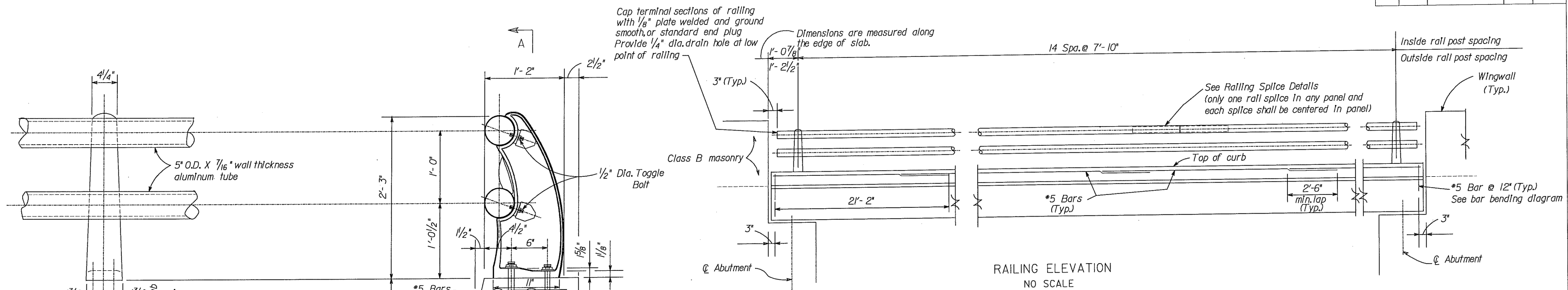


REG	STATE	PROJECT	SHEET	TOTAL
SE	TN	FOOT BDI	NO.	SHEETS

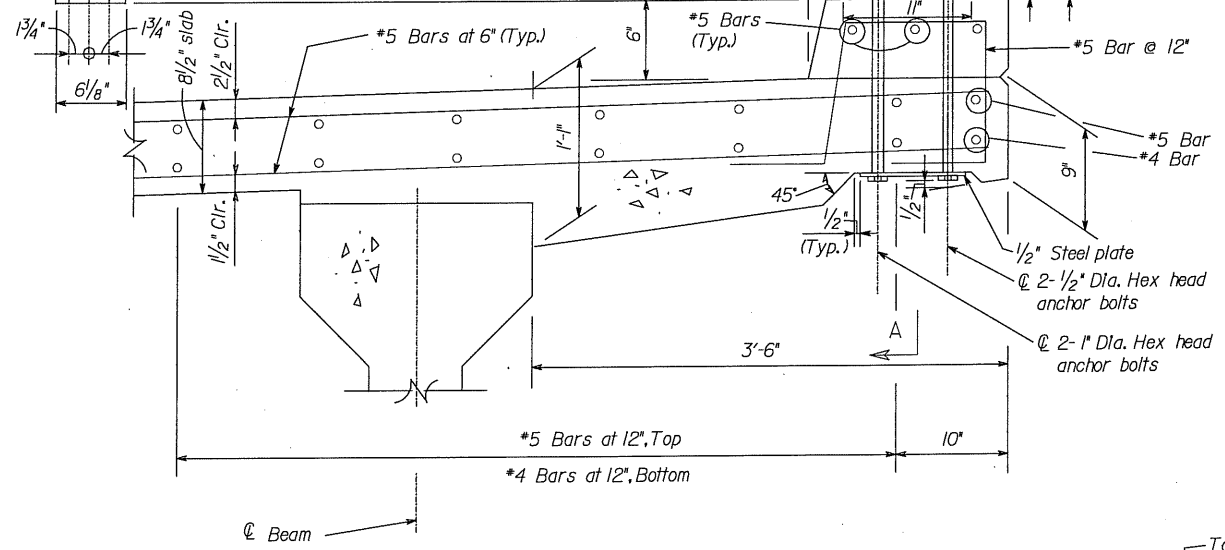


RAILING ELEVATION
NO SCALE

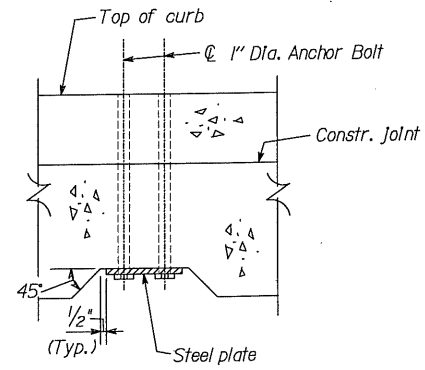
Post And Railing Notes

1. Posts shall be permanent mold cast aluminum ASTM B-108, Alloy A444 - T4.
2. Railing and rail splices shall be aluminum extruded tube ASTM B-221, Alloy 6061 - T6
3. Anchor and toggle bolts shall be steel conforming to ASTM A 276 Type 302, 304 or 316. Hex nuts, and washers shall be steel conforming to ASTM F594, Alloy 304.
4. Steel anchor plates shall conform to ASTM A 36.
5. Aluminum surfaces in contact with concrete shall be coated with aluminum caulking compound - Fed. Spe. TT - C - 589, Grade I. Preformed fabric pads (1/8") may be used as an alternate.
6. Provide aluminum shims as required for alignment of posts. Set post normal to grade. Railing splices shall be located at 1/8 points ± 4".
7. The post furnished may deviate slightly from the configuration shown, except for height, in order that an available commercial casting may be used. The casting used must conform with the requirements of the design specifications and must be submitted to the engineer for approval prior to being fabricated.
8. Railing to be continuous over 3 or more posts.
9. Rails on curved alignment shall be shop bent to the required radius.
10. All exposed surfaces of post and rail shall have a field applied No. 60 grit sandblasted finish.

