ogortney@D11CD114 - GT100.m - Wednesday February 23 2000 12:34:22 PM EST

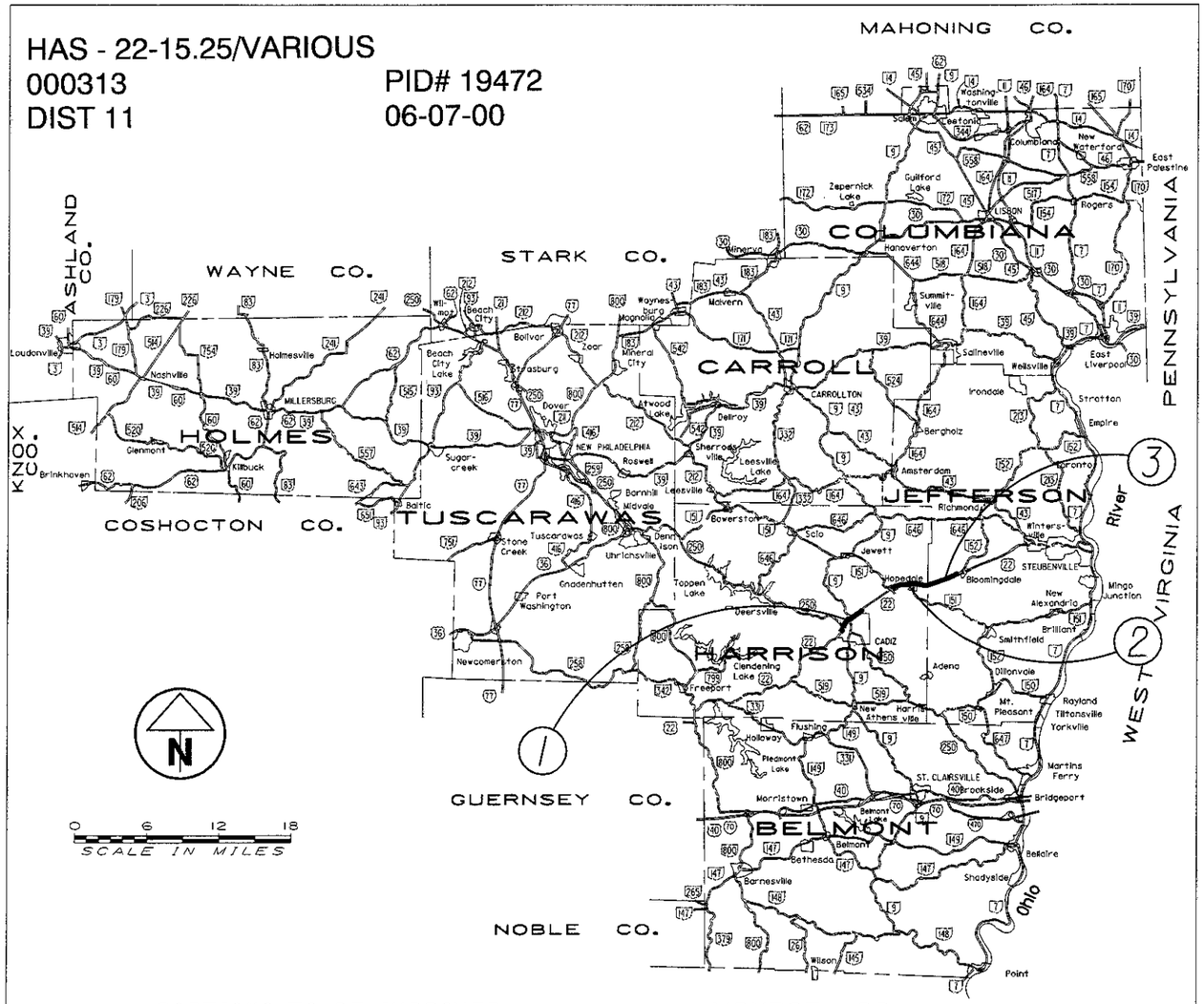
OHIO DEPARTMENT OF TRANSPORTATION

PLAN NO.

858 RESURFACING

HAS - 22-15.25/VARIOUS
000313
DIST 11

PID# 19472
06-07-00



PORTIONS TO BE IMPROVED

PART	COUNTY	ROUTE	SECTIONS	PROJECT TERMINI BEGIN	PROJECT TERMINI END	NET LENGTH MILES	VILLAGE
1	HAS	22	(15.25)	15.25	18.91	7.10	
2	HAS	22	(21.68)	21.68	25.23	6.92	
3	JEF	22	(0.00)	0.00	3.86	7.72	

The Standard 1997 Specifications of the State of Ohio, Department of Transportation, including changes and Supplemental Specifications listed in the plans and proposal 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 & 3 and provisions for the maintenance and safety of traffic will be as indicated in the proposal.

APPROVED DATE 02/23/00
DISTRICT DEPUTY DIRECTOR

APPROVED DATE 3-3-00
Gordon Proctor Jr.
DIRECTOR, DEPARTMENT OF TRANSPORTATION

UNDERGROUND UTILITIES
2 WORKING DAYS
BEFORE YOU DIG
CALL **800-362-2764** (TOLL FREE)
OHIO UTILITIES PROTECTION SERVICE
NON-MEMBERS
MUST BE CALLED DIRECTLY

PLAN PREPARED BY
O.D.O.T.
DISTRICT 11

STANDARD DRAWINGS				SUPPLEMENTAL SPECIFICATIONS			
BP-2.5M	4- 8-97	MT-98.15M	6-24-93	TC-41.20M	7- 1-94	825	1- 6-99
BP-3.1M	10-28-94	MT-98.16M	6-24-93	TC-52.10M	7-29-94	858	7-13-99
		MT-99.10M	1-30-95	TC-52.20M	7-29-94		
		MT-99.20M	1-30-95				
MT-35.10M	1-30-95	MT-105.10M	4-25-94				
MT-35.11M	1-30-95	MT-105.11M	4-25-94				
MT-95.30M	4-25-94	TC-65.10M	11- 1-95				
MT-98.13M	6-24-93	TC-65.11M	11- 1-95				
MT-98.14M	6-24-93	TC-72.20M	9- 1-93				

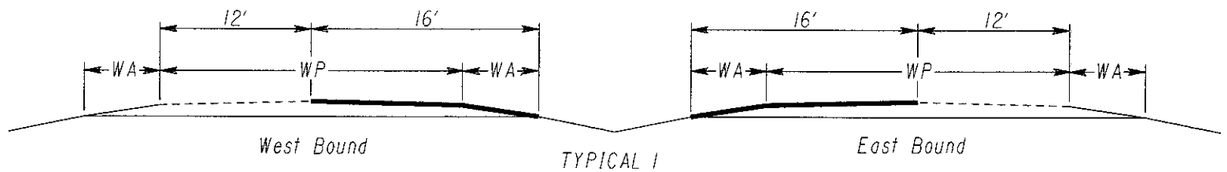
ENGINEERS SEAL:

STATE OF OHIO
CHRISTOPHER JOPNER VARCOLLA
E-55449
REGISTERED PROFESSIONAL ENGINEER

SIGNED: Christopher J. Varcolla
DATE: 2-24-00

FEDERAL PROJECT NO. TE21-G000(129)
PID NO. 19472
CONSTRUCTION PROJECT NO. HAS-22-15.25
TITLE SHEET
1/23

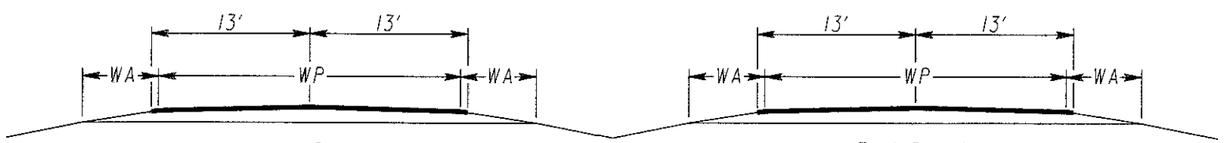
gortney@D11CD114 - GJ100.m - Wednesday February 23 2000 12:56:30 PM EST



TYPICAL 1

PART 1 - HAS-22 - SLM 16.67 TO SLM 18.91

See Planing Detail, this sheet.



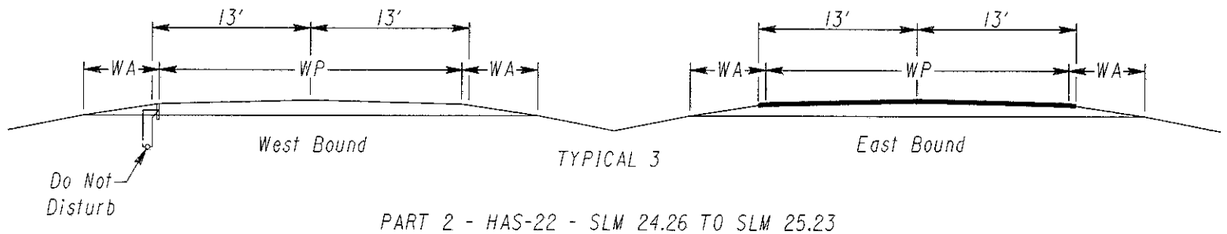
TYPICAL 2

PART 1 - HAS-22 - SLM 15.25 TO SLM 16.67

PART 2 - HAS-22 - SLM 21.68 TO SLM 25.23

PART 3 - JEF-22 - SLM 0.00 TO SLM 3.86

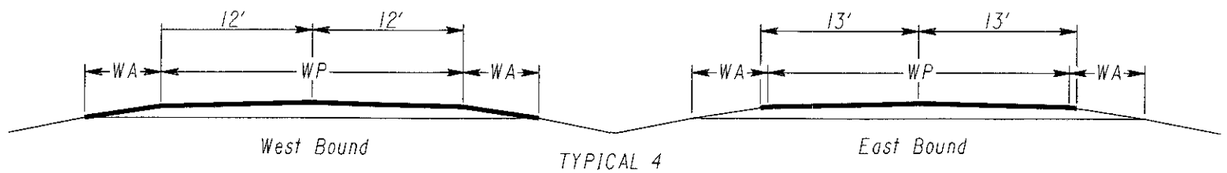
See Planing Detail, this sheet.



TYPICAL 3

PART 2 - HAS-22 - SLM 24.26 TO SLM 25.23

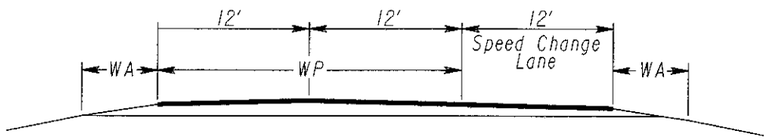
See Planing Detail, this sheet.



TYPICAL 4

PART 2 - HAS-22 - SLM 23.87 TO SLM 25.23

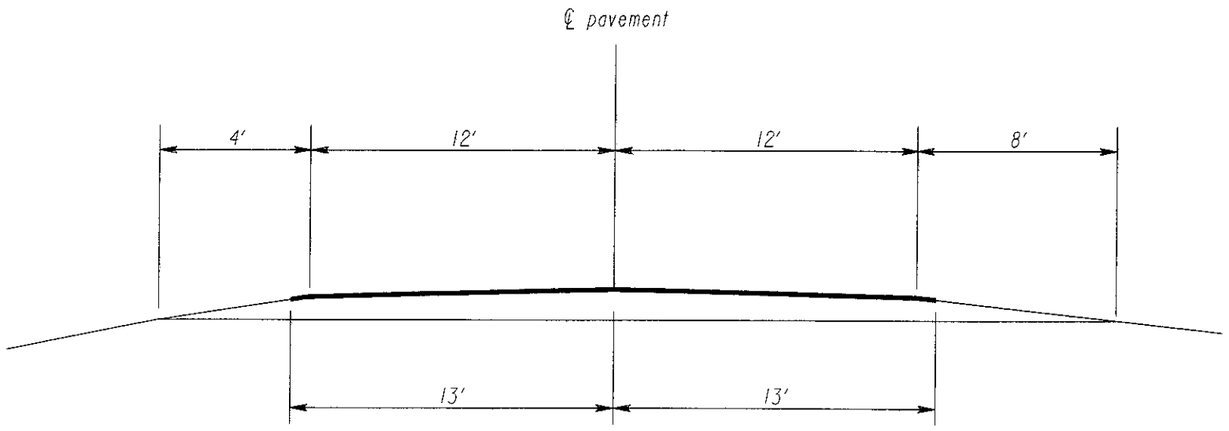
See Planing Detail, this sheet.



TYPICAL 5

PARTS 1 & 2 - Speed Change Lanes

See Planing Detail, this sheet.



PLANING DETAIL

19412

CALCULATED BLG
CHECKED GDM

TYPICAL DETAILS AND PLANING DETAIL

HAS-22-15.25

2/23

ggortney@D11CD114 - GJ100.m - Wednesday February 23 2000 12:53:53 PM EST

CALCULATED BLC CHECKED GDM

BRIDGE TREATMENT

Bridge No. HAS-22-1717R Eastbound - *Omit 237' - Do Not Resurface
Bridge No. HAS-22-1717L Westbound - *Omit 237' - Do Not Resurface

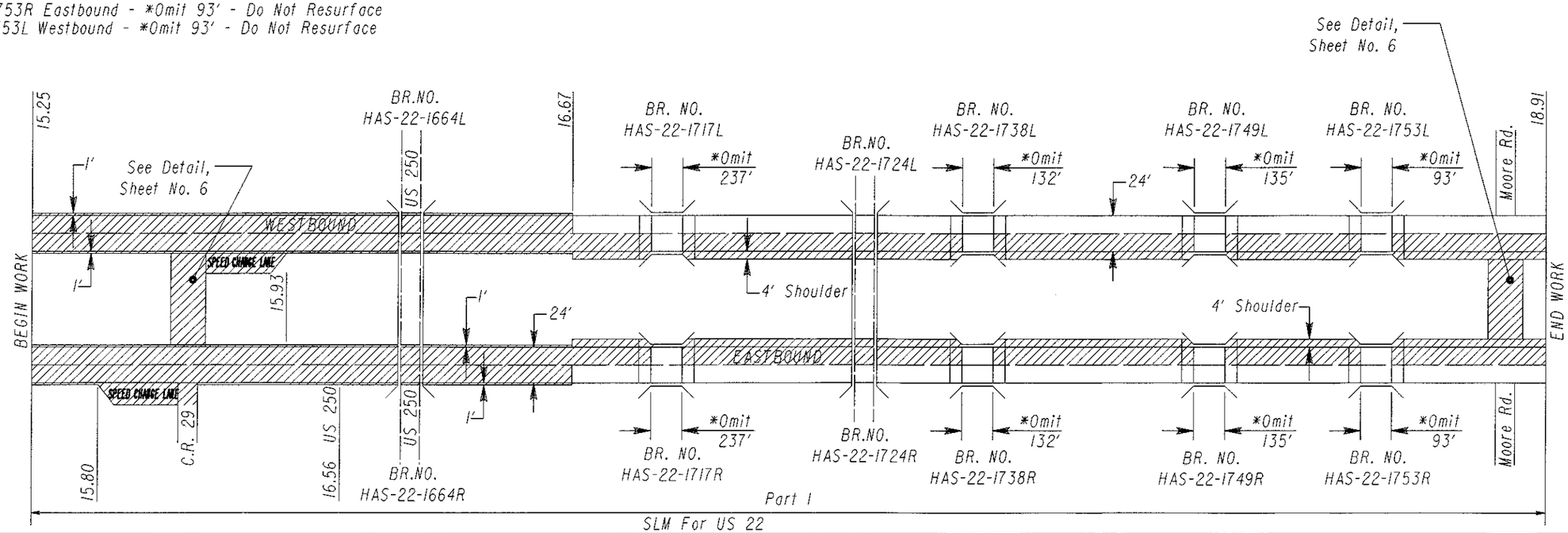
Bridge No. HAS-22-1738R Eastbound - *Omit 132' - Do Not Resurface
Bridge No. Has-22-1738L Westbound - *Omit 132' - Do Not Resurface

Bridge No. HAS-22-1749R Eastbound - *Omit 135' - Do Not Resurface
Bridge No. Has-22-1749L Westbound - *Omit 135' - Do Not Resurface

Bridge No. HAS-22-1753R Eastbound - *Omit 93' - Do Not Resurface
Bridge No. Has-22-1753L Westbound - *Omit 93' - Do Not Resurface

AREA TO BE PLANED AND RESURFACED

FOR TYPICALS AND PLANING DETAIL, SEE SHEET 2



PAVEMENT DATA

PART	ROUTE	LOG POINT TO LOG POINT (STRAIGHT LINE MILEAGE)	LENGTH MILES	LENGTH LIN. FT.	WP FEET	TYPICAL	EXISTING TYPE PAVEMENT	PAVEMENT AREA SQ. YDS.	PROPOSED PAVEMENT 407 TACK COAT @ 0.075 gal/s.y. GALLONS	ASPHALT CONCRETE, TYPE I, PG64-22 ITEM 448 INTERMEDIATE COURSE THICK INCHES MIN.	ITEM 448 INTERMEDIATE COURSE SPOT LEVELING CU. YD.	ITEM 858 THICK INCHES	ITEM 858 SURFACE COURSE, As Per Plan CU. YD.	ITEM 448 INTERMEDIATE COURSE THICK INCHES AVG.	ITEM 448 INTERMEDIATE COURSE CU. YD.	202 RAISED PAVEMENT MARKERS REMOVED FOR STORAGE EACH	254 PAVEMENT PLANING BITUMINOUS * 1½" SQ. YD.
1	US 22	EASTBOUND															
		15.25 to 16.67	1.42	7498	26	2	404	21,661	1625			1.5	903			187	21,661
		16.67 to 18.91	*2.13	*11,230	12	1	404	14,973	1123			1.5	624			281	14,973
		WESTBOUND															
		15.25 to 16.67	1.42	7498	26	2	404	21,661	1625			1.5	903			187	21,661
		16.67 to 18.91	*2.13	*11,230	12	1	404	14,973	1123			1.5	624			281	14,973
	Extra for Speed Change Lanes					5	404	1725	129			1.5	72				1725
		Extra for widening						3666	275			1.5	153				
			7.10	37,456				78,659	5900				3279			936	74,993

PAVEMENT DATA

HAS-22-15.25

19412

gortney@D11CD114 - GI100.m - Wednesday February 23 2000 12:55:39 PM EST

BRIDGE TREATMENT

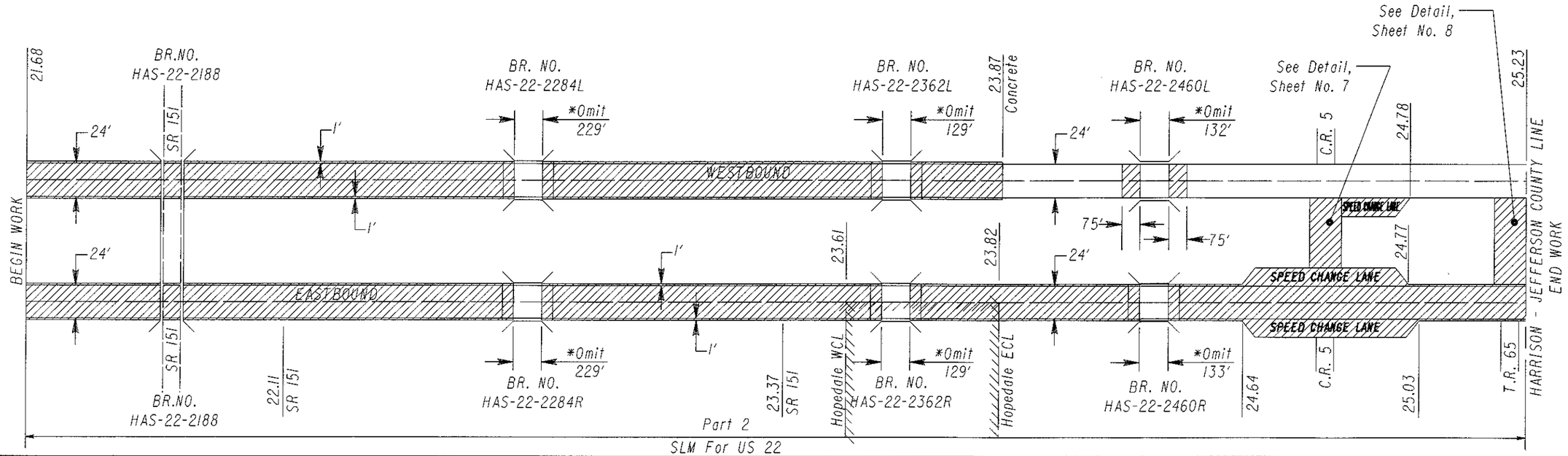
Bridge No. HAS-22-2284R Eastbound - *Omit 229' - Do Not Resurface
Bridge No. HAS-22-2284L Westbound - *Omit 229' - Do Not Resurface

Bridge No. HAS-22-2362R Eastbound - *Omit 129' - Do Not Resurface
Bridge No. HAS-22-2362L Westbound - *Omit 129' - Do Not Resurface

Bridge No. HAS-22-2460R Eastbound - *Omit 133' - Do Not Resurface
Bridge No. HAS-22-2460L Westbound - *Omit 132' - Do Not Resurface

AREA TO BE PLANED AND RESURFACED

FOR TYPICALS AND PLANING DETAIL, SEE SHEET 2



PAVEMENT DATA

PART	ROUTE	LOG POINT TO LOG POINT (STRAIGHT LINE MILEAGE)	LENGTH MILES	LENGTH LIN. FT.	WP FEET	TYPICAL	EXISTING TYPE PAVEMENT	PAVEMENT AREA SQ. YDS.	PROPOSED PAVEMENT 407 TACK COAT FOR SURFACE COURSE @ 0.075 gal/s.y. GALLONS	407 TACK COAT 702.13 RUBBERIZED @ 0.075 gal/s.y. GALLONS	407 TACK COAT FOR INTERMEDIATE COURSE @ 0.04 gal/s.y. GALLONS	ASPHALT CONCRETE, TYPE I, PG64-22 ITEM 448 INTERMEDIATE COURSE THICK INCHES MIN.	ITEM 448 INTERMEDIATE COURSE SPOT LEVELING CU. YD.	ITEM 858 THICK INCHES	ITEM 858 SURFACE COURSE, As Per Plan CU. YD.	ITEM 858 INTERMEDIATE COURSE THICK INCHES AVG.	ITEM 858 INTERMEDIATE COURSE CU. YD.	202 RAISED PAVEMENT MARKERS REMOVED FOR STORAGE EACH	202 WEARING COURSE REMOVED SQ. YD.	254 PAVEMENT PLANING BITUMINOUS * 1½" SQ. YD.		
2	US 22	EASTBOUND																					
		21.68 to 25.23	*3.46	*18,253	26	2	404	52,731	3955					1.5	2197			456		52,731		
		WESTBOUND																					
		21.68 to 23.87	*2.12	*11,205	26	2	404	32,370	2428					1.5	1349			280		32,370		
		23.87 to 25.23	*1.34	*7049	24	4	404	18,797		1409	752			1.25	627	1.75	940	176	400			
	Extra for Speed Change Lanes					5	404	5490	412					1.5	229					5490		
		Extra for widening						5199	390					1.5	217							
			6.92	36,507				114,587	7185	1409	752				4619		940	912	400	90,591		

PAVEMENT DATA

CALCULATE BLG CHECKED GDM

HAS-22-15.25

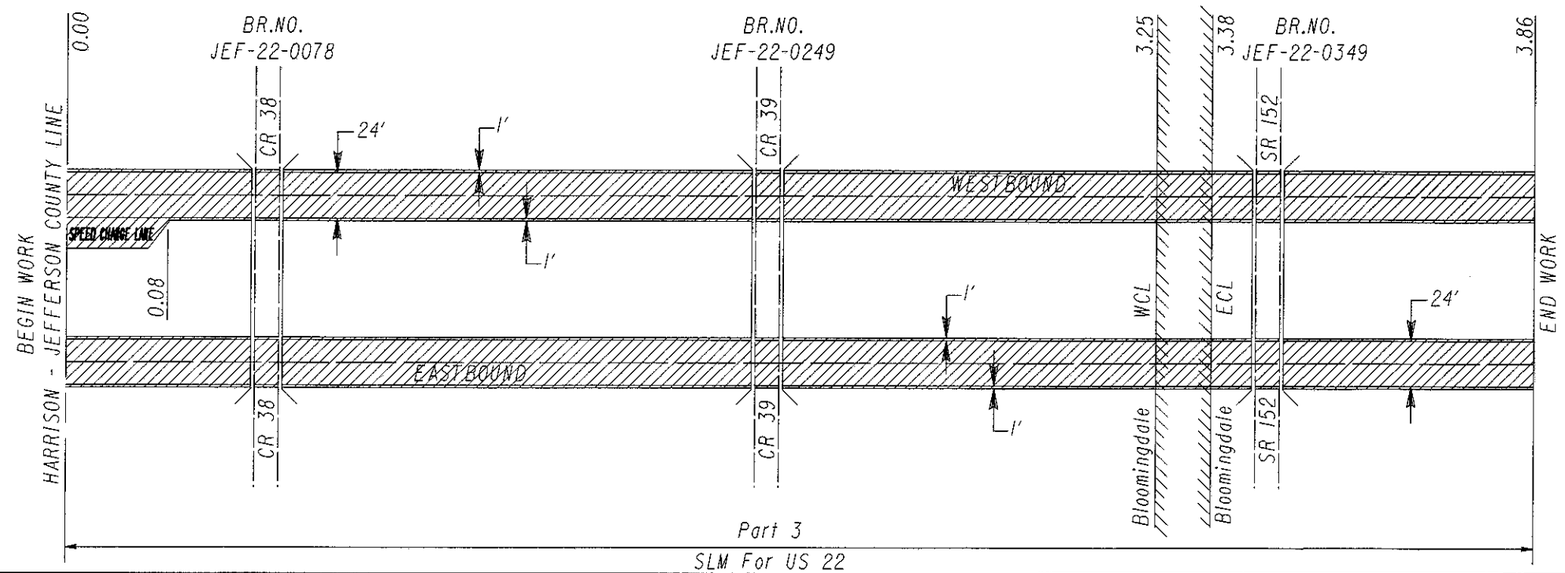
19472

gortney@D11CD114 - GJ100.m - Wednesday February 23 2000 02:13:20 PM EST

BRIDGE TREATMENT
Bridge No. JEF-22-0078 - No work
Bridge No. JEF-22-0249 - No work
Bridge No. JEF-22-0349 - No work

AREA TO BE PLANED AND RESURFACED

FOR TYPICALS AND PLANING DETAIL, SEE SHEET 2



PAVEMENT DATA

PART	ROUTE	LOG POINT TO LOG POINT (STRAIGHT LINE MILEAGE)	LENGTH MILES	LENGTH LIN. FT.	WP FEET	TYPICAL	EXISTING TYPE PAVEMENT	PAVEMENT AREA SQ. YDS.	PROPOSED PAVEMENT 407 TACK COAT @ 0.075 gal/s.y. GALLONS	ASPHALT CONCRETE, TYPE I, PG64-22 ITEM 448 INTERMEDIATE COURSE THICK INCHES MIN.	ITEM 448 INTERMEDIATE COURSE SPOT LEVELING CU. YD.	ITEM 858 THICK INCHES	ITEM 858 SURFACE COURSE, As Per Plan CU. YD.	ITEM 448 INTERMEDIATE COURSE THICK INCHES AVG.	ITEM 448 INTERMEDIATE COURSE CU. YD.	202 RAISED PAVEMENT MARKERS REMOVED FOR STORAGE EACH	254 PAVEMENT PLANING BITUMINOUS * 1½" SQ. YD.
3	US 22	EASTBOUND															
		0.00 to 3.86	3.86	20,381	26	2	404	58,878	4416			1.5	2453			510	58,878
		WESTBOUND															
		0.00 to 3.86	3.86	20,381	26	2	404	58,878	4416			1.5	2453			510	58,878
	Extra for Speed Change Lanes					5	404	563	42			1.5	23				563
		Extra for widening						5888	442			1.5	245				
			7.72	40,762				124,207	9316				5174			1020	118,319

CALCULATED BLG
CHECKED GDM

PAVEMENT DATA

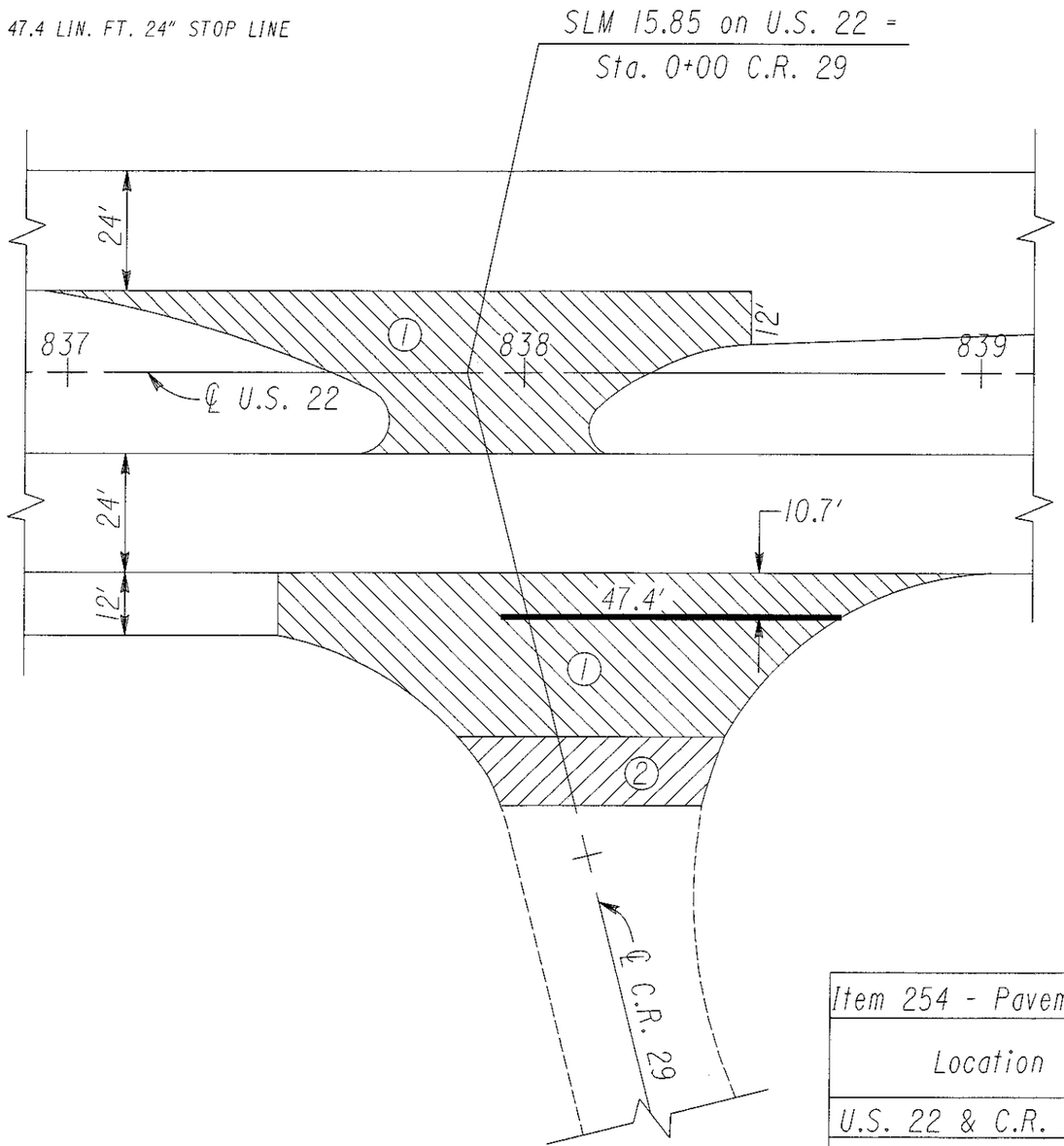
HAS-22-15.25

19472

gortney@D11CD114 - Inters:m - Wednesday February 23 2000 12:58:13 PM EST

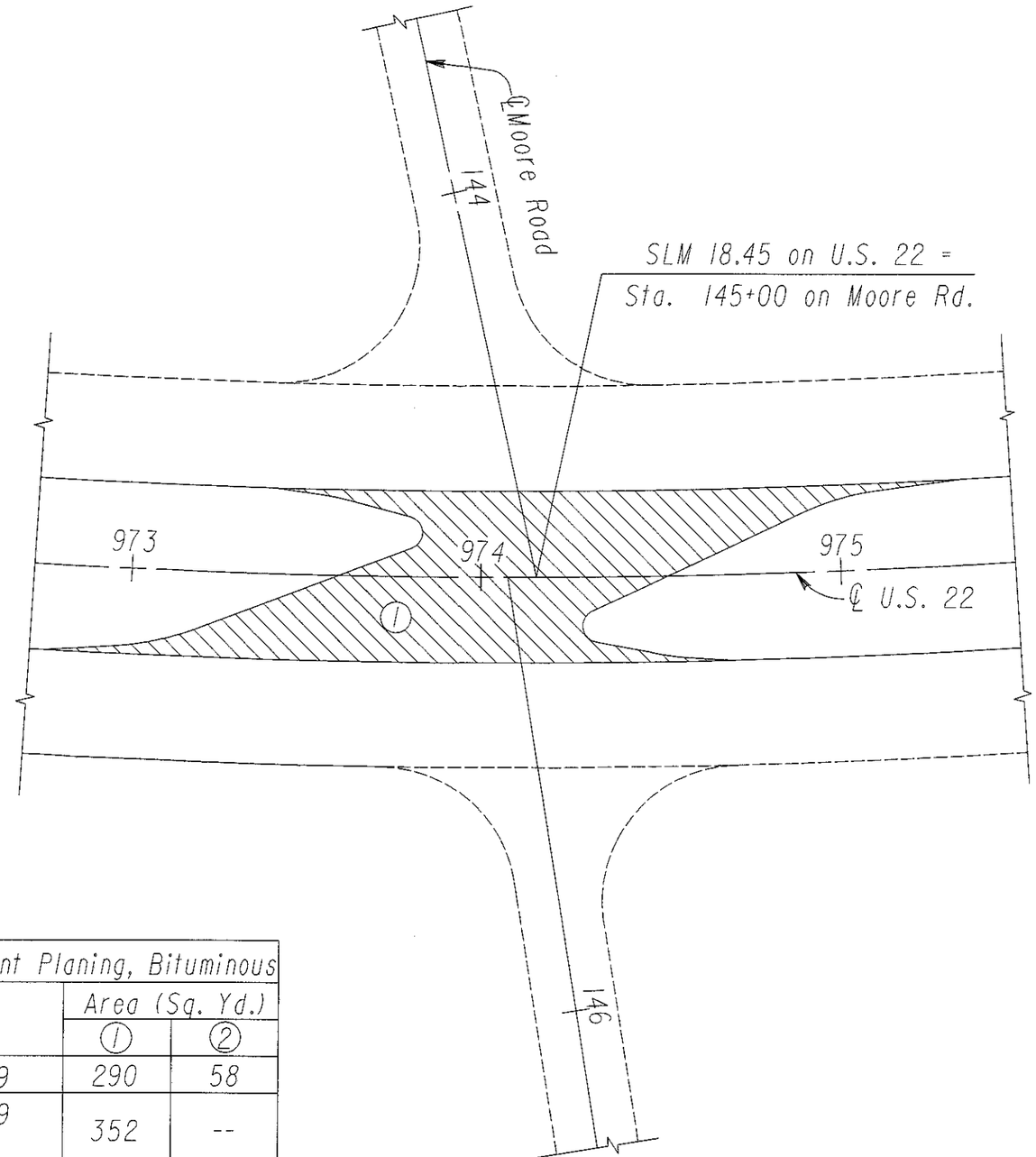
COUNTY HARRISON
ROUTE US 22
LOCATION SLM 15.85

47.4 LIN. FT. 24" STOP LINE



PART I
INTERSECTION DETAIL
U.S. 22 & C.R. 29
Not To Scale

Item 254 - Pavement Planing, Bituminous		
Location	Area (Sq. Yd.)	
	①	②
U.S. 22 & C.R. 29	290	58
U.S. 22 & C.R. 29 Intersection	352	--
Moore Road Intersection	499	--
Total (Carried to General Summary)	1141	58
All Areas Planimetered		



