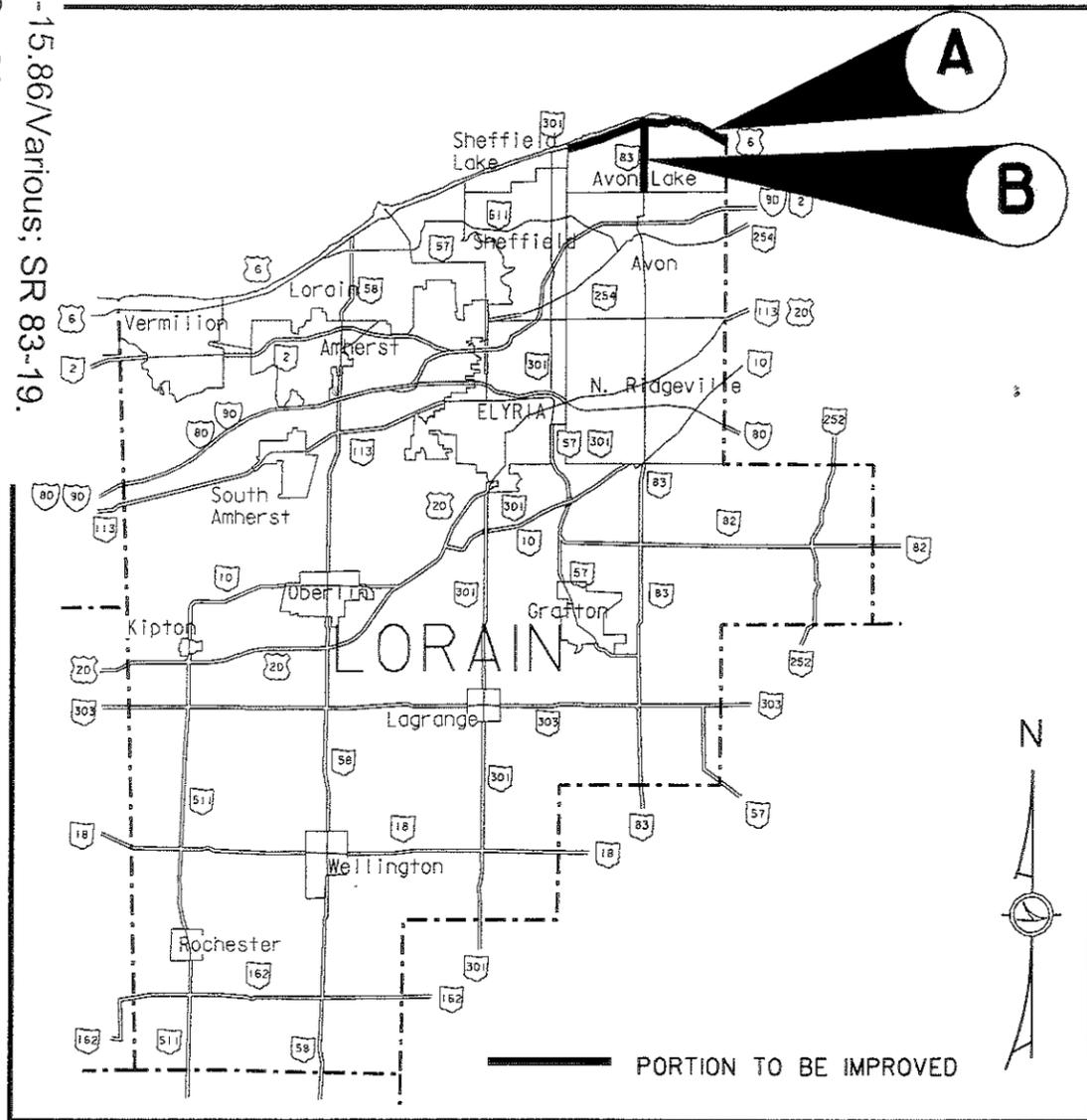


STATE OF OHIO DEPARTMENT OF TRANSPORTATION  
LOCATION MAP



LATITUDE: N 41° 29' 82" LONGITUDE: W 82° 04' 04"

LOR-6-15.86 - 21.23  
DESIGN DESIGNATION (ENGLISH UNITS)

CURRENT ADT (2004)	9060
DESIGN YEAR ADT (2016)	10850
DESIGN HOURLY VOLUME (2016)	1085
DIRECTIONAL DISTRIBUTION	60%
TRUCKS (24 HOUR B&C)	2%
DESIGN SPEED	3R PROJECT
LEGAL SPEED	
SLM 15.86-21.23	35 MPH

DESIGN FUNCTIONAL CLASSIFICATION:  
URBAN PRINCIPAL ARTERIAL  
NHS PROJECT NO

LOR-83-19.31 - 21.71  
DESIGN DESIGNATION (ENGLISH UNITS)

CURRENT ADT (2004)	15710
DESIGN YEAR ADT (2016)	19700
DESIGN HOURLY VOLUME (2016)	1970
DIRECTIONAL DISTRIBUTION	60%
TRUCKS (24 HOUR B&C)	4%
DESIGN SPEED	3R PROJECT
LEGAL SPEED	
SLM 19.31-21.71	35 MPH

DESIGN FUNCTIONAL CLASSIFICATION:  
URBAN MINOR ARTERIAL  
NHS PROJECT NO

PART	COUNTY	ROUTE	PROJECT TERMINI (STRAIGHT LINE MILEAGE)		NET LENGTH (MILES)	CITY	VILLAGE
			BEGIN	END			
A	LORAIN	US 6	15.86	21.23	5.37	AVON LAKE	
B	LORAIN	SR 83	19.31	21.71	2.40	AVON LAKE	

INDEX OF SHEETS:

- 1 - TITLE SHEET
- 2-3 - GENERAL SUMMARY
- 4 - STRAIGHT LINE DIAGRAM
- 5 - TYPICAL SECTION
- 6-7 - PAVEMENT DATA
- 8 - SHOULDER DATA
- 9-10 - GENERAL NOTES
- 11 - MAILBOX FACILITIES
- 12 - STRUCTURE SUMMARY
- 13 - BRIDGE TREATMENT
- 14 - STRUCTURE DETAILS
- 15 - PAVEMENT MARKING INFORMATION

**TWO WORKING DAYS BEFORE YOU DIG**  
Call 800-362-2764  
TOLL FREE  
OHIO UTILITIES PROTECTION SERVICE  
NON-MEMBERS MUST BE CALLED DIRECTLY



PROJECT DESCRIPTION:

THIS PROJECT WILL INCLUDE PAVEMENT PLANING, PAVEMENT REPAIR, RESURFACING WITH ASPHALT CONCRETE, ADJUSTMENT OF CASTINGS WHERE NECESSARY, BRIDGE REHABILITATION AND PAVEMENT MARKINGS AS DETAILED IN THE PLANS.

Project Earth Disturbed Area - N/A (Maintenance Project)  
Estimated Contractor Earth Disturbed Area - N/A (Maintenance Project)  
Notice of Intent Earth Disturbed Area - N/A (Maintenance Project)

CONVERSION OF METRIC STANDARD DRAWINGS

THE METRIC STANDARD DRAWINGS REFERENCED IN THIS PLAN SHALL BE CONVERTED TO ENGLISH UNITS USING THE SI (METRIC) TO ENGLISH CONVERSION FACTORS PROVIDED IN SECTION 109.02 OF THE 2002 CONSTRUCTION AND MATERIAL SPECIFICATIONS. CONVERSIONS SHALL BE APPROXIMATELY PRECISE AND SHALL REFLECT STANDARD INDUSTRY ENGLISH VALUES WHERE SUITABLE.

2002 SPECIFICATIONS

THE STANDARD 2002 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

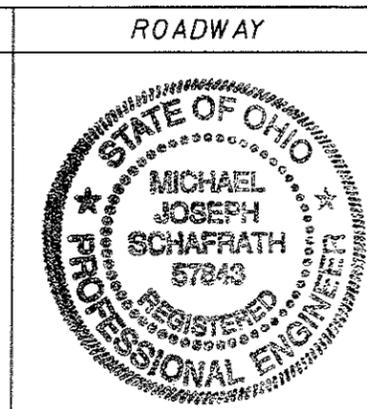
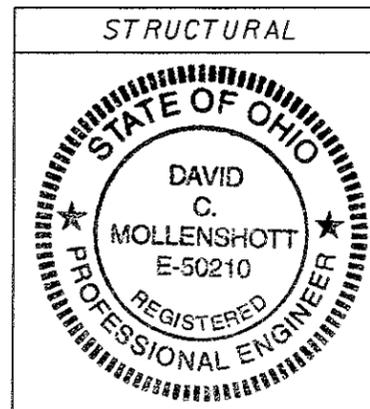
I HEREBY APPROVE THESE PLANS AND DECLARE THAT THE MAKING OF THESE IMPROVEMENTS WILL NOT REQUIRE THE CLOSING OF THE HIGHWAY AND PROVISIONS FOR THE MAINTENANCE AND SAFETY OF TRAFFIC WILL BE AS INDICATED IN THE PLAN AND PROPOSAL.

11-20-03 [Signature] APPROVED DATE DISTRICT DEPUTY DIRECTOR OF TRANSPORTATION

12-8-03 [Signature] APPROVED DATE DIRECTOR, DEPARTMENT OF TRANSPORTATION

ENGINEER'S SEAL

ENGINEER'S SEAL



SIGNED: David C. Molleshott  
DATE: 11/20/03

SIGNED: Michael J. Schafraath  
DATE: 11/20/03

STANDARD DRAWINGS				SUPPLEMENTAL SPECIFICATIONS	
BP-3.I	07-28-00	MT-95.60	04-19-02	832	02-12-03
BP-4.I	07-28-00	MT-95.61	04-19-02	833	02-12-03
		MT-97.10	04-19-02	864	07-11-00
		MT-97.12	04-19-02	908	04-18-03
DM-4.3	07-19-02	MT-99.20M	01-30-95		
DM-4.4	07-19-02	MT-105.I0	10-18-02		
		MT-105.II	10-18-02		
TC-41.20	01-19-01				
TC-65.I0	10-19-01				
TC-65.I2	10-19-01				
TC-71.I0	04-19-02				
TC-73.I0	01-19-01				
TC-82.I0	04-19-02				

FEDERAL PROJECT NO. G020(207)

PID NO. 20723

CONSTRUCTION PROJECT NO.

RAILROAD INVOLVEMENT NONE

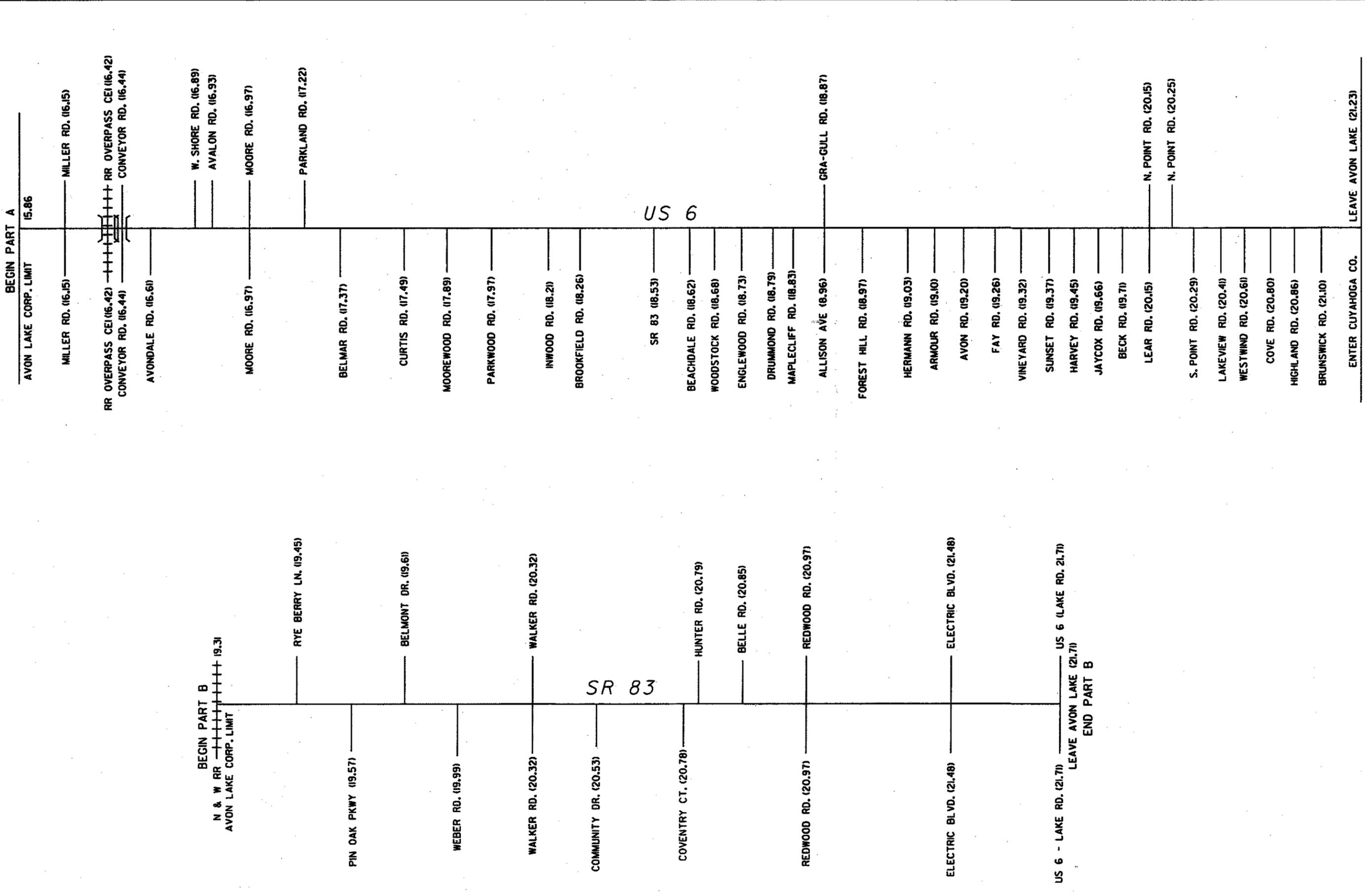
LOR-6-15.86

15

LOR - USR 6-15.86/Various; SR 83-19.  
 040128 PID - 20723  
 Dist 3 2/25/2004







Utility locations can be provided at the pre-construction meeting. Contractor is to field verify utility locations.

CJC checked  
MJS

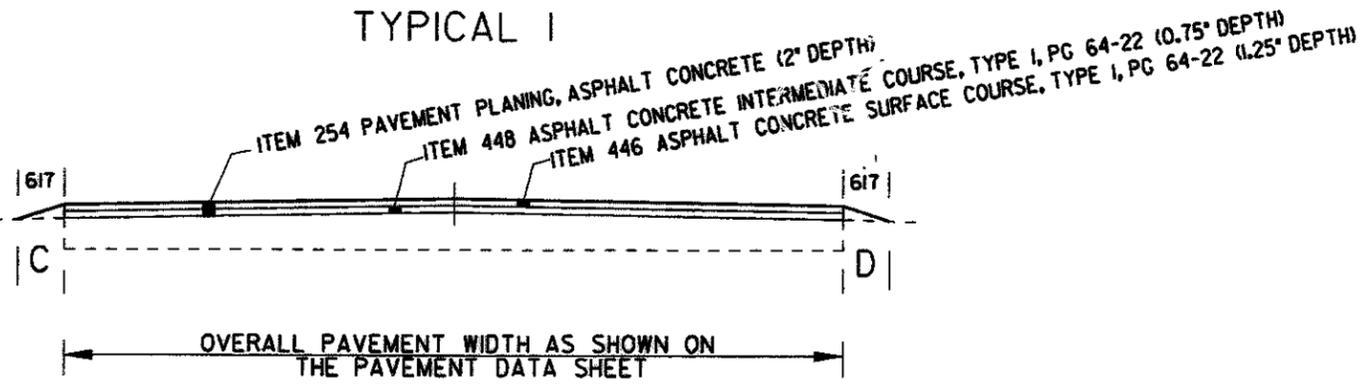
LOR-6-15.86

4  
15

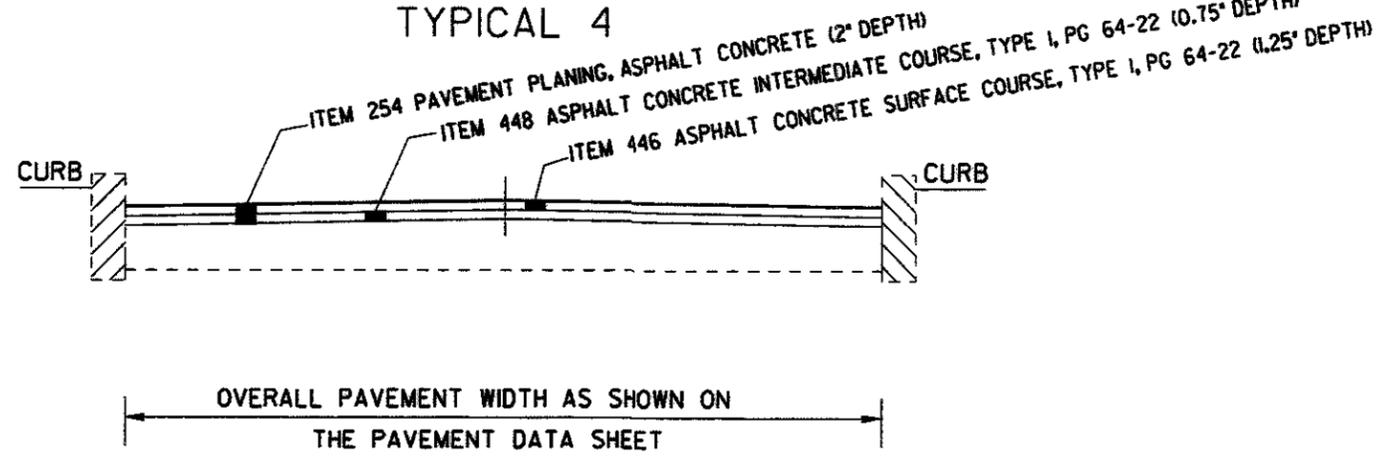
STRAIGHT LINE DIAGRAMS

END PART A

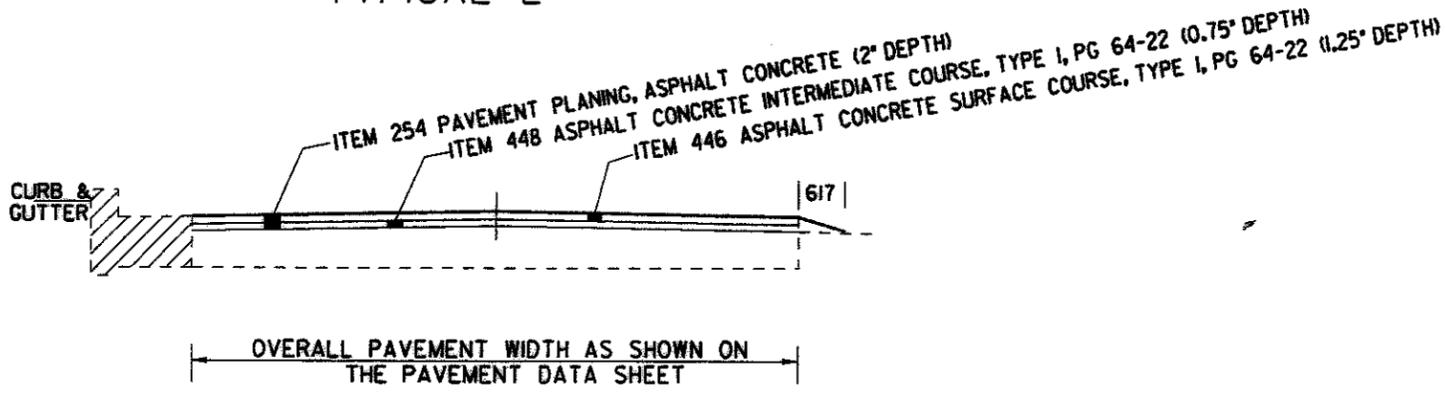
TYPICAL 1



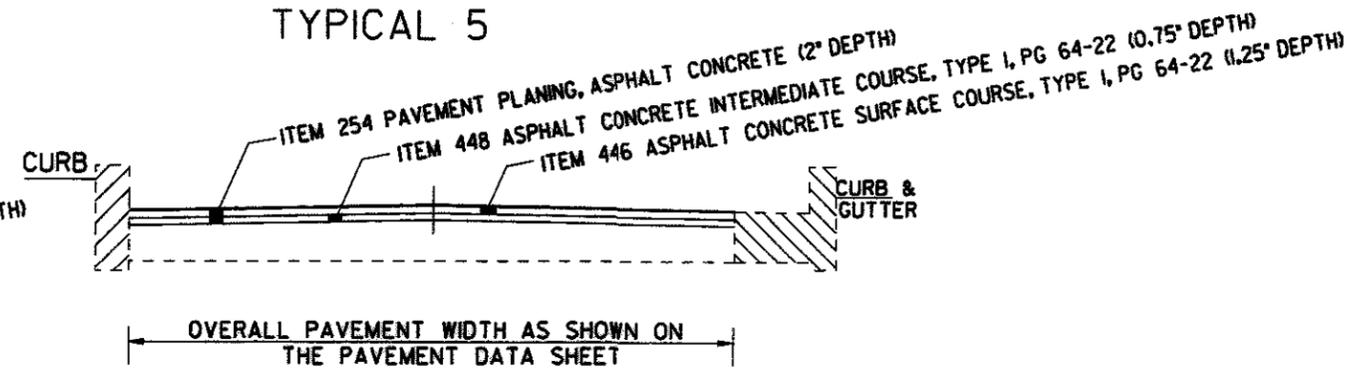
TYPICAL 4



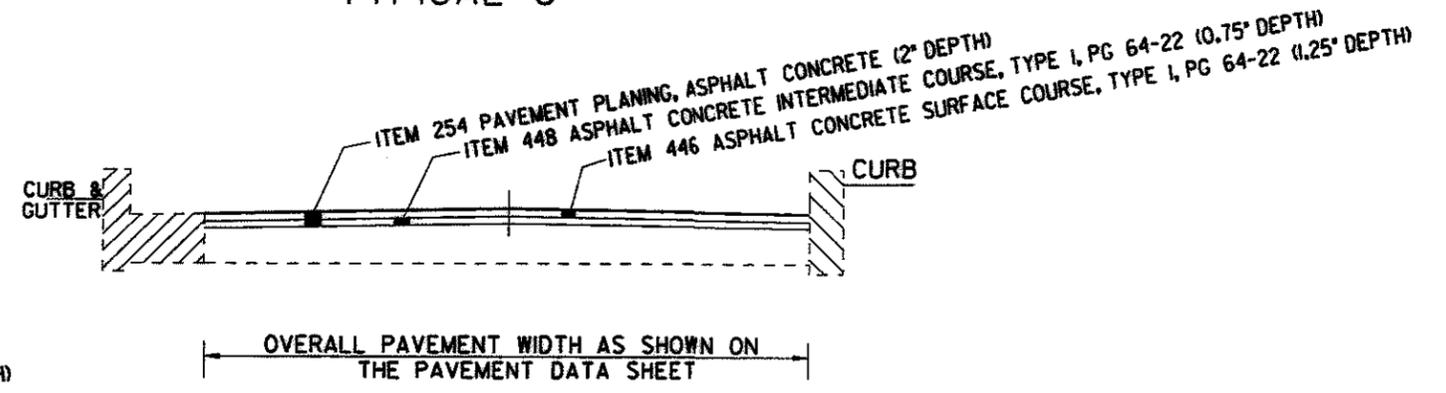
TYPICAL 2



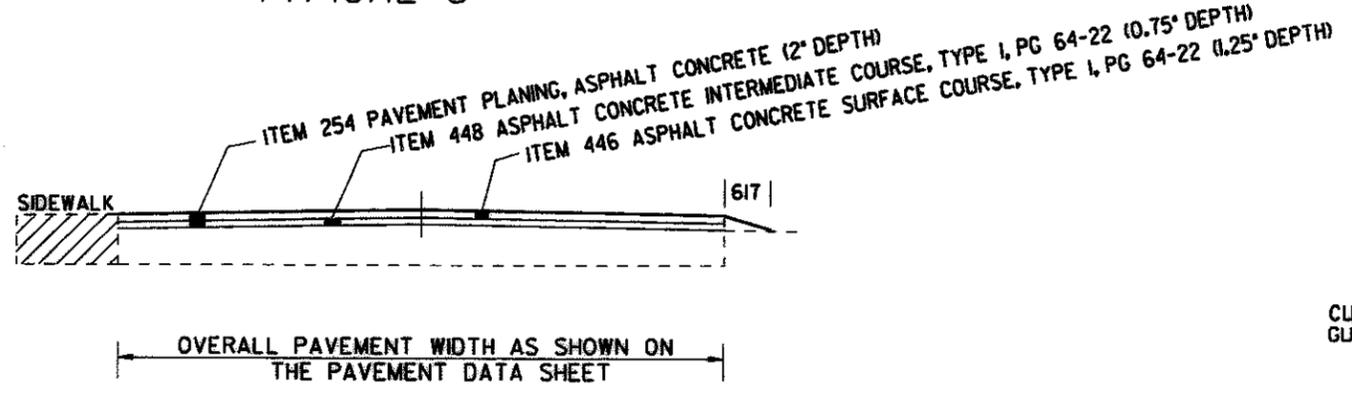
TYPICAL 5



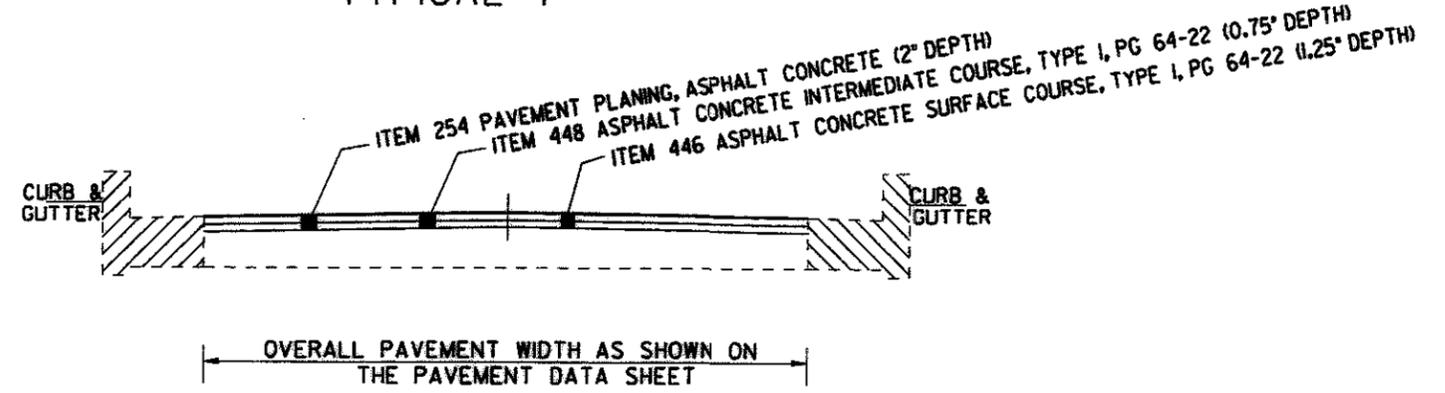
TYPICAL 6



TYPICAL 3



TYPICAL 7



\* - FOR TYPICALS, SEE SHEET 4

SEE BRIDGE TREATMENT SHEET FOR PLANING AND PAVING DETAILS

USE BUTT JOINTS THROUGHOUT PROJECT

PART	ROUTE	LOG POINT TO LOG POINT		LENGTH		WIDTH FEET AVG.	* T Y P I C A L	EXISTING PAVEMENT TYPE	PAVEMENT AREA SQ YD	407	448		446		407	254			604	604		638				
				TACK COAT @ 0.08 GAL/SY	ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 1 PG 64-22					ASPHALT CONCRETE SURFACE COURSE, TYPE 1, PG 64-22		TACK COAT FOR INTERMEDIATE COURSE @ 0.03 GAL/SY GALLON	PAVEMENT PLANING, ASPHALT CONCRETE	PATCHING PLANED SURFACES	MANHOLE ADJUSTED TO GRADE EACH	CATCH BASIN ADJUSTED TO GRADE EACH	VALVE BOX ADJUSTED TO GRADE EACH									
				GALLON	THICK AVG. INCH					CU.YD.	THICK AVG. INCH	CU.YD.	SQ.YD	SQ.YD	SQ.YD	EACH	EACH	EACH								
A	US 6	15.86	16.03	0.17	897.6	35.0	1	404	3491	279	0.75	73	1.25	121	105	3491	175					2				
A	US 6	16.03	16.10	0.07	369.6	38.0	1	404	1561	125	0.75	33	1.25	54	47	1561	78					1				
A	US 6	16.10	16.15	0.05	264	46.0	2	404	1349	108	0.75	28	1.25	47	40	1349	67									
A	US 6	16.15	16.16	0.01	52.8	53.0	2	404	311	25	0.75	6	1.25	11	9	311	16									
A	US 6	16.16	16.17	0.01	52.8	38.0	1	404	223	18	0.75	5	1.25	8	7	223	11									
A	US 6	16.17	16.23	0.06	316.8	49.0	1	404	1725	138	0.75	36	1.25	60	52	1725	86					1				
A	US 6	16.23	16.37	0.14	739.2	35.0	1	404	2875	230	0.75	60	1.25	100	86	2875	144									
A	US 6	16.37	16.58	0.21	1108.8	44.0	3	404	5421	434	0.75	113	1.25	188	163	5421	271									
A	US 6	16.58	16.60	0.02	105.6	47.0	3	404	551	44	0.75	11	1.25	19	17	551	28									
A	US 6	16.60	16.65	0.05	264	37.0	3	404	1085	87	0.75	23	1.25	38	33	1085	54									
A	US 6	16.65	16.73	0.08	422.4	32.0	1	404	1502	120	0.75	31	1.25	52	45	1502	75									
A	US 6	16.73	16.78	0.05	264	44.0	4	404	1291	103	0.75	27	1.25	45	39	1291	65									
A	US 6	16.78	16.81	0.03	158.4	42.0	5	404	739	59	0.75	15	1.25	26	22	739	37									
A	US 6	16.81	16.93	0.12	633.6	44.0	4	404	3098	248	0.75	65	1.25	108	93	3098	155		2							
A	US 6	16.93	16.97	0.04	211.2	42.0	6	404	986	79	0.75	21	1.25	34	30	986	49					1				
A	US 6	16.97	17.01	0.04	211.2	41.0	1	404	962	77	0.75	20	1.25	33	29	962	48									
A	US 6	17.01	17.12	0.11	580.8	37.0	1	404	2388	191	0.75	50	1.25	83	72	2388	119									
A	US 6	17.12	18.47	1.35	7128	35.0	1	404	27720	2218	0.75	578	1.25	963	832	27720	1386					5				
A	US 6	18.47	18.56	0.09	475.2	41.0	4	404	2165	173	0.75	45	1.25	75	65	2165	108									
A	US 6	18.56	18.59	0.03	158.4	38.0	1	404	669	54	0.75	14	1.25	23	20	669	33									
A	US 6	18.59	19.62	1.03	5438.4	35.0	1	404	21149	1692	0.75	441	1.25	734	634	21149	1057		3			4				
A	US 6	19.62	19.69	0.07	369.6	41.0	1	404	1684	135	0.75	35	1.25	58	51	1684	84					1				
A	US 6	19.69	20.10	0.41	2164.8	35.0	1	404	8419	674	0.75	175	1.25	292	253	8419	421									
A	US 6	20.10	20.17	0.07	369.6	41.0	1	404	1684	135	0.75	35	1.25	58	51	1684	84		1							
A	US 6	20.17	20.25	0.08	422.4	35.0	1	404	1643	131	0.75	34	1.25	57	49	1643	82									
A	US 6	20.25	20.32	0.07	369.6	41.0	1	404	1684	135	0.75	35	1.25	58	51	1684	84									
A	US 6	20.32	20.58	0.26	1372.8	35.0	1	404	5339	427	0.75	111	1.25	185	160	5339	267					1				
A	US 6	20.58	20.64	0.06	316.8	41.0	1	404	1443	115	0.75	30	1.25	50	43	1443	72									
A	US 6	20.64	21.23	0.59	3115.2	35.0	1	404	12115	969	0.75	252	1.25	421	363	12115	606					1				
EXTRA AREA FOR																										
INTERS., DRIVES, + MAILBOXES									5548	444	0.75	116	1.25	193	166	100	5									
<b>TOTALS</b>									<b>5.37</b>	<b>28353.6</b>				<b>120820</b>	<b>9667</b>		<b>2518</b>		<b>4194</b>	<b>3627</b>	<b>115372</b>	<b>5767</b>		<b>1</b>	<b>5</b>	<b>17</b>

CALC BY: CVH  
CHKD BY: MJS

PAVEMENT DATA

LOR-6-15.86



\* - FOR TYPICALS, SEE SHEET 4

PART	ROUTE	LOG POINT TO LOG POINT		LENGTH		TYPICAL	PAVED SHOULDER PROPOSED WIDTH FEET (AVG.)		PAVED SHOULDER AREA SQ YD	209 PREPARING SUBGRADE FOR SHOULDER PAVING		301 ASPHALT CONCRETE BASE		AGGREGATE SHOULDER PROPOSED WIDTH FEET (AVG.)		AGGREGATE SHOULDER AREA SQUARE YARDS	617 SHOULDER PREPARATION		617 COMPATED AGGREGATE TYPE A, AS PER PLAN		408 PRIME COAT @ 0.40 GAL/SY	
				MILE	FEET		A	B		DEPTH INCH	STA	AVG. THICK. INCH	CU.YD.	C	D		SQ.YD	CU.YD.	GALLON			
				STRAIGHT LINE MILEAGE																		
A	US 6	16.03	16.15	0.12	634	1								2.0	2.0	282	282	6				113
A	US 6	16.15	16.17	0.02	106	2								2.0	2.0	24	24	1				10
A	US 6	16.17	16.37	0.20	1056	1								2.0	2.0	469	469	10				188
A	US 6	16.37	16.65	0.28	1478	3								2.0	2.0	328	328	7				131
A	US 6	16.65	16.73	0.08	422	1								2.0	2.0	188	188	4				75
A	US 6	16.97	18.47	1.50	7920	1								2.0	2.0	3520	3520	74				1408
A	US 6	18.56	21.23	2.67	14098	1								2.0	2.0	6266	6266	131				2506
B	SR 83	19.31	20.32	1.01	5333	1								2.0	2.0	2370	2370	50				948
B	SR 83	20.40	20.54	0.14	739	2								2.0	2.0	164	164	4				66
B	SR 83	20.54	21.71	1.17	6178	1								2.0	2.0	2746	2746	57				1098
<b>TOTALS</b>				<b>7.19</b>	<b>37963</b>											<b>16357</b>	<b>16357</b>	<b>342</b>				<b>6543</b>

CALC BY: CVH  
CHKD BY: MJS

SHOULDER DATA

LOR-6-15.86

**PAVEMENT CONTROL**

AN AUTOMATIC SCREED CONTROL, HAVING A 20FT. MINIMUM SKI-ARM, SHALL BE USED FOR PLACING THE INTERMEDIATE COURSE AND SURFACE COURSE ON EXISTING PAVEMENT WIDTHS OF 20 FT. AND OVER.

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

THE CONTRACTOR SHALL MAINTAIN POSITIVE DRAINAGE INTO ALL CATCH BASINS AND INLETS.

**PLACEMENT OF ASPHALT CONCRETE**

TWO-WAY TRAFFIC SHALL BE MAINTAINED AT ALL TIMES EXCEPT THAT ONE-WAY TRAFFIC WILL BE PERMITTED FOR MINIMUM PERIODS OF TIME CONSISTENT WITH THE REQUIREMENTS OF THE SPECIFICATIONS FOR PROTECTION OF COMPLETED ASPHALT CONCRETE COURSES.

**PROFILE AND ALIGNMENT**

THE PROPOSED PAVEMENT RESURFACING SHALL FOLLOW THE ALIGNMENT AND PROFILE OF THE EXISTING PAVEMENT.

**ROUTINE MAINTENANCE**

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

**703.05 AGGREGATE FOR ASPHALT CONCRETE (INTERMEDIATE AND SURFACE COURSES)**

REMOVE THE PHRASE "THAT WILL BE EXPOSED TO TRAFFIC OVER THE WINTER MONTHS" FROM ITEMS b. AND c. OF C. GENERAL REQUIREMENTS FOR COURSE AND FINE AGGREGATE OF 703.05 (PAGE 767 OF THE 2002 CONSTRUCTION AND MATERIAL SPECIFICATIONS).

**RAILROAD CROSSINGS**

PRIOR TO ANY WORK AT RAILROAD CROSSINGS THE CONTRACTOR SHALL CONTACT THE AFFECTED RAILROAD AUTHORITY AS TO MAKE THEM AWARE OF THE PROGRESS AND SCHEDULE OF WORK. THE CONTRACTOR SHALL COOPERATE WITH THE RAILROAD SO AS TO ELIMINATE ANY SAFETY CONCERNS. FLAGGING MAY BE REQUIRED BY THE RAILROAD. THE CONTRACTOR IS RESPONSIBLE FOR PAYING THE RAILROAD FOR ALL FLAGGING COSTS. REFER TO RAILROAD LIABILITY INSURANCE PROPOSAL NOTE.

THE CROWN SHALL BE WORKED OUT OF THE RESURFACED PAVEMENT ON EACH SIDE OF THE RAILROAD CROSSING, BEGINNING 50 FEET FROM THE NEAREST RAIL, BY RAISING THE EDGES OF THE RESURFACED PAVEMENT TO MEET THE PLATFORM ELEVATION.

OMIT AND RESUME RESURFACING AT THE HEADER TIE, AS DIRECTED BY THE ENGINEER.

**RAILROAD CROSSING INFORMATION**

OWNER OF RAILROAD: NORFOLK AND SOUTHERN CORPORATION  
TYPE OF LINE: MAINLINE (LOR-83-19.31 S.L.M.)  
CROSSING: AT GRADE  
NO. OF TRACKS: 1

THE NUMBER OF TRAINS OPERATING THROUGH THE IMPROVEMENT IS ESTIMATED TO BE:

PASSENGER TRAINS/DAY: 0 @ 0 MILES PER HOUR  
FREIGHT TRAINS/DAY: 5 @ 45 MILES PER HOUR  
HAZARDOUS MATERIAL: YES

THE IDENTIFICATION OF THE CROSSING IS KNOWN AS:  
RR MILE POST: 19.31 S.L.M.  
AARDOT NO.: 472 258 U

LOCAL CONTACT PERSON FOR FLAGGING: MR. MASON (419) 483-1885

**ITEM SPECIAL - MISC.: ASPHALT GRINDINGS**

FROM THE ASPHALT GRINDINGS GENERATED ON THIS PROJECT, 5000 CU YDS SHALL BE DELIVERED BY THE CONTRACTOR TO THE LORAIN COUNTY ODOT PROPERTY LOCATED AT 1745 MOORE RD., AVON, OH 44011. ODOT WILL PROVIDE THE EXACT LOCATION OF THE STORAGE AREA ON THE PROPERTY TO THE CONTRACTOR AT THE PRECONSTRUCTION MEETING. THE GRINDINGS ARE NOT TO BE DELIVERED WET AND THEY ARE TO BE DELIVERED DIRECTLY FROM THE PROJECT. BEFORE DELIVERY THE CONTRACTOR SHALL CONTACT THE LORAIN COUNTY GARAGE AT 440-774-6681

THE MATERIAL IN THIS ITEM WILL BE PAID FOR BY THE CU YD.

ALL ASSOCIATED COSTS TO LOAD AND TO DELIVER TO THE SITE THE ASPHALT GRINDINGS ARE TO BE INCLUDED FOR PAYMENT BY THE CU YD PER ITEM SPECIAL, MISC.: ASPHALT GRINDINGS.

**BUTT JOINTS**

BUTT JOINTS SHALL NOT BE CUT AND LEFT OPEN TO TRAFFIC. THEY SHALL BE FILLED IN WITH A TEMPORARY ASPHALT CONCRETE WEDGE OF SUFFICIENT LENGTH, AS DIRECTED BY THE ENGINEER.

CONSTRUCTION "BUMP" (OW-62) AND "ADVISORY SPEED" (OW-143) SIGNS SHALL BE ERECTED AND MAINTAINED DURING THE PERIOD THE BUTT JOINT IS LEFT OPEN. THESE SIGNS SHALL BE PAID FOR UNDER THE LUMP SUM ITEM FOR ITEM 614 MAINTAINING TRAFFIC.

**INTERSECTIONS AND DRIVES:**

EXISTING PAVED DRIVES SHALL BE PAVED SO AS TO PROVIDE A SMOOTH TRANSITION BETWEEN THE HIGHWAY AND THE DRIVE. (DISTANCE FROM EDGE OF ROADWAY MAY VARY - AT EACH DRIVE) AS DIRECTED BY THE ENGINEER.

