AT THE CONTRACTOR'S OPTION, FERRULES WITH OPEN OR CLOSED ENDS MAY BE USED.

THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS SHALL CONSIST OF THE FOLLOWING COMPONENTS:

A. WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

GUARDRAIL ANCHOR ASSEMBLY WITH BOLTS SHALL BE ASSEMBLED IN THE SHOP. BOLT THREADS MAY BE RECUT AS NECESSARY TO INSURE FIT.

FERRULES TO BE PLUGGED DURING POURING OF SLAB AS RECOMMENDED BY THE MANUFACTURER.

PAYMENT FOR GUARDRAIL, POSTS, AND POST BASE PLATES IS INCLUDED IN ROADWAY PAY ITEMS.

SLAB REINFORCING STEEL MAY BE SHIFTED AS NECESSARY TO CLEAR GUARDRAIL ANCHOR ASSEMBLY. CARE SHOULD BE TAKEN TO KEEP THE SHIFTING OF REINFORCING STEEL TO A MINIMUM.

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS COMPLETE IN PLACE SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CLASS "A" CONCRETE.

THE CONTRACTOR MAY USE ADHESIVELY ANCHORED ANCHOR BOLTS IN PLACE OF GUARDRAIL ANCHOR ASSEMBLY. LEVEL TWO FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 1" BOLT IS 21.8 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SPECIAL PROVISIONS.

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM THICKNESS OF 0.265" WIRE STRUT. AS AN ALTERNATE, 4 - 1" X 2" BOLTS WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI MAY BE USED.

B. 4 - 1" X 2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307, AND WASHERS SHALL BE GALVANIZED. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

C. WIRE STRUTS SHOWN IN THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS DETAIL ARE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS DETAIL SHOWN IS AN ALTERNATE TO THE STANDARD GUARDRAIL ANCHOR ASSEMBLY AND SHALL MEET THE REQUIREMENTS OF THE PROPOSED STANDARD.

THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS SHALL BE DESIGNED TO MEET THE REQUIREMENTS OF THE ENGINEER. THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY FOR CULVERTS COMPLETE IN PLACE SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CLASS "A" CONCRETE.

 anchor bolts are to be used to anchor the guardrail assembly. these bolts shall conform to the requirements of aashto m169, grade 12l14 and shall have a minimum thickness of 0.265" wire strut. as an alternate, 4 - 1" x 2" bolts with a minimum tensile strength of 90,000 psi may be used.

the wire struts shown in the guardrail anchor assembly for culverts detail are minimum allowable size and shall have a minimum tensile strength of 100,000 psi. as an option, a wire strut with a minimum tensile strength of 90,000 psi is acceptable.

the guardrail anchor assembly for culverts shall be designed to meet the requirements of the engineer. the cost of the guardrail anchor assembly for culverts complete in place shall be included in the unit contract price bid for class "a" concrete.