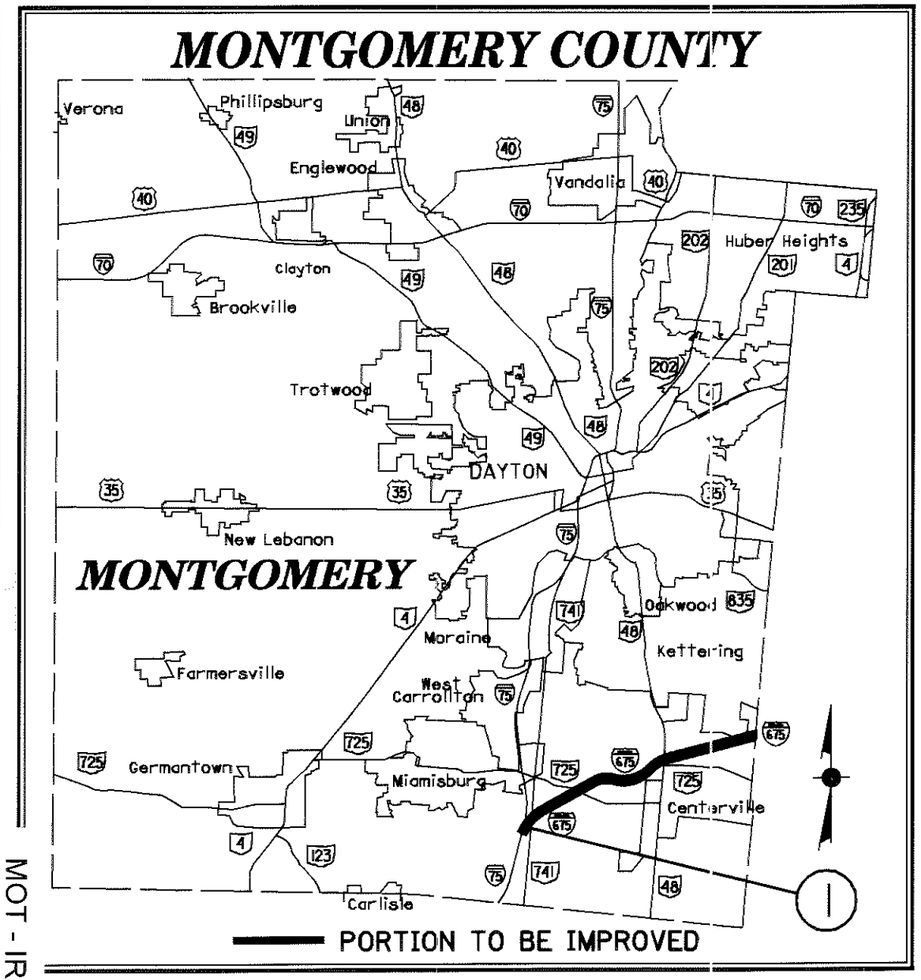
OHIO DEPARTMENT OF TRANSPORTATION

PLAN NO.

FOUR LANE RESURFACING

LOCATION MAP



PART	COUNTY	ROUTE	SECTIONS	PROJECT TERMINII BEGIN	PROJECT TERMINII END	NET LENGTH MILE	NET LENGTH KILOMETER	CITY	VILLAGE
1	MOT	I-675	(0.00-7.44)	0.00	7.44	7.44	11.97	DAYTON	MIAMISBURG
									KETTERING
									CENTERVILLE

N

INDEX OF SHEETS:

1 - Title Sheet
2 thru 7 - Pavement Data
8 thru 13 - Plan Sheets
14 thru 19 - General Notes
20 & 21 - Maintanance of Traffic
22 - Dropoffs in Work Zones
23 thru 27 - Bridge Sheets
28 - Raised Pavement Markers
29 - General Summary

1997 SPECIFICATIONS

THE STANDARD 1997 SPECIFICATIONS OF THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, INCLUDING CHANGES AND SUPPLEMENTAL SPECIFICATIONS LISTED IN THE PLANS AND THE PROPOSAL SHALL GOVERN THESE IMPROVEMENTS.

I HEREBY APPROVE THESE PLANS AND DECLARE THAT THE MAKING OF THIS IMPROVEMENT WILL NOT REQUIRE THE CLOSING OF THE HIGHWAY TO TRAFFIC AND THAT PROVISIONS FOR THE MAINTENANCE AND SAFETY OF TRAFFIC WILL BE AS SET FORTH IN THE PLANS AND ESTIMATES.

3/15/02 — Date Approved — William L. Harrison / RSM — District Deputy Director

4-2-02 — Date Approved — Gordon Proctor / JL — Director, Department of Transportation

ENGINEER'S SEAL

STATE OF OHIO — PROFESSIONAL ENGINEER

Signed Paul Robert Nathan

Date 3-15-02

UNDERGROUND UTILITIES
TWO WORKING DAYS
BEFORE YOU DIG
CALL 1-800-362-2764 (TOLL FREE)
OHIO UTILITIES PROTECTION SERVICE
NON-MEMBERS MUST BE CALLED DIRECTLY

PLAN PREPARED BY:
District D7

STANDARD DRAWINGS		STANDARD DRAWINGS		STANDARD DRAWINGS	
BP-3.1	7-28-00	MT-97.10M	4-25-94	MT-99.20M	1-30-95
		MT-97.11M	1-30-95		
BP-9.1	7-28-00			TC-65.10	10-19-01
		MT-98.12M	6-24-93	TC-65.11	10-19-01
MT-35.10	4-20-01	MT-98.13M	6-24-93	TC-65.12	10-19-01
		MT-98.15M	6-24-93		
MT-95.30M	4-25-94	MT-98.16M	6-24-93	TC-71.10M	9-1-93

SUPPLEMENTAL SPECIFICATIONS	
858	11-7-00
899	10-21-98
905	4-1-98
906	5-5-98
907	10-21-98
908	11-7-00

FEDERAL PROJECT NO. TE21-G020(248)

PID NO. 23820

CONSTRUCTION PROJECT NO.

TITLE SHEET

MONTGOMERY COUNTY MOT-675-0.00

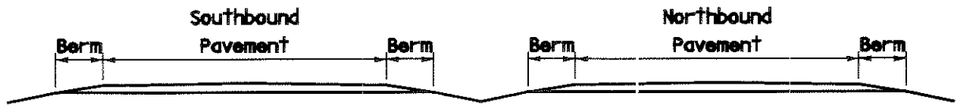
MOT - IR 675 - 0.00
020288 PID - 23820
Dist 7 6/19/2002

MOT675 March 14, 2002

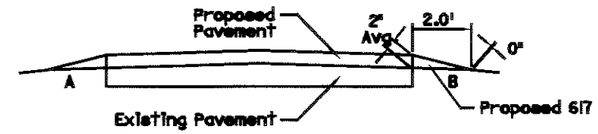
Pavement course edges will be parallel with the existing pavement edges.
If the existing pavement edge can not be used to give a straight edge a string line or other guide will be required.

* Item Special, Multi-Seal Surfacing, Type 12, Interlayer to be applied to the traveled portion only on Mainline and Ramps.

TYPICAL 1 - MAINLINE



** Item 407, Tack Coat
Apply to Berm Areas Only



TYPICAL - COMPACTED AGGREGATE

MAINLINE PAVEMENT DATA

PART	ROUTE	LOG POINT TO LOG POINT	LENGTH MILE	LENGTH FEET	DRIVING LANES WIDTH FEET	BERM WIDTH FEET	TOTAL PAVEMENT WIDTH FEET	TYPICAL	DRIVING LANES AREA SQ. YD.	BERM AREA SQ. YD.	TOTAL PAVEMENT AREA SQ. YD.	PROPOSED PAVEMENT 407 ** TACK COAT @0.075 gal./sq. yard GALLONS	ASPHALT CONCRETE 858 Interm. THICK INCH AVG.	858 Interm. CUBIC YARD	858 Surface THICK INCH	858 Surface CUBIC YARD	ITEM SPECIAL MULTI-SEAL SURFACING TYPE 12 INTERLAYER * SQUARE YARD	617 COMPACTED AGGREGATE THICK INCH AVG.	617 COMPACTED AGGREGATE CUBIC YARD
1	I-675	Sta. 0+00 to Sta. 53+50 NB	1.01	5350	24.0	14.0	38.0	1	14267	8322	22589	624			1.5	941	14267	2.0	132
		Sta. 0+00 to Sta. 37+00 SB	0.70	3700	24.0	16.0	40.0	1	9867	6577	16444	493			1.5	685	9867	2.0	91
	Station	Equation - Sta. 37+00 = Sta. 43+00 SB																	
		Sta. 43+00 to Sta. 57+00 SB	0.27	1400	24.0	16.0	40.0	1	3733	2489	6222	187			1.5	259	3733	2.0	35
		Sta. 53+50 to Sta. 70+25 NB	0.32	1675	20.0	6.0	26.0	1	3722	1117	4839	84			1.5	202	3722	2.0	41
		Sta. 43+00 to Sta. 65+00 SB	0.42	2200	20.0	6.0	26.0	1	4889	1467	6356	110			1.5	264	4889	2.0	54
		Sta. 70+25 to Sta. 87+75 NB	0.33	1750	48.0-24.0	24.0-16.0	72.0-40.0	1	7000	3889	10889	292			1.5	454	7000	2.0	43
		Sta. 87+75 to Sta. 100+00 NB	0.23	1225	24.0	16.0	40.0	1	3267	2177	5444	163			1.5	227	3267	2.0	30
		Sta. 65+00 to Sta. 75+00 SB	0.19	1000	24.0	16.0	40.0	1	2667	1777	4444	133			1.5	185	2667	2.0	25
		Sta. 75+00 to Sta. 100+00 SB	0.07	2500	24.0	16.0	40.0	1	6667	4444	11111	333			1.5	463	6667	2.0	62
		Sta. 100+00 to Sta. 110+00 NB	0.19	1000	24.0	16.0	40.0	1	2667	1777	4444	133			1.5	185	2667	2.0	25
		Sta. 110+00 to Sta. 118+00 NB	0.15	800	24.0	16.0	40.0	1	2133	1422	3555	107			1.5	148	2133	2.0	20
		Sta. 100+00 to Sta. 106+75 SB	0.13	675	24.0	16.0	40.0	1	1800	1200	3000	90			1.5	125	1800	2.0	17
		Sta. 106+75 to Sta. 126+00 SB	0.36	1925	24.0	16.0	40.0	1	5133	3422	8555	257			1.5	356	5133	2.0	48
		Sta. 118+00 to Sta. 131+50 NB	0.26	1350	24.0-36.0	16.0-20.0	40.0-56.0	1	4500	2700	7200	203			1.5	300	4500	2.0	33
		Sta. 126+00 to Sta. 131+50 SB	0.10	550	24.0-36.0	16.0-20.0	40.0-56.0	1	1833	1100	2933	83			1.5	122	1833	2.0	14
		Sta. 131+50 to Sta. 155+00 NB	0.45	2350	36.0	20.0	56.0	1	9400	5222	14622	392			1.5	609	9400	2.0	58
		Sta. 131+50 to Sta. 158+50 SB	0.51	2700	36.0	20.0	56.0	1	10800	6000	16800	450			1.5	700	10800	2.0	67
		Sta. 155+00 to Sta. 220+00 NB	1.23	6500	36.0	20.0	56.0	1	26000	14444	40444	1083			1.5	1685	26000	2.0	160
		Sta. 158+50 to Sta. 220+00 SB	1.16	6150	36.0	20.0	56.0	1	24600	13667	38267	1025			1.5	1594	24600	2.0	152
		Sta. 220+00 to Sta. 230+00 NB	0.19	1000	36.0	20.0	56.0	1	4000	2222	6222	167			1.5	259	4000	2.0	25
		Sta. 220+00 to Sta. 230+00 SB	0.19	1000	36.0	20.0	56.0	1	4000	2222	6222	167			1.5	259	4000	2.0	25
		Sta. 230+00 to Sta. 290+00 NB	1.14	6000	36.0	20.0	56.0	1	24000	13333	37333	1000			1.5	1556	24000	2.0	148
		Sta. 230+00 to Sta. 290+00 SB	1.14	6000	36.0	20.0	56.0	1	24000	13333	37333	1000			1.5	1556	24000	2.0	148
		Sta. 290+00 to Sta. 345+00 NB	1.04	5500	36.0	20.0	56.0	1	22000	12222	34222	917			1.5	1426	22000	2.0	136
		Sta. 290+00 to Sta. 345+00 SB	1.04	5500	36.0	20.0	56.0	1	22000	12222	34222	917			1.5	1426	22000	2.0	136
		Sta. 345+00 to Sta. 382+16.50 NB	0.70	3716.5	36.0	20.0	56.0	1	14866	8259	23125	619			1.5	964	14866	2.0	92
		Sta. 345+00 to Sta. 382+16.50 SB	0.70	3716.5	36.0	20.0	56.0	1	14866	8259	23125	619			1.5	964	14866	2.0	92
	Station	Equation - Sta. 382+16.50 Back = Sta. 73+00 Ahead																	

CALCULATED
CHECKED

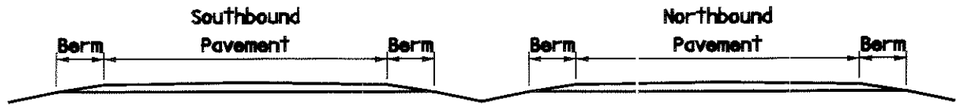
PAVEMENT DATA

MONTGOMERY COUNTY
MOT-675-0.00

Pavement course edges wi l be parallel with the existing pavement edges.
If the existing pavement edge can not be used to give a straight edge a string line or other guide will be required.

* Item Special, Multi-Seal Surfacing, Type 12, Interlayer to be applied to the traveled portion only on Mainline and Ramps.

