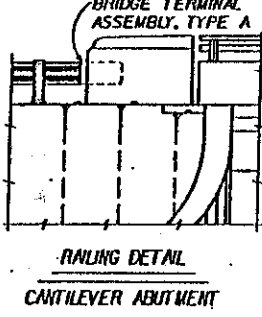
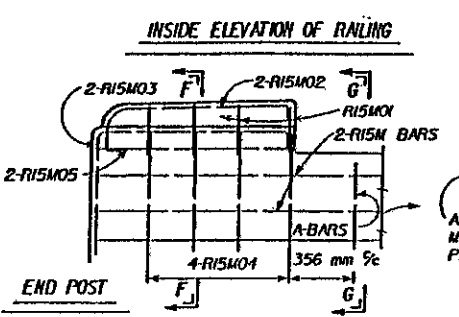


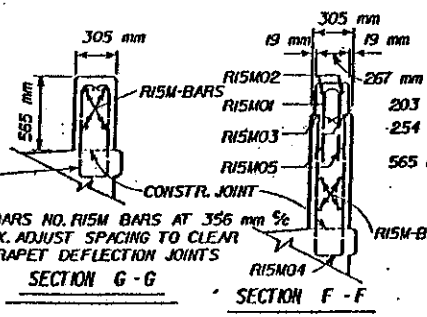
CONCRETE ABOVE SIDEWALK SURFACE CONSTRUCTION JOINT IS INCLUDED WITH RAILING FOR PAYMENT.  
6 mm PREFORMED EXPANSION JOINT FILLER, GRAY SPONGE RUBBER OR GRAY CELLULAR POLYVINYL CHLORIDE SPONGE FILLER SHALL CONFORM TO AASHTO M-153, TYPE I, EXCEPT DENSITY OF PVC SPONGE SHALL NOT BE LESS THAN 325 kg/m<sup>3</sup>. INCLUDE WITH RAILING FOR PAYMENT.



