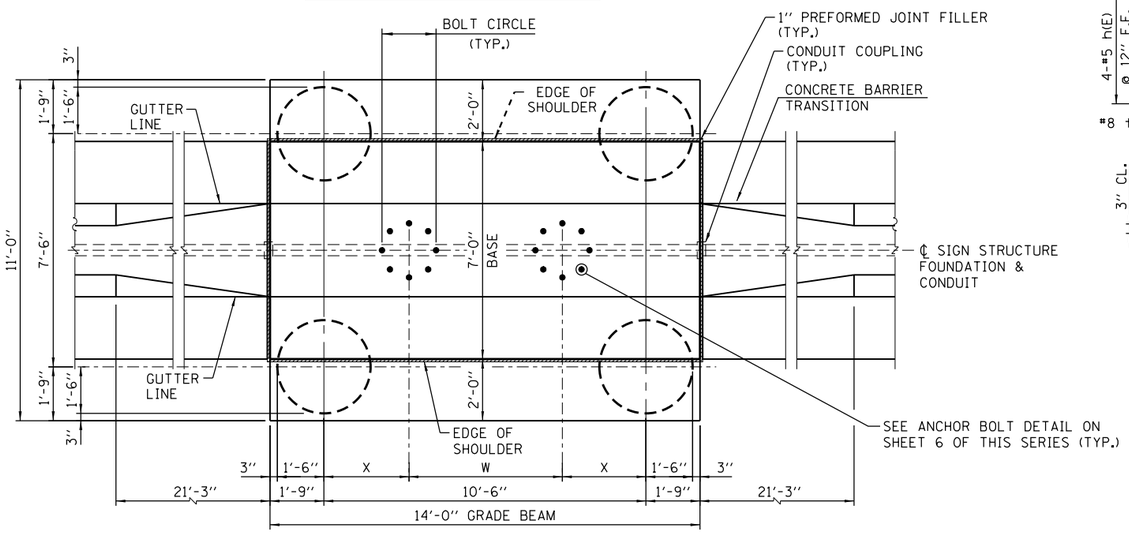
## BAR LIST - EACH FOUNDATION

| BAR | NUMBER | SIZE | LENGTH | SHAPE |
|---|---|---|---|---|
| h(E) | 16 | #5 | 13'-8" | —— |
| p(E) | 30 | #8 | 13'-8" | —— |
| s(E) | 30 | #5 | 11'-3" | ⊏ |
| †(E) | 15 | #5 | 6'-8" | —— |
| †1(E) | 76 | #8 | 12'-7" | ⌊—— |
| v(E) | 48 | #9 | B ADD 2'-3" | —— |
| #4 BAR SPIRAL (E) - SEE SIDE ELEVATION | | | | |

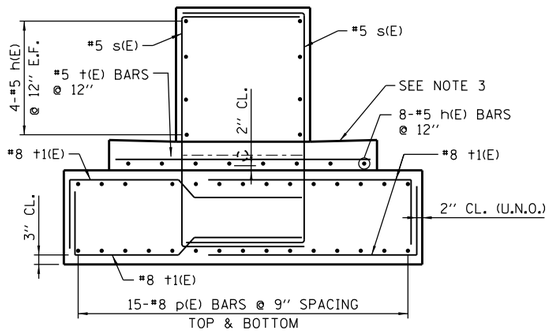
## MEDIAN BARRIER FOUNDATION SCHEDULE

| DESIGN TRUSS TYPE | W | X | B | CLASS SI CONCRETE (CU YD) | CLASS DS CONCRETE (CU YD) | REINFORCEMENT BARS (POUNDS) | PROTECTIVE COAT (SQ YD) |
|---|---|---|---|---|---|---|---|
| 120-S | 7'-4" | 1'-7" | 40'-0" | 8.2 | 59.0 | 13120 | 22.0 |
| 130-S | 7'-4" | 1'-7" | 40'-0" | 8.2 | 59.0 | 13120 | 22.0 |
| 140-S | 7'-4" | 1'-7" | 45'-0" | 8.2 | 64.2 | 14150 | 22.0 |
| 150-S | 7'-4" | 1'-7" | 50'-0" | 8.2 | 69.5 | 15170 | 22.0 |
| 160-S | 7'-4" | 1'-7" | 50'-0" | 8.2 | 69.5 | 15170 | 22.0 |

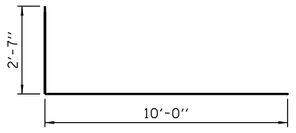
SITE GROUNDING ELECTRODE SYSTEM TO BE PROVIDED AS DETAILED ON PLANS.