PART I
INTERSECTION DETAIL
U.S. 22 & Moore Road
Not To Scale

CALCULATED BLC
CHECKED GDM

INTERSECTION DETAILS

HAS-22-15.25

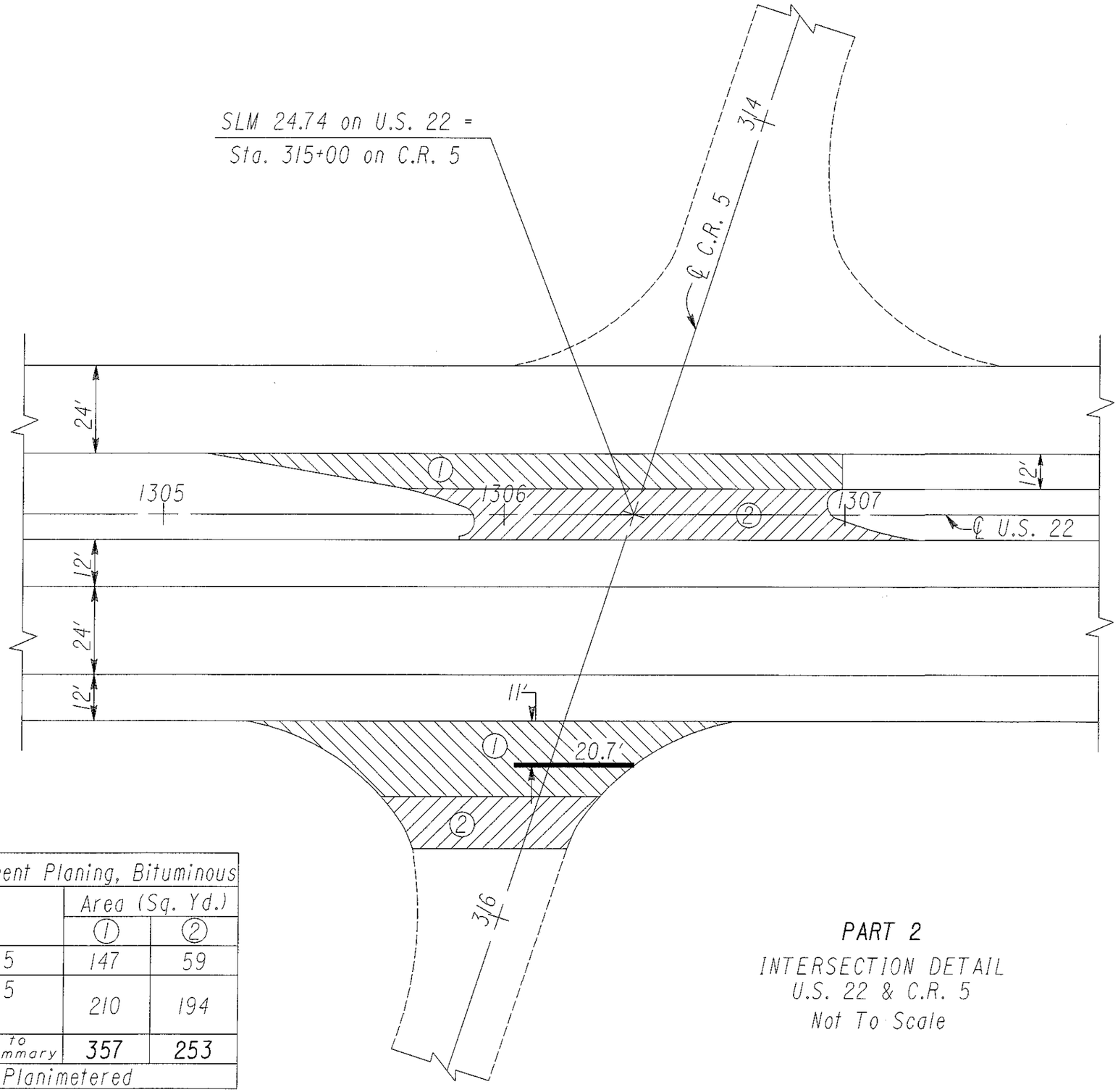
6/23

19412

sgortney@D11CD114 - Inters.m - Wednesday February 23 2000 12:59:58 PM EST

COUNTY HARRISON
ROUTE US 22
LOCATION SLM 24.74

20.7 LIN. FT. 24" STOP LINE



Item 254 - Pavement Planing, Bituminous		
Location	Area (Sq. Yd.)	
	①	②
U.S. 22 & C.R. 5	147	59
U.S. 22 & C.R. 5 Intersection	210	194
Totals Carried to General Summary	357	253
All Areas Planimetered		

PART 2
INTERSECTION DETAIL
U.S. 22 & C.R. 5
Not To Scale

CALCULATED BLG
CHECKED GDM

INTERSECTION DETAILS

HAS-22-15.25

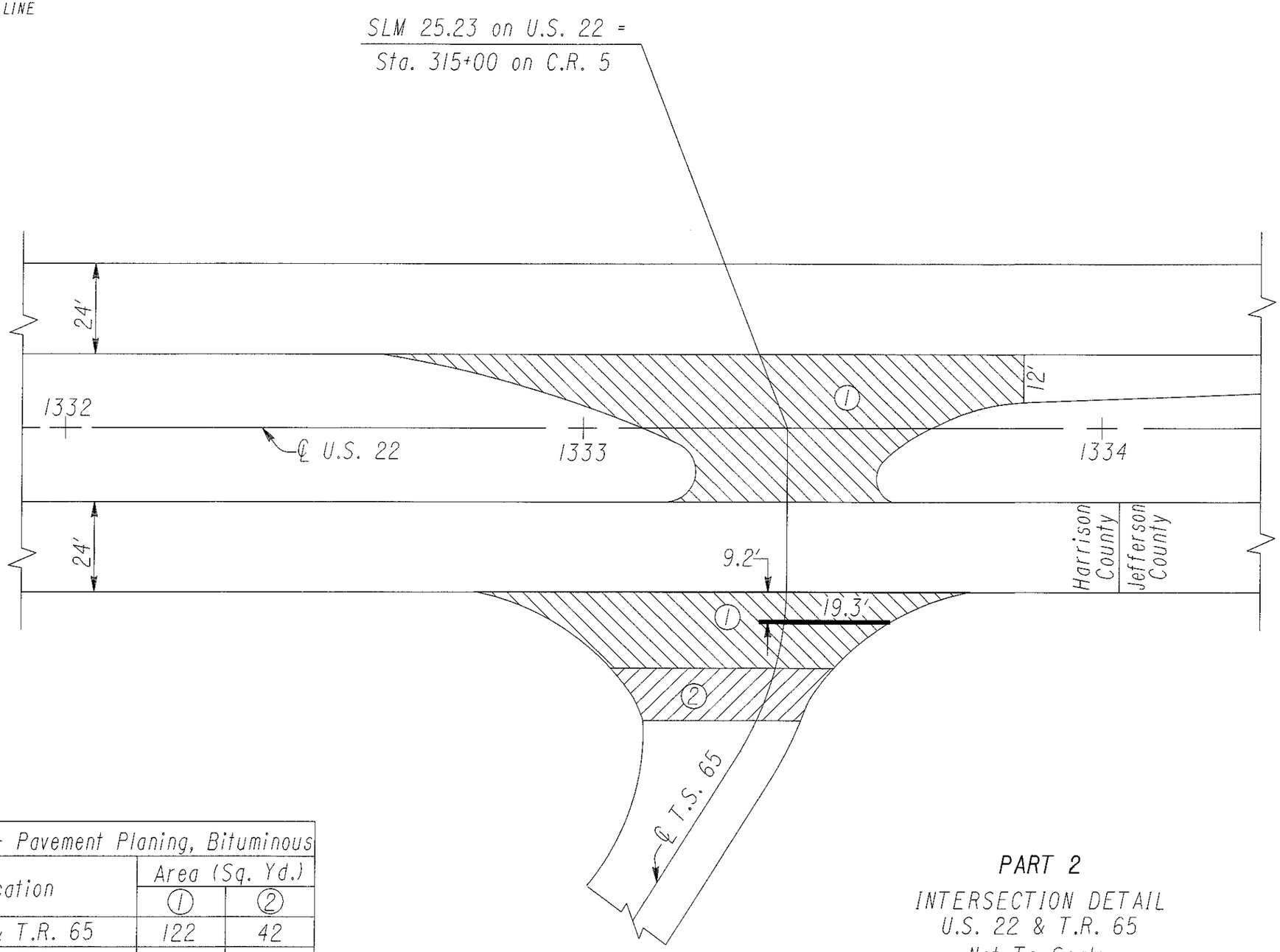
7
23

19412

jgortney@D11CD114 - Inters.m - Wednesday February 23 2000 12:59:06 PM EST

COUNTY HARRISON
ROUTE US 22
LOCATION SLM 25.23

19.3 LIN. FT. 24" STOP LINE



Item 254 - Pavement Planing, Bituminous		
Location	Area (Sq. Yd.)	
	①	②
U.S. 22 & T.R. 65	122	42
U.S. 22 & T.R. 65 Intersection	352	--
Totals (Carried to General Summary)	474	42
All Areas Planimetered		

PART 2
INTERSECTION DETAIL
U.S. 22 & T.R. 65
Not To Scale

CALCULATED BLG
CHECKED GDM

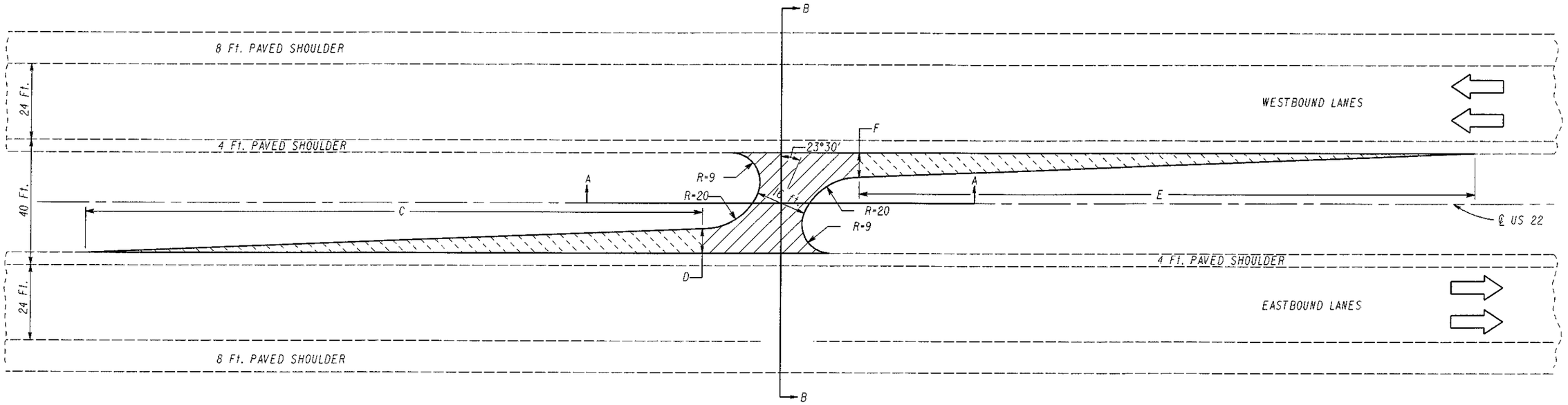
INTERSECTION DETAILS

HAS-22-15.25

8
23

19472

gortney@D11CD114 - UTurn.m - Wednesday February 23 2000 01:09:59 PM EST

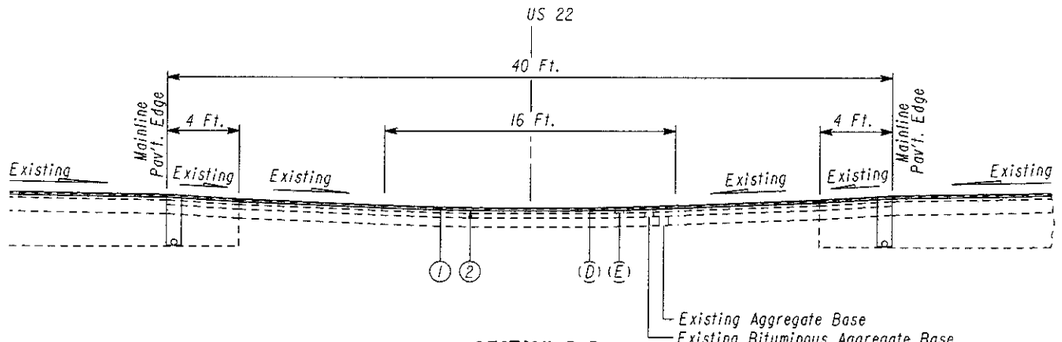


PART I - PLAN
Not To Scale

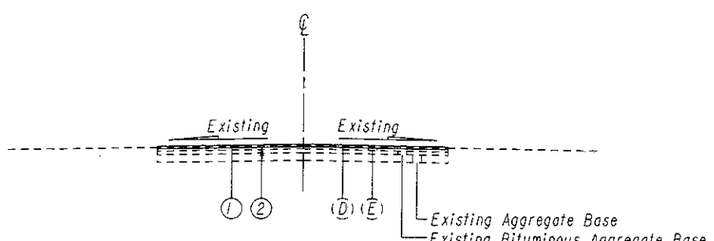
Planimetered Area = 97 sq.yds.

Tapers

SLM 16.48	C=135'	D=6'	E=135'	F=8'
135' x 6' ÷ 2 ÷ 9 =				45 sq.yds.
135' x 8' ÷ 2 ÷ 9 =				60 sq.yds.
				97 sq.yds.
				202 sq.yds.
SLM 16.84	C=95'	D=6'	E=125'	F=6'
95' x 6' ÷ 2 ÷ 9 =				32 sq.yds.
125' x 6' ÷ 2 ÷ 9 =				42 sq.yds.
				97 sq.yds.
				171 sq.yds.
SLM 17.37	C=111.1'	D=6'	E=111.8'	F=6'
111.1' x 6' ÷ 2 ÷ 9 =				37 sq.yds.
111.8' x 6' ÷ 2 ÷ 9 =				37 sq.yds.
				97 sq.yds.
				171 sq.yds.
SLM 17.80	C=124'	D=6'	E=130'	F=6'
124' x 6' ÷ 2 ÷ 9 =				41 sq.yds.
130' x 6' ÷ 2 ÷ 9 =				43 sq.yds.
				97 sq.yds.
				181 sq.yds.



SECTION B-B
Not To Scale



SECTION A-A
Not To Scale

QUANTITIES

Item 858 - 1½" Asphalt Concrete Surface Course, Type B, (446), As Per Plan:
725 sq.yds. x 9 x 0.125 = 815.625 cu. ft.
815.625 cu. ft. ÷ 27 = 30.21 Cu. Yd.

Item 407 - Tack Coat:
725 sq. yds. x 0.075 G = 55 Gallon

Quantities Carried to General Summary

LEGEND

(1) Item 858 - 1½" Asphalt Concrete Surface Course
(2) Item 407 - Tack Coat
(D) Existing Surface Course
(E) Existing Intermediate Course

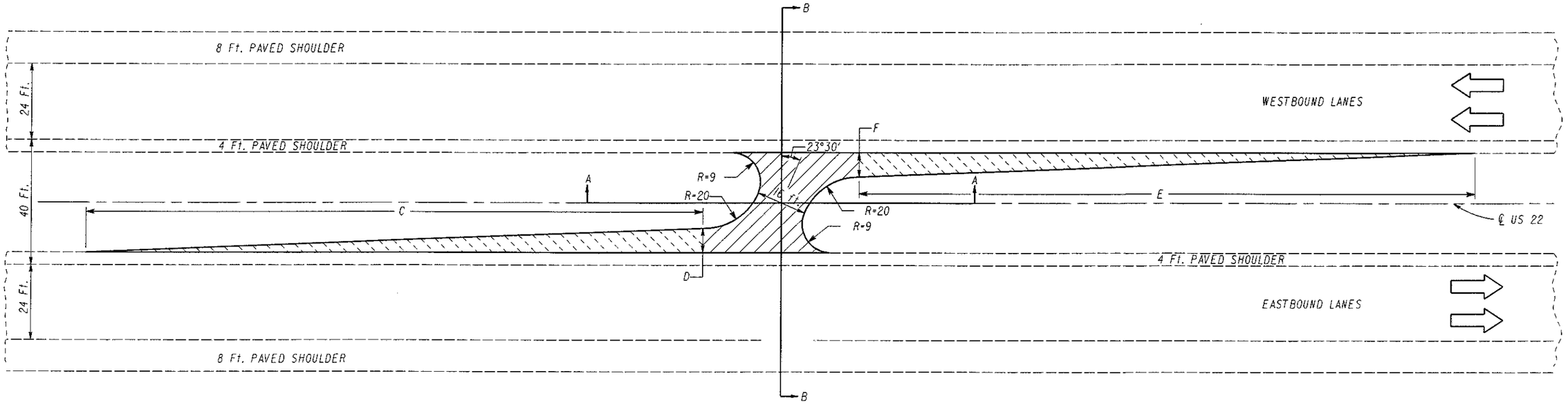
CALCULATED BLG
CHECKED GDM

U-TURN MEDIAN OPENINGS

HAS-22-15.25

19412

gortney@D11CD114 - UTurn.m - Wednesday February 23 2000 01:10:49 PM EST



PART 2 - PLAN
Not To Scale

Planimetered Area = 97 sq.yds.

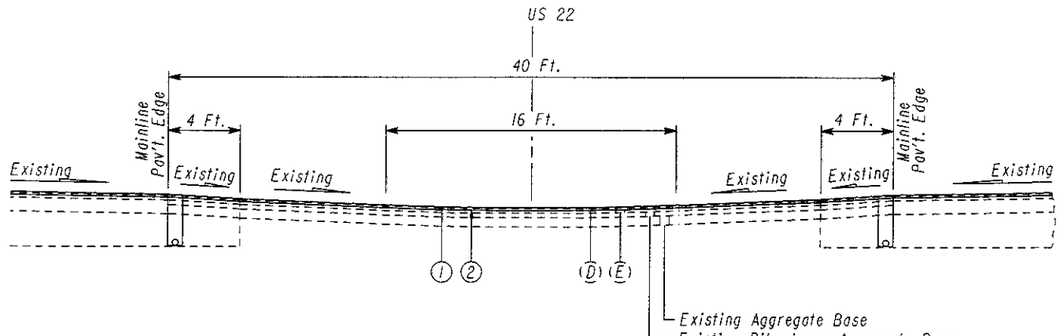
Tapers

SLM 21.91 C=175' D=6' E=180' F=6'
175' x 6' ÷ 2 ÷ 9 = 58 sq.yds.
180' x 6' ÷ 2 ÷ 9 = 60 sq.yds.
97 sq.yds.
215 sq.yds.

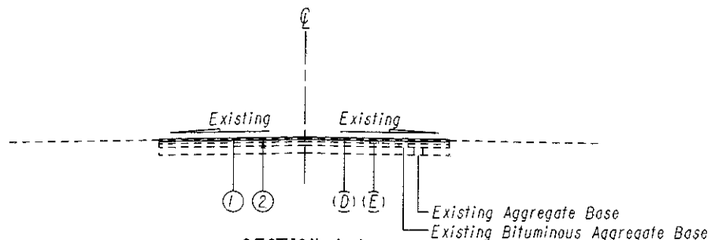
SLM 22.36 C=185' D=6' E=167.3' F=6'
185' x 6' ÷ 2 ÷ 9 = 62 sq.yds.
167.3' x 6' ÷ 2 ÷ 9 = 56 sq.yds.
97 sq.yds.
215 sq.yds.

SLM 23.00 C=191.3' D=6' E=200' F=8'
191.3' x 6' ÷ 2 ÷ 9 = 64 sq.yds.
200' x 8' ÷ 2 ÷ 9 = 89 sq.yds.
97 sq.yds.
250 sq.yds.

SLM 24.16 C=199.1' D=8' E=160' F=6'
99.1' x 8' ÷ 2 ÷ 9 = 88 sq.yds.
160' x 6' ÷ 2 ÷ 9 = 53 sq.yds.
97 sq.yds.
238 sq.yds.



SECTION B-B
Not To Scale



SECTION A-A
Not To Scale

QUANTITIES

Item 858 - 1½" Asphalt Concrete Surface Course, Type B, (446), As Per Plan:
918 sq.yds. x 9 x 0.125 = 1032.75 cu. ft.
1032.75 cu. ft. ÷ 27 = 38.25 Cu. Yd.

Item 407 - Tack Coat:
918 sq. yds. x 0.075 G = 69 Gallon

Quantities Carried to General Summary

LEGEND

(1) Item 858 - 1½" Asphalt Concrete Surface Course
(2) Item 407 - Tack Coat
(D) Existing Surface Course
(E) Existing Intermediate Course

CALCULATED BLG CHECKED GDM

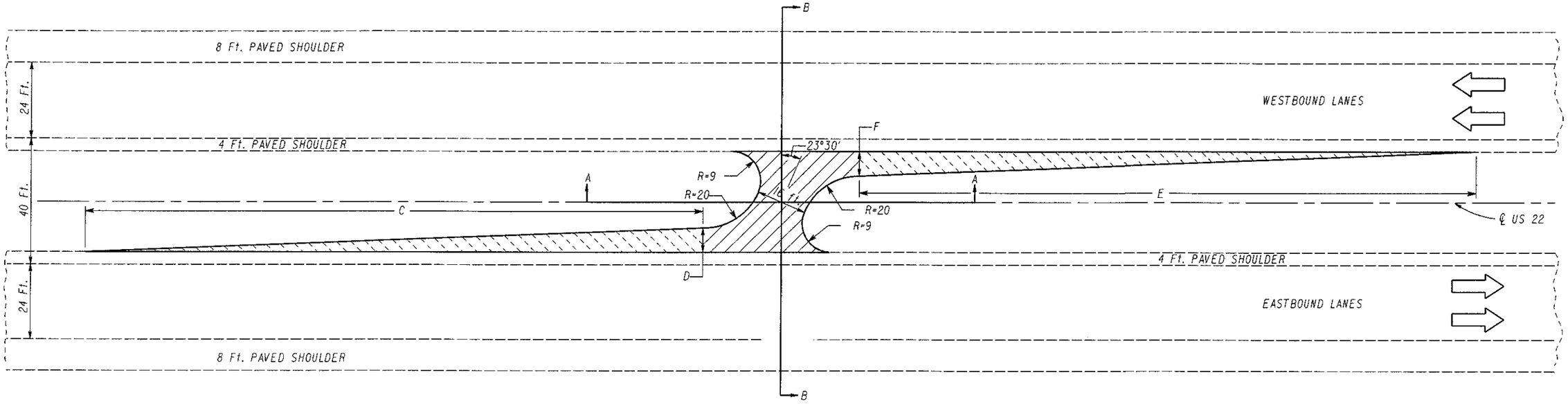
U-TURN MEDIAN OPENINGS

HAS-22-15.25

10
23

19412

gortney@D11CD114 - UTurn.in - Wednesday, February 23 2000 01:11:38 PM EST

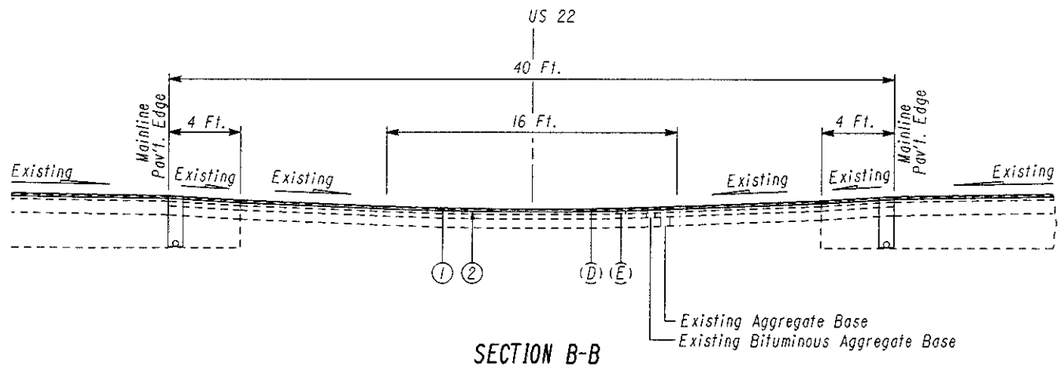


PART 3 - PLAN
Not To Scale

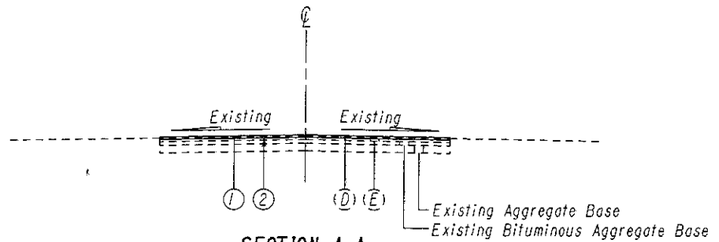
Planimetered Area = 97 sq.yds.

Tapers

SLM 2.97	C=209.6'	D=8'	E=202.5'	F=8'
209.6' x 8' ÷ 2 ÷ 9 =			93 sq.yds.	
202.5' x 8' ÷ 2 ÷ 9 =			90 sq.yds.	
			97 sq.yds.	
			280 sq.yds.	



SECTION B-B
Not To Scale



SECTION A-A
Not To Scale

QUANTITIES

Item 858 - 1½" Asphalt Concrete Surface Course, Type B, (446), As Per Plan:
280 sq.yds. x 9 x 0.125 = 315 cu. ft.
315 cu. ft. ÷ 27 = 11.67 Cu. Yards

Item 407 - Tack Coat:
280 sq. yds. x 0.075 G = 21 Gallon

Quantities Carried to General Summary

LEGEND

1. Item 858 - 1½" Asphalt Concrete Surface Course
2. Item 407 - Tack Coat
D. Existing Surface Course
E. Existing Intermediate Course

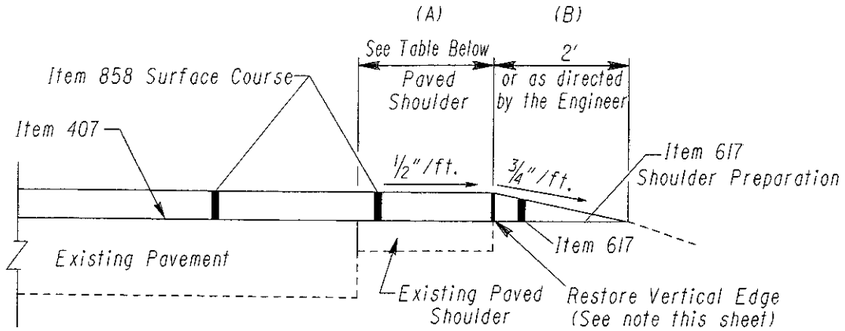
CALCULATED BLG
CHECKED GDM

U-TURN MEDIAN OPENINGS

HAS-22-15.25

1941.2

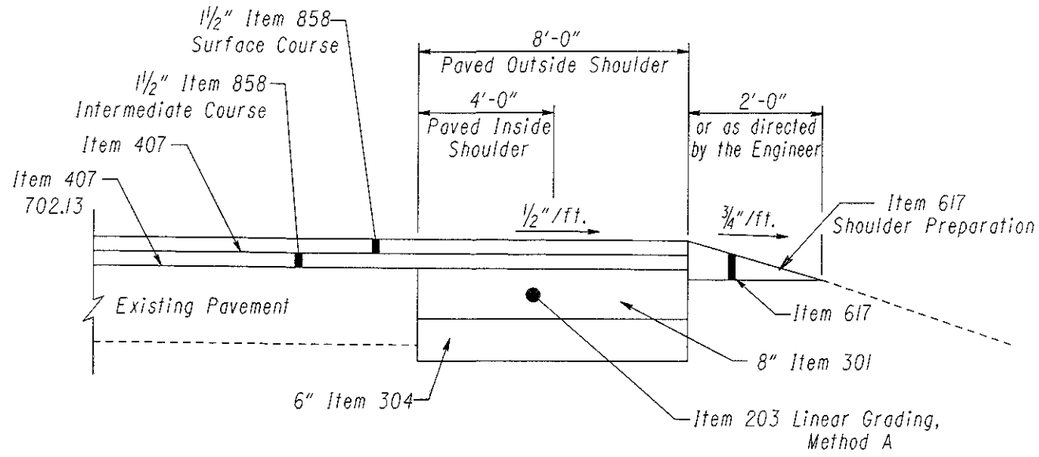
gortney@D11CD114 - GI111.m - Wednesday, February 23 2000 12:57:22 PM EST



1. TYPICAL PAVED SHOULDER DETAIL

SHOULDER PREPARATION

The Contractor per Section 617.04 shall restore a straight vertical edge to obtain the width shown in the Typical Paved Shoulder Detail. Where there are no paved shoulders present, then the straight vertical edge shall be at the edge of pavement to obtain the widths listed in the Pavement Data Sheet of this plan, or as directed by Engineer.



2. TYPICAL PAVED SHOULDER DETAIL

SHIELD

The Contractor shall provide a shield to prevent the spraying or drifting of liquid bituminous material onto the edge of the pavement or edgeline. The attention of the Contractor is directed to 107.12 of the specifications.

CALCULATED BLG CHECKED GDM

PAVED SHOULDER DATA

PAVED

PAVED SHOULDER DATA

PART	ROUTE	LOG POINT TO LOG POINT	LENGTH MILES	LENGTH LIN. FT.	TYPICAL	PROPOSED WIDTH (FT.) LEFT A	LEFT B	RIGHT A	RIGHT B	SHOULDER AREA SQ. YDS.	203 LINEAR GRADING METHOD A AS PER PLAN STATION	301 BITUMINOUS AGGREGATE BASE, AC-20 AVG. THICK INCHES	301 CU. YD.	304 AGGREGATE BASE AVG. THICK INCHES	304 CU. YD.	254 PAVEMENT PLANING BITUMINOUS SQ. YD.	858 ASPHALT CONCRETE SURFACE COURSE TYPE 1, PG64-22, AS PER PLAN THICK INCHES	858 CU. YD.	858 ASPHALT CONCRETE INTERMEDIATE COURSE TYPE 2, PG64-22 THICK INCHES	858 CU. YD.	407 TACK COAT @ 0.075 gal/sq.yd. GALLONS	407 TACK COAT FOR INTERMEDIATE COURSE @ 0.04 gal/sq.yd. GALLONS	617 COMPACTED AGGREGATE, TYPE A 2½" AVG. THICKNESS CU. YD.	617 SHOULDER PREPARATION SQ. YD.
1	US 22	EASTBOUND																						
		16.67 to 18.91	*2.13	*11,230	1			4		4991						4991	1.5	208			374			
			*(2.13)	*(11,230)	1				2	2496													175	2496
		WESTBOUND																						
		16.67 to 18.91	*2.13	*11,230	1	4				4991						4991	1.5	208			374			
			*(2.13)	*(11,230)	1		2			2496													175	2496
		TOTAL PART 1	4.26	22,460						14,974						9982		416			748		350	4992
2	US 22	WESTBOUND																						
		23.87 to 25.23	*1.34	*7049	2	8		4		9399	71	8	2099	6	1566	9399	1.5	392	1.5	392	705	376		
			*(1.34)	*(7049)	2		2		2	3133													219	3133
		TOTAL PART 2	1.34	7049						12,532	71		2099		1566	9399		392		392	705	376	219	3133

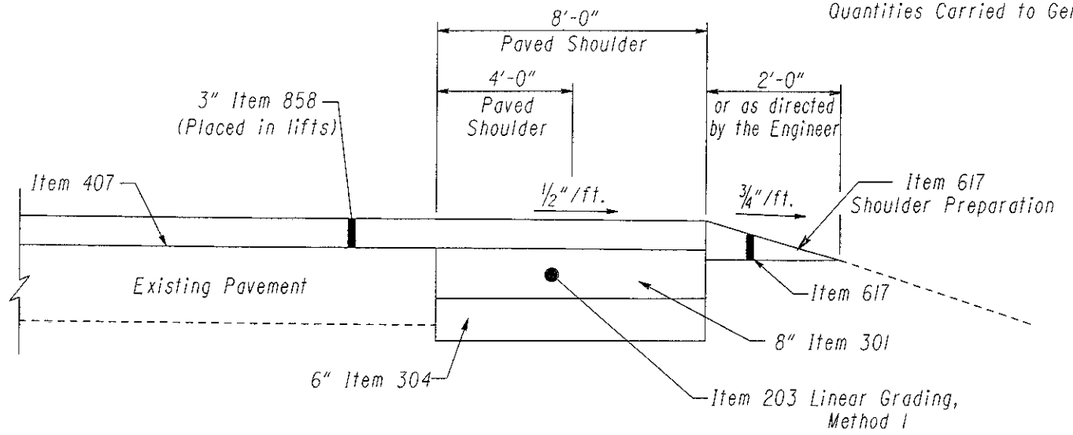
HAS-22-15.25

12/23

1942

gortney@DIICD114 - GA100.m - Wednesday February 23 2000 12:53:02 PM EST

Quantities Carried to General Summary



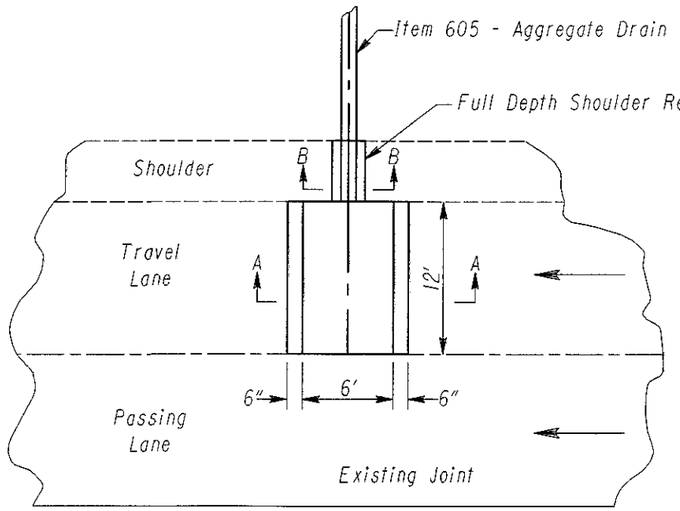
TYPICAL PAVED SHOULDER RE-CONSTRUCTION DETAIL

Part 1 - Item 858 - Asphalt Concrete Surface Course, 12.5 mm, Type B, (446), As Per Plan		224 Cu. Yd.
Item 203 - Linear Grading, Method A, As Per Plan	33	Station
Item 301 - Bituminous Aggregate Base, PG64-22	2214	Cu. Yd.
Item 304 - Aggregate Base	1659	Cu. Yd.
Item 407 - Tack Coat, As Per Plan	403	Gallon
Item 605 - Aggregate Drain, As Per Plan	213	Feet
Item 617 - Compacted Aggregate, Type A	63	Cu. Yd.
Item 617 - Shoulder Preparation	1788	Sq. Yd.
Part 2 - Item 858 - Asphalt Concrete Surface Course, 12.5 mm, Type B, (446), As Per Plan		93 Cu. Yd.
Item 203 - Linear Grading, Method A, As Per Plan	5	Station
Item 301 - Bituminous Aggregate Base, PG64-22	495	Cu. Yd.
Item 304 - Aggregate Base	371	Cu. Yd.
Item 407 - Tack Coat, As Per Plan	167	Gallon
Item 605 - Aggregate Drain, As Per Plan	208	Feet
Item 617 - Compacted Aggregate, Type A	34	Cu. Yd.
Item 617 - Shoulder Preparation	960	Sq. Yd.
Part 3 - Item 858 - Asphalt Concrete Surface Course, 12.5 mm, Type B, (446), As Per Plan		15 Cu. Yd.
Item 203 - Linear Grading, Method A, As Per Plan	8	Station
Item 301 - Bituminous Aggregate Base, PG64-22	80	Cu. Yd.
Item 304 - Aggregate Base	60	Cu. Yd.
Item 407 - Tack Coat, As Per Plan	27	Gallon
Item 605 - Aggregate Drain, As Per Plan	232	Feet
Item 617 - Compacted Aggregate, Type A	3	Cu. Yd.
Item 617 - Shoulder Preparation	85	Sq. Yd.

The above estimated quantities are to be used as directed by the Engineer. Final payment for these items shall be for the actual quantity used.

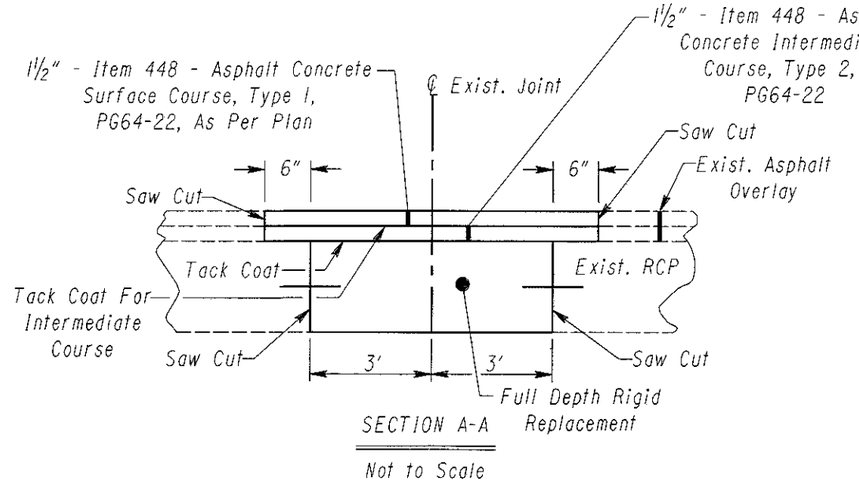
NOTE: If needed Item 605 - Aggregate Drain, As Per Plan will be used in accordance with Item 605.06 of the CMS. The Aggregate Drain, As Per Plan shall be placed prior to placing the first shoulder repair course. Aggregate shall be No. 57 size, unless otherwise directed by the Engineer.

For Details Not Shown See Std. Dwg's. That Apply.



Item Special - Full Depth Rigid Pavement Replacement, As Per Plan

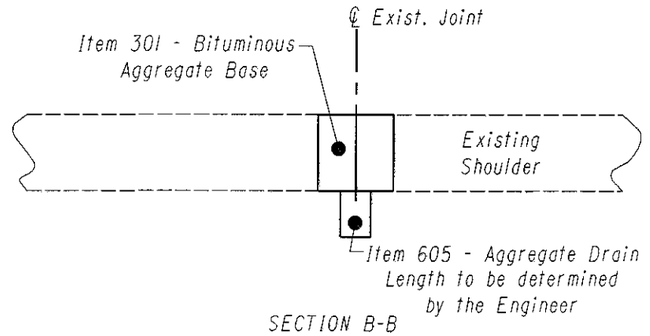
Not to Scale



SECTION A-A

Not to Scale

NOTE: Asphalt, Pavement Sawing, Removal & Replacement is to be included in the Unit Price Bid.



