

ANCHOR BOLT NOTES:

PROCEDURE FOR TIGHTENING ANCHOR BOLT NUTS ON CANTILEVER SIGN TRUSS.

- 1) THIS WORK SHALL BE PERFORMED ONLY ON DAYS WITH WINDS LESS THAN 15 MPH. ALL TIGHTENING OF THE NUTS IS TO BE DONE IN THE PRESENCE OF THE INSPECTOR. ONCE THE TIGHTENING PROCEDURE IS STARTED IT MUST BE COMPLETED ON ALL OF THE BASE PLATE NUTS WITHOUT PAUSE OR DELAY.
- 2) PROPERLY SIZED WRENCHES DESIGNED FOR TIGHTENING NUTS AND/OR BOLTS SHALL BE USED TO AVOID ROUNDING OR OTHER DAMAGE TO THE NUTS. ADJUSTABLE END OR PIPE WRENCHES MAY NOT BE USED.
- 3) BASE PLATE, ANCHOR RODS AND NUTS ARE TO BE FREE OF ANY DIRT OR DEBRIS.
- 4) APPLY STICK WAX OR BEES WAX TO THE THREADS AND BEARING SURFACES OF THE ANCHOR BOLT, NUTS, AND WASHERS.
- 5) TIGHTEN TOP NUTS SO THEY FULLY CONTACT THE BASE PLATE. TIGHTEN LEVELING NUTS TO SNUG TIGHT CONDITION. SNUG TIGHT IS DEFINED AS THE FULL EFFORT OF ONE PERSON ON A WRENCH WITH A LENGTH EQUAL TO 14 TIMES THE BOLT DIAMETER BUT NOT LESS THAN 18 INCHES. APPLY THE FULL EFFORT AS CLOSE TO THE END OF THE WRENCH AS POSSIBLE. PULL FIRMLY BY LEANING BACK AND USING ENTIRE BODY WEIGHT ON THE END OF THE WRENCH UNTIL THE NUT STOPS ROTATING. USE A MINIMUM OF TWO SEPARATE PASSES OF TIGHTENING. SEQUENCE THE TIGHTENING IN EACH PASS SO THAT THE NUT ON THE OPPOSITE SIDE, TO THE EXTENT POSSIBLE, WILL BE SUBSEQUENTLY TIGHTENED UNTIL ALL OF THE NUTS IN THAT PASS HAVE BEEN TIGHTENED.
- 6) TIGHTEN TOP NUTS TO SNUG TIGHT AS DESCRIBED FOR THE LEVELING NUTS.
- 7) MATCH-MARK THE TOP NUTS AND BASE PLATE USING PAINT, CRAYON, OR OTHER APPROVED MEANS TO PROVIDE A REFERENCE FOR DETERMINING THE RELATIVE ROTATION OF THE NUT AND BASE PLATE DURING TIGHTENING. USING A STRIKING OR HYDRAULIC WRENCH, FURTHER TIGHTEN THE TOP NUTS IN TWO PASSES AS LISTED IN THE FOLLOWING TABLE. USE A SEQUENCE OF TIGHTENING IN EACH PASS SO THAT THE NUT ON THE OPPOSITE SIDE, TO THE EXTENT POSSIBLE, WILL BE SUBSEQUENTLY TIGHTENED UNTIL ALL NUTS IN THAT PASS HAVE BEEN TURNED. DO NOT ROTATE THE LEVELING NUT DURING THE TOP NUT TIGHTENING.

ANCHOR BOLT SIZE	FIRST PASS	SECOND PASS	TOTAL ROTATION
GREATER THAN 1 1/2"	1/12 TURN	1/12 TURN	1/6 TURN

- 8) LUBRICATE, PLACE AND TIGHTEN THE JAM NUTS TO SNUG TIGHT.

DESIGN STRESSES:

DESIGN STRESSES FOR MATERIALS ARE IN ACCORDANCE WITH A.A.S.H.T.O STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGN, LUMINAIRES AND TRAFFIC SIGNALS, SERIES OF 2001 WITH CURRENT INTERIMS.

ALUMINUM ALLOY 6061-T6 IN ACCORDANCE WITH SECTION 6.
STEEL IN ACCORDANCE WITH SECTION 5.

SPECIFICATIONS:

DESIGN: A.A.S.H.T.O. STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS, SERIES OF 2001 WITH CURRENT INTERIMS; STATE STANDARD FATIGUE DESIGN.
CONSTRUCTION: IOWA D.O.T. STANDARD SPECIFICATIONS, SERIES 2001 PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.

ALUMINUM WELDING NOTES:

- 1) FABRICATION SHALL CONFORM TO SECTION 6.9 OF AASHTO 2001 STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS, EXCEPT AS MODIFIED BY THE FOLLOWING NOTES. CLASS II WORKMANSHIP REQUIRED.
- 2) ALL WELDING SHALL BE DONE BY GAS METAL-ARC WELDING (GMAW) PROCESS.
- 3) ONLY STRINGER BEAD TECHNIQUE SHALL BE USED IN WELDING. NO WEAVE BEAD TECHNIQUE IS ALLOWED.
- 4) INTERPASS TEMPERATURE SHALL NOT EXCEED 200°F.
- 5) TACK WELD ENDS SHALL BE FILLED AND NOT TERMINATE IN CRATERS. IF A TACK WELD IS CRACKED, THE CRACK SHALL BE REMOVED BEFORE WELDING BEGINS.
- 6) ALL INITIAL ROOT PASSES SHALL NOT EXCEED 5/16 INCH AND MUST PENETRATE THE ROOT.
- 7) THE CONVEXITY OF FILLET WELD SHALL NOT EXCEED 1/16 INCH.
- 8) THE ENTIRE STRUCTURE SHALL BE CLEANED BEFORE SHIPPING.
- 9) TUBES SHOULD BE MILLED TO THE REQUIRED RADIUS WITH THE MAXIMUM GAP AT ANY POINT NOT GREATER THAN 1/16 INCH
- 10) ALL AREAS OF WELDING MUST BE BRUSHED WITH STAINLESS STEEL BRUSHES IMMEDIATELY PRIOR TO MAKING THE WELDS.
- 11) ONLY MICROSCOPICALLY CLEAN WELDING WIRES (THOSE WHICH HAVE BEEN SHAVED AFTER DRAWING) SHOULD BE USED AND SPOOLS OF WIRE REMAINING AT THE END OF THE DAY'S PRODUCTION SHOULD BE SEALED IN POLYETHYLENE BAGS. WIRE NOT SO PROTECTED SHOULD BE DISCARDED. THIS INCLUDES WIRE IN THE DRIVE ROLLS AND GUN.
- 12) FORCED FITS MUST BE AVOIDED AND ONLY DOWN HAND WELDING IS ALLOWED.
- 13) ALL WELD CRATERS MUST BE ELIMINATED AND WELDS SHOULD CARRY THROUGH TIGHT AREAS WITHOUT STOPPING WHEN POSSIBLE.
- 14) ALUMINUM FILLER ALLOY ER5356 OR ER5556 SHALL BE USED.