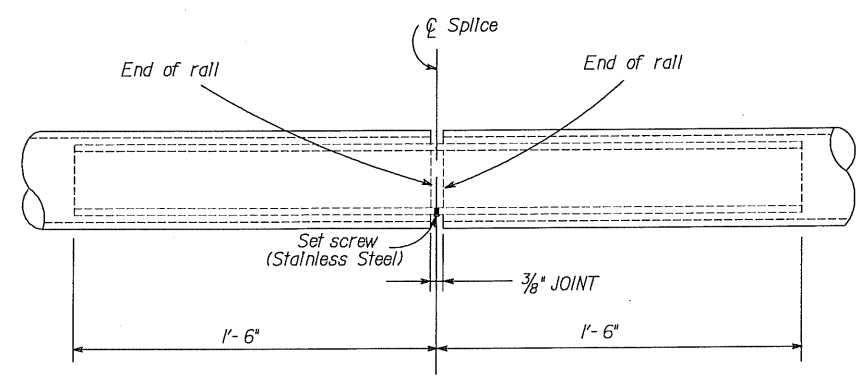
Note:
Apply a layer of heavy grease to the full length of the anchor bolts; preventing bond between the concrete and the bolt and allowing for future replacement of the bolts.



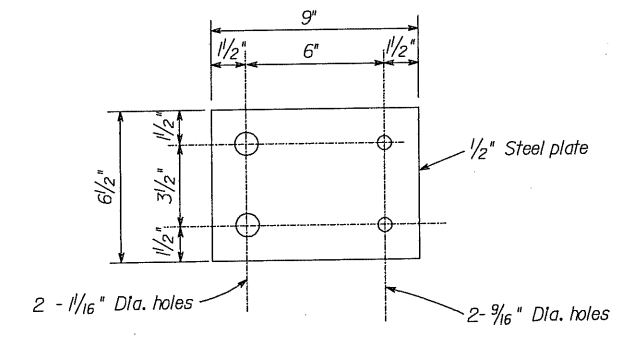
POST AND DECK SLAB DETAILS
NO SCALE



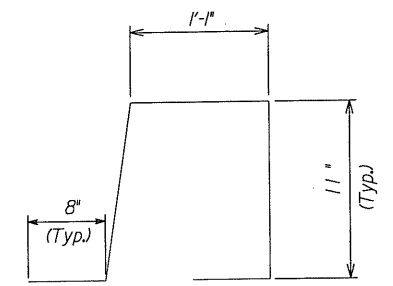
SECTION A-A
(Reinf. steel, rail and post are not shown)
NO SCALE



RAILING SPLICE DETAIL
NO SCALE



ANCHOR PLATE DETAIL
SCALE: 3" = 1'-0"