EXISTING AGGREGATE DRIVES SHALL BE PAVED WITH AN APRON THE WIDTH OF THE 617 BERM OR 2 FT. MINIMUM. THE SLOPE OF THIS APRON SHALL BE THE SAME AS THE ADJACENT PAVEMENT SLOPE OR AS DIRECTED BY THE ENGINEER. ITEM 617 AGGREGATE SHALL BE PLACED ADJACENT TO THIS APRON TO PROVIDE A SMOOTH TRANSITION FROM THE APRON TO THE EXISTING DRIVE. (WIDTH OF THIS 617 APPLICATION MAY VARY) AS DIRECTED BY THE ENGINEER. AN ADDITIONAL QUANTITY HAS BEEN ESTIMATED TO COMPLETE THIS WORK AND IS SHOWN ON THE "SHOULDER DATA" SHEET.

ANY HAZARD OR UNSAFE CONDITION RESULTING FROM THE ABOVE WORK MUST BE CORRECTED IMMEDIATELY, AS DIRECTED BY THE ENGINEER. THE CONTRACTOR IS REMINDED OF SECTIONS 105.01, 107.07 & 614.02A.

THE FOLLOWING INTERSECTIONS SHALL BE PLANED AND PAVED TO THE END OF THE RADII:

- US 6  
BRUNSWICK DRIVE SOUTH SIDE
- SR 83
- US 6 ENTIRE INTERSECTION
- ELECTRIC BLVD ENTIRE INTERSECTION
- CARRIAGE LANE EAST SIDE
- GLENVIEW DRIVE WEST SIDE
- BELLE ROAD EAST SIDE
- COVENTRY COURT WEST SIDE
- WALKER ROAD EAST SIDE

ALL OTHER INTERSECTIONS SHALL BE PLANED AND PAVED STRAIGHT THRU.

**ITEM 254 PATCHING PLANED SURFACE**

AN ESTIMATED QUANTITY OF ITEM 254, PATCHING PLANED SURFACE HAS BEEN SET UP TO BE USED AS DIRECTED BY THE ENGINEER AS DESCRIBED IN THE CONSTRUCTION AND MATERIALS SPECIFICATIONS MANUAL 254.04. PATCHING DEPTH IS 0 TO 2 IN.

**UTILITIES:**

LISTED BELOW ARE ALL UTILITIES LOCATED WITHIN THE PROJECT CONSTRUCTION LIMITS TOGETHER WITH THEIR RESPECTIVE OWNERS.

FIBER-OPTIC  
AVON LAKE SCHOOLS  
175 AVON BELDEN ROAD  
AVON LAKE, OH 44012  
440-933-6210

TELEPHONE  
CENTURY TELEPHONE OF OHIO  
1730 WEST 19TH STREET  
LORAIN, OH 44052  
440-244-8330

ELECTRIC  
ILLUMINATING COMPANY  
6896 MILLER ROAD, SUITE 101  
BRECKSVILLE, OH 44141  
440-546-8748

GAS  
COLUMBIA GAS OF OHIO  
7080 FRY ROAD  
MIDDLEBURG HTS., OH 44130  
440-891-2428

CABLE T.V.  
LEVEL 3 COMMUNICATIONS  
1025 ELDORADO BOULEVARD  
BROOMFIELD, CO 80021  
720-888-5254

CABLE T.V.  
COMCAST  
576 TERNES STREET  
ELYRIA, OH 44035  
440-366-0416 EXT. 624

TELECOMMUNICATIONS  
WITEL COMMUNICATIONS  
ONE TECHNOLOGY CENTER  
TULSA, OK 74103  
1-866-945-8351

TELECOMMUNICATIONS  
DOMINION TELECOMMUNICATIONS  
4355 INNSLAKE DRIVE  
GLEN ALLEN, VA 23060  
1-888-854-2138

ELECTRIC  
OHIO EDISON  
6326 LAKE AVENUE  
ELYRIA, OH 44035  
440-326-3257

CABLE T.V.  
ADELPHIA CABLE COMMUNICATIONS  
8385 BAVARIA ROAD  
MACEDONIA, OH 44056  
330-963-3620 EXT 101

EXTREME CAUTION SHOULD BE EXERCISED IN AREAS WITH UTILITIES. SECTIONS 105.07 AND 107.16 OF THE DEPARTMENT OF TRANSPORTATION CONSTRUCTION AND MATERIALS SPECIFICATIONS REQUIRE, AMONG OTHER THINGS, THAT THE CONTRACTOR COOPERATE WITH ALL UTILITIES LOCATED WITHIN THE LIMITS OF THIS CONSTRUCTION PROJECT AND TAKE RESPONSIBILITY FOR THE PROTECTION OF THE UTILITY PROPERTY AND SERVICES.

**ITEM 254. PAVEMENT PLANING. ASPHALT CONCRETE**

THE INTENT OF THE PLANING IS TO MILL 2 INCHES MINIMUM DEPTH AT THE CENTERLINE AND/OR EDGE OF PAVEMENT AND 1/4 INCH MINIMUM DEPTH IN BOTTOM OF WHEEL RUTS. THE PAVEMENT SLOPE MAY VARY BETWEEN 3/16 INCH AND 3/8 INCH PER FOOT, CONTINUOUS FOR PAVEMENT WIDTH. THE MILLING DEPTH SHALL BE CONTROLLED FROM THE CENTER LINE OR EDGE OF PAVEMENT, TO PRODUCE THE LEAST AMOUNT OF MILLING IN CONFORMANCE WITH ABOVE LIMITS. FIELD WORK NECESSARY FOR PROPER CONTROL WITHIN PLAN INTENT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

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

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

THE PROGRESSION OF THE PLANING SHALL PROCEED IN SUCH A MANNER THAT NORMAL TRAFFIC WILL NOT BE REQUIRED TO RUN OVER THE PLANED ROADWAY SURFACE MORE THAN TWENTY-ONE (21) CALENDAR DAYS. THE 21 CALENDAR DAYS SHALL BE CONSIDERED AN INTERIM COMPLETION DATE (SECTION 108) AND FOR EACH CALENDAR DAY BEYOND THE 21 DAYS THAT THE ROADWAY REMAINS EXPOSED TO THE PLANED SURFACE, THE CONTRACTOR WILL BE ASSESSED LIQUIDATED DAMAGES AS PER 108.07. PLANED AREAS WHICH CREATE A LONGITUDINAL JOINT BETWEEN TRAVELED LANES SHALL BE COMPLETED IN SUCH A MANNER SO AS TO REMOVE THE JOINT BEFORE THE END OF EACH DAY'S WORK. BEFORE THIS JOINT IS EXPOSED TO TRAFFIC, THE CONTRACTOR SHALL ERECT OW-171 SIGNS (UNEVEN PAVEMENT). THESE SIGNS SHALL REMAIN ONLY WHEN THE CONDITION EXISTS.

DESIGN FILE: I:\projects\20723\gennotes.dgn  
WORKSTATION: jbantz DATE: 11/25/03

CALCULATED  
CVH  
CHECKED  
M/S

GENERAL NOTES

LOR-6-15.86

**ITEM 446. ASPHALT CONCRETE SURFACE COURSE, TYPE 1, PG 64-22**

IN ADDITION TO ITEM 401.14 AND STANDARD DRAWING BP-3.1, TRANSVERSE, FEATHERED OR BUTT JOINTS SHALL BE SEALED WITH A 6 INCH WIDE BAND OF ASPHALT CEMENT ACROSS THE TOP SURFACE. THE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THIS ITEM.

BEFORE THE LONGITUDINAL JOINT IS EXPOSED TO TRAFFIC, THE CONTRACTOR SHALL ERECT OWP-171 (UNEVEN PAVEMENT) SIGNS. THESE SIGNS SHALL ONLY REMAIN WHILE THE CONDITION EXISTS.

ALL OPEN TRANSVERSE JOINTS SHALL BE TAPERED TO MEET EXISTING PAVEMENT BEFORE INTRODUCING TRAFFIC. A "BUMP" SIGN (OW-62) SHALL BE ERECTED ON EACH SIDE OF TRANSVERSE JOINTS LEFT OPEN OVER NIGHT, INCLUDING A SPEED ADVISORY SIGN, AS DIRECTED BY THE ENGINEER. THESE SIGNS SHALL BE REMOVED IMMEDIATELY AFTER JOINT HAS BEEN CLOSED. PLACEMENT OF SIGNS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THIS ITEM.

**ITEM 448. ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 1, PG 64-22**

THIS ITEM SHALL BE USED FOR CORRECTION OF CROWN, PROFILE AND ANY OTHER IRREGULARITIES.

ALL LONGITUDINAL PAVEMENT JOINTS SHALL BE CLOSED BEFORE THE END OF EACH WORK DAY.

ALL OPEN TRANSVERSE JOINTS SHALL BE TAPERED TO MEET EXISTING PAVEMENT BEFORE INTRODUCING TRAFFIC. A "BUMP" SIGN (OW-62) SHALL BE ERECTED ON EACH SIDE OF TRANSVERSE JOINTS LEFT OPEN OVER NIGHT, INCLUDING A SPEED ADVISORY SIGN, AS DIRECTED BY THE ENGINEER. THESE SIGNS SHALL BE REMOVED IMMEDIATELY AFTER JOINT HAS BEEN CLOSED. PLACEMENT OF SIGNS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THIS ITEM.

**ITEM 604. CASTINGS ADJUSTED TO GRADE**

ANY UNIT OF THIS ITEM MAY BE NON-PERFORMED IF SO DIRECTED BY THE ENGINEER AND THE SURFACE SHALL BE FEATHERED TO MEET THE EXISTING CASTING OR INLET IN A MANNER ACCEPTABLE TO THE ENGINEER. ALL ADJUSTING RINGS SHALL HAVE THE ENGINEER'S APPROVAL BEFORE USING.

UNDER ITEM 604.03, ADJUSTMENT TO GRADE, PARAGRAPH (A), THE CASTING TO BE ADJUSTED MAY OR MAY NOT HAVE AN EXISTING FRAME. THE WORK SHALL CONSIST OF ADJUSTING THE EXISTING CASTING OR GRATE TO THE SATISFACTION OF THE ENGINEER. THE CONTRACTOR IS REMINDED TO FIELD CHECK ALL ADJUSTMENT TO GRADE ITEMS PRIOR TO BIDDING, AS NO ADDITIONAL COMPENSATION WILL BE GRANTED FOR LABOR AND MATERIALS REQUIRED TO SATISFACTORILY ADJUST CASTINGS WITHOUT FRAMES.

**ITEM 614. WORK ZONE MARKING SIGN**

THE FOLLOWING ESTIMATED QUANTITY HAS BEEN CARRIED TO THE GENERAL SUMMARY FOR USE AS DIRECTED BY THE ENGINEER FOR TEMPORARY WORK ZONE MARKING SIGNS PER THE REQUIREMENTS OF THE CONSTRUCTION AND MATERIALS SPECIFICATIONS, 614.04.

**PART A**

WORK ZONE MARKING SIGN: (OW-167-36) NO EDGE LINE	=	12	EACH
WORK ZONE MARKING SIGN: (R-33-24) DO NOT PASS	=	12	EACH
WORK ZONE MARKING SIGN: PASS WITH CARE	=	11	EACH
TOTAL = 33 EACH			

**PART B**

WORK ZONE MARKING SIGN: (OW-167-36) NO EDGE LINE	=	6	EACH
WORK ZONE MARKING SIGN: (R-33-24) DO NOT PASS	=	10	EACH
TOTAL = 16 EACH			

**ITEM 617. COMPACTED AGGREGATE, TYPE A, AS PER PLAN**

THIS ITEM OF WORK SHALL CONFORM TO ITEM 617 IN THE CONSTRUCTION AND MATERIALS SPECIFICATIONS BOOK WITH EXCEPTION OF 617.02 (MATERIALS).

THE MATERIAL ON THIS PROJECT SHALL BE THE ASPHALT CONCRETE GRINDINGS RESULTING FROM ITEM 254. THE GRINDINGS USED FOR THIS WORK ARE TO BE PLACED AND COMPACTED AS DESCRIBED IN 617.05 WITH SPECIAL CARE TO CREATE PROPER COMPACTION. 100% OF THIS MATERIAL SHALL PASS A 1.5 INCH SIEVE AS JUDGED BY THE ENGINEER. THE CONTRACTOR SHALL TAKE SPECIAL CARE TO MEET THE TYPICAL SECTIONS SHOWN IN THE PLANS AND AS DIRECTED BY THE ENGINEER.

PAYMENT FOR ALL THE ABOVE SHALL BE INCLUDED IN THE UNIT PRICE BID PER CU. YD. OF ITEM 617 COMPACTED AGGREGATE, TYPE A, AS PER PLAN.

**BRIDGE LOCATION MARKER SIGN**

THE BRIDGE LOCATION MARKER SIGN INDICATES THE COUNTY, THE ROUTE, AND THE STRAIGHT LINE MILEAGE OF THE STRUCTURE. THE CONTRACTOR SHALL REMOVE THE EXISTING BRIDGE LOCATION MARKER SIGNS AND REERECT THE SIGNS IN KIND. IF THERE ARE ANY QUESTIONS ON THE LOCATION, PLEASE CONTACT THE DISTRICT BRIDGE ENGINEER.

ALL COSTS, INCLUDING THE SIGN REMOVAL, SIGN RE-ERECTION, POST REMOVAL, AND POST INSTALLATION SHALL BE INCLUDED IN THE FOLLOWING PAY ITEMS:

**PART A**

ITEM 630 GROUND MOUNTED SUPPORT, NO.2, POST	37.5 FT.
ITEM 630 REMOVAL OF GROUND MOUNTED SIGN AND REERECTION	5 EACH

**PART B**

ITEM 630 GROUND MOUNTED SUPPORT, NO.2, POST	7.5 FT.
ITEM 630 REMOVAL OF GROUND MOUNTED SIGN AND REERECTION	1 EACH

**ITEM 407. TACK COAT  
ITEM 407. TACK COAT FOR INTERMEDIATE COURSE**

AS PER 407.06 THE APPLICATION RATES SHALL BE 0.08 GAL. PER SQ. YD. PRIOR TO THE LEVELING COURSE AND SHALL BE 0.03 GAL PER SQ. YD. PRIOR TO THE SURFACE COURSE FOR ESTIMATING PURPOSES ONLY. THE RATE OF APPLICATION SHALL BE SUBJECT TO ADJUSTMENT AS DIRECTED BY THE ENGINEER. A COMPLETE PAVEMENT SURFACE COVERAGE SHALL BE REQUIRED. AREAS OF TACK STRIPPED BY CONSTRUCTION EQUIPMENT OR TRAFFIC SHALL BE RE-COATED PRIOR TO PLACING ASPHALT CONCRETE. ALL COST AS DESCRIBED ABOVE SHALL BE INCLUDED IN THE UNIT PRICE BID PER GALLON FOR ITEM 407, TACK COAT AND ITEM 407 TACK COAT FOR INTERMEDIATE COURSE.

**CONTRACTORS WORK SCHEDULE  
COOPERATION OF CONTRACTORS**

DUE TO THE CITY OF AVON LAKE'S MAJOR SEWER SEPERATION PROJECT ON SR 83 AND SOME OF ITS TRIBUTARY STREETS, THE CONTRACTOR CANNOT START WORK ON SR 83 UNTIL AUGUST 1, 2004. THE CONTRACTOR CANNOT START WORK ON US 6 FROM SR 83 TO THE CUYAHOGA COUNTY LINE UNTIL AUGUST 1, 2004 DUE TO SEWER CONSTRUCTION BY ANOTHER CONTRACTOR. WORK ON US 6 WEST OF SR 83 CAN BEGIN AFTER JUNE 1, 2004. HOWEVER, COORDINATION OF WORK BETWEEN CONTRACTORS IS THE RESPONSIBILITY OF THE CONTRACTOR.

**ITEM 614. ASPHALT CONCRETE FOR MAINTAINING TRAFFIC**

THE FOLLOWING ESTIMATED QUANTITY HAS BEEN CARRIED TO THE GENERAL SUMMARY TO CONSTRUCT A TEMPORARY ASPHALT WEDGE FROM THE EXISTING PAVEMENT TO THE PLANED SURFACE AT BUTT JOINTS AND OTHER LOCATIONS THAT RESULT IN A DROP-OFF IN EXCESS OF 1.5 INCHES, AS DIRECTED BY THE ENGINEER. THIS QUANTITY SHALL ALSO BE USED AT PLANED SURFACES WHERE A TEMPORARY ASPHALT WEDGE IS NEEDED AROUND CASTINGS, AS DIRECTED BY THE ENGINEER.

100 CU. YD. ITEM 614, ASPHALT CONCRETE FOR MAINTAINING TRAFFIC

**COORDINATION OF ASPHALT PLANING/PAVING OPERATIONS WITH LOOP DETECTOR REPLACEMENT**

DURING THE COURSE OF THE CONTRACT IT MAY BE NECESSARY FOR THE CONTRACTOR TO REPLACE THE EXISTING LOOP DETECTORS. THE INTENT IS TO REPLACE LOOP DETECTORS DAMAGED OR REMOVED BY ASPHALT PLANING OPERATIONS PRIOR TO RESURFACING COURSES. THE INTERSECTIONS INVOLVED ARE AS FOLLOWS:

- US 6 AND MILLER RD. 1-6'X30.5'
- US 6 AND MOORE RD. 1-6'X30.5' 1-7'X30'
- SR 83 AND WALKER LAKE RD. 2-8'X12'X30' 4-8'X30'

PAYMENT FOR ALL THE ABOVE SHALL BE INCLUDED IN THE UNIT PRICE BID PER EACH OF ITEM 632 DETECTOR LOOP

**ITEM 253. PAVEMENT REPAIR:**

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

THE ENGINEER SHALL DESIGNATE THE LOCATIONS AND LIMITS OF THE AREAS TO BE REPAIRED. PAVEMENT REPAIR SHALL BE PERFORMED AFTER PAVEMENT PLANING. THE REPAIR AREAS SHALL BE ROUGHLY RECTANGULAR IN SHAPE AND CUT OR SAWED TO A NEAT LINE. THE PAVEMENT SHALL BE REMOVED WITHIN THE DESIGNATED AREAS BY METHODS WHICH WILL NOT DAMAGE THE ADJACENT PAVEMENT. THE DEPTH OF REMOVAL, AS DIRECTED BY THE ENGINEER, SHALL BE SUFFICIENT TO REMOVE ALL DETERIORATED PAVEMENT (ESTIMATED DEPTH MAY VARY FROM 2 IN. TO 12 IN.). THE MATERIALS SO REMOVED SHALL BE DISPOSED OF IN ACCORDANCE WITH 105.16 AND 105.17.

REPLACEMENT MATERIAL SHALL BE ITEM 301 OR ITEM 448, TYPE 2 MATERIAL AND SHALL BE PLACED AND COMPACTED TO FINISH FLUSH WITH THE ADJACENT PAVEMENT SURFACE. THE REPAIR AREAS SHALL BE PAINTED WITH ASPHALT MATERIAL (SIDES AND BOTTOM) AT AN APPLICATION RATE OF 0.25 GAL. PER SQ.YD. ALL COMPACTION SHALL BE ACHIEVED BY MECHANICAL METHODS TO THE SATISFACTION OF THE ENGINEER. MAXIMUM LIFT THICKNESS SHALL BE 3 IN.

PAYMENT SHALL INCLUDE ALL LABOR, EQUIPMENT AND MATERIALS NECESSARY TO COMPLETE THE PAVEMENT REPAIR. THE FOLLOWING ESTIMATED QUANTITY IS PROVIDED IN THE GENERAL SUMMARY TO LOR-6-15.86 BE USED AS DIRECTED BY THE ENGINEER. PAYMENT WILL BE MADE AT THE UNIT BID PRICE PER CUBIC YARD, (BY TICKET WEIGHT CONVERSION), OF ITEM 253, PAVEMENT REPAIR.

EXACT LOCATIONS WILL BE PROVIDED AT THE PRECONSTRUCTION MEETING.

275 CU.YD - PART B

DESIGN FILE: \$\$\$\$.DGNFILESPECIFICATIONS\$\$\$\$  
WORKSTATION: #TERMINAL# DATE: ####DATE####

**ITEM SPECIAL. MAILBOX SUPPORT SYSTEM**

THIS ITEM OF WORK SHALL CONSIST OF THE REMOVAL OF EXISTING NON-STANDARD MAILBOX SUPPORTS AND FURNISHING AND ERECTING MAILBOX SUPPORTS AND ANY ASSOCIATED HARDWARE IN ACCORDANCE WITH THE DETAILS SHOWN, AND ATTACHING AN OWNER SUPPLIED MAILBOX, AT LOCATIONS DETERMINED BY THE ENGINEER.

IN ABSENCE OF A NEW BOX SUPPLIED BY THE OWNER THE CONTRACTOR SHALL SALVAGE THE EXISTING BOX AND PLACE IT ON THE NEW SUPPORT. DUE CARE SHALL BE EXERCISED IN SUCH AN OPERATION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING OR REPLACING ANY BOX DAMAGED BY IMPROPER HANDLING, AS JUDGED AND DIRECTED BY THE ENGINEER.

THE BOX SHALL BE SECURELY AND NEATLY ATTACHED BY THE CONTRACTOR TO THE NEW SUPPORT. THE CONTRACTOR SHALL SUPPLY ALL NECESSARY ATTACHMENT HARDWARE (NUTS, BOLTS, PLATES, SPACERS AND WASHERS) AS NECESSARY TO ACCOMMODATE THE COMPLETE INSTALLATION. SUPPORT HARDWARE SHALL ACCOMMODATE EITHER A SINGLE OR A DOUBLE MAILBOX INSTALLATION, AND NO MORE THAN TWO MAILBOXES MAY BE MOUNTED ON A SINGLE POST. [HARDWARE SHALL BE COMMERCIAL GRADE GALVANIZED STEEL.]

WOOD POSTS SHALL BE NOMINAL 4 IN. x 4 IN. (S4S) OR 4 1/2 IN. DIAMETER ROUND, AND CONFORM TO 710J4. STEEL POSTS SHALL BE NOMINAL PIPE SIZE 2 IN. I.D., AND CONFORM TO AASHTO M 181.

POSTS SHALL BE SET AS PER THE FIRST PARAGRAPH OF 606.03, AND SHALL IN NO INSTANCE BE ENCASED IN CONCRETE.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WORK WITH THE LOCAL POST MASTER AND NOTIFYING THE PROPERTY OWNERS PRIOR TO WORK.

GROUP MAILBOX SUPPORTS SHALL BE PLACED ON 3 FT. CENTERS AND THE TURNOUT LENGTHENED TO ACCOMMODATE THE GROUPING.

WHERE GUARDRAIL EXISTS, MAILBOXES AND THEIR SUPPORTS SHALL BE PLACED BEHIND THE GUARDRAIL. SUPPORTS MUST STILL MEET THE BREAKAWAY REQUIREMENTS LISTED ABOVE.

THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN CARRIED TO THE GENERAL SUMMARY TO BE USED AS DESCRIBED ABOVE.

ITEM SPECIAL-MAILBOX SUPPORT SYSTEM, SINGLE PART A - 4 EACH

ITEM SPECIAL-MAILBOX SUPPORT SYSTEM, DOUBLE PART A - 3 EACH

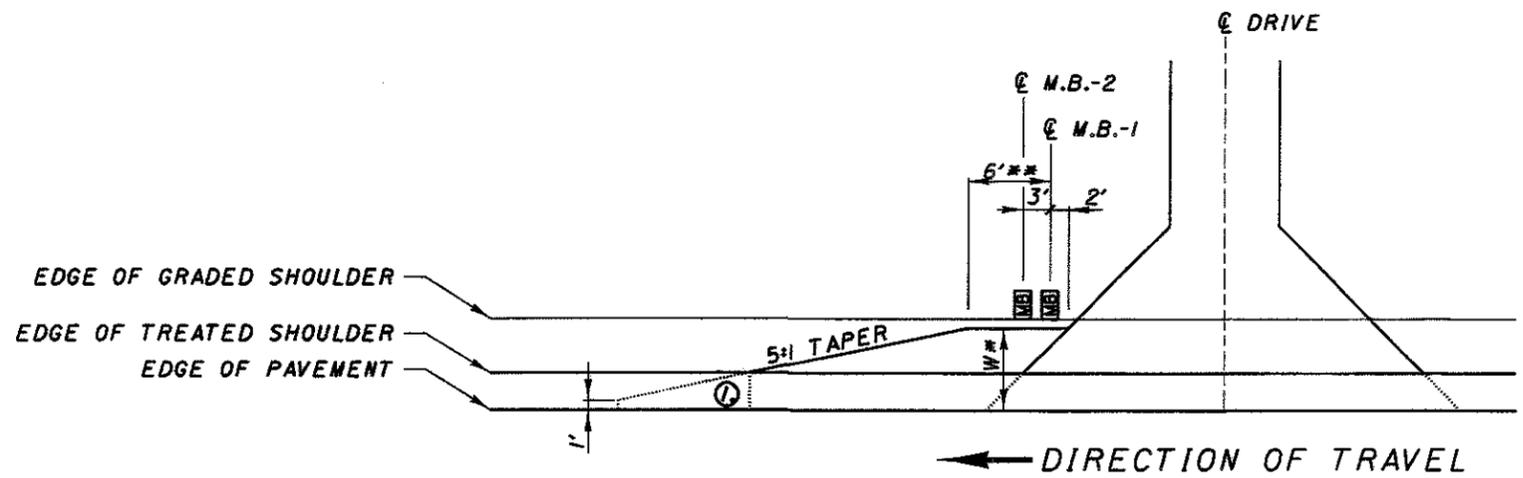
**MAILBOXES**

THE EXISTING AGGREGATE MAILBOX APPROACHES SHALL BE PAVED WITH X 0.75 IN. OF ITEM 448 INTERMEDIATE COURSE AND 1.25 IN. OF ITEM 446 SURFACE COURSE. THEY SHALL CONFORM AS MUCH AS PRACTICAL TO STANDARD DRAWING BP-4J OR AS DIRECTED BY THE ENGINEER.

GRADING SHALL BE PERFORMED IN THESE AREAS TO OBTAIN A BASE WHICH WILL ALLOW THE FINISHED GRADE TO BE FLUSH WITH ADJACENT PAVEMENT. A QUANTITY OF ITEM 617 SHOULDER RECONDITIONING, MISC.: COMPACTED AGGREGATE HAS BEEN PROVIDED FOR AREAS WHERE THE SHOULDER IS LOW PRIOR TO GRADING AND/OR LOW AREAS CAUSED BY THE REMOVAL OF UNSUITABLE MATERIAL. QUANTITIES TO PERFORM THIS WORK HAVE BEEN INCLUDED IN THE GENERAL SUMMARY AND ARE ESTIMATED AS FOLLOWS.

ITEM 209, GRADING MAILBOX APPROACHES: PART A - 448 EACH

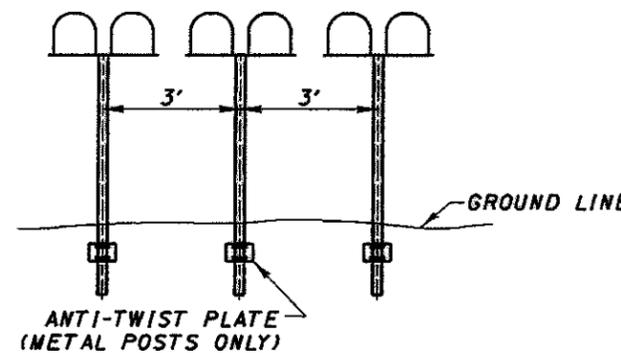
ITEM 617, COMPACTED AGGREGATE, TYPE A, AS PER PLAN PART A - 448 CU. YD.



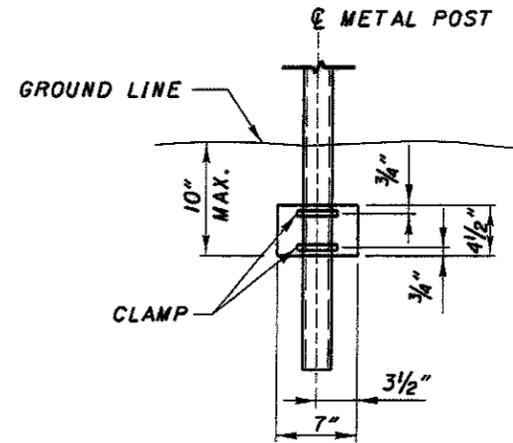
① END MAILBOX TURNOUT AT EDGE OF TREATED SHOULDER OR 1' WHICH EVER IS GREATER.

\* WHERE MAILBOX POSTS ARE BEHIND GUARDRAIL, TURNOUT WIDTH SHALL EXTEND TO FACE OF GUARDRAIL. WHERE NO GUARDRAIL IS REQUIRED, TURNOUT WIDTH SHALL BE 6 FT. MINIMUM, EXCEPT WHERE FIELD CONDITIONS WILL NOT PERMIT.

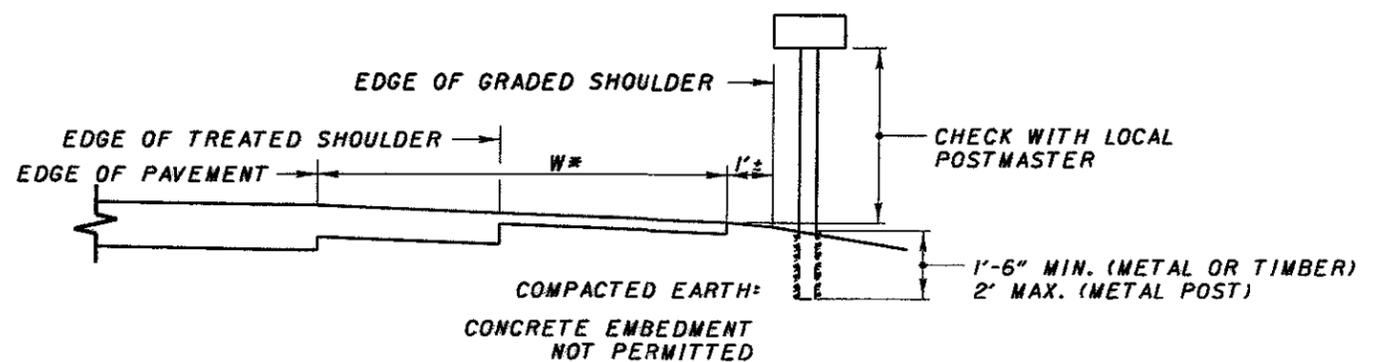
\*\* 6' FOR SINGLE MAILBOX SUPPORT, ADD 3 FT. FOR EACH ADDITIONAL MAILBOX



GROUP MAILBOX INSTALLATION



ANTI-TWIST PLATE



CROSS SECTION / ELEVATION VIEW

FOR DETAILS NOT SHOWN, SEE STANDARD CONSTRUCTION DRAWING BP-4J

DESIGN FILE: i:\projects\20723\mailbox.dgn  
 WORKSTATION: cvanhorn DATE: 11/19/03

CALCULATED  
 CHECKED

MAILBOX FACILITIES

LOR-6-15.86

BRIDGE NUMBER LOR-83-2129 SFN 4704320

ITEM	EXTENSION	QUANTITY	UNIT	DESCRIPTION
512	33010	35	SQ. YD.	TYPE 3 WATERPROOFING
864	10100	9	SQ. YD.	SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)

DESIGN FILE: I:\projects\20723\Struct\strsum.dgn  
 WORKSTATION: dmollens DATE: 11/19/03

DESIGNED dm CHECKED CAL	DRAWN dm	REVIEWED RON	DATE 11/03	DISTRICT THREE
		STRUCTURAL FILE NUMBER		
STRUCTURE SUMMARY				LOR-6-15.86
12				15

BRIDGE DECK DATA							ROADWAY DATA			
PART	COUNTY, ROUTE, BRIDGE NO.	STRUCTURE TYPE	LENGTH (BRIDGE LIMITS)	WIDTH	BRIDGE DECK AREA		EXISTING WEARING SURFACE		EXISTING PAVEMENT WIDTH	
			FT.	FT.	SQ.YD.				FT.	
A	* LOR-6-1642	CEI RAILROAD OVERPASS								
A	* LOR-6-1644	CONVEYOR BELT OVERPASS								
A	** LOR-6-1663	CONCRETE ARCH					ASPHALT			
A	** LOR-6-1848	3-SIDED CONCRETE CULVERT					ASPHALT			
A	** LOR-6-1917	3-SIDED CONCRETE CULVERT					ASPHALT			
B	*** LOR-83-2129	SINGLE-SPAN CONCRETE SLAB	12.0	26.0	35		ASPHALT			

- \* NO STRUCTURE WORK. (SEE ROADWAY PLANS FOR PLANING QUANTITIES UNDER STRUCTURE)
- \*\* NO STRUCTURE WORK. (SEE ROADWAY PLANS FOR PLANING QUANTITIES OVER STRUCTURE)
- \*\*\* SEE DETAILS IN PLAN FOR STRUCTURE WORK. (SEE ROADWAY PLANS FOR PLANING QUANTITIES OVER STRUCTURE)

DESIGN AGENCY: DISTRICT THREE  
 DATE: 11/03  
 REVIEWED: RDN  
 DRAWN: DCM  
 DESIGNED: DCM  
 CHECKED: CAL  
 REVISION: STRUCTURAL FILE NUMBER  
 BRIDGE TREATMENT  
 LOR-6-15.86  
 13  
 15



**STRUCTURE GENERAL NOTES**

**REFERENCES SHALL BE MADE TO STANDARD DRAWINGS:**

MT-97.10 DATED 4/19/02

**REFERENCES SHALL BE MADE TO SUPPLEMENTAL SPECIFICATIONS:**

864 DATED 7/11/00

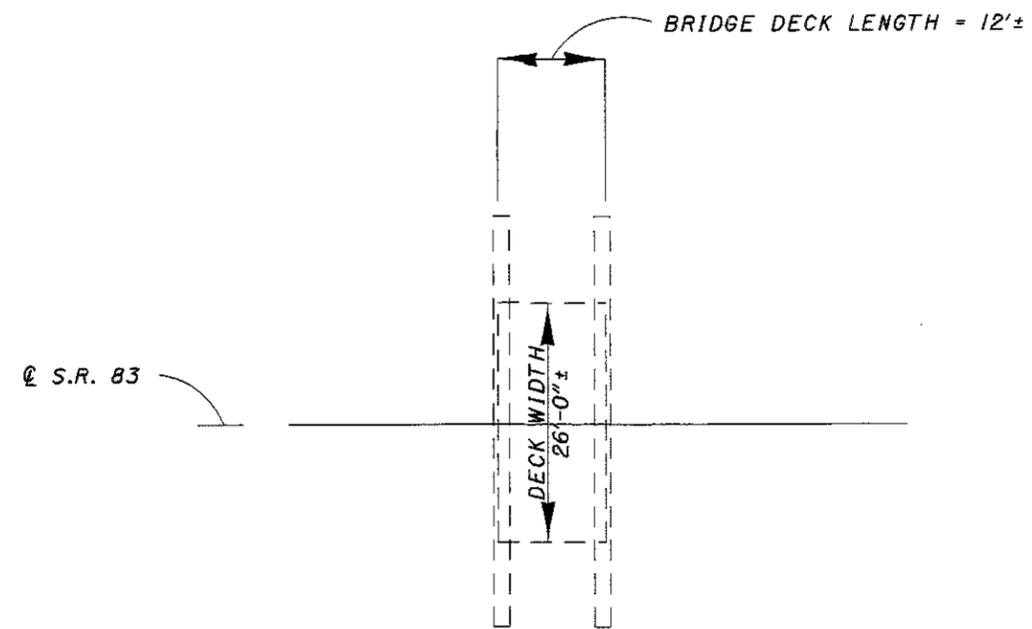
**DESIGN SPECIFICATIONS:**

THIS STRUCTURE CONFORMS TO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 2002, AND THE ODOT BRIDGE DESIGN MANUAL.

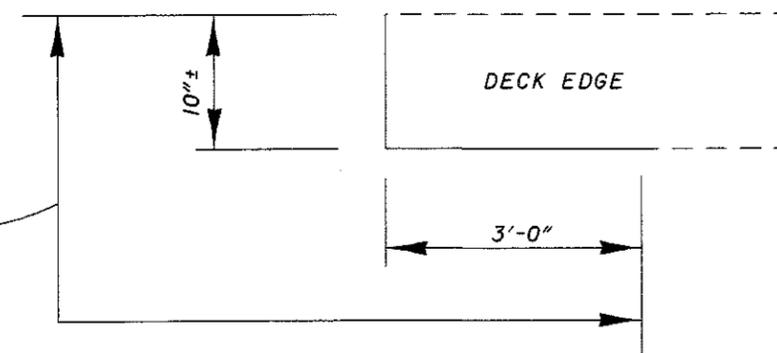
**EXISTING STRUCTURE VERIFICATION:**

DETAILS AND DIMENSIONS SHOWN ON THESE PLANS PERTAINING TO THE EXISTING STRUCTURE HAVE BEEN OBTAINED FROM FIELD OBSERVATIONS AND MEASUREMENTS. CONSEQUENTLY, THEY ARE INDICATIVE OF THE EXISTING STRUCTURE AND THE PROPOSED WORK BUT THEY SHALL BE CONSIDERED TENTATIVE AND APPROXIMATE. THE CONTRACTOR IS REFERRED TO 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 STRUCTURE BY THE CONTRACTOR. HOWEVER, ALL PROJECT WORK SHALL BE BASED ON ACTUAL DETAILS AND DIMENSIONS WHICH HAVE BEEN VERIFIED BY THE CONTRACTOR IN THE FIELD.



**PLAN VIEW**



**TYPICAL DECK EDGE VIEW**

ITEM 864 - SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)

**NOTES:**

- 1) THE DECK SHALL BE PLANED 2" DEEP AND A TYPE 3 WATERPROOFING PLACED ON TOP OF THE REMAINING ASPHALT AND THEN REPAVED WITH BOTH COURSES OF ASPHALT. (SEE ROADWAY PLANS FOR PLANING AND ASPHALT QUANTITIES)
- 2) THE EXISTING APPROACH RAIL AND BRIDGE RAIL ARE NOT SHOWN.