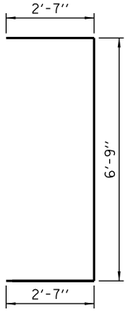

PLAN *



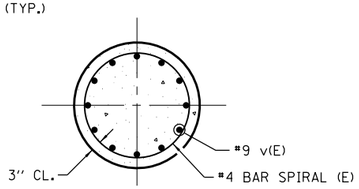

SECTION B-B




BAR †1(E)




BAR s(E)




SECTION A-A
(TYPICAL FOR 4 SHAFTS)

## NOTES:

1. SEE SHEET 7 FOR FOUNDATION NOTES AND DESIGN CRITERIA.
2. FOR SIGN STRUCTURE BASE PLATE DETAIL, SEE SHEET 6 OF THIS SERIES.
3. REFERENCE ILLINOIS TOLLWAY STANDARD DRAWING C5 FOR GUTTER SLOPE.
4. COORDINATE CONDUIT SIZE, LOCATION AND QUANTITY WITH ELECTRICAL PLANS. CONDUITS SHALL BE PLACED TO MISS REINFORCEMENT BARS. DO NOT CUT REINFORCEMENT BARS.
5. PROTECTIVE COAT SHALL BE APPLIED TO THE TRAFFIC AND TOP FACES OF BARRIER AND TOP FACE OF GUTTER.

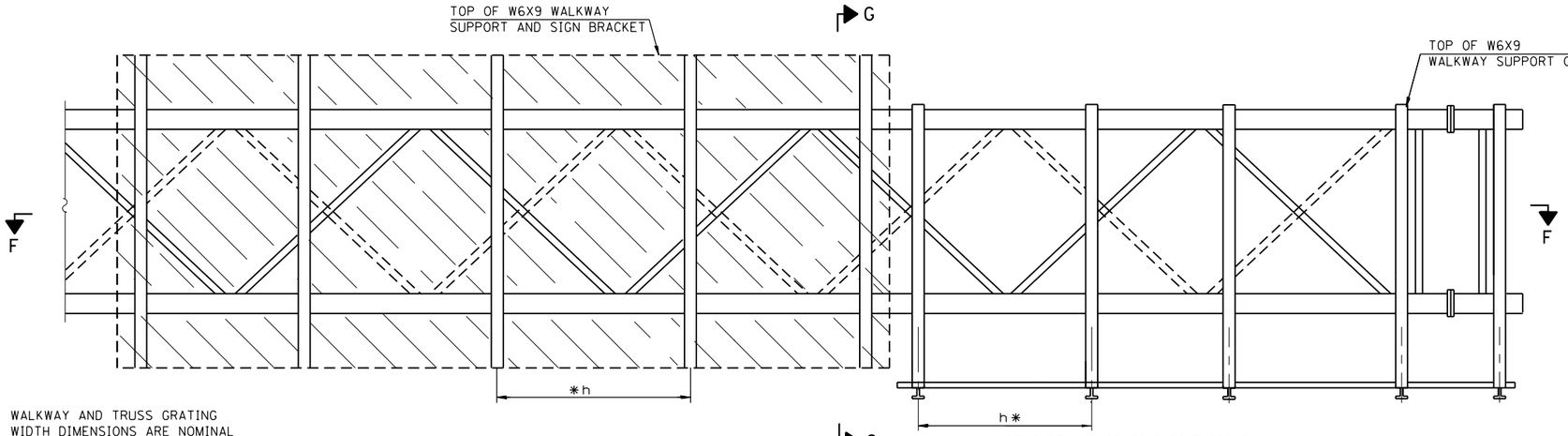
Paul Kovacs
APPROVED..... DATE 5-20-2014
CHIEF ENGINEERING OFFICER



