OHIO DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

1069-91

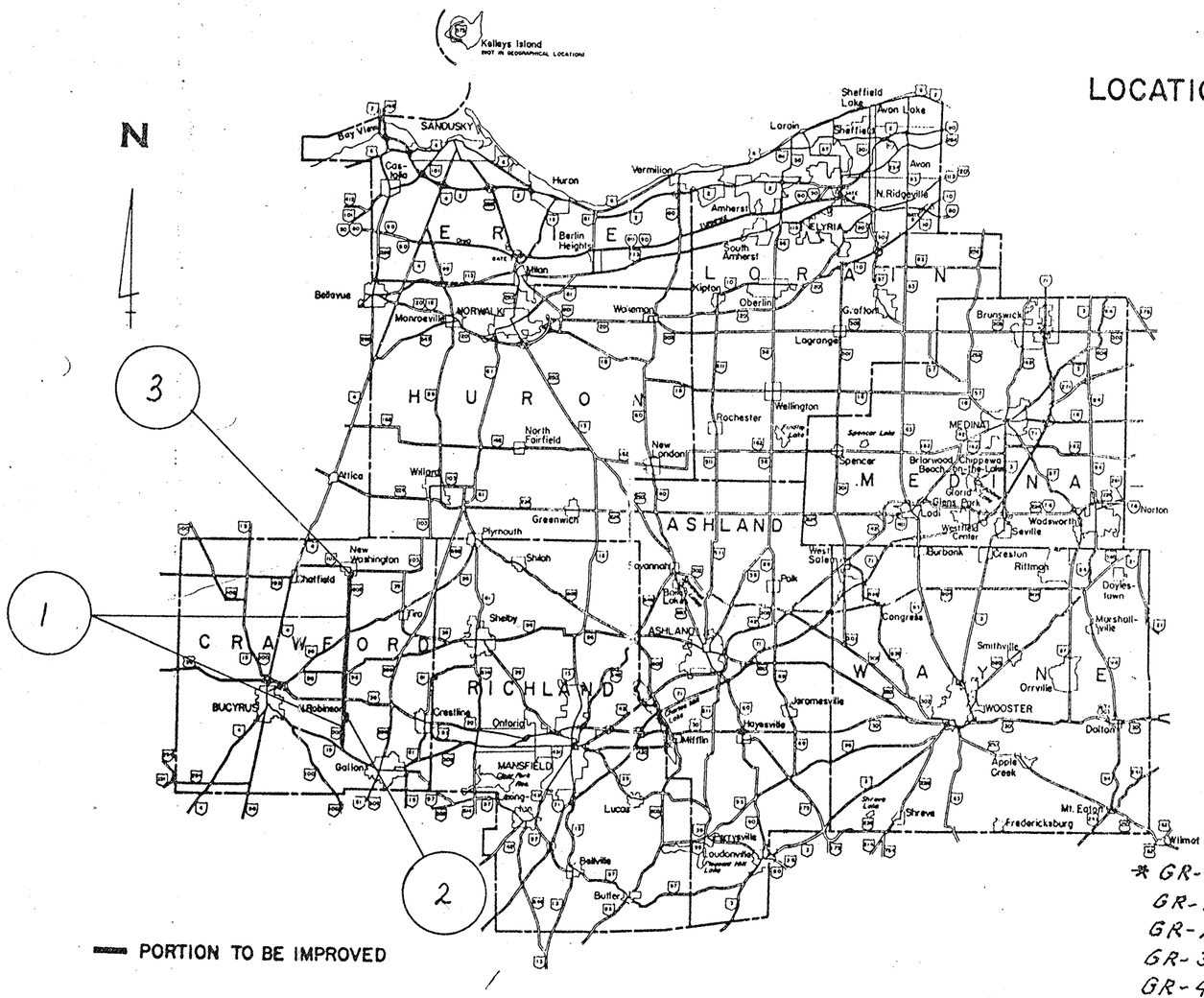
FHWA REGION	STATE	FEDERAL PROJECT		1/35
5	OHIO			

PLAN NO. 131

PART	COUNTY	ROUTE	SECTIONS	PROJECT TERMINII BEGIN	PROJECT TERMINII END	NET LENGTH MILES	TOWNSHIP	CITY	VILLAGE
1	CRA	SR-602	(0.00 - 9.61)	0.00	13.91	13.43			
2	CRA	SR-602	2.57	2.57	3.05	0.48			North Robinson
3	CRA	SR-602	(13.98 - 14.21)	13.91	14.46	0.55			New Washington

1069

LOCATION MAP



PORTION TO BE IMPROVED

* GR-1.1	05-06-91
GR-1.2	05-06-91
GR-2.1	05-06-91
GR-3.4	05-06-91
GR-4.1	05-06-91
MT-96.10	09-09-88
MT-96.20	09-09-88
MT-96.25	09-09-88

The Standard 1991 Specifications of the State of Ohio, Department of Transportation, including changes and Supplemental Specifications listed in the plans and proposal shall govern these improvements.

I hereby approve these plans and declare that the making of these improvements will require the closing of the highways to traffic on Parts No. None and that detours will be provided by State forces. The closing to traffic of the highways will not be required on Parts No. 1, 2 and 3 and provisions for the maintenance and safety of traffic will be as indicated in the proposal.

Approved Date 8-13-91 — Phillip A. Harwood, District Deputy Director of Transportation

JEM Approved Date 8-15-91 — B.D. Hartsbarger PE, Engineer of Bridges

Approved Date _____ — _____, Engineer of Maintenance

Approved Date 10-7-91 — Alexander H. Hyndo, Deputy Director, Operations

Approved Date _____ — _____, Assistant Deputy Director, Program Development

Approved Date _____ — _____, Chief Engineer, Construction

Approved Date _____ — _____, Chief Engineer, Design

Approved Date _____ — _____, Assistant Director, Department of Transportation

Approved Date 10-8-91 — Jerry Wray, Director, Department of Transportation

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED: _____

DIVISION ADMINISTRATOR _____ DATE _____

* STANDARD DRAWINGS		SUPPLEMENTAL SPECIFICATIONS	
BP-5	10-01-87		
TC-65.10	02-01-90		
TC-65.11	02-01-90	802	04-13-90
TC-65.12	02-01-90	862	12-16-88
TC-65.13	02-01-90	962	01-23-90
MT-97.10	04-29-88		
MT-97.11	10-04-89		
MT-99.10	07-14-89		
MT-99.20	04-29-88		

BP-6 10-01-87

RB DBR-2-73 04-10-73

10-L-21

DEPARTMENT OF TRANSPORTATION
GR-001 8-16-85

QUANTITIES			
Calc.		Ch'd.	
Date		Date	

FHWA REGION	STATE	PROJECT	
5	OHIO		

2/35

PLAN NO. 131

GENERAL SUMMARY

				QUANTITIES FROM SHEET ↓	PART 1 SR-602	PART 2 SR-602 NORTH ROBINSON	PART 3 SR-602 NEW WASHINGTON	ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION
				26	86			202	54100	86	EACH	RAISED PAVEMENT MARKER REMOVED FOR STORAGE
				14	75			202	38501	75	LIN.FT.	BRIDGE RAILING REMOVED, AS PER PLAN
				14	500			202	38201	500	LIN.FT.	GUARDRAIL REMOVED FOR REUSE, AS PER PLAN
				14	4			202	43000	4	EACH	ANCHOR ASSEMBLY POST REMOVED
				14	175			202	38603	175	LIN.FT.	BRIDGE RAILING REMOVED FOR REUSE, AS PER PLAN
				14	50			202	38100	50	LIN.FT.	GUARDRAIL REMOVED FOR STORAGE
				14	3			202	42206	3	EACH	ANCHOR ASSEMBLY REMOVED
				14	18			202	32001	18	LIN.FT.	CURB REMOVED, AS PER PLAN
				9	160			202	98200	160	LIN.FT.	REMOVAL MISCELLANEOUS, STEEL DRIP STRIP
				5,6	1402	47	22	203	6000	1471	STATION	LINEAR GRADING
				14	213			203	20001	213	CU.YD.	EMBANKMENT, AS PER PLAN
				8	20	3	7	253	02000	30	CU.YD.	PAVEMENT REPAIR
				4,9	2988	360	4873	254	01000	8221	SQ.YD.	PAVEMENT PLANING, BITUMINOUS
				5,6	2398	66	27	448	15000	2491	CU.YD.	ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, AC-20
				4	3981	150	170	448	14000	4301	CU.YD.	ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 1, AC-20
				4	5308	201	229	448	16000	5738	CU.YD.	ASPHALT CONCRETE SURFACE COURSE, TYPE 1, AC-20
				4	12986	514	630	407	10000	14130	GALLON	TACK COAT
				9	13			511	51100	13	CU.YD.	CLASS C CONCRETE, MISCELLANEOUS, PIER ENCASEMENT, AS PER PLAN
				9	80			516	10000	80	LIN.FT.	PREFORMED ELASTOMERIC COMPRESSION JOINT SEAL (705.11)
				14	37.50			517	76300	37.50	LIN.FT.	RAILING (DEEP BEAM RAIL WITH TWO (2) STEEL TUBULAR BACKUPS AND STEEL POSTS), AS PER PLAN
				14	175			517	72307	175	LIN.FT.	RAILING (DEEP BEAM RAIL WITH STEEL TUBULAR BACKUP AND TYPE 2 STEEL POSTS), AS PER PLAN
				9	556			SPECIAL	51273000	556	SQ.YD.	TREATING CONCRETE BRIDGE DECKS WITH "HMWM" RESIN
				9	556			SPECIAL	85050070	556	SQ.YD.	TRANSVERSE SAWCUT GROOVING of CONCRETE BRIDGE DECK OVERLAY
				9	18			SPECIAL	51861400	18	EACH	KEYWAY DRAIN
				9	354			SPECIAL	51922000	354	SQ.YD.	MICRO-SILICA MODIFIED CONCRETE OVERLAY (1.5" thick)
				9	14			SPECIAL	51922100	14	CU.YD.	MICRO-SILICA MODIFIED CONCRETE OVERLAY (variable thickness)
				9	LUMP			SPECIAL	51922300	LUMP	LUMP	TEST SLAB
				4			10	604	09000	10	EACH	CATCH BASIN ADJUSTED TO GRADE
				4			1	604	34500	1	EACH	MANHOLE ADJUSTED TO GRADE

DEPARTMENT OF TRANSPORTATION
GR-001 8-16-85

QUANTITIES			
Calc.		Chk'd.	
Date		Date	

FHWA REGION	STATE	PROJECT	
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PLAN NO.
131

GENERAL SUMMARY

				QUANTITIES FROM SHEET ↓	PART 1 SR-602	PART 2 SR-602 NORTH ROBINSON	PART 3 SR-602 NEW WASHINGTON	ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION
				15	637.5			SPECIAL	60650000	637.5	LIN.FT.	BERM RESHAPING
				15	462.5			606	16501	462.5	LIN.FT.	GUARDRAIL REBUILT, TYPE 5, AS PER PLAN
				15	4			606	35140	4	EACH	BRIDGE TERMINAL ASSEMBLY, TYPE 4
				15	4			606	35141	4	EACH	BRIDGE TERMINAL ASSEMBLY, TYPE 4, AS PER PLAN
				15	150			606	13001	150	LIN.FT.	GUARDRAIL TYPE 5, AS PER PLAN
				15	3			606	25000	3	EACH	ANCHOR ASSEMBLY, TYPE A
					50		2	614	12460	52	EACH	WORK ZONE MARKING SIGN
					LUMP	LUMP	LUMP	614	11000	LUMP	LUMP	MAINTAINING TRAFFIC
				26	26.86	0.96	1.58	614	21500	29.40	MILE	TEMPORARY CENTER LINE, CLASS II, 642 PAINT
				24	508			614	12800	508	EACH	TEMPORARY RAISED PAVEMENT MARKER
				15	22			614	26000	22	LIN.FT.	TEMPORARY STOP LINE, CLASS I
				15	.06			614	21000	.06	MILE	TEMPORARY CENTER LINE, CLASS I
				15	.04			614	22000	.04	MILE	TEMPORARY EDGE LINE, CLASS I
				15	622			615	25001	622	SQ.YD.	TEMPORARY PAVEMENT, CLASS B, AS PER PLAN
				5,6	878	29		617	10100	907	CU.YD.	COMPACTED AGGREGATE, TYPE A
				5,6	15758	528		617	20000	16286	SQ.YD.	SHOULDER PREPARATION
				5,6	32	1		617	25000	33	M.GAL.	WATER
				26	13.43	0.48	0.55	642	00300	14.46	MILE	CENTER LINE, TYPE 1
				26	26.86	0.96	1.10	642	00100	28.92	MILE	EDGE LINE, TYPE 1
				26		2		645	00990	2	EACH	RAILROAD SYMBOL MARKING, TYPE A
				26	182			645	00490	182	LIN.FT.	STOP LINE, TYPE A
				26		2		645	01108	2	EACH	SCHOOL SYMBOL MARKING, 96", TYPE A
					LUMP	LUMP	LUMP	624	10000	LUMP	LUMP	MOBILIZATION
				15	14			802	00300	14	EACH	BARRIER REFLECTOR, TYPE A2
				25	1152			862	00100	1152	EACH	RAISED PAVEMENT MARKER

DEPARTMENT OF TRANSPORTATION
M&R707 REV. 9-1-83

ASPHALT CONCRETE

FHWA REGION	STATE	PROJECT	
5	OHIO		

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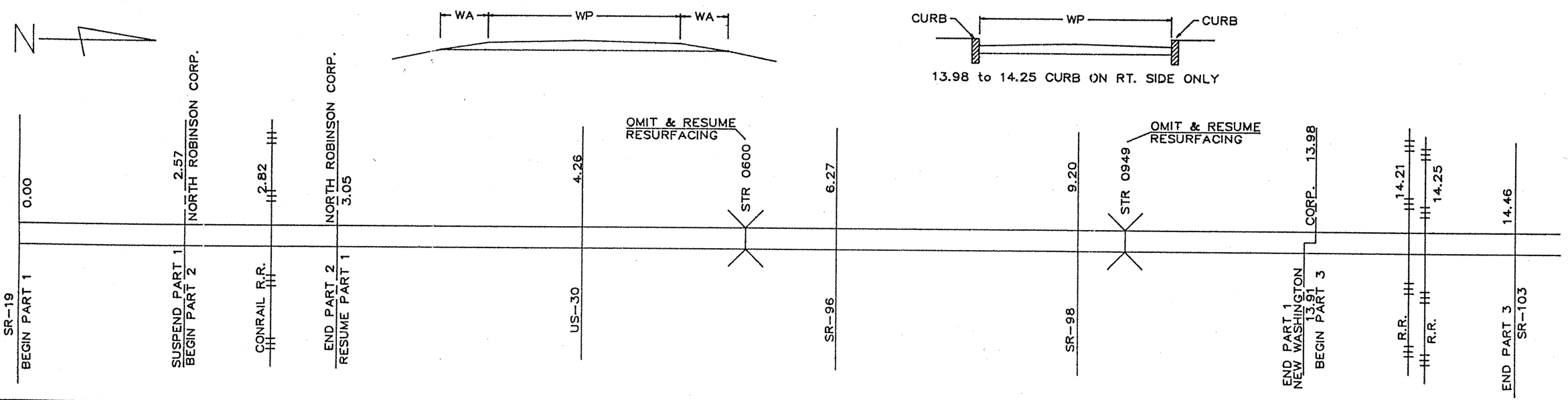
PLAN NO. 131

TYPICAL 1



TYPICAL 2

13.98 to 14.25 CURB ON RT. SIDE ONLY

* WIDTH INCLUDES PROPOSED PAVED SHOULDERS

PAVEMENT DATA

PART	ROUTE	LOG POINT TO LOG POINT	LENGTH MILES	LENGTH LIN. FT.	WP FEET *	TYPICAL	EXISTING TYPE PAVEMENT	PAVEMENT AREA SQ. YDS.	PROPOSED PAVEMENT 407 TACK COAT @ 0.08 gal./s.y. GAL.	407 COVER AGGR. @ 7 lbs./s.y. TON	ASPHALT CONCRETE ITEM 448 THICK INCHES AVG.	ITEM 448 INTERMED. COURSE, TYPE I, AC-20 CU.YD.	ITEM 448 THICK INCHES AVG.	ITEM 448 SURFACE COURSE, TYPE I, AC-20 CU.YD.	[illegible] THICK INCHES AVG.	[illegible] CU.YD.	254 PAVEMENT PLANING BITUM. SQ.YD.	604 CATCH BASINS ADJUSTED TO GRADE EACH	604 MANHOLES ADJUSTED TO GRADE EACH
1	SR602	0.00 – 2.57	2.57	13570	24	1	404	36187											
		3.05 – 13.91	10.86	57341	24	1	404	152909											
							EA FOR INTER. AND DRIVES	2000									1400		
		TOTAL PART 1	13.43	70911				191,096	≠12986		3/4	3981	1	5308			1400		
2	SR602	2.57 – 3.05	0.48	2534	24	1	404	6757											
							EA FOR INTER. AND DRIVES	465									360		
		TOTAL PART 2	0.48	2534				7222	≠ 514		3/4	150	1	201			360		
3	SR602	13.91 – 13.98	0.07	370	12/12	1	404	493/493	39/39		3/4	10/10	1	14/14					
738+44 752+40		13.98 – 14.25	0.27	1426	24	2	404	3803	304		3/4	79	1	106			3644		
752+40 – 763+49		14.25 – 14.46	0.21	1109	26	2	404	3204	256		3/4	67	1	89			1109		14 78
							EA FOR INTER. AND DRIVES	200	16		3/4	4	1	6			120		
		TOTAL PART 3	0.55	2905				493/7700	≠33/597			10/160		14/215			4873	10	1

≠ SURFACE OF PROPOSED PAVED SHOULDERS NEED NOT BE TACKED, DEDUCT THE FOLLOWING PAVEMENT AREA TO FIGURE THE 407 QUANTITIES.
PART 1 -- 28765 Sq.Yd.
PART 2 -- 792 Sq.Yd.
PART 3 -- 82/240 Sq.Yd.

DOT 1920

DEPARTMENT OF TRANSPORTATION

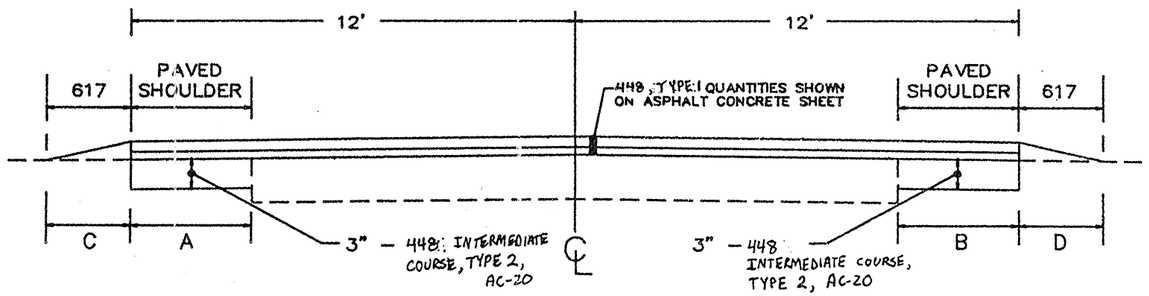
PAVED SHOULDERS

PLAN NO.

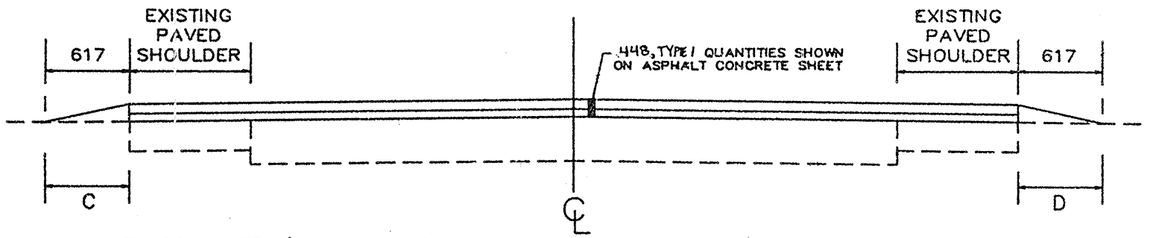
FHWA REGION	STATE	PROJECT	
5	OHIO		

5/35

TYPICAL 1



TYPICAL 2



** ONE STATION EQUALS 100 LIN.FT. (measured along each edge of pavement)

* NOTES

131

1. ITEM 203 LINEAR GRADING:
This work shall consist of preparing a subgrade for the shoulder paving by excavating the existing shoulder material to the depth shown on the plan, or as directed by the Engineer to remove any unstable material and by shaping and compacting the subgrade. The unsound or broken edge of bituminous pavements shall first be trimmed to a line established by the Engineer. The existing shoulder then shall be excavated and the subgrade shaped and compacted. Compaction shall be carried out to the satisfaction of the Engineer by means of trench roller, 401.11. Areas graded in excess of depths specified or directed by the Engineer shall be backfilled to desired grade using 617 Compacted Aggregate at the Contractor's expense. Excavation material shall be diposed of as indicated in the plan.
   - ☒ a. Used to back up shoulders where required; the balance to be disposed as directed by the Engineer.
   - ☐ b. Disposed of by the Contractor at his own responsibility outside the limits of the right of way.
   - ☐ c. Wasted adjacent to the pavement and within the right of way as directed by the Engineer.
2. ITEM 448 ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, AC-20
Prior to placing a bituminous mixture for shoulder paving, the edge of the existing pavement, for the full depth of the trench, shall be coated with bituminous material in accordance with 401.12.
3. ITEM 301 BITUMINOUS AGGREGATE BASE
May be used in lieu of Item 402 Asphalt Concrete.
4. ITEM 617 COMPACTED AGGREGATE:
A quantity of Item 617 Compacted Aggregate has been provided for areas where the shoulders were low prior to grading and/or low areas caused by removal of unsuitable material.
5. ITEM 408 BITUMINOUS PRIME COAT:
After application of the Prime Coat, no further treatment shall be performed until so directed by the Engineer.
6. SHIELD: The Contractor shall provide a shield to prevent the spraying or drifting of liquid bituminous material onto the edge of the pavement or edge-lines. The attention of the Contractor is directed to 107.12 of the Specifications.

PAVED SHOULDER DATA

PART	ROUTE	LOG POINT TO LOG POINT	LENGTH MILES	LENGTH LIN.FT.	TYPICAL	PROPOSED WIDTH (FT.) A	B	C	D	PAVED SHOULDER AREA SQ.YD.	203 LINEAR GRADING DEPTH INCHES	203 **STA.	448 ASPHALT CONCRETE AVG. THICK INCHES	448 INTERMED. COURSE, TYPE 2, AC-20 CU.YD.	301 BITUMINOUS AGGREGATE BASE AVG. THICK INCHES	301 CU.YD.	408 PRIME Bit. Matl. @..... gal./s.y. GALLON	409 SEAL Bit. Matl. @..... gal./s.y. GALLON	409 SEAL Aggr. @..... c.y./s.y. CU.YD.	617 COMPACTED AGGREGATE Type A 2" AVER. THICKNESS CU.YD.	617 SHOULDER PREPARATION — SQ.YD.	617 WATER 2 gal/sy M.GAL.	407 TACK COAT @ 0.10 gal./sq.yd. GALLON	404 ASPHALT CONCRETE AVER. THICKNESS CU.YD.	* NOTES
1	SR-602	0.00 – 2.57	2.57	13570	1	2	2	1	1	6031	2	271	3	503						168	3016				
		3.05 – 4.20	1.15	6072	1	1.5	1.5	1	1	2024	2	121	3	169						75	1349				
		4.20 – 4.75	0.55	2904	1	2	2	1	1	1291	2	58	3	108						36	645				
		4.75 – 5.25	0.50	2640	1	1.5	1.5	1	1	880	2	53	3	73						33	587				
		5.25 – 5.80	0.55	2904	1	2	2	1	1	1291	2	58	3	108						36	645				
		5.80 – 6.30	0.50	2640	1	1.5	1.5	1	1	880	2	53	3	73						33	587				
		6.30 – 7.65	1.35	7128	1	2	2	1	1	3168	2	143	3	264						88	1584				
		7.65 – 8.00	0.35	1848	1	1.5	1.5	1	1	616	2	37	3	51						23	411				
		8.00 – 9.25	1.25	6600	1	2	2	1	1	2933	2	132	3	244						82	1467				
		9.25 – 10.10	0.85	4488	1	1.5	1.5	1	1	1496	2	90	3	125						55	997				
		10.10 – 10.80	0.70	3696	1	2	2	1	1	1643	2	74	3	137						46	821				
		10.80 – 11.50	0.70	3696	1	1.5	1.5	1	1	1232	2	74	3	103						46	821				
		11.50 – 13.75	2.25	11880	1	2	2	1	1	5280	2	238	3	440						147	2640				
		13.75 – 13.91	0.16	845	2	–	–	1	1	–										10	188				
		TOTAL PART 1	13.43	70911						28765		1402		2398						878	15758	32			1,2

DEPARTMENT OF TRANSPORTATION

PAVED SHOULDERS

PLAN NO.

FHWA REGION	STATE	PROJECT	
5	OHIO		

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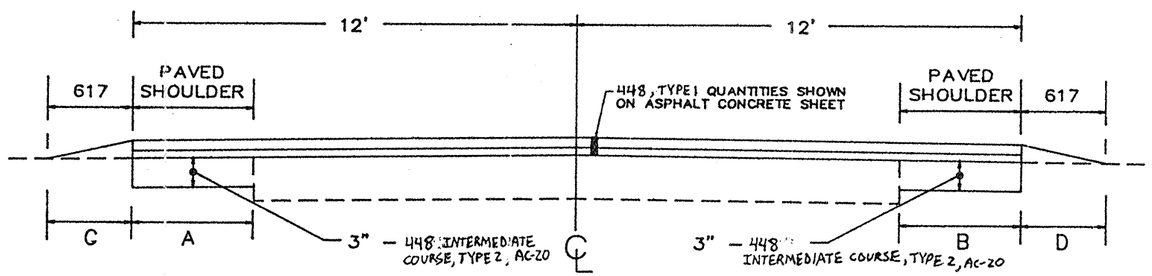
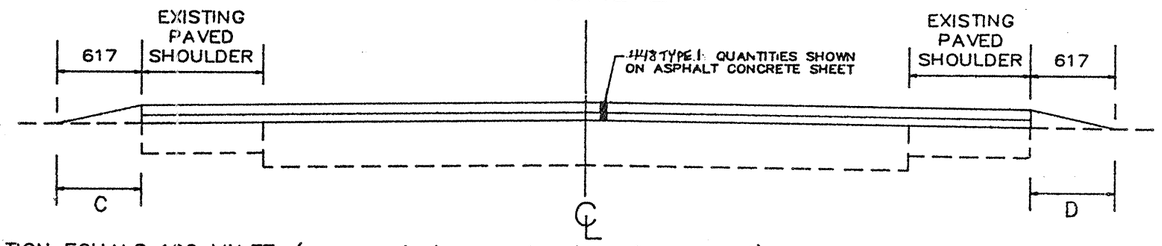
TYPICAL 1



2.82 to 2.88 HAS EXISTING PAVED SHOULDER ON RIGHT SIDE
13.98 to 14.25 HAS CURB ON RIGHT SIDE

TYPICAL 2



** ONE STATION EQUALS 100 LIN.FT. (measured along each edge of pavement)

* NOTES

131

1. ITEM 203 LINEAR GRADING:
This work shall consist of preparing a subgrade for the shoulder paving by excavating the existing shoulder material to the depth shown on the plan, or as directed by the Engineer to remove any unstable material and by shaping and compacting the subgrade. The unsound or broken edge of bituminous pavements shall first be trimmed to a line established by the Engineer. The existing shoulder then shall be excavated and the subgrade shaped and compacted. Compaction shall be carried out to the satisfaction of the Engineer by means of trench roller, 401.11. Areas graded in excess of depths specified or directed by the Engineer shall be backfilled to desired grade using 617 Compacted Aggregate at the Contractor's expense. Excavation material shall be diposed of as indicated in the plan.
   - ☒ a. Used to back up shoulders where required; the balance to be disposed as directed by the Engineer.
   - ☐ b. Disposed of by the Contractor at his own responsibility outside the limits of the right of way.
   - ☐ c. Wasted adjacent to the pavement and within the right of way as directed by the Engineer.
2. ITEM 448 ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, AC-20
Prior to placing a bituminous mixture for shoulder paving, the edge of the existing pavement, for the full depth of the trench, shall be coated with bituminous material in accordance with 401.12.
3. ITEM 301 BITUMINOUS AGGREGATE BASE
May be used in lieu of Item 402 Asphalt Concrete.
4. ITEM 617 COMPACTED AGGREGATE:
A quantity of Item 617 Compacted Aggregate has been provided for areas where the shoulders were low prior to grading and/or low areas caused by removal of unsuitable material.
5. ITEM 408 BITUMINOUS PRIME COAT:
After application of the Prime Coat, no further treatment shall be performed until so directed by the Engineer.
6. SHIELD: The Contractor shall provide a shield to prevent the spraying or drifting of liquid bituminous material onto the edge of the pavement or edge-lines. The attention of the Contractor is directed to 107.12 of the Specifications.

PAVED SHOULDER DATA

PART	ROUTE	LOG POINT TO LOG POINT	LENGTH MILES	LENGTH LIN.FT.	TYPICAL	PROPOSED WIDTH (FT.) A	B	C	D	PAVED SHOULDER AREA SQ.YD.	203 LINEAR GRADING DEPTH INCHES	203 **STA.	448 ASPHALT CONCRETE AVG. THICK INCHES	448 INTERMED. COURSE, TYPE 2, AC-20 CU.YD.	301 BITUMINOUS AGGREGATE BASE AVG. THICK INCHES	301 CU.YD.	408 PRIME Bit. Matl. @..... gal./s.y. GALLON	409 SEAL Bit. Matl. @..... gal./s.y. GALLON	409 Aggr. @..... c.y./s.y. CU.YD.	617 COMPACTED AGGREGATE TYPE A 2" AVER. THICKNESS CU.YD.	617 SHOULDER PREPARATION SQ.YD.	617 WATER 2 gal/sy M.GAL.	407 TACK COAT @ 0.10 gal./sq.yd. GALLON	404 ASPHALT CONCRETE AVER. THICKNESS CU.YD.	* NOTES
2	SR602	2.57 – 2.82	0.25	1320	1	1.5	1.5	1	1	440	2	26	3	37						16	293				
		2.82 – 2.88	0.06	317	1	1.5	–	1	–	53	2	3	3	4						2	35				
		2.88 – 3.05	0.17	898	1	1.5	1.5	1	1	299	2	18	3	25						11	200				
		TOTAL PART 2	0.48	2535						792		47		66						29	528	1			1,2
3	SR602	13.91 – 13.98	0.07	370	2	2	2	–	–	82/82	2	4/4	3	7/7											
		13.98 – 14.25	0.27	1426	1	1	–	–	–	158	2	14	3	13											
		TOTAL PART 3	0.34	1796						82/240		4/18		7/20											1,2

GENERAL NOTES

PLAN NO. 131

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ROUTINE MAINTENANCE

BETWEEN THE TIME THAT BIDS ARE TAKEN AND THE START OF CONSTRUCTION, THE MAINTAINING AGENCY MAY ENTER UPON THE PROJECT AND PERFORM ROUTINE MAINTENANCE SUCH AS CRACK SEALING, PATCHING, AND BERM AND SHOULDER REPAIR. THE EFFECTS, IF ANY, OF THE PERFORMANCE OF ROUTINE MAINTENANCE SHALL BE CONSIDERED AS INHERENT IN WORK OF THE CHARACTER PROVIDED FOR IN THE PLAN AND THE RESULTING CONDITIONS SHALL NOT BE CONSIDERED AS DIFFERING MATERIALLY FROM THOSE EXISTING AT THE TIME BIDS WERE TAKEN.

TRENCH FOR WIDENING

TRENCH EXCAVATION FOR BASE AND BERM WIDENING SHALL BE PREFORMED ONLY ON ONE SIDE OF THE PAVEMENT AT A TIME. THE OPEN TRENCH SHALL BE ADEQUATELY MAINTAINED AND PROTECTED AT ALL TIMES WITH DRUMS OR BARRICADES, WITH TYPE "C" STEADY BURN LIGHTS ATTACHED AFTER WORKING HOURS.

PLACEMENT OF THE PROPOSED BASE MATERIAL SHALL FOLLOW AS CLOSELY AS POSSIBLE BEHIND THE EXCAVATION. THE LENGTH OF WIDENING TRENCH WHICH IS OPEN AT ANY ONE TIME SHALL BE HELD TO A MINIMUM AND SHALL AT ALL TIMES BE SUBJECT TO APPROVAL BY THE ENGINEER.

BERM AND BASE WIDENING AT INTERSECTIONS AND DRIVES

PAVEMENT AND BERM QUANTITIES ARE CALCULATED THROUGH ALL INTERSECTIONS AND DRIVES. ANY PORTION MAY BE NON-PERFORMED IF SO DIRECTED BY THE ENGINNER.

INTERSECTIONS AND DRIVES

RURAL-INTERSECTIONS SHALL BE PAVED TO THE END OF THE RADII OR AS DIRECTED BY THE ENGINEER TO PROVIDE A SMOOTH TRANSISTION BETWEEN THE TWO HIGHWAYS. URBAN-INTERSECTIONS SHALL BE PAVED TO THE BACK OF CROSSWALKS OR AS DIRECTED BY THE ENGINEER. ALL DRIVES SHALL BE PAVED AS DIRECTED BY THE ENGINEER. (GRAVEL DRIVES SHALL BE PAVED WITH APRON WHICH IS THE WIDTH OF BERM OR 3' MINIMUM, WHICH EVER IS GREATER.) CARE SHALL BE TAKEN TO ELIMINATE WATER POCKETS IN CURBED SECTIONS.

ITEM 254, PAVEMENT PLANING, BITUMINOUS

THE INTENT OF THE PLANING IS TO MILL 1.5" MINIMUM DEPTH AT THE CENTERLINE AND/OR EDGE OF PAVEMENT AND 1/4" MINIMUM DEPTH IN BOTTOM OF WHEEL RUTS. THE PAVEMENT SLOPE MAY VARY BETWEEN 3/16" AND 3/8" PER FOOT, CONTINUOUS FOR PAVEMENT WIDTH. THE MILLING DEPTH SHALL BE CONTROLLED FROM THE CENTER LINE OR EDGE OF PAVEMENT, TO PRODUCE THE LEAST AMOUNT OF MILLING IN CONFORMANCE WITH ABOVE LIMITS. FIELD WORK NECESSARY FOR PROPER CONTROL WITHIN PLAN INTENT SHALL BE THE RESPOSIBILITY OF THE CONTRACTOR.

AN AUTOMATIC MILLING HEAD PROFILE CONTROL HAVING A MINIMUM 30' SKI-ARM SHALL BE USED DURING PLANING OPERATION.

ABOVE CONDITIONS DO NOT APPLY TO PLANING PERFORMED IN AREAS AS DIRECTED BY THE ENGINEER TO ELIMINATE ADVERSE SURFACE DISTORTION, OR TO PROVIDE A SATISFACTORY GRADE AT CASTINGS. THESE AREAS INCLUDE MATERIAL DISPLACED BY RUTTING OR SHOVING ASPHALT, SURFACE PATCHES, CONCRETE PATCHING, TRANSVERSE BUMPS, PAVEMENT AT RAILROADS, CASTINGS, ETC. PLANING OF THESE AREAS SHALL BE PERFORMED THROUGHOUT THE PROJECT PRIOR TO PAVING. AREAS TO BE PLANED WILL BE DESIGNATED BY THE ENGINEER.

THE PROGRESSION OF THE PLANING SHALL PROCEED IN SUCH A MANNER THAT NORMAL TRAFFIC WILL NOT BE REQUIRED TO RUN OVER THE PLANED ROADWAY SURFACE MORE THAN TWENTY-ONE (21) CALENDAR DAYS.

GENERAL NOTES

PLAN NO. 131 (8/35)

ITEM 253, PAVEMENT REPAIR

THIS ITEM OF WORK SHALL CONSIST OF THE REMOVAL OF THE EXISTING PAVEMENT OR PAVED BERM WHICH MAY BE ASPHALT, BRICK, CONCRETE, OR A COMBINATION OF EACH, IN AREAS OF EXISTING PAVEMENT FAILURE.

THE ENGINEER SHALL DESIGNATE THE LOCATIONS AND LIMITS OF THE AREAS TO BE REPAIRED. THE REPAIR AREAS SHALL BE ROUGHLY RECTANGULAR IN SHAPE AND CUT OR SAWED TO A NEAT LINE. THE PAVEMENT SHALL BE REMOVED WITHIN THE DESIGNATED AREAS BY METHODS WHICH WILL NOT DAMAGE THE ADJACENT PAVEMENT. THE DEPTH OF REMOVAL, AS DIRECTED BY THE ENGINEER, SHALL BE SUFFICIENT TO REMOVE ALL DETERIORATED PAVEMENT (ESTIMATED DEPTH MAY VARY FROM 2" TO 12"). THE MATERIALS SO REMOVED SHALL BE DISPOSED OF IN ACCORDANCE WITH 203.05.

REPLACEMENT MATERIAL SHALL BE * OR 301 MATERIAL AND SHALL BE PLACED AND COMPACTED TO FINISH FLUSH WITH THE ADJACENT PAVEMENT SURFACE. THE REPAIR AREAS SHALL BE PAINTED WITH BITUMINOUS MATERIAL (SIDES AND BOTTOM). ALL COMPACTION SHALL BE ACHIEVED BY MECHANICAL METHODS TO SATISFACTION OF THE ENGINEER, MAXIMUM LIFT THICKNESS SHALL BE THREE (3) INCHES.

PAYMENT SHALL INCLUDE ALL LABOR, EQUIPMENT AND MATERIALS NECESSARY TO COMPLETE THE PAVEMENT REPAIR. THE FOLLOWING ESTIMATED QUANTITY IS PROVIDED IN THE SUMMARY TO BE USED AS DIRECTED BY THE ENGINEER. PAYMENT WILL BE MADE AT THE UNIT PRCE BID PER CUBIC YARD,(BY TICKET WEIGHT CONVERSION), OF ITEM 253, PAVEMENT REPAIR.

20 CU.YD. – PART 1

3 CU.YD. – PART 2

7 CU.YD. – PART 3

* 448 INTERMEDIATE COURSE, TYPE 2, AC-20

PAVEMENT CONTROL

AN AUTOMATIC SCREED CONTROL, HAVING A 30 FOOT MINIMUM SKI–ARM, SHALL BE USED FOR PLACING THE ITEM 448 PRE–LEVEL AND 448 SURFACE COURSE ON EXISTING PAVEMENT WIDTHS OF 20 FEET AND OVER.

SPECIAL ATTENTION SHALL BE GIVEN TO SUPER–ELEVATED CURVES. THE SUPER–ELEVATION SHALL BE MAINTAINED AND/OR RESTORED, IF NECESSARY, AS DIRECTED BY THE ENGINEER.

BUTT JOINTS

BUTT JOINTS SHALL NOT BE CUT AND LEFT OPEN TO TRAFFIC FOR A TIME PERIOD LONGER THAN THREE (3) DAYS. IF CUT IS NOT PAVED WITHIN THREE (3) DAYS, IT SHALL BE FILLED IN WITH A TEMPORARY ASPHALT CONCRETE WEDGE, OF SUFFICIENT LENGTH, AS DIRECTED BY THE ENGINEER.

CONSTRUCTION "BUMP" SIGNS (OW–62 AND OW–143) SHALL BE ERECTED AND MAINTAINED DURING THE PERIOD THAT THE CUT FOR THE BUTT JOINT IS LEFT OPEN.

ITEM 448, ASPHALT CONCRETE SURFACE COURSE, TYPE 1, AC-20

THE COURSE AGGREGATE IN THE SURFACE COURSE SHALL BE CRUSHED CARBONATE STONE.

IN ADDITION TO ITEM 401.12, THE FEATHERED OR BUTT JOINT SHALL BE UNIFORMLY COATED WITH A 6" WIDE BAND OF A.C.. THE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM 404 ASPHALT CONCRETE.

