



CUY-90-14.90

PID 77332/85531

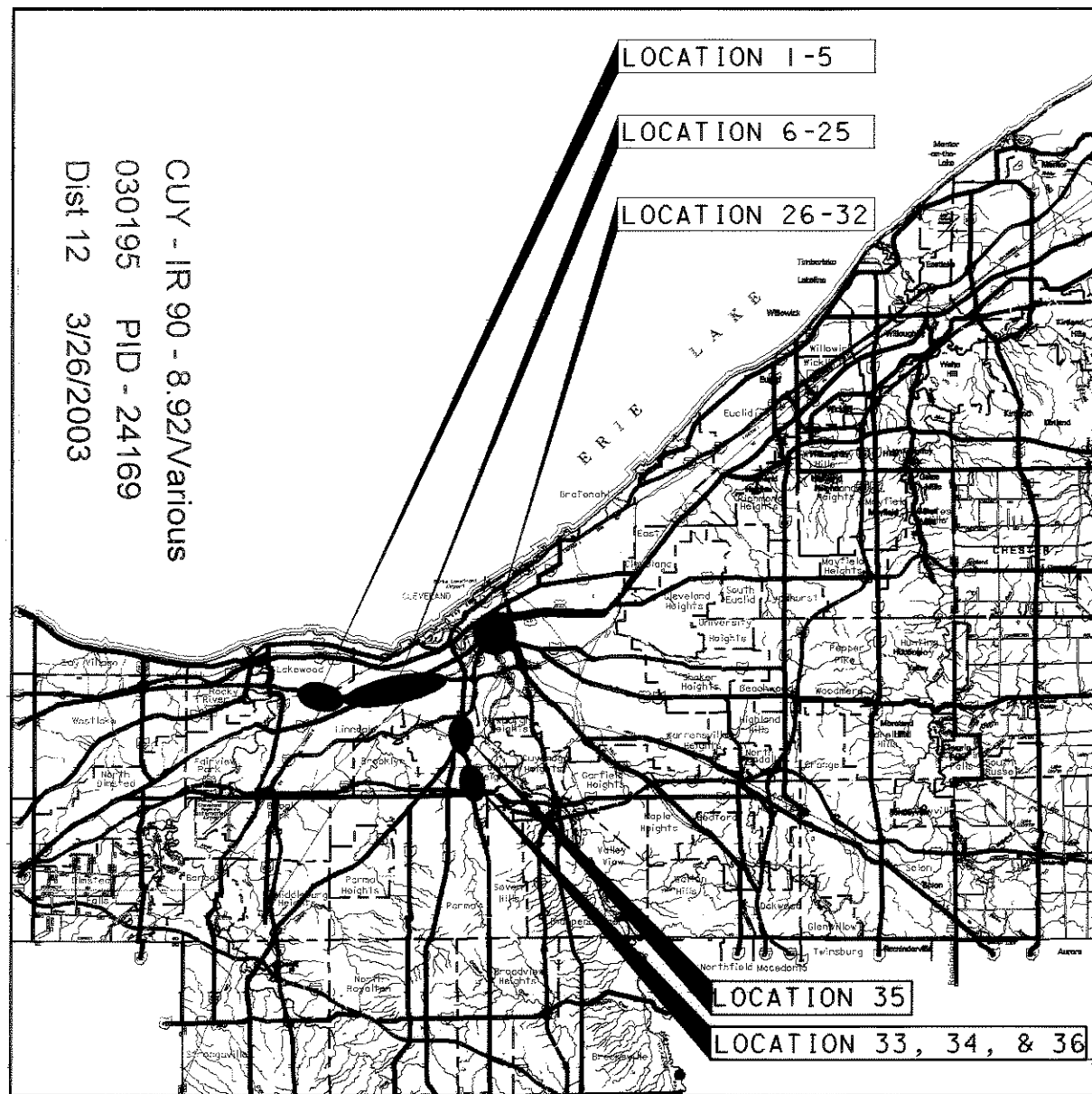
APPENDIX EX-84

CUY-090-0892/VAR PID 24169
(Reference Document)

State of Ohio
Department of Transportation
Jolene M. Molitoris, Director

Innerbelt Bridge
Construction Contract Group 1 (CCG1)

OHIO DEPARTMENT OF TRANSPORTATION



LATITUDE: N41°28'05"

LONGITUDE: W81°48'00"

LOCATION	BRIDGE NO.	STRUCTURAL FILE NO.	CITY,VILLAGE, OR TOWNSHIP
1	CUY-90-0892	1808117	CLEVELAND
2	CUY-90-0909	1808125	CLEVELAND
3	CUY-90-0947L	1808176	CLEVELAND
4	CUY-90-0947R	1808184	CLEVELAND
5	CUY-90-0970L	1808141	CLEVELAND
6	CUY-90-0970R	1808206	CLEVELAND
7	CUY-90-0991L	1808214	CLEVELAND
8	CUY-90-0991R	1808230	CLEVELAND
9	CUY-90-1062	1808249	CLEVELAND
10	CUY-90-1094	1808273	CLEVELAND
11	CUY-90-1110	1808303	CLEVELAND
12	CUY-90-1131L	1808338	CLEVELAND
13	CUY-90-1131R	1808389	CLEVELAND
14	CUY-90-1151L	1808354	CLEVELAND
15	CUY-90-1151R	1808362	CLEVELAND
16	CUY-90-1157L	1808419	CLEVELAND
17	CUY-90-1157R	1808427	CLEVELAND
18	CUY-90-1185	1808451	CLEVELAND
19	CUY-90-1201	1808478	CLEVELAND

LOCATION	BRIDGE NO.	STRUCTURAL FILE NO.	CITY,VILLAGE, OR TOWNSHIP
20	CUY-90-1214S	1808486	CLEVELAND
21	CUY-90-1237	1808532	CLEVELAND
22	CUY-90-1267R	1808680	CLEVELAND
23	CUY-90-1270	1808699	CLEVELAND
24	CUY-90-1309L	1808710	CLEVELAND
25	CUY-90-1309R	1808729	CLEVELAND
26	CUY-90-1628EN	1807552	CLEVELAND
27	CUY-90-1628L	1807498	CLEVELAND
28	CUY-90-1628R	1807714	CLEVELAND
29	CUY-90-1640	1807773	CLEVELAND
30	CUY-90-1651EX	1807919	CLEVELAND
31	CUY-90-1651L	1807900	CLEVELAND
32	CUY-90-1651R	1807803	CLEVELAND
33	CUY-480-1559	1813145	CLEVELAND
34	CUY-176-1020	1810081	CLEVELAND
35	CUY-176J-1218	1810162	CLEVELAND
36	CUY-176R-1064	1810103	CLEVELAND

INDEX OF SHEETS:

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PROJECT DESCRIPTION

Sealing bridge decks with gravity-fed resin.

2002 SPECIFICATIONS

The standard specifications of the State of Ohio, Department of Transportation, including changes and supplemental specifications listed in the proposal shall govern this improvement.

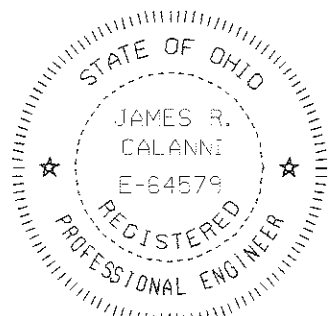
I hereby approve these plans and declare that the making of this improvement will not require the closing to traffic of the highway and that provisions for the maintenance and safety will be as set forth on plans and estimates.

Approved: *[Signature]*
 District Deputy Director of Transportation

Approved: *[Signature]*
 Director, Department of Transportation

STANDARD CONSTRUCTION DRAWINGS				SUPPLEMENTAL SPECIFICATIONS	
MT-35.10	4/20/01	MT-98.14	4/19/02		
		MT-98.15	4/19/02		
MT-95.30	4/19/02	MT-98.16	4/19/02		
MT-95.31	4/19/02				
MT-95.32	4/19/02	MT-102.20	10/18/02		
MT-97.10	4/19/02	MT-105.10	10/18/02		
		MT-105.11	10/18/02	SPECIAL PROVISIONS	
MT-98.12	4/19/02	TC-72.20	1/19/01		
MT-98.13	4/19/02	TC-73.10	1/19/01		

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

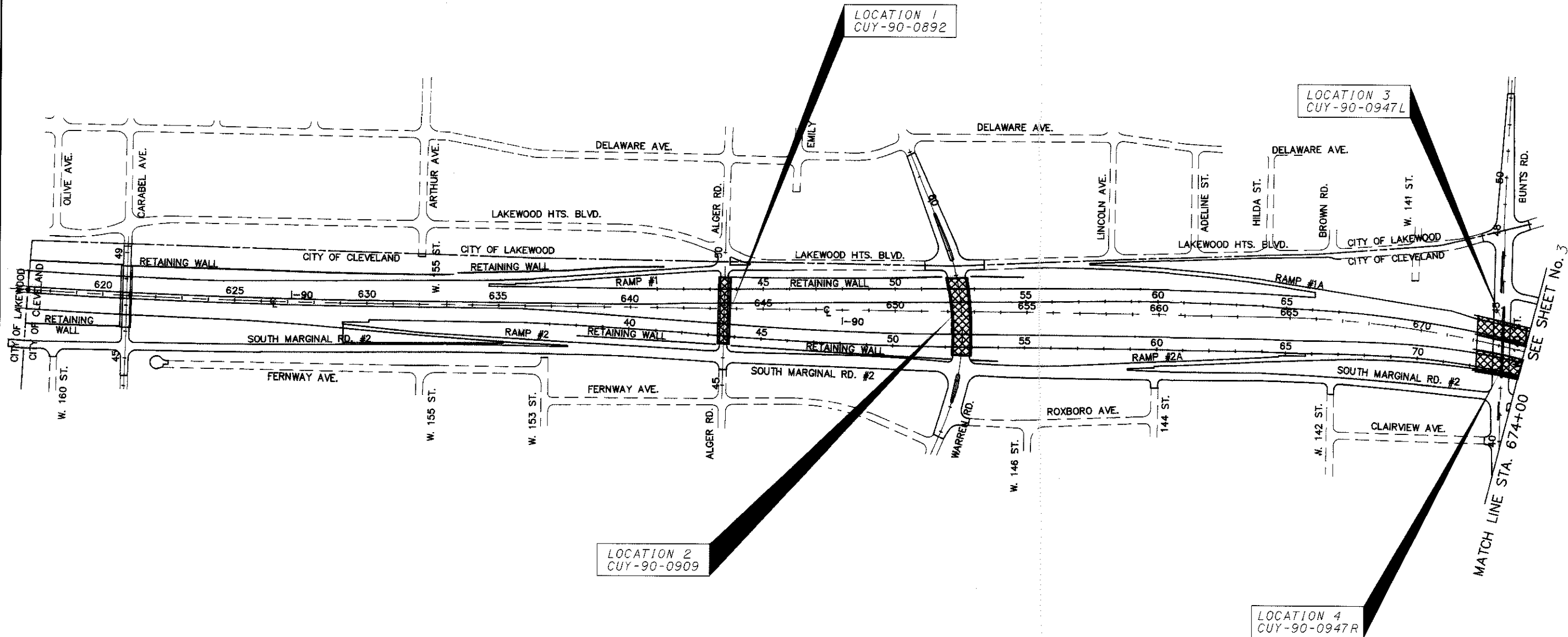


SIGNED: *James R. Calanni*
 DATE: 12/23/02

PLAN PREPARED BY:
 ODOT - DISTRICT TWELVE
 PRODUCTION DEPARTMENT
 5500 TRANSPORTATION BLVD.
 GARFIELD HEIGHTS, OHIO 44125

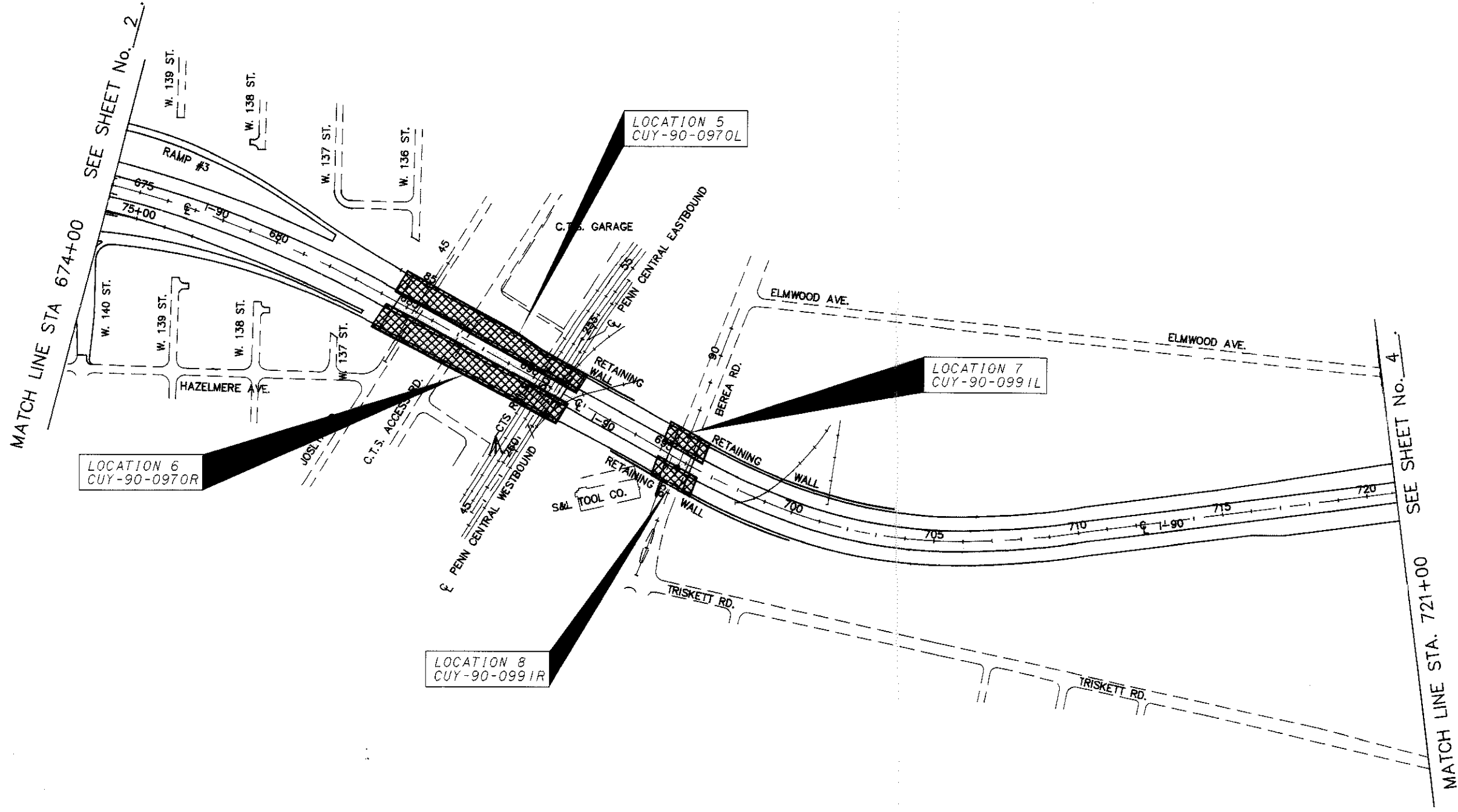
FEDERAL PROJECT NO. **NON-FEDERAL**
 CONSTRUCTION PROJECT NO. **24169**
 RAILROAD INVOLVEMENT **NONE**
CUY-90-08.92/VAR
 1/18

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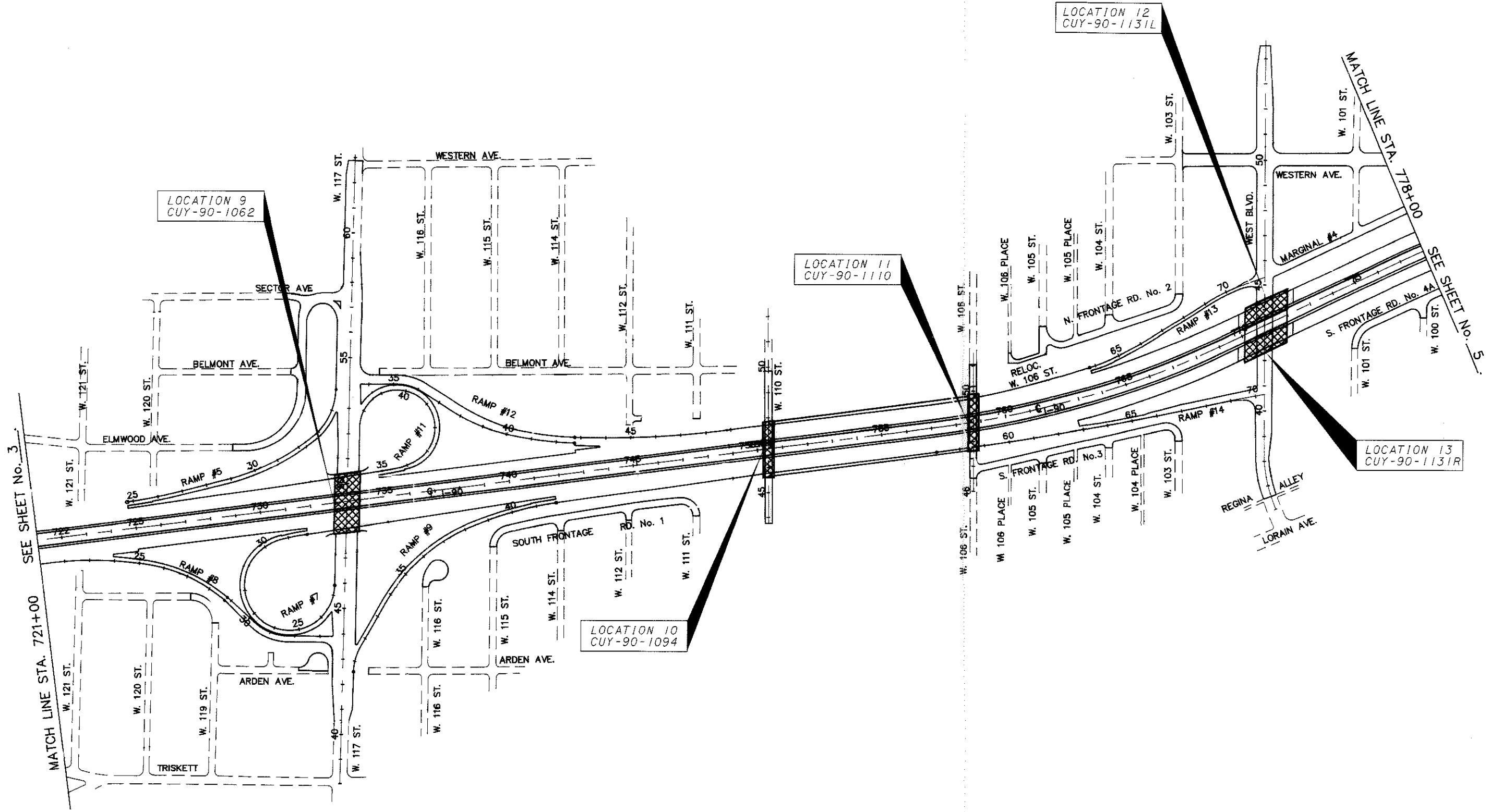
LOCATION MAPS

CUY-90-08.92/VAR.



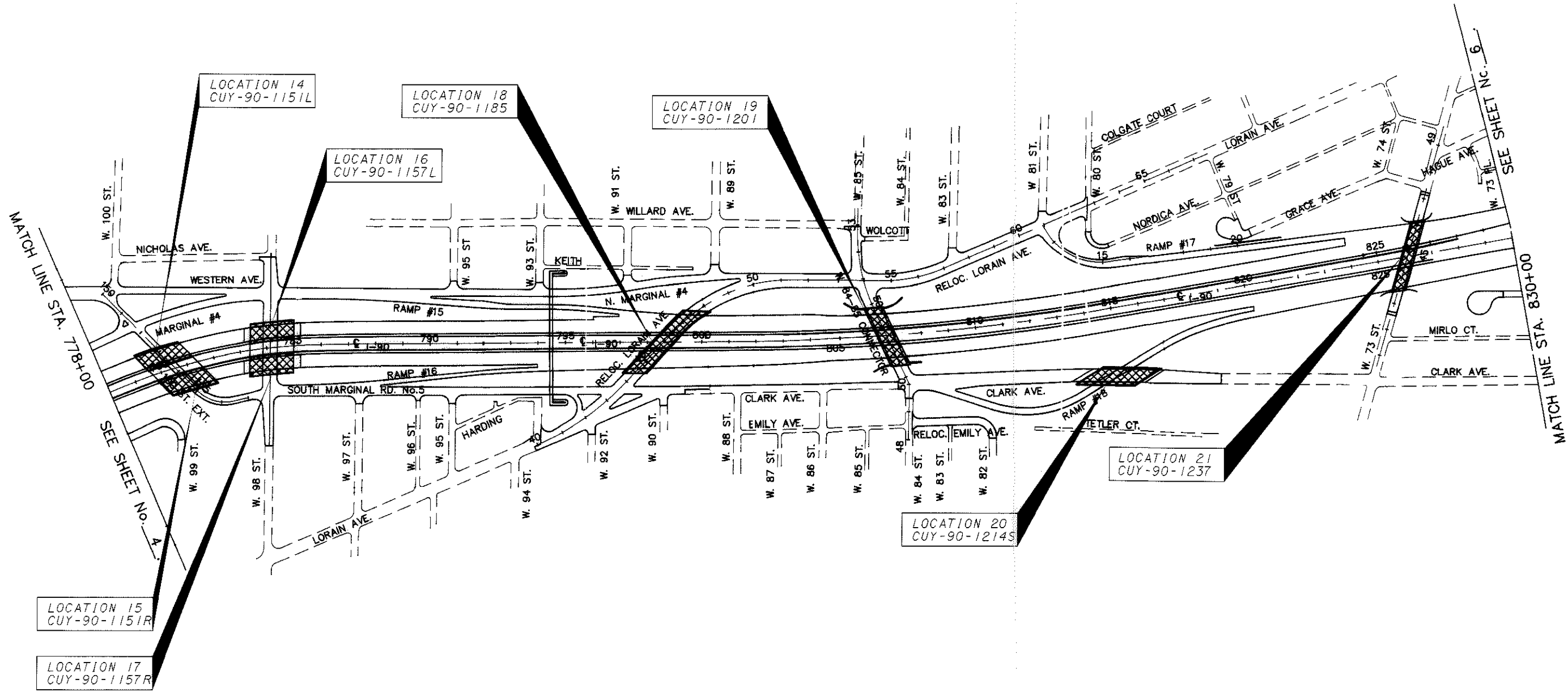
LOCATION MAPS

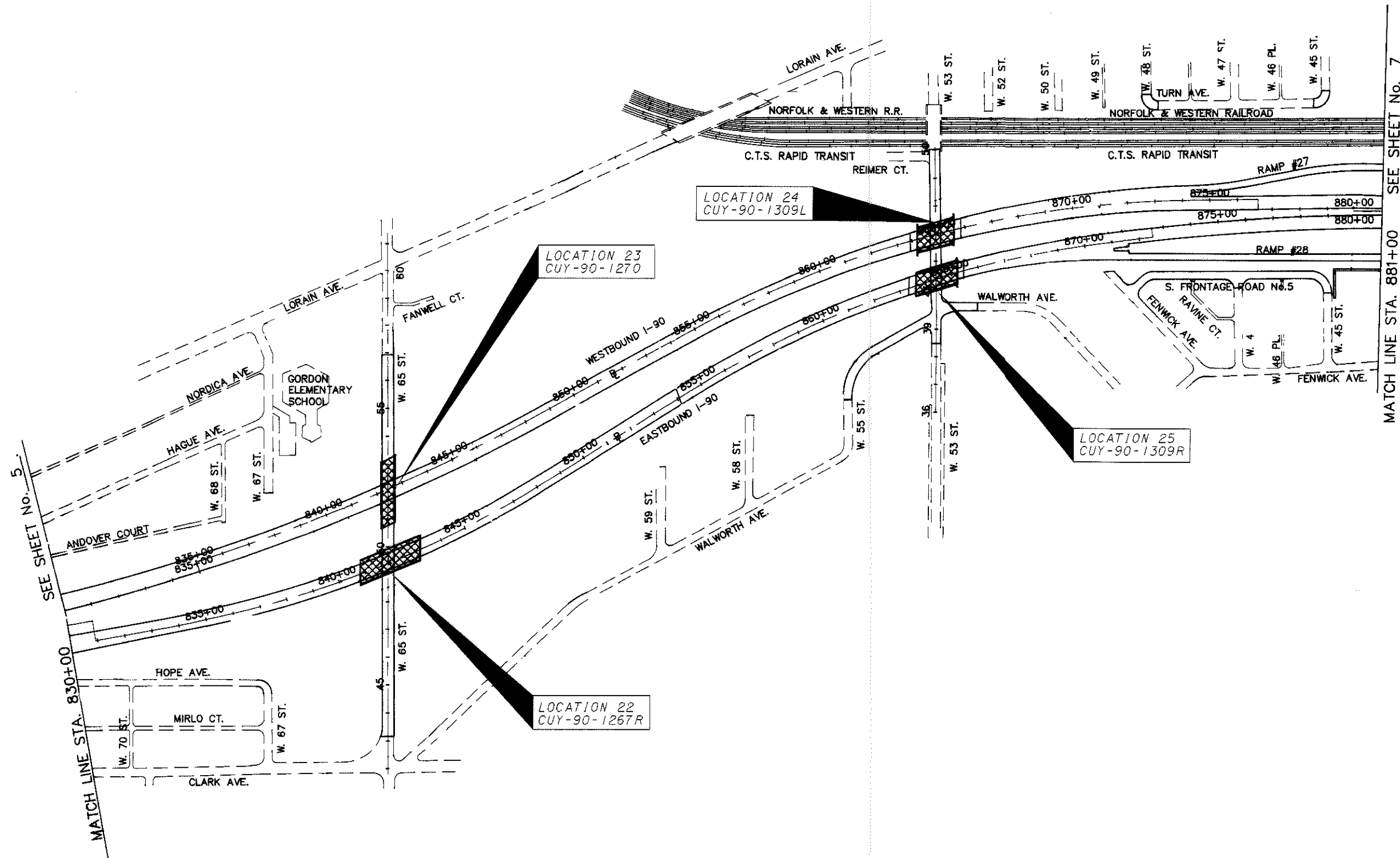
CUY-90-08.92/VAR.