Illinois Tollway

OVERHEAD SIGN STRUCTURE
SPAN TYPE (STEEL)
STRUCTURE DETAILS

STANDARD F17-04

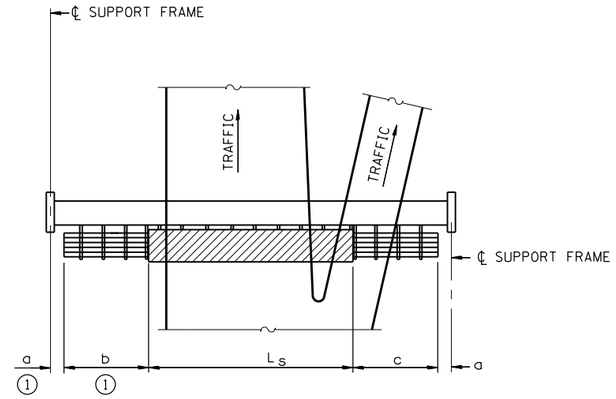



WALKWAY AND TRUSS GRATING WIDTH DIMENSIONS ARE NOMINAL AND MAY VARY ±½" BASED ON AVAILABLE STANDARD WIDTHS.

BRACKET AND GRATING DIMENSIONS ARE NOMINAL AND WILL VARY BASED ON ACTUAL DMS DIMENSIONS PLUS MANUFACTURER'S MOUNTING DEVICES.

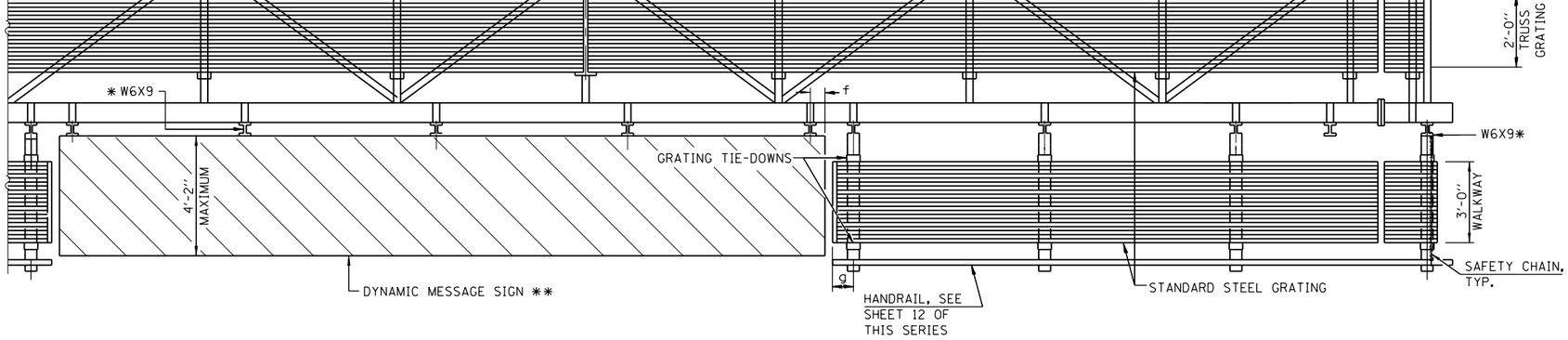
## TYPICAL FRONT ELEVATION

WITH HANDRAIL OMITTED FOR CLARITY.




## PLAN
## WALKWAY AND HANDRAIL SKETCH

(ROAD PLAN BENEATH TRUSS VARIES)




## SECTION F-F

HANDRAIL AND WALKWAY SHALL SPAN A MINIMUM OF THREE BRACKETS BETWEEN SPLICES AND/OR GAP JOINTS. PLACE ALL SIGN AND WALKWAY BRACKETS AS CLOSE TO PANEL POINTS AS PRACTICAL. GRATING AND HANDRAIL SPLICES PLACED AS NEEDED.