TYPICAL 1 - MAINLINE



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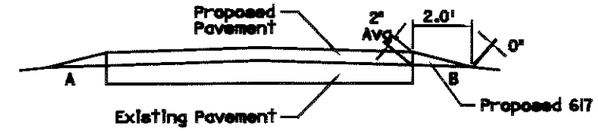

TYPICAL - COMPACTED AGGREGATE

MAINLINE PAVEMENT DATA

PART	ROUTE	LOG POINT TO LOG POINT	LENGTH MILE	LENGTH FEET	DRIVING LANES WIDTH FEET	BERM WIDTH FEET	TOTAL PAVEMENT WIDTH FEET	TYPICAL	DRIVING LANES AREA SQ. YD.	BERM AREA SQ. YD.	TOTAL PAVEMENT AREA SQ. YD.	PROPOSED PAVEMENT 407 TACK COAT @0.075 gal./sq. yard GALLONS	ASPHALT CONCRETE 858 Interm. THICK INCH AVG.	ASPHALT CONCRETE 858 Interm. CUBIC YARD	ASPHALT CONCRETE 858 Surface THICK INCH	ASPHALT CONCRETE 858 Surface CUBIC YARD	ITEM SPECIAL MULTI-SEAL SURFACING TYPE 12 INTERLAYER * SQUARE YARD	617 COMPACTED AGGREGATE THICK INCH AVG.	617 COMPACTED AGGREGATE CUBIC YARD
		Station Equation - Sta. 382+16.50 Back = Sta. 73+00 Ahead																	
1	I-675	Sta. 73+00 to Sta. 100+50 NB	0.52	2750	36.0	20.0	56.0	1	11000	6111	17111	458			1.5	713	11000	2.0	68
		Sta. 73+00 to Sta. 100+50 SB	0.52	2750	36.0	20.0	56.0	1	11000	6111	17111	458			1.5	713	11000	2.0	68
		Total Part 1 - Mainline							296677	167507	464184	12563				19430	296677		2045
		Extra Area for Crossovers								656	656	48				27			
		Pavement Planing Areas Adjustment										1313					- 13128		
		Reductions for Bridges							- 7170	- 4034	- 11204	- 303				- 467	- 7170		
		Grand Total Part 1 - Mainline							289507	164129	453636	13621				18900	276379		2045

PAVEMENT DATA

MONTGOMERY COUNTY
MOT-675-0.00

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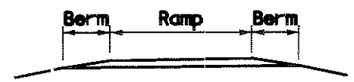
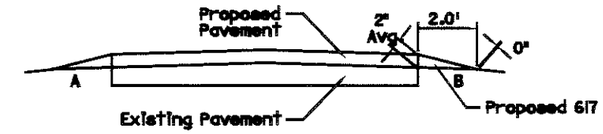
TYPICAL 2 - RAMPS





TYPICAL - COMPACTED AGGREGATE

RAMP PAVEMENT DATA

PART	RAMP	POINT TO POINT	LENGTH MILE	LENGTH FEET	RAMP LANE WIDTH FEET	BERM WIDTH FEET	TOTAL PAVEMENT WIDTH FEET	TYPICAL	RAMP LANE AREA FEET	BERM AREA FEET	TOTAL PAVEMENT AREA FEET	PROPOSED PAVEMENT 407 TACK COAT @0.075 gal./sq. yard GALLONS	ASPHALT CONCRETE 858 Interm. THICK INCH AVG.	858 Interm. CUBIC YARD	858 Surface THICK INCH	858 Surface CUBIC YARD	ITEM SPECIAL MULTI-SEAL SURFACING TYPE 12 INTERLAYER * SQUARE YARD	617 COMPACTED AGGREGATE THICK INCH AVG.	617 COMPACTED AGGREGATE CUBIC YARD
2	Ramp L	NB I-675 to State Route 725	0.37	1950	20.0	6.0	26.0	2	4333	1300	5633	98			1.5	235	4333	2.0	48
			0.05	260	24.0	8.0	32.0	2	693	231	924	17			1.5	39	693	2.0	6
	Ramp M	State Route 725 to NB I-675	0.43	2250	20.0	6.0	26.0	2	5000	1500	6500	113			1.5	271	5000	2.0	56
	Ramp N	State Route 725 to SB I-675	0.36	1925	20.0	6.0	26.0	2	4278	1283	5561	96			1.5	232	4278	2.0	48
	Ramp J	SB I-675 to Yankee Street	0.18	950	24.0	9.0	33.0	2	2533	950	3483	71			1.5	145	2533	2.0	23
	Ramp K	Yankee Street to NB I-675	0.41	2150	20.0	6.0	26.0	2	4778	1433	6211	108			1.5	258	4778	2.0	53
	Ramp F	NB I-675 to Alex-Bell Road	0.36	1900	20.0	6.0	26.0	2	4222	1267	5489	95			1.5	228	4222	2.0	47
	Ramp G	Alex-Bell Road to SB I-675	0.27	1425	20.0	6.0	26.0	2	3167	950	4117	71			1.5	172	3167	2.0	35
	Ramp A	State Route 48 to SB I-675	0.39	2050	20.0	6.0	26.0	2	4556	1366	5922	102			1.5	247	4556	2.0	51
	Ramp B	SB I-675 to State Route 48	0.09	475	36.0	12.0	48.0	2	1900	633	2533	48			1.5	106	1900	2.0	12
			0.24	1250	20.0	6.0	26.0	2	2778	833	3611	62			1.5	150	2778	2.0	31
	Ramp C	NB I-675 to State Route 48	0.42	2200	20.0	6.0	26.0	2	4889	1467	6356	110			1.5	265	4889	2.0	54
	Ramp D	State Route 48 to NB I-675	0.52	2725	20.0	6.0	26.0	2	6056	1816	7872	136			1.5	328	6056	2.0	67
	Ramp E	State Route 48 to Ramp D	0.15	800	20.0	6.0	26.0	2	1778	533	2311	40			1.5	96	1778	2.0	20

Station Equation - Sta. 382+16.50 Back = Sta. 73+00 Ahead

PAVEMENT DATA

MONTGOMERY COUNTY
MOT-675-0.00

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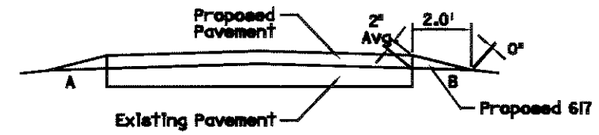
TYPICAL 2 - RAMPS



TYPICAL - COMPACTED AGGREGATE

RAMP PAVEMENT DATA

PART	RAMP	POINT TO POINT	LENGTH MILE	LENGTH FEET	RAMP LANE WIDTH FEET	BERM WIDTH FEET	TOTAL PAVEMENT WIDTH FEET	TYPICAL	RAMP LANE AREA FEET	BERM AREA FEET	TOTAL PAVEMENT AREA FEET	PROPOSED PAVEMENT 407 TACK COAT @0.075 gal./sq. yard GALLONS	ASPHALT CONCRETE 858 Interm. THICK INCH AVG.	858 Interm. CUBIC YARD	858 Surface THICK INCH	858 Surface CUBIC YARD	ITEM SPECIAL MULTI-SEAL SURFACING TYPE 12 INTERLAYER * SQUARE YARD	617 COMPACTED AGGREGATE THICK INCH AVG.	617 COMPACTED AGGREGATE CUBIC YARD
	Station Equation - Sta. 382+16.50 Back = Sta. 73+00 Ahead																		
2	Ramp A	Wilmington Pike to SB I-675	0.41	2150	20.0	6.0	26.0	2	4778	1433	6211	107			1.5	259	4778	2.0	53
			0.08	400	20.0-36.0	6.0-16.0	26.0-52.0	2	1244	489	1733	37			1.5	72	1244	2.0	10
			0.05	250	20.0	6.0	26.0	2	556	166	722	12			1.5	30	556	2.0	6
	Ramp C	NB I-675 to Wilmington Pike	0.27	1450	20.0	6.0	26.0	2	3222	967	4189	73			1.5	174	3222	2.0	36
			0.10	525	36.0	12.0	48.0	2	2100	700	2800	53			1.5	117	2100	2.0	13
	Ramp E	Wilmington Pike to Ramp A	0.07	350	20.0	6.0	26.0	2	778	233	1011	17			1.5	42	778	2.0	9
		Total Part 2 - Ramps							63639	19550	83189	1466				3466	63639		678

PAVEMENT DATA

MONTGOMERY COUNTY
MOT-675-0.00

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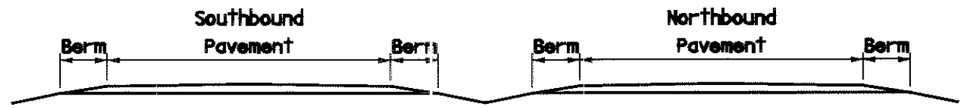
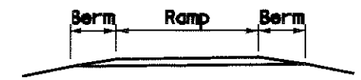
TYPICAL 1 - MAINLINE



TYPICAL 2 - RAMPS



PAVEMENT DATA - PAVEMENT PLANING AREAS

PART	ROUTE	LOG POINT TO LOG POINT	LENGTH MILE	LENGTH FEET	PAVEMENT WIDTH FEET	TYPICAL	PAVEMENT AREA SQ. YD.	PROPOSED PAVEMENT 407 TACK COAT @0.075 gal./sq. yard GALLONS	ASPHALT CONCRETE 858 Interm. THICK INCH AVG.	858 Interm. CUBIC YARD	858 Surface THICK INCH	858 Surface CUBIC YARD	202 WEARING COURSE REMOVED (BUTT JOINTS) SQ. YD.
2	I-675	Ramp S Sta. 0+00 to Sta. 1+50	0.03	150	40.0	2	667	50					667
		Ramp U Sta. 25+50 to Sta. 26+50	0.03	150	26.0	2	433	32					433
		Ramp V Sta. 0+00 to Sta. 1+50	0.03	150	38.0	2	633	47					633
		Ramp Y Sta. 45+25 to Sta. 46+75	0.03	150	26.0	2	433	32					433
		Ramp S Bridge Over I-75	0.06	300	40.0	2	1333	100					1333
		Ramp U Sky Bridge Over I-75	0.06	300	26.0	2	867	65					867
		Ramp S Bridge No. MOT-675-0063	0.06	300	40.0	2	1333	100					1333
		Ramp U Bridge No. MOT-675-0063	0.06	300	26.0	2	867	65					867
		Ramp V Bridge No. MOT-675-0063	0.06	300	38.0	2	1267	95					1267
		Ramp Y Bridge No. MOT-675-0063	0.06	300	26.0	2	867	65					867
		Ramp L at State Route 725	0.01	50	32.0	2	178	13					178
		Ramp M at State Route 725	0.01	50	26.0	2	144	11					144
		Ramp N at State Route 725	0.01	50	26.0	2	144	11					144
		Ramp J at Yankee Street	0.01	50	33.0	2	183	13					183
		Ramp K at Yankee Street	0.01	50	26.0	2	144	11					144
		Bridge No. MOT-675-0299 SB	0.06	300	56.0	1	1867	140					1867
		Bridge No. MOT-675-0299 NB	0.06	300	56.0	1	1867	140					1867
		Bridge No. MOT-675-0411 SB	0.06	300	56.0	1	1867	140					1867
		Bridge No. MOT-675-0411 NB	0.06	300	56.0	1	1867	140					1867
		Ramp F at Alex-Bell Road	0.01	50	26.0	2	144	11					144
		Ramp G at Alex-Bell Road	0.01	50	26.0	2	144	11					144
		Ramp A at State Route 48	0.01	50	26.0	2	144	11					144
		Ramp B at State Route 48	0.01	50	48.0	2	267	20					267
		Ramp C at State Route 48	0.01	50	26.0	2	144	11					144
		Ramp D at State Route 48	0.01	50	26.0	2	144	11					144
		Ramp E at State Route 48	0.01	50	26.0	2	144	11					144
		Bridge Over Wilmington Pike SB	0.03	150	56.0	1	933	70					933
		Bridge Over Wilmington Pike NB	0.03	150	56.0	1	933	70					933
		Ramp A at Wilmington Pike	0.01	50	26.0	2	144	11					144
		Ramp C at Wilmington Pike	0.01	50	48.0	2	267	20					267
		Ramp E at Wilmington Pike	0.01	50	26.0	2	144	11					144
		Total Pavement Planing Area					20513	1538					20513

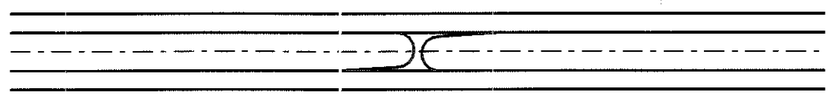
CALCULATED
CHECKED

PAVEMENT DATA

MONTGOMERY COUNTY
MOT-675-0.00

Extra Areas and Reductions

TYPICAL 3 - CROSSOVERS



PAVEMENT DATA - EXTRA AREAS

PART	ROUTE	LOCATIONS	LENGTH MILE	LENGTH FEET	PAVEMENT WIDTH FEET	TYPICAL	PAVEMENT AREA SQ. YD.	PROPOSED PAVEMENT 407 TACK COAT @0.075 gal./sq. yard GALLONS	ASPHALT CONCRETE 858 Interm. THICK INCH AVG.	858 Interm. CUBIC YARD	858 Surface THICK INCH	858 Surface CUBIC YARD
3	I-675	Crossover at Sta. 96+50	0.01	74.0	20.0	3	164	12			1.5	6.8
		Crossover at Sta. 185+50	0.01	74.0	20.0	3	164	12			1.5	6.8
		Crossover at Sta. 306+50	0.01	74.0	20.0	3	164	12			1.5	6.8
		Crossover at Sta. 370+75	0.01	74.0	20.0	3	164	12			1.5	6.8
		Total Extra Area for Crossovers					656	48				27

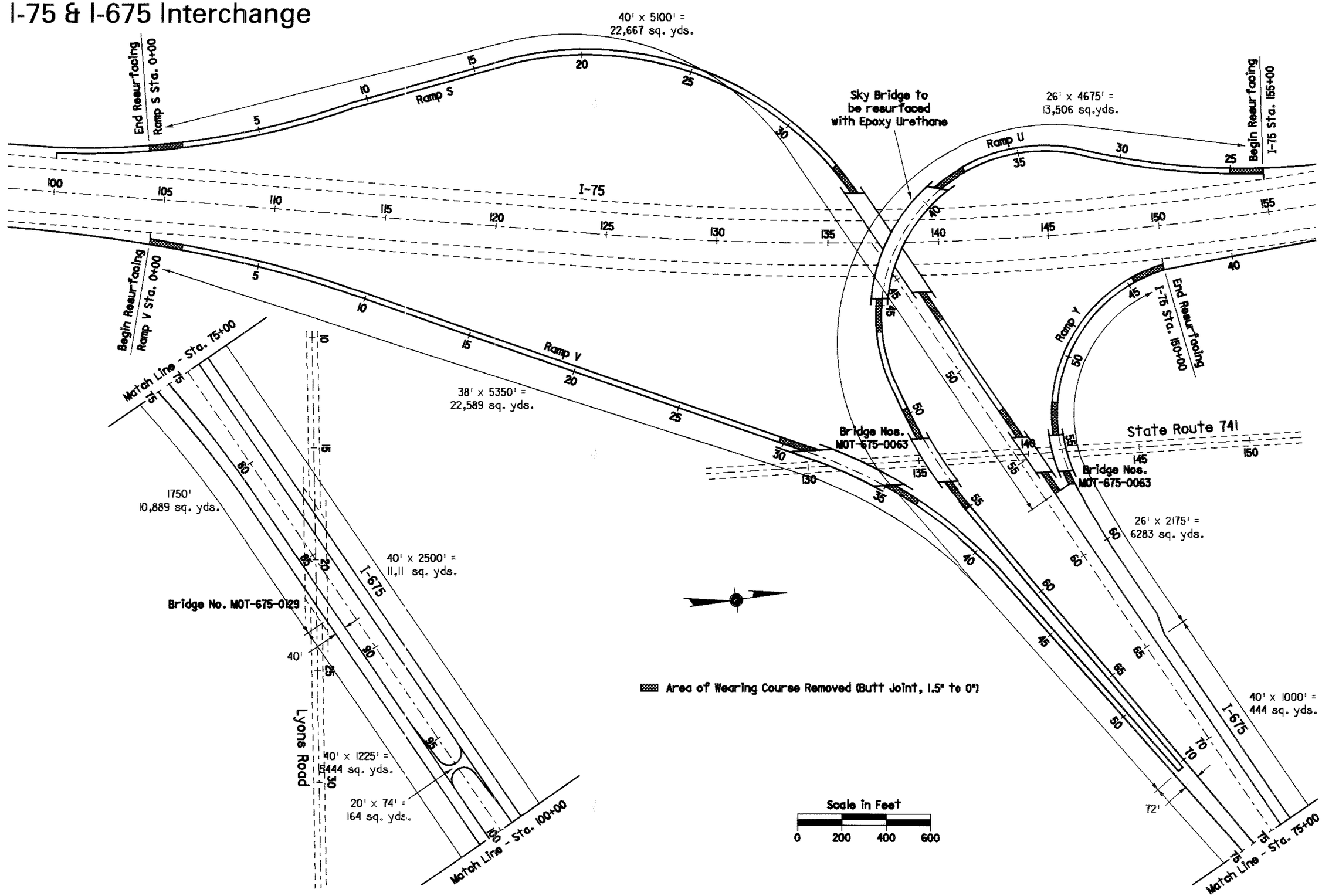
PAVEMENT DATA - REDUCTIONS

LOCATIONS	PAVEMENT LENGTH FEET	PAVEMENT WIDTH FEET	PAVEMENT AREA SQ. YD.
Bridge Over I-75 - Ramp S	411.0	40.0	1827
Sky Bridge Over I-75 - Ramp U	411.0	26.0	1187
Bridge No. MOT-675-0063 - Ramp S	216.0	40.0	960
Bridge No. MOT-675-0063 - Ramp U	216.0	26.0	624
Bridge No. MOT-675-0063 - Ramp V	334.0	38.0	1410
Bridge No. MOT-675-0063 - Ramp Y	178.0	26.0	514
Bridge No. MOT-675-0299 NB	169.0	56.0	1052
Bridge No. MOT-675-0299 SB	169.0	56.0	1052
Bridge No. MOT-675-0411 NB	188.0	56.0	1170
Bridge No. MOT-675-0411 SB	198.0	64.0	1408
Total Reductions for Bridges			11204

