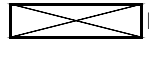
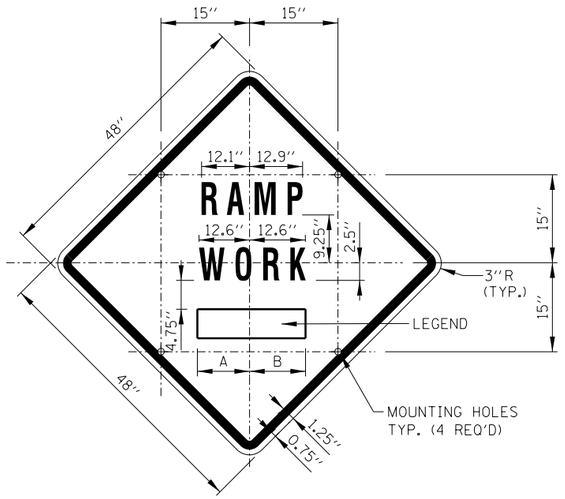
Tollway Standard Drawing Revisions

Section E	MOT	
	Standard	**Modification Summary** **Effective: 03/11/15**
	All	Revised detail descriptions to match Tollway Coded Pay Items
		Updated drawings to follow IDOT highway standard levels
	E1	**Construction Signs**
		Added mounting hole notes to Sign TS-2 and W1-4dR
	E2	**Lane Closure Details**
		Changed "End Work Zone" sign number to G20-I103(O)-6036 per IDOT
		Advance Signing Note 3. Added "Public" to information sign description
		Added additional advance work zone speed limit sign assembly with Note 17
	E3	**Shoulder Closure Details**
		Note 17. Added "Public" to information sign description
	E4	**Maintenance of Traffic Reverse Curve**
	Sheet 2	Added radius dimensions to table titles
	E5	**Temporary Gore Details**
	Sheet 1	Reconfigured temporary entrance gore to tangent section.
	E7	**Pull-Out Area**
	Sheet 1	Added limits of emergency pull-out dimension to both areas shown
		Notes have been combined on sheet 1
		Note 2. Changed "Construction Manager" to "Engineer"

New Sheet



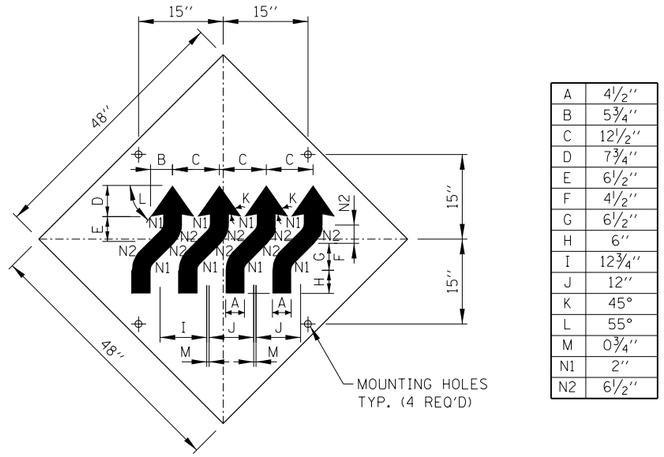
Retired Standard



SIGN NO.	LEGEND	A	B
TS-2A	AHEAD	15.50''	15.50''
TS-2B	500 FT	14.25''	15.13''
TS-2C	1000 FT	14.88'' ∠2	15.75'' ∠2
TS-2D	1500 FT	14.88'' ∠2	15.75'' ∠2
TS-2E	1/2 MILE	15.75'' ∠3	15.75'' ∠3
TS-2F	1 MILE	13.06''	13.06''

SIGN TS-2 (O)

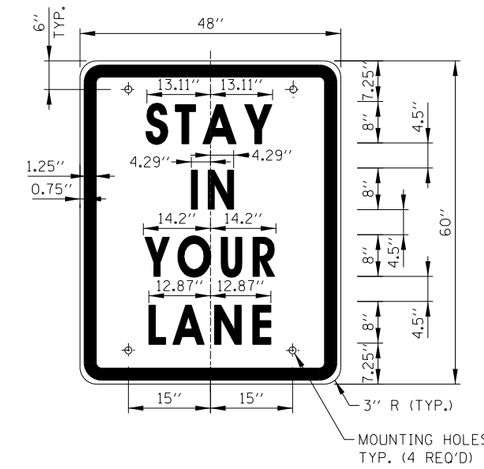
COLOR: BACKGROUND - FLUORESCENT ORANGE (O)
BORDER AND SYMBOL - BLACK
SIZE: 48''x48''
LETTERING: 7'' FEDERAL SERIES D
MOUNTING HOLES: 7/16'' DIA., 4 HOLES SPACED AS SHOWN



A	4 1/2''
B	5 3/4''
C	12 1/2''
D	7 3/4''
E	6 1/2''
F	4 1/2''
G	6 1/2''
H	6''
I	12 3/4''
J	12''
K	45°
L	55°
M	0 3/4''
N1	2''
N2	6 1/2''

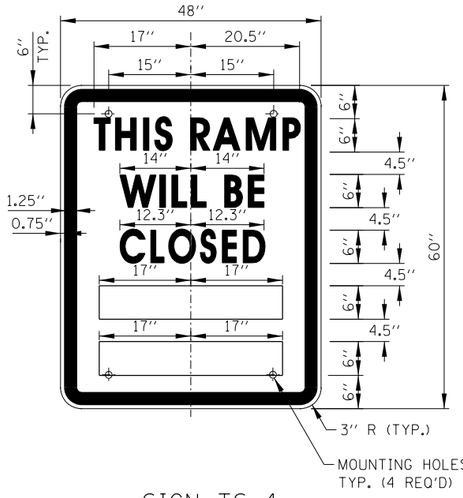
SIGN W1-4dR (O)

COLOR: BACKGROUND-FLUORESCENT ORANGE (O)
TYPE A REFLECTIVE
SHEETING PER STANDARD
SPECIFICATIONS (* A)
BORDER AND LETTERS-BLACK
SIZE: 48''x48''
MOUNTING HOLES: 7/16'' DIA., 4 HOLES SPACED AS SHOWN.



SIGN TS-3

COLOR: BACKGROUND - WHITE (REFLECTORIZED) (*A)
BORDER AND LETTERS - BLACK
SIZE: 48''x60''
LETTERING: LEGEND - 8'' FEDERAL SERIES D
MOUNTING HOLES: 7/16'' DIA., 4 HOLES, SPACED AS SHOWN

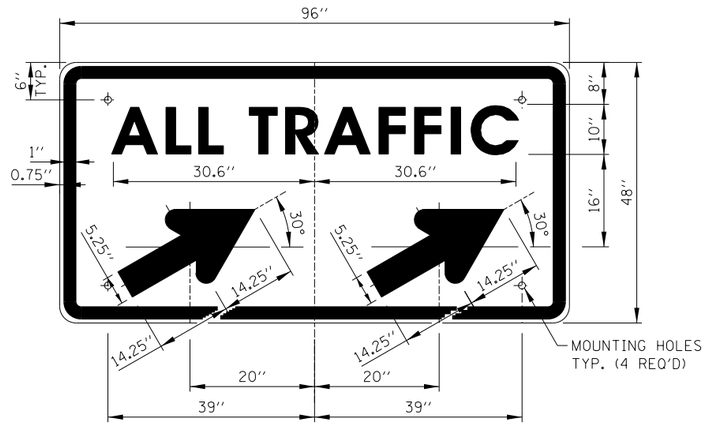


SIGN TS-4

COLOR: BACKGROUND - WHITE (REFLECTORIZED)(*A)
BORDER AND LETTERS - BLACK
SIZE: 48''x60''
LETTERING: LEGEND - 6'' FEDERAL SERIES C
MOUNTING HOLES: 7/16'' DIA., 4 HOLES, SPACED AS SHOWN

RAMP CLOSURE ADVANCE INFORMATION SIGN

THE VARIABLE MESSAGE WITH DATES FOR THE BOTTOM TWO LINES SHALL BE DETERMINED BY THE ENGINEER AND GIVEN TO THE CONTRACTOR BEFORE THE REQUIRED FIELD ERECTION DATE.



SIGN TS-5a & TS-5b

COLOR: BACKGROUND - WHITE (REFLECTORIZED)(*A)
BORDER AND LETTERS - BLACK
ARROW - BLACK
SIZE: 96''x48''
LETTERING: 10'' FEDERAL SERIES D
MOUNTING HOLES: 7/16'' DIA., 4 HOLES, SPACED AS SHOWN
NOTE: SIGN TS-5a IS SHOWN, SUBSTITUTE
LEGEND "↗" FOR "↗↗" FOR SIGN TS-5b

NOTES:

1. ALL LETTERING IS DESIGNATED BY SIZE AND SERIES IN ACCORDANCE WITH THE LATEST EDITION OF "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS" AS PUBLISHED BY THE U.S. DEPARTMENT OF TRANSPORTATION. LETTERING SPACING SHALL BE IN ACCORDANCE WITH THIS GUIDE EXCEPT WHERE NOTED.

2. SYMBOLS AND ARROWS SHALL CONFORM TO THE DETAILS SHOWN IN THE LATEST EDITION OF "STANDARD HIGHWAY SIGNS" AS PUBLISHED BY THE U.S. DEPARTMENT OF TRANSPORTATION.

3. SEE THE CONTRACT REQUIREMENTS FOR ADDITIONAL NOTES AND SPECIFICATIONS.
   (O) FLUORESCENT ORANGE REFLECTIVE SHEETING PER THE STANDARD SPECIFICATIONS.
   (*A) - REFLECTIVE SHEETING PER THE STANDARD SPECIFICATIONS.

4. DIMENSIONS INDICATED THUS ∠ ARE BASED ON A REDUCTION IN STANDARD LETTERING SPACING AS SHOWN BELOW:
   ∠1 SPACING REDUCED BY 25%
   ∠2 SPACING REDUCED BY 40%
   ∠3 SPACING REDUCED BY 50%

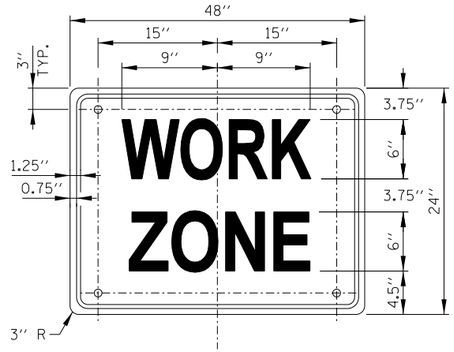
Paul Kovacs
APPROVED ..... DATE 5-1-2009
CHIEF ENGINEER

Illinois Tollway

DATE	REVISIONS
05-01-09	DELETED FLASHING ARROW BOARDS
01-01-11	ADDED SIGN COLOR DESIGNATION
11-01-12	DELETED SIGN TS-1
03-31-14	REVISED FINE SIGN NUMBER AND
	ADDED LED SPEED LIMIT DISPLAY
3-11-2015	REVISED NOTES

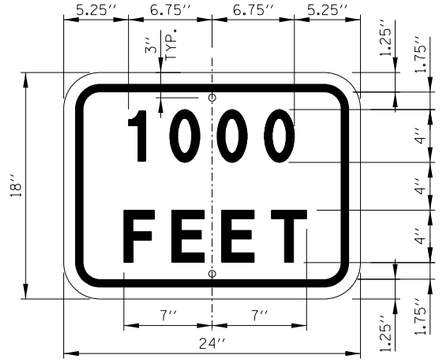
CONSTRUCTION SIGNS

STANDARD E1-05



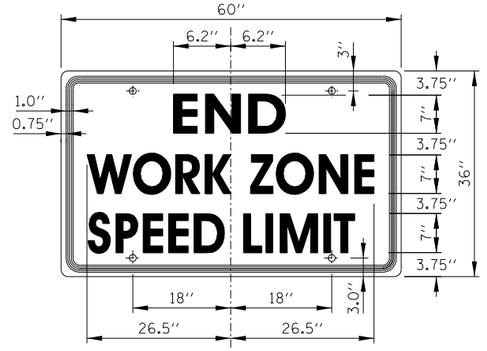
SIGN G20-I102 (0)

COLOR: BACKGROUND - FLUORESCENT ORANGE (0)
BORDER AND LETTERS - BLACK
SIZE: 48''x24''
LETTERING: 6'' FEDERAL SERIES C
MOUNTING HOLES: 7/16'' DIA., 4 HOLES SPACED AS SHOWN