ITEM	QUANTITY	UNIT	DESCRIPTION
512	35	SQ.YD.	TYPE 3 WATERPROOFING
864	9	SQ.YD.	SEALING OF CONCRETE SURFACES (EPOXY-URETHANE)

ALL QUANTITIES CARRIED TO STRUCTURE SUMMARY SHEET NO. 12

DESIGN FILE: I:\projects\20723\STRUCTURE\detail.dgn  
 WORKSTATION: dmaliens DATE: 11/19/03

DISTRICT THREE

DATE 1/1/03  
 RDN 4704320  
 STRUCTURE FILE NUMBER

DRAWN DCM  
 CHECKED CAL  
 DESIGNED DCM

PLAN VIEW  
 LOR-83-2129  
 OVER HEIDER DITCH

LOR 6-15.86

14  
15

# AUXILIARY & LONG LINE MARKINGS

PART	COUNTY	ROUTE	FROM		TO		LANE WIDTH ft	642, TYPE 2					642, TYPE 2												614							
								WHITE EDGE LINE		YELLOW EDGE LINE		LANE LINE	CENTER LINE		AUXILIARY MARKINGS (740.02)												WORK ZONE CENTER LINE, CLASS II, 642 PAINT	WORK ZONE LANE LINE, CLASS II, 642 PAINT	WORK ZONE CHANNELIZING LINE, CLASS I, 642 PAINT			
								HIGHWAY Miles	TOTAL (PAY QUANT.)	HIGHWAY Miles	TOTAL (PAY QUANT.)		SOLID LINE EQUIVALENT	TOTAL (PAY QUANT.)	CHANNELIZING LINE	STOP LINE	CROSSWALK LINE	TRANSVERSE LINE	RAILROAD SYMBOL MARKING	SCHOOL SYMBOL MARKING		BIKE LANE SYMBOL MARKING	LANE ARROW							WORD ON PAVEMENT		HANDICAP SYMBOL MARKING
								8 in	24 in	12 in	24 in	each	72 in	96 in	72 in	LEFT	RIGHT	THRU	COMBINATION	72 in	96 in	each	each	each	each	each	each	each	each	each	each	each
A	LORAIN	US 6	15.86	AVON LAKE W. CORP LIMIT	21.23	CUYAHOGA CO. LINE	•	5.37	20.88			0.45	10.74	5.37	180	101	159						41	15				15		16.11	1.35	540
B	LORAIN	SR 83	19.31	AVON LAKE S. CORP LIMIT	20.28	S. OF WALKER RD.	•	0.97	1.94				1.98	0.99	165	12		108	1											2.91		495
B	LORAIN	SR 83	20.65	N. OF WALKER RD.	21.71	US 6	•	1.06	2.30				2.12	1.06	158	75	490	168			2	2	2				2		3.18		474	
									25.12			0.45	7.42	503	188	1649	276	1	2	43	21	2	6		17		22.20	1.35	1509			

\* SEE PAVEMENT MARKING DETAIL SHEETS SUPPLIED AT THE PRECONSTRUCTION MEETING

PART	COUNTY	ROUTE	FROM		TO		LANE WIDTH ft	642 (644 ALTERNATE BID)					642 (644 ALTERNATE BID)												614													
								WHITE EDGE LINE		YELLOW EDGE LINE		LANE LINE	CENTER LINE		AUXILIARY MARKINGS (740.04)												WORK ZONE CENTER LINE, CLASS II, 642 PAINT	WORK ZONE LANE LINE, CLASS II, 642 PAINT	WORK ZONE CHANNELIZING LINE, CLASS I, 642 PAINT									
								HIGHWAY Miles	TOTAL (PAY QUANT.)	HIGHWAY Miles	TOTAL (PAY QUANT.)		SOLID LINE EQUIVALENT	TOTAL (PAY QUANT.)	CHANNELIZING LINE	STOP LINE	CROSSWALK LINE	TRANSVERSE LINE	RAILROAD SYMBOL MARKING	SCHOOL SYMBOL MARKING		PARKING LOT STALL MARKING	LANE ARROW							WORD ON PAVEMENT		ISLAND MARKING						
								8 in	24 in	12 in	24 in	each	72 in	96 in	each	each	each	each	each	each	each	each	each	each	each	each	each	each	each	each	each	each	each	each	each			
B	LORAIN	SR 83	20.28	S. OF WALKER RD.	20.65	N. OF WALKER RD.	•	0.37	0.74			0.06	0.92	0.46	1765	85	598	426											10	7	7		18		120	1.38	0.18	5295

\* SEE PAVEMENT MARKING DETAIL SHEETS SUPPLIED AT THE PRECONSTRUCTION MEETING



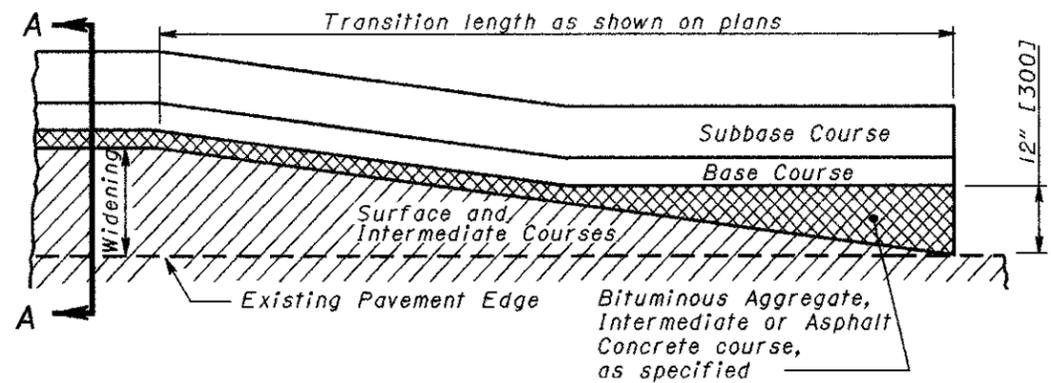
BIKE LANE SYMBOL

PAVEMENT MARKING INFORMATION

LOR-6-15.86

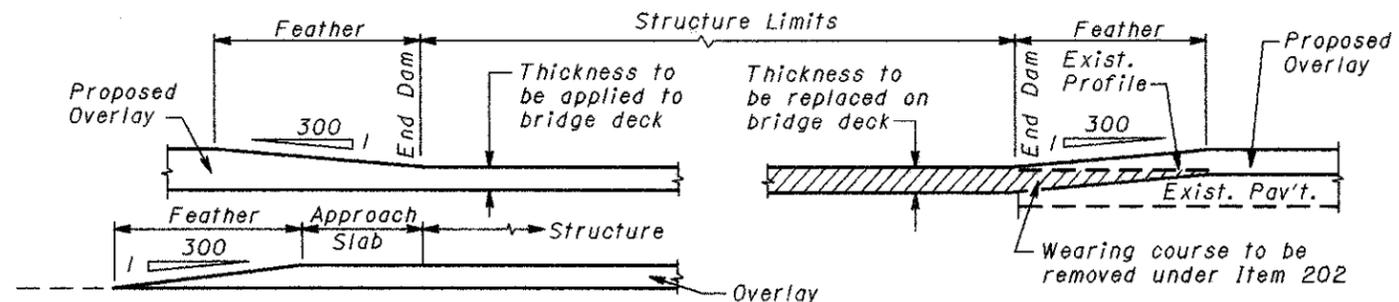
15  
15

CVH checked MJS



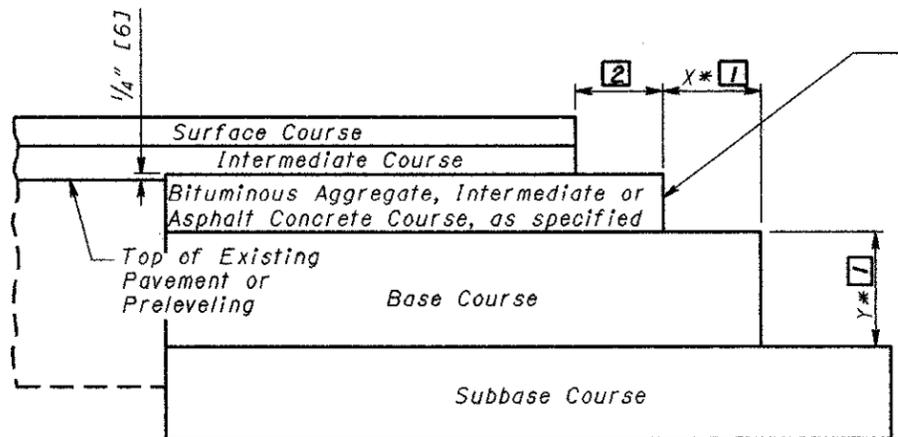
PLAN

MERGING EDGE OF PAVEMENT WIDENING WITH EDGE OF EXISTING PAVEMENT



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



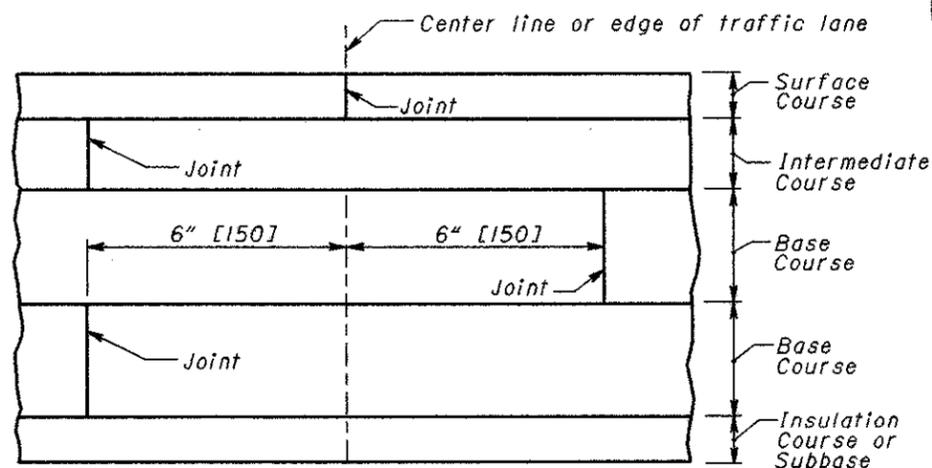
SECTION A-A

COURSE DETAIL FOR WIDENING

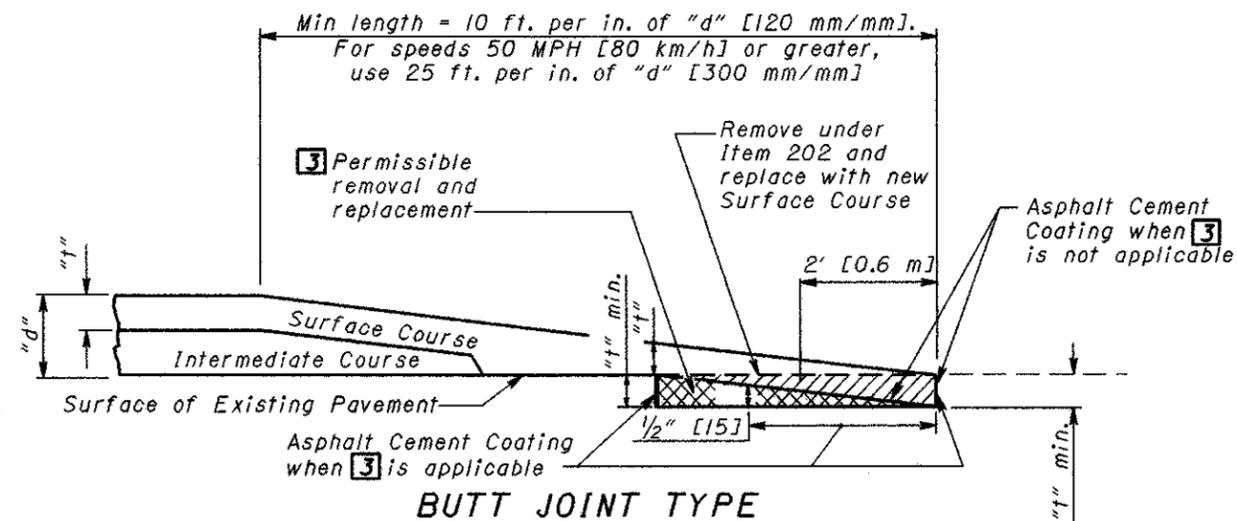
The Bituminous Aggregate in the upper part of the base widening shall finish approximately 1/4" [6] above the edge of the existing pavement where no preleveling is used. Where a preleveling (using intermediate course material) is specified it shall be placed prior to excavation of the widening trench and the upper course of the base widening shall finish approximately 1/4" [6] above the preleveling.

LEGEND

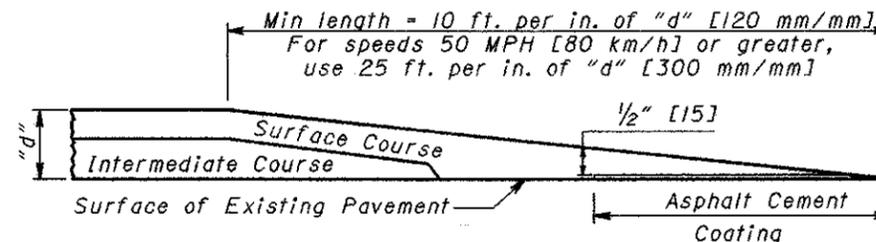
- 1 The extended width (X) of a base or subbase course shall be equal to the depth (Y) of that particular course, unless otherwise specified in the plans.
- 2 The extended width shall be equal to the thickness of the surface course plus the intermediate course, or 4 inches [100], whichever is greater.



LAPPING LONGITUDINAL JOINTS



BUTT JOINT TYPE



TAPER EDGE TYPE

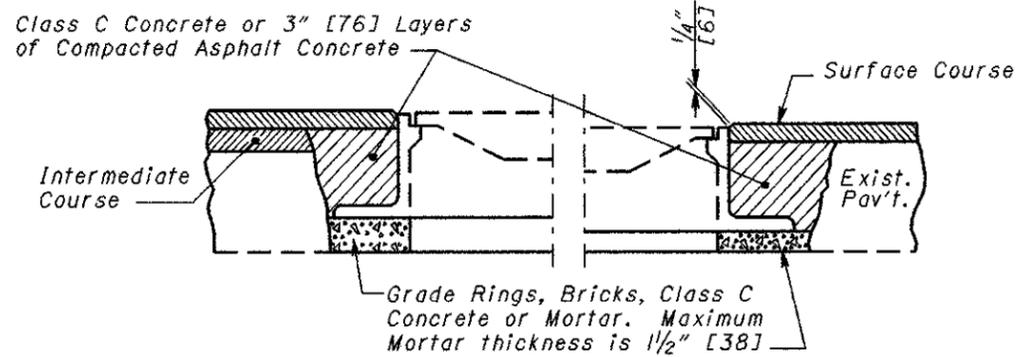
NOTE: Either butt or taper type may be used unless type is specified by the plan.

PLACING FEATHERED AREAS

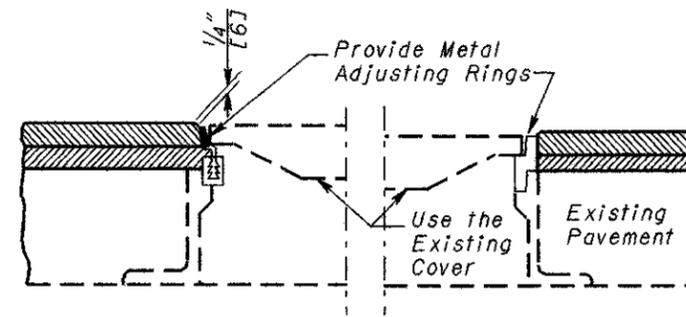
Values for "t" and "d" are obtained from the plan.

THIS DRAWING REPLACES BP-3.1M DATED 10-28-94.

REVISED	DATE	DRAWN	DATE	OHLIO DEPARTMENT OF TRANSPORTATION
STDS. ENGR.	M. EVANS	DRAWN	D. FOCKE	ROADWAY DESIGN ENGINEER
ROADWAY ENGINEERING SERVICES				
RESURFACING				
NUMBER	BP-3.1			
1	2			



USING CONCRETE OR MORTAR



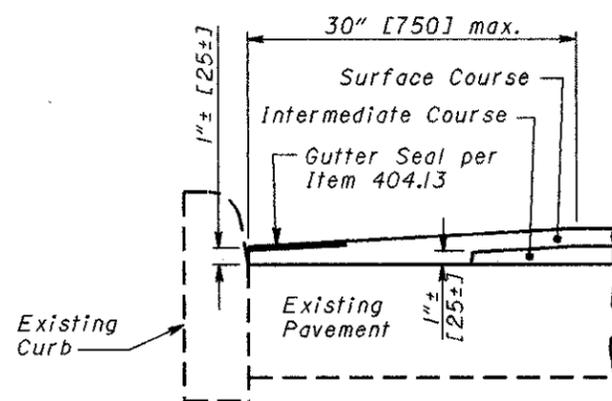
USING METAL ADJUSTING RINGS

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.

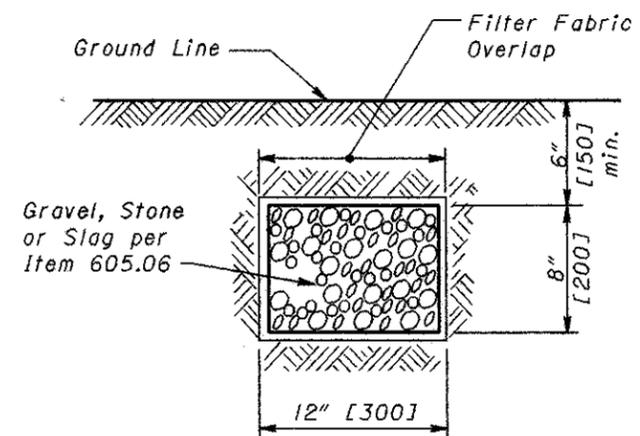
In addition, the adjusting ring type shall be a design acceptable to the local governmental agency responsible for street and sewer maintenance. Any installation unacceptable to the Engineer shall be replaced by the Contractor at his expense.

MANHOLES ADJUSTED TO GRADE



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

GUTTER FINISH



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

AGGREGATE DRAIN

THIS DRAWING REPLACES BP-3.1M DATED 10-28-94.

STANDARD ROADWAY CONSTRUCTION DRAWING

RESURFACING

NUMBER  
BP-3.1

2/2

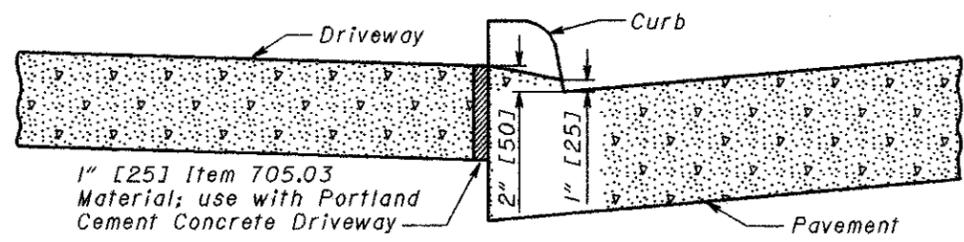
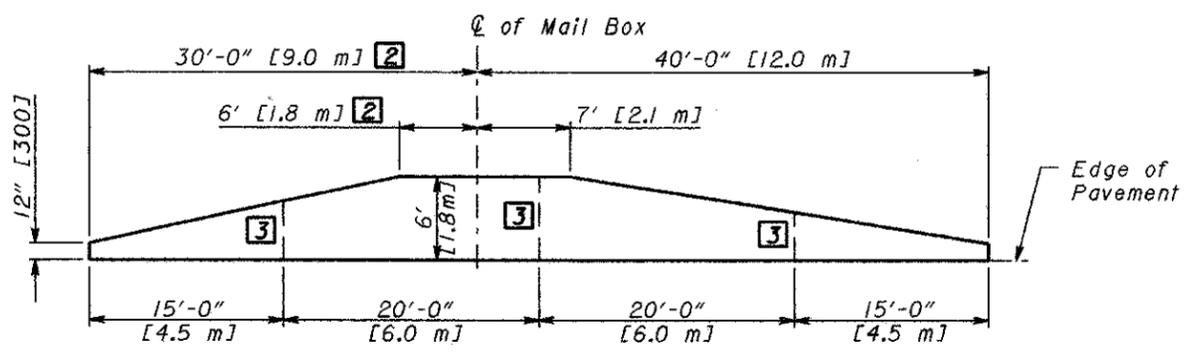
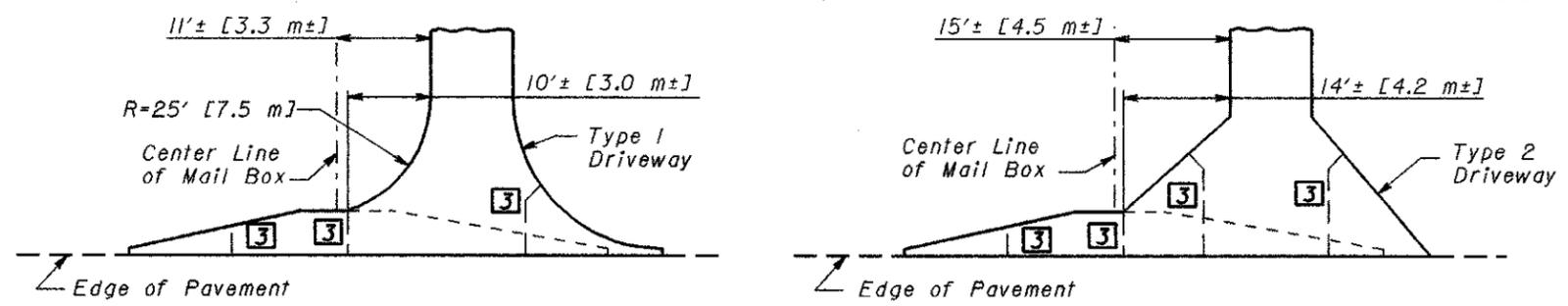
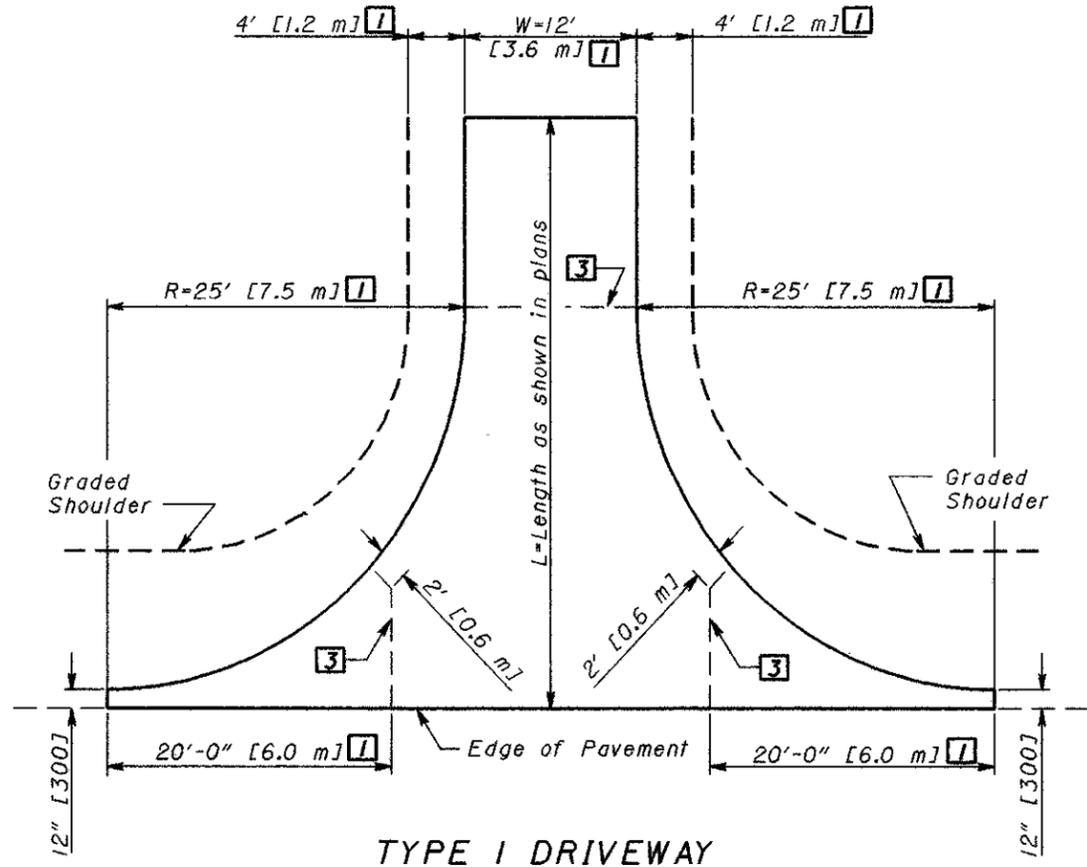
All metric dimensions (in brackets [ ]) are in millimeters unless otherwise noted.

STDS. ENGR.  
M. EVANS  
DRAWN  
D. Focke

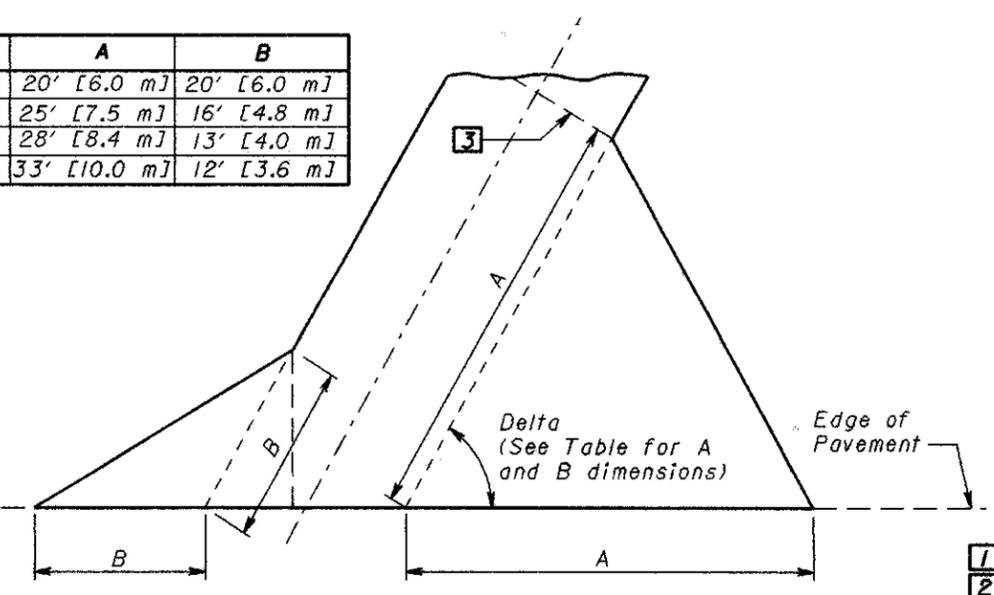
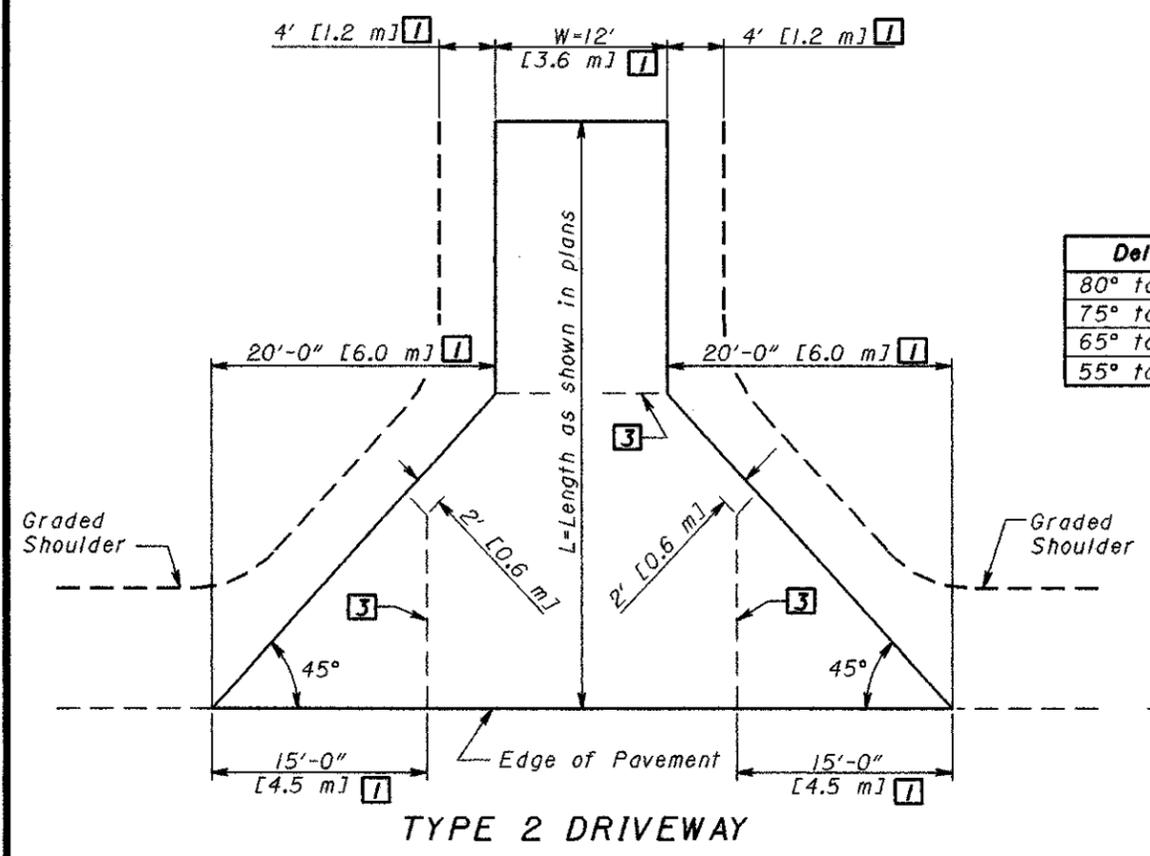
REVISIONS

DATE  
10-28-00  
ROADWAY DESIGN ENGINEER  
Ken T. Siskind

DEPARTMENT OF TRANSPORTATION



Delta	A	B
80° to 90°	20' [6.0 m]	20' [6.0 m]
75° to 85°	25' [7.5 m]	16' [4.8 m]
65° to 75°	28' [8.4 m]	13' [4.0 m]
55° to 65°	33' [10.0 m]	12' [3.6 m]



**NOTES**

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

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

Driveway and mail box approaches shall be combined when feasible.

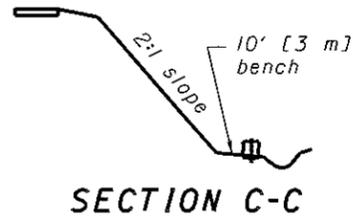
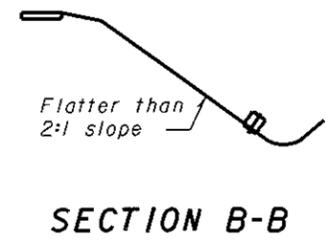
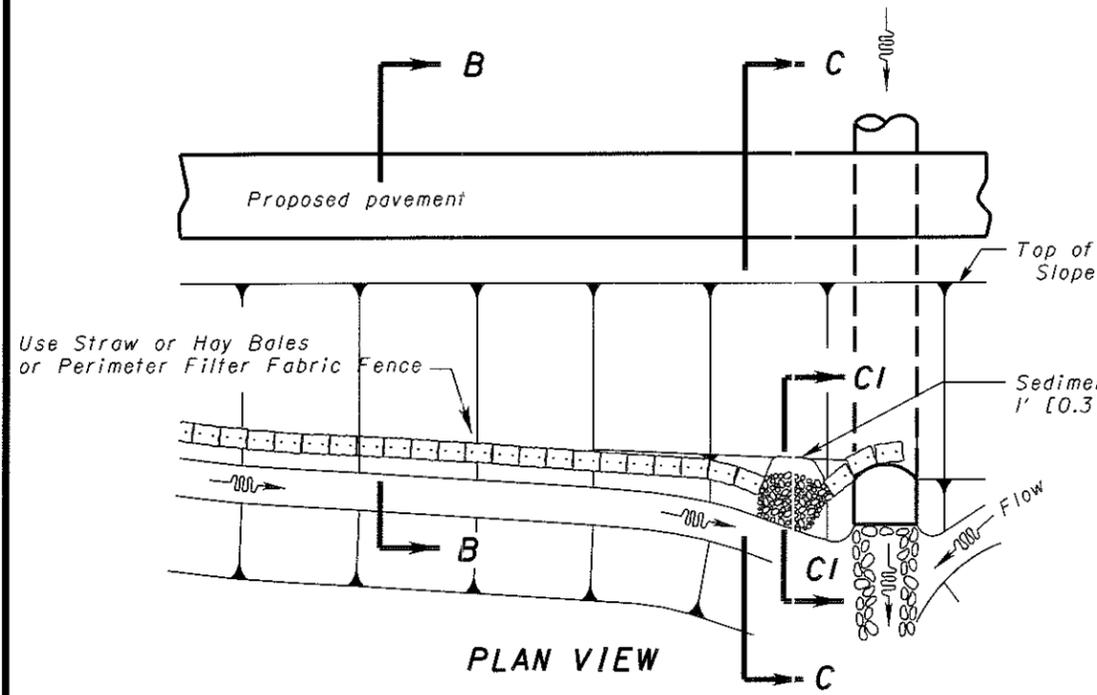
**JOINTS:** Impressed joints for portland cement concrete driveways shall be 1/4" [6] minimum width by 3"± [75±] depth and shall be sealed with Item 705.04 or ASTM D 1850.

In addition to the joints shown here, impressed joints without tie bars shall be placed in portland cement concrete driveways at intervals not to exceed 17' [5.2 m] in the portion of the driveway beyond the flare.

**LEGEND**

- 1 Unless otherwise shown in the plans.
- 2 Add 3' [0.9 m] for each additional Mail Box
- 3 Impressed Joint without Tie Bars for Portland Cement Surface

THIS DRAWING REPLACES BP-4.1M DATED 10-28-94.  
 STANDARD ROADWAY CONSTRUCTION DRAWING  
 ROADWAY ENGINEERING SERVICES  
 DEPARTMENT OF TRANSPORTATION  
 REVISIONS  
 STDS. EMGR. M. EVANS  
 DRAWN D. FOCKE  
 DATE  
 10-28-00  
 ROADWAY DESIGN ENGINEER



BALE FILTER DIKE

NOTES

**MATERIAL:** Furnish straw or hay bales. Use 30" [0.8 m] long 2"x2" [50x50] wooden stakes, reinforcing bars or fence posts to stake the bales in place. The use of filter fabric fence in lieu of straw or hay bales will be allowed. Furnish 30" [0.8 m] wide filter fabric with sound wood supports with maximum on-center spacing of 10' [3.0m]. Use filter fabric conforming to 712.09 Type C.

Use sand and gravel for the sediment pit filter material.

**CONSTRUCTION:** Trench the filter fabric fence as detailed for perimeter filter fabric fence. (see DM-4.4)

When straw or hay bales are used conform to the following: Tightly place each bale adjacent to one another. Entrench 2" [50] to 3" [75] into the ground prior to staking. Firmly stake each bale with at least two stakes. Use loose hay or straw to fill the voids under and between the bales.

Construct a 3'x3'x1' [1 m x 1 m x 0.3 m] pit for the sediment pit filter material. Fill with filter material 1' [0.3 m] above ground level.

**PAYMENT:** The Department will pay for the accepted quantities at the contract prices in feet [meters] as follows: **Item 207 - Bale Filter Dike.**

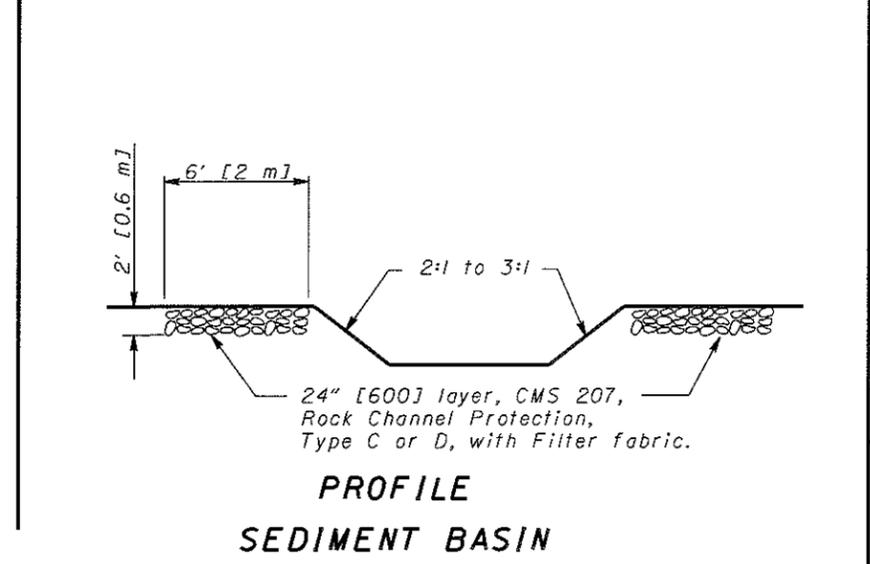
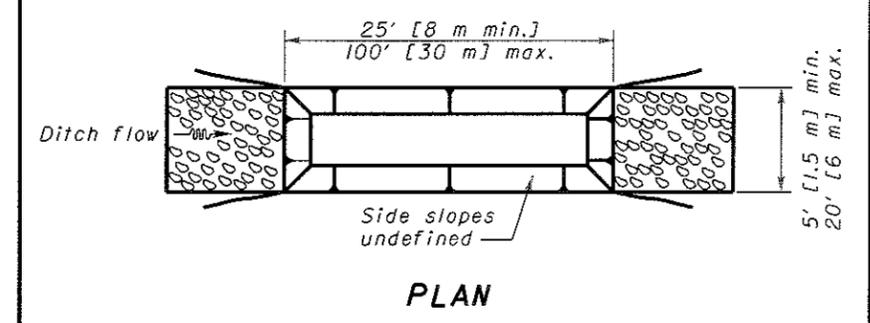
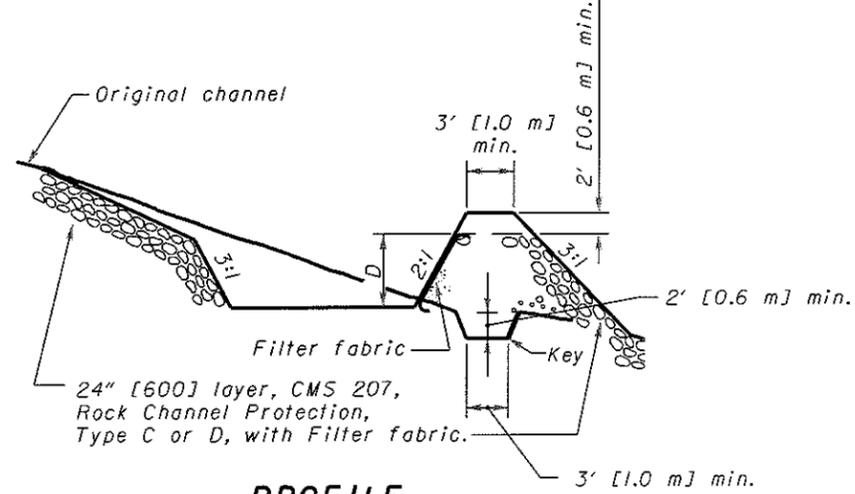
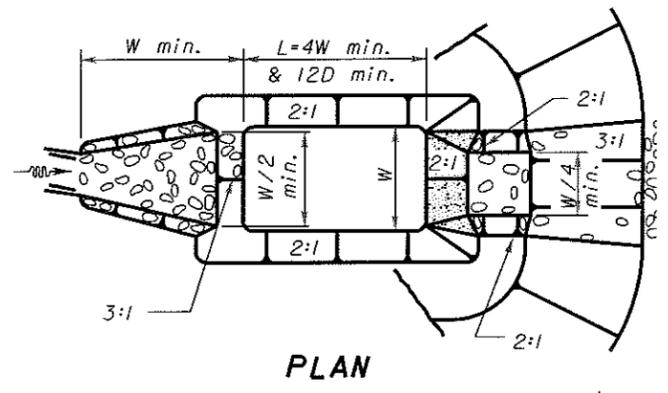
NOTES

**MATERIAL:** Furnish materials conforming to Item 203 Embankment and Item 601 Rock Channel Protection, Type C or D with filter. Furnish construction fence consisting of 4'-0" [1.3 m] high plastic fence with 6' [2 m] long metal fence posts.

**CONSTRUCTION:** Construct the Basin and Dams as detailed. Construct the construction fence in urban areas or in high pedestrian traffic areas. Construct the fence to completely surround the sediment basin or dam. Place the fence post on 8' [2.6 m] centers 2' [0.6 m] deep. Securely attach the plastic construction fence to the fence post.

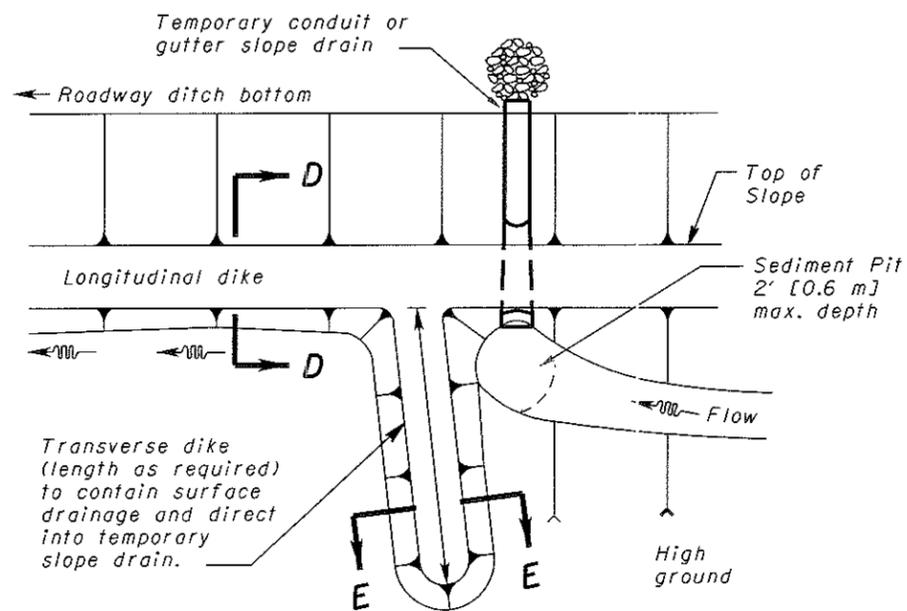
**PAYMENT:** The Department will pay for the accepted quantities at the contract prices as follows:

- Item 207 - Sediment Basins and Dams in cubic yards [cubic meters]
- Item 207 - Rock Channel Protection Type C or D with filter in cubic yards [cubic meters]
- Item 207 - Construction Fence per foot [meter]

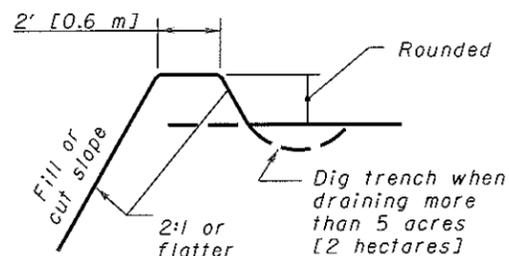


OHIO DEPARTMENT OF TRANSPORTATION  
ENGINEER OF BRIDGES  
DATE  
4-29-99  
7-19-02  
HYDRAULIC ENGINEER  
D. Gruver  
All metric dimensions (in brackets [ ]) are in millimeters unless otherwise noted.  
OFFICE OF STRUCTURAL ENGINEERING  
STANDARD HYDRAULIC CONSTRUCTION DRAWING  
SEDIMENT AND EROSION CONTROLS  
NUMBER  
DM-4.3  
1/2

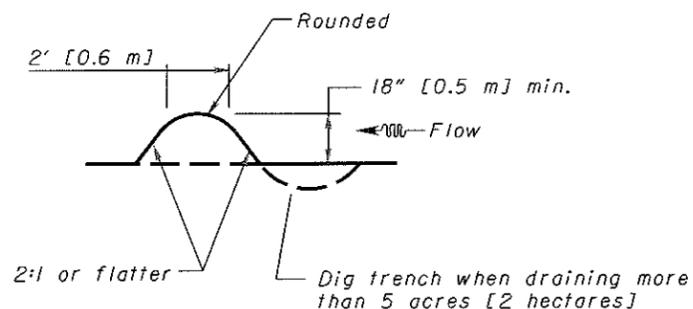
# DIKES AND SLOPE PROTECTION



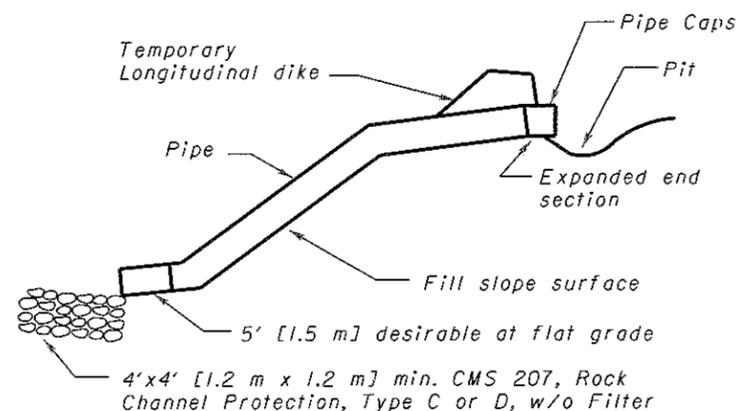
PLAN VIEW



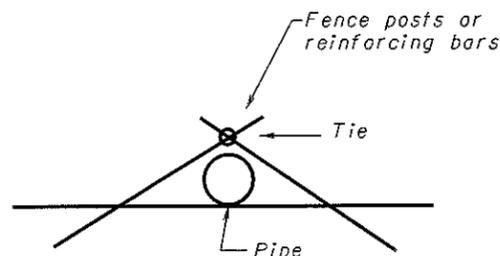
SECTION D-D



SECTION E-E



CONDUIT SLOPE DRAIN



TIE-DOWN SLOPE DRAIN

## NOTES

**MATERIAL:** Furnish materials conforming to Item 203 Embankment and Item 601 Rock Channel Protection, Type C or D, without filter.