PAVEMENT DATA

MONTGOMERY COUNTY
MOT-675-0.00

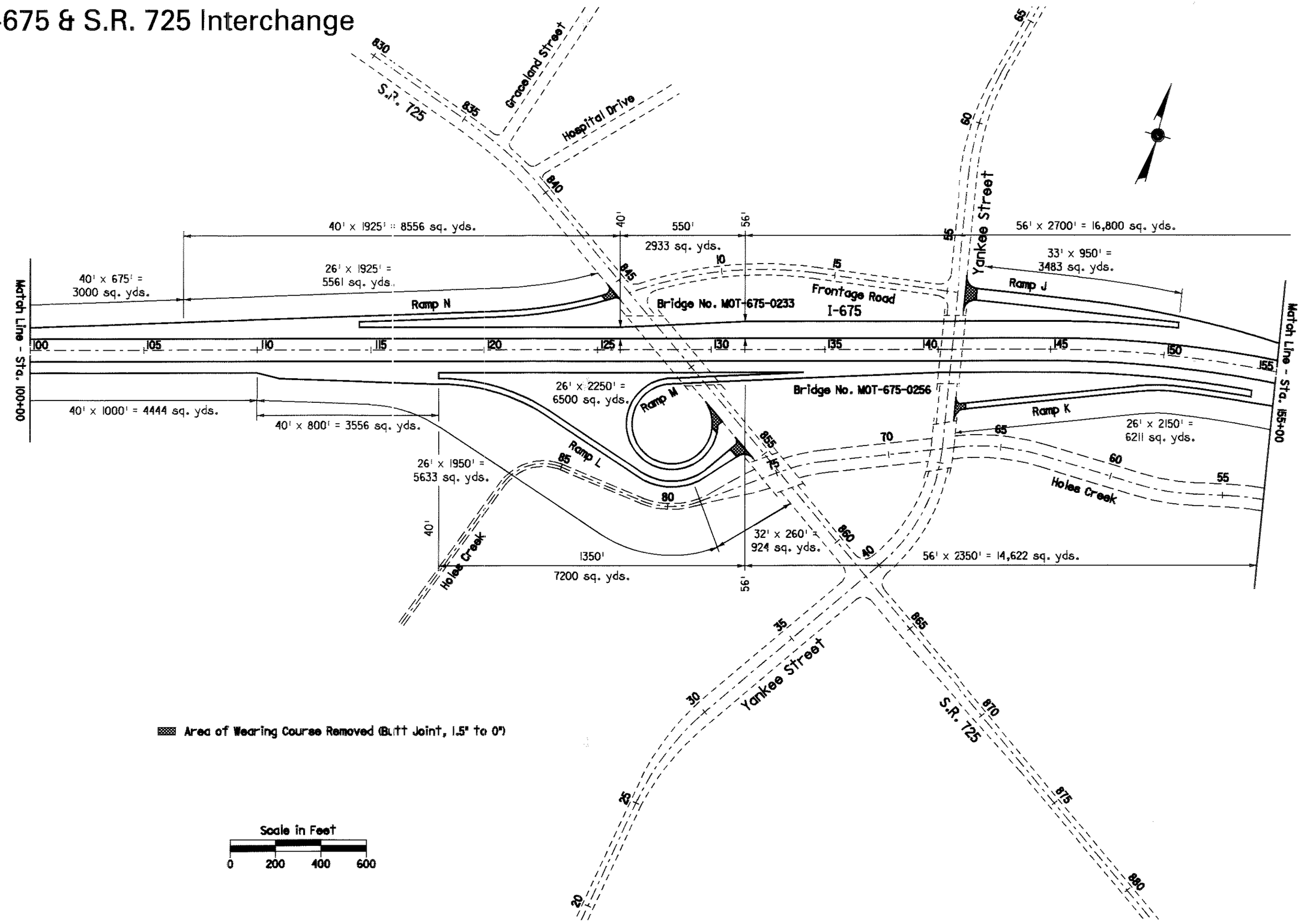
I-75 & I-675 Interchange



PLAN SHEET

MONTGOMERY COUNTY
MOT-675-0.00

I-675 & S.R. 725 Interchange

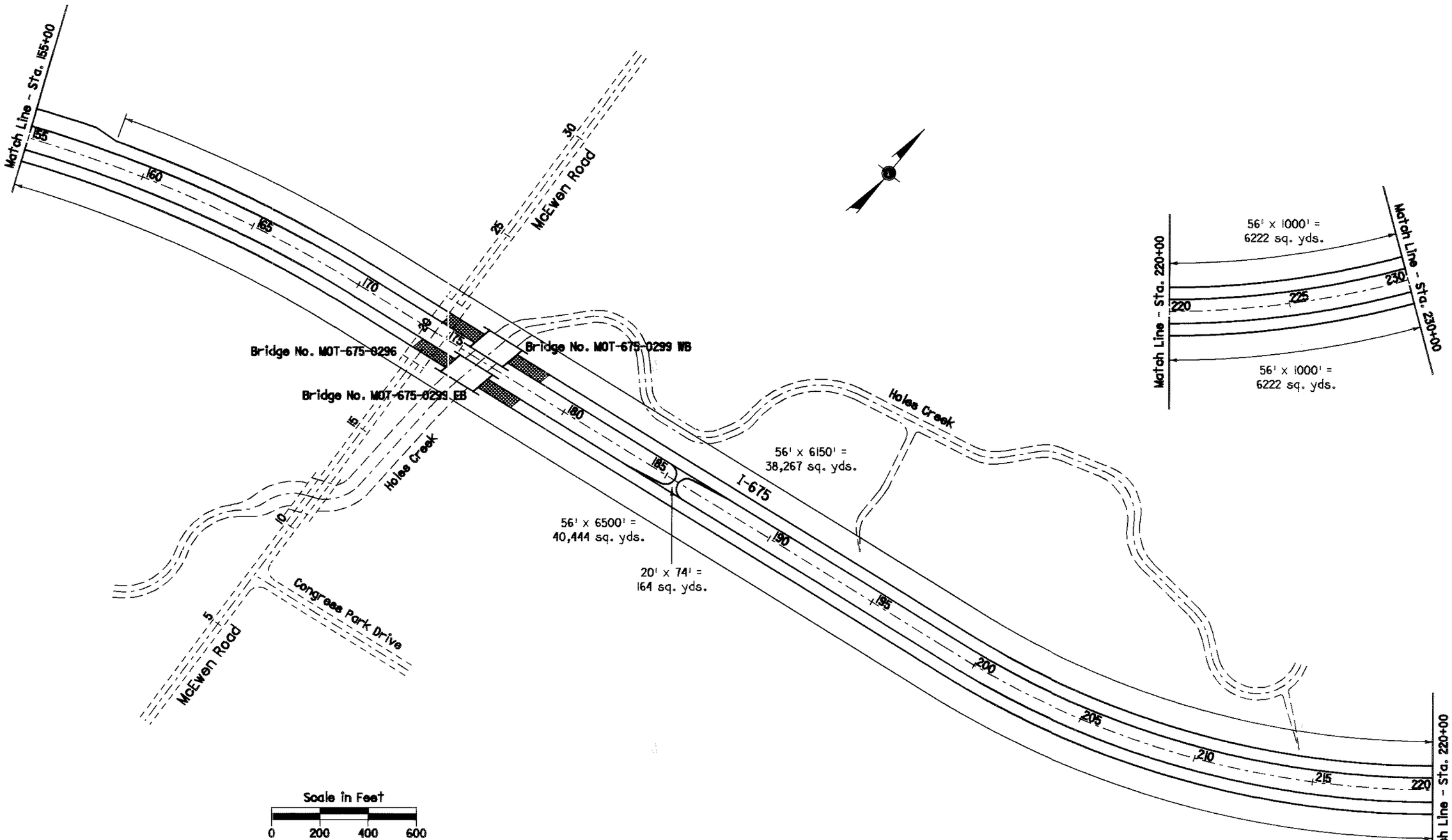


PLAN SHEET

MONTGOMERY COUNTY
MOT-675-0.00

9/29

I-675 & McEwen Road

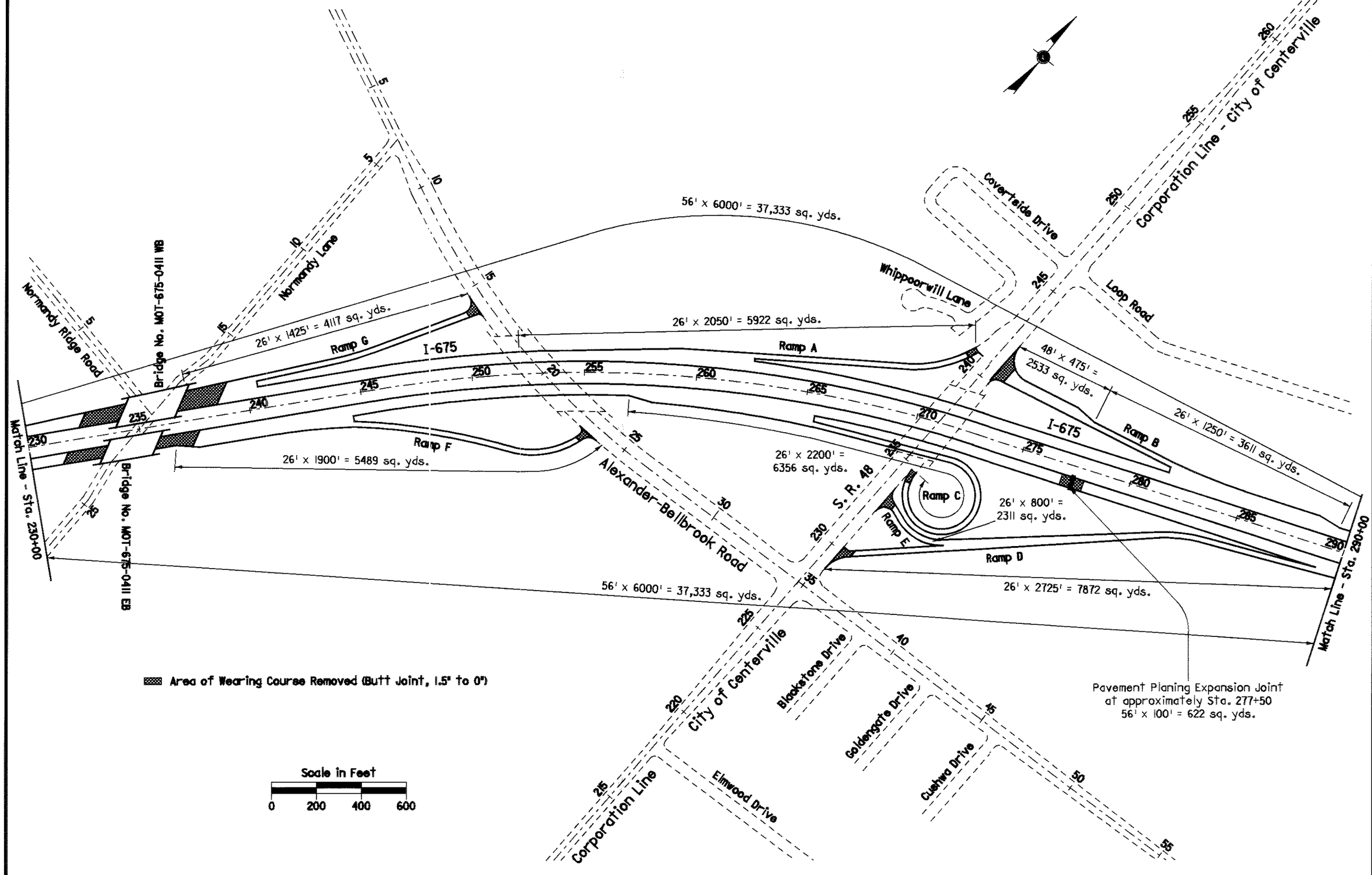


PLAN SHEET

MONTGOMERY COUNTY
MOT-675-0.00

10
29

I-675 & Alexander-Bellbrook Road & State Route 48 Interchanges

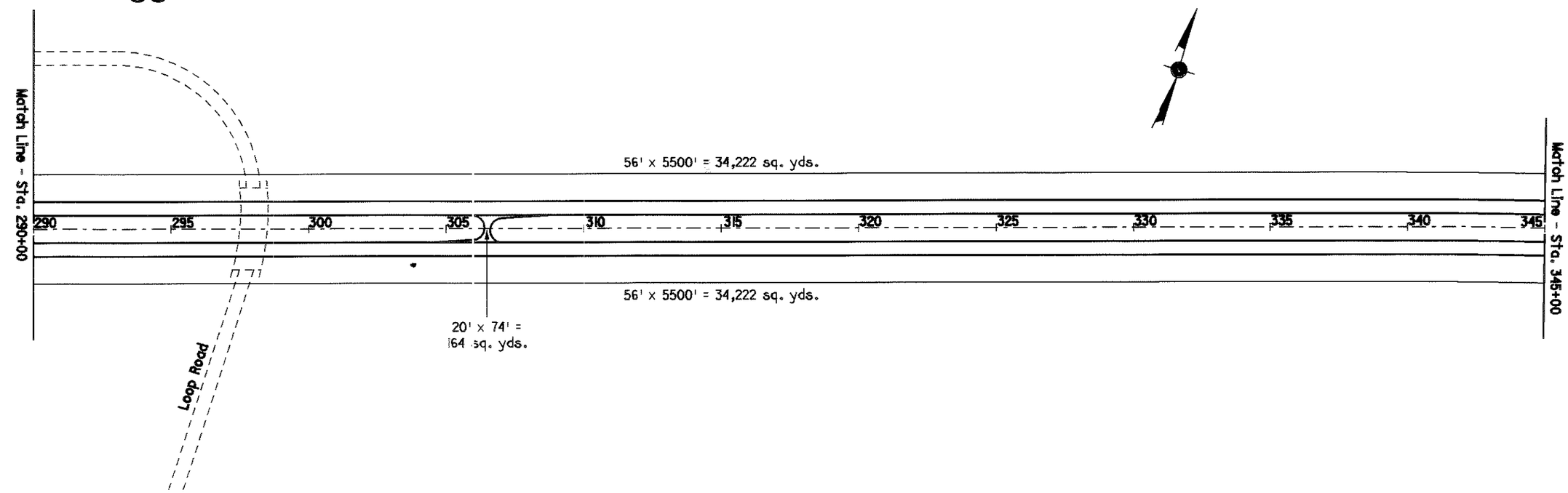


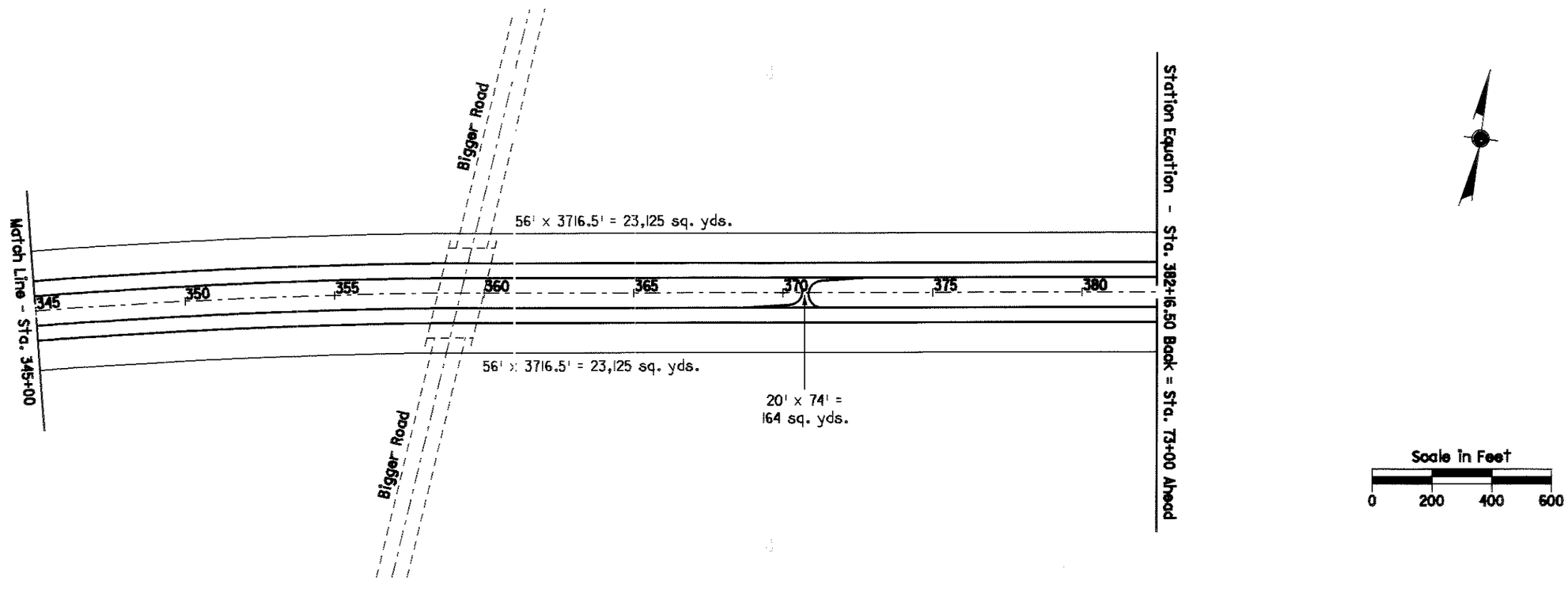
PLAN SHEET

MONTGOMERY COUNTY
MOT-675-0.00

29

I-675 & Bigger Road



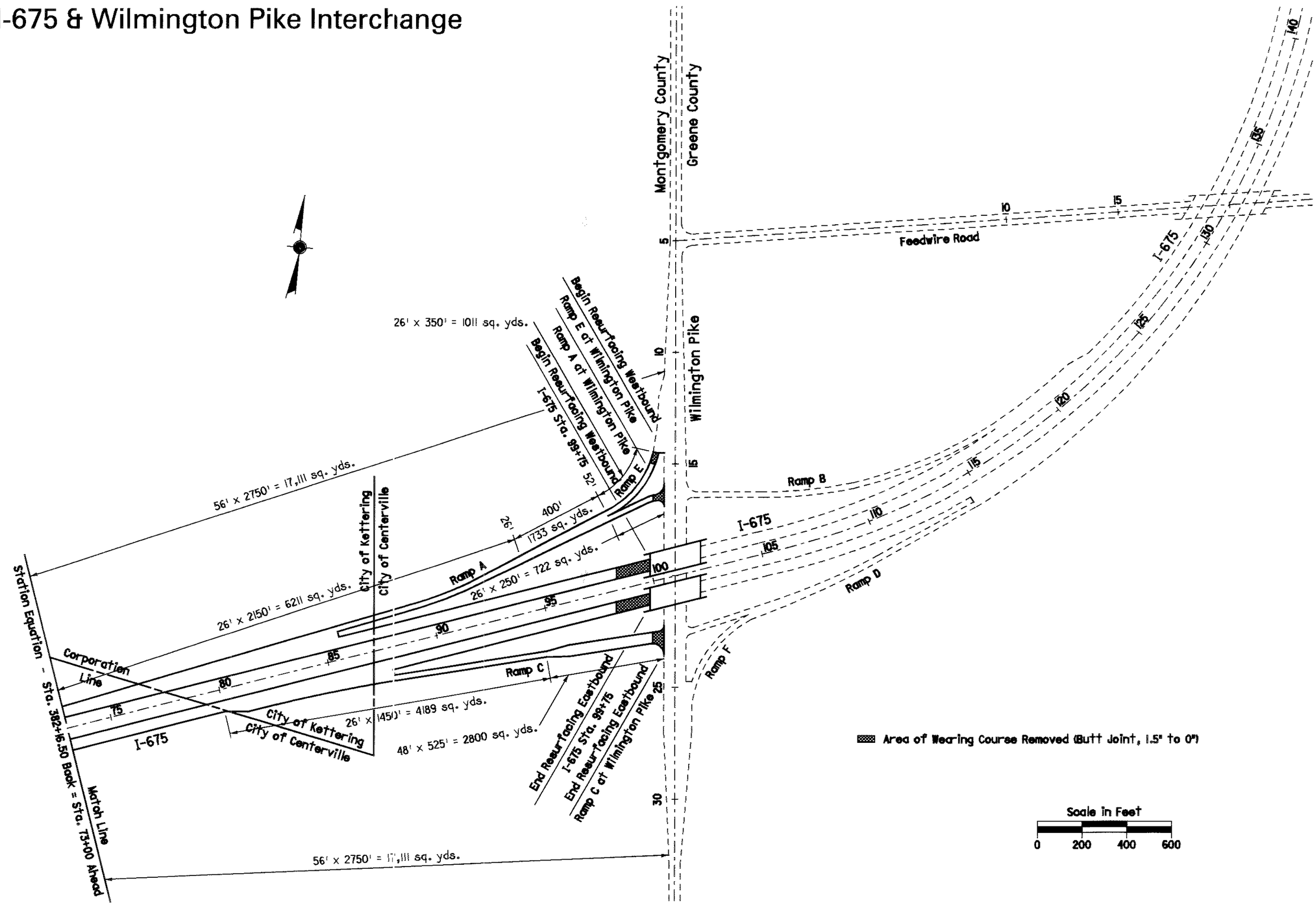


PLAN SHEET

MONTGOMERY COUNTY
MOT-675-0.00

12
29

I-675 & Wilmington Pike Interchange



PLAN SHEET

MONTGOMERY COUNTY
MOT-675-0.00

13
29

GENERAL NOTES

ITEM SPECIAL - MULTI-SEAL SURFACING

This work shall consist of furnishing all materials, equipment, labor and preparation necessary for the application of a surface treatment or interlayer of Multi-Seal Surfacing. Multi-Seal Surfacing shall consist of a layer of sealant, emulsion and aggregate properly designed/proportioned and applied to a prepared surface in a continuous and sequential manner. The three (3) layers of materials shall be applied in a continuous sequence and by one unit operated in a continuous motion,

The materials shall meet the following requirements:

Coarse Aggregate for Cover Material - The Coarse Aggregate shall be ceritfied by the manufacturer and shall be included as part of the product design. Aggregate gradation and physical properties shall be stated in the design.

Sieve Analysis (Percent passing by weight) *

Multi-Seal Type	19	12.5	9.5	4.75	2.36	300um	75um
6	100	100	100	70-90	0-20	0-5	0-2
10	100	100	90-100	10-30	0-10	0-5	0-2
12	100	90-100	50-85	5-25	0-10	0-5	0-2
18	100	75-100	20-55	0-10	0-5	NA	0-2

** In millimeters, except where otherwise indicated*

Coarse Aggregate Properties

Test	Result
Soundness, etc.	
Loss, sodium, sulfate soundness test, percent maximum	15
Aggregate of soil, silt, etc., maximum percent by weight	0.5
Physical Properties	
Percent of wear. Los Angeles test, maximum (stone or gravel)	45
Percent of fractured pieces, minimum	90
Soft pieces, percent by weight, maximum	3.0
coal and lignite, percent by weight, maximum	1.0

Multi-Seal Emulsion - The emulsion shall be an asphalt based emulsion and shall be certified by the manufacturer to be suitable for the product design. Emulsion properties shall be stated in the design. Emulsion residue shall meet the requirements stated below.

Test	Minimum	Maximum	Method
Elastic Recovery, 4° C, 10 cm, % (2)	70	NA	ASTM D 113
Softening Point, Ring & Ball, °C	60	NA	ASTM D 36
Force Ductility, 4° C, 40 cm (3)	20 lbs./in^2	NA	ASTM D 4

By distillation or evaporation

Multi-Seal Sealant - The sealant shall be asphalt based material cerified by the manufacturer to be suitable for the product design. Sealant properties shall be stated in the design. Sealant shall meet the requirements stated below.

Test	Minimum	Maximum	Method
Elastic Recovery, 4° C, 10 cm, % (2)	85	NA	ASTM D 113
Ductility, 25° C, 5 cm/min., cm	40	NA	ASTD D 113
Softening Point, Ring & Ball, °C	80	NA	ASTM D 36
Force Ductility, 25° C, 30-40 cm (3)	9.5 lbs./in^2	NA	ASTM D 4

(2) This test is an extension of the routine ductility test. The specimen is extended ten (10) cm, the distressed area is severed in the middle using shears. After one (1) hour at test temperature the severed ends are returned to contact and the ductilometer reading is taken.

(3) ASTM D 113 as modified by the addition of a load cell to the standard ductility test apparatus and using the straigh-sided ductility molds. The load cell records pounds per square centimeter. Readings are multiplied by 6.45 to yield pounds per square inch force required to extend the sample.

The properties of the sealant shall be determined from a field sample. The sample shall be taken from an application nozzle on the machine and shall include all field additives.

Equipment shall be safe, environmentally acceptable and capable of producing a consistent, quality product.

GENERAL NOTES

Multi-Seal Surfacing Applicator - The Multi-Seal Surfacing unit shall be capable of receiving all raw materials, storing those materials in adequate quantity and applying all materials without stopping to reload.

The unit shall include:
- A speed control used by the operator to control the travel speed of product application.
- A method for the driver to control the product placement edge from either side of the unit.
- A digital speed read-out in feet per minute that operates continuously and is located in the operator's view.

Sealant System - The sealant system shall include as part of the continuous applicator, the following:
- Minimum tank capacity of four hundred (400) gallons, insulated and capable of heating the sealant to the disired temperature.
- Application rate control of the sealant that is controlled by the operator to adjust to the travel speed.
- Sealant system capable of completely and uniformly applying the sealant at the rate of seventy five (75) to two hundred (200) fpm.
- Sealant system shall fill all cracks and surface voids, and strike off the sealant uniformly across the pavement.
- Sealant system shall be capable of applying sealant at an application rate range of 0.25 to 0.10 gallons per square yard.
- Sealant applicator shall be capable of placing sealant in widths of one (1) to sixteen (16) feet and in any variable width while placing material.
- Sealant system shall be capable of continuously mixing the sealant.

Emulsion System - The emulsion system shall include as part of the continuous applicator, the following:
- Minimum tank capacity of six hundred (600) gallons, insulated and capable of heating the emulsion to the desired temperature.
- Ground speed control device interconnected with the emulsion applicator.
- Computerized application rate control of the emulsion that automatically adjusts to the travel speed.
- Emulsion system capable of accurately and uniformly applying the emulsion to the pavement at a forward travel rate of seventy five (75) to two hundred (200) fpm.
- Emulsion application shall produce a uniform thickness across the pavement and the shutoff shall be instantaneous with no dripping.
- Emulsion system shall be capable of maintaining the specified application rate within ± 0.02 gallon per square yard.
- Emulsion system shall be capable of placing emulsion in widths of one (1) to sixteen (16) feet and adjustable while placing material.

Aggregate System - The aggregate system shall include, as part of the continuous applicator, the following:
- Minimum hopper capacity of four (4) cubic yards