STAINLESS STEEL BOLTING NOTES:

- 1) UNLESS OTHERWISE NOTED ON THE PLAN, ALL STAINLESS STEEL BOLTS AND U-BOLTS SHALL BE FURNISHED WITH STAINLESS STEEL REGULAR HEXAGONAL NUTS, JAM NUTS AND WASHERS UNDER BOTH HEADS AND NUTS.
- 2) IN CASE STAINLESS STEEL LOCK WASHERS ARE USED IN LIEU OF JAM NUTS, THE REGULAR WASHERS UNDER NUTS ARE TO BE OMITTED.
- 3) STAINLESS STEEL BOLTS SHALL COMPLY WITH ASTM A-320 OR F593 AS PER STANDARD SPECIFICATIONS. STAINLESS STEEL PARTS SHALL COMPLY WITH ASTM A240, 300 SERIES.

STEEL NOTES:

ALL STEEL SHAPES, BARS, AND PLATES SHALL COMPLY WITH ASTM A36 EXCEPT MINOR PARTS APPROVED BY THE ENGINEER MAY COMPLY WITH ASTM A575 GRADE M1020. ALL STEEL PIPE SHALL COMPLY WITH THE REQUIREMENTS OF ASTM A53 GRADE B, TYPE E OR S OR API 5L GRADE B.

ALL STEEL SECTIONS SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123. PROVIDE VENT HOLES FOR GALVANIZING.

ALL ANCHOR BOLT MATERIAL SHALL COMPLY WITH THE REQUIREMENTS OF IOWA DOT MATERIALS IM 453.08.

STEEL WELDING SHALL BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE AWS SPECIFICATIONS D1.1, STRUCTURAL WELDING CODE-STEEL.

ULTRASONIC TESTING SHALL BE PERFORMED ON THE POST TO BASE PLATE. MAGNETIC PARTICAL TESTING SHALL BE PERFORMED ON THE POST TO STIFFENER WELDS.

THE 1 1/4" A325 BOLTS SHALL BE TORQUED TO 1400 FT-LBS.

DESIGN NO.	STATION	LOCATION

GENERAL NOTES:

ALL CANTILEVER TRUSSES ARE DESIGNED FOR 30 lb/ft² WIND PRESSURE ON TRUSS MEMBERS AND SIGN PANELS.

ALL ROUND TUBES, SIGN SUPPORT ANGLES AND BRACKETS, BARS, AND PLATES FOR THE CANTILEVER SIGN TRUSS SHALL BE ALUMINUM ALLOY 6061-T6 UNLESS OTHERWISE NOTED OR SHOWN.

ALL DIAMETERS OF ALUMINUM TUBING SHOWN ARE OUTSIDE DIAMETERS.

SHOP DRAWINGS SHALL BE SUBMITTED FOR APPROVAL.

CLEAR DISTANCE FROM FACE OF CONCRETE TO THE NEAREST REINFORCING BAR SHALL BE 2" UNLESS OTHERWISE SHOWN.

THE ANCHOR BOLT ASSEMBLY SHALL BE CENTERED AT THE CENTER OF SHAFT AND SECURELY WIRED IN PLACE BEFORE CONCRETE IS PLACED.

THE FOOTING SHALL BE BACKFILLED PRIOR TO ERECTING SIGN TRUSS.

DESIGN ALLOWABLE SOIL BEARING IS 1.0 TONS PER SQ. FT.

ALL REINFORCING TO BE GRADE 60.

ALL CONCRETE TO BE CLASS "C" STRUCTURAL CONCRETE.

KEYWAY DIMENSIONS SHOWN ON THE PLANS ARE BASED ON NOMINAL DIMENSIONS UNLESS STATED OTHERWISE. IN ADDITION, THE BEVEL USED ON THE KEYWAY SHALL BE LIMITED TO A MAXIMUM OF 10 DEGREES FROM VERTICAL.

FOUNDATIONS AND ANCHOR BOLTS:

- 1) THE ELEVATION AT THE TOP OF THE FOUNDATION SHALL BE WITHIN 1 INCH OF PLAN ELEVATION.
- 2) ANCHOR BOLT GROUPS SHALL BE LOCATED ACCURATELY BY TEMPLATE OR OTHER POSITIVE MEANS, WITH CENTERS OF ADJACENT ANCHOR BOLT GROUPS WITHIN 3/16 INCH OF THE CORRECT DISTANCE APART.
- 3) ANCHOR BOLTS SHALL BE PLUMB WITHIN 1/4 INCH PER FOOT FROM VERTICAL.
- 4) ANCHOR BOLTS SHALL PROJECT ABOVE TOP OF FOUNDATION WITHIN 1/4 INCH OF THE PLAN DIMENSION.
- 5) WELDING OF ANCHOR BOLTS SHALL NOT BE ALLOWED. THE CONTRACTOR SHALL OBTAIN A TEMPLATE FROM THE MANUFACTURER / FABRICATOR FOR PROPER PLACEMENT OF THE ANCHOR BOLTS.