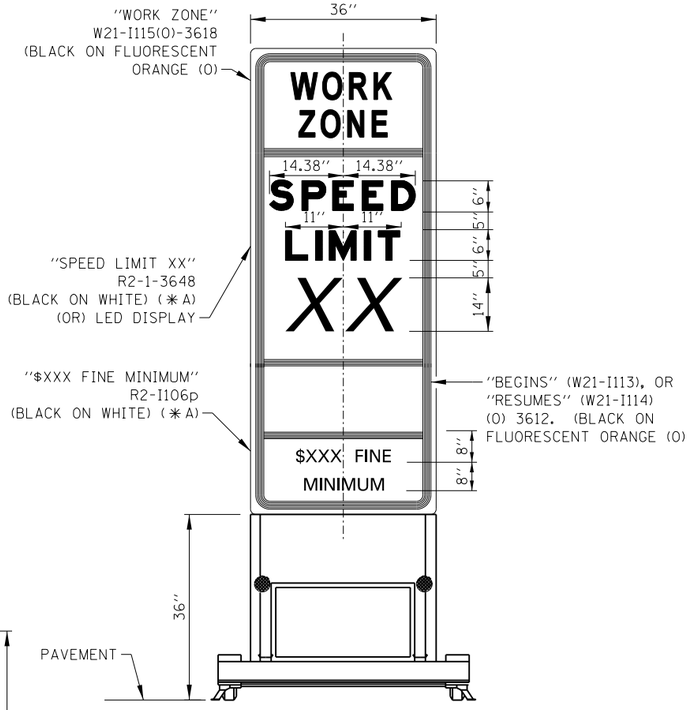
SUPPLEMENTAL PLATE (0)

COLOR: BACKGROUND - FLUORESCENT ORANGE (0)
BORDER AND LETTTERS - BLACK
SIZE: 24''x18''
LETTERING: 4'' FEDERAL SERIES D
MOUNTING HOLES: 7/16'' DIA., 2 HOLES SPACED AS SHOWN

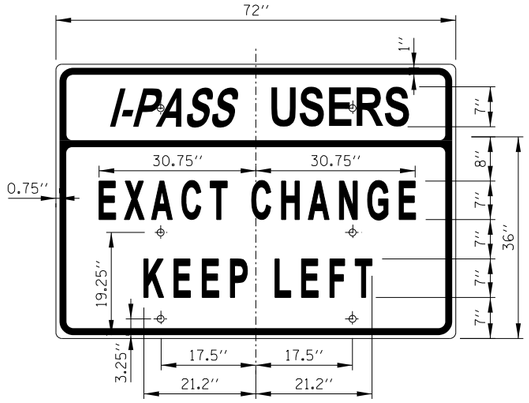


SIGN G20-I103 (0)

COLOR: BACKGROUND - FLUORESCENT ORANGE (0)
BORDER AND LETTERS - BLACK
SIZE: 60''x36''
LETTERING: 6'' FEDERAL SERIES C
MOUNTING HOLES: 7/16'' DIA., 4 HOLES SPACED AS SHOWN

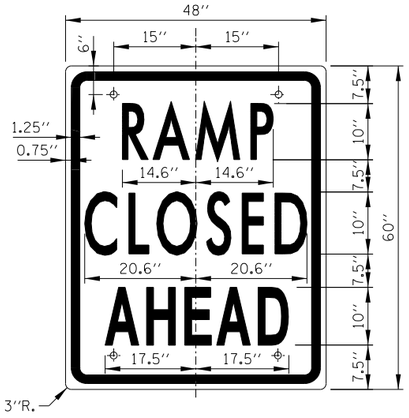


WORK ZONE SPEED LIMIT
SIGN ASSEMBLY



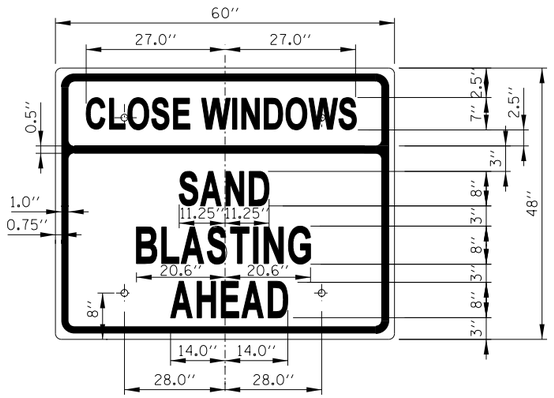
SIGN TS-7

COLOR: BACKGROUND - WHITE (REFLECTORIZED) (* A)
BORDER AND LETTTERS - BLACK
SIZE: 72''x36''
LETTERING: 7'' FEDERAL SERIES C
MOUNTING HOLES: 7/16'' DIA., 4 HOLES SPACED AS SHOWN



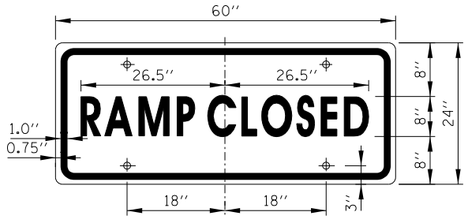
SIGN TS-9

COLOR: BACKGROUND - WHITE (REFLECTORIZED) (* A)
BORDER AND LETTTERS - BLACK
SIZE: 48''x60''
LETTERING: 10'' FEDERAL SERIES C
MOUNTING HOLES: 7/16'' DIA., 4 HOLES SPACED AS SHOWN



SIGN TS-10 (0)

COLOR: BACKGROUND - FLUORESCENT ORANGE (0)
BORDER AND LETTTERS - BLACK
SIZE: 60''x48''
LETTERING: 8'' FEDERAL SERIES C, 7'' FEDERAL SERIES B
MOUNTING HOLES: 7/16'' DIA., 4 HOLES SPACED AS SHOWN



SIGN TS-6

COLOR: BACKGROUND - WHITE (REFLECTORIZED) (* A)
BORDER AND LETTTERS - BLACK
SIZE: 60''x24''
LETTERING: 8'' FEDERAL SERIES C
MOUNTING HOLES: 7/16'' DIA., 4 HOLES SPACED AS SHOWN

GENERAL NOTES:

1. ALL LETTERING IS DESIGNATED BY SIZE AND SERIES IN ACCORDANCE WITH THE LATEST EDITION OF ''STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS'' AS PUBLISHED BY THE U.S. DEPARTMENT OF TRANSPORTATION. LETTERING SPACING SHALL BE IN ACCORDANCE WITH THIS GUIDE EXCEPT WHERE NOTED.

2. SYMBOLS AND ARROWS SHALL CONFORM TO THE DETAILS SHOWN IN THE LATEST EDITION OF ''STANDARD HIGHWAY SIGNS'' AS PUBLISHED BY THE U.S. DEPARTMENT OF TRANSPORTATION.

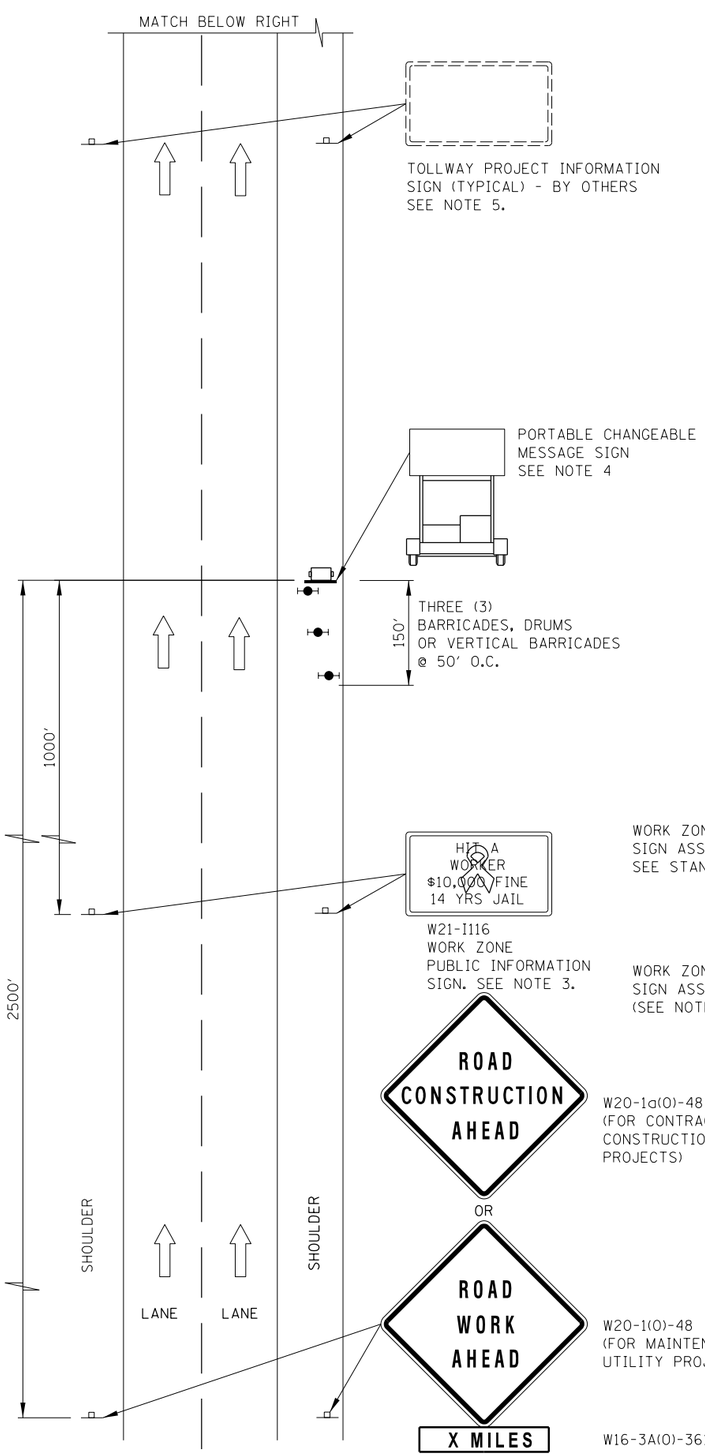
3. SEE THE CONTRACT REQUIREMENTS FOR ADDITIONAL NOTES AND SPECIFICATIONS.
   (0) FLUORESCENT ORANGE REFLECTIVE SHEETING PER THE STANDARD SPECIFICATIONS.
   (* A) - REFLECTIVE SHEETING PER THE STANDARD SPECIFICATIONS.

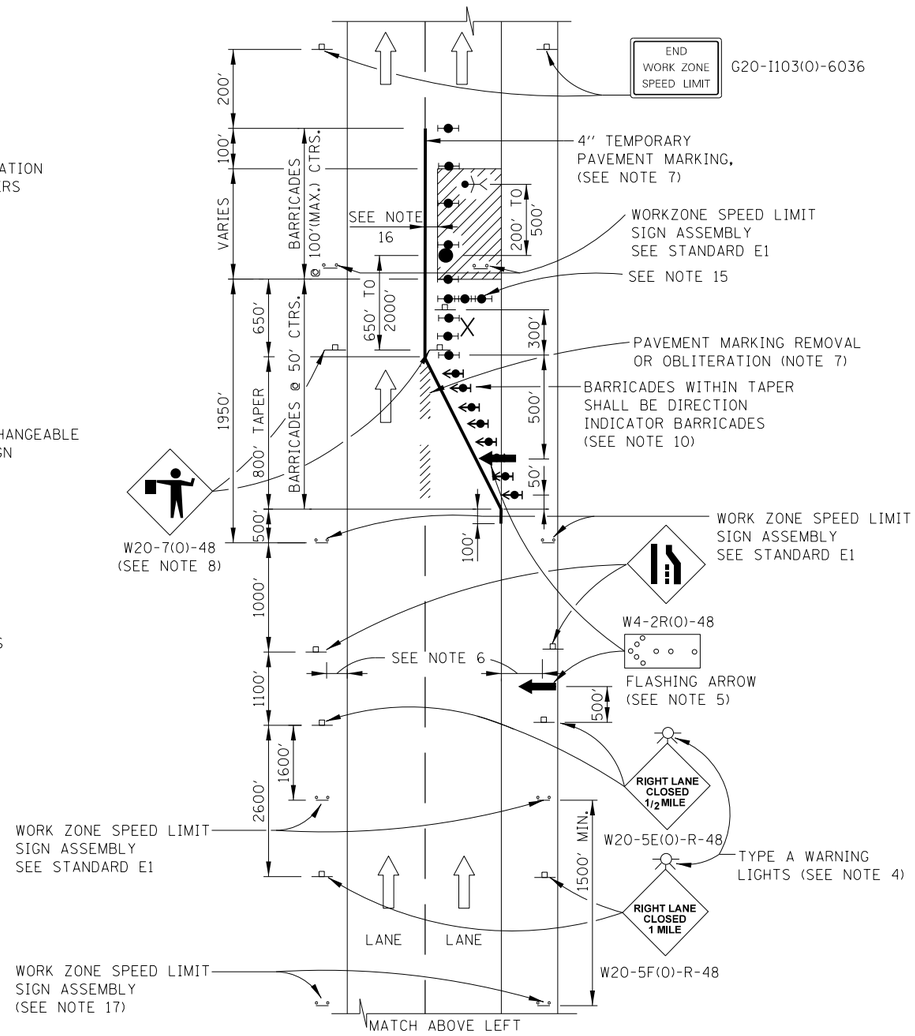
Paul Kovacs
APPROVED ..... CHIEF ENGINEER
DATE 5-1-2009

