



Highway Standards

March 1, 2019



Illinois Department of Transportation
Bureau of Design and Environment



Illinois Department of Transportation

Memorandum

To: Highway Standards Users

From: Jack A. Elston

Subject: Revision #222

Date: January 18, 2019

Revision #222 of the Highway Standards, effective March 1, 2019, is now available on the department's website.

The revisions are as follows:

<u>Removed</u>	<u>Inserted</u>	<u>Remarks</u>
Division 000 Index January 1, 2019	Division 000 Index March 1, 2019	Updated.
Division 200 Index January 1, 2019	Division 200 Index March 1, 2019	Updated.
Division 300 Index January 1, 2019	Division 300 Index March 1, 2019	Updated.
Division 400 Index January 1, 2019	Division 400 Index March 1, 2019	Updated.
Division 500 Index January 1, 2019	Division 500 Index March 1, 2019	Updated.
Division 600 Index January 1, 2019	Division 600 Index March 1, 2019	Updated.
602401-05	602401-06	Moved wall reinforcement from inside face to middle.
602402-01	602402-02	Moved wall reinforcement from inside face to middle.
602406-09	602406-10	Moved wall reinforcement from inside face to middle.
602411-07	602411-08	Moved wall reinforcement from inside face to middle.

<u>Removed</u>	<u>Inserted</u>	<u>Remarks</u>
602416-07	602416-08	Moved wall reinforcement from inside face to middle.
602421-07	602421-08	Moved wall reinforcement from inside face to middle.
602426-01	602426-02	Moved wall reinforcement of 4'-0" (1.22 m) riser from inside face to middle.
602501-04	602501-05	Moved wall reinforcement from inside face to middle.
602506-01	602506-02	Moved wall reinforcement from inside face to middle.
Division 700 Index January 1, 2019	Division 700 Index March 1, 2019	Updated.
Division 800 Index January 1, 2019	Division 800 Index March 1, 2019	Updated.
Division BLR Index January 1, 2019	Division BLR Index March 1, 2019	Updated.
Standards by Subject/Title January 1, 2019	Standards by Subject/Title March 1, 2019	Updated.

If you have any questions pertaining to the Highway Standards, please contact the Policy and Procedures Section in the Bureau of Design and Environment at (217) 782-7651.

March 1, 2019




Standards by Division

DIVISION 000 MISCELLANEOUS TABLES

STD. NO.	TITLE
000001-07	Standard Symbols, Abbreviations and Patterns
001001-02	Areas of Reinforcement Bars
001006	Decimal of an Inch and of a Foot

ABV	ABOVE	CJ YD	CUBIC YARD	HD	HEAD	PED	PEDESTAL	STD	STANDARD
A/C	ACCESS CONTROL	CULV	CULVERT	HDW	HEADWALL	PNT	POINT	SBI	STATE BOND ISSUE
AC	ACRE	C&G	CURB & GUTTER	HDUTY	HEAVY DUTY	PC	POINT OF CURVATURE	SR	STATE ROUTE
ADJ	ADJUST	D	DEGREE OF CURVE	ha	HECTARE	PI	POINT OF INTERSECTION OF HORIZONTAL CURVE	STA	STATION
AS	AERIAL SURVEYS	DC	DEPRESSED CURVE	HMA	HOT MIX ASPHALT			SPBGR	STEEL PLATE BEAM GUARDRAIL
AGG	AGGREGATE	DET	DETECTOR	HWY	HIGHWAY	PRC	POINT OF REVERSE CURVE	SS	STORM SEWER
AH	AHEAD	DIA	DIAMETER	HORIZ	HORIZONTAL	PT	POINT OF TANGENCY	STY	STORY
APT	APARTMENT	DIST	DISTRICT	HSE	HOUSE	POT	POINT ON TANGENT	ST	STREET
ASPH	ASPHALT	DOM	DOMESTIC	IL	ILLINOIS	POLYETH	POLYETHYLENE	STR	STRUCTURE
AUX	AUXILIARY	DBL	DOUBLE	IMP	IMPROVEMENT	PCC	PORTLAND CEMENT CONCRETE	e	SUPERELEVATION RATE
AGS	AUXILIARY GAS VALVE (SERVICE)	DSFL	DOWNSTREAM ELEVATION	IN DIA	INCH DIAMETER	PP	POWER POLE OR PRINCIPAL POINT	S.E. RUN,	SUPERELEVATION RUNOFF LENGTH
AVE	AVENUE	DR	DRAINAGE OR DRIVE	INL	INLET	PRM	PRIME	SURF	SURFACE
AX	AXIS OF ROTATION	DI	DRAINAGE INLET OR DROP INLET	INST	INSTALLATION	PE	PRIVATE ENTRANCE	SMK	SURVEY MARKER
BK	BACK	IDS	INTERSECTION DESIGN STUDY	INV	INVERT	PROF	PROFILE	T	TANGENT DISTANCE
B-B	BACK TO BACK	DRV	DRIVEWAY	IP	IRON PIPE	PGL	PROFILE GRADELINE	T.R.	TANGENT RUNOUT DISTANCE
BKPL	BACKPLATE	DCT	DUCT	IR	IRON ROD	PROJ	PROJECT	TEL	TELEPHONE
B	BARN	EA	EACH	JT	JOINT	P.C.	PROPERTY CORNER	TB	TELEPHONE BOX
BARR	BARRICADE	EB	EASTBOUND	kg	KILOGRAM	PL	PROPERTY LINE	TP	TELEPHONE POLE
BGN	BEGIN	EOP	EDGE OF PAVEMENT	km	KILOMETER	PR	PROPOSED	TEMP	TEMPORARY
BM	BENCHMARK	E-CL	EDGE TO CENTERLINE	LS	LANDSCAPING	R	RADIUS	TBM	TEMPORARY BENCH MARK
BIND	BINDER	E-E	EDGE TO EDGE	LN	LANE	RR	RAILROAD	TD	TILE DRAIN
BIT	BITUMINOUS	EL	ELEVATION	LT	LEFT	RSS	RAILROAD SPIKE	TBE	TO BE EXTENDED
BTM	BOTTOM	ENTR	ENTRANCE	LP	LIGHT POLE	RPS	REFERENCE POINT STAKE	TBR	TO BE REMOVED
BLVD	BOULEVARD	EXC	EXCAVATION	LGT	LIGHTING	REF	REFLECTIVE	TBS	TO BE SAVED
BRK	BRICK	EX	EXISTING	LF	LINEAL FEET OR LINEAR FEET	RCCP	REINFORCED CONCRETE CULVERT PIPE	TWP	TOWNSHIP
BBOX	BUFFALO BOX	EXPWAY	EXPRESSWAY	L	LITER OR CURVE LENGTH	REINF	REINFORCEMENT	TR	TOWNSHIP ROAD
BLDG	BUILDING	E	EXTERNAL DISTANCE OF HORIZONTAL CURVE	LC	LONG CHORD	REM	REMOVAL	TS	TRAFFIC SIGNAL
CIP	CAST IRON PIPE	E	OFFSET DISTANCE TO VERTICAL CURVE	LNG	LONGITUDINAL	RC	REMOVE CROWN	TSCB	TRAFFIC SIGNAL CONTROL BOX
CB	CATCH BASIN	F-F	FACE TO FACE	L SUM	LUMP SUM	REP	REPLACEMENT	TSC	TRAFFIC SYSTEMS CENTER
C-C	CENTER TO CENTER	FA	FEDERAL AID	MACH	MACHINE	REST	RESTAURANT	TRVS	TRANSVERSE
CL	CENTERLINE OR CLEARANCE	FAI	FEDERAL AID INTERSTATE	MB	MAIL BOX	RESURF	RESURFACING	TRVL	TRAVEL
CL-E	CENTERLINE TO EDGE	FAP	FEDERAL AID PRIMARY	MH	MANHOLE	RET	RETAINING	TRN	TURN
CL-F	CENTERLINE TO FACE	FAS	FEDERAL AID SECONDARY	MATL	MATERIAL	RT	RIGHT	TY	TYPE
CTS	CENTERS	FAUS	FEDERAL AID URBAN SECONDARY	MED	MEDIAN	ROW	RIGHT-OF-WAY	T-A	TYPE A
CERT	CERTIFIED	FP	FENCE POST	m	METER	RD	ROAD	TYP	TYPICAL
CHSLD	CHISELED	FE	FIELD ENTRANCE	METH	METHOD	RDWY	ROADWAY	UNDGND	UNDERGROUND
CS	CITY STREET	FH	FIRE HYDRANT	M	MID-ORDINATE	RTE	ROUTE	USGS	U.S. GEOLOGICAL SURVEY
CP	CLAY PIPE	FL	FLOW LINE	mm	MILLIMETER	SAN	SANITARY	USEL	UPSTREAM ELEVATION
CLSD	CLOSED	FDN	FOUNDATION	mm DIA	MILLIMETER DIAMETER	SANS	SANITARY SEWER	USFL	UPSTREAM FLOWLINE
CLID	CLOSED LID	FR	FRAME	MIX	MIXTURE	SEC	SECTION	UTIL	UTILITY
CT	COAT OR COURT	F&G	FRAME & GRATE	MOD	MODIFIED	SEED	SEEDING	VBOX	VALVE BOX
COMB	COMBINATION	FRWAY	FREEWAY	MBH	MOBILE HOME	SHAP	SHAPING	VV	VALVE VAULT
C	COMMERCIAL BUILDING	GAL	GALLON	MFT	MODIFIED	S	SHED	VLT	VAULT
CE	COMMERCIAL ENTRANCE	GALV	GALVANIZED	N & BC	NAIL & BOTTLE CAP	SH	SHEET	VEH	VEHICLE
CONC	CONCRETE	G	GARAGE	N & C	NAIL & CAP	SHLD	SHOULDER	VP	VENT PIPE
CONST	CONSTRUCT	GM	GAS METER	N & W	NAIL & WASHER	SW	SIDEWALK OR SOUTHWEST	VERT	VERTICAL
CONTD	CONTINUED	GV	GAS VALVE	NOAA	NATIONAL OCEANIC ATMOSPHERIC ADMINISTRATION	SIG	SIGNAL	VC	VERTICAL CURVE
CONT	CONTINUOUS	GRAN	GRANULAR	NC	NORMAL CROWN	SOD	SODDING	VPC	VERTICAL POINT OF CURVATURE
COR	CORNER	GR	GRATE	NB	NORTHBOUND	SM	SOLID MEDIUM	VPI	VERTICAL POINT OF INTERSECTION
CORR	CORRUGATED	GRV	GRAVEL	NE	NORTHEAST	SB	SOUTHBOUND	VPT	VERTICAL POINT OF TANGENCY
CMP	CORRUGATED METAL PIPE	GND	GROUND	NW	NORTHWEST	SE	SOUTHEAST	WM	WATER METER
CNTY	COUNTY	GUT	GUTTER	OLID	OPEN LID	SPL	SPECIAL	WV	WATER VALVE
CH	COUNTY HIGHWAY	GP	GUY POLE	PAT	PATTERN	SD	SPECIAL DITCH	WMAIN	WATER MAIN
CSE	COURSE	GW	GUY WIRE	PVD	PAVED	SQ FT	SQUARE FEET	WB	WESTBOUND
XSECT	CROSS SECTION	HH	HANDHOLE	PVMT	PAVEMENT	m ²	SQUARE METER	WDFL	WILDFLOWERS
m ³	CUBIC METER	HATCH	HATCH	PM	PAVEMENT MARKING	mm ²	SQUARE MILLIMETER	W	WITH
mm ³	CUBIC MILLIMETER					SQ YD	SQUARE YARD	WO	WITHOUT
						STB	STABILIZED		


 Illinois Department of Transportation
 PASSED *Michael Bond* January 1, 2019
 ENGINEER OF POLICY AND PROCEDURES
 APPROVED *Scott E. G...* January 1, 2019
 ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-19	Added new symbols.
1-1-11	Updated abbrevlations and symbols.

**STANDARD SYMBOLS,
 ABBREVIATIONS
 AND PATTERNS**
(Sheet 1 of 9)
STANDARD 000001-07

<u>ADJUSTMENT ITEMS</u>		<u>EX</u>	<u>PR</u>	<u>ALIGNMENT ITEMS</u>		<u>EX</u>	<u>PR</u>	<u>DRAINAGE ITEMS</u>		<u>EX</u>	<u>PR</u>
Structure To Be Adjusted			ADJ	Baseline				Channel or Stream Line			
Structure To Be Cleaned			C	Centerline				Culvert Line			
Main Structure To Be Filled			FM	Centerline Break Circle				Grading & Shaping Ditches			
Structure To Be Filled			F	Baseline Symbol				Drainage Boundary Line			
Structure To Be Filled Special			FSP	Centerline Symbol				Paved Ditch			
Structure To Be Removed			R	PI Indicator				Aggregate Ditch			
Structure To Be Reconstructed			REC	Point Indicator				Pipe Underdrain			
Structure To Be Reconstructed Special			RSP	Horizontal Curve Data (Half Size)	CURVE P.I. STA= ΔP= D= R= T= L= E= θ= T.R.= S.E. RUN= P.C. STA= P.T. STA=	CURVE P.I. STA= ΔP= D= R= T= L= E= θ= T.R.= S.E. RUN= P.C. STA= P.T. STA=		Storm Sewer			
Frame and Grate To Be Adjusted			A	<u>BOUNDARIES ITEMS</u>		<u>EX</u>	<u>PR</u>	Flowline			
Frame and Lid To Be Adjusted			A	Dashed Property Line				Ditch Check			
Domestic Service Box To Be Adjusted			A	Solid Property/Lot Line				Headwall			
Valve Vault To Be Adjusted			A	Section/Grant Line				Inlet			
Special Adjustment			SP	Quarter Section Line				Manhole			
Item To Be Abandoned			AB	Quarter/Quarter Section Line				Summit			
Item To Be Moved			M	County/Township Line				Roadway Ditch Flow			
Item To Be Relocated			REL	State Line				Swale			
Pavement Removal and Replacement				Iron Pipe Found				Catch Basin			
				Iron Pipe Set				Culvert End Section			
				Survey Marker				Water Surface Indicator			
				Property Line Symbol				Rlrap			
				Same Ownership Symbol (Half Size)				<u>HYDRAULICS ITEMS</u>		<u>EX</u>	<u>PR</u>
				Northwest Quarter Corner (Half Size)				Overflow			
				Section Corner (Half Size)				Sheet Flow			
				Southeast Quarter Corner (Half Size)				Hydrant Outlet			

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**STANDARD SYMBOLS,
 ABBREVIATIONS
 AND PATTERNS**
 (Sheet 2 of 9)
STANDARD 000001-07

EROSION & SEDIMENT CONTROL ITEMS		EX	PR	NON-HIGHWAY IMPROVEMENT ITEMS			EX	PR	EXISTING LANDSCAPING ITEMS (contd.)		EX	PR
Cleaning & Grading Limits				Noise Attn./Levee					Seeding Class 5			
Dike				Field Line					Seeding Class 7			
Erosion Control Fence				Fence					Seedlings Type 1			
Perimeter Erosion Barrier				Base of Levee					Seedlings Type 2			
Temporary Fence				Mallbox					Mowstake w/Sign			
Ditch Check Temporary				Multiple Mallboxes					Tree Trunk Protection			
Ditch Check Permanent				Pay Telephone					Evergreen Tree			
Inlet & Pipe Protection				Advertising Sign					Shade Tree			
Sediment Basin				ITS Camera					Duct			
Erosion Control Blanket				Wind Turbine					Conduit			
Fabric Formed Concrete Revetment Mat				Cellular Tower					Electrical Aerial Cable			
Turf Reinforcement Mat				Intelligent Transportation Systems					Electrical Buried Cable			
Mulch Temporary				LANDSCAPING ITEMS					Controller			
Mulch Method 1				Contour Mounding Line					Underpass Luminaire			
Mulch Method 2 Stabilized				Fence					Power Pole			
Mulch Method 3 Hydraulic				Fence Post								
				Shrubs								
				Mowline								
				Perennial Plants								
				Seeding Class 2								
				Seeding Class 2A								
				Seeding Class 4								
				Seeding Class 4 & 5 Combined								
CONTOUR ITEMS			EX	PR				EX	PR	LIGHTING		
Approx. Index Line												
Approx. Intermediate Line												
Index Contour												
Intermediate Contour												

**STANDARD SYMBOLS,
ABBREVIATIONS
AND PATTERNS**
(Sheet 3 of 9)

STANDARD 00001-07

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APPROVED January 1, 2019
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**LIGHTING
(contd.)**

	EX	PR
Pull Point		
Handhole		
Heavy Duty Handhole		
Junction Box		
Light Unit Comb.		
Electrical Ground		
Traffic Flow Arrow		
High Mast Pole (Half Size)		
Light Unit-1		

PAVEMENT (MISC.)

	EX	PR
Keyed Long, Joint		
Keyed Long, Joint w/Tie Bars		
Sawed Long, Joint w/Tie Bars		
Bituminous Shoulder		
Bituminous Taper		
Stabilized Driveway		
Widening		

PAVEMENT MARKINGS

	EX	PR
Handicap Symbol		
RR Crossing		
Raised Marker Amber 1 Way		
Raised Marker Amber 2 Way		
Raised Marker Crystal 1 Way		
Two Way Turn Left		
Shoulder Diagonal Pattern		
Skip-Dash White		
Skip-Dash Yellow		
Stop Line		
Solid Line		
Double Centerline		
Dotted Lines		

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PASSED *Michael Bond* January 1, 2019
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APPROVED *Scott Egan* January 1, 2019
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ISSUES

**STANDARD SYMBOLS,
ABBREVIATIONS
AND PATTERNS**
 (Sheet 4 of 9)

STANDARD 000001-07

PAVEMENT MARKINGS
(contd.)

EX

PR

CL 2Ln 2Way
RRPM 12.2 m (40') o.c.



CL 2Ln 2Way
RRPM 80' (24.4 m) o.c.



CL Multilane Div.
RRPM 40' (12.2 m) o.c.



CL Multilane Div.
RRPM 80' (24.4 m) o.c.



CL Multilane Div. DbI.
RRPM 80' (24.4 m) o.c.



CL Multilane Undiv.



Two Way Turn Left Line



Urban Combination Left



Urban Combination Right



Urban Left Turn Arrow



Urban Right Turn Arrow



Urban Left Turn Only



ONLY ONLY ONLY



Urban Right Turn Only



Urban Thru Only

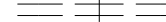


RAILROAD ITEMS

EX

PR

Abandoned Railroad



Railroad



Railroad Point



Control Box



Crossing Gate



Flashing Signal



Railroad Cant. Mast Arm



Crossbuck

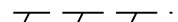


REMOVAL ITEMS

EX

PR

Removal Tic



Bituminous Removal



Hatch Pattern



Tree Removal Single



RIGHT OF WAY ITEMS

EX

PR

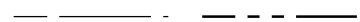
Future ROW Corner Monument



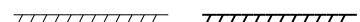
ROW Marker



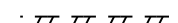
ROW Line



Easement



Temporary Easement



Illinois Department of Transportation

PASSED *Michael B. ...* January 1, 2019

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APPROVED *...* January 1, 2019

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**STANDARD SYMBOLS,
ABBREVIATIONS
AND PATTERNS**
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STANDARD 000001-07

PAVEMENT MARKINGS
(contd.)

EX

PR

Urban U-Turn



Urban Combined U-Turn



Rural Combination Left



Rural Combination Right



Rural Left Turn Arrow



Rural Right Turn Arrow



Rural Left Turn Only



ONLY



Rural Right Turn Only



ONLY



Rural Thru Only



ONLY



Bike Lane Symbol



Bike Lane Text



Bike Path Shared



Bike Shared Roadway



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PASSED *Will Boyd* January 1, 2019
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APPROVED *Seamus* January 1, 2019
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LEG-1 03/15/21

**STANDARD SYMBOLS,
ABBREVIATIONS
AND PATTERNS**

(Sheet 6 of 9)

STANDARD 000001-07

**SIGNING ITEMS
(contd.)**

EX

PR

One Way Arrow Lrg. W1-6-(O)
(Half Size)



Two Way Arrow Large W1-7-(O)
(Half Size)



Detour M4-10L-(O)
(Half Size)



Detour M4-10R-(O)
(Half Size)



One Way Left R6-1L
(Half Size)



One Way Right R6-1R
(Half Size)



Left Turn Lane R3-1100L
(Half Size)



Keep Left R4-7AL
(Half Size)



Keep Left R4-7BL
(Half Size)



Keep Right R4-7AR
(Half Size)



Keep Right R4-7BR
(Half Size)



Stop Here On Red R10-6-AL
(Half Size)



Stop Here On Red R10-6-AR
(Half Size)



No Left Turn R3-2
(Half Size)



No Right Turn R3-1
(Half Size)



Road Closed R11-2
(Half Size)



Road Closed Thru Traffic R11-2
(Half Size)



STRUCTURES ITEMS

EX

PR

Box Culvert Barrel



Box Culvert Headwall



Bridge Pier



Bridge



Retaining Wall



Temporary Sheet Piling



**TRAFFIC SHEET
ITEMS**

EX

PR

Cable Number



Left Turn Green



Left Turn Yellow



Signal Backplate



Signal Section 8" (200 mm)



Signal Section 12" (300 mm)



Walk/Don't Walk Letters



Walk/Don't Walk Symbols



**TRAFFIC SIGNAL
ITEMS**

EX

PR

Galv. Steel Conduit



Underground Cable



Detector Loop Line



Detector Loop Large



Detector Loop Small



Detector Loop Quadrapole



**STANDARD SYMBOLS,
ABBREVIATIONS
AND PATTERNS**

(Sheet 8 of 9)

STANDARD 000001-07

Illinois Department of Transportation

PASSED *Michael Reed* January 1, 2019
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APPROVED *Scott Egan* January 1, 2019
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LEG-11 03/11/12

REINFORCEMENT BARS - ENGLISH (METRIC)																	
Bar Size English (metric)	Dia. in. mm	Cross- Sectional Area sq. in. (sq. mm)	Weight lbs./ft. kg/m	SPACING, In. (mm)													
				4 (100)	4½ (115)	5 (125)	5½ (140)	6 (150)	6½ (165)	7 (175)	7½ (190)	8 (200)	8½ (215)	9 (225)	10 (250)	11 (275)	12 (300)
				AREA OF STEEL PER FOOT (METER), sq. in. (sq. mm)													
3 (10)	0.375 (9.5)	0.110 (71)	0.376 (0.560)	0.330 (710)	0.293 (617)	0.264 (568)	0.240 (507)	0.220 (473)	0.203 (430)	0.189 (406)	0.176 (374)	0.165 (355)	0.155 (330)	0.147 (316)	0.132 (284)	0.120 (258)	0.110 (237)
4 (13)	0.500 (12.7)	0.196 (129)	0.668 (0.944)	0.588 (1290)	0.523 (1122)	0.470 (1032)	0.428 (921)	0.392 (860)	0.362 (782)	0.336 (737)	0.314 (679)	0.294 (645)	0.277 (600)	0.261 (573)	0.235 (516)	0.214 (469)	0.196 (430)
5 (16)	0.625 (15.9)	0.307 (199)	1.043 (1.552)	0.921 (1990)	0.819 (1730)	0.737 (1592)	0.670 (1421)	0.614 (1327)	0.567 (1206)	0.526 (1137)	0.491 (1047)	0.461 (995)	0.433 (926)	0.409 (884)	0.368 (796)	0.335 (724)	0.307 (663)
6 (19)	0.750 (19.1)	0.442 (284)	1.502 (2.235)	1.326 (2840)	1.179 (2470)	1.061 (2272)	0.964 (2029)	0.884 (1893)	0.816 (1721)	0.758 (1623)	0.707 (1495)	0.663 (1420)	0.624 (1321)	0.589 (1262)	0.530 (1136)	0.482 (1033)	0.442 (947)
7 (22)	0.875 (22.2)	0.601 (387)	2.044 (3.042)	1.803 (3870)	1.603 (3365)	1.442 (3096)	1.311 (2764)	1.202 (2580)	1.110 (2345)	1.030 (2211)	0.962 (2037)	0.902 (1935)	0.848 (1800)	0.801 (1720)	0.721 (1548)	0.656 (1407)	0.601 (1290)
8 (25)	1.000 (25.4)	0.785 (510)	2.670 (3.973)	2.355 (5100)	2.093 (4435)	1.884 (4080)	1.713 (3543)	1.570 (3400)	1.449 (3091)	1.346 (2914)	1.256 (2684)	1.178 (2550)	1.108 (2372)	1.047 (2267)	0.942 (2040)	0.856 (1855)	0.785 (1700)
9 (29)	1.128 (28.7)	1.000 (645)	3.400 (5.060)	3.000 (6450)	2.667 (5609)	2.400 (5160)	2.182 (4607)	2.000 (4300)	1.846 (3909)	1.714 (3686)	1.600 (3395)	1.500 (3225)	1.412 (3000)	1.333 (2867)	1.200 (2580)	1.091 (2345)	1.000 (2150)
10 (32)	1.270 (32.3)	1.267 (819)	4.303 (6.404)	3.801 (8190)	3.379 (7122)	3.041 (6552)	2.764 (5850)	2.534 (5460)	2.339 (4964)	2.172 (4680)	2.027 (4311)	1.901 (4095)	1.789 (3809)	1.689 (3640)	1.520 (3276)	1.382 (2978)	1.267 (2730)
11 (36)	1.410 (35.8)	1.561 (1006)	5.313 (7.907)	4.683 (10060)	4.163 (8748)	3.746 (8048)	3.406 (7186)	3.122 (6707)	2.882 (6097)	2.676 (5749)	2.498 (5295)	2.342 (5030)	2.204 (4679)	2.081 (4471)	1.873 (4024)	1.703 (3658)	1.561 (3353)

 Illinois Department of Transportation
 PASSED January 1, 2009
Scott S. Kelly
 ENGINEER OF POLICY AND PROCEDURES
 APPROVED January 1, 2009
Ken E. Han
 ENGINEER OF DESIGN AND ENVIRONMENT

469-1-03/ISS

DATE	REVISIONS	AREAS OF REINFORCEMENT BARS
1-1-09	Switched units to English (metric).	
1-1-07	Deleted metric table, Soft converted English table.	
		STANDARD 001001-02

DECIMAL OF AN INCH AND OF A FOOT

A		B	A		B	A		B	A		B	A		B
1/16	0.0052	1/32	1/8	0.171875	2 1/16	1/32	0.3385	4 1/16	3/16	0.5052	6 1/16	1/4	0.671875	8 1/16
	0.0104	1/16		0.1771	2 1/8		0.34375	4 1/8		0.5104	6 1/8		0.6771	8 1/8
	0.015625	3/32		0.1823	2 1/4		0.3490	4 1/4		0.515625	6 1/4		0.6823	8 1/4
	0.0208	1/8		0.1875	2 1/2		0.3542	4 1/2		0.5208	6 1/2		0.6875	8 1/2
1/8	0.0260	1/16	3/16	0.1927	2 3/8	1/8	0.359375	4 3/8	1/2	0.5260	6 3/8	3/4	0.6927	8 3/8
	0.03125	1/8		0.1979	2 1/2		0.3646	4 1/2		0.53125	6 1/2		0.6979	8 1/2
	0.0365	3/16		0.203125	2 5/8		0.3698	4 5/8		0.5365	6 5/8		0.703125	8 5/8
	0.0417	1/4		0.2083	2 3/4		0.3750	4 3/4		0.5417	6 3/4		0.7083	8 3/4
3/16	0.046875	3/32	1/2	0.2135	2 7/8	3/8	0.3802	4 7/8	5/8	0.546875	6 7/8	7/8	0.7135	8 7/8
	0.0521	1/8		0.21875	2 3/4		0.3854	4 3/4		0.5521	6 3/4		0.71875	8 3/4
	0.0573	3/16		0.2240	2 11/16		0.390625	4 11/16		0.5573	6 11/16		0.7240	8 11/16
	0.0625	1/4		0.2292	2 5/4		0.3958	4 5/4		0.5625	6 5/4		0.7292	8 5/4
1/4	0.0677	1 1/16	3/4	0.234375	2 1 1/16	7/8	0.4010	4 1 1/16	9/8	0.5677	6 1 1/16	1 1/8	0.734375	8 1 1/16
	0.0729	1/8		0.2396	2 1/4		0.40625	4 1/4		0.5729	6 1/4		0.7396	8 1/4
	0.078125	3/16		0.2448	2 1 1/4		0.4115	4 1 1/4		0.578125	6 1 1/4		0.7448	8 1 1/4
	0.0833	1		0.2500	3		0.4167	5		0.5833	7		0.7500	9
1/2	0.0885	1 1/8	7/8	0.2552	3 1/8	1 1/8	0.421875	5 1/8	1 3/8	0.5885	7 1/8	1 7/8	0.7552	9 1/8
	0.09375	1 1/4		0.2604	3 1/4		0.4271	5 1/4		0.59375	7 1/4		0.7604	9 1/4
	0.0990	3/8		0.265625	3 3/8		0.4323	5 3/8		0.5990	7 3/8		0.765625	9 3/8
	0.1042	1/2		0.2708	3 1/2		0.4375	5 1/2		0.6042	7 1/2		0.7708	9 1/2
3/8	0.109375	1 1/16	1	0.2760	3 1/16	1 1/8	0.4427	5 1/16	1 5/8	0.609375	7 1/16	1 7/8	0.7760	9 1/16
	0.1146	1 1/8		0.28125	3 1/8		0.4479	5 1/8		0.6146	7 1/8		0.78125	9 1/8
	0.1198	1 1/4		0.2865	3 1/4		0.453125	5 1/4		0.6198	7 1/4		0.7865	9 1/4
	0.1250	1 1/2		0.2917	3 1/2		0.4583	5 1/2		0.6250	7 1/2		0.7917	9 1/2
1/2	0.1302	1 3/16	1 1/8	0.296875	3 3/16	1 1/4	0.4635	5 3/16	1 5/8	0.6302	7 3/16	1 7/8	0.796875	9 3/16
	0.1354	1 1/4		0.3021	3 1/4		0.46875	5 1/4		0.6354	7 1/4		0.8021	9 1/4
	0.140625	1 1/2		0.3073	3 1/2		0.4740	5 1/2		0.640625	7 1/2		0.8073	9 1/2
	0.1458	1 3/4		0.3125	3 3/4		0.4792	5 3/4		0.6458	7 3/4		0.8125	9 3/4
3/4	0.1510	1 7/16	1 1/4	0.3177	3 7/16	1 3/8	0.484375	5 7/16	1 7/8	0.6510	7 7/16	1 9/8	0.8177	9 7/16
	0.15625	1 1/2		0.3229	3 1/2		0.4896	5 1/2		0.65625	7 1/2		0.8229	9 1/2
	0.1615	1 3/4		0.328125	3 3/4		0.4948	5 3/4		0.6615	7 3/4		0.828125	9 3/4
	0.1667	2		0.3333	4		0.5000	6		0.6667	8		0.8333	10

A = Fractions of Inch or Foot
 B = Inch Equivalents to Foot Fractions

Illinois Department of Transportation

PASSED January 1, 1997

APPROVED January 1, 1997

ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-97	New Standard.

DECIMAL OF AN INCH AND OF A FOOT

STANDARD 001006

March 1, 2019



Standards by Division

DIVISION 200 EARTHWORK, LANDSCAPING, and EROSION CONTROL

STD. NO. TITLE

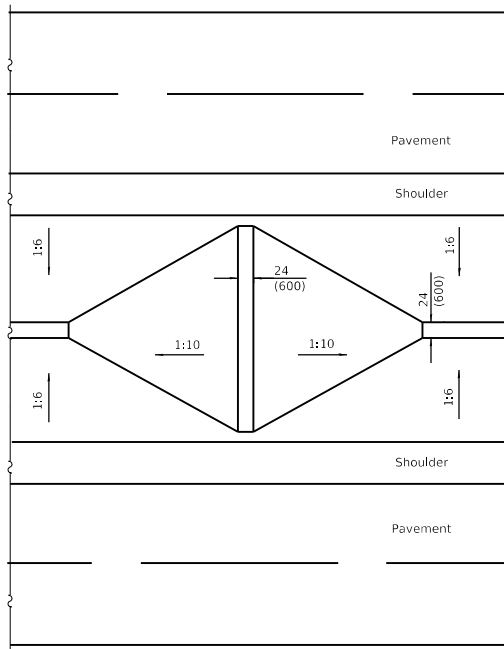
EARTHWORK

202001-01 Earth Median Ditch Check

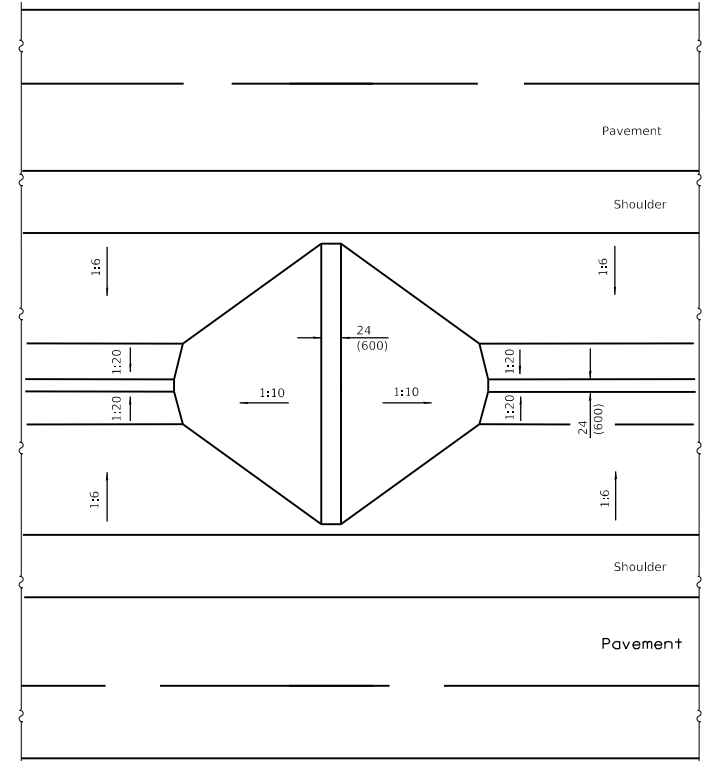
EROSION CONTROL

280001-07 Temporary Erosion Control Systems

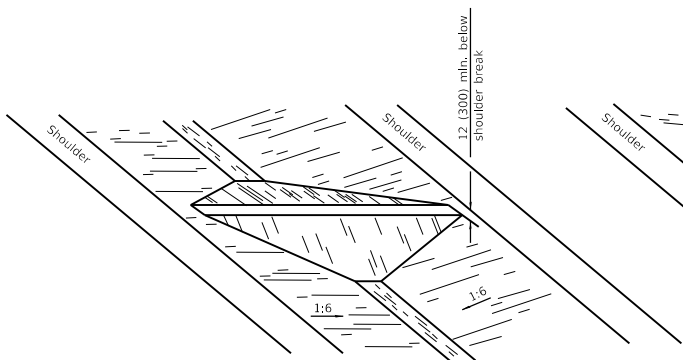
285001-02 Fabric Formed Concrete Revetment Mats



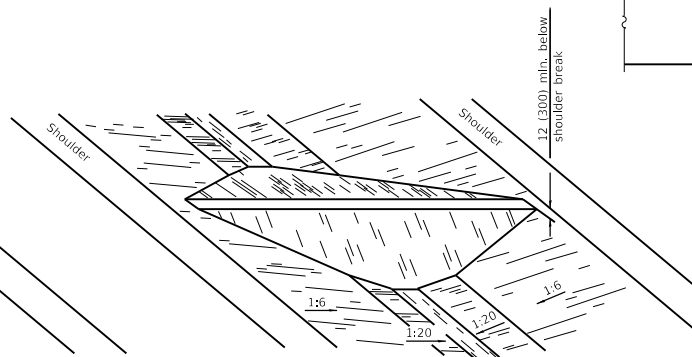
DITCH CHECK FOR NARROW MEDIAN



DITCH CHECK FOR WIDE MEDIAN



VIEW OF NARROW MEDIAN



VIEW OF WIDE MEDIAN

GENERAL NOTES

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2008

ENGINEER OF POLICY AND PROCEDURES

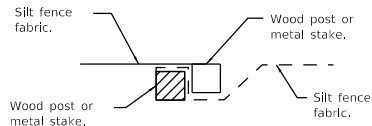
APPROVED January 1, 2008

ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-08	Switched units to English (metric).
1-1-97	Renum. Standard 2355-1.

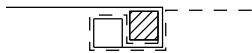
EARTH MEDIAN DITCH CHECK

STANDARD 202001-01



Place end-post (stake) of first silt fence adjacent to end-post (stake) of second silt fence with fabric positioned as shown.

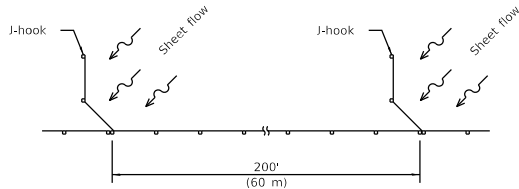
STEP 1



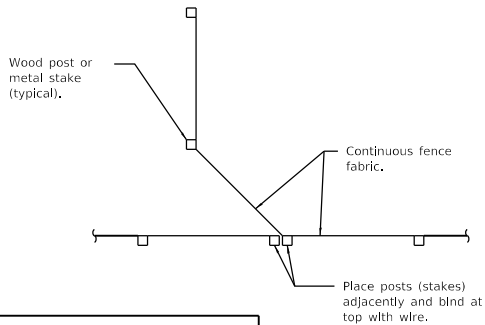
Rotate posts (stakes) together 180° clockwise and drive both posts (stakes) 18 (450) into ground.

STEP 2

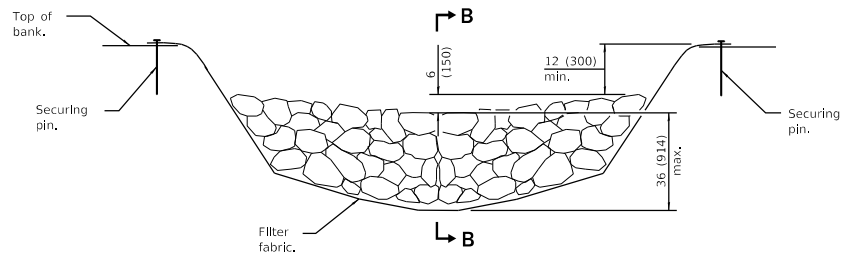
ATTACHING TWO SILT FILTER FENCES
(Not applicable for J-hooks)



SILT FILTER J-HOOK PLACEMENT

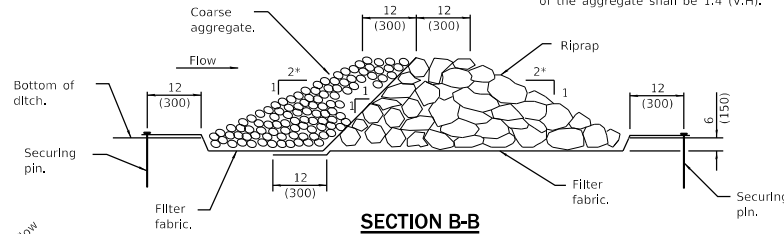


J-HOOK



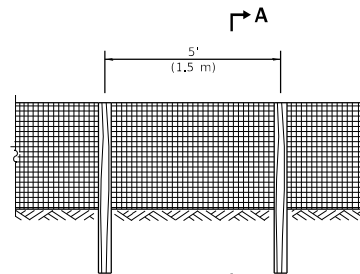
ELEVATION

* When the ditch check is within the clear zone and the road is open to traffic, the traffic approach slope of the aggregate shall be 1:4 (V:H).



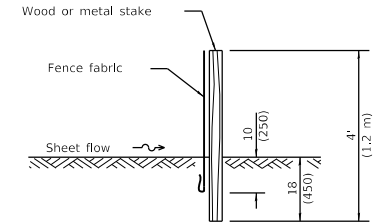
SECTION B-B

AGGREGATE DITCH CHECK

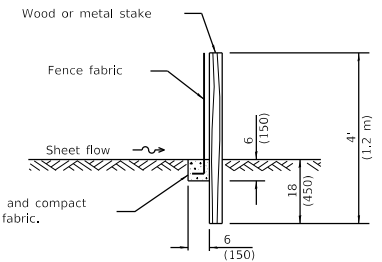


ELEVATION

SILT FILTER FENCE AS A PERIMETER EROSION BARRIER



SLICE METHOD



TRENCH METHOD

SECTION A-A

Excavate, backfill and compact trench to secure fabric.

GENERAL NOTES

The installation details and dimensions shown for perimeter erosion barriers shall also apply for inlet and pipe protection.

All dimensions are in Inches (millimeters) unless otherwise shown.

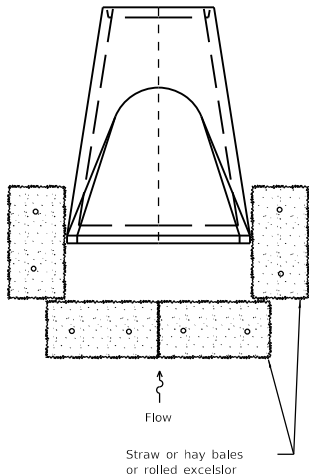
Illinois Department of Transportation
 PASSED January 1, 2013
 Michael Beard
 ENGINEER OF POLICY AND PROCEDURES
 APPROVED January 1, 2013
 ENGINEER OF DESIGN AND ENVIRONMENT

J-HOOK

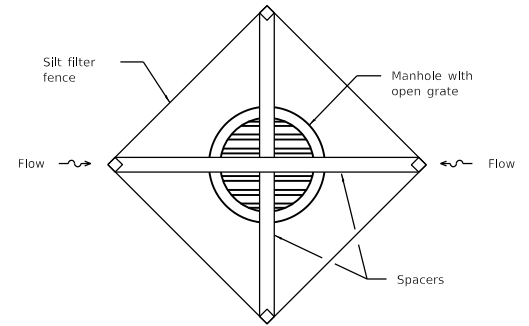
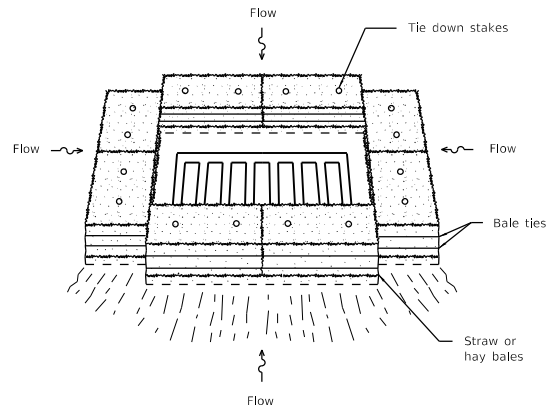
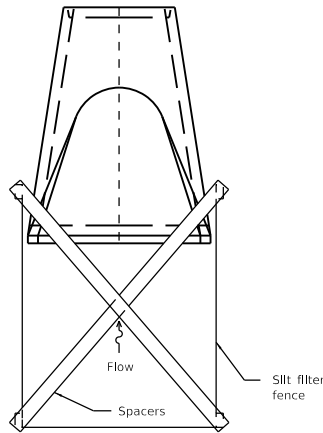
DATE	REVISIONS
1-1-13	Corrected notation for flowline (f _l) on SEDIMENT BASIN ELEVATION.
1-1-12	Omitted hay/straw perimeter barrier. Added SLICE METHOD to SECTION A-A.

TEMPORARY EROSION CONTROL SYSTEMS
(Sheet 1 of 2)

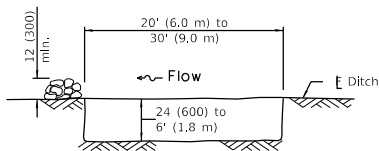
STANDARD 280001-07



Straw or hay bales or rolled excelsior

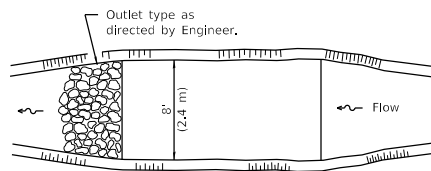


INLET AND PIPE PROTECTION



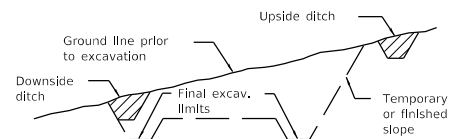
The performance of the basin will improve if put into a series.

ELEVATION

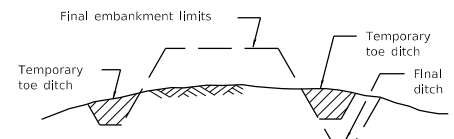


The long dimension should be parallel with the direction of the flow. Accumulated silt shall be removed anytime the basins become 75% filled.

PLAN



TYPICAL CUT CROSS-SECTION



TYPICAL FILL CROSS-SECTION

TEMPORARY DITCHES FOR CUT & FILL SECTIONS

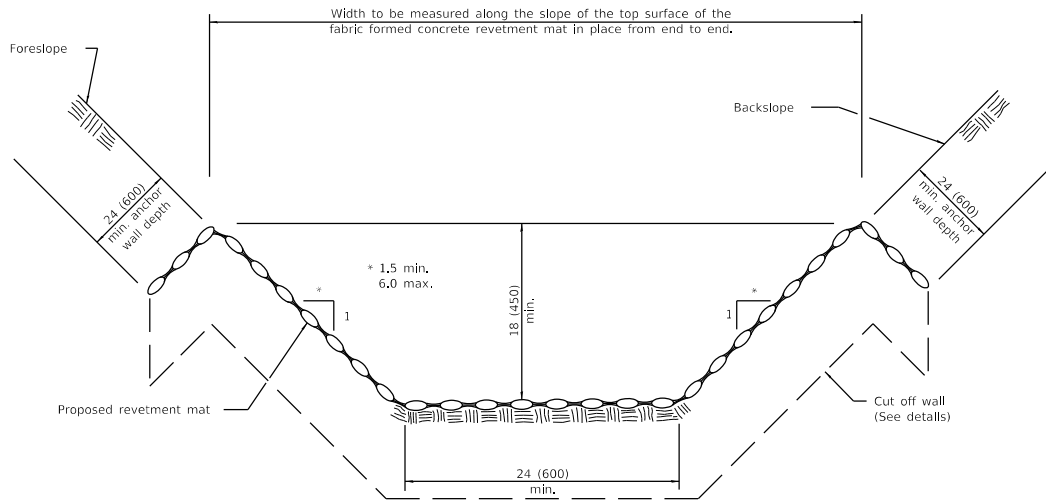
SEDIMENT BASIN

Illinois Department of Transportation	
PASSED <i>Michael Beard</i> ENGINEER OF POLICY AND PROCEDURES APPROVED <i>[Signature]</i> ENGINEER OF DESIGN AND ENVIRONMENT	January 1, 2013 2013 2013

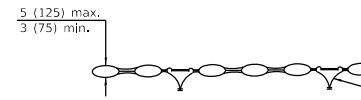
TEMPORARY EROSION CONTROL SYSTEMS

(Sheet 2 of 2)

STANDARD 280001-07

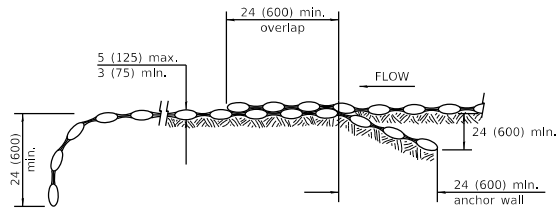


TYPICAL FABRIC FORMED CONCRETE REVETMENT MAT LINED DITCH



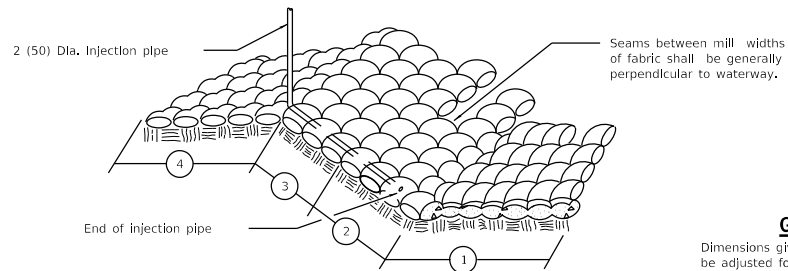
Locate field sewn joint midway between mortar stops. Lay seams down for best appearance.

TYPICAL SECTION THRU FILTER POINT MAT



CUT OFF WALL DETAILS

TYPICAL LAP JOINTS W/ANCHOR WALL



INSTALLATION DETAILS

- In placing inserts through fabric use care to avoid breaking drop stitches.
- ① - Indicates sequence of pour.

GENERAL NOTES

Dimensions given with minimum limits shall be adjusted for field conditions as directed by the Engineer.

All anchor walls on slide slopes and at lap joints, as well as cut off walls, shall be installed in trenches.

Cut off walls shall be installed at the upstream and downstream ends.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation	
PASSED	January 1, 2008
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2008
ENGINEER OF DESIGN AND ENVIRONMENT	

DATE	REVISIONS
1-1-08	Switched units to English (metric).
1-1-02	Revised second note.

FABRIC FORMED CONCRETE REVTMENT MATS
STANDARD 285001-02

March 1, 2019



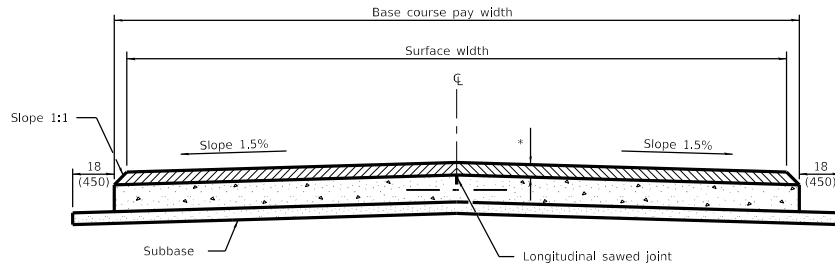
Standards by Division

DIVISION 300 SUBGRADES, SUBBASES, and BASE COURSES

STD. NO. TITLE

BASE COURSE

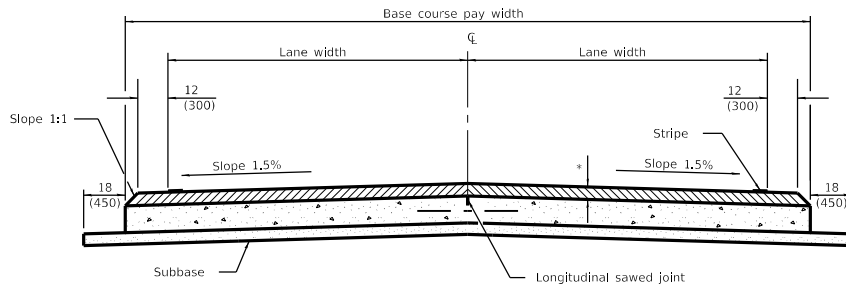
353001-05 PCC Base Course with HMA Binder and Surface Courses



SECTION A-A

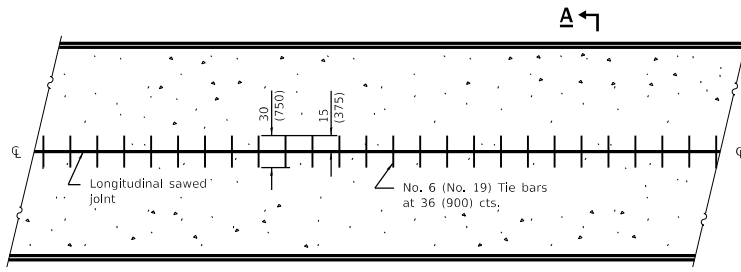
(TYPICAL 2 LANE WITH SHOULDERS)

* HMA binder and surface courses

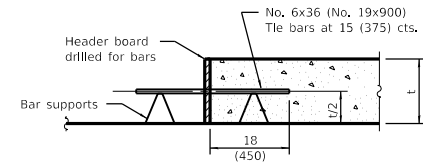


ALTERNATE SECTION A-A

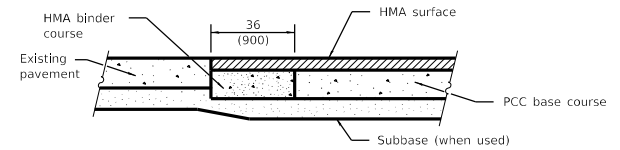
(TYPICAL 2 LANE WITH SHOULDERS)



PLAN



TRANSVERSE CONSTRUCTION JOINT



LONGITUDINAL SECTION SHOWING CONSTRUCTION ADJACENT TO EXISTING PAVEMENT

GENERAL NOTES

The longitudinal sawed joint shall be as detailed on Standard 420001 except the sawed groove does not require sealing.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2018
Michael Beard
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2018
Maureen M. Behr
 ENGINEER OF DESIGN AND ENVIRONMENT

464-1-1 CHANGES

DATE	REVISIONS
1-1-18	Changed tie bar spacing to 36 (900) cts.
1-1-08	Switched units to English (metric).

PCC BASE COURSE WITH HMA BINDER AND SURFACE COURSES

STANDARD 353001-05



Standards by Division

DIVISION 400 SURFACE COURSES, PAVEMENTS, REHABILITATION, AND SHOULDERS

STD. NO. TITLE**BITUMINOUS SURFACES AND HOT-MIX ASPHALT PAVEMENTS**

406001-06	Entrance Ramp Terminal (Flexible Ramp Pavement Adjacent to Flexible Mainline Pavement)
406101-05	Exit Ramp Terminal (Flexible Ramp Pavement Adjacent to Flexible Mainline Pavement)
406201-01	Mailbox Turnout

PORTLAND CEMENT CONCRETE PAVEMENTS AND SIDEWALKS

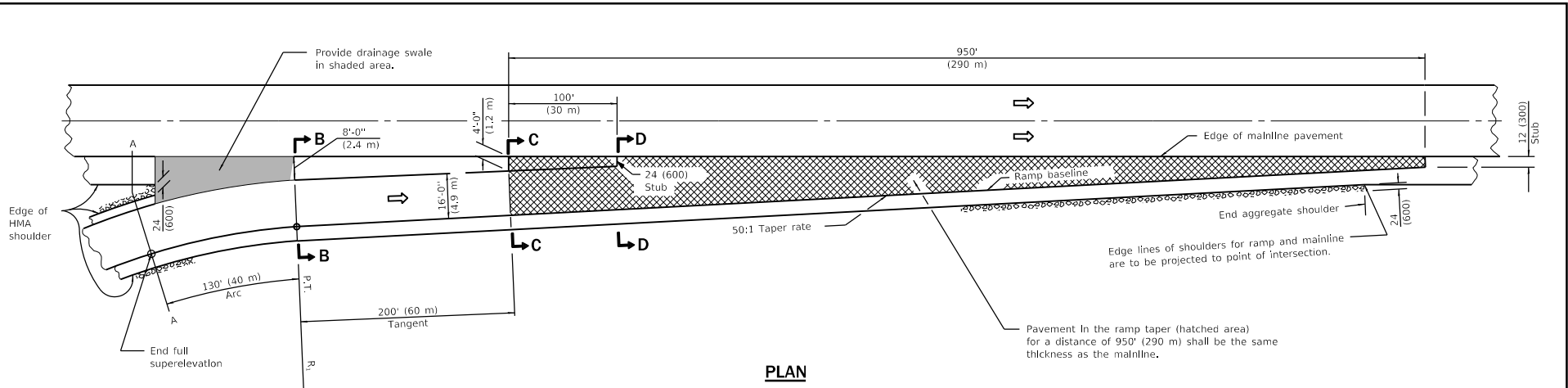
420001-09	Pavement Joints
420101-06	24' (7.2 m) Jointed PCC Pavement
420106-06	36' (10.8 m) Jointed PCC Pavement
420111-04	PCC Pavement Roundouts
420201-11	Entrance Ramp Terminal (Jointed PCC Ramp Pavement Adjacent to Jointed PCC Mainline Pavt.)
420206-12	Entrance Ramp Terminal (Jointed PCC Ramp Pavement Adjacent to CRC Mainline Pavement)
420301-08	Exit Ramp Terminal (Jointed PCC Ramp Pavement Adjacent to Jointed PCC Mainline Pavt.)
420306-10	Exit Ramp Terminal (Jointed PCC Ramp Pavement Adjacent to CRC Mainline Pavement)
420401-13	Pavement Connector (PCC) for Bridge Approach Slab
420406	Pavement Connector (HMA) for Bridge Approach Slab
420501-07	PCC Pavement and PCC Base Course Adjacent to Railroad Grade Crossing
420701-03	Pavement Welded Wire Reinforcement
421001-03	Bar Reinforcement for CRC Pavement
421101-10	24' (7.2 m) CRC Pavement (With Wide Flange Beam Terminal Joint)
421106-10	36' (10.8 m) CRC Pavement (With Wide Flange Beam Terminal Joint)
421201-07	24' (7.2 m) CRC Pavement (With Lug System)
421206-07	36' (10.8 m) CRC Pavement (With Lug System)
424001-11	Perpendicular Curb Ramps for Sidewalks
424006-04	Diagonal Curb Ramps for Sidewalks
424011-04	Corner Parallel Curb Ramps for Sidewalks
424016-05	Mid-block Curb Ramps for Sidewalks
424021-05	Depressed Corner for Sidewalks
424026-03	Entrance / Alley Pedestrian Crossings
424031-02	Median Pedestrian Crossings

PAVEMENT REHABILITATION

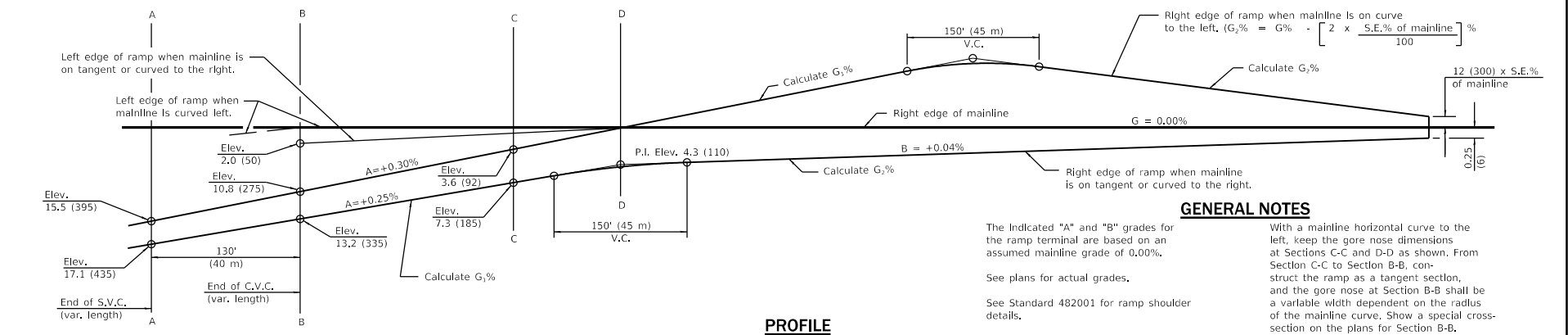
442001-04	Class A Patches
442101-09	Class B Patches
442201-03	Class C and D Patches

SHOULDERS

482001-02	HMA Shoulder Adjacent to Flexible Pavement
482006-03	HMA Shoulder Adjacent to Rigid Pavement
482011-03	HMA Shoulder Strips/Shoulders With Resurfacing or Widening and Resurfacing Projects
483001-05	PCC Shoulder



PLAN



PROFILE

GENERAL NOTES

- The Indicated "A" and "B" grades for the ramp terminal are based on an assumed mainline grade of 0.00%.
- See Plans for actual grades.
- See Standard 482001 for ramp shoulder details.
- Between Sections A-A and B-B (shaded area), provide a drainage swale and flush Inlet to enhance drainage.
- When using grades expressed in %, the grade value shall be divided by 100 to obtain vertical offsets.
- When using a radius R1 less than the minimum, verify the required acceleration length will be provided.
- With a mainline horizontal curve to the left, keep the gore nose dimensions at Sections C-C and D-D as shown. From Section C-C to Section B-B, construct the ramp as a tangent section, and the gore nose at Section B-B shall be a variable width dependent on the radius of the mainline curve. Show a special cross-section on the plans for Section B-B.
- With a mainline horizontal curve to the right, keep the gore nose dimensions at Sections D-D, C-C, and B-B as shown, and the edge of the ramp between Sections C-C and B-B shall be constructed as a compound curve tying Section C-C.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2015

Michael Beard

ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2015

ENGINEER OF DESIGN AND ENVIRONMENT

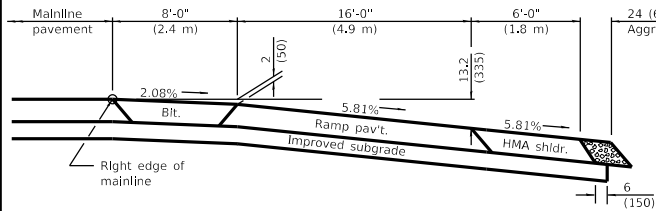
DATE	REVISIONS
1-1-15	Revised general note to be generic for R1.
1-1-08	Switched units to English (metric).
	Revised General Notes.

ENTRANCE RAMP TERMINAL

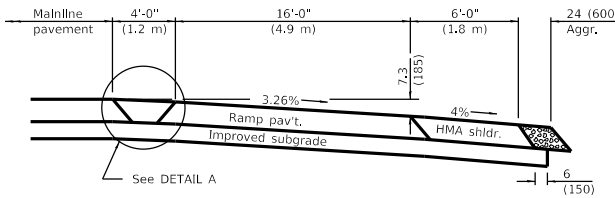
(FLEXIBLE RAMP PAVEMENT ADJACENT TO FLEXIBLE MAINLINE PAVEMENT)

(Sheet 1 of 2)

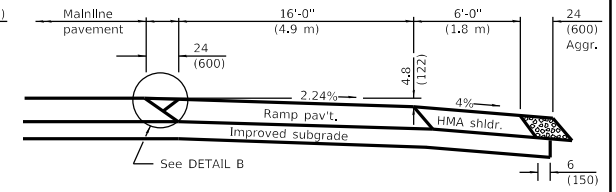
STANDARD 406001-06



SECTION B-B

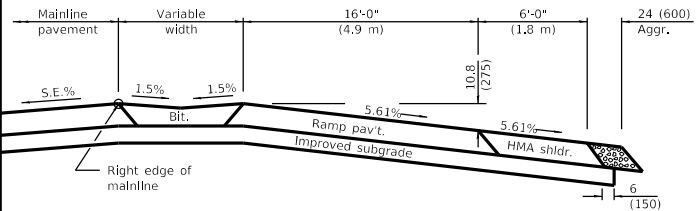


SECTION C-C

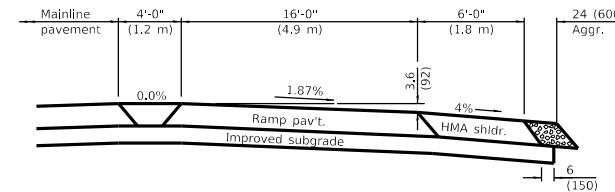


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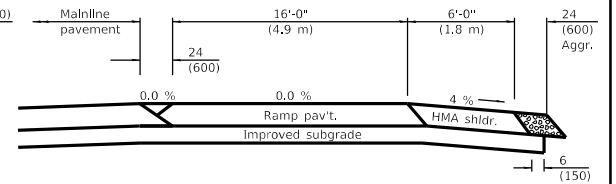
CROSS SECTIONS WHEN MAINLINE IS ON TANGENT OR CURVED TO THE RIGHT



SECTION B-B

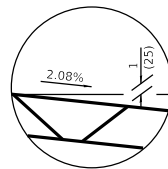


SECTION C-C

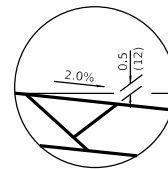


SECTION D-D

CROSS SECTIONS WHEN MAINLINE IS CURVED TO THE LEFT



DETAIL A



DETAIL B

Illinois Department of Transportation

PASSED January 1, 2015
Michael Beard
 ENGINEER OF POLICY AND PROCEDURES

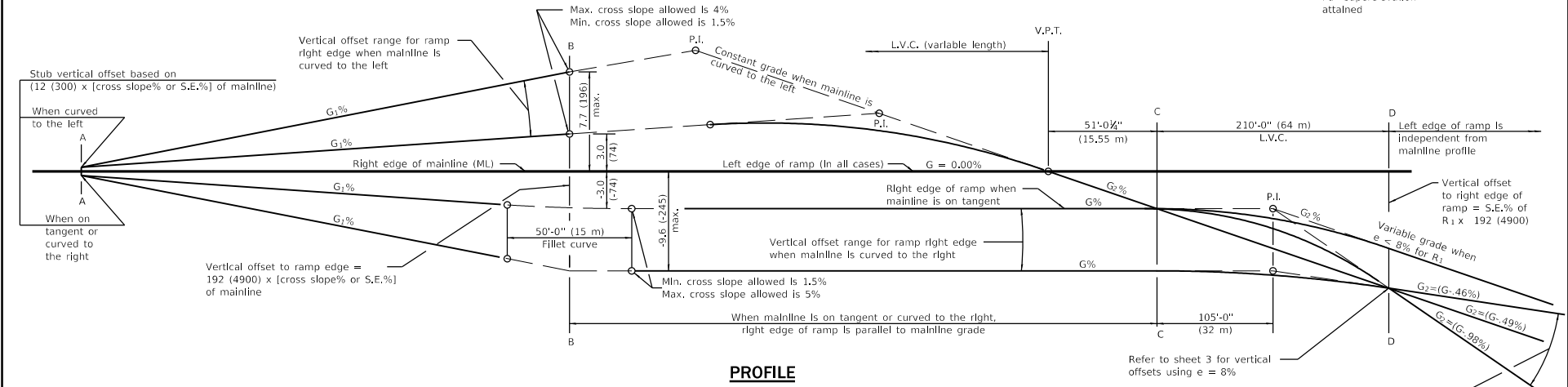
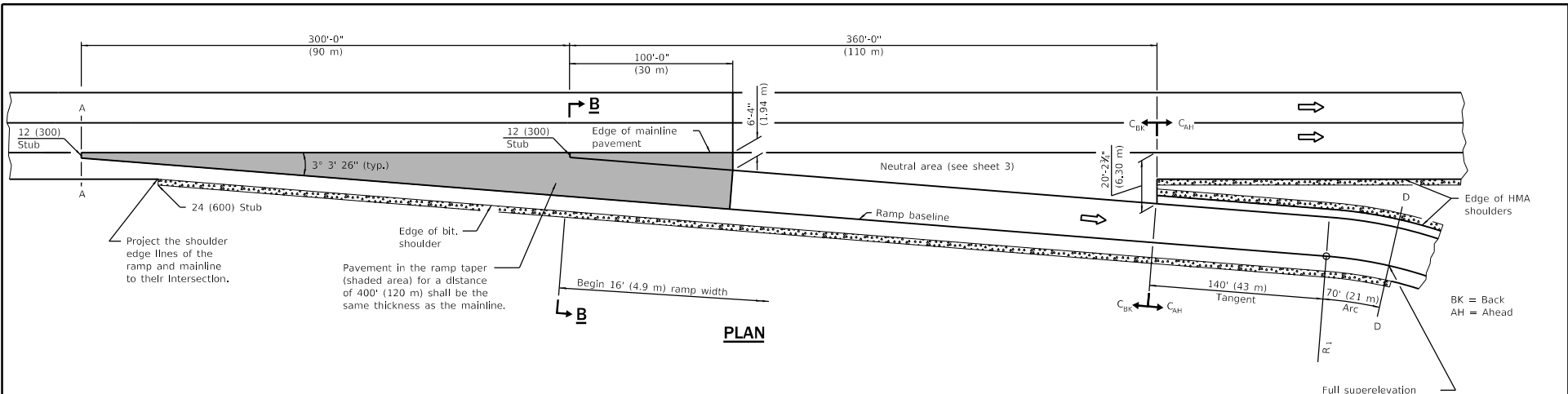
APPROVED January 1, 2015
[Signature]
 ENGINEER OF DESIGN AND ENVIRONMENT

4661-1 03/15/11

ENTRANCE RAMP TERMINAL
 (FLEXIBLE RAMP PAVEMENT ADJACENT TO FLEXIBLE MAINLINE PAVEMENT)

(Sheet 2 of 2)

STANDARD 406001-06



See Sheet 3 for GENERAL NOTES

Illinois Department of Transportation

PASSED January 1, 2015
Michael Beard
ENGINEER OF POLICY AND PROCEDURES

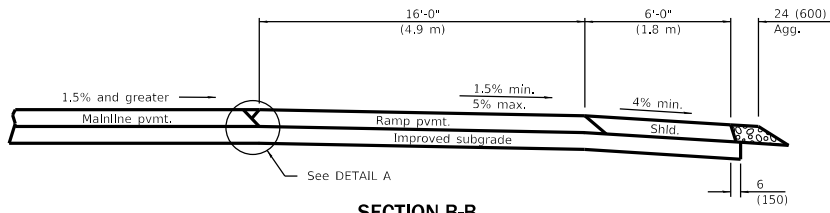
APPROVED January 1, 2015
[Signature]
ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-15	Corrected divergence angle at taper. Based profile off of e-max instead of R ₁ .
1-1-08	Switched units to English (metric).

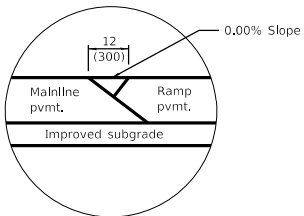
EXIT RAMP TERMINAL
(FLEXIBLE RAMP PAVEMENT ADJACENT TO FLEXIBLE MAINLINE PAVEMENT)

(Sheet 1 of 3)

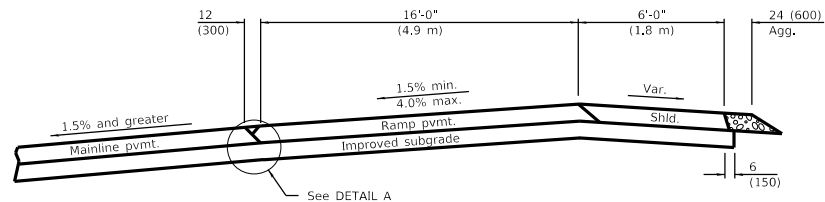
STANDARD 406101-05



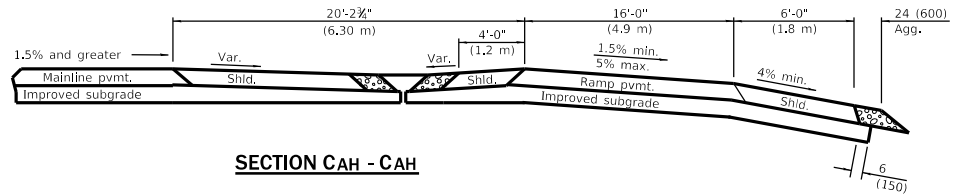
SECTION B-B



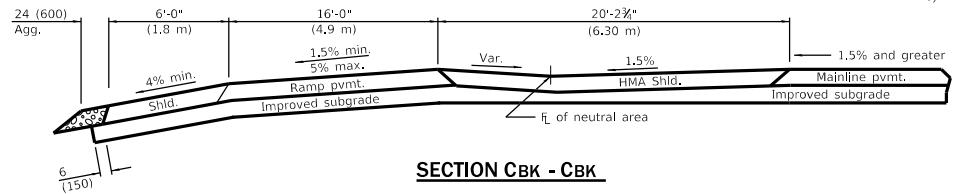
DETAIL A



SECTION B-B



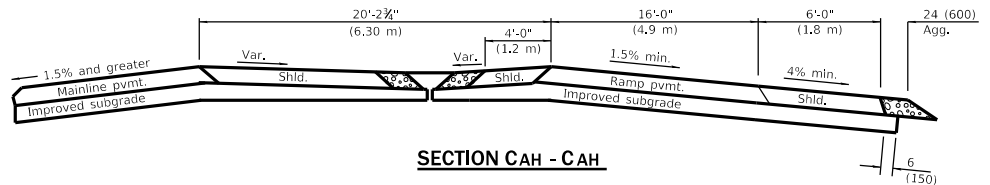
SECTION CAH - CAH



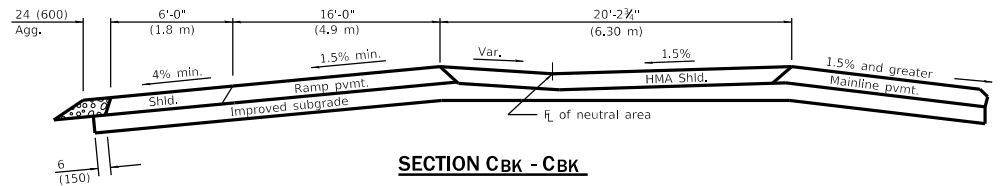
SECTION CBK - CBK

BK = Back
AH = Ahead

WHEN MAINLINE IS ON TANGENT OR CURVED TO THE RIGHT



SECTION CAH - CAH



SECTION CBK - CBK

WHEN MAINLINE IS CURVED TO THE LEFT

See Sheet 3 for GENERAL NOTES

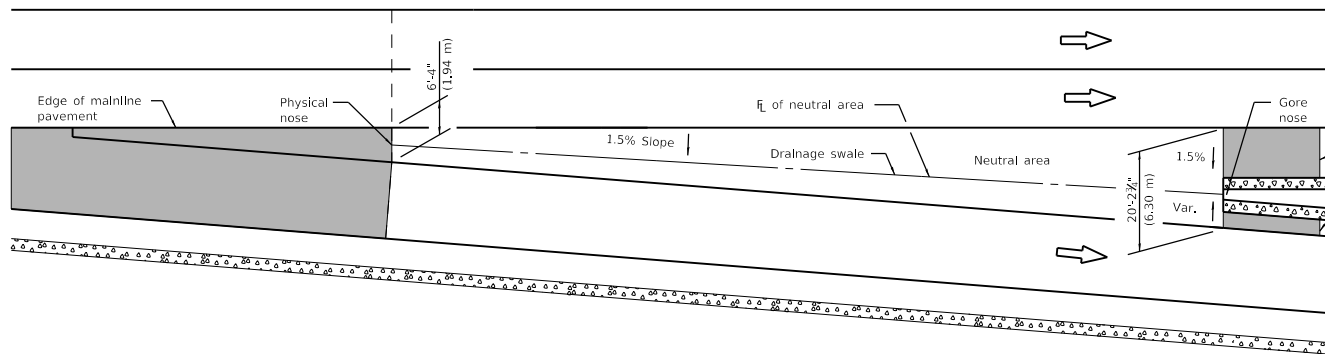
Illinois Department of Transportation
 PASSED January 1, 2015
Michael Beard
 ENGINEER OF POLICY AND PROCEDURES
 APPROVED January 1, 2015
[Signature]
 ENGINEER OF DESIGN AND ENVIRONMENT

EXIT RAMP TERMINAL

(FLEXIBLE RAMP PAVEMENT ADJACENT TO FLEXIBLE MAINLINE PAVEMENT)

(Sheet 2 of 3)

STANDARD 406101-05



Shaded area indicates shoulder transition zone from neutral area to design shoulder slope. In this area, the relative profile grade difference along the outside pavement edge and that along the outside shoulder edge shall not exceed 0.50%.

DETAILS FOR DRAINAGE IN NEUTRAL AREA

① Vertical offsets in inches for right edge of ramp, when e = 8%				① Vertical offsets in mm for right edge of ramp, when e = 8%			
Sections	Mainline on Tangent	Mainline Curved Right	Mainline Curved Left	Sections	Mainline on Tangent	Mainline Curved Right	Mainline Curved Left
A	- 0.18	S.E. % ML x 12	S.E. % ML x 12 ②	A	- 5	S.E. % ML x 300	S.E. % ML x 300 ②
B	- 3.0	S.E. % ML x 192	S.E. % ML x 192 ②	B	- 74	S.E. % ML x 4900	S.E. % ML x 4900 ②
C	- 3.0	S.E. % ML x 192	- 3.0	C	- 74	S.E. % ML x 4900	- 74
D	- 15.4	- 15.4	- 15.4	D	- 392	- 392	- 392

- ① Vertical offset values are calculated and based on the right edge of mainline pavement at 0.0 % grade.
- ② The vertical offsets of these points are above the mainline pavement and lie on an upgrade in relationship to the mainline grade.
- ③ S.E.=Superelevation Rate

GENERAL NOTES

The initial ramp grade (G_i) is based on the line generated through the PI that is 105 ft. (32 m) past Section C-C and the point created by the vertical offset at Section D-D.

See plans for actual grades.

See Standard 482001 for ramp shoulder details.

In the neutral area, provide a swale and flush inlet to enhance drainage.

When using grades expressed in %, the grade values shall be divided by 100 to obtain vertical offsets.

Where an exit ramp terminal is proposed adjacent to a mainline horizontal curve, construct the edge of the terminal by using offset widths, and for the terminal segment downstream from Section C-C to R₁, construct the ramp as a 140 ft. (43 m) tangent section.

All dimensions are in inches (millimeters) unless otherwise shown.

EXIT RAMP TERMINAL

(FLEXIBLE RAMP PAVEMENT ADJACENT TO FLEXIBLE MAINLINE PAVEMENT)

(Sheet 3 of 3)

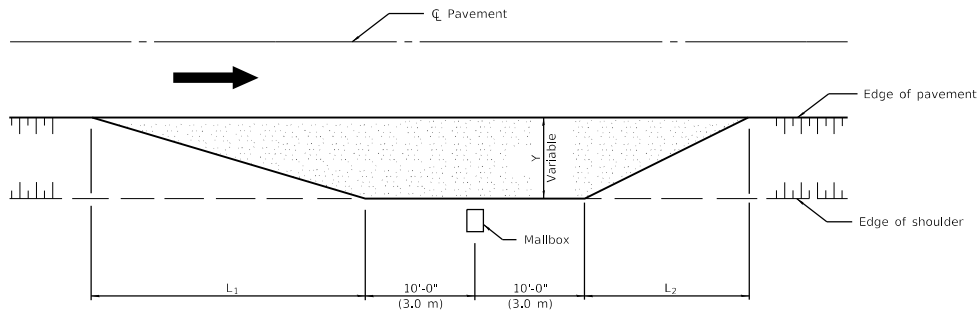
STANDARD 406101-05

Illinois Department of Transportation

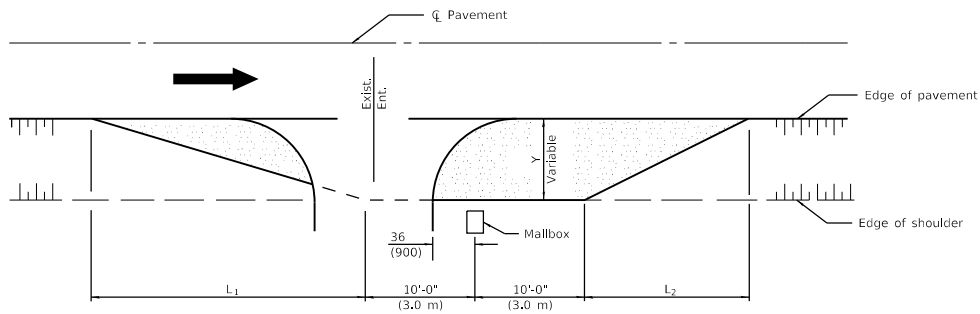
PASSED January 1, 2015
Michael Beard
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2015
[Signature]
 ENGINEER OF DESIGN AND ENVIRONMENT

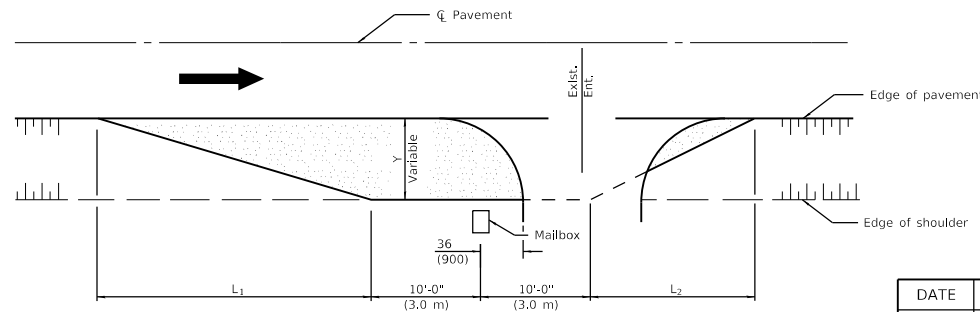
464-1-03/ISS



TYPICAL APPLICATION



MAILBOX ON FAR SIDE OF ENTRANCE



MAILBOX ON NEAR SIDE OF ENTRANCE

DIMENSIONS - ft. (m)		
Width of Shoulder	4-8 (1.2-2.4)	10 (3.0)
Width of Turnout (Y)	8 (2.4)	8-10 (2.4-3.0)
L ₁	32 (9.5)	32 (9.5)
L ₂	20 (6.0)	20 (6.0)

GENERAL NOTES

Mailboxes shall be mounted such that the face of the mailbox is 6 (150) to 12 (300), and the post a minimum of 24 (600), from the edge of the turnout surfacing.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-08	Switched units to English (metric).
1-1-97	Renum. Standard 2171-1. Deleted note regarding Township & Dist. roads

MAILBOX TURNOUT

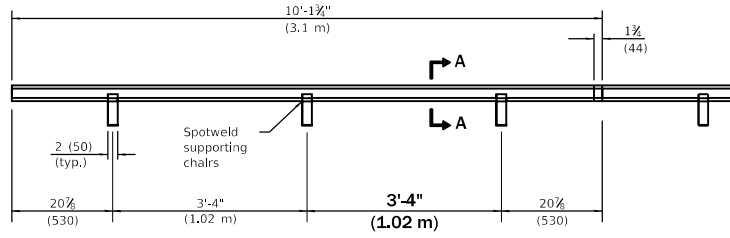
STANDARD 406201-01

Illinois Department of Transportation

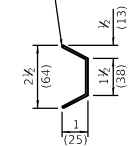
PASSED January 1, 2008
Spotts
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2008
Lee E. Han
 ENGINEER OF DESIGN AND ENVIRONMENT

46P-1-03/ISS

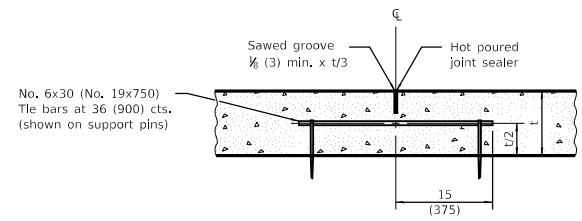


Sheet steel of suitable thickness to form keyway as detailed or approved equal.

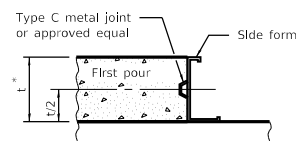


TYPE C METAL JOINT

SECTION A-A

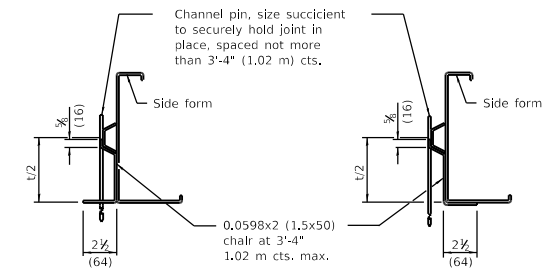


LONGITUDINAL SAWED JOINT



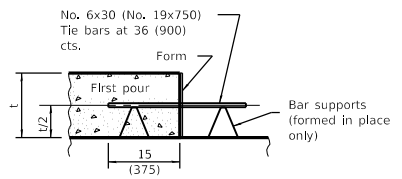
LONGITUDINAL KEYPED JOINT

* 8 (203) min. pavement thickness for keyed joints.

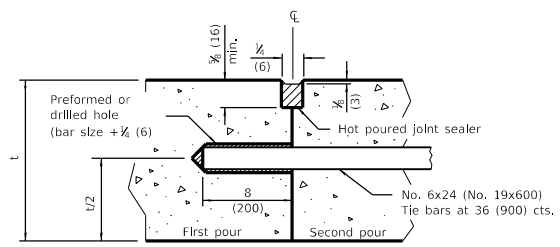


SUPPORTING CHAIR ALTERNATE

SUPPORTING CHAIR ALTERNATE



LONGITUDINAL CONSTRUCTION JOINT
(TIE BAR FORMED IN PLACE OR MECHANICALLY INSERTED)



LONGITUDINAL CONSTRUCTION JOINT
(TIE BAR GROUDED IN PLACE)

GENERAL NOTES

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2018
Michael Beard
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2018
Maureen M. Behr
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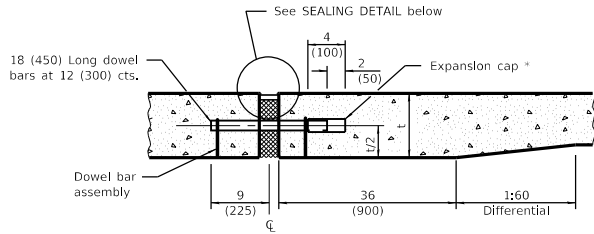
LEG-11 03/11/SSJ

DATE	REVISIONS
1-1-18	Changed tie bar spacing to 36 (900) cts. Revised DOWEL BAR TABEL.
1-1-08	Switched units to English (metric).

PAVEMENT JOINTS

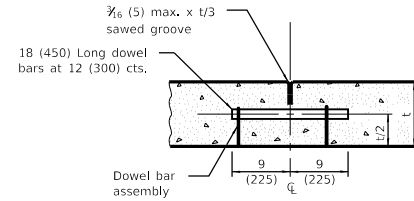
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STANDARD 420001-09

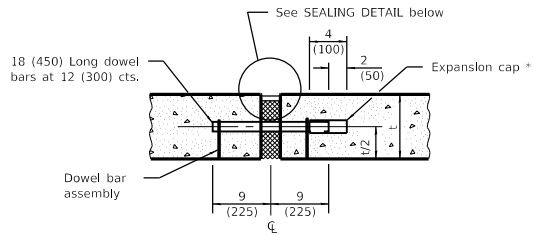


TRANSVERSE EXPANSION JOINT
(FOR PAVEMENTS WITH UNEQUAL THICKNESS)

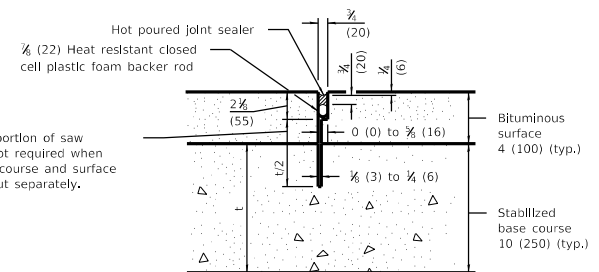
* Expansion caps shall be installed on the exposed end of each dowel bar once the header has been removed and the joint filler material has been installed.



TRANSVERSE CONTRACTION JOINT

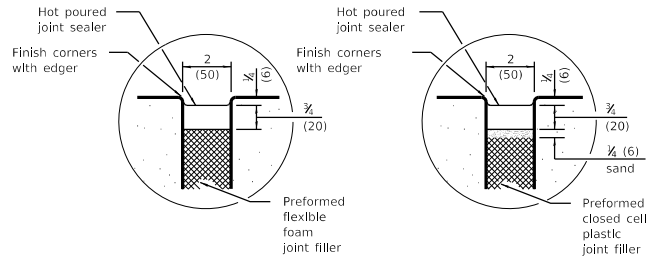


TRANSVERSE EXPANSION JOINT
(FOR PAVEMENTS WITH EQUAL THICKNESS)



This portion of saw cut not required when base course and surface are cut separately.

TRANSVERSE CONTRACTION JOINT
(FOR CAM, CFA AND LFA BASE COURSE MIXTURES)



SEALING DETAIL

DOWEL BAR TABLE	
PAVEMENT THICKNESS	DOWEL BAR DIAMETER
10 (250) or greater	1 1/2 (38)
8 (200) thru 9.99 (249)	1 1/4 (32)
Less than 8 (200)	1 (25)

Illinois Department of Transportation

PASSED January 1, 2018
Michael Beard
ENGINEER OF POLICY AND PROCEDURES

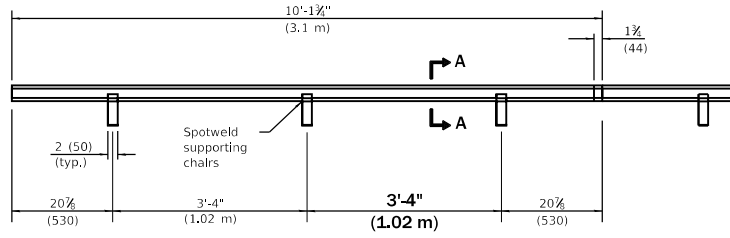
APPROVED January 1, 2018
Maureen M. Behr
ENGINEER OF DESIGN AND ENVIRONMENT

LEG-11 03/15/12

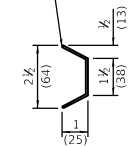
PAVEMENT JOINTS

(Sheet 2 of 2)

STANDARD 420001-09

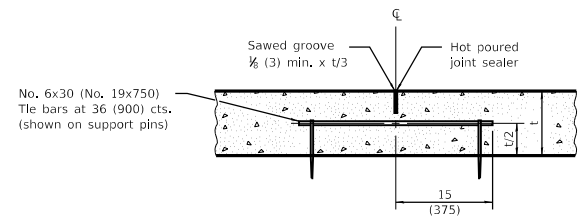


Sheet steel of suitable thickness to form keyway as detailed or approved equal.

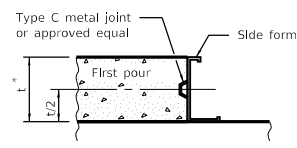


TYPE C METAL JOINT

SECTION A-A

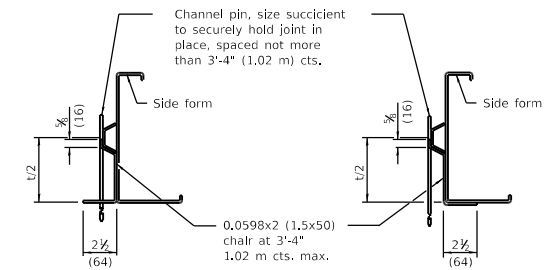


LONGITUDINAL SAWED JOINT



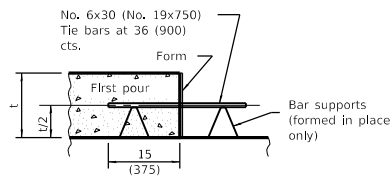
LONGITUDINAL KEYPED JOINT

* 8 (203) min. pavement thickness for keyed joints.

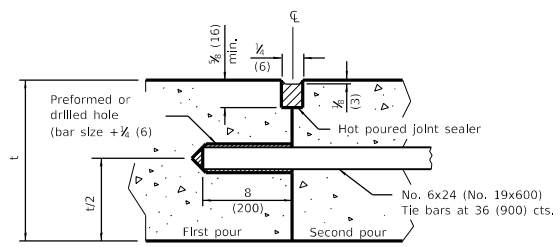


SUPPORTING CHAIR ALTERNATE

SUPPORTING CHAIR ALTERNATE



LONGITUDINAL CONSTRUCTION JOINT
(TIE BAR FORMED IN PLACE OR MECHANICALLY INSERTED)



LONGITUDINAL CONSTRUCTION JOINT
(TIE BAR GROUDED IN PLACE)

GENERAL NOTES

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2018
Michael Beard
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APPROVED January 1, 2018
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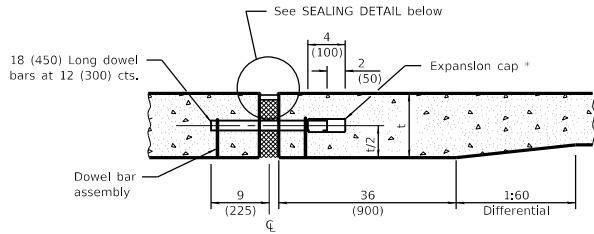
LEG-11 03/11/SSJ

DATE	REVISIONS
1-1-18	Changed tie bar spacing to 36 (900) cts. Revised DOWEL BAR TABEL.
1-1-08	Switched units to English (metric).

PAVEMENT JOINTS

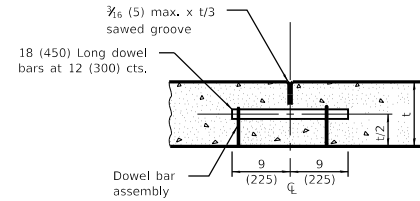
(Sheet 1 of 2)

STANDARD 420001-09

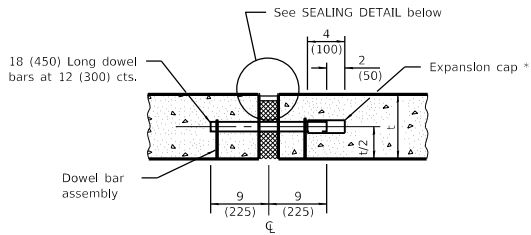


TRANSVERSE EXPANSION JOINT
(FOR PAVEMENTS WITH UNEQUAL THICKNESS)

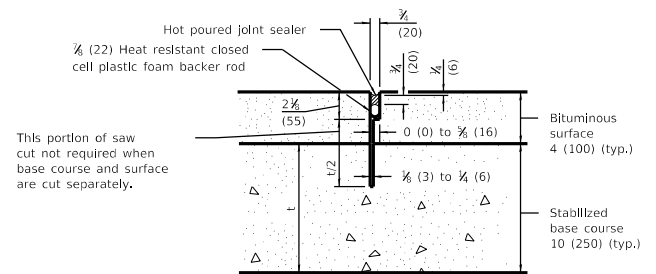
* Expansion caps shall be installed on the exposed end of each dowel bar once the header has been removed and the joint filler material has been installed.



TRANSVERSE CONTRACTION JOINT

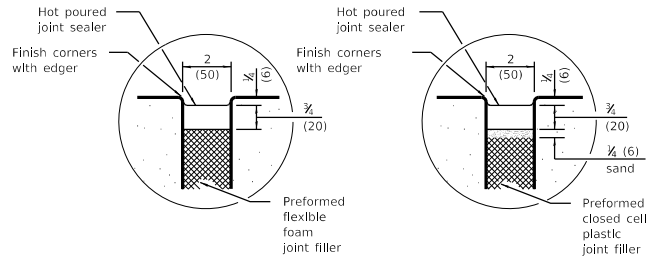


TRANSVERSE EXPANSION JOINT
(FOR PAVEMENTS WITH EQUAL THICKNESS)



This portion of saw cut not required when base course and surface are cut separately.

TRANSVERSE CONTRACTION JOINT
(FOR CAM, CFA AND LFA BASE COURSE MIXTURES)



SEALING DETAIL

DOWEL BAR TABLE	
PAVEMENT THICKNESS	DOWEL BAR DIAMETER
10 (250) or greater	1 1/2 (38)
8 (200) thru 9.99 (249)	1 1/4 (32)
Less than 8 (200)	1 (25)

Illinois Department of Transportation

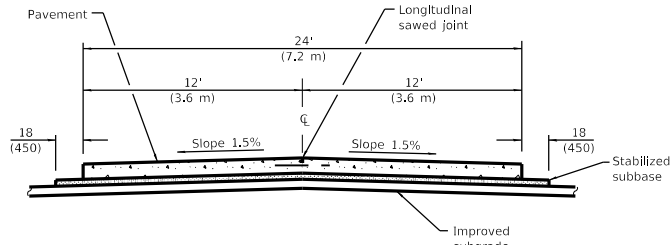
PASSED January 1, 2018
Michael Beard
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2018
Maureen M. Behr
ENGINEER OF DESIGN AND ENVIRONMENT

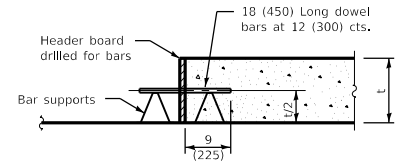
LEG-11 03/15/12

PAVEMENT JOINTS
(Sheet 2 of 2)

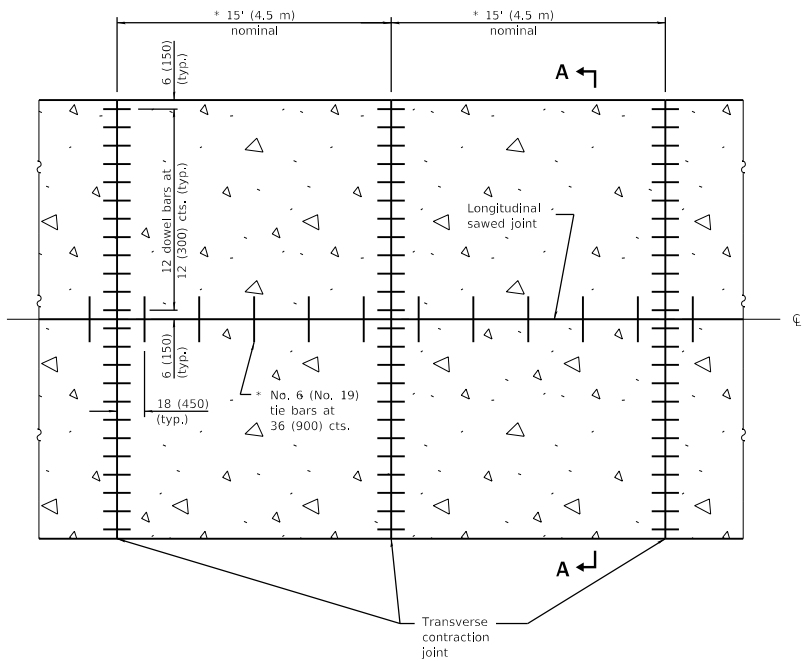
STANDARD 420001-09



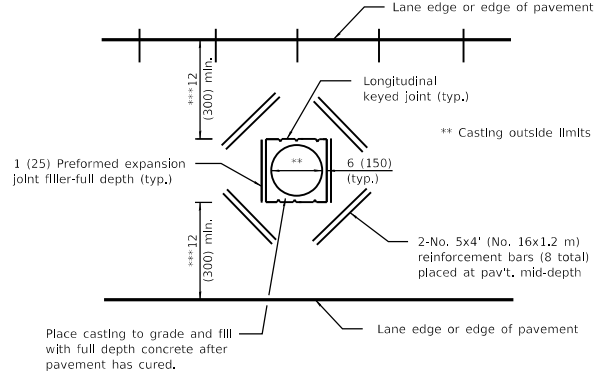
SECTION A-A
(TYPICAL 2-LANE WITH SHOULDERS)



TRANSVERSE CONSTRUCTION JOINT



PAVEMENT PLAN



DETAIL OF ADDED REINFORCEMENT FOR PAVEMENT BLOCKS-OUTS

*** When the 12 (300) minimum cannot be achieved, the transverse joints shall be extended to either the longitudinal joint or edge of pavement.

GENERAL NOTES

See Standard 420001 for details of joints not shown.

All dimensions are in inches (millimeters) unless otherwise shown.

* The 15' (4.5 m) dimension shall be adjusted to 12' (3.6 m) min. to 18' (5.5 m) max. when placed adjacent to existing pcc pavement structure so that the joints are in prolongation. Adjust the tie bar spacing to maintain a clearance of 6 (150) from dowel bars.

Illinois Department of Transportation

PASSED January 1, 2018
Michael Beard
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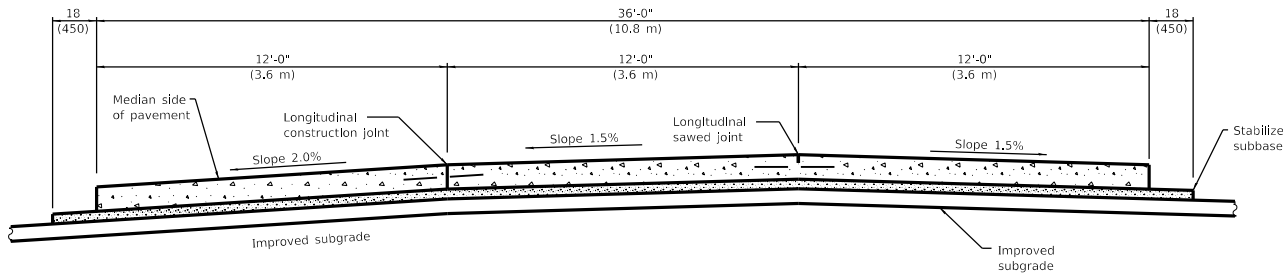
APPROVED January 1, 2018
Maureen M. O'Neil
ENGINEER OF DESIGN AND ENVIRONMENT

464-C 03/15/11

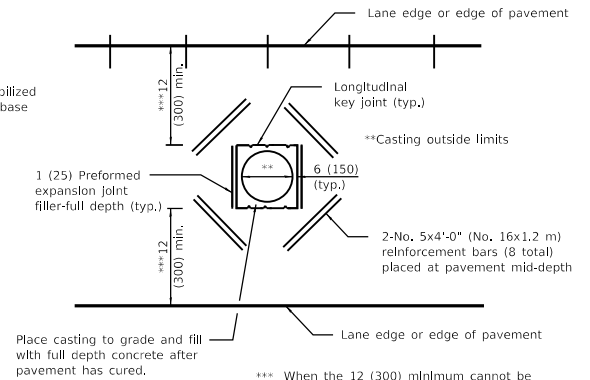
DATE	REVISIONS
1-1-18	Changed spacing of tie bars to 36 (900).
1-1-15	Added dimension of tie bars from transverse contraction joints

24' (7.2 m) JOINTED PCC PAVEMENT

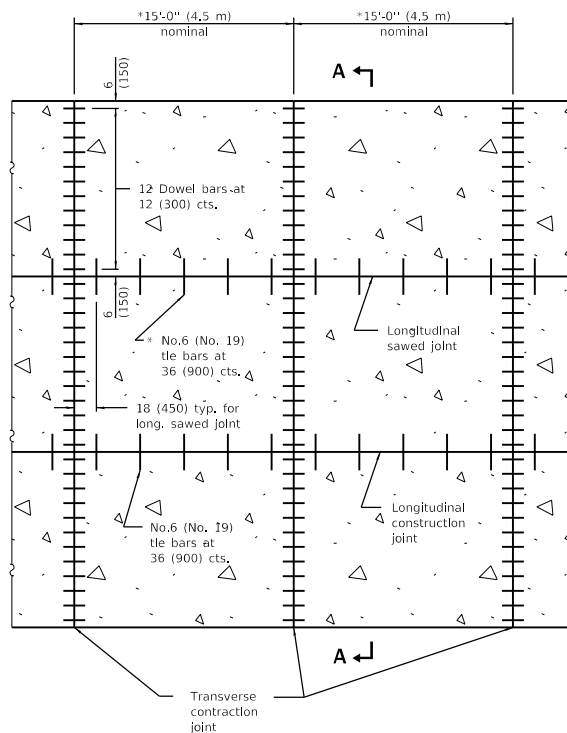
STANDARD 420101-06



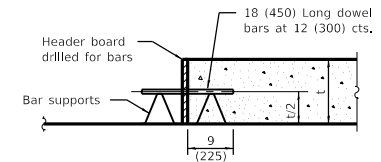
SECTION A-A
(TYPICAL 3-LANE, 1-WAY WITH SHOULDERS)



**DETAIL OF ADDED REINFORCEMENT
FOR PAVEMENT BLOCK-OUTS**



PAVEMENT PLAN



TRANSVERSE CONSTRUCTION JOINT

* The 15' (4.5 m) dimension shall be adjusted to 12' (3.6 m) min. to 18' (5.5 m) max. when placed adjacent to existing pcc pavement structure so that the joints are in prolongation. Adjust the tie bar spacing to maintain a clearance of 6 (150) from dowel bars.

GENERAL NOTES
See Standard 420001 for details of joints not shown.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-15	Changed spacing of tie bars to 36 (900).
1-1-15	Added dimension of tie bars from transverse contraction joints.

**36' (10.8 m) JOINTED
PCC PAVEMENT**

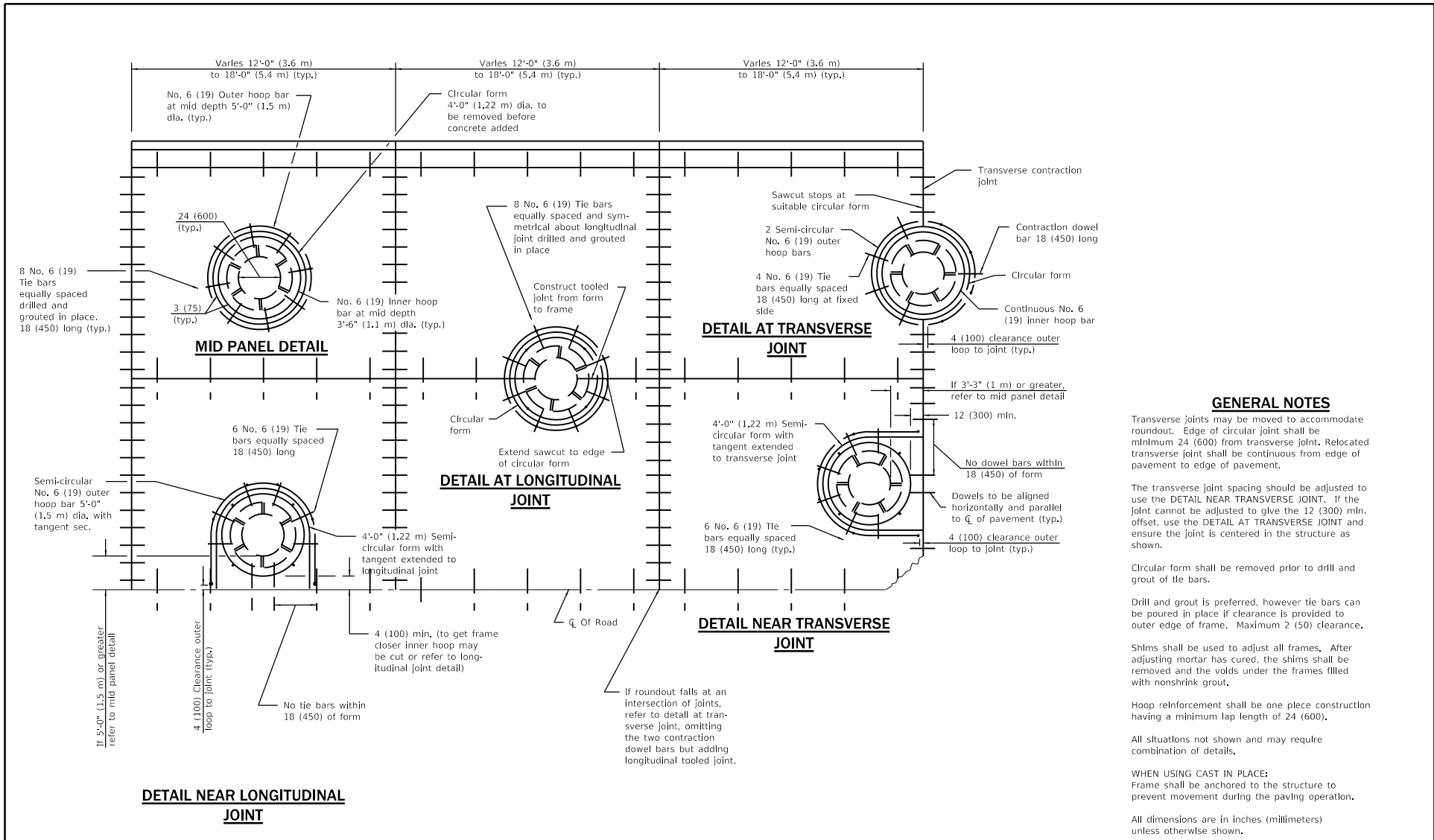
STANDARD 420106-06

Illinois Department of Transportation

PASSED January 1, 2018
Michael Beard
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2018
Maureen M. O'Connell
ENGINEER OF DESIGN AND ENVIRONMENT

LEG-C-03/ISS-1



Illinois Department of Transportation

PASSED January 1, 2018
Michael Beard
ENGINEER OF POLICY AND PROCEDURES

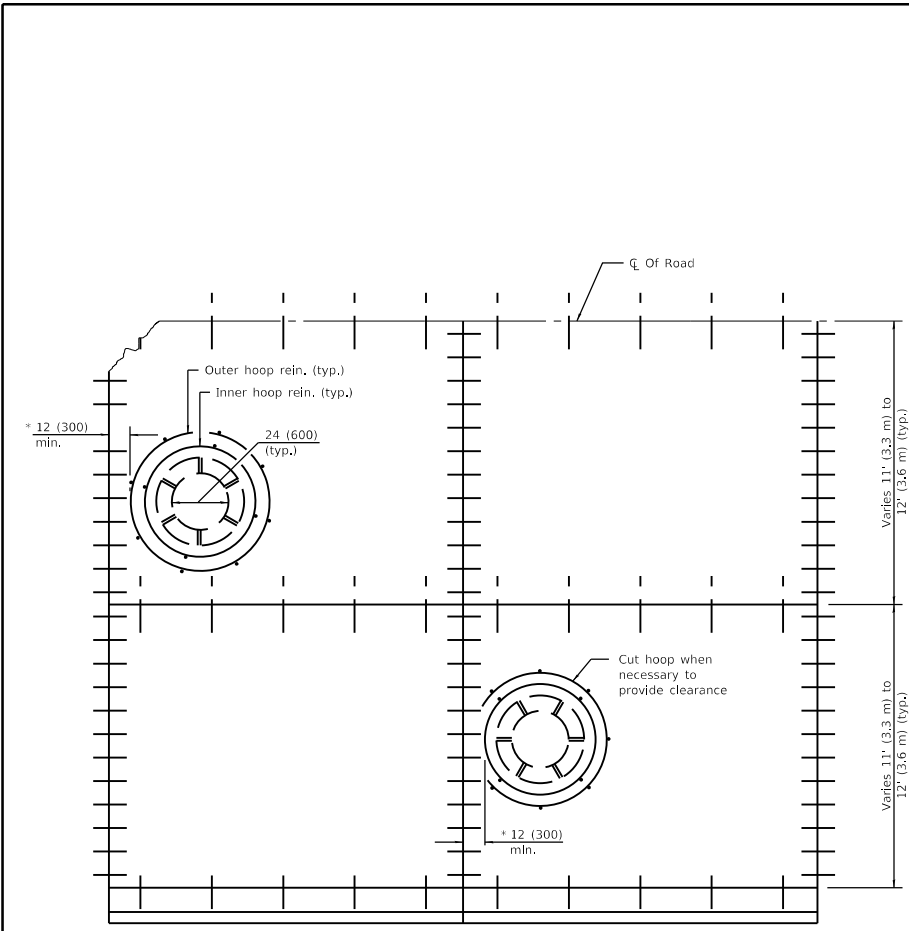
APPROVED January 1, 2018
Maureen M. O'Brien
ENGINEER OF DESIGN AND ENVIRONMENT

464-C 03/11/11

DATE	REVISIONS
1-1-18	Revised standard for 36 (900) tie bar spacing. Revised General Notes.
1-1-11	Corrected "T/2" dim. on DETAIL OF REINFORCEMENT FOR PAVEMENT ROUNDOUT.

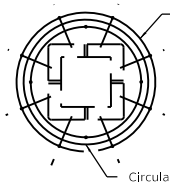
PCC PAVEMENT ROUNDOUTS
(Sheet 1 of 2)

STANDARD 4201.11-04



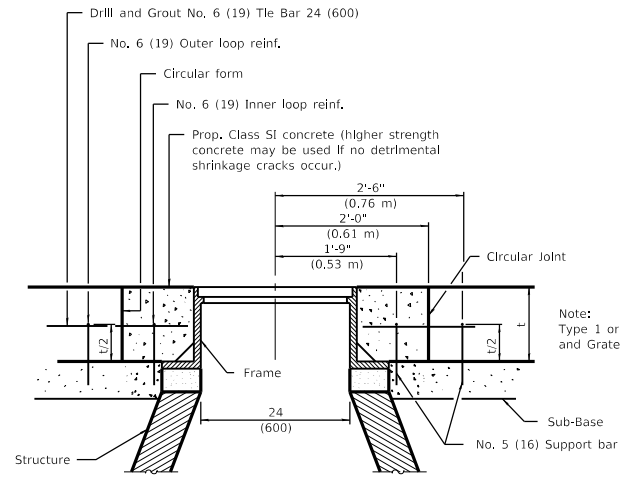
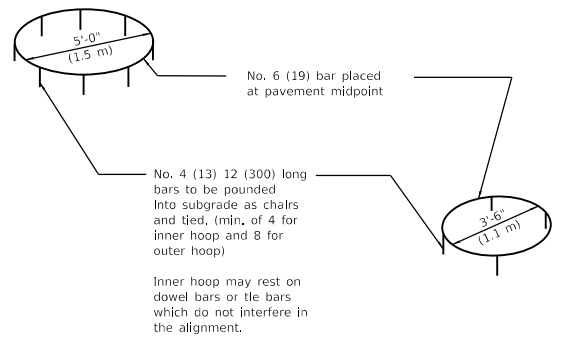
CAST IN PLACE DETAIL

* Less than 12 (300) formed roundout to be used.



All dimensions same for the majority of circular frame & grates. For larger structures increase hoop bar and circular form diameter by 12 (300) each and add two additional equally spaced tie bars.

ROUNDOUT FOR SQUARE FRAME & GRATE AND MANHOLES



DETAIL OF REINFORCEMENT FOR PAVEMENT ROUNDOUT

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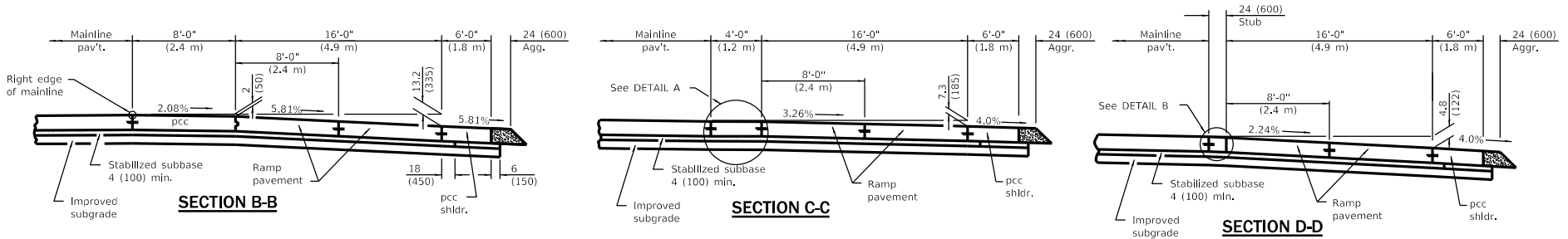
PASSED January 1, 2018
Michael Beard
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2018
Maureen M. O'Connell
 ENGINEER OF DESIGN AND ENVIRONMENT

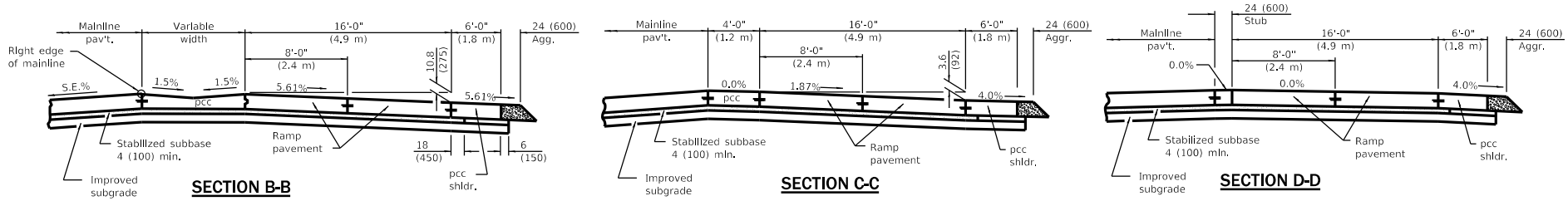
469-1-1 Q3/ISS/1

PCC PAVEMENT ROUNDOUTS
 (Sheet 2 of 2)

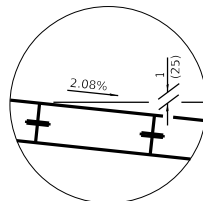
STANDARD 420111-04



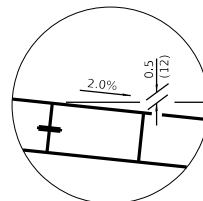
CROSS SECTIONS WHEN MAINLINE IS ON TANGENT OR CURVED TO THE RIGHT



CROSS SECTIONS WHEN MAINLINE IS CURVED TO THE LEFT



DETAIL A



DETAIL B

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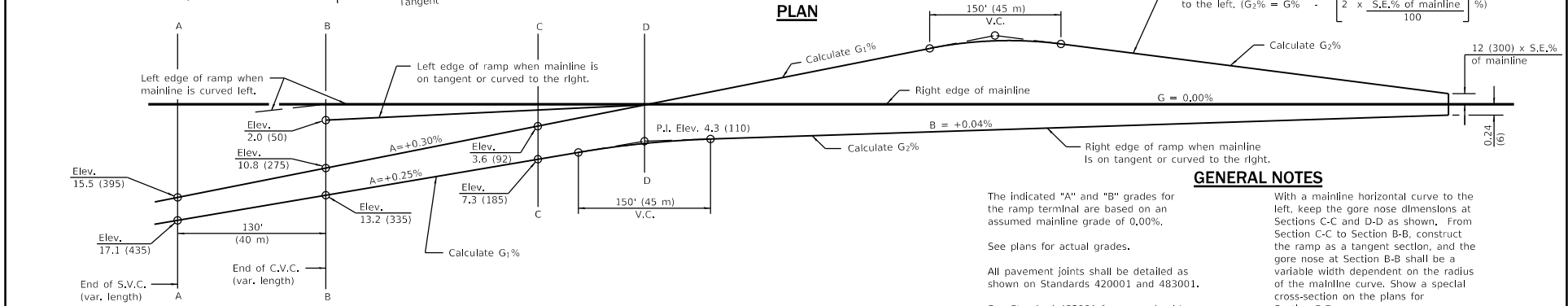
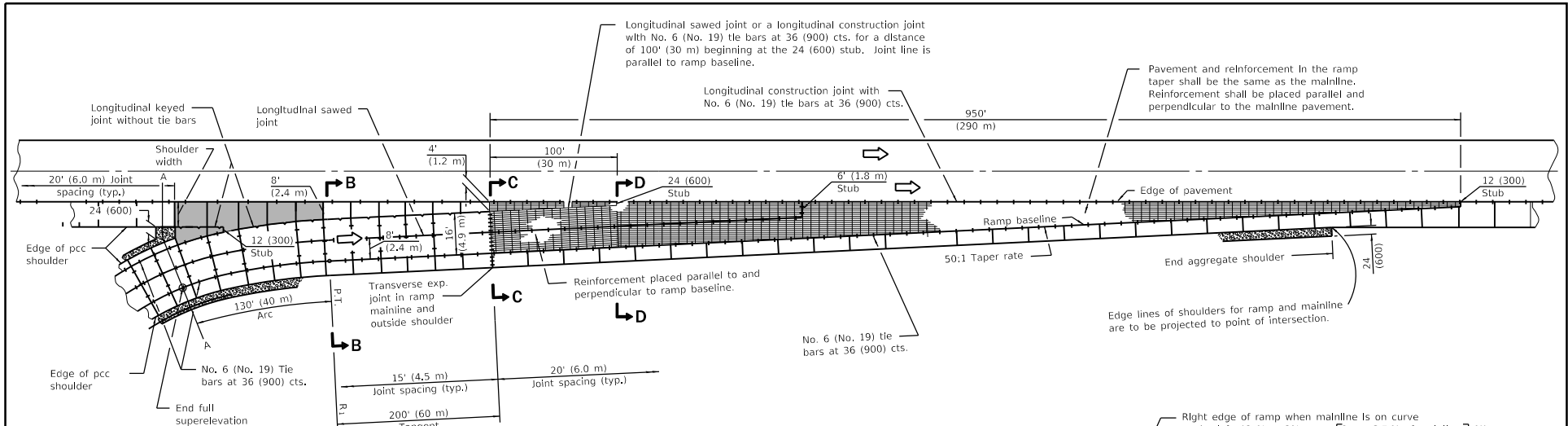
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464-11 03/15/11

ENTRANCE RAMP TERMINAL
 (JOINTED PCC RAMP PAVEMENT ADJACENT TO
 JOINTED PCC MAINLINE PAVEMENT)

(Sheet 2 of 2)

STANDARD 420201-11



PROFILE

GENERAL NOTES

- The indicated "A" and "B" grades for the ramp terminal are based on an assumed mainline grade of 0.00%.
- See plans for actual grades.
- All pavement joints shall be detailed as shown on Standards 420001 and 483001.
- See Standard 483001 for ramp shoulder details.
- When using grades expressed in %, the grade value shall be divided by 100 to obtain vertical offsets.
- When using a radius R1 less than the minimum, verify the required acceleration length will be provided.
- With a mainline horizontal curve to the left, keep the gore nose dimensions at Sections C-C and D-D as shown. From Section C-C to Section B-B, construct the ramp as a tangent section, and the gore nose at Section B-B shall be a variable width dependent on the radius of the mainline curve. Show a special cross-section on the plans for Section B-B.
- With a mainline horizontal curve to the right, keep the gore nose dimensions at Sections D-D, C-C, and B-B as shown, and the edge of the ramp between Sections C-C and B-B is constructed as a compound curve tying Section C-C.
- All dimensions are in inches (millimeters) unless otherwise shown.

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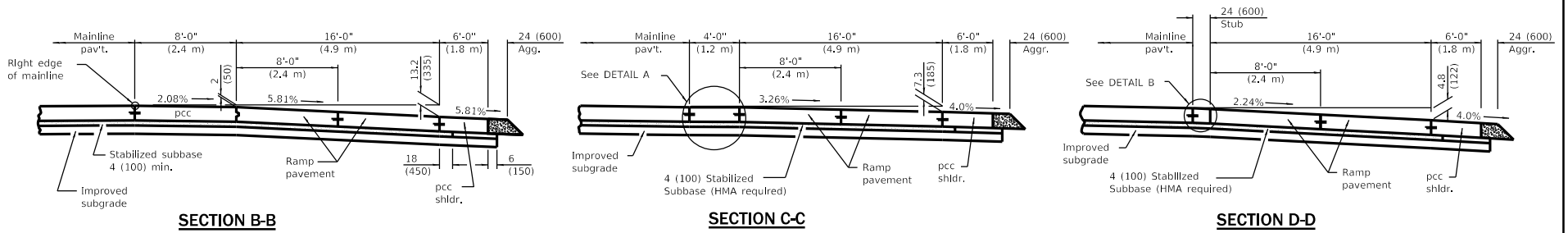
LEF-CI 02/15/11

DATE	REVISIONS
1-1-18	Changed tie bar spacing to 36 (900) cts.
1-1-17	Added longitudinal sawed joint to middle of ramp pavement.

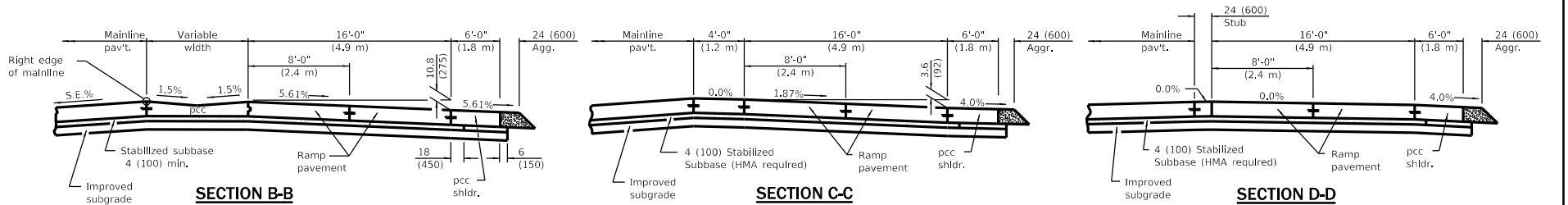
ENTRANCE RAMP TERMINAL
 (JOINTED PCC RAMP PAVEMENT ADJACENT TO CRC MAINLINE PAVEMENT)

(Sheet 1 of 2)

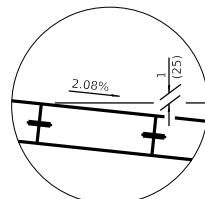
STANDARD 420206-12



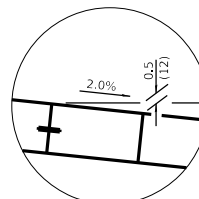
CROSS SECTIONS WHEN MAINLINE IS ON TANGENT OR CURVED TO THE RIGHT



CROSS SECTIONS WHEN MAINLINE IS CURVED TO THE LEFT



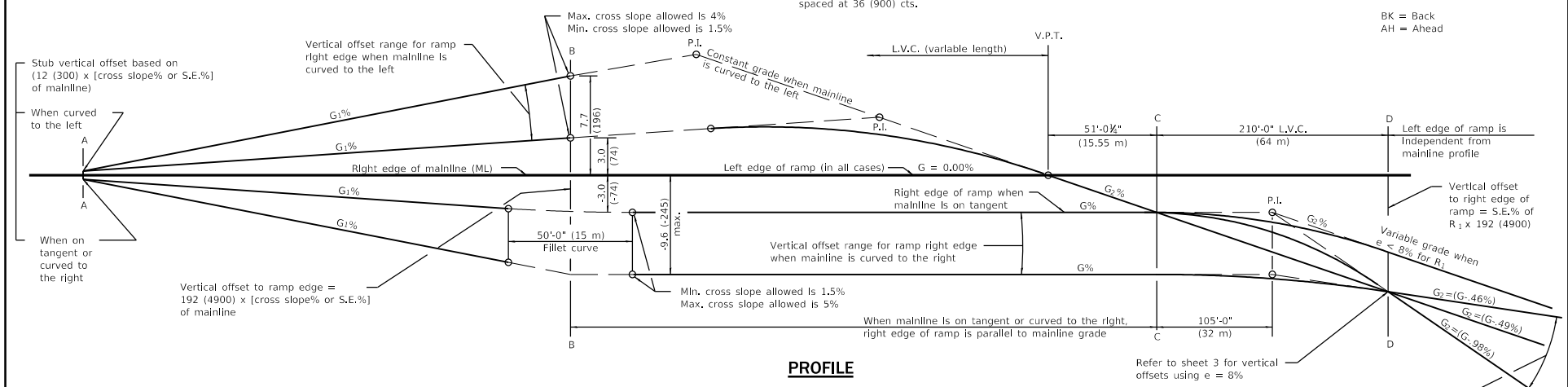
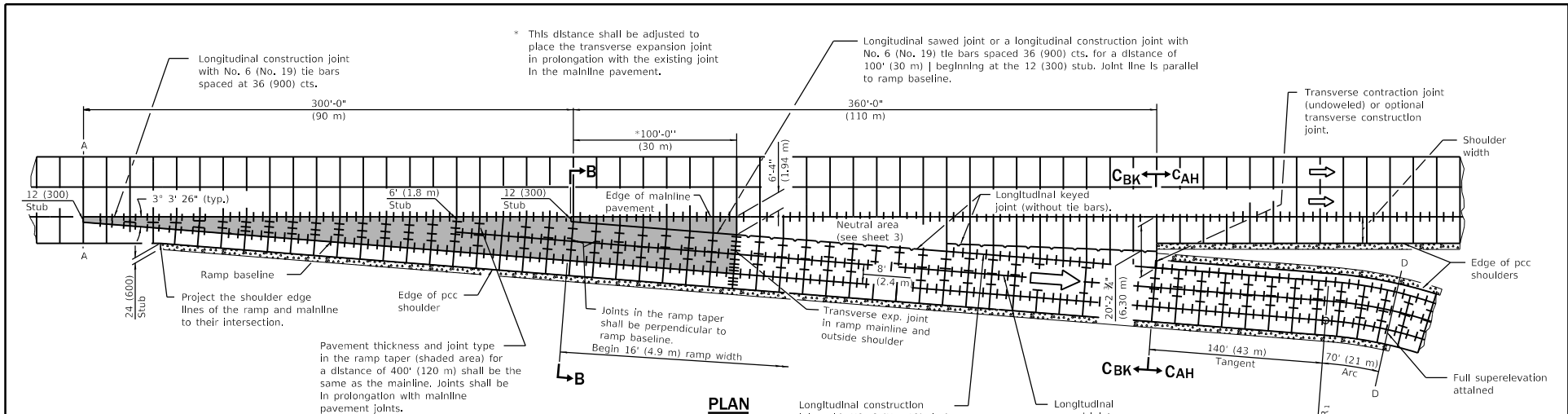
DETAIL A



DETAIL B

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 ENGINEER OF POLICY AND PROCEDURES
 APPROVED January 1, 2018
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ENTRANCE RAMP TERMINAL
 (JOINTED PCC RAMP PAVEMENT
 ADJACENT TO CRC MAINLINE PAVEMENT)
 (Sheet 2 of 2)
STANDARD 420206-12



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LEP-C 03/15/11

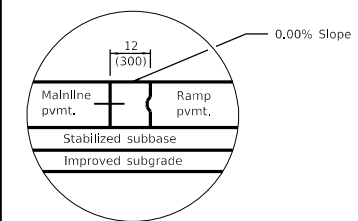
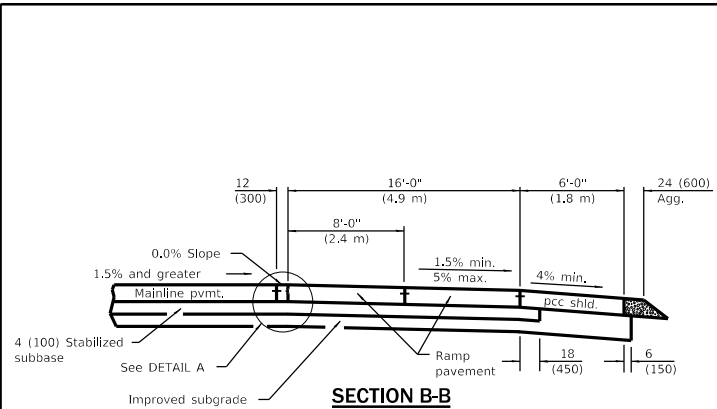
DATE	REVISIONS
1-1-18	Changed tie bar spacing to 36 (900) cts.
1-1-17	Added longitudinal sawed joint to middle of ramp pavement.

See Sheet 3 for GENERAL NOTES

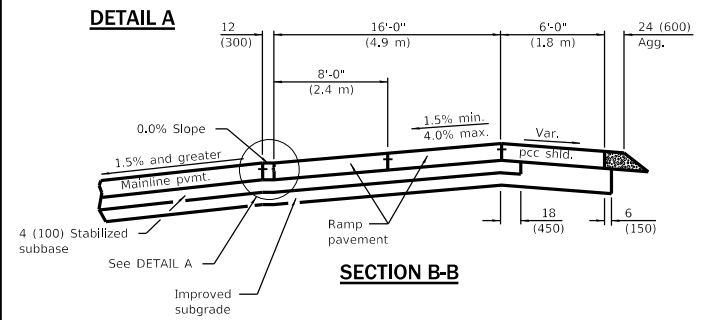
EXIT RAMP TERMINAL
 (JOINTED PCC RAMP PAVEMENT
 ADJACENT TO JOINTED PCC MAINLINE PAVEMENT)

(Sheet 1 of 3)

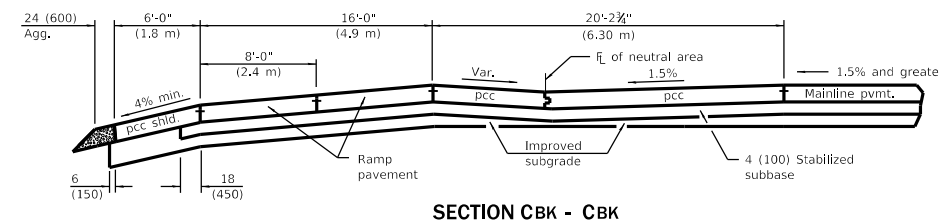
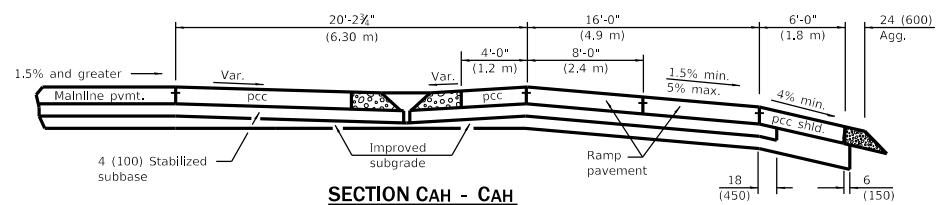
STANDARD 420301-08



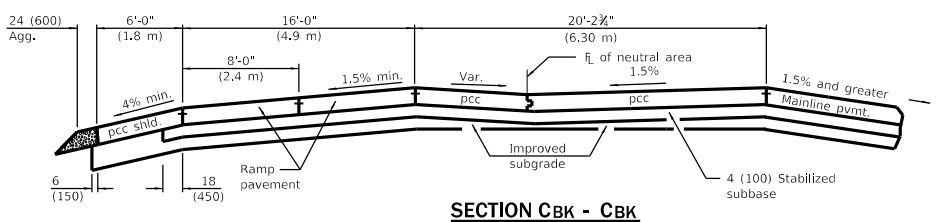
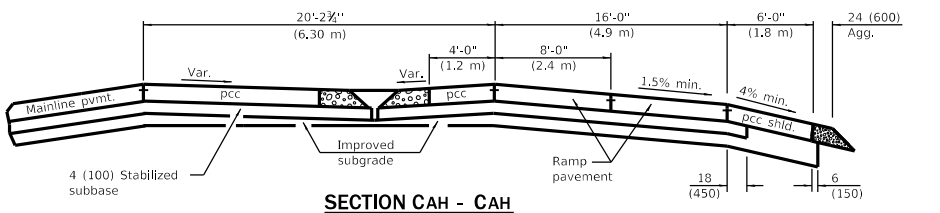
WHEN MAINLINE IS ON TANGENT OR CURVED TO THE RIGHT



WHEN MAINLINE IS CURVED TO THE LEFT



BK = Back
AH = Ahead



See Sheet 3 for GENERAL NOTES

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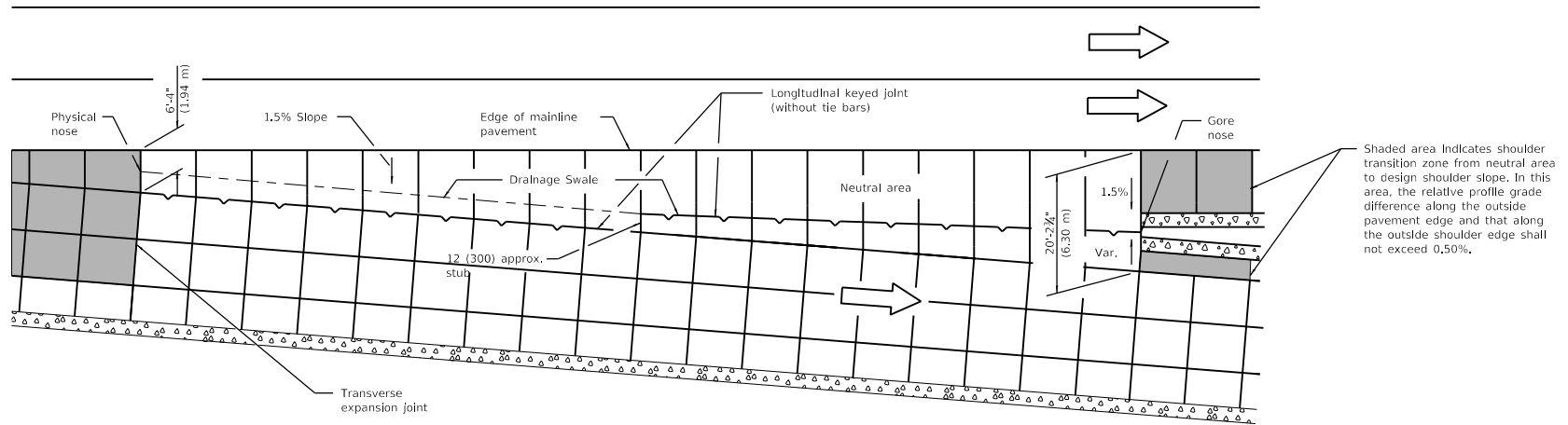
APPROVED January 1, 2018
Maureen M. O'Brien
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469-1-03/ISS/1

EXIT RAMP TERMINAL
(JOINTED PCC RAMP PAVEMENT
ADJACENT TO JOINTED PCC MAINLINE PAVEMENT)

(Sheet 2 of 3)

STANDARD 420301-08



DETAILS FOR DRAINAGE IN NEUTRAL AREA

① Vertical offsets in inches for right edge of ramp, when e = 8%				① Vertical offsets in mm for right edge of ramp, when e = 8%			
Sections	Mainline on Tangent	Mainline Curved Right	Mainline Curved Left	Sections	Mainline on Tangent	Mainline Curved Right	Mainline Curved Left
A	- 0.18	S.E. % ML x 12	S.E. % ML x 12 ②	A	- 5	S.E. % ML x 300	S.E. % ML x 300 ②
B	- 3.0	S.E. % ML x 192	S.E. % ML x 192 ②	B	- 74	S.E. % ML x 4900	S.E. % ML x 4900 ②
C	- 3.0	S.E. % ML x 192	- 3.0	C	- 74	S.E. % ML x 4900	- 74
D	- 15.4	- 15.4	- 15.4	D	- 392	- 392	- 392

- ① Vertical offset values are calculated and based on the right edge of mainline pavement at 0.0 % grade.
- ② The vertical offsets of these points are above the mainline pavement and lie on an upgrade in relationship to the mainline grade.
- ③ S.E.=Superelevation Rate

GENERAL NOTES
 The initial ramp grade (G) is based on the line generated through the PI that is 105' (32 m) past Section C-C and the point created by the vertical offset at Section D-D.

See plans for actual grades.
 All pavement joints shall be detailed as shown on Standards 420001 and 483001.
 See Standard 483001 for ramp shoulder details.
 In the neutral area, provide a swale and flush inlet to enhance drainage.

When using grades expressed in %, the grade values shall be divided by 100 to obtain vertical offsets.
 Where an exit ramp terminal is proposed adjacent to a mainline horizontal curve, construct the edge of the terminal by using offset widths, and for the terminal segment downstream from Section C-C to R, construct the ramp as a 141' (43 m) tangent section.

All dimensions are in inches (millimeters) unless otherwise shown.

EXIT RAMP TERMINAL
 (JOINTED PCC RAMP PAVEMENT
 ADJACENT TO JOINTED PCC MAINLINE PAVEMENT)

(Sheet 3 of 3)

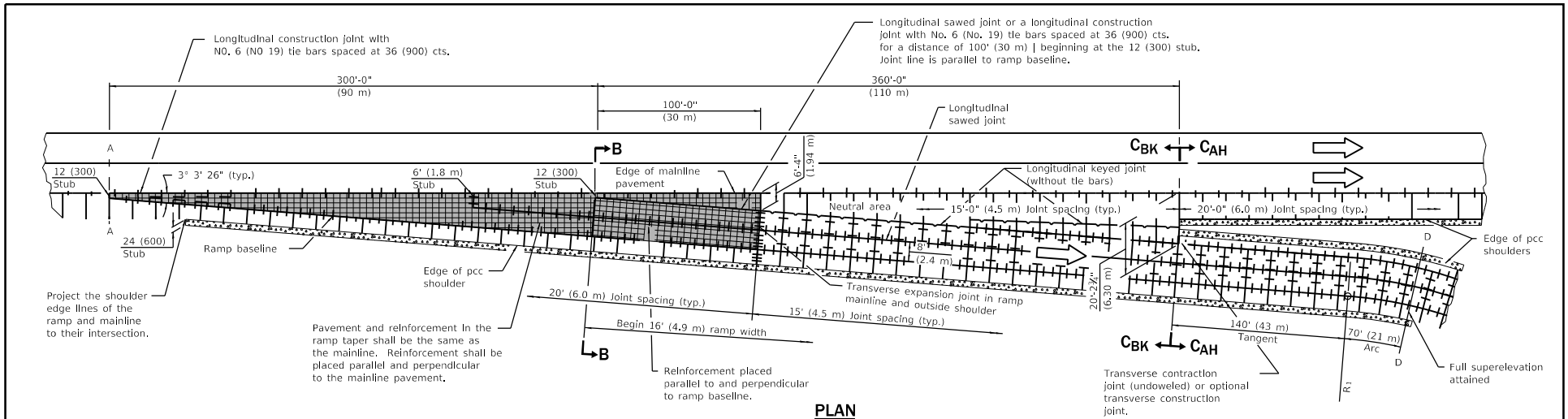
STANDARD 420301-08

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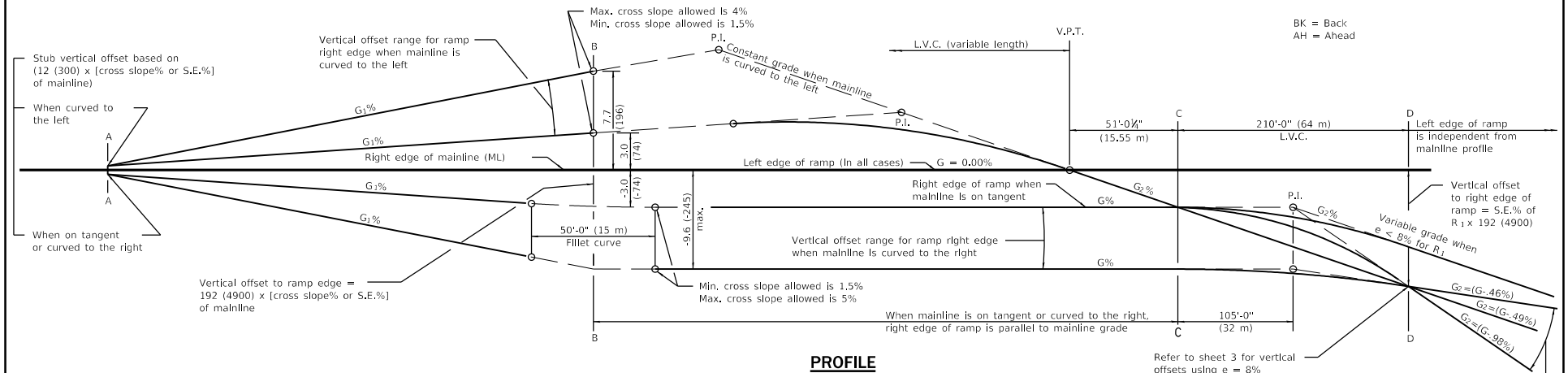
PASSED January 1, 2018
Michael Beard
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2018
Maureen M. O'Neil
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LEGISLATIVE COUNSEL



PLAN



PROFILE

See Sheet 3 for GENERAL NOTES

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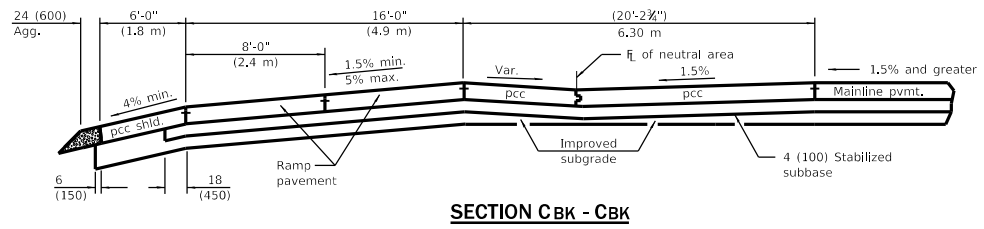
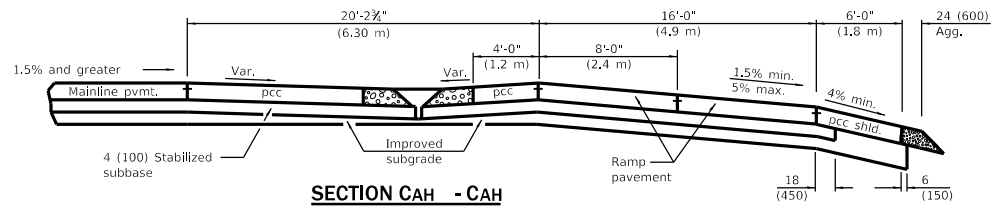
LEP-CI 03/15/11

DATE	REVISIONS
1-1-18	Changed spacing of tie bars to 36 (900) cts.
1-1-17	Added longitudinal sawed joint to middle of ramp pavement.

EXIT RAMP TERMINAL
 (JOINTED PCC RAMP PAVEMENT ADJACENT TO CRC MAINLINE PAVEMENT)

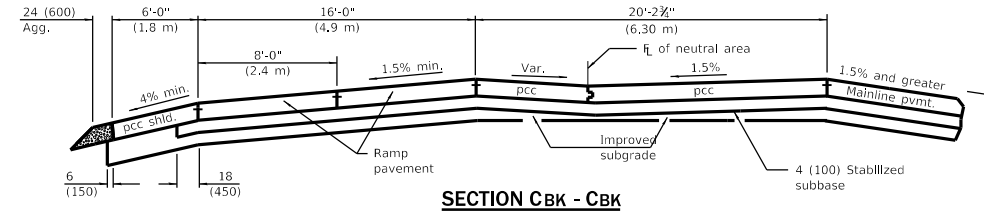
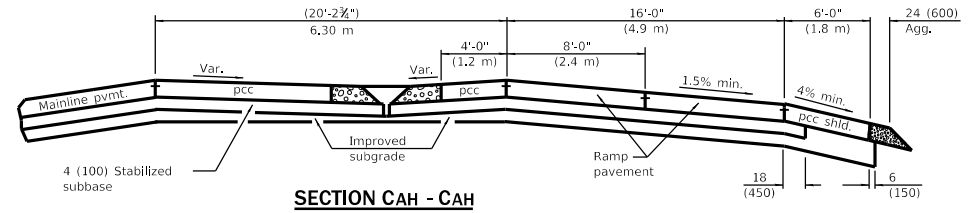
(Sheet 1 of 3)

STANDARD 420306-10



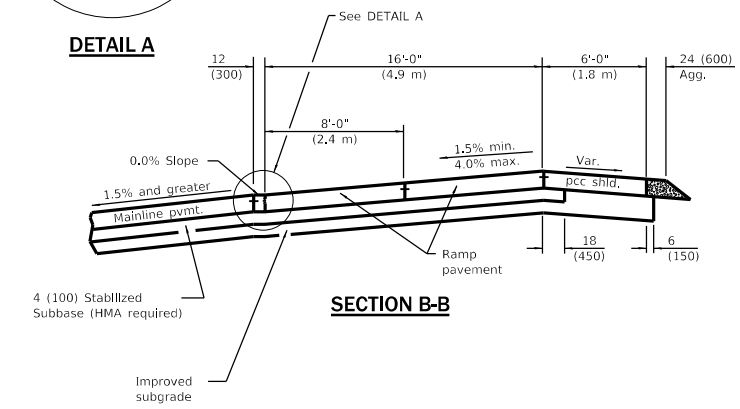
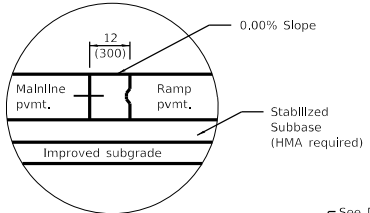
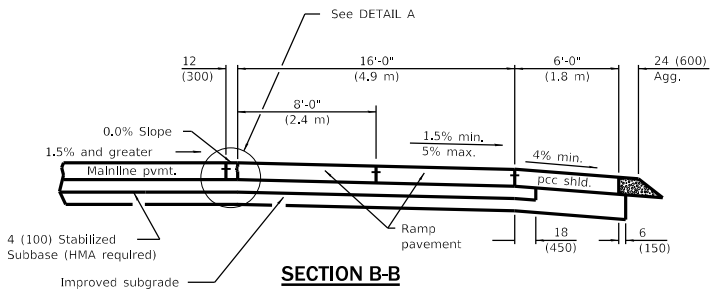
BK = Back
AH = Ahead

WHEN MAINLINE IS ON TANGENT OR CURVED TO THE RIGHT



See Sheet 3 for GENERAL NOTES

WHEN MAINLINE IS CURVED TO THE LEFT



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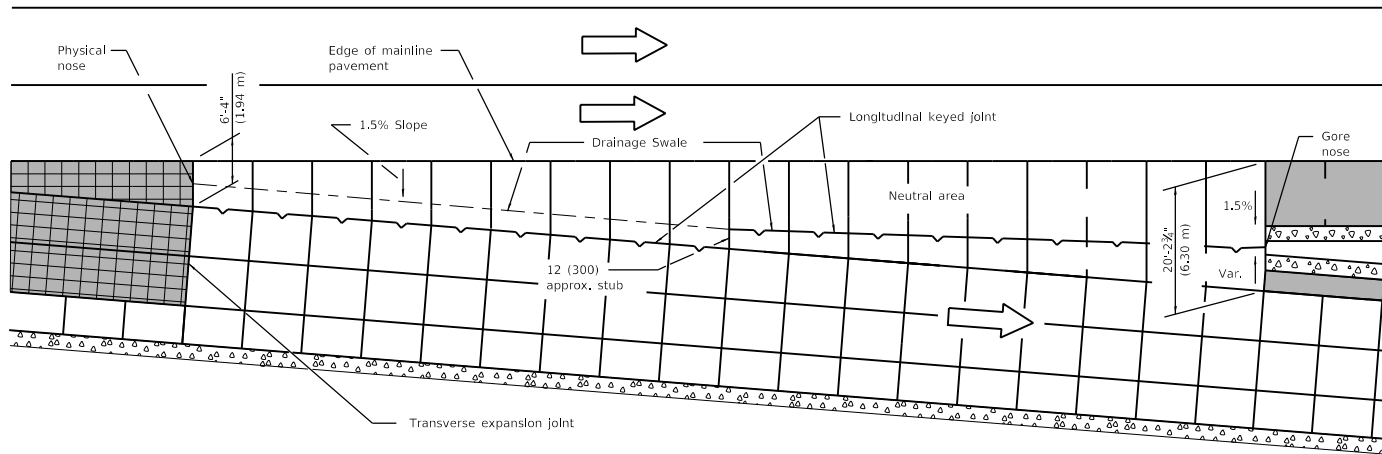
APPROVED January 1, 2018
Maureen M. O'Brien
ENGINEER OF DESIGN AND ENVIRONMENT

469-1-1 QM/ISS/1

EXIT RAMP TERMINAL
(JOINTED PCC RAMP PAVEMENT
ADJACENT TO CRC MAINLINE PAVEMENT)

(Sheet 2 of 3)

STANDARD 420306-10



Shaded area indicates shoulder transition zone from neutral area to design shoulder slope. In this area, the relative profile grade difference along the outside pavement edge and that along the outside shoulder edge shall not exceed 0.50%.

DETAILS FOR DRAINAGE IN NEUTRAL AREA

① Vertical offsets in inches for right edge of ramp, when e = 8%				① Vertical offsets in mm for right edge of ramp, when e = 8%			
Sections	Mainline on Tangent	Mainline Curved Right	Mainline Curved Left	Sections	Mainline on Tangent	Mainline Curved Right	Mainline Curved Left
A	- 0.18	S.E. % ML x 12	S.E. % ML x 12 ②	A	- 5	S.E.% ML x 300	S.E.% ML x 300 ②
B	- 3.0	S.E. % ML x 192	S.E. % ML x 192 ②	B	- 74	S.E.% ML x 4900	S.E.% ML x 4900 ②
C	- 3.0	S.E. % ML x 192	- 3.0	C	- 74	S.E. % ML x 4900	- 74
D	- 15.4	- 15.4	- 15.4	D	- 392	- 392	- 392

- ① Vertical offset values are calculated and based on the right edge of mainline pavement at 0.0 % grade.
- ② The vertical offsets of these points are above the mainline pavement and lie on an upgrade in relationship to the mainline grade.
- ③ S.E.=Superelevation Rate

GENERAL NOTES

The initial ramp grade (G₂) is based on the line generated through the PI that is 105' (32 m) past Section C-C and the point created by the vertical offset at Section D-D.
 See plans for actual grades.
 All pavement joints shall be detailed as shown on Standards 420001 and 483001. See Standard 483001 for ramp shoulder details.
 In the neutral area, provide a swale and flush inlet to enhance drainage.
 When using grades expressed in %, the grade values shall be divided by 100 to obtain vertical offsets.
 Where an exit ramp terminal is proposed adjacent to a mainline horizontal curve, construct the edge of the terminal by using offset widths, and for the terminal segment downstream from Section C-C to R₁, construct the ramp as a 141' (43 m) tangent section.
 All dimensions are in inches (millimeters) unless otherwise shown.

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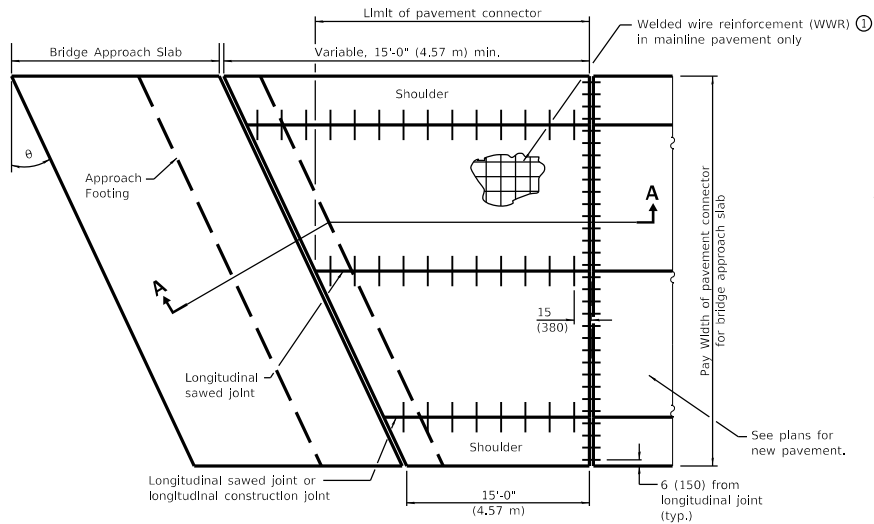
APPROVED January 1, 2018
Maureen M. O'Brien
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LEG-11 Q3/15/18

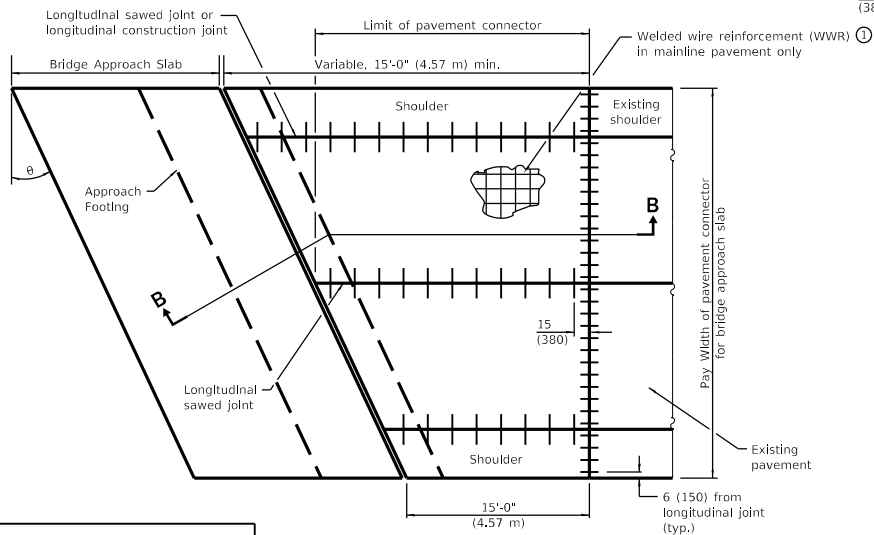
EXIT RAMP TERMINAL
 (JOINTED PCC RAMP PAVEMENT
 ADJACENT TO CRC MAINLINE PAVEMENT)

(Sheet 3 of 3)

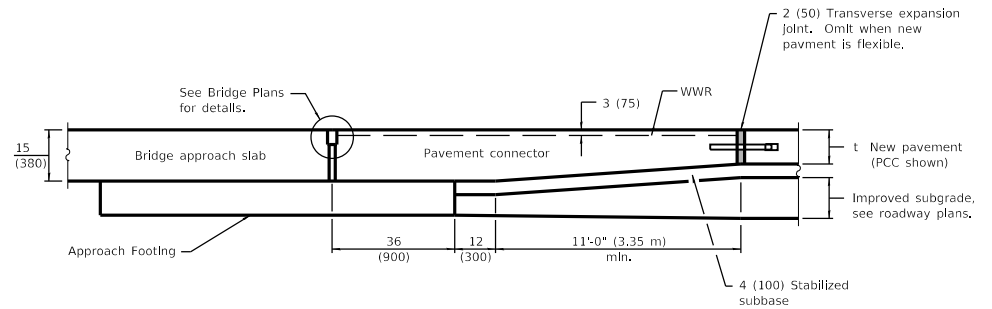
STANDARD 420306-10



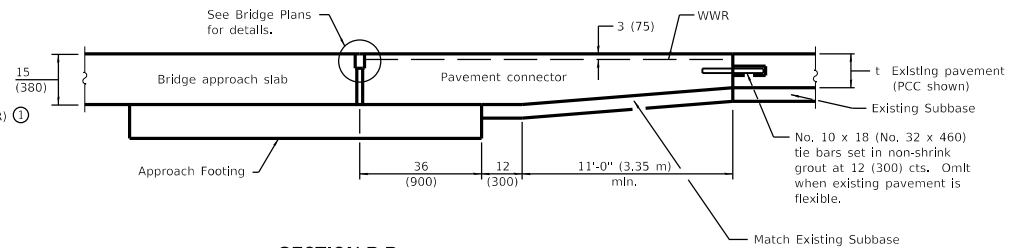
**PLAN
NEW CONSTRUCTION**



**PLAN
EXISTING CONSTRUCTION**



SECTION A-A



SECTION B-B

① WWR shall be 0.11 sq. in./ft. (230 sq. mm/m) in both directions. Maximum wire spacing shall be 6 (150). Minimum lap distance shall be two cross wires.

GENERAL NOTES

THICKNESS-"t"=Thickness of Pavement.

See Standard 420001 for pavement joint details not shown.

See Standard 610001 for shoulder Inlet with curb when required.

See plans for details of bridge approach slab, approach footing and joint treatment.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-19	Changed rebar in pavement connector to welded wire reinforcement.
4-1-16	Revised pavement connector to be rigid only. Omitted WFB term. joint. Renamed std.

**PAVEMENT CONNECTOR (PCC)
FOR BRIDGE APPROACH SLAB**

STANDARD 420401-13

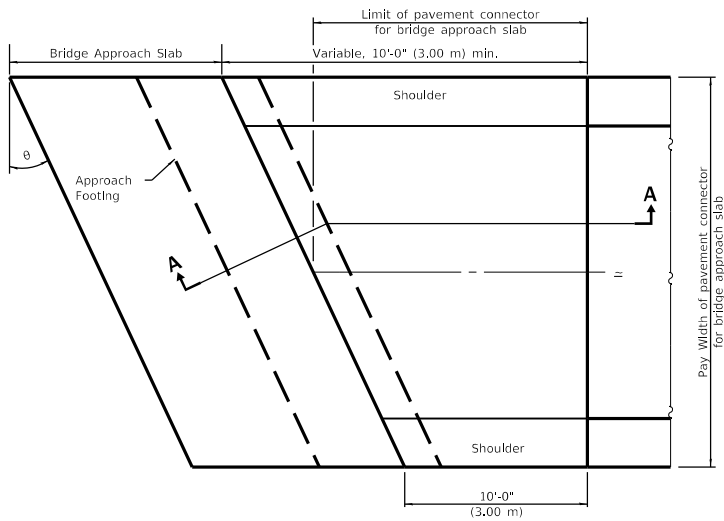
Illinois Department of Transportation

PASSED January 1 2019

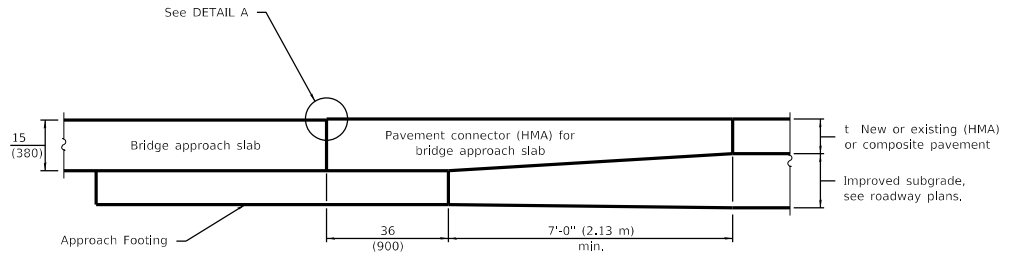
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1 2019

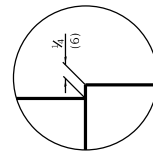
ENGINEER OF DESIGN AND ENVIRONMENT



PLAN
(New or existing construction)



SECTION A-A



DETAIL A

GENERAL NOTES

THICKNESS-"t"=Thickness of Pavement.

See Standard 610001 for shoulder inlet with curb when required.

See plans for details of bridge approach slab and approach footing.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
4-1-16	New standard.

**PAVEMENT CONNECTOR (HMA)
FOR BRIDGE APPROACH SLAB**

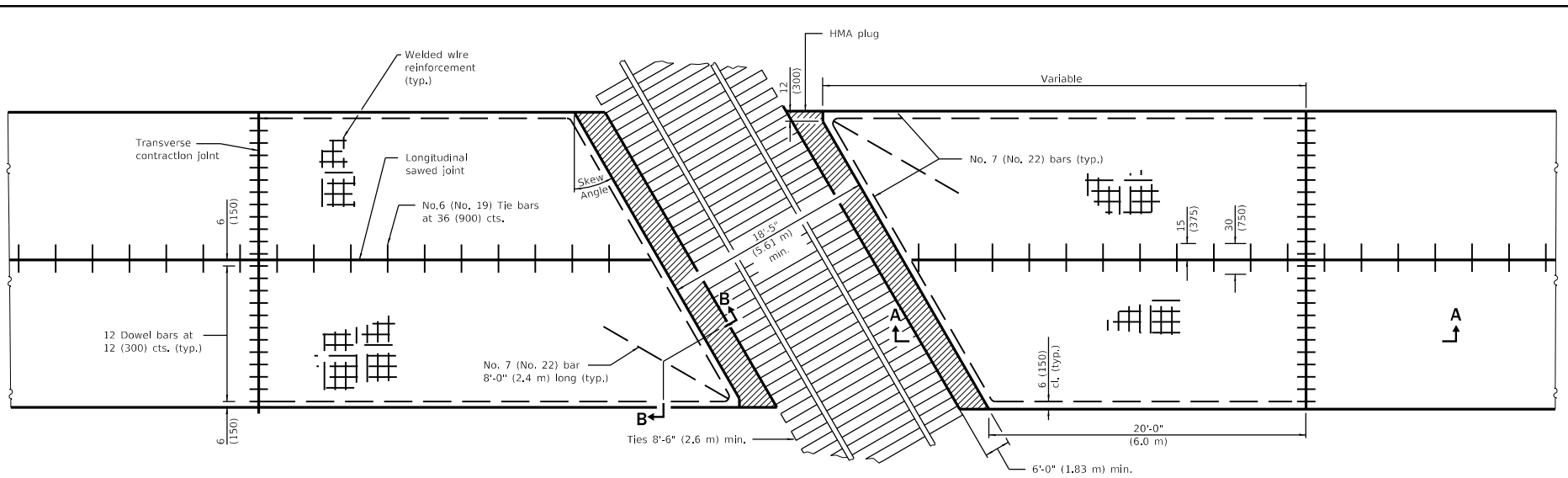
STANDARD 420406

Illinois Department of Transportation

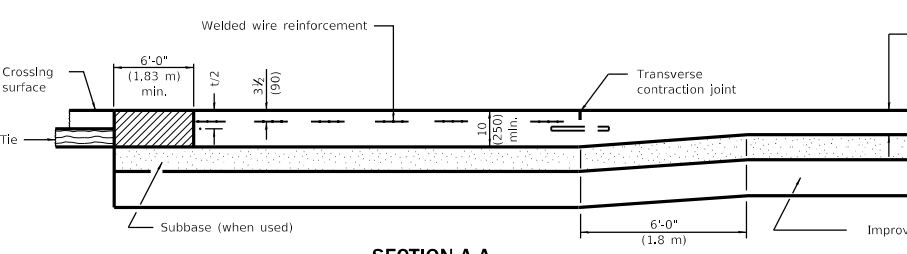
PASSED April 1, 2016
Michael Beard
ENGINEER OF POLICY AND PROCEDURES

APPROVED April 1, 2016
[Signature]
ENGINEER OF DESIGN AND ENVIRONMENT

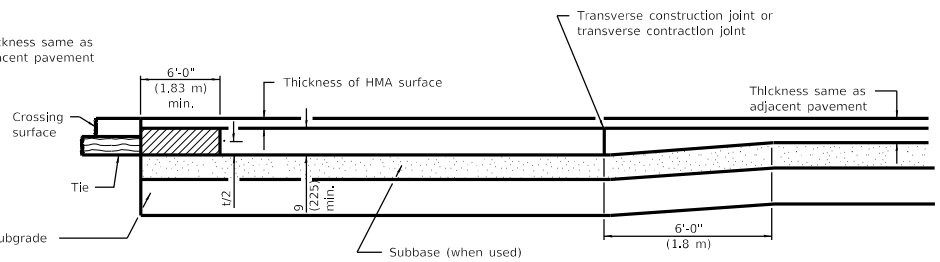
ISSUES: 469-1-1



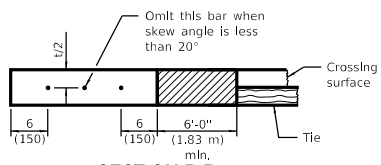
PLAN



SECTION A-A
(FOR PCC PAVEMENT)



SECTION A-A
(FOR PCC BASE COURSE WITH HMA SURFACE)



SECTION B-B

GENERAL NOTES

See Standard 420001 for joint details not shown.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-18	Revised standard to reflect change of tie bar spacing to 36 (900) cts.
4-1-16	Changed terminology to 'welded wire reinforcement'.

PCC PAVEMENT AND PCC BASE COURSE ADJACENT TO RAILROAD GRADE CROSSING

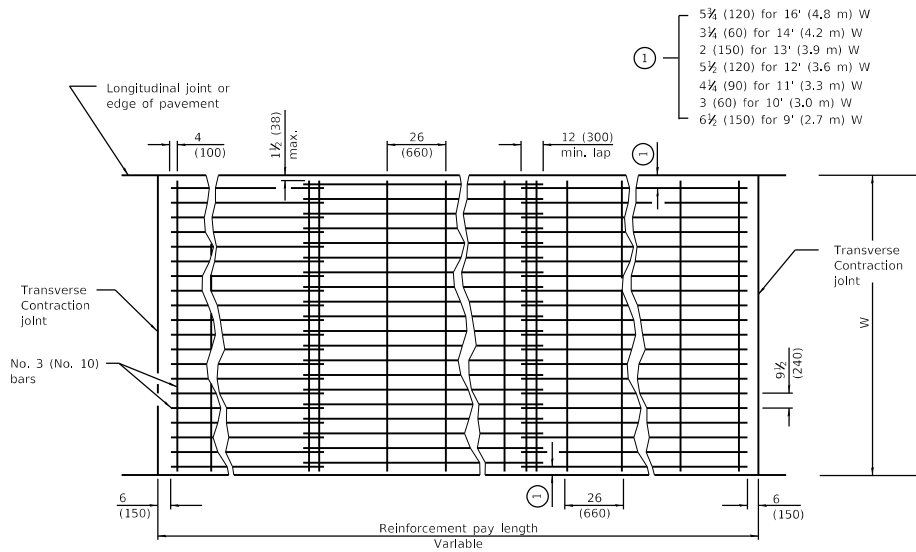
STANDARD 420501-07

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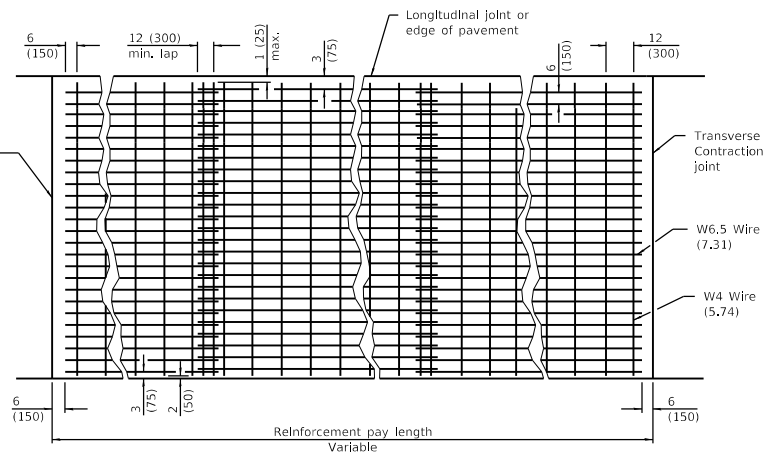
APPROVED January 1, 2018
Maureen M. O'Brien
 ENGINEER OF DESIGN AND ENVIRONMENT

464-C 03/15/11



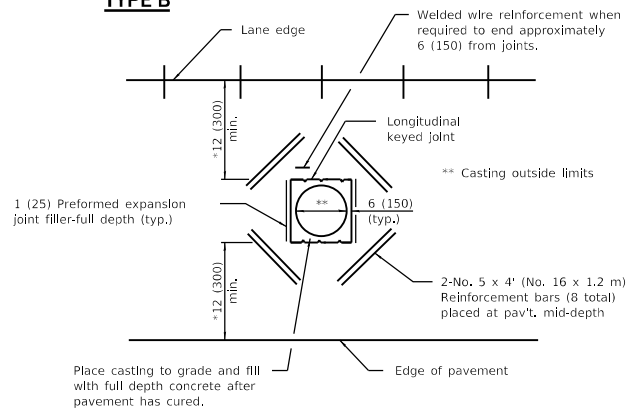
Approximately 63 lbs./100 sq. ft. (3.07 kg/m²)

When clipped bar mats are used, each bar intersection shall be clipped with W1.7 (3.74) wire.



Approximately 63 lbs./100 sq. ft. (3.07 kg/m²)

TYPE B



DETAIL OF ADDED REINFORCEMENT FOR PAVEMENT BLOCK-OUTS

TYPE A

GENERAL NOTES

Pavement block-outs shall be at least 24 (600) from contraction joints.

Welded wire reinforcement which is lapped longitudinally shall have a minimum lap of 6 (150).

Welded wire reinforcement may be positioned with the transverse wires on top or bottom of the longitudinal wires.

All dimensions are in inches (millimeters) unless otherwise shown.

* When the 12 (300) minimum cannot be achieved, the transverse joints shall be extended to either the longitudinal joint or edge of pavement.

Illinois Department of Transportation

PASSED April 1, 2016
Michael Beard
 ENGINEER OF POLICY AND PROCEDURES

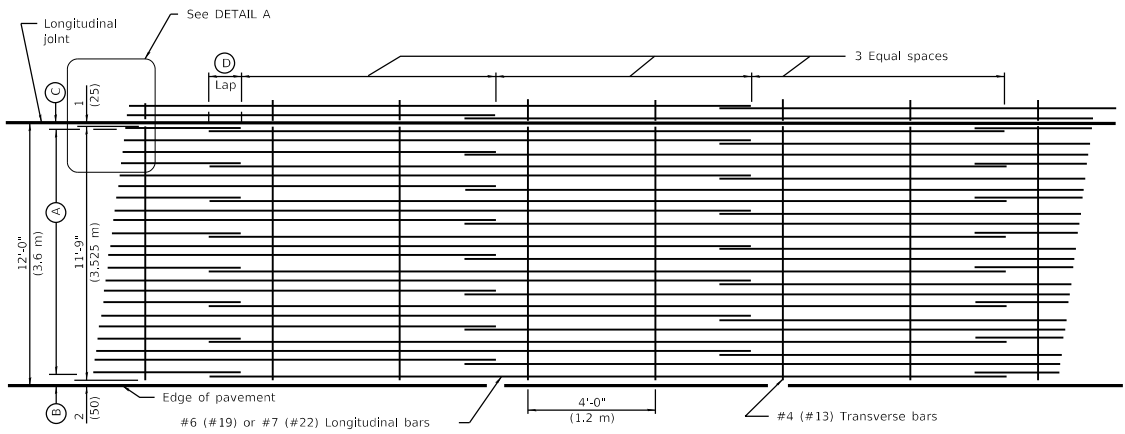
APPROVED April 1, 2016
[Signature]
 ENGINEER OF DESIGN AND ENVIRONMENT

LEG-CI 03/15/11

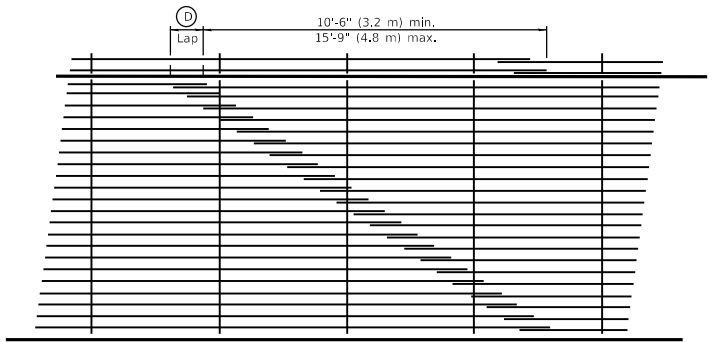
DATE	REVISIONS
4-1-16	Changed terminology to 'welded wire reinforcement'. Renamed standard.
1-1-08	Switched units to English (metric).

PAVEMENT WELDED WIRE REINFORCEMENT

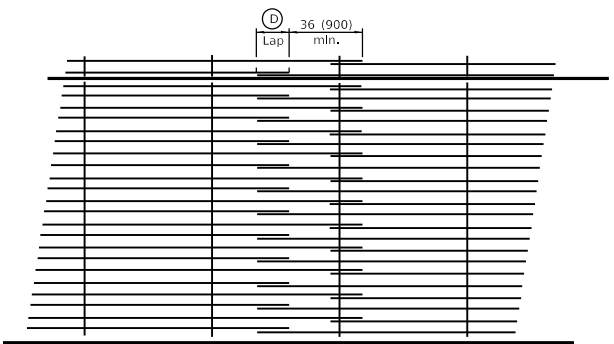
STANDARD 420701-03



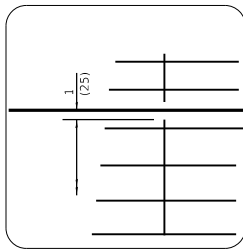
LAP DETAIL I



LAP DETAIL II



LAP DETAIL III



DETAIL A

ENGLISH (Inches)					
Bar Size	Pavement Thickness	Ⓐ (Approx. Spacing)	Ⓑ	Ⓒ	Ⓓ
#6	7½ thru 8½	18 spaces (19 bars) @ 7½	3½	3	22
#6	8½ thru 9½	20 spaces (21 bars) @ 6¾	3½	3	22
#6	9½ thru 10½	22 spaces (23 bars) @ 6¼	3½	3	22
#6	10½ thru 11½	24 spaces (25 bars) @ 5¾	3½	3	22
#6	11½ thru 12½	27 spaces (28 bars) @ 5½	3½	3	22
#7	9½ thru 10½	16 spaces (17 bars) @ 8¾	3½	3	26
#7	10½ thru 11½	18 spaces (19 bars) @ 7¾	3½	3	26
#7	11½ thru 12½	19 spaces (20 bars) @ 7¼	3½	3	26
#7	12½ thru 13½	21 spaces (22 bars) @ 6½	3½	3	26
#7	13½ thru 14½	23 spaces (24 bars) @ 6	3½	3	26
#7	14½ thru 15½	24 spaces (25 bars) @ 5¾	3½	3	26
#7	15½ thru 16½	26 spaces (27 bars) @ 5¼	3½	3	26

METRIC (mm)					
Bar Size	Pavement Thickness	Ⓐ (Approx. Spacing)	Ⓑ	Ⓒ	Ⓓ
#19	200 thru 220	18 spaces (19 bars) @ 191	90	75	560
#19	230 thru 250	21 spaces (22 bars) @ 163	95	80	560
#19	260 thru 280	23 spaces (24 bars) @ 149	90	80	560
#19	290 thru 310	26 spaces (27 bars) @ 132	90	75	560
#19	320 thru 340	29 spaces (30 bars) @ 118	95	80	560
#22	230 thru 250	15 spaces (16 bars) @ 229	90	75	660
#22	260 thru 280	17 spaces (18 bars) @ 202	90	75	660
#22	290 thru 310	19 spaces (20 bars) @ 181	90	70	660
#22	320 thru 340	21 spaces (22 bars) @ 163	95	80	660
#22	350 thru 370	23 spaces (24 bars) @ 149	90	80	660
#22	380 thru 400	25 spaces (26 bars) @ 137	95	80	660
#22	410 thru 430	27 spaces (28 bars) @ 127	90	80	660

GENERAL NOTES

Except as noted or shown, the dimensions and notes specified for LAP DETAIL I are typical for LAP DETAIL II and III.

The Ⓒ dimension and the distance from the end of the transverse bar to the edge of pavement may be increased by 1 (25) for slip form paving.

The minimum length of longitudinal bars shall be 30' (9 m) except as required to establish the lap arrangement selected.

All dimensions are in Inches (millimeters) unless otherwise shown.

DATE	REVISIONS
4-1-16	Revised general notes with respect to 30' bar length.
1-1-08	Switched units to English (metric).

BAR REINFORCEMENT FOR CRC PAVEMENT

STANDARD 421001-03

Illinois Department of Transportation

PASSED April 1, 2016

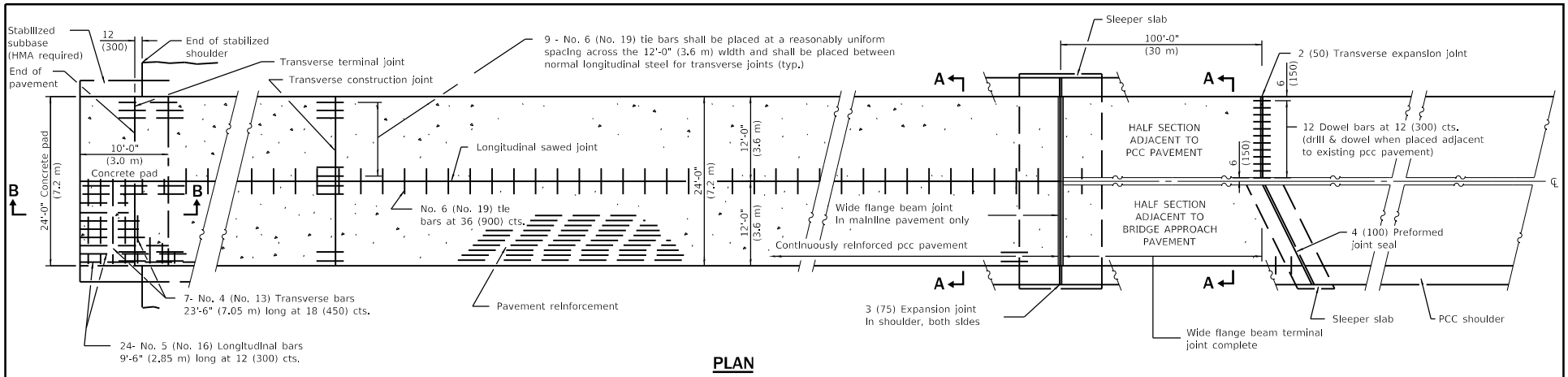
Michael Beard

ENGINEER OF POLICY AND PROCEDURES

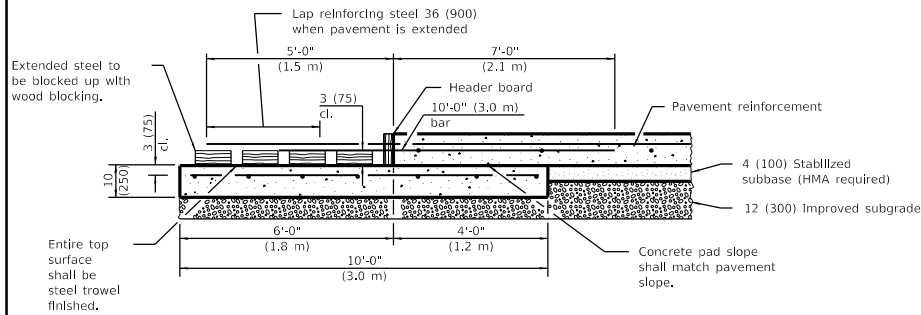
APPROVED April 1, 2016

ENGINEER OF DESIGN AND ENVIRONMENT

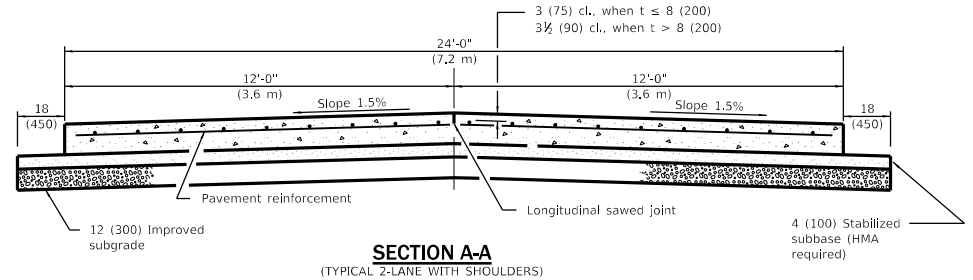
LEG-C1 03/15/11



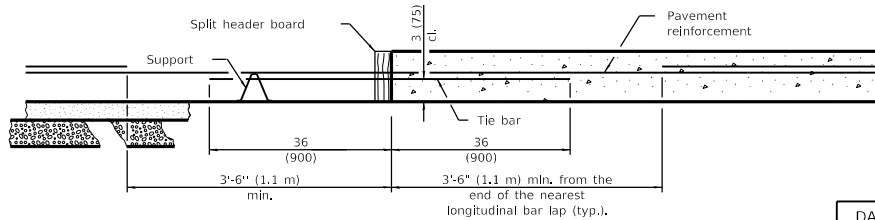
PLAN



TRANSVERSE TERMINAL JOINT SECTION B-B



SECTION A-A (TYPICAL 2-LANE WITH SHOULDERS)



TRANSVERSE CONSTRUCTION JOINT

GENERAL NOTES

Sealant components for the wide flange beam terminal joint shall be as follows: The sealant shall be Dow Corning 888 Silicone Highway Joint Sealant. The tape shall be Polyethylene Tape No. 40. The primer, used on the metal only, shall be Dow Corning 1200. At the Contractor's option the joint may be sealed as shown in the optional groove detail.

See Standards 420001 and 420401 for joint details not shown.

See Standard 421001 for details of pavement reinforcement.

All dimensions are in Inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-18	Changed tie bar spacing to 36 (900) cts.
1-1-14	Added exp. jnts. in shlds. & omitted bars, cnst. jnt. over wide flange beam slpr slab.

24' (7.2 m)
CRC PAVEMENT
 (WITH WIDE FLANGE BEAM TERMINAL JOINT)
 (Sheet 1 of 2)

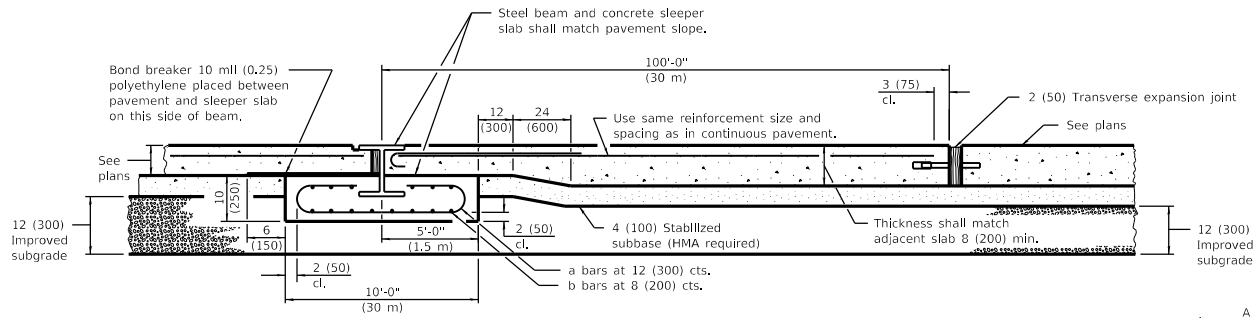
STANDARD 421101-10

Illinois Department of Transportation

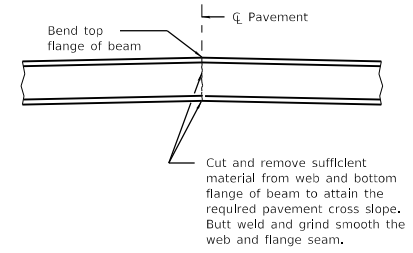
PASSED January 1, 2018
Michael Beard
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2018
Maureen M. O'Brien
 ENGINEER OF DESIGN AND ENVIRONMENT

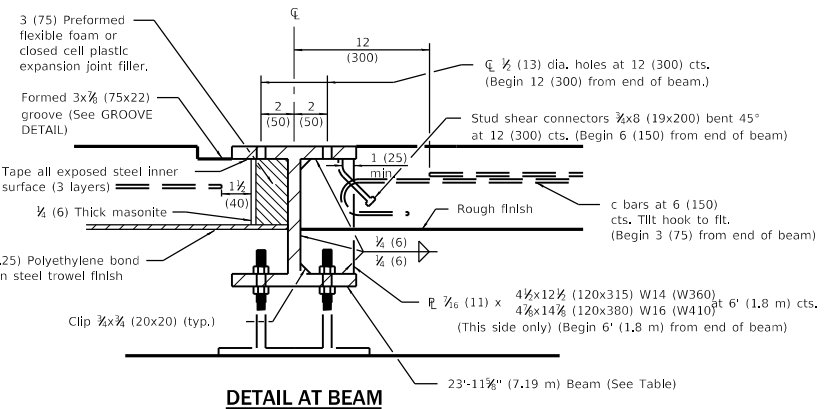
464-C 03/15/21



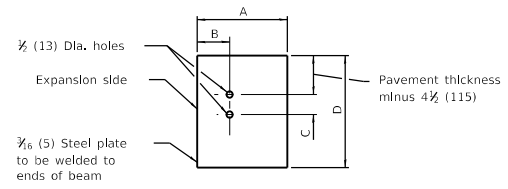
WIDE FLANGE BEAM TERMINAL JOINT



DETAIL OF CUTTING AND WELDING BEAM



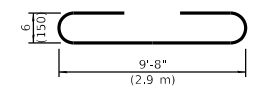
DETAIL AT BEAM



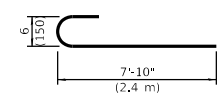
END PLATE

PAVEMENT THICKNESS	<10 (250)	≥10 (250)
BEAM SIZE	W14x82 (W360x122)	W16x100 (W410x1149)
A	10 1/2 (255)	10 1/2 (265)
B	4 7/8 (110)	4 7/8 (115)
C	3 (75)	4 (100)
D	14 1/2 (360)	17 (430)

MATERIALS REQUIRED FOR ONE TRANSVERSE TERMINAL JOINT COMPLETE	
Concrete, cu. yds. (m³)	7.4 (5.4)
Reinforcement bars, lbs. (kg)	348 (160)
Pavement reinforcement, sq. yds. (m²)	13.3 (10.8)



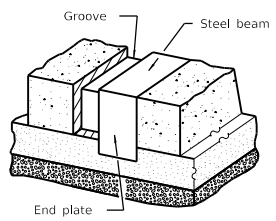
BAR a



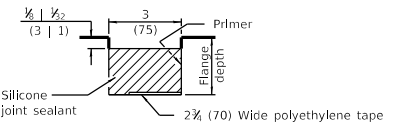
BAR c

MATERIALS REQUIRED FOR ONE WIDE FLANGE BEAM TERMINAL JOINT COMPLETE				
Bar	No.	Size	Length	Shape
a	24	No. 4 (No. 13)	19'-0" (5.8 m)	
b	29	No. 5 (No. 16)	23'-8" (7.1 m)	
c	48	No. 6 (No. 19)	8'-6" (2.6 m)	
Concrete, cu. yds. (m³)		7.4 (5.4)		
Reinforcement Bars, lbs. (kg)		1635 (740)		
Structural Steel, lbs. (kg)		W14 (W360) 2025* (906*) W16 (W410) 2466* (1104*)		
Pavement, sq. yds. (m²)		266.7 (216)		
Pavement Reinforcement, sq. yds. (m²)		266.7 (216)		
Stabilized Subbase, sq. yds. (m²)		285 (230.8)		
Improved Subgrade, sq. yds. (m²)		300 (243)		

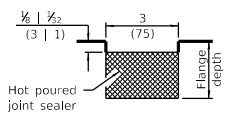
* Weight includes beam, end plates, stiffener plates and studs.



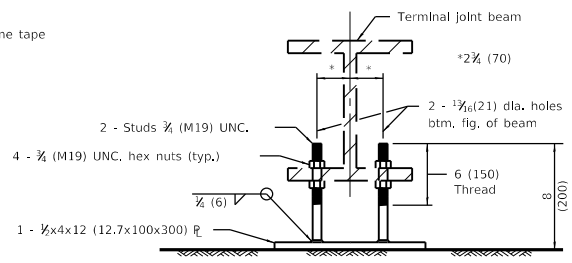
VIEW OF GROOVE AT EDGE OF PAVEMENT



GROOVE DETAIL



GROOVE DETAIL (OPTIONAL)



OPTIONAL ADJUSTABLE CHAIR

Illinois Department of Transportation

PASSED January 1, 2018

Michael Beard
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2018

Maureen M. O'Brien
ENGINEER OF DESIGN AND ENVIRONMENT

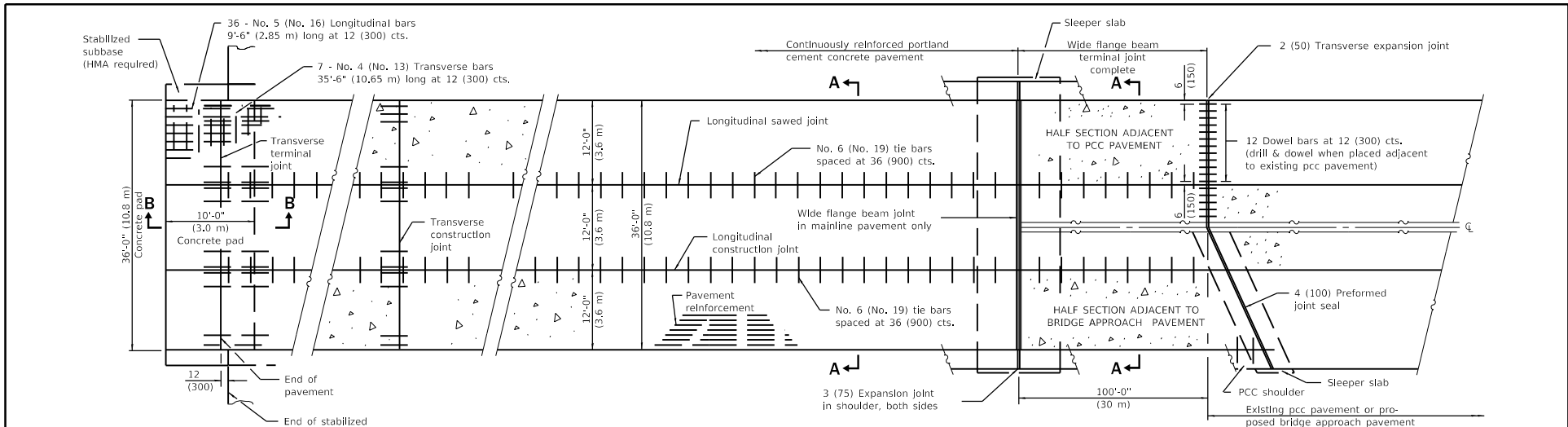
24' (7.2 m)

CRC PAVEMENT

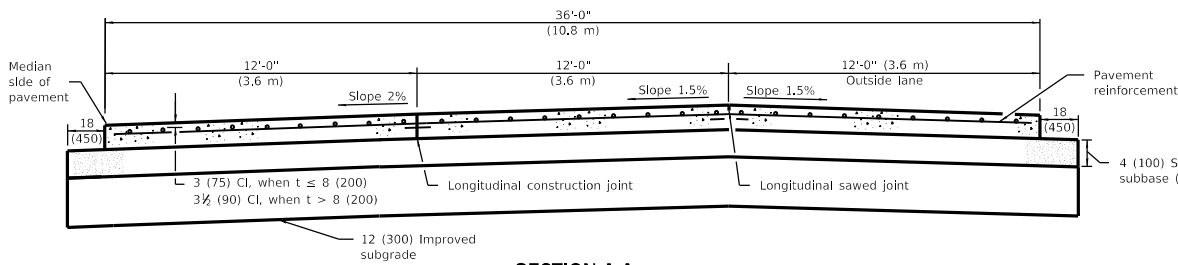
(WITH WIDE FLANGE BEAM TERMINAL JOINT)

(Sheet 2 of 2)

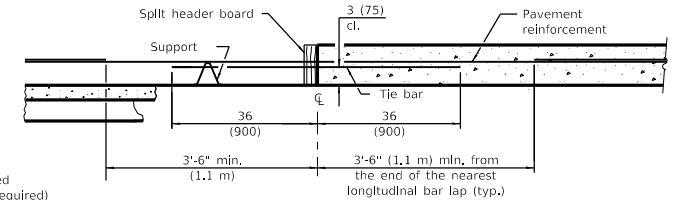
STANDARD 421101-10



PLAN



SECTION A-A
(TYPICAL 3-LANE, 1-WAY WITH SHOULDERS)



TRANSVERSE CONSTRUCTION JOINT

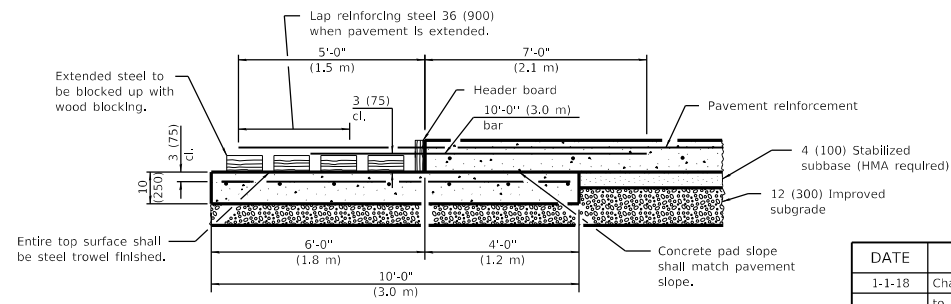
GENERAL NOTES

Sealant components for the wide flange beam terminal joint shall be as follows: The sealant shall be Dow Corning 888 Silicone Highway Joint Sealant. The tape shall be Polyethylene Tape No. 40. The primer, used on the metal only, shall be Dow Corning 1200. At the Contractor's option the joint may be sealed as shown in the optional groove detail.

See Standard 421001 for details of pavement reinforcement.

See Standards 420001 and 420401 for joint details not shown.

All dimensions shall be in inches (millimeters) unless otherwise shown.



TRANSVERSE TERMINAL JOINT SECTION B-B

Illinois Department of Transportation

PASSED January 1, 2018
Michael Beard
ENGINEER OF POLICY AND PROCEDURES

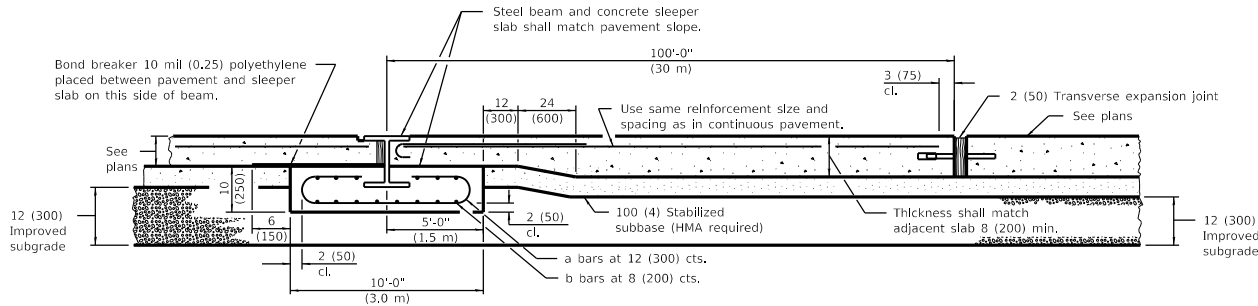
APPROVED January 1, 2018
Maureen M. O'Brien
ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-18	Changed tie bar spacing to 36 (900) cts.
1-1-14	Added exp. jnts, in shlds, & omitted bars, const. jnt, over wide flange beam slpr. slab.

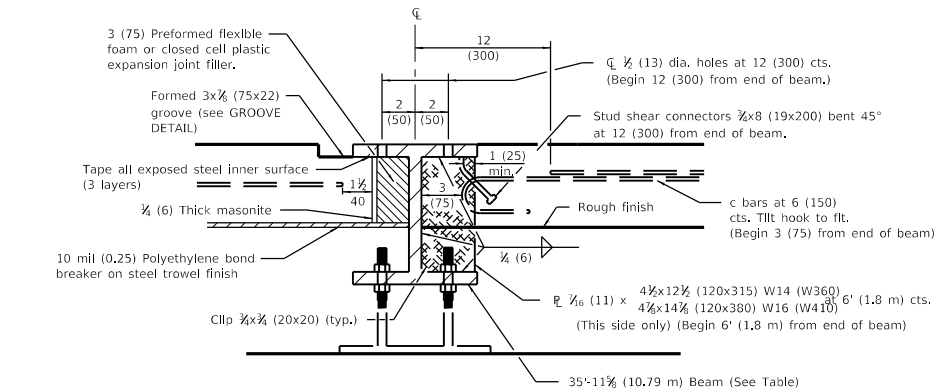
36' (10.8 m)
CRC PAVEMENT
(WITH WIDE FLANGE BEAM TERMINAL JOINT)

(Sheet 1 of 2)

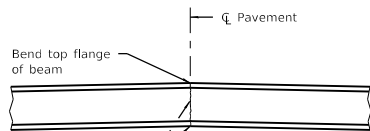
STANDARD 421106-10



WIDE FLANGE BEAM TERMINAL JOINT



DETAIL AT BEAM

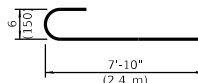


DETAIL OF CUTTING AND WELDING BEAM

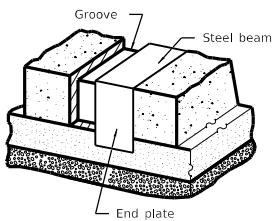
Cut and remove sufficient material from web and bottom flange of beam to attain the required pavement cross slope. Butt weld and grind smooth the web and flange seam.



