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STATE OF  
 NORTH CAROLINA  
 DEPT. OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 RALEIGH, N.C.

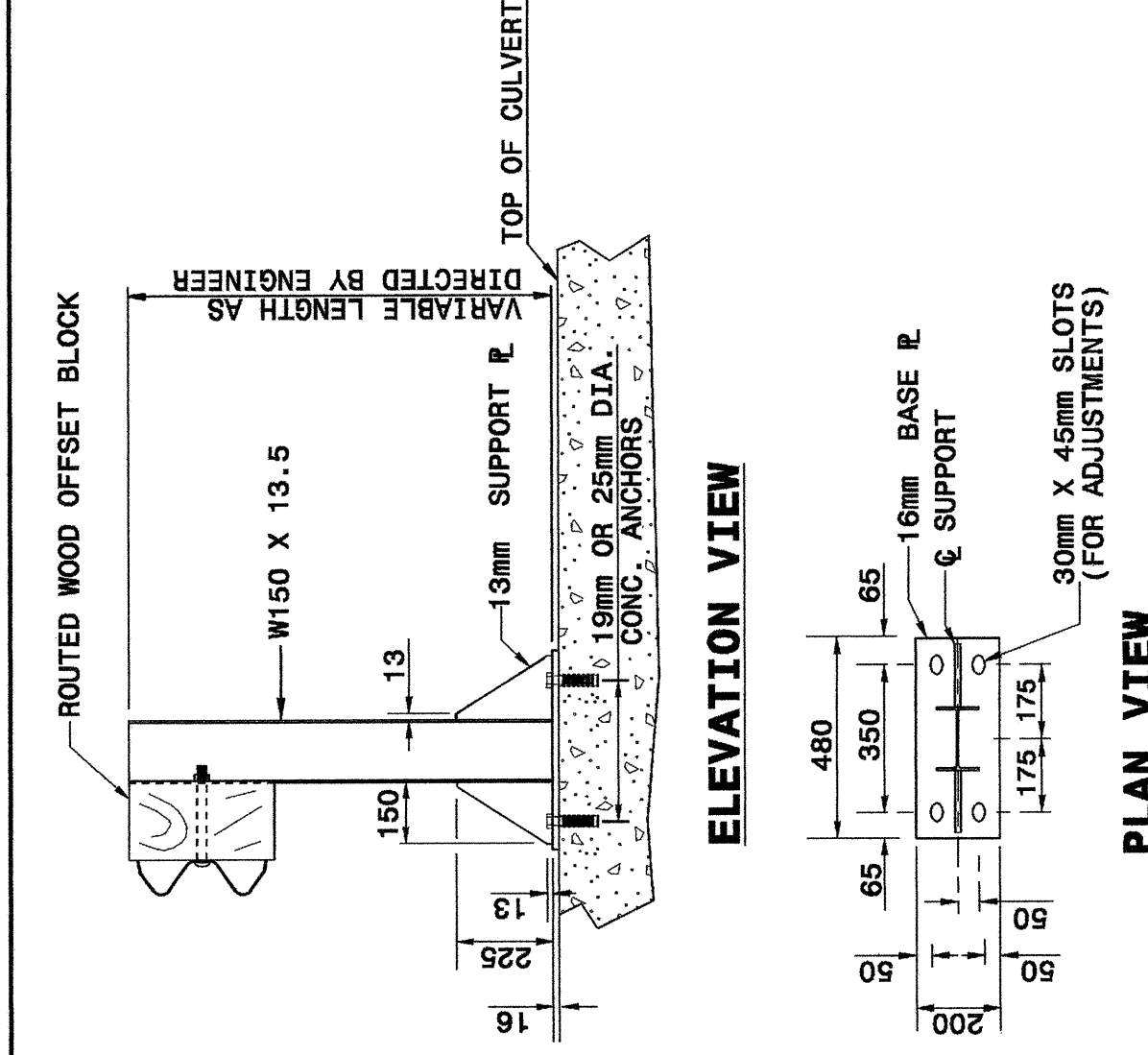
METRIC DETAIL DRAWING FOR  
**STRUCTURE ANCHOR UNITS**  
 ANCHORAGE FOR GUARDRAIL POST ON BOX CULVERT