Illinois Tollway

CONSTRUCTION SIGNS

STANDARD E1-05





ONE-LANE CLOSURE

LANE CLOSURE NOTES:

1. IF CLOSURES ARE EXPECTED TO PRODUCE TRAFFIC BACKUPS EXTENDING BEYOND THE FIRST WARNING SIGN SHOWN ON THE DETAILS, ADDITIONAL UPSTREAM SIGNS SHALL BE PLACED SO THAT THE TRAFFIC CONTROL ZONE ENCOMPASSES THE ANTICIPATED BACKUP ZONE.
2. LONGITUDINAL DIMENSIONS MAY BE ADJUSTED SLIGHTLY TO FIT FIELD CONDITIONS.
3. THESE DETAILS ALSO APPLY TO OPPOSITE HAND LANE CLOSURES BY CHANGING SIGN LEGENDS AND ARROW DIRECTIONS TO INDICATE THE APPROPRIATE CLOSURE.
4. FOR NIGHT TIME CLOSURES, ONE TYPE A WARNING LIGHT SHALL BE INSTALLED ABOVE EACH OF THE 1 MILE AND ½ MILE ADVANCE WARNING SIGNS. FOR DAYLIGHT-ONLY CLOSURES, THE LIGHTS MAY BE OMITTED.
5. FOR ANY LANE CLOSURE, FLASHING ARROW BOARDS SHALL BE REQUIRED AND IN OPERATION AT ALL TIMES. THE FLASHING ARROW BOARD IN ADVANCE OF THE TAPER SHALL BE PROTECTED WITH THREE TYPE II BARRICADES AT 50' O.C.
6. CONSTRUCTION SIGNS SHALL GENERALLY BE POST-MOUNTED OR ATTACHED TO PORTABLE SUPPORTS AND SHALL BE INSTALLED 8' TO 12' FROM ADJACENT TRAVEL LANE WHEREVER POSSIBLE. IN NO CASE SHALL SIGNS BE LOCATED TO PROVIDE LESS THAN 2' CLEARANCE BETWEEN EDGE OF SIGN AND ADJACENT TRAVEL LANE.
7. PAVEMENT MARKING TAPE AND REMOVAL OR OBLITERATION OF EXISTING MARKINGS SHALL BE REQUIRED WHEN THE CLOSURE TIME EXCEEDS FOUR DAYS. THIS WORK SHALL BE MEASURED AND PAID FOR SEPARATELY.
8. WHEN A FLAGGER IS NOT ON STATION, THE FLAGGER SIGN SHALL BE PROMPTLY REMOVED, COVERED OR TURNED TO FACE AWAY FROM TRAFFIC. FLAGGER SIGNS SHALL BE MOVED AS NECESSARY TO MAINTAIN THE REQUIRED SPACING BETWEEN THE SIGNS AND THE WORKERS IN EACH SEPARATE WORK ACTIVITY, PER THE TOLLWAY SUPPLEMENTAL SPECIFICATIONS.
9. WORK ZONE SPEED LIMIT. SIGN ASSEMBLIES, SHALL BE PLACED ADJACENT TO THE OPEN TRAFFIC LANE(S). WORK ZONE SPEED SIGNS SHALL BE MOVED AS NECESSARY TO MAINTAIN THE REQUIRED SPACING BETWEEN SIGNS AND THE WORKERS IN EACH SEPARATE WORK ACTIVITY PER THE TOLLWAY SUPPLEMENTAL SPECIFICATIONS.
10. DIRECTION INDICATOR BARRICADES SHALL BE USED IN LANE TAPERS.
11. FOR CLOSURES OTHER THAN SHORT TERM (SUNRISE TO ONE HOUR BEFORE SUNSET), THE MINIMUM HEIGHT OF THE SIGN FROM SHOULDER ELEVATION SHALL BE 7'-0".
12. CONES MAY BE USED IN LIEU OF BARRICADES IN THE BUFFER AND WORK AREAS, WHEN THE CLOSURE IS FOR MAINTENANCE OPERATIONS.
13. BARRICADES ARE TO BE LOCATED AT JOINT LINE WHEN WORK AREA EXTENDS UP TO JOINT UNLESS OTHERWISE SHOWN ON THE PLANS.
14. SEE MAINTENANCE OF TRAFFIC DRAWINGS FOR ADDITIONAL SIGNING IN THIS AREA.
15. CHECK BARRICADES SHALL BE PLACED IN THE MIDDLE OF THE CLOSED LANE AND AT THE SHOULDER AT 1000 FOOT CENTERS.
16. A 1'-0" MINIMUM/2'-0" DESIRABLE SHY DISTANCE SHALL BE PROVIDED, MEASURED BETWEEN EDGE OF PAVEMENT LANE MARKING TO THE EDGE OF THE TRAFFIC CONTROL DEVICE.
17. ADDITIONAL WORK ZONE SPEED LIMIT SIGNS SHALL BE PLACED WHEN DIFFERENCE BETWEEN POSTED TO WORK ZONE SPEED LIMIT IS > 20 M.P.H.

ADVANCE SIGNING NOTES:

1. THE ADVANCE SIGNING SHOWN ON THIS STANDARD SHALL APPLY ANY TIME THE CONTRACTOR CLOSES ONE OR MORE LANES, OR IS REQUIRED TO SHIFT THE LANE ALIGNMENT. THE "ROAD WORK AHEAD" OR "ROAD CONSTRUCTION AHEAD" SIGNS, WORK ZONE PUBLIC INFORMATION SIGNS AND PORTABLE CHANGEABLE MESSAGE ARE STATIONARY.
2. THE ROAD CONSTRUCTION AHEAD SIGN (W20-1A, WITH W16-3a SUPPLEMENTAL PLATE) OR ROAD WORK AHEAD SIGN (W20-1, WITH W16-3A SUPPLEMENTAL PLATE) SHALL BE LOCATED UP TO 5 MILES IN ADVANCE OF THE PROJECT LIMITS, WITH THE LOCATION BEING DETERMINED BY THE ENGINEER.
3. THE WORK ZONE PUBLIC INFORMATION SIGN IS 60" WIDE BY 48" HIGH. THE CONTRACTOR SHALL OBTAIN THE CAMERA-READY ARTWORK REQUIRED FOR THE SIGN MESSAGE BY CONTACTING IDOT'S CENTRAL BUREAU OF OPERATIONS.
4. THE PORTABLE CHANGEABLE MESSAGE SIGN SHALL BE USED TO DISPLAY THE STATUS OF LANE WITHIN THE CONTRACT LIMITS. THE PRIMARY MESSAGES SHALL BE: "RIGHT LANE(S) CLOSED" / "x MILES AHEAD", "LEFT LANE(S) CLOSED" / "x MILES AHEAD", "LANE(S) SHIFT" / "x MILES AHEAD", "ALL LANES OPEN". THE PORTABLE CHANGEABLE MESSAGE SIGN MAY BE MOVED TO THE MEDIAN SHOULDER WHEN THE LANE CLOSURES ARE ON THE LEFT, PROVIDED THE EXISTING SHOULDER WIDTH IS ADEQUATE.
5. THE TOLLWAY WILL FURNISH AND INSTALL STATIC PROJECT INFORMATION SIGNS IN ADVANCE, THROUGH AND AT THE END OF THE WORK ZONE. THESE SIGNS WILL BE INSTALLED ALONG THE OUTSIDE SHOULDER WITH THE ADVANCE SIGNS LOCATED BEYOND THE PORTABLE CHANGEABLE MESSAGE SIGN. THE ENGINEER AND CONTRACTOR SHALL COORDINATE WITH THE TOLLWAY REGARDING THE LOCATION OF THESE SIGNS AND NOTIFY THE TOLLWAY OF ANY DAMAGE TO THE SIGNS OR SUPPORTS.

SYMBOLS

- ARROW BOARD
- WORK AREA
- SIGN
- DIRECTION INDICATOR BARRICADE WITH STEADY BURN MONODIRECTIONAL LIGHT
- TYPE II BARRICADE, DRUM, OR VERTICAL BARRICADE WITH STEADY BURN MONODIRECTIONAL LIGHT
- FLAGGER WITH TRAFFIC CONTROL SIGN
- WORKER
- LANE CLOSED