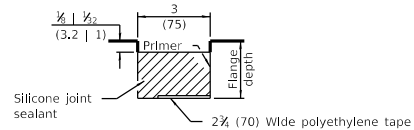
BAR a



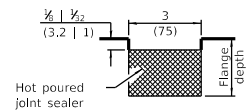
BAR c



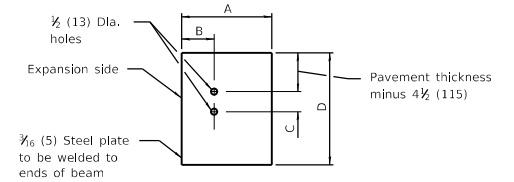
VIEW OF GROOVE AT EDGE OF PAVEMENT



GROOVE DETAIL



GROOVE DETAIL (OPTIONAL)

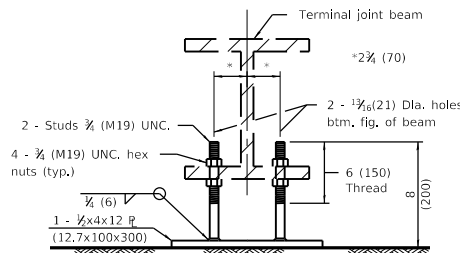


END PLATE

PAVEMENT THICKNESS	<10 (250)	≥10 (250)
BEAM SIZE	W14x82 (W360x122)	w16x100 (W410x149)
A	10 1/2 (265)	10 1/2 (265)
B	4 7/8 (110)	4 7/8 (115)
C	3 (75)	4 (100)
D	14 1/4 (360)	17 (430)

MATERIALS REQUIRED FOR ONE TRANSVERSE TERMINAL JOINT COMPLETE	
Concrete, cu. yds. (m³)	11.1 (8.1)
Reinforcement bars, lbs. (kg)	523 (235)
Pavement reinforcement, sq. yds. (m²)	20 (16.2)

MATERIALS REQUIRED FOR ONE WIDE FLANGE BEAM TERMINAL JOINT COMPLETE				
Bar	No.	Size	Length	Shape
a	36	No. 4 (No. 13)	19'-0" (5.8 m)	
b	29	No. 5 (No. 16)	35'-8" (10.7 m)	
c	72	No. 6 (No. 19)	8'-6" (2.6 m)	
Concrete, cu. yds. (m³)			11.1 (8.1)	
Reinforcement Bars, lbs. (kg)			2455 (1115)	
Structural Steel, lbs. (kg)			3040 (1360)	
			W14 (W360) 3040 (1360)	
			W16 (W410) 3710 (1655)	
* Weight includes beam, end plates, stiffener plates and studs.				
Pavement, sq. yds. (m²)			400 (324)	
Pavement Reinforcement, sq. yds. (m²)			400 (324)	
4 (100) Stabilized Subbase, sq. yds. (m²)			411.6 (333.5)	
Improved Subgrade, sq. yds. (m²)			433.3 (351)	



OPTIONAL ADJUSTABLE CHAIR

Illinois Department of Transportation

PASSED January 1, 2018

APPROVED January 1, 2018

Michael Beard
ENGINEER OF POLICY AND PROCEDURES

Maureen M. Behr
ENGINEER OF DESIGN AND ENVIRONMENT

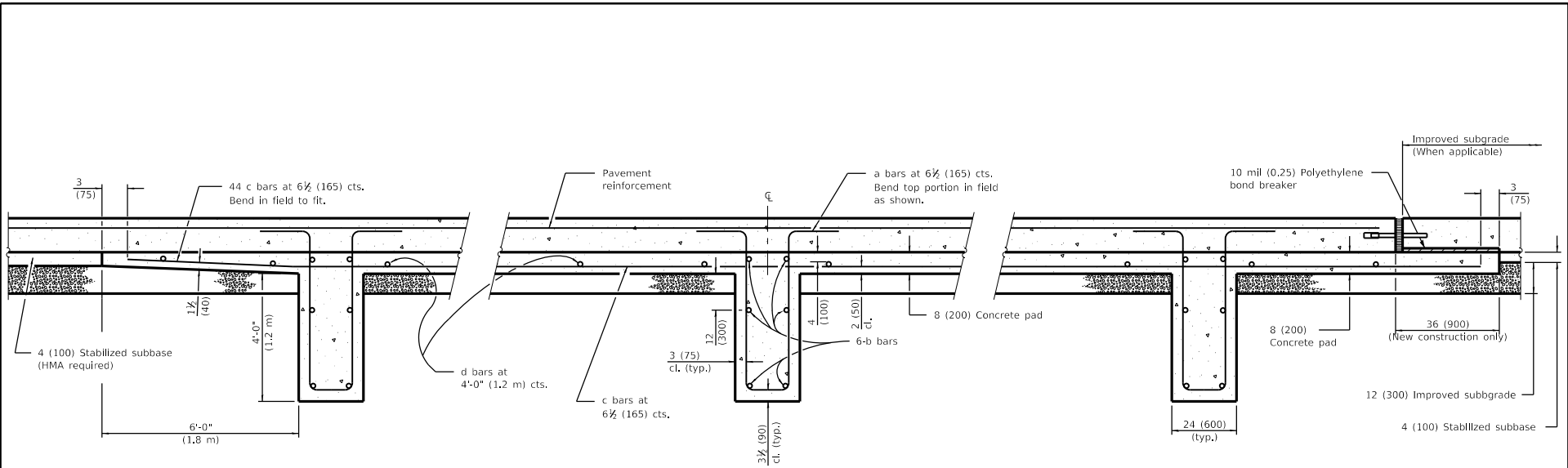
36' (10.8 m)

CRC PAVEMENT

(WITH WIDE FLANGE BEAM TERMINAL JOINT)

(Sheet 2 of 2)

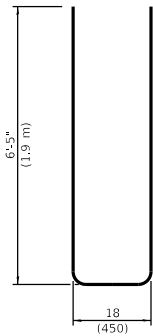
STANDARD 421106-10



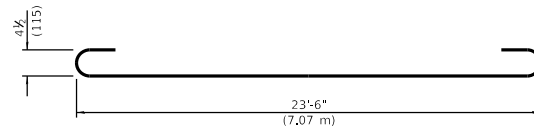
SECTION AT LUG W

SECTION AT LUG X

SECTION AT LUG Y



BAR a



BAR b

MATERIALS REQUIRED FOR (1) ONE LUG SYSTEM
(Excluding Pavement Concrete and Pavement Reinforcement)

Bar	Qty.	Size	Length	Shape
a	132	No. 8 (No. 25)	14'-0" (4.25 m)	
b	18	No. 5 (No. 16)	24'-9" (7.43 m)	
c	132	No. 5 (No. 16)	20'-0" (6.10 m)	
d	28	No. 4 (No. 13)	11'-9" (3.52 m)	

Concrete, cu. yds. (m ³)	64.0 (48.9)
Reinforcing Bars, lbs. (kg)	8372 (3800)
Concrete Pad, sq. yds. (m ²)	144 (120)
Improved Subgrade, sq. yds. (m ²)	162 (135)

Illinois Department of Transportation

PASSED January 1, 2018
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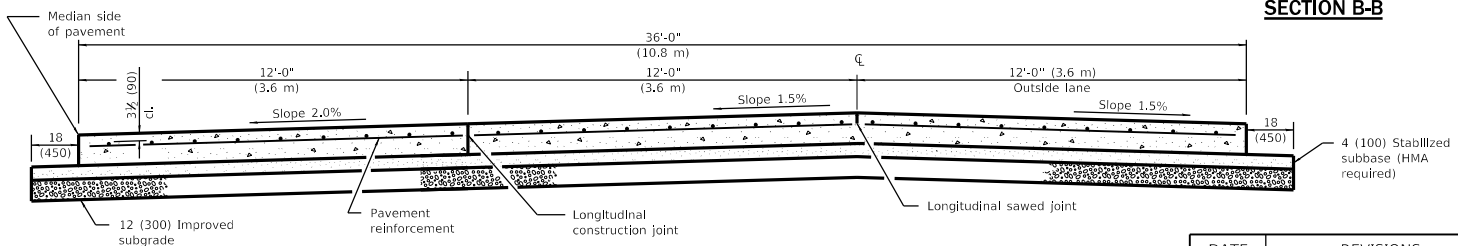
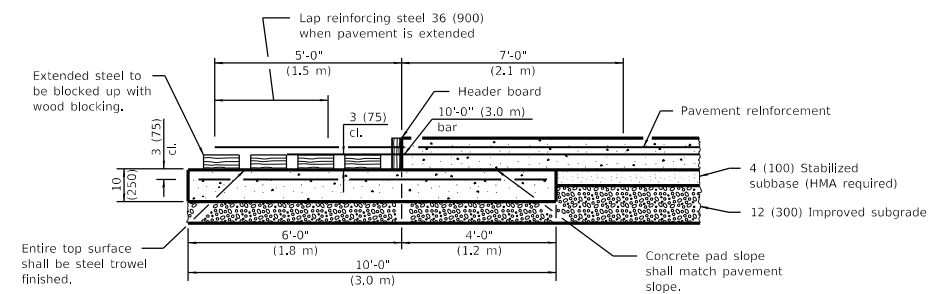
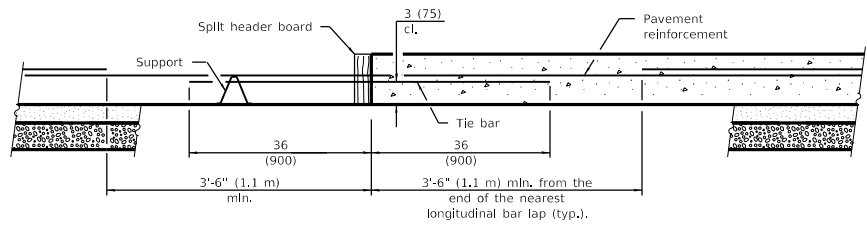
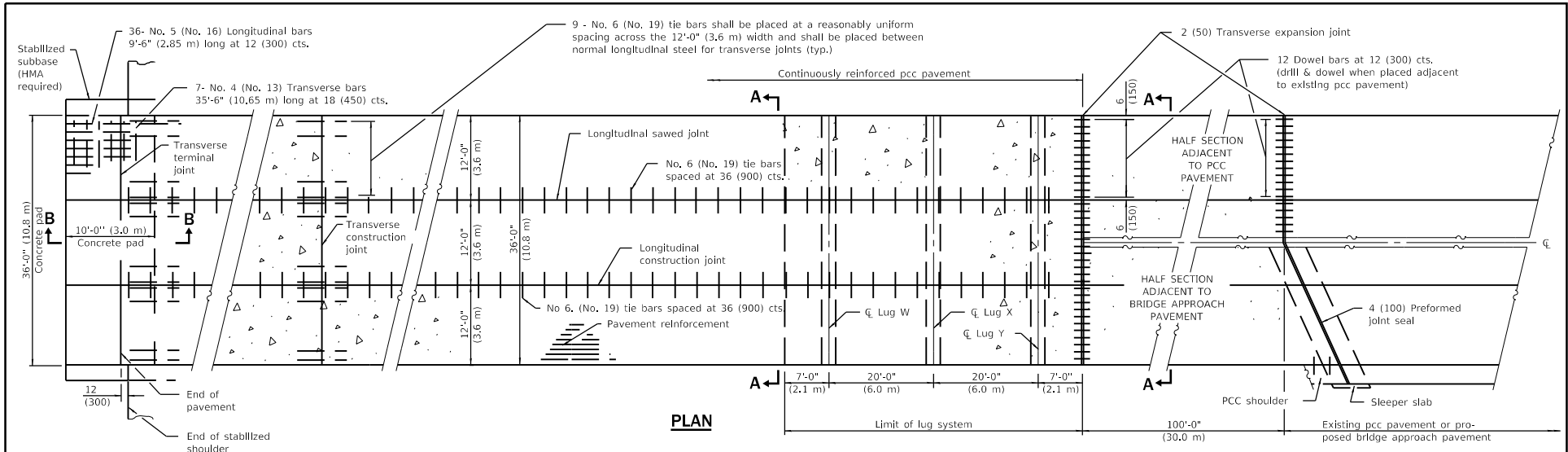
APPROVED January 1, 2018
Maureen M. O'Brien
ENGINEER OF DESIGN AND ENVIRONMENT

469-1-1 Q3/11/15/1

24' (7.2 m)
CRC PAVEMENT
(WITH LUG SYSTEM)

(Sheet 2 of 2)

STANDARD 421201-07



GENERAL NOTES

See Standard 421001 for details of pavement reinforcement.

See Standards 420001 and 420401 for joint details not shown.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2018

APPROVED January 1, 2018

ENGINEER OF POLICY AND PROCEDURES

ENGINEER OF DESIGN AND ENVIRONMENT

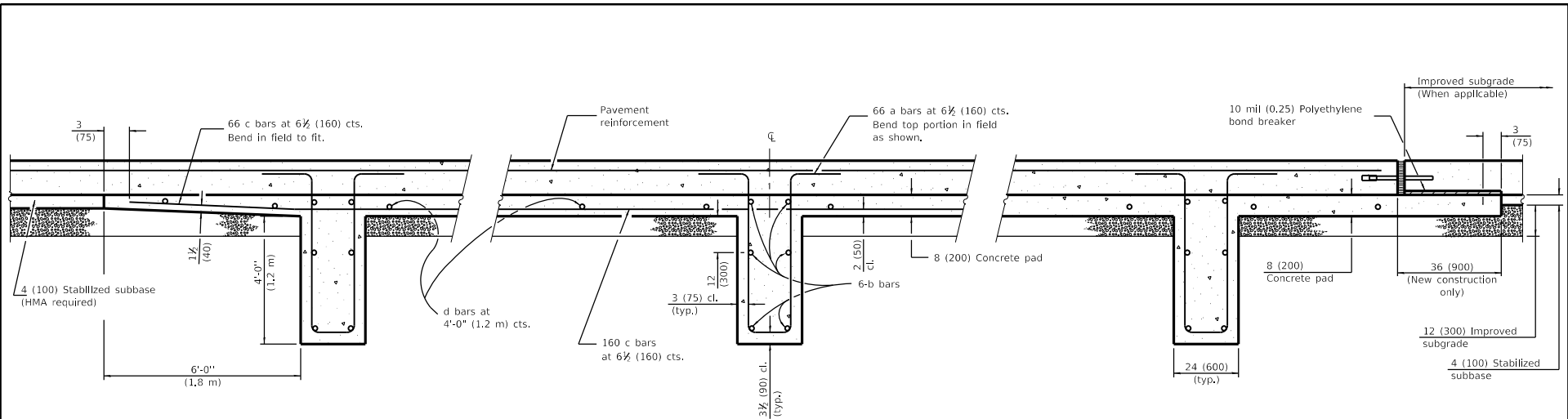
SECTION A-A
(TYPICAL 3-LANE, 1-WAY WITH SHOULDERS)

DATE	REVISIONS
1-1-18	Changed tie bar spacing to 36 (900).
1-1-08	Switched units to English (metric). Revised Lug Sys. Table.

36' (10.8 m)
CRC PAVEMENT
(WITH LUG SYSTEM)

(Sheet 1 of 2)

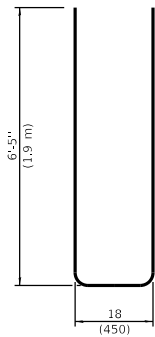
STANDARD 421206-07



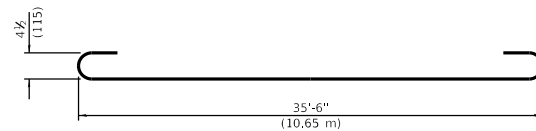
SECTION AT LUG W

SECTION AT LUG X

SECTION AT LUG Y



BAR a



BAR b

MATERIALS REQUIRED FOR (1) ONE LUG SYSTEM (Excluding Pavement Concrete and Pavement Reinforcement)				
Bar	No.	Size	Length	Shape
a	198	No. 8 (No. 25)	14'-0" (4.25 m)	
b	18	No. 5 (No. 16)	36'-9" (11.30 m)	
c	198	No. 5 (No. 16)	20'-0" (6.10 m)	
d	42	No. 4 (No. 13)	11'-9" (3.52 m)	

Concrete, cu. yds. (m ³)	96.0 (73.4)
Reinforcing Bars, lbs. (kg)	12,550 (5695)
Concrete Pad, sq. yds. (m ²)	216 (181)
Improved Subgrade, sq. yds. (m ²)	208 (174)

Illinois Department of Transportation

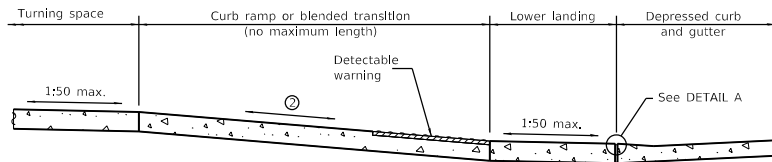
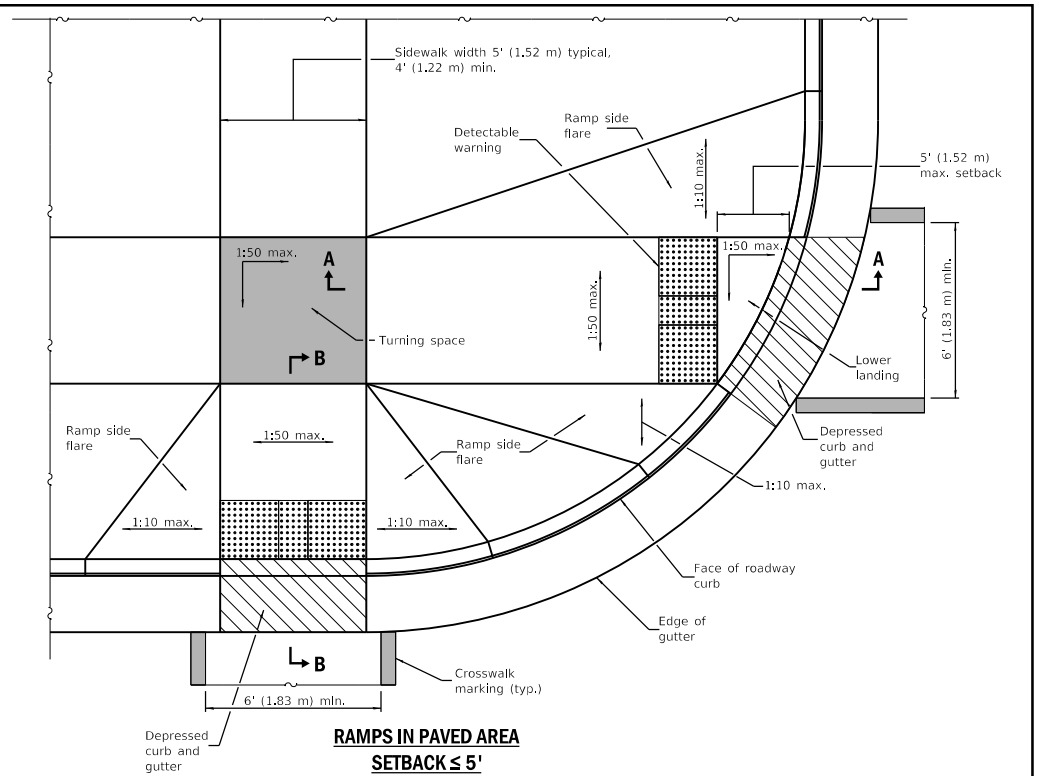
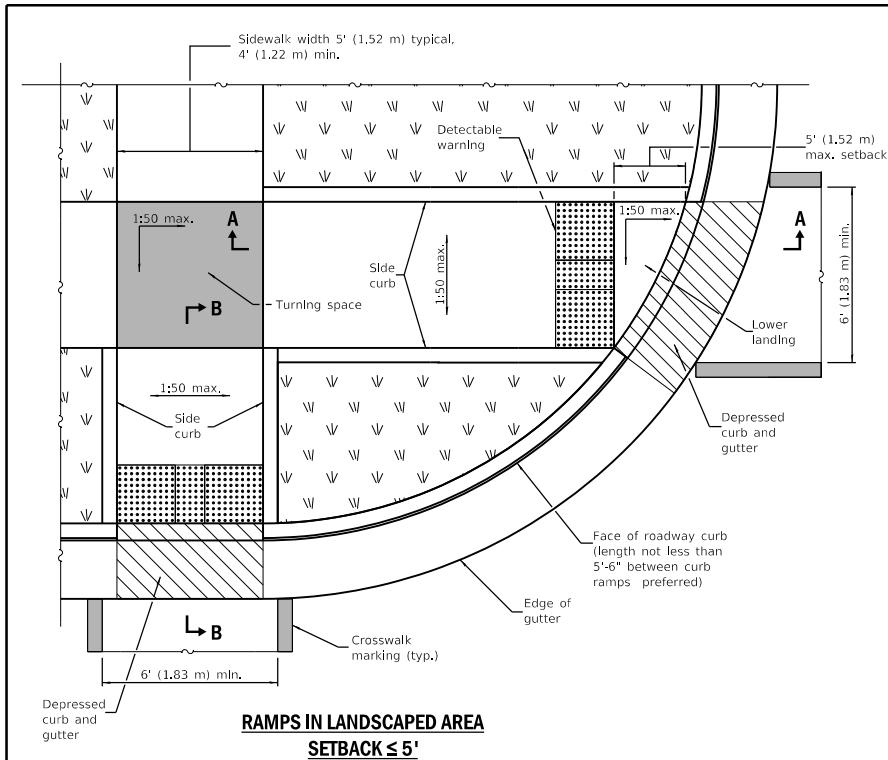
PASSED January 1, 2018
Michael Beard
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2018
Maureen M. O'Brien
 ENGINEER OF DESIGN AND ENVIRONMENT

464-C1 03/15/18

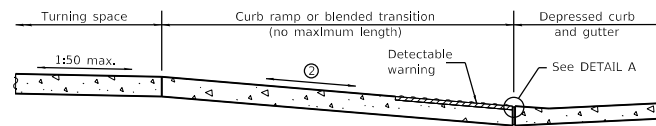
36' (10.8 m)
CRC PAVEMENT
 (WITH LUG SYSTEM) (Sheet 2 of 2)

STANDARD 421206-07



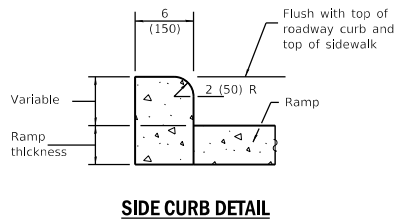
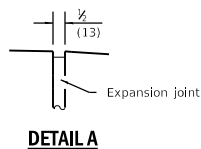
SECTION A-A

② The running slope of a curb ramp shall be 1:20 min. and 1:12 max. The running slope of a blended transition shall be 1:20 max.



SECTION B-B

② The running slope of a curb ramp shall be 1:20 min. and 1:12 max. The running slope of a blended transition shall be 1:20 max.



See Sheet 2 for GENERAL NOTES.

Illinois Department of Transportation

PASSED January 1, 2019

ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2019

ENGINEER OF DESIGN AND ENVIRONMENT

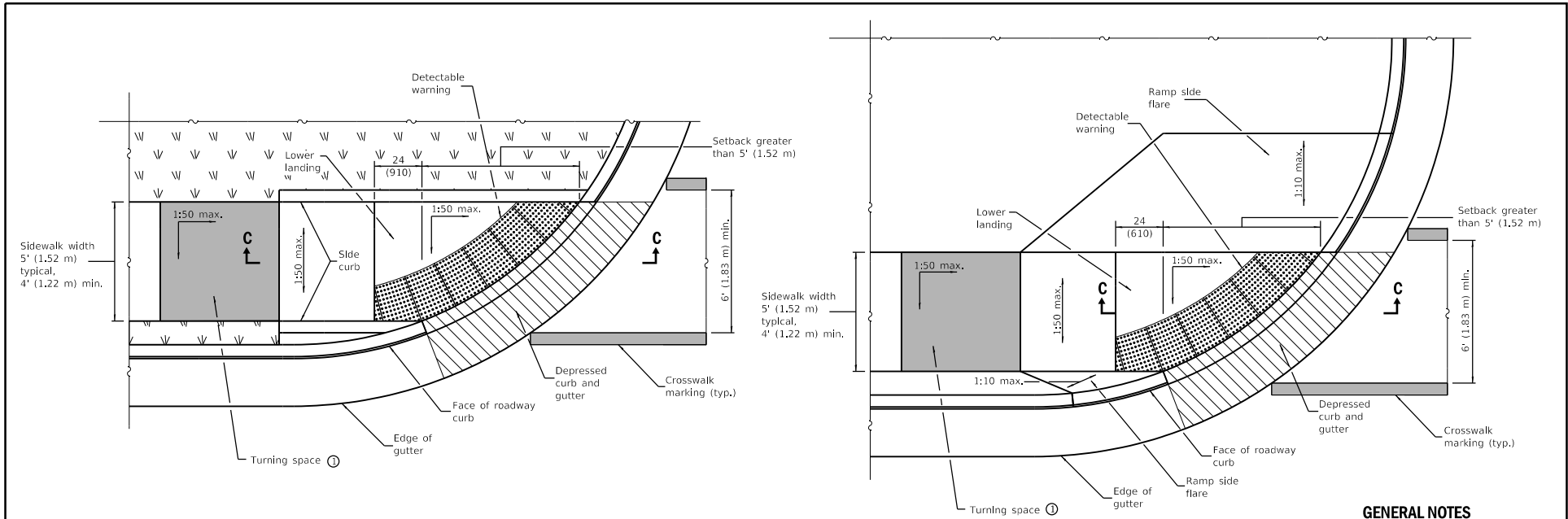
464-C 03/15/11

DATE	REVISIONS
1-1-19	Removed "15-foot rule", added "Blended transitions" and placement tolerances for detectable warnings.
1-1-18	Omitted diagonal slope at turning spaces and lower landings.

PERPENDICULAR CURB RAMPS FOR SIDEWALKS

(Sheet 1 of 2)

STANDARD 424001-11



**RAMP IN LANDSCAPED AREA
SETBACK > 5'**

**RAMP IN PAVED AREA
SETBACK > 5'**

GENERAL NOTES

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

Where the turning space is constrained on a side opposite a ramp, the minimum length of the turning space in the direction of the ramp-run shall be 5' (1.52 m).

Where 1:50 maximum slope is shown, 1:64 is preferred.

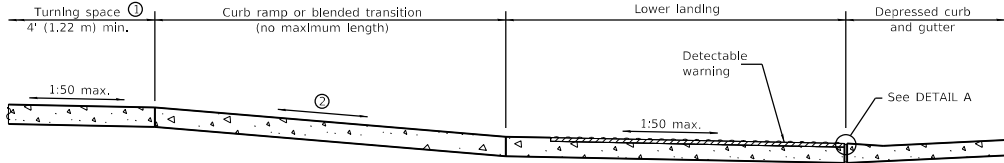
Detectable warnings are shown in their ideal locations but the following placement tolerances are allowed.

Side Border - Detectable warnings should extend the full width of the walking surface (excluding flared slides) but a border along each side up to 2 in. (50 mm) in width is allowed.

Curb Set-Back - Detectable warnings located at the back of curb should closely align with the curb but a gap up to 6 in. (150 mm) behind the curb is allowed.

See Standard 606001 for details of depressed curb adjacent to curb ramp.

All dimensions are in inches (millimeters) unless otherwise shown.



SECTION C-C

- ① This turning space not required for blended transitions.
- ② The running slope of a curb ramp shall be 1:20 min. and 1:12 max. The running slope of a blended transition shall be 1:20 max.

Illinois Department of Transportation

PASSED January 1, 2019
Michael B. ...
 ENGINEER OF POLICY AND PROCEDURES

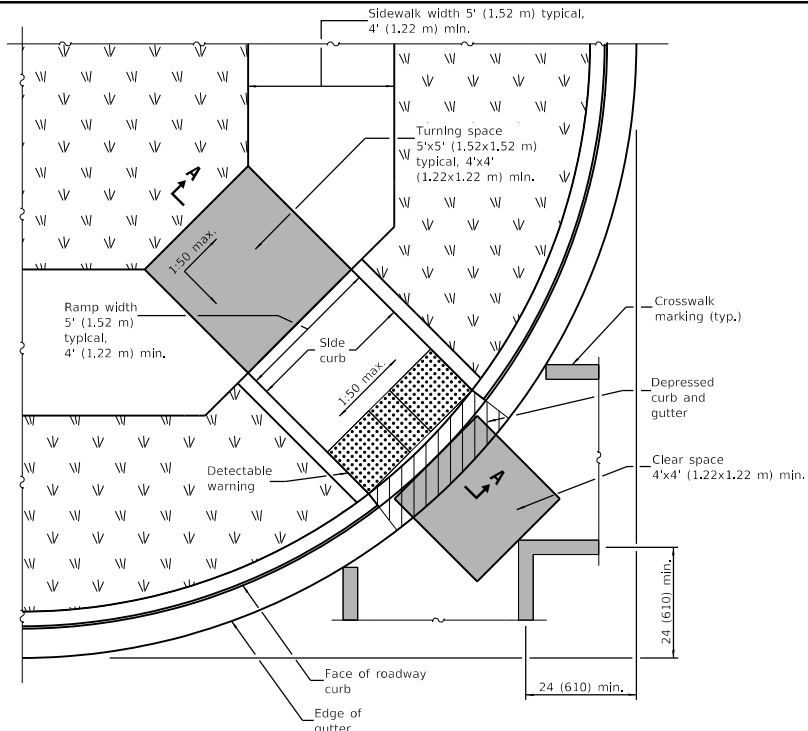
APPROVED January 1, 2019
...
 ENGINEER OF DESIGN AND ENVIRONMENT

1664-C1 03/11/15

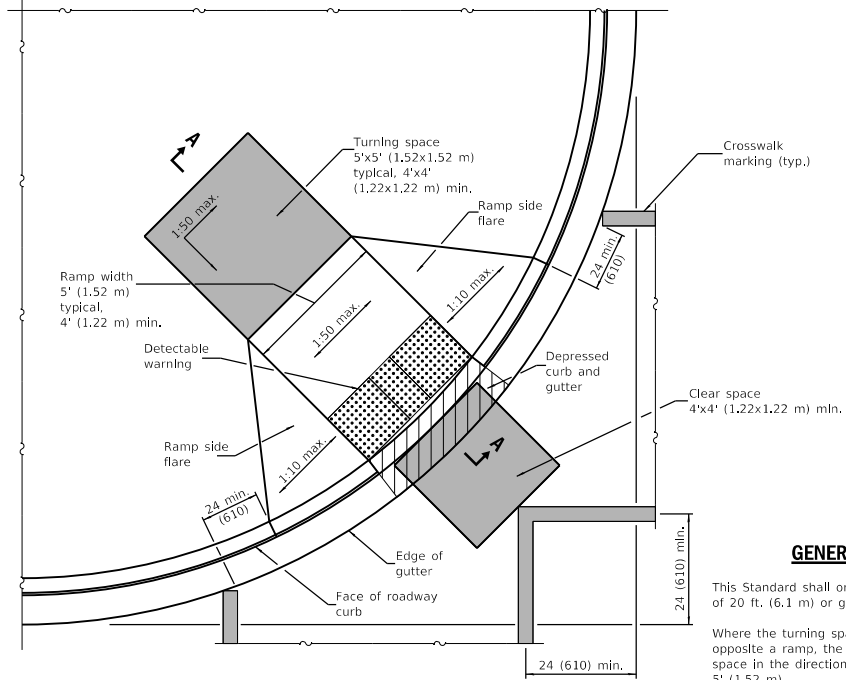
**PERPENDICULAR CURB RAMPS
FOR SIDEWALKS**

(Sheet 2 of 2)

STANDARD 424001-11



RAMP IN LANDSCAPED AREA



RAMP IN PAVED AREA

GENERAL NOTES

This Standard shall only be used for curb radii of 20 ft. (6.1 m) or greater.

Where the turning space is constrained on a side opposite a ramp, the minimum length of the turning space in the direction of the ramp-run shall be 5' (1.52 m).

Where 1:50 maximum slope is shown, 1:64 is preferred.

Detectable warnings are shown in their ideal locations but the following placement tolerances are allowed.

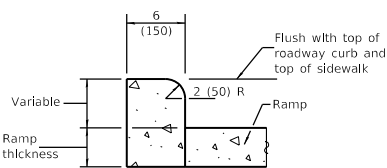
Side Border - Detectable warnings should extend the full width of the walking surface (excluding flared sides) but a border along each side up to 2 in. (50 mm) in width is allowed.

Curb Set-Back - Detectable warnings located at the back of curb should closely align with the curb but a gap up to 6 in. (150 mm) behind the curb is allowed.

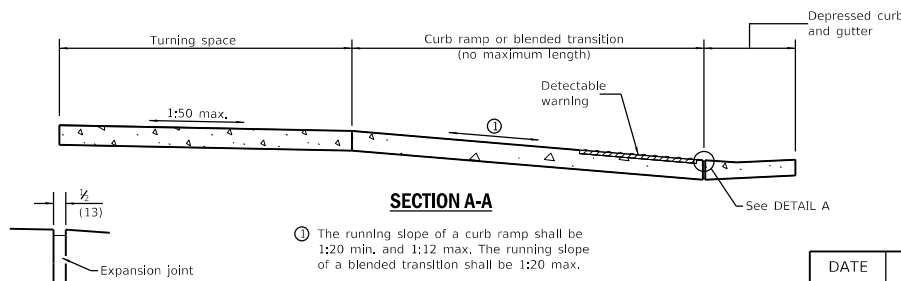
All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

See Standard 606001 for details of depressed curb adjacent to curb ramp.

All dimensions are in inches (millimeters) unless otherwise shown.



SIDE CURB DETAIL



SECTION A-A

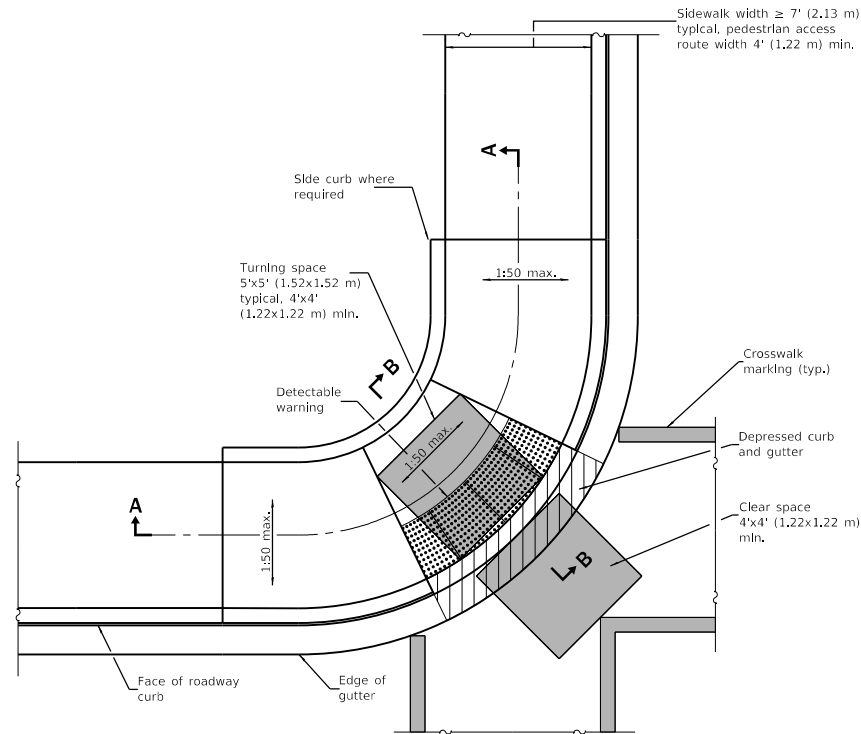
DETAIL A

Illinois Department of Transportation	
PASSED January 1, 2019 <i>Michael B. ...</i> ENGINEER OF POLICY AND PROCEDURES	ISSUED 1-1-12
APPROVED January 1, 2019 <i>...</i> ENGINEER OF DESIGN AND ENVIRONMENT	

DATE	REVISIONS
1-1-19	Removed "15-foot rule", added "blended transitions" and placement tolerances for detectable warnings.
1-1-18	Omitted diagonal slope at turning spaces.

DIAGONAL CURB RAMPS FOR SIDEWALKS

STANDARD 424006-04



CORNER PARALLEL CURB RAMP

Sidewalk width $\geq 7'$ (2.13 m) typical, pedestrian access route width 4' (1.22 m) min.

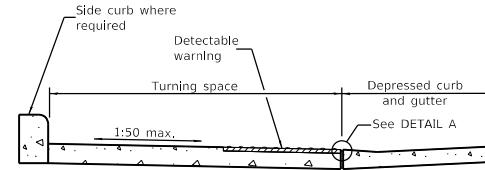
Turning space 5'x5' (1.52x1.52 m) typical, 4'x4' (1.22x1.22 m) min.

Face of roadway curb
Edge of gutter

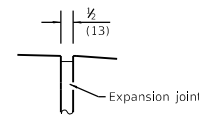
Crosswalk marking (typ.)

Depressed curb and gutter

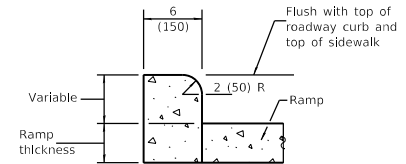
Clear space 4'x4' (1.22x1.22 m) min.



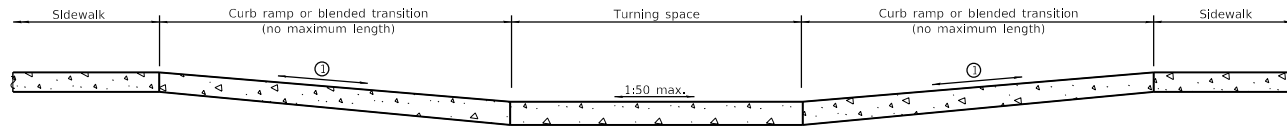
SECTION B-B



DETAIL A



SIDE CURB DETAIL



SECTION A-A

① The running slope of a curb ramp shall be 1:20 min. and 1:12 max. The running slope of a blended transition shall be 1:20 max.

GENERAL NOTES

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

Where the turning space is constrained on a side opposite a ramp, the minimum length of the turning space in the direction of the ramp-run shall be 5' (1.52 m).

Where 1:50 maximum slope is shown, 1:64 is preferred.

Detectable warnings are shown in their ideal locations but the following placement tolerances are allowed.

Side Border - Detectable warnings should extend the full width of the walking surface (excluding flared sides) but a border along each side up to 2 in. (50 mm) in width is allowed.

Curb Set-Back - Detectable warnings located at the back of curb should closely align with the curb but a gap up to 6 in. (150 mm) behind the curb is allowed.

See Standard 606001 for details of depressed curb adjacent to curb ramp.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-19	Removed upper landing, added blended transition and detectable warning tolerances.
1-1-17	Revised sidewalk width to include 24 (610) buffer behind curb.

CORNER PARALLEL CURB RAMPS FOR SIDEWALKS

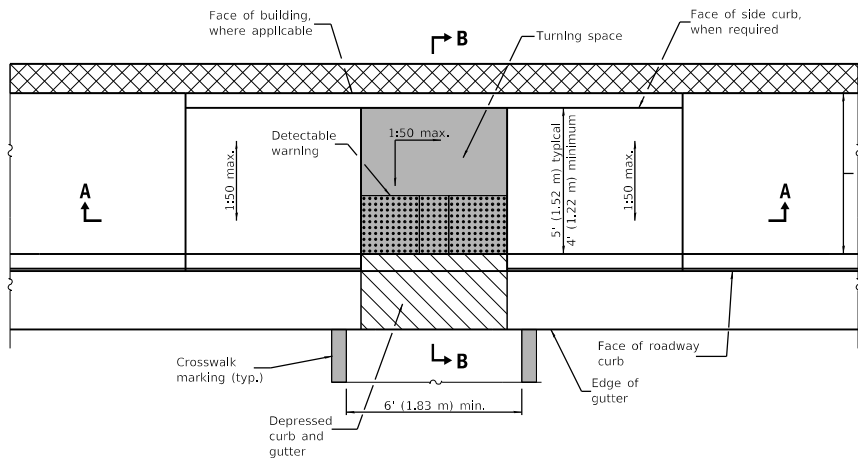
STANDARD 424011-04

Illinois Department of Transportation

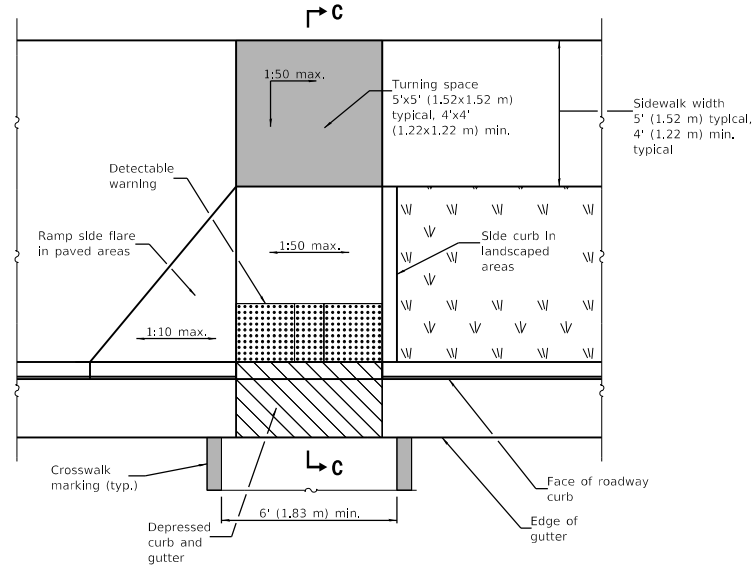
PASSED January 1, 2019
Michael B. ...
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2019
...
 ENGINEER OF DESIGN AND ENVIRONMENT

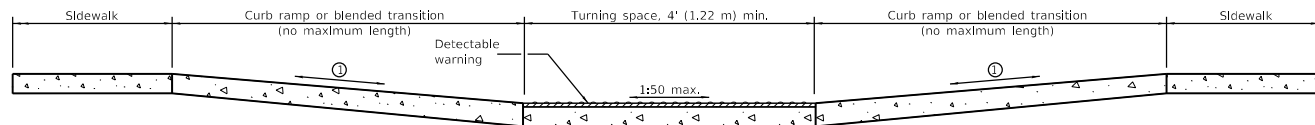
ISSUED 1-1-12



PARALLEL MID-BLOCK CURB RAMP

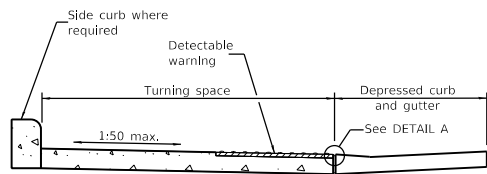


PERPENDICULAR MID-BLOCK CURB RAMP

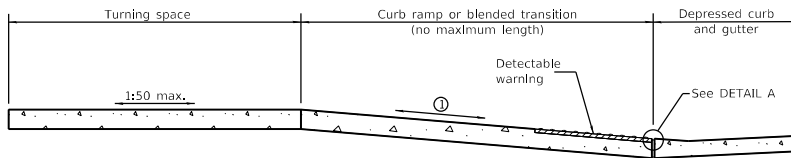


SECTION A-A

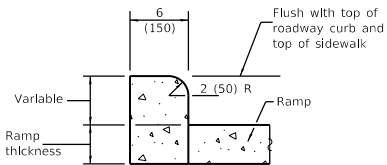
① The running slope of a curb ramp shall be 1:20 min. and 1:12 max. The running slope of a blended transition shall be 1:20 max.



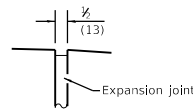
SECTION B-B



SECTION C-C



SIDE CURB DETAIL



DETAIL A

GENERAL NOTES

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

Where the turning space is constrained on a side opposite a ramp, the minimum length of the turning space in the direction of the ramp-run shall be 5' (1.52 m).

Where 1:50 maximum slope is shown, 1:64 is preferred.

Detectable warnings are shown in their ideal locations but the following placement tolerances are allowed.

Side Border - Detectable warnings should extend the full width of the walking surface (excluding flared sides) but a border along each side up to 2 in. (50 mm) in. width is allowed.

Curb Set-Back - Detectable warnings located at the back of curb should closely align with the curb but a gap up to 6 in. (150 mm) behind the curb is allowed.

See Standard 606001 for details of depressed curb adjacent to curb ramp.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-19	Removed upper landing, added blended transitions and detectable warning tolerances.
1-1-18	Omitted diagonal slope at turning spaces and upper landings.

MID-BLOCK CURB RAMPS FOR SIDEWALKS

STANDARD 424016-05

Illinois Department of Transportation

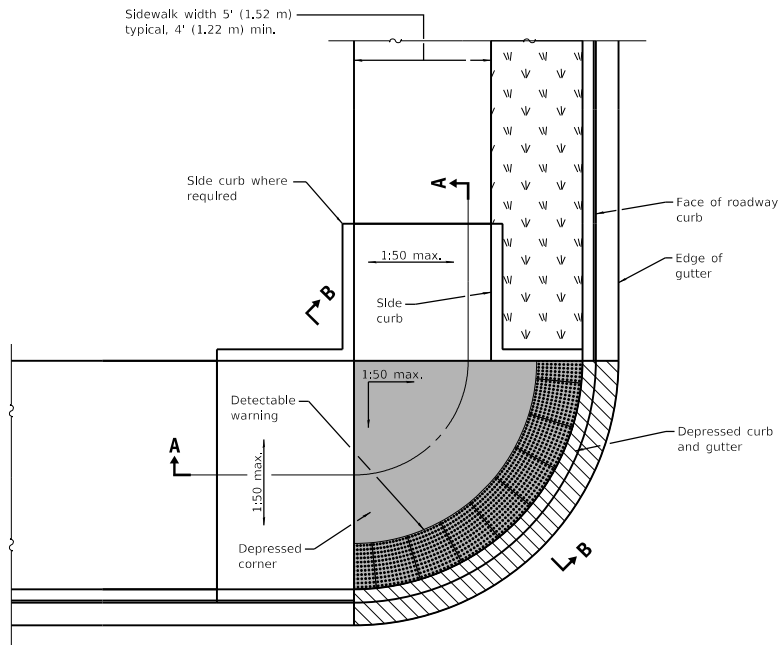
PASSED January 1, 2019

ISSUED 1-1-12

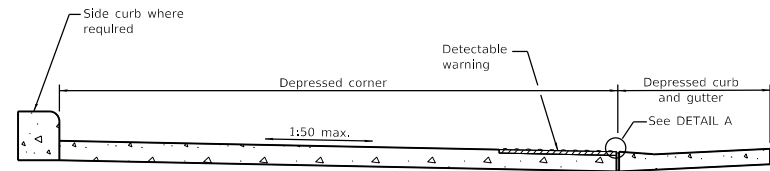
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2019

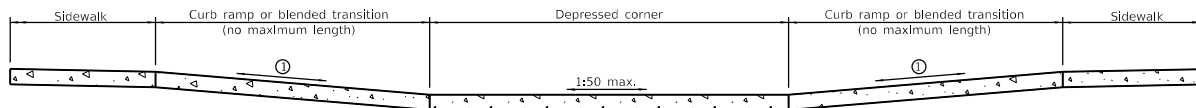
ENGINEER OF DESIGN AND ENVIRONMENT



DEPRESSED CORNER

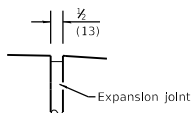


SECTION B-B

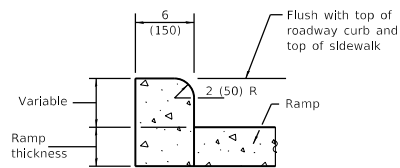


SECTION A-A

① The running slope of a curb ramp shall be 1:20 min. and 1:12 max. The running slope of a blended transition shall be 1:20 max.



DETAIL A



SIDE CURB DETAIL

GENERAL NOTES

This standard shall only be used for curb radii of 6 ft. (1.83 m) or greater.

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

Where 1:50 maximum slope is shown, 1:64 is preferred.

Detectable warnings are shown in their ideal tolerances but the following placement tolerances are allowed.

Side Border - Detectable warnings should extend the full width of the walking surface (excluding flared slides) but a border along each side up to 2 in. (50 mm) in. width is allowed.

Curb Set-Back - Detectable warnings located at the back of curb should closely align with the curb but a gap up to 6 in. (150 mm) behind the curb is allowed.

See Standard 606001 for details of depressed curb adjacent to curb ramp.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-19	Removed upper landings, added blended transition and detectable warning tolerances.
1-1-18	Omitted diagonal slope at turning spaces and upper landings.

DEPRESSED CORNER FOR SIDEWALKS

STANDARD 424021-05

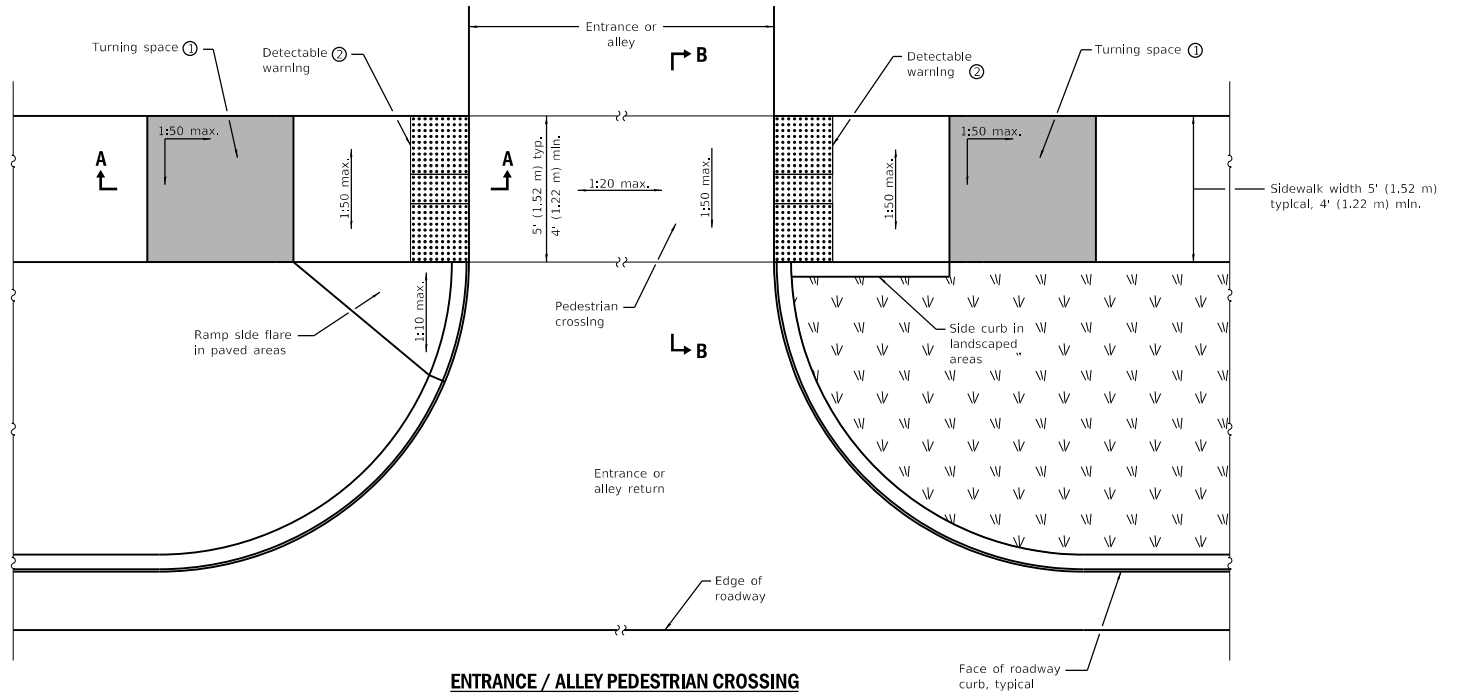
Illinois Department of Transportation

PASSED January 1, 2019
Michael B. ...
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2019
...
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12

- ② Detectable warning shall only be installed at entrances/alleys with permanent traffic control devices (i.e. stop signs, signals).
- ③ Where possible, maintain the grade of the sidewalk across the entrance/alley to avoid the need for ramps and turning spaces.



ENTRANCE / ALLEY PEDESTRIAN CROSSING

GENERAL NOTES

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

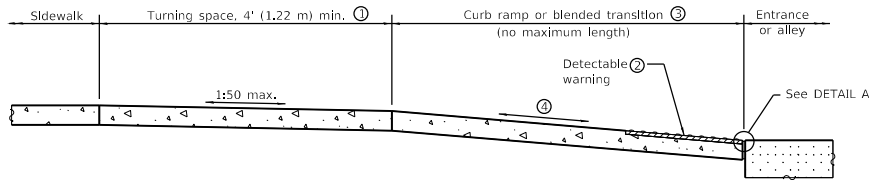
Where 1:50 maximum slope is shown, 1:64 is preferred.

Detectable warnings are shown in their ideal locations but the following placement tolerances are allowed.

Side Border - Detectable warnings should extend the full width of the walking surface (excluding flared sides) but a border along each side up to 2 in. (50 mm) in width is allowed.

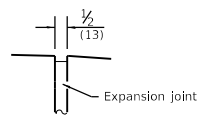
Curb Set-Back - Detectable warnings located at the back of curb should closely align with the curb but a gap up to 6 in. (150 mm) behind the curb is allowed.

All dimensions are in inches (millimeters) unless otherwise shown.

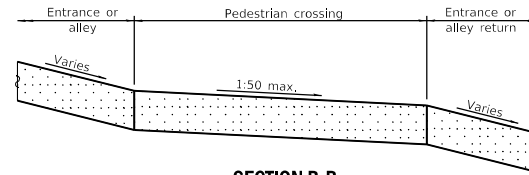


SECTION A-A

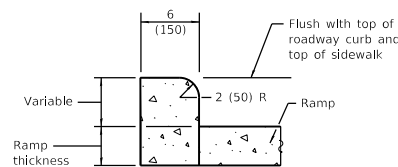
- ① Turning space not required for blended transitions.
- ④ The running slope of a curb ramp shall be 1:20 min and 1:12 max. The running slope of a blended transition shall be 1:20 max.



DETAIL A



SECTION B-B



SIDE CURB DETAIL

DATE	REVISIONS
1-1-19	Added blended transitions and placement tolerances for detectable warnings.
1-1-18	Omitted diagonal slope at upper landings.

ENTRANCE / ALLEY PEDESTRIAN CROSSINGS

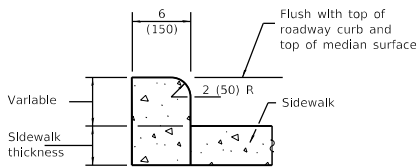
STANDARD 424026-03

Illinois Department of Transportation

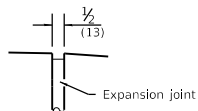
PASSED January 1, 2019
Michael B. ...
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2019
...
 ENGINEER OF DESIGN AND ENVIRONMENT

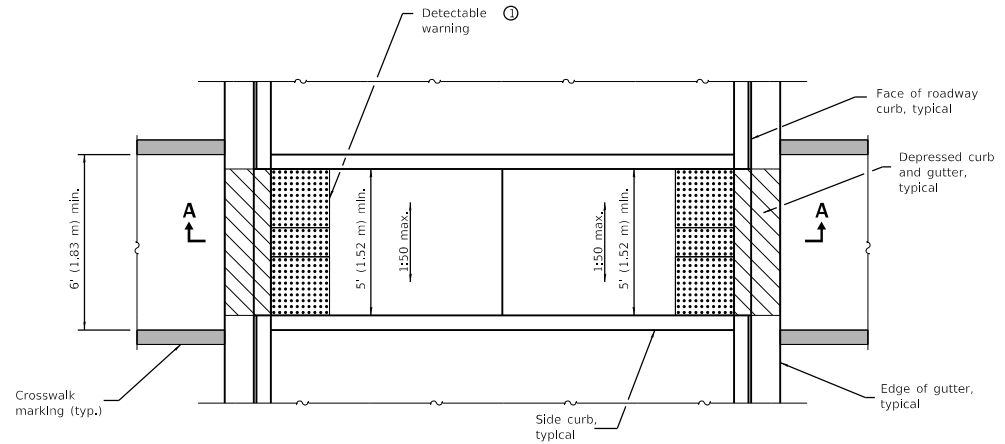
ISSUED 1-1-12



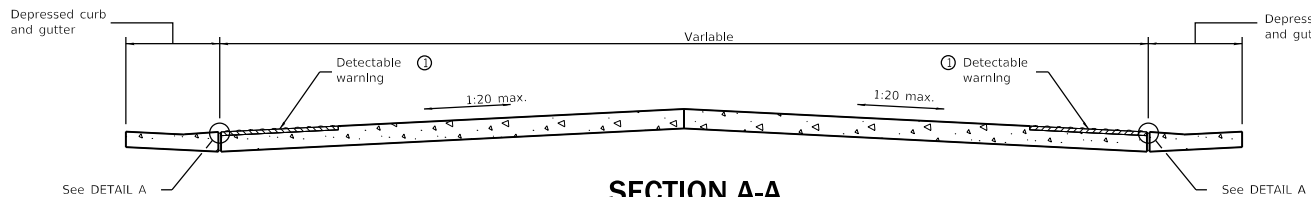
SIDE CURB DETAIL



DETAIL A



MEDIAN PEDESTRIAN CROSSING



SECTION A-A

① Omit detectable warnings when distance between back of curbs is less than 6' (1.83 m).

GENERAL NOTES

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

Where 1:50 maximum slope is shown, 1:64 is preferred.

Detectable warnings are shown in their ideal locations but the following placement tolerances are allowed.

Side Border - Detectable warnings should extend the full width of the walking surface (excluding flared slides) but a border along each side up to 2 in. (50 mm) in width is allowed.

Curb Set-Back - Detectable warnings located at the back of curb should closely align with the curb but a gap up to 6 in. (150 mm) behind the curb is allowed.

See Standard 606001 for details of depressed curb adjacent to curb ramp.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED *Michael Boyd* January 1, 2019
 ENGINEER OF POLICY AND PROCEDURES

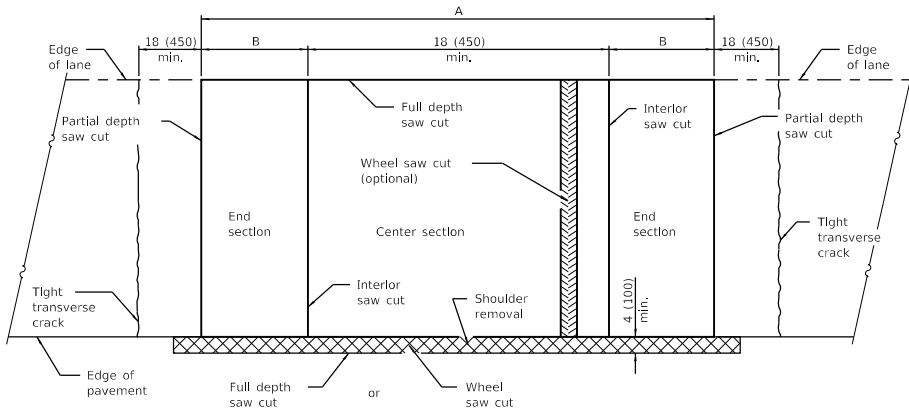
APPROVED *Scott E. G...* January 1, 2019
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12

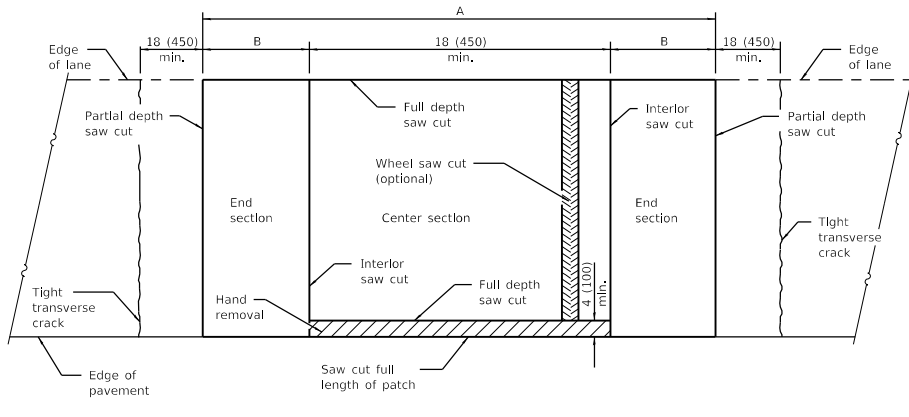
DATE	REVISIONS
1-1-19	Added placement tolerances for detectable warnings.
1-1-12	Widened crosswalk to 6' (1.83 m) min. inside dimension.
	Revised General Notes.

MEDIAN PEDESTRIAN CROSSINGS

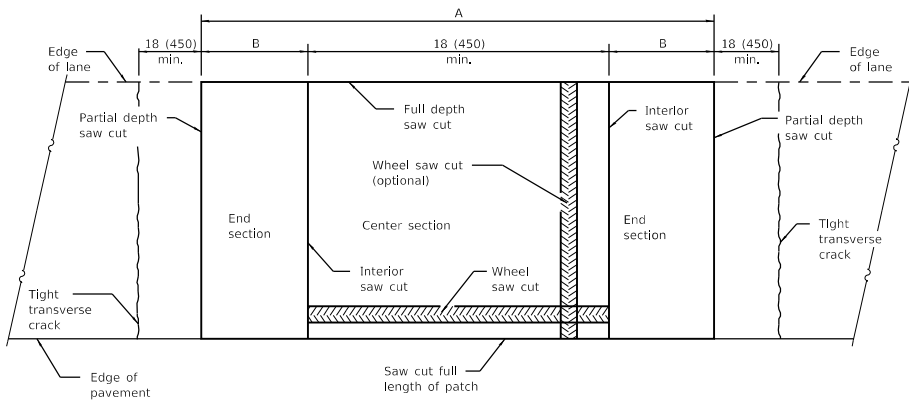
STANDARD 424031-02



PAVEMENT SAWING DETAIL
(HMA SHOULDER)



PAVEMENT SAWING DETAIL
(PCC SHOULDER)



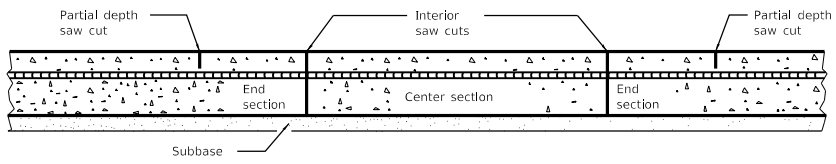
ALTERNATE SAWING DETAIL
(PCC SHOULDER)

EXISTING REINFORCEMENT BARS	A (min.)	B (min.)	C (min.)
No. 5	4'-6"	18	16
(No. 16)	(1.4 m)	(450)	(400)
No. 6	5'-0"	21	19
(No. 19)	(1.5 m)	(525)	(475)
No. 7	5'-6"	24	22
(No. 22)	(1.7 m)	(600)	(550)
Fabric	5'-0"	21	18
	(1.5 m)	(525)	(450)

GENERAL NOTES

When patching two adjacent lanes in one operation, the longitudinal joint shall be a longitudinal sawed joint as detailed on Standard 420001; however, the groove may be either performed or sawed.

All dimensions are in Inches (millimeters) unless otherwise shown.



SAW CUT DETAIL

Illinois Department of Transportation

PASSED January 1, 2008

ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2008

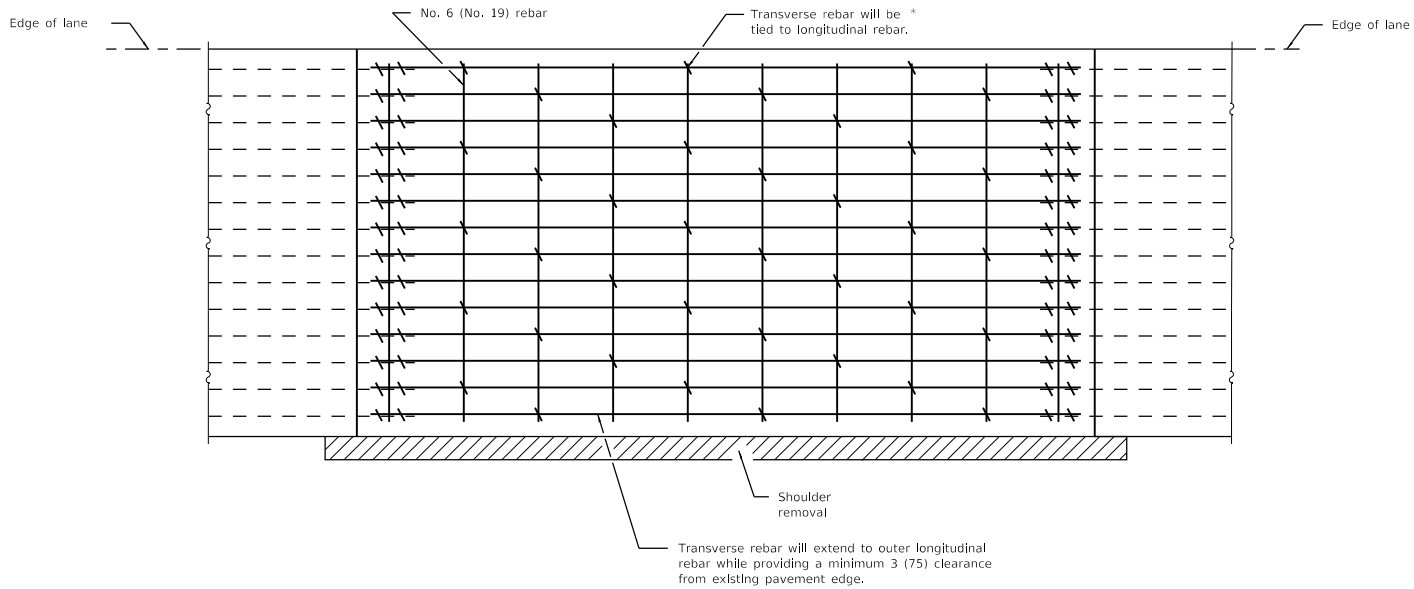
ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-08	Switched units to English (metric).
1-1-07	Revised General Notes.

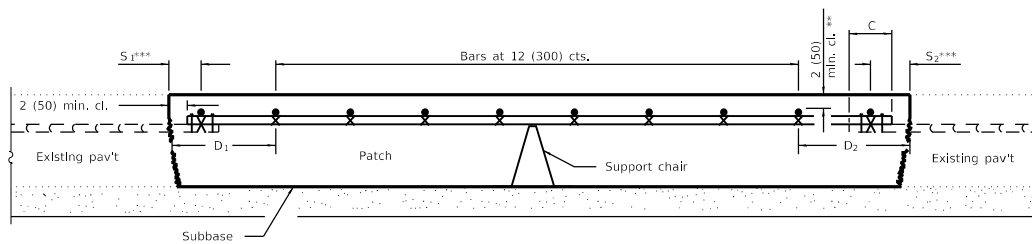
CLASS A PATCHES

(Sheet 1 of 2)

STANDARD 442001-04



PAVEMENT REINFORCEMENT DETAIL



PATCHING DETAIL

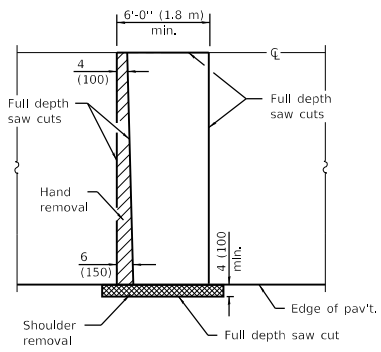
* Every 3rd intersection must be tied.

** When the minimum clearance cannot be obtained with the transverse bar on top then the transverse rebar shall be tied to the bottom of the longitudinal rebar.

*** Variable: Where S_1 and S_2 are $2\frac{1}{2}$ (65) min. and 12 (300) max. $D_1 = 2(S_1)$ and $D_2 = 2(S_2)$.

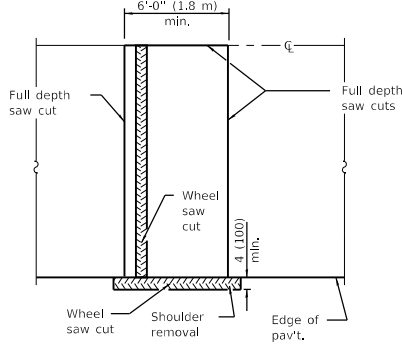
Illinois Department of Transportation	
PASSED <u>January 1, 2008</u> <i>Spotts</i>	ISSUED 1-1-08
ENGINEER OF POLICY AND PROCEDURES	
APPROVED <u>January 1, 2008</u> <i>Lee E. Han</i> ENGINEER OF DESIGN AND ENVIRONMENT	

CLASS A PATCHES (Sheet 2 of 2)
STANDARD 442001-04



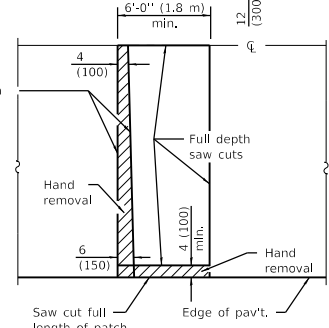
PAVEMENT SAWING DETAIL

(HMA SHOULDER)



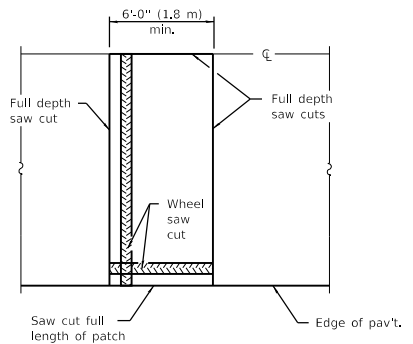
ALTERNATE SAWING DETAIL

(HMA SHOULDER)



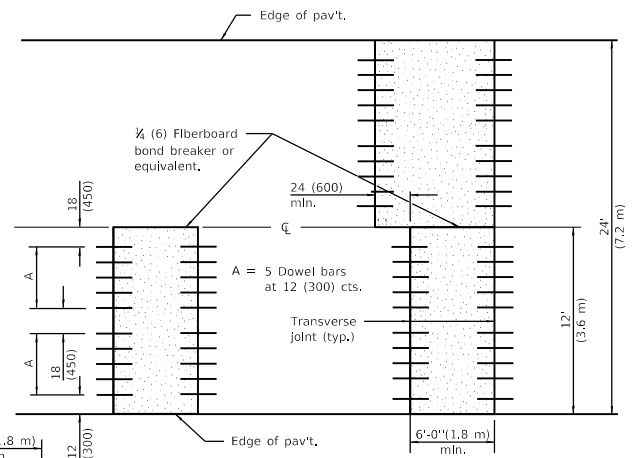
PAVEMENT SAWING DETAIL

(PCC SHOULDER)

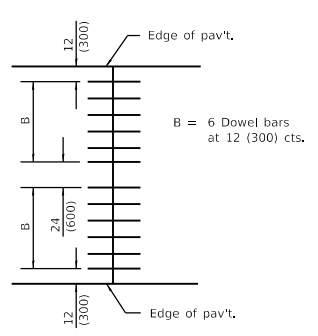


ALTERNATE SAWING DETAIL

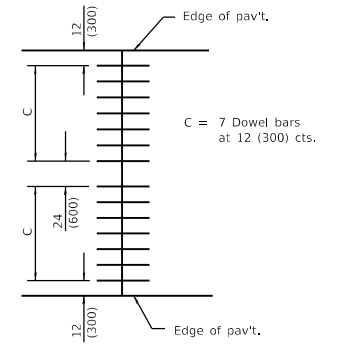
(PCC SHOULDER)



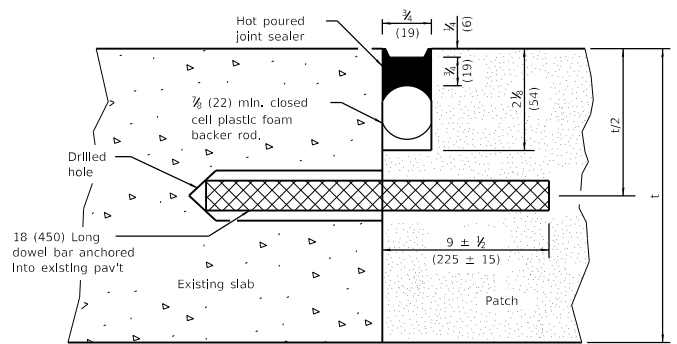
12' (3.6 m) WIDE LANES



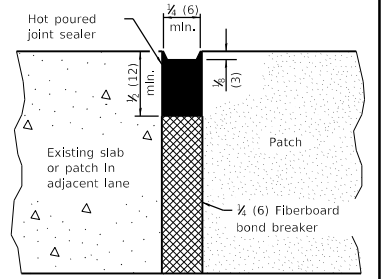
14' (4.2 m) WIDE RAMP



16' (4.8 m) WIDE RAMP



TRANSVERSE JOINT



CENTERLINE JOINT

DOWEL BAR TABLE		
PAVEMENT THICKNESS	DOWEL BAR DIAMETER	HOLE DIAMETER
10 (250) or greater	1 1/2 (38)	1 3/4 (41)
8 (200) thru 9.99 (249)	1 1/4 (32)	1 3/8 (35)
Less than 8 (200)	1 (25)	1 1/8 (29)

GENERAL NOTES

The transverse joints for Class B patches shall align with joints or cracks in the adjacent lane whenever possible.
 See Standard 420701 for details of welded wire reinforcement.
 All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-19	Revised reference to Standard 420701 in General Notes.
1-1-18	Revised DOWEL BAR TABLE.

CLASS B PATCHES

(Sheet 1 of 2)

STANDARD 442101-09

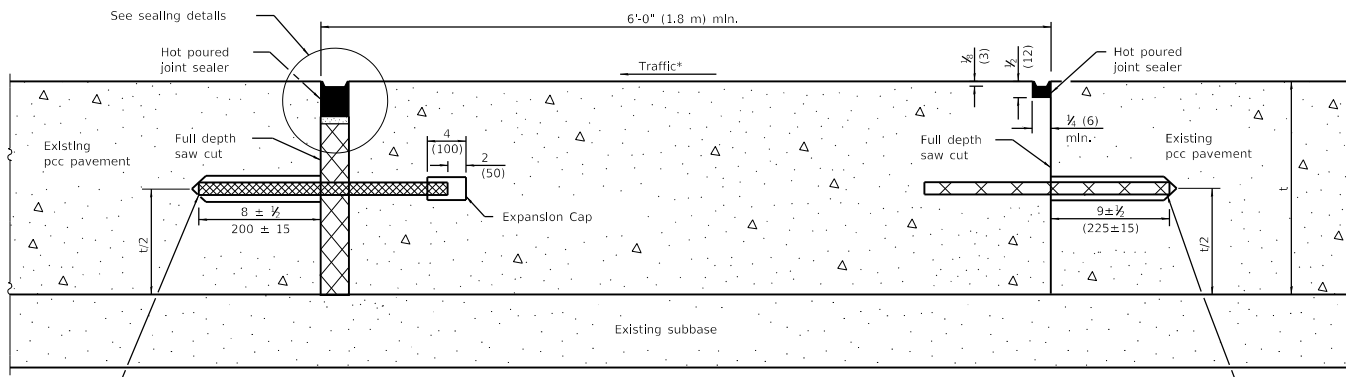
Illinois Department of Transportation

PASSED January 1, 2019
Michael B. ...
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2019
...
 ENGINEER OF DESIGN AND ENVIRONMENT

469-1-03/ISSU

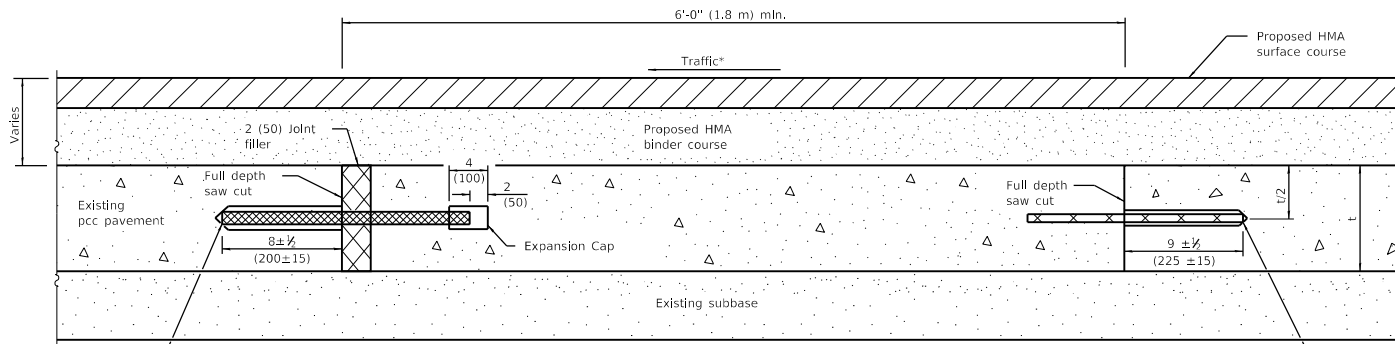
TRANSVERSE EXPANSION JOINTS



18 (450) Long dowel bars anchored into existing pavement at 12 (300) cts.

METHOD I
(Without Resurfacing)

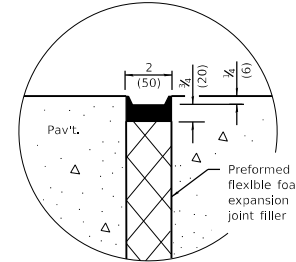
No. 10x18 (No. 32x450) Tie bars anchored into existing pavement at 12 (300) cts.



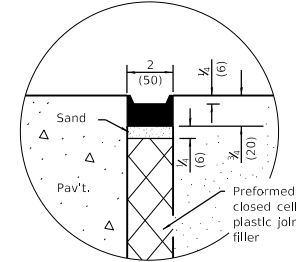
18 (450) Long dowel bars anchored into existing pavement at 12 (300) cts.

METHOD II
(With Resurfacing)

No. 10x18 (No. 32x450) Tie bars anchored into existing pavement at 12 (300) cts.



SEALING DETAIL



SEALING DETAIL

NOTE

* When re-establishing a transverse expansion joint on a two-lane, two-way road, reverse the orientation of the dowel bars with respect to traffic for one of the patches such that the joint will be continuous across both lanes.

Illinois Department of Transportation

PASSED January 1, 2018
Michael Beard
ENGINEER OF POLICY AND PROCEDURES

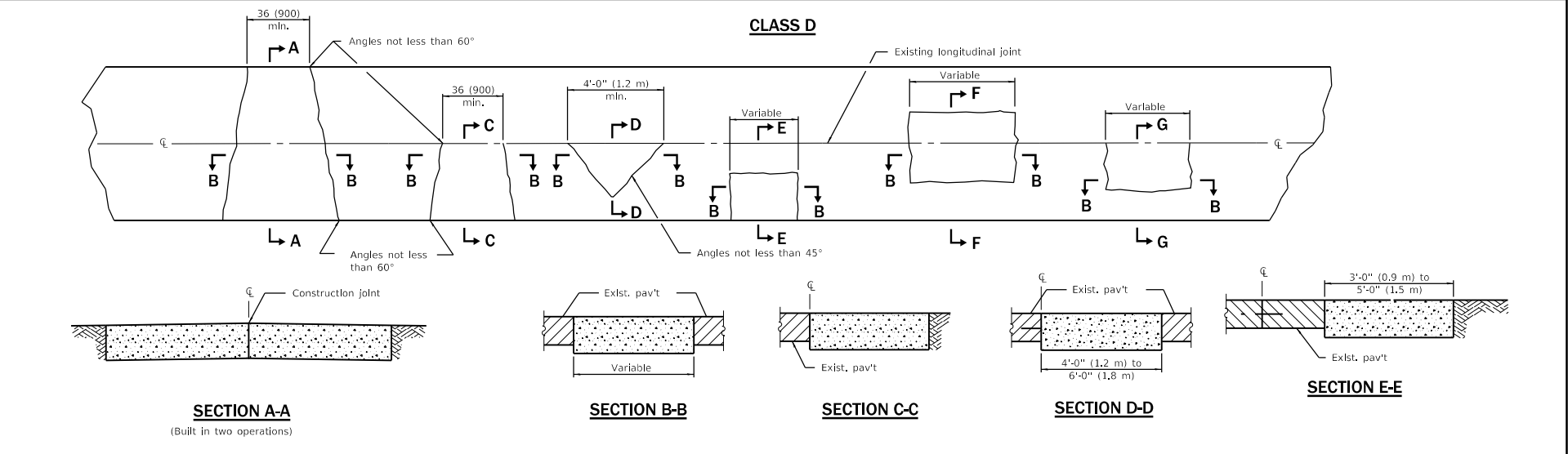
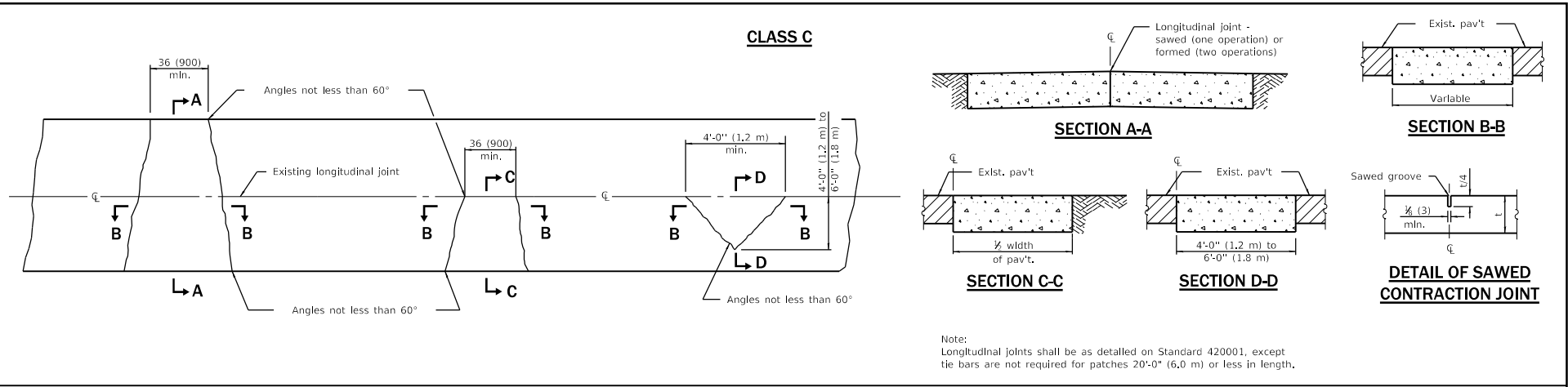
APPROVED January 1, 2018
Maureen M. Behr
ENGINEER OF DESIGN AND ENVIRONMENT

464-C 03/15/11

CLASS B PATCHES

(Sheet 2 of 2)

STANDARD 442101-08



GENERAL NOTES
 Existing tie bars shall be either cut or removed. Marginal bars shall be cut.
 All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-08	Switched units to English (metric).
1-1-07	Revised Note for Class C patches.

CLASS C and D PATCHES

STANDARD 442201-03

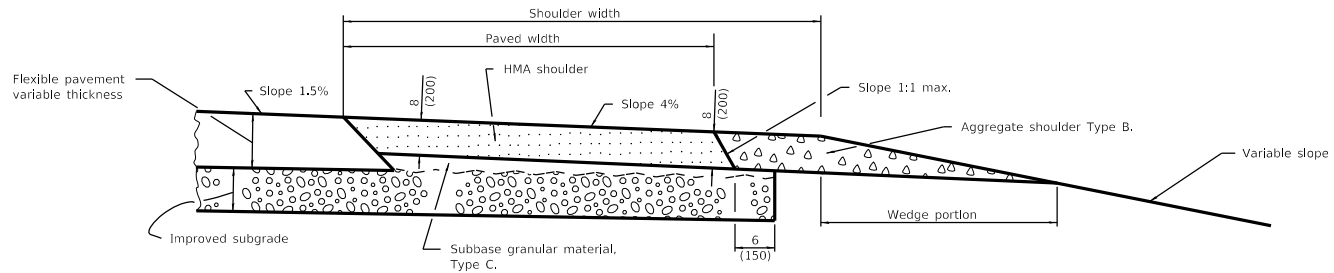
Illinois Department of Transportation

PASSED January 1, 2008

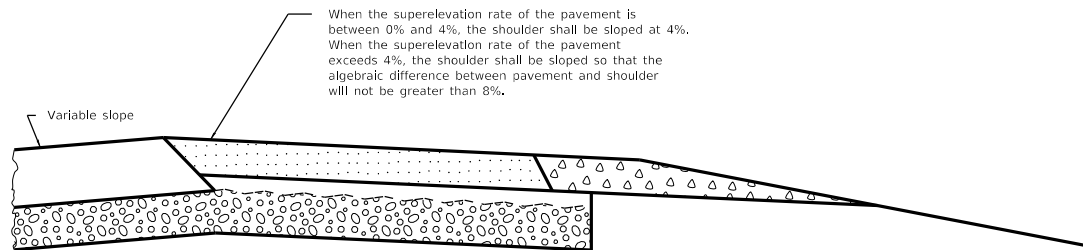
APPROVED January 1, 2008

ENGINEER OF POLICY AND PROCEDURES

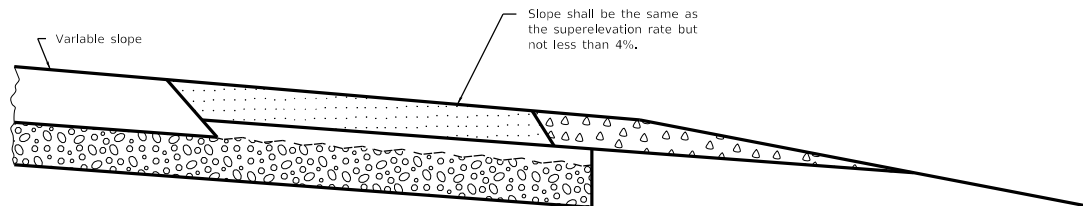
ENGINEER OF DESIGN AND ENVIRONMENT



SHOULDER FOR TANGENT PAVEMENT



**SHOULDER FOR SUPERELEVATED PAVEMENT
(OUTSIDE OF CURVE)**



**SHOULDER FOR SUPERELEVATED PAVEMENT
(INSIDE OF CURVE)**

GENERAL NOTES

Except as noted or shown the dimensions and notes specified for the shoulder of tangent pavement are typical for the shoulders of superelevated pavement.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2008
[Signature]
 ENGINEER OF POLICY AND PROCEDURES

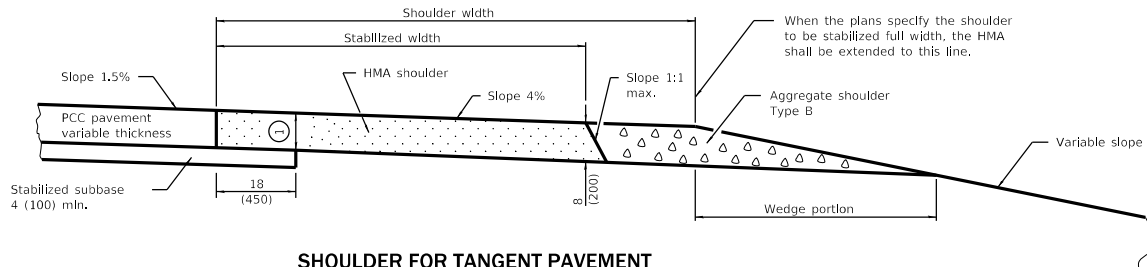
APPROVED January 1, 2008
[Signature]
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 484-1-03/11/55

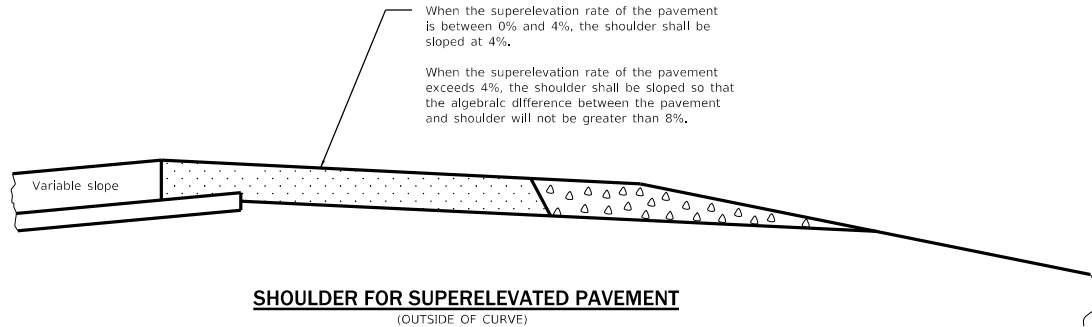
DATE	REVISIONS
1-1-08	Switched units to English (metric).
1-1-07	Switched to Hot-Mix Asphalt (HMA) terminology.

HMA SHOULDER ADJACENT TO FLEXIBLE PAVEMENT

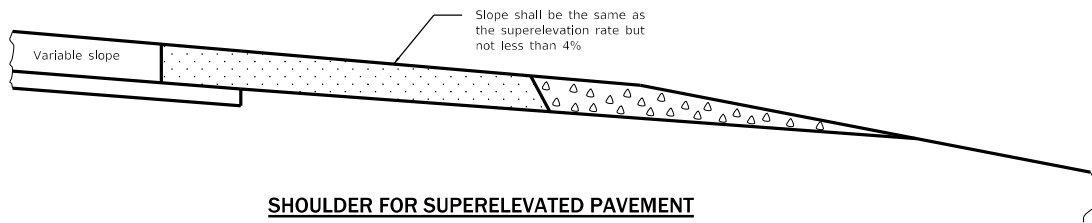
STANDARD 482001-02



SHOULDER FOR TANGENT PAVEMENT



**SHOULDER FOR SUPERELEVATED PAVEMENT
(OUTSIDE OF CURVE)**



**SHOULDER FOR SUPERELEVATED PAVEMENT
(INSIDE OF CURVE)**

① (Applies only when subbase extension is to remain in place.) This thickness will vary with the thickness of pavement, extended length of subbase, and the slope of pavement. When this thickness is less than 8 (200), the stabilized shoulder shall be stepped down at this line to provide a 8 (200) minimum thickness.

GENERAL NOTES

Except as noted or shown the dimensions and notes specified for the shoulder of tangent pavement are typical for the shoulders of superelevated pavement.

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2008
Spotts
 ENGINEER OF POLICY AND PROCEDURES

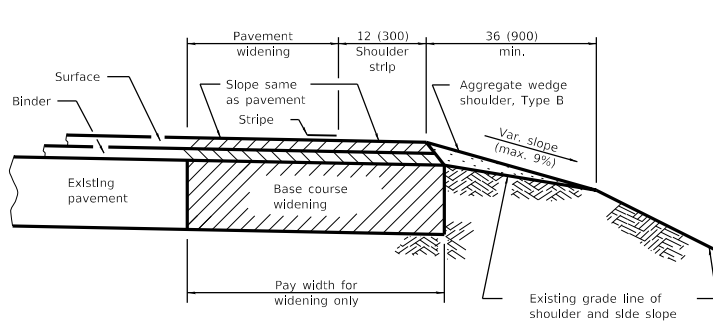
APPROVED January 1, 2008
Lee E. Han
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 484-1-03/15/08

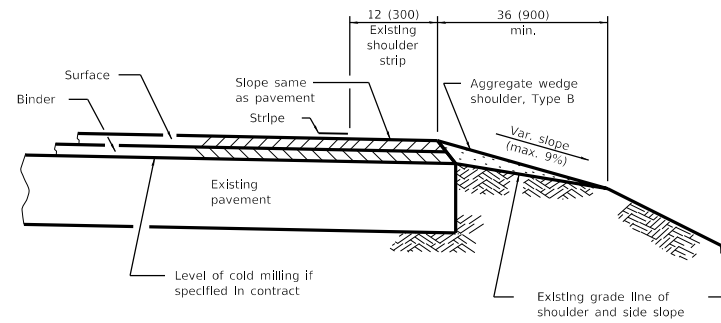
DATE	REVISIONS
1-1-08	Switched units to English (metric).
1-1-07	Switched to Hot-Mix Asphalt (HMA) terminology.

HMA SHOULDER ADJACENT TO RIGID PAVEMENT

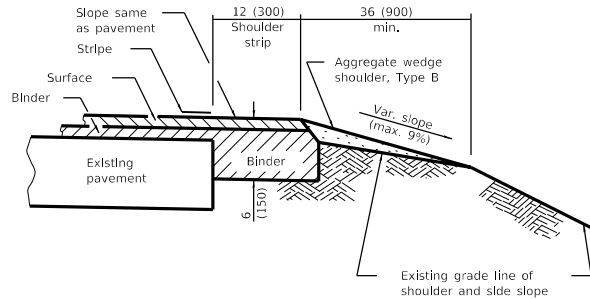
STANDARD 482006-03



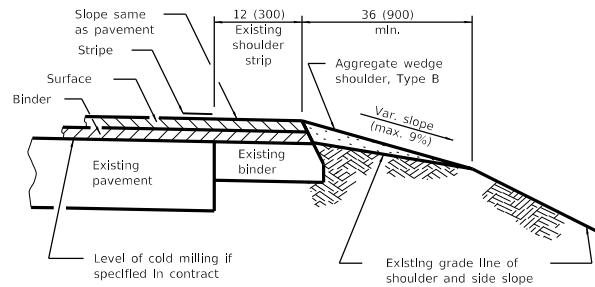
**HMA SHOULDER STRIP AND
AGGREGATE WEDGE WITH WIDENING**
(Cross-section A)



**COLD MILLING AND/OR RESURFACING OF
EXISTING PAVEMENT WITH SHOULDER STRIPS**
(Cross-section C)



**HMA SHOULDER STRIP AND
AGGREGATE WEDGE WITH RESURFACING**
(Cross-section B)



**COLD MILLING AND/OR RESURFACING OF
EXISTING PAVEMENT WITH SHOULDER STRIPS**
(Cross-section D)

All dimensions are in inches (millimeters)
unless otherwise shown.

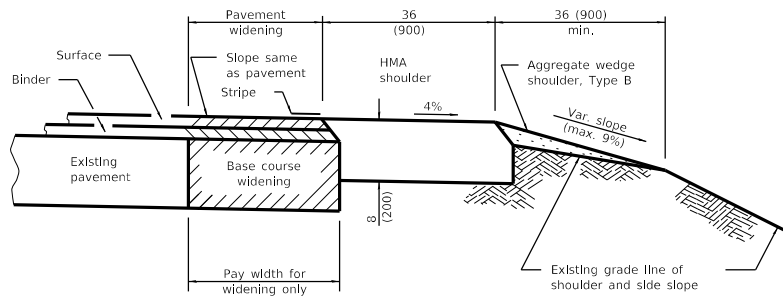
Illinois Department of Transportation	
PASSED	January 1, 2008
SCOTT S. KELLY ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2008
KEN E. HAN ENGINEER OF DESIGN AND ENVIRONMENT	
464-1	03/11/08

DATE	REVISIONS
1-1-08	Switched units to English (metric).
1-1-07	Switched to Hot-Mix Asphalt (HMA) terminology.

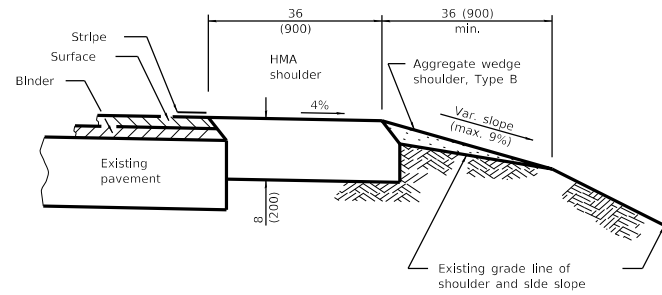
**HMA SHLD. STRIPS/SHLDS. WITH
RESURFACING OR WIDENING
AND RESURFACING PROJECTS**

(Sheet 1 of 2)

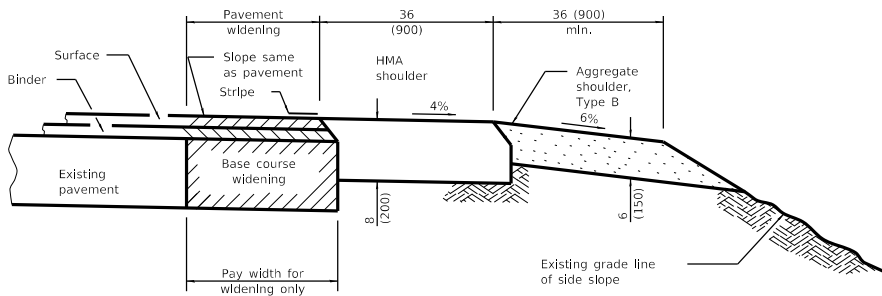
STANDARD 482011-03



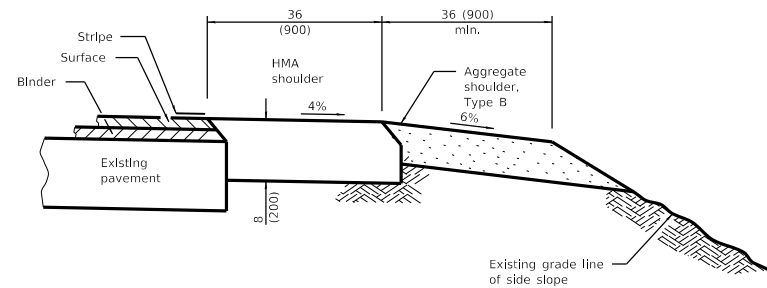
HMA SHOULDER AND AGGREGATE WEDGE WITH WIDENING
(Cross-section E)



HMA SHOULDER AND AGGREGATE WEDGE WITH RESURFACING
(Cross-section G)



HMA AND AGGREGATE SHOULDERS WITH WIDENING
(Cross-section F)



HMA AND AGGREGATE SHOULDERS WITH RESURFACING
(Cross-section H)

Illinois Department of Transportation

PASSED January 1, 2008

ENGINEER OF POLICY AND PROCEDURES

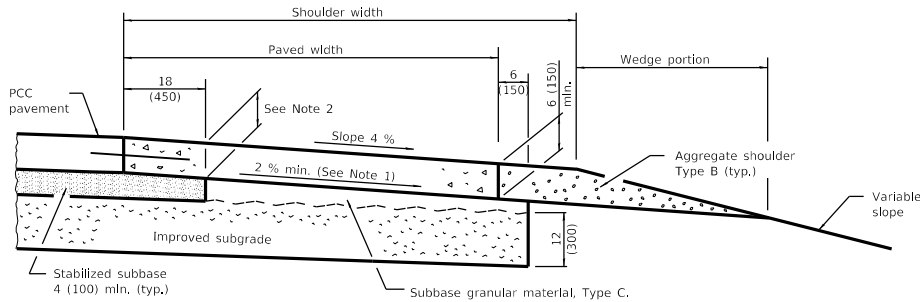
APPROVED January 1, 2008

ENGINEER OF DESIGN AND ENVIRONMENT

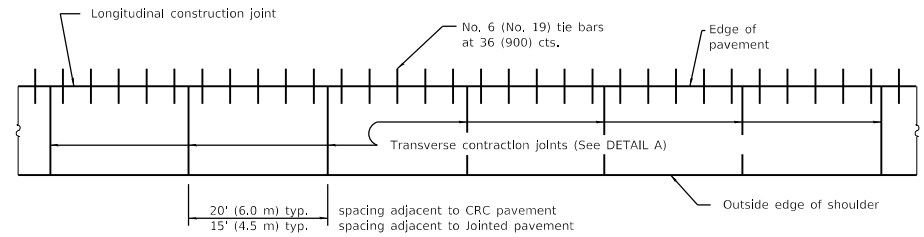
HMA SHLD. STRIPS/SHLDS. WITH RESURFACING OR WIDENING AND RESURFACING PROJECTS

(Sheet 2 of 2)

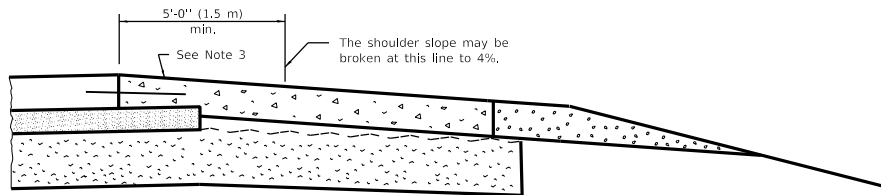
STANDARD 482011-03



SHOULDER FOR TANGENT PAVEMENT

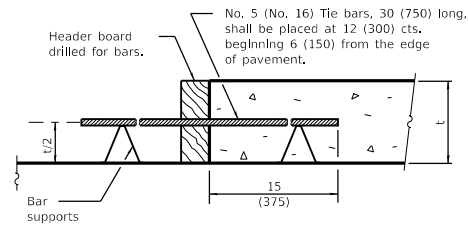


PLAN

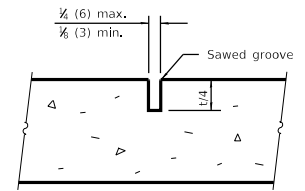


SHOULDER FOR SUPERELEVATED PAVEMENT

(Outside of curve)

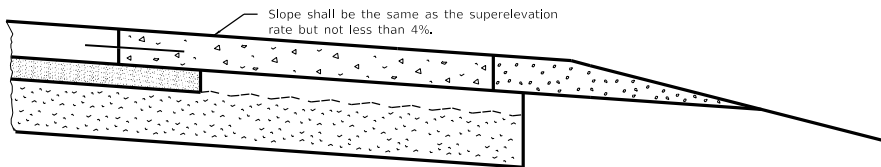


TRANSVERSE CONSTRUCTION JOINT



DETAIL A

TRANSVERSE CONTRACTION JOINT



SHOULDER FOR SUPERELEVATED PAVEMENT

(Inside of curve)

NOTES

- Note 1: Does not apply when sub-surface drains are installed.
- Note 2: When the subbase is not removed, this thickness will vary with the thickness of pavement, extended length of subbase, and the slope of pavement. When this thickness is less than 6 (150), the paved shoulder shall be stepped down at this line to provide a 6 (150) minimum thickness.
- Note 3: When the superlevation rate of the pavement is between 0% and 4%, the shoulder shall be sloped at 4%. When the superlevation rate of the pavement exceeds 4%, the shoulder shall be sloped so that the algebraic difference between the pavement and shoulder slopes will not be greater than 8%.

GENERAL NOTES

Except as noted or shown, the dimensions and notes specified for the shoulder of the tangent pavement are typical for the shoulders of superelevated pavement.

Transverse expansion joints shall be as detailed on Standard 420001 except that dowel bars will not be required.

See Standard 420001 for details not shown.

All dimensions are in Inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2018
Michael Beard
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2018
Maureen M. O'Brien
 ENGINEER OF DESIGN AND ENVIRONMENT

LEG-C OBR/SSJ

DATE	REVISIONS
1-1-18	Modified PLAN view.
	Changed tie bar spacing to 36 (900).
1-1-08	Switched units to English (metric).

PCC SHOULDER

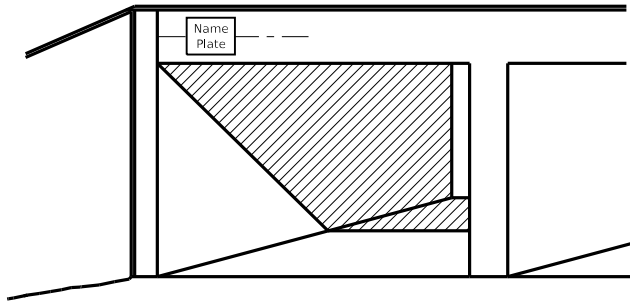
STANDARD 483001-05



Standards by Division

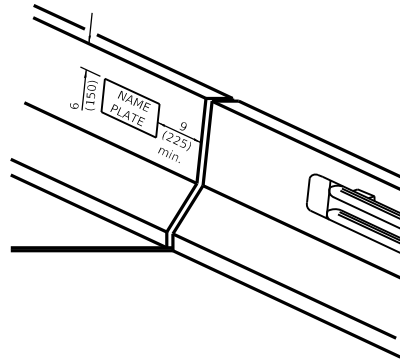
DIVISION 500 BRIDGES and CULVERTS

STD. NO.	TITLE
BRIDGES	
515001-03	Name Plate for Bridges
CULVERTS	
542001-06	Concrete End Sections for Pipe Culverts 15" (375 mm) thru 84" (2100 mm) Diameter
542011-02	Concrete End Sections for Elliptical Pipe Culverts 15" (375 mm) thru 72" (1800 mm) Equivalent Diameter
542201-02	Reinforced Concrete End Sections for Pipe Culverts, 15" (375 mm) thru 36" (900 mm) Diameter Skewed With Roadway
542206-04	Reinforced Concrete End Sections for Pipe Culverts, 42" (1050 mm) thru 60" (1500 mm) Diameter Skewed With Roadway
542301-03	Precast Reinforced Concrete Flared End Section
542306-03	Precast Reinforced Concrete Elliptical Flared End Section
542311-07	Traversable Pipe Grate for Concrete End Section
542401-03	Metal Flared End Section for Pipe Culverts
542406-03	Metal Flared End Section for Pipe Arches
542411	Sloped Metal End Sections for Pipe Culverts 15" (375 mm) thru 60" (1500 mm) Diameter
542416	Sloped Metal End Sections for Pipe Arch Culverts 15" (375 mm) thru 72" (1800 mm) Equivalent Diameter
542501-02	Inlet Box Type 24 (600) A
542506-03	Inlet Box Type 24 (600) B
542511-02	Inlet Box Type 24 (600) C
542516-03	Inlet Box Type 24 (600) D
542521-02	Inlet Box Type 24 (600) E
542526-03	Inlet Box Type 24 (600) F
542531-04	Inlet Box Type 24 (600) G
542536-03	Inlet Box Type 36 (900) A
542541-02	Inlet Box Type 48 (1200) A
542546-01	Flush Inlet Box for Median
542601-03	Reinforced Concrete Pipe Elbow 24", 30" or 36" (600 mm, 750 mm or 900 mm)
542606-02	Reinforced Concrete Pipe Tee

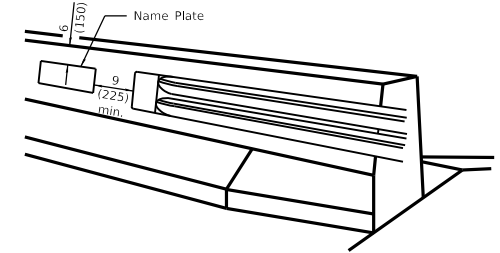


FOR MULTI-SPAN CULVERTS

(Unless otherwise noted on the plans, name plates are not required for structures less than 20' (6.1 m) in length)

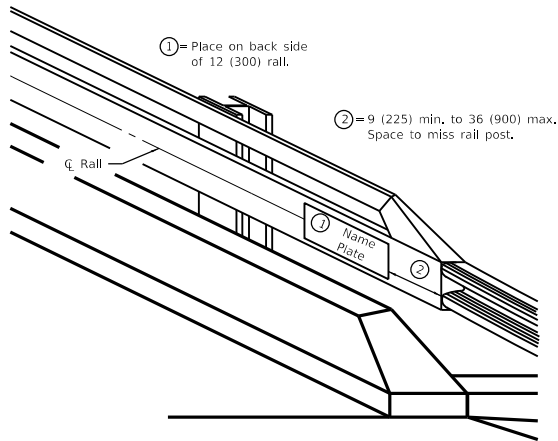


FOR PARAPET AND END POST MOUNTED



FOR PARAPET

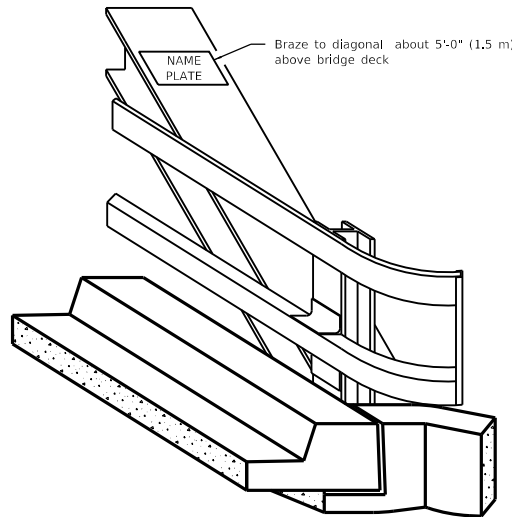
(When Dog Ear Wing is used)



FOR STEEL RAILS

① = Place on back side of 12 (300) rail.

② = 9 (225) min. to 36 (900) max. Space to miss rail post.

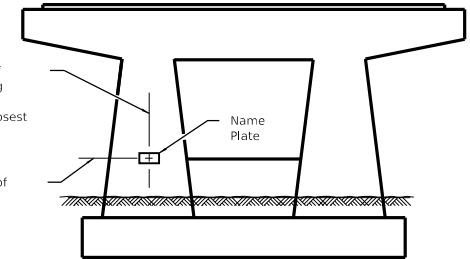


FOR TRUSSES

Braze to diagonal about 5'-0" (1.5 m) above bridge deck

For column type piers, ϕ of column nearest approaching traffic. For solid piers, 3'-0" \pm from end of pier closest to approaching traffic.

4'-0" \pm above crown of roadway elevation.



FOR PIERS ON FAI ROUTES

GENERAL NOTES

On one-way traffic structures, place name plate on right side of approach end. On two-way traffic structures, place name plate on right side of approach end while looking in the direction of increasing stationing.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

APPROVED January 1, 2009
Ralph E. Anderson
 ENGINEER OF BRIDGES AND STRUCTURES

APPROVED January 1, 2009
Ken E. Han
 ENGINEER OF DESIGN AND ENVIRONMENT

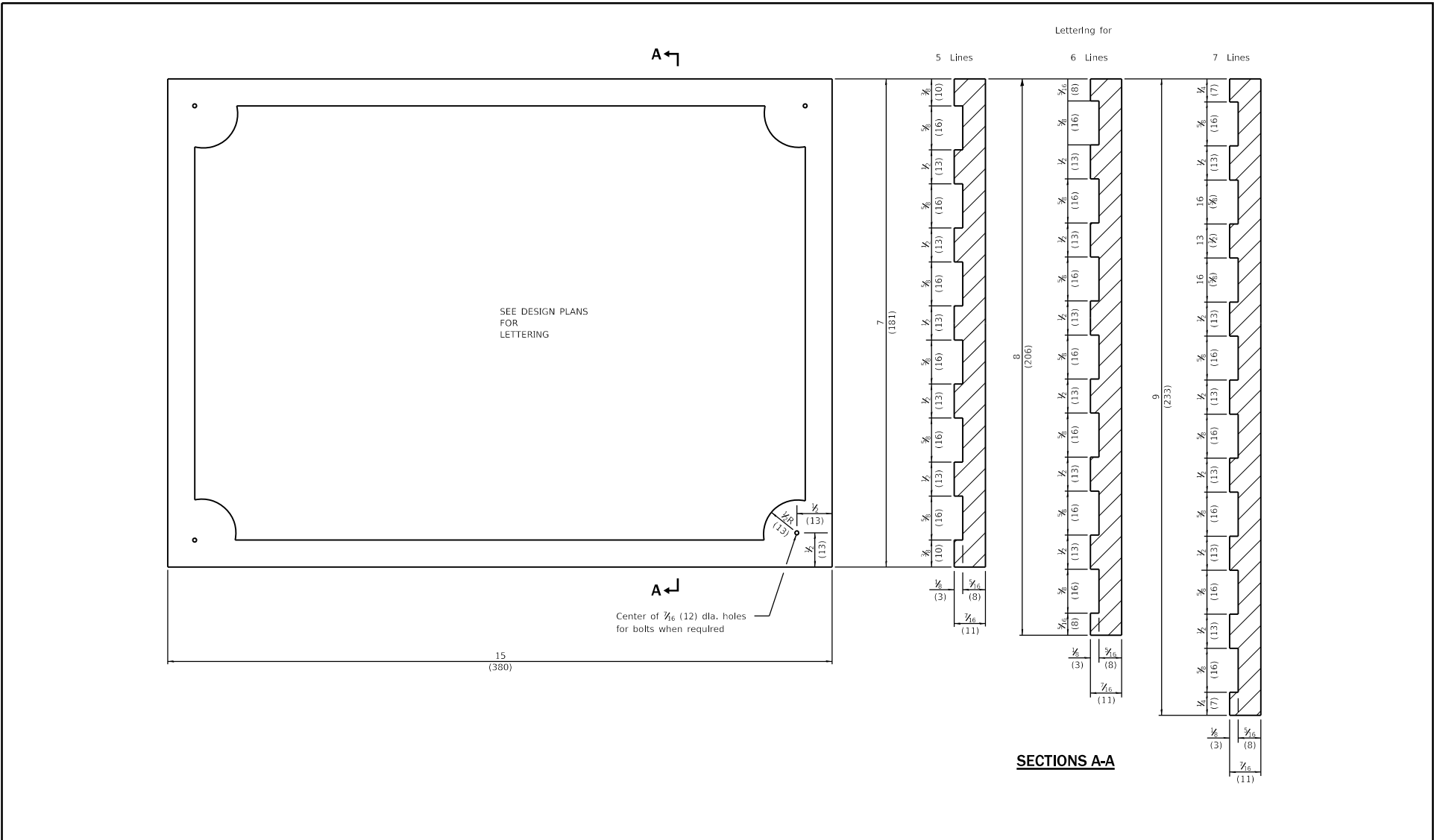
464-1 03/15/02

DATE	REVISIONS
1-1-09	Switched units to English (metric). Added pier detail.
1-1-02	Remove Placing note on sht. 2. Added Braze to diag. note on sht. 1.

NAME PLATE FOR BRIDGES

(Sheet 1 of 2)

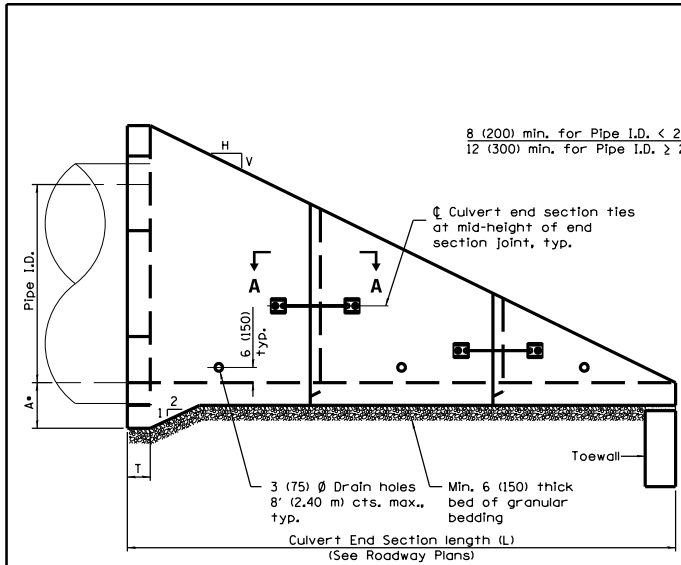
STANDARD 515001-03



Illinois Department of Transportation
 APPROVED January 1, 2009
Ralph E. Anderson
 ENGINEER OF BRIDGES AND STRUCTURES
 APPROVED January 1, 2009
Lee E. Han
 ENGINEER OF DESIGN AND ENVIRONMENT

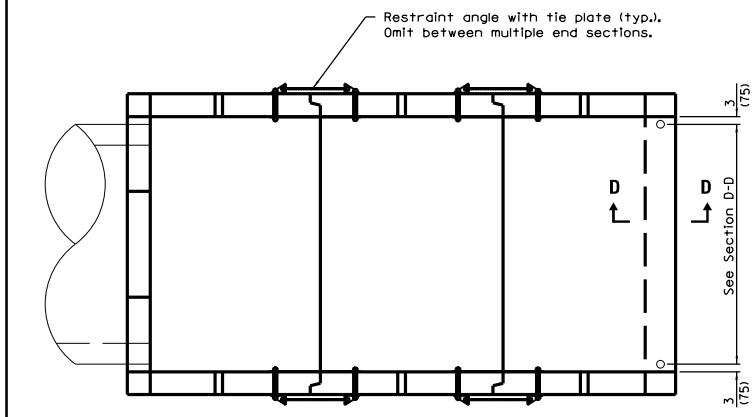
NOTE
 Border and lettering:
 Raised $\frac{3}{8}$ (3), square cut and not tapered.

**NAME PLATE
 FOR BRIDGES**
(Sheet 2 of 2)
STANDARD 515001-03



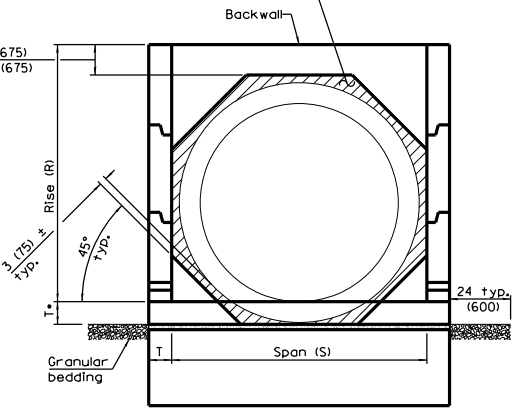
ELEVATION

* This dimension shall be increased by 1/2 (38) for CIP field construction. See General Notes.

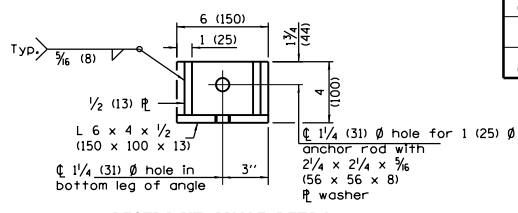


PLAN

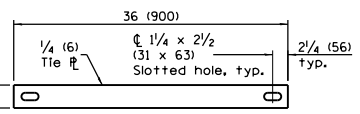
Hatched area indicates void between the pipe and the backwall to be filled with Class SI concrete.



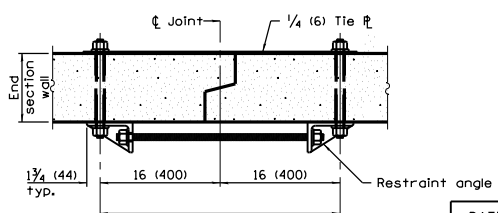
END VIEW



RESTRAINT ANGLE DETAIL



TIE PLATE DETAIL



1 (25) Ø Anchor rods with 2/4 x 2/4 x 3/8 (56 x 56 x 8) plate washers installed in 1/8 (28) Ø formed holes in end section walls

SECTION A-A
(Showing end section tie details)

PIPE CULVERT END SECTION DIMENSIONS

Pipe I.D.	A	R	S	T	L			
					Slope of End Section			
					1:2	1:3	1:4	1:6
15 (375)	14 (350)	29 (737)	28 (711)	8 (200)	5'-6" (1.68 m)	7'-11" (2.42 m)	10'-4" (3.16 m)	15'-2" (4.63 m)
18 (450)	15 (375)	33 (838)	32 (813)	8 (200)	6'-2" (1.88 m)	8'-11" (2.72 m)	11'-8" (3.56 m)	17'-2" (5.24 m)
21 (525)	15 (375)	36 (914)	34 (864)	8 (200)	6'-8" (2.03 m)	9'-8" (2.95 m)	12'-8" (3.86 m)	18'-8" (5.69 m)
24 (600)	15 (375)	39 (990)	38 (970)	8 (200)	7'-2" (2.19 m)	10'-5" (3.18 m)	13'-8" (4.17 m)	20'-2" (6.15 m)
27 (675)	15 (375)	3'-10" (1.17 m)	3'-6" (1.07 m)	8 (200)	8'-4" (2.54 m)	12'-2" (3.71 m)	16'-0" (4.88 m)	23'-8" (7.21 m)
30 (750)	16 (400)	4'-2" (1.27 m)	3'-10" (1.17 m)	8 (200)	9'-0" (2.75 m)	13'-2" (4.02 m)	17'-4" (5.29 m)	25'-8" (7.83 m)
33 (825)	16 (400)	4'-5" (1.35 m)	4'-0" (1.22 m)	8 (200)	9'-6" (2.90 m)	13'-11" (4.25 m)	18'-4" (5.60 m)	27'-2" (8.29 m)
36 (900)	16 (400)	4'-8" (1.42 m)	4'-4" (1.32 m)	8 (200)	10'-0" (3.05 m)	14'-8" (4.47 m)	19'-4" (5.90 m)	28'-8" (8.74 m)
42 (1050)	17 (425)	5'-3" (1.60 m)	5'-0" (1.52 m)	8 (200)	11'-2" (3.41 m)	16'-5" (5.01 m)	21'-8" (6.61 m)	32'-2" (9.81 m)
48 (1200)	17 (425)	5'-9" (1.75 m)	5'-6" (1.68 m)	8 (200)	12'-2" (3.71 m)	17'-11" (5.46 m)	23'-8" (7.22 m)	35'-2" (10.73 m)
54 (1350)	18 (450)	6'-4" (1.93 m)	6'-2" (1.88 m)	8 (200)	13'-4" (4.07 m)	19'-8" (5.73 m)	26'-0" (7.93 m)	38'-8" (11.79 m)
60 (1500)	18 (450)	6'-10" (2.08 m)	6'-8" (2.03 m)	8 (200)	14'-4" (4.37 m)	21'-2" (6.46 m)	28'-0" (8.54 m)	41'-8" (12.71 m)
66 (1650)	19 (475)	7'-5" (2.26 m)	7'-4" (2.24 m)	8 (200)	15'-5" (4.73 m)	22'-11" (6.99 m)	30'-4" (9.26 m)	45'-2" (13.78 m)
72 (1800)	19 (475)	7'-11" (2.41 m)	7'-10" (2.39 m)	8 (200)	16'-6" (5.03 m)	24'-5" (7.45 m)	32'-4" (9.87 m)	48'-2" (14.70 m)
78 (1950)	21 (525)	8'-6" (2.59 m)	8'-6" (2.59 m)	9 (230)	17'-9" (5.41 m)	26'-3" (8.01 m)	34'-9" (10.60 m)	51'-9" (15.78 m)
84 (2100)	21 (525)	9'-0" (2.74 m)	9'-0" (2.74 m)	9 (230)	18'-9" (5.72 m)	27'-9" (8.46 m)	36'-9" (11.21 m)	54'-9" (16.70 m)

GENERAL NOTES

This Standard is for use with single pipe culverts and multi-pipe culvert installations. For multi-pipe culvert installations, place the end sections side-by-side leaving a 3 (75) space between adjacent end section walls and fill the space(s) with Class SI concrete.

The number of segments shown in elevation is for example only. The length and number of precast sections required to construct the end section shall be determined by the Contractor.

See roadway plans for slope (V/H) and pipe inside diameter.

End section may be installed up to ± 15 degrees skewed with roadway.

2/4 x 2/4 x 3/8 (56 x 56 x 8) plate washers shall be provided under each nut required for the anchor rods. Holes in the walls for the culvert tie assembly may be drilled using core bits in lieu of formed holes.

See Standard 542311 for end sections having traversable pipe grate.

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V/H).

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
4-15-16	Added general note for multiple end sections.
4-1-16	Added note to omit restraint angle and tie plate for mult. end sections.

CONCRETE END SECTIONS FOR PIPE CULVERTS
15" (375 mm) THRU 84" (2100 mm) DIA.

(Sheet 1 of 3)

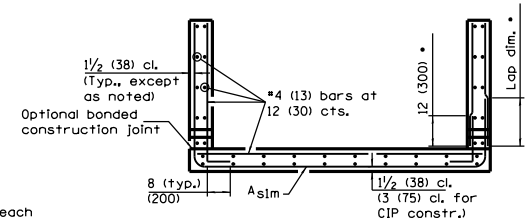
STANDARD 542001-06

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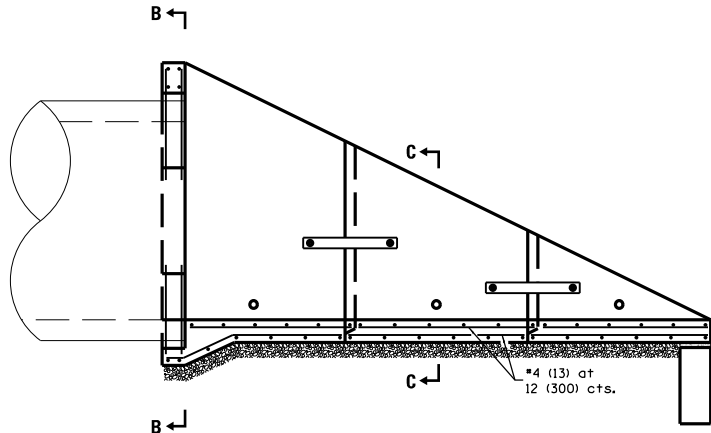
LAP DIMENSION

- *4 (13) bar = 17 (425)
- *5 (16) bar = 21 (525)
- *6 (19) bar = 25 (625)

* The Contractor may use lap splices for the sidewall reinforcement at the locations shown.

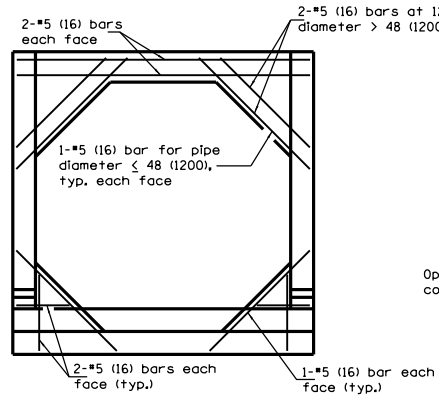


SECTION C-C



LONGITUDINAL SECTION

(Showing bottom slab and backwall reinforcement.)

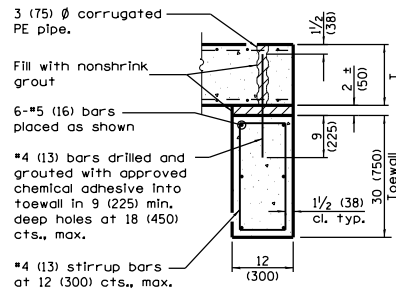


SECTION B-B

(Showing backwall reinforcement only.)
(Pipe omitted for clarity.)

REINFORCEMENT SCHEDULE

Pipe I.D.	Asim	
	Bar Size	Bar Spacing
15 (375)	4 (13)	12 (300)
18 (450)	4 (13)	12 (300)
21 (525)	4 (13)	12 (300)
24 (600)	4 (13)	12 (300)
27 (675)	4 (13)	12 (300)
30 (750)	4 (13)	12 (300)
33 (825)	4 (13)	12 (300)
36 (900)	4 (13)	12 (300)
42 (1050)	4 (13)	8 (200)
48 (1200)	4 (13)	8 (200)
54 (1350)	5 (16)	8 (200)
60 (1500)	5 (16)	8 (200)
66 (1650)	5 (16)	8 (200)
72 (1800)	6 (19)	8 (200)
78 (1950)	6 (19)	8 (200)
84 (2100)	6 (19)	8 (200)



SECTION D-D

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ISSUED 1-1-97

CONCRETE END SECTIONS FOR PIPE CULVERTS
15" (375 mm) THRU 84" (2100 mm) DIA.

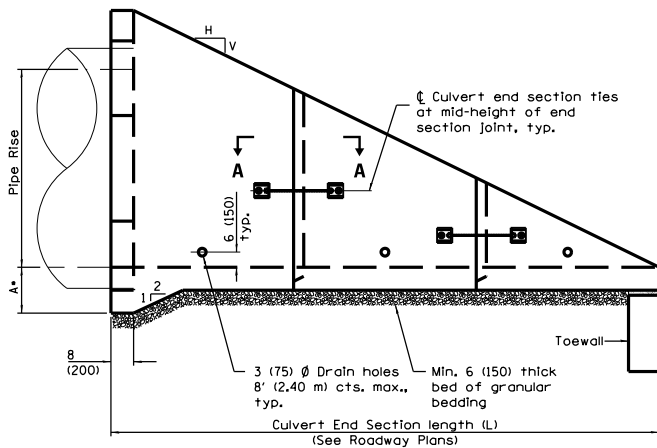
(Sheet 2 of 3)

STANDARD 542001-06

QUANTITIES

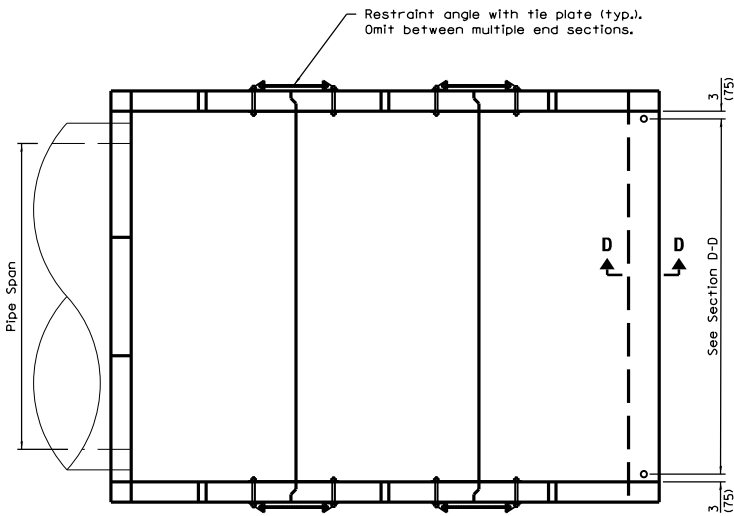
Pipe I.D.	Concrete yd ³ (m ³) ①				Reinforcement Without Lap lbs. (kg)				Reinforcement With Lap lbs (kg)			
	Slope of End Section				Slope of End Section				Slope of End Section			
	1:2	1:3	1:4	1:6	1:2	1:3	1:4	1:6	1:2	1:3	1:4	1:6
15 (375)	1.3 (1.0)	1.7 (1.3)	2.1 (1.6)	2.8 (2.1)	190 (85.2)	230 (104.1)	280 (123.3)	360 (159.2)	210 (94.9)	260 (117.6)	310 (140.3)	410 (182.9)
18 (450)	1.6 (1.2)	2.1 (1.6)	2.6 (2.0)	3.5 (2.7)	230 (104.3)	290 (131.1)	350 (158.0)	460 (207.3)	260 (114.8)	330 (146.0)	400 (177.3)	520 (234.0)
21 (525)	1.8 (1.4)	2.3 (1.8)	2.9 (2.2)	3.9 (3.0)	260 (114.5)	320 (143.3)	380 (172.2)	510 (229.9)	280 (126.5)	360 (159.7)	430 (193.0)	580 (259.5)
24 (600)	2.1 (1.6)	2.7 (2.1)	3.3 (2.5)	4.5 (3.4)	270 (121.9)	350 (155.8)	420 (189.3)	560 (251.5)	300 (133.9)	390 (172.8)	470 (211.6)	630 (282.6)
27 (675)	2.6 (2.0)	3.4 (2.6)	4.2 (3.2)	5.8 (4.4)	350 (155.5)	440 (198.5)	540 (244.4)	740 (336.3)	380 (169.6)	480 (217.8)	600 (269.6)	830 (373.2)
30 (750)	2.9 (2.2)	3.9 (3.0)	4.9 (3.7)	6.8 (5.2)	380 (169.6)	490 (219.2)	600 (271.9)	830 (374.0)	410 (184.5)	530 (240.0)	660 (299.2)	920 (413.9)
33 (825)	3.2 (2.4)	4.3 (3.3)	5.3 (4.1)	7.4 (5.7)	400 (179.7)	520 (234.9)	640 (290.3)	880 (397.6)	430 (195.2)	570 (257.2)	710 (319.0)	970 (438.9)
36 (900)	3.5 (2.7)	4.7 (3.6)	5.9 (4.5)	8.3 (6.3)	440 (197.8)	580 (262.4)	720 (323.8)	990 (449.4)	480 (214.2)	630 (286.1)	780 (354.0)	1090 (493.7)
42 (1050)	4.3 (3.3)	5.8 (4.4)	7.3 (5.6)	10.3 (7.9)	570 (256.4)	770 (346.4)	950 (429.0)	1330 (601.3)	620 (279.4)	840 (380.0)	1040 (471.6)	1470 (663.7)
48 (1200)	5.0 (3.8)	6.8 (5.2)	8.6 (6.6)	12.2 (9.3)	670 (301.1)	910 (409.9)	1140 (514.8)	1610 (728.2)	720 (325.6)	990 (445.8)	1240 (561.2)	1760 (796.8)
54 (1350)	6.0 (4.6)	8.2 (6.3)	10.3 (7.9)	14.7 (11.2)	890 (403.6)	1200 (544.5)	1530 (692.0)	2170 (985.0)	990 (448.6)	1340 (608.1)	1710 (775.8)	2440 (1108.2)
60 (1500)	6.8 (5.2)	9.3 (7.1)	11.8 (9.0)	16.8 (12.8)	1020 (461.5)	1400 (635.3)	1780 (806.8)	2530 (1149.8)	1120 (508.8)	1550 (704.5)	1980 (896.8)	2820 (1281.5)
66 (1650)	7.9 (6.0)	10.9 (8.3)	13.8 (10.6)	19.7 (15.1)	1150 (519.0)	1570 (712.4)	2010 (911.1)	2880 (1305.8)	1260 (570.2)	1730 (786.1)	2220 (1007.9)	3190 (1449.3)
72 (1800)	8.8 (6.7)	12.2 (9.3)	15.5 (11.9)	22.2 (17.0)	1520 (689.9)	2120 (962.1)	2690 (1222.5)	3880 (1761.3)	1710 (777.0)	2400 (1088.2)	3050 (1384.8)	4410 (2001.0)
78 (1950)	11.4 (8.7)	15.8 (12.1)	20.1 (15.4)	28.9 (22.1)	1750 (791.1)	2400 (1090.7)	3100 (1409.0)	4490 (2039.7)	1950 (885.5)	2700 (1223.1)	3490 (1583.9)	5060 (2298.9)
84 (2100)	12.6 (9.6)	17.4 (13.3)	22.3 (17.0)	32.1 (24.5)	1900 (862.7)	2680 (1217.4)	3430 (1558.6)	4960 (2254.4)	2120 (959.6)	2840 (1359.6)	3560 (1743.2)	5560 (2526.8)

① For cast-in-place construction, increase concrete volumes by approximately 12%.



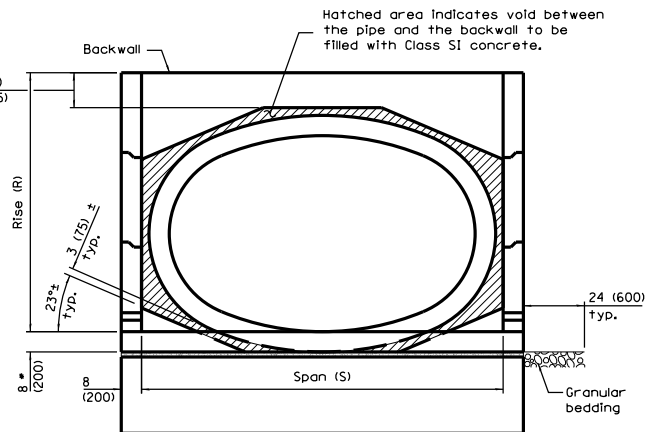
ELEVATION

- This dimension shall be increased by 1/2 (38) for CIP field construction.



PLAN

8 (200) min. for EORS < 21 (525)
12 (300) min. for EORS ≥ 21 (525)



END VIEW

PIPE CULVERT END SECTION DIMENSIONS

Equivalent Round Size Pipe I.D.	Pipe Span	Pipe Rise	A	R	S	L			
						Slope of End Section			
						1:2	1:3	1:4	1:6
15 (375)	23 (575)	14 (350)	15 (375)	28 (711)	36 (914)	5'-4" (1,62 m)	7'-8" (2,34 m)	10'-0" (3,05 m)	14'-8" (4,47 m)
18 (450)	23 (575)	14 (350)	15 (375)	28 (711)	36 (914)	5'-4" (1,62 m)	7'-8" (2,34 m)	10'-0" (3,05 m)	14'-8" (4,47 m)
21 (525)	30 (750)	19 (475)	15 (375)	38 (965)	38 (965)	3'-8" (1,12 m)	7'-0" (2,14 m)	10'-2" (3,10 m)	13'-4" (4,07 m)
24 (600)	30 (750)	19 (475)	15 (375)	38 (965)	38 (965)	3'-8" (1,12 m)	7'-0" (2,14 m)	10'-2" (3,10 m)	13'-4" (4,07 m)
27 (675)	34 (850)	22 (550)	15 (375)	3'-5" (1,04 m)	4'-0" (1,22 m)	4'-0" (1,22 m)	7'-6" (2,29 m)	10'-11" (3,33 m)	14'-4" (4,38 m)
30 (750)	38 (950)	24 (600)	15 (375)	3'-7" (1,09 m)	4'-4" (1,32 m)	4'-4" (1,32 m)	7'-10" (2,39 m)	11'-5" (3,48 m)	15'-0" (4,57 m)
36 (900)	45 (1125)	29 (725)	16 (400)	4'-1" (1,24 m)	5'-0" (1,52 m)	5'-0" (1,52 m)	8'-10" (2,69 m)	12'-11" (3,94 m)	17'-0" (5,18 m)
42 (1050)	53 (1325)	34 (850)	16 (400)	4'-6" (1,37 m)	5'-10" (1,78 m)	5'-10" (1,78 m)	9'-8" (2,95 m)	14'-2" (4,32 m)	18'-8" (5,69 m)
48 (1200)	60 (1500)	38 (950)	17 (425)	4'-11" (1,50 m)	6'-6" (1,98 m)	6'-6" (1,98 m)	10'-6" (3,20 m)	15'-5" (4,71 m)	20'-4" (6,21 m)
54 (1350)	68 (1700)	43 (1075)	17 (425)	5'-4" (1,63 m)	7'-2" (2,18 m)	7'-2" (2,18 m)	11'-4" (3,45 m)	16'-8" (5,08 m)	22'-0" (6,71 m)
60 (1500)	76 (1900)	48 (1200)	18 (450)	5'-10" (1,78 m)	8'-0" (2,44 m)	8'-0" (2,44 m)	12'-4" (3,76 m)	18'-2" (5,54 m)	24'-0" (7,32 m)
66 (1650)	83 (2075)	53 (1325)	18 (450)	6'-3" (1,91 m)	8'-8" (2,64 m)	8'-8" (2,64 m)	13'-2" (4,02 m)	19'-5" (5,92 m)	25'-8" (7,83 m)
72 (1800)	91 (2275)	58 (1450)	19 (475)	6'-9" (2,06 m)	9'-4" (2,84 m)	9'-4" (2,84 m)	14'-2" (4,32 m)	20'-11" (6,38 m)	27'-8" (8,44 m)

See Sheet 3 for GENERAL NOTES.

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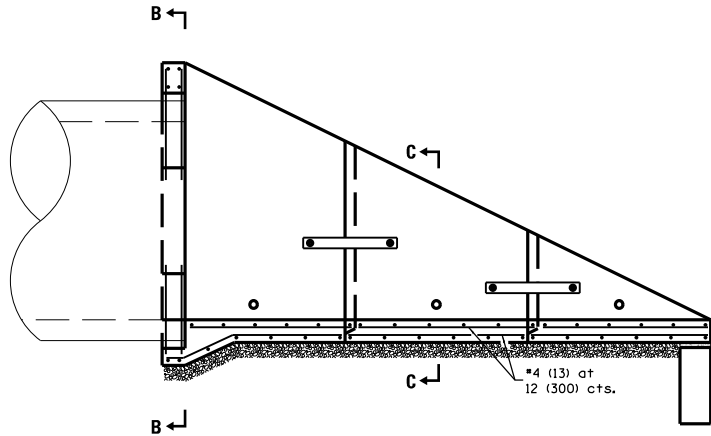
ISSUED E1-1-1-1

DATE	REVISIONS
4-15-16	Added general note for multiple end sections.
4-1-16	Added note to omit restraint angle and tie plate for mult. end sections.

CONCRETE END SECTIONS FOR ELLIPTICAL PIPE CULVERTS 15" (375 mm) THRU 72" (1800 mm) EQUIVALENT DIAMETER

(Sheet 1 of 3)

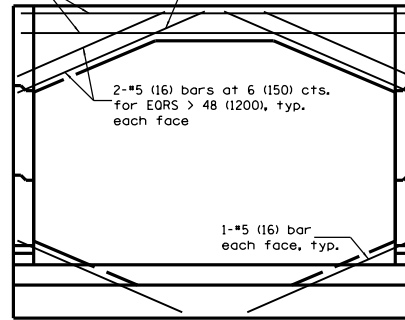
STANDARD 542011-02



LONGITUDINAL SECTION

(Showing bottom slab and backwall reinforcement.)

2-#5 (16) bars each face
1-#5 (16) bar for EORS ≤ 48 (1200), typ. each face



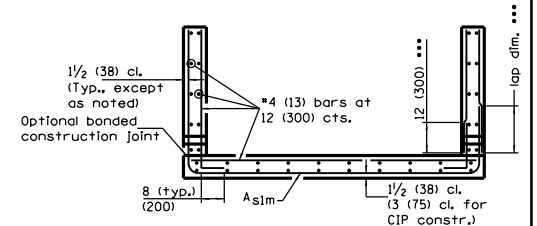
SECTION B-B

(Showing backwall reinforcement only.)
(Pipe omitted for clarity.)

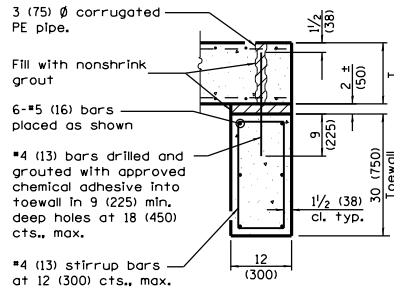
LAP DIMENSION

- #4 (13) bar = 17 (425)
- #5 (16) bar = 21 (525)
- #6 (19) bar = 25 (625)

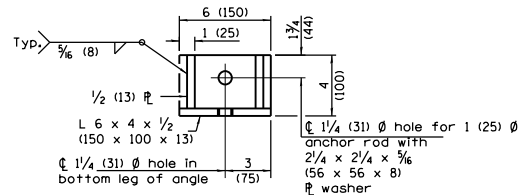
... The Contractor may use lap splices for the sidewall reinforcement at the locations shown.



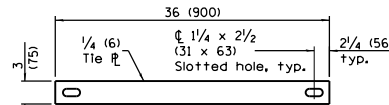
SECTION C-C



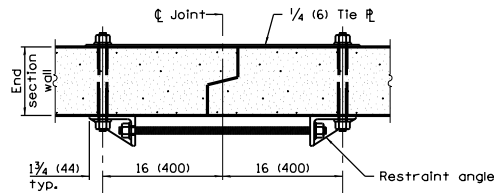
SECTION D-D



RESTRAINT ANGLE DETAIL



TIE PLATE DETAIL



SECTION A-A

(Showing end section tie details.)

REINFORCEMENT SCHEDULE

Equivalent Round Size Pipe I.D.	Asim	
	Bar Size	Bar Spacing
15 (375)	4 (13)	12 (300)
18 (450)	4 (13)	12 (300)
21 (525)	4 (13)	12 (300)
24 (600)	4 (13)	12 (300)
27 (700)	4 (13)	12 (300)
30 (750)	4 (13)	12 (300)
36 (900)	4 (13)	12 (300)
42 (1050)	4 (13)	12 (300)
48 (1200)	4 (13)	8 (200)
54 (1350)	4 (13)	8 (200)
60 (1500)	4 (13)	8 (200)
66 (1650)	5 (16)	8 (200)
72 (1800)	5 (16)	8 (200)

CONCRETE END SECTIONS FOR ELLIPTICAL PIPE CULVERTS 15" (375 mm) THRU 72" (1800 mm) EQUIVALENT DIAMETER

(Sheet 2 of 3)

STANDARD 542011-02

Illinois Department of Transportation

APPROVED Apr 15, 2016

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APPROVED Apr 15, 2016

ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-16

QUANTITIES

Equivalent Round Size Pipe I.D.	Concrete yd ³ (m ³) ①				Reinforcement Without Lap lbs. (kg)				Reinforcement With Lap lbs. (kg)			
	Slope of End Section				Slope of End Section				Slope of End Section			
	1:2	1:3	1:4	1:6	1:2	1:3	1:4	1:6	1:2	1:3	1:4	1:6
15 (375)	1.5 (1.1)	1.9 (1.6)	2.3 (1.8)	3.0 (2.3)	220 (120.8)	270 (148.3)	320 (172.9)	420 (228.5)	240 (132.3)	300 (164.3)	350 (192.8)	470 (257.4)
18 (450)	1.5 (1.3)	1.9 (1.6)	2.3 (1.8)	3.0 (2.3)	220 (120.8)	270 (148.3)	320 (172.9)	420 (228.5)	240 (132.3)	300 (164.3)	350 (192.8)	470 (257.4)
21 (525)	2.2 (1.7)	2.8 (2.1)	3.5 (2.7)	4.8 (3.7)	310 (167.2)	390 (172.9)	470 (211.5)	630 (285.2)	330 (181.8)	420 (189.3)	520 (232.9)	700 (316.3)
24 (600)	2.2 (1.7)	2.8 (2.1)	3.5 (2.7)	4.8 (3.7)	310 (167.2)	390 (172.9)	470 (211.5)	630 (285.2)	330 (181.8)	420 (189.3)	520 (232.9)	700 (316.3)
27 (700)	2.5 (1.9)	3.2 (2.4)	3.9 (3.0)	5.4 (4.1)	330 (181.7)	420 (190.1)	510 (231.4)	690 (310.5)	360 (197.0)	460 (208.0)	560 (254.3)	760 (343.1)
30 (750)	2.7 (2.1)	3.5 (2.7)	4.3 (3.3)	5.9 (4.5)	350 (193.1)	450 (201.9)	540 (244.9)	730 (331.3)	380 (209.5)	490 (220.4)	600 (268.7)	810 (365.3)
36 (900)	3.3 (2.5)	4.4 (3.4)	5.4 (4.1)	7.5 (5.7)	430 (237.6)	560 (252.2)	690 (309.3)	940 (423.4)	470 (255.8)	610 (273.0)	740 (335.9)	1020 (461.8)
42 (1050)	4.0 (3.1)	5.3 (4.1)	6.6 (5.0)	9.2 (7.0)	510 (279.8)	660 (295.6)	820 (369.1)	1120 (508.5)	550 (299.8)	700 (317.9)	880 (398.7)	1220 (551.3)
48 (1200)	4.7 (3.6)	6.2 (4.7)	7.8 (6.0)	10.9 (8.3)	660 (362.5)	870 (391.5)	1070 (485.4)	1490 (672.8)	710 (389.5)	940 (422.8)	1160 (525.7)	1610 (731.4)
54 (1350)	5.3 (4.1)	7.2 (5.5)	9.0 (6.9)	12.6 (9.6)	730 (400.1)	960 (434.4)	1190 (540.2)	1670 (756.6)	780 (428.9)	1030 (467.9)	1290 (583.7)	1810 (820.5)
60 (1500)	6.3 (4.8)	8.5 (6.5)	10.7 (8.2)	15.1 (11.5)	830 (458.1)	1110 (500.0)	1390 (629.0)	1950 (882.2)	890 (488.7)	1180 (535.9)	1490 (676.2)	2100 (951.4)
66 (1650)	7.1 (5.4)	9.6 (7.3)	12.2 (9.3)	17.2 (13.2)	1080 (596.0)	1470 (665.5)	1840 (836.2)	2610 (1185.3)	1180 (650.1)	1610 (729.0)	2030 (918.3)	2880 (1306.3)
72 (1800)	8.2 (6.3)	11.1 (8.5)	14.0 (10.7)	19.8 (14.9)	1190 (653.9)	1620 (734.2)	2050 (931.6)	2930 (1328.9)	1290 (710.7)	1770 (801.7)	2250 (1019.9)	3220 (1460.0)

① For cast-in-place construction, increase concrete volumes by approximately 13%.

GENERAL NOTES

This Standard is used with single pipe culverts and multi-pipe culvert installations. For multi-pipe culvert installations, place the end sections side-by-side leaving a 3 (75) space between adjacent end section walls and fill the space(s) with Class SI concrete.

The number of segments shown in elevation is for example only. The length and number of precast sections required to construct the end section shall be determined by the Contractor.

See roadway plans for slope (V:H) and pipe inside diameter.

End section may be installed up to ± 15 degrees skewed with roadway.

2/4 x 2/4 x 5/8 (56 x 56 x 8) plate washers shall be provided under each nut required for the anchor rods. Holes in the walls for the culvert tie assembly may be drilled using core bits in lieu of formed holes.


See Standard 542311 for end sections having traversable pipe grate.

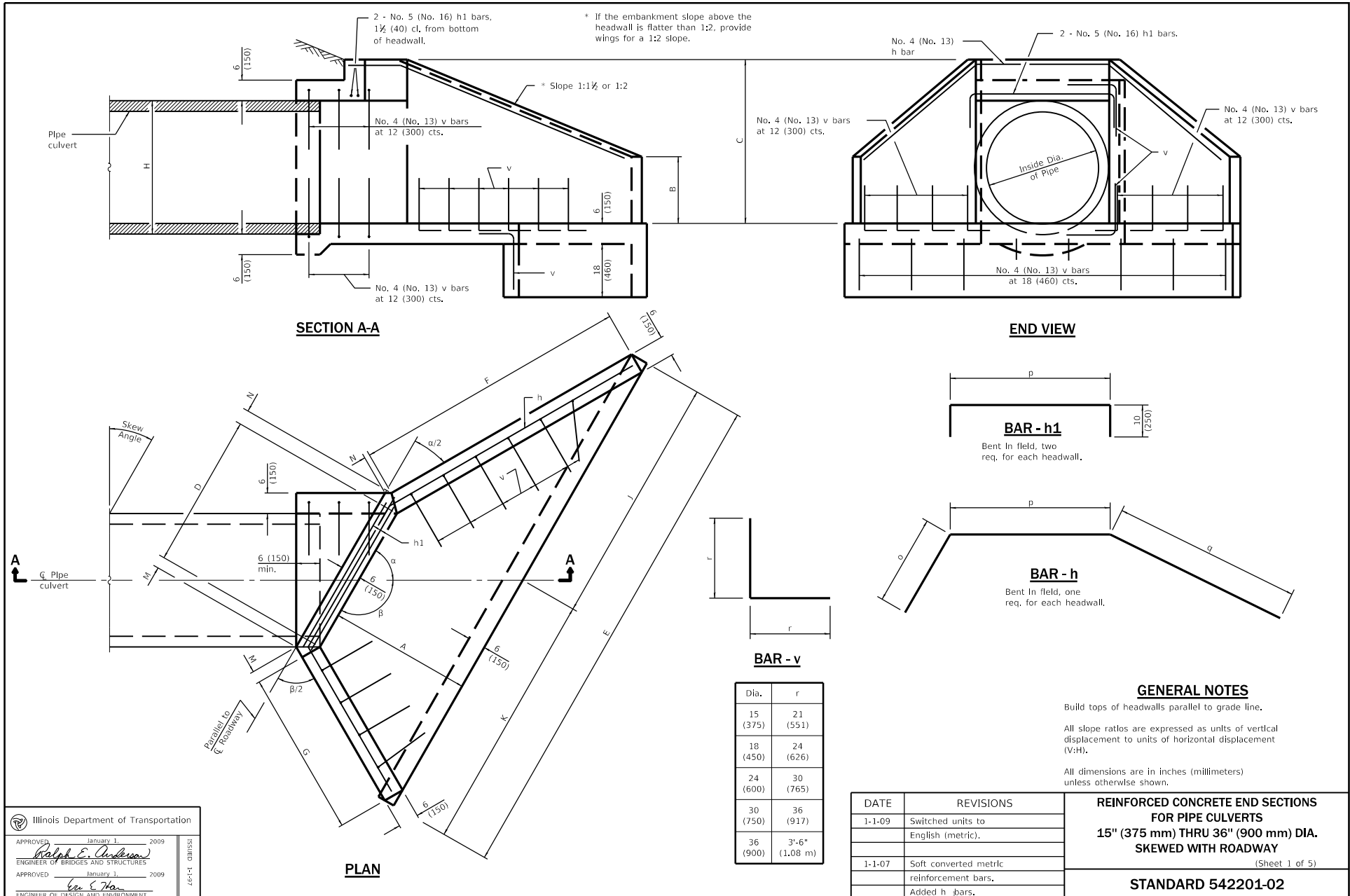
All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in inches (millimeters) unless otherwise shown.

CONCRETE END SECTIONS FOR ELLIPTICAL PIPE CULVERTS 15" (375 mm) THRU 72" (1800 mm) EQUIVALENT DIAMETER
(Sheet 3 of 3)

STANDARD 542011-02

 Illinois Department of Transportation	
APPROVED <i>[Signature]</i> Apr 11 15, 2016 ENGINEER OF BRIDGES AND STRUCTURES	ISSUED I-1-13
APPROVED <i>[Signature]</i> Apr 11 15, 2016 ENGINEER OF DESIGN AND ENVIRONMENT	



Illinois Department of Transportation
 APPROVED January 1, 2009
Ralph E. Anderson
 ENGINEER OF BRIDGES AND STRUCTURES
 APPROVED January 1, 2009
Lee E. Han
 ENGINEER OF DESIGN AND ENVIRONMENT

464-C 03/15/02

Dia.	r
15 (375)	21 (551)
18 (450)	24 (626)
24 (600)	30 (765)
30 (750)	36 (917)
36 (900)	3'-6" (1.08 m)

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-07	Soft converted metric reinforcement bars.
	Added h bars.

GENERAL NOTES
 Build tops of headwalls parallel to grade line.
 All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).
 All dimensions are in inches (millimeters) unless otherwise shown.

REINFORCED CONCRETE END SECTIONS FOR PIPE CULVERTS
15" (375 mm) THRU 36" (900 mm) DIA. SKEWED WITH ROADWAY
 (Sheet 1 of 5)
STANDARD 542201-02

WINGS FOR 1:1 1/2 SLOPE

Skew Angle	Design No.	Nominal Pipe Dia.	DIMENSIONS FOR CONCRETE											Concrete 2 End Sections yd ³ (m ³)	Reinf. Bars - 2 End Sections						Bars for 2 End Sections lbs. (kg)			
			A	B	C	D	E	F	G	H	J	K	M		N	α	h - bars			h1 - bars		v-bars No.		
																	o	p	q	Lgth.			p	Lgth.
5°	DS 15-1 1/2 (DS 375-1 1/2)	15 (375)	28 (720)	10 (260)	29 (740)	19 (485)	6'-11 1/2" (2.15 m)	3'-5 1/2" (1.07 m)	38 (980)	19 (483)	3'-5 1/2" (1.07 m)	3'-6" (1.08 m)	2 1/2 (70)	2 1/4 (60)	85°	1.4 (1.1)	3'-6" (1.01 m)	21 (551)	3'-9" (1.09 m)	9'-0" (2.65 m)	21 (551)	3'-5" (1.04 m)	28 (41)	90 (41)
	DS 18-1 1/2 (DS 450-1 1/2)	18 (450)	28 (720)	13 (330)	32 (810)	22 (561)	7'-2 1/2" (2.22 m)	3'-5 1/2" (1.07 m)	38 (980)	22 (559)	3'-7 1/2" (1.11 m)	3'-7 1/2" (1.11 m)	2 1/2 (70)	2 1/4 (60)	85°	1.6 (1.2)	3'-6" (1.03 m)	24 (626)	3'-9" (1.12 m)	9'-3" (2.78 m)	24 (626)	3'-8" (1.12 m)	28 (45)	100 (45)
	DS 24-1 1/2 (DS 600-1 1/2)	24 (600)	34 (870)	16 (410)	39 (990)	30 (765)	8'-10 1/2" (2.73 m)	4'-2 1/2" (1.29 m)	3'-10" (1.18 m)	30 (762)	4'-5 1/4" (1.36 m)	4'-5 1/4" (1.37 m)	2 1/2 (70)	2 1/4 (60)	85°	2.2 (1.7)	4'-3" (1.23 m)	32 (832)	4'-7" (1.33 m)	11'-6" (3.39 m)	32 (832)	4'-4" (1.32 m)	32 (63)	140 (63)
	DS 30-1 1/2 (DS 750-1 1/2)	30 (750)	39 (990)	19 (480)	44 (1140)	36 (917)	10'-3" (3.12 m)	4'-9 1/2" (1.47 m)	4'-5" (1.35 m)	36 (914)	5'-1 1/4" (1.56 m)	5'-1 1/4" (1.56 m)	2 1/2 (70)	2 1/4 (60)	85°	2.7 (2.1)	4'-10" (1.39 m)	39 (983)	5'-2" (1.51 m)	13'-3" (3.88 m)	39 (983)	4'-11" (1.50 m)	36 (81)	180 (81)
	DS 36-1 1/2 (DS 900-1 1/2)	36 (900)	39 (990)	22 (560)	44 (1140)	36 (917)	11'-11" (3.63 m)	5'-6 1/2" (1.69 m)	5'-1" (1.55 m)	36 (914)	5'-11 1/4" (1.81 m)	5'-11 1/4" (1.82 m)	2 1/2 (70)	2 1/4 (60)	85°	3.3 (2.5)	5'-7" (1.6 m)	31-11" (1.19 m)	6'-0" (1.73 m)	15'-6" (4.52 m)	31-11" (1.19 m)	5'-7" (1.70 m)	42 (108)	240 (108)
	DS 15-1 1/2 (DS 375-1 1/2)	15 (375)	28 (720)	10 (260)	29 (740)	19 (485)	7'-0 1/2" (2.17 m)	3'-7 1/2" (1.12 m)	36 1/2 (940)	19 (483)	3'-6" (1.08 m)	3'-6" (1.09 m)	2 1/2 (70)	2 1/4 (60)	80°	1.5 (1.2)	3'-4" (922)	22 (557)	3'-10" (1.14 m)	9'-0" (2.67 m)	22 (557)	3'-6" (1.07 m)	28 (41)	90 (41)
10°	DS 18-1 1/2 (DS 450-1 1/2)	18 (450)	28 (720)	13 (330)	32 (810)	22 (568)	7'-3 1/2" (2.24 m)	3'-7 1/2" (1.12 m)	36 1/2 (940)	22 (559)	3'-7 1/2" (1.11 m)	3'-8 1/2" (1.13 m)	2 1/2 (70)	2 1/4 (60)	80°	1.6 (1.2)	3'-4" (990)	25 (633)	3'-10" (1.17 m)	9'-3" (2.8 m)	25 (633)	3'-9" (1.14 m)	28 (45)	100 (45)
	DS 24-1 1/2 (DS 600-1 1/2)	24 (600)	34 (870)	16 (410)	39 (990)	30 (774)	9'-0" (2.76 m)	4'-5" (1.36 m)	3'-8 1/2" (1.14 m)	30 (762)	4'-5" (1.37 m)	4'-6" (1.39 m)	2 1/2 (70)	2 1/4 (60)	80°	2.2 (1.7)	4'-1" (1.18 m)	33 (841)	4'-8" (1.4 m)	11'-6" (3.42 m)	33 (841)	4'-5" (1.35 m)	34 (68)	150 (68)
	DS 30-1 1/2 (DS 750-1 1/2)	30 (750)	39 (990)	19 (480)	44 (1140)	36 (928)	10'-4 1/2" (3.15 m)	5'-0 1/2" (1.54 m)	4'-3" (1.3 m)	36 (914)	5'-1 1/2" (1.57 m)	5'-2" (1.58 m)	2 1/2 (70)	2 1/4 (60)	80°	2.8 (2.1)	4'-9" (1.34 m)	39 (993)	5'-6" (1.58 m)	13'-6" (3.92 m)	39 (993)	4'-11" (1.50 m)	36 (81)	180 (81)
	DS 36-1 1/2 (DS 900-1 1/2)	36 (900)	39 (990)	22 (560)	44 (1140)	36 (917)	12'-0 1/2" (3.67 m)	5'-10" (1.78 m)	4'-10 1/2" (1.49 m)	36 (914)	6'-0" (1.83 m)	6'-0" (1.84 m)	2 1/2 (70)	2 1/4 (60)	80°	3.5 (2.7)	5'-6" (1.54 m)	31-11" (1.19 m)	6'-4" (1.82 m)	15'-9" (4.56 m)	31-11" (1.19 m)	5'-7" (1.70 m)	42 (108)	240 (108)
	DS 15-1 1/2 (DS 375-1 1/2)	15 (375)	28 (720)	10 (260)	29 (740)	19 (500)	7'-2" (2.2 m)	3'-10" (1.19 m)	35 1/2 (910)	19 (483)	3'-6 1/2" (1.09 m)	3'-7 1/2" (1.11 m)	3 (80)	2 1/4 (50)	75°	1.5 (1.2)	3'-4" (942)	22 (567)	4'-1" (1.2 m)	9'-3" (2.71 m)	22 (567)	3'-6" (1.07 m)	28 (41)	90 (41)
	DS 18-1 1/2 (DS 450-1 1/2)	18 (450)	28 (720)	13 (330)	32 (810)	22 (579)	7'-5 1/2" (2.28 m)	3'-10" (1.19 m)	35 1/2 (910)	22 (559)	3'-8" (1.13 m)	3'-9 1/2" (1.15 m)	3 (80)	2 1/4 (50)	75°	1.7 (1.3)	3'-4" (965)	25 (644)	4'-1" (1.23 m)	9'-6" (2.84 m)	25 (644)	3'-9" (1.14 m)	28 (45)	100 (45)
15°	DS 24-1 1/2 (DS 600-1 1/2)	24 (600)	34 (870)	16 (410)	39 (990)	31 (789)	9'-2" (2.8 m)	4'-7 1/2" (1.42 m)	3'-6" (1.1 m)	30 (762)	4'-6 1/2" (1.39 m)	4'-7 1/2" (1.41 m)	3 (80)	2 1/4 (50)	75°	2.3 (1.8)	4'-0" (1.15 m)	34 (857)	4'-11" (1.47 m)	11'-9" (3.67 m)	34 (857)	4'-6" (1.37 m)	34 (68)	150 (68)
	DS 30-1 1/2 (DS 750-1 1/2)	30 (750)	39 (990)	19 (480)	44 (1140)	37 (946)	10'-4 1/2" (3.21 m)	5'-4" (1.63 m)	4'-1 1/2" (1.25 m)	36 (914)	5'-3" (1.59 m)	5'-3" (1.62 m)	3 (80)	2 1/4 (50)	75°	2.2 (2.2)	4'-0" (1.3 m)	34 (901)	5'-9" (1.67 m)	13'-9" (3.98 m)	34 (901)	5'-0" (1.52 m)	40 (90)	200 (90)
	DS 36-1 1/2 (DS 900-1 1/2)	36 (900)	39 (990)	22 (560)	44 (1140)	39 (1158)	12'-3 1/2" (3.73 m)	6'-2" (1.87 m)	4'-8 1/2" (1.44 m)	38 (950)	6'-1" (1.85 m)	6'-2" (1.88 m)	3 (80)	2 1/4 (50)	75°	3.8 (2.9)	5'-3" (1.49 m)	4'-0" (1.22 m)	6'-6" (1.92 m)	15'-9" (4.63 m)	4'-0" (1.22 m)	5'-8" (1.73 m)	46 (117)	260 (117)
	DS 15-1 1/2 (DS 375-1 1/2)	15 (375)	28 (720)	10 (260)	29 (740)	20 (514)	7'-4" (2.26 m)	4'-0 1/2" (1.26 m)	34 1/2 (880)	19 (483)	3'-7 1/2" (1.11 m)	3'-8 1/2" (1.15 m)	3 (80)	2 1/4 (50)	70°	1.6 (1.2)	3'-9" (916)	23 (581)	4'-4" (1.27 m)	9'-6" (2.77 m)	23 (581)	3'-7" (1.09 m)	28 (41)	90 (41)
	DS 18-1 1/2 (DS 450-1 1/2)	18 (450)	28 (720)	13 (330)	32 (810)	23 (595)	7'-7 1/2" (2.34 m)	4'-0 1/2" (1.26 m)	34 1/2 (880)	22 (559)	3'-9" (1.15 m)	3'-10 1/2" (1.19 m)	3 (80)	2 1/4 (50)	70°	1.7 (1.3)	3-9" (938)	26 (661)	4'-4" (1.31 m)	9'-9" (2.9 m)	26 (661)	3'-10" (1.17 m)	28 (45)	100 (45)
	DS 24-1 1/2 (DS 600-1 1/2)	24 (600)	34 (870)	16 (410)	39 (990)	32 (811)	9'-4 1/2" (2.87 m)	4'-11 1/2" (1.52 m)	3'-5 1/2" (1.07 m)	30 (762)	4'-7 1/2" (1.42 m)	4'-9" (1.45 m)	3 (80)	2 1/4 (50)	70°	2.4 (1.8)	3'-11" (1.11 m)	35 (879)	5'-2" (1.56 m)	12'-0" (3.55 m)	35 (879)	4'-7" (1.40 m)	38 (72)	160 (72)
20°	DS 30-1 1/2 (DS 750-1 1/2)	30 (750)	39 (990)	19 (480)	44 (1140)	28 (973)	10'-9 1/2" (3.29 m)	5'-8" (1.73 m)	3'-11 1/2" (1.21 m)	36 (914)	5'-4 1/2" (1.63 m)	5'-5 1/2" (1.66 m)	3 (80)	2 1/4 (50)	70°	3.1 (2.4)	4'-5" (1.26 m)	3'-5" (1.04 m)	5'-11" (1.77 m)	13'-9" (4.07 m)	3'-5" (1.04 m)	5'-1" (1.55 m)	42 (95)	210 (95)
	DS 36-1 1/2 (DS 900-1 1/2)	36 (900)	39 (990)	22 (560)	44 (1140)	22 (1191)	12'-7" (3.86 m)	6'-6 1/2" (1.99 m)	4'-7" (1.41 m)	38 (950)	6'-2 1/2" (1.9 m)	6'-4 1/2" (1.93 m)	3 (80)	2 1/4 (50)	70°	4.0 (3.1)	5'-3" (1.45 m)	4'-1" (1.26 m)	6'-11" (2.03 m)	16'-3" (4.73 m)	4'-1" (1.26 m)	5'-9" (1.75 m)	50 (126)	280 (126)
	DS 15-1 1/2 (DS 375-1 1/2)	15 (375)	28 (720)	10 (260)	29 (740)	21 (533)	7'-7" (2.33 m)	4'-4" (1.34 m)	33 1/2 (860)	19 (483)	3'-8 1/2" (1.14 m)	3'-10 1/2" (1.19 m)	3 1/2 (90)	1 1/2 (50)	65°	1.6 (1.2)	3-9" (893)	23 (600)	4'-7" (1.36 m)	9'-9" (2.85 m)	23 (600)	3'-7" (1.09 m)	28 (41)	90 (41)
	DS 18-1 1/2 (DS 450-1 1/2)	18 (450)	28 (720)	13 (330)	32 (810)	24 (617)	7'-10 1/2" (2.42 m)	4'-4" (1.34 m)	33 1/2 (860)	22 (559)	3'-10 1/2" (1.19 m)	4'-0" (1.23 m)	3 1/2 (90)	1 1/2 (50)	65°	1.8 (1.4)	3-8" (914)	27 (683)	4'-7" (1.39 m)	10'-0" (2.99 m)	27 (683)	3'-11" (1.19 m)	32 (54)	120 (54)
	DS 24-1 1/2 (DS 600-1 1/2)	24 (600)	34 (870)	16 (410)	39 (990)	33 (841)	9'-8 1/2" (2.97 m)	5'-3 1/2" (1.62 m)	3'-4 1/2" (1.04 m)	30 (762)	4'-9 1/2" (1.46 m)	4'-11 1/2" (1.51 m)	3 1/2 (90)	1 1/2 (50)	65°	2.5 (1.9)	3'-10" (1.09 m)	35 (909)	5'-6" (1.66 m)	12'-3" (3.65 m)	35 (909)	4'-7" (1.40 m)	36 (72)	160 (72)
	DS 30-1 1/2 (DS 750-1 1/2)	30 (750)	39 (990)	19 (480)	44 (1140)	33 (841)	11'-2" (3.4 m)	6'-0 1/2" (1.83 m)	3'-10 1/2" (1.18 m)	36 (914)	5'-6" (1.68 m)	5'-8" (1.72 m)	3 1/2 (90)	1 1/2 (50)	65°	3.3 (2.5)	4'-5" (1.23 m)	3'-6" (1.08 m)	6'-4" (1.88 m)	14'-3" (4.18 m)	3'-6" (1.08 m)	5'-2" (1.58 m)	44 (99)	220 (99)
DS 36-1 1/2 (DS 900-1 1/2)	36 (900)	39 (990)	22 (560)	44 (1140)	33 (1235)	13'-0 1/2" (3.96 m)	6'-11 1/2" (2.12 m)	4'-5 1/2" (1.36 m)	38 (950)	6'-5 1/2" (1.99 m)	6-7" (2 m)	3 1/2 (90)	1 1/2 (50)	65°	4.3 (3.3)	5'-0" (1.41 m)	4'-3" (1.3 m)	7'-3" (2.16 m)	16'-6" (4.87 m)	4'-3" (1.3 m)	5'-10" (1.80 m)	50 (126)	280 (126)	
30°	DS 15-1 1/2 (DS 375-1 1/2)	15 (375)	28 (720)	10 (260)	29 (740)	22 (558)	7'-10 1/2" (2.43 m)	4'-8" (1.44 m)	32 1/2 (830)	19 (483)	3'-10 1/2" (1.19 m)	4'-0" (1.24 m)	3 1/2 (90)	1 1/2 (40)	60°	1.7 (1.3)	3-7" (873)	24 (626)	4'-11" (1.46 m)	10'-0" (2.95 m)	24 (626)	3'-8" (1.12 m)	36 (50)	110 (50)
	DS 18-1 1/2 (DS 450-1 1/2)	18 (450)	28 (720)	13 (330)	32 (810)	25 (645)	8'-2 1/2" (2.52 m)	4'-8" (1.44 m)	32 1/2 (830)	22 (559)	4'-0" (1.23 m)	4'-2 1/2" (1.29 m)	3 1/2 (90)	1 1/2 (40)	60°	1.9 (1.5)	3-8" (893)	28 (712)	5'-0" (1.49 m)	10'-6" (3.1 m)	28 (712)	4'-0" (1.22 m)	36 (59)	130 (59)
	DS 24-1 1/2 (DS 600-1 1/2)	24 (600)	34 (870)	16 (410)	39 (990)	34 (880)	10'-1 1/2" (3.1 m)	5'-8" (1.74 m)	3'-3 1/2" (1.01 m)	30 (762)	4'-11 1/2" (1.52 m)	5'-1 1/2" (1.58 m)	3 1/2 (90)	1 1/2 (40)	60°	2.7 (2.1)	3'-9" (1.06 m)	37 (949)	5'-11" (1.78 m)	12'-9" (3.79 m)	37 (949)	4'-9" (1.45 m)	40 (77)	170 (77)
	DS 30-1 1/2 (DS 750-1 1/2)	30 (750)	39 (990)	19 (480)	44 (1140)	35 (1055)	11'-7 1/2" (3.55 m)	6'-6" (1.98 m)	3'-9" (1.15 m)	36 (914)	5'-8" (1.75 m)	5'-11" (1.8 m)	3 1/2 (90)	1 1/2 (40)	60°	3.5 (2.7)	4'-4" (1.2 m)	3'-8" (1.12 m)	6'-9" (2.02 m)	14'-9" (4.34 m)	3'-8" (1.12 m)	5'-4" (1.63 m)	46 (104)	230 (104)
	DS 36-1 1/2 (DS 900-1 1/2)	36																						

WINGS FOR 1:1½ SLOPE

Skew Angle	Desgn No.	Nominal Pipe Dia.	DIMENSIONS FOR CONCRETE													Concrete 2 End Sections yd ³ (m ³)	Reinf. Bars - 2 End Sections						Bars for 2 End Sections lbs. (kg)		
			A	B	C	D	E	F	G	H	J	K	M	N	α		h - bars			h1 - bars		v-bars No.			
																	o	p	q	Lgth.	p			Lgth.	
35°	DS 15-1½ (DS 375-1½)	15 (375)	28 (720)	10 (260)	29 (740)	23¼ (590)	8'-3¾" (2.55 m)	5'-0¾" (1.56 m)	31¼ (820)	19 (483)	4'-0½" (1.24 m)	4'-3" (1.31 m)	3¾ (90)	1½ (40)	55°	1.8 (1.4)	37 (855)	26 (658)	5'-3" (1.57 m)	10'-6" (3.09 m)	26 (658)	3'-10" (1.17 m)	36 (81)	110 (50)	
	DS 18-1½ (DS 450-1½)	18 (450)	28 (720)	13 (330)	32 (810)	27 (682)	8'-7¼" (2.65 m)	5'-0¾" (1.56 m)	31¼ (820)	22 (559)	4'-2½" (1.29 m)	4'-5" (1.36 m)	3¾ (90)	1½ (40)	55°	2.0 (1.5)	37 (876)	29 (750)	5'-3" (1.61 m)	10'-9" (3.24 m)	29 (750)	4'-11" (1.25 m)	36 (59)	130 (59)	
	DS 24-1½ (DS 600-1½)	24 (600)	34 (870)	16 (410)	39 (990)	39 (930)	3'-8" (3.26 m)	10'-7¾" (3.26 m)	6'-1¾" (1.88 m)	38¾ (980)	30 (762)	5'-2½" (1.66 m)	5'-5¾" (1.66 m)	3¾ (90)	1½ (40)	55°	2.9 (2.2)	3'-8" (1.04 m)	39 (1.0 m)	6'-4" (1.92 m)	13'-3" (3.96 m)	39 (1.0 m)	4'-11" (1.50 m)	40 (77)	170 (77)
	DS 30-1½ (DS 750-1½)	30 (750)	39 (990)	19 (480)	39 (1140)	39 (930)	3'-8" (1.116 m)	12'-3¼" (3.74 m)	7'-0¾" (2.15 m)	3'-8" (1.12 m)	36 (914)	6'-0" (1.84 m)	6'-3" (1.9 m)	3¾ (90)	1½ (40)	55°	3.7 (2.8)	4'-2" (1.17 m)	3'-11" (1.18 m)	7'-2" (2.18 m)	15'-3" (4.54 m)	3'-11" (1.18 m)	5'-7" (1.70 m)	50 (108)	240 (108)
	DS 36-1½ (DS 900-1½)	36 (900)	3'-9" (1140)	22 (560)	4'-4" (1320)	4'-5¾" (1.366 m)	4'-4" (4.35 m)	14'-3¾" (4.35 m)	8'-1¾" (2.47 m)	4'-2½" (1.3 m)	3'-8" (1.119 m)	7'-0¾" (2.14 m)	7'-3¾" (2.21 m)	3¾ (90)	1½ (40)	55°	4.9 (3.8)	4'-11" (1.34 m)	4'-8" (1.43 m)	8'-5" (2.51 m)	18'-0" (5.29 m)	4'-8" (1.43 m)	6'-4" (1.93 m)	56 (140)	310 (140)
	DS 15-1½ (DS 375-1½)	15 (375)	28 (720)	10 (260)	29 (740)	24¾ (631)	8'-10" (2.71 m)	5'-6¾" (1.71 m)	31 (780)	19 (483)	4'-3¾" (1.32 m)	4'-6" (1.39 m)	3¾ (90)	1½ (40)	50°	1.9 (1.5)	37 (840)	27 (700)	5'-8" (1.71 m)	11'-0" (3.25 m)	27 (700)	3'-11" (1.19 m)	38 (54)	120 (54)	
	DS 18-1½ (DS 450-1½)	18 (450)	28 (720)	13 (330)	32 (810)	28¾ (730)	9'-1¼" (2.81 m)	5'-6¾" (1.71 m)	31 (780)	22 (559)	4'-5½" (1.37 m)	4'-8¾" (1.44 m)	3¾ (90)	1½ (40)	50°	2.2 (1.7)	36 (860)	31 (798)	5'-8" (1.76 m)	11'-3" (3.41 m)	31 (798)	4'-3" (1.30 m)	38 (59)	130 (59)	
	DS 24-1½ (DS 600-1½)	24 (600)	34 (870)	16 (410)	39 (990)	39 (930)	3'-3¾" (1.14 m)	11'-4" (3.47 m)	6'-8¾" (2.08 m)	37¾ (960)	30 (762)	5'-6" (1.77 m)	5'-9¾" (1.77 m)	3¾ (90)	1½ (40)	50°	3.1 (2.4)	3'-8" (1.02 m)	3'-6" (1.07 m)	6'-10" (2.1 m)	14'-0" (4.18 m)	3'-6" (1.07 m)	5'-2" (1.58 m)	48 (90)	200 (90)
	DS 30-1½ (DS 750-1½)	30 (750)	39 (990)	19 (480)	39 (1140)	3'-9" (1.193 m)	13'-0¾" (3.98 m)	7'-8¾" (2.35 m)	3'-7" (1.1 m)	36 (914)	6'-5" (1.95 m)	6'-7¾" (2.03 m)	3¾ (90)	1½ (40)	50°	4.0 (3.1)	4'-2" (1.15 m)	4'-2" (1.26 m)	7'-11" (2.38 m)	16'-3" (4.79 m)	4'-2" (1.26 m)	5'-10" (1.78 m)	54 (117)	260 (117)	
	DS 36-1½ (DS 900-1½)	36 (900)	3'-9" (1140)	22 (560)	4'-4" (1320)	4'-9¾" (1.461 m)	15'-3" (4.64 m)	8'-10¾" (2.7 m)	4'-1¾" (1.26 m)	3'-8" (1.119 m)	7'-6" (2.28 m)	7'-9" (2.35 m)	3¾ (90)	1½ (40)	50°	5.3 (4.1)	4'-10" (1.32 m)	5'-0" (1.53 m)	9'-2" (2.74 m)	19'-0" (5.59 m)	5'-0" (1.53 m)	6'-8" (2.03 m)	62 (153)	340 (153)	
40°	DS 15-1½ (DS 375-1½)	15 (375)	28 (720)	10 (260)	29 (740)	27 (683)	9'-6" (2.92 m)	6'-1¾" (1.88 m)	30¾ (780)	19 (483)	4'-7½" (1.5 m)	4'-10¾" (1.5 m)	4 (100)	1½ (30)	45°	2.1 (1.6)	36 (829)	29 (753)	6'-1" (1.89 m)	11'-6" (3.47 m)	29 (753)	4'-1" (1.25 m)	40 (59)	130 (59)	
	DS 18-1½ (DS 450-1½)	18 (450)	28 (720)	13 (330)	32 (810)	32 (791)	9'-10¾" (3.03 m)	6'-1¾" (1.88 m)	30¾ (780)	22 (559)	4'-9¼" (1.47 m)	5'-0¾" (1.56 m)	4 (100)	1½ (30)	45°	2.4 (1.8)	36 (847)	34 (859)	6'-2" (1.94 m)	12'-0" (3.64 m)	34 (859)	4'-6" (1.37 m)	44 (68)	150 (68)	
	DS 24-1½ (DS 600-1½)	24 (600)	34 (870)	16 (410)	39 (990)	39 (930)	3'-6¾" (1.078 m)	12'-3¾" (3.74 m)	7'-4¾" (2.29 m)	36¾ (950)	30 (762)	5'-11¼" (1.83 m)	6'-3" (1.91 m)	4 (100)	1½ (30)	45°	3.4 (2.6)	3'-8" (1.0 m)	3'-9" (1.15 m)	15'-0" (4.47 m)	3'-9" (1.15 m)	5'-5" (1.65 m)	50 (95)	210 (95)	
	DS 30-1½ (DS 750-1½)	30 (750)	39 (990)	19 (480)	39 (1140)	3'-9" (1.293 m)	14'-1" (4.29 m)	8'-6" (2.59 m)	3'-6¾" (1.08 m)	36 (914)	6'-11" (2.1 m)	7'-2" (2.19 m)	4 (100)	1½ (30)	45°	4.4 (3.4)	4'-2" (1.13 m)	4'-5" (1.36 m)	8'-2" (2.63 m)	17'-3" (5.12 m)	4'-5" (1.36 m)	6'-1" (1.86 m)	62 (135)	300 (135)	
	DS 36-1½ (DS 900-1½)	36 (900)	3'-9" (1140)	22 (560)	4'-4" (1320)	5'-2¼" (1.583 m)	16'-5¾" (5.01 m)	9'-9¾" (2.98 m)	4'-0¾" (1.24 m)	3'-8" (1.119 m)	8'-1" (2.46 m)	8'-4¾" (2.55 m)	4 (100)	1½ (30)	45°	5.7 (4.4)	4'-10" (1.3 m)	5'-5" (1.65 m)	10'-0" (3.02 m)	20'-3" (5.97 m)	5'-5" (1.65 m)	7'-1" (2.16 m)	66 (167)	370 (167)	
	DS 15-1½ (DS 375-1½)	15 (375)	28 (720)	10 (260)	29 (740)	29¼ (751)	10'-4¾" (3.18 m)	6'-10" (2.11 m)	29¾ (770)	19 (483)	5'-0¾" (1.55 m)	5'-4" (1.64 m)	4½ (110)	1 (30)	40°	2.3 (1.8)	35 (817)	32 (822)	6'-11" (2.11 m)	12'-6" (3.75 m)	32 (822)	4'-4" (1.32 m)	46 (63)	140 (63)	
	DS 18-1½ (DS 450-1½)	18 (450)	28 (720)	13 (330)	32 (810)	24¾ (870)	10'-9" (3.31 m)	6'-10" (2.11 m)	29¾ (770)	22 (559)	5'-2½" (1.61 m)	5'-6¾" (1.7 m)	4½ (110)	1 (30)	40°	2.6 (2.0)	36 (836)	37 (939)	6'-11" (2.16 m)	13'-0" (3.94 m)	37 (939)	4'-9" (1.45 m)	46 (72)	160 (72)	
	DS 24-1½ (DS 600-1½)	24 (600)	34 (870)	16 (410)	39 (990)	39 (930)	3'-10¾" (1.185 m)	13'-4¾" (4.08 m)	8'-3¾" (2.55 m)	36¾ (930)	30 (762)	6'-6" (2 m)	6'-10" (2.09 m)	4½ (110)	1 (30)	40°	3.7 (2.8)	3'-7" (990)	4'-1" (1.26 m)	8'-4" (2.58 m)	16'-0" (4.83 m)	4'-1" (1.26 m)	5'-9" (1.75 m)	56 (104)	230 (104)
	DS 30-1½ (DS 750-1½)	30 (750)	39 (990)	19 (480)	39 (1140)	3'-9" (1.422 m)	15'-5" (4.7 m)	9'-6" (2.9 m)	3'-5½" (1.06 m)	36 (914)	7'-6" (2.3 m)	7'-10½" (2.39 m)	4½ (110)	1 (30)	40°	4.8 (3.7)	4'-1" (1.12 m)	4'-10" (1.49 m)	9'-7" (2.94 m)	18'-6" (5.54 m)	4'-10" (1.49 m)	6'-6" (1.98 m)	66 (144)	320 (144)	
	DS 36-1½ (DS 900-1½)	36 (900)	3'-9" (1140)	22 (560)	4'-4" (1320)	5'-8¾" (1.741 m)	18'-0¾" (5.48 m)	10'-11¾" (3.34 m)	4'-0" (1.22 m)	3'-8" (1.119 m)	8'-10¾" (2.7 m)	9'-2" (2.78 m)	4½ (110)	1 (30)	40°	6.3 (4.8)	4'-9" (1.28 m)	5'-11" (1.81 m)	11'-1" (3.38 m)	21'-9" (6.47 m)	5'-11" (1.81 m)	7'-7" (2.31 m)	74 (185)	410 (185)	
50°	DS 15-1½ (DS 375-1½)	15 (375)	28 (720)	10 (260)	29 (740)	33 (842)	11'-6¾" (3.54 m)	7'-9" (2.4 m)	29¾ (760)	19 (483)	5'-7¾" (1.72 m)	5'-11" (1.82 m)	4½ (110)	1 (30)	35°	2.6 (2.0)	35 (809)	36 (914)	7'-10" (2.4 m)	13'-9" (4.12 m)	36 (914)	4'-8" (1.42 m)	50 (68)	150 (68)	
	DS 18-1½ (DS 450-1½)	18 (450)	28 (720)	13 (330)	32 (810)	38¾ (975)	11'-11¼" (3.68 m)	7'-9" (2.4 m)	29¾ (760)	22 (559)	5'-9¾" (1.79 m)	6'-1¾" (1.89 m)	4½ (110)	1 (30)	35°	2.9 (2.2)	36 (827)	36 (915)	7'-10" (2.46 m)	14'-3" (4.33 m)	36 (915)	5'-1" (1.55 m)	50 (77)	170 (77)	
	DS 24-1½ (DS 600-1½)	24 (600)	34 (870)	16 (410)	39 (990)	39 (930)	4'-4¾" (1.329 m)	14'-10¾" (4.55 m)	9'-5" (2.9 m)	36 (914)	7'-3¾" (2.23 m)	7'-7" (2.32 m)	4½ (110)	1 (30)	35°	4.2 (3.2)	3'-6" (978)	4'-7" (1.4 m)	9'-5" (2.94 m)	17'-6" (5.32 m)	4'-7" (1.4 m)	6'-3" (1.91 m)	62 (135)	260 (135)	
	DS 30-1½ (DS 750-1½)	30 (750)	39 (990)	19 (480)	39 (1140)	3'-9" (1.594 m)	17'-2¾" (5.24 m)	10'-9¾" (3.3 m)	3'-5" (1.04 m)	36 (914)	8'-5" (2.57 m)	8'-9" (2.67 m)	4½ (110)	1 (30)	35°	5.4 (4.1)	4'-1" (1.1 m)	5'-6" (1.66 m)	10'-11" (3.33 m)	20'-6" (6.1 m)	5'-6" (1.66 m)	7'-2" (2.19 m)	74 (158)	350 (158)	
	DS 36-1½ (DS 900-1½)	36 (900)	3'-9" (1140)	22 (560)	4'-4" (1320)	6'-4¾" (1.951 m)	20'-1¼" (6.12 m)	12'-5¾" (3.79 m)	3'-11¼" (1.2 m)	3'-8" (1.119 m)	9'-10¾" (3.01 m)	10'-2¾" (3.11 m)	4½ (110)	1 (30)	35°	7.1 (5.4)	4'-9" (1.26 m)	6'-7" (2.02 m)	12'-8" (3.84 m)	24'-0" (7.12 m)	6'-7" (2.02 m)	8'-3" (2.52 m)	86 (470)	210 (470)	
	DS 15-1½ (DS 375-1½)	15 (375)	28 (720)	10 (260)	29 (740)	38 (966)	13'-1¼" (4.03 m)	9'-0¾" (2.78 m)	29 (750)	19 (483)	6'-4¾" (2.07 m)	6'-8¾" (2.07 m)	4½ (120)	0½ (20)	30°	2.9 (2.2)	34 (802)	34 (802)	3'-5" (1.04 m)	9'-0" (2.78 m)	3'-5" (1.04 m)	5'-5" (1.55 m)	54 (77)	170 (77)	
	DS 18-1½ (DS 450-1½)	18 (450)	28 (720)	13 (330)	32 (810)	32 (810)	13'-7¾" (4.18 m)	9'-0¾" (2.78 m)	29 (750)	22 (559)	6'-7¾" (2.04 m)	6'-11¼" (2.14 m)	4½ (120)	0½ (20)	30°	3.2 (2.5)	34 (820)	34 (820)	3'-11" (1.19 m)	9'-0" (2.85 m)	3'-11" (1.19 m)	5'-7" (1.70 m)	58 (90)	200 (90)	
	DS 24-1½ (DS 600-1½)	24 (600)	34 (870)	16 (410)	39 (990)	39 (930)	5'-0" (1.524 m)	16'-11¼" (5.19 m)	10'-11¼" (3.36 m)	35¾ (900)	30 (762)	8'-3¾" (2.65 m)	8'-7" (2.65 m)	4½ (120)	0½ (20)	30°	4.7 (3.6)	3'-6" (969)	5'-3" (1.6 m)	11'-0" (3.41 m)	19'-9" (5.98 m)	5'-3" (1.6 m)	6'-11" (2.11 m)	72 (135)	300 (135)
	DS 30-1½ (DS 750-1½)	30 (750)	39 (990)	19 (480)	39 (1140)	3'-9" (1.828 m)	6'-0" (5.97 m)	19'-7¾" (5.97 m)	12'-6¾" (3.83 m)	3'-4¾" (1.03 m)	36 (914)	9'-7" (2.93 m)	9'-11¼" (3.04 m)	4½ (120)	0½ (20)	30°	6.1 (4.7)	4'-1" (1.09 m)	6'-3" (1.9 m)	12'-8" (3.87 m)	23'-0" (6.86 m)	6'-3" (1.9 m)	7'-11" (2.41 m)	82 (176)	390 (176)
	DS 36-1½ (DS 900-1½)	36 (900)	3'-9" (1140)	22 (560)	4'-4" (1320)	7'-4" (2.238 m)	22'-11¼" (6.98 m)	14'-5¾" (4.41 m)	3'-10¾" (1.18 m)	3'-8" (1.119 m)	11'-3¾" (3.44 m)	11'-7¼" (3.54 m)	4½ (119)	0½ (20)	30°	8.1 (6.2)	4'-7" (1.25 m)	7'-7"							

WINGS FOR 1:2 SLOPE

Skew Angle	Design No.	Nominal Pipe Dia.	DIMENSIONS FOR CONCRETE													Concrete 2 End Sections yd ³ (m ³)	Reinf. Bars - 2 End Sections						Bars for 2 End Sections lbs. (kg)	
			A	B	C	D	E	F	G	H	J	K	M	N	α		h - bars			h1 - bars		v-bars No.		
																	o	p	q	Lgth.	p			Lgth.
5°	DS 15-2 (DS 375-2)	15 (375)	38 (960)	10 (260)	29 (740)	19 (485)	8'-7 1/2" (2.63 m)	4'-8 1/2" (1.42 m)	4'-3 1/2" (1.31 m)	19 (483)	4'-3 3/4" (1.31 m)	4'-4" (1.32 m)	2 1/2 (70)	2 1/4 (60)	85°	1.9 (1.5)	4'-7" (1.33 m)	21 (551)	4'-11" (1.45 m)	11'-3" (3.33 m)	551 (501)	3'-5" (1.04 m)	34 (50)	110 (50)
	DS 18-2 (DS 450-2)	18 (450)	38 (960)	13 (330)	32 (810)	22 (561)	8'-10 1/2" (2.7 m)	4'-8 1/2" (1.42 m)	4'-3 3/4" (1.31 m)	22 (559)	4'-5 1/2" (1.35 m)	4'-5 1/2" (1.35 m)	2 1/2 (70)	2 1/4 (60)	85°	2.0 (1.5)	4'-7" (1.36 m)	24 (626)	4'-11" (1.48 m)	11'-6" (4.47 m)	24 (626)	3'-8" (1.12 m)	34 (54)	120 (54)
	DS 24-2 (DS 600-2)	24 (600)	3'-10" (1.16 m)	16 (410)	39 (990)	30 (765)	10'-11" (3.31 m)	5'-8" (1.72 m)	5'-2 1/2" (1.58 m)	30 (762)	5'-5 1/2" (1.65 m)	5'-5 1/2" (1.66 m)	2 1/2 (70)	2 1/4 (60)	85°	2.9 (2.2)	5'-5" (1.62 m)	32 (832)	5'-11" (1.77 m)	14'-0" (4.22 m)	32 (832)	4'-4" (1.32 m)	42 (81)	180 (81)
	DS 30-2 (DS 750-2)	30 (750)	4'-4" (1.32 m)	19 (480)	3'-9" (1.14 m)	36 (917)	12'-5" (3.78 m)	6'-5" (1.96 m)	5'-10 1/2" (1.79 m)	36 (914)	6'-2 1/2" (1.89 m)	6'-2 1/2" (1.89 m)	2 1/2 (70)	2 1/4 (60)	85°	3.7 (2.8)	6'-3" (1.84 m)	39 (983)	6'-9" (2.0 m)	16'-3" (4.83 m)	39 (983)	4'-11" (1.50 m)	48 (104)	230 (104)
	DS 36-2 (DS 900-2)	36 (900)	5'-0" (1.52 m)	22 (560)	4'-4" (1.32 m)	3'-8 1/2" (1.123 m)	14'-5" (4.39 m)	7'-4 1/2" (2.25 m)	6'-9 1/2" (2.07 m)	3'-8" (1.119 m)	7'-2 1/2" (2.19 m)	7'-2 1/2" (2.2 m)	2 1/2 (70)	2 1/4 (60)	85°	4.5 (3.4)	7'-2" (2.12 m)	3'-11" (1.19 m)	7'-8" (2.3 m)	18'-9" (5.6 m)	3'-11" (1.19 m)	5'-7" (1.70 m)	54 (135)	300 (135)
	DS 15-2 (DS 375-2)	15 (375)	38 (960)	10 (260)	29 (740)	19 (490)	8'-9" (2.65 m)	4'-11" (1.5 m)	4'-1 1/2" (1.26 m)	19 (483)	4'-4" (1.32 m)	4'-5" (1.33 m)	2 1/2 (70)	2 1/4 (60)	80°	2.0 (1.5)	4'-4" (1.28 m)	22 (557)	5'-1" (1.52 m)	2'-3" (3.36 m)	22 (557)	3'-6" (1.07 m)	34 (50)	110 (50)
	DS 18-2 (DS 450-2)	18 (450)	38 (960)	13 (330)	32 (810)	22 (568)	9'-0" (2.73 m)	4'-11" (1.5 m)	4'-1 1/2" (1.26 m)	22 (559)	4'-5 1/2" (1.36 m)	4'-6 1/2" (1.37 m)	2 1/2 (70)	2 1/4 (60)	80°	2.1 (1.6)	4'-4" (1.32 m)	25 (633)	5'-1" (1.55 m)	1'-6" (6.33)	25 (633)	3'-9" (1.14 m)	34 (54)	120 (54)
	DS 24-2 (DS 600-2)	24 (600)	3'-10" (1.16 m)	16 (410)	39 (990)	30 1/2 (774)	11'-0 1/2" (3.34 m)	5'-11 1/2" (1.81 m)	5'-0" (1.52 m)	30 (762)	5'-5 1/2" (1.66 m)	5'-6 1/2" (1.68 m)	2 1/2 (70)	2 1/4 (60)	80°	3.0 (2.3)	5'-4" (1.57 m)	33 (841)	6'-2" (1.85 m)	14'-3" (4.26 m)	33 (841)	4'-5" (1.35 m)	42 (81)	180 (81)
10°	DS 30-2 (DS 750-2)	30 (750)	4'-4" (1.32 m)	19 (480)	3'-9" (1.14 m)	36 1/2 (928)	12'-6 1/2" (3.82 m)	6'-9" (2.06 m)	5'-8" (1.73 m)	36 (914)	6'-3" (1.9 m)	6'-3 1/2" (1.92 m)	2 1/2 (70)	2 1/4 (60)	80°	3.8 (2.9)	6'-0" (1.78 m)	39 (993)	7'-0" (2.1 m)	16'-3" (4.87 m)	39 (993)	4'-11" (1.50 m)	48 (104)	230 (104)
	DS 36-2 (DS 900-2)	36 (900)	5'-0" (1.52 m)	22 (560)	4'-4" (1.32 m)	3'-8 1/2" (1.136 m)	14'-7" (4.44 m)	7'-9 1/2" (2.37 m)	6'-6 1/2" (1.99 m)	3'-8" (1.119 m)	7'-3" (2.21 m)	7'-4" (2.23 m)	2 1/2 (70)	2 1/4 (60)	80°	4.7 (3.6)	7'-0" (2.04 m)	3'-11" (1.2 m)	8'-1" (2.42 m)	19'-0" (5.66 m)	3'-11" (1.2 m)	5'-7" (1.70 m)	54 (135)	300 (135)
	DS 15-2 (DS 375-2)	15 (375)	38 (960)	10 (260)	29 (740)	19 1/2 (500)	8'-10 1/2" (2.7 m)	5'-2 1/2" (1.58 m)	4'-0" (1.21 m)	19 (483)	4'-4 1/2" (1.34 m)	4'-6" (1.36 m)	3 (50)	2 (50)	75°	2.0 (1.5)	4'-3" (1.24 m)	22 (567)	5'-5" (1.6 m)	11'-6" (3.41 m)	22 (567)	3'-6" (1.07 m)	34 (50)	110 (50)
	DS 18-2 (DS 450-2)	18 (450)	38 (960)	13 (330)	32 (810)	22 1/2 (579)	9'-2" (2.78 m)	5'-2 1/2" (1.58 m)	4'-0" (1.21 m)	22 (559)	4'-6 1/2" (1.38 m)	4'-7 1/2" (1.4 m)	3 (50)	2 (50)	75°	2.2 (1.7)	4'-3" (1.27 m)	25 (644)	5'-5" (1.64 m)	11'-9" (3.55 m)	25 (644)	3'-9" (1.14 m)	34 (54)	120 (54)
	DS 24-2 (DS 600-2)	24 (600)	3'-10" (1.16 m)	16 (410)	39 (990)	31 (789)	11'-2 1/2" (3.41 m)	6'-3 1/2" (1.91 m)	4'-10" (1.47 m)	30 (762)	5'-6 1/2" (1.72 m)	5'-8" (1.73 m)	3 (50)	2 (50)	75°	3.1 (2.4)	5'-2" (1.52 m)	34 (857)	6'-6" (1.95 m)	14'-6" (4.32 m)	34 (857)	4'-6" (1.37 m)	42 (81)	180 (81)
	DS 30-2 (DS 750-2)	30 (750)	4'-4" (1.32 m)	19 (480)	3'-9" (1.14 m)	37 1/2 (946)	12'-9 1/2" (3.89 m)	7'-1 1/2" (2.17 m)	6'-5 1/2" (1.67 m)	36 (914)	6'-4" (1.93 m)	6'-5 1/2" (1.96 m)	3 (50)	2 (50)	75°	3.0 (3.0)	5'-10" (1.72 m)	3'-4" (1.01 m)	7'-4" (2.21 m)	16'-6" (4.94 m)	3'-4" (1.01 m)	5'-0" (1.52 m)	52 (113)	250 (113)
	DS 36-2 (DS 900-2)	36 (900)	5'-0" (1.52 m)	22 (560)	4'-4" (1.32 m)	3'-9 1/2" (1.158)	14'-10 1/2" (4.52 m)	8'-2 1/2" (2.5 m)	6'-3 1/2" (1.92 m)	3'-8" (1.119 m)	7'-4 1/2" (2.25 m)	7'-5 1/2" (2.27 m)	3 (50)	2 (50)	75°	5.0 (3.8)	6'-9" (1.97 m)	4'-0" (1.22 m)	8'-6" (2.55 m)	19'-3" (5.74 m)	4'-0" (1.22 m)	5'-8" (1.73 m)	56 (140)	310 (140)
	DS 15-2 (DS 375-2)	15 (375)	38 (960)	10 (260)	29 (740)	20 1/2 (514)	9'-1 1/2" (2.77 m)	5'-6 1/2" (1.68 m)	3'-10 1/2" (1.18 m)	19 (483)	4'-6" (1.37 m)	4'-7 1/2" (1.4 m)	3 (50)	2 (50)	70°	2.1 (1.6)	4'-2" (1.21 m)	23 (581)	5'-8" (1.69 m)	11'-9" (3.48 m)	23 (581)	3'-7" (1.09 m)	36 (50)	130 (50)
20°	DS 18-2 (DS 450-2)	18 (450)	38 (960)	13 (330)	32 (810)	23 1/2 (595)	9'-4 1/2" (2.85 m)	5'-6 1/2" (1.68 m)	3'-10 1/2" (1.18 m)	22 (559)	4'-7 1/2" (1.41 m)	4'-9" (1.44 m)	3 (50)	2 (50)	70°	2.3 (1.8)	4'-2" (1.24 m)	26 (661)	5'-8" (1.73 m)	12'-0" (3.63 m)	26 (661)	3'-10" (1.17 m)	36 (59)	130 (59)
	DS 24-2 (DS 600-2)	24 (600)	3'-10" (1.16 m)	16 (410)	39 (990)	32 (811)	11'-6 1/2" (3.49 m)	6'-8 1/2" (2.03 m)	4'-8 1/2" (1.42 m)	30 (762)	5'-8 1/2" (1.76 m)	5'-9 1/2" (1.80 m)	3 (50)	2 (50)	70°	3.2 (2.4)	5'-0" (1.47 m)	35 (879)	6'-10" (2.07 m)	14'-9" (4.42 m)	35 (879)	4'-7" (1.40 m)	200 (90)	
	DS 30-2 (DS 750-2)	30 (750)	4'-4" (1.32 m)	19 (480)	3'-9" (1.14 m)	38 1/2 (973)	13'-1 1/2" (3.99 m)	7'-6 1/2" (2.3 m)	6'-7 1/2" (1.61 m)	36 (914)	6'-6" (1.98 m)	6'-7 1/2" (2.01 m)	3 (50)	2 (50)	70°	4.1 (3.1)	5'-9" (1.67 m)	3'-5" (1.04 m)	7'-10" (2.35 m)	17'-0" (5.05 m)	3'-5" (1.04 m)	5'-1" (1.55 m)	48 (113)	250 (113)
	DS 36-2 (DS 900-2)	36 (900)	5'-0" (1.52 m)	22 (560)	4'-4" (1.32 m)	3'-10 1/2" (1.191 m)	15'-3" (4.64 m)	8'-8 1/2" (2.65 m)	6'-1 1/2" (1.86 m)	3'-8" (1.119 m)	7'-6 1/2" (2.3 m)	7'-8 1/2" (2.34 m)	3 (50)	2 (50)	70°	5.3 (4.1)	6'-6" (1.91 m)	4'-1" (1.26 m)	8'-11" (2.7 m)	19'-6" (5.87 m)	4'-1" (1.26 m)	5'-9" (1.75 m)	58 (144)	320 (144)
	DS 15-2 (DS 375-2)	15 (375)	38 (960)	10 (260)	29 (740)	21 (533)	9'-5" (2.86 m)	5'-10 1/2" (1.79 m)	3'-9" (1.14 m)	19 (483)	4'-7 1/2" (1.41 m)	4'-9 1/2" (1.45 m)	3 1/2 (90)	1 1/2 (50)	65°	2.2 (1.7)	4'-1" (1.12 m)	23 (600)	6'-0" (1.8 m)	12'-0" (3.58 m)	23 (600)	3'-7" (1.09 m)	38 (54)	120 (54)
	DS 18-2 (DS 450-2)	18 (450)	38 (960)	13 (330)	32 (810)	24 1/2 (617)	9'-8 1/2" (2.95 m)	5'-10 1/2" (1.79 m)	3'-9" (1.14 m)	22 (559)	4'-9 1/2" (1.45 m)	4'-11 1/2" (1.5 m)	3 1/2 (90)	1 1/2 (50)	65°	2.4 (1.8)	4'-0" (1.2 m)	27 (683)	6'-0" (1.85 m)	12'-3" (3.73 m)	27 (683)	3'-11" (1.19 m)	42 (63)	140 (63)
	DS 24-2 (DS 600-2)	24 (600)	3'-10" (1.16 m)	16 (410)	39 (990)	33 (841)	11'-11" (3.61 m)	7'-1 1/2" (2.16 m)	4'-6 1/2" (1.36 m)	30 (762)	5'-10 1/2" (1.78 m)	6'-0" (1.83 m)	3 1/2 (90)	1 1/2 (50)	65°	3.4 (2.6)	4'-11" (1.43 m)	35 (909)	7'-4" (2.2 m)	15'-3" (4.55 m)	35 (909)	4'-7" (1.40 m)	200 (90)	
	DS 30-2 (DS 750-2)	30 (750)	4'-4" (1.32 m)	19 (480)	3'-9" (1.14 m)	3'-3 1/2" (1.008 m)	13'-6 1/2" (4.13 m)	8'-0 1/2" (2.46 m)	5'-1 1/2" (1.57 m)	36 (914)	6'-2" (1.89 m)	6'-10 1/2" (2.09 m)	3 1/2 (90)	1 1/2 (50)	65°	4.3 (3.3)	5'-6" (1.62 m)	3'-6" (1.08 m)	8'-3" (2.5 m)	17'-3" (5.2 m)	3'-6" (1.08 m)	5'-2" (1.58 m)	52 (113)	250 (113)
DS 36-2 (DS 900-2)	36 (900)	5'-0" (1.52 m)	22 (560)	4'-4" (1.32 m)	4'-0 1/2" (1.235 m)	15'-9 1/2" (4.8 m)	9'-3 1/2" (2.83 m)	5'-11 1/2" (1.81 m)	3'-8" (1.119 m)	7'-9 1/2" (2.38 m)	7'-11 1/2" (2.42 m)	3 1/2 (90)	1 1/2 (50)	65°	5.6 (4.3)	6'-5" (1.86 m)	4'-3" (1.3 m)	9'-7" (2.88 m)	20'-3" (6.04 m)	4'-3" (1.3 m)	5'-11" (1.80 m)	60 (149)	330 (149)	
30°	DS 15-2 (DS 375-2)	15 (375)	38 (960)	10 (260)	29 (740)	22 (558)	9'-9 1/2" (2.98 m)	6'-4" (1.92 m)	3'-8" (1.11 m)	19 (483)	4'-9 1/2" (1.46 m)	5'-0" (1.52 m)	3 1/2 (90)	1 1/2 (50)	60°	2.3 (1.8)	4'-0" (1.15 m)	24 (626)	6'-6" (1.93 m)	12'-6" (3.71 m)	24 (626)	3'-8" (1.12 m)	42 (59)	130 (59)
	DS 18-2 (DS 450-2)	18 (450)	38 (960)	13 (330)	32 (810)	25 1/2 (645)	10'-1 1/2" (3.07 m)	6'-4" (1.92 m)	3'-8" (1.11 m)	22 (559)	4'-11 1/2" (1.51 m)	5'-2" (1.56 m)	3 1/2 (90)	1 1/2 (50)	60°	2.5 (1.9)	4'-0" (1.18 m)	28 (712)	6'-5" (1.98 m)	3.87 m (12'-9")	28 (712)	4'-0" (1.22 m)	42 (68)	150 (68)
	DS 24-2 (DS 600-2)	24 (600)	3'-10" (1.16 m)	16 (410)	39 (990)	34 1/2 (880)	12'-5" (3.77 m)	7'-8" (2.32 m)	4'-5" (1.34 m)	30 (762)	6'-1 1/2" (1.86 m)	6'-3 1/2" (1.91 m)	3 1/2 (90)	1 1/2 (50)	60°	3.6 (2.8)	4'-10" (1.4 m)	37 (949)	7'-10" (2.37 m)	4.71 m (15'-9")	37 (949)	4'-9" (1.45 m)	52 (95)	210 (95)
	DS 30-2 (DS 750-2)	30 (750)	4'-4" (1.32 m)	19 (480)	3'-9" (1.14 m)	3'-5 1/2" (1.055 m)	14'-1 1/2" (4.31 m)	8'-8" (2.64 m)	5'-0" (1.53 m)	36 (914)	6'-11 1/2" (2.13 m)	7'-2" (2.18 m)	3 1/2 (90)	1 1/2 (50)	60°	4.5 (3.4)	5'-6" (1.58 m)	3'-8" (1.12 m)	8'-10" (2.69 m)	5.39 m (18'-0")	3'-8" (1.12 m)	5'-4" (1.63 m)	56 (122)	270 (122)
	DS 36-2 (DS 900-2)	36 (900)	5'-0" (1.52 m)	22 (560)	4'-4" (1.32 m)	4'-2 1/2" (1.292 m)	16'-5 1/2" (5.01 m)	10'-0" (3.04 m)	5'-9 1/2" (1.76 m)	3'-8" (1.119 m)	8'-1 1/2" (2.48 m)	8'-3 1/2" (2.53 m)	3 1/2 (90)	1 1/2 (50)	60°	5.9 (4.5)	6'-4" (1.82 m)	4'-5" (1.36 m)	10'-3" (3.09 m)	6.26 m (21'-0")	4'-5" (1.36 m)	6'-1" (1.81 m)	66 (162)	360 (162)

Illinois Department of Transportation
 APPROVED January 1, 2009
Ralph E. Anderson
 ENGINEER OF BRIDGES AND STRUCTURES
 APPROVED January 1, 2009
Lee E. Han
 ENGINEER OF DESIGN AND ENVIRONMENT

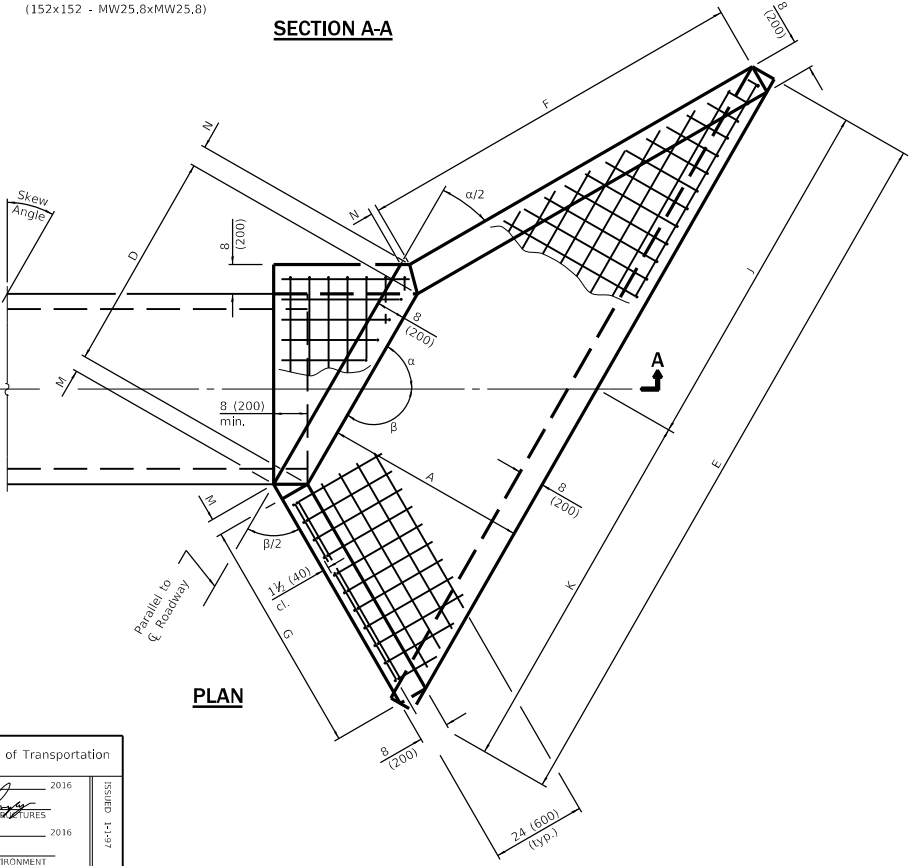
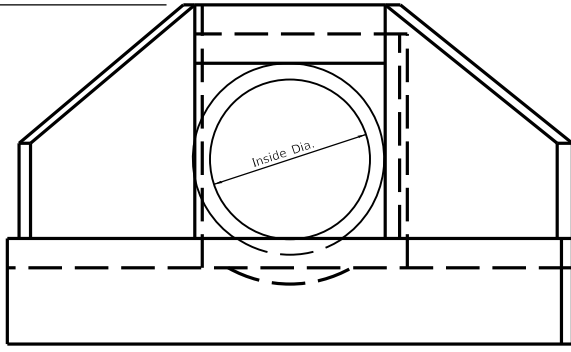
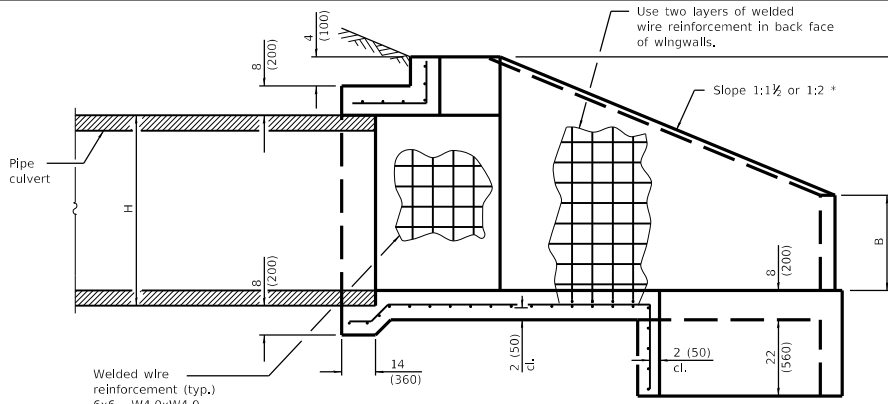
REINFORCED CONCRETE END SECTIONS
 FOR PIPE CULVERTS
 15" (375 mm) THRU 36" (900 mm) DIA.
 SKEWED WITH ROADWAY
 (Sheet 4 of 5)
 STANDARD 542201-02

WINGS FOR 1:2 SLOPE

Skew Angle	Deslgn No.	Nominal Pipe Dia.	DIMENSIONS FOR CONCRETE												Concrete 2 End Sections yd ³ (m ³)	Reinf. Bars - 2 End Sections							Bars for 2 End Sections lbs. (kg)
			A	B	C	D	E	F	G	H	J	K	M	N		α	h - bars			h1 - bars		v-bars No.	
			o	p	q	Lgth.	p	Lgth.	o	p	q	Lgth.											
35°	DS 15-2 (DS 375-2)	15 (375)	38 (960)	10 (260)	29 (740)	23 3/4 (590)	10'-4" (3.14 m)	6'-10 1/2" (2.08 m)	3'-6 3/4" (1.08 m)	19 (485)	5'-0 3/4" (1.54 m)	5'-3 3/4" (1.6 m)	3 3/4" (90)	1 1/2" (40)	55°	2.4 (1.8)	3'-11" (1.13 m)	26 (658)	6'-11" (2.09 m)	13'-0" (3.87 m)	26 (658)	3'-10" (1.17 m)	44 (63)
	DS 18-2 (DS 450-2)	18 (450)	38 (960)	13 (330)	32 (810)	27 (683)	10'-7 3/4" (3.23 m)	6'-10 1/2" (2.08 m)	3'-6 3/4" (1.09 m)	22 (559)	5'-2 1/2" (1.58 m)	5'-5 1/2" (1.65 m)	3 3/4" (90)	1 1/2" (40)	55°	2.6 (2.0)	3'-11" (1.15 m)	29 (750)	6'-11" (2.14 m)	13'-3" (4.04 m)	29 (750)	4'-11" (1.25 m)	44 (68)
	DS 24-2 (DS 600-2)	24 (600)	3'-10" (1.16 m)	16 (410)	39 (990)	36 1/2 (930)	13'-1" (3.97 m)	8'-3 3/4" (2.52 m)	4'-3 3/4" (1.31 m)	30 (762)	6'-5 1/2" (1.95 m)	6'-7 1/2" (2.02 m)	3 3/4" (90)	1 1/2" (40)	55°	3.8 (2.9)	4'-8" (1.37 m)	39 (1.0 m)	8'-4" (2.56 m)	16'-3" (4.93 m)	39 (1.0 m)	4'-11" (1.50 m)	52 (99)
	DS 30-2 (DS 750-2)	30 (750)	4'-4" (1.32 m)	19 (480)	3'-9" (1.14 m)	31" (810)	14'-11" (4.54 m)	9'-4 1/2" (2.86 m)	4'-10 1/2" (1.49 m)	36 (914)	7'-4 1/2" (2.24 m)	7'-6 1/2" (2.3 m)	3 3/4" (90)	1 1/2" (40)	55°	4.9 (3.7)	5'-4" (1.55 m)	3'-11" (1.18 m)	9'-6" (2.9 m)	18'-9" (5.64 m)	3'-11" (1.18 m)	5'-7" (1.70 m)	60 (131)
	DS 36-2 (DS 900-2)	36 (900)	5'-0" (1.52 m)	22 (560)	4'-4" (1.32 m)	4'-5 1/2" (1.366 m)	17'-4 1/2" (5.28 m)	10'-10" (3.29 m)	5'-7 1/2" (1.72 m)	31" (789)	8'-6 1/2" (2.61 m)	8'-9 1/2" (2.67 m)	3 3/4" (90)	1 1/2" (40)	55°	6.3 (4.8)	6'-1" (1.78 m)	4'-8" (1.43 m)	11'-0" (3.34 m)	21'-9" (6.55 m)	4'-8" (1.43 m)	6'-4" (1.93 m)	70 (171)
	DS 15-2 (DS 375-2)	15 (375)	38 (960)	10 (260)	29 (740)	23 3/4 (590)	11'-0" (3.34 m)	7'-6" (2.27 m)	3'-6" (1.06 m)	19 (485)	5'-4 1/2" (1.63 m)	5'-7 1/2" (1.71 m)	3 3/4" (90)	1 1/2" (40)	50°	2.6 (2.0)	3'-10" (1.1 m)	28 (700)	7'-7" (2.28 m)	13'-9" (4.08 m)	28 (700)	3'-11" (1.19 m)	48 (68)
	DS 18-2 (DS 450-2)	18 (450)	38 (960)	13 (330)	32 (810)	28 1/2 (730)	11'-4" (3.44 m)	7'-6" (2.27 m)	3'-6" (1.08 m)	22 (559)	5'-6 1/2" (1.68 m)	5'-9 1/2" (1.76 m)	3 3/4" (90)	1 1/2" (40)	50°	2.8 (2.1)	3'-10" (1.13 m)	31 (798)	7'-7" (2.34 m)	14'-0" (4.26 m)	31 (798)	4'-3" (1.30 m)	48 (72)
	DS 24-2 (DS 600-2)	24 (600)	3'-10" (1.16 m)	16 (410)	39 (990)	33-3/4 (863)	13'-11 1/2" (4.23 m)	9'-0 1/2" (2.75 m)	4'-2 1/2" (1.28 m)	30 (762)	6'-10 1/2" (2.08 m)	7'-1" (2.15 m)	3 3/4" (90)	1 1/2" (40)	50°	4.1 (3.1)	4'-7" (1.34 m)	3'-6" (1.07 m)	9'-2" (2.79 m)	17'-3" (5.2 m)	3'-6" (1.07 m)	5'-2" (1.58 m)	58 (108)
	DS 30-2 (DS 750-2)	30 (750)	4'-4" (1.32 m)	19 (480)	3'-9" (1.14 m)	3'-11" (1.193 m)	15'-10 1/2" (4.84 m)	10'-3" (3.12 m)	4'-9 1/2" (1.46 m)	36 (914)	7'-10" (2.38 m)	8'-0 1/2" (2.46 m)	3 3/4" (90)	1 1/2" (40)	50°	5.2 (4.0)	5'-3" (1.52 m)	4'-2" (1.26 m)	10'-4" (3.17 m)	19'-9" (5.95 m)	4'-2" (1.26 m)	5'-10" (1.78 m)	64 (140)
	DS 36-2 (DS 900-2)	36 (900)	5'-0" (1.52 m)	22 (560)	4'-4" (1.32 m)	4'-9 1/2" (1.461 m)	18'-6" (5.63 m)	11'-10" (3.6 m)	5'-6 1/2" (1.68 m)	31" (789)	9'-1 1/2" (2.78 m)	9'-4 1/2" (2.85 m)	3 3/4" (90)	1 1/2" (40)	50°	6.8 (5.2)	6'-0" (1.74 m)	5'-0" (1.53 m)	12'-0" (3.65 m)	23'-0" (6.92 m)	5'-0" (1.53 m)	6'-3" (2.03 m)	78 (189)
40°	DS 15-2 (DS 375-2)	15 (375)	38 (960)	10 (260)	29 (740)	27 (683)	11'-10 1/2" (3.6 m)	8'-3 3/4" (2.51 m)	3'-5 1/2" (1.04 m)	19 (485)	5'-9 1/2" (1.81 m)	6'-0 1/2" (1.84 m)	4 1/4" (100)	1 3/4" (40)	45°	2.8 (2.1)	3'-9" (1.09 m)	29 (753)	8'-4" (2.51 m)	14'-6" (4.35 m)	29 (753)	4'-1" (1.25 m)	48 (68)
	DS 18-2 (DS 450-2)	18 (450)	38 (960)	13 (330)	32 (810)	31 (791)	12'-2 1/2" (3.7 m)	8'-3 3/4" (2.51 m)	3'-5 1/2" (1.04 m)	22 (559)	5'-11 1/2" (1.81 m)	6'-3" (1.89 m)	4 1/4" (100)	1 3/4" (40)	45°	3.1 (2.4)	3'-10" (1.11 m)	34 (859)	8'-4" (2.58 m)	15'-0" (4.55 m)	34 (859)	4'-6" (1.37 m)	52 (81)
	DS 24-2 (DS 600-2)	24 (600)	3'-10" (1.16 m)	16 (410)	39 (990)	33-3/4 (863)	15'-0 1/2" (4.56 m)	10'-0 1/2" (3.03 m)	4'-1 1/2" (1.26 m)	30 (762)	6'-10 1/2" (2.24 m)	7'-7 1/2" (2.32 m)	4 1/4" (100)	1 3/4" (40)	45°	4.4 (3.4)	4'-6" (1.32 m)	3'-9" (1.15 m)	10'-0" (3.08 m)	18'-3" (5.55 m)	3'-9" (1.15 m)	5'-5" (1.65 m)	60 (133)
	DS 30-2 (DS 750-2)	30 (750)	4'-4" (1.32 m)	19 (480)	3'-9" (1.14 m)	4'-3" (1.293 m)	17'-4 1/2" (5.23 m)	11'-4" (3.45 m)	4'-8 1/2" (1.43 m)	36 (914)	7'-10" (2.57 m)	8'-0 1/2" (2.66 m)	4 1/4" (100)	1 3/4" (40)	45°	4.5 (4.3)	4'-6" (1.49 m)	3'-6" (1.36 m)	11'-5" (3.5 m)	21'-0" (6.35 m)	4'-5" (1.36 m)	6'-1" (1.86 m)	72 (153)
	DS 36-2 (DS 900-2)	36 (900)	5'-0" (1.52 m)	22 (560)	4'-4" (1.32 m)	5'-2 1/2" (1.583 m)	19'-11 1/2" (6.08 m)	13'-0 1/2" (3.97 m)	5'-5" (1.65 m)	31" (789)	9'-10 1/2" (3.0 m)	10'-1 1/2" (3.08 m)	4 1/4" (100)	1 3/4" (40)	45°	5.7 (5.7)	5'-11" (1.71 m)	5'-5" (1.65 m)	13'-2" (4.02 m)	24'-6" (7.39 m)	5'-5" (1.65 m)	7'-1" (2.16 m)	82 (203)
	DS 15-2 (DS 375-2)	15 (375)	38 (960)	10 (260)	29 (740)	29 1/2 (751)	12'-11 1/2" (3.93 m)	9'-3" (2.81 m)	3'-4 1/2" (1.03 m)	19 (485)	6'-4" (1.92 m)	6'-7 1/2" (2.01 m)	4 1/4" (100)	1 3/4" (40)	40°	3.1 (2.4)	3'-9" (1.07 m)	32 (822)	9'-4" (2.81 m)	15'-9" (4.7 m)	32 (822)	4'-4" (1.32 m)	54 (77)
	DS 18-2 (DS 450-2)	18 (450)	38 (960)	13 (330)	32 (810)	34 1/2 (870)	13'-4 1/2" (4.05 m)	9'-3" (2.81 m)	3'-4 1/2" (1.03 m)	22 (559)	6'-6 1/2" (1.98 m)	6'-10" (2.07 m)	4 1/4" (100)	1 3/4" (40)	40°	3.4 (2.6)	3'-8" (1.1 m)	37 (939)	9'-3" (2.88 m)	16'-0" (4.92 m)	37 (939)	4'-9" (1.45 m)	54 (86)
	DS 24-2 (DS 600-2)	24 (600)	3'-10" (1.16 m)	16 (410)	39 (990)	33-10/32 (870)	11'-2 1/2" (4.99 m)	11'-2 1/2" (4.99 m)	4'-1" (1.24 m)	30 (762)	8'-1" (2.45 m)	8'-4 1/2" (2.54 m)	4 1/4" (100)	1 3/4" (40)	40°	4.8 (3.7)	4'-6" (1.3 m)	4'-1" (1.26 m)	11'-2" (3.44 m)	19'-9" (6.0 m)	4'-1" (1.26 m)	5'-9" (1.75 m)	68 (126)
	DS 30-2 (DS 750-2)	30 (750)	4'-4" (1.32 m)	19 (480)	3'-9" (1.14 m)	4'-8" (1.422 m)	18'-9 1/2" (5.72 m)	12'-8" (3.86 m)	4'-7 1/2" (1.41 m)	36 (914)	9'-3" (2.82 m)	9'-6 1/2" (2.92 m)	4 1/4" (100)	1 3/4" (40)	40°	6.2 (4.7)	5'-1" (1.47 m)	4'-10" (1.49 m)	12'-9" (3.91 m)	22'-9" (6.87 m)	4'-10" (1.49 m)	6'-6" (1.98 m)	78 (167)
	DS 36-2 (DS 900-2)	36 (900)	5'-0" (1.52 m)	22 (560)	4'-4" (1.32 m)	5'-8 1/2" (1.741 m)	21'-10 1/2" (6.67 m)	14'-7 1/2" (4.45 m)	5'-3 1/2" (1.62 m)	31" (789)	10'-9 1/2" (3.29 m)	11'-1 1/2" (3.38 m)	4 1/4" (100)	1 3/4" (40)	40°	8.1 (6.2)	5'-10" (1.69 m)	5'-11" (1.81 m)	14'-9" (4.5 m)	26'-6" (8.0 m)	5'-11" (1.81 m)	7'-7" (2.31 m)	90 (221)
45°	DS 15-2 (DS 375-2)	15 (375)	38 (960)	10 (260)	29 (740)	33 (842)	14'-5" (4.38 m)	10'-6 1/2" (3.2 m)	3'-4" (1.01 m)	19 (485)	7'-0 1/2" (2.14 m)	7'-4 1/2" (2.24 m)	4 1/2" (100)	1 3/4" (40)	35°	3.4 (2.6)	3'-8" (1.06 m)	36 (914)	10'-7" (3.18 m)	17'-3" (5.17 m)	36 (914)	4'-8" (1.42 m)	60 (81)
	DS 18-2 (DS 450-2)	18 (450)	38 (960)	13 (330)	32 (810)	38 1/2 (975)	14'-10 1/2" (4.56 m)	10'-6 1/2" (3.2 m)	3'-4" (1.01 m)	22 (559)	7'-3 1/2" (2.21 m)	7'-7" (2.3 m)	4 1/2" (100)	1 3/4" (40)	35°	3.7 (2.8)	3'-9" (1.08 m)	35 (905)	10'-7" (3.27 m)	17'-9" (5.4 m)	35 (905)	5'-1" (1.55 m)	60 (95)
	DS 24-2 (DS 600-2)	24 (600)	3'-10" (1.16 m)	16 (410)	39 (990)	41-4/32 (104)	14'-10 1/2" (4.56 m)	12'-9" (3.86 m)	4'-0 1/2" (1.22 m)	30 (762)	9'-0 1/2" (2.73 m)	9'-4" (2.83 m)	4 1/2" (100)	1 3/4" (40)	35°	5.4 (4.1)	4'-5" (1.29 m)	4'-7" (1.4 m)	12'-9" (3.91 m)	21'-9" (6.6 m)	4'-7" (1.4 m)	6'-3" (1.91 m)	74 (195)
	DS 30-2 (DS 750-2)	30 (750)	4'-4" (1.32 m)	19 (480)	3'-9" (1.14 m)	5'-2 1/2" (1.594 m)	20'-11 1/2" (6.39 m)	14'-5" (4.39 m)	4'-6 1/2" (1.39 m)	36 (914)	10'-3 1/2" (3.15 m)	10'-7 1/2" (3.24 m)	4 1/2" (100)	1 3/4" (40)	35°	6.9 (5.3)	5'-1" (1.45 m)	5'-6" (1.66 m)	14'-6" (4.44 m)	25'-0" (7.56 m)	5'-6" (1.66 m)	7'-2" (2.19 m)	88 (189)
	DS 36-2 (DS 900-2)	36 (900)	5'-0" (1.52 m)	22 (560)	4'-4" (1.32 m)	6'-4 1/2" (1.951 m)	24'-5 1/2" (7.44 m)	16'-7 1/2" (5.06 m)	5'-3" (1.61 m)	31" (789)	12'-0 1/2" (3.67 m)	12'-4 1/2" (3.77 m)	4 1/2" (100)	1 3/4" (40)	35°	9.1 (7.0)	5'-10" (1.67 m)	6'-7" (2.02 m)	16'-7" (5.11 m)	29'-0" (8.8 m)	6'-7" (2.02 m)	8'-3" (2.52 m)	102 (248)
	DS 15-2 (DS 375-2)	15 (375)	38 (960)	10 (260)	29 (740)	38 (966)	16'-5 1/2" (4.99 m)	12'-2 1/2" (3.71 m)	3'-3 1/2" (1.0 m)	19 (485)	8'-0 1/2" (2.44 m)	8'-4 1/2" (2.55 m)	4 1/2" (100)	1 3/4" (40)	30°	3.9 (3.0)	3'-8" (1.05 m)	3'-5" (1.04 m)	12'-2" (3.7 m)	19'-3" (5.79 m)	3'-5" (1.04 m)	5'-1" (1.55 m)	64 (90)
	DS 18-2 (DS 450-2)	18 (450)	38 (960)	13 (330)	32 (810)	41 (1,118)	16'-11 1/2" (5.15 m)	12'-2 1/2" (3.71 m)	3'-3 1/2" (1.0 m)	22 (559)	8'-3 1/2" (2.52 m)	8'-7 1/2" (2.63 m)	4 1/2" (100)	1 3/4" (40)	30°	4.2 (3.2)	3'-8" (1.07 m)	3'-11" (1.19 m)	12'-2" (3.8 m)	19'-9" (6.06 m)	3'-11" (1.19 m)	5'-7" (1.70 m)	70 (108)
	DS 24-2 (DS 600-2)	24 (600)	3'-10" (1.16 m)	16 (410)	39 (990)	41 (1,154)	20'-11 1/2" (6.35 m)	14'-9 1/2" (4.48 m)	3'-11 1/2" (1.2 m)	30 (762)	10'-3 1/2" (3.12 m)	10'-7 1/2" (3.23 m)	4 1/2" (100)	1 3/4" (40)	30°	6.1 (4.7)	4'-5" (1.27 m)	5'-3" (1.6 m)	14'-10" (4.54 m)	24'-6" (7.41 m)	5'-3" (1.6 m)	6'-11" (2.11 m)	86 (158)
	DS 30-2 (DS 750-2)	30 (750)	4'-4" (1.32 m)	19 (480)	3'-9" (1.14 m)	5'-0" (1.828 m)	23'-11 1/2" (7.29 m)	16'-9" (5.1 m)	4'-5 1/2" (1.37 m)	36 (914)	11'-9 1/2" (3.59 m)	12'-1 1/2" (3.7 m)	4 1/2" (100)	1 3/4" (40)	30°	7.9 (6.0)	5'-0" (1.44 m)	6'-3" (1.9 m)	16'-9" (5.16 m)	28'-0" (8.5 m)	6'-3" (1.9 m)	7'-11" (2.41 m)	100 (212)
	DS 36-2 (DS 900-2)	36 (900)	5'-0" (1.52 m)	22 (560)	4'-4" (1.32 m)	7'-4" (2,238 m)	27'-11 1/2" (8.51 m)	19'-3 1/2" (5.88 m)	5'-2" (1.57 m)	31" (789)	13'-9 1/2" (4.2 m)	14'-1 1/2" (4.31 m)	4 1/2" (100)	1 3/4" (40)	30°	10.4 (8.0)	5'-10" (1.65 m)	7'-7" (2.31 m)	19'-4" (5.94 m)	32'-9" (9.89 m)	7'-7" (2.31 m)	9'-3" (2.82 m)	114 (279)

Illinois Department of Transportation
 APPROVED January 1, 2009
Ralph E. Anderson
 ENGINEER OF BRIDGES AND STRUCTURES
 APPROVED January 1, 2009
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REINFORCED CONCRETE END SECTIONS FOR PIPE CULVERTS
15" (375 mm) THRU 36" (900 mm) DIA.
SKewed WITH ROADWAY
 (Sheet 5 of 5)
STANDARD 542201-02



Welded wire reinforcement (typ.)
6x6 - W4.0xW4.0
(152x152 - MW25.8xMW25.8)

SECTION A-A

END VIEW

PLAN

GENERAL NOTES

- Build tops of headwalls parallel to grade line.
- When lapping sheets of welded wire reinforcement, the overlap measured between the outermost cross wires of each reinforcement sheet shall not be less than 8 (200).
- All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).
- All dimensions are in inches (millimeters) unless otherwise shown.