LOCATION MAPS

CUY-90-08.92/ VAR.





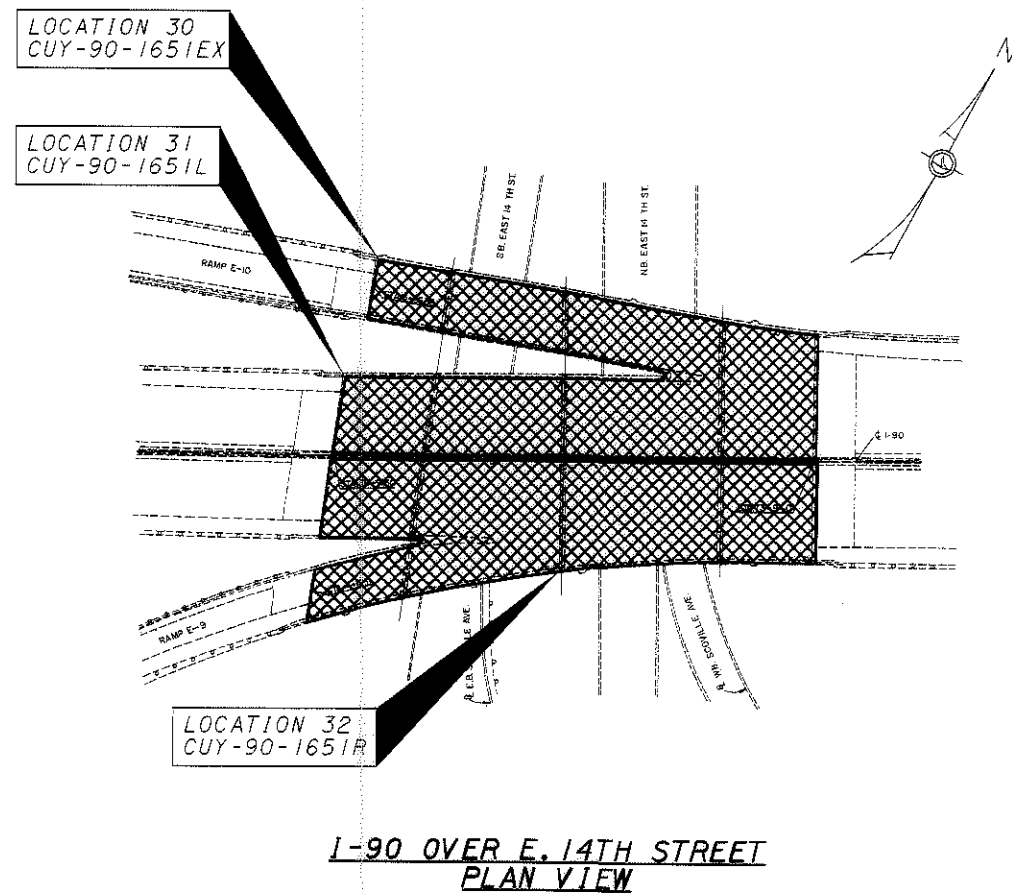
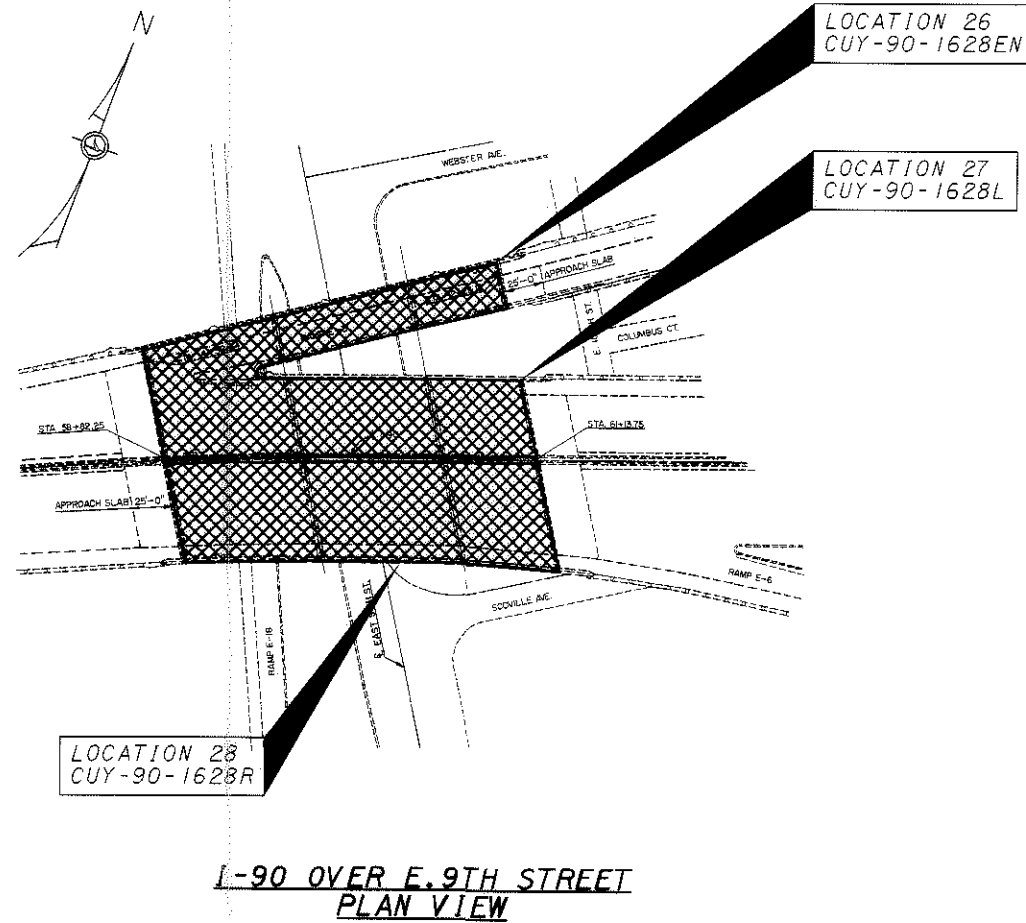
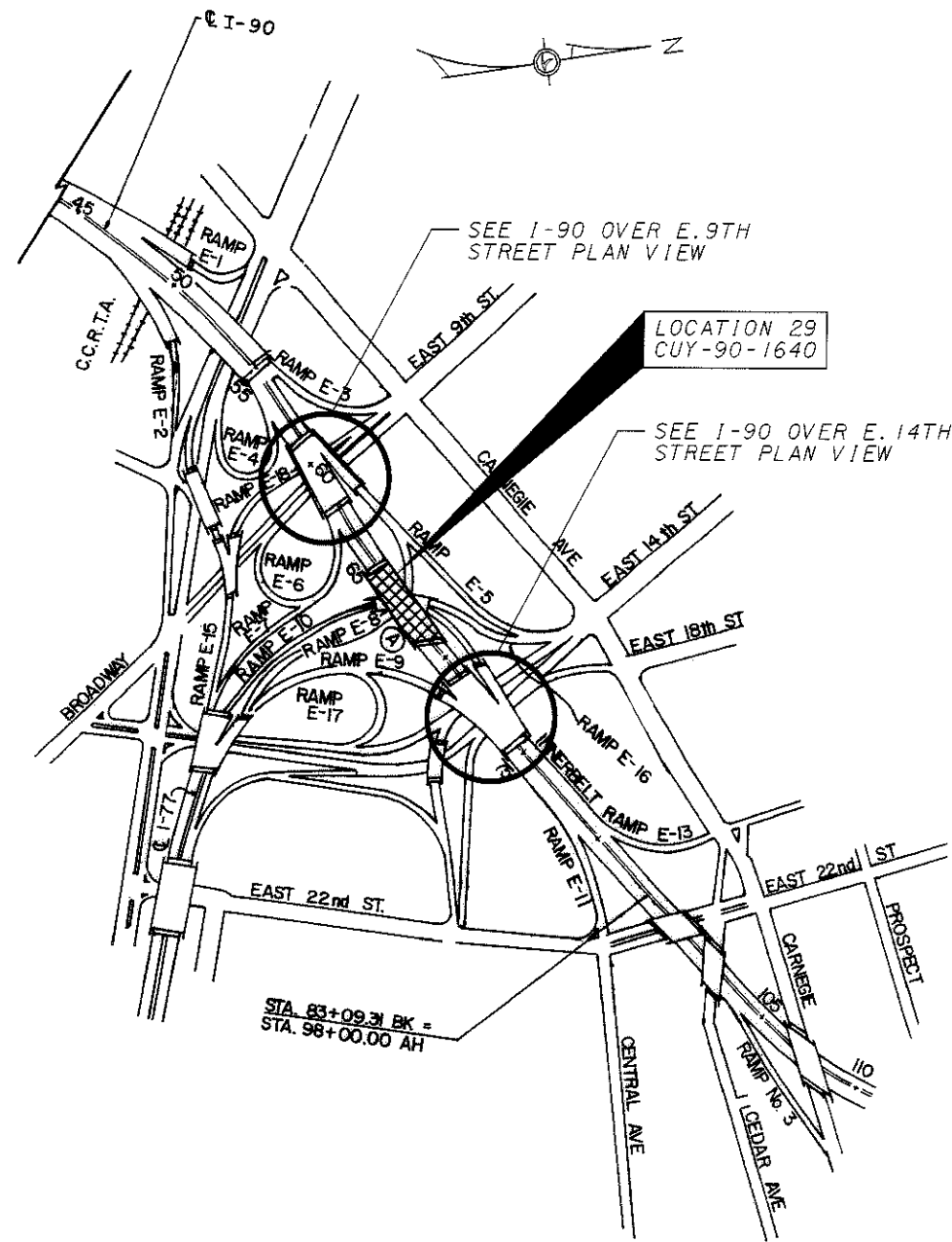
SEE SHEET No. 5
MATCH LINE STA. 830+00

MATCH LINE STA. 881+00 SEE SHEET No. 7



LOCATION MAPS

CUY-90-08.92 / VAR.

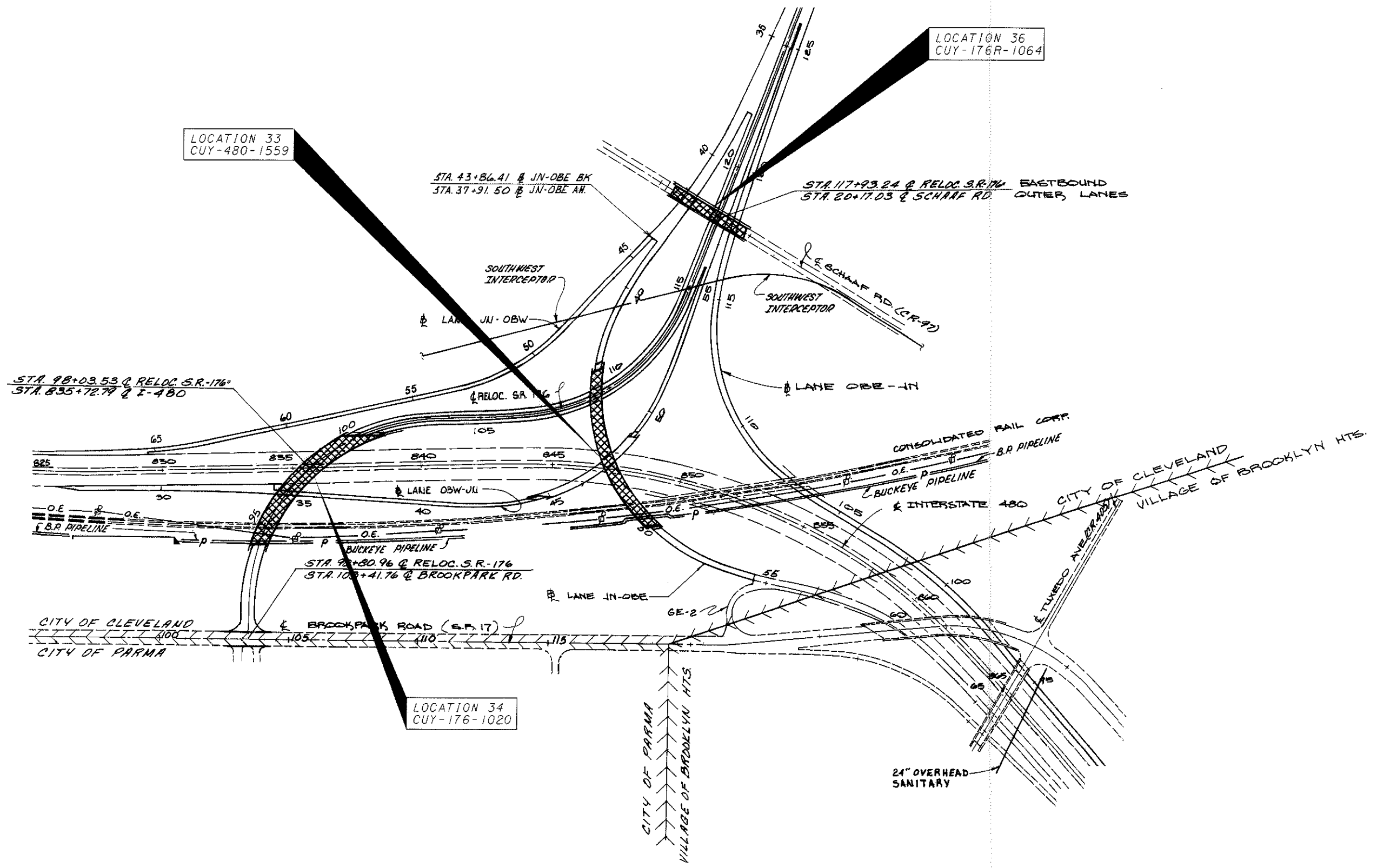




LOCATION MAPS

CUY-90-08.92 / VAR.

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LOCATION 33
CUY-480-1559

LOCATION 36
CUY-176-1064

STA. 43+86.41 & JN-OBE BK
STA. 37+91.50 & JN-OBE AH.

STA. 117+93.24 & RELOC. S.R. 176 EASTBOUND
STA. 20+17.03 & SCHAFF RD. OUTER LANES

STA. 98+03.53 & RELOC. S.R. 176
STA. 835+72.79 & I-480

STA. 98+80.96 & RELOC. S.R. 176
STA. 100+41.76 & BROOKPARK RD.

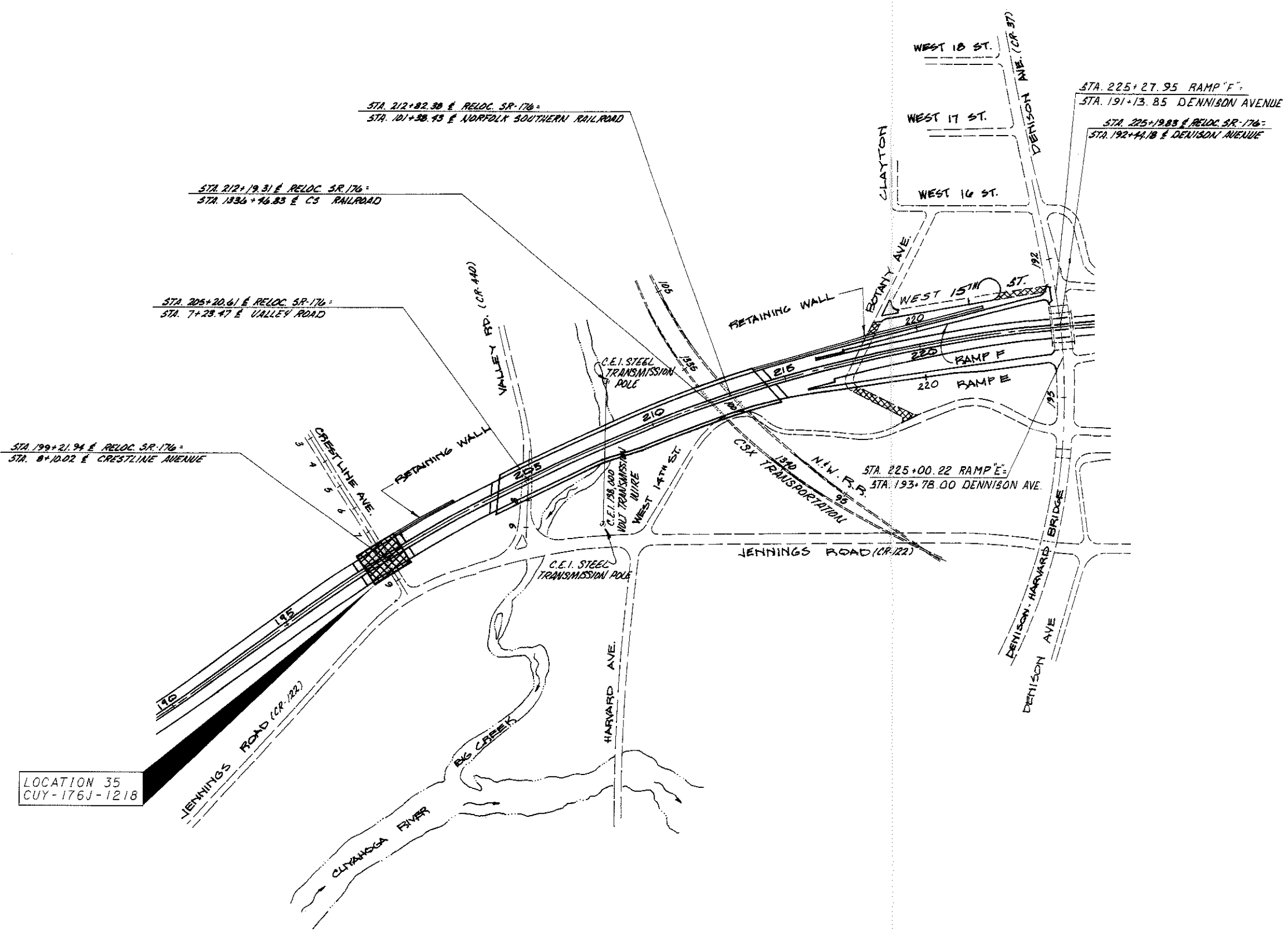
LOCATION 34
CUY-176-1020

CITY OF CLEVELAND
CITY OF PARMA

CITY OF PARMA
VILLAGE OF BROOKLYN HTS.

CONSOLIDATED RAIL CORP.
B.R. PIPELINE
& INTERSTATE 480
CITY OF CLEVELAND
VILLAGE OF BROOKLYN HTS.

24" OVERHEAD
SANITARY



LOCATION 35
CUY-176J-1218



REFERENCE SHALL BE MADE TO STANDARD DRAWINGS:

LISTED ON THE TITLE SHEET.

AND TO SUPPLEMENTAL SPECIFICATIONS:

LISTED ON THE TITLE SHEET.

AND TO PROPOSAL NOTES:

PATCHING CONCRETE BRIDGE DECKS
TREATING CONCRETE BRIDGE DECKS WITH GRAVITY-FED RESIN

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 CMS. THE APPENDIX OF ASTM E 380 SHALL BE UTILIZED FOR ANY ADDITIONAL CONVERSION FACTORS REQUIRED. CONVERSIONS SHALL BE APPROXIMATELY PRECISE AND SHALL REFLECT STANDARD INDUSTRY ENGLISH VALUES WHERE SUITABLE.

EXISTING STRUCTURE VERIFICATION:

DETAILS AND DIMENSIONS SHOWN ON THESE PLANS PERTAINING TO THE EXISTING STRUCTURE HAVE BEEN OBTAINED FROM PLANS OF THE EXISTING STRUCTURE AND FROM FIELD 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 C.M.S. SECTIONS 102.05 AND 105.02. THE ORIGINAL CONSTRUCTION PLANS OF THE EXISTING BRIDGE ARE AVAILABLE UPON REQUEST AT THE DISTRICT 12 OFFICE OF THE OHIO DEPARTMENT OF TRANSPORTATION, GARFIELD HEIGHTS, OHIO.

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

UTILITIES:

THERE ARE NO UTILITIES SHOWN ON THIS PLAN. THE NATURE OF THE WORK REQUIRED BY THIS PROJECT WILL NOT AFFECT ANY KNOWN UTILITIES IN THE WORK AREA.

LIMITATIONS OF OPERATIONS:

THE CONTRACTOR'S ACTIVITIES AND WORK SCHEDULE SHALL BE CONSTRAINED BY THE FOLLOWING SPECIAL LIMITATIONS:

1. MAINTENANCE OF TRAFFIC RESTRICTIONS (REFER TO THE MAINTENANCE OF TRAFFIC SHEETS IN THIS PLAN).
2. ALL WORK SHALL BE COMPLETED BY SEPTEMBER 30, 2004.