BRIDGE DECK TREATMENT

BRIDGE DECK DATA

PART	COUNTY, ROUTE, BRIDGE NO.	LENGTH (BRIDGE LIMITS)	WIDTH	BRIDGE DECK AREA	EXISTING WEARING SURFACE	EXISTING PAVEMENT WIDTH	BRIDGE DECK REPAIR ITEM SPECIAL-MICRO-SILICA MODIFED CONCRETE (SEE PROPOSAL NOTE) 1 ½" THICK OVERLAY	BRIDGE DECK REPAIR ITEM SPECIAL-MICRO-SILICA MODIFED CONCRETE (SEE PROPOSAL NOTE) VARIABLE THICKNESS OVERLAY	BRIDGE DECK REPAIR ITEM SPECIAL-MICRO-SILICA MODIFED CONCRETE (SEE PROPOSAL NOTE) TEST SLAB	202 REMOVAL MISCELLANEOUS, STEEL DRIP STRIP	254 PAVEMENT PLANING BITUMINOUS		511 CLASS C CONCRETE, MISCELLANEOUS, PIER ENCASEMENT, AS PER PLAN	516 PREFORMED ELASTOMERIC COMPRESSION JOINT SEAL (705.11)		SPECIAL TREATING CONCRETE BRIDGE DECKS WITH HMWM RESIN (SEE PROPOSAL NOTE)	SPECIAL BRIDGE DECK GROOVING (SEE PROPOSAL NOTE)	SPECIAL KEYWAY DRAIN
		LIN. FT.	LIN. FT.	SQ. YD.		FEET	SQ. YD.	CU. YD.	LUMP	LIN. FT.	SQ. YD.		CU. YD.	LIN. FT.		SQ. YD.	SQ. YD.	EACH
	★ CRA-602-0543				ASPHALT	21												
	★★CRA-602-0577				ASPHALT	22												
	CRA-602-0600	139	36	556	LMC	21					‡ 467					556	556	
	CRA-602-0949	79.6	40	354	ASPHALT	23	354	14	LUMP	160	‡‡ 1121		13	80				18
	TOTAL PART I						354	14	LUMP	160	1588		13	80		556	556	18

★ PAVE OVER STRUCTURE CRA-602-0543

★★ PAVE OVER STRUCTURE CRA-602-0577 (SEE DETAILS IN THE PLAN FOR ADDITIONAL WORK)

‡ PLANE 100' ON EACH APPROACH, OMIT RESURFACING ON BRIDGE DECK, BUTT JOINT AT BRIDGE DECK

‡‡ PLANE ALL ASPHALT FROM EXISTING CONCRETE SLAB BRIDGE AND 150' ON EACH APPROACH AT THE SAME TIME THAT THE BRIDGE IS PLANED. REMOVAL OF EXISTING MEMBRANE WATERPROOFING FROM BRIDGE DECK IS INCLUDED IN ITEM 254. (SEE DETAILS IN THE PLAN FOR ADDITIONAL WORK).

PAYMENT FOR ALL OF THE ABOVE SHALL BE AT UNIT PRICE BID PER SQ. YD. FOR ITEM 254 PAVEMENT PLANING BITUMINOUS, WHICH SHALL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS, AND INCIDENTALS NECESSARY TO COMPLETE THE ABOVE WORK.

DESIGN FIL 602EQ

BRIDGE DECK TREATMENT

O. D. O. T. DISTRICT THREE BRIDGE DEPARTMENT

DESIGNED	DRAWN	CHECKED	REVIEWED	DATE
D.M. 7-91	T.R.D.	KW 8/91	JEC	8/91

GENERAL NOTES

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10/35

REFERENCES SHALL BE MADE TO STANDARD DRAWINGS:

BP-5	DATED	10/1/87	MT-96.10	DATED	9-9-88
GR-1.1	DATED	5/6/91	MT-96.20	DATED	9-9-88
GR-1.2	DATED	5/6/91	MT-96.25	DATED	9-9-88
GR-2.1	DATED	5/6/91	MT-97.10	DATED	4-29-88
GR-3.4	DATED	5/6/91	DBR-2-73	DATED	4-10-73
GR-4.1	DATED	5/6/91			

AND TO SUPPLEMENTAL SPECIFICATIONS:

802 DATED 4/13/90

EXISTING STRUCTURE VERIFICATION:

DETAILS AND DIMENSIONS SHOWN ON THESE PLANS PERTAINING TO THE EXISTING STRUCTURE HAVE BEEN OBTAINED FROM PLANS OF THE EXISTING STRUCTURE AND FROM FIELD OBSERVATION AND MEASUREMENTS. CONSEQUENTLY, THEY ARE INDICATIVE OF THE EXISTING STRUCTURE AND THE PROPOSED WORK BUT THEY SHALL BE CONSIDERED TENTATIVE AND APPROXIMATE. THE CONTRACTOR IS REFERRED TO C.M.S. SECTIONS 102.05, 105.02 AND 513.02. THE ORIGINAL CONSTRUCTION PLANS OF THE EXISTING BRIDGE ARE AVAILABLE UPON REQUEST AT THE DISTRICT 3 OFFICE OF THE OHIO DEPARTMENT OF TRANSPORTATION, ASHLAND, OHIO.

CONTRACT BID PRICES SHALL BE BASED UPON A RECOGNITION OF THE UNCERTAINTIES DESCRIBED ABOVE AND UPON A PRE-BID EXAMINATION OF THE EXISTING STRUCTURE BY THE CONTRACTOR. HOWEVER, ALL PROJECT WORK SHALL BE BASED ON ACTUAL DETAILS AND DIMENSIONS WHICH HAVE BEEN VERIFIED BY THE CONTRACTOR IN THE FIELD.

DESIGN SPECIFICATIONS:

THIS STRUCTURE CONFORMS TO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 1989 AND THE OHIO "SUPPLEMENT" TO THESE SPECIFICATIONS.

DESIGN DATA:

CONCRETE CLASS C - COMPRESSIVE STRENGTH 4000 PSI

GUARDRAIL REPLACEMENT:

NO HAZARD SHALL BE LEFT UNPROTECTED EXCEPT FOR THE ACTUAL TIME NECESSARY TO REMOVE, GRADE, AND REINSTALL GUARDRAIL IN A CONTINUOUS OPERATION. THE REMOVAL OF ALL GUARDRAIL SHALL AT ALL TIMES BE AS DIRECTED BY THE ENGINEER. NO GUARDRAIL SHALL BE REMOVED UNTIL THE REPLACEMENT MATERIAL IS ON THE SITE, READY FOR INSTALLATION. FAILURE TO COMPLY WITH THIS REQUIREMENT SHALL BE DEEMED SUFFICIENT CAUSE TO ORDER WORK SUSPENDED ON THIS PROJECT UNTIL SUCH TIME THAT THE ENGINEER IS ASSURED OF SAID COMPLIANCE.

PLACING ASPHALT CONCRETE FEATHERING ON APPROACHES TO BRIDGES:

SPECIAL CARE SHALL BE TAKEN, WHEN PLACING THE ASPHALT CONCRETE FEATHERING TO EFFECT A SMOOTH TRANSITION FROM THE EXISTING APPROACH PAVEMENT TO THE BRIDGE DECK. THE CONTRACTOR'S ATTENTION IS CALLED TO SECTION 404.16 OF THE CMS AND TO STANDARD DRAWING BP-5 DATED 10-01-87 FOR REQUIRED TOLERANCES.

TEMPORARY WEDGE:

AFTER THE CONCRETE OVERLAY HAS BEEN PLACED AND BEFORE THE BRIDGE IS OPENED TO TRAFFIC, A TEMPORARY WEDGE WILL BE INSTALLED TO MAINTAIN TRAFFIC IF THE PERMANENT ASPHALT IS NOT IN PLACE. THE TEMPORARY WEDGE WILL BE 448, TYPE 1 ASPHALT CONCRETE BUILT AS PER STANDARD DRAWING BP-5, EXCEPT NO TACK COAT WILL BE REQUIRED. THE TEMPORARY WEDGE WILL BE FEATHERED AT ONE INCH PER TWENTY-FIVE FEET OR AS DIRECTED BY THE ENGINEER.

THE TEMPORARY WEDGE WILL BE COMPLETELY REMOVED JUST BEFORE ANY NEW ROADWAY ASPHALT IS INSTALLED AND IN NO CASE SHALL TRAFFIC BE ALLOWED TO CROSS AN END DAM WITHOUT AN APPROVED TEMPORARY WEDGE.

ITEM 202 - GUARDRAIL REMOVED FOR STORAGE:

THIS ITEM SHALL BE USED ON STRUCTURE CRA-602-0577 TO REMOVE THE GUARDRAIL AS DESIGNATED IN THE PLAN AND STORED FOR PICK-UP BY THE STATE. THE GUARDRAIL SHALL BE CAREFULLY DISMANTLED SO NOT TO DAMAGE IT.

ANY MISCELLANEOUS HARDWARE AND POSTS SHALL BECOME PROPERTY OF THE CONTRACTOR.

PAYMENT FOR ALL OF THE ABOVE SHALL BE AT UNIT PRICE BID PER LIN.FT. FOR ITEM 202 GUARDRAIL REMOVED FOR STORAGE WHICH SHALL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS, AND INCIDENTALS NECESSARY TO COMPLETE THE ABOVE WORK.

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GENERAL NOTES

GENERAL NOTES

ITEM 202 – CURB REMOVED, AS PER PLAN:

THIS ITEM SHALL BE USED ON STRUCTURE CRA–602–0577 TO REMOVE THE EXISTING CONCRETE CURBS. THE EXISTING CUT OFF STEEL POSTS SHALL BE LOWERED TO 1' BELOW GROUND LEVEL. THE POST LOWERING IS INCIDENTAL TO THIS ITEM AND WILL NOT BE PAID FOR SEPARATELY.

PAYMENT FOR ALL OF THE ABOVE SHALL BE AT UNIT PRICE BID PER LIN.FT. FOR ITEM 202 CURB REMOVED, AS PER PLAN WHICH SHALL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS, AND INCIDENTALS NECESSARY TO COMPLETE THE ABOVE WORK.

ITEM 202 – ANCHOR ASSEMBLY POST REMOVED:

THE EXISTING TYPE A ANCHOR ASSEMBLIES ON THE GUARDRAIL ON THIS PROJECT SHALL BE MODIFIED TO REMOVE POST "C" (POST NEAREST TO THE CONCRETE ANCHOR) INCLUDING SPACER BLOCKS AND CONCRETE ENCASEMENT, TO A MINIMUM OF ONE FOOT BELOW THE GROUND LINE. THE RESULTING POST HOLE SHALL BE BACKFILLED AND TAMPED AND THE SITE RESTORED. SPECIAL CARE SHALL BE EXCERCISED SO AS NOT TO DAMAGE THE RAIL ELEMENT OF THE ANCHOR ASSEMBLY AND ANY DAMAGE SHALL BE REPAIRED AS DIRECTED BY THE ENGINEER AT NO COST TO THE STATE. ALL MATERIALS REMOVED SHALL BE DISPOSED OF BY THE CONTRACTOR.

PAYMENT FOR ALL THE ABOVE SHALL BE AT THE UNIT PRICE BID PER EACH FOR ITEM 202 ANCHOR ASSEMBLY POST REMOVED WHICH SHALL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS NECESSARY TO COMPLETE THE ABOVE WORK.

ITEM 202 – REMOVAL MISC.; STEEL DRIP STRIP:

THIS ITEM SHALL BE USED ON STRUCTURE CRA–602–0949 TO REMOVE THE EXISTING DRIP STRIP. CARE SHALL BE TAKEN NOT TO DAMAGE THE EXISTING CONCRETE DECK. IF ANY DAMAGE OCCURS THE CONTRACTOR SHALL REPAIR THE DECK TO THE SATISFACTION OF THE BRIDGE ENGINEER AT NO COST TO THE STATE.

PAYMENT FOR ALL THE ABOVE SHALL BE AT THE UNIT PRICE BID PER LIN.FT. FOR ITEM 202 REMOVAL MISC.; STEEL DRIP STRIP WHICH SHALL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS NECESSARY TO COMPLETE THE ABOVE WORK.

ITEM 202 – BRIDGE RAILING REMOVED, AS PER PLAN:

THIS ITEM SHALL BE USED ON STRUCTURE CRA–602–0577 TO REMOVE THE EXISTING BRIDGE RAIL, STEEL POSTS, AND STEEL BACKUP BEAM. THE RAIL SHALL BE CAREFULLY DISMANTLED AND STORED BY THE CONTRACTOR IN SUCH A MANNER AS TO NOT DAMAGE ANY ITEM.

THE SALVAGED BACKUP BEAM SHALL BECOME THE PROPERTY OF THE STATE OF OHIO AND SHALL BE STORED ON THE PROJECT FOR PICKUP BY THE STATE.

ANY MISCELLANEOUS HARDWARE, STEEL POSTS AND GUARDRAIL SHALL BECOME THE PROPERTY OF THE CONTRACTOR.

PAYMENT FOR ALL THE ABOVE SHALL BE AT THE UNIT PRICE BID PER LIN.FT. FOR ITEM 202 BRIDGE RAILING REMOVED, AS PER PLAN WHICH SHALL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS NECESSARY TO COMPLETE THE ABOVE WORK.

ITEM 202 – BRIDGE RAILING REMOVED FOR REUSE, AS PER PLAN:

THIS ITEM SHALL BE USED ON STRUCTURE CRA–602–0949 TO REMOVE THE EXISTING BRIDGE RAIL, WHEEL RAIL, TUBULAR BACKUP, AND POSTS. THE RAIL, TUBULAR BACKUP, AND POSTS SHALL BE CAREFULLY DISMANTLED AND STORED BY THE CONTRACTOR IN SUCH A MANNER AS TO NOT DAMAGE ANY ITEM.

THE SALVAGED BRIDGE RAIL SHALL BE REUSED. THE TUBULAR BACKUP SHALL BECOME THE PROPERTY OF THE STATE OF OHIO AND SHALL BE STORED ON THE PROJECT FOR PICK–UP BY THE STATE.

ANY MISCELLANEOUS HARDWARE, STEEL POSTS AND WHEELRAIL SHALL BECOME THE PROPERTY OF THE CONTRACTOR.

PAYMENT FOR ALL THE ABOVE SHALL BE AT THE UNIT PRICE BID PER LIN.FT. FOR ITEM 202 BRIDGE RAILING REMOVED, FOR REUSE, AS PER PLAN WHICH SHALL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS NECESSARY TO COMPLETE THE ABOVE WORK.

ITEM 202 – GUARDRAIL REMOVED FOR REUSE, AS PER PLAN:

THIS ITEM OF WORK SHALL INCLUDE REMOVAL OF GUARDRAIL INCLUDING BRIDGE TERMINAL ASSEMBLIES WHERE DESIGNATED IN THE PLAN AND THE WHEEL RAIL ON STRUCTURE CRA–602–0949. ALL RAILING AND ANY ATTACHED POSTS OR CONNECTORS SHALL BE CAREFULLY DISMANTLED AND STORED BY THE CONTRACTOR IN SUCH A MANNER AS TO NOT DAMAGE THE RAIL.

THE SALVAGED DEEP BEAM RAIL SHALL BE REUSED ON THE PROJECT.

ANY MISCELLANEOUS HARDWARE, WHEELRAIL AND POSTS SHALL BECOME THE PROPERTY OF THE CONTRACTOR.

PAYMENT FOR ALL THE ABOVE SHALL BE AT THE UNIT PRICE BID PER LIN.FT. FOR ITEM 202 GUARDRAIL REMOVED FOR REUSE, AS PER PLAN WHICH SHALL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS NECESSARY TO COMPLETE THE ABOVE WORK.

GENERAL NOTES

ITEM 203 – EMBANKMENT, AS PER PLAN:

AREAS WHERE EMBANKMENT MATERIALS ARE TO BE PLACED SHALL BE SCALPED. THE COST OF THE SCALPING SHALL BE PAID FOR UNDER ITEM SPECIAL BERM RESHAPING. AFTER THE EMBANKMENT HAS BEEN PLACED THE AREAS SHALL BE FERTILIZED, SEEDED, MULCHED AND WATERED ACCORDING TO ITEM 659, THE COST SHALL BE INCLUDED IN THIS ITEM FOR PAYMENT. THE REQUIREMENTS FOR MOISTURE, DENSITY CONTROL AND BENCHING SHALL BE WAIVED. THE DEPTH OF LAYERS IN WHICH THE EMBANKMENTS ARE PLACED AND THEIR COMPACTION SHALL, IN LIEU OF THE REQUIREMENTS OF ITEM 203, CONFORM TO ACCEPTABLE CONSTRUCTION PRACTICES AS DETERMINED BY THE ENGINEER. THE METHOD OF MEASUREMENT FOR EMBANKMENT MATERIAL FURNISHED AND PLACED SHALL BE THE NUMBER OF CUBIC YARDS MEASURED BY LOOSE VOLUME IN THE CARRIER AT THE WORK SITE, IN LIEU OF THE REQUIREMENTS OF 203.15.

PAYMENT FOR ALL OF THE ABOVE SHALL BE AT THE UNIT PRICE BID PER CUBIC YARD FOR ITEM 203, EMBANKMENT, AS PER PLAN WHICH SHALL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS, AND INCIDENTALS NECESSARY TO COMPLETE THE ABOVE WORK.

ITEM 511 – CLASS C CONCRETE, MISCELLANEOUS; PIER ENCASEMENT, AS PER PLAN:

SURFACE PREPARATION: ALL LOOSE MATERIAL SHALL BE REMOVED WITH HAND TOOLS

ANY EXCAVATION IS INCLUDED IN THIS ITEM.

PAYMENT FOR ALL OF THE ABOVE SHALL BE AT UNIT PRICE BID PER CU.YD. FOR ITEM 511 CLASS C CONCRETE, MISCELLANEOUS; PIER ENCASEMENT, AS PER PLAN WHICH SHALL INCLUDE ALL EXCAVATION, LABOR, EQUIPMENT, MATERIALS, AND INCIDENTALS NECESSARY TO COMPLETE THE ABOVE WORK.

ITEM 517 – RAILING (DEEP BEAM RAIL WITH STEEL TUBULAR BACKUP AND TYPE 2 STEEL POSTS), AS PER PLAN:

THIS ITEM SHALL BE USED ON STRUCTURE CRA–602–0949 TO INSTALL NEW STEEL TUBULAR BACKUP, NEW TYPE 2 STEEL POSTS AND TO INSTALL THE SALVAGED DEEP BEAM RAIL ONTO THE NEW POSTS AND TUBULAR BACKUP WITH NEW HARDWARE.

PAYMENT FOR ALL OF THE ABOVE SHALL BE AT UNIT PRICE BID PER LIN.FT. FOR ITEM 517 RAILING (DEEP BEAM RAIL WITH STEEL TUBULAR BACKUP AND TYPE 2 STEEL POSTS), AS PER PLAN WHICH SHALL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS, AND INCIDENTALS NECESSARY TO COMPLETE THE ABOVE WORK.

ITEM 517 – RAILING (DEEP BEAM RAIL WITH TWO (2) STEEL TUBULAR BACKUP AND STEEL POSTS), AS PER PLAN:

THIS ITEM SHALL BE USED ON STRUCTURE CRA–602–0577 TO INSTALL TWO NEW STEEL TUBULAR BACKUP, NEW STEEL POSTS AND TO INSTALL THE SALVAGED DEEP BEAM RAIL ONTO THE NEW POSTS AND TUBULAR BACKUP WITH NEW HARDWARE.

PAYMENT FOR ALL OF THE ABOVE SHALL BE AT UNIT PRICE BID PER LIN.FT. FOR ITEM 517 RAILING (DEEP BEAM RAIL WITH TWO (2) STEEL TUBULAR BACKUP AND STEEL POSTS), AS PER PLAN WHICH SHALL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS, AND INCIDENTALS NECESSARY TO COMPLETE THE ABOVE WORK.

ITEM 606 – GUARDRAIL, TYPE 5, AS PER PLAN:

THIS ITEM SHALL BE USED TO INSTALL NEW GUARDRAIL AT THE LOCATIONS INDICATED IN THE PLAN. THE POSTS SHALL BE 9' LONG. THE COST OF THE LONGER POSTS SHALL BE INCLUDED IN THIS ITEM.

PAYMENT FOR ALL OF THE ABOVE SHALL BE AT UNIT PRICE BID PER EACH FOR ITEM 606 GUARDRAIL, TYPE 5, AS PER PLAN WHICH SHALL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS, AND INCIDENTALS NECESSARY TO COMPLETE THE ABOVE WORK.

ITEM 606 – BRIDGE TERMINAL ASSEMBLY, TYPE 4, AS PER PLAN:

THIS ITEM SHALL BE USED ON STRUCTURE CRA–602–0577 TO CONSTRUCT NEW BRIDGE TERMINAL ASSEMBLIES. THE FIRST POST OFF THE BRIDGE SHALL BE 9' LONG ENCASED IN CONCRETE. THE COST OF THE LONGER POSTS SHALL BE INCLUDED IN THIS ITEM.

PAYMENT FOR ALL OF THE ABOVE SHALL BE AT UNIT PRICE BID PER EACH FOR ITEM 606 BRIDGE TERMINAL ASSEMBLY, TYPE 4, AS PER PLAN WHICH SHALL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS, AND INCIDENTALS NECESSARY TO COMPLETE THE ABOVE WORK.

GENERAL NOTES

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ITEM 606 – GUARDRAIL, REBUILT, TYPE 5, AS PER PLAN:

THIS ITEM SHALL BE USED TO INSTALL THE SALVAGED GUARDRAIL ONTO NEW POSTS WITH NEW HARDWARE AT LOCATIONS INDICATED IN THE PLAN. THE NEW POSTS SHALL BE 9' LONG ON THE RIGHT SIDE. THE COST OF THE LONGER POSTS SHALL BE INCLUDED IN THIS ITEM.

PAYMENT FOR ALL OF THE ABOVE SHALL BE AT UNIT PRICE BID PER LIN.FT. FOR ITEM 606 GUARDRAIL, REBUILT, TYPE 5, AS PER PLAN WHICH SHALL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS, AND INCIDENTALS NECESSARY TO COMPLETE THE ABOVE WORK.

ITEM 615 – TEMPORARY PAVEMENT CLASS B, AS PER PLAN:

THIS ITEM SHALL BE USED AS PAVEMENT WIDENING TO MAINTAIN ONE LANE OF TRAFFIC WITH SIGNALS AS PER DETAILS IN THE PLAN.

ALL EXCAVATION, FILL MATERIAL AND ANY INCIDENTAL ITEMS NEEDED SHALL BE INCLUDED IN THIS ITEM. WHEN NO LONGER NEEDED FOR TRAFFIC MAINTENANCE; THE TEMPORARY PAVEMENT SHALL REMAIN IN PLACE. ALL TEMPORARY PAVEMENT MARKINGS AND TEMPORARY RAISED PAVEMENT MARKERS SHALL BE REMOVED AS PER 621.134.

PAYMENT FOR ALL OF THE ABOVE SHALL BE AT UNIT PRICE BID PER SQ.YD. FOR ITEM 615 TEMPORARY PAVEMENT CLASS B, AS PER PLAN WHICH SHALL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS NECESSARY TO COMPLETE THE ABOVE WORK.

ITEM SPECIAL – MICRO–SILICA MODIFIED CONCRETE OVERLAY (1 1/2 INCHES THICK):

COURSE AGGREGATE SHALL BE LIMESTONE OR SLAG.

PAYMENT FOR ALL OF THE ABOVE SHALL BE AT UNIT PRICE BID PER SQ.YD. FOR ITEM SPECIAL MICRO–SILICA MODIFIED CONCRETE OVERLAY (1 1/2 INCHES THICK) WHICH SHALL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS NECESSARY TO COMPLETE THE ABOVE WORK.

ITEM SPECIAL – KEYWAY DRAIN:

HOLES SHALL BE DRILLED IN THE ABUTMENT FOR KEYWAY DRAINS AS SHOWN IN DETAILS ON SHEET NOS. 20 .THE HOLES SHALL BE SPACED AT APPROXIMATELY FIVE (5) FOOT CENTERS AS DIRECTED BY THE ENGINEER.

PAYMENT FOR ALL OF THE ABOVE SHALL BE AT UNIT PRICE BID PER EACH FOR ITEM SPECIAL KEYWAY DRAIN WHICH SHALL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS NECESSARY TO COMPLETE THE ABOVE WORK.

ITEM SPECIAL – BERM RESHAPING:

BERMS AND SHOULDERS AT LOCATIONS WHERE EXISTING GUARDRAIL IS REMOVED OR WHERE GUARDRAIL IS TO BE BUILT, SHALL BE RESHAPED AS DIRECTED BY THE ENGINEER TO INSURE A SMOOTH SURFACE FREE OF IRREGULARITIES. EXCESS MATERIAL RESULTING FROM RESHAPING BERMS SHALL BE DISPOSED OF. THE AREA WHERE EMBANKMENT IS TO BE PLACED SHALL BE SCALPED.

PAYMENT FOR ALL OF THE ABOVE SHALL BE AT UNIT PRICE BID PER LIN.FT. FOR ITEM SPECIAL BERM RESHAPING WHICH SHALL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS NECESSARY TO COMPLETE THE ABOVE WORK.

TODD\GENERAL NOTE

ESTIMATED QUANTITIES

PART	BRIDGE NUMBER	SIDE	202 BRIDGE RAILING REMOVED, AS PER PLAN (LIN. FT.)	202 GUARDRAIL REMOVED FOR REUSE, AS PER PLAN (LIN. FT.)	202 ANCHOR ASSEMBLY POST REMOVED (EACH)	202 BRIDGE RAILING REMOVED FOR REUSE, AS PER PLAN (LIN. FT.)	202 GUARDRAIL REMOVED FOR STORAGE (LIN. FT.)	202 ANCHOR ASSEMBLY REMOVED (EACH)	202 CURB REMOVED, AS PER PLAN (LIN. FT.)		203 EMBANKMENT, AS PER PLAN (CU. YD.)		517 RAILING (DEEP BEAM RAIL WITH TWO (2) STEEL TUBULAR BACKUP AND STEEL POSTS), AS PER PLAN (LIN. FT.)	517 RAILING (DEEP BEAM RAIL WITH STEEL TUBULAR BACKUP AND TYPE 2 STEEL POSTS), AS PER PLAN (LIN. FT.)	
1	CRA-602-0577	L	37.50	187.50			25.00	1	9				18.75		
		R	37.50	212.50			25.00	2	9		213		18.75		
1	CRA-602-0949	L		50.00	2	87.50								87.50	
		R		50.00	2	87.50								87.50	
	TOTAL PART 1		75.00	500.00	4	175.00	50.00	3	18		213		37.50	175.00	

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ESTIMATED QUANTITIES

O.D.O.T. DISTRICT THREE BRIDGE DEPARTMENT

DESIGNED	DRAWN	CHECKED	REVIEWED	DATE
D.M. 7-91	T.R.D.	KW 8/91	[illegible]	8/91

ESTIMATED QUANTITIES

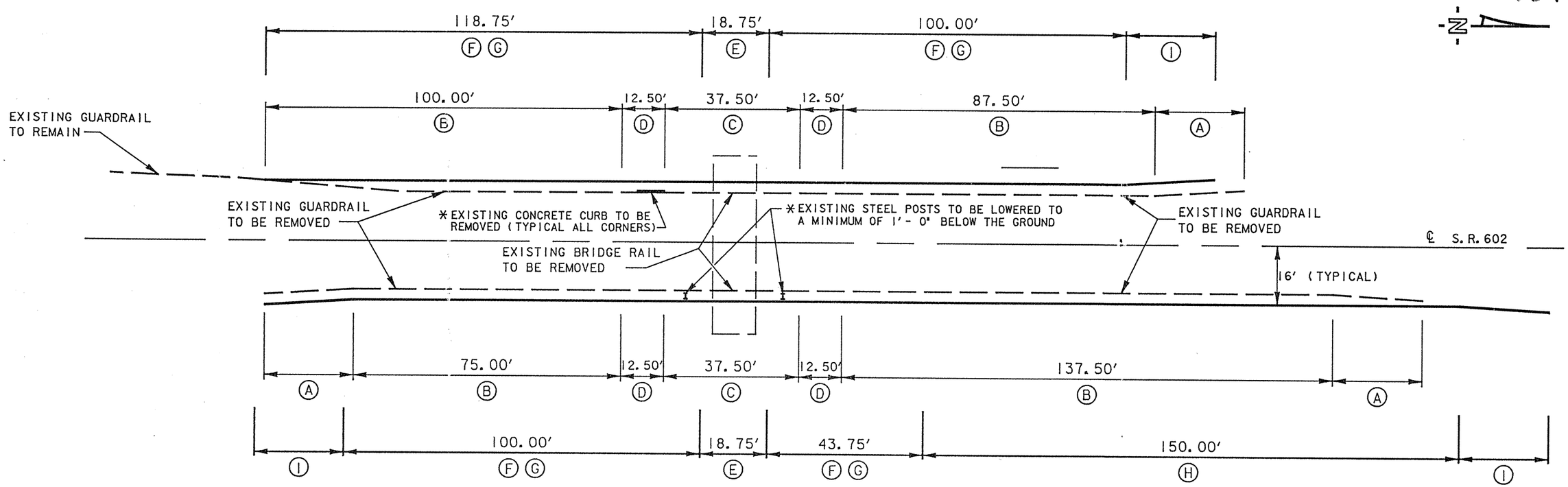
PART	BRIDGE NUMBER	SIDE	~ 606 GUARDRAIL REBUILT, TYPE 5, AS PER PLAN	~ 606 BRIDGE TERMINAL ASSEMBLY, TYPE 4	~ 606 BRIDGE TERMINAL ASSEMBLY, TYPE 4, AS PER PLAN	~ 606 GUARDRAIL, TYPE 5, AS PER PLAN	~ 606 ANCHOR ASSEMBLY, TYPE A	614 TEMPORARY Stop Line, CLASS 1	~ 615 TEMPORARY PAVEMENT CLASS B, AS PER PLAN	614 TEMPORARY CENTER LINE, CLASS 1	~ 802 BARRIER REFLECTOR TYPE A2	614 TEMPORARY EDGE LINE, CLASS 1	SPECIAL BERM RESHAPING		
			LIN. FT.	EACH	EACH	LIN. FT.	EACH	LIN. FT.	SQ. YD.	MILE	EACH	MILE	LIN. FT.		
1	CRA-602-0577	L	218.75		2		1						275.00		
		R	143.75		2	150.00	2						362.50		
1	CRA-602-0949	L	50.00	2				11	311	.03	7	.02			
		R	50.00	2				11	311	.03	7	.02			
	TOTAL PART 1		462.50	4	4	150.00	3	22	622	.06	14	.04	637.50		

DESIGN FIL 602EQ

ESTIMATED QUANTITIES				
O.D.O.T. DISTRICT THREE BRIDGE DEPARTMENT				
DESIGNED	DRAWN	CHECKED	REVIEWED	DATE
D.M. 7-91	T.R.D.	KW 8/91	JEC	8-91

131

16/35



CRA-602-0577

* INCLUDE COST IN ITEM 202 CURB REMOVED, AS PER PLAN

Ⓐ ITEM 202 - ANCHOR ASSEMBLY REMOVED

Ⓑ ITEM 202 - GUARDRAIL REMOVED FOR REUSE, AS PER PLAN

Ⓒ ITEM 202 - BRIDGE RAILING REMOVED, AS PER PLAN

Ⓓ ITEM 202 - GUARDRAIL REMOVED FOR STORAGE

Ⓔ ITEM 517 - RAILING (DEEP BEAM RAIL WITH TWO (2) STEEL TUBULAR BACKUP AND STEEL POSTS), AS PER PLAN

Ⓕ ITEM 606 - BRIDGE TERMINAL ASSEMBLY, TYPE 4, AS PER PLAN

Ⓖ ITEM 606 - GUARDRAIL REBUILT, TYPE 5, AS PER PLAN

Ⓗ ITEM 606 - GUARDRAIL, TYPE 5, AS PER PLAN

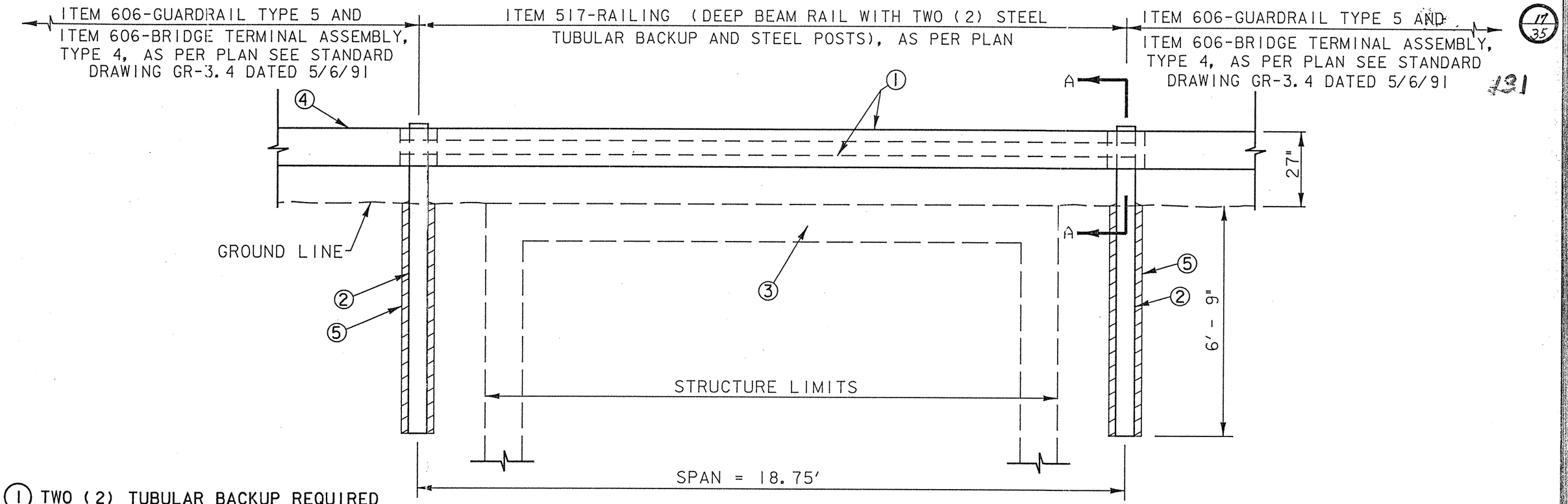
Ⓘ ITEM 606 - ANCHOR ASSEMBLY, TYPE A

GUARDRAIL DETAIL

CRA-602-0577

O.D.O.T. DISTRICT THREE BRIDGE DEPARTMENT				
DESIGNED	DRAWN	CHECKED	REVIEWED	DATE
D.M. 7-91	T.R.D.	KW 8/91	FEL	8/91

DESIGN FI C6022LAN



(1) TWO (2) TUBULAR BACKUP REQUIRED FOR ENTIRE LENGTH OF SPAN (SEE CHART FOR SIZE)

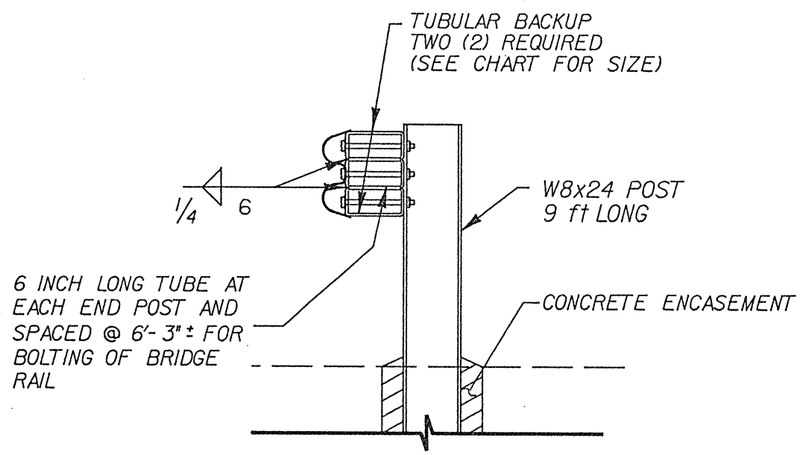
(2) STEEL POSTS - 9 ft LENGTH SET POSTS EQUAL DISTANCE FROM CENTER OF STRUCTURE

(3) STRUCTURE, CONCRETE HEADWALL OR CONCRETE OBSTACLE

(4) DEEP BEAM RAIL (SALVAGED)

(5) CONCRETE ENCASEMENT, 4" MINIMUM

SPAN (ft)	TUBE SIZE
11-15	8X4X3/16"
16-19	8X4X1/4"



SECTION A-A

NOTES

ITEM 517 - RAILING (DEEP BEAM RAIL WITH TWO (2) STEEL TUBULAR BACKUP AND STEEL POSTS), AS PER PLAN. PAYMENT SHALL BE THE LENGTH BETWEEN THE TWO 9 FOOT POSTS.

THE DEEP BEAM RAIL SHALL BE BOLTED TO THE TUBULAR BACKUP @ 6'-3" C/C USING STANDARD DEEP BEAM RAIL BOLTS 5/8" X 10" LONG WITH SPECIAL WASHERS.