SECTION B-B

Not to Scale

CALCULATED BLG
CHECKED GDM

SHOULDER REPAIR / ITEM 605 - AGGREGATE DRAIN

HAS-22-15.25

13
23

1947.2

gortney@D11CD114 - dropoffzo.m - Wednesday February 23 2000 12:51:47 PM EST

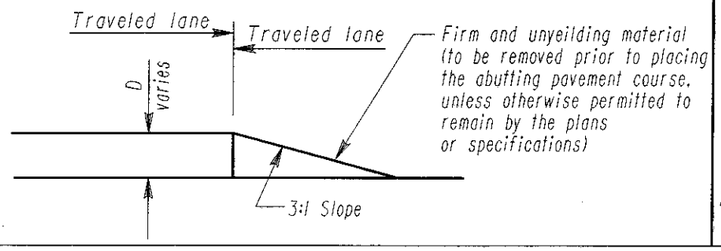
GENERAL NOTES

1. It is intended that this drawing be used for treatment of drop-offs that develop during construction operations, and that are not otherwise provided for in the construction plans. Where the plans do not provide specific items for labor, equipment, or materials to implement the drop-off treatments specified hereon, they shall be included for payment in the lump sum bid for Item 614 - Maintaining Traffic.
2. While the need for certain advisory signing is noted hereon, it is not intended that this be indicative of all signing that may be required to advise or warn motorists, and all requirements of the Ohio Manual of Uniform Traffic Control Devices (OMUTCD) must be fulfilled.
3. In urban or otherwise heavily developed areas where pedestrians and/or bicyclists may be present in significant numbers, additional signing and protective measures other than those shown hereon may be required.
4. The drop-off treatment selected for use at any given location shall be as appropriate for the prevailing conditions at the site.
5. Where concrete barrier is specified, it shall be in accordance with Standard Construction Drawing RM-4.2 and Item 622.
6. When drums are specified for a dropoff condition, a minimum number of four drums shall be used. Spacing shall be as indicated in the plans or as specified in the OMUTCD.
7. When OW-15l (Low Shoulder) signs or OW-17l (Uneven Lanes) and OWP-17l Signs are required, they shall be placed 750' in advance of the construction, on all intersecting entrance ramps within the limits of the condition and immediately beyond all intersecting roadways within the limits of the condition. When the dropoff condition extends more than one-half mile, additional signs should be erected at intervals of one mile or less.
8. For locations, such as at ramps, lane shifts, lane closures, etc., where traffic is required to negotiate any difference in elevation between pavements, a 3:1 slope treatment similar to the Optional Wedge Treatment shall be provided.
9. Portable concrete barrier shall be placed on the same level as the traffic surface and shall not encroach on lane width(s) designated as the mimimum required for traffic use. Where drums are used, and their presence would reduce traveled lane widths to less than 10', drums may be placed on the opposite level from that of traffic provided the dropoff depth does not exceed 5" and approval is granted by the Project Engineer.
10. Pavement repairs (or similar work):
    a. Lengths greater than 60 feet - utilize appropriate treament from Condition I.
    b. Lengths of 60 feet or less - repairs shall be effected in accordance with 255.08. Drums may be used as a separator adjacent to the traveled lane.

OPTIONAL WEDGE TREATMENT

(MILLING OR RESURFACING)

1. This treatment may be used when permitted for Condition I only.
2. OW-17l and OWP-17l signs required.



19412

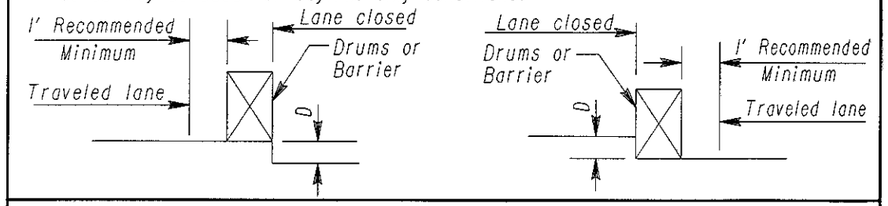
CONDITION I

DROPOFFS BETWEEN TRAVELED LANES

1. These treatments are to be used for resurfacing, pavement planing, excavation, etc. between or within traveled lanes.

D (in.)	Treatment
≤ 1½	Erect OW-17l and OWP-17l signs.
>1½ ≤3	1) Lane closure utilizing drums* as shown below or 2) Optional Wedge Treatment.
>3 ≤5	Lane closure utilizing drums as shown below.
> 5	Lane closure utilizing portable concrete barrier as shown below

*Cones may be used for daytime only conditions.



CONDITION II

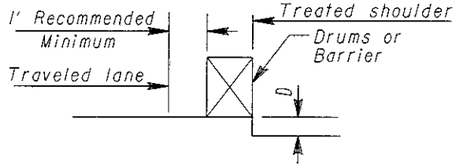
DROPOFFS WITHIN GRADED SHOULDER AREA

1. The treatments indicated below are for use in conjunction with resurfacing, planing, or excavations within the graded shoulder area.

2. The graded shoulder area is that flat or gradually sloping area between the edge of a normally traveling lane and the more steeply sloping ditch foreslope or embankment slope. Its surface may be soil or turf, and/or it may be inclusive of a "treated" area (improved with aggregates, asphaltic materials, or concrete). For the purposes herein, its maximum width shall be considered to twelve (12) feet.

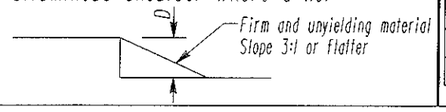
D (in.)	Treatment
≤ 1½	1) If edgelines are present, no treatment necessary or 2) Erect OW-17l and OWP-17l signs.
>1½ ≤5	1) If min. lane width* requirements can be met, maintain lanes utilizing drums as shown below or 2) If min. lane width* requirements cannot be met, close adjacent lane utilizing drums or 3) Optional Shoulder Treatment.
>5 ≤12 Daylight only	If min. lane width* requirements can be met, maintain lanes utilizing drums as shown below.
>5 ≤24	1) If min. lane width* requirements can be met, maintian lanes utilizing portable concrete barrier as shown below or 2) If min. lane width* requirements cannot be met, close adjacent lane utilizing drums.
>24	Lane closure utilizing portable concrete barrier as shown below.

*Minimum lane widths shall be 10' unless otherwise specified in the plans.



OPTIONAL SHOULDER TREATMENT

1. This treatment may not be used within a bituminous shoulder where a hot longitudnal joint per 40l.15 is required
2. OW-15l signs required.



CONDITION III

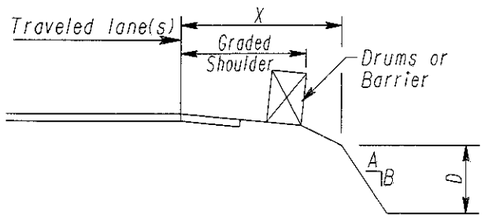
DROPOFFS BEYOND GRADED SHOULDER OR BACK OF CURB

1. See Note 2 under Condition II.
2. Use Chart A or B below, as applicable

CHART A

USE FOR:

1. Uncurbed Facilities.
2. Curbed Facilities, where:
   a. Curbs are less than 6" in height.
   b. Curbs are 6" or greater in height and the legal speed is greater than 40 mph.

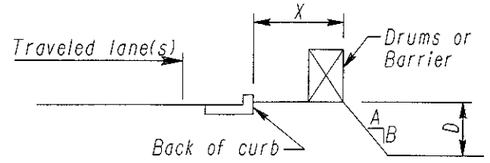


X (ft.)	D (in.)	A/B	Treatment Required: Day	Treatment Required: Night
<4	Any	Any	(a)	(a)
>4 ≤30	Any	3:1 or Flatter	None	None
>4 ≤12	≤3	Steeper than 3:1	None	None
>4 ≤12	>3 ≤12	Steeper than 3:1	Drums	Drums
>4 ≤12	>12	Steeper than 3:1	Drums	Barrier
>12 ≤20	≤12	Steeper than 3:1	None	None
>12 ≤20	>12 ≤24	Steeper than 3:1	Drums	Drums
>12 ≤20	>24	Steeper than 3:1	Drums	Barrier
>20 ≤30	≤24	Steeper than 3:1	None	Drums
>20 ≤30	>24	Steeper than 3:1	Drums	Barrier
>30	Any	Any	None	None
(a) Use treatment specified under Condition II				

CHART B

USE FOR:

Curbed facilities where the curb is 6" or greater in height and the legal speed is 40 mph or less.

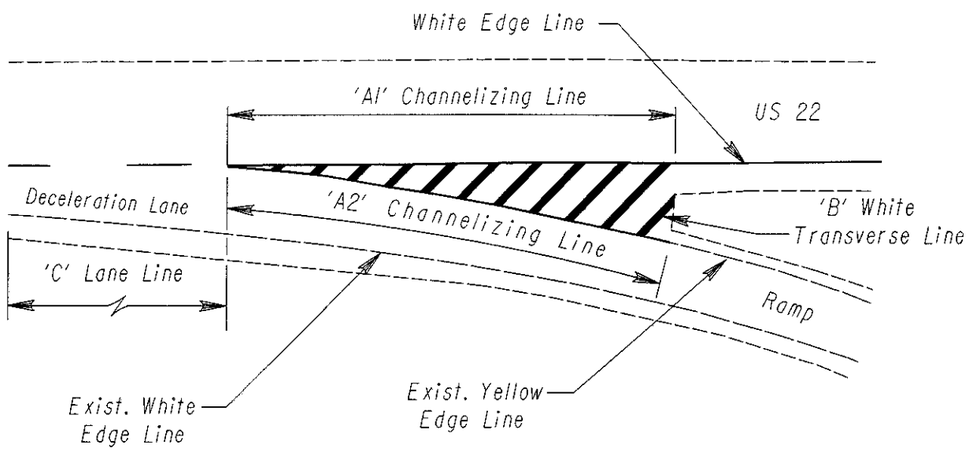


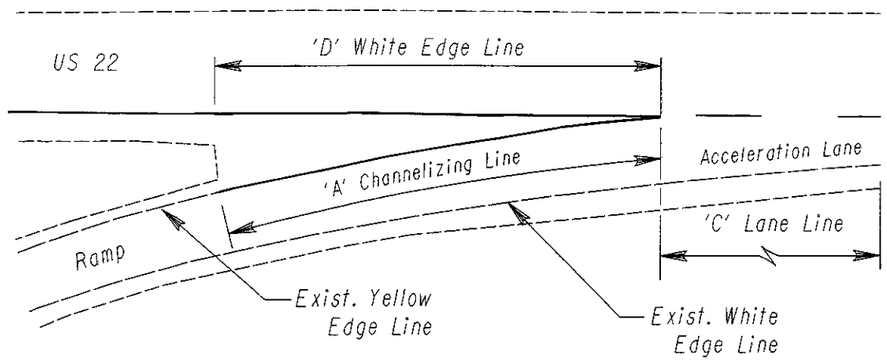
X (ft.)	D (in.)	A/B	Treatment Required: Day	Treatment Required: Night
0-10	<12	Any	None	Drums
0-10	>12	Any	Drums	Drums
>10	Any	Any	None	None

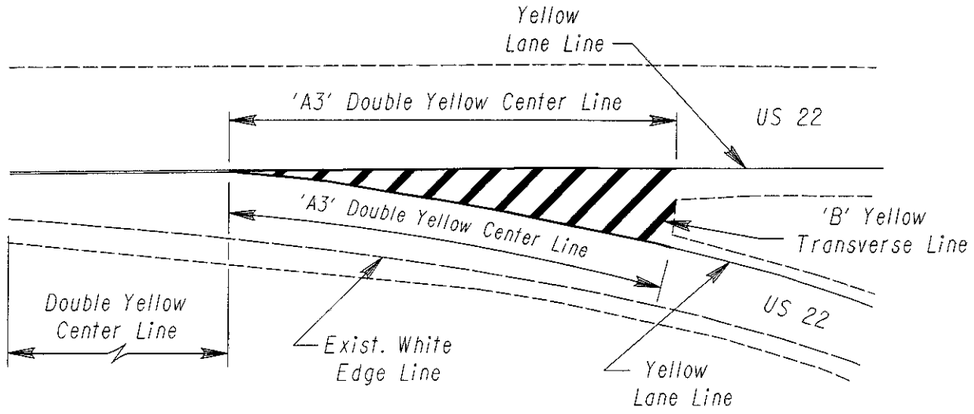
DROP OFFS IN WORK ZONES

HAS-22-15.25

rgortney@D11CD114 - TD100.m - Wednesday February 23 2000 01:04:53 PM EST







ITEM 642, TYPE I - PAVEMENT MARKING

PART	ROUTE	LOCATION	DIRECTION	Channelizing Lines 'A'		Channelizing Lines 'A1'		Channelizing Lines 'A2'		Double Solid Yellow Center Lines 'A3'	Transverse Lines 'B'		Lane Line 'C'	Edge Line 'D'	Remarks
				Yellow	White	Yellow	White	Yellow	White		Yellow	White	White	White	
		SLM		Lin.Ft.	Lin.Ft.	Lin.Ft.	Lin.Ft.	Lin.Ft.	Lin.Ft.	Mile	Lin.Ft.	Lin.Ft.	Mile	Mile	
1	US 22	15.26	EB							0.22	243.0				2 Lane to 4 Lane
		Ramp 'C'	EB				78.0		86.2			80.7	0.03		Deceleration Lane
		Ramp 'D'	EB		63.4								0.04	0.01	Acceleration Lane
		18.85 to 18.91	EB							0.19	436.2				4 Lane to 2 Land
	US 22	Ramp 'B'	WB		68.2								0.02	0.01	Acceleration Lane
2	US 22	21.68	EB							0.23	222.0				2 Lane to 4 Lane
		Ramp 'L'	EB				75.0		75.8			47.8	0.02		Deceleration Lane
		Ramp 'M'	EB		65.0									0.01	Acceleration Lane
		Ramp 'Q'	EB				136.0		137.4			138.4	0.01		Deceleration Lane
		Ramp 'T'	EB		121.8									0.02	Acceleration Lane
	US 22	Ramp 'K'	WB		80.5								0.02	0.02	Acceleration Lane
		Ramp 'J'	WB				182.4		180.7			140.4	0.02		Deceleration Lane
		Ramp 'N'	WB		111.0								0.04	0.02	Acceleration Lane
		Ramp 'S'	WB				118.0		117.4			117.9	0.02		Deceleration Lane
3	US 22	Ramp 'C'	EB				293.0		291.8			294.5	0.04		Deceleration Lane
		Ramp 'D'	EB		137.7								0.02	0.06	Acceleration Lane
	US 22	Ramp 'A'	WB		234.7								0.02	0.07	Acceleration Lane
		Ramp 'B'	WB				227.2		226.1			223.6	0.02		Deceleration Lane

See Sheet 16 for Quantities

CALCULATED BLC
CHECKED GDM

AUXILIARY PAVEMENT MARKING

HAS-22-15.25

19472

gortney@D11CD114 - TS100.m - Wednesday February 23 2000 01:08:16 PM EST

ITEM 621 - RAISED PAVEMENT MARKER

PART	ROUTE	LOCATION	Length	Spacing	Prismatic Retroreflector		RPM Casting Installation Only	Remarks	See Sheet No.
					1-Way Yellow	2-Way White/ Red		All Raised Pavement Markers will be placed in accordance with Std. Dwg. TC-65.10M, MT-65.11M and TC-65-12M dated 11/1/95	
			Lin. Ft.	Lin. Ft.	Each	Each	Each		
1	HAS-22	EB & WB	37,456	80		469	469	Lane Line	15
		SLM 15.26	572	40	15		15	Double Solid Yellow Line	15
		Ramp 'B'	68	--		5	5	Channelizing Line	15
		Ramp 'C'	164	--		5	5	Channelizing Line	15
		Ramp 'D'	63	--		5	5	Channelizing Line	15
		SLM 18.85	511	40	13		13	Double Solid Yellow Line	15
					28	484			
		Part 1 - Sub-Total			512		512		
2	HAS-22	EB & WB	36,507	80		457	457	Lane Line	15
		SLM 21.68	614	40	17		17	Double Solid Yellow Line	15
		Ramp 'J'	363	40		9	9	Channelizing Line	15
		Ramp 'K'	81	--		5	5	Channelizing Line	15
		Ramp 'L'	151	40		5	5	Channelizing Line	15
		Ramp 'M'	65	--		5	5	Channelizing Line	15
		Ramp 'N'	111	--		5	5	Channelizing Line	15
		Ramp 'Q'	274	40		7	7	Channelizing Line	15
		Ramp 'S'	236	40		6	6	Channelizing Line	15
		Ramp 'T'	122	--		5	5	Channelizing Line	15
					17	504			
		Part 2 - Sub-Total			521		521		
3	JEF-22	EB & WB	40,762	80		510	510	Lane Line	15
		Ramp 'A'	235	40		6	6	Channelizing Line	15
		Ramp 'B'	453	40		11	11	Channelizing Line	15
		Ramp 'C'	585	40		15	15	Channelizing Line	15
		Ramp 'D'	138	--		5	5	Channelizing Line	15
		Part 3 - Sub-Total				547	547		
		SUB-TOTAL			45	1535			
		TOTALS (Carried To General Summary)			1580		1580		

ITEM 642, TYPE I - PAVEMENT MARKING

PART	ROUTE	LOCATION	Edge Line		Lane Line	DOUBLE SOLID YELLOW CENTER LINE	Channelizing Line	Transverse Line		Stop Line			See Sheet No.
			Yellow	White				Yellow	White				
			Mile	Mile	Mile	Mile	Lin. Ft.	Lin. Ft.	Lin. Ft.	Lin. Ft.			
1	HAS-22	EB & WB	7.10	2.84	7.10								15
		SLM 15.26				0.22		243					15
		SLM 15.85								47			15
		Ramp 'B'		0.01	0.02		68						15
		Ramp 'C'			0.03		164		81				15
		Ramp 'D'		0.01	0.04		64						15
		SLM 18.85				0.19		436					15
			7.10	2.86				679	81				
		Part 1 Sub-Totals	9.96		7.19	0.41	296	760		47			
2	HAS-22	EB & WB	6.92	6.92	6.92								15
		SLM 21.68				0.23		222					15
		Ramp 'J'			0.02		363		140				15
		Ramp 'K'		0.02	0.02		81						15
		Ramp 'L'			0.02		151		48				15
		Ramp 'M'		0.01			65						15
		Ramp 'N'		0.02	0.04		111						15
		Ramp 'Q'			0.01		274		139				15
		Ramp 'S'			0.02		236		118				15
		Ramp 'T'		0.02			122						15
		SLM 24.74								21			15
		SLM 25.13								19			15
			6.92	6.99				222	445				
		Part 2 Sub-Totals	13.91		7.05	0.23	1403	667		40			
3	JEF-22	EB & WB	7.72	7.72	7.72								15
		Ramp 'A'		0.07	0.02		235						15
		Ramp 'B'			0.02		453		224				15
		Ramp 'C'			0.04		585		295				15
		Ramp 'D'		0.06	0.02		138						15
			7.72	7.85				--	519				
		Part 3 Sub-Totals	15.57		7.82	--	1411	519		--			
		TOTALS (Carried To General Summary)	21.74	17.70				901	1045				
			39.44		22.06	0.64	3110	1946		87			

CALCULATED BLG CHECKED GDM

PAVEMENT MARKING AND RAISED PAVEMENT MARKERS QUANTITIES

HAS-22-15.25

16 / 23

19472

gortney@D11CD114 - TS100.m - Wednesday February 23 2000 01:09:09 PM EST

ITEM 614 - TEMPORARY PAVEMENT MARKING

PART	ROUTE	LOCATION	LENGTH	Temporary Edge Line, Class 1		Temporary Lane Line, Class 1	Temporary Channelizing Line, Class 1	Temporary Center Line, Class 1
				Yellow	White			
			Mile	Mile	Mile	Mile	Lin. Ft.	Mile
1	HAS-22	EB & WB	7.10	7.10	2.84	7.10		
		SLM 15.26						0.22
		Ramp 'B'					68	
		Ramp 'C'					164	
		Ramp 'D'					63	
		SLM 18.85						0.19
				7.10	2.84			
	Part 1 - Sub-Totals			9.94		7.10	295	0.41
2	HAS-22	EB & WB	6.92	6.92	6.92	6.92		
		SLM 21.68						0.23
		Ramp 'J'					363	
		Ramp 'K'					81	
		Ramp 'L'					151	
		Ramp 'M'					65	
		Ramp 'N'					111	
		Ramp 'Q'					274	
		Ramp 'S'					236	
		Ramp 'T'					122	
				6.92	6.92			
	Part 2 - Sub-Totals			13.84		6.92	1403	0.23
3	JEF-22	EB & WB	7.72	7.72	7.72	7.72		
		Ramp 'A'					235	
		Ramp 'B'					453	
		Ramp 'C'					585	
		Ramp 'D'					138	
				7.72	7.72			
	Part 3 - Sub-Totals			15.44		7.72	1411	--
TOTALS (Carried To General Summary)				21.74	17.48			
				39.22		21.74	3109	0.64

CALCULATED: BLC
CHECKED: GDM

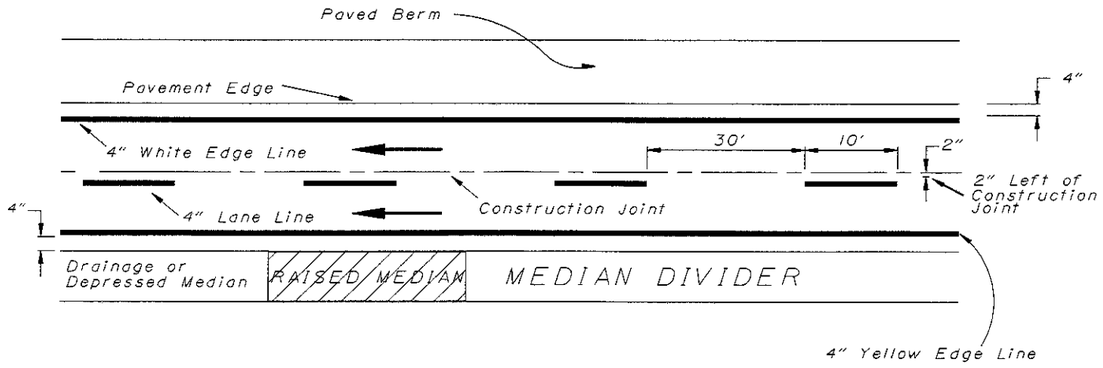
TEMPORARY PAVEMENT MARKING

HAS-22-15.25

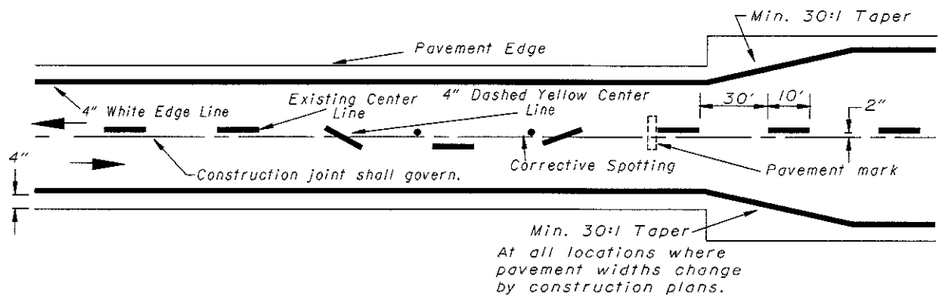
19412

gortney@D11CD114 - TD199.m - Wednesday February 23 2000 01:05:45 PM EST

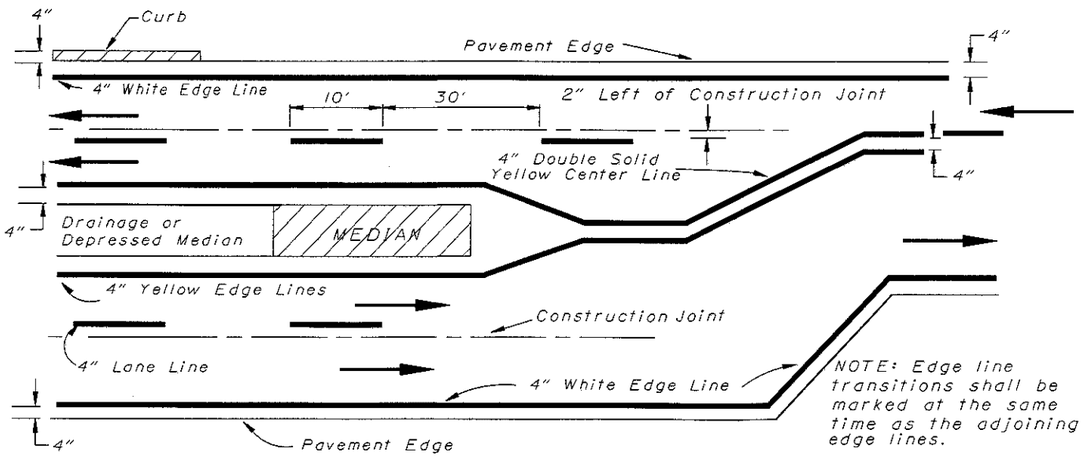
FREEWAY & EXPRESSWAY MAINLINE MARKINGS



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.

CALCULATED BLG
CHECKED GDM

PAVEMENT MARKING TYPICAL DETAIL

HAS-22-15.25

19472

ggortney@D11CD114 - GN100.m - Wednesday February 23 2000 12:40:53 PM EST

ITEM 614 - MAINTAINING TRAFFIC

All planed areas shall be resurfaced with the proposed courses of Item 858 Asphalt Concrete, Surface Course, 12.5mm, Type B (446) before opening to traffic. Resurfaced areas shall be opened at the direction of the Engineer.

Shoulder re-construction trench operations will not remove any more material than can be replaced by the end of each day's work. In areas where this is not possible or where adverse conditions prevent it, overnight trench openings shall be temporarily backfilled. For more information see sheet 14.

No work shall be performed and all existing lanes shall be open to traffic during the following designated holidays or events:

Memorial Day	Fourth of July
Labor Day	Thanksgiving

The period of time that the lanes are to be opened depends on the day of the week on which the holiday or event falls. The following schedule shall be used to determine this period:

Day of the Week	Time all lanes must be opened to traffic
Sunday	12:00N Friday through 12:00N Monday
Monday	12:00N Friday through 12:00N Tuesday
Tuesday	12:00N Monday through 12:00N Wednesday
Wednesday	12:00N Tuesday through 12:00N Thursday
Thursday	12:00N Wednesday through 12:00N Monday
Friday	12:00N Thursday through 12:00N Monday
Saturday	12:00N Friday through 12:00N Monday

No extensions of time shall be granted for delays in material deliveries, unless such delays are industry-wide, or for labor strikes, unless such strikes are area-wide. Should the Contractor fail to meet any of these requirements, the Contractor shall be assessed liquidated damages, in accordance with 108.07.

Length and duration of lane closures and restrictions shall be at the approval of the Engineer. It is the intent to minimize the impact to the traveling public. Lane closures or restrictions over segments of the project in which no work is anticipated within a reasonable time frame, as determined by the Engineer, shall not be permitted. The level of utilization of maintenance of traffic devices shall be commensurate with the work in progress.

All work and traffic control devices shall be in accordance with 614 and other applicable portions of the specifications, as well as the Ohio Manual of Uniform Traffic Control Devices. Payment for all labor, equipment and materials shall be included in the lump sum contract price for Item 614, Maintaining traffic, unless separately itemized in the plan.

MAINLINE

At least one lane of traffic shall be maintained in each direction at all times as per Standard Construction Drawing MT-95.30M. The Advisory Speed Signs (OW-143-24) with 55 MPH shall also be installed.

Construction work shall be permitted on only one side of the directional roadway at a time and any open pavement trench shall be adequately maintained and protected with barricades, drums or vertical panels. Under no circumstances shall the Contractor be permitted to have work zones that alternately close both the passing lane and the travel lane unless the distance between the lane restrictions exceeds two (2) miles.

COOPERATION BETWEEN CONTRACTORS

The Contractor is hereby advised that several bridges are being replaced on HAS-22 and may be under construction during the same period this project is to be constructed. Upon award of this contract, the Contractor shall notify the Engineer and the other Contractors of the effects of this contract upon the other projects. The Contractor shall cooperate with the other Contractors in accordance with Sec. 105.07 and arrange a mutually acceptable work schedule, subject to the approval of the Engineer. Any conflicts between contractors involving work schedules, work areas or cooperation will be resolved by the Engineer.

SPEED CHANGE LANES

Speed change lane traffic shall be maintained at all times by use of portions of the existing and/or resurfaced pavement and existing shoulders, as per Standard Construction Drawings MT-98.12M, MT-98.13M, MT-98.14M, MT-98.15M, and MT-98.16M.

CONTINGENCY QUANTITIES

The Contractor shall not order materials or perform work for items designated by plan note to be used "As Directed by the Engineer" unless authorized by the Engineer. The actual work locations and quantities used for such items shall be incorporated into the final change order governing completion of this project

ITEM 614, LAW ENFORCEMENT OFFICER WITH PATROL CAR

In addition to the requirements of 614 and the latest edition of the Ohio Manual of Uniform Traffic Control Devices (OMUTCD), a uniformed law enforcement officer and an official patrol car with working top-mounted emergency flashing lights shall be provided for controlling traffic for the following tasks:

1. For lane closures: during initial set-up periods, tear down periods, substantial shifts of a closure point or when new lane closure arrangements are initiated.
2. Grinding and paving of the speed change lanes and at-grade intersections as directed by the Engineer.
3. For any operation or location as directed by the Engineer.

Law enforcement officers (LEO's) should not be used where the OMUTCD intends that flaggers be used. The LEO's are considered to be employed by the Contractor, and the Contractor shall be responsible for their actions. Although they are employed by the Contractor, the Project Engineer shall have control over their placement. The official patrol car shall be a public safety vehicle as required by the Ohio Revised Code.

The Contractor shall make arrangements for these services with the Ohio Highway Patrol, Steubenville Patrol Post, 1377 Cadiz Road, Wintersville, Ohio 43953, Phone 740-264-1641, the Harrison County Sheriff's Department, Phone 740-942-4123 or the Jefferson County Sheriff's Department, Phone 740-283-8600. Law enforcement officers with patrol car required by the traffic maintenance tasks above shall be paid for on an hourly basis under Item Special, Law Enforcement Officer With Patrol Car. The following estimated quantity has been carried to the General Summary:

Item 614, Law Enforcement Officer With Patrol Car - - - - - - - 350 Hours

The hours paid shall include minimum show-up time required by the law enforcement agency involved.

If the Contractor wishes to utilize LEO's for flagging and traffic control other than that required in these plans, he may do so at his own expense. Payment for the excess above the contract requirements will be included under Item 614, Maintaining Traffic.

ITEM 858 - ASPHALT CONCRETE SURFACE COURSE, 12.5 MM, TYPE B, (446) AS PER PLAN
ITEM 448 - ASPHALT CONCRETE SURFACE COURSE, TYPE 1, PG64-22, AS PER PLAN

Materials furnished for fine and course aggregates used in these items shall exclude all limestone and crushed carbonate stone.

ITEM 614 - WORK ZONE MARKING SIGNS

The following quantity of work zone marking signs ("NO EDGE LINES" OW-167) are carried to the general summary to be used as directed by the Engineer.

Item 614 - Work Zone Marking Signs: Part 1 - 24 each
Item 614 - Work Zone Marking Signs: Part 2 - 24 each
Item 614 - Work Zone Marking Signs: Part 3 - 14 each

CALCULATED BLC
CHECKED GDM

GENERAL NOTES

HAS-22-15.25

19
23

19472

jgortney@D11CD114 - GN100.m - Wednesday February 23 2000 12:41:47 PM EST

ITEM 614 - TEMPORARY PAVEMENT MARKINGS

The Contractor shall install Item 614 - Temporary Channelizing Line, Class I and Temporary Edge Line, Class I, prior to opening the lane to traffic, also Temporary Lane Line, Class I when the existing markings have been covered or damaged, as per requirement 614.10 of the CMS.

The quantity for following items shall be used as Directed by the Engineer.

22.14 Mile - 614 - Temporary Lane Line, Class I, 642 Paint
3109 Lin. Ft. - 614 - Temporary Channelizing Line, Class I, 642 Paint
39.80 Mile - 642 - Temporary Edge Line, Class I, 642 Paint

COORDINATION OF RESURFACING AND PLANING OPERATIONS

The travel lane shall be planed first.

Once the pavement planing operation has begun, it shall proceed continuously until all elements of the work associated with the pavement planing operation are completed. The pavement planing operation shall be completed in a timely manner as directed by the Engineer. The resurfacing operation shall begin no later than 24 hours after the pavement planing operation has begun.

The grindings shall become the property of the Contractor and be disposed of at his expense outside of the limits of Right of Way, with the following exceptions:

5000 tons delivered by the Contractor to the Cadiz Yard located at
701 Lincoln Ave, Cadiz, Ohio 43907 Phone (740) 942-3274

1500 tons delivered by the Contractor to the intersection of C.R. 22A
and US 22 just off the Reeds Mill exit ramp E.B. US22-7.1
Phone (740) 264-1722

ITEM 407 - TACK COAT
ITEM 407 - TACK COAT, 702.13
ITEM 407 - TACK COAT FOR INTERMEDIATE COURSE

The following estimated quantity has been carried to the General Summary for use as directed by the Engineer. For estimating purposes only, the plan quantities indicate an average application rate of:

Item 407 - Tack Coat - 0.075 gallon per square yard

When paving directly onto portland cement concrete, SLM 23.87 to SLM 25.23 Westbound, the pavement shall be tacked with rubberized asphalt emulsion meeting 702.13.

When refilling joints, Item 407 - Tack Coat For Intermediate Course shall be used between the intermediate and surface courses, at a rate of 0.04 gallon per square yard.

PROFILE AND ALIGNMENT

The proposed pavement resurfacing shall follow the alignment and profile of the existing pavement. The proposed asphalt concrete overlay shall be as specified in this plan.

CONTRACTOR'S EQUIPMENT - OPERATION AND STORAGE

The Contractor's equipment shall be operated in the direction of traffic. A qualified Flagger shall be employed where the Contractor's equipment must merge with the traffic stream. The Contractor's equipment shall be equipped with at least one (1) amber flashing light. Pavers, rollers and other equipment may be parked in areas along the highway when pavement repair or paving operations are scheduled to within the next workday; otherwise the equipment shall be stored at a storage area, the location of which shall have prior approval of the Engineer. When parking along the highway, the equipment shall be parked either thirty feet, from the outside edge of pavement or six (6) feet behind guardrail with a minimum of 130 feet of guardrail preceeding the equipment. All other equipment, including private vehicles, shall be stored at the approved Contractor's storage area.

The Contractor shall designate an individual, other than the Superintendent and subject to the approval of the Engineer, to continuously inspect all traffic control devices whenever construction work is being performed within the work limits of the project. The designated individual shall also inspect all traffic control devices at the end of each work day. The designated individual shall also be available on an around-the-clock basis to repair and/or replace damaged or missing traffic control devices. Payment for the Traffic Control Inspector shall be included in the lump sum price bid for Item 614 - Maintaining Traffic.

NOTIFICATION OF WORK ZONE LANE RESTRICTIONS

The Contractor shall notify the Engineer at least eighteen (18) days prior to implementing any work zone restrictions which will reduce the width or vertical clearance of any lane on which traffic will be maintained during construction. The Engineer shall immediately notify the District Roadway Services Manager to advise the Office of Highway Management of the restrictions.

ITEM 254 - PATCHING PLANED SURFACE

The following quantity is to be used as directed by the Engineer for the purpose of patching the planed surface per Section 254.05:

Item 254 - Patching Planed Surface - 30,753 Sq. Yard

SURFACE COURSE COMPLETION REQUIREMENTS

Any given length of work on which resurfacing operations have been started in a construction season shall have the surface course placed that same season.

CONVERSION OF METRIC STANDARD DRAWINGS

The metric standard drawings referenced on the Title Sheet shall be converted to English units using the SI (Metric) to English Conversion Factors provided in Section 109.011 of the 1997 Construction and Materials Specifications. The appendix of ASTM E 380 shall be utilized for any additional conversion factors required. Conversions shall be appropriately precise, and shall reflect standard industry English values where suitable.

ITEM 621 - RAISED PAVEMENT MARKER CASTING, INSTALLATION ONLY, AS PER PLAN

This Item shall consist of installing a two-way plowable Raised Pavement Marker casting furnished to the Contractor by the Ohio Department of Transportation. The casting will not be equipped with an attached Prismatic Retro-Reflector. The Contractor will be paid separately for Prismatic Retro-Reflector to be attached to these castings. The RPM shall be installed as shown in Item 621. Prismatic Retro-Reflectors will be paid for separately as Item 621 Prismatic Reflector.

Payment for installing the ODOT furnished Raised Pavement Marker shall be included in the unit price bid for each Item 621 Raised Pavement Marker Casting Installation Only, As Per Plan shall include all material, equipment, labor and incidentals required to perform the above work.

RAISED PAVEMENT MARKERS SUPPLIED BY ODOT

All materials are to be Contractor furnished, except that the Ohio Department of Transportation shall supply to the Contractor Raised Pavement Marker materials in the quantities shown in the plan. Pay Items for ODOT supplied materials shall be indicated as "Installation Only". The quantity and type of ODOT supplied materials are shown in the plan.