Furnish the following for the slope drains: corrugated steel pipe, corrugated or smooth plastic pipe, pipe caps with: holes that comprise at least 30 percent of the cross sectional area of the cap and specifically designed to connect to the pipe, reinforcing bars or fence posts and sand and gravel for the sediment pit filter material.

**CONSTRUCTION:** Construct as detailed. Compact the dike to 85% of the maximum density as determined by Supplement 1015.

Use reinforcing bars or fence posts to tie down the slope drains and to keep the pipe from moving.

Construct a 3'x3'x2' [1 m x 1 m x 0.6 m] pit for the sediment pit filter material. Fill with filter material to the ground level.

**BASIS OF PAYMENT:** The Department will pay for the accepted quantities at the contract prices as follows:

Item 207 - Dikes in cubic yards [cubic meters]

Item 207 - Slope Drains in feet [meters]

Item 207 - Rock Channel Protection Type C or D without filter in cubic yards [cubic meters]

TEMPORARY SLOPE DRAINS RECOMMENDED SIZES		
AREA in acres [hectares]	PIPE SIZES	
	Smooth	Corrugated
0-4 [0-1.6]	6" [150]	6" [150]
4-8 [1.6-3.2]	8" [200]	12" [300]
8-12 [3.2-4.9]	10" [250]	15" [375]

OHIO DEPARTMENT OF TRANSPORTATION  
ENGINEER OF BRIDGES

DATE  
4-29-99  
7-19-02

HYDRAULIC ENGINEER  
D. Gruver

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

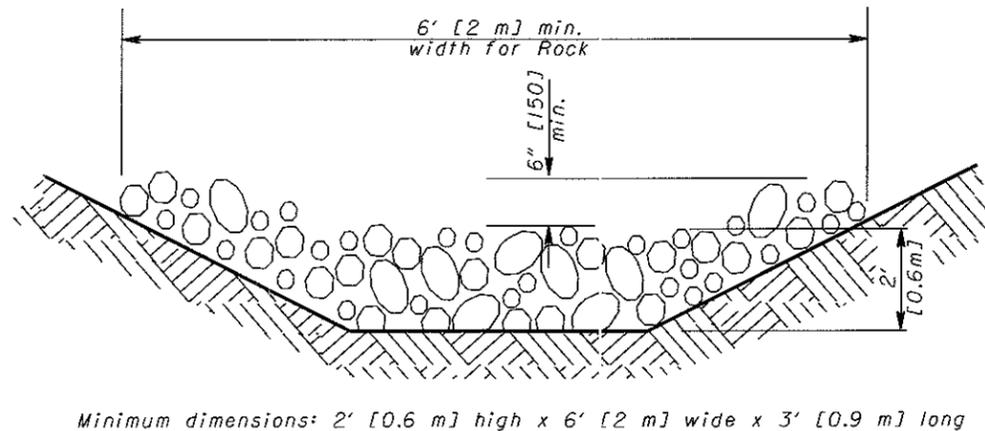
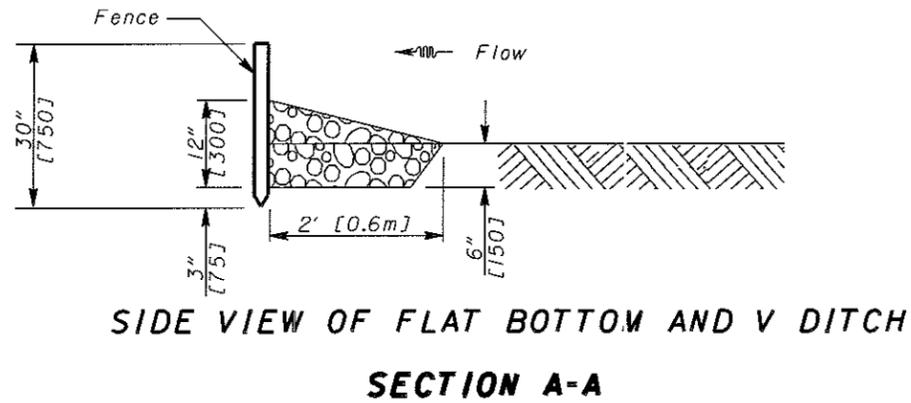
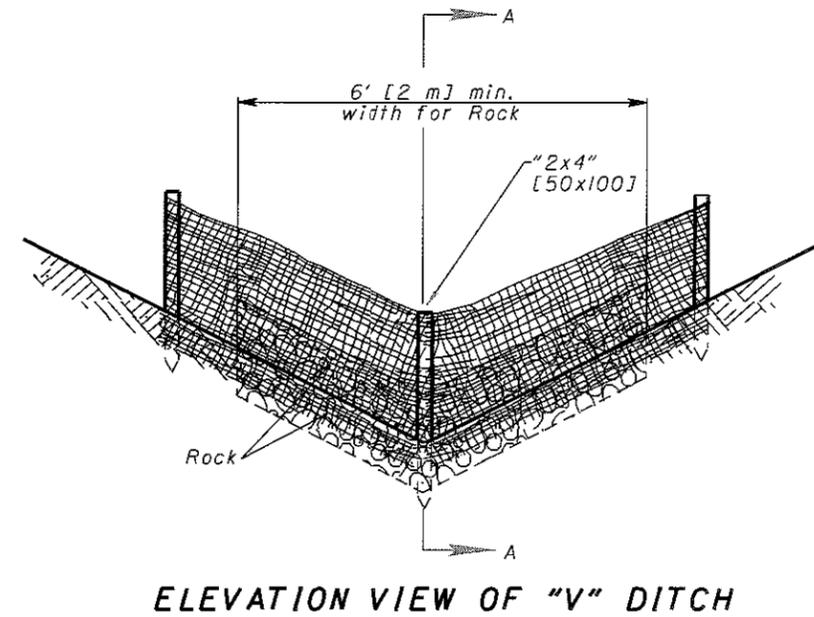
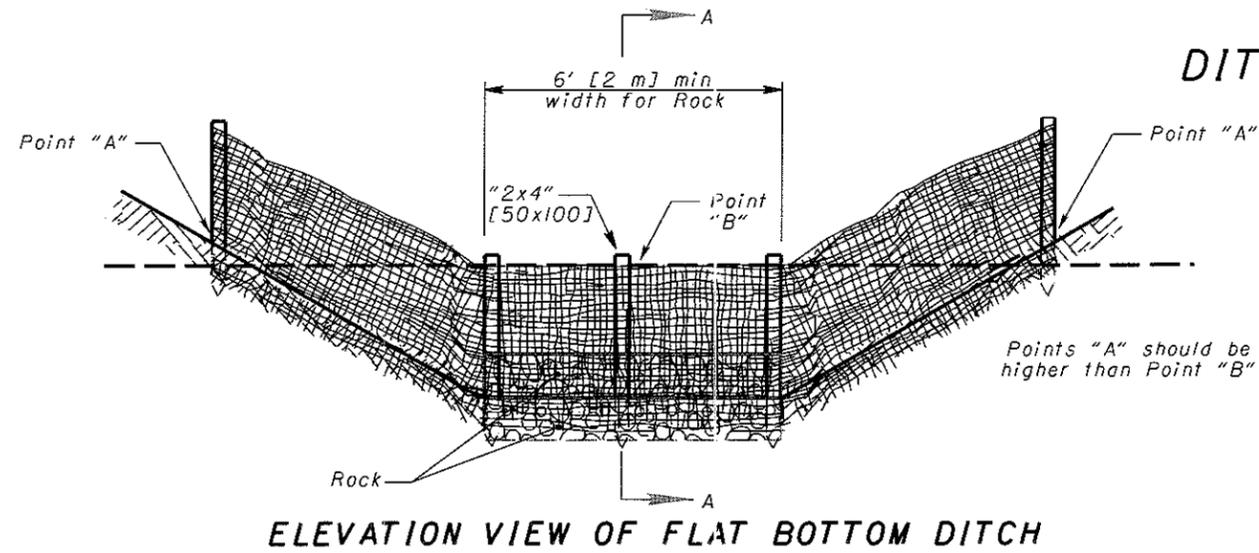
OFFICE OF STRUCTURAL ENGINEERING

STANDARD HYDRAULIC CONSTRUCTION DRAWING  
SEDIMENT AND EROSION CONTROLS

NUMBER  
DM-4.3

2 / 2

# DITCH CHECKS



## NOTES

### FILTER FABRIC DITCH CHECKS:

**MATERIALS:** Furnish filter fabric ditch checks consisting of the following materials:

1. 30" [0.8 m] wide filter fabric with sound wood supports with maximum on-center spacing of 10' [3.0 m]. Use filter fabric conforming to 712.09 Type C.
2. A vertically driven "2x4" [50x100] stake in the center of the ditch
3. Gravel or limestone material conforming to one of the following gradations No. 1 through No. 4 on Table 703.01-1.

**CONSTRUCTION:** Trench the filter fabric fence as detailed for PERIMETER FILTER FABRIC FENCE. (see Sheet 2/2) Place a vertical "2x4" [50x100] stake in the center of the ditch with the top level to the top of the fence and at least 6" [150] below the bottom of the ditch. Excavate for and place the gravel or limestone on the upstream side of the ditch check.

**PAYMENT:** The Department will pay for the accepted quantities at the contract prices in feet [meters] as follows: **Item 207 - Filter Fabric Ditch Check.**

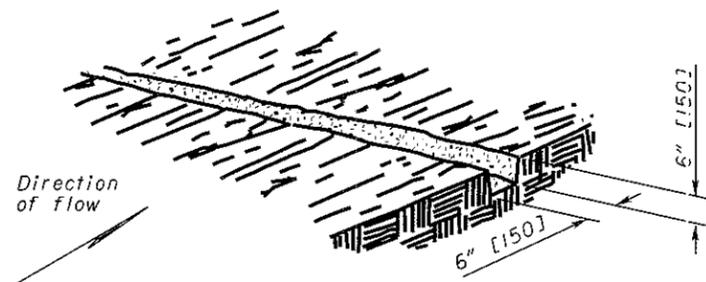
### ROCK CHECKS:

**MATERIALS:** Furnish material conforming to Item 601 Rock Channel Protection Type C or D without filter.

**CONSTRUCTION:** Place the rock outside the traffic clear zone in the ditch.

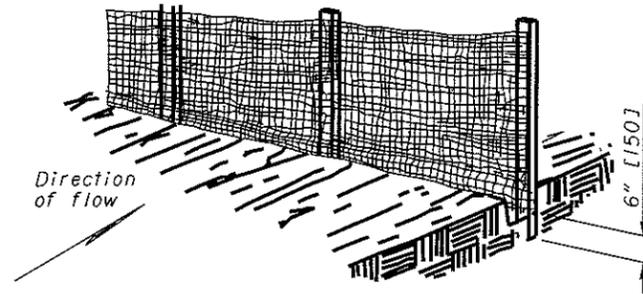
**PAYMENT:** The Department will pay for the accepted quantities at the contract prices in cubic yards [cubic meters] as follows: **Item 207 - Rock Channel Protection Type C or D without filter.**

## PERIMETER FILTER FABRIC FENCE



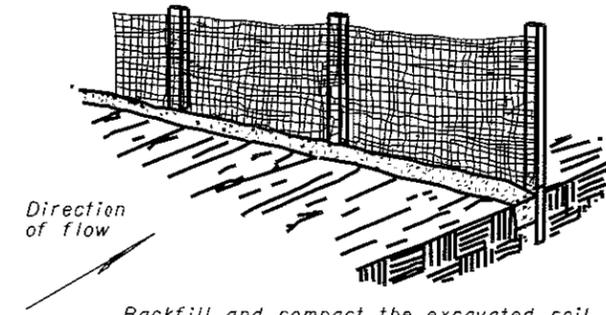
Excavate a 6"x6" [150x150] trench along the proposed fence line.

### STEP 1



Place fabric and support stakes and extend fabric into the trench.

### STEP 2



Backfill and compact the excavated soil.

### STEP 3

## NOTES

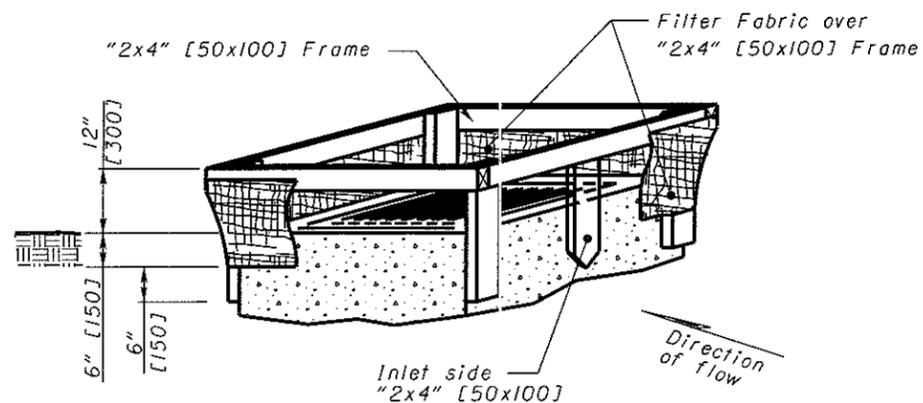
**MATERIALS:** Furnish 30" [0.8 m] wide filter fabric with sound wood supports with maximum on-center spacing of 10' [3.0 m]. Use filter fabric conforming to 712.09 Type C. The Contractor may elect to use straw or hay bales. Use 30" [750] long 2"x2" [50x50] wooden stakes, reinforcing bars or fence posts for the straw or hay bales.

**CONSTRUCTION:** Trench the filter fabric fence as detailed. The Contractor may elect to trench the fence detailed on steps 1 through 3 in one plowing operation.

When straw or hay bales are used conform to the following: Tightly place each bale adjacent to one another. Entrench 2" [50] to 3" [75] into the ground prior to staking. Firmly stake each bale with at least two stakes. Use loose hay or straw to fill the voids under or between the bales.

**PAYMENT:** The Department will pay for the accepted quantities at the contract prices in feet [meters] as follows: **Item 207 - Perimeter Filter Fabric Fence.**

## INLET PROTECTION



### INLET PROTECTION

## NOTES

**MATERIALS:** Furnish inlet protection consisting of 18" [0.5 m] wide filter fabric fence with a securely nailed "2x4" [50x100] wood frame with a vertically driven "2x4" [50x100] on the inlet or flow side of the structure. Use filter fabric conforming to 712.09 Type C.

**CONSTRUCTION:** Construct an 18" [0.5 m] wide filter fabric fence supported around a storm drain inlet or catch basin with a securely nailed "2x4" [50x100] wood frame. Excavate a 6" [150] trench around the inlet, and drive support posts 6" [150] below the excavated trench bottom. Stretch the fabric around the frame. Secure it tightly ensuring that 6" [150] of fabric is in the trench. Overlap the fabric on one side of the inlet so that the fabric ends are not attached to the same post. Backfill and compact the excavated soil tightly onto the fabric. Place a vertical "2x4" [50x100] in the center of the inlet so that the top is at the top of the fence and the bottom is at least 6" [150] below the bottom of the ditch.

**PAYMENT:** The Department will pay for the accepted quantities at the contract prices in feet [meters] as follows: **Item 207 - Inlet Protection.**

OHIO DEPARTMENT OF TRANSPORTATION  
ENGINEER OF BRIDGES

DATE  
4-29-02  
7-19-02

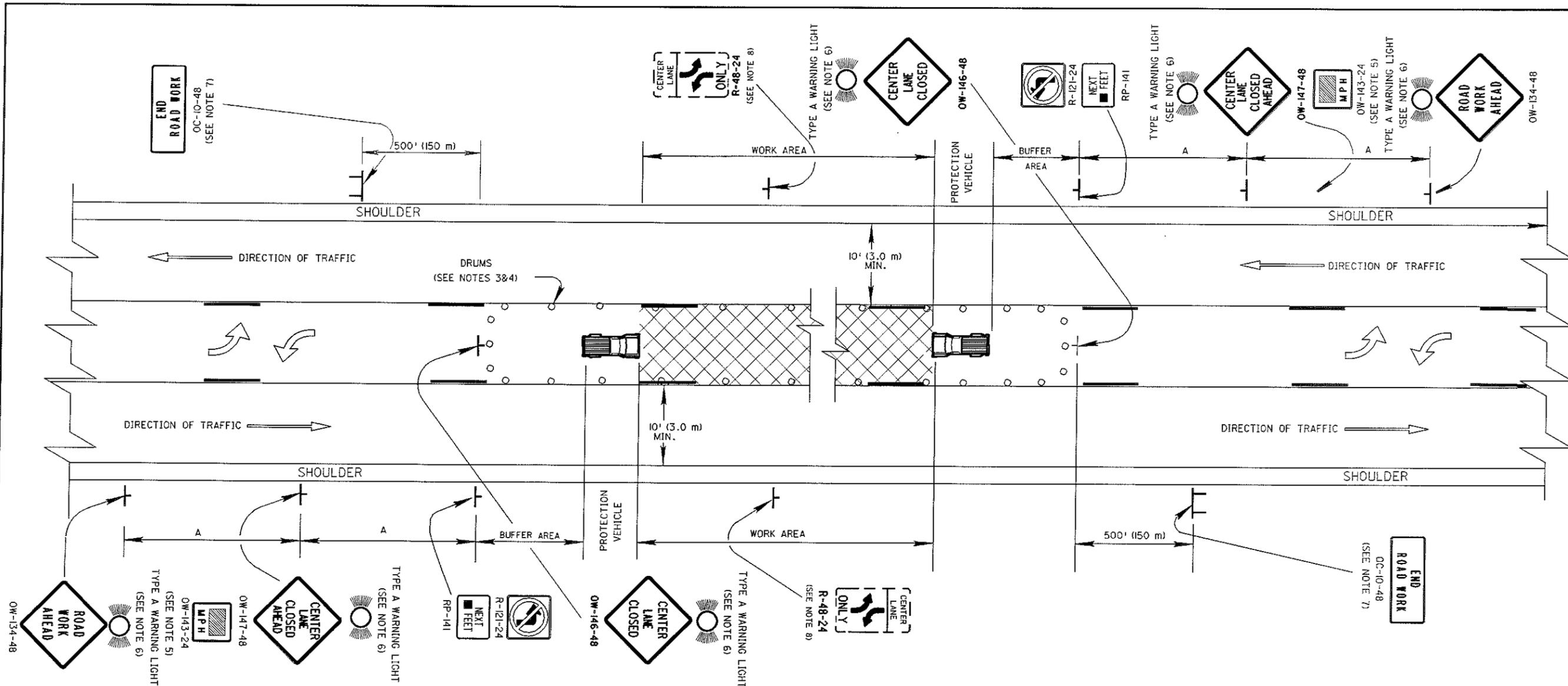
HYDRAULIC  
ENGINEER  
D. Gruver

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

OFFICE OF  
STRUCTURAL  
ENGINEERING

STANDARD HYDRAULIC CONSTRUCTION DRAWING  
CONSTRUCTION EROSION CONTROL

NUMBER  
DM-4.4



**GENERAL NOTES:**

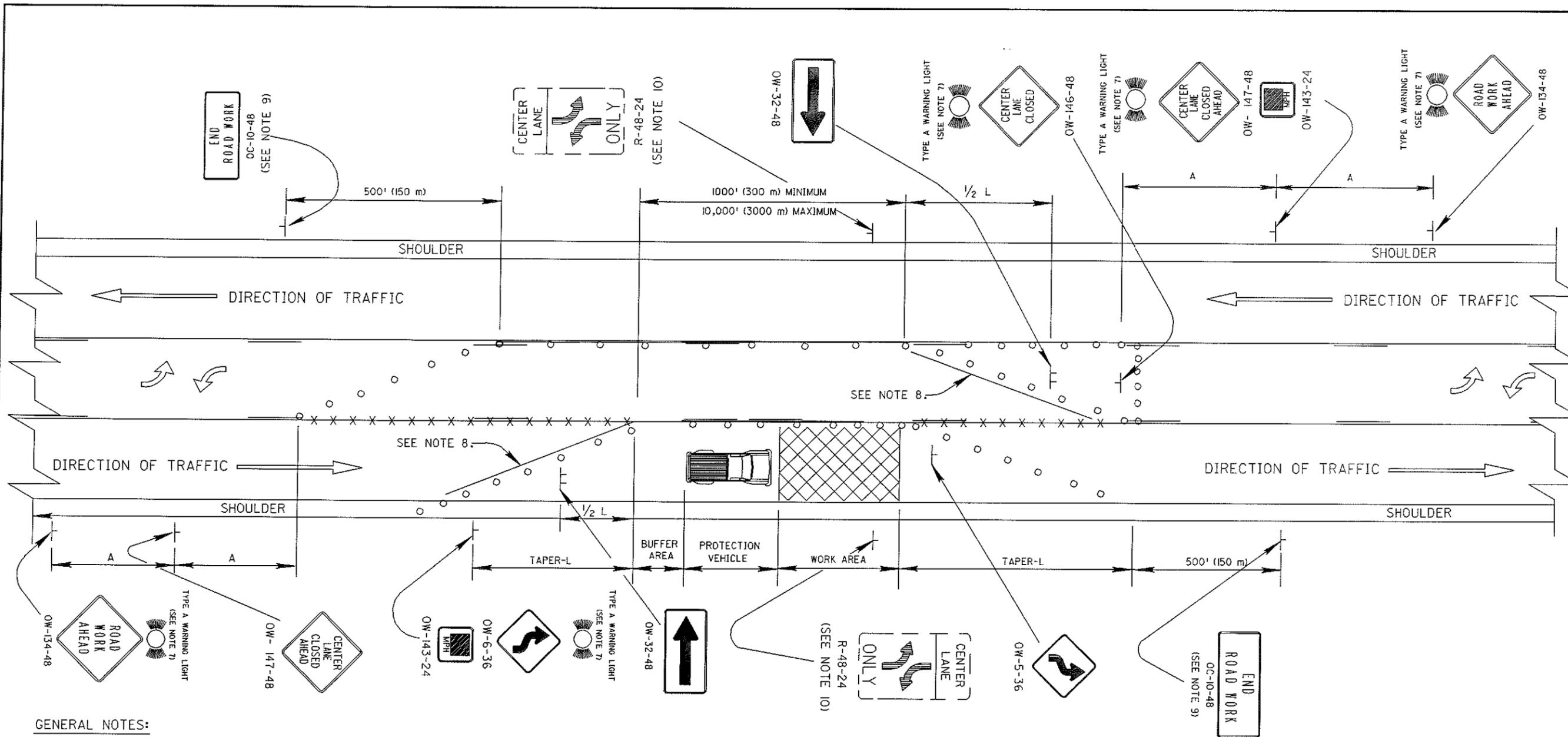
- The location of the Advance Warning signs should be adjusted to provide for adequate sight distance for the existing vertical and horizontal roadway alignment.
- The spacing between proposed signs should be adjusted to not conflict with and to provide a minimum of 200 ft (60 m) clearance to existing signs.
- Cones having a minimum height of 28" (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.
- The buffer area length and spacing(s) of drums shall conform to Table II. Drum spacing(s) shall be used for the buffer area and the first 1000 ft (300 m) of the work area and at other hazardous locations as directed by the Engineer. The maximum spacing for the balance of the work area is to be two times the spacing(s) in Table II.
- The Advisory Speed sign OW-143 shall be used when specified in the plan.
- Type A flashing warning lights shown on the OW-134, OW-147 and OW-146 signs are required whenever a night lane closure is necessary.
- The OC-10 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.
- If the lane closure will exist for more than one day, existing R-48 signs in the work area shall be removed or covered.
- 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 work zone edge lines shall be applied along the taper. Work zone edge lines which would conflict with final traffic lanes shall be removable (740.06 Type D) tape unless the area will be resurfaced in the next work phase after completion of the work. Pavement marking shall be removed in accordance with 641.10 and the original marking and raised pavement marker reflectors shall be restored, at no additional cost.
- All material and equipment shall be removed from the closure and the work area when no work is being done.
- The protection vehicle shown at the beginning of the work area shall be in place and unoccupied whenever workers are in the work area. The 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 1/4 mile (400 m). Other protective devices may be used in lieu of the protective vehicle shown when approved by the Engineer.
- 36 inch (900 mm) Warning Sign sizes may be used when the legal speed limit is 40 MPH or less.

TABLE I

MINIMUM DISTANCE FT (m)	A
URBAN (≤ 40 MPH)	200 (60)
URBAN (≥ 45 MPH)	350 (105)
RURAL	500 (150)

TABLE II

SPEED LIMIT (MPH)	BUFFER AREA FT (METERS)	MAXIMUM SPACING(S) OF DRUMS FT (METERS)
20 - 25	100 (30)	20 (6)
30 - 40	170 (45)	30 (9)
45 - 55	335 (60)	40 (12)



**GENERAL NOTES:**

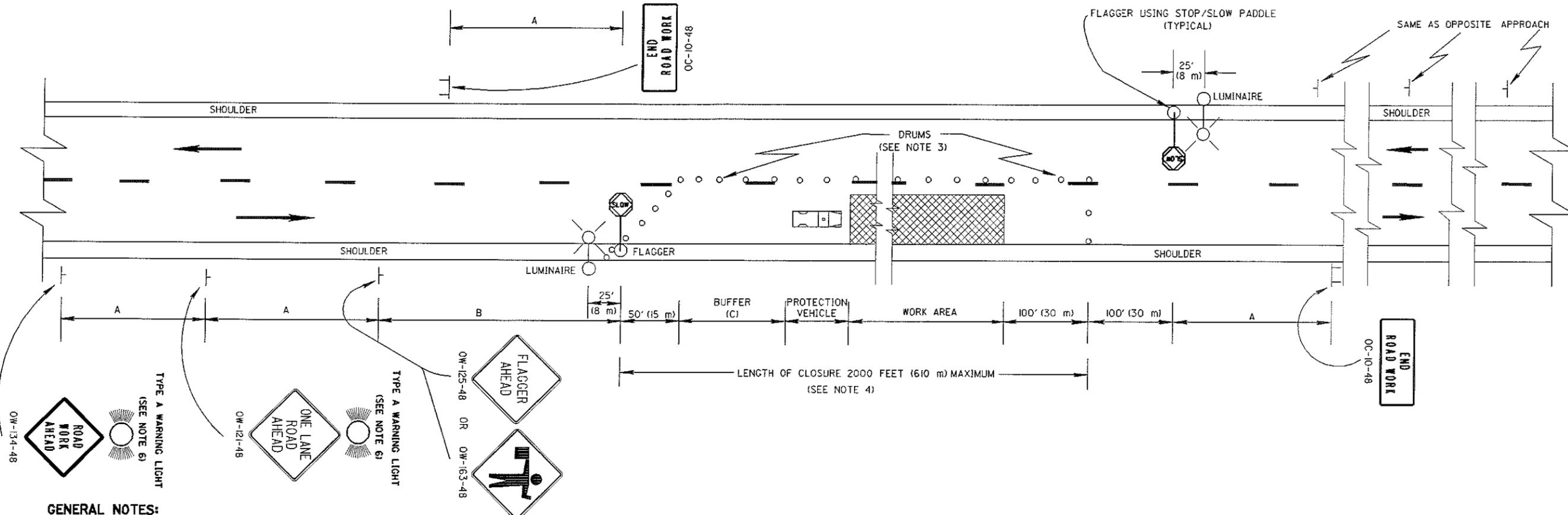
1. The location of the transition taper and the Advance Warning signs should be adjusted to provide for adequate sight distance for the existing vertical and horizontal roadway alignment.
2. The spacing between proposed signs should be adjusted to not conflict with and to provide a minimum of 200' (60 m) 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 1000' (300 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 in the shoulder taper.
4. Cones having a minimum height of 28" (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 protection vehicle shown at the beginning of the work area shall be in place and unoccupied whenever workers are in the work area. The 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 1/4 mile (400 m). Other protective devices may be used in lieu of the protective vehicle shown when approved by the Engineer.
7. Type A flashing warning lights shown on the OW-134, OW-146, OW-147 and OW-6 signs are required whenever a night lane closure is necessary.
8. 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 work zone edge lines shall be applied along the taper. Work zone edge lines which would conflict with final traffic lanes shall be removable (740.06 Type-1) tape unless the area will be resurfaced in the next work phase after completion of the work. 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.
9. The OC-10 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.
10. If the lane closure will exist for more than one day, existing R-48 signs in the work area shall be removed or covered.
11. All material and equipment shall be removed from the closure and work area when no work is being done.
12. 36 inch (900 mm) warning sign sizes may be used when the speed limit is 40 mph or less.

TABLE I

MINIMUM DISTANCE FT (m)	A
URBAN (≤ 40 MPH)	200 (60)
URBAN (≥ 45 MPH)	350 (105)
RURAL	500 (150)

TABLE II

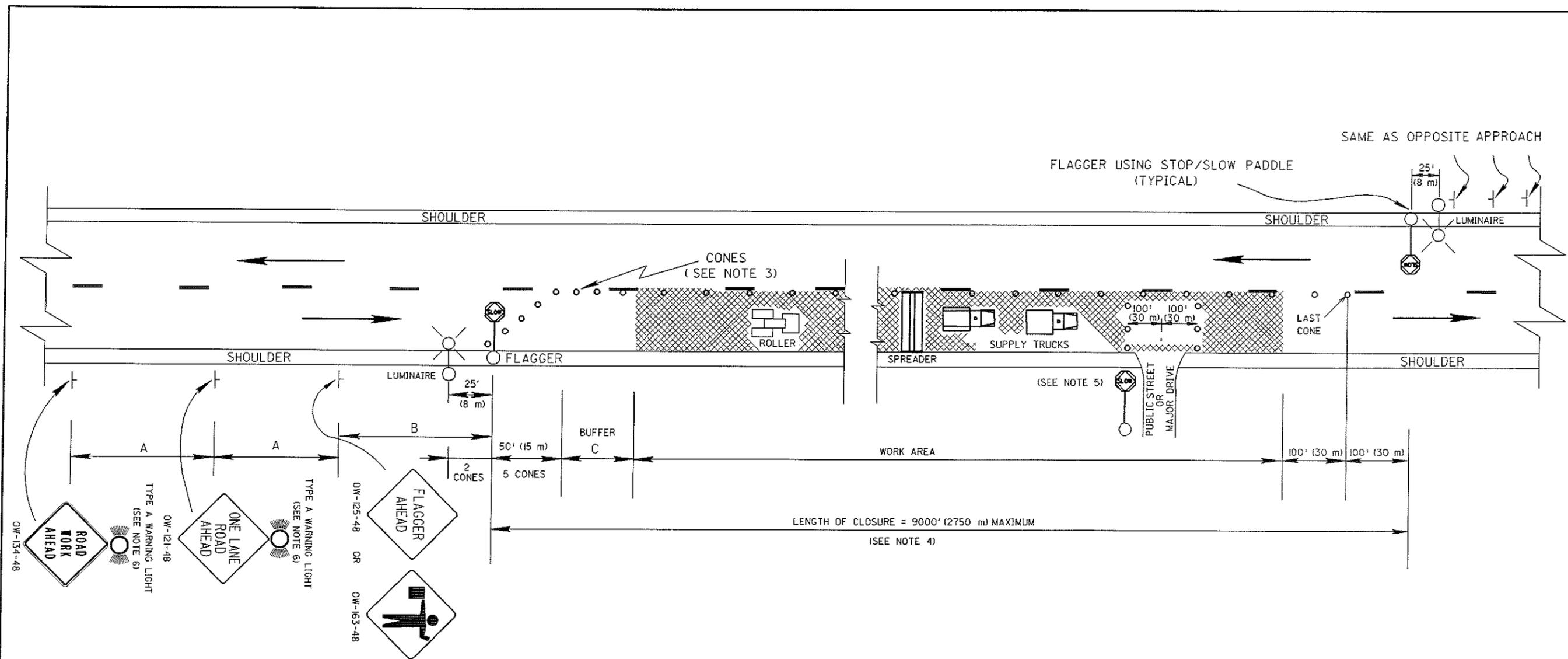
SPEED LIMIT (MPH)	MINIMUM TAPER (L) FT (M)	MAXIMUM SPACING (S) OF DRUMS FT (M)	BUFFER AREA FT (M)
20-25	125 (38)	20 (6)	100 (30)
30-40	320 (98)	30 (9)	170 (45)
45-55	660 (201)	40 (12)	335 (60)



**GENERAL NOTES:**

- The location of the Advance Warning signs should be adjusted to provide for adequate sight distance for the existing vertical and horizontal roadway alignment. The distances shown are minimums.
- Flaggers, one for each direction shall be used to control traffic continuously for as long as a one lane operation is in effect. The flaggers shall be able to communicate with each other at all times.
- Drums shall be spaced at 50' (15 m) center to center along the closure. Drums on the advance taper shall be spaced at 10' (3 m) center to center. Cones having a minimum height of 28' (0.7 m) may be substituted for drums for daytime lane closures. Provisions shall be made to stabilize the cones to prevent them from blowing over.
- Several small work areas close together shall be combined into one work zone. However, the closure shall not be more than 2000' (610 m) long unless approved by the Engineer. The minimum length between closures shall be 2000' (610 m). Only one side of the road shall be closed in any one work zone.
- The protection vehicle shown at the beginning of the work area shall be in place and unoccupied whenever workers are in the work area. This protection vehicle shall be removed from the pavement when workers are not in the work area. Other protective devices such as truck mounted attenuator may be used. The vehicle shall be equipped with a 360° rotation or flashing amber beacon clearly visible a minimum of one quarter mile (400 m).
- The Type A flashing warning lights shown on the OW-134 and the OW-121 signs are required whenever a night lane closure is necessary.
- Adequate area illumination of each flagger station shall be provided at night by using 150 watt minimum high pressure sodium luminaires or 250 watt minimum mercury luminaires. Luminaires shall be located adjacent to one flagger station for each direction of traffic as shown above. The mounting height for luminaires shall be a minimum of 27' (8.2 m) above the pavement and mounted on a support of adequate strength to provide a satisfactory installation. The overhead conductor clearance shall be a minimum of 18' (5.5 m) above the pavement. The luminaire arm shall be of sufficient length to extend to the edge of the pavement. Poles shall be erected a minimum of 6'6" (2.1 m) behind face of guardrail where existing, or 12' (3.6 m) from the edge of pavement, where possible locate the luminaires behind ditch. Lighting material shall comply with specification 713.
- Within the length of closure, provision shall be made to control traffic entering from intersecting streets and major drives as necessary to prevent wrong way movements and to keep vehicles off of new pavement not ready for traffic. The method of control shall be subject to the approval of the Engineer.
- 36 inch (900 mm) warning sign sizes may be used when the legal speed limit is 40 mph or less.

MINIMUM DISTANCE FT (m)	A	B	C
URBAN (≤ 40 MPH)	200 (60)	200 (60)	170 (50)
URBAN (≥ 45 MPH)	350 (105)	350 (105)	335 (100)
RURAL	500 (150)	500 (150)	335 (100)



**GENERAL NOTES:**

- The location of the Advance Warning signs should be adjusted to provide for adequate sight distance for the existing vertical and horizontal roadway alignment. The distances shown are minimum.
  - Flaggers, one for each direction, shall be used to control traffic continuously for as long as a one lane operation is in effect. The flaggers shall be able to communicate with each other at all times.
  - Cones on the tapers shall be spaced at 10' (3 m) center to center. Cones in the buffer shall be spaced at 40' (12 m) center to center. Cones shall have a minimum height of 28" (0.7 m) and shall be safely stabilized to prevent them from blowing over. Closures at night shall use drums rather than cones.
  - It is required that the length of closure be kept to a minimum at all times, as directed by the Engineer.
- When the ambient temperature exceeds 80°F (27°C), the Engineer may increase the maximum allowable length of closure to allow for sufficient cooling of new pavement.
- The Engineer may shorten the maximum allowable length of closure to relieve excessive traffic backups or to improve traffic operation.

- All traffic control signs, cones (or drums), and the flagger shall be moved forward as a group before the closure reaches the maximum allowable length. Only one side of the road shall be closed at any time.
- Within the length of closure, provision shall be made to control traffic entering from intersecting streets and major drives as necessary to prevent wrong way movements and to keep vehicles off of new pavement not ready for traffic. As a minimum, the Contractor shall:
  - provide an additional flagger at every public street intersection and major driveway or -
  - place a row of 3 cones across the closed lane approximately 100' (30 m) on each side of the intersection or driveway.
 Rows of cones may be moved off the road to allow passage of rollers, paving spreader or supply trucks but shall be moved back onto the road when the activity has passed.
- The Type A flashing warning lights are required on the OW-134 and the OW-121 signs whenever a night lane closure is necessary.

- Adequate area illumination of each flagger station shall be provided at night by using 150 watt minimum high pressure sodium luminaires or 250 watt minimum mercury luminaires. Luminaires shall be located adjacent to one flagger station for each direction of traffic.
- 36 inch (900 mm) warning sign sizes may be used when the legal speed limit is 40 MPH or less.

MINIMUM DISTANCE FT (m)	A	B	C
URBAN (≤ 40 MPH)	200 (60)	200 (60)	170 (50)
URBAN (≥ 45 MPH)	350 (105)	350 (105)	335 (100)
RURAL	500 (150)	500 (150)	335 (100)

**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 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, EXCEPT WHEN APPLIED AS COMPONENTS OF GORE MARKINGS SPRAYED IN MOVING OPERATIONS SEPARATE FROM THE APPLICATION OF TRANSVERSE LINES.

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

# METRIC

BUREAU OF DESIGN SERVICES  
DIVISION OF HIGHWAYS  
OHIO DEPARTMENT OF TRANSPORTATION

MAINTENANCE OF TRAFFIC	DATE
TRAFFIC CONTROL FOR LONG LINE PAVEMENT MARKING OPERATIONS	01/30/95

STANDARD CONSTRUCTION DRAWING **MT-99.20M**

APPROVED *[Signature]* ENGR. OF DESIGN SERVICES

# 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 2' (0.6 m) behind face of curb.
  - C) Uncurbed roadway - 12' (3.6 m) from edge of traffic lane or 6' (1.8 m) from edge of paved or useable shoulder, whichever is greater.
  - D) Behind guardrail or barrier - preferably 2' (0.6 m) behind face of guardrail (minimum 1' (0.3 m)) for signs on class a supports; 4' (1.2 m) for Class B or C supports; 1' (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 - 5' (1.5 m) when parked cars, construction equipment, etc will not obscure sign visibility.
  - B) Rural areas with parked cars or construction equipment - 7' (2.1 m)
  - C) Urban - 7' (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 400' (120 m) to 600' (180 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 1' (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 may only be used where fully protected by guardrail, concrete barrier and in locations positively protected from traffic such as on retaining walls.