SHEET 1 OF 4  
**862D03**

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METRIC DETAIL DRAWING FOR  
**STRUCTURE ANCHOR UNITS**  
 ANCHORAGE FOR GUARDRAIL POST ON BOX CULVERT

SHEET 1 OF 4  
**862D03**



**ELEVATION VIEW**  
 ROUTED WOOD OFFSET BLOCK  
 W150 X 13.5  
 13mm SUPPORT PLATE  
 19mm OR 25mm DIA. CONC. ANCHORS  
 TOP OF CULVERT  
 VARIABLE LENGTH AS DIRECTED BY ENGINEER

**PLAN VIEW**  
 480  
 350  
 65  
 16mm BASE R  
 13mm SUPPORT PLATE  
 30mm X 45mm SLOTS (FOR ADJUSTMENTS)

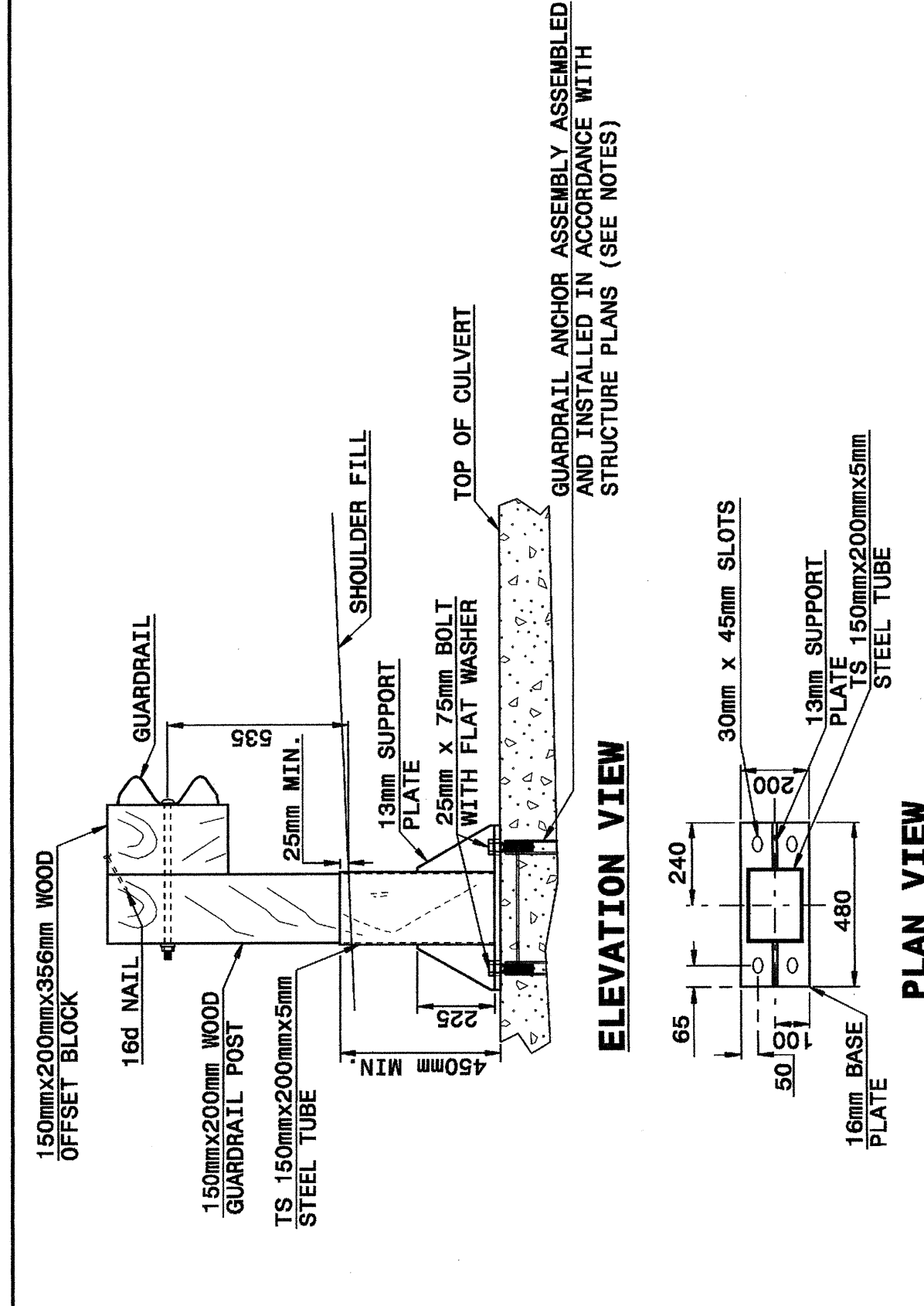
**NOTES FOR:**  
 GUARDRAIL POST ANCHORED TO STRUCTURE:  
 -USE FILL LENGTH 6mm BUT WELDS AT ALL LOCATIONS OF CONTACT BETWEEN THE BASE PLATE, SUPPORT PLATES AND STEEL POST OR STEEL TUBE.  
 -USE POST AND POST BASE PLATES CONFORMING TO THE REQUIREMENTS OF A.S.T.M. A-36 AND GALVANIZED AFTER FABRICATION TO CONFORM TO A.S.T.M. A-123.  
 -USE WOOD POSTS WHICH FIT SNUGLY IN THE STEEL TUBE WITH A MAXIMUM OF 3mm CLEARANCE BETWEEN TUBE WALL AND POST.