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APPROVED April 1, 2016

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DATE	REVISIONS
4-1-16	Changed terminology to 'welded wire reinforcement'.
1-1-14	Corrected skew angles in table on Sheet 5.

REINFORCED CONCRETE END SECTIONS FOR PIPE CULVERTS 42" (1050 mm) THRU 60" (1500 mm) DIA. SKEWED WITH ROADWAY

(Sheet 1 of 5)

STANDARD 542206-04

WINGS FOR 1:1 1/2 SLOPE

Skew Angle	Nominal Pipe Dia.	Dimensions for Concrete													Concrete 2 End Secs. cu. yd. (m ³)	Welded Wire Reinforcement 2 End Secs. sq. yd. (m ²)
		A	B	C	D	E	F	G	H	J	K	M	N	α		
5°	42 (1050)	4'-1" (1.25 m)	26 (660)	4'-10 1/2" (1.49 m)	4'-3 3/4" (1.299 m)	13'-5" (4.09 m)	6'-0 1/2" (1.85 m)	5'-6 1/2" (1.69 m)	4'-3" (1.295 m)	6'-8 1/2" (2.04 m)	6'-8 1/2" (2.05 m)	3 1/2 (90)	3 (80)	85°	6.0 (4.6)	46 (38)
	48 (1200)	4'-6" (1.35 m)	29 (740)	5'-5" (1.64 m)	4'-10 1/2" (1.478 m)	14'-10" (4.48 m)	6'-8" (2.0 m)	6'-1 1/2" (1.83 m)	4'-10" (1.473 m)	7'-4 1/2" (2.23 m)	7'-5 1/2" (2.25 m)	3 1/2 (90)	3 (80)	85°	7.2 (5.5)	53 (44)
	54 (1350)	4'-11" (1.56 m)	32 (810)	5'-11 1/2" (1.85 m)	5'-5 1/2" (1.657 m)	16'-3" (5.08 m)	7'-3 1/2" (2.31 m)	6'-8" (2.12 m)	5'-5" (1.651 m)	8'-1 1/2" (2.53 m)	8'-1 1/2" (2.55 m)	3 1/2 (90)	3 (80)	85°	8.4 (6.4)	65 (55)
	60 (1500)	5'-4" (1.62 m)	35 (890)	6'-6" (1.97 m)	6'-0 1/2" (1.835 m)	17'-8" (5.37 m)	7'-10 1/2" (2.4 m)	7'-2 1/2" (2.2 m)	6'-0" (1.829 m)	8'-9 1/2" (2.68 m)	8'-10 1/2" (2.69 m)	3 1/2 (90)	3 (80)	85°	9.8 (7.5)	71 (59)
	42 (1050)	4'-1" (1.25 m)	26 (660)	4'-10 1/2" (1.49 m)	4'-3 3/4" (1.314 m)	13'-6 1/2" (4.13 m)	6'-4 1/2" (1.94 m)	5'-4" (1.63 m)	4'-3" (1.295 m)	6'-8 1/2" (2.05 m)	6'-9 1/2" (2.08 m)	3 1/2 (100)	3 (80)	80°	6.3 (4.8)	47 (39)
10°	48 (1200)	4'-6" (1.35 m)	29 (740)	5'-5" (1.64 m)	4'-11" (1.495 m)	15'-0" (4.52 m)	7'-0" (2.1 m)	5'-10 1/2" (1.77 m)	4'-10" (1.473 m)	7'-5 1/2" (2.25 m)	7'-6 1/2" (2.27 m)	3 1/2 (100)	3 (80)	80°	7.5 (5.7)	54 (45)
	54 (1350)	4'-11" (1.56 m)	32 (810)	5'-11 1/2" (1.85 m)	5'-6" (1.676 m)	16'-5" (5.13 m)	7'-7 1/2" (2.43 m)	6'-5" (2.04 m)	5'-5" (1.651 m)	8'-2" (2.55 m)	8'-3" (2.58 m)	3 1/2 (100)	3 (80)	80°	8.8 (6.7)	66 (56)
	60 (1500)	5'-4" (1.62 m)	35 (890)	6'-6" (1.97 m)	6'-1" (1.857 m)	17'-10 1/2" (5.43 m)	8'-3 1/2" (2.52 m)	6'-11 1/2" (2.11 m)	6'-0" (1.829 m)	8'-10 1/2" (2.7 m)	8'-11 1/2" (2.73 m)	3 1/2 (100)	3 (80)	80°	10.3 (7.9)	73 (61)
	42 (1050)	4'-1" (1.25 m)	26 (660)	4'-10 1/2" (1.49 m)	4'-4 1/2" (1.34 m)	13'-9 1/2" (4.2 m)	6'-8 1/2" (2.05 m)	5'-1 1/2" (1.57 m)	4'-3" (1.295 m)	6'-10" (2.08 m)	6'-11 1/2" (2.12 m)	4 (100)	2 1/2 (70)	75°	6.6 (5.0)	48 (40)
	48 (1200)	4'-6" (1.35 m)	29 (740)	5'-5" (1.64 m)	5'-0" (1.524 m)	15'-3" (4.6 m)	7'-4 1/2" (2.22 m)	5'-8" (1.71 m)	4'-10" (1.473 m)	7'-6 1/2" (2.29 m)	7'-8 1/2" (2.32 m)	4 (100)	2 1/2 (70)	75°	7.9 (6.0)	55 (46)
15°	54 (1350)	4'-11" (1.56 m)	32 (810)	5'-11 1/2" (1.85 m)	5'-7 1/2" (1.709 m)	16'-8" (5.22 m)	8'-1" (2.57 m)	6'-2 1/2" (1.97 m)	5'-5" (1.651 m)	8'-3 1/2" (2.59 m)	8'-5" (2.63 m)	4 (100)	2 1/2 (70)	75°	9.3 (7.1)	68 (57)
	60 (1500)	5'-4" (1.62 m)	35 (890)	6'-6" (1.97 m)	6'-2 1/2" (1.893 m)	18'-2 1/2" (5.53 m)	8'-9 1/2" (2.66 m)	6'-8 1/2" (2.05 m)	6'-0" (1.829 m)	9'-0 1/2" (2.75 m)	9'-1 1/2" (2.78 m)	4 (100)	2 1/2 (70)	75°	10.8 (8.3)	75 (62)
	42 (1050)	4'-1" (1.25 m)	26 (660)	4'-10 1/2" (1.49 m)	4'-6 1/2" (1.378 m)	14'-1 1/2" (4.31 m)	7'-1 1/2" (2.17 m)	4'-11 1/2" (1.52 m)	4'-3" (1.295 m)	7'-0" (2.13 m)	7'-1 1/2" (2.18 m)	4 1/2 (105)	2 1/2 (70)	70°	7.0 (5.4)	49 (41)
	48 (1200)	4'-6" (1.35 m)	29 (740)	5'-5" (1.64 m)	5'-1 1/2" (1.567 m)	15'-7 1/2" (4.72 m)	7'-10 1/2" (2.36 m)	5'-6" (1.65 m)	4'-10" (1.473 m)	7'-9" (2.34 m)	7'-10 1/2" (2.38 m)	4 1/2 (105)	2 1/2 (70)	70°	8.4 (6.4)	51 (48)
	54 (1350)	4'-11" (1.56 m)	32 (810)	5'-11 1/2" (1.85 m)	5'-9 1/2" (1.756 m)	17'-2" (5.36 m)	7'-2" (2.27 m)	6'-0" (1.91 m)	5'-5" (1.651 m)	8'-6" (2.65 m)	8'-8" (2.7 m)	4 1/2 (105)	2 1/2 (70)	70°	9.9 (7.6)	70 (59)
20°	60 (1500)	5'-4" (1.62 m)	35 (890)	6'-6" (1.97 m)	6'-4 1/2" (1.946 m)	18'-8" (5.68 m)	9'-3 1/2" (2.83 m)	6'-6 1/2" (1.98 m)	6'-0" (1.829 m)	9'-3" (2.82 m)	9'-5" (2.86 m)	4 1/2 (105)	2 1/2 (70)	70°	11.5 (8.8)	77 (64)
	42 (1050)	4'-1" (1.25 m)	26 (660)	4'-10 1/2" (1.49 m)	4'-8 1/2" (1.428 m)	14'-7 1/2" (4.46 m)	7'-7 1/2" (2.32 m)	4'-10" (1.48 m)	4'-3" (1.295 m)	7'-2 1/2" (2.22 m)	7'-5" (2.26 m)	4 1/2 (110)	2 1/2 (60)	65°	7.4 (5.7)	51 (43)
	48 (1200)	4'-6" (1.35 m)	29 (740)	5'-5" (1.64 m)	5'-4" (1.625 m)	16'-2 1/2" (4.88 m)	8'-4 1/2" (2.52 m)	5'-4" (1.6 m)	4'-10" (1.473 m)	8'-0" (2.41 m)	8'-2 1/2" (2.47 m)	4 1/2 (110)	2 1/2 (60)	65°	8.9 (6.8)	59 (49)
	54 (1350)	4'-11" (1.56 m)	32 (810)	5'-11 1/2" (1.85 m)	5'-11 1/2" (1.821 m)	17'-9" (5.54 m)	9'-1 1/2" (2.91 m)	5'-10" (1.85 m)	5'-5" (1.651 m)	8'-9 1/2" (2.74 m)	8'-11 1/2" (2.8 m)	4 1/2 (110)	2 1/2 (60)	65°	10.5 (8.0)	73 (61)
	60 (1500)	5'-4" (1.62 m)	35 (890)	6'-6" (1.97 m)	6'-7 1/2" (2.018 m)	19'-3 1/2" (5.87 m)	9'-11" (3.02 m)	6'-4" (1.92 m)	6'-0" (1.829 m)	9'-6 1/2" (2.90 m)	9'-9" (2.97 m)	4 1/2 (110)	2 1/2 (60)	65°	12.2 (9.3)	80 (67)
25°	42 (1050)	4'-1" (1.25 m)	26 (660)	4'-10 1/2" (1.49 m)	4'-11" (1.495 m)	15'-3" (4.65 m)	8'-2" (2.49 m)	4'-8 1/2" (1.44 m)	4'-3" (1.295 m)	7'-6" (2.29 m)	7'-9" (2.36 m)	4 1/2 (120)	2 1/2 (60)	60°	6.0 (4.5)	45 (37)
	48 (1200)	4'-6" (1.35 m)	29 (740)	5'-5" (1.64 m)	5'-7" (1.7 m)	16'-10 1/2" (5.1 m)	9'-0" (2.7 m)	5'-2 1/2" (1.56 m)	4'-10" (1.473 m)	8'-3 1/2" (2.51 m)	8'-6 1/2" (2.59 m)	4 1/2 (120)	2 1/2 (60)	60°	9.5 (7.3)	62 (52)
	54 (1350)	4'-11" (1.56 m)	32 (810)	5'-11 1/2" (1.85 m)	6'-3" (1.906 m)	18'-6 1/2" (5.79 m)	9'-10" (3.12 m)	5'-8" (1.8 m)	5'-5" (1.651 m)	9'-1 1/2" (2.85 m)	9'-4 1/2" (2.92 m)	4 1/2 (120)	2 1/2 (60)	60°	11.2 (8.6)	77 (64)
	60 (1500)	5'-4" (1.62 m)	35 (890)	6'-6" (1.97 m)	6'-11 1/2" (2.111 m)	20'-2" (6.13 m)	10'-8" (3.24 m)	6'-2" (1.87 m)	6'-0" (1.829 m)	9'-11 1/2" (3.03 m)	10'-2 1/2" (3.1 m)	4 1/2 (120)	2 1/2 (60)	60°	13.1 (10.0)	84 (70)

Illinois Department of Transportation

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ENGINEER OF BRIDGES AND STRUCTURES

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**REINFORCED CONCRETE END SECTIONS
FOR PIPE CULVERTS
42" (1050 mm) THRU 60" (1500 mm) DIA.
SKEWED WITH ROADWAY**

(Sheet 2 of 5)

STANDARD 542206-04

WINGS FOR 1:1 1/2 SLOPE

Skew Angle	Nominal Pipe Dia.	Dimensions for Concrete													Concrete 2 End Secs. cu. yd. (m ³)	Welded Wire Reinforcement 2 End Secs. sq. yd. (m ²)
		A	B	C	D	E	F	G	H	J	K	M	N	α		
35°	42 (1050)	4'-1" (1.25 m)	26 (660)	4'-10 1/2" (1.49 m)	5'-2 1/2" (1.58 m)	16'-0 1/2" (4.59 m)	8'-10" (2.71 m)	4'-7 1/2" (1.41 m)	4'-3" (1.295 m)	7'-10 1/2" (2.4 m)	8'-2" (2.49 m)	4 1/2" (120)	2 (50)	55°	8.5 (6.5)	56 (47)
	48 (1200)	4'-6" (1.35 m)	29 (740)	5'-5" (1.64 m)	5'-10 1/2" (1.798 m)	17'-9 1/2" (5.36 m)	9'-9" (2.93 m)	5'-1" (1.53 m)	4'-10" (1.473 m)	8'-9" (2.64 m)	9'-0 1/2" (2.73 m)	4 1/2" (120)	2 (50)	55°	10.2 (7.8)	66 (55)
	54 (1350)	4'-11" (1.56 m)	32 (810)	5'-11 1/2" (1.85 m)	6'-7 1/2" (2.015 m)	19'-6 1/2" (6.1 m)	10'-7 1/2" (3.38 m)	5'-6 1/2" (1.76 m)	5'-5" (1.651 m)	9'-7 1/2" (3.01 m)	9'-10 1/2" (3.09 m)	4 1/2" (120)	2 (50)	55°	12.0 (9.2)	81 (68)
	60 (1500)	5'-4" (1.62 m)	35 (890)	6'-6" (1.97 m)	7'-4" (2.232 m)	21'-3" (6.46 m)	11'-6 1/2" (3.51 m)	6'-0 1/2" (1.83 m)	6'-0" (1.829 m)	10'-5 1/2" (3.19 m)	10'-9 1/2" (3.27 m)	4 1/2" (120)	2 (50)	55°	14.1 (10.8)	89 (74)
	42 (1050)	4'-1" (1.25 m)	26 (660)	4'-10 1/2" (1.49 m)	5'-6 1/2" (1.69 m)	17'-1 1/2" (5.21 m)	9'-8" (2.95 m)	4'-6" (1.38 m)	4'-3" (1.295 m)	8'-4 1/2" (2.56 m)	8'-8 1/2" (2.65 m)	5 1 1/2" (130)	1 1/2" (50)	50°	9.1 (7.0)	60 (50)
40°	48 (1200)	4'-6" (1.35 m)	29 (740)	5'-5" (1.64 m)	6'-3 3/4" (1.922 m)	18'-11 1/4" (5.72 m)	10'-7 1/2" (3.2 m)	4'-11 1/2" (1.49 m)	4'-10" (1.473 m)	9'-3 3/4" (2.81 m)	9'-7 1/2" (2.91 m)	5 1 1/2" (130)	1 1/2" (50)	50°	11.0 (8.4)	70 (58)
	54 (1350)	4'-11" (1.56 m)	32 (810)	5'-11 1/2" (1.85 m)	7'-0 1/2" (2.155 m)	20'-9 1/2" (6.5 m)	11'-7 1/2" (3.69 m)	5'-5" (1.72 m)	5'-5" (1.651 m)	10'-2 1/2" (3.2 m)	10'-6 1/2" (3.3 m)	5 1 1/2" (130)	1 1/2" (50)	50°	13.0 (9.9)	86 (72)
	60 (1500)	5'-4" (1.62 m)	35 (890)	6'-6" (1.97 m)	7'-10" (2.387 m)	22'-7 1/2" (6.89 m)	12'-7 1/2" (3.84 m)	6'-0" (1.79 m)	6'-0" (1.829 m)	11'-2" (3.4 m)	11'-5 1/2" (3.49 m)	5 1 1/2" (130)	1 1/2" (50)	50°	15.2 (11.6)	95 (79)
	42 (1050)	4'-1" (1.25 m)	26 (660)	4'-10 1/2" (1.49 m)	6'-0" (1.831 m)	18'-5 1/2" (5.62 m)	10'-8" (3.26 m)	4'-5" (1.35 m)	4'-3" (1.295 m)	9'-0 1/2" (2.76 m)	9'-4 1/2" (2.86 m)	5 1/2" (140)	1 1/2" (40)	45°	10.0 (7.6)	65 (54)
	48 (1200)	4'-6" (1.35 m)	29 (740)	5'-5" (1.64 m)	6'-10" (2.083 m)	20'-5 1/2" (6.17 m)	11'-9" (3.53 m)	4'-10 1/2" (1.46 m)	4'-10" (1.473 m)	10'-0 1/2" (3.03 m)	10'-4 1/2" (3.14 m)	5 1/2" (140)	1 1/2" (40)	45°	12.0 (9.2)	75 (63)
45°	54 (1350)	4'-11" (1.56 m)	32 (810)	5'-11 1/2" (1.85 m)	7'-8" (2.334 m)	22'-5 1/2" (7.01 m)	12'-10 1/2" (4.08 m)	5'-3 3/4" (1.69 m)	5'-5" (1.651 m)	11'-0 1/2" (3.45 m)	11'-4 1/2" (3.56 m)	5 1/2" (140)	1 1/2" (40)	45°	14.2 (10.9)	93 (78)
	60 (1500)	5'-4" (1.62 m)	35 (890)	6'-6" (1.97 m)	8'-5 3/4" (2.586 m)	24'-5 1/2" (7.43 m)	13'-11 1/2" (4.24 m)	5'-9 1/2" (1.76 m)	6'-0" (1.829 m)	12'-0 1/2" (3.66 m)	12'-4 1/2" (3.77 m)	5 1/2" (140)	1 1/2" (40)	45°	16.7 (12.8)	103 (86)
	42 (1050)	4'-1" (1.25 m)	26 (660)	4'-10 1/2" (1.49 m)	6'-7 1/2" (2.014 m)	20'-2" (6.15 m)	11'-11 1/2" (3.64 m)	4'-4 1/2" (1.33 m)	4'-3" (1.295 m)	9'-10 1/2" (3.01 m)	10'-3 1/2" (3.14 m)	5 1/2" (140)	1 1/2" (40)	40°	11.0 (8.4)	71 (59)
	48 (1200)	4'-6" (1.35 m)	29 (740)	5'-5" (1.64 m)	7'-6 1/2" (2.291 m)	22'-4 1/2" (6.75 m)	13'-2" (3.95 m)	4'-9 1/2" (1.44 m)	4'-10" (1.473 m)	10'-11 1/2" (3.31 m)	11'-4 1/2" (3.44 m)	5 1/2" (140)	1 1/2" (40)	40°	13.3 (10.2)	82 (69)
	54 (1350)	4'-11" (1.56 m)	32 (810)	5'-11 1/2" (1.85 m)	8'-5" (2.568 m)	24'-7" (7.68 m)	14'-4 1/2" (4.56 m)	5'-2 1/2" (1.66 m)	5'-5" (1.651 m)	12'-1" (3.78 m)	12'-6" (3.9 m)	5 1/2" (140)	1 1/2" (40)	40°	15.8 (12.1)	102 (85)
50°	60 (1500)	5'-4" (1.62 m)	35 (890)	6'-6" (1.97 m)	9'-4" (2.845 m)	26'-9 1/2" (8.15 m)	15'-7 1/2" (4.72 m)	5'-8" (1.73 m)	6'-0" (1.829 m)	13'-2 1/2" (4.02 m)	13'-7" (4.13 m)	5 1/2" (140)	1 1/2" (40)	40°	18.5 (14.1)	112 (94)
	42 (1050)	4'-1" (1.25 m)	26 (660)	4'-10 1/2" (1.49 m)	7'-5" (2.257 m)	22'-5 1/2" (6.85 m)	13'-7" (4.14 m)	4'-3 3/4" (1.31 m)	4'-3" (1.295 m)	11'-0 1/2" (3.36 m)	11'-5 1/2" (3.49 m)	5 1/2" (150)	1 1/2" (30)	35°	12.3 (9.4)	79 (66)
	48 (1200)	4'-6" (1.35 m)	29 (740)	5'-5" (1.64 m)	8'-5" (2.568 m)	24'-11 1/2" (7.53 m)	14'-11 1/2" (4.49 m)	4'-8 1/2" (1.42 m)	4'-10" (1.473 m)	12'-3" (3.7 m)	12'-8 1/2" (3.83 m)	5 1/2" (150)	1 1/2" (30)	35°	14.9 (11.4)	92 (77)
	54 (1350)	4'-11" (1.56 m)	32 (810)	5'-11 1/2" (1.85 m)	9'-5 1/2" (2.878 m)	27'-5" (8.57 m)	16'-4 1/2" (5.19 m)	5'-12 1/2" (1.64 m)	5'-5" (1.651 m)	13'-6" (4.22 m)	13'-11" (4.35 m)	5 1/2" (150)	1 1/2" (30)	35°	17.7 (13.5)	113 (95)
	60 (1500)	5'-4" (1.62 m)	35 (890)	6'-6" (1.97 m)	10'-5 1/2" (3.188 m)	29'-10 1/2" (9.09 m)	17'-8 1/2" (5.39 m)	5'-7" (1.7 m)	6'-0" (1.829 m)	14'-8 1/2" (4.48 m)	15'-2" (4.61 m)	5 1/2" (150)	1 1/2" (30)	35°	20.8 (15.9)	125 (104)
60°	42 (1050)	4'-1" (1.25 m)	26 (660)	4'-10 1/2" (1.49 m)	8'-6" (2.59 m)	23'-7 1/2" (7.82 m)	15'-9 1/2" (4.81 m)	4'-2 1/2" (1.29 m)	4'-3" (1.295 m)	12'-7" (3.84 m)	13'-0 1/2" (3.98 m)	6 1/2" (160)	1 (30)	30°	14.1 (10.8)	89 (75)
	48 (1200)	4'-6" (1.35 m)	29 (740)	5'-5" (1.64 m)	9'-8" (2.946 m)	28'-5 1/2" (8.59 m)	17'-4 1/2" (5.22 m)	4'-8" (1.4 m)	4'-10" (1.473 m)	14'-0" (4.22 m)	14'-5 1/2" (4.37 m)	6 1/2" (160)	1 (30)	30°	17.0 (13.0)	104 (87)
	54 (1350)	4'-11" (1.56 m)	32 (810)	5'-11 1/2" (1.85 m)	10'-10" (3.302 m)	31'-3 1/2" (9.79 m)	19'-0" (6.03 m)	5'-1" (1.62 m)	5'-5" (1.651 m)	15'-5" (4.82 m)	15'-10 1/2" (4.97 m)	6 1/2" (160)	1 (30)	30°	20.3 (15.5)	129 (108)
	60 (1500)	5'-4" (1.62 m)	35 (890)	6'-6" (1.97 m)	12'-0" (3.658 m)	34'-1 1/2" (10.39 m)	20'-7 1/2" (6.26 m)	5'-6 1/2" (1.68 m)	6'-0" (1.829 m)	16'-10" (5.12 m)	17'-3 1/2" (5.27 m)	6 1/2" (160)	1 (30)	30°	23.8 (18.2)	142 (119)

Illinois Department of Transportation
 APPROVED April 1, 2016
 ENGINEER OF BRIDGES AND STRUCTURES
 APPROVED April 1, 2016
 ENGINEER OF DESIGN AND ENVIRONMENT

**REINFORCED CONCRETE END SECTIONS
 FOR PIPE CULVERTS
 42" (1050 mm) THRU 60" (1500 mm) DIA.
 SKEWED WITH ROADWAY**
 (Sheet 3 of 5)
STANDARD 542206-04

WINGS FOR 1:2 SLOPE

Skew Angle	Nominal Pipe Dia.	Dimensions for Concrete													Concrete 2 End Secs. cu. yd. (m ³)	Welded Wire Reinforcement 2 End Secs. sq. yd. (m ²)
		A	B	C	D	E	F	G	H	J	K	M	N	α		
5°	42 (1050)	5'-5"	26 (660)	4'-10 1/2"	4'-3 3/4"	16'-1"	8'-0 1/2"	7'-4 1/4"	4'-3"	8'-0 1/2"	8'-0 1/2"	3 1/2	3	85°	8.0 (6.1)	61 (51)
	48 (1200)	6'-0"	29 (740)	5'-5"	4'-10 1/4"	17'-10"	8'-10 1/2"	8'-1 1/4"	1,473 m	8'-10 1/2"	8'-11 1/4"	3 1/2	3	85°	9.6 (7.3)	71 (59)
	54 (1350)	6'-7"	32 (810)	5'-11 1/2"	5'-5 1/2"	19'-7"	9'-9"	8'-11 1/2"	1,651 m	9'-9 1/2"	9'-9 1/2"	3 1/2	3	85°	11.3 (8.6)	88 (74)
	60 (1500)	7'-2"	35 (890)	6'-6"	6'-0 1/2"	21'-4 1/2"	10'-7 1/2"	9'-8 3/4"	1,829 m	10'-8"	10'-8 1/2"	3 1/2	3	85°	13.2 (10.1)	96 (80)
	42 (1050)	5'-5"	26 (660)	4'-10 1/2"	4'-3 3/4"	16'-3"	8'-5"	7'-0 3/4"	1,295 m	8'-1"	8'-2"	3 1/2	3	80°	8.3 (6.3)	62 (52)
10°	48 (1200)	6'-0"	29 (740)	5'-5"	4'-11"	18'-0 1/2"	9'-4"	7'-10"	1,473 m	8'-11 1/2"	9'-0 1/2"	3 1/2	3	80°	9.9 (7.6)	72 (60)
	54 (1350)	6'-7"	32 (810)	5'-11 1/2"	5'-6"	19'-9 1/2"	10'-3"	8'-7 1/4"	1,651 m	9'-10 1/2"	9'-11 1/2"	3 1/2	3	80°	11.7 (8.9)	90 (75)
	60 (1500)	7'-2"	35 (890)	6'-6"	6'-1"	21'-7"	11'-1 1/2"	9'-4 1/4"	1,829 m	10'-9"	10'-10"	3 1/2	3	80°	13.7 (10.5)	98 (82)
	42 (1050)	5'-5"	26 (660)	4'-10 1/2"	4'-4 1/4"	16'-6 1/2"	8'-10 1/2"	6'-10"	1,295 m	8'-2 1/2"	8'-4"	4	2 1/2	75°	8.6 (6.6)	64 (53)
	48 (1200)	6'-0"	29 (740)	5'-5"	5'-0"	18'-4 1/2"	9'-10 1/2"	7'-6 1/2"	1,473 m	9'-1 1/2"	9'-3"	4	2 1/2	75°	10.4 (8.0)	74 (62)
15°	54 (1350)	6'-7"	32 (810)	5'-11 1/2"	5'-7 1/4"	20'-2"	10'-9 1/2"	8'-3 1/2"	1,651 m	10'-0 1/2"	10'-1 1/2"	4	2 1/2	75°	12.3 (9.4)	92 (77)
	60 (1500)	7'-2"	35 (890)	6'-6"	6'-2 1/2"	21'-11 1/2"	11'-9 1/2"	9'-0 1/2"	1,829 m	10'-11 1/2"	11'-0 1/2"	4	2 1/2	75°	14.3 (10.9)	100 (84)
	42 (1050)	5'-5"	26 (660)	4'-10 1/2"	4'-6 1/2"	16'-11 1/2"	9'-5 1/2"	6'-7 1/4"	1,295 m	8'-5"	8'-6 1/2"	4 1/2	2 1/2	70°	9.0 (6.9)	66 (55)
	48 (1200)	6'-0"	29 (740)	5'-5"	5'-1 1/2"	18'-10"	10'-5 1/2"	7'-4"	1,473 m	9'-4"	9'-6"	4 1/2	2 1/2	70°	10.9 (8.3)	76 (64)
	54 (1350)	6'-7"	32 (810)	5'-11 1/2"	5'-9 1/2"	20'-8 1/2"	11'-5 1/2"	8'-0 1/2"	1,651 m	10'-3 1/2"	10'-5 1/2"	4 1/2	2 1/2	70°	12.9 (9.9)	94 (79)
20°	60 (1500)	7'-2"	35 (890)	6'-6"	6'-4 1/2"	22'-6 1/2"	12'-6"	8'-9"	1,829 m	11'-2 1/2"	11'-4 1/2"	4 1/2	2 1/2	70°	15.1 (11.5)	103 (86)
	42 (1050)	5'-5"	26 (660)	4'-10 1/2"	4'-8 1/4"	17'-6 1/2"	10'-1"	6'-5"	1,295 m	8'-8 1/4"	8'-10 1/2"	4 1/2	2 1/2	65°	9.5 (7.3)	65 (55)
	48 (1200)	6'-0"	29 (740)	5'-5"	5'-4"	19'-6"	11'-2"	7'-1 1/4"	1,473 m	9'-7 1/2"	9'-10 1/2"	4 1/2	2 1/2	65°	11.5 (8.8)	79 (66)
	54 (1350)	6'-7"	32 (810)	5'-11 1/2"	5'-11 1/4"	21'-5"	12'-3"	7'-9 1/4"	1,651 m	10'-7 1/2"	10'-9 1/2"	4 1/2	2 1/2	65°	13.6 (10.4)	98 (82)
	60 (1500)	7'-2"	35 (890)	6'-6"	6'-7 1/2"	23'-4 1/2"	13'-4"	8'-6"	1,829 m	11'-7"	11'-9 1/2"	4 1/2	2 1/2	65°	15.9 (12.2)	107 (90)
30°	42 (1050)	5'-5"	26 (660)	4'-10 1/2"	4'-11"	18'-4"	10'-10"	6'-3"	1,295 m	9'-0 1/2"	9'-3 1/2"	4 1/2	2 1/2	60°	10.1 (7.7)	71 (60)
	48 (1200)	6'-0"	29 (740)	5'-5"	5'-7"	20'-4 1/2"	12'-0"	6'-11 1/2"	1,473 m	10'-0 1/2"	10'-3 1/2"	4 1/2	2 1/2	60°	12.2 (9.3)	82 (69)
	54 (1350)	6'-7"	32 (810)	5'-11 1/2"	6'-3"	22'-4 1/2"	13'-2"	7'-7 1/4"	1,651 m	11'-0 1/2"	11'-3 1/2"	4 1/2	2 1/2	60°	14.4 (11.0)	102 (86)
	60 (1500)	7'-2"	35 (890)	6'-6"	6'-11 1/2"	24'-4 1/2"	14'-4"	8'-3 1/4"	1,829 m	12'-1"	12'-3 1/2"	4 1/2	2 1/2	60°	16.9 (12.9)	112 (93)

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 FOR PIPE CULVERTS
 42" (1050 mm) THRU 60" (1500 mm) DIA.
 SKEWED WITH ROADWAY**
 (Sheet 4 of 5)
STANDARD 542206-04

WINGS FOR 1:1 1/2 SLOPE

Skew Angle	Nominal Pipe Dia.	Dimensions for Concrete													Concrete 2 End Secs. cu. yd. (m ³)	Welded Wire Reinforcement 2 End Secs. sq. yd. (m ²)
		A	B	C	D	E	F	G	H	J	K	M	N	α		
35°	42 (1050)	5'-5"	26 (660)	4'-10 1/2"	5'-2 1/2"	19'-3 3/4"	11'-8 1/2"	6'-1 1/2"	4'-3"	9'-6 1/2"	9'-9 1/2"	4 1/2"	2 (50)	55°	10.8 (8.3)	75 (63)
	48 (1200)	6'-0"	29 (740)	5'-5"	5'-10 1/2"	21'-5 1/2"	13'-0"	6'-9 1/2"	4'-10"	10'-7"	10'-10 1/2"	4 1/2"	2 (50)	55°	13.0 (9.9)	87 (73)
	54 (1350)	6'-7"	32 (810)	5'-11 1/2"	6'-7 1/2"	23'-7"	14'-3"	7'-5"	5'-5"	11'-7 1/2"	11'-11 1/2"	4 1/2"	2 (50)	55°	15.4 (11.8)	108 (90)
	60 (1500)	7'-2"	35 (890)	6'-6"	7'-4"	25'-8 3/4"	15'-6 1/2"	8'-1"	6'-0"	12'-8 3/4"	13'-0"	4 1/2"	2 (50)	55°	18.1 (13.8)	118 (99)
	42 (1050)	5'-5"	26 (660)	4'-10 1/2"	5'-6 1/2"	20'-7"	12'-9 1/2"	5'-11 1/2"	4'-3"	10'-1 1/2"	10'-5 1/2"	5 1 1/2"	1 1/2 (50)	50°	11.6 (8.9)	80 (67)
40°	48 (1200)	6'-0"	29 (740)	5'-5"	6'-3 3/4"	22'-10 1/4"	14'-2 1/4"	6'-7 1/2"	4'-10"	11'-3 1/4"	11'-7"	5 1 1/2"	1 1/2 (50)	50°	14.0 (10.7)	93 (77)
	54 (1350)	6'-7"	32 (810)	5'-11 1/2"	7'-0 1/2"	25'-1 1/4"	15'-7"	7'-3 1/4"	5'-5"	12'-5"	12'-8 3/4"	5 1 1/2"	1 1/2 (50)	50°	16.7 (12.8)	115 (96)
	60 (1500)	7'-2"	35 (890)	6'-6"	7'-10"	27'-5 1/4"	16'-11 1/4"	7'-11"	6'-0"	13'-6 1/4"	13'-10 1/4"	5 1 1/2"	1 1/2 (50)	50°	19.5 (14.9)	126 (105)
	42 (1050)	5'-5"	26 (660)	4'-10 1/2"	6'-0"	22'-2 1/2"	14'-1 1/2"	5'-10 1/2"	4'-3"	10'-11"	11'-3 1/2"	5 1/2"	1 1/2 (40)	45°	12.6 (9.6)	86 (72)
	48 (1200)	6'-0"	29 (740)	5'-5"	6'-10"	24'-8 1/4"	15'-8 1/2"	6'-6"	4'-10"	12'-2"	12'-6 1/2"	5 1/2"	1 1/2 (40)	45°	15.2 (12.0)	100 (83)
45°	54 (1350)	6'-7"	32 (810)	5'-11 1/2"	7'-8"	27'-1 1/2"	17'-2 1/2"	7'-1 1/2"	5'-5"	13'-4 1/2"	13'-9"	5 1/2"	1 1/2 (40)	45°	18.2 (13.9)	124 (104)
	60 (1500)	7'-2"	35 (890)	6'-6"	8'-5 1/2"	29'-7 1/2"	18'-8 1/2"	7'-9"	6'-0"	14'-7 1/2"	15'-0"	5 1/2"	1 1/2 (40)	45°	21.3 (16.3)	136 (114)
	42 (1050)	5'-5"	26 (660)	4'-10 1/2"	6'-7 1/2"	24'-3 1/4"	15'-10"	5'-9 1/2"	4'-3"	11'-11 1/2"	12'-4 1/4"	5 1/2"	1 1/2 (40)	40°	13.9 (10.6)	94 (78)
	48 (1200)	6'-0"	29 (740)	5'-5"	7'-6 1/2"	27'-0 1/4"	17'-6 1/2"	6'-4 1/2"	4'-10"	13'-3 1/2"	13'-8 1/2"	5 1/2"	1 1/2 (40)	40°	16.8 (12.8)	109 (91)
	54 (1350)	6'-7"	32 (810)	5'-11 1/2"	8'-5"	29'-9 1/4"	19'-3"	7'-0"	5'-5"	14'-8 1/2"	15'-1"	5 1/2"	1 1/2 (40)	40°	20.0 (15.3)	135 (113)
50°	60 (1500)	7'-2"	35 (890)	6'-6"	9'-4"	32'-5 1/2"	20'-11 1/2"	7'-7 1/2"	6'-0"	16'-0 1/2"	16'-5 1/2"	5 1/2"	1 1/2 (40)	40°	23.5 (18.0)	148 (124)
	42 (1050)	5'-5"	26 (660)	4'-10 1/2"	7'-5"	27'-1 1/2"	18'-0 1/2"	5'-8 1/2"	4'-3"	13'-4 1/2"	13'-9 1/2"	5 1/2"	1 1/2 (30)	35°	15.5 (11.9)	104 (87)
	48 (1200)	6'-0"	29 (740)	5'-5"	8'-5"	30'-2 1/2"	19'-11 1/2"	6'-3 1/2"	4'-10"	14'-10 1/2"	15'-3 1/2"	5 1/2"	1 1/2 (30)	35°	18.8 (14.4)	121 (101)
	54 (1350)	6'-7"	32 (810)	5'-11 1/2"	9'-5 1/2"	33'-2 1/2"	21'-10 1/2"	6'-10 1/2"	5'-5"	16'-4 1/2"	16'-10"	5 1/2"	1 1/2 (30)	35°	22.4 (17.1)	150 (125)
	60 (1500)	7'-2"	35 (890)	6'-6"	10'-5 1/2"	36'-3 1/2"	23'-10"	7'-6 1/2"	6'-0"	17'-11 1/2"	18'-4 1/2"	5 1/2"	1 1/2 (30)	35°	26.4 (20.2)	165 (138)
60°	42 (1050)	5'-5"	26 (660)	4'-10 1/2"	8'-6"	30'-1 1/4"	20'-11 1/4"	5'-7 1/2"	4'-3"	15'-3"	15'-8 1/2"	6 1/4"	1 (30)	30°	17.7 (13.5)	118 (98)
	48 (1200)	6'-0"	29 (740)	5'-5"	9'-8"	34'-5 1/4"	23'-2 1/4"	6'-5 1/4"	4'-10"	17'-0"	17'-5 1/4"	6 1/4"	1 (30)	30°	21.5 (16.4)	137 (115)
	54 (1350)	6'-7"	32 (810)	5'-11 1/2"	10'-10"	37'-11 1/4"	25'-5 1/4"	6'-9 1/4"	5'-5"	18'-9"	19'-2 1/4"	6 1/4"	1 (30)	30°	25.7 (19.6)	170 (142)
	60 (1500)	7'-2"	35 (890)	6'-6"	12'-0"	41'-5 1/4"	27'-8 1/4"	7'-5"	6'-0"	20'-6"	20'-11 1/4"	6 1/4"	1 (30)	30°	30.2 (23.1)	187 (157)
	42 (1050)	5'-5"	26 (660)	4'-10 1/2"	8'-6"	30'-1 1/4"	20'-11 1/4"	5'-7 1/2"	4'-3"	15'-3"	15'-8 1/2"	6 1/4"	1 (30)	30°	17.7 (13.5)	118 (98)

Illinois Department of Transportation

APPROVED April 1, 2016

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APPROVED April 1, 2016

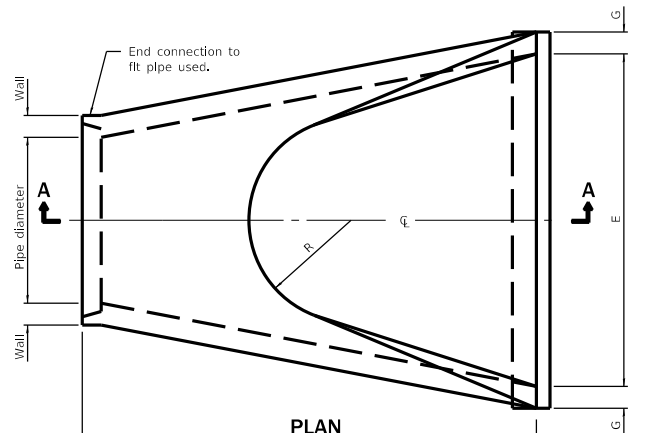
ENGINEER OF DESIGN AND ENVIRONMENT

464-C1 03/15/12

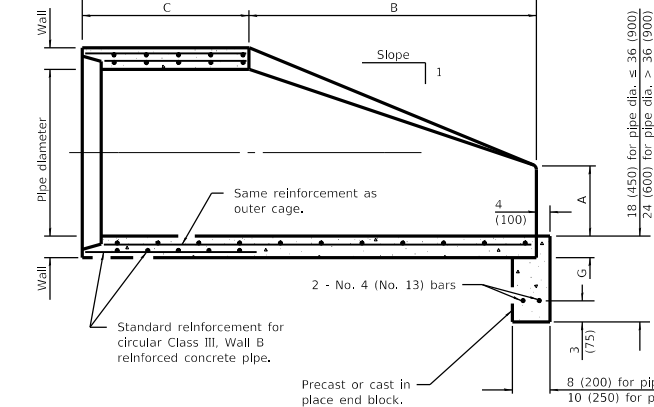
**REINFORCED CONCRETE END SECTIONS
FOR PIPE CULVERTS
42" (1050 mm) THRU 60" (1500 mm) DIA.
SKEWED WITH ROADWAY**

(Sheet 5 of 5)

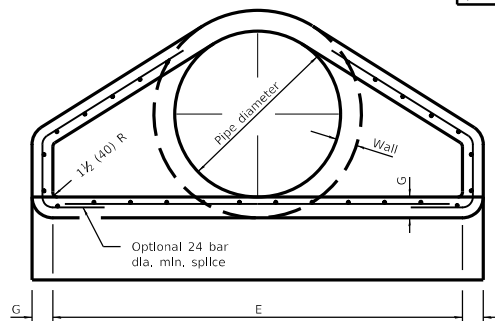
STANDARD 542206-04



PLAN



SECTION A-A



END VIEW

PIPE DIA.	APPROX. QTY. lbs. (kg)	WALL	A	B	C	D	E	G	R	APPROX. SLOPE
12 (300)	530 (240)	2 (51)	4 (102)	24 (610)	4'-0 1/2" (1,241 m)	6'-0 1/2" (1,851 m)	24 (610)	2 (51)	9 (229)	1:2.4
15 (375)	740 (335)	2 1/2 (64)	6 (152)	27 (686)	3'-10" (1,168 m)	6'-1" (1,854 m)	30 (762)	2 1/2 (64)	11 (280)	1:2.4
18 (450)	990 (450)	2 1/2 (64)	9 (229)	27 (686)	3'-10" (1,168 m)	6'-1" (1,854 m)	36 (914)	2 1/2 (64)	12 (305)	1:2.4
21 (525)	1280 (580)	2 1/2 (64)	9 (229)	35 (889)	3'-10" (1,168 m)	6'-1" (1,854 m)	36 (914)	2 1/2 (64)	13 (330)	1:2.4
24 (600)	1520 (690)	3 (76)	9 1/2 (241)	3'-7 1/2" (1,105 m)	6'-1 1/2" (1,867 m)	4'-0" (1,219 m)	3 (76)	14 (356)	1:2.5	
27 (675)	1930 (875)	3 1/2 (83)	10 1/2 (267)	4'-0" (1,219 m)	25 1/2" (648)	6'-1 1/2" (1,867 m)	4'-6" (1,372 m)	3 1/2 (83)	14 1/2 (368)	1:2.4
30 (750)	2190 (995)	3 1/2 (83)	12 (305)	4'-6" (1,375 m)	19 1/2" (502)	6'-1 1/2" (1,874 m)	5'-0" (1,524 m)	3 1/2 (83)	15 (381)	1:2.5
33 (825)	3200 (1450)	3 1/2 (83)	13 1/2 (343)	4'-10 1/2" (1,486 m)	39 1/2" (997)	8'-1 1/2" (2,483 m)	5'-6" (1,676 m)	3 1/2 (83)	17 1/2 (445)	1:2.5
36 (900)	4100 (1860)	4 (102)	15 (381)	5'-3" (1,6 m)	34 1/2" (883)	8'-1 1/2" (2,483 m)	6'-0" (1,829 m)	4 (102)	20 (508)	1:2.5
42 (1050)	5380 (2440)	4 1/2 (114)	21 (533)	5'-3" (1,6 m)	35 (889)	8'-2" (2,489 m)	6'-6" (1,981 m)	4 1/2 (114)	22 (559)	1:2.5
48 (1200)	6550 (2970)	5 (127)	24 (610)	6'-0" (1,829 m)	26 (660)	8'-2" (2,489 m)	7'-0" (2,134 m)	5 (127)	22 (559)	1:2.5
54 (1350)	8240 (3740)	5 1/2 (140)	27 (686)	5'-5" (1,651 m)	35 (889)	8'-4" (2,54 m)	7'-6" (2,286 m)	5 1/2 (140)	24 (610)	1:2.0
60 (1500)	8730 (3960)	6 (152)	35 (889)	5'-0" (1,524 m)	39 (991)	8'-3" (2,515 m)	8'-0" (2,438 m)	5 (127)	-	1:1.9
66 (1650)	10710 (4860)	6 1/2 (165)	30 (762)	6'-0" (1,829 m)	27 (686)	8'-3" (2,515 m)	8'-6" (2,591 m)	5 1/2 (140)	-	1:1.7
72 (1800)	12520 (5680)	7 (178)	36 (914)	6'-6" (1,981 m)	21 (533)	8'-3" (2,514 m)	9'-0" (2,743 m)	6 (152)	-	1:1.8
78 (1950)	14770 (6700)	7 1/2 (191)	36 (914)	7'-6" (2,286 m)	21 (533)	9'-3" (2,819 m)	9'-6" (2,896 m)	6 1/2 (165)	-	1:1.8
84 (2100)	18160 (8240)	8 (203)	36 (914)	7'-6 1/2" (2,299 m)	21 (533)	9'-3 1/2" (2,832 m)	10'-0" (3,048 m)	6 1/2 (165)	-	1:1.6

* Radius as furnished by manufacturer

GENERAL NOTES

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in Inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-11	Clarified ref. to pipe dia. on Section A-A. Changed 'inner' to 'outer' cage ref.
1-1-09	Switched units to English (metric).

PRECAST REINFORCED CONCRETE FLARED END SECTION

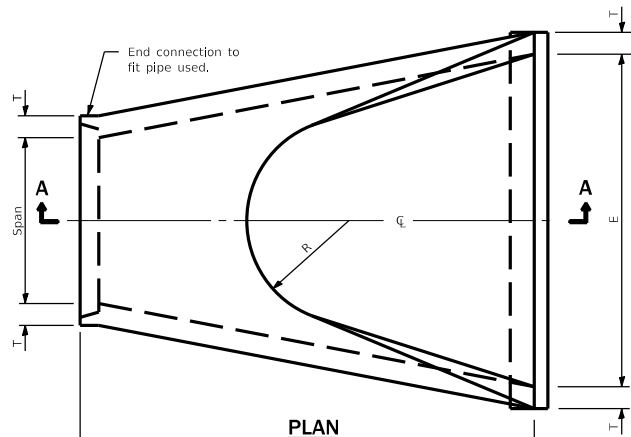
STANDARD 542301-03

Illinois Department of Transportation

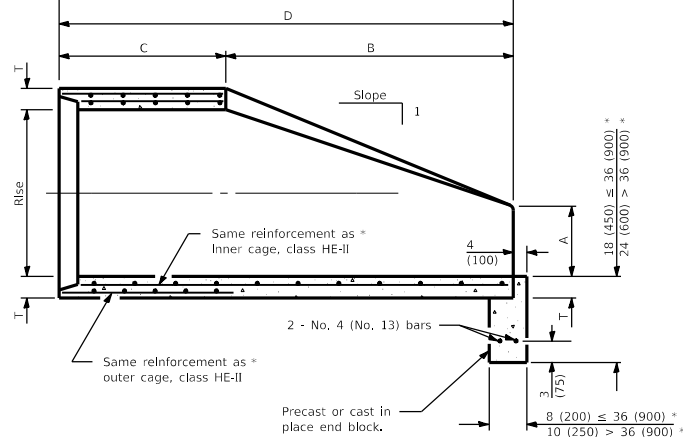
APPROVED January 1, 2011
Ralph E. Anderson
 ENGINEER OF BRIDGES AND STRUCTURES

APPROVED January 1, 2011
Scott R. ...
 ENGINEER OF DESIGN AND ENVIRONMENT

464-C 03/11/SSJ



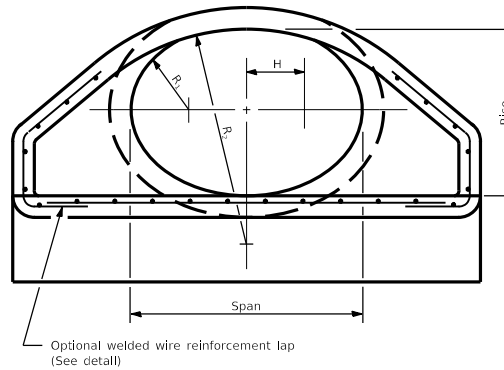
PLAN



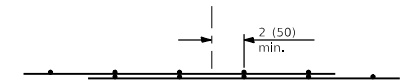
SECTION A-A

* Refers to the equivalent pipe diameter.

SPAN	RISE	EQUIV. DIA.	WALL T	A	B	C	D	E	H	R	R ₁	R ₂	APPROX. SLOPE
23 (584)	14 (356)	18 (450)	2½ (70)	8 (203)	27 (686)	3'-9" (1,143 m)	6'-0" (1,829 m)	36 (914)	5½ (137)	6 (152)	6 (152)	20 (508)	1:3.1
30 (762)	19 (483)	24 (600)	3¼ (83)	8½ (216)	39 (991)	33 (838)	6'-0" (1,829 m)	4'-0" (1,219 m)	6½ (175)	7 (178)	8½ (210)	26½ (667)	1:2.8
34 (864)	22 (559)	27 (675)	3½ (89)	9 (229)	4'-0" (1,219 m)	24 (610)	6'-0" (1,829 m)	4'-6" (1,372 m)	7½ (197)	8 (203)	9½ (235)	29½ (743)	1:2.9
38 (965)	24 (610)	30 (750)	3½ (95)	9½ (241)	4'-6" (1,372 m)	18 (475)	6'-0" (1,829 m)	5'-0" (1,524 m)	8½ (219)	9 (229)	10½ (260)	32½ (832)	1:2.9
45 (1143)	29 (737)	36 (900)	4½ (114)	11¼ (286)	5'-0" (1,524 m)	36 (914)	8'-0" (2,438 m)	6'-0" (1,829 m)	10½ (267)	12 (305)	12½ (311)	39½ (997)	1:2.7
53 (1346)	34 (864)	42 (1050)	5 (127)	15½ (400)	5'-0" (1,524 m)	36 (914)	8'-0" (2,438 m)	6'-6" (1,981 m)	12½ (308)	13 (330)	14½ (368)	3'-10" (1,168 m)	1:2.6
60 (1524)	38 (965)	48 (1200)	5½ (140)	21 (533)	5'-0" (1,524 m)	36 (914)	8'-0" (2,438 m)	7'-0" (2,134 m)	13½ (343)	14 (356)	16½ (419)	4'-3½" (1,308 m)	1:2.7
68 (1727)	43 (1092)	54 (1350)	6 (152)	26 (660)	5'-0" (1,524 m)	36 (914)	8'-0" (2,438 m)	7'-6" (2,286 m)	15½ (387)	16 (406)	18½ (476)	4'-10½" (1,486 m)	1:2.6
76 (1930)	48 (1219)	60 (1500)	6½ (165)	31 (787)	5'-0" (1,524 m)	36 (914)	8'-0" (2,438 m)	8'-0" (2,439 m)	17 (432)	18 (457)	20½ (527)	5'-5" (1,651 m)	1:2.6



END VIEW



OPTIONAL WELDED WIRE REINFORCEMENT LAP

GENERAL NOTES

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
4-1-16	Changed terminology to 'welded wire reinforcement'.
	Corrected min. lap dimension.
1-1-09	Switched units to English (metric).

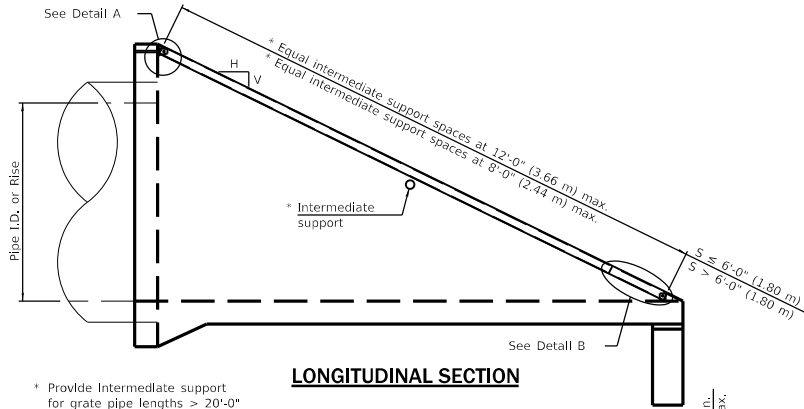
PRECAST REINFORCED CONCRETE ELLIPTICAL FLARED END SECTION

STANDARD 542306-03

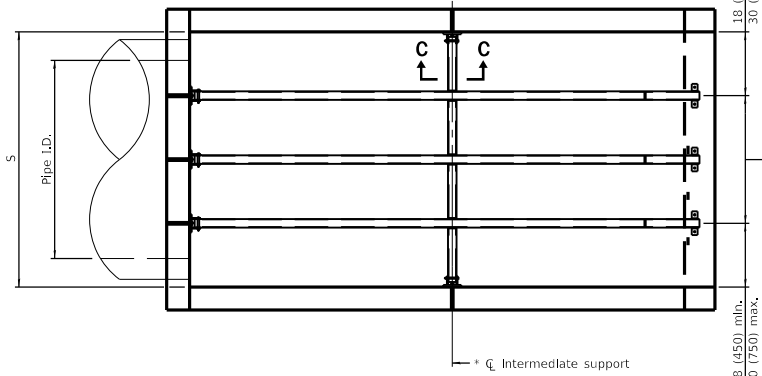
Illinois Department of Transportation

APPROVED April 1, 2016
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 APPROVED April 1, 2016
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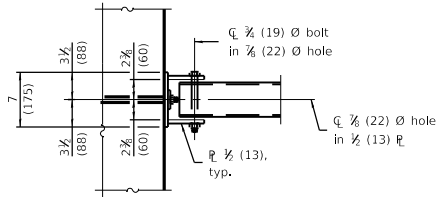
464-C 03/15/11



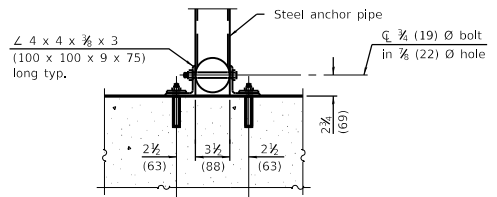
LONGITUDINAL SECTION



PLAN VIEW

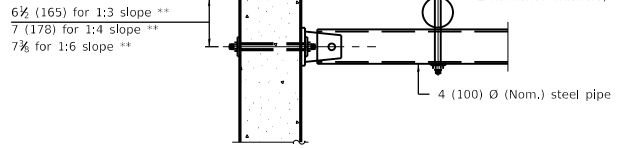


VIEW A-A



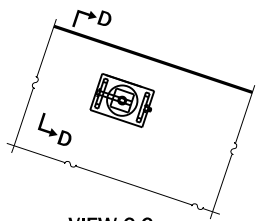
SECTION B-B

1/2 (19) Ø hole in ∠ for 1/2 (16) Ø anchor rods w/ 2 1/2 x 2 1/2 x 3/16 (63 x 63 x 8) R washer



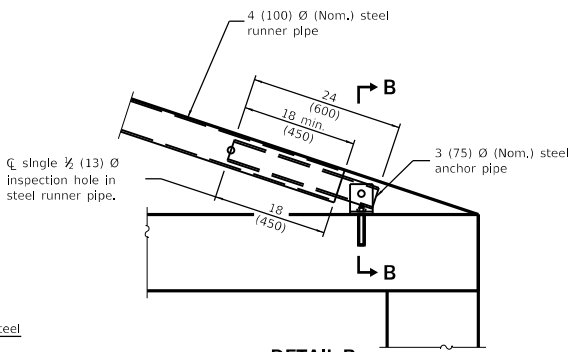
SECTION D-D

** Measured perpendicular to top of culvert wall. In addition, formed hole shall be located a minimum of 6 (150) measured horizontally from any vertical joints necessary for construction of the culvert end section.

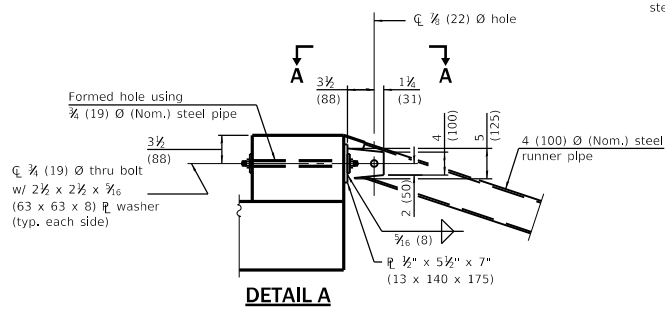


VIEW C-C

(See Detail A for dimensions and details not shown.)



DETAIL B



DETAIL A

GENERAL NOTES

This standard shall only be used on concrete end sections not skewed more than ± 15 degrees with roadway.
The minimum distance from the center of a hole to the free edge of a structural shape or plate shall be 1 1/2 (38) unless noted otherwise.
All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation
 APPROVED January 1, 2018
 ENGINEER OF BRIDGES AND STRUCTURES
 APPROVED January 1, 2018
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DATE	REVISIONS
1-1-18	Corrected value in elliptical pipe table. Renamed standard.
4-1-16	Corrected typo.

TRAVERSABLE PIPE GRATE FOR CONCRETE END SECTIONS (Sheet 1 of 2)
STANDARD 542311-07

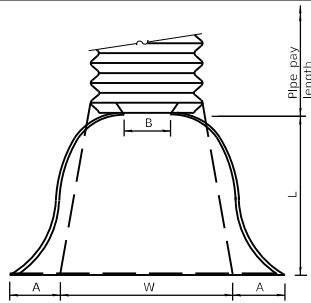
PIPE-GRATE SCHEDULE FOR PIPE CULVERT END SECTIONS

Pipe I.D.	Slope of End Section								
	1:3			1:4			1:6		
	Main Pipe No. / Length	Int. Support No. / Length	Total Length of Pipe	Main Pipe No. / Length	Int. Support No. / Length	Total Length of Pipe	Main Pipe No. / Length	Int. Support No. / Length	Total Length of Pipe
27 (675)	1 @ 9'-8" 1 @ (2.95 m)	N/A	9'-8" (2.95 m)	1 @ 12'-11" 1 @ (3.94 m)	N/A	12'-11" (3.94 m)	1 @ 19'-7" 1 @ (5.97 m)	N/A	19'-7" (5.97 m)
30 (750)	1 @ 11'-4" 1 @ (3.43 m)	N/A	11'-4" (3.43 m)	1 @ 14'-10" 1 @ (4.52 m)	N/A	14'-10" (4.52 m)	1 @ 21'-10" 1 @ (6.65 m)	1 @ 3'-6" 1 @ (1.07 m)	25'-4" (7.72 m)
33 (825)	1 @ 12'-1" 1 @ (3.68 m)	N/A	12'-1" (3.68 m)	1 @ 15'-10" 1 @ (4.83 m)	N/A	15'-10" (4.83 m)	1 @ 23'-5" 1 @ (7.14 m)	1 @ 3'-7" 1 @ (1.09 m)	27'-0" (8.23 m)
36 (900)	1 @ 12'-10" 1 @ (3.91 m)	N/A	12'-10" (3.91 m)	1 @ 16'-10" 1 @ (5.13 m)	N/A	16'-10" (5.13 m)	1 @ 24'-11" 1 @ (7.59 m)	2 @ 3'-11" 2 @ (1.19 m)	32'-9" (9.97 m)
42 (1050)	2 @ 14'-9" 2 @ (4.50 m)	N/A	29'-6" (9.00 m)	2 @ 19'-3" 2 @ (5.87 m)	N/A	38'-6" (11.74 m)	2 @ 28'-6" 2 @ (8.69 m)	2 @ 4'-7" 2 @ (1.40 m)	66'-2" (20.18 m)
48 (1200)	2 @ 16'-4" 2 @ (4.98 m)	N/A	32'-8" (9.96 m)	2 @ 21'-4" 2 @ (6.50 m)	1 @ 5'-1" 1 @ (1.55 m)	47'-9" (14.55 m)	2 @ 31'-6" 2 @ (9.60 m)	2 @ 5'-1" 2 @ (1.55 m)	73'-2" (22.30 m)
54 (1350)	2 @ 18'-2" 2 @ (5.54 m)	N/A	36'-4" (11.08 m)	2 @ 23'-9" 2 @ (7.24 m)	2 @ 5'-9" 2 @ (1.75 m)	59'-0" (18.23 m)	2 @ 35'-1" 2 @ (10.69 m)	4 @ 5'-9" 4 @ (1.75 m)	93'-2" (28.38 m)
60 (1500)	2 @ 19'-9" 2 @ (6.02 m)	N/A	39'-6" (12.04 m)	2 @ 25'-10" 2 @ (7.87 m)	3 @ 6'-3" 3 @ (1.91 m)	70'-5" (21.47 m)	2 @ 38'-1" 2 @ (11.61 m)	4 @ 6'-3" 4 @ (1.91 m)	101'-2" (30.86 m)
66 (1650)	2 @ 21'-7" 2 @ (6.58 m)	2 @ 6'-11" 2 @ (2.11 m)	57'-4" (17.38 m)	2 @ 28'-2" 2 @ (8.59 m)	3 @ 6'-11" 3 @ (2.11 m)	77'-1" (23.51 m)	2 @ 41'-11" 2 @ (12.78 m)	5 @ 6'-11" 5 @ (2.11 m)	127'-5" (36.11 m)
72 (1800)	3 @ 23'-2" 3 @ (7.06 m)	2 @ 7'-5" 2 @ (2.26 m)	84'-4" (25.70 m)	3 @ 30'-3" 3 @ (9.22 m)	3 @ 7'-5" 3 @ (2.26 m)	113'-0" (34.44 m)	3 @ 44'-8" 3 @ (13.61 m)	5 @ 7'-5" 5 @ (2.26 m)	171'-1" (52.13 m)
78 (1950)	3 @ 25'-0" 3 @ (7.62 m)	3 @ 8'-1" 3 @ (2.46 m)	99'-3" (30.24 m)	3 @ 32'-8" 3 @ (9.96 m)	4 @ 8'-1" 4 @ (2.46 m)	130'-4" (39.72 m)	3 @ 48'-3" 3 @ (14.71 m)	6 @ 8'-1" 6 @ (2.46 m)	193'-3" (58.89 m)
84 (2100)	3 @ 26'-7" 3 @ (8.10 m)	3 @ 8'-7" 3 @ (2.62 m)	105'-6" (32.16 m)	3 @ 34'-9" 3 @ (10.59 m)	4 @ 8'-7" 4 @ (2.62 m)	138'-7" (42.25 m)	3 @ 51'-3" 3 @ (15.62 m)	6 @ 8'-7" 6 @ (2.62 m)	206'-3" (62.58 m)

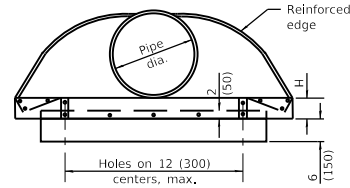
PIPE-GRATE SCHEDULE FOR ELLIPTICAL PIPE CULVERT END SECTIONS

Pipe I.D. (Equiv. Round)	Slope of End Section								
	1:3			1:4			1:6		
	Main Pipe No. / Length	Int. Support No. / Length	Total Length of Pipe	Main Pipe No. / Length	Int. Support No. / Length	Total Length of Pipe	Main Pipe No. / Length	Int. Support No. / Length	Total Length of Pipe
21 (525)	1 @ 8'-2" 1 @ (2.49 m)	N/A	8'-2" (2.49 m)	1 @ 11'-2" 1 @ (3.40 m)	N/A	11'-2" (3.40 m)	1 @ 17'-5" 1 @ (5.31 m)	N/A	17'-5" (5.31 m)
24 (600)	1 @ 8'-2" 1 @ (2.49 m)	N/A	8'-2" (2.49 m)	1 @ 11'-2" 1 @ (3.40 m)	N/A	11'-2" (3.40 m)	1 @ 17'-5" 1 @ (5.31 m)	N/A	17'-5" (5.31 m)
27 (675)	1 @ 8'-11" 1 @ (2.72 m)	N/A	8'-11" (2.72 m)	1 @ 12'-2" 1 @ (3.71 m)	N/A	12'-2" (3.71 m)	1 @ 18'-11" 1 @ (5.77 m)	N/A	18'-11" (5.77 m)
30 (750)	1 @ 9'-5" 1 @ (2.87 m)	N/A	9'-5" (2.87 m)	1 @ 12'-11" 1 @ (3.94 m)	N/A	12'-11" (3.94 m)	1 @ 19'-11" 1 @ (6.07 m)	N/A	19'-11" (6.07 m)
36 (900)	2 @ 11'-0" 2 @ (3.35 m)	N/A	22'-0" (6.70 m)	2 @ 14'-11" 2 @ (4.55 m)	N/A	29'-10" (9.10 m)	2 @ 22'-11" 2 @ (6.99 m)	1 @ 4'-7" 1 @ (1.40 m)	50'-5" (15.38 m)
42 (1050)	2 @ 12'-4" 2 @ (3.76 m)	N/A	24'-8" (7.52 m)	2 @ 16'-8" 2 @ (5.08 m)	N/A	33'-4" (10.16 m)	2 @ 25'-6" 2 @ (7.77 m)	2 @ 5'-5" 2 @ (1.65 m)	61'-10" (18.84 m)
48 (1200)	2 @ 13'-8" 2 @ (4.17 m)	N/A	27'-4" (8.34 m)	2 @ 18'-5" 2 @ (5.61 m)	N/A	36'-10" (11.22 m)	2 @ 28'-0" 2 @ (8.53 m)	3 @ 6'-1" 3 @ (1.85 m)	74'-3" (22.61 m)
54 (1350)	2 @ 15'-0" 2 @ (4.75 m)	N/A	30'-0" (9.50 m)	2 @ 20'-1" 2 @ (6.12 m)	2 @ 6'-9" 2 @ (2.06 m)	53'-8" (16.36 m)	2 @ 30'-7" 2 @ (9.32 m)	3 @ 6'-9" 3 @ (2.06 m)	81'-5" (24.82 m)
60 (1500)	3 @ 16'-7" 3 @ (5.05 m)	N/A	49'-9" (15.15 m)	3 @ 22'-2" 3 @ (6.76 m)	2 @ 7'-7" 2 @ (2.31 m)	81'-8" (24.90 m)	3 @ 33'-7" 3 @ (10.24 m)	4 @ 7'-7" 4 @ (2.31 m)	131'-1" (39.96 m)
66 (1650)	3 @ 17'-11" 3 @ (5.46 m)	N/A	53'-9" (16.38 m)	3 @ 23'-11" 3 @ (7.29 m)	2 @ 8'-3" 2 @ (2.51 m)	88'-3" (26.89 m)	3 @ 36'-2" 3 @ (11.02 m)	4 @ 8'-3" 4 @ (2.51 m)	141'-6" (43.10 m)
72 (1800)	3 @ 19'-6" 3 @ (5.94 m)	N/A	58'-6" (17.82 m)	3 @ 25'-11" 3 @ (7.90 m)	3 @ 8'-11" 3 @ (2.72 m)	104'-6" (31.86 m)	3 @ 39'-2" 3 @ (11.94 m)	4 @ 8'-11" 4 @ (2.72 m)	153'-2" (46.70 m)

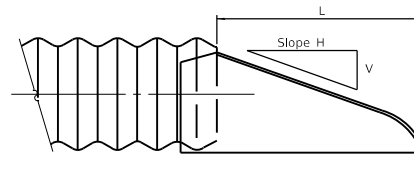
PIPE DIA.	THICKNESS	DIMENSIONS					SLOPE (Approx.) (V:H)	BODY
		A	B	H	L	W		
12 (300)	0.064 (1.63)	6 (150)	6 (150)	6 (150)	21 (535)	24 (610)	1:2 1/2	1 Pc.
15 (375)	0.064 (1.63)	7 (180)	8 (205)	6 (150)	26 (660)	30 (760)	1:2 1/2	1 Pc.
18 (450)	0.079 (2.01)	8 (205)	10 (255)	6 (150)	31 (785)	36 (915)	1:2 1/2	1 Pc.
21 (525)	0.079 (2.01)	9 (230)	12 (305)	6 (150)	36 (915)	42 (1,065 m)	1:2 1/2	1 Pc.
24 (600)	0.079 (2.01)	10 (255)	13 (330)	6 (150)	41 (1,040 m)	48 (1,220 m)	1:2 1/2	1 Pc.
30 (750)	0.109 (2.77)	12 (305)	16 (405)	8 (205)	51 (1,295 m)	60 (1,525 m)	1:2 1/2	1 Pc.
36 (900)	0.109 (2.77)	14 (355)	19 (480)	9 (230)	60 (1,525 m)	72 (1,830 m)	1:2 1/2	2 Pc.
42 (1050)	0.079 (2.01)	16 (405)	22 (560)	11 (280)	69 (1,750 m)	84 (2,135 m)	1:2 1/2	2 Pc.
48 (1200)	0.109 (2.77)	18 (455)	27 (685)	12 (305)	78 (1,980 m)	90 (2,285 m)	1:2 1/2	2 Pc.
54 (1350)	0.109 (2.77)	18 (455)	30 (760)	12 (305)	84 (2,135 m)	102 (2,590 m)	1:2	2 Pc.
60 (1500)	0.109 (2.77)	18 (455)	33 (840)	12 (305)	87 (2,210 m)	114 (2,895 m)	1:1 1/2	3 Pc.
66 (1650)	0.109 (2.77)	18 (455)	36 (915)	12 (305)	87 (2,210 m)	120 (3,050 m)	1:1 1/2	3 Pc.
72 (1800)	0.138 (3.51)	18 (455)	39 (990)	12 (305)	87 (2,210 m)	126 (3,200 m)	1:1 1/3	3 Pc.
78 (1950)	0.168 (4.27)	18 (455)	42 (1,065 m)	12 (305)	87 (2,210 m)	132 (3,355 m)	1:1 1/2	3 Pc.
84 (2250)	0.168 (4.27)	18 (455)	45 (1,145 m)	12 (305)	87 (2,210 m)	138 (3,505 m)	1:1 1/6	3 Pc.



PLAN



END VIEW



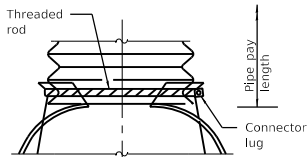
SIDE VIEW

END SECTION

NOTES

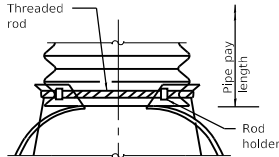
For 60 (1500) thru 84 (2250) sizes, reinforced edges shall be supplemented with stiffener angles. The angles shall be 2x2x1/4(51x51x6.4) for 60 (1500) thru 72 (1800) diameter and 2 1/2 x 2 1/2 x 1/4 (64x64x6.4) for 78 (1950) thru 84 (2250) diameter. The angles shall be attached by 3/8 (M10) rivets or bolts.

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).



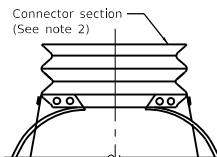
TYPE 1

For 12 (300) thru 24 (600) only
(See Note 1)



TYPE 2

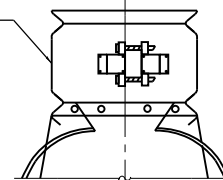
For 30 (750) and 36 (900) only
(See Note 1)



TYPE 3

(See Note 2)

Band shop bolted to end section with 3/8 (M10) bolts.



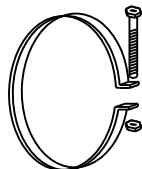
TYPE 4

(See Note 3)

NOTES

- Types 1 and 2 for pipes with annular ends only.
- Type 3 connection may be used for all pipe sizes and includes 12 (300) of the pipe length. The connector section shall be attached to the end section by rivets or bolts and shall be the same metal thickness as the end section. Stub shall be either 2 1/2 (60) pitch x 1/2 (13) depth or 3 (75) pitch x 1 (25) depth annular corrugated pipe.
- Type 4 connection can be used for all pipe sizes. Coupler shall be 2 1/2 x 1/2 (68x13) dimple, hugger, or annular band of 3x1 (75x25). The dimple, hugger, or annular band may be used with corrugated metal pipes having annular ends. For corrugated metal pipes having helical ends, only the dimple band will be allowed.

All dimensions are in Inches (millimeters) unless otherwise shown.



ALTERNATE STRAP CONNECTOR

(For Type 1 only)

1 (25) wide, 0.109 (2.77) thick strap with standard 1/2 x 6 (M12x150) band bolt and nut.

CONNECTIONS OF END SECTIONS

DATE	REVISIONS
1-1-18	Renamed standard.
4-1-16	Revised THICKNESS values in table.

METAL FLARED END SECTION FOR PIPE CULVERTS

STANDARD 542401-03

Illinois Department of Transportation

PASSED January 1, 2018

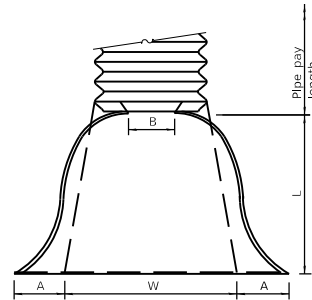
Michael Beard
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2018

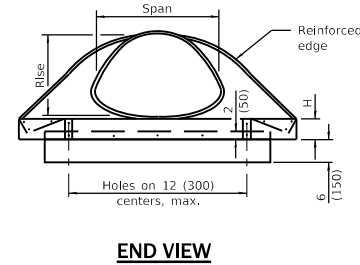
Maureen M. O'Brien
ENGINEER OF DESIGN AND ENVIRONMENT

464-C 03/15/18

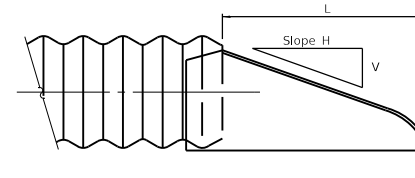
PIPE ARCH DIMENSIONS		THICKNESS	DIMENSIONS					SLOPE (Approx.) (V:H)	BODY
SPAN	RISE		A	B	H	L	W		
17 (432)	13 (330)	0.064 (1.63)	7 (180)	9 (230)	6 (150)	19 (485)	30 (760)	1:2 1/2	1 Pc.
21 (533)	15 (381)	0.064 (1.63)	7 (180)	10 (255)	6 (150)	23 (585)	36 (915)	1:2 1/2	1 Pc.
24 (610)	18 (457)	0.064 (1.63)	8 (205)	12 (305)	6 (150)	28 (710)	42 (1,065 m)	1:2 1/2	1 Pc.
28 (711)	20 (508)	0.079 (2.01)	9 (230)	14 (355)	6 (150)	32 (815)	48 (1,220 m)	1:2 1/2	1 Pc.
35 (889)	24 (610)	0.079 (2.01)	10 (255)	16 (405)	6 (150)	39 (990)	60 (1,525 m)	1:2 1/2	1 Pc.
42 (1,067)	29 (737)	0.079 (2.01)	12 (305)	18 (460)	8 (205)	53 (1,345 m)	75 (1,905 m)	1:2 1/2	1 Pc.
49 (1,245)	33 (838)	0.109 (2.77)	13 (330)	21 (535)	9 (230)	46 (1,170 m)	85 (2,160 m)	1:2 1/2	2 Pc.
57 (1,448)	38 (965)	0.109 (2.77)	18 (460)	26 (660)	12 (305)	63 (1,600 m)	90 (2,285 m)	1:2 1/2	2 Pc.
64 (1,626)	43 (1,092)	0.109 (2.77)	18 (460)	30 (760)	12 (305)	70 (1,780 m)	102 (2,590 m)	1:2 1/2	2 Pc.
71 (1,803)	47 (1,194)	0.138 (3.51)	18 (460)	33 (840)	12 (305)	77 (1,955 m)	114 (2,895 m)	1:2 1/2	3 Pc.
77 (1,956)	52 (1,321)	0.168 (4.27)	18 (460)	36 (915)	12 (305)	77 (1,955 m)	126 (3,200 m)	1:2	3 Pc.
83 (2,108)	57 (1,448)	0.168 (4.27)	18 (460)	39 (990)	12 (305)	77 (1,955 m)	138 (3,505 m)	1:2	3 Pc.



PLAN



END VIEW



SIDE VIEW

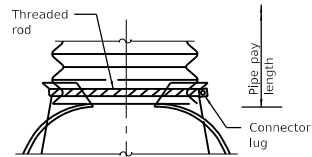
END SECTION

NOTES

For the 77x52 (1956x1321) and 83x57 (2108x1448) sizes, reinforced edges shall be supplemented with 2x2x 1/4 (51x51x6.4) stiffener angles. The angles shall be attached by 3/8 (M10) rivets or bolts.

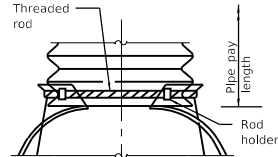
Angle reinforcement shall be placed under the center panel seams on the 77x52 (1956x1321) and 83x57 (2108x1448) sizes.

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).



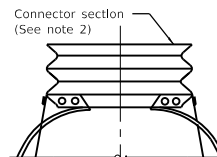
TYPE 1

For 17x13 (432x330) thru 28x20 (711x508) only (See Note 1)



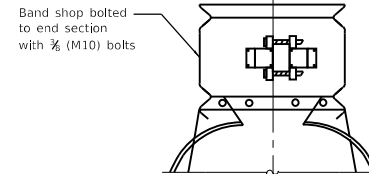
TYPE 2

For 17x13 (432x330) thru 57x38 (1448x965) only (See Note 1)



TYPE 3

(See Note 2)



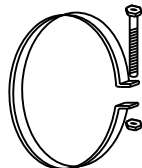
TYPE 4

(See Note 3)

NOTES

- Type 1 and 2 connection shall be used only with pipes with annular ends.
- Type 3 connection can be used with all pipe arch sizes and includes 12 (300) of the pipe length. The annular connector section shall be attached to the end section by rivets or bolts and shall be the same metal thickness as the end section. When coupling the type 3 end section to a pipe with helical ends, only the dimple type coupling band shall be used.
- Type 4 connection can be used with all pipe arch sizes. The end section band shall be either a dimple, hugger, or annular band and can be used with pipes having annular ends. For pipes having helical ends, only the dimple end section band will be used.

All dimensions are in Inches (millimeters) unless otherwise shown.



ALTERNATE STRAP CONNECTOR

(For Type 1 only)

1 (25) wide, 0.109 (2.77) thick strap with standard 1/2x6 (M12x150) band bolt and nut.

CONNECTIONS OF END SECTIONS

DATE	REVISIONS
1-1-18	Renamed standard.
4-1-16	Revised THICKNESS values in table.

METAL FLARED END SECTIONS FOR PIPE ARCHES

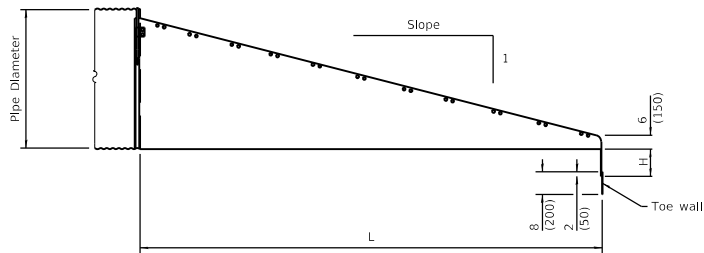
STANDARD 542406-03

Illinois Department of Transportation

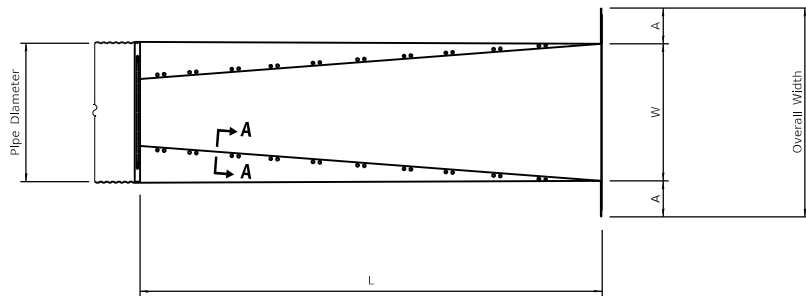
PASSED January 1, 2018
Michael Beard
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2018
Maureen M. O'Brien
 ENGINEER OF DESIGN AND ENVIRONMENT

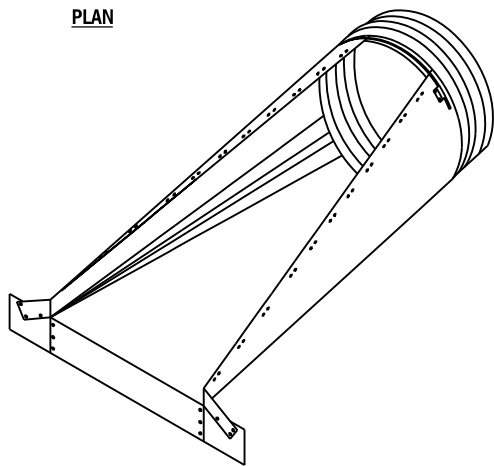
464-C 03/15/11



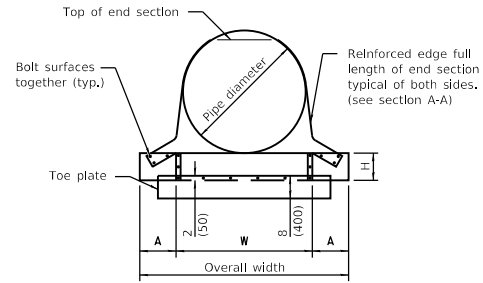
ELEVATION



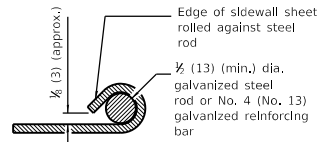
PLAN



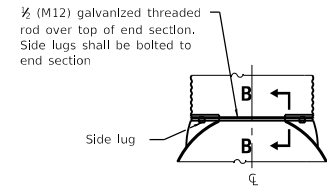
**END SECTION
PERSPECTIVE VIEW**



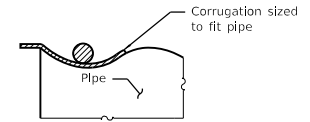
END VIEW



SECTION A-A



CONNECTIONS OF END SECTION



SECTION B-B

METAL END SECTIONS FOR ROUND PIPE CULVERT

PIPE DIA.	METAL THICK. (min.)	DIMENSIONS					
		A	H	W	OVERALL WIDTH	L	
						SLOPE 1:4	SLOPE 1:6
15 (375)	0,064 (1,63)	8 (200)	6 (150)	21 (525)	37 (950)	20 (500)	30 (750)
18 (450)	0,064 (1,63)	8 (200)	6 (150)	24 (600)	40 (1000)	32 (800)	48 (1200)
21 (525)	0,064 (1,63)	8 (200)	6 (150)	27 (700)	43 (1100)	44 (1100)	60 (1500)
24 (600)	0,064 (1,63)	8 (200)	6 (150)	30 (750)	46 (1150)	55 (1400)	83 (2100)
30 (750)	0,109 (2,77)	12 (300)	9 (230)	36 (900)	60 (1500)	79 (2000)	118 (3000)
36 (900)	0,109 (2,77)	12 (300)	9 (230)	42 (1050)	66 (1650)	102 (2600)	154 (3900)
42 (1050)	0,109 (2,77)	16 (400)	12 (300)	48 (1200)	80 (2000)	126 (3200)	189 (4800)
48 (1200)	0,109 (2,77)	16 (400)	12 (300)	54 (1350)	86 (2150)	150 (3800)	224 (5700)
54 (1350)	0,109 (2,77)	16 (400)	12 (300)	60 (1500)	92 (2300)	173 (4400)	260 (6600)
60 (1500)	0,109 (2,77)	16 (400)	12 (300)	66 (1650)	98 (2450)	197 (5000)	295 (7500)

GENERAL NOTES

See roadway plans for slope (V:H) and pipe diameter.

Provide traversable pipe grate when specified.

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-18	New standard.

**SLOPED METAL END SECTIONS
FOR PIPE CULVERTS 15" (375 mm)
THRU 60" (1500 mm) DIA.**
(Sheet 1 of 2)

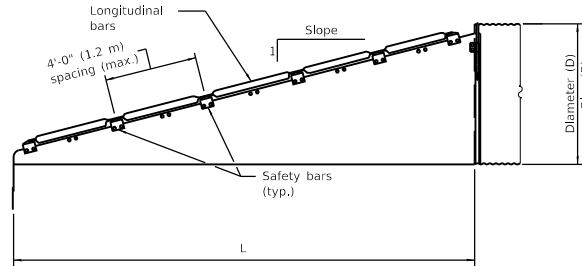
STANDARD 542411

Illinois Department of Transportation

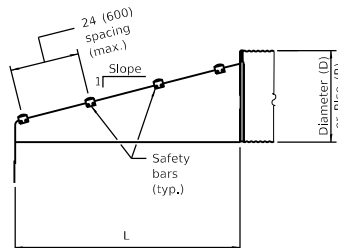
PASSED January 1, 2018
Michael Beard
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2018
Maureen M. O'Brien
ENGINEER OF DESIGN AND ENVIRONMENT

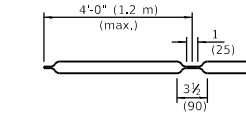
811-1 03/15/18



**CROSS DRAINAGE
END SECTION - ELEVATION**

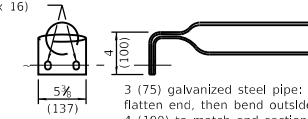


**PARALLEL DRAINAGE
END SECTION - ELEVATION**



LONGITUDINAL DRAINAGE BAR

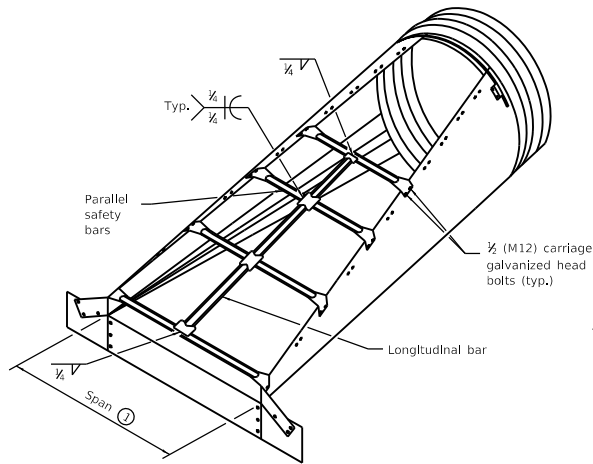
1 x 3/8 (25 x 16)
slots



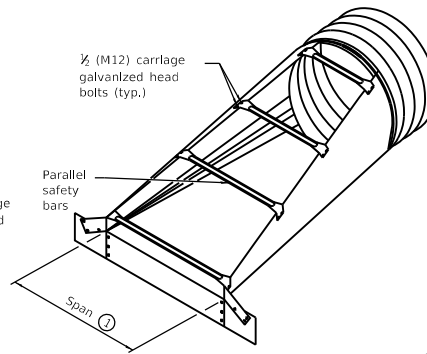
3 (75) galvanized steel pipe:
flatten end, then bend outside
4 (100) to match end section
sides.

PARALLEL BARS

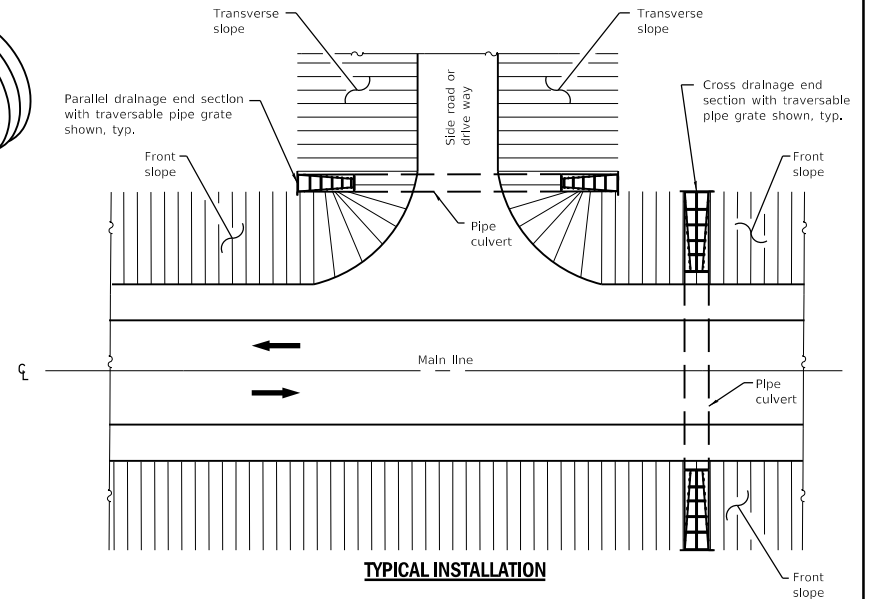
SAFETY BAR DETAILS



CROSS DRAINAGE END SECTION

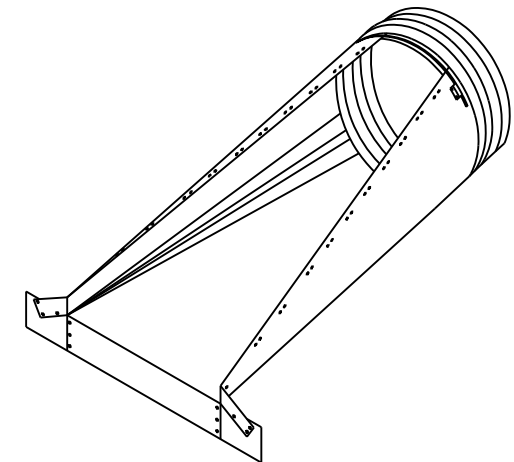
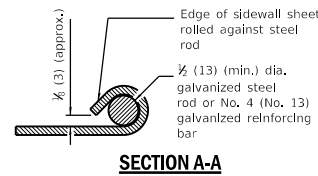
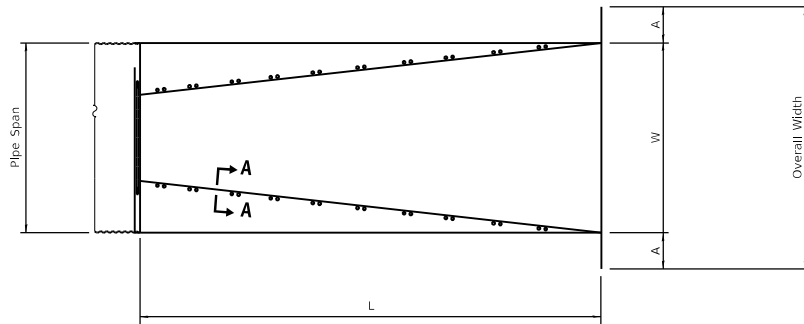
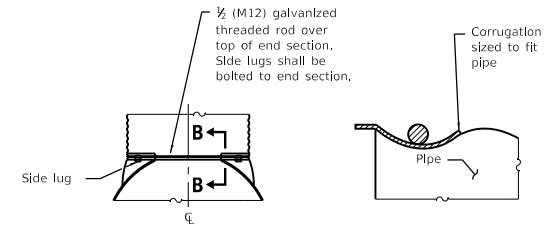
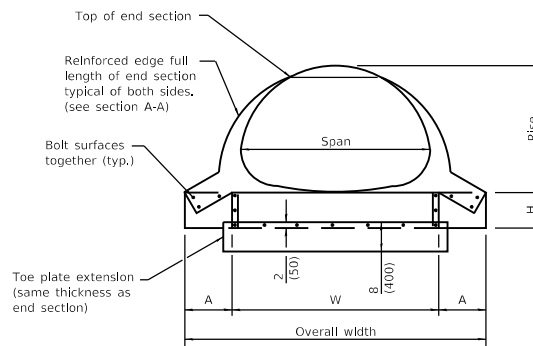
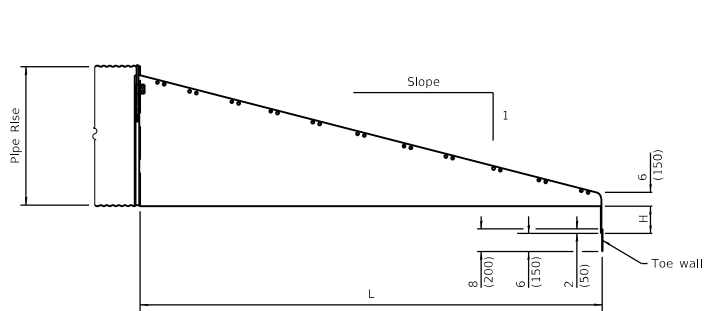


**PARALLEL DRAINAGE
END SECTION**



TYPICAL INSTALLATION

① Provide longitudinal bar(s) when the span exceeds 30 (750). Provide additional longitudinal bars as needed so that spacing does not exceed 30 (750) for larger end sections.



METAL END SECTIONS FOR PIPE ARCH CULVERT

PIPE EQUIV. ROUND DIA.	METAL THICK. (min.)	DIMENSIONS											
		A	H	W	OVERALL WIDTH	CORRIGATION 2½ x ½				CORRIGATION 3 x 1 OR 5 x 1			
						SPAN	RISE	SLOPE 1:4	SLOPE 1:6	SPAN	RISE	SLOPE 1:4	SLOPE 1:6
15 (375)	0.064 (1.63)	8 (200)	6 (150)	23 (585)	39 (1000)	17 (430)	13 (330)	12 (300)	18 (460)	—	—	—	—
18 (450)	0.064 (1.63)	8 (200)	6 (150)	27 (700)	43 (1100)	21 (530)	15 (380)	20 (500)	30 (750)	—	—	—	—
21 (525)	0.064 (1.63)	8 (200)	6 (150)	30 (750)	46 (1150)	24 (610)	18 (460)	32 (810)	48 (1220)	—	—	—	—
24 (600)	0.064 (1.63)	8 (200)	6 (150)	33 (830)	49 (1250)	28 (700)	20 (500)	40 (1000)	60 (1500)	—	—	—	—
30 (750)	0.109 (2.77)	12 (300)	9 (225)	40 (1025)	64 (1625)	35 (870)	24 (630)	55 (1400)	83 (2100)	—	—	—	—
36 (900)	0.109 (2.77)	12 (300)	9 (225)	47 (1200)	71 (1800)	42 (1060)	29 (740)	75 (1900)	112 (2850)	—	—	—	—
42 (1050)	0.109 (2.77)	16 (400)	12 (300)	54 (1375)	86 (2175)	49 (1240)	33 (840)	90 (2300)	136 (3450)	—	—	—	—
48 (1200)	0.109 (2.77)	16 (400)	12 (300)	62 (1575)	94 (2375)	57 (1440)	38 (970)	110 (2800)	165 (4200)	53 (1340)	41 (1050)	124 (3150)	186 (4720)
54 (1350)	0.109 (2.77)	16 (400)	12 (300)	69 (1750)	101 (2550)	64 (1620)	43 (1100)	130 (3300)	195 (4950)	60 (1520)	46 (1170)	144 (3660)	216 (5490)
60 (1500)	0.109 (2.77)	16 (400)	12 (300)	76 (1925)	107 (2725)	71 (1800)	47 (1200)	146 (3700)	218 (5550)	66 (1670)	51 (1300)	164 (4170)	246 (6250)
66 (1650)	0.109 (2.77)	16 (400)	12 (300)	79 (2000)	111 (2800)	77 (1950)	52 (1320)	180 (4600)	270 (6850)	73 (1850)	55 (1400)	180 (4580)	270 (6860)
72 (1800)	0.109 (2.77)	16 (400)	12 (300)	86 (2225)	120 (3025)	83 (2100)	57 (1450)	185 (4700)	278 (7050)	81 (2050)	59 (1500)	196 (4980)	294 (7470)

GENERAL NOTES

See roadway plans for slope (V:H) and pipe diameter.

Provide traversable pipe grate when specified.

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-18	New standard.

SLOPED METAL END SECTIONS FOR PIPE ARCH CULVERTS 15" (375 mm) THRU 72" (1800 mm) EQUIVALENT DIA.

(Sheet 1 of 2)

STANDARD 542416

Illinois Department of Transportation

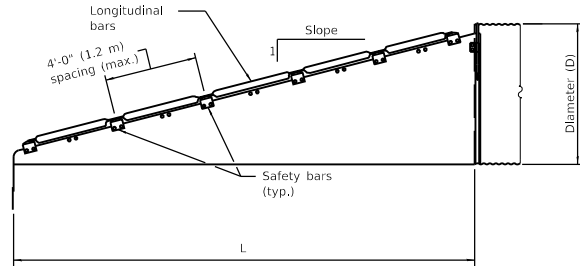
PASSED January 1, 2018

Michael Beard
ENGINEER OF POLICY AND PROCEDURES

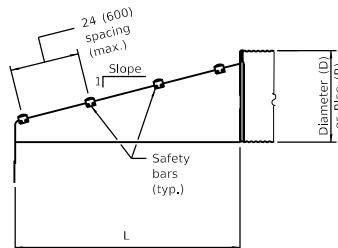
APPROVED January 1, 2018

Maureen M. Behr
ENGINEER OF DESIGN AND ENVIRONMENT

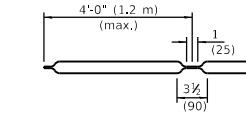
811-C 03/15/18



**CROSS DRAINAGE
END SECTION - ELEVATION**

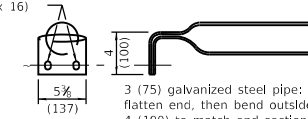


**PARALLEL DRAINAGE
END SECTION - ELEVATION**



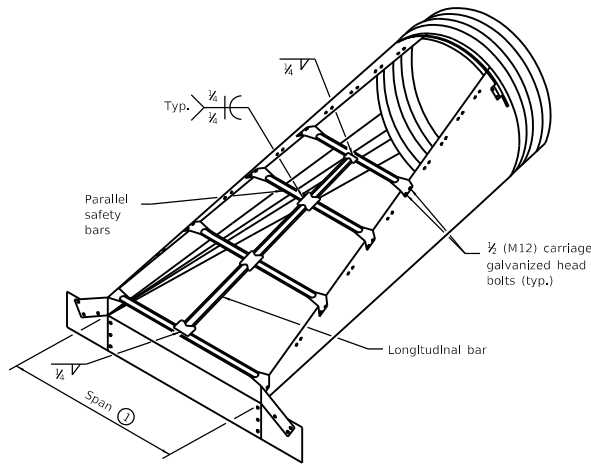
LONGITUDINAL DRAINAGE BAR

1 x 3/8 (25 x 16) slots

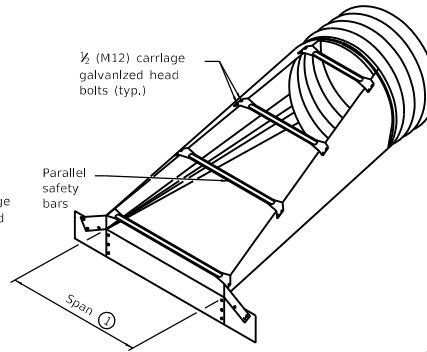


PARALLEL BARS

SAFETY BAR DETAILS

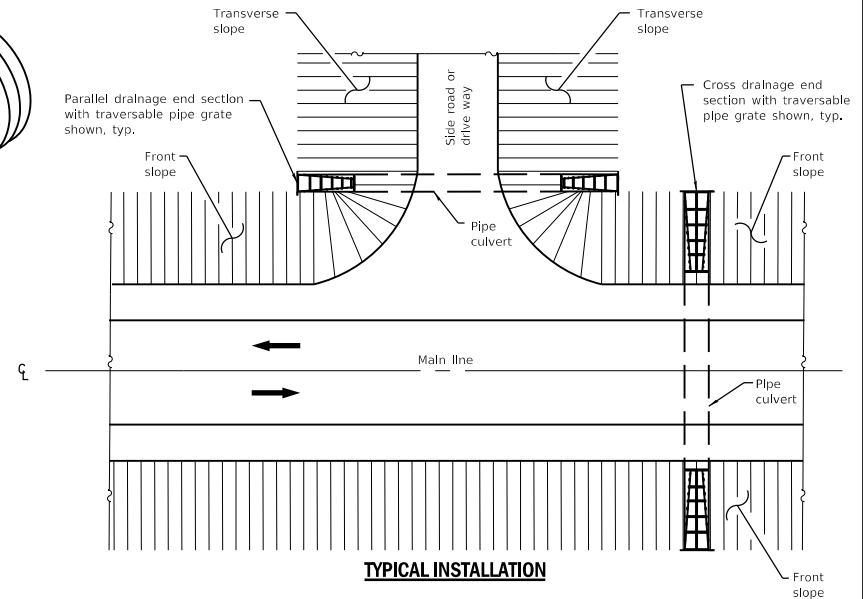


CROSS DRAINAGE END SECTION

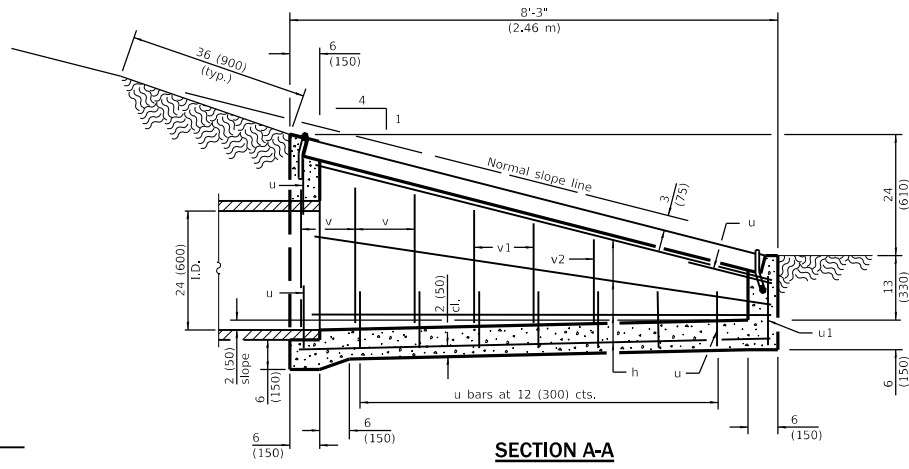


**PARALLEL DRAINAGE
END SECTION**

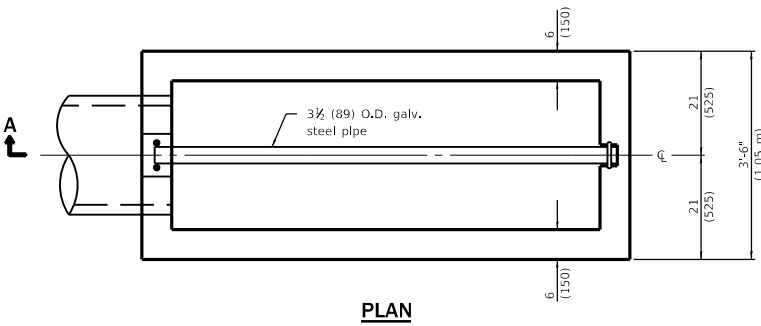
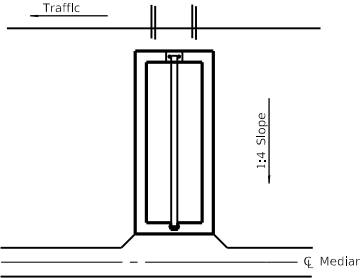
① Provide longitudinal bar(s) when the span exceeds 30 (750). Provide additional longitudinal bars as needed so that spacing does not exceed 30 (750) for larger end sections.



TYPICAL INSTALLATION



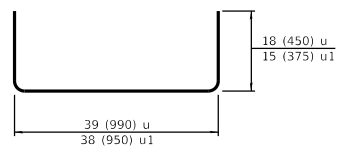
SECTION A-A



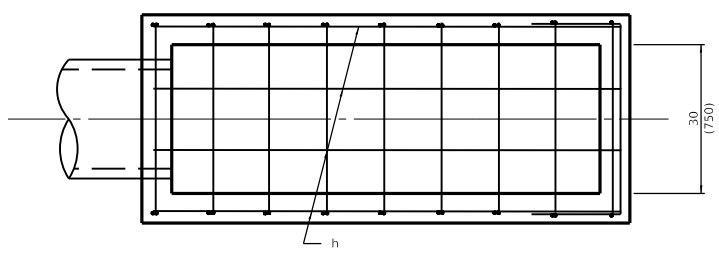
PLAN

Material required for one Inlet box

Bar	Qty.	Size	Length
h	10	No. 4 (No. 13)	7'-9" (2.35 m)
u	10	No. 4 (No. 13)	6'-3" (1.90 m)
u1	1	No. 4 (No. 13)	5'-8" (1.70 m)
v	6	No. 4 (No. 13)	30 (760)
v1	4	No. 4 (No. 13)	24 (610)
v2	2	No. 4 (No. 13)	18 (460)
Galv. Steel Pipe		3 1/2 (89) O.D.	8'-0" (2.38 m)
Concrete		cu. yds. (m³)	1.2 (0.9)
Reinf. Bars		lbs. (kg)	115 (52.2)



Bars u & u1



PLAN OF REINFORCEMENT

Sketch showing location and direction of box in relation to median.

GENERAL NOTES
 All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).
 All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-07	Soft converted metric reinforcement bars.

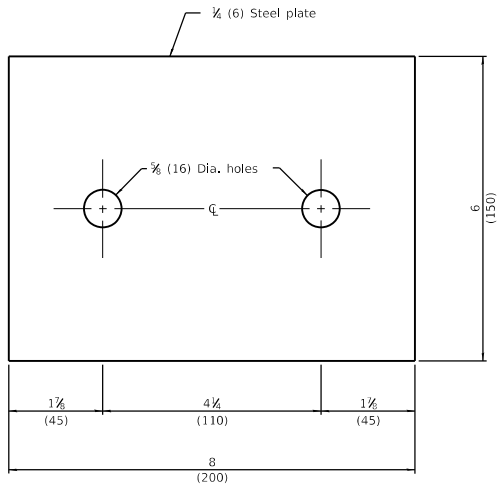
**INLET BOX
 TYPE 24 (600) A**
 (Sheet 1 of 2)
STANDARD 542501-02

Illinois Department of Transportation

PASSED January 1, 2009
Spotts
 ENGINEER OF POLICY AND PROCEDURES

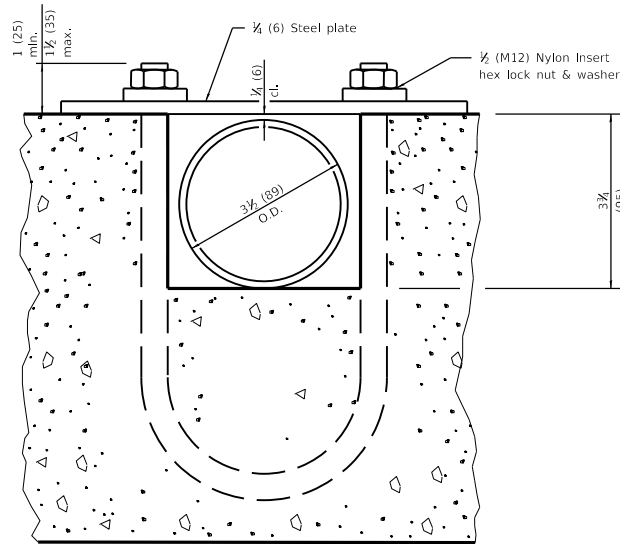
APPROVED January 1, 2009
Lee E. Han
 ENGINEER OF DESIGN AND ENVIRONMENT

464-C1 03/15/02

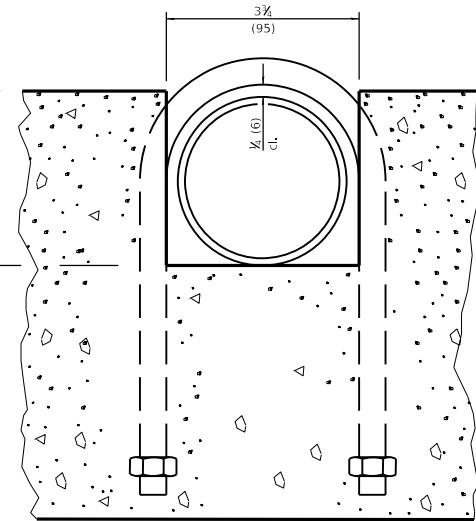


TOP ANCHOR PLATE

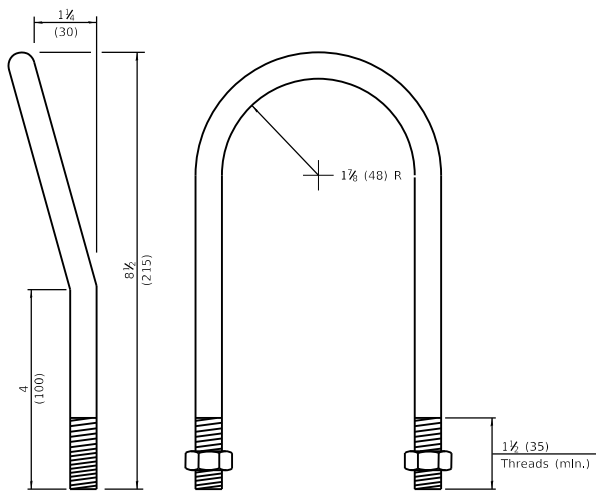
(1 - required)



SECTION B-B

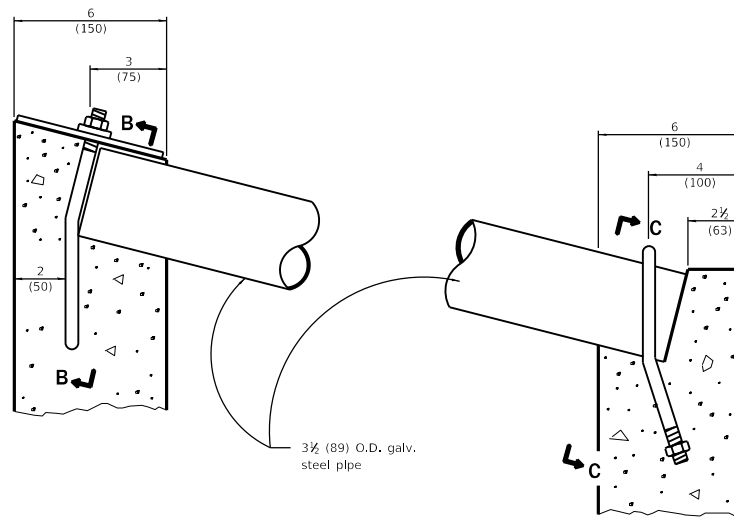


SECTION C-C



1/2 (M12) U BOLT

(2 - required)



DETAIL AT BLOCKOUTS

Illinois Department of Transportation

PASSED January 1, 2009

ENGINEER OF POLICY AND PROCEDURES

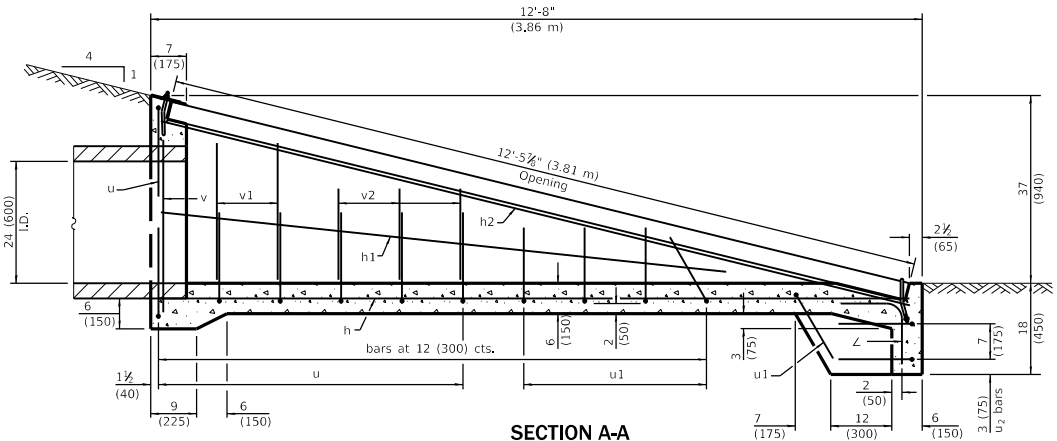
APPROVED January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

**INLET BOX
TYPE 24 (600) A**

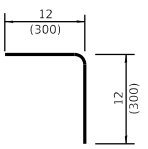
(Sheet 2 of 2)

STANDARD 542501-02

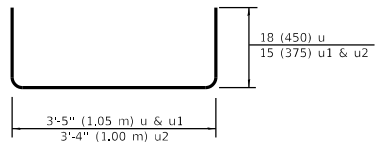


SECTION A-A

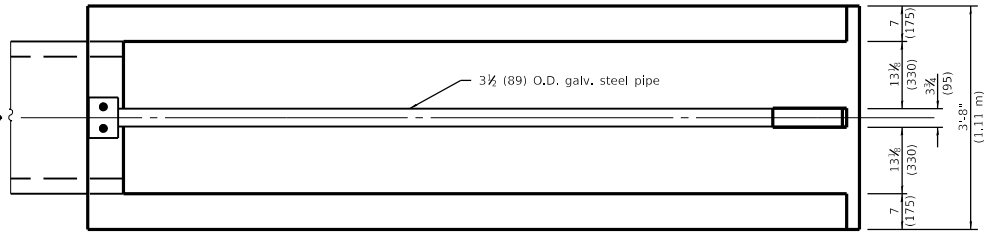
Material required for one inlet box			
Bar	Qty.	Size	Length
h	4	No. 4 (No. 13)	12'-4" (3.76 m)
h1	2	No. 4 (No. 13)	9'-4" (2.84 m)
h2	2	No. 4 (No. 13)	12'-8" (3.86 m)
∟	4	No. 4 (No. 13)	2'-0" (0.60 m)
u	7	No. 4 (No. 13)	6'-5" (1.95 m)
u1	5	No. 4 (No. 13)	5'-11" (1.80 m)
u2	2	No. 4 (No. 13)	5'-10" (1.75 m)
v	2	No. 4 (No. 13)	34 (864)
v1	4	No. 4 (No. 13)	27 (680)
v2	6	No. 4 (No. 13)	18 (460)
Concrete		cu. yds. (m ³)	1.9 (1.5)
Reinf. Bars		lbs. (kg)	141 (64.0)
Galv. Steel Pipe		3 1/2 (89) O.D.	12'-5 1/2" (3.80 m)



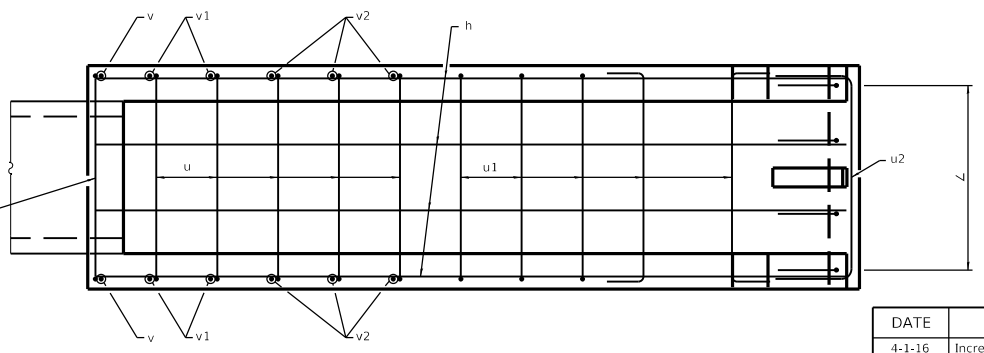
Bar L



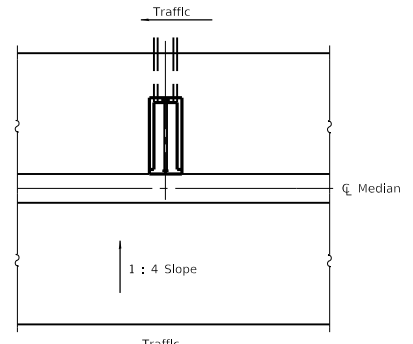
Bars u, u1 & u2



PLAN



PLAN OF REINFORCEMENT



Sketch showing location and direction of box in relation to median.

GENERAL NOTES

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in Inches (millimeters) unless otherwise shown.

DATE	REVISIONS
4-1-16	Increased length of inlet box to provide clearance for top u-bolt.
1-1-09	Switched units to English (metric).

**INLET BOX
TYPE 24 (600) B**

(Sheet 1 of 2)

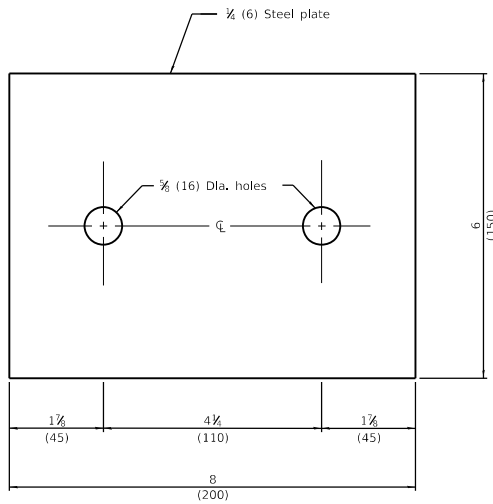
STANDARD 542506-03

Illinois Department of Transportation

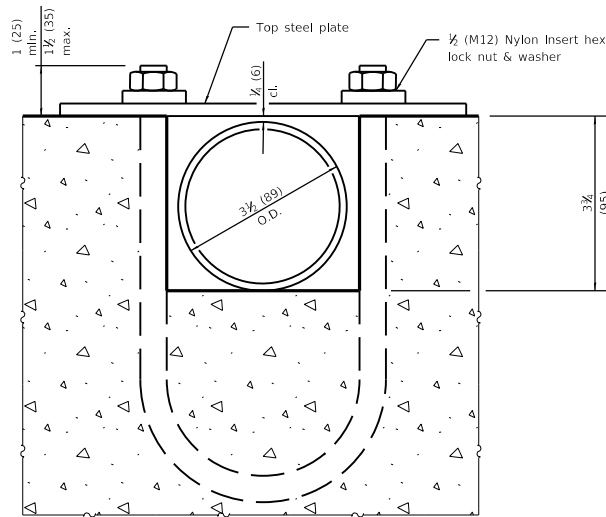
PASSED April 1, 2016
Michael Beard
ENGINEER OF POLICY AND PROCEDURES

APPROVED April 1, 2016
[Signature]
ENGINEER OF DESIGN AND ENVIRONMENT

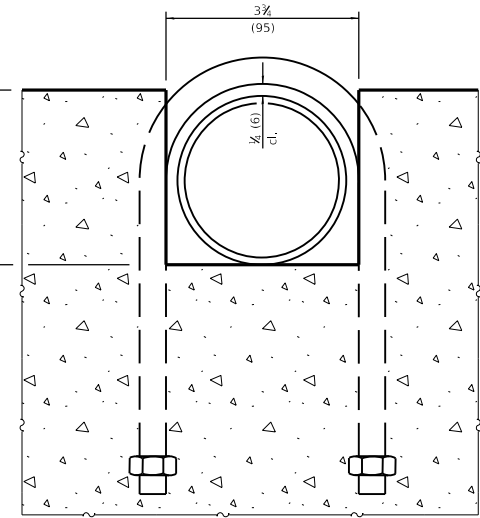
464-C 03/15/11



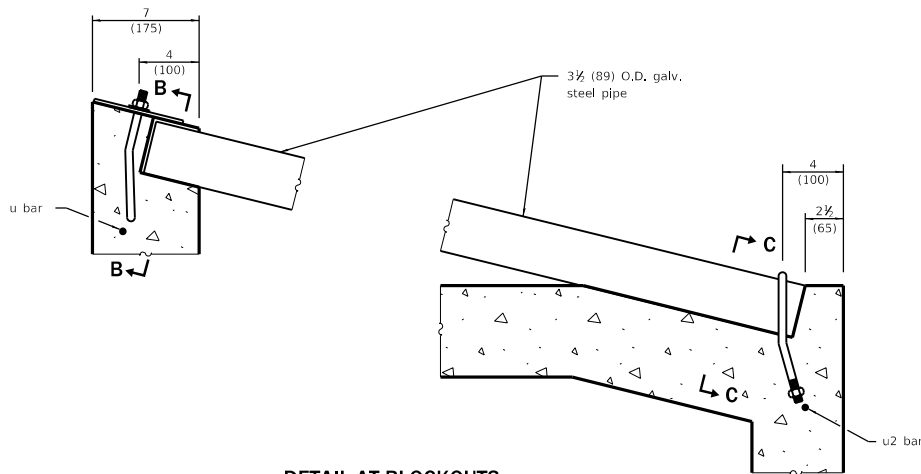
TOP ANCHOR PLATE
(1 - required)



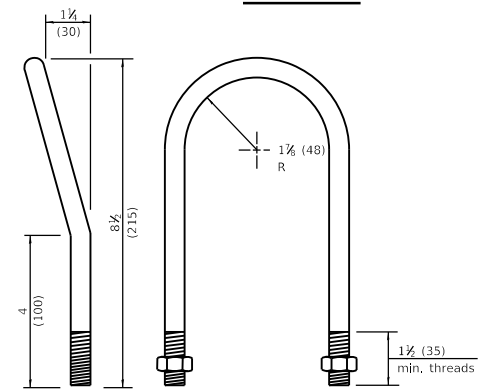
SECTION B-B



SECTION C-C



DETAIL AT BLOCKOUTS



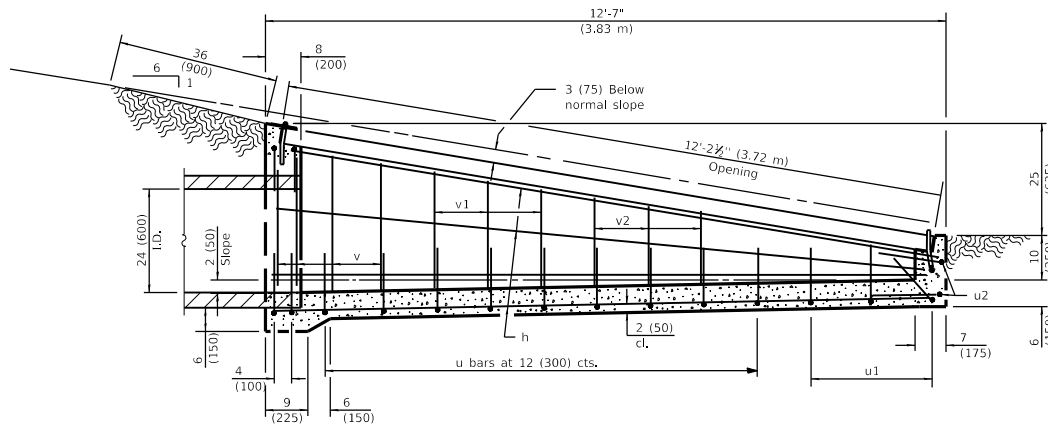
1/2 (M12) U BOLT
(2 - required)

Illinois Department of Transportation
 PASSED April 1, 2016
Michael Beard
 ENGINEER OF POLICY AND PROCEDURES
 APPROVED April 1, 2016
[Signature]
 ENGINEER OF DESIGN AND ENVIRONMENT

INLET BOX
TYPE 24 (600) B

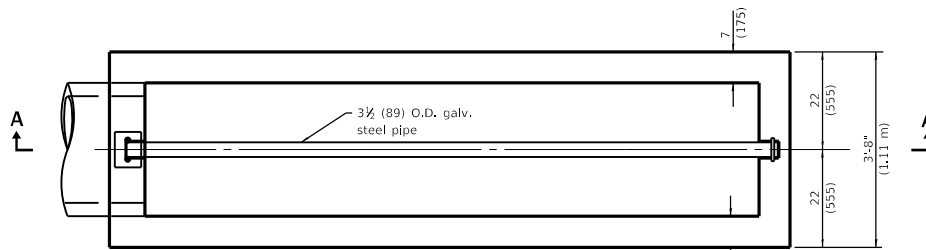
(Sheet 2 of 2)

STANDARD 542506-03

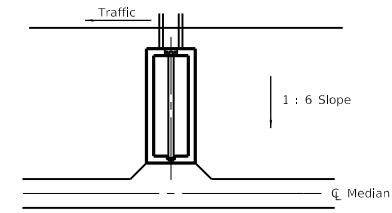


SECTION A-A

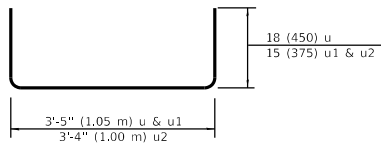
Material required for one Inlet box			
Bar	Qty.	Size	Length
h	10	No. 4 (No. 13)	12'-0" (3.65 m)
u	13	No. 4 (No. 13)	6'-5" (1.95 m)
u1	3	No. 4 (No. 13)	5'-11" (1.80 m)
u2	2	No. 4 (No. 13)	5'-10" (1.75 m)
v	8	No. 4 (No. 13)	30 (760)
v1	6	No. 4 (No. 13)	24 (610)
v2	6	No. 4 (No. 13)	18 (460)
Concrete	cu. yds. (m ³)		1.9 (1.45)
Reinf. Bars	lbs. (kg)		83 (183)
Galv. Steel Pipe	3 1/2 (89) O.D.		12'-2 1/2" (3.71 m)



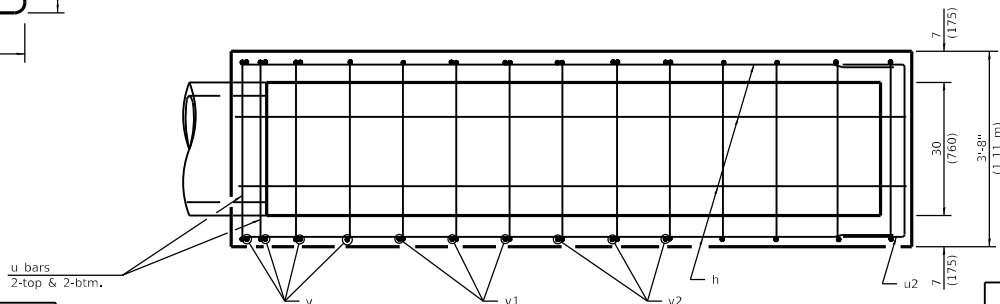
PLAN



Sketch showing location and direction of box in relation to C Median.



Bars u, u1 & u2



PLAN OF REINFORCEMENT

GENERAL NOTES

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2009

APPROVED January 1, 2009

ENGINEER OF POLICY AND PROCEDURES

ENGINEER OF DESIGN AND ENVIRONMENT

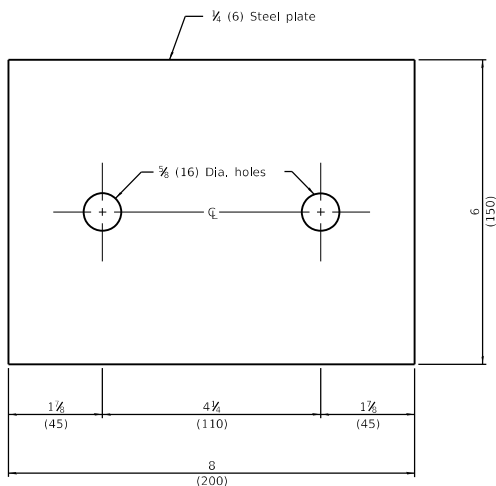
DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-07	Soft converted metric reinforcement bars.

INLET BOX

TYPE 24 (600) C

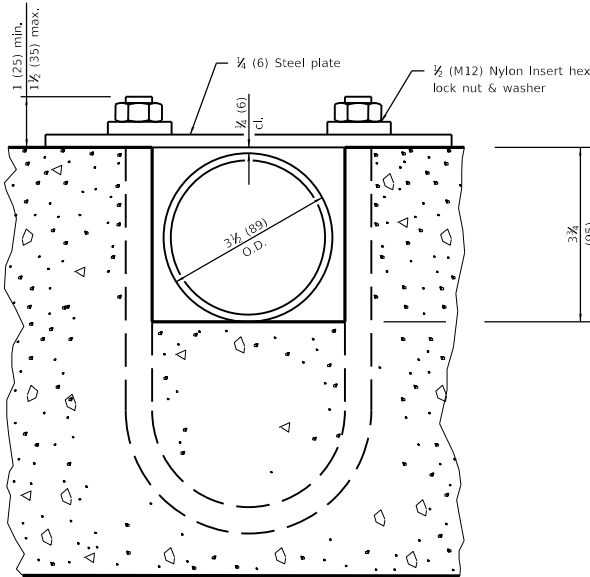
(Sheet 1 of 2)

STANDARD 542511-02

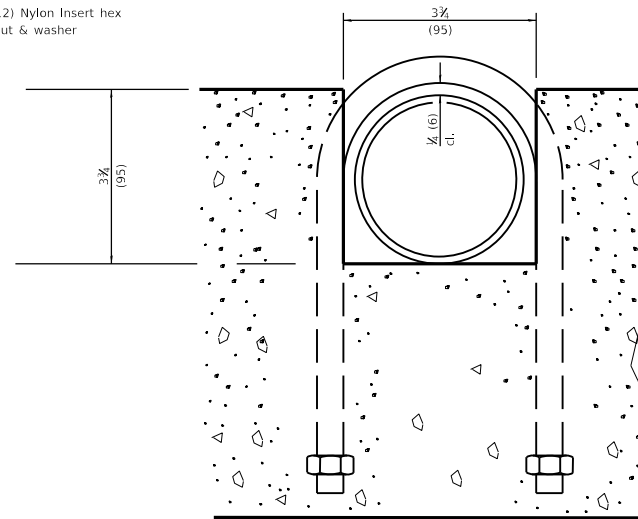


TOP ANCHOR PLATE

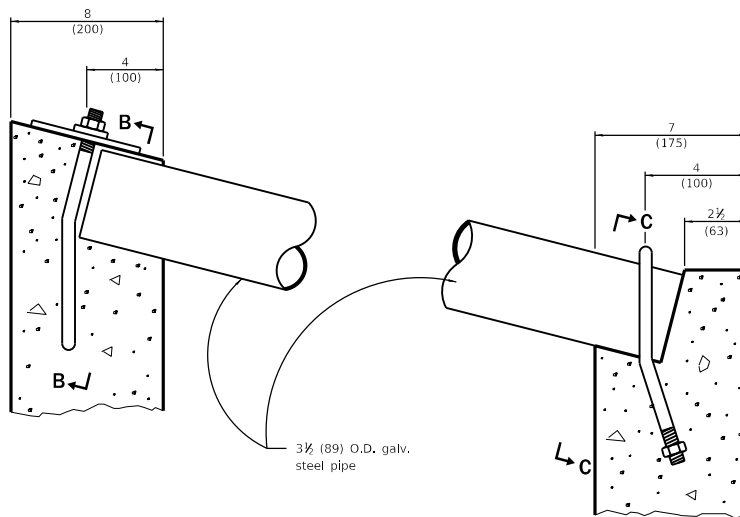
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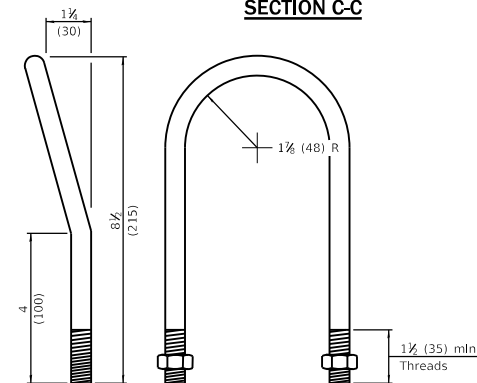
SECTION B-B



SECTION C-C



DETAIL AT BLOCKOUTS



1/2 (M12) U BOLT

(2 - required)

**INLET BOX
TYPE 24 (600) C**

(Sheet 2 of 2)

STANDARD 542511-02

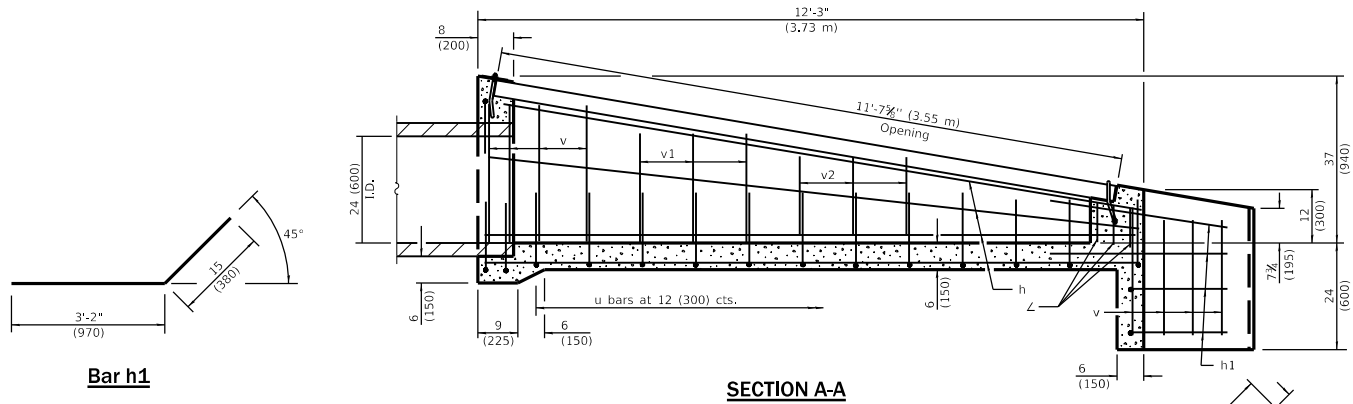
Illinois Department of Transportation

PASSED January 1, 2009

ENGINEER OF POLICY AND PROCEDURES

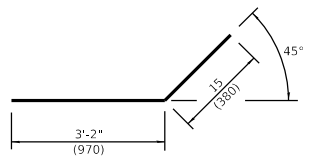
APPROVED January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

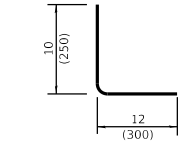


Material required for one Inlet box

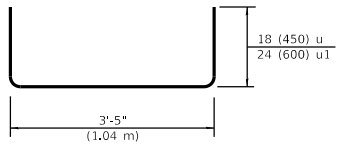
Bar	Qty.	Size	Length
h	10	No. 4 (No. 13)	12'-0" (3.66 m)
h1	8	No. 4 (No. 13)	4'-5" (1.35 m)
L	3	No. 4 (No. 13)	22 (550)
u	14	No. 4 (No. 13)	6'-5" (1.94 m)
u1	2	No. 4 (No. 13)	7'-5" (2.24 m)
v	16	No. 4 (No. 13)	30 (760)
v1	6	No. 4 (No. 13)	24 (610)
v2	8	No. 4 (No. 13)	18 (460)
Concrete	cu. yds. (m ³)		2.2 (1.68)
Reinf. Bars	lbs. (kg)		220 (99.8)
Galv. Steel Pipe	3 1/2 (89) O.D.		11'-7 1/2" (3.55 m)



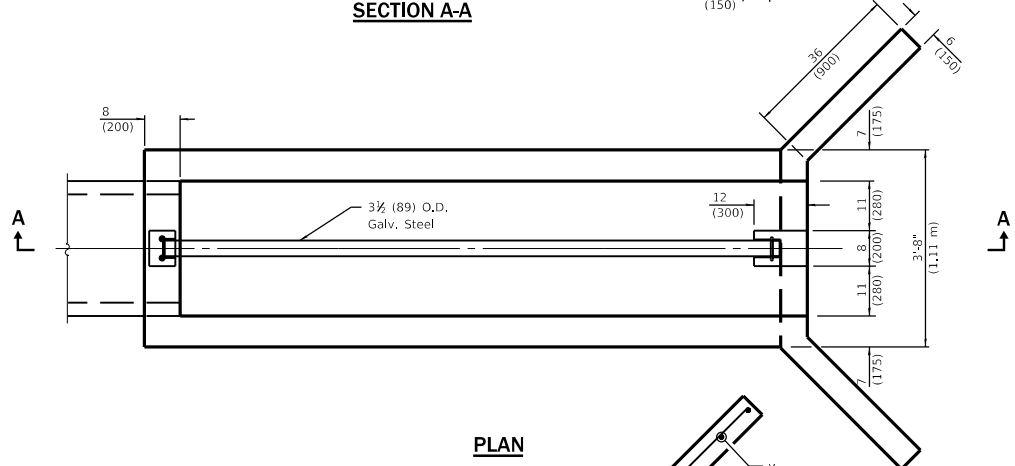
Bar h1



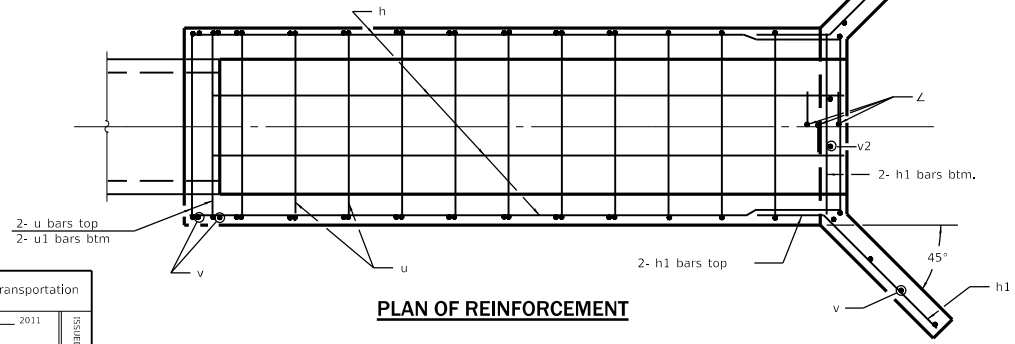
Bar L



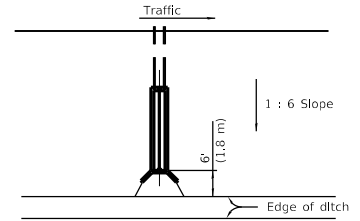
Bar u & u1



PLAN



PLAN OF REINFORCEMENT



Sketch showing location and direction of box in relation to ditch.

GENERAL NOTES

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in Inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-11	Corrected two bars in weir to 'v2'.
1-1-09	Switched units to English (metric).

**INLET BOX
TYPE 24 (600) D**

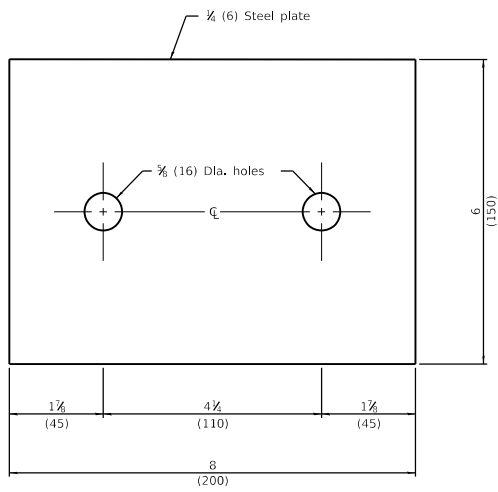
(Sheet 1 of 2)

STANDARD 542516-03

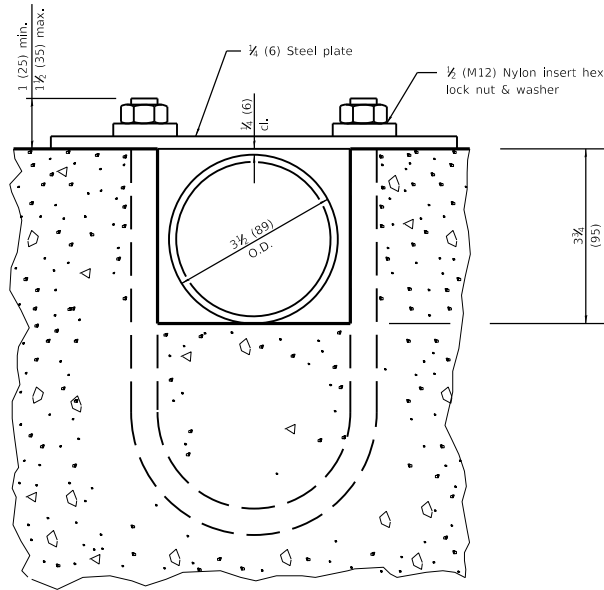
Illinois Department of Transportation

PASSED January 1, 2011
Michael Beard
 ENGINEER OF POLICY AND PROCEDURES

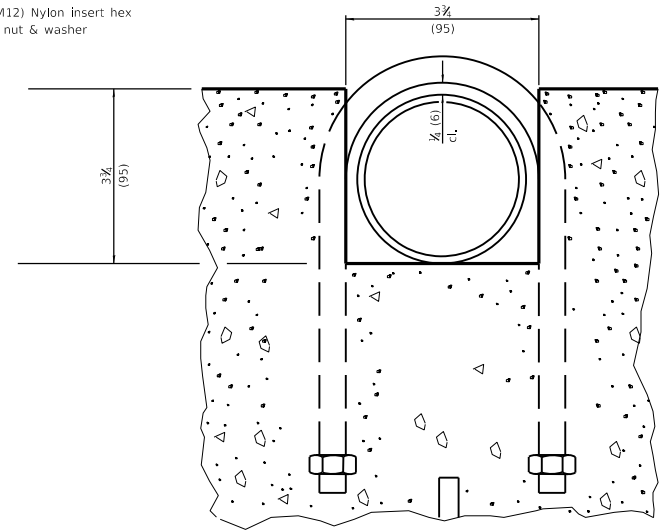
APPROVED January 1, 2011
Scott Smith
 ENGINEER OF DESIGN AND ENVIRONMENT



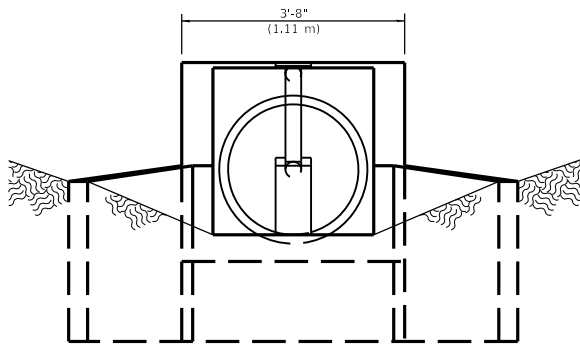
TOP ANCHOR PLATE
(1-required)



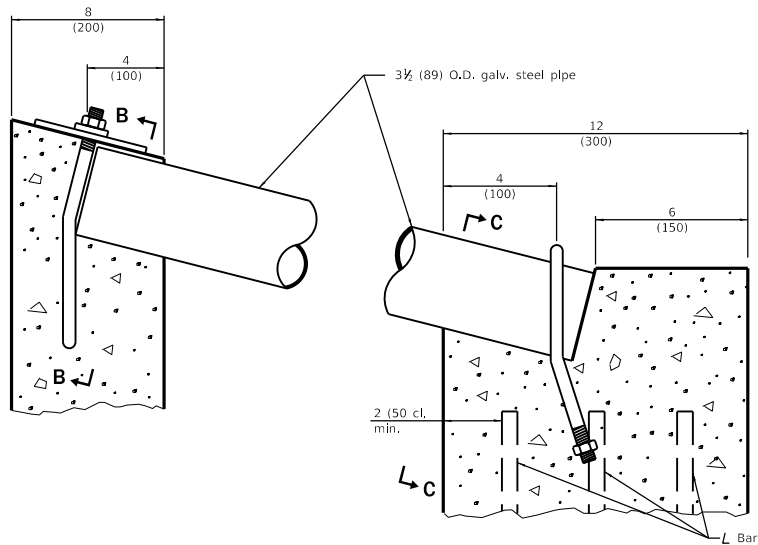
SECTION B-B



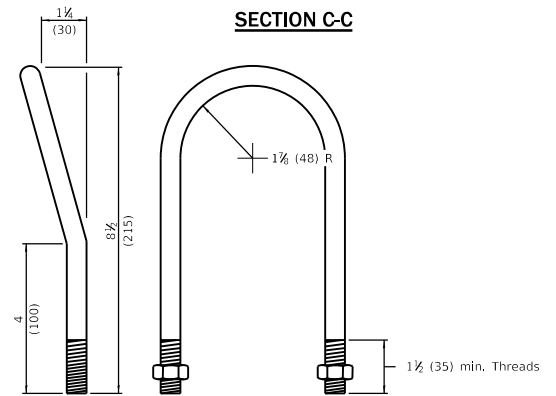
SECTION C-C



END VIEW



DETAIL AT BLOCKOUTS



1/2 (M12) U BOLT
(2-required)

**INLET BOX
TYPE 24 (600) D**

(Sheet 2 of 2)

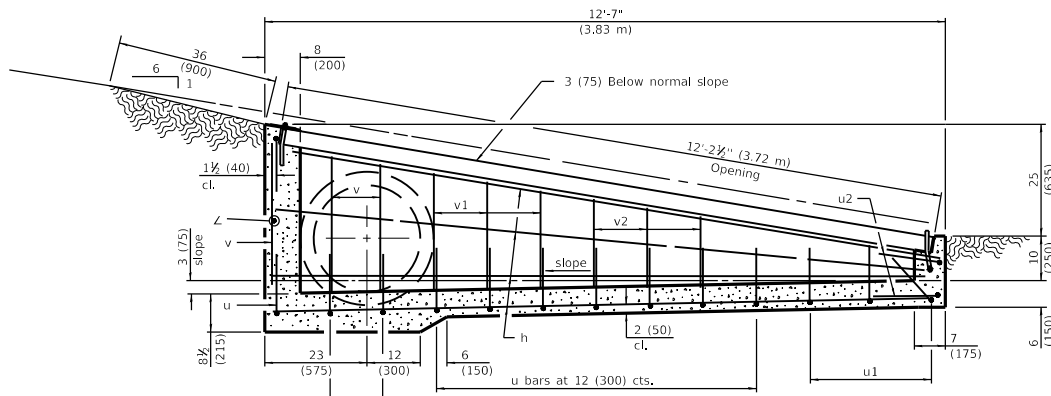
STANDARD 542516-03

Illinois Department of Transportation

PASSED January 1, 2011
Michael Beard
ENGINEER OF POLICY AND PROCEDURES

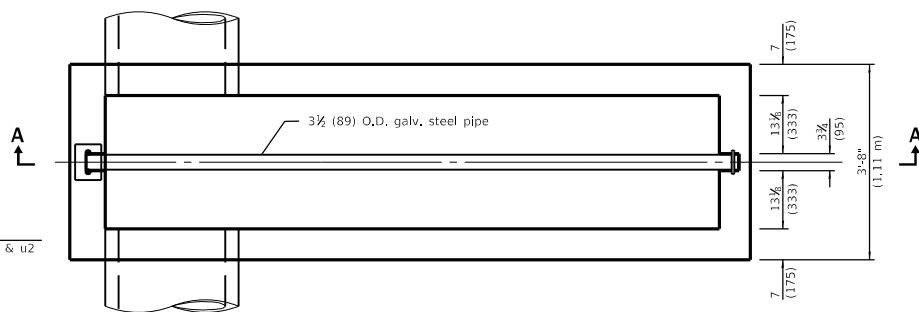
APPROVED January 1, 2011
Scott Smith
ENGINEER OF DESIGN AND ENVIRONMENT

LEG-C1 03/11/SS

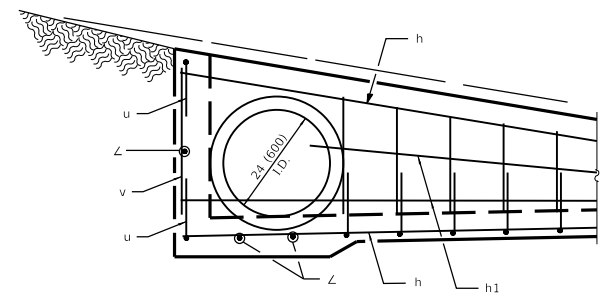


SECTION A-A

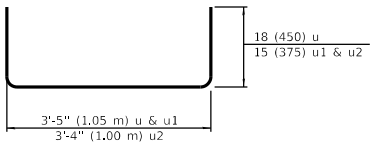
Material required for one Inlet box			
Bar	Qty.	Size	Length
h	8	No. 4 (No. 13)	12'-0" (3.66 m)
h1	2	No. 4 (No. 13)	9'-0" (2.75 m)
L	5	No. 4 (No. 13)	5'-0" (1.50 m)
u	9	No. 4 (No. 13)	6'-5" (1.95 m)
u1	3	No. 4 (No. 13)	5'-11" (1.80 m)
u2	2	No. 4 (No. 13)	5'-10" (1.75 m)
v	6	No. 4 (No. 13)	30 (760)
v1	6	No. 4 (No. 13)	24 (610)
v2	6	No. 4 (No. 13)	18 (460)
Concrete	cu. yds. (m ³)		2.0 (1.5)
Reinforcement Bars	lbs. (kg)		175 (79.4)
Galv. Steel Pipe	3 1/2 (89) O.D.		12'-2 1/2" (3.71 m)



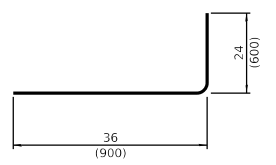
PLAN



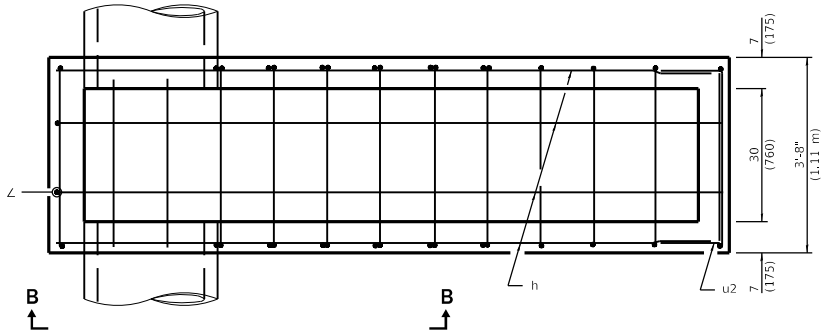
SECTION B-B



Bars u, u1 & u2



Bar L



PLAN OF REINFORCEMENT

GENERAL NOTES
 All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).
 All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-07	Soft converted metric reinforcement bars.

**INLET BOX
 TYPE 24 (600) E**

(Sheet 1 of 2)

STANDARD 542521-02

Illinois Department of Transportation

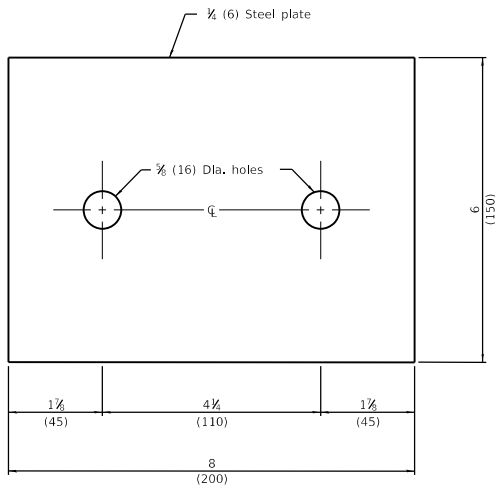
PASSED January 1, 2009
Spotts

ENGINEER OF POLICY AND PROCEDURES

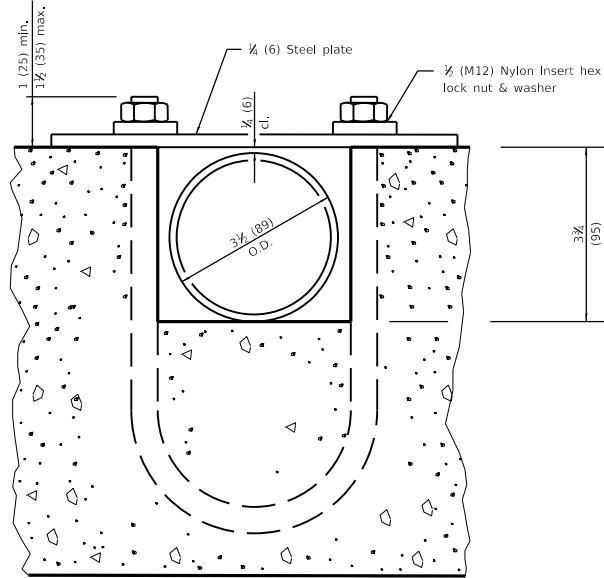
APPROVED January 1, 2009
Lee E. Han

ENGINEER OF DESIGN AND ENVIRONMENT

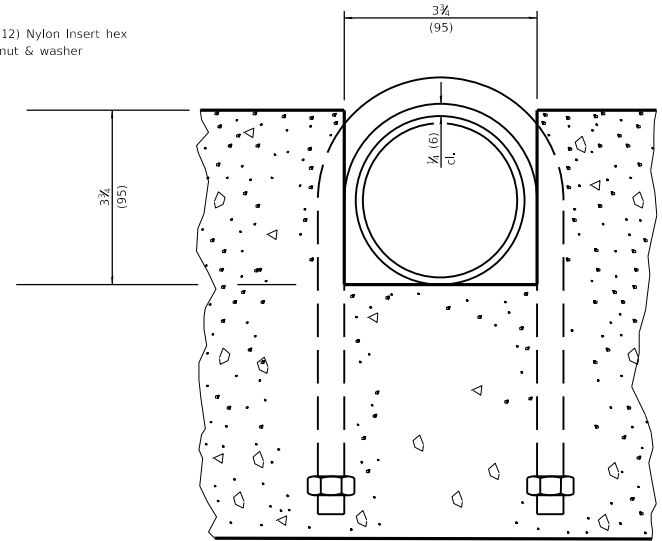
464-C OMISSI



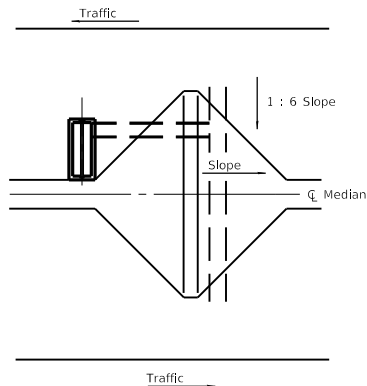
TOP ANCHOR PLATE
(1 - required)



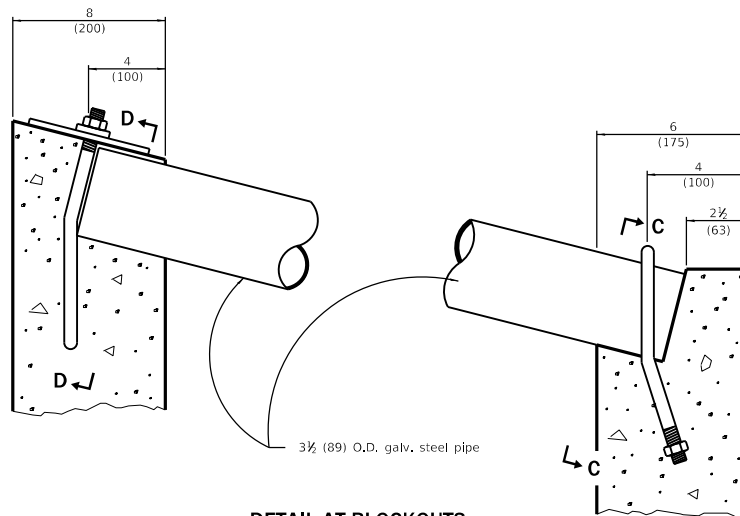
SECTION D-D



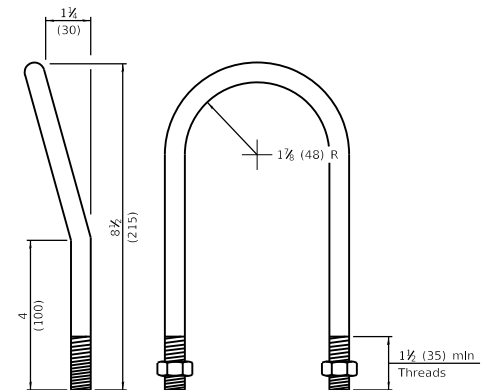
SECTION C-C



Sketch showing location and direction of box in relation to \bar{C} median.



DETAIL AT BLOCKOUTS



1/2 (M12) U BOLT
(2 - required)

**INLET BOX
TYPE 24 (600) E**

(Sheet 2 of 2)

STANDARD 542521-02

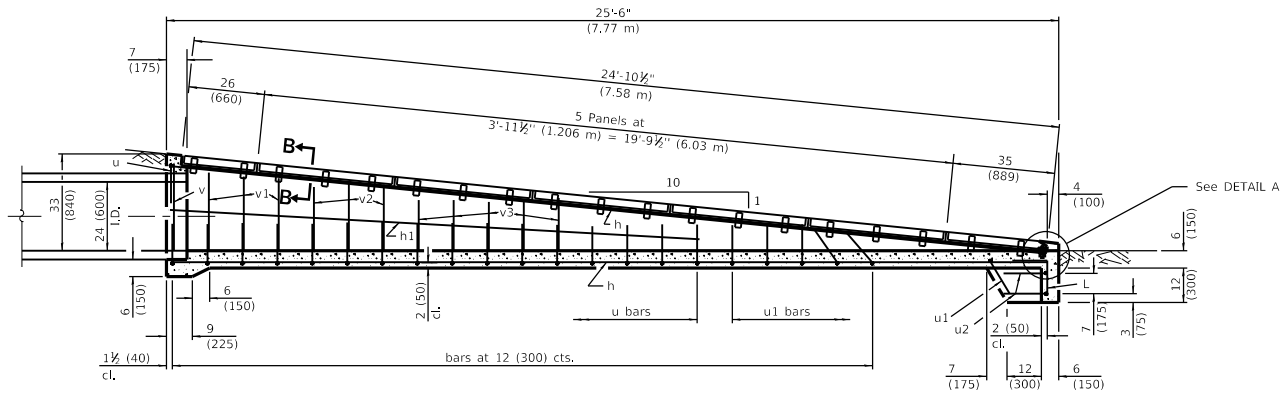
Illinois Department of Transportation

PASSED January 1, 2009

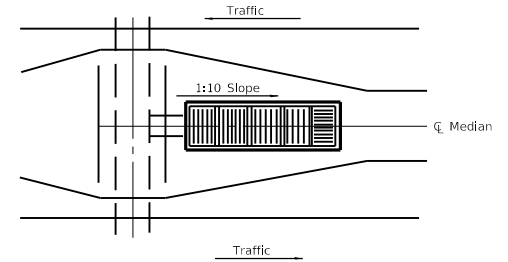
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009

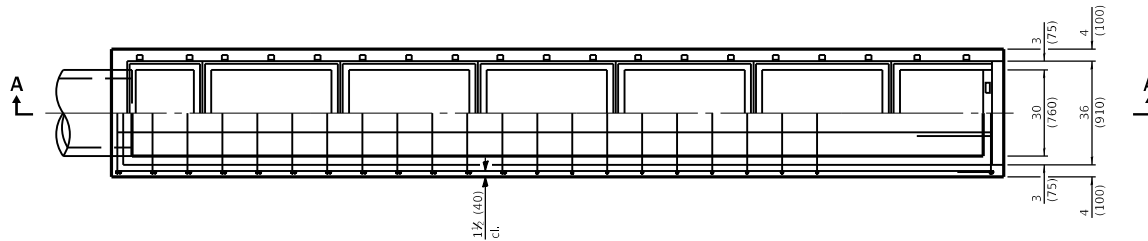
ENGINEER OF DESIGN AND ENVIRONMENT



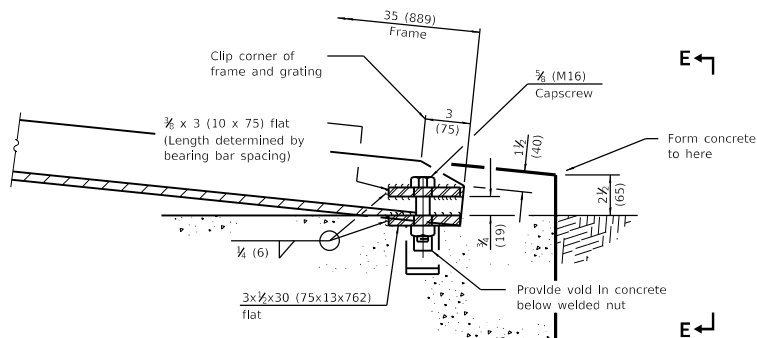
SECTION A-A



Sketch showing location and direction of main bearing bars in relation to C Median



PLAN



DETAIL A

GENERAL NOTES

If field conditions permit, the bottom of the inlet box shall have a 2 (50) slope.

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-11	Corrected weld symbols on Sheet 2.
1-1-09	Switched units to English (metric). Revised General Notes.

**INLET BOX
TYPE 24 (600) F**

(Sheet 1 of 2)

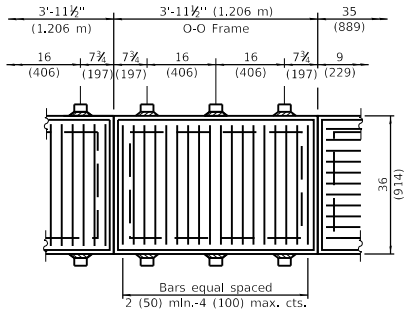
STANDARD 542526-03

Illinois Department of Transportation

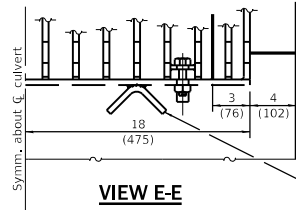
PASSED January 1, 2011
Michael Beard
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2011
Scott Sisk
 ENGINEER OF DESIGN AND ENVIRONMENT

469-C-03/ISS/2



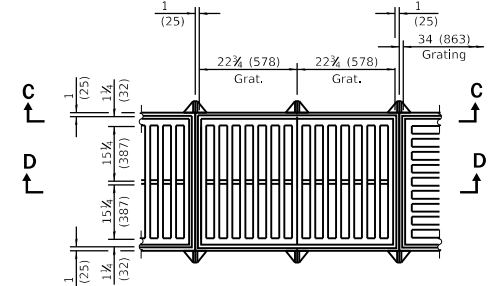
TYPICAL STEEL GRATING



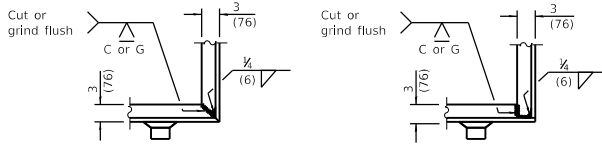
1/2 x 1 1/2 x 5 (12.7 x 40 x 125)
1/8 (6) clw to 1/2 x 3 (12.7 x 75) flat

Material Required for One Inlet Box

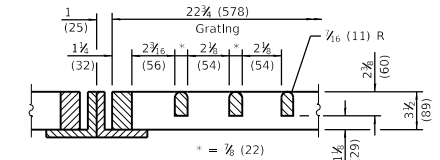
Bar	No.	Size	Length
h	6	No. 4 (No. 13)	25'-0" (7.62 m)
h1	2	No. 4 (No. 13)	11'-0" (3.35 m)
L	4	No. 4 (No. 13)	24 (600)
u	17	No. 4 (No. 13)	6'-5" (1.96 m)
u1	6	No. 4 (No. 13)	5'-11" (1.80 m)
u2	2	No. 4 (No. 13)	5'-10" (1.78 m)
v	2	No. 4 (No. 13)	30 (760)
v1	6	No. 4 (No. 13)	27 (690)
v2	6	No. 4 (No. 13)	24 (610)
v3	10	No. 4 (No. 13)	18 (460)
Concrete	cu. yds. (m ³)		3.4 (2.6)
Reinf. Bars	lbs. (kg)		250 (113)
Grating	(sq. ft.) (m ²)		70.4 (6.54)



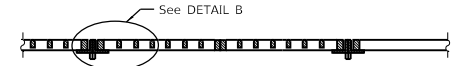
TYPICAL CAST GRATING



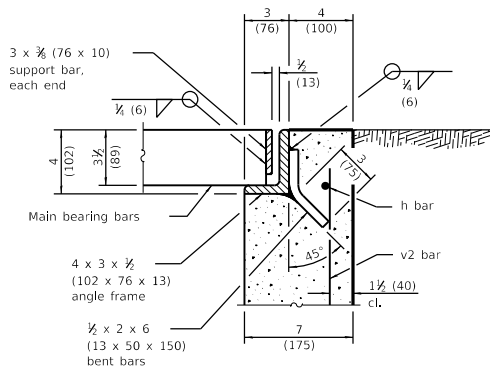
TYPICAL CORNER OF STEEL GRATING FRAME



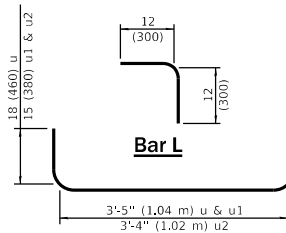
DETAIL B



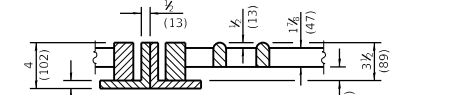
SECTION C-C



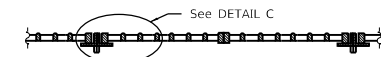
SECTION B-B



BARS u, u1 & u2



DETAIL C



SECTION D-D

Illinois Department of Transportation

PASSED January 1, 2011

Michael Beard
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2011

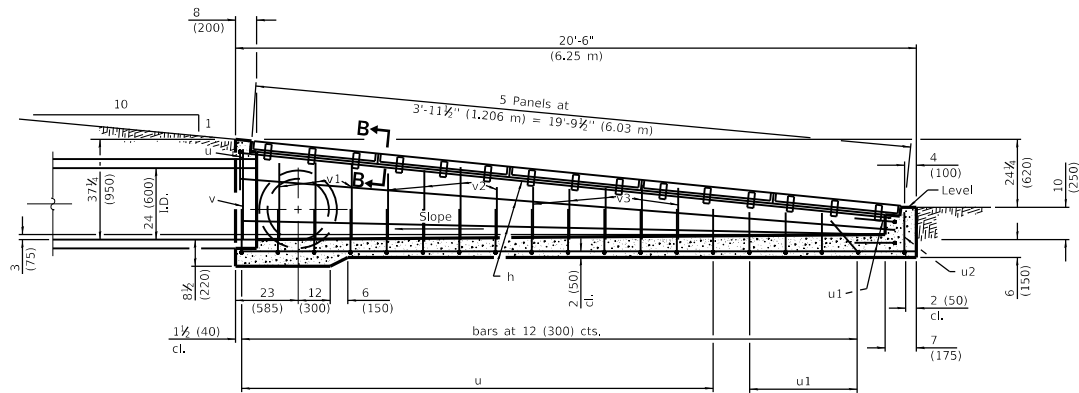
2011

ENGINEER OF DESIGN AND ENVIRONMENT

**INLET BOX
TYPE 24 (600) F**

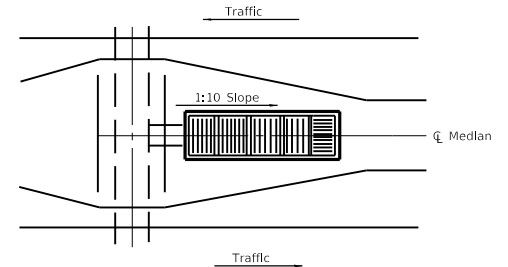
(Sheet 2 of 2)

STANDARD 542526-03

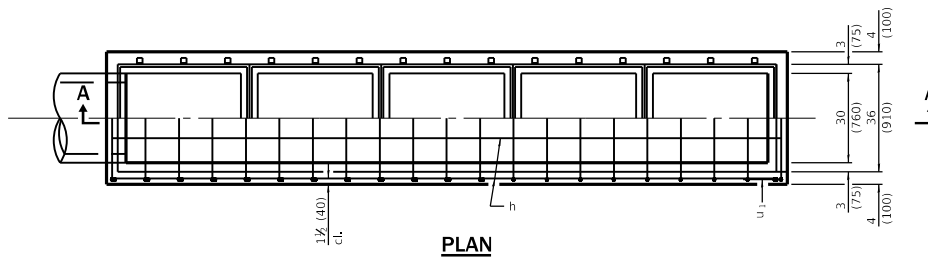


SECTION A-A

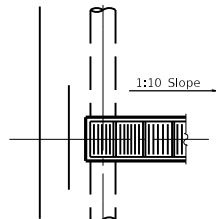
NOTE:
Culvert pipe may exit from the side (or sides) by changing reinforcement bars in that area and in the headwall end of box.



Sketch showing location and direction of main bearing bars in relation to CL median (showing exit from end)



PLAN



Detail showing exit from side (or sides)

GENERAL NOTES

If field conditions will permit, bottom of Inlet box shall have 2 (50) slope.

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-11	Added 36 (910) dimension to plan view. Corrected weld symbols on Sheet 2.
1-1-09	Switched units to English (metric). Revised General Notes.

**INLET BOX
TYPE 24 (600) G**

(Sheet 1 of 2)

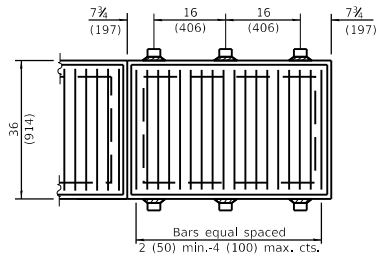
STANDARD 542531-04

Illinois Department of Transportation

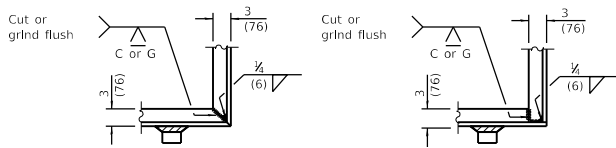
PASSED January 1, 2011
Michael Beard
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2011
Scott S. [Signature]
ENGINEER OF DESIGN AND ENVIRONMENT

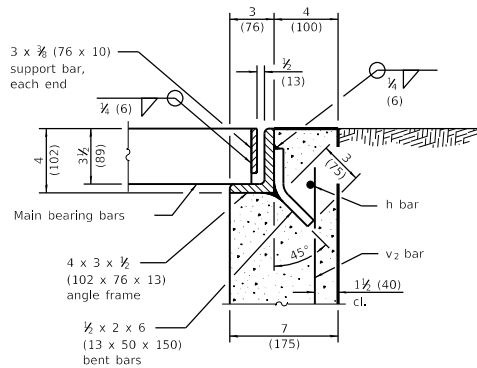
464-C1 03/11/SSJ



TYPICAL STEEL GRATING



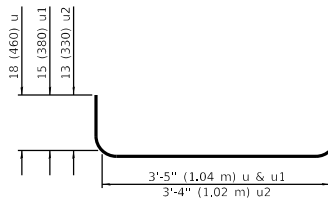
TYPICAL CORNER OF STEEL GRATING FRAME



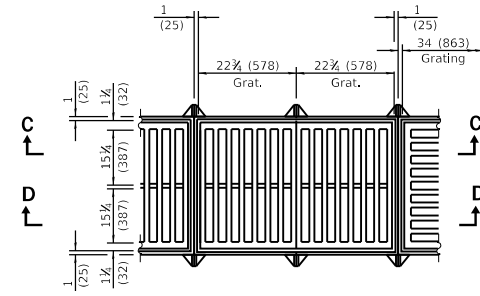
SECTION B-B

Material Required for One Inlet Box

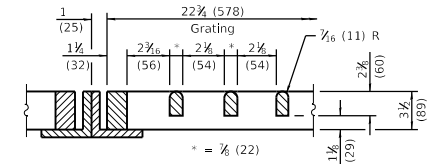
Bar	No.	Size	Length
h	10	No. 4 (No. 13)	20'-0" (6.10 m)
u	17	No. 4 (No. 13)	6'-5" (1.96 m)
u1	6	No. 4 (No. 13)	5'-11" (1.80 m)
u2	1	No. 4 (No. 13)	5'-6" (1.68 m)
v	2	No. 4 (No. 13)	33 (840)
v1	6	No. 4 (No. 13)	30 (760)
v2	10	No. 4 (No. 13)	24 (610)
v3	10	No. 4 (No. 13)	18 (460)
Concrete		cu. yds. (m ³)	3.2 (2.45)
Reinf. Bars		lbs. (kg)	270 (122)
Grating		(sq. ft.) (m ²)	56.0 (5.20)



BARS u, u1 & u2



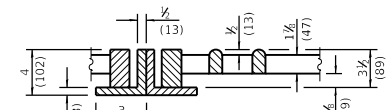
TYPICAL CAST GRATING



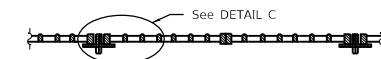
DETAIL B



SECTION C-C



DETAIL C



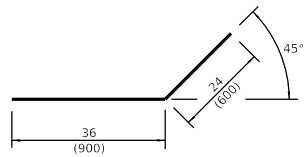
SECTION D-D

Illinois Department of Transportation
 PASSED January 1, 2011
 Michael Beard
 ENGINEER OF POLICY AND PROCEDURES
 APPROVED January 1, 2011
 Engineer of Design and Environment

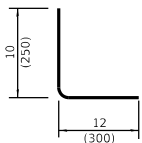
**INLET BOX
 TYPE 24 (600) G**

(Sheet 2 of 2)

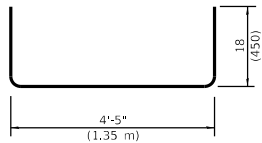
STANDARD 542531-04



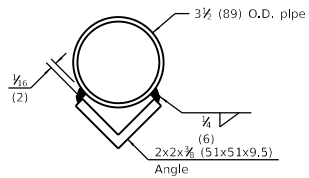
Bar h2



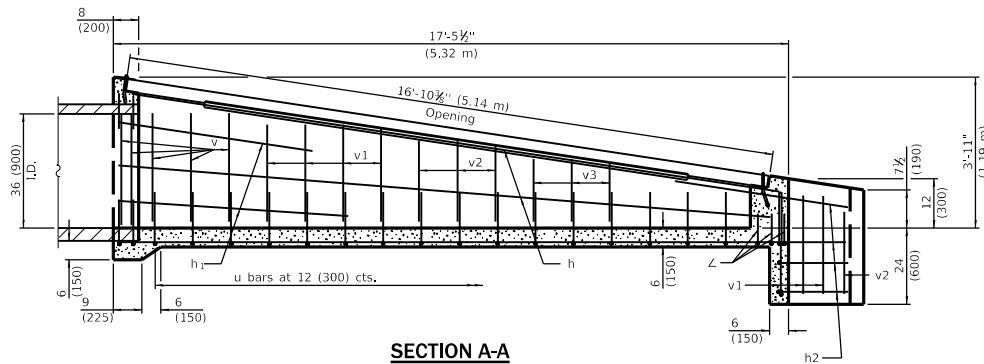
Bar L



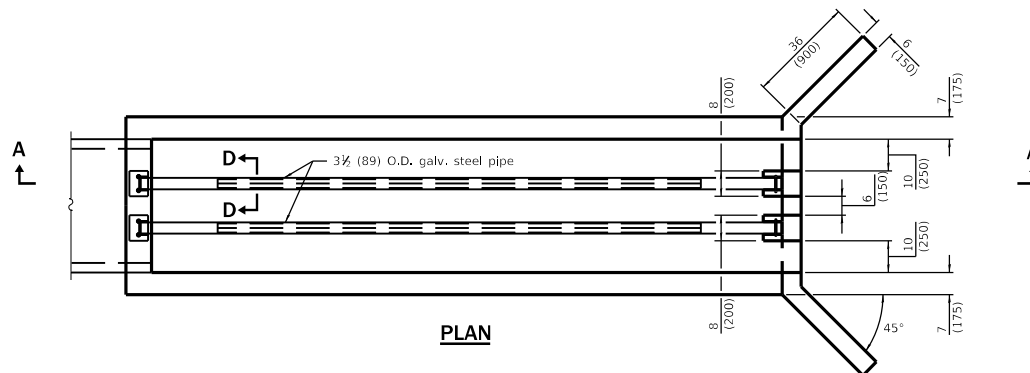
Bar u



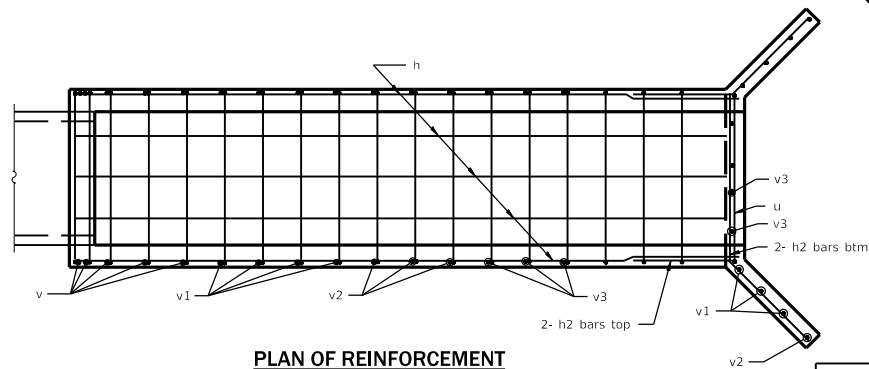
SECTION D-D



SECTION A-A



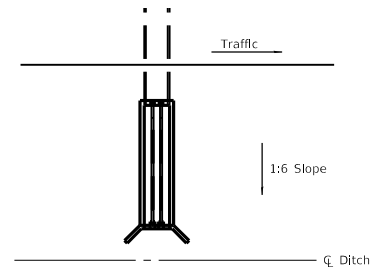
PLAN



PLAN OF REINFORCEMENT

Material required for one inlet box

Bar	Qty.	Size	Length
h	9	No. 4 (No. 13)	17'-0" (5.18 m)
h1	4	No. 4 (No. 13)	6'-3" (1.90 m)
h2	8	No. 4 (No. 13)	5'-0" (1.50 m)
L	6	No. 4 (No. 13)	22 (550)
u	21	No. 4 (No. 13)	7'-5" (2.25 m)
v	10	No. 4 (No. 13)	36 (910)
v1	14	No. 4 (No. 13)	30 (760)
v2	8	No. 4 (No. 13)	24 (610)
v3	10	No. 4 (No. 13)	18 (460)
Concrete	cu. yds. (m ³)		3.9 (3.0)
Reinf. Bars	lbs. (kg)		319 (145)
Galv. Steel Pipe	3 1/2 (89) O.D.	2 at 16'-10 1/2" (5.15 m)	
Galv. Steel Angle	2x2x 3/8 (51x51x9.5)	2 at 12'-10" (3.90 m)	



Sketch showing location and direction of box in relation to ∇ of ditch.

GENERAL NOTES

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-10	Corrected 3'-11" vertical dimension line in Section A-A.
1-1-09	Switched units to English (metric).