Paul Kovacs
APPROVED ..... CHIEF ENGINEER
DATE 5-1-2009

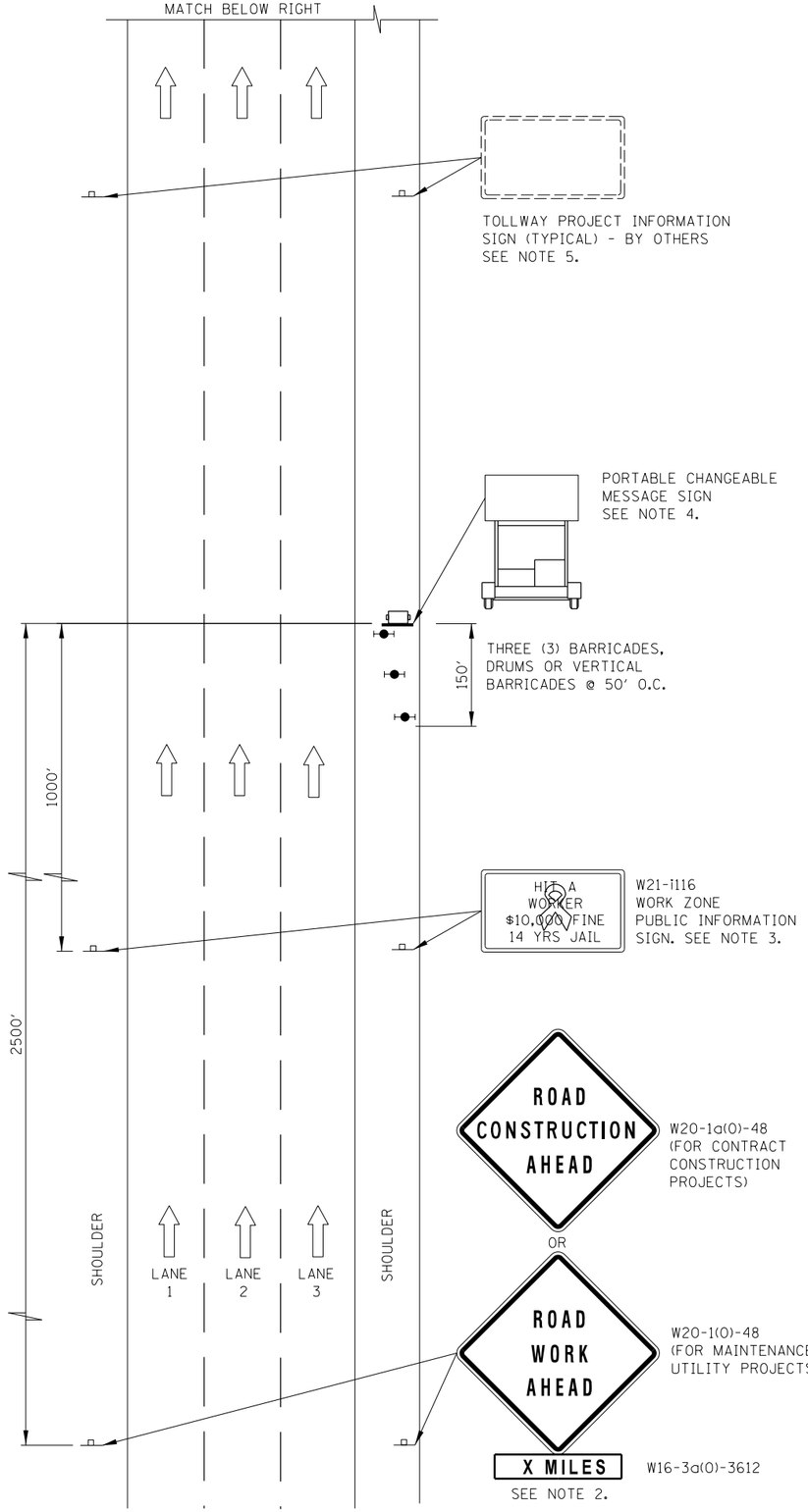
SHEET 1 OF 3

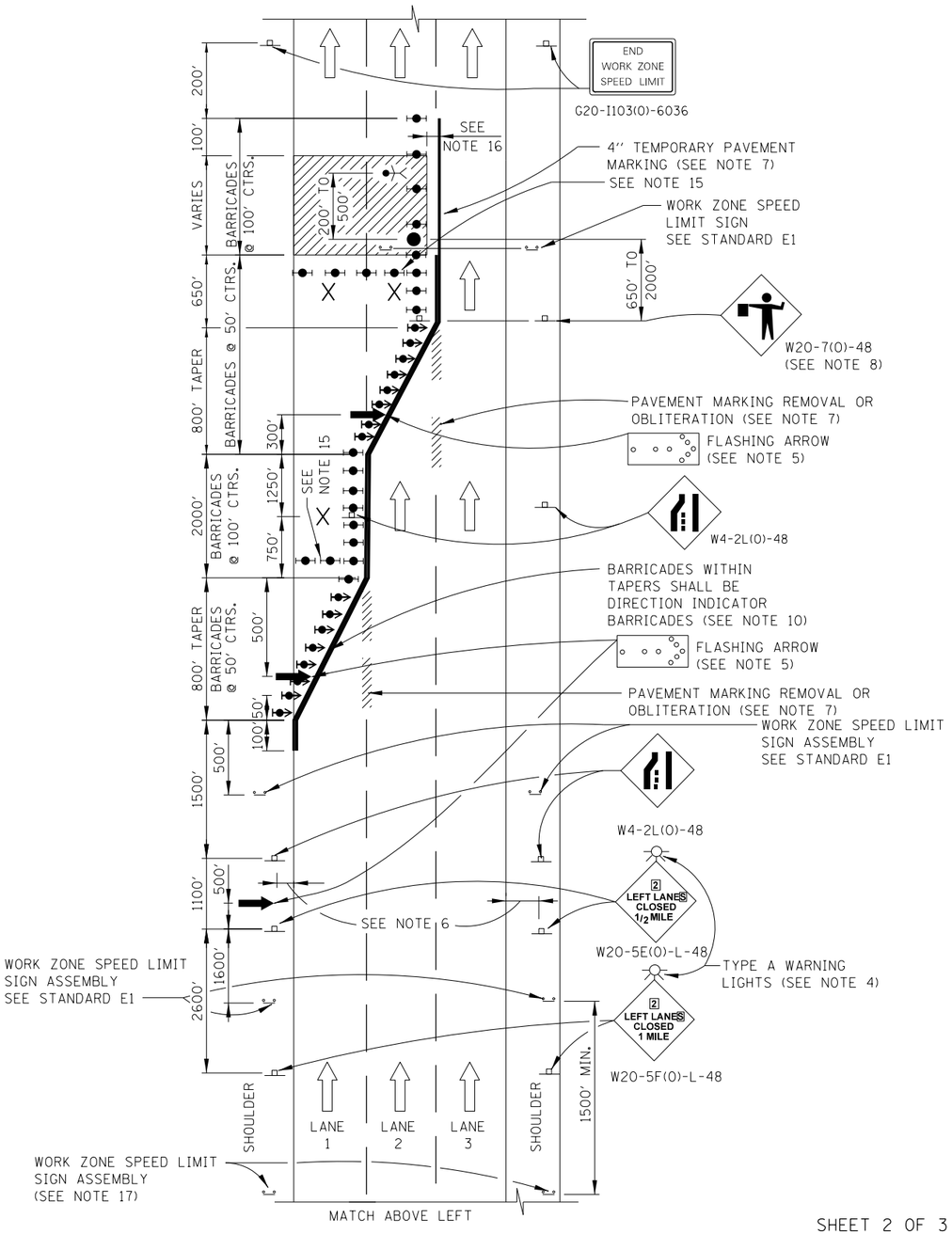
Illinois Tollway

DATE	REVISIONS
01-01-11	CHANGED SYMBOL DESIGNTATION, REVISED NOTES
11-01-12	ADDED THREE LANE CLOSURE
03-31-14	REVISED BUFFER SPACE, TAPER DIMENSIONS AND REVISED NOTES.
3-11-2015	REVISED NOTES.

LANE CLOSURE DETAILS

STANDARD E2-05





SYMBOLS

- ARROW BOARD
- WORK AREA
- SIGN
- DIRECTION INDICATOR BARRICADE WITH STEADY BURN MONODIRECTIONAL LIGHT
- TYPE II BARRICADE, DRUM, OR VERTICAL BARRICADE WITH STEADY BURN MONODIRECTIONAL LIGHT
- FLAGGER WITH TRAFFIC CONTROL SIGN
- WORKER
- LANE CLOSED

TWO-LANE CLOSURE

Paul Kovacs
APPROVED ..... CHIEF ENGINEER
DATE 5-1-2009

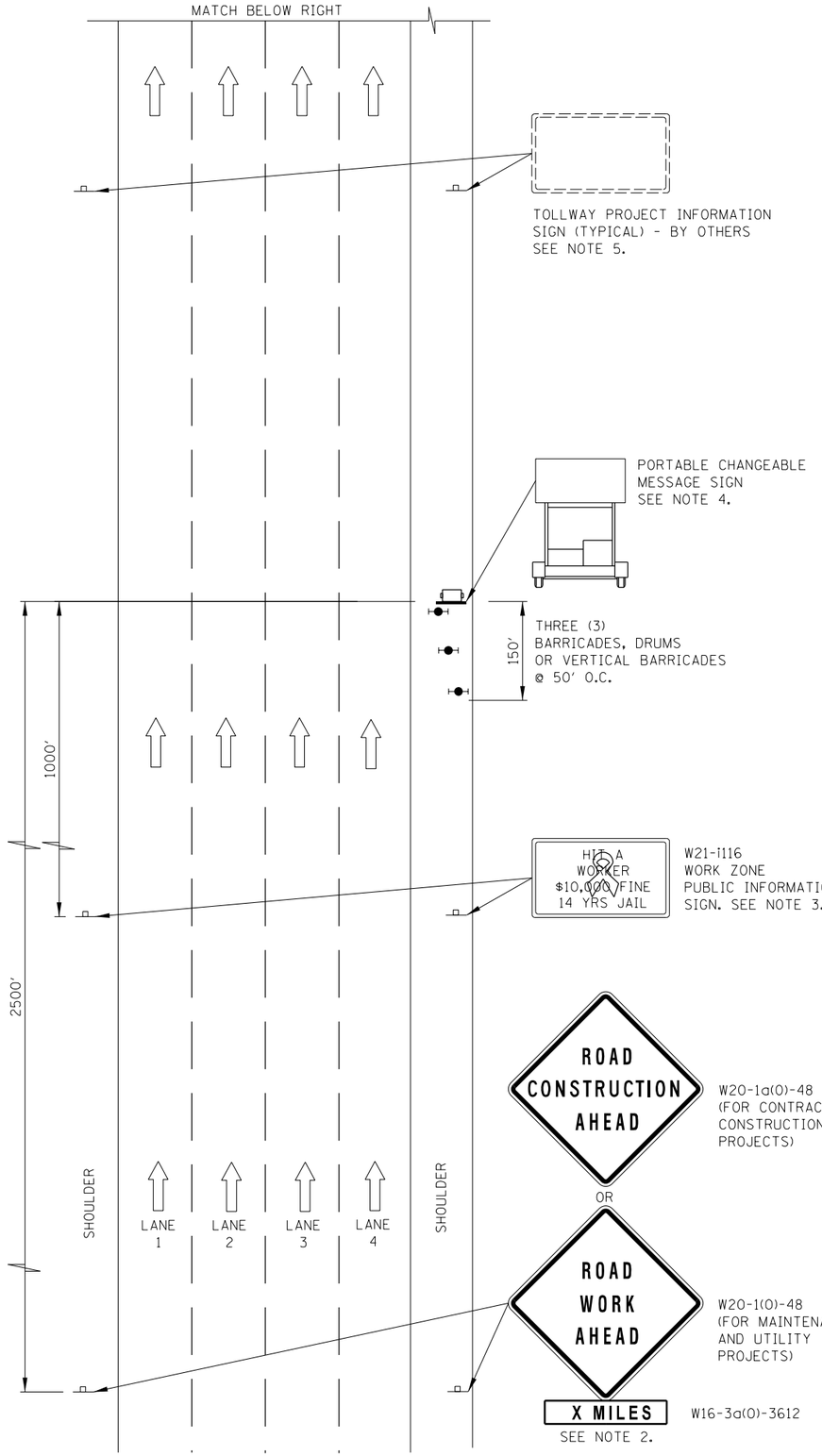
SEE SHEET 1 IN THIS SERIES FOR GENERAL NOTES

SHEET 2 OF 3

Illinois Tollway

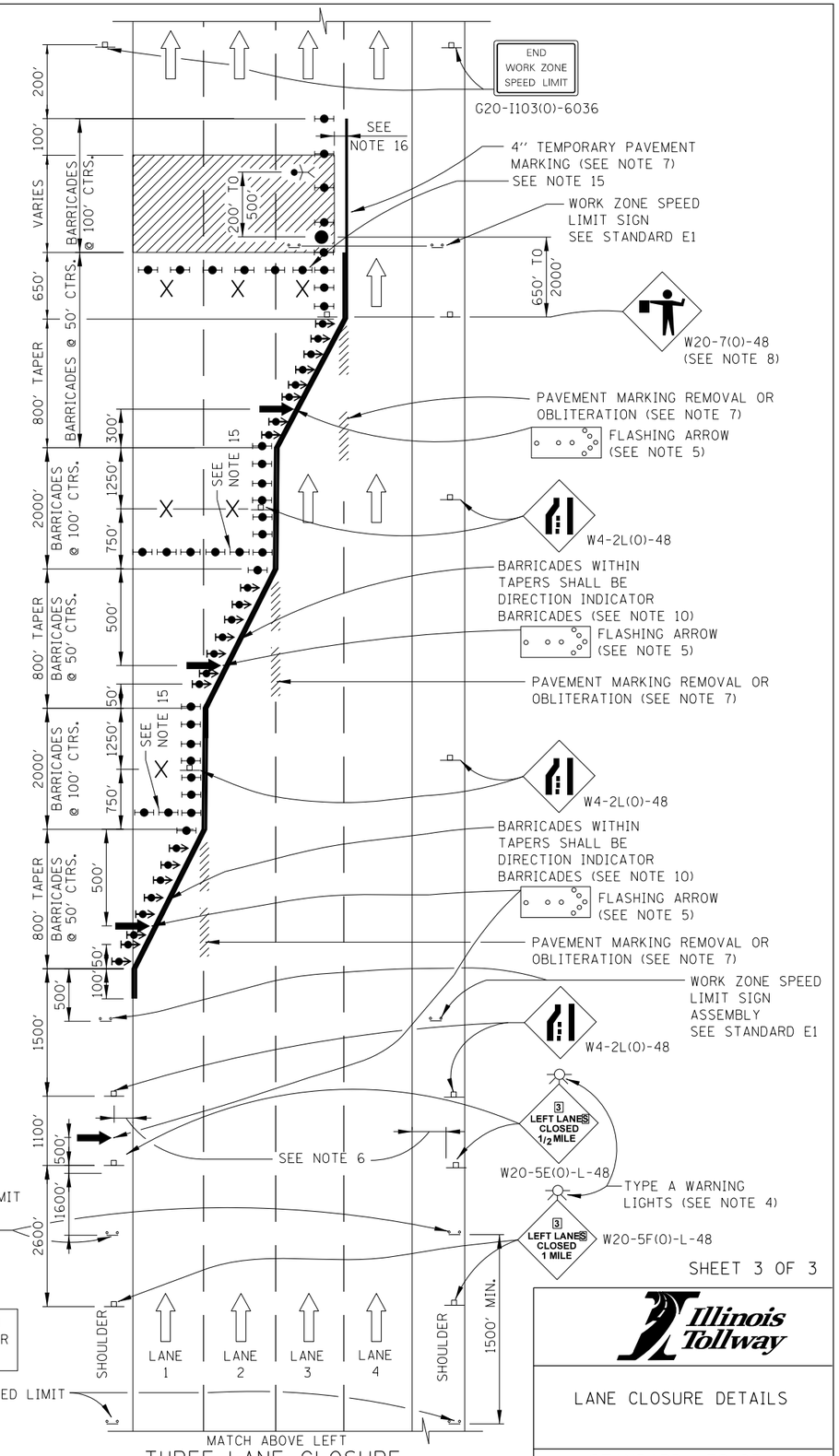
LANE CLOSURE DETAILS

STANDARD E2-05



SYMBOLS

- ARROW BOARD
- WORK AREA
- SIGN
- DIRECTION INDICATOR BARRICADE WITH STEADY BURN MONODIRECTIONAL LIGHT
- TYPE II BARRICADE, DRUM, OR VERTICAL BARRICADE WITH STEADY BURN MONODIRECTIONAL LIGHT
- FLAGGER WITH TRAFFIC CONTROL SIGN
- WORKER
- LANE CLOSED