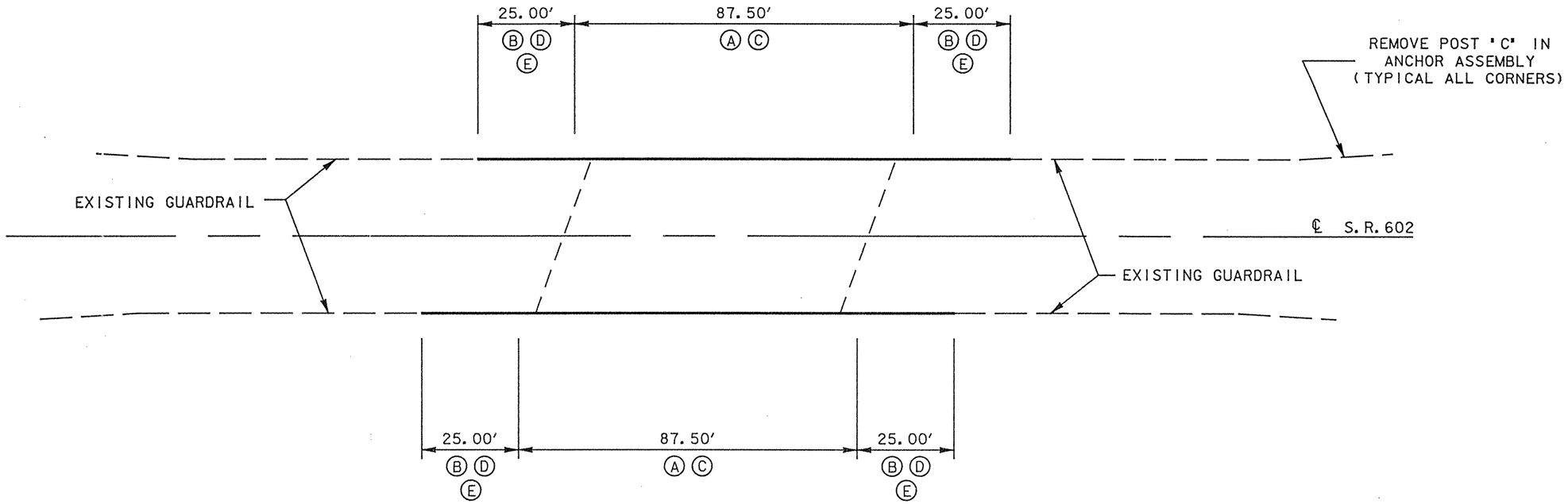
FOR DETAILS NOT SHOWN SEE STANDARD DRAWING DBR-2-73

GUARDRAIL RETROFIT

CRA-602-0577

O.D.O.T. DISTRICT THREE BRIDGE DEPARTMENT				
DESIGNED	DRAWN	CHECKED	REVIEWED	DATE
D.M. 7-91	T.R.D.	KW 8/91	JEC	:/91

DESIGN F : C6022LAN



CRA-602-0949

Ⓐ ITEM 202 - BRIDGE RAILING REMOVED FOR REUSE, AS PER PLAN

Ⓑ ITEM 202 - GUARDRAIL REMOVED FOR REUSE, AS PER PLAN

Ⓒ ITEM 517 - RAILING (DEEP BEAM RAIL WITH STEEL TUBULAR BACKUP AND TYPE 2 STEEL POSTS), AS PER PLAN

Ⓓ ITEM 606 - BRIDGE TERMINAL ASSEMBLY, TYPE 4

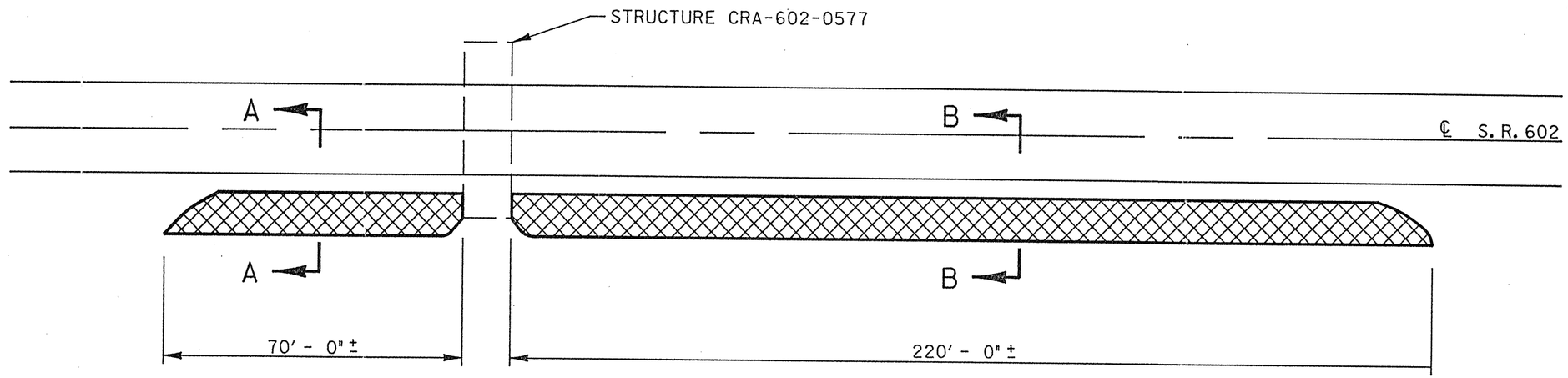
Ⓔ ITEM 606 - GUARDRAIL REBUILT, TYPE 5, AS PER PLAN

GUARDRAIL DETAIL

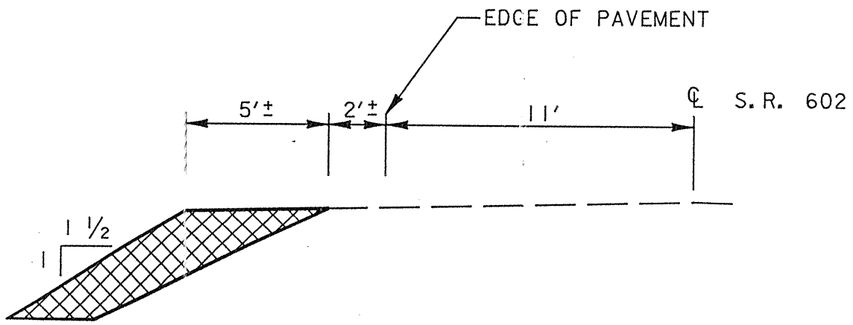
CRA-602-0949

O.D.O.T. DISTRICT THREE BRIDGE DEPARTMENT				
DESIGNED	DRAWN	CHECKED	REVIEWED	DATE
D.M. 7-91	T.R.D.	KW 8/91	JEC	8/91

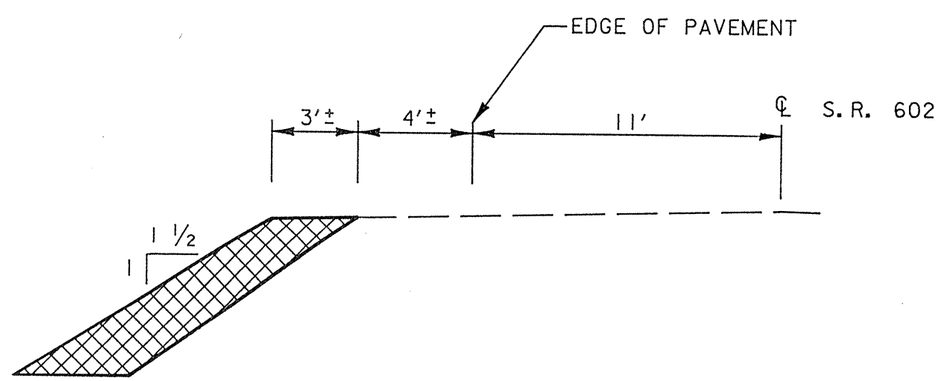
DESIGN FIL 6022LAN



PLAN VIEW



SECTION A - A



SECTION B - B

- AREA TO BE FILLED

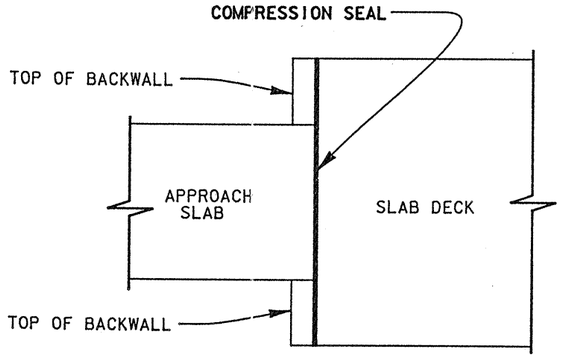
EMBANKMENT DETAIL

CRA-602-0577

O. D. O. T. DISTRICT THREE BRIDGE DEPARTMENT

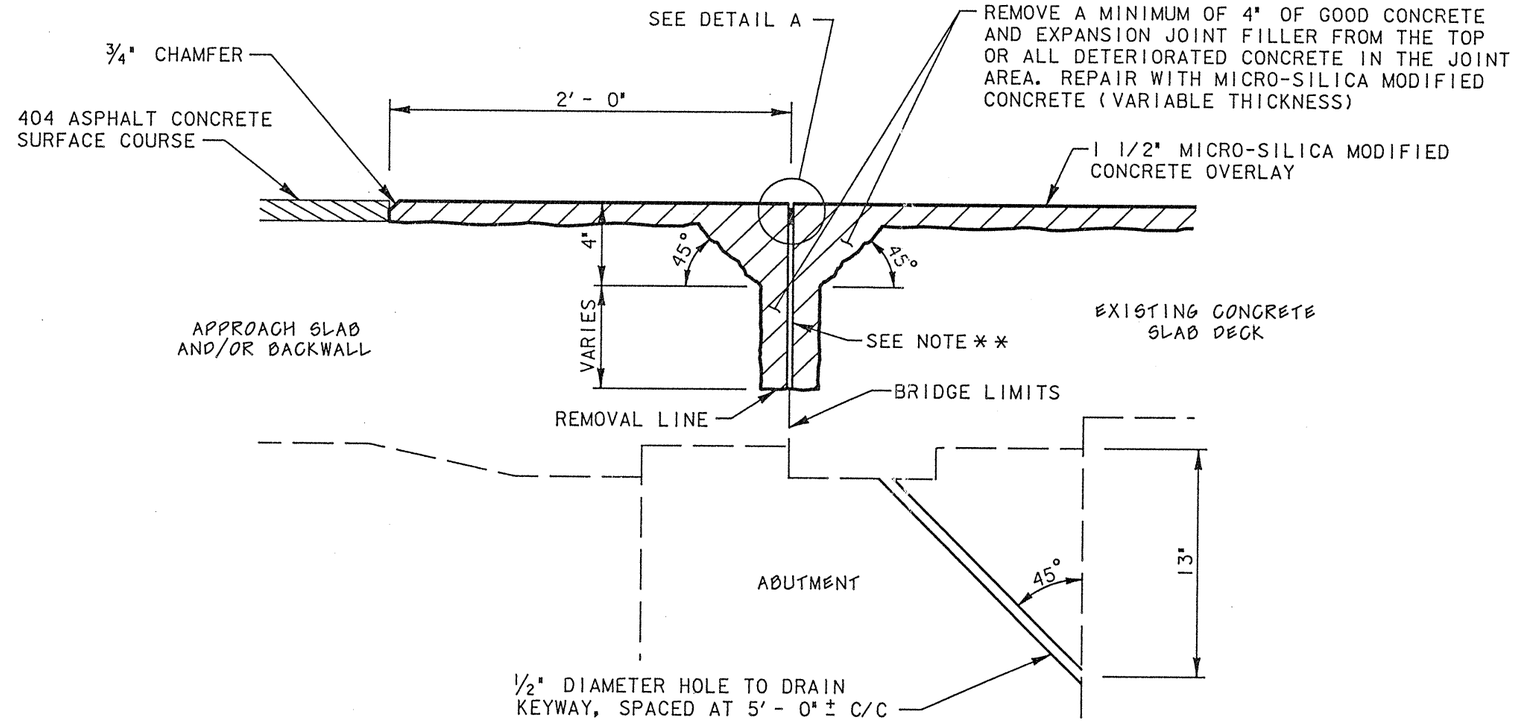
DESIGNED	DRAWN	CHECKED	REVIEWED	DATE
D.M. 7-91	T.R.D.	KW 8/91	JEC	8/91

DESIGN FI C6022LAN



PLAN VIEW

NOTE : THE COMPRESSION SEAL SHALL BE ONE CONTINUOUS PIECE AND SHALL SEAL THE JOINT THE FULL WIDTH OF THE SLAB DECK.



TYPICAL JOINT REPAIR DETAIL FOR CONCRETE SLAB DECK

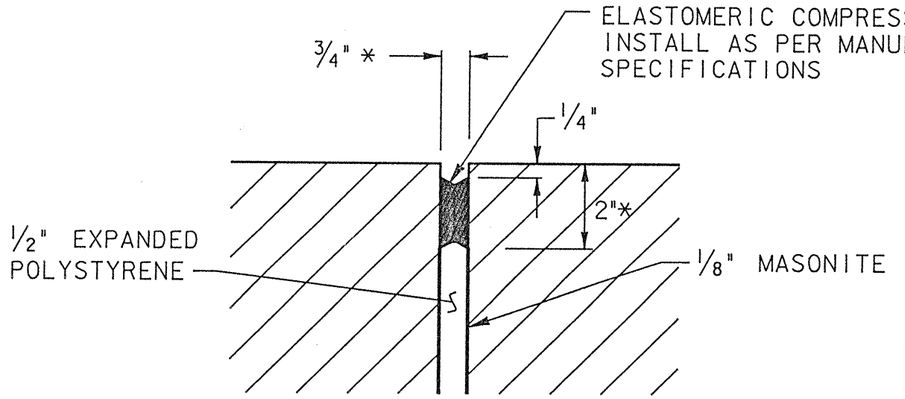
* DIMENSIONS SHOWN ARE FOR WATSON BOWMAN ACME INC. WA-125, STRUCTURAL ACCESSORIES SAI250 OR D.S. BROWN H-1250. USE ANY OF THE ABOVE OR APPROVED EQUAL AS PER 705.11.

* * GLUE 1/2" EXPANDED POLYSTYRENE BETWEEN TWO PIECES OF 1/8" MASONITE, INSTALL TOTAL DEPTH OF REPAIRED AREA. THE MASONITE AND POLYSTYRENE SHALL BE IN PLACE BEFORE ANY CONCRETE IS PLACED, AND SHALL BE BELOW THE FINAL ROADWAY GRADE TO FACILITATE FINISHING OF THE CONCRETE ON BOTH SIDES OF THE JOINT.

IF THE CONCRETE ON BOTH SIDES OF THE JOINT IS NOT FINISHED TO THE SAME HEIGHT, THE JOINT SURFACE SHALL BE GROUND SMOOTH AS DIRECTED BY THE ENGINEER.

SAW OUT ENOUGH MASONITE AND POLYSTYRENE TO INSTALL THE COMPRESSION SEAL AFTER THE JOINT HAS BEEN REPAIRED.

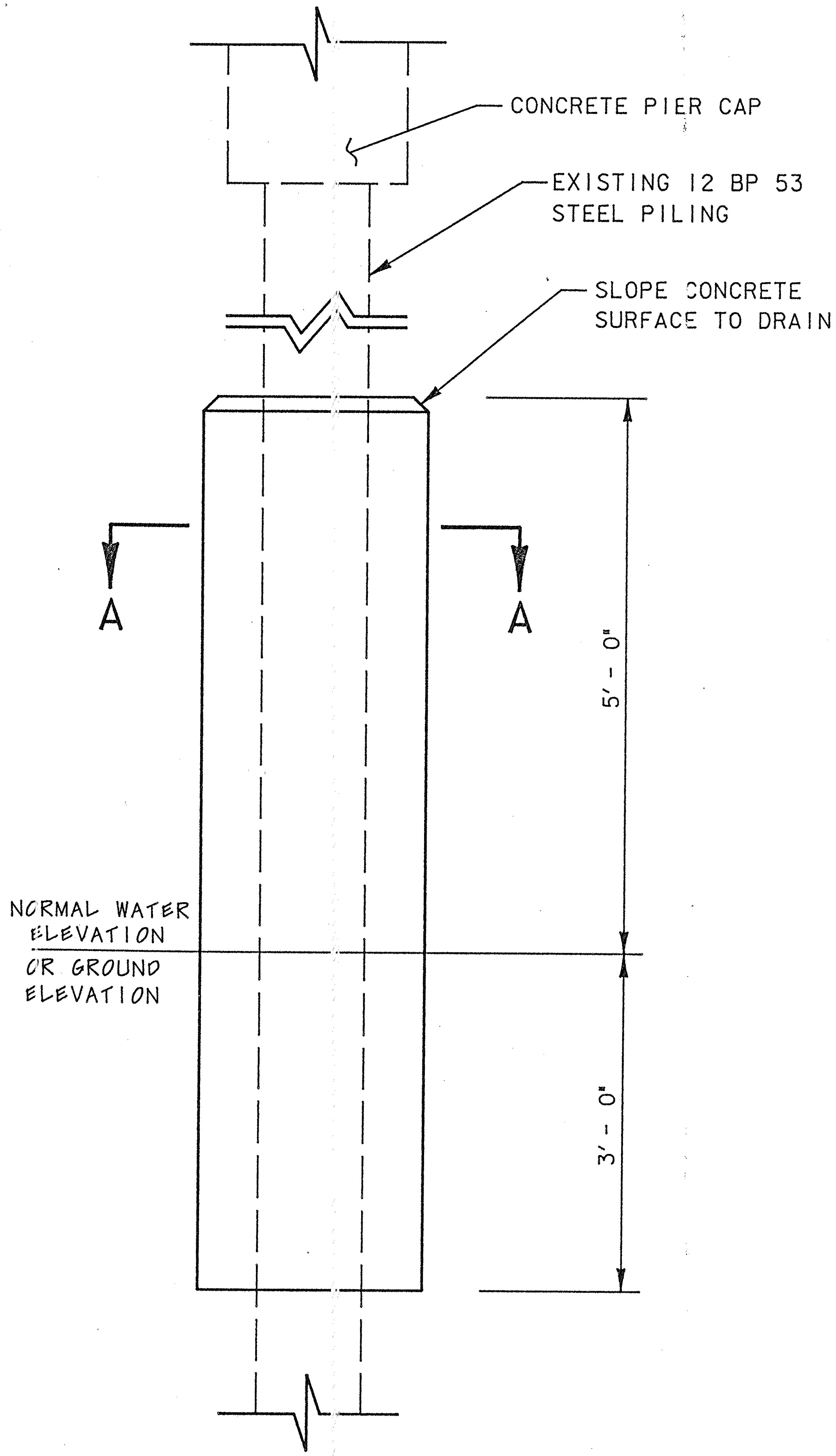
PAYMENT FOR ALL MATERIALS, EXCEPT THE CONCRETE, AND LABOR TO REPAIR THE JOINT AS PER DETAILS ON THIS SHEET SHALL BE INCLUDED IN THE UNIT PRICE BID PER LINEAR FOOT OF ITEM 516, PREFORMED ELASTOMERIC COMPRESSION JOINT SEAL (705.11)



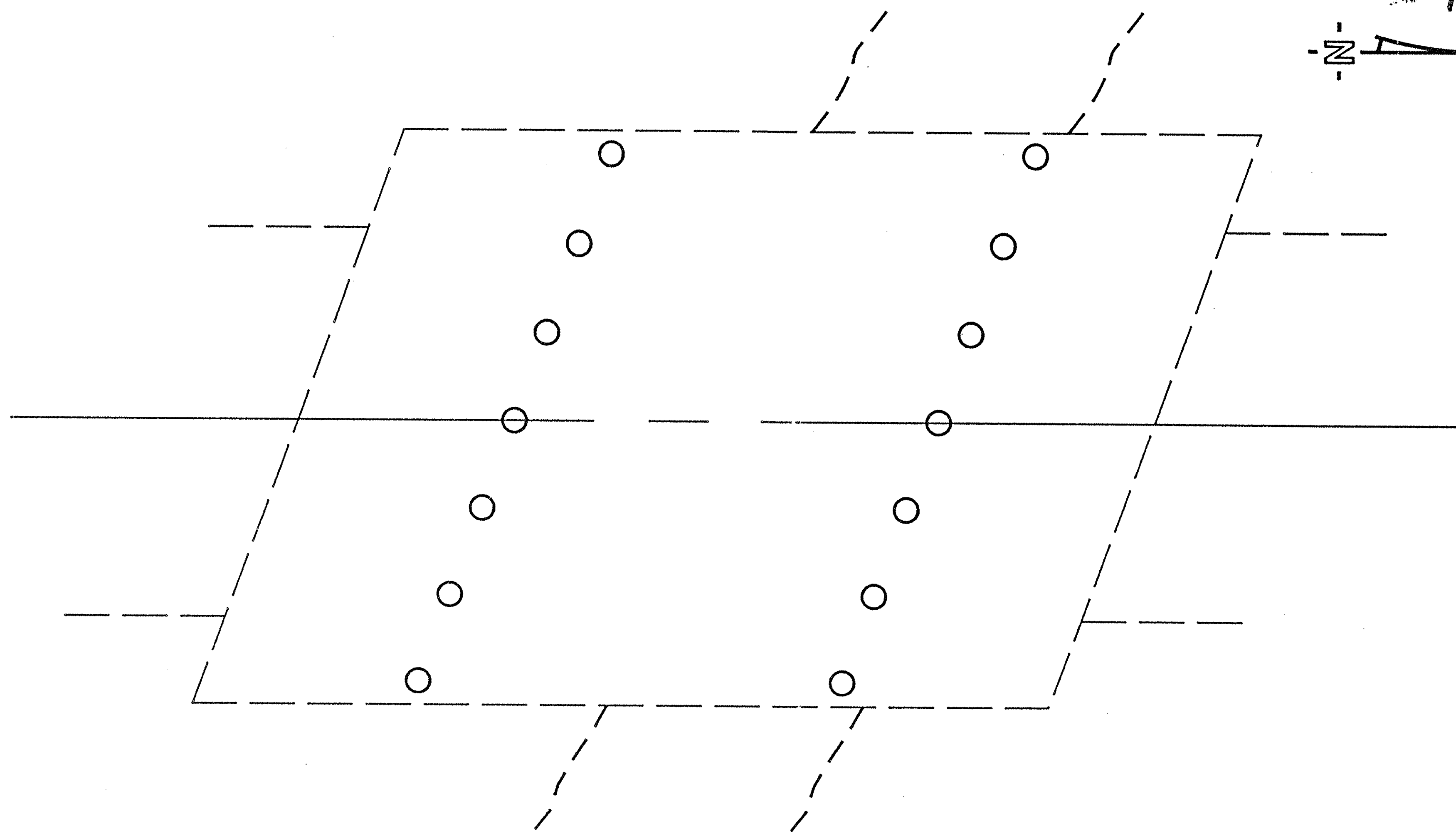
DETAIL A

PREFORMED ELASTOMERIC COMPRESSION SEAL AND KEYWAY DRAINS CRA-602-0949				
O.D.O.T. DISTRICT THREE BRIDGE DEPARTMENT				
DESIGNED	DRAWN	CHECKED	REVIEWED	DATE
D.M. 7-91	T.R.D.	KW 8/91	JEC	8/91

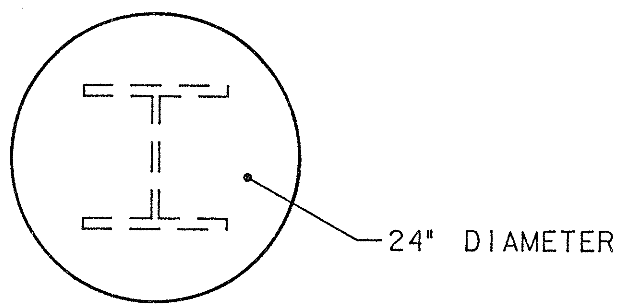
DESIGN FL 36022LAN



TYPICAL PIER ENCASEMENT



LOCATION OF PIER ENCASEMENT



PIER COLUMNS TO BE ENCASED	NUMBER OF PIER COLUMNS	PIER COLUMN ENCASEMENT LENGTH	ITEM 511 CLASS C CONCRETE MISC; PIER ENCASEMENT, AS PER PLAN CU. YD.
ALL	14	8' - 0"	★ 13

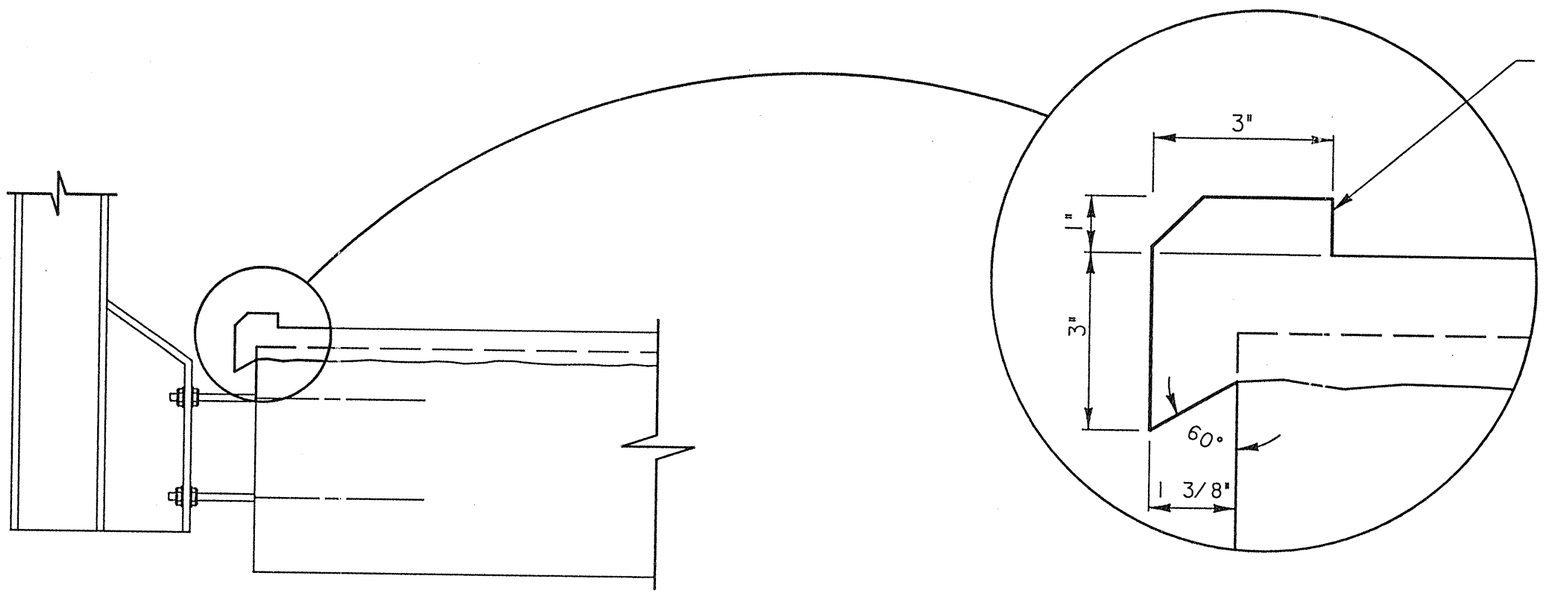
★ QUANTITY CARRIED TO BRIDGE DECK TREATMENT SHEET

PIER ENCASEMENT

CRA-602-0949

O. D. O. T. DISTRICT THREE BRIDGE DEPARTMENT				
DESIGNED	DRAWN	CHECKED	REVIEWED	DATE
D.M. 7-91	T.R.D.	KW 8/91	JEC	8/91

DESIGN FI 60221AN



CONCRETE DRIP STRIP EXTENDS THE
LENGTH OF THE BRIDGE ON BOTH SIDES

CONCRETE DRIP STRIP DETAIL
FOR CONCRETE SLAB BRIDGE

DESIGN E CS022LAN

DECK EDGE DETAIL

CRA-602-0949

O. D. O. T. DISTRICT THREE BRIDGE DEPARTMENT

DESIGNED	DRAWN	CHECKED	REVIEWED	DATE
D. M. 7-91	T.R.B.	KW 8/91	Acc	8/91

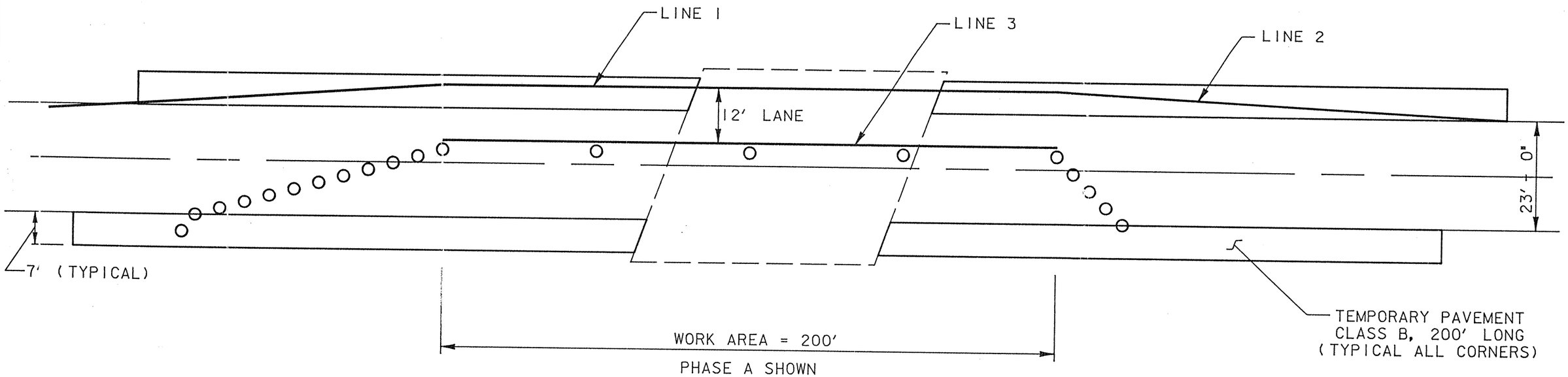
EXISTING STRUCTURE WIDTH: 40'

CLOSE: 24'

REPAIR: 20'

131 (23/35)

FOR DETAILS NOT SHOWN SEE
STANDARD DRAWING MT-96.10



BARRIER REFLECTOR

STATIONING	SPACING	TYPE A2	TYPE B2
PHASE A			
LINES 1 & 2	50'	7	
PHASE B			
LINES 1 & 2	50'	7	
TOTAL		14	

SIGNAL TIMING

A TWO PHASE CONTROLLER WITH CABINET CAPABLE OF BEING SET WITH THE FOLLOWING SPLITS SHALL BE FURNISHED.

CYCLE LENGTH 60 SECONDS

	GREEN	AMBER	RED
PHASE A	15	5	10
PHASE B	15	5	10

THE ABOVE TIMING MAY BE CHANGED WITH APPROVAL OF THE ENGINEER.

TRAFFIC CONTROL

CRA-602-0949

O.D.O.T. DISTRICT THREE BRIDGE DEPARTMENT

DESIGNED	DRAWN	CHECKED	REVIEWED	DATE
D.M. 7-91	T.R.D.	KW 8/91	JEC	8/91

DESIGN F' 66022LAN

DETAIL	
1	MULTILANE DIVIDED
1	TYPICAL SPACING

DETAIL	
2	TAPERED ACCEL LANE
3	DECELERATION LANE
4	PARALLEL ACEL LANE
5	MULTILANE DIVIDED/ EXPRESSWAY

DETAIL	
6	STOP APPROACH
7	1 LANE APPR. W/LT. TURN LANE
8	THRU APPROACH
9	2 LANE APPR. W/LT TURN LANE

DETAIL	
10	4 LANE DIVIDED TO 2 LANE TRANSITION
11	4 LANE UNDIVIDED TO 2 LANE TRANSITION
12	TWO LANE NARROW BRIDGE
13	TWO WAY LEFT TURN LANE
14	ONE LANE BRIDGE
15	HORIZONTAL CURVE

FED RD. DIVISION	STATE	PROJECT	
5	OHIO		

25
35

PLAN NO. ~~RPM-3-90~~ 131

16	HORIZONTAL CURVE ALT.
17	STOP APPROACH ALT.
GAP	CENTERLINE AT 80' TYP.

Raised Pavement Marker SUB-SUMMARY

LOCATION				DETAIL	RPM	RPM PLOWABLE CASTING INSTALLATION ONLY			PRISMATIC RETRO REFLECTOR	PRISMATIC RETRO-REFLECTOR TYPES					REMARKS	LOCATION NUMBER
		S.L.M. SECTION				ONE WAY	TWO WAY	USED		ONE - WAY		TWO - WAY				
COUNTY	ROUTE	FROM	TO							WHITE	YELLOW	WHITE/ WHITE	YELLOW/ YELLOW	WHITE/ RED		
PART 1																
CRA	SR602	0.00	2.57	GAP	170								170		CONTINUOUS ROUTE TREATMENT	
CRA	SR602	3.05	4.06	GAP	67								67		CONTINUOUS ROUTE TREATMENT	
CRA	SR602	4.06	4.46	6	132					78			54		STOP APPROACHES AT US30	
CRA	SR602	4.46	6.10	GAP	108								108		CONTINUOUS ROUTE TREAMENT	
CRA	SR602	6.10	6.44	8	76					32			44		THRU APPROACHES AT SR96	
CRA	SR602	6.44	9.00	GAP	169								169		CONTINUOUS ROUTE TREATMENT	
CRA	SR602	9.00	9.40	6	132					78			54		STOP APPROACHES AT SR98	
CRA	SR602	9.40	13.91	GAP	298								298		CONTINUOUS ROUTE TREATMENT	
TOTAL PART 1					1152					188			964			

PAVEMENT MARKING SUB-SUMMARY

QUANTITIES			
Calc.		Chk'd.	
Date		Date	

PLAN NO. 3

FHWA REGION	STATE	PROJECT	
5	OHIO		

26/35

CO.	ROUTE	FROM S.L.M.	FROM	TO S.L.M.	TO	642 QUANTITIES CENTER LINE MILES TOTAL (PAY QUANT.)	642 QUANTITIES CENTER LINE MILES SOLID LINE EQUIV.	RAISED PAVEMENT MARKERS REMOVED FOR STORAGE EACH	642 CENTER LINE REMARKS
CR9	SR-602	0.00	SR-19	2.57	North Robinson S. Corp.	2.57	0.803	-	Part I 614-Temp. ℄ 2.57 x 2 = 5.14 mi.
"	"	3.05	North Robinson N. Corp.	13.91	New Washington S. Corp.	10.86	10.071	86	Part I " " 10.86 x 2 = 21.72 mi.
"	"	2.57	North Robinson S. Corp.	3.05	North Robinson N. Corp.	0.48	0.291	-	Part II-Village " " 0.48 x 2 = 0.96 mi.
"	"	13.91	New Washington S. Corp.	14.46	SR-103	0.55	0.367	-	Part III-Village " " 0.07 x 2 = 0.14 mi.
									0.48 x 3 = 1.44 mi.
CENTER LINE TOTAL						14.46	11.532	86	

CO.	ROUTE	FROM S.L.M.	FROM	TO S.L.M.	TO	642 QUANTITIES 4" LANE LINE MILES TOTAL	DASHED	SOLID	RAISED PAVEMENT MARKERS REMOVED FOR STORAGE EACH	642 LANE LINE REMARKS
LANE LINE TOTAL										

CO.	ROUTE	FROM S.L.M.	FROM	TO S.L.M.	TO	WHITE EDGE LINE QUANTITIES TOTAL MILES	HWY. MILES	RAMP MILES	PART.	YELLOW EDGE LINE QUANTITIES TOTAL	HWY.	RAMP	PART.	642 EDGE LINE
CR9	SR-602	0.00	SR-19	2.57	North Robinson S. Corp.	5.14	2.57							Part I 10' Lanes
"	"	3.05	North Robinson N. Corp.	13.91	New Washington S. Corp.	21.72	10.86							Part I 10' Lanes
"	"	2.57	North Robinson S. Corp.	3.05	North Robinson N. Corp.	0.96	0.48							Part II-Village - 10' Lanes
"	"	13.91	New Washington S. Corp.	14.46	SR-103	1.10	0.55							Part III-Village - 10' Lanes
EDGE LINE TOTAL						28.92	14.46							

CO.	ROUTE	FROM S.L.M.	FROM	TO S.L.M.	TO	642 QUANTITIES 8" CHANNELIZING LINES MILES	LIN. FT.	PARTICIPATION	642 CHANNELIZING LINE REMARKS
CHANNELIZING LINE TOTAL									

645 AUXILIARY MARKING 740.05 TYPE A

CO.	ROUTE	S.L.M. FROM	S.L.M. TO	24" TRANSVERSE LINES WHITE LIN. FT.	24" TRANSVERSE LINES YELLOW LIN. FT.	STOP LINES 24" LIN. FT.	12" CROSS-WALK LINES WHITE LIN. FT.	WORD ON PAVEMENT ONLY EACH	WORD ON PAVEMENT SCHOOL 96" EACH	LANE ARROWS TURN LEFT EACH	LANE ARROWS TURN RIGHT EACH	LANE ARROWS THRU EACH	LANE ARROWS COMB. EACH	R.R. SYMBOL MARKING EACH	DOTTED LINES WHITE LIN. FT.	DOTTED LINES YELLOW LIN. FT.	REMARKS
CR9	SR-602	0.00	2.57			40											Part I
"	"	3.05	13.91			142											Part I
"	"	2.57	3.05						2					2			Part II-Village
"	"	13.91	14.46														Part III-Village
AUXILIARY MARKING TOTALS						182			2					2			

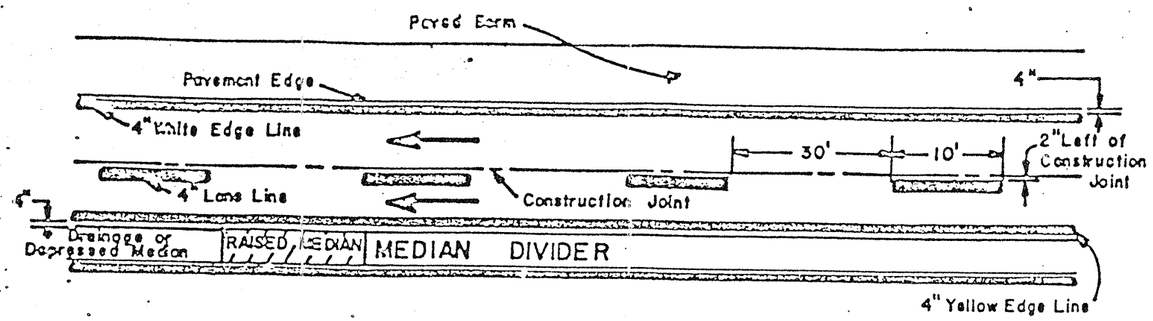
PAVEMENT MARKING TYPICAL DETAILS

FED.RD DIV.	STATE	PROJECT	
5	OHIO		

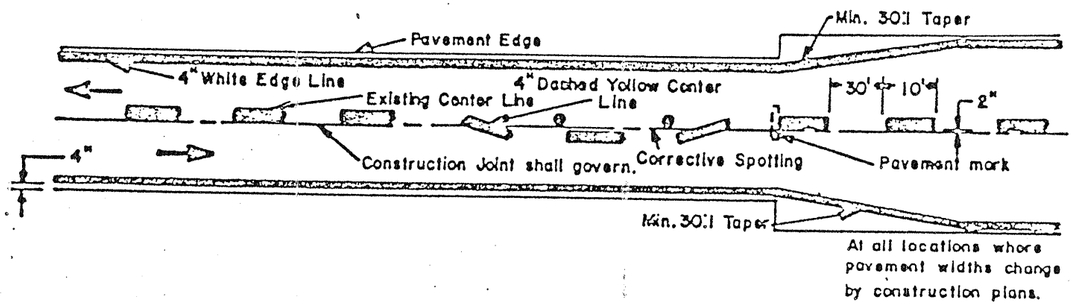
22/35

PLAN NO. 3

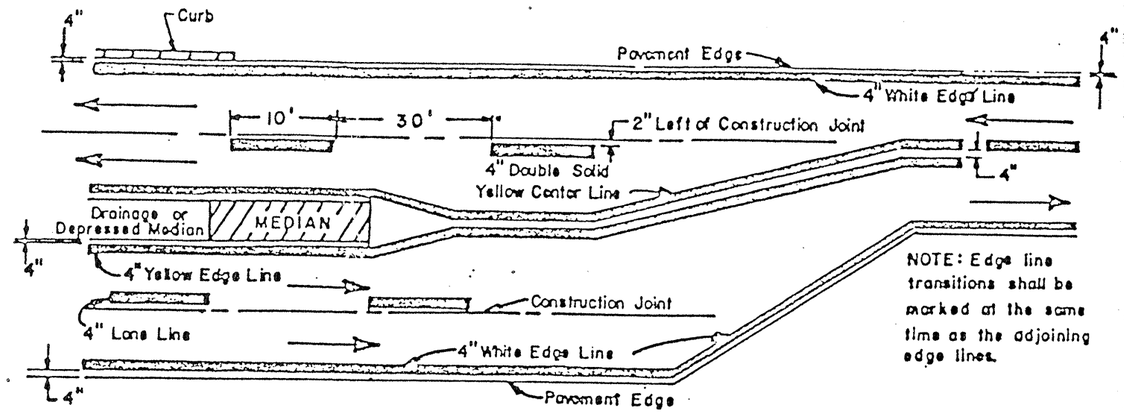
FREEWAY & EXPRESSWAY MAINLINE MARKINGS



TWO LANE MARKINGS



MULTILANE DIVIDED & UNDIVIDED HIGHWAY MARKINGS



NOTES:

1. THE DISTANCE FROM THE PAVEMENT EDGE TO THE NEARSIDE EDGE OF THE EDGELINE MAY BE INCREASED WITH THE APPROVAL OF THE ENGINEER IN ORDER TO MAINTAIN UNIFORM LANE WIDTH.
2. SEE TC 72.20 FOR ENTRANCE AND EXIT RAMP MARKINGS.
3. The cycle length for dashed lines shall be 40 feet plus or minus 6 inches. The minimum length of dash shall be sufficiently long to maintain a 3:1 ratio between length of gap and length of dash.