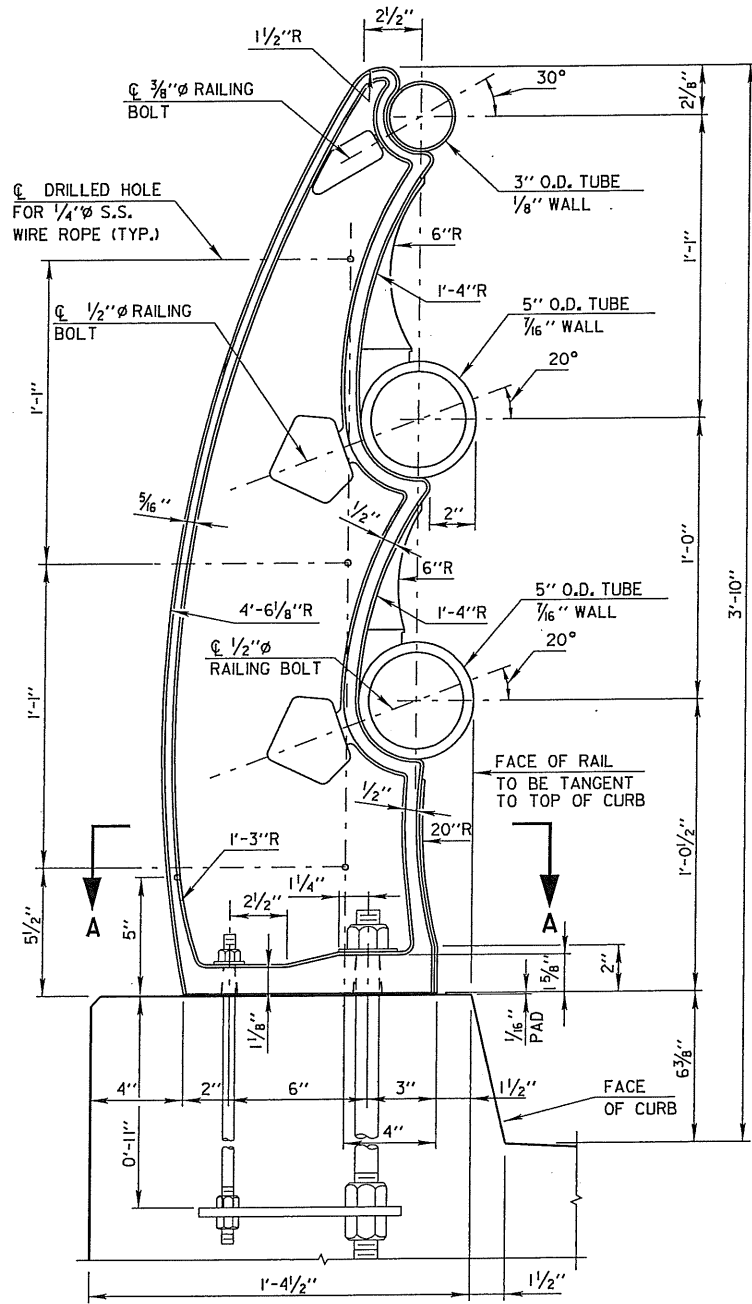
BAR BENDING DIAGRAM

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
EASTERN FEDERAL LANDS HIGHWAY DIVISION
FOOTHILLS PARKWAY

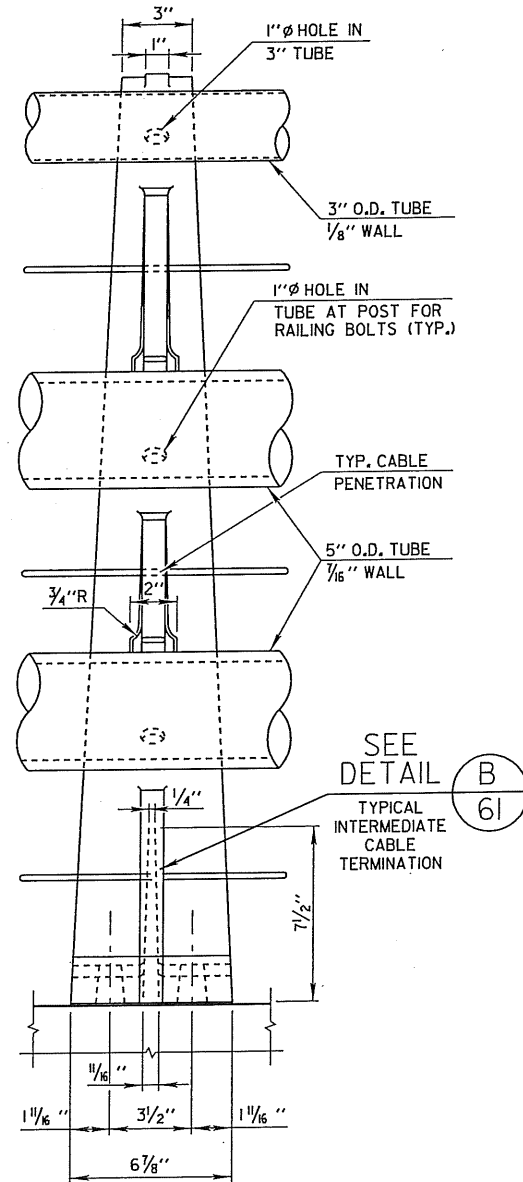
RAIL DETAILS

DESIGNED BY	DRAWN BY	CHECKED BY	SQUAD LEADER	DATE July 1989	G -
			Shoukry Elnahal	SCALE As shown	Br. Dwg. No. of

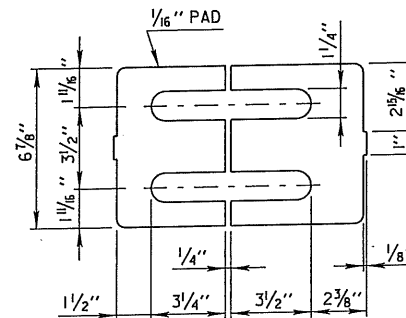
3/27/2003 7:47:51 AM \\M:\udam\WEBV\c001115\CADD\NF.par.3.dgn



ALUMINUM RAILING POST

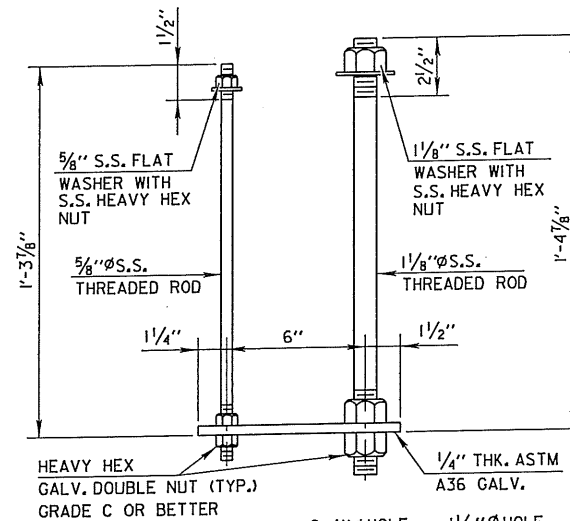


SECTION A-A

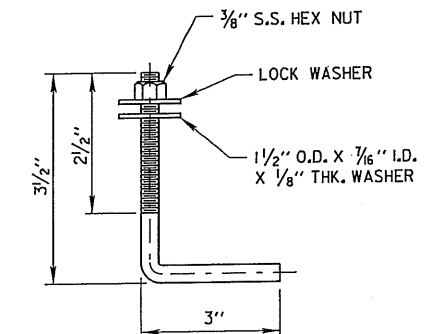


NOTE: PREFORMED PADS SHALL CONSIST OF COTTON FIBERS BONDED WITH NATURAL OR SYNTHETIC RUBBER. WEIGHT OF FIBER SHALL BE APPROX. 50% OF THE TOTAL WEIGHT OF THE PAD. ULTIMATE BREAKDOWN LIMIT OF THE PAD UNDER COMPRESSIVE LOADING SHALL BE AT LEAST 10,000 P.S.I.