THREE-LANE CLOSURE

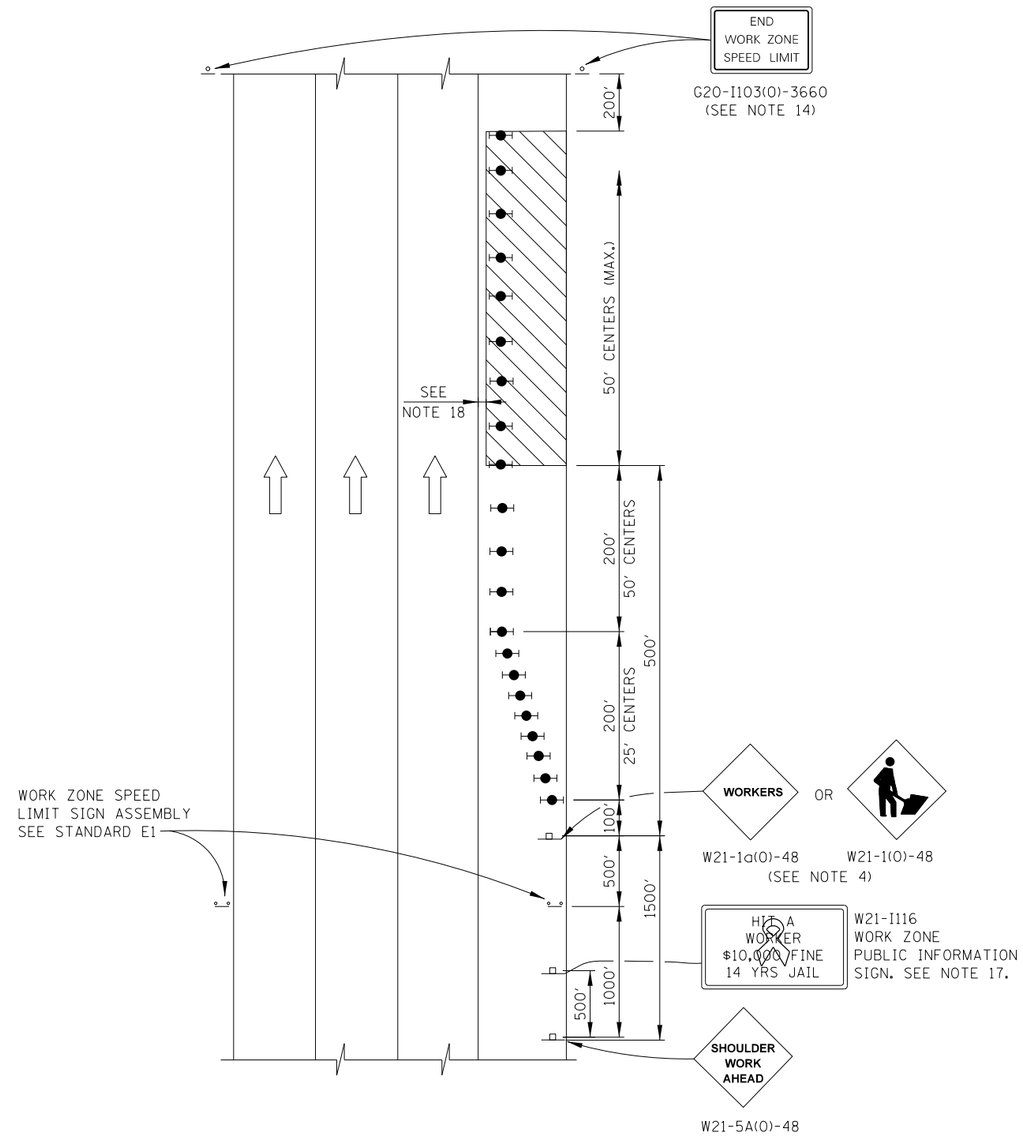
APPROVED Paul Kovacs CHIEF ENGINEER DATE 5-1-2009

SHEET 3 OF 3

Illinois Tollway

LANE CLOSURE DETAILS

STANDARD E2-05



WORK ZONE

N.T.S.

GENERAL NOTES:

1. THE SHOULDER SHALL BE CLOSED WHEN A WORK ACTIVITY REQUIRING 15 OR MORE MINUTES IS PERFORMED AT A DISTANCE WHICH IS LESS THAN 15 FEET BUT NO CLOSER THAN 2 FEET THE EDGE OF PAVEMENT.
2. THE ADJACENT EXTERIOR LANE SHALL BE CLOSED WHEN WORK IS PERFORMED WITHIN 2 FEET FROM THE EDGE OF PAVEMENT.
3. THE CHANNELIZING DEVICES WHICH SEPARATE THE WORK SPACE FROM THE ADJACENT TRAVEL LANE SHALL BE SPACED AT 25' FOR (200 FEET) AND AT A MAXIMUM OF 50' FOR ALL ADDITIONAL DEVICES.
4. WHEN THE WORKSITE IS UNATTENDED, SUBSTITUTE - "SHOULDER WORK AHEAD" SIGN FOR THE SECOND SIGN.
5. WORKER SIGNS OR SHOULDER WORK SIGNS AND CHANNELIZATION DEVICES ARE PLACED ONLY ON THE SIDE OF THE ROADWAY ON WHICH THE ACTIVITY IS PERFORMED.
6. FOR SHOULDER CLOSURE EXTENDING OVERNIGHT, BARRICADE TYPE II WITH STEADY BURNING LIGHT, TYPE C SHALL BE USED.
7. FOR SHORT TERM CLOSURE (SUNRISE TO ONE HOUR BEFORE SUNSET) NOT EXTENDING INTO DARKNESS, CONES MAY BE USED.
8. ONE WORK ZONE SPEED LIMIT SIGN ASSEMBLY SHALL BE PLACED AT A DISTANCE OF 500' TO 2,500' MAXIMUM IN ADVANCE OF WORKERS THROUGHOUT THE SHOULDER CLOSURE. MOVING OPERATIONS MAY REQUIRE CONTINUOUS ADJUSTMENT OF THE SIGN ASSEMBLY LOCATION TO MAINTAIN THE ABOVE INTERVAL.
9. AN ADDITIONAL SIGN ASSEMBLY SHALL BE PLACED 500' BEYOND THE LAST ENTRANCE RAMP FOR EACH INTERCHANGE THAT FALLS WITHIN THE 2,500'.
10. THE SIGN ASSEMBLY SHALL BE PLACED NO CLOSER THAN 500' TO ANY OTHER SIGN.
11. THE SIGN ASSEMBLY SHALL NOT BE UTILIZED WHEN WORKERS ARE BEHIND A TEMPORARY (MOVABLE BARRIER) WALL.
12. THE WORK ZONE SPEED LIMIT SIGNS AND SIGN ASSEMBLY SHALL BE PROMPTLY REMOVED OR COVERED WHEN SHOULDER CLOSURE IS NOT IN USE.
13. ALL CONFLICTING SPEED LIMIT SIGNS SHALL BE COVERED OR REMOVED.
14. "END WORK ZONE SPEED LIMIT" SIGNS SHALL BE IN PLACE ONLY WHEN THE EXISTING POSTED SPEED > 55MPH.
15. FOR SHOULDER REPAIRS OR REPLACEMENT THE CHANNELIZING DEVICES SHALL BE PLACED AT THE EDGE OF PAVEMENT WHENEVER THE WORK ACTIVITIES RESULT IN A DROPOFF AT THE EDGE OF PAVEMENT.
16. ANY UNATTENDED OBSTACLE OR EXCAVATION LEFT ON THE SHOULDER OVERNIGHT SHALL BE IN COMPLIANCE WITH THE ROADWAY TRAFFIC CONTROL AND COMMUNICATIONS MANUAL.
17. THE WORK ZONE PUBLIC INFORMATION SIGN IS 60" WIDE BY 48" HIGH. THE CONTRACTOR SHALL OBTAIN THE CAMERA-READY ARTWORK REQUIRED FOR THE SIGN MESSAGE BY CONTACTING IDOT'S CENTRAL BUREAU OF OPERATIONS.
18. A 1'-0" MINIMUM/2'-0" DESIRABLE SHY DISTANCE SHALL BE PROVIDED, MEASURED BETWEEN EDGE OF PAVEMENT LANE MARKING TO THE EDGE OF THE TRAFFIC CONTROL DEVICE.

SYMBOLS

- WORK AREA
- SIGN
- TYPE II BARRICADE, DRUM, OR VERTICAL BARRICADE WITH STEADY BURN MONODIRECTIONAL LIGHT

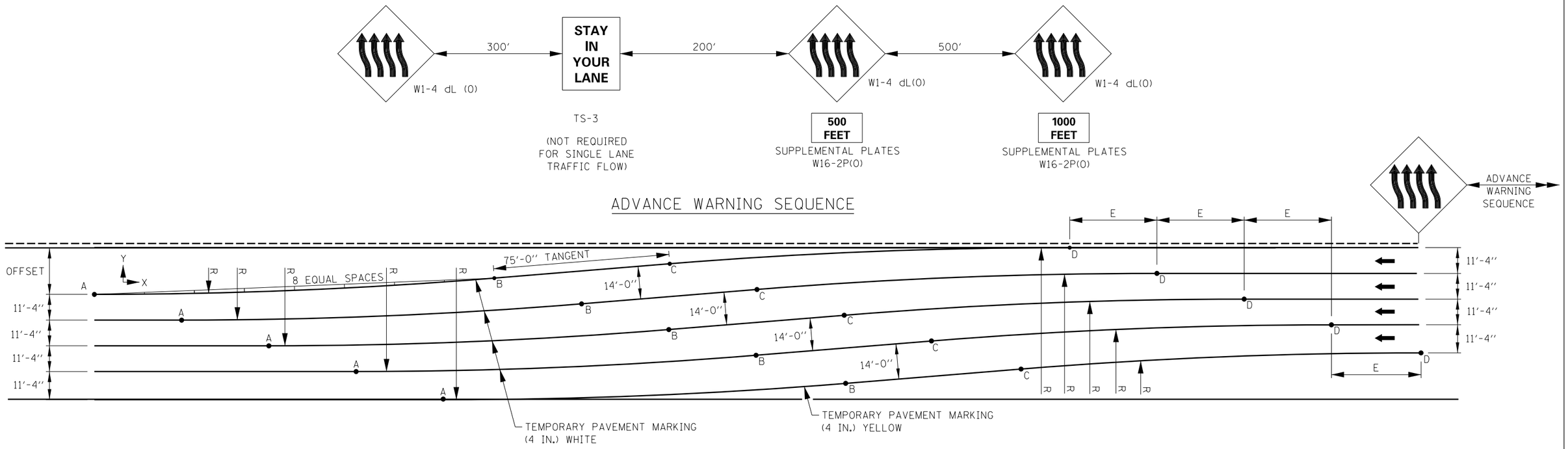
Paul Kovacs
APPROVED ..... CHIEF ENGINEER
DATE 5-1-2009

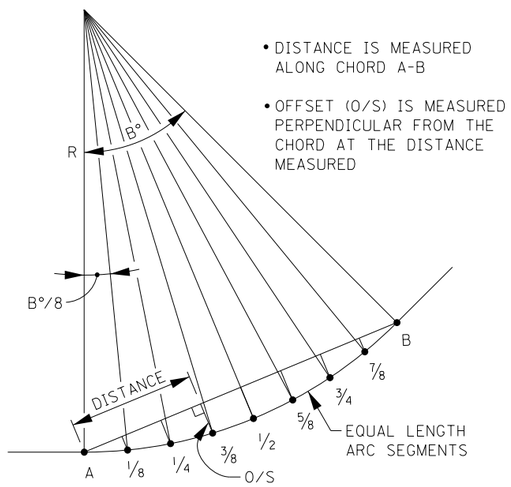
Illinois Tollway

DATE	REVISIONS
01-01-11	CHANGED SYMBOL DESIGNATION
	REVISED NOTES
03-31-14	REVISED WORKER SIGN NUMBERS PER
	"MUTCD" AND REVISED NOTES.
3-11-2015	REVISED NOTES

SHOULDER CLOSURE DETAILS

STANDARD E3-04





CHORD OFFSET SKETCH

GENERAL NOTES:

1. REVERSE CURVE INFORMATION CAN BE USED FOR SINGLE LANE OR MULTILANE TRAFFIC FLOWS, SHIFTING RIGHT TO LEFT (AS SHOWN) OR LEFT TO RIGHT BY CHANGING TO THE APPROPRIATE ADVANCE WARNING SEQUENCE.
2. THE REVERSE CURVE SHALL NOT BE USED OUTSIDE THE ACTIVITY AREA. LANE SHIFTS IN ADVANCE OF OR ON THE APPROACH TO THE ACTIVITY AREA SHALL BE IMPLEMENTED WITH A SHIFT RATE OF 65:1.
3. LANE SHIFTS FOR DEPARTURES OUT OF THE ACTIVITY AREA SHALL BE IMPLEMENTED WITH A SHIFT RATE OF 65:1.