**NEW STRUCTURES:**  
 -ATTACH POST TO INSERT ASSEMBLY UNITS (USING ANCHOR BOLTS SUPPLIED WITH INSERTS) WHICH HAVE BEEN CAST INTO THE STRUCTURE DURING CONSTRUCTION.

**EXISTING STRUCTURES:**  
 -CONCRETE ANCHORS CONSISTING OF A STUD BOLT WITH NUT AND WASHER. USE STUDS THREADED ON ONE END AND HAVING AN EXPANDED WEDGE ASSEMBLY POSITIONED AT THE OTHER END. USE ANCHORS WHICH PROVIDE A MINIMUM SAFE HOLDING POWER OF 1300kg. FOR A 19mm OR 25mm DIAMETER BOLT. CALCULATE HOLDING POWER BASED ON 1/4 THE ACTUAL HOLDING POWER OF THE ANCHOR IN 24MPa CONCRETE AS DETERMINED BY AN APPROVED COMMERCIAL TESTING LABORATORY.

-USE ANCHORS GALVANIZED IN ACCORDANCE WITH A.S.T.M. A-153. SIZE HOLES FOR THE CONCRETE ANCHORS IN ACCORDANCE WITH THE ANCHOR MANUFACTURER'S RECOMMENDATIONS. DRILL HOLES WITH A CARBIDE OR DIAMOND TIPPED MASONRY BIT POWERED BY A ROTARY OR ROTARY IMPACT DRILL. NO OTHER IMPACT TOOLS WILL BE PERMITTED. DRILL HOLES VERTICALLY. FURNISH DOCUMENTATION OF HOLE SIZE RECOMMENDED FOR THE SPECIFIED ANCHOR TO THE ENGINEER BEFORE DRILLING HOLES. THOROUGHLY CLEAN HOLES FOR ANCHORS OF ALL CONCRETE CHIPS, DUST, GREASE, OIL, ETC. BEFORE ANCHORS ARE INSTALLED. REPAIR ALL DAMAGE CAUSED BY THIS WORK TO THE SATISFACTION OF THE ENGINEER.