## BRACKET TABLE

| W6X9 | | |
|---|---|---|
| SIGN WIDTH | | NUMBER BRACKETS REQUIRED |
| GREATER THAN | LESS THAN OR EQUAL TO | |
| | 8'-0" | 2 |
| 8'-0" | 14'-0" | 3 |
| 14'-0" | 20'-0" | 4 |
| 20'-0" | 26'-0" | 5 |
| 26'-0" | 32'-0" | 6 |

## NOTES:

* SPACE W6X9 WALKWAY BRACKETS AND SIGN BRACKETS FOR EFFICIENCY AND WITHIN LIMITS SHOWN:

  f = 12" MAXIMUM, 4" MINIMUM (END OF SIGN TO ℄ OF NEAREST BRACKET)
  g = 12" MAXIMUM, 4" MINIMUM (END OF WALKWAY GRATING TO ℄ OF NEAREST SUPPORT BRACKET)
  h = 6'-0" MAXIMUM (℄ TO ℄ SIGN AND/OR WALKWAY SUPPORT BRACKETS, W6X9)

** MAXIMUM DMS WEIGHT = 5000 LBS. 4'-2" MAXIMUM THICKNESS INCLUDES THICKNESS OF DMS TYPE 1 PLUS CONNECTION TO W6X9.

FOR SECTION G-G AND GRATING SPLICE DETAILS, SEE SHEET 11 OF THIS SERIES. FOR HANDRAIL SPLICE DETAILS, SEE SHEET 12 OF THIS SERIES.

TRUSS GRATING TO FACILITATE INSPECTION SHALL RUN FULL LENGTH (CENTER TO CENTER OF SUPPORT FRAMES) ±12" ON OVERHEAD TRUSSES.

(1) IF WALKWAY IS REQUIRED LEFT OF THE DMS, a = 1'-6" AND b = WALKWAY LENGTHS. IF WALKWAY IS NOT REQUIRED LEFT OF THE DMS, b = 0 AND "a" IS DIMENSION FROM LEFT SUPPORT FRAME TO LEFT END OF DMS.