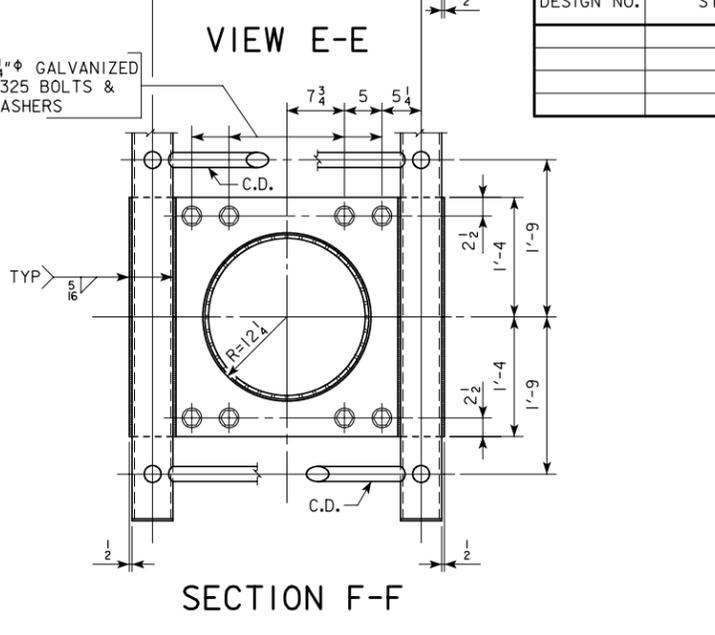
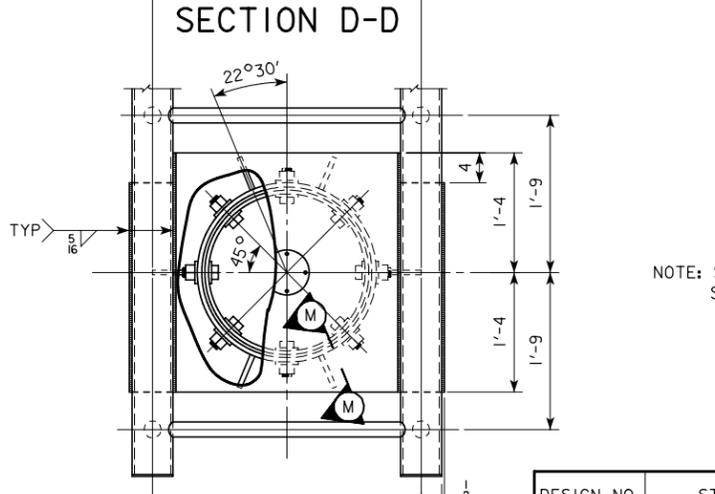
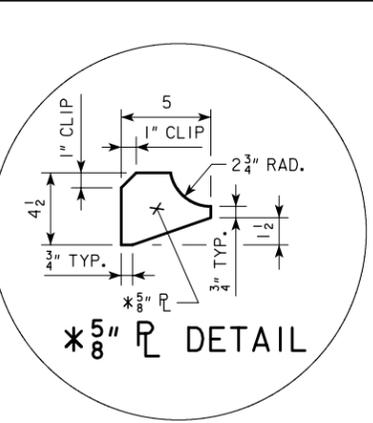
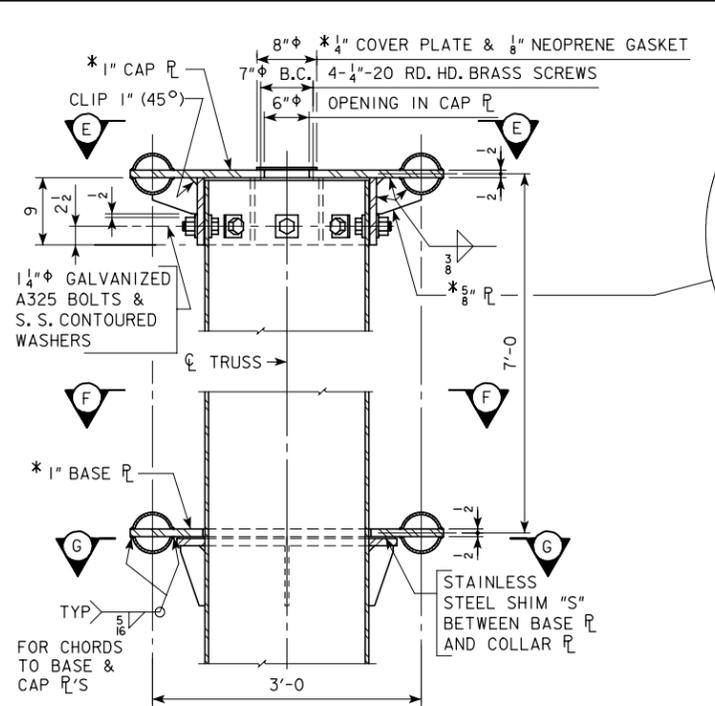
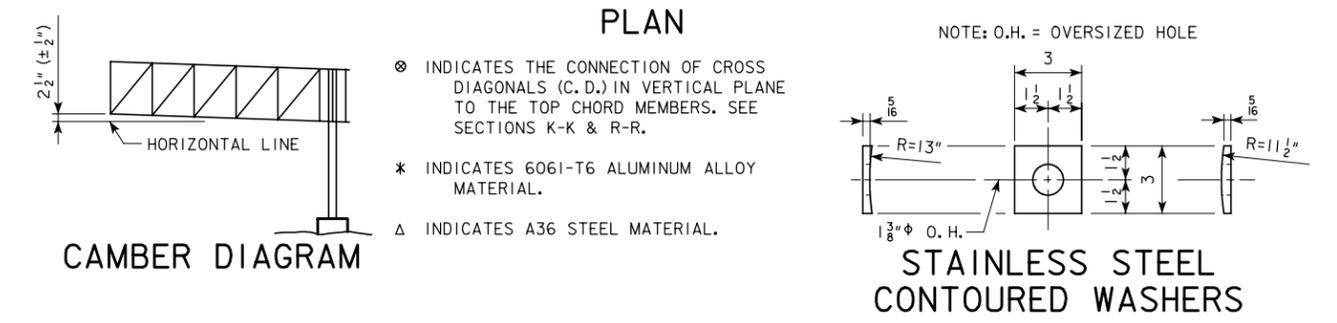
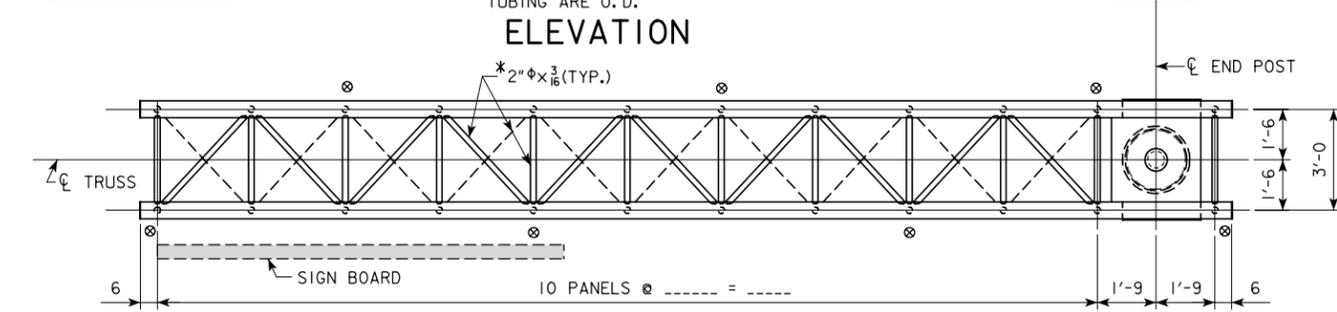
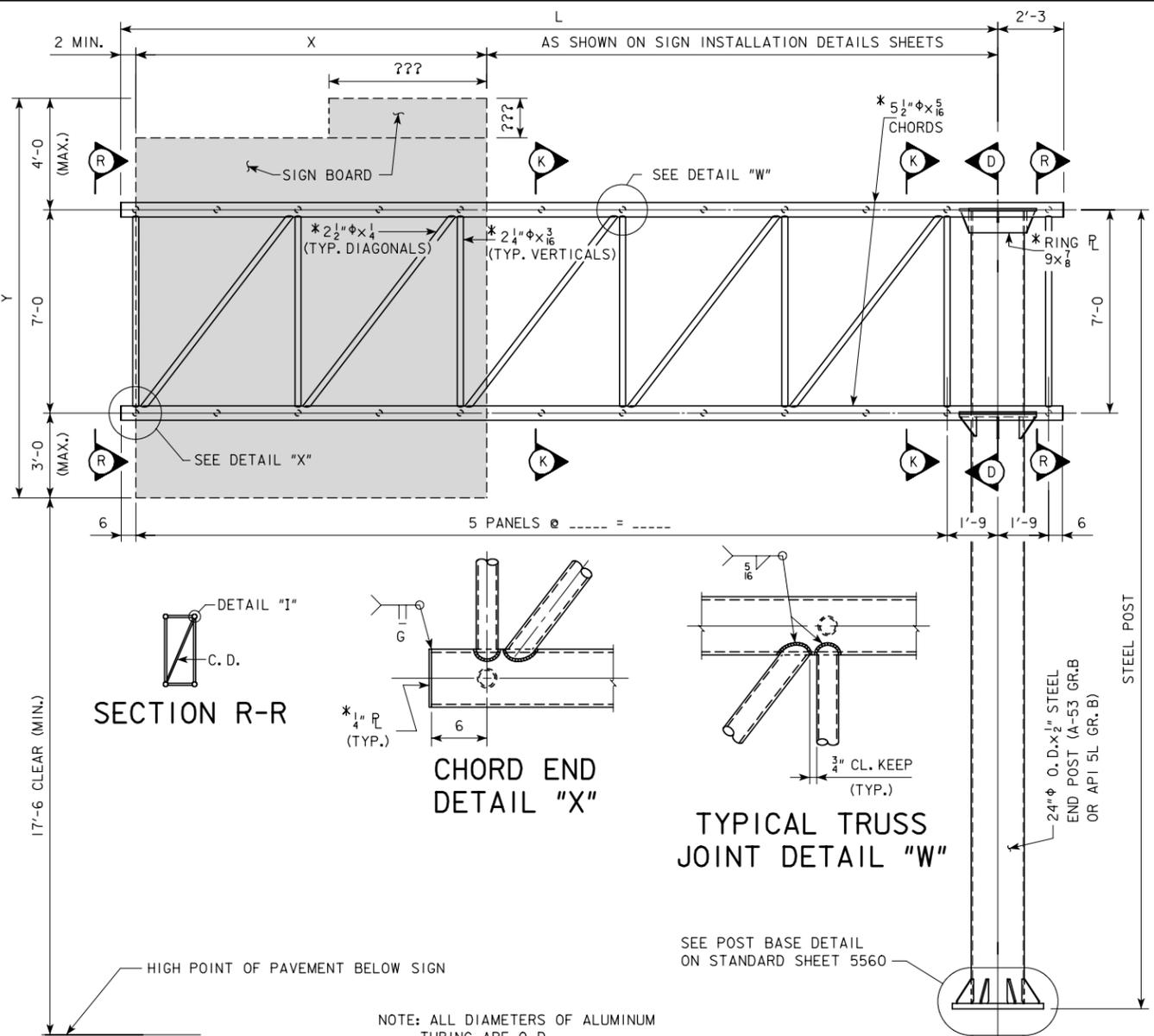
COMPLETED ALUMINUM AND STEEL STRUCTURE:

- 1) THE STEEL END POST SHALL BE PLUMB WITHIN 1/16 INCH PER FOOT OF VERTICAL IN TWO PERPENDICULAR DIRECTIONS.
- 2) THE TRUSS SHALL BE SQUARE WITHIN SUPPORTS. HORIZONTAL LINE BETWEEN CHORDS SHALL BE LEVEL WITHIN 1/16 INCH PER FOOT OF HORIZONTAL, AND VERTICAL LINE BETWEEN CHORDS SHALL BE PLUMB WITHIN 1/16 INCH PER FOOT OF VERTICAL.

DESIGN FOR
**ALUMINUM CANTILEVER TRUSS
AND STEEL END POST**
GENERAL NOTES

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. _____ OF _____ FILE NO. _____ DESIGN NO. _____

CANTILEVER SIGN TRUSS.DGN - 5557 - THIS SHEET ISSUED 04-09.



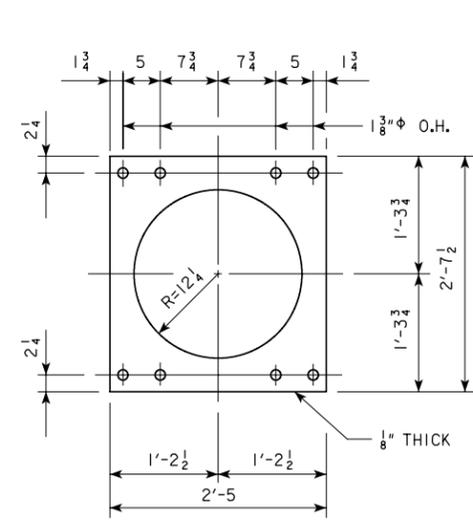
NOTE: SEE STANDARD 5559 FOR SECTIONS G-G, K-K, & M-M.