Paul Kovacs
APPROVED CHIEF ENGINEER DATE 2-7-2012

DATE	REVISIONS
02-07-12	REVISED NOTES
11-01-12	REVISED NOTES
03-31-14	REVISED CURVE DATA PER MPH AND
	REVISED NOTES.
3-11-2015	REVISED NOTES AND ADDED RADIUS
	DIMENSIONS TO TABLES

Illinois Tollway

MAINTENANCE OF TRAFFIC
REVERSE CURVE

STANDARD E4-05

TYPE I (45 MPH) (RADIUS: 2100')

			POINT LAY-OUT								CHORD OFFSET DATA							
OFFSET	E	B	A		B		C		D		1/8 & 7/8		1/4 & 3/4		3/8 & 5/8		1/2	
			X	Y	X	Y	X	Y	X	Y	O/S	DIST	O/S	DIST	O/S	DIST	O/S	DIST
10	50.23	3.06	0	0	112.2	3.0	187.1	7.0	299.2	10.0	0.3	14.0	0.6	28.0	0.7	42.1	0.7	56.1
12	44.94	3.43	0	0	125.6	3.8	200.4	8.2	326.0	12.0	0.4	15.7	0.7	31.4	0.9	47.1	0.9	62.8
14	40.96	3.77	0	0	138.0	4.5	212.8	9.5	350.8	14.0	0.5	17.3	0.9	34.5	1.1	51.8	1.1	69.0
16	37.86	4.08	0	0	149.5	5.3	224.3	10.7	373.9	16.0	0.6	18.7	1.0	37.4	1.2	56.1	1.3	74.8
18	35.34	4.38	0	0	160.4	6.1	235.2	11.9	395.6	18.0	0.7	20.1	1.2	40.1	1.4	60.2	1.5	80.3
20	33.26	4.66	0	0	170.7	7.0	245.5	13.0	416.2	20.0	0.8	21.4	1.3	42.7	1.6	64.1	1.7	85.4
22	31.50	4.93	0	0	180.5	7.8	255.3	14.2	435.8	22.0	0.9	22.6	1.5	45.2	1.8	67.8	1.9	90.4
24	30.00	5.19	0	0	189.9	8.6	264.6	15.4	454.6	24.0	0.9	23.8	1.6	47.5	2.0	71.3	2.2	95.1
26	28.68	5.44	0	0	199.0	9.4	273.6	16.6	472.6	26.0	1.0	24.9	1.8	49.8	2.2	74.7	2.4	99.6
28	27.53	5.67	0	0	207.7	10.3	282.3	17.7	489.9	28.0	1.1	26.0	1.9	52.0	2.4	78.0	2.6	104.0
30	26.51	5.90	0	0	216.0	11.1	290.6	18.9	506.7	30.0	1.2	27.0	2.1	54.1	2.6	81.1	2.8	108.2
32	25.59	6.13	0	0	224.2	12.0	298.7	20.0	522.9	32.0	1.3	28.0	2.3	56.1	2.8	84.2	3.0	112.2
34	24.76	6.34	0	0	232.0	12.9	306.6	21.1	538.6	34.0	1.4	29.0	2.4	58.1	3.0	87.1	3.2	116.2
36	24.02	6.55	0	0	239.7	13.7	314.2	22.3	553.8	36.0	1.5	30.0	2.6	60.0	3.2	90.0	3.4	120.0
38	23.33	6.76	0	0	247.1	14.6	321.6	23.4	568.7	38.0	1.6	30.9	2.7	61.9	3.4	92.8	3.7	123.8
40	22.71	6.96	0	0	254.3	15.5	328.8	24.5	583.1	40.0	1.7	31.8	2.9	63.7	3.6	95.5	3.9	127.4
42	22.13	7.15	0	0	261.4	16.3	335.8	25.7	597.2	42.0	1.8	32.7	3.1	65.4	3.8	98.2	4.1	131.0
44	21.60	7.34	0	0	268.3	17.2	342.7	26.8	611.0	44.0	1.9	33.6	3.2	67.2	4.0	100.8	4.3	134.4
46	21.11	7.53	0	0	275.0	18.1	349.4	27.9	624.4	46.0	2.0	34.4	3.4	68.9	4.2	103.3	4.5	137.8
48	20.65	7.71	0	0	281.6	19.0	356.0	29.0	637.6	48.0	2.1	35.2	3.6	70.5	4.5	105.8	4.7	141.1
50	20.22	7.89	0	0	288.1	19.9	362.4	30.1	650.5	50.0	2.2	36.1	3.7	72.2	4.7	108.3	5.0	144.4
52	19.82	8.06	0	0	294.4	20.7	368.7	31.3	663.1	52.0	2.3	36.9	3.9	73.7	4.9	110.7	5.2	147.6
54	19.44	8.23	0	0	300.6	21.6	374.9	32.4	675.5	54.0	2.4	37.6	4.1	75.3	5.1	113.0	5.4	150.7
56	19.09	8.40	0	0	306.7	22.5	380.9	33.5	687.7	56.0	2.5	38.4	4.2	76.8	5.3	115.3	5.6	153.8
58	18.76	8.56	0	0	312.7	23.4	386.9	34.6	699.6	58.0	2.6	39.2	4.4	78.3	5.5	117.6	5.9	156.8
60	18.44	8.73	0	0	318.6	24.3	392.7	35.7	711.4	60.0	2.7	39.9	4.6	79.8	5.7	119.8	6.1	159.8

TYPE II (50-55 MPH) (RADIUS: 3100')

			POINT LAY-OUT								CHORD OFFSET DATA							
OFFSET	E	B	A		B		C		D		1/8 & 7/8		1/4 & 3/4		3/8 & 5/8		1/2	
			X	Y	X	Y	X	Y	X	Y	O/S	DIST	O/S	DIST	O/S	DIST	O/S	DIST
10	58.28	2.63	0	0	142.5	3.3	217.4	6.7	359.9	10.0	0.4	17.8	0.6	35.6	0.8	53.4	0.8	48.3
12	52.30	2.94	0	0	158.9	4.1	233.8	7.9	392.8	12.0	0.4	19.9	0.8	39.7	1.0	59.6	1.0	53.9
14	47.80	3.22	0	0	174.1	4.9	249.0	9.1	423.1	14.0	0.5	21.8	0.9	43.5	1.1	65.3	1.2	59.0
16	44.25	3.73	0	0	188.3	5.7	263.1	10.3	451.4	16.0	0.6	23.5	1.1	47.1	1.3	70.6	1.4	63.8
18	41.38	3.73	0	0	201.6	6.6	276.4	11.4	478.0	18.0	0.7	25.2	1.2	50.4	1.5	75.6	1.6	68.3
20	38.99	3.96	0	0	214.2	7.4	289.0	12.6	503.2	20.0	0.8	26.8	1.4	53.6	1.7	80.4	1.9	72.6
22	39.96	4.18	0	0	226.2	8.3	301.0	13.7	527.2	22.0	0.9	28.3	1.5	56.6	1.9	84.9	2.1	76.7
24	35.22	4.40	0	0	237.7	9.1	312.5	14.9	550.1	24.0	1.0	29.7	1.7	59.5	2.1	89.2	2.3	80.6
26	33.70	4.60	0	0	248.7	10.0	323.5	16.0	572.1	26.0	1.1	31.1	1.9	62.2	2.3	93.3	2.5	84.3
28	32.36	4.80	0	0	259.3	10.9	334.0	17.1	593.3	28.0	1.2	32.4	2.0	64.9	2.5	97.3	2.7	87.9
30	31.16	4.99	0	0	269.5	11.7	344.2	18.3	613.8	30.0	1.3	33.7	2.2	67.4	2.8	101.2	2.9	91.4
32	30.10	5.17	0	0	279.4	12.6	354.1	19.4	633.6	32.0	1.4	34.9	2.4	69.9	3.0	104.9	3.2	94.7
34	29.13	5.35	0	0	289.0	13.5	363.7	20.5	652.7	34.0	1.5	36.2	2.5	72.3	3.2	108.5	3.4	98.0
36	28.25	5.52	0	0	298.4	14.4	373.0	21.6	671.4	36.0	1.6	37.3	2.7	74.7	3.4	112.0	3.6	101.2
38	27.45	5.69	0	0	307.4	15.3	382.1	22.7	689.5	38.0	1.7	38.5	2.9	76.9	3.6	115.4	3.8	104.3
40	26.72	5.86	0	0	316.3	16.2	390.9	23.8	707.1	40.0	1.8	39.6	3.0	79.1	3.8	118.7	4.0	107.3
42	26.04	6.02	0	0	324.9	17.1	399.5	24.9	724.3	42.0	1.9	40.6	3.2	81.3	4.0	122.0	4.3	110.2
44	25.41	6.17	0	0	333.3	18.0	407.9	26.0	741.1	44.0	2.0	41.7	3.4	83.4	4.2	125.1	4.5	113.1
46	24.83	6.32	0	0	341.5	18.9	416.1	27.1	757.6	46.0	2.1	42.7	3.5	85.5	4.4	128.2	4.7	115.8
48	24.29	6.47	0	0	349.6	19.8	424.1	28.2	773.6	48.0	2.2	43.7	3.7	87.5	4.6	131.3	4.9	118.6
50	23.78	6.62	0	0	357.4	20.7	431.9	29.3	789.4	50.0	2.3	44.7	3.9	89.5	4.8	134.2	5.2	121.3
52	23.31	6.76	0	0	365.2	21.6	439.6	30.4	804.8	52.0	2.4	45.7	4.0	91.4	5.1	137.2	5.4	123.9
54	22.86	6.91	0	0	372.7	22.5	447.2	31.5	819.9	54.0	2.5	46.6	4.2	93.3	5.3	140.0	5.6	126.5
56	22.44	7.04	0	0	380.2	23.4	454.6	32.6	834.8	56.0	2.6	47.6	4.4	95.2	5.5	142.8	5.9	129.0
58	22.05	7.18	0	0	387.5	24.3	461.9	33.7	849.4	58.0	2.7	48.5	4.6	97.0	5.7	145.6	6.1	131.5
60	21.67	7.31	0	0	394.7	25.2	469.1	34.8	863.7	60.0	2.8	49.4	4.7	98.8	5.9	148.3	6.3	134.0

TYPE III (60-65 MPH) (RADIUS: 4400')