**Note:** This drawing is dimensioned in millimeters unless otherwise depicted within the drawing.



**ELEVATION VIEW**  
 150mm x 200mm x 356mm WOOD OFFSET BLOCK  
 16d NAIL  
 150mm x 200mm WOOD GUARDRAIL POST  
 TS 150mm x 200mm x 5mm STEEL TUBE  
 25mm MIN.  
 13mm SUPPORT PLATE  
 25mm X 75mm BOLT WITH FLAT WASHER  
 450mm MIN.  
 TOP OF CULVERT  
 GUARDRAIL ANCHOR ASSEMBLY ASSEMBLED AND INSTALLED IN ACCORDANCE WITH STRUCTURE PLANS (SEE NOTES)

**PLAN VIEW**  
 240  
 65  
 50  
 480  
 16mm BASE PLATE  
 30mm X 45mm SLOTS  
 13mm SUPPORT PLATE  
 TS 150mm X 200mm X 5mm STEEL TUBE

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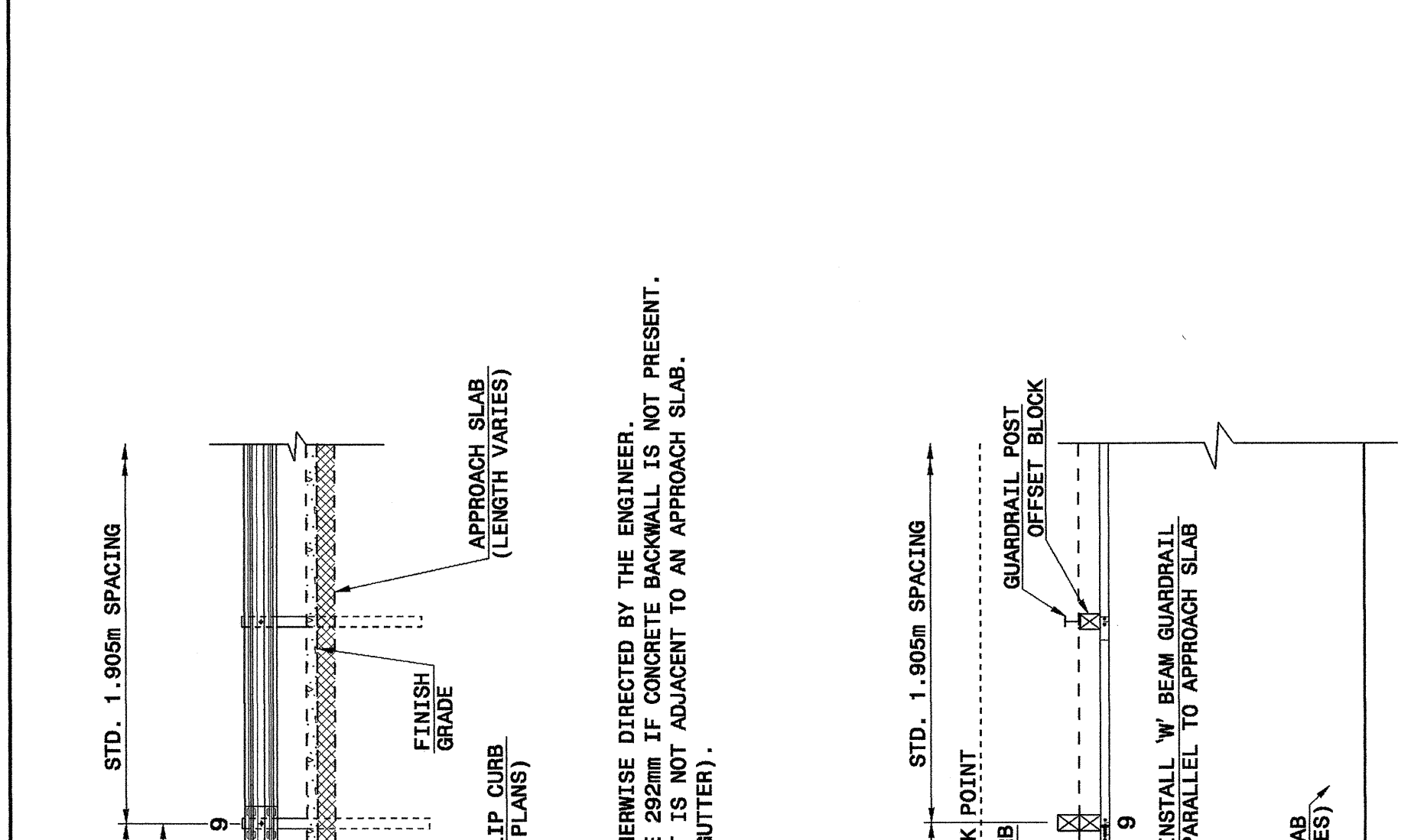
METRIC DETAIL DRAWING FOR  
**STRUCTURE ANCHOR UNITS**  
 GUARDRAIL ANCHOR UNIT, TYPE III  
 FOR ATTACHMENT TO RAIL ON BRIDGE