CONTINGENCY QUANTITIES:

THE CONTRACTOR SHALL NOT ORDER MATERIALS OR PERFORM WORK FOR ITEMS DESIGNATED BY PLAN NOTE TO BE USED "AS DIRECTED BY THE ENGINEER" UNLESS AUTHORIZED BY THE ENGINEER. THE ACTUAL WORK LOCATIONS AND QUANTITIES USED FOR SUCH ITEMS SHALL BE INCORPORATED INTO THE FINAL CHANGE ORDER GOVERNING COMPLETION OF THIS PROJECT.

COOPERATION BETWEEN CONTRACTORS:

THE CONTRACTOR SHALL COOPERATE AND COORDINATE HIS OPERATIONS WITH THE CONTRACTORS ON OTHER PROJECTS THAT MAY BE IN FORCE DURING THE LIFE OF THE CONTRACT. NO WAIVER OF ANY PROVISIONS OF 105.08 OF THE CONSTRUCTION AND MATERIAL SPECIFICATIONS IS INTENDED.

ITEM 621 - RPM REFLECTOR:

THE FOLLOWING ESTIMATED QUANTITY HAS BEEN INCLUDED IN THE GENERAL SUMMARY TO BE USED AS DIRECTED BY THE ENGINEER TO REPLACE THE RETROREFLECTORS WHICH ARE MISSING OR BROKE ON THE BRIDGE DECKS TO BE SEALED.

THIS ITEM SHALL INCLUDE THE COST OF REMOVING THE RETROREFLECTOR AND REPLACING IT WITH A CONTRACTOR SUPPLIED REFLECTOR OF THE REQUIRED COLOR. THE FOLLOWING QUANTITY HAS BEEN INCLUDED IN THE GENERAL SUMMARY.

ITEM 621 - RPM REFLECTOR	<u>15 EA</u>
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ITEM 646. AS PER PLAN:

PRIOR TO ANY CONCRETE DECK SEALING THE CONTRACTOR SHALL FIELD SURVEY THE LOCATIONS OF THE EXISTING PAVEMENT MARKINGS WITHIN THE PROJECT LIMITS. THIS SURVEY SHALL BE USED TO PLACE THE TEMPORARY AND PROPOSED FINAL PAVEMENT MARKINGS IN THE LOCATIONS OF THE ORIGINAL PAVEMENT MARKINGS.

ALL COSTS ASSOCIATED WITH THIS SURVEY SHALL BE INCLUDED IN THE UNIT BID PRICE FOR THE APPROPRIATE ITEM 646, AS PER PLAN. (i.e., COST ASSOCIATED WITH THE SURVEY OF LANE LINES SHALL BE INCLUDED IN THE UNIT BID PRICE FOR ITEM 646 - LANE LINE, AS PER PLAN.)

ITEM SPECIAL - TREATING CONCRETE BRIDGE DECKS WITH GRAVITY-FED RESIN

NO GRAVITY-FED RESIN SHALL BE PERMITTED ON THE PARAPETS. THE CONTRACTOR SHALL TAKE MEASURES TO ENSURE THE PARAPETS ARE PROTECTED AGAINST ANY GRAVITY-FED RESIN OVER SPRAY.

LOCATION 36 (CUI-176R-1064):

NO LANE LINES SHALL BE PLACED ON CUI-176R-1064.

SUB-TOTAL #1 FROM SHEET	SUB-TOTAL #2 FROM SHEET	GENERAL	ITEM	ITEM EXTENSION	TOTAL	UNIT	DESCRIPTION
							TRAFFIC CONTROL
		3.58	614	20100	3.58	MILE	WORK ZONE LANE LINE, CLASS 1, 642 PAINT *
		0.49	614	21100	0.49	MILE	WORK ZONE CENTER LINE, CLASS 1, 642 PAINT *
		15	621	00300	15	EA	RPM REFLECTOR *
		3.12	646	10001	3.12	MILE	EDGE LINE, AS PER PLAN
		3.58	646	10101	3.58	MILE	LANE LINE, AS PER PLAN
		0.49	646	10201	0.49	MILE	CENTER LINE, AS PER PLAN
		1665	646	10301	1665	LF	CHANNELIZING LINE, AS PER PLAN
		135	646	10601	135	LF	TRANSVERSE LINE, AS PER PLAN
		12	646	20301	12	EA	LANE ARROW, AS PER PLAN
		4	646	20401	4	EA	WORD ON PAVEMENT, 72", AS PER PLAN
							STRUCTURE
33442	11716		SPECIAL	512E73500	45158	SQ YD	TREATING CONCRETE BRIDGE DECKS WITH GRAVITY FED RESIN
		30	SPECIAL	519E12300	36	SQ YD	PATCHING CONCRETE BRIDGE DECK - TYPE B *
							MAINTENANCE OF TRAFFIC
		LUMP	614	11000		LUMP	MAINTAINING TRAFFIC
		1000	614	11100	1000	HOURL	LAW ENFORCEMENT OFFICER WITH PATROL CAR *
		14	614	18511	14	MONTH	PORTABLE CHANGEABLE MESSAGE SIGN, AS PER PLAN
		17	619	16000	17	MONTH	FIELD OFFICE, TYPE A
		LUMP	624	10000		LUMP	MOBILIZATION

* - THIS ITEM SHALL BE USED AS DIRECTED BY THE ENGINEER. ALL OR A PORTION OF THE QUANTITY ASSOCIATED WITH THIS ITEM IS SUBJECT TO NON-PERFORMANCE WITHOUT PENALTY TO THE STATE OF OHIO.

LOCATION																		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
CUY-90-0892	CUY-90-0909	CUY-90-0947L	CUY-90-0947R	CUY-90-0970L	CUY-90-0970R	CUY-90-0991L	CUY-90-0991R	CUY-90-1062	CUY-90-1094	CUY-90-1110	CUY-90-1132L	CUY-90-1132R	CUY-90-1151L	CUY-90-1151R	CUY-90-1157L	CUY-90-1157R	CUY-90-1185	CUY-90-1201
786	2104	1513	1612	5551	5901	674	674	2102	684	702	1415	1441	1261	1264	1262	1241	1920	1335
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

ITEM	ITEM EXTENSION	SUB-TOTAL # 1	UNIT	DESCRIPTION
SPECIAL	512E73500	33442	SQ YD	TREATING CONCRETE BRIDGE DECKS WITH GRAVITY FED RESIN
SPECIAL	519E12300	19	SQ YD	PATCHING CONCRETE BRIDGE DECK - TYPE B

LOCATION																		
20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36		
CUY-90-1214S	CUY-90-1237	CUY-90-1267R	CUY-90-1270	CUY-90-1309L	CUY-90-1309R	CUY-90-1628EN	CUY-90-1628L	CUY-90-1628R	CUY-90-1640	CUY-90-1651EX	CUY-90-1651L	CUY-90-1651R	CUY-480-1559	CUY-176-1020	CUY-176J-1218	CUY-176R-1064		
1277	1138	1647	871	1288	1495	619	236	236	309	287	307	307	675	537	161	326		
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		

ITEM	ITEM EXTENSION	SUB-TOTAL # 2	UNIT	DESCRIPTION
SPECIAL	512E73500	11716	SQ YD	TREATING CONCRETE BRIDGE DECKS WITH GRAVITY FED RESIN
SPECIAL	519E12300	17	SQ YD	PATCHING CONCRETE BRIDGE DECK - TYPE B

NOTE:

SUB-TOTAL #1 AND SUB-TOTAL #2 HAVE BEEN INCLUDED IN THE GENERAL SUMMARY.

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LOCATION	BRIDGE NUMBER AND INTERSECTION	STRUCTURE TYPE	EXISTING CONDITION											PROPOSED WORK
			BRIDGE LIMITS (FT)	ROADWAY WIDTH (FT)	DECK AREA (SY)	NUMBER OF LANES	EDGE LINE (FT)	LANE LINE (FT)	CENTER LINE (FT)	CHANNEL LINE (FT)	TRANS. LINE (FT)	LANE ARROW (EA)	WORD ON PAVEMENT (EA)	
1	CUY-90-0892 ALGER ROAD OVER I-90	2 SPAN CONT. STEEL BEAM WITH CONCRETE DECK	255	28	786	1 N.B. 1 S.B.	NONE	NONE	253	NONE	NONE	2	NONE	- SEAL DECK WITH GRAVITY-FED RESIN
2	CUY-90-0909 WARREN ROAD OVER I-90	2 SPAN CONT. STEEL BEAM WITH CONCRETE DECK	298	64	2104	2 N.B. 3 S.B.	NONE	581	296	307	NONE	6	2	- SEAL DECK WITH GRAVITY-FED RESIN
3	CUY-90-0947L I-90 OVER W. 140TH STREET	3 SPAN CONT. STEEL BEAM WITH CONCRETE DECK	197	69.25	1513	4 W.B.	394	591	NONE	NONE	NONE	NONE	NONE	- SEAL DECK WITH GRAVITY-FED RESIN
4	CUY-90-0947R I-90 OVER W. 140TH STREET	3 SPAN CONT. STEEL BEAM WITH CONCRETE DECK	195	74.21 (AVG)	1612	4 E.B.	391	587	NONE	NONE	NONE	NONE	NONE	- SEAL DECK WITH GRAVITY-FED RESIN
5	CUY-90-0970L I-90 OVER JOSLYN ROAD	6 SPAN CONT. STEEL GIRDER WITH CONCRETE DECK	660	VARIES 83 TO 68.75	5551	4 W.B. 1 DECEL. LANE	1315	2171	NONE	NONE	NONE	NONE	NONE	- SEAL DECK WITH GRAVITY-FED RESIN
6	CUY-90-0970R I-90 OVER JOSLYN ROAD	6 SPAN CONT. STEEL GIRDER WITH CONCRETE DECK	660	VARIES 89.08 TO 72.59	5901	4 E.B. 1 ACCEL. LANE	1315	2213	NONE	270	NONE	NONE	NONE	- SEAL DECK WITH GRAVITY-FED RESIN
7	CUY-90-0991L I-90 OVER BEREA ROAD	1 SPAN CONT. STEEL BEAM WITH CONCRETE DECK	92	68	674	4 W.B.	179	268	NONE	NONE	NONE	NONE	NONE	- SEAL DECK WITH GRAVITY-FED RESIN
8	CUY-90-0991R I-90 OVER BEREA ROAD	1 SPAN CONT. STEEL BEAM WITH CONCRETE DECK	92	68	674	4 E.B.	179	268	NONE	NONE	NONE	NONE	NONE	- SEAL DECK WITH GRAVITY-FED RESIN
9	CUY-90-1062 W. 117TH STREET OVER I-90	3 SPAN CONT. STEEL BEAM WITH CONCRETE DECK	239	40 N.B. 40 S.B.	2102	3 N.B. 3 S.B.	946	946	NONE	NONE	NONE	NONE	NONE	- SEAL DECK WITH GRAVITY-FED RESIN
10	CUY-90-1094 W. 110TH STREET OVER I-90	3 SPAN CONT. STEEL BEAM WITH CONCRETE DECK	222	28	684	1 N.B. 1 S.B.	NONE	NONE	220	NONE	NONE	NONE	NONE	- SEAL DECK WITH GRAVITY-FED RESIN
11	CUY-90-1110 W. 106TH STREET OVER I-90	3 SPAN CONT. STEEL GIRDER WITH CONCRETE DECK	228	28	702	1 N.B. 1 S.B.	NONE	NONE	226	NONE	NONE	NONE	NONE	- SEAL DECK WITH GRAVITY-FED RESIN
12	CUY-90-1132L I-90 OVER WEST BOULEVARD	3 SPAN CONT. STEEL BEAM WITH CONCRETE DECK	187	68	1415	4 W.B.	375	562	NONE	NONE	NONE	NONE	NONE	- SEAL DECK WITH GRAVITY-FED RESIN
13	CUY-90-1132R I-90 OVER WEST BOULEVARD	3 SPAN CONT. STEEL BEAM WITH CONCRETE DECK	187	69.25	1441	4 E.B.	375	562	NONE	NONE	NONE	NONE	NONE	- SEAL DECK WITH GRAVITY-FED RESIN

* - MEASURED FROM TOE TO TOE OF PARAPET OR FACE TO FACE OF CURB

BRIDGE DATA

CUY-90-08.92/VAR

13
18

LOCATION	BRIDGE NUMBER AND INTERSECTION	STRUCTURE TYPE	EXISTING CONDITION											PROPOSED WORK
			BRIDGE LIMITS (FT)	ROADWAY WIDTH (FT)	DECK AREA (SY)	NUMBER OF LANES	EDGE LINE (FT)	LANE LINE (FT)	CENTER LINE (FT)	CHANNEL LINE (FT)	TRANS. LINE (FT)	LANE ARROW (EA)	WORD ON PAVEMENT (EA)	
14	CUY-90-1151L I-90 OVER W. 100TH STREET	3 SPAN CONT. STEEL BEAM WITH CONCRETE DECK	165	69.25	1261	4 W.B.	328	492	NONE	NONE	NONE	NONE	NONE	- SEAL DECK WITH GRAVITY-FED RESIN
15	CUY-90-1151R I-90 OVER W. 100TH STREET	3 SPAN CONT. STEEL BEAM WITH CONCRETE DECK	165	68	1264	4 E.B.	335	502	NONE	NONE	NONE	NONE	NONE	- SEAL DECK WITH GRAVITY-FED RESIN
16	CUY-90-1157L I-90 OVER W. 98TH STREET	3 SPAN CONT. STEEL BEAM WITH CONCRETE DECK	164	69.25	1262	4 W.B.	328	492	NONE	NONE	NONE	NONE	NONE	- SEAL DECK WITH GRAVITY-FED RESIN
17	CUY-90-1157R I-90 OVER W. 98TH STREET	3 SPAN CONT. STEEL BEAM WITH CONCRETE DECK	164	68	1241	4 E.B.	329	493	NONE	NONE	NONE	NONE	NONE	- SEAL DECK WITH GRAVITY-FED RESIN
18	CUY-90-1185 LORAIN AVENUE OVER I-90	3 SPAN CONT. STEEL GIRDER WITH CONCRETE DECK	321	54	1920	2 N.B. 2 S.B.	NONE	643	322	NONE	NONE	NONE	NONE	- SEAL DECK WITH GRAVITY-FED RESIN
19	CUY-90-1201 W. 84TH STREET TO W. 85TH STREET CONNECTOR ROAD OVER I-90	SIMPLE SPAN STEEL BEAM	234	52	1335	2 N.B. 2 S.B.	NONE	420	231	42	NONE	4	2	- SEAL DECK WITH GRAVITY-FED RESIN
20	CUY-90-1214S CLARK AVENUE OVER I-90	3 SPAN CONT. STEEL BEAM WITH CONCRETE DECK	223	52	1277	2 W.B. 2 E.B.	NONE	442	221	NONE	NONE	NONE	NONE	- SEAL DECK WITH GRAVITY-FED RESIN
21	CUY-90-1237 W. 73RD STREET OVER I-90	3 SPAN CONT. STEEL GIRDER WITH CONCRETE DECK	287	36	1138	1 N.B. 1 S.B.	NONE	NONE	285	NONE	NONE	NONE	NONE	- SEAL DECK WITH GRAVITY-FED RESIN
22	CUY-90-1267R I-90 E.B. OVER W. 65TH STREET	3 SPAN CONT. STEEL BEAM WITH CONCRETE DECK	185	81.25	1647	5 E.B.	365	730	NONE	NONE	NONE	NONE	NONE	- SEAL DECK WITH GRAVITY-FED RESIN
23	CUY-90-1270 W. 65TH STREET OVER I-90 W.B	3 SPAN CONT. STEEL BEAM WITH CONCRETE DECK	196	40	871	1 N.B. 1 S.B.	NONE	NONE	196	NONE	NONE	NONE	NONE	- SEAL DECK WITH GRAVITY-FED RESIN
24	CUY-90-1309L I-90 OVER W. 53RD STREET	3 SPAN CONT. STEEL BEAM WITH CONCRETE DECK	128	VARIES 89.60 TO 91.43	1288	5 W.B.	256	384	NONE	128	NONE	NONE	NONE	- SEAL DECK WITH GRAVITY-FED RESIN
25	CUY-90-1309R I-90 OVER W. 53RD STREET	3 SPAN CONT. STEEL BEAM WITH CONCRETE DECK	166	81.25	1495	5 E.B.	332	498	NONE	166	NONE	NONE	NONE	- SEAL DECK WITH GRAVITY-FED RESIN
26	CUY-90-1628EN I-90 OVER E. 9TH STREET	3 SPAN CONT. STEEL BEAM WITH CONCRETE DECK	231	VARIES 25.83 TO 18.48	619	1 W.B.	436	NONE	NONE	21	NONE	NONE	NONE	- SEAL DECK WITH GRAVITY-FED RESIN

* - MEASURED FROM TOE TO TOE OF PARAPET OR FACE TO FACE OF CURB

BRIDGE DATA

CUY-90-08.92/VAR

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LOCATION	BRIDGE NUMBER AND INTERSECTION	STRUCTURE TYPE	EXISTING CONDITION										PROPOSED WORK	
			BRIDGE LIMITS (FT)	ROADWAY* WIDTH (FT)	DECK AREA (SY)	NUMBER OF LANES	EDGE LINE (FT)	LANE LINE (FT)	CENTER LINE (FT)	CHANNEL LINE (FT)	TRANS. LINE (FT)	LANE ARROW (EA)		WORD ON PAVEMENT (EA)
27	CUY-90-1628L I-90 OVER E. 9TH STREET	3 SPAN CONT. STEEL BEAM WITH CONCRETE DECK	236	47.83	1241	3 W.B.	438	701	NONE	29	NONE	NONE	NONE	- SEAL DECK WITH GRAVITY-FED RESIN
28	CUY-90-1628R I-90 OVER E. 9TH STREET	3 SPAN CONT. STEEL BEAM WITH CONCRETE DECK	236	VARIES 59.46 TO 63.26	1563	4 E.B.	467	467	NONE	234	NONE	NONE	NONE	- SEAL DECK WITH GRAVITY-FED RESIN
29	CUY-90-1640 I-90 OVER I-77 N.B. TO I-90 W.B. AND I-90 W.B. TO I-77 S.B.	3 SPAN CONT. STEEL GIRDER WITH CONCRETE DECK	309	47.83 E.B. & 47.83 W.B.	3246	3 E.B. 3 W.B.	1222	1222	NONE	NONE	NONE	NONE	NONE	- SEAL DECK WITH GRAVITY-FED RESIN
30	CUY-90-1651EX I-90 OVER E. 14TH STREET	4 SPAN CONT. STEEL GIRDER WITH CONCRETE DECK	287	VARIES 27.00 TO 35.83	1095	2 W.B.	498	114	NONE	237	135	NONE	NONE	- SEAL DECK WITH GRAVITY-FED RESIN
31	CUY-90-1651L I-90 OVER E. 14TH STREET	4 SPAN CONT. STEEL GIRDER WITH CONCRETE DECK	307	47.83	1640	3 W.B.	542	610	NONE	68	NONE	NONE	NONE	- SEAL DECK WITH GRAVITY-FED RESIN
32	CUY-90-1651R I-90 OVER E. 14TH STREET	4 SPAN CONT. STEEL GIRDER WITH CONCRETE DECK	307	47.83 MAINLINE (RAMP VARIES▲)	2340	4 E.B. 1 ACCEL. LANE	1017	647	NONE	163	NONE	NONE	NONE	- SEAL DECK WITH GRAVITY-FED RESIN
33	CUY-480-1559 RAMP SR-176 S.B. TO I-480 E.B. OVER S.R.-176 AND I-480	5 SPAN CONT. STEEL GIRDER WITH CONCRETE DECK	675	40	2988	2 E.B.	1344	673	NONE	NONE	NONE	NONE	NONE	- SEAL DECK WITH GRAVITY-FED RESIN
34	CUY-176-1020 SR-176 OVER I-480 AND CONRAIL TRACKS	5 SPAN CONT. STEEL GIRDER WITH CONCRETE DECK	537	32.75 N.B. & 32.75 S.B.	3869	1 N.B. 1 S.B.	2127	NONE	NONE	NONE	NONE	NONE	NONE	- SEAL DECK WITH GRAVITY-FED RESIN
35	CUY-176J-1218 SR-176 OVER CRESTLINE AVENUE	3 SPAN CONT. STEEL BEAM WITH CONCRETE DECK	161	59.42 N.B. & 59.42 S.B.	2126	3 N.B. 3 S.B.	644	644	NONE	NONE	NONE	NONE	NONE	- SEAL DECK WITH GRAVITY-FED RESIN
36	CUY-176R-1064 SCHAAF RD OVER SR-176	3 SPAN CONT. STEEL GIRDER WITH CONCRETE DECK	326	52	1868	2 E.B. 2 W.B.	NONE	648	324	NONE	NONE	NONE	NONE	- SEAL DECK WITH GRAVITY-FED RESIN

* - MEASURED FROM TOE TO TOE OF PARAPET OR FACE TO FACE OF CURB
 ▲ - RAMP VARIES FROM 27.83' TO 22.83' AT GORE

BRIDGE DATA

CUY-90-08.92/VAR

ITEM 614 - MAINTAINING TRAFFIC:

GENERAL

GENERALLY THE CONTRACTOR SHALL CONDUCT HIS OPERATIONS AS TO MAKE THE PROPOSED REPAIR WITH A MINIMUM OF HAZARD, DELAY AND INCONVENIENCE TO THE MOTORISTS USING THE HIGHWAY. FURTHERMORE, IN ADDITION TO THE CONSTRUCTION AND MATERIAL SPECIFICATIONS, THE FOLLOWING SPECIFIC PROVISIONS ARE MANDATORY.

NOTIFICATION

SINCE FUNCTIONAL TRAFFIC CONTROL IS A MAJOR CONCERN ON THIS PROJECT, IT IS ESSENTIAL THAT THE MOTORING PUBLIC BE ADEQUATELY FOREWARNED OF FUTURE LANE CLOSURES AND TRAFFIC CONSTRUCTIONS. THEREFORE, THE CONTRACTOR SHALL SUBMIT A SCHEDULE TO THE OHIO DEPARTMENT OF TRANSPORTATION INDICATING THE LOCATIONS AND DATES OF THE LANE CLOSURES AT LEAST THREE (3) DAYS PRIOR TO THE IMPLEMENTATION OF ANY SUCH CLOSURES. THE CONTRACTOR SHALL ALSO NOTIFY THE LOCAL LAW ENFORCEMENT AGENCIES OF LANE CLOSURES AT LEAST THREE (3) DAYS PRIOR TO IMPLEMENTATION.

RESTRICTIONS

LANE CLOSURES MAY ONLY BE IMPLEMENTED AT THE TIMES PERMITTED BY THE "DISTRICT 12, PERMITTED LANE CLOSURE TIMES" LIST, WHICH IS LOCATED ON THE ODOT WEB SITE:

www.dot.state.oh.us/d12/workzone/laneclo.htm

THE LATEST REVISION, AT 14 DAYS PRIOR TO THE BID DATE, SHALL BE IN EFFECT FOR THIS PROJECT.

WITH THE FOLLOWING EXCEPTIONS TO LOCATION 26 (CUI-90-1628EN) AND LOCATION 30 (CUI-90-1651EX):

- RAMPS ARE PERMITTED TO BE CLOSED 7PM TO 6AM WEEKDAYS AND WEEKENDS.
- ALL SPECIAL EVENT AND HOLIDAY RESTRICTIONS ARE APPLICABLE AT THESE LOCATIONS.

ANY ROADWAY NOT LISTED IN THE "DISTRICT 12 PERMITTED LANE CLOSURE TIMES" SHALL NOT HAVE ANY CLOSURES WEEKDAYS FROM 7am-9am AND 3pm-6pm.