**INLET BOX
TYPE 36 (900) A**

(Sheet 1 of 2)

STANDARD 542536-03

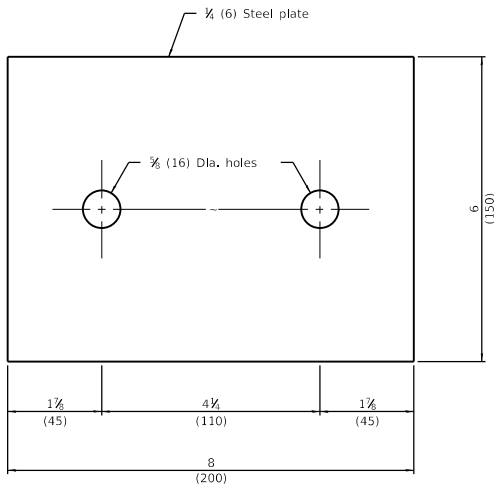
Illinois Department of Transportation

PASSED January 1, 2010

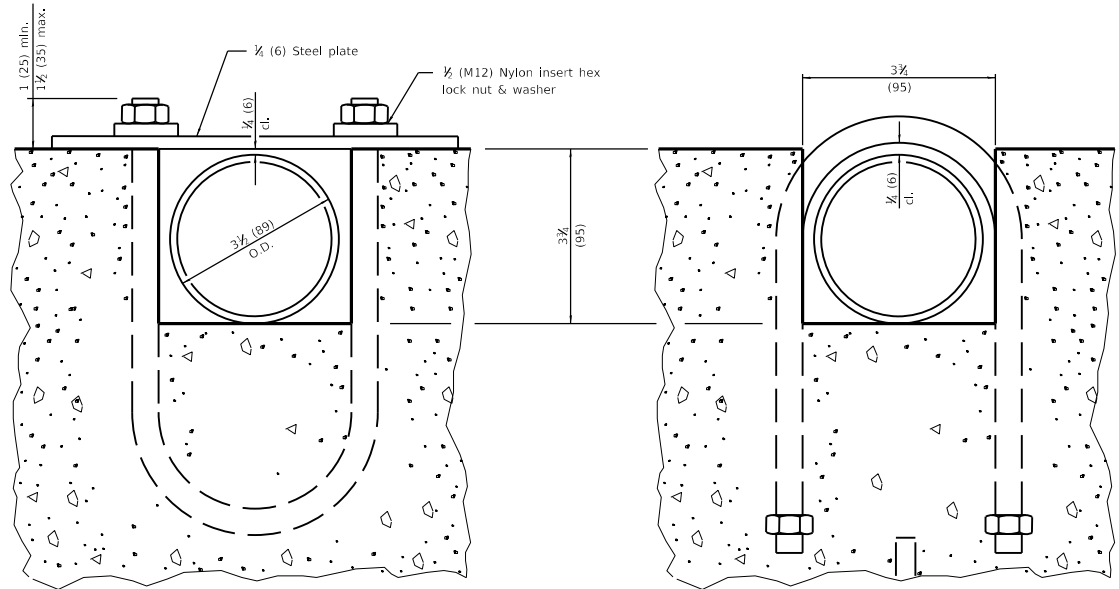
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2010

ENGINEER OF DESIGN AND ENVIRONMENT

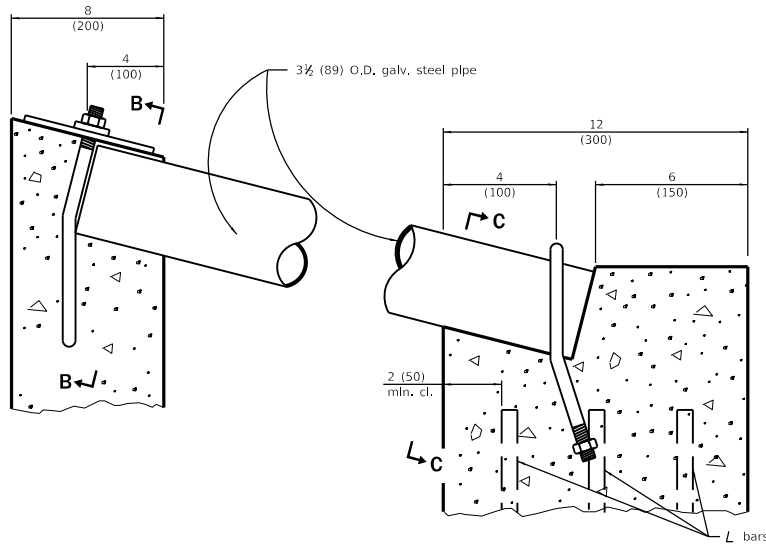
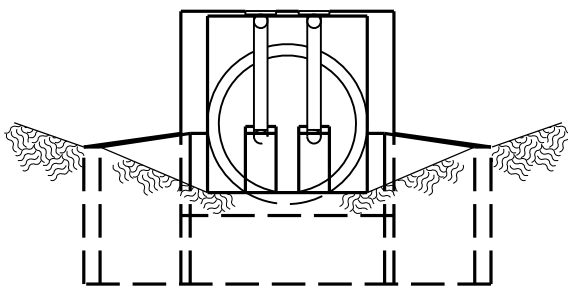


TOP ANCHOR PLATE
(2 - required)

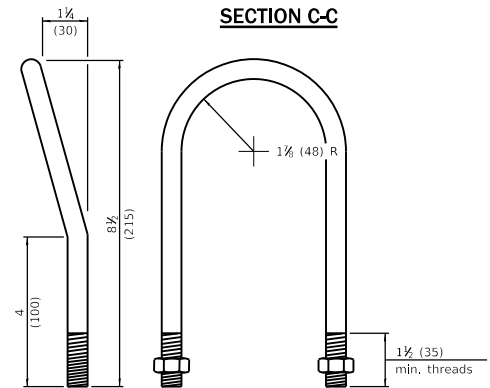


SECTION B-B

SECTION C-C



DETAIL AT BLOCKOUTS



1/2 (M12) U BOLT
(4 - required)

**INLET BOX
TYPE 36 (900) A**

(Sheet 2 of 2)

STANDARD 542536-03

Illinois Department of Transportation

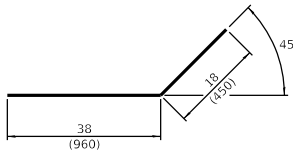
PASSED January 1, 2010

ENGINEER OF POLICY AND PROCEDURES

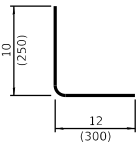
APPROVED January 1, 2010

ENGINEER OF DESIGN AND ENVIRONMENT

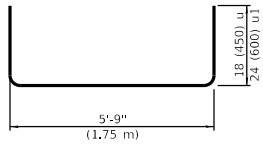
LEGISLATIVE COUNSEL



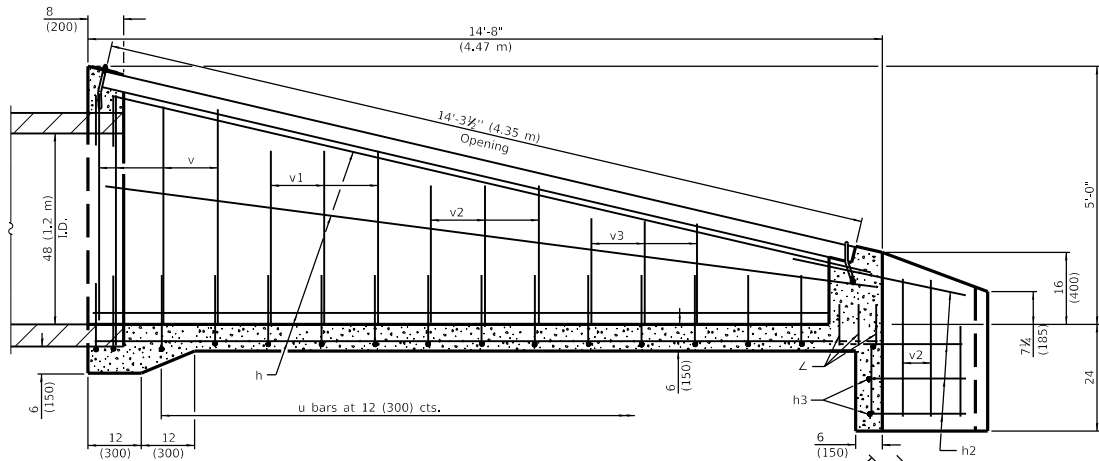
Bar h2



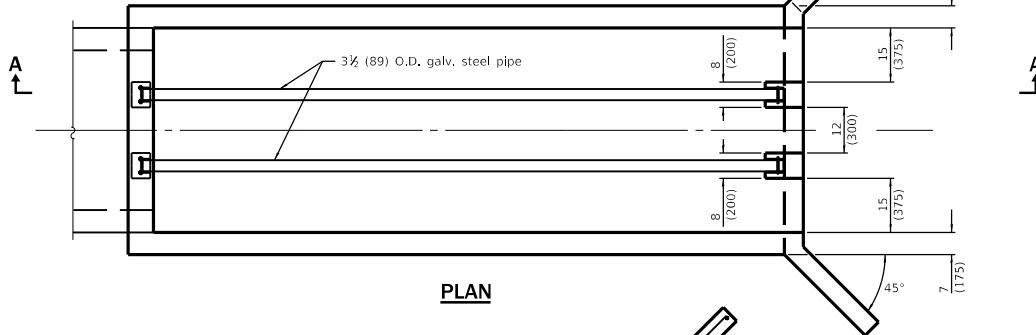
Bar L



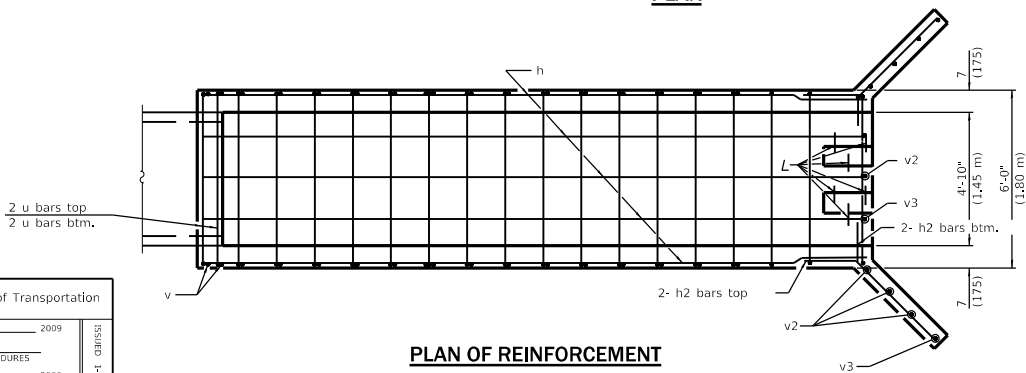
Bar u & u1



SECTION A-A

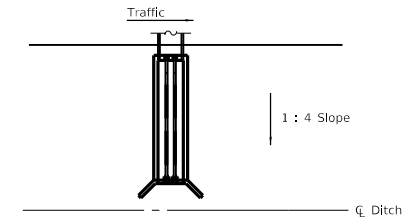


PLAN



PLAN OF REINFORCEMENT

Material required for one inlet box			
Bar	Qty.	Size	Length
h	11	No. 4 (No. 13)	14'-5" (4.40 m)
h2	8	No. 4 (No. 13)	4'-8" (1.40 m)
h3	2	No. 4 (No. 13)	5'-6" (1.70 m)
L	6	No. 4 (No. 13)	22 (550)
u	16	No. 4 (No. 13)	8'-9" (2.67 m)
u1	2	No. 4 (No. 13)	9'-9" (2.97 m)
v	8	No. 4 (No. 13)	4'-3" (1.30 m)
v1	6	No. 4 (No. 13)	3'-6" (1.07 m)
v2	13	No. 4 (No. 13)	33 (840)
v3	10	No. 4 (No. 13)	21 (530)
Concrete		cu. yds. (m ³)	5.0 (3.80)
Reinf. Bars		lbs. (kg)	324 (147)
Galv. Steel Pipe		3 1/2" (89) O.D.	2 at 14'-3 1/4" (4.35 m)



Sketch showing location and direction of box in relation to centerline of ditch.

GENERAL NOTES

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2009

ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009

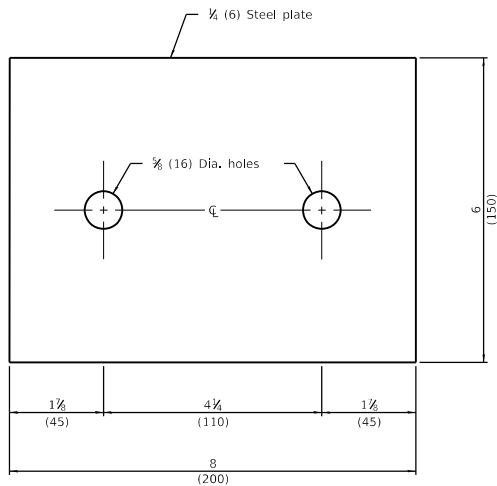
ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-07	Soft converted metric rebars.

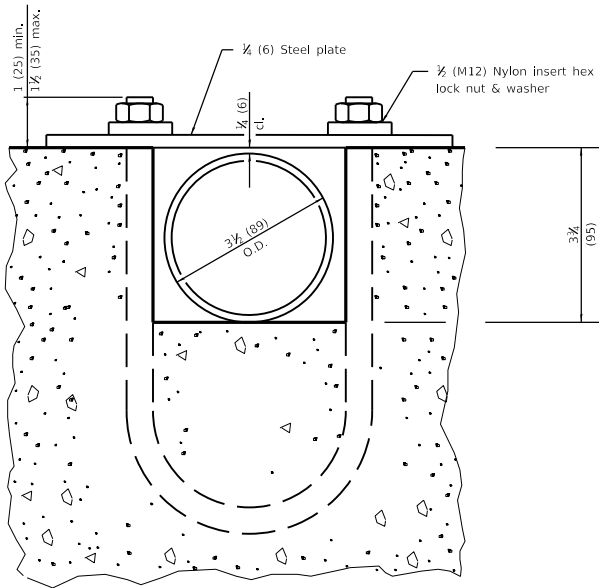
**INLET BOX
TYPE 48 (1200) A**

(Sheet 1 of 2)

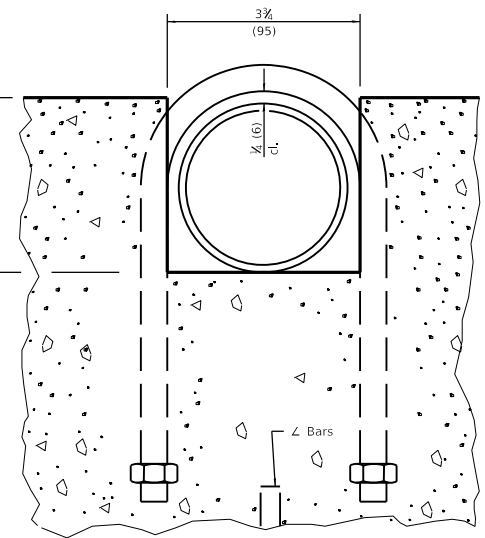
STANDARD 542541-02



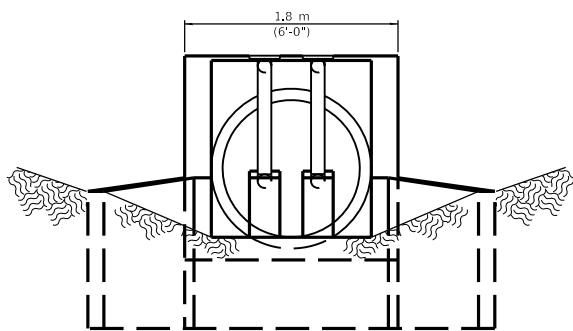
TOP ANCHOR PLATE
(2 - required)



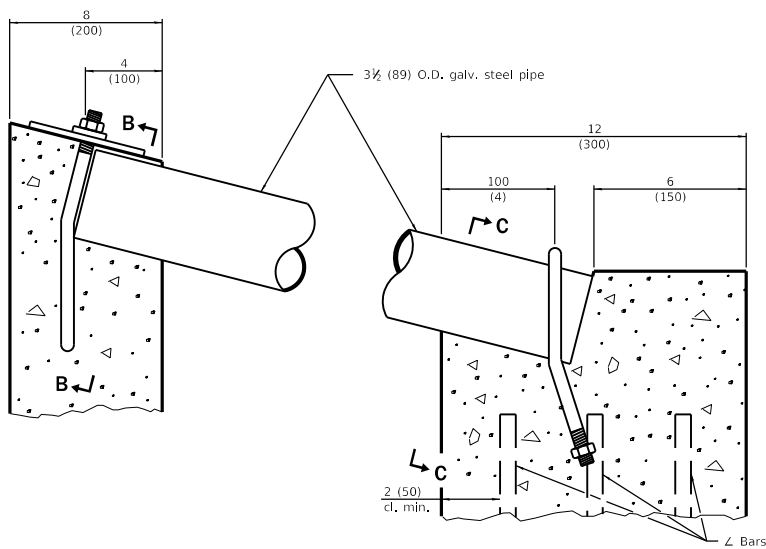
SECTION B-B



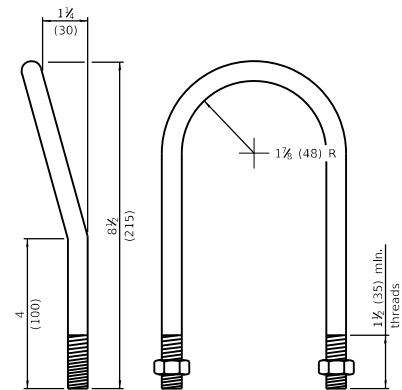
SECTION C-C



END VIEW



DETAIL AT BLOCKOUTS



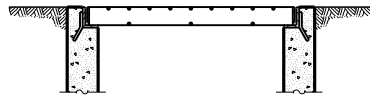
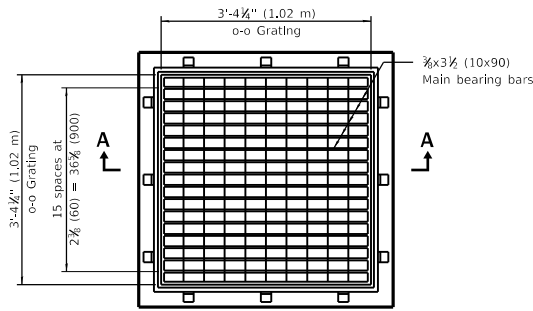
1/2 (M12) U BOLT
(4 - required)

**INLET BOX
TYPE 48 (1200) A**

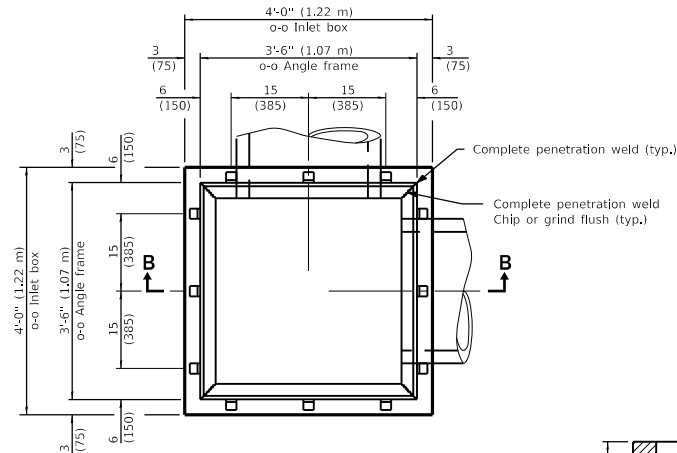
(Sheet 2 of 2)

STANDARD 542541-02

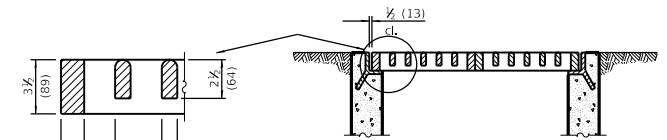
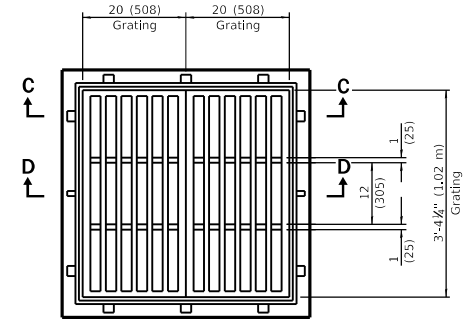
	Illinois Department of Transportation	
	PASSED	January 1, 2009
	ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2009	4841-1 03/ISS/1
ENGINEER OF DESIGN AND ENVIRONMENT		



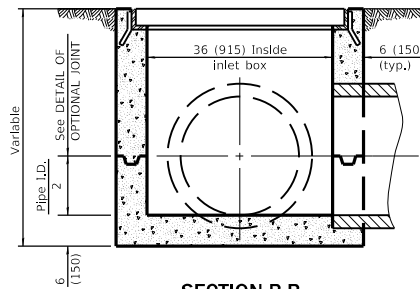
SECTION A-A



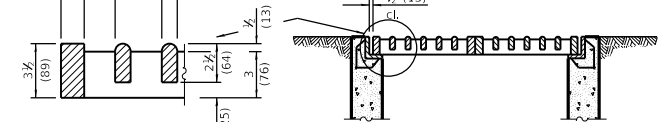
PLAN
(Grating omitted for clarity)



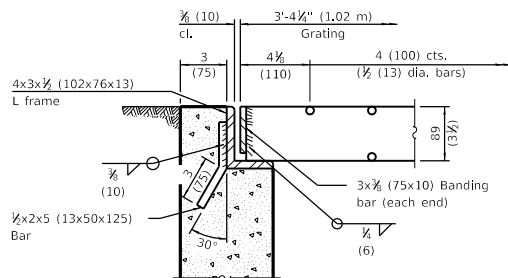
SECTION C-C



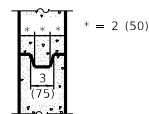
SECTION B-B



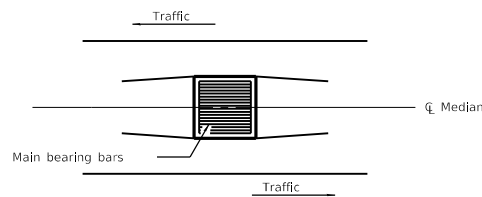
SECTION D-D
CAST FRAME & GRATE



STEEL FRAME & GRATE



**DETAIL OF
OPTIONAL JOINT**



Sketch showing location and direction of main bearing bars in relation to Cl median

All dimensions are in inches (millimeters) unless otherwise shown.

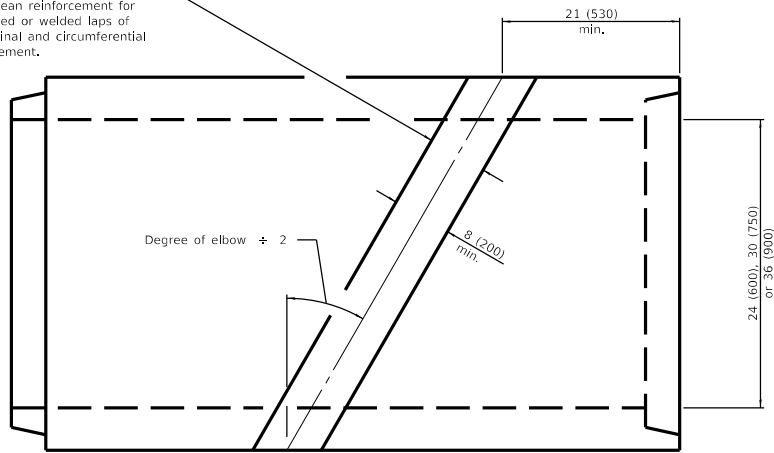
Illinois Department of Transportation PASSED January 1, 2009 ENGINEER OF POLICY AND PROCEDURES APPROVED January 1, 2009 ENGINEER OF DESIGN AND ENVIRONMENT	464-C1 03/15/01
	[Signature]
	[Signature]
	[Signature]

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-97	Renum. Standard 2240-6.

**FLUSH INLET BOX
FOR MEDIAN**

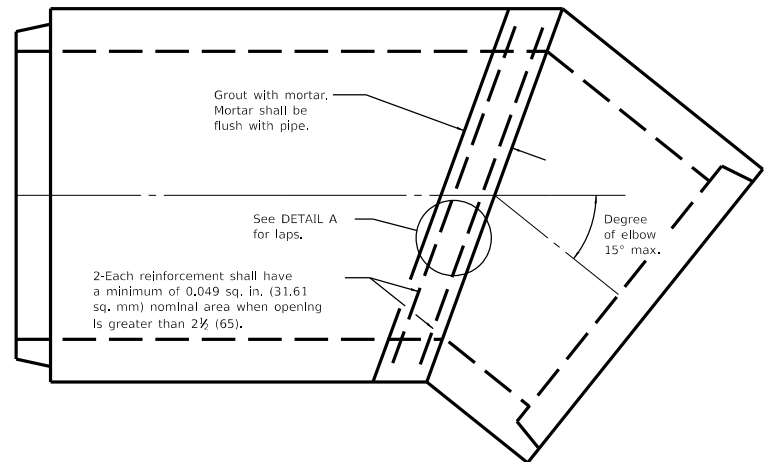
STANDARD 542546-01

Remove concrete along these lines. Clean reinforcement for either tied or welded laps of longitudinal and circumferential reinforcement.

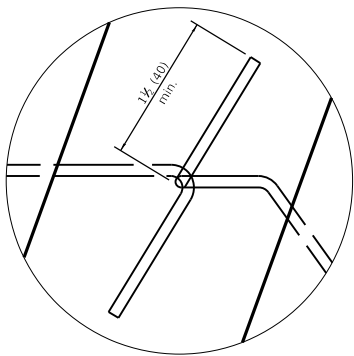


PLAN
(Reinforced concrete pipe)

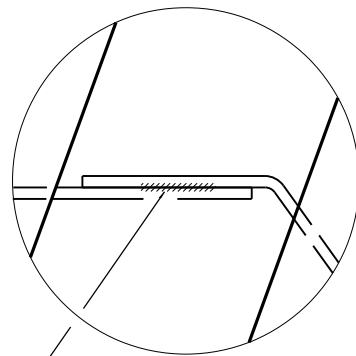
1 1/2 (40) min., 2 1/2 (65) max., (Tied lap)
1 1/2 (40) min., 6 (150) max., (Welded lap)



PLAN
(Reinforced concrete pipe elbow)



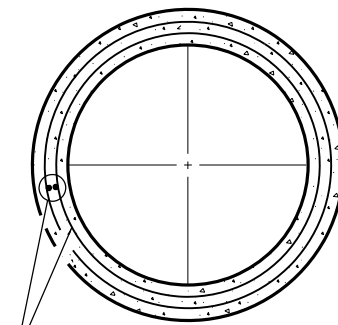
TIED LAP



For wire dia. W14 - W6 (10.72 - 7.01),
length of weld shall be 3/4 (20) min.
For wire dia. W5.5 - W2.9 (6.73 - 4.88),
length of weld shall be 1/2 (10) min.
Other wire dia. shall be tied per detail.

WELDED LAP

DETAIL A



TRANSVERSE SECTION

All dimensions are in inches (millimeters)
unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2011
Michael Beard
ENGINEER OF POLICY AND PROCEDURES

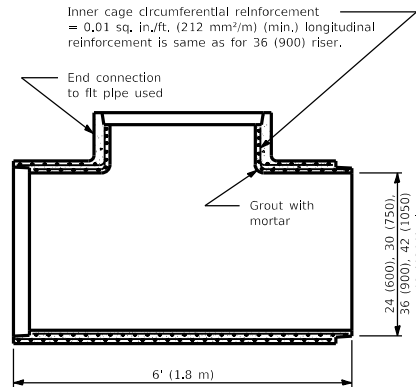
APPROVED January 1, 2011
Scott Smith
ENGINEER OF DESIGN AND ENVIRONMENT

LEG-C Q311/SS1

DATE	REVISIONS
1-1-11	Corr. weld sym. on WELDED LAP det. Added pipe dia. to title. Set elbow to 15° max.
1-1-10	Corrected pipe diameter dimension lines.

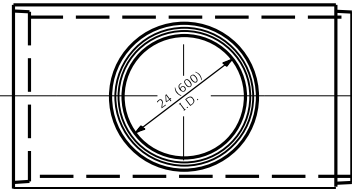
**REINFORCED CONCRETE PIPE
ELBOW 24", 30" OR 36"
(600 mm, 750 mm OR 900 mm)**

STANDARD 542601-03

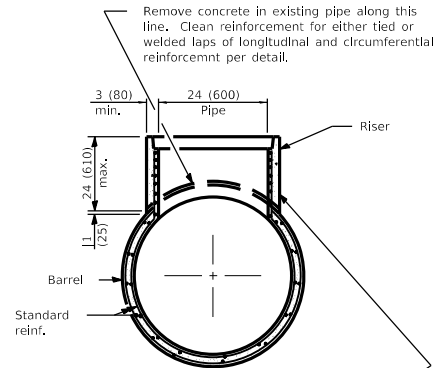


LONGITUDINAL SECTION

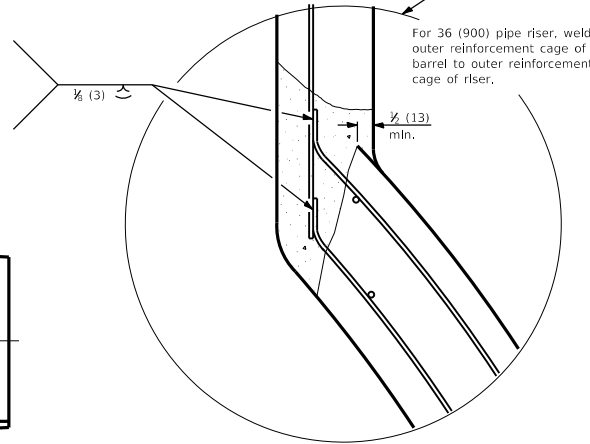
For wire W12 thru W2 (10,008 thru 7,188), length of weld shall be $\frac{3}{8}$ (20) min.
 For wire W5.5 thru W2.5 (6,655 thru 4,496), length of weld shall be $\frac{3}{8}$ (10) min.
 Other wire gauges shall be tied per detail.



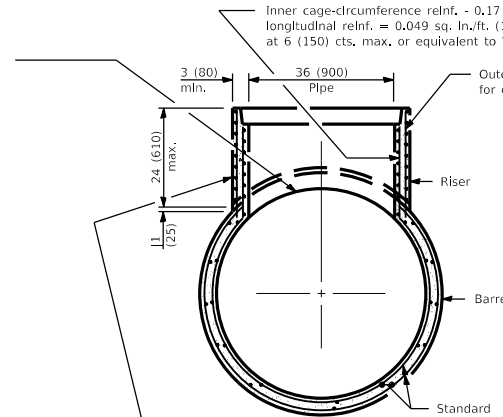
**PLAN
TEE WITH 24 (600) RISER**



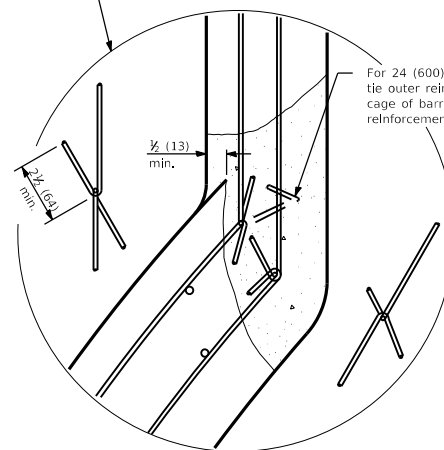
TRANSVERSE SECTION



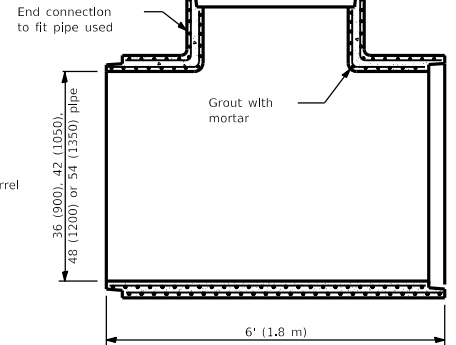
WELDED LAP



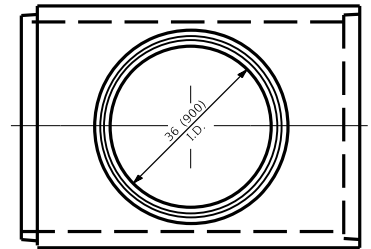
TRANSVERSE SECTION



TIED LAP



LONGITUDINAL SECTION



**PLAN
TEE WITH 36 (900) RISER**

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation
 PASSED January 1, 2011
 Michael Beard
 ENGINEER OF POLICY AND PROCEDURES
 APPROVED January 1, 2011
 Engineer of Design and Environment

DATE	REVISIONS
1-1-11	Corrected weld symbol on Welded Lap detail.
1-1-09	Switched units to English (metric).

**REINFORCED CONCRETE
PIPE TEE**

STANDARD 542606-02



Standards by Division

DIVISION 600 INCIDENTAL CONSTRUCTION

STD. NO. TITLE
DRAINAGE RELATED ITEMS

601001-05	Pipe Underdrains
601101-02	Concrete Headwall for Pipe Underdrain
602001-02	Catch Basin, Type A
602006-04	Catch Basin, Type B
602011-02	Catch Basin, Type C
602016-02	Catch Basin, Type D
602106-02	Drainage Structures, Types 4 & 5
602301-04	Inlet, Type A
602306-03	Inlet, Type B
602401-06	Precast Manhole, Type A, 4' (1.22 m) Diameter
602402-02	Precast Manhole, Type A, 5' (1.52 m) Diameter
602406-10	Precast Manhole, Type A, 6' (1.83 m) Diameter
602411-08	Precast Manhole, Type A, 7' (2.13 m) Diameter
602416-08	Precast Manhole, Type A, 8' (2.44 m) Diameter
602421-08	Precast Manhole, Type A, 9' (2.74 m) Diameter
602426-02	Precast Manhole, Type A, 10' (3.05 m) Diameter
602501-05	Precast Valve Vault, Type A, 4' (1.22 m) Diameter
602506-02	Precast Valve Vault, Type A, 5' (1.52 m) Diameter
602601-06	Precast Reinforced Concrete Flat Slab Top
602701-02	Manhole Steps
604001-04	Frame and Lids, Type 1
604006-05	Frame and Grate, Type 3
604011-05	Frame and Grate, Type 3V
604016-04	Frame and Grate, Type 4
604021-03	Base, Frame and Lids, Type 5
604026-03	Frame and Grate, Type 6
604031-03	Grate, Type 7
604036-03	Grate, Type 8
604041-03	Frame and Grate, Type 9
604046-03	Frame and Grate, Type 10
604051-04	Frame and Grate, Type 11
604056-04	Frame and Grate, Type 11V
604061-03	Frame and Grate, Type 12
604066-02	Frame and Lid, Type 15
604071-05	Frame and Grate, Type 20
604076-04	Frame and Grate, Type 21
604081-04	Frames and Grates, Type 22
604086-03	Frame and Grate, Type 23
604091-03	Frame and Grate, Type 24

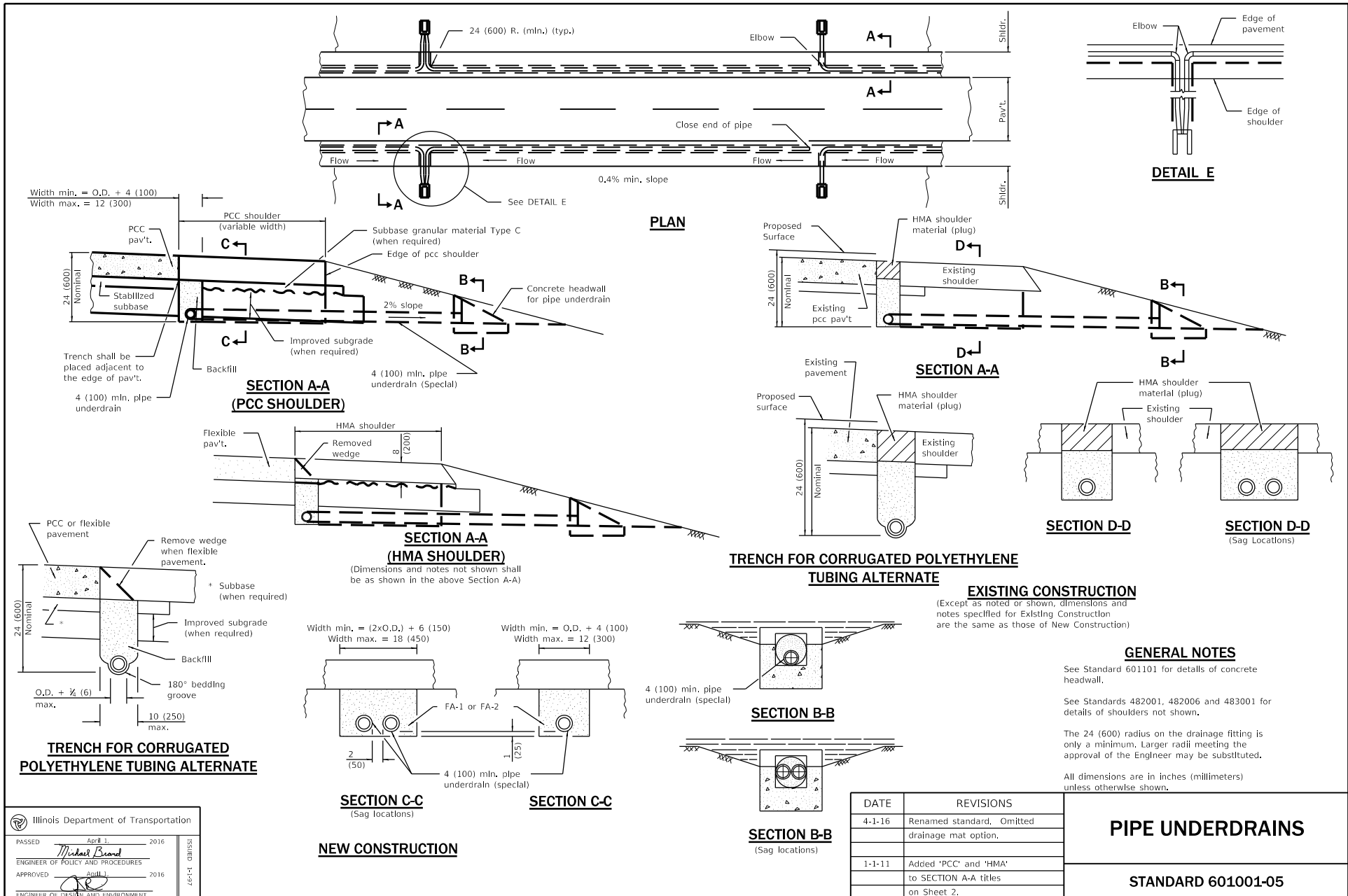
604101-01	Median Inlet for 24" (600 mm) Reinforced Concrete Pipe
604106-01	Median Inlet for 36" (900 mm) Reinforced Concrete Pipe
606001-07	Concrete Curb Type B and Combination Concrete Curb and Gutter
606006-04	Outlet for Concrete Curb and Gutter, Type B-6.24 (B-15.60)
606101-05	Type A Gutter (Inlet, Outlet, and Entrance)
606106-05	Outlet, Type I for Type A Gutter
606111-03	Outlets, Type 2 for Type A Gutter
606201-04	Type B Gutter (Inlet, Outlet, and Entrance)
606206-04	Outlet, Type 1 for Type B Gutter
606211-04	Outlets, Type 2 for Type B Gutter
606301-04	PC Concrete Islands And Medians
606306-04	Corrugated PC Concrete Medians
606401-02	Paved Ditch
610001-08	Shoulder Inlet With Curb

SAFETY RELATED ITEMS

630001-12	Steel Plate Beam Guardrail
630006	Non-blocked Steel Plate Beam Guardrail
630101-10	Strong Post Guardrail Attached to Culvert
630106-02	Long-Span Guardrail Over Culvert
630111	Weak Post Guardrail Attached to Culvert
630116	Back Side Protection of Guardrail
630201-07	PCC/HMA Stabilization at Steel Plate Beam Guardrail
630301-09	Shoulder Widening for Type 1 (Special) Guardrail Terminals
631006-08	Traffic Barrier Terminal, Type 1B
631011-10	Traffic Barrier Terminal, Type 2
631026-06	Traffic Barrier Terminal, Type 5
631031-15	Traffic Barrier Terminal, Type 6
631032-09	Traffic Barrier Terminal, Type 6A
631033-07	Traffic Barrier Terminal, Type 6B
631046-04	Traffic Barrier Terminal, Type 10
631051-03	Traffic Barrier Terminal, Type 11
635001-02	Delineators
636001-02	Cable Road Guard Single Strand
637006-04	Concrete Barrier Double Face, 44 in. (1120 mm) Height
638101-02	Concrete Glare Screen
639001-02	Sight Screen Precast Prestressed Concrete Panel Wall
640001-01	Sight Screen Chain Link Fence
641001-01	Sight Screen Cedar Stockade Fence Type S
641006-01	Sight Screen Wood Plank Fence Type P
642001-02	Shoulder Rumble Strips, 16 in.
642006	Shoulder Rumble Strips, 8 in.
643001-02	Sand Module Impact Attenuators

OTHER ITEMS

664001-02	Chain Link Fence
665001-02	Woven Wire Fence
666001-01	Right-of-Way Markers
667001-01	Drainage Markers
667101-02	Permanent Survey Markers
668001-01	U.S. Geological Survey and National Geodetic Survey Benchmarks, Resetting Method



Illinois Department of Transportation

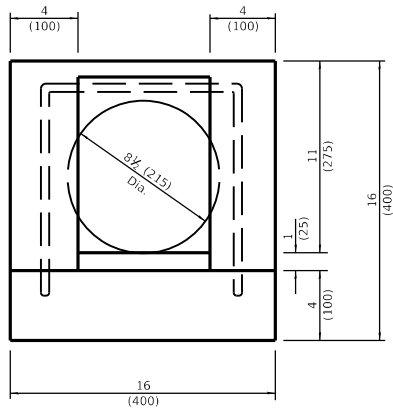
PASSED April 1, 2016
Michael Beard
ENGINEER OF POLICY AND PROCEDURES

APPROVED April 1, 2016
[Signature]
ENGINEER OF DESIGN AND ENVIRONMENT

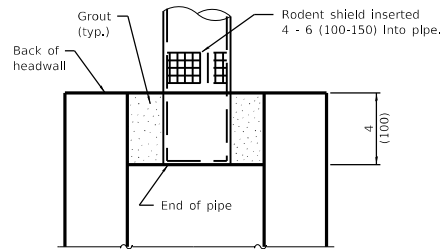
482-1-03/ISS

PIPE UNDERDRAINS

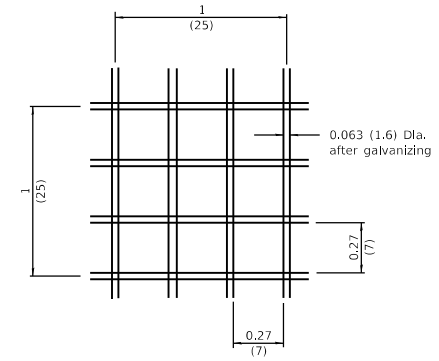
STANDARD 601001-05



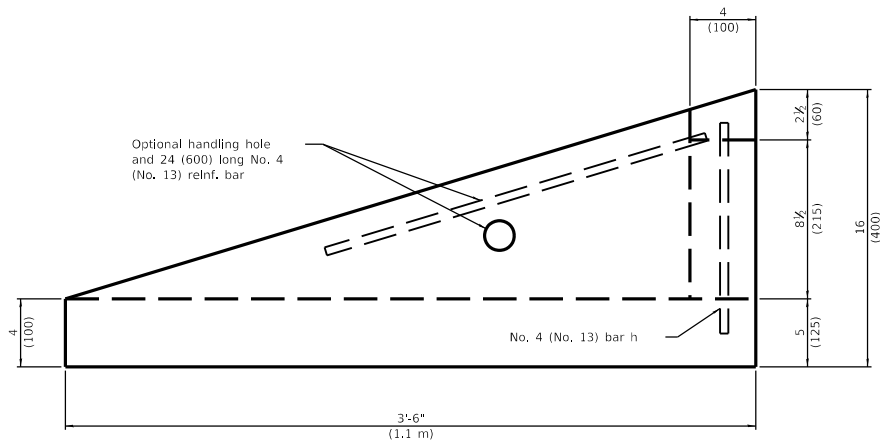
FRONT VIEW



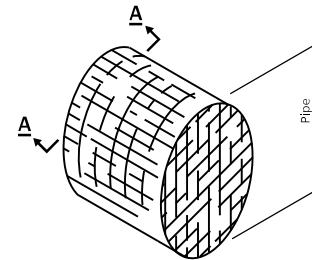
RODENT SHIELD PLACEMENT



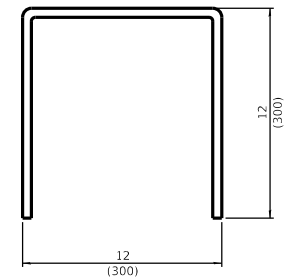
SECTION A-A



SIDE VIEW



DETAIL OF RODENT SHIELD



BAR h

GENERAL NOTES

An alternate paved invert meeting the approval of the Engineer may be substituted for that shown in side view.

All dimensions are in Inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED April 1, 2016
Michael Beard
 ENGINEER OF POLICY AND PROCEDURES

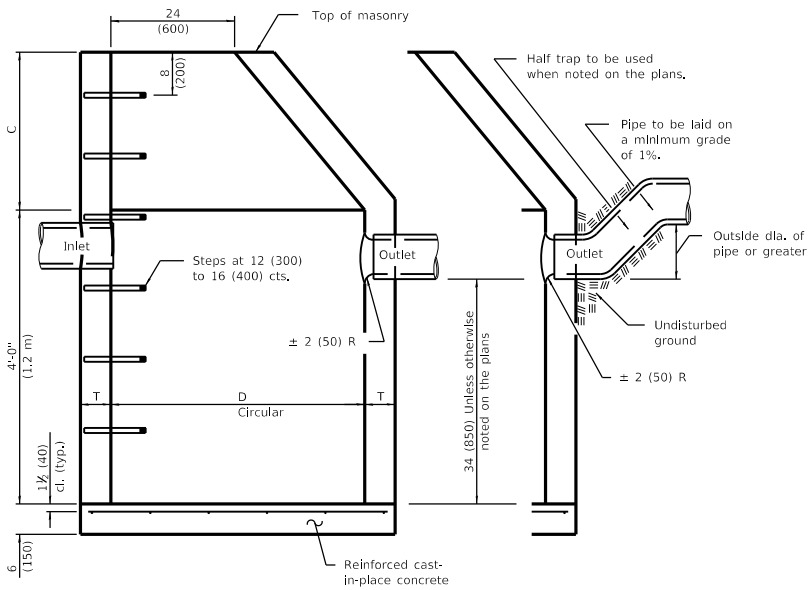
APPROVED April 1, 2016
[Signature]
 ENGINEER OF DESIGN AND ENVIRONMENT

LEG-C1 03/11/15

DATE	REVISIONS
4-1-16	Renamed standard to be consistent with specs and other standards.
1-1-09	Switched units to English (metric).

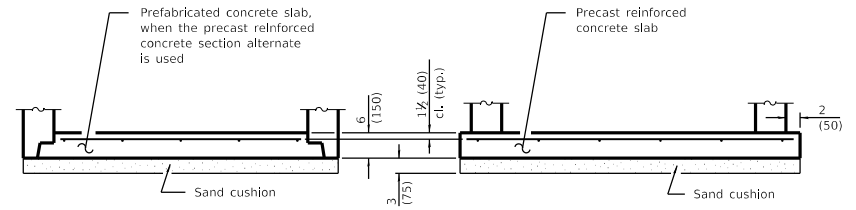
CONCRETE HEADWALL FOR PIPE UNDERDRAINS

STANDARD 601101-02



ELEVATION
(Standard Outlet)

ELEVATION
(Half Trap)



ALTERNATE BOTTOM SLAB

ALTERNATE MATERIALS FOR WALLS	D	C*	T (min.)
Concrete Masonry Unit	4'-0" (1.2 m)	30 (750)	5 (125)
	5'-0" (1.5 m)	3'-9" (1.15 m)	5 (125)
Brick Masonry	4'-0" (1.2 m)	30 (750)	8 (200)
	5'-0" (1.5 m)	3'-9" (1.15 m)	8 (200)
Precast Reinforced Concrete Section	4'-0" (1.2 m)	30 (750)	4 (100)
	5'-0" (1.5 m)	3'-9" (1.15 m)	5 (125)
Cast-in-place Concrete	4'-0" (1.2 m)	30 (750)	6 (150)
	5'-0" (1.5 m)	3'-9" (1.15 m)	6 (150)

* For precast reinforced concrete sections, dimension "C" may vary from the dimension given to plus 6 (150).

GENERAL NOTES

Bottom slabs shall be reinforced with a minimum of 0.20 sq. in./ft (420 sq. mm/m) in both directions with a maximum spacing of 12 (300).

Bottom slabs may be connected to the riser as determined by the fabricator; however, only a single row of reinforcement around the perimeter may be utilized.

See Standard 602601 for optional precast reinforced concrete flat slab top.

See Standard 602701 for details of steps.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-11	Added 'Outside' to half trap note. Detail reln. in slabs.
	Revised general notes.
1-1-09	Switched units to English (metric).

**CATCH BASIN
TYPE A**

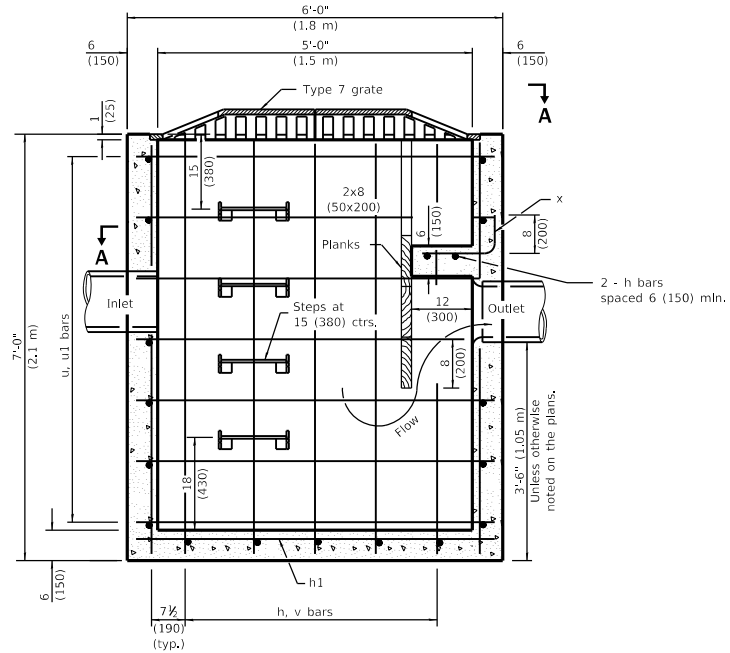
STANDARD 602001-02

Illinois Department of Transportation

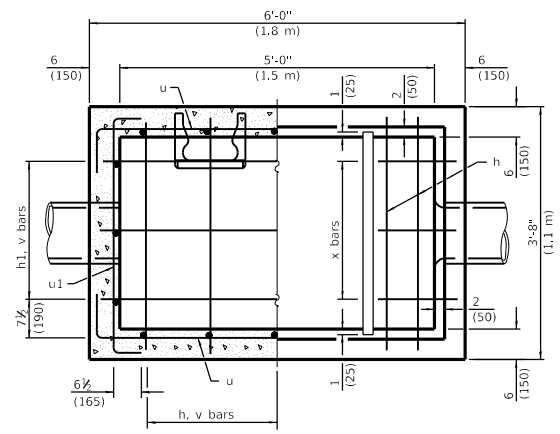
PASSED January 1, 2011
Michael Beard
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2011
Scott Smith
ENGINEER OF DESIGN AND ENVIRONMENT

464-C 03/11/11



ELEVATION



SECTION A-A

(Grating removed to show plan of baffles.)

**MATERIALS REQUIRED FOR ONE (1)
TYPE B CATCH BASIN**

Bar	Qty.	Size	Shape	Length
h	7	No. 4 (No. 13)	—	3'-5" (1.02 m)
h1	3	No. 4 (No. 13)	—	5'-9" (1.72 m)
u	14	No. 4 (No. 13)	U	7'-0" (2.10 m)
u1	14	No. 4 (No. 13)	U	4'-6" (1.35 m)
v	16	No. 4 (No. 13)	—	6'-9" (2.02 m)
x	3	No. 4 (No. 13)	—	1'-11" (580)
Concrete			cu. yd. (m ³)	2.5 (1.90)
Reinforcement bars			lbs. (kg)	210 (95)

All bars shall be at 12 (300) centers unless otherwise shown. Reinforcement bar clearance shall be 1 1/2 (40).

GENERAL NOTES

See Standard 602701 for details of steps.

All dimensions are in Inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

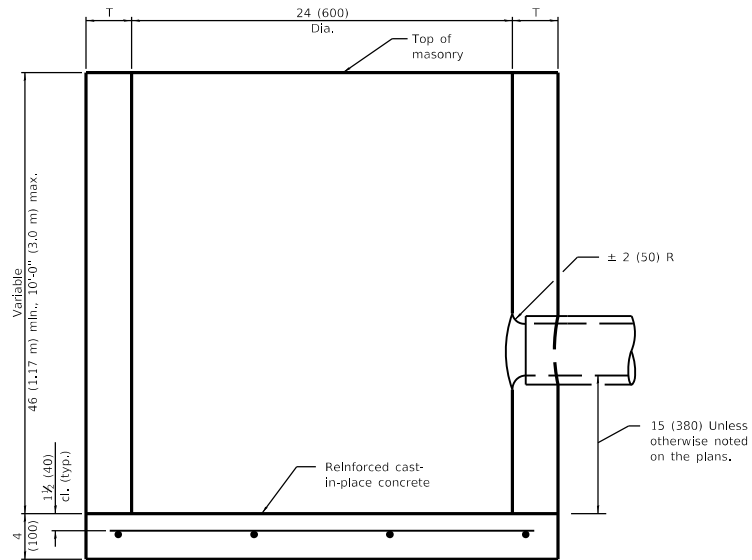
PASSED January 1, 2013
Michael Beard
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2013
[Signature]
ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-13	Revised and relocated steps.
1-1-11	Added additional bar identification.

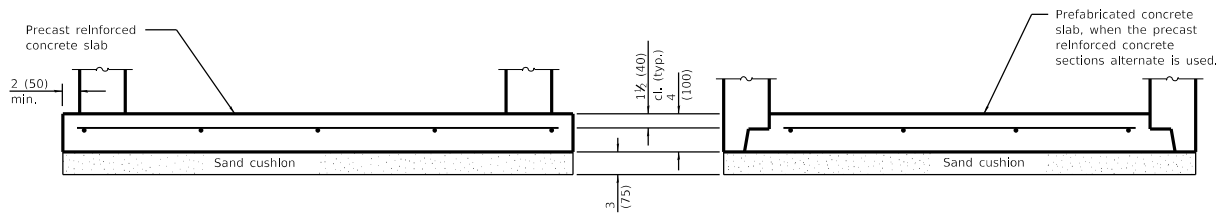
**CATCH BASIN
TYPE B**

STANDARD 602006-04



ALTERNATE MATERIALS FOR WALLS	T (min)
Precast Reinforced Concrete Section	3 (75)
Concrete Masonry Unit	5 (125)
Cast-In-Place Concrete	6 (150)
Brck Masonry	8 (200)

ELEVATION



ALTERNATE BOTTOM SLAB

GENERAL NOTES

Bottom slabs shall be reinforced with a minimum of 0.27 sq. in./ft. (570 sq. mm/m) in both directions with a maximum spacing of 9 (230).

Bottom slabs may be connected to the riser as determined by the fabricator; however, only a single row of reinforcement around the perimeter may be utilized.

All dimensions are in inches (millimeters) unless otherwise shown.

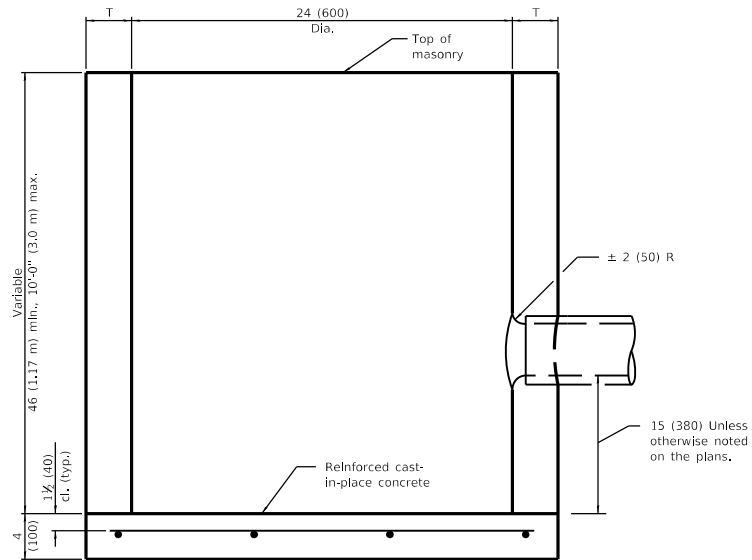
DATE	REVISIONS	CATCH BASIN TYPE C
1-1-11	Detailed rein. in slabs. Added max. limit to height. Added general notes.	
1-1-09	Switched units to English (metric).	STANDARD 602011-02

Illinois Department of Transportation

PASSED January 1, 2011
Michael Beard
 ENGINEER OF POLICY AND PROCEDURES

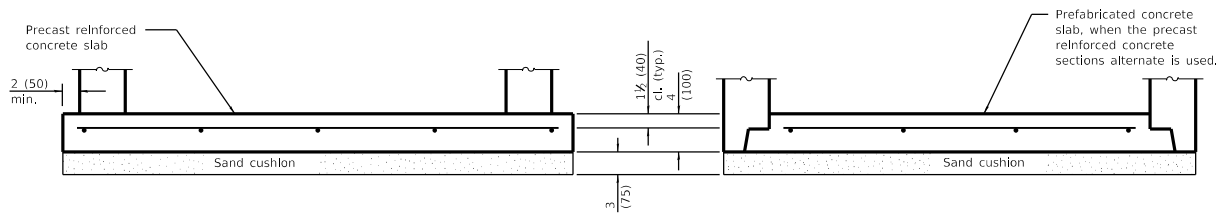
APPROVED January 1, 2011
Scott Sisk
 ENGINEER OF DESIGN AND ENVIRONMENT

469-1-03/ISS/2



ALTERNATE MATERIALS FOR WALLS	T (min)
Precast Reinforced Concrete Section	3 (75)
Concrete Masonry Unit	5 (125)
Cast-In-Place Concrete	6 (150)
Brck Masonry	8 (200)

ELEVATION



ALTERNATE BOTTOM SLAB

GENERAL NOTES

Bottom slabs shall be reinforced with a minimum of 0.27 sq. in./ft. (570 sq. mm/m) in both directions with a maximum spacing of 9 (230).

Bottom slabs may be connected to the riser as determined by the fabricator; however, only a single row of reinforcement around the perimeter may be utilized.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-11	Detailed rein. in slabs.
	Added max. limit to height.
	Added general notes.
1-1-09	Switched units to
	English (metric).

CATCH BASIN TYPE C

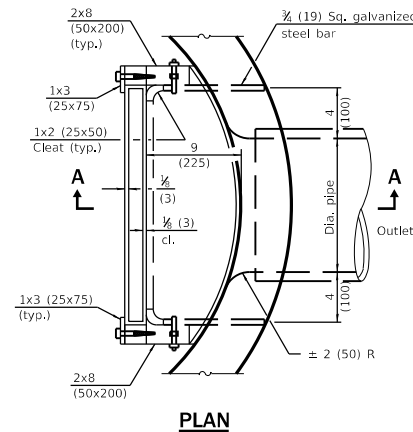
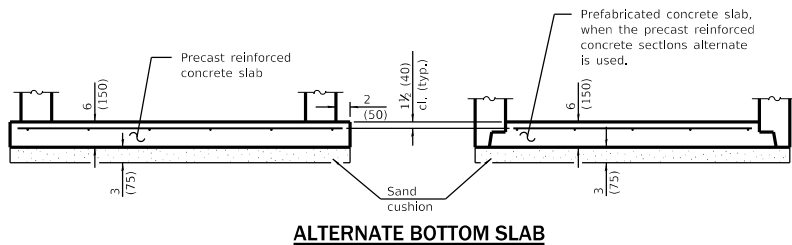
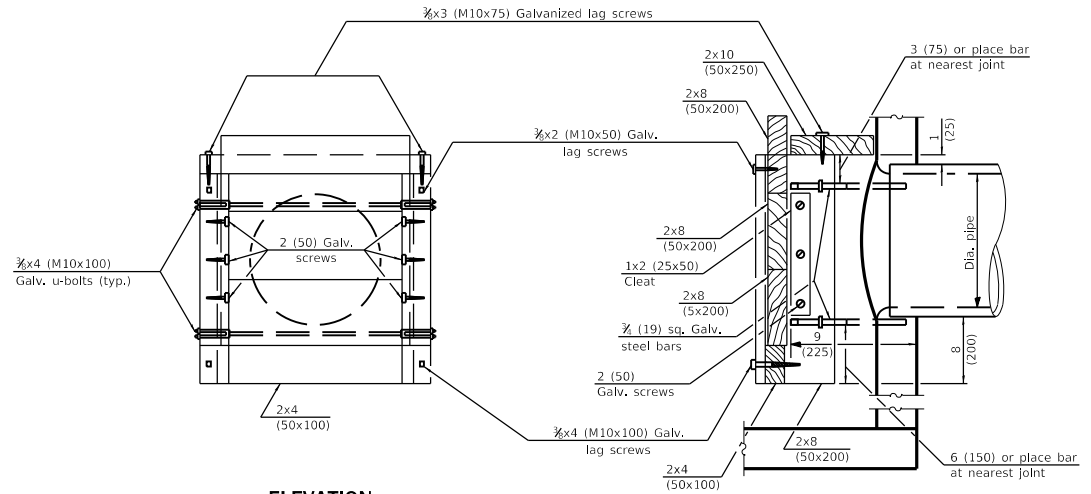
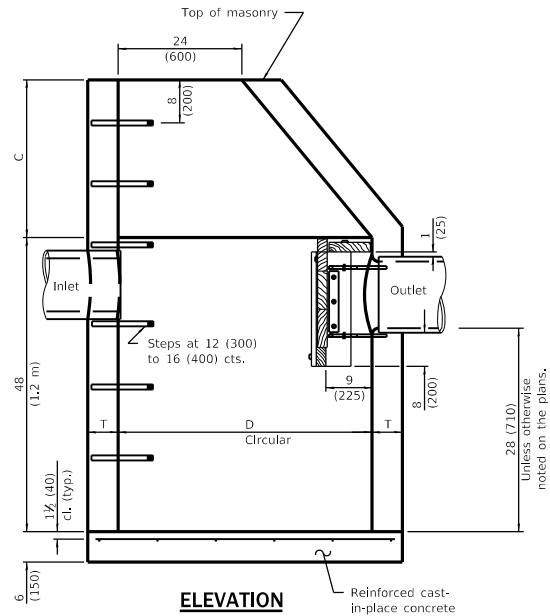
STANDARD 602011-02

Illinois Department of Transportation

PASSED January 1, 2011
Michael Beard
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2011
Scott Smith
 ENGINEER OF DESIGN AND ENVIRONMENT

469-1-03/ISS/2



ALTERNATE MATERIALS FOR WALLS	D	C*	T (min.)
Concrete Masonry Unit	36 (900) 4'-0" (1.20 m)	15 (380) 30 (760)	5 (125) 5 (125)
Brick Masonry	36 (900) 4'-0" (1.20 m)	15 (380) 30 (760)	8 (200) 8 (200)
Precast Reinforced Concrete Section	36 (900) 4'-0" (1.20 m)	15 (380) 30 (760)	3 (75) 4 (100)
Cast-in-Place Concrete	36 (900) 4'-0" (1.20 m)	15 (380) 30 (760)	6 (150) 6 (150)

* For precast reinforced concrete sections, dimension "C" may vary from the dimension given to plus 6 (150).

GENERAL NOTES

Bottom slabs shall be reinforced with a minimum of 0.20 sq. in./ft. (420 sq. mm/m) in both directions with a maximum spacing of 12 (300).

Bottom slabs may be connected to the riser as determined by the fabricator; however, only a single row of reinforcement around the perimeter may be utilized.

See Standard 602701 for details of steps.

See Standard 602601 for optional precast reinforced concrete flat slab top.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2011

Michael Beard
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2011

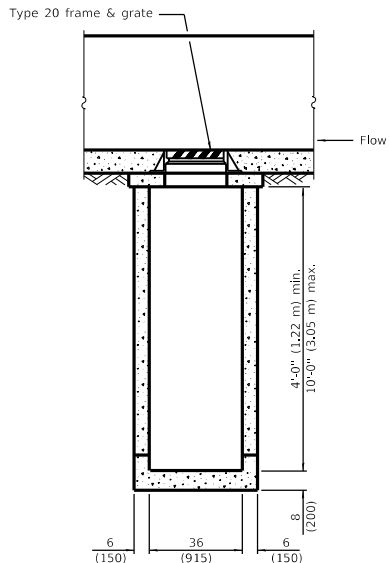
LEGAT-1 03/15/11

ENGINEER OF DESIGN AND ENVIRONMENT

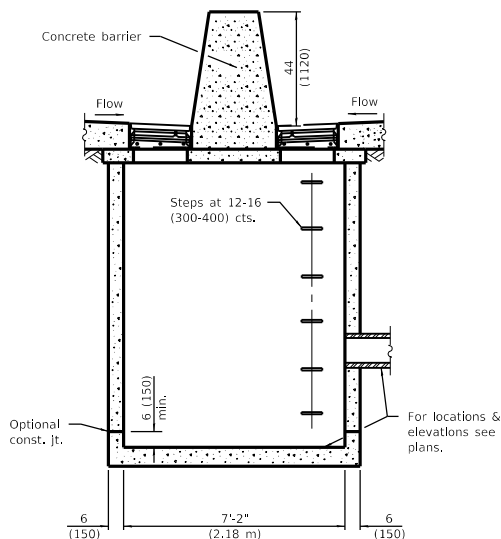
DATE	REVISIONS
1-1-11	Detailed reinforcement in slabs, Revised general notes.
1-1-09	Switched units to English (metric).

**CATCH BASIN
TYPE D**

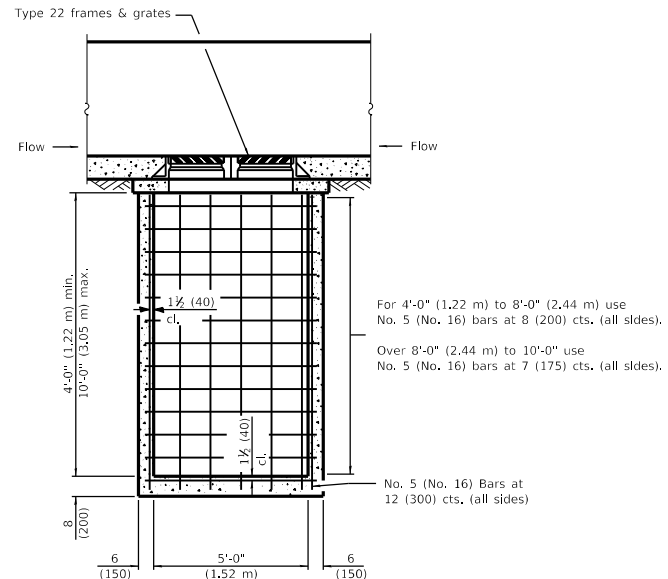
STANDARD 602016-02



FRONT ELEVATION - TYPE 4



SIDE ELEVATION - TYPE 4 & 5



FRONT ELEVATION - TYPE 5

GENERAL NOTES

These structures are for use with concrete barrier, double face, 44 (1120) height (Standard 637006).

The reinforcement shown in the front elevation of the Type 5 is typical for both elevations of all types.

See Standard 602701 for details of steps.

Exposed edges shall be beveled 1/4 (19).

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2019
Michael B. ...
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2019
...
 ENGINEER OF DESIGN AND ENVIRONMENT

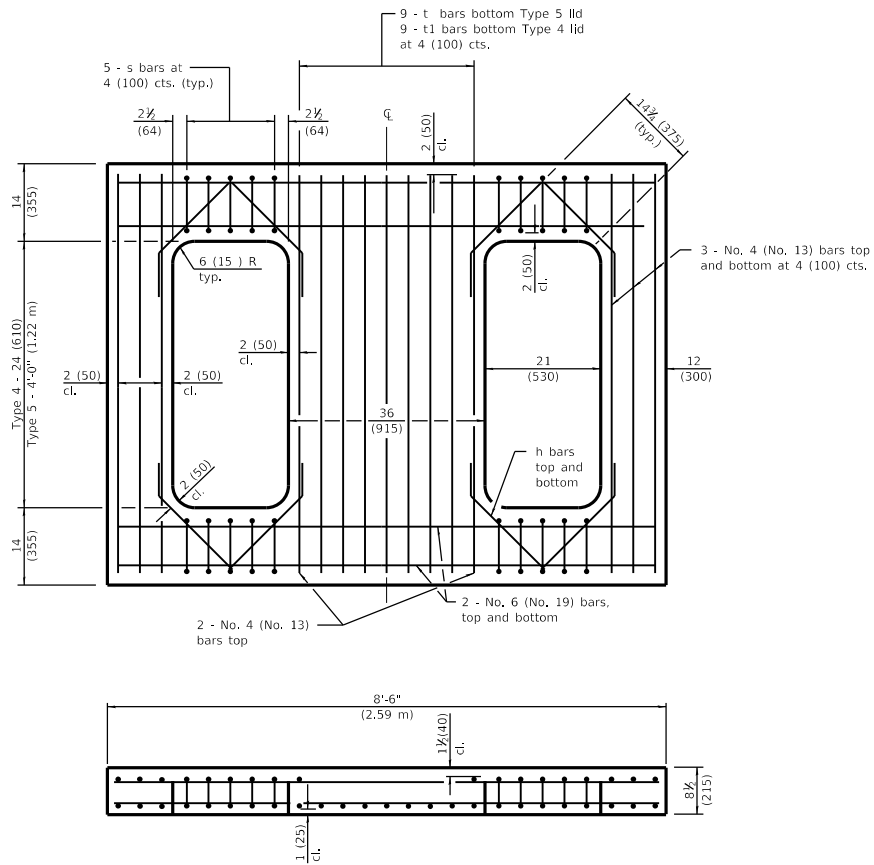
ISSUES: 0
 CHANGES: 0

DATE	REVISIONS
1-1-19	Deleted Type 6 and revised Types 4 and 5 to fit with 44 (1120) height, constant slope barrier.
1-1-09	Switched units to English (metric).

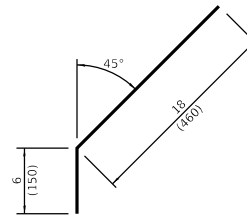
**DRAINAGE STRUCTURES
 TYPES 4 & 5**

(Sheet 1 of 2)

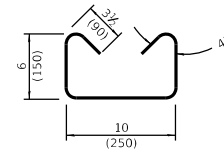
STANDARD 602106-02



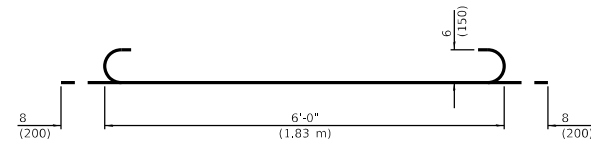
REINFORCED LID - TYPE 4 & 5



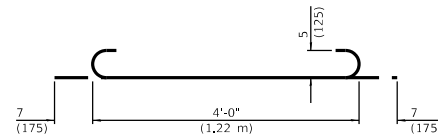
No. 4 (No. 13) Bar h



No. 3 (No. 10) Bar s



No. 6 (No. 19) Bar t



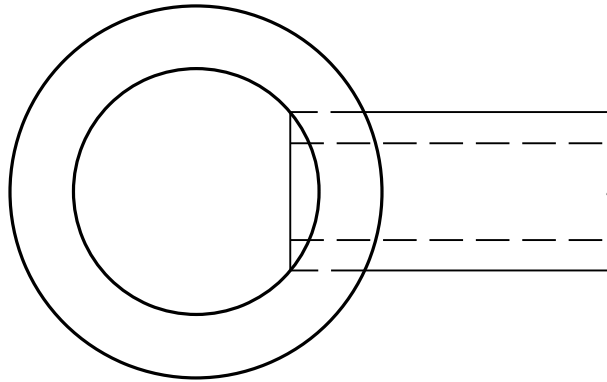
No. 5 (No. 16) Bar t1

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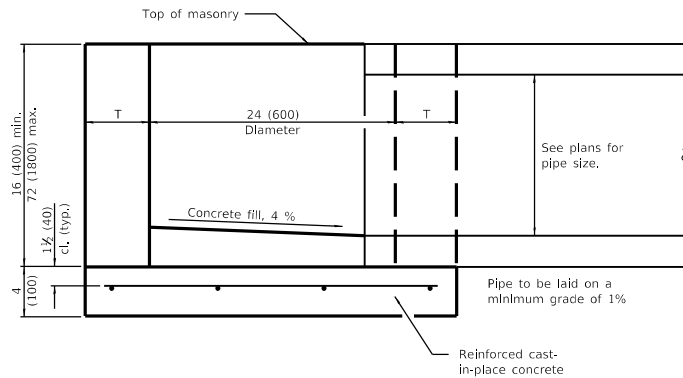
PASSED *Michael B. ...* January 1, 2019
 ENGINEER OF POLICY AND PROCEDURES

APPROVED *...* January 1, 2019
 ENGINEER OF DESIGN AND ENVIRONMENT

DRAINAGE STRUCTURES
TYPES 4 & 5
 (Sheet 2 of 2)
STANDARD 602106-02

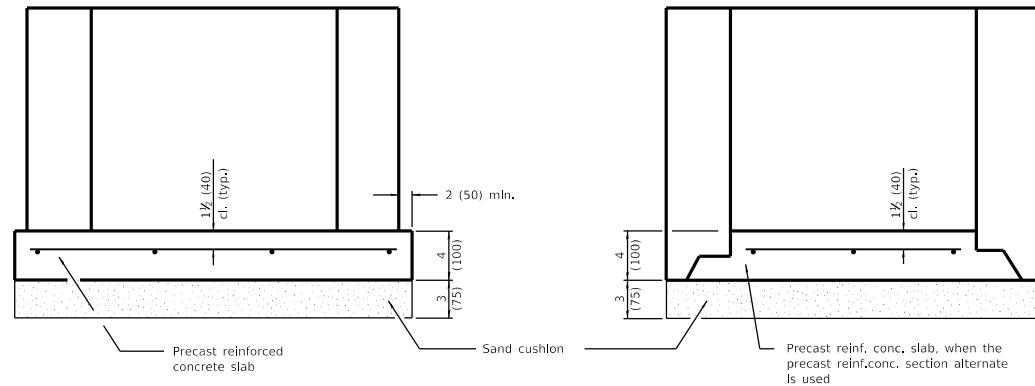


PLAN



ELEVATION

ALTERNATE MATERIALS FOR WALLS	T
BRICK MASONRY	8 (200)
CAST-IN-PLACE CONCRETE	6 (150)
CONCRETE MASONRY UNIT	5 (125)
PRECAST REINFORCED CONCRETE SECTION	3 (75)



ALTERNATE METHODS

GENERAL NOTES

Bottom slabs shall be reinforced with a minimum of 0.24 sq. in./ft. (510 sq. mm/m) in both directions with a maximum spacing of 10 (250).

Bottom slabs may be connected to the riser as determined by the fabricator; however, only a single row of reinforcement around the perimeter may be utilized.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-14	Increased height to 72 (1800) maximum.
1-1-11	Detailed reln. in slabs.
	Added max. limit to height.
	Added general notes.

INLET - TYPE A

STANDARD 602301-04

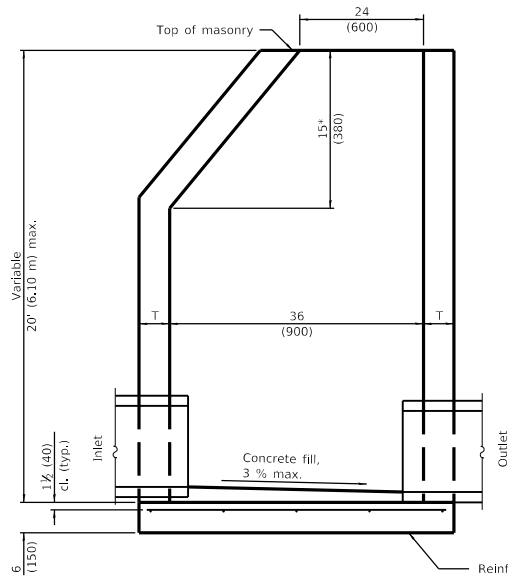
Illinois Department of Transportation

PASSED January 1, 2014
Michael Beard
 ENGINEER OF POLICY AND PROCEDURES

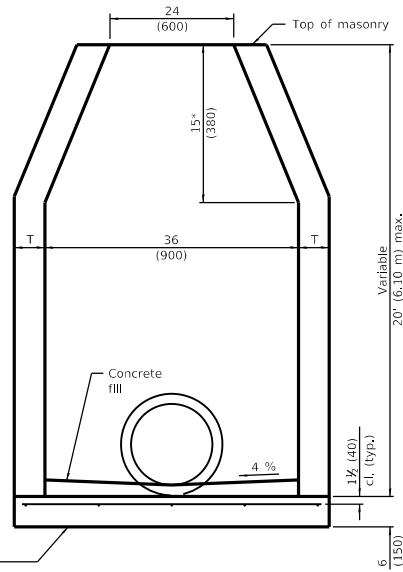
APPROVED January 1, 2014
[Signature]
 ENGINEER OF DESIGN AND ENVIRONMENT

469-C1 03/11/13

* For precast reinforced concrete sections, this dimension may vary from the dimension given to plus 6 (150).

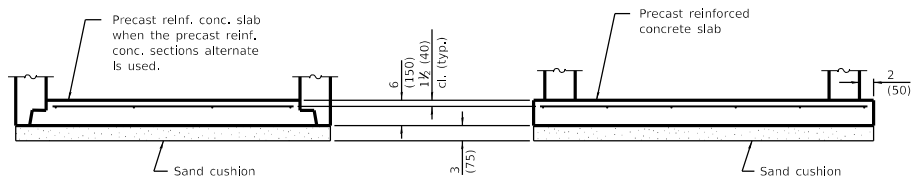


ELEVATION - ECCENTRIC



ELEVATION - CONCENTRIC

ALTERNATE MATERIALS FOR WALLS	T (min.)
Concrete Masonry Unit	5 (125)
Brick Masonry	8 (200)
Precast Reinforced Concrete Section	3 (75)
Cast-In-Place Concrete	6 (150)



ALTERNATE BOTTOM SLAB

GENERAL NOTES

Bottom slabs shall be reinforced with a minimum of 0.20 sq. in./ft. (420 sq. mm/m) in both directions with a maximum spacing of 12 (300).

Bottom slabs may be connected to the riser as determined by the fabricator; however, only a single row of reinforcement around the perimeter may be utilized.

See Standard 602601 for optional Precast Reinforced Concrete Flat Slab Top.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-11	Detailed rein. in slabs.
	Added max. limit to height.
	Revised general notes.
1-1-09	Switched units to English (metric).

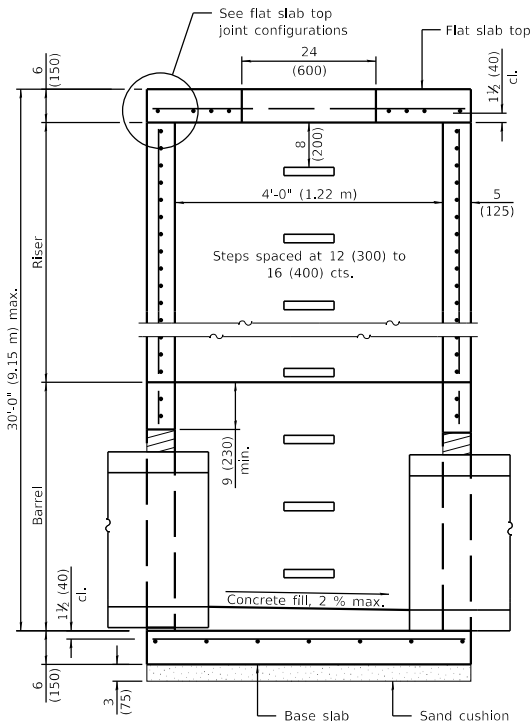
INLET - TYPE B
STANDARD 602306-03

Illinois Department of Transportation

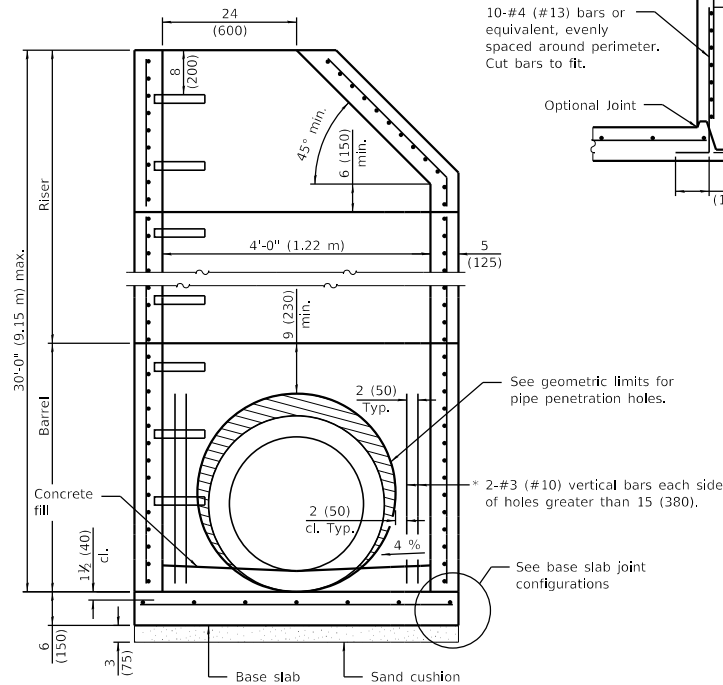
PASSED January 1, 2011
Michael Beard
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2011
Scott Smith
 ENGINEER OF DESIGN AND ENVIRONMENT

LEG-C1 03/11/2011



SECTION PARALLEL TO PIPE
(Without conical top riser)

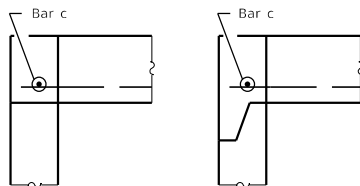


SECTION PERPENDICULAR TO PIPE
(With conical top riser)

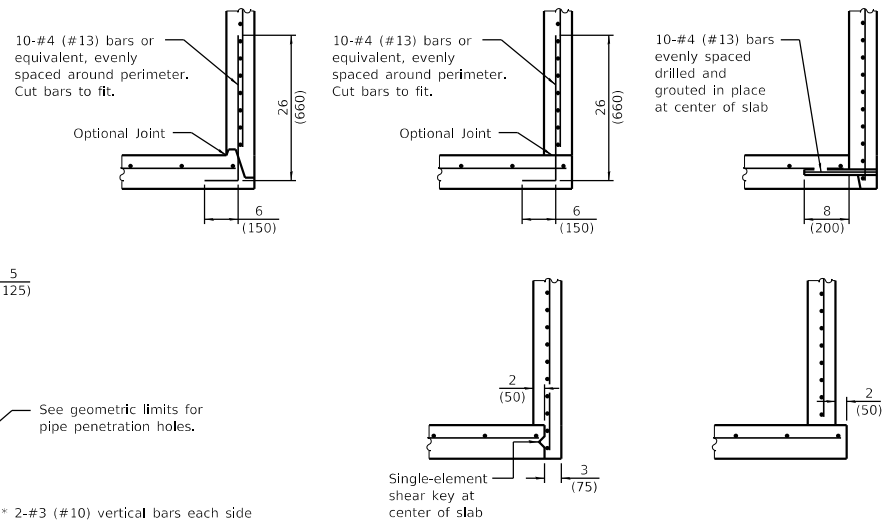
* As an alternate, the barrel wall reinforcement may be reduced to riser wall reinforcement with #3 (#10) bars placed around the pipe penetration holes as shown. This option may be utilized when the pipe penetration holes are formed as opposed to cored.

GEOMETRIC LIMITS FOR PIPE PENETRATION HOLES

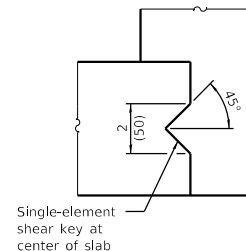
1. A minimum of 9 (230) of monolithic reinforced concrete shall be maintained above pipe penetration holes > 24 (600).
2. A minimum 12 (300) inside arc length of reinforced concrete shall be maintained between pipe penetration holes > 15 (380).
3. A maximum of 60 percent of the inside perimeter of the reinforced concrete manhole walls may be removed.
4. Horizontal joints that intersect pipe penetration holes > 15 (380) shall have one joint splice for every location around the perimeter of the joint where the inside arc length between pipe penetration holes is < 24 (600). See joint splice detail.
5. The recommended pipe penetration hole is equal to the O.D. of the pipe plus 4 (100).
6. Only pipe penetration holes ≤ 15 (380) are allowed in riser sections.



FLAT SLAB TOP JOINT CONFIGURATIONS
(Shown at access hole)



BASE SLAB JOINT CONFIGURATIONS



Single-element shear key at center of slab
SHEAR KEY GEOMETRY
(Reinforcement not shown for clarity)

GENERAL NOTES

The manufacturer shall ensure that all precast manhole sections are additionally reinforced where required to resist damage from handling, shipping and installation stresses.

Lifting holes shall be located in the sections as per the manufacturer's recommendations, except as noted.

See Standard 602701 for details of manhole steps.

All dimensions are in inches (millimeters) unless otherwise noted.

DATE	REVISIONS
3-1-19	Moved wall reinforcement from inside face to middle.
1-1-19	Expanded / refined reinforcement options. Increased manhole depths.

PRECAST MANHOLE TYPE A
4' (1.22 m) DIAMETER

(Sheet 1 of 2)

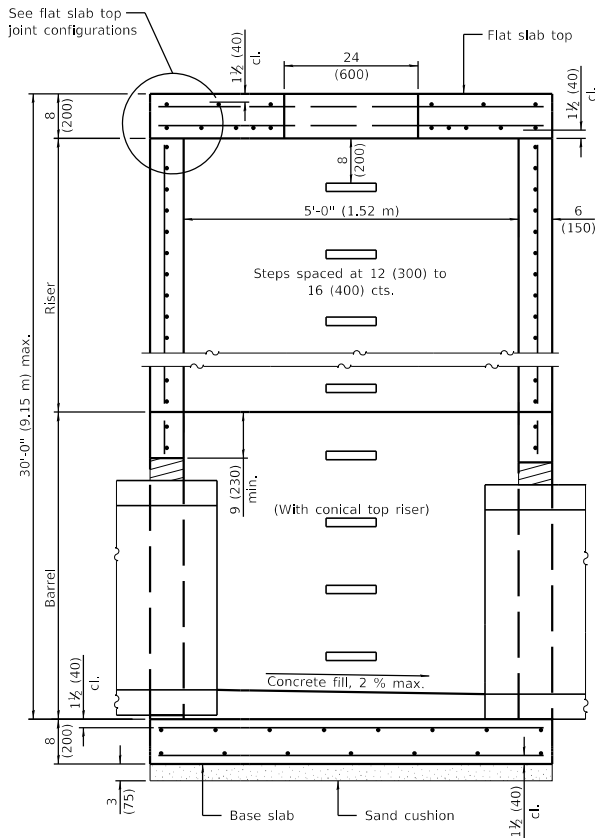
STANDARD 602401-06

Illinois Department of Transportation

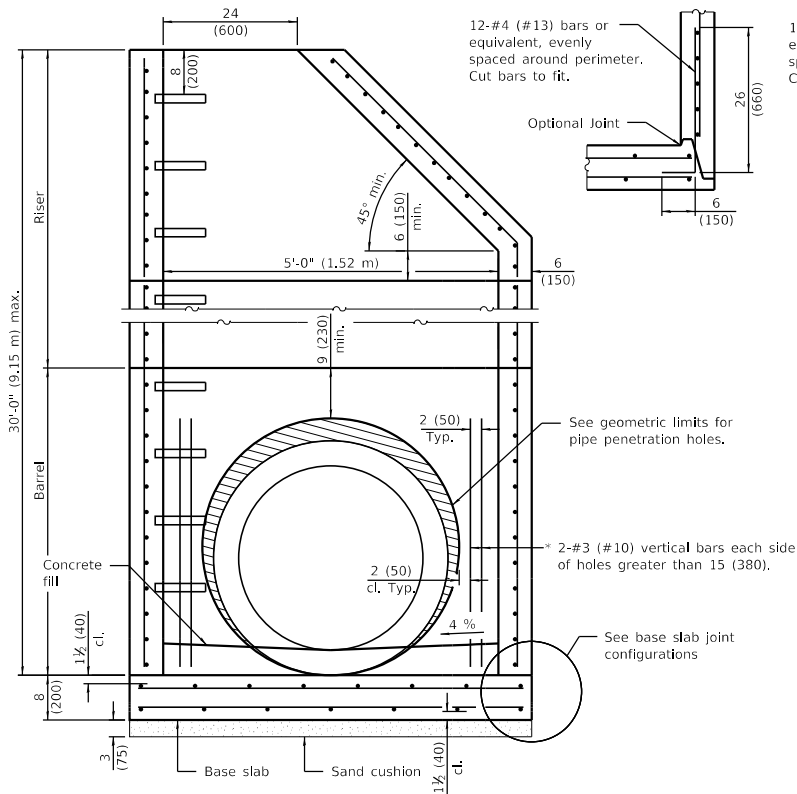
PASSED *M. B. D.* March 1, 2019
ENGINEER OF POLICY AND PROCEDURES

APPROVED *S. E. G.* March 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-17



SECTION PARALLEL TO PIPE
(Without conical top riser)

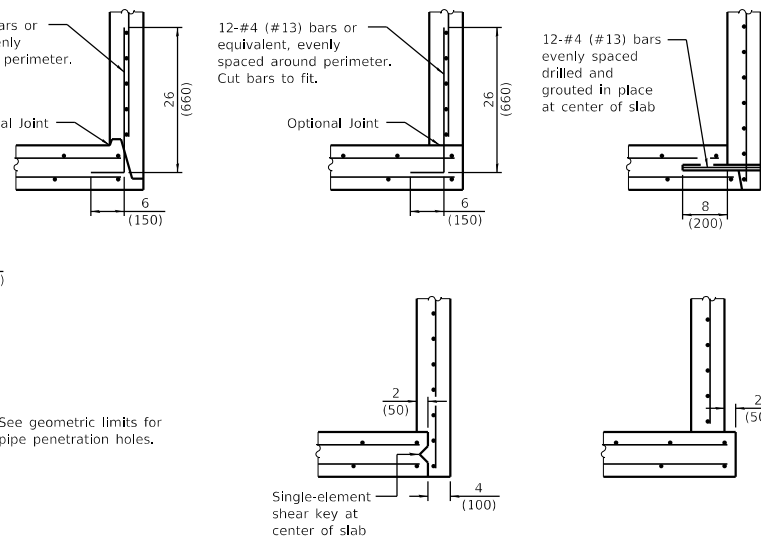


SECTION PERPENDICULAR TO PIPE
(With conical top riser)

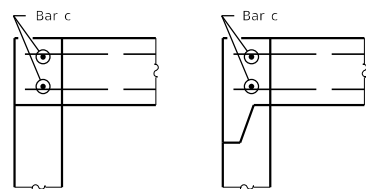
* As an alternate, the barrel wall reinforcement may be reduced to riser wall reinforcement with #3 (#10) bars placed around the pipe penetration holes as shown. This option may be utilized when the pipe penetration holes are formed as opposed to cored.

GEOMETRIC LIMITS FOR PIPE PENETRATION HOLES

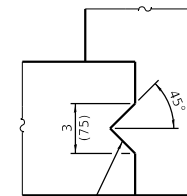
1. A minimum of 9 (230) of monolithic reinforced concrete shall be maintained above pipe penetration holes > 32 (810).
2. A minimum 12 (300) inside arc length of reinforced concrete shall be maintained between pipe penetration holes > 15 (380).
3. A maximum of 60 percent of the inside perimeter of the reinforced concrete manhole walls may be removed.
4. Horizontal joints that intersect pipe penetration holes > 15 (380) shall have one joint splice for every location around the perimeter of the joint where the inside arc length between pipe penetration holes is < 24 (600). See joint splice detail.
5. The recommended pipe penetration hole is equal to the O.D. of the pipe plus 4 (100).
6. Only pipe penetration holes ≤ 15 (380) are allowed in riser sections.



BASE SLAB JOINT CONFIGURATIONS



FLAT SLAB TOP JOINT CONFIGURATIONS
(Shown at access hole)



Single-element shear key at center of slab

SHEAR KEY GEOMETRY
(Reinforcement not shown for clarity)

GENERAL NOTES

The manufacturer shall ensure that all precast manhole sections are additionally reinforced where required to resist damage from handling, shipping and installation stresses.

Lifting holes shall be located in the sections as per the manufacturer's recommendations, except as noted.

See Standard 602701 for details of manhole steps.

All dimensions are in inches (millimeters) unless otherwise noted.

DATE	REVISIONS
3-1-19	Moved wall reinforcement from inside face to middle.
1-1-19	Expanded / refined reinforcement options. Increased manhole depths.

PRECAST MANHOLE TYPE A
5' (1.52 m) DIAMETER

(Sheet 1 of 2)

STANDARD 602402-02

Illinois Department of Transportation

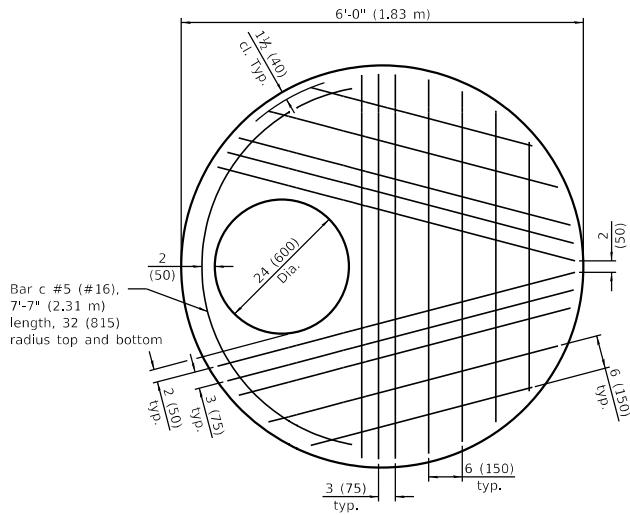
PASSED March 1, 2019

ENGINEER OF POLICY AND PROCEDURES

APPROVED March 1, 2019

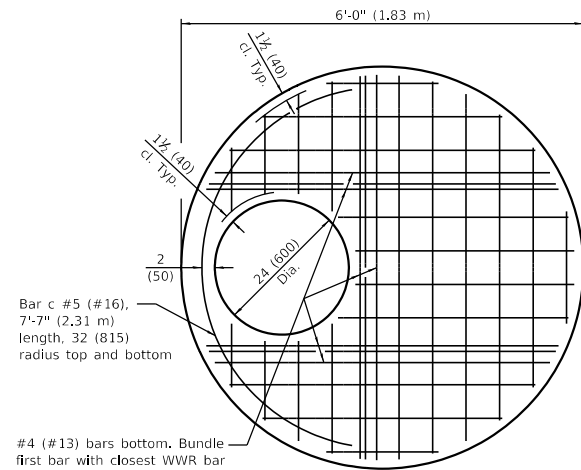
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-19



PLAN - FLAT SLAB TOP

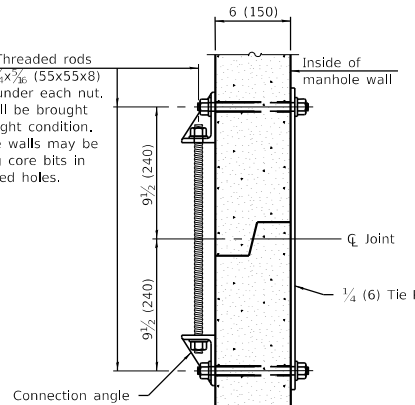
(Showing layout of bottom reinforcement bars and c bars)



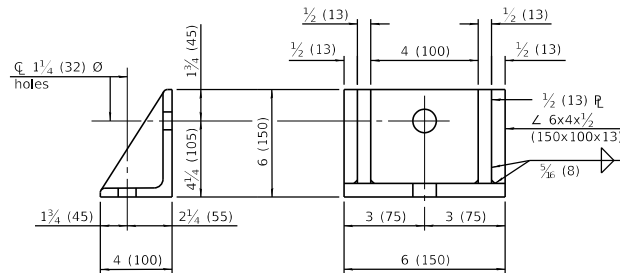
PLAN - FLAT SLAB TOP

(Showing layout of welded wire reinforcement and c bars)

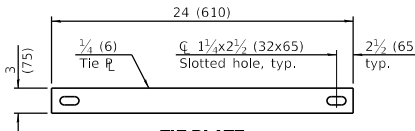
1 (25) \varnothing Threaded rods with $2\frac{1}{4} \times 2\frac{1}{4} \times \frac{3}{16}$ (55x55x8) \mathbb{R} washers under each nut. All nuts shall be brought to a snug tight condition. Holes in the walls may be drilled using core bits in lieu of formed holes.



JOINT SPLICE



CONNECTION ANGLE



TIE PLATE

FLAT SLAB TOP REINFORCEMENT

Location	WWR (each direction)		Rebar (each direction except as noted)		
	A_s (min.)	Spacing (max.)	A_s (min.)	Spacing (max.)	Bar Size
Top Mat	0.11 sq. in./ft. (233 sq. mm/m)	18 (450)	0.11 sq. in./ft. (233 sq. mm/m)	18 (450)	#3 or #4 (#10) (#13)
Bottom Mat	** 0.40 sq. in./ft. (847 sq. mm/m)	6 (150)	See plan view for rebar orientation and spacing and this table for bar size		
					#4 (#13)

** Only one layer of WWR permitted to avoid congestion.

WALL REINFORCEMENT

Location	Orientation	WWR or Rebar	
		A_s (min.)	Spacing (max.)
Riser	Circumferential	0.15 sq. in./ft. (318 sq. mm/m)	6 (150)
	Vertical	0.045 sq. in./ft. (95 sq. mm/m)	8 (200)
Barrel	Circumferential	0.15 sq. in./ft. (318 sq. mm/m)	6 (150)
	Vertical	0.16 sq. in./ft. (339 sq. mm/m)	4 (100)

BASE SLAB REINFORCEMENT

Location	Total Height	WWR or Rebar (each direction)	
		A_s (min.)	Spacing (max.)
Top Mat	≤ 20 ft. (6.10 m)	0.24 sq. in./ft. (508 sq. mm/m)	10 (250)
	> 20 ft. (6.10 m)	0.28 sq. in./ft. (593 sq. mm/m)	8 (200)
Bottom Mat	All	0.11 sq. in./ft. (233 sq. mm/m)	18 (450)

Illinois Department of Transportation

PASSED March 1, 2019

ENGINEER OF POLICY AND PROCEDURES

APPROVED March 1, 2019

ENGINEER OF DESIGN AND ENVIRONMENT

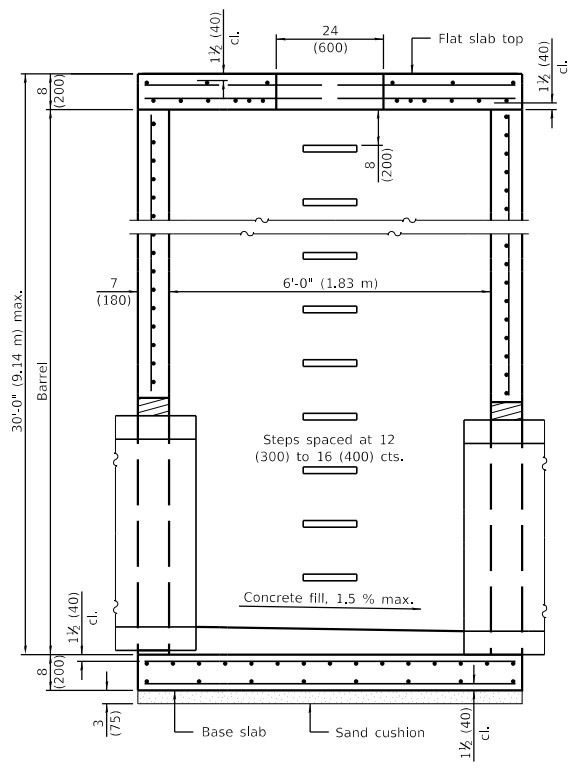
ISSUED 1-1-18

PRECAST MANHOLE TYPE A

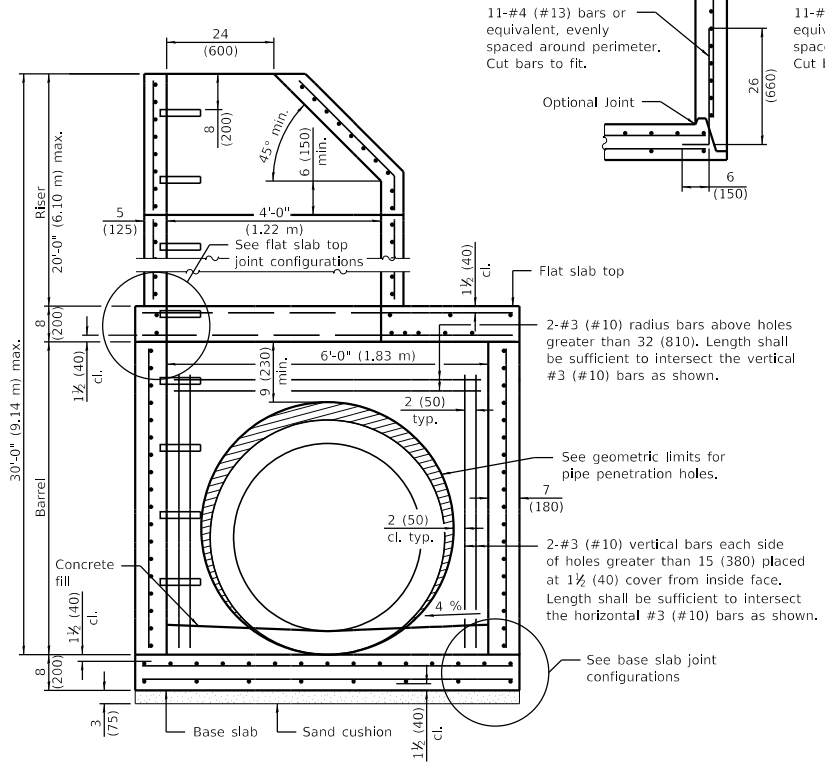
5' (1.52 m) DIAMETER

(Sheet 2 of 2)

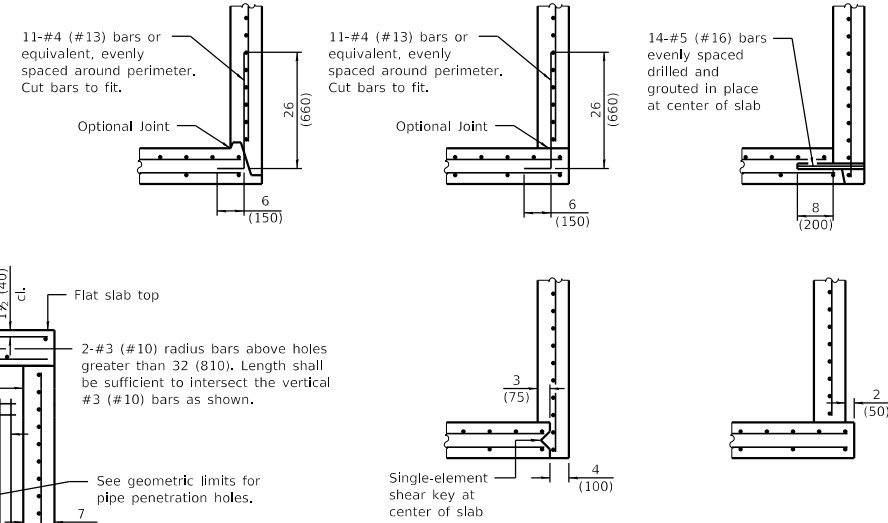
STANDARD 602402-02



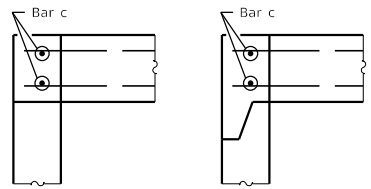
SECTION PARALLEL TO PIPE
(Without conical top riser)



SECTION PERPENDICULAR TO PIPE
(With conical top riser)



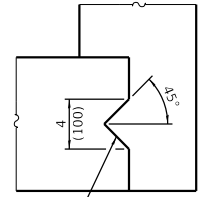
BASE SLAB JOINT CONFIGURATIONS



FLAT SLAB TOP JOINT CONFIGURATIONS
(Shown at access hole)

GEOMETRIC LIMITS FOR PIPE PENETRATION HOLES

1. A minimum of 9 (230) of monolithic reinforced concrete shall be maintained above pipe penetration holes > 32 (810).
2. A minimum 9 (230) inside arc length of reinforced concrete shall be maintained between pipe penetration holes > 15 (380).
3. A maximum of 60 percent of the inside perimeter of the reinforced concrete manhole walls may be removed.
4. Horizontal joints that intersect pipe penetration holes > 15 (380) shall have one joint splice for every location around the perimeter of the joint where the inside arc length between pipe penetration holes is < 24 (600). See joint splice detail.
5. The recommended pipe penetration hole is equal to the O.D. of the pipe plus 4 (100).
6. Only pipe penetration holes ≤ 15 (380) are allowed in riser sections.



Single-element shear key at center of slab
SHEAR KEY GEOMETRY
(Reinforcement not shown for clarity)

GENERAL NOTES

- Pipe holes shall be formed to facilitate proper placement of hole reinforcement.
- The manufacturer shall ensure that all precast manhole sections are additionally reinforced where required to resist damage from handling, shipping and installation stresses.
- Lifting holes shall be located in the sections as per the manufacturer's recommendations, except as noted.
- See Standard 602701 for details of manhole steps.
- All dimensions are in inches (millimeters) unless otherwise noted.

DATE	REVISIONS
3-1-19	Moved wall reinforcement from inside face to middle.
1-1-19	Expanded / refined reinforcement options. Increased manhole depths.

PRECAST MANHOLE TYPE A
6' (1.83 m) DIAMETER
(Sheet 1 of 3)

STANDARD 602406-10

Illinois Department of Transportation

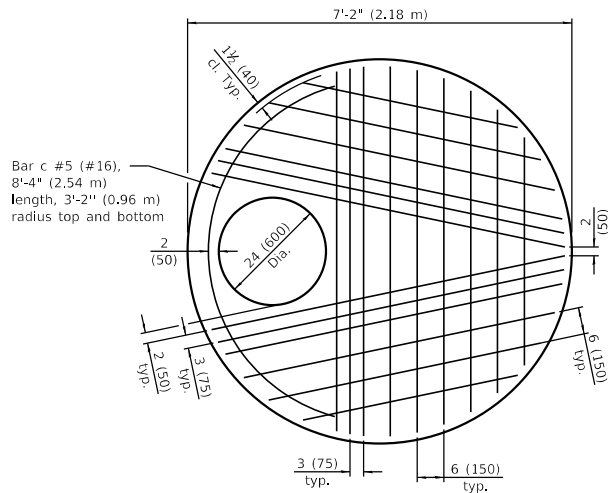
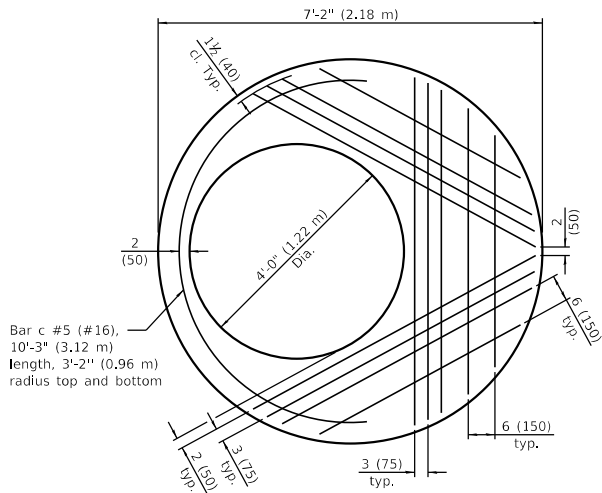
PASSED March 1, 2019

ENGINEER OF POLICY AND PROCEDURES

APPROVED March 1, 2019

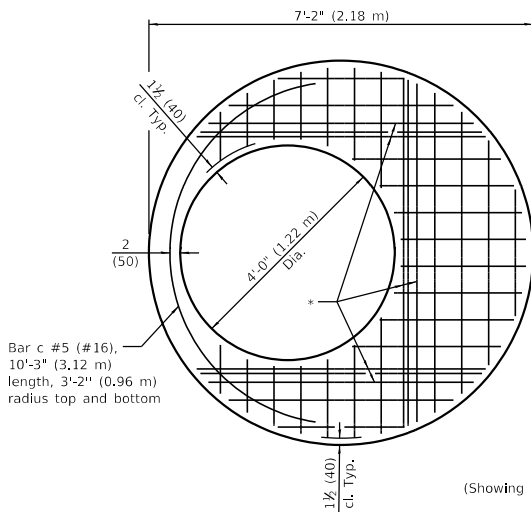
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-17



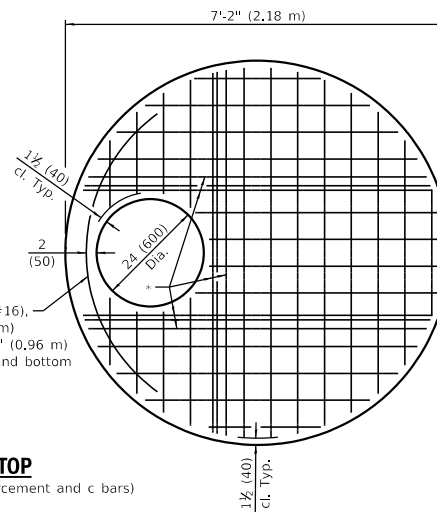
PLAN - FLAT SLAB TOP

(Showing layout of bottom reinforcement bars and c bars)



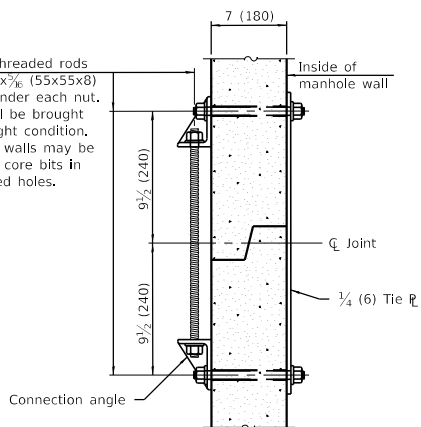
PLAN - FLAT SLAB TOP

(Showing layout of welded wire reinforcement and c bars)

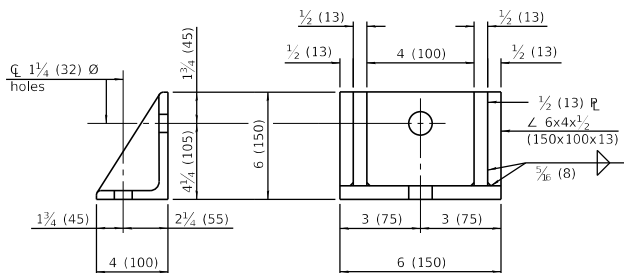


* #5 (#16) bars for risers ≤ 10 ft. (3.05 m) tall or #6 (#19) bars for risers > 10 ft. (3.05 m) tall bottom. Bundle first bar with closest WWR bar to the opening and place second bar ±3 (75) away.

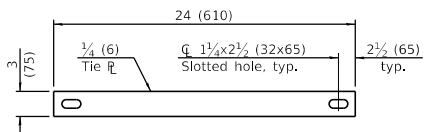
\varnothing 1(25) \varnothing Threaded rods
 with $2\frac{1}{4} \times 2\frac{1}{4} \times \frac{5}{16}$ (55x55x8)
 \varnothing washers under each nut.
 All nuts shall be brought
 to a snug tight condition.
 Holes in the walls may be
 drilled using core bits in
 lieu of formed holes.



JOINT SPLICE



CONNECTION ANGLE



TIE PLATE

FLAT SLAB TOP REINFORCEMENT

Location	Riser Height (RH)	WWR (each direction)		Rebar (each direction except as noted)		
		As (min.)	Spacing (max.)	As (min.)	Spacing (max.)	Bar Size
Top Mat	All	0.11 sq. in./ft. (233 sq. mm/m)	18 (450)	0.11 sq. in./ft. (233 sq. mm/m)	18 (450)	#3 or #4 (#10) (#13)
Bottom Mat	RH \leq 10 ft. (3.05 m)	** 0.62 sq. in./ft. (1312 sq. mm/m)	6 (150)	See plan view for rebar orientation and spacing and this table for bar size		#5 (#16)
	RH > 10 ft. (3.05 m)	** 0.88 sq. in./ft. (1863 sq. mm/m)	6 (150)			#6 (#19)

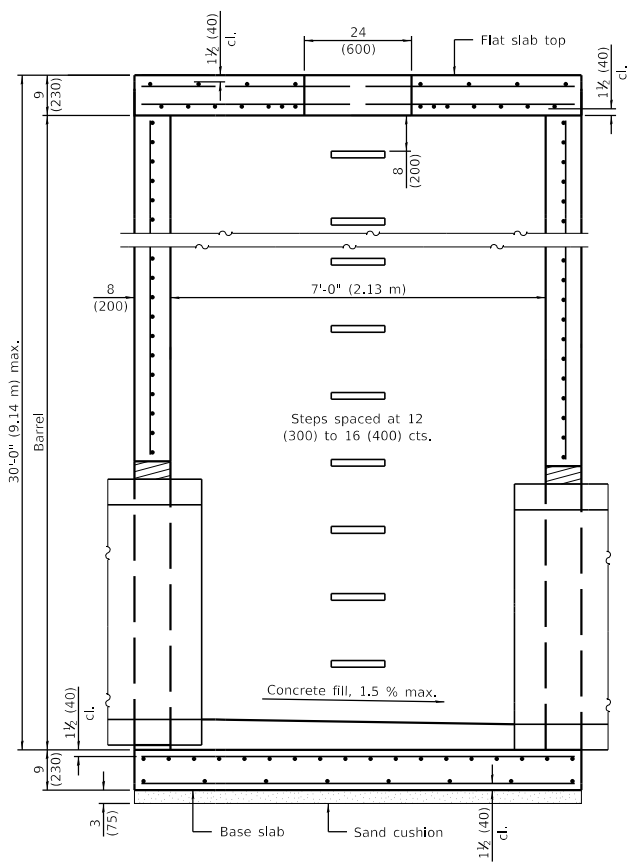
** Only one layer of WWR permitted to avoid congestion.

WALL REINFORCEMENT

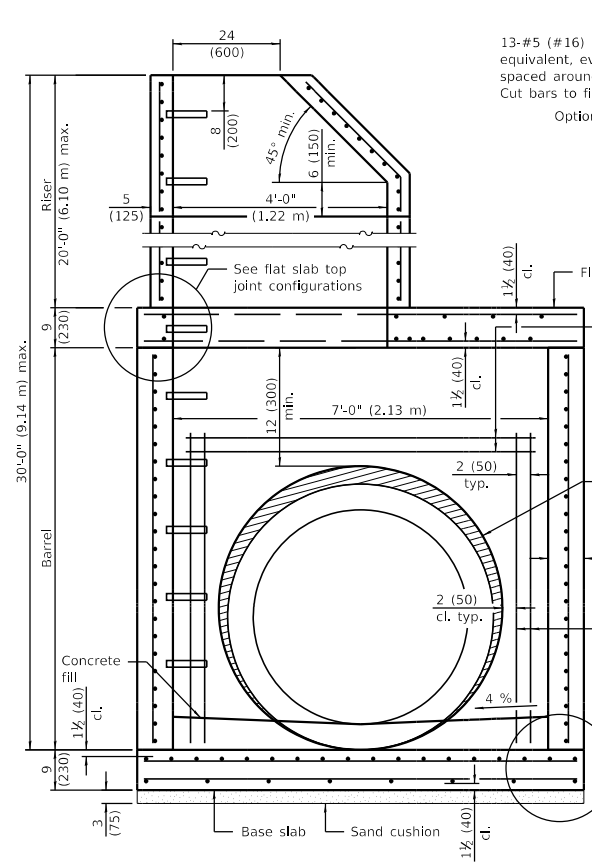
Location	Orientation	WWR or Rebar	
		As (min.)	Spacing (max.)
4 ft. (1.22 m) \varnothing Riser	Circumferential	0.12 sq. in./ft. (254 sq. mm/m)	6 (150)
	Vertical	0.045 sq. in./ft. (95 sq. mm/m)	8 (200)
6 ft. (1.83 m) \varnothing Barrel	Circumferential	0.18 sq. in./ft. (381 sq. mm/m)	6 (150)
	Vertical	0.045 sq. in./ft. (95 sq. mm/m)	8 (200)

BASE SLAB REINFORCEMENT

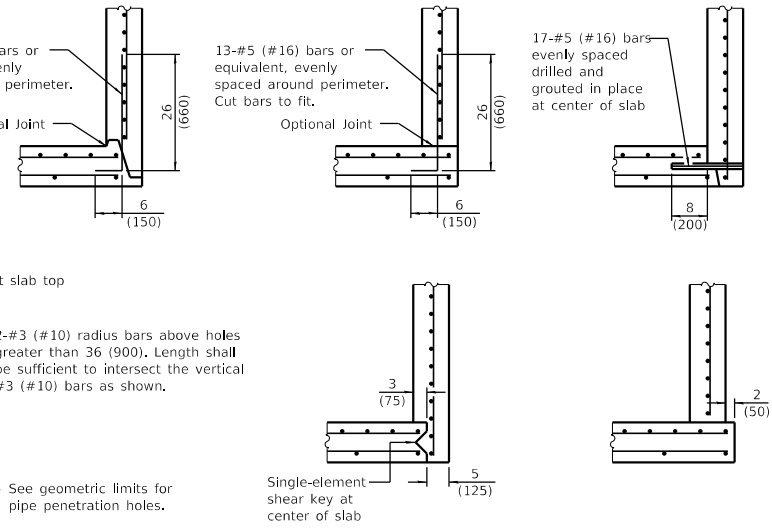
Location	Riser Height (RH)/ Total Height (TH)	WWR or Rebar (each direction)	
		As (min.)	Spacing (max.)
Top Mat	RH \leq 10 ft. (3.05 m) & TH \leq 20 ft. (6.10 m)	0.28 sq. in./ft. (593 sq. mm/m)	6 (150)
	RH > 10 ft. (3.05 m) or TH > 20 ft. (6.10 m)	0.40 sq. in./ft. (847 sq. mm/m)	6 (150)
Bottom Mat	All	0.11 sq. in./ft. (233 sq. mm/m)	18 (450)



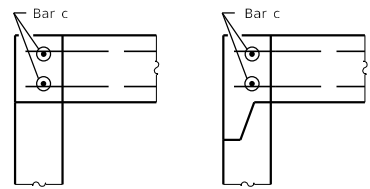
SECTION PARALLEL TO PIPE
(Without conical top riser)



SECTION PERPENDICULAR TO PIPE
(With conical top riser)



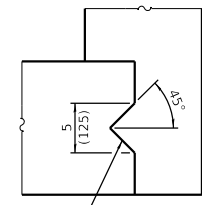
BASE SLAB JOINT CONFIGURATIONS



FLAT SLAB TOP JOINT CONFIGURATIONS
(Shown at access hole)

GEOMETRIC LIMITS FOR PIPE PENETRATION HOLES

1. A minimum of 12 (300) of monolithic reinforced concrete shall be maintained above pipe penetration holes > 36 (900).
2. A minimum 12 (300) inside arc length of reinforced concrete shall be maintained between pipe penetration holes > 15 (380).
3. A maximum of 60 percent of the inside perimeter of the reinforced concrete manhole walls may be removed.
4. Horizontal joints that intersect pipe penetration holes > 15 (380) shall have one joint splice for every location around the perimeter of the joint where the inside arc length between pipe penetration holes is < 24 (600). See joint splice detail.
5. The recommended pipe penetration hole is equal to the O.D. of the pipe plus 4 (100).
6. Only pipe penetration holes ≤ 15 (380) are allowed in riser sections.



Single-element shear key at center of slab

SHEAR KEY GEOMETRY

(Reinforcement not shown for clarity)

GENERAL NOTES

- Pipe holes shall be formed to facilitate proper placement of hole reinforcement.
- The manufacturer shall ensure that all precast manhole sections are additionally reinforced where required to resist damage from handling, shipping and installation stresses.
- Lifting holes shall be located in the sections as per the manufacturer's recommendations, except as noted.
- See Standard 602701 for details of manhole steps.
- All dimensions are in inches (millimeters) unless otherwise noted.

DATE	REVISIONS
3-1-19	Moved wall reinforcement from inside face to middle.
1-1-19	Expanded / refined reinforcement options. Increased manhole depths.

PRECAST MANHOLE TYPE A
7' (2.13 m) DIAMETER

(Sheet 1 of 3)

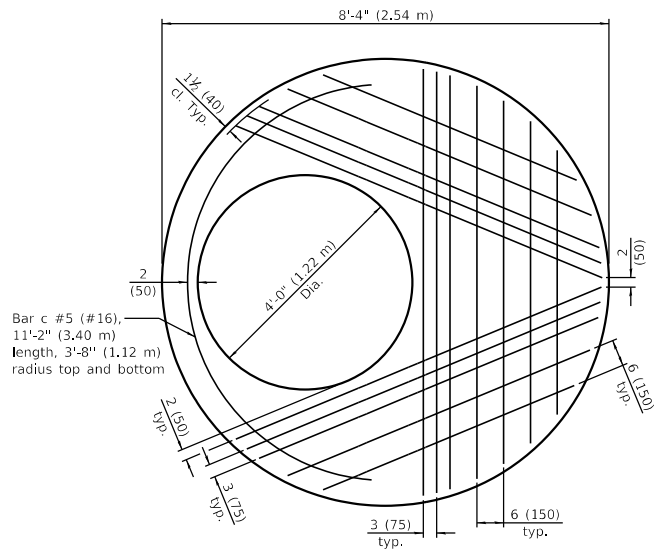
STANDARD 602411-08

Illinois Department of Transportation

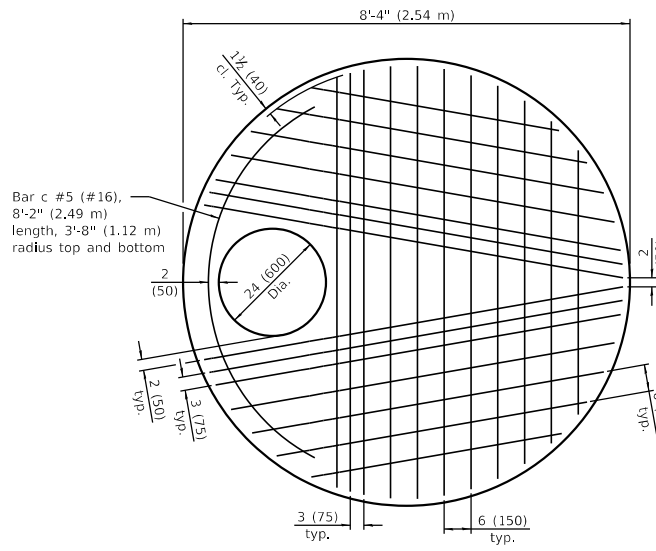
PASSED *M. B. D.* March 1, 2019
ENGINEER OF POLICY AND PROCEDURES

APPROVED *S. E. G.* March 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 90-1-14

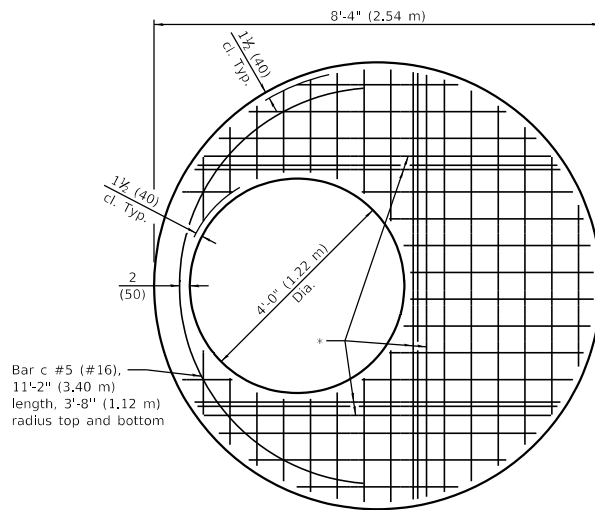


Bar c #5 (#16),
11'-2" (3.40 m)
length, 3'-8" (1.12 m)
radius top and bottom

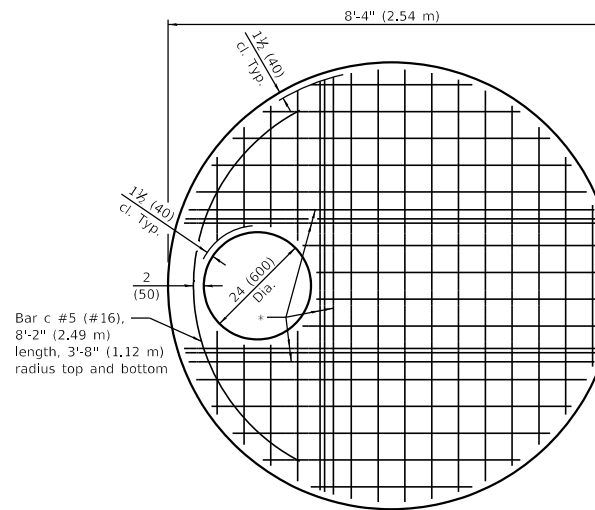


Bar c #5 (#16),
8'-2" (2.49 m)
length, 3'-8" (1.12 m)
radius top and bottom

PLAN - FLAT SLAB TOP
(Showing layout of bottom reinforcement bars and c bars)



Bar c #5 (#16),
11'-2" (3.40 m)
length, 3'-8" (1.12 m)
radius top and bottom

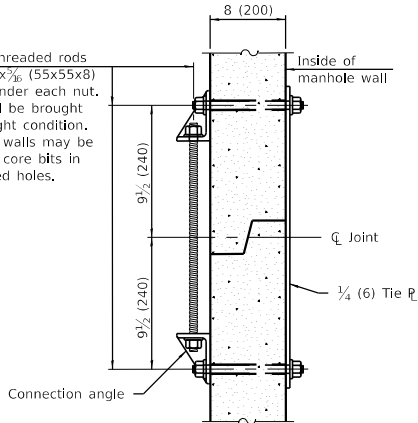


Bar c #5 (#16),
8'-2" (2.49 m)
length, 3'-8" (1.12 m)
radius top and bottom

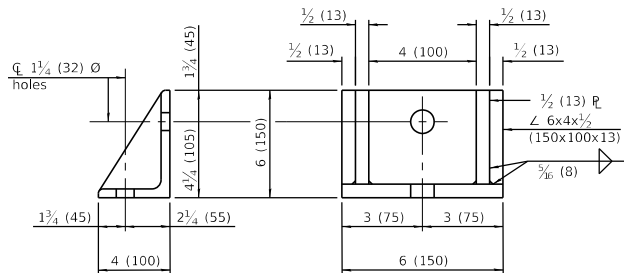
PLAN - FLAT SLAB TOP
(Showing layout of Welded Wire Reinforcement and c bars)
WWR not permitted for riser heights > 10' (3.05 m).

* #5 (#16) bars bottom. Bundle first bar with closest WWR bar to the opening and place second bar ±3 (75) away.

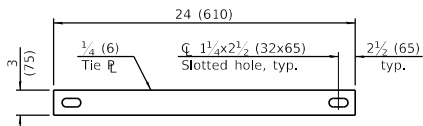
\varnothing 1(25) \varnothing Threaded rods
 with $2\frac{1}{4} \times 2\frac{1}{4} \times \frac{3}{16}$ (55x55x8)
 \varnothing washers under each nut.
 All nuts shall be brought
 to a snug tight condition.
 Holes in the walls may be
 drilled using core bits in
 lieu of formed holes.



JOINT SPLICE



CONNECTION ANGLE



TIE PLATE

FLAT SLAB TOP REINFORCEMENT

Location	Riser Height (RH)	WWR (each direction)		Rebar (each direction except as noted)		
		A _s (min.)	Spacing (max.)	A _s (min.)	Spacing (max.)	Bar Size
Top Mat	All	0.11 sq. in./ft. (233 sq. mm/m)	18 (450)	0.11 sq. in./ft. (233 sq. mm/m)	18 (450)	#3 or #4 (#10) (#13)
Bottom Mat	RH ≤ 10 ft. (3.05 m)	** 0.62 sq. in./ft. (312 sq. mm/m)	6 (150)	See plan view for rebar orientation and spacing and this table for bar size		#5 (#16)
	RH > 10 ft. (3.05 m)	WWR not permitted				#7 (#22)

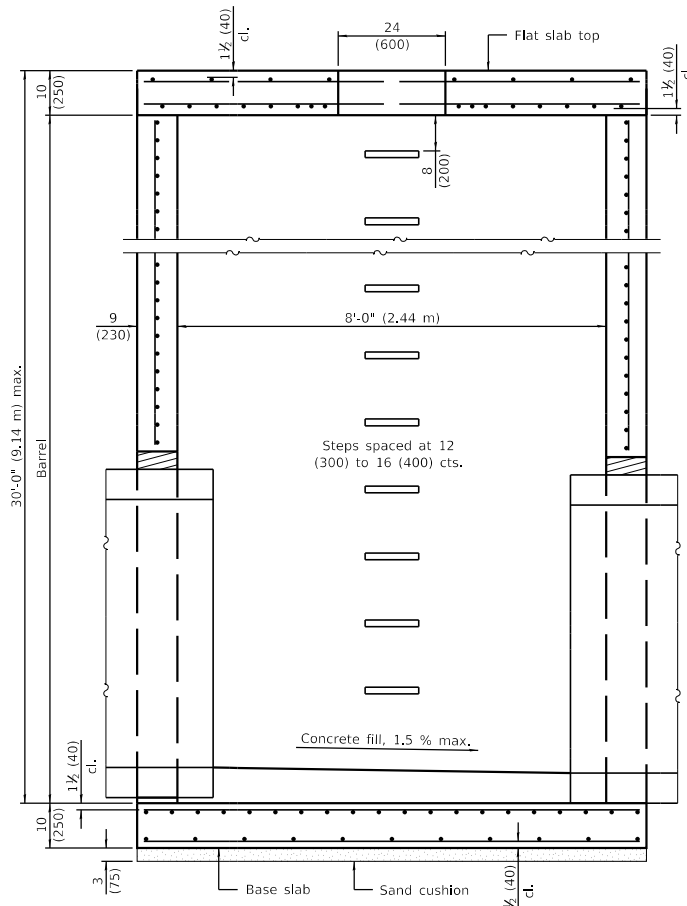
** Only one layer of WWR permitted to avoid congestion.

WALL REINFORCEMENT

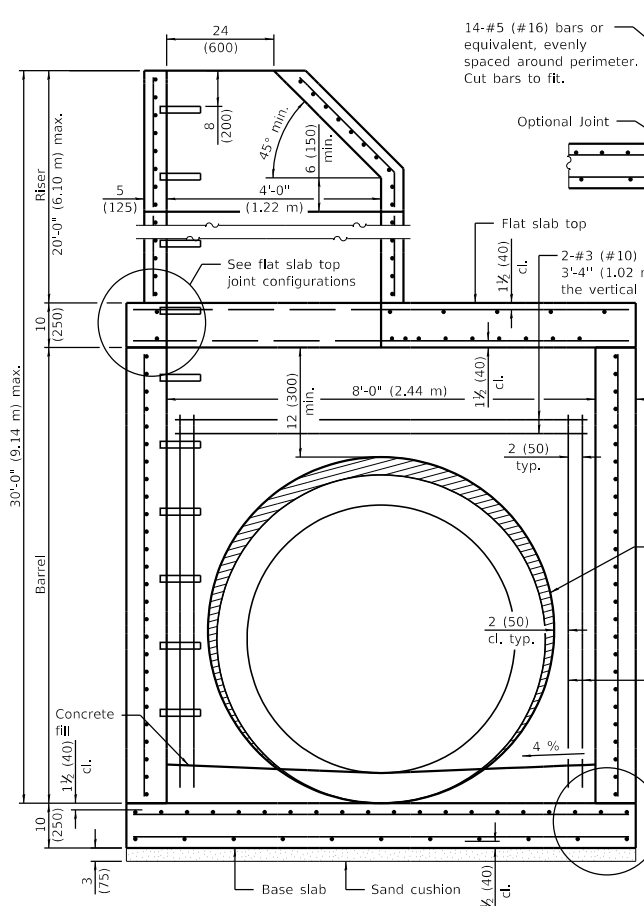
Location	Orientation	WWR or Rebar	
		A _s (min.)	Spacing (max.)
4 ft. (1.22 m) \varnothing Riser	Circumferential	0.12 sq. in./ft. (254 sq. mm/m)	6 (150)
	Vertical	0.045 sq. in./ft. (95 sq. mm/m)	8 (200)
7 ft. (2.13 m) \varnothing Barrel	Circumferential	0.21 sq. in./ft. (445 sq. mm/m)	6 (150)
	Vertical	0.045 sq. in./ft. (95 sq. mm/m)	8 (200)

BASE SLAB REINFORCEMENT

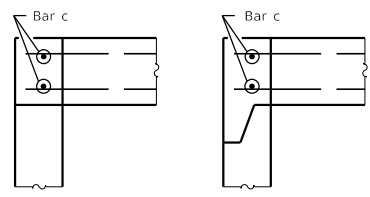
Location	Riser Height (RH)/ Total Height (TH)	WWR or Rebar (each direction)	
		A _s (min.)	Spacing (max.)
Top Mat	RH ≤ 10 ft. (3.05 m) & TH ≤ 20 ft. (6.10 m)	0.32 sq. in./ft. (677 sq. mm/m)	6 (150)
	RH > 10 ft. (3.05 m) or TH > 20 ft. (6.10 m)	0.52 sq. in./ft. (1101 sq. mm/m)	6 (150)
Bottom Mat	All	0.11 sq. in./ft. (233 sq. mm/m)	18 (450)



SECTION PARALLEL TO PIPE
(Without conical top riser)



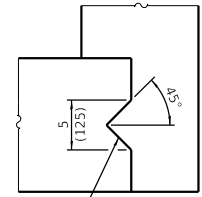
SECTION PERPENDICULAR TO PIPE
(With conical top riser)



FLAT SLAB TOP JOINT CONFIGURATIONS
(Shown at access hole)

GEOMETRIC LIMITS FOR PIPE PENETRATION HOLES

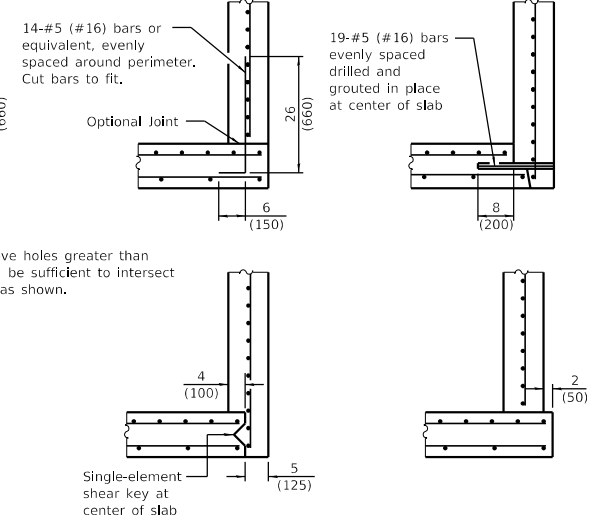
1. A minimum of 12 (300) of monolithic reinforced concrete shall be maintained above pipe penetration holes > 3'-4" (1.02 m).
2. A minimum 12 (300) inside arc length of reinforced concrete shall be maintained between pipe penetration holes > 15 (380).
3. A maximum of 60 percent of the inside perimeter of the reinforced concrete manhole walls may be removed.
4. Horizontal joints that intersect pipe penetration holes > 15 (380) shall have one joint splice for every location around the perimeter of the joint where the inside arc length between pipe penetration holes is < 24 (600). See joint splice detail.
5. The recommended pipe penetration hole is equal to the O.D. of the pipe plus 4 (100).
6. Only pipe penetration holes ≤ 15 (380) are allowed in riser sections.



Single-element shear key at center of slab

SHEAR KEY GEOMETRY

(Reinforcement not shown for clarity)



BASE SLAB JOINT CONFIGURATIONS

GENERAL NOTES

- Pipe holes shall be formed to facilitate proper placement of hole reinforcement.
- The manufacturer shall ensure that all precast manhole sections are additionally reinforced where required to resist damage from handling, shipping and installation stresses.
- Lifting holes shall be located in the sections as per the manufacturer's recommendations, except as noted.
- See Standard 602701 for details of manhole steps.
- All dimensions are in inches (millimeters) unless otherwise noted.

DATE	REVISIONS
3-1-19	Moved wall reinforcement from inside face to middle.
1-1-19	Expanded / refined reinforcement options. Increased manhole depths.

PRECAST MANHOLE TYPE A
8' (2.44 m) DIAMETER

(Sheet 1 of 3)

STANDARD 602416-08

Illinois Department of Transportation

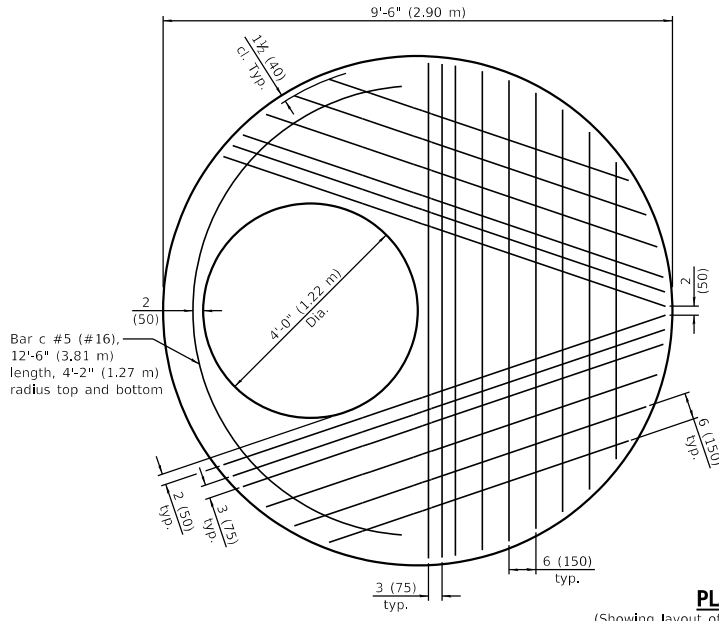
PASSED *March 1, 2019*

ENGINEER OF POLICY AND PROCEDURES

APPROVED *March 1, 2019*

ENGINEER OF DESIGN AND ENVIRONMENT

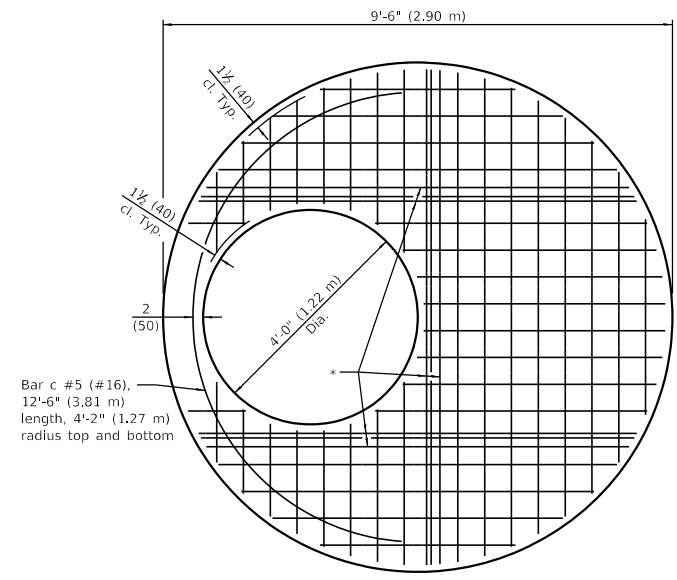
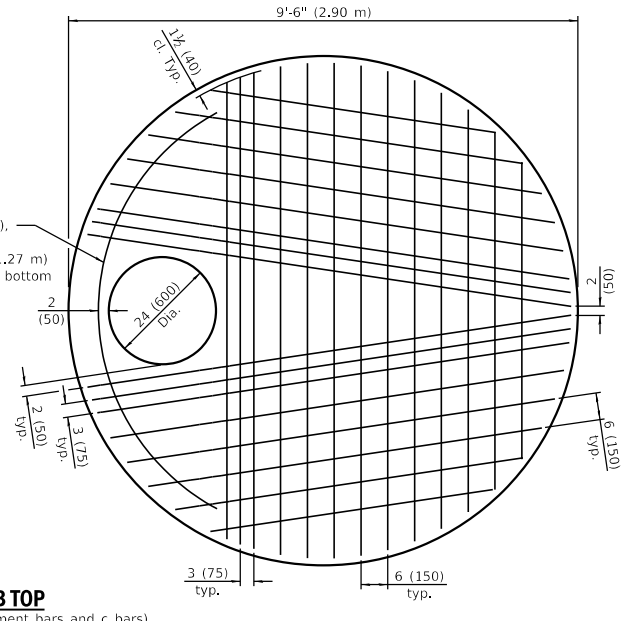
ISSUED 90-1-19



Bar c #5 (#16),
9'-2" (2.79 m)
length, 4'-2" (1.27 m)
radius top and bottom

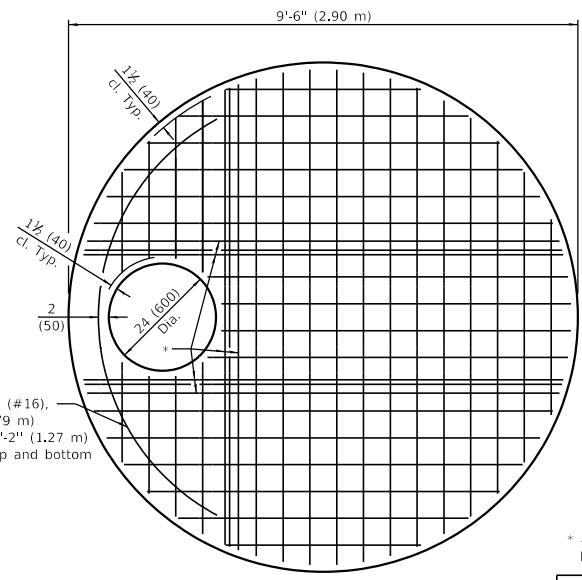
PLAN - FLAT SLAB TOP

(Showing layout of bottom reinforcement bars and c bars)



PLAN - FLAT SLAB TOP

(Showing layout of Welded Wire Reinforcement and c bars)
WWR not permitted for riser heights > 10' (3.05 m).



* #6 (#19) bars bottom. Bundle first bar with closest WWR bar to the opening and place second bar ±3 (75) away.

Illinois Department of Transportation

PASSED March 1, 2019

ENGINEER OF POLICY AND PROCEDURES

APPROVED March 1, 2019

ENGINEER OF DESIGN AND ENVIRONMENT

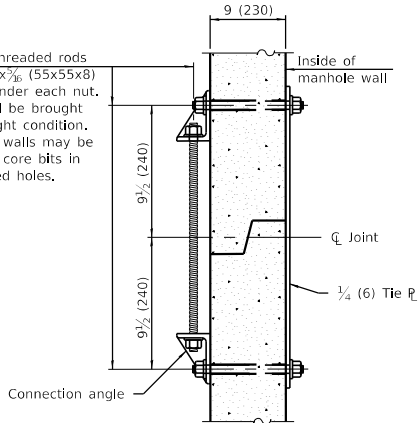
ISSUED 4-1-19

PRECAST MANHOLE TYPE A
8' (2.44 m) DIAMETER

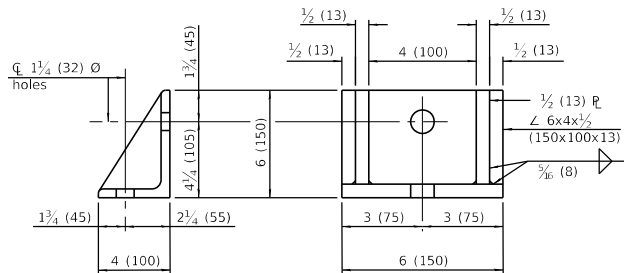
(Sheet 2 of 3)

STANDARD 602416-08

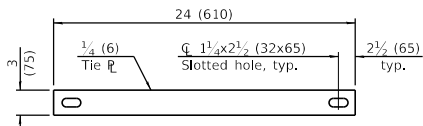
\varnothing 1(25) \varnothing Threaded rods with $2\frac{1}{4} \times 2\frac{1}{4} \times \frac{3}{16}$ (55x55x8) \varnothing washers under each nut. All nuts shall be brought to a snug tight condition. Holes in the walls may be drilled using core bits in lieu of formed holes.



JOINT SPLICE



CONNECTION ANGLE



TIE PLATE

FLAT SLAB TOP REINFORCEMENT

Location	Riser Height (RH)	WWR (each direction)		Rebar (each direction except as noted)		
		A _s (min.)	Spacing (max.)	A _s (min.)	Spacing (max.)	Bar Size
Top Mat	All	0.11 sq. in./ft. (233 sq. mm/m)	18 (450)	0.11 sq. in./ft. (233 sq. mm/m)	18 (450)	#3 or #4 (#10) (#13)
Bottom Mat	RH ≤ 10 ft. (3.05 m)	** 0.88 sq. in./ft. (1863 sq. mm/m)	6 (150)	See plan view for rebar orientation and spacing and this table for bar size		#6 (#19)
	RH > 10 ft. (3.05 m)	WWR not permitted				#7 (#22)

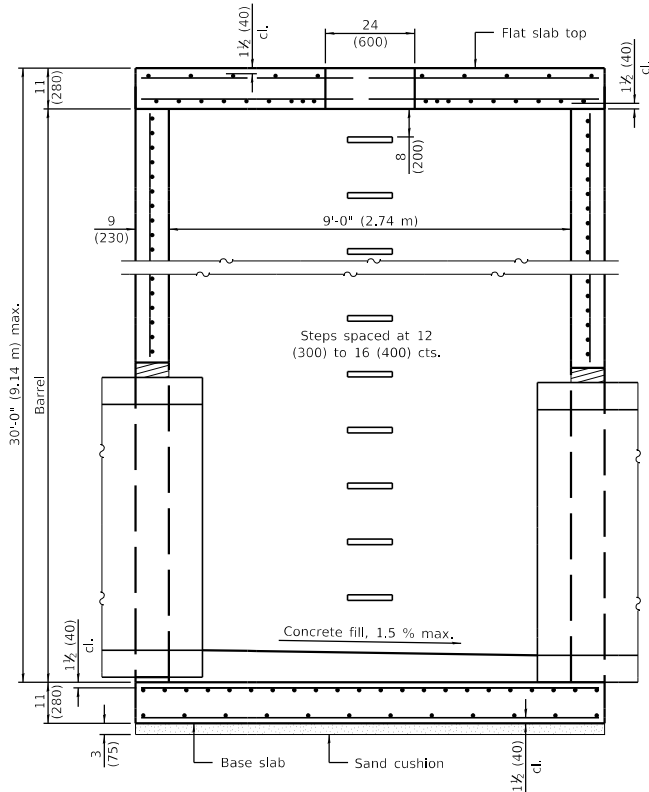
** Only one layer of WWR permitted to avoid congestion.

WALL REINFORCEMENT

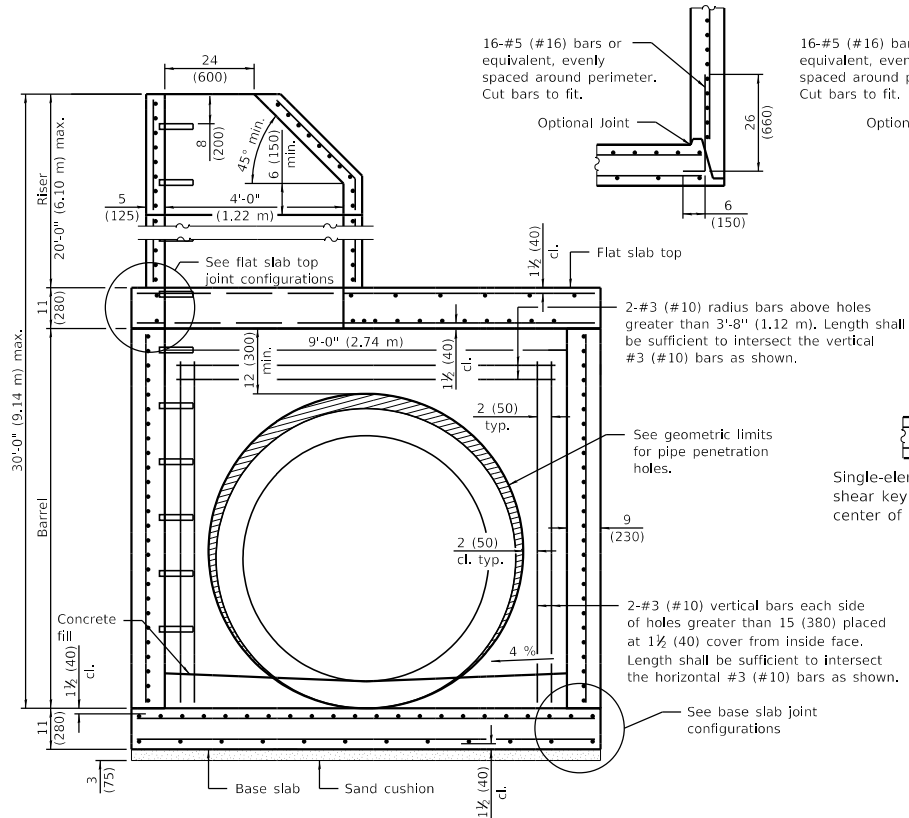
Location	Orientation	WWR or Rebar	
		A _s (min.)	Spacing (max.)
4 ft. (1.22 m) \varnothing Riser	Circumferential	0.12 sq. in./ft. (254 sq. mm/m)	6 (150)
	Vertical	0.045 sq. in./ft. (95 sq. mm/m)	8 (200)
8 ft. (2.44 m) \varnothing Barrel	Circumferential	0.24 sq. in./ft. (508 sq. mm/m)	6 (150)
	Vertical	0.045 sq. in./ft. (95 sq. mm/m)	8 (200)

BASE SLAB REINFORCEMENT

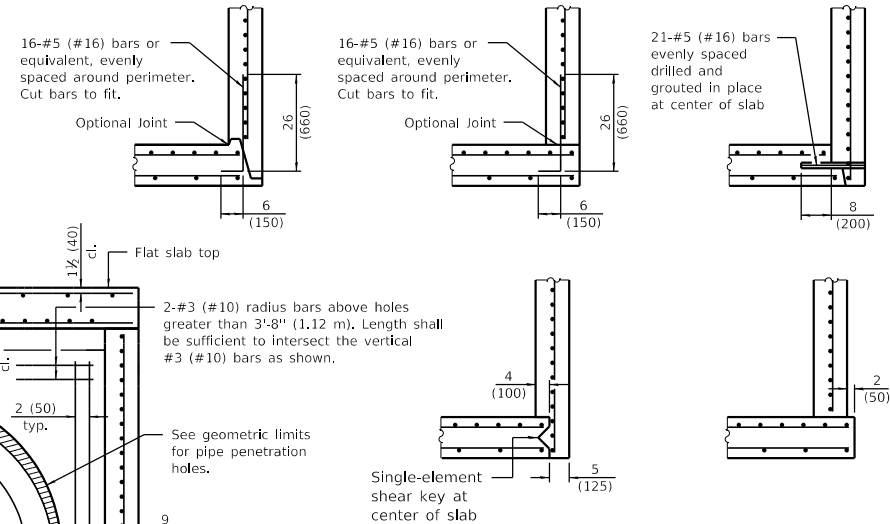
Location	Riser Height (RH)/ Total Height (TH)	WWR or Rebar (each direction)	
		A _s (min.)	Spacing (max.)
Top Mat	RH ≤ 10 ft. (3.05 m) & TH ≤ 20 ft. (6.10 m)	0.36 sq. in./ft. (762 sq. mm/m)	6 (150)
	RH > 10 ft. (3.05 m) or TH > 20 ft. (6.10 m)	0.60 sq. in./ft. (1270 sq. mm/m)	6 (150)
Bottom Mat	All	0.11 sq. in./ft. (233 sq. mm/m)	18 (450)



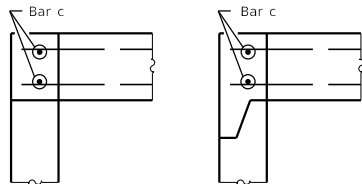
SECTION PARALLEL TO PIPE
(Without conical top riser)



SECTION PERPENDICULAR TO PIPE
(With conical top riser)



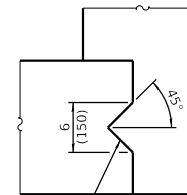
BASE SLAB JOINT CONFIGURATIONS



FLAT SLAB TOP JOINT CONFIGURATIONS
(Shown at access hole)

GEOMETRIC LIMITS FOR PIPE PENETRATION HOLES

- A minimum of 12 (300) of monolithic reinforced concrete shall be maintained above pipe penetration holes > 3'-8" (1.12 m).
- A minimum 12 (300) inside arc length of reinforced concrete shall be maintained between pipe penetration holes > 15 (380).
- A maximum of 60 percent of the inside perimeter of the reinforced concrete manhole walls may be removed.
- Horizontal joints that intersect pipe penetration holes > 15 (380) shall have one joint splice for every location around the perimeter of the joint where the inside arc length between pipe penetration holes is < 24 (600). See joint splice detail.
- The recommended pipe penetration hole is equal to the O.D. of the pipe plus 4 (100).
- Only pipe penetration holes ≤ 15 (380) are allowed in riser sections.



Single-element shear key at center of slab

SHEAR KEY GEOMETRY

(Reinforcement not shown for clarity)

GENERAL NOTES

- Pipe holes shall be formed to facilitate proper placement of hole reinforcement.
- The manufacturer shall ensure that all precast manhole sections are additionally reinforced where required to resist damage from handling, shipping and installation stresses.
- Lifting holes shall be located in the sections as per the manufacturer's recommendations, except as noted.
- See Standard 602701 for details of manhole steps.
- All dimensions are in inches (millimeters) unless otherwise noted.

DATE	REVISIONS
3-1-19	Moved wall reinforcement from inside face to middle.
1-1-19	Expanded / refined reinforcement options. Increased manhole depths.

PRECAST MANHOLE TYPE A
9' (2.74 m) DIAMETER

(Sheet 1 of 3)

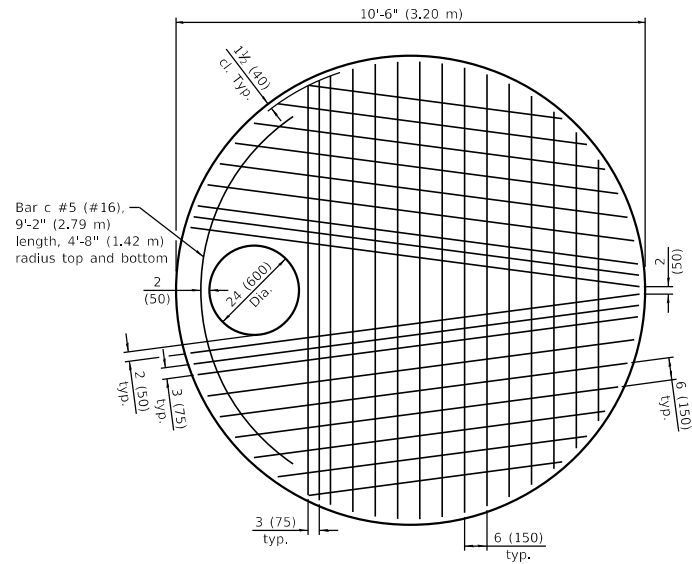
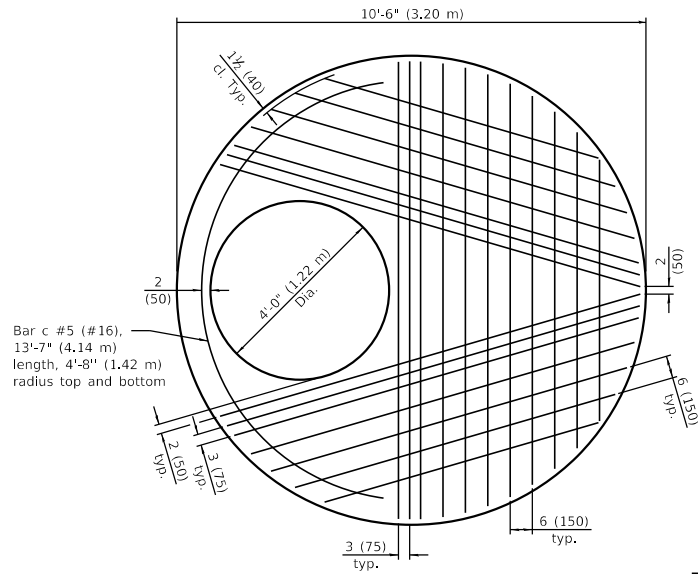
STANDARD 602421-08

Illinois Department of Transportation

PASSED March 1, 2019
Michael B. D.
 ENGINEER OF POLICY AND PROCEDURES

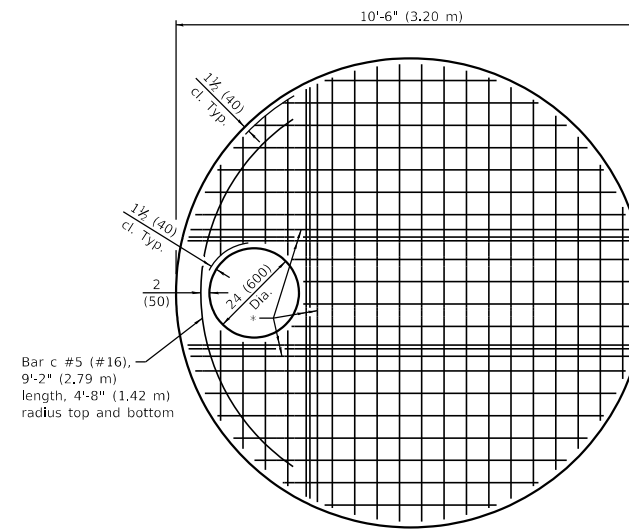
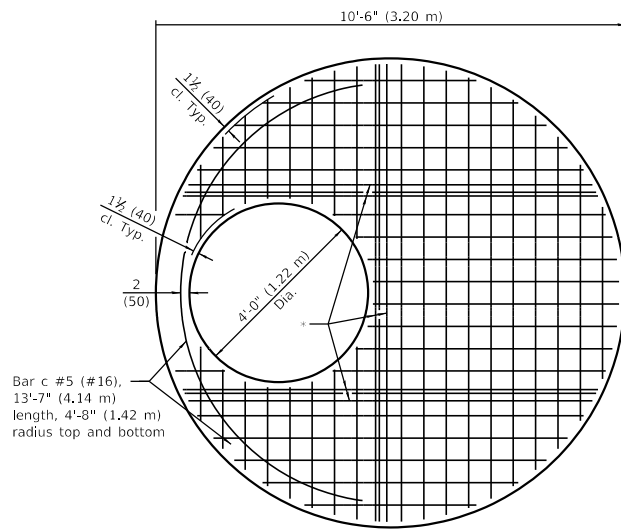
APPROVED March 1, 2019
John E. G.
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 4-1-19



PLAN - FLAT SLAB TOP

(Showing layout of bottom reinforcement bars and c bars)



PLAN - FLAT SLAB TOP

(Showing layout of welded wire reinforcement and c bars)
WWR not permitted for riser heights > 10' (3.05 m).

* #6 (#19) bars bottom. Bundle first bar with closest WWR bar to the opening and place second bar ±3 (75) away.

Illinois Department of Transportation

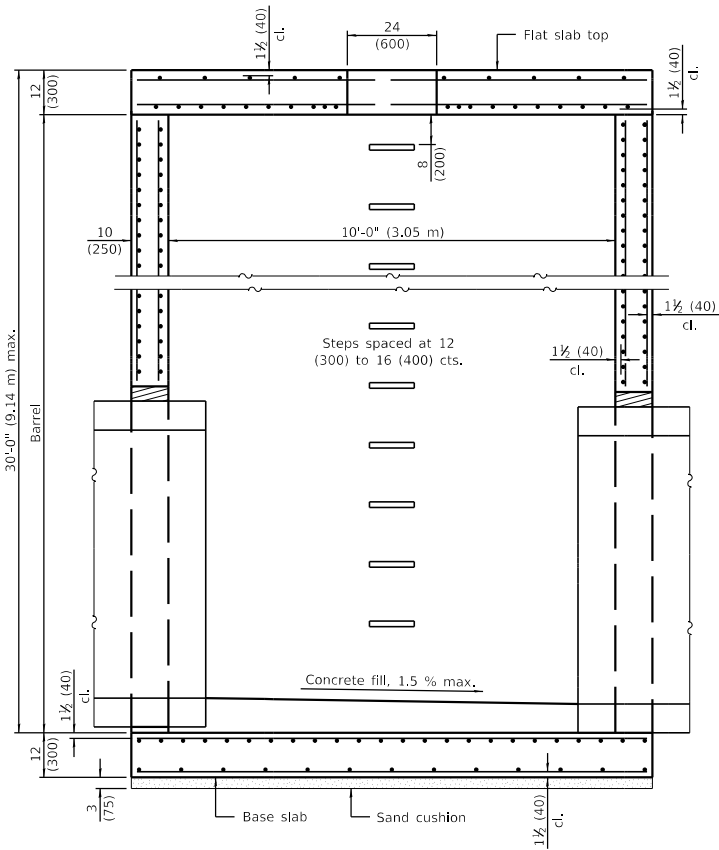
PASSED *M.B.D.* March 1, 2019
ENGINEER OF POLICY AND PROCEDURES

APPROVED *S.E.G.* March 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

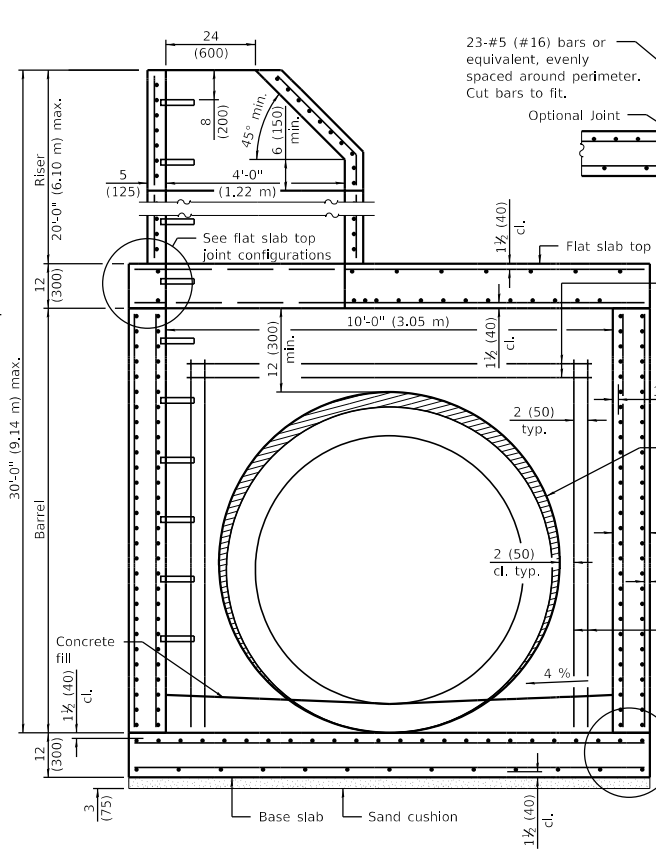
ISSUED 4-1-19

PRECAST MANHOLE TYPE A
9' (2.74 m) DIAMETER
(Sheet 2 of 3)

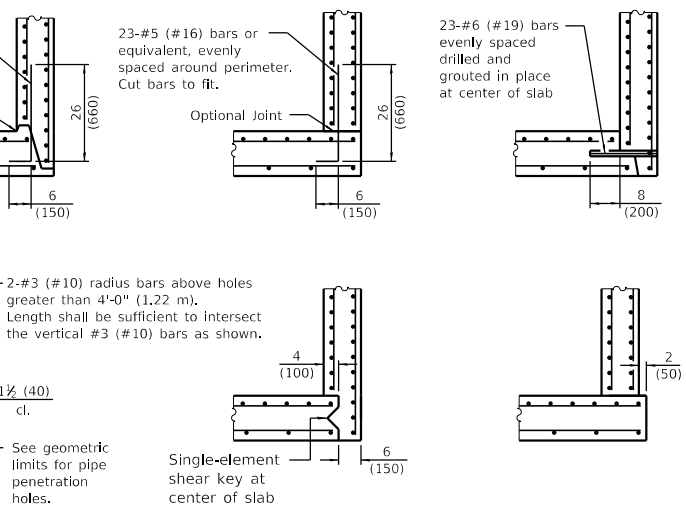
STANDARD 602421-08



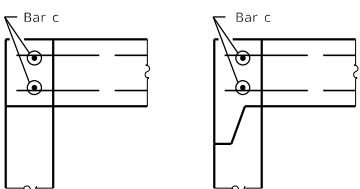
SECTION PARALLEL TO PIPE
(Without conical top riser)



SECTION PERPENDICULAR TO PIPE
(With conical top riser)



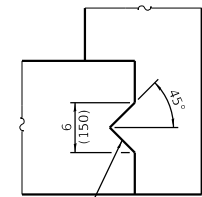
BASE SLAB JOINT CONFIGURATIONS



FLAT SLAB TOP JOINT CONFIGURATIONS
(Shown at access hole)

GEOMETRIC LIMITS FOR PIPE PENETRATION HOLES

- A minimum of 12 (300) of monolithic reinforced concrete shall be maintained above pipe penetration holes > 4'-0" (1.22 m).
- A minimum 12 (300) inside arc length of reinforced concrete shall be maintained between pipe penetration holes > 15 (380).
- A maximum of 60 percent of the inside perimeter of the reinforced concrete manhole walls may be removed.
- Horizontal joints that intersect pipe penetration holes > 15 (380) shall have one joint splice for every location around the perimeter of the joint where the inside arc length between pipe penetration holes is < 24 (600). See joint splice detail.
- The recommended pipe penetration hole is equal to the O.D. of the pipe plus 4 (100).
- Only pipe penetration holes ≤ 15 (380) are allowed in riser sections.



Single-element shear key at center of slab

SHEAR KEY GEOMETRY
(Reinforcement not shown for clarity)

GENERAL NOTES

- Pipe holes shall be formed to facilitate proper placement of hole reinforcement.
- The manufacturer shall ensure that all precast manhole sections are additionally reinforced where required to resist damage from handling, shipping and installation stresses.
- Lifting holes shall be located in the sections as per the manufacturer's recommendations.
- See Standard 602701 for details of manhole steps.
- All dimensions are in inches (millimeters) unless otherwise noted.

DATE	REVISIONS
3-1-19	Moved wall reinforcement of 4'-0" (1.22 m) riser from inside face to middle.
1-1-19	Expanded / refined reinforcement options. Increased manhole depths.

PRECAST MANHOLE TYPE A
10' (3.05 m) DIAMETER
(Sheet 1 of 3)

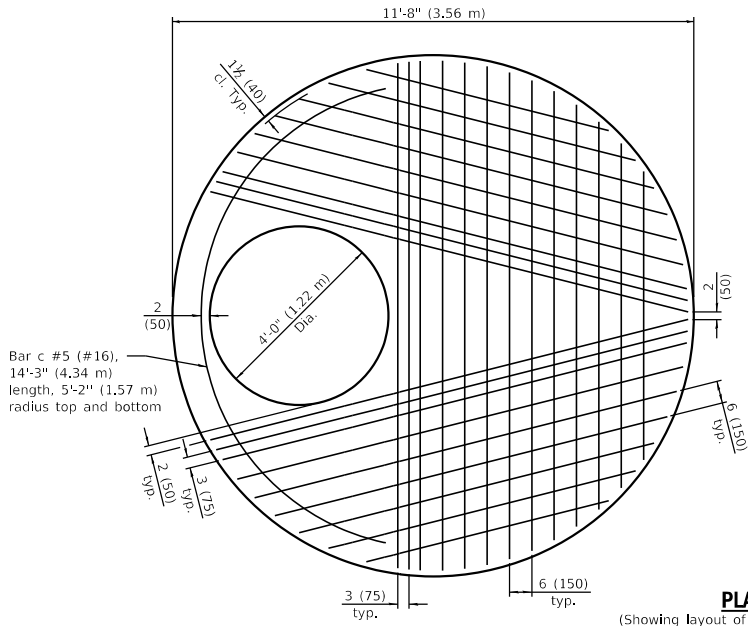
STANDARD 602426-02

Illinois Department of Transportation

PASSED *Mark B. D.* March 1, 2019
ENGINEER OF POLICY AND PROCEDURES

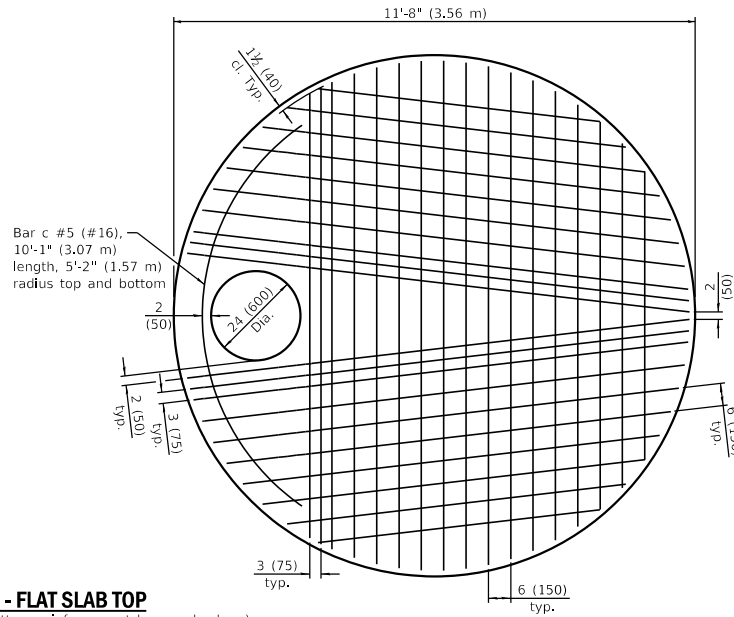
APPROVED *John E. G.* March 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-18



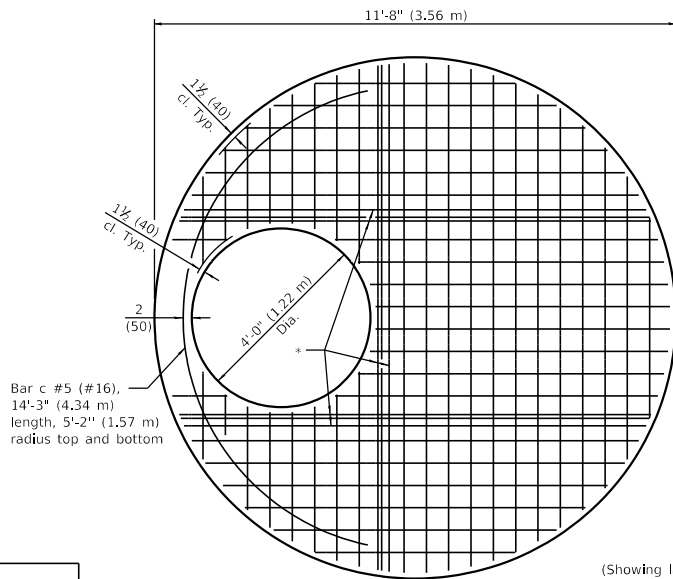
PLAN - FLAT SLAB TOP

(Showing layout of bottom reinforcement bars and c bars)



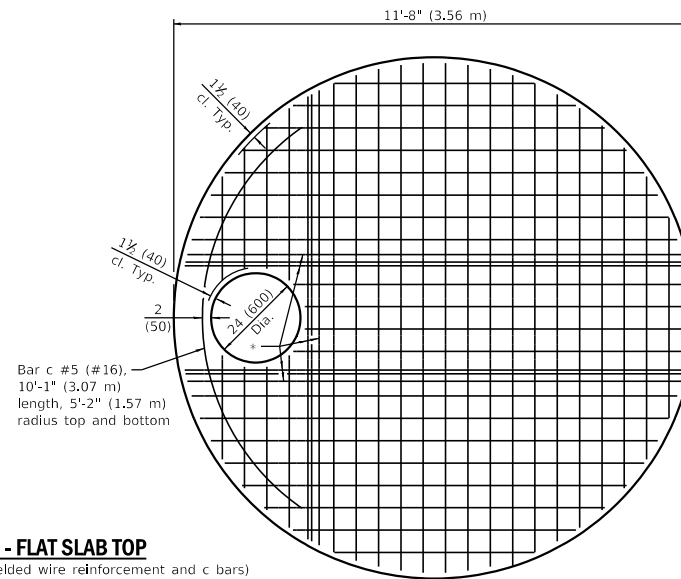
PLAN - FLAT SLAB TOP

(Showing layout of welded wire reinforcement and c bars)
WWR not permitted for riser heights > 10' (3.05 m).



PLAN - FLAT SLAB TOP

(Showing layout of welded wire reinforcement and c bars)
WWR not permitted for riser heights > 10' (3.05 m).



* #6 (#19) bars bottom. Bundle first bar with closest WWR bar to the opening and place second bar ±3 (75) away.

PRECAST MANHOLE TYPE A
10' (3.05 m) DIAMETER

(Sheet 2 of 3)

STANDARD 602426-02

Illinois Department of Transportation

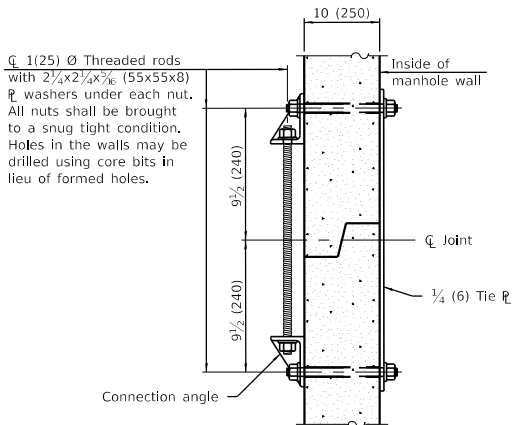
PASSED March 1, 2019

ENGINEER OF POLICY AND PROCEDURES

APPROVED March 1, 2019

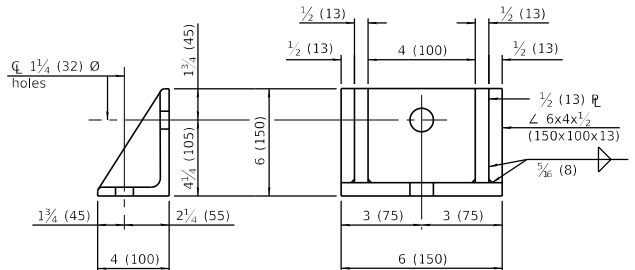
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-18

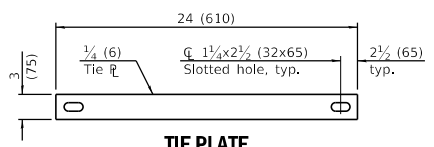


1 (25) \varnothing Threaded rods with $2 \frac{1}{2} \times 2 \frac{1}{4} \times \frac{5}{16}$ (55x55x8) washers under each nut. All nuts shall be brought to a snug tight condition. Holes in the walls may be drilled using core bits in lieu of formed holes.

JOINT SPLICE



CONNECTION ANGLE



TIE PLATE

FLAT SLAB TOP REINFORCEMENT

Location	Riser Height (RH)	WWR (each direction)		Rebar (each direction except as noted)		
		A _s (min.)	Spacing (max.)	A _s (min.)	Spacing (max.)	Bar Size
Top Mat	All	0.11 sq. in./ft. (233 sq. mm/m)	18 (450)	0.11 sq. in./ft. (233 sq. mm/m)	18 (450)	#3 or #4 (#10) (#13)
Bottom Mat	RH ≤ 10 ft. (3.05 m)	** 0.88 sq. in./ft. (1863 sq. mm/m)	6 (150)	See plan view for rebar orientation and spacing and this table for bar size		#6 (#19)
	RH > 10 ft. (3.05 m)	WWR not permitted				#8 (#25)

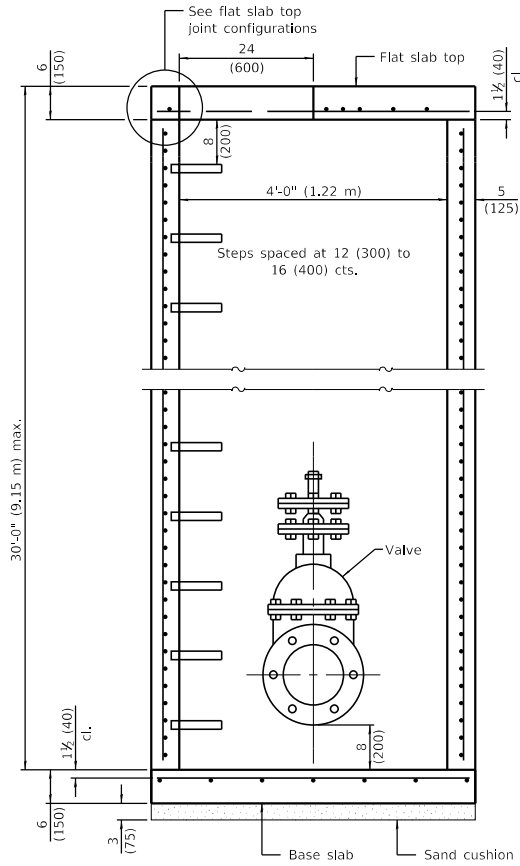
** Only one layer of WWR permitted to avoid congestion.

WALL REINFORCEMENT

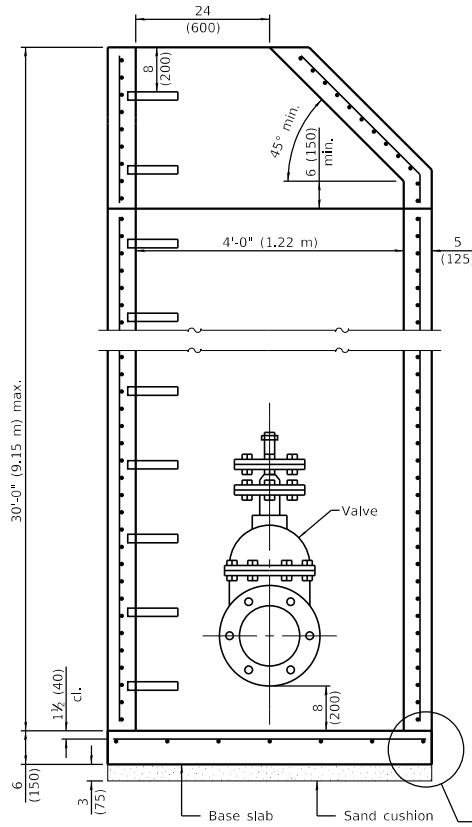
Location	Orientation	WWR or Rebar	
		A _s (min.)	Spacing (max.)
4 ft. (1.22 m) \varnothing Riser	Circumferential	0.12 sq. in./ft. (254 sq. mm/m)	6 (150)
	Vertical	0.045 sq. in./ft. (95 sq. mm/m)	8 (200)
10 ft. (3.05 m) \varnothing Barrel Inside Mat	Circumferential	0.30 sq. in./ft. (635 sq. mm/m)	6 (150)
	Vertical	0.045 sq. in./ft. (95 sq. mm/m)	8 (200)
10 ft. (3.05 m) \varnothing Barrel Outside Mat	Circumferential	0.11 sq. in./ft. (233 sq. mm/m)	6 (150)
	Vertical	0.045 sq. in./ft. (95 sq. mm/m)	8 (200)

BASE SLAB REINFORCEMENT

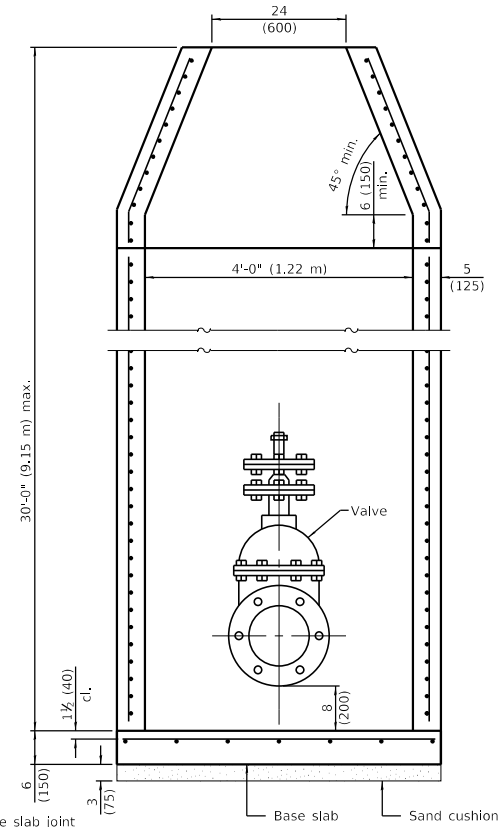
Location	Riser Height (RH)/ Total Height (TH)	WWR or Rebar (each direction)	
		A _s (min.)	Spacing (max.)
Top Mat	RH ≤ 10 ft. (3.05 m) & TH ≤ 20 ft. (6.10 m)	0.48 sq. in./ft. (889 sq. mm/m)	6 (150)
	RH > 10 ft. (3.05 m) or TH > 20 ft. (6.10 m)	0.78 sq. in./ft. (1651 sq. mm/m)	6 (150)
Bottom Mat	All	0.11 sq. in./ft. (233 sq. mm/m)	18 (450)



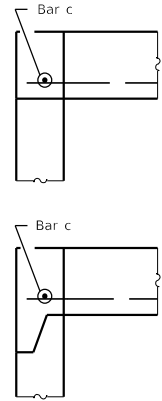
SECTION THRU VALVE VAULT
(Without conical top)



SECTION THRU VALVE VAULT
(With conical top)



SECTION THRU VALVE VAULT
(With concentric conical top)



FLAT SLAB TOP JOINT CONFIGURATIONS
(Shown at access hole)

GENERAL NOTES

Use this standard for water mains ≤ 8 (200).

The manufacturer shall ensure that all precast manhole sections are additionally reinforced where required to resist damage from handling, shipping and installation stresses.

Lifting holes shall be located in the sections as per the manufacturer's recommendations, except as noted.

See Standard 602701 for details of manhole steps.

All dimensions are in inches (millimeters) unless otherwise noted.

DATE	REVISIONS
3-1-19	Moved wall reinforcement from inside face to middle.
1-1-19	Expanded / refined reinforcement options. Increased vault depths.

PRECAST VALVE VAULT TYPE A
4' (1.22 m) DIAMETER
(Sheet 1 of 2)

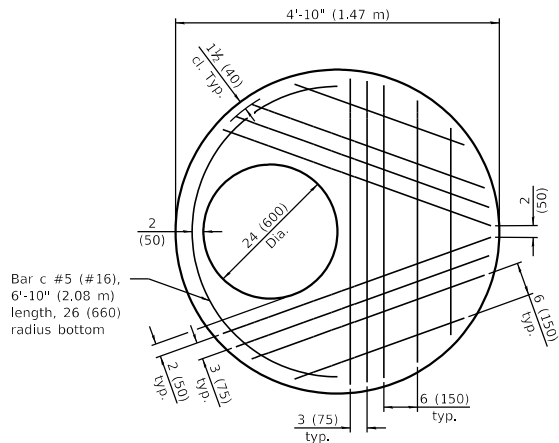
STANDARD 602501-05

Illinois Department of Transportation

PASSED *[Signature]* March 1, 2019
ENGINEER OF POLICY AND PROCEDURES

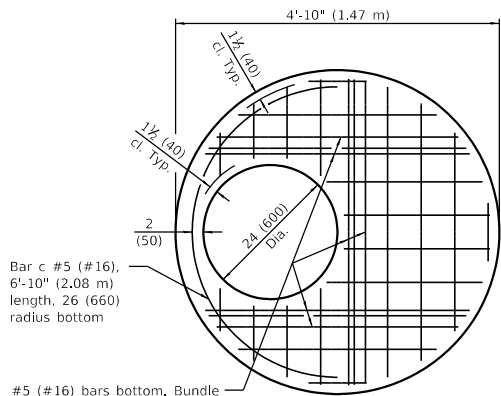
APPROVED *[Signature]* March 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-17



PLAN - FLAT SLAB TOP

(Showing layout of reinforcement bars and c bars)



PLAN - FLAT SLAB TOP

(Showing layout of welded wire reinforcement and c bars)

Bar c #5 (#16), 6'-10" (2.08 m) length, 26 (660) radius bottom

#5 (#16) bars bottom. Bundle first bar with closest WWR bar to the opening and place second bar ±3 (75) away.

FLAT SLAB TOP REINFORCEMENT

Location	WWR (each direction)		Rebar		
	A _s (min.)	Spacing (max.)	A _s (min.)	Spacing (max.)	Bar Size
Bottom Mat	* 0.62 sq. in./ft. (1312 sq. mm/m)	6 (150)	See plan view for rebar orientation and spacing and this table for bar size		#5 (#16)

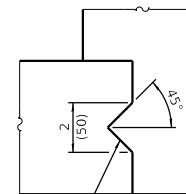
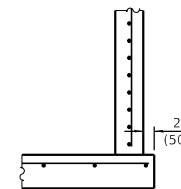
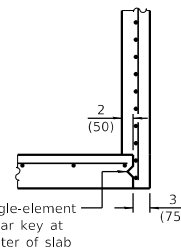
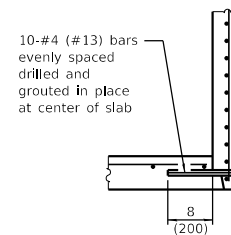
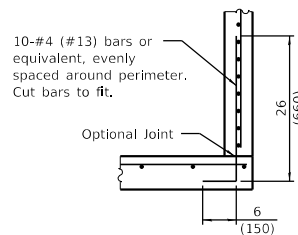
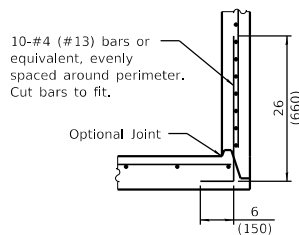
* Only one layer of WWR permitted to avoid congestion.

WALL REINFORCEMENT

Orientation	WWR or Rebar	
	A _s (min.)	Spacing (max.)
Circumferential	0.12 sq. in./ft. (254 sq. mm/m)	6 (150)
Vertical	0.045 sq. in./ft. (95 sq. mm/m)	8 (200)

BASE SLAB REINFORCEMENT

Location	Total Height	WWR or Rebar (each direction)	
		A _s (min.)	Spacing (max.)
Top Mat	≤ 20 ft. (6.10 m)	0.24 sq. in./ft. (508 sq. mm/m)	10 (250)
	> 20 ft. (6.10 m)	0.24 sq. in./ft. (508 sq. mm/m)	10 (250)



Single-element shear key at center of slab

SHEAR KEY GEOMETRY

(Reinforcement not shown for clarity)

BASE SLAB JOINT CONFIGURATIONS

**PRECAST VALVE VAULT TYPE A
4' (1.22 m) DIAMETER**

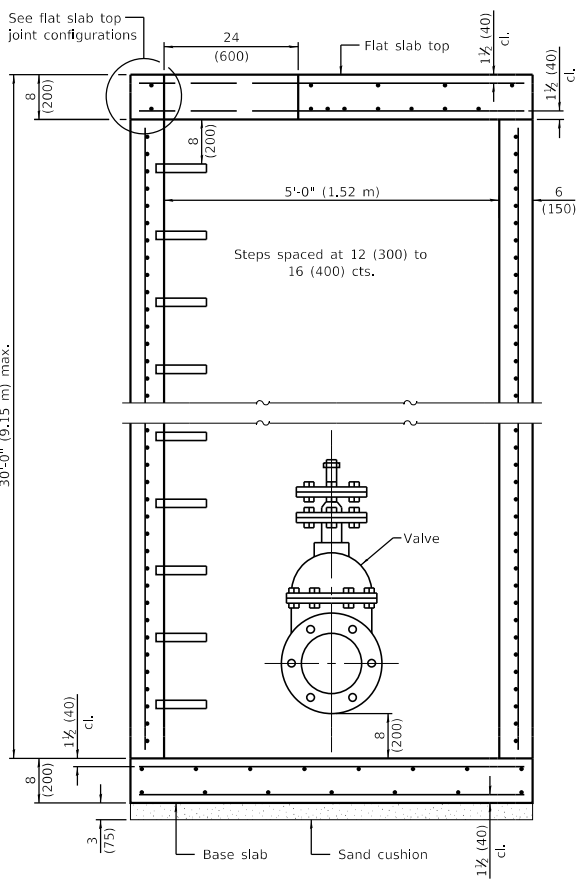
(Sheet 2 of 2)

STANDARD 602501-05

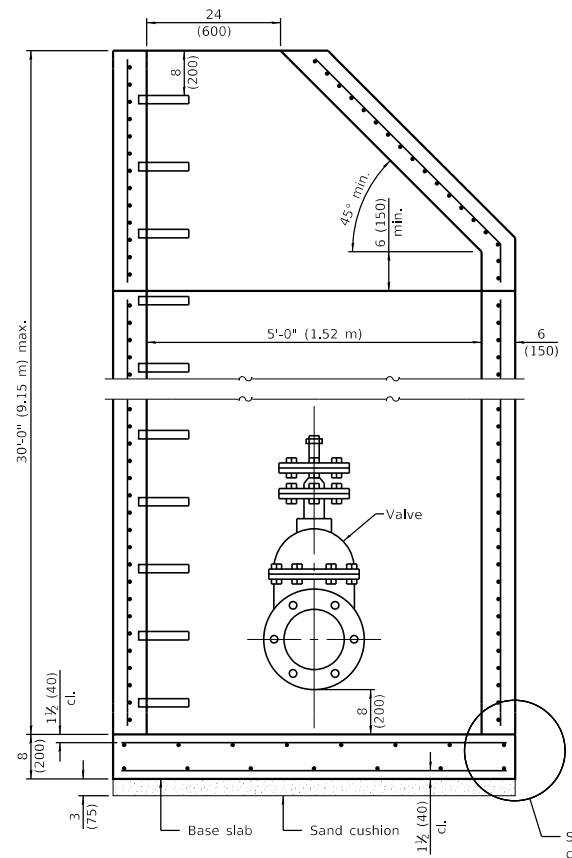
Illinois Department of Transportation

PASSED March 1, 2019
 ENGINEER OF POLICY AND PROCEDURES
 APPROVED March 1, 2019
 ENGINEER OF DESIGN AND ENVIRONMENT

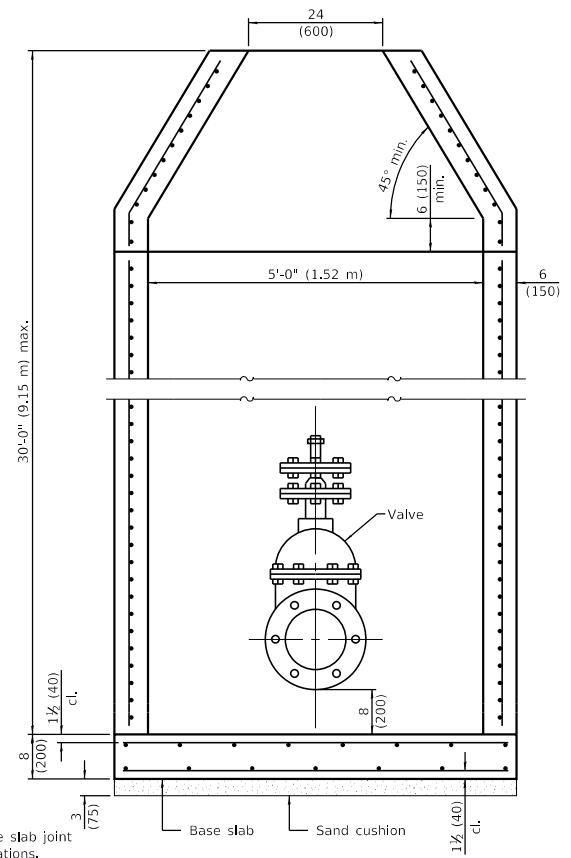
ISSUED 1-1-17



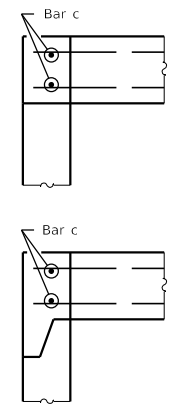
SECTION THRU VALVE VAULT
(Without conical top)



SECTION THRU VALVE VAULT
(With conical top)



SECTION THRU VALVE VAULT
(With concentric conical top)



FLAT SLAB TOP JOINT CONFIGURATIONS
(Shown at access hole)

GENERAL NOTES

- Use this standard for water mains ≥ 10 (250).
- The manufacturer shall ensure that all precast manhole sections are additionally reinforced where required to resist damage from handling, shipping and installation stresses.
- Lifting holes shall be located in the sections as per the manufacturer's recommendations, except as noted.
- See Standard 602701 for details of manhole steps.
- All dimensions are in inches (millimeters) unless otherwise noted.

DATE	REVISIONS
3-1-19	Moved wall reinforcement from inside face to middle.
1-1-19	Expanded / refined reinforcement options. Increased vault depths.

PRECAST VALVE VAULT TYPE A
5' (1.52 m) DIAMETER
(Sheet 1 of 2)

STANDARD 602506-02

Illinois Department of Transportation

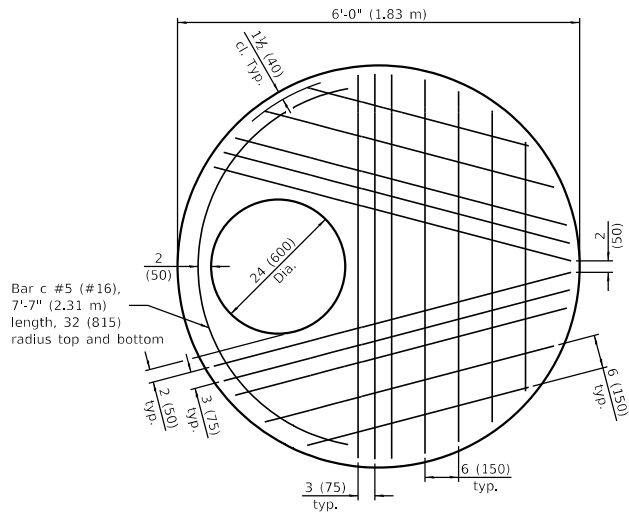
PASSED March 1, 2019

ENGINEER OF POLICY AND PROCEDURES

APPROVED March 1, 2019

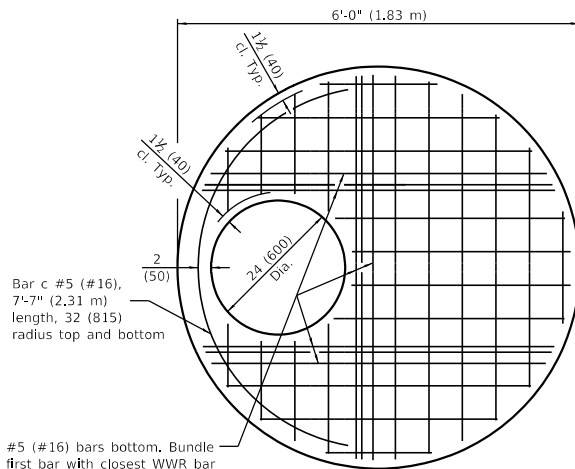
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-18



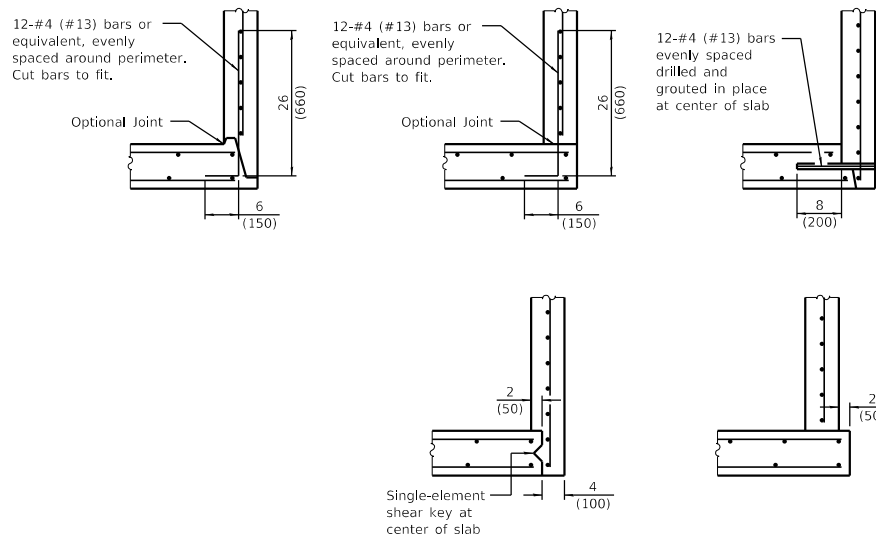
PLAN - FLAT SLAB TOP

(Showing layout of bottom reinforcement bars and c bars)



PLAN - FLAT SLAB TOP

(Showing layout of welded wire reinforcement and c bars)



BASE SLAB JOINT CONFIGURATIONS

FLAT SLAB TOP REINFORCEMENT

Location	WWR (each direction)		Rebar (each direction except as noted)		
	A _s (min.)	Spacing (max.)	A _s (min.)	Spacing (max.)	Bar Size
Top Mat	0.11 sq. in./ft. (233 sq. mm/m)	18 (450)	0.11 sq. in./ft. (233 sq. mm/m)	18 (450)	#3 or #4 (#10) (#13)
Bottom Mat	* 0.40 sq. in./ft. (847 sq. mm/m)	6 (150)	See plan view for rebar orientation and spacing and this table for bar size		#4 (#13)

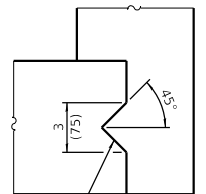
* Only one layer of WWR permitted to avoid congestion.

WALL REINFORCEMENT

Orientation	WWR or Rebar	
	A _s (min.)	Spacing (max.)
Circumferential	0.15 sq. in./ft. (318 sq. mm/m)	6 (150)
Vertical	0.045 sq. in./ft. (95 sq. mm/m)	8 (200)

BASE SLAB REINFORCEMENT

Location	Total Height	WWR or Rebar (each direction)	
		A _s (min.)	Spacing (max.)
Top Mat	≤ 20 ft. (6.10 m)	0.24 sq. in./ft. (508 sq. mm/m)	10 (250)
	> 20 ft. (6.10 m)	0.28 sq. in./ft. (593 sq. mm/m)	8 (200)
Bottom Mat	All	0.11 sq. in./ft. (233 sq. mm/m)	18 (450)



Single-element shear key at center of slab

SHEAR KEY GEOMETRY
(Reinforcement not shown for clarity)

Illinois Department of Transportation

PASSED March 1, 2019

ENGINEER OF POLICY AND PROCEDURES

APPROVED March 1, 2019

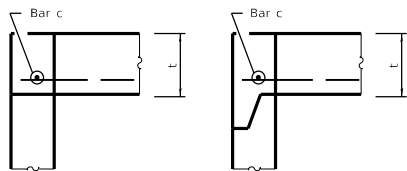
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-18

PRECAST VALVE VAULT TYPE A
5' (1.52 m) DIAMETER

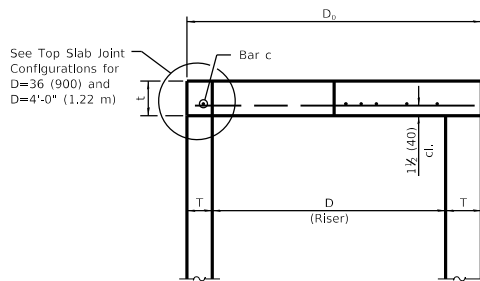
(Sheet 2 of 2)

STANDARD 602506-02

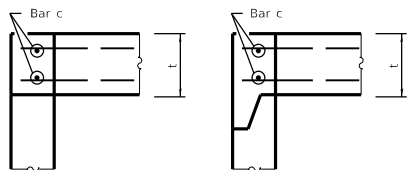


**FLAT SLAB TOP JOINT CONFIGURATIONS
FOR D = 36 (900) AND D = 4'-0" (1.22 m)**

(Shown at access hole)

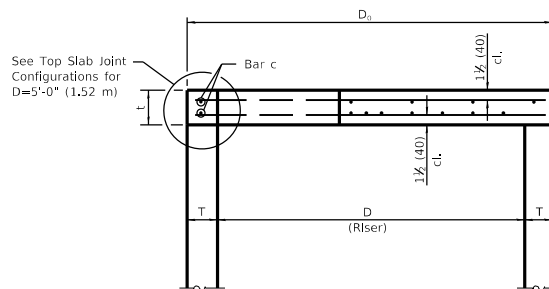


**SECTION THRU FLAT SLAB TOP
FOR D = 36 (900) AND D = 4'-0" (1.22 m)**



**FLAT SLAB TOP JOINT CONFIGURATIONS
D = 5'-0" (1.52 m)**

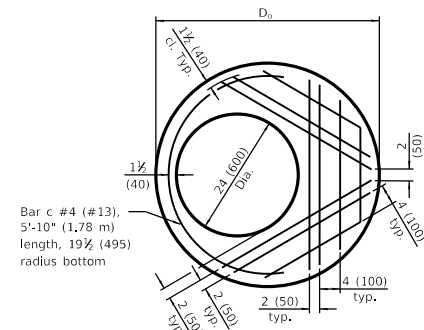
(Shown at access hole)



**SECTION THRU FLAT SLAB TOP
FOR D = 5'-0" (1.52 m)**

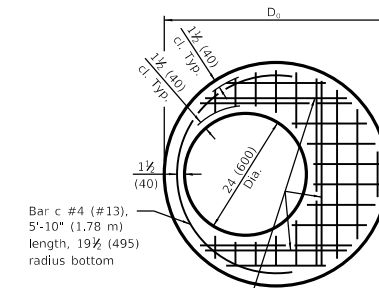
TABLE

D	T	D _o (min.)	t
36 (900)	See applicable Standards	D + 2T	6 (150)
4'-0" (1.2 m)			6 (150)
5'-0" (1.5 m)			8 (200)



Bar c #4 (#13),
5'-10" (1.78 m)
length, 19 1/2 (495)
radius bottom

PLAN - FLAT SLAB TOP FOR D = 36 (900)
(Showing layout of reinforcement bars and c bars)



Bar c #4 (#13),
5'-10" (1.78 m)
length, 19 1/2 (495)
radius bottom

#4 (#13) bars bottom. Bundle with
closest WWR bar to the opening.

PLAN - FLAT SLAB TOP FOR D = 36 (900)
(Showing layout of welded wire reinforcement and c bars)

GENERAL NOTES

The flat slab top may be used in lieu of the tapered tops shown on Standards 602001, 602016, or 602306 at the option of the Contractor or when field conditions prohibit the use of tapered tops.

Lifting holes shall be located in the sections as per the manufacturer's recommendations.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2019

ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2019

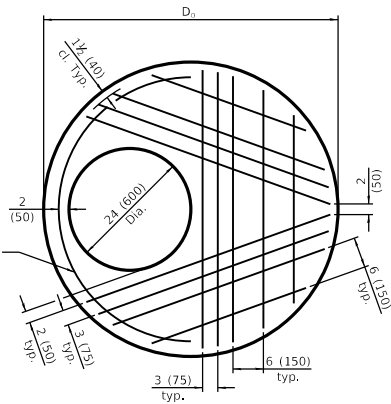
ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-19	Expanded / refined reinforcement options.
1-1-18	Revised for compliance with LRFD.

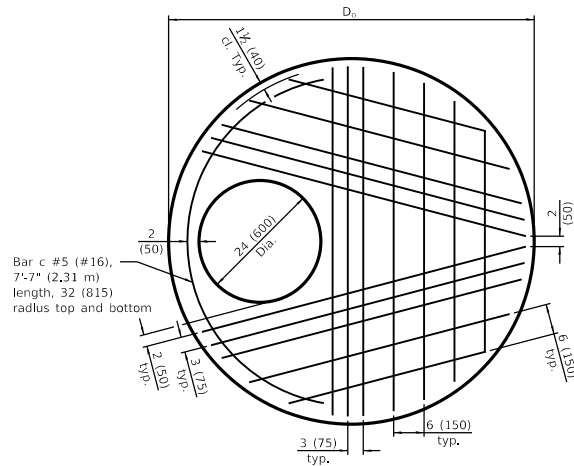
**PRECAST REINFORCED
CONCRETE FLAT SLAB TOP**

(Sheet 1 of 2)

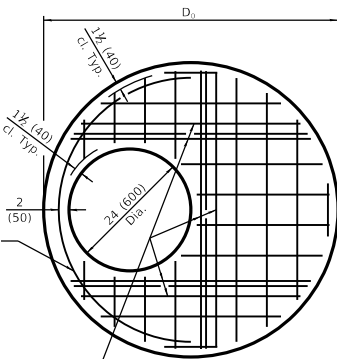
STANDARD 602601-06



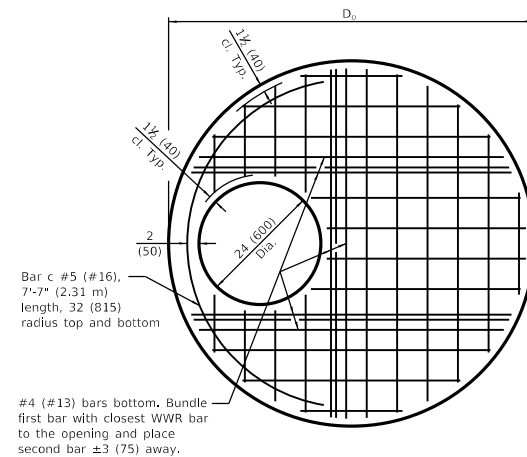
PLAN - FLAT SLAB TOP FOR D = 4'-0" (1.22 m)
(Showing layout of reinforcement bars and c bars)



PLAN - FLAT SLAB TOP FOR D = 5'-0" (1.52 m)
(Showing layout of bottom reinforcement bars and c bars)



PLAN - FLAT SLAB TOP FOR D = 4'-0" (1.22 m)
(Showing layout of welded wire reinforcement and c bars)



PLAN - FLAT SLAB TOP FOR D = 5'-0" (1.52 m)
(Showing layout of welded wire reinforcement and c bars)

FLAT SLAB TOP REINFORCEMENT FOR D = 36 (900)

Location	WWR (each direction)		Rebar		Bar Size
	A _s (min.)	Spacing (max.)	A _s (min.)	Spacing (max.)	
Bottom Mat	* 0.60 sq. in./ft. (1270 sq. mm/m)	6 (150)	See plan view for rebar orientation and spacing and this table for bar size		#4 (#13)

FLAT SLAB TOP REINFORCEMENT FOR D = 4'-0" (1.22 m)

Location	WWR (each direction)		Rebar		Bar Size
	A _s (min.)	Spacing (max.)	A _s (min.)	Spacing (max.)	
Bottom Mat	* 0.62 sq. in./ft. (1312 sq. mm/m)	6 (150)	See plan view for rebar orientation and spacing and this table for bar size		#5 (#16)

FLAT SLAB TOP REINFORCEMENT FOR D = 5'-0" (1.52 m)

Location	WWR (each direction)		Rebar (each direction except as noted)		
	A _s (min.)	Spacing (max.)	A _s (min.)	Spacing (max.)	Bar Size
Top Mat	0.11 sq. in./ft. (233 sq. mm/m)	18 (450)	0.11 sq. in./ft. (233 sq. mm/m)	18 (450)	#3 or #4 (#10) (#13)
Bottom Mat	* 0.40 sq. in./ft. (847 sq. mm/m)	6 (150)	See plan view for rebar orientation and spacing and this table for bar size		#4 (#13)

* Only one layer of WWR permitted to avoid congestion.

