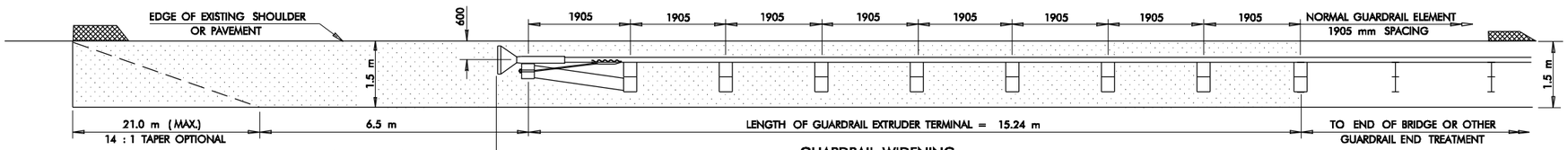
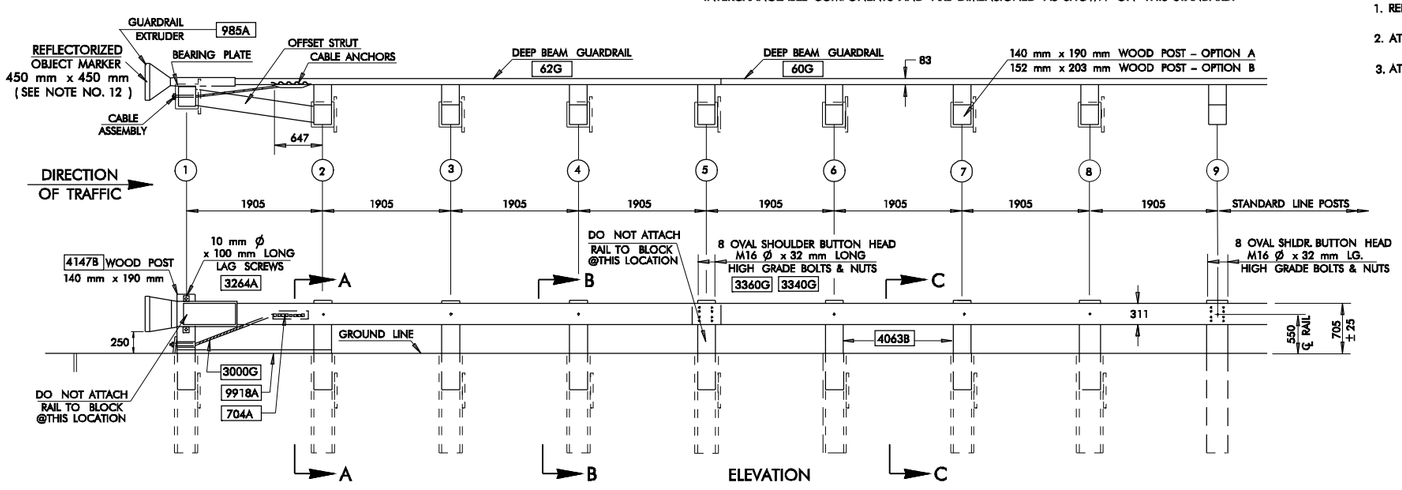
REVISIONS	
DESCRIPTION	DATE
RE-ISSUED W/METRIC 1999 SPECS. Taper&Width For Guardrail Widen'g GET Alternatives Note	lgc 7/99
GET Impact Head Offset Dimension	lgc 8/00



GUARDRAIL WIDENING

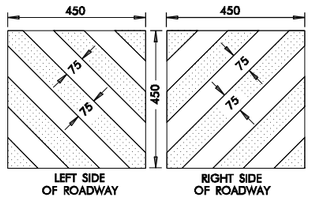
THE CONTRACTOR MAY SUBMIT FOR APPROVAL & USE AN EQUIVALENT 4 OR 8 TUBE G.E.T. TYPE END TREATMENT, SUCH AS THE SKT–350 (SEQUENTIAL KINKING TERMINAL), OR OTHER 4 OR 8 TUBE SYSTEMS WHICH HAVE SUCCESSFULLY PASSED NCHRP 350 TEST LEVEL 3, ARE OF THE SAME OVERALL LENGTH, HAVE INTERCHANGEABLE COMPONENTS AND ARE DIMENSIONED AS SHOWN ON THIS STANDARD.