## 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 30' (9 m) FROM EDGE OF PAVEMENT	WITHIN 30' (9 m) FROM EDGE OF PAVEMENT
40 AND HIGHER	A OR B	A OR B	A OR B **	A ONLY
26 TO 39	A OR B	A OR B	A OR B	A OR B
0 TO 25	A OR B	A OR B	A OR B	A OR B

\* If supports are behind guardrail but not fully 5'6" (1.7 m) behind face of rail or if sign is not 1' (0.3 m) behind face of concrete barrier.

\*\* 30' (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 1' (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 1' (0.3 m) deep by 1' (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.
- 3) Supports that are not NCHRP 350 compliant.

# CLASS A SUPPORTS FIXED SUPPORTS

- 1) All #2 and #3 posts when installed singly or in pairs (side by side) according to the details of TC-41.20. The number of supports shall be as shown on TC-52.10 and TC-52.20.
- 2) The following post types, when installed singly, by imbedment or driving into earth to a depth of about 42 inches (1.1 m).
  - A) - up to 4"x4" (102x102 mm) wood.
  - B) - up to 2" (51 mm) diameter schedule 40 steel pipe.
  - C) - up to 3" (76 mm) diameter schedule 40 aluminum pipe.
  - D) - up to 2 1/4" (56.4 mm) square, 12 gauge wall, punched steel post.
  - E) - up to 6"x8" (152x203 mm) wood with breakaway holes shown on MT-105.11.
- 3) The following post types when installed in pairs (side by side) with less than 6'-5/8" (2 m) between posts, by imbedment or driving into earth to a depth of about 42 inches (1.1 m):
  - A) - up to 4"x4" (102x102 mm) wood.
  - B) - up to 2" (51 mm) diameter schedule 40 steel pipe.
  - C) - up to 3" (76 mm) diameter schedule 40 aluminum pipe.
  - D) - up to 2" (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-41.10 with a minimum clear distance between supports of 7' (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-105.11 )

10-18-02

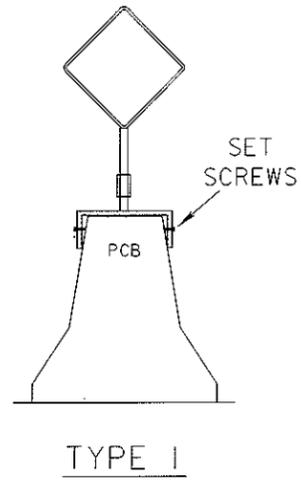
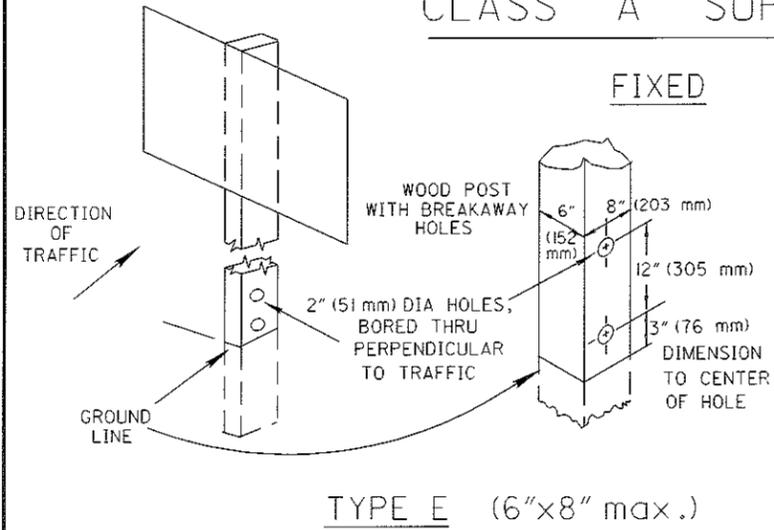
TEMPORARY SIGN SUPPORT I

OFFICE OF TRAFFIC  
ENGINEERING

MT-105.10

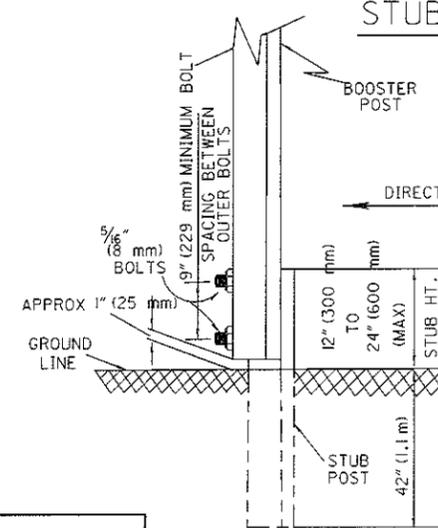
JAM

## CLASS A SUPPORTS



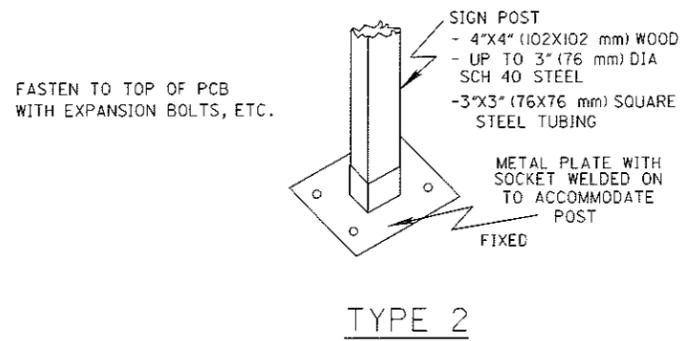
## CLASS A SUPPORTS

### STUBBING STANDARD



### NOTES

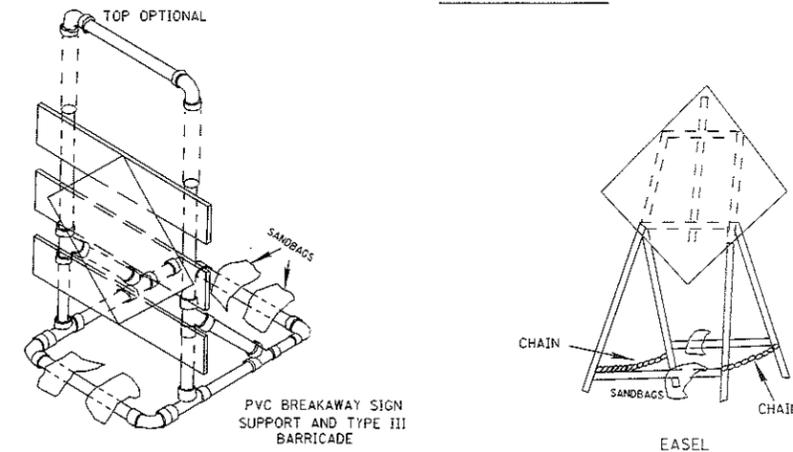
1. FOR USE WITH #3 POST OR SMALLER ONLY
2. BOLTS SHALL BE STEEL OR ALUMINUM
3. A MINIMUM OF TWO FASTENERS SHALL BE USED PER ASSEMBLY
4. BOOSTER POST SHALL BE MOUNTED BEHIND STUB POST
5. BOOSTER POST SHALL BE THE SAME OR 1LB/FT (1.5 kg/m) LESS THAN STUB POST



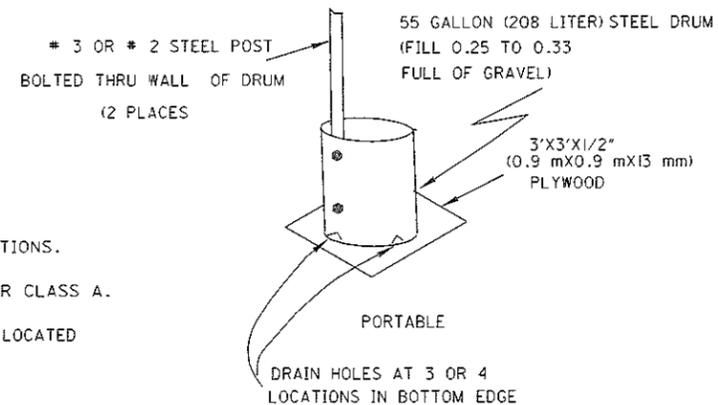
NOTE: SPECIFIC INFORMATION SEE MT-105.10

## CLASS A SUPPORTS

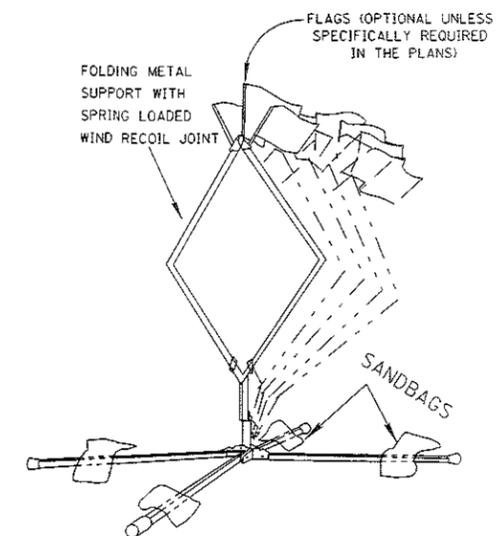
### PORTABLE



## CLASS B SUPPORTS



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



**State of Ohio  
Department of Transportation  
Supplemental Specification 832  
Temporary Sediment and Erosion Control**

February 12, 2003

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**832.01 Description** This work consists of furnishing and locating TSEC (Temporary Sediment and Erosion Control) BMP (Best Management Practices) for both project and off project EDA (Earth Disturbing Activity) areas and developing a SWPPP (Storm Water Pollution Prevention Plan) if required. Furnish these TSEC BMP prior to any EDA. Furnish a SWPPP if required prior to any EDA. In the event of conflict between these requirements and pollution control laws, rules, or regulations of other Federal, State, or local agencies, adhere to the more restrictive laws, rules, or regulations.

**832.02 Definitions**

- BMP** Best Management Practices
- CMS** Construction and Material Specifications of the Ohio Department of Transportation Dated January 1, 2002
- Earth Disturbing Activity (EDA)** Means any activity that exposes bare ground or an erodible material to storm water and anywhere 2002 CMS Item 659 Seeding, SS 870 Seeding, 2002 CMS Item 660 Sodding, or SS 870 Sodding is being furnished
- EPA** Environmental Protection Agency
- Isolated Wetland Permit** Ohio EPA permit allowing the discharge of fill material into an isolated wetland
- NOI** Notice of Intent

- NOT** Notice of Termination
- NPDES** National Pollutant Discharge Elimination System
- OEPA** Ohio EPA
- OES** Office of Environmental Services-ODOT
- OWPCA** Ohio Water Pollution Control Act
- OHWM** Ordinary High Water Mark; the USACE's jurisdictional limits involving streams; usually equivalent to a 2 year high water elevation.
- PCN** Pre-Construction Notification for 404 permit
- SCD** Standard Construction Drawing
- Supplemental Specification 833 (SS 833)** OEPA NPDES Construction Effluent Guidelines Permit
- SWPPP** Storm Water Pollution Prevention Plan
- TSEC** Temporary Sediment and Erosion Control
- USACE** United States Army Corps of Engineers
- 404 Permit** USACE permit authorizing discharge of fill material into Waters of the US, per Section 404 of the Clean Water Act
- 401 Water Quality Certification (401 WQC)** Ohio EPA permit authorizing discharge of fill material, per Section 401 of the Clean Water Act

**832.03 Standard Construction Drawing References**

- Bale Filter Dike SCD DM-4.3/4.4
- Construction Fence SCD DM-4.3
- Dikes SCD DM-4.3
- Filter Fabric Ditch Check SCD DM-4.4
- Inlet Protection SCD DM-4.4
- Perimeter Filter Fabric Fence SCD DM-4.4
- Rock Channel Protection Type C or D with/without Filter SCD DM-4.3/4.4
- Sediment Basins and Dams SCD DM-4.3
- Slope Drains SCD DM-4.3

**832.04 Requirements.** Furnish and locate TSEC BMP to represent and warrant compliance with the Clean Water Act, 33 USC Section 1251 et seq. and the OWPCA, ORC 6111.01 et seq., all conditions of 404 permit/401 WQC/Isolated Wetland Permit, and related rules, local government agency requirements, specifications, SCD, and permits. Furnish a SWPPP to represent and warrant compliance with SS 833, related rules, specifications, SCD, and permits.

Post Construction controls as described in SS 833 are not a part of this specification. All post construction controls are furnished in the project.

**832.05 Provisions** These provisions survive the completion and/or termination of the contract. The following provisions must be followed:

A. Provision 1. If a governmental agency or a local governmental authority finds a violation of the above noted requirements, or that the TSEC BMP are incomplete, or that the SWPPP is incomplete or that the implementation of the SWPPP is not being performed correctly or completely, full responsibility will be borne by the Contractor to make all corrections.

B. Provision 2. If a governmental agency or a local governmental authority furnishes an assessment, damage judgment or finding, fine, penalty, or expense for a violation of the above noted requirements, or that the TSEC BMP are incomplete, or that the SWPPP is incomplete or that the implementation of the SWPPP is not being performed correctly or completely, the Contractor will reimburse the Department within 10 Calendar Days of the amount for any of the above. The Department may withhold the amount of money requested for the above from the Contractor's next pay estimate and deliver that sum to the governmental agency or local governmental authority issuing the assessment, damage judgment or finding, fine, penalty or expense.

C. Provision 3. The Contractor agrees to indemnify and hold harmless the Department, and will reimburse the Department for any assessments, damage judgment or finding, fine, penalty, or expense as a result of the failure of performing this portion of the Contract. The Department may withhold the amount of any assessments, damage judgment or finding, fine, penalty or expense from the Contractor's next pay estimate.

D. Provision 4. If a governmental agency or a local governmental authority furnishes a stop work order for a violation of the above noted requirements, or that the TSEC BMP are incomplete, or that the SWPPP is incomplete or that the implementation of the SWPPP is not being performed correctly or completely the Department will find the Contractor in default.

E. Provision 5. If the Department finds a violation of the above noted requirements, or that the TSEC BMP are incomplete, or that the SWPPP is incomplete or that the implementation of the SWPPP is not being performed correctly or completely, the Contractor will make all corrections. The Department may withhold and continue to withhold progress payments until such corrections are made.

**832.06 EDA Requirements.** Comply with 2002 CMS 105.16 when EDA (including borrow and waste areas) are involved, unless the areas in question have been cleared through prior environmental studies. If a project is identified on the plan title sheet as a Maintenance Project, only A, B, and C below apply. Furnish TSEC BMP for any EDA as follows:

A. Project Identified EDA = 0, Contractor EDA = 0, Total EDA = 0 Acre: There are no requirements.

B. Project Identified EDA = 0, Contractor EDA > 0, Total EDA < 1 Acre: Furnish TSEC BMP for the EDA areas. These TSEC BMP will not be compensated. No SWPPP, NOI (Notice of Intent), NOT (Notice of Termination), or, weekly inspections are required.

C. Project Identified EDA = 0, Contractor EDA  $\geq$  1, Total EDA  $\geq$  1 Acre: Furnish a NOI, SWPPP with TSEC BMP, and a NOT for those EDA areas. The NOI, SWPPP and those TSEC BMP, and the NOT will not be compensated.

D. Project Identified EDA < 1, Contractor EDA > 0, Total EDA < 1 Acre: Furnish TSEC BMP for the EDA areas. These TSEC BMP will be compensated. No NOI, SWPPP, NOT, or, weekly inspections are required. The Department will furnish a NOI and NOT.

E. Project Identified EDA < 1, Contractor EDA > 0, Total EDA  $\geq$  1 Acre: Furnish a SWPPP with TSEC BMP for the EDA areas. The SWPPP, and these TSEC BMP will be compensated. The Department will furnish a NOI and NOT.

F. Project Identified EDA  $\geq$  1, Contractor EDA  $\geq$  0, Total EDA  $\geq$  1 Acre: Furnish a SWPPP with TSEC BMP for the EDA areas. The SWPPP, and these TSEC BMP will be compensated. The Department will furnish a NOI and NOT.

**832.07 TSEC BMP Materials.** Furnish commercial fertilizer, seed, and mulch materials conforming to 2002 CMS Item 659.

Furnish filter fabric ditch checks, rock checks, inlet protection, perimeter filter fabric fence, bale filter dikes, sediment basins and dams, dikes, slope drains, and rock channel protection materials as specified on the SCD. Furnish construction ditch and slope protection conforming to the requirements of 2002 CMS Item 670. The seeding and mulching of the mats are not required. The Department may accept other materials as BMP.

**832.08 Furnish and Locate TSEC BMP.** Furnish and locate the TSEC BMP as required or as outlined in the Ohio Department of Transportation Location Design Manual Volume II - Drainage Design, or as outlined in the SWPPP. Keep TSEC BMP functional until the areas are fully stabilized.

Construct items A, B, and D through G below according to the SCD.

A. Perimeter Controls. Use perimeter filter fabric fence to protect the project from sheet flow runoff from off Right-of-Way and off construction limit locations. Use perimeter filter fabric fence to protect the following project items from sheet flow runoff: water bodies, wetlands, or other significant items shown on the plans.

Use dikes to prevent sediment flow from coming onto the project and to non-vegetated barren areas on the project.

Install perimeter filter fabric fence and dikes before any clearing and grubbing operations.

Ensure that the ponding of water behind the perimeter filter fabric fence or dike will not damage property or risk the safety of life.

B. Inlet Protection. Construct the inlet protection for existing inlets at the beginning of construction and for new inlets immediately after completing the sump. Ensure that the ponding of water behind the inlet will not damage property or risk the safety of life.

C. Construction Seeding and Mulching. Apply seed and mulch materials according to 2002 CMS Item 659 as modified below. When straw mulch is used, apply at a rate of 2 tons per acre (0.5 metric ton/1000 m<sup>2</sup>). Seed and mulch during and after construction, and before or during winter shut down to stabilize EDA areas and as required. Fertilize construction seeding areas at one-half the application rate specified in 2002 CMS Item 659. If project conditions prevent fertilizing the soil and preparing the seedbed, then the fertilizing and preparation requirements of 2002 CMS Item 659 may be waived. Do not place construction seed on frozen ground.

D. Slope Protection. Place dikes, install slope drains, and construct ditches to divert water from bare non-vegetated areas and to protect cut and fill slopes. Protect the side slopes from erosion by placing dikes at the top of fill slopes.

Before furnishing a cut slope, construct a ditch at the top of the cut slope to reduce runoff coming on the slope.

Furnish Construction Slope Protection at the required locations or at the locations shown on the SWPPP as the slopes are constructed. Furnish all permanent slope protection as final grade is complete.

E. Ditch Checks and Ditch Protection. Place filter fabric ditch checks or rock checks across a ditch and perpendicular to the flow to protect the ditch from erosion and to filter sediment from the flowing water.

Place ditch checks as soon as the ditch is cut. If working on a ditch, replace the ditch checks by the end of the workday.

Install filter fabric ditch checks for drainage areas less than or equal to 2 acres (0.8 ha) as shown in the SCD. Install rock checks for drainage areas between 2 to 5 acres (0.8 to 2.0 ha) as shown in the SCD.

Install ditch checks in conjunction with sediment basins and dams.

Furnish Construction Ditch Protection at the required locations or at the locations shown on the SWPPP as the ditches are cut. Furnish all permanent ditch protection as final grade is complete.

F. Bale Filter Dike. Install bale filter dike a few feet (meters) from the toe of a slope to filter and direct sediment to an appropriate control item before the runoff enters a water body on or off the Project limits.

Use the bale filter dike to collect sediment from:

1. Areas less than 1/4 acre (0.1 ha) for each sediment pit.
2. Slopes with a length of less than 100 feet (30 m) and having a maximum 2:1 slope.

Use a sediment pit every 100 feet (30 m) for a 2:1 slope for every 1/4 acre (0.1 ha). Use a greater spacing of the sediment basin for flatter slopes.

Begin constructing bale filter dikes within 7 days of commencing grubbing operations. Complete the construction of the bale filter dike before starting the grading operations.

G. Sediment Basins and Dams. Construct basins and dams at concentrated and critical flow locations to settle out sediment before the water leaves the EDA area. Use basins at the bottom of a ravine, at a culvert inlet, or outlet, along or at the end of a ditch and at any concentrated water exit point of the project. Construct the basins to retain 67 cubic yards (125 m<sup>3</sup>) of water for every acre (1.0 ha) of drainage area. Use a series of smaller basins or dams as a substitute for a larger basin or dam.

Begin constructing sediment basins and dams within 7 days of commencing grubbing operations. Complete the construction of the sediment basins and dams before starting the grading operations.

When needed construct construction fence around the sediment basins or dams.

H. River, Stream, and Water Body Protection. Protect all streams or water bodies passing through or on the project using Perimeter Filter Fabric Fence or Bale Filter Dike to line the water edge. Divert project water flow using dikes and slope protection. The Contractor may use a combination of items listed in one through seven above and other TSEC BMP.

I. Stream Relocation. Fully stabilize the new stream channel with erosion control mats, or 70 percent grass growth before diverting flow into the new channel. This also applies to ditches that incorporate stream flow. This also applies to Temporary Channels

J. Stream and River Crossings (Causeways) Fording of streams and rivers is not allowed. Evaluate the 404/401 permits to determine whether or not a temporary causeway has been permitted by the USACE/OEPA. If a temporary causeway has been permitted, construct the causeway per the 404/401 permits and the application for those permits. Particular attention should be given to the configuration of the temporary causeway, the surface area (acreage) of temporary fill, and volume of temporary fill that was permitted and contained in the permit application. The project engineer will consult with the Office of Environmental Services (OES) for any technical questions regarding 404/401 permits.

If the Contractor determines that a temporary causeway will be required and has not been permitted through the 404/401 permit process, the Contractor must coordinate the temporary causeway with the project engineer and OES. The temporary causeway will be coordinated with the USACE through the pre-construction notification (PCN) process for authorization under the 404 nationwide permit (NWP) program. Supply the project engineer/OES with the following information:

1. a plan and profile drawing showing the temporary causeway with OHWM elevation
2. volume of temporary fill below the OHWM
3. the surface area of temporary fill below the OHWM
4. a restoration plan for the area affected by the causeway
5. time frames for placement and removal of the temporary causeway.

The time frame allowed for the coordination of the temporary causeway will be 60 days, at a minimum, and the temporary fill will not occur prior to the 404 NWP being authorized by the USACE. All coordination with the USACE and/or OEPA will be performed through OES.

Begin planning and installing causeways as early in construction as possible to avoid conflicts with 404/401 permits or other environmental commitments that have been included in the construction plans.

Make every attempt to minimize disturbance to water bodies during construction, maintenance and removal of the causeway. Construct the causeway as narrow as practical. Make the causeway in shallow areas rather than deep pools where possible. Minimize clearing, grubbing, and excavation of stream banks, bed, and approach sections. Construct the causeway as to not erode stream banks or allow sediment deposits in the channel.

Construct the causeway to a water elevation at least 1 foot (0.3 m) above the normal water elevation. If the causeway fills more than one-third the width of the stream, then use culvert pipes to allow the movement of aquatic life. Normal downstream flows will be maintained. Ensure that any ponding of water behind the causeway will not damage property or cause a human safety concern.

The following minimum requirements apply where culverts are used.

1. Furnish culverts on the existing stream bottom.
2. Avoid a drop in water elevation at the downstream end of the culvert.
3. Furnish culverts with a diameter at least two times the depth of normal stream flow measured at the causeway centerline or with a minimum diameter of 18 inches (0.5 m) whichever is greater
4. Furnish a sufficient number of culverts to completely cross the channel from stream bank to stream bank with no more than 10 feet (3 m) between each culvert.

For all fill and surface material placed in the channel, around the culverts, or on the surface of the causeway, furnish clean, non-erodible, nontoxic dumped rock fill, Type B, C, or D, as specified in 2002 CMS 703.19.B. Extend rock fill up the slope from original stream bank for 50 feet (10 m) to catch and remove erodible material from equipment.

When the Contractor has finished work requiring the causeway, all portions of the causeway (including all rock and culverts) will be removed in its entirety. The material will not be disposed in other waters of the US or isolated wetland. The stream bottom affected by the causeway will be restored to its pre-construction elevations.

K. Other Temporary Construction Access Fills in Streams or Rivers. Evaluate if a temporary construction access fill(s), other than a causeway, is required. This may include, but is not limited to, cofferdams, access pads, temporary bridges, etc. If required, evaluate the existing 404/401 permit and application in the same manner as in 832.08(J), to determine if the temporary fill activity has been permitted.

If the Contractor requires temporary construction access fill(s) below the OHWM and those temporary fill(s) have not been permitted, then the Contractor will follow the coordination procedures set forth in 832.08(J). All temporary construction access fills will be removed following completion of its use and the affected stream bottom will be restored to its pre-construction elevations.

L. Concrete washout areas TSCE BMP. For the purpose of payment this BMP is part

of the concrete work for payment.

M. Project access TSEC BMP locations. For the purpose of payment this BMP is part of the total project for payment.

N. Project fueling and refueling TSEC BMP locations. For the purpose of payment this BMP is part of the total project for payment.

O. All other TSEC BMP: All other TSEC BMP that are required but not specifically referenced will not be paid as a separate item but will be included by the Contractor as part of the total project cost.

**832.09 Maintenance.** Properly maintain all TSEC BMP. Dispose of silt removed from TSEC BMP according to 2002 CMS 105.16. If a recorded rain event is greater than 0.5 inches (13mm) the Department will pay to replace all TSEC BMP that have failed. Remove all TSEC BMP before the project is accepted. Dispose of the removed materials according to 2002 CMS 105.16 and 2002 CMS 105.17. Maintain the TSEC BMP until the up-slope permanent grass coverage is 70 percent or better. At this stage, remove the TSEC BMP.

A Perimeter Filter Fabric Fence, Filter Fabric Ditch Checks, Rock Checks, Inlet Protection, Dikes, and Bale Filter Dikes. Remove trapped sediment when it reaches half the height of the lowest section. Make appropriate corrections when the TSEC BMP becomes nonfunctional.

B Sediment Basins and Dams. Remove deposited sediment when sediments reduce the initial volume of the sediment basin or dam by one-half. Make appropriate corrections when these TSEC BMP fail. Remove dams and basins after the up slope has been stabilized.

**832.10 Storm Water Pollution Prevention Plan.** If required, prepare the SWPPP as outlined in this specification and Supplemental Specification 833. Additional guidance can be found in the Ohio Department of Transportation Location and Design Manual Volume II - Drainage Design and the Ohio Department of Transportation Location and Design Manual Volume III- Highway Plans. Examples of some of the design and information requirements that must be shown on the SWPPP are as follows:

- A. A Professional Engineer qualified in TSEC BMP must design and sign the SWPPP.
- B. Locate the required TSEC BMP for both on and off project EDA areas.
- C. Furnish quantity totals for all TSEC BMP.
- D. Locate the following a minimum of 100 Ft. (30 m) from the water's edge of any

stream, ephemeral stream, wetland, or body of water:

- 1. Concrete or asphalt plant areas
- 2. Material and equipment staging or storage areas
- 3. Dewatering Areas
- 4. Concrete truck wash out areas
- 5. Construction access locations
- 6. Vehicle fueling and refueling locations

E. Furnish an implementation schedule for each construction sequence.

F. For any additional requirements, See 2002 CMS 107.19

G. Furnish the total EDA areas in acres.

H. Locate all slopes that will be inactive for 21 calendar days or longer.

I. Furnish the name of the individual on site who is in charge of the SWPPP and the TSEC BMP practices.

J. Describe the type of construction activities that will be taking place.

K. Furnish a quantity for Item 832 Sediment Removal for removing sediment from basins and dams, inlet protection, ditch checks, rock checks, perimeter filter fabric fence, bale filter dikes, and all other types of filter fabrics, straw or hay bales, or any other TSEC BMP.

L. Furnish signatures of all contractors and subcontractors involved in TSEC practices (see App. B).

If there are plan sheets which meet any of the SS 833 requirements use that information. Design files may be furnished to the awarded Contractor in electronic form in the future.

**832.11 SWPPP Review.** Furnish the initial SWPPP to the Department for review. Allow ten working days for the Department to review the SWPPP. Allow another ten working days to review any revised submitted SWPPP. No time extensions to the contract will be granted for the above referenced review times. The Department's review will only ensure that the following items have been furnished:

- A. The type and location of TSEC BMP with totals.
- B. A schedule of placing TSEC BMP.
- C. The applicable requirements of those contained in SS832.10.

Revise the accepted SWPPP as needed. These revisions to the accepted SWPPP will be at no additional cost to the Department unless caused solely by the Department. Payment for Department caused revisions to the SWPPP will be included as part of the revised work.

**832.12 Inspections.** Perform SS 833 required inspections. The inspection reports are to be prepared for projects that have a SWPPP. Submit a copy of the inspection reports to the project. Use the report form furnished in Appendix A.

**832.13 Compensation.** The Department will furnish Item 832 Lump Sum Erosion Control with an amount in the proposal to pay for TSEC BMP work. This amount is an estimate by the Department of the total cost of TSEC BMP work. If the TSEC BMP work exceeds this amount the TSEC BMP work will still be paid at the pre-determined prices. The pre-determined prices are located in the Proposal. All TSEC BMP work will be paid at the proposal pre-determined unit price times the correctly installed TSEC BMP number of units. The payment due will be deducted from Item 832 Lump Sum Erosion Control.

The Department will only pay for one accepted SWPPP regardless of the number of Construction phases, revisions, or project redesigns.

**832.14 Method of Measurement**

- A. The Department will measure the SWPPP plan as each.
- B. The Department will measure Construction Seeding and Mulching by the number of square yards (square meters).
- C. The Department will measure Slope Drains by the number of feet (meters).
- D. The Department will measure Sediment Basins and Dams by the number of cubic yards (cubic meters) of excavation and embankment.
- E. The Department will measure Perimeter Filter Fabric Fence, Bale Filter Dike and Construction Fence by the number of feet (meters).
- F. The Department will measure Filter Fabric Ditch Check by the number of feet (meters).
- G. The Department will measure Inlet Protection by the number of feet (meters).
- H. The Department will measure Dikes by the number of cubic yards (cubic meters) of excavation and embankment.
- I. The Department will measure Construction Ditch Protection and Construction Slope Protection by the number of square yards (square meters).

J. The Department will measure Rock Channel Protection, Type C or D (with or without filter) by the number of cubic yards (cubic meters).

K. The Department will measure Sediment Removal by the number of cubic yards (cubic meters).

**832.15 Basis of Payment**

- A. The Department will not pay if temporary erosion and sediment control Items are required due to the Contractor's negligence, carelessness, or failure to install permanent controls.
- B. The Department will not pay for causeway work specified.
- C. The Department will not pay to replace TSEC BMP that has failed due to lack of proper maintenance or installation.
- D. The Department will not pay for concrete washout areas.
- E. The Department will not pay for project access locations.
- F. The Department will not pay for all other TSEC BMP that are required but not specifically referenced as a separate item but will be included by the Contractor as part of the total project cost.
- G. The Department will pay for the following Erosion Control Items (TSEC BMP) that are properly placed at the pre-determined price in the proposal conforming to 832.13.

Item	Unit	Description
832	Square Yard (Square Meter)	Construction Seeding and Mulching
832	Foot (Meter)	Slope Drains
832	Cubic Yard (Cubic Meter)	Sediment Basins and Dams
832	Foot (Meter)	Perimeter Filter Fabric Fence
832	Foot (Meter)	Bale Filter Dike
832	Foot (Meter)	Filter Fabric Ditch Check
832	Foot (Meter)	Inlet Protection
832	Cubic Yard (Cubic Meter)	Dikes
832	Square Yard (Square Meter)	Construction Ditch Protection
832	Square Yard (Square Meter)	Construction Slope Protection
832	Cubic Yard (Cubic Meter)	Rock Channel Protection Type C or D with Filter
832	Cubic Yard (Cubic Meter)	Rock Channel Protection Type C or D without Filter

- 832 Cubic Yard (Cubic Meter) Sediment Removal
  - 832 Foot (Meter) Construction Fence
- H. The Department will pay the contract price for each SWPPP plan.
- | Item | Unit | Description                           |
|------|------|---------------------------------------|
| 832  | Each | Storm Water Pollution Prevention Plan |

**Appendix A**

**Weekly and Rain Event Erosion Control Checklist**

Contractor \_\_\_\_\_  
 Project Number \_\_\_\_\_ Co.-Rt.-Sec. \_\_\_\_\_ Date \_\_\_\_\_

R=Replacement W=Working M=Maintenance I=Install D=Delete Rain Amt Inspection \_\_\_\_\_  
 Date \_\_\_\_\_

Station	To	Station	Side	Offset	Balloon Ref.	Perimeter control	Inlet Protection	Constr. Seed	Dikes Fill Slopes	Ditch Cut Slopes	Slope Drains	FF Ditch Checks	Rock Ditch Ch	Bale Filter Dike	Sediment Basins	Stream Relocate	Stream Crossing	Date Work Was Complete	
	To																		
	To																		
	To																		
	To																		
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Notes:

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Total Station-to-Station Inspected

\_\_\_\_\_  
 \_\_\_\_\_

Inspect By Signature \_\_\_\_\_ Title \_\_\_\_\_ Date Given To \_\_\_\_\_  
 ODOT

**Appendix B**

**Signature list**

<b>Signature</b>	<b>Printed Name</b>	<b>Title</b>	<b>Company</b>	<b>Date</b>

**Designer Note:**

This supplemental specification 832 will be provided on all projects along with supplemental specification 833. Provide proposal note 205 only as required.

State Of Ohio  
Department of Transportation

Supplemental Specification 833  
Ohio Environmental Protection Agency National Pollutant Discharge Elimination System  
Construction Effluent Guidelines Permit  
February 12, 2003

Ohio EPA Permit No.: OHC000002  
Effective Date: April 21, 2003

Expiration Date: April 20, 2008

**OHIO ENVIRONMENTAL PROTECTION AGENCY  
AUTHORIZATION FOR STORM WATER DISCHARGES ASSOCIATED  
WITH CONSTRUCTION ACTIVITY UNDER THE  
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM**

In compliance with the provisions of the federal Water Pollution Control Act, as amended (33 U.S.C. Section 1251 et. seq. hereafter referred to as "the Act") and the Ohio Water Pollution Control Act [Ohio Revised Code ("ORC") Chapter 6111], dischargers of storm water from sites where construction activity is being conducted, as defined in Part I.B of this permit, are authorized by the Ohio Environmental Protection Agency, hereafter referred to as "Ohio EPA," to discharge from the outfalls at the sites and to the receiving surface waters of the state identified in their Notice of Intent ("NOI") application form on file with Ohio EPA in accordance with the conditions specified in Parts I through VII of this permit.

This permit is conditioned upon payment of applicable fees, submittal of a complete NOI application form and written approval of coverage from the director of Ohio EPA in accordance with Ohio Administrative Code ("OAC") Rule 3745-38-06.

Original signed by Christopher Jones  
Christopher Jones  
Director

Page 2 of 36 Ohio EPA Permit No.: OHC000002

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**PART VI. REOPENER CLAUSE****PART VII. DEFINITIONS****PART I. COVERAGE UNDER THIS PERMIT****A. Permit Area.**

This permit covers the entire State of Ohio.

**B. Eligibility.**

1. Construction activities covered. Except for storm water discharges identified under Part I.B.2, this permit may cover all new and existing discharges composed entirely of storm water discharges associated with construction activity that enter surface waters of the state or a storm drain leading to surface waters of the state.

For the purposes of this permit, construction activities include any clearing, grading, excavating, grubbing and/or filling activities that disturb the threshold acreage described in the next paragraph. Discharges from trench dewatering are also covered by this permit as long as the dewatering activity is carried out in accordance with the practices outlined in Part III.G.2.g.iv of this permit.

Prior to March 10, 2003, only construction activities disturbing five or more acres of total land were required to obtain NPDES construction storm water permit coverage. On and after March 10, 2003, construction activities disturbing one or more acres of total land will be eligible for coverage under this permit. The threshold acreage includes the entire area disturbed in the larger common plan of development or sale.

This permit also authorizes storm water discharges from support activities (e.g., concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, borrow areas) provided:

- a. The support activity is directly related to a construction site that is required to have NPDES permit coverage for discharges of storm water associated with construction activity;
- b. The support activity is not a commercial operation serving multiple unrelated construction projects and does not operate beyond the completion of the construction activity at the site it supports;
- c. Appropriate controls and measures are identified in a storm water pollution prevention plan (SWP3) covering the discharges from the support activity; and
- d. The support activity is on or contiguous with the property defined in the NOI;

**Part I.B**

2. Limitations on coverage. The following storm water discharges associated with construction activity are not covered by this permit:

- a. Storm water discharges that originate from the site after construction activities have been completed, including any temporary support activity, and the site has achieved final stabilization. Industrial post-construction storm water discharges may need to be covered by an NPDES permit;
- b. Storm water discharges associated with construction activity that the director has shown to be or may reasonably expect to be contributing to a violation of a water quality standard; and
- c. Storm water discharges authorized by an individual NPDES permit or another NPDES general permit;

3. Waivers. After March 10, 2003, sites whose larger common plan of development or sale have at least one, but less than five acres of land disturbance, which would otherwise require permit coverage for storm water discharges associated with construction activities, may request that the director waive their permit requirement. Entities wishing to request such a waiver must certify in writing that the construction activity meets one of the two the waiver conditions:

- a. Rainfall erosivity waiver. For a construction site to qualify for the rainfall erosivity waiver, the cumulative rainfall erosivity over the project duration must be five or less and the site must be stabilized with at least a 70 percent vegetative cover or other permanent, non-erosive cover. The rainfall erosivity must be calculated according to the method in U.S. EPA Fact Sheet 3.1 Construction Rainfall Erosivity Waiver dated January 2001. If it is determined that a construction activity will take place during a time period where the rainfall erosivity factor is less than five, a written waiver certification must be submitted to Ohio EPA at least 21 days before construction activity is scheduled to begin. If the construction activity will extend beyond the dates specified in the waiver certification, the operator must either:
  - (a) recalculate the waiver using the original start date with the new ending date (if the R factor is still less than five, a new waiver certification must be submitted) or
  - (b) submit an NOI application form and fee for coverage under this general permit at least seven days prior to the end of the waiver period (see Attachment A); or

**Part I.B.3**

b. TMDL (Total Maximum Daily Load) waiver. Storm water controls are not needed based on a TMDL approved or established by U.S. EPA that addresses the pollutant(s) of concern or, for non-impaired waters that do not require TMDLs, an equivalent analysis that determines allocations for small construction sites for the pollutant(s) of concern or that determines that such allocations are not needed to protect water quality based on consideration of existing in-stream concentrations, expected growth in pollutant contributions from all sources, and a margin of safety. The pollutant(s) of concern include sediment or a parameter that addresses sediment (such as total suspended solids, turbidity or siltation) and any other pollutant that has been identified as a cause of impairment of any water body that will receive a discharge from the construction activity. The operator must certify to the director of Ohio EPA that the construction activity will take place, and storm water discharges will occur, within the drainage area addressed by the TMDL or equivalent analysis. A written waiver certification must be submitted to Ohio EPA at least 21 days before the construction activity is scheduled to begin.

4. Prohibition on non-storm water discharges. All discharges covered by this permit must be composed entirely of storm water with the exception of the following: discharges from fire fighting activities; fire hydrant flushings; potable water sources including waterline flushings; irrigation drainage; lawn watering; routine external building washdown which does not use detergents; pavement wash waters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used; air conditioning condensate; springs; uncontaminated ground water from trench or well point dewatering and foundation or footing drains where flows are not contaminated with process materials such as solvents. Dewatering activities must be done in compliance with Part III.G.2.g.iv of this permit. Discharges of material other than storm water or the authorized non-storm water discharges listed above must comply with an individual NPDES permit or an alternative NPDES general permit issued for the discharge.

Except for flows from fire fighting activities, sources of non-storm water listed above that are combined with storm water discharges associated with construction activity must be identified in the SWP3. The SWP3 must identify and ensure the implementation of appropriate pollution prevention measures for the non-storm water component(s) of the discharge.

**Part I.B**

5. Spills and unintended releases (Releases in excess of Reportable Quantities). This permit does not relieve the permittee of the reporting requirements of 40 CFR Part 117 and 40 CFR Part 302. In the event of a spill or other unintended release, the discharge of hazardous substances in the storm water discharge(s) from a construction site must be minimized in accordance with the applicable storm water pollution prevention plan for the construction activity and in no case, during any 24-hour period, may the discharge(s) contain a hazardous substance equal to or in excess of reportable quantities.

40 CFR Part 117 sets forth a determination of the reportable quantity for each substance designated as hazardous in 40 CFR Part 116. The regulation applies to quantities of designated substances equal to or greater than the reportable quantities, when discharged to surface waters of the state. 40 CFR Part 302 designates under section 102(a) of the Comprehensive Environmental Response, Compensation and Liability Act of 1980, those substances in the statutes referred to in section 101(14), identifies reportable quantities for these substances and sets forth the notification requirements for releases of these substances. This regulation also sets forth reportable quantities for hazardous substances designated under section 311(b)(2)(A) of the Clean Water Act (CWA).

**C. Requiring an individual NPDES permit or an alternative NPDES general permit.**

1. The director may require an alternative permit. The director may require any operator eligible for this permit to apply for and obtain either an individual NPDES permit or coverage under an alternative NPDES general permit in accordance with OAC Rule 3745-38-04. Any interested person may petition the director to take action under this paragraph.