NO LANE OR SHOULDER CLOSURES SHALL BE IN PLACE WHEN NO WORK IS BEING PERFORMED.

UNLESS OTHERWISE NOTED EXIT AND ENTRANCE RAMPS LANES SHALL REMAIN OPEN AT ALL TIMES AND EXHIBIT A MINIMUM WIDTH OF TEN (10) FEET.

MAINTENANCE OF TRAFFIC SCHEME

FOR THE FOLLOWING LOCATIONS:

LOCATION	BRIDGE NUMBER
1	CUI-90-0892
2	CUI-90-0909
9	CUI-90-1062
26	CUI-90-1628EN
27	CUI-90-1628L
28	CUI-90-1628R
30	CUI-90-1651EX
31	CUI-90-1651L
32	CUI-90-1651R

THE CONTRACTOR SHALL DEVISE A SIMPLE MAINTENANCE OF TRAFFIC SCHEME, WHICH SHALL BE STAMPED BY A PROFESSIONAL ENGINEER (SCHEME MAY BE A HAND SKETCH) AND PRESENTED TO THE DISTRICT WORKZONE TRAFFIC CONTROL ENGINEER AND PROJECT ENGINEER FOR APPROVAL AT LEAST TWO WEEKS PRIOR TO IMPLEMENTATION. THE MAINTENANCE OF TRAFFIC SCHEME SHALL PRESENT, IN GENERAL, THE METHODS FOR MAINTAINING TRAFFIC THAT THE CONTRACTOR PROPOSES TO USE FOR CONDUCTING THE REQUIRED WORK IN A SAFE AND EFFICIENT MANNER, SUPPORTED BY HAND SKETCHES AS NECESSARY. THE MAINTENANCE OF TRAFFIC SCHEME SHALL BE IN CONFORMANCE WITH THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, LATEST REVISION, THE REFERENCED STANDARD CONSTRUCTION DRAWINGS, THE ATTACHED MAINTENANCE OF TRAFFIC SHEETS, AND THE SPECIFICATIONS. THE CONTRACTOR SHALL NOT COMMENCE WORK UNTIL THE MAINTENANCE OF TRAFFIC SCHEME HAS BEEN APPROVED.

FOR ALL OTHER LOCATIONS:

THE CONTRACTOR SHALL HAVE THE WORKSITE TRAFFIC SUPERVISOR TURN INTO THE PROJECT ENGINEER A HAND SKETCH, TRAFFIC CONTROL PLAN, 1 DAY BEFORE THE ZONE IS TO BE SET UP. THE TRAFFIC CONTROL PLAN SHALL SHOW THE LOCATIONS OF THE WORK ZONE SIGNS, TAPER LENGTHS, DELINEATION DEVICES, ARROW BOARDS AND ALL WORK ZONE TRAFFIC CONTROL ITEMS. STANDARD DRAWINGS, PLAN SHEETS AND THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES SHALL BE USED AS A REFERENCE.

FOR ALL LOCATIONS:

ALL WORK SHALL BE CONDUCTED FROM WITHIN A ONE, TWO, OR THREE LANE CLOSURE USING DRUMS ACCORDING TO THE RESTRICTIONS AND THE CONCEPTS PRESENTED IN MT-95.30 AND ASSOCIATED STANDARD CONSTRUCTION DRAWINGS MT-98.12 THRU MT-98.16 (SEE TITLE SHEET), AND THESE PLANS.

IF DURING THE PROJECT, THE ENGINEER DETERMINES THAT THE MAINTENANCE OF TRAFFIC PLAN IS NOT PERFORMING AS DESIRED, THE WORK SHALL BE SUSPENDED UNTIL THE PROBLEM IS RESOLVED TO THE SATISFACTION OF THE ENGINEER AND THE MAINTENANCE OF TRAFFIC PLAN IS REVISED ACCORDINGLY. ANY COSTS OR DELAYS INCURRED AS A RESULT OF THE FAILURE OF THE SATISFACTION OF THE ENGINEER SHALL BE THE FULL RESPONSIBILITY OF THE CONTRACTOR.

DURING NON-WORKING HOURS, ALL LANES SHALL BE IN FULL OPERATION WITH ALL TRAFFIC CONTROL SIGNS, EXCEPT 0W-124 (ROAD CONSTRUCTION AHEAD) SIGNS, REMOVED OR COVERED AND ALL CHANNELIZING DEVICES REMOVED FROM THE PAVEMENT SURFACES. CHANNELIZING DEVICES MAY BE STORED OR DEPLOYED TEMPORARILY ADJACENT TO THE SHOULDER TO MINIMIZE THE NIGHTLY TRAFFIC CONTROL SET-UP TIME.

CONSTRUCTION EQUIPMENT, PRIVATE VEHICLES AND MATERIALS SHALL NOT BE PARKED OR STORED ON THE ROADWAY ADJACENT TO THE ROADWAY WITHIN THE 30 FOOT CLEAR ZONE OF THE TRAVELED LANES.

IF IN THE OPINION OF THE ENGINEER, THE CONTRACTOR FAILS TO COMPLY WITH THESE REQUIREMENTS OR THE PROVISIONS OF THE APPROVED MAINTENANCE OF TRAFFIC PLAN, THE ENGINEER SHALL SUSPEND WORK UNTIL ALL REQUIREMENTS ARE COMPLIED WITH. ANY COSTS OR DELAYS INCURRED AS A RESULT OF THE FAILURE SHALL BE THE FULL RESPONSIBILITY OF THE CONTRACTOR.

NOTWITHSTANDING THE ABOVE, NO LANE OR SHOULDER CLOSURES SHALL OCCUR DURING THE PERIOD BEGINNING AT 12:00 NOON ON THE DAY PRECEDING AND CONTINUING UNTIL NOON ON THE DAY FOLLOWING LEGAL HOLIDAYS AND HOLIDAY WEEKENDS SUCH AS MEMORIAL DAY, FOURTH OF JULY, AND LABOR DAY.

FURTHERMORE, NO LANE CLOSURES SHALL BE IMPLEMENTED OR IN PLACE DURING INCREASED TRAFFIC VOLUMES CAUSED BY SPECIAL EVENTS WITH A SEATING CAPACITY OVER 40,000 (IN LIEU OF NOTE 1 IN THE "DISTRICT 12, PERMITTED LANE CLOSURE TIMES" LIST), OR WHEN THE ENGINEER DEEMS THE CLIMATOLOGICAL CONDITIONS TOO HAZARDOUS.

PAYMENT FOR ALL THE ITEMS REQUIRED TO MAINTAIN TRAFFIC IN ACCORDANCE WITH THESE REQUIREMENTS SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR ITEM 614 - MAINTAINING TRAFFIC.

ITEM 614 - PORTABLE CHANGEABLE MESSAGE SIGN, AS PER PLAN

THE CONTRACTOR SHALL FURNISH, INSTALL, MAINTAIN, AND REMOVE WHEN NO LONGER NEEDED A PORTABLE CHANGEABLE MESSAGE SIGN (S). THE PCMS SHALL BE OF THE TYPE SHOWN ON THE LIST OF APPROVED PCMS MAINTAINED BY THE DIRECTOR. THE PCMS SHALL BE A CLASS I OR II TYPE UNIT. NO FLIP DISK ALLOWED.

THE PORTABLE CHANGEABLE MESSAGE SIGN SHALL BE MOUNTED ON A TRAILER. THE LOCATION OF THE PCMS SHALL BE AS DIRECTED BY THE ENGINEER. THE ENGINEER SHALL BE PROVIDED ACCESS TO EACH SIGN UNIT AND SHALL BE PROVIDED WITH APPROPRIATE TRAINING AND OPERATION INSTRUCTIONS.

THE PCMS SHALL CONTAIN A CELLULAR TELEPHONE LINK WHICH WILL ALLOW REMOTE SIGN ACTIVATION, DEACTIVATION, MESSAGE CHANGES, MESSAGE ADDITIONS AND REVISIONS TO TIME OF DAY PROGRAMS. THE SYSTEM SHALL ALSO PERMIT VERIFICATION OF CURRENT AND PROGRAMMED MESSAGES.

THE CONTRACTOR SHALL PROVIDE TO THE ENGINEER THE SOFTWARE NECESSARY TO CONTROL THE PCMS REMOTELY.

THE PCMS SHALL BE EQUIPPED WITH A MYRIAD SAFETY BEAM OR AN APPROVED EQUAL AS DETERMINED BY THE ENGINEER. THE MYRIAD SAFETY BEAM SENDS OUT A SIGNAL THAT ACTIVATES RADAR DETECTORS. THE BEAM IS APPROVED BY THE F.C.C. THE MYRIAD SAFETY BEAM SHALL USE THE SAME POWER SUPPLY AS THE PCMS. THE MYRIAD SAFETY BEAM SHALL BE ABLE TO BE ACTIVATED WITH THE PCMS RUNNING OR NOT. THE MYRIAD SAFETY BEAM IS DISTRIBUTED BY THE TRIPLEX GROUP, INC., P.O. BOX 428. NEW HOPE, PA. 18938. PHONE (215) 862-5077.

AT THE DIRECTION OF THE ENGINEER THE PCMS MAY BE REMOVED FOR PERIODS OR TIMES WHEN NOT IN USE. NO PAYMENT WILL BE MADE FOR THESE TIMES (EX. WINTER MONTHS).

THERE SHALL BE ONE CLASS I OR II CHANGEABLE MESSAGE SIGN AT 14 MONTHS.

ITEM 614 - PORTABLE CHANGEABLE MESSAGE SIGN, AS PER PLAN 14 SIGN-MONTHS

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MAINTENANCE OF TRAFFIC NOTES

CUY-71-10.16 / VAR

MAINTENANCE OF TRAFFIC SYSTEMS

A. WHEN REQUIRED

WHENEVER ANY PART OF THE TRAVELED SURFACE IS BEING WORKED UPON OR IS OTHERWISE NOT SUITABLE FOR SAFE AND CONVENIENT USE BY VEHICLES, TRAFFIC CONTROL DEVICES SUFFICIENT TO PROTECT SUCH AREAS TO ASSURE THE SAFE AND CONVENIENT PASSAGE OF VEHICULAR TRAFFIC SHALL BE INSTALLED AND MAINTAINED. SUCH TRAFFIC CONTROL DEVICES AND THE MANNER IN WHICH THEY ARE USED SHALL BE CONSISTENT WITH THESE PLANS AND THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS (HEREINAFTER REFERRED TO AS THE "MANUAL"). THE TRAFFIC CONTROL DEVICE SYSTEM SHALL CONSTITUTE THE MINIMUM PROVISIONS FOR TRAFFIC CONTROL FOR EACH PARTICULAR SITUATION. WHENEVER THE ENGINEER DEEMS IT NECESSARY ESPECIALLY WHERE A GRADE, CURVE, OR MERGE CONDITIONS EXIST, HE MAY DIRECT THAT ADDITIONAL OR ALTERNATIVE DEVICES BE USED.

B. CONDITIONS

DURING ALL PARTS OF THIS PROJECT, SIGNING, BARRICADES, FLASHING AROWS, ETC. SHALL BE LOCATED AS INDICATED IN THE MANUAL OR AS SHOWN ON THE MAINTENANCE OF TRAFFIC SHEETS.

C. ADVANCE WARNING SIGNS

ALL ADVANCE WARNING SIGNS FOR ANY CONDITION WHICH RESTRICTS TRAFFIC SHALL BE ERECTED BEFORE ANY SUCH RESTRICTION IS PUT INTO EFFECT. ALL SUCH SIGNS SHALL BE COVERED OR REMOVED FROM THE VIEW OF TRAFFIC WHENEVER THEY ARE NOT APPLICABLE.

D. FLASHING ARROW REQUIREMENT

FLASHING ARROWS SHALL BE FURNISHED AS SHOWN ON THE MAINTENANCE OF TRAFFIC PLANS.

E. PROTECTION OF PUBLIC

WHENEVER ANY WORK IS BEING DONE OVER A TRAVELED LANE OR SHOULDER, THE CONTRACTOR SHALL SUPPLY SUFFICIENT SAFETY EQUIPMENT AS APPROVED BY THE DIRECTOR TO PROTECT THE TRAVELING PUBLIC FROM ANY CONSTRUCTION DEBRIS. IF TRAVELED LANES UNDER STRUCTURES ARE TO BE CLOSED FOR REASONS OF SAFETY, METHOD AND TIME OF CLOSURE MUST BE APPROVED PRIOR TO IMPLEMENTATION. PERSONAL CARS SHALL NOT BE PARKED WITHIN THE L/A.

F. FLAGGERS

FLAGGERS SHALL BE IN ACCORDANCE WITH MT-97.10. THE MAINTENANCE OF TRAFFIC PLANS REQUIRE THE USE OF TWO (2) FLAGGERS. ADDITIONAL FLAGGERS SHALL BE USED AS DIRECTED BY THE ENGINEER.

G. LAW ENFORCEMENT OFFICER WITH PATROL CAR

THE CONTRACTOR SHALL PROVIDE AND PAY ALL COST FOR THE SERVICES OF LAW ENFORCEMENT OFFICER WITH PATROL CAR FOR THE EXCLUSIVE PURPOSE OF CONTROLLING TRAFFIC AS DETERMINED BY THE ENGINEER. THE NUMBER OF OFFICERS AND CARS REQUIRED FOR THIS PURPOSE SHALL BE DETERMINED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER. THE OFFICERS SHALL MOVE THEIR PATROL CARS AS NECESSARY TO INSURE THEIR CONSTANT PRESENCE AT THE POINT(S) OF SLOWDOWN, STOPPAGE OR BACK-UP. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAKE ARRANGEMENTS FOR SCHEDULING AND PAYMENT OF LAW ENFORCEMENT OFFICER WITH PATROL CAR.

PAYMENT FOR ALL OF THE ABOVE SHALL BE INCLUDED IN THE MAN HOUR PRICE BID FOR ITEM 614 - LAW ENFORCEMENT OFFICER WITH PATROL CAR.

H. WORKSITE TRAFFIC SUPERVISOR

THE CONTRACTOR SHALL EMPLOY (OTHER THAN THE SUPERINTENDENT) AND SUBJECT TO THE APPROVAL OF THE ENGINEER, A CERTIFIED WORKSITE TRAFFIC SUPERVISOR (WTS). THE WTS MAY BE CERTIFIED FROM ONE OF THE FOLLOWING ORGANIZATIONS:

- 1) AMERICAN TRAFFIC SAFETY SERVICE ASSOCIATION A.T.S.S.A. PHONE NUMBER 1-800-272-8772) CERTIFIED WORKSITE TRAFFIC SUPERVISOR (WTS)
- 2) THE NATIONAL SAFETY COUNCIL, TRAFFIC CONTROL ZONES SUPERVISORS COURSE, PHONE NO. 1-800-441-5103
- 3) NATIONAL HIGHWAY INSTITUTE, DESIGN AND OPERATION OF WORK ZONE TRAFFIC CONTROL, PHONE NO. 1-703-235-0528

THE WTS POSITION IS ESTABLISHED FOR THE PURPOSE OF MONITORING AND CORRECTING ANY TRAFFIC CONTROL DEFICIENCIES IN THE WORK ZONE. THE WTS SHALL OVERSEE ALL OPERATIONS THAT AFFECT THE MOVEMENT OF VEHICULAR AND PEDESTRIAN TRAFFIC THROUGH THE WORK ZONE.

THE WTS SHALL BE PRESENT WHEN THE CONTRACTOR OR SUBCONTRACTOR INSTALLS A TRAFFIC RESTRICTION, LANE CLOSURE, ETC. IN LIEU OF THE WTS BEING PRESENT WHEN A SUBCONTRACTOR HAS A WORKZONE IN PLACE, THE CONTRACTOR MAY USE HIS OWN PERSONNEL THAT IS A CERTIFIED WTS. THE CONTRACTOR OR SUBCONTRACTOR MUST PRESENT A COPY OF HIS WTS CERTIFICATE TO THE PROJECT ENGINEER. A WTS MUST BE PRESENT WHEN THE WORK ZONE IS BEING SET UP. HE MUST APPROVE THE WORK ZONE BEFORE HE LEAVES OR PERFORMS OTHER DUTIES.

THE RESTRICTIONS ARE SHORT TERM, THE WTS SHALL MONITOR THE ZONE FOR COMPLIANCE. DURING THE LANE CLOSURE HE SHALL MAKE SURE ALL TRAFFIC CONTROL ITEMS ARE FUNCTIONING PROPERLY. TRAFFIC CONTROL WILL BE THE WTS' MAIN DUTY DURING IMPLEMENTATION OF ZONES OR SHORT TERM ZONES. THE WTS SHALL HAVE THE AUTHORITY TO HAVE DEFICIENCIES CORRECTED AS SOON AS POSSIBLE. THE WTS SHALL PROVIDE THE DISTRICT WORK ZONE TRAFFIC CONTROL ENGINEER A SKETCH OF THE TRAFFIC CONTROL PLAN (TCP) EVERYDAY THERE IS TO BE A SHORT TERM TRAFFIC RESTRICTION, LANE CLOSURE, ETC. THIS TCP SHALL SHOW HOW THE WORK ZONES ARE TO BE IMPLEMENTED.

THE WTS SHALL BE AVAILABLE ON A 24-HOUR BASIS TO REPAIR AND/OR REPLACE DAMAGED OR MISSING TRAFFIC CONTROL DEVICES. A 24-HOUR PHONE NUMBER SHALL BE MADE AVAILABLE TO THE PROJECT ENGINEER IN ORDER TO CONTACT THE WTS. THE WTS SHALL HAVE A PAGER AND THE PHONE NUMBER PROVIDED TO THE PROJECT ENGINEER.

FAILURE OF THE CONTRACTOR TO COMPLY WITH ANY OF THE ABOVE, SHALL CONSTITUTE CAUSE FOR THE PROJECT ENGINEER TO DEDUCT \$500.00 PER DAY FROM MONEY DUE TO THE CONTRACTOR NOT AS A PENALTY, BUT AS A LIQUIDATED DAMAGE.

PAYMENT FOR THE WTS SHALL BE INCLUDED UNDER THE LUMP SUM ITEM 614 - MAINTAINING TRAFFIC.

I. FAILURE TO COMPLY

IF THERE IS ANY FAILURE TO COMPLY WITH PROVISION FOR TRAFFIC CONTROL SET OUT IN THESE PLANS AND NOTES, OR WITH THE PROVISIONS OF THE "MANUAL", THE HIGHWAY IN THE VICINITY OF THE WORK AREA SHALL NOT BE CONSIDERED IN A CONDITION FOR THE SAFE AND CONVENIENT USE BY THE TRAVELING PUBLIC. ANY FAILURE TO KEEP THE HIGHWAY, IN THE VICINITY OF THE WORK AREA, IN A CONDITION FOR THE SAFE AND CONVENIENT USE BY THE TRAVELING PUBLIC SHALL BE CONSIDERED A BREACH OF THIS CONTRACT. WORK SHALL BE SUSPENDED UNTIL THE CONTRACTOR COMPLIES WITH THE PROVISION OF THE AFOREMENTIONED ITEMS.

MAINTENANCE OF TRAFFIC CONTROL MATERIAL

A. SIGNS

SIGN DIMENSIONS AND SPECIFICATIONS, INCLUDING LETTER SIZES SHALL BE AS PROVIDED IN THE "MANUAL", OR IN DESIGN DRAWINGS PROVIDED BY THE DEPARTMENT OF TRANSPORTATION. THE SIGNS SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER PRIOR TO THE START OF THIS PROJECT.

WORK ZONE MARKING SIGNS

WORK ZONE MARKING SIGNS SHALL BE ERECTED PER STANDARD DRAWING MT-99.10M AND ITEM 614 OF THE CMS.

B. SIGN SUPPORTS

SIGN SUPPORTS SHALL BE AS SHOWN ON STANDARD DRAWINGS MT-105.10M AND MT-105.11M.

C. FLASHING ARROWS

THE ELECTRIC FLASHING ARROW SHALL BE AS SHOWN ON STANDARD CONSTRUCTION DRAWING MT-35.10.

D. CONES

CONES SHALL BE LOCATED AS SHOWN IN THE "MANUAL" AND THE TRAFFIC CONTROL PLANS.

E. DRUMS

DRUMS SHALL BE LOCATED AS SHOWN ON THE TRAFFIC CONTROL PLANS AND ARE REQUIRED FOR NIGHTTIME CLOSURES.

F. FLOODLIGHTING

FLOODLIGHTING OF THE WORK SITE FOR OPERATIONS CONDUCTED DURING NIGHT TIME PERIODS SHALL BE ACCOMPLISHED SO THAT THE LIGHTS DO NOT CAUSE GLARE TO THE DRIVERS ON THE ROADWAY. TO ENSURE ADEQUACY OF THE FLOODLIGHT PLACEMENT, THE CONTRACTOR AND ENGINEER SHALL DRIVE THROUGH THE WORK SITE EACH NIGHT WHEN THE LIGHTING IS IN PLACE AND OPERATIVE PRIOR TO COMMENCING ANY WORK. IF GLARE IS DETECTED THE LIGHT PLACEMENT AND SHIELDING SHALL BE ADJUSTED TO THE SATISFACTION OF THE ENGINEER BEFORE WORK PROCEEDS.

PAYMENT FOR ALL LABOR, EQUIPMENT AND MATERIALS SHALL BE INCLUDED IN THE LUMP SUM CONTRACT PRICE FOR MAINTAINING TRAFFIC.

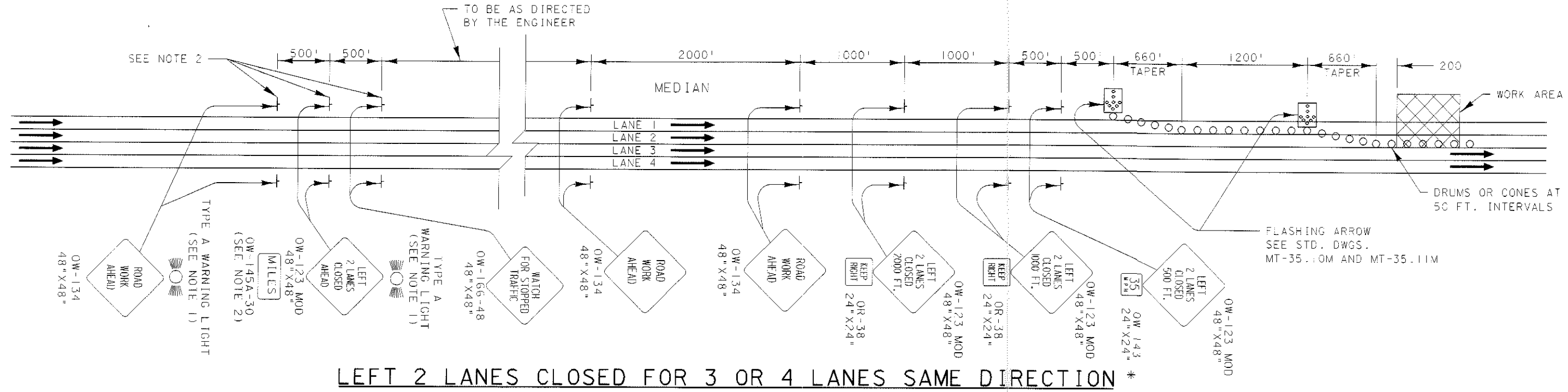
G. WORK VEHICLES

ALL WORK VEHICLES LICENSED TO OPERATE ON THE HIGHWAY, INCLUDING TRUCKS, SHALL BE EQUIPPED WITH A FLASHING, ROTATING OR OSCILLATING AMBER LIGHT VISIBLE TO ALL DIRECTIONS OF TRAFFIC FOR A MINIMUM OF ONE-QUARTER MILE IN BRIGHT SUNLIGHT AND SHALL BE OPERATED WITH LIGHTED HEAD AND TAIL LAMPS. THE AMBER LIGHT SHALL BE IN OPERATION AT ALL TIMES WITHIN THE WORK ZONE AND WHILE TRAVELING TO AND FROM THE WORK ZONE WHENEVER THE VEHICLE SPEED IS BELOW 55 MPH. VEHICLE HAZARD LAMPS DO NOT SATISFY THIS REQUIREMENT. ALL OTHER EQUIPMENT SHALL BE EQUIPPED WITH A FLASHING, ROTATING OR OSCILLATING AMBER LIGHT VISIBLE IN ALL DIRECTIONS OF TRAFFIC FOR A MINIMUM OF ONE-QUARTER MILE IN BRIGHT SUNLIGHT. THE AMBER LIGHT SHALL BE IN OPERATION WHILE THE EQUIPMENT IS WITHIN THE WORK ZONE.