The Contractor will be informed at the pre-construction conference of the location in Columbus of the ODOT supplied materials. When specified, additional Raised Pavement Marker materials will be stored within the District for use on this project, The Contractor shall pick up ODOT supplied Raised Pavement Marker materials at the specified location(s) for transport to the work site or to the Contractor's storage facility. An authorization for pick up form will be furnished by the District Construction Engineer to the Contractor at the pre-construction conference. The Contractor shall notify the District and/or the parties listed on the authorization form (dependant on the storage locations of the materials) in writing at least 5 calendar days prior to pick up of ODOT supplied materials. He shall store them without damage or contamination with foreign matter. A deduction in the amount of the actual cost to ODOT shall be made for materials damaged by the Contractor or for castings received by the Contractor which were not installed and were not returned to ODOT.

CALCULATED BLG CHECKED GDM

GENERAL NOTES

HAS-22-15.25

1941/2

jgortney@D11CD114 - GN100.m - Wednesday, February 23 2000 12:42:42 PM EST

ITEM 255 - FULL DEPTH PAVEMENT REMOVAL AND RIGID REPLACEMENT, AS PER PLAN

For details see Standard Construction Drawing BP-2.5. All transverse joints shall be "Type Y". Item 605 - Aggregate Drain will be used as directed by the Engineer. The quantities below are carried directly to the General Summary.
The estimated quantity below are contingency items, the Contractor shall not order materials or perform this work unless Directed by the Engineer.

Part 1 - 240 Sq. Yd. - Item 255 - Full Depth Pavement Removal And Rigid Replacement, Class FS, As Per Plan
Part 1 - 900 Lin. Ft. - Item 255 - Full Depth Pavement Sawing
Part 1 - 360 Lin. Ft. - Item 605 - Aggregate Drain, As Per Plan
Part 1 - 12 Cu. Yd. - Item 448 - Asphalt Concrete Surface Course, Type 2, PG64-22
Part 1 - 12 Cu. Yd. - Item 448 - Asphalt Concrete Intermediate Course, Type 2, PG64-22
Part 1 - 2 Gal/Sq. Yd. - Item 407 - Tack Coat, As Per Plan
Part 1 - 1 Gal/Sq. Yd. - Item 407 - Tack Coat for Intermediate Course

Part 2 - 2640 Sq. Yd. - Item 255 - Full Depth Pavement Removal And Rigid Replacement, Class FS, As Per Plan
Part 2 - 9900 Lin. Ft. - Item 255 - Full Depth Pavement Sawing
Part 2 - 3960 Lin. Ft. - Item 605 - Aggregate Drain, As Per Plan
Part 2 - 12 Cu. Yd. - Item 448 - Asphalt Concrete Surface Course, Type 2, PG64-22
Part 2 - 12 Cu. Yd. - Item 448 - Asphalt Concrete Intermediate Course, Type 2, PG64-22
Part 2 - 2 Gal/Sq. Yd. - Item 407 - Tack Coat, As Per Plan
Part 2 - 1 Gal/Sq. Yd. - Item 407 - Tack Coat for Intermediate Course

Part 3 - 160 Sq. Yd. - Item 255 - Full Depth Pavement Removal And Rigid Replacement, Class FS, As Per Plan
Part 3 - 600 Lin. Ft. - Item 255 - Full Depth Pavement Sawing
Part 3 - 240 Lin. Ft. - Item 605 - Aggregate Drain, As Per Plan
Part 3 - 8 Cu. Yd. - Item 448 - Asphalt Concrete Surface Course, Type 2, PG64-22
Part 3 - 8 Cu. Yd. - Item 448 - Asphalt Concrete Intermediate Course, Type 2, PG64-22
Part 3 - 2 Gal/Sq. Yd. - Item 407 - Tack Coat, As Per Plan
Part 3 - 1 Gal/Sq. Yd. - Item 407 - Tack Coat for Intermediate Course

ITEM 825 - CRACK SEALING, TYPE II

This work shall consist of the preparation and sealing of the perimeter of the "Superpave" where it meets the existing wearing course with Hot-Applied Crack Sealant material in accordance with Supplemental Specification-825 dated January 1, 1999.

At 4 inches wide and 1/16" deep - 25 pounds per 100 lineal feet will be used.

Item 825 - Crack Sealing, Type II: Part 1 - 9364 pounds
Item 825 - Crack Sealing, Type II: Part 2 - 9127 pounds
Item 825 - Crack Sealing, Type II: Part 3 - 10,191 pounds

ITEM 203 - LINEAR GRADING, METHOD A, AS PER PLAN

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 Item 617 - Compacted Aggregate at the Contractor's expense. Excavated material shall be disposed of as indicated in the plan.

A. Used to back up shoulders where required; The balance to be disposed of as directed by the Engineer.

CALCULATED BLC
CHECKED GDM

GENERAL NOTES

HAS-22-15.25

21/23

19472

ggortney@D11CD114 - GG100.m - Wednesday February 23 2000 02:16:13 PM EST

PART 1	PART 2	PART 3		PARTS 1,2&3					ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION	SEE SHEET NO.
--	400	--							202	23500	400	SQ YD	WEARING COURSE REMOVED	
936	912	1020							202	54100	2868	EACH	RAISED PAVEMENT MARKER REMOVED FOR STORAGE	
33	76	8							203	60201	117	STATION	LINEAR GRADING, METHOD A, AS PER PLAN	21
86,899	102,034	118,599							254	01000	307,532	SQ YD	PAVEMENT PLANING, BITUMINOUS	
				30,753					254	01600	30,753	SQ YD	PATCHING PLANED SURFACE	
240	2640	160							255	10101	3040	SQ YD	FULL DEPTH PAVEMENT REMOVAL AND RIGID REPLACEMENT, CLASS FS, AS PER PLAN	21
900	9900	600							255	20000	11,400	LIN FT	FULL DEPTH PAVEMENT SAWING	
2214	2594	80							301	46000	4888	CU YD	BITUMINUS AGGREGATE BASE, PG64-22	
1659	1937	60							304	20000	3656	CU YD	AGGREGATE BASE	
7053	8059	9345							407	10001	24,457	GALLON	TACK COAT	
--	1785	--							407	13901	1785	GALLON	TACK COAT, 702.13	
1	1129	1							407	14000	1131	GALLON	TACK COAT FOR INTERMEDIATE COURSE	
12	12	8							448	46050	32	CU YD	ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, PG64-22	
12	12	8							448	47021	32	CU YD	ASPHALT CONCRETE SURFACE COURSE, TYPE 1, PG64-22, AS PER PLAN	20
9364	9127	10,191							825	00104	28,682	POUND	CRACK SEALING, TYPE II	21
4251	5681	5224							858	10051	15,156	CU YD	ASPHALT CONCRETE SURFACE COURSE, 12.5 MM, TYPE B, (446), AS PER PLAN	19
--	1332	--							858	10150	1332	CU YD	ASPHALT CONCRETE INTERMEDIATE COURSE, 19 MM, TYPE B, (446)	19
573	4168	472							605	31101	5213	LIN FT	AGGREGATE DRAIN, AS PER PLAN	13
413	253	3							617	10100	669	CU YD	COMPACTED AGGREGATE, TYPE A	
6780	4093	85							617	20000	10,958	SQ YD	SHOULDER PREPARATION	
512	521	547							621	00300	1580	EACH	PRISMATIC RETROREFLECTOR	
512	521	547							621	00601	1580	EACH	RAISED PAVEMENT MARKER CASTING, INSTALLATION ONLY, AS PER PLAN	20
9.96	13.91	15.57							642	00100	39.44	MILE	EDGE LINE, TYPE 1	
7.19	7.05	7.82							642	00200	22.06	MILE	LANE LINE, TYPE 1	
0.41	0.23	--							642	00300	0.64	MILE	CENTER LINE, TYPE 1	
296	1403	1411							642	00400	3110	LIN FT	CHANNELIZING LINE, TYPE 1	
47	40	--							642	00500	87	LIN FT	STOP LINE, TYPE 1	
760	667	519							642	00700	1946	LIN FT	TRANSVERSE LINE, TYPE 1	

CALCULATED: BLG
CHECKED: GDM

GENERAL SUMMARY

HAS-22-15.25

gortney@D11CD114 - GG100.m - Wednesday February 23 2000 12:46:04 PM EST

CALCULATE BLG CHECKED GDM

PART 1	PART 2	PART 3		PARTS 1,2&3					ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION	SEE SHEET NO.
				350					614	11100	350	HOUR	LAW ENFORCEMENT OFFICER WITH PATROL CAR	
24	24	14							614	12460	62	EACH	WORK ZONE MARKING SIGN	
7.10	6.92	7.72							614	20000	21.74	MILE	TEMPORARY LANE LINE, CLASS I	
0.41	0.23	--							614	21000	0.64	MILE	TEMPORARY CENTER LINE, CLASS I	
9.94	13.84	15.44							614	22000	39.22	MILE	TEMPORARY EDGE LINE, CLASS I	
295	1403	1411							614	23000	3109	LIN FT	TEMPORARY CHANNELIZING LINE, CLASS I	
LUMP	LUMP	LUMP							614	11000	LUMP		MAINTAINING TRAFFIC	
LUMP	LUMP	LUMP							624	10000	LUMP		MOBILIZATION	

GENERAL SUMMARY

HAS-22-15.25

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION

SUPPLEMENTAL SPECIFICATION 825
CRACK SEALING, HOT APPLIED

September 14, 1999

825.01 Description. This work shall consist of the preparation and sealing of pavement cracks or joints with a hot-applied crack sealant material in accordance with this specification. The crack sealant shall be the type specified and shall be in accordance with the following requirements.

825.02 Material. The hot applied crack seal material used shall be the type specified and meet the following requirements:

Type I	705.04
Type II	925.02
Type III	925.03
Type IV	925.04

Type I crack sealant shall be preapproved by the Laboratory before shipment to the project. The other crack sealants shall be approved in accordance with Supplemental Specification 925.

Backer rod material shall be on the approved list maintained by the Laboratory.

825.03 Equipment. Equipment used in the performance of the work shall be subject to the approval of the Engineer and to the requirements of 108.05.

For Type I crack sealant, the sealant shall be heated in a kettle or melter constructed as a double boiler, with the space between the inner and outer shells filled with oil or other heat-transfer fluid. The kettle or melter shall have positive temperature control of the oil bath and mixing vat, mechanical agitation, and recirculating pumps shall be provided. Direct heating shall not be used.

For Type II, III and IV crack sealants, the sealant shall be heated in a kettle or melter constructed as a double boiler, with the space between the inner and outer shells filled with oil or other heat-transfer fluid. Separate thermometers shall be provided for the oil bath and mixing vat. The kettle shall be equipped with a full sweep type agitator. It shall also be equipped with a 2-inch (50 mm) recirculating pump to provide circulation of the materials when not applying the crack sealant. Direct heating shall not be used.

For Type I and IV crack sealant, the mechanical applicator wand shall be capable of continuously feeding the sealant through nozzles shaped to penetrate the cracks or joints. A positive sealant flow shutoff mechanism is required. The wand shall produce a band no greater than 2 inches (50 mm) wide and 1/16 inch (2 mm) in height.

For Type II and III crack sealants, the mechanical applicator wand shall have a applicator head which can place the crack sealant in a manner to achieve a height above the pavement surface of 1/16 to 3/16 inches (2 to 5 mm) and a band no greater than 4 inches (100 mm), while filling the cracks. A positive sealant flow shutoff mechanism is required.

Air compressors shall be portable and capable of furnishing not less than 100 psi (690 kPa) air pressure at the nozzle. The compressor shall be equipped with traps that will maintain the compressed air free of oil and water.

Water cleaning equipment shall be capable of delivering water under pressure of 2,000 psi (14 MPa) from a nozzle to the crack or joint being cleaned, to remove existing crack sealant, debris or loose material from the crack or joint.

Equipment for drying cracks or joints and for removal of vegetation from cracks or joints shall be a propane lance unit capable of producing a blast of hot air which operates at 1000°F (538°C) and a gas velocity of 2000 feet per second (600 m/s).

Routing and sawing equipment shall be mechanical and power driven, capable of following close to the path of cracks and of widening the cracks to the required dimension without causing excessive spalling or damage to the adjacent pavement. Saw blades shall be a diamond blade with a diameter of 8 inches (200 mm) or less.

Equipment for forming the joint between a rigid pavement and flexible shoulder shall be power driven, capable of following the path of the joint while widening the joint to the required dimensions without causing damage to the rigid pavement.

825.04 Weather Limitations. Sealing shall not be performed when the surface is visibly damp or the temperature is below:

40^0 F (5^0 C)	For projects requiring a warranty
45^0 F (7^0 C)	For projects not requiring a warranty

825.05 Preparation. The Engineer shall designate the location of the cracks or joints to be sealed.

If routing is specified, all transverse cracks with an opening less than 3/4 inch (19 mm) shall be routed to provide a sealant reservoir with a nominal size of 3/4 inch (19 mm) width by 1 inch (25 mm) depth. Longitudinal cracks with an opening less than 1/2 inch (13 mm)

shall be routed to provide a sealant reservoir with a nominal size of 1/2 inch (13 mm) width by 3/4 inch (19 mm) depth.

If sawing is specified, all cracks shall be sawed to a width of 3/4 to 7/8 inch (19 to 22 mm) and a depth of 7/8 to 1 inch (22 to 25 mm). All slivers of asphalt concrete less than 1 inch (25 mm) in width remaining along the crack after sawing shall be removed with hand tools or a lightweight chipping hammer. Immediately prior to sealing, both faces of the sawed crack shall be sand blasted to remove all contamination and to texture the faces. If the crack below the sealant reservoir is greater than 3/8 inch (10 mm) in width, a backer rod shall be inserted into the crack to form the bottom of the reservoir at the proper depth.

If joint sealing between a rigid pavement and a flexible shoulder is specified, the joint reservoir shall be formed to not less than 2 inches (50 mm) deep and 3/4 inch (19 mm) wide in the flexible shoulder adjacent to the rigid pavement.

Prior to the application of the hot sealant, cracks or joints shall be thoroughly cleaned by an approved method or methods to remove dust, dirt, moisture, vegetation, and other foreign material. These areas shall be kept clean and dry until all sealing operations are completed.

Sealing shall be limited to cracks that are open enough to permit entry of sealant. Tightly closed cracks [less than 1/4 inch (6 mm)] shall only be sealed if they show signs of raveling or spalling. Cracks greater than 1 inch (25 mm) shall not be sealed, and spalls or cavities greater than 4 inches (100 mm) shall not be sealed, unless otherwise directed.

825.06 Mixing Type II and III. Weigh tickets for the binder shall be used in determining the specified proportion of fiber to be blended into the binder. Fibers shall be added to the binder and thoroughly mixed in the kettle. The temperature of the sealant in the field application shall not exceed the safe heating temperature recommended by the manufacturer. Type III crack sealant shall not be heated greater than 295ºF (146ºC).

825.07 Application of Sealant. The crack or joint sealing operation shall stay within 250 feet (76 meters) of the cleaning operation.

For Type I and IV crack sealant, the entire crack or joint reservoir shall be filled with the sealant from the bottom up to approximately 1/16 inch (2 mm) above the pavement surface. The filled cracks or joints shall be scraped promptly with a "V" or "U"-shaped squeegee or similar hand tool to smooth the overfill. This may require more than one application of sealant. Width of band of sealant on the pavement surface in excess of 2 inches (50 mm) will not be acceptable.

For Type II and III crack sealants, the sealant shall be placed such that it fills the cracks and leaves a 2.0 to 4.0 inch (50 to 100 mm) width band with a thickness of 1/16 to 3/16 inches (2 to 5 mm).

825.08 Opening to Traffic. Traffic shall not be allowed on the sealant until it has cured and the possibility of tracking does not exist. However, when it is necessary to allow vehicle traffic to pass over crack sealant prior to adequate curing, portland cement or other approved material shall be dusted over sealed cracks to eliminate pickup or tracking.

825.09 Warranty Requirements. If the pay item requires the crack sealing to be warranted, the Contractor shall warrant the sealing for 2 years and the following additional requirements shall be met:

1) Warranty Bond. When the successful Bidder provides the Department with the performance and payment bonds specified in 103.05, the successful Bidder shall also furnish a maintenance bond for a 2 year period equal to 100 percent of the total amount bid for Item 825 but not less than $10,000.00. The Surety that underwrites the maintenance bond is required to have an A.M. Best rating of "A -" or better. The cost of the maintenance bond shall be included in the pay item for the premium for the contract performance bond and the payment bond.

The effective date of the maintenance bond is the date the Department's Form C-85 is issued for the pavement. The issuance of Form C-85 for the pavement shall occur within 30 days after all of the pavement items, including all pavement markings, are completed. After Form C-85 is issued, the Department will notify the Surety and will establish all final quantities for the project and the project will be finalized using standard procedures. The maintenance bond expires after 2 years from the issuance of Form C-85.

The Contractor shall maintain the liability insurance specified in 107.14, insuring against Contractor or Contractor authorized operations negligently performed during the warranty period. This insurance shall be in effect throughout the warranty period. A copy of the Certificate of Insurance shall be sent to the District each year.

2) Warranty Items. Warranty items are specified in Table A. Meeting the minimum requirements and guidelines of this specification are not to be construed as a warranty, expressed or implied, as to the materials properties and workmanship efforts required to meet the performance criteria set forth in Table A. The warranty does not apply to structural problems below the sealing, provided the structural problem is not the fault of the Contractor. The Contractor is not responsible for sealing damage beyond the Contractor's control (i.e., snow plow, car fire, oil spill, etc.).

The Contractor may perform work during the warranty period, but this work is limited to work to repair failed areas or perform additional sawing and sealing prior to an annual review by the District. All work must be approved by the Department.

3) Review, Appeal, and Remedial Actions. A review by the District will be conducted informally at least annually in early spring. If a problem is noted, then a formal review by a District Review Team (DRT) according to Table A will be conducted. The DRT shall notify the Contractor of the scheduled review. The Contractor or any other interested party may attend the annual review, for observation only. Any comments by the Contractor or other interested party will be recorded by the DRT. Within 15 days after the completion of the review, the results will be issued in writing to the Contractor.

The Contractor may appeal a finding of the DRT. Any appeal shall be submitted to the DCE, in writing, within 15 days after the written results of the DRT are given to the Contractor. The DCE will evaluate the Contractor's appeal. This evaluation will include reviewing the disputed area in the field and consulting with the Construction Section of the Office of Highway Management. The evaluation may also include reviewing test data,

obtaining samples, or interviewing Department (District or Central Office) or Contractor employees. The DCE's determination will be issued in writing to the Contractor within 45 days after the DCE receives the appeal.

If the Contractor disagrees with the DCE's determination, the Contractor may appeal the determination using an arbitration method acceptable to the Department. The Department will agree, in all cases, to arbitration in the manner in which those methods are practiced by the Department. If the Contractor selects arbitration, written notice of this approach must be made to the DCE within 15 days of receipt of the DCE's determination. After written notice has been provided, the parties shall agree in writing to the Arbitrator and agree to share equally the fees of the Arbitrator.

After the Arbitrator is given notice to proceed, the Arbitrator shall conduct an investigation and issue a determination within 45 days. The Arbitrator's determination will be limited to determining whether or not the pavement distress is or is not the fault of the Contractor.

Should the Arbitrator find fault with the Contractor and the November 1 work restriction has passed, Remedial Actions will be performed the following season. If Remedial Action is required beyond the 2 year warranty period, a bond to carry through the period of Remedial Action shall be obtained according to 825.09 Section 1. If the District determines repairs are necessary before the next season, repairs acceptable to the District shall be made and final repairs be performed the following season.

TABLE A

Distress	Threshold Limit	Remedial Action
Debonding *	Any continuous length greater than 2 feet	Remove and replace debonded material in accordance with 825.

* Debonding is defined as either adhesion or cohesion failure and includes any adjacent adhesion separated by pulling on the debonded sealant with a light hand.

All Remedial Actions shall be performed from March 1 to November 1. Prior to performing a Remedial Action, the Contractor shall submit a Remedial Action plan to the Engineer for approval. The Contractor's traffic control for Remedial Action work or maintenance shall be in accordance with current Department policy, the Ohio Manual of Uniform Traffic Control Devices for Streets and Highways, and subject to Department approval of the time the work will be performed. Any major change in Department construction traffic control policy will be considered a changed condition.

825.10 Method of Measurement. The quantities will be the number of pounds (kilograms) of hot applied sealant in place, completed and accepted.

825.11 Basis of Payment. Payment for this work will be made at the contract unit price per pound (kilogram) for preparation and sealing of cracks in the existing pavement, complete in place, which price includes all materials, equipment, tools and labor incidental thereto.

Item	Unit	Description
825	Pound (kilogram)	Crack sealing, Type I
825	Pound (kilogram)	Crack sealing with routing, Type I
825	Pound (kilogram)	Crack sealing with sawing, Type I
825	Pound (kilogram)	Joint sealing between rigid pavement and flexible shoulders, Type I
825	Pound (kilogram)	Crack sealing, Type II
825	Pound (kilogram)	Crack sealing, Type III
825	Pound (kilogram)	Crack sealing, Type II or III
825	Pound (kilogram)	Crack sealing, Type IV
825	Pound (kilogram)	Crack sealing with warranty, Type I
825	Pound (kilogram)	Crack sealing with routing and warranty, Type I
825	Pound (kilogram)	Crack sealing with sawing and warranty, Type I
825	Pound (kilogram)	Crack sealing with warranty, Type II
825	Pound (kilogram)	Crack sealing with warranty, Type III
825	Pound (kilogram)	Crack sealing with warranty, Type II or III
825	Pound (kilogram)	Crack sealing with warranty, Type IV

State of Ohio
Department of Transportation

Supplemental Specification 858

Superpave Asphalt Concrete

July 13, 1999

858.01 Description. Following are the gyratory mix design, material and quality control requirements for constructing an asphalt concrete pavement surface or intermediate course. The requirements of 441 shall apply except as noted. The asphalt concrete pavement course shall consist of aggregate and performance graded binder or modified binder mixed in a central plant and spread and compacted on a prepared surface in accordance with the specifications and in reasonably close conformity with the lines, grades and typical sections shown on the plan or established by the Engineer.

858.02 Mix Design for Asphalt Concrete Mix Type A. The mixture composition for Asphalt Concrete Type A shall be per 441.02 and the most recent Asphalt Institute Superpave Mix Design manual SP-2 for design procedures and material properties except as modified below. JMF submittals shall include the standard Department cover and summary page; all printouts from the compactor (all gyratory points not necessary); and analysis covering the required mix properties. One compacted gyratory sample and loose mix for compaction of another sample, in addition to a 4.4-pound (2000-gram) loose sample, shall be submitted for each JMF.

Design gyrations shall be per the lane current Average Daily Truck Traffic (ADTT) as follows unless otherwise specified in the plans. Lane ADTT can be calculated from the plan as follows:

Lane ADTT = Current ADT x %B&C trucks x 0.5 x 0.9

If multiple N_{des} exist due to a multiple section project etc. the lower design gyrations shall apply unless otherwise specified in the plans.

Gyration Level and Material Requirements							
Lane ADTT	N_{ini}	N_{des}	N_{max}	Coarse Agg. Angularity	Fine Agg. Angularity	Flat and Elon. Particles	Sand Equiv.
<4000	7	86	134	95/90	44	10	45
>4000	8	109	174	100/100	44	10	50

All virgin aggregate used shall be approved by the Department. If fine aggregate is from crushed carbonate stone or air cooled blast furnace slag, the fine aggregate angularity (FAA) test is not required. For any other material FAA shall be 44. A blend of a material not meeting FAA with a material that meets FAA is allowed, but the FAA result shall be calculated mathematically based on the individual Department FAA results and actual blend percentages. Blends must be approved by the Department. All other Department aggregate requirements will apply except gradation for fine aggregate. Aggregate to be used must be submitted to the Laboratory with sufficient lead time to perform testing for JMF approval.

Control points shall be per the most recent SP-2 except as follows. The restricted zone shall not apply.

Sieve	9.5mm mix	12.5mm mix	19mm mix
No. 8 (2.36mm)		32-43%	28-45%
No. 4 (4.75mm)	70 max		
1/2 inch (12.5mm)		95-100%	
3/4 inch (19mm)			85-100%
1 1/2 inch (37.5mm)			100%

The F/A ratio shall be 1.2 max. A four hour cure in design shall be used.

If more than 15 percent fine aggregate not meeting FAA is used, a loaded wheel test (LWT) per Supplement 1057 is required. For estimating LWT sample mix volume, the bulk density from gyratory specimens at N_{des} is required. Results less than 0.20 in (5.0mm) at 115 F (46 C) are considered passing.

Rollers keeping far back on a mix at normal compaction temperature is an indication of a tender, rut prone mix and may be justification for requiring a redesign. The Marshall flow test may be used in design as an indicator of potential for excess tenderness.

Recycled asphalt concrete or bituminous aggregate base (RAP) can be used per Supplement 1055 in surface courses or up to 20 percent in intermediate courses per 441.03. RAP stockpiles shall be visually inspected and approved by the District prior to production. Final RAP gradation and asphalt content is to be based on four separate stockpile (or roadway for concurrent grinding) samples all agreeing within 0.4 percent for asphalt content and 5 percent passing the No. 4 (4.75mm) sieve. All four test results and an average shall be reported in the JMF.

Design volumetric properties shall be tested at N_{des}. N_{max} shall be tested for the required criteria.

SP-2 Table 5.2 VMA shall be (percent minimum): 9.5mm - 15
12.5mm - 14.0
19.0mm - 13

AASHTO T 283 with freeze cycles and a TSR of 80 are required per SP-2. Testing of mix and storage of antistrip shall be per Supplements 1051 and 1053. The cost of this additional testing and the addition of any antistrip additive shall be included in the contract price for the bituminous aggregate base or asphalt concrete. Requirements for treatment if needed are as follows:

Liquid Antistrip Material - the mix shall include liquid antistrip material at a rate of 0.50 to 1.25

percent by weight of the binder.

Hydrated Lime - the mix shall include hydrated lime in dry form at a rate of 1.0 percent by dry aggregate weight for asphalt concrete. The hydrated lime shall meet the requirements of AASHTO M303, Type 1. The following information shall be provided to the DET for each shipment of hydrated lime: (1) letter of certification, (2) production date, (3) shipment date, (4) shipment destination, (5) batch or lot number, and (6) net weight.

The JMF shall include:

1. All TSR data (before and after the addition of the antistrip additive).
2. Rate of addition of the liquid antistrip material, if used.
3. Product information, recent supplier State project information using the liquid antistrip material, and letter of certification (only for liquid antistrip material, if used).

The Laboratory may perform additional tests in accordance with Supplements 1051, 1052, and 1004. These tests may be performed on material conforming to a proposed JMF or on material obtained during production of an approved JMF. If a change in the aggregate production is suspected, the District/ Laboratory may require the Contractor to perform washed gradations on components and calculate adherent fines to determine the need for additional TSR review. The Laboratory may obtain samples of the hydrated lime at any time to verify quality. If the quality of the hydrated lime is in question, the Laboratory may require independent laboratory testing verifying AASHTO M 303 is met.

At the end of the project or at the end of each construction year on a multiple year project, the Contractor shall provide delivery tickets to the Engineer verifying the number of pounds (kilograms) of antistrip additive used. The Engineer shall verify the quantity of antistrip additive is within 10 percent of the calculated amount of antistrip additive required for the total pounds of bitumen, based on the JMF, used in the bituminous aggregate base or asphalt concrete.

858.03 Mix Design for Asphalt Concrete Mix Type B. The mix design as in 858.02 above shall apply for Asphalt Concrete Type B except as follows:

Gyration Level and Material Requirements							
Lane ADTT	N_{ini}	N_{des}	N_{max}	Coarse Agg. Angularity	Fine Agg. Angularity	Flat and Elon. Particles	Sand Equiv.
<4000	7	86	134	65	44	10	45
>4000	8	109	174	75/70	44	10	50

If fine aggregate is from crushed carbonate stone or air cooled blast furnace slag, the FAA test is not required. At least 50 percent by weight of virgin fine aggregate shall be aggregate meeting FAA or be crushed carbonate stone or air cooled blast furnace slag. Aggregate to be used must be submitted to the Laboratory for approval three weeks prior to a JMF submittal for approval.

Control points to be per the most recent SP-2 except as follows. The restricted zone shall not apply.

Sieve	9.5mm mix	12.5mm mix	19mm mix
No. 8 (2.36mm)		34-40%	28-45%
No. 4 (4.75mm)	70 max		
1/2 inch (12.5mm)		95-100%	
3/4 inch (19mm)			85-100%
1 1/2 inch (37.5mm)			100%

A F/T value of +2 shall apply per 441.02 and 441.10.

858.04 Binder. Binder shall be used as follows:

12.5mm Surface course	Supplement 1055
9.5mm Surface course	Supplement 1055
9.5mm Intermediate course	PG 64-28
19mm Intermediate course	PG 64-28

The minimum total binder content for a surface course shall be:

5.6 percent for N_{des} = 86
5.4 percent for N_{des} = 109

858.05 Quality Control. 441.10 shall be followed with the following exceptions. A Contractor's representative holding a Level 2 qualification is required to be at the asphalt plant until a full production day is achieved with results satisfactory to the DET. Plant operation and quality control testing shall conform to the contractor's Plant Operation Quality Control Program.

A gyratory compactor meeting the requirements of Superpave and verified by FHWA (or a representative of their office) is required. If the gyratory compactor was moved to the plant prior to production, it must be calibrated and have results presented to the DET. Samples for air voids shall be conditioned two hours. Starting within the first 4 production days, if air voids are consistently low, four hour conditioning may be used but shall be used for the remainder of JMF production. Other uses of four hour conditioning for information is at the discretion of the Contractor but shall be reported. Bulk gravity for air voids determination shall be determined on specimens compacted to $N_{des.}$ Once each day for the first three production days and once each third production day thereafter, one set of specimens shall be compacted to $N_{max.}$ Density at N_{max} based on percent Gmm shall be less than 98.0. Production will not be allowed to continue if greater than or equal to 98.0 unless acceptable corrections and retest are made.

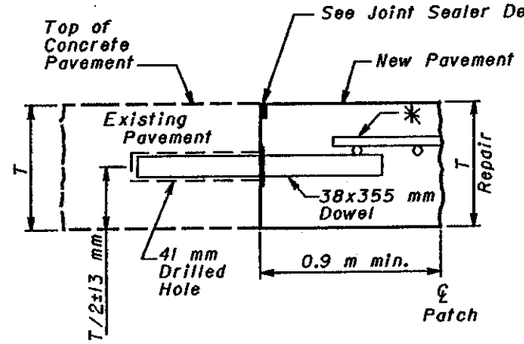
If the design gradation requires an LWT test, a sample sufficient to compact one LWT test beam must be taken once each day for the first three days and tested according to Supplement 1057. The LWT can be in the Contractor's Level 2 lab, but the sample beam must be compacted the same day the sample was taken, cured overnight and tested the following day. The test result and beam density must be given to the DET the day of the LWT test. The LWT data shall be reported on the TE 199.

Once in every five hot mix production days, a Department monitor will instruct the Contractor to take a 1 quart (1 liter) binder sample from between the last piping 'Tee' in the line and inlet into the asphalt plant for each binder type used. Two samples will be taken, one for the Department and the other for the Contractor. The Contractor will label the samples with binder type, supplier, project number and date and retain them in the plant laboratory for future reference by the Department. This sample will be held until otherwise notified by the monitoring team.

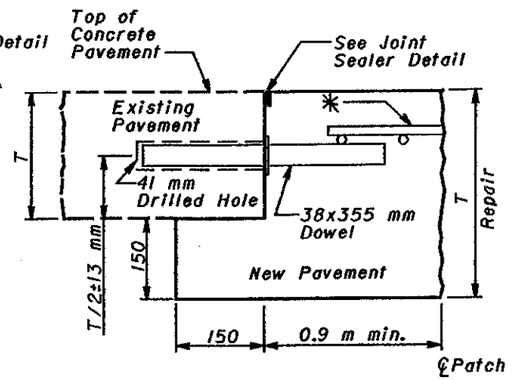
858.06 Acceptance. Acceptance of the asphalt concrete mix will be based on the Item specified in the Contract (such as 446, 448, etc.)

858.07 Basis of Payment.

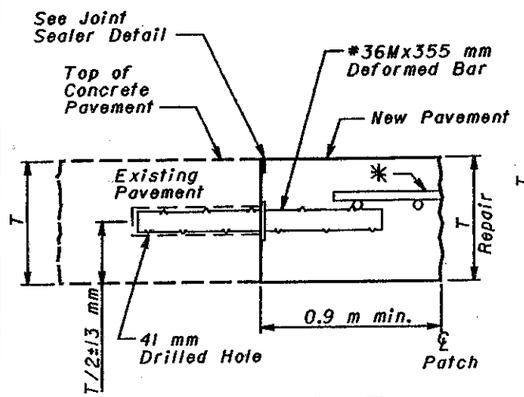
Item	Unit	Description
858	Cubic yard (cubic meter)	Asphalt concrete surface course, 12.5mm, Type A (446)
858	Cubic yard (cubic meter)	Asphalt concrete surface course, 12.5mm, Type B (446)
858	Cubic yard (cubic meter)	Asphalt concrete surface course, 9.5mm, Type A (446)
858	Cubic yard (cubic meter)	Asphalt concrete surface course, 9.5mm, Type B (446)
858	Cubic yard (cubic meter)	Asphalt concrete Intermediate course, 19mm, Type A (446)
858	Cubic yard (cubic meter)	Asphalt concrete intermediate course, 19mm, Type B (446)
858	Cubic yard (cubic meter)	Asphalt concrete intermediate course, 9.5mm, Type A (448)
858	Cubic yard (cubic meter)	Asphalt concrete intermediate course, 9.5mm, Type B (448)
858	Cubic yard (cubic meter)	Asphalt concrete surface course, 12.5mm, Type A (448)
858	Cubic yard (cubic meter)	Asphalt concrete surface course, 12.5mm, Type B (448)
858	Cubic yard (cubic meter)	Asphalt concrete surface course, 9.5mm, Type A (448)
858	Cubic yard (cubic meter)	Asphalt concrete surface course, 9.5mm, Type B (448)
858	Cubic yard (cubic meter)	Asphalt concrete intermediate course, 19mm, Type A (448)
858	Cubic yard (cubic meter)	Asphalt concrete intermediate course, 19mm, Type B (448)



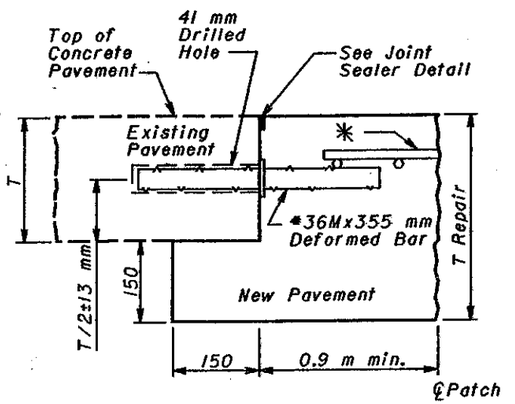
SECTION - TYPE Y
(Contraction)



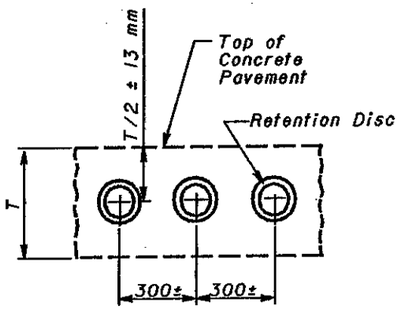
SECTION - TYPE YU
(Undercut : Contraction)



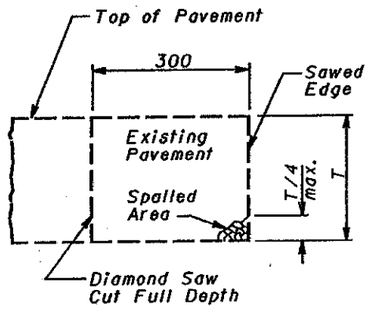
SECTION - TYPE T
(Tied)



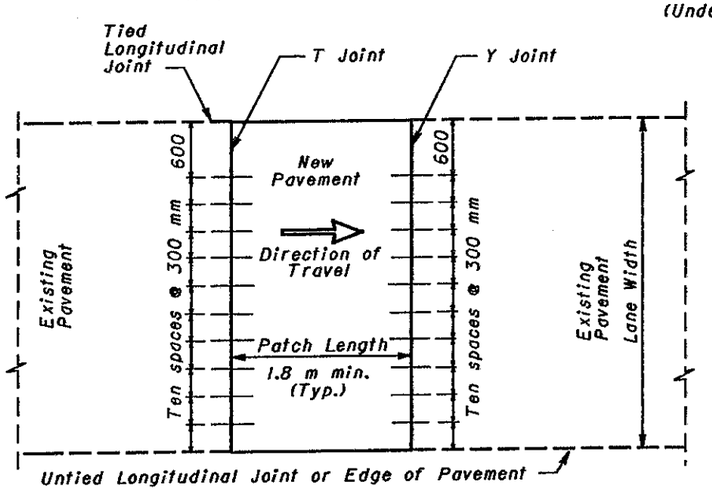
SECTION - TYPE TU
(Undercut : Tied)



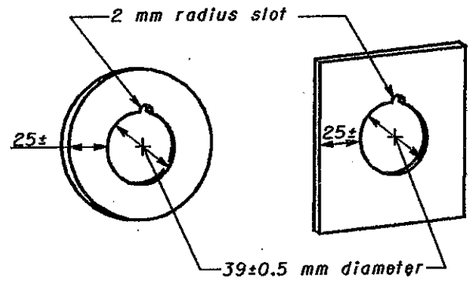
HOLE DRILLING DETAIL



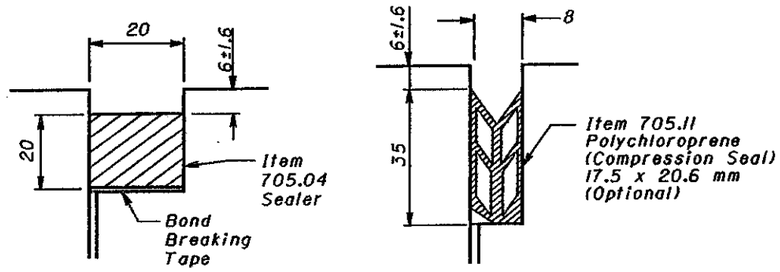
ADDITIONAL PAVEMENT REMOVALS



TIE / DOWEL BAR PLACEMENT DETAIL
(See Note ✦ for Bar Placement)



NYLON OR PLASTIC GROUT RETENSION DISCS FOR DOWEL/TIE BARS ⊛
(1.6 mm min. thickness)



JOINT SEALER DETAIL

NOTES

GENERAL: All joints shall be constructed normal to the centerline of the pavement lane unless otherwise specified in the plans.