DEPARTMENT OF TRANSPORTATION

PAVEMENT MARKING TYPICAL DETAILS

DATE 11/80

JDL / CDR

9/86

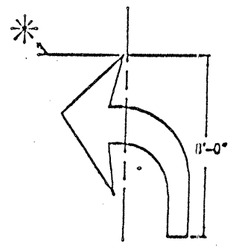
WORD AND SYMBOL MARKING DETAILS

FED AD DMSION	STATE	PROJECT	
5	OHIO		

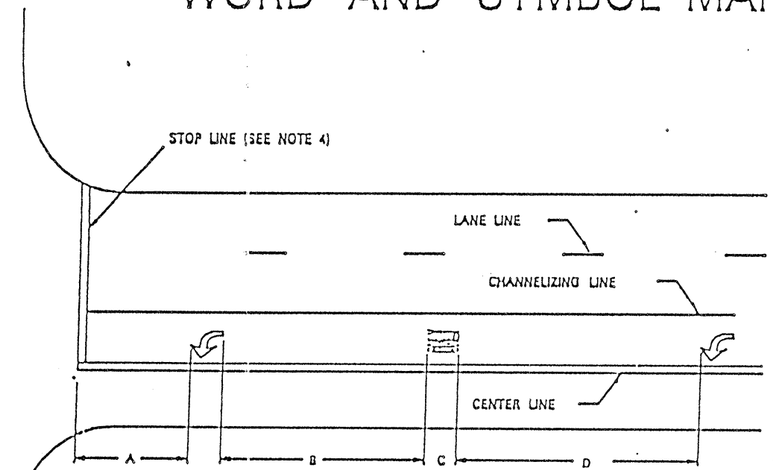
28
35

PLAN NO. 13

CENTER OF LANE

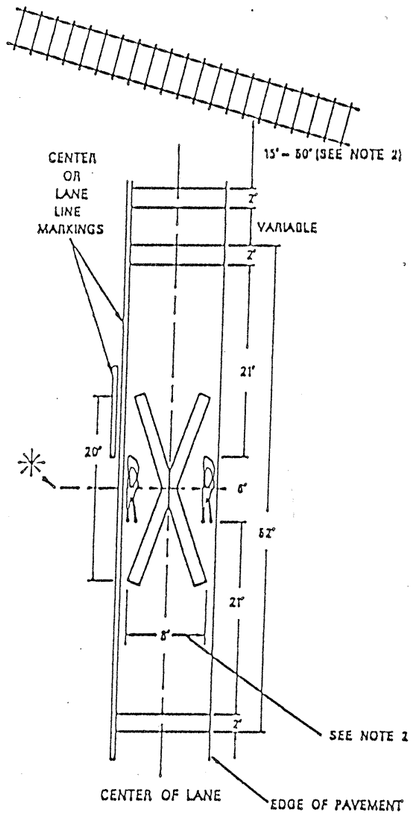


TURN ARROW
(LEFT ARROW SHOWN
RIGHT ARROW OPPOSITE)

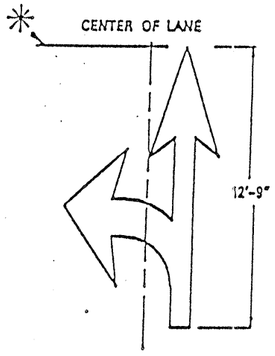


NOTE:
STOP LINE LOCATED MIN. 40' FROM AT LEAST ONE SIGNAL HEAD WHICH APPLIES TO THAT APPROACH

TYPE	DIMENSIONS (FEET)			
	A	B	C	D
RURAL	30 MIN.	22-80	8	22-80
URBAN	10 MIN.	22-80	8	24-80

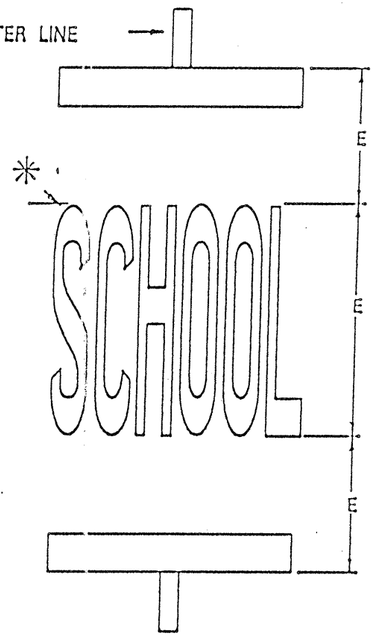


CENTER OF LANE



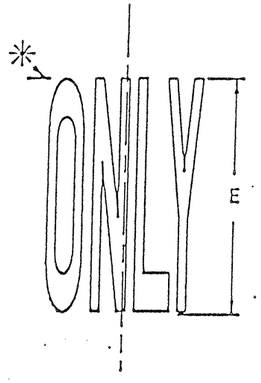
COMBINED ARROW
(THREE HEAD DIRECTIONAL ARROWS CAN BE ACHIEVED BY THE COMBINATION OF TURN ARROWS.)

LANE OR CENTER LINE

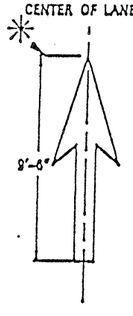


TYPE	INCHES
	E
RURAL	96
URBAN	72

CENTER OF LANE



CENTER OF LANE



THROUGH ARROW

NOTES:

1. ON MULTI-LANE APPROACHES, THE TRANSVERSE LINES USED WITH THE RAILROAD SYMBOLS SHALL EXTEND ACROSS ALL APPROACH LANES AND SYMBOLS SHALL BE PLACED IN EACH APPROACH LANE.

2. THE RAILROAD SYMBOL SHALL BE LOCATED SO THAT THE W-94, "RAILROAD ADVANCE WARNING SIGN", IS WITHIN THE TWO TRANSVERSE BOUNDRY LINES OF THE RAILROAD SYMBOL. THE STOP LINE SHALL BE LOCATED FOR BEST SIGHT DISTANCE WITHIN 15 FEET TO 50 FEET OF THE NEAR EDGE OF THE TRACKS. STOP LINES SHALL BE PERPENDICULAR TO THE CENTER LINE OF THE ROADWAY. WIDTH OF "X" MAY VARY ACCORDING TO LANE WIDTH.

3. ON MULTI-LANE APPROACHES, THE TRANSVERSE LINES USED WITH THE WORD "SCHOOL" SHALL EXTEND ACROSS ALL APPROACH LANES WITH A SINGLE WORD "SCHOOL" CENTERED ACROSS THE APPROACH LANES. ON TWO LANE ROADWAYS, THE TRANSVERSE LINES SHALL EXTEND ACROSS THE ROADWAY WITH THE WORD "SCHOOL" CENTERED ACROSS THE ROADWAY. CENTER OR LANE LINES SHALL NOT PASS THROUGH THE "SCHOOL" MARKING.

4. THE STOP LINE SHOULD BE PLACED WHERE CROSS-CORNER VISION IS MAXIMUM, IN NO CASE MORE THAN 30 FEET OR LESS THAN 4 FEET FROM THE NEAREST EDGE OF THE INTERSECTING ROADWAY. FOR NORMAL INTERSECTIONS A MAXIMUM DISTANCE OF 10 FEET IS RECOMMENDED.

   IF A MARKED CROSSWALK IS PRESENT, THE STOP LINE SHOULD BE PLACED 4 FEET IN ADVANCE OF AND PARALLEL TO THE NEAREST CROSSWALK.

5. FOR TRAFFIC PAINT AND POLYESTER APPLICATION, TEMPLATE GAPS SHALL BE FILLED WITH MARKING MATERIAL IN ACCORDANCE WITH 641.03. FOR EXTRUDED THERMOPLASTIC MATERIAL, THESE GAPS MAY REMAIN UNFILLED IN ACCORDANCE WITH 644.03.

8. USE STANDARD DIMENSIONS CONFORMING TO REQUIREMENTS OF OMUTCD SECTION 3B-40 THROUGH 3B-43 INCLUSIVE. (THAT IS THE 1977 METRIC EDITION STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKING WITH ERRATA.)

INDICATES STATION REFERENCE POINT

REV. 11-90 by W.J.C

FHWA REGION	STATE	PROJECT	
5	OHIO		

29/35

PLAN NO. 131

Standard Alphabet and Symbols for Highway Pavement Markings

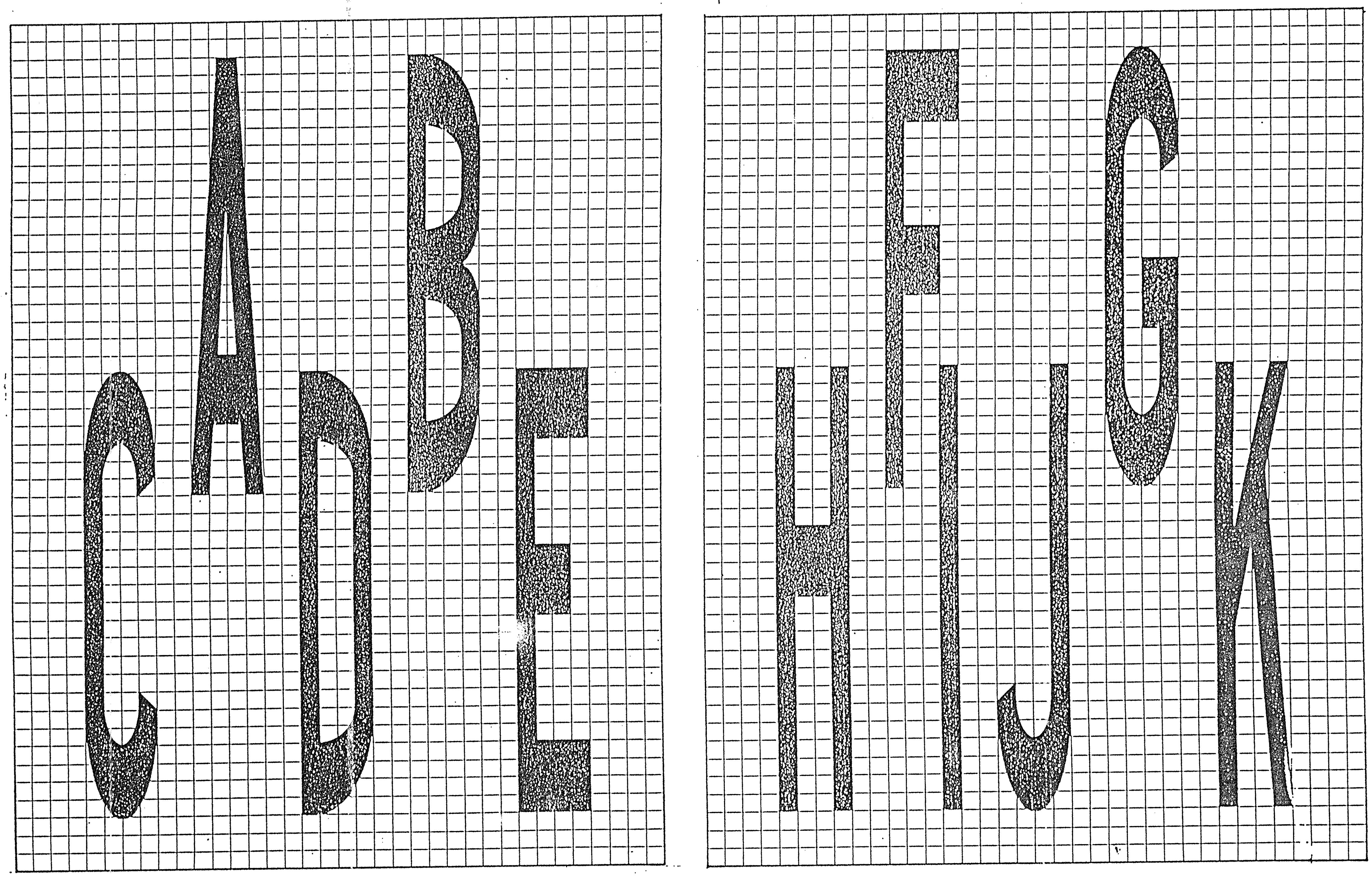
The Standard Pavement Marking Alphabet and Symbols was prepared by the Federal Highway Administration at the request of the National Advisory Committee on Uniform Traffic Control Devices.

The design of the standard alphabet, numbers, and symbols for pavement marking is shown in exact detail on a 5mm grid to facilitate enlarging. The characters and symbols may be enlarged to the desired size by any conventional process and will remain in proper proportion. To obtain characters of any height, divide the desired height in millimeters by 25 and use this value for this side dimension of the grid unit. For example, characters 2.5 meters high will require a grid unit dimension of 100 millimeters. Similar means may be used to enlarge the symbols.

Standard characters are 25 grid units high and 4 units wide. Horizontal strokes are 4 units wide and vertical strokes are 1 unit wide. The space between characters should be 1 unit, but optical spacing may be used. All characters having an arc at the top or bottom are extended slightly above or below the grid lines. An indentical set of curves is used for "B", "D", and similar characters. Another identical set of curves is used for "C", "G", "2" etc.