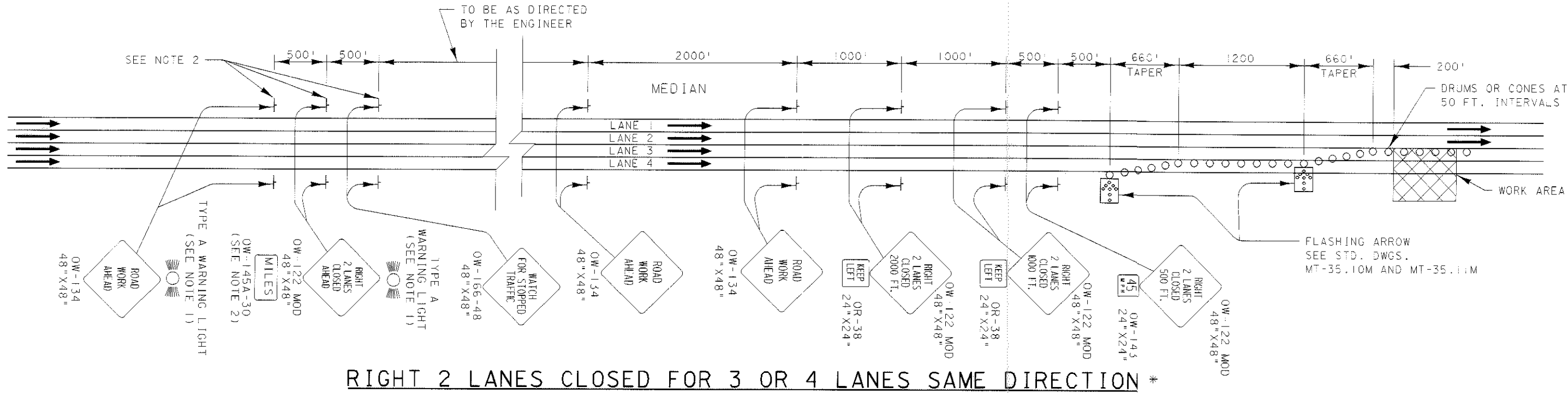
PAYMENT

PAYMENT FOR PROVIDING, ERECTING, MAINTAINING AND REMOVING TEMPORARY MAINTENANCE OF TRAFFIC CONTROL DEVICES, INCLUDING WORK ZONE MARKING SIGNS, SHALL BE MADE UNDER THE LUMP SUM PRICE BID FOR ITEM 614 - MAINTAINING TRAFFIC UNLESS SEPARATELY ITEMIZED.

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LEFT 2 LANES CLOSED FOR 3 OR 4 LANES SAME DIRECTION *

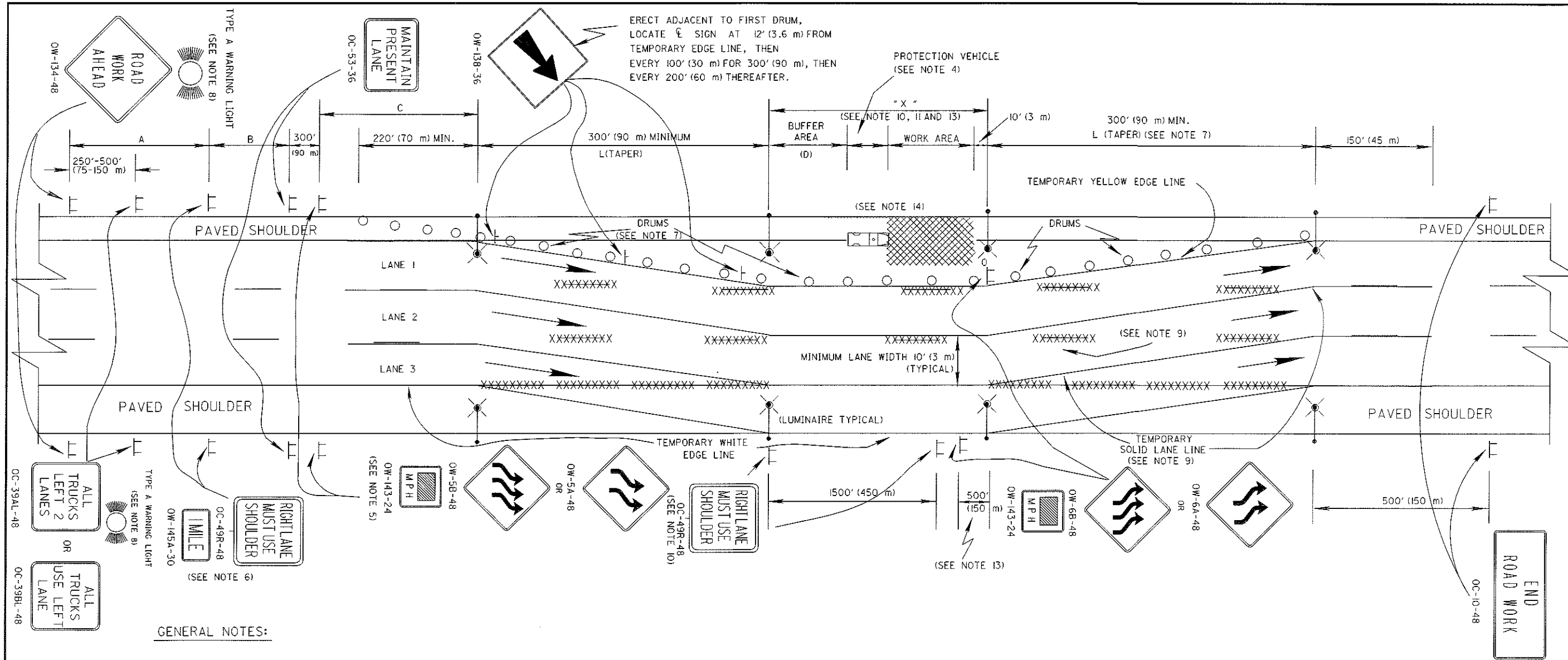


RIGHT 2 LANES CLOSED FOR 3 OR 4 LANES SAME DIRECTION *

GENERAL NOTES:

1. TYPE A FLASHING WARNING LIGHTS SHOWN ON THE "ROAD WORK AHEAD" AND "RIGHT(OR LEFT) 2 LANES CLOSED AHEAD" SIGNS ARE REQUIRED WHENEVER A NIGHT LANE CLOSURE IS NECESSARY.
2. EXTRA ADVANCE WARNING SIGN GROUPS CONSISTING OF OW-128, OW-122 MOD, OR OW 123 MOD AND OW-166 SIGNS PLUS DISTANCE PLATES MAY BE SPECIFIED IN THE PLANS OR REQUIRED TO BE ERECTED AT THE DIRECTION OF THE ENGINEER.

* FOR RIGHT 3 LANE OR LEFT 3 LANE CLOSURE ADD 1200' BETWEEN TAPERS, A 660' TAPER AND AN ADDITIONAL ARROW BOARD. (SUBSTITUTE RIGHT 3 LANES CLOSED...SIGNS FOR RIGHT 2 LANES CLOSED...SIGNS)



GENERAL NOTES:

- 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.
- 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.
- This traffic control plan should be used when the work area extends into either the right or left hand lane of a multiple lane divided highway and it is not desirable, for capacity reasons, to reduce the number of available lanes. The minimum resultant width of any lane is 10' (3 m). The plan shown is for a Left-Lane closure. When there is a Right-Lane closure, make the following sign substitutions: an OC-49L for the OC-49R; an OC-39AR, for the OC-39AL; an OW-6A or OW-6B for the OW-5A or OW-5B; and an OW-5A or OW-5B, for the OW-6A or OW-6B.
- 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 vehicle shall be removed from the pavement whenever workers are not in the work area. Other protective devices may be used in lieu of the protection vehicle shown when approved by the Engineer. The vehicle shall be equipped with a 360 degree rotating or flashing amber beacon clearly visible a minimum of 1/4 mile (400 m).
- The Advisory Speed Sign OW-143 shall be used when specified in the plan.
- The distance plate OW-145A shall indicate the distance to the beginning of the pavement taper (L). Distances less than 1 mile may be expressed in feet.
- The Taper Rate (R) of drums shall be based upon the average approach speed or speed limit whichever is greater and shall be as shown in Table II, except that the resulting length of taper should not be less than 300' (90 m). The taper (L) shall equal the Taper Rate (R) multiplied by the offset (O). A minimum of five channelizing devices shall be used to form the taper on the shoulder.
- The Type A Flashing Warning Lights shown on OW-134 signs, and OC-39AL signs are required.
- The existing conflicting Pavement Markings and Reflectors from the Raised Pavement Markers (RPM's) shall be removed and the appropriate color Temporary Lines shall be applied. Temporary Lines which would conflict with final traffic lanes shall be removable (740.06 Type-I) tape unless the area will be resurfaced in the next work phase. After completion of the work, Temporary 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.
- The maximum spacing of the OC-49R, near the work area is 1500' (450 m). When the distance "X" is less than 1700' (520 m), the second OC-49R should be deleted. Also if it would be within 200' (60 m) of the OW-6A or OW-6B sign the OR-49R sign should be deleted.
- Lighting poles not located behind existing guardrail shall be set back 40' (12 m) from edge of the nearest traffic lane (including any shoulder or temporary pavement used as a traffic lane). Where local conditions prevent the 40' (12 m) set back, it may be reduced to 30' (9 m) with the approval of the Engineer. When located behind existing guardrail, light poles shall be a minimum of 3' (0.9 m) clear from back of guardrail post to face of pole. Any poles provided for power service shall be set back at least as far as the lighting poles. Spacing and type of luminaires shall provide an average illumination of 1.0 to 1.2 foot candles (10.8 lux to 12.9 lux) with max. uniformity ratios of 4:1 average to minimum and 10:1 maximum to minimum throughout the lighted area. When tapers are required to be lighted and dimension "X" is less than 2000' (600 m) lighting shall be continuous between tapers.
- 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 distance "X" is less than 1000' (300 m), place the OW-6A or OW-6B sign at the mid point of distance "X".
- All material and equipment shall be removed from work area when no work is being done.

TABLE II

SPEED (MPH)	TAPER RATE (R)	MAXIMUM SPACING (S) OF DRUMS	BUFFER (D)
30 - 40	27:1	30' (9 m)	170' (52 m)
45 - 55	55:1	40' (12 m)	335' (102 m)
60 - 65	65:1	60' (18 m)	485' (148 m)

TABLE I

MINIMUM DISTANCE	A FT (m)	B FT (m)	C FT (m)
MAJOR STANDARD	500' (150)	500' (150)	500' (150)
FREEWAY & EXPRESSWAY	2600' (780)	1600' (480)	1000' (300)

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

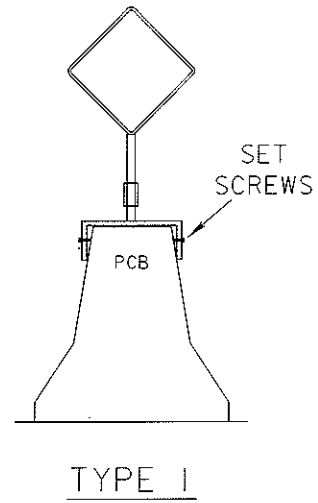
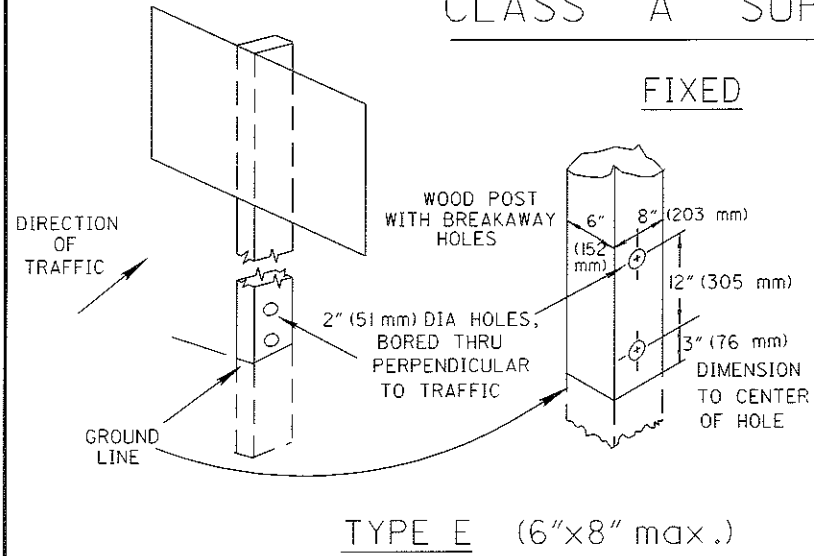
TEMPORARY SIGN SUPPORT I

OFFICE OF TRAFFIC
ENGINEERING

MT-105.10

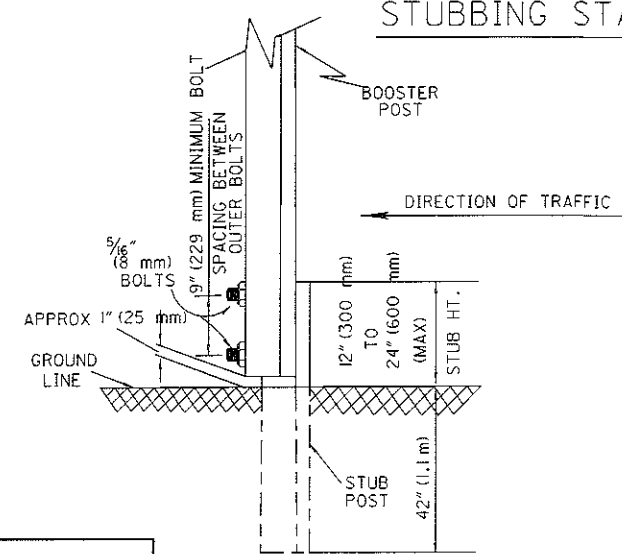
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CLASS A SUPPORTS



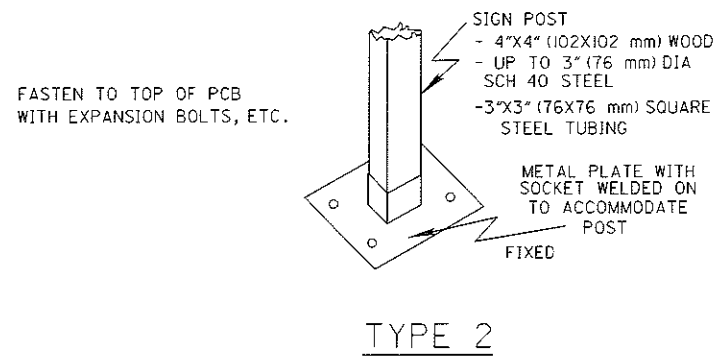
CLASS A SUPPORTS

STUBBING STANDARD



NOTES

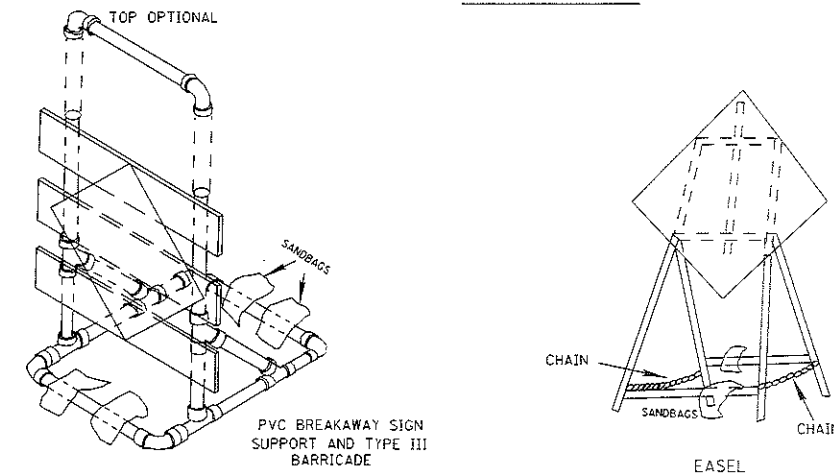
1. FOR USE WITH #3 POST OR SMALLER ONLY
2. BOLTS SHALL BE STEEL OR ALUMINUM
3. A MINIMUM OF TWO FASTENERS SHALL BE USED PER ASSEMBLY
4. BOOSTER POST SHALL BE MOUNTED BEHIND STUB POST
5. BOOSTER POST SHALL BE THE SAME OR 1LB/FT (1.5 kg/m) LESS THAN STUB POST



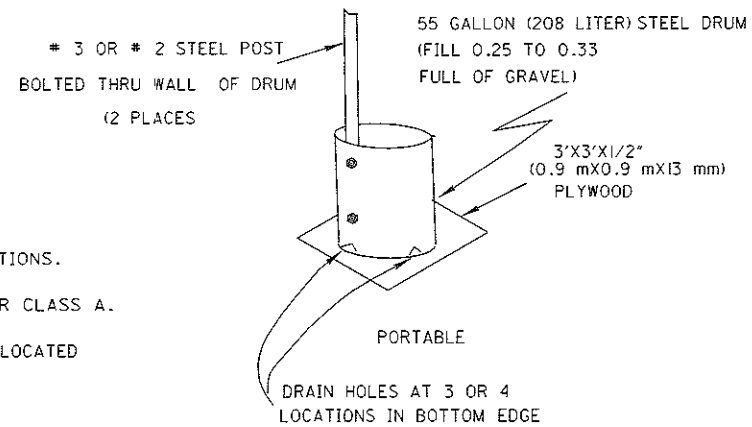
NOTE: SPECIFIC INFORMATION SEE MT-105.10

CLASS A SUPPORTS

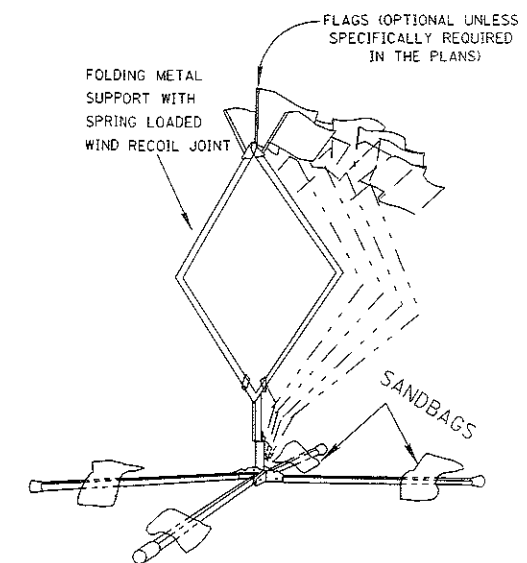
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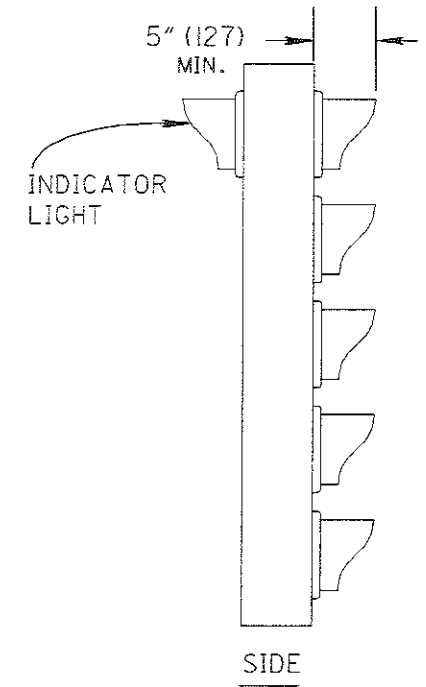
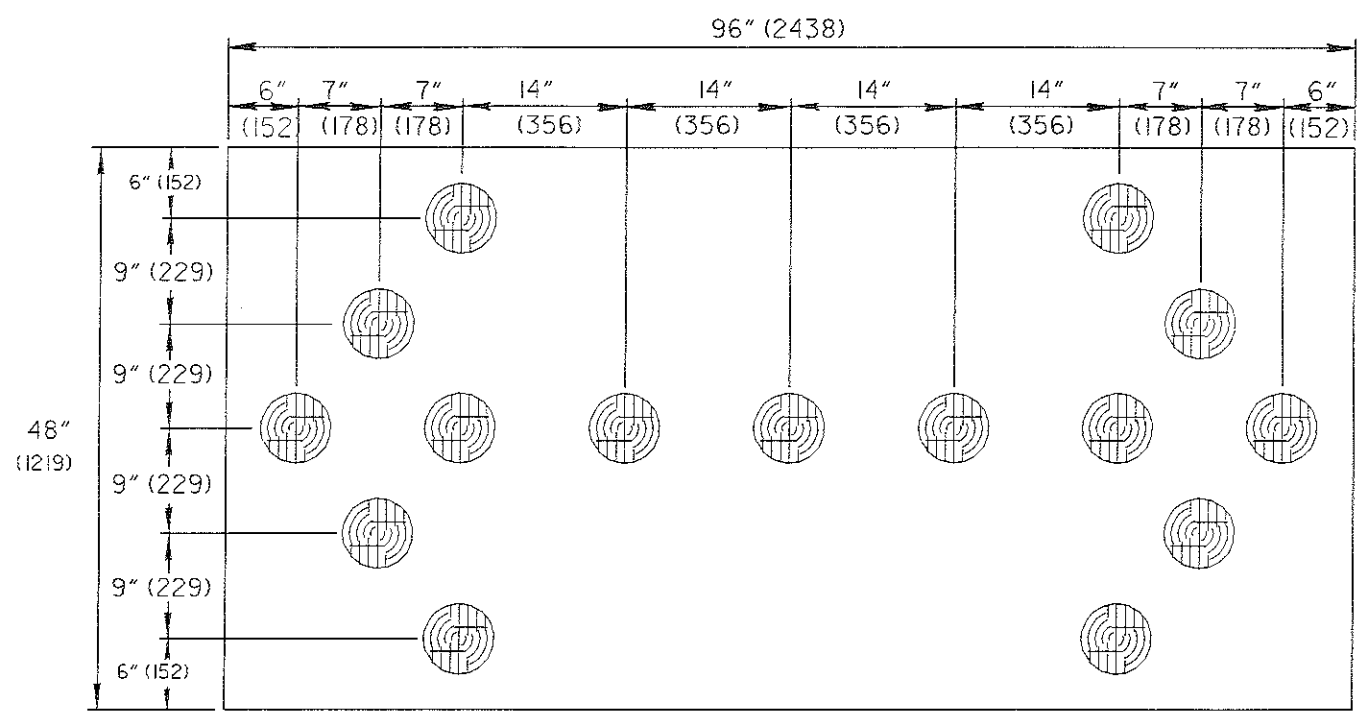
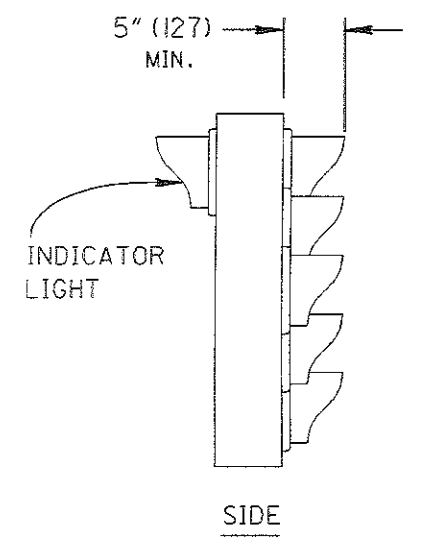
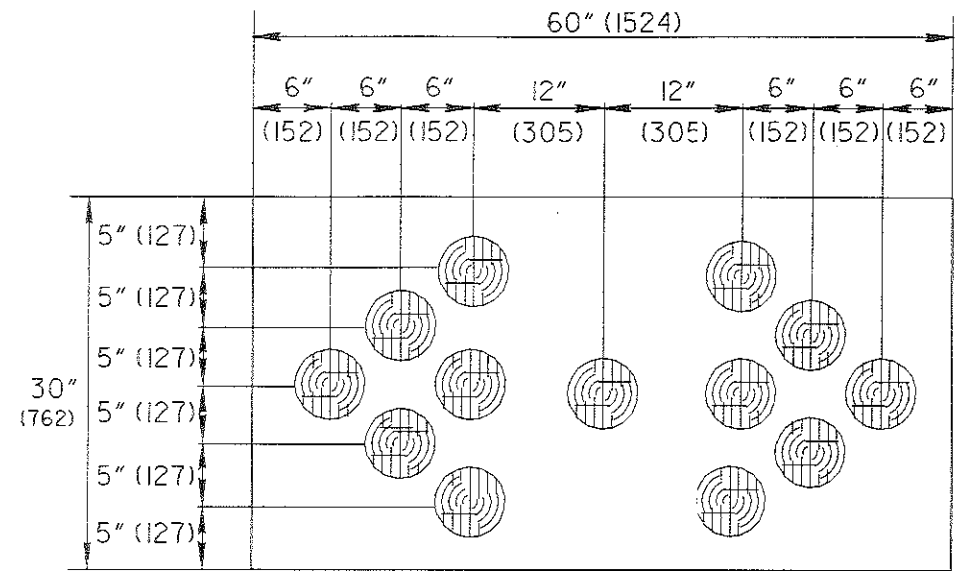
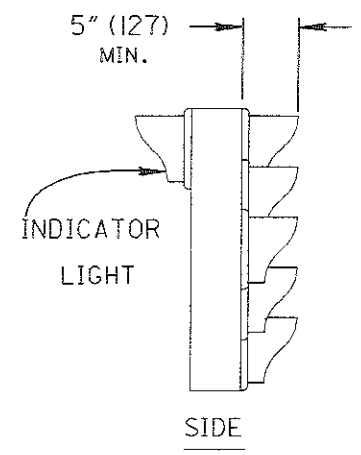
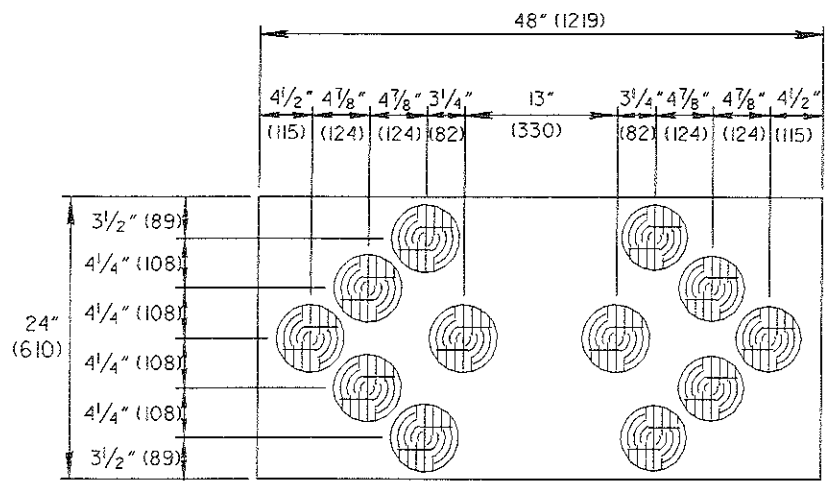