All dowel holes shall be drilled by a mechanical device that will allow independent adjustment of all drill shafts in the horizontal and vertical direction. The device shall be capable of drilling a minimum of three holes at a time.

All smooth dowels shall be coated with a thin layer of oil or other "bond-breaking" material after they have been installed in the existing pavement and just prior to placing the patch. All dowels shall be placed parallel to the pavement surface and the centerline of the pavement lane.

This standard drawing is intended for use in repairing both concrete and composite pavements. For clarity, asphalt overlays are not shown.

When Prefabricated Edge Drains are used, they shall be placed after joint repairs are completed.

TYPE N JOINT: Joints referred to as Type N joints on the plan shall be constructed as contraction joints as per Std. Constr. Dwg. BP-2.2M.

ADDITIONAL PAVEMENT REMOVAL: If, after the sawing and removal of the pavement from the area to be repaired, the face of the remaining pavement is spalled or deteriorated for a height greater than one-fourth (1/4) the thickness of the rigid pavement, an additional saw cut shall be made as shown and as directed by the Engineer. This additional work shall be measured for additional payment for full depth pavement sawing, rigid pavement removal and replacement.

LONGITUDINAL JOINT: For patches 3.0 meters or greater in length, the longitudinal joint shall be constructed as per BP-2.1M.

The tie bars or hook bolts shall be spaced at no more than 760 mm nor less than 610 mm on center.

✦ Bars shall be placed 600 mm from the tied longitudinal joint and continue across with a 300 mm spacing to the edge of pavement or an untied longitudinal joint. Where lane widths are between two tied longitudinaljoints, begin bars 600 mm from each tied longitudinal joint and continue across with a 300 mm spacing.

* Reinforcement will be required for all repairs greater than 3.0 m in length or for repairs which will be opened to traffic within 24 hours of placement. The fabric shall consist of MW55 or MD55 longitudinal wires spaced 152 mm c/c and MW26 or MD26 transverse wires spaced 305 mm c/c. The clearance from the end of the wire fabric to the edge of pavement or new transverse joint shall be 100±50 mm.

⊛ Nylon or plastic grout retention discs shall be clear or opaque white in color.

metric units

All dimensions are in millimeters unless otherwise noted.

This Drawing Replaces BP-2.5.

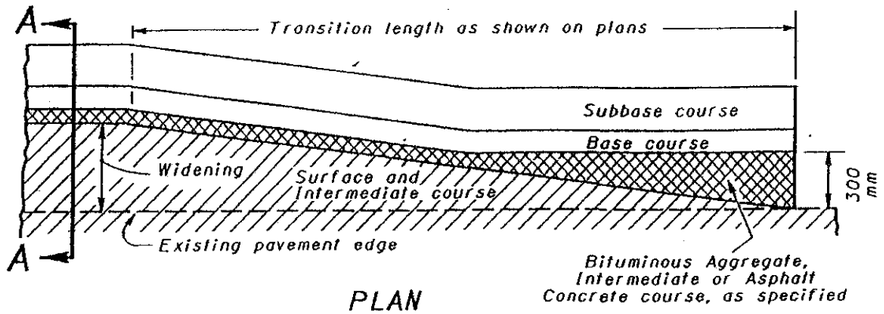
OFFICE OF PLANNING
OHIO DEPARTMENT OF TRANSPORTATION

RIGID REPLACEMENT

DATE
10-28-94
4-8-97

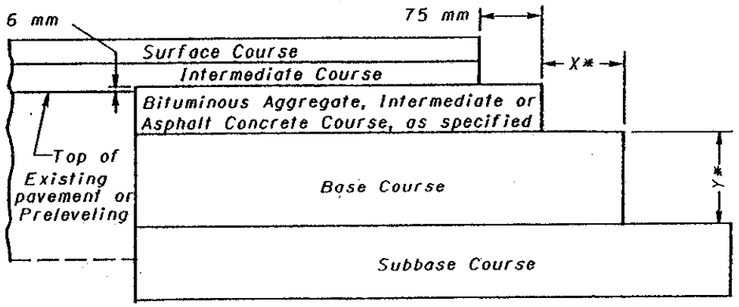
STANDARD CONSTRUCTION DRAWING **BP-2.5M**

APPROVED Larry F. Sutherland
ADMINISTRATOR



PLAN

MERGING EDGE OF PAVEMENT WIDENING WITH EDGE OF EXISTING PAVEMENT

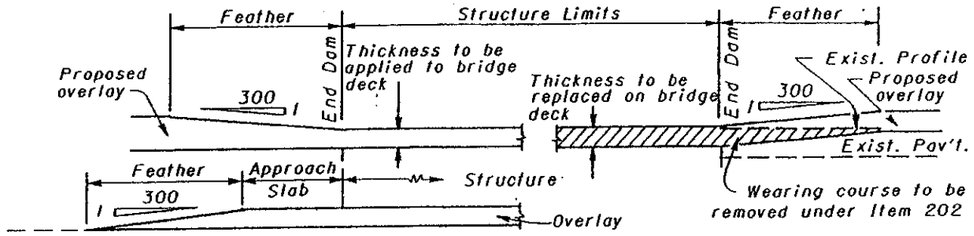


The Bituminous Aggregate in the upper part of the base widening shall finish approximately 6 mm above the edge of the existing pavement where no preleveling is used. Where a preleveling (using intermediate course material) is specified it shall be placed prior to excavation of the widening trench and the upper course of the base widening shall finish approximately 6 mm above the preleveling.

*The extended width (X) of a base or subbase course shall be equal to the depth (Y) of that particular course. unless otherwise specified in the plans.

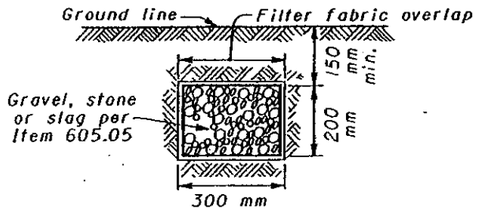
SECTION A-A

COURSE DETAIL FOR WIDENING



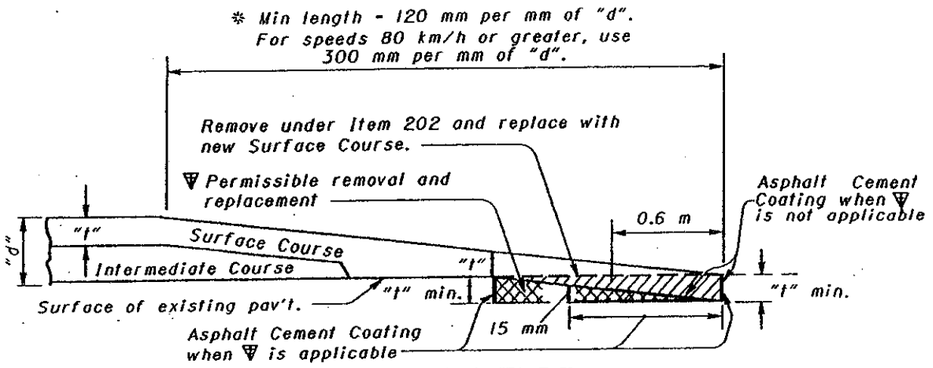
Details assume non-settled approach slabs. Smoothing of the profile for settlement is required per plan grades or as directed by the Engineer.

FEATHERING AT STRUCTURES

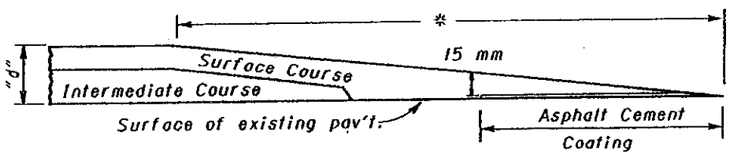


Aggregate drains to be placed where and as directed by Engineer. Provide filter fabric when specified as a separate pay item.

AGGREGATE DRAIN



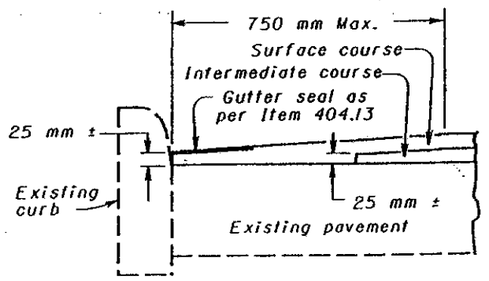
BUTT JOINT TYPE



TAPER EDGE TYPE

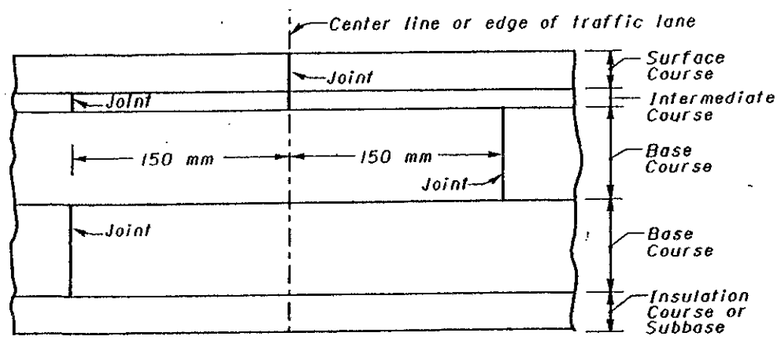
NOTE: Either butt or taper type may be used unless type is specified by the plan.

PLACING FEATHERED AREAS

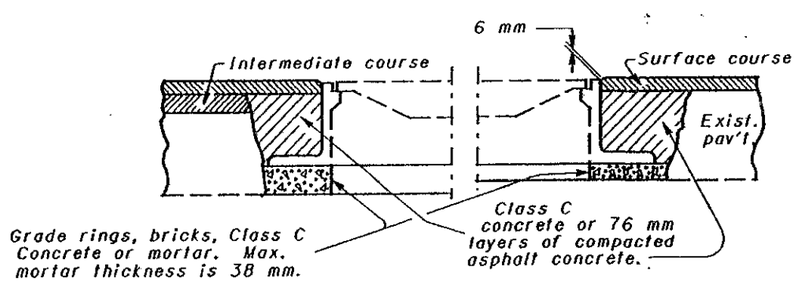


Special care shall be taken during construction to obtain maximum compaction of bituminous concrete in gutters.

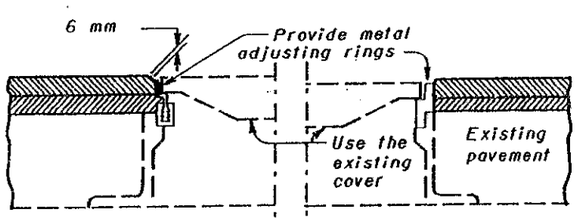
GUTTER FINISH



LAPPING LONGITUDINAL JOINTS



USING CONCRETE OR MORTAR



USING METAL ADJUSTING RINGS

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

metric units

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

RESURFACING

DATE 10-28-94

STANDARD CONSTRUCTION DRAWING **BP-3.1M**

APPROVED W. K. Hukman
ENGR., L & D

TEMPORARY SIGN SUPPORT REQUIREMENTS

A. PLACEMENT OF SIGNS WHICH WILL REMAIN MORE THAN ONE DAY:

1) LATERAL PLACEMENT TO NEAREST EDGE OF SIGNS SHALL BE AS FOLLOWS:

   a) ON THE RIGHT SIDE OF THE ROAD FOR APPROACHING TRAFFIC (EXCEPT FOR DUAL MOUNTED SIGNS AND SIGNS DESIGNATED IN THE PLANS FOR LEFT SIDE MOUNTING).

   b) CURBED ROADWAY - MINIMUM 0.6 m BEHIND FACE OF CURB.

   c) UNCURBED ROADWAY- 3.7 m FROM EDGE OF TRAFFIC LANE OR 1.8 m FROM EDGE OF PAVED OR USEABLE SHOULDER, WHICHEVER IS GREATER.

   d) BEHIND GUARDRAIL OR BARRIER - PREFERABLY 0.6 m BEHIND FACE OF GUARDRAIL (MINIMUM 0.3 m) FOR SIGNS ON CLASS A SUPPORTS: 1.2 m FOR CLASS B OR C SUPPORTS: 0.3 m BEHIND FACE OF CONCRETE BARRIER UNLESS BARRIER TOP MOUNTING IS REQUIRED BY THE PLAN.

2) VERTICAL CLEARANCE OF SIGNS, MEASURED ABOVE ROADWAY ELEVATION; SHALL BE AS FOLLOWS:

   a) RURAL - 1.5 m WHEN PARKED CARS, CONSTRUCTION EQUIPMENT, ETC WILL NOT OBSCURE SIGN VISIBILITY.

   b) RURAL AREAS WITH PARKED CARS OR CONSTRUCTION EQUIPMENT - 2.1 m

   c) URBAN - 2.1 m

   d) CARE SHALL BE TAKEN TO ASSURE THAT SIGNS WILL NOT BE OBSCURED BY CONSTRUCTION EQUIPMENT, TREES, WEEDS OR OTHER OBSTACLES. BRUSH, WEEDS OR GRASS WITHIN THE RIGHT OF WAY SHALL BE TRIMMED AS NECESSARY. SIGNS SHALL NORMALLY BE VISIBLE TO TRAFFIC 122 m TO 183 m IN ADVANCE OF THE SIGN.

3) SUPPORTS FOR SIGNS WHICH WILL REMAIN IN PLACE MORE THAN ONE DAY SHALL BE FIXED RATHER THAN PORTABLE EXCEPT IN SITUATIONS WHERE THE SIGN MUST REST ON PERMANENT PAVEMENT OR OTHER SURFACE WHICH WOULD BE DAMAGED BY INSERTION OF POST TYPE SUPPORTS.

B. PLACEMENT OF SIGNS WHICH WILL REMAIN FOR ONE DAY OR LESS:

1) SAME AS A-1 ABOVE EXCEPT THAT SIGNS MAY BE PLACED ON THE ROADWAY ONLY IF THEY DO NOT INTRUDE INTO A TRAFFIC LANE IN USE.

2) MINIMUM OF 0.3 m ABOVE ROADWAY

C. CLASSES OF SUPPORTS:

ALL TEMPORARY SIGN SUPPORTS SHALL BE OF THE FOLLOWING TYPES:

1) CLASS A:

SUPPORTS SHALL BE USED FOR EXPOSED LOCATIONS ON HIGHWAYS WHERE TRAFFIC APPROACH SPEEDS OF 40 MPH AND HIGHER ARE ENCOUNTERED. THEY ARE ALSO SUITABLE FOR USE IN ALL OTHER LOCATIONS.

2) CLASS B:

SUPPORTS SHALL BE USED FOR EXPOSED LOCATIONS ON HIGHWAYS WHERE TRAFFIC APPROACH SPEEDS OF LESS THAN 40 MPH ARE ENCOUNTERED. THEY ARE ALSO SUITABLE FOR USE IN ALL APPLICATIONS DEFINED FOR CLASS C SUPPORTS.

3) CLASS C:

SUPPORTS MAY ONLY BE USED WHERE FULLY PROTECTED BY GUARDRAIL, CONCRETE BARRIER AND IN LOCATIONS POSITIVELY PROTECTED FROM TRAFFIC SUCH AS ON RETAINING WALLS OR WHERE TRAFFIC APPROACH SPEEDS ARE LESS THAN 25 MPH.

D. TRAFFIC APPROACH SPEEDS:

TRAFFIC APPROACH SPEEDS SHALL BE THE LOCALLY POSTED SPEED (NOT ADVISORY SPEED SIGNS) OR THE MEASURED ACTUAL (85TH PERCENTILE) SPEED (IF AVAILABLE) OF APPROACHING TRAFFIC, WHICHEVER IS HIGHER, ADJACENT TO THE SIGN LOCATION.

TABLE

APPROACH SPEED (MPH)	COMPLETELY PROTECTED BY GUARDRAIL OR BARRIER	PARTLY PROTECTED BY GUARDRAIL OR BARRIER *	GREATER THAN 9 m FROM EDGE OF PAVEMENT	WITHIN 9 m FROM EDGE OF PAVEMENT
40 AND HIGHER	A, B OR C	A OR B	A OR B **	A ONLY
26 TO 39	A, B OR C	A OR B	A OR B	A OR B
0 TO 25	A, B OR C	A, B OR C	A, B OR C	A, B OR C

* IF SUPPORTS ARE BEHIND GUARDRAIL BUT NOT FULLY 1.7 m BEHIND FACE OF RAIL OR IF SIGN IS NOT 0.3 m BEHIND FACE OF CONCRETE BARRIER.

** 9 m CRITERION IS BASED UPON STRAIGHT ROADWAY AND A SLOPE OF 6 to 1 OR FLATTER. SUPPORTS ON THE OUTSIDE OF CURVES OR LOCATED DOWN A SLOPE (STEEPER THAN 6 : 1) WILL REQUIRE USE OF CLASS A SUPPORTS.

E. BALLASTING

BALLASTING OF PORTABLE SUPPORTS SHALL BE WITH SANDBAGS PLACED WITHIN 0.3 m OF THE GROUND. IN NO CASE SHALL HARD OBJECTS BE USED FOR BALLAST.

F. STRENGTH OF SIGN SUPPORTS

THE CONTRACTOR SHALL CHOOSE SIGN SUPPORTS OF ADEQUATE STRENGTH AND WITH ADEQUATE FOUNDATIONS AND ANCHORAGE TO SUPPORT THE SIGN SIZES ERECTED. PROPRIETARY DEVICES SHALL NOT BE LOADED BEYOND THE LIMITS RECOMMENDED BY THE MANUFACTURER. SLIP BASE TYPE BREAKAWAY BEAM CONNECTIONS SHALL BE AT LEAST PARTIALLY EMBEDDED IN CONCRETE CONSISTING OF A 0.3 m DEEP BY 0.3 m DIAMETER COLLAR. SIGN SUPPORTS WHICH FAIL UNDER TYPICAL WIND LOAD CONDITIONS SHALL BE IMMEDIATELY MODIFIED OR REPLACED WITH A SUPPORT OF ADEQUATE STRENGTH.

G. PROHIBITED SUPPORTS

THE FOLLOWING SUPPORT TYPES SHALL NOT BE PERMITTED ON PROJECTS:

1) SUPPORTS FABRICATED FROM AUTOMOTIVE AXLE DIFFERENTIAL ASSEMBLIES AND SIMILARLY HEAVY ASSEMBLIES WHICH CANNOT BE CONSIDERED BREAKAWAY TYPE.

2) SUPPORTS CONSISTING OF VERTICAL POSTS WITH ANGLED BRACES MADE FROM DRIVEPOST OR OTHER RIGID ELEMENTS.

CLASS A SUPPORTS

FIXED SUPPORTS

1) ALL #2 AND #3 POST WHEN INSTALLED SINGLY OR IN PAIRS (SIDE BY SIDE) ACCORDING TO THE DETAILS OF TC-41.20M. THE NUMBER OF SUPPORTS SHALL BE AS SHOWN ON TC-52.10M AND TC-52.20M.

2) THE FOLLOWING POST TYPES, WHEN INSTALLED SINGLY, BY IMBEDMENT OR DRIVING INTO EARTH TO A DEPTH OF ABOUT 1.1 m.

   a) - UP TO 102 X 102 mm WOOD.

   b) - UP TO 51 mm DIAMETER SCHEDULE 40 STEEL PIPE.

   c) - UP TO 76 mm DIAMETER SCHEDULE 40 ALUMINUM PIPE.

   d) - UP TO 56.4 mm SQUARE, 12 GAUGE WALL, PUNCHED STEEL POST.

   e) - UP TO 152 X 203 mm WOOD WITH BREAKAWAY HOLES SHOWN BELOW.

3) THE FOLLOWING POST TYPES WHEN INSTALLED IN PAIRS (SIDE BY SIDE) WITH LESS THAN 2 m BETWEEN POSTS, BY IMBEDMENT OR DRIVING INTO EARTH TO A DEPTH OF ABOUT 1.1 m :

   a) - UP TO 102 X 102 mm WOOD.

   b) - UP TO 51 mm DIAMETER SCHEDULE 40 STEEL PIPE.

   c) - UP TO 76 mm DIAMETER SCHEDULE 40 ALUMINUM PIPE.

   d) - UP TO 51 mm SQUARE, 14 GAUGE WALL, PUNCHED STEEL POST.

4) FIXED TYPE III BARRICADES:

5) ALL BREAKAWAY CONNECTION BEAM SUPPORTS, WHEN INSTALLED ACCORDING TO THE PROPER DETAILS SHOWN ON TC-41.10M WITH A MINIMUM CLEAR DISTANCE BETWEEN SUPPORTS OF 2.1 m FOR SUPPORTS LARGER THAN W6 X 9.

6) ANY BREAKAWAY POST OR POST AND CONNECTION WHICH HAS BEEN CRASH TESTED AND APPROVED BY THE FHWA AS SATISFYING THE BREAKAWAY CRITERIA DESCRIBED IN 630.06.

(CONTINUED ON MT-105.11M)

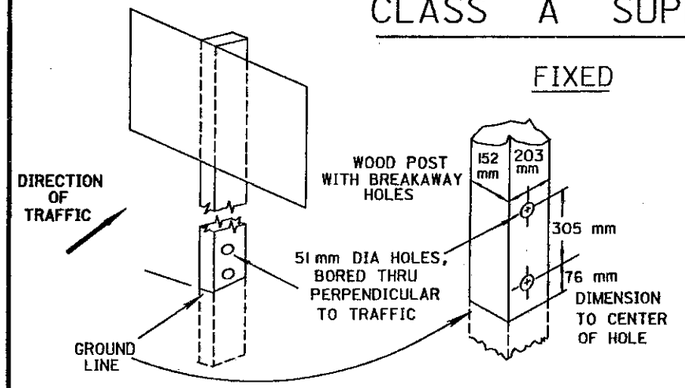
METRIC

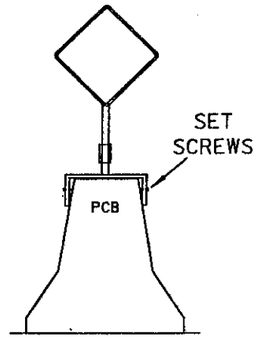
BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

MAINTENANCE OF TRAFFIC	DATE 04/25/94
TEMPORARY SIGN SUPPORT	
STANDARD CONSTRUCTION DRAWING MT-105.10M	
APPROVED Jay Drage ENGR. OF DESIGN SERVICES	

CLASS A SUPPORTS

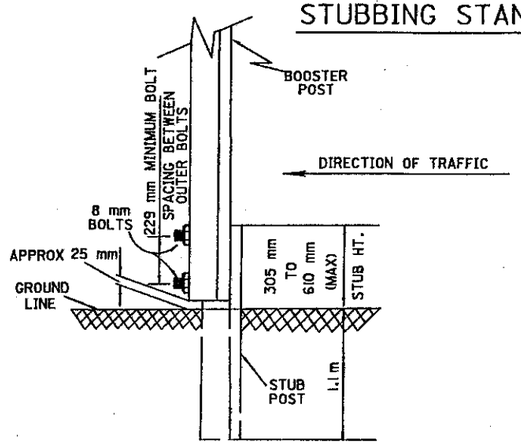
FIXED





CLASS A SUPPORTS

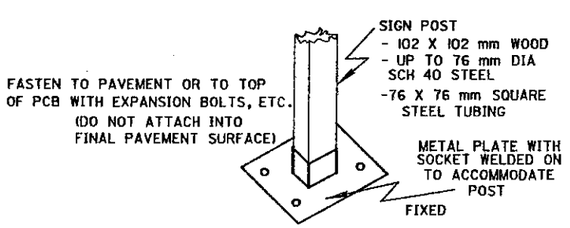
STUBBING STANDARD

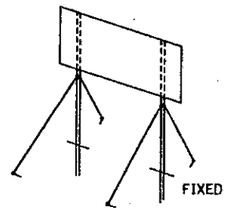


NOTES

1. FOR USE WITH #3 POST OR SMALLER ONLY
2. BOLTS SHALL BE STEEL OR ALUMINUM
3. A MINIMUM OF TWO FASTENERS SHALL BE USED PER ASSEMBLY
4. BOOSTER POST SHALL BE MOUNTED BEHIND STUB POST
5. BOOSTER POST SHALL BE THE SAME OR 1.5 kg/m LESS THAN STUB POST

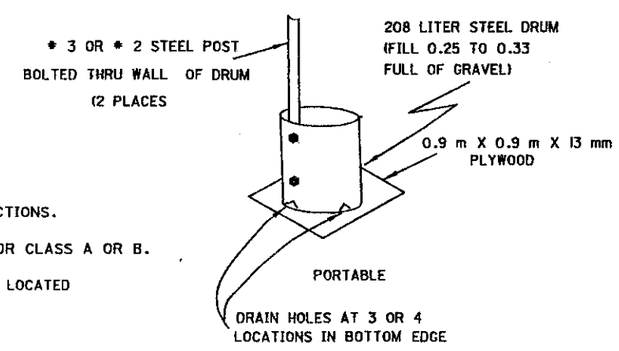
CLASS B SUPPORTS





ANY CLASS A SIGN POST WITH GUY WIRES ADDED TO INCREASE SIGN CARRYING ABILITY. (GUY WIRES SHALL NOT BE HEAVIER THAN 3.2 mm DIA. BRAIDED CABLE. GUY ANCHORS SHALL NOT EXTEND MORE THAN 152 mm ABOVE GROUND SURFACE).

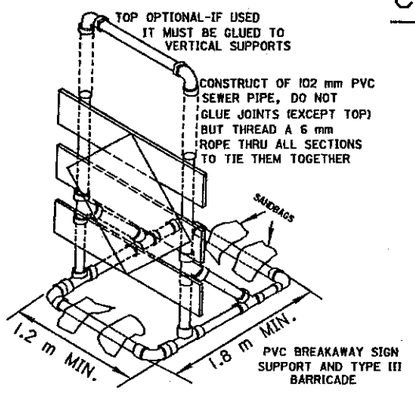
CLASS C SUPPORTS

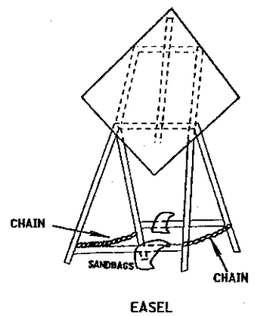


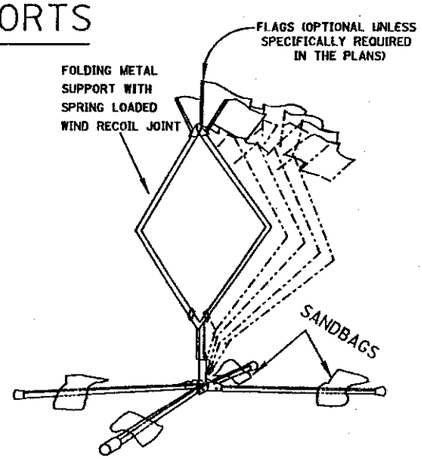
1. ALL BEAM TYPE SUPPORTS WITHOUT BREAKAWAY CONNECTIONS.
2. SUPPORTS SIMILAR TO BUT LARGER THAN PERMITTED FOR CLASS A OR B.
3. THE STEEL DRUM(S) SHOWN BELOW MAY BE USED ONLY WHEN LOCATED BEHIND GUARDRAIL OR BARRIER.

CLASS A SUPPORTS

PORTABLE







NOTES

RAIL MATERIALS:
25 X 203 mm OR 51 X 203 mm COMMON LUMBER
203 mm X (16 mm TO 25 mm) THICK EXTERIOR PLYWOOD
EXTRUDED PLASTIC OR FORMED SHEET METAL WITH A 203 mm WIDE SURFACE AND OF SUFFICENT STIFFNESS TO RESIST TYPICAL WIND LOADS OF UP TO 147 kg/m², BUT HAVING A WEIGHT OF NOT MORE THAN 7.5 kg/m.

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 THE OMUTCD. PAYMENT FOR ALL LABOR, EQUIPMENT AND MATERIALS TO PROVIDE THIS METHOD OF TRAFFIC CONTROL SHALL BE INCLUDED IN THE LUMP SUM BID FOR 614 MAINTAINING TRAFFIC, UNLESS SEPARATELY ITEMIZED IN THE PLAN.

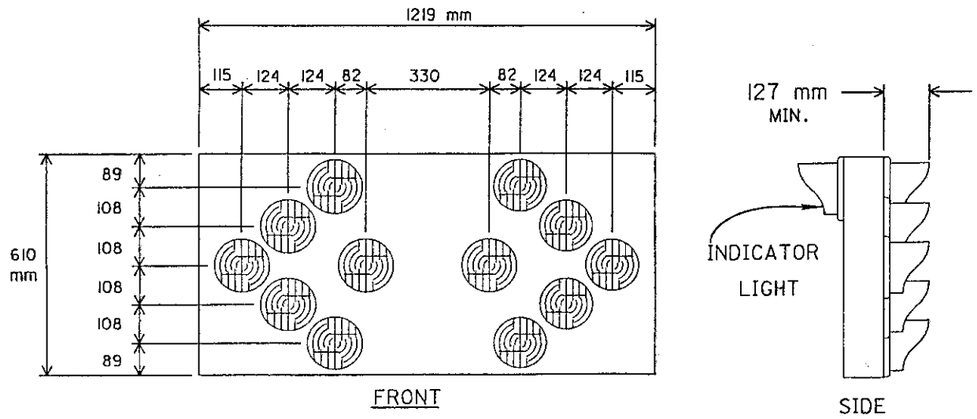
METRIC

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

MAINTENANCE OF TRAFFIC	DATE 04/25/94
TEMPORARY SIGN SUPPORT	
STANDARD CONSTRUCTION DRAWING MT-105.11M	

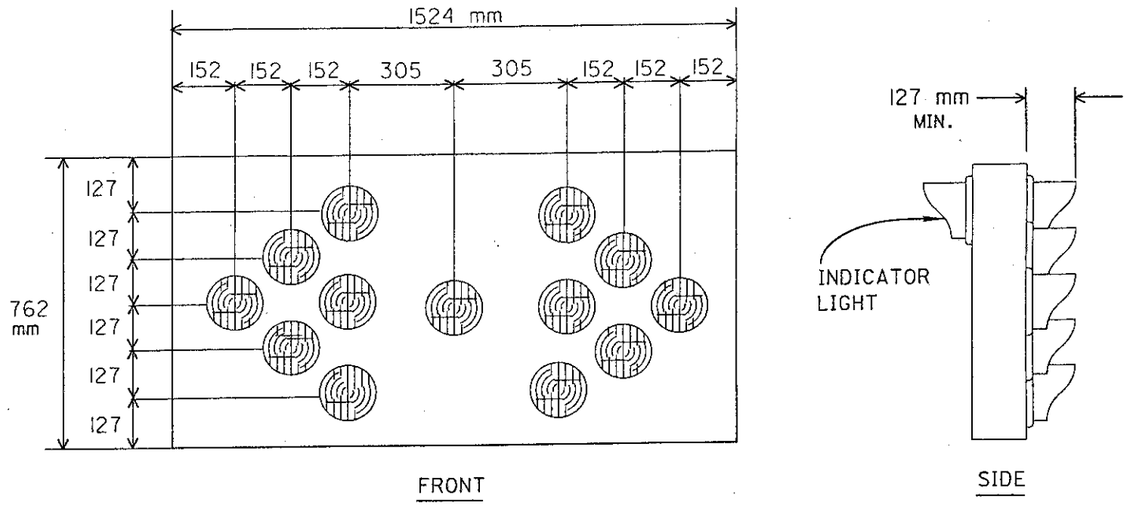
APPROVED Daryl Cuyo ENGR. OF DESIGN SERVICES

ALL MEASUREMENTS ARE IN MILLIMETERS



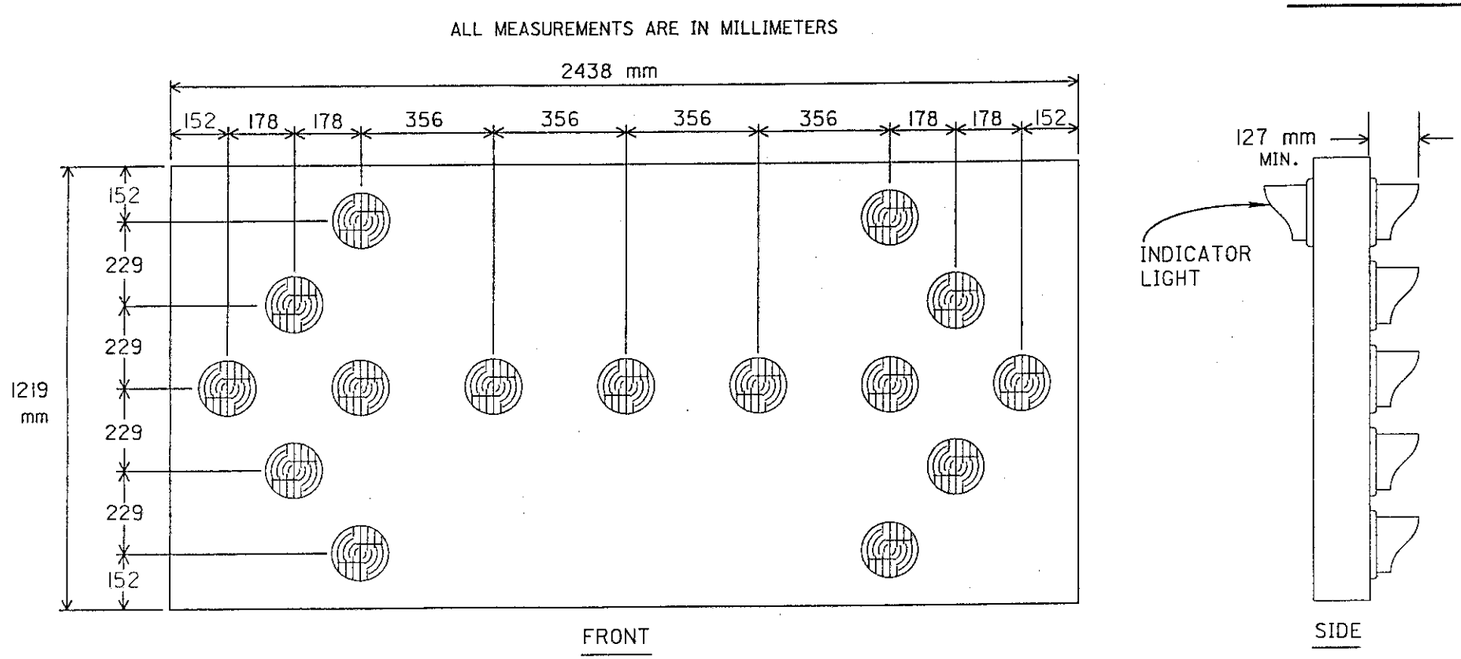
TYPE A PANEL

ALL MEASUREMENTS ARE IN MILLIMETERS



TYPE B PANEL

ALL MEASUREMENTS ARE IN MILLIMETERS



TYPE C PANEL

METRIC

(SEE MT-35.11M FOR NOTES)

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

MAINTENANCE OF TRAFFIC

DATE 01/30/95

FLASHING ARROW PANEL

STANDARD CONSTRUCTION DRAWING

MT-35.10M

APPROVED _____ ENGR. OF DESIGN SERVICES

WCC

FLASHING ARROW PANEL

THE FLASHING ARROW PANEL SHALL CONSIST OF THE FOLLOWING COMPONENTS:

A. FLASHER PANEL

B. LAMPS

C. CONTROLS

D. POWER SUPPLY

E. MOUNTING

A. FLASHER PANEL

THE FLASHER PANEL SHALL BE OF EXTERIOR TYPE PLYWOOD BY CORROSION RESISTANT METAL CONSTRUCTION OF ADEQUATE DESIGN AND STRENGTH. THE PANEL FINISH SHALL BE FLAT BLACK.

A FLASHER PANEL SHALL BE ONE OF THREE SIZES. THE TYPE A PANEL SHALL BE A NOMINAL 610 MILLIMETERS HIGH BY 1219 MILLIMETERS WIDE. TYPE B SHALL BE A NOMINAL 762 MILLIMETERS HIGH BY 1524 MILLIMETERS WIDE. TYPE C SHALL BE A NOMINAL 1219 MILLIMETERS HIGH BY 2438 MILLIMETERS WIDE.