The director will send written notification that an alternative NPDES permit is required. This notice shall include a brief statement of the reasons for this decision, an application form and a statement setting a deadline for the operator to file the application. If an operator fails to submit an application in a timely manner as required by the director under this paragraph, then coverage, if in effect, under this permit is automatically terminated at the end of the day specified for application submittal.

**Part I.C**

2. Operators may request an individual NPDES permit. Any owner or operator eligible for this permit may request to be excluded from the coverage of this permit by applying for an individual permit. The owner or operator shall submit an individual application with reasons supporting the request to the director in accordance with the requirements of 40 CFR 122.26. If the reasons adequately support the request, the director shall grant it by issuing an individual NPDES permit.

3. When an individual NPDES permit is issued to an owner or operator otherwise subject to this permit or the owner or operator is approved for coverage under an alternative NPDES general permit, the applicability of this permit to the individual NPDES permittee is automatically terminated on the effective date of the individual permit or the date of approval for coverage under the alternative general permit, whichever the case may be.

**D. Permit requirements when portions of a site are sold.**

If an operator obtains a permit for a development, and then the operator (permittee) sells off lots or parcels within that development, permit coverage must be continued on those lots until a Notice of Termination (NOT) in accordance with Part IV.B is submitted. For developments which require the use of centralized sediment and erosion controls (i.e., controls that address storm water runoff from one or more lots) for which the conveyance of permit coverage for a portion of the development will either prevent or impair the implementation of the controls and therefore jeopardize compliance with the terms and conditions of this permit, the permittee will be required to maintain responsibility for the implementation of those controls. For developments where this is not the case, it is the permittee's responsibility to temporarily stabilize all lots sold to individual lot owners unless an exception is approved in accordance with Part III.G.4. In cases where permit coverage for individual lot(s) will be conveyed, the permittee shall inform the individual lot owner of the obligations under this permit and ensure that the Individual Lot NOI application is submitted to Ohio EPA.

**Part I****E. Authorization**

1. Obtaining authorization to discharge. Operators that discharge storm water associated with construction activity must submit an NOI application form in accordance with the requirements of Part II of this permit to obtain authorization to discharge under this general permit. As required under OAC Rule 3745-38-06(E), the director, in response to the NOI submission, shall notify the applicant in writing that he/she has been granted general permit coverage to discharge storm water associated with construction activity under the terms and conditions of this permit or that the applicant must apply for an individual NPDES permit or coverage under an alternate general NPDES permit as described in Part I.C.1.

2. No release from other requirements. No condition of this permit shall release the permittee from any responsibility or requirements under other environmental statutes or regulations. Other permit requirements commonly associated with construction activities include, but are not limited to, section 401 water quality certifications, isolated wetland permits, permits to install sanitary sewers or other devices that discharge or convey polluted water, permits to install drinking water lines, single lot sanitary system permits and disturbance of land which was used to operate a solid or hazardous waste facility (i.e., coverage under this NPDES general permit does not satisfy the requirements of OAC Rule 3745-27-13 or ORC Section 3734.02(H)). This permit does not relieve the permittee of other responsibilities associated with construction activities such as contacting the Ohio Department of Natural Resources, Division of Water, to ensure proper well installation and abandonment of wells.

**Part II. NOTICE OF INTENT REQUIREMENTS****A. Deadlines for notification.**

Initial coverage: Operators who intend to obtain initial coverage for a storm water discharge associated with construction activity under this general permit must submit a complete and accurate NOI application form and appropriate fee at least 21 days prior to the commencement of construction activity. If more than one operator, as defined in Part VII of this general permit, will be engaged at a site, each operator shall seek coverage under this general permit. Where one operator has already submitted an NOI prior to other operator(s) being identified, the additional operator shall request modification of coverage to become a co-permittee. In such instances, the co-permittees shall be covered under the same facility permit number. No additional permit fee is required.

**Part II.A**

Individual lot transfer of coverage: Operators must each submit an individual lot notice of intent (Individual Lot NOI) application form (no fee required) to Ohio EPA at least seven days prior to the date that they intend to accept responsibility for permit requirements for their portion of the original permitted development from the previous permittee. The original permittee may submit an Individual Lot NOT at the time the Individual Lot NOI is submitted. Transfer of permit coverage is not granted until an approval letter from the director of Ohio EPA is received by the applicant.

**B. Failure to notify.**

Operators who fail to notify the director of their intent to be covered and who discharge pollutants to surface waters of the state without an NPDES permit are in violation of ORC Chapter 6111. In such instances, Ohio EPA may bring an enforcement action for any discharges of storm water associated with construction activity.

**C. Where to submit an NOI.**

Operators seeking coverage under this permit must submit a signed NOI form, provided by Ohio EPA, to the address found in the associated instructions.

**D. Additional notification.**

The permittee shall make NOIs and SWP3s available upon request of the director of Ohio EPA, local agencies approving sediment and erosion control plans, grading plans or storm water management plans, local governmental officials, or operators of municipal separate storm sewer systems (MS4s) receiving drainage from the permitted site. Each operator that discharges to an NPDES permitted MS4 shall provide a copy of its Ohio EPA NOI submission to the MS4 in accordance with the MS4's requirements, if applicable.

**E. Renotification.**

Upon renewal of this general permit, the permittee is required to notify the director of his intent to be covered by the general permit renewal. Permittees covered under the previous NPDES general permit for storm water discharges associated with construction activity (NPDES permit number OHR100000) shall have continuing coverage under this permit. The permittees covered under OHR100000 shall submit a letter within 90 days of receipt of written notification by Ohio EPA expressing their intent that coverage be continued. There is no fee associated with these letters of intent for continued coverage. Permit coverage will be terminated after the 90-day period if the letter is not received by Ohio EPA. Ohio EPA will provide instructions on the contents of the letter and where it is to be sent within the notification letter.

**PART III. STORM WATER POLLUTION PREVENTION PLAN (SWP3)****A. Storm Water Pollution Prevention Plans.**

A SWP3 shall be developed for each site covered by this permit. For a multi-phase construction project, a separate NOI shall be submitted when a separate SWP3 will be prepared for subsequent phases. SWP3s shall be prepared in accordance with sound engineering and/or conservation practices by a professional experienced in the design and implementation of standard erosion and sediment controls and storm water management practices addressing all phases of construction. The SWP3 shall identify potential sources of pollution which may reasonably be expected to affect the quality of storm water discharges associated with construction activities. In addition, the SWP3 shall describe and ensure the implementation of best management practices (BMPs) that reduce the pollutants in storm water discharges during construction and pollutants associated with post-construction activities to ensure compliance with ORC Section 6111.04, OAC Chapter 3745-1 and the terms and conditions of this permit.

**B. Timing**

A SWP3 shall be completed prior to the timely submittal of an NOI and updated in accordance with Part III.D. Upon request and good cause shown, the director may waive the requirement to have a SWP3 completed at the time of NOI submission. If a waiver has been granted, the SWP3 must be completed prior to the initiation of construction activities. The SWP3 must be implemented upon initiation of construction activities.

Permittees continuing coverage from the previous generation of this permit (OHR100000) that have initiated construction activity prior to the receipt of written notification from Ohio EPA to submit a letter of intent to continue coverage, as required in Part II.E, are not required to update their SWP3 as a result of this renewal (OHC000002). All permittees developing sites with coverage under OHR100000 that seek continuation of coverage do not need to update the post-construction section of their SWP3 as required in Part III.G.2.e of this permit.

**C. SWP3 Signature and Review.**

1. Plan Signature and Retention On Site. The SWP3 shall be signed in accordance with Part V.G. and retained on site during working hours.

## 2. Plan Availability

a. On-site: The plan shall be made available immediately upon request of the director or his authorized representative during working hours. A copy of the NOI and letter granting permit coverage under this general permit also shall be made available at the site.

**Part III.C.2**

b. By written request: The permittee must provide a copy of the SWP3 within 10 days upon written request of any of the following:

i. The director or the director's authorized representative;

ii. A local agency approving sediment and erosion plans, grading plans or storm water management plans; or

iii. In the case of a storm water discharge associated with construction activity which discharges through a municipal separate storm sewer system with an NPDES permit, to the operator of the system.

c. To the public: All NOIs, general permit approval for coverage letters, and SWP3s are considered reports that shall be available to the public in accordance with the Ohio Public Records law. The permittee shall make documents available to the public upon request or provide a copy at public expense, at cost, in a timely manner. However, the permittee may claim to Ohio EPA any portion of an SWP3 as confidential in accordance with Ohio law.

3. Plan Revision. The director or authorized representative, may notify the permittee at any time that the SWP3 does not meet one or more of the minimum requirements of this part. Within 10 days after such notification from the director, (or as otherwise provided in the notification) or authorized representative, the permittee shall make the required changes to the SWP3 and, if requested, shall submit to Ohio EPA the revised SWP3 or a written certification that the requested changes have been made.

**D. Amendments**

The permittee shall amend the SWP3 whenever there is a change in design, construction, operation or maintenance, which has a significant effect on the potential for the discharge of pollutants to surface waters of the state or if the SWP3 proves to be ineffective in achieving the general objectives of controlling pollutants in storm water discharges associated with construction activity. Amendments to the SWP3 may be reviewed by Ohio EPA in the same manner as Part III.C.

**Part III****E. Duty to inform contractors and subcontractors.**

The permittee shall inform all contractors and subcontractors not otherwise defined as "operators" in Part VII of this general permit, who will be involved in the implementation of the SWP3, of the terms and conditions of this general permit. The permittee shall maintain a written document containing the signatures of all contractors and subcontractors involved in the implementation of the SWP3 as proof acknowledging that they reviewed and understand the conditions and responsibilities of the SWP3. The written document shall be created and signatures shall be obtained prior to commencement of work on the construction site.

**F. Total Maximum Daily Load (TMDL) allocations**

If a TMDL is approved for any waterbody into which the permittee's site discharges and requires specific BMPs for construction sites, the director may require the permittee to revise his/her SWP3.

**G. SWP3 Requirements**

Operations that discharge storm water from construction activities are subject to the following requirements and the SWP3 shall include the following items:

1. Site description. Each SWP3 shall provide:
  - a. A description of the nature and type of the construction activity (e.g., low density residential, shopping mall, highway, etc.);
  - b. Total area of the site and the area of the site that is expected to be disturbed (i.e., grubbing, clearing, excavation, filling or grading, including off-site borrow areas);
  - c. A calculation of the runoff coefficients for both the pre-construction and post construction site conditions;
  - d. An estimate of the impervious area and percent imperviousness created by the construction activity;
  - e. Existing data describing the soil and, if available, the quality of any discharge from the site;
  - f. A description of prior land uses at the site;

**Part III.G.1**

- g. An implementation schedule which describes the sequence of major construction operations (i.e., grubbing, excavating, grading, utilities and infrastructure installation) and the implementation of erosion, sediment and storm water management practices or facilities to be employed during each operation of the sequence;
- h. The name and/or location of the immediate receiving stream or surface water(s) and the first subsequent named receiving water(s) and the areal extent and description of wetlands or other special aquatic sites at or near the site which will be disturbed or which will receive discharges from disturbed areas of the project;
- i. For subdivided developments where the SWP3 does not call for a centralized sediment control capable of controlling multiple individual lots, a detail drawing of a typical individual lot showing standard individual lot erosion and sediment control practices. This does not remove the responsibility to designate specific erosion and sediment control practices in the SWP3 for critical areas such as steep slopes, stream banks, drainage ways and riparian zones.
- j. Location and description of any storm water discharges associated with dedicated asphalt and dedicated concrete plants covered by this permit and the best management practices to address pollutants in these storm water discharges;
- k. A copy of the permit requirements (attaching a copy of this permit is acceptable);
- l. Site map showing:
  - i. Limits of earth-disturbing activity of the site including associated off-site borrow or spoil areas that are not addressed by a separate NOI and associated SWP3;
  - ii. Soils types should be depicted for all areas of the site, including locations of unstable or highly erodible soils;
  - iii. Existing and proposed contours. A delineation of drainage watersheds expected during and after major grading activities as well as the size of each drainage watershed, in acres;

**Part III.G.1.I**

- iv. Surface water locations including springs, wetlands, streams, lakes, water wells, etc., on or within 200 feet of the site, including the boundaries of wetlands or stream channels and first subsequent named receiving water(s) the permittee intends to fill or relocate for which the permittee is seeking approval from the Army Corps of Engineers and/or Ohio EPA;
- v. Existing and planned locations of buildings, roads, parking facilities and utilities;
- vi. The location of all erosion and sediment control practices, including the location of areas likely to require temporary stabilization during the course of site development;
- vii. Sediment and storm water management basins noting their sediment settling volume and contributing drainage area;
- viii. Permanent storm water management practices to be used to control pollutants in storm water after construction operations have been completed;
- ix. Areas designated for the storage or disposal of solid, sanitary and toxic wastes, including dumpster areas, areas designated for cement truck washout, and vehicle fueling;
- x. The location of designated construction entrances where the vehicles will access the construction site;
- xi. The location of any in-stream activities including stream crossings.

2. Controls. The SWP3 must contain a description of the controls appropriate for each construction operation covered by this permit and the operator(s) must implement such controls. The SWP3 must clearly describe for each major construction activity identified in Part III.G.1.g: (a) appropriate control measures and the general timing (or sequence) during the construction process that the measures will be implemented; and (b) which contractor is responsible for implementation (e.g., contractor A will clear land and install perimeter controls and contractor B will maintain perimeter controls until final stabilization). Ohio EPA recommends that the erosion, sediment, and storm water management practices used to satisfy the conditions of this permit, should meet the standards and specifications in the current edition of Ohio's Rainwater and Land Development (see definitions) manual or other standards acceptable to Ohio EPA. The controls shall include the following minimum components:

**Part III.G.2**

- a. Non-Structural Preservation Methods. The SWP3 must make use of practices which preserve the existing natural condition as much as feasible. Such practices may include: preserving riparian areas adjacent to surface waters of the state, preserving existing vegetation and vegetative buffer strips, phasing of construction operations in order to minimize the amount of disturbed land at any one time and designation of tree preservation areas or other protective clearing or grubbing practices. The recommended buffer that operators should leave undisturbed along a surface water of the state is 25 feet as measured from the ordinary high water mark of the surface water.
- b. Erosion Control Practices. The SWP3 must make use of erosion controls that are capable of providing cover over disturbed soils unless an exception is approved in accordance with Part III.G.4. A description of control practices designed to restabilize disturbed areas after grading or construction shall be included in the SWP3. The SWP3 must provide specifications for stabilization of all disturbed areas of the site and provide guidance as to which method of stabilization will be employed for any time of the year. Such practices may include: temporary seeding, permanent seeding, mulching, matting, sod stabilization, vegetative buffer strips, phasing of construction operations, use of construction entrances and the use of alternative ground cover.
- i. Stabilization. Disturbed areas must be stabilized as specified in the following tables below. Permanent and temporary stabilization are defined in Part VII.

Table 1: Permanent Stabilization

Area requiring permanent stabilization	Time frame to apply erosion controls
Any areas that will lie dormant for one year or more	Within seven days of the most recent disturbance
Any areas within 50 feet of a stream and at final grade	Within two days of reaching final grade
Any other areas at final grade	Within seven days of reaching final grade within that area

**Part III.G.2.b.i**

Table 2: Temporary Stabilization

Area requiring temporary stabilization	Time frame to apply erosion controls
Any disturbed areas within 50 feet of a stream and not at final grade	Within two days of the most recent disturbance if the area will remain idle for more than 21 days
For all construction activities, any disturbed areas that will be dormant for more than 21 days but less than one year, and not within 50 feet of a stream	Within seven days of the most recent disturbance within the area  For residential subdivisions, disturbed areas must be stabilized at least seven days prior to transfer of permit coverage for the individual lot(s).
Disturbed areas that will be idle over winter	Prior to the onset of winter weather
Where vegetative stabilization techniques may cause structural instability or are otherwise unobtainable, alternative stabilization techniques must be employed.	

ii. Permanent stabilization of conveyance channels. Operators shall undertake special measures to stabilize channels and outfalls and prevent erosive flows. Measures may include seeding, dormant seeding (as defined in the 1996 edition of the Rainwater and Land Development manual), mulching, erosion control matting, sodding, riprap, natural channel design with bioengineering techniques or rock check dams.

c. Runoff Control Practices. The SWP3 shall incorporate measures which control the flow of runoff from disturbed areas so as to prevent erosion from occurring. Such practices may include rock check dams, pipe slope drains, diversions to direct flow away from exposed soils and protective grading practices. These practices shall divert runoff away from disturbed areas and steep slopes where practicable.

d. Sediment Control Practices. The plan shall include a description of structural practices that shall store runoff allowing sediments to settle and/or divert flows away from exposed soils or otherwise limit runoff from exposed areas. Structural practices shall be used to control erosion and trap sediment from a site remaining disturbed for more than 14 days. Such practices may include, among others: sediment settling ponds, silt fences, earth diversion dikes or channels which direct runoff to a sediment settling pond and storm drain inlet protection. All sediment control practices must be capable of ponding runoff in order to be considered functional. Earth diversion dikes or channels alone are not considered a sediment control practice unless those are used in conjunction with a sediment settling pond.

**Part III.G.2.d**

The SWP3 must contain detail drawings for all structural practices.

i. Timing. Sediment control structures shall be functional throughout the course of earth disturbing activity. Sediment basins and perimeter sediment barriers shall be implemented prior to grading and within seven days from the start of grubbing. They shall continue to function until the up slope development area is restabilized. As construction progresses and the topography is altered, appropriate controls must be constructed or existing controls altered to address the changing drainage patterns.

ii. Sediment settling ponds. Concentrated storm water runoff and runoff from drainage areas, which exceed the design capacity of silt fence or inlet protection, shall pass through a sediment settling pond. For common drainage locations that serve an area with 10 or more acres disturbed at one time, a temporary (or permanent) sediment settling pond must be provided until final stabilization of the site. The permittee may request approval from Ohio EPA to use alternative controls if it can demonstrate the alternative controls are equivalent in effectiveness to a sediment settling pond. It is recommended for drainage locations serving less than 10 acres, smaller sediment basins and/or sediment traps should be used.

The sediment settling pond shall be sized to provide at least 67 cubic yards of storage per acre of total contributing drainage area. When determining the total contributing drainage area, off-site areas and areas which remain undisturbed by construction activity must be included unless runoff from these areas is diverted away from the sediment settling pond and is not commingled with sediment-laden runoff. The depth of the sediment settling pond must be less than or equal to five feet. The configuration between inlets and the outlet of the basin must provide at least two units of length for each one unit of width (> 2:1 length:width ratio). Sediment must be removed from the sediment settling pond when the design capacity has been reduced by 40 percent (This is typically reached when sediment occupies one-half of the basin depth). When designing sediment settling ponds, the permittee must consider public safety, especially as it relates to children, as a design factor for the sediment basin and alternative sediment controls must be used where site limitations would preclude a safe design. The use of a combination of sediment and erosion control measures in order to achieve maximum pollutant removal is encouraged.

**Part III.G.2.d**

iii. Silt Fence and Diversions. Sheet flow runoff from denuded areas shall be intercepted by silt fence or diversions to protect adjacent properties and water resources from sediment transported via sheet flow. Where intended to provide sediment control, silt fence shall be placed on a level contour. This permit does not preclude the use of other sediment barriers designed to control sheet flow runoff. The relationship between the maximum drainage area to silt fence for a particular slope range is shown in the table below.

Maximum drainage area (in acres) to 100 linear feet of silt fence	Range of slope for a particular drainage area (in percent)
0.5	< 2%
0.25	≥ 2% but < 20%
0.125	≥ 20% but < 50%

Storm water diversion practices shall be used to keep runoff away from disturbed areas and steep slopes where practicable. Such devices, which include swales, dikes or berms, may receive storm water runoff from areas up to 10 acres.

iv. Inlet Protection. Other erosion and sediment control practices shall minimize sediment laden water entering active storm drain systems, unless the storm drain system drains to a sediment settling pond.

v. Stream Protection. If construction activities disturb areas adjacent to streams, structural practices shall be designed and implemented on site to protect all adjacent streams from the impacts of sediment runoff. No structural sediment controls (e.g., the installation of silt fence or a sediment settling pond in-stream) shall be used in a stream. For all construction activities immediately adjacent to surface waters of the state, it is recommended that a setback of at least 25-feet, as measured from the ordinary high water mark of the surface water, be maintained in its natural state as a permanent buffer. Where impacts within this setback area are unavoidable due to the nature of the construction activity (e.g., stream crossings for roads or utilities), the project shall be designed such that the number of stream crossings and the width of the disturbance within the setback area are minimized.

vi. Modifying Controls. If periodic inspections or other information indicates a control has been used inappropriately or incorrectly, the permittee must replace or modify the control for site conditions.

**Part III.G.2**

e. Post-Construction Storm Water Management Requirements. So that receiving stream's physical, chemical, and biological characteristics are protected and stream functions are maintained, post-construction storm water practices shall provide perpetual management of runoff quality and quantity. To meet the post-construction requirements of this permit, the SWP3 must contain a description of the post-construction BMPs that will be installed during construction for the site and the rationale for their selection. The rationale must address the anticipated impacts on the channel and floodplain morphology, hydrology, and water quality.

Detail drawings and maintenance plans must be provided for all post - construction BMPs. Maintenance plans shall be provided by the permittee to the post-construction operator of the site (including homeowner associations) upon completion of construction activities (prior to termination of permit coverage). For sites located within a community with a regulated municipal separate storm sewer system (MS4), the permittee, land owner, or other entity with legal control of the property may be required to develop and implement a maintenance plan to comply with the requirements of the MS4. Maintenance plans must ensure that pollutants collected within structural post-construction practices, be disposed of in accordance with local, state, and federal regulations. Permittees, except for those regulated under the small MS4 program, are not responsible under this permit for operation and maintenance of post-construction practices once coverage under this permit is terminated.

This permit does not preclude the use of innovation or experimental post-construction storm water management technologies. However, the director may require discharges from such structures to be monitored to ensure compliance with Part III.G.2.e of this permit. The installation of structural controls in certain scenarios may also require a separate permit under section 404 of the CWA. Permittees are only responsible for the installation and maintenance of storm water management measures prior to final stabilization of the site and are not responsible for maintenance after storm water discharges associated with construction activity have been eliminated from the site. However, post-construction storm water BMPs that discharge pollutants from point sources once construction is completed, may in themselves, need authorization under a separate NPDES permit.

Linear construction projects, (e.g., pipeline or utility line installation), which do not result in the installation of impervious surface, are not required to comply with the conditions of Part III.G.2.e of this permit. However, linear construction projects must be designed to minimize the number of stream crossings and the width of disturbance.

**Part III.G.2.e**

Large Construction Activities. For all large construction activities (involving the disturbance of five or more acres of land or will disturb less than five acres, but is a part of a larger common plan of development or sale which will disturb five or more acres of land), the post construction BMP(s) chosen must be able to detain storm water runoff for protection of the stream channels, stream erosion control, and improved water quality. Structural (designed) post-construction storm water treatment practices shall be incorporated into the permanent drainage system for the site. The BMP(s) chosen must be sized to treat the water quality volume (WQ<sub>v</sub>) and ensure compliance with Ohio's Water Quality Standards in OAC Chapter 3745-1. The WQ<sub>v</sub> shall be equivalent to the volume of runoff from a 0.75-inch rainfall and shall be determined according to one of the two following methods:

- i. Through a site hydrologic study approved by the local municipal permitting authority that uses continuous hydrologic simulation and local long-term hourly precipitation records or
- ii. Using the following equation:  $WQ_v = C * P * A / 12$   
 where:  
 WQ<sub>v</sub> = water quality volume in acre-feet  
 C = Runoff Coefficient appropriate for storms less than 1 inch (see Table 1)  
 P = 0.75 inch precipitation depth  
 A = area draining into the BMP in acres

**Table 1  
Runoff Coefficients Based on the Type of Land Use**

Land Use	Runoff Coefficient
Industrial & Commercial	0.8
High Density Residential (>8 dwellings/acre)	0.5
Medium Density Residential (4 to 8 dwellings/acre)	0.4
Low Density Residential (<4 dwellings/acre)	0.3
Open Space and Recreational Areas	0.2

Where the land use will be mixed, the runoff coefficient should be calculated using a weighted average. For example, if 60% of the contributing drainage area to the storm water treatment structure is Low Density Residential, 30% is High Density Residential, and 10% is Open Space, the runoff coefficient is calculated as follows  $(0.6)(0.3) + (0.3)(0.5) + (0.1)(0.2) = 0.35$ .

**Part III.G.2.e**

An additional volume equal to 20 percent of the WQ<sub>v</sub> shall be incorporated into the BMP for sediment storage and/or reduced infiltration capacity. Ohio EPA recommends that BMPs be designed according to the methodology included in the Rainwater and Land Development manual or in another design manual acceptable for use by Ohio EPA. BMPs shall be designed such that the drain time is long enough to provide treatment, but short enough to provide storage available for successive rainfall events as described in Table 2 below.

**Table 2  
Target Draw Down (Drain) Times for Structural  
Post-Construction Treatment Control Practices**

Best Management Practice	Drain Time of WQ <sub>v</sub>
Infiltration	24 - 48 hours
Vegetated Swale and Filter Strip	24 hours
Extended Detention Basin (Dry Basins)	48 hours
Retention Basins (Wet Basins)*	24 hours
Constructed Wetlands (above permanent pool)	24 hours
Media Filtration, Bioretention	40 hours

\* Provide both a permanent pool and an extended detention volume above the permanent pool, each sized at 0.75 \* WQ<sub>v</sub>

The permittee may request approval from Ohio EPA to use alternative structural post-construction BMPs if the permittee can demonstrate that the alternative BMPs are equivalent in effectiveness to those listed in Table 2 above. Construction activities shall be exempt from this condition if it can be demonstrated that the WQ<sub>v</sub> is provided within an existing structural post-construction BMP that is part of a larger common plan of development or if structural post-construction BMPs are addressed in a regional or local storm water management plan. Public entities (i.e., the state, counties, townships, cities, or villages) shall comply with the post-construction storm water management requirements of Part III.G.2.e for roadway construction projects initiated after March 10, 2006 and where practicable for projects initiated as of the effective date of this permit and thereafter. For redevelopment projects (i.e., developments on previously developed property), post-construction practices shall either ensure a 20 percent net reduction of the site impervious area, provide for treatment of at least 20 percent of the WQ<sub>v</sub>, or a combination of the two.

**Part III.G.2.e**

Small Construction Activities. For all small land disturbance activities (which disturb one or more, but less than five acres of land and is not a part of a larger common plan of development or sale which will disturb five or more acres of land), a description of measures that will be installed during the construction process to control pollutants in storm water discharges that will occur after construction operations have been completed must be included in the SWP3. Structural measures should be placed on upland soils to the degree attainable.

i. Such practices may include, but are not limited to: storm water detention structures (including wet basins); storm water retention structures; flow attenuation by use of open vegetated swales and natural depressions; infiltration of runoff onsite; and sequential systems (which combine several practices). The SWP3 shall include an explanation of the technical basis used to select the practices to control pollution where flows exceed pre-development levels.

ii. Velocity dissipation devices shall be placed at discharge locations and along the length of any outfall channel to provide non-erosive flow velocity from the structure to a water course so that the natural physical and biological characteristics and functions are maintained and protected (e.g., no significant changes in the hydrological regime of the receiving water).

f. Surface Water Protection. If the project site contains any streams, rivers, lakes, wetlands or other surface waters, certain construction activities at the site may be regulated under the CWA and/or state isolated wetland permit requirements. Sections 404 and 401 of the Act regulate the discharge of dredged or fill material into surface waters and the impacts of such activities on water quality, respectively. Construction activities in surface waters which may be subject to CWA regulation and/or state isolated wetland permit requirements include, but are not limited to: sewer line crossings, grading, backfilling or culverting streams, filling wetlands, road and utility line construction, bridge installation and installation of flow control structures. If the project contains streams, rivers, lakes or wetlands or possible wetlands, the permittee must contact the appropriate U.S. Army Corps of Engineers District Office. (CAUTION: Any area of seasonally wet hydric soil is a potential wetland - please consult the Soil Survey and list of hydric soils for your County, available at your county's Soil and Water Conservation District. If you have any questions about Section 401 water quality certification, please contact the Ohio Environmental Protection Agency, Section 401 Coordinator.)

**Part III.G.2.f**

U.S. Army Corps of Engineers (Section 404 regulation): Huntington, WV District (304) 529-5210 (Muskingum, Hocking and Scioto River Basin)  
Buffalo, NY District (716) 879-4329 (Lake Erie Basin)  
Pittsburgh, PA District (412) 395-7152 (Mahoning River Basin)  
Louisville, KY District (502) 315-6678 (Little & Great Miami River Basin)  
Ohio Environmental Protection Agency (Section 401 regulation):  
Columbus, OH (614) 644-2001 (all of Ohio)

g. Other controls.

i. Non-Sediment Pollutant Controls. No solid (other than sediment) or liquid waste, including building materials, shall be discharged in storm water runoff. The permittee must implement all necessary BMPs to prevent the discharge of non-sediment pollutants to the drainage system of the site or surface waters of the state. Under no circumstance shall concrete trucks wash out directly into a drainage channel, storm sewer or surface waters of the state. No exposure of storm water to waste materials is recommended.

ii. Off-site traffic. Off-site vehicle tracking of sediments and dust generation shall be minimized.

iii. Compliance with other requirements. The SWP3 shall be consistent with applicable State and/or local waste disposal, sanitary sewer or septic system regulations, including provisions prohibiting waste disposal by open burning and shall provide for the proper disposal of contaminated soils to the extent these are located within the permitted area.

iv. Trench and ground water control. There shall be no turbid discharges to surface waters of the state resulting from dewatering activities. If trench or ground water contains sediment, it must pass through a sediment settling pond or other equally effective sediment control device, prior to being discharged from the construction site. Alternatively, sediment may be removed by settling in place or by dewatering into a sump pit, filter bag or comparable practice. Ground water dewatering which does not contain sediment or other pollutants is not required to be treated prior to discharge. However, care must be taken when discharging ground water to ensure that it does not become pollutant laden by traversing over disturbed soils or other pollutant sources.

**Part III.G.2**

h. Maintenance. All temporary and permanent control practices shall be maintained and repaired as needed to ensure continued performance of their intended function. All sediment control practices must be maintained in a functional condition until all up slope areas they control are permanently stabilized. The SWP3 shall be designed to minimize maintenance requirements. The applicant shall provide a description of maintenance procedures needed to ensure the continued performance of control practices.

i. Inspections. At a minimum, procedures in an SWP3 shall provide that all controls on the site are inspected at least once every seven calendar days and within 24 hours after any storm event greater than one-half inch of rain per 24 hour period. The permittee shall assign qualified inspection personnel (those with knowledge and experience in the installation and maintenance of sediment and erosion controls) to conduct these inspections to ensure that the control practices are functional and to evaluate whether the SWP3 is adequate and properly implemented in accordance with the schedule proposed in Part III.G.1.g of this permit or whether additional control measures are required. Disturbed areas and areas used for storage of materials that are exposed to precipitation shall be inspected for evidence of or the potential for, pollutants entering the drainage system. Erosion and sediment control measures identified in the SWP3 shall be observed to ensure that those are operating correctly. Discharge locations shall be inspected to ascertain whether erosion and sediment control measures are effective in preventing significant impacts to the receiving waters. Locations where vehicles enter or exit the site shall be inspected for evidence of off-site vehicle tracking.

The permittee shall maintain for three years following the submittal of a notice of termination form, a record summarizing the results of the inspection, names(s) and qualifications of personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of the SWP3 and a certification as to whether the facility is in compliance with the SWP3 and the permit and identify any incidents of non-compliance. The record and certification shall be signed in accordance with Part V.G. of this permit.

i. When practices require repair or maintenance. If the inspection reveals that a control practice is in need of repair or maintenance, with the exception of a sediment settling pond, it must be repaired or maintained within three days of the inspection. Sediment settling ponds must be repaired or maintained within 10 days of the inspection.

**Part III.G.2.i**

ii. When practices fail to provide their intended function. If the inspection reveals that a control practice fails to perform its intended function and that another, more appropriate control practice is required, the SWP3 must be amended and the new control practice must be installed within 10 days of the inspection.

iii. When practices depicted on the SWP3 are not installed. If the inspection reveals that a control practice has not been implemented in accordance with the schedule contained in Part III.G.1.g of this permit, the control practice must be implemented within 10 days from the date of the inspection. If the inspection reveals that the planned control practice is not needed, the record must contain a statement of explanation as to why the control practice is not needed.

3. Approved State or local plans. All dischargers regulated under this general permit must comply, except those exempted under state law, with the lawful requirements of municipalities, counties and other local agencies regarding discharges of storm water from construction activities. All erosion and sediment control plans and storm water management plans approved by local officials shall be retained with the SWP3 prepared in accordance with this permit. Applicable requirements for erosion and sediment control and storm water management approved by local officials are, upon submittal of a NOI form, incorporated by reference and enforceable under this permit even if they are not specifically included in an SWP3 required under this permit. When the project is located within the jurisdiction of a regulated municipal separate storm sewer system (MS4), the permittee must certify that the SWP3 complies with the requirements of the storm water management program of the MS4 operator.

4. Exceptions. If specific site conditions prohibit the implementation of any of the erosion and sediment control practices contained in this permit or site specific conditions are such that implementation of any erosion and sediment control practices contained in this permit will result in no environmental benefit, then the permittee shall provide justification for rejecting each practice based on site conditions. Exceptions from implementing the erosion and sediment control standards contained in this permit will be approved or denied on a case-by-case basis.

**PART IV. NOTICE OF TERMINATION REQUIREMENTS****A. Failure to notify.**

The terms and conditions of this permit shall remain in effect until a signed Notice of Termination (NOT) form is submitted. Failure to submit an NOT constitutes a violation of this permit and may affect the ability of the permittee to obtain general permit coverage in the future.

**B. When to submit a NOT**

1. Permittees wishing to terminate coverage under this permit must submit an NOT form in accordance with Part V.G. of this permit. Compliance with this permit is required until an NOT form is submitted. The permittee's authorization to discharge under this permit terminates at midnight of the day the NOT form is submitted.

2. All permittees must submit an NOT form within 45 days of completing all permitted land disturbance activities. Enforcement actions may be taken if a permittee submits an NOT form without meeting one or more of the following conditions:

- a. Final stabilization (see definition in Part VII) has been achieved on all portions of the site for which the permittee is responsible (including, if applicable, returning agricultural land to its pre-construction agricultural use);
- b. Another operator(s) has assumed control over all areas of the site that have not been finally stabilized;
- c. For residential construction only, temporary stabilization has been completed and the lot, which includes a home, has been transferred to the homeowner. (Note: individual lots without housing which are sold by the developer must undergo final stabilization prior to termination of permit coverage.); or
- d. An exception has been granted under Part III.G.4.

**C. How to submit a NOT**

Permittees must use Ohio EPA's approved NOT form. The form must be completed and mailed according to the instructions and signed in accordance with Part V.G of this permit.

**PART V. STANDARD PERMIT CONDITIONS.****A. Duty to comply.**

1. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of ORC Chapter 6111, and is grounds for enforcement action.

2. Ohio law imposes penalties and fines for persons who knowingly make false statements or knowingly swear or affirm the truth of a false statement previously made.

**B. Continuation of an expired general permit.**

An expired general permit continues in force and effect until a new general permit is issued.

**C. Need to halt or reduce activity not a defense.**

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

**D. Duty to mitigate.**

The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

**E. Duty to provide information.**

The permittee shall furnish to the director, within 10 days of written request, any information which the director may request to determine compliance with this permit. The permittee shall also furnish to the director upon request copies of records required to be kept by this permit.

**F. Other information.**

When the permittee becomes aware that he or she failed to submit any relevant facts or submitted incorrect information in the NOI, SWP3, NOT or in any other report to the director, he or she shall promptly submit such facts or information.

**Part V****G. Signatory requirements.**

All NOIs, NOTs, SWP3s, reports, certifications or information either submitted to the director or that this permit requires to be maintained by the permittee, shall be signed.

## 1. These items shall be signed as follows:

a. For a corporation: By a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:

- i. A president, secretary, treasurer or vice-president of the corporation in charge of a principal business function or any other person who performs similar policy or decision-making functions for the corporation; or
- ii. The manager of one or more manufacturing, production or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

b. For a partnership or sole proprietorship: By a general partner or the proprietor, respectively; or

c. For a municipality, State, Federal or other public agency: By either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes (1) the chief executive officer of the agency or (2) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of U.S. EPA).

2. All reports required by the permits and other information requested by the director shall be signed by a person described in Part V.G.1 of this permit or by a duly authorized representative of that person. A person is a duly authorized representative only if:

**Part V.G.2**

a. The authorization is made in writing by a person described in Part V.G.1 of this permit and submitted to the director;

b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of manager, operator of a well or well field, superintendent, position of equivalent responsibility or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and

c. The written authorization is submitted to the director.

3. Changes to authorization. If an authorization under Part V.G.2 of this permit is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Part V.G.2 of this permit must be submitted to the director prior to or together with any reports, information or applications to be signed by an authorized representative.

**H. Certification.**

Any person signing documents under this section shall make the following certification: *"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."*

**I. Oil and hazardous substance liability.**

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities or penalties to which the permittee is or may be subject under section 311 of the CWA or 40 CFR Part 112. 40 CFR Part 112 establishes procedures, methods and equipment and other requirements for equipment to prevent the discharge of oil from non-transportation-related onshore and offshore facilities into or upon the navigable surface waters of the State or adjoining shorelines.

**Part V****J. Property rights.**

The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges, nor does it authorize any injury to private property nor any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations.

**K. Severability.**

The provisions of this permit are severable and if any provision of this permit or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this permit shall not be affected thereby.

**L. Transfers.**

Ohio NPDES general permit coverage is transferable. Ohio EPA must be notified in writing sixty days prior to any proposed transfer of coverage under an Ohio NPDES general permit. The transferee must inform Ohio EPA it will assume the responsibilities of the original permittee transferor.

**M. Environmental laws.**

No condition of this permit shall release the permittee from any responsibility or requirements under other environmental statutes or regulations.

**N. Proper operation and maintenance.**

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit and with the requirements of SWP3s. Proper operation and maintenance requires the operation of backup or auxiliary facilities or similar systems, installed by a permittee only when necessary to achieve compliance with the conditions of the permit.

**O. Inspection and entry.**

The permittee shall allow the director or an authorized representative of Ohio EPA, upon the presentation of credentials and other documents as may be required by law, to:

**Part V.O**

1. Enter upon the permittee's premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of this permit;
2. Have access to and copy at reasonable times, any records that must be kept under the conditions of this permit; and
3. Inspect at reasonable times any facilities or equipment (including monitoring and control equipment).

**PART VI. REOPENER CLAUSE**

A. If there is evidence indicating potential or realized impacts on water quality due to any storm water discharge associated with construction activity covered by this permit, the permittee of such discharge may be required to obtain coverage under an individual permit or an alternative general permit in accordance with Part I.C of this permit or the permit may be modified to include different limitations and/or requirements.

B. Permit modification or revocation will be conducted according to ORC Chapter 6111.

**PART VII. DEFINITIONS**

A. "Act" means Clean Water Act (formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act Amendments of 1972) Pub. L. 92- 500, as amended Pub. L. 95-217, Pub. L. 95-576, Pub. L. 96-483, Pub. L. 97-117 and Pub. L. 100-4, 33 U.S.C. 1251 et. seq.

B. "Best management practices (BMPs)" means schedules of activities, prohibitions of practices, maintenance procedures and other management practices (both structural and non-structural) to prevent or reduce the pollution of surface waters of the state. BMP's also include treatment requirements, operating procedures and practices to control plant and/or construction site runoff, spillage or leaks, sludge or waste disposal or drainage from raw material storage.

C. "Commencement of construction" means the initial disturbance of soils associated with clearing, grubbing, grading, placement of fill or excavating activities or other construction activities.

D. "Concentrated storm water runoff" means any storm water runoff which flows through a drainage pipe, ditch, diversion or other discrete conveyance channel.

E. "Director" means the director of the Ohio Environmental Protection Agency.

**Part VII**

F. "Discharge" means the addition of any pollutant to the surface waters of the state from a point source.

G. "Disturbance" means any clearing, grading, excavating, filling, or other alteration of land surface where natural or man-made cover is destroyed in a manner that exposes the underlying soils.

H. "Final stabilization" means that either:

1. All soil disturbing activities at the site are complete and a uniform perennial vegetative cover (e.g., evenly distributed, without large bare areas) with a density of at least 70 percent cover for the area has been established on all unpaved areas and areas not covered by permanent structures or equivalent stabilization measures (such as the use of mulches, rip-rap, gabions or geotextiles) have been employed. In addition, all temporary erosion and sediment control practices are removed and disposed of and all trapped sediment is permanently stabilized to prevent further erosion; or

2. For individual lots in residential construction by either:

a. The homebuilder completing final stabilization as specified above or

b. The homebuilder establishing temporary stabilization including perimeter controls for an individual lot prior to occupation of the home by the homeowner and informing the homeowner of the need for and benefits of, final stabilization. (Homeowners typically have an incentive to put in the landscaping functionally equivalent to final stabilization as quick as possible to keep mud out of their homes and off sidewalks and driveways.); or

3. For construction projects on land used for agricultural purposes (e.g., pipelines across crop or range land), final stabilization may be accomplished by returning the disturbed land to its pre-construction agricultural use. Areas disturbed that were previously used for agricultural activities, such as buffer strips immediately adjacent to surface waters of the state and which are not being returned to their pre-construction agricultural use, must meet the final stabilization criteria in (1) or (2) above.