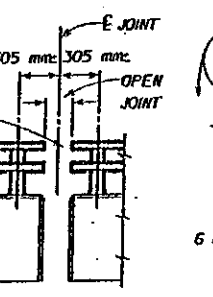
CANTILEVER ABUTMENT RAILING DETAIL



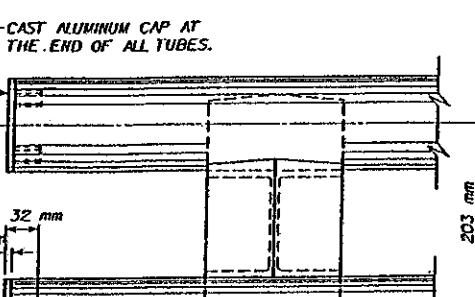
INSIDE ELEVATION OF RAILING



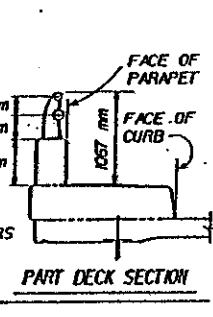
SECTION G-G SECTION F-F



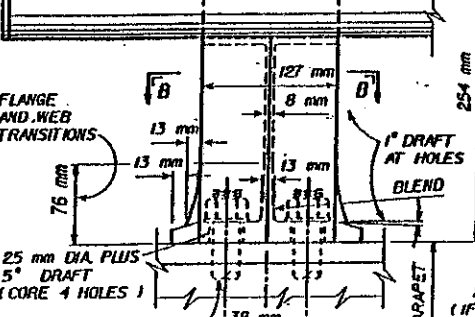
RAILING DETAIL AT DECK EXPANSION JOINT



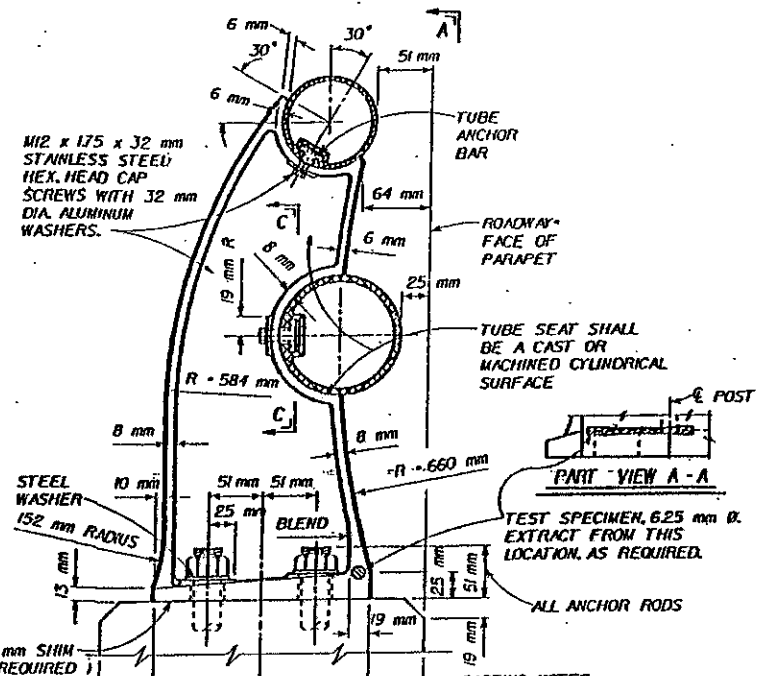
CAST ALUMINUM CAP AT THE END OF ALL TUBES



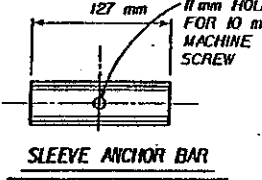
PART DECK SECTION



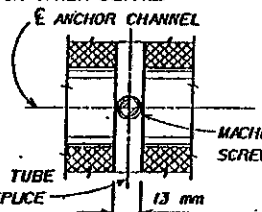
VIEW A-A



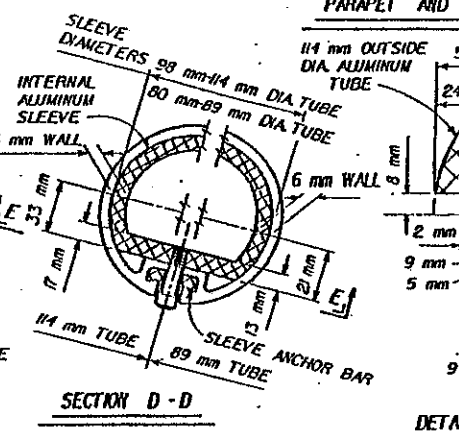
TYPICAL SECTION



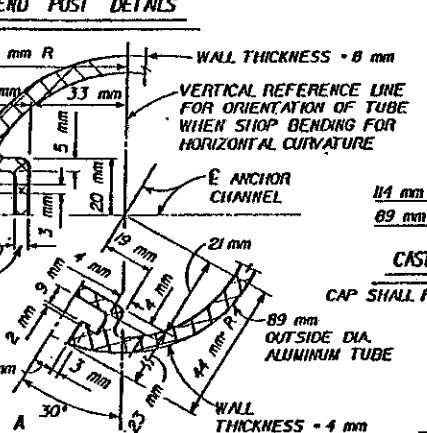
SLEEVE ANCHOR BAR



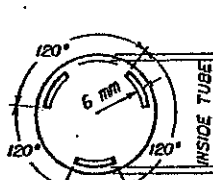
SECTION E-E



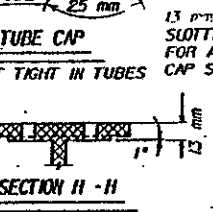
INTERNAL SLEEVE DETAIL



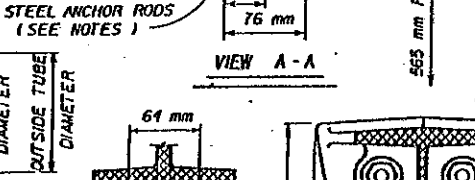
PARAPET AND END POST DETAILS



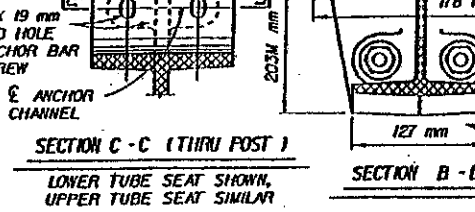
CAST TUBE CAP



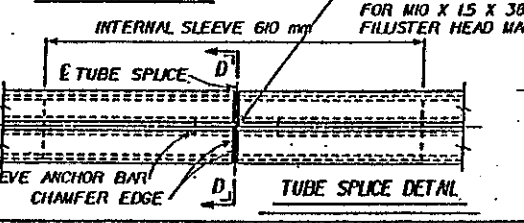
SECTION H-H



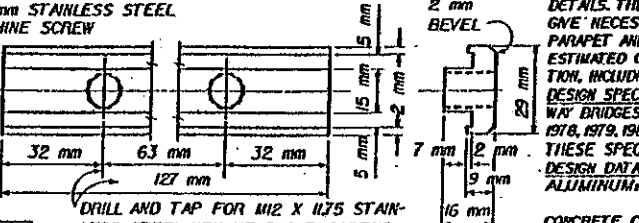
SECTION C-C (THRU POST)