- Ground speed control device interconnected with the aggregate applicator.
- Computerized application rate control of the aggregate that automatically adjusts to the travel speed.
- Aggregate system shall be capable of accurately and uniformly applying the aggregate at the rate of seventy five (75) to two hundred (200) feet per minute (fpm).
- Aggregate system shall produce a uniform application and shall be adjustable to properly cover exposed emulsion.
- Aggregate system shall be capable of maintaining the specified application rate within ± one (1.0) pound per square yard.
- Screen to remove oversized aggregate.
- Aggregate handling system capable of delivering at a minimum rate of one hundred and eighty (180) tons per hour.
- Aggregate applicator shall be capable of placing aggregate in widths of one (1) to sixteen (16) feet and in any variable width while placing material.
- Aggregate system shall be capable of applying aggregate at an application rate range of seventy (70) to five (5) pounds per sq. yd.

Compacting Equipment - Self-propelled pneumatic-tired rollers weighing not less than eight (8) tons shall be used for compaction.

Miscellaneous - All equipment, including hand tools, thermometers, etc., shall be provided. All equipment used on the roadway shall be equipped with at least one (1) approved flashing, rotating or oscillating amber light visible from all sides. All material storage tanks and material handling units shall be capable of heating and storing materials without causing damage.

GENERAL NOTES

The completed product design shall contain prescribed information in the following format identified below. Highway Preservation Systems, Ltd. shall perform the completed product design and shall approve all component materials.

a. Source of each component material
   1. Sealant
   2. Emulsion
   3. Aggregate

b. Completed product design tests
   1. Stripping test
   2. Loss of abrasion
   3. Aggregate and binder compatibility
   4. Emulsion rate - flushing under temperature and load
   5. Sealant, application temperature
   6. Emulsion, application temperature
   7. Moisture content of aggregate
   8. Product set time

c. Aggregate
   1. Gradation
   2. Physical properties

d. Sealant and Emulsion properties

e. Maximum expected pavement temperature and average daily traffic count including percent commercial traffic for the pavement section that the design will be used for.

An on-site pre-paving meeting between the Engineer and the Contractor will be held prior to beginning work. The agenda for this meeting will include:
   1. Review work schedule
   2. Review traffic control plan
   3. Review equipment calibration and adjustments
   4. Review condition of materials and equipment, including transport units
   5. Product Design: Course aggregate gradations and application rates for sealant and emulsion
   6. Review quality control plan (Yield Check Methods, etc.)

The Contractor shall produce a completed product that will be in compliance with the product design and the quality control tolerances. The methods described in this section shall be used by the Contractor to measure compliance. The Contractor shall maintain all quality control documentation and make it available to the Engineer upon request or at the completion of work.

During the progress of work, if any of the quality control test results exceed the identified quality control tolerances, the Contractor shall identify the cause and document in detail what corrective action was taken.

Aggregate - The Contractor shall sample from the project stockpile and test for gradation at a rate of one (1) per five hundred (500) tons of aggregate used, or a minimum of one (1) per day of product application. The quality control tolerances from the product design are listed below.

Quality Control Tolerances

Sieve Size	Tolerance
19.0 mm	± 5.0%
12.5 mm	± 5.0%
9.5 mm	± 5.0%
4.75 mm	± 5.0%
2.36 mm	± 5.0%
300 um	± 4.0%
75 um	± 1.5%

Temperature Limitations indicate that the Multi-Seal Surfacing shall be placed when the pavement and atmospheric temperature is forty five degrees (45°) F or above. Placement is not permitted if the weather is threatening or if temperatures are forcasted to be below thirty two degrees (32°) F within twenty four (24) hours from the time of work. Placement is not permitted if visible signs of moisture exist on the pavement surface

GENERAL NOTES

The Contractor is responsible for all surface preparation including cleaning, removal of any foreign materials and any other preparation that may effect the adhesion of the Multi-Seal Surfacing.

The Contractor shall remove all loose debris from the pavement cracks or joints larger than one-quarter inch (1/4") wide and clean the pavement surface with a motorized power broom to remove any loose material. Any depressions not reached by the power broom shall be cleaned using other methods.

The longitudinal construction joints and lane edges shall coincide with the proposed painted lane lines. Longitudinal joints shall be constructed with less than a seventy five (75) mm overlay on adjacent passes and no more than six and one-half (6.5) mm overlay thickness as measured with a three (3) mm straight edge. If applicable, place overlapping passes on the uphill side to prevent any ponding of water. Construct neat and uniform transverse joints with no more than a three (3) mm difference in elevation across the joint as measured with a three (3) meter straight edge. The edge shall be neat and uniform with no more than fifty (50) mm horizontal variance in any thirty (30) meters.

When a double seal is specified in the proposal the Contractor shall not incorporate the sealant application on the second course. Prior to applying the second course, the first course shall be properly swept and shall show no deficiencies. A cure period of one hour minimum shall occur before placing the second course.

The multi-seal surface, when used as an interlayer, shall be cured prior to placing a bituminous overlay, micro-surfacing or other asphalt surfacing. The status of "cured" shall be determined by the ability to sweep all loose aggregate from the surface and that no moisture is visible in the aggregate. Aggregate shall be adhered to the binder and the binder shall exhibit elastic properties with recovery when stretched. A "cured" state will normally occur in one (1) to two (2) hours after placement under normal atmospheric conditions. A tack or bond coat is not typically required when placing bituminous overlays or micro-surfacing over the interlayer. The Engineer may require a bond or tack coat when the surface of the interlayer contains dust or moisture.