FLASHING ARROW PANELS, SHALL NORMALLY UTILIZE HIGH OUTPUT (4412A AND 4415A) LAMPS POWERED BY AN ENGINE DRIVEN GENERATOR WHEN PERMITTED BY THE PLANS. THE CONTRACTOR MAY ALSO FURNISH UNITS POWERED BY A SOLAR ARRAY AND BATTERIES OR ONLY BATTERIES; HOWEVER THESE UNITS SHALL NOT BE USED WHERE THE APPROACHING TRAFFIC WOULD BE ON A HORIZONTAL CURVE IN EXCESS OF 3 DEGREES. THESE UNITS SHALL NOT BE USED IF THE APPROACHING TRAFFIC, CLOSER THAN 1.6 km (.8 km WHERE SPEED LIMITS ARE LESS THAN 64 km/h), IS MORE THAN 5½ DEGREES HORIZONTALLY OR 2 DEGREES VERTICALLY FROM THE CENTRAL AXIS OF THE LENSE UNITS.

B. LAMPS

FOR ENGINE POWERED GENERATOR UNITS, LAMPS SHALL BE ANSI NUMBER 4412A (PAR 46) FOR TYPE B AND C AND 4415A (PAR 36) FOR TYPE A. THE LAMP SHALL BE FITTED WITH AN UPPER HOOD OF NOT LESS THAN 180° AT LEAST 127 MILLIMETERS LONG. ARROW PANELS MAY USE A LOWER POWER (WATTAGE) LAMP THAN THE STANDARD ARROW PANELS. THE LAMPS SHALL BE APPROXIMATELY 127 MILLIMETER DIAMETER WITH A PARABOLIC REFLECTOR. THE LAMP SHALL PROVIDE IMPROVED LIGHT DISTRIBUTION CONTROL BY MEANS OF HIGH QUALITY REFLECTORS AND REFRACTORS. THE LIGHT OUTPUT FROM EACH LAMP OF THE ARROW SHALL NOT BE LESS THAN SHOWN IN FIGURE I WHEN OPERATING AT FULL DAYTIME BRIGHTNESS:

THE LAMPS SHALL BE SECURELY MOUNTED AND POSITIONED IN THE PANEL PERPENDICULAR TO THE PANEL FACE AND ORIENTED SO THAT THE LAMP LOCATION LUG (ON BACK OF THE LAMP) IS ON THE HORIZONTAL CENTER LINE THROUGH THE LENS. THE LUG WILL BE ON THE RIGHT SIDE OF THE LAMP AS VIEWED FROM THE FRONT.

THE LAMPS SHALL BE WIRED IN CIRCUITS THAT CAN BE SWITCHED TO DISPLAY ANY ONE OF THE FOLOWING MESSAGES: LEFT ARROW, RIGHT ARROW, LEFT AND RIGHT, AND CAUTION BAR. A MINIMUM OF THREE INDICATOR LIGHTS SHALL BE PLACED ON THE BACK OF THE PANEL TO INDICATE WHICH MESSAGE MODE IS IN OPERATION.

EACH PANEL SHALL CONTAIN THE FOLLOWING NUMBER OF LAMPS AS A MINIMUM: TYPE A-12 LAMPS, TYPE B-13 LAMPS, TYPE C-15 LAMPS.

LUX POWER CHART

		215	215	215			4°
108	1076	1614	2152	1614	1076	108	2°
215	2152	4304	5380	4304	2152	215	0° HORIZONTAL
108	1076	1614	2152	1614	1076	108	- 2°
		215	215	215			- 4°
7.5°	5°	2.5°	0°	2.5°	5°	7.5°	
LEFT			CENTER			RIGHT	

FIGURE I

(1) MEASUREMENTS EXPRESSED IN LUX.

(2) COLOR OF OUTPUT LIGHT SHALL BE YELLOW TO LIGHT YELLOW.

C. CONTROLS

EACH FLASHING ARROW PANEL SHALL CONTAIN A FLASHER CONTROL AND A DIMMER CONTROL UNIT HOUSED IN A CABINET WHICH CAN BE LOCKED.

1. FLASHER CONTROL

THE FLASH RATE FOR THE SIGN PANEL SHALL BE 25 TO 40 FLASHES PER MINUTE. THE FLASHER SHALL NOT CAUSE ELECTROMAGNETIC INTERFERENCE. THE LAMPS SHALL HAVE A MINIMUM "ON TIME" OF 50% AND A MAXIMUM OF 66%.

2. DIMMER CONTROL

LAMP INTENSITY SHALL BE VARIABLE BY MEANS OF A PHOTOELECTRICALLY CONTROLLED CIRCUIT WHICH SHALL REDUCE LAMP OUTPUT DURING LOW AMBIENT LIGHT CONDITIONS. THE PHOTOELECTRIC CONTROL SHALL BE CALIBRATED TO ACTUATE A LAMP DIMMING CIRCUIT AT 22 TO 54 AMBIENT LUX AND TO RESTORE THE LIGHTS TO NORMAL AT 54 TO 108 AMBIENT LUX. A TIME DELAY SHALL BE BUILT INTO THE CONTROL TO PREVENT FALSE OPERATION DUE TO LIGHT FLASHES. THE PHOTOELECTRIC CONTROL SHALL CONTAIN A SWITCH WHICH SHALL OVERRIDE THE PHOTOELECTRIC CONTROL. THE DIMMING CIRCUIT SHALL BE EXTERNALLY ADJUSTABLE SUCH THAT THE LIGHT OUTPUT MAY BE ADJUSTED WITHIN THE RANGE OF 50% TO 100% OF THE NORMAL LAMP OUTPUT. IT SHALL NORMALLY BE SET AT 50% UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

D. POWER SUPPLY

THE FLASHING ARROW PANEL SHALL OPERATE FROM POWER SOURCES CAPABLE OF CONTINUOUSLY FURNISHING THE PROPER VOLTAGE TO THE LAMPS A MINIMUM OF 24 HOURS WITHOUT ATTENDANCE.

D. CONT.

MOTOR GENERATORS, IF USED SHALL BE OF MODERN DESIGN TO PROVIDE LOW EMISSION OF POLLUTANTS AND SHALL BE PROPERLY MUFFLED. THE MOTOR GENERATOR SHALL BE ENCLOSED IN A MESH ENCLOSURE WHICH CAN BE LOCKED. THE FUEL TANK SHALL HAVE A CAP WHICH CAN BE LOCKED. MOTOR GENERATORS SUPPLYING POWER TO A FLASHING ARROW SIGN SHALL NOT BE USED TO SUPPLY POWER TO OTHER EQUIPMENT. GASOLINE FUELED ENGINES SHALL NOT BE USED.

BATTERY AND SOLAR/BATTERY UNITS SHALL HAVE A NO-CHARGE-LIFE OF NOT LESS THAN 15 DAYS. NO-CHARGE-LIFE IS THE NUMBER OF CONSECUTIVE DAYS THAT THE SYSTEM CAN CONTINUE TO FUNCTION (DOUBLE ARROW MODE, NORMAL DIMMING DURING 12 HOUR NIGHT, FULL OUTPUT DURING 12 HOUR DAY) STARTING WITH A FULL BATTERY CHARGE AND WITH NO ADDITIONAL CHARGE BEING PROVIDED BY THE SOLAR CELLS. THE NO-CHARGE-LIFE MAY BE BASED UPON CALCULATIONS PROVIDING THAT MANUFACTURER'S RATINGS AND EFFICIENCY CALCULATIONS ARE FURNISHED FOR EACH MAJOR COMPONENT.

E. MOUNTING

THE FLASHING ARROW PANEL MAY BE TRAILER OR VEHICLE MOUNTED OR MOUNTED ON A RIGID SUPPORTING DEVICE SUITABLE FOR MAINTAINING IT IN THE DESIGNATED POSITION. EACH OF THE MOUNTING METHODS SHALL BE SUITABLY STABLE SUCH AS TO PREVENT MOVEMENT DUE TO HIGH WINDS OR PASSAGE OF LARGE VEHICLES.

WHEN A TRAILER IS USED, CONSTRUCTION SHALL BE SUCH AS TO TRANSPORT THE FLASHING ARROW PANEL AND APPURTANCES ADEQUATELY AND LEGALLY AS WELL AS SUPPORT THEM PROPERLY DURING OPERATION. THE TRAILER SHALL BE EQUIPPED WITH DEVICES WHICH SHALL PROVIDE LEVELING AND STABILITY DURING OPERATION.

MINIMUM ARROW PANEL MOUNTING HEIGHT SHALL BE 2.1 m ABOVE THE PAVEMENT SURFACE (MEASURED TO THE BOTTOM OF THE PANEL).

USE AND OPERATION

THE FLASHING ARROW PANEL SHALL BE LOCATED AS SHOWN IN THE MAINTAINENCE OF TEAFFIC DRAWINGS OR AS DIRECTED BY THE ENGINEER AND OPERATED CONTINUOUSLY DURING TRAFFIC MAINTAINED PERIODS. THE CONTRACTOR SHALL SUPPLY ALL FUEL, LUBRICANTS AND PARTS NECESSARY TO OBTAIN CONTINUOUS OPERATION AND SHALL PROVIDE ALL SERVICE. THE CONTRACTOR SHALL INSPECT THE OPERATION OF THE UNIT DAILY, INCLUDING WEEKENDS AND HOLIDAYS. THE CONTRACTOR SHALL ARRANGE WITH THE ENGINEER, AN ACCEPTABLE METHOD OF OBTAINING SERVICE FOR A MALFUNCTIONING PANEL WITHIN 30 MINUTES OF A REPORTED MALFUNCTION. LAMP INTENSITY SHALL BE ADJUSTED TO PROVIDE MINIMUM LEGIBILITY DISTANCES OF .8 km (TYPE A), 1.21 km (TYPE B) AND 1.6 km (TYPE C).

TYPE C PANELS SHALL BE USED FOR STATIONARY OPERATIONS ON HIGH SPEED (88 km/h OR GREATER), HIGH VOLUME ROADWAYS. TYPE B SHALL BE USED FOR STATIONARY OPERATIONS ON INTERMEDIATE SPEED (64-80 km/h) FACILITIES, AND TYPE A ON LOW SPEED (32-56 km/h) FACILITIES.

IN ADDITION, TYPE B PANELS SHALL BE USD FOR MOVING OPERATIONS ON FREEWAYS AND EXPRESSWAYS AND TYPE A FOR MOVING OPERATIONS ON OTHER FACILITIES.

BATTERY AND SOLAR/BATTERY UNITS SHALL BE FULLY CHARGED WHEN FIRST SET UP. THEY SHALL HAVE GAUGES TO INDICATE APPROXIMATE BATTERY CHARGE REMAINING. THE CONTRACTOR SHALL VERIFY DAILY THAT THE UNIT IS OPERATING SATISFACTORILY AND THE REMAINING BATTERY CHARGE IS SUFFICIENT FOR AT LEAST 2 MORE DAYS.

FLASHING ARROW PANELS ARE NOT TO BE USED ON TWO LANE-TWO WAY ROADWAYS.

WHEN LEFT UNATTENDED THE CONTROL CABINET, MOTOR GENERATOR ENCLOSURE AND FUEL TANK SHALL BE LOCKED.

TYPE A AND TYPE B PANELS USED IN MOVING OPERATIONS MAY BE POWERED BY THE VEHICLE'S ELECTRICAL SYSTEM BUT SHALL NOT BE LEFT UNATTENDED WHEN SO POWERED.

WHEN NOT IN USE, THE FLASHING ARROW PANEL SHALL BE STORED AT A LOCATION WHICH WILL NOT BE HAZARDOUS TO TRAFFIC OR PEDESTRIANS.

THE PANELS SHALL BE DESIGNED FOR OPERATION IN 100% HUMIDITY AND TEMPERATURES FROM -29 TO + 54 DEGREES CELCIUS.

METRIC

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

MAINTENANCE OF TRAFFIC	DATE 01/30/95
FLASHING ARROW PANEL NOTES	
STANDARD CONSTRUCTION DRAWING MT-35.11M	
APPROVED Jay J Krueger ENGR. OF DESIGN SERVICES	

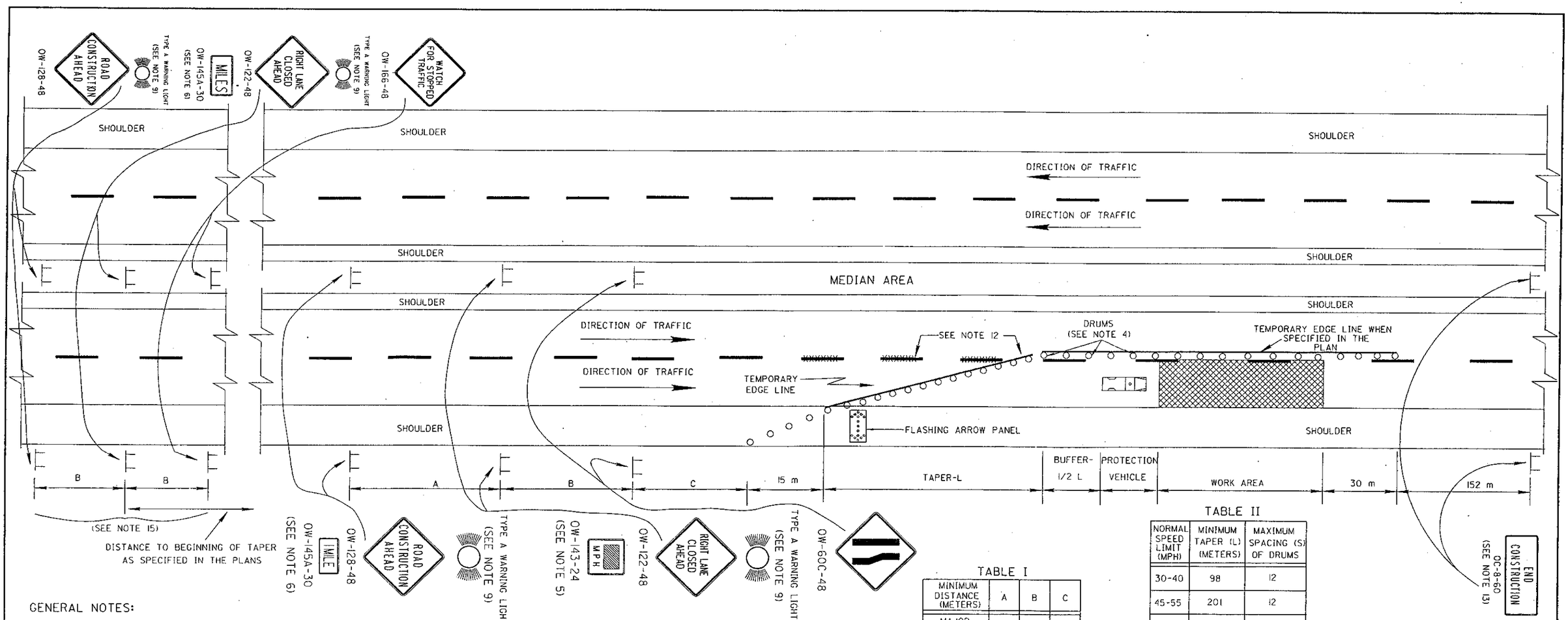


TABLE I

MINIMUM DISTANCE (METERS)	A	B	C
MAJOR STANDARD	152	152	152
URBAN FREEWAY & EXPRESSWAY	152 TO 305	152 TO 305	152 TO 305
RURAL FREEWAY & EXPRESSWAY	792	488	305

TABLE II

NORMAL SPEED LIMIT (MPH)	MINIMUM TAPER (L) (METERS)	MAXIMUM SPACING (S) OF DRUMS
30-40	98	12
45-55	201	12
60-65	238	18

GENERAL NOTES:

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

2. THE SPACING BETWEEN PROPOSED SIGNS SHOULD BE ADJUSTED TO NOT CONFLICT WITH AND TO PROVIDE A MINIMUM OF 61m CLEARANCE TO EXISTING SIGNS.

3. THE TAPER LENGTH (L) AND SPACING (S) OF DRUMS SHALL CONFORM TO TABLE II. DRUM SPACING (S) SHALL BE USED FOR THE MERGING TAPER, THE BUFFER AREA AND FOR THE FIRST 305 m OF THE WORK AREA AND AT OTHER HAZARDOUS LOCATIONS AS DIRECTED BY THE ENGINEER. THE MAXIMUM DRUM SPACING FOR THE BALANCE OF THE WORK AREA IS TO BE TWO TIMES THE SPACING (S) IN TABLE II. A MINIMUM OF 5 DRUMS SHALL BE USED TO CLOSE THE SHOULDER.

4. CONES HAVING A MINIMUM HEIGHT OF 0.7 m MAY BE SUBSTITUTED FOR DRUMS FOR DAYTIME LANE CLOSURES. PROVISIONS SHALL BE MADE TO SAFELY STABILIZE THE CONES TO PREVENT THEM FROM BLOWING OVER. IF THIS CANNOT BE ACHIEVED, DRUMS SHALL BE USED.

5. THE ADVISORY SPEED SIGN OW-143 SHALL BE USED WHEN SPECIFIED IN THE PLAN.

6. THE DISTANCE PLATE OW-145A SHALL INDICATE THE DISTANCE TO THE BEGINNING OF THE MERGING TAPER (L). DISTANCES LESS THAN ONE MILE MAY BE EXPRESSED IN FEET. THE PLAQUE MAY BE OMITTED IF EXTRA ADVANCE SIGN GROUPS ARE NOT USED.

7. THE PROTECTION VEHICLE, LOCATED CLOSE TO THE WORK, SHALL BE IN PLACE AND UNOCCUPIED WHENEVER WORKERS ARE IN THE WORK AREA. THIS VEHICLE SHALL BE REMOVED FROM THE PAVEMENT WHENEVER WORKERS ARE NOT IN THE WORK AREA. THE VEHICLE SHALL BE EQUIPPED WITH A 360 DEGREE ROTATING OR FLASHING AMBER BEACON CLEARLY VISIBLE A MINIMUM OF 402 m. OTHER PROTECTIVE DEVICES MAY BE USED IN LIEU OF THE PROTECTION VEHICLE SHOWN WHEN APPROVED BY THE ENGINEER.

8. THE FLASHING ARROW PANEL SHALL MEET REQUIREMENTS OF STANDARD CONSTRUCTION DRAWING TC-35.10M.

9. TYPE A FLASHING WARNING LIGHTS SHOWN ON THE OW-128 AND OW-122 - (123) SIGNS ARE REQUIRED WHENEVER A NIGHT LANE CLOSURE IS NECESSARY

10. WHEN WORK IS BEING PERFORMED IN THE LANE ADJACENT TO THE MEDIAN ON A DIVIDED HIGHWAY, OW-123 SIGNS SHALL BE SUBSTITUTED FOR THE OW-122 SIGNS AND OW-60D SIGNS SHALL BE SUBSTITUTED FOR THE OW-60C SIGNS.

11. 36 INCH WARNING SIGN SIZES MAY BE USED ON DIVIDED ROADWAYS THAT ARE NOT CLASSIFIED AS FREEWAYS OR EXPRESSWAYS.

12. IF THE CONSTRUCTION OPERATION REQUIRES THE LANE CLOSURE FOR MORE THAN ONE DAY THEN THE EXISTING CONFLICTING PAVEMENT MARKINGS AND REFLECTORS FROM THE RAISED PAVEMENT MARKERS (RPMS) SHALL BE REMOVED AND THE APPROPRIATE COLOR TEMPORARY EDGE LINES SHALL BE APPLIED ALONG THE TAPER. TEMPORARY EDGE LINES WHICH WOULD CONFLICT WITH FINAL TRAFFIC LANES SHALL BE REMOVABLE (740.05 TYPE C) TAPE UNLESS

12. CONT. THE AREA WILL BE RESURFACED IN THE NEXT WORK PHASE. AFTER COMPLETION OF THE WORK, PAVEMENT MARKINGS OTHER THAN 740.05 TYPE C SHALL BE REMOVED IN ACCORDANCE WITH 641.10. THE ORIGINAL MARKINGS AND PAVEMENT MARKER REFLECTORS SHALL BE RESTORED AT NO ADDITIONAL COST.

13. THE OC-8 SIGNS ARE ONLY REQUIRED FOR LANE CLOSURES OF MORE THAN ONE DAY AND MAY BE OMITTED IF THEY FALL WITHIN THE LIMITS OF A CONSTRUCTION PROJECT.

14. OW-128 SIGNS SHALL BE PROVIDED ON ENTRANCE RAMPS AND/OR SIDE ROADS LOCATED WITHIN THE WORK LIMITS OR THE ADVANCE WARNING SIGN GROUP. WITHIN THE LENGTH OF CLOSURE, PROVISION SHALL BE MADE TO CONTROL TRAFFIC ENTERING FROM INTERSECTING STREETS AND DRIVEWAYS. THREE DRUMS SHALL BE PLACED ON EACH SIDE ACROSS THE CLOSED LANE AT EACH INTERSECTION AND DRIVEWAY.

15. EXTRA ADVANCE WARNING SIGN GROUPS CONSISTING OF OW-128, OW-122 AND OW-166 SIGNS PLUS DISTANCE PLATES MAY BE SPECIFIED IN THE PLANS OR REQUIRED TO BE ERECTED AT THE DIRECTION OF THE ENGINEER.

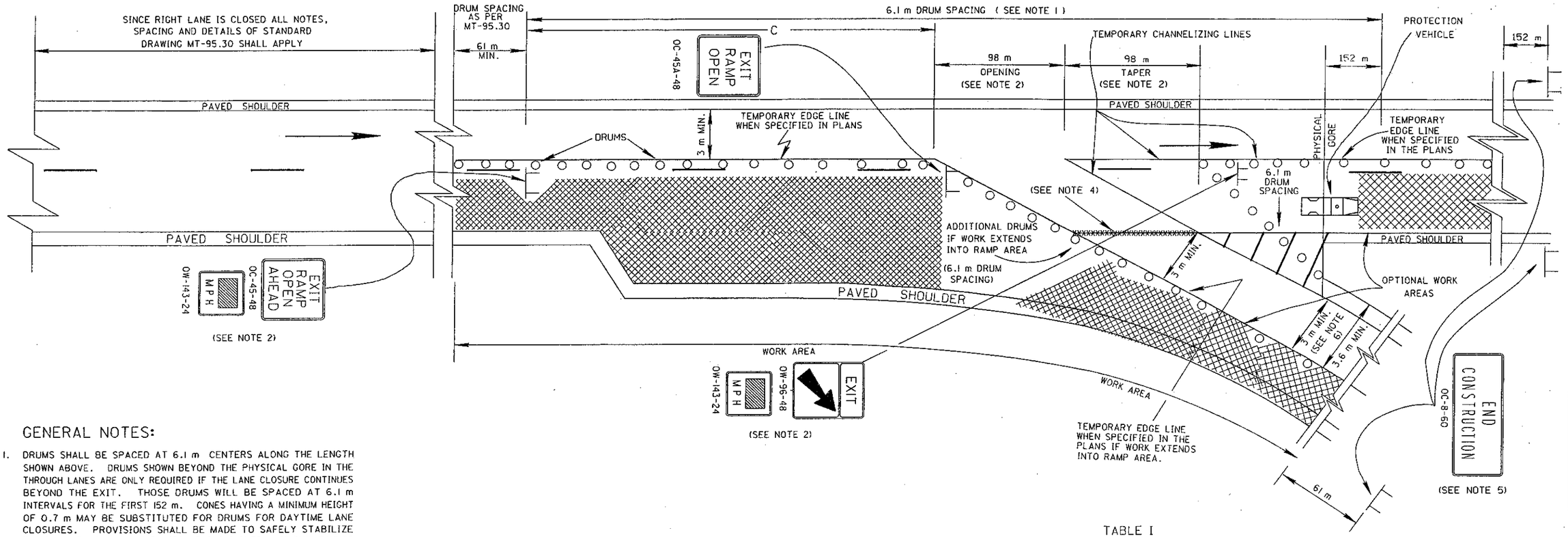
16. ALL MATERIAL AND EQUIPMENT SHALL BE REMOVED FROM THE CLOSURE AND THE WORK AREA WHEN NO WORK IS BEING DONE.

METRIC

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 INCLUDED IN THE LUMP SUM BID FOR 614 MAINTAININC TRAFFIC, UNLESS SEPARATELY ITEMIZED IN THE PLAN.

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

MAINTENANCE OF TRAFFIC	DATE
CLOSING RIGHT OR LEFT LANE OF A MULTI-LANE DIVIDED HIGHWAY WITH DRUMS	04/25/94
STANDARD CONSTRUCTION DRAWING MT-95.30M	
APPROVED _____ ENGR. OF DESIGN SERVICES	



GENERAL NOTES:

1. DRUMS SHALL BE SPACED AT 6.1 m CENTERS ALONG THE LENGTH SHOWN ABOVE. DRUMS SHOWN BEYOND THE PHYSICAL GORE IN THE THROUGH LANES ARE ONLY REQUIRED IF THE LANE CLOSURE CONTINUES BEYOND THE EXIT. THOSE DRUMS WILL BE SPACED AT 6.1 m INTERVALS FOR THE FIRST 152 m. CONES HAVING A MINIMUM HEIGHT OF 0.7 m MAY BE SUBSTITUTED FOR DRUMS FOR DAYTIME LANE CLOSURES. PROVISIONS SHALL BE MADE TO SAFELY STABILIZE THE CONES TO PREVENT THEM FROM BLOWING OVER. IF THIS CANNOT BE ACHIEVED, DRUMS SHALL BE USED.

2. THE OPENING TO THE RAMP AND THE TAPER ACROSS THE CLOSED LANE SHOULD EACH BE 98 m OR MORE WHENEVER POSSIBLE. A LESSER OPENING AND/OR TAPER MAY BE PROVIDED IF NO OTHER ALTERNATIVE IS AVAILABLE. THE OPENING SHALL NEVER BE LESS THAN THE TAPER, BUT MAY BE MORE. WHEN LESSER OPENING AND/OR TAPER LENGTHS ARE PROVIDED, ADVISORY SPEED PLAQUES (OW-143) SHALL BE ADDED TO THE OW-96 AND OC-45 SIGNS AS FOLLOWS:

OPENING/TAPER	ADVISORY SPEED
88 m	80 km/h - 50 MPH
79 m	72 km/h - 45 MPH
70 m	64 km/h - 40 MPH
61 m	56 km/h - 35 MPH

IF 61 m MINIMUM DIMENSIONS CANNOT BE PROVIDED, THE RAMP SHOULD BE CLOSED.

THE ADVISORY SPEED DISPLAYED SHALL NOT BE GREATER THAN WOULD OTHERWISE BE REQUIRED TO ACCOMMODATE THE PERMANENT RAMP GEOMETRY NEAR THE EXIT.

ADVISORY SPEEDS WITHIN 16.1 km/h OF THE LEGAL SPEED LIMIT NEED NOT BE DISPLAYED.

3. THE PROTECTION VEHICLE LOCATED CLOSE TO THE WORK SHALL BE IN PLACE AND UNOCCUPIED WHENEVER WORKERS ARE IN THE WORK AREA. THIS VEHICLE SHALL BE REMOVED FROM THE PAVEMENT WHENEVER WORKERS ARE NOT IN THE WORK AREA. THE VEHICLE SHALL BE EQUIPPED WITH A 360 DEGREE ROTATING OR FLASHING AMBER BEACON CLEARLY VISIBLE A MINIMUM OF 402 m. OTHER PROTECTIVE DEVICES MAY BE USED IN LIEU OF THE PROTECTION VEHICLE SHOWN WHEN APPROVED BY THE ENGINEER.

4. IF THE CONSTRUCTION OPERATION REQUIRES THE LANE CLOSURE FOR MORE THAN ONE DAY THEN THE EXISTING CONFLICTING PAVEMENT MARKINGS AND REFLECTORS FROM THE RAISED PAVEMENT MARKERS (RPMS) SHALL BE REMOVED AND a) TEMPORARY CHANNELIZING LINES SHALL BE APPLIED AND b) THE APPROPRIATE COLOR TEMPORARY EDGE LINES SHALL BE APPLIED WHEN SPECIFIED IN THE PLANS. TEMPORARY CHANNELIZING LINES AND EDGE LINES WHICH WOULD CONFLICT WITH FINAL TRAFFIC LANES SHALL BE REMOVABLE (740.05 TYPE C) TAPE UNLESS THE AREA WILL BE RESURFACED IN THE NEXT WORK PHASE. AFTER COMPLETION OF THE WORK, PAVEMENT MARKINGS OTHER THAN 740.05 TYPE C SHALL BE REMOVED IN ACCORDANCE WITH 641.10. THE ORIGINAL MARKINGS AND PAVEMENT MARKER REFLECTORS SHALL BE RESTORED AT NO ADDITIONAL COST.

5. THE OC-8 SIGNS ARE ONLY REQUIRED FOR LANE CLOSURES OF MORE THAN ONE DAY AND MAY BE OMITTED IF THEY FALL WITHIN THE LIMITS OF A CONSTRUCTION PROJECT.

6. NORMALLY A 3 m MINIMUM RAMP WIDTH SHALL BE MAINTAINED ON EXISTING RAMP PAVEMENT. WHERE THIS IS NOT POSSIBLE, A MINIMUM WIDTH OF 3.6 m INCLUDING THE PAVED SHOULDER MAY BE USED ONLY: (1) IF THE TRAFFIC WILL BE ON THE SHOULDER LESS THAN ONE DAY AND THE SHOULDER IS IN GOOD CONDITION, OR (2) IF THE SHOULDER PAVEMENT IS STRENGTHENED TO HOLD THE ANTICIPATED LOAD.

7. ALL MATERIAL AND EQUIPMENT SHALL BE REMOVED FROM THE CLOSURE AND THE WORK AREA WHEN NO WORK IS BEING DONE.

TABLE I

MINIMUM DISTANCE (METERS)	
	C
URBAN FREEWAY & EXPRESSWAY	152 TO 305
RURAL FREEWAY & EXPRESSWAY	305

METRIC

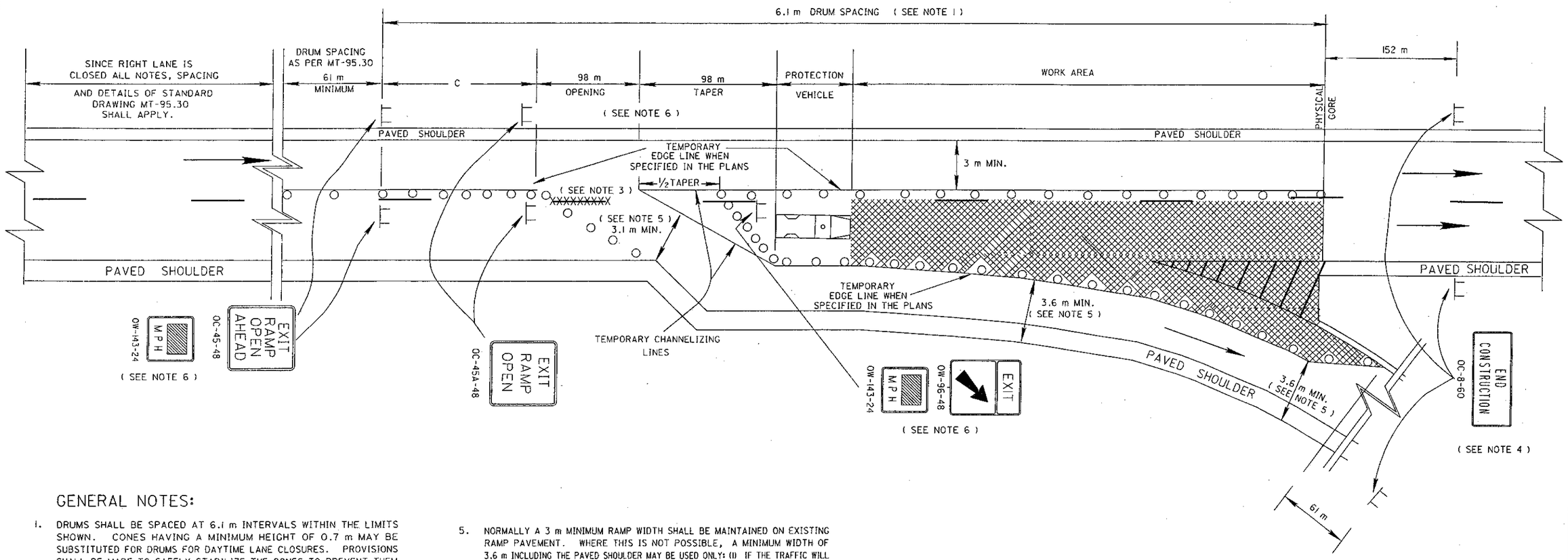
ALL WORK AND TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH 614 AND OTHER APPLICABLE PORTIONS OF THE C & M SPECIFICATIONS AS WELL AS IN ACCORDANCE WITH PART 7 OF OMUTCD. PAYMENT FOR ALL LABOR, EQUIPMENT AND MATERIALS TO PROVIDE THIS METHOD OF TRAFFIC CONTROL SHALL BE INCLUDED IN THE LUMP SUM BID 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 06/24/93
LANE CLOSURE BEFORE EXIT GORE	
STANDARD CONSTRUCTION DRAWING MT-98.13M	

APPROVED Amy L Creager ENGR. OF DESIGN SERVICES

WCC



GENERAL NOTES:

1. DRUMS SHALL BE SPACED AT 6.1 m INTERVALS WITHIN THE LIMITS SHOWN. CONES HAVING A MINIMUM HEIGHT OF 0.7 m MAY BE SUBSTITUTED FOR DRUMS FOR DAYTIME LANE CLOSURES. PROVISIONS SHALL BE MADE TO SAFELY STABILIZE THE CONES TO PREVENT THEM FROM BLOWING OVER. IF THIS CANNOT BE ACHIEVED, DRUMS SHALL BE USED.

2. THE PROTECTION VEHICLE LOCATED CLOSE TO THE WORK SHALL BE IN PLACE AND UNOCCUPIED WHENEVER WORKERS ARE IN THE WORK AREA. THIS VEHICLE SHALL BE REMOVED FROM THE PAVEMENT WHENEVER WORKERS ARE NOT IN THE WORK AREA. THE VEHICLE SHALL BE EQUIPPED WITH A 360 DEGREE ROTATING OR FLASHING AMBER BEACON CLEARLY VISIBLE A MINIMUM OF 402 m. OTHER PROTECTIVE DEVICES MAY BE USED IN LIEU OF THE PROTECTION VEHICLE SHOWN WHEN APPROVED BY THE ENGINEER.

3. IF THE CONSTRUCTION OPERATION REQUIRES THE LANE CLOSURE FOR MORE THAN ONE DAY THEN THE EXISTING CONFLICTING PAVEMENT MARKINGS AND REFLECTORS FROM THE RAISED PAVEMENT MARKERS (RPMS) SHALL BE REMOVED AND a) TEMPORARY CHANNELIZING LINES SHALL BE APPLIED AND b) THE APPROPRIATE COLOR TEMPORARY EDGE LINES SHALL BE APPLIED WHEN SPECIFIED IN THE PLANS. TEMPORARY CHANNELIZING LINES AND EDGE LINES WHICH WOULD CONFLICT WITH FINAL TRAFFIC LANES SHALL BE REMOVABLE (740.05 TYPE C) TAPE UNLESS THE AREA WILL BE RESURFACED IN THE NEXT WORK PHASE. AFTER COMPLETION OF THE WORK, PAVEMENT MARKINGS OTHER THAN 740.05 TYPE C SHALL BE REMOVED IN ACCORDANCE WITH 641.10. THE ORIGINAL MARKINGS AND PAVEMENT MARKER REFLECTORS SHALL BE RESTORED AT NO ADDITIONAL COST.

4. THE OC-8 SIGNS ARE ONLY REQUIRED FOR LANE CLOSURES OF MORE THAN ONE DAY AND MAY BE OMITTED IF THEY FALL WITHIN THE LIMITS OF A CONSTRUCTION PROJECT.

5. NORMALLY A 3 m MINIMUM RAMP WIDTH SHALL BE MAINTAINED ON EXISTING RAMP PAVEMENT. WHERE THIS IS NOT POSSIBLE, A MINIMUM WIDTH OF 3.6 m INCLUDING THE PAVED SHOULDER MAY BE USED ONLY: (1) IF THE TRAFFIC WILL BE ON THE SHOULDER LESS THAN ONE DAY AND THE SHOULDER IS IN GOOD CONDITION, OR (2) IF THE SHOULDER PAVEMENT IS STRENGTHENED TO HOLD THE ANTICIPATED LOAD.

6. THE OPENING TO THE RAMP AND THE TAPER IN ADVANCE OF THE CLOSED LANE SHOULD EACH BE 98 m OR MORE WHENEVER POSSIBLE. A LESSER OPENING AND/OR TAPER LENGTH MAY BE PROVIDED IF NO OTHER ALTERNATIVE IS AVAILABLE. THE OPENING SHALL NEVER BE LESS THAN THE TAPER, BUT MAY BE MORE. WHEN LESSER OPENING AND/OR TAPER LENGTHS ARE PROVIDED, ADVISORY SPEED PLAQUES (OW-143) SHALL BE ADDED TO THE OW-96 AND OC-45 SIGNS AS FOLLOWS:

OPENING/TAPER	ADVISORY SPEED
88 m	80 km/h - 50 MPH
79 m	72 km/h - 45 MPH
70 m	64 km/h - 40 MPH
61 m	56 km/h - 35 MPH

IF 61 m MINIMUM DIMENSION CANNOT BE PROVIDED, THE RAMP SHOULD BE CLOSED.

THE ADVISORY SPEED DISPLAYED SHALL NOT BE GREATER THAN WOULD OTHERWISE BE REQUIRED TO ACCOMMODATE THE PERMANENT RAMP GEOMETRY NEAR THE EXIT.