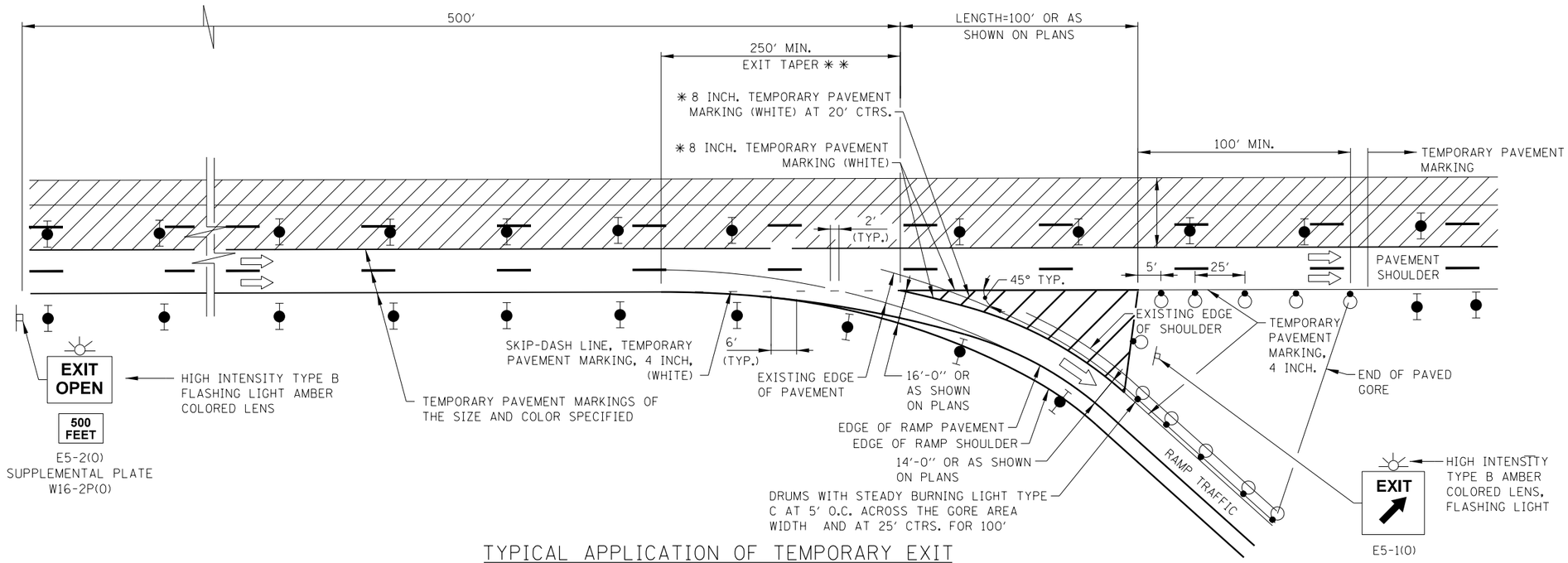
			POINT LAY-OUT								CHORD OFFSET DATA							
OFFSET	E	B	A		B		C		D		1/8 & 7/8		1/4 & 3/4		3/8 & 5/8		1/2	
			X	Y	X	Y	X	Y	X	Y	O/S	DIST	O/S	DIST	O/S	DIST	O/S	DIST
10	67.06	2.29	0	0	175.6	3.5	250.5	6.5	426.1	10.0	0.4	21.9	0.7	43.9	0.8	65.8	0.9	41.9
12	60.34	2.54	0	0	195.3	4.3	270.2	7.7	465.5	12.0	0.5	24.4	0.8	48.8	1.0	73.2	1.1	46.6
14	55.24	2.78	0	0	213.5	5.2	288.4	8.8	501.8	14.0	0.6	26.7	1.0	53.4	1.2	80.1	1.3	51.0
16	51.22	3.00	0	0	230.4	6.0	305.3	10.0	535.7	16.0	0.7	28.8	1.1	57.6	1.4	86.4	1.5	55.0
18	47.95	3.21	0	0	246.3	6.9	321.2	11.1	567.5	18.0	0.8	30.8	1.3	61.6	1.6	92.4	1.7	58.8
20	45.22	3.41	0	0	261.4	7.8	336.3	12.2	597.7	20.0	0.9	32.7	1.5	65.4	1.8	98.1	1.9	62.4
22	42.90	3.59	0	0	275.8	8.6	350.6	13.4	626.4	22.0	0.9	34.5	1.6	69.0	2.0	103.5	2.2	65.8
24	40.91	3.77	0	0	289.5	9.5	364.3	14.5	653.8	24.0	1.0	36.2	1.8	72.4	2.2	108.6	2.4	69.1
26	39.16	3.94	0	0	302.6	10.4	377.5	15.6	680.1	26.0	1.1	37.8	2.0	75.7	2.4	113.6	2.6	72.3
28	37.62	4.11	0	0	315.3	11.3	390.1	16.7	705.4	28.0	1.2	39.4	2.1	78.9	2.7	118.3	2.8	75.3
30	36.24	4.27	0	0	327.5	12.2	402.3	17.8	729.9	30.0	1.3	41.0	2.3	81.9	2.9	122.9	3.1	78.2
32	35.01	4.42	0	0	339.4	13.1	414.2	18.9	753.5	32.0	1.4	42.4	2.5	84.9	3.1	127.4	3.3	81.0
34	33.90	4.57	0	0	350.8	14.0	425.6	20.0	776.4	34.0	1.5	43.9	2.6	87.8	3.3	131.7	3.5	83.8
36	32.88	4.72	0	0	362.0	14.9	436.7	21.1	798.7	36.0	1.6	45.3	2.8	90.6	3.5	135.8	3.7	86.5
38	31.95	4.86	0	0	372.8	15.8	447.5	22.2	820.4	38.0	1.7	46.6	3.0	93.3	3.7	139.9	4.0	89.0
40	31.10	5.00	0	0	383.4	16.7	458.1	23.3	841.4	40.0	1.8	47.9	3.1	95.9	3.9	143.9	4.2	91.6
42	30.31	5.13	0	0	393.7	17.6	468.4	24.4	862.0	42.0	1.9	49.2	3.3	98.5	4.1	147.8	4.4	94.0
44	29.59	5.26	0	0	403.7	18.6	478.4	25.4	882.1	44.0	2.0	50.5	3.5	101.0	4.4	151.5	4.6	96.4
46	28.91	5.39	0	0	413.5	19.5	488.2	26.5	901.7	46.0	2.1	51.7	3.7	103.5	4.6	155.2	4.9	98.8
48	28.28	5.52	0	0	423.1	20.4	497.8	27.6	920.9	48.0	2.2	52.9	3.8	105.9	4.8	158.8	5.1	101.1
50	27.68	5.64	0	0	432.6	21.3	507.2	28.7	939.7	50.0	2.3	54.1	4.0	108.2	5.0	162.4	5.3	103.3
52	27.13	5.76	0	0	441.8	22.2	516.4	29.8	958.2	52.0	2.4	55.3	4.2	110.6	5.2	165.9	5.6	105.6
54	26.61	5.88	0	0	450.8	23.2	524.4	30.8	976.3	54.0	2.5	56.4	4.3	112.8	5.4	169.3	5.8	107.7
56	26.12	6.00	0	0	459.7	24.1	534.3	31.9	994.0	56.0	2.6	57.5	4.5	115.0	5.6	172.6	6.0	109.9
58	25.65	6.11	0	0	468.4	25.0	543.0	33.0	1011.5	58.0	2.7	58.6	4.7	117.2	5.9	175.9	6.3	111.9
60	25.21	6.22	0	0	477.0	25.9	551.6	34.1	1028.6	60.0	2.8	59.7	4.9	119.4	6.1	179.1	6.5	114.0

Paul Kovacs
APPROVED ..... CHIEF ENGINEER
DATE 2-7-2012

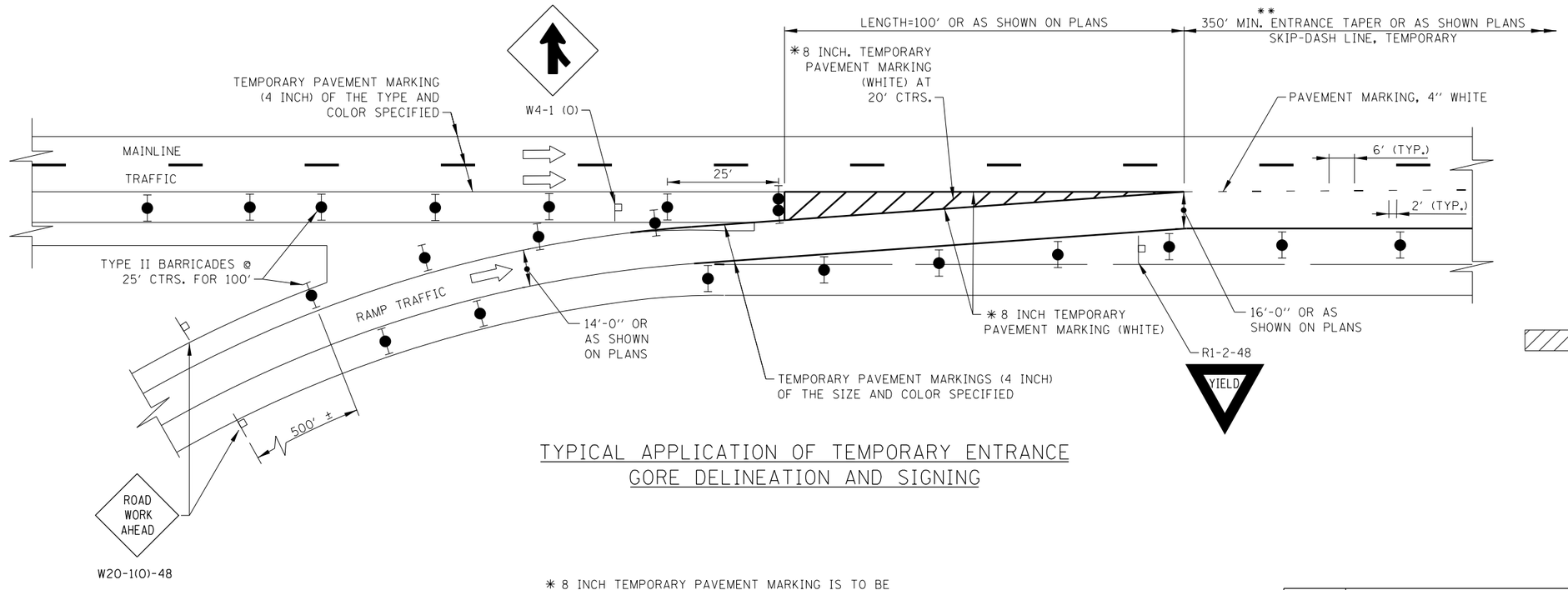
Illinois Tollway

MAINTENANCE OF TRAFFIC
REVERSE CURVE

STANDARD E4-05



TYPICAL APPLICATION OF TEMPORARY EXIT GORE DELINEATION AND SIGNING



TYPICAL APPLICATION OF TEMPORARY ENTRANCE GORE DELINEATION AND SIGNING

SYMBOLS

- WORK AREA
- SIGN
- TYPE II BARRICADE, DRUM, OR VERTICAL BARRICADE WITH STEADY BURN MONODIRECTIONAL LIGHT
- DRUM WITH STEADY BURNING LIGHT

* 8 INCH TEMPORARY PAVEMENT MARKING IS TO BE MADE OF 2-TEMPORARY PAVEMENT MARKING 4 INCH, WHITE OF THE TYPE SPECIFIED.

* * BASED ON A MAINLINE WORK ZONE SPEED LIMIT OF 45 M.P.H.

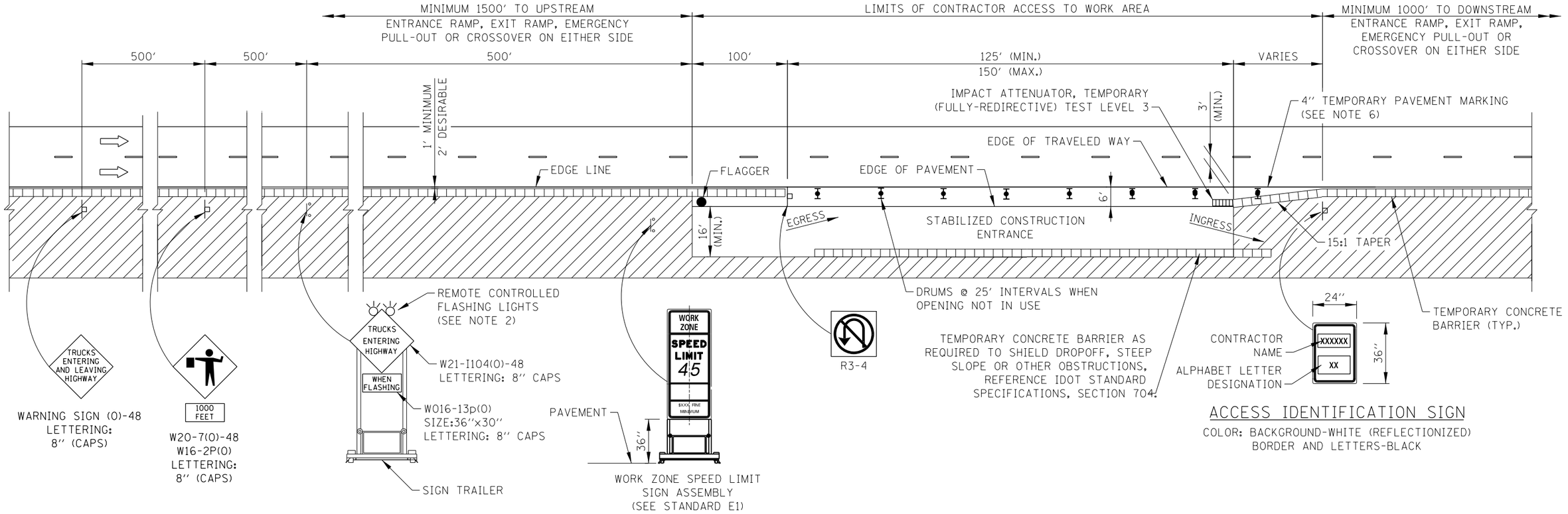
Paul Kovacs
APPROVED ..... DATE 5-1-2009
CHIEF ENGINEER

Illinois Tollway

DATE	REVISIONS
1-01-2011	CHANGE SYMBOL DESIGNATION
2-07-2012	REVISED MERGE SIGN.
3-31-2014	ADDED 45 MPH SPEED TO ENTRANCE TAPER.
3-11-2015	REVISED EXIT/ENTRANCE DETAIL LAYOUTS
	REMOVED DETAILS NOT NEEDED

TEMPORARY GORE DETAILS

STANDARD E5-04



ACCESS IDENTIFICATION SIGN

COLOR: BACKGROUND-WHITE (REFLECTIONIZED)
BORDER AND LETTERS-BLACK

CONTRACTOR ACCESS TO WORK AREA

(45 M.P.H.)