DESIGN NO.	STATION	LOCATION	SIGN LENGTH "X"	SIGN HEIGHT "Y"	STEEL POST	CANTILEVER LENGTH "L"

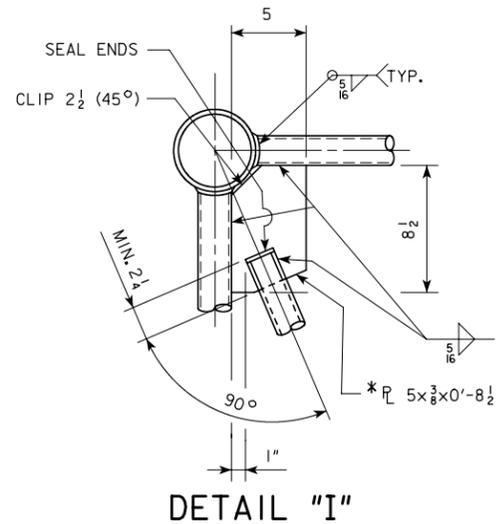
TRUSS LENGTH MAX. "L"	MAX. SIGN HEIGHT "Y"	MAX. AREA FT ²	MAX. STEEL POST
35'-0"	14'-0"	210	27'-0"
34'-0"	14'-0"	224	27'-0"
33'-0"	14'-0"	238	27'-0"

DESIGN FOR
ALUMINUM CANTILEVER TRUSS AND STEEL END POST SIGN SUPPORT DETAILS
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. _____ OF _____ FILE NO. _____ DESIGN NO. _____

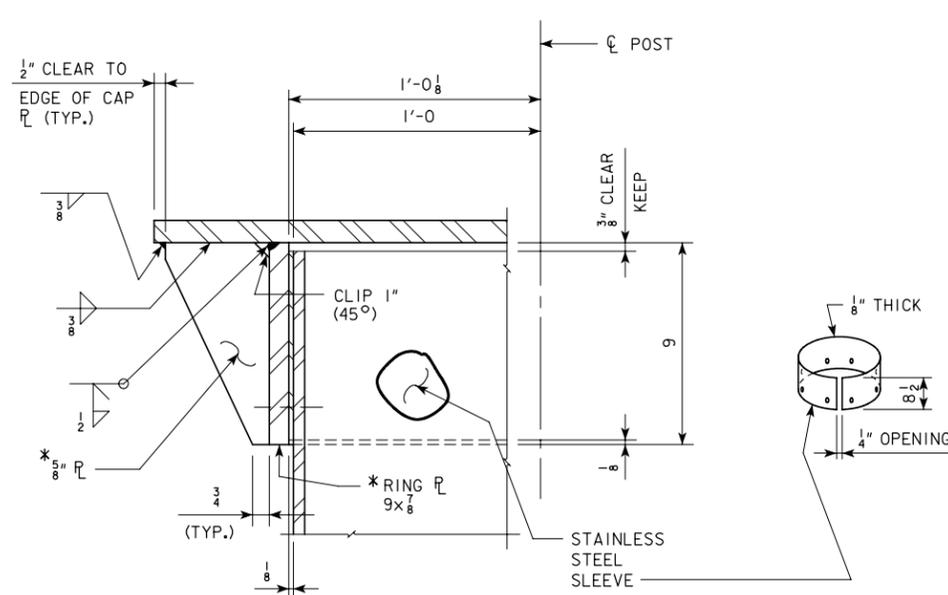
REVISION 05-09 - ADDED THE MAXIMUM STEEL POST HEIGHT. CANTILEVER SIGN TRUSS.DGN - 5558 - THIS SHEET ISSUED 04-09.



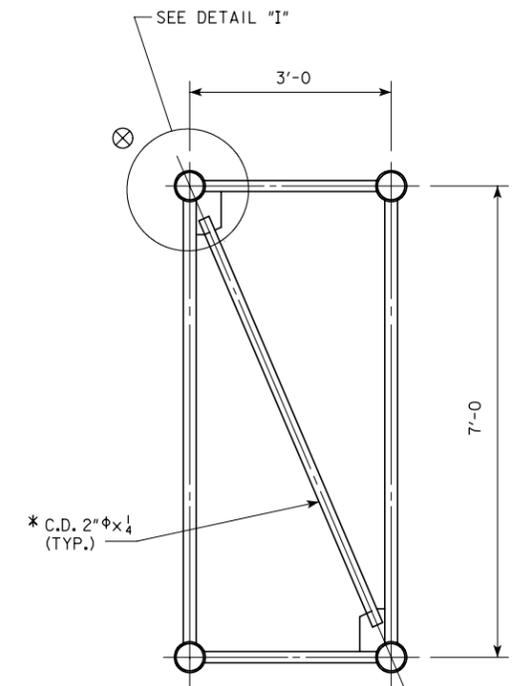
STAINLESS STEEL SHIM "S"



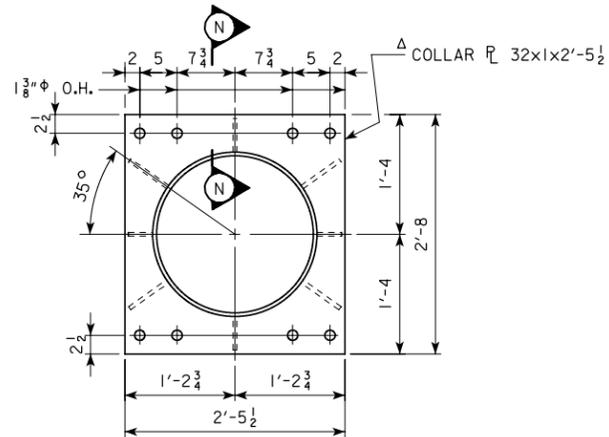
DETAIL "I"



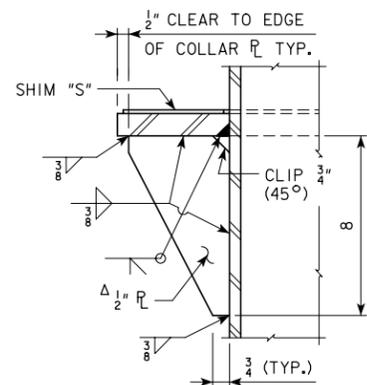
SECTION M-M



SECTION K-K



SECTION G-G



SECTION N-N

- ⊗ INDICATES THE CONNECTION OF CROSS DIAGONALS (C.D.) IN VERTICAL PLANE TO THE TOP CHORD MEMBERS. SEE SECTIONS K-K & R-R.
- * INDICATES 6061-T6 ALUMINUM ALLOY MATERIAL.
- Δ INDICATES A36 STEEL MATERIAL.

NOTE: SEE STANDARD 5558 FOR LOCATIONS OF SECTIONS G-G, K-K, & M-M.