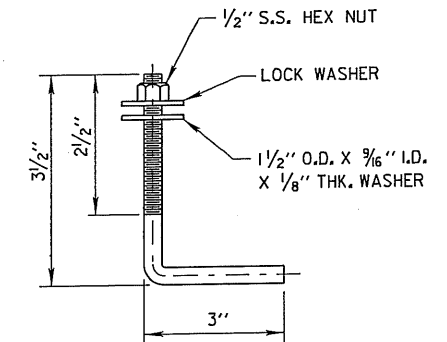
RUBBER FIBER PAD



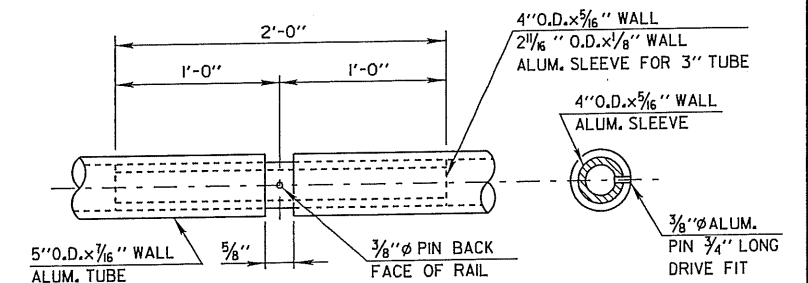
ANCHORAGE DETAIL



3/8" DIA. RAILING BOLT

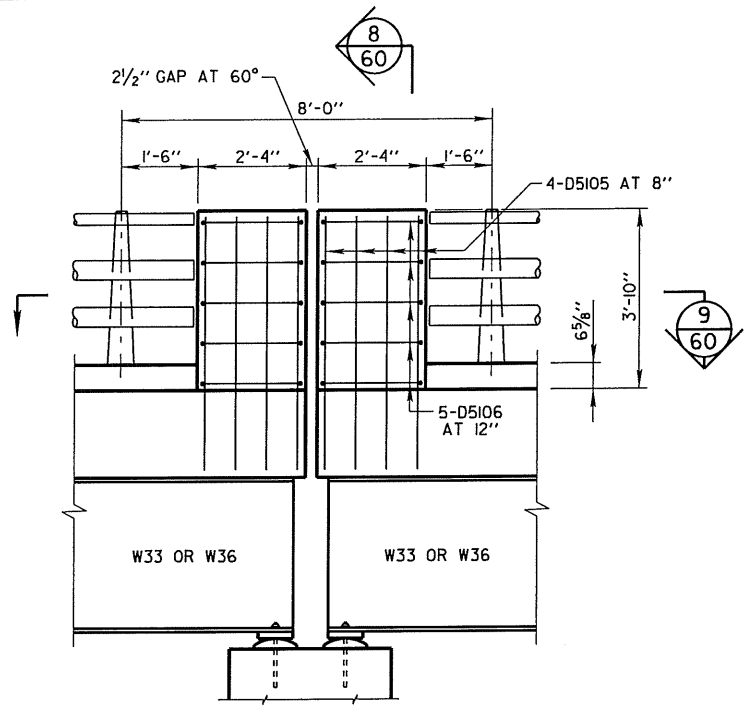


1/2" DIA. RAILING BOLT

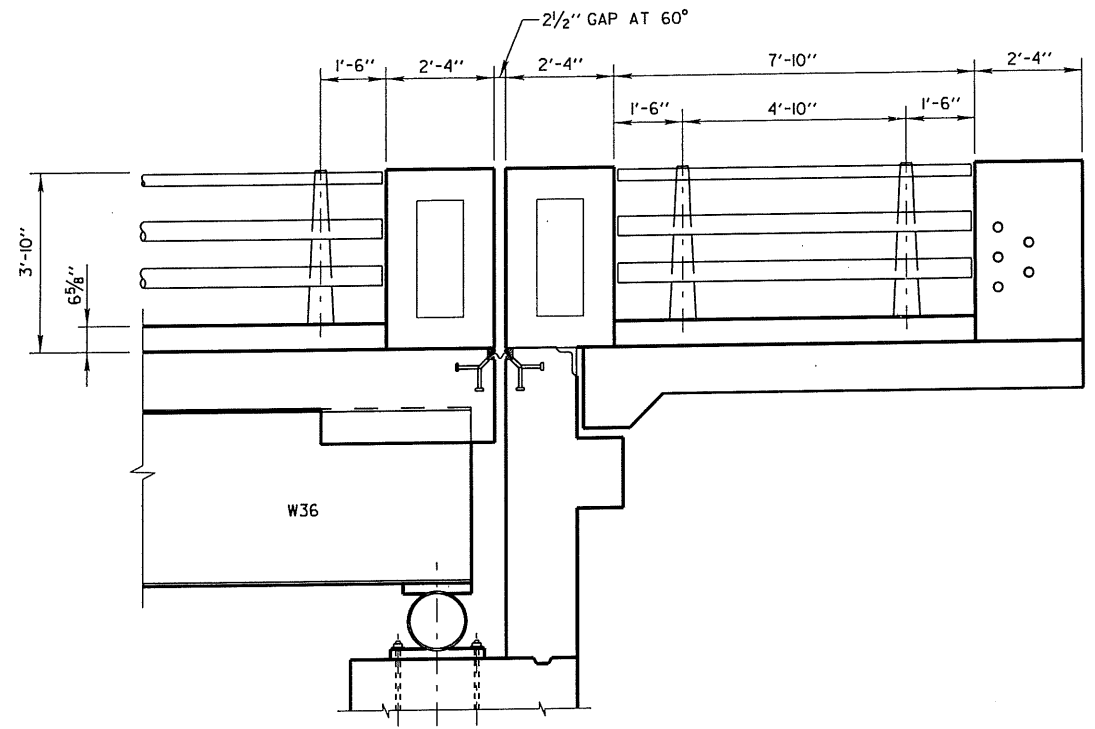


ALUMINUM SLEEVE

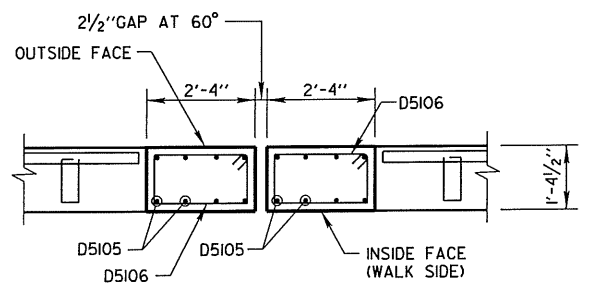
NO.	DATE	REVISION	BY
CITY OF MILWAUKEE DEPARTMENT OF PUBLIC WORKS INFRASTRUCTURE SERVICES DIVISION			