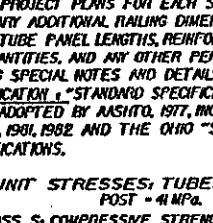
SECTION B-B



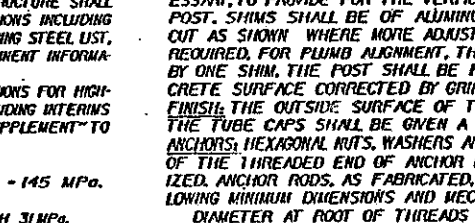
TUBE SPUCE DETAIL



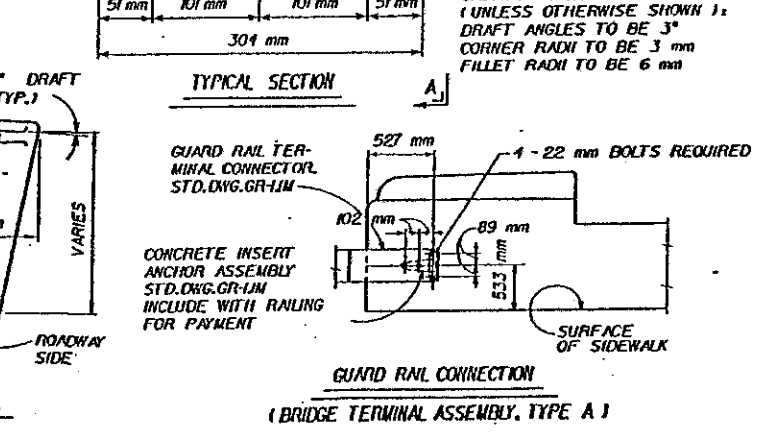
TUBE ANCHOR BAR DETAIL



DETAIL A

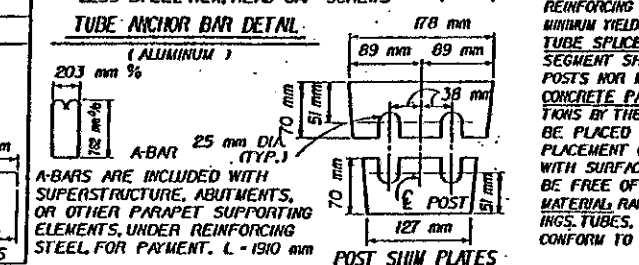


SECTION D-D



GUARD RAIL CONNECTION (BRIDGE TERMINAL ASSEMBLY, TYPE A)

RAILING REINFORCING STEEL table with columns: MARK, LENGTH, WEIGHT, SHAPE, BENDING DIAGRAMS. Lists bars R15M01 through R15M05 and R15M BARS.



POST SHIM PLATES

GENERAL: THIS DRAWING PROVIDES DESIGN AND CONSTRUCTION DETAILS. THE PROJECT PLANS FOR EACH STRUCTURE SHALL GIVE NECESSARY ADDITIONAL RAILING DIMENSIONS INCLUDING PARAPET AND TUBE PANEL LENGTHS, REINFORCING STEEL LIST, ESTIMATED QUANTITIES, AND ANY OTHER PERTINENT INFORMATION, INCLUDING SPECIAL NOTES AND DETAILS.  
DESIGN SPECIFICATION: "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES" AASHTO, 1977, INCLUDING INTERIMS 1978, 1979, 1980, 1981, 1982 AND THE OHIO "SUPPLEMENT" TO THESE SPECIFICATIONS.  
DESIGN DATA: ALUMINUM UNIT STRESSES; TUBES - 145 MPa, POST - 41 MPa.  
CONCRETE CLASS S<sub>3</sub> COMPRESSIVE STRENGTH 31 MPa, REINFORCING STEEL ASTM A615M, A615M OR A615M, GRADE 400, MINIMUM YIELD STRENGTH 400 MPa AND SHALL BE EPOXY COATED. TUBE SPLICES ARE TO BE LOCATED SO THAT EACH TUBE SEGMENT SHALL BE CONNECTED TO NOT LESS THAN TWO POSTS NOR MORE THAN THREE.  
CONCRETE PARAPETS SHALL BE PLACED IN ALTERNATE SECTIONS BY THE USE OF BULKHEADS. CLOSING SECTIONS SHALL BE PLACED AFTER REMOVAL OF BULKHEADS AND AFTER PLACEMENT OF SPONGE FILLER FILLER SHALL BE FLUSH WITH SURFACE OF CONCRETE AND EXPOSED EDGES SHALL BE FREE OF MORTAR.  
MATERIAL: RAILING POSTS SHALL BE PERMANENT MOLD CASTINGS, TUBES, INTERNAL SLEEVES AND ANCHOR BARS SHALL CONFORM TO ASTM B221M, 6061-T6 OR 6351-T5.