I. "Individual Lot NOI" means a Notice of Intent for an individual lot to be covered by this permit (see parts I and II of this permit).

J. "Larger common plan of development or sale"- means a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under one plan.

**Part VII**

K. "MS4" means municipal separate storm sewer system which means a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels or storm drains) that are:

1. Owned or operated by the federal government, state, municipality, township, county, district(s) or other public body (created by or pursuant to state or federal law) including special district under state law such as a sewer district, flood control district or drainage districts or similar entity or a designated and approved management agency under section 208 of the act that discharges into surface waters of the state; and
2. Designed or used for collecting or conveying solely storm water,
3. Which is not a combined sewer and,
4. Which is not a part of a publicly owned treatment works.

L. "National Pollutant Discharge Elimination System (NPDES)" means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits and enforcing pretreatment requirements, under sections 307, 402, 318 and 405 of the CWA. The term includes an "approved program."

M. "NOI" means notice of intent to be covered by this permit.

N. "NOT" means notice of termination.

O. "Operator" means any party associated with a construction project that meets either of the following two criteria:

1. The party has operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or
2. The party has day-to-day operational control of those activities at a project which are necessary to ensure compliance with an SWP3 for the site or other permit conditions (e.g., they are authorized to direct workers at a site to carry out activities required by the SWP3 or comply with other permit conditions).

As set forth in Part II.A, there can be more than one operator at a site and under these circumstances, the operators shall be co-permittees.

P. "Owner or operator" means the owner or operator of any "facility or activity" subject to regulation under the NPDES program.

**Part VII**

Q. "Permanent stabilization" means the establishment of permanent vegetation, decorative landscape mulching, matting, sod, rip rap and landscaping techniques to provide permanent erosion control on areas where construction operations are complete or where no further disturbance is expected for at least one year.

R. "Percent imperviousness" means the impervious area created divided by the total area of the project site.

S. "Point source" means any discernible, confined and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or the floating craft from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture or agricultural storm water runoff.

T. "Rainwater and Land Development" is a manual describing construction and post-construction best management practices and associated specifications. A copy of the manual may be obtained by contacting the Ohio Department of Natural Resources, Division of Soil & Water Conservation.

U. "Riparian area" means the transition area between flowing water and terrestrial (land) ecosystems composed of trees, shrubs and surrounding vegetation which serve to stabilize erodible soil, improve both surface and ground water quality, increase stream shading and enhance wildlife habitat.

V. "Runoff coefficient" means the fraction of total rainfall that will appear at the conveyance as runoff.

W. "Sediment settling pond" means a sediment trap, sediment basin or permanent basin that has been temporarily modified for sediment control, as described in the latest edition of the Rainwater and Land Development manual.

X. "State isolated wetland permit requirements" means the requirements set forth in Sections 6111.02 through 6111.029 of the ORC.

Y. "Storm water" means storm water runoff, snow melt and surface runoff and drainage.

Z. "Surface waters of the state" or "water bodies" means all streams, lakes, reservoirs, ponds, marshes, wetlands or other waterways which are situated wholly or partially within the boundaries of the state, except those private waters which do not combine or effect a junction with natural surface or underground waters. Waters defined as sewerage systems, treatment works or disposal systems in Section 6111.01 of the ORC are not included.

**Part VII**

AA. "SWP3" means storm water pollution prevention plan.

BB. "Temporary stabilization" means the establishment of temporary vegetation, mulching, geotextiles, sod, preservation of existing vegetation and other techniques capable of quickly establishing cover over disturbed areas to provide erosion control between construction operations.

CC. "Water Quality Volume (WQ<sub>v</sub>)" means the volume of storm water runoff which must be captured and treated prior to discharge from the developed site after construction is complete. WQ<sub>v</sub> is based on the expected runoff generated by the mean storm precipitation volume from post-construction site conditions at which rapidly diminishing returns in the number of runoff events captured begins to occur.

**Designer Note:**

**This is ODOT's general permit issued by Ohio Environmental Protection Agency.**

**This supplemental specification will be provided with both supplemental specification 832 and proposal note 205.**

STATE OF OHIO  
DEPARTMENT OF TRANSPORTATION

SUPPLEMENTAL SPECIFICATION 864  
SEALING OF CONCRETE SURFACES

July 11, 2000

864.01	Description
864.02	Materials
864.03	Equipment
864.04	Mixing
864.05	Storage
864.06	Surface Condition
864.07	Surface Preparation
864.08	Application and Coverage
864.09	Test Site/Application
864.10	Appearance
864.11	Traffic
864.12	Safety Precautions
864.13	Protection of Adjoining Surfaces and the Public
864.14	Environmental Requirements
864.15	Method of Measurement
864.16	Basis of Payment

**864.01 Description.** This work consists of applying an approved sealer on existing and new concrete surface areas after the concrete is cured and repairs completed and cured. Apply the sealer to locations described in the plans. Use sealers on the Office of Materials Management's approved list. Apply the sealer listed in the pay item description. Choose a type of sealer if no sealer is listed in the pay item description.

**864.02 Materials.** Approved sealer systems meet the following performance requirements:

1. Absorption - ASTM C642 (non-air entrained concrete). Concrete should be proportioned and mixed in accordance with ASTM C672. Sealed concrete, under total immersion, will not exceed 1.0% after 48 hours or 2.0% after 50 days
2. Scaling Resistance - ASTM C672 A rating of "No Scaling" after 100 cycles on the sealed concrete (non-air entrained concrete) as compared to "Severe Scaling" on untreated concrete.
3. NCHRP 244, Series 11 - Cube Test
  - 3.1 Weight gain - not to exceed 25% of untreated cube
  - 3.2 Absorbed chloride - not to exceed 25% of untreated cube
4. NCHRP 244, Series IV - Southern Exposure
  - 4.1 Absorbed chloride - not to exceed 10% of untreated concrete

5. Record and report the application rate (square footage/gallon) of sealer during the tests.

Provide test data from an approved independent testing facility. The sealer manufacturer funds the testing costs. Furnish the test data, a one quart (one liter) sample, and the MSDS to the Office of Materials Management. Pre-qualified sealers will be on the Department's approved list

**864.03 Equipment.** Use application equipment recommended by the sealer manufacturer. Use spray equipment, tanks, hoses, brooms, rollers, coaters, squeegees, etc., that is clean, free of foreign matter, oil residue and water.

**864.04 Mixing.** Mix the sealer according to the manufacturer's recommended procedures. Furnish the Engineer with the manufacturer's application instructions. Don't mix or apply the sealer until the manufacturer's written recommendations are supplied to the Engineer. Mixed materials to a uniform consistency and maintain during application.

**864.05 Storage.** Store all sealer components in tightly sealed containers, in a dry location, and as recommended by the manufacturer. Deliver unopened drums or containers of the sealer or sealer components to the job site with the manufacturer's numbered seal intact.

**864.06 Surface Condition.** Apply sealers to surfaces which are dry, free from dust, dirt, oil, wax, curing compounds, efflorescence, laitance, coatings and other foreign materials. Repair any structurally unsound surfaces, weak sections or spalled areas before applying any sealer.

Air dry concrete surfaces for at least five (5) days after completion of required curing. Air dry any cavities which require grout filling and curing for five days. Do not apply sealer until the air drying is complete.

Seal accelerated cured precast concrete after it has attained the required 28 day strength and after any cavities which require grout filling have been filled, cured and air-dried for five days.

**864.07 Surface Preparation.** Remove dust, dirt, oil, wax, curing compounds, efflorescence, laitance, coatings and other foreign materials from surfaces to be sealed. Use chemicals or other cleaning compounds if removal requires their use but only use products approved by the sealer manufacturer. Furnish the Engineer documentation of the sealer manufacturer's approval. Apply the sealer within 48 hours of surface preparation.

Install suitable traps, filters, drip pans and other separation devices in the cleaning equipment so oil and other foreign material isn't deposited on the surface.

Use the following cleaning methods depending on the surface type:

- A. New water cured exposed concrete surfaces.
  1. Water blast at 7,000 psi (48 MPa) minimum
- B. New, liquid membrane cured, exposed concrete surfaces.

1. Water blast at 7,000 psi (48 MPa) minimum, or
  2. Sandblast, followed by air brooming or power sweeping, to remove dust and sand from the surfaces and opened pores. Remove all membrane curing compound.
- C. Exposed surfaces of new prestressed concrete box beams
1. Clean with high pressure hot water or steam jenny, or
  2. Water blast at 7,000 psi (48 MPa) minimum, or
  3. Sandblast, followed by air brooming or power sweeping, to remove dust and sand from the surfaces and opened pores
- D. Existing concrete surfaces.
1. Water blast at 7,000 psi (48 MPa) minimum, or
  2. Sandblast, followed by air brooming or power sweeping, to remove dust and sand from the surface and opened pores.

#### 864.08 Application and Coverage.

##### A. Epoxy - Urethane sealers.

1. Apply each coat of the Epoxy-urethane sealer at the coverage rate specified on the Office of Materials Management's approved list.  
(Web site is: <http://www.dot.state.oh.us/testlab/applists/cement/Epoxies.htm>)  
If no application rate is listed, apply each coat at 120 square feet per gallon (2.9 square meter/liter).
2. Only apply sealer when the surface temperature is 50F (10 C) or above
3. Apply with a brush, squeegee, roller or spraying equipment and as recommended by the manufacturer.
4. Apply one coat of epoxy and one coat of the urethane top coat. Time between coats shall meet the manufacturer's recommendation. Use epoxy and urethane from the same manufacturer. Achieve specified coverage regardless of the number of passes per coat.
5. Tint so the final color is Federal Color Standard No. 17778 - Light Neutral. Pigment content shall be limited so as not to reduce sealing effectiveness of the second coat. Refer to the plans for colors for specific projects.
6. Sags and runs are not acceptable in the sealer.
7. For sealed sidewalks or other horizontal surfaces with repetitive foot traffic or vehicular traffic, integrate 1-1/2 lbs. per square yard(0.8 kg/square meter) of silica sand into the surface of the second coat to produce a non-skid surface satisfactory to the Engineer.

##### B. Non-epoxy sealer.

1. Apply the sealer according to the manufacturer's recommended mode of application and under the observation of the Engineer.
2. Coverage.  
Surfaces subject to abrasive wear (bridge decks, bridge deck shoulders and sidewalks)
  1. Minimum, one gallon (3.875 liter) of sealer for each 100 square feet (9.0 square meter);

- Curbs, vertical surfaces of beams and deck slabs subject to direct roadway drainage
2. Minimum, one gallon (3.875 liter) for each 125 square feet (11.5 square meter)
- Other surfaces (for example, parapets, abutments, pier caps and median dividers)
3. Minimum, one gallon (3.875 liter) for each 150 square feet (14.0 square meter)

3. Apply sealer on surfaces in a one-pass operation at the required coverage. Acceptable applications saturate a horizontal surface and take a few seconds before completely penetrating. Broom in the sealer if recommended by the manufacturer.
4. Vertical surface sealer spraying will create runs. Acceptable applications of penetrating sealer developing 6 to 12 inch (150 to 300 mm) runs below the spray pattern. Apply additional passes in 10 to 15 minutes if coverage rate is not achieved with first pass. Apply sealers with brush or roller if recommended by the manufacturer.
5. After 10 to 15 minutes, squeegee off excess material on smooth finished or dense concretes where the required coverage is not absorbed.
6. For sealed sidewalks or other horizontal surfaces with repetitive foot traffic or vehicular traffic, integrate 1-1/2 lbs. per square yard(0.8 kg/square meter) of silica sand into the sealer application to produce a non-skid surface satisfactory to the Engineer.
7. Tint clear non-epoxy sealers with a vanishing dye that will not damage the concrete.
8. Don't apply sealer if the ambient temperature is below 40F (5 C) or will fall below 32 F (0 C) within 12 hours after application.

General. Do not apply sealer if rain is anticipated within 2 hours after application. Clearly mark where the sealer application stops if not continuous.

**864.09 Test Site/Application** Apply sealer to measured coverage areas, both on a horizontal and vertical surfaces, and on different concrete types, demonstrating:

1. The project's visual effects for the epoxy/urethane sealer application at the required coverage rate.
2. Visually, the absorption necessary to achieve the specified coverage rate for the non-epoxy sealer. Use at least 1/2 gallon (2 liter) of sealer, following the manufacturer's recommended method of application, for the total of the test surfaces.
3. Apply to the deck, safety curb or sidewalk for the horizontal test surfaces Use an abutment parapet or pier face for the vertical test surface and so different textures are tested.

#### 864.10 Appearance.

Epoxy/Urethane sealers. Uniform appearance and the final color shall visually match the test section. Re-coating, removal and re-application or other methods recommended by the manufacturer will be required to final appearance.

Non Epoxy Sealers. The sealer shall result in a uniform appearance.

**864.11 Traffic.** Allow traffic on deck shoulder areas after 12 hours of drying time for an epoxy/urethane sealer. Keep traffic off a non-epoxy sealer until the sealer appears totally dry.

**864.12 Safety Precautions.** Follow precautions defined on the manufacturer's MSDS. Provide the Engineer a copy of the MSDS sheet for information before any work commences.

**864.13 Protection of Adjoining Surfaces and the Public.** Protect the public during all operations, specially when applying sealer to the fascia or the underside portions a bridge that span an area used by the public.

During sealing, mask off, or use other means of protection, for surfaces not being sealed . Protect asphalt and mastic type surfaces from spillage and heavy overspray. Do not apply sealers to joint sealants which have not cured according to the manufacturer's instructions. Joint sealants, traffic paints and asphalt overlays may be applied to the treated surfaces 48 hours after the sealer has been applied. Protect nearby steel, aluminum or glass surfaces when non-epoxy overspray could be deposited on those surfaces.

**864.14 Environmental Requirements.** Protect plants and vegetation from overspray by covering with drop cloths.

**864.15 Method of Measurement.** The quantity will be the actual area in square yards (square meters ) of surfaces sealed.

**864.16 Basis of Payment.** Payment will be made for completed and accepted work, including surface preparation, material, application, and pre-qualification testing costs, under the following:

ITEM	UNIT	DESCRIPTION
864	Square yard (square meter)	Sealing of concrete surfaces
864	Square yard (square meter)	Sealing of concrete surfaces (non-epoxy)
864	Square yard (square meter)	Sealing of concrete surfaces (epoxy-urethane)

STATE OF OHIO  
DEPARTMENT OF TRANSPORTATION

SUPPLEMENTAL SPECIFICATION 908

PERFORMANCE GRADE (PG) BINDER REQUIREMENTS

April 18, 2003

- 908.01 General
- 908.02 Materials and Manufacture
- 908.03 Performance
- 908.04 Storage
- 908.050 Requirements for PGM Binder
- 908.051 Sampling of PGM Binder
- 908.052 Mix Design for PGM Binder
- 908.053 Quality Control for PGM Binder

**908.01 General.** The requirements of AASHTO MP1-98 shall apply, deviations from these are as follows.

PG Binders with the suffix "M" (e.g., PG 70-22M, PG 76-22M) shall meet the requirements for a PGM Binder.

For this specification, an independent laboratory shall not be owned or operated, in whole or part, by the binder supplier, Contractor, or affiliates of either.

**908.02 Materials and Manufacture.** The requirements of the AASHTO MP1-98 "Materials and Manufacture" Section shall be completely replaced with the following:

**5.1** The PG Binder shall be an asphalt cement from the refining of crude petroleum, or combination of asphalt cements from the refining of crude petroleum, or asphalt cements and suitable liquid from the refining of crude petroleum, and possible organic modifiers for performance enhancement. Material from the crude refining stream will be considered neat. Liquid from crude refining may be used for adjustments, but shall not be used for the purpose of substitution of crude refined asphalt cement in a PG Binder. In the event of a failure investigation where binders exhibit unusual properties a supplier may be requested by the Laboratory to supply information about the makeup of a PG Binder. Failure to cooperate will mean removal from Supplement 1032 certification.

**5.2** A modifier may be any organic material of suitable manufacture that is proven compatible with asphalt cement (does not separate appreciably in routine

storage), and that is dissolved, dispersed or reacted in asphalt cement to improve its performance. Performance enhancement is defined as a decrease in the temperature susceptibility of the asphalt cement while maintaining or improving desirable properties in a neat asphalt cement such as coatability, adhesiveness and cohesiveness. The use of modifiers shall be limited to 6.0 percent by PG Binder weight.

**5.3** The use of previously used materials must be approved by the Department. Since no standard test procedures exist for reprocessed materials (and original tests were not developed with the use of such materials in mind), appropriate test methods may be chosen by the Department for review. Department approval does not relieve the binder supplier from full responsibility for content and use of any previously used material nor guarantee suitable performance enhancement as defined above. The detected presence in a PG Binder sample of any unapproved previously used material will mean immediate removal from Supplement 1032 certification. Approved reprocessed materials will be limited to 6.0 percent by PG Binder weight.

**5.4** The PG Binder shall be homogeneous, free from water and deleterious materials, and shall not foam when heated to 350F (175C). The asphalt binder (before modification or after modification if liquid modifier used) shall be proven fully compatible with a negative result by means of the Spot Test per AASHTO T 102 using standard naphtha solvent. If standard naphtha shows a positive result, a retest using 35 percent Xylene/ 65 percent Heptane (volume) may be used.

**5.5** The PG Binder shall be at least 99.0 percent soluble as determined by ASTM D 5546 or D 2042. Any insoluble component shall be substantially free of fibers and have discrete particles less than 75µm.

**5.6** Flash point shall be 500F (260C) min. Mass loss on RTFO of final PG grade binder shall be 0.5 percent max.

**5.7** PG 58-28 shall have a minimum Viscosity (ASTM D2171 @ 60C) of 800 poise and PG 64-22 shall have a Penetration ( ASTM D5) between 55 and 75.

**5.8** Direct Tension testing is not required, unless otherwise required in this specification.

**908.03 Performance.** Should excess fat spots, regular random areas of flushing, or excess drainage occur on a project and not be attributable to over rolling, plant operation, or mix quality compared to the JMF, the PG Binder will be rejected. This rejection includes any PGM Binders with an incompatible polymer or that have been improperly handled. The Contractor will not be allowed to use any of the rejected PG Binder. Correction of problem areas will be at the District's discretion depending on the

problem severity, but if an unsafe condition exists, the area in question will be removed and replaced. Before work is resumed, the Contractor or PG Binder supplier shall show to the Laboratory the material properties and compatibility of another PG Binder, by reporting actual test data, and that proper binder production equipment is in use.

The Contractor has a responsibility to ensure traffic is not released early on the mat, unless overridden by the Department. This Contractor responsibility includes allowing sufficient cooling time when night paving before morning rush hour release of traffic. Should traffic be on the mat in a manner leading to flushing or excess surface/tire adhesion and tracking of binder, the mat area in question shall be evaluated for removal and replacement or repair. Any removal and replacement or repair shall be at the Contractor's expense, unless the responsibility was overridden by the Department.

**908.04 Storage.** PG Binder storage shall be in accordance with 402, with the following additions:

A separate storage tank shall be used whenever a Contractor is providing a binder other than a PG Binder to customers other than the Department (excepting winter carryover work) or switching between different PG Binders because of alternating mix types.

When the Contractor switches between two different binder grades and is going to use the same storage tank, the storage tank shall be at least 90 percent empty by tank height. When the Contractor is switching to a PGM Binder or a PG Binder used to make a PGM Binder, the storage tank shall be at least 95 percent empty by tank height.

PGM Binder shall not be stored at the asphalt concrete mixing plant over the winter. No PG Binder to be used in producing a PGM Binder at the asphalt concrete mixing plant will be stored at the facility over the winter. SBR polymer shall be stored in a heated area over winter, but shall not exceed supplier requirements.

The Monitoring Team shall be notified before the delivery of the first load of each type of PG Binder with sufficient lead time to allow for verification of the storage tank condition and if the storage tank meets handling requirements of the binder supplier. The Monitoring Team may sample the first storage tank load or give the Contractor permission to proceed with no tank verification.

**908.050 Requirements for PGM Binder.** A PGM Binder shall meet the requirements of Table A and shall be obtained through modification of a non-oxidized, neat asphalt binder by using a styrene butadiene latex rubber compound (SBR polymer) or a styrene butadiene styrene polymer block copolymer (SBS polymer). The polymer supplier shall certify to the refiner and Contractor that the polymer used meets a minimum 68 percent by weight butadiene content. SBS polymer modification shall be performed prior to shipment to the asphalt concrete mixing plant (preblend). SBR polymer modification shall be performed at the asphalt concrete mixing plant (postblend) or prior to shipment to the

asphalt concrete mixing plant (preblend).

For each project, the PGM Binder supplier shall give the Contractor a handling guide specifying temperature, circulation, shelf life, and other requirements for assuring the PGM Binder will perform as desired. This handling guide will be given to the Monitoring Team and be available in the plant control room and plant laboratory. If PGM Binder is retained at the asphalt concrete mixing plant for more than two weeks before use or beyond the supplier recommended shelf life, whichever is less, a top and bottom sample test (material property difference between samples taken from the top and bottom of the storage tank) shall be performed by the Laboratory on samples retrieved by the Contractor at the District's direction and material on hand shall not be used until approved.

**908.051 Sampling of PGM Binder.** The Contractor shall take two 1 quart (1 liter) binder samples from the first transport truck load, before incorporation into the storage tank. 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.

In addition to the above sampling requirements, twice during each project (once if project has less than 3000 tons (3000 metric tons) of mix), the Monitoring Team will direct the Contractor to take two 1 quart (1 liter) samples of a PGM Binder, except when SBR polymer is incorporated into batch plants. In this case the base binder and SBR polymer shall be sampled and stored independently. Samples shall be taken from the binder line between the last piping 'tee' and inlet into the plant. They shall be labeled and handled as above. All samples shall be held after project completion until the District Engineer of Tests (DET) collects or releases them.

**908.052 Mix Design for PGM Binder.** The PGM Binder supplier, as well as the polymer type, shall be identified on the Job Mix Formula (JMF) submittal. A change in binder or polymer source will require a redesign. The PGM Binder shall be graded, except for Direct Tension, and provide the actual pass temperatures confirming the grade requirement. All dated data shall be reported with the JMF submittal. In addition to the PG Binder grading, the dated test results for the requirements of Table A shall be reported. All data shall be neatly summarized on one page. No data shall be more than two months old. If SBR polymer is added at the asphalt concrete mixing plant, the JMF shall contain data from the SBR polymer supplier for total solids (percent) and ash (percent) according to the 702.14. As well, the submittal shall contain the target amount of SBR polymer greater than or equal to 3.5 percent to achieve the properties specified. A letter of certification from the polymer supplier verifying percent butadiene in the SBS or SBR polymer shall be included in the JMF submittal.

Each JMF submittal shall report results of temperature-viscosity testing for mixing and compaction temperatures performed according to Asphalt Institute Manual SP-2. Supplier recommended temperatures may be used in lieu of the Asphalt Institute Manual SP-2 temperatures, but the temperature-viscosity results must still be reported.

A maximum of 10 percent reclaimed asphalt concrete pavement or reclaimed bituminous aggregate base may be used in accordance with 401.04, except it shall be included in the JMF. At no time shall the amount of reclaimed asphalt concrete pavement or reclaimed bituminous aggregate base in production exceed 10 percent of the mix by dry weight.

**908.053 Quality Control for PGM Binder.** The Contractor's Plant Operation Quality Control Plan (403.03) shall include plans for meeting this specification and any handling requirements of the PGM Binder supplier. If the Contractor does additional testing or plant modifications, this shall be explained in the plan.

A preapproved asphalt ignition oven is required to obtain an aggregate sample from an asphalt concrete sample. The asphalt ignition oven may be used in place of hot bin or belt samples.

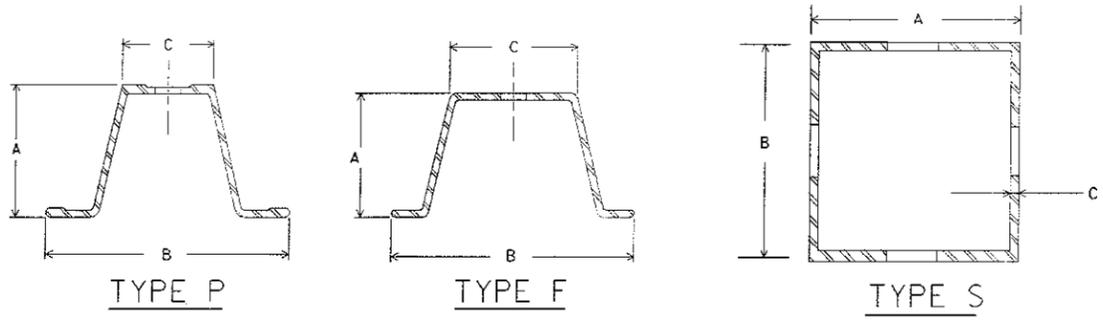
Some solvent testing may be performed early in a project as information in helping to verify plant operation and determining an Asphalt Content Nuclear Gauge (AC Gauge) or asphalt ignition oven calibration. However, any solvent testing shall be accompanied by an asphalt ignition oven test.

For SBR polymers added at the asphalt concrete mixing plant, the flow meter printouts shall be totaled for each day's production. The percent of polymer versus neat binder in the mix shall be calculated each day and recorded on the TE-199. Calculation worksheets and printouts shall be available in the plant laboratory for review by the Monitoring Team. A +/- 0.2 percent tolerance from the target amount of SBR polymer shall be used as a guide for an acceptable amount of SBR polymer use, but shall not be consistently low. Disposition of all data records shall be at the direction of the DET.

Table A Material Requirements for PGM Binder					
Test / Requirement	SBR Polymer		SBS Polymer		Notes
Final PG Binder Grade	70-22 (a)	70-22 (b)	70-22 (a)	76-22 (a)	c
Actual Pass Temperatures	Report		Report		i
RTFO Mass Loss, percent	≤ 0.5		≤ 0.5		d
Phase Angle, max	76		80	76	d
Elastic Recovery, min			65	75	e
Toughness, in lb	118				f, d
Tenacity, in lb	68				f, d
Elongation, in, min	20				f, d
Ductility, in, min	28				j, d
Separation, F max	10		10		g
Homogeneity			None Visible		h, d

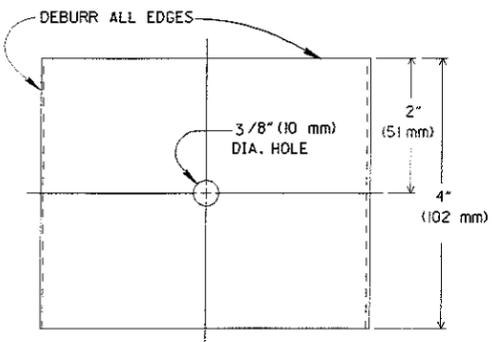
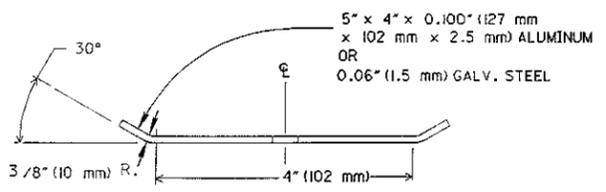
- a. Preblended PGM Binder with a base binder of at least -22 grade or stiffer.
- b. Post blended PGM Binder made from neat Supplement 1032 certified or preapproved standard PG Binder grade and rubber solids amount equal to or above 3.5 percent by weight of total binder to achieve the PG Binder grade.
- c. As required by 908.052.
- d. PGM Binder
- e. ASTM D 6084, 10cm @ 25C, hold 5 min. before cutting, on RTFO material
- f. ASTM D 5801, 50cm/min @ 25C
- g. Softening point difference of top and bottom of frozen sealed aluminum tube conditioned at 340F for 48 hours. Compatibility of polymer and neat binder is sole responsibility of supplier.

- PGM Binder shall be formulated to retain dispersion for 3 days minimum. Failure in the field to retain dispersion for this time will mean automatic removal from Supplement 1032 certification.
- h. Heat a minimum 400 gram sample at 177C for 2.5-3 hours. Pour entire sample over a hot No 50 (300 μm) sieve at 340F. Look for retained polymer lumps.
- i. Actual high and low temperature achieved by PGM Binder beyond required grade, but shall not grade out to the next standard PG Binder grade for low temperature.
- j. ASTM D 113, @ 4C, 1 cm/min

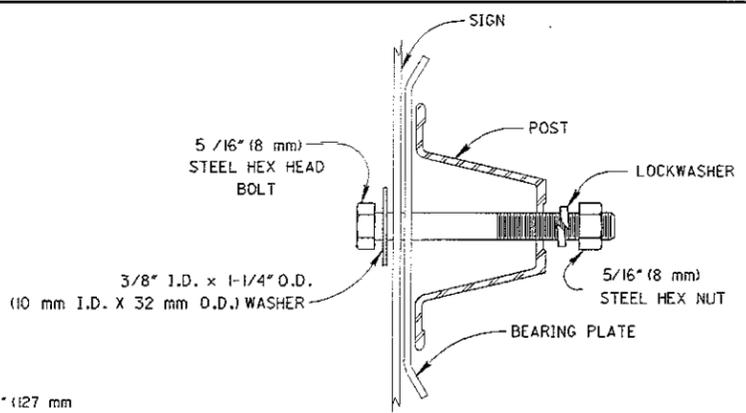


POST NO.	TYPE	LB/FT	POST DIMENSIONS (INCHES)			ANCHOR DIMENSIONS			NUMBER OF POSTS PERMITTED IN SEVEN FOOT PATH IN EXPOSED LOCATIONS
			A	B	C	A	B	C	
1	F	1.12	0.875	2.063	0.813				
	P	2.00	1.469	3.063	1.281				2
2	F	2.00	1.516	3.125	1.250				2
	S		1.750	1.750	0.083	2.000	2.000	0.105	2
3	P	3.00	1.875	3.500	1.313				2
	F	3.00	1.750	3.500	1.625				2
4	S		2.00	2.00	0.083	2.250	2.250	0.105	2
	P	4.00	TWO NO.2 POST						0
6	F	6.00	TWO NO.2 POST						0
	S		2.500	2.500	0.105	3.000	3.000	0.188	1

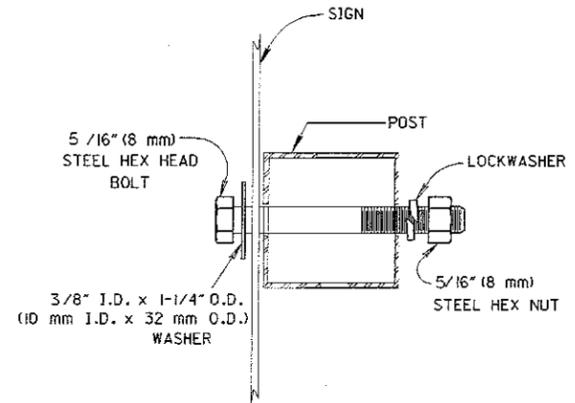
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			A	B	C	A	B	C	
1	F	1.7	22	52	21				
	P	3.0	37	78	33				2
2	F	3.0	39	79	32				2
	S		44	44	2.1	51	51	2.7	2
3	P	4.5	48	89	33				2
	F	4.5	44	89	41				2
4	S		51	51	2.1	57	57	2.7	2
	P	6.0	TWO NO.2 POST						0
6	F	9.0	TWO NO.2 POST						0
	S		63	63	2.7	76	76	4.8	1



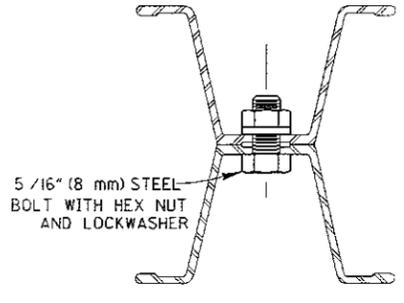
BEARING PLATE



U - CHANNEL SIGN ATTACHMENT DETAIL



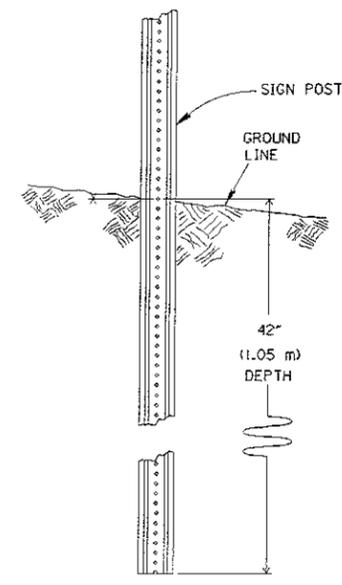
SQUARE POST SIGN ATTACHMENT DETAIL



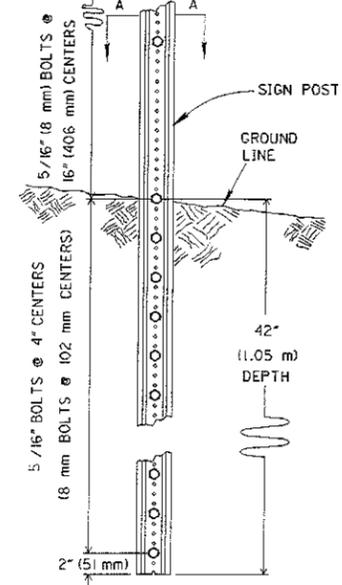
SECTION A - A

NOTES

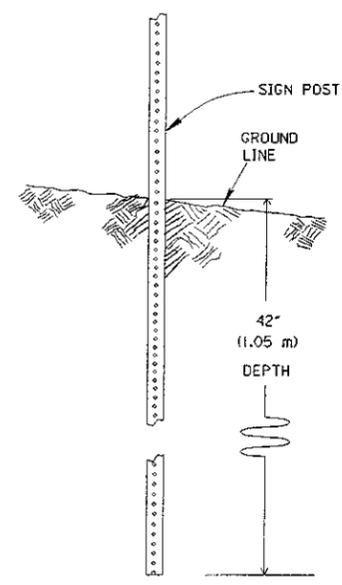
1. Install number 4 type P and F posts, and number 6 type P and F posts, only in protected locations (e.g. behind guardrail). Install two post installations of number 4 type S posts within 7 foot (2.1m) path only in protected locations.
2. Use of anchor base with No. 2 and No. 3 square post is optional. Use of anchor base with No. 4 square post is required.
3. Square post may have die-cut knockouts or open holes.



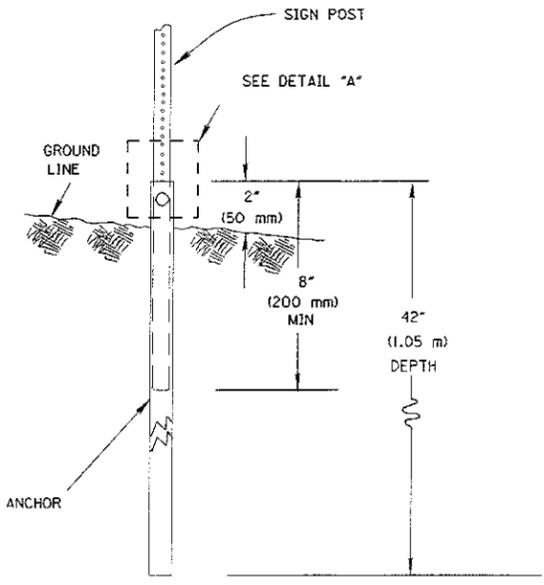
TYPICAL NO. 1, NO. 2 AND NO. 3 U - CHANNEL DRIVEN INSTALLATION



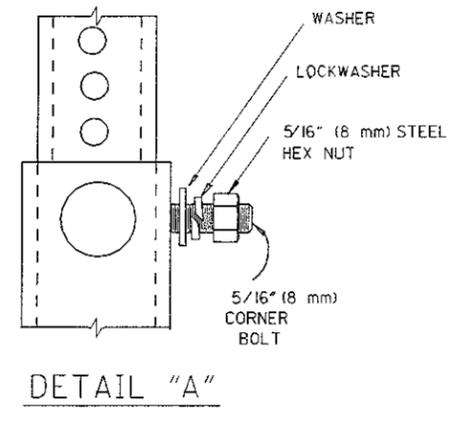
TYPICAL NO. 4 AND NO. 6 U - CHANNEL DRIVEN INSTALLATION



TYPICAL SQUARE POST DRIVEN INSTALLATION



TYPICAL SQUARE POST ANCHOR BASE INSTALLATION



DETAIL "A"

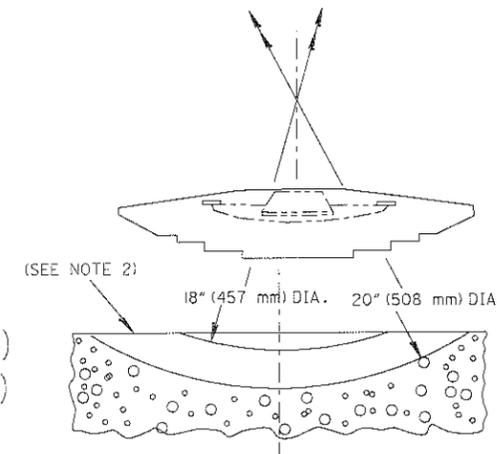
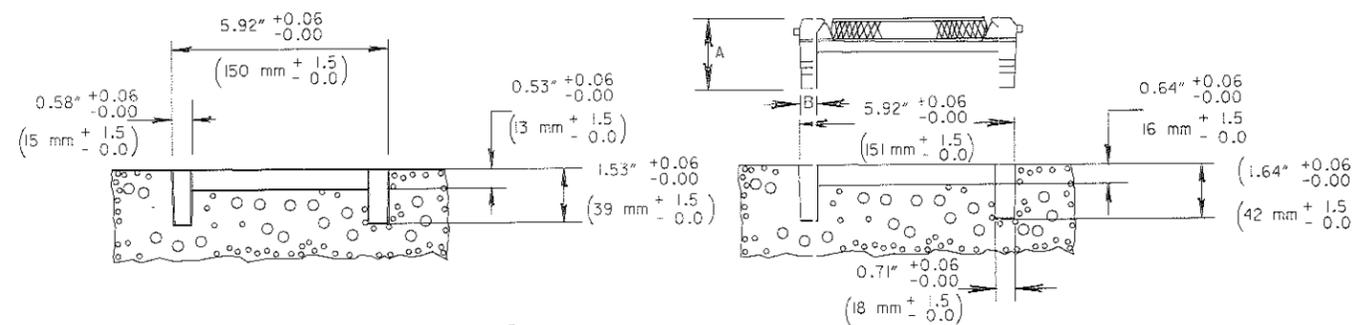
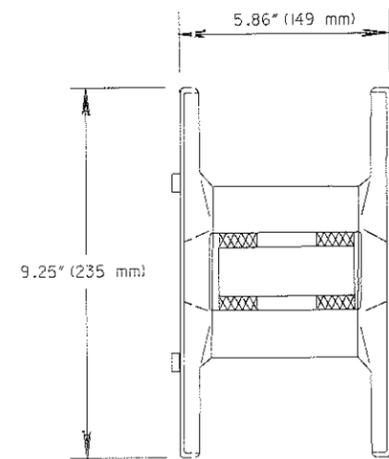
# NOTES

- 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 1" (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.
- To facilitate the cutting of the two parallel slots and intervening concaved surface simultaneously, it is recommended that an arbor and saw blade assembly be used. For additional details and tolerances of the casting and arbor-saw assembly contact the casting manufacture.
- For horizontal curves of 5° or greater (radius of 380 m or less), the spacing of the center line markers shall be reduced to 40' (12 m) between P.C. or T.S. and P.T. or S.T.
- For horizontal curves of 10° or greater (radius of 250 m or less) the spacing of the center line markers may be reduced to 20' (6 m) between P.C. or T.S. and P.T. or S.T. When using 20' (6 m) spacing, 12 raised pavement markers at 40' (12 m) spacing shall be installed on each end of the 20' (6 m) spacing.
- When a channelizing line is less than 80' (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.
- Raised pavement markers on lane lines on freeways shall be one way white spaced at 120' (36 m). All other raised pavement makers on lane line on multilane or divided roadways shall be two way red/white spaced at 80' (24 m).