STRUCTURE P-40-804			
DESIGNED BY	RVK	DRAWN BY	KPS
CHECKED BY	RVK	DATE	03-2011
3-LINE ALUMINUM RAILING DETAILS			SHEET 59 OF 86
			X



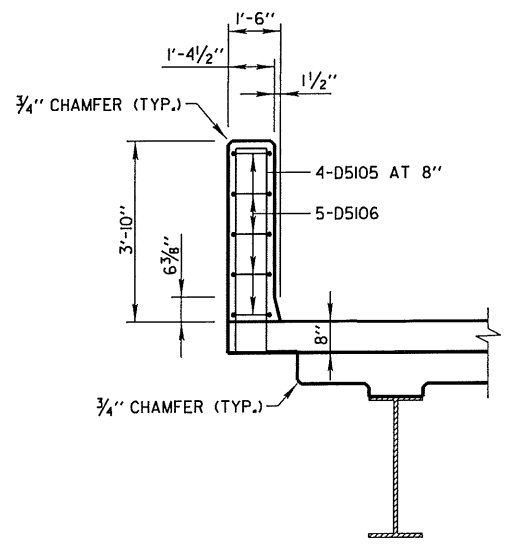
DETAIL AT PIER
 3 3 3 3 3 3 3
 6 7 8 9 19 20 24
 DETAIL AT PIERS 2, 3, 4, 5, 8 & 12 (LOOKING NORTH)



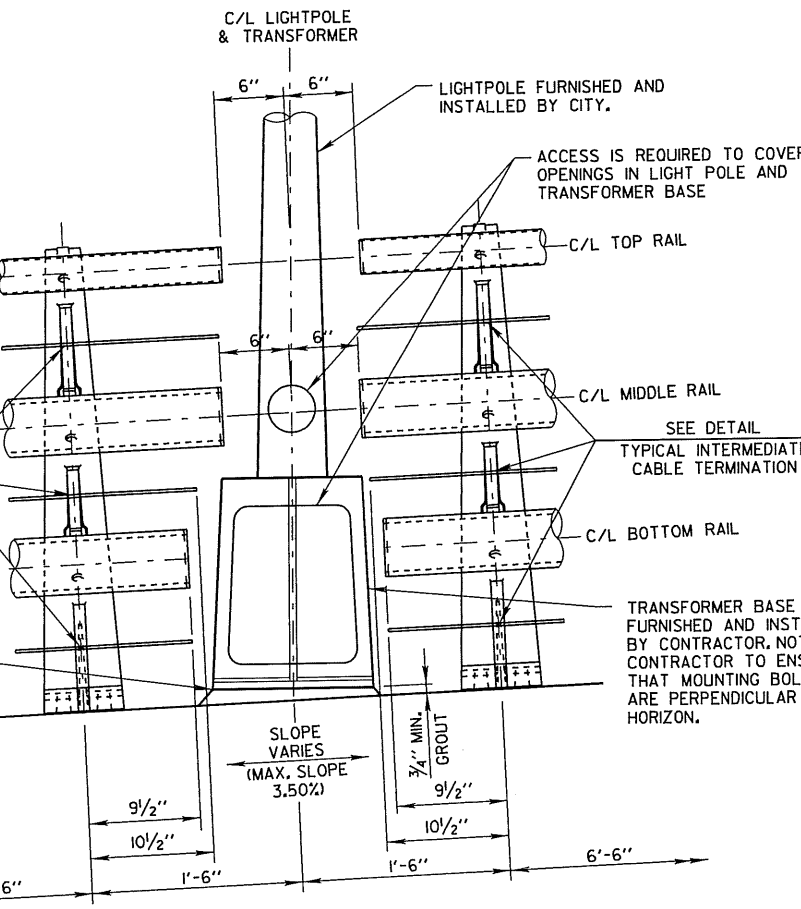
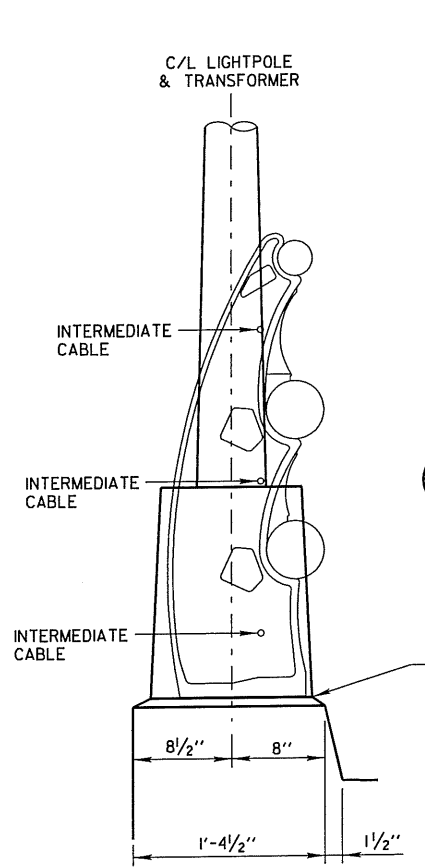
C
 56
 DETAIL AT ABUTMENT