SHEET 2 OF 4  
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METRIC DETAIL DRAWING FOR  
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 GUARDRAIL ANCHOR UNIT, TYPE III  
 FOR ATTACHMENT TO RAIL ON BRIDGE

SHEET 2 OF 4  
**862D03**

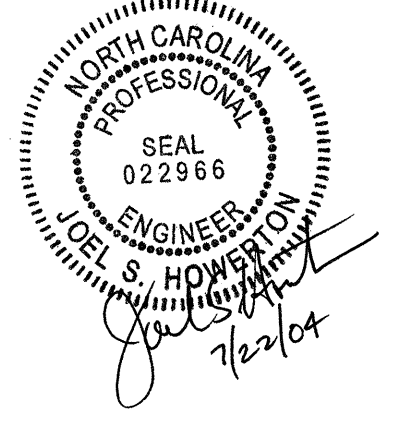


**ELEVATION**  
 PAY LIMITS  
 THIRLE BEAM GUARDRAIL 'NESTED' (ONE RAIL INSIDE ANOTHER)  
 WTR SECTION  
 FINISH GRADE  
 CONCRETE BACKWALL  
 APPROACH SLAB (LENGTH VARIES)  
 200mm X 100mm LIP CURB (SEE STRUCTURE PLANS)  
 FINISH GRADE  
 APPROACH SLAB (LENGTH VARIES)

**NOTE:**  
 \*\*POST NOT REQUIRED FOR SKEW ANGLES GREATER THAN 150° OR LESS THAN 30° UNLESS OTHERWISE DIRECTED BY THE ENGINEER.  
 \*THE DISTANCE FROM END OF BRIDGE RAIL TO CENTER LINE OF THE FIRST POST SHOULD BE 282mm IF CONCRETE BACKWALL IS NOT PRESENT.  
 -SHOULDER BERM GUTTER MUST BE INSTALLED WITHIN THE PAY LIMITS IF THE ANCHOR UNIT IS NOT ADJACENT TO AN APPROACH SLAB.  
 -MEASURE GUARDRAIL HEIGHT FROM THE TOP OF ADJACENT SURFACE (SHOULDER, BERM, OR GUTTER).  
 -USE NO STEEL POSTS WITHIN THE GUARDRAIL ANCHOR UNIT LIMITS.  
 -LAP JOINTS IN THE DIRECTION OF TRAFFIC FLOW.  
 -SEE SHEET 4 FOR POST SECTIONS 1 THRU 9.

**PLAN VIEW**  
 VAR. (MAX. 476mm)  
 4 SPACES @ 476mm  
 3 SPACES @ 963mm  
 STD. 1.905m SPACING  
 SHOULDER BREAK POINT  
 200mm X 100mm LIP CURB (SEE STRUCTURE PLANS)  
 GUARDRAIL POST OFFSET BLOCK  
 BRIDGE END POST  
 BRIDGE RAIL  
 3.5mm THICK END SHOE  
 EXP. JOINT  
 BRIDGE DECK  
 WTR SECTION  
 THIRLE BEAM GUARDRAIL  
 INSTALL 'W' BEAM GUARDRAIL PARALLEL TO APPROACH SLAB  
 APPROACH SLAB (LENGTH VARIES)

**Note:** This drawing is dimensioned in millimeters unless otherwise depicted within the drawing.



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 STANDARDS AND SPECIAL DESIGN  
 Office 919-250-4128 FAX 919-250-4119

**SEE PLATE FOR TITLE**

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