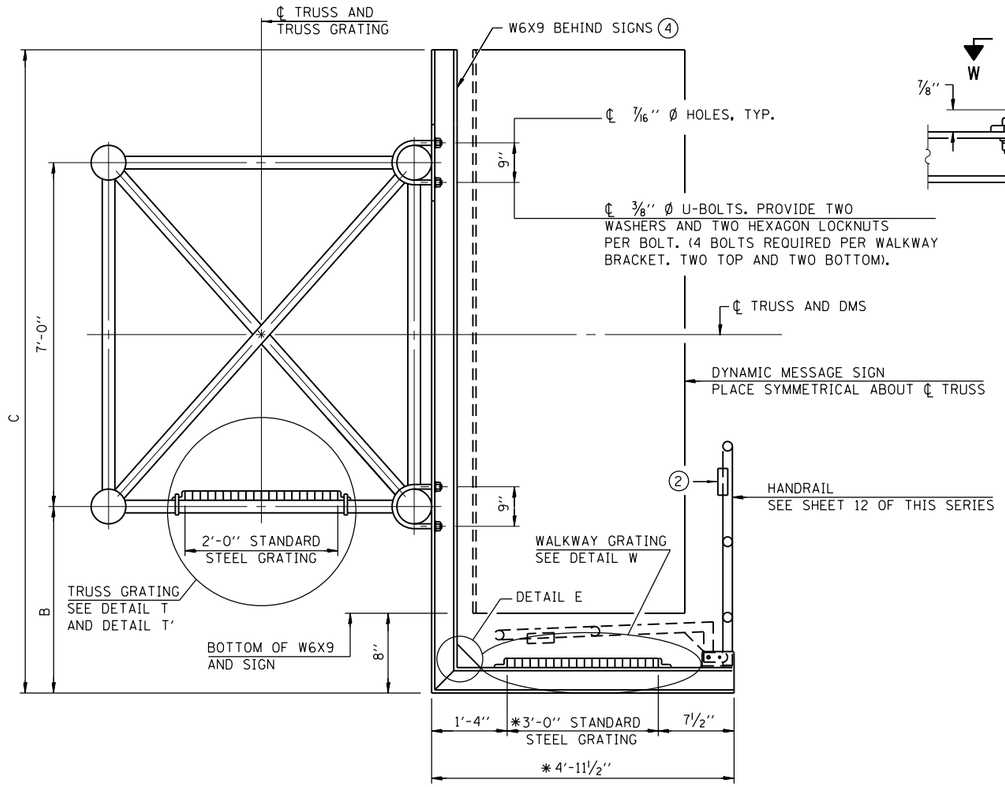


APPROVED Paul Kovacs DATE 5-20-2014
CHIEF ENGINEERING OFFICER

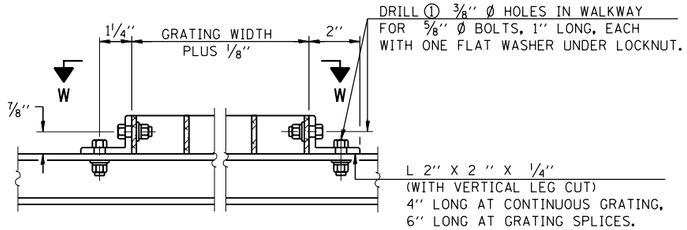
Illinois Tollway

OVERHEAD SIGN STRUCTURE
SPAN TYPE (STEEL)
STRUCTURE DETAILS

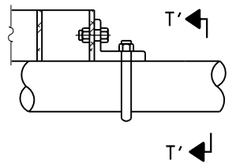
STANDARD F17-04



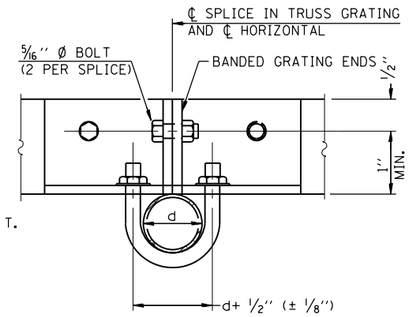

SECTION G-G



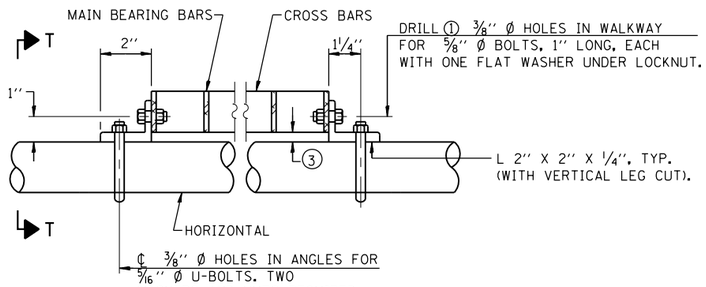

DETAIL W
(WALKWAY GRATING)



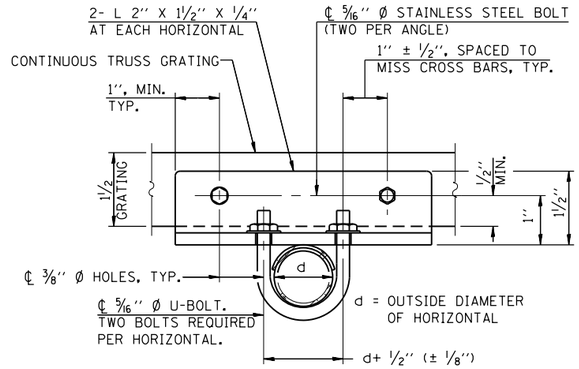

DETAIL T'
(TRUSS GRATING SPLICE)
DETAILS NOT SHOWN SAME AS DETAIL T. ALTERNATE MATERIALS MAY BE USED SUBJECT TO THE ENGINEER'S REVIEW AND APPROVAL.