9
 60
 SECTION



8
 60
 SECTION



NOTE: VARY LENGTH OF TOP AND INTERMEDIATE RAIL TO PROVIDE CLEARANCE FROM LIGHT POLE AS SHOWN

A
 61
 SEE DETAIL TYPICAL INTERMEDIATE CABLE TERMINATION

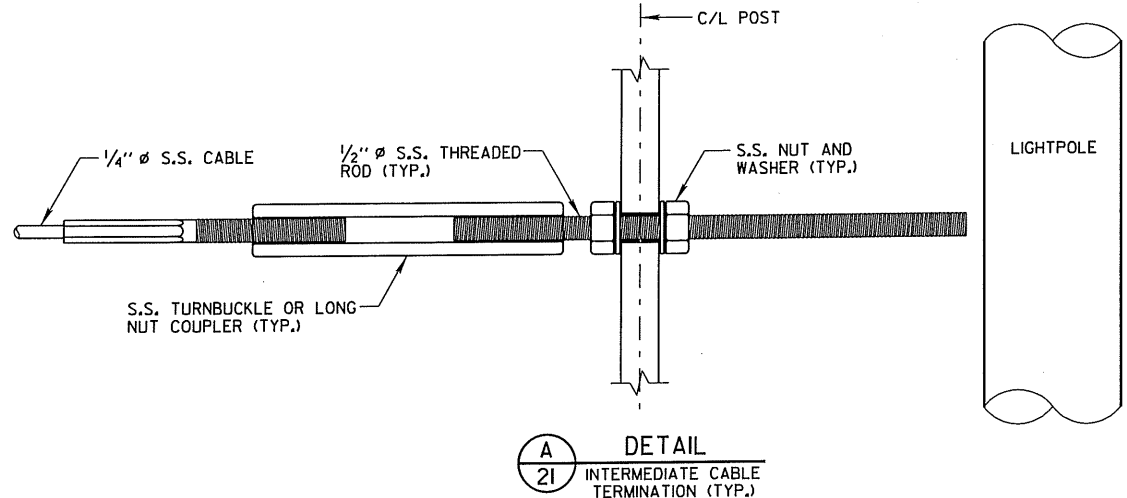
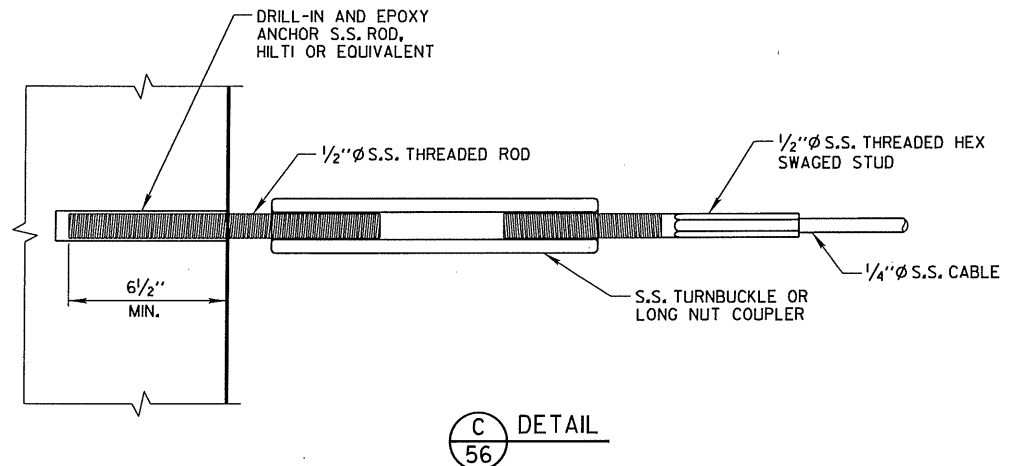
ALUMINUM RAILING BREAK AT LIGHT POLE
 55

WASTEWATER/FINAL PLANS/
 RAILING LIGHTPOLE DRAIN/
 60-RAIL2.DGN 03-23-2011

8

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NO.	DATE	REVISION	BY
CITY OF MILWAUKEE DEPARTMENT OF PUBLIC WORKS INFRASTRUCTURE SERVICES DIVISION STRUCTURE P-40-804			
DESIGNED BY	RVK	DRAWN BY	KPS
CHECKED BY	JMW	DATE	03-2011
RAILING: CABLE TERMINATION AND LIGHT POLE DETAILS			SHEET 60 OF 86 X