ELEVATION

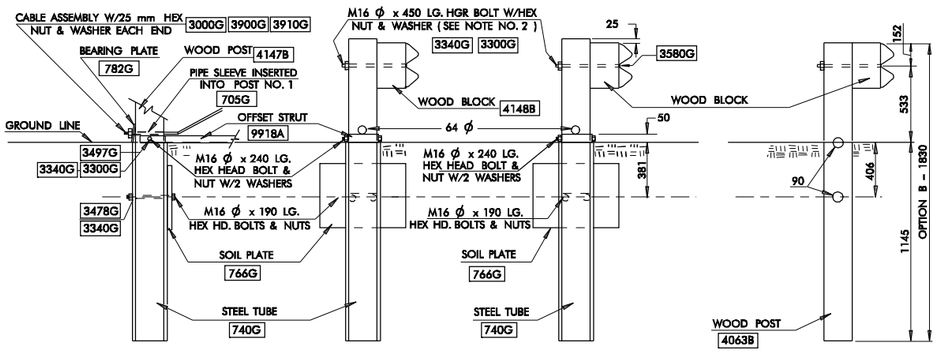
REFLECTIVE MARKER

1. REFLECTORIZED MARKER SHOULD BE ATTACHED TO VERTICAL END (450 mm x 450 mm FACE) OF G.E.T PRIOR TO INSTALLATION.
2. ATTACHMENT SURFACE SHOULD BE THOROUGHLY CLEANED & DRY BEFORE ATTACHING ADHESIVE MARKER (STICK–ON SHEETING).
3. ATTACHED ADHESIVE SHEETING SHOULD BE FREE OF AIR BUBBLES WITH ALL EDGES FIRMLY BONDED.