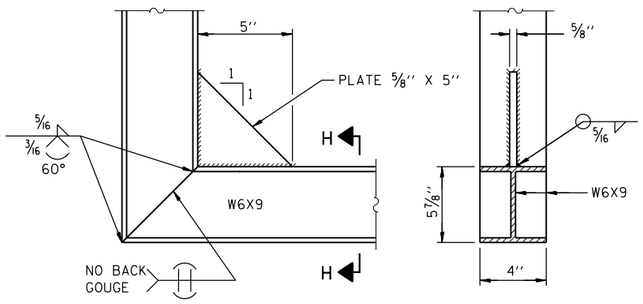

SECTION T'-T'




DETAIL T
(CONTINUOUS TRUSS GRATING)



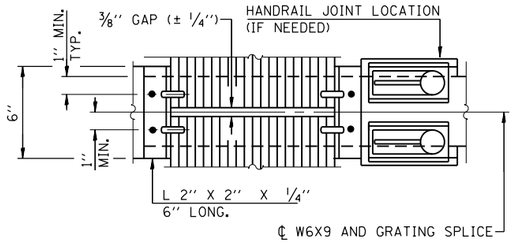

SECTION T-T



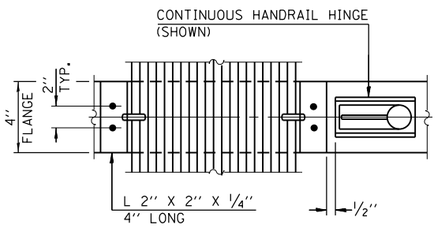

DETAIL E




SECTION H-H




(AT WALKWAY GRATING SPLICE)




(CONTINUOUS WALKWAY GRATING)

SECTION W-W

## NOTES:

① DRILLING HOLES IN GRATING MAY BE DONE IN SHOP OR FIELD, BASED ON CONTRACTOR'S PREFERENCE AND SUBJECT TO ACCURATE ALIGNMENT.

② PL 1/8'' X 1/2'' X 2'' WELDED TO HANDRAIL POSTS TO PROTECT LOCATIONS THAT CONTACT GRATING.

③ TUBE TO GRATING GAP MAY VARY FROM 0 TO 1/2'', MAX. TO ALIGN WALKWAY, ALLOW FOR CAMBER, ETC.

④ DMS MANUFACTURER SHALL DESIGN AND SUPPLY HARDWARE FOR CONNECTION OF DMS TO W6x9. BOLTS SHALL BE STAINLESS STEEL OR HOT DIP GALVANIZED HIGH STRENGTH PER ILLINOIS TOLLWAY SPECIFICATIONS.

* BRACKET AND GRATING DIMENSIONS ARE NOMINAL AND WILL VARY BASED ON ACTUAL DMS DIMENSIONS PLUS MANUFACTURER'S MOUNTING DEVICES.

## BARS SIZES FOR STANDARD STEEL GRATING

TRUSS GRATING: MAIN BEARING BARS 3/16'' X 1 1/2'' ON 1 3/16'' CENTERS. CROSS BARS 3/16'' X 1 1/2'' ON 4'' CENTERS.

WALKWAY GRATING: MAIN BEARING BARS 3/16'' X 1 1/2'' ON 1 3/16'' CENTERS. CROSS BARS 3/16'' X 1 1/2'' ON 4'' CENTERS.

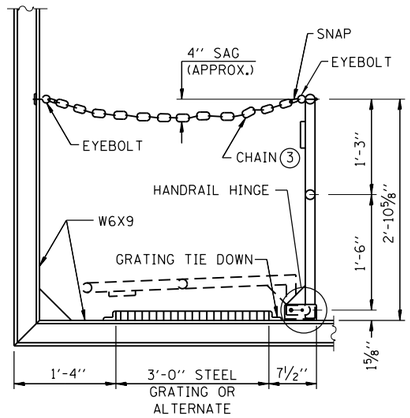
Paul Kovacs
APPROVED..... DATE 5-20-2014
CHIEF ENGINEERING OFFICER