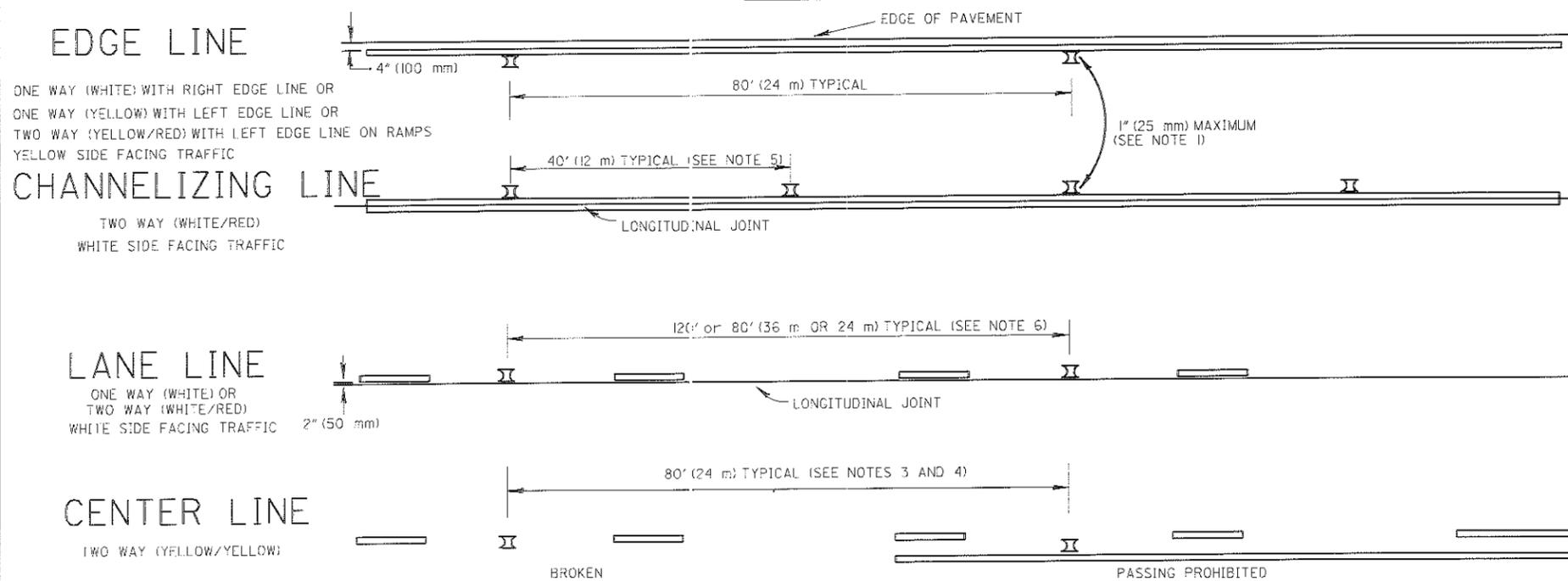
	CONVENTIONAL TYPE	LOW PROFILE TYPE
A	1.74"	1.69"
B	.46"	.59"

(METRIC)

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



## CASTING AND SAW CUT DETAILS



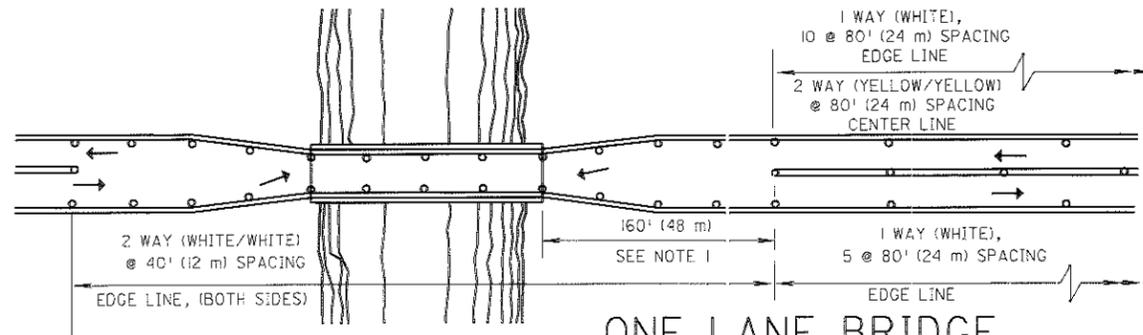
## TYPICAL RAISED PAVEMENT MARKER PLACEMENT WITH LONGITUDINAL PAVEMENT MARKINGS

### NOTES

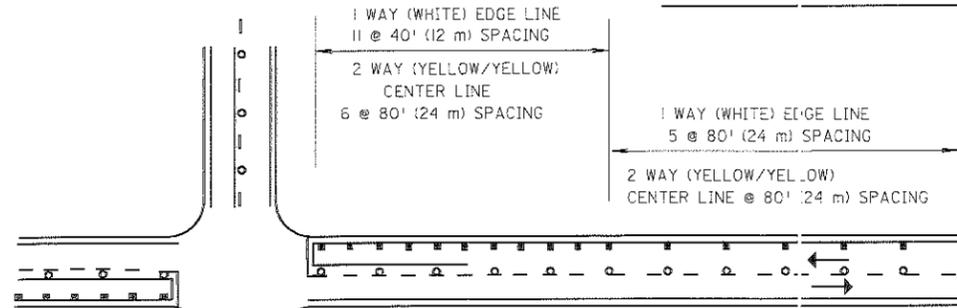
1. For one lane bridges, painted center line and center line markers shall be omitted 160' (48 m) on each side and across the bridge.
2. For horizontal curves of 5° or greater (radius of 380 m or less), the spacing of the center line markers shall be reduced to 40' (12 m) between P.C. or T.S. and P.T. or S.T.
3. For horizontal curves of 10° or greater (radius of 250 m or less), the spacing of the center line markers may be reduced to 20' (6 m) between P.C. and T.S. and P.T. or S.T. When using 20' (6 m) spacing, 12 raised pavement markers at 40' (12 m) spacing shall be installed on each end of the 20' (6 m) spacing.
4. A minimum of 3 equally spaced raised pavement markers shall be installed on the back taper.
5. When a channelizing line is less than 80' (24 m) long, 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 shall not be placed on edge lines on a through approach.
7. All approaches at a signalized intersection shall be treated as shown in the stop approach detail.

### LEGEND

- 1 WAY REFLECTORS
- 2 WAY REFLECTORS



### ONE LANE BRIDGE

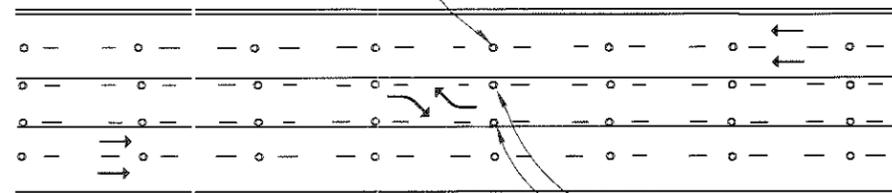


### STOP APPROACH (SEE NOTE 7)

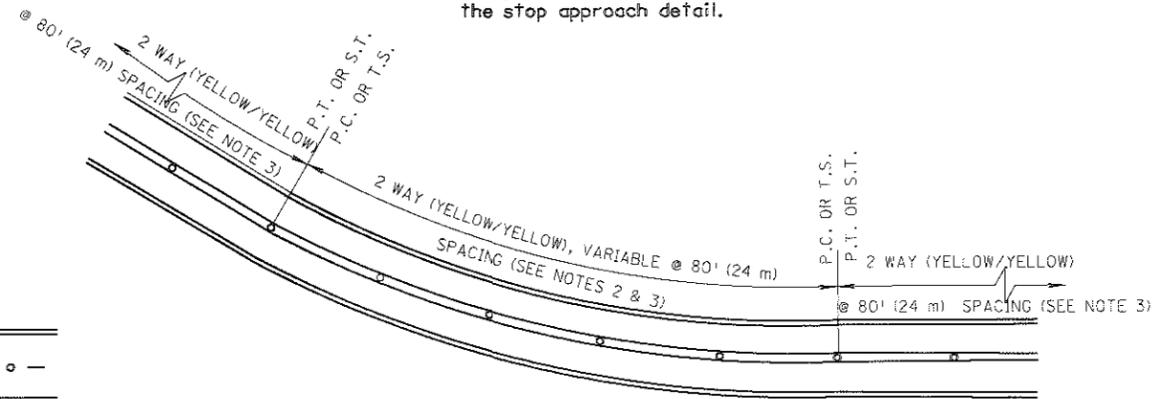
THROUGH APPROACH  
(SEE NOTE 6)



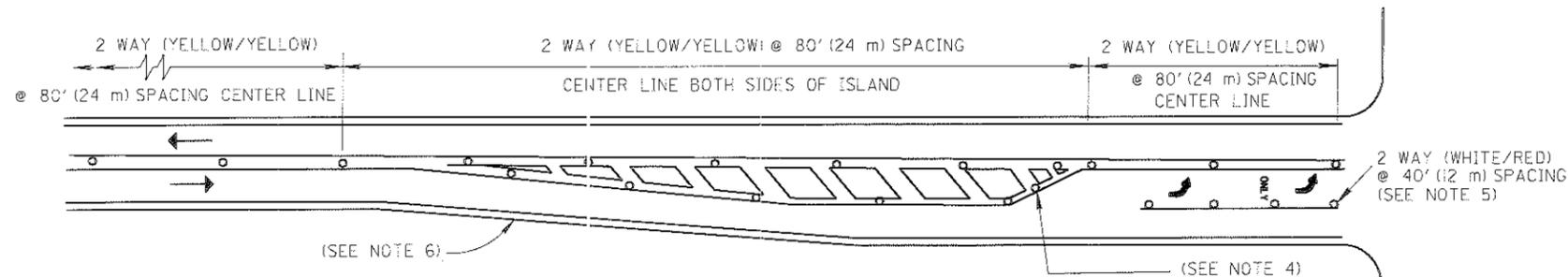
2 WAY (WHITE/RED) @ 80' (24 m) SPACING



### TWO WAY LEFT TURN LANE



### HORIZONTAL CURVE



### APPROACH W/LEFT TURN LANE

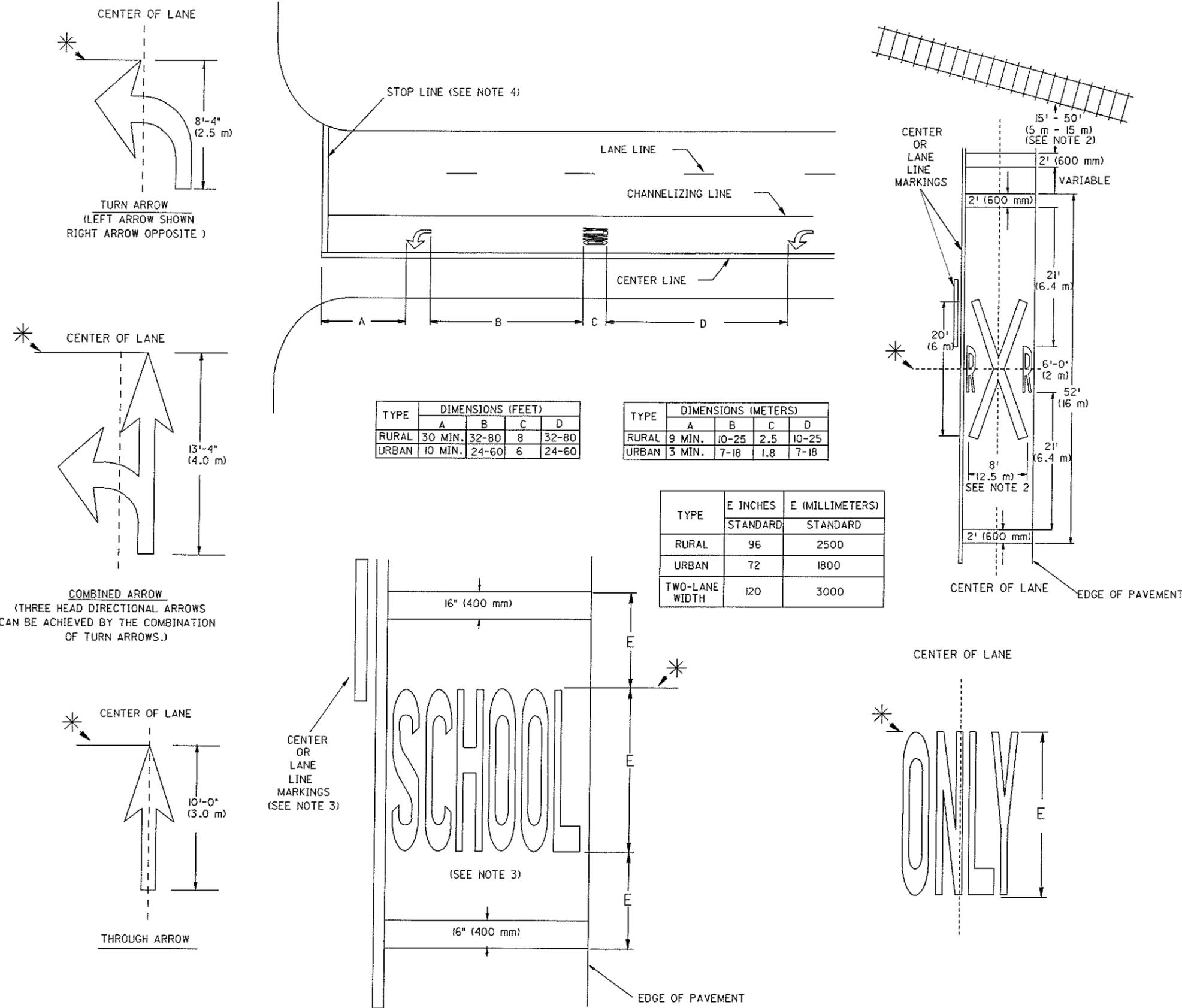
(SEE NOTE 6)

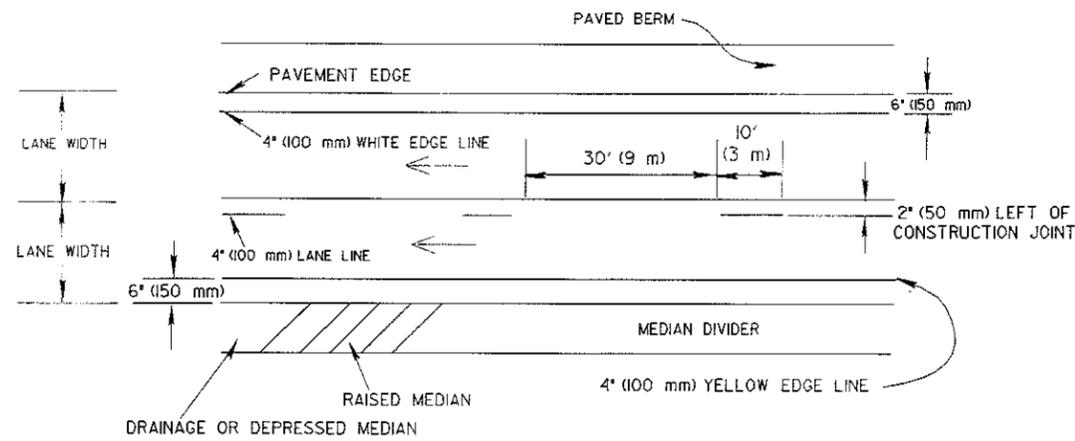
(SEE NOTE 4)

## NOTES

1. On multi-lane approaches, the transverse lines used with the railroad symbols shall extend across all approach lanes, and symbols shall be placed in each approach lane.
2. The railroad symbol shall be located so that the W-94, "railroad advance warning sign", is within the two transverse boundary lines of the railroad symbol. The stop line shall be located for best sight distance within 15' to 50' (5 m to 15 m) of the near edge of the tracks. Width of "x" may vary according to lane width. Stop lines shall be approximately 8' (2.4 m) from a gate (if present). Refer to Figure M-27 and Table WS-1 of the OMUTCD to determine the distance between the Stop Line and adjacent transverse pavement marking.
3. Preferably, the word "SCHOOL" should be contained in a single lane. On one lane applications, the transverse lines should extend across the lane which approaches the zone with the word "SCHOOL" centered across that lane. When a two-lane width is used the characters should be 10' (3 m) or more in height. For two approach lanes, each lane should have a separate word "SCHOOL" centered across it. On two lane, two way roadways with insufficient pavement width, the word and transverse lines shall extend across both lanes of traffic. On four lane, two way roadways with insufficient pavement width, the word and transverse lines shall extend across both lanes entering the school zone. Center or lane lines shall not pass through the "SCHOOL" marking. (OMUTCD section 5C-19)
4. The stop line should be placed where cross-corner vision is maximum, in no case more than 30' (9.1 m) or less than 4' (1.2 m) from the nearest edge of the intersecting roadway. For normal intersections a maximum distance of 10' (3 m) is recommended.  
  
If a marked crosswalk is present, the stop line should be placed 4' (1.2 m) in advance of, and parallel to the nearest crosswalk line.
5. For traffic paint and polyester application, template gaps shall be filled with marking material in accordance with 641.03. For extruded thermoplastic material, these gaps may remain unfilled in accordance with 641.03.

\* - INDICATES STATION REFERENCE POINT

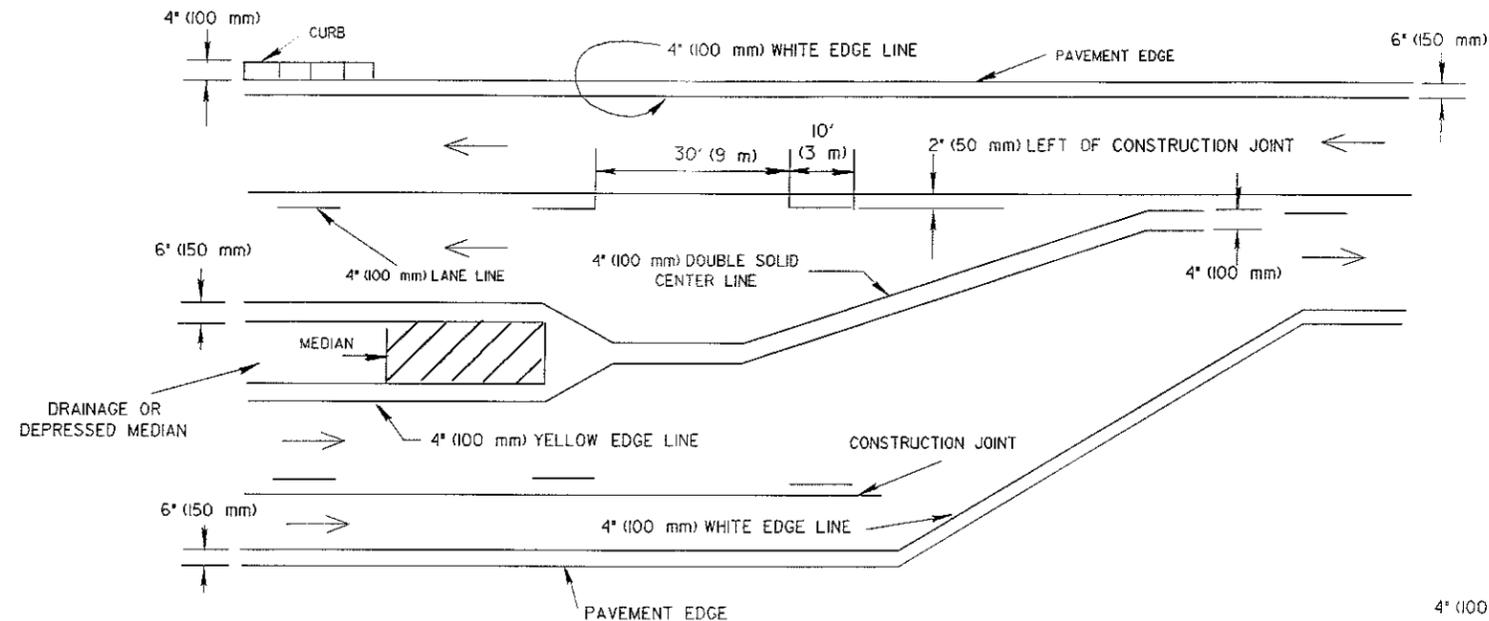




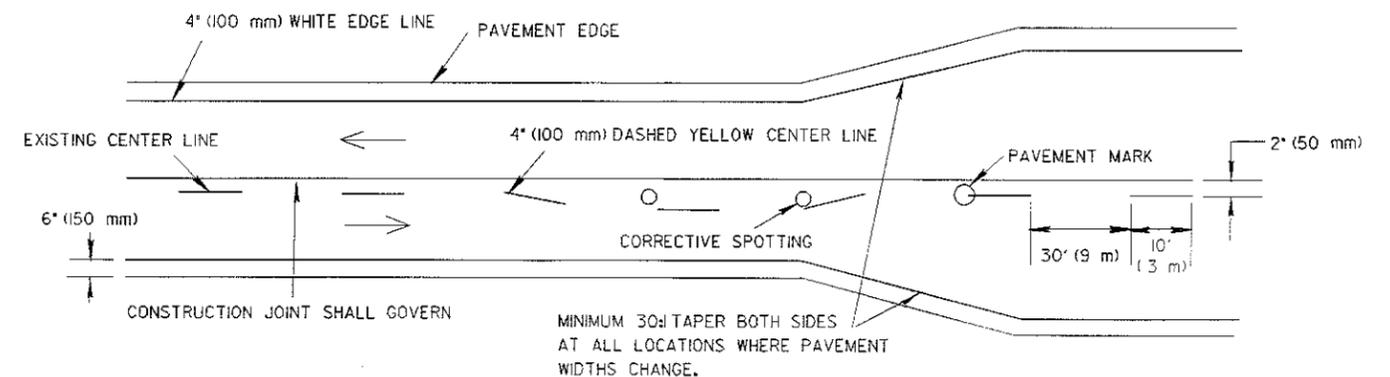
**FREEWAY & EXPRESSWAY MAINLINE MARKINGS**

**NOTES**

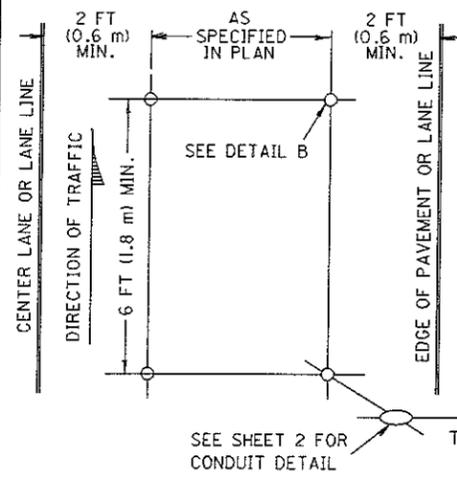
1. The distance from the pavement edge to the nearside edge of the edge line may be increased with the approval of the Engineer in order to maintain uniform lane width.
2. See TC-72.20 for entrance and exit ramp markings.
3. The cycle length for dashed lines shall be 40' (12 m) plus or minus 6" (150 mm). The minimum length of dash shall be sufficiently long to maintain a 3:1 ratio between length of gap and length of dash.
4. Edge Line transitions shall be marked at the same time as the adjoining Edge Lines.



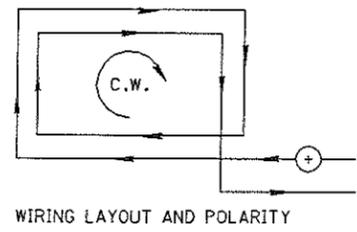
**MULTILANE DIVIDED & UNDIVIDED HIGHWAY MARKINGS**



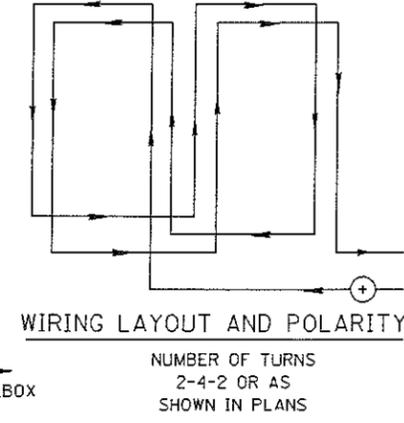
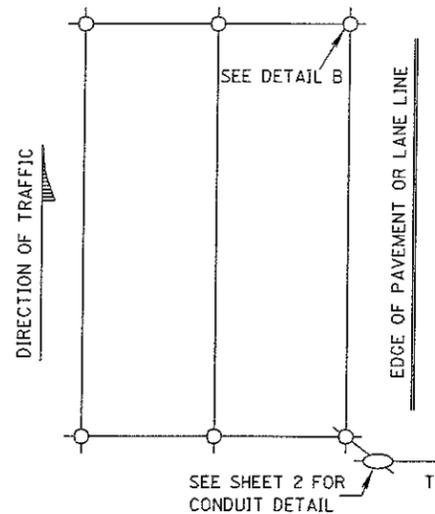
**TWO LANE MARKINGS**



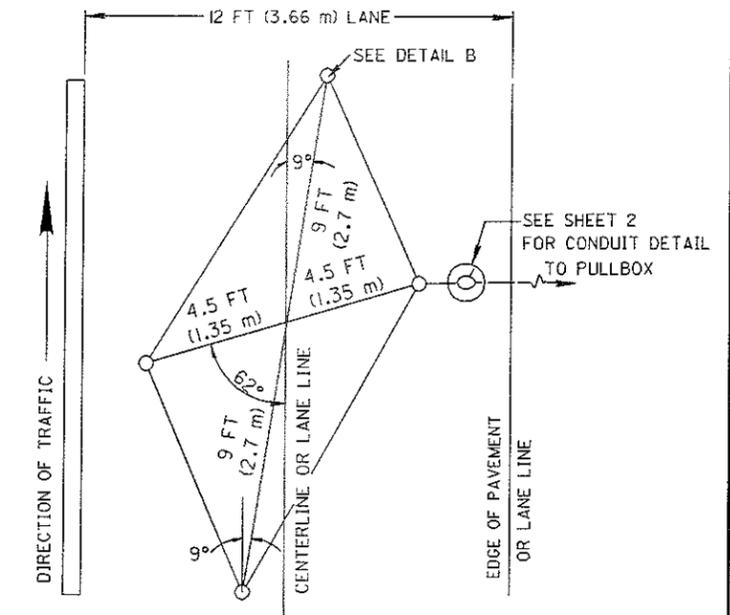
LOOP CONSTRUCTION	
LOOP PERIMETER	NUMBER OF TURNS
LESS THAN 40 FT (12 m)	4
40 FT (12 m) TO 160 FT (49 m)	3
OVER 160 FT (49 m)	2



**TYPICAL DETECTOR LOOP DETAILS**

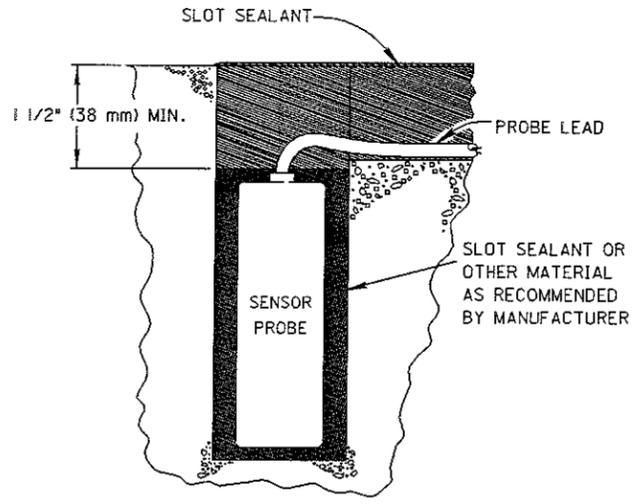


**FIGURE 8 (QUADRUPOLE) LOOP DETAILS**



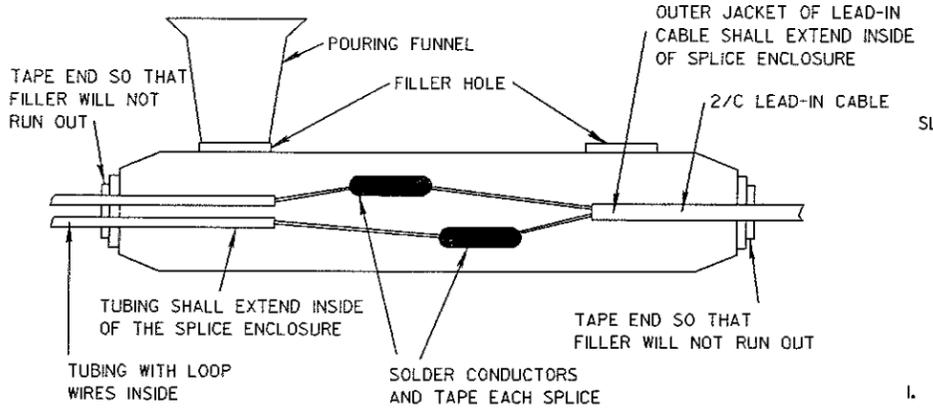
OTHER SIZES CAN BE DESIGNATED AS LONG AS THE ANGLES REMAIN THE SAME AS SHOWN AND THE DIMENSION RATIO REMAINS 2:1.

**ANGULAR DESIGN DETECTION LOOP DETAIL**



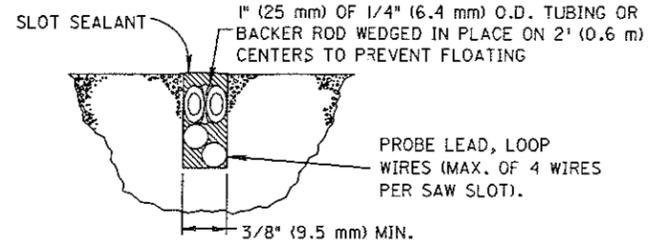
THE MAGNETOMETER HOLE SIZE SHALL BE APPROXIMATELY 3/4" (19 mm) LARGER THAN THE DETECTOR PROBE DIAMETER AND A DEPTH AS RECOMMENDED BY THE MANUFACTURER OR AS DIRECTED BY THE ENGINEER.

**MAGNETOMETER SENSOR PROBE DETAIL**



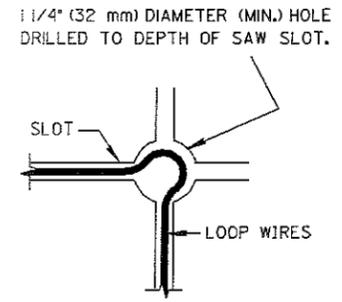
1. LOOP DETECTOR WIRE TO LEAD-IN CABLE SPLICES WITHIN THE ENCAPSULATED SPLICE ENCLOSURE SHALL BE SOLDERED.
2. IF A PULLBOX IS NOT SPECIFIED IN THE PLANS, THE WATERPROOF SPLICE ENCLOSURE SHALL BE LOCATED IN THE FIRST ENTERED POLE OR PEDESTAL, EXCEPT IF THE CONTROLLER CABINET IS MOUNTED ON THAT POLE OR PEDESTAL, IN WHICH CASE THE LOOP WIRES SHALL BE ROUTED DIRECTLY INTO THE CABINET.
3. VISIBLE AIR BUBBLES (VOIDS) OF 1/4" (6 mm) OR GREATER MAY BE CAUSE FOR REJECTION OF THE SPLICE.

**SPLICE ENCLOSURE DETAIL**

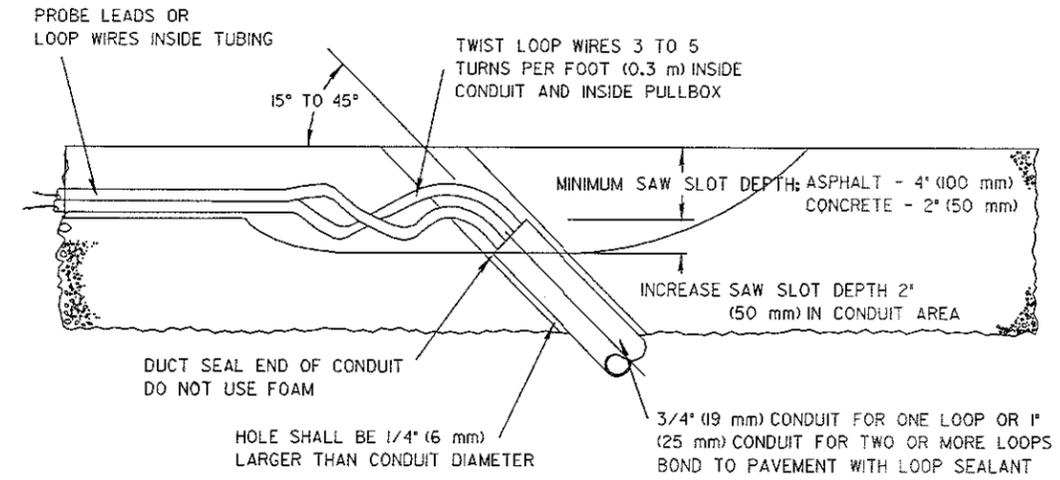
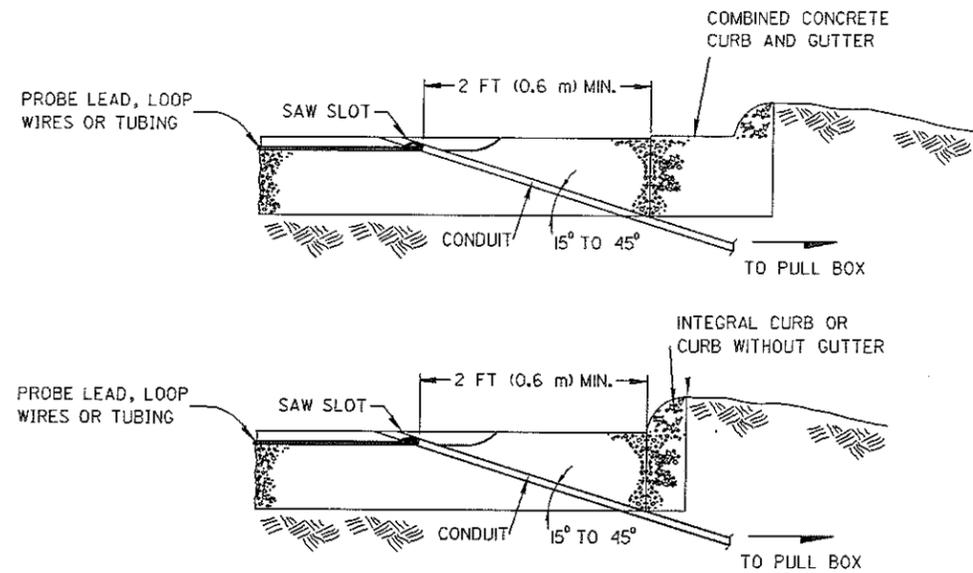


1. MINIMUM SAW SLOT DEPTH: ASPHALT 4" (100 mm), CONCRETE 2" (50 mm)
2. LOOP DETECTOR WIRE IN TUBING SHALL BE AS SPECIFIED IN CMS TABLE 732J9-1.
3. LOOP DETECTOR SEALANT SHALL BE A PREQUALIFIED PRODUCT IN ACCORDANCE WITH SUPPLEMENT 104B.
4. SAW SLOTS AND PROBE HOLES SHALL BE THOROUGHLY CLEANED AND DRIED PRIOR TO INSTALLATION OF SEALANT.
5. WIRE INSTALLATIONS IN NEW ASPHALT MAY BE SAWED AND EMBEDDED WITH SEALANT IN A SUB-SURFACE COURSE WITH SUBSEQUENT COVERING BY THE SURFACE COURSE, SUBJECT TO APPROVAL OF THE ENGINEER.

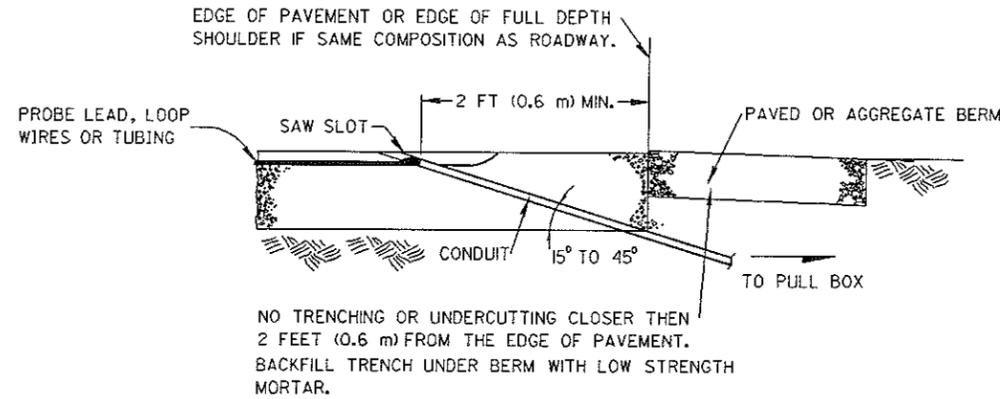
**SLOT DETAIL**



**DETAIL B**

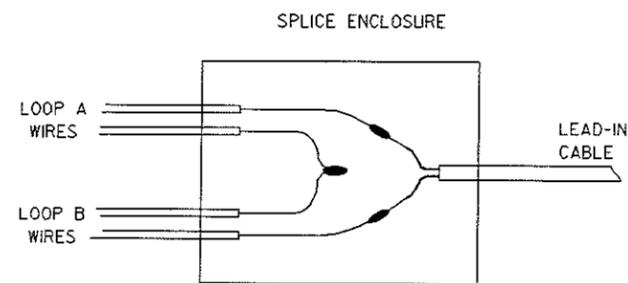


**CONDUIT DRILLED HOLE DETAIL**



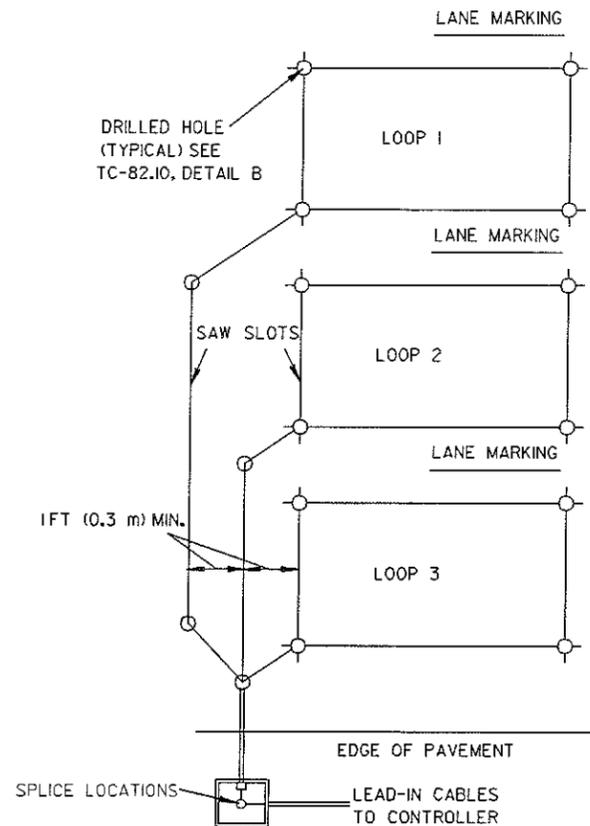
1. THE DRILLED HOLE SHALL BE LOCATED AS SHOWN ABOVE AND WITHIN THE FULL DEPTH PAVEMENT. IT SHALL NOT BE DRILLED OR CUT THROUGH THE PAVED BERM, CURB OR CURB AND GUTTER SECTION.
2. IN AREAS OF POOR PAVEMENT CONDITION, THE SAW SLOT DEPTH SHALL BE INCREASED TO INSURE ADEQUATE WIRE EMBEDMENT. ALL FIELD ADJUSTMENTS SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER.

**TYPICAL DRILLED HOLE LOCATIONS**



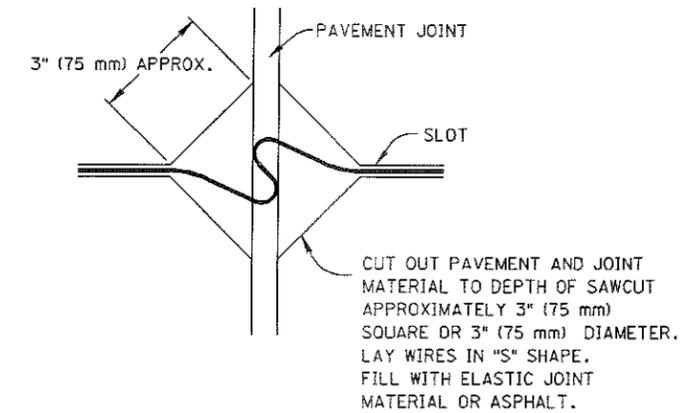
**SERIES CONNECTIONS**

1. WHERE MULTIPLE LOOPS USE A SINGLE LEAD-IN CABLE, SERIES CONNECTIONS SHALL BE USED.
2. A MAXIMUM OF 2 LOOPS (3 WIRE SPLICES) SHALL BE USED IN ANY ENCAPSULATED SPLICE KIT.



**MULTIPLE LOOP LAYOUT**

1. ONLY ONE SET OF LOOP WIRES SHALL BE RUN IN A SAW SLOT OVER TO THE CONDUIT HOLE LOCATION.
2. ALL ADJACENT SAW SLOTS SHALL HAVE A MINIMUM DISTANCE OF 1 FOOT (0.3 m) BETWEEN THEM. NO SAW SLOT SHALL BE LOCATED WITHIN 1 FOOT (0.3 m) OF A LONGITUDINAL OR TRANSVERSE JOINT IN P.C.C. PAVEMENTS IF THE SLOT IS PARALLEL TO THE JOINT.



**JOINT CROSSING DETAIL IN P.C.C. PAVEMENTS**