GENERAL NOTES

1. ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE 1999 METRIC STANDARD SPECIFICATIONS.
2. ALL BOLTS, NUTS, CABLE ASSEMBLIES, CABLE ANCHORS, GROUNDLINE CABLES AND BEARING PLATES SHALL BE GALVANIZED IN ACCORDANCE WITH SECTION 731 OF THE 1999 METRIC STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.
3. GUARDRAIL COMPONENTS SHALL MEET THE APPLICABLE STANDARDS OF "A GUIDE TO STANDARDIZED HIGHWAY RAIL HARDWARE" PREPARED AND APPROVED BY THE AASHTO–ARTBA–AGC JOINT COOPERATIVE COMMITTEE, TECHNICAL BULLETIN NUMBER 2688.
4. THE STEEL TUBES SHALL NOT PROTRUDE MORE THAN 100 mm ABOVE THE GROUND. SITE GRADING MAY BE USED TO MEET THIS REQUIREMENT, USING 1500 mm CHORD.
5. THE STEEL TUBES MAY BE DRIVEN WITH AN APPROVED DRIVING HEAD. THEY SHALL NOT BE DRIVEN WITH THE WOOD POST IN THE TUBE. IF THE STEEL TUBES ARE PLACED IN DRILLED HOLES, THE BACKFILL MATERIAL MUST BE COMPACTED TO INSURE ZERO SETTLEMENT OF TUBE.
6. WHEN ROCK EXCAVATION IS ENCOUNTERED, A 300 mm DIAMETER POST HOLE, 500 mm DEEP MAY BE USED, IF APPROVED BY THE ENGINEER. GRANULAR MATERIAL WILL BE PLACED TO A DEPTH OF APPROXIMATELY 65 mm IN THE BOTTOM OF A 500 mm DEEP HOLE, TO PROVIDE DRAINAGE. THE STEEL TUBE SLEEVES MAY BE FIELD CUT TO 500 mm IN LENGTH, PLACED IN THE HOLE AND BACKFILLED WITH ADEQUATELY COMPACTED MATERIAL FROM THE HOLE.
7. THE BREAKAWAY CABLE ASSEMBLY MUST BE TAUT. A LOCKING DEVICE, SUCH AS VICE GRIPS OR CHANNEL LOCK PLIERS, SHOULD BE USED TO PREVENT THE CABLE FROM TWISTING WHEN TIGHTENING NUTS.
8. THE WOOD BLOCKOUTS SHALL BE 'TOE NAILED' INTO THE RECTANGULAR WOOD POSTS TO PREVENT THEM FROM TURNING WHEN THE WOOD SHRINKS.
9. FOR CURB INSTALLATIONS, THE SOIL TUBES AND POST SHALL BE INSTALLED AT THE PROPER GROUND ELEVATION BEHIND THE CURB. THE POSTS WILL THEN REQUIRE NEW HOLES TO BE FIELD DRILLED TO ACCOMMODATE THE 'RAIL TO POST' CONNECTION BOLT TO MAINTAIN THE PROPER HEIGHT OF THE RAIL ABOVE THE GUTTER PAN. THE EXCESS POST LENGTH ABOVE THE THE RAIL WILL BE REMOVED, IF DIRECTED BY THE ENGINEER.
10. WHEN THE GUARDRAIL EXTRUDER TERMINAL IS SPECIFIED AS THE END TREATMENT FOR THE MBGF INSTALLATION, THE MBGF WILL BE TAPERED AT A RATE OF 50 TO 1, OVER THE 15.25 m LENGTH OF THE G.E.T. SYSTEM, TO PREVENT THE EXTRUDER HEAD FROM ENCROACHING ON THE SHOULDER. THE TAPER MAY BE DECREASED OR ELIMINATED FOR SPECIFIC INSTALLATIONS, IF DIRECTED BY THE ENGINEER. A 25 TO 1 TAPER RATE WILL BE USED AT CURB SECTIONS, BEGINNING AT POST NUMBER FIVE AND ENDING AT POST NUMBER ONE (RECOMMENDED FOR CURBED SECTIONS NO GREATER THAN 100 mm IN HEIGHT). (MBGF=METAL BEAM GUARD FENCE)
11. EXTRUDER TYPE TERMINALS SHALL NOT BE INSTALLED WHEN ADJACENT DRIVING LANES ARE WITHIN 7.62 m (HORIZONTALLY) OF EXTRUSION SIDE OF THE EXTRUDER TERMINAL.
12. EXTRUDER APPROACH END (450 mm x 450 mm FACE) SHALL BE COVERED BY A TYPE I OBJECT MARKER OR A SIMULATED TYPE III OBJECT MARKER, WITH COST TO BE INCLUDED IN THE PRICE OF THE EXTRUDER TERMINAL. SEE DETAIL THIS SHEET.
13. THE 16 mm FLAT WASHER IS USED UNDER THE NUT BEHIND THE POST ONLY. NO WASHER IS USED AT THE RAIL.
14. THE BREAKAWAY POSTS AT LOCATIONS #5, 6, 7 & 8 MAY BE AS SHOWN OR MAY UTILIZE POSTS AS SHOWN IN OPTION B WITHOUT FOUNDATION TUBES. POSTS AT LOCATIONS #1, 2, 3 & 4 MUST USE FOUNDATION TUBES.
15. WOOD POSTS ARE REQUIRED WITH THE GUARDRAIL EXTRUDER TERMINAL (G.E.T.).
16. FOR ADDITIONAL INFORMATION ON THE WIDENING TYPICAL SECTION, SEE 1999 METRIC ROADWAY STANDARD GRAU1–1, LATEST REVISION.