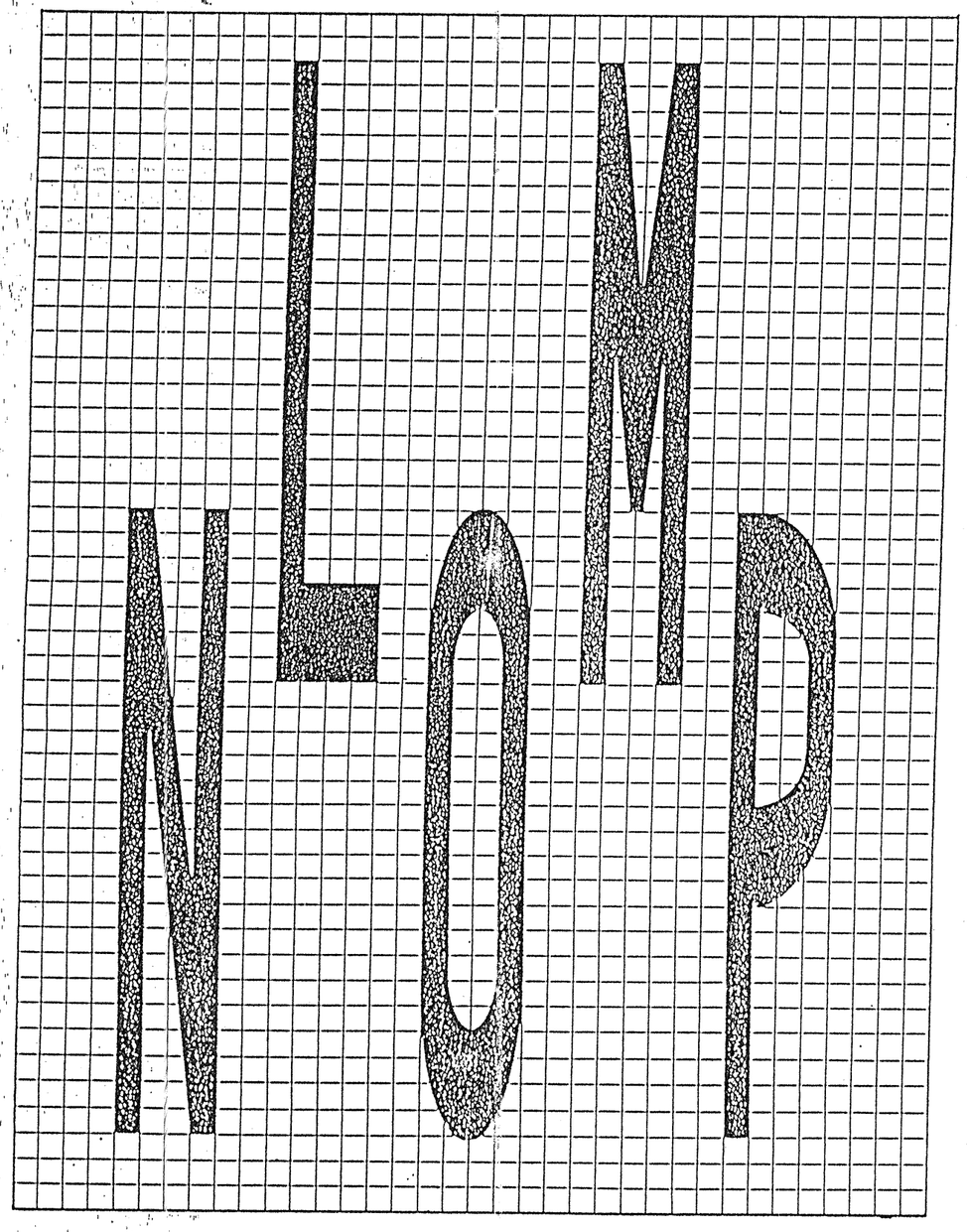
PLAN NO.: 31

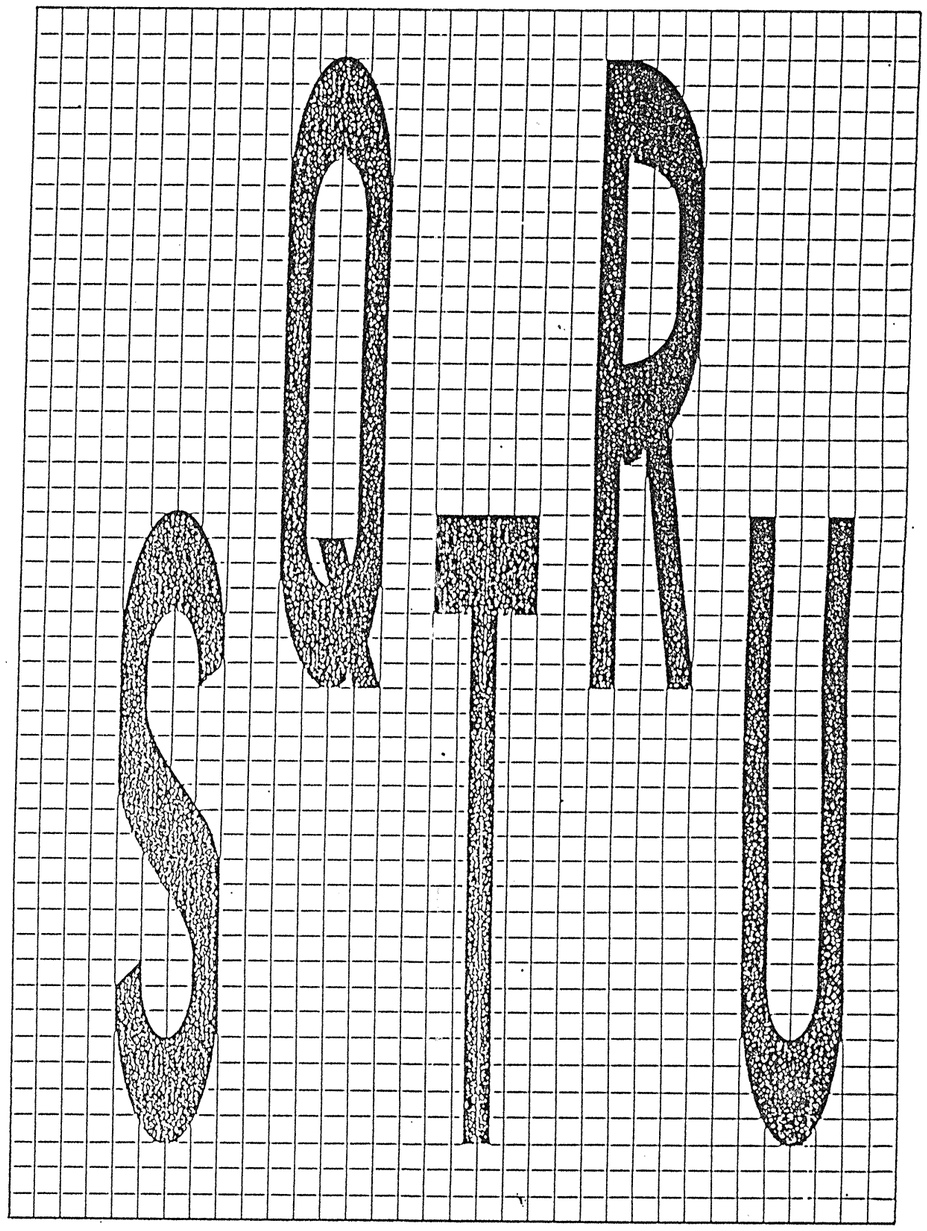
30/35



PLAN NO.: 3

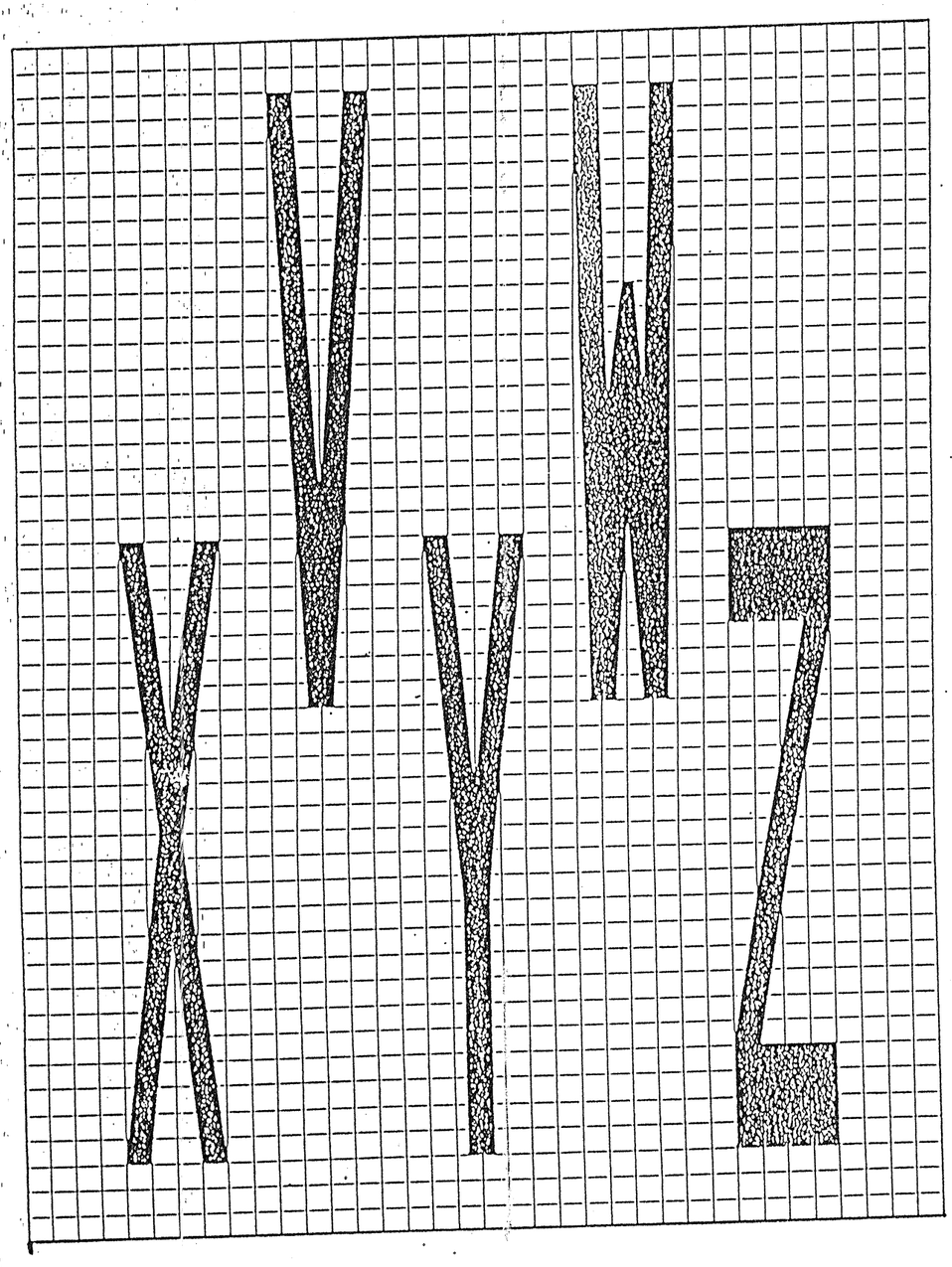
31/35

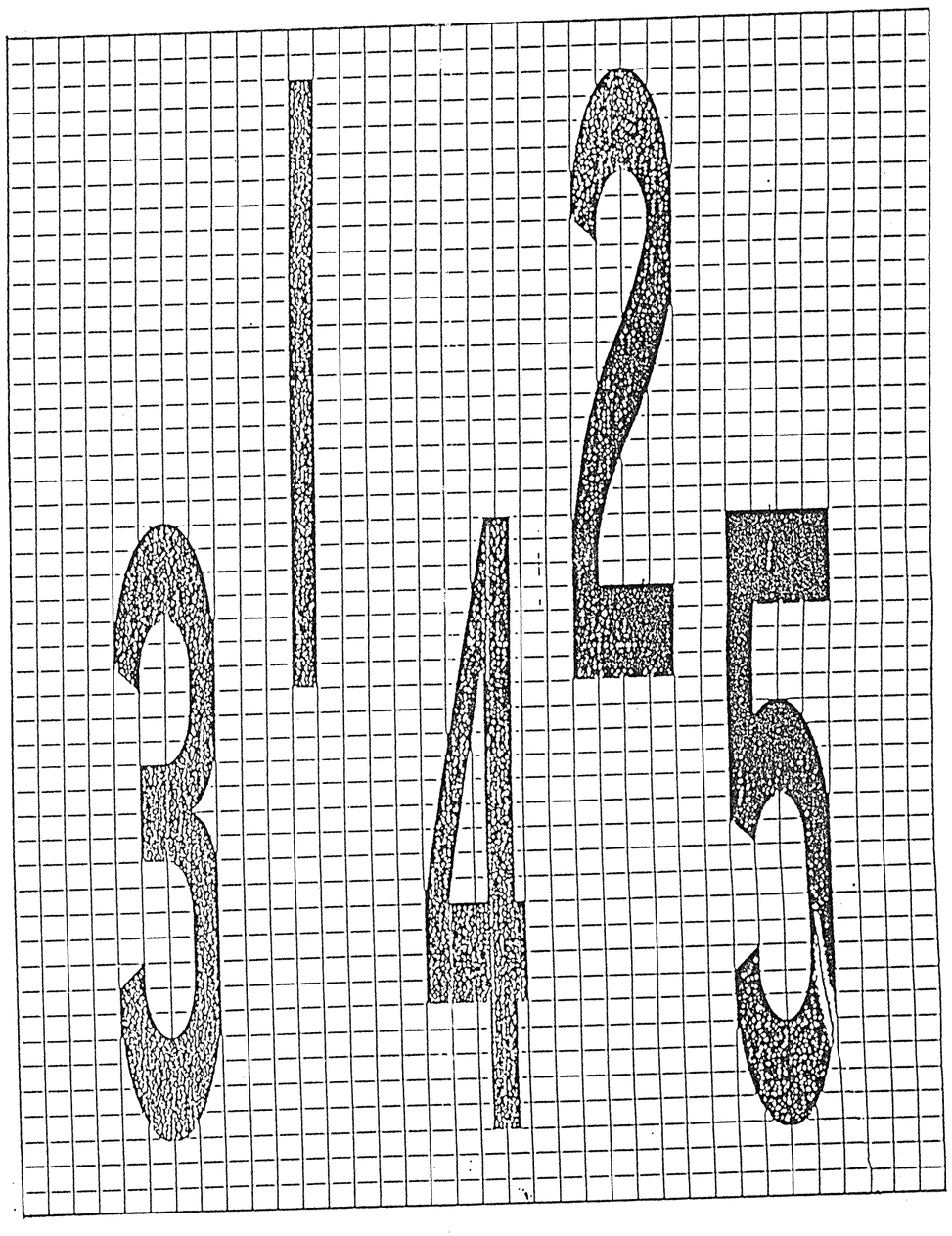




PLAN NO.: 3

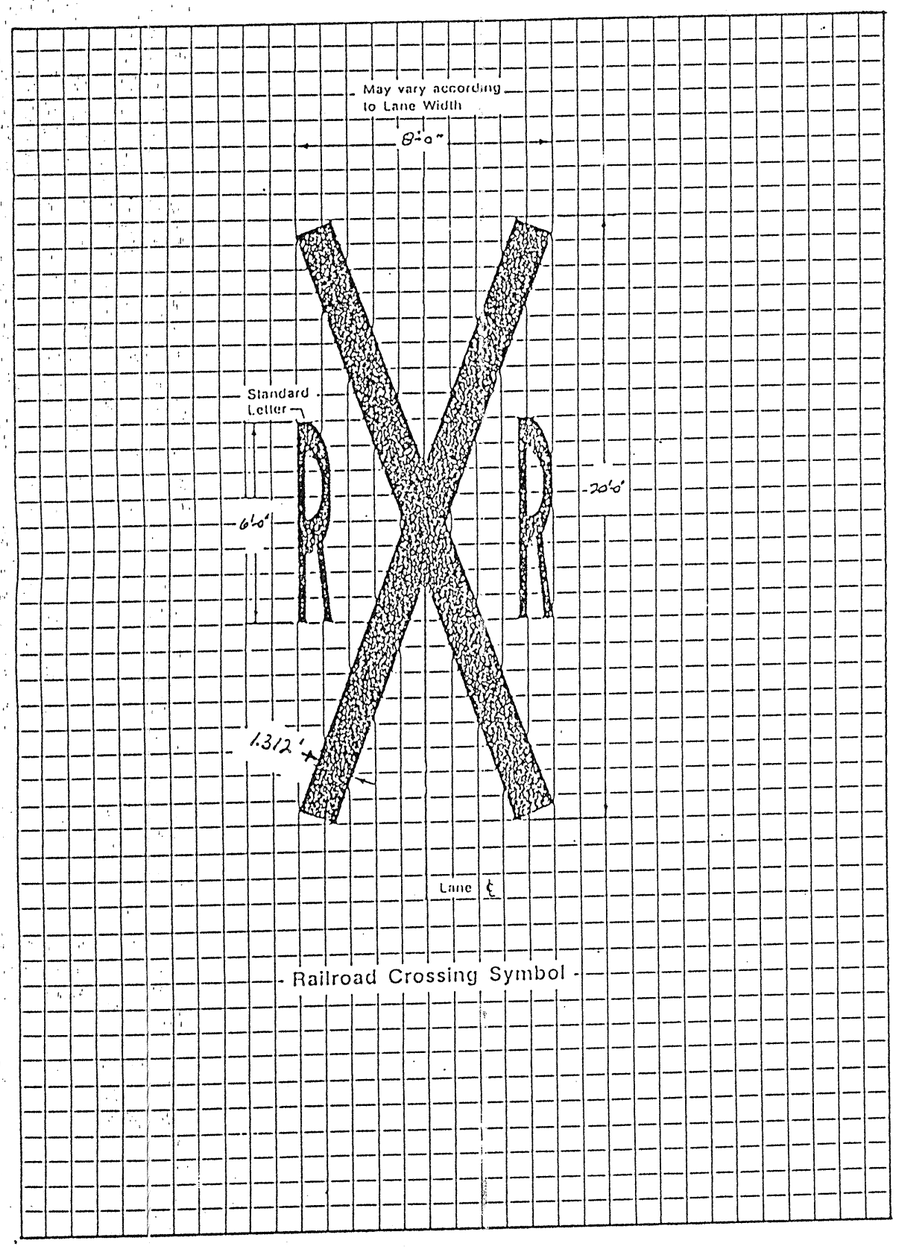
32/35

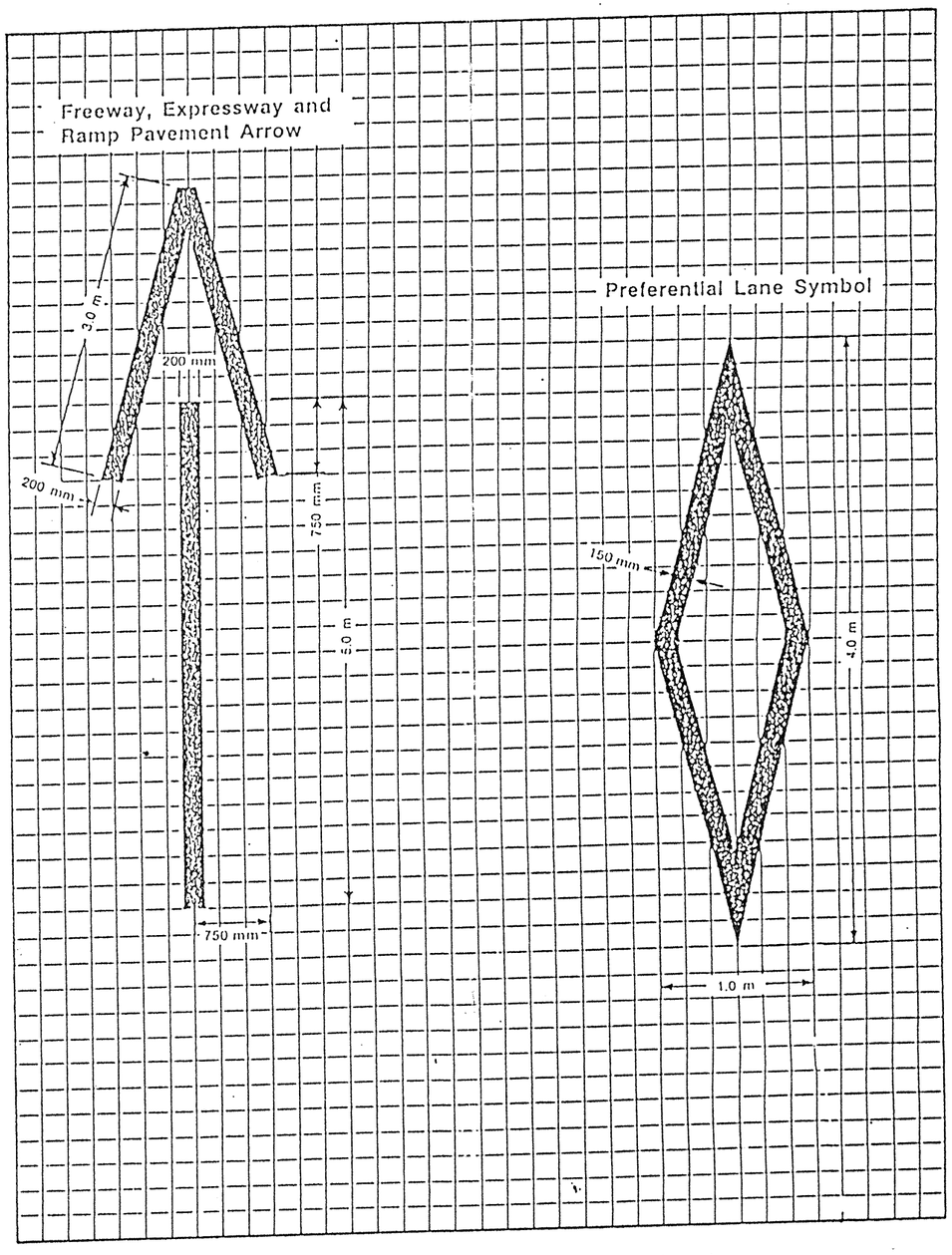




PLAN NO.: 13

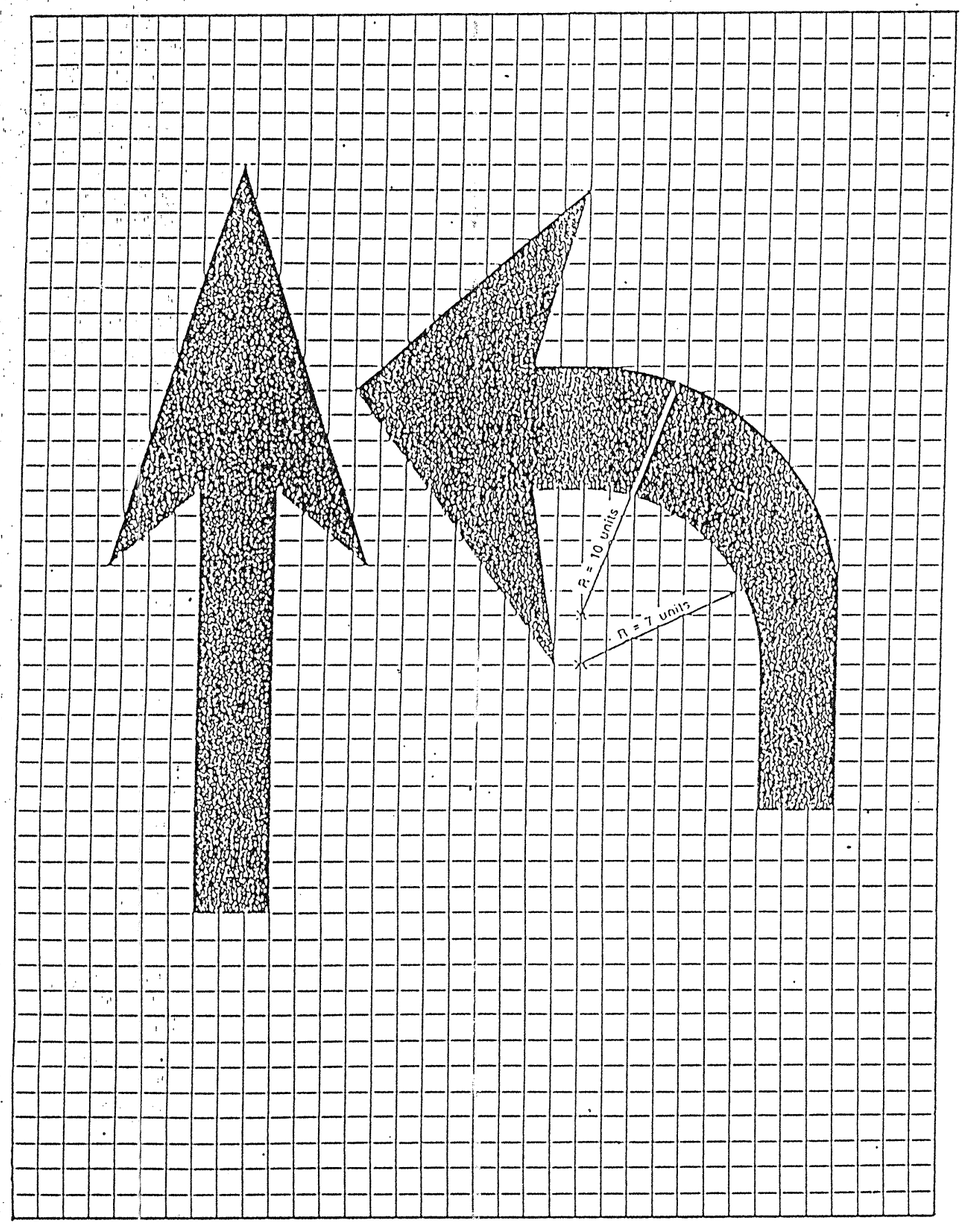
33/35

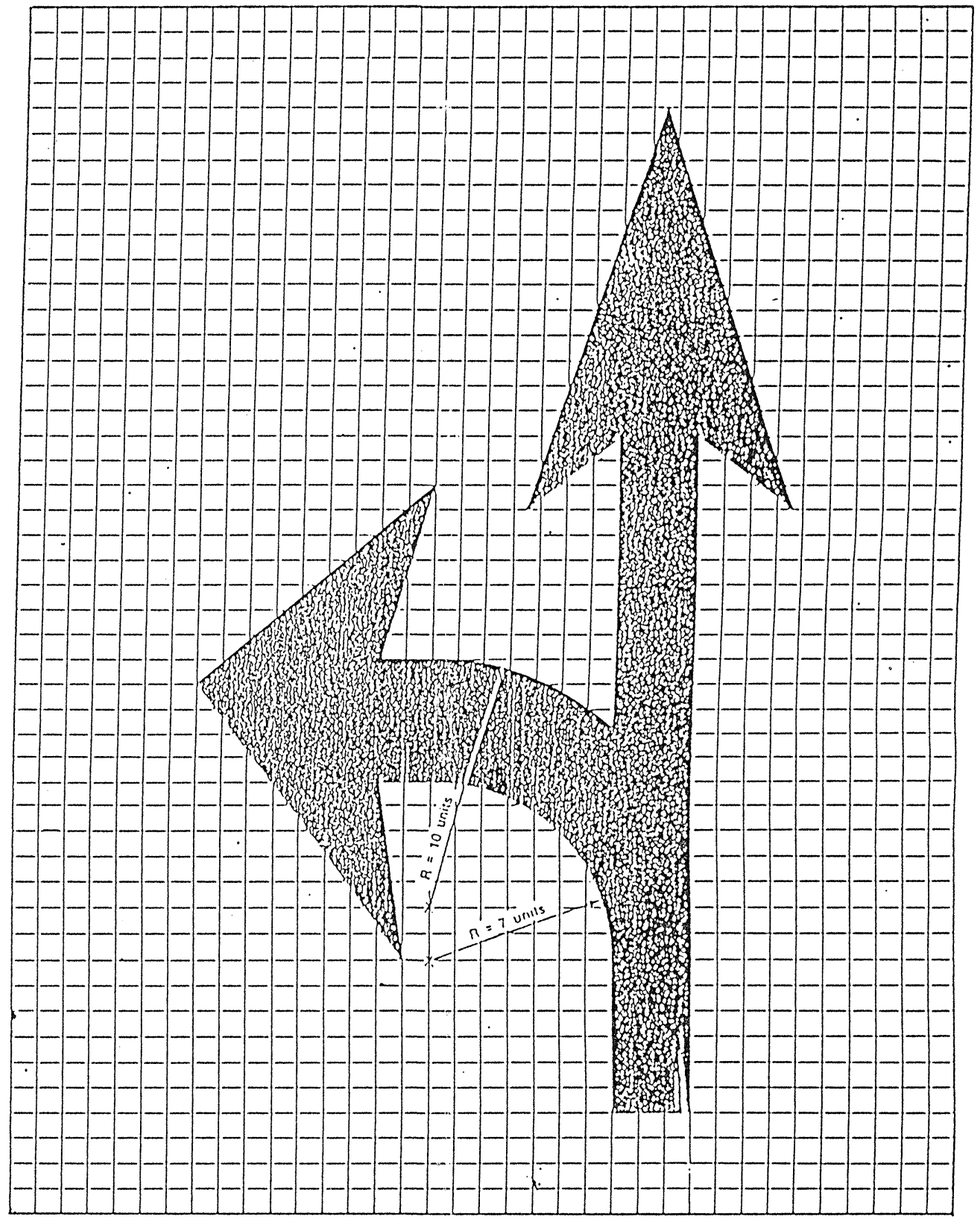




PLAN NO.: 3

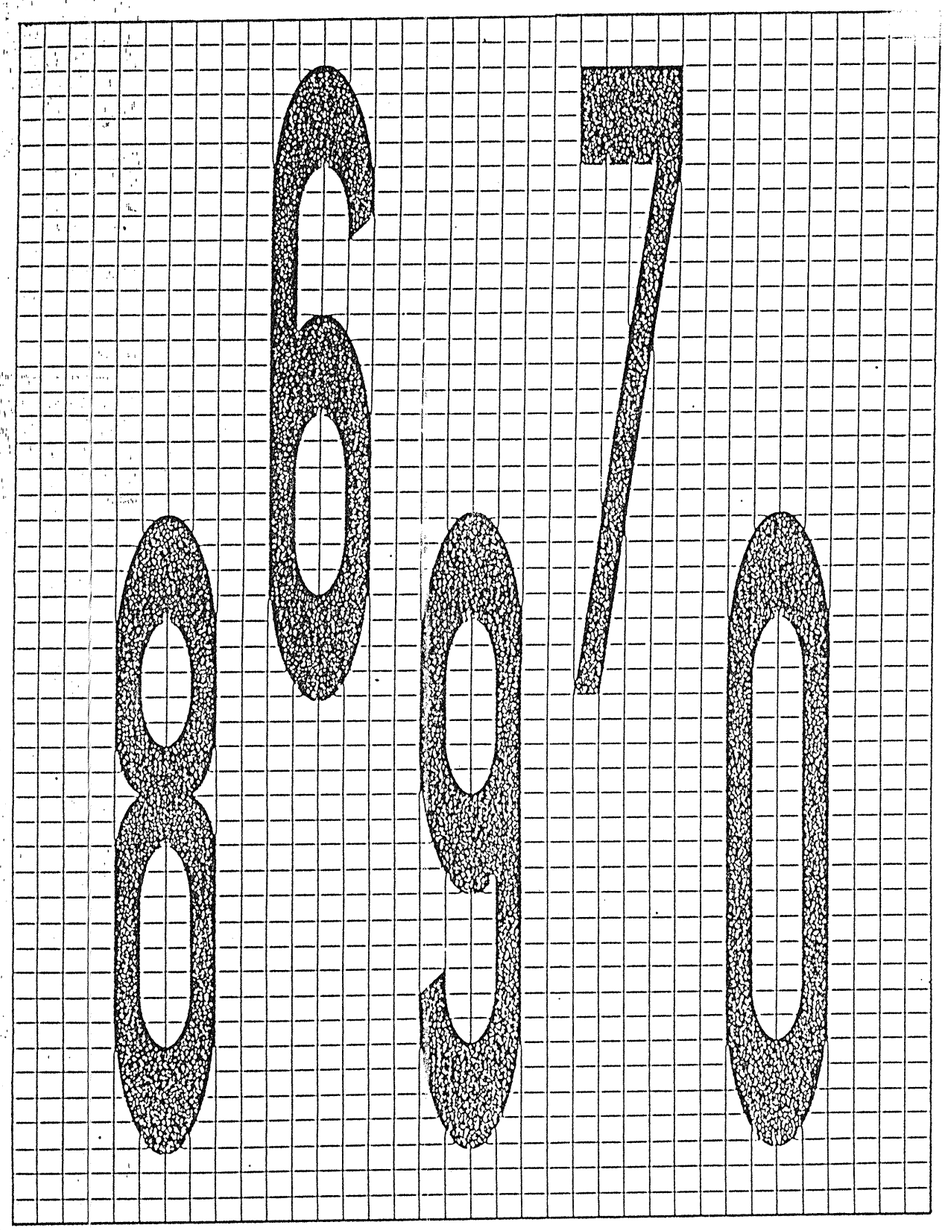
34/35

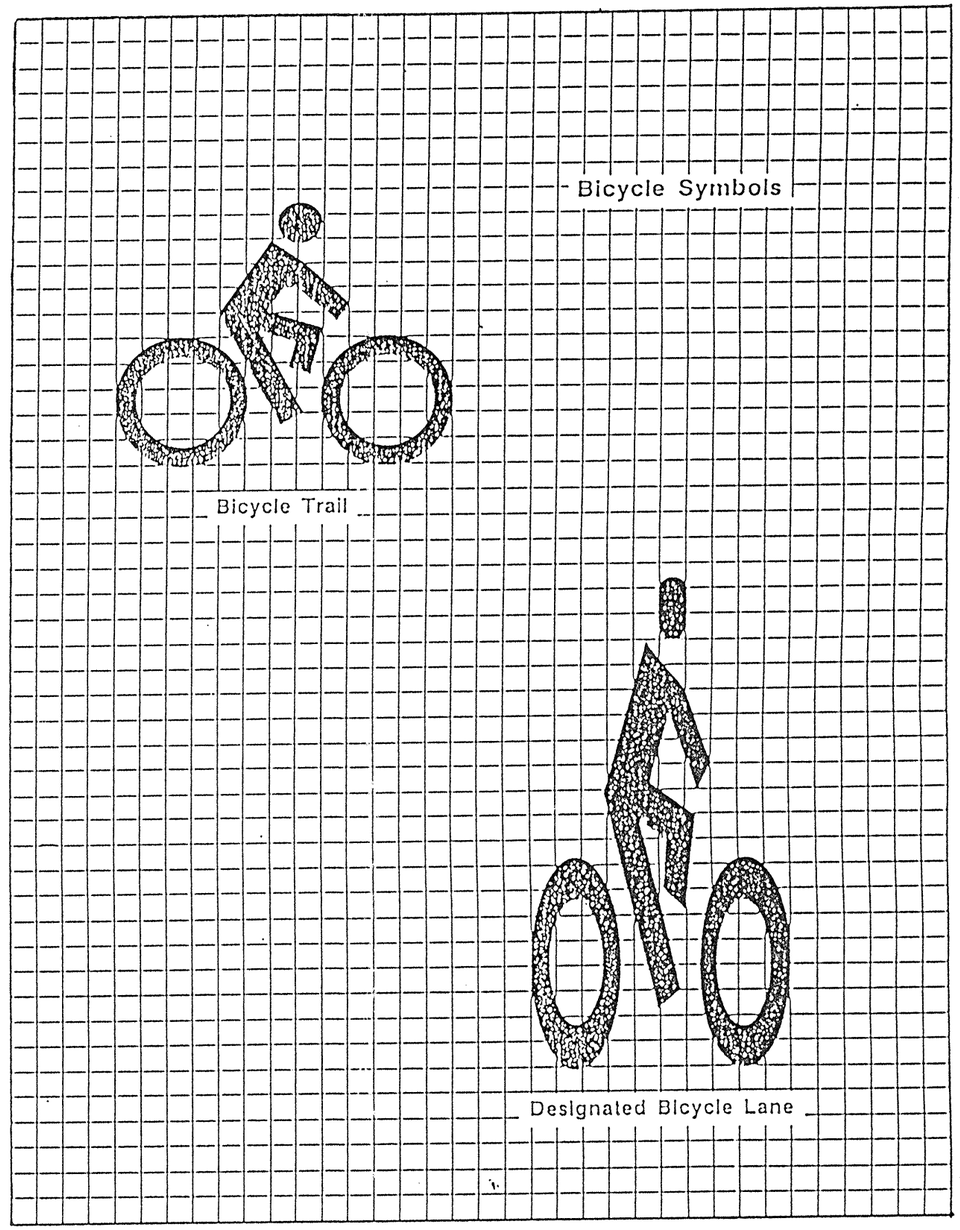




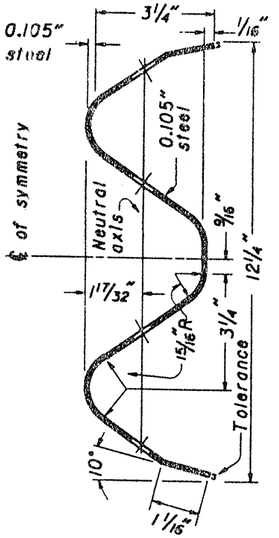
PLAN NO.: 13

35/35

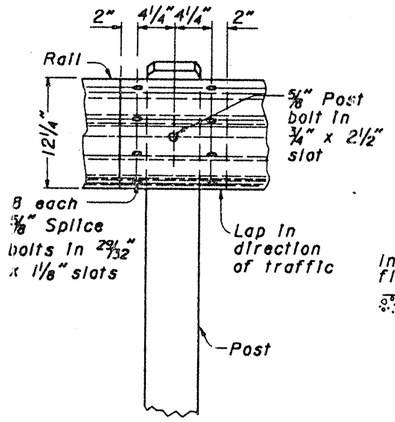




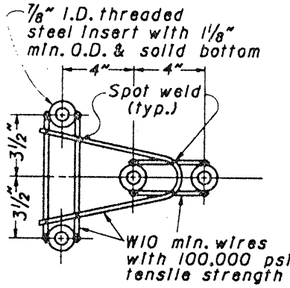
8 of



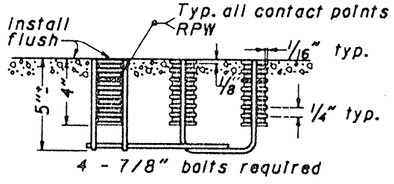
SECTION
W-BEAM RAIL



W-BEAM RAIL SPLICE

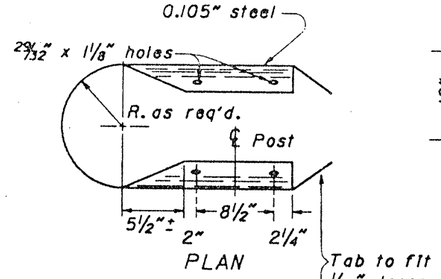


PLAN



ELEVATION

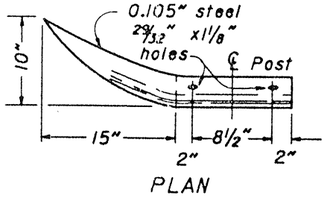
CONCRETE INSERT ANCHOR ASSEMBLY (W-BEAM ONLY)



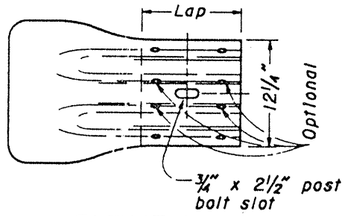
PLAN

ELEVATION

W-BEAM BUFFER END SECTION

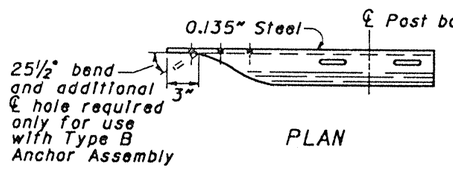


PLAN

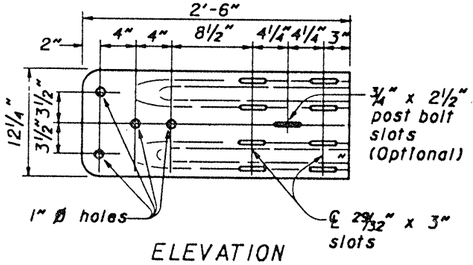


ELEVATION

W-BEAM FLARED END SECTION

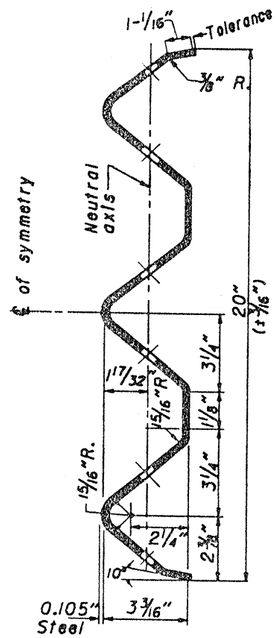


PLAN

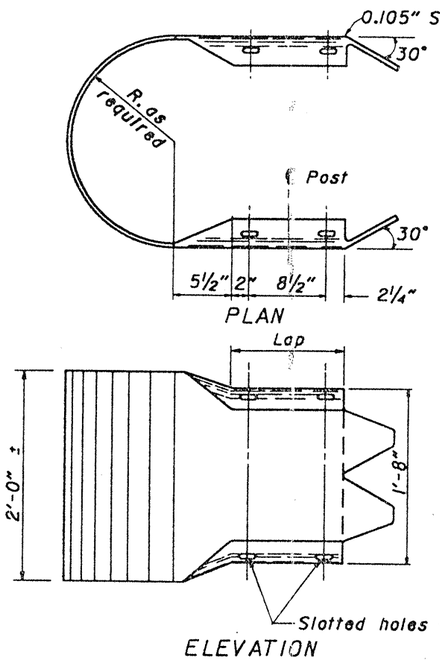


ELEVATION

W-BEAM TERMINAL CONNECTOR



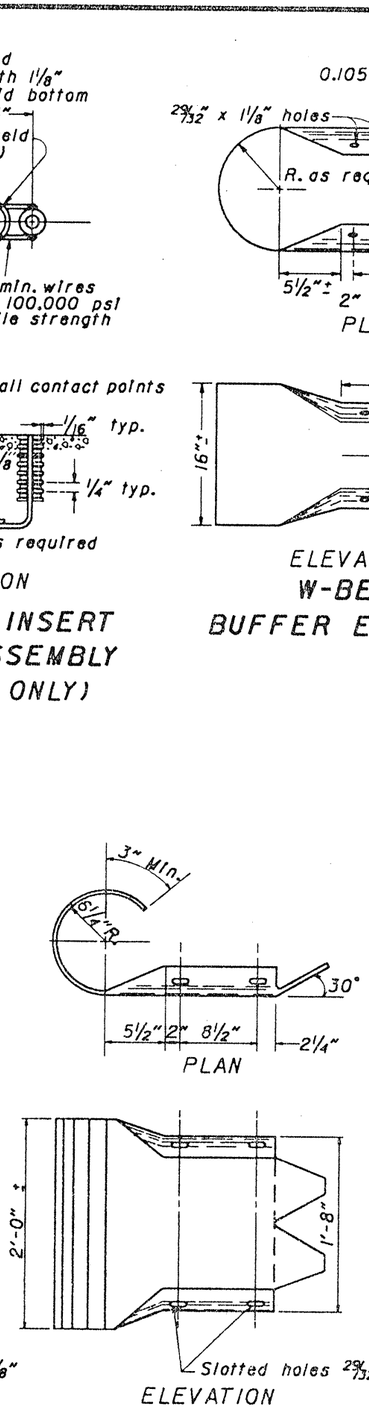
THRIE BEAM RAIL



PLAN

ELEVATION

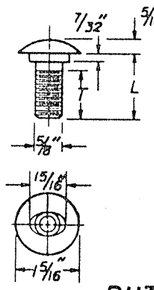
THRIE BEAM BUFFER END SECTION



PLAN

ELEVATION

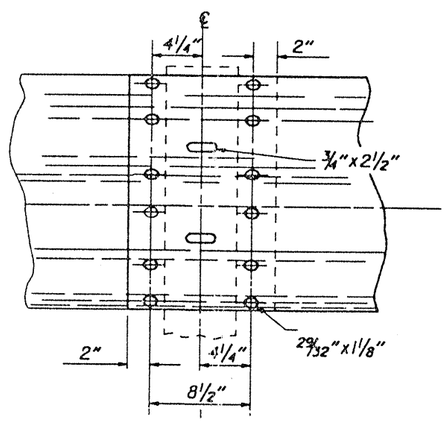
THRIE BEAM ROUNDED END SECTION



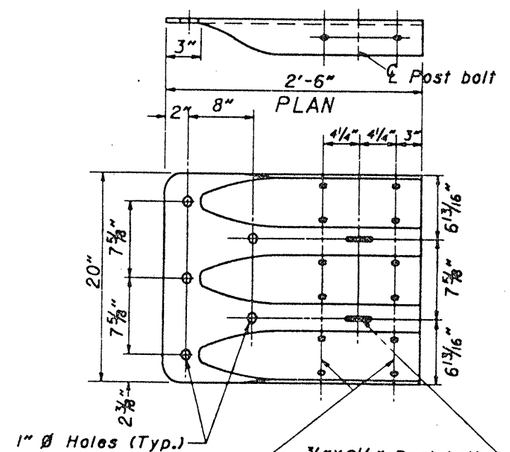
L (In.) Std.	L (In.) Bar.	T (In.) min.	Bolt Use
18	26	3½	Type 5: WP/WB
10		2½	Type 4: WP Type 5: SP/WB
2		1½	Type 4: SP Type 5: SP/SB
1¼		Full	Splice bolt

WP= wood post WB= wood block
SP= steel post SB= steel block
Longer bolt may be needed for round WP larger than 8" dia.

BUTTON HEAD BOLT
(For post and splice bolts)



THRIE BEAM RAIL SPLICE



ELEVATION

THRIE BEAM TERMINAL CONNECTOR

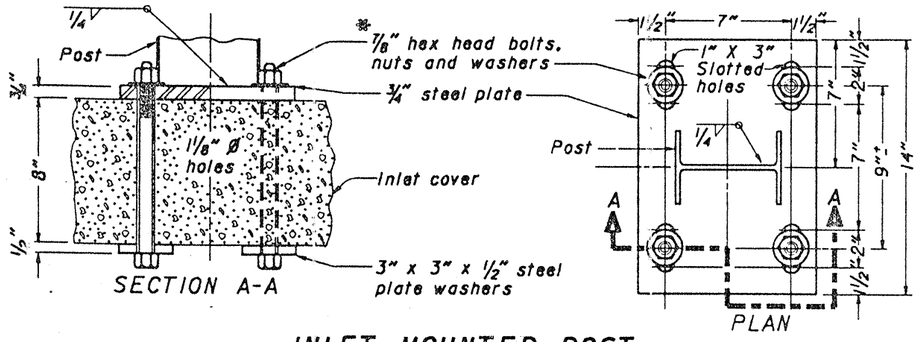
BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

GUARDRAIL DETAILS

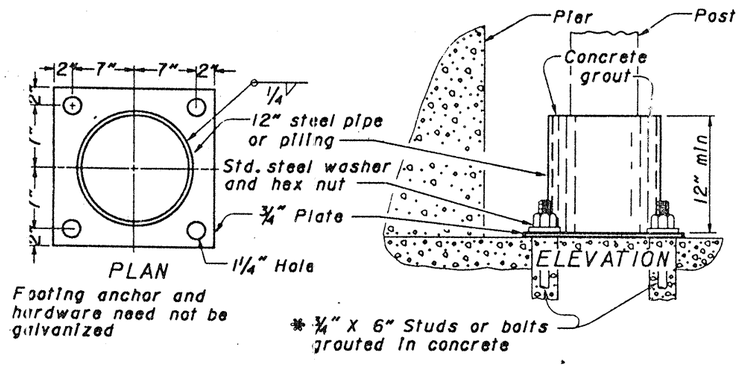
DATE 5-6-91

STANDARD CONSTRUCTION DRAWING **GR-1.1**

APPROVED D.K. Hulman ENGR., L. & D.

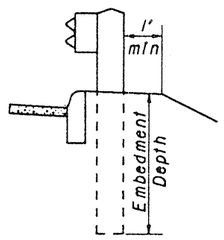


INLET MOUNTED POST

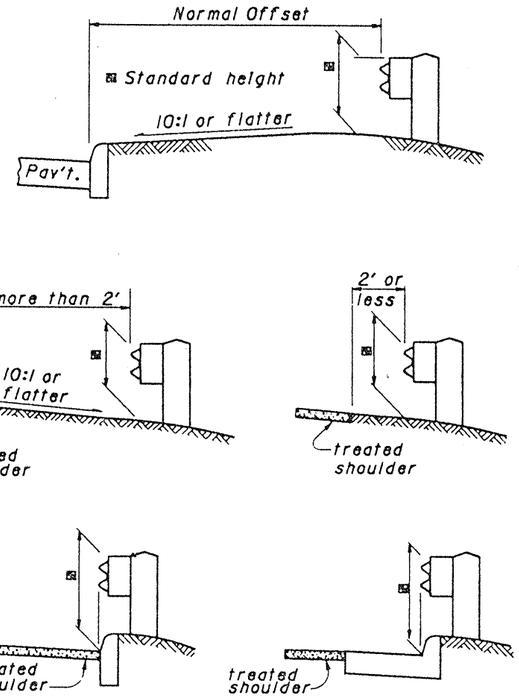


Footing anchor and hardware need not be galvanized

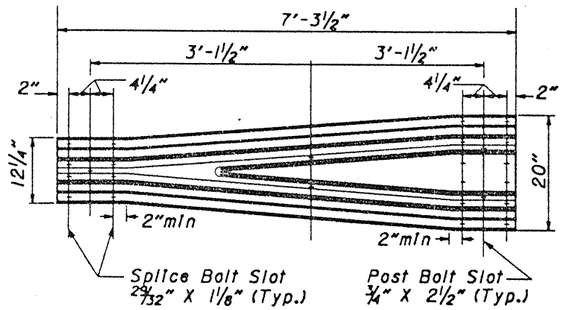
FOOTING ANCHOR



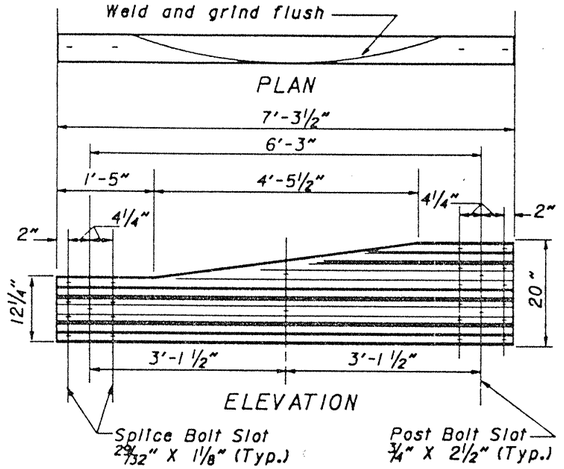
DETAIL A



MEASURING GUARDRAIL HEIGHT



TYPE 1



TYPE 2

TRANSITION SECTIONS

NOTES

BEAM RAIL ELEMENTS shall be 12'-6" effective length, unless otherwise specified, with 3/4" x 2 1/2" post bolt slots on 6'-3" centers regardless of post spacing. Field punching or drilling of bolt holes or slots for irregularly spaced posts shall be according to 606.05.

BEAM RAIL SPLICE between two rail elements, or rail and terminal connector shall be lapped in the direction of traffic. The buffer or flared end sections shall lap on the traffic face. A 12" length of beam rail (Back-up Plate), with a 3/4" dia. bolt hole or a 3/4" x 2 1/2" slot, shall be provided at posts not having a rail splice.

EMBEDMENT DEPTH: Where less than 1' of graded shoulder width (10:1 or flatter) extends beyond posts (see Detail "A") longer posts shall be used so that a minimum of 5'-5" embedment depth is provided.

PROTECTIVE COATING: In lieu of the requirements of 710.06, expansion shields, anchors and insert anchor assemblies installed (embedded) in concrete shall be coated in accordance with ASTM A153 or Stainless Steel. Any bolts screwed into these embedded devices shall meet 710.06.

STEEL POST SIZES: The W6 x 8.5 posts may be used in lieu of the W6 x 9 which are shown on the various Standard Construction Drawings for guardrail.

SPECIAL POST MOUNTINGS: Inlet mounted posts are required for guardrail posts located on a drainage inlet. Footing anchors are required for guardrail posts located on footers with less than 3'-5" cover except that for footer cover of 2'-6" to 3'-5" the post may be installed by using a 4" minimum concrete encasement. The inlet mounted post may be used for footing anchors in runs with steel posts.

When standard post depth is not available due to a culvert, the guardrail posts directly over the culvert shall not be driven, but set in holes with a 4' minimum concrete encasement for the maximum post depth available.

Cost of the inlet mounted posts, footing anchors, and concrete encasement shall be included in the unit price bid for guardrail of the type required by the plan.

* **ANCHORS** conforming to 712.01 or anchors per FF-S-325 Group VIII, Type I with proof load certification per 712.01, may be substituted with the same bolt diameter specified.

Also, Partial Depth Resin-Bonded Anchoring Systems may be used. The anchor shall be galvanized and be the same diameter and strength as the bolts specified. 1" diameter anchor systems should resist an average ultimate tensile load of 43,700 pounds (7/8" diameter, 24,000 pounds). Test load data shall be submitted to verify manufacturers' recommended anchor, hole size, embedment depth, bonding medium, etc. to satisfy the load requirements.

If anchor bolts are located within a haunch with slopes flatter than 6:1 and through-bolting is used, beveled plate washers shall be used on the bottom. For haunches with slopes steeper than 6:1, partial depth resin-bonded anchors should be used.

If there is any question of deteriorated concrete, expansion anchors will not be allowed, as determined by the Engineer. Where self-drilling anchors are permitted and used for guardrail construction, the holes shall be drilled with the expansion shield (not by a drill bit) and the shield shall be installed flush with the concrete surface.

The Engineer shall visually inspect, after installation, all expansion anchors used in guardrail construction. The Engineer may require the Contractor to test load any expansion anchor to 1/4 the certified proof load in direct pull. The equipment and method used shall meet the approval of the Engineer. Each expansion anchor that fails to meet the test requirements shall be reset or removed and replaced with bolts extending through the concrete or grouted in place, as directed by the Engineer.

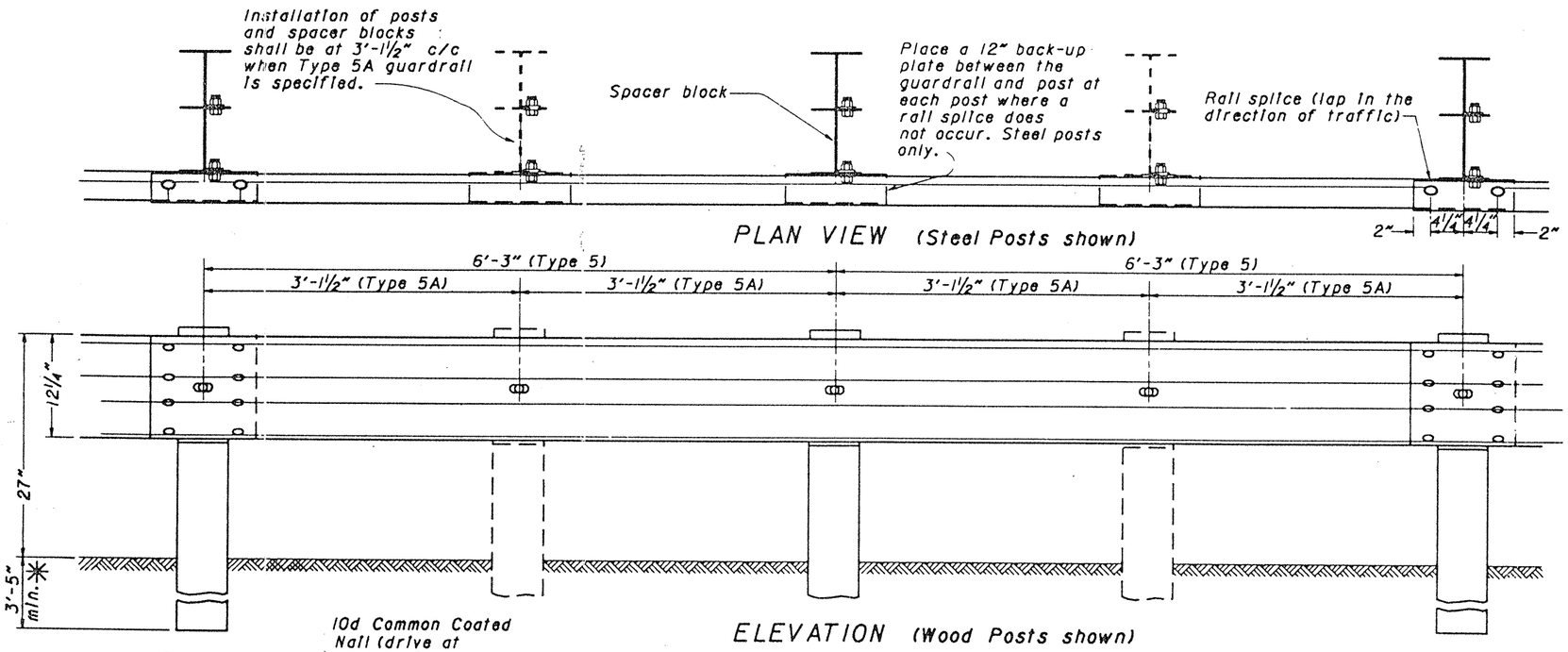
BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

GUARDRAIL DETAILS

DATE 5-6-91

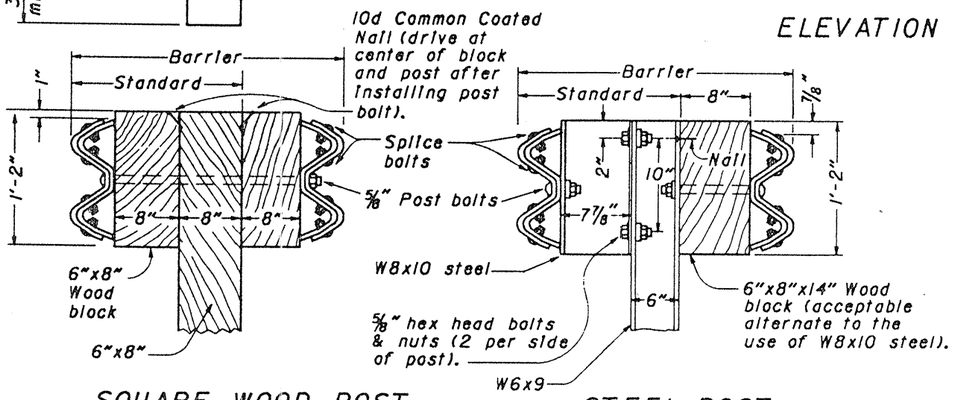
STANDARD CONSTRUCTION DRAWING GR-1.2

APPROVED D.K. Hulman ENGR., L. & D.



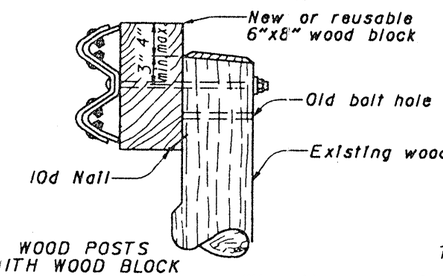
PLAN VIEW (Steel Posts shown)

ELEVATION (Wood Posts shown)

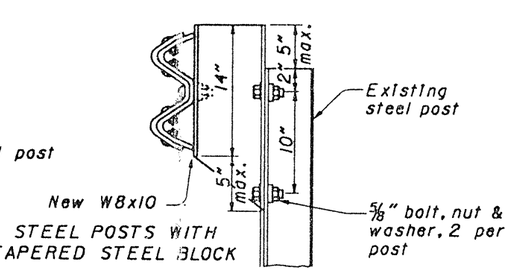


SQUARE WOOD POST

STEEL POST



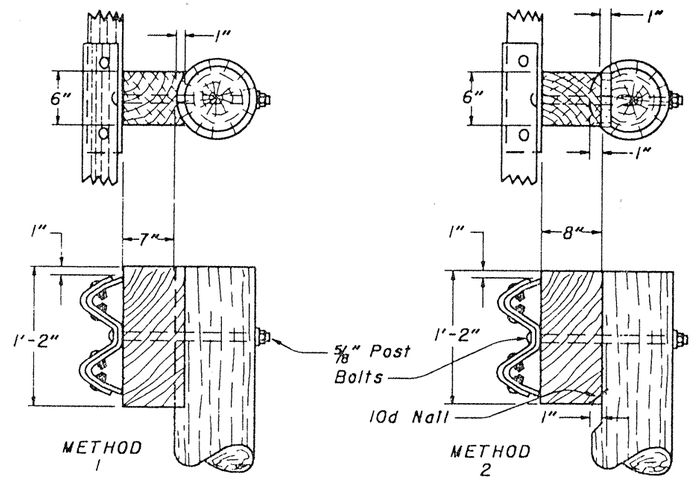
WOOD POSTS WITH WOOD BLOCK



STEEL POSTS WITH TAPERED STEEL BLOCK

When the guardrail height is to be raised, wood blocks shall not be used on existing steel post.

RAISING EXISTING GUARDRAIL HEIGHT



Alternate methods of placing the spacer blocks on round posts may be submitted for consideration and approval by the Engineer.

ROUND WOOD POSTS

NOTES

POSTS: Post may be round (single rail only) or 6"x8" square-sawed pressure-treated wood or W6x9 galvanized steel. The same type post shall be used throughout the length of project unless otherwise required by the plans or permitted by the Engineer. Round posts shall be 8" plus or minus 1" in diameter at the top and not more than 3" larger at the butt with a uniform taper.

Post may be set in drilled holes or may be driven to grade.

Wood posts shall be fabricated with square ends. Posts and spacer blocks shall be pressure-treated as per 710.14. Bolt holes shall be bored and tops of posts trimmed as shown, if required, after posts are set.

SPACER BLOCKS: When wood spacer blocks are used with the steel post, a 10d nail shall be driven through the hole in the adjacent flange to prevent blocks from turning.

WASHERS: All washers indicated are standard galvanized steel of the appropiate size.

WELDED BEAMS: Welded beam guardrail posts and spacer blocks may be used for Item 606, Guardrail, provided the web and flange sizes are as shown hereon. Welding of the web to the flanges shall conform to ASTM A769, Class I using Grade 36 steel with the following exceptions:

7.2 Test reports of tensile properties for each lot shall accompany each shipment.

12. Beams which have imperfections repaired by welding shall not be accepted for use in Item 606.

13. Random samples shall be tested by the Department from materials delivered to the project site or other locations designated by the Laboratory.

* **FOR SPECIFIC POST** embedment depth requirements see Std. Const. Dwg. GR-1.2.

STEEL BEAM POSTS & BLOCKS				
Size	Beam depth	Flange width	Flange thickness	Web thickness
Rolled W 6x8.5	5.83"	3.94"	.194"	.170"
Rolled W 6x9	5.90"	3.94"	.215"	.170"
Rolled W 8x10	7.89"	3.94"	.205"	.170"
Welded 6x8.5	6.0"	3.94"	.194"	.170"
Welded 6x9	6.0"	3.94"	.215"	.170"
Welded 8x10	8.0"	3.94"	.205"	.170"

MISCELLANEOUS: For details not shown see Standard Construction Drawings GR-1.1 and GR-1.2.

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

GUARDRAIL TYPE 5 & 5A

DATE 5-6-91

STANDARD CONSTRUCTION DRAWING **GR-2.1**

APPROVED D.K. Hubman ENGR., L. & D.

See appropriate Std. Dwg. (DBR-2-73 or GR-2.2) for railing systems details

W6X15 or W6X25 steel post

TS8X4X.1875 tubing, 6" long (2 per post)

6"X8" wood post (Typ.)

Blockout shall be included with item 517 for payment

3/4"

6"X8"X14" wood blockout (Typ.)

Bridge Limits

Abutment

PLAN

* Guardrail not attached to posts. Blockout fastened to post with standard post bolt.

Item 517 Bridge Railing or Item 606 Guardrail, Type 5 with Tubular Backup

5'-3"

4 Spa. @ 1'-6 3/4" = 6'-3"

Item 606 Guard Rail

4 Spa. @ 3'-1 1/2" = 12'-6"

6'-3"

3" min.

Bridge Limits

Abutment

1'-9"

2'-3" ±

5' 5" min.

℄ Deep Beam Rail

Two sections of W-beam rail nested (One inside the other)

Post and mounting bolts included with Bridge Terminal Assembly for payment

TYPE 4

ELEVATION

** See Std. Const. Dwg. GR-1.2 for additional post embedment details.

NOTES

GENERAL

For additional details, see Std. Const. Dwgs. GR-1.1, GR-1.2 and other Standard Drawings pertaining to design of specific guardrail types.

APPLICATION

The Type 4 Bridge Terminal Assembly shall be used to connect guardrail runs to bridges having W-beam railing with Tubular Backup.

DETAIL INFORMATION

The first post off the bridge shall be steel (W6x15 or W6x25). All holes in the off-structure end of the approach panel W-beam rail section that spans the abutment shall be slotted 1/4" x 2 1/2" and bolts shall be tightened as specified for expansion joints in 606.05.

POSTS

GENERAL- Posts may be set in drilled holes or driven to grade.

POSTS shall be square-sawed pressure treated wood as per 710.14 and fabricated with square ends. Bolt holes shall be bored and tops of posts trimmed if required, after posts are set.

PAYMENT

Payment for Item 606 - Each, Bridge Terminal Assembly, Type 4 shall include the extra cost, in excess of normal guardrail cost, for additional posts and other hardware. The TS 8x4 spacers and tubular back-up rail extending to the first post off the bridge shall be included with Item 517 - Railing or Item 606 - Gurardrail, Type 5 with Tubular Backup for payment.

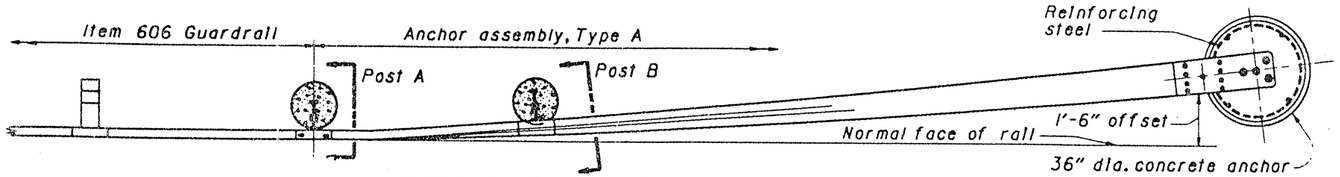
BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

BRIDGE TERMINAL ASSEMBLY, TYPE 4

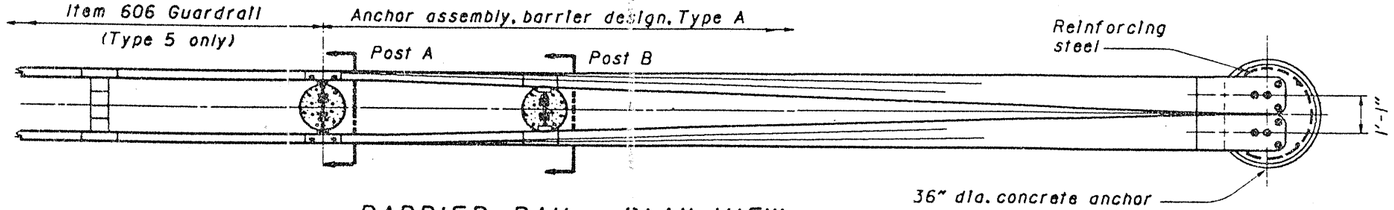
DATE 5-6-91

STANDARD CONSTRUCTION DRAWING GR-3.4

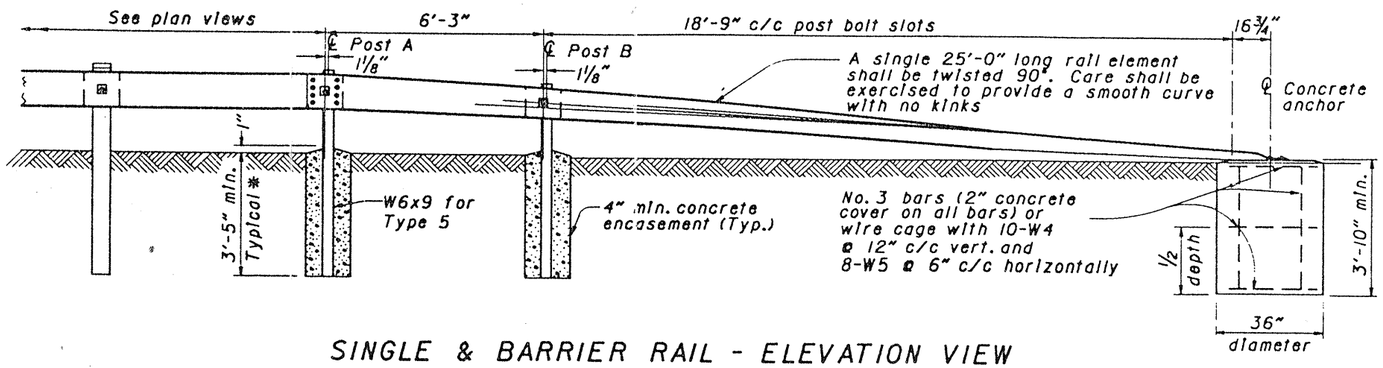
APPROVED D. K. Huhman ENGR., L. & D.