- NOTES:**
1. THIS RAILING IS BASED ON THE AASHTO CRASH TESTED BR2 TYPE A ALUMINUM RAILING.
 2. ELECTRODES FOR WELDING SHALL CONFORM TO AWS A5.10, ALLOY ER.
 3. ALL WELDS TO BE SMOOTH AND FREE FROM SHARP EDGES AND/OR BURRS.
 4. POST TO BE ALUMINUM ALLOY PERMANENT MOLD CASTING CONFORMING TO AASHTO DESIGNATION M193, ALLOY A444-T4.
 5. RAILS AND SPLICE SLEEVES SHALL BE ALUMINUM ALLOY EXTRUDED TUBING 6061-T6 PER ASTM B221.
 6. ALL POSTS SHALL BE SET NORMAL TO THE PGL. RAILS SHALL BE ATTACHED TO A MINIMUM OF 4 POSTS.
 7. ALL RAILS SHALL BE FREE FROM SHARP EDGES OR BURRS THAT COULD CAUSE INJURY.
 8. HOLES FOR BOLTS IN RAILS ARE TO BE FIELD DRILLED TO INSURE PROPER FIT.
 9. FOR PEDESTRIAN CABLE DETAILS, SEE THIS SHEET AND SHT. 60.
 10. CABLES SHALL BE TIGHTENED AFTER ATTACHMENT OF RAILING.
 11. INTERMEDIATE CABLE TERMINATORS SHALL BE LOCATED AT ± 75'.

RAIL TO POST HARDWARE:

RAILING BOLT ASSEMBLY MATERIALS SHALL BE AS FOLLOWS:

STAINLESS STEEL THREADED RODS SHALL BE ASTM A276 TYPE 304, ANNEALED COLD FINISHED. MINIMUM TENSILE STRENGTH SHALL BE 90 KSI.

STAINLESS STEEL HEX NUTS AND WASHERS SHALL BE ASTM A276 TYPE 300 SERIES.

ANCHOR HARDWARE:

ALL THREADED RODS SHALL BE STAINLESS STEEL ASTM A276 TYPE 300 OR 400 SERIES WITH A MINIMUM TENSILE STRENGTH OF 90 KSI, MINIMUM YIELD STRENGTH OF 35 KSI AND MIN ELONGATION OF 15% IN 2 INCHES.

ALL HEAVY HEX NUTS AND WASHERS SHALL BE STAINLESS STEEL U.N.O.

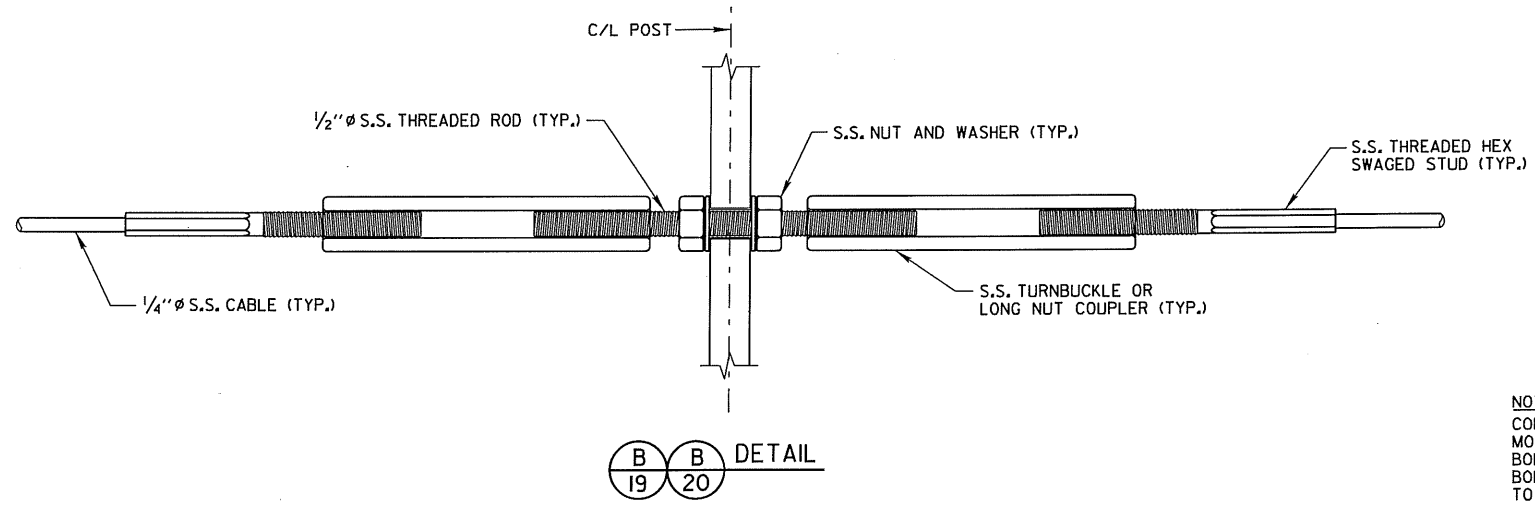
NEOPRENE PADS SHALL HAVE A NOMINAL DUROMETER HARDNESS OF 60±5

SHIM MATERIAL SHALL BE ASTM B209, ALLOY 1100-0.