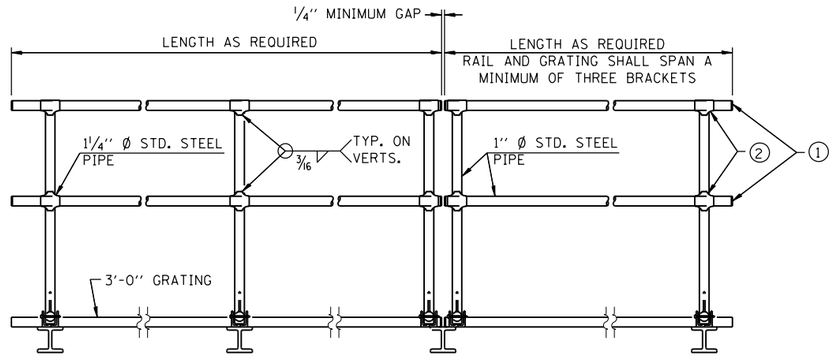
Illinois Tollway

OVERHEAD SIGN STRUCTURE
SPAN TYPE (STEEL)
STRUCTURE DETAILS

STANDARD F17-04

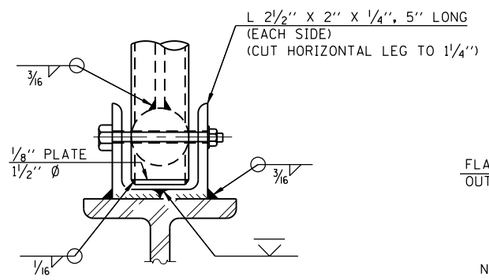



SIDE ELEVATION
(SHOWING SAFETY CHAIN W/O SIGN)

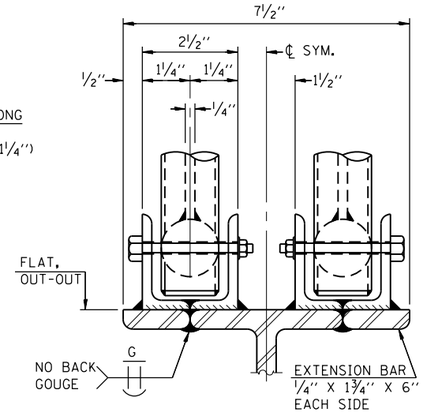



FRONT ELEVATION

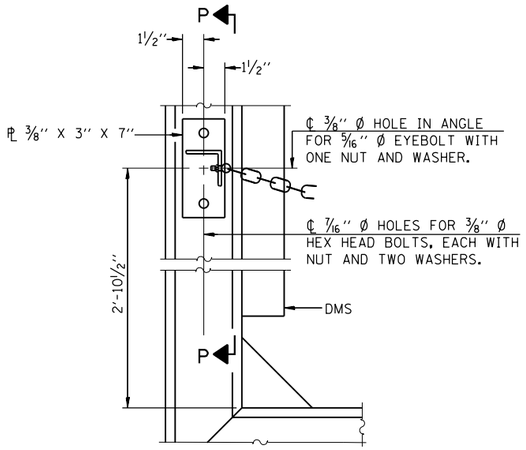
# HANDRAIL DETAILS



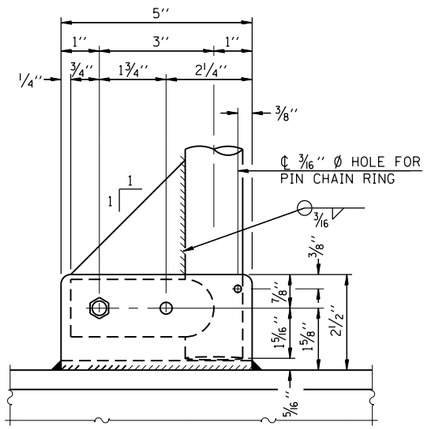

FRONT ELEVATION
SEE ''ELEVATION'' AT RIGHT FOR DIMENSIONS.