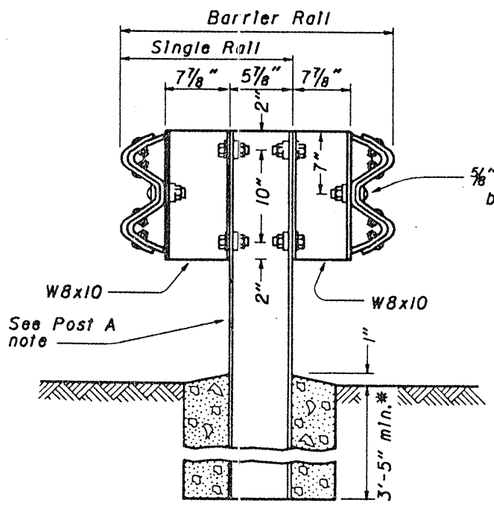
SINGLE RAIL - PLAN VIEW



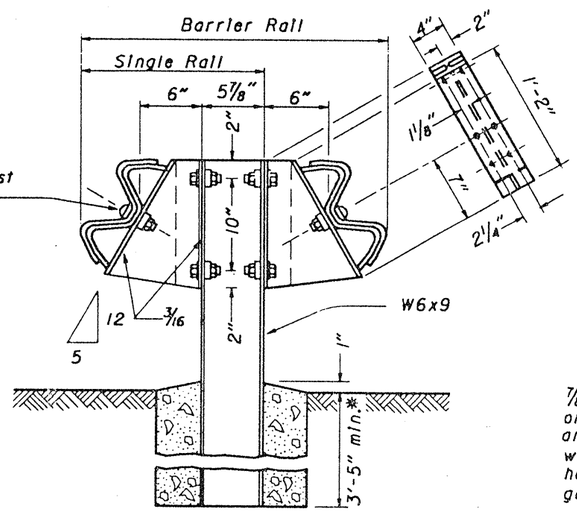
BARRIER RAIL - PLAN VIEW



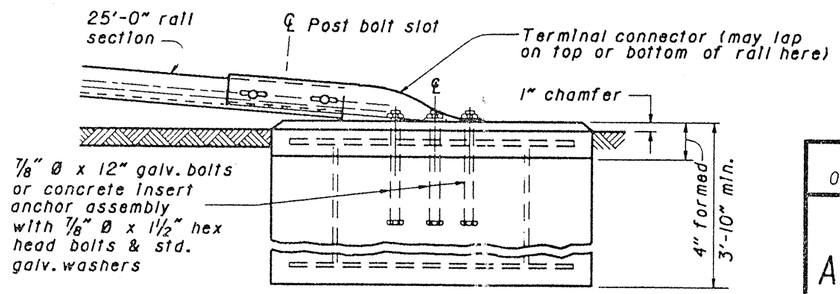
SINGLE & BARRIER RAIL - ELEVATION VIEW



POST A



POST B



CONCRETE ANCHOR

NOTES

GENERAL: For details not shown, see Std. Const. Dwgs. GR-1.1, GR-1.2 and other Standard Construction Drawings pertaining to specific guardrail type. All steel parts shall be galvanized.

The 1'-6" flare offset from normal face of rail, shown in the plan view (for single rail installations), will be utilized only where shoulder width is insufficient for providing standard offsets.

SPACERS for Post B shall be made of 3/16" steel plate as per 710.15, or two sections of W6 x 9 or W8 x 10 cut in the web (see dashed line) and welded together on both sides.

All steel spacers and posts may be provided with additional bolt holes so that these items will not be required to be made right and left handed.

Spacers shall be fastened to their posts with two ⅝" hexhead bolts and nuts with standard washers on both sides.

ALL WASHERS INDICATED on this drawing are standard galvanized steel of the appropriate size.

CONCRETE ANCHOR: Form top 4" of anchor and slope the top to conform to slope of the adjacent ground. The 36" diameter anchor may be replaced by a 2'-6" square anchor at the contractor's option.

POST A: Rail details are shown for Type 5 guardrail. Where anchor assembly is attached to Type 4 guardrail, Post A shall be a standard Type 4 line post set in concrete, and the spacer block shall be omitted. Post bolt shall be ⅝" diameter.

* **FOR SINGLE RAIL INSTALLATIONS,** see Standard Construction Drawing GR-1.2 for additional post embedment details.

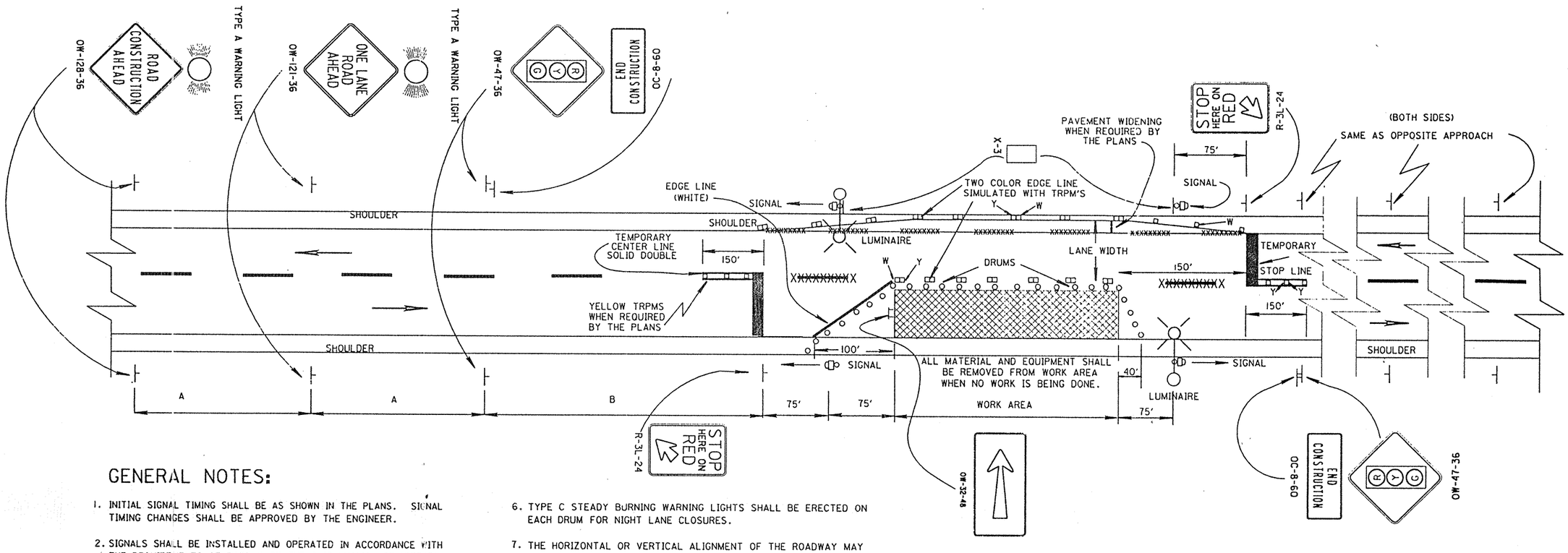
BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

TYPE A ANCHOR ASSEMBLY

DATE 5-6-91

STANDARD CONSTRUCTION DRAWING GR-4.1

APPROVED D. K. Hulman ENGR., L. & D.



GENERAL NOTES:

1. INITIAL SIGNAL TIMING SHALL BE AS SHOWN IN THE PLANS. SIGNAL TIMING CHANGES SHALL BE APPROVED BY THE ENGINEER.

2. SIGNALS SHALL BE INSTALLED AND OPERATED IN ACCORDANCE WITH THE REQUIREMENTS OF PART 6 OF THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.

3. DRUMS SHALL BE SPACED AT 50' CENTER TO CENTER WITHIN THE WORK AREA. DRUMS ON THE ADVANCE AND RETURN TAPERS SHALL BE SPACED AT 10' CENTER TO CENTER.

4. ADEQUATE AREA ILLUMINATION TO CLEARLY IDENTIFY BOTH ENDS OF THE WORK AREA AT NIGHT SHALL BE PROVIDED BY USING 150 WATT MINIMUM HIGH PRESSURE SODIUM LUMINAIRES OR 250 WATT MINIMUM MERCURY LUMINAIRES. LUMINAIRES SHALL BE LOCATED ADJACENT TO THE SIGNAL LOCATIONS AS SHOWN ABOVE. THE MOUNTING HEIGHT FOR LUMINAIRES SHALL BE A MINIMUM OF 27 FEET ABOVE THE PAVEMENT BUT IN NO CASE LESS THAN 15 FEET ABOVE THE TOP OF THE SIGNAL AND MOUNTED ON A SUPPORT OF ADEQUATE STRENGTH TO PROVIDE A SATISFACTORY INSTALLATION. THE OVERHEAD CONDUCTOR CLEARANCE SHALL BE A MINIMUM OF 18 FEET ABOVE THE PAVEMENT. THE LUMINAIRE ARM SHALL BE OF SUFFICIENT LENGTH TO EXTEND TO THE EDGE OF THE PAVEMENT. POLES SHALL BE ERECTED A MINIMUM OF 5.5 FEET BEHIND FACE OF GUARDRAIL WHERE EXISTING, OR 12 FEET FROM THE EDGE OF PAVEMENT. WHERE POSSIBLE LOCATE BEHIND DITCH.

5. TEMPORARY CENTER LINE: SOLID, DOUBLE, AS SHOWN, SHALL BE INSTALLED AND MAINTAINED WHERE NO PASSING LINES ARE NOT ALREADY IN PLACE. 12" STOP LINES SHALL ALSO BE INSTALLED. TEMPORARY RAISED PAVEMENT MARKERS, (TRPM'S) TO SIMULATE A TWO COLOR EDGE LINE SHALL BE PROVIDED. EXISTING CONFLICTING PAVEMENT MARKINGS OR RAISED PAVEMENT MARKER REFLECTORS BETWEEN THE WORK AREA AND THE STOP LINES OR WITHIN THE ONE WAY LANE WIDTH SHALL BE REMOVED. AFTER COMPLETION OF THE WORK. TEMPORARY MARKINGS AND TRPM'S SHALL BE REMOVED IN ACCORDANCE WITH 621.134 AND THE ORIGINAL MARKINGS AND RAISED PAVEMENT MARKER REFLECTORS SHALL BE RESTORED.

6. TYPE C STEADY BURNING WARNING LIGHTS SHALL BE ERECTED ON EACH DRUM FOR NIGHT LANE CLOSURES.

7. THE HORIZONTAL OR VERTICAL ALIGNMENT OF THE ROADWAY MAY REQUIRE ADJUSTMENTS IN THE LOCATION OF THE ADVANCE WARNING SIGNS OR THE SIGNAL HEADS. TREE OR BRUSH TRIMMING TO PROVIDE ADEQUATE SIGHT DISTANCE TO SIGN AND SIGNALS SHALL BE PROVIDED AS DIRECTED BY THE ENGINEER. THE DISTANCES SHOWN FOR ADVANCE WARNING SIGN SPACINGS ARE MINIMUM,

8. THE SPACING BETWEEN PROPOSED SIGNS SHOULD BE ADJUSTED TO NOT CONFLICT WITH AND TO PROVIDE A MINIMUM OF 200 FEET CLEARANCE TO EXISTING SIGNS.

9. ALL TRAFFIC SIGNAL AND LIGHTING EQUIPMENT USED IN THIS INSTALLATION, SUCH AS SIGNAL OR LIGHTING CABLE, SIGNAL HEADS, LUMINAIRES OR SIGNAL CONTROLLER SHALL BE IN CONFORMANCE WITH SPECIFICATION ITEMS 625, 632, 633, 713, 732 AND 733. HOWEVER, THE PERFORMANCE TESTS OF 625.22E AND 632.27(6). THE WORKING DRAWING REQUIREMENTS OF 625.04, 632.03 AND 633.03. THE WIRING DIAGRAM AND SERVICE MANUAL REQUIREMENT OF 633.04 AND THE TESTING AND PREQUALIFICATION REQUIREMENT OF 633.05 ARE WAIVED. ALSO THE REQUIREMENTS OF 733.01 CONCERNING EXPANSIBLE 3-DIAL UNITS AND TWELVE SIGNAL CIRCUITS ARE WAIVED. USED EQUIPMENT IS ACCEPTABLE. CONFLICT MONITORS SHALL BE USED EXCEPT WITH ELECTROMECHANICAL PRETIMED CONTROLLERS WITH CAM SHAFT.

10. IF THE SIGNAL IS CHANGED TO FLASHING OPERATION. RED SHALL BE FLASHED TO BOTH APPROACHES ON ALL SIGNAL HEADS.

DISTANCE	A	B
URBAN	200'	350'
RURAL	500'	750'

xxxxxxxxx —— EXISTING MARKINGS REMOVED

W —— TRPM, WHITE, 1-WAY

Y —— TRPM, YELLOW, 1-WAY

Y — Y —— TRPM, YELLOW, 2-WAY

Y — W —— TWO TRPM'S BACK TO BACK

ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH 614 AND OTHER APPLICABLE PORTIONS OF THE C & M SPECIFICATIONS AS WELL AS IN ACCORDANCE WITH PART 7 OF OMUTCD. PAYMENT FOR ALL LABOR, EQUIPMENT AND MATERIALS TO PROVIDE THIS METHOD OF TRAFFIC CONTROL SHALL BE INCIDENTAL TO THE LUMP SUM BID FOR 614 MAINTAINING TRAFFIC, UNLESS SEPARATELY ITEMIZED IN THE PLAN.

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

MAINTENANCE OF TRAFFIC

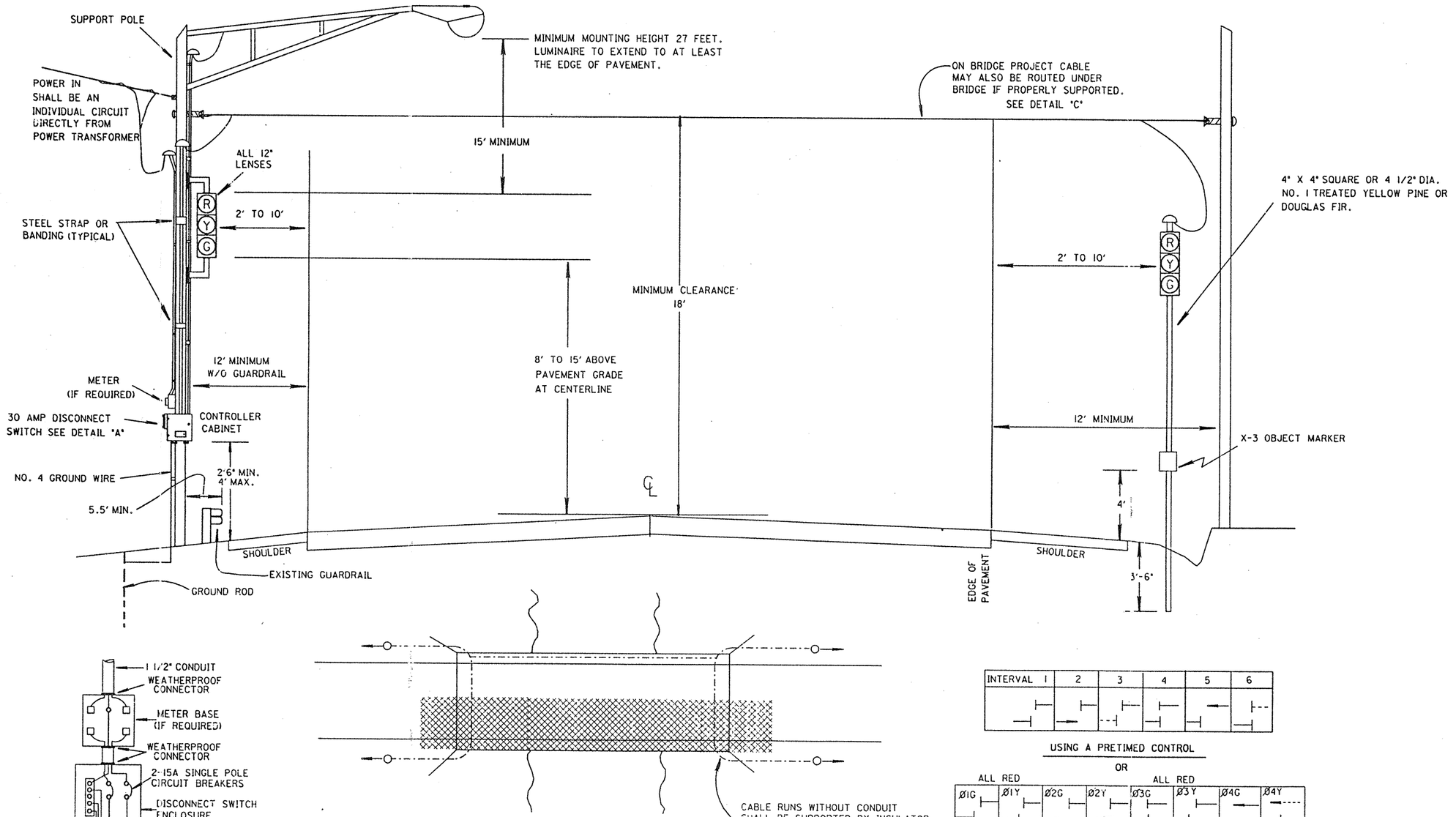
DATE 09/09/88

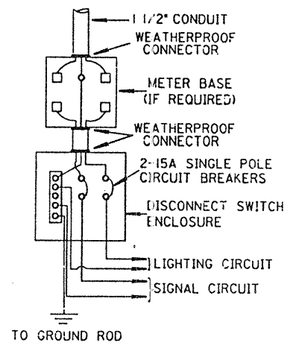
SIGNALIZED CLOSING
1 LANE OF A 2 LANE
HIGHWAY WITH DRUMS

STANDARD CONSTRUCTION DRAWING MT-96.10

APPROVED _____ ENGR. OF DESIGN SERVICES

296.10 WC

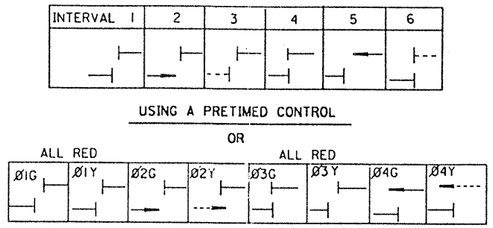




DETAIL "A"

ALTERNATE CABLE ROUTING

DETAIL "C"



USING A PRETIMED CONTROL

OR

WHEN CALLED FOR IN THE PLANS, Ø2 GREEN AND Ø4 GREEN SHALL BE ACTUATED BY DETECTORS AT APPROACH TO THE WORK ZONE. Ø1 & Ø3 ARE DUMMY PHASES TO TIME ALL RED INTERVAL. TIMING INITIALIZES ON PHASE ONE.

USING A 4 PHASE ACTUATED CONTROL

DETAIL "B"
SIGNAL PHASING

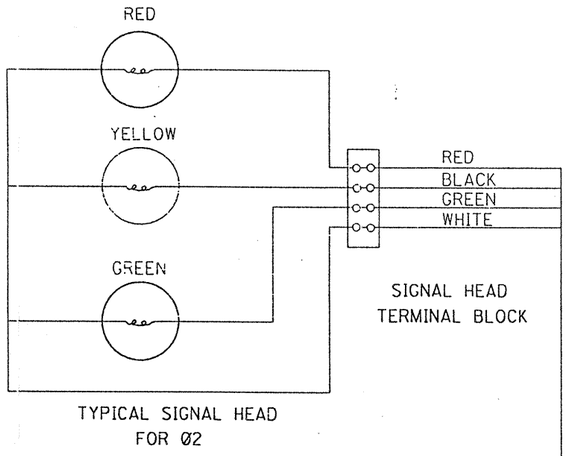
BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

MAINTENANCE OF TRAFFIC	DATE 09/09/88
DETAILS FOR SIGNALIZED CLOSING 1 LANE OF A 2 LANE HIGHWAY	
STANDARD CONSTRUCTION DRAWING MT-96.20	

APPROVED _____ ENGR. OF DESIGN SERVICES

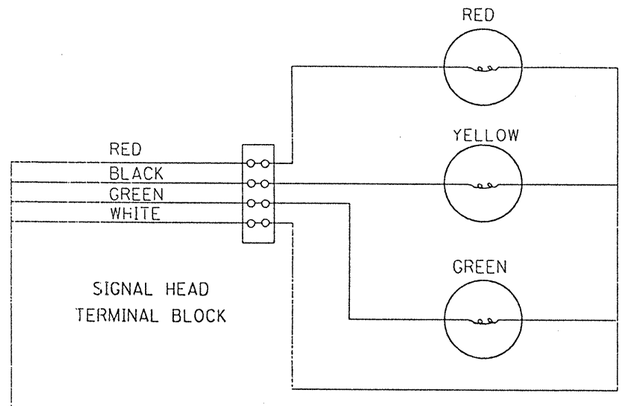
296.20 WC

CABLE SHALL BE 4-CONDUCTOR NO. 14 COPPER SIGNAL CABLE, COLOR CODED AND STRANDED. ALL ELECTRICAL CONNECTIONS TO BE MADE AT TERMINAL BLOCKS USING LOCK FORK TERMINALS. SPLICES IN SIGNAL CABLE SHOULD BE AVOIDED BUT IF NECESSARY SPLICE KITS SHALL BE USED. ALL CONNECTIONS AT SPLICE POINTS SHALL BE SOLDERED.

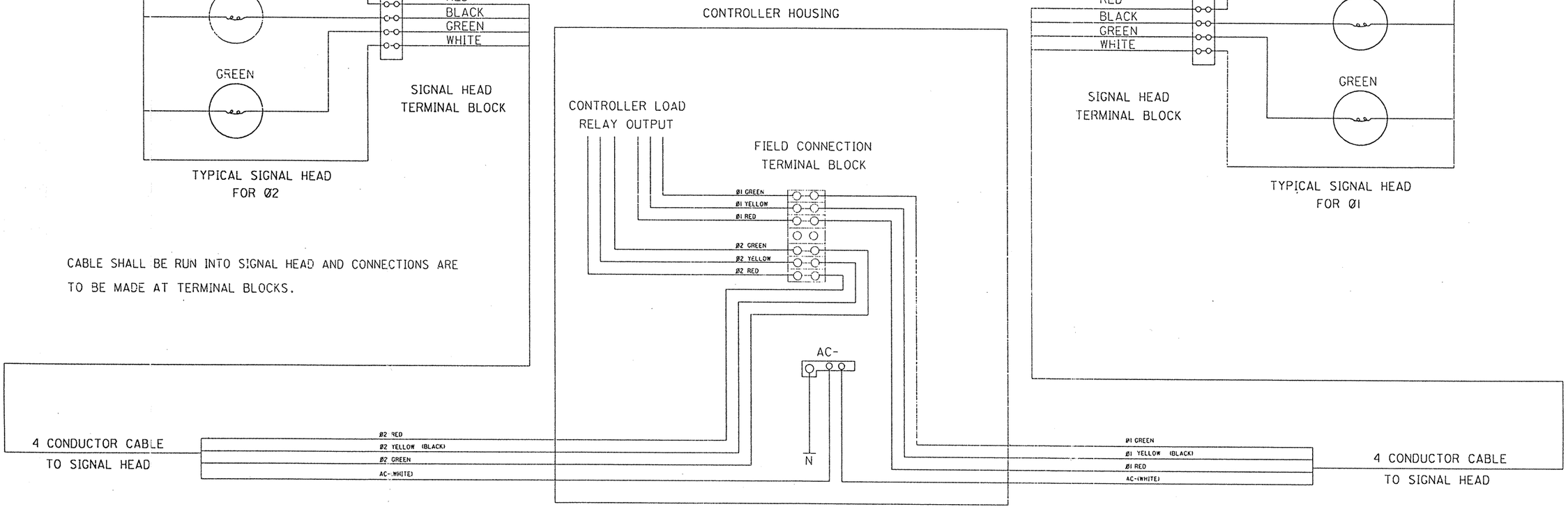


TYPICAL SIGNAL HEAD
FOR Ø2

CABLE SHALL BE RUN INTO SIGNAL HEAD AND CONNECTIONS ARE TO BE MADE AT TERMINAL BLOCKS.



TYPICAL SIGNAL HEAD
FOR Ø1



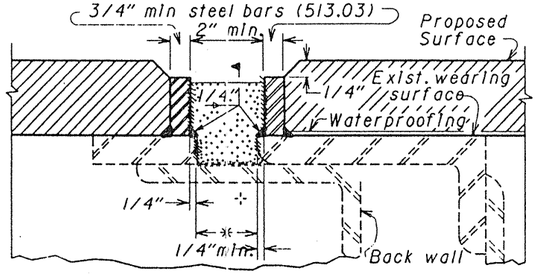
TYPICAL SIGNAL HEAD HOOK-UP

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

MAINTENANCE OF TRAFFIC	DATE 09/09/88
WIRING DIAGRAM FOR SIGNALIZED CLOSING I LANE OF A 2 LANE HIGHWAY	
STANDARD CONSTRUCTION DRAWING MT-96.25	
APPROVED ENGR. OF DESIGN SERVICES	

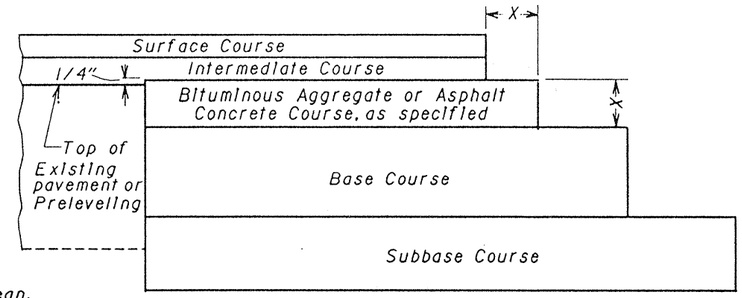
RESURFACING

⊹ Increase as necessary to maintain 2" min. opening
✱ Vertical extension of joints found to be closed to 1/2" or less may be non-performed as directed by the Engineer.



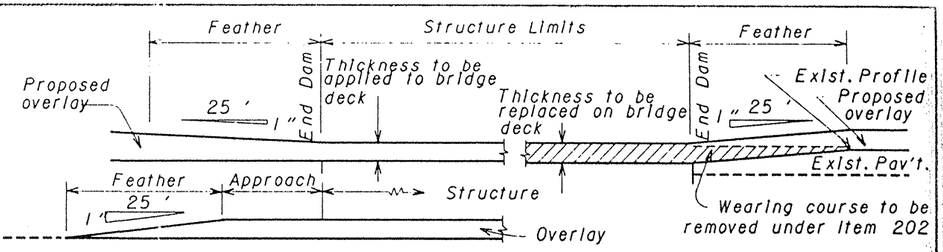
⊡ As a part of Item 516, seal joint with a hot-applied bridge deck waterproofing material which also meets the requirements of 705.04. Sandblast vertical surfaces (✱) and wipe clean. Seal joint before rust forms. If rust forms, re-sandblast. Use bond breaker on the horizontal surface (✱✱).

MAINTENANCE OF TRAFFIC: Generally the bars shall be welded while the lane is closed for waterproofing or resurfacing. However, if traffic is routed over the bars before resurfacing, temporary ramps shall be constructed to the tops of the bars using 402 feathering at a max. slope of 6 ft/in. The ramps shall be removed prior to resurfacing. Payment for placing and removing the ramps shall be included in the lump sum bid for Item 614.



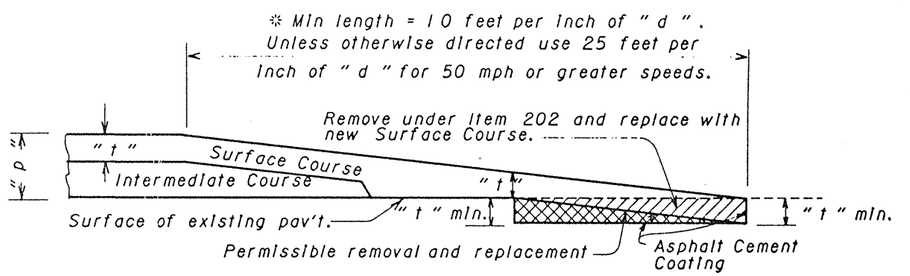
The Bituminous Aggregate in the upper part of the base widening shall finish approximately 1/4" above the edge of the existing pavement where no preleveling is used. Where a preleveling (using intermediate course material) is specified it shall be placed prior to excavation of the widening trench and the upper course of the base widening shall finish approximately 1/4" above the preleveling.

COURSE DETAIL FOR WIDENING

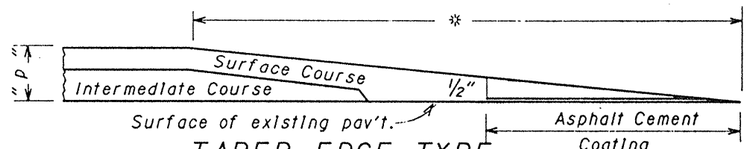


Details assume non-settled approach slabs. Smoothing of the profile for settlement is required per plan grades or as directed by the Engineer.

FEATHERING AT STRUCTURES



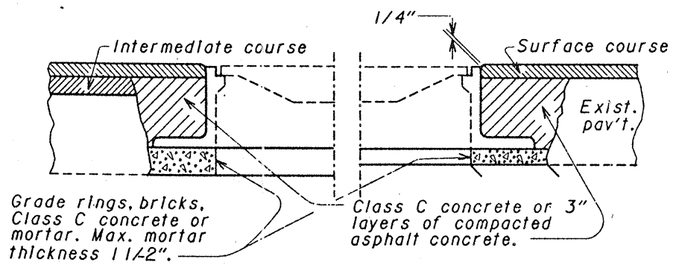
BUTT JOINT TYPE



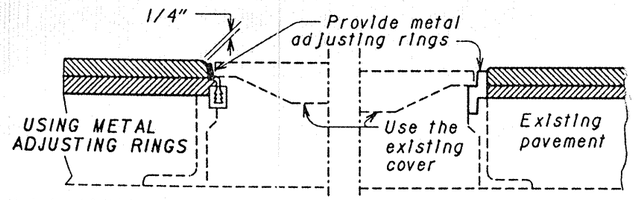
TAPER EDGE TYPE

NOTE : Either butt or taper type may be used unless type is specified by the plan.

VERTICAL EXTENSION OF STRUCTURAL EXPANSION JOINTS

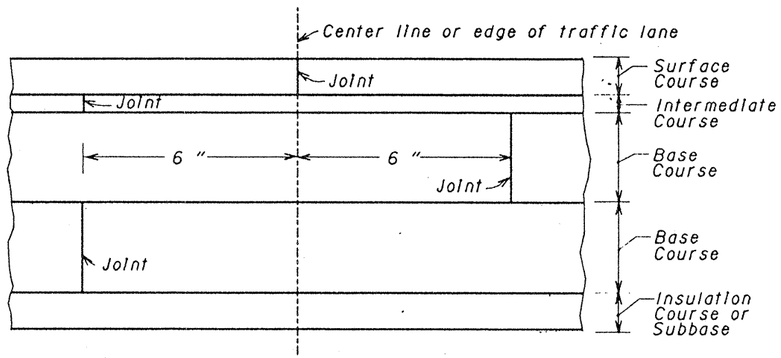


USING CONCRETE OR MORTAR

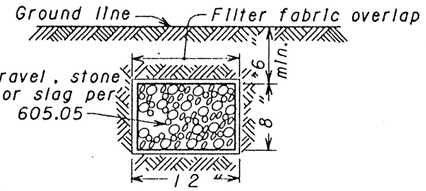


Metal adjusting rings shall: (a) attach securely to the existing frame by welding or mechanical devices; (b) consist either of cast metal having an integral rim and seat, or be fabricated metal with a sturdy connection between the seat and rim; and (c) provide an even seat for the manhole cover. In addition, the adjusting ring type shall be a design acceptable to the local governmental agency responsible for street and sewer maintenance. Any installation unacceptable to the Engineer shall be replaced by the Contractor at his expense.

MANHOLES ADJUSTED TO GRADE

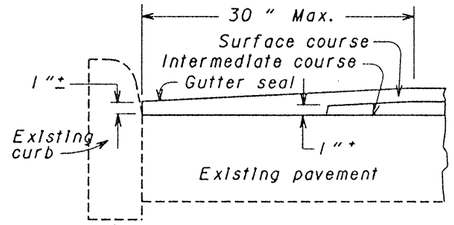


LAPPING LONGITUDINAL JOINTS



Aggregate drains to be placed where and as directed by Engineer. Provide filter fabric when specified as a separate pay item

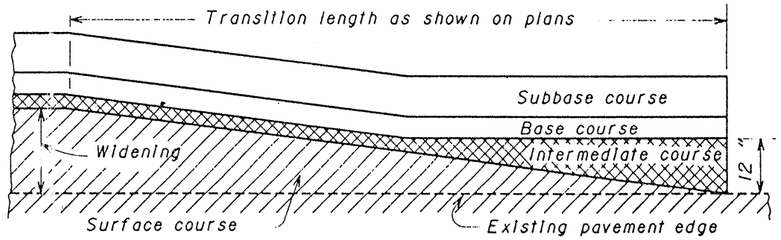
AGGREGATE DRAIN



Special care shall be taken during construction to obtain maximum compaction of bituminous concrete in gutters.

GUTTER FINISH

PLACING FEATHERED AREAS



MERGING EDGE OF PAVEMENT WIDENING WITH EDGE OF EXISTING PAVEMENT

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

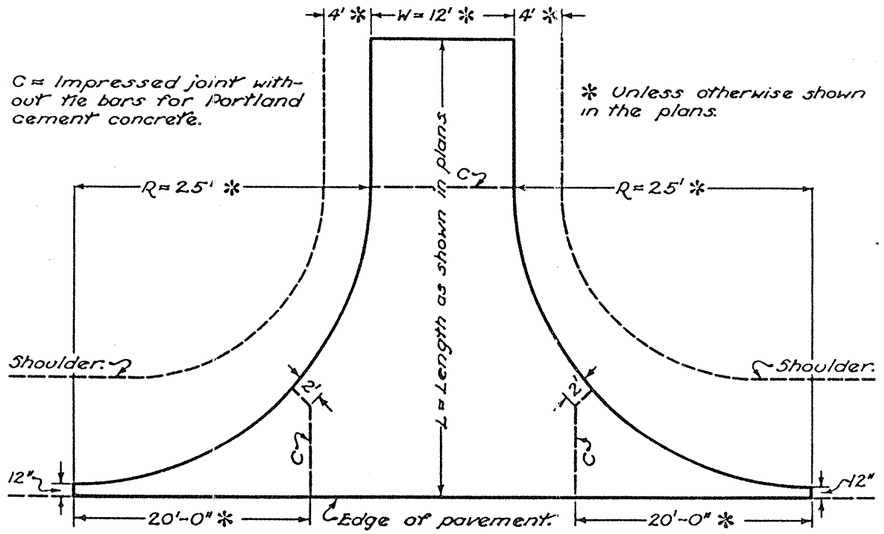
RESURFACING

STANDARD CONSTRUCTION DRAWING BP-5

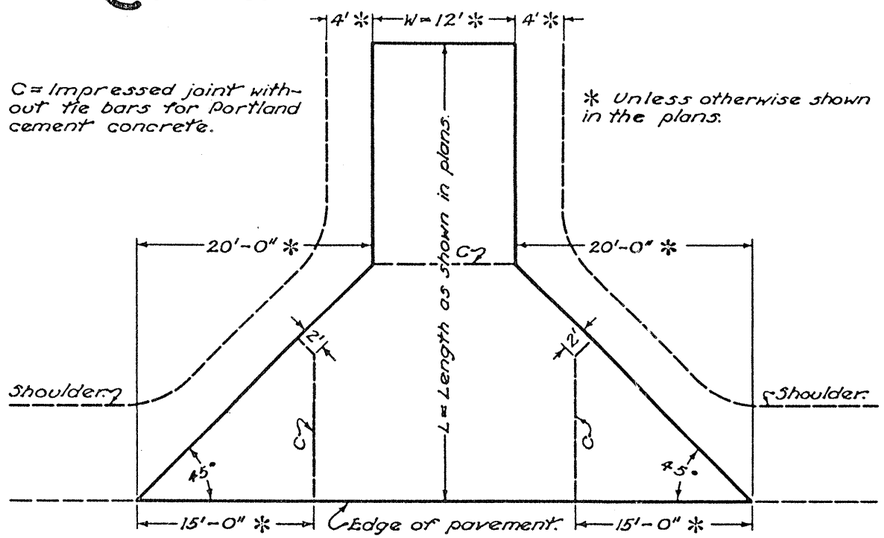
APPROVED D. L. Kuhlman ENGR., L&D

DATE
6-1-65
1-1-71
6-1-72
8-11-75
4-16-79
7-16-81
1-11-85
10-1-87

DRIVEWAYS



TYPE 1 DRIVEWAY



TYPE 2 DRIVEWAY

NOTES

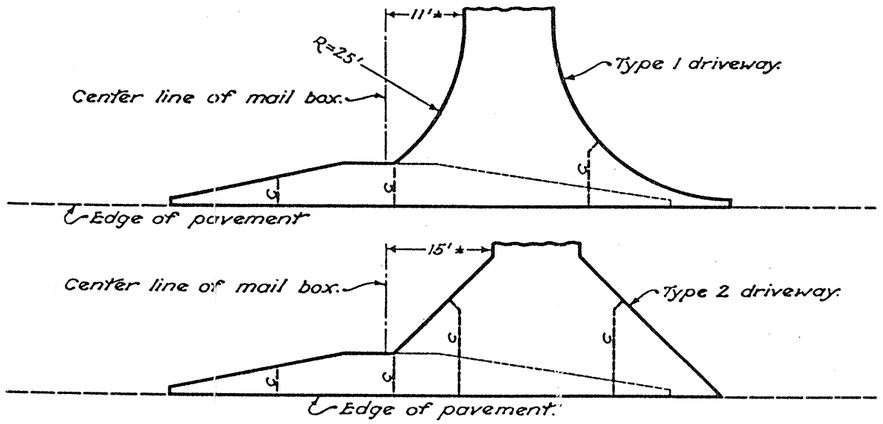
GENERAL:— The design details shown hereon shall govern the construction of driveways unless otherwise shown in the project plans.

The pavement type and thickness shall be specified in the project plans.

Driveway and mail box approaches shall be combined when feasible.

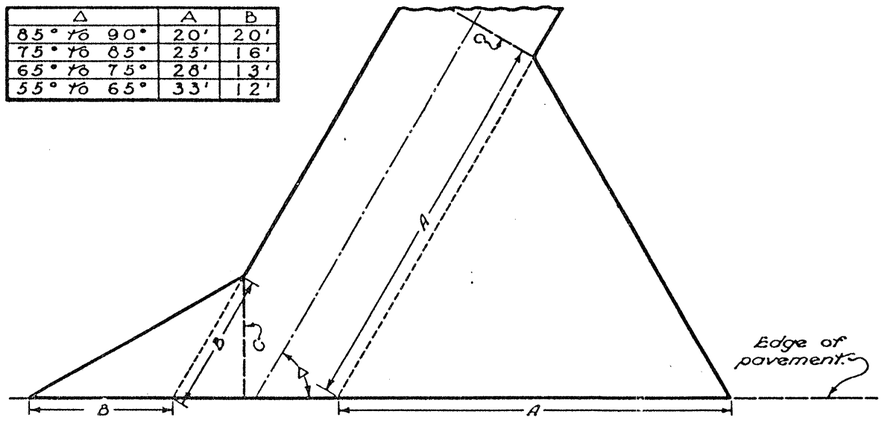
JOINTS:— Impressed joints for portland cement concrete driveways shall be ¼" minimum width by 3"± depth and shall be sealed with joint seal.

In addition to the joints shown hereon, impressed joints without tie bars shall be placed in portland cement concrete driveways at intervals not to exceed seventeen feet in the portion of the driveway back of the flare.

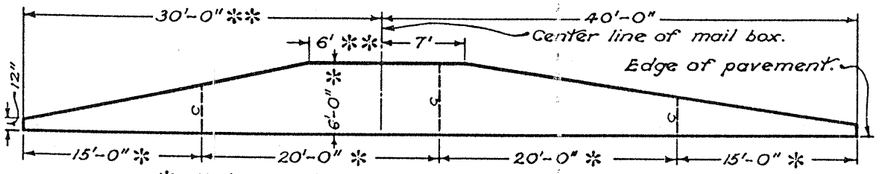


COMBINED DRIVEWAY & MAIL BOX APPROACH

Δ	A	B
85° to 90°	20'	20'
75° to 85°	25'	16'
65° to 75°	28'	13'
55° to 65°	33'	12'

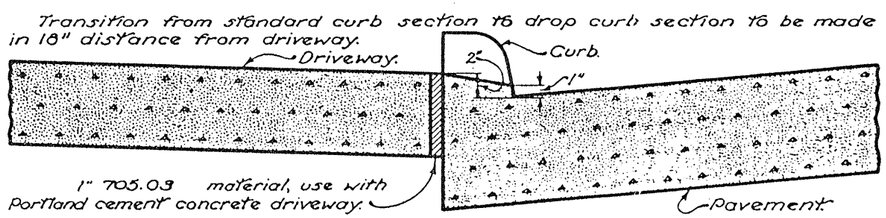


TYPE 2 SKEWED DRIVEWAY



* Unless otherwise shown in plan.
** Add 2 feet for each additional mail box.