CLASS B SUPPORTS



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.





ALL DIMENSIONS IN PARENTHESES ARE IN MILLIMETERS, UNLESS NOTED OTHERWISE.

FLASHING ARROW PANEL

The flashing arrow panel shall consist of the following components:

- A. flasher panel
- B. lamps
- C. controls
- D. power supply
- E. mounting

A. Flasher panel

The flasher panel shall be of exterior type plywood or corrosion resistant metal construction of adequate design and strength. The panel finish shall be flat black.

A flasher panel shall be one of three sizes. The type A panel shall be a nominal 24" (610 mm) high by 48" (1219 mm) wide. Type B shall be a nominal 30" (762 mm) high by 60" (1524 mm) wide. Type C shall be a nominal 48" (1219 mm) high by 96" (2438 mm) wide.

Flashing arrow panels shall normally utilize high output (4412A and 4415A) lamps powered by an engine driven generator when permitted by the plans. The contractor may also furnish units powered by a solar array and batteries or only batteries. However, these units shall not be used where the approaching traffic would be on a horizontal curve in excess of 3 degrees. These units shall not be used if the approaching traffic, closer than 1 mile (1.6 km) [1/2 mile (.8 km) where speed limits are less than 40 MPH], is more than 5 1/2 degrees horizontally or 2 degrees vertically from the central axis of the lens units.

B. Lamps

For engine powered generator units, lamps shall be ANSI Number 4412a (PAR 46) for type B and C and 4415a (PAR 36) for type A. The lamp shall be fitted with an upper hood of not less than 180° at least 5" (127 mm) long. Arrow panels may use a lower power (wattage) lamp than the standard arrow panels. The lamps shall be approximately 5" (127 mm) diameter with a parabolic reflector. The lamp shall provide improved light distribution control by means of high quality reflectors and refractors. The light output from each lamp of the arrow shall not be less than shown in figure 1 when operating at full daytime brightness.

The lamps shall be securely mounted and positioned in the panel perpendicular to the panel face and oriented so that the lamp location lug (on back of the lamp) is on the horizontal center line through the lens. The lug will be on the right side of the lamp as viewed from the front.

The lamps shall be wired in circuits that can be switched to display any one of the following messages: left arrow, right arrow, left and right, and caution bar. A minimum of three indicator lights shall be placed on the back of the panel to indicate which message mode is in operation.

Each panel shall contain the following number of lamps as a minimum: type A-12 lamps, type B-13 lamps, type C-15 lamps.

CANDLE POWER CHART

				100						4°	
		100	150	200	150	100				2°	
100	150	200	250	350	250	200	150	100		0° HORIZONTAL	
		100	150	200	150	100				- 2°	
				100						- 4°	
10°	7.5°	5°	2.5°	0°	2.5°	5°	7.5°	10°			
LEFT			CENTER				RIGHT				

- (1) Measurements expressed in candela.
- (2) Color of output light shall be yellow to light yellow.

Figure 1

C. Controls

Each flashing arrow panel shall contain a flasher control and a dimmer control unit housed in a cabinet which can be locked.

1. Flasher control

The flash rate for the sign panel shall be 25 to 40 flashes per minute. The flasher shall not cause electromagnetic interference. The lamps shall have a minimum "on time" of 50% and a maximum of 66%.

2. Dimmer control

Lamp intensity shall be variable by means of a photoelectrically controlled circuit which shall reduce lamp output during low ambient light conditions. Lamp intensity shall be at the nighttime level whenever the ambient illumination is in or below the range 2 foot-candle (21 lux) to 5 foot-candle (54 lux) and shall be at daytime level when ambient illumination is in or above the range 5 foot-candle (54 lux) to 10 foot-candle (108 lux). If controls provide for continuous adjustment of lamp intensity with respect to ambient illumination, then lamp intensity shall increase linearly from nighttime intensity at 5 foot-candle (54 lux) to daytime intensity at 3250 foot-candle (35,000 lux). A time delay shall be built into the control to prevent false operation due to light flashes. The photoelectric control shall contain a switch which shall override the photoelectric control.

D. Power supply

The flashing arrow panel shall operate from power sources capable of continuously furnishing the proper voltage to the lamps a minimum of 24 hours without attendance.

D. Cont.

Motor generators, if used shall be of modern design to provide low emission of pollutants and shall be properly muffled. The motor generator shall be enclosed in a mesh enclosure which can be locked. The fuel tank shall have a cap which can be locked. Motor generators supplying power to a flashing arrow sign shall not be used to supply power to other equipment. Gasoline fueled engines shall not be used.

Battery and solar/battery units shall have a no-charge-life of not less than 15 days. No-charge-life is the number of consecutive days that the system can continue to function (double arrow mode, normal dimming during 12 hour night, full output during 12 hour day) starting with a full battery charge and with no additional charge being provided by the solar cells. The no-charge-life may be based upon calculations providing that manufacturer's ratings and efficiency calculations are furnished for each major component.

E. Mounting

The flashing arrow panel may be trailer or vehicle mounted or mounted on a rigid supporting device suitable for maintaining it in the designated position. Each of the mounting methods shall be suitably stable such as to prevent movement due to high winds or passage of large vehicles.

When a trailer is used, construction shall be such as to transport the flashing arrow panel and appurtenances adequately and legally as well as support them properly during operation. The trailer shall be equipped with devices which shall provide leveling and stability during operation.

Minimum arrow panel mounting height shall be 7 feet (2.1m) above the pavement surface (measured to the bottom of the panel).

Use and operation

The flashing arrow panel shall be located as shown in the maintenance of traffic drawings or as directed by the Engineer and operated continuously during traffic maintained periods. The Contractor shall supply all fuel, lubricants and parts necessary to obtain continuous operation and shall provide all service. The Contractor shall inspect the operation of the unit daily, including weekends and holidays. The Contractor shall arrange with the Engineer, an acceptable method of obtaining service for a malfunctioning panel within 30 minutes of a reported malfunction. Lamp intensity shall be adjusted to provide minimum legibility distances of 1/2 mile (.8 km) type A, 3/4 mile (1.21 km) type B and 1 mile (1.6 km) type C.

Type C panels shall be used for stationary operations on high speed 55 MPH or greater, high volume roadways. Type B shall be used for stationary operations on intermediate speed 40-50 MPH facilities, and type A on low speed 20-35 MPH facilities.

In addition, type B panels shall be used for moving operations on freeways and expressways and type A for moving operations on other facilities.

Battery and solar/battery units shall be fully charged when first set up. They shall have gauges to indicate approximate battery charge remaining. The Contractor shall verify daily that the unit is operating satisfactorily and the remaining battery charge is sufficient for at least 2 more days.

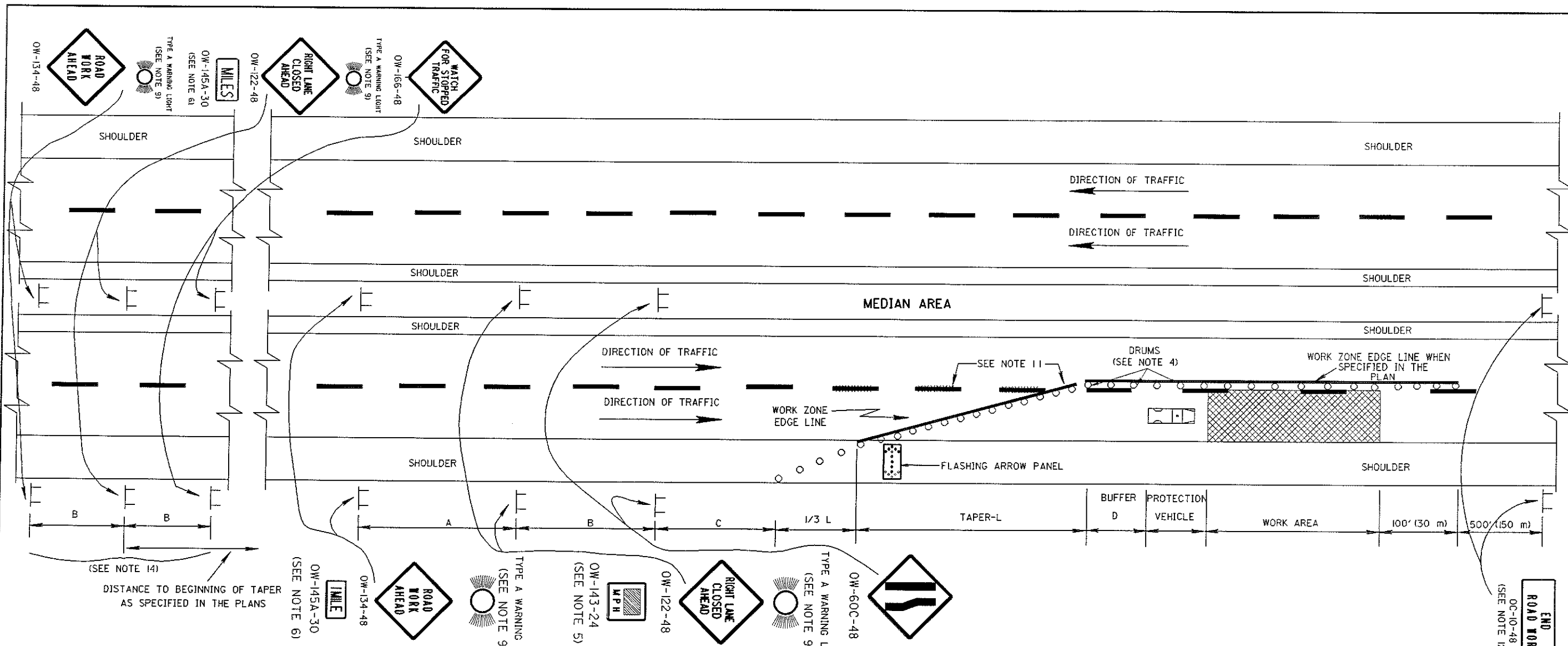
Flashing arrow panels are not to be used on two lane-two way roadways.

When left unattended the control cabinet, motor generator enclosure and fuel tank shall be locked.

Type A and type B panels used in moving operations may be powered by the vehicle's electrical system but shall not be left unattended when so powered.

When not in use, the flashing arrow panel shall be stored at a location which will not be hazardous to traffic or pedestrians.

The panels shall be designed for operation in 100% humidity and temperatures from -20 to + 130 degrees Fahrenheit (-29 to + 54 degrees Celsius).



GENERAL NOTES:

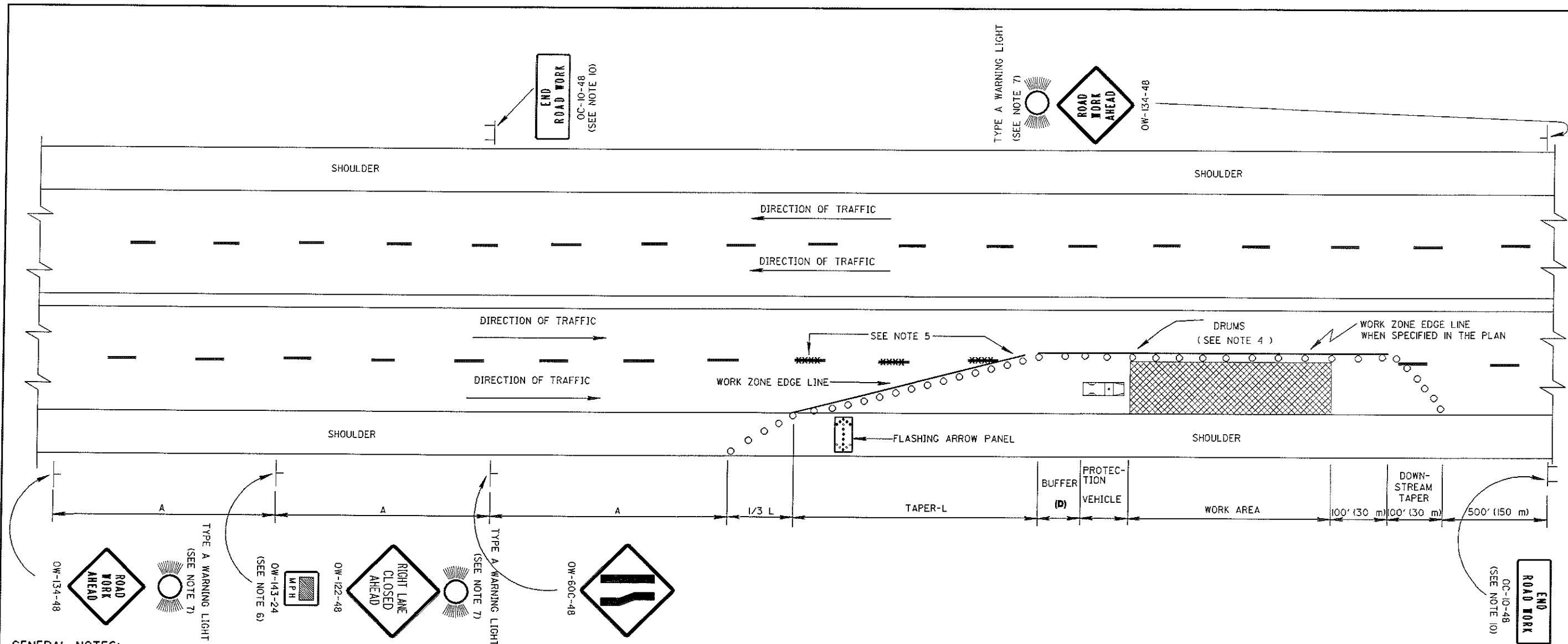
- The location of the merging taper and the advance warning signs should be adjusted to provide for adequate sight distance for the existing vertical and horizontal roadway alignment.
- The spacing between proposed signs should be adjusted to not conflict with and to provide a minimum of 200 ft (60 m) clearance to existing signs.
- 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 ft (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 to close the shoulder.
- Cones having a minimum height of 28 inches (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 advisory speed sign OW-143 shall be used when specified in the plan.
- The distance plate OW-145A shall indicate the distance to the beginning of the merging taper (L). Distances less than one mile may be expressed in feet. The plaque may be omitted if extra advance sign groups are not used.
- The protection vehicle, located close to the work, shall be in place and unoccupied whenever workers are in the work area. This vehicle shall be removed from the pavement whenever workers are not in the work area. The vehicle shall be equipped with a 360 degree rotating or flashing amber beacon clearly visible a minimum of 1/4 mile (400 m). Other protective devices may be used in lieu of the protection vehicle shown when approved by the Engineer.
- The flashing arrow panel shall meet the requirements of Standard Construction Drawing MT-35.10.
- Type A flashing warning lights shown on the OW-134 and OW-122 (123) signs are required whenever a night lane closure is necessary
- When work is being performed in the lane adjacent to the median on a divided highway, OW-123 signs shall be substituted for the OW-122 signs and OW-60D signs shall be substituted for the OW-60C signs.
- 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 line shall be applied along the taper. Work zone edge lines which would conflict with final traffic lanes shall be removable (740.06 type I) tape unless the area will be resurfaced in the next work phase. After completion of the work, pavement markings other than 740.06 type I shall be removed in accordance with 641.10. The original markings and raised pavement marker reflectors shall be restored at no additional cost.
- The DC-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.
- OW-134 signs shall be provided on entrance ramps and/or side roads located within the work limits or the advance warning sign group. Within the length of closure, provision shall be made to control traffic entering from intersecting streets and driveways. Three drums shall be placed on each side across the closed lane at each intersection and driveway.
- Extra advance warning sign groups consisting of OW-134, OW-122 and OW-166 signs plus distance plates may be specified in the plans or required to be erected at the direction of the Engineer.
- All material and equipment shall be removed from the closure and the work area when no work is being done.
- The speed limit chosen for design of tapers shall be the normal legal speed except where the legal speed limit is reduced due to the construction and the subject lane closure is not the first active construction area encountered by traffic within the project.
- This drawing should be used on projects with dropoffs less than 5' in the work area. Projects with dropoffs greater than 5' in the work area should refer to MT-95.40 or MT-95.41.

TABLE I

MINIMUM DISTANCE FT (METERS)	A	B	C
MAJOR STANDARD	500 (150)	500 (150)	500 (150)
FREEWAY & EXPRESSWAY	2600 (780)	1600 (480)	1000 (300)

TABLE II

NORMAL SPEED LIMIT (MPH)	MINIMUM TAPER (L) FT (m)	MAXIMUM SPACING (S) OF DRUMS FT (m)	BUFFER (D) FT (m)
30-40	320 (98)	30 (9)	170 (52)
45-55	660 (201)	40 (12)	335 (102)
60-65	780 (238)	60 (18)	485 (148)



GENERAL NOTES:

- The location of the merging taper and the Advance Warning signs should be adjusted to provide for adequate sight distance for the existing vertical and horizontal roadway alignment.
- 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.
- This taper length (L) and spacing (S) of drums shall conform to table I. Drum spacing (s) shall be used for the merging taper, the buffer area and for the first 1000 ft (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 I. A minimum of 5 drums shall be used to close the shoulder and the downstream taper.
- Cones having a minimum height of 28 inches (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.
- 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 line 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 other than 740.06 type 1 shall be removed in accordance with 641.10. The original markings and raised pavement marker reflectors shall be restored at no additional cost.
- The advisory speed sign OW-143 shall be used when specified in the plan.
- Type A flashing warning lights shown on the OW-134 and OW-122 signs are required whenever a night lane closure is necessary.
- The flashing arrow panel shall meet the requirements of Standard Construction Drawing MT-35.10.
- The protection vehicle, located close to the work, shall be in place and unoccupied whenever workers are in the work area. This vehicle shall be removed from the pavement whenever workers are not in the work area. The vehicle shall be equipped with a 360 degree rotating or flashing amber beacon clearly visible a minimum of 1/4 mile (400 m). Other protective devices may be used in lieu of the protection vehicle shown when approved by the Engineer.
- 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.