ADVISORY SPEEDS WITHIN 16.1 km/h OF THE LEGAL SPEED LIMIT NEED NOT BE DISPLAYED.

7. ALL MATERIAL AND EQUIPMENT SHALL BE REMOVED FROM THE CLOSURE AND THE WORK AREA WHEN NO WORK IS BEING DONE.

TABLE I

MINIMUM DISTANCE (METERS)	
	C
URBAN FREEWAY & EXPRESSWAY	152 TO 305
RURAL FREEWAY & EXPRESSWAY	305

METRIC

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 INCLUDED IN 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

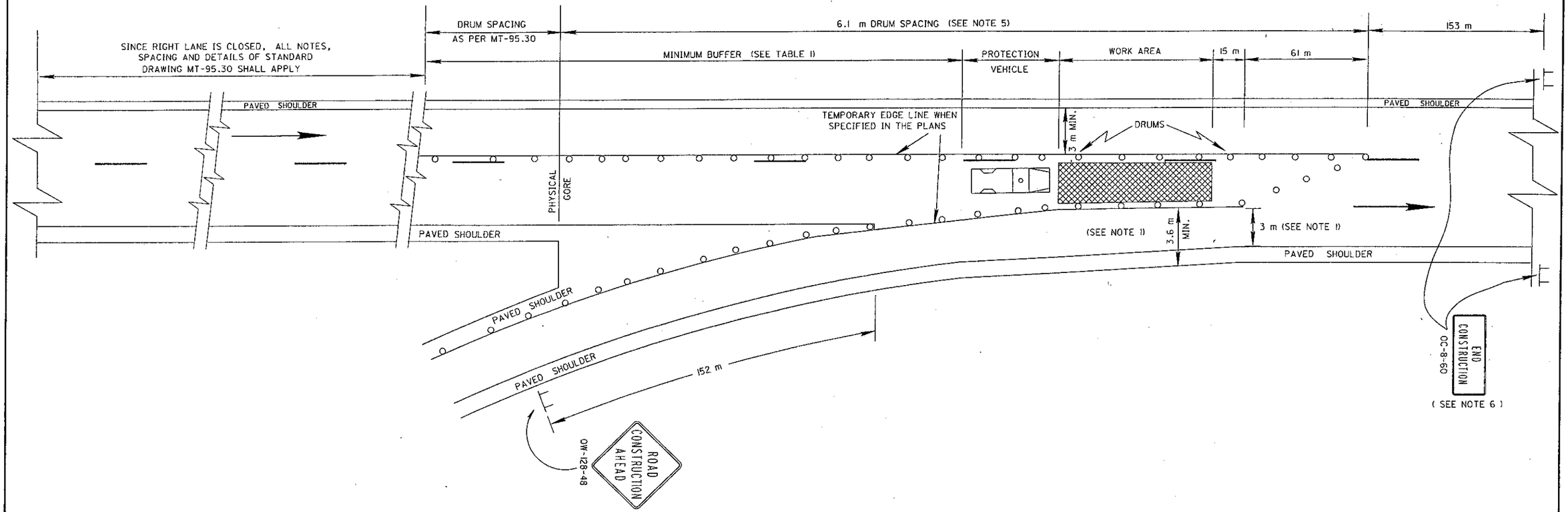
DATE 06/24/93

LANE CLOSURE
AT EXIT GORE

STANDARD CONSTRUCTION DRAWING MT-98.14M

APPROVED Daryl Cregg ENGR. OF DESIGN SERVICES

WCC



GENERAL NOTES:

1. THIS WORK AREA TRAFFIC CONTROL APPLICATION SHALL BE EMPLOYED ONLY WHEN THE LATERAL CLEARANCE BETWEEN THE CHANNELIZING DEVICES AT THE RIGHT EDGE OF THE WORK AREA AND THE EDGE OF THE RAMP PAVEMENT IS 3 m OR MORE. NORMALLY A 3 m MINIMUM RAMP WIDTH SHALL BE MAINTAINED ON EXISTING RAMP PAVEMENT. WHERE THIS IS NOT POSSIBLE, A MINIMUM WIDTH OF 3.6 m INCLUDING THE PAVED SHOULDER MAY BE USED ONLY: (1) IF THE TRAFFIC WILL BE ON THE SHOULDER LESS THAN ONE DAY AND THE SHOULDER IS IN GOOD CONDITION, OR (2) IF THE SHOULDER PAVEMENT IS STRENGTHENED TO HOLD THE ANTICIPATED LOAD. WHEN THE RAMP IS CLOSED APPROPRIATE DETOUR SIGNS SHALL BE PROVIDED.

2. WHEN THE RAMP IS NOT LONG ENOUGH TO ALLOW SIGN PLACEMENT AS SPECIFIED ABOVE, THEY MAY BE SPACED PROPORTIONATELY WITHIN THE SPACE AVAILABLE AS DETERMINED BY THE ENGINEER (A 61 m MINIMUM SPACING MUST BE MAINTAINED).

3. THE PROTECTION VEHICLE LOCATED CLOSE TO THE WORK AREA SHALL BE IN PLACE AND UNOCCUPIED WHENEVER WORKERS ARE IN THE WORK AREA. THIS VEHICLE SHALL BE REMOVED FROM THE PAVEMENT WHENEVER WORKERS ARE NOT IN THE WORK AREA. THE VEHICLE SHALL BE EQUIPPED WITH A 360 DEGREE ROTATING OR FLASHING AMBER BEACON VISIBLE A MINIMUM OF 402 m. OTHER PROTECTIVE DEVICES MAY BE USED IN LIEU OF THE PROTECTION VEHICLE SHOWN WHEN APPROVED BY THE ENGINEER.

4. IF THE CONSTRUCTION OPERATION REQUIRES THE LANE CLOSURE FOR MORE THAN ONE DAY THEN THE EXISTING CONFLICTING PAVEMENT MARKINGS AND REFLECTORS FROM THE RAISED PAVEMENT MARKERS (RPMS) SHALL BE REMOVED AND THE APPROPRIATE COLOR TEMPORARY EDGE LINES SHALL BE APPLIED WHEN SPECIFIED IN THE PLANS. TEMPORARY EDGE LINES WHICH WOULD CONFLICT WITH FINAL TRAFFIC LANES SHALL BE REMOVABLE (740.05 TYPE C) TAPE UNLESS THE AREA WILL BE RESURFACED IN THE NEXT WORK PHASE. AFTER COMPLETION OF THE WORK, PAVEMENT MARKINGS OTHER THAN 740.05 TYPE C SHALL BE REMOVED IN ACCORDANCE WITH 641.10. THE ORIGINAL MARKINGS AND PAVEMENT MARKER REFLECTORS SHALL BE RESTORED AT NO ADDITIONAL COST.

5. DRUMS SHALL BE SPACED AT 6.1 m INTERVALS ON BOTH SIDES OF THE WORK AREA WITHIN THE LIMITS SHOWN. CONES HAVING A MINIMUM HEIGHT OF 0.7 m MAY BE SUBSTITUTED FOR DRUMS FOR DAYTIME LANE CLOSURES. PROVISIONS SHALL BE MADE TO SAFELY STABILIZE THE CONES TO PREVENT THEM FROM BLOWING OVER. IF THIS CANNOT BE ACHIEVED, DRUMS SHALL BE USED.

6. THE OC-8 SIGNS ARE ONLY REQUIRED FOR LANE CLOSURES OF MORE THAN ONE DAY AND MAY BE OMITTED IF THEY FALL WITHIN THE LIMITS OF A CONSTRUCTION PROJECT.

7. ALL MATERIAL AND EQUIPMENT SHALL BE REMOVED FROM THE CLOSURE AND THE WORK AREA WHEN NO WORK IS BEING DONE.

TABLE I

NORMAL SPEED LIMIT		MINIMUM BUFFER
(MPH)	(km/h)	(METERS)
45 - 50	72 - 88	101
60 - 65	96 - 104	119

METRIC

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 INCLUDED IN 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

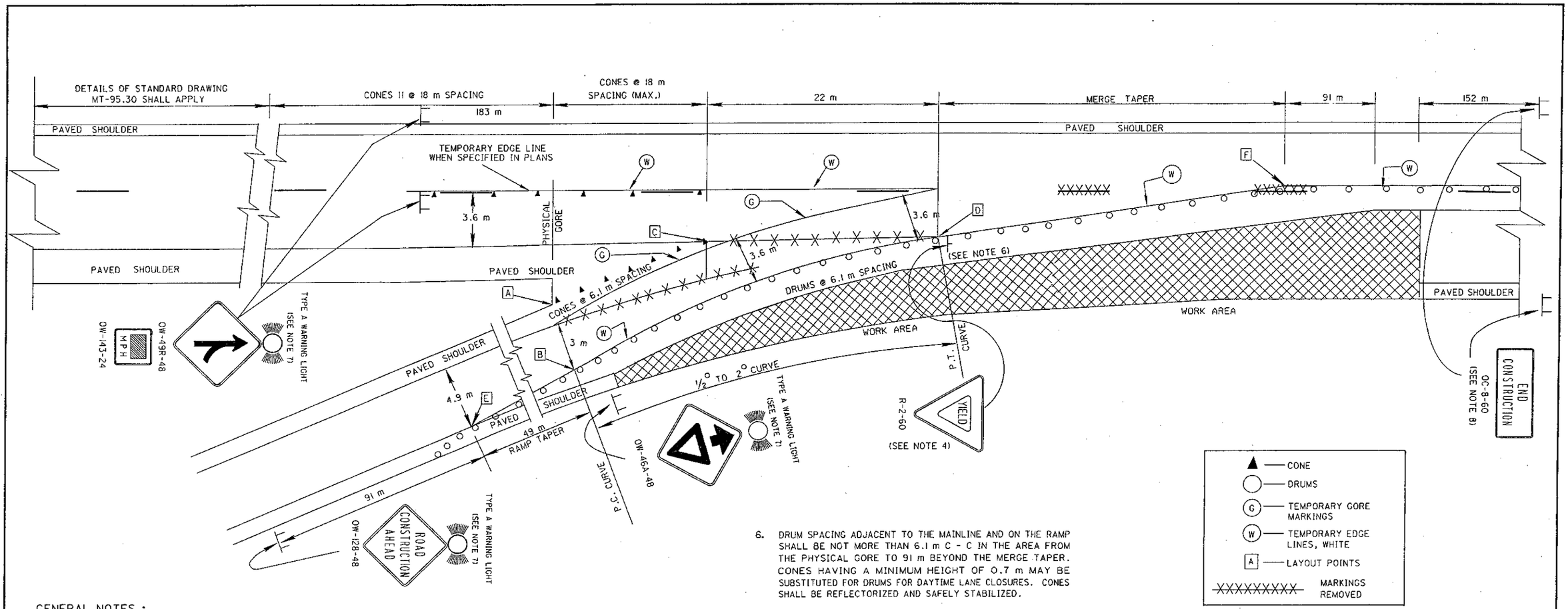
LANE CLOSURE AT
ENTRANCE RAMP: PLAN A

DATE 06/24/93

STANDARD CONSTRUCTION DRAWING MT-98.15M

APPROVED Doug Kreuger ENGR. OF DESIGN SERVICES

WCC



GENERAL NOTES :

1. THIS WORK AREA TRAFFIC CONTROL APPLICATION SHALL BE EMPLOYED WHEN: (1) THE LATERAL CLEARANCE BETWEEN CHANNELIZING DEVICES AT THE RIGHT EDGE OF THE WORK AREA AND THE EDGE OF PAVEMENT IS LESS THAN 3 m (3.6 m IF THE SHOULDER PAVEMENT IS USED) AS SHOWN ON DRAWING MT-98.15, AND (2) THE REQUIRED RAMP TAPERS AND CURVES CAN BE PROVIDED AS SHOWN EXCEPT AS DESCRIBED IN NOTE 4. IN THE EVENT THE WORK ZONE CONDITION WOULD PERMIT THE USE OF EITHER MT-98.15 OR MT-98.16, MT-98.15 SHALL BE USED. THIS TRAFFIC CONTROL MEASURE SHALL NOT BE PLACED IN EFFECT UNTIL IMMEDIATELY BEFORE THE CONTRACTOR IS FULLY PREPARED TO PERFORM THE WORK ON THE RAMP OR LANE ADJACENT TO IT. ONCE THIS MEASURE IS PLACED INTO EFFECT, THE CONTRACTOR SHALL EXPEDITIOUSLY PURSUE THE WORK (WORKING CONTINUOUSLY WITH FULL CREW IN THE RAMP AREA ON ALL NORMAL WORKING DAYS) UNTIL IT IS COMPLETED AND SHALL IMMEDIATELY OPEN THE AREA TO NORMAL TRAFFIC OR, AS A MINIMUM, REVERT TO THE METHODS SHOWN ON MT-98.15. IT IS THE INTENT THAT THE LONGEST MERGING TAPER LENGTH POSSIBLE SHALL BE CHOSEN, COMMENSURATE WITH THE REQUIREMENTS OF CONSTRUCTION.

2. THE RAMP TAPER SHALL DESIRABLY BE LOCATED TO PROVIDE A 3 m MINIMUM PATH BETWEEN DRUMS AND THE PAVED SHOULDER IN THE GORE. THE RAMP TRAFFIC MAY BE PLACED ON THE PAVED GORE AS SHOWN ABOVE ONLY IF: (1) THE TRAFFIC WILL USE THE PAVED SHOULDER PAVEMENT LESS THAN ONE DAY AND THE SHOULDER PAVEMENT IS IN GOOD CONDITION AND IS LEVEL AND SMOOTH OR (2) IF THE SHOULDER PAVEMENT IS ADEQUATELY STRENGTHENED, LEVELED AND SMOOTHED TO CARRY THE ANTICIPATED LOAD. A MINIMUM OF 3 DRUMS SHALL BE USED TO CLOSE THE RAMP SHOULDER.

3. WHEN THE RAMP IS NOT LONG ENOUGH TO ALLOW SIGN PLACEMENT AS SPECIFIED ABOVE, THEY MAY BE SPACED PROPORTIONATELY WITHIN THE SPACE AVAILABLE AS DETERMINED BY THE ENGINEER (A 61 m MINIMUM SPACING MUST BE MAINTAINED).

4. IT WILL BE NECESSARY TO MOVE THE LOCATION OF ANY EXISTING YIELD SIGN. IN THESE CASES, THE PERMANENT R-2 SIGN INSTALLATION SHALL BE REMOVED (AND SUBSEQUENTLY RESTORED) AND THE TEMPORARY INSTALLATION SHALL BE MOUNTED APPROPRIATELY. IF THE REQUIRED DISTANCES (RAMP TAPER, CURVE AND MERGE TAPER) CANNOT BE OBTAINED, THE ENGINEER MAY APPROVE SLIGHTLY LOWER VALUES FOR A SHORT TIME, IN WHICH CASE THE YIELD SIGN SHALL BE REMOVED AND A 1.2 m STOP SIGN PLACED APPROPRIATELY TO BE VIDIBLE TO RAMP TRAFFIC BUT NOT BE OBTRUSIVE TO MAINLINE TRAFFIC.

5. IF THE CONSTRUCTION OPERATION REQUIRES THE LANE CLOSURE FOR MORE THAN ONE DAY THEN THE EXISTING CONFLICTING PAVEMENT MARKINGS AND REFLECTORS FROM THE RAISED PAVEMENT MARKERS (RPMS) SHALL BE REMOVED AT NO ADDITIONAL COST. THE APPROPRIATE COLOR TEMPORARY EDGE LINES SHALL BE APPLIED ALONG THE TAPER. TEMPORARY PAVEMENT MARKINGS WHICH WOULD CONFLICT WITH FINAL TRAFFIC LANES SHALL BE REMOVABLE (740.05 TYPE C TAPE UNLESS THE AREA WILL BE RESURFACED IN THE NEXT WORK PHASE. AFTER COMPLETION OF THE WORK, TEMPORARY PAVEMENT MARKINGS SHALL BE REMOVED IN ACCORDANCE WITH 641.10 AND THE ORIGINAL MARKINGS AND RAISED PAVEMENT MARKER REFLECTORS SHALL BE RESTORED AT NO ADDITIONAL COST.

6. DRUM SPACING ADJACENT TO THE MAINLINE AND ON THE RAMP SHALL BE NOT MORE THAN 6.1 m C - C IN THE AREA FROM THE PHYSICAL GORE TO 91 m BEYOND THE MERGE TAPER. CONES HAVING A MINIMUM HEIGHT OF 0.7 m MAY BE SUBSTITUTED FOR DRUMS FOR DAYTIME LANE CLOSURES. CONES SHALL BE REFLECTORIZED AND SAFELY STABILIZED.

7. TYPE A FLASHING WARNING LIGHTS ARE REQUIRED ON THE ROAD CONSTRUCTION AHEAD (OW-128-48), MERGE (OW-49R-48) AND THE YIELD AHEAD (OW-46-48) SIGNS WHENEVER A NIGHT LANE CLOSURE IS NECESSARY.

8. THE OC-8 SIGNS ARE ONLY REQUIRED FOR LANE CLOSURES OF MORE THAN ONE DAY AND MAY BE OMITTED IF THEY FALL WITHIN THE LIMITS OF A CONSTRUCTION PROJECT.

9. FROM THE END OF THE GORE AREA GRADED SHOULDER (POINT A), LOCATE THE PC OF THE CURVE BY MEASURING PERPENDICULAR TO THE RAMP CENTERLINE 3 m OF RAMP PAVEMENT, NOT INCLUDING PAVED SHOULDER WIDTH (POINT B). FROM THE END OF THE GORE AREA PAVED SHOULDER (POINT C), LOCATE THE PT OF THE CURVE BY MEASURING 22 m FROM POINT C ALONG THE EDGE OF PAVEMENT EXTENDED (POINT D).

10. PLACEMENT OF DRUMS SHALL BEGIN AT (POINT E) 49 m UPSTREAM FROM THE PREVIOUSLY LOCATED PC (POINT B) AND AT THE RIGHT EDGE OF RAMP PAVEMENT. FROM THIS POINT A DRUM TAPER SHALL BE PLACED TO THE PC (POINT B) AND THEN ALONG A CURVE AS SHOWN TO THE PT (POINT D) WHERE A 48:1 (MIN.) MERGE TAPER SHALL MEET MAINLINE TRAFFIC CONTROL (POINT F).

11. ALL MATERIAL AND EQUIPMENT SHALL BE REMOVED FROM THE CLOSURE AND THE WORK AREA WHEN NO WORK IS BEING DONE.

METRIC

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 THE OMUTCD. PAYMENT FOR ALL LABOR, EQUIPMENT AND MATERIALS TO PROVIDE THIS METHOD OF TRAFFIC CONTROL SHALL BE INCLUDED IN 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 06/24/93
LANE CLOSURE AT ENTRANCE RAMP: PLAN B	
STANDARD CONSTRUCTION DRAWING MT-98.16M	

APPROVED Gary L. Craig ENGR. OF DESIGN SERVICES

WCC

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 641.02 PAINT OR 740.05 TYPE B OR TYPE C PREFORMED MATERIAL.

PAINT

PAINTED MARKINGS SHALL BE IN ACCORDANCE WITH 642 EXCEPT THAT (a) PARAGRAPH 641.11 SHALL NOT APPLY, (b) WHERE THE MARKINGS ARE NOT LIABLE TO BE TRACKED, EITHER CONVENTIONAL OR FAST DRY PAINT MAY BE USED FOR 641.02 AND (c) WHEN APPLYIED TO NEW ASPHALT PAVEMENT SURFACES PLACED BY THIS PROJECT, THE SPECIFIED APPLICATION RATE SHALL BE AS FOLLOWS:

LITERS PER KILOMETER OF LINE	WIDTH OF LINE (MILLIMETERS) 100	200	300		
SOLID LINE	56.6	113.3	169.9	-	-
3.0 m DASHED LINE	14.2	-	-	-	-
1.2 m DASHED LINE	5.7	-	-	-	-
DOTTED LINE	19.0	-	-	-	-

(d) WHEN APPLIED TO PLANED ASPHALT PAVEMENT SURFACES, THE SPECIFIED APPLICATION RATE SHALL BE AS FOLLOWS:

LITERS PER KILOMETER OF LINE	WIDTH OF LINE (MILLIMETERS) 100	200	300		
SOLID LINE	67.9	135.9	203.8	-	-
3.0 m DASHED LINE	17.0	-	-	-	-
1.2 m DASHED LINE	6.8	-	-	-	-
DOTTED LINE	22.7	-	-	-	-

TYPE B AND TYPE C PREFORMED MATERIAL

PREFORMED MATERIAL SHALL COMPLY WITH 740.05 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 740.05 PREFORMED MATERIAL SHALL BE REMOVED PRIOR TO PLACEMENT OF 642 OR 644 SURFACE COURSE MARKINGS AT THAT LOCATION. PREFORMED MATERIAL SHALL BE IN ACCORDANCE WITH 644 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 641.10.

LINE PLACEMENT TOLERANCE FOR FINAL SURFACES SHALL BE IN ACCORDANCE WITH 641.07. ON SURFACES OTHER THAN THE FINAL, THE TOLERANCE PERMITTED SHALL BE TWICE THAT IN 641.07. LAYOUT AND PREMARKING SHALL BE IN ACCORDANCE WITH 641.06.

TEMPORARY MARKING CLASSES

CLASS I MARKINGS

CLASS I MARKINGS SHALL BE APPLIED TO THE STANDARD DIMENSIONS AS DEFINED IN 642 WITH THE FOLLOWING EXCEPTION:

1. TRANSVERSE LINES SHALL BE 200 mm IN WIDTH.
2. STOP LINES SHALL BE 300 mm IN WIDTH.
3. CROSSWALK LINES SHALL BE 200 mm IN WIDTH.

CLASS II MARKINGS

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

CENTER LINES SHALL CONSIST OF SINGLE, YELLOW 100 mm WIDE BY A MINIMUM OF 1.2 m LONG DASHES SPACED AT A MAXIMUM OF 12.0 m INTERVALS.

LANE LINES SHALL CONSIST OF WHITE 100 mm WIDE BY A MINIMUM OF 1.2 m LONG DASHES SPACED AT A MAXIMUM OF 12.0 m INTERVALS.

GORE MARKINGS SHALL BE CONTINUOUS, WHITE 100 mm LINES PLACED AT THE THEORETICAL GORE OF AN EXIT RAMP OR DIVERGING ROADWAYS.

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 641.10. 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.

ALLOWABLE DURATION OF CLASS II CENTER LINES

EXCEPT AS NOTED BELOW, ANYTIME EXISTING PERMANENT NO PASSING ZONE MARKINGS HAVE BEEN REMOVED OR OBLITERATED AS THE RESULT OF A CONSTRUCTION OPERATION (PAVEMENT GRINDING, ASPHALT PAVEMENT OVERLAYS, ETC,) AND THE SECTION OF PAVEMENT CONTINUES TO BE USED BY THE TRAVELING PUBLIC, THE CONTRACTOR MUST WITHIN 3 CALENDAR DAYS PLACE FINAL CENTER LINE MARKINGS AS SPECIFIED BY THE PLAN. EQUIVALENT 614 CLASS I CENTER LINE 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 MARKINGS AS PART OF THE LUMP SUM BID FOR MAINTAINING TRAFFIC.

IF AFTER THE ORIGINAL MARKINGS ARE REMOVED OR OBLITERATED, THE CONTRACTOR RETURNS TO THE SUBJECT NO PASSING ZONE AND PLACES A PLAN SPECIFIED PAVEMENT COURSE WITHIN THE 3 CALENDAR DAY LIMIT, OR PERFORMS WORK IN PREPARATION FOR A SUBSEQUENT PAVEMENT COURSE, THE CONTRACTOR WILL HAVE TEMPORARILY SATISFIED THE CONDITIONS OF THE PREVIOUS PARAGRAPH. IN THIS EVENT THE 3 CALENDAR DAY LIMIT WILL BEGIN AGAIN.

SECTIONS OF PAVEMENT WHERE PASSING IS PERMITTED IN BOTH DIRECTIONS SHALL BE GOVERNED BY THE 21 DAY LIMIT DESCRIBED BELOW IN THE PARAGRAPH ENTITLED "ALLOWABLE DURATION OF CLASS II LANE LINES, GORE MARKINGS AND ABSENCE OF EDGE LINES."

FOR EACH CALENDAR DAY BEYOND 3 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.

ALLOWABLE DURATION OF CLASS II LANE LINES AND GORE MARKINGS AND ABSENCE OF EDGE LINES

ANYTIME EXISTING PERMANENT LANE LINES, GORE MARKINGS OR EDGE LINES HAVE BEEN REMOVED OR OBLITERATED AS THE RESULT OF A CONSTRUCTION OPERATION (PAVEMENT GRINDING, ASPHALT PAVEMENT OVERLAYS, PAVEMENT WIDENING, ETC.) AND THE SECTION OF PAVEMENT CONTINUES TO BE USED BY THE TRAVELING PUBLIC, THE CONTRACTOR MUST WITHIN 21 CALENDAR DAYS PLACE FINAL PAVEMENT MARKINGS AS SPECIFIED BY THE PLAN. EQUIVALENT 614 CLASS I 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 MARKINGS AS PART OF THE LUMP SUM BID FOR 614 MAINTAINING TRAFFIC.

IF, AFTER THE ORIGINAL MARKINGS ARE REMOVED OR OBLITERATED, THE CONTRACTOR RETURNS TO THE SUBJECT SECTION OF PAVEMENT AND PLACES A PLAN SPECIFIED PAVEMENT COURSE WITHIN THE 21 CALENDAR DAY LIMIT, OR PERFORMS SPECIFIED WORK WHICH REQUIRES A LANE CLOSURE, EXCEPT ROUTINE MAINTENANCE REQUIRED BY 614.02, THE CONTRACTOR WILL HAVE TEMPORARILY SATISFIED THE CONDITIONS OF THE PREVIOUS PARAGRAPH. IN THIS EVENT, THE 21 CALENDAR DAY LIMIT WILL BEGIN AGAIN.

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.

IF A SECTION OF PAVEMENT IS IN A CONTINUOUS PART OF THE PROJECT THEN A NEW 21 DAY LIMIT FOR RENEWED WORK ON A SECTION SHALL APPLY TO ALL SECTIONS IN THAT PART. IF THE PROJECT IS IN PARTS AND THE TRAVELING PUBLIC WOULD NOT DISCERN THE PARTS AS ONE CONTINUOUS PROJECT, THEN A NEW 21 DAY LIMIT IN ONE PART WILL NOT APPLY TO THE OTHER PARTS. THE TWO DIRECTIONAL SIDES OF A FREEWAY SHALL BE TREATED AS SEPARATE PARTS. WORK ON ONE SIDE OF A FREEWAY SHALL NOT CREATE A NEW 21 DAY LIMIT FOR THE OTHER SIDE.

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.

ITEM	UNIT	DESCRIPTION
614	KILOMETER	TEMPORARY LANE LINES, CLASS____, ____*
614	KILOMETER	TEMPORARY CENTER LINES, CLASS____, ____*
614	METER	TEMPORARY CHANNELIZING LINES, CLASS I, ____*
614	KILOMETER	TEMPORARY EDGE LINES, CLASS I, ____*
614	METER	TEMPORARY GORE MARKINGS, CLASS I I, ____*
614	METER	TEMPORARY STOP LINES, CLASS I, ____*
614	METER	TEMPORARY CROSSWALK LINES, CLASS I, ____*
614	METER	TEMPORARY DOTTED LINES, CLASS I, ____*

* TYPE MATERIAL (642 PAINT, 740.05 TYPE B OR 740.05 TYPE C OR LEFT BLANK TO PERMIT ANY OF THE THREE)

614 WORK ZONE MARKING SIGNS

GENERAL

THE CONTRACTOR SHALL FURNISH, INSTALL, MAINTAIN AND SUBSEQUENTLY REMOVE WORK ZONE MARKING SIGNS (OW-1-67, R-33 AND R-34) AND THEIR SUPPORTS WITHIN THE WORK LIMITS IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS.

THE CONTRACTOR SHALL, IN ADVANCE OF ANY SECTION OF ROADWAY LACKING OMUTCD STANDARD EDGE LINE MARKINGS, ERECT A "NO EDGE LINES" (OW-1-67-36) SIGN. ON FREEWAYS AND EXPRESSWAYS AN OW-1-67-48 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 CONDITIONS AND AT LEAST ONCE EVERY 3.2 km ALONG THE ROADWAY. THESE SIGNS SHALL BE REMOVED WHEN THEY DO NOT APPLY.

THE CONTRACTOR SHALL AT THE BEGINNING OF EACH NO-PASSING ZONE LACKING OMUTCD STANDARD CENTER LINE MARKINGS, ERECT A "DO NOT PASS" (R-33-30) SIGN AND AT THE END OF EACH NO-PASSING ZONE, ERECT A "PASS WITH CARE" (R-34-30) SIGN.

MATERIALS

THE CONTRACTOR MAY USE SIGNS AND SUPPORTS IN USED BUT GOOD CONDITION. 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.

METHOD OF MEASUREMENT

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

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 REMOVAL OF THE SIGNS.

ITEM	UNIT	DESCRIPTION
614	EACH	WORK ZONE MARKING SIGNS

METRIC

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

MAINTENANCE OF TRAFFIC

WORK ZONE PAVEMENT MARKINGS AND SIGNS

DATE 01/30/95

STANDARD CONSTRUCTION DRAWING MT-99.10M

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 AT NO ADDITIONAL COST.

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 122 m TO 183 m.

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 400 m.
2. LIGHTED HEADLIGHTS AND TAILLIGHTS , AND
3. A KEEP RIGHT SIGN (OC-31R-48) AND WET PAINT SIGN (OC-52-48) MOUNTED A MINIMUM OF 1.5 m 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 400 m.
2. LIGHTED HEADLIGHTS AND TAILLIGHTS , AND
3. ✳ A FLASHING ARROW PANEL 1.4 X .76 m CONFORMING TO MT-35.10M (TYPE B) VISIBLE TO THE REAR MOUNTED A MINIMUM OF 2 m 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 400 m, MOUNTED A MINIMUM OF 2 m 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 1.4 X .76 m CONFORMING TO MT-35.10M (TYPE B) DISPLAYED TO THE REAR MOUNTED A MINIMUM OF 2 m ABOVE THE THE ROAD SURFACE, MEASURED TO 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 2 m 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 0.3 m ABOVE THE ROAD SURFACE.
4. A KEEP RIGHT SIGN (OC-31R-48) AND WET PAINT SIGN (OC-52-48) MOUNTED A MINIMUM OF 1.5 m ABOVE THE ROAD SURFACE, MEASURED TO THE BOTTOM OF THE SIGN 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 0.4 m 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 400 m,
2. ✳ (A) A FLASHING ARROW PANEL 1.4 X .76 m CONFORMING TO MT-35.10M (TYPE B) VISIBLE TO THE REAR MOUNTED AT A MINIMUM HEIGHT OF 2 m 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 2 m 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 1.4 m ABOVE THE ROAD SURFACE AND OC-51-48 SHALL BE MOUNTED A MINIMUM OF 1.5 m 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 0.46 m. THEY SHALL BE SPACED TO PROTECT THE WET LINE NORMALLY BETWEEN 37 m AND 61 m. IN AREAS OF TRAFFIC CONGESTION , ON CURVES AND AT OTHER LOCATIONS WHERE TRACKING OF THE WET LINE IS EXPECTED SPACINGS AS CLOSE AS 6.1 m 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 1.6 km.

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 400 m.
2. LIGHTED HEADLIGHTS AND TAILLIGHTS, AND
3. A KEEP RIGHT SIGN (OC-31R-48) MOUNTED A MINIMUM OF 1.5 m 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 305 m.

DURING NIGHTTIME CONDITIONS THE FOLLOWING TRAFFIC CONTROL SHALL BE PROVIDED:

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

THE PRESENCE OF HIGHWAY LIGHTING DOES NOT WAIVE THESE REQUIREMENTS.

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 (0.7 m 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 61 m OR LESS SHALL BE CONSIDERED AUXILIARY MARKINGS, EXECPT 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

METRIC

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

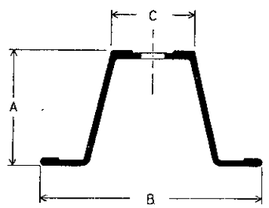
MAINTENANCE OF TRAFFIC

DATE 01/30/95

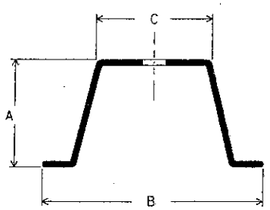
TRAFFIC CONTROL FOR LONG LINE PAVEMENT MARKING OPERATIONS

STANDARD CONSTRUCTION DRAWING MT-99.20M

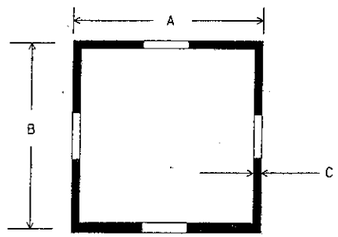
APPROVED Roy J. Crump ENGR. OF DESIGN SERVICES



TYPE P

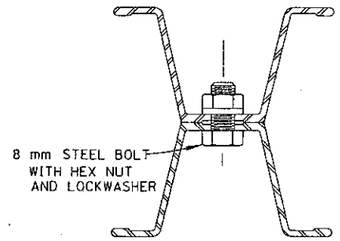


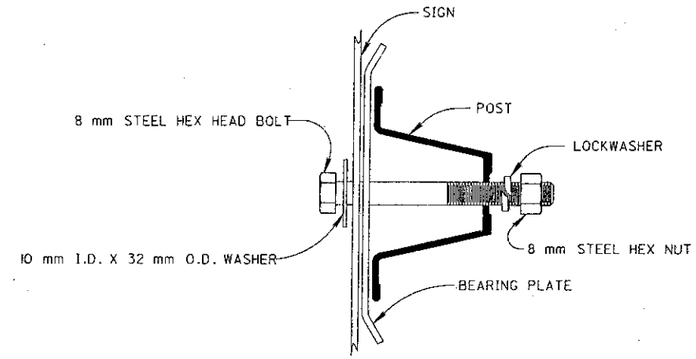
TYPE F



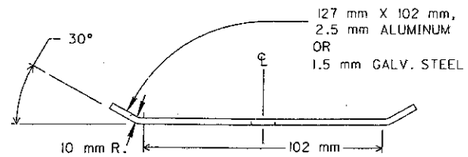
TYPE S

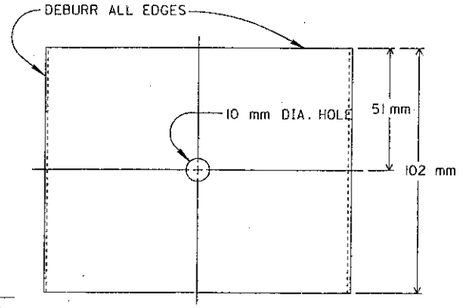
POST NO.	TYPE	Kg/m	POST DIMENSIONS MILLIMETERS A	B	C	ANCHOR DIMENSIONS A	B	C	NUMBER OF POSTS PERMITTED IN SEVEN FOOT PATH IN EXPOSED LOCATIONS
1	F	1.7	22	52	2.1				
2	P	3.0	37	78	3.3				2
	F	3.0	39	79	3.2				2
	S		51	51	2.1	57	57	2.7	2
3	P	4.5	48	89	3.3				2
	F	4.5	44	89	4.1				2
	S		51	51	2.1	57	57	2.7	2
4	P	6.0	TWO NO.2 POST						0
	F	6.0	TWO NO.2 POST						0
	S		63	63	2.7	76	76	4.8	1
6	P	9.0	TWO NO.3 POST						0
	F	9.0	TWO NO.3 POST						0



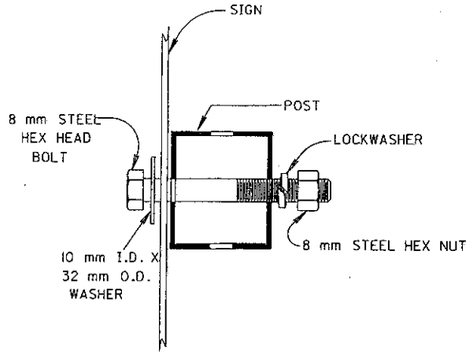


U - CHANNEL
SIGN ATTACHMENT DETAIL





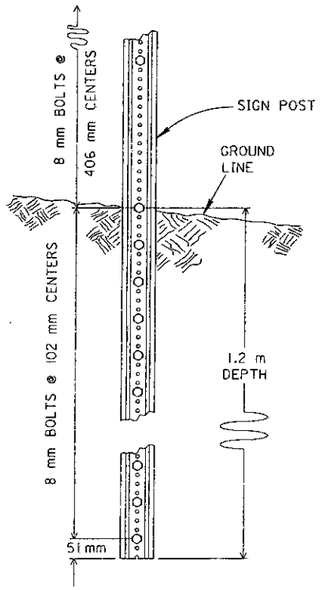
BEARING PLATE



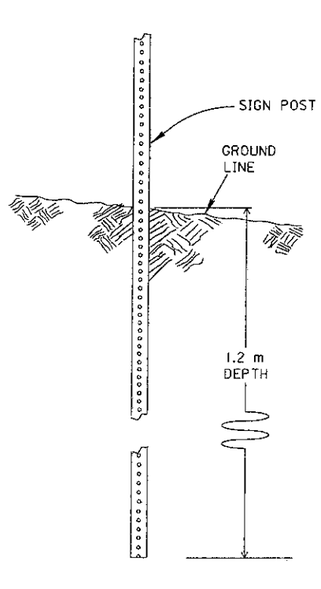
SQUARE POST
SIGN ATTACHMENT DETAIL

NOTES

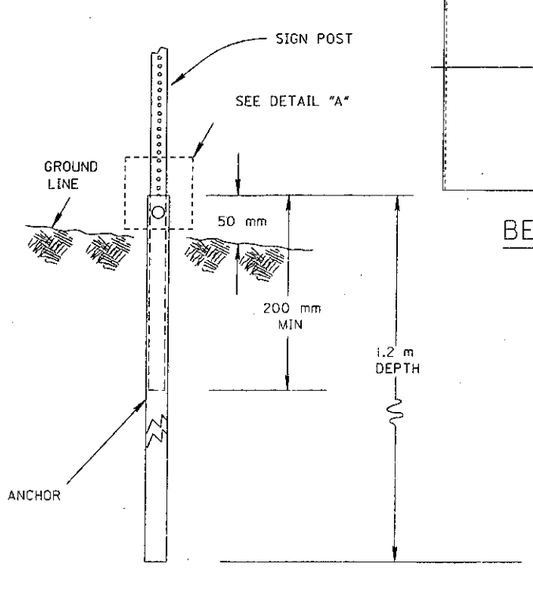
1. NUMBER 4 TYPE P AND F POST, AND NUMBER 6 TYPE P AND F POST, SHALL ONLY BE INSTALLED IN PROTECTED LOCATIONS (e.g. BEHIND GUARDRAIL). TWO POST INSTALLATIONS OF NUMBER 4 TYPE S POST SHALL BE INSTALLED IN PROTECTED LOCATIONS.
2. USE OF ANCHOR BASE WITH SQUARE POST IS OPTIONAL.
3. SQUARE POST MAY HAVE DIE-CUT KNOCKOUTS OR OPEN HOLES.