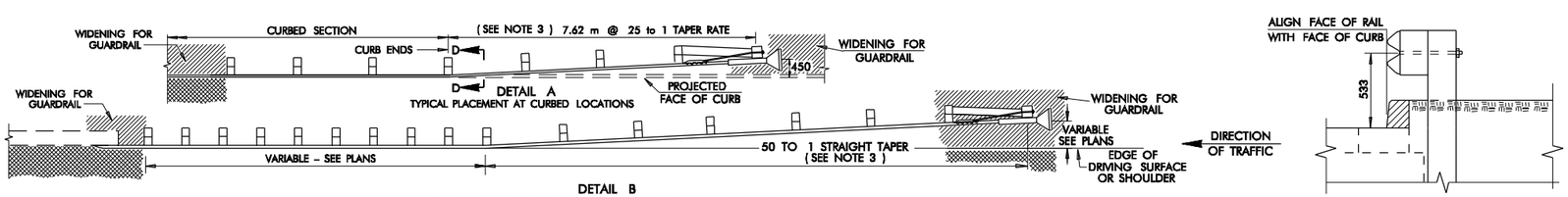
PARTIAL VIEW @ POST NO. 1

SECTION A–A @ POST NO. 2

SECTION B–B
OPTION A: TYPICAL @ POSTS #3 THRU #8 (EXCEPT RAIL NOT ATTACHED @ POST #5)
OPTION B: TYPICAL @ POSTS #3 & #4

SECTION C–C
OPTION B: TYPICAL @ POSTS #5 THRU #8 (EXCEPT RAIL NOT ATTACHED @ POST #5)

	OPTION		G. E. T. BILL OF MATERIALS
	A	B	
Code #	QTY.	QTY.	DESCRIPTION
62G	1	1	DEEP BEAM GUARDRAIL (12 GA.)
60G	1	1	DEEP BEAM GUARDRAIL (12 GA.)
740G	8	4	STEEL TUBE – 150 mm x 200 mm x 1370 mm x 5 mm
766G	8	4	SOIL PLATE – 450 mm x 600 mm x 6 mm
4147B	8	4	WOOD POSTS –140 mm x 190 mm x 1140 mm
4148B	7	7	WOOD BLOCK – 140 mm x 190 mm x 355 mm
705G	1	1	PIPE SLEEVE – 50 mm STD. PIPE x 140 mm
782G	1	1	BEARING PLATE – 200 mm x 200 mm x 16 mm
704A	1	1	CABLE ANCHOR
3000G	1	1	CABLE ASSEMBLY
9918A	1	1	OFFSET STRUT
985A	1	1	GUARDRAIL EXTRUDER
4063B		4	WOOD POSTS –140 mm x 190 mm x 1825 mm
			HARDWARE
3478G	16	8	M16 x 190 mm HEX HEAD BOLT (SOIL PLATES)
3497G	8	4	M16 x 240 mm HEX HEAD Bolt (TOP OF TUBES)
3300G	11	11	M16 WASHER(2 EACH AT TUBES 1 & 2 + 7 POSTS)
3580G	7	7	M16 x 450 m H. G. R. POST BOLT (POSTS 2, 3 & 4)
3360G	16	16	M16 x 32 mm H. G. R. SPLICE BOLT
3340G	47	35	M16 H. G. R. NUT (SPL–16, TUBES–12, GR–16)
3264G	2	2	M10 x 100 mm LAG SCREW
3910G	2	2	25 mm HEX NUT (ANCHOR CABLE)
3900G	2	2	25 mm WASHER (ANCHOR CABLE)
3117B	1	1	REFLECTORIZED OBJECT MARKER (450 mm x 450 mm)



DETAIL B
TYPICAL PLACEMENT TO PROTECT BRIDGE ENDS

SECTION D – D

BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
623.06(H)	GUARDRAIL EXTRUDER TERMINAL END SECTION	EACH

APPROVED BY ROADWAY ENGINEER DATE

OKLAHOMA DEPT. OF TRANSPORTATION
ROADWAY STANDARD (METRIC)

GUARDRAIL EXTRUDER TERMINAL

1999 SPECIFICATIONS	GET–2	01M
ALL DIMENSIONS ON THIS SHEET IN MILLIMETERS UNLESS OTHERWISE NOTED.		R–138M