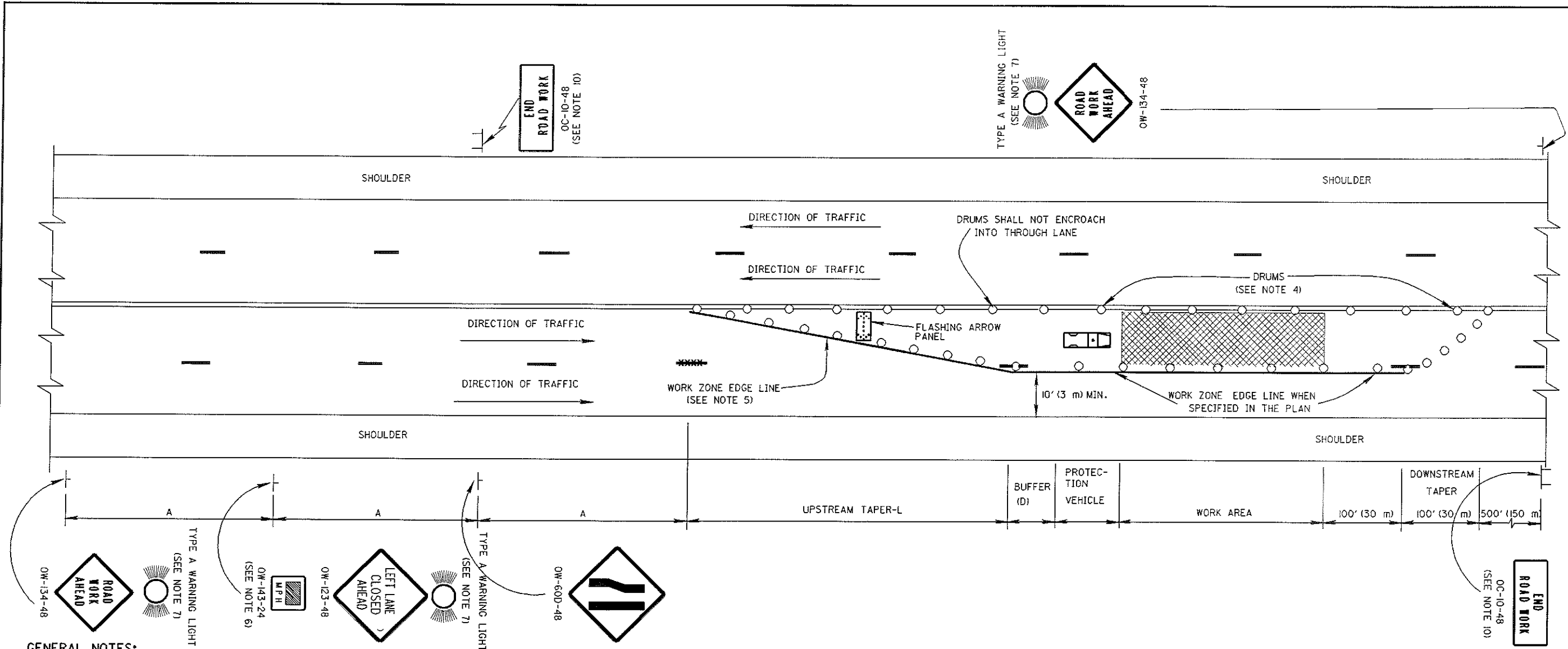
- OW-134 signs shall be provided on entrance ramps and/or side roads located within the work limits or the Advance Warning sign group. Within the length of closure, provision shall be made to control traffic entering from intersecting streets and driveways. Three drums shall be placed on each side across the closed lane at each intersection and driveway.
- All material and equipment shall be removed from the closure and the work area when no work is being done.
- The speed limit chosen for design tapers shall be the normal legal speed except where the legal speed limit is reduced due to the construction and the subject lane closure is not the first active construction area encountered by traffic within the project.
- 36 inch (900 mm) warning signs sizes may be used when the legal speed limit is 40 MPH or less.
- This drawing should be used on projects with dropoffs less than 5' in the work area. Projects with dropoffs greater than 5' in the work area should refer to MT-95.40 or MT-95.41.

TABLE I

SPEED LIMIT (MPH)	MINIMUM TAPER (L) FT (m)	MAXIMUM SPACING (S) OF DRUMS FT (m)	BUFFER (D) FT (m)
20-25	125 (38)	20 (6)	55 (17)
30-40	320 (98)	30 (9)	170 (52)
45-55	660 (201)	40 (12)	335 (102)

TABLE II

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



GENERAL NOTES:

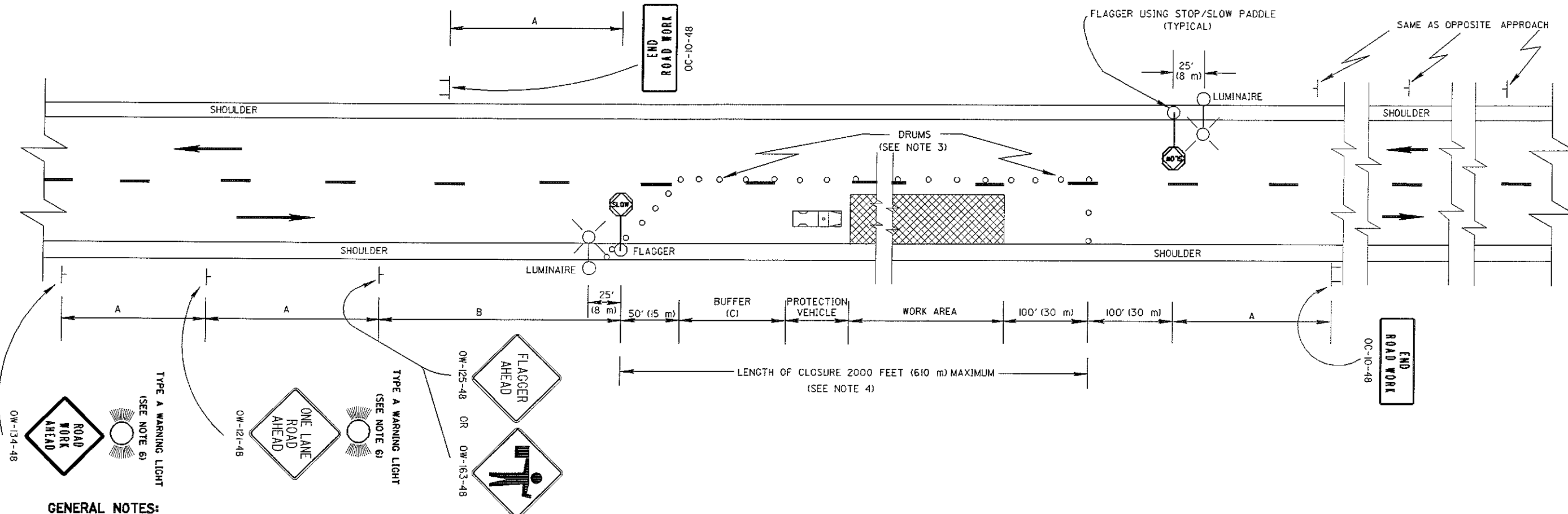
- The location of the merging taper and the Advance Warning signs should be adjusted to provide for adequate sight distance for the existing vertical and horizontal roadway alignment.
- The spacing between proposed signs should be adjusted not to conflict with and to provide a minimum of 200 ft (60 m) clearance to existing signs.
- The taper length (L) and spacing (S) of drums for the merging taper shall conform to table I. Drums placed along the centerline shall be spaced at (s). Drum spacing (s) shall also be used for the buffer area and for the first 1000 ft (300 m) of the work area and at other locations as directed by the Engineer. The maximum drum spacing for the balance of the work area except along the centerline is to be two times the spacing (s) in table I. A minimum of 5 drums shall be used in the downstream taper.
- Cones having a minimum height of 28 inches (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.
- 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 I) tape unless the area will be resurfaced in the next work phase. After completion of the work, pavement markings other than 740.06 type I shall be removed in accordance with 641.10. The original markings and raised pavement marker reflectors shall be restored at no additional cost.
- The advisory speed sign OW-143 shall be used when specified in the plan.
- Type A flashing warning lights shown on the OW-134 and OW-123 signs are required whenever a night lane closure is necessary.
- The flashing arrow panel shall meet the requirements of Standard Construction Drawing MT-35.10.
- The protection vehicle, located close to the work, shall be in place and unoccupied whenever workers are in the work area. This vehicle shall be removed from the pavement whenever workers are not in the work area.
- The vehicle shall be equipped with a 360 degree rotating cont. or flashing amber beacon clearly visible a minimum of 1/4 mile (400 m). Other protective devices may be used in lieu of the protection vehicle shown when approved by the Engineer.
- 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.
- OW-134 signs shall be provided on entrance ramps and/or side roads located within the work limits or the Advance Warning sign group. Within the length of closure, provision shall be made to control traffic entering from intersecting streets and driveways. Three drums shall be placed on each side across the closed lane at each intersection and driveway.
- All material and equipment shall be removed from the closure and the work area when no work is being done.
- The speed chosen for design of tapers shall be the normal legal speed except where the legal speed limit is reduced due to the construction and the subject lane closure is not the first active construction area encountered by traffic within the project.
- 36 inch (900 mm) warning sign sizes may be used when the legal speed limit is 40 mph or less.
- This drawing should be used on projects with dropoffs less than 5' in the work area. Projects with dropoffs greater than 5' in the work area should refer to MT-95.40 or MT-95.41.

TABLE I

SPEED LIMIT (MPH)	MINIMUM TAPER (L) FT (m)	MAXIMUM SPACING (S) OF DRUMS FT (m)	BUFFER (D) FT (m)
20-25	125 (38)	20 (6)	55 (17)
30-40	320 (98)	30 (9)	170 (52)
45-55	660 (201)	40 (12)	335 (102)

TABLE II

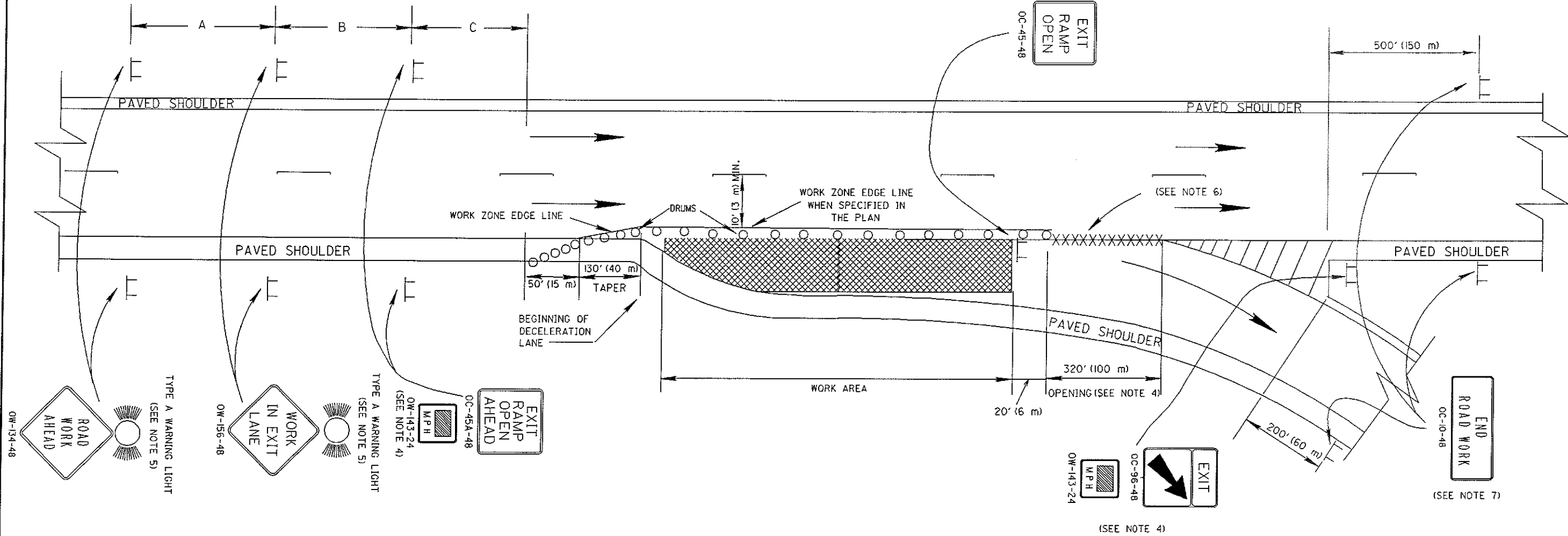
MINIMUM DISTANCE FT (m)	A
URBAN (≤ 40 MPH)	200 (60)
URBAN (≥ 45 MPH)	350 (105)
MAJOR STANDARD	500 (150)



GENERAL NOTES:

1. The location of the Advance Warning signs should be adjusted to provide for adequate sight distance for the existing vertical and horizontal roadway alignment. The distances shown are minimums.
2. Flaggers, one for each direction shall be used to control traffic continuously for as long as a one lane operation is in effect. The flaggers shall be able to communicate with each other at all times.
3. Drums shall be spaced at 50' (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.
4. 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.
5. 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).
6. 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.
7. 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.
8. 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.
9. 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:

1. The location of the Advance Warning signs should be adjusted to provide for adequate sight distance for the existing vertical and horizontal roadway alignment.
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, except the OW-96-48 sign which may be adjacent to the GF sign in the gore.
3. Along the closure drums shall be spaced at 20' (6 m) center to center. A minimum of 5 drums shall be used to close the shoulder. 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.
4. The opening to the ramp shall be 320' (100 m) or more, whenever possible. A lesser opening may be provided if no other alternative is available. When a lesser opening is provided, Advisory Speed plaques (OW-143) shall be added to the OW-96 and OC-45A signs as follows:

Opening	Advisory speed
290' (90 m)	50 mph
260' (80 m)	45 mph
230' (70 m)	40 mph
200' (60 m)	35 mph

If a 200' (60 m) opening cannot be provided, the ramp should be closed.

4. The Advisory Speed displayed shall not be greater than would otherwise be required to accommodate the permanent ramp geometry near the exit. Advisory speeds within 10 MPH of the legal speed limit need not be displayed. If no speed reduction is required then the existing sign should be used. If a reduction is required then the existing sign should be covered and the sign configuration shown should be used.

5. Type A flashing warning lights shown on the OW-134 and OW-156 signs are required whenever a night lane closure is necessary.

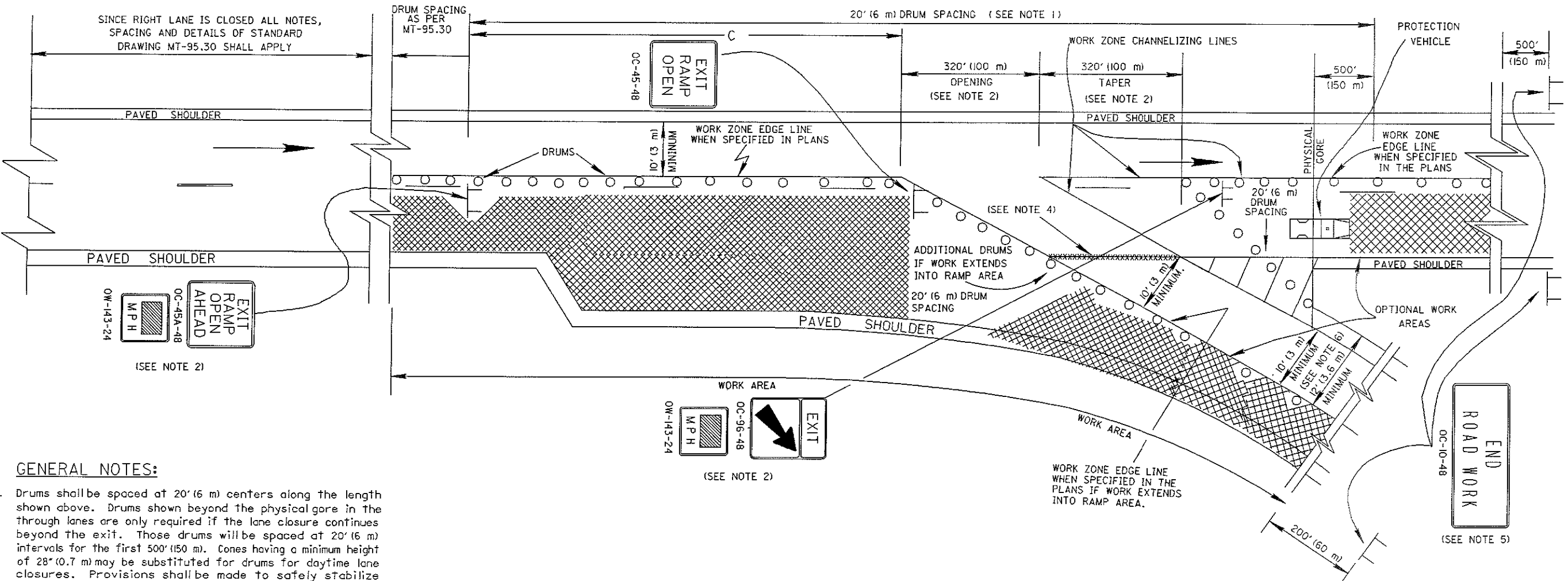
6. If the construction operation requires the lane closure for more than one day then the existing conflicting pavement markings and reflectors from the raised pavement markers (RPMs) shall be removed and the appropriate color work zone edge lines shall be applied along the taper. Work zone edge lines which would conflict with final traffic lanes shall be removable (740.05 Type I) tape unless the area will be resurfaced in the next work phase. After completion of the work, pavement markings other than 740.05 Type I shall be removed in accordance with 641.10. The original markings and raised pavement marker reflectors shall be restored at no additional cost.

7. 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.

8. All material and equipment shall be removed from the closure and the work area when no work is being done.

TABLE I
MINIMUM DISTANCE - FT (m)

	A	B	C
FREEWAY & EXPRESSWAY	2600 (780)	1600 (480)	1000 (300)



GENERAL NOTES:

- Drums shall be spaced at 20' (6 m) centers along the length shown above. Drums shown beyond the physical gore in the through lanes are only required if the lane closure continues beyond the exit. Those drums will be spaced at 20' (6 m) intervals for the first 500' (150 m). 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 opening to the ramp and the taper across the closed lane should each be 320' (100 m) or more whenever possible. A lesser opening and/or taper may be provided if no other alternative is available. The opening shall never be less than the taper, but may be more. When lesser opening and/or taper lengths are provided, advisory speed plaques (OW-143) shall be added to the OC-96 and OC-45A signs as follows:

Opening/taper	Advisory speed
290' (90 m)	50 mph
260' (80 m)	45 mph
230' (70 m)	40 mph
200' (60 m)	35 mph

If 200' (60 m) minimum dimensions cannot be provided, the ramp should be closed.

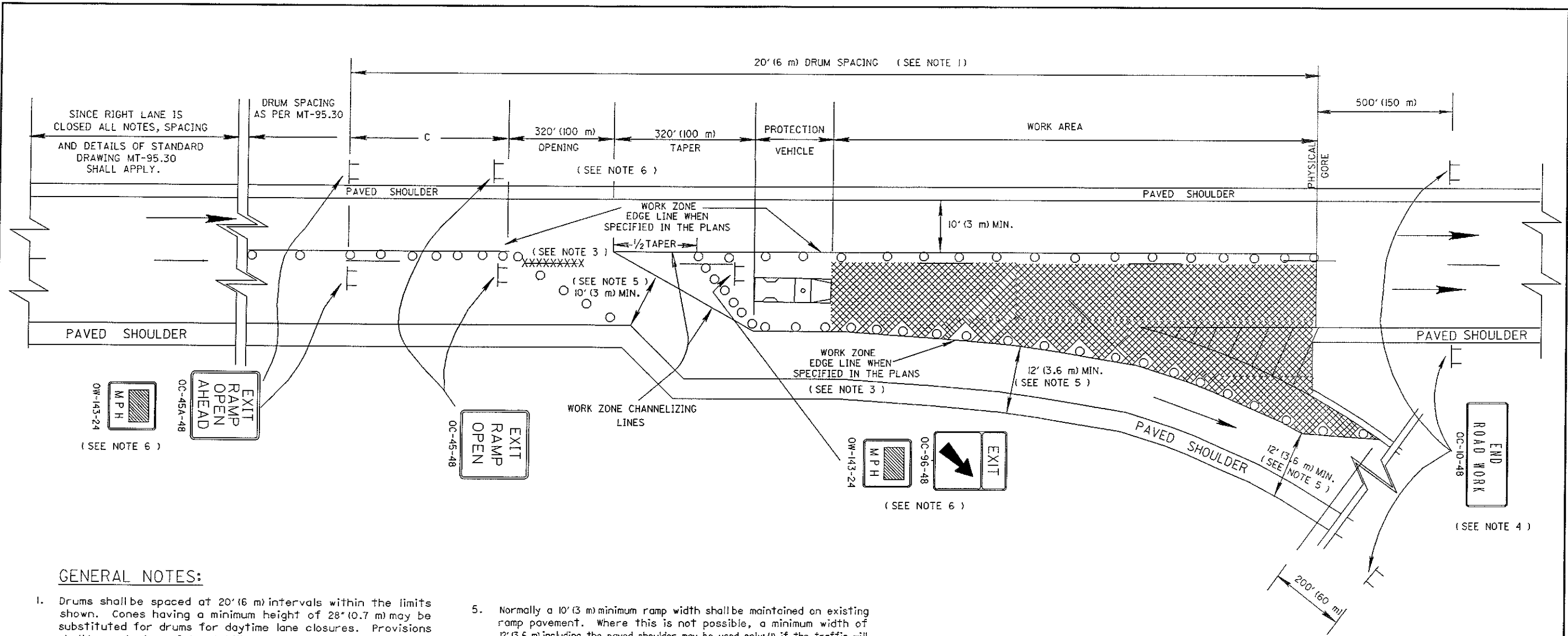
The advisory speed displayed shall not be greater than would otherwise be required to accommodate the permanent ramp geometry near the exit.

Advisory speeds within 10 mph of the legal speed limit need not be displayed.
- The protection vehicle located close to the work shall be in place and unoccupied whenever workers are in the work area. This vehicle shall be removed from the pavement whenever workers are not in the work area. The vehicle shall be equipped with a 360 degree rotating or flashing amber beacon clearly visible a minimum of one quarter mile (400 m). Other protective devices may be used in lieu of the protection vehicle shown when approved by the Engineer.

- If the construction operation requires the lane closure for more than one day then the existing conflicting pavement markings and reflectors from the raised pavement markers (RPMs) shall be removed and a) work zone channelizing lines shall be applied and b) the appropriate color work zone edge lines shall be applied when specified in the plans. Work zone channelizing lines and edge lines which would conflict with final traffic lanes shall be removable (740.06 Type I) tape unless the area will be resurfaced in the next work phase. After completion of the work, pavement markings other than 740.06 Type I shall be removed in accordance with 641.10. The original markings and raised pavement marker reflectors shall be restored at no additional cost.
- 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.
- Normally a 10' (3 m) minimum ramp width shall be maintained on existing ramp pavement. Where this is not possible, a minimum width of 12' (3.6 m) including the paved shoulder may be used only: (1) if the traffic will be on the shoulder less than one day and the shoulder is in good condition, or (2) if the shoulder pavement is strengthened to hold the anticipated load.
- All material and equipment shall be removed from the closure and the work area when no work is being done.

TABLE 1

MINIMUM DISTANCE - FT (m)	
	C
FREWAY & EXPRESSWAY	1000 (300)



GENERAL NOTES:

1. Drums shall be spaced at 20' (6 m) intervals within the limits shown. 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.
2. The protection vehicle located close to the work shall be in place and unoccupied whenever workers are in the work area. This vehicle shall be removed from the pavement whenever workers are not in the work area. The vehicle shall be equipped with a 360 degree rotating or flashing amber beacon clearly visible a minimum of one quarter mile (400 m). Other protective devices may be used in lieu of the protection vehicle shown when approved by the Engineer.
3. If the construction operation requires the lane closure for more than one day then the existing conflicting pavement markings and reflectors from the raised pavement markers (RPMs) shall be removed and a) work zone channelizing lines shall be applied and b) the appropriate color work zone edge lines shall be applied when specified in the plans. Work zone channelizing lines and edge lines which would conflict with final traffic lanes shall be removable (740.06 Type I) tape unless the area will be resurfaced in the next work phase. After completion of the work, pavement markings other than 740.06 Type I shall be removed in accordance with 641.10. The original markings and raised pavement marker reflectors shall be restored at no additional cost.
4. 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.

5. Normally a 10' (3 m) minimum ramp width shall be maintained on existing ramp pavement. Where this is not possible, a minimum width of 12' (3.6 m) including the paved shoulder may be used only: (1) if the traffic will be on the shoulder less than one day and the shoulder is in good condition, or (2) if the shoulder pavement is strengthened to hold the anticipated load.
6. The opening to the ramp and the taper in advance of the closed lane should each be 320' (100 m) or more whenever possible. A lesser opening and/or taper length may be provided if no other alternative is available. The opening shall never be less than the taper, but may be more. When lesser opening and/or taper lengths are provided, advisory speed plaques (OW-143) shall be added to the OC-96 and OC-45A signs as follows:

Opening/taper	Advisory speed
290' (90 m)	50 mph
260' (80 m)	45 mph
230' (70 m)	40 mph
200' (60 m)	35 mph

If 200' (60 m) minimum dimension cannot be provided, the ramp should be closed.