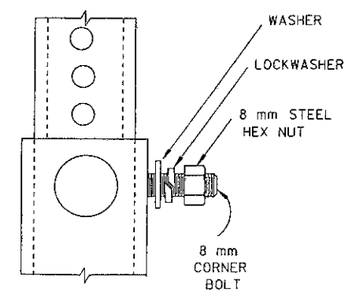
TYPICAL U - CHANNEL
DRIVEN INSTALLATION



TYPICAL SQUARE POST
DRIVEN INSTALLATION



TYPICAL SQUARE POST ANCHOR
BASE INSTALLATION



DETAIL "A"

METRIC

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL

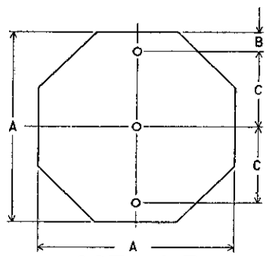
DATE 07/01/94

YIELDING POST

STANDARD CONSTRUCTION DRAWING TC-41.20M

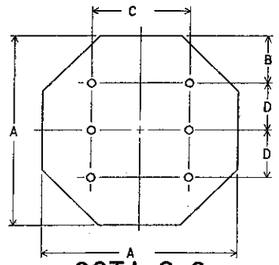
APPROVED _____ ENGR. OF DESIGN SERVICES

WCC



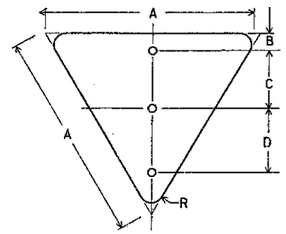
OCTA-1-3

A	B	C	THICKNESS	m^2
750	75	300	2.0	0.56
900	150	300	2.0	0.81



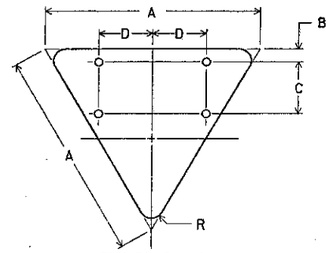
OCTA-2-6

A	B	C	D	THICKNESS	m^2
1200	300	600	300	2.5	1.44



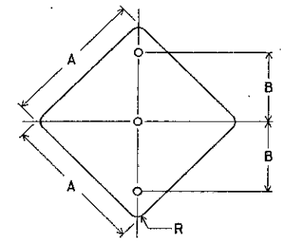
TRI-1-3

A	B	C	D	R	THICKNESS	m^2
900	75	250	275	50	2.5	0.35



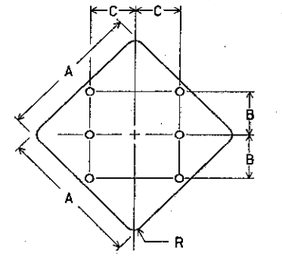
TRI-2-4

A	B	C	D	R	THICKNESS	m^2
1200	75	300	300	75	2.5	0.62
1500	75	450	375	100	2.5	0.97



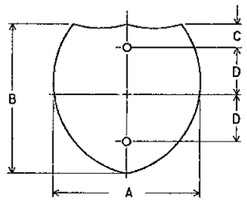
DIA-1-3

A	B	R	THICKNESS	m^2
600	300	38	1.6	0.36
750	375	48	2.0	0.56
900	450	57	2.0	0.81



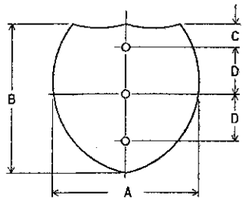
DIA-2-6

A	B	C	R	THICKNESS	m^2
1200	375	375	75	2.5	1.44
1500	450	450	95	2.5	2.25



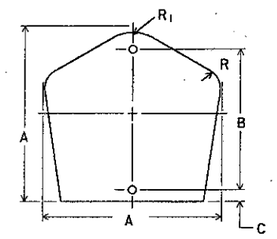
I.S.-1-2

A	B	C	D	THICKNESS	m^2
600	600	75	225	1.6	0.36
750	600	75	225	2.0	0.45
750	750	75	300	2.0	0.56
1000	750	75	300	2.0	0.75



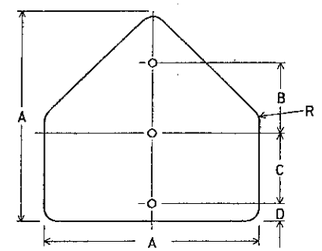
I.S.-1-3

A	B	C	D	THICKNESS	m^2
900	900	150	300	2.0	0.81
1200	900	150	300	2.5	1.08



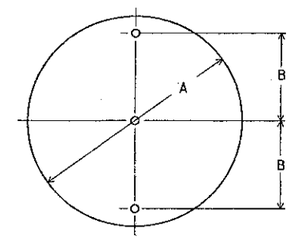
CO-1-2

A	B	C	R_1	R	THICKNESS	m^2
450	375	25	125	50	1.6	0.20
600	450	50	135	68	1.6	0.36
750	600	50	168	86	2.0	0.56



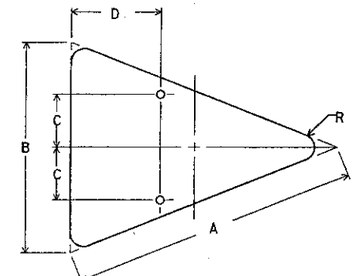
PENT-1-3

A	B	C	D	R	THICKNESS	m^2
750	250	275	75	48	2.0	0.56
900	300	300	75	57	2.0	0.81
1050	350	325	100	64	2.5	1.10



CIR-1-3

A	B	THICKNESS	m^2
750	300	1.6	0.56
900	375	2.0	0.81

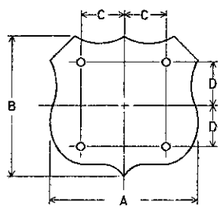


ISOS-1-2

A	B	C	D	R	THICKNESS	m^2
1000	750	187	300	48	2.0	0.35
1200	900	225	375	57	2.5	0.50

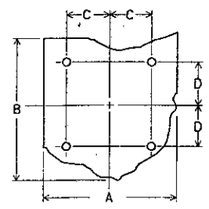
ROUTE SHIELDS

(FOR GUIDE SIGNS ONLY)



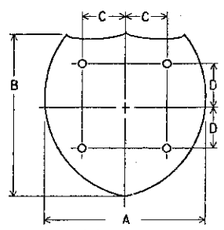
M-1C-

A	B	C	D
610	600	175	175
750	600	200	200
750	750	225	225
937	750	225	225
900	900	250	250
1125	900	375	250



M-2C-

A	B	C	D
600	600	175	175
750	600	200	200
750	750	225	225
937	750	225	225
900	900	250	250
1125	900	375	250



M-5C-

A	B	C	D
600	600	175	175
750	600	200	200
750	750	225	225
1000	750	225	225
900	900	250	250
1200	900	375	250

ALL SHIELDS SHALL BE 1.6 mm THICK

SHAPE — OCTA-2-6 — NO. BOLTS REQUIRED

NO. SUPPORTS REQUIRED

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE NOTED.
2. ALL BOLT HOLES SHALL BE 10 MILLIMETERS IN DIAMETER, AND MAY BE DRILLED OR PUNCHED TO FINISHED SIZE.
3. DIMENSIONS BETWEEN BOLT HOLES SHALL BE TO TOLERANCE OF ± 0.8 MILLIMETER.
4. FOR ADDITIONAL BLANK DETAILS, SEE SIGN LAYOUT DRAWING.

METRIC

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL

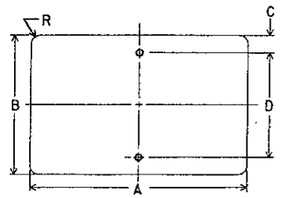
DATE 07/29/94

SIGN BLANK DETAILS I

STANDARD CONSTRUCTION DRAWING TC-52.10M

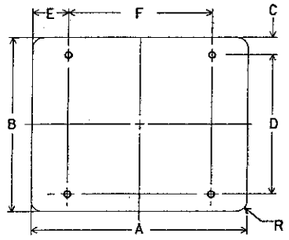
APPROVED Gary Brogan ENGR. OF DESIGN SERVICES

WCC



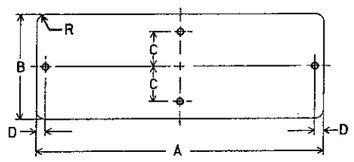
H-REC-1-2

A	B	C	D	R	THICKNESS	m^2
300	150	37.5	75	38	1.6	0.05
450	150	37.5	75	38	1.6	0.07
450	300	37.5	225	38	1.6	0.14
525	375	37.5	300	38	1.6	0.20
525	450	75	300	38	1.6	0.24
600	150	37.5	75	38	1.6	0.09
600	200	37.5	125	38	1.6	0.12
600	250	37.5	175	38	1.6	0.15
600	300	37.5	225	38	1.6	0.18
600	450	75	300	38	1.6	0.27
750	200	37.5	125	38	1.6	0.15
750	250	37.5	175	38	1.6	0.19
750	300	37.5	225	38	2.0	0.23
750	375	37.5	300	38	2.0	0.28
750	400	37.5	325	38	2.0	0.30
750	450	75	300	38	2.0	0.34
750	600	75	450	38	2.0	0.45
900	150	37.5	75	38	2.0	0.14
900	300	37.5	225	38	2.0	0.27
900	375	37.5	300	38	2.0	0.34
900	450	75	300	38	2.0	0.41
900	600	75	450	38	2.0	0.54
937	750	75	600	38	2.0	0.70
1050	375	37.5	300	38	2.0	0.39
1200	500	75	350	38	2.0	0.60



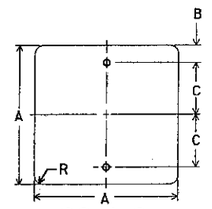
H-REC-2-4

A	B	C	D	E	F	R	THICKNESS	m^2
900	600	75	450	150	600	38	2.0	0.54
900	750	75	600	150	600	48	2.0	0.68
1000	500	75	350	150	700	38	2.0	0.50
1050	900	150	600	225	600	57	2.5	0.95
1125	900	150	600	225	675	57	2.5	1.01
1200	200	37.5	125	225	750	38	2.0	0.24
1200	212	37.5	137	225	750	38	2.0	0.25
1200	350	37.5	275	225	750	38	2.0	0.42
1200	400	37.5	325	225	750	38	2.0	0.48
1200	450	75	300	225	750	38	2.0	0.54
1200	600	75	450	225	750	48	2.5	0.72
1200	750	75	600	225	750	48	2.5	0.90
1200	900	150	600	225	750	57	2.5	1.08
1200	1050	150	750	225	750	57	2.5	1.26
1400	200	37.5	125	300	800	38	2.5	0.28
1500	300	37.5	225	300	900	38	2.0	0.45
1500	600	75	450	300	900	38	2.5	0.90
1500	750	75	600	300	900	48	2.5	1.13
1500	900	150	600	300	900	57	2.5	1.35
1500	1000	150	700	300	900	57	2.5	1.50
1600	200	37.5	125	300	1000	38	2.5	0.32
1650	600	75	450	300	1050	38	2.5	0.99
1650	900	150	600	300	1050	57	2.5	1.49
1800	300	37.5	225	300	1200	38	2.5	0.54
1800	450	75	300	300	1200	38	2.5	0.81
1800	600	75	450	300	1200	38	2.5	1.08
1800	900	75	600	300	1200	38	2.5	1.62



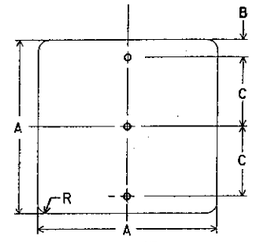
H-REC-1-4 (ONE WAY)

A	B	C	D	R	THICKNESS	m^2
900	300	100	25	38	2.0	0.27
1200	450	150	38	38	2.5	0.54



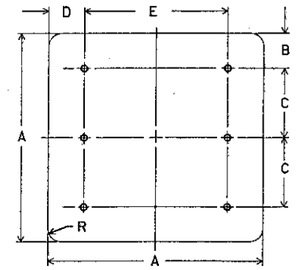
SQ-1-2

A	B	C	R	THICKNESS	m^2
375	75	112.5	38	1.6	0.14
450	75	150	38	1.6	0.20
600	75	225	38	1.6	0.36



SQ-1-3

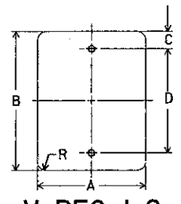
A	B	C	R	THICKNESS	m^2
750	75	300	48	2.0	0.56
900	150	300	57	2.0	0.81



SQ-2-6

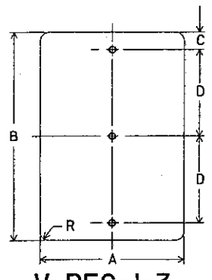
	A	B	C	D	E	R	THICKNESS	m^2
*	900	150	300	150	600	57	2.0	0.81
	1200	150	450	225	750	75	2.5	1.44

* "DO NOT ENTER" SIGN.



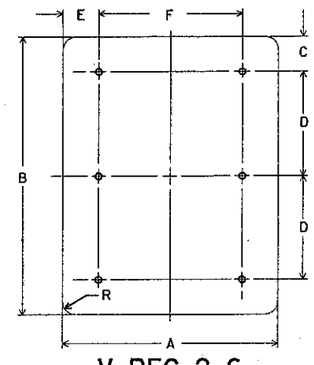
V-REC-1-2

A	B	C	D	R	THICKNESS	m^2
200	650	125	400	38	1.6	0.13
225	300	37.5	225	38	1.6	0.07
300	450	37.5	375	38	1.6	0.14
300	600	75	450	38	1.6	0.18
450	600	75	450	38	1.6	0.27



V-REC-1-3

A	B	C	D	R	THICKNESS	m^2
150	1350	225	450	38	2.0	0.20
300	900	75	375	38	1.6	0.27
300	1200	150	450	38	2.0	0.36
600	750	75	300	38	2.0	0.45
600	900	75	375	38	2.0	0.54
600	1200	225	375	38	2.5	0.72
750	900	75	375	48	2.0	0.68
750	950	75	400	38	2.0	0.68
750	1050	225	300	38	2.0	0.79
900	1050	225	300	57	2.5	0.95



V-REC-2-6

A	B	C	D	E	F	R	THICKNESS	m^2
900	1200	150	450	150	600	57	2.0	1.08
900	1350	150	525	150	600	57	2.5	1.22
900	1500	150	600	150	600	57	2.5	1.35
900	1800	225	675	150	600	57	2.5	1.62
1200	1350	150	525	225	750	75	2.5	1.62
1200	1500	150	600	225	750	75	2.5	1.80
1200	2400	300	900	225	750	75	2.5	2.88

SHAPE — H-REC-2-4 — NO. BOLTS REQUIRED

NO. SUPPORTS REQUIRED

NOTES

1. ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE NOTED.
2. ALL BOLT HOLES SHALL BE 10 MILLIMETERS IN DIAMETER, AND MAY BE DRILLED OR PUNCHED TO FINISHED SIZE.
3. DIMENSIONS BETWEEN BOLT HOLES SHALL BE TO TOLERANCE OF ± 0.8 MILLIMETER.
4. FOR ADDITIONAL BLANK DETAILS SEE SIGN LAYOUT DRAWINGS.

METRIC

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL

DATE 07/29/94

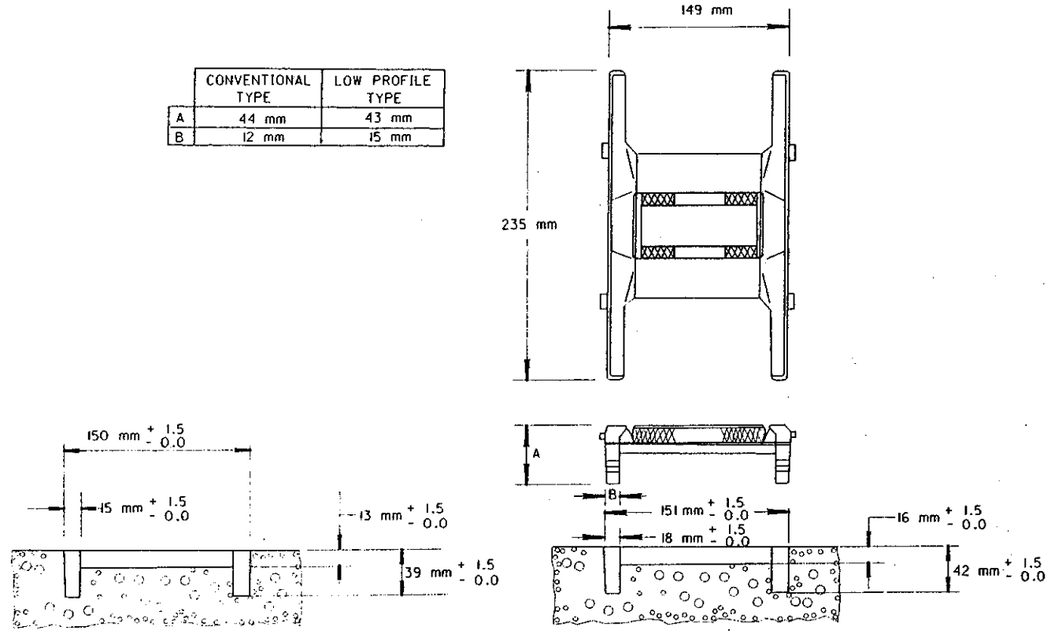
SIGN BLANK DETAILS II

STANDARD CONSTRUCTION DRAWING TC-52.20M

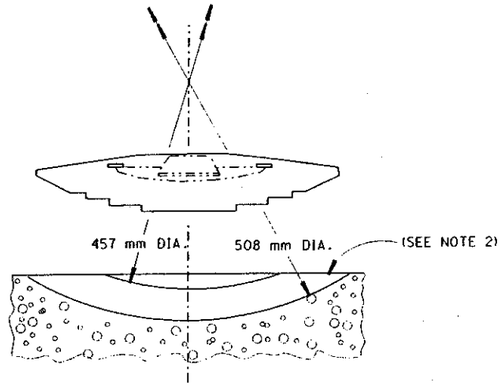
APPROVED Dayl Creager ENGR. OF DESIGN SERVICES

WCC

	CONVENTIONAL TYPE	LOW PROFILE TYPE
A	44 mm	43 mm
B	12 mm	15 mm



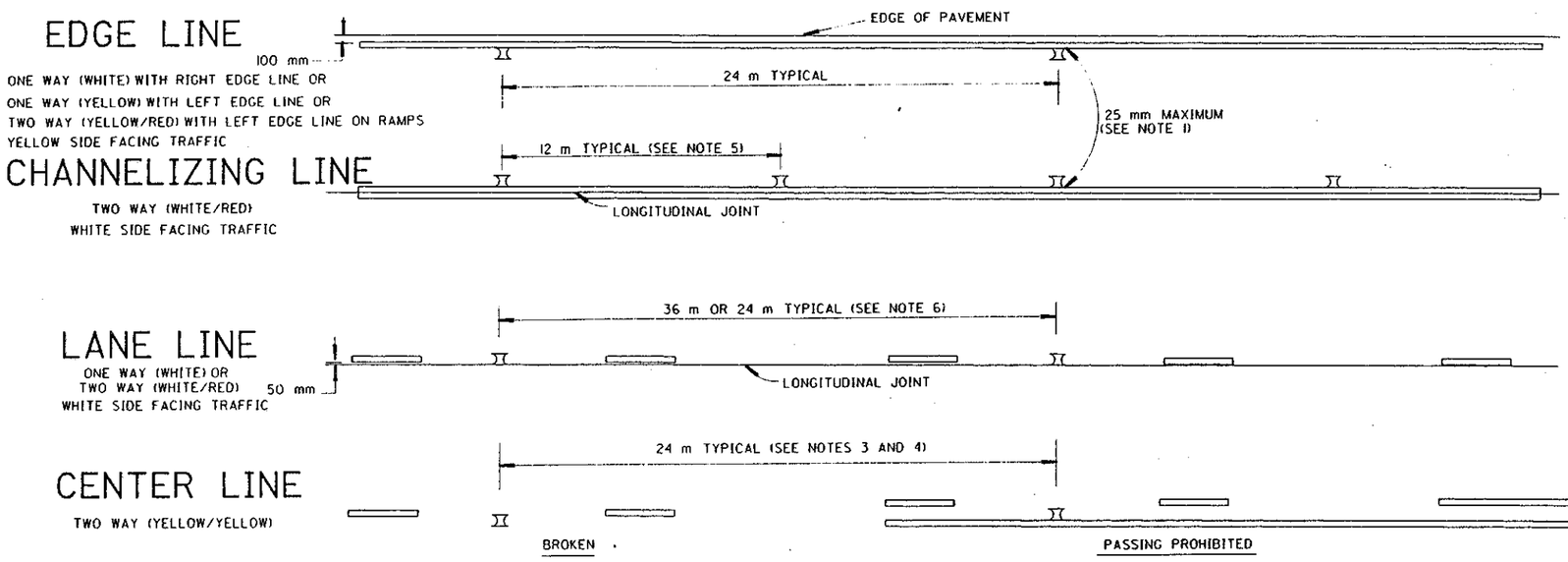
OPTIONAL FOR CONVENTIONAL TYPE



NOTES

1. CENTER LINE MARKERS 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 25 mm FROM THE NEAR EDGE OF THE LINE. MARKERS INSTALLED ALONG A LANE LINE OR DASHED YELLOW CENTER LINE 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. FOR HORIZONTAL CURVE RADIUS OF 380 METERS OR LESS, THE SPACING OF THE CENTER LINE MARKERS SHALL BE REDUCED TO 12 m BETWEEN P.C. OR T.S. AND P.T. OR S.T.
4. FOR HORIZONTAL CURVE RADIUS OF 250 METERS OR LESS, THE SPACING OF THE CENTER LINE MARKERS MAY BE REDUCED TO 6 m BETWEEN P.C. OR T.S. AND P.T. OR S.T. WHEN USING 6m SPACING, 12 RAISED PAVEMENT MARKERS AT 12 m SPACING SHALL BE INSTALLED ON EACH END OF THE 6 m SPACING.
5. WHEN A CHANNELIZING LINE IS LESS THAN 24 m IN LENGTH, ONE RAISED PAVEMENT MARKER SHALL BE PLACED AT EACH END OF THE LINE AND ONE SHALL BE PLACED IN THE CENTER OF THE LINE.
6. RAISED PAVEMENT MARKERS ON LANE LINES ON FREEWAYS SHALL BE ONE WAY WHITE SPACED AT 36 METERS. ALL OTHER RAISED PAVEMENT MARKERS ON LANE LINES ON MULTILANE OR DIVIDED ROADWAYS SHALL BE TWO WAY RED/WHITE SPACED AT 24 METERS.

CASTING AND SAW CUT DETAILS



TYPICAL RAISED PAVEMENT MARKER PLACEMENT WITH LONGITUDINAL PAVEMENT MARKINGS

metric Units

OFFICE OF TRAFFIC ENGINEERING
DIVISION OF ENGINEERING POLICY
OHIO DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL

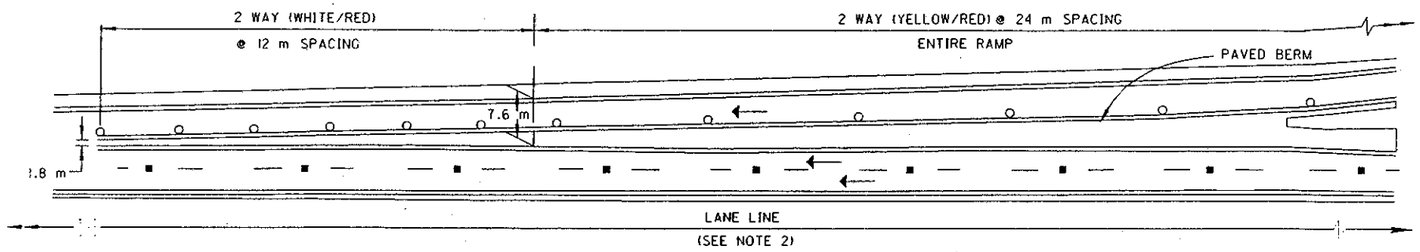
RAISED PAVEMENT MARKER INSTALLATION DETAILS

STANDARD CONSTRUCTION DRAWING TC-65.10M

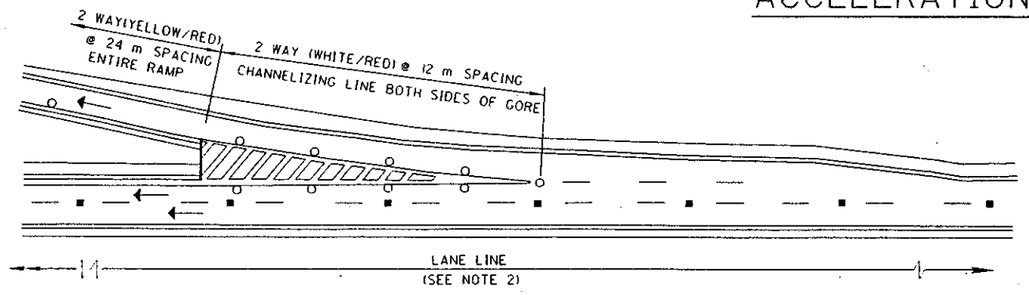
APPROVED _____ ADMINISTRATOR

DATE
11/03/93
11/01/95

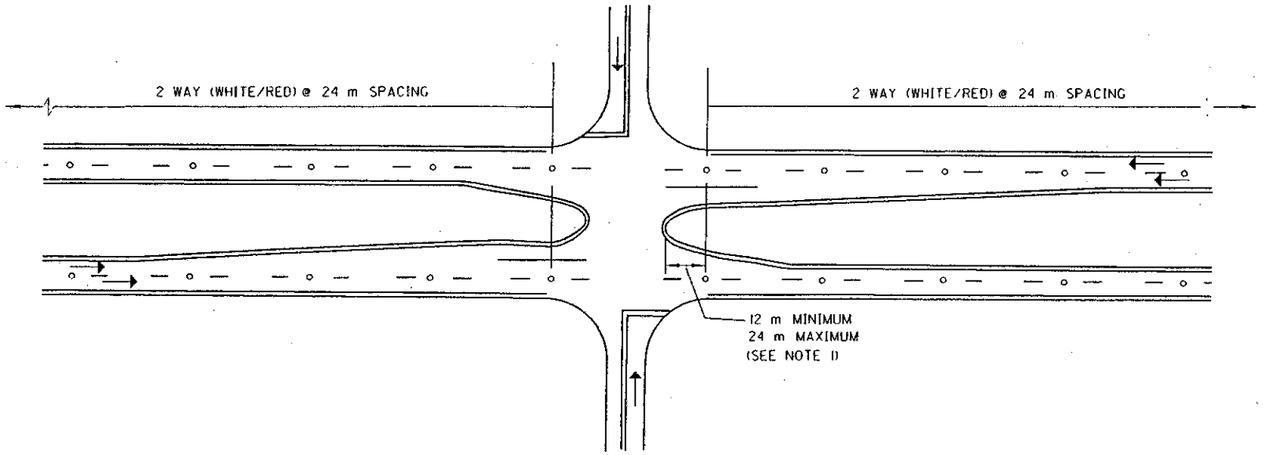
WCC



ACCELERATION LANE

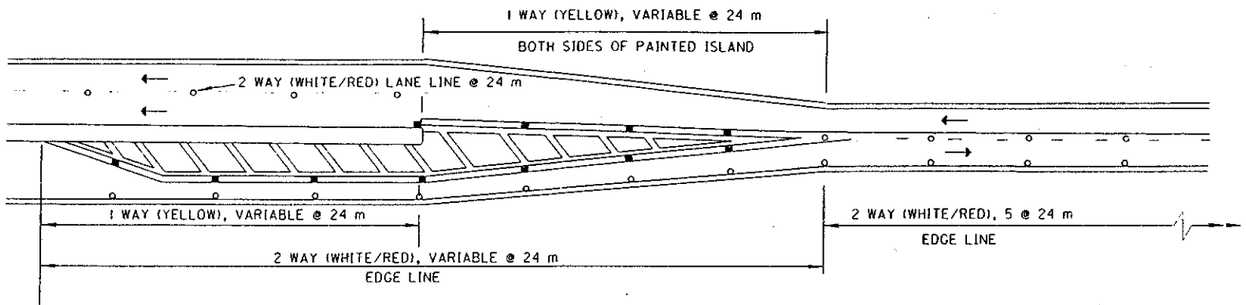


DECELERATION LANE

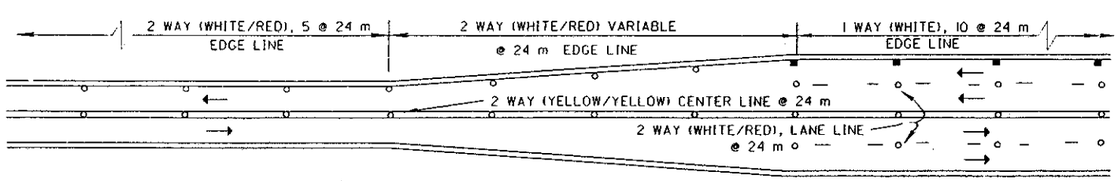


MULTILANE DIVIDED-CONTROLLED ACCESS

(SEE NOTE 2)



4 LANE DIVIDED TO 2 LANE TRANSITION



4 LANE UNDIVIDED TO 2 LANE TRANSITION

NOTES

1. RAISED PAVEMENT MARKERS SHALL NOT BE PLACED IN THE DIRECTIONAL ROADWAYS WITHIN THE INTERSECTION AREA.
2. RAISED PAVEMENT MARKERS ON LANE LINES ON FREEWAYS SHALL BE ONE WAY WHITE SPACED AT 36 METERS. ALL OTHER RAISED PAVEMENT MARKERS ON LANE LINES ON MULTILANE OR DIVIDED ROADWAYS SHALL BE TWO WAY RED/WHITE SPACED AT 24 METERS.

LEGEND

- ■ 1 WAY REFLECTORS
- ○ 2 WAY REFLECTORS

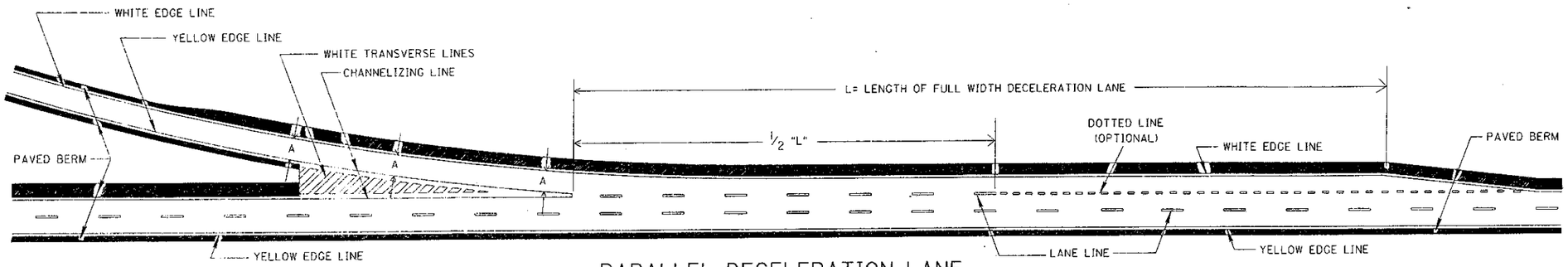
STATE OF OHIO DEPARTMENT OF TRANSPORTATION

metric units

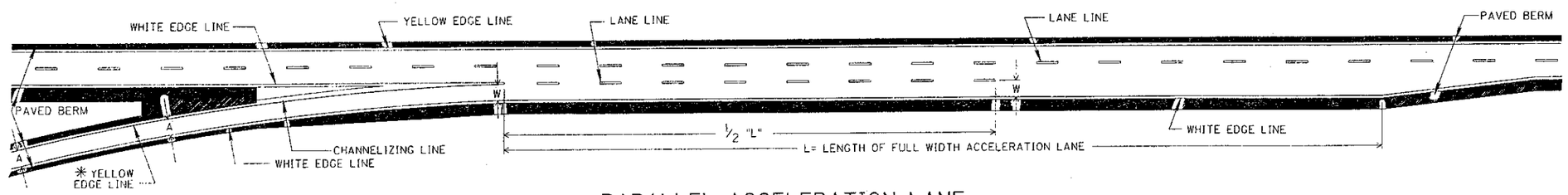
OFFICE OF TRAFFIC ENGINEERING
DIVISION OF ENGINEERING POLICY
OHIO DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL	DATE 11/03/93 11/01/95
RAISED PAVEMENT MARKER DETAILS I	
STANDARD CONSTRUCTION DRAWING TC-65.11M	

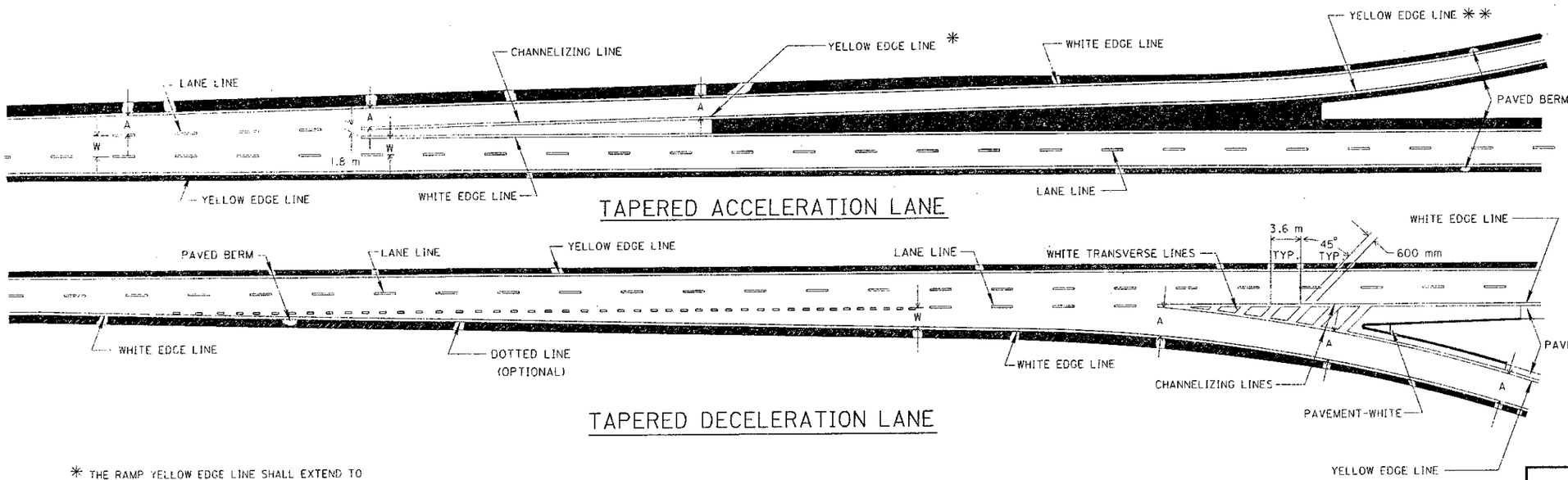
APPROVED _____ ADMINISTRATOR



PARALLEL DECELERATION LANE



PARALLEL ACCELERATION LANE



TAPERED ACCELERATION LANE

TAPERED DECELERATION LANE

✳ THE RAMP YELLOW EDGE LINE SHALL EXTEND TO WHERE THE PAVED BERM ENDS.

✳✳ ANY EXISTING CURB SHALL BE PAINTED WHITE.

A = UNIFORM RAMP WIDTH

W = LANE WIDTH

METRIC

BUREAU OF DESIGN SERVICES
DIVISION OF HIGHWAYS
OHIO DEPARTMENT OF TRANSPORTATION

TRAFFIC CONTROL	DATE 09/01/93
FREEWAY ENTRANCE AND EXIT MARKINGS	
STANDARD CONSTRUCTION DRAWING TC-72.20M	
APPROVED D. J. Mrega ENGR. OF DESIGN SERVICES	

WCC