Rolling shall be performed immediately after the placement of the coarse aggregate and before the emulsion has set up. No coarse aggregate shall be left unrolled for more than three (3) minutes. A minimum of one (1) complete rolling trip over the treated surface will be required. A complete trip is one (1) pass forward and backward over the same path. Each additional trip shall overlap the previous trip by about One-half the width of the roller. A minimum of two (2) rollers shall be used and the rollers shall proceed in a longitudinal direction at a speed not greater then five (5) miles per hour.

The Contractor shall use the appropriate equipment and perform an initial sweeping of the completed surface to remove any excess loose aggregate prior to opening to uncontrolled traffic and by the end of each day's work. A final sweeping shall occur within twenty four (24) hours after the pavement has been opened to traffic. A pick-up type sweeper shall be used in lawn and curbed areas where an aggregate shoulder does not exist. Loose aggregate shall not be swept into lawns, curbed areas and intersections. Water shall be used during all sweeping operations to control dust.

Before opening to traffic, the Contractor shall post the roadway with "LOOSE GRAVEL" signs, FHWA W8-7, and a thirty five mile per hour (35 MPH) speed plaque mounted below the sign. These signs shall be spaced at a maximum of .25 mile intervals.

The Contractor shall inspect the multi-seal surfacing during the application process for dificiencies. This includes workmanship, overlap on longitudinal and transverse construction joints, flushing, surface patterns, complete fill of cracks and joints, loss of aggregate and sweeping. The Contractor shall correct any and all feficiencies found.

The Contractor shall protect all utility castings and raised pavement markers by covering with tarpaper or other approved material. The covering shall be removed prior to sweeping and opening to full use.

The Contractor shall protect the new surface from potential damage at intersections and driveways. Any damage by traffic to the multi-seal shall be repaired by and at the Contractor's expense.

The Contractor, when placing an interlayer, shall in advance of performing the work, notify all residents and businesses on the pavement section to be treated. The notice shall include that the pavement will be overlaid with a bituminous treatment and shall be approved by the Engineer.

GENERAL NOTES

The Contractor shall apply the sealant, emulsion and aggregate within a total time lapse of ten (10) seconds over a specific point. The sealant shall be applied to provide full width coverage and is required to fill the pavement voids and cracks and at a temperature between three hundred degrees (300°) F and three hundred and ninety degrees (390°) F. The emulsion shall follow at the designed rate and at a temperature between one hundred and fifty degrees (150°) F and two hundred degrees (200°) F. A uniform application of coarse aggregate shall cover the emulsion prior to emulsion break and provide complete coverage. Streaking in the multi-seal surface will not be permitted. If streaking occurs, the Contractor shall cease operation until the deficiencies have been corrected.

Areas not accessible to the equipment shall be performed by applying the emulsion and aggregate by hand spraying and spreading. Any cracks that exist in these areas shall be filled with the emulsion prior to sealing the pavement surface. Compoaction shall be used following the standard method.

The Contractor shall submit a design that identifies the emulsion application rate based on the gradation of the coarse aggregate and the application rate range of sealant. If during the progress of work, the Contractor determines the design rate of the emulsion application requires change, the change shall be documented.

Coarse aggregate shall be applied at a rate necessary to provide full coverage of the emulsion. No tracking of the emulsion shall occur by the rollers. The Contractor shall adjust the rate of aggregate placed to provide a minimum of loose aggregate.

The Contractor shall provide the Engineer a daily report (documentation) with the following information:

- Control Section / Project Number / County / Route / Engineer
- Date / Air Temperature / Pavement Temperature / Humidity
- Sealant and Asphalt Emulsion Temperature
- Beginning and Ending Stations of Completed Work
- Yield Checks on Emulsion Rate (3 per day, minimum)
- Yield Checks on Sealant Rare (3 per day, minimum)
- Aggregate Gradation (1 per day, minimum)
- Length / Width / Total Square Yards
- Contractor's Signature

Payment for Multi-Seal Surfacing, Type 12 Interlayer includes all materials, equipment, labor, designs, surface preparation, sweeping and documentation.

The completed work, as measured, will be paid at the contract unit price for the following contract item(s):

Multi-Seal Surfacing, Type 12 Interlayer	340,018.0 Square Yard

Traffic Control Requirements - Multi-seal surfacing requires no set or cure time prior to allowing controlled use by traffic. Traffic shall be allowed to cross or use the surface immediately after placement and before rolling, but should be restricted to ten mile per hour (10 MPH) or less. After compaction and a ten (10) minute set time, the traffic can operate at or below thirty five mile per hour (35 MPH) without creating damage. Full use may resume after the first sweeping. For heavy or higher speed traffic areas, the completed surface should be swept clean before opening to traffic.

The following traffic control procedures are suitable:

- Flag control sequence with a two (2) mile length
- Lane closure with a five (5) mile length
- Moving closure with a maximum one-half (1/2) mile separation between flaggers

GENERAL NOTES

ITEM 253 - PAVEMENT REPAIR, AS PER PLAN

This item of work shall consist of the removal of the existing pavement in areas of existing pavement failure.

The Engineer shall designate the locations and limits of the areas to be repaired. The repair areas shall be roughly rectangular in shape and sawed to a neat line. The pavement shall be removed within the designated areas by methods which will not damage the adjacent pavement. The depth of removal, as directed by the Engineer, shall be sufficient to remove all deteriorated pavement (four inch (4") average for Item 253 - Pavement Repair). Material removed shall be disposed of in accordance with 203.05.

The vertical faces of the repair area shall be tacked prior to placing the Asphalt Concrete, Type 2, PG 64-28 for Item 253 - Pavement Repair. The asphalt shall be placed and compacted to finish flush with the adjacent existing pavement surface prior to placing the proposed asphalt concrete overlay. Compaction shall be achieved by mechanical methods to the satisfaction of the Engineer.

Payment shall include all labor, equipment and materials necessary to complete the pavement repair. An estimated quantity is provided in the General Summary to be used as directed by the Engineer. Payment will be made at the unit price bid per square yard of Item 253 - Pavement Repair.

Item 253 - Pavement Repair	200.0 square yards

ITEM 858 - ASPHALT CONCRETE SURFACE COURSE, 12.5 mm, TYPE A (446), AS PER PLAN

The material used for resurfacing shall consist of one and one half inch (1.5") of Item 858, Asphalt Concrete Surface Course, 12.5 mm, Type A (446), As Per Plan. The 858.04 Binder shall be PG 76-22.

The Contractor shall use a material transfer vehicle for all of the surface course pavement. This vehicle shall be a non-contact vehicle and shall be capable of transferring and remixing the asphalt concrete from the truck to the paver.

The Contractor is to arrange his work schedule and begin placement of Item 858, Asphalt Concrete Surface Course within thirty-six (36) hours after Item Special 409, Multi-Seal Surfacing. Type 12, Interlayer has been placed per daily operation.

RESTRICTIONS - TRAFFIC VOLUME, TEMPERATURES, WEATHER LIMITATIONS

Temperature Restrictions - Multi-seal surfacing shall not be placed when the air or pavement surface temperature is forty five degrees (45°) F or below. Pavement temperature below sixty five degrees (65°) F will slow the cure rate of the product. Additional cure time should be allowed prior to sweeping and opening to full use. Pavement temperatures above one hundred and twenty degrees (120°) F will cause a softer or more tender product. Additional use of controlled traffic should be used prior to sweeping and opening to full use.

Weather Limitations - Multi-seal surfacing shall not be placed when visible moisture is present on the pavement surface. Product placement should not occur if heavy rain is expected within two (2) hours or if freezing conditions are forcasted within twenty four (24) hours.

Note:
- Tack or bond coats are not typically used over a clean interlayer.
- A thin leveling course should be used when rutting or a poor profile exists.
- Thickness recommendation: one and one-half inch (1 ½") over Type 12.

TRAFFIC

Traffic shall be maintained at all times. The length of restricted traffic zones shall be kept to a minimum consistent with the specification requirements for protection of completed courses.

The use of paved berms to maintain traffic is prohibited. Should any existing or new berm areas become damaged or destroyed due to the Contractor's negligence or failure to provide adequate signs, barricades, cones, flagmen or other traffic control devices, the restoration of the berms will be at the Contractor's expense, unless otherwise approved by the Engineer.

MAINTENANCE OF TRAFFIC

In addition to the requirements as indicated in the "Ohio Manual of Uniform Traffic Control for Streets and Highways", and pertinent items of the Construction and Materials Specifications, the following requirements shall apply.

Due to traffic congestion on this project, the Contractor shall be required to expedite his work to meet the time detour or lane closure time limitations as detailed in the plans. The Contractor shall meet these dates using whatever measures are necessary including, but not limited to, performing work by multiple crews, multiple shifts, overtime, etc.

Work can be performed simultaneously in the Northbound and Southbound lanes. One lane of directional traffic on Interstate 675 will be permitted while the Contractor is actively working on or immediately adjacent to the pavement, and then only for minimum periods of time consistent with the actual requirements of the specific type of work being performed. It is intended that the roadway not be subjected to any work closures unless active work is being performed within or immediately adjacent to the closed lane. The roadway shall not be restricted to one lane directional traffic during periods of intermittent or irregular work, nor closed solely for the convenience of the Contractor. The Engineer shall make the final determination as to what constitutes active work and whether or not the actual work being performed warrants the lane closure. If the lane closure is not justified, the Engineer may order all or part of the closed lane re-opened to traffic until such time that this condition is corrected. The duration and length of all lane closures shall be at all times commensurate with the actual work being performed.

The Contractor shall submit, in detail, a schedule of operations and maintenance of traffic to the District Construction Engineer and receive written approval before work is started on the project.

Should the Contractor fail to meet any of these requirements or date set for final completion, the Contractor shall be subject to liquidated damages per Specification 108.07.

It is the intention to perform the required work with the least inconvenience to and the maximum safety of the Contractor and the traveling public. Any variances from these Maintenance of Traffic Notes must be approved in advance in writing by the Director.

No areas of Item 202, Wearing Course Removed, on the Mainline, shall be open to the traveling public. It is the intent of the Ohio Department of Transportation that the Wearing Course Removal and Asphalt Concrete Paving be done as one (1) operation.

The Contractor shall arrange his operations to prevent any interference to the continuous flow of traffic. All vehicles, equipment, men and their activities are restricted at all times to one side of the pavement unless otherwise approved by the Engineer.

The use of berms to maintain traffic is prohibited. Should any berm areas become damaged or destroyed due to the Contractor's negligence or failure to provide adequate signs, barricades, cones, flagmen or other traffic control devices, the restoration of the berms will be at the Contractor's expense, unless otherwise approved by the Engineer.

During all hours when traffic is restricted to less than two (2) lanes in the same direction of flow, the Contractor shall employ at least one (1) qualified person to continuously patrol, twenty-four (24) hours a day, the restricted areas. The Contractor shall maintain all lights, barricades, signs, cones, drums, etc. in order to provide a safe facility for the traveling public. He shall have available all tools and materials necessary to perform this function at all times. This will be in addition to the required Law Enforcement Officers with Patrol Cars.

A minimum lane width of eleven linear feet (11.0') shall be provided at all times.

Before work begins, the Contractor shall submit to the Engineer the names and telephone numbers of a person or persons who can be contacted twenty-four (24) hours a day by the Ohio Department of Transportation and all interested police agencies. This person or persons shall be responsible for placing or replacing necessary traffic control devices to maintain the traveled pavement safely.

The Contractor shall be required to provide, erect, maintain (in proper position, clean, legible and good working condition) and remove all lights, signs, barricades, cones and all other traffic control devices necessary for the maintenance of traffic, including pavement markings.

Special Duty Law Enforcement Officer(s) shall be present when any lanes are closed. They shall also be present during the setup and takedown periods.

MAINTENANCE OF TRAFFIC

The Contractor shall notify the Engineer forty-eight (48) hours in advance of any lane closures. Information regarding arrangements by the Contractor for Special Duty Law Enforcement Officer(s) may be obtained by contacting the Ohio Highway Patrol, 660 East Main Street, Columbus, Ohio. Telephone (614) 466-2660.

An estimated quantity has been provided in the General Summary to be used as directed by the Engineer.

Item 614 - Law Enforcement Officer with Patrol Car 280 Hours.

The Contractor shall furnish and install two (2) "Watch for Stopped Traffic" signs (OW-166) one thousand three hundred linear feet (1300') downstream from the "Road Construction Ahead" sign (OW-128). If traffic backups reach the "Watch for Stopped Traffic" signs, the Contractor shall install two (2) additional "Watch for Stopped Traffic" signs every two thousand linear feet (2000') upstream from the "Road Construction Ahead" signs. The necessity for these signs shall be constantly monitored by the Contractor.

The Contractor shall furnish and install two (2) "Road Construction Next 8 Miles" signs (OC-8) at each end of the project for a total of six (6) signs.

Two (2) signs at Ramp V, the entrance ramp from NB I-75 to EB I-675
Two (2) signs at Ramp U, the entrance ramp from SB I-75 to EB I-675
Two (2) signs on Westbound I-675 at Wilmington Pike

Night Time Work: All work shall be completed between the hours of 8:00 p.m. and 6:00 a.m.

Surface Temerature: Before any newly placed Asphalt Concrete is opened to traffic, it shall have a surface temperature of less than one hundred fifty (150) degrees fahrenheit.

HOLIDAYS AND SPECIAL EVENTS

No work shall be performed and existing lanes shall be open to traffic during the Labor Day Weekend.

The period of time that the lanes are to be open 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 Open to Traffic
Sunday	12:00 Noon on Friday thru 12:00 Noon on Monday
Monday	12:00 Noon on Friday thru 12:00 Noon on Tuesday
Tuesday	12:00 Noon on Monday thru 12:00 Noon on Wednesday
Wednesday	12:00 Noon on Tueday thru 12:00 Noon on Thursday
Thursday	12:00 Noon on Wednesday thru 12:00 Noon on Monday
Friday	12:00 Noon on Thursday thru 12:00 Noon on Monday
Saturday	12:00 Noon on Friday thru 12:00 Noon on Monday

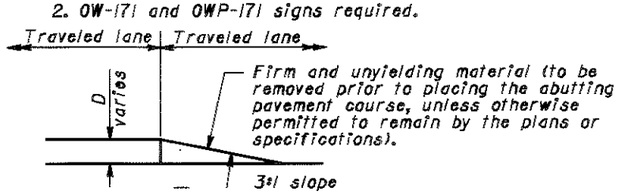
Should the Contractor fail to meet any of these requirements, the Contractor shall be assessed liquidated damages in accordance with 108.07 of the Construction and Material Specifications.

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. The suggested treatments are intended for high volume projects that will last at least seven days and have an active work zone 1 mile [1.6 km] or less in length. For guidance on the use of this sheet, see L&D Manual Volume One, Section 500. 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 **SCD RM-4.2** and Item 622.
6. When drums are specified for a drop-off 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' [230 m] in advance of the condition, on all intersecting entrance ramps within the limits of the condition and immediately beyond all inter secting roadways within the limits of the condition. When the drop-off condition extends more than 0.5 mile [800 m], additional signs should be erected at intervals of 1.0 mile [1600 m] or less.
8. For locations, such as at ramps, lane shifts, lane closures, etc., where traffic is required to negotiate a 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 minimum required for traffic use. Where drums are used, and their presence would reduce traveled lane widths to less than 10' [3.0 m], drums may be placed on the opposite level from that of traffic provided the dropoff depth does not exceed 5" [125] and approval is granted by the Project Engineer.
10. Pavement Repairs (or similar work):
    a. Lengths greater than 60' [18 m] - utilize appropriate treatment from Condition I.
    b. Lengths of 60' [18 m] or less - repairs shall be effected in accordance with CMS 255.08. Drums may be used as a separtor 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.