TYPICAL MAIL BOX APPROACH



DROP CURB DETAILS AT DRIVEWAYS

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF HIGHWAYS

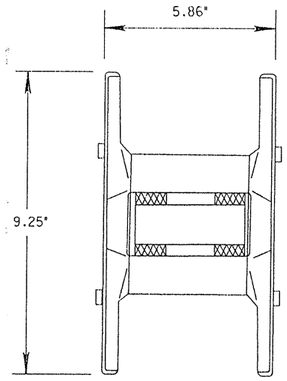
DRIVEWAYS

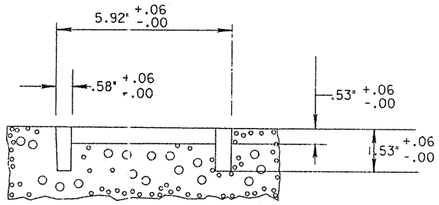
DATE
6-1-65
10-1-87

STANDARD CONSTRUCTION DRAWING **BP-6**

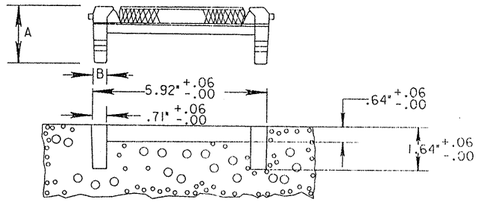
APPROVED _____ ENGR. L. & D.

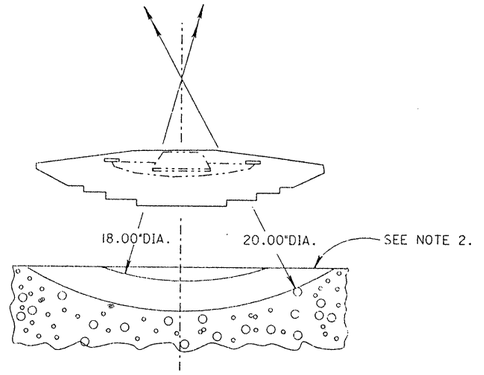
	CONVENTIONAL TYPE	LOW PROFILE TYPE
A	1.74"	1.69"
B	.46"	.59"





OPTIONAL FOR CONVENTIONAL TYPE





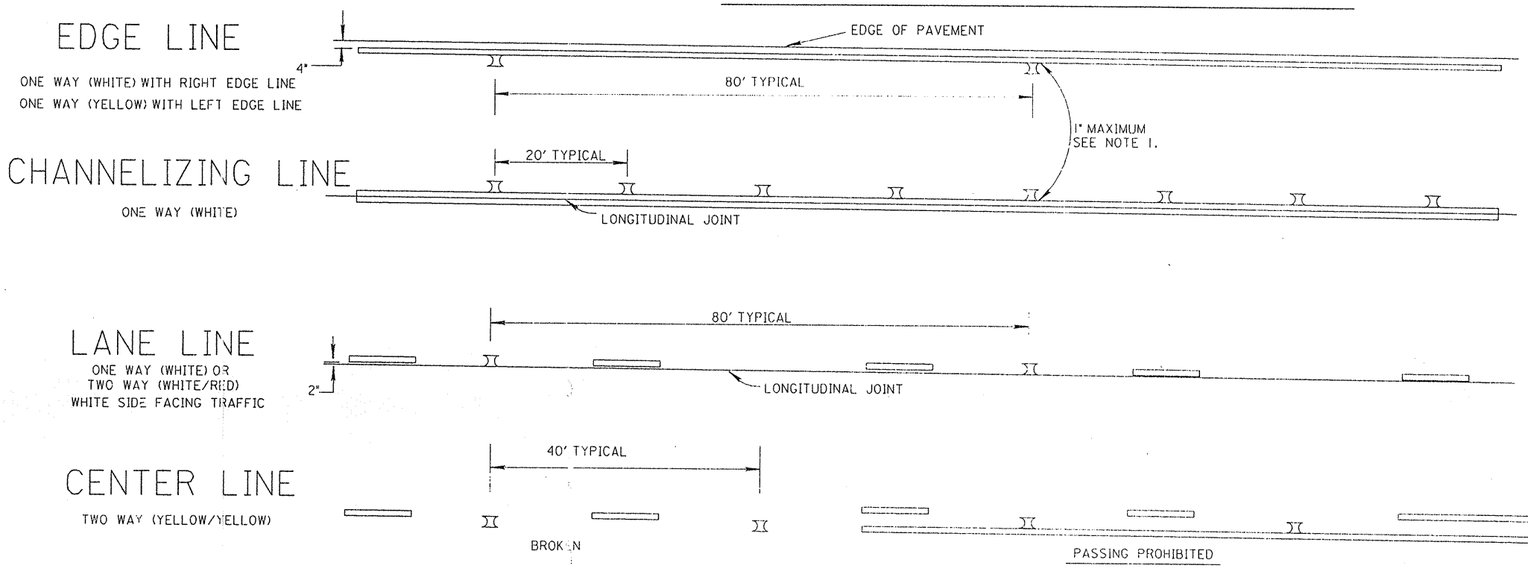
NOTES

1. MARKERS INSTALLED AT DOUBLE YELLOW CENTERLINES SHALL BE PLACED BETWEEN THE TWO LINES. MARKERS INSTALLED ALONG AN EDGE LINE OR CHANNELIZING LINE SHALL BE PLACED SO THAT THE CASTING IS NO MORE THAN 1" FROM THE NEAR EDGE OF THE LINE. MARKERS INSTALLED ALONG A LANE LINE OR DASHED YELLOW CENTERLINE SHALL BE PLACED BETWEEN AND IN LINE WITH THE DASHES. MARKERS SHALL NOT BE PLACED OVER THE LINES EXCEPT WHERE THE LINES DEVIATE VISIBLY FROM THEIR CORRECT ALIGNMENT, AND THEN ONLY WITH THE APPROVAL OF THE ENGINEER.

2. TO FACILITATE THE CUTTING OF THE TWO PARALLEL SLOTS AND INTERVENING CONCAVED SURFACE SIMULTANEOUSLY, IT IS RECOMMENDED THAT AN ARBOR AND SAW BLADES ASSEMBLY BE USED. FOR ADDITIONAL DETAILS AND TOLERANCES OF THE CASTING AND ARBOR-SAW ASSEMBLY CONTACT THE CASTING MANUFACTURE.

3. WHEN THE DISTANCE BETWEEN TWO SEPARATE RPM INSTALLATIONS IS SUCH THAT A GAP OF ONE-HALF MILE OF LESS WOULD EXIST WITHOUT ANY RPM'S, CENTERLINE RPM SHALL BE PLACED IN THE GAP AT 80 FOOT TYPICAL SPACING.

CASTING AND SAW CUT DETAILS



TYPICAL RAISED PAVEMENT MARKER PLACEMENT WITH LONGITUDINAL PAVEMENT MARKINGS

ALL ITEMS SHALL CONFORM TO C & M SPECIFICATIONS AND SUPPLEMENTAL SPECIFICATIONS 862 AND 962 UNLESS OTHERWISE SPECIFIED.

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL

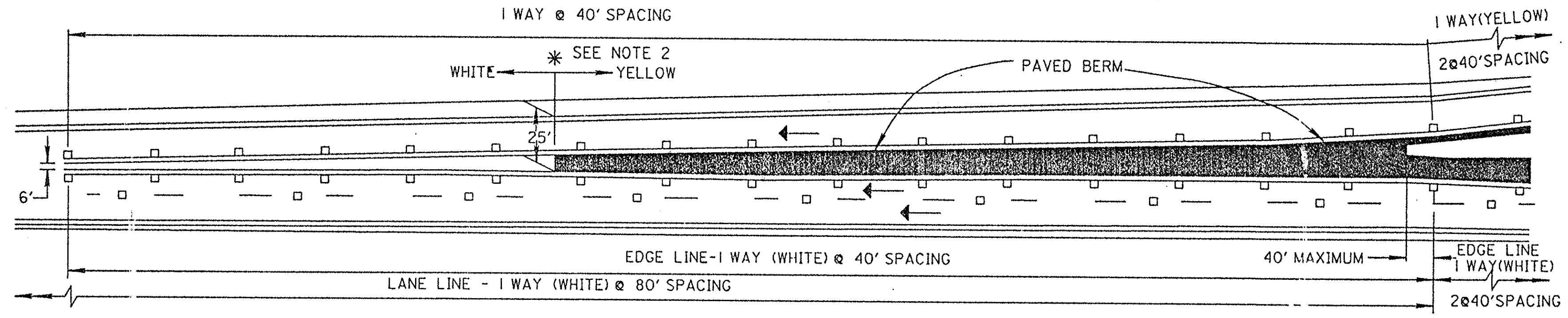
RAISED PAVEMENT MARKERS INSTALLATION DETAILS

STANDARD CONSTRUCTION DRAWING TC-65.10

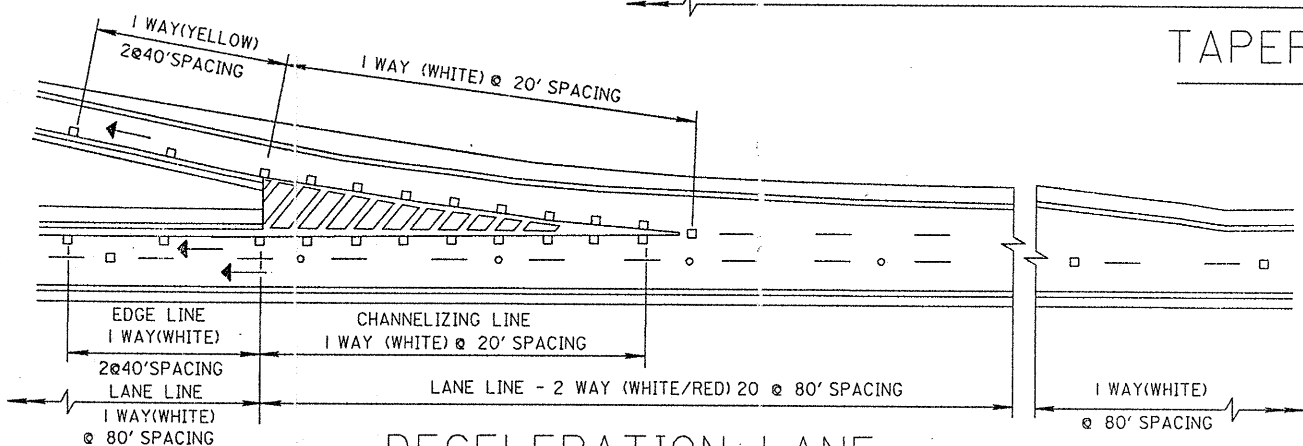
APPROVED Doug L Crespo ENGR. OF DESIGN SERVICES

DATE 02/01/90

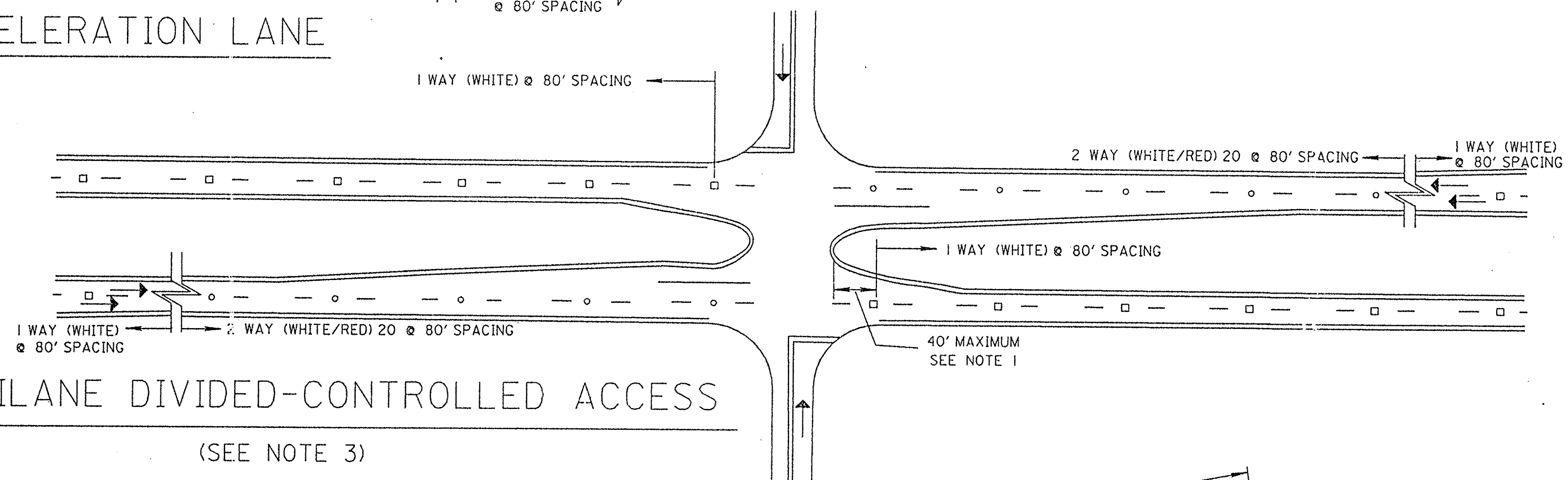
WCC



TAPERED ACCELERATION LANE

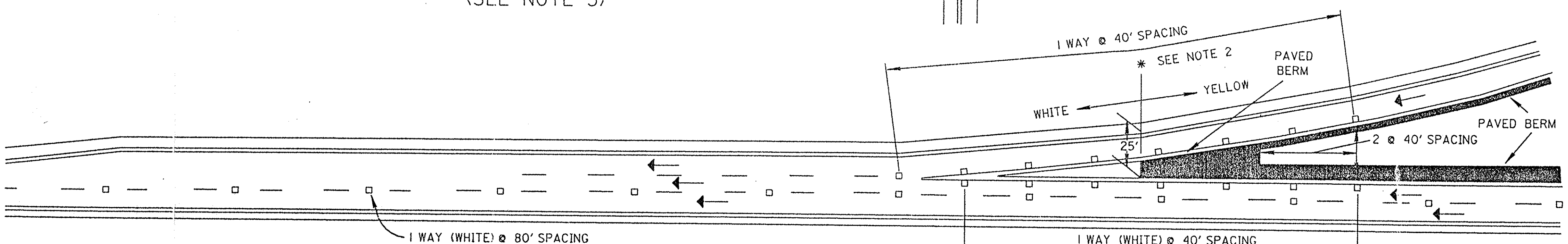


DECELERATION LANE



MULTILANE DIVIDED-CONTROLLED ACCESS

(SEE NOTE 3)



PARALLEL ACCELERATION LANE

NOTES

1. RAISED PAVEMENT MARKERS SHALL NOT BE PLACED IN THE DIRECTIONAL ROADWAYS WITHIN THE INTERSECTION AREA.
2. IF A MARKER FALLS ON THE TRANSITION POINT MARKED * IT SHALL BE WHITE.
3. ON MULTILANE DIVIDED HIGHWAYS WITHOUT CONTROLLED ACCESS, LANE LINE RPM'S SHALL BE 2 WAY (WHITE/RED) AT 80 FT. SPACING.

LEGEND

□ I WAY REFLECTORS

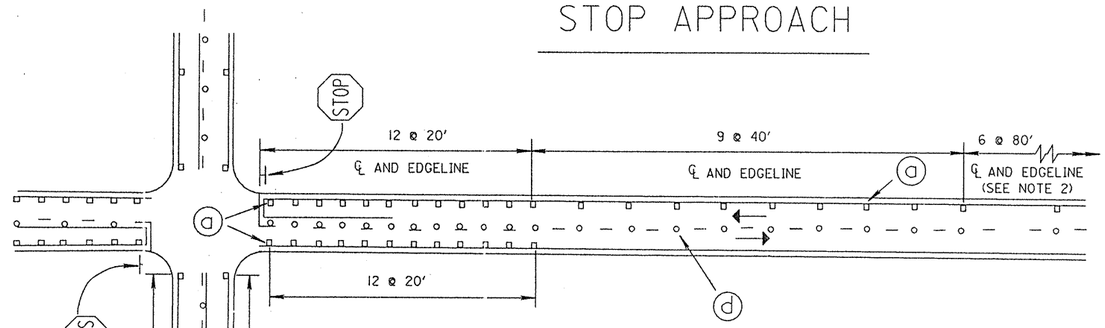
○ 2 WAY REFLECTORS

ALL ITEMS SHALL CONFORM TO C & M SPECIFICATIONS AND SUPPLEMENTAL SPECIFICATIONS 862 AND 962 UNLESS OTHERWISE SPECIFIED.

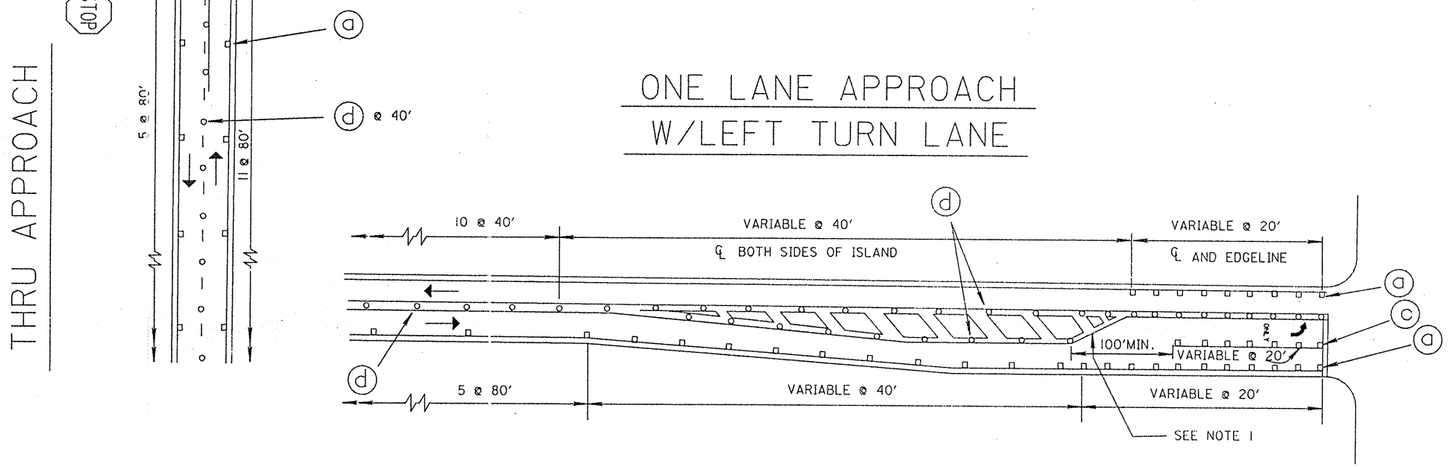
BUREAU OF DESIGN SERVICES DIVISION OF HIGHWAYS OHIO DEPARTMENT OF TRANSPORTATION	
TRAFFIC CONTROL	DATE 02/01/90
RAISED PAVEMENT MARKERS FREEWAY/EXPRESSWAY DETAILS	
STANDARD CONSTRUCTION DRAWING TC-65.11	
APPROVED Gary L. Creager ENGR. OF DESIGN SERVICES	

WCC

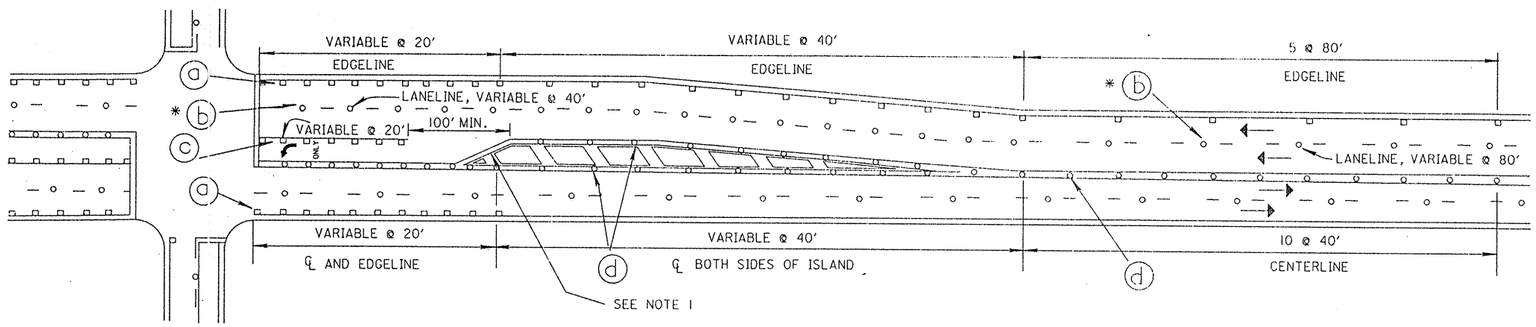
STOP APPROACH



ONE LANE APPROACH W/LEFT TURN LANE



TWO LANE APPROACH W/LEFT TURN LANE



NOTES

1. IF BACK TAPER LENGTH IS 200' OR GREATER, RPM'S SHALL BE INSTALLED ON THE TAPER AT 20' SPACING WITH MARKERS PARALLEL TO THE MAIN ROADWAY.
2. WHEN A SECTION OF ROADWAY ADJACENT TO THE STOP APPROACH HAS RAISED PAVEMENT MARKERS SPACED AT 40' ON THE CENTERLINE, THE MAXIMUM SPACING OF CENTERLINE RPM'S ON THAT STOP APPROACH SHALL BE 40' IN LIEU OF 80' SPACING SHOWN.

LEGEND

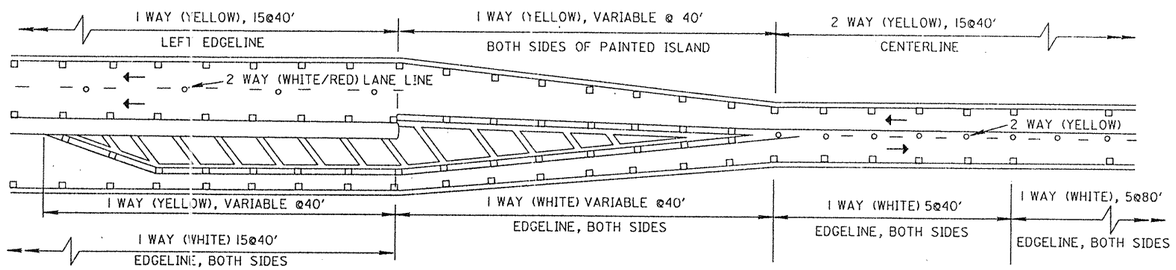
□	1-WAY REFLECTORS
○	2-WAY REFLECTORS
(a)	EDGELINE, 1-WAY (WHITE)
(b)	LANELINE, 2-WAY (WHITE/RED)
(c)	CHANNELIZING LINE, 1-WAY (WHITE)
(d)	CENTERLINE, 2-WAY (YELLOW/YELLOW)
*	WHITE SIDE SHALL FACE TRAFFIC

ALL ITEMS SHALL CONFORM TO C & M SPECIFICATIONS AND SUPPLEMENTAL SPECIFICATIONS 862 AND 962 UNLESS OTHERWISE SPECIFIED.

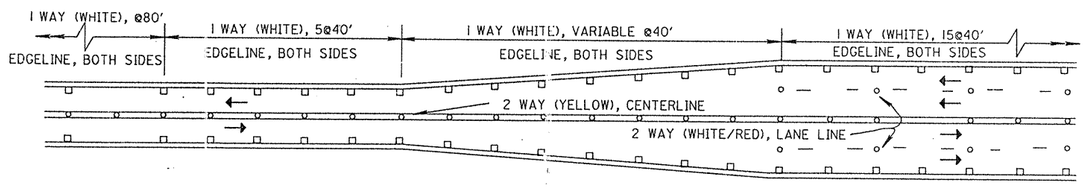
BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL	DATE 02/01/90
RAISED PAVEMENT MARKERS INTERSECTION DETAILS	
STANDARD CONSTRUCTION DRAWING TC-65.12	
APPROVED Harry L. Craqun ENGR. OF DESIGN SERVICES	

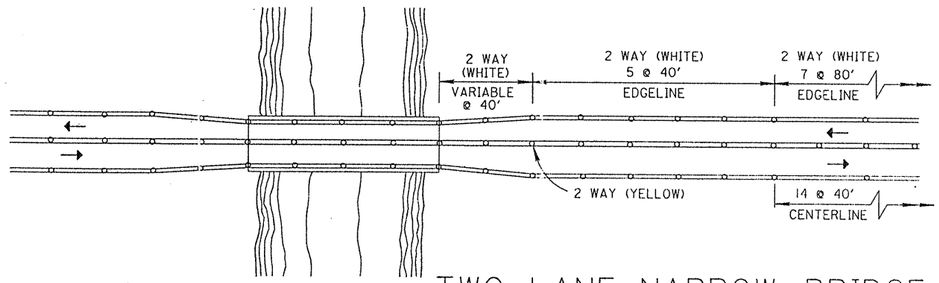
WCC



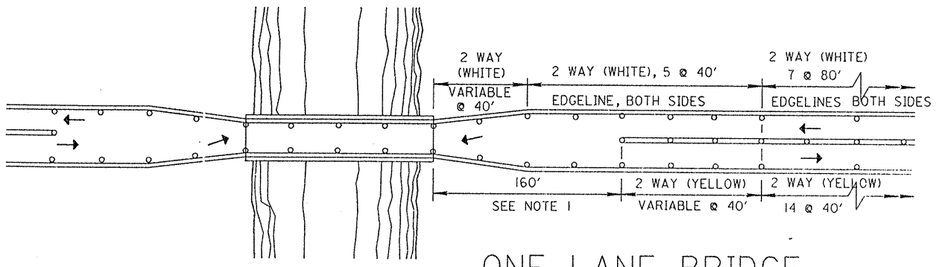
4 LANE DIVIDED TO 2 LANE TRANSITION



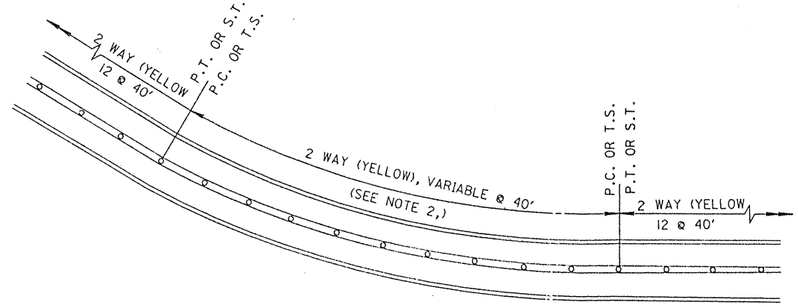
4 LANE UNDIVIDED TO 2 LANE TRANSITION



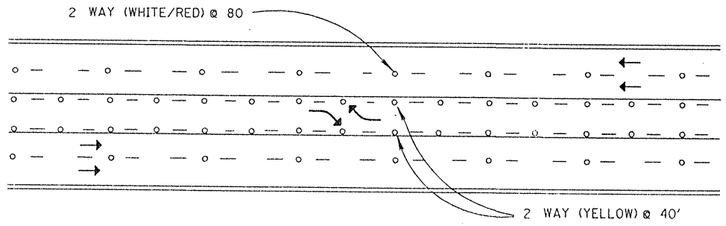
TWO LANE NARROW BRIDGE



ONE LANE BRIDGE



HORIZONTAL CURVE



TWO WAY LEFT TURN LANE

LEGEND

□ 1 WAY REFLECTORS

○ 2 WAY REFLECTORS

NOTES

1. FOR ONE LANE BRIDGES, PAINTED CENTERLINE AND CENTERLINE MARKERS SHALL BE OMITTED 160 FEET ON EACH SIDE AND ACCROSS THE BRIDGE.
2. FOR HORIZONTAL CURVES OF 5° OR GREATER, WHEN THE LENGTH OF CURVE IS 500 FEET OR LESS, THE SPACING OF THE CENTERLINE MARKERS SHALL BE REDUCED TO 20 FEET BETWEEN P.C. OR T.S. AND P.T. OR S.T.

ALL ITEMS SHALL CONFORM TO C & M SPECIFICATIONS AND SUPPLEMENTAL SPECIFICATIONS 862 AND 962 UNLESS OTHERWISE SPECIFIED.

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL

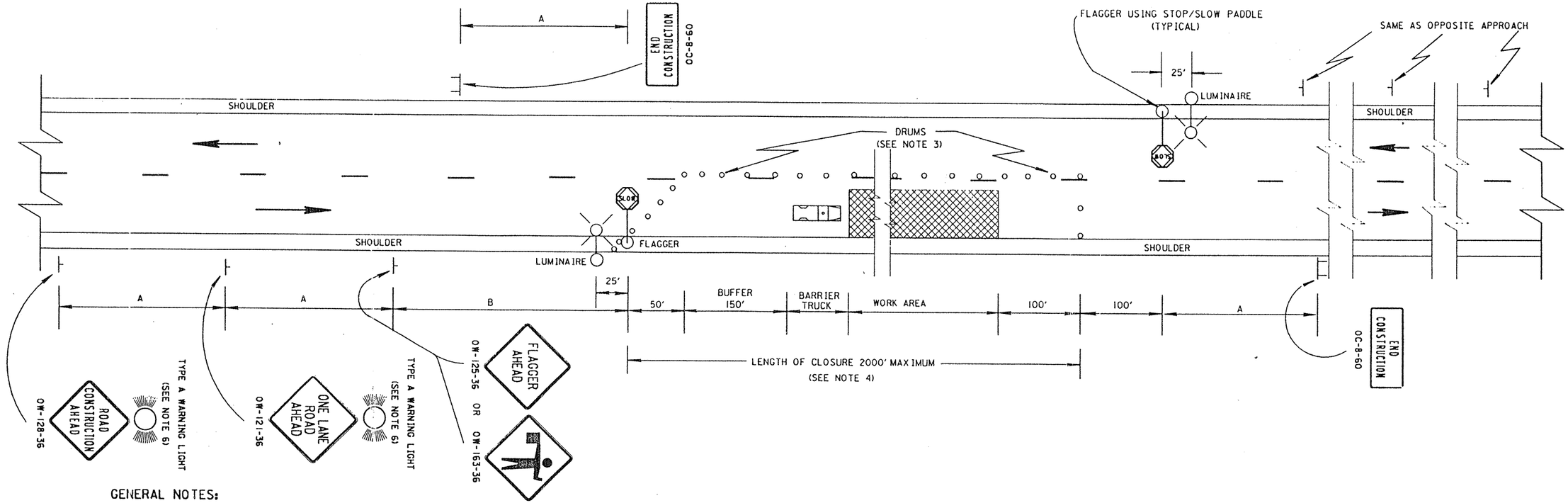
DATE 02/01/90

RAISED PAVEMENT MARKERS
MISCELLANEOUS DETAILS

STANDARD CONSTRUCTION DRAWING TC-65.13

APPROVED Dayl L Creager ENGR. OF DESIGN SERVICES

WCC



GENERAL NOTES:

1. THE LOCATION OF THE ADVANCE WARNING SIGNS SHOULD BE ADJUSTED TO PROVIDE FOR ADEQUATE SIGHT DISTANCE FOR THE EXISTING VERTICAL AND HORIZONTAL ROADWAY ALIGNMENT. THE DISTANCES SHOWN ARE MINIMUMS. DISTANCE B MAY ALSO BE INCREASED, PRIOR TO IMPLEMENTATION OF THE CLOSURE OR AFTER IT IS IN EFFECT, AS DIRECTED BY THE ENGINEER FOR SUCH OCCURENCES AS LONG TRAFFIC BACKUPS.

2. FLAGGERS, ONE FOR EACH DIRECTION SHALL BE USED TO CONTROL TRAFFIC CONTINUOUSLY FOR AS LONG AS A ONE LANE OPERATION IS IN EFFECT. THE FLAGGERS SHALL BE ABLE TO COMMUNICATE WITH EACH OTHER AT ALL TIMES.

3. DRUMS SHALL BE SPACED AT 50' CENTER TO CENTER ALONG THE CLOSURE. DRUMS ON THE ADVANCE TAPER SHALL BE SPACED AT 10' CENTER TO CENTER. CONES HAVING A MINIMUM HEIGHT OF 28 INCHES MAY BE SUBSTITUTED FOR DRUMS FOR DAY-TIME LANE CLOSURES. PROVISIONS SHALL BE MADE TO STABILIZE THE CONES TO PREVENT THEM FROM BLOWING OVER.

4. SEVERAL SMALL WORK AREAS CLOSE TOGETHER SHALL BE COMBINED INTO ONE WORK ZONE. HOWEVER, THE CLOSURE SHALL NOT BE MORE THAN 2000 FEET LONG UNLESS APPROVED BY THE ENGINEER. THE MINIMUM LENGTH BETWEEN CLOSURES SHALL BE 2000 FEET. ONLY ONE SIDE OF THE ROAD SHALL BE CLOSED IN ANY ONE WORK ZONE.

5. THE BARRIER TRUCK SHOWN AT THE BEGINNING OF THE WORK AREA SHALL BE IN PLACE AND UNOCCUPIED WHENEVER WORKERS ARE IN THE WORK AREA. THIS BARRIER TRUCK SHALL BE REMOVED FROM THE PAVEMENT WHEN WORKERS ARE NOT IN THE WORK AREA. OTHER PROTECTIVE DEVICES MAY BE USED IN LIEU OF THE BARRIER TRUCK SHOWN WHEN APPROVED BY THE ENGINEER. THE VEHICLE SHALL BE EQUIPPED WITH A 360° ROTATION OR FLASHING AMBER BEACON CLEARLY VISIBLE A MINIMUM OF ONE-QUARTER MILE.

6. THE TYPE A FLASHING WARNING LIGHTS SHOWN ON THE "ROAD CONSTRUCTION AHEAD" (OW-128) AND THE "ONE LANE ROAD AHEAD" (OW-121) SIGNS ARE REQUIRED WHENEVER A NIGHT LANE CLOSURE IS NECESSARY.

7. TYPE C STEADY BURNING WARNING LIGHTS SHALL BE ERECTED ON EACH DRUM FOR NIGHT LANE CLOSURES.

8. ADEQUATE AREA ILLUMINATION OF EACH FLAGGER STATION SHALL BE PROVIDED AT NIGHT BY USING 150 WATT MINIMUM HIGH PRESSURE SODIUM LUMINAIRES OR 250 WATT MINIMUM MERCURY LUMINAIRES. LUMINAIRES SHALL BE LOCATED ADJACENT TO ONE FLAGGER STATION FOR EACH DIRECTION OF TRAFFIC AS SHOWN ABOVE. THE MOUNTING HEIGHT FOR LUMINAIRES SHALL BE A MINIMUM OF 27 FEET ABOVE THE PAVEMENT AND MOUNTED ON A SUPPORT OF ADEQUATE STRENGTH TO PROVIDE A SATISFACTORY INSTALLATION. THE OVERHEAD CONDUCTOR CLEARANCE SHALL BE A MINIMUM OF 18 FEET ABOVE THE PAVEMENT. THE LUMINAIRE ARM SHALL BE OF SUFFICIENT LENGTH TO EXTEND TO THE EDGE OF THE PAVEMENT. POLES SHALL BE ERECTED A MINIMUM OF 5.5' BEHIND FACE OF GUARDRAIL WHERE EXISTING, OR 12' FROM THE EDGE OF PAVEMENT. WHERE POSSIBLE LOCATE BEHIND DITCH. LIGHTING MATERIAL SHALL COMPLY WITH SPECIFICATION 713.

9. WITHIN THE LENGTH OF CLOSURE, PROVISION SHALL BE MADE TO CONTROL TRAFFIC ENTERING FROM INTERSECTING STREETS AND MAJOR DRIVES AS NECESSARY TO PREVENT WRONG WAY MOVEMENTS AND TO KEEP VEHICLES OFF OF NEW PAVEMENT NOT READY FOR TRAFFIC. THE METHOD OF CONTROL SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER.

MINIMUM DISTANCE	A	B
URBAN	200	200
RURAL	500	500

ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH 614 AND OTHER APPLICABLE PORTIONS OF THE C & M SPECIFICATIONS AS WELL AS IN ACCORDANCE WITH PART 7 OF OMUTCD. PAYMENT FOR ALL LABOR, EQUIPMENT AND MATERIALS TO PROVIDE THIS METHOD OF TRAFFIC CONTROL SHALL BE INCIDENTAL TO THE LUMP SUM BID FOR 614 MAINTAINING TRAFFIC, UNLESS SEPARATELY ITEMIZED IN THE PLAN.

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

MAINTENANCE OF TRAFFIC

DATE 04/29/88

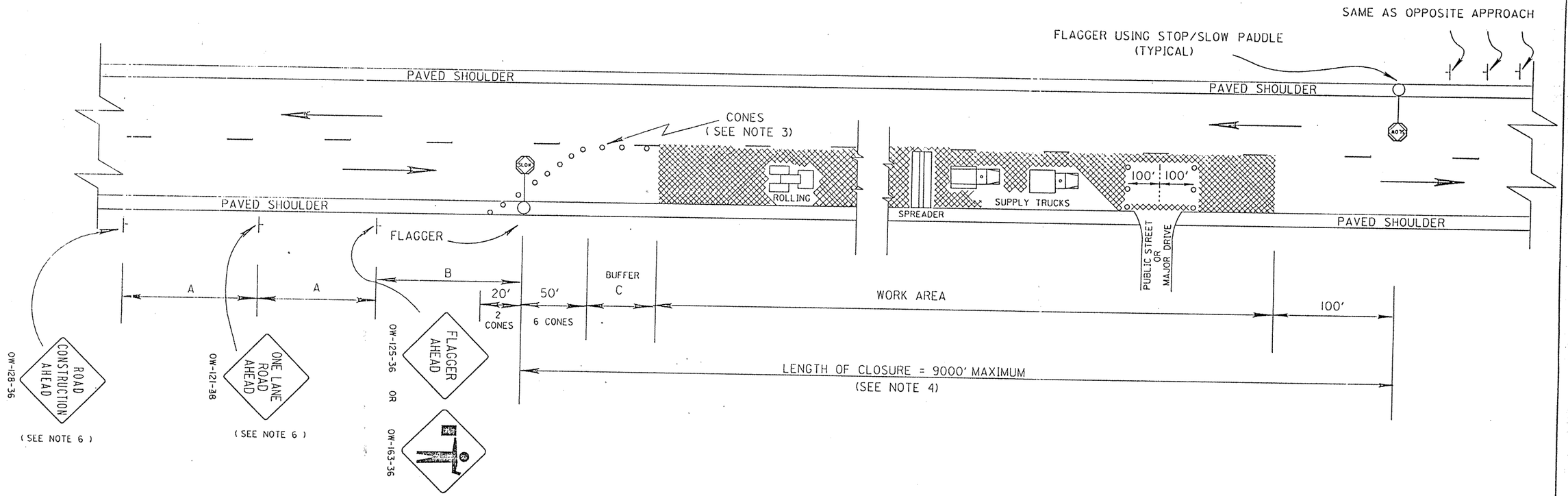
FLAGGERS CLOSING
1 LANE OF A 2 LANE HIGHWAY
STATIONARY OPERATION

STANDARD CONSTRUCTION DRAWING MT-97.10

APPROVED _____ ENGR. OF DESIGN SERVICES

7G-1

WC



GENERAL NOTES:

1. THE LOCATION OF THE ADVANCE WARNING SIGNS SHOULD ONLY BE ADJUSTED TO PROVIDE FOR ADEQUATE SIGHT DISTANCE FOR THE EXISTING VERTICAL AND HORIZONTAL ROADWAY ALIGNMENT.

2. FLAGGERS, ONE FOR EACH DIRECTION SHALL BE USED TO CONTROL TRAFFIC CONTINUOUSLY FOR AS LONG AS A ONE LANE OPERATION IS IN EFFECT. THE FLAGGERS SHALL BE ABLE TO COMMUNICATE WITH EACH OTHER AT ALL TIMES.

3. CONES ON THE TAPERS SHALL BE SPACED AT 10' CENTER TO CENTER. CONES IN THE BUFFER SHALL BE SPACED AT 40 FT. CENTER TO CENTER. CONES SHALL HAVE A MINIMUM HEIGHT OF 28 INCHES AND SHALL BE STABILIZED TO PREVENT THEM FROM BLOWING OVER. CLOSURES AT NIGHT SHALL USE DRUMS RATHER THAN CONES.

4. IT IS REQUIRED THAT THE LENGTH OF CLOSURE BE KEPT TO A MINIMUM AT ALL TIMES, AS DIRECTED BY THE ENGINEER.

   WHEN THE AMBIENT TEMPERATURE EXCEEDS 80 DEGREES F, THE ENGINEER MAY INCREASE THE MAXIMUM LENGTH OF CLOSURE TO ALLOW FOR SUFFICIENT COOLING OF NEW PAVEMENT.