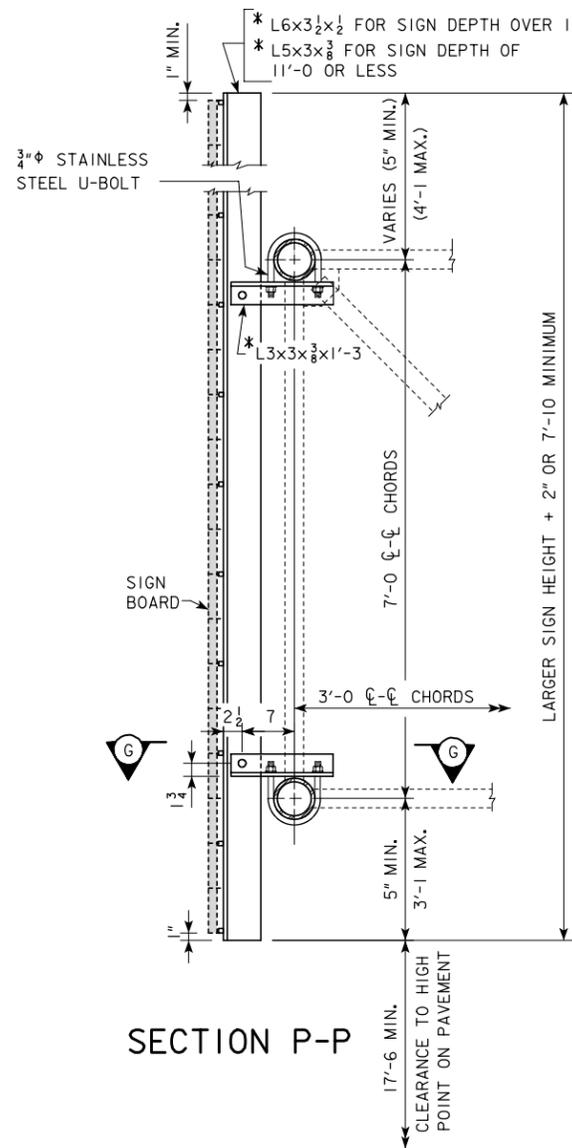
DESIGN NO.	STATION	LOCATION

DESIGN FOR
**ALUMINUM CANTILEVER TRUSS
 AND STEEL END POST
 SIGN SUPPORT DETAILS**

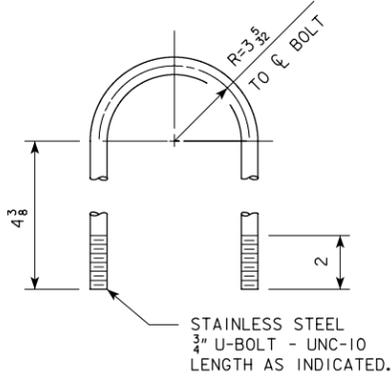
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. ____ OF ____ FILE NO. ____ DESIGN NO. ____

CANTILEVER SIGN TRUSS.DGN - 5559 - THIS SHEET ISSUED 04-09.

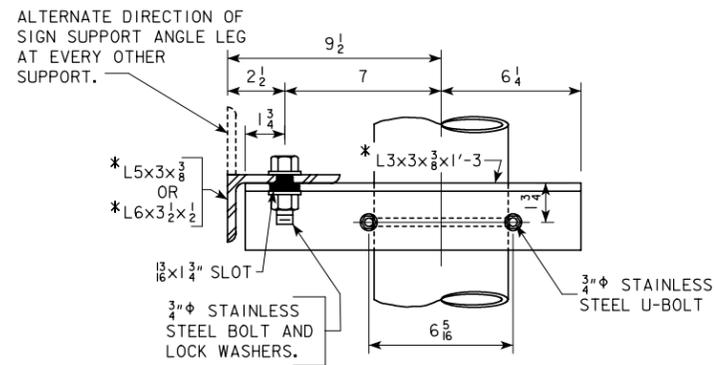
REVISION 05-10 - CORRECTED THE PLACEMENT OF THE SIGN SUPPORT ANGLE LEGS TO REPRESENT THE ALTERNATING DIRECTION ON 'PART SIGN TRUSS PLAN'. CANTILEVERSIGNTRUSS.DGN - 5560 - THIS SHEET ISSUED 04-09.



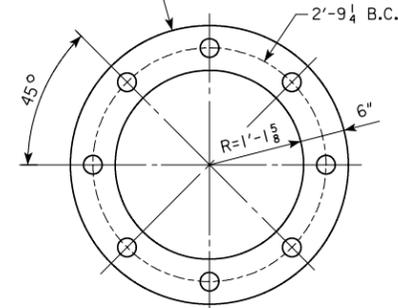
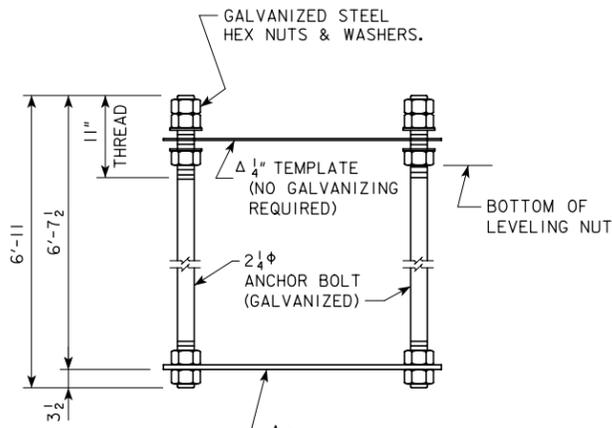
SECTION P-P



U-BOLT DETAILS

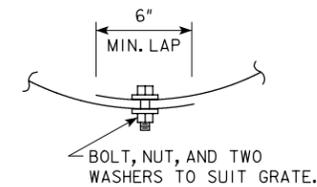


SECTION G-G



ANCHOR BOLTS ASSEMBLY

(ALL ANCHOR BOLT MATERIAL SHALL COMPLY WITH THE REQUIREMENTS OF IOWA DOT MATERIALS I.M. 453.08.)



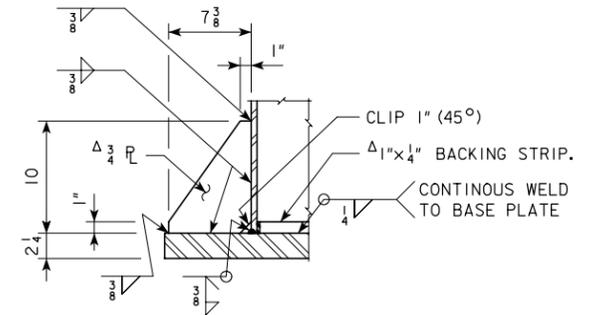
RODENT GUARD CLOSURE DETAIL

A RODENT GUARD SHALL BE PLACED BETWEEN THE CONCRETE FOOTING AND THE BASE PLATE, SEE MATERIALS I.M. 443.01.