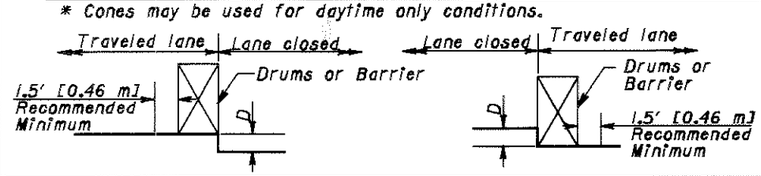


CONDITION I
DROP-OFFS BETWEEN TRAVELED LANES

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

D	Treatment
≤1½" [≤40]	Erect OW-17l and OWP-17l signs.
1½"-3" [40-75]	1) Lane closure utilizing drums* as shown below OR 2) Optional Wedge Treatment
>3"-5" [>75-125]	Lane closure utilizing drums as shown below.
>5" [>125]	Lane closure utilizing portable concrete barrier as shown below.

* Cones may be used for daytime only conditions.

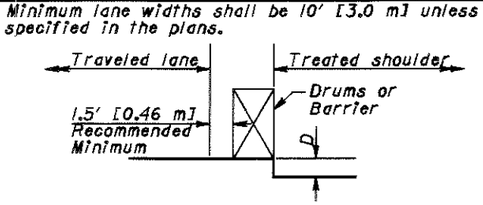


CONDITION II
DROP-OFFS WITHIN GRADED SHOULDER AREA

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 traveled 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 purpose herein, its maximum width shall be considered to be 12' [3.6 m].

D	Treatment
≤1½" [≤40]	1) If edgelines are present, no treatment is necessary OR 2) Erect OW-17l and OWP-17l signs.
>1½"-5" [>40-125]	1) If minimum lane width* requirements can be met, maintain lanes utilizing drums as shown below OR 2) If minimum. lane width* requirements cannot be met, close adjacent lane utilizing drums OR 3) Optional Shoulder Treatment.
>5"-12" [125-305] Daylight only	If minimum lane width* requirements can be met, maintain lanes utilizing drums as shown below.
>5"-24" [>125-610]	1) If minimum lane width* requirements can be met, maintain lanes utilizing portable concrete barrier as shown below. OR 2) If minimum lane width* requirements cannot be met, close adjacent lane utilizing drums.
>24" [>610]	Lane closure utilizing portable concrete barrier as shown below.

* Minimum lane widths shall be 10' [3.0 m] unless otherwise specified in the plans.



OPTIONAL SHOULDER TREATMENT

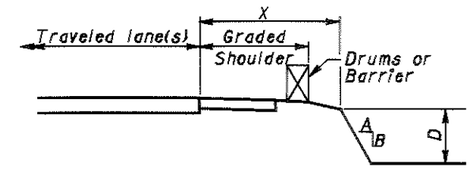
1. This treatment may not be used within a bitumunos shoulder where a hot longitudnal joint per CMS 401.15 is required.
2. OW-15l signs required.

CONDITION III
DROP-OFFS 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

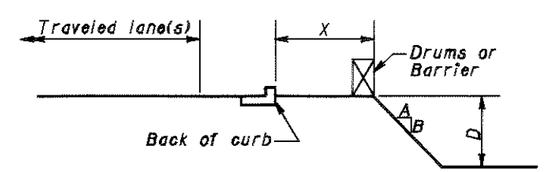
USE FOR: 1. Uncurbed Facilities.
2. Curbed Facilities, where:
   a. Curbs are less than 6" [150] in height.
   b. Curbs are 6" [150] or greater in height and the legal speed is greater than 40 mph [70 km/h].



X	D	A/B	Treatment Required	
			Day	Night
0-4' [0-1.2 m]	Any	Any	(a)	(a)
4'-30' [1.2-9.1 m]	Any	3:1 or Flatter	None	None
4'-12' [1.2-3.6 m]	≤3" [≤75]	Steeper than 3:1	None	None
4'-12' [1.2-3.6 m]	>3"-≤12" [>75-≤305]	Steeper than 3:1	Drums	Drums
4'-12' [1.2-3.6 m]	>12" [>305]	Steeper than 3:1	Drums	Barrier
>12'-20' [>3.6-6.1 m]	<12" [<305]	Steeper than 3:1	None	None
>12'-20' [>3.6-6.1 m]	>12"-≤24" [>305-≤610]	Steeper than 3:1	Drums	Drums
>12'-20' [>3.6-6.1 m]	>24" [>610]	Steeper than 3:1	Drums	Barrier
>20'-30' [>6.1-9.1 m]	<24" [<610]	Steeper than 3:1	None	None
>20'-30' [>6.1-9.1 m]	>24" [>610]	Steeper than 3:1	Drums	Barrier
>30' [>9.1 m]	Any	Any	None	None
(a) Use treatment specified under Condition II.				

CHART B

USE FOR: Curbed facilities, where the curb is 6" [150] or greater in height and the legal speed is 40 mph [70 km/h] or less.



X	D	A/B	Treatment Required	
			Day	Night
0-10' [0-3.0 m]	<12" [<305]	Any	None	Drums
0-10' [0-3.0 m]	>12" [>305]	Any	Drums	Drums
>10' [>3.0 m]	Any	Any	None	None

NOTE: All metric dimensions (in brackets [ ]) are in millimeters unless otherwise noted.

DROPOFFS IN WORK ZONES

MONTGOMERY COUNTY
MOT-675-0.00

EPOXY-URETHANE WATERPROOFING OVERLAY

1. SCOPE

1.1 THIS SPECIFICATION DESCRIBES THE PRETREATMENT AND OVERLAY CONSISTING OF MULTIPLE LAYERS OF HYBRID POLYMER SYSTEMS AND A SPECIAL BLEND OF EXTREMELY HARD AGGREGATE DESIGNED TO PROVIDE A MINIMUM OF ¼ INCH THICK APPLICATION FOR THE PURPOSE OF COMPLETE WATERPROOFING AS WELL AS PROVIDING A NONSKID SURFACE TO WITHSTAND CONTINUOUS HEAVY TRAFFIC AND EXTREME CHANGES IN WEATHER CONDITIONS.

2. MATERIALS

PRETREATMENT:

2.1 HAIRLINE CRACKS AND ENCAPSULATING STEEL GRID

THIS TWO PART HYBRID POLYMER SHALL BE FREE OF ANY FILLERS, VOLATILE SOLVENTS AND SHALL BE FORMULATED TO PROVIDE SIMPLE VOLUMETRIC RATIO OF TWO COMPONENTS SUCH AS ONE TO ONE OR TWO TO ONE BY VOLUME.

THIS HYBRID POLYMER SYSTEM SHALL BE FORMULATED TO PROVIDE A UNIQUE COMBINATION OF EXTREMELY LOW VISCOSITY AND LOW SURFACE TENSION COUPLED WITH A BUILT IN AFFINITY FOR CONCRETE AND STEEL.

OVERLAY

2.2 THE TWO-PART EPOXY-URETHANE CO-POLYMER SYSTEM SHALL BE FREE OF ANY FILLERS, VOLATILE SOLVENTS AND SHALL BE FORMULATED TO PROVIDE SIMPLE VOLUMETRIC MIXING RATIO OF TWO COMPONENTS SUCH AS ONE TO ONE OR TWO TO ONE BY VOLUME.

THE EPOXY-URETHANE CO-POLYMER SYSTEM SHALL BE FORMULATED TO PROVIDE FLEXIBILITY IN THE SYSTEM WITHOUT ANY SACRIFICE OF THE HARDNESS, CHEMICAL RESISTANCE OR STRENGTH OF THE EPOXY-URETHANE CO-POLYMER SYSTEM. USE OF EXTERNAL/CONVENTIONAL FLEXIBILIZERS ARE NOT ACCEPTABLE. FLEXIBILITY SHALL BE INTRODUCED BY INTERACTION OF ELASTOMERS TO CHEMICALLY LINK IN THE PROCESS OF CURING SO THAT THE FLEXIBILITY OF THE MOLECULE IS THE LEAST AFFECTED DURING THE LOW TEMPERATURE CONDITIONS THAT ARE CONFRONTED IN ACTUAL USE.

2.3 MATERIAL REQUIREMENTS

2.3.1 PHYSICAL REQUIREMENTS OF CURED PRETREATMENT FOR CRACKS SYSTEM

WHEN COMPONENTS A AND B ARE MIXED IN THE APPROPRIATE RATIO, CURED RESIN SHALL CONFORM TO THE REQUIREMENTS OF TABLE 1. (TEST METHODS ARE DISCUSSED IN DETAIL IN ITEM 3 OF THIS SPECIFICATION.)

TABLE 1
PHYSICAL PROPERTIES OF THE CURED SYSTEM

PROPERTY	VALUE
COMPRESSIVE STRENGTH, MIN. PSI	5,500-6,000
TENSILE STRENGTH, MIN. PSI	3,100-3,400
TENSILE ELONGATION, PERSENT MIN.	35 +/- 5
WATER ABSORPTION, PERCENT BY WT. MAX.	<0.10
SHORE D HARDNESS, 25°C (77°F), MIN.	70 +/- 5
GEL TIME, MINUTES	48-52 (200GMS)
ADHESION TO CONCRETE	100% FAILURE IN CONCRETE
SURFACE TENSION	LESS THAN 32 DYNES/CC
PERCENT SOLIDS	100

2.3.2 PHYSICAL REQUIREMENTS OF EPOXY-URETHANE CO-POLYMER OVERLAY SYSTEM

WHEN COMPONENTS ARE MIXED IN THE APPROPRIATE RATIO, THE CURED RESIN SHALL CONFORM TO THE REQUIREMENTS OF TABLE 2. (TEST METHODS ARE DISCUSSED IN DETAIL IN ITEM 3 OF THIS SPECIFICATION.)

TABLE 2
PHYSICAL PROPERTIES OF THE CURED SYSTEM

PROPERTY	VALUE
COMPRESSIVE STRENGTH, MIN. PSI	7,000
TENSILE STRENGTH, MIN. PSI	2,500
TENSILE ELONGATION, PERSENT MIN.	35 +/- 5
WATER ABSORPTION, PERCENT BY WT. MAX.	0.20
SHORE D HARDNESS, 25°C (77°F), MIN.	65 +/- 5
GEL TIME, MINUTES	22-31
ABRASION RESISTANCE, MG., MAX.	85
ADHESION TO CONCRETE	100% FAILURE IN CONCRETE
FLEXURAL CREEP: TOTAL MOVEMENT IN 7 DAYS	0.0065 INCHES
FLEXURAL YIELD STRENGTH, MIN. PSI	5,000
PERCENT SOLIDS	100

2.3.2.1 VISCO-ELASTIC OF EPOXY-URETHANE CO-POLYMER SYSTEM

THE MODULS OF THE CURED EPOXY-URETHANE SYSTEM DETERMINED BY VARIABLE TEMPERATURE DYNAMIC MECHANICAL ANALYSIS (DMA) USING DMA INSTRUMENTS SUCH AS PAAR PHYSICA UDS-200, SHALL CONFORM TO THE FOLLOWING MINIMUM VALUES AS GIVEN IN TABLE 3.

TABLE 3
VISCO-ELEASTIC PROPERTIES OF THE CURED SYSTEM

TEMPERATURE	STORAGE/MODULUS DYNES/SQ. CM.	LOSS MODULUS DYNES/ SQ. CM.
-10°C	-10°C	6×10^8
20°C	20°C	9×10^8
50°C	50°C	3×10^8
60°C	60°C	7×10^7
70°C	70°C	2×10^7

THE TESTS SHALL BE CONDUCTED AT A FREQUENCY OF 1 HZ WITH A 0.3% STRAIN IN ACCORDANCE WITH THE GUIDELINES DESCRIBED IN THE TESTING EQUIPMENT MANUAL.

2.3.2.2 LOAD BEARING CAPACITY

THE CURED EPOXY-URETHANE SYSTEM MUST EXHIBIT THE FOLLOWING LOAD BEARING CAPACITY. AT APPROXIMATELY 20% STRAIN, THE POLYMER SHALL RETAIN AT LEAST 85% OF ITS ORIGINAL LOAD BEARING STRENGTH (TENSILE STRESS) AS PER ASTM D-638.

2.3.3 THE FOLLOWING ARE ACCEPTABLE MATERIALS FOR APPLICATION AS BRIDGE DECK RESTORATION SYSTEM:

PRETREATMENT: MARK-135 OVERLAY: MARK-163 FLEXOGRID AS MANUFACTURED BY POLY-CARD, INC.,
33095 BAINBRIDGE ROAD, SOLON, OHIO 44139,
(440) 248-1223; OR EQUAL ALTERNATE MEETING THIS SPECIFICATION AND APPROVED BY THE DISTRICT BRIDGE ENGINEER.

2.4 AGGREGATE

2.4.1 AGGREGATE USED FOR ALL LAYERS SHALL BE NON-FRIABLE, NON-POLISHING, CLEAN AND FREE FROM SURFACE MOISTURE. IT SHALL BE DURABLE AND SOUND AND HAVE A PROVEN RECORD OF PERFORMANCE IN APPLICATIONS OF THIS TYPE. THE AGGREGATE SHALL BE 100% FRACTURED, THROUGHLY WASHED AND KILN DRIED TO A MAXIMUM MOISTURE CONTENT OF 0.2 PERCENT BY WEIGHT, MEASURED IN ACCORDANCE WITH ASTM C566. THE FRACTURE REQUIREMENTS SHALL BE AT LEAST ONE MECHANICALLY FRACTURED FACE AND WILL APPLY TO THE MATERIALS RETAINED ON A U.S. NO. 10 SIEVE. THE RECOMMENDED AGGREGATE IS WASHINGTON STONE AND ITS PROPERTIES ARE AS FOLLOWS:

GLACIAL GRAVEL GRANITE	BASALT QUARTZITE GRANITE % BY WEIGHT
SiO_2	75.03
Al_2O_3	11.49
Fe_2O_3	3.57
CaO	2.84
MgO	1.59
SO_3	0.08
Na_2O	2.58
K_2O	0.99
Combined alkali	3.20
Ignition loss	1.72

ALTERNATE AGGREGATES MAY BE ALLOWED UPON WRITTEN APPROVAL OF THE MANUFACTURER OF THE HYBRID POLYMER SYSTEMS.

2.4.2 AGGREGATE FOR ALL LAYERS SHALL HAVE A MINIMUM MOHS SCALE HARDNESS OF 6.5.

2.4.3 THE GRADING OF THE AGGREGATE SHALL CONFORM TO THE REQUIREMENTS OF TABLE 4.

TABLE 4
AGGREGATE GRADATION

SIEVE SIZE (6 X 10)	PERCENT PASSING
NO. 6	80 - 100
NO. 10	10 - 35
NO. 20	0 - 10

3. METHOD OF TESTING

3.1 TESTS SHALL BE CONDUCTED IN ACCORDANCE WITH THE FOLLOWING METHODS:

3.1.1 COMPRESSIVE STRENGTH: ASTM C109, COMPRESSIVE STRENGTH OF HYDRAULIC CEMENT MORTARS. THE TWO COMPONENTS OF THE RESIN ARE TO BE THROUGHLY MIXED IN THEIR APPROPRIATE RATIOS. TWO VOLUMES OF GRADED SILICA SAND SHALL BE ADDED TO ONE VOLUME OF MIXED RESIN. THE SAMPLES SHALL THEN BE PREPARED ACCORDING TO THE REQUIREMENTS OF ASTM C109 AND ALLOWED TO CURE FOR 7 DAYS AT 23° +/- 2°C.

3.1.2 TENSILE STRENGTH AND ELONGATION: ASTM D638, TENSILE PROPERTIES OF PLASTICS, SPECIMEN TYPE I OR TYPE II. SAMPLES SHALL BE CURED AT 23° +/- 2°C (73.4 +/- 3.6°F) AND 50 +/- 5% RELATIVE HUMIDITY. TESTS ARE THEN CARRIED OUT AS PER SECTION 6.1.

3.1.3 WATER ABSORPTION: ASTM D570, WATER ABSORPTION OF PLASTICS. SAMPLE SPECIMENS SHALL BE PREPARED ACCORDING TO SECTION 4.1 AND ALLOWED TO CURE AT 23° +/- 2°C (73.4° +/- 3.6°F).

3.1.4 SHORE D HARDNESS: ASTM D2240, RUBBER PROPERTY - DUROMETER HARDNESS. SPECIMEN SHALL BE PREPARED AS PER ASTM D570 SECTION 4.1 AND ALLOWED TO CURE AT 23° +/-2°C (73.4° +/-3.6°F).