Illinois Department of Transportation

PASSED *Michael Bond* January 1, 2019
 ENGINEER OF POLICY AND PROCEDURES

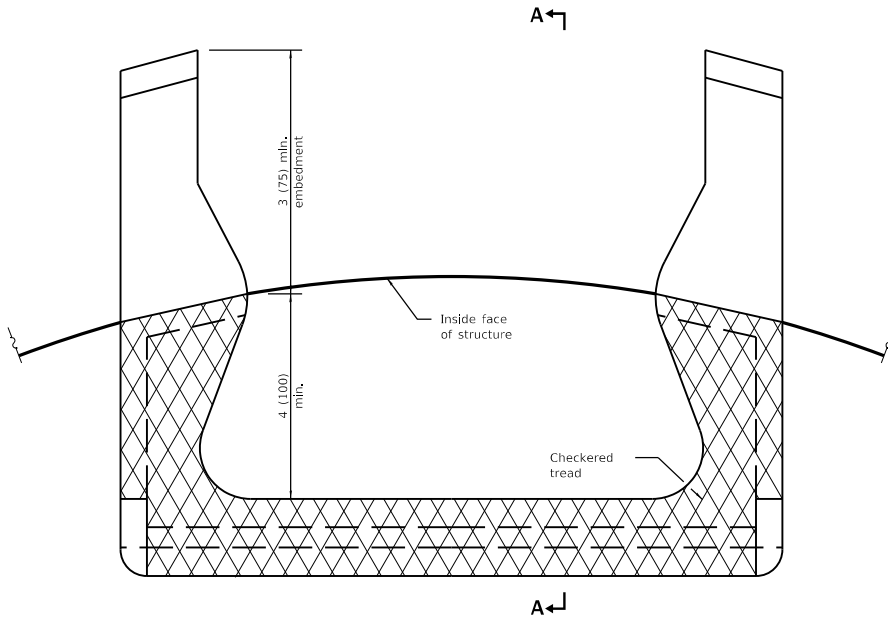
APPROVED *Scott Egan* January 1, 2019
 ENGINEER OF DESIGN AND ENVIRONMENT

LEF-C 03/ISS/1

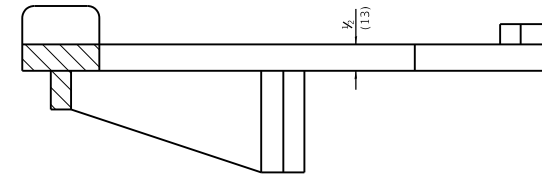
**PRECAST REINFORCED
CONCRETE FLAT SLAB TOP**
(Sheet 2 of 2)

STANDARD 602601-06

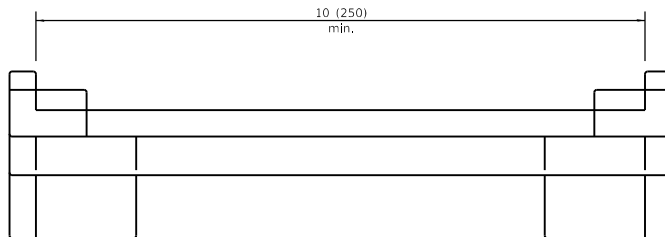
CAST IRON STEPS



PLAN VIEW



SECTION A-A



ELEVATION VIEW

All dimensions are in inches (millimeters) unless otherwise shown.

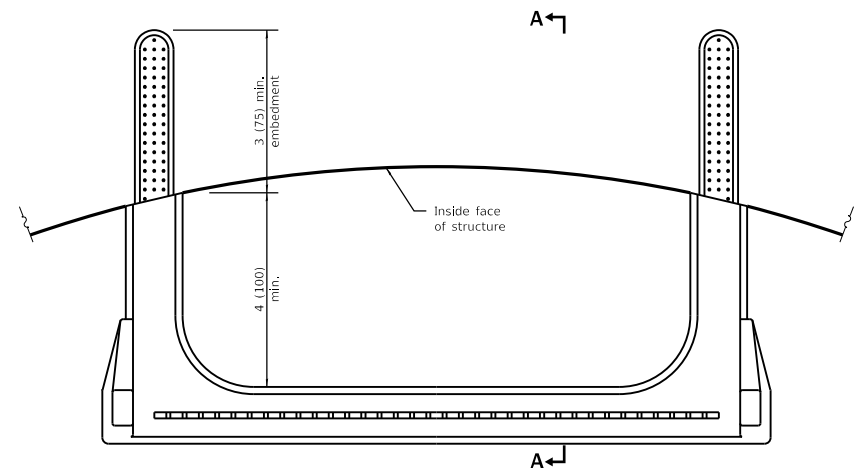
Illinois Department of Transportation	
PASSED	January 1, 2009
SCOTT S. KELLY ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2009
KEN E. HAN ENGINEER OF DESIGN AND ENVIRONMENT	

DATE	REVISIONS
1-1-09	Switched units to English (metric).
4-1-06	Revised title, drawings, and added plastic steps on sheet 2.

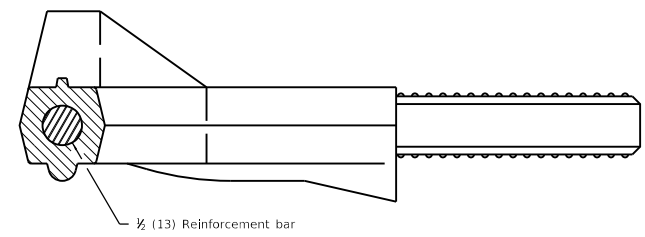
MANHOLE STEPS

(Sheet 1 of 2)

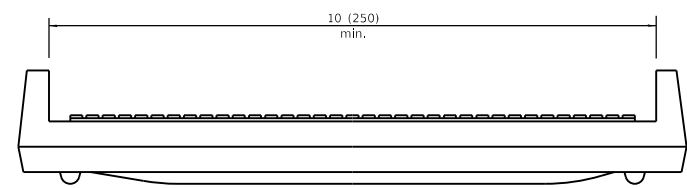
STANDARD 602701-02



PLAN VIEW



SECTION A-A



ELEVATION VIEW

Illinois Department of Transportation

PASSED January 1, 2009

ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009

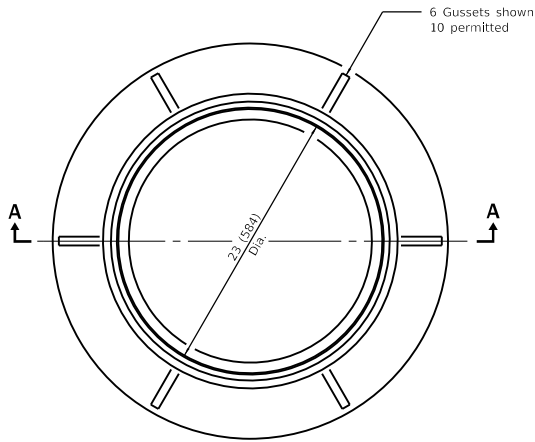
ENGINEER OF DESIGN AND ENVIRONMENT

669-1-03/ISS

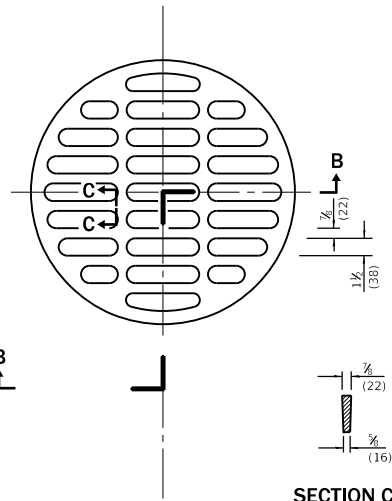
MANHOLE STEPS

(Sheet 2 of 2)

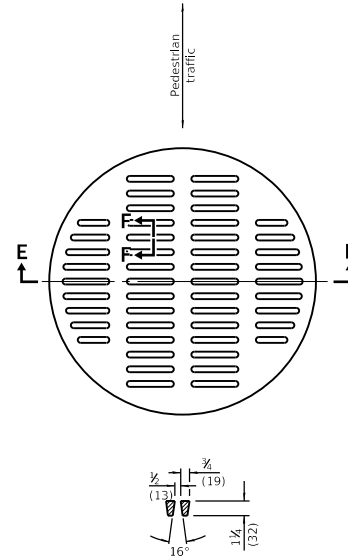
STANDARD 602701-02



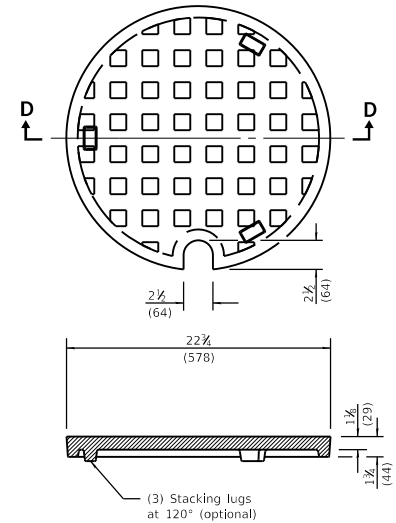
CAST FRAME



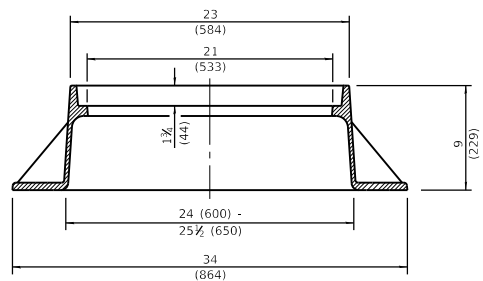
SECTION C-C



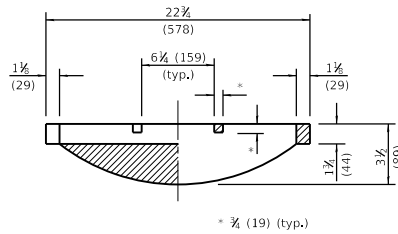
SECTION F-F



SECTION D-D

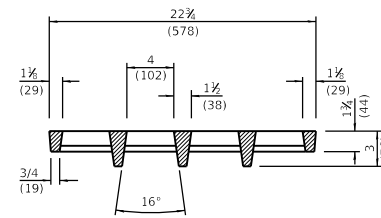


SECTION A-A
Gray Iron



SECTION B-B

CAST OPEN LID



SECTION E-E

**ADA COMPLIANT
CAST OPEN LID**

CAST CLOSED LID
Gray Iron Lid

All dimensions are in inches (millimeters)
unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2015
Michael Beard
ENGINEER OF POLICY AND PROCEDURES

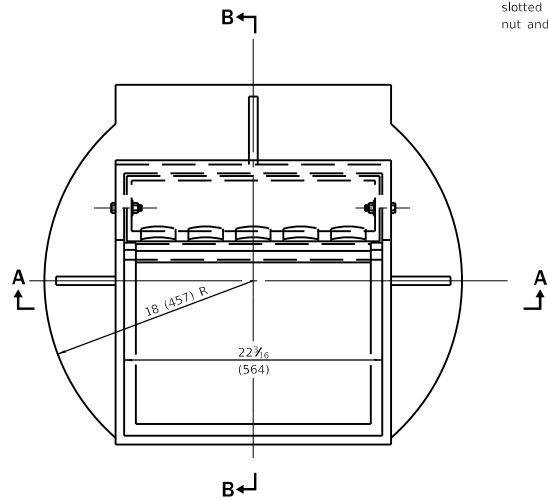
APPROVED January 1, 2015
[Signature]
ENGINEER OF DESIGN AND ENVIRONMENT

664-C 03/15/15

DATE	REVISIONS
1-1-15	Revised dimensioning of frame. Added ADA compliant open lid.
1-1-09	Switched units to English (metric).

**FRAME AND LIDS
TYPE 1**

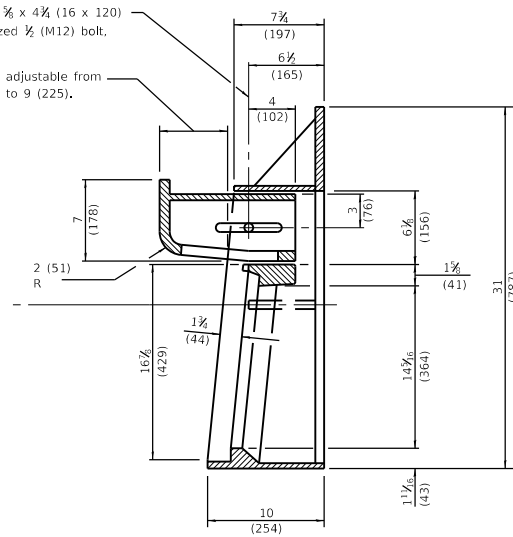
STANDARD 604001-04



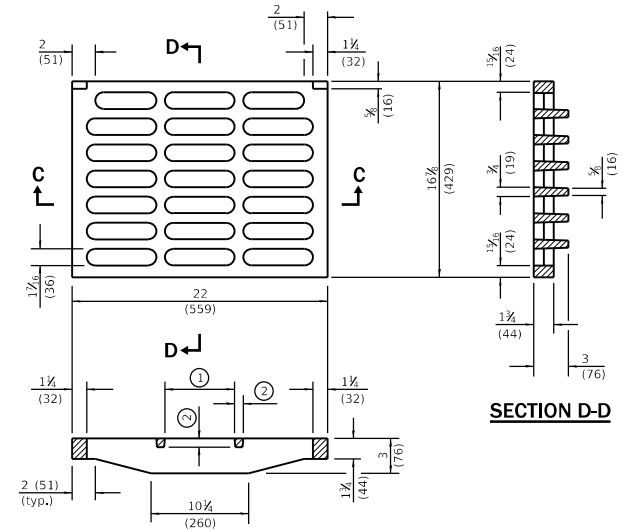
CAST FRAME

Ø 5/8 (16) dia. hole and 5/8 x 4 1/4 (16 x 120) slotted hole for galvanized 1/2 (M12) bolt, nut and washer.

Curb box adjustable from 5 1/4 (135) to 9 (225).



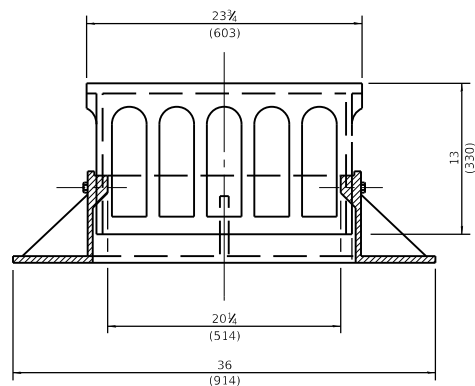
SECTION B-B



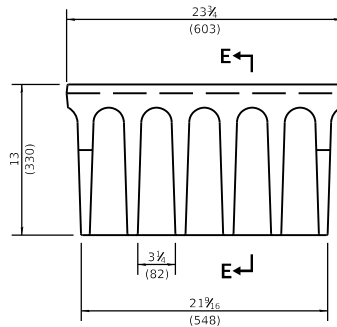
SECTION C-C

- ① = 6 (152) typ.
- ② = 3/8 (19) typ.

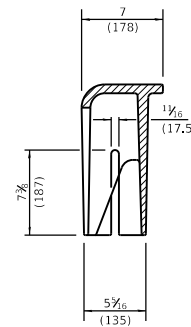
CAST GRATE



SECTION A-A



ALTERNATE CURB BOX



SECTION E-E

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2015
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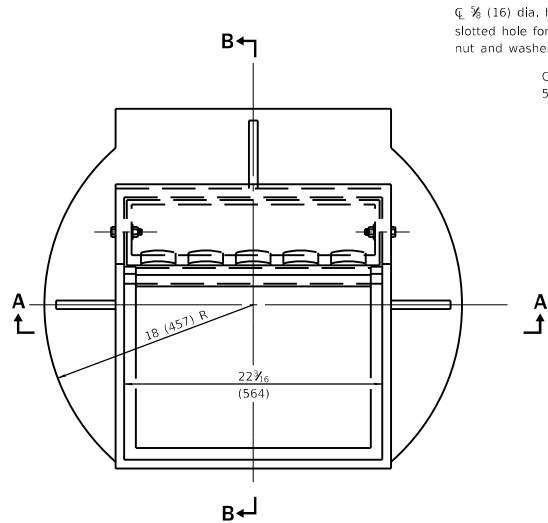
APPROVED January 1, 2015
[Signature]
 ENGINEER OF DESIGN AND ENVIRONMENT

464-C-1 03/15/11

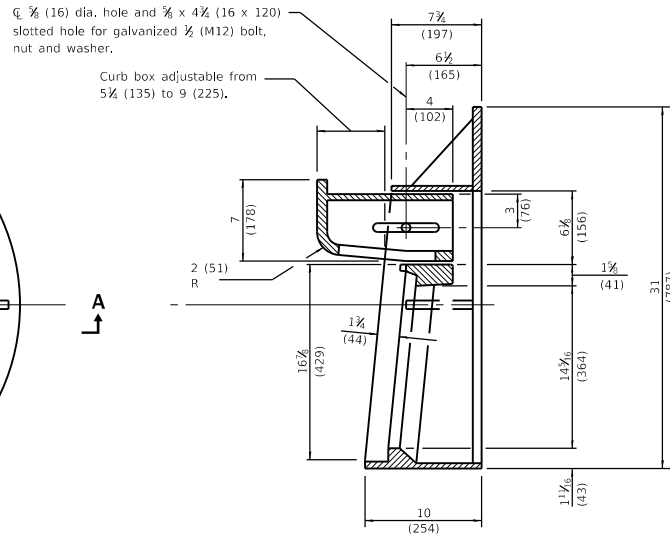
DATE	REVISIONS
1-1-15	Revised dimensions of frame and alternate curb box.
1-1-09	Switched units to English (metric).

**FRAME AND GRATE
TYPE 3**

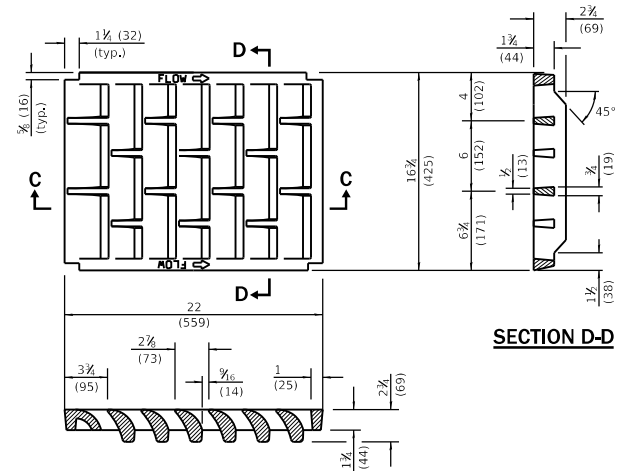
STANDARD 604006-05



CAST FRAME



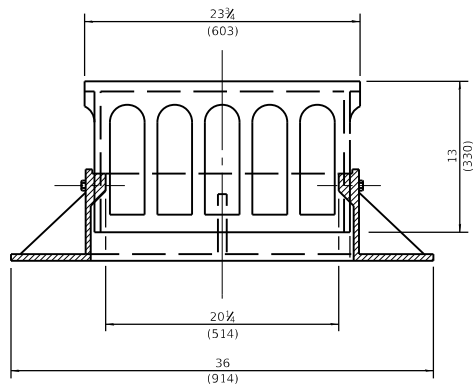
SECTION B-B



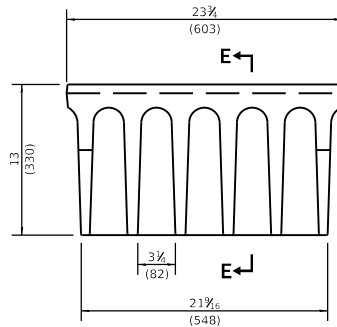
SECTION D-D

SECTION C-C

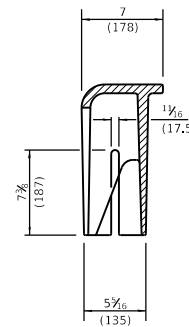
CAST GRATE



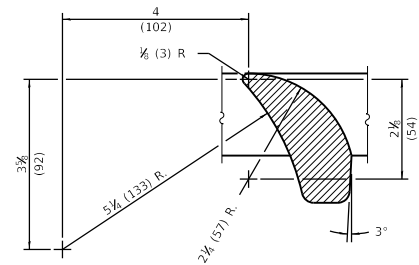
SECTION A-A



ALTERNATE CURB BOX



SECTION E-E



VANE DETAIL

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2015
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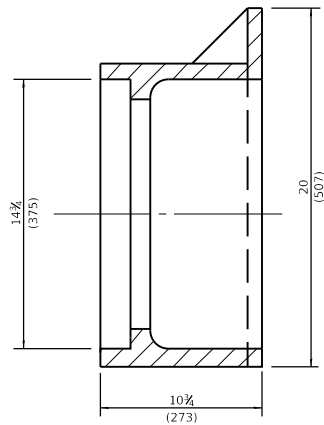
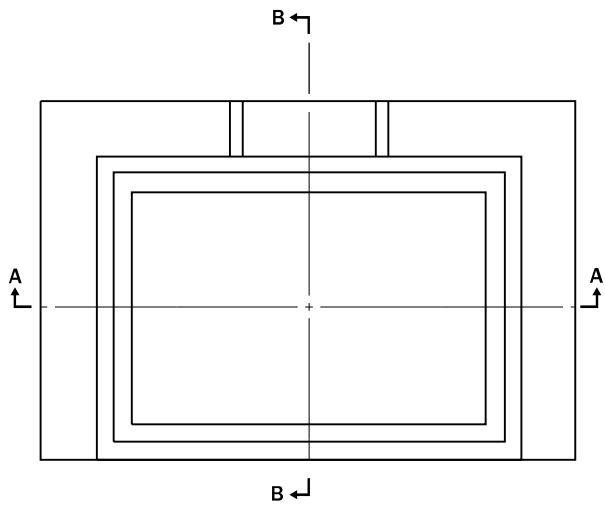
APPROVED January 1, 2015
[Signature]
 ENGINEER OF DESIGN AND ENVIRONMENT

464-C1 03/15/15

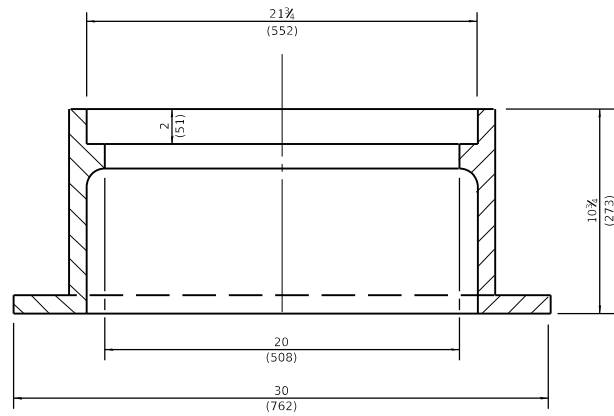
DATE	REVISIONS
1-1-15	Revised dimensions of frame and alternate curb box.
1-1-09	Switched units to English (metric).

**FRAME AND GRATE
TYPE 3V**

STANDARD 604011-05

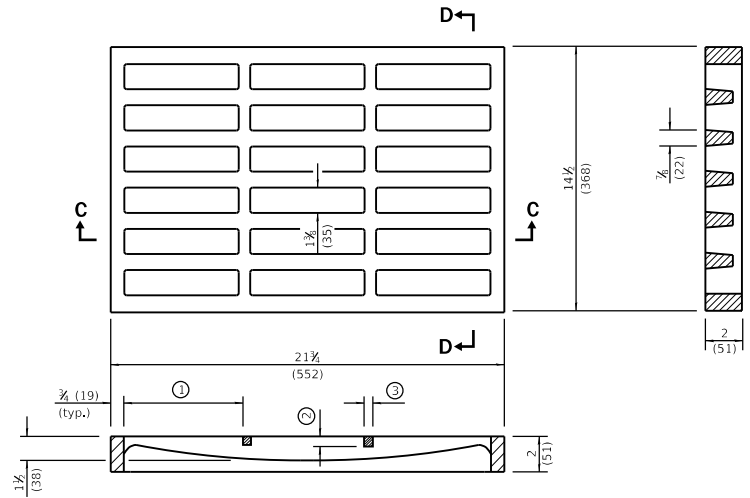


SECTION B-B



SECTION A-A

CAST FRAME



SECTION C-C

SECTION D-D

- ① = $6\frac{1}{2}$ (159) (typ.)
- ② = $\frac{1}{2}$ (19) (typ.)
- ③ = $\frac{3}{8}$ (16) (typ.)

CAST GRATE

All dimensions are in inches (millimeters) unless otherwise shown.

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PASSED April 1, 2016
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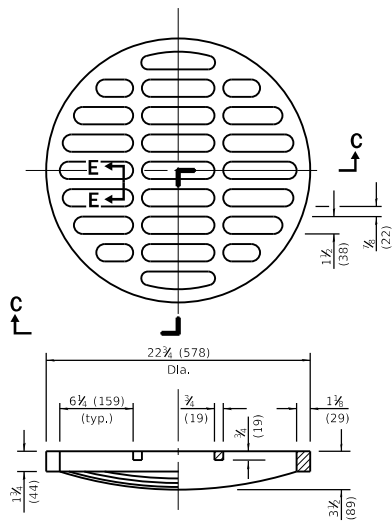
APPROVED April 1, 2016
[Signature]
 ENGINEER OF DESIGN AND ENVIRONMENT

464-C 03/15/11

DATE	REVISIONS
4-1-16	Corrected dimension on SECTION A-A.
1-1-15	Revised dimensions of frame and grate.

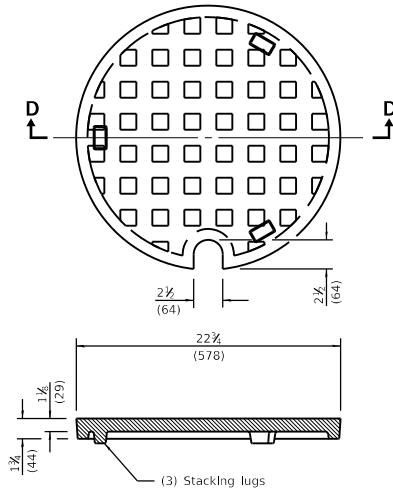
**FRAME AND GRATE
TYPE 4**

STANDARD 604016-04



SECTION C-C

CAST OPEN LID

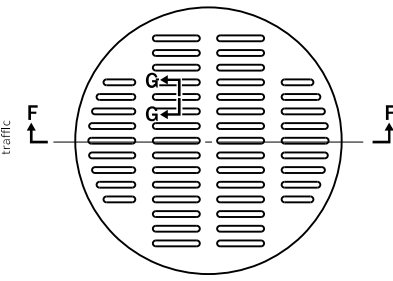


SECTION D-D

CAST CLOSED LID

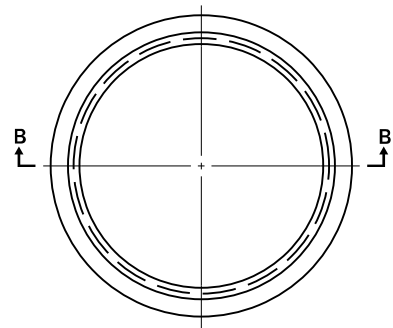
Gray Iron

Pedestrian traffic



SECTION F-F

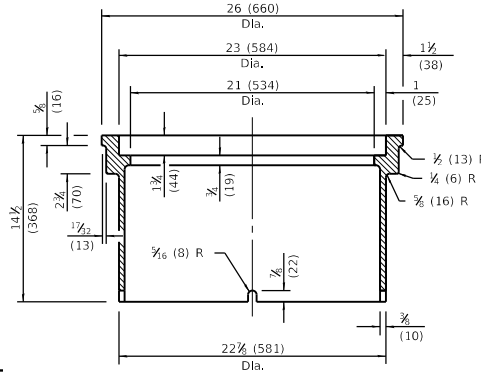
ADA COMPLIANT CAST OPEN LID



SECTION B-B

CAST FRAME

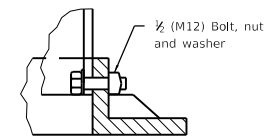
Gray Iron



SECTION A-A

CAST BASE

Gray Iron



DETAIL OF BOLTING FRAME TO BASE

NOTE: Bolts shall be removed after pavement has been placed.

GENERAL NOTES

The four holes in the cast base may be rotated 45° from the position shown in section A-A

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

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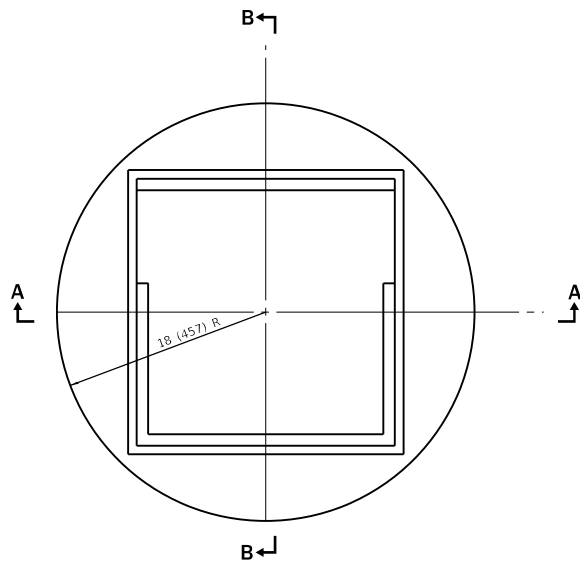
APPROVED January 1, 2015
[Signature]
 ENGINEER OF DESIGN AND ENVIRONMENT

464-C1 03/ISS/SL

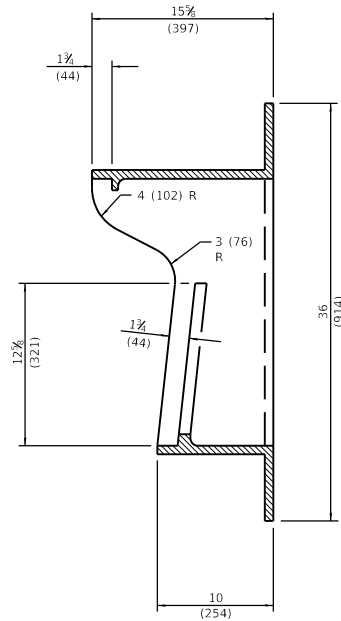
DATE	REVISIONS
1-1-15	Added ADA compliant open lid.
1-1-09	Switched units to English (metric).

BASE, FRAME AND LIDS TYPE 5

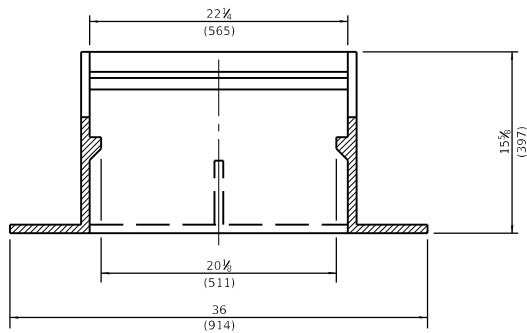
STANDARD 604021-03



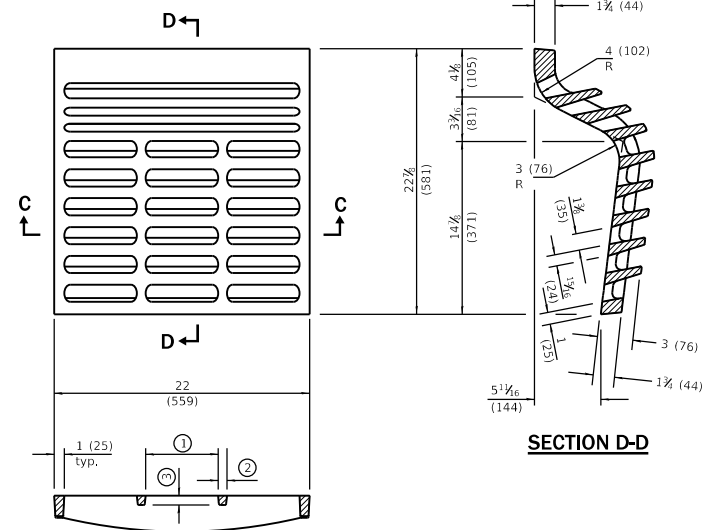
SECTION A-A



SECTION B-B



CAST FRAME



SECTION D-D

SECTION C-C

- ① = 6 3/8 (159) max. (typ.)
- ② = 3/8 (19) min. (typ.)
- ③ = 3/16 (21) min. (typ.)

CAST GRATE

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

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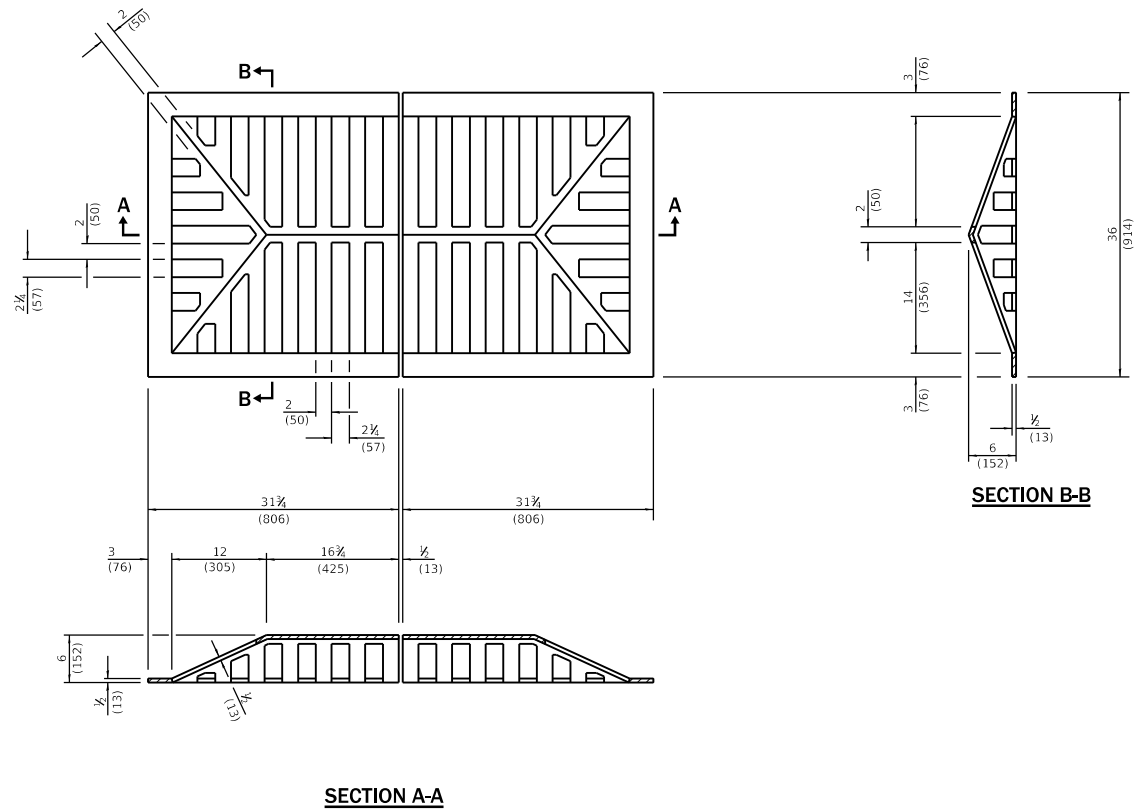
APPROVED January 1, 2015
[Signature]
 ENGINEER OF DESIGN AND ENVIRONMENT

464-C1 03/15/15

DATE	REVISIONS
1-1-15	Revised dimensions of frame and grate.
1-1-09	Switched units to English (metric).

**FRAME AND GRATE
TYPE 6**

STANDARD 604026-03



SECTION A-A

SECTION B-B

CAST GRATE

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2015
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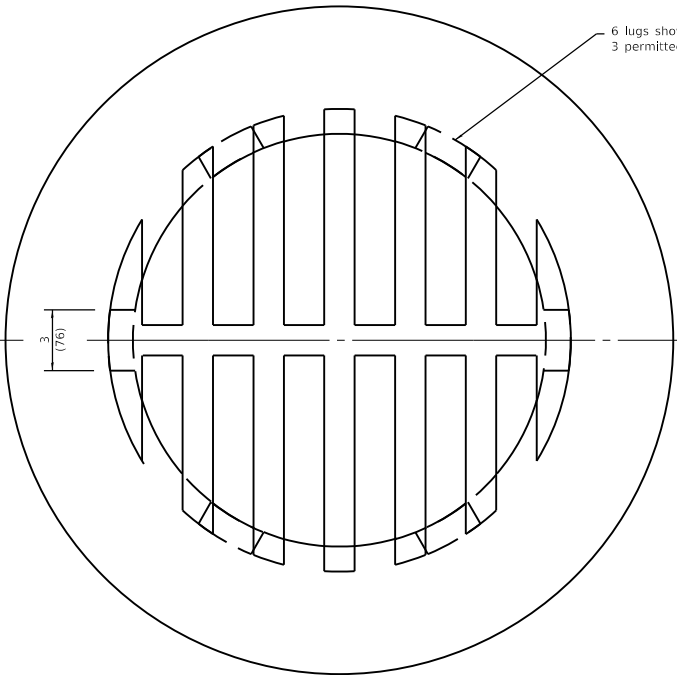
APPROVED January 1, 2015
[Signature]
 ENGINEER OF DESIGN AND ENVIRONMENT

469-1-1 Q3/ISS/2

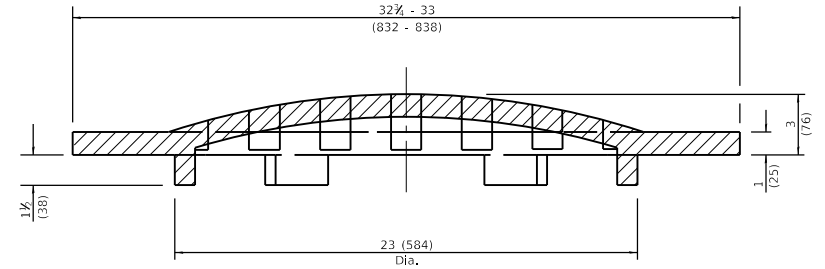
DATE	REVISIONS
1-1-15	Revised grate thickness.
1-1-09	Switched units to English (metric).

GRATE TYPE 7

STANDARD 604031-03



6 lugs shown,
3 permitted.



SECTION A-A

CAST GRATE

All dimensions are in Inches (millimeters)
unless otherwise shown.

Illinois Department of Transportation

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ENGINEER OF POLICY AND PROCEDURES

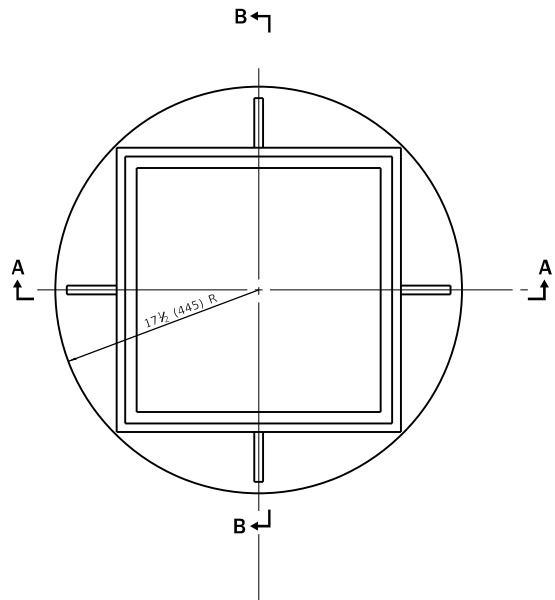
APPROVED January 1, 2015
[Signature]
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUES: 464-1-1

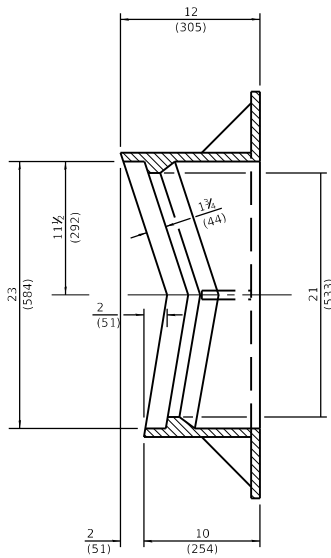
DATE	REVISIONS
1-1-15	Revised dimensions.
1-1-09	Switched units to English (metric).

GRATE TYPE 8

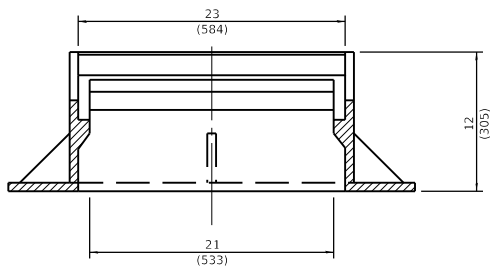
STANDARD 604036-03



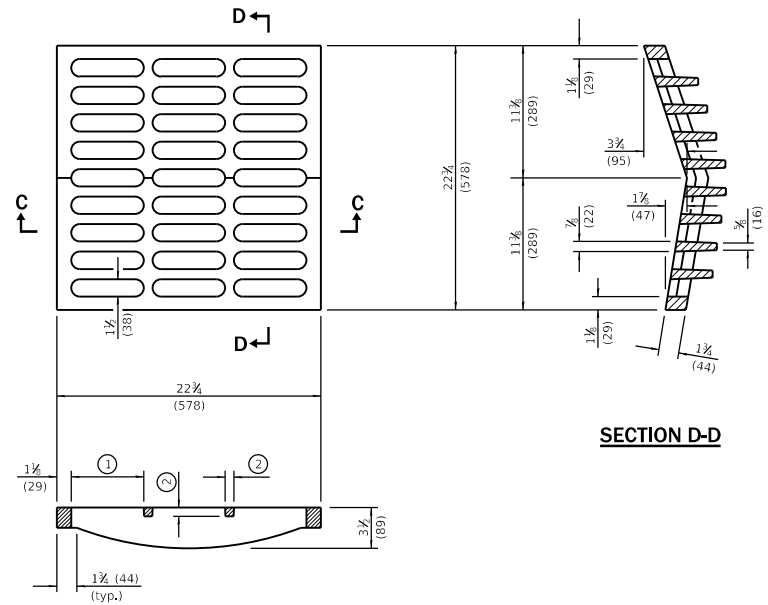
SECTION A-A



SECTION B-B



CAST FRAME



SECTION D-D

SECTION C-C

- ① = 6 1/2 (159) max. (typ.)
- ② = 3/8 (19) min. (typ.)

CAST GRATE

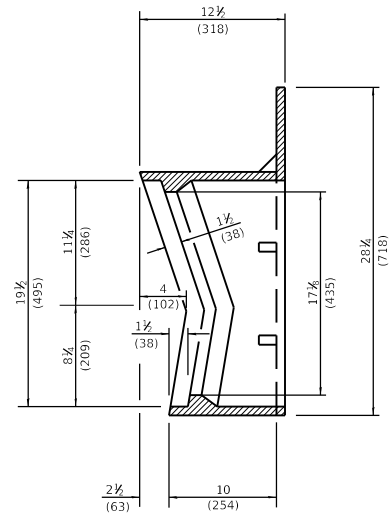
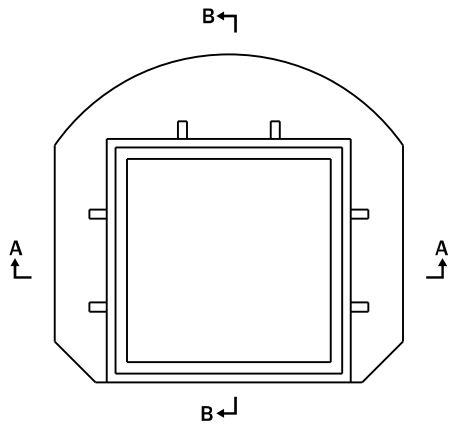
All dimensions are in Inches (millimeters) unless otherwise shown.

Illinois Department of Transportation	
PASSED	January 1, 2015
Michael Beard	
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2015
ENGINEER OF DESIGN AND ENVIRONMENT	

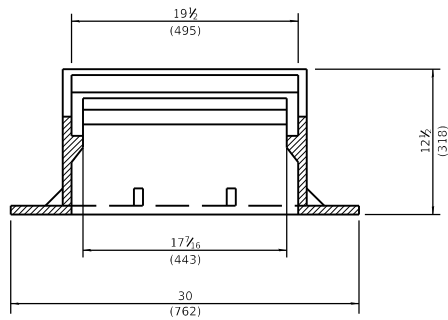
DATE	REVISIONS
1-1-15	Revised dimensions of frame.
1-1-09	Switched units to English (metric).

**FRAME AND GRATE
TYPE 9**

STANDARD 604041-03

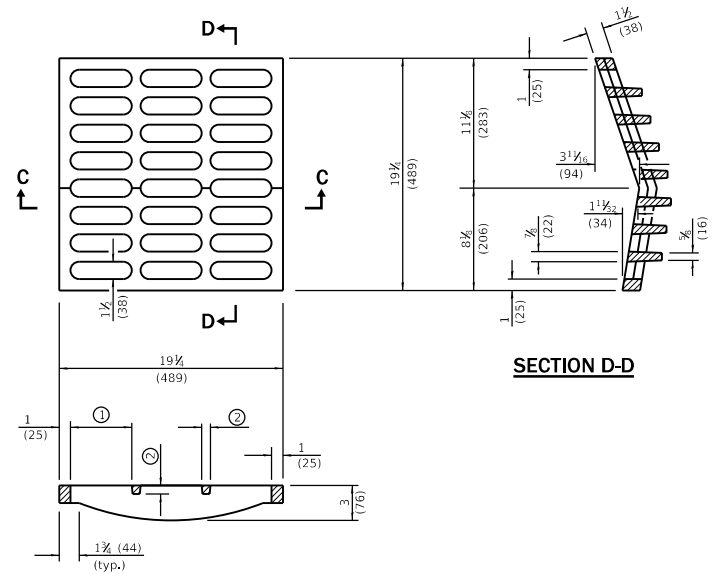


SECTION B-B



SECTION A-A

CAST FRAME



SECTION D-D

SECTION C-C

- ① = 6 1/2 (159) max. (typ.)
- ② = 1/2 (19) min. (typ.)

CAST GRATE

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2015
Michael Beard
 ENGINEER OF POLICY AND PROCEDURES

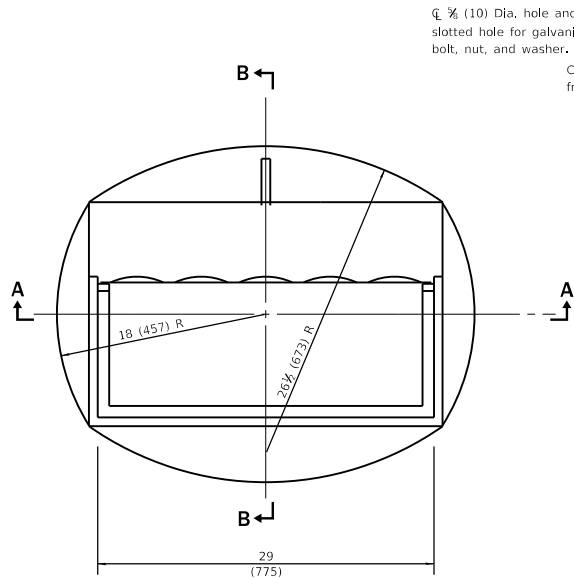
APPROVED January 1, 2015
[Signature]
 ENGINEER OF DESIGN AND ENVIRONMENT

464-C1 03/15/15

DATE	REVISIONS
1-1-15	Revised dimensions of frame.
1-1-09	Switched units to English (metric).

**FRAME AND GRATE
TYPE 10**

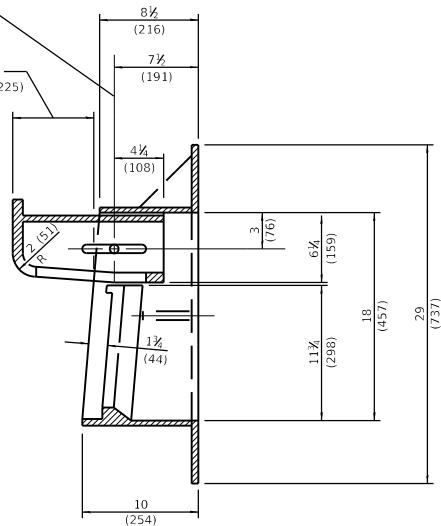
STANDARD 604046-03



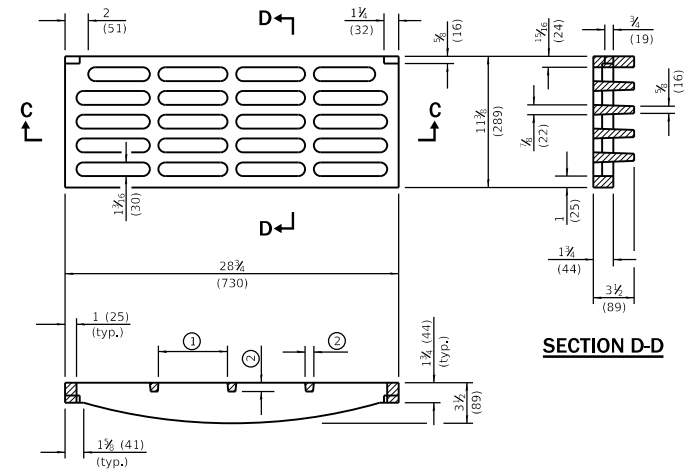
CAST FRAME

∅ 1/4 (10) Dia. hole and 3/8x5 1/2 (16x140) slotted hole for galvanized 1/2 (M12) bolt, nut, and washer.

Curb box adjustable from 4 1/2 (115) to 9 (225)



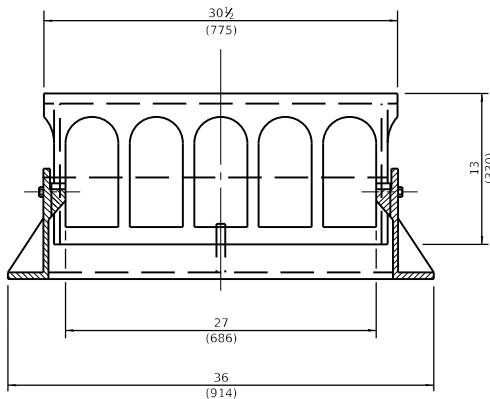
SECTION B-B



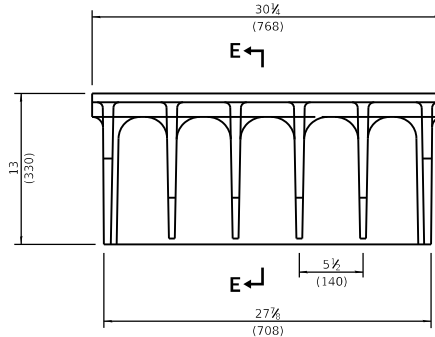
SECTION C-C

- ① = 6 3/4 (159) max. (typ.)
- ② = 3/4 (19) min. (typ.)

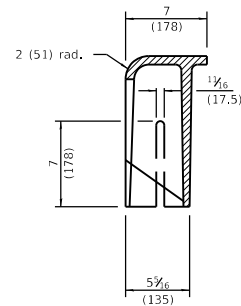
SECTION D-D



SECTION A-A



ALTERNATE CURB BOX



SECTION E-E

CAST GRATE

All dimensions are in Inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2015
Michael Beard
 ENGINEER OF POLICY AND PROCEDURES

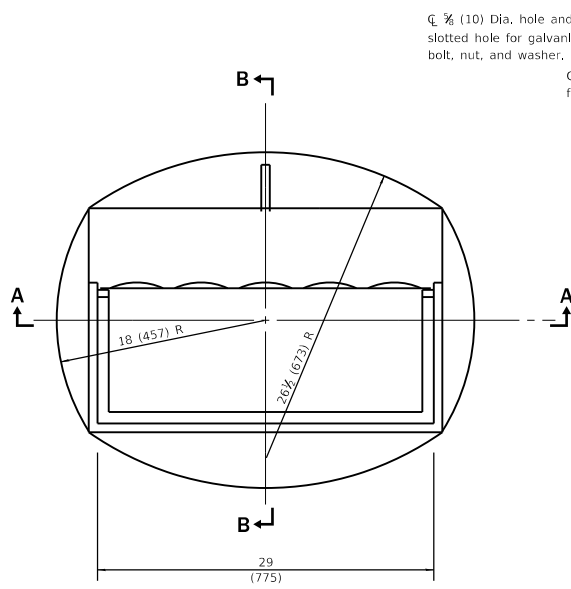
APPROVED January 1, 2015
[Signature]
 ENGINEER OF DESIGN AND ENVIRONMENT

LEP-C1 03/15/11

DATE	REVISIONS
1-1-15	Revised dimensions of frame and alternate curb box.
4-1-09	Switched units to English (metric).

**FRAME AND GRATE
TYPE 11**

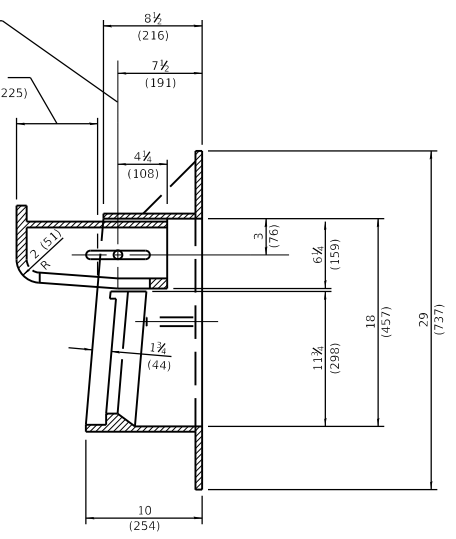
STANDARD 604051-04



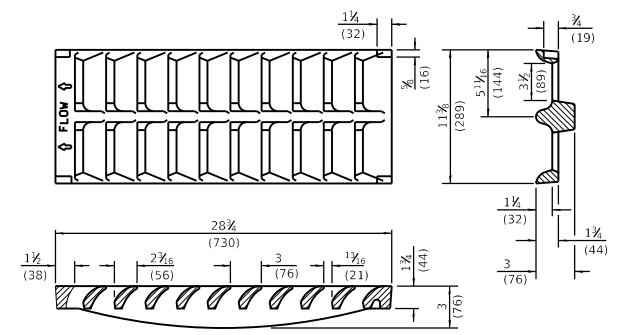
CAST FRAME

Ø 5/8 (10) Dia. hole and 3/8x5 1/2 (16x140) slotted hole for galvanized 1/2 (M12) bolt, nut, and washer.

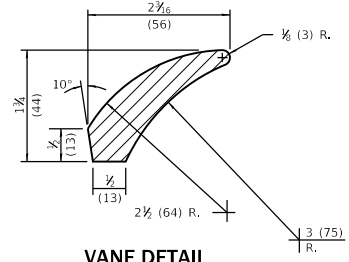
Curb box adjustable from 4 1/2 (115) to 9 (225)



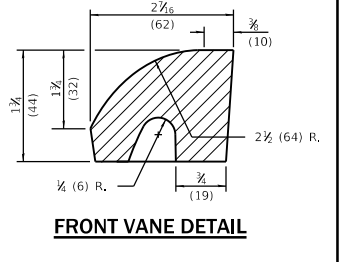
SECTION B-B



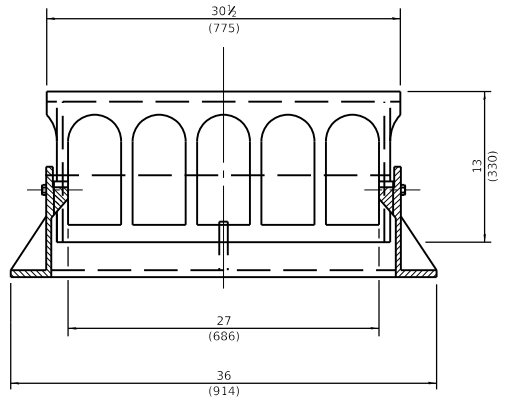
CAST GRATE



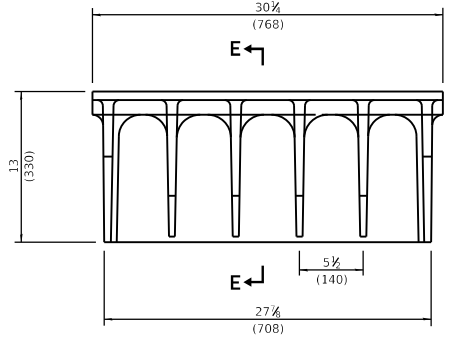
VANE DETAIL



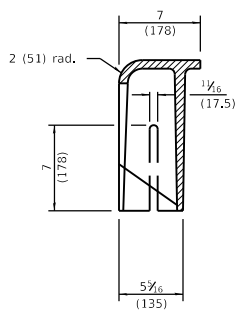
FRONT VANE DETAIL



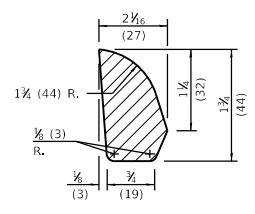
SECTION A-A



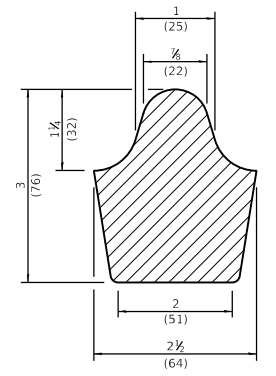
ALTERNATE CURB BOX



SECTION E-E



SIDE RIB DETAIL



MIDDLE RIB DETAIL

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

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Michael Beard
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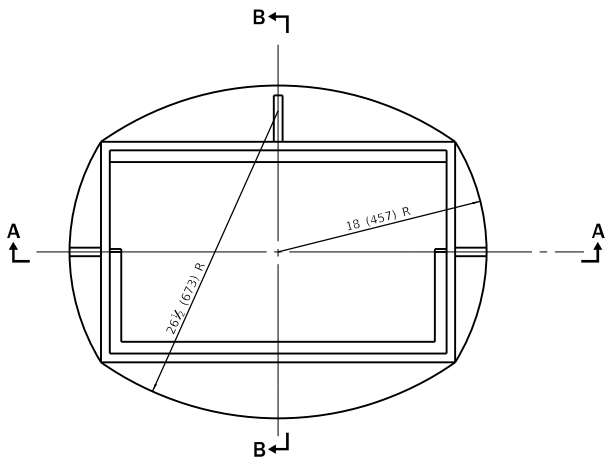
APPROVED January 1, 2015
[Signature]
 ENGINEER OF DESIGN AND ENVIRONMENT

464-C1 03/15/15

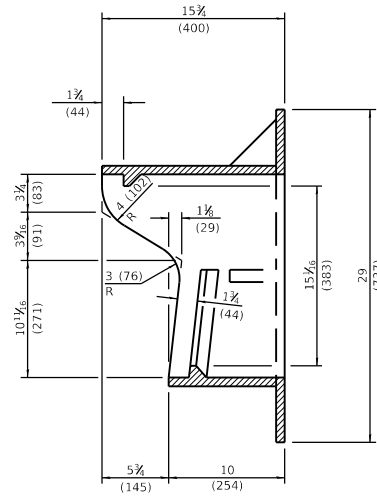
DATE	REVISIONS
1-1-15	Revised dimensions of frame and alternate curb box.
1-1-09	Switched units to English (metric).

**FRAME AND GRATE
TYPE 11V**

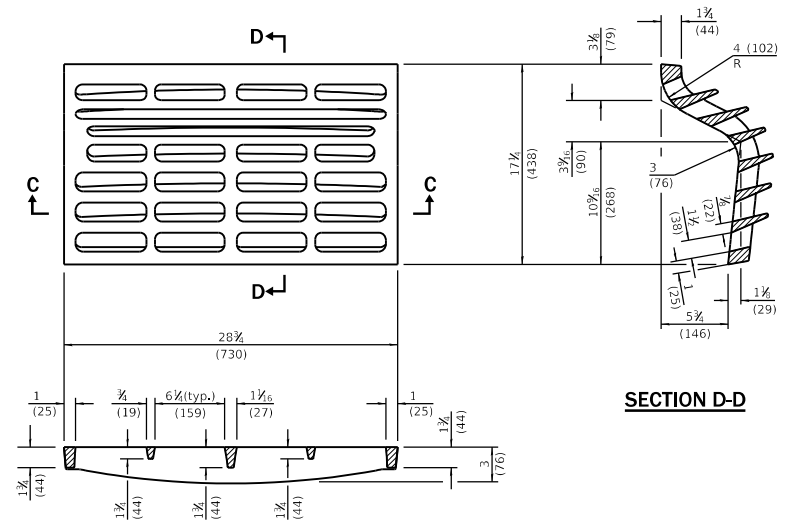
STANDARD 604056-04



SECTION A-A



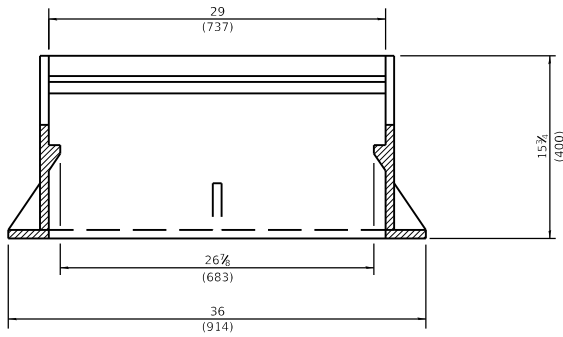
SECTION B-B



SECTION D-D

SECTION C-C

CAST GRATE



CAST FRAME

All dimensions are in Inches (millimeters) unless otherwise shown.

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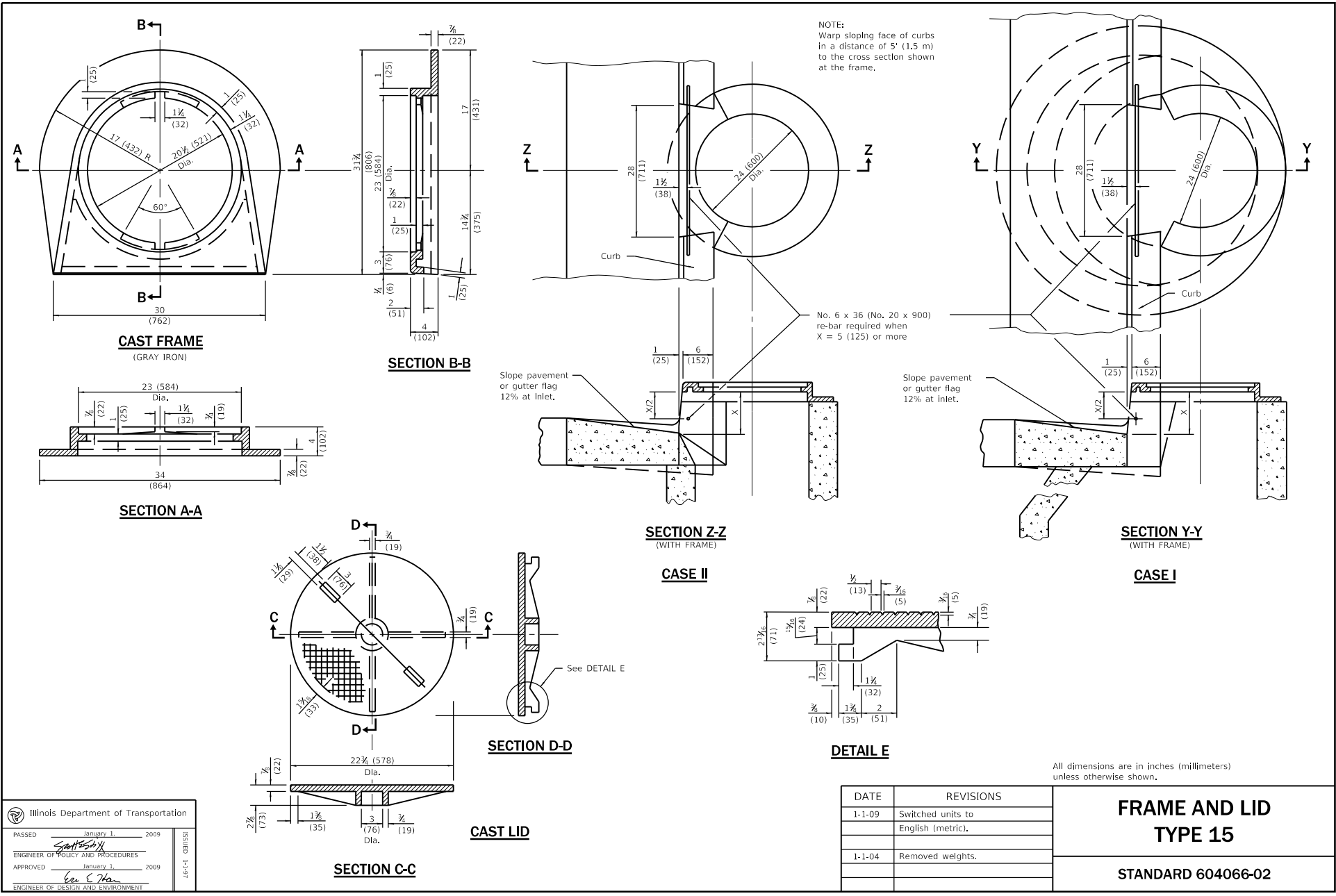
APPROVED January 1, 2015
[Signature]
 ENGINEER OF DESIGN AND ENVIRONMENT

664-1-03/ISS

DATE	REVISIONS
1-1-15	Revised dimensions of frame and grate.
1-1-09	Switched units to English (metric).

**FRAME AND GRATE
TYPE 12**

STANDARD 604061-03



Illinois Department of Transportation

PASSED January 1, 2009

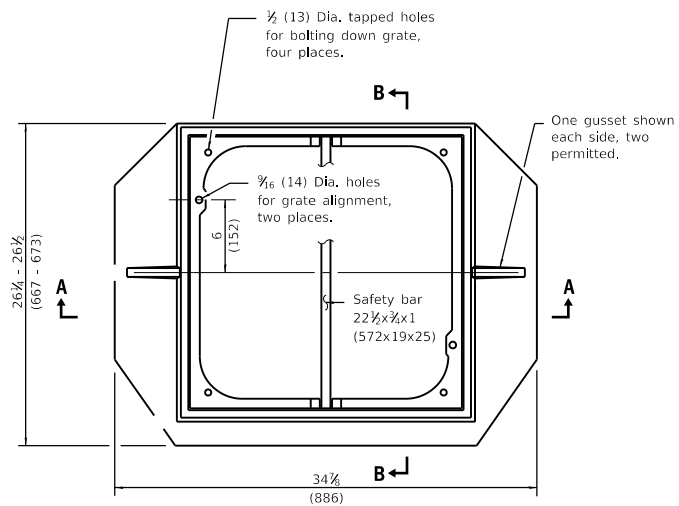
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

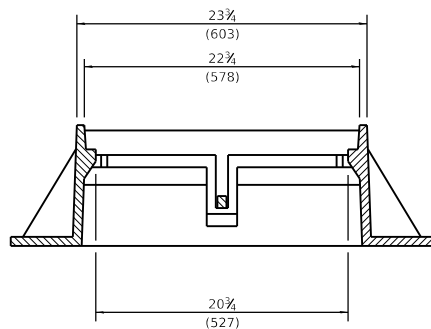
**FRAME AND LID
TYPE 15**

STANDARD 604066-02

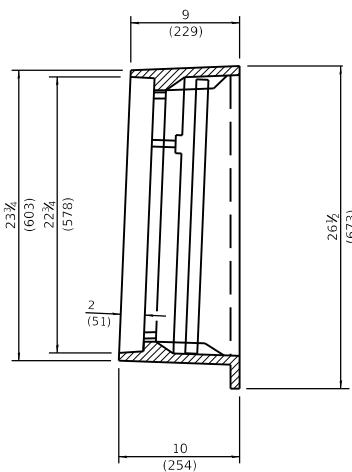


PLAN

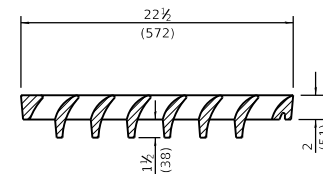
CAST FRAME



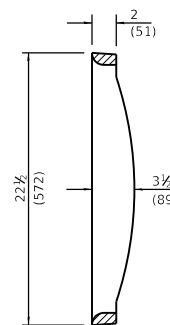
SECTION A-A



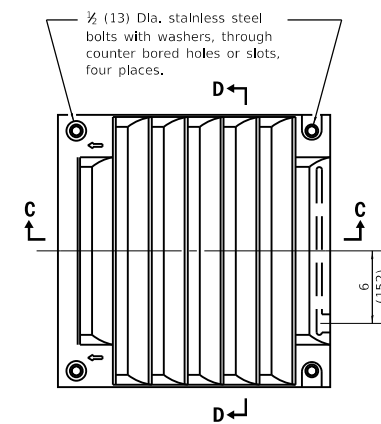
SECTION B-B



SECTION C-C



SECTION D-D



CAST GRATE

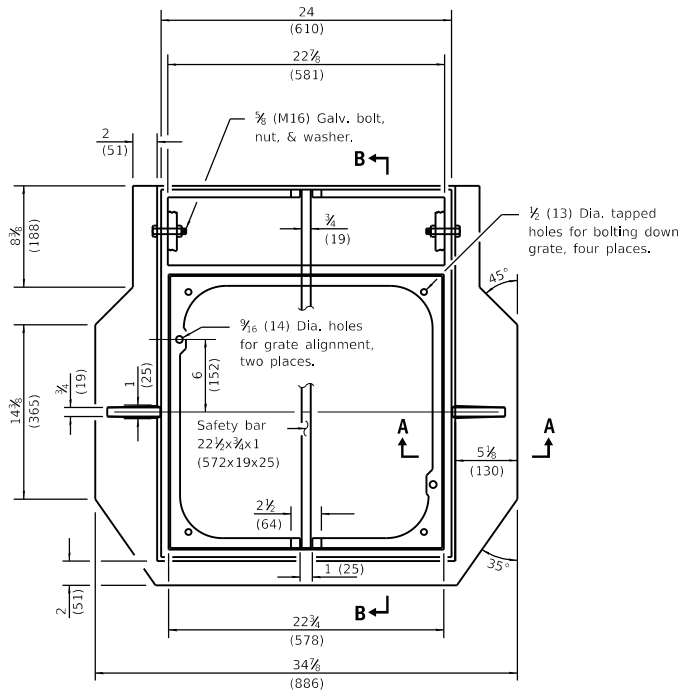
All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation	
PASSED	January 1, 2015
<i>Michael Beard</i>	
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2015
<i>[Signature]</i>	
ENGINEER OF DESIGN AND ENVIRONMENT	

DATE	REVISIONS
1-1-15	Revised dimensions of frame.
1-1-09	Switched units to English (metric).

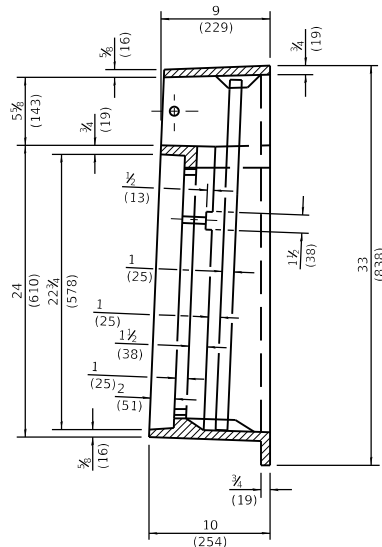
**FRAME AND GRATE
TYPE 20**

STANDARD 604071-05

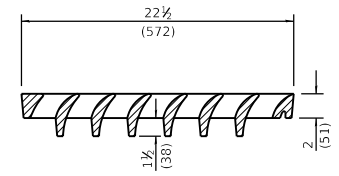


PLAN

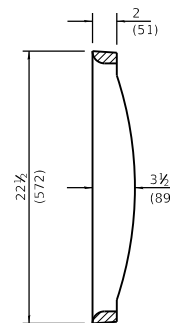
CAST FRAME



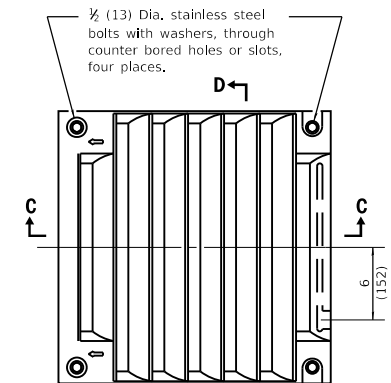
SECTION B-B



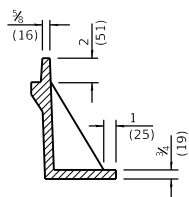
SECTION C-C



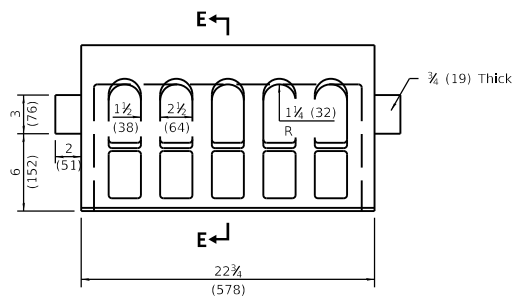
SECTION D-D



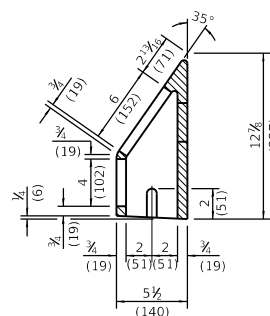
CAST GRATE



SECTION A-A



CURB BOX



SECTION E-E

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-07	Revised frame flanges, changed to a bolt down grate w/ deeper vanes.

**FRAME AND GRATE
TYPE 21**

STANDARD 604076-04

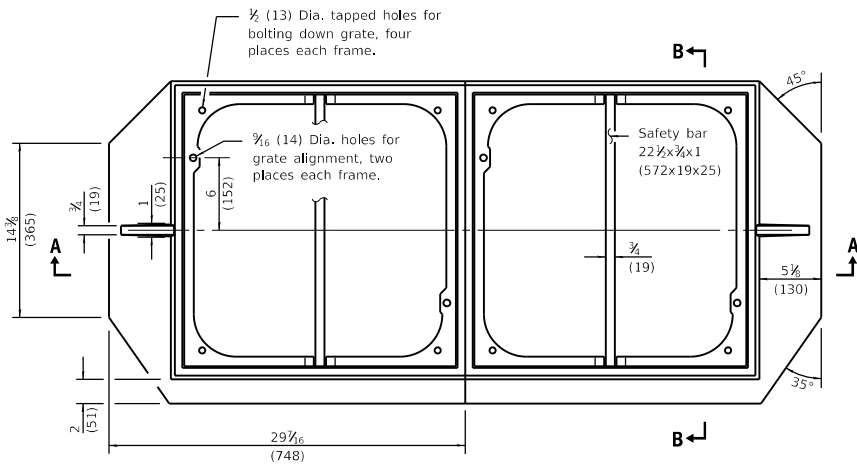
Illinois Department of Transportation

PASSED January 1, 2009

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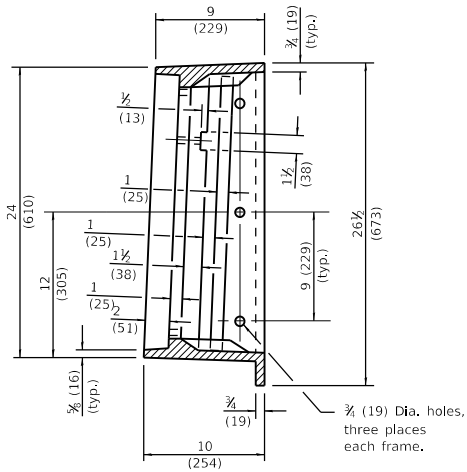
APPROVED January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

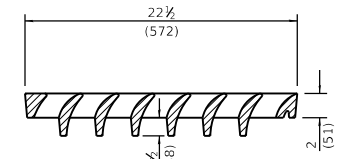


PLAN

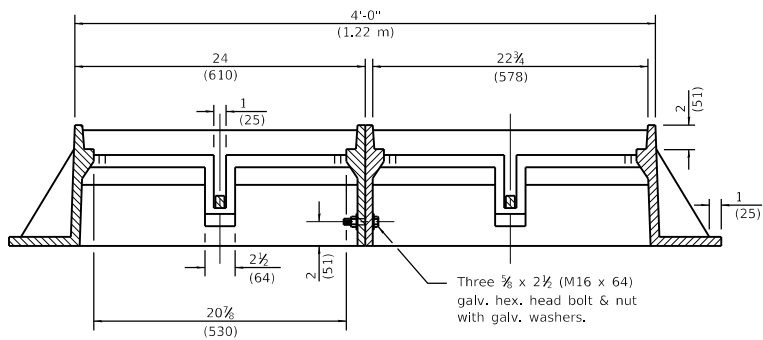
CAST FRAME



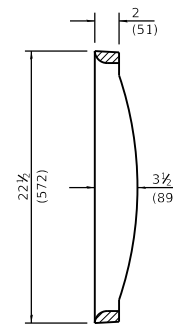
SECTION B-B



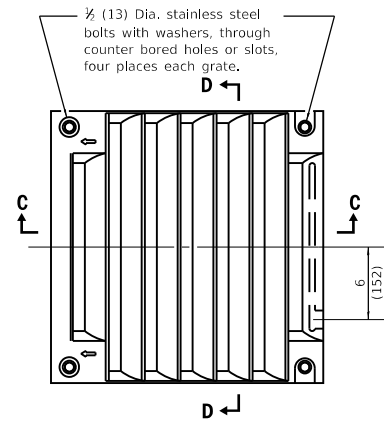
SECTION C-C



SECTION A-A



SECTION D-D



CAST GRATE

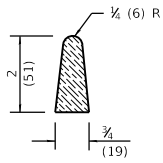
All dimensions are in inches (millimeters) unless otherwise shown.

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ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT	

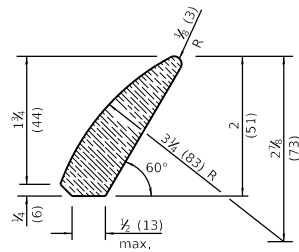
DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-07	Revised frame flanges, changed to a bolt down grate w/ deeper vanes.

**FRAMES AND GRATES
TYPE 22**

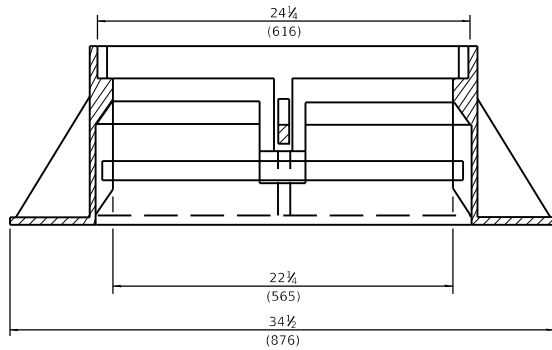
STANDARD 604081-04



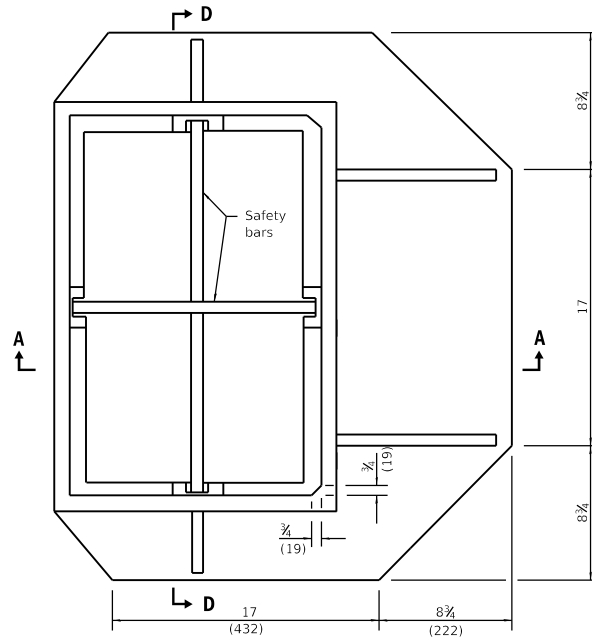
DETAIL A



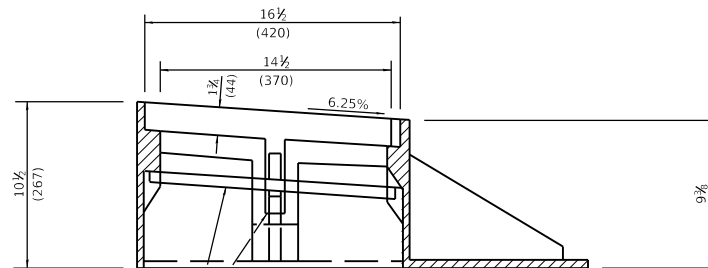
DETAIL B



SECTION D-D

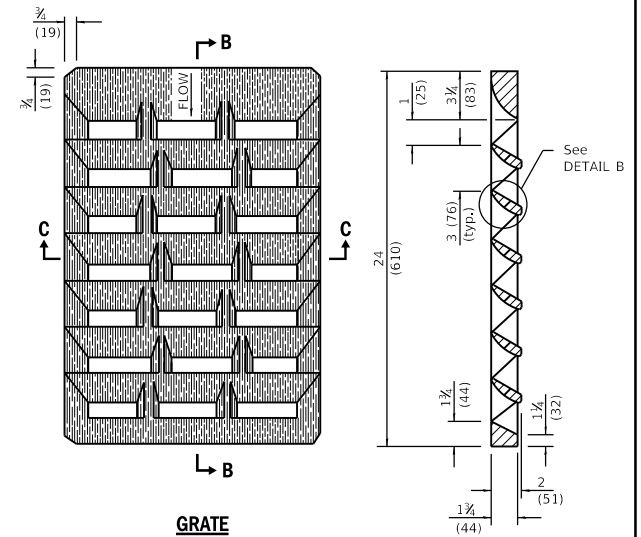


PLAN - FRAME



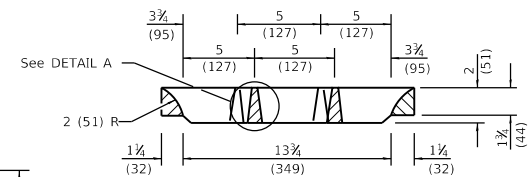
SECTION A-A

Safety bars
 1 - 16x3/4x1 (406x19x25)
 1 - 23 3/4x3/4x1 (603x19x25)



GRATE

SECTION B-B



SECTION C-C

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

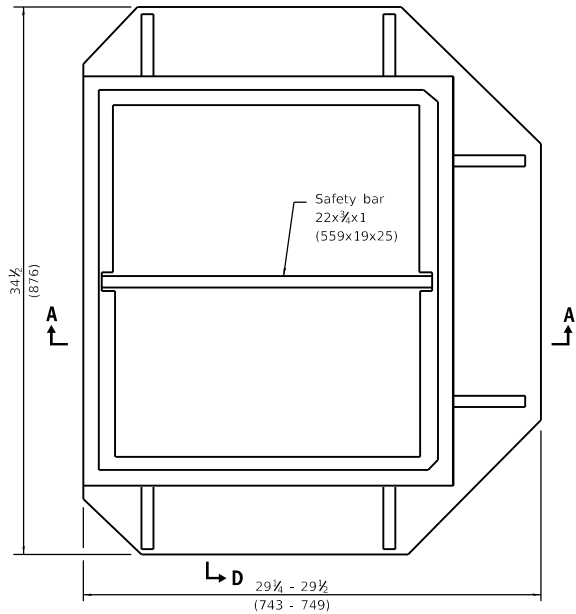
PASSED January 1, 2015
Michael Beard
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2015
[Signature]
 ENGINEER OF DESIGN AND ENVIRONMENT

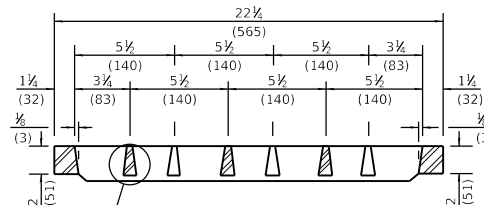
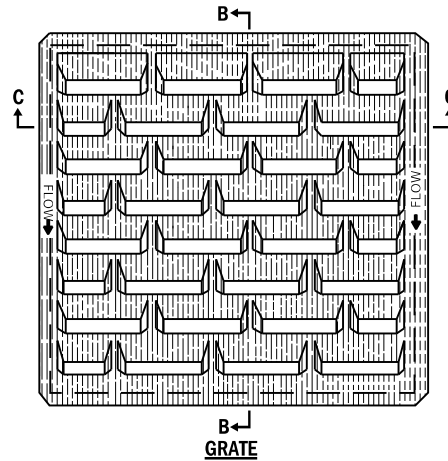
DATE	REVISIONS
1-1-15	Revised dimensions of frame.
1-1-09	Switched units to English (metric).

**FRAME AND GRATE
 TYPE 23**

STANDARD 604086-03

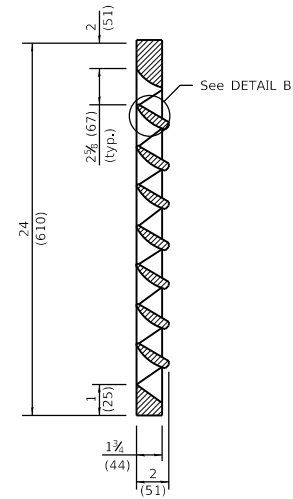


PLAN - FRAME

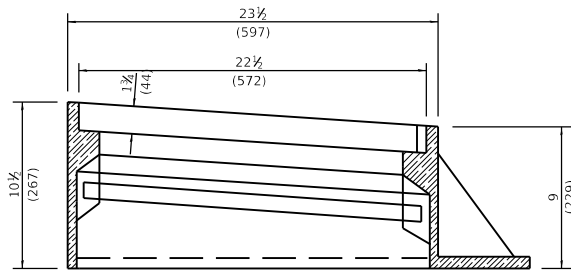


SECTION C-C

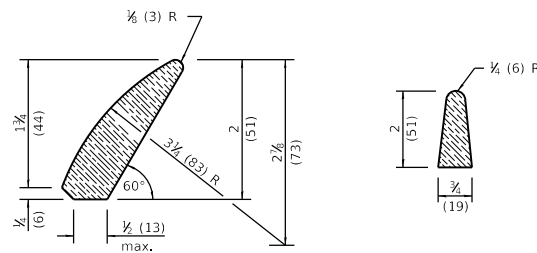
See DETAIL A



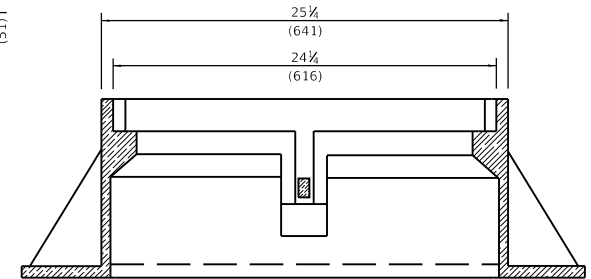
SECTION B-B



SECTION A-A



DETAIL A



SECTION D-D

All dimensions are in inches (millimeters) unless otherwise shown.

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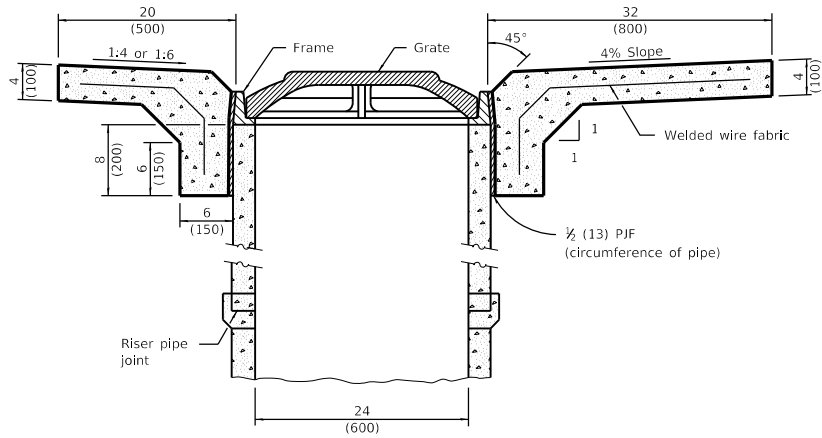
APPROVED January 1, 2015
[Signature]
ENGINEER OF DESIGN AND ENVIRONMENT

464-C 03/11/SSJ

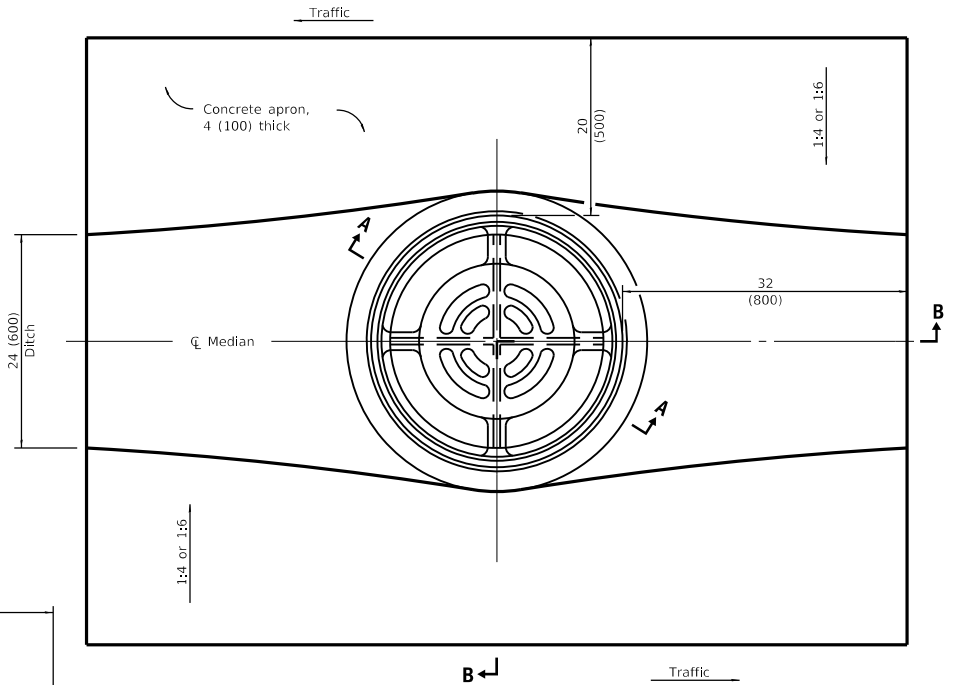
DATE	REVISIONS
1-1-15	Revised dimensions of frame.
1-1-09	Switched units to English (metric).

**FRAME AND GRATE
TYPE 24**

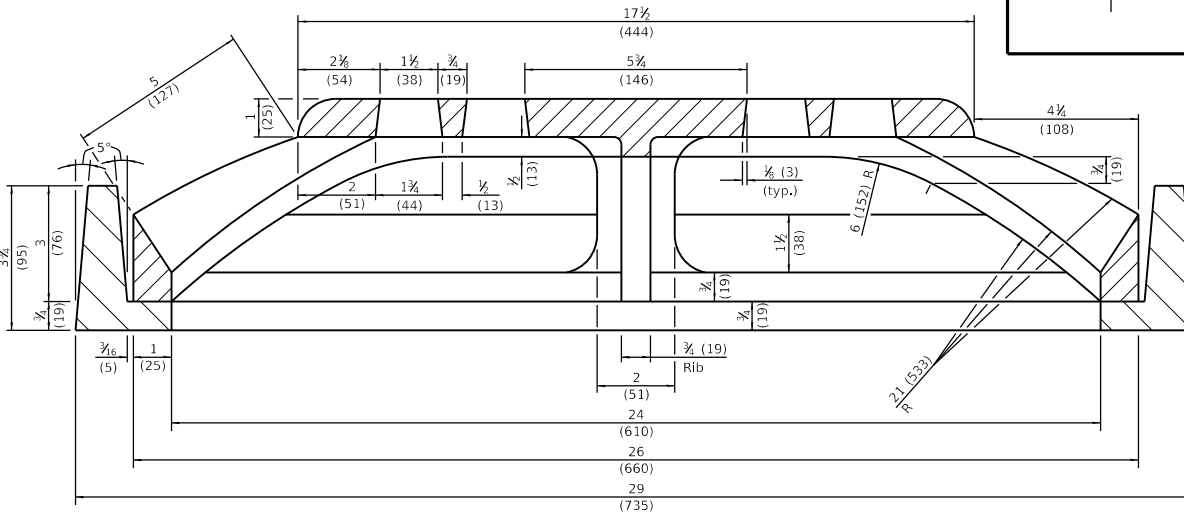
STANDARD 604091-03



SECTION B-B



LOCATION SKETCH - PLAN



SECTION A-A

GENERAL NOTES

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2009
Spotts
 ENGINEER OF POLICY AND PROCEDURES

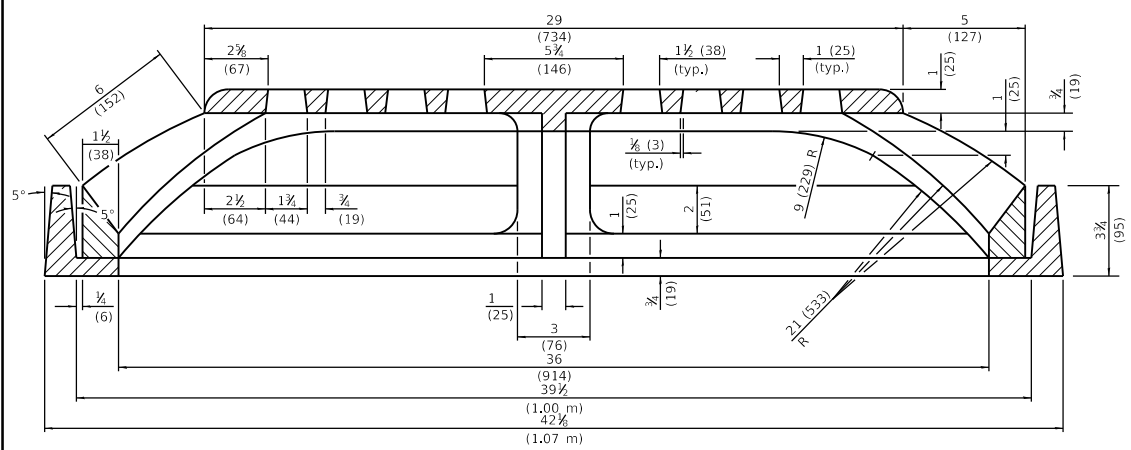
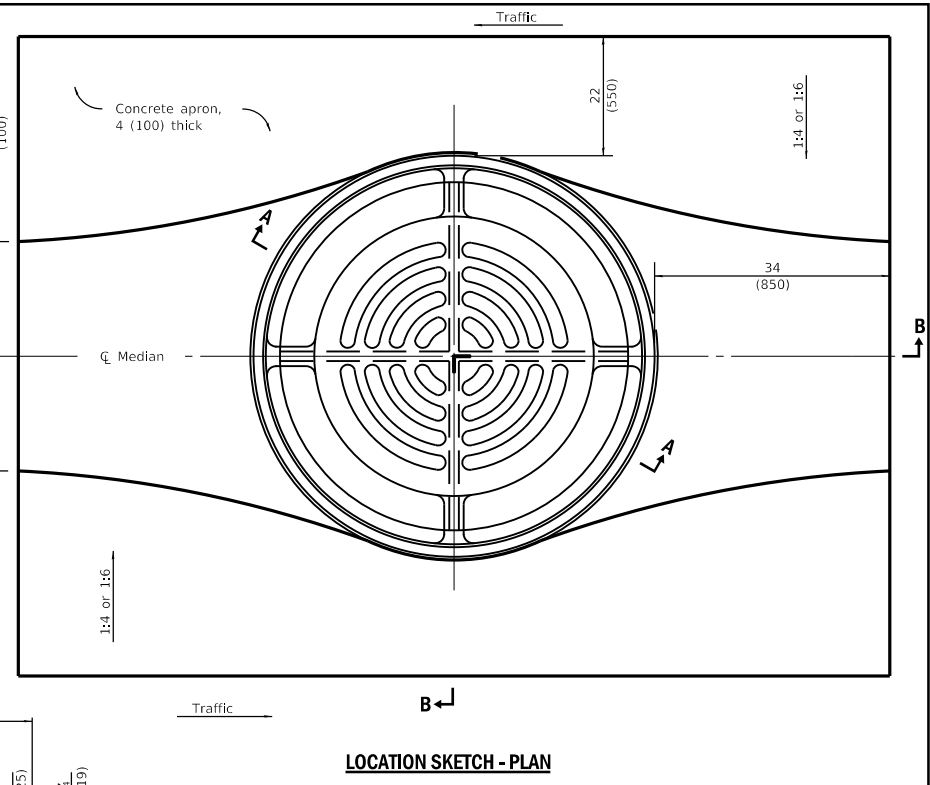
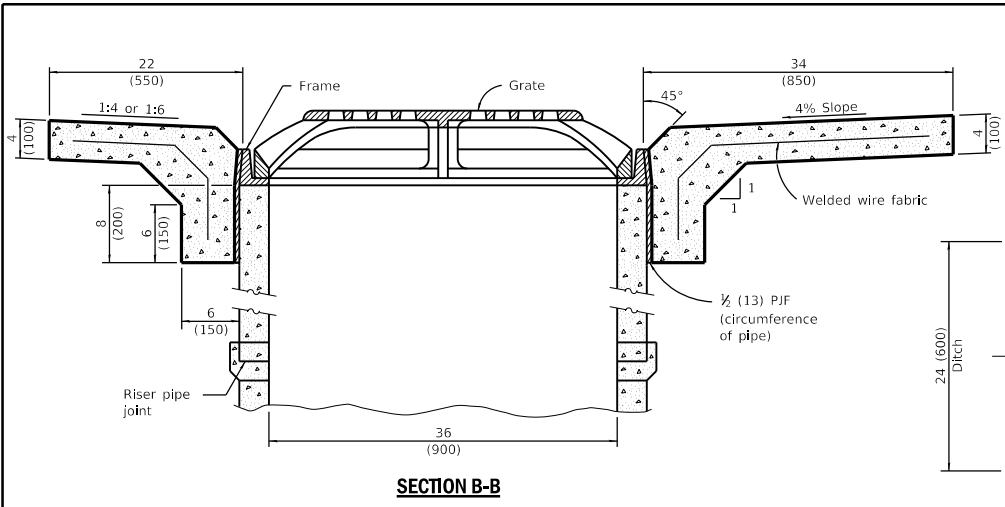
APPROVED January 1, 2009
Lee E. Han
 ENGINEER OF DESIGN AND ENVIRONMENT

LEG-CI 03/11/02

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-97	Renum, Standard 2250-3.

**MEDIAN INLET for 24" (600 mm)
 REINFORCED CONCRETE PIPE**

STANDARD 604101-01



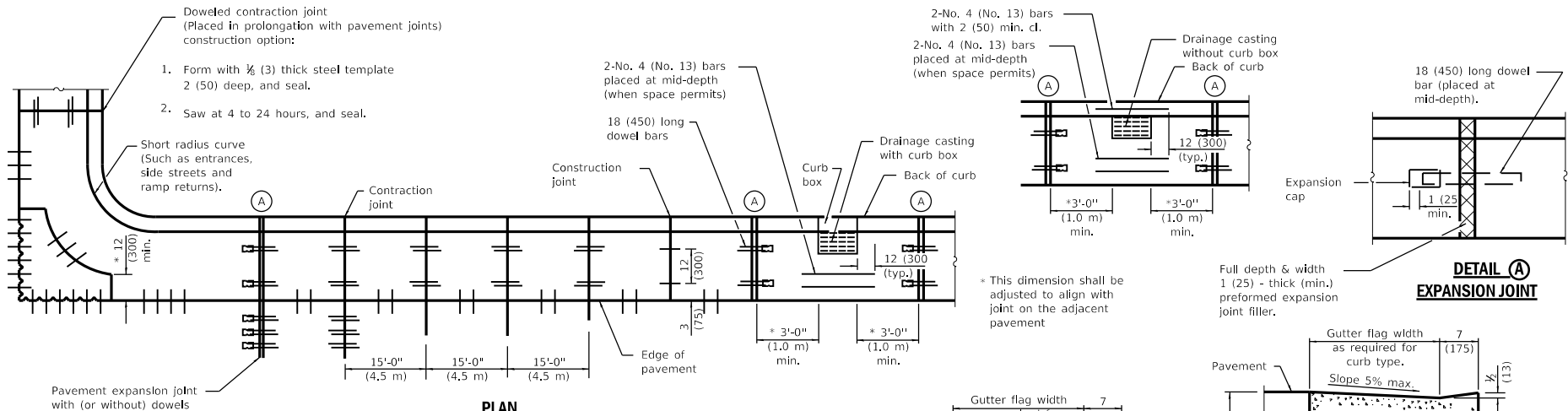
GENERAL NOTES
 All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).
 All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation
 PASSED January 1, 2009
 ENGINEER OF POLICY AND PROCEDURES
 APPROVED January 1, 2009
 ENGINEER OF DESIGN AND ENVIRONMENT

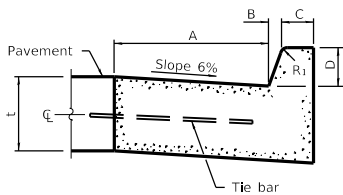
DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-97	Renum. Standard 2251-2.

MEDIAN INLET for 36" (900 mm) REINFORCED CONCRETE PIPE

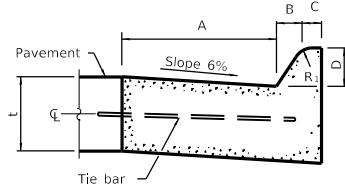
STANDARD 604106-01



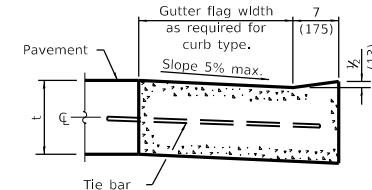
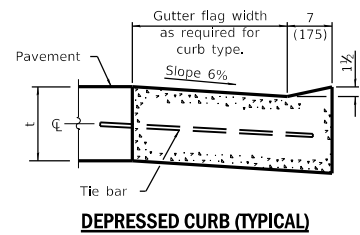
PLAN
ADJACENT TO PCC PAVEMENT OR PCC BASE COURSE



BARRIER CURB



MOUNTABLE CURB



GENERAL NOTES

The bottom slope of combination curb and gutter constructed adjacent to pcc pavement shall be the same slope as the subbase or 6% when subbase is omitted.

t = Thickness of pavement.

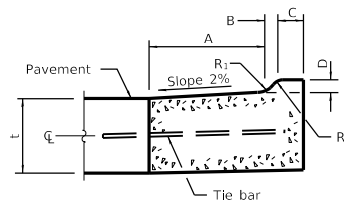
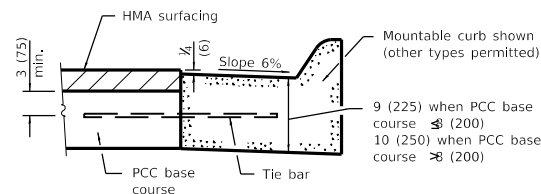
Longitudinal joint tie bars shall be No. 6 (No. 19) at 36 (900) centers in accordance with details for longitudinal construction joint shown on Standard 420001.

A minimum clearance of 2 (50) between the end of the tie bar and the back of the curb shall be maintained.

The dowel bars shown in contraction joints will only be required for monolithic construction.

See Standard 606301 for details of corner islands.

All dimensions are in inches (millimeters) unless otherwise shown.



M-2.06 (M-5.15) and M-2.12 (M-5.30)

TABLE OF DIMENSIONS BARRIER CURB					
TYPE	A	B	C	D	R ₁
B-6.06 *	6	1	6	6	1
(B-15.15)	(150)	(25)	(150)	(150)	(25)
B-6.12	12	1	6	6	1
(B-15.3)	(300)	(25)	(150)	(150)	(25)
B-6.18	18	1	6	6	1
(B-15.45)	(450)	(25)	(150)	(150)	(25)
B-6.24	24	1	6	6	1
(B-15.60)	(600)	(25)	(150)	(150)	(25)
B-9.12	12	2	5	9	1
(B-22.30)	(300)	(50)	(125)	(225)	(25)
B-9.18	18	2	5	9	1
(B-22.45)	(450)	(50)	(125)	(225)	(25)
B-9.24	24	2	5	9	1
(B-22.60)	(600)	(50)	(125)	(225)	(25)

* For corner islands only.

TABLE OF DIMENSIONS MOUNTABLE CURB						
TYPE	A	B	C	D	R ₁	R ₂
M-2.06	6	2	4	2	3	2
(M-5.15)	(150)	(50)	(100)	(50)	(75)	(50)
M-2.12	12	2	4	2	3	2
(M-5.30)	(300)	(50)	(100)	(50)	(75)	(50)
M-4.06	6	4	3	4	3	NA
(M-10.15)	(150)	(100)	(75)	(100)	(75)	NA
M-4.12	12	4	3	4	3	NA
(M-10.30)	(300)	(100)	(75)	(100)	(75)	NA
M-4.18	18	4	3	4	3	NA
(M-10.45)	(450)	(100)	(75)	(100)	(75)	NA
M-4.24	24	4	3	4	3	NA
(M-10.60)	(600)	(100)	(75)	(100)	(75)	NA
M-6.06	6	6	2	6	2	NA
(M-15.15)	(150)	(150)	(50)	(150)	(50)	NA
M-6.12	12	6	2	6	2	NA
(M-15.30)	(300)	(150)	(50)	(150)	(50)	NA
M-6.18	18	6	2	6	2	NA
(M-15.45)	(450)	(150)	(50)	(150)	(50)	NA
M-6.24	24	6	2	6	2	NA
(M-15.60)	(600)	(150)	(50)	(150)	(50)	NA

DATE	REVISIONS
1-1-18	Revised General Note for tie bar spacing to 36 (900) cts.
1-1-15	Added B-6.06 (B-15.15) barrier curb and gutter to table (corner islands only).

**CONCRETE CURB TYPE B
AND COMBINATION
CONCRETE CURB AND GUTTER**
(Sheet 1 of 2)

STANDARD 606001-07

Illinois Department of Transportation

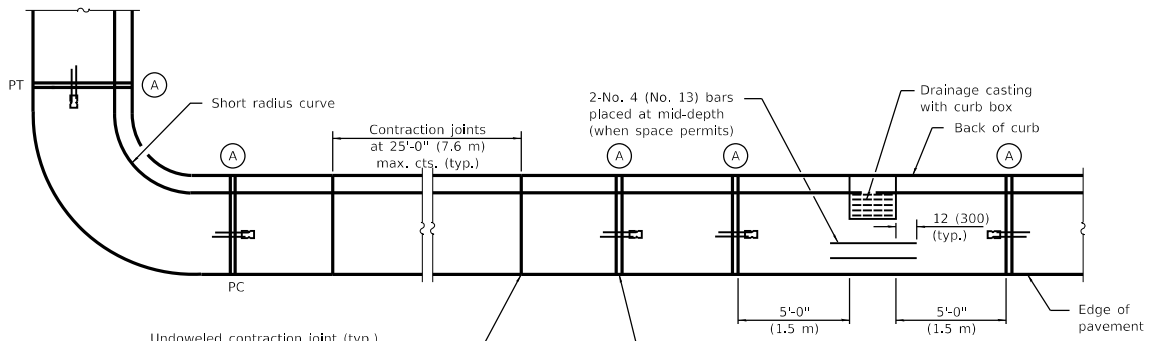
PASSED January 1, 2018

Michael Beard
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2018

Maureen M. Bello
ENGINEER OF DESIGN AND ENVIRONMENT

461-C 03/15/11

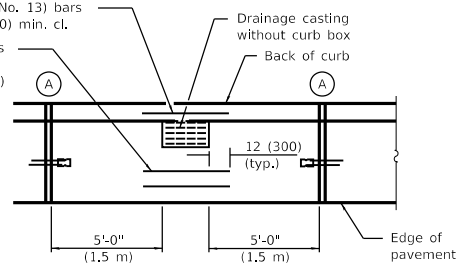


Undoweled contraction joint (typ.) construction options:

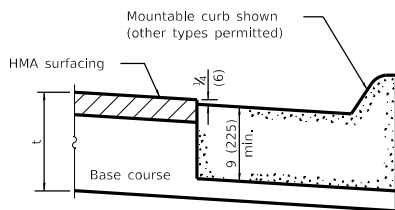
1. Form with $\frac{3}{8}$ (3) thick steel template 2 (50) deep, and seal.
2. Saw 2 (50) deep at 4 to 24 hours, and seal.
3. Insert $\frac{3}{4}$ (20) thick preformed joint filler full depth and width.

Construction joint
2-No. 4 (No. 13) bars with 2 (50) min. cl.

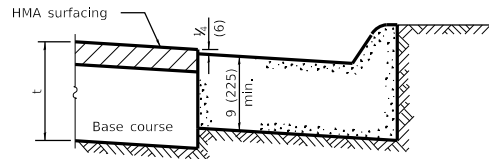
2-No. 4 (No. 13) bars placed at mid-depth (when space permits)



PLAN

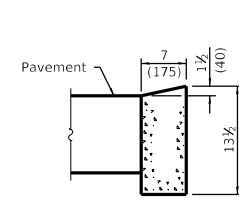


ON DISTURBED SUBGRADE

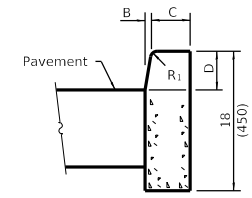


ON UNDISTURBED SUBGRADE

ADJACENT TO FLEXIBLE PAVEMENT

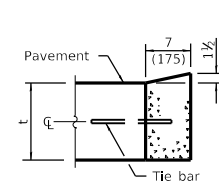


DEPRESSED CURB

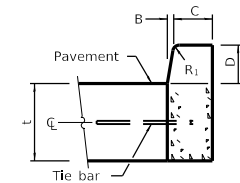


BARRIER CURB

ADJACENT TO FLEXIBLE PAVEMENT



DEPRESSED CURB



BARRIER CURB

ADJACENT TO PCC PAVEMENT OR PCC BASE COURSE

CONCRETE CURB TYPE B

**CONCRETE CURB TYPE B
AND COMBINATION
CONCRETE CURB AND GUTTER**
(Sheet 2 of 2)

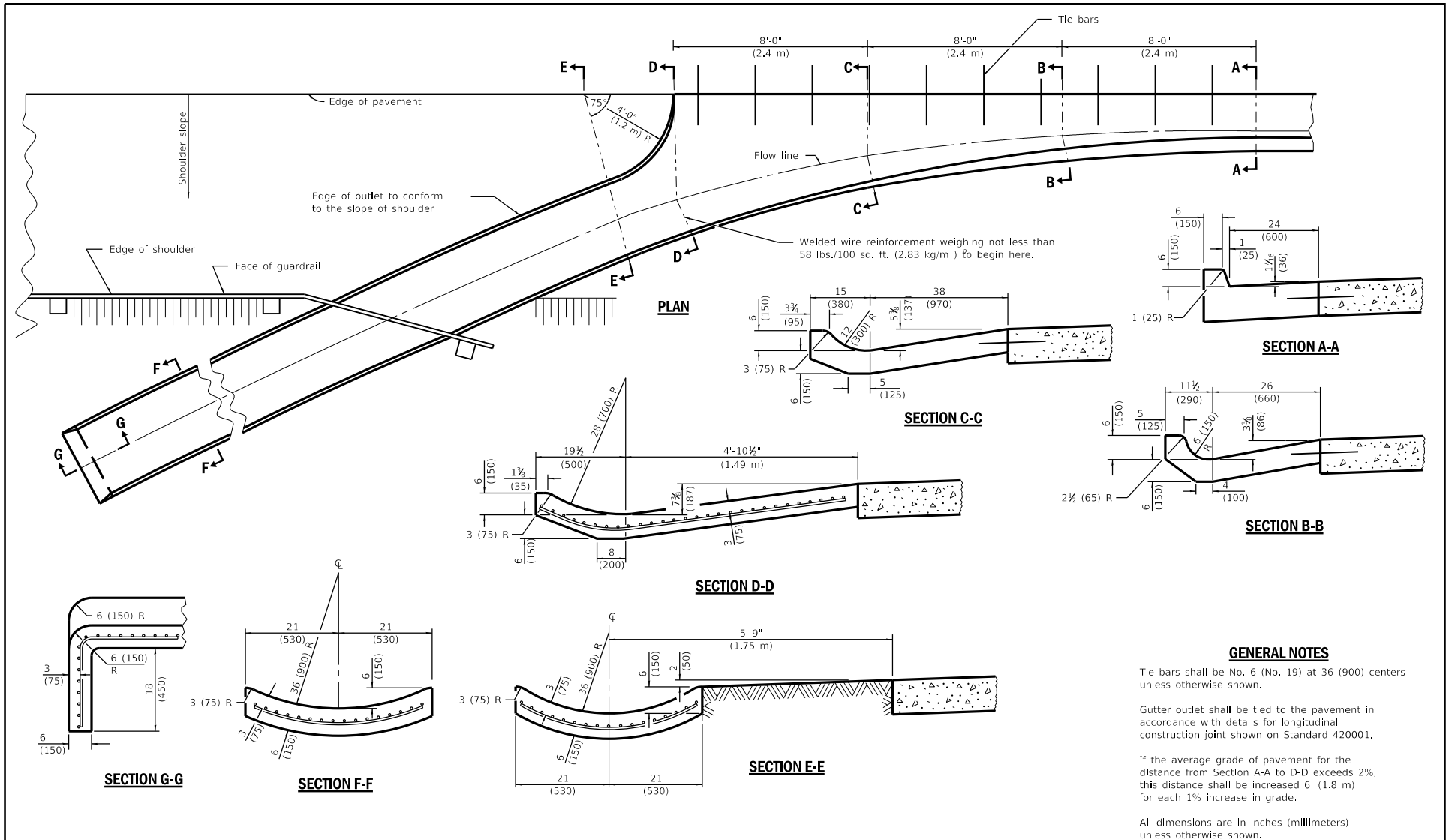
STANDARD 606001-07

Illinois Department of Transportation

PASSED January 1, 2018
Michael Beard
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2018
Maureen M. O'Brien
ENGINEER OF DESIGN AND ENVIRONMENT

LEG-1 03/15/11



GENERAL NOTES

Tie bars shall be No. 6 (No. 19) at 36 (900) centers unless otherwise shown.

Gutter outlet shall be tied to the pavement in accordance with details for longitudinal construction joint shown on Standard 420001.

If the average grade of pavement for the distance from Section A-A to D-D exceeds 2%, this distance shall be increased 6' (1.8 m) for each 1% increase in grade.

All dimensions are in inches (millimeters) unless otherwise shown.

QUANTITIES

For Section A-A to E-E and curtain wall =
 2.38 cu. yds. (1.82 m³) concrete for 9 (225) pav't.
 2.41 cu. yds. (1.84 m³) concrete for 10 (250) pav't.

For Section F-F =
 0.069 cu. yds. (0.17 m³) concrete per ft. (m)

STANDARD OUTLET

DATE	REVISIONS
1-1-18	Revised General Notes for tie bar spacing to 36 (900) cts.
4-1-16	Changed terminology to 'welded wire reinforcement'.

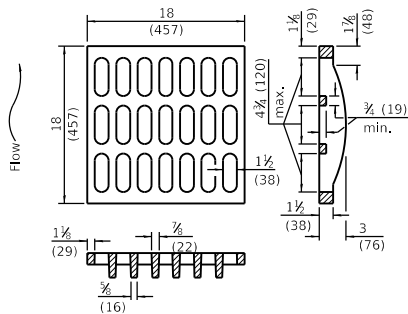
OUTLETS FOR CONCRETE CURB AND GUTTER TYPE B-6.24 (B-15.60)
 (Sheet 1 of 2)
STANDARD 606006-04

Illinois Department of Transportation

PASSED January 1, 2018
Michael Beard
 ENGINEER OF POLICY AND PROCEDURES

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Maureen M. Behr
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464-C 03/15/11

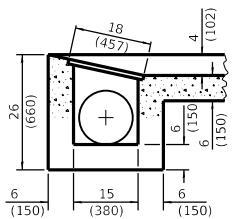


GRATE TYPE A

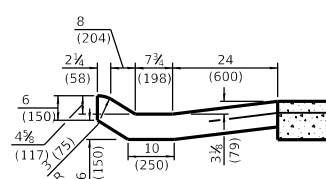
QUANTITIES

1.98 cu. yds. (1.51 m³) concrete for 9 (225) pav't.

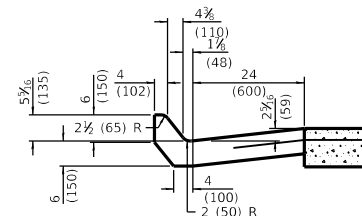
2.01 cu. yds. (1.54 m³) concrete for 10 (250) pav't.



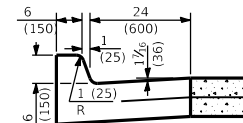
SECTION E-E



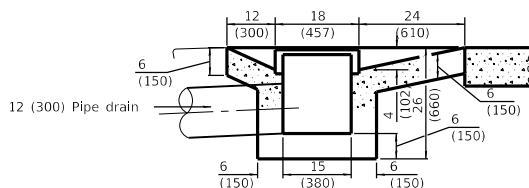
SECTION C-C



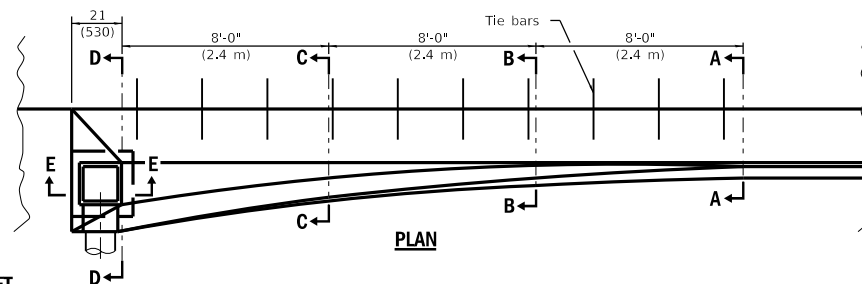
SECTION B-B



SECTION A-A

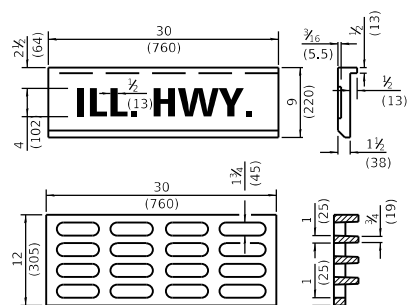


SECTION D-D

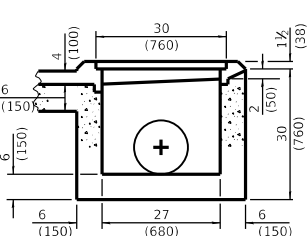


PLAN

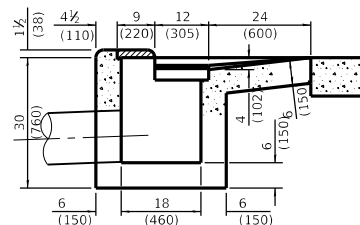
TYPE 1 OUTLET



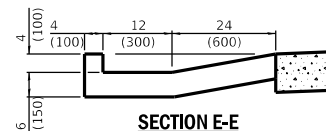
GRATE AND COVER TYPE 2B



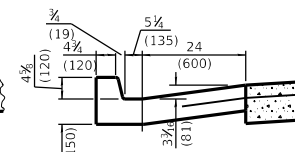
SECTION F-F



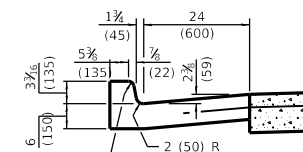
SECTION D-D



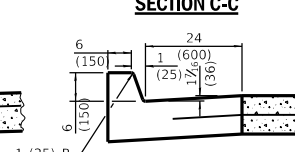
SECTION E-E



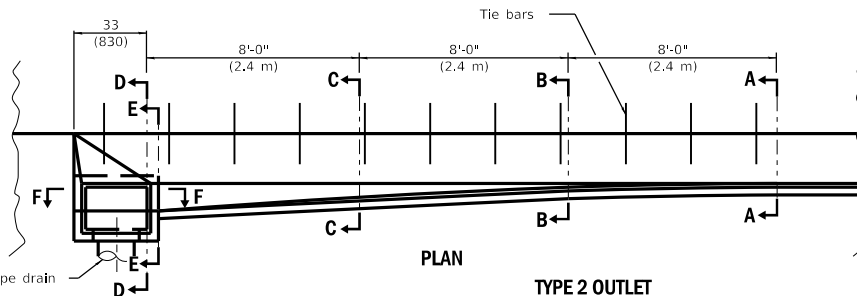
SECTION C-C



SECTION B-B



SECTION A-A



PLAN

TYPE 2 OUTLET

QUANTITIES

2.07 cu. yds. (1.58 m³) concrete for 9 (225) pav't.

2.07 cu. yds. (1.60 m³) concrete for 10 (250) pav't.

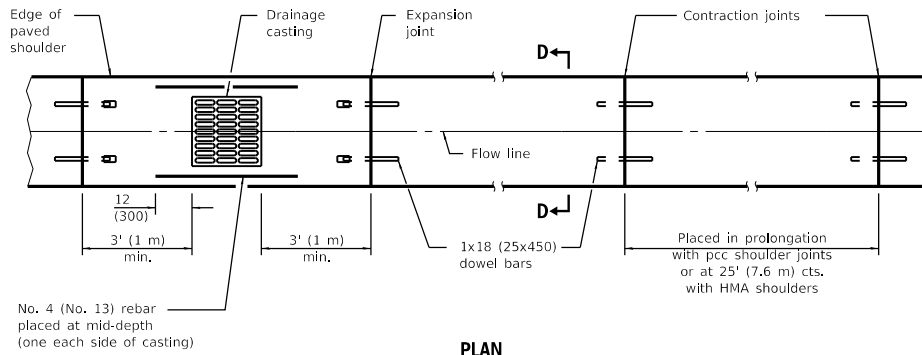
All dimensions are in inches (millimeters) unless otherwise shown.

OUTLETS FOR CONCRETE CURB AND GUTTER TYPE B-6.24 (B-15.60)

(Sheet 2 of 2)

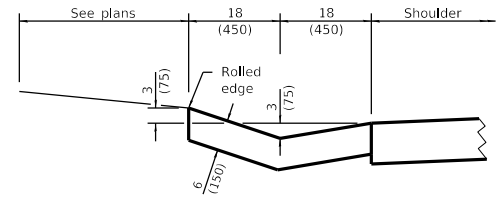
STANDARD 606006-04

Illinois Department of Transportation
 PASSED January 1, 2018
 Michael Beard
 ENGINEER OF POLICY AND PROCEDURES
 APPROVED January 1, 2018
 Maureen M. O'Brien
 ENGINEER OF DESIGN AND ENVIRONMENT

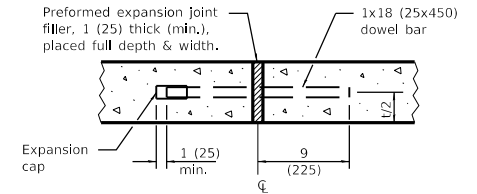


PLAN

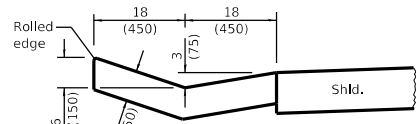
TYPE A GUTTER



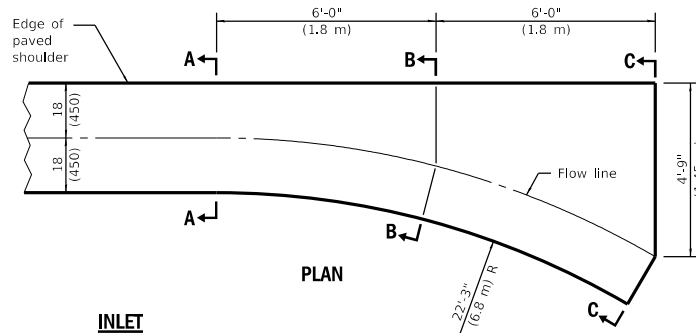
SECTION D-D



EXPANSION JOINT

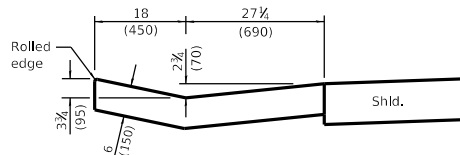


SECTION A-A

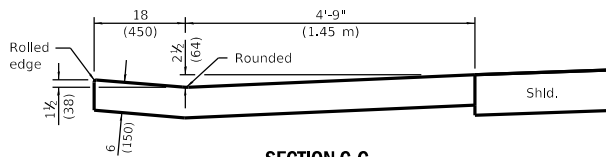


INLET

QUANTITY OF CONCRETE
Section A-A to C-C
0.93 cu. yd. (0.71 m³)



SECTION B-B



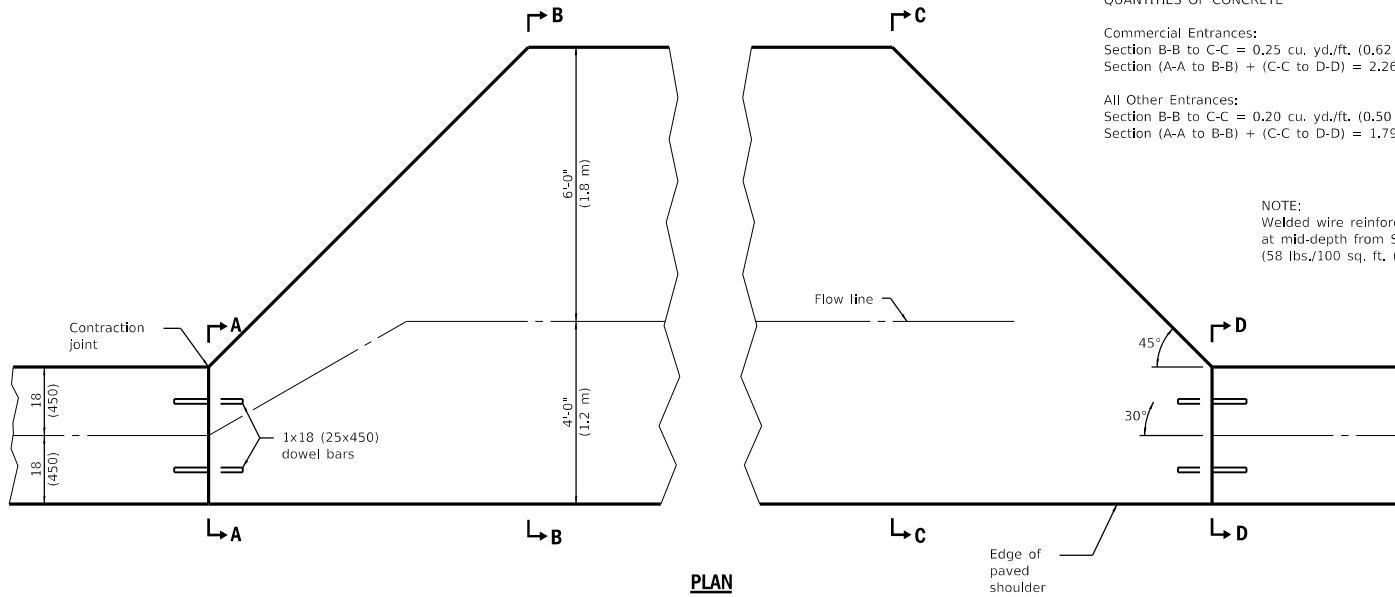
SECTION C-C

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation	
PASSED	April 1, 2016
Michael Beard ENGINEER OF POLICY AND PROCEDURES	
APPROVED	April 1, 2016
 ENGINEER OF DESIGN AND ENVIRONMENT	

DATE	REVISIONS
4-1-16	Changed terminology to 'welded wire reinforcement'.
1-1-09	Switched units to English (metric). Changed radii, adjusted qty's.

TYPE A GUTTER
(INLET, OUTLET & ENTRANCE)
(Sheet 1 of 3)
STANDARD 606101-05



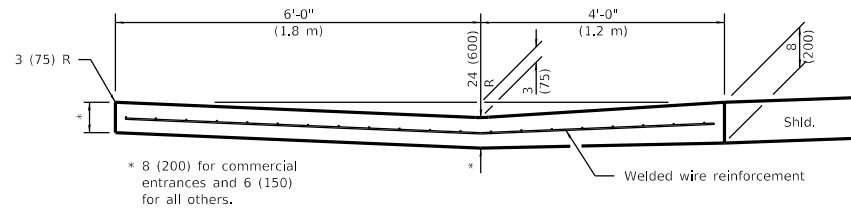
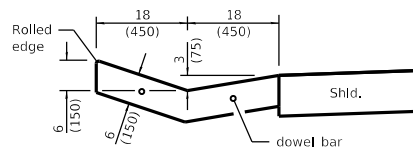
QUANTITIES OF CONCRETE

Commercial Entrances:
 Section B-B to C-C = 0.25 cu. yd./ft. (0.62 m³/m).
 Section (A-A to B-B) + (C-C to D-D) = 2.26 cu. yd. (1.73 m³).

All Other Entrances:
 Section B-B to C-C = 0.20 cu. yd./ft. (0.50 m³/m).
 Section (A-A to B-B) + (C-C to D-D) = 1.79 cu. yd. (1.37 m³).

NOTE:
 Welded wire reinforcement shall be installed at mid-depth from Section A-A to D-D. (58 lbs./100 sq. ft. (2.83 kg/m²))

ENTRANCE



Illinois Department of Transportation

PASSED April 1, 2016

ENGINEER OF POLICY AND PROCEDURES

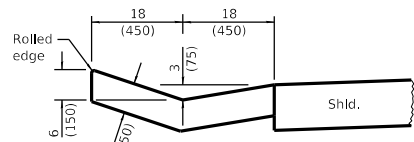
APPROVED April 1, 2016

ENGINEER OF DESIGN AND ENVIRONMENT

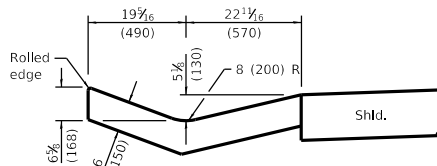
TYPE A GUTTER
(INLET, OUTLET & ENTRANCE)

(Sheet 2 of 3)

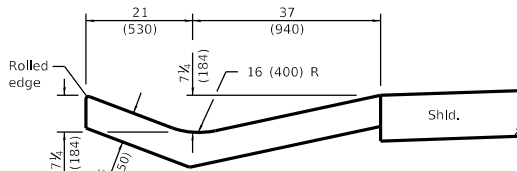
STANDARD 606101-05



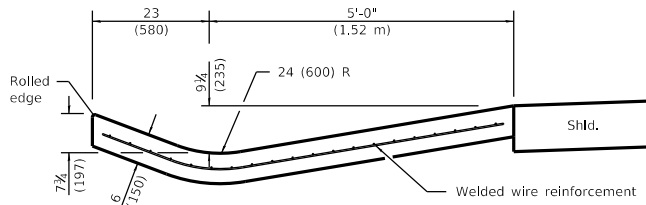
SECTION A-A



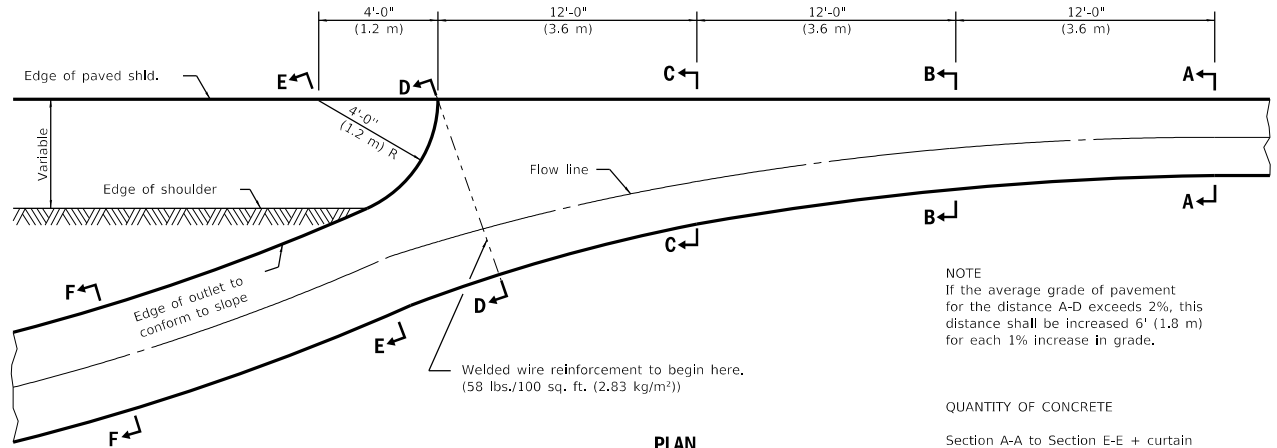
SECTION B-B



SECTION C-C



SECTION D-D



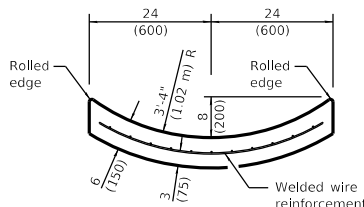
OUTLET

PLAN

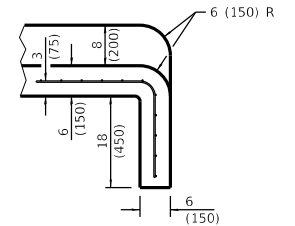
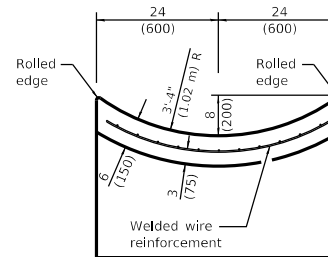
NOTE
If the average grade of pavement for the distance A-D exceeds 2%, this distance shall be increased 6' (1.8 m) for each 1% increase in grade.

QUANTITY OF CONCRETE

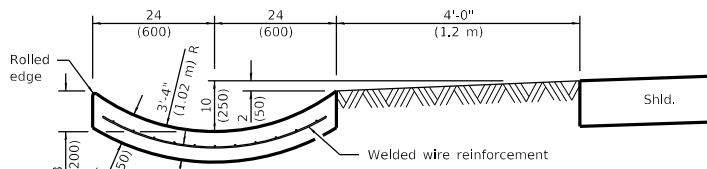
Section A-A to Section E-E + curtain wall = 3.53 cu. yd. (2.70 m³) of concrete.
Section F-F = 0.079 cu. yd./ft. (0.2 m³/m).



SECTION F-F



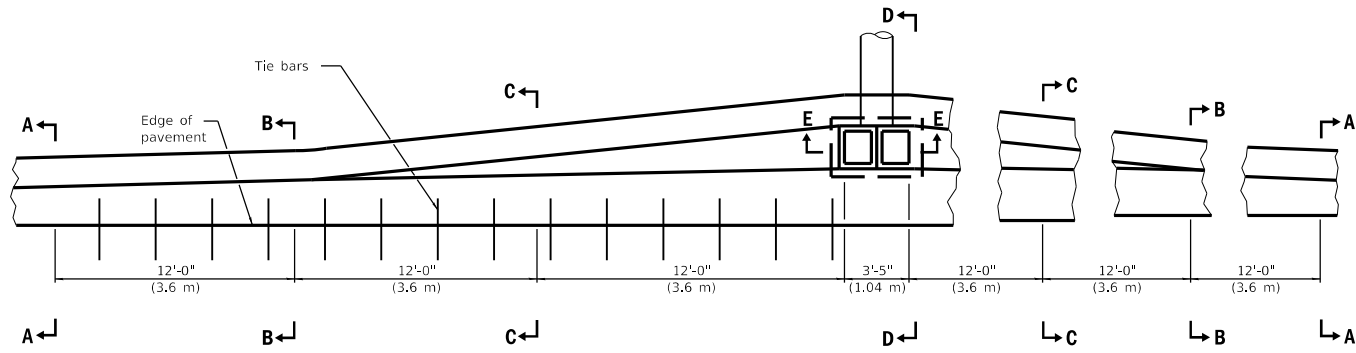
SECTIONS AT END OF OUTLET



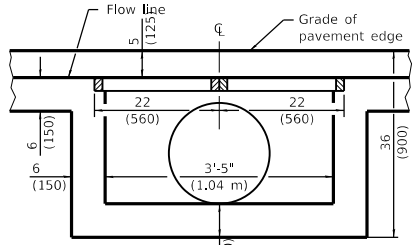
SECTION E-E

Illinois Department of Transportation
PASSED April 1, 2016
Michael Beard
ENGINEER OF POLICY AND PROCEDURES
APPROVED April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

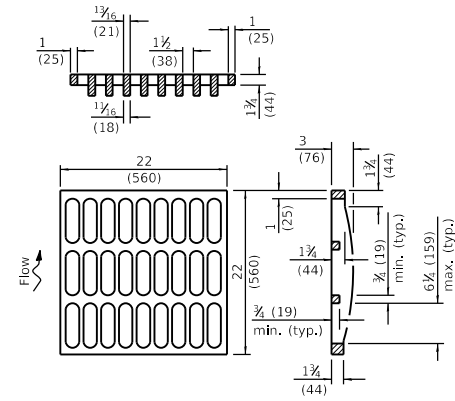
**TYPE A GUTTER
(INLET, OUTLET & ENTRANCE)**
(Sheet 3 of 3)
STANDARD 606101-05



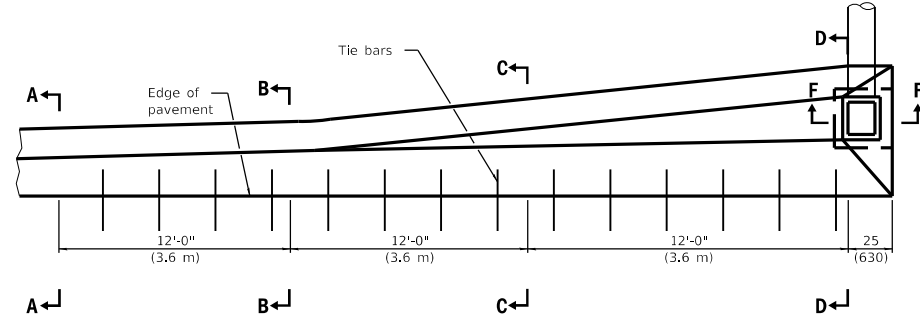
PLAN-DOUBLE OUTLET



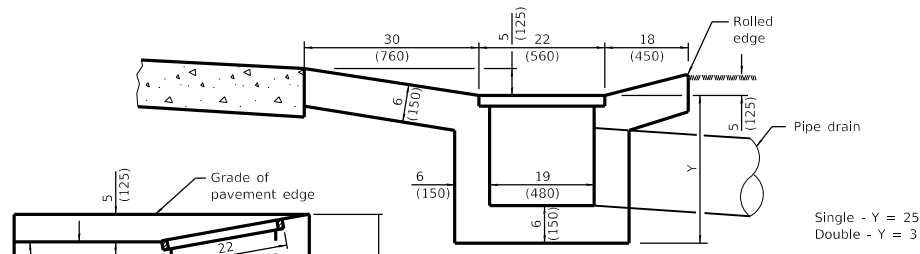
SECTION E-E



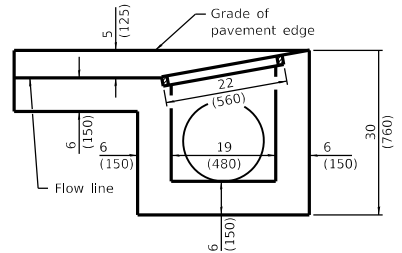
GRATE TYPE A



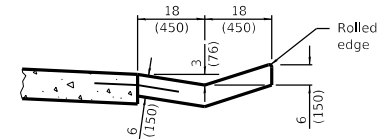
PLAN-SINGLE OUTLET



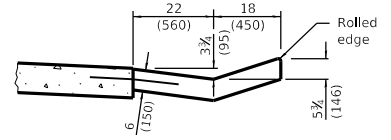
SECTION D-D



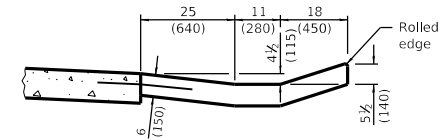
SECTION F-F



SECTION A-A



SECTION B-B



SECTION C-C

QUANTITIES

Material	Single	Double
Concrete - cu. yd. (m ³)	3.3 (2.5)	6.5 (5)
Cast Iron Grate - Ea.	1	2
Pipe Drain - Dia. in. (mm)	15 (375)	18 (450)

GENERAL NOTES

The gutter outlet shall be tied to the pavement in accordance with details for longitudinal construction joint shown on Standard 420001.

Tie bars shall be No. 6 (No. 19) at 36 (900) centers unless otherwise shown.

If the average grade of pavement for the distance A-D exceeds 2%, this distance shall be increased 6' (1.8 m) for each 1% increase in grade.

All dimensions are in inches (millimeters) unless otherwise shown.

Single - Y = 25 (635)
Double - Y = 31 (775)

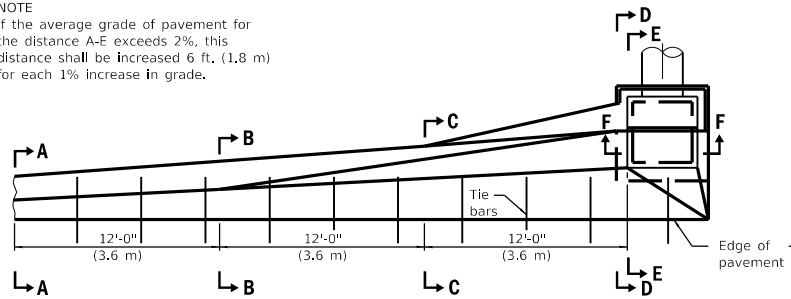
Illinois Department of Transportation
 PASSED January 1, 2018
 Michael Beard
 ENGINEER OF POLICY AND PROCEDURES
 APPROVED January 1, 2018
 Maureen M. Bello
 ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-18	Revised General Notes for tile bar spacing of 36 (900) cts.
1-1-09	Switched units to English (metric).

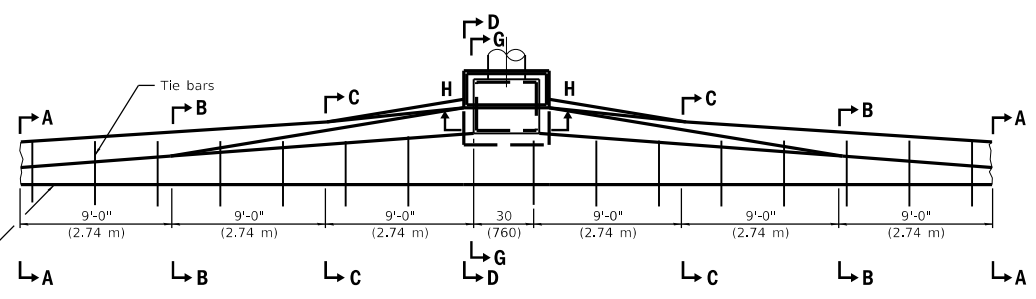
OUTLET TYPE 1 FOR TYPE A GUTTER

STANDARD 606106-05

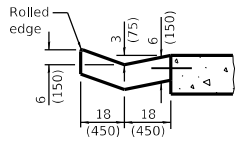
NOTE
 If the average grade of pavement for the distance A-E exceeds 2%, this distance shall be increased 6 ft. (1.8 m) for each 1% increase in grade.



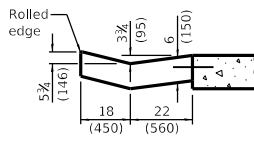
PLAN - SINGLE OUTLET



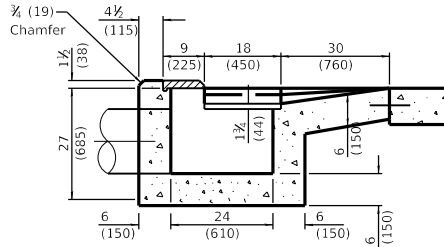
PLAN - DOUBLE OUTLET



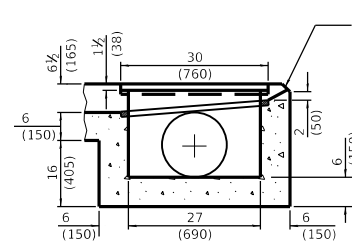
SECTION A-A



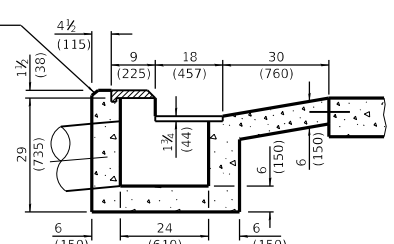
SECTION B-B



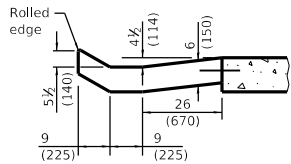
SECTION E-E



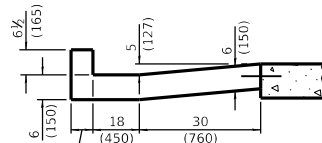
SECTION F-F



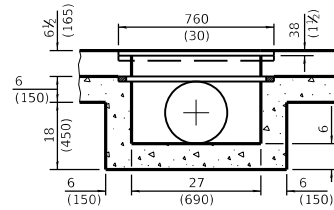
SECTION G-G



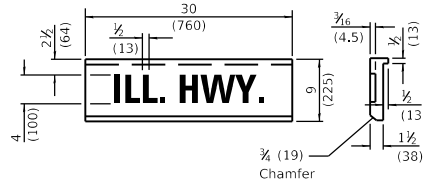
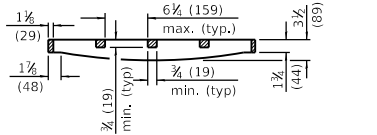
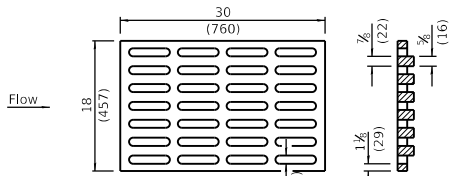
SECTION C-C



SECTION D-D



SECTION H-H



GRATE AND COVER TYPE 2A

QUANTITIES

Material	Single	Double
Concrete - cu. yd. (m ³)	3.07 (2.35)	4.33 (3.31)
Cast Iron Grate - Ea.	1	1
Cast Iron Cover - Ea.	1	1
Pipe Drain - Dia. in. (mm)	15 (375)	18 (450)

GENERAL NOTES

The gutter outlet shall be tied to the pavement in accordance with details for longitudinal construction joint shown on Standard 420001.

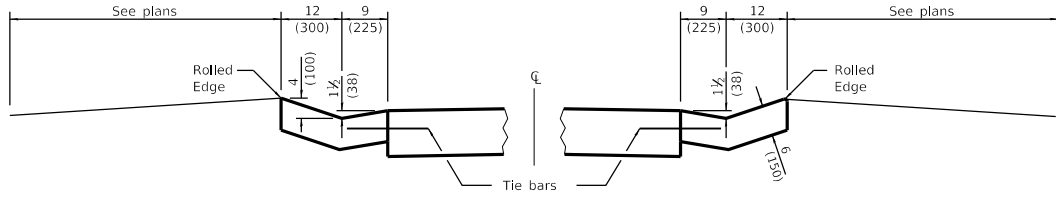
All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation
 PASSED January 1, 2009
 ENGINEER OF POLICY AND PROCEDURES
 APPROVED January 1, 2009
 ENGINEER OF DESIGN AND ENVIRONMENT

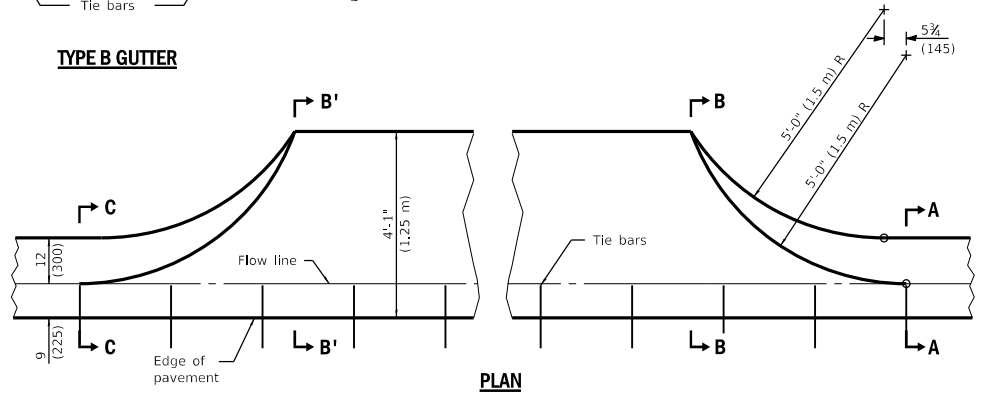
DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-07	Removed weight of grate and cover.

OUTLETS TYPE 2 FOR TYPE A GUTTER

STANDARD 606111-03

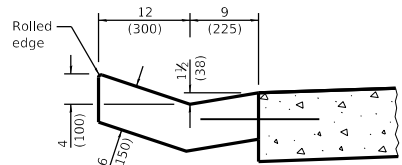


TYPE B GUTTER

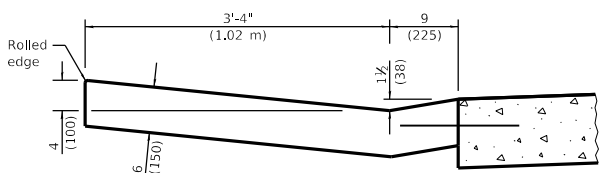


PLAN

QUANTITY OF CONCRETE
 Section B'-B' to B-B = 0.076 cu. yd./ft. (0.19 m³/m)
 Section (C-C to B'-B') + (B-B to A-A) = 0.44 cu. yd. (0.34 m³)



SECTIONS A-A & C-C



SECTIONS B-B & B'-B'

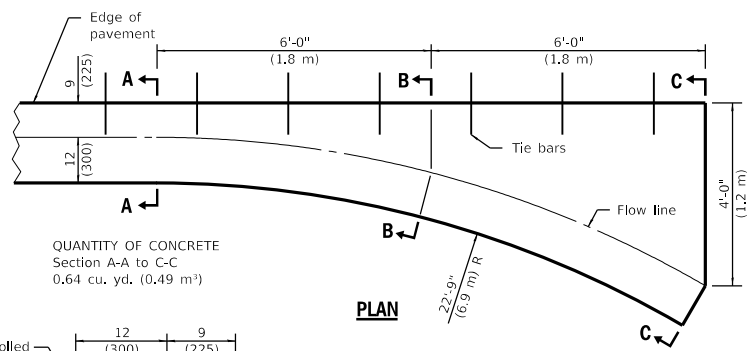
ENTRANCE

GENERAL NOTES

Gutter, gutter Inlet, gutter outlet and gutter entrance shall be tied to the pavement in accordance with details for longitudinal construction joint shown on Standard 420001.

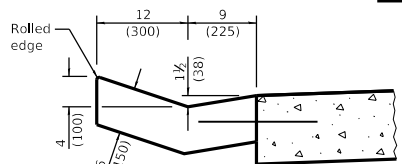
Two 1-1/4 x 18 (32 x 450) dowel bars shall be installed in all joints when the gutter is constructed adjacent to flexible pavement.

All dimensions are in inches (millimeters) unless otherwise shown.

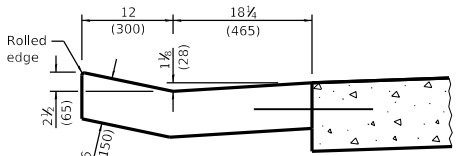


PLAN

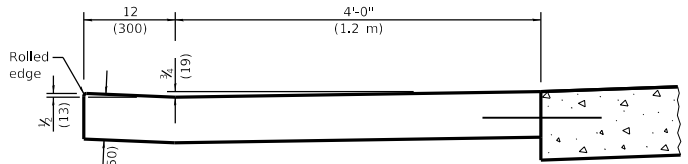
QUANTITY OF CONCRETE
 Section A-A to C-C
 0.64 cu. yd. (0.49 m³)



SECTION A-A



SECTION B-B



SECTION C-C

INLET

Illinois Department of Transportation

PASSED January 1, 2018
Michael Beard
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2018
Maureen M. Behr
 ENGINEER OF DESIGN AND ENVIRONMENT

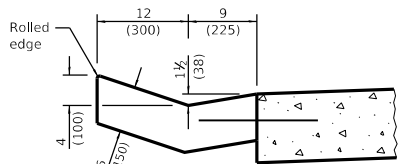
464-C 03/15/12

DATE	REVISIONS
1-1-18	Deleted first General Note to avoid conflict with second General Note.
4-1-16	Changed terminology to 'welded wire reinforcement'.

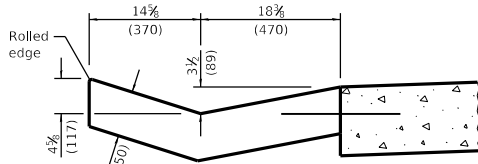
**TYPE B GUTTER
 (INLET, OUTLET & ENTRANCE)**

(Sheet 1 of 2)

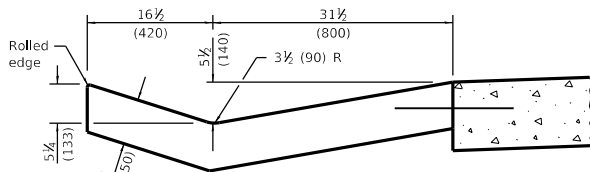
STANDARD 606201-04



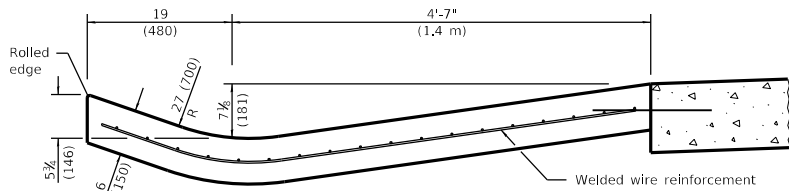
SECTION A-A



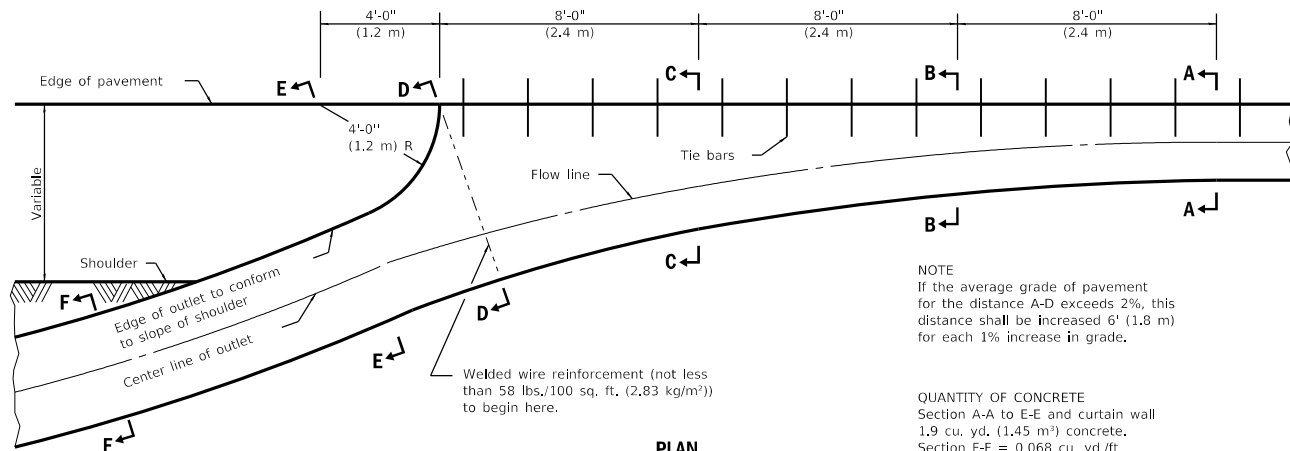
SECTION B-B



SECTION C-C



SECTION D-D

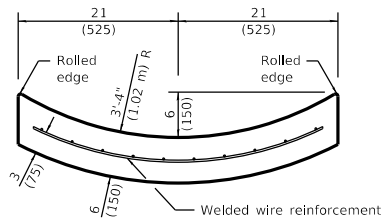


PLAN

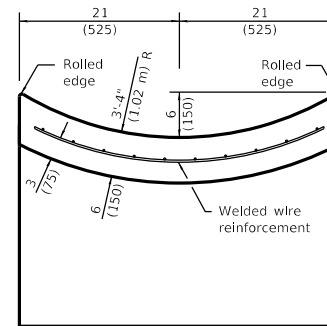
NOTE
If the average grade of pavement for the distance A-D exceeds 2%, this distance shall be increased 6' (1.8 m) for each 1% increase in grade.

QUANTITY OF CONCRETE
Section A-A to E-E and curtain wall 1.9 cu. yd. (1.45 m³) concrete.
Section F-F = 0.068 cu. yd./ft. (0.17 m³/m).

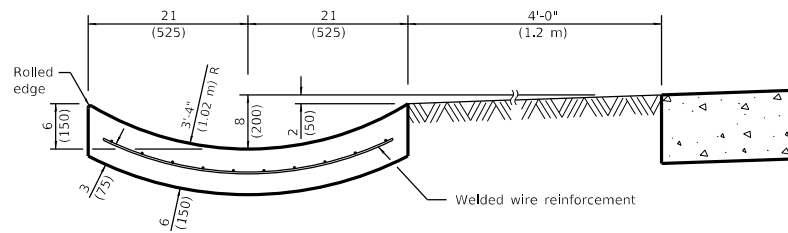
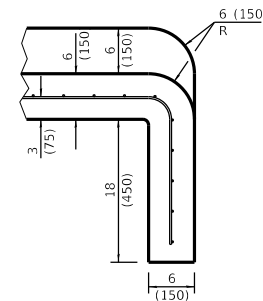
OUTLET



SECTION F-F



SECTIONS AT END OF OUTLET



SECTION E-E

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PASSED January 1, 2018
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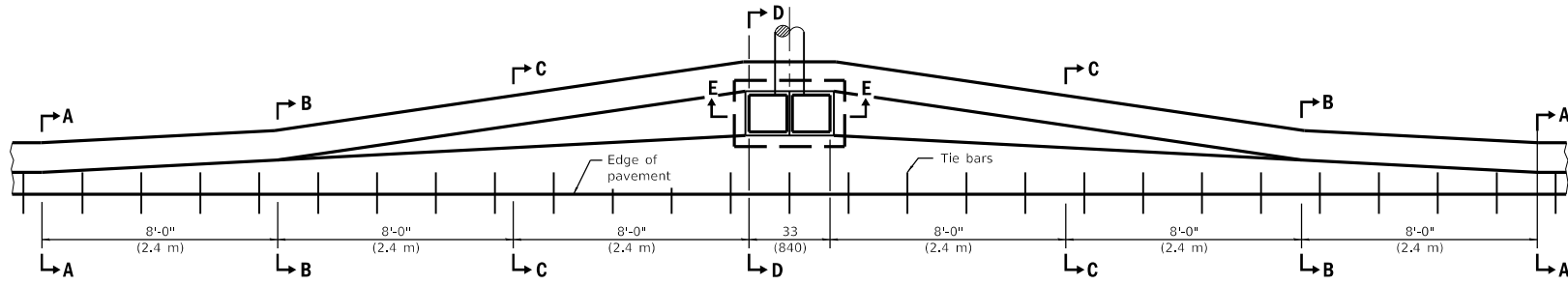
APPROVED January 1, 2018
Maureen M. Bales
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LEG-11 03/15/11

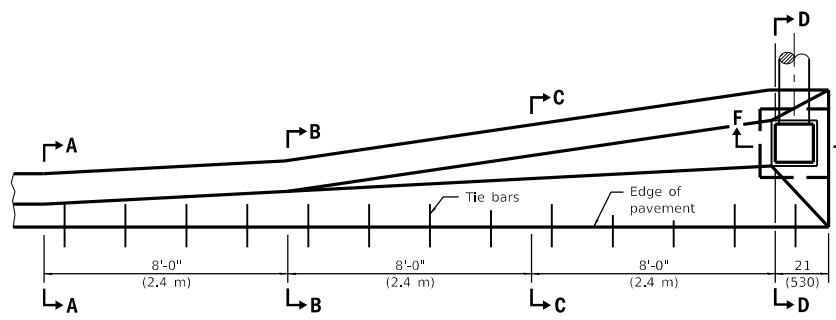
TYPE B GUTTER
(INLET, OUTLET & ENTRANCE)

(Sheet 2 of 2)

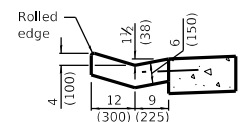
STANDARD 606201-04



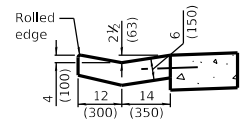
PLAN - DOUBLE OUTLET



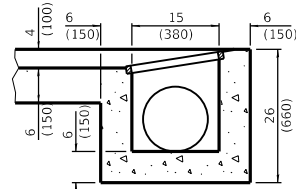
PLAN - SINGLE OUTLET



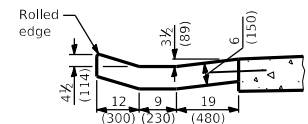
SECTION A-A



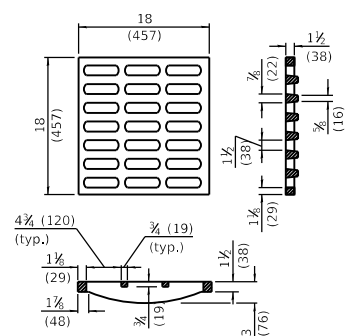
SECTION B-B



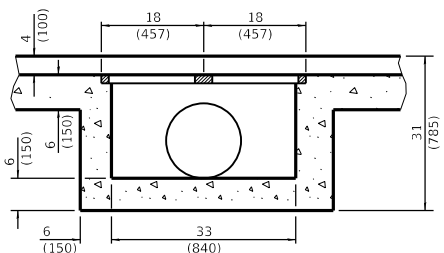
SECTION F-F



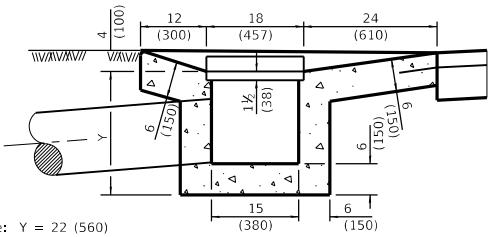
SECTION C-C



GRATE TYPE B



SECTION E-E



SECTION D-D

Single: Y = 22 (560)
Double: Y = 27 (685)

QUANTITIES

Material	Single	Double
Concrete - cu. yd. (m ³)	1.7 (1.3)	3.1 (2.4)
Cast Iron Grate - Ea.	1	2
Pipe Drain - Dia. in (mm)	12 (300)	15 (375)

GENERAL NOTES

The gutter outlet shall be tied to the pavement in accordance with details for longitudinal construction joint shown on Standard 420001.

If the average grade of the pavement for the distance A-D exceeds 2%, this distance shall be increased 6'-0" (1.8 m) for each 1% increase in grade.

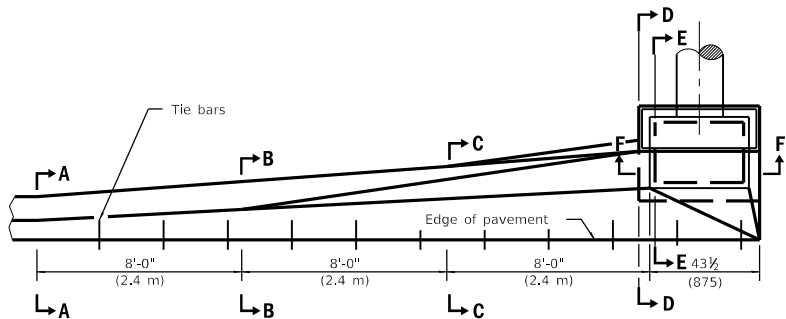
All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-18	Deleted second General Note to avoid conflict with first General Note.
1-1-09	Switched units to English (metric).

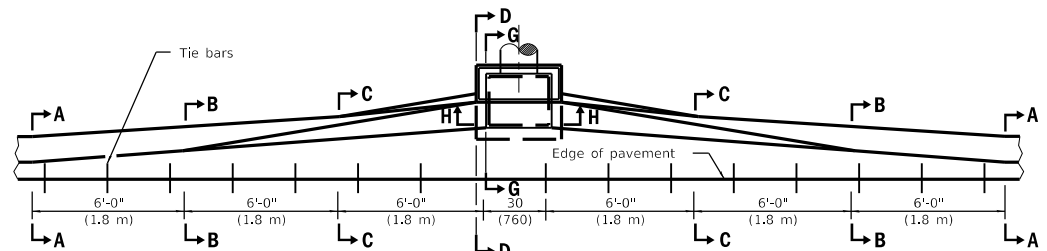
OUTLET TYPE 1 FOR TYPE B GUTTER

STANDARD 606206-04

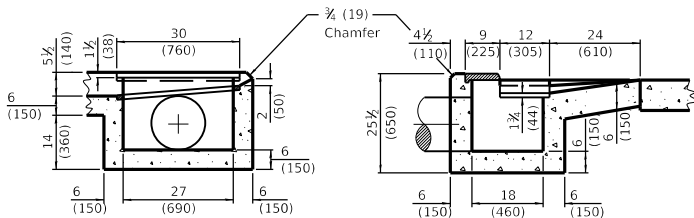
Illinois Department of Transportation
 PASSED January 1, 2018
 Michael Beard
 ENGINEER OF POLICY AND PROCEDURES
 APPROVED January 1, 2018
 Maureen M. Bello
 ENGINEER OF DESIGN AND ENVIRONMENT



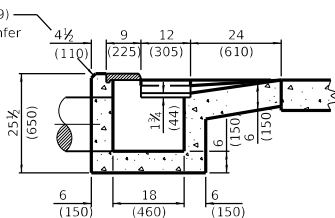
PLAN - SINGLE OUTLET



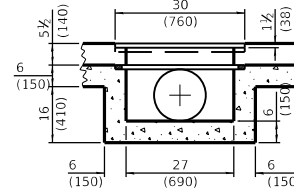
PLAN - DOUBLE OUTLET



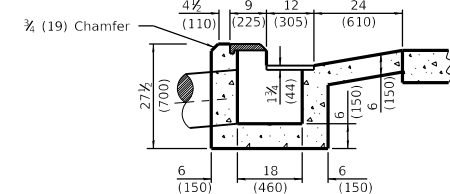
SECTION F-F



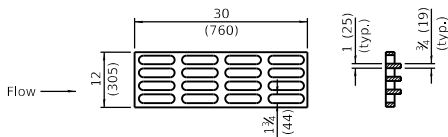
SECTION E-E



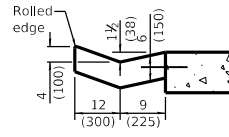
SECTION H-H



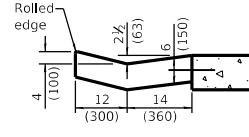
SECTION G-G



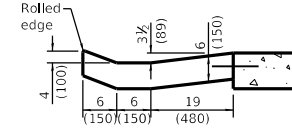
SECTION A-A



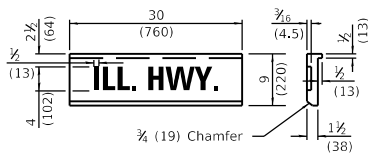
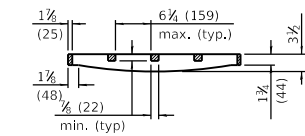
SECTION B-B



SECTION C-C



SECTION D-D



GRATE AND COVER TYPE 2B

QUANTITIES

Material	Single	Double
Concrete - cu. yd. (m ³)	1.62 (1.24)	2.18 (1.67)
Cast Iron Grate - Ea.	1	1
Cast Iron Cover - Ea.	1	1
Pipe Drain - Dia. in. (mm)	12 (300)	15 (375)

GENERAL NOTES

If the average grade of pavement for the distance A-E exceeds 2 percent, this distance shall be increased 6 ft. (1.8 m) for each 1 percent increase in grade.

The gutter outlet shall be tied to the pavement in accordance with details for longitudinal construction joint shown on Standard 420001.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-18	Revised tie bar notes to be consistent with other gutter Highway Standards.
1-1-09	Switched units to English (metric).

OUTLETS TYPE 2 FOR TYPE B GUTTER

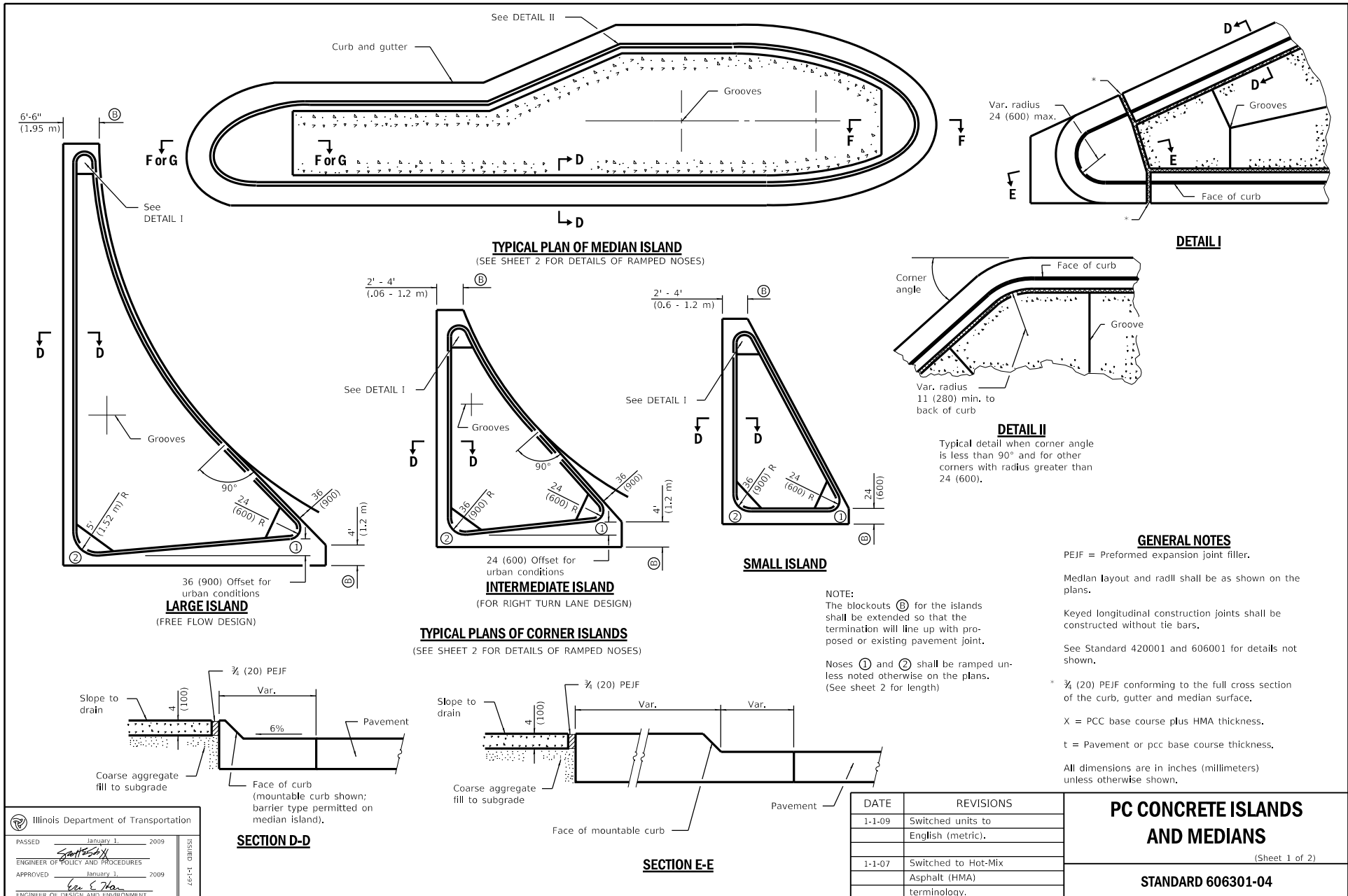
STANDARD 606211-04

Illinois Department of Transportation

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Michael Beard
 ENGINEER OF POLICY AND PROCEDURES

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Maureen M. Behr
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LEF-C1 03/15/11



Illinois Department of Transportation

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ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009

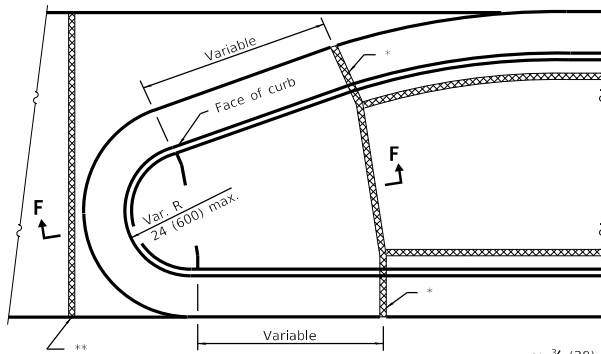
ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-07	Switched to Hot-Mix Asphalt (HMA) terminology.

PC CONCRETE ISLANDS AND MEDIANS

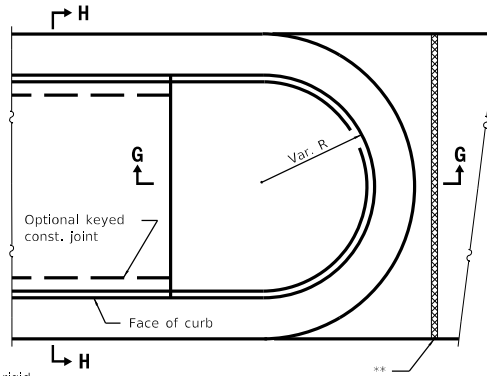
(Sheet 1 of 2)

STANDARD 606301-04



TYPE P MEDIAN SURFACE

** 3/4" (20) PEIF between rigid pavement and median end. Align with joint in adjacent pavement.



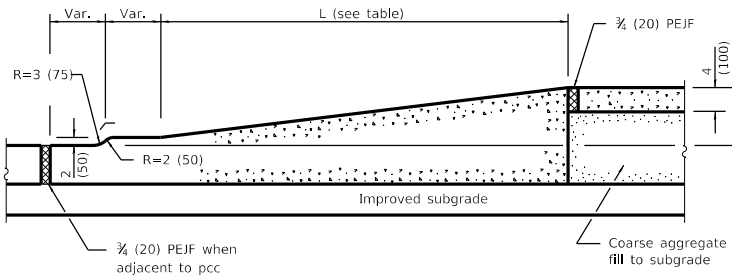
SOLID MEDIAN

TABLE OF DIMENSIONS					
TYPE SB MEDIANS					
TYPE	A	B	C	D	R ₁
SB-6.06	6	1	6	6	1
(SB-15.15)	(150)	(25)	(150)	(150)	(25)
SB-6.12	12	1	6	6	1
(SB-15.30)	(300)	(25)	(150)	(150)	(25)
SB-6.18	18	1	6	6	1
(SB-15.45)	(450)	(25)	(150)	(150)	(25)
SB-6.24	24	1	6	6	1
(SB-15.60)	(600)	(25)	(150)	(150)	(25)
SB-9.06	6	2	5	9	1
(SB-22.15)	(150)	(50)	(125)	(225)	(25)
SB-9.12	12	2	5	9	1
(SB-22.30)	(300)	(50)	(125)	(225)	(25)
SB-9.18	18	2	5	9	1
(SB-22.45)	(450)	(50)	(125)	(225)	(25)
SB-9.24	24	2	5	9	1
(SB-22.60)	(600)	(50)	(125)	(225)	(25)

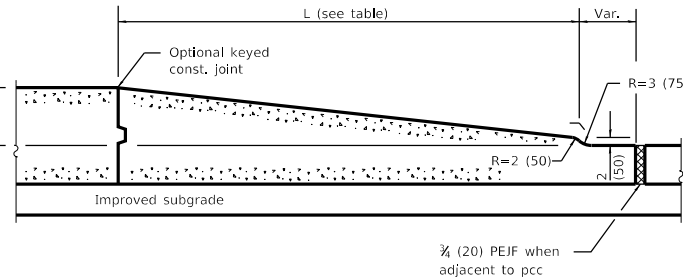
TABLE OF DIMENSIONS					
TYPE M AND SM MEDIANS					
TYPE	A	B	C	D	R ₁
M-2.06	6	2	4	2	2
(M-5.15)	(150)	(50)	(100)	(50)	(50)
M-2.12	12	2	4	2	2
(M-5.30)	(300)	(50)	(100)	(50)	(50)
SM-4.06	6	4	3	4	3
(SM-10.15)	(150)	(100)	(75)	(100)	(75)
SM-4.12	12	4	3	4	3
(SM-10.30)	(300)	(100)	(75)	(100)	(75)
SM-4.18	18	4	3	4	3
(SM-10.45)	(450)	(100)	(75)	(100)	(75)
SM-4.24	24	4	3	4	3
(SM-10.60)	(600)	(100)	(75)	(100)	(75)
SM-6.06	6	6	2	6	2
(SM-15.15)	(150)	(150)	(50)	(150)	(50)
SM-6.12	12	6	2	6	2
(SM-15.30)	(300)	(150)	(50)	(150)	(50)
SM-6.18	18	6	2	6	2
(SM-15.45)	(450)	(150)	(50)	(150)	(50)
SM-6.24	24	6	2	6	2
(SM-15.60)	(600)	(150)	(50)	(150)	(50)

PLAN

(RAMPED NOSES)



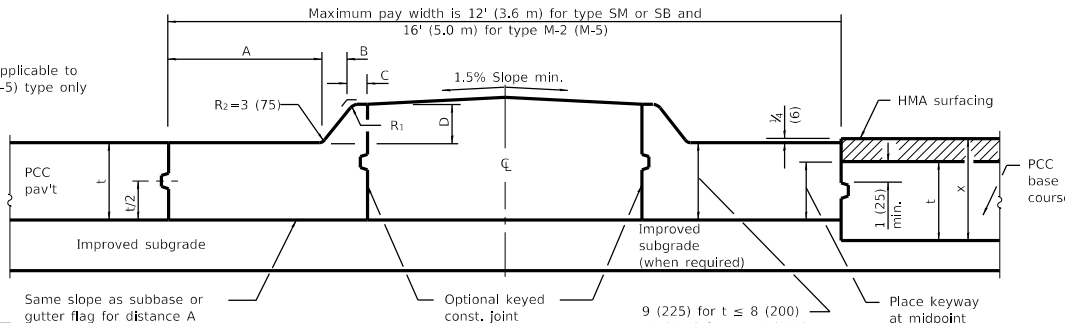
SECTION F-F



SECTION G-G

TABLE OF RAMPED NOSE LENGTHS	
TYPE OF NOSE	L
Median	6' (1.8 m)
Small Island	24 (600)
Intermediate Island	4' (1.2 m)
Large Island	6' (1.8 m)

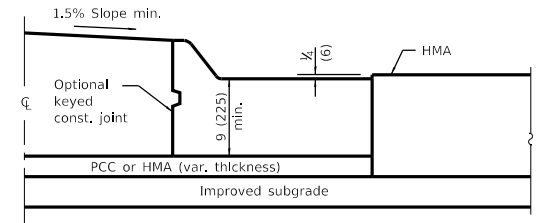
NOTE
R₂ is applicable to M-2 (M-5) type only



HALF SECTION FOR PCC PAVEMENT

HALF SECTION FOR PCC BASE COURSE

SECTION H-H
(TYPE SM, SB & M-5 (M-2) MEDIANS)



HALF SECTION FOR FLEXIBLE PAVEMENT

Illinois Department of Transportation

PASSED January 1, 2009

ENGINEER OF POLICY AND PROCEDURES

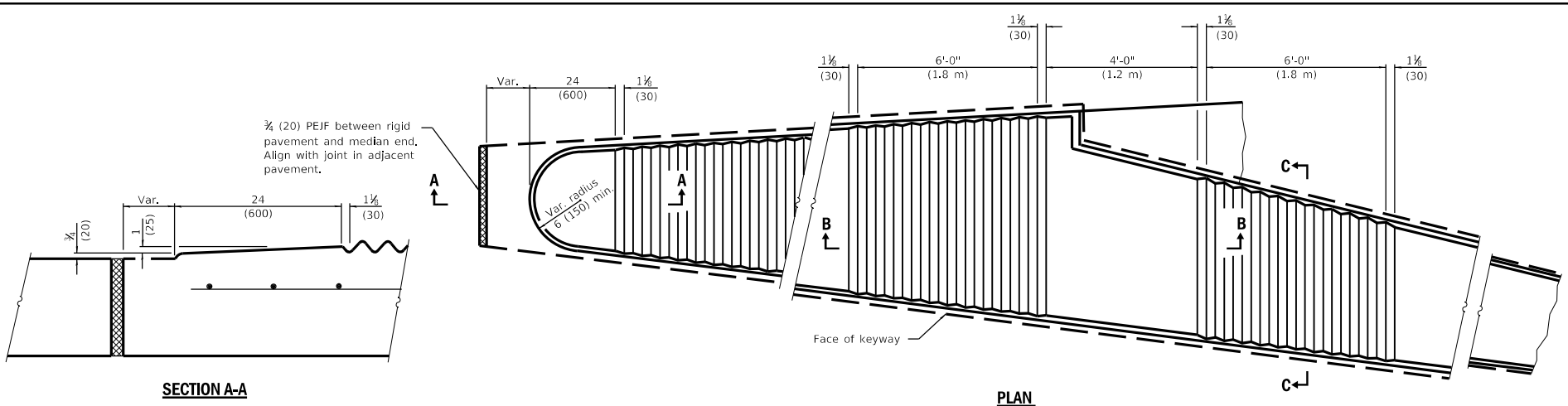
APPROVED January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

PC CONCRETE ISLANDS AND MEDIANS

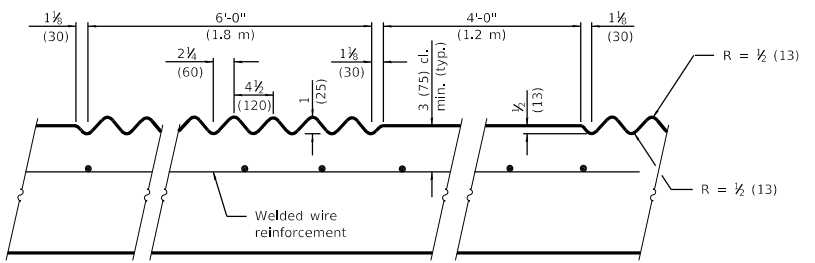
(Sheet 2 of 2)

STANDARD 606301-04

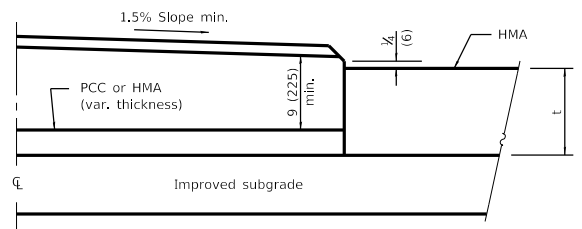


SECTION A-A

PLAN

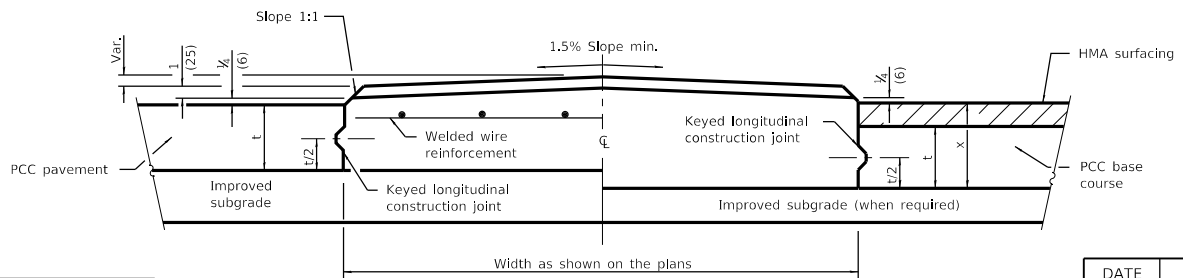


SECTION B-B



HALF SECTION FOR FLEXIBLE PAVEMENT

SECTION C-C



HALF SECTION FOR PCC PAVEMENT

SECTION C-C

HALF SECTION FOR PCC BASE COURSE

GENERAL NOTES

- PEJF = Preformed expansion joint filler.
- Median layout and radii shall be as shown on the plans.
- Keyed longitudinal construction joints shall be constructed without tie bars.
- X = PCC base course plus HMA thickness.
- t = Pavement or pcc base course thickness.
- Welded wire reinforcement required for medians built contiguous to reinforced pcc pavement only.
- See Standards 420001 and 420701 for details not shown.
- All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED April 1, 2016
Michael Beard
 ENGINEER OF POLICY AND PROCEDURES

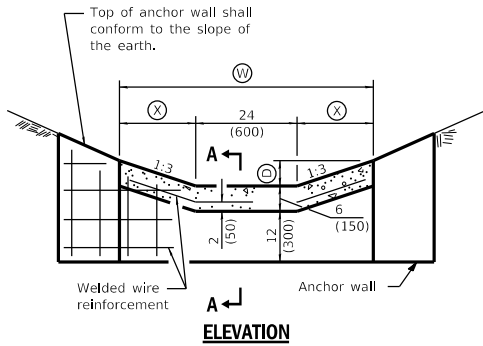
APPROVED April 1, 2016
[Signature]
 ENGINEER OF DESIGN AND ENVIRONMENT

LEP-C1 03/15/11

DATE	REVISIONS
4-1-16	Changed terminology to 'welded wire reinforcement'.
1-1-09	Switched units to English (metric).

CORRUGATED PC CONCRETE MEDIANS

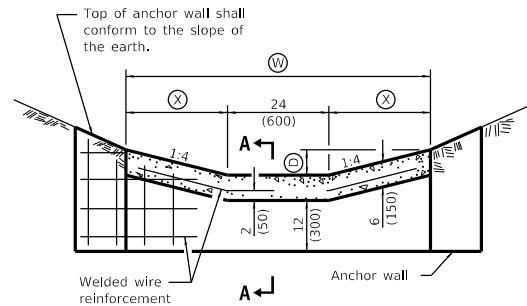
STANDARD 606306-04



ELEVATION

TABLE FOR PAVED DITCH TYPE A

TYPE	(D)	(W)	(X)	Flow Area sq. ft. (m ²)	Conc. Area sq. yd. (m ²)
A-15	6 (150)	5'-0" (1.5 m)	18 (450)	1.75 (0.175)	0.278 (0.225)
A-22	9 (225)	6'-6" (1.95 m)	27 (675)	3.19 (0.287)	0.361 (0.293)
A-30	12 (300)	8'-0" (2.4 m)	36 (900)	5.00 (0.450)	0.444 (0.360)
A-37	15 (375)	9'-6" (2.85 m)	3'-9" (1.12 m)	7.19 (0.645)	0.528 (0.426)
A-45	18 (450)	11'-0" (3.3 m)	4'-6" (1.35 m)	9.75 (0.877)	0.611 (0.495)
A-52	21 (525)	12'-6" (3.75 m)	5'-3" (1.58 m)	12.69 (1.144)	0.694 (0.564)
A-60	24 (600)	14'-0" (4.2 m)	6'-0" (1.8 m)	16.00 (1.440)	0.778 (0.630)

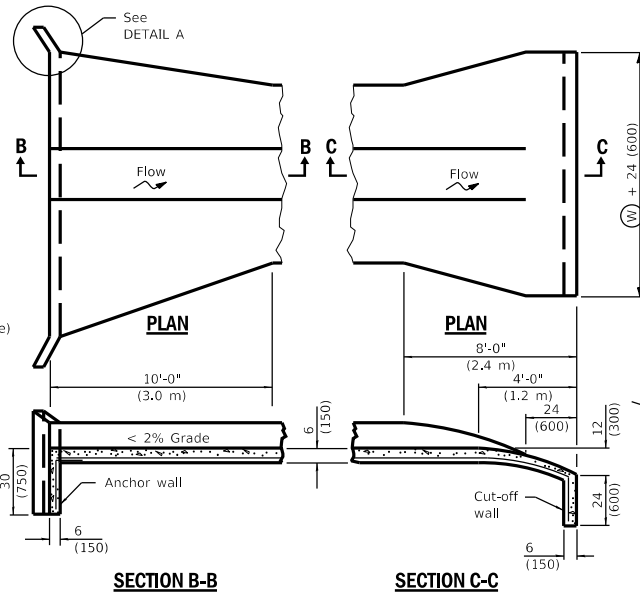


ELEVATION

TABLE FOR PAVED DITCH TYPE B

TYPE	(D)	(W)	(X)	Flow Area sq. ft. (m ²)	Conc. Area sq. yd. (m ²)
B-15	6 (150)	6'-0" (1.8 m)	24 (600)	2.00 (0.180)	0.333 (0.270)
B-22	9 (225)	8'-0" (2.4 m)	36 (900)	3.75 (0.337)	0.444 (0.360)
B-30	12 (300)	10'-0" (3.0 m)	4'-0" (1.2 m)	6.00 (0.540)	0.555 (0.450)
B-37	15 (375)	12'-0" (3.6 m)	5'-0" (1.5 m)	8.75 (0.787)	0.667 (0.540)
B-45	18 (450)	14'-0" (4.2 m)	6'-0" (1.8 m)	12.00 (1.080)	0.778 (0.630)
B-52	21 (525)	16'-0" (4.8 m)	7'-0" (2.1 m)	15.75 (1.417)	0.889 (0.720)
B-60	24 (600)	18'-0" (5.4 m)	8'-0" (2.4 m)	20.00 (1.800)	1.000 (0.810)

PAVED DITCH TYPE A

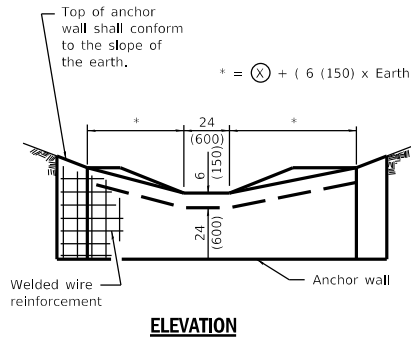


SECTION B-B

SECTION C-C

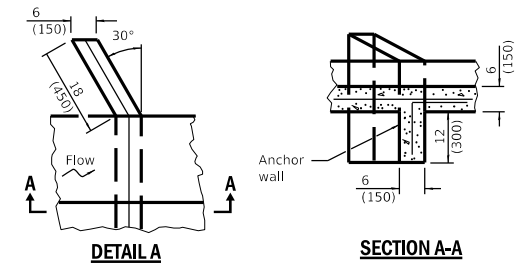
DETAIL OF UPSTREAM END

DETAIL OF DOWNSTREAM END



ELEVATION

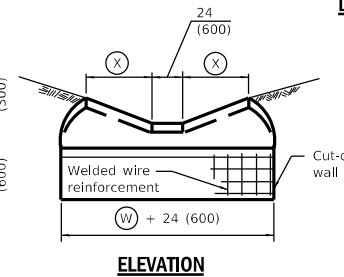
PAVED DITCH TYPE B



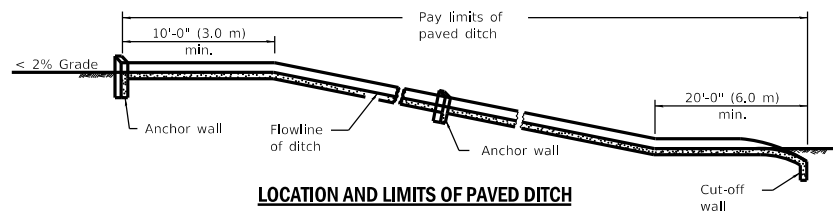
DETAIL A

SECTION A-A

DETAIL OF ANCHOR WALL



ELEVATION



LOCATION AND LIMITS OF PAVED DITCH

GENERAL NOTES

All slopes are expressed as of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in inches (millimeters) unless otherwise shown.

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PASSED April 1, 2016
Michael Beard
 ENGINEER OF POLICY AND PROCEDURES

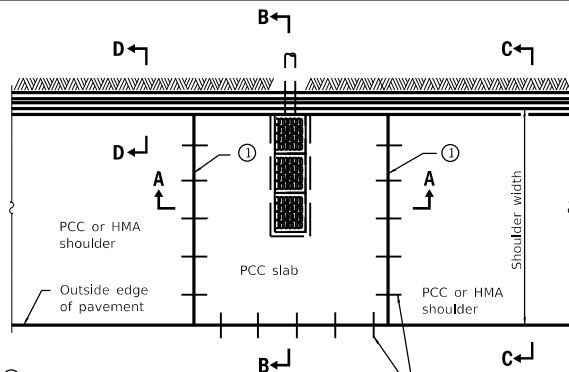
APPROVED April 1, 2016
[Signature]
 ENGINEER OF DESIGN AND ENVIRONMENT

LEP-C1 03/15/11

DATE	REVISIONS
4-1-16	Changed terminology to 'welded wire reinforcement'.
1-1-09	Switched units to English (metric).

PAVED DITCH

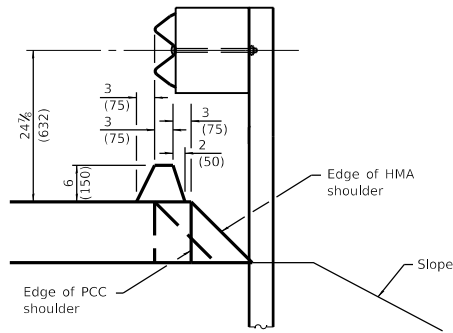
STANDARD 606401-02



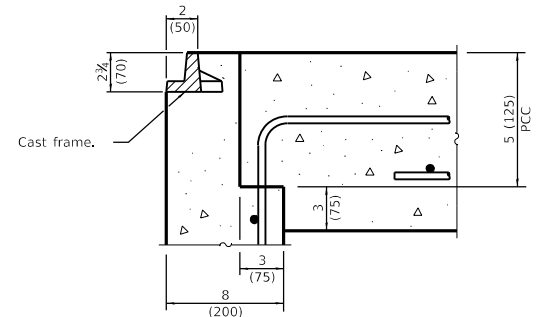
① Joints in prolongation with existing joints in pavements.

PLAN

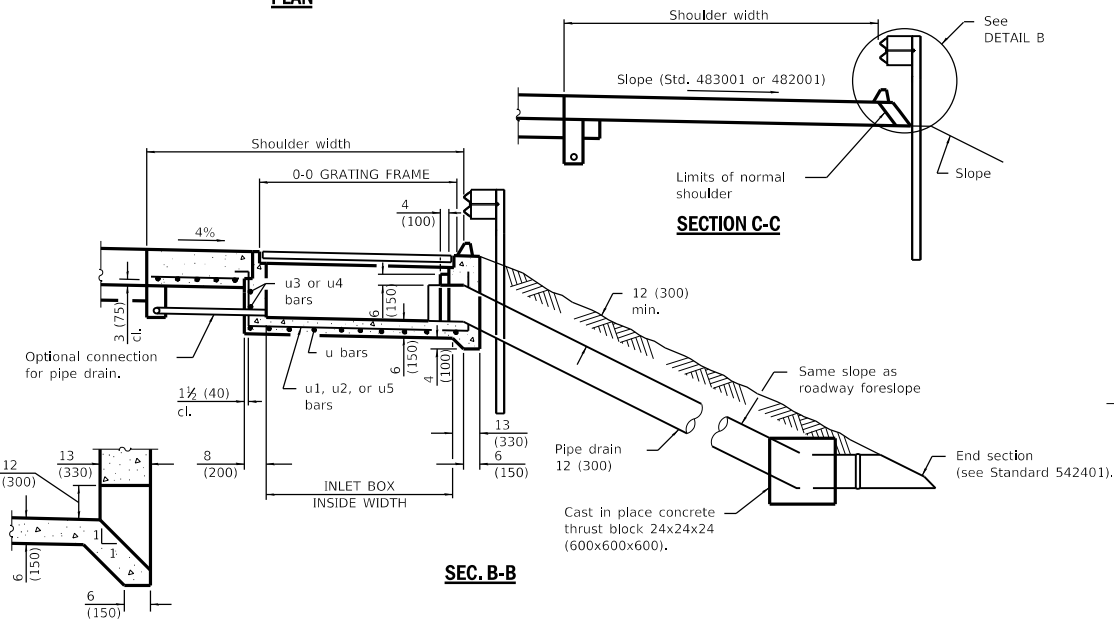
No. 6 (No. 19) Tie bars or expansion anchor ties at 36 (900) cts.



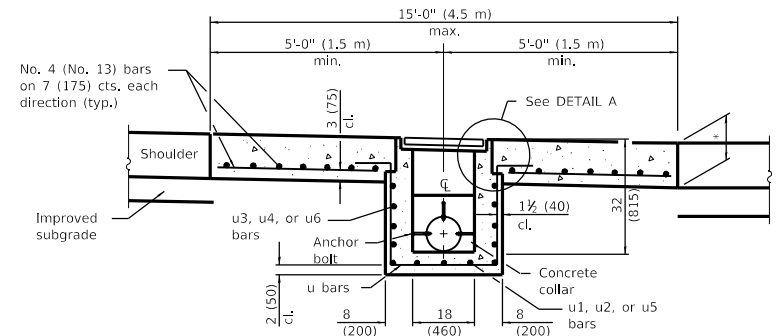
DETAIL B



DETAIL A

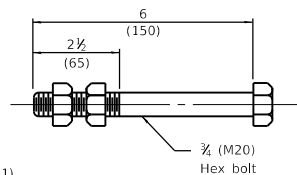


SECTION C-C



SEC. A-A

* PCC slab thickness same as adjacent shoulder.



ANCHOR BOLT

(Used to tie pipe to concrete collar)

GENERAL NOTES
 See Standard 420001 for joint details not shown.
 See Standard 630001 for details of guardrail not shown.

All exposed edges of the inlet, except the upper perimeter, shall be beveled 3/4 (20).
 For placement of drainage elements on existing construction with existing rigid pavement, substitute expansion anchor ties for tie bars.
 For nonrigid pavements or monolithic construction of PCC slab and shoulder, omit tie bars.

All dimensions are in inches (millimeters) unless otherwise shown.

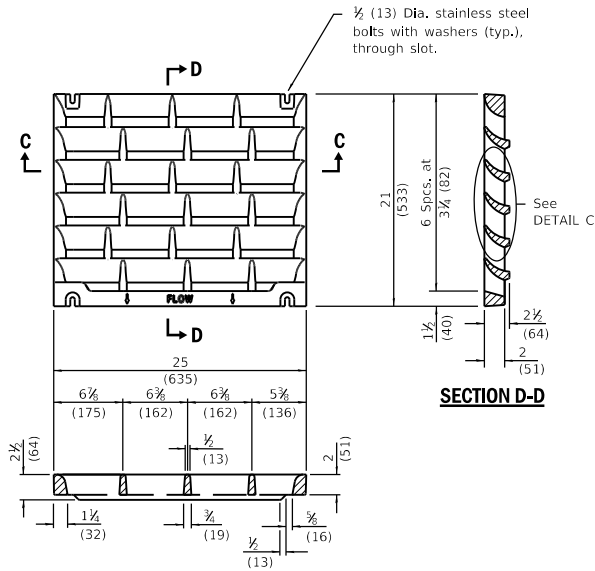
BOX OUTLET WHEN PRECAST

INLET TYPE	SHOULDER WIDTH	O-O GRATING FRAME	INLET BOX INSIDE WIDTH	INLET BOX INSIDE LENGTH
Type E	8' (2.4 m)	4'-4" (1.325 m)	3'-11" (1.195 m)	18 (460)
Type F	10' (3.0 m)	6'-5" (1.960 m)	6'-0" (1.830 m)	18 (460)
Type G	5' (1.5 m) or less	27 (690)	22 (560)	18 (460)

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 APPROVED January 1, 2018
 ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-18	Changed tie bar spacing to 36 (900) cts.
1-1-17	Revised to reflect Midwest Guardrail System 12 in. blackout. Revised gen. notes.