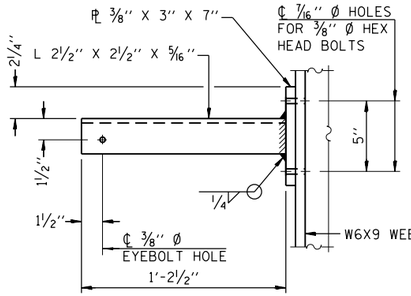

ELEVATION AT HANDRAIL JOINT



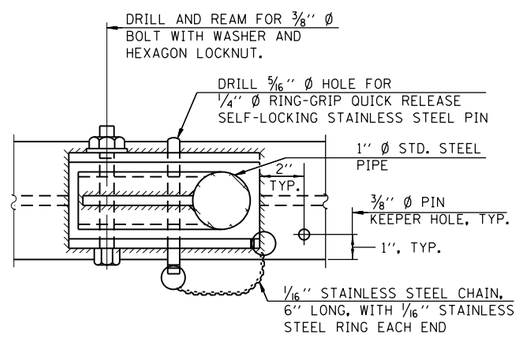

ALTERNATE SAFETY CHAIN ATTACHMENT
(WITH SIGN PRESENT)
ITEMS NOT SHOWN SAME AS ''SIDE ELEVATION'' OF ''HANDRAIL DETAILS''



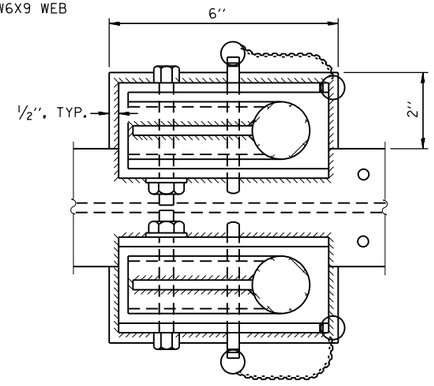

SIDE ELEVATION



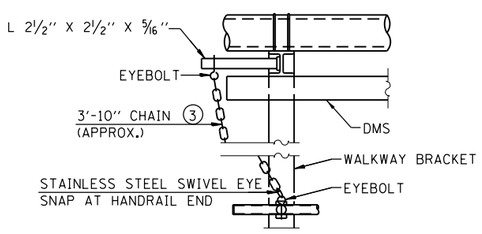

SECTION P-P



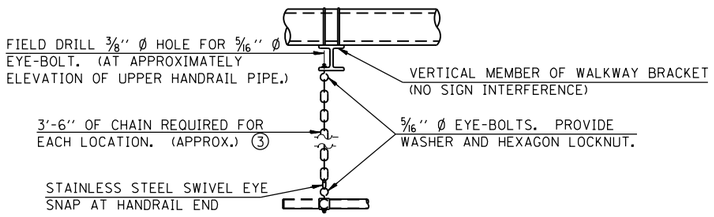

PLAN AT HANDRAIL HINGE




PLAN AT HANDRAIL JOINT
DETAILS NOT SHOWN SAME AS ''PLAN''




ALTERNATE SAFETY CHAIN ATTACHMENT
DETAILS NOT SHOWN SIMILAR TO ''SAFETY CHAIN'' DETAILS
(WALKWAY OMITTED FOR CLARITY)




SAFETY CHAIN
ONE REQUIRED FOR EACH END OF EACH WALKWAY.

## NOTES:

1 INSTALL STANDARD FORCE-FIT END CAPS OR WELD ⅛'' END PLATES WITH ⅛'' C.F.W. AND GRIND SMOOTH. (ALL RAIL ENDS)

2 HORIZONTAL HANDRAIL MEMBER SHALL BE CONTINUOUS THRU 1¼'' Ø PIPE. PROVIDE 7/16'' Ø HOLE IN 1¼'' Ø PIPE FOR ⅜'' Ø BOLT. FIELD DRILL 7/16'' Ø HOLE IN HORIZONTAL RAIL MEMBER. PROVIDE WASHER AND LOCKNUT FOR BOLT. (USE 5/16'' EYEBOLTS IN 7/16'' Ø HOLES ON TOP RAIL AT ENDS ONLY.)

3 3/16'' TYPE 304L STAINLESS STEEL CHAIN, APPROXIMATELY 12 LINKS PER FOOT.



Paul Kovacs
APPROVED..... DATE 5-20-2014
CHIEF ENGINEERING OFFICER

Illinois Tollway

OVERHEAD SIGN STRUCTURE
SPAN TYPE (STEEL)
STRUCTURE DETAILS

STANDARD F17-04