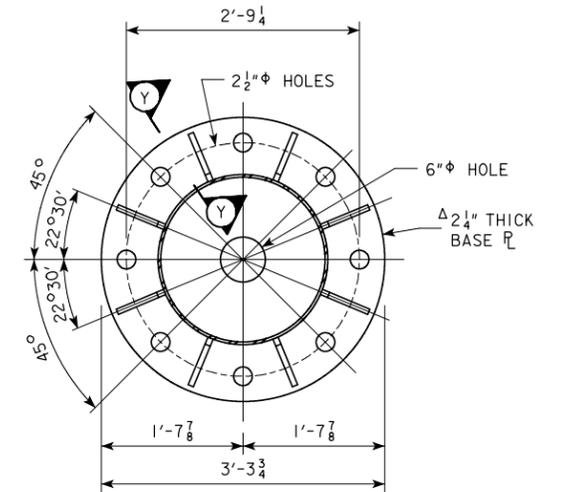
AS AN ALTERNATE STAINLESS STEEL STANDARD GRADE WIRE CLOTH, 1/4" MAXIMUM OPENING WITH A MINIMUM WIRE DIAMETER OF AWG. NO. 16 WITH A MINIMUM 2" LAP. SECURE TO BASE PLATE AFTER ERECTION WITH 3/4" STAINLESS STEEL BANDING.

* INDICATES 6061-T6 ALUMINUM ALLOY MATERIAL.

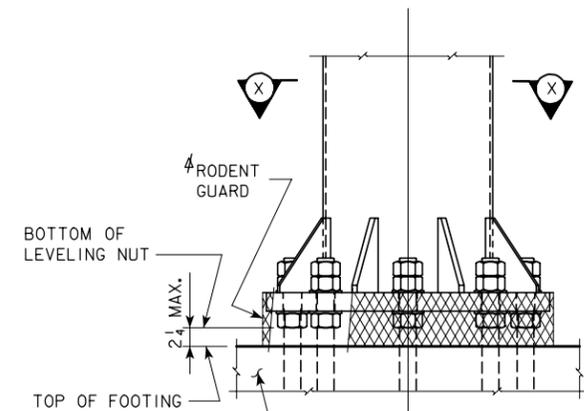
Δ INDICATES A36 STEEL MATERIAL.



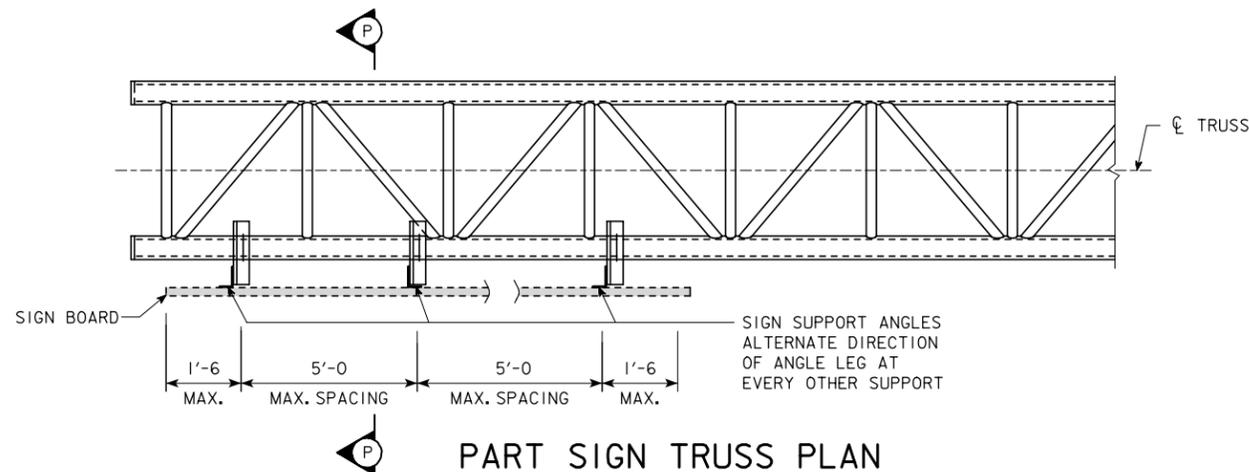
SECTION Y-Y



SECTION X-X



POST BASE DETAIL



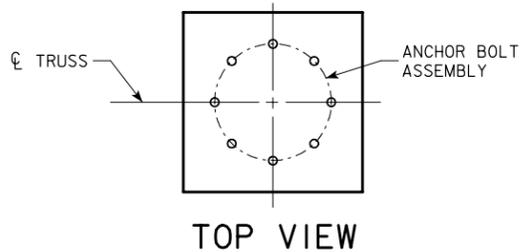
PART SIGN TRUSS PLAN

DESIGN NO.	STATION	LOCATION

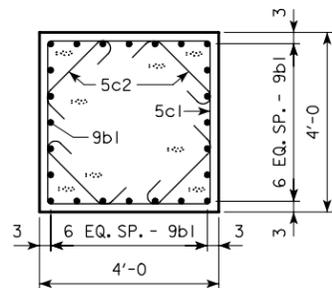
DESIGN FOR
**ALUMINUM CANTILEVER TRUSS
 AND STEEL END POST
 SIGN SUPPORT DETAILS**

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. _____ OF _____ FILE NO. _____ DESIGN NO. _____

REVISION 05-09 - REFERENCE TO DETERMINE THE TOP OF SHAFT ELEVATION CHANGED. CANTILEVERSIGNTRUSS.DGN - 5561 - THIS SHEET ISSUED 04-09.