SHOULDER INLET WITH CURB
 (Sheet 1 of 2)
STANDARD 610001-08

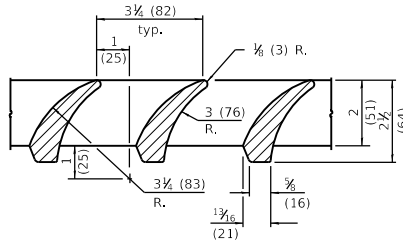


SECTION D-D

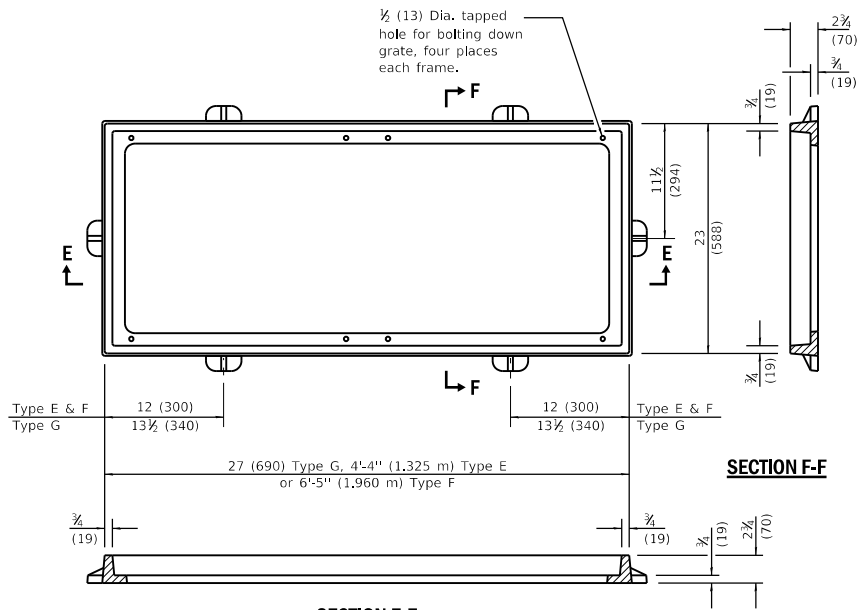
SECTION C-C

DETAIL OF CAST GRATE

Type G requires 1 grate
Type E requires 2 grates
Type F requires 3 grates



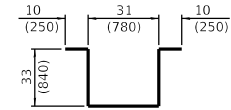
DETAIL C



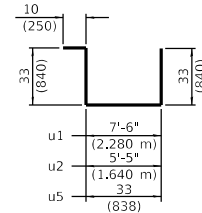
SECTION E-E

SECTION F-F

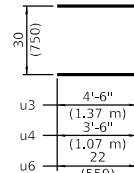
DETAIL OF CAST FRAME
(Type E shown)



BAR u



BARS u1, u2, & u5



BARS u3, u4 & u6

INLET BOX

REQUIRED MATERIAL			
TYPE F			
Bar	Qty.	Size	Length
u	8	No. 4 (No.13)	9'-9" (2,96 m)
u1	3	No. 4 (No.13)	13'-10" (4,21 m)
u3	6	No. 4 (No.13)	11'-6" (3,49 m)
Concrete	cu. yds. (m ³)		1,7 (1,3)
Reinf. bars	lbs. (kg)		126 (57,2)
Grating	sq. ft. (m ²)		10,9 (1,02)
TYPE E			
Bar	Qty.	Size	Length
u	6	No. 4 (No.13)	9'-9" (2,96 m)
u2	3	No. 4 (No.13)	11'-9" (3,57 m)
u4	6	No. 4 (No.13)	9'-6" (2,89 m)
Concrete	cu. yds. (m ³)		1,3 (1,0)
Reinf. bars	lbs. (kg)		101 (45,8)
Grating	sq. ft. (m ²)		7,3 (0,68)
TYPE G			
Bar	Qty.	Size	Length
u	4	No. 4 (No.13)	9'-9" (2,69 m)
u5	3	No. 4 (No.13)	9'-1" (2,78 m)
u6	4	No. 4 (No.13)	6'-2" (1,87 m)
Concrete	cu. yds. (m ³)		0,5 (0,4)
Reinf. bars	lbs. (kg)		55 (25,0)
Grating	sq. ft. (m ²)		3,6 (0,34)

SHOULDER INLET WITH CURB

(Sheet 2 of 2)

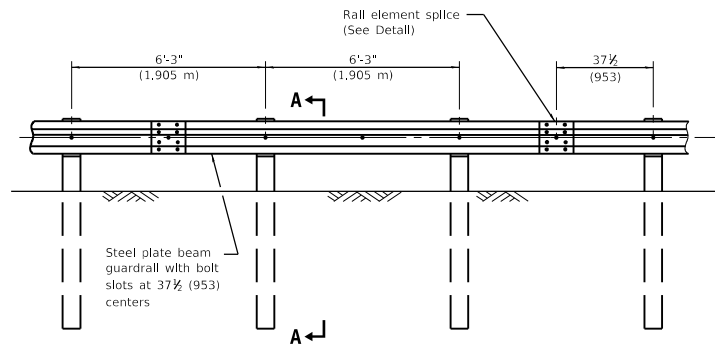
STANDARD 610001-08

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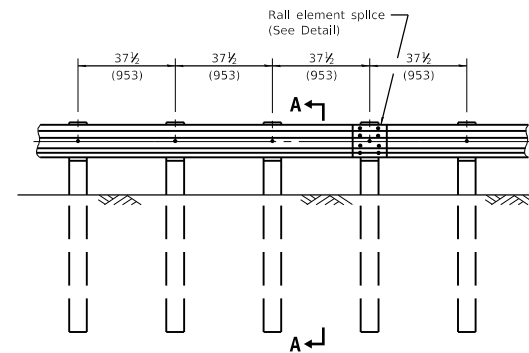
464-C 03/15/21



ELEVATION

TYPE A

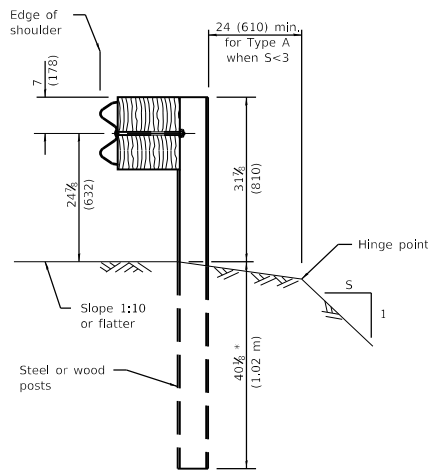
6'-3" (1.905 m) Typical post spacing



ELEVATION

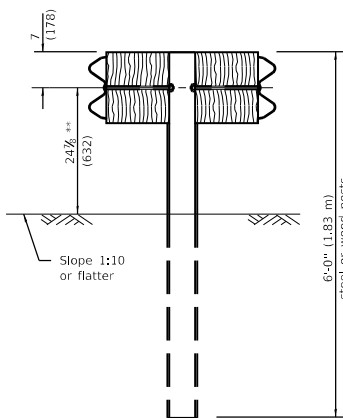
TYPE B

37 1/2" (953) Closed post spacing



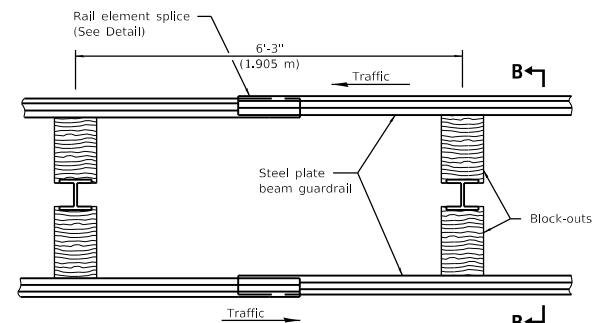
SECTION A-A

* When "S" is less than 3 and the distance from the back of post is less than 24 (610), the post shall be steel and the embedment shall be 76 1/2 (1.93 m) and the minimum top of rail height shall be 31 (787).



SECTION B-B

** When connecting Type D guardrail to an Impact attenuator, adjust this dimension to match over a distance of 25'-0" (7.62 m) from point of connection if necessary.



PLAN

TYPE D

Double steel plate beam guardrail
6'-3" (1.905 m) typical post spacing

GENERAL NOTES

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in inches (millimeters) unless otherwise shown.

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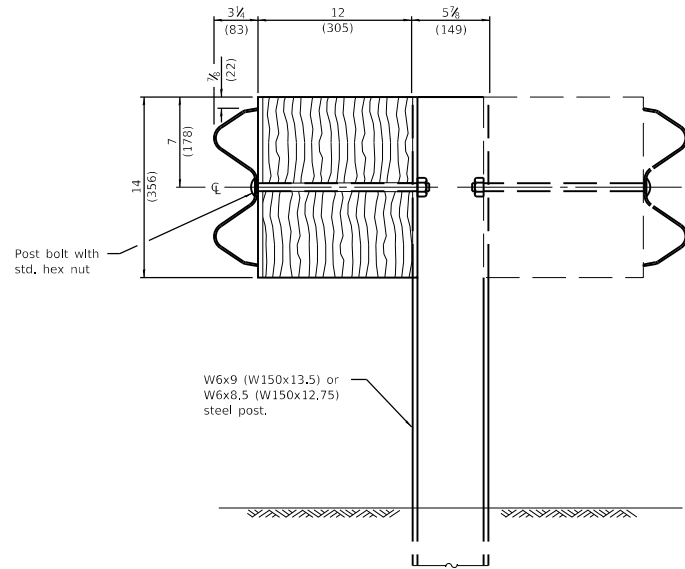
464-C1 03/15/21

DATE	REVISIONS
1-1-18	Revised steel post to have four holes in each flange.
1-1-17	Added detail for leave-out.
	Rev. 'D' to less than 6 (150) for guardrail behind curb.

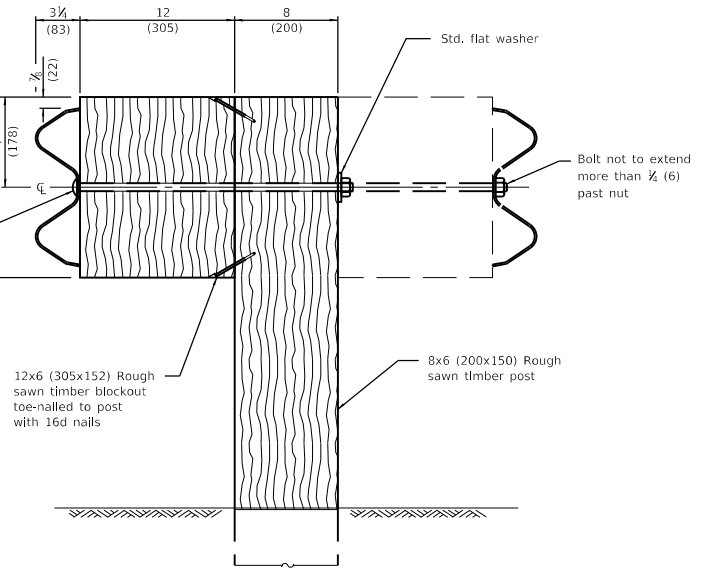
STEEL PLATE BEAM GUARDRAIL

(Sheet 1 of 4)

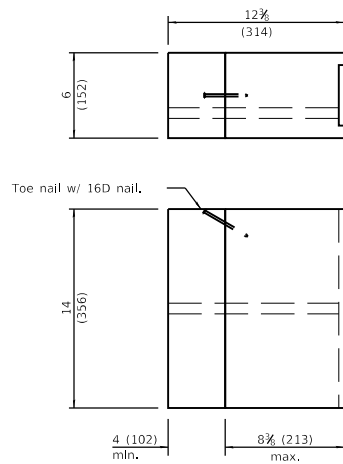
STANDARD 630001-12



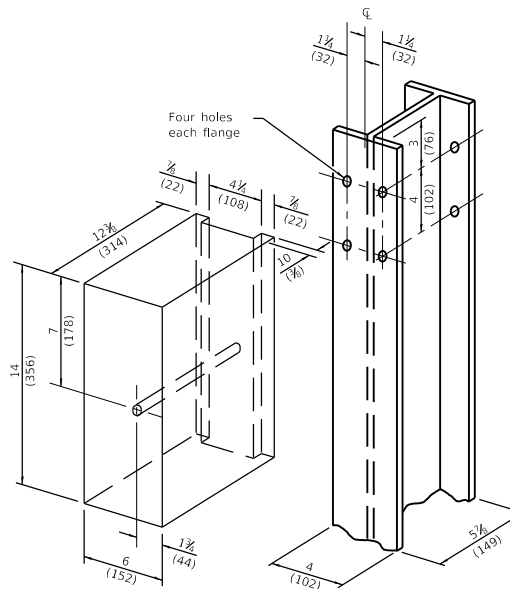
STEEL POST CONSTRUCTION



WOOD POST CONSTRUCTION

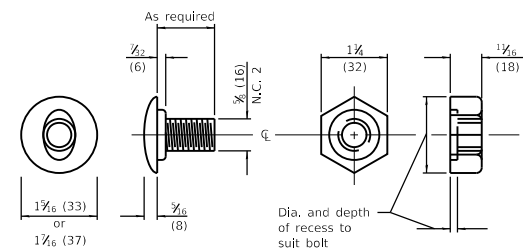


TWO-PIECE WOOD BLOCKOUT OPTION



WOOD BLOCK-OUT AND STEEL POST DETAILS

Note:
All holes 3/4 (20) dia.



POST OR SPLICE BOLT & NUT

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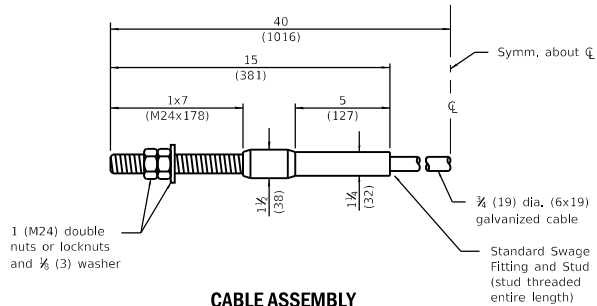
Maureen M. O'Brien

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STEEL PLATE BEAM GUARDRAIL

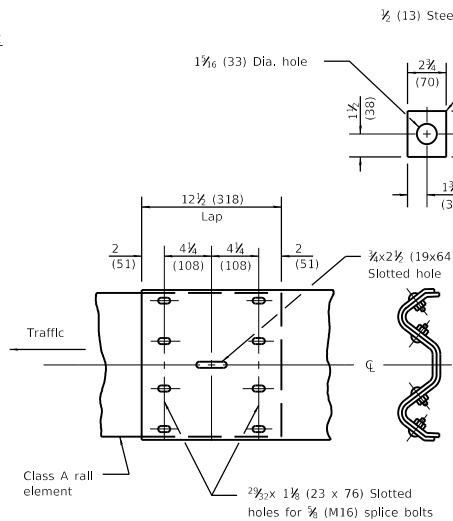
(Sheet 2 of 4)

STANDARD 630001-12

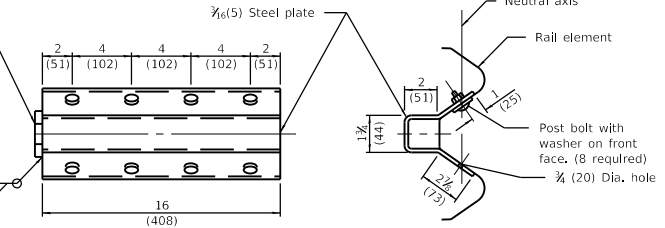


CABLE ASSEMBLY

(42,800 lbs. (190 kN) min. breaking strength)
Tighten to taut tension.

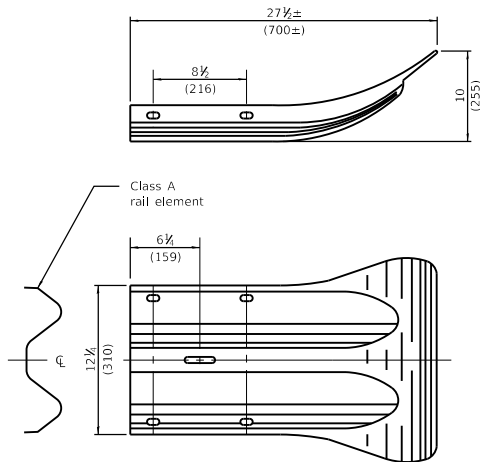


RAIL ELEMENT SPLICE

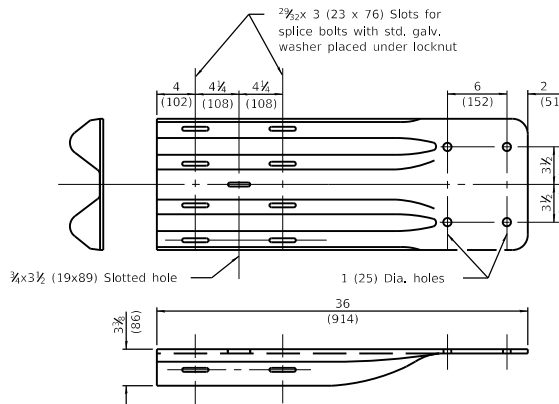


NOTE
Anchor plate T shall be used to attach cable assembly to guardrail when required on traffic barrier terminals.

ANCHOR PLATE T DETAILS



END SECTION

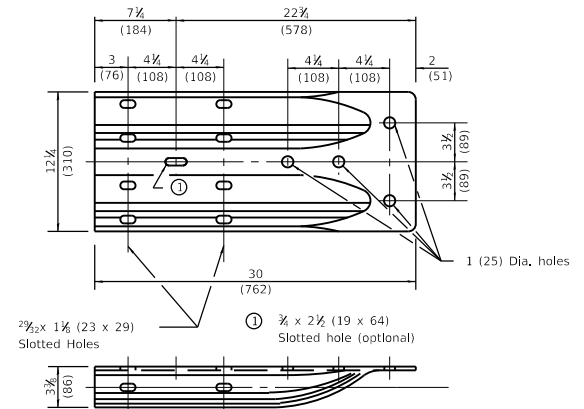


NOTE
When end shoe is attached to a bridge parapet which has an expansion joint, the bolts shall be provided with a locknut or double nut and shall be tightened only to a point that will allow guardrail movement.

The standard end shoe shall be attached to the concrete with pre-drilled or self-drilling anchor bolts. The anchor cone shall be set flush with the surface of the concrete.

Externally threaded studs protruding from the surface of the concrete will not be permitted.

END SHOE



ALTERNATE END SHOE

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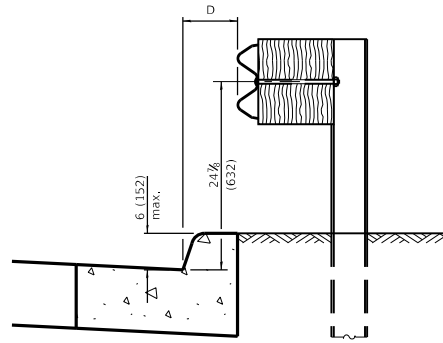
APPROVED January 1, 2018
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LEG-C 03/11/SSJ

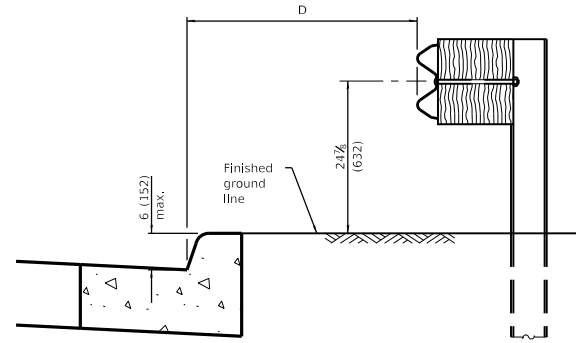
**STEEL PLATE BEAM
GUARDRAIL**

(Sheet 3 of 4)

STANDARD 630001-12



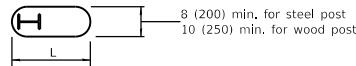
$0 \leq D < 6 (150 \text{ m})$



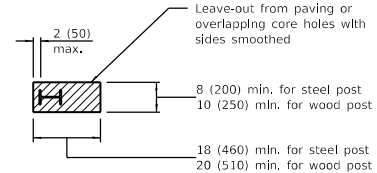
$4'-0'' (1.2 \text{ m}) \leq D \leq 12'-0'' (3.7 \text{ m})$

GUARDRAIL PLACED BEHIND CURB

Note: 'D' shall not exceed 6 (152) for design speeds greater than 45 mph.

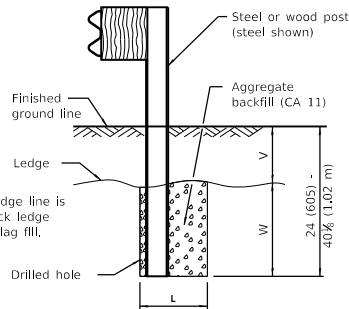


PLAN



PLAN

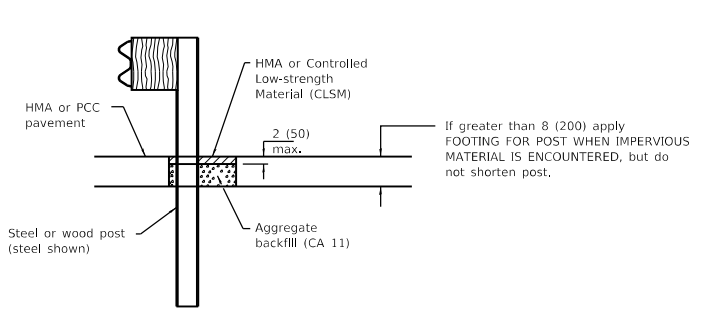
V	W	L	
		Steel Post	Wood Post
0 - 6 (0 - 152)	24 (610)	21 (530)	23 (580)
> 6 - 18 (> 152 - 458)	18 (458)	14 1/2 (368)	16 1/2 (419)
> 18 - 31 (> 458 - 787)	12 (305)	8 (203)	10 (250)
> 31 - 40 1/2 (> 787 - 1,02 m)	12 - 0 (305 - 0)	8 (203)	10 (250)



Note: Ledge line is top of rock ledge or hard slag fill.

ELEVATION

FOOTING FOR POST WHEN IMPERVIOUS MATERIAL IS ENCOUNTERED



If greater than 8 (200) apply FOOTING FOR POST WHEN IMPERVIOUS MATERIAL IS ENCOUNTERED, but do not shorten post.

ELEVATION

LEAVE-OUT FOR POST WHEN PAVED MATERIAL IS ENCOUNTERED

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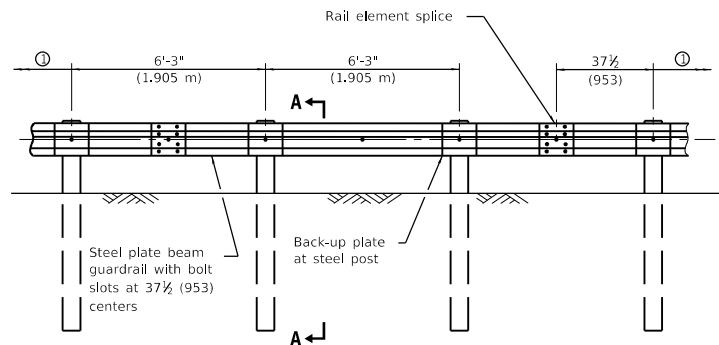
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LEG-1-03/15/21

**STEEL PLATE BEAM
 GUARDRAIL**

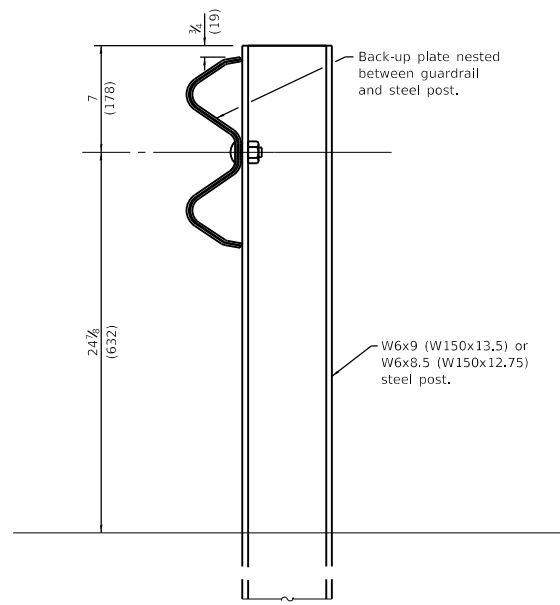
(Sheet 4 of 4)

STANDARD 630001-12

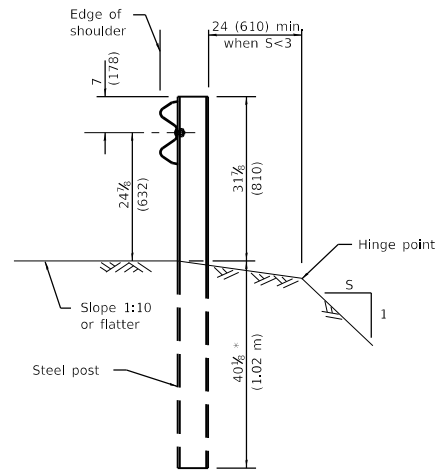


ELEVATION

① When connecting to long-span guardrail over culvert, the next post may be the third (farthest from culvert) CRT wood post (See Standard 630106).

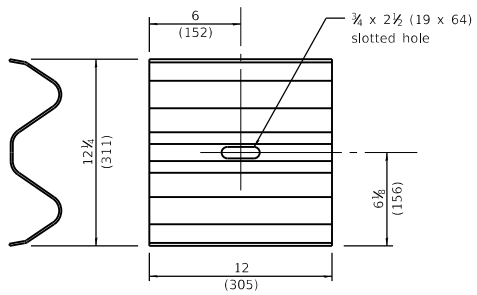


DETAIL AT POST



SECTION A-A

* When "S" is less than 3 and the distance from the back of post is less than 24 (610), the post embedment shall be 76 1/2 (1.93 m) and the minimum top of rail height shall be 31 (787).



BACK-UP PLATE

GENERAL NOTES

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

For details of guardrail elements not shown, see Standard 630001.

All dimensions are in inches (millimeters) unless otherwise shown.

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APPROVED January 1, 2017
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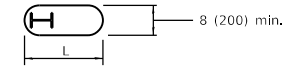
DATE	REVISIONS
1-1-17	New standard.

**NON-BLOCKED STEEL
 PLATE BEAM GUARDRAIL**

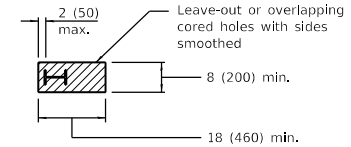
(Sheet 1 of 2)

STANDARD 630006

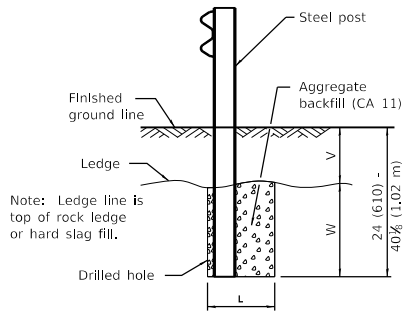
V	W	L
0 - 6	24	21
(0 - 152)	(610)	(530)
> 6 - 18	18	14½
(> 152 - 458)	(458)	(368)
> 18 - 31	12	8
(> 458 - 787)	(305)	(203)
> 31 - 40½	12 - 0	8
(> 787 - 1,02 m)	(305 - 0)	(203)



PLAN

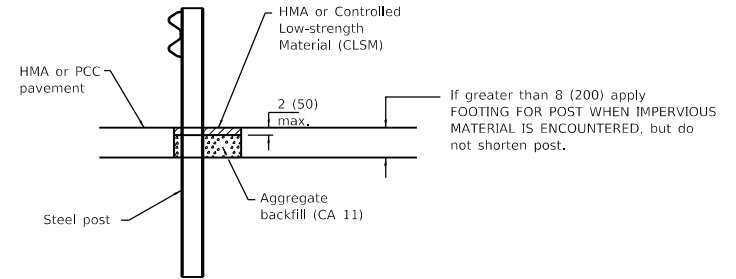


PLAN



ELEVATION

FOOTING FOR POST WHEN IMPERVIOUS MATERIAL IS ENCOUNTERED



ELEVATION

LEAVE-OUT FOR POST WHEN PAVED MATERIAL IS ENCOUNTERED

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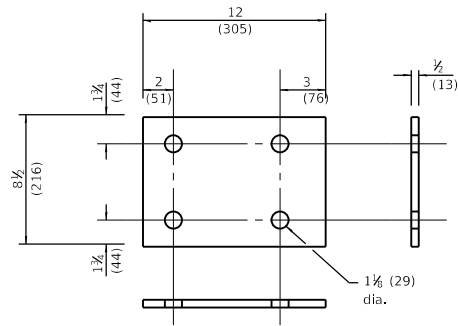
APPROVED January 1, 2017
Maureen M. Bales
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ISSUED 1-1-17

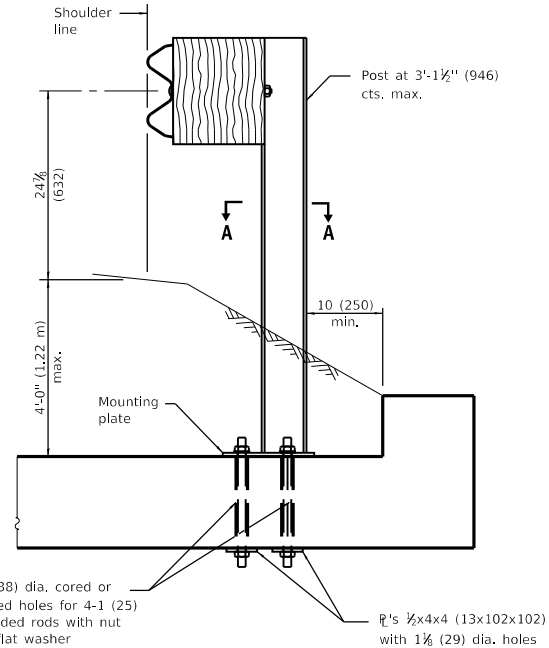
**NON-BLOCKED STEEL
 PLATE BEAM GUARDRAIL**

(Sheet 2 of 2)

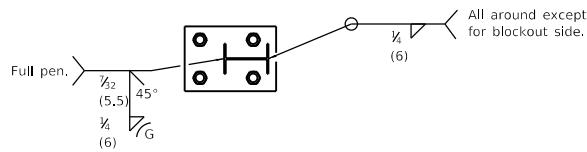
STANDARD 630006



MOUNTING PLATE



CROSS SECTION



SECTION A-A

1 1/2 (38) dia. cored or formed holes for 4-1 (25) threaded rods with nut and flat washer

4-1 (25) threaded rods with 1 1/2 (29) dia. holes

GENERAL NOTES

For details of guardrail elements not shown, see Standard 630001.

All threaded rods shall be installed with heavy hex nuts and standard washers.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-17	Omitted all cases but MNT. ON SLAB. Renamed standard.
1-1-11	Added mounting plate detail. Revised weld detail for Case IV.

**STRONG POST
GUARDRAIL ATTACHED
TO CULVERT**

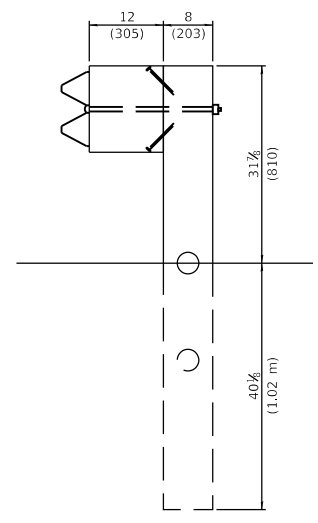
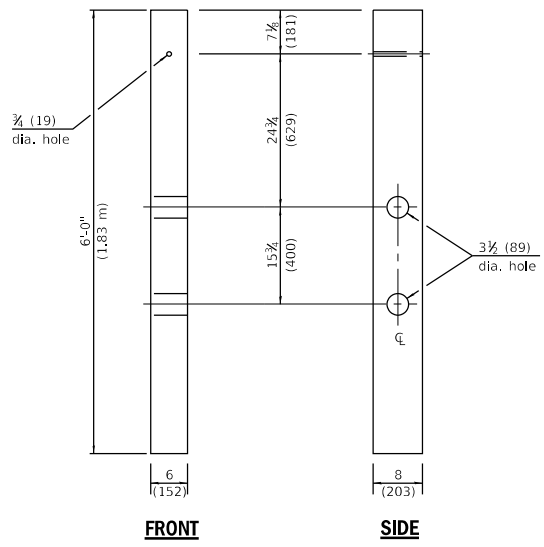
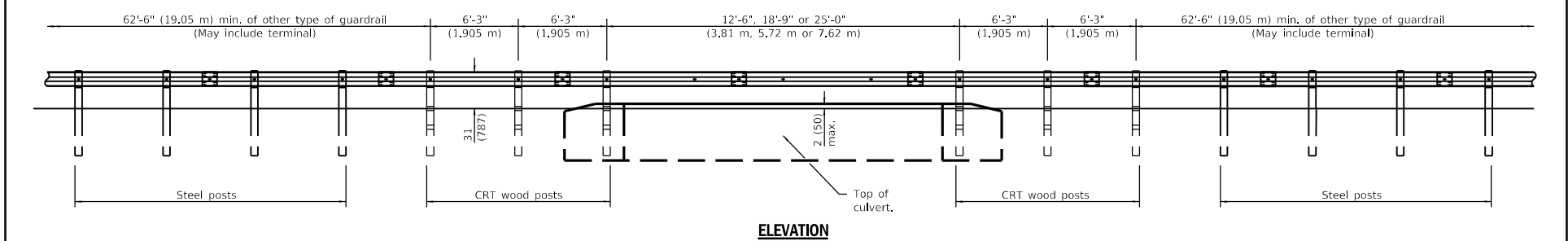
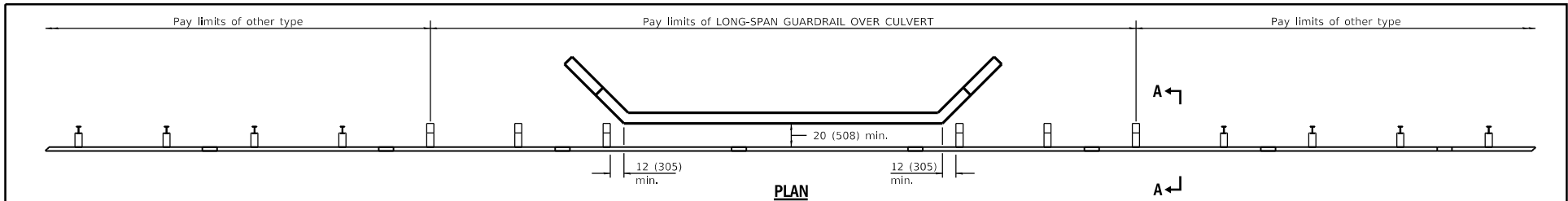
STANDARD 630101-10

Illinois Department of Transportation

PASSED January 1, 2017
Michael Beard
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2017
Maureen M. O'Connell
ENGINEER OF DESIGN AND ENVIRONMENT

6301-10 03/11/2011



GENERAL NOTES

See Standard 630001 for details of guardrail not shown.

Blockouts shown at steel posts shall be omitted when NON-BLOCKED STEEL PLATE BEAM GUARDRAIL is specified. See Standard 630006 for details not shown.

All dimensions are in inches (millimeters) unless otherwise shown.

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PASSED January 1, 2017

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APPROVED January 1, 2017

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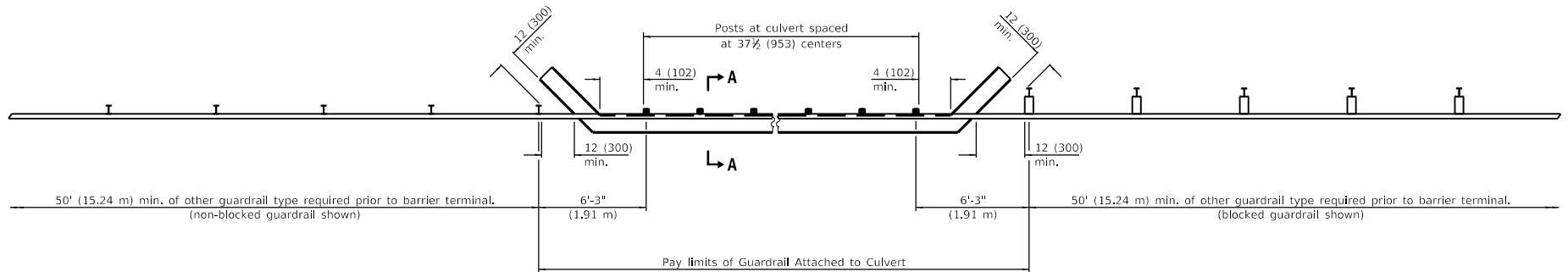
1"=1' GRADINGS

CRT WOOD POST

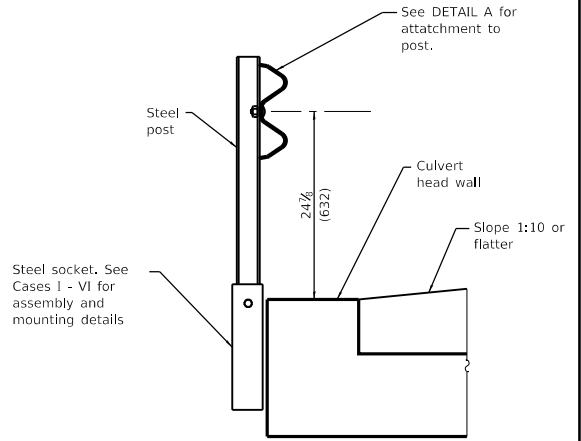
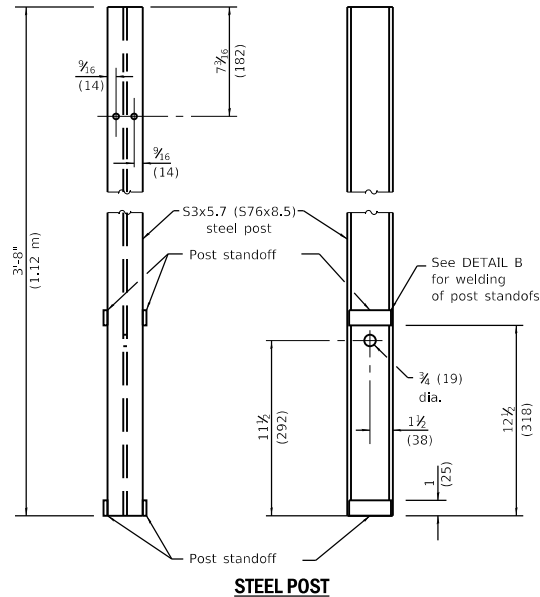
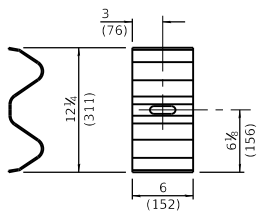
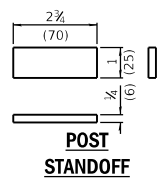
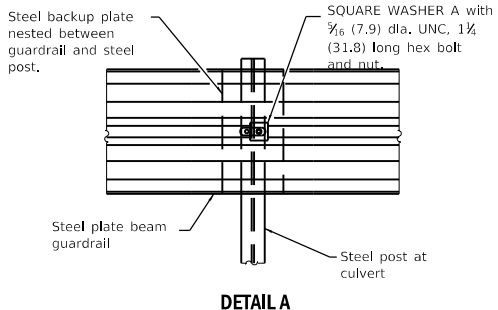
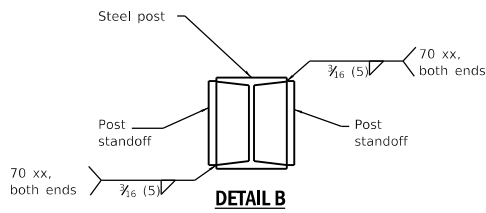
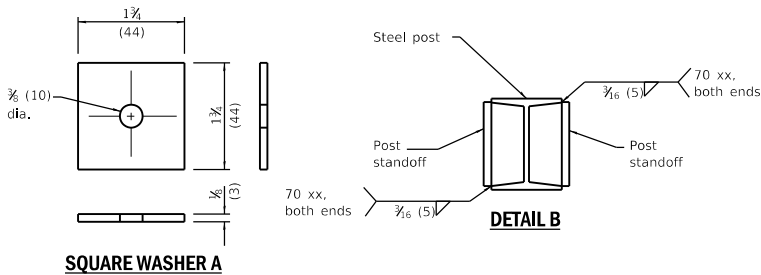
DATE	REVISIONS
1-1-17	Revised general notes for non-blocked guardrail option.
	Revised pay limits.
1-1-13	Added min. dim. from guardrail to headwall. Added dim. to section A-A.

LONG-SPAN GUARDRAIL OVER CULVERT

STANDARD 630106-02



PLAN



GENERAL NOTES

- See Standard 630001 for details of guardrail not shown.
- See Standard 630006 for details of non-blocked guardrail not shown.
- All threaded rods and bolts shall be installed with heavy hex nuts and standard washers unless noted otherwise.
- All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2017

APPROVED January 1, 2017

ENGINEER OF POLICY AND PROCEDURES

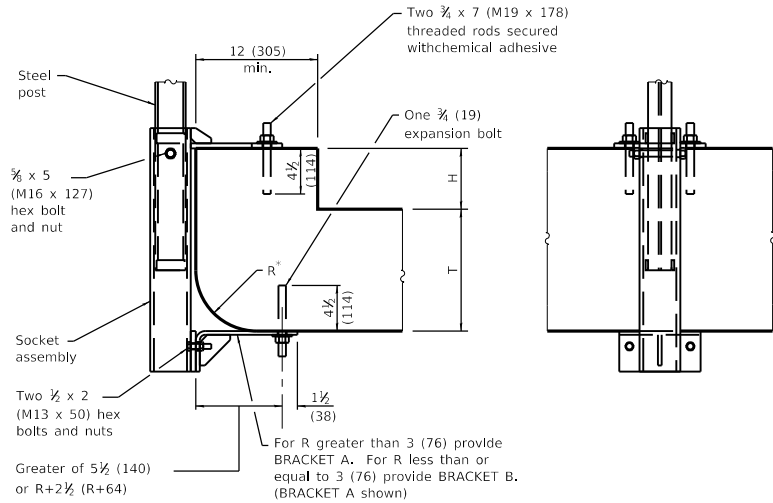
ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-17	New Standard.

WEAK POST GUARDRAIL ATTACHED TO CULVERT

(Sheet 1 of 6)

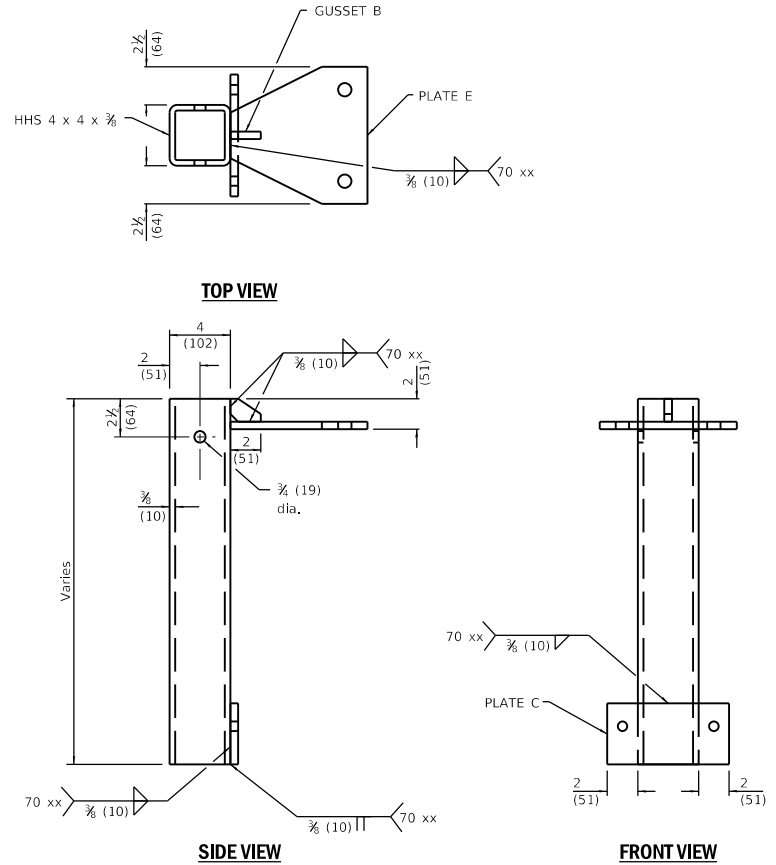
STANDARD 630111



CROSS SECTION

ELEVATION

CASE I, (H+T-R) < 18 (457), TOP MOUNT



TOP VIEW

SIDE VIEW

FRONT VIEW

SOCKET ASSEMBLY FOR CASE I

Illinois Department of Transportation

PASSED January 1, 2017

ISSUED 1-1-17

ENGINEER OF POLICY AND PROCEDURES

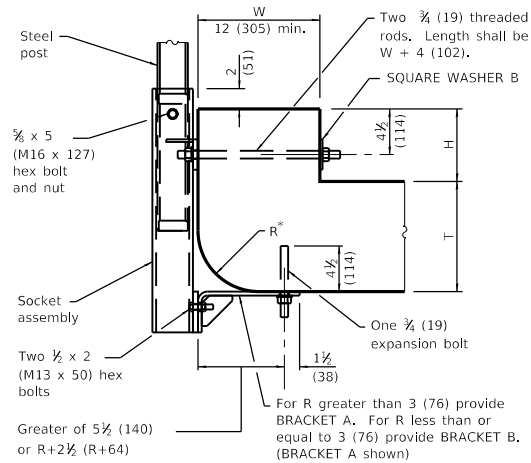
APPROVED January 1, 2017

ENGINEER OF DESIGN AND ENVIRONMENT

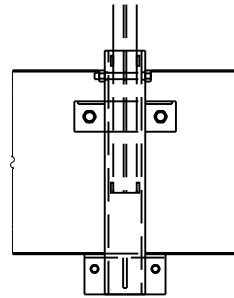
WEAK POST GUARDRAIL ATTACHED TO CULVERT

(Sheet 2 of 6)

STANDARD 630111

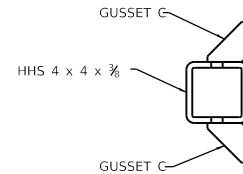


CROSS SECTION

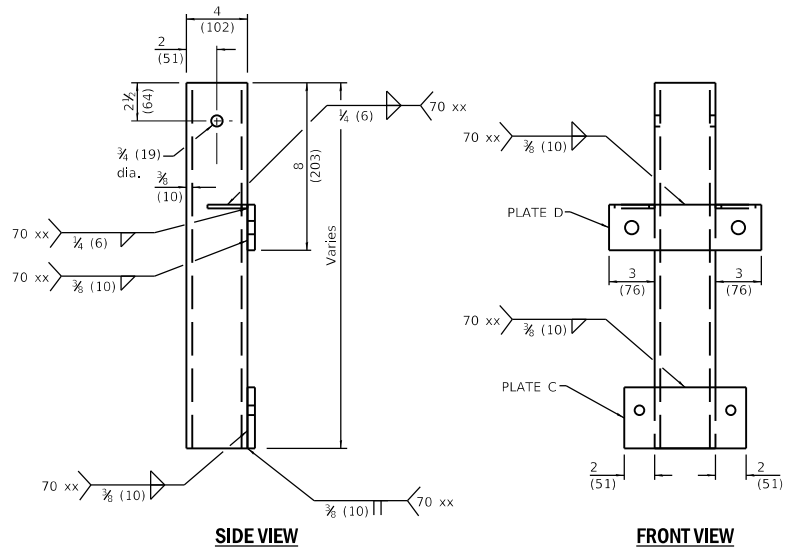


ELEVATION

CASE II, (H+T-R) < 18 (457), SIDE-MOUNT THROUGH-BOLT



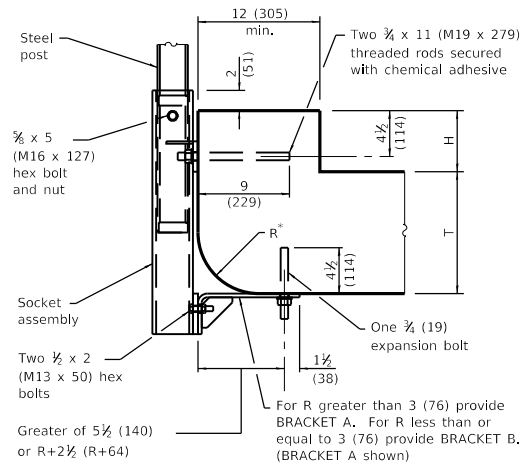
TOP VIEW



SIDE VIEW

FRONT VIEW

SOCKET ASSEMBLY FOR CASES II & III



CROSS SECTION

ELEVATION

CASE III, (H+T-R) < 18 (457), SIDE-MOUNT ANCHORED

Illinois Department of Transportation

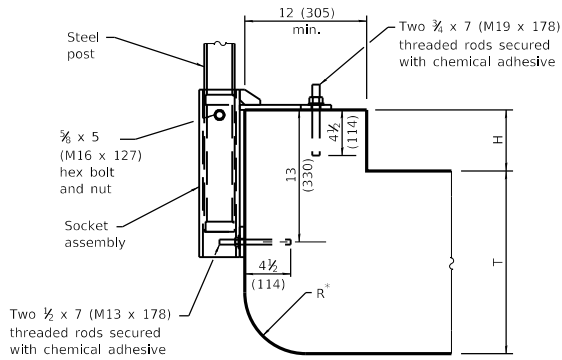
PASSED January 1, 2017
Michael Beard
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2017
Maureen M. O'Brien
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WEAK POST GUARDRAIL ATTACHED TO CULVERT

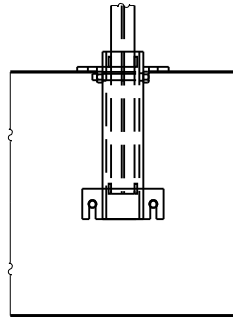
(Sheet 3 of 6)

STANDARD 630111



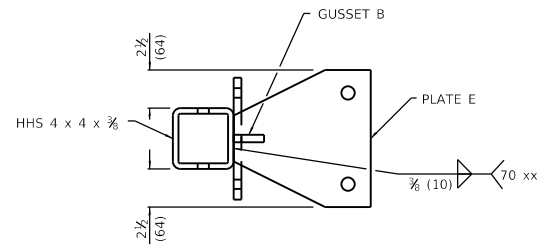
* R varies between 0 to 6 (152)

CROSS SECTION

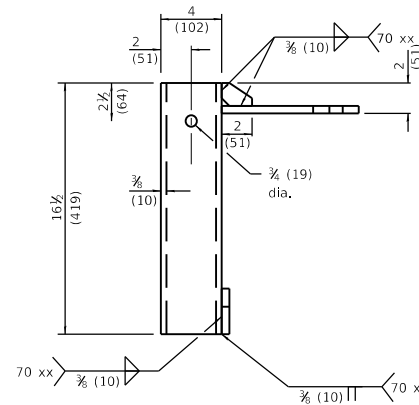


ELEVATION

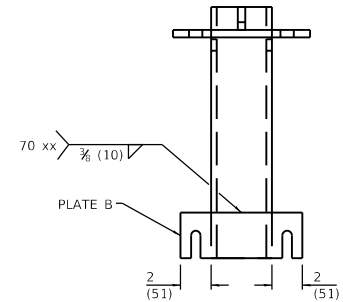
CASE IV, (H+T-R) ≥ 18 (457), TOP MOUNT



TOP VIEW

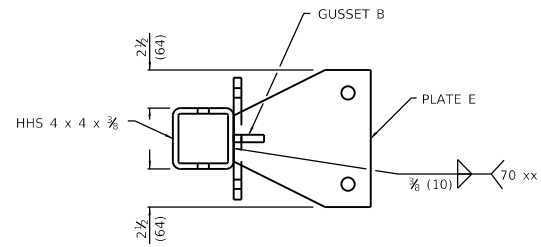


SIDE VIEW

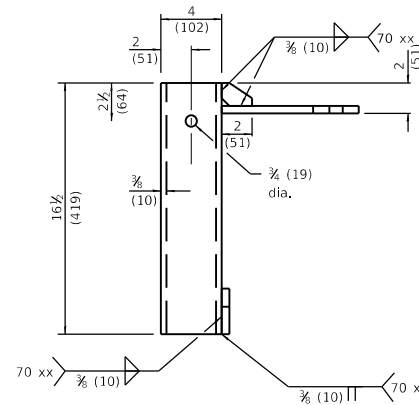


FRONT VIEW

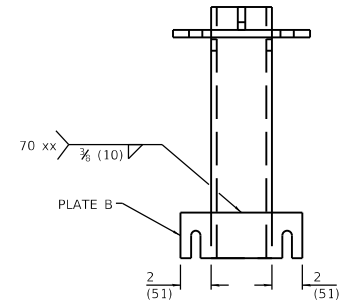
SOCKET ASSEMBLY FOR CASE IV



TOP VIEW



SIDE VIEW



FRONT VIEW

SOCKET ASSEMBLY FOR CASE IV

Illinois Department of Transportation

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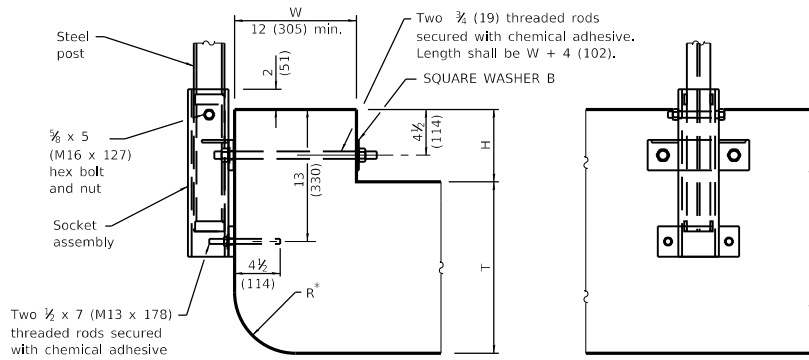
APPROVED January 1, 2017
Maureen M. O'Connell
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ISSUED 1-1-17

WEAK POST GUARDRAIL ATTACHED TO CULVERT

(Sheet 4 of 6)

STANDARD 630111

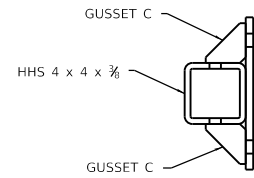


* R varies between 0 to 6 (152)

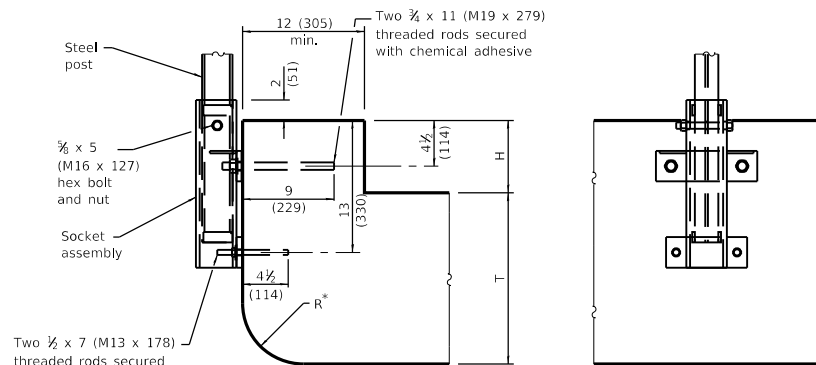
CROSS SECTION

ELEVATION

CASE V, (H+T-R) ≥ 18 (457), SIDE-MOUNT, THROUGH-BOLT



TOP VIEW

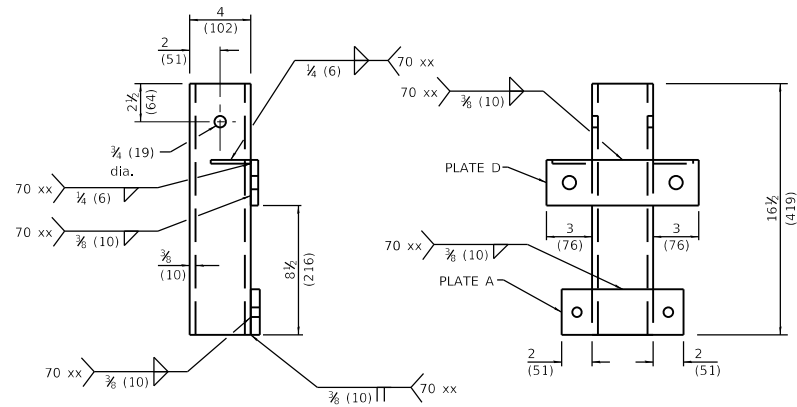


* R varies between 0 to 6 (152)

CROSS SECTION

ELEVATION

CASE VI, (H+T-R) ≥ 18 (457), SIDE-MOUNT ANCHORED



SIDE VIEW

FRONT VIEW

SOCKET ASSEMBLY FOR CASES V & VI

Illinois Department of Transportation

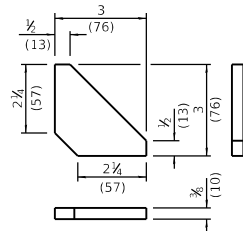
PASSED January 1, 2017
Michael Beard
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2017
Maureen M. Bello
 ENGINEER OF DESIGN AND ENVIRONMENT

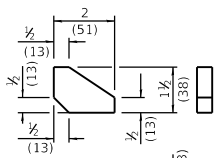
WEAK POST GUARDRAIL ATTACHED TO CULVERT

(Sheet 5 of 6)

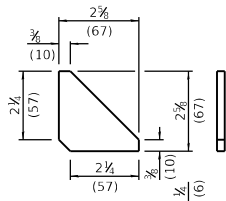
STANDARD 630111



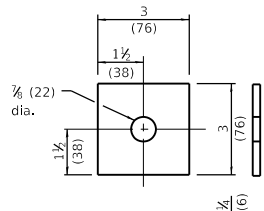
GUSSET A



GUSSET B



GUSSET C



SQUARE WASHER B

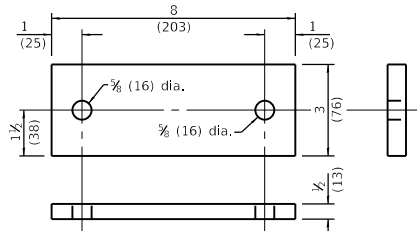


PLATE A

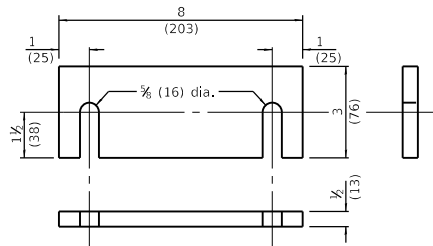


PLATE B

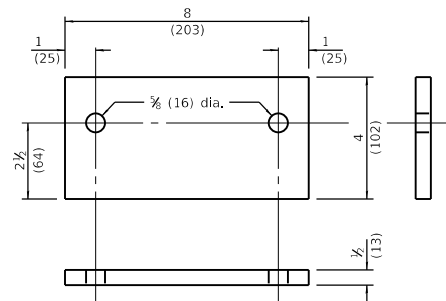


PLATE C

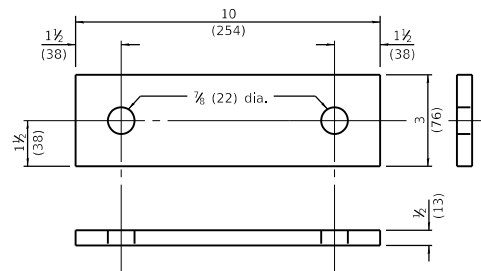
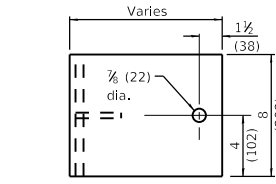
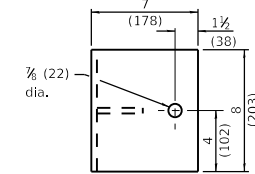
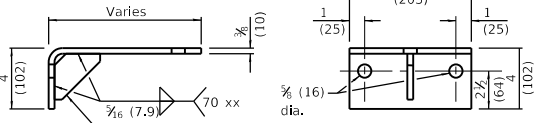


PLATE D



BRACKET A



BRACKET B

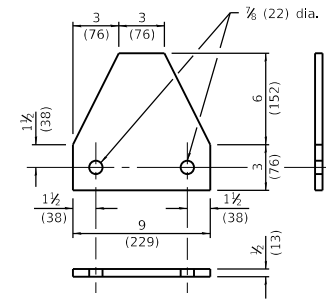
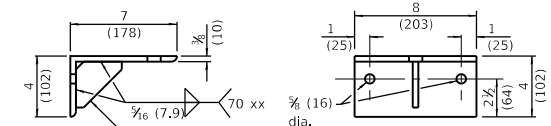


PLATE E

Illinois Department of Transportation

PASSED January 1, 2017
Michael Beard
 ENGINEER OF POLICY AND PROCEDURES

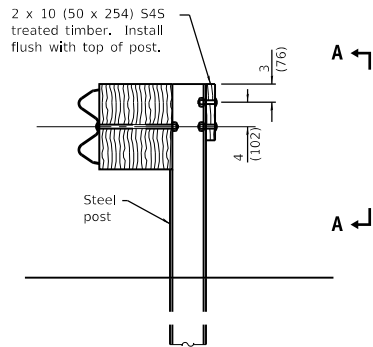
APPROVED January 1, 2017
Maureen M. Bello
 ENGINEER OF DESIGN AND ENVIRONMENT

41-H-1 03/ISSI

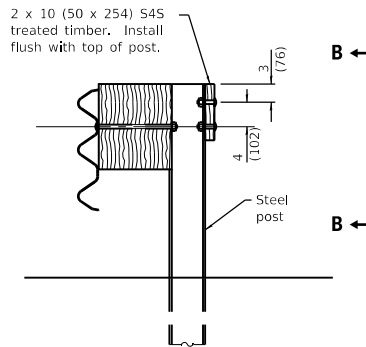
**WEAK POST GUARDRAIL
 ATTACHED TO CULVERT**

(Sheet 6 of 6)

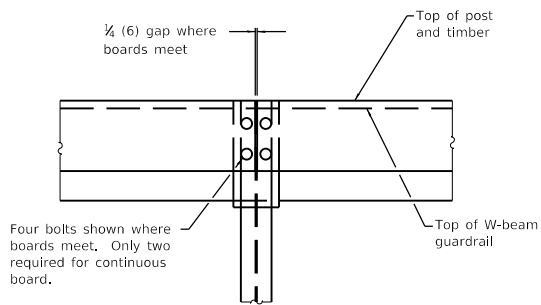
STANDARD 630111



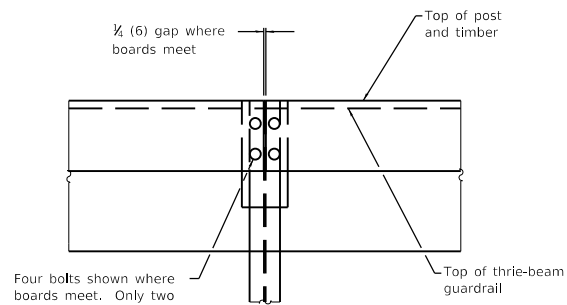
**ELEVATION WITH
W-BEAM GUARDRAIL**



**ELEVATION WITH
THRIE-BEAM GUARDRAIL**



VIEW A-A



VIEW B-B

GENERAL NOTES

For details of guardrail elements not shown, see Standard 630001.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2017
Michael Beard
ENGINEER OF POLICY AND PROCEDURES

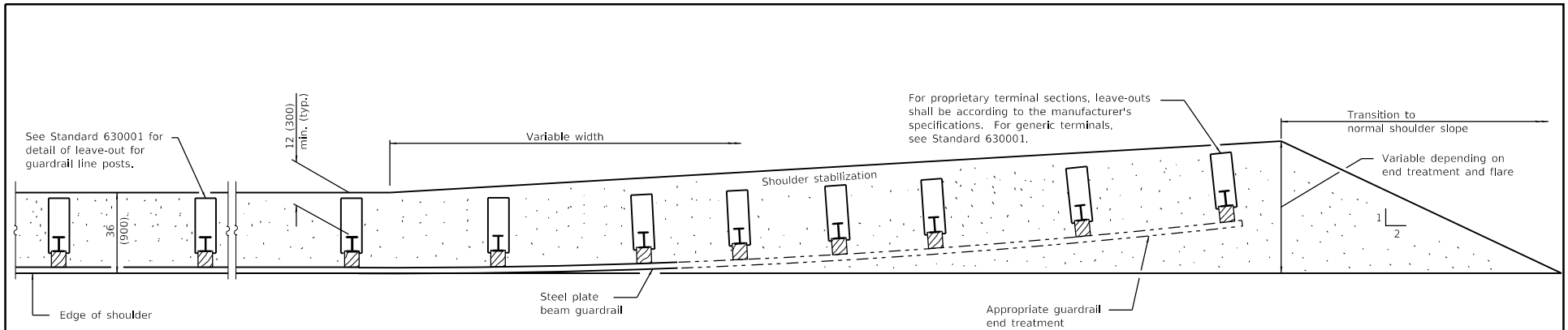
APPROVED January 1, 2017
Maureen M. O'Neil
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-17

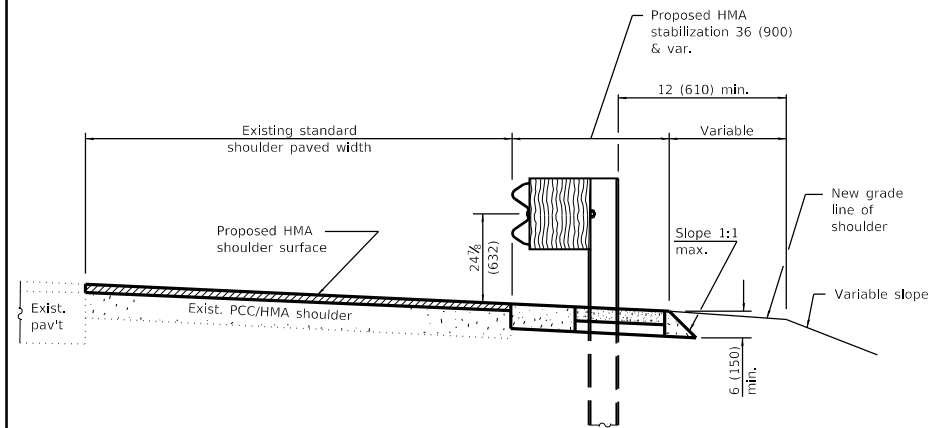
DATE	REVISIONS
1-1-17	New standard.

**BACK SIDE PROTECTION
OF GUARDRAIL**

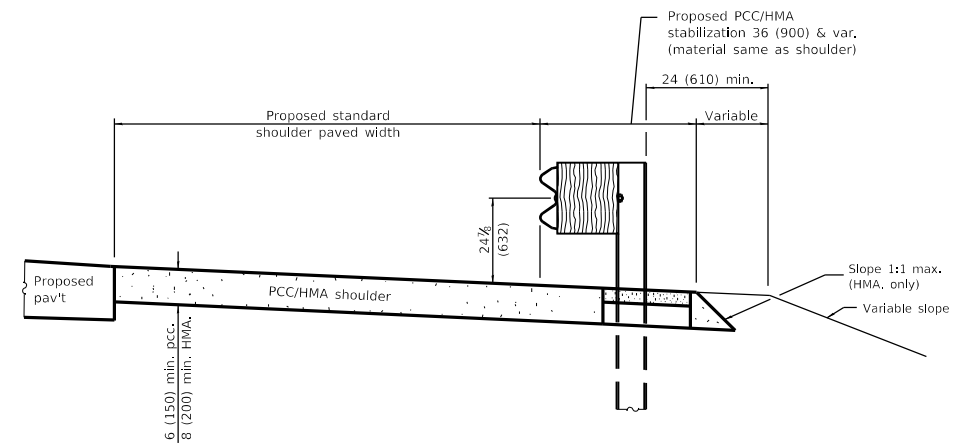
STANDARD 630116



PLAN



RESURFACING



NEW CONSTRUCTION

GENERAL NOTES

See Standard 482001, 482006, 483001 and 630001 for details not shown.

All dimensions are in inches (millimeters) unless otherwise shown.

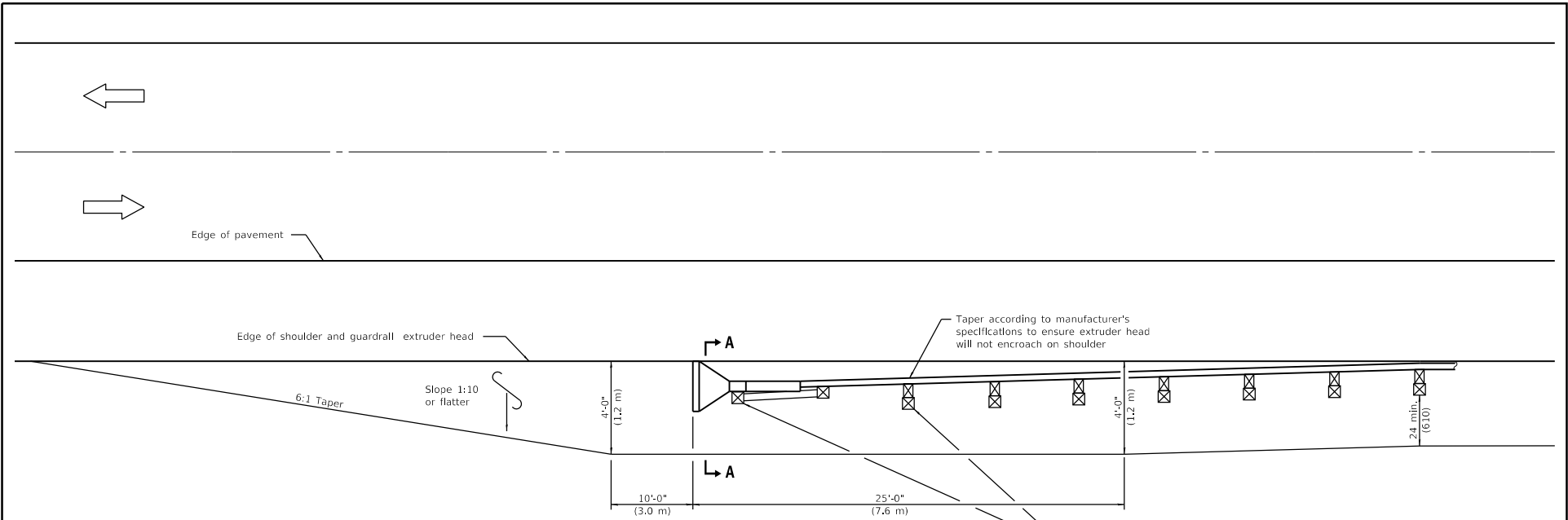
Illinois Department of Transportation

PASSED January 1, 2017
Michael Beard
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2017
Maureen M. O'Connell
 ENGINEER OF DESIGN AND ENVIRONMENT

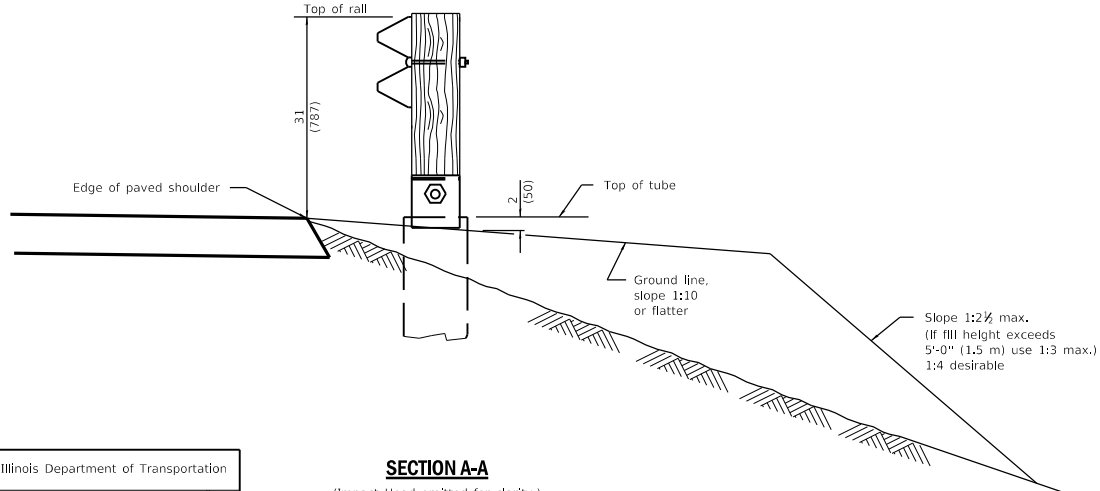
484-1-03/ISS/2

DATE	REVISIONS	PCC / HMA STABILIZATION AT STEEL PLATE BEAM GUARDRAIL
1-1-17	Revised leave-outs, moved dimensions to Standard 630001.	
1-1-09	Switched units to English (metric).	
		STANDARD 630201-07



**SHOULDER WIDENING TRANSITION
FOR TANGENT TERMINAL**

Beginning length of need point varies by manufacturer, typically occurs between posts 1 and 3.



SECTION A-A
(Impact Head omitted for clarity.)

GENERAL NOTES

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-19	Removed pay limits. Revised notes regarding the taper/flare and length of need point.
1-1-18	Omitted posts from 'Pay limits of other type'.

**SHOULDER WIDENING FOR
TYPE 1 (SPECIAL)
GUARDRAIL TERMINALS**
(Sheet 1 of 2)

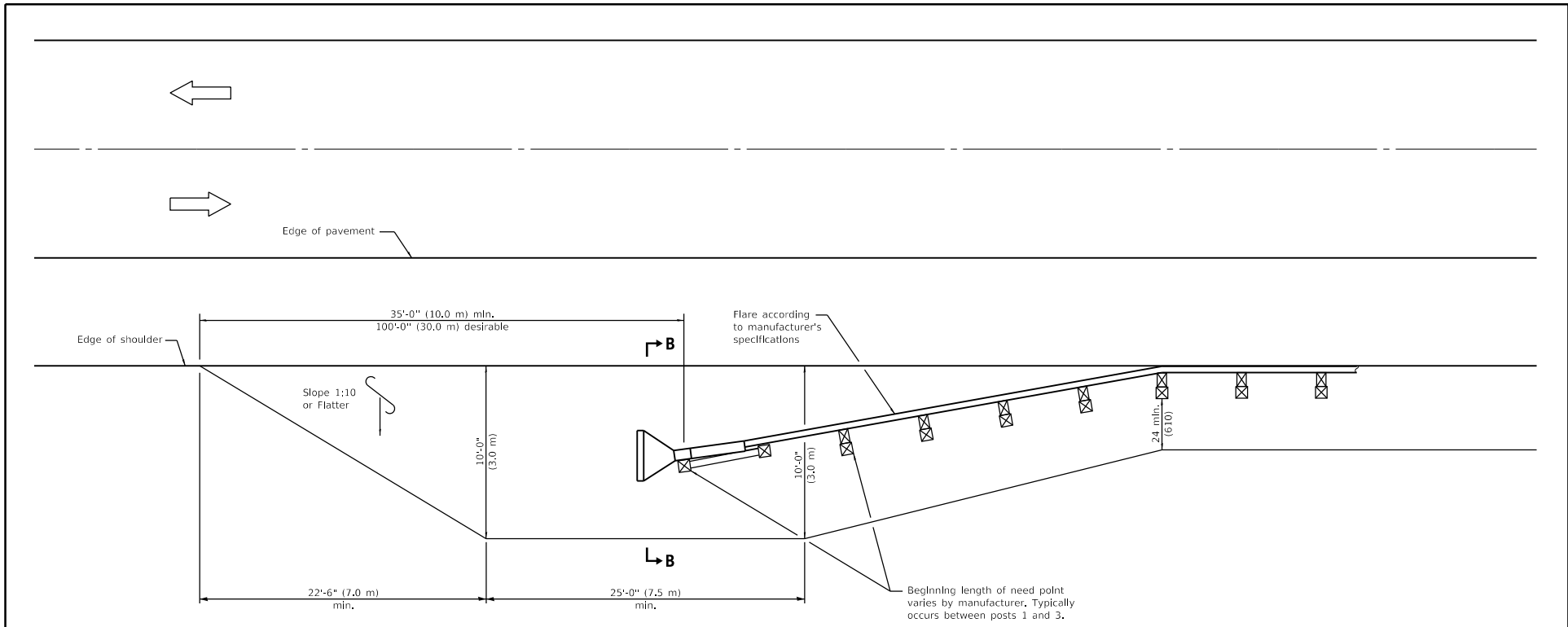
STANDARD 630301-09

Illinois Department of Transportation

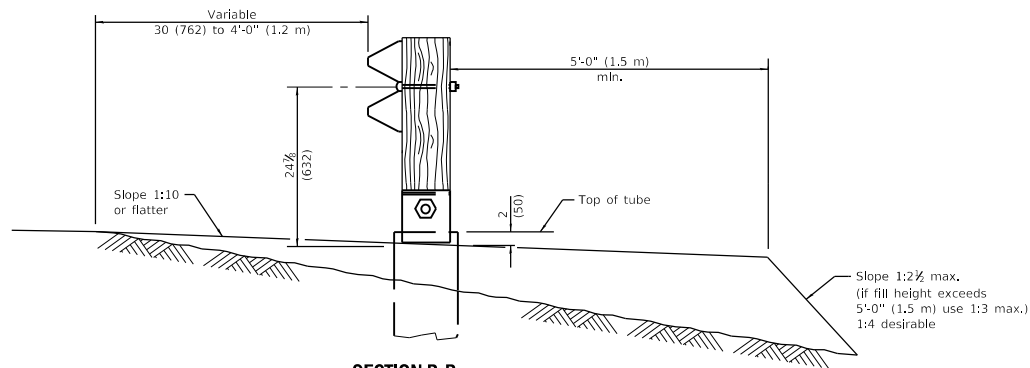
PASSED *Michael Boyd* January 1, 2019
ENGINEER OF POLICY AND PROCEDURES

APPROVED *[Signature]* January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUES: 004-1-031155



**SHOULDER WIDENING TRANSITION
FOR FLARED TERMINAL**



SECTION B-B

(Impact Head omitted for clarity.)

Illinois Department of Transportation

PASSED January 1, 2019

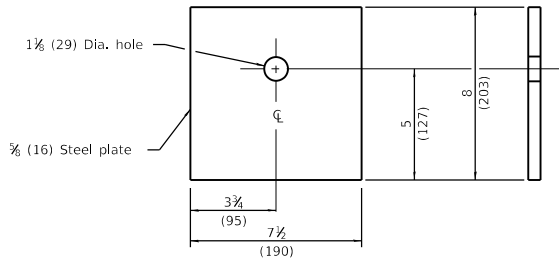
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2019

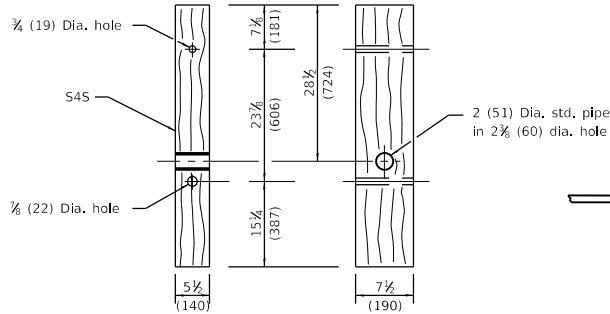
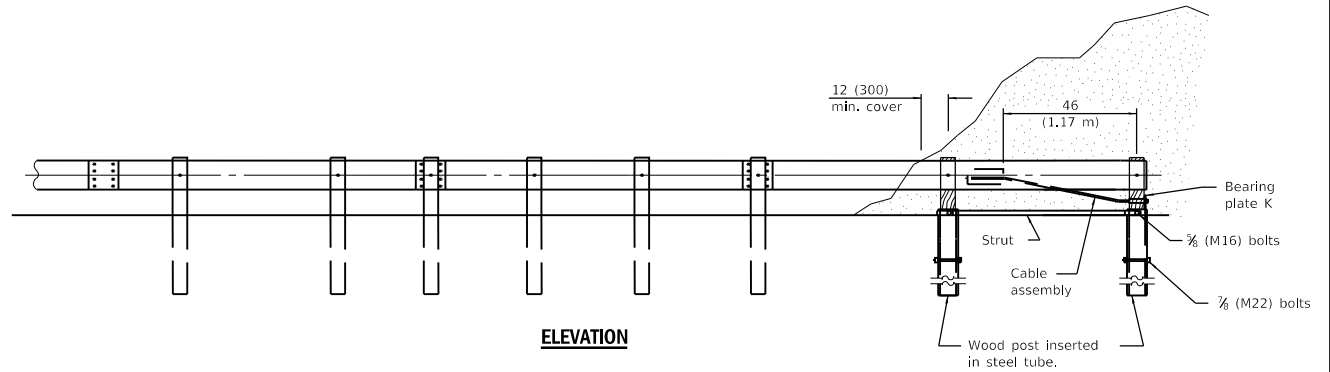
ENGINEER OF DESIGN AND ENVIRONMENT

**SHOULDER WIDENING FOR
TYPE 1 (SPECIAL)
GUARDRAIL TERMINALS**
(Sheet 2 of 2)

STANDARD 630301-09



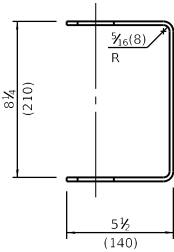
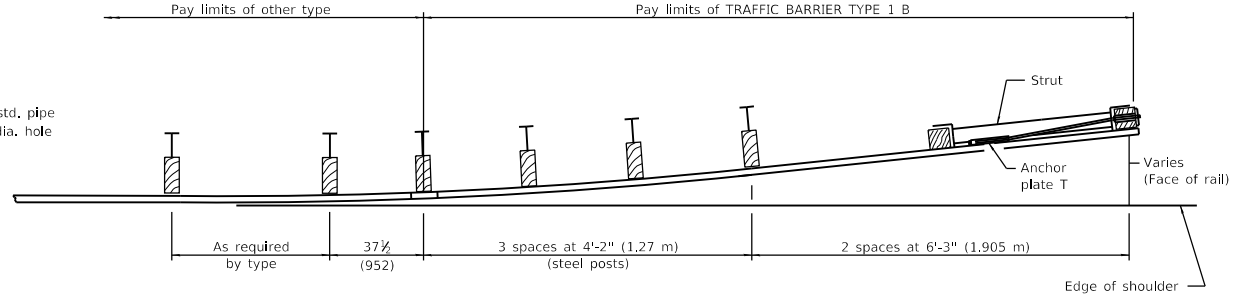
BEARING PLATE K



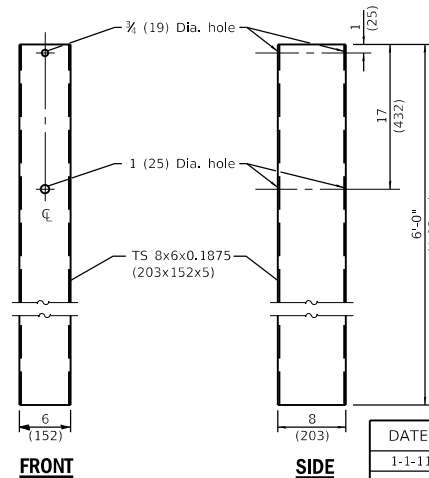
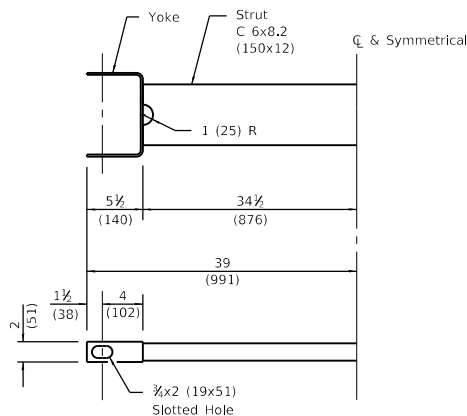
FRONT

SIDE

WOOD POST



YOKE



FRONT

SIDE

STEEL TUBE

GENERAL NOTES

See Standard 630001 for details of guardrail not shown.

The bearing plate K shall be held in position by two eight penny nails driven into the post and bent over the top of the plate.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-11	Revised steel tube length to 6'-0" (1.83 m).
1-1-10	Increased steel tube length, corrected hole locations in tube.

TRAFFIC BARRIER TERMINAL, TYPE 1B

STANDARD 631006-08

Illinois Department of Transportation

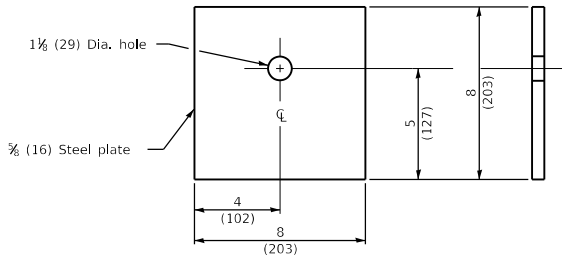
PASSED January 1, 2011

Michael Beard
ENGINEER OF POLICY AND PROCEDURES

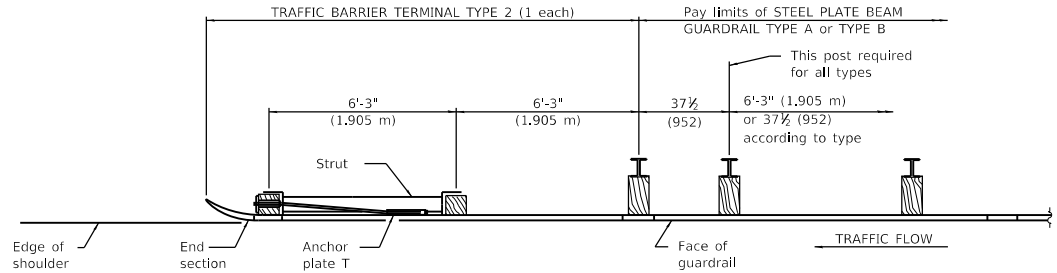
APPROVED January 3, 2011

ENGINEER OF DESIGN AND ENVIRONMENT

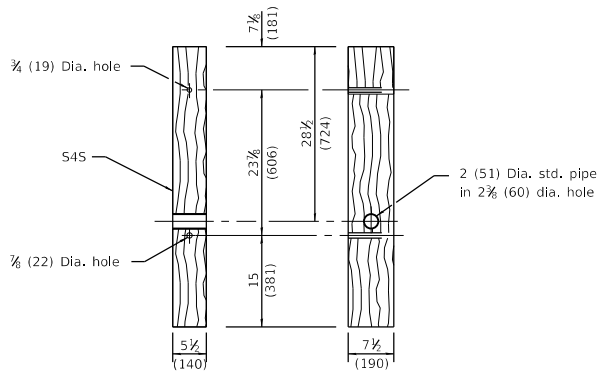
464-C1 03/11/SSJ



BEARING PLATE K



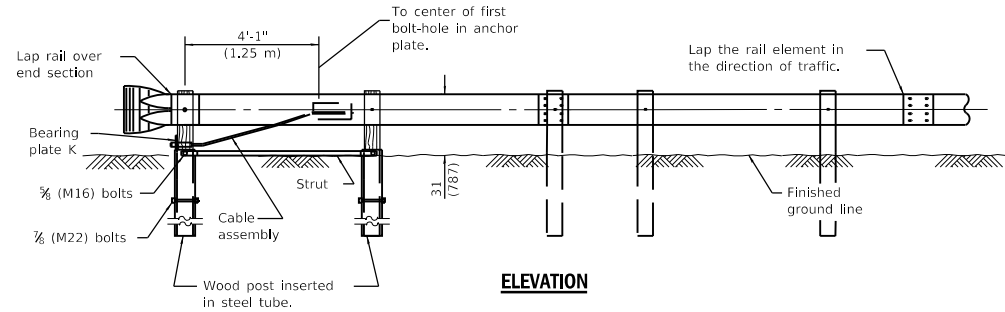
PLAN



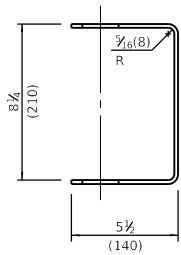
FRONT

SIDE

WOOD POST

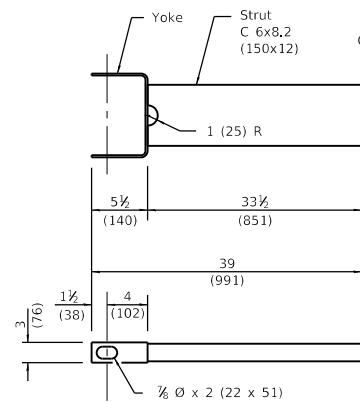


ELEVATION

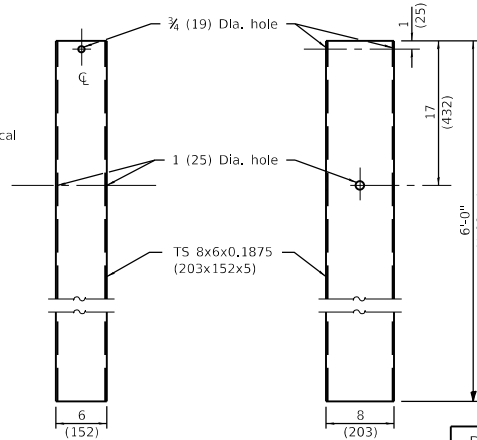


YOKE

3/16 (8) thick steel



CABLE STRUT



FRONT

SIDE

STEEL TUBE

GENERAL NOTES

See Standard 630001 for details of guardrail not shown.

The bearing plate K shall be held in position by two eight penny nails driven into the post and bent over the top of the plate.

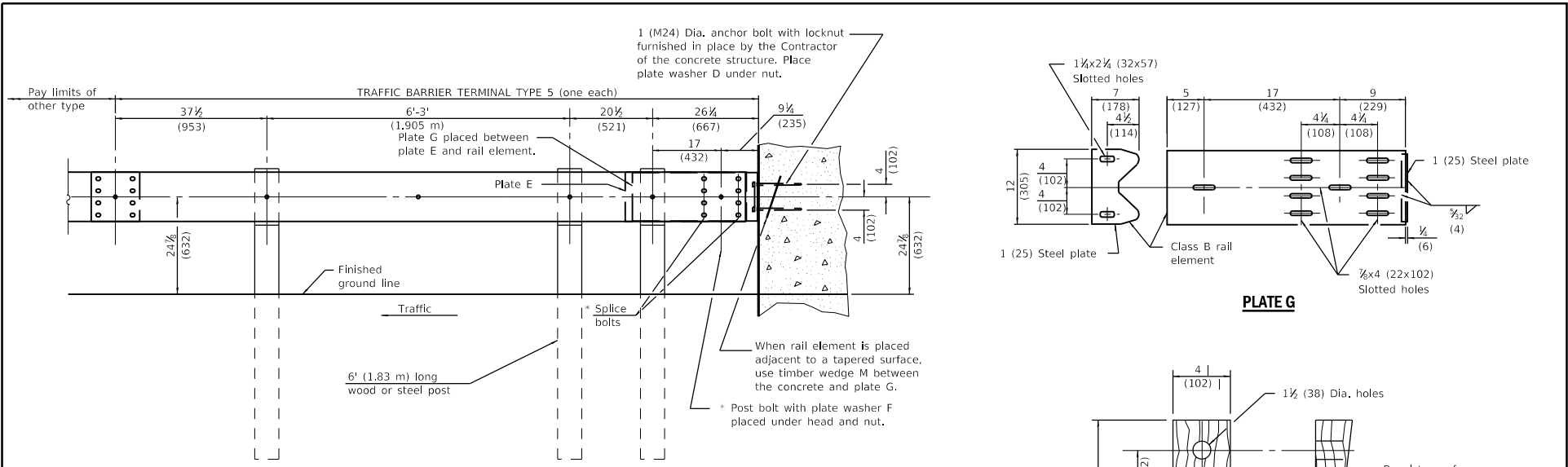
All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-17	Revised wood post length and hole spacing.
1-1-13	Corrected metric dimension for BEARING PLATE K. Changed pipe dia. in wood post.

TRAFFIC BARRIER TERMINAL, TYPE 2

STANDARD 631011-10

Illinois Department of Transportation
 PASSED January 1, 2017
 Michael Beard
 ENGINEER OF POLICY AND PROCEDURES
 APPROVED January 1, 2017
 Maureen M. Behr
 ENGINEER OF DESIGN AND ENVIRONMENT



TYPE 5 - CONCRETE BRIDGE PARAPET

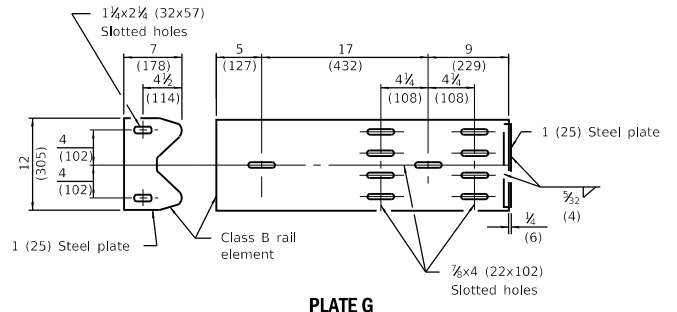
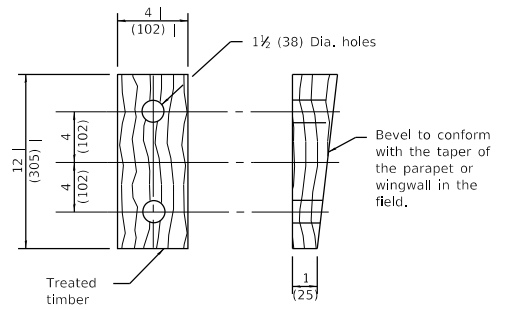


PLATE G



WEDGE M

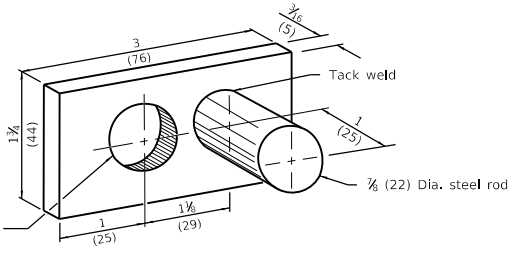
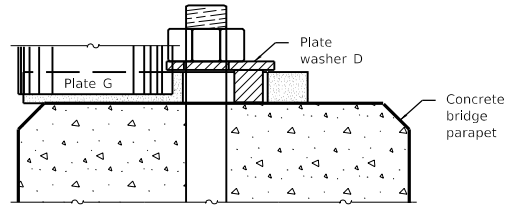


PLATE WASHER D



PLACEMENT OF PLATE WASHER D

(PLAN)

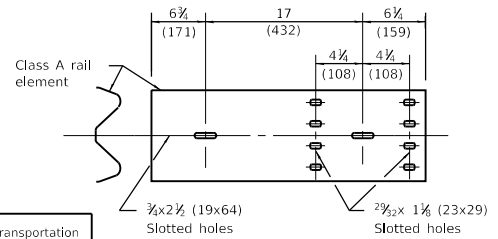


PLATE E

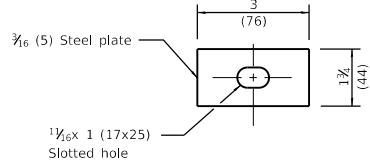


PLATE WASHER F

GENERAL NOTES

Install plate washer D so the 1 (25) projection fills the remainder of the slotted holes in the 1 (25) end plate on plate G after the 1 (M24) dia. bolts are in place.

* When an expansion joint exists below the connector, bolts shall be provided with a locknut or double nuts and shall be tightened only to a point that will allow plate G to be free to move.

See Standard 630001 for details of guardrail not shown.

All dimensions are in inches (millimeters) unless otherwise shown.

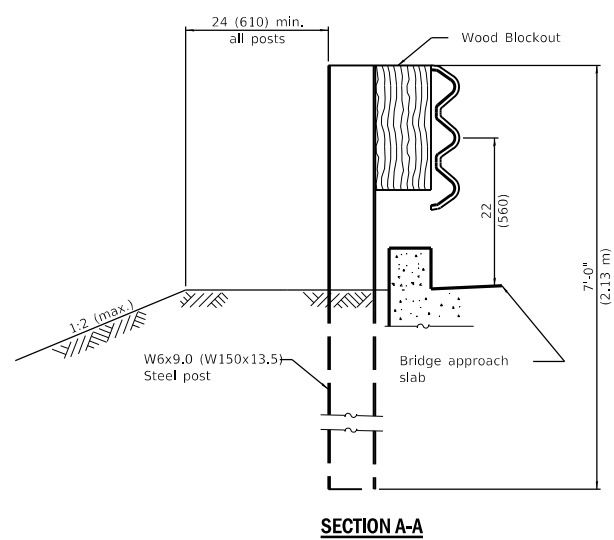
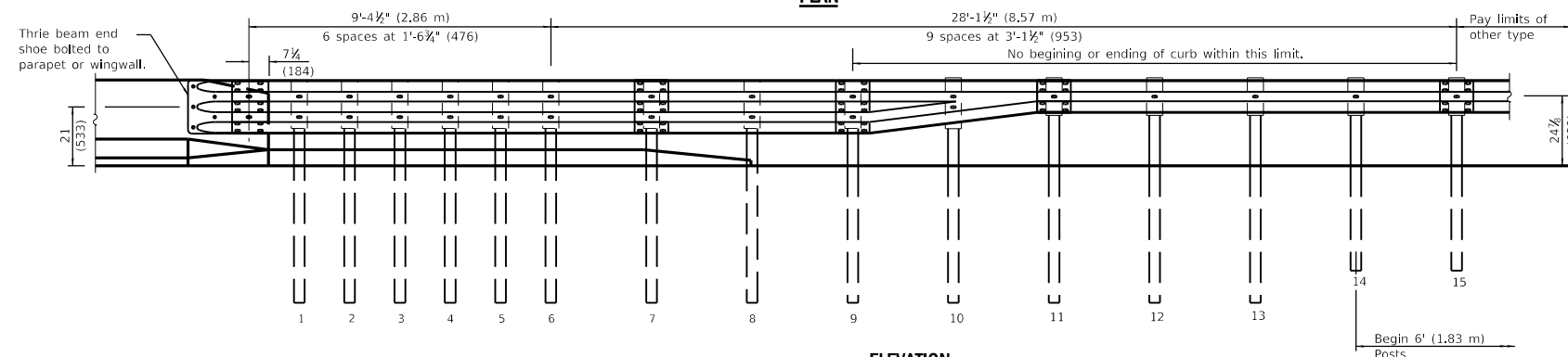
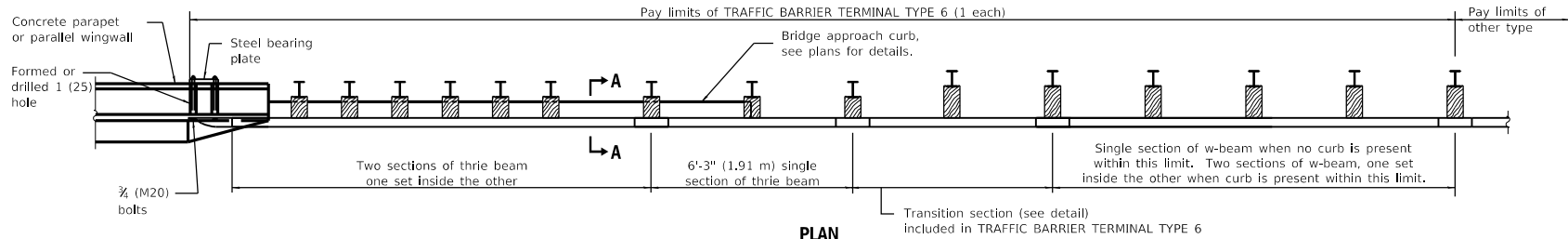
Illinois Department of Transportation
 PASSED January 1, 2015
 Michael Beard
 ENGINEER OF POLICY AND PROCEDURES
 APPROVED January 1, 2015
 ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-15	Revised post spacing dimensions on elevation.
1-1-09	Switched units to English (metric).

TRAFFIC BARRIER TERMINAL, TYPE 5

STANDARD 631026-06

PARAPET OR WINGWALL



GENERAL NOTES

See Standard 630001 for details of guardrail not shown.

Thrie beam rail shall be bolted to block-out at all posts.

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-17	Revised length of thrie beam. Revised length of posts.
4-1-16	Changed 'Bridge approach pavement' to 'Bridge approach slab'.

**TRAFFIC BARRIER
TERMINAL, TYPE 6**

(Sheet 1 of 3)

STANDARD 631031-15

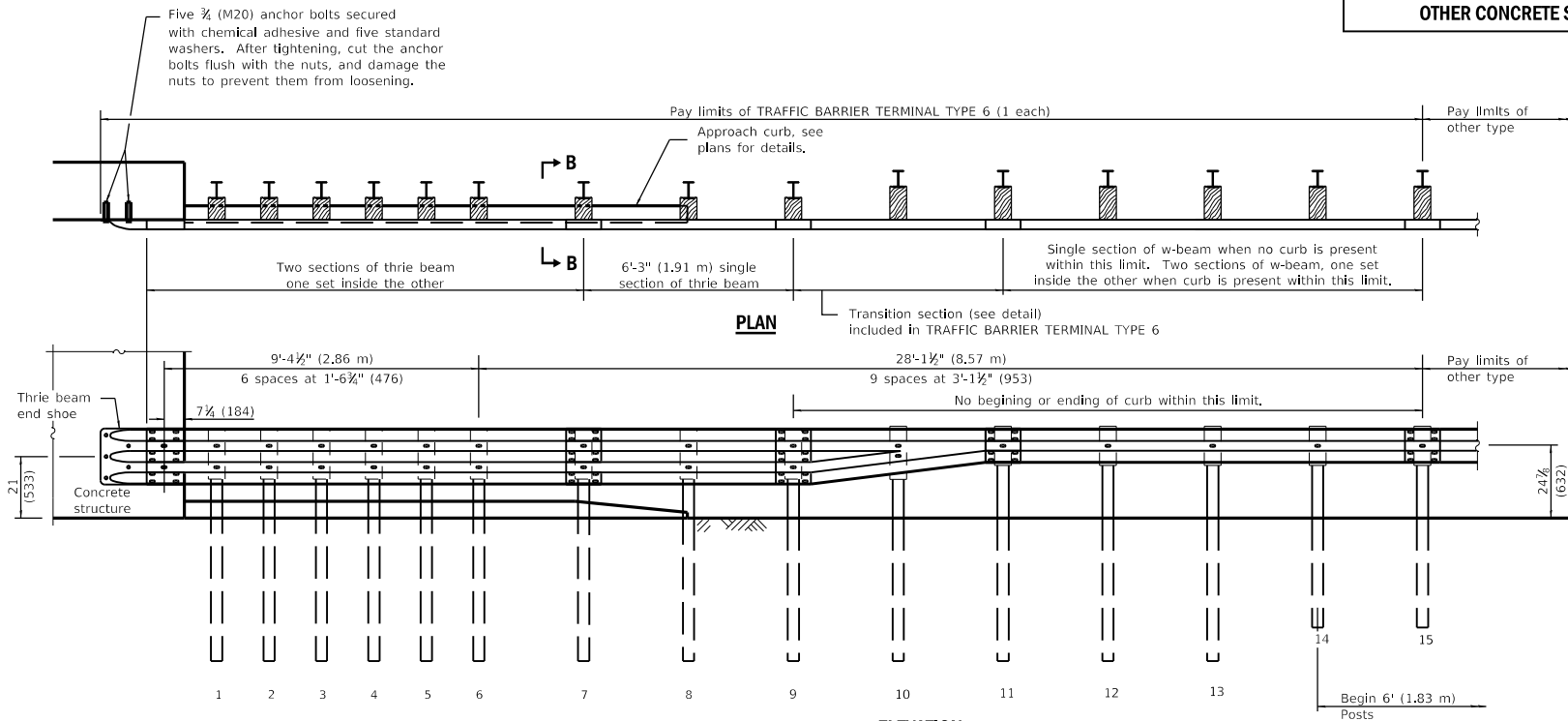
Illinois Department of Transportation

PASSED January 1, 2017
Michael Beard
 ENGINEER OF POLICY AND PROCEDURES

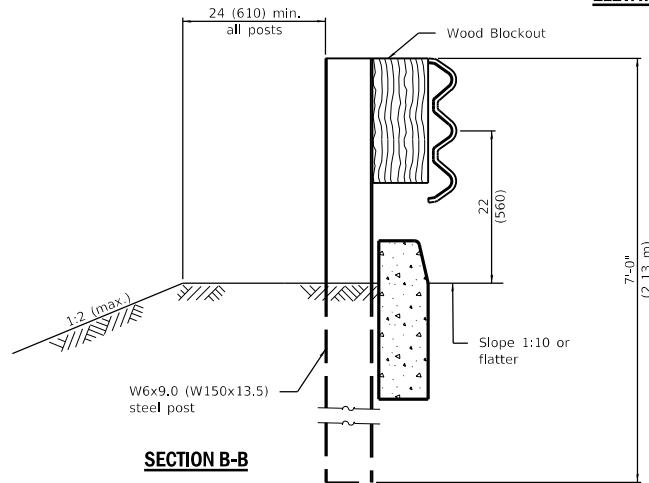
APPROVED January 1, 2017
Maureen M. Behr
 ENGINEER OF DESIGN AND ENVIRONMENT

469-1-1 Q3/ISS/1

OTHER CONCRETE STRUCTURE



ELEVATION



SECTION B-B

**TRAFFIC BARRIER
TERMINAL, TYPE 6**

(Sheet 2 of 3)

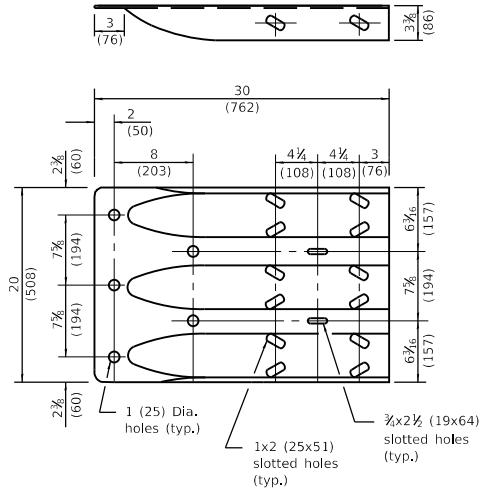
STANDARD 631031-15

Illinois Department of Transportation

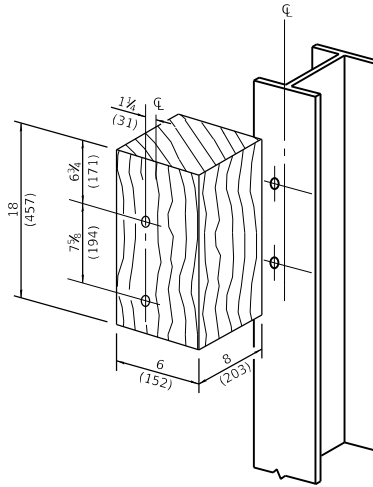
PASSED January 1, 2017
Michael Beard
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2017
Maureen M. O'Connell
ENGINEER OF DESIGN AND ENVIRONMENT

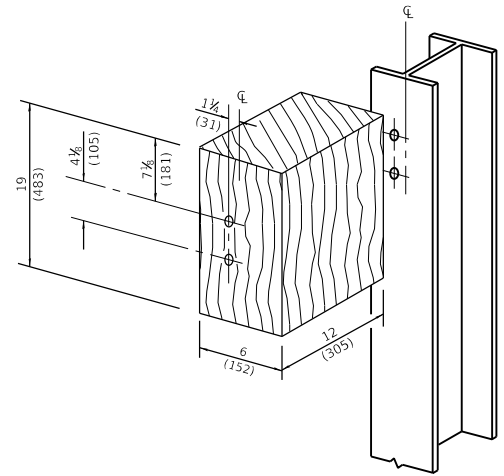
LEGISLATIVE COUNSEL



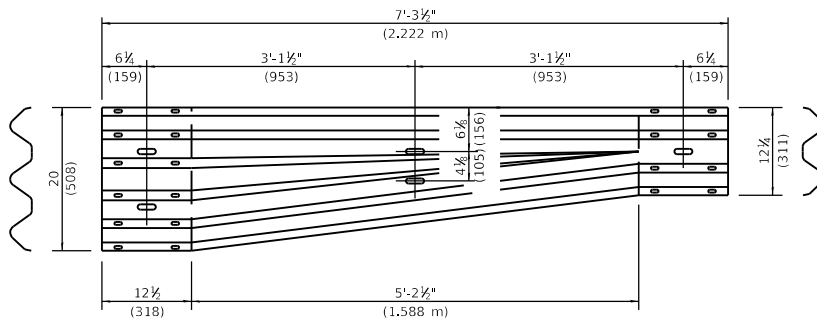
THRIE BEAM END SHOE DETAIL



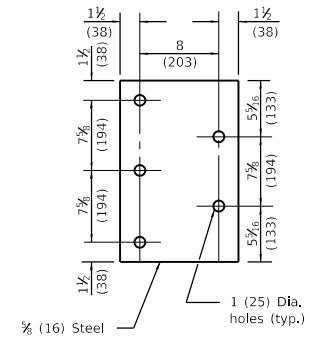
POSTS 1-9 WOOD BLOCKOUT DETAIL



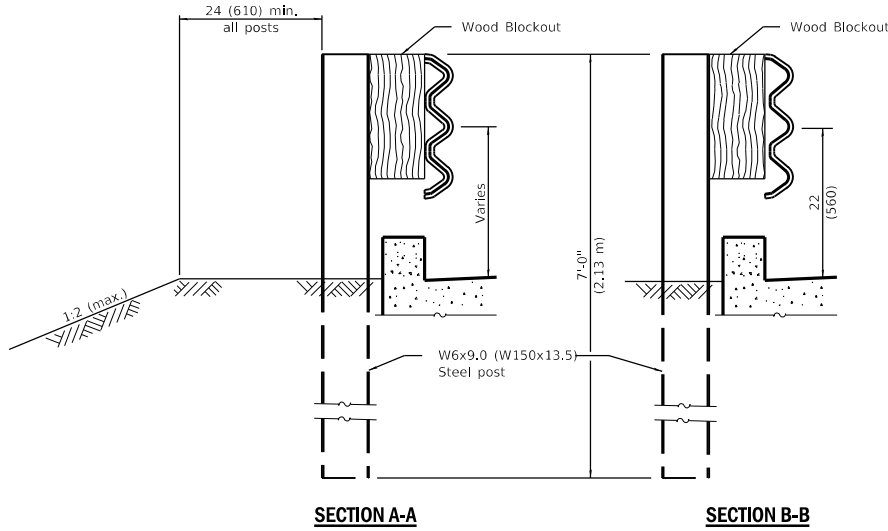
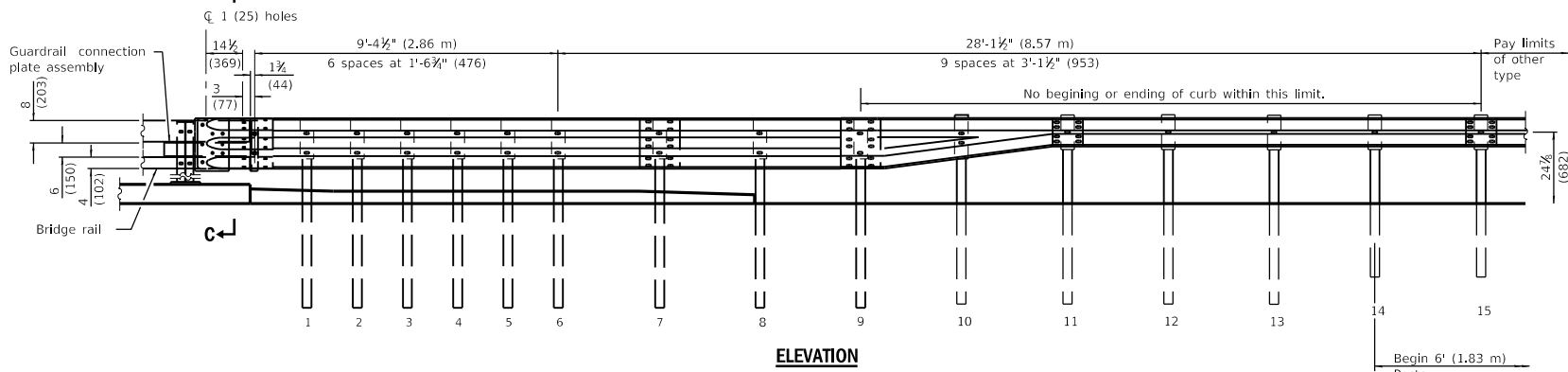
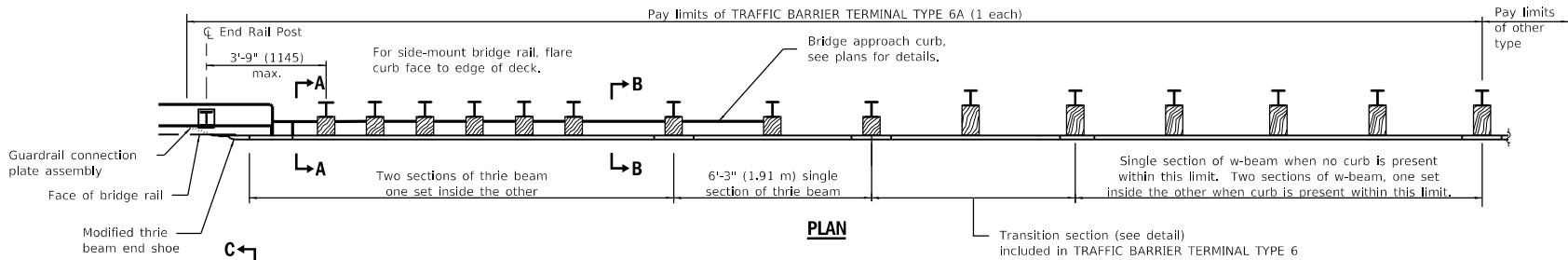
POST 10 WOOD BLOCKOUT DETAIL
(See Standard 630001 for post 11-15 blockouts.)



TRANSITION SECTION
(10 gauge (3.4) rail element)



PARAPET STEEL BEARING PLATE DETAIL
(5 each individual 5x5x1/2 (125x125x16) steel plates with centered 1 (25) holes may be substituted for the plate shown.)



GENERAL NOTES

This standard shows attachment to curb mounted bridge rail. Attachment to side mounted bridge rail is similar.

See Standard 630001 for details of guardrail not shown.

Thrie beam rail shall be bolted to block-out at all posts.

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-17	Revised length of thrie beam. Revised length of posts.
1-1-13	Added note to see plans for bridge approach curb details.

**TRAFFIC BARRIER
TERMINAL, TYPE 6A**

(Sheet 1 of 3)

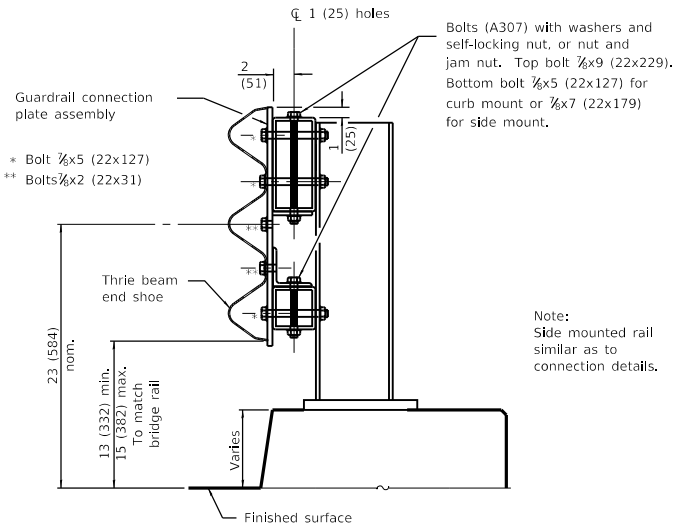
STANDARD 631032-09

Illinois Department of Transportation

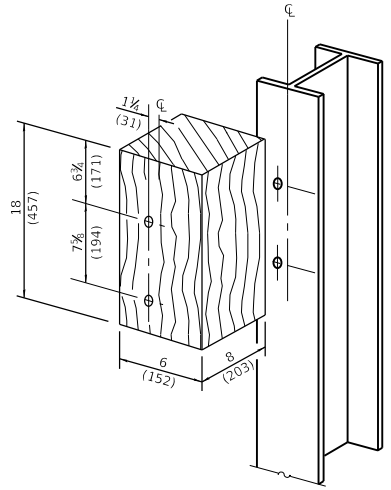
PASSED January 1, 2017
Michael Beard
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2017
Maureen M. Behr
ENGINEER OF DESIGN AND ENVIRONMENT

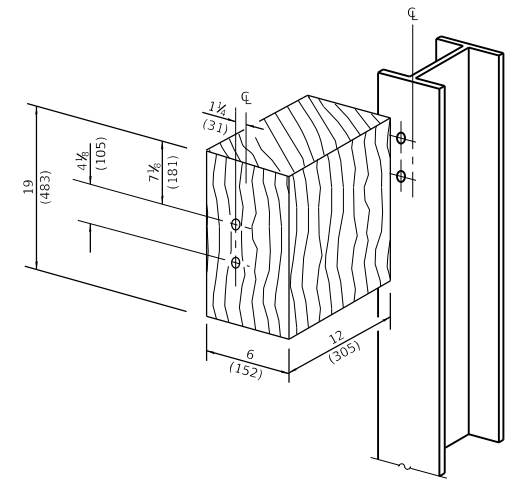
END-C-1 03/15/11



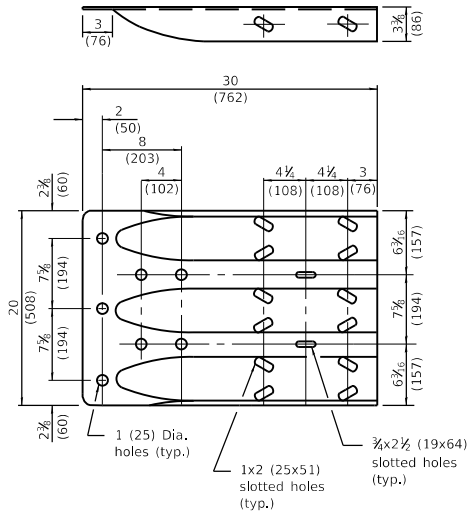
SECTION C-C



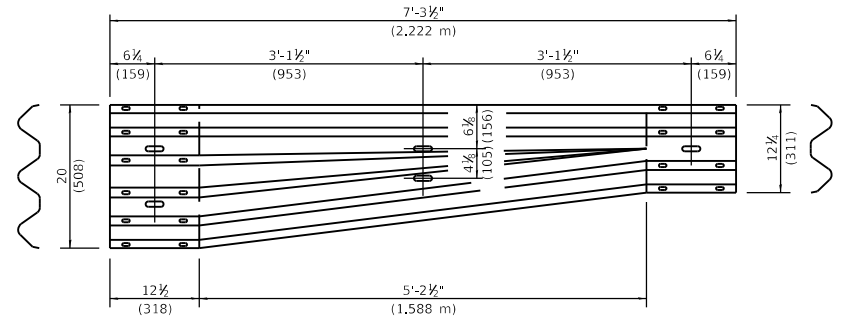
POSTS 1-9 WOOD BLOCKOUT DETAIL



POST 10 WOOD BLOCKOUT DETAIL
 (See Standard 630001 for post 11-15 blockouts.)



MODIFIED THRIE BEAM END SHOE DETAIL



TRANSITION SECTION
 (10 gauge (3.4) rail element)

Illinois Department of Transportation

PASSED January 1, 2017
Michael Beard
 ENGINEER OF POLICY AND PROCEDURES

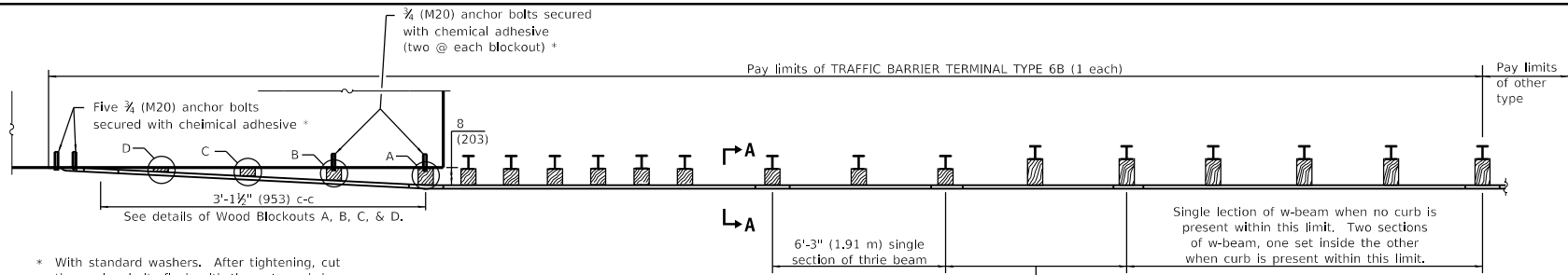
APPROVED January 1, 2017
Maureen M. Bello
 ENGINEER OF DESIGN AND ENVIRONMENT

END-C-1 03/ISS/1

**TRAFFIC BARRIER
 TERMINAL, TYPE 6A**

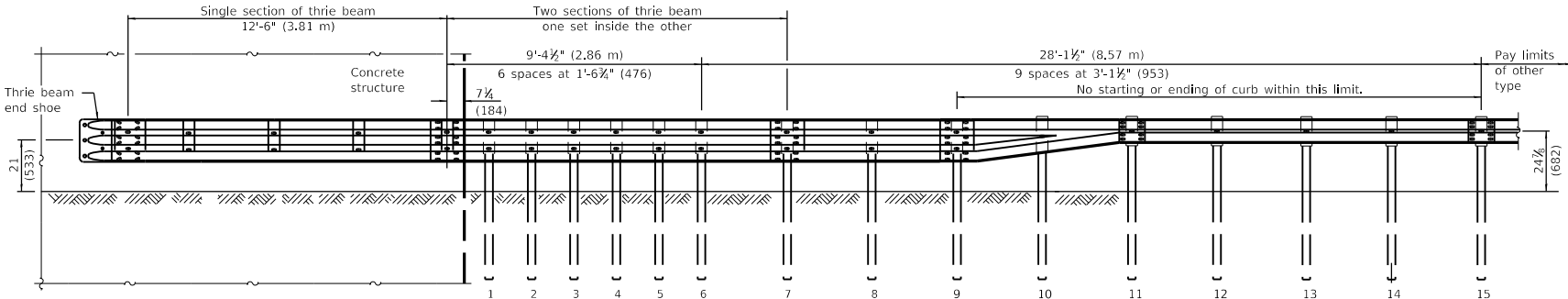
(Sheet 2 of 3)

STANDARD 631032-09

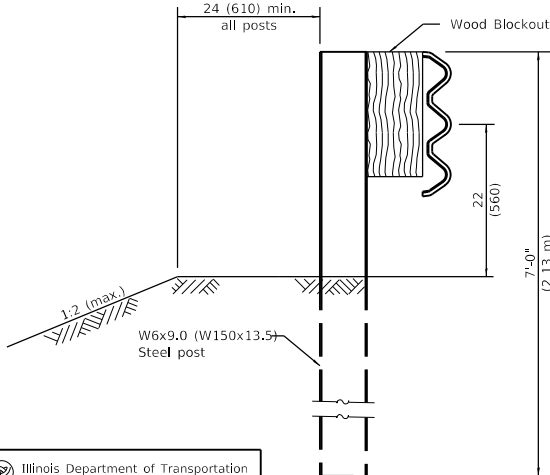


* With standard washers. After tightening, cut the anchor bolts flush with the nuts and damage the nuts to prevent them from loosening.

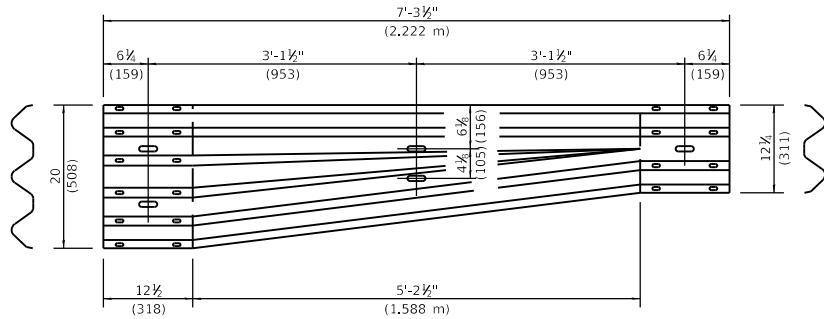
PLAN



ELEVATION



SECTION A-A



TRANSITION SECTION
(10 gauge (3.4) rail element)

GENERAL NOTES

- See Standard 630001 for details of guardrail not shown.
- Thrie beam rail shall be bolted to block-out at all posts.
- All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).
- All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-17	Revised length of thrie beam. Revised length of posts.
1-1-15	Revised notes for attachment to concrete structure.

**TRAFFIC BARRIER
TERMINAL, TYPE 6B**

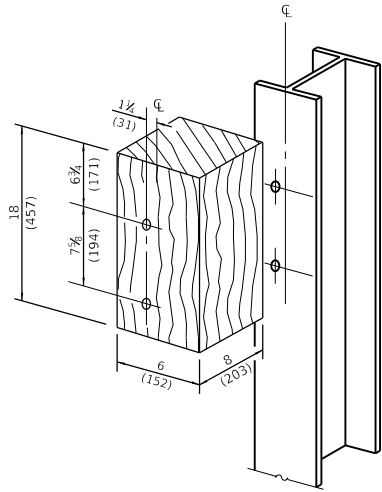
(Sheet 1 of 2)

STANDARD 631033-07

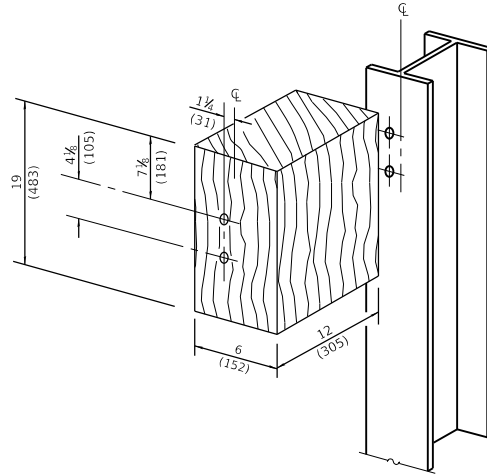
Illinois Department of Transportation

PASSED January 1, 2017
Michael Beard
ENGINEER OF POLICY AND PROCEDURES

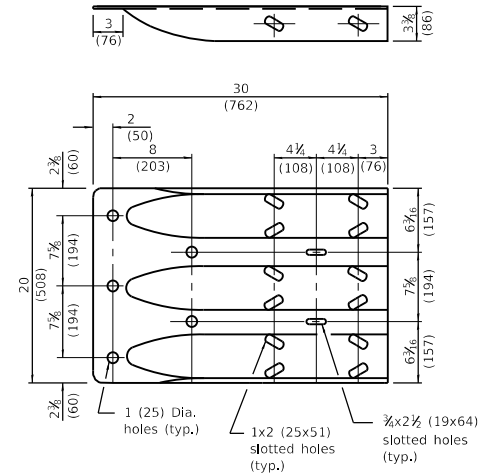
APPROVED January 1, 2017
Maureen M. O'Brien
ENGINEER OF DESIGN AND ENVIRONMENT



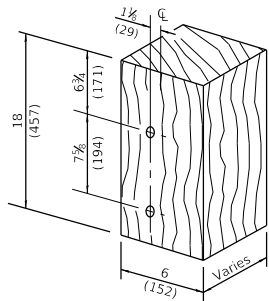
POSTS 1-9 WOOD BLOCKOUT DETAIL



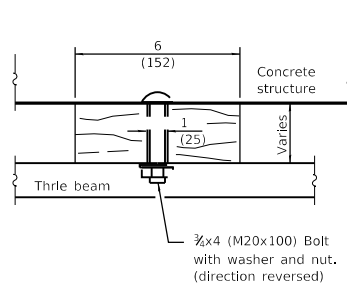
POST 10 WOOD BLOCKOUT DETAIL
(See Standard 630001 for post 11-15 blockouts.)



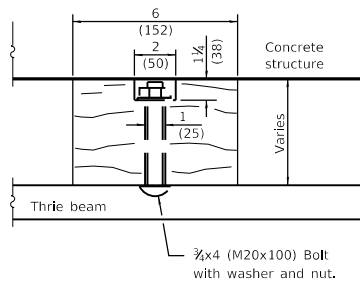
THRIE BEAM END SHOE DETAIL



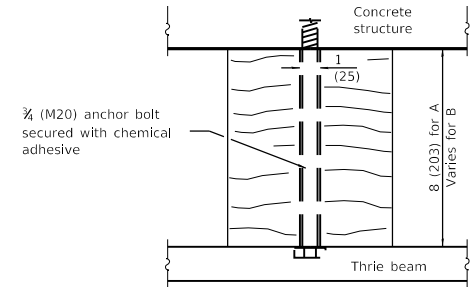
MODIFIED THICKNESS DETAIL
WOOD BLOCKOUTS A, B, C, & D



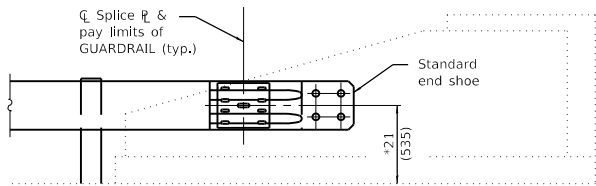
WOOD BLOCKOUT D



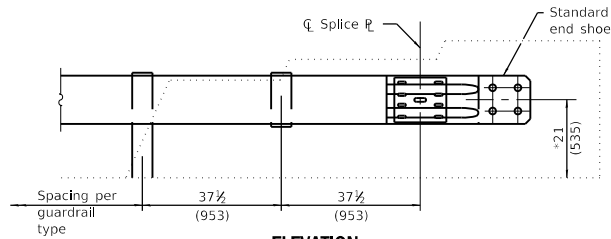
WOOD BLOCKOUT C



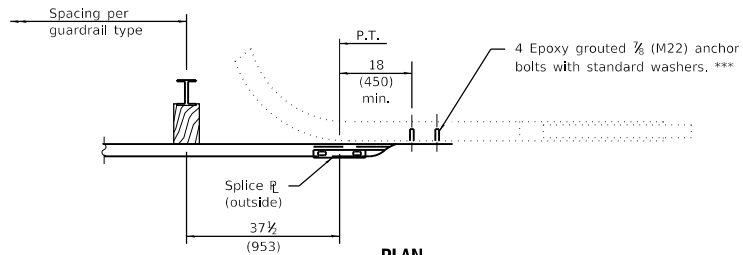
WOOD BLOCKOUT A & B



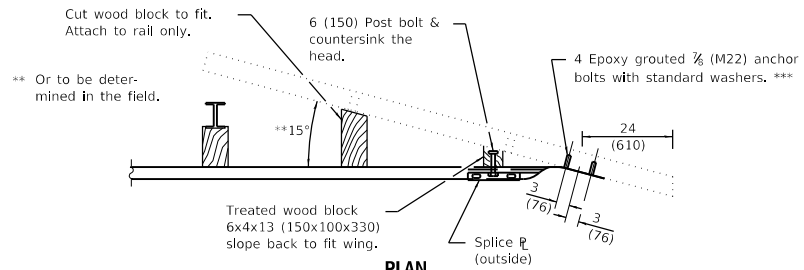
ELEVATION



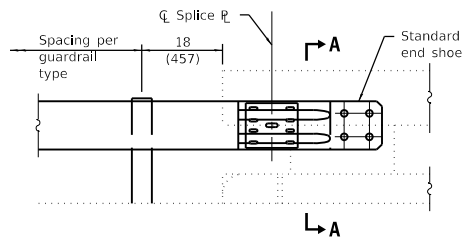
ELEVATION



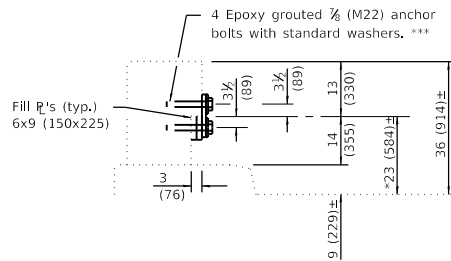
PLAN CURVED WING



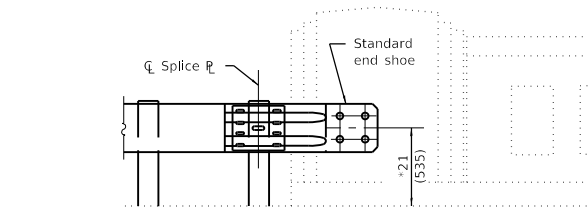
PLAN FLARED WING



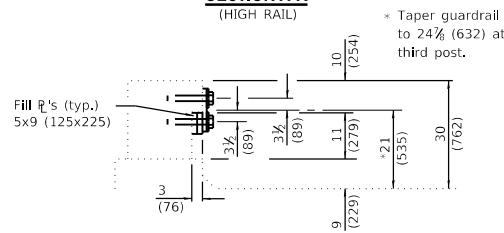
ELEVATION



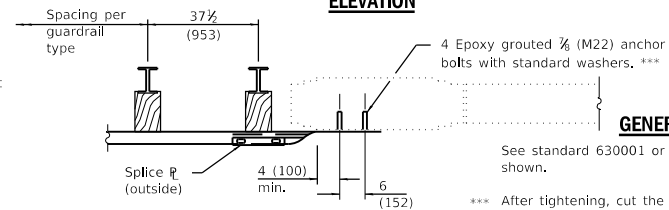
SECTION A-A (HIGH RAIL)



ELEVATION



SECTION A-A (LOW RAIL)



PLAN CONCRETE HANDRAIL

GENERAL NOTES

See standard 630001 or details of guardrail not shown.

*** After tightening, cut the anchor bolts flush with nuts, and damage the bolt head to prevent it from loosening.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2009

ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009

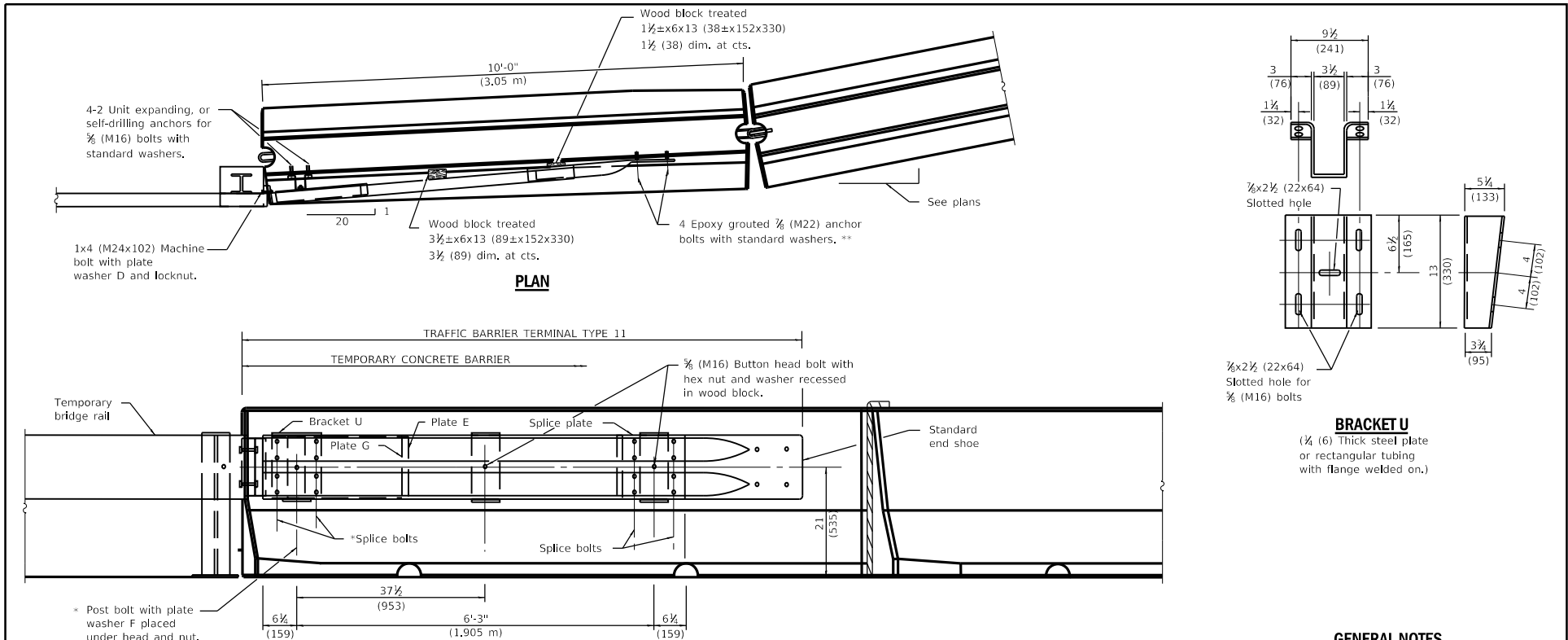
ENGINEER OF DESIGN AND ENVIRONMENT

REINFORCED CONCRETE HANDRAIL

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-07	Changes adopted to implement the Midwest Guardrail System.

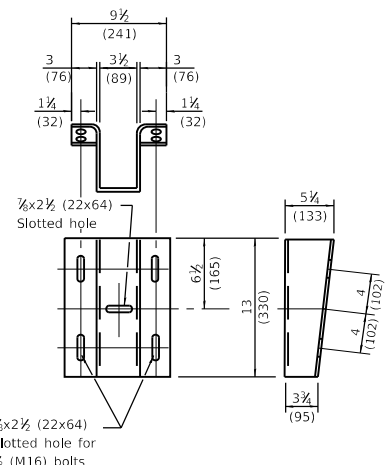
TRAFFIC BARRIER TERMINAL, TYPE 10

STANDARD 631046-04



PLAN

ELEVATION



BRACKET U
(3/8 (6) Thick steel plate or rectangular tubing with flange welded on.)

GENERAL NOTES
For details of guardrail not shown, see Standard 630001.

Install the face of the guardrail flush with the face of the temporary bridge rail. Install plate washer D so that the 1 (25) projection fills the remainder of the slotted holes in the 1 (25) end plate on plate G after the 1 (M24) diameter bolts are in place.

* Bolts shall be provided with a lock nut or double nut and shall be tightened only to a point that will allow plate G to be free to move.

** After tightening, cut the anchor bolts flush with nuts, and damage the bolt head to prevent them from loosening.

All dimensions are in inches (millimeters) unless otherwise shown.

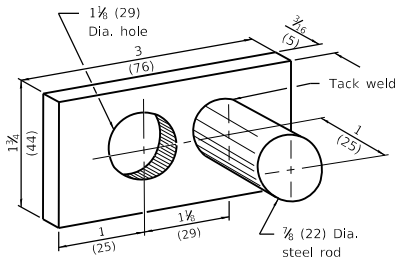


PLATE WASHER D

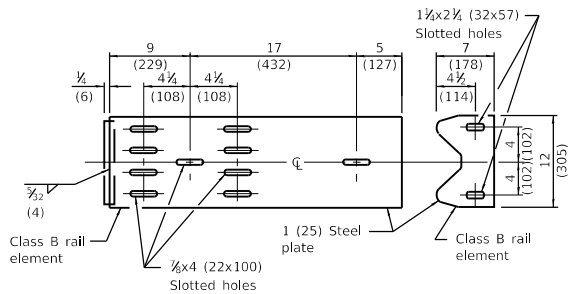


PLATE G
(Place between the rail element and Plate E)

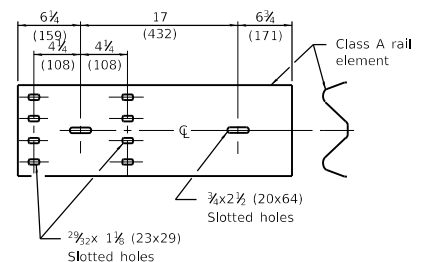


PLATE E

Illinois Department of Transportation

PASSED January 1, 2011
Michael Beard
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2011
Scott Smith
ENGINEER OF DESIGN AND ENVIRONMENT

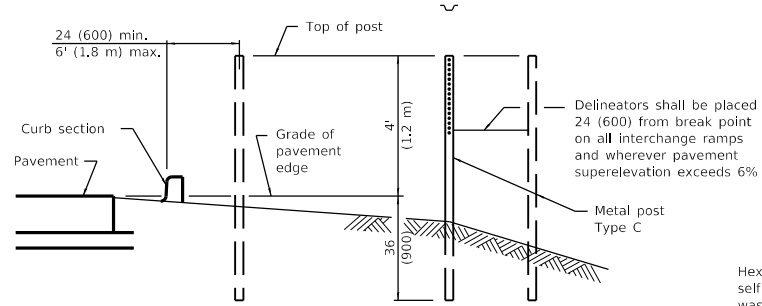
DATE	REVISIONS
1-1-11	Corrected weld symbol on PLATE G detail.
1-1-09	Switched units to English (metric).

**TRAFFIC BARRIER
TERMINAL TYPE 11**

STANDARD 631051-03

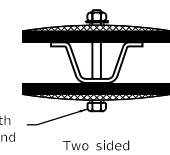
**SPACING FOR DELINEATORS
ON HORIZONTAL CURVES**

Radius of Curve Feet (m)	Spacing on Curve Feet (m)	Spacing in Advance and Beyond Curve Feet (m)		
		1st. Space	2nd. Space	3rd. Space
Less than 100 (30)	20 (5)	40 (10)	65 (20)	125 (40)
100 - 174 (30 - 54)	30 (10)	60 (20)	90 (25)	180 (55)
175 - 224 (55 - 69)	35 (10)	70 (20)	110 (35)	200 (60)
225 - 274 (70 - 84)	40 (10)	85 (25)	125 (40)	200 (60)
275 - 349 (85 - 104)	50 (15)	95 (30)	145 (45)	200 (60)
350 - 449 (105 - 134)	55 (15)	110 (35)	170 (50)	200 (60)
450 - 549 (135 - 164)	65 (20)	125 (40)	190 (60)	200 (60)
550 - 649 (165 - 199)	70 (20)	140 (45)	200 (60)	200 (60)
650 - 749 (200 - 229)	75 (25)	150 (45)	200 (60)	200 (60)
750 - 849 (230 - 259)	80 (25)	165 (50)	200 (60)	200 (60)
850 - 949 (260 - 289)	85 (25)	175 (55)	200 (60)	200 (60)
950 - 1049 (290 - 319)	90 (25)	185 (55)	200 (60)	200 (60)
1050 - 1299 (320 - 394)	100 (30)	200 (60)	200 (60)	200 (60)
1300 - 1999 (395 - 609)	125 (40)	200 (60)	200 (60)	300 (90)
2000 - 2999 (610 - 914)	150 (45)	200 (60)	200 (60)	300 (90)
3000 - 3999 (915 - 1219)	175 (55)	200 (60)	300 (90)	300 (90)
4000 or greater (1220)	400 (120)	400 (120)	400 (120)	400 (120)

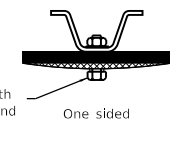


SECTIONAL VIEW

Hex head bolt with self locking nut and washer

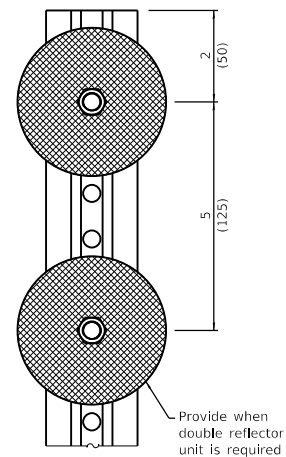


Two sided



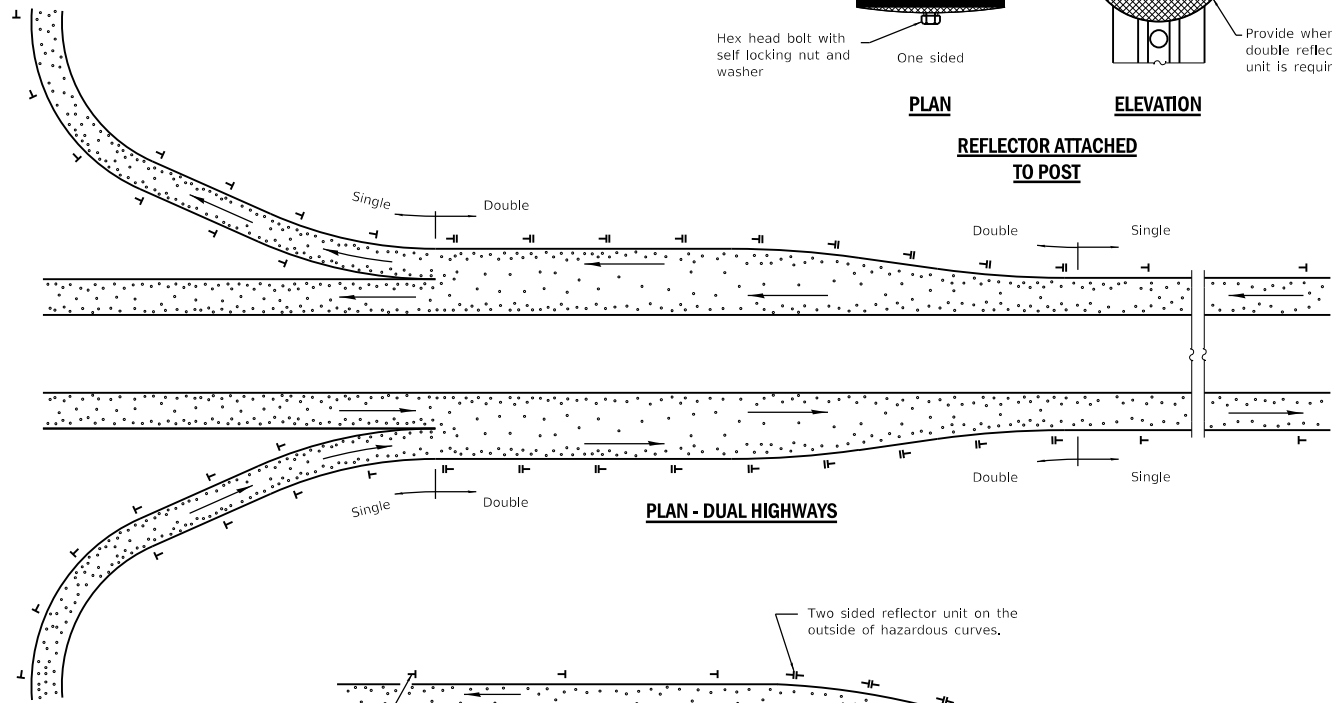
One sided

PLAN

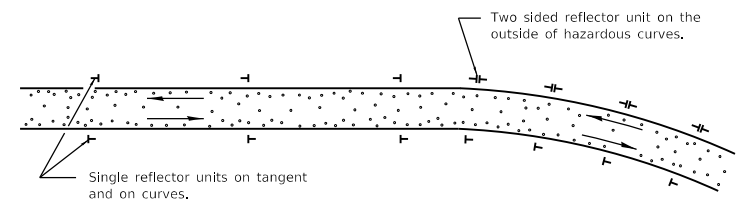


ELEVATION

REFLECTOR ATTACHED TO POST



PLAN - DUAL HIGHWAYS



PLAN - TWO-WAY ROADWAYS

GENERAL NOTES

Delineators on tangent sections of main line roadways shall be placed at 400' (120 m) spacing. Delineators on ramps and acceleration and deceleration lanes shall be placed at a maximum spacing of 100' (30 m).

Refer to Standard 720011 for details of metal post.

Double reflector units shall be used on the outside of all acceleration and deceleration lanes. Single reflector units shall be used on ramps. Delineators shall be used on outside of all curved sections of ramps.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED April 1, 2009
ENGINEER OF OPERATIONS

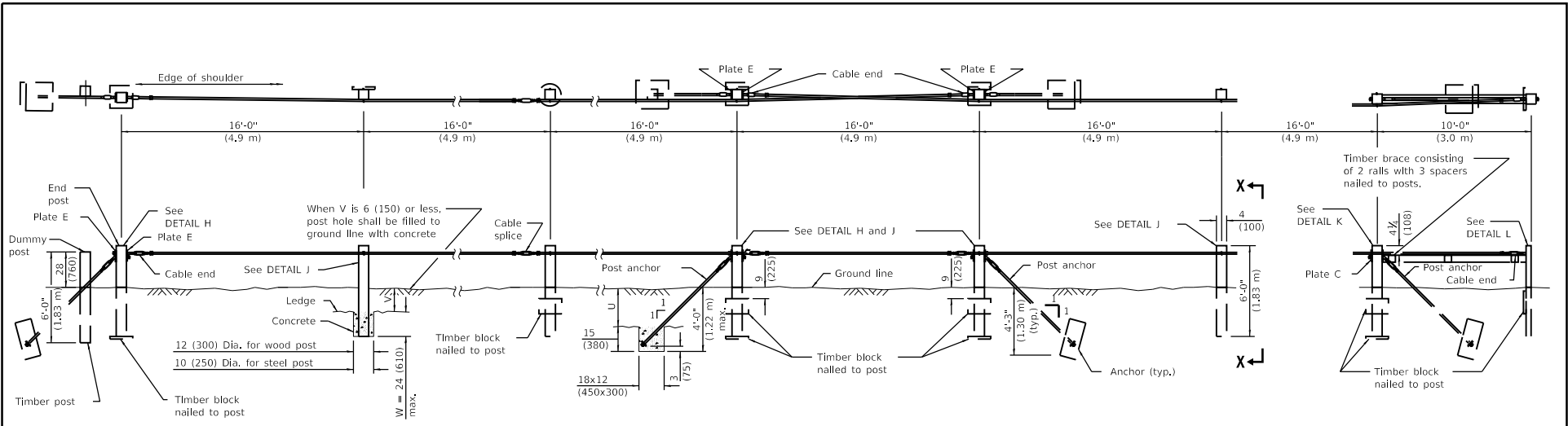
APPROVED April 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT

LEG-C OMISS

DATE	REVISIONS
4-1-16	Added detail of reflector attached to post. Revised signature block.
1-1-09	Switched units to English (metric). Revised notes.

DELINEATORS

STANDARD 635001-02



END ANCHOR ARRANGEMENT

TYPICAL FOOTINGS FOR POST AND ANCHOR WHEN IMPERVIOUS MATERIAL IS ENCOUNTERED

INTERMEDIATE ANCHOR ARRANGEMENT

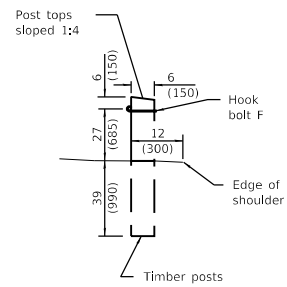
DEAD END ANCHOR ARRANGEMENT

NOTES

V + W shall not exceed 39 (990). When V is 0 to 15 (380), W = 24 (610), and posts shall be shortened as required. When V exceeds 15 (380), W shall be shortened correspondingly.

T = 15 (380) when U is 33 (840) or less. When U exceeds 33 (840) the impervious material shall be removed and the standard anchor shall be used.

Timber blocks shall be nailed to each wood post on the concave side of curve for curves having a radius of less than 600' (180 m).



VIEW X-X

Typical Wood Materials	
Item	Size
Post	4x4x6'-0" (100x150x1.83 m)
Block	2x12x18 (50x300x450)
Rail	2x6 (50x150)
Spacer	2x6x6 (50x150x150)

GENERAL NOTES

The Engineer will determine the stability of the impervious material for anchoring.

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2009

APPROVED January 1, 2009

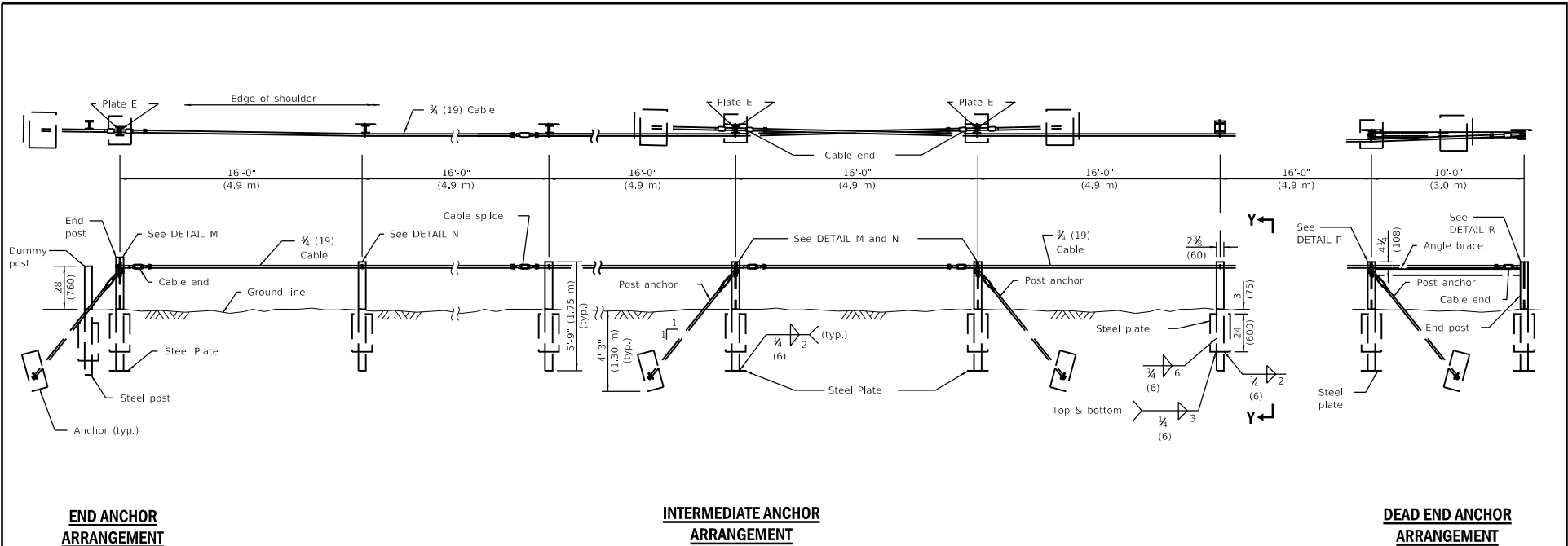
ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-09	Switched units to Eng. (met.), omitted precast deadman and gen. note.
1-1-05	Corrected note on Post Anchor detail on sheet 3 of 3.

CABLE ROAD GUARD SINGLE STRAND

(Sheet 1 of 3)

STANDARD 636001-02

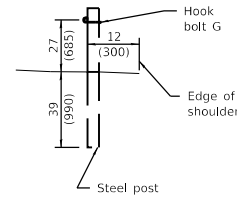


END ANCHOR ARRANGEMENT

INTERMEDIATE ANCHOR ARRANGEMENT

DEAD END ANCHOR ARRANGEMENT

TYPICAL STEEL MATERIALS	
Item	Size
Post	53x5.7x5'-9" (575x8.5x1.75 m)
Bottom Plate	1/4x8x8
Side Plate	1/4x8x24
Plate	(6x200x600)
Brace	L 4x3x3/8 (L 102x76x9.5)



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PASSED January 1, 2009

ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

**CABLE ROAD GUARD
SINGLE STRAND**

(Sheet 2 of 3)

STANDARD 636001-02

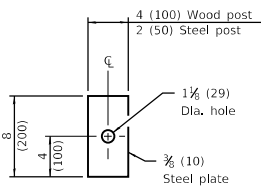


PLATE C

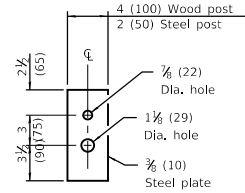
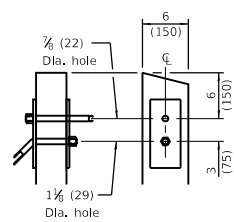
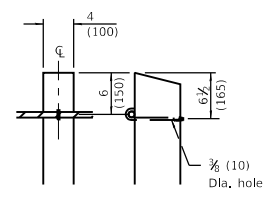


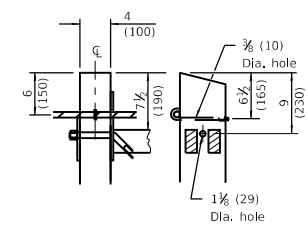
PLATE E



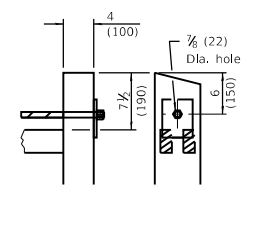
DETAIL H



DETAIL J



DETAIL K



DETAIL L

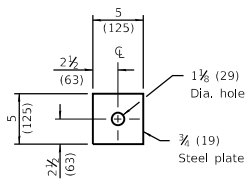


PLATE B

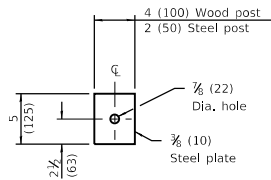
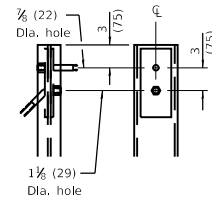
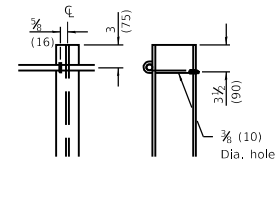


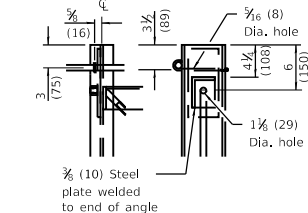
PLATE D



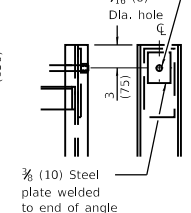
DETAIL M



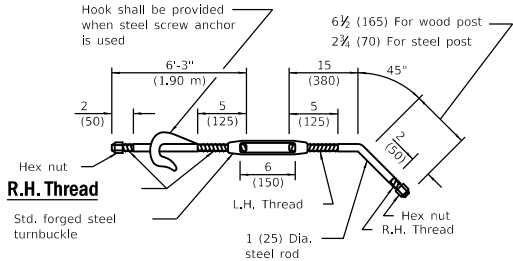
DETAIL N



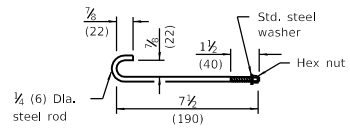
DETAIL P



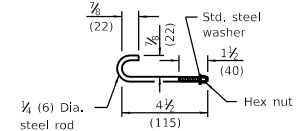
DETAIL R



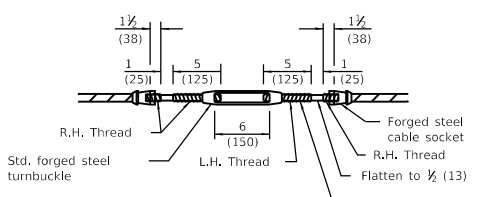
POST ANCHOR



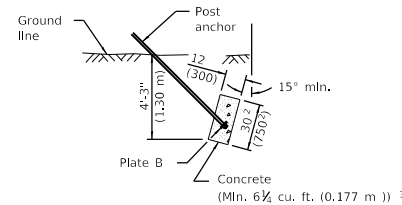
HOOK BOLT F



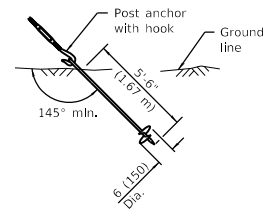
HOOK BOLT G



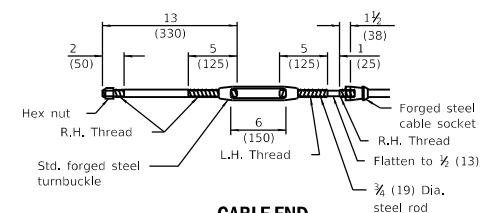
CABLE SPLICE



CAST IN PLACE DEADMAN



STEEL SCREW



CABLE END

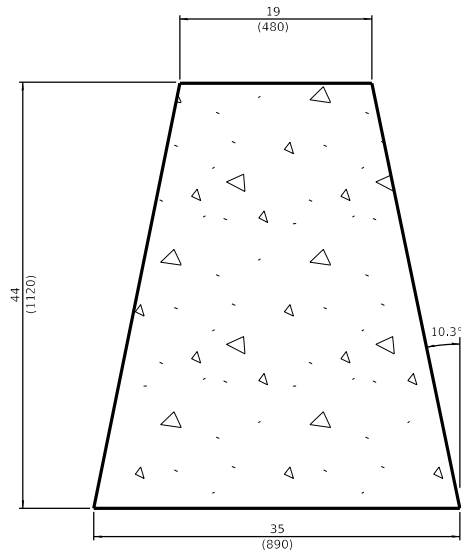
Illinois Department of Transportation
 PASSED January 1, 2009
 ENGINEER OF POLICY AND PROCEDURES
 APPROVED January 1, 2009
 ENGINEER OF DESIGN AND ENVIRONMENT

ALTERNATE - ANCHORS

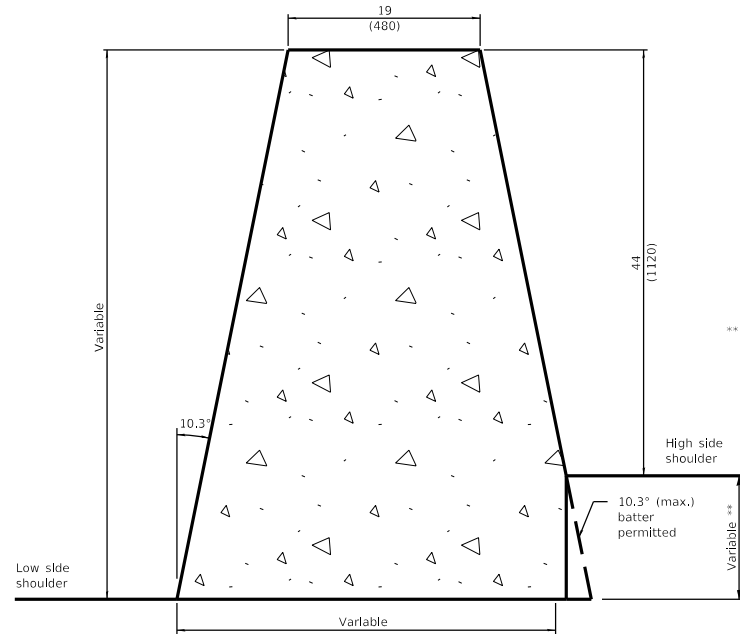
**CABLE ROAD GUARD
 SINGLE STRAND**

(Sheet 3 of 3)

STANDARD 636001-02

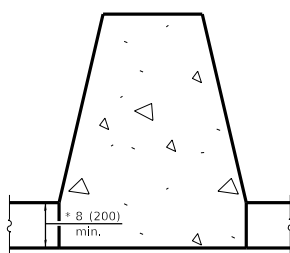


TYPICAL CROSS-SECTION



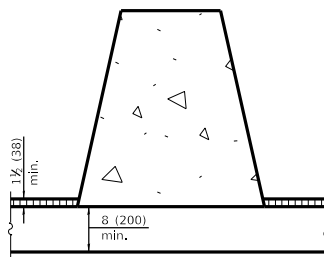
VARIABLE CROSS-SECTION

** When this dimension exceeds 12 (300), the barrier may be cast in two pours. No. 6 x 12 (No. 19 x 300) tie bars at 30 (760) centers, or a suitable keyway, shall be used between pours.

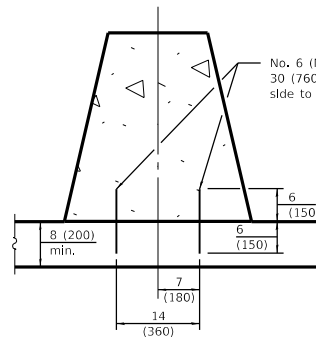


NEW MONOLITHIC PCC BASE

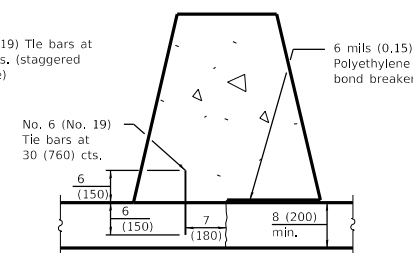
* This dimension shall be 10 (250) minimum when the barrier is confined by earth.



NEW OR EXISTING BIT./PCC BASE WITH OVERLAY CONFINEMENT



NEW OR EXISTING PCC BASE



EXISTING PCC BASE WITH LONGITUDINAL JOINT

GENERAL NOTES

The Variable Cross-Section shall be used when there is a difference in elevation between the two sides of the barrier.

See standard 836011 for additional light pole foundation details where required in concrete barrier.

All dimensions are in inches (millimeters) unless otherwise shown.

ANCHORING METHODS

Illinois Department of Transportation

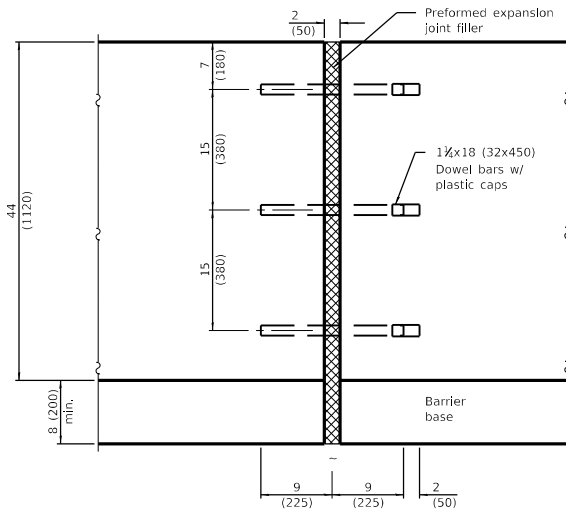
PASSED *Michael B. ...* January 1, 2019
 ENGINEER OF POLICY AND PROCEDURES

APPROVED *...* January 1, 2019
 ENGINEER OF DESIGN AND ENVIRONMENT

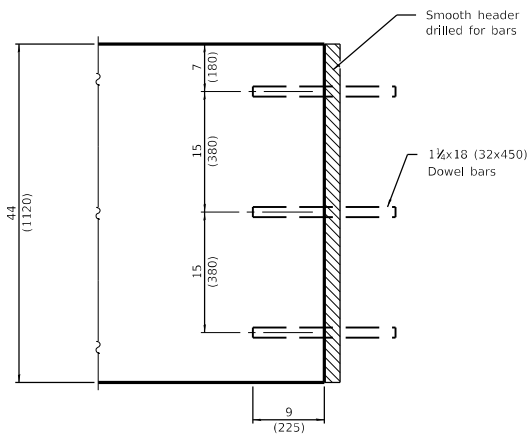
DATE	REVISIONS
1-1-19	Revised from F-shape to constant slope, increased height, and renamed standard.
1-1-13	Revised general note to reference standard 836006 for light pole foundation.

**CONCRETE BARRIER,
 DOUBLE FACE,
 44 in. (1120 mm) HEIGHT**
 (Sheet 1 of 2)

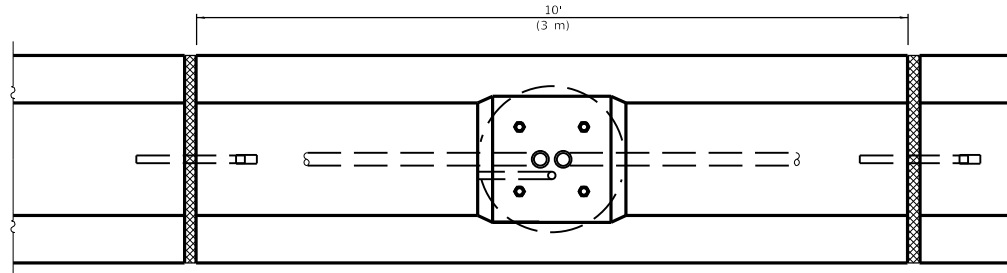
STANDARD 637006-04



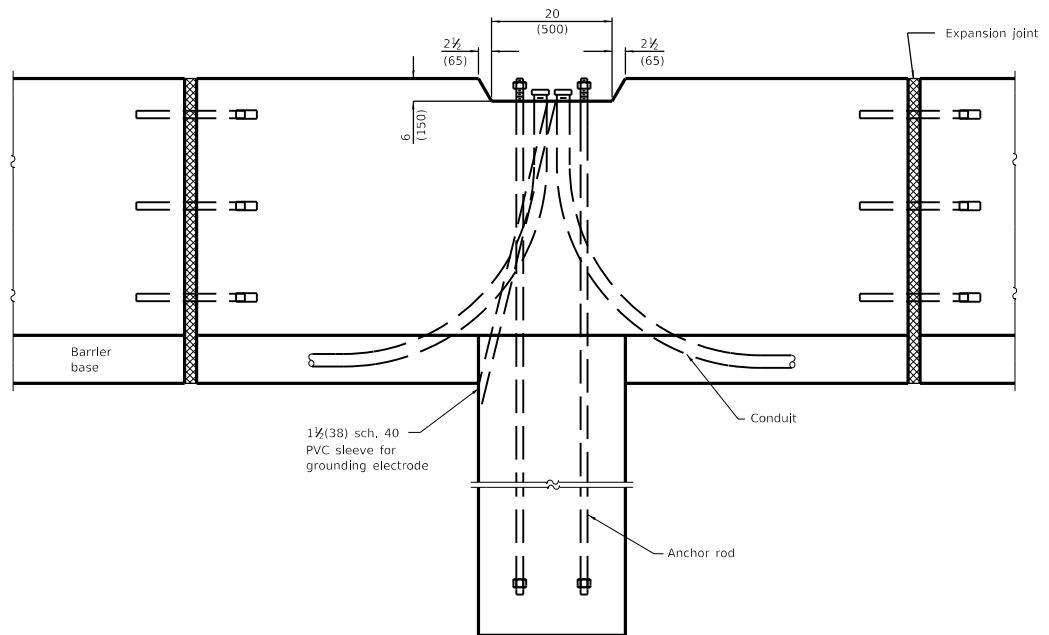
EXPANSION JOINT



CONSTRUCTION JOINT



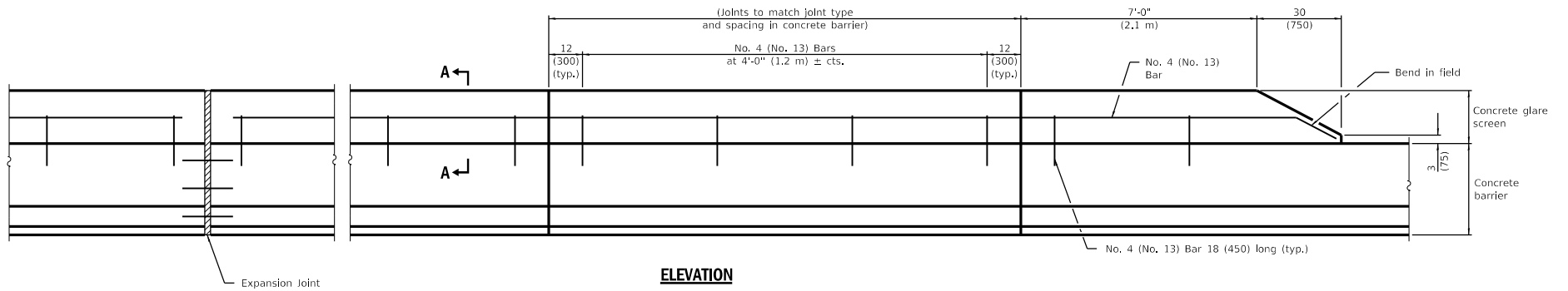
PLAN AT LIGHTING FOUNDATION



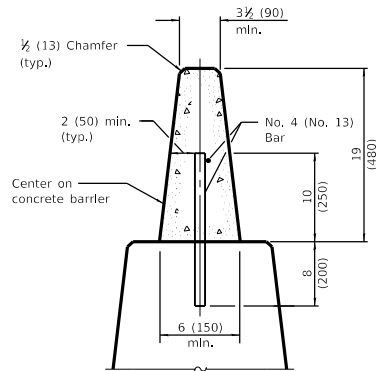
ELEVATION AT LIGHTING FOUNDATION

Illinois Department of Transportation
 PASSED *Michael B. ...* January 1, 2019
 ENGINEER OF POLICY AND PROCEDURES
 APPROVED *...* January 1, 2019
 ENGINEER OF DESIGN AND ENVIRONMENT

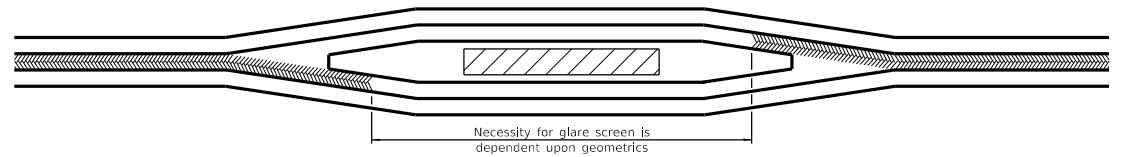
**CONCRETE BARRIER,
 DOUBLE FACE,
 44 in. (1120 mm) HEIGHT**
 (Sheet 2 of 2)
STANDARD 637006-04



ELEVATION



SECTION A-A



TYPICAL APPLICATION AT MEDIAN OBSTRUCTIONS

 Glare Screen

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2009

ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

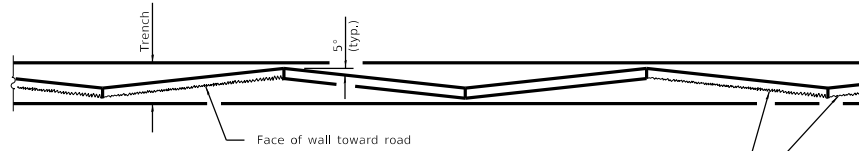
ISSUES

664-1-03/ISSUE

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-04	Revised for F shape barrier.

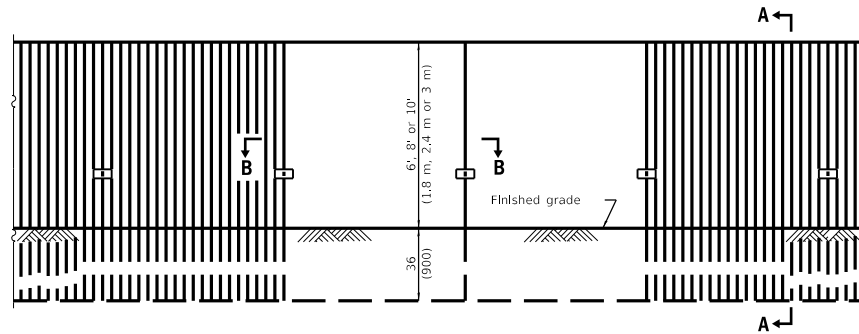
**CONCRETE
GLARE SCREEN**

STANDARD 638101-02

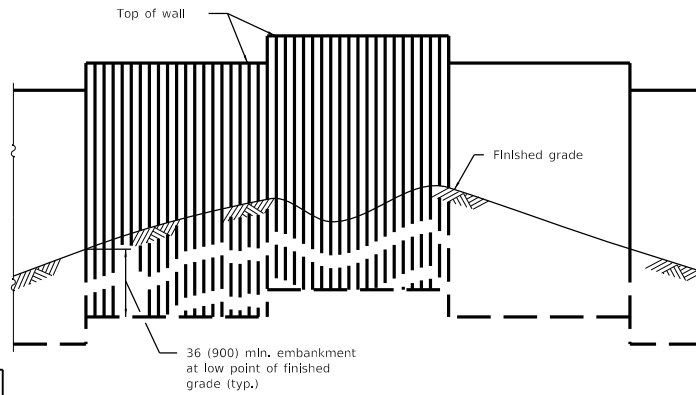


Each alternate pair of panels shall have a textured surface finish as shown, and shall be alternated with pairs having a smooth finish. The Intersection of every two panels having the same finish shall point toward the road as shown.

PLAN

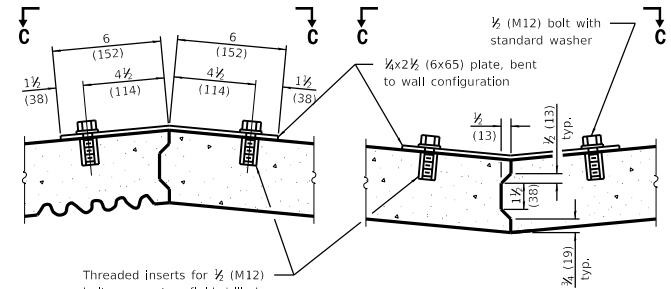


ELEVATION



ELEVATION

(Showing Installation of wall in irregular ground)

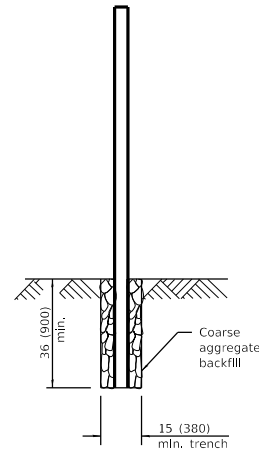


Threaded inserts for 1/2 (M12) bolts, precast or field drilled, as necessary, into panels.

Showing typical metal band connector dimensions

Showing typical shear key dimensions

SECTION B-B



SECTION A-A

GENERAL NOTES

Loading for 80 mph (130 km/h) wind with 30% gust factor, normal to wall.

ALLOWABLE STRESSES:

Concrete: $f'_c = 3,500$ psi (24 MPa)
 $f'_{ct} = 2,250$ psi (15 MPa)
 Prestressing Steel: $f'_s = 270,000$ psi (1860 MPa)
 $f_{sl} = 189,000$ psi (1300 MPa)
 Reinforcing Steel: $f_y = 40,000$ psi min. (270 MPa)
 Structural Steel: $f_s = 20,000$ psi (138 MPa)
 Minimum allowable soil bearing pressure: $= 1.25$ tsf (120 kPa)

All dimensions are in Inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-07	Soft converted metric reinforcement bars & corrected dimensions.

**SIGHT SCREEN
 PRECAST PRESTRESSED
 CONCRETE PANEL WALL**
 (Sheet 1 of 2)

STANDARD 639001-02

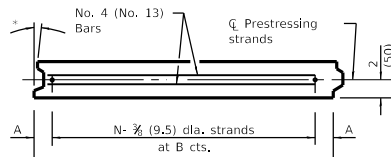
Illinois Department of Transportation

APPROVED January 1, 2009
Ralph E. Anderson
 ENGINEER OF BRIDGES AND STRUCTURES

APPROVED January 1, 2009
Lee E. Han
 ENGINEER OF DESIGN AND ENVIRONMENT

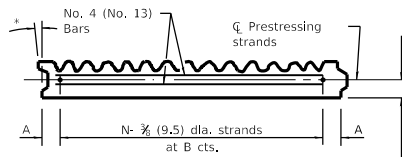
LEG-1 03/11/05

* 5" left or right as required by geometry of wall.



SECTION E-E

(For panels with smooth surface finish)

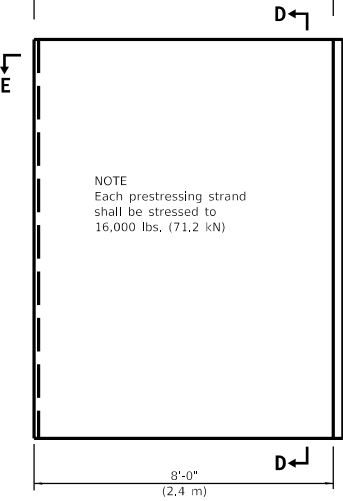


SECTION E-E

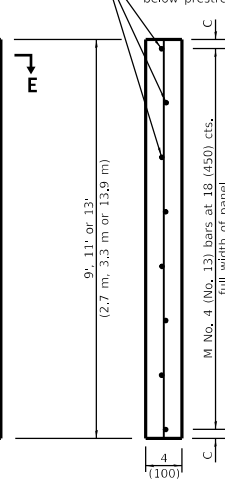
(For panels with textured surface finish)

No. 4 (No. 13) bars shall be alternated above and below prestressing strands.

1 3/8 (40) when 1 (25) surface ribs used
1 1/2 (45) when 3/4 (19) surface ribs used



ELEVATION

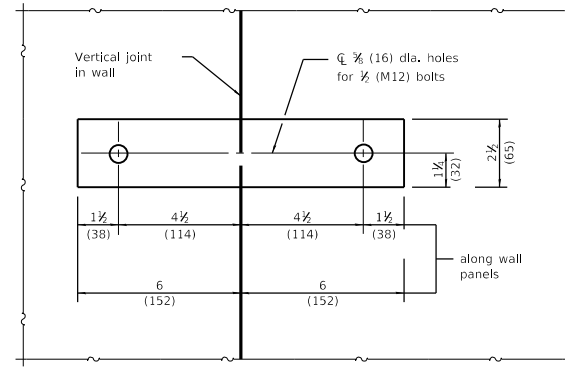


SEC. D-D

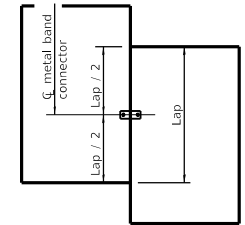
NOTE
Each prestressing strand shall be stressed to 16,000 lbs, (71.2 kN)

STRAND and REINFORCEMENT LAYOUT

Nominal Panel Size	A	N	B	C	M
8'-0" x 9'-0" (2.4 m x 2.7 m)	6 (150)	8	12 (300)	9 (225)	6
8'-0" x 11'-0" (2.4 m x 3.3 m)	3 (75)	11	9 (225)	3 (75)	8
8'-0" x 13'-0" (2.4 m x 3.9 m)	3 (75)	16	6 (150)	6 (150)	9

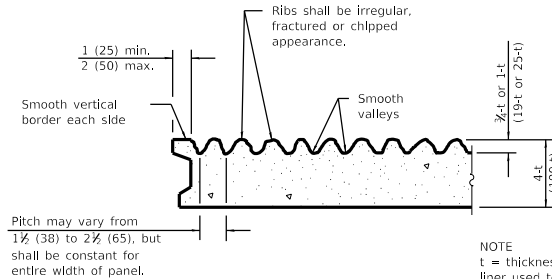


SECTION C-C



PANEL ELEVATION

(Showing location of metal band connector)



TEXTURED SURFACE FINISH DETAIL

NOTE
t = thickness of form liner used to obtain surface finish.

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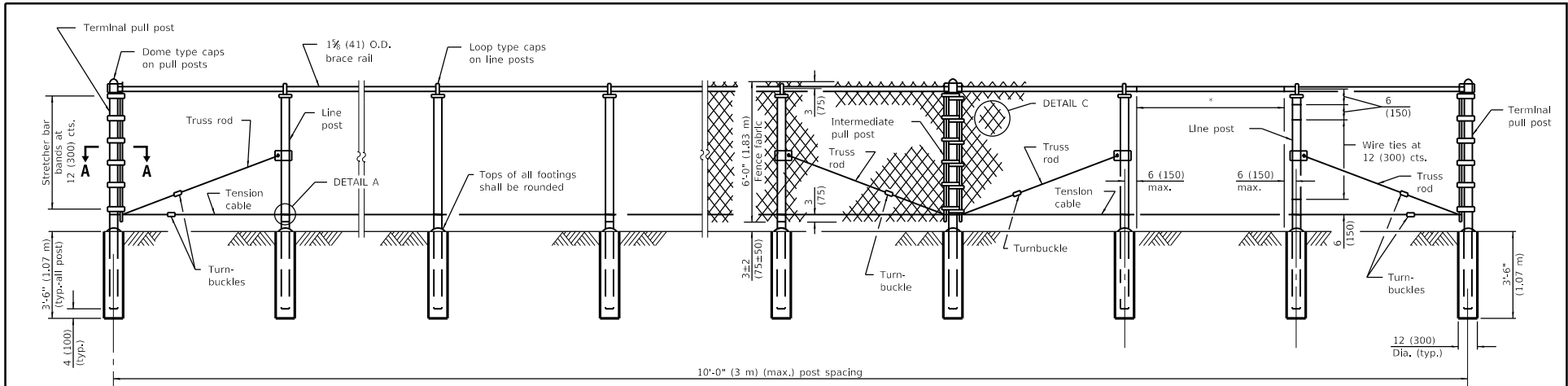
APPROVED January 1, 2009
Ralph E. Anderson
ENGINEER OF BRIDGES AND STRUCTURES

APPROVED January 1, 2009
Ken E. Han
ENGINEER OF DESIGN AND ENVIRONMENT

464-C 03/11/02

**SIGHT SCREEN
PRECAST PRESTRESSED
CONCRETE PANEL WALL**
(Sheet 2 of 2)

STANDARD 639001-02

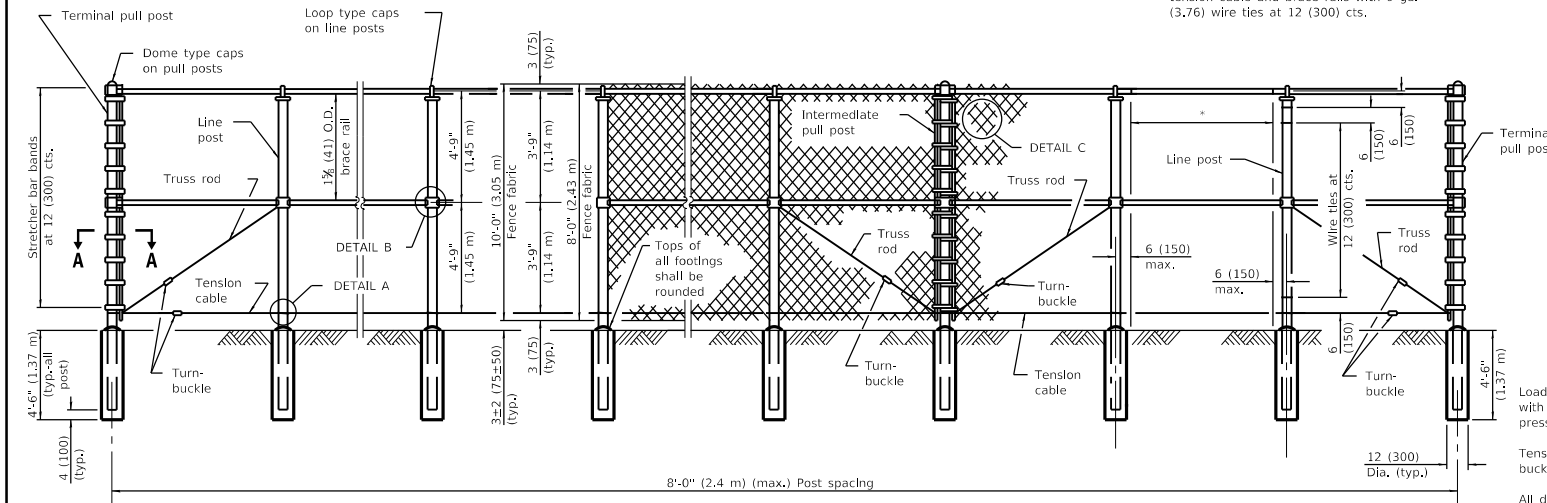


ELEVATION - 6' (1.83 m) FENCE
(Looking toward highway)

FENCE HEIGHT	POST SECTION (O.D.)	lbs./ft. (kg/m)
6 ft. (1.83 m)	4 (102)	9.11 (13.6)
8 ft. (2.43 m)	4 (102)	12.51 (18.6)
10 ft. (3.05 m)	4 (102)	22.85 (34)

* Fence fabric shall be tied to all line posts, tension cable and brace rails with 9 ga. (3.76) wire ties at 12 (300) cts.

Post sizes other than those shown may be used subject to approval by the Engineer.



ELEVATION - 8' (2.43 m) & 10' (3.05 m) FENCES
(Looking toward highway)

GENERAL NOTES

Loading for wind 80 mph (130 km/h) with 30% gust factor. Minimum allowable soil pressure = 1.25 tsf (120 kPa).

Tension cable shall be provided with one turn buckle between each pair of pull posts.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

APPROVED January 1, 2009
Ralph E. Anderson
ENGINEER OF BRIDGES AND STRUCTURES

APPROVED January 1, 2009
Lee E. Han
ENGINEER OF DESIGN AND ENVIRONMENT

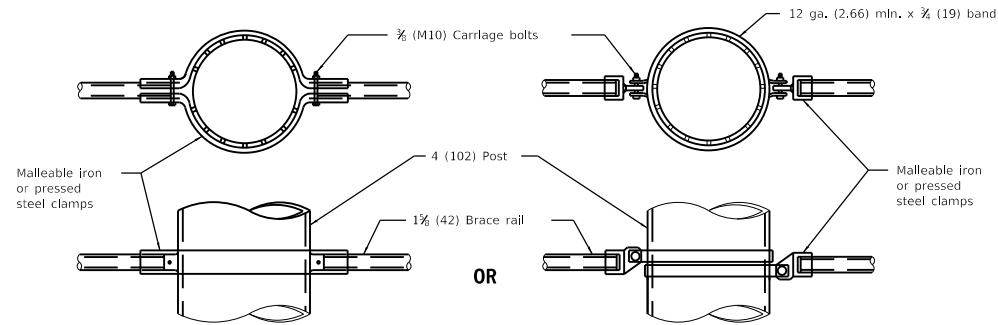
464-C 03/ISS/1

DATE	REVISIONS
1-1-09	Switched units to English (metric).
	Revised General Notes.
1-1-97	Renum. Standard 2365-6.

**SIGHT SCREEN
CHAIN LINK FENCE**

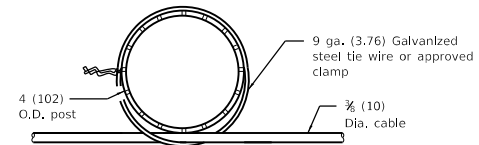
(Sheet 1 of 2)

STANDARD 640001-01

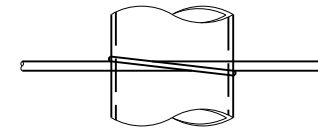


DETAIL B

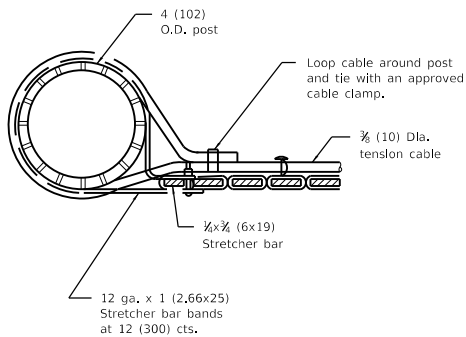
(Showing typical method of attaching middle brace rails to posts.)



PLAN

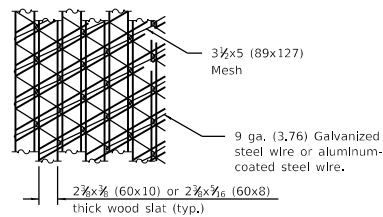


DETAIL A



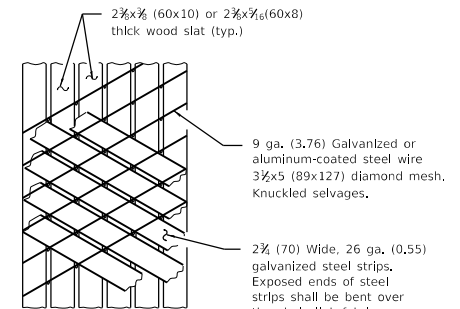
SECTION A-A

(Showing method of fastening bottom tension cable and fence fabric to pull posts.)



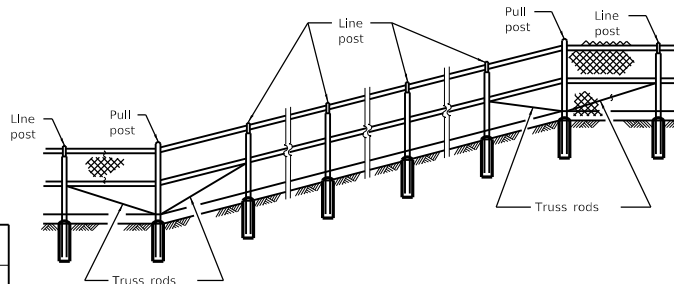
DETAIL OF FABRIC

(Looking from highway)

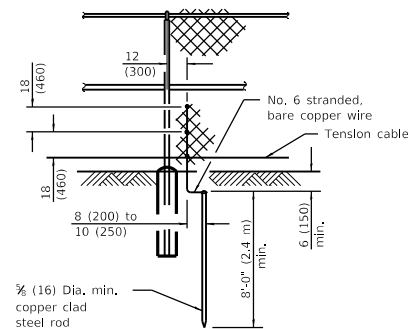


DETAIL C

(Looking toward highway)



FENCE INSTALLATION ON SLOPES



PROTECTIVE ELECTRICAL GROUND

SIGHT SCREEN CHAIN LINK FENCE

(Sheet 2 of 2)

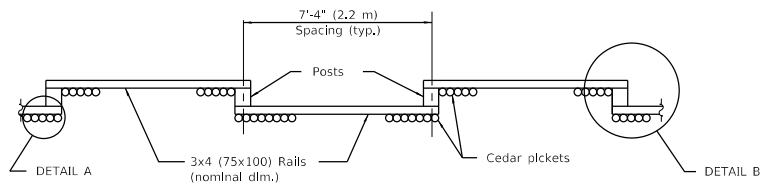
STANDARD 640001-01

Illinois Department of Transportation

APPROVED January 1, 2009
Ralph E. Anderson
 ENGINEER OF BRIDGES AND STRUCTURES

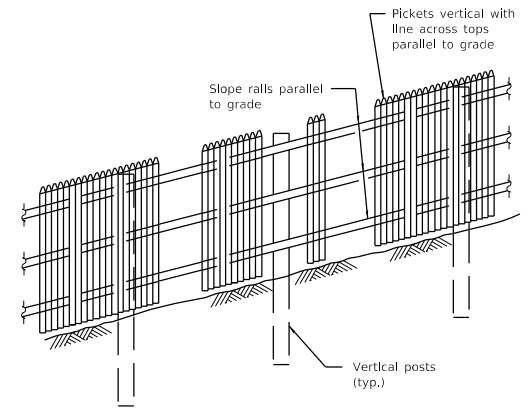
APPROVED January 1, 2009
Lee E. Han
 ENGINEER OF DESIGN AND ENVIRONMENT

464-1 03/15/09

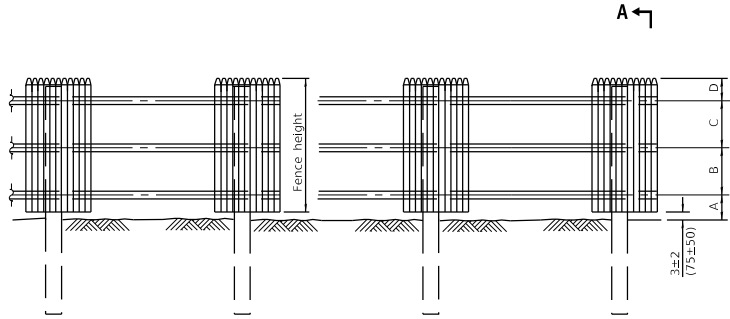


PLAN
(Facing highway)

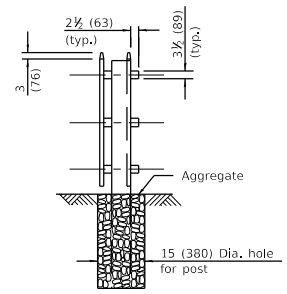
	FENCE HEIGHT	
	6'-0" (1.8 m)	8'-0" (2.4 m)
Post Size (nominal dlm.)	6x8 (150x200)	8x8 (200x200)
Post Length	10'-0" (3.0 m)	14'-0" (4.3 m)
Post Embedment	4'-0" (1.2 m)	6'-0" (1.8 m)
A	15 (380)	18 (460)
B	24 (600)	33 (870)
C	24 (600)	33 (870)
D	12 (300)	15 (380)



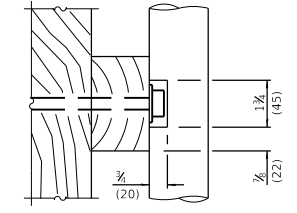
ELEVATION
(Showing treatment with sloping ground)



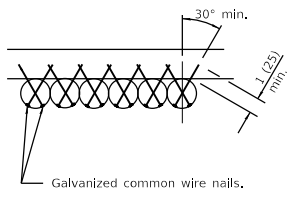
ELEVATION



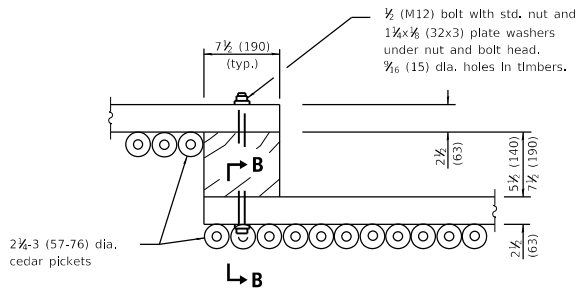
SEC. A-A



SECTION B-B
(Notch pickets when required to clear washer and bolt head.)



DETAIL A
(Showing typical picket to rail attachment)



DETAIL B
(Showing typical panel to post connection at each rail.)

GENERAL NOTES

Loading is based on 80 mph (130 km/h) with 30% gust factor. Minimum allowable soil pressure = 1.25 tsf (120 kPa).

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-09	Switched units to English (metric). Changed Sec. B-B to Detail B.
1-1-97	Renum. Standard 2367-3. Deleted DN Symbol.

**SIGHT SCREEN
CEDAR STOCKADE FENCE
TYPE S**

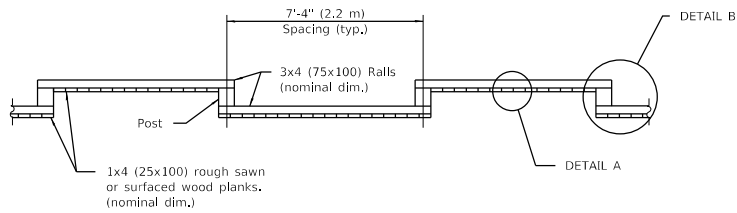
STANDARD 641001-01

Illinois Department of Transportation

APPROVED January 1, 2009
Ralph E. Anderson
ENGINEER OF BRIDGES AND STRUCTURES

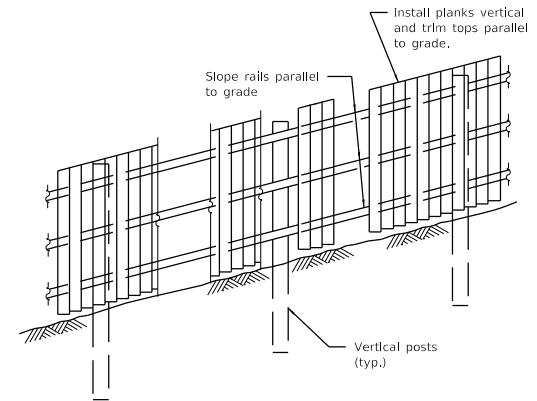
APPROVED January 1, 2009
Lee E. Han
ENGINEER OF DESIGN AND ENVIRONMENT

464-C 03/11/52

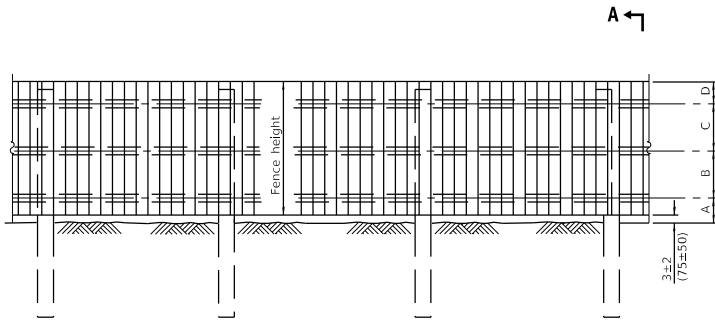


PLAN
(Facing Highway)

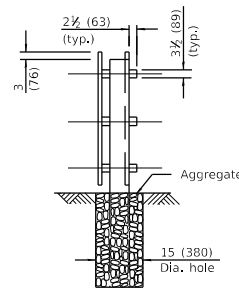
	FENCE HEIGHT	
	6'-0" (1.8 m)	8'-0" (2.4 m)
Post Size (nominal dim.)	6x8 (150x200)	8x8 (200x200)
Post Length	10'-0" (3.0 m)	14'-0" (4.3 m)
Post Embedment	4'-0" (1.2 m)	6'-0" (1.8 m)
A	15 (380)	18 (460)
B	24 (600)	33 (870)
C	24 (600)	33 (870)
D	12 (300)	15 (380)



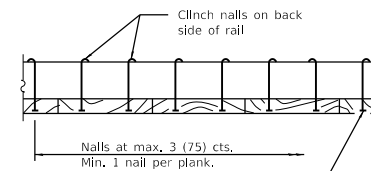
ELEVATION
(Showing treatment with sloping ground)



ELEVATION

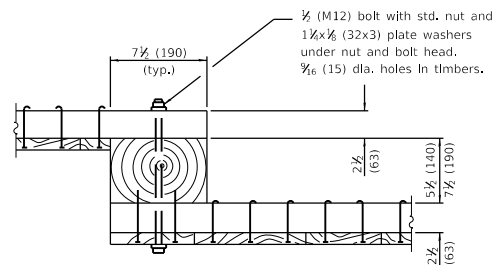


SEC. A-A



Galvanized common wire nails of sufficient length to have a minimum 1/2 (13) projection to clinch nails in back.

DETAIL A
(Showing typical plank to rail attachment each rail.)



DETAIL B
(Showing typical panel to post connection details)

GENERAL NOTES

Loading was based on 80 mph (130 km/h) with 30% gust factor. Minimum allowable soil pressure = 1.25 tsf (120 kPa).

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-09	Switched units to English (metric). Changed Section B-B to Detail B.
1-1-97	Renum. Standard 2367-3.
	Deleted DN Symbol.