3.1.5 GEL TIME: THE FOLLOWING PROCEDURE SHALL BE USED TO DETERMINE GEL TIME. MEASURE 4 OZ. OF PART A AND 2 OZ. OF PART B EACH AT 25°C (77°F) INTO AN UNWAXED PAPER CUP AND RECORD THE TIME AND MIX IMMEDIATELY. 100 GMS OF THIS MIXTURE SHALL BE POURED INTO A 6 OZ. UNWAXED PAPER CUP AND PLACED ON A WOODEN BENCH TOP. STARTED 20 MINUTES FROM THE TIME RECORDED ABOVE, THE MIXTURE SHALL BE PROBED EVERY TWO MINUTES UNTIL A SMALL BALL FORMS IN THE CENTER OF THE CONTAINER. THE TOTAL TIME, INCLUDING MIXING, REQUIRED FOR THE BALL TO FORM SHALL BE REGARDED AS THE GEL TIME. THE TEST SHALL BE PERFORMED IN A ROOM OR ENCLOSED AREA MAINTAINED AT 25° +/-2°C (77° =/-3/6°F) AND 50 +/-5% RELATIVE HUMIDITY.

3.1.6 ABRASION RESISTANCE: ASTM C501, TEST FOR RELATIVE RESISTANCE TO WEAR OF UNGLAZED CERAMIC TILE BY THE TILE ABRADER. TESTS SHALL BE DONE USING A CS-17 WHEEL AND A 1,000 GRAM LOAD FOR 1,000 CYCLES.

3.1.7 ADHESION TO CONCRETE. ACI-503-R; PULL OUT TEST.

3.1.8 FLEXURAL CREEP: CALIFORNIA TEST METHOD 419.

3.1.9 FLEXURAL YIELD STRENGTH: ASTM D-790

3.1.10 SURFACE TENSION: ASTM D-971.

4. CONSTRUCTION PRACTICE

4.1 REPAIR OF SPALLED AREAS

4.1.1 DECK PATCHING SHALL BE PERFORMED AS OUTLINED IN PROPOSAL NOTE 512 UTILIZING TYPE I PATCHING MATERIAL. ALL PATCHING MATERIAL SHALL BE FREE OF MAGNESIUM PHOSPHATE.

4.1.2 PATCHING SHALL BE SCHEDULED SO THAT THE BRIDGE CAN BE OPEN TO TRAFFIC DURING ALL NON-WORKING HOURS.

4.1.3 TRAFFIC SHALL BE ALLOWED TO USE THE BRIDGE DURING THE CURING PERIOD.

4.2 SURFACE PREPARATION

4.2.1 THE ENTIRE CONCRETE DECK SHALL BE CLEANED BY SHOTBLASTING TO REMOVE ANY OIL, DIRT, RUBBER OR ANY OTHER POTENTIALLY DETRIMENTAL MATERIAL SUCH AS CURING COMPUND AND LAITANCES WHICH, IN THE MANUFACTURER AND ENGINEER'S OPINION, WOULD PREVENT PROPER BONDING TO AND CURING OF THE MATERIAL.

4.2.2 IN AREAS THAT SHOTBLASTING EQUIPMENT CANNOT REACH (IE. ALONG CURBS AND MEDIAN WALLS), SANDBLASTING IS PERMITTED TO AN EXTENT SATISFACTORY TO THE MANUFACTURER AND THE ENGINEER. THIS SHOULD BE PERFORMED PRIOR TO THE SHOTBLASTING WHENEVER APPLICABLE AND PRACTICAL.

4.2.3 FOR ASPHALT SURFACES, THE ASPHALT DECK SHALL BE THROUGHLY POWER WASHED TO REMOVE ANY OIL, DIRT, RUBBER OR ANY OTHER POTENTIALLY DETRIMENTAL MATERIAL WHICH, IN THE MANUFACTURER AND ENGINEER'S OPINION, WOULD PREVENT POOR BONDING TO AND CURING OF THE MATERIAL. THIS SHOULD BE DONE NOT MORE THAN 24 HOURS PRIOR TO APPLICATION UNLESS OTHERWISE APPROVED BY THE MANUFACTURER.

4.2.4 STEEL SURFACES SUCH AS EXPANSION JOINTS, SIDEWALKS, STEEL GRIDS AND STEEL PLATES TO BE TREATED WITH THE RESTORATION SYSTEM, SHALL BE SHOT OR SANDBLASTED CLEAN TO SSPC-SP-6 STANDARDS. NOTE: FOR STEEL PLATE DECKS PLEASE CONSULT THE MANUFACTURER FOR APPROPRIATE SPECIFICATIONS.

4.2.5 TRAFFIC SHALL NOT BE ALLOWED ON ANY PORTION OF THE DECK WHICH HAS BEEN SHOTBLASTED OR ON WHICH PART OF THE OVERLAY HAS ALREADY BEEN PLACED. THE OVERLAY APPLICATION EQUIPMENT, HOWEVER, WILL BE ALLOWED TO DRIVE ON THE DECK SURFACE DURING APPLICATION PROVIDED PRECAUTIONS HAVE BEEN TAKEN TO INSURE THAT THE DECK SURFACE WILL NOT BECOME CONTAMINATED.

4.2.6 ALL SURFACES TO BE TREATED SHALL BE DRY AT THE TIME OF APPLICATION. IMMEDIATELY BEFORE THE APPLICATION OF ANY LIQUIDS, ALL PREPARED SURFACES SHALL BE CLEANED WITH COMPRESSED AIR (OR VACUUMED) TO REMOVE DUST AND DEBRIS.

4.2.7 THE APPLICATION OF THE SYSTEM SHALL NOT BE MADE WHEN IT HAS RAINED 24 HOURS BEFORE THE APPLICATION AND RAIN IS FORECASTED WITHIN EIGHT HOURS AFTER THE APPLICATION OR AS DETERMINED BY THE MANUFACTURER, ALTHOUGH FOG AND HIGH HUMIDITY WILL NOT IMPEDE THE APPLICATION OF OR AFFECT THE PERFORMANCE OF THE OVERLAY. IF WAITING FOR 24 HOURS IS IMPRACTICAL THEN THE MOISTURE CONTENT IN THE CONCRETE SUBSTRATE SHALL NOT EXCEED 4.5% WHEN MEASURED BY AN ELECTRONIC MOISTURE METER. ANY EXCEPTION SHALL BE DETERMINED BY THE MOISTURE CONTENT PRESENT IN THE DECK WHICH SHALL NOT EXCEED 75% OF AIR ENTRAPMENT IN THE MIX DESIGN.

4.2.8 THE MINIMUM RECOMMENDED TEMPERATURE IN WHICH THE SYSTEM SHALL BE APPLIED IS 50°F AND RISING. ALL APPLICATIONS AT TEMPERATURES BELOW 50°F SHALL REQUIRE PRIOR WRITTEN APPROVAL FROM THE MANUFACTURER.

4.3 APPLICATION OF THE OVERLAY

4.3.1 THE MANUFACTURER SHALL HAVE A REPRESENTATIVE ON THE JOBSITE AT ALL TIMES WHO, UPON CONSULTATION WITH THE ENGINEER, MAY SUSPEND ANY ITEM OF WORK THAT IS SUSPECT AND DOES NOT MEET THE REQUIREMENTS OF THIS SPECIFICATION. RESUMPTION OF WORK WILL OCCUR ONLY AFTER THE MANUFACTURER'S REPRESENTATIVE AND THE ENGINEER ARE SATISFIED THAT APPROPRIATE REMEDIAL ACTION HAS BEEN TAKEN BY THE CONTRACTOR.

4.3.2 THE OVERLAY SHALL BE APPLIED ON ALL DECK AREAS USING METERING, MIXING AND DISTRIBUTION MACHINERY OWNED AND OPERATED BY THE MANUFACTURER. THE APPLICATION MACHINE SHALL FEATURE POSITIVE DISPLACEMENT VOLUMETRIC METERING PUMPS CONTROLLED BY A HYDRAULIC POWER UNIT. COMPONENTS A AND B SHALLED BE STORED IN TEMPERATURE CONTROLLED RESERVOIRS CAPABLE OF MAINTAINING 100°F +/- 10°F TO INSURE OPTIMUM MIXING. RATIO CHECK VERIFICATION AT THE PUMP OUTLETS AS WELL AS CYCLE COUNTING CAPABILITIES TO MONITOR OUTPUT WILL BE STANDARD FEATURES. IN LINE MIXING SHALL BE MOTIONLESS SO AS TO NOT OVERLY SHEAR THE MATERIAL OR ENTRAP AIR IN THE MIX. THE MACHINE SHALL ALSO MAKE MAXIMUM USE OF THE WORKING TIME OF THE MATERIAL TO INSURE PROPER 'WETTING' OF THE SYSTEM BY MIXING IT IMMEDIATELY PRIOR TO DISPENSING ONTO THE DECK.

4.3.4 APPLICATION OF THE PRE-TREATMENT

CRACK FILLING (FIRST LAYER)

APPLICATION OF THE LIQUID: AFTER MANUALLY OR MECHANICALLY MEASURING AND MIXING OF THE COMPONENTS, THE LIQUID SHALL BE EVENLY DISTRIBUTED ON THE CLEAN, DRY DECK SURFACE AT THE RATE AS RECOMMENDED BY THE MANUFACTURER. AFTER THE ENTIRE DECK SURFACE IS WET, ALLOW 1-2 HOURS FOR THE LIQUID TO ACHIEVE FULL DEPTH PENETRATION INTO CRACKS AS WELL AS ADEQUATELY ENCAPSULATING THE STEEL GRID IF ANY. AFTER THE LIQUID IS ALLOWED TO PENETRATE, MEDIUM SIZE COURSE SILICA SAND MAY BE BROADCAST EVENLY IF THE SUBSEQUENT APPLICATION IF GOING TO BE APPLIED AFTER 8-12 HOURS.

4.3.5 OVERLAY (SECOND AND THIRD LAYERS)

APPLICATION OF LIQUID: PRIOR TO THE APPLICATION, IF THERE EXISTS ANY EXCESS LOOSE AGGREGATE FROM THE PREVIOUS COAT, SUCH EXCESS AGGREGATE SHALL BE COMPLETELY REMOVED BY VACUUM OR WITH COMPRESSED AIR. AFTER MIXING OF THE COMPONENTS VIA THE MECHANICAL APPLICATION EQUIPMENT, THE LIQUID SHALL BE EVENLY DISTRIBUTED ON THE CLEAN, DRY DECK SURFACE AT THE RATE AS RECOMMENDED BY THE MANUFACTURER.

4.3.6 AFTER THE APPLICATION OF THE LIQUID IN THE SECOND AND THIRD COATS, THE MAXIMUM TIME ALLOWED BEFORE BROADCASTING OF THE AGGREGATE IS AS FOLLOWS:

ABOVE 90°F	10 MINUTES
80°F TO 90°F	15 MINUTES
70°F TO 80°F	20 MINUTES
60°F TO 70°F	25 MINUTES
50°F TO 60°F	35 MINUTES

4.3.6 BROADCASTING ON DECKS SHALL BE BY TRUCK-MOUNTED EQUIPMENT CAPABLE OF DISPENSING THE AGGREGATE ONTO THE DECK IN A UNIFORM MANNER AS DIRECTED OR OTHERWISE APPROVED BY THE MANUFACTURER.

4.3.7 THE AGGREGATE SHALL BE BROADCAST AS DESCRIBED BELOW SO AS TO COVER THE SURFACE SO THAT NO WET SPOTS APPEAR AND BEFORE THE CO-POLYMER BEGINS TO GEL (SEE SECTION 4.3.6). THE AGGREGATE MUST BE DROPPED VERTICALLY IN SUCH A MANNER THAT THE LEVEL OF THE LIQUID IS NOT DISTURBED.

4.3.7.1 IN THE FIRST AND SECOND LAYER OF THE OVERLAY LIQUID, AGGREGATE CONFORMING TO TABLE 4 SHALL BE BROADCAST TO SATURATION UNTIL NO WET SPOTS REMAIN.

4.3.9 REMOVAL OF EXCESS AGGREGATE: AFTER THE OVERLAY HAS HARDENED, REMOVAL OF ALL LOOSE AND EXCESS AGGREGATE WITH A POWER VACUUM OR OTHER METHOD SHALL BE MADE PRIOR TO THE APPLICATION OF SUBSEQUENT COATS.

4.3.10 JOINTS IN THE OVERLAY (IE. BETWEEN TWO ADJACENT LANES) SHALL BE STAGGERED AND OVERLAPPED BETWEEN SUCCESSIVE COATS SO THAT NO RIDGES WILL APPEAR.

4.3.11 TRAFFIC MAY BE ALLOWED ON THE FINAL LAYER OR IN BETWEEN LAYERS AFTER THE RESIN HAS CURED (OR AS DIRECTED BY THE MANUFACTURER) AND AFTER REMOVAL OF ALL EXCESS, LOOSE AGGREGATE.

5. STORAGE AND HANDLING

5.1 LIQUID MATERIAL: ALL MATERIAL SHALL BE TRANSPORTED AND STORED IN THEIR ORIGINAL CONTAINERS INSIDE A DRY, TEMPERATURE CONTROLLED FACILITY AND MAINTAINED AT A MINIMUM TEMPERATURE OF 60°F AND NOT TO EXCEED 120°F.

5.2 JOB SITE STORAGE: THE MATERIALS SHALL BE STORED ON THE JOBSITE IN A DRY, WEATHER PROTECTED FACILITY AWAY FROM MOISTURE AND WITHIN THE TEMPERATURE RANGE OF 60°F TO 90°F.

5.3 HANDLING OF LIQUID MATERIALS ON THE JOB: PROTECTIVE GLOVES, CLOTHING, BOOTS AND GOGGLES SHALL BE PROVIDED TO WORKERS AND INSPECTORS DIRECTLY EXPOSED TO THE MATERIAL. PRODUCT SAFETY DATA SHEETS SHALL BE PROVIDED AND INSPECTORS AS OBTAINED FROM THE MANUFACTURER.

5.4 PACKING REQUIREMENT: ALL MATERIALS MUST BE PACKAGED IN STRONG, SUBSTANTIAL CONTAINERS. THE CONTAINERS SHALL BE IDENTIFIED AS PART A AND PART B AND SHALL BE PLAINLY MARKED WITH THE NAME AND ADDRESS OF THE MANUFACTURER, NAME OF THE PRODUCT, MIXING PROPORTIONS AND INSTRUCTIONS, LOT AND BATCH NUMBERS, DATE OF MANUFACTURE, AND QUANTITY CONTAINED THEREIN.

5.5 AGGREGATE: ALL AGGREGATE SHALL BE STORED IN A DRY, MOISTURE FREE ATMOSPHERE. THE AGGREGATE SHALL BE FULLY PROTECTED FROM ANY CONTAMINANTS ON THE JOBSITE AND SHALL BE STORED SO AS NOT TO BE EXPOSED TO THE RAIN OR ANY OTHER MOISTURE SOURCE.

6. SAMPLING AND ACCEPTANCE

6.1 INDEPENDENT LAB PERFORMANCE

A NATIONALLY RECOGNIZED INDEPENDENT LAB MUST VERIFY THAT THE MATERIAL:

1. HAS THE CAPABILITY OF PREVENTING THE INGRESS OF ESSENTIALLY ALL THE CHLORIDE IONS INTO THE CONCRETE AT 1" DEPTH WHEN TESTED ACCORDING TO NCHRP-244 METHOD.
2. HAS THE CAPABILITY TO DE-ACTIVATE EXISTING CHLORIDE IONS IN THE CONCRETE SPECIMEN SO THAT THE CORROSION OF THE STEEL REBARS EMBEDDED IN THE CONCRETE STOP CORRODING.
3. WHEN TESTED AS PER TABLES 1, 2, AND 3, FULLY COMPLY WITH THE TEST RESULTS SPECIFIED FOR CURED SYSTEM.

6.1.2 INFARED SPECTROGRAPH: IN ADDITION TO THE INITIAL CERTIFICATION PROCESS EACH MANUFACTURER SHALL FURNISH THE STATE AN INFARED SPECTRA OF EACH COMPONENT OF SYSTEM FOR IT'S PERMANENT RECORD AND FOR INDIVIDUAL INSTALLATION VERIFICATION.