SHIMS SHALL BE PROVIDED UNDER RAILING POST, WHERE NECESSARY, TO PROVIDE FOR THE VERTICAL ADJUSTMENT OF THE POST. SHIMS SHALL BE OF ALUMINUM ALLOY, 2 mm THICK, CUT AS SHOWN WHERE MORE ADJUSTMENT OF THE POST IS REQUIRED. FOR PLUMB ALIGNMENT, THAN CAN BE CORRECTED BY ONE SHIM, THE POST SHALL BE REMOVED AND THE CONCRETE SURFACE CORRECTED BY GRINDING. FINISH THE OUTSIDE SURFACE OF THE POST FLANGES AND THE TUBE CAPS SHALL BE GIVEN A 40 GRIT FINISH.  
ANCHORS: HEXAGONAL NUTS, WASHERS AND A MINIMUM OF 152 mm OF THE THREADED END OF ANCHOR RODS SHALL BE GALVANIZED. ANCHOR RODS, AS FABRICATED, SHALL HAVE THE FOLLOWING MINIMUM DIMENSIONS AND MECHANICAL PROPERTIES:  
DIAMETER AT ROOT OF THREADS 16 mm  
STRAIGHT PORTION OF ROD 305 mm LONG  
HOOK AT BOTTOM 64 mm 90° BEND  
ANCHOR TENSILE STRENGTH 93 412 N  
HEXAGONAL NUT SHALL DEVELOP THE TENSILE STRENGTH OF THE ANCHOR ROD.  
CAP SCREWS SHALL BE STAINLESS STEEL, ASTM A276, TYPE 410 WITH A MINIMUM YIELD STRENGTH OF 550 MPa. FILLISTER HEAD MACHINE SCREWS SHALL BE STAINLESS STEEL, ASTM A276, TYPE 302 WITH A MINIMUM YIELD STRENGTH OF 310 MPa.  
PARAPET DEFLECTION JOINTS GENERALLY SHALL BE LOCATED MIDWAY BETWEEN RAIL POSTS AND SPACED TWO RAIL PANEL LENGTHS APART. FOR CONTINUOUS STRUCTURES THE PARAPET PANELS SHALL BE FURTHER SUBDIVIDED IN THE NEGATIVE

MOMENT REGION (OVER THE PIERS) INTO PANEL LENGTHS OF NOT LESS THAN 152 mm NOR MORE THAN 2290 mm. JOINTS SHALL CLEAR POST ANCHORS BY 203 mm MINIMUM.  
HORIZONTAL CURVATURE: THIS STANDARD IS APPLICABLE TO STRUCTURES HAVING A RAILING CURVATURE RADIUS OF 600 mm OR MORE. FOR A RADIUS LESS THAN 600 mm, THE DESIGN SHALL BE SPECIAL. FOR STRUCTURES ON CURVATURES OF 3° OR LESS, THE TUBES MAY BE FURNISHED STRAIGHT AND FORCED INTO POSITION IN THE FIELD.  
BAR SIZE IS INDICATED IN THE BAR MARK. THE FIRST LETTER IDENTIFIES THE BAR LOCATION, NEXT TWO DIGITS AND LETTER INDICATES THE METRIC BAR SIZE DESIGNATION, AND THE REMAINING DIGITS ITS SEQUENCE NUMBER.  
EXAMPLE: P15M01  
P-LOCATION OF THE BAR IN THE  
15M-METRIC BAR SIZE DESIGNATION  
01-SEQUENCE NUMBER