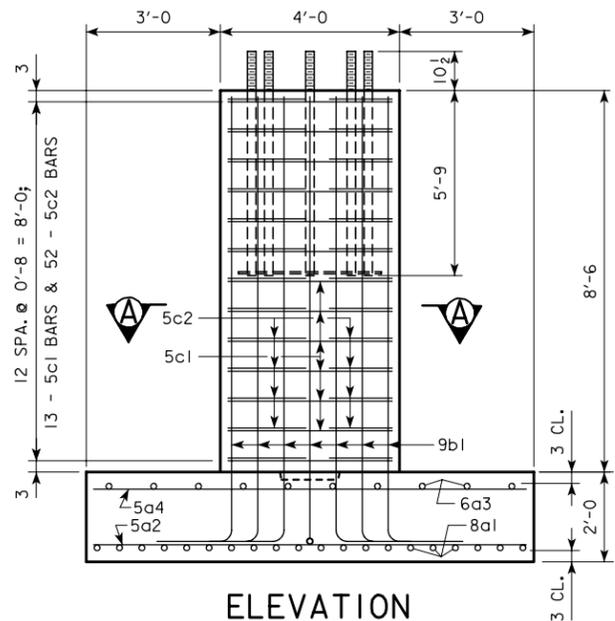


TOP VIEW

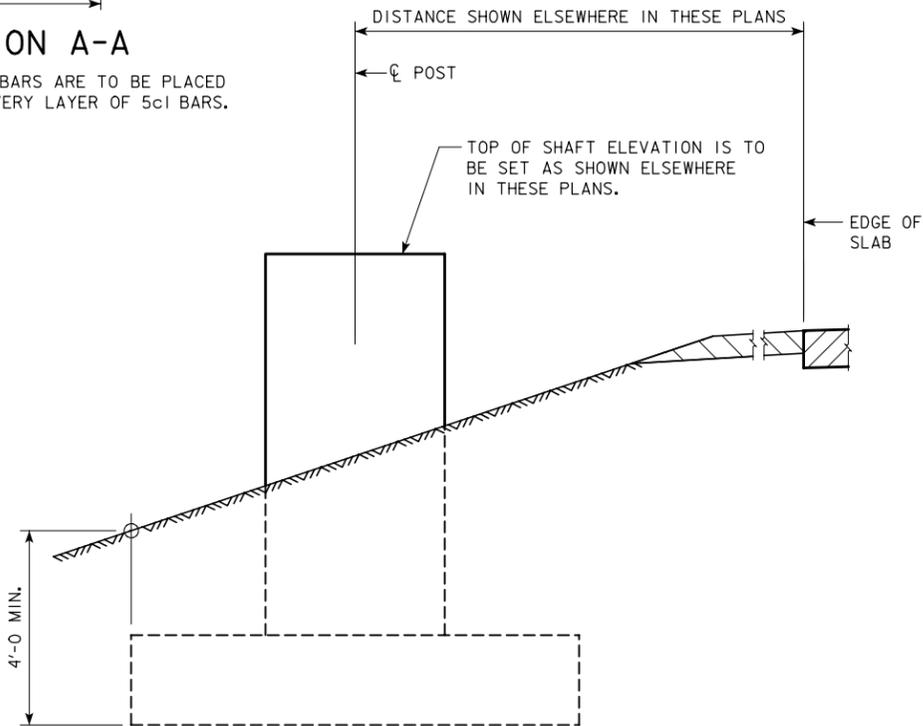


SECTION A-A

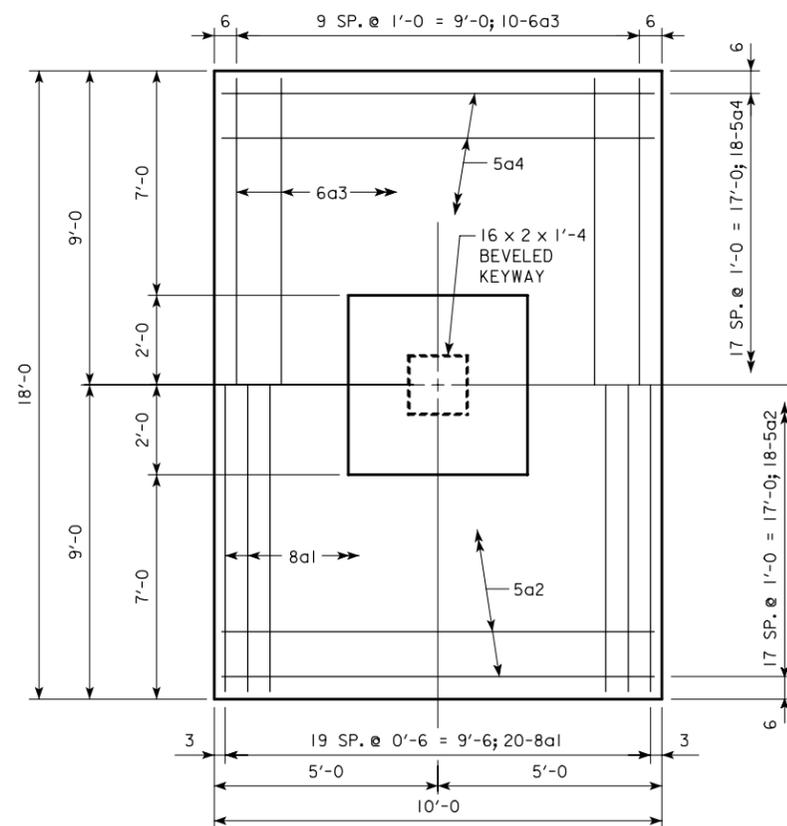
NOTE: 4 - 5c2 BARS ARE TO BE PLACED WITH EVERY LAYER OF 5c1 BARS.



ELEVATION



ELEVATION - TOP OF SHAFT AND BACKFILL



FOOTING PLAN

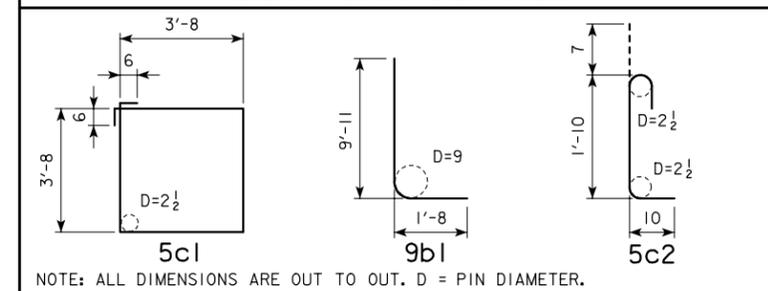
TOP REINF. STEEL

BOTTOM REINF. STEEL

EPOXY COATED REINFORCING BAR LIST

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
8a1	FOOTING BOT., LONGIT.	—	20	17'-8"	943
5a2	FOOTING BOT., TRANSV.	—	18	9'-8"	181
6a3	FOOTING TOP, LONGIT.	—	10	17'-8"	265
5a4	FOOTING TOP, TRANSV.	—	18	9'-8"	181
9b1	FOOTING TO SHAFT DOWEL	L	24	11'-7"	945
5c1	SHAFT HOOPS	□	13	15'-8"	212
5c2	SHAFT TIES	⌒	52	3'-3"	176
EPOXY COATED REINFORCING STEEL - TOTAL (LBS.)					2903

BENT BAR DETAILS



CONCRETE PLACEMENT QUANTITIES

SHAFT	5.0
FOOTING	13.3
TOTAL - CU. YDS.	18.3

ESTIMATED FOOTING QUANTITIES

ITEM	UNIT	DESIGN NO.	DESIGN NO.	DESIGN NO.	DESIGN NO.
STRUCTURAL CONCRETE	CU. YDS.	18.3	18.3	18.3	18.3
REINFORCING STEEL-EPOXY COATED	LBS.	2903	2903	2903	2903
CLASS 20 EXCAVATION	CU. YDS.				

DESIGN NO.	STATION	LOCATION

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AND STEEL END POST
FOOTING DETAILS

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DESIGN SHEET NO. ___ OF ___ FILE NO. ___ DESIGN NO. ___