6.1.3 FIELD PERFORMANCE: THE SELECTED MATERIAL MUST HAVE A VERIFIABLE SATISFACTORY PERFORMANCE OF AT LEAST 8 (EIGHT) YEARS IN THE STATE AND/OR 8 (EIGHT) YEARS OF SATISFACTORY PERFORMANCE IN THE UNITED STATES OR CANADA.

6.2 CERTIFICATION FOR COMPLIANCE: AT THE PRE-CONSTRUCTION CONFERENCE, THE CONTRACTOR SHALL NOTIFY THE STATE PROJECT ENGINEER OF THE SOURCE OF THE MATERIAL.

6.2.1 INDEPENDENT TEST LAB REPORT: TEST RESULTS CERTIFIED AND VERIFIED BY A NATIONALLY RECOGNIZED INDEPENT TESTING LABORATORY VERIFYING PROPERTIES OF THE CURED SYSTEM AS PER TABLE 1, 2, AND 3 SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO THE BID OPENING. THIS CERTIFICATION SHALL BE PROVIDED ON EACH LOT NUMBER TO BE USED ON THE PROJECT.

6.2.2 INFARED SPECTRA: INFARED SPECTRA OF EACH COMPONENT FROM EACH LOT NUMBER (TO BE USED ON THE PROJECT) SHALL BE SUBMITTED WITH THE INDEPENDENT LAB CERTIFICATION.

6.3 PERFORMANCE ACCEPTANCE

6.3.1 THICKNESS VERIFICATION: THE STATE SHALL BE NOTIFIED OF THE NUMBER OF GALLONS USED ON THE PROJECT WITH TWO NOTARIZED STATEMENTS - ONE FROM THE CONTRACTOR AND ONE FROM THE MANUFACTURER. IN ADDITION, THE CONTRACTOR SHALL VERIFY TO THE STATE THAT THE OVERLAY IS AT LEAST ¼" THICK AT THREE RANDOM LOCATIONS SELECTED BY THE ENGINEER FOR EVERY 1000 SQUARE YARDS OF DECK SURFACE. THIN AREAS SHALL BE RE-COATED AS DESCRIBED ABOVE BY THE CONTRACTOR AND RE-VERIFIED AT NO ADDITIONAL COST TO THE STATE. THIS VERIFICATION MAY CONSIST OF CORES, HOLES, ETC., BUT IN ALL CASES, ANY DESTRUCTIVELY TESTED AREAS SHALL BE REPAIRED BY THE CONTRACTOR BEFORE FINAL ACCEPTANCE BY THE ENGINEER.

6.3.2 PERFORMANCE GUARANTEE: THE EPOXY-URETHANE CO-POLYMER MANUFACTURER AND THE CONTRACTOR, BY ACCEPTANCE OF THE WORK DESCRIBED IN THIS SPECIFICATION, JOINTLY AGREE TO GUARANTEE THE WEARING SURFACE AGAINST ALL DEFECTS INCURRED DURING NORMAL TRAFFIC USE FOR A PERIOD OF 5 YEARS. THE GUARANTEE PERIOD SHALL COMMENCE ON THE DATE OF ACCEPTANCE OF THE WORK, USUALLY THE DATE TRAFFIC IS ALLOWED ON THE SECOND HALF OF THE DECK. THE GUARANTEE COVERS ALL LABOR AND MATERIALS REQUIRED TO SATISFACTORILY REPAIR OR REPLACE THE WEARING SURFACE.

7. BASIS OF PAYMENT

PAYMENT FOR COMPLETED AND ACCEPTED QUANTITIES AS MEASURED ABOVE WILL BE MADE AT THE CONTRACT PRICE BID FOR ITEM SPECIAL, CRACK TREATMENT AND EPOXY-URETHANE WATERPROOFING OVERLAY FOR BRIDGE DECKS.

EXISTING STRUCTURE VERIFICATION

DETAILS AND DIMENSIONS SHOWN IN THESE PLANS PERTAINING TO THE EXISTING STRUCTURE HAVE BEEN OBTAINED FROM THE PLANS OF THE EXISTING STRUCTURE AND FROM FIELD OBSERVATION AND MEASUREMENTS. CONSEQUENTLY, THEY ARE INDICATIVE OF THE STRUCTURE AND PROPOSED WORK, BUT THEY SHALL BE CONSIDERED TENTATIVE AND APPROXIMATE. THE CONTRACTOR IS REFERRED TO THE CMS SECTIONS 102.05 AND 105.02.

CONTRACT BID PRICES SHALL BE BASED UPON A RECOGNITION OF THE UNCERTAINTIES DESCRIBED ABOVE AND UPON A PRE-BID EXAMINATION OF THE EXISTING STRUCTURES BY THE CONTRACTOR. HOWEVER, ALL PROJECT WORK SHALL BE BASED UPON ACTUAL DETAILS AND DIMENSIONS, WHICH HAVE BEEN VERIFIED BY THE CONTRACTOR IN THE FIELD. PLANS OF THE EXISTING STRUCTURES MAY BE EXAMINED AT THE DISTRICT SEVEN OFFICE IN SIDNEY, OHIO OR THE OFFICE OF STRUCTURAL ENGINEERING AT COLUMBUS, OHIO.

MAINTAINING TRAFFIC, AS PER PLAN

MOT-675-0055L: STRUCTURE WILL REQUIRE CLOSURE FOR A MAXIMUM OF 3 CONSECUTIVE NIGHTS, 8 P.M. TO 6 A.M., SUNDAY THROUGH WEDNESDAY ONLY. AT NO TIME SHALL THE ROADWAY BE CLOSED THURSDAY THROUGH SATURDAY. THE CONTRACTOR SHALL NOTIFY THE ROADWAY SERVICES ENGINEER TWO (2) WEEKS PRIOR TO CLOSURE.

WEARING COURSE REMOVED, AS PER PLAN

MOT-675-0055L: REMOVE THE EXISTING 0.25" EPOXY OVERLAY.

ITEM SPECIAL - EPOXY-URETHANE WATERPROOFING OVERLAY

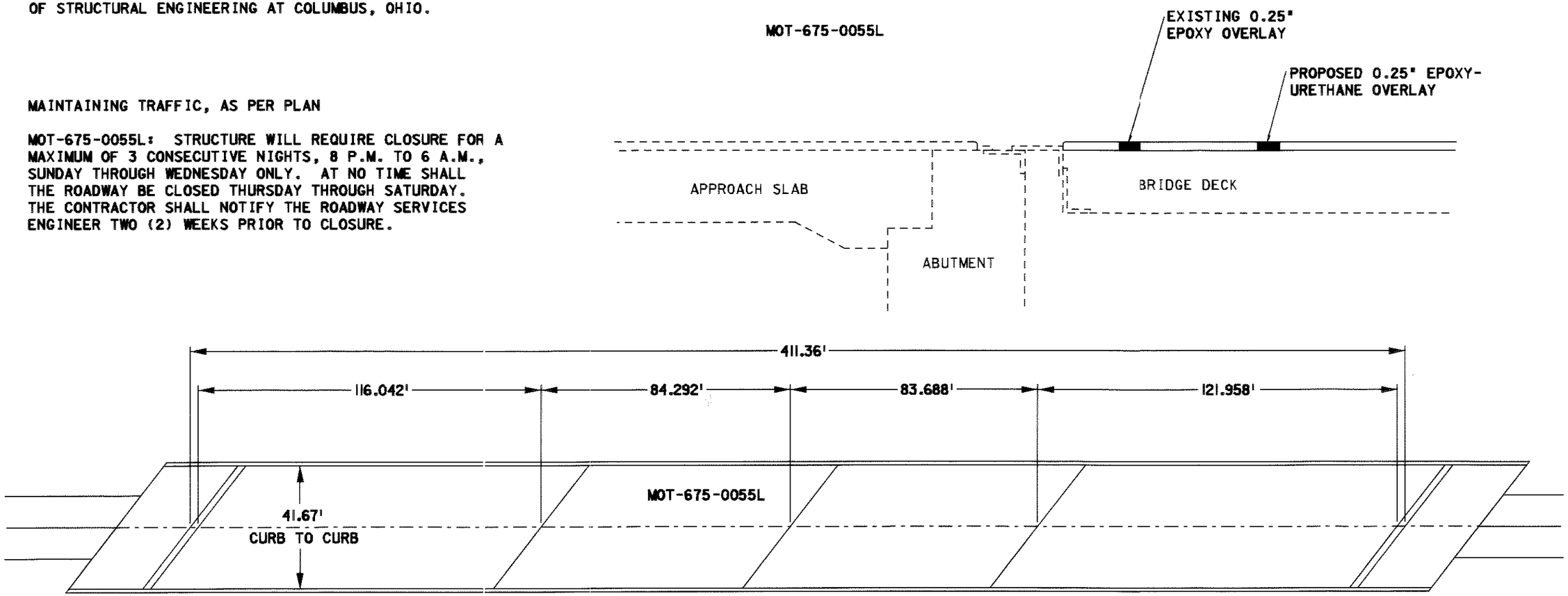
THIS SHALL INCLUDE ALL PREPARATION, MATERIALS, LABOR, AND INCIDENTIALS NEEDED TO PROVIDE AN OVERLAY AS PER SPECIFICATIONS INCLUDED IN THESE PLANS.

PROPOSED WORK - MOT-675-0411 L
PATCH TOP OF BACKWALL - FORWARD ABUTMENT, 8" DEEP OR TO SOUND CONCRETE.

PROPOSED WORK - MOT-675-0411 R
PATCH TOP OF BACKWALL - REAR ABUTMENT, 8" DEEP OR TO SOUND CONCRETE.

PROPOSED WORK - MOT-675-0055L

REMOVE THE EXISTING EPOXY OVERLAY. PATCH CONCRETE BRIDGE DECK. OVERLAY DECK WITH EPOXY-URETHANE WATERPROOFING OVERLAY.



CALCULATED LEE
CHECKED

BRIDGE SUMMARY

MONTGOMERY COUNTY
MOT-675-0.00

PART	MOT-675 0055L	MOT-675 0411L	MOT-675 0411R		ITEM	ITEM EXTENSION	GRAND TOTAL	UNIT	DESCRIPTION
	1905				202	23500	1905	SQ. YD.	WEARING COURSE REMOVED, AS PER PLAN
		18	18		SPEC.	5191 1600	36	SQ. FT.	PATCHING CONCRETE STRUCTURES, MISC.: BACKWALL
	90				SPEC.	5192300	90	SQ. YD.	PATCHING CONCRETE BRIDGE DECKS, TYPE B
	1905				SPEC.	5127 2010	1905	SQ. YD.	EPOXY-URETHANE WATERPROOFING OVERLAY
					614	11001		LUMP	MAINTAINING TRAFFIC, AS PER PLAN
					624	10000		LUMP	MOBILIZATION

Quantities shall be carried to the General Summary

BRIDGE NO.	LENGTH (Bridge Limits) L.F.	WIDTH L.F.	BRIDGE DECK AREA S.Y.	STRUCTURE FILE NUMBER	COMMENTS
MOT-675-0055L	411.36	41.67	1905	5710707	Existing epoxy overlay = 0.25" +/-
MOT-675-0411L	200.00	64.30	1428	5711266	Existing concrete deck
MOT-675-0411R	189.00	54.00	1134	5711274	Existing concrete deck

CALCULATED LEE
CHECKED

BRIDGE SUMMARY

MONTGOMERY COUNTY
MOT-675-0.00

RAISED PAVEMENT MARKERS

LOCATION				DETAIL	RPM	PRISMATIC RETRO-REFLECTOR TYPES					REMARKS
		SLM SECTION				ONE-WAY		TWO-WAY			
PART	ROUTE	FROM	TO			WHITE	YELLOW	WHITE/ WHITE	WHITE/ RED	YELLOW/ RED	
	I-675	0.69	2.26	5	124	124					
	I-675	1.78	2.62	2 & 3	152				74	78	Interchange with State Route 725 and Yankee Street
	I-675	2.26	3.99	5	304	304					
	I-675	3.99	7.42	5	603	603					
	I-675	4.18	5.28	2 & 3	167				62	105	Interchange with State Route 48 and Alex Bell
	I-675	7.13	7.25	2 & 3	66				30	36	Interchange with Wilmington Pike
	I-675 NB	0.00	0.95	5	160	42			51	67	Northbound I-75 Entrance Ramp to Northbound I-675
	I-675 NB	0.98	1.27	4	59					59	Southbound I-75 Entrance Ramp to Northbound I-675
	I-675 SB	0.28	0.69	5	127	42			15	70	Southbound I-75 Entrance Ramp to Southbound I-675
	I-675 SB	0.72	0.79	3	17					17	Northbound I-75 Entrance Ramp to Southbound I-675
					1779	1115			232	432	

1	Multilane Divided	5	Multilane Divided / Expressway	10	Four Lane Divided to Two Lane Transition	15	Horizontal Curve
1	Typical Spacing	6	Stop Approach	11	Four Lane Undivided to Two Lane Transition	16	Horizontal Curve Alternate
2	Tapered Acceleration Lane	7	One Lane Approach w/Left Turn Lane	12	Two Lane Narrow Bridge	17	Stop Approach Alternate
3	Deceleration Lane	8	Thru Approach	13	Two Way Left Turn Lane	GAP	Centerline at 80 feet Typical
4	Parallel Acceleration Lane	9	Two Lane Approach w/Left Turn Lane	14	One Lane Bridge		

CALCULATED
CHECKED

RAISED PAVEMENT MARKERS

MONTGOMERY COUNTY
MOT-675-0.00

GENERAL SUMMARY

PART 1	PART 2	ITEM	ITEM EXTENSION	GRAND TOTAL	UNIT	DESCRIPTION
	20513	202	23500	20513	SQ. YD.	Wearing Course Removed
1905		202	23501	1905	SQ. YD.	Wearing Course Removed, As Per Plan
2058		202	54100	2058	EACH	Raised Pavement Marker Removed for Storage
200		253	01001	200	SQ. YD.	Pavement Repair, As Per Plan
622		254	01000	622	SQ. YD.	Pavement Planing, Bituminous
13621	3004	407	10000	16625	GALLON	Tack Coat
276379	63639	409	98000	340018	SQ. YD.	Sealing, Miscellaneous: Multi-Seal Surfacing, Type 12, Interlayer
1905		SPECIAL	512 72010	1905	SQ. YD.	Epoxy-Urethane Waterproofing Overlay (1/4" Thick)
36		SPECIAL	519 11600	36	SQ. FT.	Patching Concrete Structures, Miscellaneous: Backwall
90		SPECIAL	519 12300	90	SQ. YD.	Patching Concrete Bridge Deck, Type B
280		614	11100	280	HOURS	Law Enforcement Officer with Patrol Car
30		614	12460	30	EACH	Work Zone Marking Sign
53.44		614	20000	53.44	MILE	Temporary Lane Line, Class I
2045	678	617	10100	2723	CU. YD.	Compacted Aggregate, Type A
28.70		618	40600	28.70	MILE	Rumble Strips, Type 2 (Asphalt)
1779		621	00200	1779	EACH	Raised Pavement Marker, Installation Only
30.58	9.12	644	00100	39.70	MILE	Edge Line
26.72		644	00200	26.72	MILE	Lane Line
9393		644	00400	9393	LIN. FT.	Channelizing Line
	222	644	00500	222	LIN. FT.	Stop Line
3314		644	00700	3314	LIN. FT.	Transverse Line
	5	644	01300	5	EACH	Lane Arrow
	2	644	01410	2	EACH	Word on Pavement, 96 Inch
18900	3466	858	10001	22366	CU. YD.	Asphalt Concrete Surface Course, 12.5 mm, Type A (446), As Per Plan
LUMP	LUMP	614	11000	LUMP		Maintaining Traffic
LUMP		614	11001	LUMP		Maintaining Traffic, As Per Plan
LUMP	LUMP	624	10000	LUMP		Mobilization

CALCULATED
CHECKED

GENERAL SUMMARY

MONTGOMERY COUNTY
MOT-675-0.00