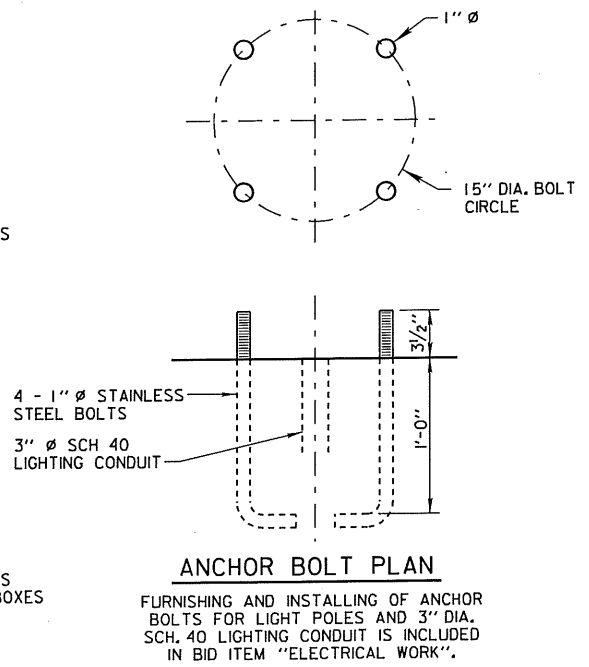
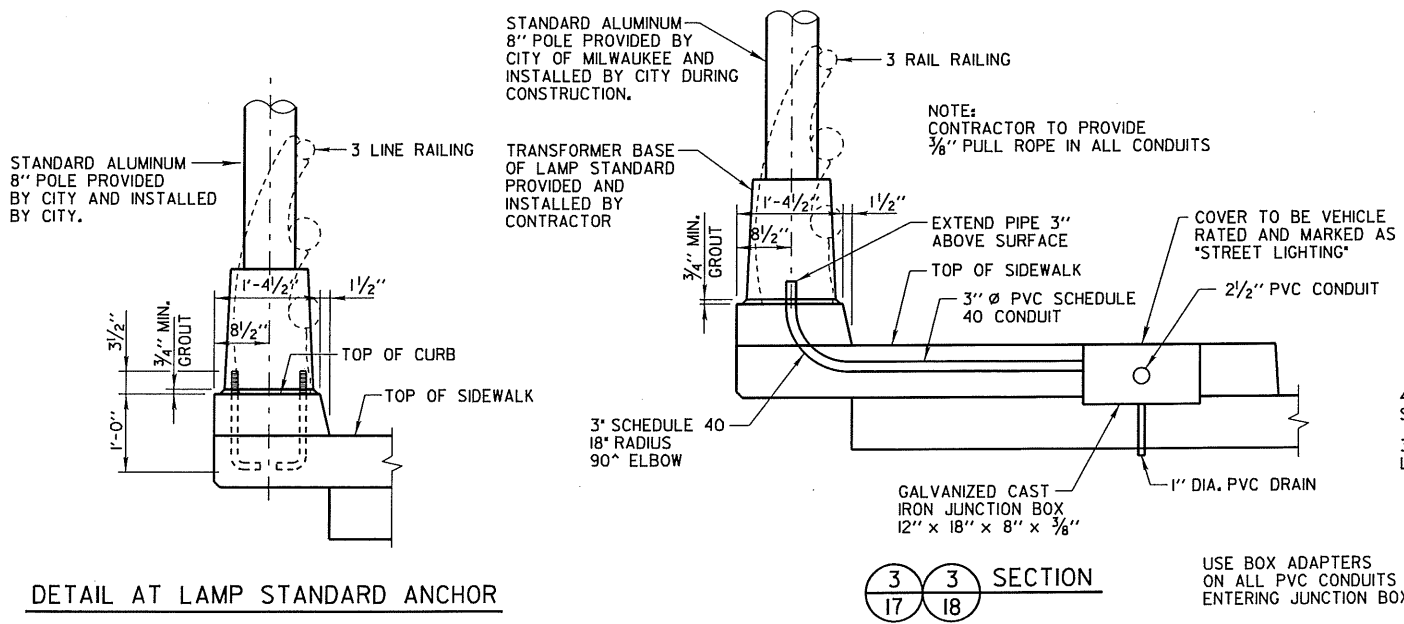
CABLE HARDWARE:

CABLE
 1/4" S.S. IX19 CLASS.
 BREAKING STRENGTH OF 8,200 LB

THREADED HEX SWAGED STUD
 THREAD SIZE : 1/2" - 20
 LENGTH OF THREAD : 3" MIN
 TOTAL LENGTH : AS MANUFACTURER REQUIRED
 FOR 1/4" IX19 SS CABLE
 PART NO. H58-50FCC
 THE CABLE CONNECTION
 5224 HIGHWAY 50E
 CARSON CITY, NV 89701
 800-851-2961
 OR EQUIVALENT



NOTE:
 CONTRACTOR TO ENSURE THAT MOUNTING BOLTS FOR 15-INCH BOLT CIRCLE AND ALSO MOUNTING BOLTS FOR 11-INCH BOLT CIRCLE TO BE PERPENDICULAR TO HORIZON.



W:\STRYB02\FINAL PLANS\ E-RAILING LIGHTPOLE DRAIN\ 61_RAIL 3.DGN 3-23-2011

NO.	DATE	REVISION	BY
CITY OF MILWAUKEE DEPARTMENT OF PUBLIC WORKS INFRASTRUCTURE SERVICES DIVISION			
STRUCTURE P-40-804			
DESIGNED BY	RVK	DRAWN BY	KPS
CHECKED BY	JMW	DATE	03-2011
RAILING: CABLE TERMINATION AND LIGHT POLE DETAILS X			SHEET 61 OF 86

8

8