   THE ENGINEER MAY SHORTEN THE MAXIMUM ALLOWABLE LENGTH OF CLOSURE TO RELIEVE EXCESSIVE TRAFFIC BACKUPS OR TO IMPROVE TRAFFIC OPERATION.

4. CONT. ALL TRAFFIC CONTROL SIGNS, CONES (OR DRUMS), AND THE FLAGGER SHALL BE MOVED FORWARD AS A GROUP BEFORE THE CLOSURE REACHES THE MAXIMUM ALLOWABLE LENGTH. ONLY ONE SIDE OF THE ROAD SHALL BE CLOSED AT ANY TIME.

5. WITHIN THE LENGTH OF CLOSURE, PROVISION SHALL BE MADE TO CONTROL TRAFFIC ENTERING FROM INTERSECTING STREETS AND MAJOR DRIVES AS NECESSARY TO PREVENT WRONG WAY MOVEMENTS AND TO KEEP VEHICLES OFF OF NEW PAVEMENT NOT READY FOR TRAFFIC. AS A MINIMUM, THE CONTRACTOR SHALL:

   A) PROVIDE AN ADDITIONAL FLAGGER AT EVERY PUBLIC STREET INTERSECTION AND MAJOR DRIVEWAY OR -

   B) PLACE A ROW OF 3 CONES ACROSS THE CLOSED LANE APPROXIMATELY 100 FT. ON EACH SIDE OF AN INTERSECTION.

   ROWS OF CONES MAY BE MOVED OFF THE ROAD TO ALLOW PASSAGE OF ROLLERS, PAVING SPREADER OR SUPPLY TRUCKS BUT SHALL BE MOVED BACK ONTO THE ROAD WHEN THE ACTIVITY HAS PASSED.

6. THE TYPE A FLASHING WARNING LIGHTS ARE REQUIRED ON THE "ROAD CONSTRUCTION AHEAD" (OW-128) AND THE "ONE LANE ROAD AHEAD" (OW-121) SIGNS WHENEVER A NIGHT LANE CLOSURE IS NECESSARY.

7. TYPE C STEADY BURNING WARNING LIGHTS SHALL BE ERECTED ON EACH DRUM FOR NIGHT LANE CLOSURES.

8. ADEQUATE AREA ILLUMINATION OF EACH FLAGGER STATION SHALL BE PROVIDED AT NIGHT BY USING 150 WATT MINIMUM HIGH PRESSURE SODIUM LUMINAIRES OR 250 WATT MINIMUM MERCURY LUMINAIRES. LUMINAIRES SHALL BE LOCATED ADJACENT TO ONE FLAGGER STATION FOR EACH DIRECTION OF TRAFFIC.

DISTANCE	A	B	C
URBAN	200	350	100
RURAL	500	650	200

ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH 614 AND OTHER APPLICABLE PORTIONS OF THE C & M SPECIFICATIONS AS WELL AS IN ACCORDANCE WITH PART 7 OF OMUTCD. PAYMENT FOR ALL LABOR, EQUIPMENT AND MATERIALS TO PROVIDE THIS METHOD OF TRAFFIC CONTROL SHALL BE INCIDENTAL TO THE LUMP SUM BID FOR 614 MAINTAINING TRAFFIC, UNLESS SEPARATELY ITEMIZED IN THE PLAN.

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

MAINTENANCE OF TRAFFIC

FLAGGER CLOSING
1 LANE OF A 2 LANE HIGHWAY
FOR PAVING OPERATIONS

DATE 10/04/89

STANDARD CONSTRUCTION DRAWING MT-97.11

APPROVED _____
ASSISTANT DEPUTY DIRECTOR
DESIGN DEVELOPMENT ADMINISTRATION

WC

WORK ZONE PAVEMENT MARKINGS AND SIGNS

614 WORK ZONE PAVEMENT MARKINGS

GENERAL

THE CONTRACTOR SHALL FURNISH, INSTALL, MAINTAIN AND WHEN NECESSARY, REMOVE WORK ZONE RETROREFLECTIVE PAVEMENT MARKINGS ON EXISTING, RECONSTRUCTED, RESURFACED OR TEMPORARY ROADS WITHIN THE WORK LIMITS, IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS.

THE MARKINGS SHALL BE EVALUATED BY THE ENGINEER IN ACCORDANCE WITH THE THREE PERFORMANCE PARAMETERS CONTAINED IN SUPPLEMENT 1047. THE MARKINGS SHALL BE REPAIRED OR REPLACED WHEN THE NUMERICAL RATING OF A PARAMETER IS (a) SIX OR LOWER FOR DURABILITY, (b) FOUR OR LOWER FOR VISUAL EFFECTIVENESS AND (c) FOUR OR LOWER FOR NIGHT VISIBILITY. THE CONTRACTOR SHALL REPAIR OR REPLACE UNSATISFACTORY MARKINGS IMMEDIATELY AND AT NO ADDITIONAL COST TO THE STATE.

TEMPORARY PAVEMENT MARKING MATERIALS

UNLESS OTHERWISE INDICATED ON THE PLANS, TEMPORARY PAVEMENT MARKINGS MAY BE EITHER 621.02 PAINT OR 947.03 TYPE B OR TYPE C PREFORMED MATERIAL.

PAINT

PAINTED MARKINGS SHALL BE IN ACCORDANCE WITH 621 EXCEPT THAT (a) PARAGRAPH 621.14 SHALL NOT APPLY, (b) WHERE THE MARKINGS ARE NOT LIABLE TO BE TRACKED, EITHER CONVENTIONAL OR FAST DRY PAINT MAY BE USED FOR 621.02, AND (c) WHEN APPLIED TO NEW ASPHALT PAVEMENT SURFACES OR PLANED ASPHALT PAVEMENT SURFACES, THE SPECIFIED APPLICATION RATE SHALL BE AS FOLLOWS:

GALLONS PER MILE OF LINE					
WIDTH OF LINE, IN.	4	6	8	12	24
SOLID LINE	24	36	48	72	144
DASHED LINE	6	9	-	-	-
DOTTED LINE	8	12	-	-	-

TYPE B AND TYPE C PREFORMED MATERIAL

PREFORMED MATERIAL SHALL COMPLY WITH 947.03 EXCEPT THAT NO PREFORMED MATERIAL CONTAINING METAL SHALL BE PLACED ON ANY SURFACE UNLESS IT WILL BE REMOVED LATER BY THE CONTRACTOR. TEMPORARY PAVEMENT MARKINGS OF 947.03 PREFORMED MATERIAL SHALL BE REMOVED PRIOR TO PLACEMENT OF 621 OR 847 SURFACE COURSE MARKINGS AT THAT LOCATION. PREFORMED MATERIAL SHALL BE APPLIED IN ACCORDANCE WITH 847 EXCEPT AS MODIFIED HEREIN.

PLACEMENT

TEMPORARY MARKINGS SHALL BE COMPLETE AND IN PLACE ON ALL PAVEMENT, INCLUDING RAMPS, PRIOR TO EXPOSING IT TO TRAFFIC. WHEN TEMPORARY MARKINGS CONFLICT WITH THE TRAFFIC PATTERN, THEY SHALL BE REMOVED BY THE CONTRACTOR IN ACCORDANCE WITH 621.134.

LINE PLACEMENT TOLERANCE FOR FINAL SURFACES SHALL BE IN ACCORDANCE WITH 621.052. ON SURFACES OTHER THAN THE FINAL, THE TOLERANCE PERMITTED SHALL BE TWICE THAT IN 621.052. LAYOUT AND PREMARKING SHALL BE IN ACCORDANCE WITH 621.051.

TEMPORARY MARKING CLASSES

CLASS I MARKINGS

CLASS I MARKINGS SHALL BE APPLIED TO THE FULL DIMENSIONS AS DEFINED IN 621 WITH THE FOLLOWING ADDITIONS OR EXCEPTIONS:

1. TRANSVERSE LINES SHALL BE 8-INCHES IN WIDTH.
2. STOP LINES SHALL BE 12-INCHES IN WIDTH.
3. CROSS WALK LINES SHALL BE 8-INCHES IN WIDTH.

TEMPORARY MARKING CLASSES (CONTINUED)

CLASS II MARKINGS

CLASS II MARKINGS (ABBREVIATED) SHALL BE DEFINED AS FOLLOWS:

CENTER LINES SHALL CONSIST OF SINGLE, YELLOW 4-INCH WIDE BY A MINIMUM OF 48-INCH LONG DASHES SPACED AT A MAXIMUM OF 40-FOOT INTERVALS.

LANE LINES SHALL CONSIST OF WHITE 4-INCH WIDE BY A MINIMUM OF 48-INCH LONG DASHES SPACED AT A MAXIMUM OF 40-FOOT INTERVALS.

GORE MARKINGS SHALL BE CONTINUOUS, WHITE 4-INCH LINES PLACED AT THE THEORETICAL GORE OF AN EXIT RAMP OR DIVERGING ROADWAYS.

THE PAINT APPLICATION RATE SHALL BE NOT LESS THAN 2.4 GALLONS PER MILE FOR LANE LINE AND CENTER LINE AND 24 GALLONS PER MILE FOR GORE MARKINGS.

CONFLICTING EXISTING MARKINGS

THE CONTRACTOR SHALL, PRIOR TO PLACING TEMPORARY MARKINGS, REMOVE ALL CONFLICTING EXISTING MARKINGS VISIBLE TO THE TRAVELING PUBLIC DURING DAYLIGHT OR NIGHTTIME HOURS IN ACCORDANCE WITH 621.134. THE COST FOR REMOVAL OF CONFLICTING MARKINGS SHALL BE INCLUDED IN 614 MAINTAINING TRAFFIC UNLESS SPECIFICALLY ITEMIZED.

THE CONTRACTOR SHALL ALSO REMOVE THE PRISMATIC RETRO-REFLECTOR WITHIN ANY RAISED PAVEMENT MARKER (RPM) WHICH IS IN CONFLICT WITH THE TEMPORARY PAVEMENT MARKINGS. WHEN THE TEMPORARY PAVEMENT MARKINGS ARE REMOVED AND THE RPM IS NO LONGER IN CONFLICT, THE CONTRACTOR SHALL THOROUGHLY CLEAN THE RECESSED REFLECTOR ATTACHMENT AREA OF THE CASTING AND INSTALL A NEW PRISMATIC RETRO-REFLECTOR OF THE SAME KIND AND COLOR. THE COST FOR THIS WORK SHALL BE INCIDENTAL TO THE VARIOUS PAY ITEMS.

INTERIM MARKINGS

WITHIN 21 CALENDAR DAYS AFTER OPENING ANY LENGTH OF PAVEMENT TO TRAFFIC, THE 621 OR 847 PAVEMENT MARKINGS CALLED FOR IN THE PLANS SHALL BE APPLIED. EQUIVALENT 614 CLASS I, PAINT MARKINGS MAY BE USED IN LIEU OF FINAL MARKINGS. IN THIS EVENT, THE CONTRACTOR SHALL FURNISH ALL LABOR, EQUIPMENT AND MATERIAL NECESSARY TO PLACE AND MAINTAIN 614 CLASS I PAINT MARKINGS AS PART OF THE LUMP SUM BID FOR 614 MAINTAINING TRAFFIC.

FOR EACH CALENDAR DAY BEYOND 21 DAYS THAT THIS WORK SHALL REMAIN UNCOMPLETED, THE SUM OF $200 PER CALENDAR DAY WILL BE DEDUCTED FROM ANY MONEY DUE THE CONTRACTOR, NOT AS A PENALTY BUT AS LIQUIDATED DAMAGES.

METHOD OF MEASUREMENT

TEMPORARY PAVEMENT MARKINGS WILL BE MEASURED COMPLETE IN PLACE, BY CLASS AND MATERIAL, IN THE UNITS DESIGNATED. LINE QUANTITIES WILL BE THE LENGTH OF THE COMPLETED STRIPE, INCLUDING GAPS, INTERSECTIONS, AND OTHER SECTIONS OF PAVEMENT NOT NORMALLY MARKED.

TEMPORARY PAVEMENT MARKINGS WILL INCLUDE THE LAYOUT, APPLICATION AND REMOVAL OF THE MARKINGS, WHEN REQUIRED.

BASIS OF PAYMENT

PAYMENT FOR ACCEPTED QUANTITIES COMPLETE IN PLACE WILL BE MADE AT THE CONTRACT UNIT PRICE. PAYMENT SHALL BE FULL COMPENSATION FOR ALL MATERIALS, LABOR, INCIDENTALS AND EQUIPMENT FOR PLACEMENT, MAINTENANCE AND NECESSARY REMOVAL OF MARKINGS.

BASIS OF PAYMENT (CONTINUED)

ITEM	UNIT	DESCRIPTION
614	MILES	TEMPORARY LANE LINES, CLASS____, ____•
614	MILES	TEMPORARY CENTER LINES, CLASS____, ____•
614	LIN. FT.	TEMPORARY CHANNELIZING LINES, CLASS I, ____•
614	MILES	TEMPORARY EDGE LINES, CLASS I, ____•
614	LIN. FT.	TEMPORARY GORE MARKINGS, CLASS II, ____•
614	LIN. FT.	TEMPORARY STOP LINES, CLASS I, ____•
614	LIN. FT.	TEMPORARY CROSSWALK LINES, CLASS I, ____•
614	EACH	TEMPORARY LANE ARROWS, CLASS I, ____•
614	EACH	TEMPORARY RAILROAD SYMBOL MARKINGS, CLASS I, ____•
614	EACH	TEMPORARY WORD "ONLY" ON PAVEMENT, 72 INCH, CLASS I, ____•
614	LIN. FT.	TEMPORARY TRANSVERSE LINES, CLASS I, ____•
614	LIN. FT.	TEMPORARY DOTTED LINES, CLASS I, ____•

• TYPE MATERIAL (621 PAINT, 947.03 TYPE B OR 947.03 TYPE C OR LEFT BLANK TO PERMIT ANY OF THE THREE)

614 WORK ZONE MARKING SIGNS

THE CONTRACTOR SHALL FURNISH, INSTALL, MAINTAIN AND SUBSEQUENTLY REMOVE WORK ZONE MARKING SIGNS (OW-167 AND OW-168) WITHIN THE WORK LIMITS IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS.

THE CONTRACTOR SHALL, IN ADVANCE OF ANY SECTION OF ROADWAY LACKING OMUTCD FULL PATTERN STANDARD DIMENSION EDGE LINE OR CENTER LINE MARKINGS, ERECT A "NO EDGE LINES" (OW-167-36) SIGN OR "UNMARKED NO PASSING ZONES" (OW-168-36) SIGN OR BOTH AS MAY BE APPROPRIATE. ON FREEWAYS AND EXPRESSWAYS AN OW-167-48 SIGN SHALL BE USED. THESE SIGNS SHALL BE IN PLACE PRIOR TO EXPOSING THE ROADWAY TO TRAFFIC. THESE SIGNS SHALL ALSO BE ERECTED ON EACH ENTRANCE RAMP, AT INTERSECTIONS OF THROUGH ROADS TO WARN ENTERING OR TURNING TRAFFIC OF THE CONDITION AND AT LEAST ONCE EVERY TWO MILES ALONG THE ROADWAY. THESE SIGNS SHALL BE REMOVED WHEN THEY NO LONGER APPLY.

THE CONTRACTOR MAY USE SIGNS AND SUPPORTS IN USED BUT GOOD CONDITION PROVIDED THE SIGNS MEET CURRENT DEPARTMENT SPECIFICATIONS. SIGN FACES SHALL BE REFLECTORIZED WITH TYPE G SHEETING COMPLYING WITH THE REQUIREMENTS OF 730.19. WORK ZONE MARKING SIGNS SHALL BE PROVIDED WITH SUITABLE YIELDING SUPPORTS OF SUFFICIENT STRENGTH AND STABILITY.

WORK ZONE MARKING SIGNS WILL BE MEASURED AS THE NUMBER OF SIGN INSTALLATIONS, INCLUDING THE SIGN AND NECESSARY SUPPORTS. ALL OTHER WORK ZONE SIGNS SHALL BE INCLUDED IN 614 MAINTAINING TRAFFIC UNLESS SEPARATELY ITEMIZED.

PAYMENT FOR ACCEPTED QUANTITIES, COMPLETE, IN PLACE WILL BE MADE AT THE CONTRACT UNIT PRICE. PAYMENT SHALL BE FULL COMPENSATION FOR ALL MATERIALS, LABOR, INCIDENTALS AND EQUIPMENT FOR PLACEMENT, MAINTENANCE AND REMOVAL OF THE SIGNS.

ITEM	UNIT	DESCRIPTION
614	EACH	WORK ZONE MARKING SIGNS

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

MAINTENANCE OF TRAFFIC

DATE 11/14/86

WORK ZONE PAVEMENT MARKINGS AND SIGNS

STANDARD CONSTRUCTION DRAWING MT-99.10

APPROVED: ENGR. OF DESIGN SERVICES

GENERAL

IN ADDITION TO 614, TRAFFIC SHALL BE MAINTAINED IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS.

THE PURPOSE OF THE FOLLOWING REQUIREMENTS FOR TRAFFIC CONTROL FOR PAVEMENT MARKING OPERATIONS IS TO PROVIDE SAFETY FOR HIGHWAY USERS, WORKERS AND EQUIPMENT AND TO PROTECT THE MARKINGS FROM DAMAGE DURING APPLICATION. THESE REQUIREMENTS ARE THE REQUIRED MINIMUMS. IF AT ANY TIME DURING THE APPLICATION OF MARKINGS IT IS FOUND BY THE ENGINEER THAT THESE MINIMUM TRAFFIC CONTROL REQUIREMENTS ARE NOT ACHIEVING THE NECESSARY SAFETY AND MARKING PROTECTION, ADDITIONAL TRAFFIC CONTROL SHALL BE IMPLEMENTED IN ACCORDANCE WITH ITEM 104.02.

THE ENGINEER MAY SUSPEND WORK IN ORDER TO RELIEVE TRAFFIC CONGESTION AT ANY TIME. NO WORK SHALL BE DONE DURING PEAK HOURS, AS DETERMINED BY THE ENGINEER.

VEHICLES TRANSPORTING FLAMMABLE PAVEMENT MARKING MATERIALS (MATERIAL SUPPLY VEHICLES) SHALL NOT BE UTILIZED FOR LEAD OR TRAIL VEHICLES OR FOR POWER BROOM EQUIPMENT. ALL PAVEMENT MARKING APPLICATION, PROTECTION AND SUPPORT EQUIPMENT FOLLOWING THE LINE MARKING MACHINE SHALL HAVE THE TRAFFIC CONTROL EQUIPMENT OF A TRAIL VEHICLE.

LINE MARKING MACHINES SHALL NOT BE USED FOR SIGN AND CONE PLACEMENT.

LEAD VEHICLE

A LEAD VEHICLE IS TO BE USED TO WARN OPPOSING TRAFFIC OF THE APPROACH OF CENTER LINE AND OTHER MARKING EQUIPMENT WHEN THIS EQUIPMENT EXTENDS INTO THE ADJACENT OPPOSING TRAFFIC LANE. THE LEAD VEHICLE SHALL PRECEDE THE "LEFT OF CENTER" MARKING EQUIPMENT A DISTANCE THAT WILL PROVIDE ADVANCE SAFE WARNING TO APPROACHING TRAFFIC. THE OPERATOR OF THIS UNIT SHALL DRIVE AHEAD OF THE CREST OF A VERTICAL CURVE OR AROUND A HORIZONTAL CURVE AND WAIT UNTIL THE "LEFT OF CENTER" MARKING EQUIPMENT NEARS AND THEN PROCEED, MAINTAINING AN ADVANCE LOCATION OF 400' TO 600'.

A LEAD VEHICLE SHALL BE EQUIPPED AND OPERATED WITH THE FOLLOWING TRAFFIC CONTROL DEVICES:

1. A 360° ROTATING OR FLASHING AMBER BEACON CLEARLY VISIBLE IN ALL DIRECTIONS A MINIMUM OF ONE-QUARTER MILE.
2. LIGHTED HEADLIGHTS AND TAILLIGHTS, AND
3. A KEEP RIGHT SIGN (OC-3IR-48) AND WET PAINT SIGN (OC-52-48) MOUNTED A MINIMUM OF 5' ABOVE THE ROAD SURFACE, MEASURED TO THE BOTTOM OF THE SIGN, AND VISIBLE TO OPPOSING TRAFFIC.

POWER BROOM EQUIPMENT

POWER BROOM EQUIPMENT SHALL BE EQUIPPED AND OPERATED DURING PAVEMENT PREPARATIONS WITH THE FOLLOWING TRAFFIC CONTROL DEVICES:

1. A 360° ROTATING OR FLASHING AMBER BEACON CLEARLY VISIBLE IN ALL DIRECTIONS A MINIMUM OF ONE-QUARTER MILE.
2. LIGHTED HEADLIGHTS AND TAILLIGHTS, AND
3. ✱ A FLASHING ARROW PANEL 54" X 30" (TYPE B) VISIBLE TO THE REAR MOUNTED A MINIMUM OF 7' ABOVE THE ROAD SURFACE, MEASURED TO THE BOTTOM OF THE PANEL, AND USED ONLY ON MULTI-LANE HIGHWAYS.

LINE MARKING MACHINE

ALL TRAFFIC LINE MARKING MACHINES SHALL BE EQUIPPED AND OPERATED WITH THE FOLLOWING TRAFFIC CONTROL EQUIPMENT:

1. THREE 360° ROTATING OR FLASHING AMBER BEACONS CLEARLY VISIBLE IN ALL DIRECTIONS A MINIMUM OF ONE-QUARTER MILE MOUNTED A MINIMUM OF 7' ABOVE THE ROAD SURFACE, ONE FORWARD, ONE ON THE RIGHT REAR AND ONE ON THE LEFT REAR OF THE VEHICLE.
2. ✱ (A) A FLASHING ARROW PANEL 54" X 30" (TYPE B) DISPLAYED TO THE REAR MOUNTED A MINIMUM OF 7' ABOVE THE ROAD SURFACE, MEASURED TO THE BOTTOM OF THE PANEL, AND USED ONLY ON MULTI-LANE HIGHWAYS, OR
   (B) A DO NOT PASS SIGN (R-33A-48) VISIBLE TO THE REAR DURING CENTER LINE MARKING ON TWO-LANE, TWO-WAY ROADWAYS AND MOUNTED A MINIMUM OF 7' ABOVE THE ROAD SURFACE, MEASURED TO THE BOTTOM OF THE SIGN. THIS SIGN MAY BE USED TO COVER THE ARROW PANEL, WHICH SHALL NOT BE USED ON TWO-LANE, TWO-WAY ROADWAYS.
3. A WET PAINT WITH ARROW SIGN (OC-50-24 OR OC-51-48) SHALL FACE THE REAR. THE SIGN SHALL BE POSITIONED WITH THE ARROW POINTING TO THE WET LINE. WHEN USED, OC-50-24 SHALL BE MOUNTED ON THE SIDE OF THE VEHICLE NEAREST THE WET MARKING MATERIAL. OC-50-24 AND OC-51-48 SIGNS SHALL BE MOUNTED A MINIMUM OF 1' ABOVE THE ROAD SURFACE.
4. A KEEP RIGHT SIGN (OC-3IR-48) AND WET PAINT SIGN (OC-52-48) MOUNTED A MINIMUM OF 5' ABOVE THE ROAD SURFACE, MEASURED TO THE BOTTOM OF THE SIGN, AND FACING OPPOSING TRAFFIC WHEN THIS UNIT EXTENDS INTO THE ADJACENT OPPOSING TRAFFIC LANE.
5. THE GUIDE AND SIDE MOUNTED MARKING CARRIAGES SHALL EACH BE EQUIPPED WITH A CLEAN RED FLAG NOT LESS THAN 16" SQUARE AND FASTENED TO A STAFF OF SUFFICIENT LENGTH SO AS TO PERMIT THE FLAG TO MOVE FREELY OF ANY OBSTRUCTION.

TRAIL VEHICLE

WHEN REQUIRED, A TRAIL VEHICLE SHALL BE POSITIONED AT THE TRACK FREE END OF THE WET LINE.

TRAIL VEHICLES SHALL BE EQUIPPED AND OPERATED WITH THE FOLLOWING TRAFFIC CONTROL EQUIPMENT:

1. A 360° ROTATING OR FLASHING AMBER BEACON CLEARLY VISIBLE IN ALL DIRECTIONS A MINIMUM OF ONE-QUARTER MILE.
2. ✱ (A) A FLASHING ARROW PANEL 54" X 30" (TYPE B) VISIBLE TO THE REAR MOUNTED AT A MINIMUM HEIGHT OF 7' ABOVE THE ROAD SURFACE, MEASURED TO THE BOTTOM OF THE PANEL, AND USED ONLY ON MULTI-LANE HIGHWAYS, OR
   (B) A DO NOT PASS SIGN (R-33A-48) VISIBLE TO THE REAR DURING CENTER LINE MARKING ON TWO-LANE, TWO-WAY ROADWAYS AND MOUNTED A MINIMUM OF 7' ABOVE THE ROAD SURFACE, MEASURED TO THE BOTTOM OF THE SIGN. THIS SIGN MAY BE USED TO COVER THE ARROW PANEL, WHICH SHALL NOT BE USED ON TWO-LANE, TWO-WAY ROADWAYS.
3. A WET PAINT WITH ARROW SIGN (OC-50-24 OR OC-51-48) SHALL FACE THE REAR. THE SIGN SHALL BE POSITIONED WITH THE ARROW POINTING TO THE WET LINE. WHEN USED, OC-50-24 SHALL BE MOUNTED ON THE SIDE OF THE VEHICLE NEAREST THE WET MARKING MATERIAL. OC-50-24 SHALL BE MOUNTED A MINIMUM OF 4'6" ABOVE THE ROAD SURFACE AND OC-51-48 SHALL BE MOUNTED A MINIMUM OF 5'0" ABOVE THE ROAD SURFACE, BOTH MEASURED TO THE BOTTOM OF THE SIGN.

✱ WHEN A VEHICLE IS OPERATING ON A TWO-LANE TWO-WAY ROADWAY THE FLASHING ARROW PANEL SHALL BE TILTED HORIZONTALLY OR COVERED.

CONES AND WET PAINT-KEEP OFF SIGNS

CONES AND WET PAINT-KEEP OFF SIGNS (R-87-24) SHALL BE PLACED TO PROTECT THE LINE WHENEVER THE TRACK FREE TIME EXCEEDS 2 MINUTES. THESE DEVICES SHALL NOT BE REMOVED UNTIL THE LINE HAS DRIED TO A TRACK FREE CONDITION. RETRIEVAL EQUIPMENT SHALL HAVE THE TRAFFIC CONTROL EQUIPMENT OF A TRAIL VEHICLE. CONES SHALL HAVE A MINIMUM HEIGHT OF 18". THEY SHALL BE SPACED TO PROTECT THE WET LINE, NORMALLY BETWEEN 120' AND 200'. IN AREAS OF TRAFFIC CONGESTION, ON CURVES AND AT OTHER LOCATIONS WHERE TRACKING OF THE WET LINE IS EXPECTED SPACINGS AS CLOSE AS 20' MAY BE REQUIRED. THE WET PAINT-KEEP OFF SIGNS (R-87-24) SHALL BE PLACED FACING TRAFFIC AT:

A. THE BEGINNING AND END OF LINE APPLICATION,
B. ALL SIDE AND CROSS ROADS, AND
C. MAXIMUM INTERVALS OF ONE MILE.

WHEN LANE LINE MARKINGS REQUIRE GREATER THAN A TWO MINUTE DRYING TIME, THE LANE FROM WHICH THE LINE MARKING MACHINE APPLIES LANE LINE MARKINGS SHALL BE CLOSED UNTIL THE LINE HAS DRIED TO A TOTALLY TRACK FREE CONDITION.

IMMOBILE OPERATIONS

WHEN LOADING MATERIAL, CLEANING OR PERFORMING OTHER OPERATIONS IN THE FIELD, EVERY EFFORT SHALL BE MADE TO HAVE ALL EQUIPMENT COMPLETELY OFF OF THE TRAVELED WAY. WHEN IT BECOMES NECESSARY TO ENTER UPON PRIVATE PROPERTY, PERMISSION SHALL BE OBTAINED IN ADVANCE. WHEN THE CONTRACTOR CANNOT REMOVE HIS EQUIPMENT FROM THE TRAVELED WAY ALL TRAFFIC CONTROL DEVICES ON THE VEHICLES SHALL BE IN OPERATION AND FLAGGERS AND VEHICLES SHALL BE STATIONED TO PROTECT THE WORK SITE AND THE TRAVELING PUBLIC.

TWO-WAY TRAFFIC SHALL BE MAINTAINED. FLAGGERS SHALL BE EQUIPPED IN ACCORDANCE WITH ITEM 614.03.

AUXILIARY MARKINGS

PAVEMENT PREPARATION AND PLACING OF AUXILIARY MARKINGS (SEE (3)) ARE CONSIDERED TO BE STATIONARY OPERATIONS AND TRAFFIC CONTROL SHALL BE IN ACCORDANCE WITH PLAN DETAILS, STANDARD CONSTRUCTION DRAWINGS AND THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (OMUTCD).

LAYOUT AND PREMARKING

THE VEHICLE USED IN LAYOUT AND PREMARKING SHALL BE EQUIPPED AND OPERATED WITH THE FOLLOWING EQUIPMENT:

1. A 360° ROTATING OR FLASHING AMBER BEACON CLEARLY VISIBLE IN ALL DIRECTIONS A MINIMUM OF ONE-QUARTER MILE.
2. LIGHTED HEADLIGHTS AND TAILLIGHTS, AND
3. A KEEP RIGHT SIGN (OC-3IR-48) MOUNTED A MINIMUM OF 5' ABOVE THE ROAD SURFACE, MEASURED TO THE BOTTOM OF THE SIGN, AND VISIBLE TO OPPOSING TRAFFIC.

NIGHTTIME OPERATION

NIGHTTIME OPERATION IS DEFINED TO INCLUDE THE TIME FROM ONE-HALF HOUR AFTER SUNSET TO ONE-HALF HOUR BEFORE SUNRISE, AND AT ANY OTHER TIME WHEN THERE ARE UNFAVORABLE ATMOSPHERIC CONDITIONS OR WHEN THERE IS NOT SUFFICIENT NATURAL LIGHT TO RENDER DISCERNIBLE PERSONS, VEHICLES, AND SUBSTANTIAL OBJECTS ON THE HIGHWAY AT A DISTANCE OF 1000'.

DURING NIGHTTIME CONDITIONS THE FOLLOWING TRAFFIC CONTROL SHALL BE PROVIDED:

1. CONES SHALL BE REFLECTORIZED OR EQUIPPED WITH LIGHTING DEVICES FOR MAXIMUM VISIBILITY (SEE 7E-5, OMUTCD), AND
2. THE GUIDE AND SIDE-MOUNTED CARRIAGES SHALL BE ILLUMINATED.

THE PRESENCE OF HIGHWAY LIGHTING DOES NOT WAIVE THESE REQUIRMENTS.

MINIMUM PAVEMENT MARKING TRAFFIC CONTROL EQUIPMENT REQUIREMENTS

THIS TABLE INDICATES THE TRAFFIC CONTROL EQUIPMENT WHICH SHALL BE FURNISHED FOR EACH TYPE OF LONG LINE PAVEMENT MARKING OPERATION. IN ADDITION, THE TYPE OF TRAFFIC CONTROL EQUIPMENT WHICH SHALL BE FURNISHED WHEN DIRECTED BY THE ENGINEER IS INDICATED.

EQUIPMENT	PAVEMENT MARKING LINE TYPE (1)					
	CENTER LINE		EDGE LINE		LANE LINE (2) CHANNELIZING LINE (3)	
	LONGER THAN 2 MIN. DRY	2 MIN. OR LESS DRY	LONGER THAN 2 MIN. DRY	2 MIN. OR LESS DRY	LONGER THAN 2 MIN. DRY	2 MIN. OR LESS DRY
LEAD VEHICLE	A	A	C	C	C	C
POWER BROOM EQUIPMENT	B	B	A	A	B	B
LINE MARKING MACHINE	A	A	A	A	A	A
TRAIL VEHICLE	D	A	D	A	LANE CLOSURE REQUIRED (28" CONES REQUIRED)	A
TRAIL VEHICLE (ADDITIONAL)	C	B	C	B		A
TRAIL VEHICLE (SIGN & CONE RETRIEVAL)	A	C	A	C		C
TRAIL VEHICLE (SHADOW FOR RETRIEVAL)	A	C	A	C		C

(1) FOR EQUIPMENT REQUIREMENTS FOR AUXILIARY MARKING OPERATIONS SEE THE PLANS AND PART 7, OMUTCD.

(2) INCLUDES BOTH DASHED AND SOLID LANE LINES.

(3) CHANNELIZING LINE SEGMENTS OF 200 FEET OR LESS SHALL BE CONSIDERED AUXILIARY MARKINGS, EXCEPT WHEN APPLIED AS COMPONENTS OF GORE MARKINGS SPRAYED IN MOVING OPERATIONS SEPARATE FROM THE APPLICATION OF TRANSVERSE LINES.

A	REQUIRED EQUIPMENT
B	EQUIPMENT REQUIRED WHEN DIRECTED BY THE ENGINEER
C	NOT REQUIRED
D	REQUIRED EQUIPMENT FOR SIGN & CONE PLACEMENT

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

MAINTENANCE OF TRAFFIC

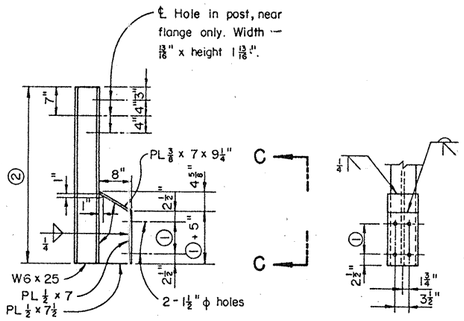
TRAFFIC CONTROL FOR LONG LINE PAVEMENT MARKING OPERATIONS

STANDARD CONSTRUCTION DRAWING MT-99.20

APPROVED [signature] ENGR. OF DESIGN SERVICES

DATE
11/14/86
04/29/88

WC



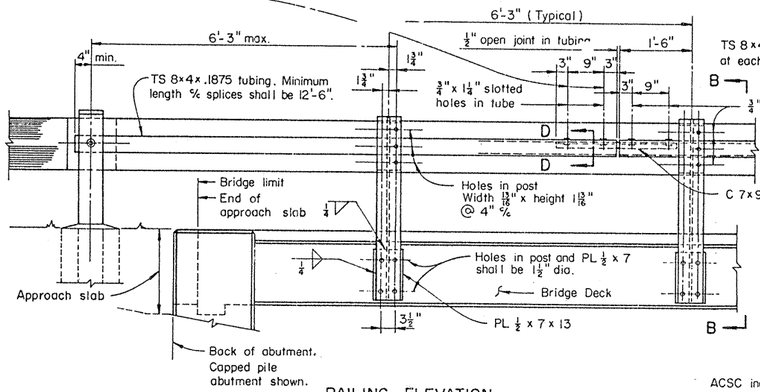
Dimension ① is 6" or 8" depending on box beam depth. See project plans and POST ANCHORAGE DETAILS, PRESTRESSED CONCRETE BOX BEAMS.

For Dimension ② see project plans.

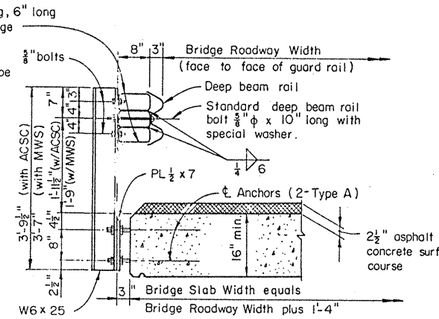
SECTION B-B
TYPE 2 POST

(For use with prestressed concrete box beams)

Bolts in slotted holes shall not be drawn up so tight as to prevent sliding between the tube and channel.

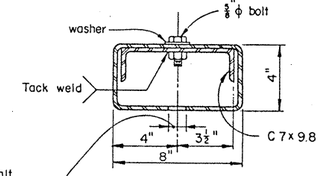


RAILING ELEVATION
(Type 1 posts shown)



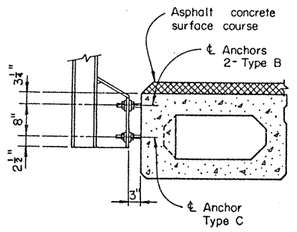
ACSC indicates Asphalt Concrete Surface Course.
MWS indicates Monolithic Wearing Surface.

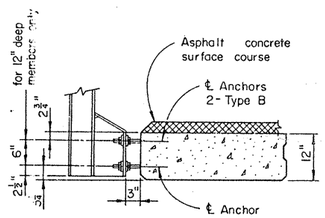
SECTION B-B
TYPE 1 POST



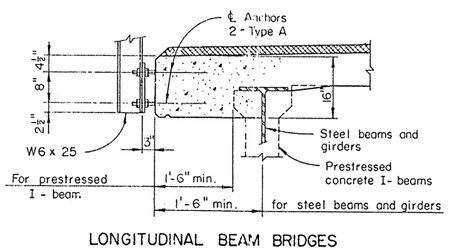
SECTION D-D

1" ϕ drain hole (only in tube at lowest point when sag vertical curves are encountered). Location to be shown on project plans.

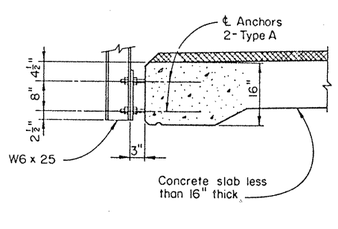




POST ANCHORAGE DETAILS
PRESTRESSED CONCRETE BOX BEAMS

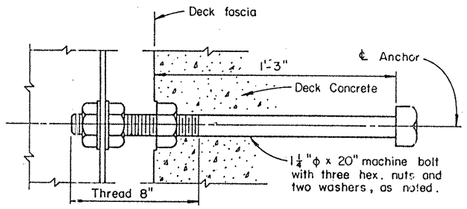


LONGITUDINAL BEAM BRIDGES

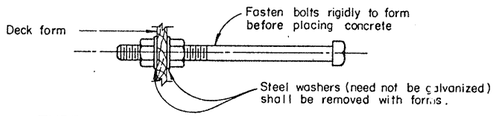


CONCRETE SLABS

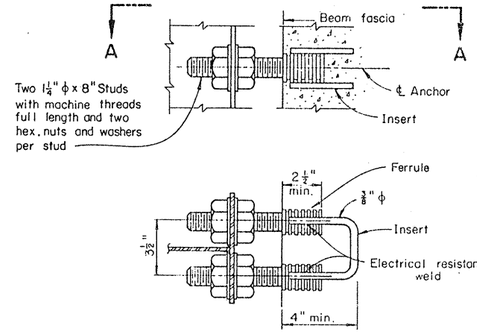
POST ANCHORAGE DETAILS
(Not for use with prestressed concrete box beams)



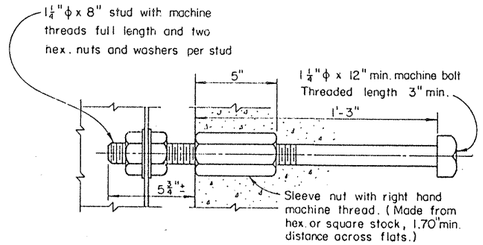
TYPE A ANCHOR DETAIL



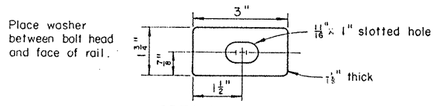
TYPE A ANCHORS SUPPORTED BY FORMS



SECTION A-A
TYPE C ANCHOR DETAIL



TYPE B ANCHOR DETAIL



SPECIAL WASHER

MATERIAL: All anchor bolts, nuts and studs shall conform to the physical properties of ASTM-A325 except that the minimum elongation shall be 10%. The chemical properties are waived.

GALVANIZING: All guard rail posts, tubes, hardware and accessories shall be galvanized in accordance with ASTM A123 or ASTM A153, except as otherwise noted.

TYPE C ANCHOR INSERTS of a different type may be provided if approved by the Director.

REVISIONS	STATE OF OHIO DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS BUREAU OF BRIDGES
	STANDARD
	DEEP BEAM BRIDGE GUARD RAIL WITH TUBULAR BACKUP
	APPROVED: Robert B. Chisha DATE: 4/10/73 ENGINEER OF BRIDGES — DRAWING NO. DBR-2-73

PREPARED	TRACED	CHECKED	REVIEWED
INNES	TGC	CPD	BFG FHR MFW