**SIGHT SCREEN
WOOD PLANK FENCE
TYPE P**

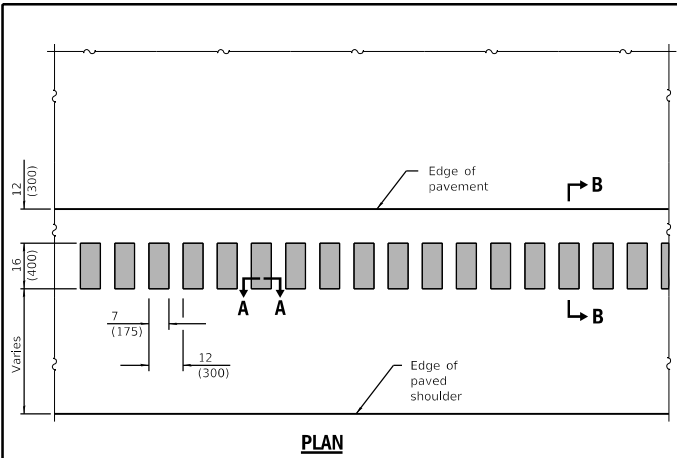
STANDARD 641006-01

Illinois Department of Transportation

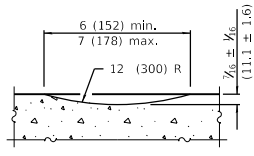
APPROVED January 1, 2009
Ralph E. Anderson
ENGINEER OF BRIDGES AND STRUCTURES

APPROVED January 1, 2009
Lee E. Han
ENGINEER OF DESIGN AND ENVIRONMENT

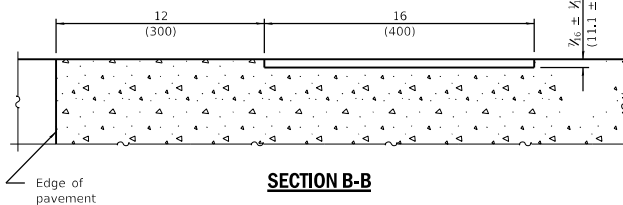
ISSUED



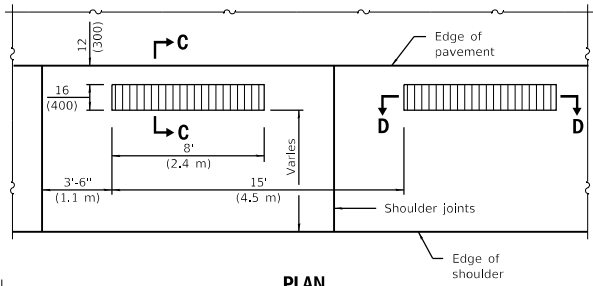
PLAN



SECTION A-A

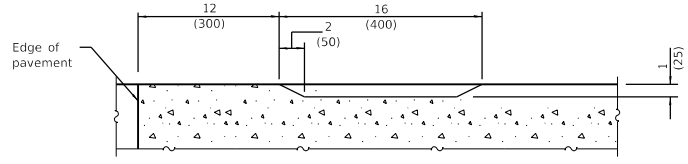


SECTION B-B

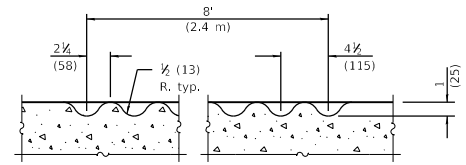


PLAN

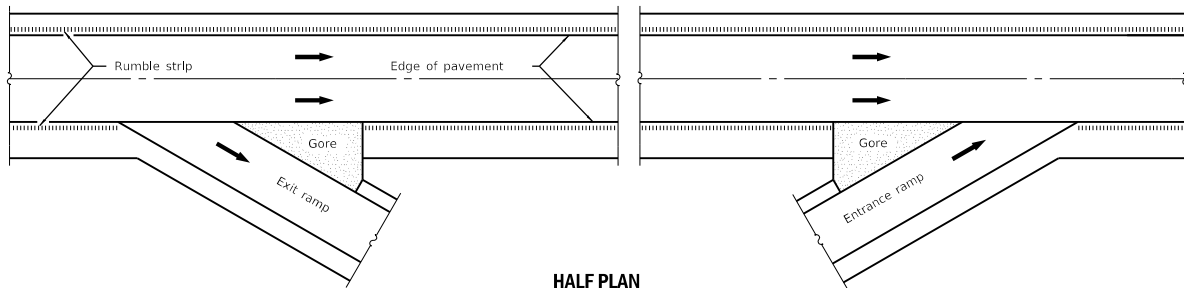
(Formed Alternate for PCC Shoulders)



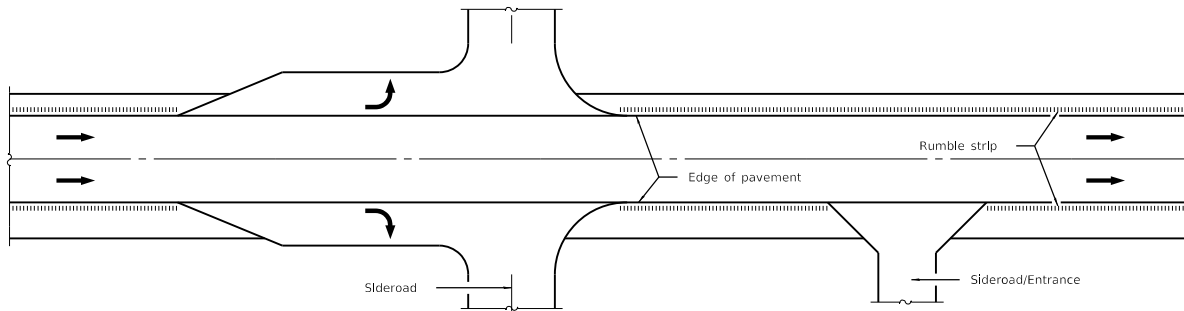
SECTION C-C



SECTION D-D



HALF PLAN
TYPICAL APPLICATION AT AN INTERCHANGE



HALF PLAN
TYPICAL APPLICATION AT AN INTERSECTION OR ENTRANCE

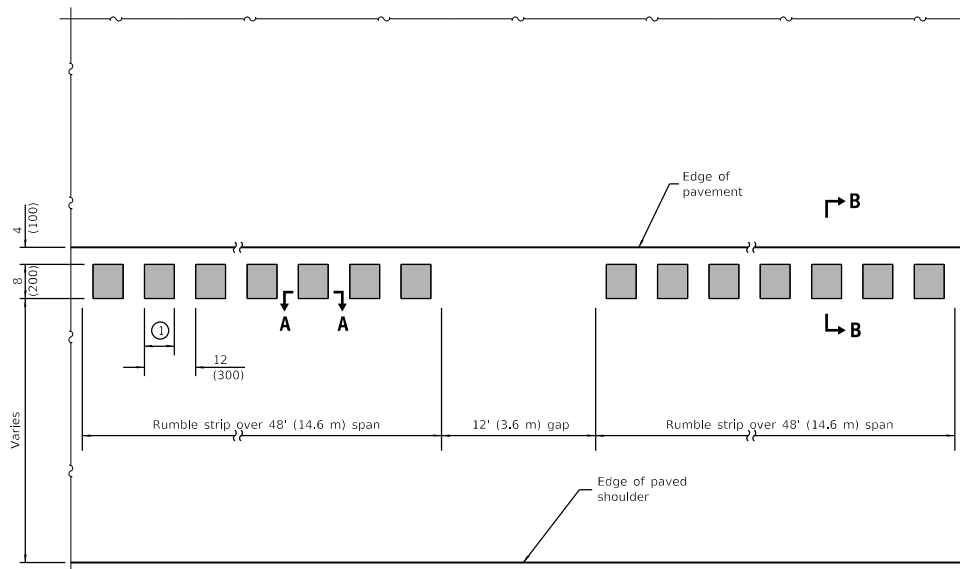
GENERAL NOTES
On Portland cement concrete shoulders, no shoulder rumble strip shall be located closer than 6 (150) to a transverse joint.
Omit shoulder rumble strips across structures.
All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation
 PASSED January 1, 2012
 Michael Beard
 ENGINEER OF POLICY AND PROCEDURES
 APPROVED January 1, 2012
 [Signature]
 ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-12	Changed formed rumble strip to 16 (400) wide, Rev'd milled strip. Renamed standard.
1-1-09	Switched units to English (metric).

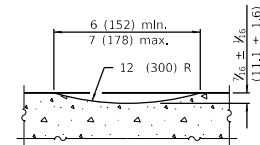
SHOULDER RUMBLE STRIPS, 16 in.

STANDARD 642001-02

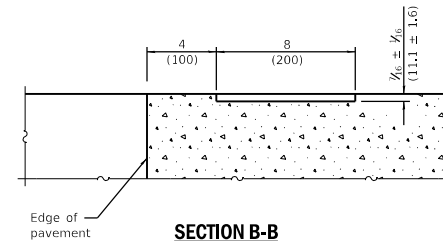


PLAN

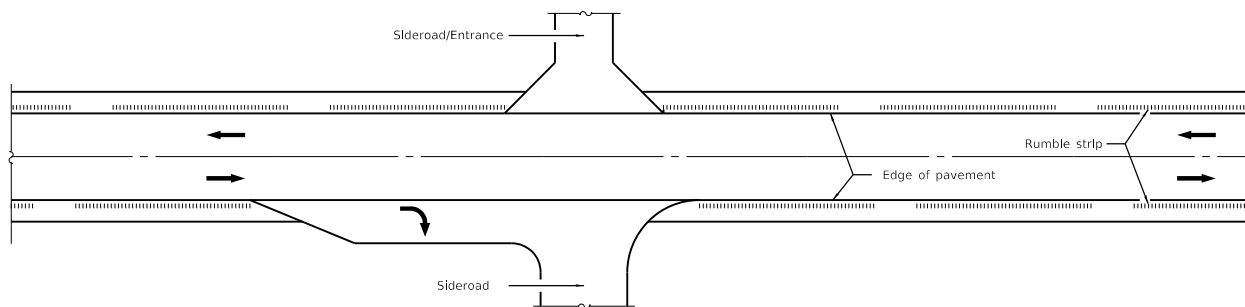
① See Section A-A.



SECTION A-A



SECTION B-B



TYPICAL APPLICATION AT AN INTERSECTION OR ENTRANCE

GENERAL NOTES

Omit shoulder rumble strips across structures and at mailbox turnouts.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2012
Michael Beard
 ENGINEER OF POLICY AND PROCEDURES

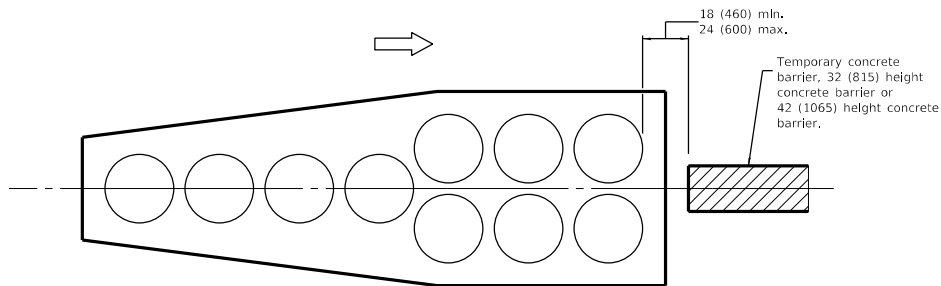
APPROVED January 1, 2012
Scott R. ...
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12

DATE	REVISIONS
1-1-12	New standard.

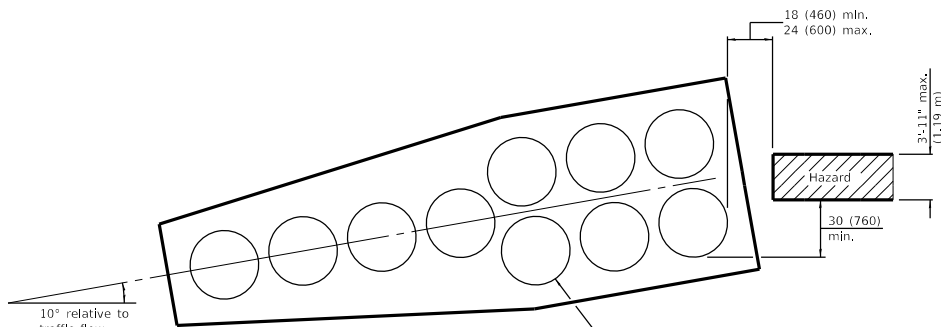
SHOULDER RUMBLE STRIPS, 8 in.

STANDARD 642006



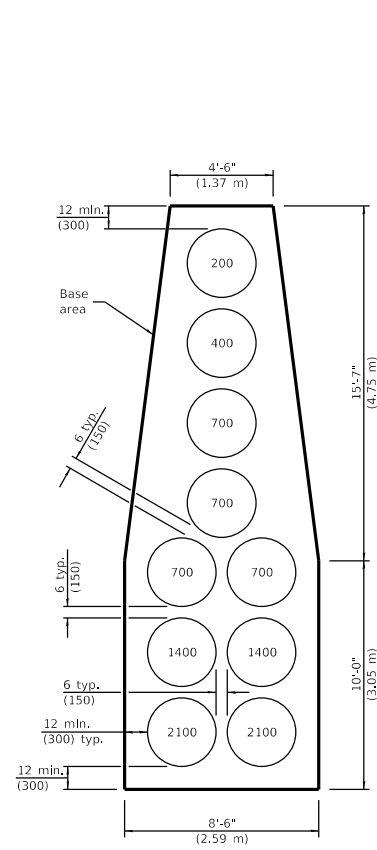
Direction of traffic flow

GORE INSTALLATION
(Traffic approaches on both sides)
(Test Level 2 array shown)



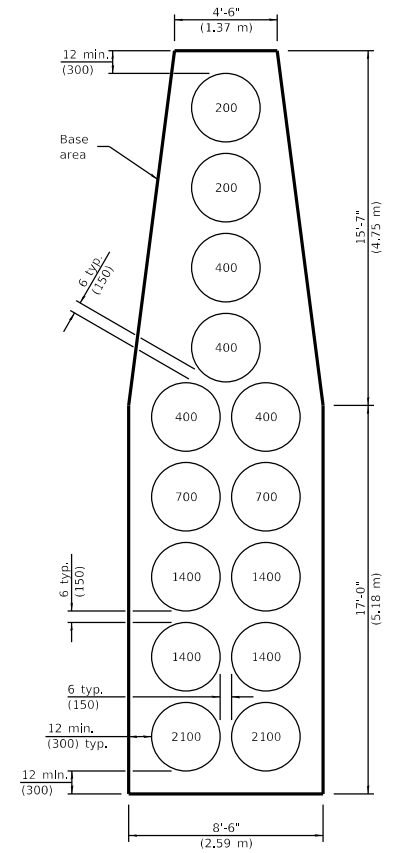
Direction of traffic flow

ROADSIDE INSTALLATION
(Traffic approaches on one side)
(Test Level 2 array shown)



TEST LEVEL 2 ARRAY

(For design speed less than or equal to 45 mph.)
(Numbers inside sand modules indicate sand weight in pounds.)



TEST LEVEL 3 ARRAY

(For design speed greater than 45 mph.)
(Numbers inside sand modules indicate sand weight in pounds.)

GENERAL NOTES

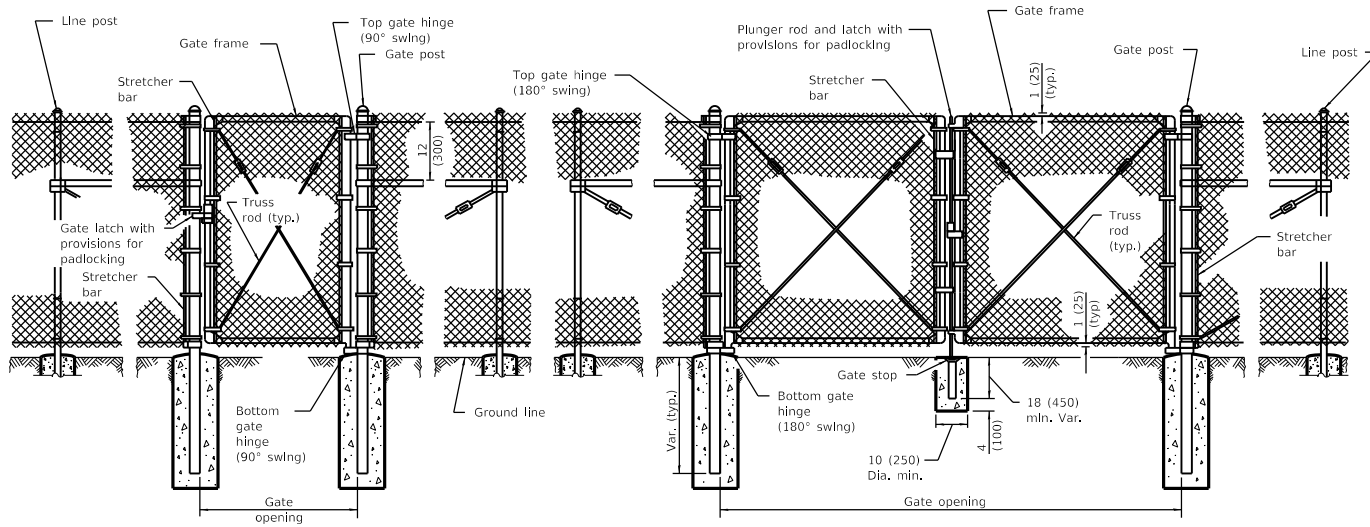
All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation	
PASSED	January 1, 2014
<i>Michael Beard</i>	
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2014
<i>[Signature]</i>	
ENGINEER OF DESIGN AND ENVIRONMENT	

DATE	REVISIONS
1-1-14	Revised distance from barrels to hazard.
1-1-13	Changed 'posted speed' to 'design speed'.

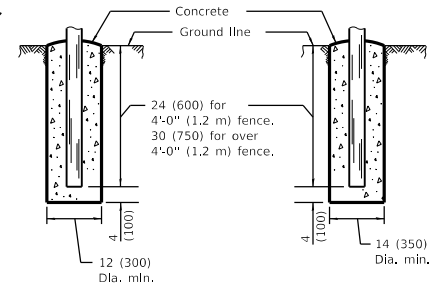
**SAND MODULE
IMPACT ATTENUATORS**

STANDARD 643001-02



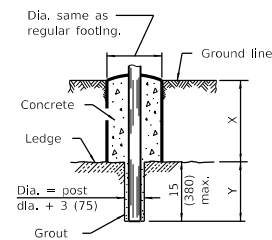
PEDESTRIAN GATE ARRANGEMENT

VEHICLE GATE ARRANGEMENT

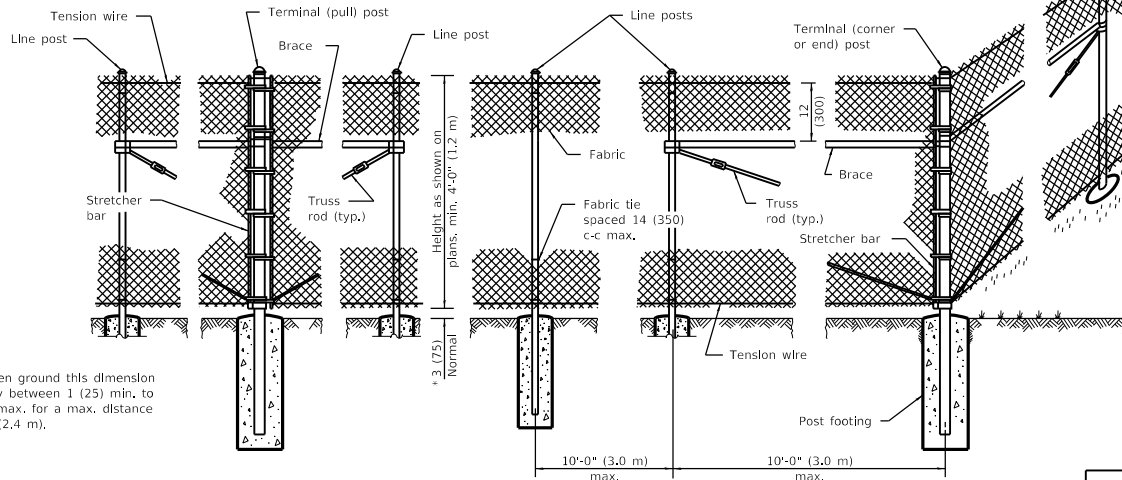


FOOTING FOR LINE POST

FOOTING FOR GATE & TERMINAL POST



FOOTING FOR POST IN ROCK LEDGE



PULL POST ARRANGEMENT

LINE POST ARRANGEMENT

CORNER OR END POST ARRANGEMENT

* On uneven ground this dimension may vary between 1 (25) min. to 5 (125) max. for a max. distance of 8'-0" (2.4 m).

GENERAL NOTES

Pull posts shall be placed at locations determined by the Engineer. They shall be placed at 660' (200 m) intervals between posts to which the ends of the fabric are clamped or midway between such posts when the distance is less than 1320' (400 m) and greater than 660' (200 m).

X + Y shall not exceed 24 (600), 30 (750), or 36 (900), as applicable. When X is 0 - 9 (0 - 225), 15 (380), or 21 (525), then Y = 15 (375) and the post shall be shortened as required. When X exceeds 9 (225), 15 (380), or 21 (525), then Y shall be decreased correspondingly.

All dimensions are in Inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2009

ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009

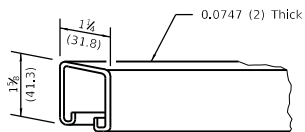
ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-99	Rev. "pans" to "plans" in LINE POST ARRANGEMENT.

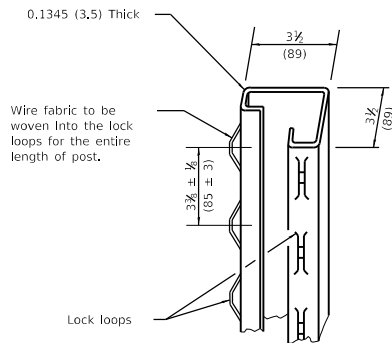
CHAIN LINK FENCE

(Sheet 1 of 3)

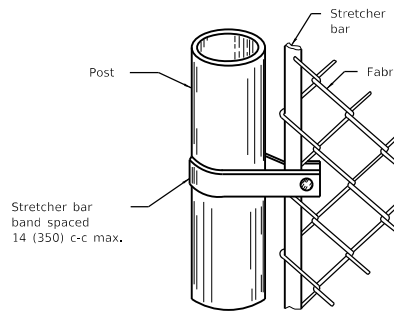
STANDARD 664001-02



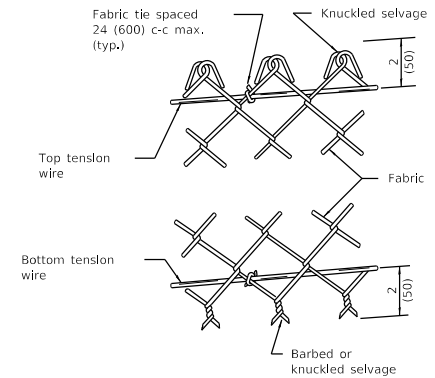
ROLL FORMED SECTION OF BRACE



ROLL FORMED SECTION OF TERMINAL & GATE POST



METHOD OF FASTENING STRETCHER BAR TO POST



METHOD OF TYING FABRIC TO TENSION WIRES

LINE POST	
Section	lbs./ft. (kg/m)
Pipe Type A 1.90 (48.3) O.D.	2.72 (4.05)
Pipe Type B 1.90 (48.3) O.D.	2.28 (3.39)
Pipe Type C 1.90 (48.3) O.D.	2.26 (3.36)
H 1.875x1.625 (47.6x41.3)	2.72 (4.05)
C	1.60 (2.38)
I	2.30 (3.42)

TERMINAL POST	
Section	lbs./ft. (kg/m)
Pipe Type A 2.375 (60.3) O.D.	3.65 (5.43)
Pipe Type B 2.375 (60.3) O.D.	3.11 (4.63)
Pipe Type C 2.375 (60.3) O.D.	3.09 (4.60)
Roll Formed 3 1/2 x 3 1/2 (89.0 x 89.0)	See detail
Sq. Tubing 2 1/2 x 2 1/2 (63.5 x 63.5)	4.32 (6.43)

HORIZONTAL BRACES	
Section	lbs./ft. (kg/m)
Pipe Type A 1.66 (42.2) O.D.	2.27 (3.38)
Pipe Type B 1.66 (42.2) O.D.	1.83 (2.72)
Pipe Type C 1.66 (42.2) O.D.	1.82 (2.71)
H 1.31x1.5 (33.3x38.1)	2.25 (3.35)
Roll Formed 1 1/2 x 1 1/2 (41.3 x 31.8)	See detail

GATE FRAMES	
Section	lbs./ft. (kg/m)
Pipe Type A 1.66 (42.2) O.D.	2.27 (3.38)
Pipe Type B 1.66 (42.2) O.D.	1.83 (2.72)
Pipe Type C 1.66 (42.2) O.D.	1.82 (2.71)

GATE POSTS *						
Gate Opening * ft. (m)		Pipe Type A		Sq. Tubing	Pipe Type B	
Single	Double	Size (O.D.)	lbs./ft. (kg/m)	Size	Size (O.D.)	kg/m (lbs./ft.)
Up to 4 (1.2)	Up to 8 (2.5)	2.375 (60.3)	3.65 (5.43)	2 1/2 (63.5)	2.375 (60.3)	3.11 (4.63)
Over 4 (1.2) to 8 (2.5)	Over 8 (2.5) to 16 (5.0)	2.875 (73.0)	5.79 (8.62)	3 (76.2)	2.875 (73.0)	4.64 (6.91)
Over 8 (2.5) to 12 (3.6)	Over 16 (5.0) to 24 (7.4)	3.5 (89.0)	7.58 (11.28)	3 (76.2)	3.5 (89)	5.707 (8.49)

* The 3 1/2 x 3 1/2 (89.0 x 89.0) roll formed section as detailed may be used as gate posts for single gate up to 6' (1.8 m) and double gate up to 12' (3.6 m).

Illinois Department of Transportation

PASSED January 1, 2009

APPROVED January 1, 2009

ENGINEER OF POLICY AND PROCEDURES

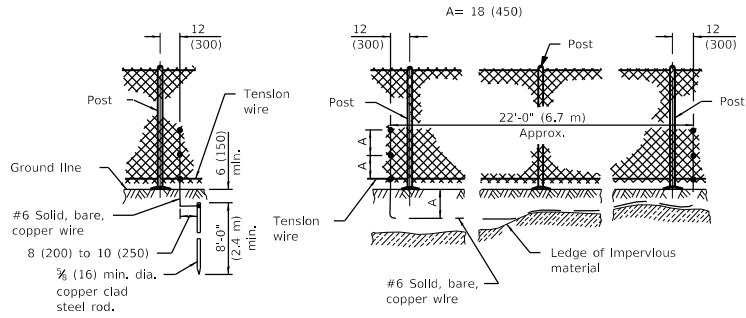
ENGINEER OF DESIGN AND ENVIRONMENT

464-C 03/11/02

CHAIN LINK FENCE

(Sheet 2 of 3)

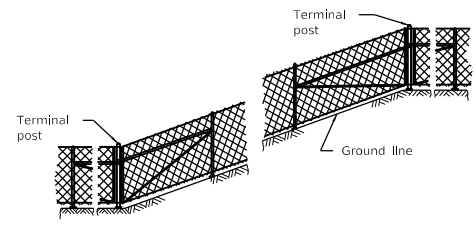
STANDARD 664001-02



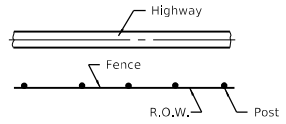
STANDARD GROUND

COUNTERPOISE GROUND (ALTERNATE)

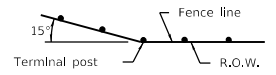
PROTECTIVE ELECTRICAL GROUNDS



INSTALLATION ON SLOPES



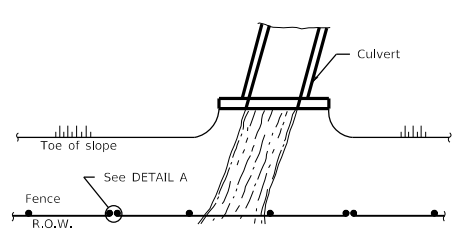
PLAN



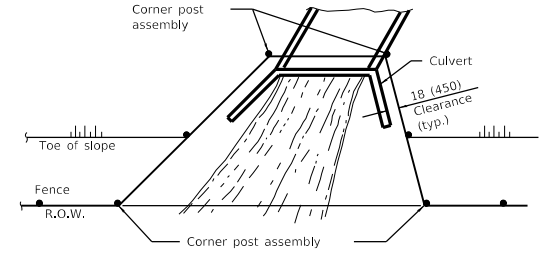
When fence line has a change in direction of 15° or more, a terminal post shall be placed as shown above.

Where angle is less than 15° and existing conditions require a terminal post, they shall be placed as directed by the Engineer.

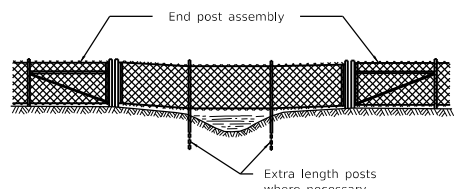
INSTALLATION AT CORNERS



PLAN AT STREAM CROSSING

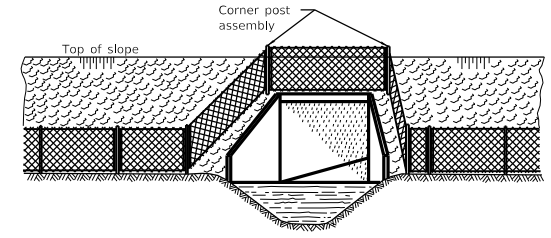


PLAN AT HEADWALL



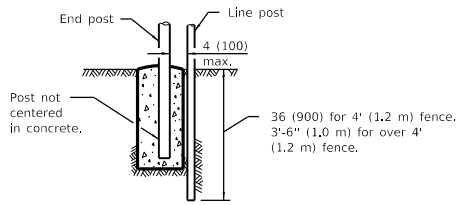
The chain link fabric shall be replaced by barbed wire strands at 12 (300) maximum centers between the double posts shown on DETAIL A when shown on the plans.

ELEVATION INSTALLATION OVER STREAM



When the width of the culvert makes it necessary to anchor a post to the top of the culvert, a cast iron shoe or other device approved by the Engineer shall be used.

ELEVATION INSTALLATION AROUND HEADWALL



DETAIL A

Illinois Department of Transportation

PASSED January 1, 2009

ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009

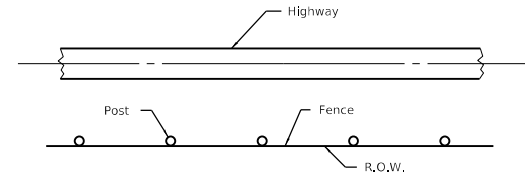
ENGINEER OF DESIGN AND ENVIRONMENT

CHAIN LINK FENCE

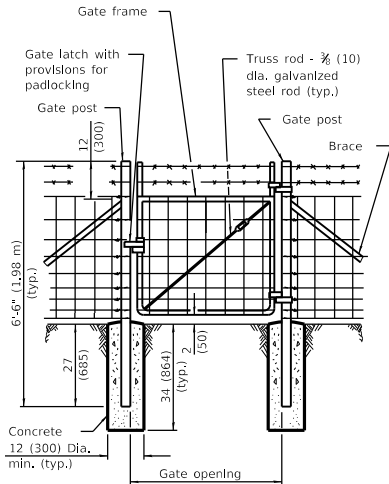
(Sheet 3 of 3)

STANDARD 664001-02

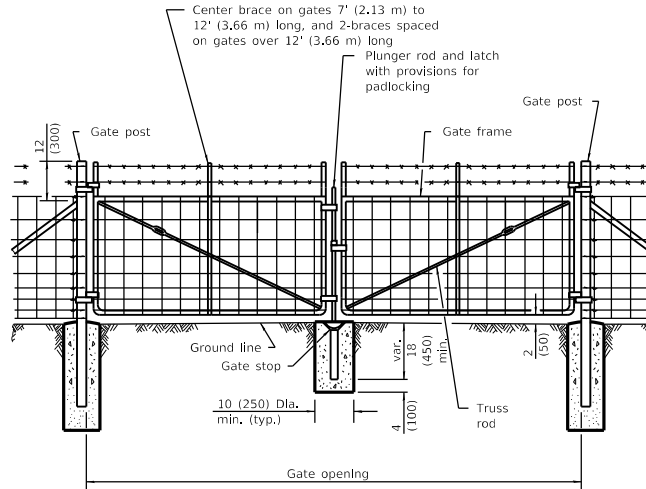
FENCE USING METAL POSTS



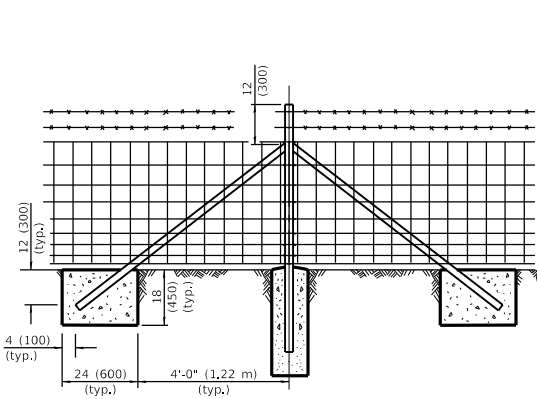
PLAN



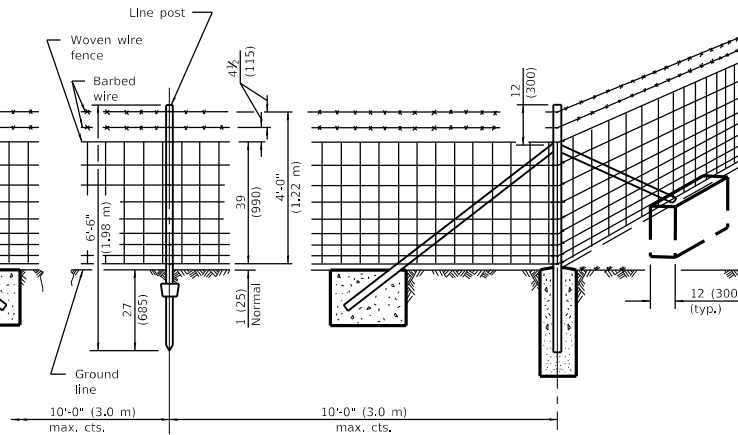
SINGLE GATE



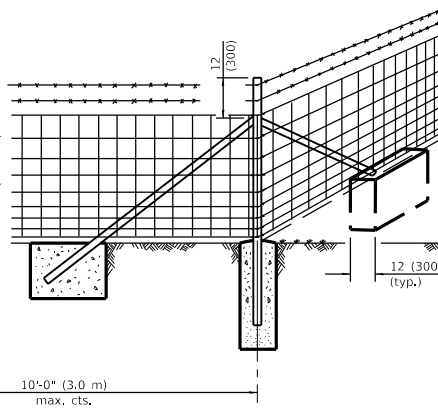
DOUBLE GATE



PULL POST



LINE POST



CORNER OR END POST

NOTES

Barbed wires shall be tied to each post. Top and bottom wires of woven fence shall be tied to each post. Tie every other wire between, alternating on successive posts.

Barbed wires and line wires of woven fence shall be fastened to the corner, end, pull, and gate posts by wrapping the wires around the post and tying back on itself with not less than 3 twists tightly wrapped.

GENERAL NOTES

Pull posts shall be placed at the locations determined by the Engineer. They shall be placed at 660' (200 m) intervals between posts to which the ends of the fabric and barbed wires are fastened or midway between such posts when the distance is less than 1320' (400 m) and greater than 660' (200 m).

Bracing for gate posts shall be the same type used for end posts.

The clearance between the bottom fence wire and the ground may be up to 3 (75) for a maximum distance of 8' (2.4 m) when uneven ground is encountered.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2009
Spotts
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009
Ken E. Han
 ENGINEER OF DESIGN AND ENVIRONMENT

464-11 03/11/SSJ

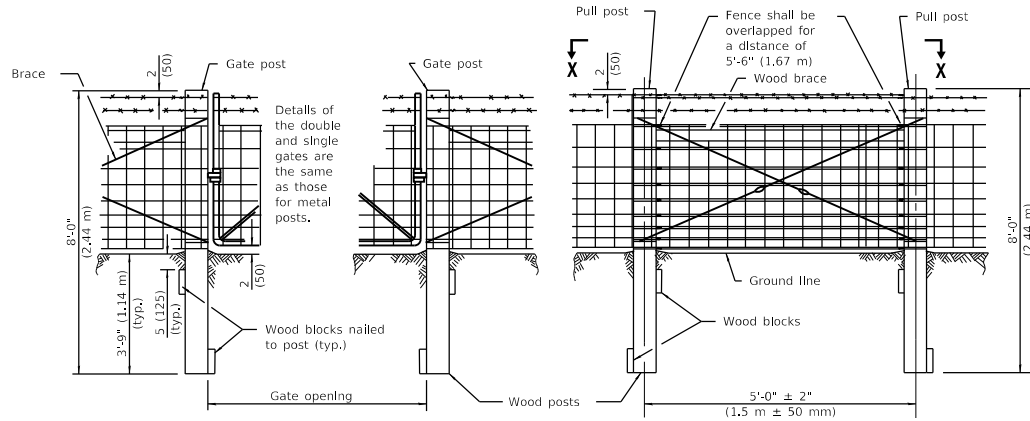
DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-02	Corrected dimensions on sheet 3 and 4.

WOVEN WIRE FENCE

(Sheet 1 of 4)

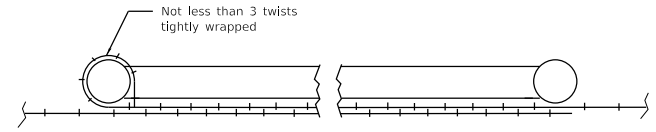
STANDARD 665001-02

FENCE USING WOOD POSTS

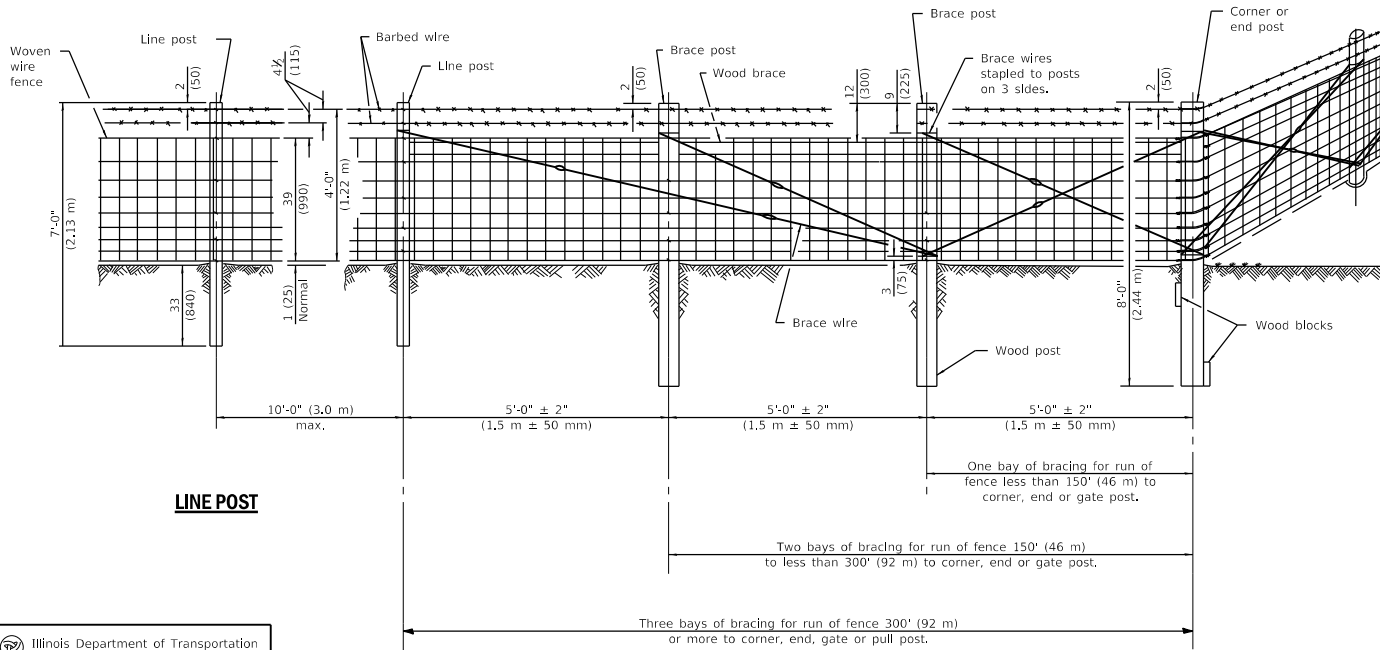


SINGLE OR DOUBLE GATE

PULL POST



SECTION X-X



LINE POST

CORNER OR END POST

NOTES

Barbed wires shall be stapled to each post. Top and bottom wire of woven fence shall be stapled to each post. Staple every other wire between, alternating on successive posts.

Metal line posts may be used in lieu of wood line posts.

WOVEN WIRE FENCE

(Sheet 2 of 4)

STANDARD 665001-02

Illinois Department of Transportation

PASSED January 1, 2009

ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

METAL ITEMS

GATE FRAMES		CORNER, END or PULL POSTS		LINE POSTS		BRACES	
Section	lbs./ft. (kg/m)	Section	lbs./ft. (kg/m)	Section	lbs./ft. (kg/m)	Section	lbs./ft. (kg/m)
Type A: Pipe 1.66 (42.2) O.D. Type B: Pipe 1.66 (42.2) O.D. Type C: Pipe 1.66 (42.2) O.D.	2.27 (3.38) 1.83 (2.72) 1.82 (2.71)	Type A: Pipe 2.375 (60.3) O.D. Type B: Pipe 2.375 (60.3) O.D. Type C: Pipe 2.375 (60.3) O.D. Tubing 2.5 (63.5) Sq. Angle 2½x2½x¼ (64x64x6.4)	3.65 (5.43) 3.11 (4.63) 3.09 (4.60) 4.32 (6.43) 4.1 (6.10)	Type A: Pipe 1.315 (33.4) O.D. Type B: Pipe 1.315 (33.4) O.D. Type C: Pipe 1.315 (33.4) O.D. Tubing 1 (25.4) Sq.	1.68 (2.50) 1.34 (1.99) 1.33 (1.98) 1.41 (2.10)	Type A: Pipe 1.66 (42.2) O.D. Type B: Pipe 1.66 (42.2) O.D. Type C: Pipe 1.66 (42.2) O.D. Angle 2½x2½x¼ (64x64x6.4)	2.27 (3.38) 1.83 (2.72) 1.82 (2.71) 3.19 (4.75)
		H, I, U, structural shapes	4.1 (6.10) min.	L, C, T, U, Y or other approved structural shapes	1.33 (1.98) min.	or other approved structural shapes	3.1 (4.61) min.


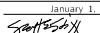
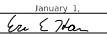
METAL ITEMS

GATE POSTS					
Single gate up to 4 ft. (1.22 m) Double gate up to 8 ft. (2.44 m)		over 4 ft. to 8 ft. (1.22 m to 2.44 m) over 8 ft. to 16 ft. (2.44 m to 4.88 m)		over 8 ft. to 12 ft. (2.44 m to 3.66 m) over 16 ft. to 24 ft. (4.88 m to 7.32 m)	
Section	lbs./ft. (kg/m)	Section	lbs./ft. (kg/m)	Section	lbs./ft. (kg/m)
Type A: Pipe 2.375 (60.3) O.D. Type B: Pipe 2.375 (60.3) O.D. Type C: Pipe 2.375 (60.3) O.D. Tubing 2.5 (63.5) Sq. Angle 2½x2½x¼ (64x64x6.4) H, I, U, structural shapes	3.65 (5.43) 3.11 (4.63) 3.09 (4.60) 4.32 (6.43) 4.1 (6.10) 4.1 (6.10) min.	2.875 (73.0) O.D. 2.875 (73.0) O.D. 2.875 (73.0) O.D. 3 (76.2) Sq. 3x3x¼ (76x76x7.9)	5.79 (8.62) 4.64 (6.91) 3.78 (5.63) 5.78 (8.60) 6.1 (9.08) 6.1 (9.08) min.	3.500 (88.9) O.D. 3 (76.2) Sq. 3½x3½x¾ (76x76x9.5)	7.58 (11.28) 8.80 (31.10) 8.5 (10.70) 8.5 (10.70) min.

WOOD ITEMS

(S4S or Rough Sawn)

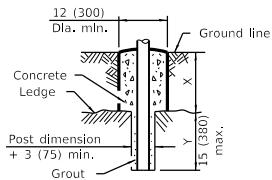
GATE, CORNER, END or PULL POSTS	BRACES and LINE POSTS	BLOCKS
6 to 7 (150 to 175) Top dia. 6x6 (150x150)	4 to 5 (100 to 125) Top dia. 4x4 (100x100)	2x8x18 (50x200x450)

 Illinois Department of Transportation	PASSED	January 1, 2009	ISSUED 464-1
	 ENGINEER OF POLICY AND PROCEDURES		
	APPROVED	January 1, 2009	
	 ENGINEER OF DESIGN AND ENVIRONMENT		

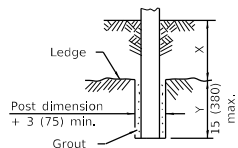
WOVEN WIRE FENCE

(Sheet 3 of 4)

STANDARD 665001-02



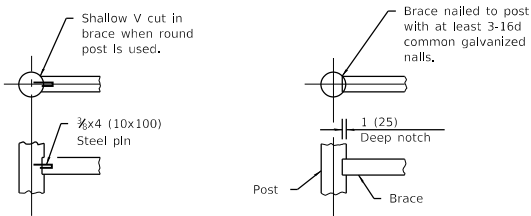
METAL POST



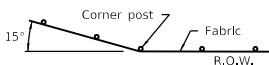
WOOD POST

NOTE
 X + Y shall not exceed 27 (685), 33 (840), or 3'-9" (1.14 m) as applicable. When X is 0 to 12 (300), 18 (450), or 30 (760), Y = 15 (380), and the post shall be shortened as required. When X exceeds 12 (300), 18 (450), or 30 (760), Y shall be decreased correspondingly.

**FOOTING FOR POSTS
 WHEN ROCK LEDGE IS ENCOUNTERED**

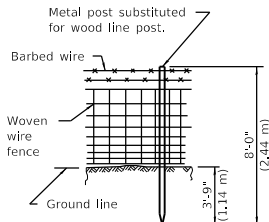


**ALTERNATE DETAILS FOR FASTENING
 WOOD BRACE TO WOOD POST**

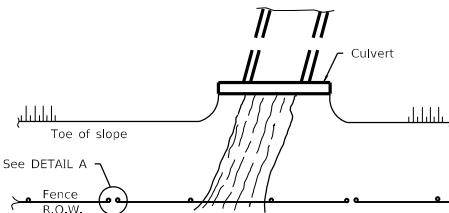


NOTE
 Where fence line has a change in direction of 15° or more, a corner post with bracing as required shall be placed as shown above. Where angle is less than 15° and existing conditions require a corner post, they shall be placed as directed by the Engineer.

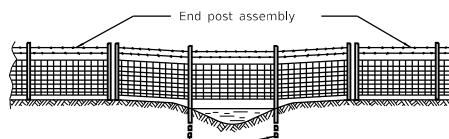
INSTALLATION AT CORNERS



**PROTECTIVE ELECTRICAL GROUNDING
 FOR WOOD POST FENCE INSTALLATION**



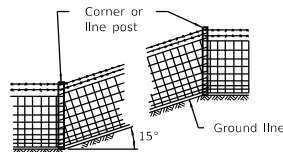
PLAN AT STREAM CROSSING



ELEVATION

NOTE
 The woven wire fabric shall be replaced by barbed wire strands at 12 (300) maximum centers between the double posts shown on DETAIL A when shown on the plans.

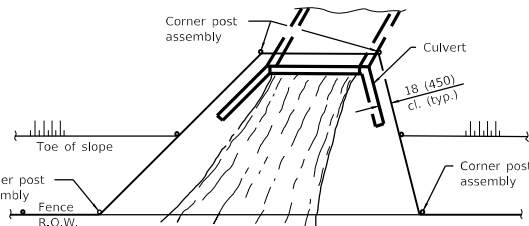
INSTALLATION OVER STREAM



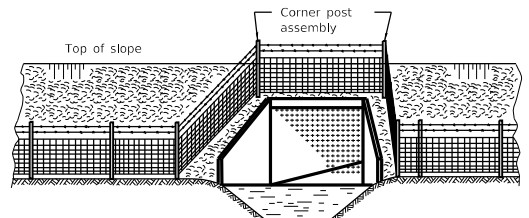
NOTE
 Where grade line has a change in slope of 15° or more, a corner post with bracing as required shall be placed as shown above. Where angle is less than 15° line posts may be used.

When the tension of the fence tends to pull the posts from the ground, the line posts shall be anchored with the applicable concrete or wood anchorage specified for corner posts.

INSTALLATION ON SLOPES



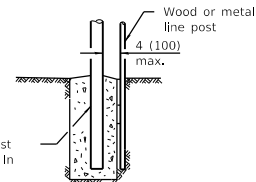
PLAN AT HEADWALL



ELEVATION

NOTE
 When the width of the culvert makes it necessary to anchor a post to the top of the culvert, a cast iron shoe or other device approved by the Engineer shall be used.

INSTALLATION AROUND HEADWALL



DETAIL A

WOVEN WIRE FENCE

(Sheet 4 of 4)

STANDARD 665001-02

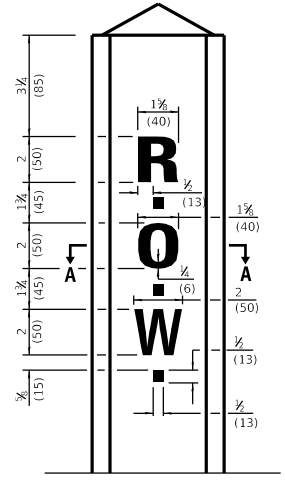
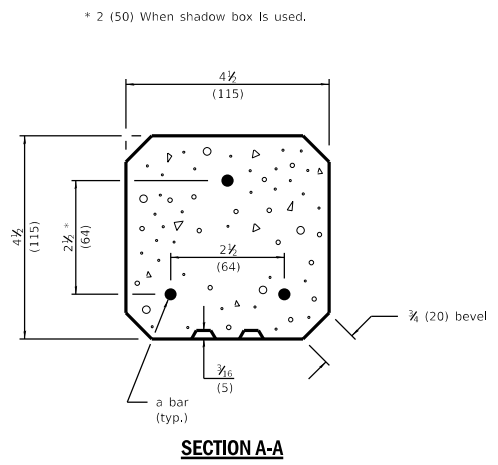
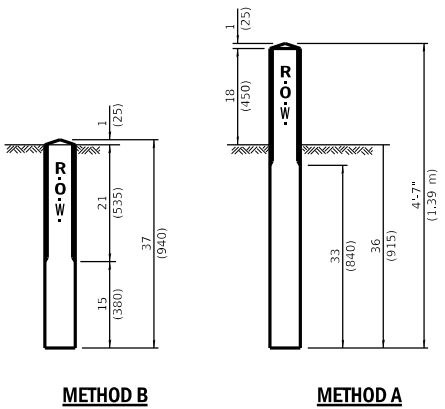
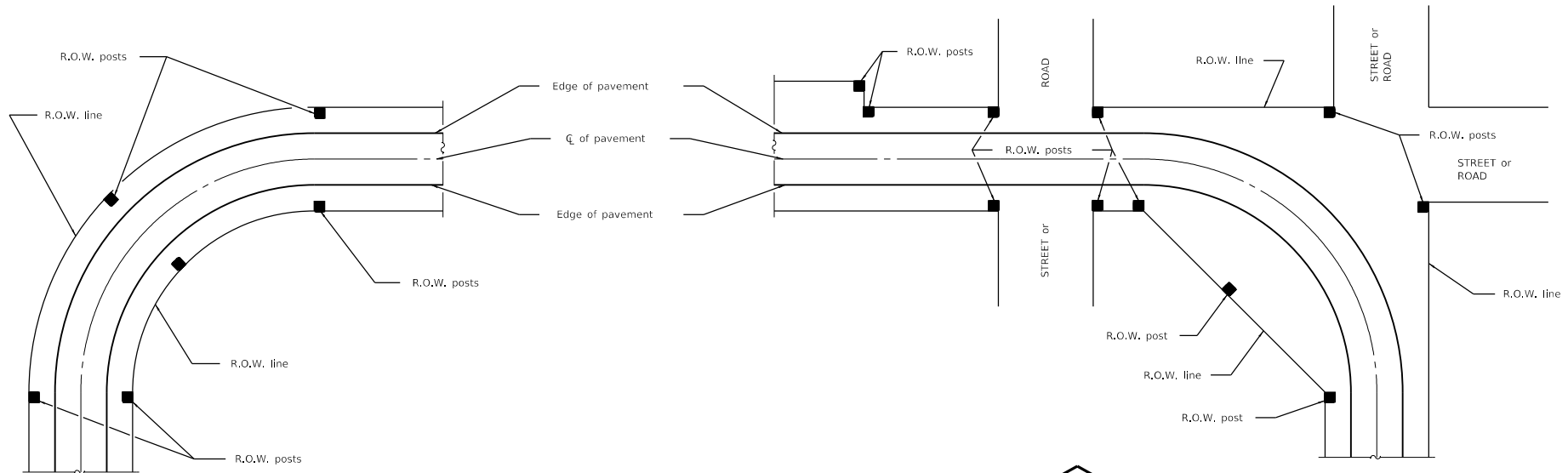
Illinois Department of Transportation

PASSED January 1, 2009

ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT



GENERAL NOTE
 Reinforcement bars shall be No. 3 (No. 10) unless otherwise specified.
 A 2 1/2 x 12 1/2 (70 x 310) shadow box with beveled edges, and a 3/16 (5) thick indentation may be used with the standard lettering shown.
 All dimensions are in Inches (millimeters) unless otherwise shown.

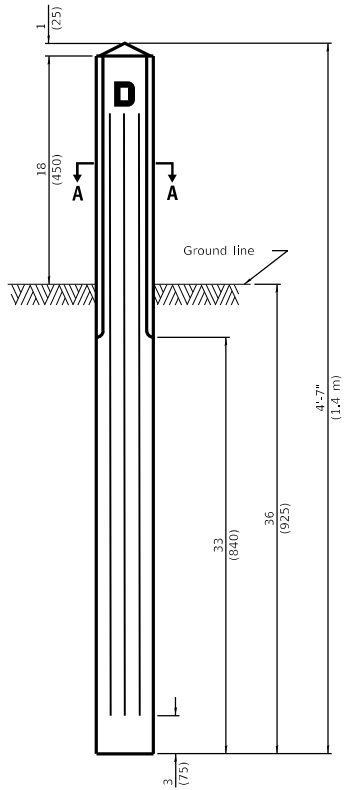
METHOD A	4'-0" (1.2 m)
METHOD B	30 (750)

a BAR

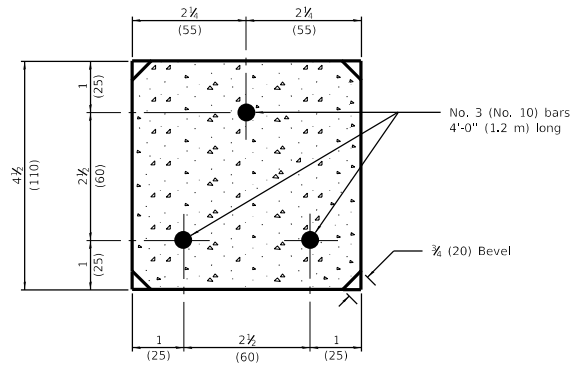
Illinois Department of Transportation
 PASSED January 1, 2009
 ENGINEER OF POLICY AND PROCEDURES
 APPROVED January 1, 2009
 ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-97	Renum. Standard 1744-6.

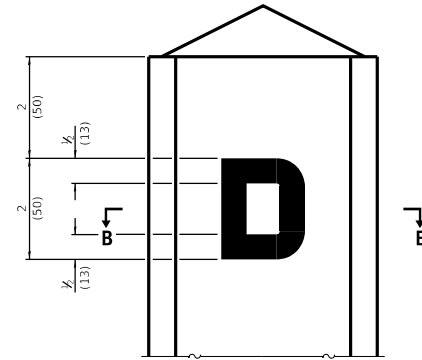
RIGHT OF WAY MARKERS
STANDARD 666001-01



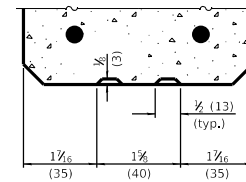
FRONT ELEVATION



SECTION A-A



DETAIL OF LETTER



SECTION B-B

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2009
Spotts

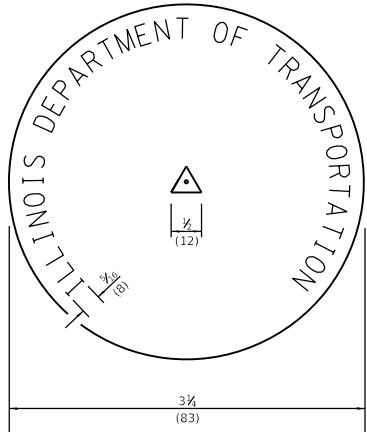
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009
Ken E. Han

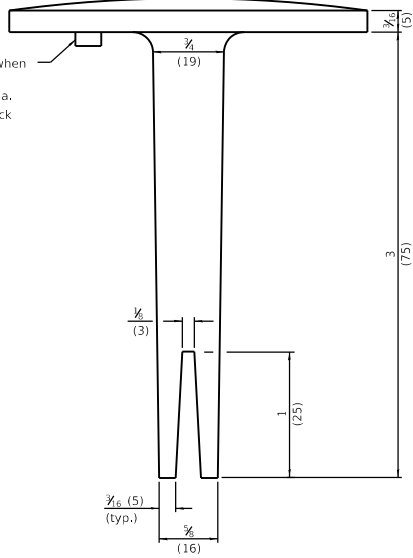
ENGINEER OF DESIGN AND ENVIRONMENT

LEG-1 CH/ISS/

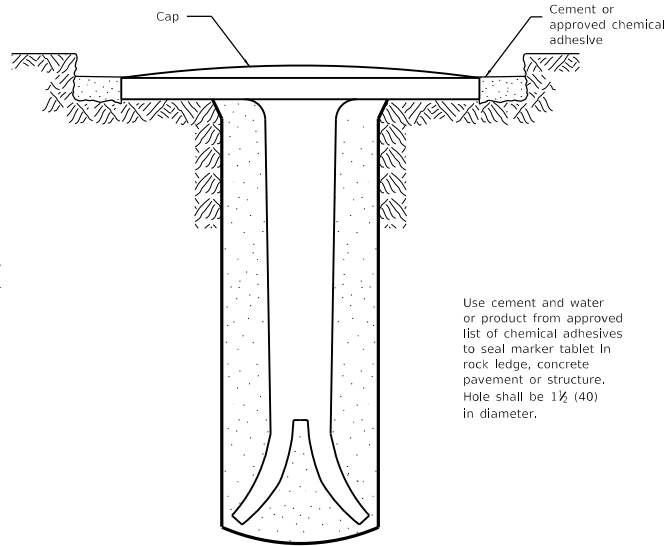
DATE	REVISIONS	DRAINAGE MARKERS
1-1-09	Switched units to English (metric).	
1-1-97	Renum. Standard 1999-4.	
		STANDARD 667001-01



Magnet when required
 1/2 (13) dia.
 1/4 (6) thick



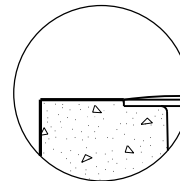
ALUMINUM TABLET



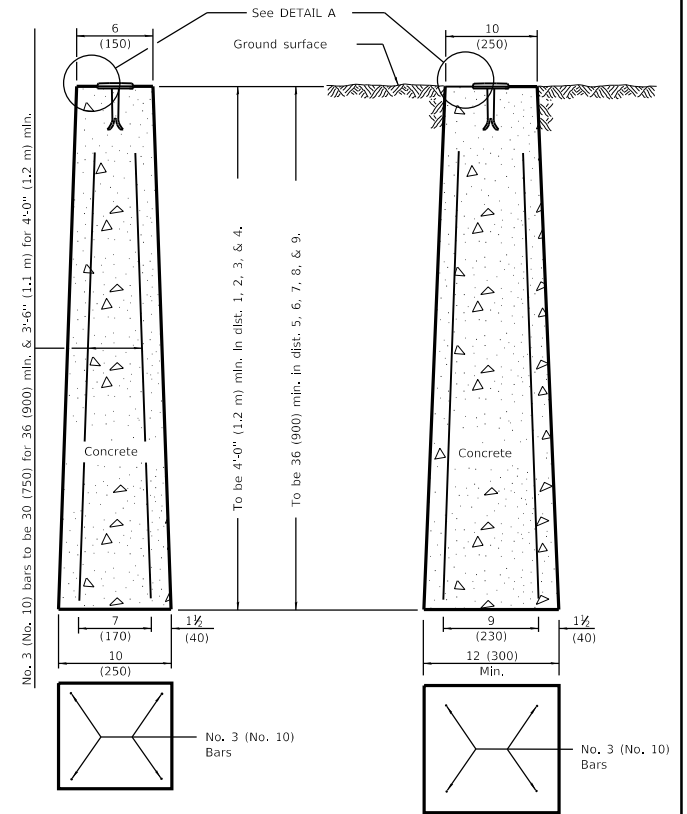
Use cement and water or product from approved list of chemical adhesives to seal marker tablet in rock ledge, concrete pavement or structure. Hole shall be 1 1/2 (40) in diameter.

Tablet constructed in rock ledge or concrete.

TYPE I



DETAIL A



PRECAST MARKER

CAST-IN-PLACE MARKER

TYPE II

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2012
Michael Beard
 ENGINEER OF POLICY AND PROCEDURES

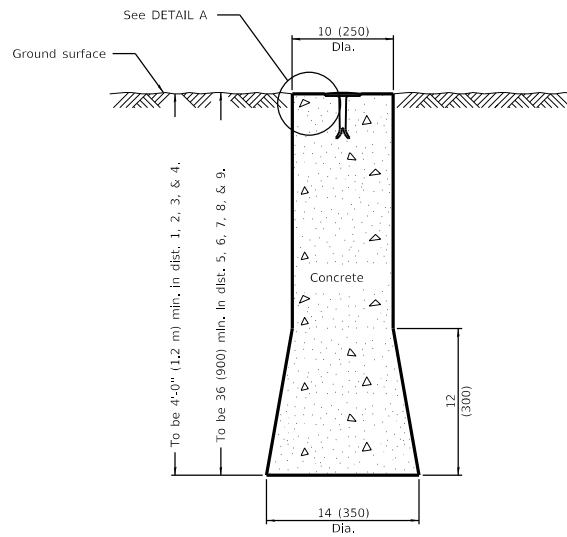
APPROVED January 1, 2012
Scott Smith
 ENGINEER OF DESIGN AND ENVIRONMENT

LEG-CI 03/11/12

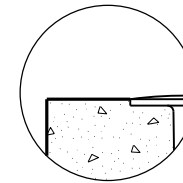
DATE	REVISIONS
1-1-12	Changed 'epoxy' references to 'chemical adhesives'.
1-1-09	Switched units to English (metric).

PERMANENT SURVEY MARKERS

STANDARD 667101-02



ELEVATION



DETAIL A

All dimensions are in inches (millimeters)
unless otherwise shown.

Illinois Department of Transportation	
PASSED	January 1, 2009
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT	

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-97	Renum. Standard 2448, Revised depth.

U.S. GEOLOGICAL SURVEY AND NATIONAL GEODETIC SURVEY BENCHMARKS RESETTING METHOD
STANDARD 668001-01



Standards by Division

**DIVISION 700 WORK ZONE TRAFFIC CONTROL AND PROTECTION,
SIGNING, AND PAVEMENT MARKING**

STD. NO.	TITLE
WORK ZONE TRAFFIC CONTROL AND PROTECTION	
701001-02	Off-Road Operations, 2L, 2W, More Than 15' (4.5 m) Away
701006-05	Off-Road Operations, 2L, 2W, 15' (4.5 m) to 24" (600 mm) From Pavement Edge
701011-04	Off-Road Moving Operations, 2L, 2W, Day Only
701101-05	Off-Road Operations, Multilane, 15' (4.5 m) to 24" (600 mm) From Pavement Edge
701106-02	Off-Road Operations, Multilane, More Than 15' (4.5 m) Away
701201-05	Lane Closure, 2L, 2W, Day Only, for Speeds \geq 45 MPH
701206-05	Lane Closure, 2L, 2W, Night Only, for Speeds \geq 45 MPH
701301-04	Lane Closure, 2L, 2W, Short Time Operations
701306-04	Lane Closure, 2L, 2W, Slow Moving Operations Day Only, for Speeds \geq 45 MPH
701311-03	Lane Closure, 2L, 2W, Moving Operations - Day Only
701316-12	Lane Closure, 2L, 2W, Bridge Repair, for Speeds \geq 45 MPH
701321-17	Lane Closure, 2L, 2W, Bridge Repair with Barrier
701326-04	Lane Closure, 2L, 2W, Pavement Widening, for Speeds \geq 45 MPH
701331-05	Lane Closure, 2L, 2W, With Run-Around, for Speeds \geq 45 MPH
701336-07	Lane Closure, 2L, 2W, Work Areas in Series, for Speeds \geq 45 MPH
701400-09	Approach to Lane Closure, Freeway/Expressway
701401-12	Lane Closure, Freeway/Expressway
701402-12	Lane Closure, Freeway/Expressway, with Barrier
701406-12	Lane Closure, Freeway/Expressway, Day Operations Only
701411-09	Lane Closure, Multilane, at Entrance or Exit Ramp, for Speeds \geq 45 MPH
701416-11	Lane Closure, Freeway/Expressway, with Crossover and Barrier
701421-08	Lane Closure, Multilane, Day Operations Only, for Speeds \geq 45 MPH to 55 MPH
701422-10	Lane Closure, Multilane, for Speeds \geq 45 MPH to 55 MPH
701423-10	Lane Closure, Multilane, with Barrier, for Speeds \geq 45 MPH to 55 MPH
701426-09	Lane Closure, Multilane, Intermittent or Moving Operation, for Speeds \geq 45 MPH
701427-05	Lane Closure, Multilane, Intermittent or Moving Operation, for Speeds \leq 40 MPH
701428-01	Traffic Control, Setup and Removal, Freeway/Expressway
701431-13	Lane Closure, Multilane, Undivided with Crossover, for Speeds \geq 45 MPH to 55 MPH
701446-09	Two Lane Closure, Freeway/Expressway
701451-05	Ramp Closure Freeway/Expressway
701456-05	Partial Exit Ramp Closure Freeway/Expressway
701501-06	Urban Lane Closure, 2L, 2W, Undivided
701502-09	Urban Lane Closure, 2L, 2W, with Bidirectional Left Turn Lane
701601-09	Urban Lane Closure, Multilane, 1W or 2W with Nontraversable Median
701602-10	Urban Lane Closure, Multilane, 2W with Bidirectional Left Turn Lane
701606-10	Urban Single Lane Closure, Multilane, 2W with Mountable Median
701611-01	Urban Half Road Closure, Multilane, 2W with Mountable Median
701701-10	Urban Lane Closure, Multilane Intersection

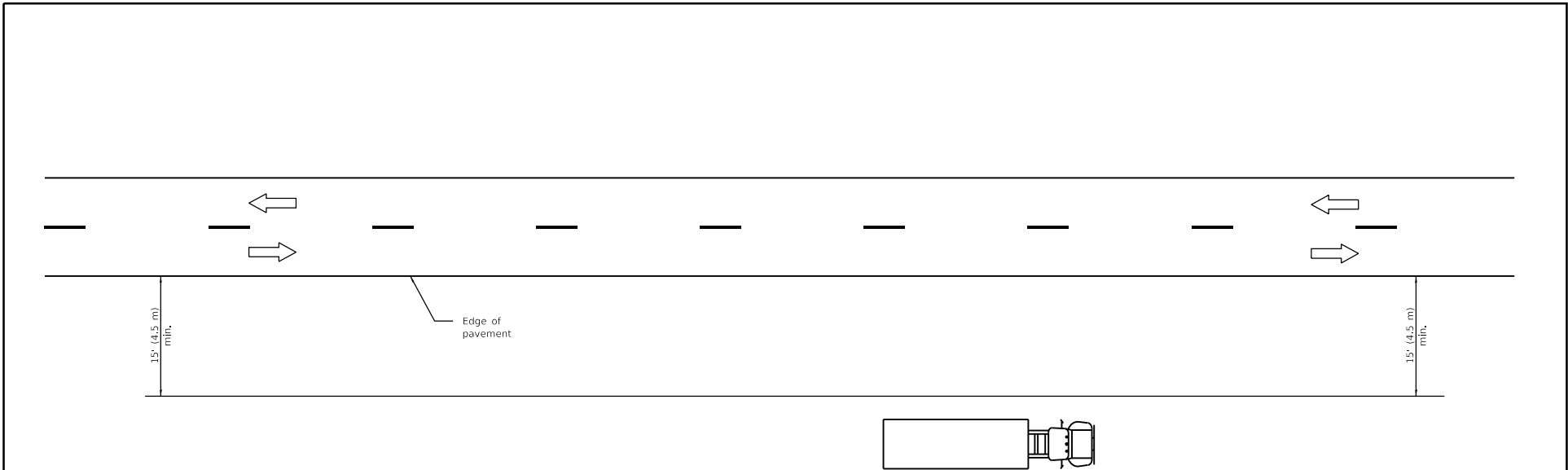
701801-06 Sidewalk, Corner or Crosswalk Closure
701901-08 Traffic Control Devices
704001-08 Temporary Concrete Barrier

SIGNING

720001-01 Sign Panel Mounting Details
720006-04 Sign Panel Erection Details
720011-01 Metal Posts for Signs, Markers and Delineators
720016-04 Mast Arm Mounted Street Name Signs
720021-02 Sign Panels, Extruded Aluminum Type
725001-01 Object and Terminal Markers
728001-01 Telescoping Steel Sign Support
729001-01 Applications of Types A and B Metal Posts (For Signs & Markers)
731001-01 Base for Telescoping Steel Sign Support

PAVEMENT MARKING

780001-05 Typical Pavement Markings
781001-04 Typical Applications Raised Reflective Pavement Markers
782001-01 Curb Reflectors
782006 Guardrail and Barrier Wall Reflector Mounting Details



TYPICAL APPLICATIONS

- Landscaping work
- Utility work
- Fencing contracts and maintenance
- Cleaning culverts

GENERAL NOTES

This Standard is used where at all times all vehicles, equipment, workers or their activities are more than 15' (4.5 m) from the edge of pavement.

When the work operation requires that two or more work vehicles cross the 15' (4.5 m) clear zone in any one hour, traffic control shall be according to Standard 701006.

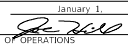
All dimensions are in Inches (millimeters) unless otherwise shown.

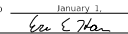
DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-05	Revised title and notes.

**OFF-RD OPERATIONS,
2L, 2W, MORE THAN
15' (4.5 m) AWAY**

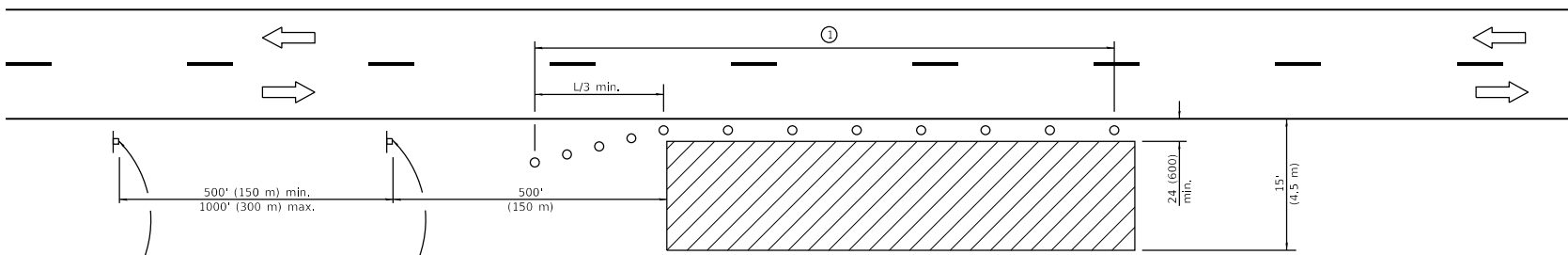
STANDARD 701001-02

Illinois Department of Transportation


PASSED January 1, 2009

 ENGINEER OF OPERATIONS

APPROVED January 1, 2009

 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUES



For contract construction projects




W20-1103(0)-48



W21-1(0)-48

For maintenance and utility projects






W20-1(0)-48

TYPICAL APPLICATIONS

- Utility operations
- Culvert extensions
- Side slope changes
- Guardrail installation and maintenance
- Delineator installation
- Landscape operations
- Shoulder repair
- Sign installation and maintenance

SYMBOLS

-  Work area
-  Sign
-  Cone, drum or barricade

① When the work operation exceeds one hour, cones, drums or barricades shall be placed at 25' (8 m) centers for 1/3 distance, and at 50' (15 m) centers through the remainder of the work area.

GENERAL NOTES

This Standard is used where any vehicles, equipment, workers or their activities will encroach in the area 15' (4.5 m) to 24' (600) from the edge of pavement.

Calculate L as follows:


SPEED LIMIT	FORMULAS	
	English	(Metric)
40 mph (70 km/h) or less:	$L = \frac{WS^2}{60}$	$L = \frac{WS^2}{150}$
45 mph (80 km/h) or greater:	$L = (W)(S)$	$L = 0.65(W)(S)$


W = Width of offset
In feet (meters).

S = Normal posted speed
mph (km/h).

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

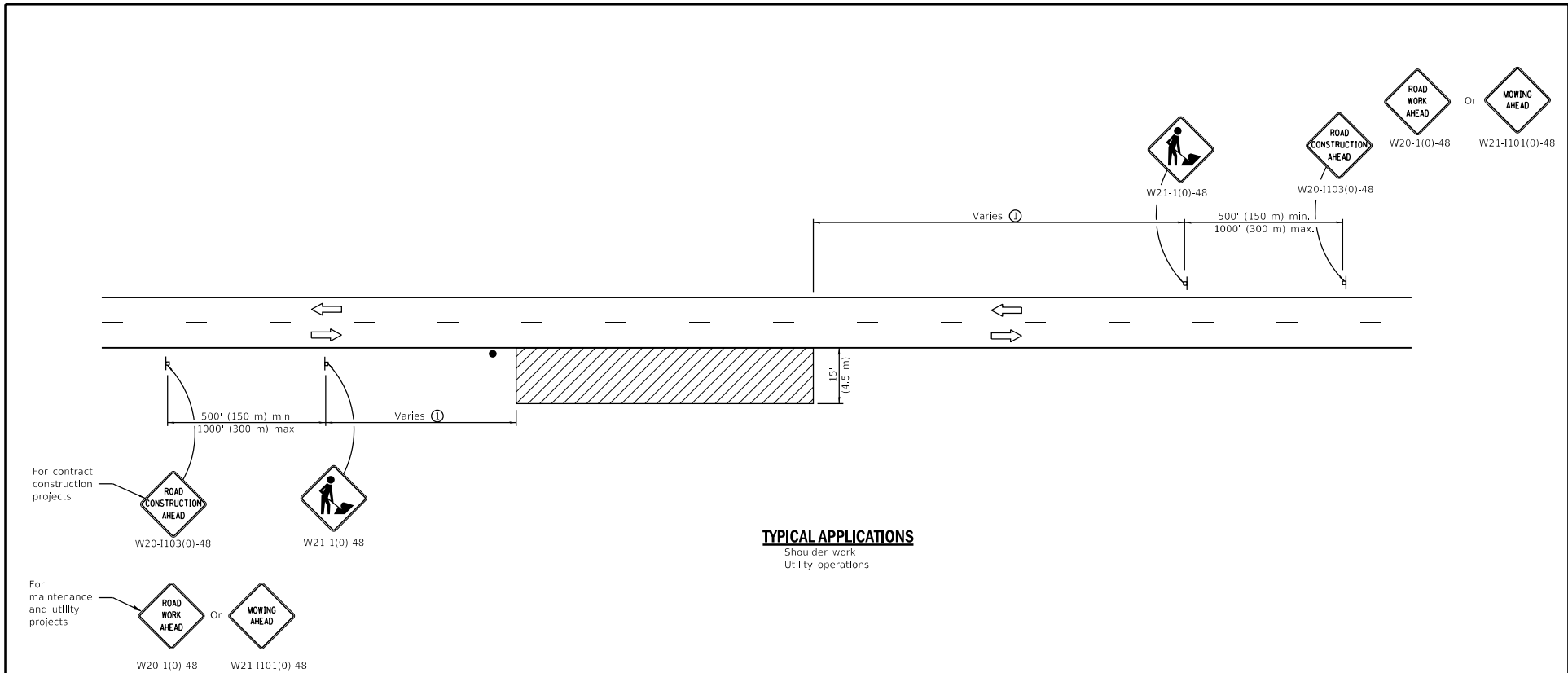
PASSED January 3, 2014

 ENGINEER OF SAFETY ENGINEERING

APPROVED January 3, 2014

 ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-14	Revised workers sign number to agree with current MUTCD.
1-1-13	Omitted text 'WORKERS' sign.

OFF-RD OPERATIONS, 2L, 2W, 15' (4.5 m) TO 24" (600 mm) FROM PAVEMENT EDGE

STANDARD 701006-05



TYPICAL APPLICATIONS

Shoulder work
Utility operations

SYMBOLS



Work area



Sign



Flagger with traffic control sign when required

① Minimum distance is 200' (60 m). Maximum distance to be determined by the Engineer but should not exceed 1/2 the length required for one normal working day's operation, or 4 miles (6.4 km) whichever is less.

GENERAL NOTES

This Standard is used where at any time, any vehicle, equipment, workers or their activities require an intermittent or continuous moving operation on the shoulder, where the average speed is 1 mph (2 km/h) or less.

When the work operation does not exceed 60 minutes, traffic control may be according to Standard 701301.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-14	Revised workers sign number to agree with current MUTCD.
1-1-13	Omitted text 'WORKERS' sign.

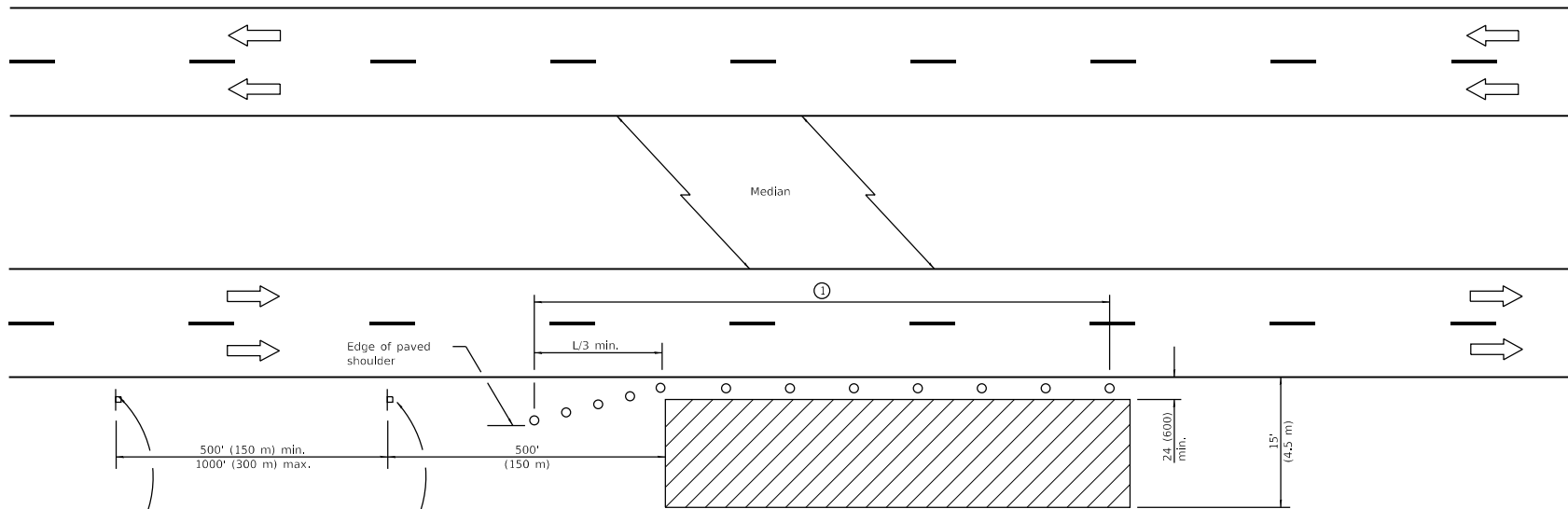
OFF-ROAD MOVING OPERATIONS, 2L, 2W, DAY ONLY

STANDARD 701011-04

Illinois Department of Transportation

PASSED January 3, 2014
[Signature]
 ENGINEER OF SAFETY ENGINEERING

APPROVED January 3, 2014
[Signature]
 ENGINEER OF DESIGN AND ENVIRONMENT



For contract construction projects



W20-1103(0)-48

For maintenance and utility projects



W20-1(0)-48



W21-1(0)-48

TYPICAL APPLICATIONS

- Utility operations
- Culvert extensions
- Side slope changes
- Guardrail installation and maintenance
- Delineator installation
- Landscaping operations
- Shoulder repair
- Sign installation and maintenance

① When the work operation exceeds one hour, cones, drums or barricades shall be placed at 25' (8 m) centers for L/3 distance, and at 50' (15 m) centers through the remainder of the work area.

SYMBOLS

- Work area
- Sign
- Cone, drum or barricade

GENERAL NOTES

This Standard is used where any vehicles, equipment, workers or their activities will encroach in the area 15' (4.5 m) to 24' (6000) from the edge of pavement.

Calculate L as follows:

SPEED LIMIT	FORMULAS	
	English	(Metric)
40 mph (70 km/h) or less:	$L = \frac{WS^2}{60}$	$L = \frac{WS^2}{150}$
45 mph (80 km/h) or greater:	$L = (W)(S)$	$L = 0.65(W)(S)$

W = Width of offset in feet (meters).

S = Normal posted speed mph (km/h).

All dimensions are in inches (millimeters) unless otherwise shown.

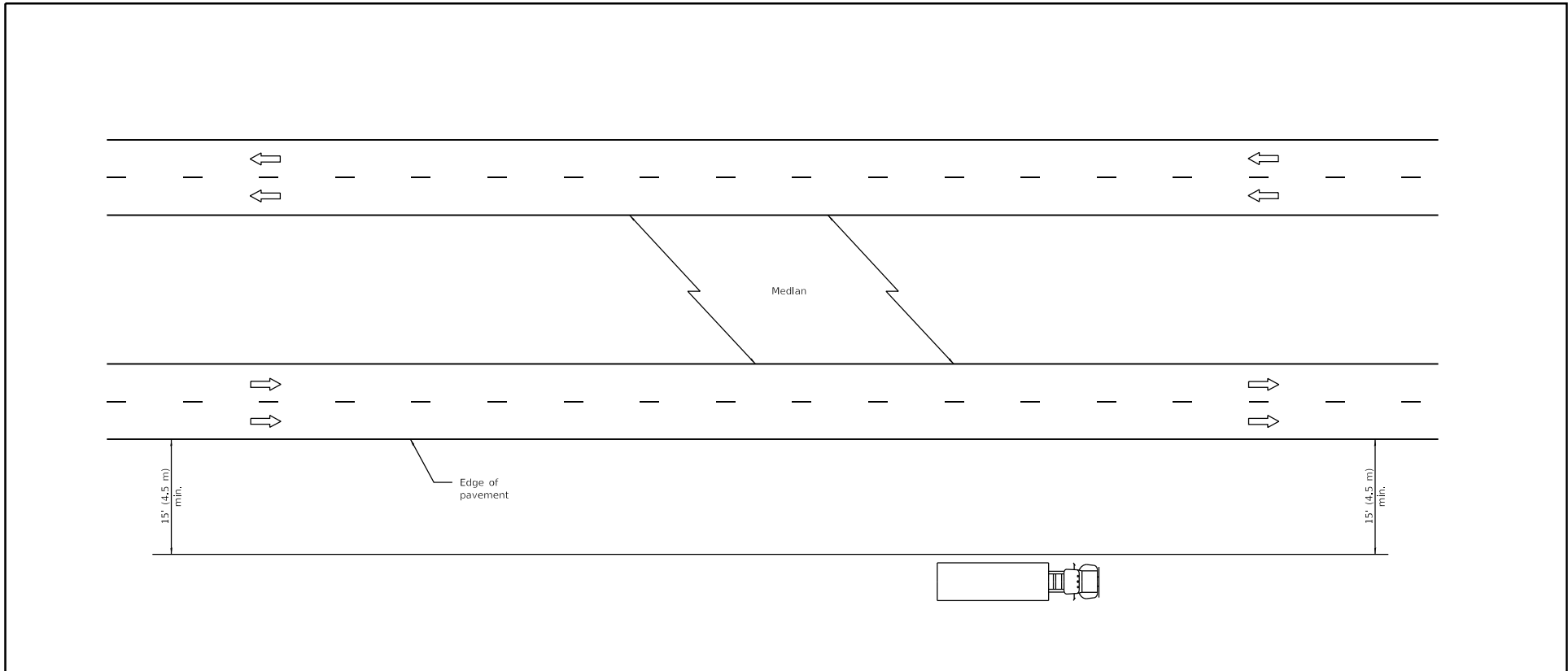
Illinois Department of Transportation

PASSED April 1, 2016
 ENGINEER OF SAFETY ENGINEERING
 APPROVED April 1, 2016
 ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
4-1-16	Corrected typo in title.
1-1-14	Revised workers sign number to agree with current MUTCD.

OFF-RD OPERATIONS, MULTILANE, 15' (4.5 m) TO 24' (600 mm) FROM PAVEMENT EDGE

STANDARD 701101-05



Median

Edge of pavement

15' (4.5 m) min.

15' (4.5 m) min.

TYPICAL APPLICATIONS

- Landscaping work
- Utility work
- Fencing contracts

GENERAL NOTES

This Standard is used where at all times all vehicles, equipment, workers or their activities are more than 15' (4.5 m) from the edge of pavement.

When the work operation requires that two or more work vehicles cross the 15' (4.5 m) clear zone in any one hour, traffic control shall be according to Standard 701101.

This Standard also applies to work performed in the median more than 15' (4.5 m) from either pavement.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2009

ENGINEER OF OPERATIONS

APPROVED January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-05	Switched units to English (metric).
1-1-05	Revised title.

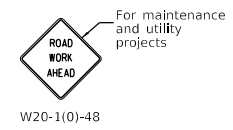
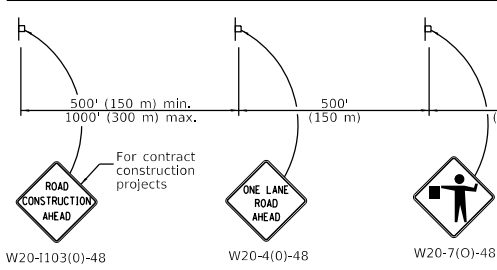
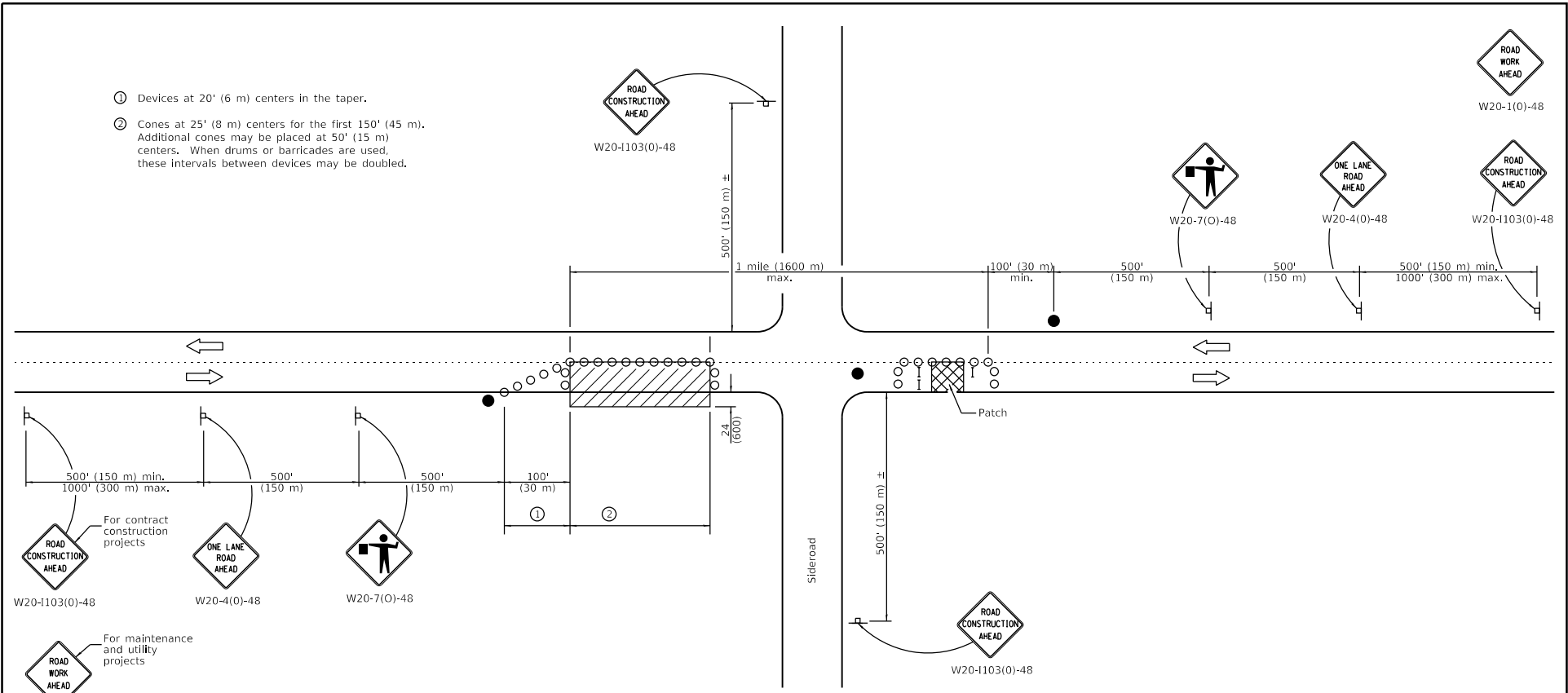
OFF-RD OPERATIONS, MULTILANE, MORE THAN 15' (4.5 m) AWAY

STANDARD 701106-02

- ① Devices at 20' (6 m) centers in the taper.
- ② Cones at 25' (8 m) centers for the first 150' (45 m). Additional cones may be placed at 50' (15 m) centers. When drums or barricades are used, these intervals between devices may be doubled.



W20-1103(0)-48



TYPICAL APPLICATIONS

- Isolated patching
- Utility operations
- Storm sewer
- Culverts
- Cable placement

SYMBOLS

- Work area
- Sign
- Barricade or drum
- Cone, drum or barricade
- Flagger with traffic control sign

GENERAL NOTES

This Standard is used where at any time, any vehicles, equipment, workers or their activities will encroach in the area between the center line and a line 24 (600) outside the edge of pavement for daylight operation.

When the distance between successive work areas exceeds 2000' (600 m), additional warning signs, flaggers, and taper shall be placed as shown.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

APPROVED January 1, 2019
Cynthia A. [Signature]
 ENGINEER OF SAFETY PROG. AND ENGINEERING

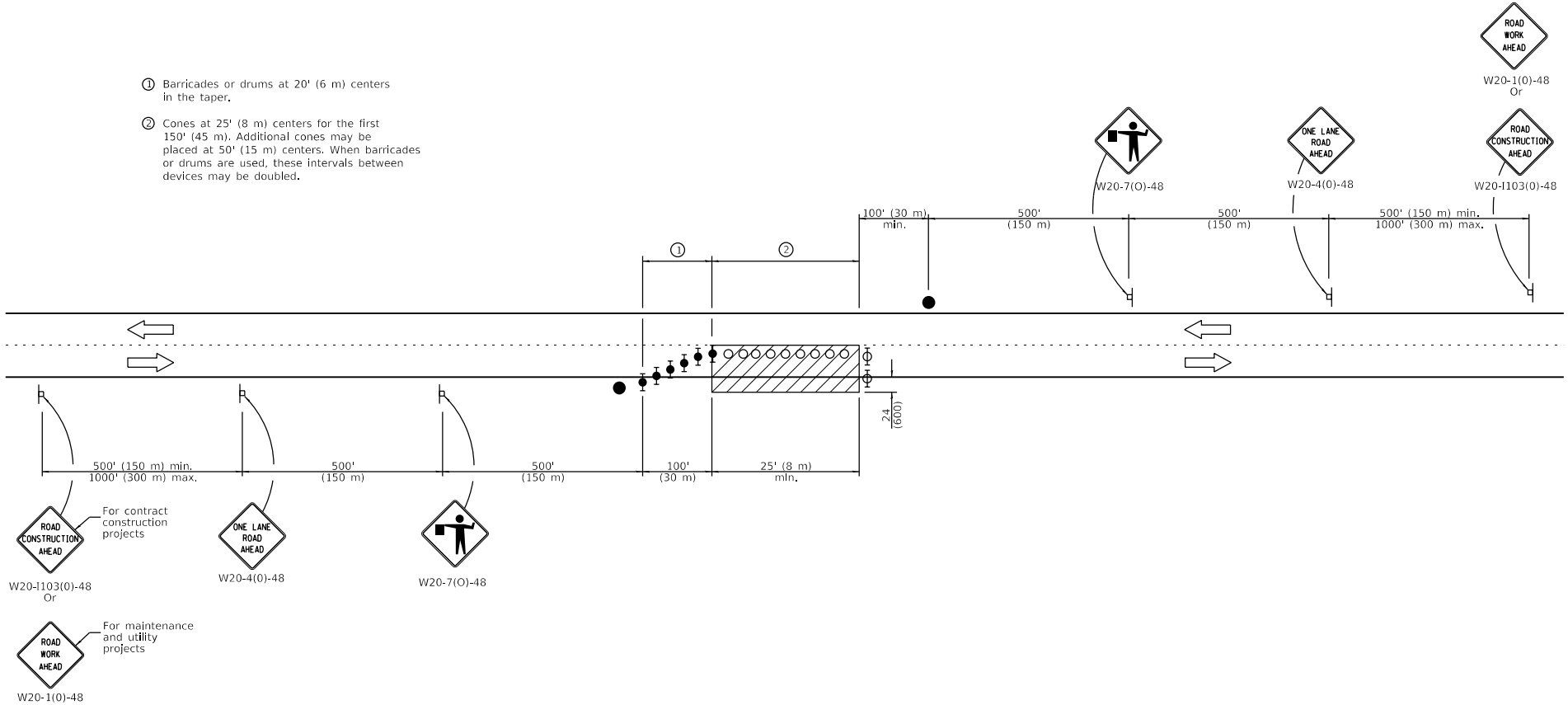
APPROVED January 1, 2019
[Signature]
 ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-19	Revised device spacing in taper.
1-1-11	Revised flagger sign.

**LANE CLOSURE, 2L, 2W,
 DAY ONLY,
 FOR SPEEDS ≥ 45 MPH**

STANDARD 701201-05

- ① Barricades or drums at 20' (6 m) centers in the taper.
- ② Cones at 25' (8 m) centers for the first 150' (45 m). Additional cones may be placed at 50' (15 m) centers. When barricades or drums are used, these intervals between devices may be doubled.



TYPICAL APPLICATIONS

Isolated patch
Installation of drainage structure
Utility operations

SYMBOLS

- Work area
- Sign
- Flagger with traffic control sign
- Cone, drum or barricade
- Barricade or drum with flashing light
- Barricade or drum with steady burning light

GENERAL NOTES

This Standard is used where at any time, any vehicle, equipment, workers or their activities will encroach in the area between the center line and a line 24 (600) from the edge of pavement for nighttime operation.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-19	Revised device spacing in taper and added cones as an option.
1-1-18	Omitted steady burning lights in tangent.

**LANE CLOSURE, 2L, 2W,
NIGHT ONLY,
FOR SPEEDS ≥ 45 MPH**

STANDARD 701206-05

Illinois Department of Transportation

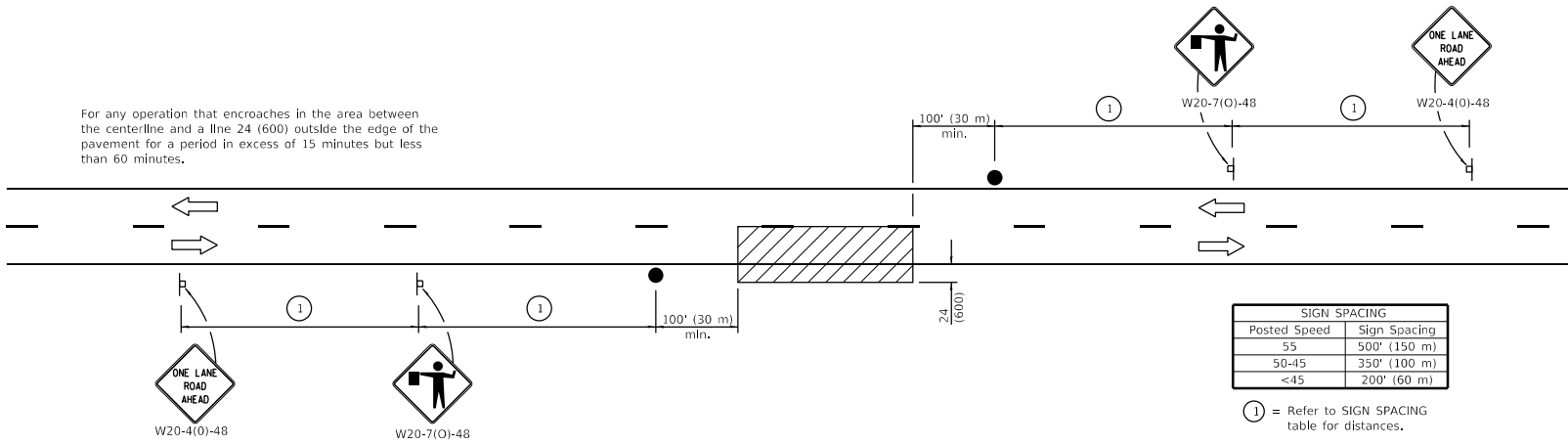
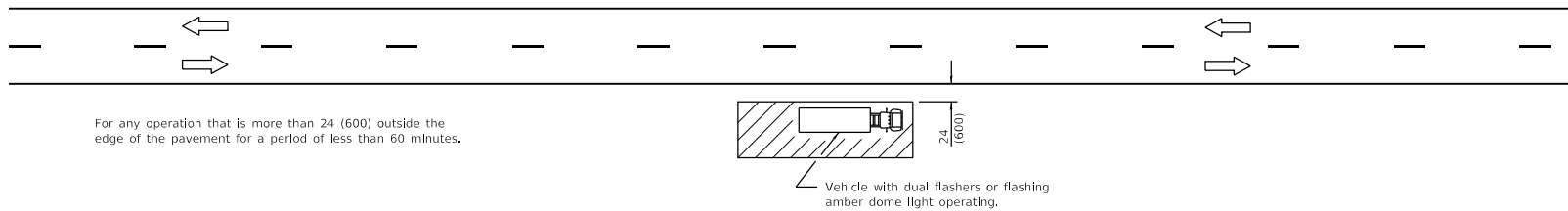
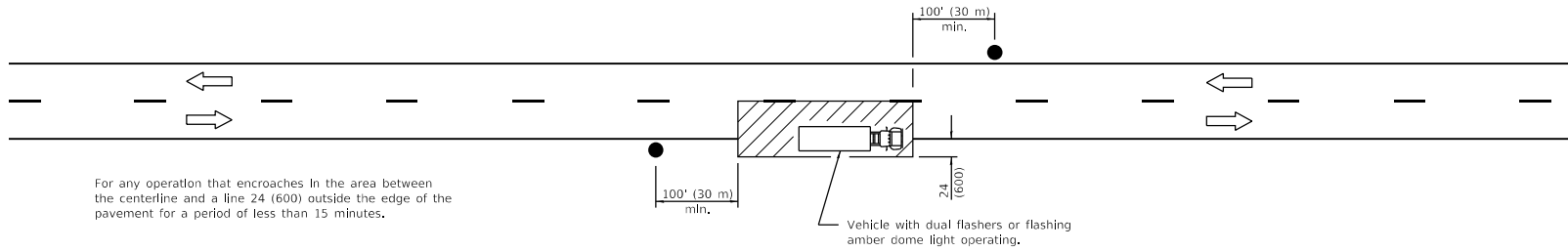
APPROVED January 1, 2019

 ENGINEER OF SAFETY PROG. AND ENGINEERING

APPROVED January 1, 2019

 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUES: _____
 464-1-03/ISSUE



TYPICAL APPLICATIONS

- Marking patches
- Field survey
- String line
- Utility operations
- Cleaning up debris on pavement

SYMBOLS

- Work area
- Sign on portable or permanent support
- Flagger with traffic control sign

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

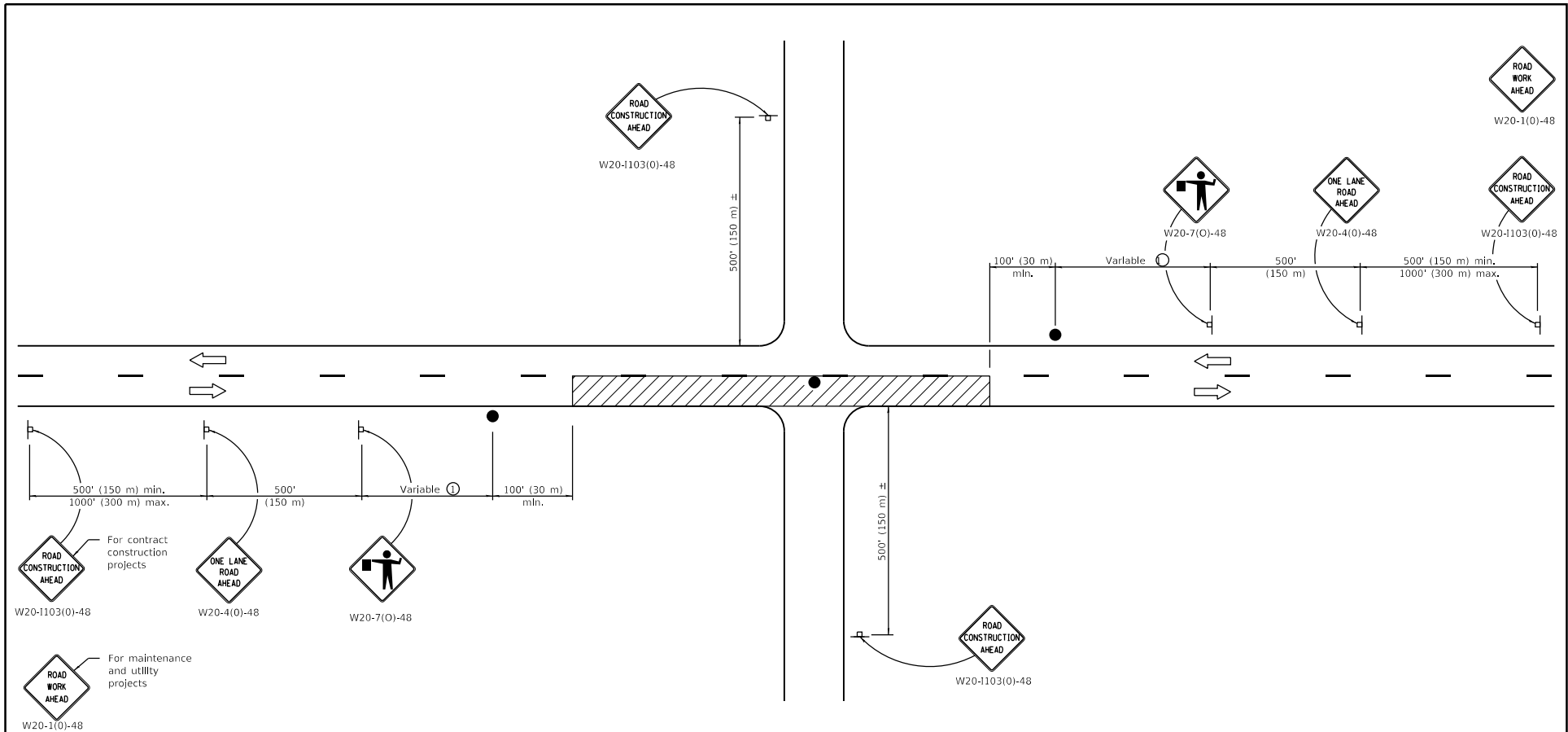
PASSED January 1, 2011
Amelia R. [Signature]
 ENGINEER OF SAFETY ENGINEERING

APPROVED January 1, 2011
[Signature]
 ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-11	Revised flagger sign.
1-1-09	Switched units to English (metric).

LANE CLOSURE, 2L, 2W, SHORT TIME OPERATIONS




STANDARD 701301-04



TYPICAL APPLICATIONS

Bituminous resurfacing
Milling operations
Utility operations
Shoulder operations

SYMBOLS

-  Work area
-  Sign on portable or permanent support
-  Flagger with traffic control sign

① Minimum distance is 200' (60 m). Maximum distance to be determined by the Engineer but should not exceed 1/2 the length required for one normal working day's operation or 2 miles (3200 m), whichever is less.

GENERAL NOTES

This Standard is used where at any time, any vehicle, equipment, workers or their activities require an intermittent or continuous moving operation on the pavement where the average speed of movement is greater than 1/2 mph (1 km/h) and less than 4 mph (6 km/h).

When the operation does not exceed 60 minutes, traffic control may be according to Standard 701301.

All dimensions are in inches (millimeters) unless otherwise shown.

LANE CLOSURE, 2L, 2W, SLOW MOVING OPERATIONS DAY ONLY, FOR SPEEDS ≥ 45 MPH

STANDARD 701306-04

Illinois Department of Transportation

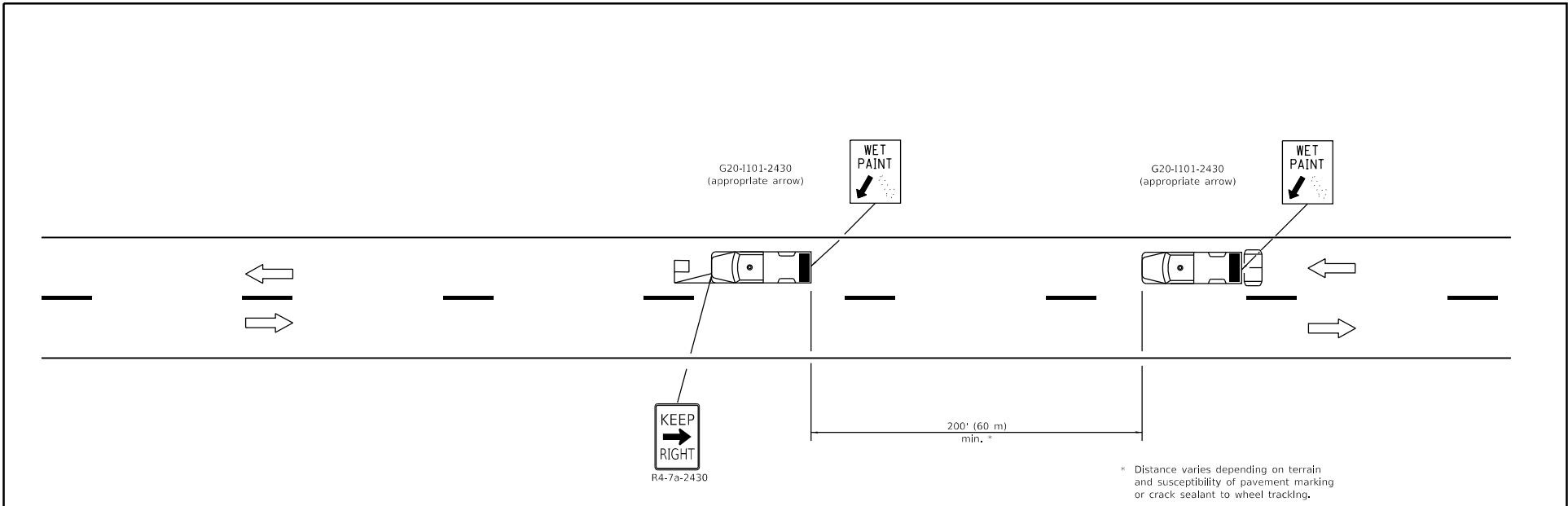
PASSED January 1, 2018

ENGINEER OF SAFETY, PROG. AND ENGINEERING

APPROVED January 1, 2018

ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-18	Revised lower speed limit for operation to 1/2 mph.
1-1-11	Revised flagger sign.







* Distance varies depending on terrain and susceptibility of pavement marking or crack sealant to wheel tracking.

TYPICAL APPLICATIONS

- Landscaping work
- Utility work
- Pavement marking
- Weed spraying
- Roadometer measurements
- Debris cleanup
- Crack pouring

SYMBOLS

-  Arrow board (Hazard Mode only)
-  Truck with headlights, emergency flashers and flashing amber light. (visible from all directions)
-  18x18 (450x450) min. orange flag (use when guide wheel is used)
-  Truck mounted attenuator

GENERAL NOTES

This Standard is used where any vehicle, equipment, workers or their activities will require a continuous moving operation where the average speed is greater than 3 mph (5 km/h).

For shoulder operations not encroaching on the pavement, use DETAIL A, Standard 701426.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2009

ENGINEER OF OPERATIONS

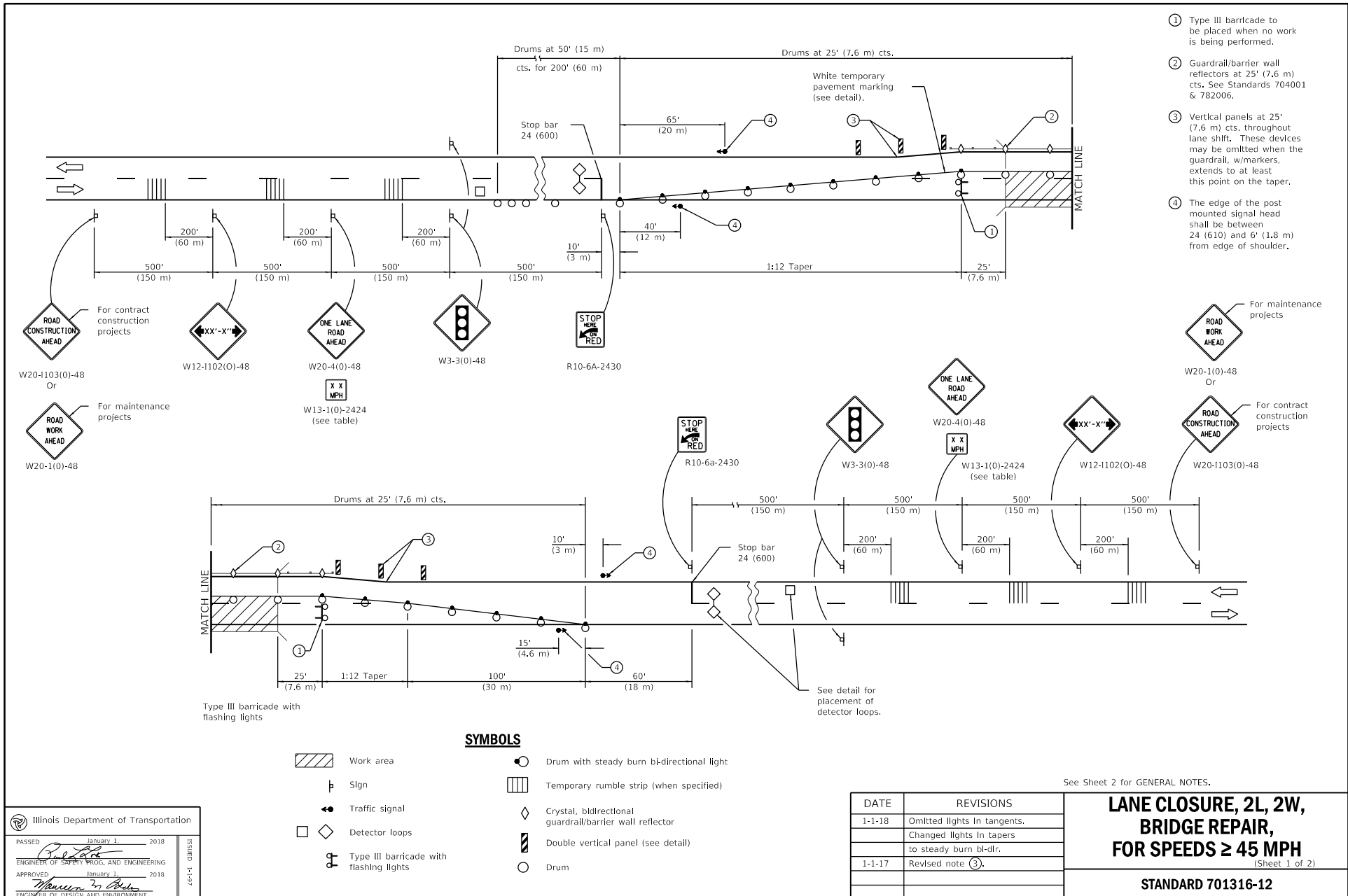
APPROVED January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-09	Switched units to English (metric). Omitted Pass With Care sign.
1-1-00	Elim. speed restrictions in Standard title.

LANE CLOSURE 2L, 2W MOVING OPERATIONS-DAY ONLY

STANDARD 701311-03



- ① Type III barricade to be placed when no work is being performed.
- ② Guardrail/barrier wall reflectors at 25' (7.6 m) cts. See Standards 704001 & 782006.
- ③ Vertical panels at 25' (7.6 m) cts. throughout lane shift. These devices may be omitted when the guardrail, w/markers, extends to at least this point on the taper.
- ④ The edge of the post mounted signal head shall be between 24 (610) and 6' (1.8 m) from edge of shoulder.

SYMBOLS

- Work area
- Sign
- Traffic signal
- Detector loops
- Type III barricade with flashing lights
- Drum with steady burn bi-directional light
- Temporary rumble strip (when specified)
- Crystal, bi-directional guardrail/barrier wall reflector
- Double vertical panel (see detail)
- Drum

See Sheet 2 for GENERAL NOTES.

DATE	REVISIONS
1-1-18	Omitted lights in tangents. Changed lights in tapers to steady burn bi-dir.
1-1-17	Revised note ③.

**LANE CLOSURE, 2L, 2W,
BRIDGE REPAIR,
FOR SPEEDS ≥ 45 MPH**
(Sheet 1 of 2)

STANDARD 701316-12

Illinois Department of Transportation

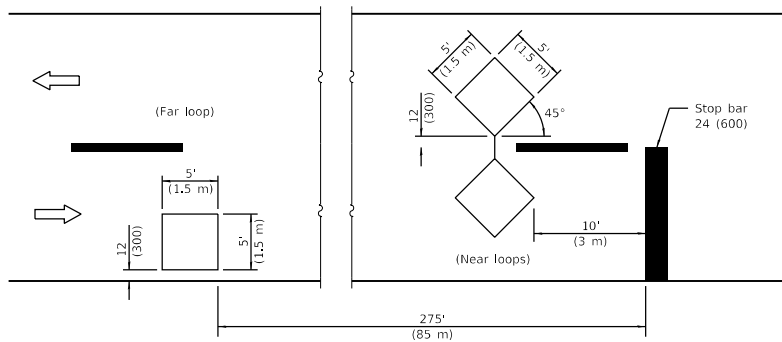
PASSED January 1, 2018

 ENGINEER OF SAFETY, PROG. AND ENGINEERING

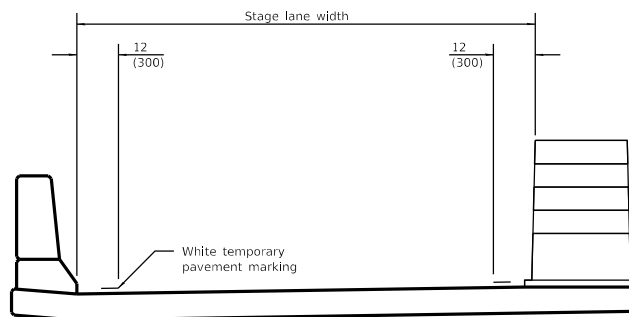
APPROVED January 1, 2018

 ENGINEER OF DESIGN AND ENVIRONMENT

LEG-C1 03/15/11



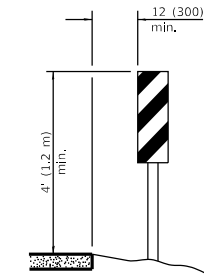
DETECTOR LOOPS



TEMPORARY PAVEMENT MARKING

TRAFFIC SIGNAL SEQUENCE						
PHASE	A			B		
INTERVAL	1	2	3	4	5	6
NORTHBOUND OR EASTBOUND	G	Y	R	R	R	R
SOUTHBOUND OR WESTBOUND	R	R	R	G	Y	R

ADVISORY SPEED LIMIT	
NORMAL POSTED SPEED	ADVISORY SPEED
55 - 45 mph	40 mph
40 mph	35 mph
35 - 30 mph	30 mph



VERTICAL PANELS
(Post mounted, one each side)

GENERAL NOTES

This Standard is used where, at any time any vehicle, equipment, workers or their activities will encroach on one lane of a bridge and traffic signals are required.

When traffic signals are not in operation, flaggers shall be used and traffic control devices shall conform to Standard 701201 or 701206.

Existing or temporary pavement markings shall be on both sides of open lane from stop bar to stop bar.

All dimensions are in inches (millimeters) unless otherwise shown.

**LANE CLOSURE, 2L, 2W,
BRIDGE REPAIR,
FOR SPEEDS ≥ 45 MPH**
(Sheet 2 of 2)

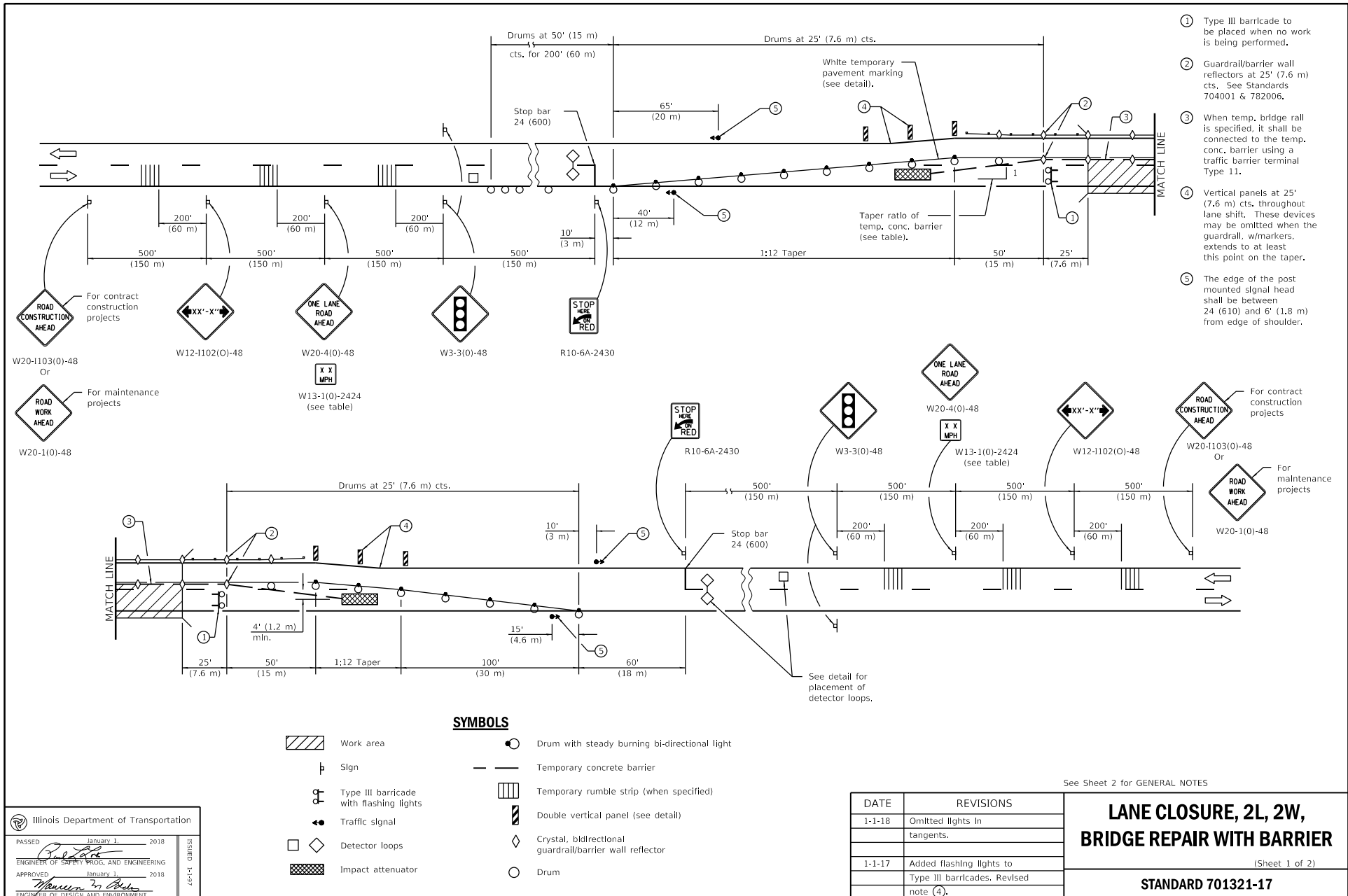
STANDARD 701316-12

Illinois Department of Transportation

PASSED January 1, 2018
[Signature]
 ENGINEER OF SAFETY, PROC. AND ENGINEERING

APPROVED January 1, 2018
[Signature]
 ENGINEER OF DESIGN AND ENVIRONMENT

LEG-1 03/11/21



- ① Type III barricade to be placed when no work is being performed.
- ② Guardrail/barrier wall reflectors at 25' (7.6 m) cts. See Standards 704001 & 782006.
- ③ When temp. bridge rail is specified, it shall be connected to the temp. conc. barrier using a traffic barrier terminal Type 11.
- ④ Vertical panels at 25' (7.6 m) cts. throughout lane shift. These devices may be omitted when the guardrail, w/markers, extends to at least this point on the taper.
- ⑤ The edge of the post mounted signal head shall be between 24 (610) and 6' (1.8 m) from edge of shoulder.

Illinois Department of Transportation

PASSED January 1, 2018

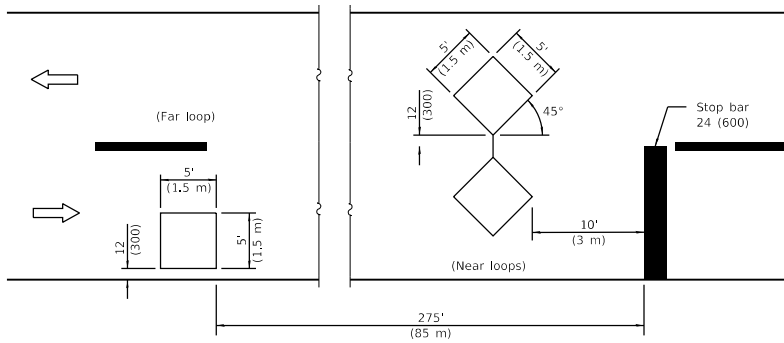
 ENGINEER OF SAFETY, PROG. AND ENGINEERING

APPROVED January 1, 2018

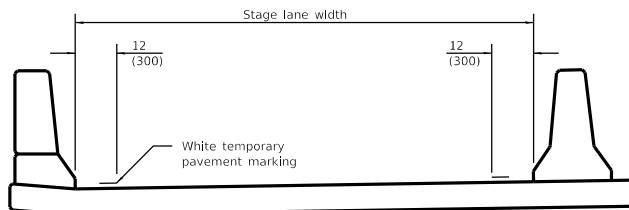
 ENGINEER OF DESIGN AND ENVIRONMENT

LEG-1 CHISSI

See Sheet 2 for GENERAL NOTES



DETECTOR LOOPS

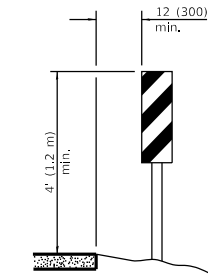


TEMPORARY PAVEMENT MARKING

TRAFFIC SIGNAL SEQUENCE						
PHASE	A			B		
INTERVAL	1	2	3	4	5	6
NORTHBOUND OR EASTBOUND	G	Y	R	R	R	R
SOUTHBOUND OR WESTBOUND	R	R	R	G	Y	R

TEMPORARY CONCRETE BARRIER	
NORMAL POSTED SPEED	TAPER RATIO
40 mph AND ABOVE	12:1
BELOW 40 mph	8:1

ADVISORY SPEED LIMIT	
NORMAL POSTED SPEED	ADVISORY SPEED
55 - 45 mph	40 mph
40 mph	35 mph
35 - 30 mph	30 mph



VERTICAL PANELS
(Post mounted, one each side)

GENERAL NOTES

This Standard is used where, at any time, any vehicle, equipment, workers, or their activities will encroach on one lane of a bridge. Traffic signals and a positive barrier are required.

Traffic signals shall be operational only when all traffic controls are in place. When traffic signals are not in operation, flaggers shall be used and traffic control shall conform to Standard 701201 or 701206.

Temporary concrete barrier shall be according to Standard 704001.

Existing or temporary pavement markings shall be on both sides of open lane from stop bar to stop bar.

All dimensions are in inches (millimeters) unless otherwise shown.

**LANE CLOSURE, 2L, 2W,
BRIDGE REPAIR WITH BARRIER**

(Sheet 2 of 2)

STANDARD 701321-17

Illinois Department of Transportation

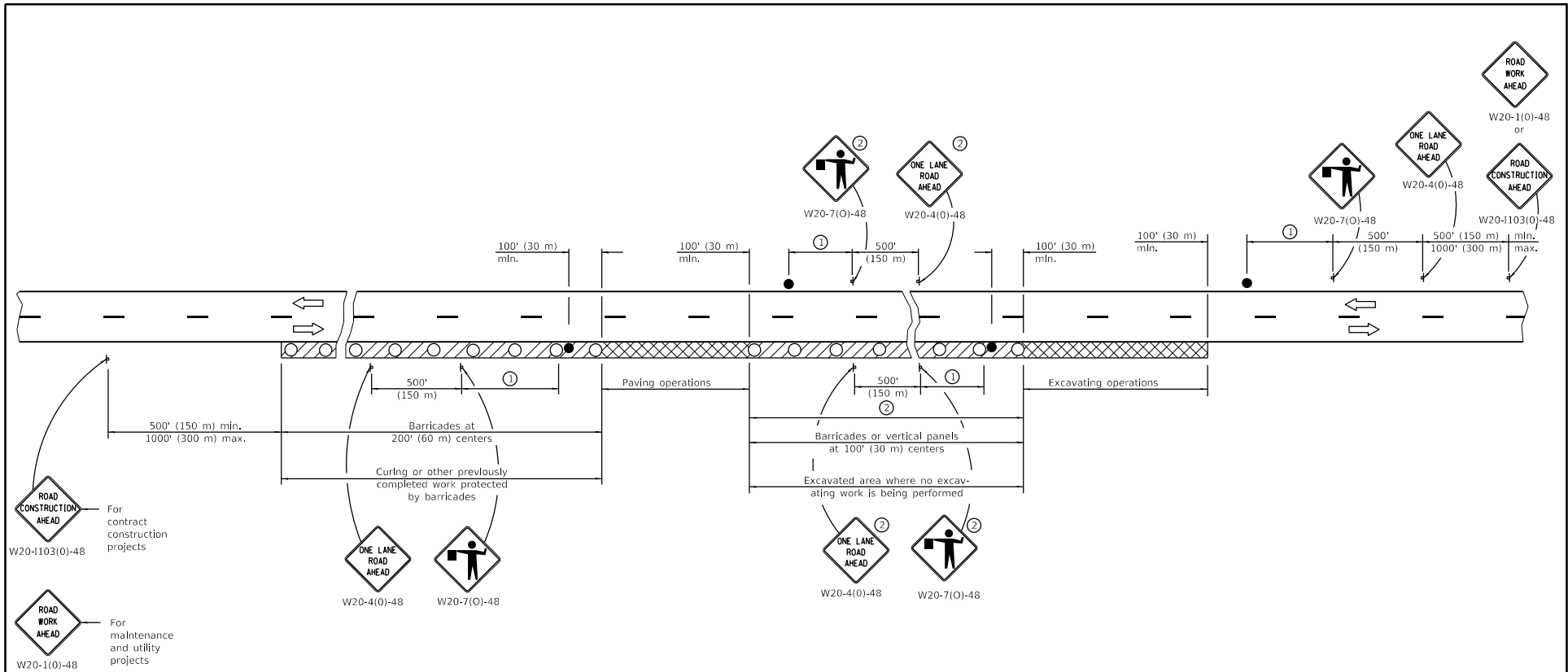
PASSED January 1, 2018

ENGINEER OF SAFETY PROC. AND ENGINEERING

APPROVED January 1, 2018

ENGINEER OF DESIGN AND ENVIRONMENT

469-1-03/11/21



SYMBOLS

- Work area
- Active Work area
- Sign
- Barricade, drum, or vertical panels
- Flagger with traffic control sign

- ① Minimum distance is 200' (60 m). Maximum distance to be determined by the Engineer but in no case to exceed the length of 1/2 day's normal operation or 2 miles (3200 m) whichever is less.
- ② Signs are not required if distance between work operations is less than 2000' (600 m) unless restricted sight distance exists.

GENERAL NOTES

This Standard is used where at any time, any vehicle, equipment, workers or their activities will encroach on the pavement during widening operations.

Two flaggers are required for each separate operation.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

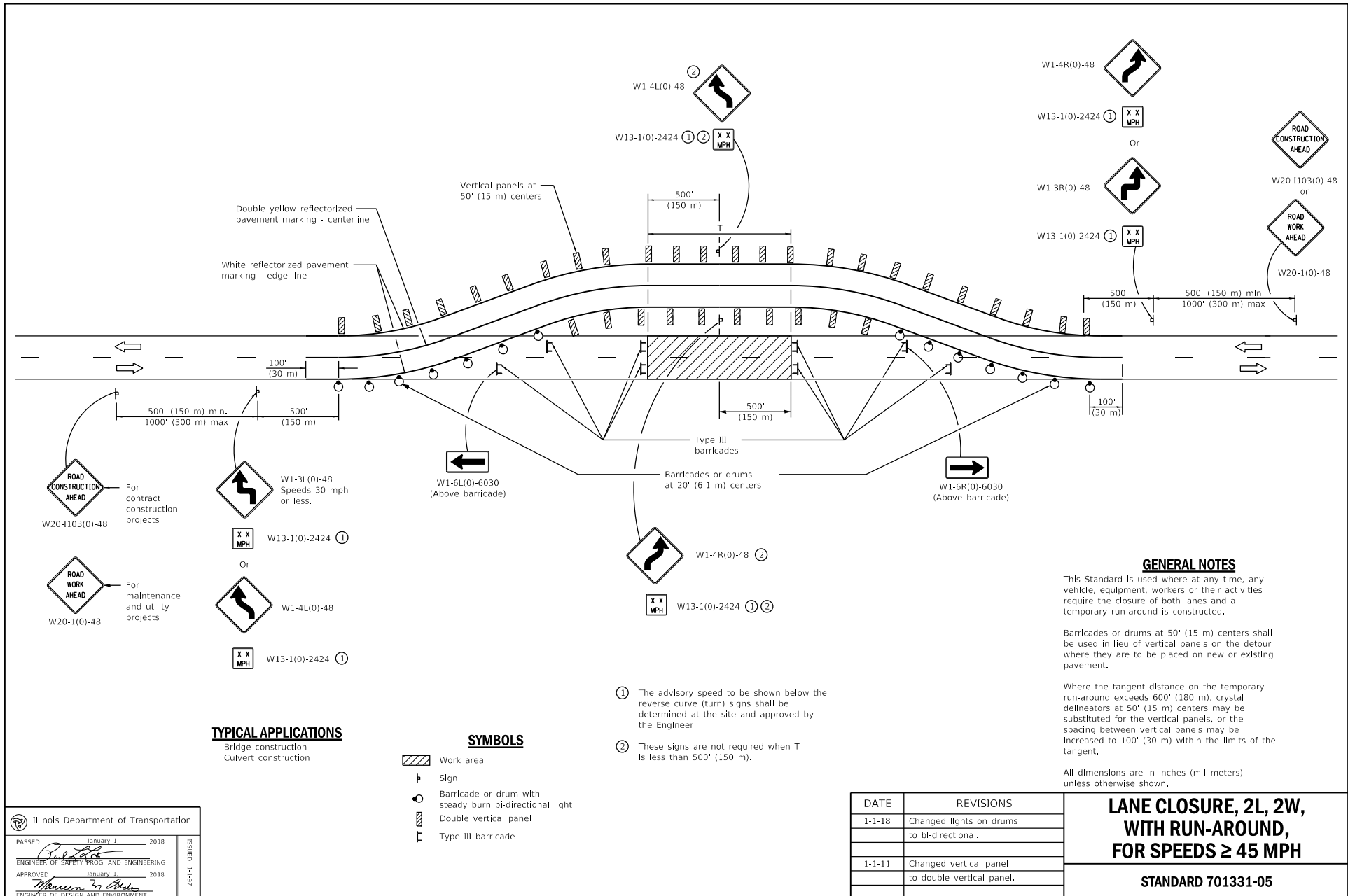
PASSED January 1, 2011
[Signature]
 ENGINEER OF SAFETY ENGINEERING

APPROVED January 1, 2011
[Signature]
 ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-11	Revised flagger sign.
1-1-09	Switched units to English (metric). Corrected sign No.'s.

**LANE CLOSURE, 2L, 2W,
PAVEMENT WIDENING,
FOR SPEEDS ≥ 45 MPH**

STANDARD 701326-04



ROAD CONSTRUCTION AHEAD
W20-1103(0)-48
For contract construction projects

ROAD WORK AHEAD
W20-1(0)-48
For maintenance and utility projects

W1-3L(0)-48
Speeds 30 mph or less.

W13-1(0)-2424 ①

Or
W1-4L(0)-48

W13-1(0)-2424 ①

TYPICAL APPLICATIONS

Bridge construction
Culvert construction

SYMBOLS

- Work area
- Sign
- Barricade or drum with steady burn bi-directional light
- Double vertical panel
- Type III barricade

- ① The advisory speed to be shown below the reverse curve (turn) signs shall be determined at the site and approved by the Engineer.
- ② These signs are not required when T is less than 500' (150 m).

W1-4R(0)-48
W13-1(0)-2424 ① **X X MPH**
Or
W1-3R(0)-48
W13-1(0)-2424 ① **X X MPH**
ROAD CONSTRUCTION AHEAD
W20-1103(0)-48
or
ROAD WORK AHEAD
W20-1(0)-48

GENERAL NOTES

This Standard is used where at any time, any vehicle, equipment, workers or their activities require the closure of both lanes and a temporary run-around is constructed.

Barricades or drums at 50' (15 m) centers shall be used in lieu of vertical panels on the detour where they are to be placed on new or existing pavement.

Where the tangent distance on the temporary run-around exceeds 600' (180 m), crystal delineators at 50' (15 m) centers may be substituted for the vertical panels, or the spacing between vertical panels may be increased to 100' (30 m) within the limits of the tangent.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-18	Changed lights on drums to bi-directional.
1-1-11	Changed vertical panel to double vertical panel.

LANE CLOSURE, 2L, 2W, WITH RUN-AROUND, FOR SPEEDS ≥ 45 MPH

STANDARD 701331-05

Illinois Department of Transportation

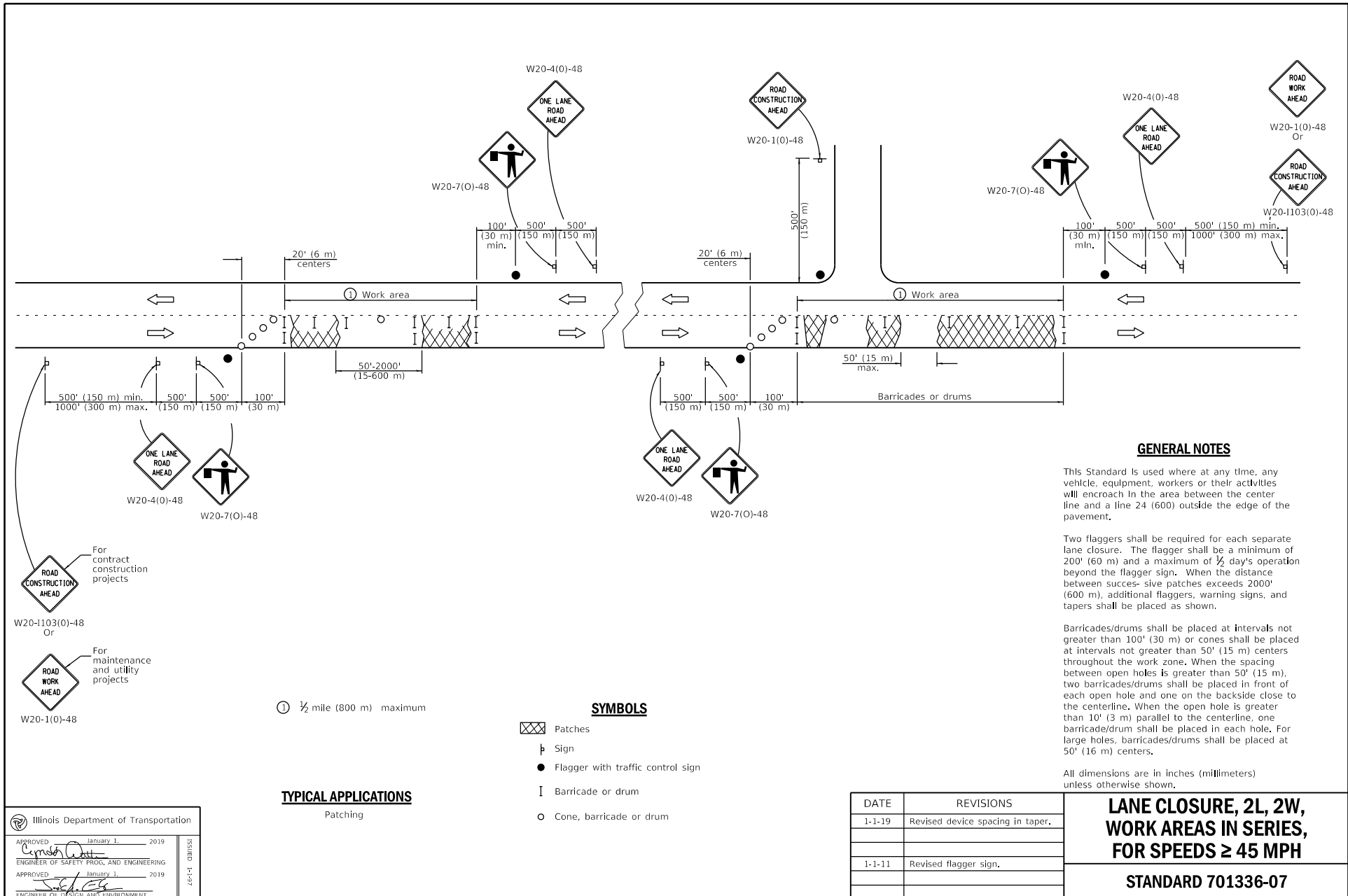
PASSED January 1, 2018

 ENGINEER OF SAFETY PROC. AND ENGINEERING

APPROVED January 1, 2018

 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUE 1 03/11/15



Illinois Department of Transportation

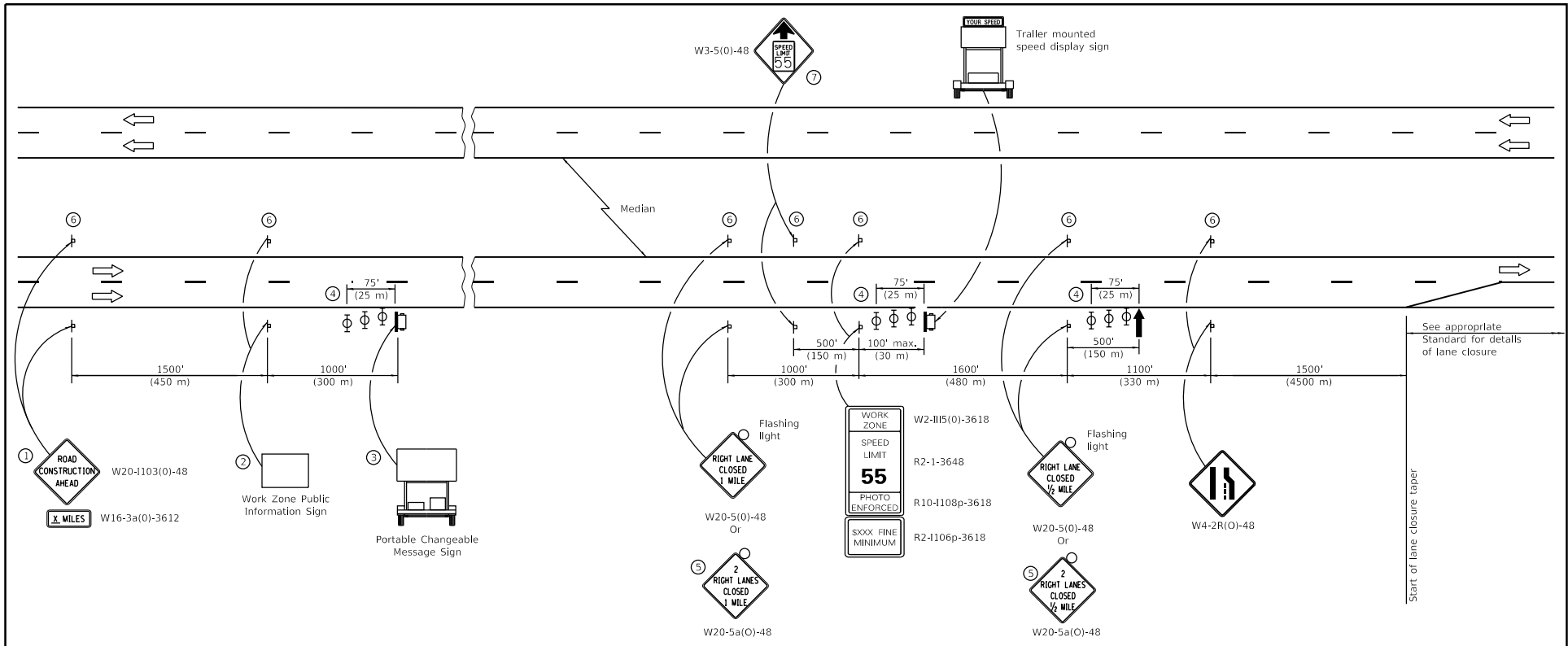
APPROVED January 1, 2019
 ENGINEER OF SAFETY PROG. AND ENGINEERING

APPROVED January 1, 2019
 ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-19	Revised device spacing in taper.
1-1-11	Revised flagger sign.

**LANE CLOSURE, 2L, 2W,
 WORK AREAS IN SERIES,
 FOR SPEEDS ≥ 45 MPH**

STANDARD 701336-07



See appropriate Standard for details of lane closure

Start of lane closure taper

SYMBOLS

- ↑ Arrow board
- ☐ Trailer mounted sign
- ⊢ Sign
- ⊕ Type II barricade, drum, or vertical barricade with monodirectional flashing light

- ① The Road Construction Ahead sign shall be located 3 to 5 miles in advance of the project limits.
- ② The message and size of the Work Zone Public Information Sign shall be as specified by the Department.
- ③ The message board shall be used to display status of lanes within the project. The primary messages shall be:
"Right Lane Closed" / " x Miles Ahead"
"Left Lane Closed" / " x Miles Ahead"
"All Lanes Open"
- ④ Three, Type II barricades, drums, or vertical barricades at 25' (8 m) centers.
- ⑤ This sign shall be used when 2 lanes are closed.
- ⑥ This sign shall be omitted when median width is less than 10' (3 m).
- ⑦ This sign shall only be used if the existing speed limit is greater than 65 mph.

GENERAL NOTES

This standard is used where at any time a lane is closed on a freeway/expressway. When the left lane is closed, LEFT LANE CLOSED signs shall be substituted for the RIGHT LANE CLOSED signs.

The first two signs and the message board are stationary.

The last four signs and arrow board shall be moved as necessary to maintain the required distance from the start of the lane closure taper(s).

All dimensions are in inches (millimeters) unless otherwise shown.

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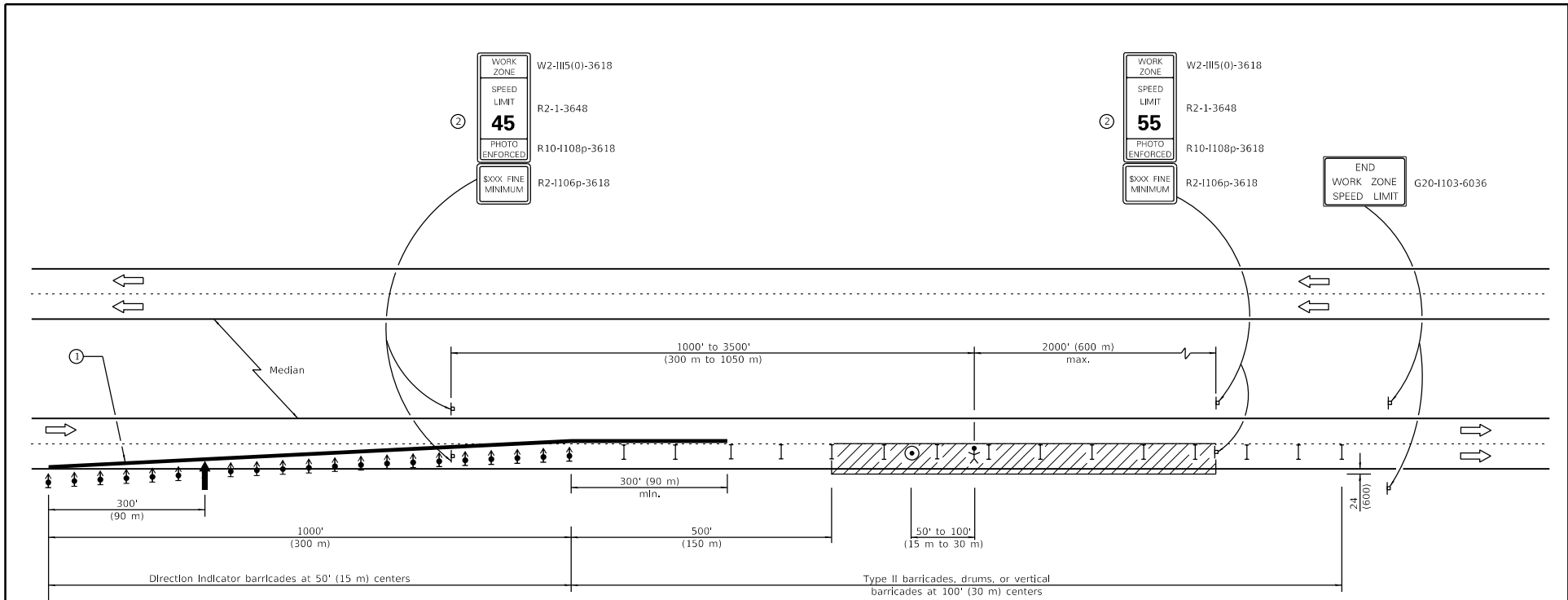
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUES/CHANGES

DATE	REVISIONS
1-1-17	Added trailer mounted speed display sign. Changed device spacing and note (4).
1-1-15	Revised '2 RIGHT LANES CLOSED X MILE' sign number.

**APPROACH TO
LANE CLOSURE,
FREEWAY/EXPRESSWAY**

STANDARD 701400-09



See Standard 701400 for approach
Start of lane closure taper

SYMBOLS

- ↑ Arrow board
- ▨ Work area
- ⚠ Worker
- ♣ Sign
- ↕ Direction indicator barricade with steady burn monodirectional light
- I Type II barricade, drum, or vertical barricade
- ⊙ Spotter

- ① ReflectORIZED temporary pavement marking tape shall be placed throughout the taper and for 300' (90 m) along-side the work area when the closure time is greater than fourteen days. The edge line shall be white for right lane closure and yellow for left lane closures.
- ② Work Zone speed limit signs shall be moved as necessary to maintain the required spacing between the signs and the workers in each separate work activity. Work Zone Speed Limit 55 Photo Enforced sign shall be omitted when the work area dictates placement of the sign array within 500' (150 m) of the End Work Zone Speed Limit Sign.

GENERAL NOTES

This Standard is used where at any time any vehicle, equipment, workers or their activities will encroach on the lane adjacent to the shoulder, or on the shoulder within 24 (600) of the edge of pavement.

This Standard must always be used in combination with Standard 701400.

This Standard also applies when work is being performed in the left lane. Under these conditions, the setup would be a mirror image to what is shown.

A check barricade shall be placed in the middle of the closed lane and at the shoulder at 1000' (300 m) centers.

All dimensions are in Inches (millimeters) unless otherwise shown.

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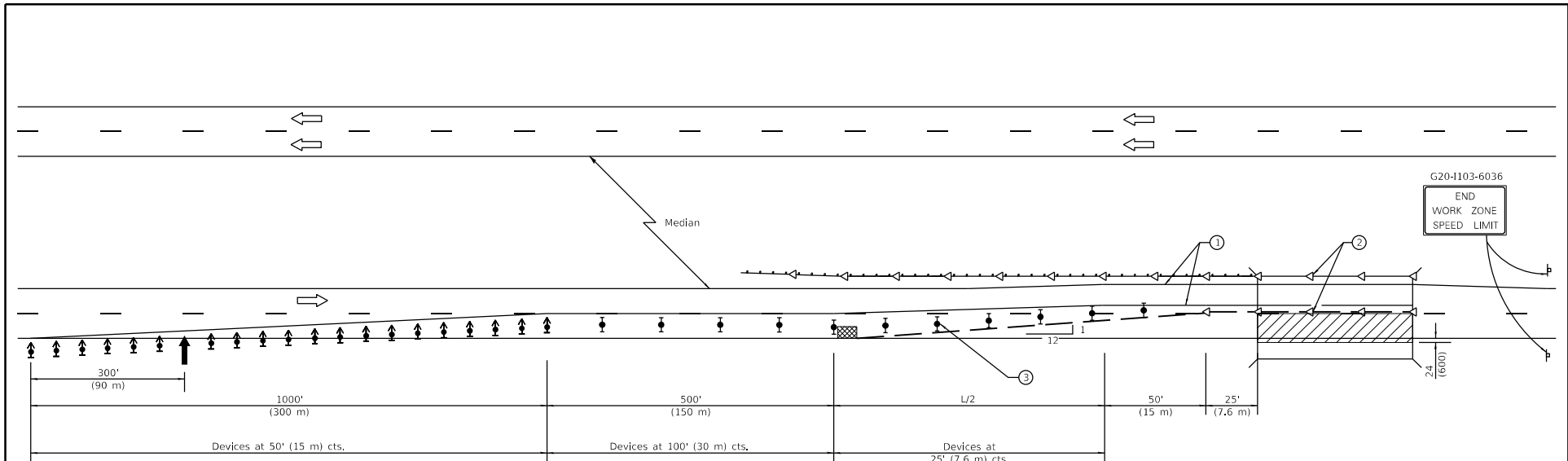
 ENGINEER OF DESIGN AND ENVIRONMENT

464-11 03/15/21

DATE	REVISIONS
1-1-19	Replaced flagger with spotter.
1-1-18	Omitted lights in tangent.

**LANE CLOSURE,
FREEWAY / EXPRESSWAY**

STANDARD 701401-12



GENERAL NOTES

This Standard is used where at any time any vehicle, equipment, workers or their activities will encroach on the pavement or on the shoulder within 24 (600) of the edge of pavement for daylight operation exceeding one day and where temporary concrete barrier is utilized.

This Standard must always be used in combination with Standard 701400.

When work is being performed in the left lane, the set up would be a mirror image to what is shown.

Temporary concrete barrier shall be according to Standard 704001.

Calculate L as follows:

NORMAL POSTED SPEED FORMULAS

English (Metric)
 $L = (W)(S)$ $L = 0.65(W)(S)$

W = Width of offset
 in feet (meters).

S = Normal posted speed
 in mph (km/h).

All dimensions are in inches (millimeters) unless otherwise shown.

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
- Temporary concrete barrier
- ◁ Monodirectional guardrail/barrier wall reflector
- ▩ Impact attenuator

- ① Temporary pavement marking tape shall be placed throughout the taper and along-side the work area. The right edge line shall be white and the left edge line shall be yellow.
- ② Guardrail/barrier wall reflectors at 25' (7.6 m). Markers on right shall be crystal and markers on left shall be amber. See Standards 704001 and 782006.
- ③ Vertical barricades shall not be used in lane shift taper.

See Standard 701400 for approach Start of lane closure taper

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[Signature]
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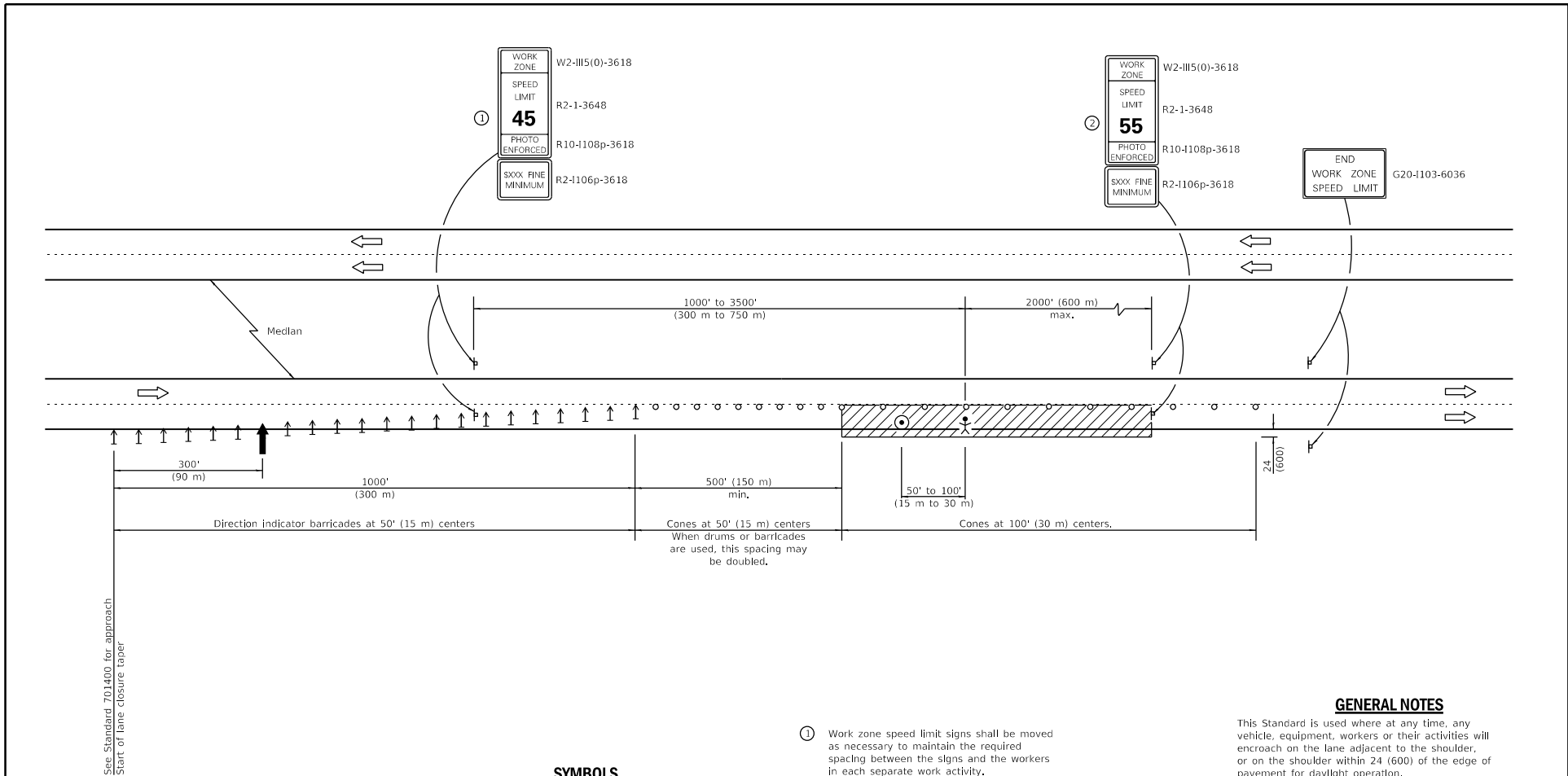
APPROVED January 1, 2017
[Signature]
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 004-1-03

DATE	REVISIONS
1-1-17	Revised END WORK ZONE SPEED LIMIT sign from orange to white background.
4-1-16	Added reference to Standards 704001 and 782006 in note (2).

**LANE CLOSURE,
 FREEWAY/EXPRESSWAY,
 WITH BARRIER**

STANDARD 701402-12



See Standard 701400 for approach
Start of lane closure taper

TYPICAL APPLICATIONS

- Pavement patch
- Utility operations
- Bituminous resurfacing

SYMBOLS

- Arrow board
- Work area
- Worker
- Sign
- Direction Indicator barricade
- Cone, drum or barricade
- Spotter

- ① Work zone speed limit signs shall be moved as necessary to maintain the required spacing between the signs and the workers in each separate work activity.
- ② Work Zone Speed Limit 55 Photo Enforced sign shall be omitted when the work area dictates placement of the sign array within 500' (150 m) of the End Work Zone Speed Limit sign.

GENERAL NOTES

This Standard is used where at any time, any vehicle, equipment, workers or their activities will encroach on the lane adjacent to the shoulder, or on the shoulder within 24 (600) of the edge of pavement for daylight operation.

This Standard must always be used in combination with Standard 701400.

This Standard also applies when work is being performed in the left lane. Under these conditions, the set up would be a mirror image to what is shown.

All dimensions are in inches (millimeters) unless otherwise shown.

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APPROVED January 1, 2019

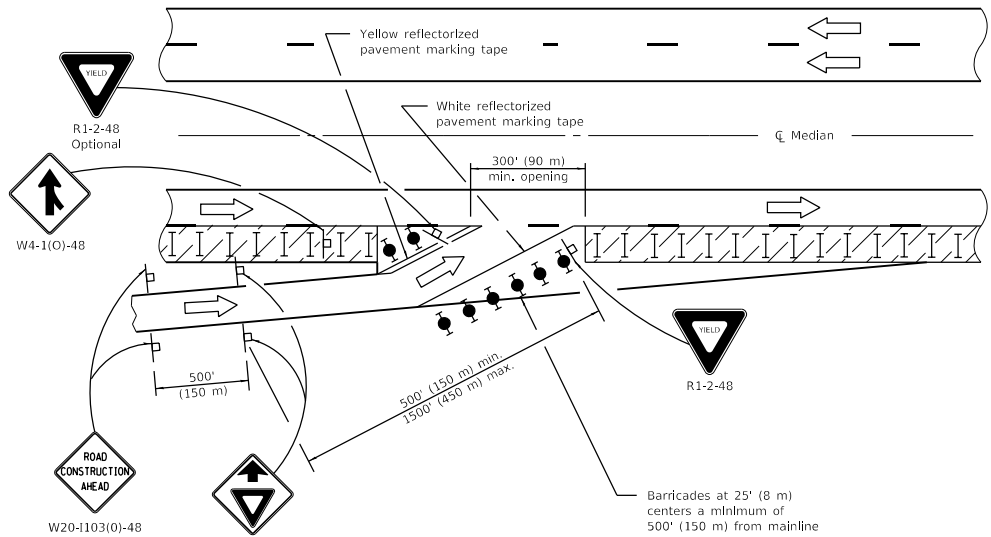
 ENGINEER OF DESIGN AND ENVIRONMENT

464-1 03/15/21

DATE	REVISIONS
1-1-19	Replaced flagger with spotter.
1-1-17	Revised END WORK ZONE SPEED LIMIT sign from orange to white background.

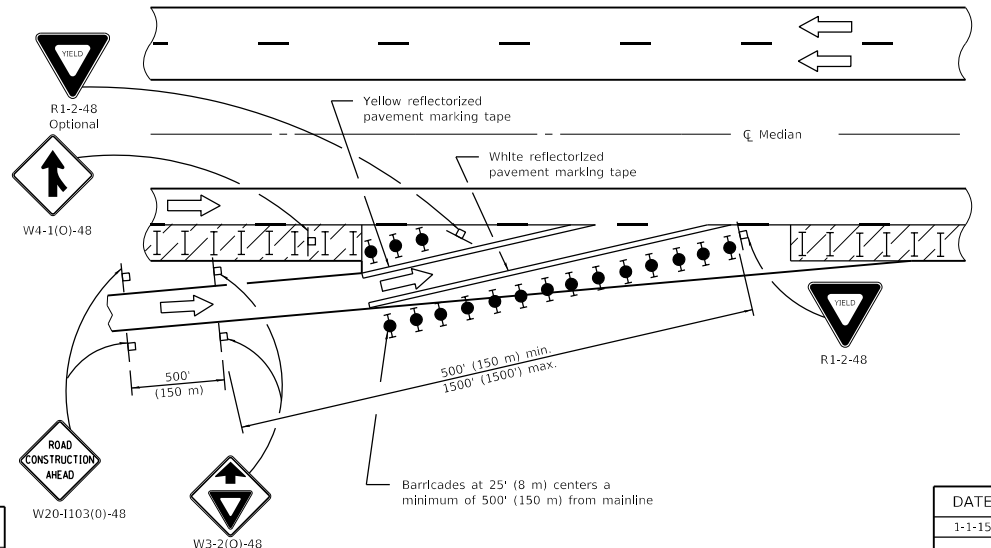
**LANE CLOSURE,
FREEWAY/EXPRESSWAY,
DAY OPERATIONS ONLY**

STANDARD 701406-12



APPLICATION NO. 1

Application No. 1 depicts a modified entrance ramp. This method shall be utilized whenever existing entrance tapers cannot be retained due to the close proximity of the work zone. The entrance location may be shifted, with the approval of the Engineer, to perform work in the entrance area. Application No. 2 shall be put into effect as soon as possible.



APPLICATION NO. 2

Application No. 2 depicts a shortening of the normal entrance ramp. This method shall be used whenever the existing geometrics can be retained. Consideration should be given to the entering motorists' line of sight, through, between, or over the delineation devices.

- SYMBOLS**
- Work area
 - Sign
 - Type II barricades or drums with steady burning monodirectional light
 - Type I barricades or drums
 - Drums with steady burning monodirectional light

GENERAL NOTES

This Standard is used where, at any time any vehicle, equipment, workers or their activities require a lane closure in close proximity of an exit or entrance ramp and supplements other traffic control Standards for lane closures.

These applications also apply when work is being performed in the left lanes and the ramps enter and exit on the left. Under these conditions, the Exit sign arrow and the Side road symbol sign shall be changed.

Cones may be utilized during daylight operations, at one half the spacing of drums/barricades.

Use of these APPLICATION NO. 1 and APPLICATION NO. 3 shall be limited to five days per location.

When work does not exceed five days, pavement marking tape may be omitted.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-15	Revised gen. notes to limit App's 1 and 3 to five days, omit pvt. tape for ≤ 5 days.
1-1-12	Revised merge sign to agree with MUTCD. Dimensioned EXIT OPEN AHEAD sign.

LANE CLOSURE, MULTILANE, AT ENTRANCE OR EXIT RAMP, FOR SPEEDS ≥ 45 MPH
(Sheet 1 of 2)

STANDARD 701411-09

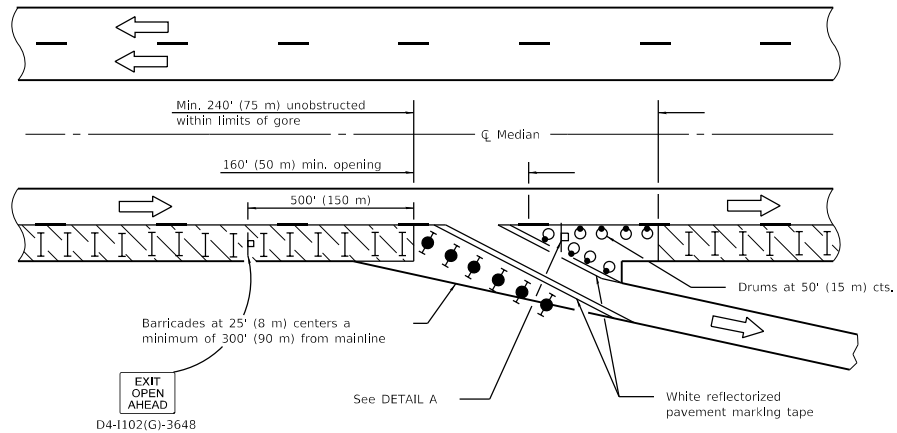
Illinois Department of Transportation

PASSED January 3, 2015

ENGINEER OF SAFETY ENGINEERING

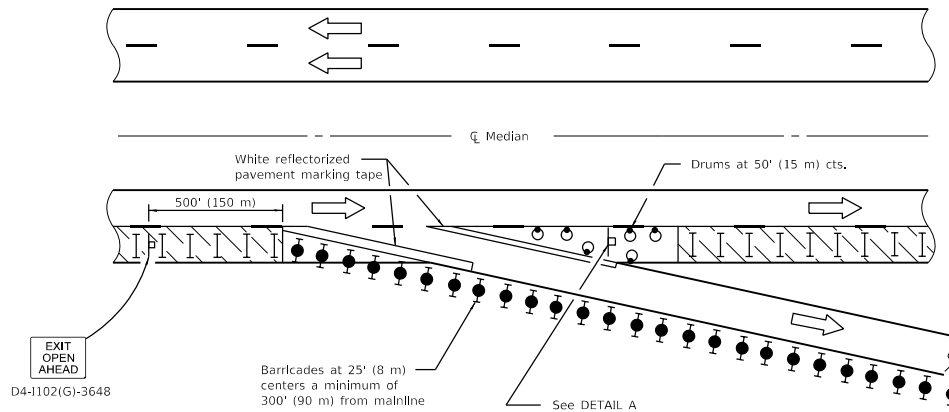
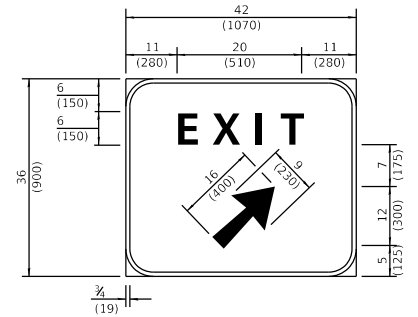
APPROVED January 3, 2015

ENGINEER OF DESIGN AND ENVIRONMENT



APPLICATION NO. 3

Application No. 3 depicts a modified exit ramp. The channelizing devices shall provide a clearly defined path for the exiting motorists. The minimum dimensions shown shall be increased as soon as the progress of the work will permit. The open portion of the ramp may be shifted, with the approval of the Engineer, to perform work in stages on the area adjacent to the ramp exit. Application No. 4 shall be put into effect as soon as possible.



APPLICATION NO. 4

Application No. 4 depicts an extension of the normal exit ramp. This method shall be used whenever existing geometrics can be retained. Consideration should be given to the exiting motorist's line of sight through, between or over the delineation devices.

**LANE CLOSURE, MULTILANE,
AT ENTRANCE OR EXIT RAMP,
FOR SPEEDS ≥ 45 MPH**
(Sheet 2 of 2)

STANDARD 701411-09

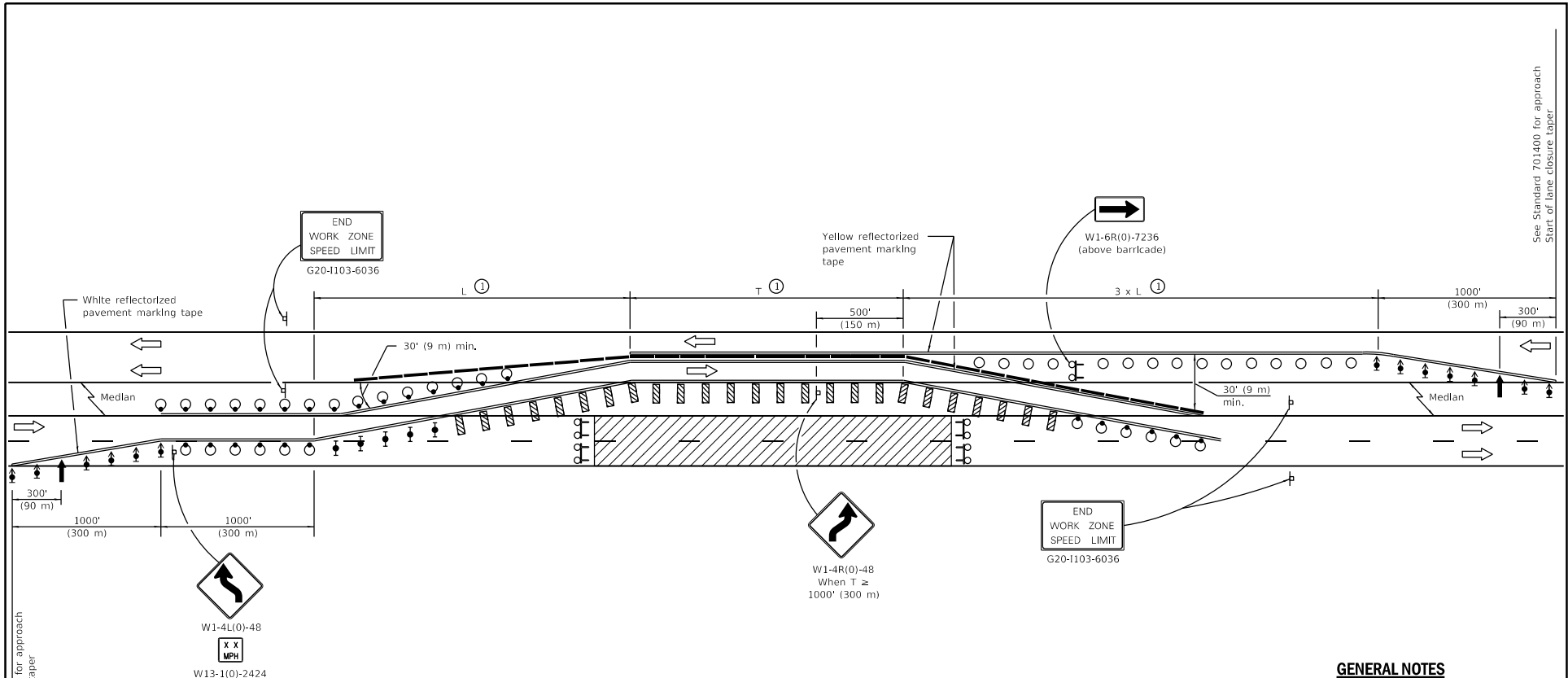
Illinois Department of Transportation

PASSED January 3, 2015











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APPROVED January 3, 2015

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SYMBOLS

-  Arrow board
-  Work area
-  Sign
-  Direction Indicator barricade with steady burn monodirectional light
-  Type II barricade with steady burn monodirectional light
-  Drum with steady burn monodirectional light
-  Vertical Panel
-  Type III barricade with flashing lights
-  Temporary concrete barrier
-  Drum

① "L" and "T" shall be as shown on the plan details.

GENERAL NOTES

This Standard is used where at any time, any vehicle, equipment, workers or their activities require the closure of two adjacent lanes and a temporary crossover is provided by making use of one lane of pavement normally used by opposing flow of traffic and concrete barrier is used to separate the opposing traffic.

This Standard must always be used in combination with Standard 701400.

All barricades, drums, and vertical panels shall be at 50 ft. (15 m) centers.

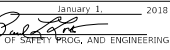
Temporary concrete barrier shall be according to Standard 704001.

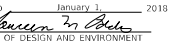
All dimensions are in inches (millimeters) unless otherwise shown.

See Standard 701400 for approach Start of lane closure taper

See Standard 701400 for approach Start of lane closure taper.

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PASSED January 1, 2018

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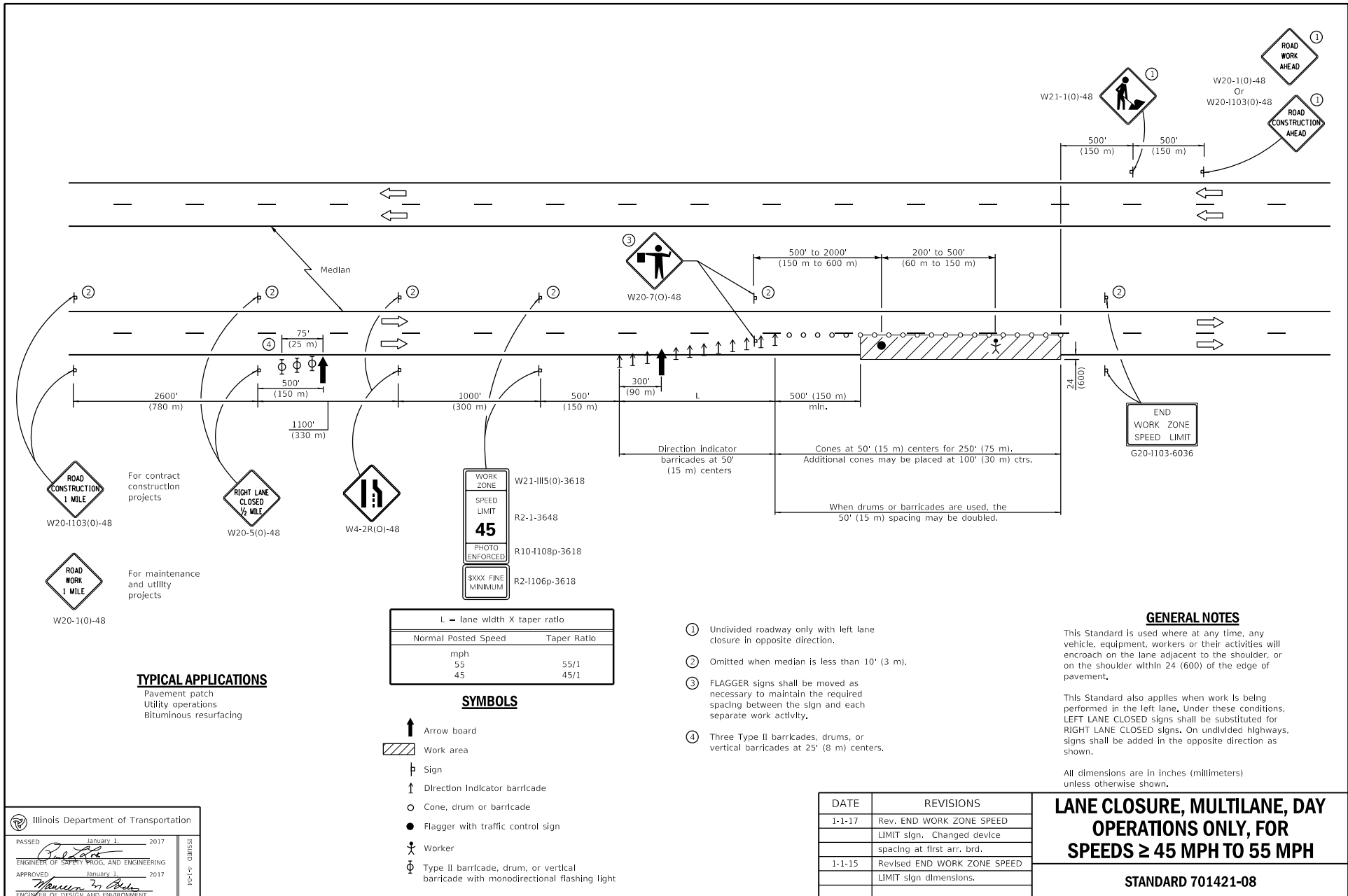
APPROVED January 1, 2018

 ENGINEER OF DESIGN AND ENVIRONMENT

DESIGNER

DATE	REVISIONS
1-1-18	Omitted lights on drums for the '3 x L' tangent.
1-1-17	Revised END WORK ZONE SPEED LIMIT sign from orange to white background.

**LANE CLOSURE,
 FREEWAY / EXPRESSWAY,
 WITH CROSSOVER AND BARRIER**

STANDARD 701416-11



TYPICAL APPLICATIONS

Pavement patch
Utility operations
Bituminous resurfacing

L = lane width X taper ratio

Normal Posted Speed	Taper Ratio
mph	
55	55/1
45	45/1

SYMBOLS

- ↑ Arrow board
- ▨ Work area
- ⊥ Sign
- ↑ Direction Indicator barricade
- Cone, drum or barricade
- Flagger with traffic control sign
- ⚠ Worker
- ⦿ Type II barricade, drum, or vertical barricade with monodirectional flashing light

- ① Undivided roadway only with left lane closure in opposite direction.
- ② Omitted when median is less than 10' (3 m).
- ③ FLAGGER signs shall be moved as necessary to maintain the required spacing between the sign and each separate work activity.
- ④ Three Type II barricades, drums, or vertical barricades at 25' (8 m) centers.

GENERAL NOTES

This Standard is used where at any time, any vehicle, equipment, workers or their activities will encroach on the lane adjacent to the shoulder, or on the shoulder within 24 (600)' of the edge of pavement.

This Standard also applies when work is being performed in the left lane. Under these conditions, LEFT LANE CLOSED signs shall be substituted for RIGHT LANE CLOSED signs. On undivided highways, signs shall be added in the opposite direction as shown.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-17	Rev. END WORK ZONE SPEED LIMIT sign. Changed device spacing at first arr. brd.
1-1-15	Revised END WORK ZONE SPEED LIMIT sign dimensions.

LANE CLOSURE, MULTILANE, DAY OPERATIONS ONLY, FOR SPEEDS ≥ 45 MPH TO 55 MPH

STANDARD 701421-08

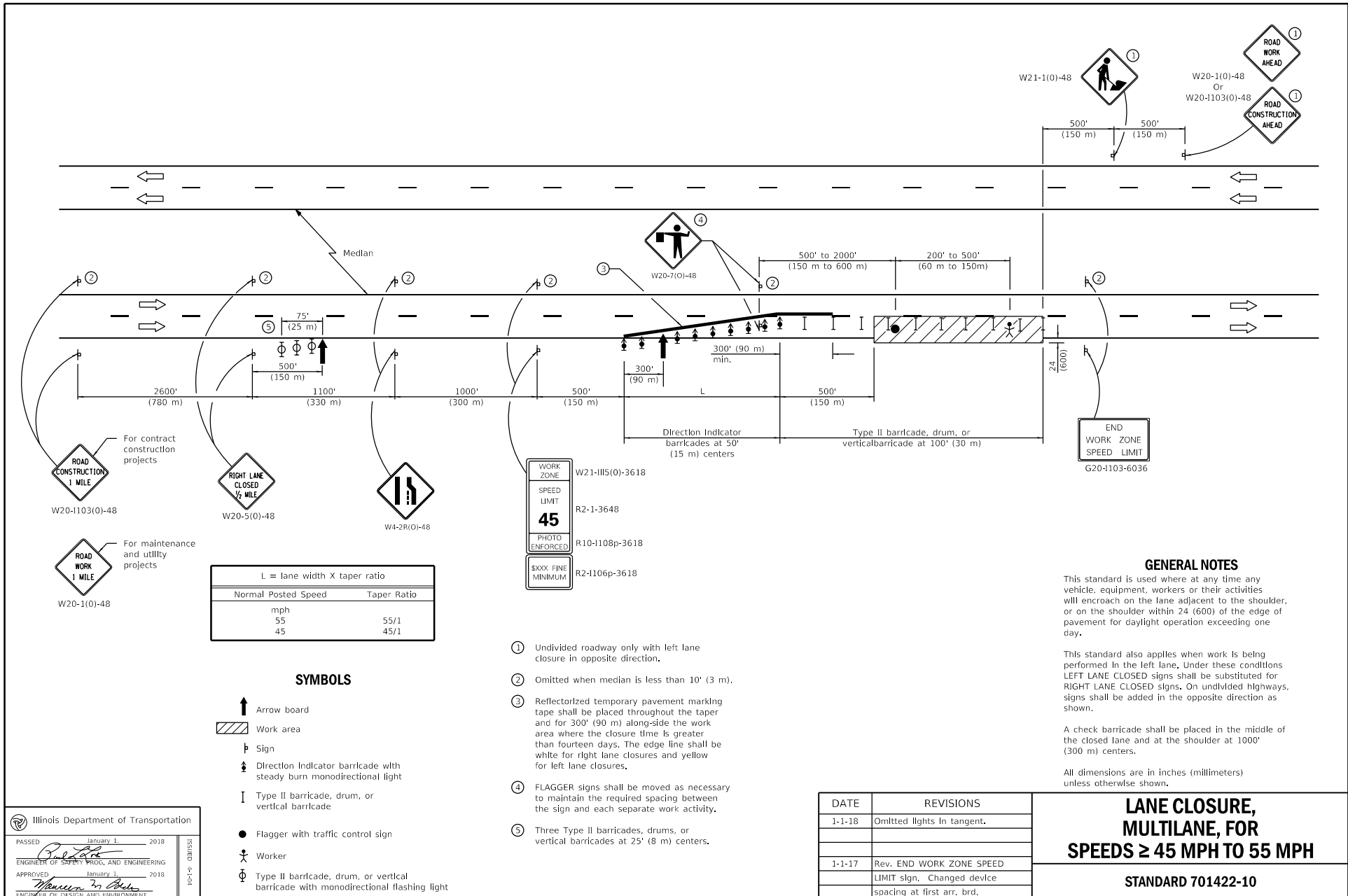
Illinois Department of Transportation

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APPROVED January 1, 2017

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For contract construction projects
 W20-1103(O)-48

For maintenance and utility projects
 W20-1(O)-48

RIGHT LANE CLOSED 1/2 MILE
 W20-5(O)-48

ROAD WORK 1 MILE
 W4-2R(O)-48

L = lane width X taper ratio	
Normal Posted Speed	Taper Ratio
mph	
55	55/1
45	45/1

WORK ZONE
 W21-1115(O)-3618

SPEED LIMIT 45
 R2-1-3648

PHOTO ENFORCED
 R10-1108p-3618

EXXX FINE MINIMUM
 R2-1106p-3618

SYMBOLS

- ↑ Arrow board
- ▨ Work area
- ⌵ Sign
- ⬆ Direction Indicator barricade with steady burn monodirectional light
- ⌄ Type II barricade, drum, or vertical barricade
- Flagger with traffic control sign
- ⚠ Worker
- ⦿ Type II barricade, drum, or vertical barricade with monodirectional flashing light

- ① Undivided roadway only with left lane closure in opposite direction.
- ② Omitted when median is less than 10' (3 m).
- ③ ReflectORIZED temporary pavement marking tape shall be placed throughout the taper and for 300' (90 m) along-side the work area where the closure time is greater than fourteen days. The edge line shall be white for right lane closures and yellow for left lane closures.
- ④ FLAGGER signs shall be moved as necessary to maintain the required spacing between the sign and each separate work activity.
- ⑤ Three Type II barricades, drums, or vertical barricades at 25' (8 m) centers.

GENERAL NOTES

This standard is used where at any time any vehicle, equipment, workers or their activities will encroach on the lane adjacent to the shoulder, or on the shoulder within 24 (600) of the edge of pavement for daylight operation exceeding one day.

This standard also applies when work is being performed in the left lane. Under these conditions LEFT LANE CLOSED signs shall be substituted for RIGHT LANE CLOSED signs. On undivided highways, signs shall be added in the opposite direction as shown.

A check barricade shall be placed in the middle of the closed lane and at the shoulder at 1000' (300 m) centers.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-18	Omitted lights in tangent.
1-1-17	Rev. END WORK ZONE SPEED LIMIT sign, Changed device spacing at first arr. brd.

LANE CLOSURE, MULTILANE, FOR SPEEDS ≥ 45 MPH TO 55 MPH

STANDARD 701422-10

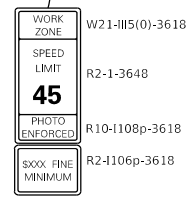
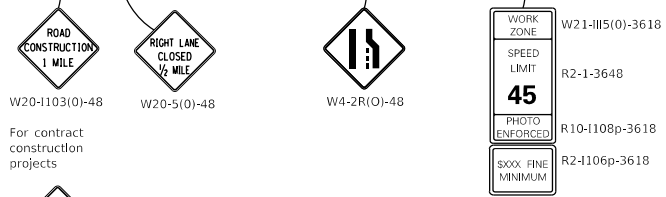
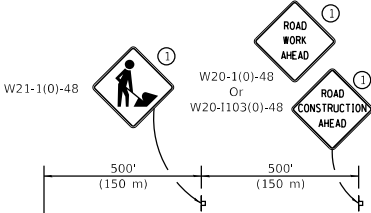
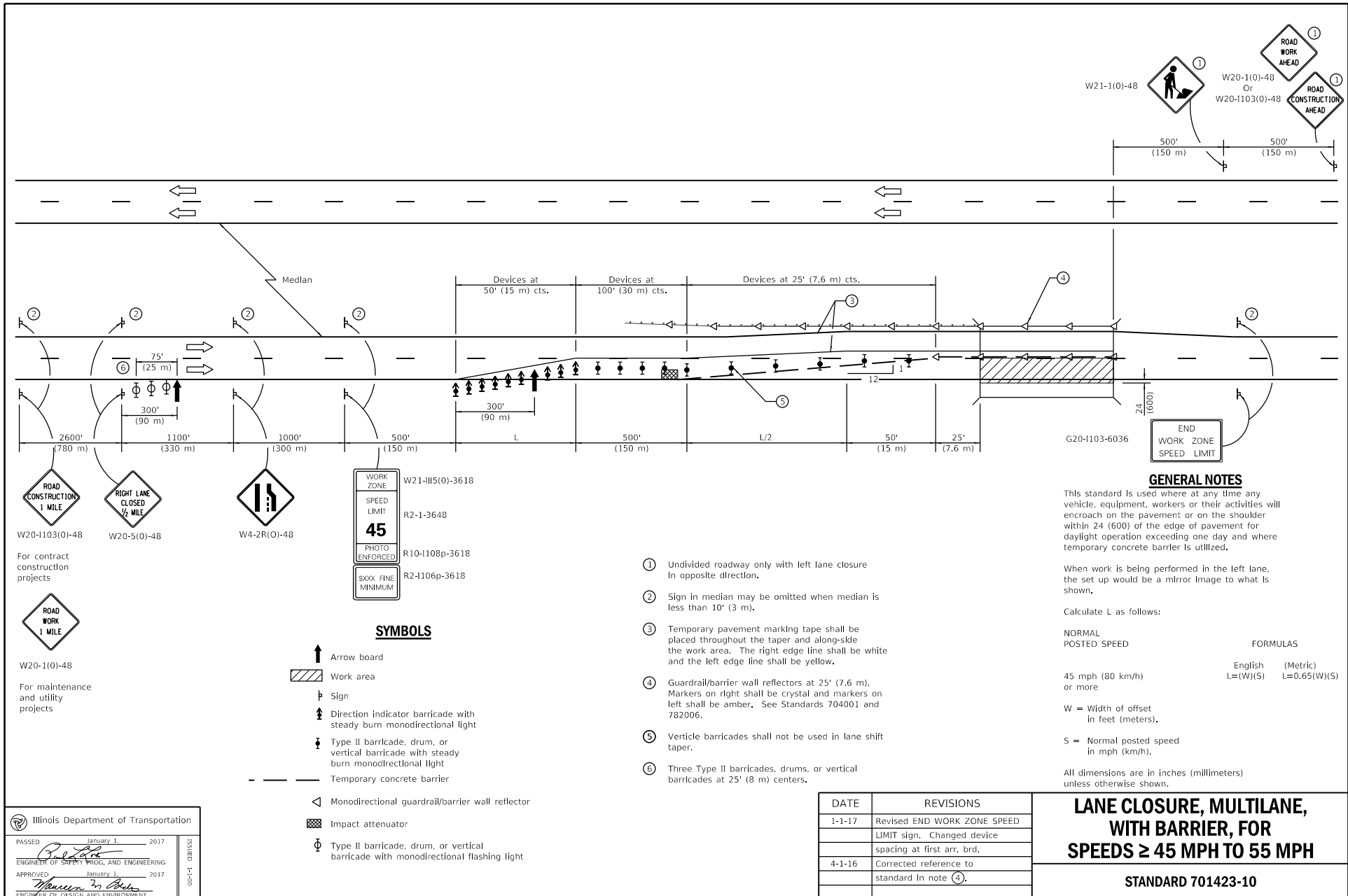
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APPROVED January 1, 2018

ENGINEER OF DESIGN AND ENVIRONMENT



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
- - - - - Temporary concrete barrier
- ◁ Monodirectional guardrail/barrier wall reflector
- ▣ Impact attenuator
- ⊕ Type II barricade, drum, or vertical barricade with monodirectional flashing light

GENERAL NOTES
 This standard is used where at any time any vehicle, equipment, workers or their activities will encroach on the pavement or on the shoulder within 24 (600) of the edge of pavement for daylight operation exceeding one day and where temporary concrete barrier is utilized.

When work is being performed in the left lane, the set up would be a mirror image to what is shown.

Calculate L as follows:

NORMAL POSTED SPEED FORMULAS

English (Metric)
 $L = (W)(S)$ $L = 0.65(W)(S)$

W = Width of offset in feet (meters).
 S = Normal posted speed in mph (km/h).

All dimensions are in inches (millimeters) unless otherwise shown.

- ① Undivided roadway only with left lane closure in opposite direction.
- ② Sign in median may be omitted when median is less than 10' (3 m).
- ③ Temporary pavement marking tape shall be placed throughout the taper and along side the work area. The right edge line shall be white and the left edge line shall be yellow.
- ④ Guardrail/barrier wall reflectors at 25' (7.6 m). Markers on right shall be crystal and markers on left shall be amber. See Standards 704001 and 782006.
- ⑤ Verticle barricades shall not be used in lane shift taper.
- ⑥ Three Type II barricades, drums, or vertical barricades at 25' (8 m) centers.

DATE	REVISIONS
1-1-17	Revised END WORK ZONE SPEED LIMIT sign, Changed device spacing at first arr. brd.
4-1-16	Corrected reference to standard in note ④.

LANE CLOSURE, MULTILANE, WITH BARRIER, FOR SPEEDS ≥ 45 MPH TO 55 MPH

STANDARD 701423-10

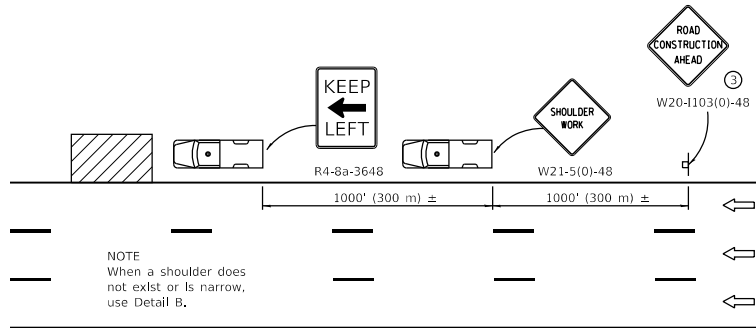
Illinois Department of Transportation

PASSED January 1, 2017

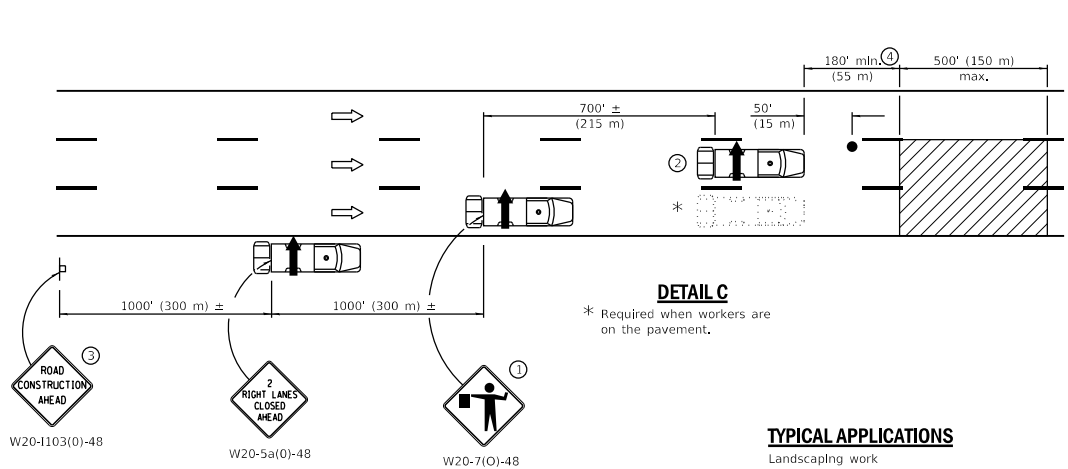
ENGINEER OF SAFETY, PROG. AND ENGINEERING

APPROVED January 1, 2017

ENGINEER OF DESIGN AND ENVIRONMENT



DETAIL A



DETAIL C

TYPICAL APPLICATIONS

- Landscaping work
- Utility work
- Pavement marking
- Weed spraying
- Roadometer measurements
- Debris cleanup
- Crack pouring



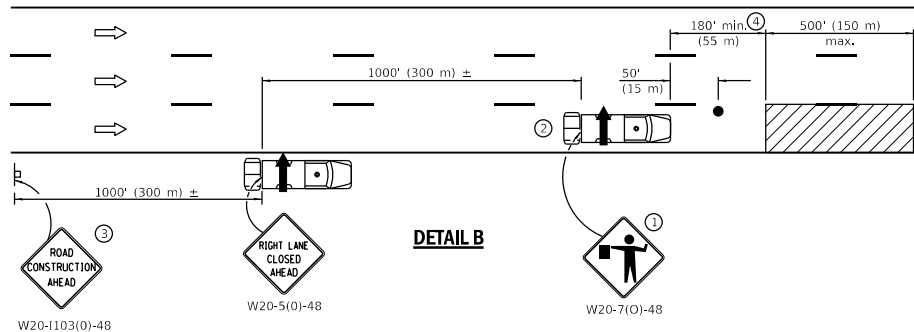
G20-1101-2430
(appropriate arrow)
② (when striping only)

GENERAL NOTES

This Standard is used where any vehicle, equipment, workers or their activities will require: 1) stationary operations up to 1 hour, or 2) a continuous or intermittent moving operation where the average speed of movement is greater than 1 mph (2 km/h).

This Standard is also applicable when work is being performed in the left lane(s) or on the median shoulder. Under these conditions, KEEP RIGHT signs shall be substituted for KEEP LEFT signs and arrow board indications shall be directed to the right.

All dimensions are in inches (millimeter) unless otherwise shown.



DETAIL B

- ① Flaggers are required when workers are on the pavement.
- ② For striping operations only. See sign arrow detail on this standard.
- ③ For stationary operations which are on the roadway or shoulder, greater than 15 minutes and up to 1 hour.
- ④ The distance between the work and the lead truck may vary according to terrain or paint/crack sealing drying time.

SYMBOLS

- ↑ Arrow board
- ▨ Work area
- Truck with flashing amber light
- Truck/Trailer mounted attenuator
- Flagger with traffic control sign
- Sign

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PASSED January 1, 2017

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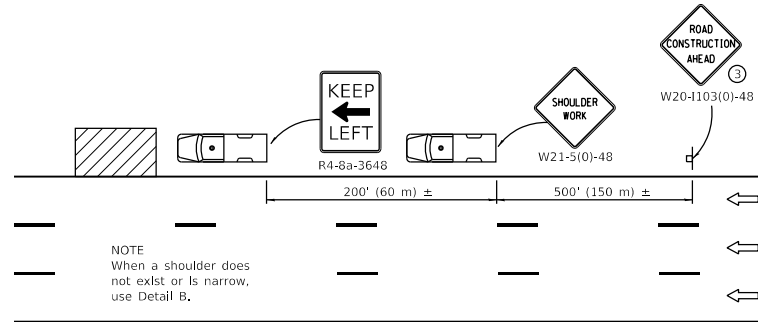
APPROVED January 1, 2017

ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-17	Revised 'NOTE' on DETAIL A to use DETAIL B in lieu of DETAIL C.
4-1-16	Added trailer option for attenuator symbol. Added note(4). Revised gen. notes.

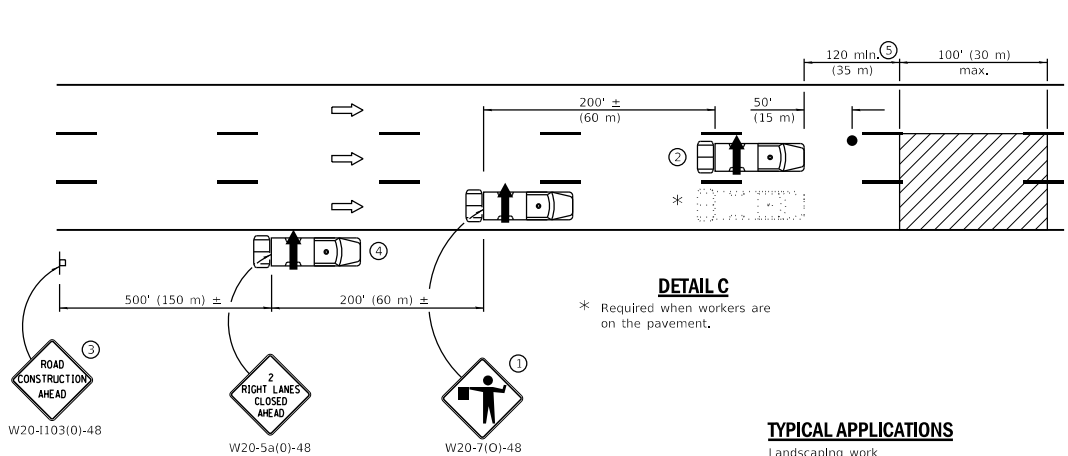
LANE CLOSURE, MULTILANE, INTERMITTENT OR MOVING OPER., FOR SPEEDS ≥ 45 MPH

STANDARD 701426-09



NOTE
When a shoulder does not exist or is narrow, use Detail B.

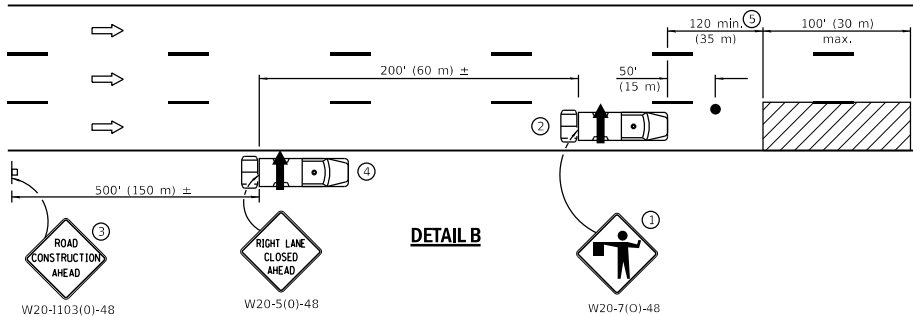
DETAIL A



DETAIL C
* Required when workers are on the pavement.

TYPICAL APPLICATIONS

- Landscaping work
- Utility work
- Pavement marking
- Weed spraying
- Roadometer measurements
- Debris cleanup
- Crack pouring



DETAIL B

- ① Flaggers are required when workers are on the pavement.
- ② For striping operations only. See sign arrow detail on this standard.
- ③ For stationary operations which are on the roadway or shoulder, greater than 15 minutes and up to 1 hour.
- ④ Omit truck, attenuator and arrow board when no shoulder exists due to curb and gutter.
- ⑤ The distance between the work and the lead truck may vary according to terrain or paint/crack sealing time.



GENERAL NOTES

This Standard is used where any vehicle, equipment, workers or their activities will require: 1) stationary operations up to 1 hour, or 2) a continuous or intermittent moving operation where the average speed of movement is greater than 1 mph (2 km/h).

This Standard is also applicable when work is being performed in the left lane(s) or on the median shoulder. Under these conditions, KEEP RIGHT signs shall be substituted for KEEP LEFT signs and arrow board indications shall be directed to the right.

All dimensions are in inches (millimeter) unless otherwise shown.

SYMBOLS

- Arrow board
- Work area
- Truck with flashing amber light
- Truck/Trailer mounted attenuator
- Flagger with traffic control sign
- Sign

Illinois Department of Transportation

PASSED January 1, 2017
[Signature]
ENGINEER OF SAFETY PROC. AND ENGINEERING

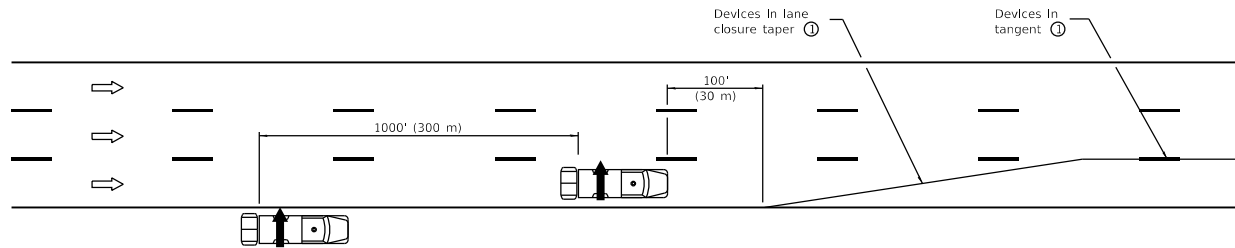
APPROVED January 1, 2017
[Signature]
ENGINEER OF DESIGN AND ENVIRONMENT

1-1-1 CHANGES

DATE	REVISIONS
1-1-17	Revised 'NOTE' on DETAIL A to use DETAIL B in lieu of DETAIL C.
4-1-16	Rev. gen. notes. Added note ⑤. Rev. dist. between work and lead truck.

LANE CLOSURE, MULTILANE, INTERMITTENT OR MOVING OPER., FOR SPEEDS ≤ 40 MPH

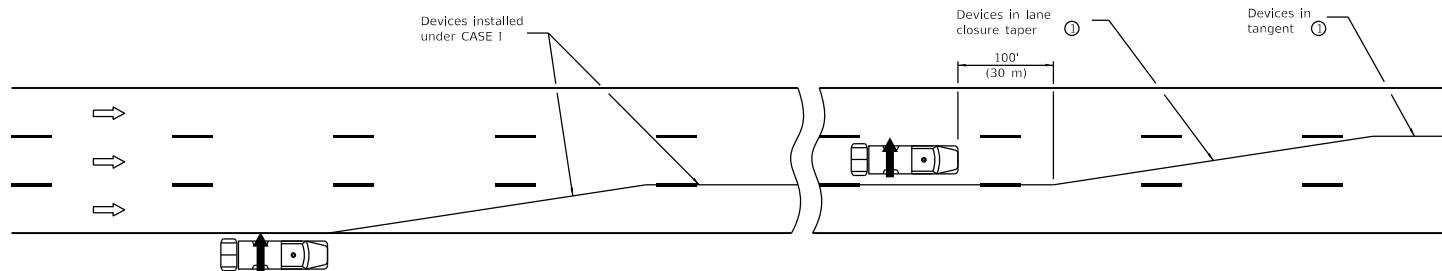
STANDARD 701427-05



① See plans or appropriate Standard for delineating devices, spacing and length of taper/tangent.

CASE I




CASE I depicts the setup of delineating devices for a single outside lane closure.



CASE II

CASE II depicts the setup of delineating devices for a two lane closure. The single lane closure device setup as depicted in CASE I shall be performed prior to the setup for the second lane closure.

SYMBOLS

-  Arrow board
-  Truck with flashing amber light
-  Truck/Trailer mounted attenuator

GENERAL NOTES

This Standard is used for setup and removal of lane closures on freeways/expressways having ADT greater than 25,000.

Trucks with arrow boards and truck-mounted-attenuators shall be in place as shown for the setup and removal of the lane closure taper(s) and the first 100' (30 m) of channelizing devices in the tangent(s).

This Standard is also applicable when work is being performed in the left lane(s) or on the median shoulder. Under these conditions arrow board indications shall be directed to the right.

All dimensions are in inches (millimeter) unless otherwise shown.

DATE	REVISIONS
4-1-16	Added trailer option for attenuator symbol.
1-1-14	New Standard.

**TRAFFIC CONTROL
SETUP AND REMOVAL
FREEWAY/EXPRESSWAY**

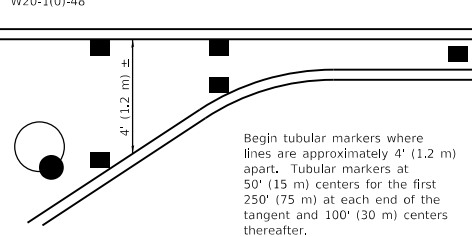
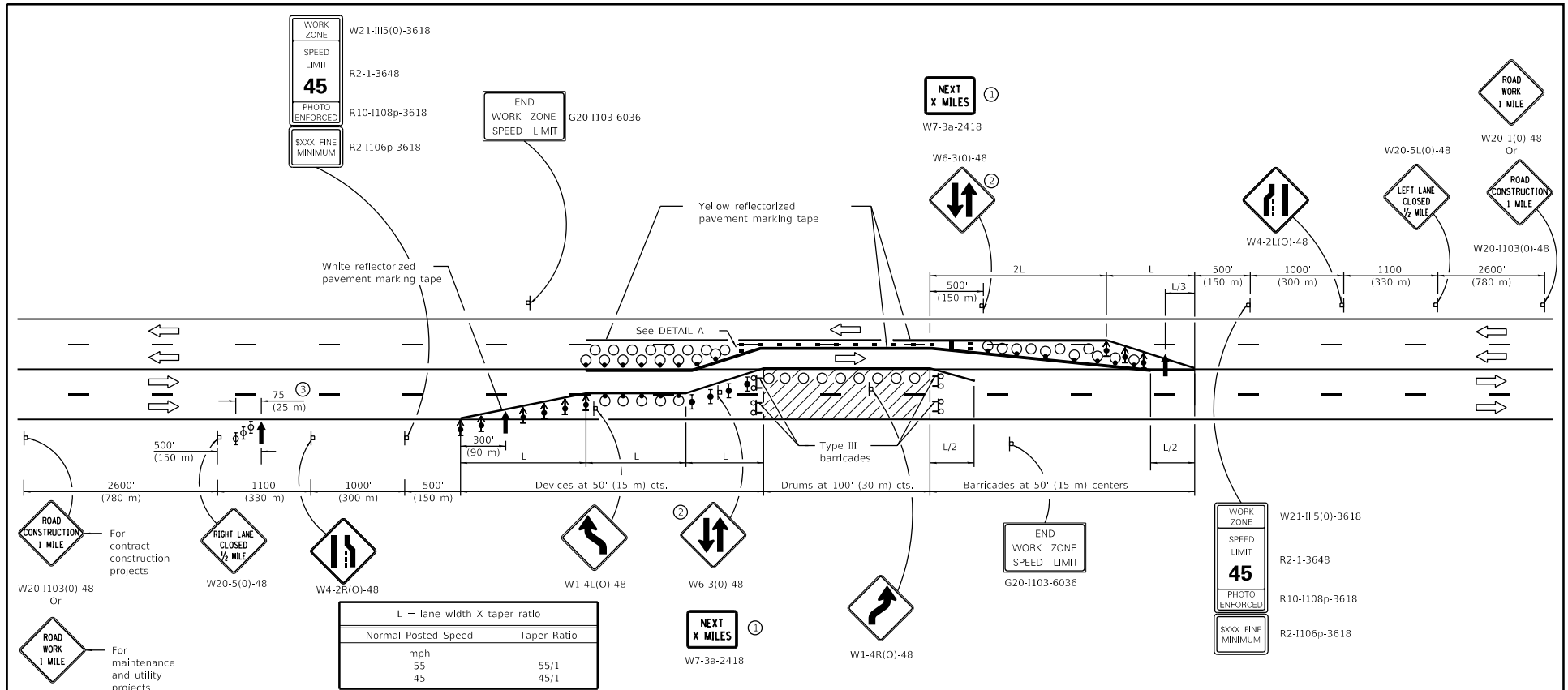
STANDARD 701428-01

Illinois Department of Transportation

PASSED *[Signature]* April 1, 2016
ENGINEER OF SAFETY ENGINEERING

APPROVED *[Signature]* April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUE: 1-1-14



DETAIL A

SYMBOLS

- ↑ Arrow board
- ▨ Work area
- ⊢ Sign
- Drum with steady burn monodirectional light
- ⬆ Direction Indicator barricade with steady burn monodirectional light
- ⬇ Type II barricade with steady burn monodirectional light
- ⊕ Type II barricade, drum or vertical barricade with monodirectional flashing light
- Tubular marker
- ⊕ Type III barricade with flashing monodirectional lights
- Drum

- ① Shall be repeated every 1 mile (1.6 km).
- ② Shall be repeated every 1 mile (1.6 km) in each direction in the tangent section unless concrete barrier is used.
- ③ Three Type II barricades, drums or vertical barricades at 25' (8 m) centers.