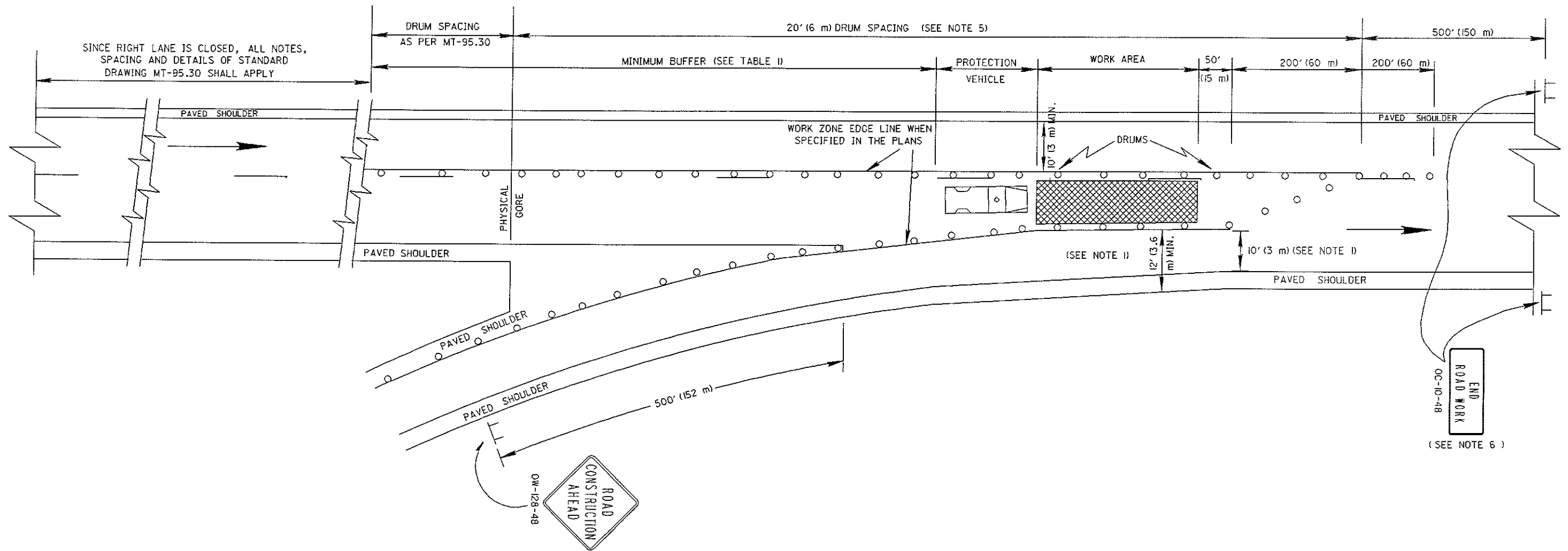
The advisory speed displayed shall not be greater than would otherwise be required to accommodate the permanent ramp geometry near the exit.

Advisory speeds within 10 mph of the legal speed limit need not be displayed.

7. All material and equipment shall be removed from the closure and the work area when no work is being done.

TABLE I

MINIMUM DISTANCE - FT (m)	
	C
FREEWAY & EXPRESSWAY	1000 (300)

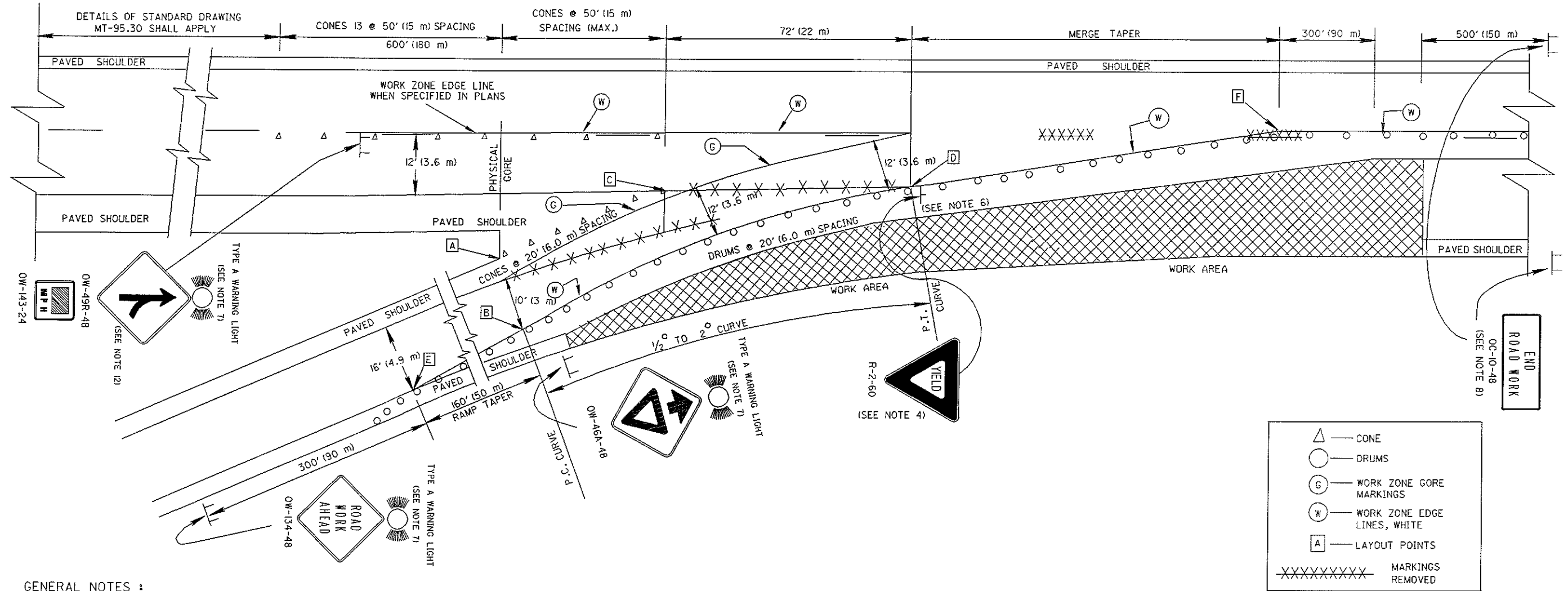


GENERAL NOTES:

1. This work area traffic control application shall be employed only when the lateral clearance between the channelizing devices at the right edge of the work area and the edge of the ramp pavement is 10' (3 m) or more. Normally a 10' (3 m) minimum ramp width shall be maintained on existing ramp pavement. Where this is not possible, a minimum width of 12' (3.6 m) including the paved shoulder may be used only: (1) if the traffic will be on the shoulder less than one day and the shoulder is in good condition, or (2) if the shoulder pavement is strengthened to hold the anticipated load. When the ramp is closed appropriate detour signs shall be provided.
2. When the ramp is not long enough to allow sign placement as specified above, they may be spaced proportionately within the space available as determined by the Engineer (a 200' (60 m) minimum spacing must be maintained).
3. The protection vehicle located close to the work area shall be in place and unoccupied whenever workers are in the work area. This vehicle shall be removed from the pavement whenever workers are not in the work area. The vehicle shall be equipped with a 360 degree rotating or flashing amber beacon visible a minimum of one quarter mile (400 m). Other protective devices may be used in lieu of the protection vehicle shown when approved by the Engineer.
4. If the construction operation requires the lane closure for more than one day then the existing conflicting pavement markings and reflectors from the raised pavement markers (RPMs) shall be removed and the appropriate color work zone edge lines shall be applied when specified in the plans. Work zone edge lines which would conflict with final traffic lanes shall be removable (740.05 Type D) tape unless the area will be resurfaced in the next work phase. After completion of the work, pavement markings other than 740.05 shall be removed in accordance with 641.10. The original markings and raised pavement marker reflectors shall be restored at no additional cost.
5. Drums shall be spaced at 20' (6 m) intervals on both sides of the work area within the limits shown. 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.
6. 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.
7. All material and equipment shall be removed from the closure and the work area when no work is being done.

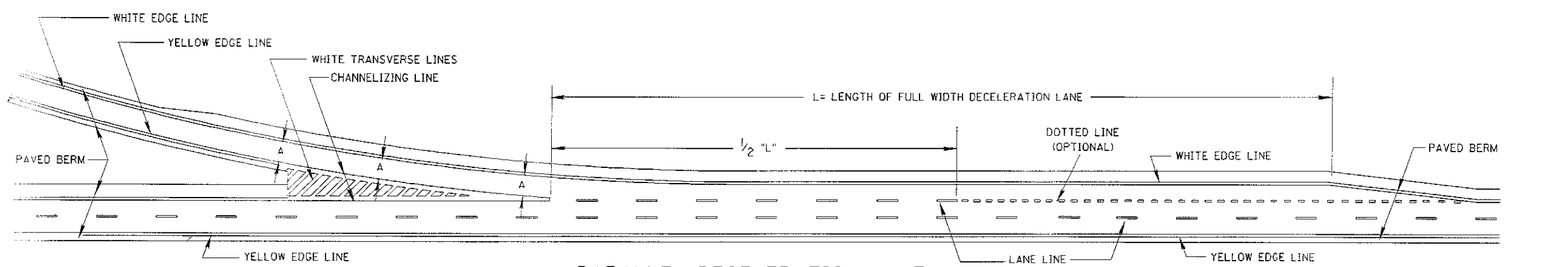
TABLE I

SPEED LIMIT (MPH)	BUFFER AREA FT (METERS)
45 - 50	280 (85)
60 - 65	485 (145)

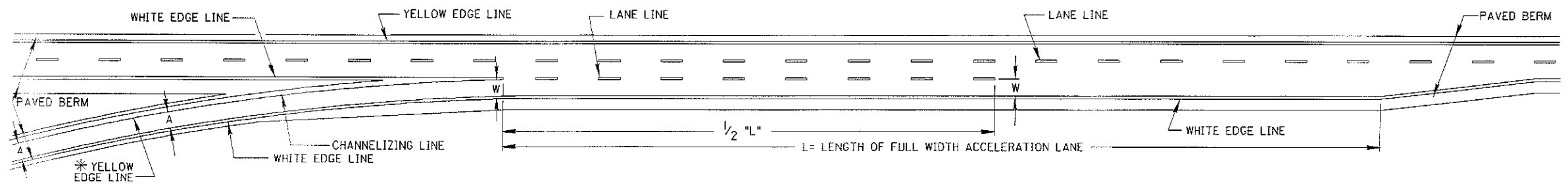


GENERAL NOTES :

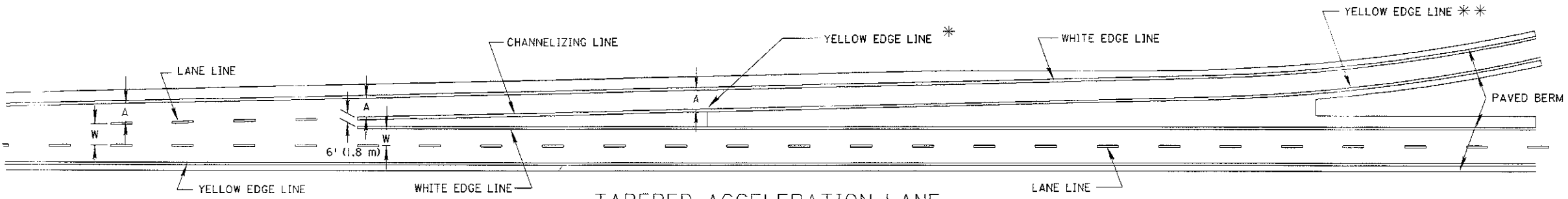
- This work area traffic control application shall be employed when: (1) the lateral clearance between channelizing devices at the right edge of the work area and the edge of pavement is less than 10' (3 m) (12' (3.6 m) if the shoulder pavement is used) as shown on drawing MT-98.15, and (2) the required ramp tapers and curves can be provided as shown except as described in note 4. In the event the work zone condition would permit the use of either MT-98.15 or MT-98.16, MT-98.15 shall be used. This traffic control measure shall not be placed in effect until immediately before the Contractor is fully prepared to perform the work on the ramp or lane adjacent to it. Once this measure is placed into effect, the Contractor shall expeditiously pursue the work (working continuously with full crew in the ramp area on all normal working days) until it is completed and shall immediately open the area to normal traffic or, as a minimum, revert to the methods shown on MT-98.15. It is the intent that the longest merging taper length possible shall be chosen, commensurate with the requirements of construction.
- The ramp taper shall desirably be located to provide a 10' (3 m) minimum path between drums and the paved shoulder in the gore. The ramp traffic may be placed on the paved gore as shown above only if: (1) the traffic will use the paved shoulder pavement less than one day and the shoulder pavement is in good condition and is level and smooth or (2) if the shoulder pavement is adequately strengthened, leveled and smoothed to carry the anticipated load. A minimum of 3 drums shall be used to close the ramp shoulder.
- When the ramp is not long enough to allow sign placement as specified above, they may be spaced proportionately within the space available as determined by the Engineer. A 200' (60 m) minimum spacing must be maintained.
- It will be necessary to move the location of any existing yield sign. In these cases, the permanent R-2 sign installation shall be removed (and subsequently restored) and the temporary installation shall be mounted appropriately. If the required distances (ramp taper, curve and merge taper) cannot be obtained, the Engineer may approve slightly lower values for a short time, in which case the yield sign shall be removed and a 48" (1200 mm) stop sign placed appropriately to be visible to ramp traffic but not be obtrusive to mainline traffic.
- If the construction operation requires the lane closure for more than one day then the existing conflicting pavement markings and reflectors from the raised pavement markers (RPMs) shall be removed at no additional cost. The appropriate color temporary edge lines shall be applied along the taper. Work zone pavement markings which would conflict with final traffic lanes shall be removable (740.05 Type D) tape unless the area will be resurfaced in the next work phase. After completion of the work, work zone 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.
- Drum spacing adjacent to the mainline and on the ramp shall be not more than 20' (6 m) C - C in the area from the physical gore to 300' (90 m) beyond the merge taper. Cones having a minimum height of 28" (0.7 m) may be substituted for drums for daytime lane closures. Cones shall be reflectorized and safely stabilized.
- Type A flashing warning lights are required on the OW-134, OW-49R and the OW-46 signs 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.
- From the end of the gore area graded shoulder (point A), locate the PC of the curve by measuring perpendicular to the ramp centerline 10' (3 m) of ramp pavement, not including paved shoulder width (point B). From the end of the gore area paved shoulder (point C), locate the PT of the curve by measuring 72' (22 m) from point C along the edge of pavement extended (point D).
- Placement of drums shall begin at (point E) 160' (50 m) upstream from the previously located PC (point B) and at the right edge of ramp pavement. From this point a drum taper shall be placed to the PC (point B) and then along a curve as shown to the PT (point D) where a 48" (min.) merge taper shall meet mainline traffic control (point F).
- All material and equipment shall be removed from the closure and the work area when no work is being done.
- It is intended that the merge sign OW-49R-48 be located to the right of the through lane as shown. However if the sign cannot be located as shown due to the activity at the location, the sign may be located to the left of the through lane as an alternate location.



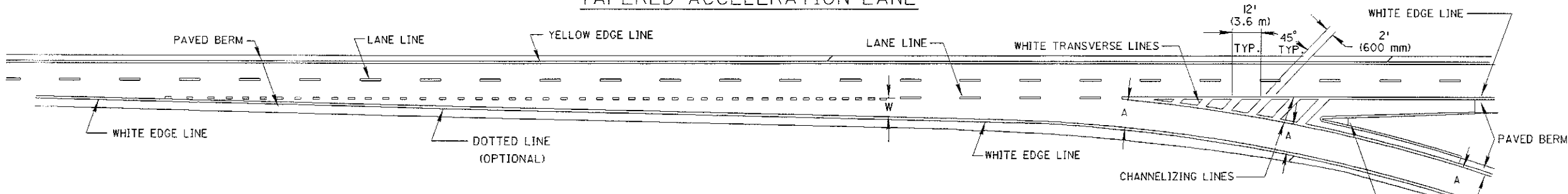
PARALLEL DECELERATION LANE



PARALLEL ACCELERATION LANE

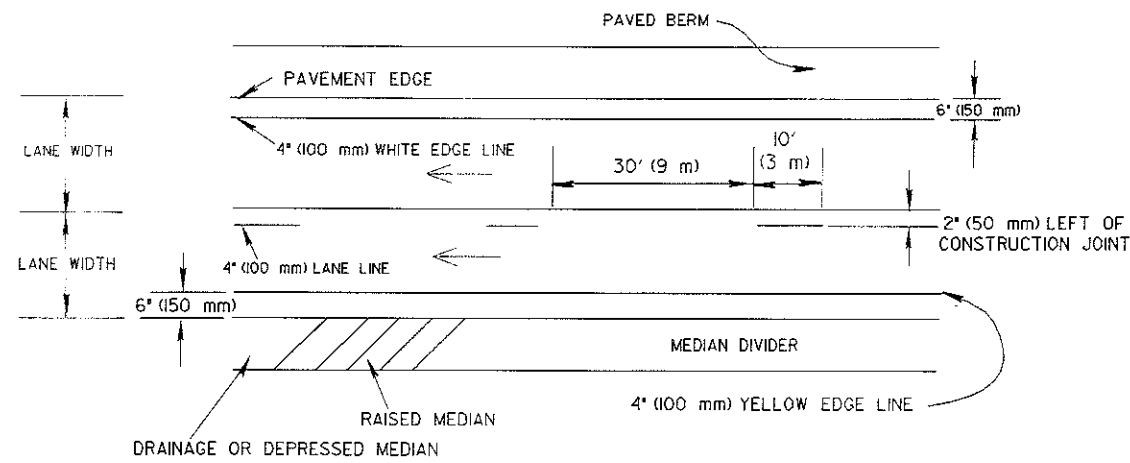


TAPERED ACCELERATION LANE



TAPERED DECELERATION LANE

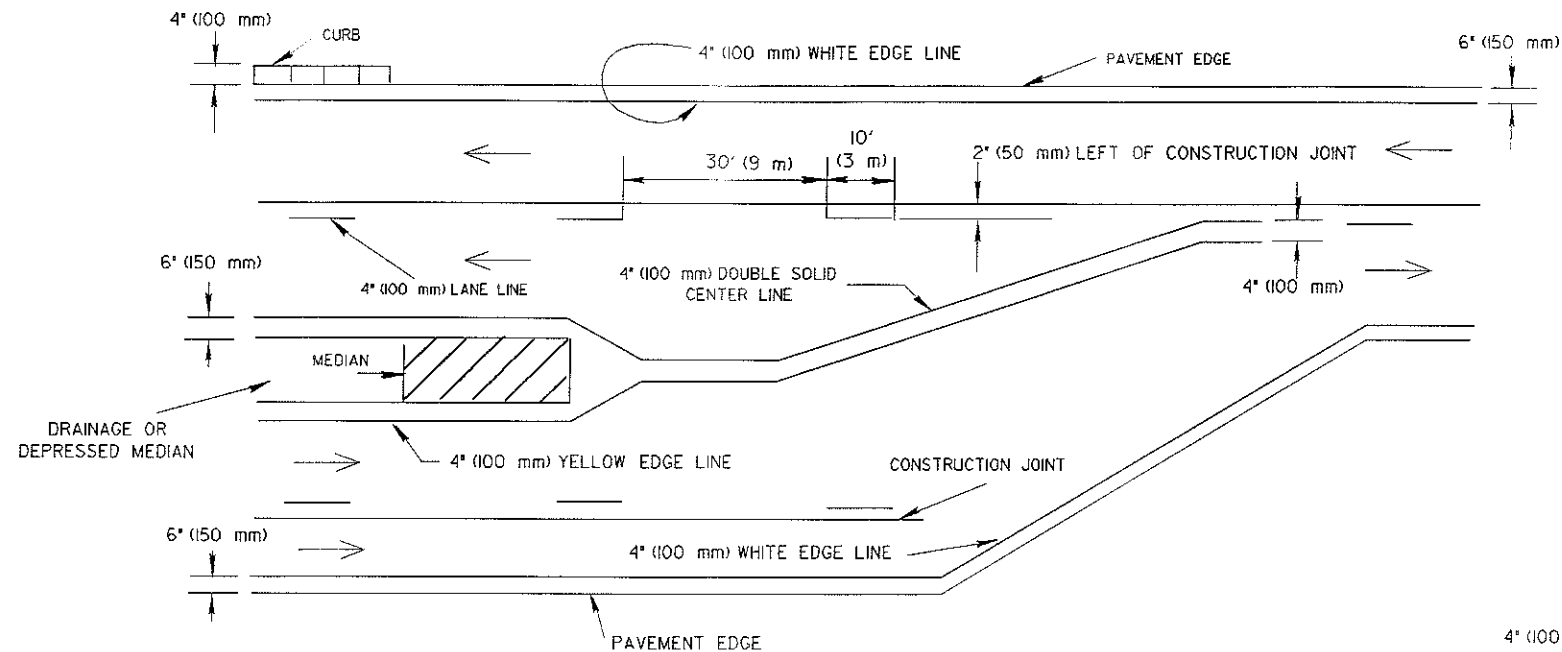
- * THE RAMP YELLOW EDGE LINE SHALL EXTEND TO WHERE THE PAVED BERM ENDS.
- ** ANY EXISTING CURB SHALL BE PAINTED WHITE.
- A = UNIFORM RAMP WIDTH
- W = LANE WIDTH



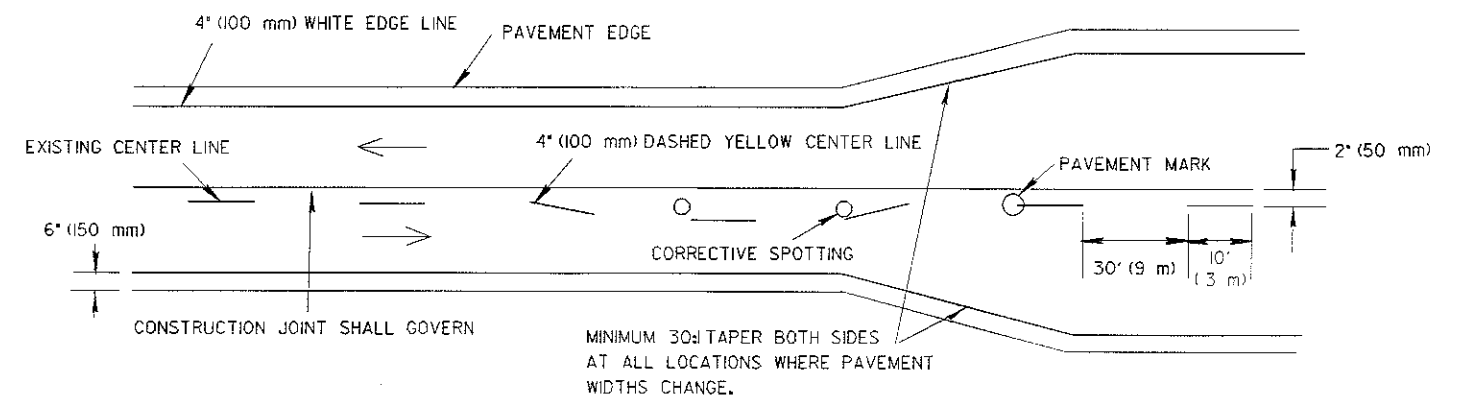
FREEWAY & EXPRESSWAY MAINLINE MARKINGS

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