LEGEND

- ● FLAGGER
- CONSTRUCTION SIGN ON SUPPORT PER TOLLWAY STANDARD UNLESS NOTED
- DIRECTION OF TRAFFIC FLOW
- WORK AREA
- DRUM WITH STEADY BURNING MONODIRECTIONAL LIGHT

NOTES:

1. SIGNS DESIGNATED FOR THIS ACCESS TO WORK AREA SHALL BE COVERED OR TURNED AWAY FROM THE TRAFFIC WHEN THE FLAGGER IS NOT ON STATION AND THE ACCESS OPENINGS ARE NOT IN USE.
2. THE FLASHING WARNING LIGHT SHALL MEET THE REQUIREMENTS OF TOLLWAY SUPPLEMENTAL SPECIFICATIONS AND BE OPERATED BY THE FLAGGER REMOTELY. THE LIGHTS SHALL BE FLASHING ONLY WHEN A VEHICLE IS ENTERING THE TOLLWAY.
3. WHEN THREE LANES OR MORE ARE OPENED TO TRAFFIC, ADVANCE WARNING SIGNS AND ASSEMBLIES SHALL BE PROVIDED ON BOTH SIDES OF TRAVELED WAY.
4. WHEN CONTRACTOR ACCESS TO WORK AREA IS ON OPPOSITE SIDE FROM SHOWN, ALL INSTALLATIONS ARE MIRROR IMAGE.
5. FOR NIGHTIME OPERATIONS, TEMPORARY LIGHTING OF CONSTRUCTION ACCESS TO WORK AREA SHALL BE PROVIDED.
6. TEMPORARY PAVEMENT MARKINGS SHALL BE REPLACED AS OFTEN AS NECESSARY TO DELINEATE OPENINGS.
7. IF POSSIBLE, LANE CLOSURES SHALL BE UTILIZED TO ELIMINATE THE MERGING OF CONSTRUCTION TRAFFIC INTO THROUGH TRAFFIC LANES.
8. A 1'-0" MINIMUM/2'-0" DESIRABLE SHY DISTANCE SHALL BE PROVIVED, MEASURED BETWEEN EDGE OF PAVEMENT LANE MARKING TO THE EDGE OF THE TRAFFIC CONTROL DEVICES.
9. "TRUCKS ENTERING HIGHWAY" SIGN MAY BE SUPPORTED BY OPTIONAL POST OR STAND MOUINTED DEVICES WHEN POSITIONED BEHIND TEMPORARY CONCRETE BARRIER.

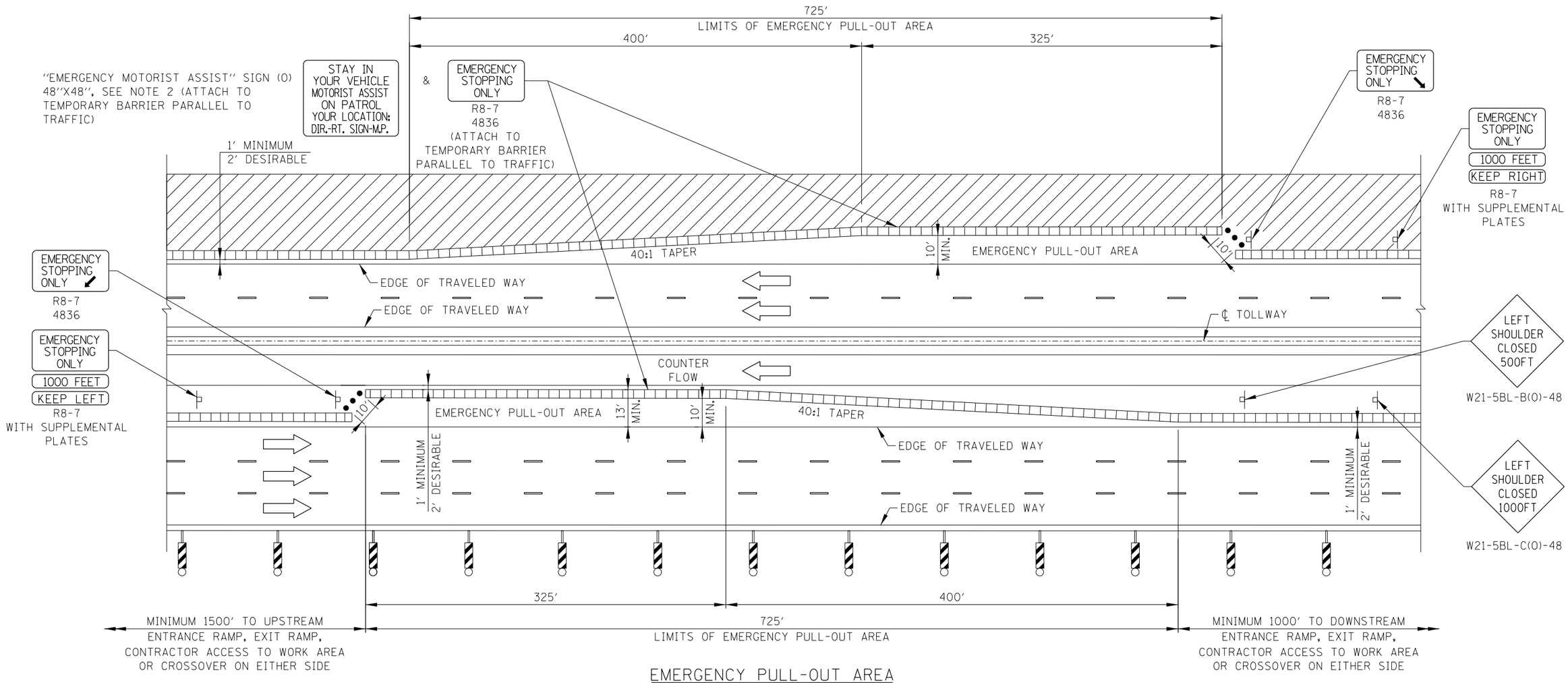
Paul Kovacs
APPROVED ..... DATE 2-7-2012
CHIEF ENGINEER

Illinois Tollway

DATE	REVISIONS
3-01-2013	REVISED NOTES.
3-31-2014	REVISED NOTE FOR TEMPORARY CONCRETE BARRIER.

CONTRACTOR ACCESS TO WORK AREA

STANDARD E6-02



EMERGENCY PULL-OUT AREA

LEGEND

- TEMPORARY CONCRETE BARRIER WITH BARRIER DELINEATORS ON TRAFFIC SIDE
- VERTICAL PANELS WITH STEADY BURNING LIGHTS @ 100 FT CENTERS ALONG ROADWAY (TANGENT) AND 50 FT CENTERS ALONG TAPERS.
- WORK AREA
- FLEXIBLE DELINEATOR POSTS
- DIRECTION OF TRAFFIC FLOW
- CONSTRUCTION SIGN ON SUPPORT PER TOLLWAY STANDARD UNLESS NOTED.

NOTES:

1. PULL-OUT AREA SPACED PER CONTRACT DOCUMENTS.
2. ENGINEER TO DETERMINE EMERGENCY ASSIST SIGN'S INFORMATION FOR DIRECTION-ROUTE SIGN-MILEPOST ONCE THE LOCATION HAS BEEN ACCEPTED.
3. A 1'-0" MINIMUM/2'-0" DESIRABLE SHY DISTANCE SHALL BE PROVIDED, MEASURED BETWEEN EDGE OF PAVEMENT LANE MARKING TO THE EDGE OF THE TRAFFIC CONTROL DEVICE.
4. FLEXIBLE DELINEATORS TO BE 48" IN HEIGHT ABOVE BASE, TUBULAR POSTS (ORANGE) WITH 360 DEGREES FULL VIEW TWO-4" FLOURESCENT ORANGE REFLECTORIZED TAPE BANDS. FLEXIBLE DELINEATORS SHALL BE CAPABLE OF BENDING UNDER REPEATED IMPACTS AND RETURN TO AN UPRIGHT POSITION WITHOUT DAMAGE TO THE IMPACTING VEHICLE OR THE DELINEATORS. THE DELINEATOR'S BASE SHALL BE SECURELY MOUNTED TO THE ROADWAY SURFACE. THE POSTS SHALL BE REMOVABLE FROM THE BASES TO PERMIT REPLACEMENT OF DAMAGED UNITS AS REQUIRED.

Paul Kovacs
APPROVED ..... CHIEF ENGINEER
DATE 2-7-2012

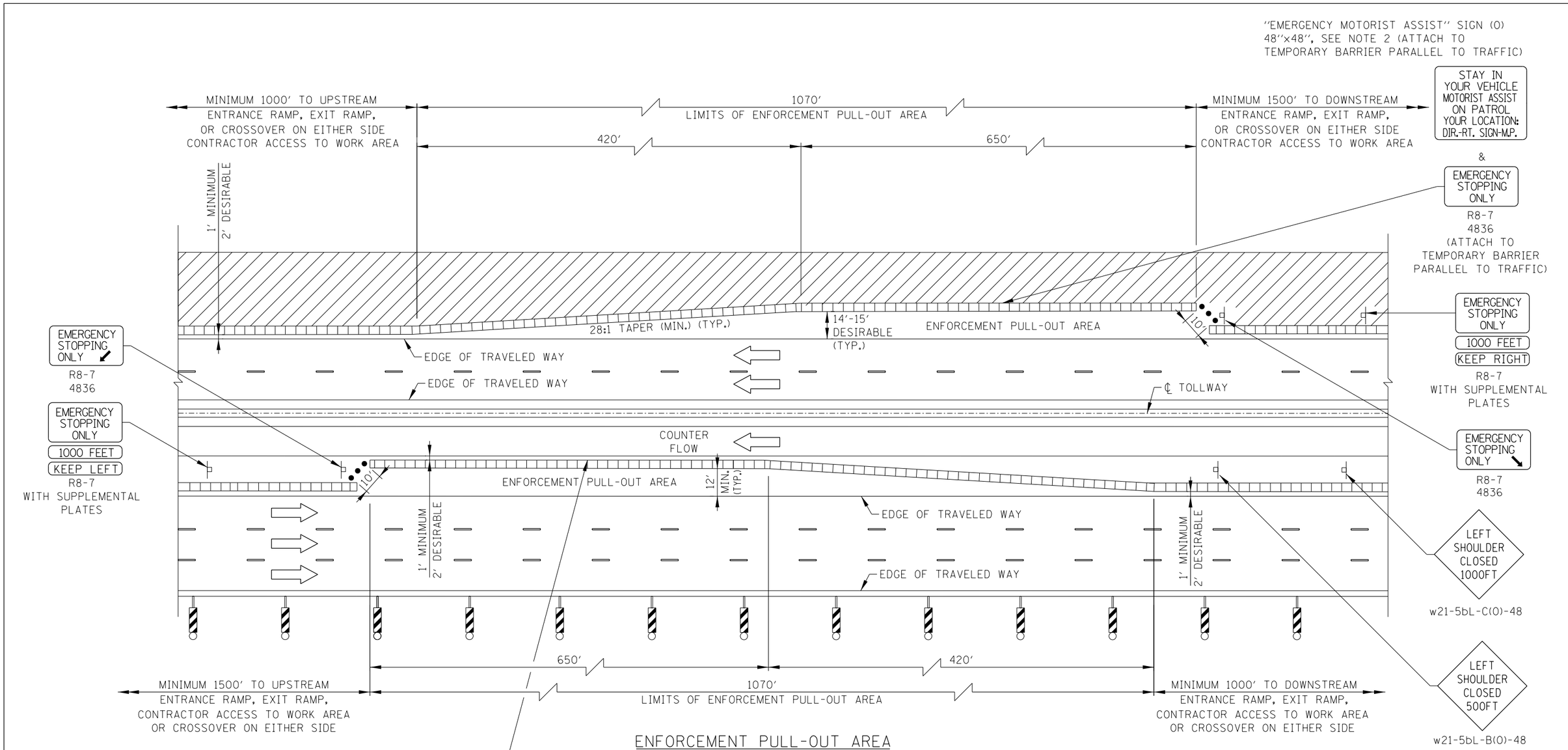
SHEET 1 OF 2

Illinois Tollway

DATE	REVISIONS
11-01-12	REVISED LENGTH OF PULL-OUT AREA
	REVISED NOTES
03-01-13	REVISED "EMERGENCY MOTORIST
	ASSIST" SIGN NOTE.
03-31-14	ADDED ENFORCEMENT PULL-OUT AREA
03-11-15	REVISED NOTES

PULL-OUT AREA

STANDARD E7-04



ENFORCEMENT PULL-OUT AREA

"EMERGENCY MOTORIST ASSIST" SIGN (O)
48"x48", SEE NOTE 2 (ATTACH TO
TEMPORARY BARRIER PARALLEL TO TRAFFIC)

STAY IN YOUR VEHICLE MOTORIST ASSIST ON PATROL YOUR LOCATION: DIR.-RT. SIGN-M.P.

&

EMERGENCY STOPPING ONLY

R8-7
4836
(ATTACH TO
TEMPORARY BARRIER
PARALLEL TO TRAFFIC)

LEGEND

- TEMPORARY CONCRETE BARRIER WITH BARRIER DELINEATORS ON TRAFFIC SIDE
- VERTICAL PANELS WITH STEADY BURNING LIGHTS @ 100 FT CENTERS ALONG ROADWAY (TANGENT) AND 50 FT CENTERS ALONG TAPERS.
- WORK AREA
- FLEXIBLE DELINEATOR POSTS
- DIRECTION OF TRAFFIC FLOW
- CONSTRUCTION SIGN ON SUPPORT PER TOLLWAY STANDARD UNLESS NOTED.

SEE SHEET 1 IN THIS SERIES FOR NOTES.

Paul Kovacs
APPROVED ..... DATE 2-7-2012
CHIEF ENGINEER

Illinois Tollway

PULL-OUT AREA

STANDARD E7-04