GENERAL NOTES

This Standard is used where at any time, any vehicle, equipment, workers or their activities require the closure of two adjacent lanes and a temporary crossover is provided by making use of one lane of pavement normally used by opposing flow of traffic and flexible delineators are used to separate the opposing traffic.

Cones may be substituted for flexible delineators during daytime operations at half the spacing.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-18	Omitted lights on drums in tangent for westbound traffic and at work area.
1-1-17	Replaced W18-1100 plaque with W7-3a plaque. Changed flexible delineator to tubular marker.

LANE CLOSURE, MULTILANE, UNDIV. WITH CROSSOVER, FOR SPEEDS ≥ 45 MPH TO 55 MPH

STANDARD 701431-13

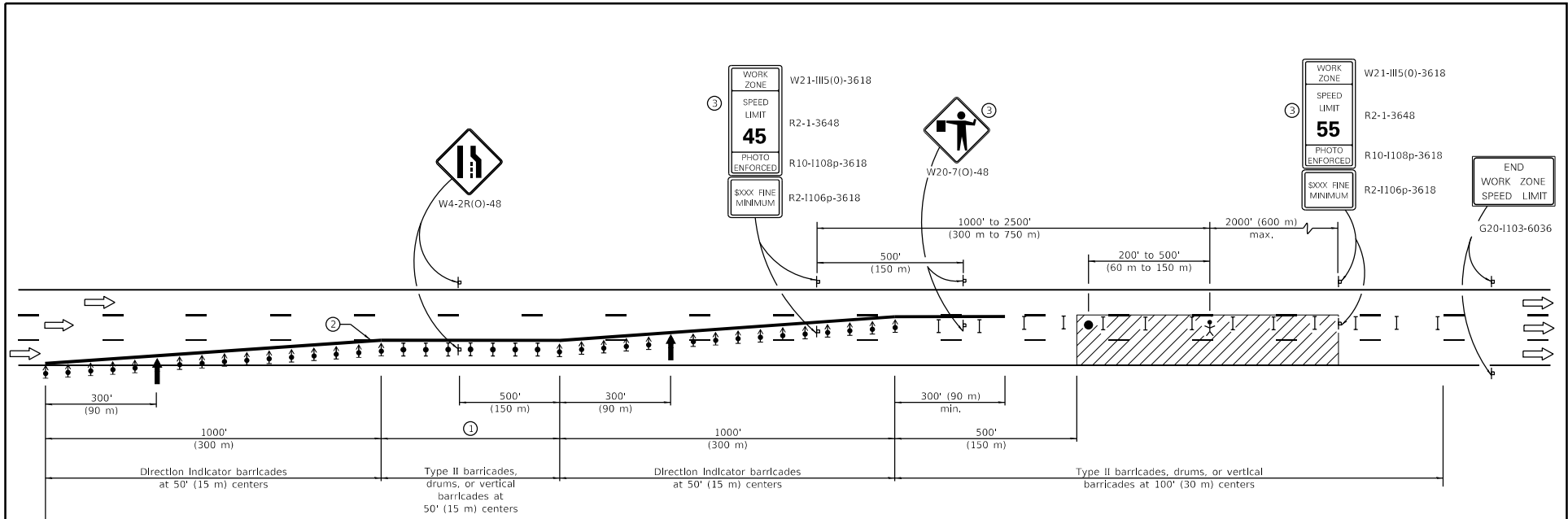
Illinois Department of Transportation

PASSED January 1, 2018

ENGINEER OF SAFETY PROC. AND ENGINEERING

APPROVED January 1, 2018

ENGINEER OF DESIGN AND ENVIRONMENT



See Standard 701400 for approach Start of lane closure taper

① The length of the tangent section shall be:

Duration of Closure	Length of Tangent Section
< 14 Days	1000' (300 m)
≥ 14 Days	2000' (600 m)

- ② ReflectORIZED temporary pavement marking tape shall be placed throughout the tapers and for 300' (90 m) along-side the work area when the closure time is greater than fourteen days. The edge line shall be white for right lane closures and yellow for left lane closures.
- ③ Work zone speed limits signs and FLAGGER signs shall be moved as necessary to maintain the required spacing between the signs and the workers in each separate work activity. Work Zone Speed Limit 55 Photo Enforced sign shall be omitted when the work area dictates that placement of the sign array within 500' (150 m) of the End Work Zone Speed Limit sign.

SYMBOLS

- ↑ Arrow board
- ▨ Work area
- ⚓ Worker
- ⌵ 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
- I Type II barricade, drum, or vertical barricade

GENERAL NOTES

This Standard is used where at any time any vehicle, equipment, workers or their activities will encroach on two lanes of a freeway/expressway.

This Standard must always be used in combination with Standard 701400.

This Standard also applies when work is being performed in the left lanes. Under these conditions, the set up would be a mirror image to what is shown.

Check barricades shall be placed in the middle of the closed lanes at 100' (30 m) centers.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2018

ENGINEER OF SAFETY, PROC. AND ENGINEERING

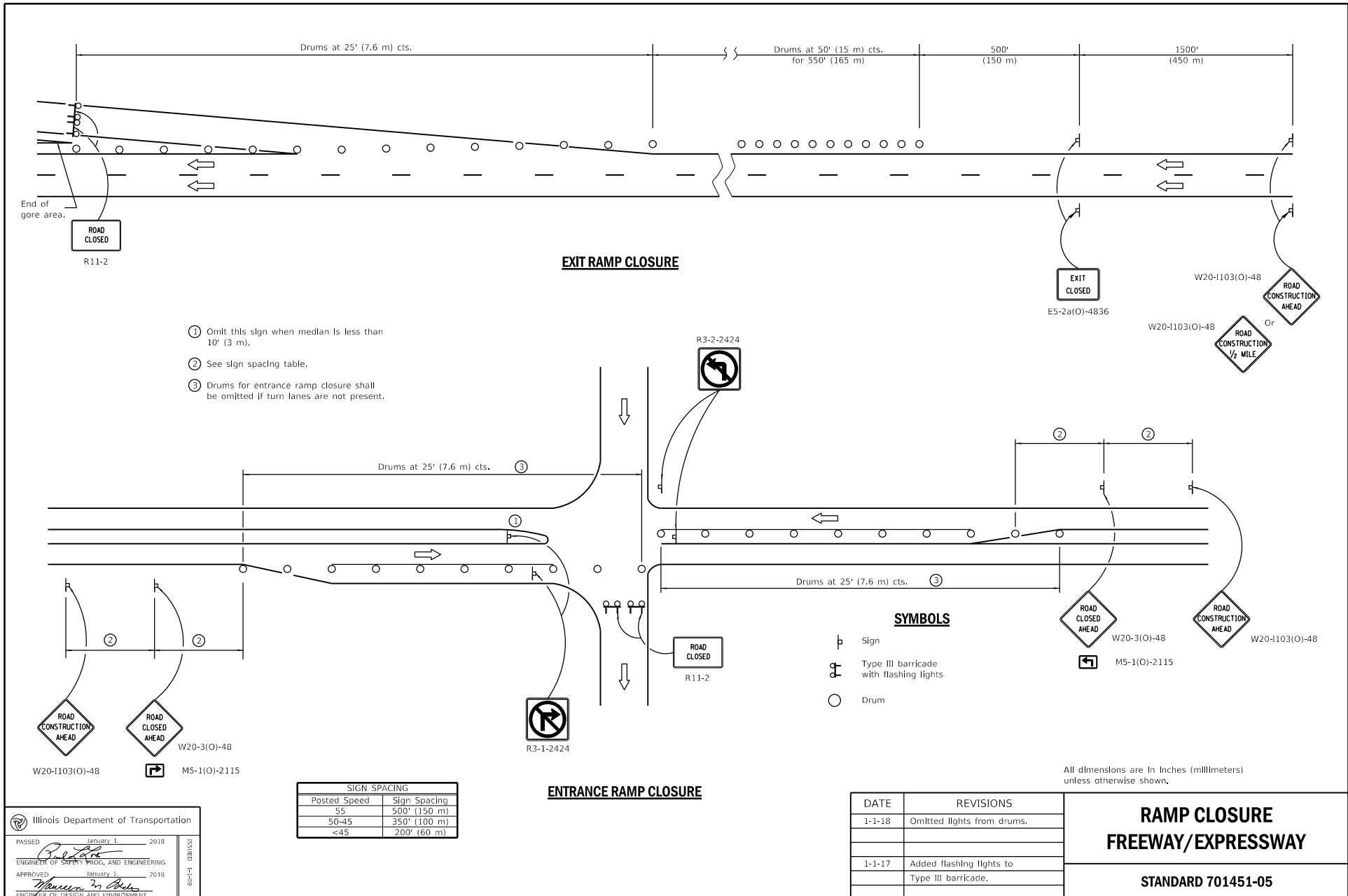
APPROVED January 1, 2018

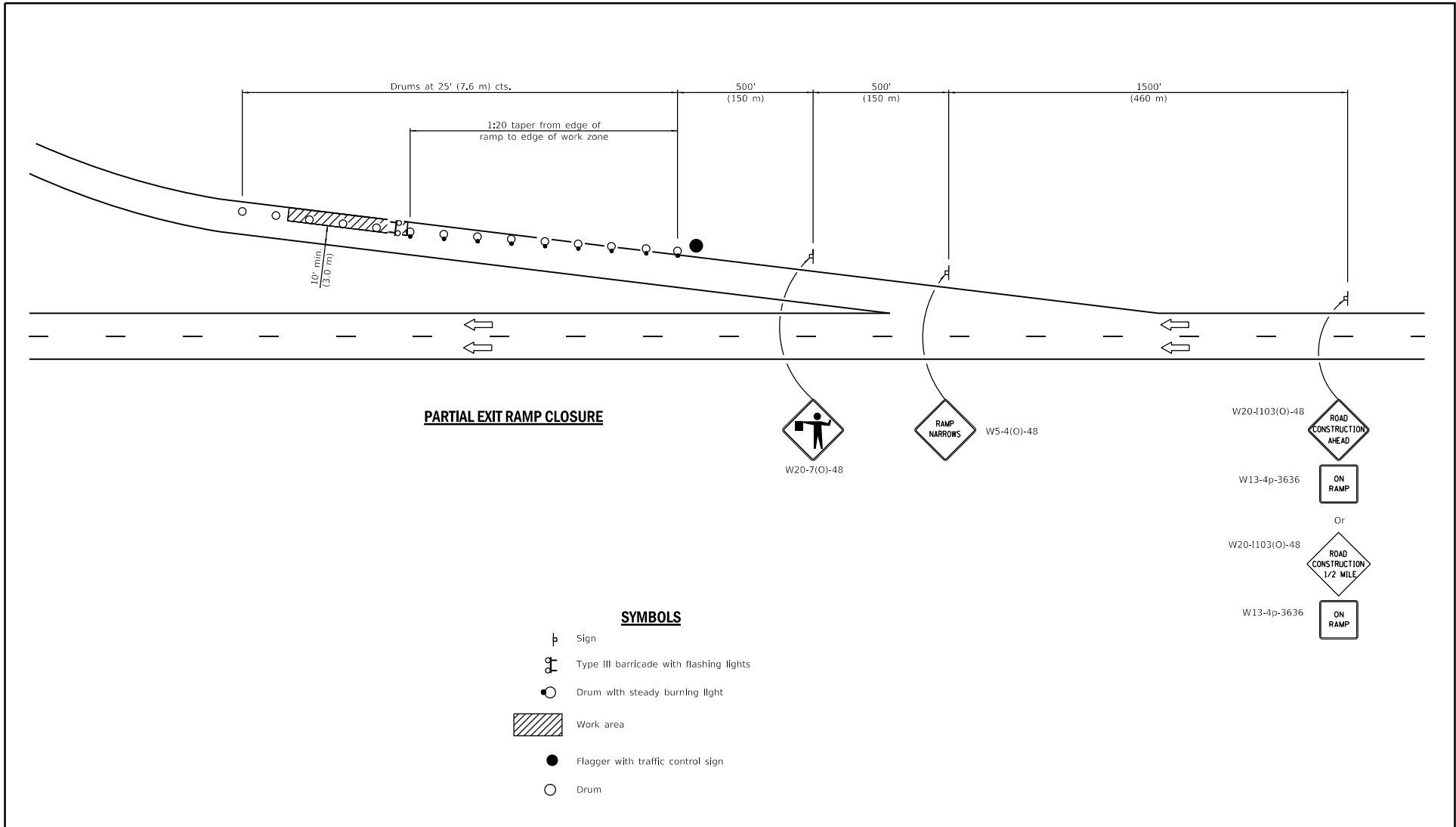
ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-18	Omitted lights in tangent near work area.
1-1-17	Revised END WORK ZONE SPEED LIMIT sign from orange to white background.

**TWO LANE CLOSURE,
FREEWAY / EXPRESSWAY**

STANDARD 701446-09





SYMBOLS

- ⌋ Sign
- ⚡ Type III barricade with flashing lights
- Drum with steady burning light
- ▨ Work area
- Flagger with traffic control sign
- Drum

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-18	Omitted lights on drums in tangent.
1-1-17	Added flashing lights to Type III barricade.

**PARTIAL EXIT RAMP CLOSURE
FREEWAY / EXPRESSWAY**

STANDARD 701456-05

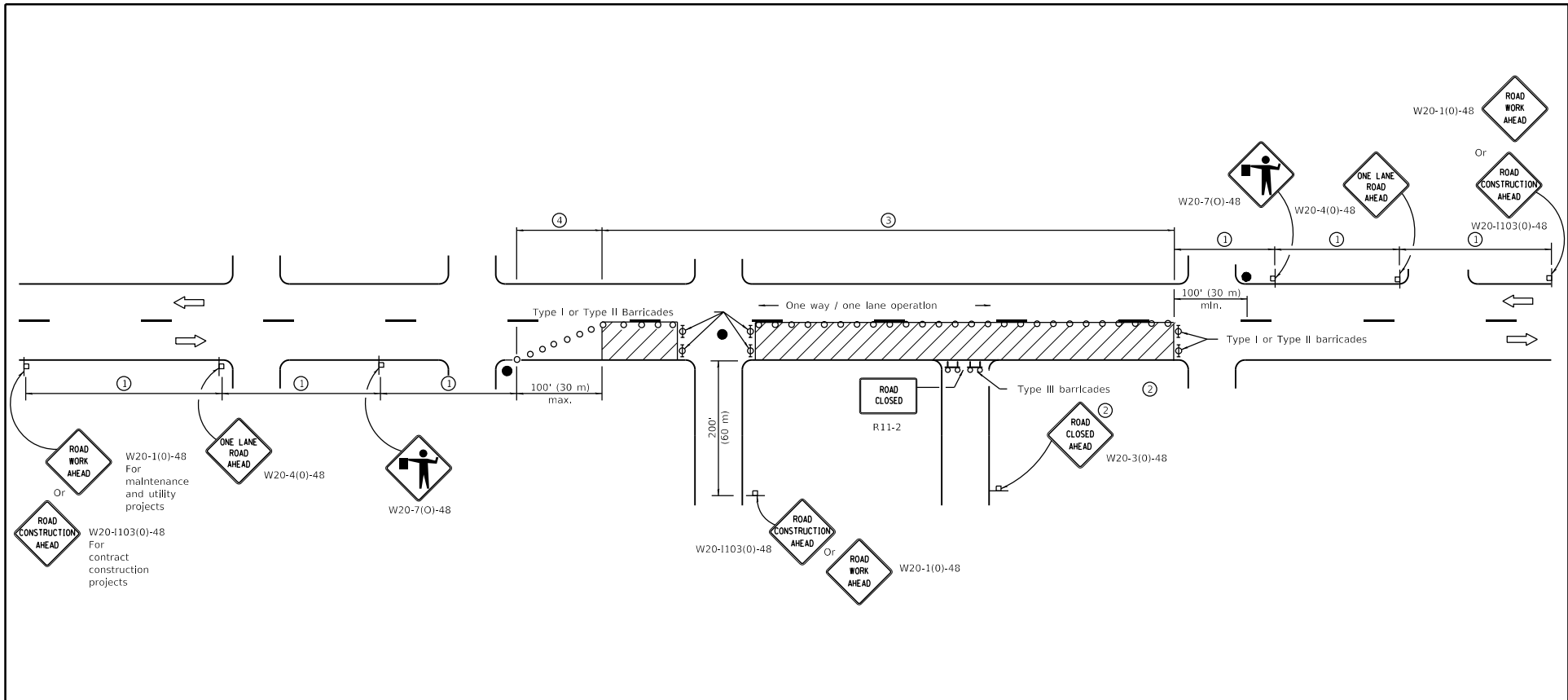
Illinois Department of Transportation

PASSED January 1, 2018

ENGINEER OF SAFETY, PROG. AND ENGINEERING

APPROVED January 1, 2018

ENGINEER OF DESIGN AND ENVIRONMENT



SIGN SPACING	
Posted Speed	Sign Spacing
55	500' (150 m)
50-45	350' (100 m)
<45	200' (60 m)

SYMBOLS

- Work area
- Cone, drum or barricade (not required for moving operations)
- Sign on portable or permanent support
- Flagger with traffic control sign
- Barricade or drum with flashing light
- Type III barricade with flashing lights

- ① Refer to SIGN SPACING TABLE for distances.
- ② For approved slideroad closures.
- ③ Cones at 25' (8 m) centers for 250' (75 m). Additional cones may be placed at 50' (15 m) centers. When drums or Type I or Type II barricades are used, the interval between devices may be doubled.
- ④ Cones, drums or barricades at 20' (6 m) centers.

GENERAL NOTES

This Standard is used where at any time, day or night, any vehicle, equipment, workers or their activities encroach on the pavement requiring the closure of one traffic lane in an urban area.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2011
David A. [Signature]
 ENGINEER OF SAFETY ENGINEERING

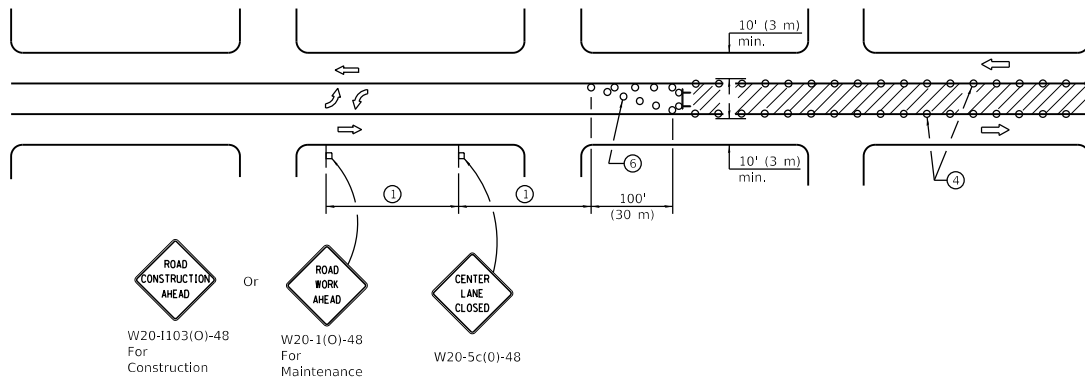
APPROVED January 1, 2011
[Signature]
 ENGINEER OF DESIGN AND ENVIRONMENT

LEG-11 03/11/05

DATE	REVISIONS
1-1-11	Revised flagger sign.
1-1-09	Switched units to English (metric). Corrected sign No.'s.

**URBAN LANE CLOSURE,
2L, 2W, UNDIVIDED**

STANDARD 701501-06



ROAD CONSTRUCTION AHEAD
W20-1103(O)-48
For Construction

ROAD WORK AHEAD
W20-1(O)-48
For Maintenance

CENTER LANE CLOSED
W20-5c(O)-48

CASE I

(Signs required for both directions)

SIGN SPACING	
Posted Speed	Sign Spacing
55	500' (150 m)
50-45	350' (100 m)
<45	200' (60 m)

SYMBOLS

- Work area
- Barricade or drum with flashing light
- Flagger with traffic control sign
- Cone, drum or barricade
- Sign on portable or permanent support
- Type III barricade with flashing lights

- ① Refer to SIGN SPACING TABLE for distances.
- ② Required for speeds > 40 mph (70 km/h).
- ③ Required if work exceeds 500' (164 m) or 1 block.
- ④ Cones at 25' (8 m) centers for 250' (75 m) on approach. Additional cones may be placed at 50' (15 m) centers. When drums or type I or II barricades are used, the interval between devices may be doubled.
- ⑤ For approved sideroad closures.
- ⑥ Cones, drums or barricades at 20' (6 m) centers in taper.
- ⑦ Use flagger sign only when flagger is present.

GENERAL NOTES

This Standard is used to close one lane of an urban, two lane, two way roadway with a bidirectional turn lane.

Case I applies when no workers are present. When workers are present, two lanes shall be closed and traffic control shall be according to Standard 701501.

Calculate L as follows:

SPEED LIMIT	FORMULAS	
	English	(Metric)
40 mph (70 km/h) or less:	$L = \frac{WS^2}{60}$	$L = \frac{WS^2}{150}$
45 mph (80 km/h) or greater:	$L = (W)(S)$	$L = 0.65(W)(S)$

W = Width of offset in feet (meters).

S = Normal posted speed mph (km/h).

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

APPROVED January 1, 2019

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APPROVED January 1, 2019

 ENGINEER OF DESIGN AND ENVIRONMENT

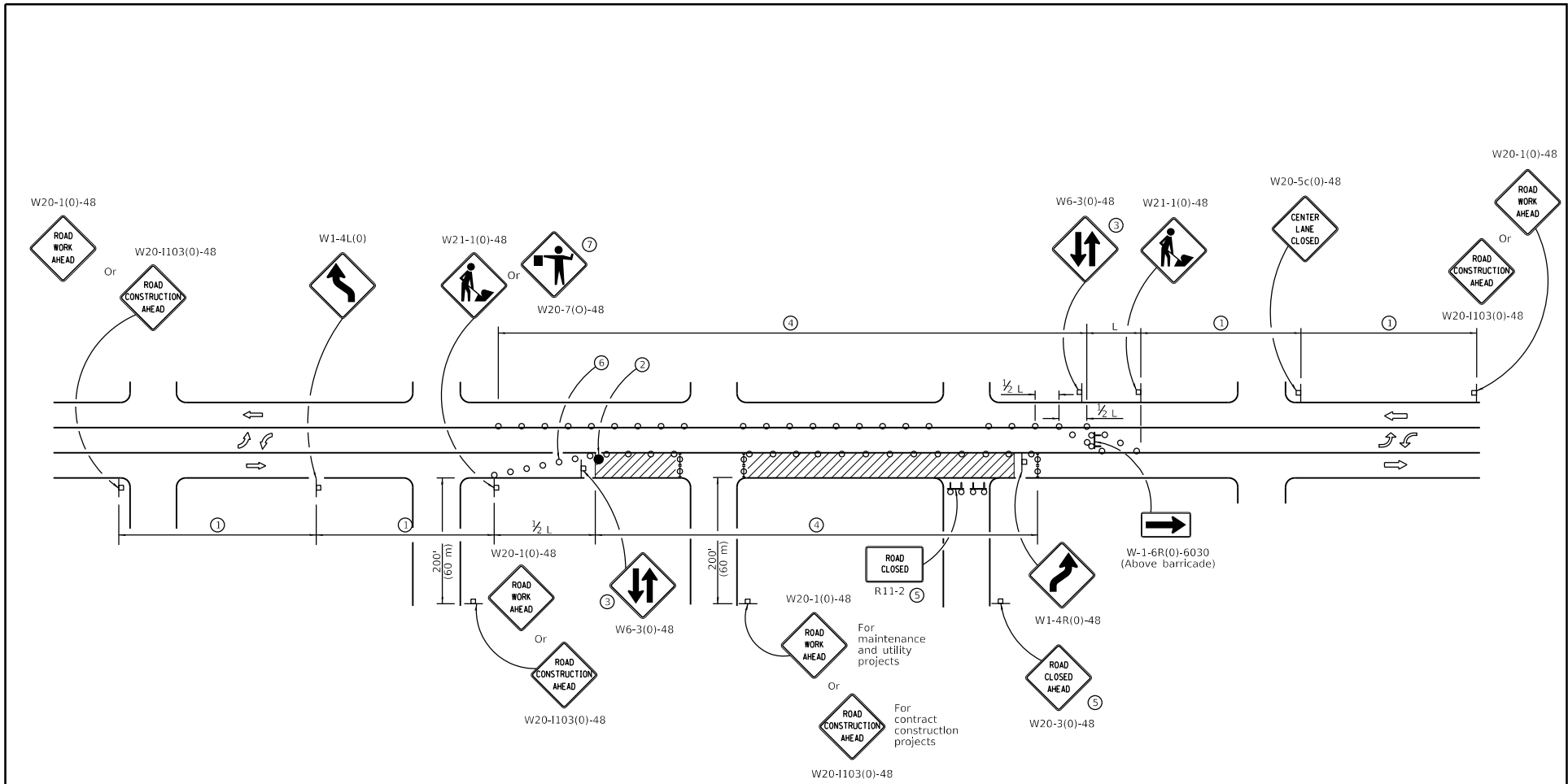
ED-CT 03/15/21

DATE	REVISIONS
1-1-19	Revised to allow cones at night.
1-1-18	Corrected sign number for TWO WAY TRAFFIC sign for CASE II.

**URBAN LANE CLOSURE,
2L, 2W, WITH BIDIRECTIONAL
LEFT TURN LANE**

(Sheet 1 of 2)

STANDARD 701502-09



CASE II

Illinois Department of Transportation

APPROVED January 1, 2019
Cynthia A. [Signature]
 ENGINEER OF SAFETY PROG. AND ENGINEERING

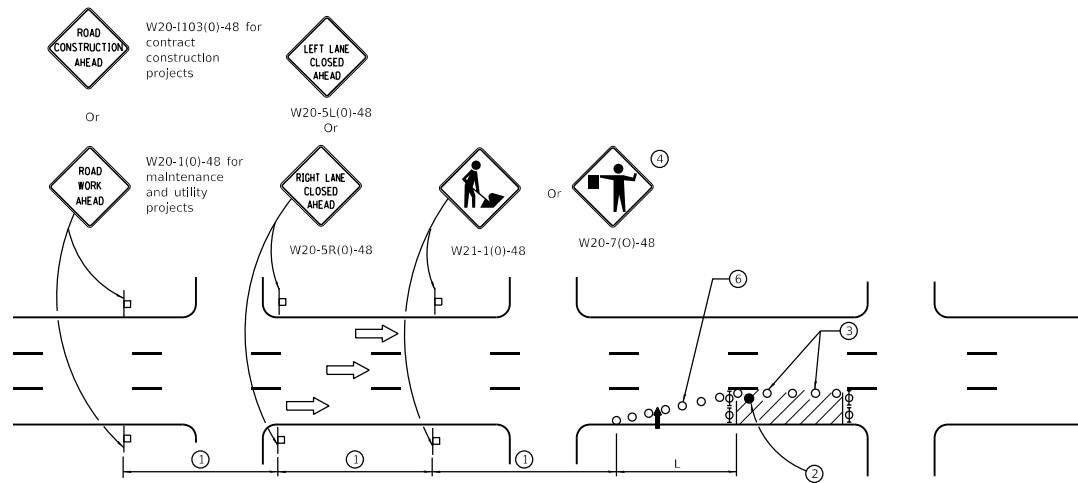
APPROVED January 1, 2019
[Signature]
 ENGINEER OF DESIGN AND ENVIRONMENT

ED-CT QM/ISS

**URBAN LANE CLOSURE,
 2L, 2W, WITH BIDIRECTIONAL
 LEFT TURN LANE**

(Sheet 2 of 2)

STANDARD 701502-09



SIGN SPACING	
Posted Speed	Sign Spacing
55	500' (150 m)
50-45	350' (100 m)
<45	200' (60 m)

SYMBOLS

- Arrow board
- Cone, drum or barricade
- Sign on portable or permanent support
- Work area
- Barricade or drum with flashing light
- Type III barricade with flashing lights
- Flagger with traffic control sign.

- ① Refer to SIGN SPACING TABLE for distances.
- ② Required for speeds > 40 MPH
- ③ Cones at 25' (8 m) centers for 250' (75 m). Additional cones may be placed at 50' (15 m) centers. When drums or Type I or Type II barricades are used, the interval between devices may be doubled.
- ④ Use flagger sign only when flagger is present.
- ⑤ For approved sideroad closures.
- ⑥ Cones, drums or barricades at 20' (6 m) in taper.

GENERAL NOTES

This Standard is used where at any time, day or night, any vehicle, equipment, workers or their activities encroach on the pavement during shoulder operations or where construction requires lane closures in urban areas.

Calculate L as follows:

SPEED LIMIT	FORMULAS	
	English	(Metric)
40 mph (70 km/h) or less:	$L = \frac{WS^2}{60}$	$L = \frac{WS^2}{150}$
45 mph (80 km/h) or greater:	$L = (W)(S)$	$L = 0.65(W)(S)$

W = Width of offset in feet (meters).

S = Normal posted speed mph (km/h).

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

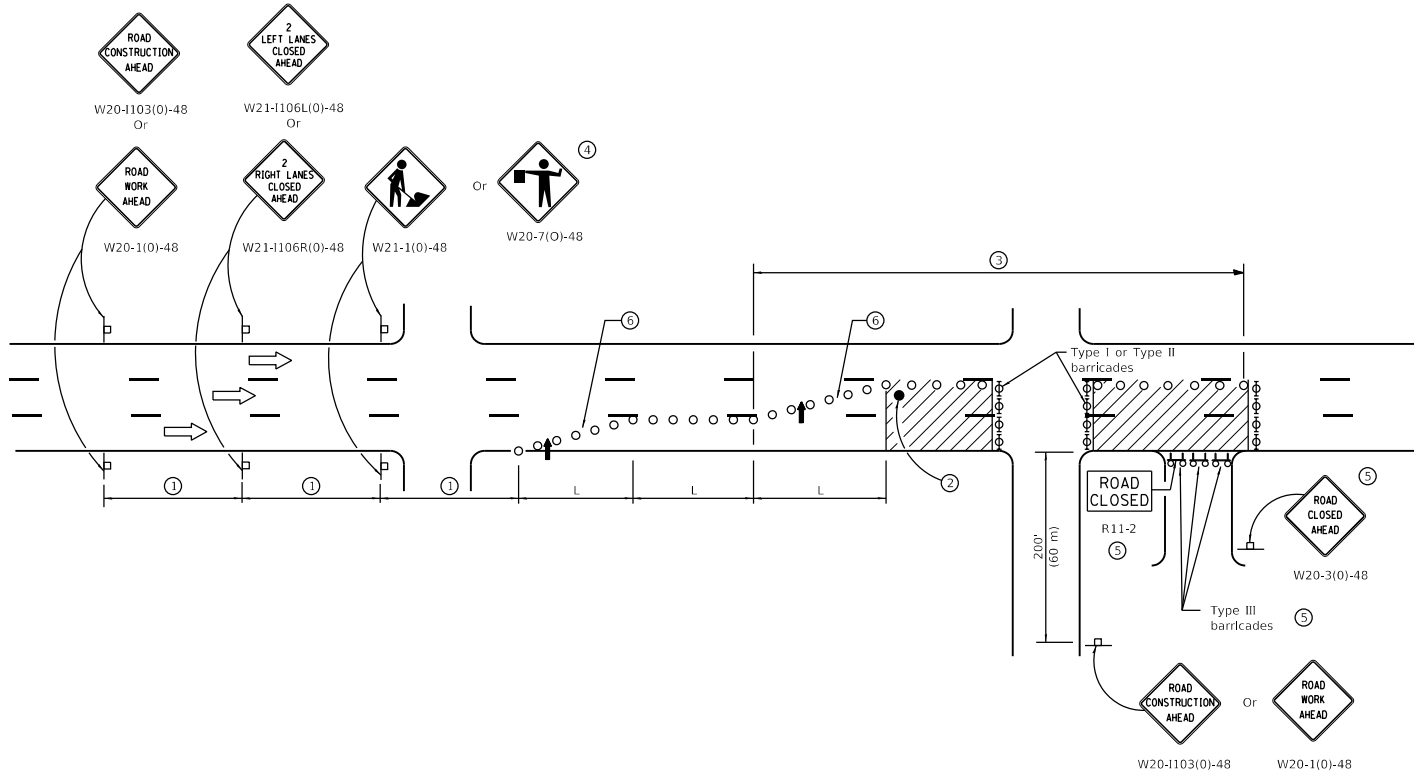
PASSED January 1, 2014
 APPROVED January 1, 2014


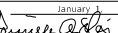
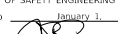
ENGINEER OF SAFETY ENGINEERING
 ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-14	Revised workers sign number to agree with current MUTCD.
1-1-13	Omitted text 'WORKERS' sign.

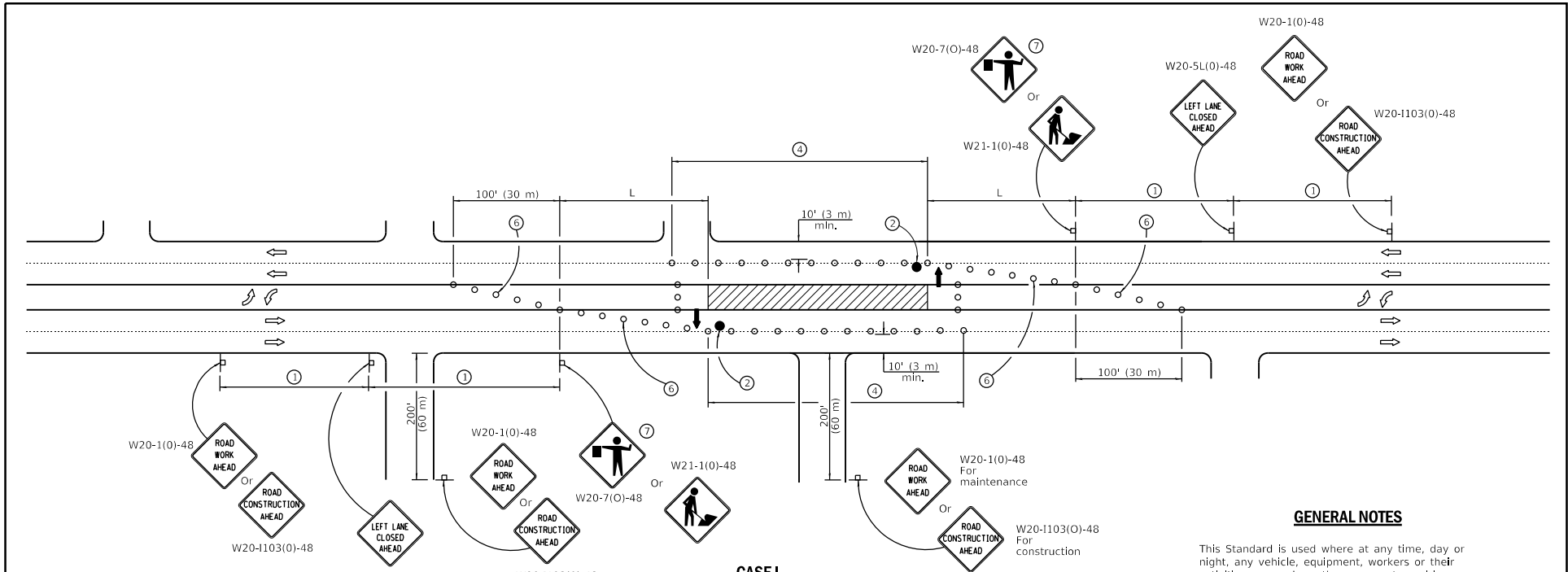
URBAN LANE CLOSURE, MULTILANE, 1W OR 2W WITH NONTRAVERSABLE MEDIAN
 (Sheet 1 of 2)

STANDARD 701601-09



 Illinois Department of Transportation
 PASSED January 1, 2014

 ENGINEER OF SAFETY ENGINEERING
 APPROVED January 1, 2014

 ENGINEER OF DESIGN AND ENVIRONMENT

**URBAN LANE CLOSURE,
 MULTILANE, 1W OR 2W WITH
 NONTRAVERSABLE MEDIAN**
(Sheet 2 of 2)
STANDARD 701601-09



SIGN SPACING	
Posted Speed	Sign Spacing
55	500' (150 m)
50-45	350' (100 m)
<45	200' (60 m)

- SYMBOLS**
- Arrow board
 - Work area
 - Barricade or drum with steady burning mondirectional light
 - Flagger with traffic control sign
 - Cone, drum or barricade
 - Sign on portable or permanent support
 - Type III barricade with flashing lights

CASE I

- ① Refer to SIGN SPACING TABLE for distances.
- ② Required for speeds > 40 mph (70 km/h).
- ③ Required if work exceeds 500' (164 m) or 1 block, repeat every 1 mile (1.6 km).
- ④ Cones at 25' (8 m) centers for 250' (75 m) on approach. Additional cones may be placed at 50' (15 m) centers. When drums or type I or II barricades are used, the interval between devices may be doubled.
- ⑤ For approved sideroad closures.
- ⑥ Cones, drums or barricades at 20' (6 m) centers in taper.
- ⑦ Use flagger sign only when flagger is present.

GENERAL NOTES

This Standard is used where at any time, day or night, any vehicle, equipment, workers or their activities encroach on the pavement requiring the closure of one traffic lane in an Urban area.

If the work operation is performed between 9:00 a.m. and 3:00 p.m. and does not exceed 15 min. Traffic protection shall be as shown for Standard 701426.

Calculate L as follows:

SPEED LIMIT	FORMULAS	
	English	(Metric)
40 mph (70 km/h) or less:	$L = \frac{WS^2}{60}$	$L = \frac{WS^2}{150}$
45 mph (80 km/h) or greater:	$L = (W)(S)$	$L = 0.65(W)(S)$

W = Width of offset in feet (meters).

s = Normal posted speed mph (km/h).

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

APPROVED January 1, 2019
Cynthia A. White
 ENGINEER OF SAFETY PROG. AND ENGINEERING

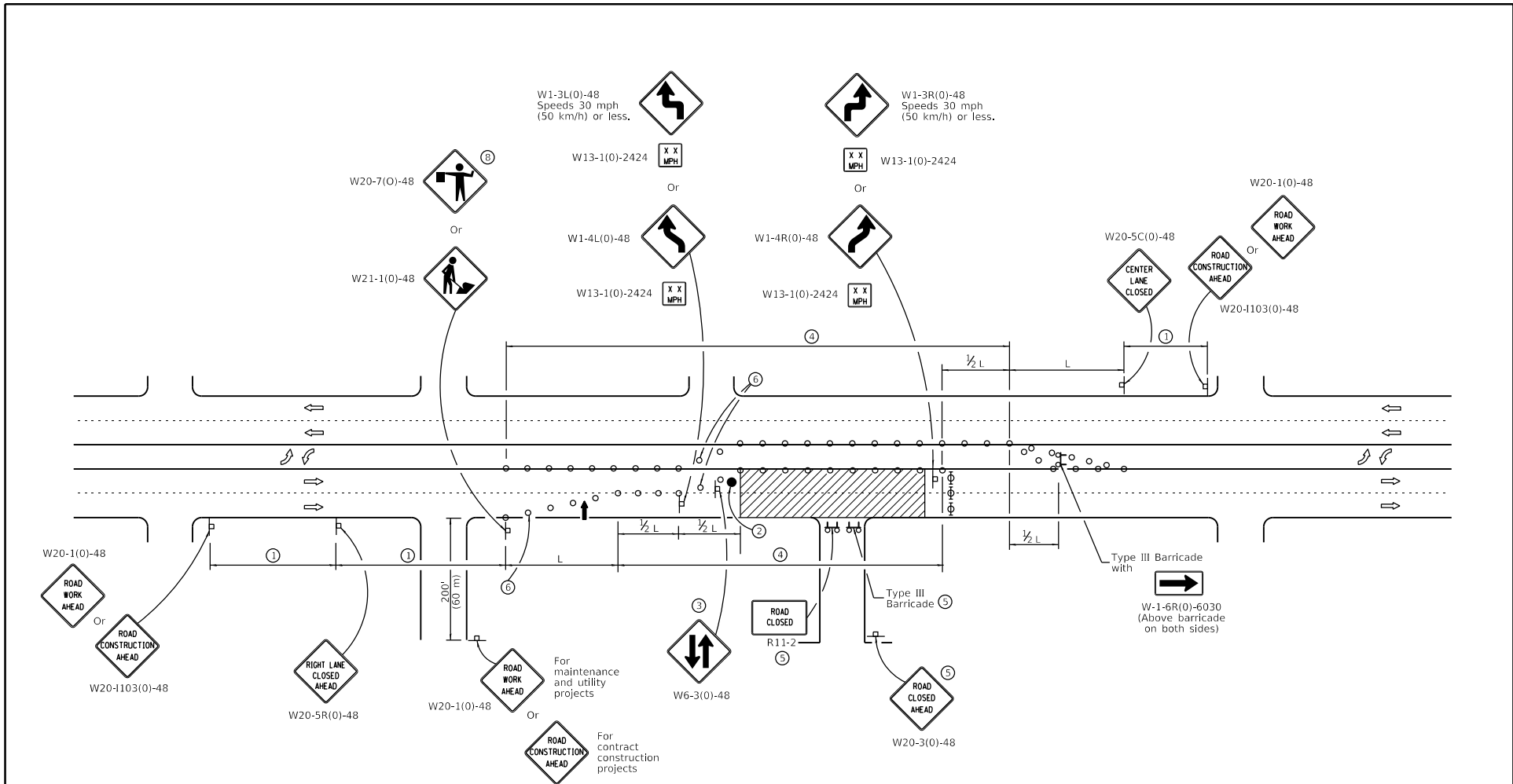
APPROVED January 1, 2019
John E. ...
 ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-19	Revised to allow cones at night.
1-1-18	Moved arrow boards into closed lanes for CASE I.

URBAN LANE CLOSURE, MULTILANE, 2W WITH BIDIRECTIONAL LEFT TURN LANE

(Sheet 1 of 4)

STANDARD 701602-10



CASE II

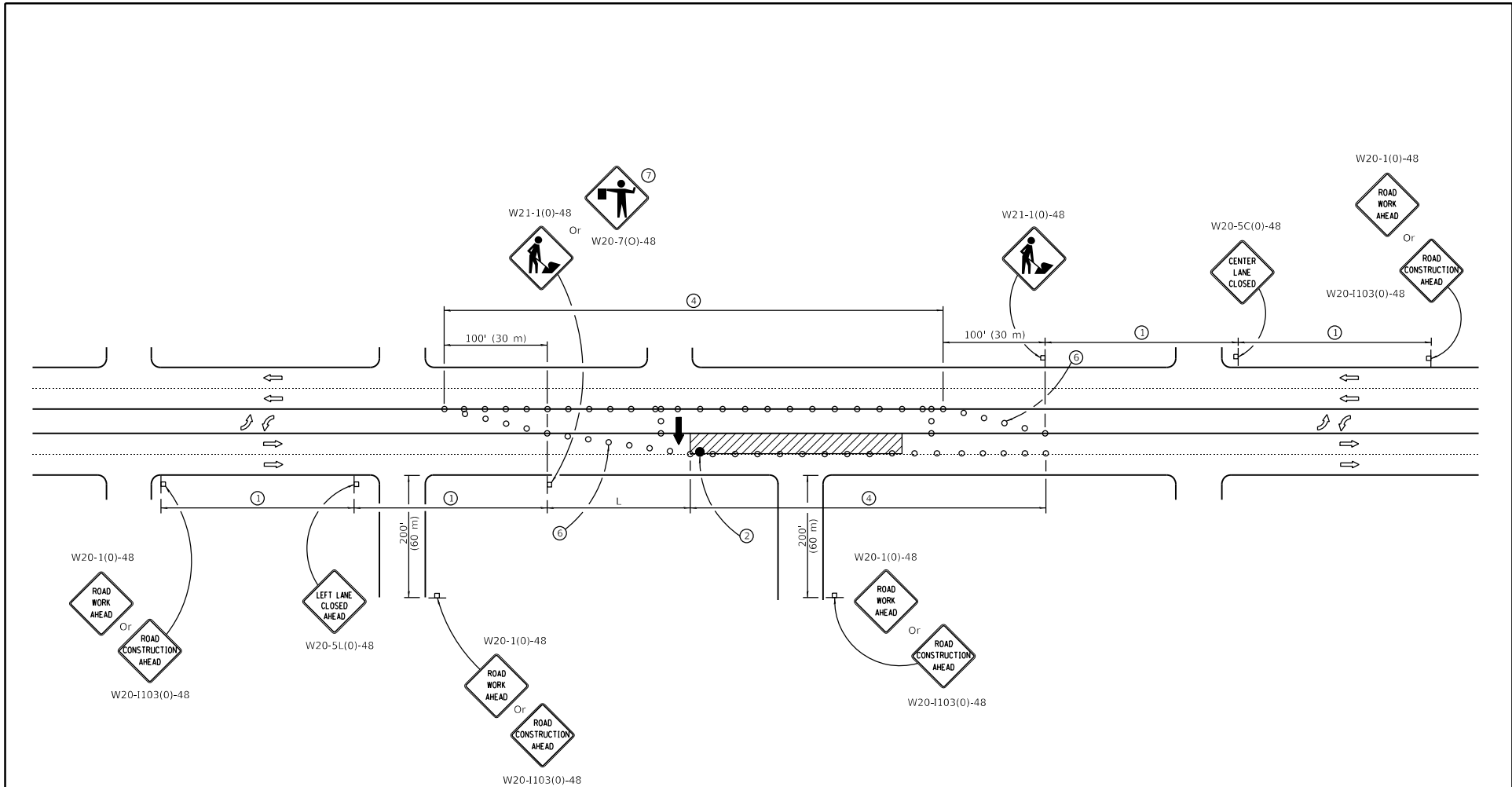
Illinois Department of Transportation

APPROVED	January 1, 2019	ISSUED	E1-H
<i>[Signature]</i>			
ENGINEER OF SAFETY PROG. AND ENGINEERING			
APPROVED	January 1, 2019		
<i>[Signature]</i>			
ENGINEER OF DESIGN AND ENVIRONMENT			

**URBAN LANE CLOSURE,
MULTILANE, 2W WITH
BIDIRECTIONAL LEFT TURN LANE**

(Sheet 2 of 4)

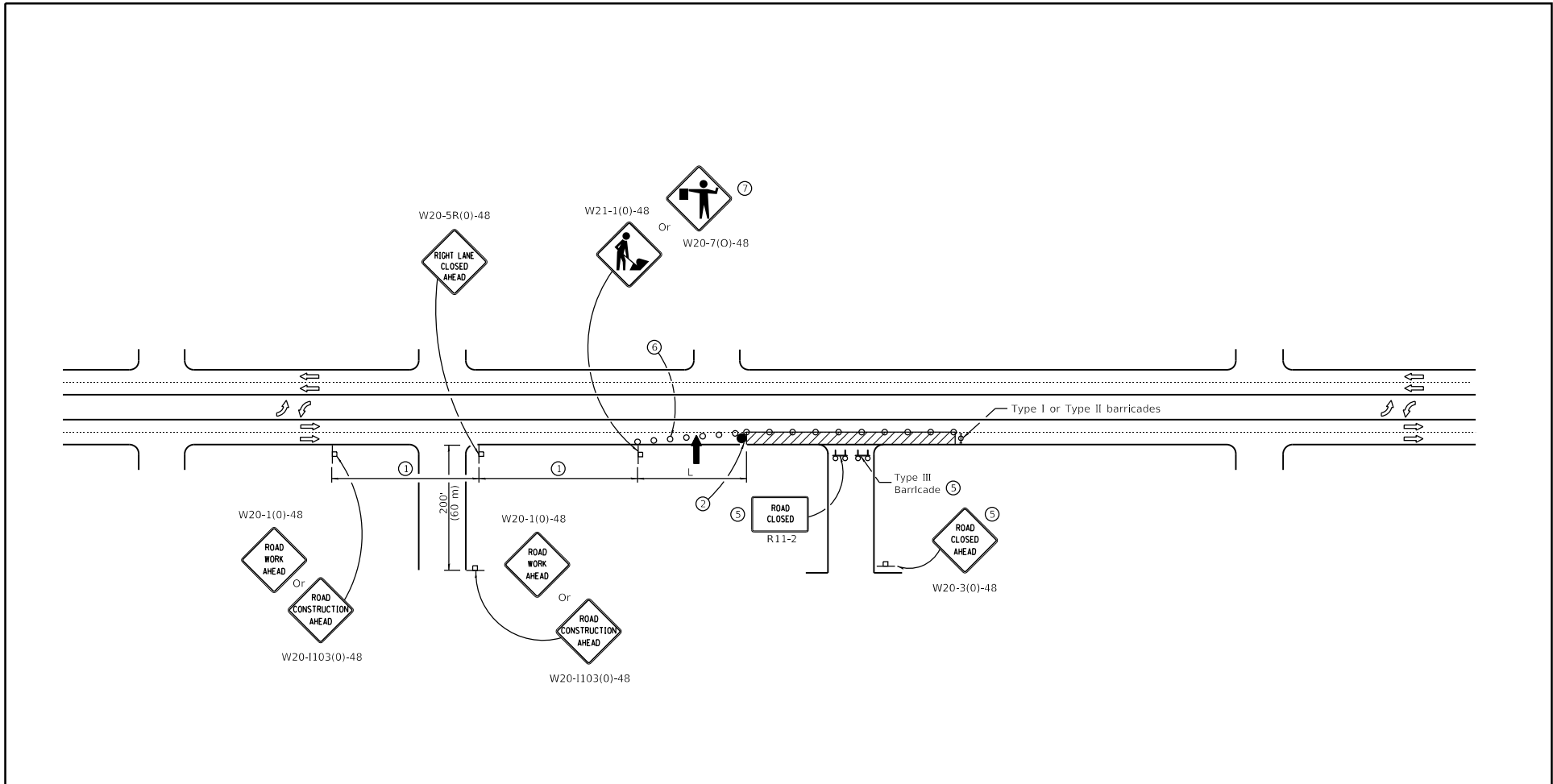
STANDARD 701602-10



CASE III

Illinois Department of Transportation	
APPROVED January 1, 2019 <i>Cynthia A. White</i> ENGINEER OF SAFETY PROG. AND ENGINEERING	ISSUED 1-1-19 E1-1-19
APPROVED January 1, 2019 <i>Scott E. G...</i> ENGINEER OF DESIGN AND ENVIRONMENT	

URBAN LANE CLOSURE, MULTILANE, 2W WITH BIDIRECTIONAL LEFT TURN LANE <small>(Sheet 3 of 4)</small>
STANDARD 701602-10



CASE IV

Illinois Department of Transportation

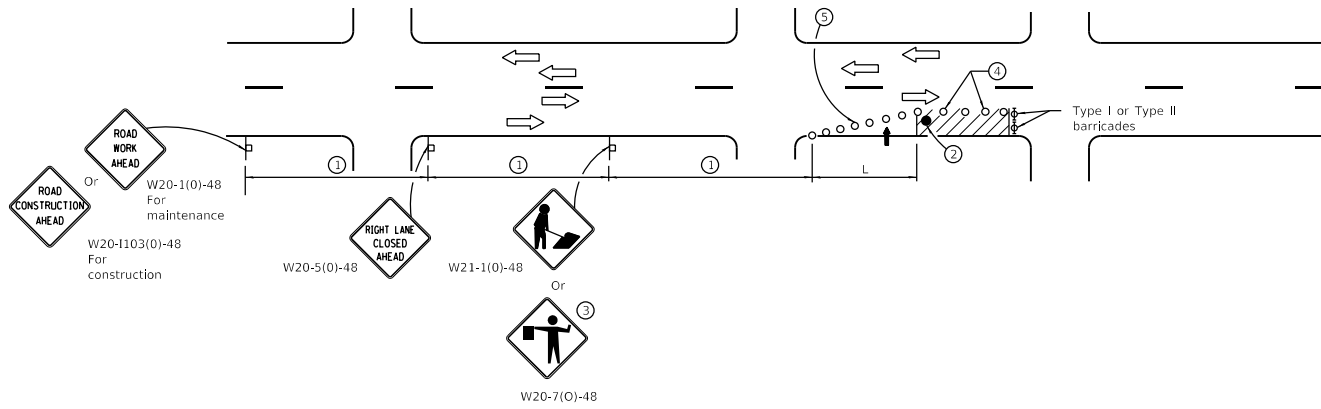
APPROVED January 1, 2019
Cynthia A. [Signature]
 ENGINEER OF SAFETY PROG. AND ENGINEERING

ISSUED 1-1-19

APPROVED January 1, 2019
[Signature]
 ENGINEER OF DESIGN AND ENVIRONMENT

**URBAN LANE CLOSURE,
 MULTILANE, 2W WITH
 BIDIRECTIONAL LEFT TURN LANE**
 (Sheet 4 of 4)

STANDARD 701602-10



SIGN SPACING	
Posted Speed	Sign Spacing
55	500' (150 m)
50-45	350' (100 m)
<45	200' (60 m)

- SYMBOLS**
- Arrow board
 - Cone, drum or barricade
 - Sign on portable or permanent support
 - Work area
 - Barricade or drum with flashing light
 - Flagger with traffic control sign.

- ① Refer to SIGN SPACING TABLE for distances.
- ② Required for speeds > 40 mph.
- ③ Use flagger sign only when flagger is present.
- ④ Cones at 25' (8 m) centers for 250' (75 m). Additional cones may be placed at 50' (15 m) centers. When drums or Type I or Type II barricades are used, the interval between devices may be doubled.
- ⑤ Cones, drums or barricades at 20' (6 m) centers in taper.

GENERAL NOTES

This Standard is used where at any time, day or night, any vehicle, equipment, workers or their activities encroach on the pavement requiring the closure of one traffic lane in an Urban area.

Calculate L as follows:

SPEED LIMIT	FORMULAS	
	English	(Metric)
40 mph (70 km/h) or less:	$L = \frac{WS^2}{60}$	$L = \frac{WS^2}{150}$
45 mph (80 km/h) or greater:	$L = (W)(S)$	$L = 0.65(W)(S)$

W = Width of offset in feet (meters).

S = Normal posted speed mph (km/h).

All dimensions are in inches (millimeters) unless otherwise shown.

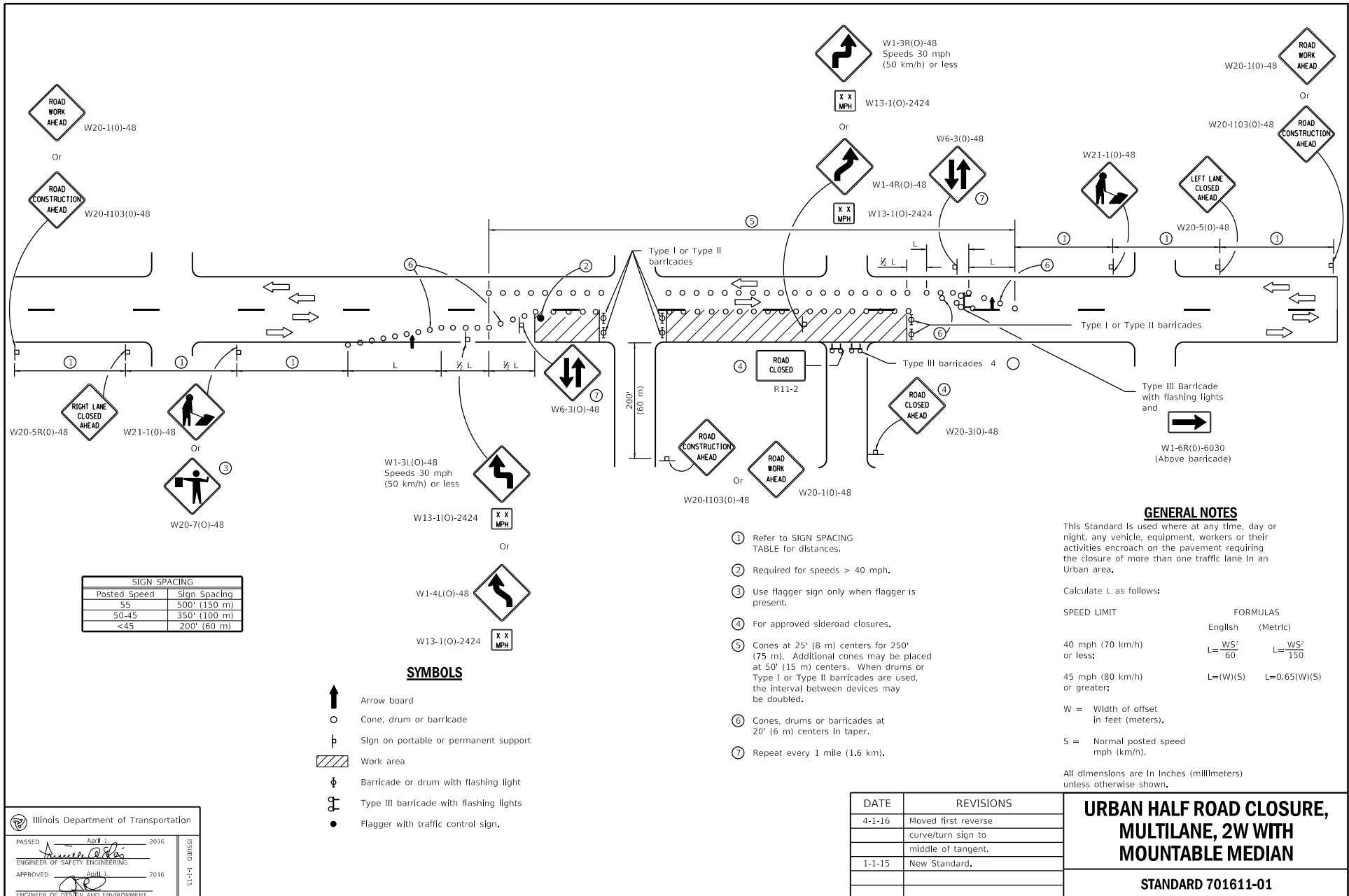
Illinois Department of Transportation

PASSED January 1, 2015
 ENGINEER OF SAFETY ENGINEERING
 APPROVED January 1, 2015
 ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-15	Renamed standard. Moved case on Sheet 2 to new Highway Standard.
1-1-14	Revised workers sign number to agree with current MUTCD.

URBAN SINGLE LANE CLOSURE, MULTILANE, 2W WITH MOUNTABLE MEDIAN

STANDARD 701606-10



SIGN SPACING	
Posted Speed	Sign Spacing
55	500' (150 m)
50-45	350' (100 m)
<45	200' (60 m)

SYMBOLS

- Arrow board
- Cone, drum or barricade
- Sign on portable or permanent support
- Work area
- Barricade or drum with flashing light
- Type III barricade with flashing lights
- Flagger with traffic control sign.

GENERAL NOTES

This Standard is used where at any time, day or night, any vehicle, equipment, workers or their activities encroach on the pavement requiring the closure of more than one traffic lane in an Urban area.

Calculate L as follows:

SPEED LIMIT	FORMULAS	
	English	Metric
40 mph (70 km/h) or less:	$L = \frac{WS^2}{60}$	$L = \frac{WS^2}{150}$
45 mph (80 km/h) or greater:	$L = (W)(S)$	$L = 0.65(W)(S)$

W = Width of offset in feet (meters).

S = Normal posted speed mph (km/h).

All dimensions are in inches (millimeters) unless otherwise shown.

- 1 Refer to SIGN SPACING TABLE for distances.
- 2 Required for speeds > 40 mph.
- 3 Use flagger sign only when flagger is present.
- 4 For approved sideroad closures.
- 5 Cones at 25' (8 m) centers for 250' (75 m). Additional cones may be placed at 50' (15 m) centers. When drums or Type I or Type II barricades are used, the interval between devices may be doubled.
- 6 Cones, drums or barricades at 20' (6 m) centers in taper.
- 7 Repeat every 1 mile (1.6 km).

DATE	REVISIONS
4-1-16	Moved first reverse curve/turn sign to middle of tangent.
1-1-15	New Standard.

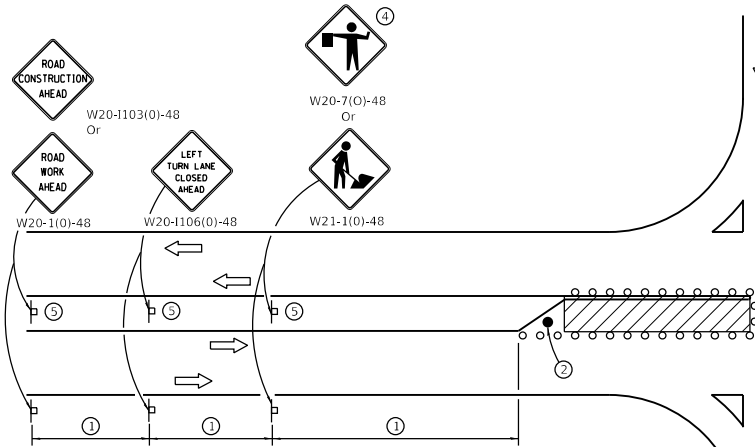
URBAN HALF ROAD CLOSURE, MULTILANE, 2W WITH MOUNTABLE MEDIAN

STANDARD 701611-01

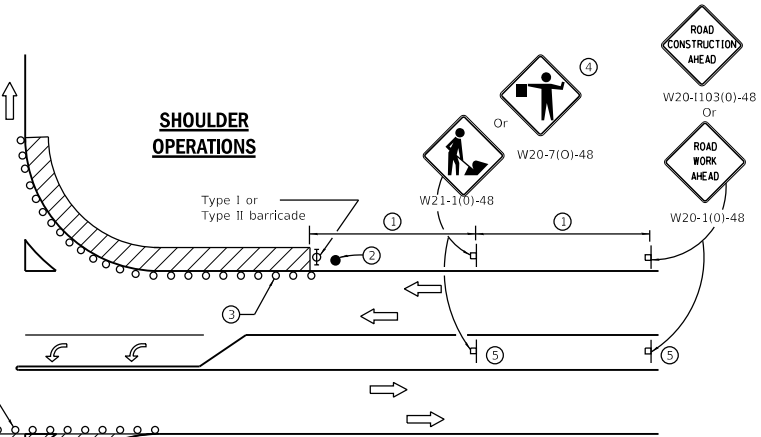
Illinois Department of Transportation

PASSED April 1, 2016
 ENGINEER OF SAFETY ENGINEERING
 APPROVED April 1, 2016
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-15



SHOULDER OPERATIONS



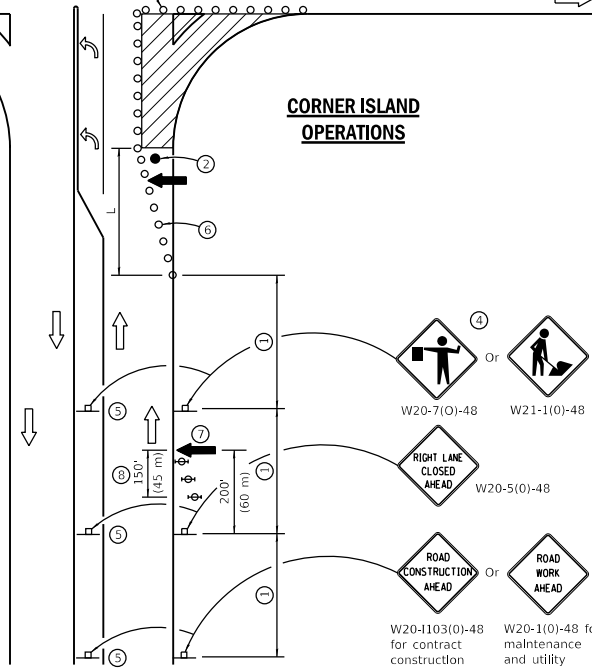
LEFT TURN LANE OR CENTER MEDIAN OPERATIONS

- ① Refer to SIGN SPACING TABLE for distance.
- ② Required for speed > 40 mph.
- ③ Cones at 25' (8 m) centers for 250' (75 m). Additional cones may be placed at 50' (15 m) centers. When drums or Type I or Type II barricades are used, the interval between devices may be doubled.
- ④ Use flagger sign only when flagger is present.
- ⑤ Omit this sign when median is less than 10' (3 m) or for bi-directional turn lanes.
- ⑥ Cones, drums or barricades at 20' (6 m) centers in taper.
- ⑦ Advanced arrow board required for speeds > 45 mph.
- ⑧ Three Type II barricades, drums or vertical barricades at 50' (15 m) centers.

SYMBOLS

- Work area
- Cone, drum or barricade
- Sign on portable or permanent support
- Arrow board
- Barricade or drum with flashing light
- Flagger with traffic control sign

CORNER ISLAND OPERATIONS



SIGN SPACING	
Posted Speed	Sign Spacing
55	500' (150 m)
50-45	350' (100 m)
<45	200' (60 m)

GENERAL NOTES

This Standard is used where at any time, day or night, any vehicle, equipment, workers or their activities encroach on the pavement during shoulder operations or where construction requires lane closures in an urban area.

Calculate L as follows:

SPEED LIMIT	FORMULAS	
	English	(Metric)
40 mph (70 km/h) or less:	$L = \frac{WS^2}{60}$	$L = \frac{WS^2}{150}$
45 mph (80 km/h) or greater:	$L = (W)(S)$	$L = 0.65(W)(S)$

W = Width of offset
In feet (meters).

S = Normal posted speed
mph (km/h).

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED April 1, 2016

 ENGINEER OF SAFETY ENGINEERING

APPROVED April 1, 2016

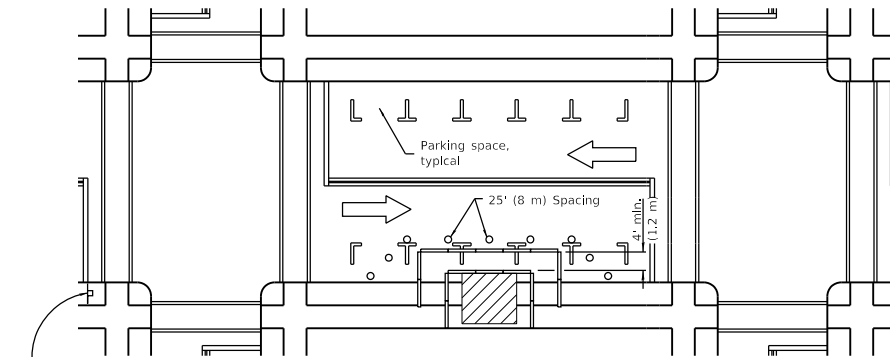
 ENGINEER OF DESIGN AND ENVIRONMENT

LEP-C1 03/15/22

DATE	REVISIONS
4-1-16	Corrected sign number for LEFT TURN LANE CLOSED AHEAD.
1-1-14	Added devices at arrow board upstream from taper.
	Rev. workers sign number.

URBAN LANE CLOSURE, MULTILANE INTERSECTION

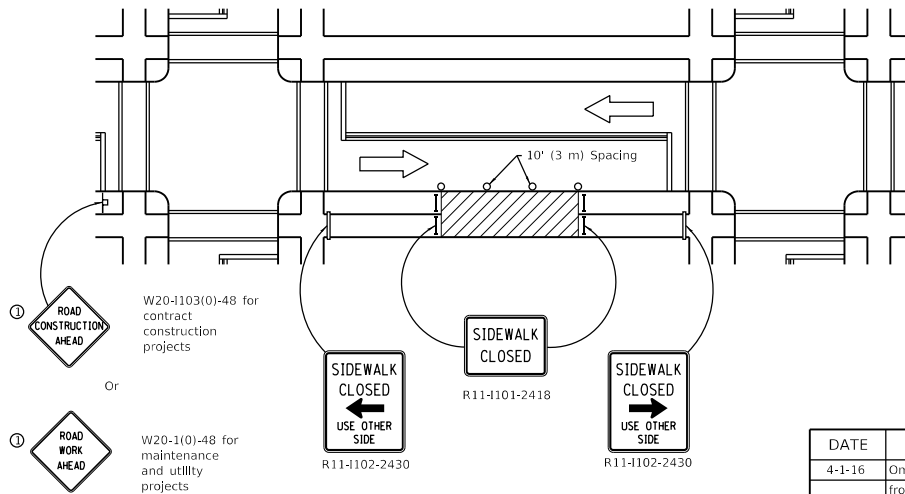
STANDARD 701701-10



① ROAD CONSTRUCTION AHEAD W20-1103(0)-48 for contract construction projects

Or
① ROAD WORK AHEAD W20-110(0)-48 for maintenance and utility projects

SIDEWALK DIVERSION



① ROAD CONSTRUCTION AHEAD W20-1103(0)-48 for contract construction projects

Or
① ROAD WORK AHEAD W20-110(0)-48 for maintenance and utility projects

SIDEWALK CLOSURE

① Omit whenever duplicated by road work traffic control.

GENERAL NOTES

This Standard is used where, at any time, pedestrian traffic must be rerouted due to work being performed.

This Standard must be used in conjunction with other Traffic Control & Protection Standards when roadway traffic is affected.

Temporary facilities shall be detectable and accessible.

The temporary pedestrian facilities shall be provided on the same side of the closed facilities whenever possible.

The SIDEWALK CLOSED / USE OTHER SIDE sign shall be placed at the nearest crosswalk or intersection to each end of the closure. Where the closure occurs at a corner, the signs shall be erected on the corners across the street from the closure. The SIDEWALK CLOSED signs shall be used at the ends of the actual closures.

Type III barricades and R11-2-4830 signs shall be positioned as shown in "ROAD CLOSED TO ALL TRAFFIC" detail on Standard 701901.

All dimensions are in Inches (millimeters) unless otherwise shown.

SYMBOLS

- Work area
- Sign on portable or permanent support
- Barricade or drum
- Cone, drum or barricade
- Type III barricade
- Detectable pedestrian channelizing barricade

Illinois Department of Transportation

PASSED April 1, 2016
Amber A. DeLoe
 ENGINEER OF SAFETY ENGINEERING

APPROVED April 1, 2016
DR
 ENGINEER OF DESIGN AND ENVIRONMENT

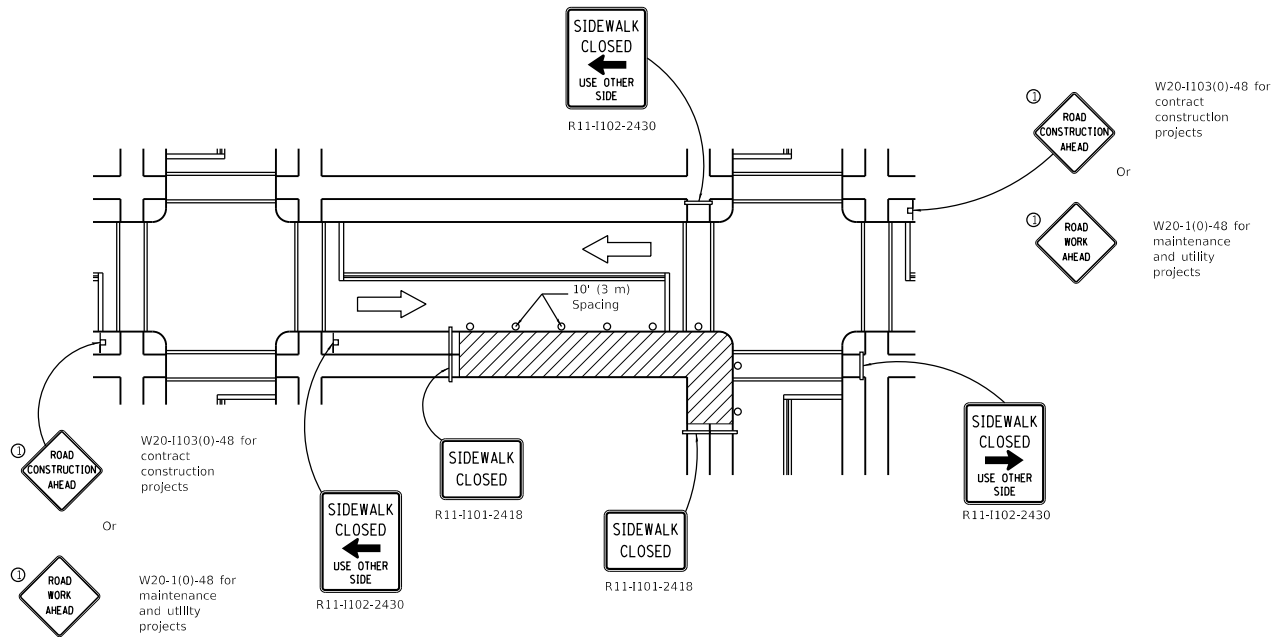
664-C 03/15/12

DATE	REVISIONS
4-1-16	Omitted orange safety fence from standard as this is covered in the std. spec.
1-1-12	Added SIDEWALK DIVERSION. Modified appearance of plan views. Renamed Std.

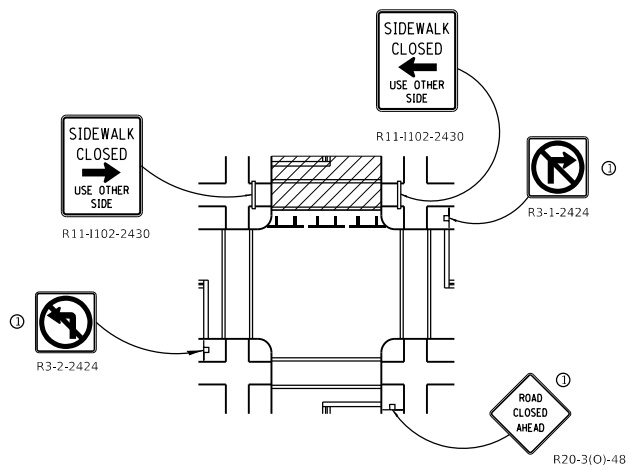
SIDEWALK, CORNER OR CROSSWALK CLOSURE

(Sheet 1 of 2)

STANDARD 701801-06



CORNER CLOSURE



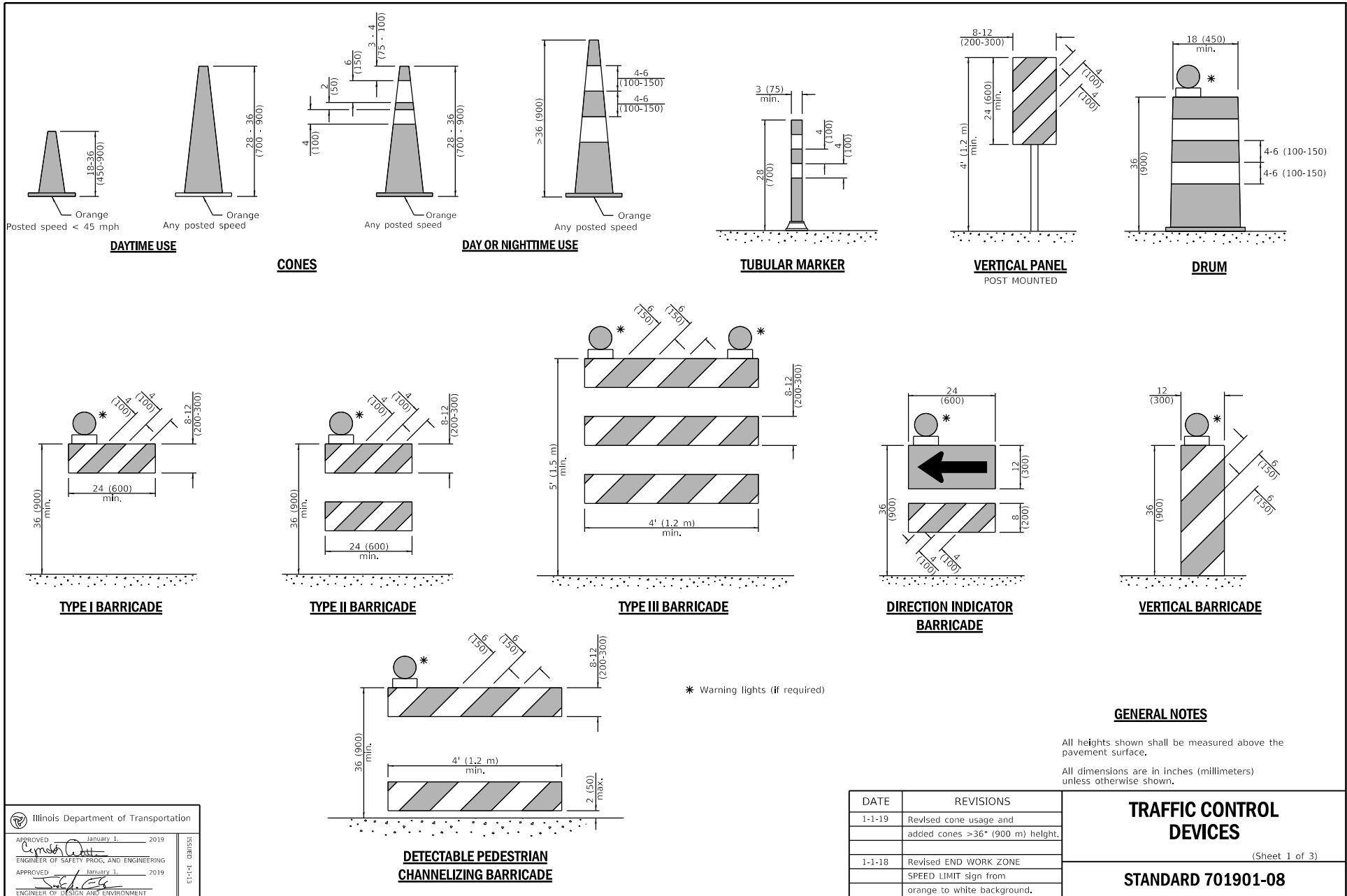
CROSSWALK CLOSURE

SIDEWALK, CORNER OR CROSSWALK CLOSURE

(Sheet 2 of 2)

STANDARD 701801-06

Illinois Department of Transportation	
PASSED	April 1, 2016
ENGINEER OF SAFETY ENGINEERING	
APPROVED	April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT	



Illinois Department of Transportation

APPROVED January 1, 2019
Cynthia A. [Signature]
 ENGINEER OF SAFETY PROG. AND ENGINEERING

APPROVED January 1, 2019
[Signature]
 ENGINEER OF DESIGN AND ENVIRONMENT

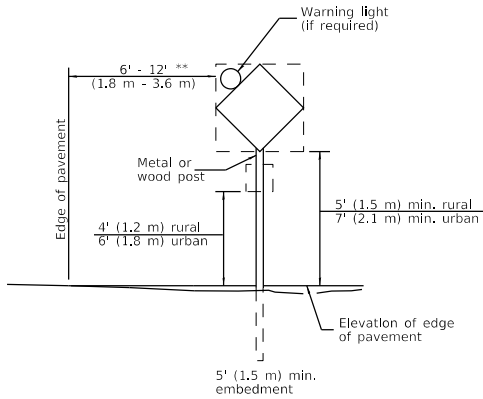
11-1-1 ADM/ISS/

DATE	REVISIONS
1-1-19	Revised cone usage and added cones >36" (900 mm) height.
1-1-18	Revised END WORK ZONE SPEED LIMIT sign from orange to white background.

TRAFFIC CONTROL DEVICES

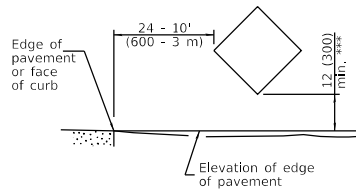
(Sheet 1 of 3)

STANDARD 701901-08



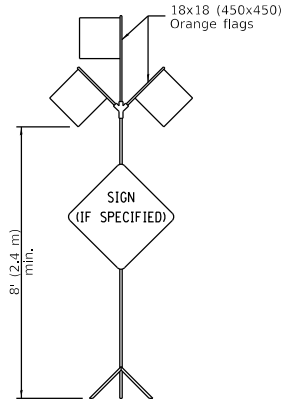
POST MOUNTED SIGNS

** When curb or paved shoulder are present this dimension shall be 24 (600) to the face of curb or 6' (1.8 m) to the outside edge of the paved shoulder.



SIGNS ON TEMPORARY SUPPORTS

*** When work operations exceed four days, this dimension shall be 5' (1.5 m) min. If located behind other devices, the height shall be sufficient to be seen completely above the devices.



HIGH LEVEL WARNING DEVICE

ROAD CONSTRUCTION NEXT X MILES

G20-1104(0)-6036

END CONSTRUCTION

G20-1105(0)-6024

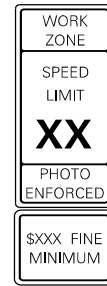
This signing is required for all projects 2 miles (3200 m) or more in length.

ROAD CONSTRUCTION NEXT X MILES sign shall be placed 500' (150 m) in advance of project limits.

END CONSTRUCTION sign shall be erected at the end of the job unless another job is within 2 miles (3200 m).

Dual sign displays shall be utilized on multi-lane highways.

WORK LIMIT SIGNING



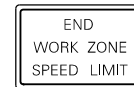
W21-1115(0)-3618

R2-1-3648

R10-1108p-3618 ****

R2-1106p-3618

Sign assembly as shown on Standards or as allowed by District Operations.

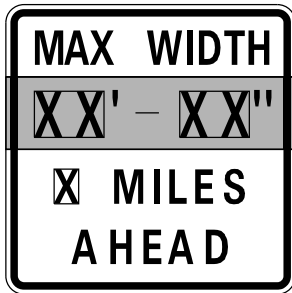


G20-1103-6036

This sign shall be used when the above sign assembly is used.

HIGHWAY CONSTRUCTION SPEED ZONE SIGNS

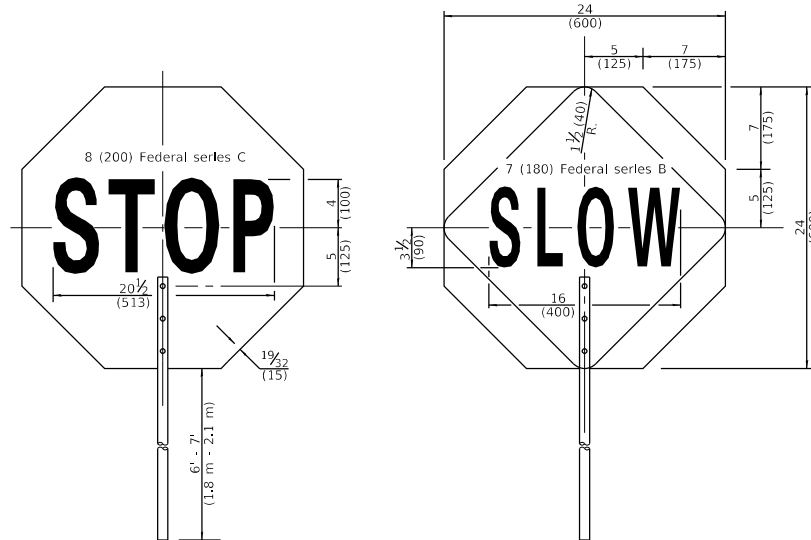
**** R10-1108p shall only be used along roadways under the jurisdiction of the State.



W12-1103-4848

WIDTH RESTRICTION SIGN

XX'-XX" width and X miles are variable.



FRONT SIDE

REVERSE SIDE

FLAGGER TRAFFIC CONTROL SIGN

Illinois Department of Transportation

APPROVED January 1, 2019
Cynthia A. White
 ENGINEER OF SAFETY PROG. AND ENGINEERING

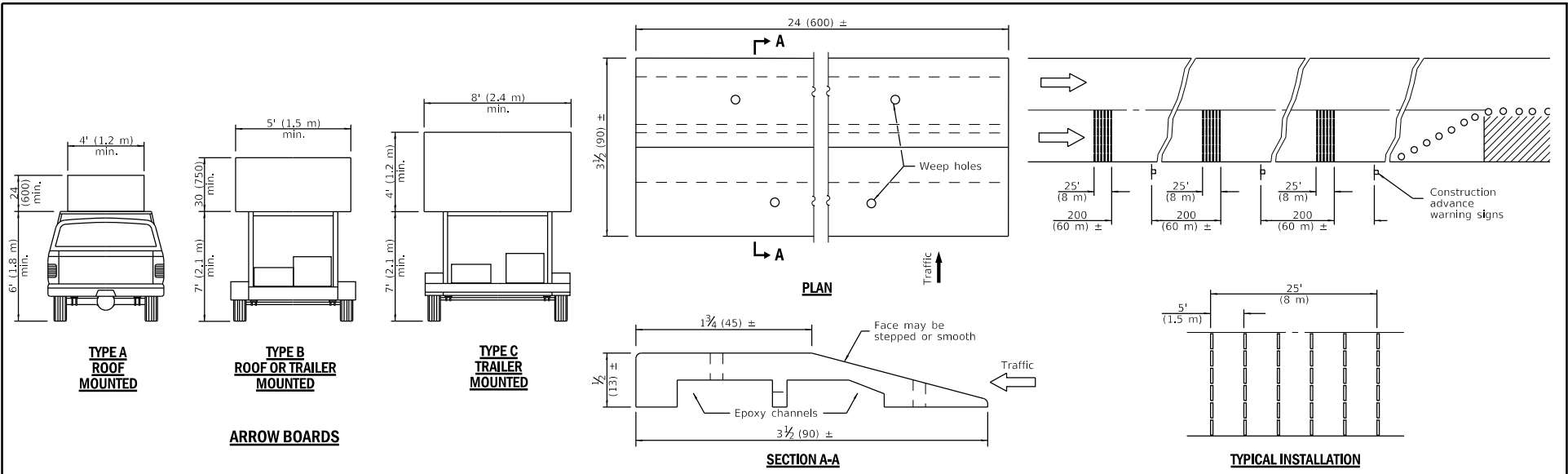
APPROVED January 1, 2019
Scott E. ...
 ENGINEER OF DESIGN AND ENVIRONMENT

1521/1521
 61-1-1

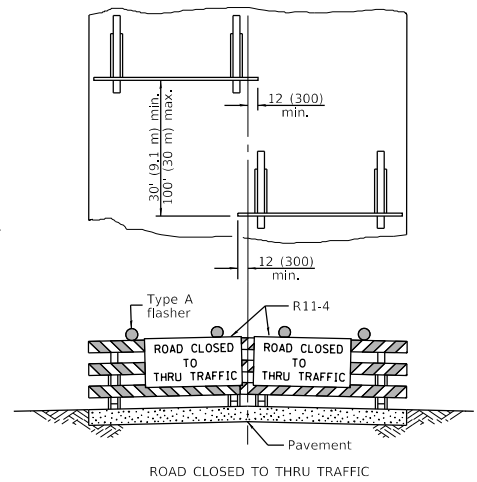
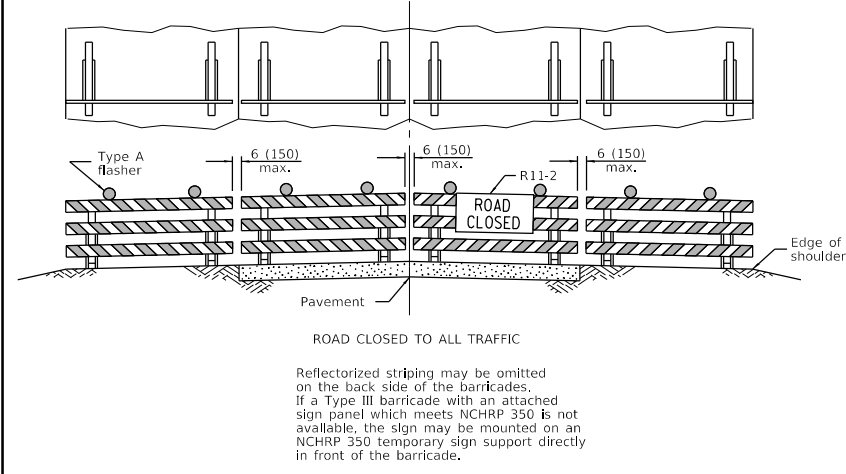
TRAFFIC CONTROL DEVICES

(Sheet 2 of 3)

STANDARD 701901-08



TEMPORARY RUMBLE STRIPS

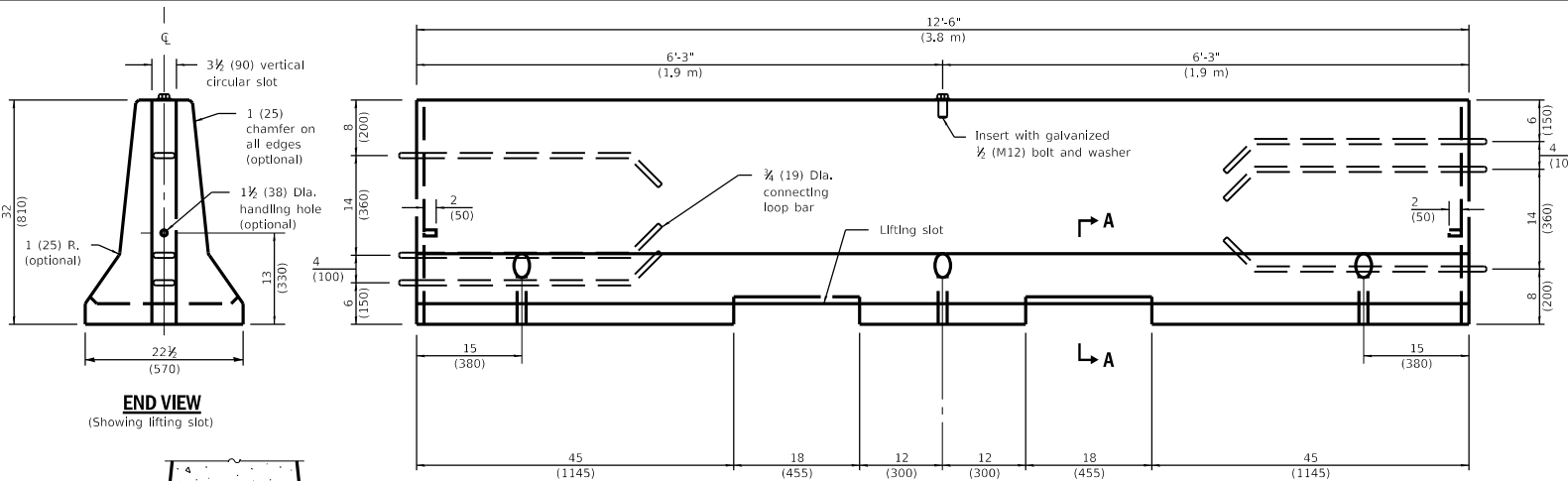


TYPICAL APPLICATIONS OF TYPE III BARRICADES CLOSING A ROAD

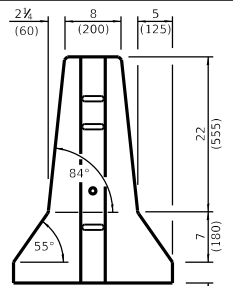
Reflectorized striping shall appear on both sides of the barricades. If a Type III barricade with an attached sign panel which meets NCHRP 350 is not available, the signs may be mounted on NCHRP 350 temporary sign supports directly in front of the barricade.

TRAFFIC CONTROL DEVICES
(Sheet 3 of 3)
STANDARD 701901-08

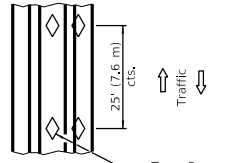
Illinois Department of Transportation	
APPROVED January 1, 2019	DESIGNED BY E1-H-1-1
<i>Cynthia C. [Signature]</i> ENGINEER OF SAFETY PROG. AND ENGINEERING	
APPROVED January 1, 2019	
<i>[Signature]</i> ENGINEER OF DESIGN AND ENVIRONMENT	



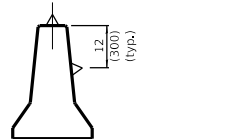
F SHAPE DESIGN



END VIEW



TOP VIEW



BARRIER WALL REFLECTORS

GENERAL NOTES

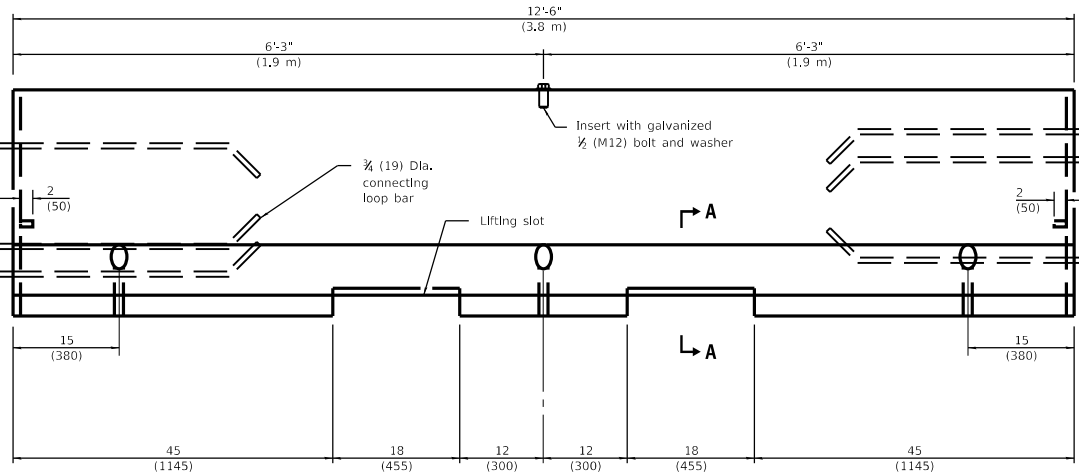
Each F shape barrier shall be clearly marked with "ILLINOIS F SHAPE", the Producer's mark and the date of manufacture. The markings shall be indented on the barrier or painted thereon with waterproof paint/ink.

The Insert for the 1/2 (M12) bolt shall be capable of 3,000 lb (13 kN) pull-out strength.

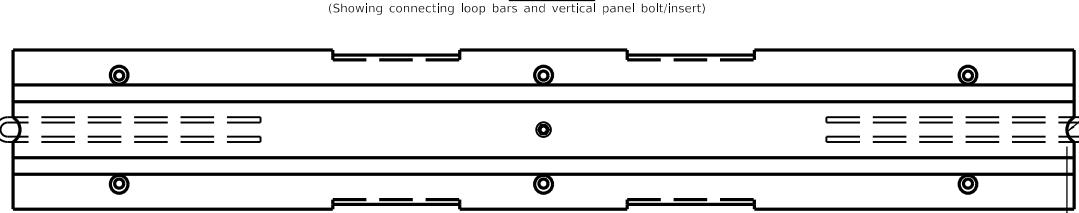
When barrier separates opposing flows of traffic markers shall be on both sides of barrier.

See Standard 782006 for dimensions of Type C reflector.

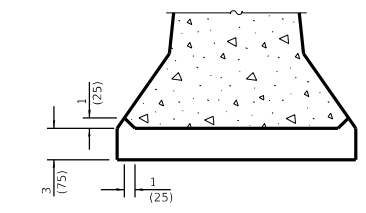
All dimensions are in Inches (millimeters) unless otherwise shown.



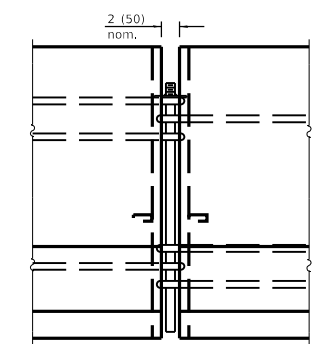
ELEVATION



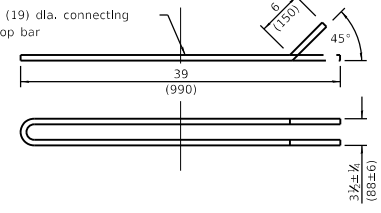
PLAN



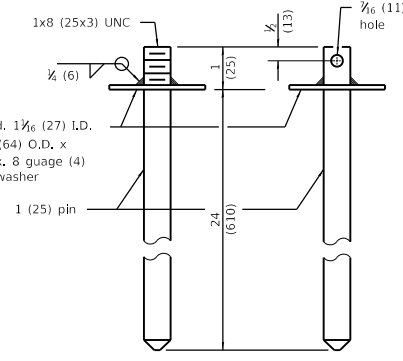
SECTION A-A LIFTING SLOT



CONNECTING DETAIL



CONNECTING LOOP BAR



CONNECTING AND ANCHOR PINS

(End may be beveled 1/2 (6) max.)

2 1/2 (63) measured from face of barrier to end of loop bar

DATE	REVISIONS
4-1-16	Rev. opt. chamfer on all edges to 1 (25). Reference to Std. 635011 now 782006.
1-1-12	Omitted 'ALTERNATE' from connecting and anchoring pins detail.

TEMPORARY CONCRETE BARRIER

(Sheet 1 of 2)

STANDARD 704001-08

Illinois Department of Transportation

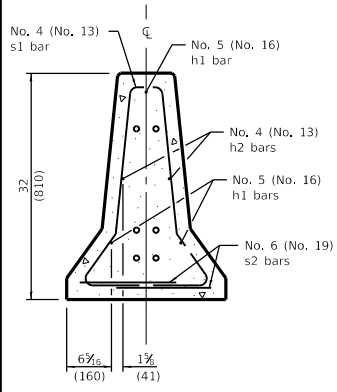
PASSED April 1, 2016

Michael Beard

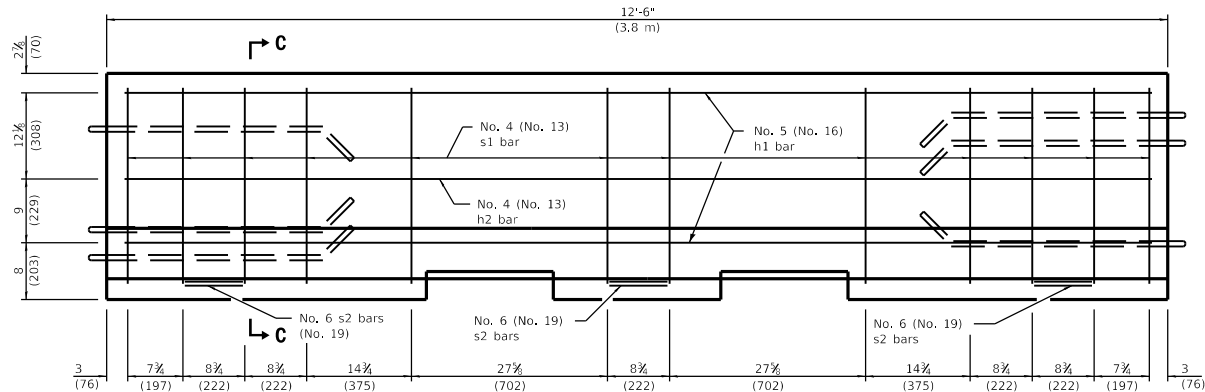
ENGINEER OF POLICY AND PROCEDURES

APPROVED April 1, 2016

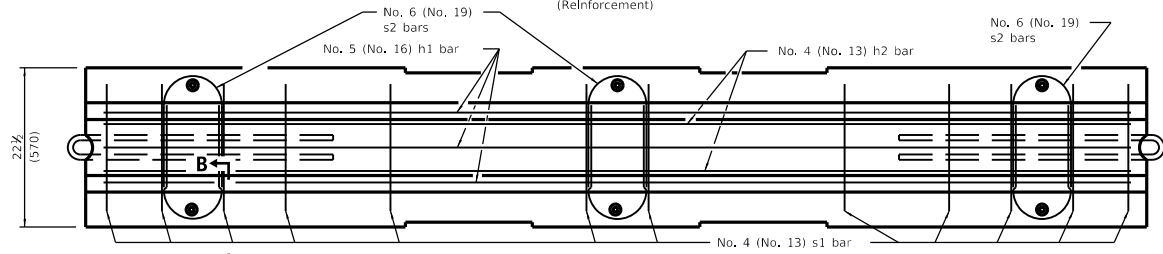
ENGINEER OF DESIGN AND ENVIRONMENT



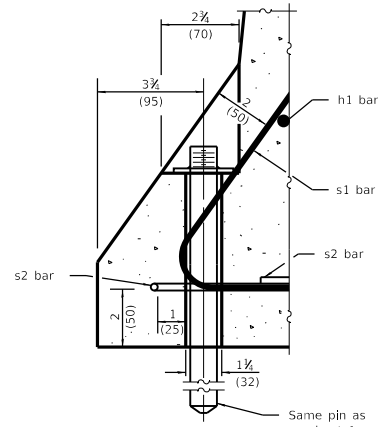
SECTION C-C



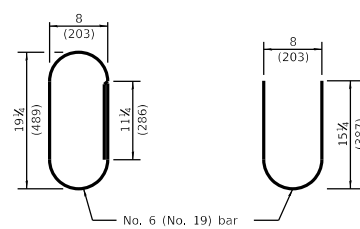
ELEVATION
(Reinforcement)



PLAN

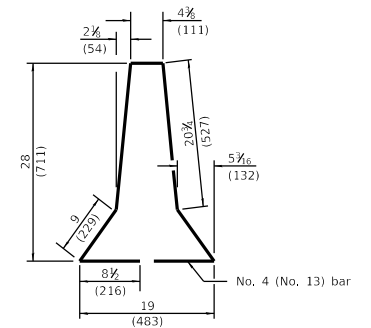


SECTION B-B
ANCHORING DETAIL

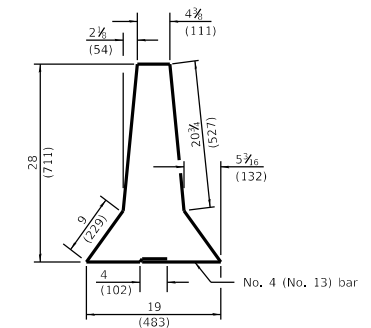


ALTERNATE s2 BARS

F SHAPE DESIGN



s1 BAR



ALTERNATE s1 BAR

Illinois Department of Transportation

PASSED April 1, 2016
Michael Beard
 ENGINEER OF POLICY AND PROCEDURES

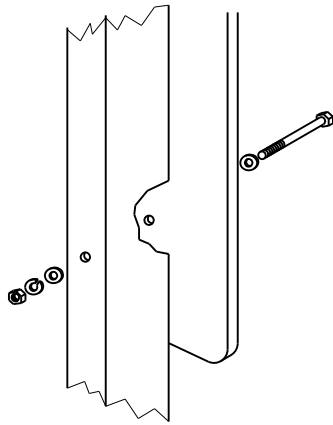
APPROVED April 1, 2016
[Signature]
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 10-1-03

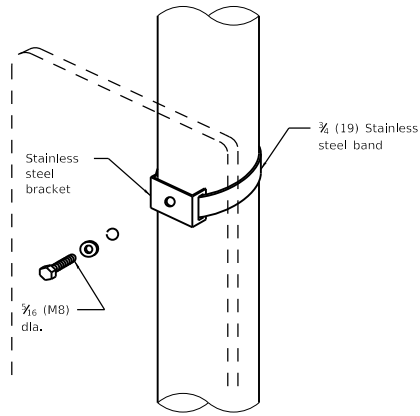
TEMPORARY CONCRETE BARRIER

(Sheet 2 of 2)

STANDARD 704001-08

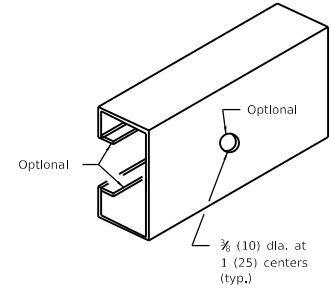
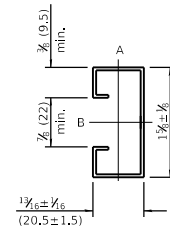


Sign panel 36 (900) wide or less

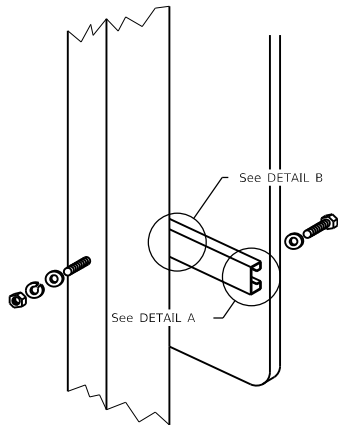


Sign panel 36 (900) wide or less

Section modulus (minimum)	Axis A	Axis B
Steel	0,050 in. ³ (819 mm ³)	0,105 in. ³ (1720 mm ³)
Aluminum	0,150 in. ³ (2458 mm ³)	0,315 in. ³ (5162 mm ³)

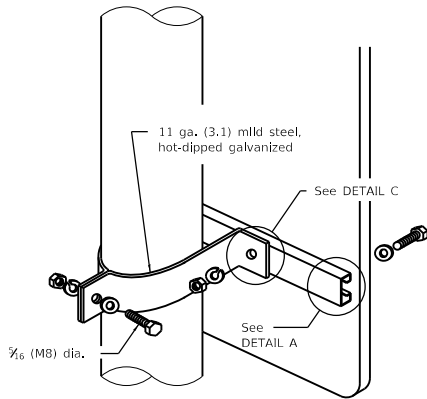


SUPPORTING CHANNEL DETAILS



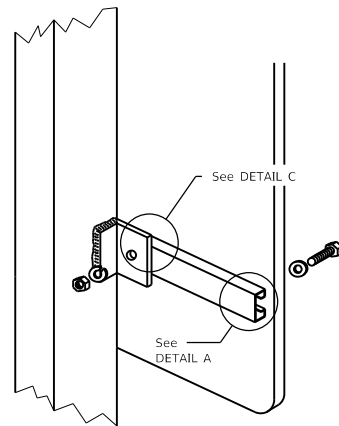
Sign panel over 36 (900) wide

WOOD OR TELESCOPING STEEL POSTS

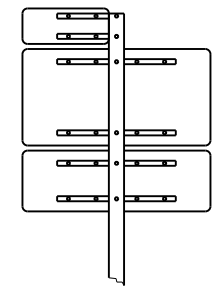


Sign panel over 36 (900) wide

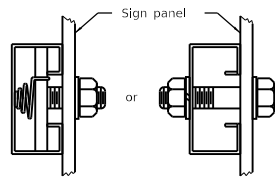
LIGHT OR SIGNAL STANDARDS



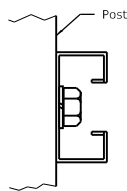
BREAKAWAY STEEL TUBING POSTS
(All sign panel sizes)



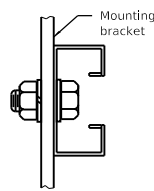
ROUTE MARKER ASSEMBLY



DETAIL A



DETAIL B



DETAIL C

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2009

ENGINEER OF OPERATIONS

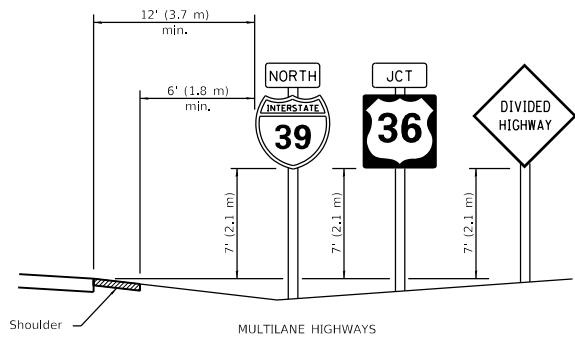
APPROVED January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

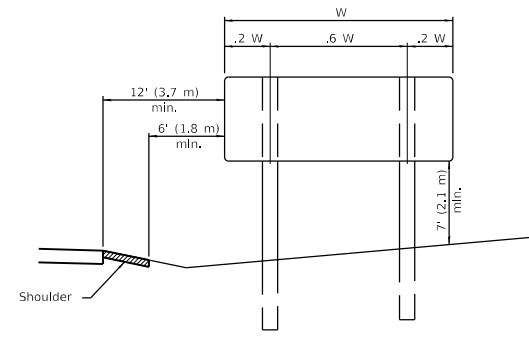
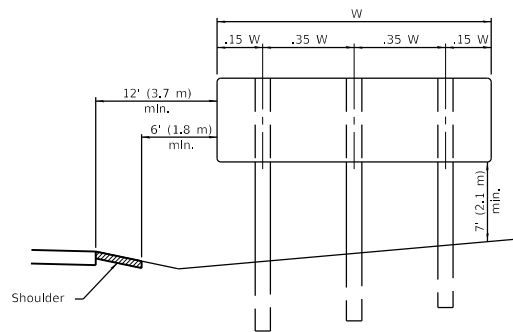
DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-97	Renum. Standard 2319-6.

SIGN PANEL MOUNTING DETAILS

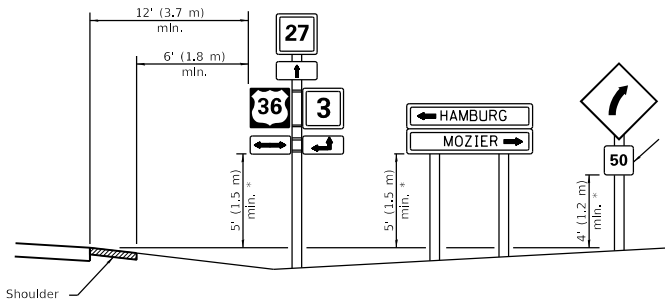
STANDARD 720001-01



MULTILANE HIGHWAYS



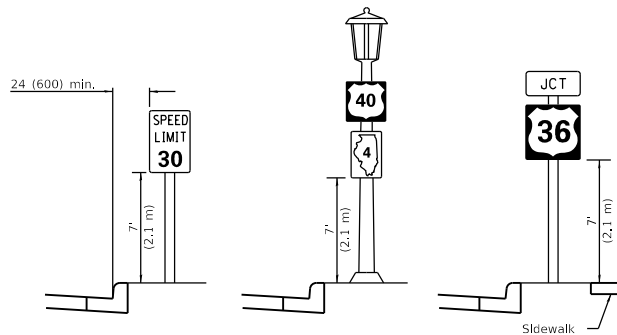
POST SPACING FOR NON-FREEWAY SIGN PANELS



Secondary sign

* In any area where parking is likely to occur or where there are obstructions to view or where signs are located over sidewalks, the height shall be at least 7' (2.1 m).

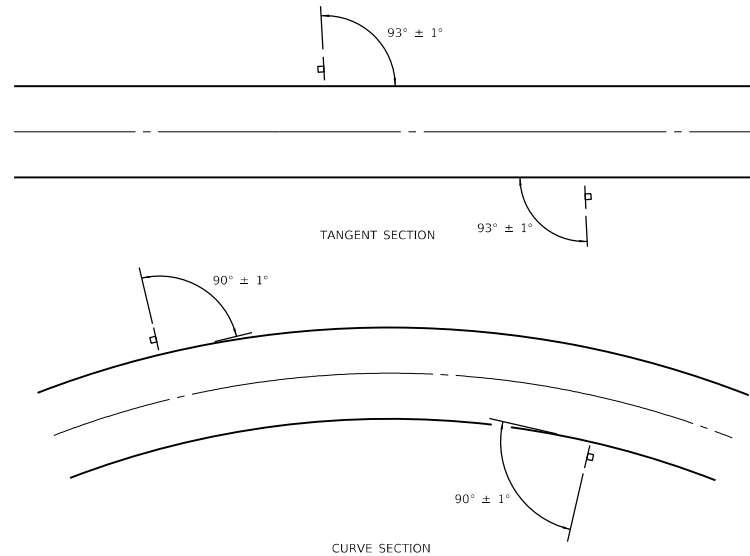
TWO LANE RURAL HIGHWAYS



URBAN LOCATIONS

TYPICAL INSTALLATIONS

Signs in any area shall be erected to a uniform height above the edge of the pavement.



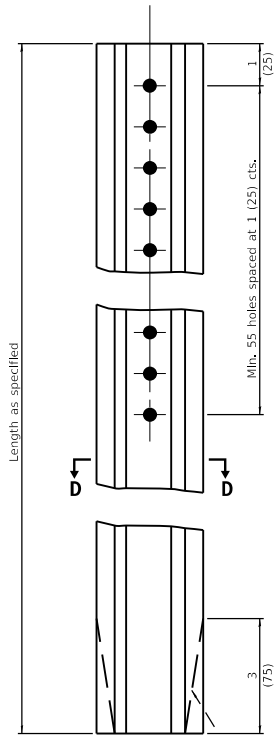
GROUND MOUNT SIGN POSITIONING

All dimensions are in inches (millimeters) unless otherwise shown.

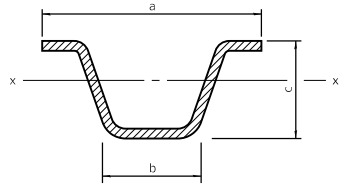
PASSED	January 1, 2014
ENGINEER OF OPERATIONS	
APPROVED	January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT	

DATE	REVISIONS
1-1-14	Added shoulders and slopes.
	Changed sign distances from roadway and shoulder.
1-1-12	Rev. sign elev. for multilane hwy's, Revised sign elev. and dist. to curb for rural loc.

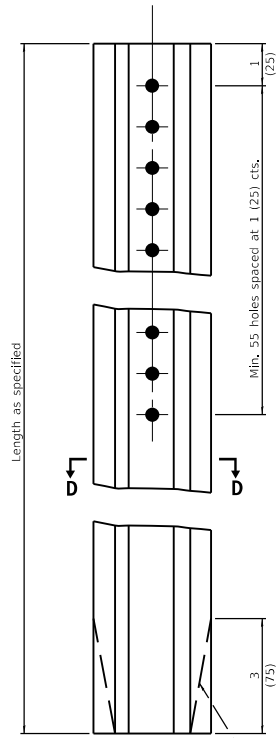
<p>SIGN PANEL ERECTION DETAILS</p>
<p>STANDARD 720006-04</p>



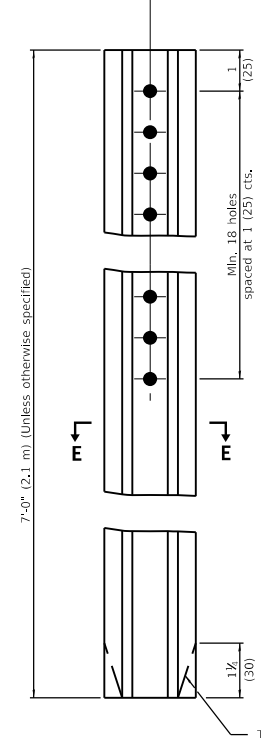
TYPE A



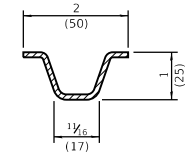
SECTION D-D



TYPE B



TYPE C



SECTION E-E

Steel - 1.12 lbs./ft. (1.67 kg/m)

		a	b	c	Sx-x In. ² (mm ²)	lbs./ft. (kg/m)
TYPE A	Steel	3 3/8 (78)	1 1/4 (32)	1 3/8 (37)	0.223 (3,654)	2.00 (2,98)
	Aluminum	3 3/8 (89)	1 1/4 (41)	1 3/8 (48)	0.435 (7,128)	0.90 (1,34)
TYPE B	Steel	3 3/8 (81)	1 1/4 (32)	1 3/8 (38)	0.341 (5,508)	3.00 (4,46)
	Aluminum	4 1/8 (118)	2 1/8 (57)	2 3/8 (66)	0.888 (14,552)	1.30 (1,83)

GENERAL NOTES

Dimensions shown for cross sections are minimum.

All holes are 3/16 (10).

Sx-x is the minimum section modulus about the x-x axis of the post as shown. For posts in which holes are punched or drilled for more than half their length, Sx-x shall be computed for the net section.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-97	Renum. Standard 2350-4.

METAL POSTS FOR SIGNS, MARKERS & DELINEATORS

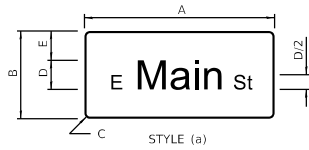
STANDARD 720011-01

Illinois Department of Transportation

PASSED January 1, 2009
Scott S. [Signature]
 ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009
Ken E. [Signature]
 ENGINEER OF DESIGN AND ENVIRONMENT

LEG-11 03/11/01



STYLE (a)



STYLE (b)



STYLE (c)



STYLE (d)



STYLE (e)



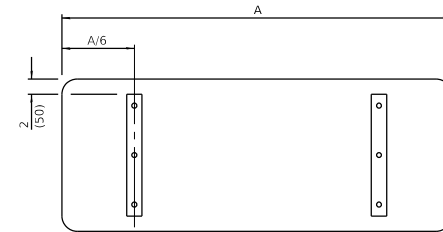
STYLE (f)

When road classification only is on the second line, it should not be abbreviated.

TYPICAL SIGN STYLES

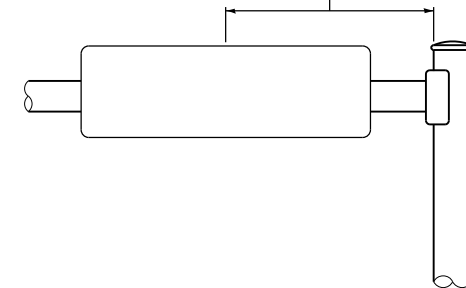
SIGN STYLE	DIMENSIONS								LETTER SIZE UC/LC PRIMARY			BORDER
	A	B	C	D	E	F	G	H	1	2	*	
a,b,d	Var.	12 (300)	1 1/2 (40)	6 (150)	3 (75)	-	-	-	6/4 1/2 (150/115)	-	-	3/4 (10)
	Var.	18 (450)	1 1/2 (40)	8 (200)	5 (125)	-	-	-	8/6 (200/150)	-	-	3/4 (15)
	Var.	24 (600)	1 1/2 (40)	10 (250)	7 (175)	-	-	-	10/7 1/2 (250/190)	-	-	3/4 (15)
	Var.	30 (750)	1 1/2 (45)	12 (300)	9 (225)	-	-	-	12/9 (400/300)	-	-	3/4 (20)
c,e	Var.	24 (600)	1 1/2 (40)	6 (150)	-	-	5 1/2 (140)	4 (100)	6/4 1/2 (150/115)	-	3 (75)	3/4 (15)
	Var.	30 (750)	1 1/2 (45)	8 (200)	-	-	7 (175)	4 1/2 (115)	8/6 (200/150)	-	4 (100)	3/4 (20)
	Var.	36 (900)	2 1/2 (60)	10 (250)	-	-	7 1/2 (190)	6 (150)	10/7 1/2 (250/190)	-	5 (125)	3/4 (20)
	Var.	42 (1050)	3 (75)	12 (300)	-	-	8 1/2 (215)	7 (175)	12/9 (400/300)	-	6 (150)	1 (25)
f	Var.	24 (600)	1 1/2 (40)	6 (150)	4 (100)	4 (100)	-	-	6/4 1/2 (150/115)	6/4 1/2 (150/115)	-	3/4 (15)
	Var.	30 (750)	1 1/2 (45)	8 (200)	4 1/2 (115)	5 (125)	-	-	8/6 (200/150)	8/6 (200/150)	-	3/4 (20)
	Var.	42 (1050)	3 (75)	10 (250)	7 1/2 (190)	7 (175)	-	-	10/7 1/2 (250/190)	10/7 1/2 (250/190)	-	1 (25)
	Var.	48 (1200)	3 (75)	12 (300)	7 1/2 (190)	8 (200)	-	-	12/9 (400/300)	12/9 (400/300)	-	1 (25)

* Supplemental Messages



SUPPORTING CHANNELS

8' (2.4 m) max. for mastarms 16' (4.9 m) through 55' (16.8 m), 18' (5.5 m) max. for mastarms 56' (17.1 m) through 75' (22.9 m) to mid-point of sign panel or blankout sign.



MOUNTING LOCATION

GENERAL NOTES

All signs shall have a white reflectorized legend and border on a green reflectorized background.

The sign panels shall be mounted as shown on Standard 72001 or as specified in the plans.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-18	Revised MOUNTING LOCATION detail.
1-1-12	Revised table and lettering to upper/lower case per current MUTCD.

MAST ARM MOUNTED STREET NAME SIGNS

STANDARD 720016-04

Illinois Department of Transportation

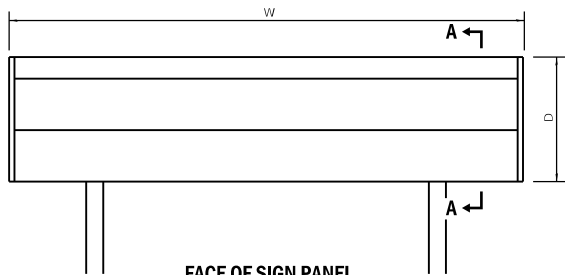
PASSED January 1, 2018

APPROVED January 1, 2018

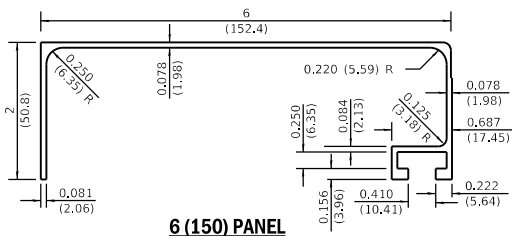
ENGINEER OF OPERATIONS

ENGINEER OF DESIGN AND ENVIRONMENT

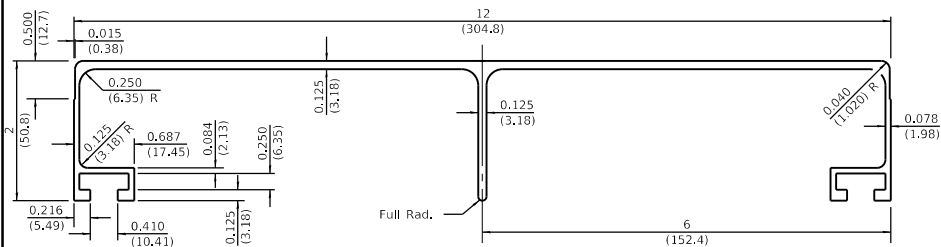
464-C OMI/ISS



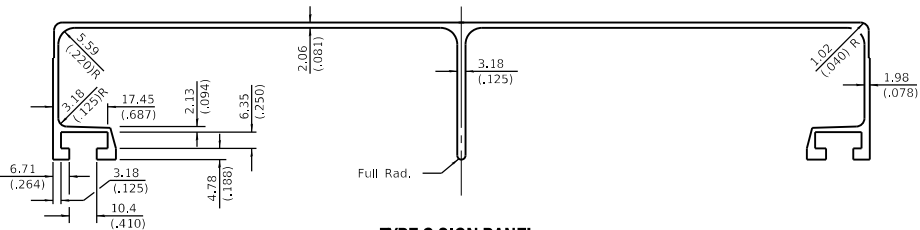
FACE OF SIGN PANEL



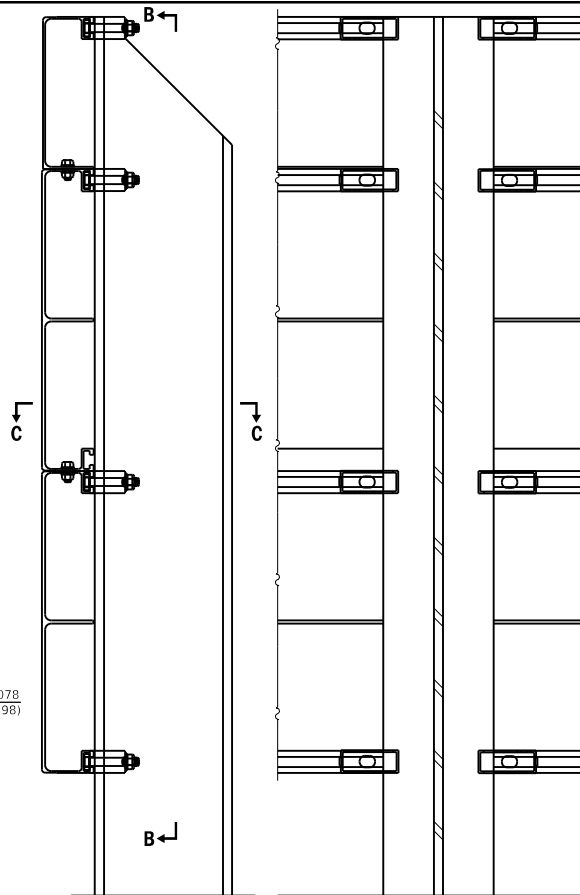
6 (150) PANEL



TYPE B SIGN PANEL



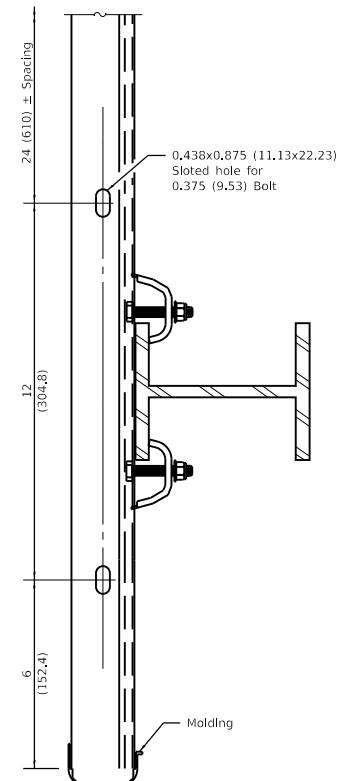
TYPE C SIGN PANEL



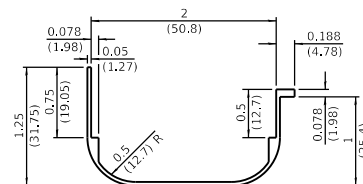
SECTION A-A

SECTION B-B

(Provide two post clips top and bottom. Alternate at interior panel joints on ground-mounted signs, and provide two clips at all panel joints on over-head mounted signs.)



SECTION C-C
(w/o panel bolts)



SIGN MOLDING

(Color shall match sign facematerial. To be riveted to sign panel at 24 (600) O.C.)

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2009

ENGINEER OF OPERATIONS

APPROVED January 1, 2009

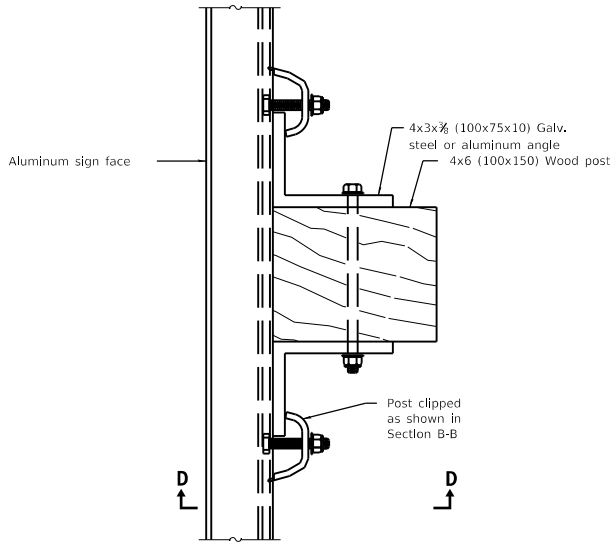
ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-09	Added aluminium clip.
	Switched units to English (metric).
1-1-03	Revised stainless steel clip design, and minor changes.

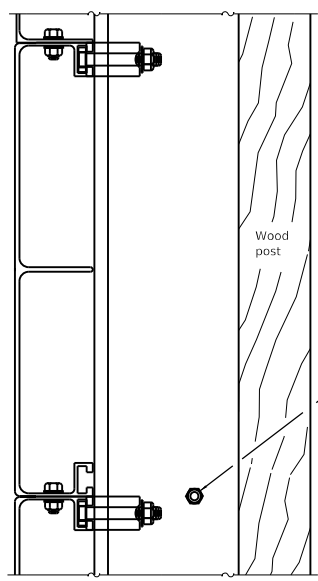
SIGN PANELS
EXTRUDED ALUMINUM TYPE

(Sheet 1 of 2)

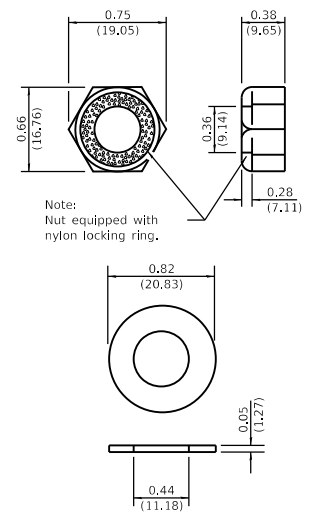
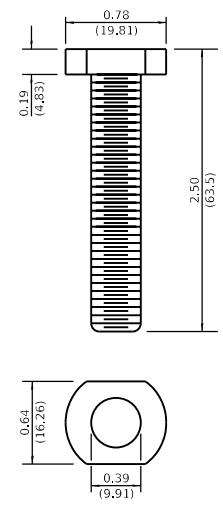
STANDARD 720021-02



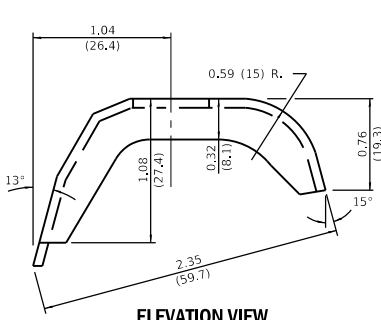
SIGN PANEL ATTACHMENT TO WOOD POST



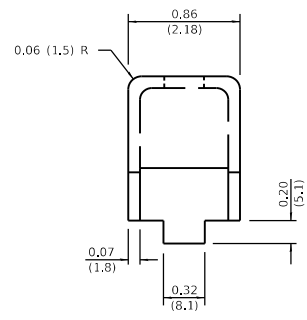
SECTION D-D



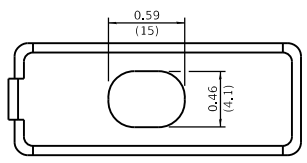
STAINLESS STEEL CLIP NUT, BOLT AND WASHER ASSEMBLY



ELEVATION VIEW

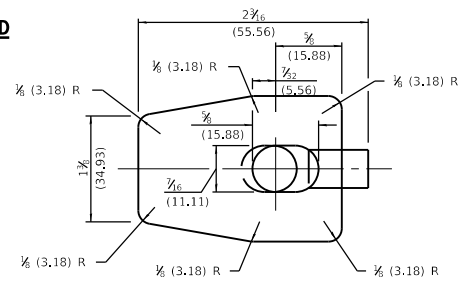


END VIEW

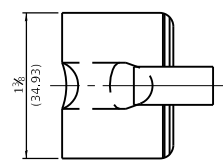


PLAN VIEW

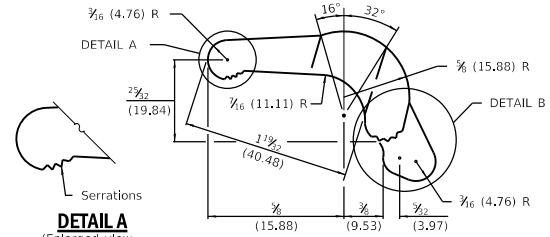
STAINLESS STEEL CLIP



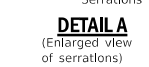
PLAN VIEW



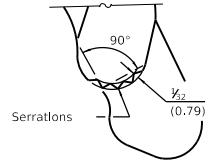
END VIEW



ELEVATION VIEW



DETAIL A
(Enlarged view of serrations)



DETAIL B
(Enlarged detail of serrations)

ALUMINUM CLIP

SIGN PANELS EXTRUDED ALUMINUM TYPE

(Sheet 2 of 2)

STANDARD 720021-02

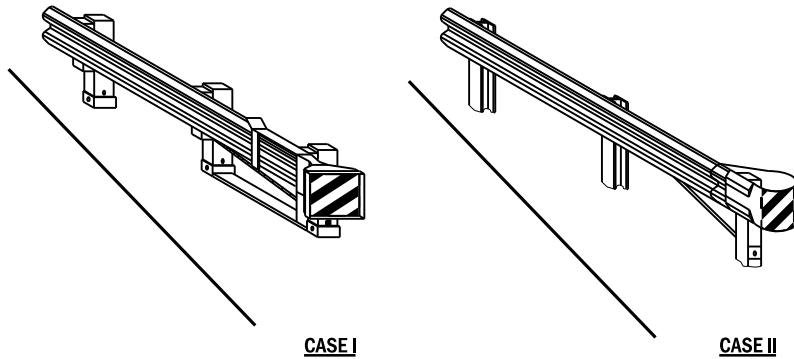
Illinois Department of Transportation

PASSED January 1, 2009

ENGINEER OF OPERATIONS

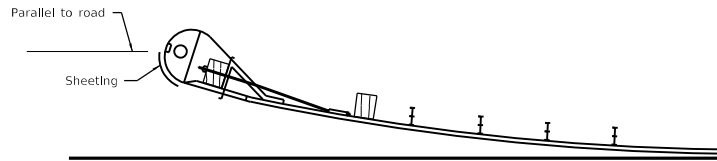
APPROVED January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

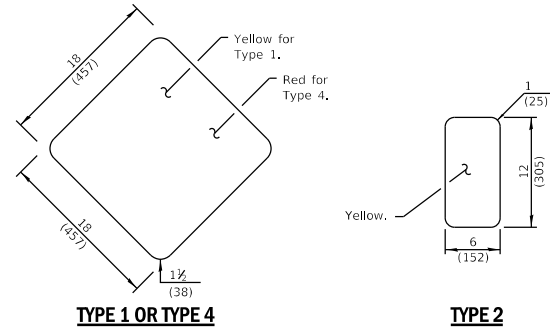


CASE I

CASE II



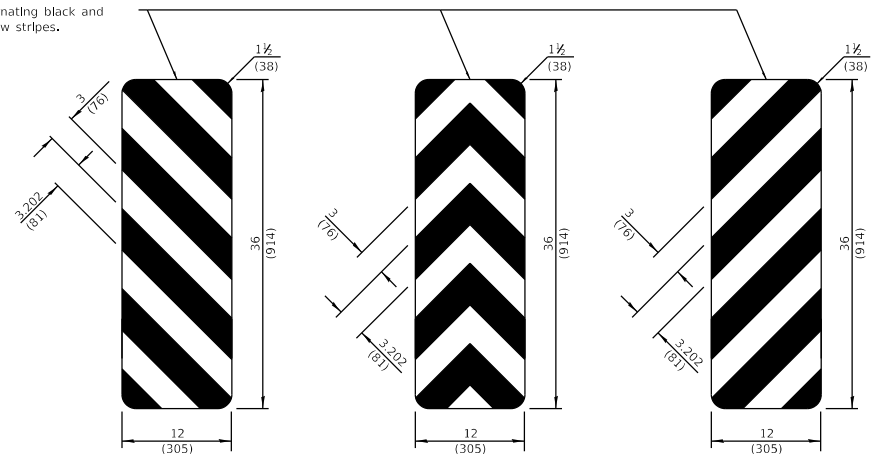
SHEETING POSITION: CASE II



TYPE 1 OR TYPE 4

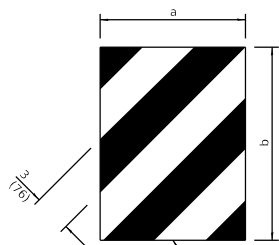
TYPE 2

Alternating black and yellow stripes.

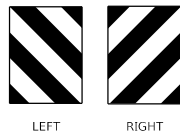


TYPE 3

OBJECT MARKER DETAILS



Alternating black and yellow stripes.



LEFT RIGHT

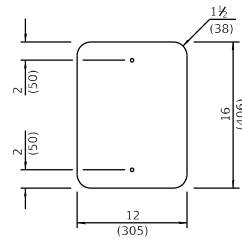
DIMENSION	CASE I	CASE II
a	*	18 (450)
b	*	16 (406)

DIRECT APPLIED

TERMINAL MARKER DETAILS

Color: Black / Yellow reflectorized

* The width and height (a, b) of the terminal marker shall be within approximately 1 (25) of the outer edge of the terminal end.



POST MOUNTED

GENERAL NOTES

See detail on Standard 729001 for mounting markers to posts.

All dimensions are in Inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-17	Omitted minimum reflective area requirement for terminal marker.
4-1-16	Renumbered standard from 635006.

OBJECT AND TERMINAL MARKERS

STANDARD 725001-01

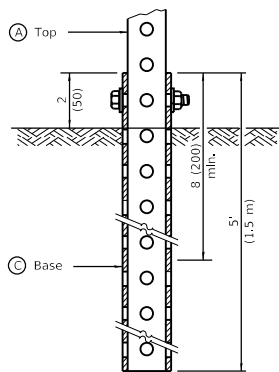
Illinois Department of Transportation

PASSED January 1, 2017

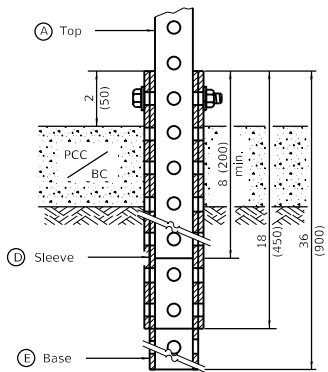
ENGINEER OF OPERATIONS

APPROVED January 3, 2017

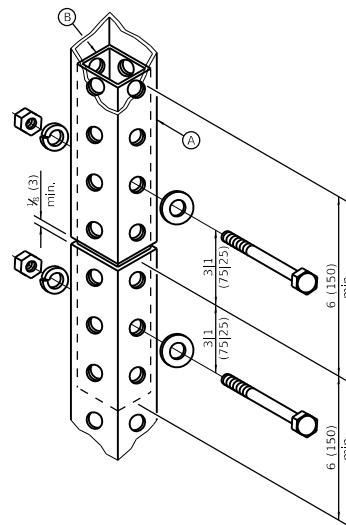
ENGINEER OF DESIGN AND ENVIRONMENT



GROUND MOUNT DETAIL



PAVEMENT MOUNT DETAIL



SPLICE DETAIL

A	2 x 2 x var. (51 x 51 var.)
B	1 1/2 x 1 1/2 x 12 (44 x 44 x 300)
C	2 1/2 x 2 1/2 x 60 (57 x 57 x 1500)
D	2 1/2 x 2 1/2 x 18 (64 x 64 x 450)
E	2 1/2 x 2 1/2 x 36 (57 x 57 x 900)

GENERAL NOTES

All bolts 3/8 (M10) hex head zinc or cadmium plated.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2009

ENGINEER OF OPERATIONS

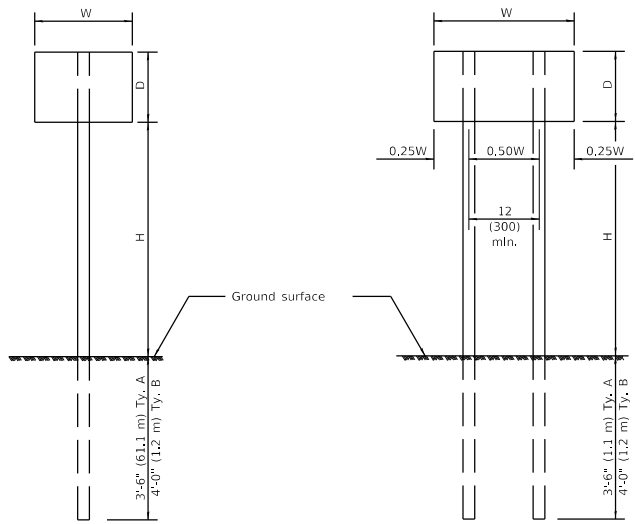
APPROVED January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-07	New Standard. Used to be part of Standard 720006.

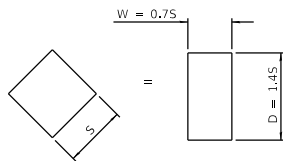
TELESCOPING STEEL SIGN SUPPORT

STANDARD 728001-01



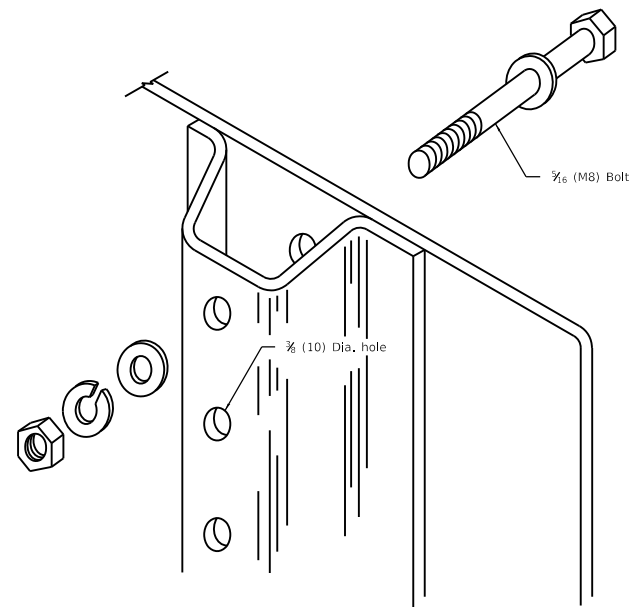
ONE POST INSTALLATION

TWO POST INSTALLATION



For diamond shaped sign with side S as shown, use required post size for a sign with W = 0.7S and D = 1.4S.

SIGN DEPTH (D)	H	NO. AND TYPE OF POST FOR SIGN WIDTH (W)				
		12 (300)	18 (450)	24 (600)	30 (750)	36 (900)
18 (450)	5'-0" (1.5 m)	A	A	A	A	A
	5'-6" (1.7 m)	A	A	A	A	A
	6'-0" (1.8 m)	A	A	A	A	B
	6'-6" (2.0 m)	A	A	A	A	B
	7'-0" (2.1 m)	A	A	A	A	B
	7'-6" (2.3 m)	A	A	A	A	B
	8'-0" (2.4 m)	A	A	A	A	B
	8'-6" (2.6 m)	A	A	A	B	B
	9'-0" (2.7 m)	A	A	A	B	B
24 (600)	5'-0" (1.5 m)	A	A	A	A	B
	5'-6" (1.7 m)	A	A	A	A	B
	6'-0" (1.8 m)	A	A	A	A	B
	6'-6" (2.0 m)	A	A	A	B	B
	7'-0" (2.1 m)	A	A	A	B	B
	7'-6" (2.3 m)	A	A	A	B	B
	8'-0" (2.4 m)	A	A	A	B	2A
	8'-6" (2.6 m)	A	A	B	B	2A
	9'-0" (2.7 m)	A	A	B	B	2A
30 (750)	5'-0" (1.5 m)	A	A	A	B	B
	5'-6" (1.7 m)	A	A	A	B	2A
	6'-0" (1.8 m)	A	A	A	B	2A
	6'-6" (2.0 m)	A	A	A	B	2A
	7'-0" (2.1 m)	A	A	B	B	2A
	7'-6" (2.3 m)	A	A	B	B	2A
	8'-0" (2.4 m)	A	A	B	B	2A
	8'-6" (2.6 m)	A	A	B	B	2A
	9'-0" (2.7 m)	A	A	B	B	2A
36 (900)	5'-0" (1.5 m)	A	A	B	B	2A
	5'-6" (1.7 m)	A	A	B	B	2A
	6'-0" (1.8 m)	A	A	B	B	2A
	6'-6" (2.0 m)	A	A	B	2A	2A
	7'-0" (2.1 m)	A	A	B	2A	2A
	7'-6" (2.3 m)	A	A	B	2A	2A
	8'-0" (2.4 m)	A	B	B	2A	2A
	8'-6" (2.6 m)	A	B	B	2A	2B
	9'-0" (2.7 m)	A	B	2A	2A	2B
4'-0" (1.2 m)	5'-0" (1.5 m)	A	A	B	2A	2A
	5'-6" (1.7 m)	A	B	B	2A	2A
	6'-0" (1.8 m)	A	B	B	2A	2A
	6'-6" (2.0 m)	A	B	2A	2A	2B
	7'-0" (2.1 m)	A	B	2A	2A	2B
	7'-6" (2.3 m)	A	B	2A	2B	2B
	8'-0" (2.4 m)	A	B	2A	2B	2B
	8'-6" (2.6 m)	B	B	2B	2B	2B
	9'-0" (2.7 m)	B	2A	2B	2B	2B



DETAIL OF MOUNTING SIGN TO POST

NOTE: Minimum of 2 bolts per post required.

GENERAL NOTES

DESIGN: Current AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals.

LOADING: for 60 mph (95 km/h) wind velocity with 30% gust factor, normal to sign.

SOIL PRESSURE: Minimum allowable soil pressure 1.25 tsf (120 kPa).

See Standard 720011 for details of Types A and B posts.

All dimensions are in Inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-97	Renum. Standard 2363-2.

APPLICATIONS OF TYPES A & B METAL POSTS (FOR SIGNS & MARKERS)

STANDARD 729001-01

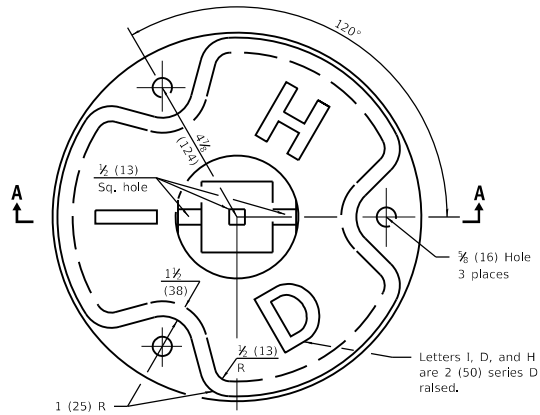
Illinois Department of Transportation

PASSED January 1, 2009

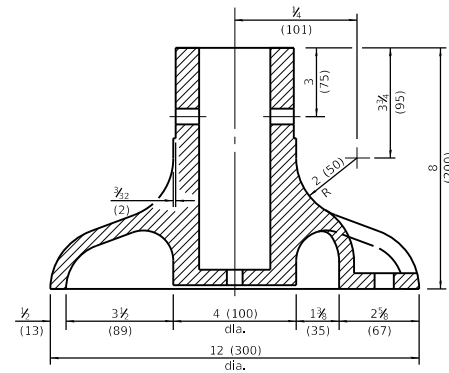
ENGINEER OF POLICY AND PROCEDURES

APPROVED January 1, 2009

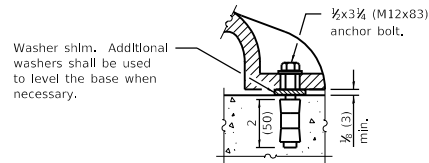
ENGINEER OF DESIGN AND ENVIRONMENT



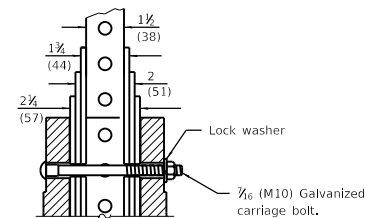
PLAN



SECTION A-A



ANCHOR BOLT DETAIL



POST ASSEMBLY DETAIL

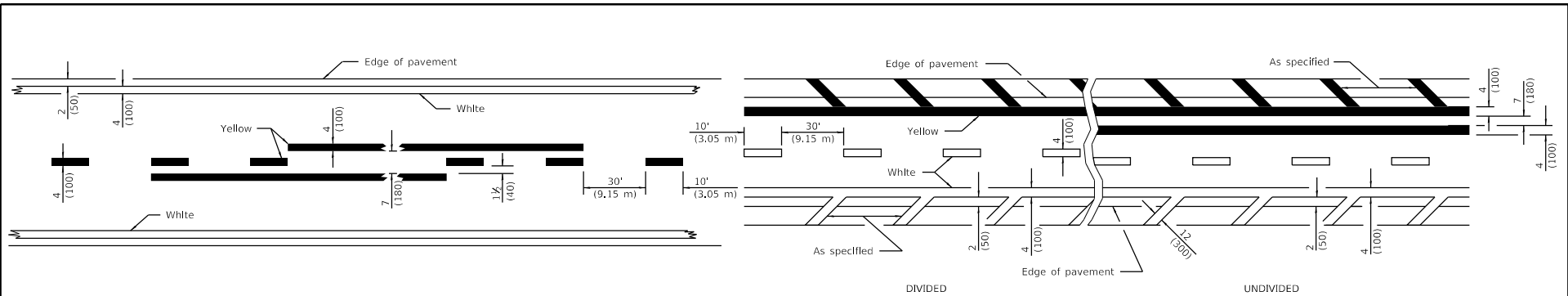
All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation	
PASSED <i>[Signature]</i> ENGINEER OF OPERATIONS APPROVED <i>[Signature]</i> ENGINEER OF DESIGN AND ENVIRONMENT	January 1, 2009 2009 2009

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-07	New Standard. Used to be part of Standard 720006.

BASE FOR TELESCOPING STEEL SIGN SUPPORT

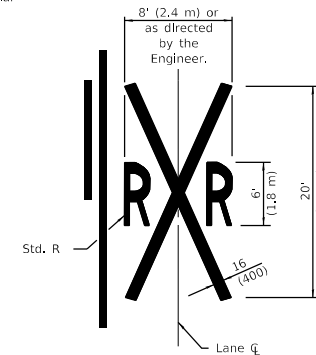
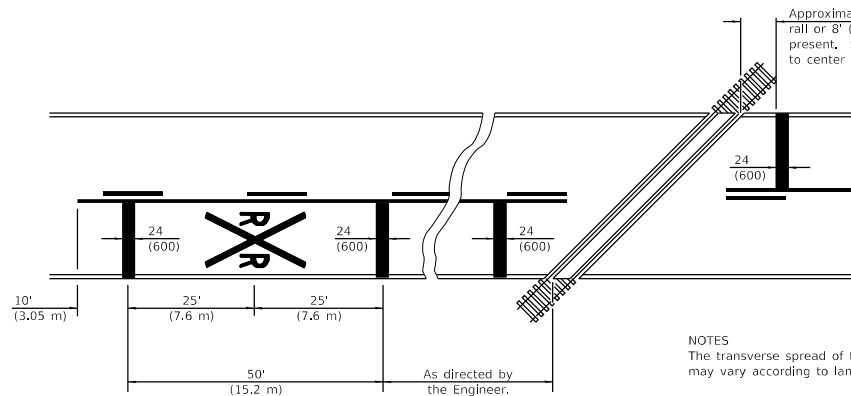
STANDARD 731001-01



2 LANE

MULTI LANE

LANE AND EDGE LINES



NOTES
The transverse spread of the "X" may vary according to lane width.

On multi-lane roads, the stop lines shall extend across all approach lanes and separate RXX symbols shall be placed adjacent to each other in each lane.

When the pavement marking symbol is used, a portion of the symbol should be located directly adjacent to the Advance Warning Sign (W10-1) as placed by Table 2C-4, Condition B of the MUTCD.

All dimensions are in inches (millimeters) unless otherwise shown.

PAVEMENT MARKINGS AT RAILROAD-HIGHWAY GRADE CROSSING

DATE	REVISIONS
1-1-15	Added symbols. Revised bike symbol. Revised note for stop line at RR crossing.
1-1-14	Added bike symbol. Renamed 'LANE DROP ARROW' detail to 'LANE-REDUCTION ARROW'.

TYPICAL PAVEMENT MARKINGS

(Sheet 1 of 3)

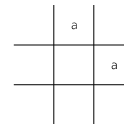
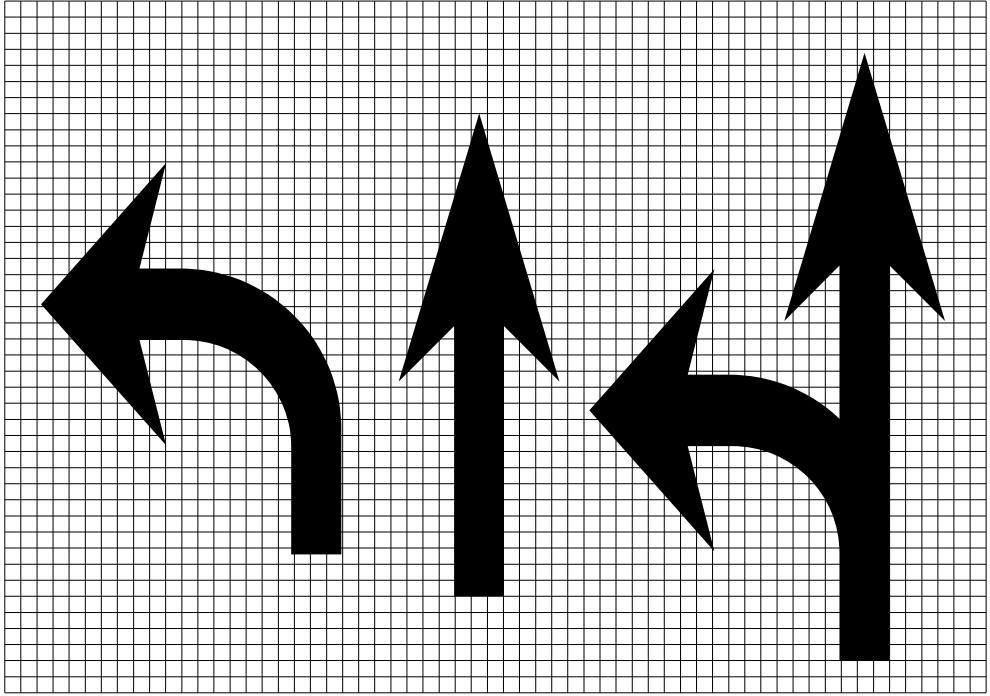
STANDARD 780001-05

Illinois Department of Transportation

PASSED January 1, 2015
Jim Allen
 ENGINEER OF OPERATIONS

APPROVED January 1, 2015
DR
 ENGINEER OF DESIGN AND ENVIRONMENT

LEGISLATIVE COUNSEL



Legend Height	Arrow Size	a
6' (1.8 m)	Small	2.9 (74)
8' (2.4 m)	Large	3.8 (96)

The space between adjacent letters or numerals should be approximately 3 (75) for 6' (1.8 m) legend and 4 (100) for 8' (2.4 m) legend.

LETTER AND ARROW GRID SCALE

Illinois Department of Transportation

PASSED January 1, 2015
Jim Allen
 ENGINEER OF OPERATIONS

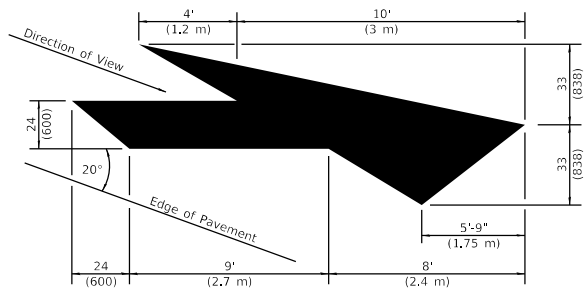
APPROVED January 1, 2015
DR
 ENGINEER OF DESIGN AND ENVIRONMENT

464-C 03/15/15

TYPICAL PAVEMENT MARKINGS

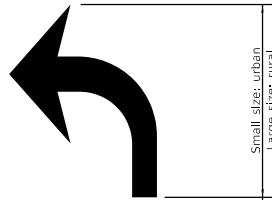
(Sheet 2 of 3)

STANDARD 780001-05



LANE-REDUCTION ARROW

Right lane-reduction arrow shown.
Use mirror image for left lane.

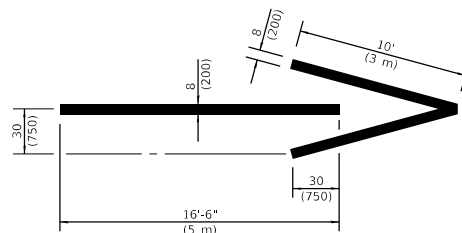


20' (6 m): urban
50' (15 m): rural
(Between arrow
and word or
between words)

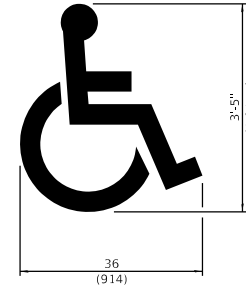
ONLY

WORD AND ARROW LAYOUT

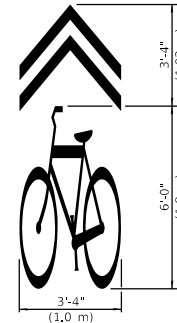
6' (1.8 m): urban
8' (2.4 m): rural



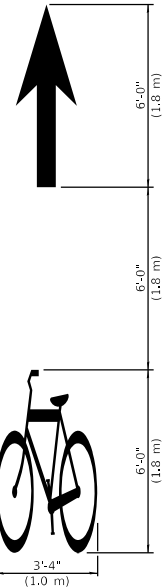
WRONG WAY ARROW



**INTERNATIONAL
SYMBOL OF
ACCESSIBILITY**



**SHARED LANE
SYMBOL**



BIKE SYMBOL
(Arrow is optional.)

Illinois Department of Transportation

PASSED January 1, 2015

ENGINEER OF OPERATIONS

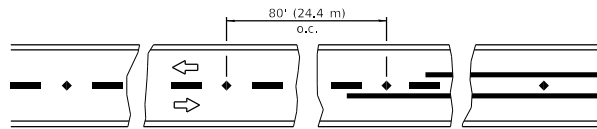
APPROVED January 1, 2015

ENGINEER OF DESIGN AND ENVIRONMENT

**TYPICAL PAVEMENT
MARKINGS**

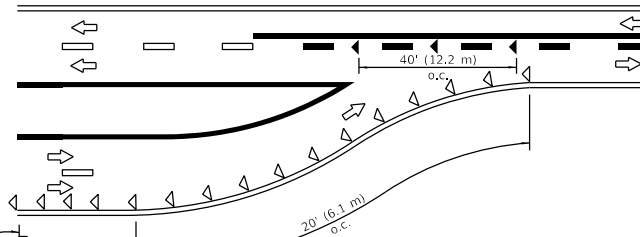
(Sheet 3 of 3)

STANDARD 780001-05



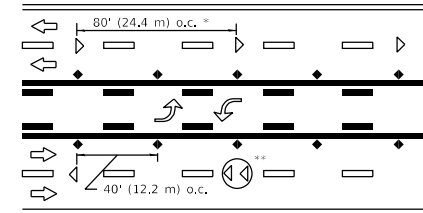
Reduce to 40' (12.2 m) o.c. on curves with posted or advisory speeds of 45 mph (70 km/h) or less.

TWO-LANE / TWO-WAY



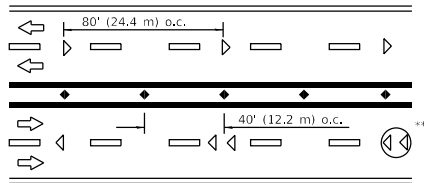
W4-2

LANE REDUCTION TRANSITION



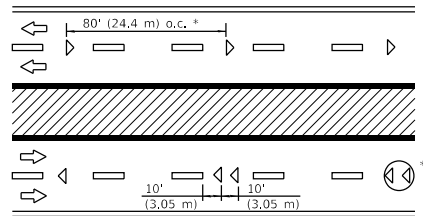
*,** See MULTI LANE DIVIDED detail for lane marker notes.

TWO-WAY LEFT TURN



*,** See MULTI LANE DIVIDED detail for lane marker notes.

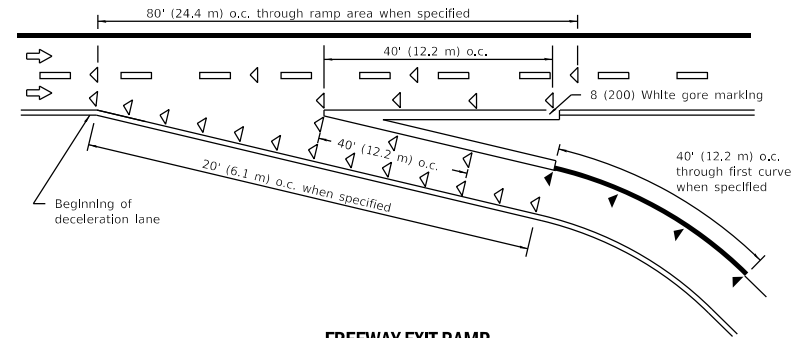
MULTI-LANE UNDIVIDED



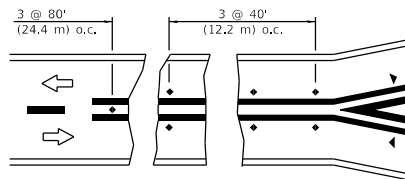
* Reduce to 40' (12.2 m) o.c. on curves where advisory speeds are 10 mph (15 km/h) lower than posted speeds.

** Where double lane line markers are specified, they shall be spaced as shown.

MULTI-LANE DIVIDED



FREEWAY EXIT RAMP



RURAL LEFT TURN

SYMBOLS

- Yellow stripe
- White stripe
- One-way amber marker
- One-way crystal marker
- Two-way amber marker

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED April 1, 2016

APPROVED April 1, 2016

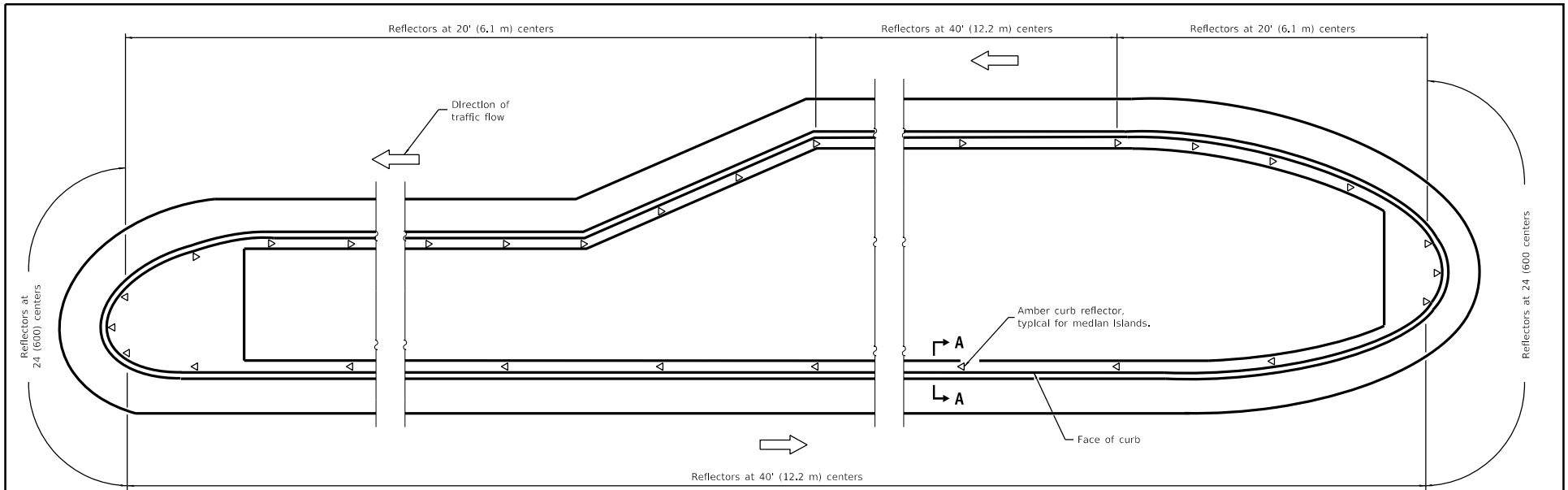
ENGINEER OF OPERATIONS

ENGINEER OF DESIGN AND ENVIRONMENT

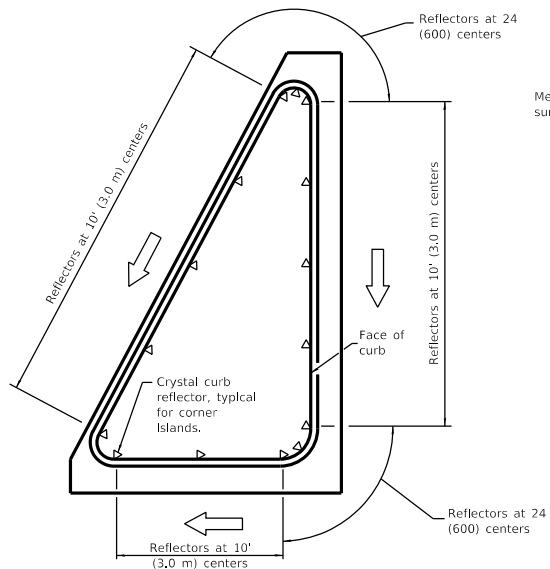
DATE	REVISIONS
4-1-16	Revised LANE ENDS sign
	W4-2 to agree with current MUTCD.
1-1-09	Switched units to English (metric).

**TYPICAL APPLICATIONS
RAISED REFLECTIVE
PAVEMENT MARKERS**

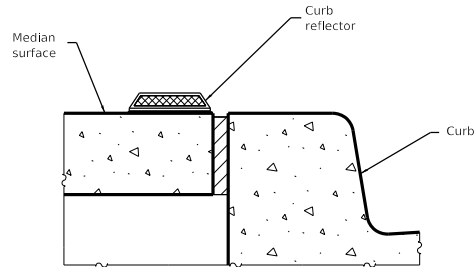
STANDARD 781001-04



MEDIAN ISLAND



CORNER ISLAND



SECTION A-A
(Similar for corner islands.)

GENERAL NOTES

Curb reflectors shall be monodirectional and oriented with the reflective face toward approaching traffic.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED April 1, 2016

ENGINEER OF OPERATIONS

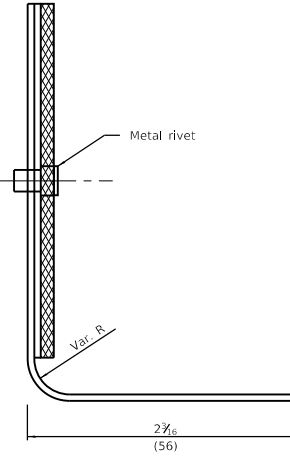
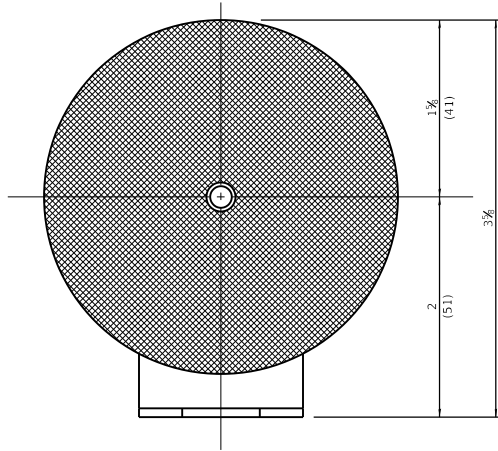
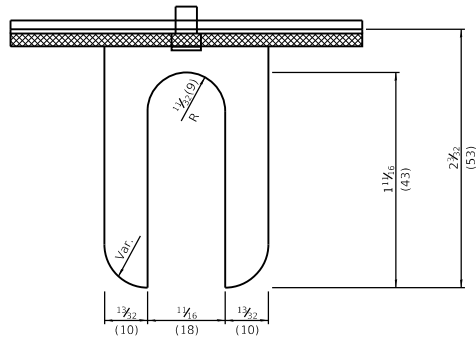
APPROVED April 1, 2016

ENGINEER OF DESIGN AND ENVIRONMENT

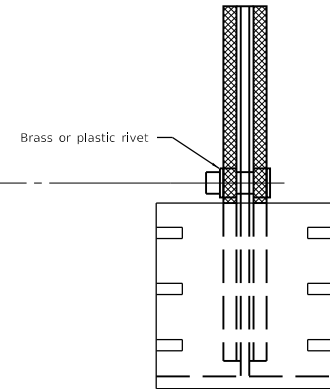
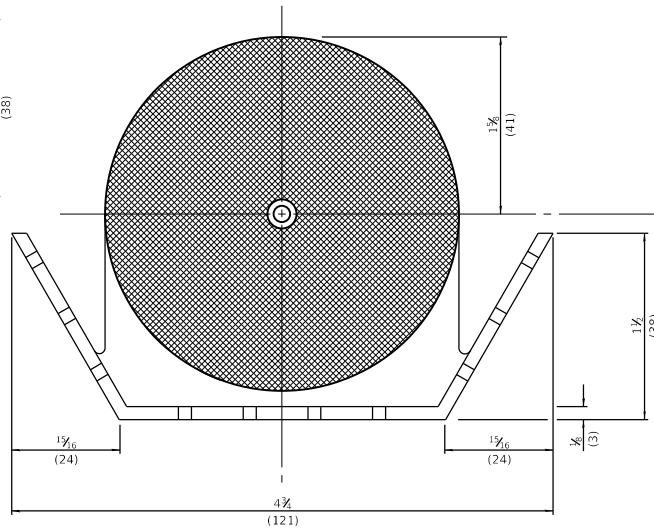
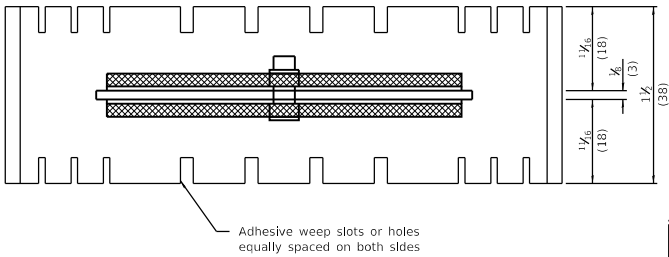
DATE	REVISIONS
4-1-16	Revised title and removed work "prismatic".
1-1-12	New standard.

CURB REFLECTORS

STANDARD 782001-01



REFLECTOR TYPE A
(monodirectional shown)



All dimensions are in inches (millimeters)
unless otherwise shown.

REFLECTOR TYPE B
(bidirectional shown)

DATE	REVISIONS
4-1-16	Added reflector spacing detail. Moved TERMINAL MARKER to std. 725001.
1-1-09	Switched units to English (metric).

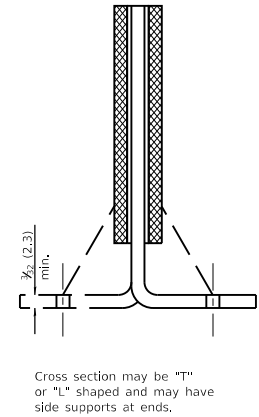
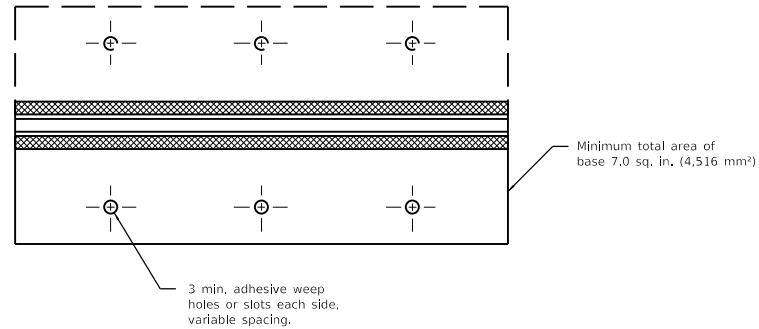
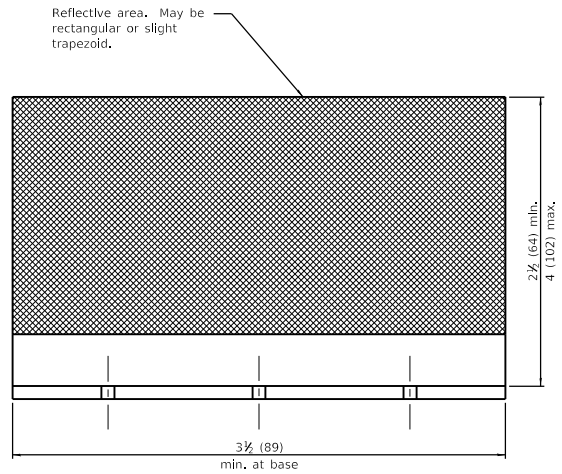
**GUARDRAIL AND
BARRIER WALL REFLECTOR
MOUNTING DETAILS**
(Sheet 1 of 3)

STANDARD 782006

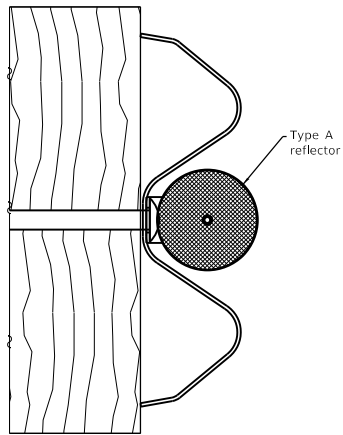
Illinois Department of Transportation

PASSED April 1, 2016
 ENGINEER OF OPERATIONS
 APPROVED April 1, 2016
 ENGINEER OF DESIGN AND ENVIRONMENT

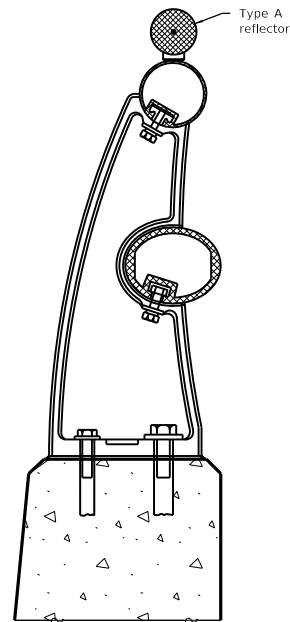
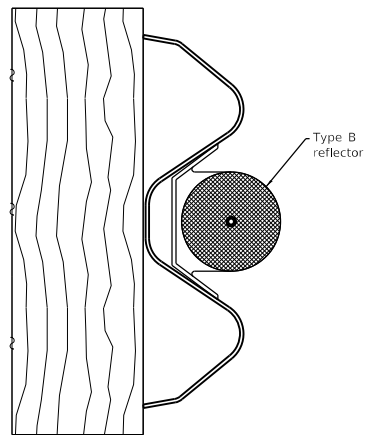
0902-C-1 03/15/12



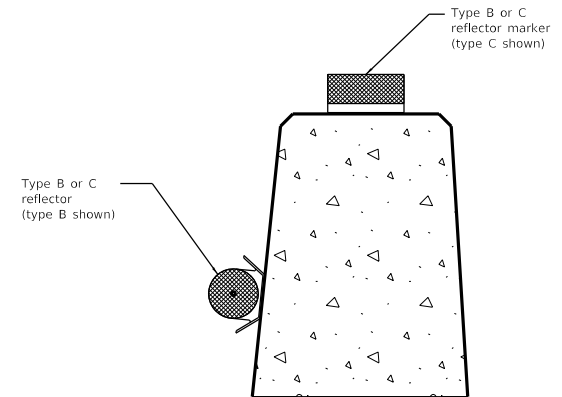
REFLECTOR TYPE C



TYPICAL MOUNTING DETAIL FOR GUARDRAIL REFLECTOR



TYPICAL MOUNTING DETAIL FOR BRIDGE RAIL REFLECTOR



TYPICAL MOUNTING DETAIL FOR BARRIER WALL REFLECTOR

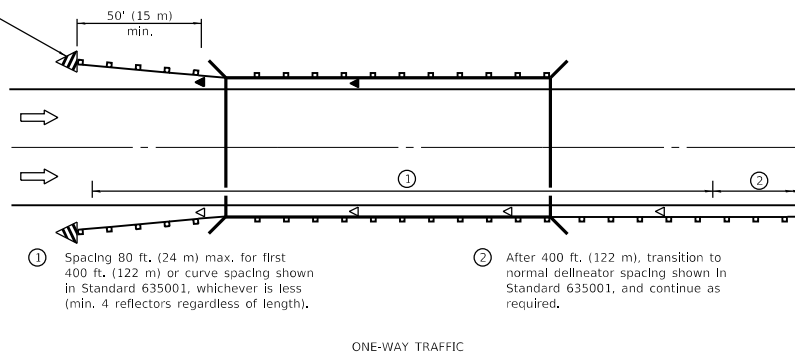
GUARDRAIL AND BARRIER WALL REFLECTOR MOUNTING DETAILS

(Sheet 2 of 3)

STANDARD 782006

Illinois Department of Transportation	
PASSED <i>Jim Allen</i> ENGINEER OF OPERATIONS	APRIL 1, 2016
APPROVED <i>Jim Allen</i> ENGINEER OF DESIGN AND ENVIRONMENT	APRIL 1, 2016
0802-1-1	03/11/SS

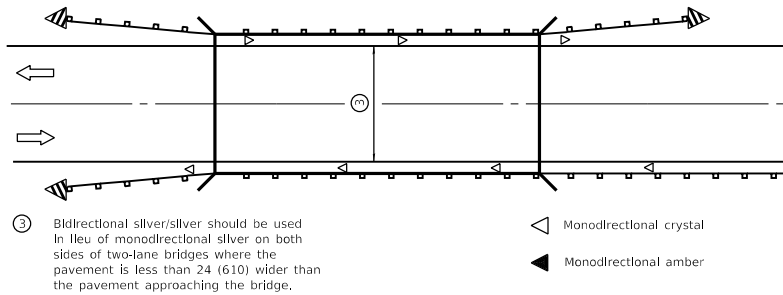
Terminal marker.
See standard
725001.



① Spacing 80 ft. (24 m) max. for first 400 ft. (122 m) or curve spacing shown in Standard 635001, whichever is less (min. 4 reflectors regardless of length).

② After 400 ft. (122 m), transition to normal delineator spacing shown in Standard 635001, and continue as required.

ONE-WAY TRAFFIC



③ Bidirectional silver/silver should be used in lieu of monodirectional silver on both sides of two-lane bridges where the pavement is less than 24 (610) wider than the pavement approaching the bridge.

△ Monodirectional crystal

▲ Monodirectional amber

TWO-WAY TRAFFIC

**GUARDRAIL / BARRIER WALL
REFLECTOR PLACEMENT DETAIL**

Illinois Department of Transportation	
PASSED	April 1, 2016
ENGINEER OF OPERATIONS	
APPROVED	April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT	

**GUARDRAIL AND
BARRIER WALL REFLECTOR
MOUNTING DETAILS**
(Sheet 3 of 3)

STANDARD 782006



Standards by Division

DIVISION 800 ELECTRICAL

STD. NO. TITLE**GENERAL ELECTRICAL REQUIREMENTS**

805001-01 Electrical Service Installation Details

WIREWAY AND CONDUIT SYSTEMS

812001 Raceway Embedded in Structure

814001-03 Handholes

814006-02 Double Handholes

LIGHTING – LUMINAIRES

821001 Underpass Lighting Wall Mount

821006 Underpass Lighting Suspended

821101-02 Luminaire Wiring in Pole

LIGHTING – CONTROLLERS

825001-04 Lighting Controller, Pole Mounted, 240V

825006-03 Lighting Controller, Pole Mounted, 480V

825011-04 Lighting Controller, Pedestal Mounted, 240V

825016-04 Lighting Controller, Pedestal Mounted, 480V

825021-04 Lighting Controller, Base Mounted, 240V

825026-04 Lighting Controller, Base Mounted, 480V

826001-02 Navigation Obstruction Lighting Controller, 240V

826006-02 Navigation Obstruction Lighting Controller, 480V

LIGHTING – POLES

830001-03 Light Pole Aluminum Mast Arm

830006-05 Light Pole Aluminum Davit Arm

830011-03 Light Pole Steel Mast Arm

830016-03 Light Pole Steel Davit Arm

830021-03 Light Pole Steel Tenon Top

830026-01 Temporary Roadway Lighting

LIGHTING – TOWERS

835001-01 Light Tower

LIGHTING – FOUNDATIONS

836001-04 Light Pole Foundation

836011-02 Light Pole Foundation with 44 in. (1120 mm) Concrete Barrier

837001-04 Light Tower Foundation

LIGHTING – BREAKAWAY DEVICES

838001-01 Breakaway Devices

TRAFFIC SIGNALS - CONTROLLERS AND EQUIPMENT

857001-01 Standard Phase Designation Diagrams and Phase Sequences

857006-01 Supervised Railroad Interconnect Circuit

862001-01 Uninterruptable Power Supply (UPS)

TRAFFIC SIGNALS - WIRE AND CABLE

873001-02 Traffic Signal Grounding & Bonding

TRAFFIC SIGNALS - POSTS AND FOUNDATIONS

876001-04 Pedestrian Push Button Post

877001-07 Steel Mast Arm Assembly and Pole 16' Through 55'

877002-04 Steel Mast Arm Assembly and Pole 56' Through 75'

877006-06 Steel Mast Arm Assembly and Pole with Dual Mast Arms

877011-10 Steel Combination Mast Arm Assembly and Pole 16' Through 55'

877012-07 Steel Combination Mast Arm Assembly and Pole 56' Through 75'

878001-10 Concrete Foundation Details

TRAFFIC SIGNALS - SIGNAL HEADS

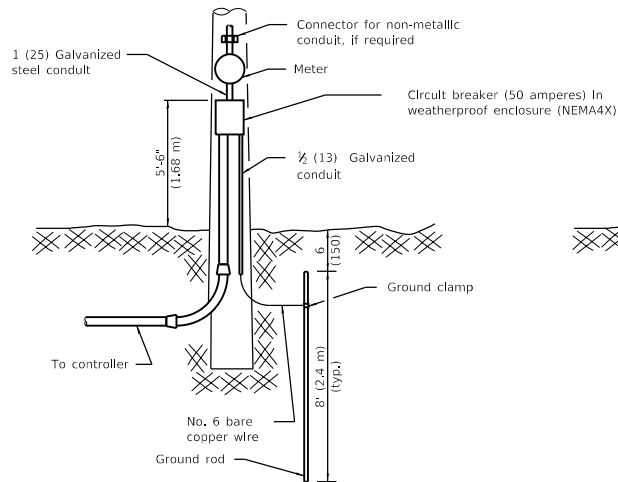
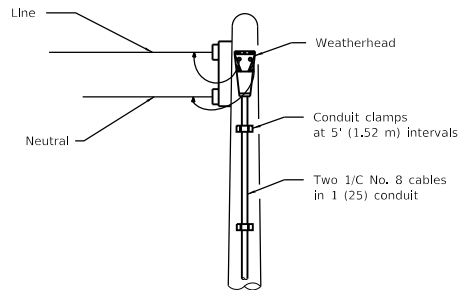
880001-01 Span Wire Mounted Signals and Flashing Beacon Installation

880006-01 Traffic Signal Mounting Details

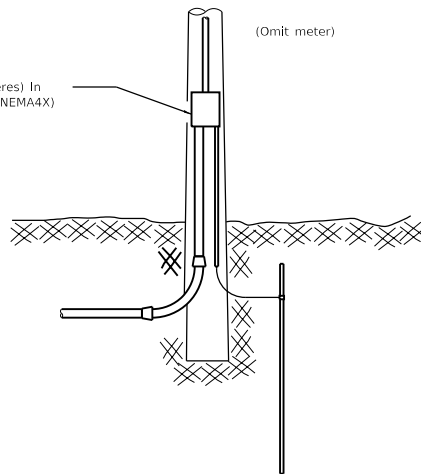
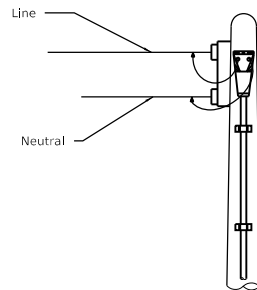
TRAFFIC SIGNALS - DETECTION

886001-01 Detector Loop Installations

886006-01 Typical Layout for Detection Loops

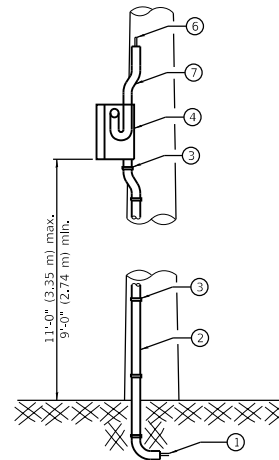


TYPE A



TYPE B

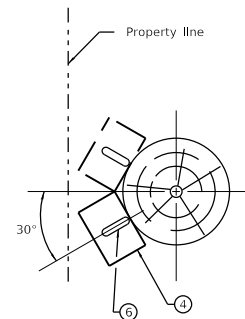
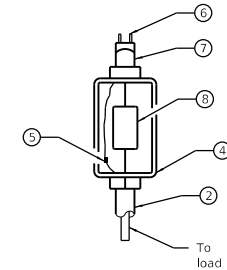
Except for the changes noted below, details for TYPE A and TYPE B service installations shall correspond.



The following equipment is to be furnished and installed on the TYPE C installation.

- ① Cable in conduit (electric cable, No. 6, 2/C except where otherwise specified)
- ② Galvanized steel conduit 1 1/4 (32) with bend
- ③ Galvanized conduit clamps
- ④ Aluminum weatherproof box with gasketed cover. Weatherproof box shall be installed facing the adjacent property line. (See diagram for alternate installation.)
- ⑤ Ground stud for neutral connection
- ⑥ Service cables
- ⑦ Offset weatherproof fitting
- ⑧ Circuit breaker

TYPE C



ALTERNATE INSTALLATION

(Installation when weatherproof box cannot be installed facing the adjacent property line.)

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2009

ENGINEER OF OPERATIONS

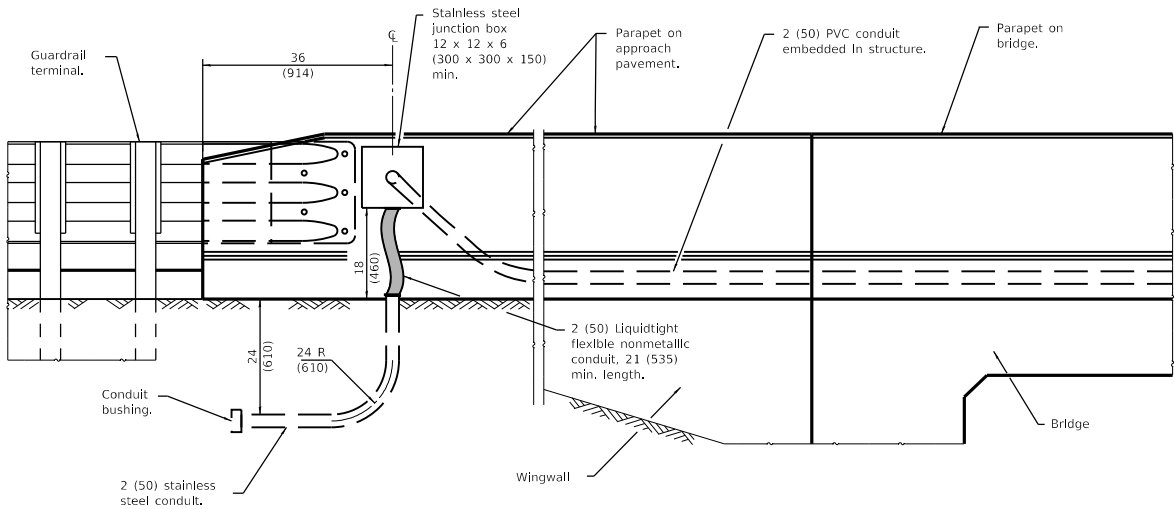
APPROVED January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

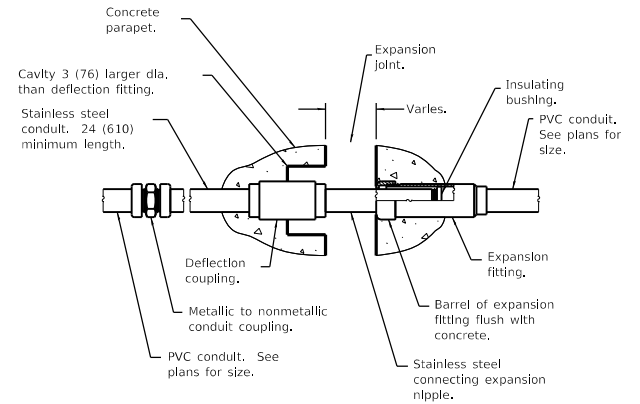
DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-02	Renum. Standard 2373-1.

ELECTRICAL SERVICE INSTALLATION DETAILS

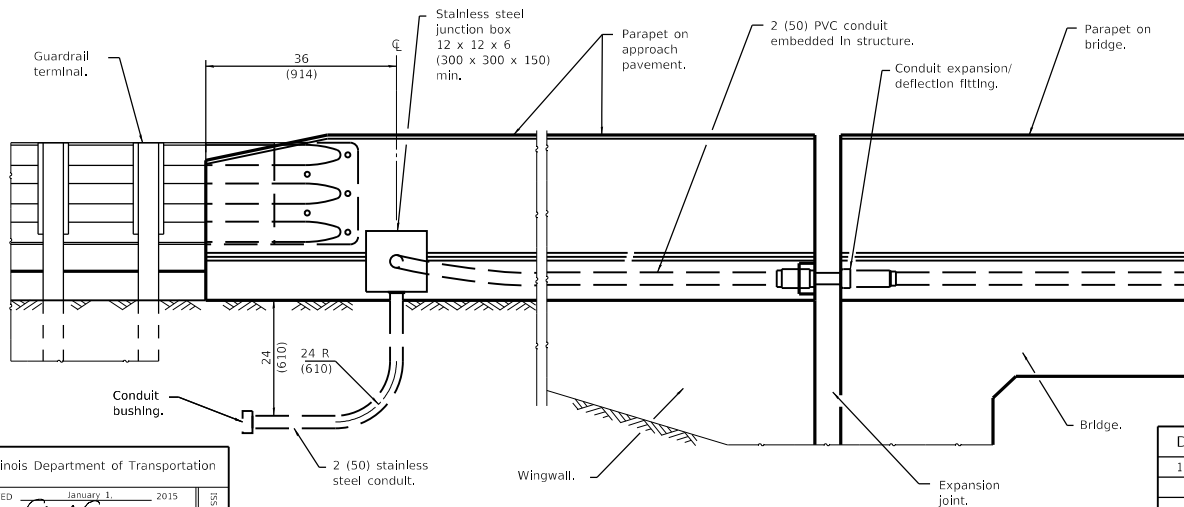
STANDARD 805001-01



**INTEGRAL/SEMI-INTEGRAL ABUTMENT WITH
PARAPET ON APPROACH PAVEMENT**



COMBINATION EXPANSION/ DEFLECTION FITTING



**JOINTED ABUTMENT WITH
PARAPET ON APPROACH PAVEMENT**

GENERAL NOTES

The barrel in the expansion fitting shall be fully embedded in the concrete on one side of the expansion joint. One half the length of the deflection fitting shall be embedded in the concrete on the other side of the expansion joint.

The Contractor shall install combination expansion deflection fittings at all bridge expansion joints.

With the approval of the Engineer, the Contractor may substitute two 12 x 12 x 6 (300 x 300 x 150) min. stainless steel junction boxes attached to back of wall and connected with liquidtight flexible nonmetallic conduit for all expansion joints.

All dimensions are in Inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

APPROVED: January 1, 2015
Sheryl Gentry
 ENGINEER OF POLICY AND PROCEDURES

APPROVED: January 1, 2015
[Signature]
 ENGINEER OF DESIGN AND ENVIRONMENT

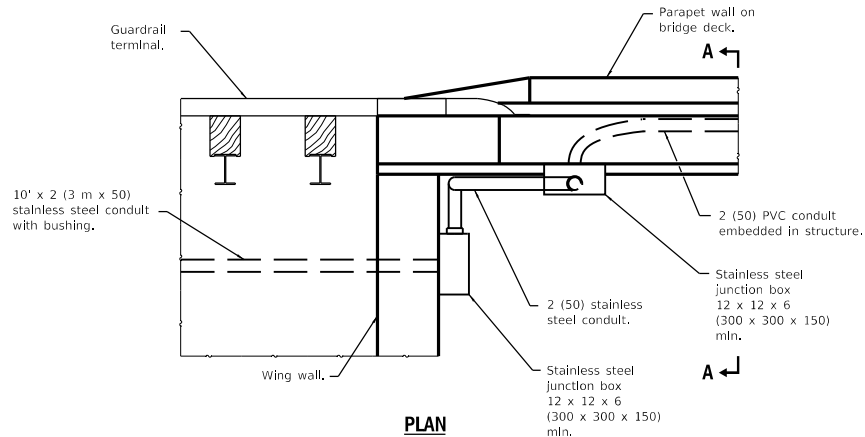
ISSUES: 51-H-1-03158

DATE	REVISIONS
1-1-15	New standard.

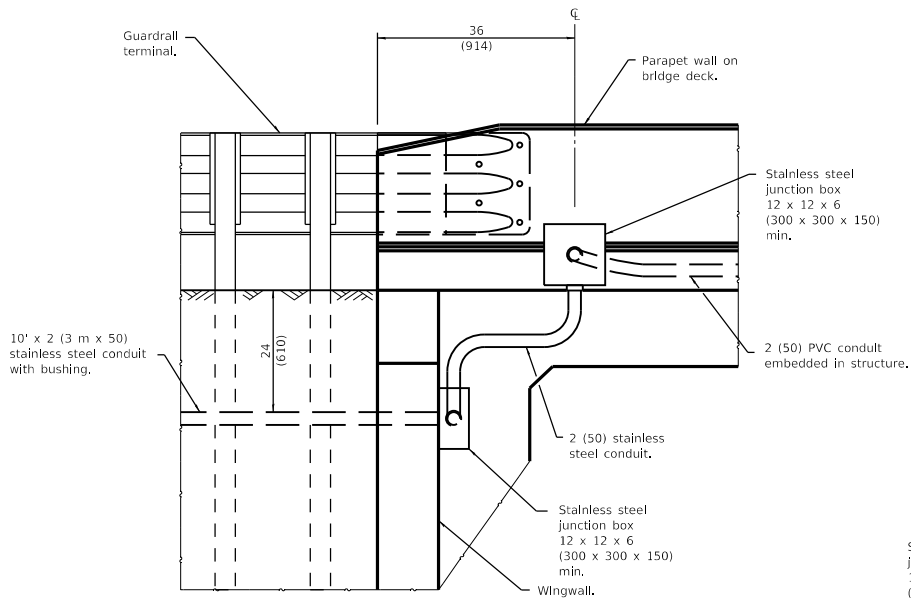
**RACEWAY EMBEDDED
IN STRUCTURE**

(Sheet 1 of 3)

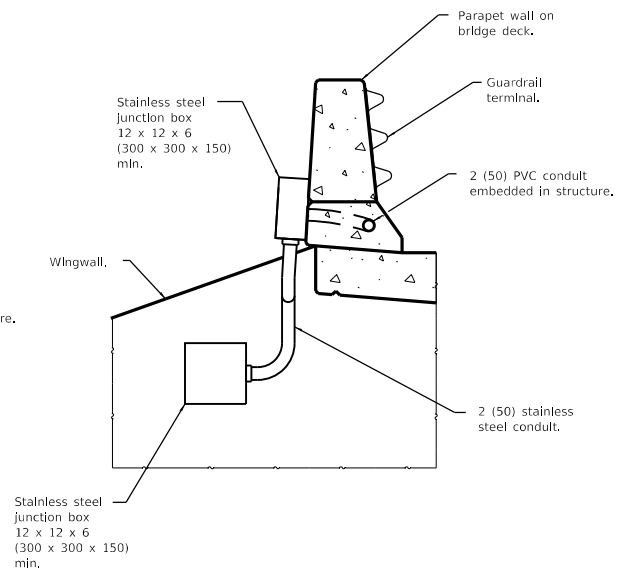
STANDARD 812001



PLAN



ELEVATION



VIEW A-A

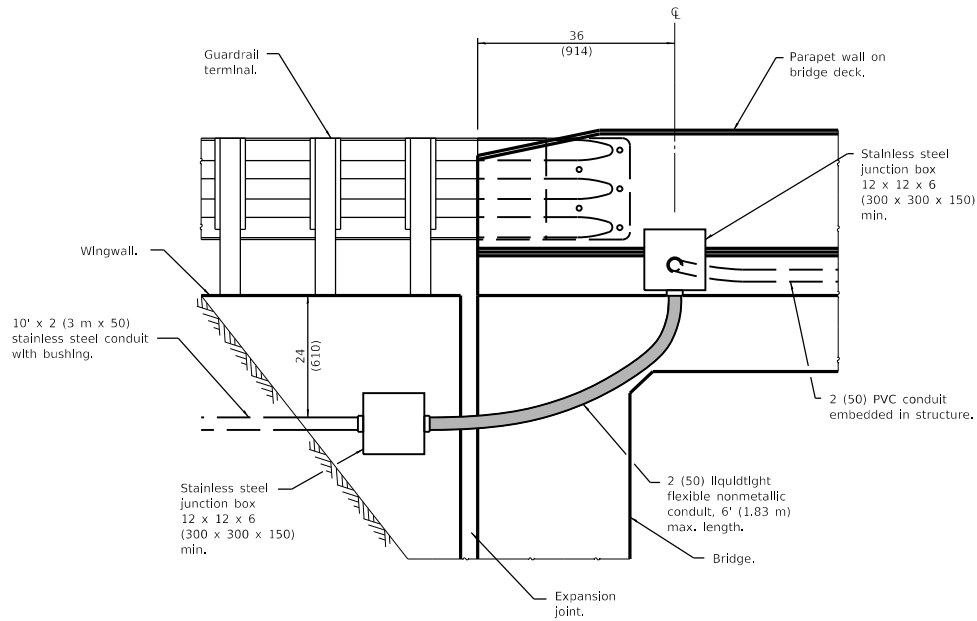
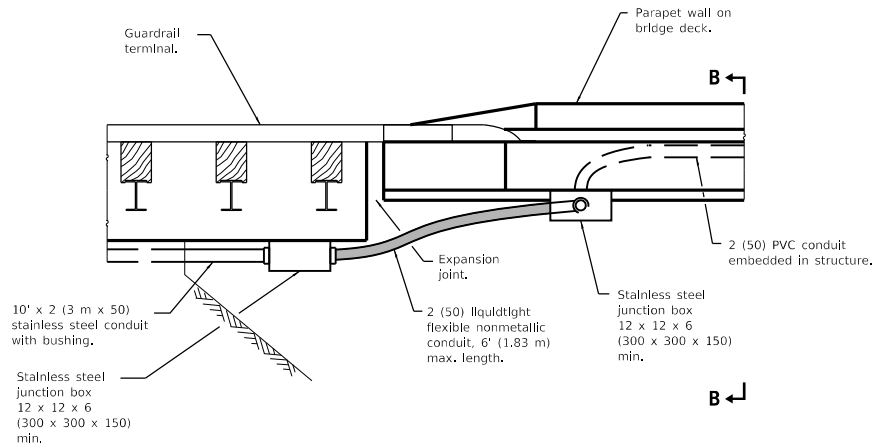
**INTEGRAL/SEMI-INTEGRAL ABUTMENT WITH
PARAPET ENDING ON BRIDGE DECK**

**RACEWAY EMBEDDED
IN STRUCTURE**

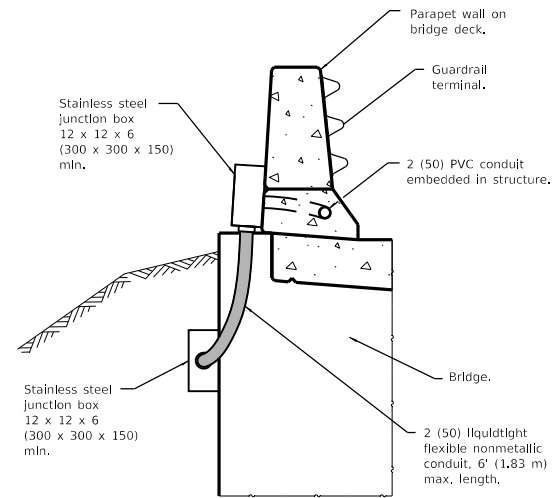
(Sheet 2 of 3)

STANDARD 812001

Illinois Department of Transportation	
APPROVED: <i>Sheryl Gentry</i> January 1, 2015 ENGINEER OF POLICY AND PROCEDURES	ISSUED: 1-1-15
APPROVED: <i>DR</i> January 1, 2015 ENGINEER OF DESIGN AND ENVIRONMENT	



ELEVATION



VIEW B-B

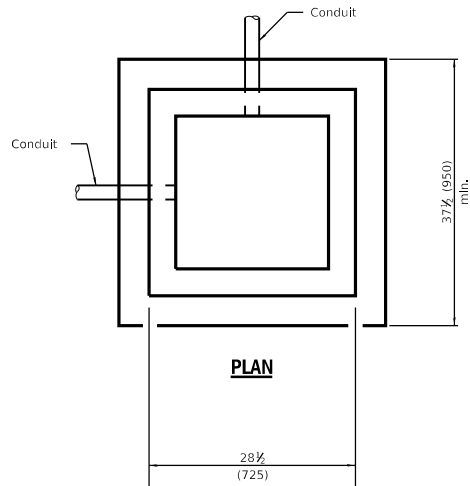
**JOINTED ABUTMENT WITH
PARAPET ENDING ON BRIDGE DECK**

**RACEWAY EMBEDDED
IN STRUCTURE**

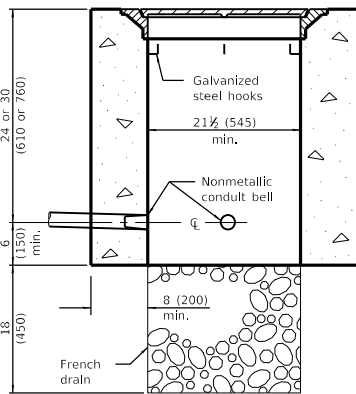
(Sheet 3 of 3)

STANDARD 812001

Illinois Department of Transportation	
APPROVED: <i>Cheryl Gentry</i> January 1, 2015 ENGINEER OF POLICY AND PROCEDURES	ISSUED: 1-1-15
APPROVED: <i>[Signature]</i> January 1, 2015 ENGINEER OF DESIGN AND ENVIRONMENT	

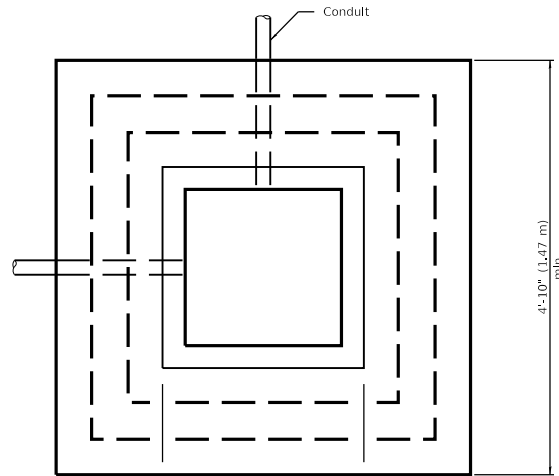


PLAN

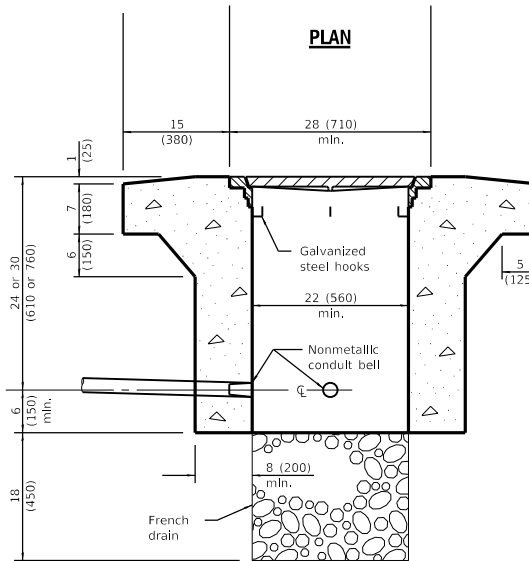


ELEVATION

PORTLAND CEMENT CONCRETE

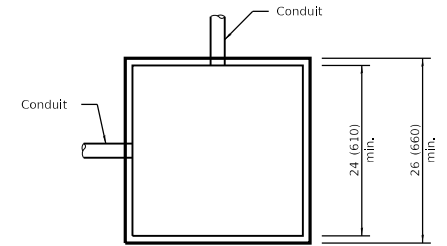


PLAN

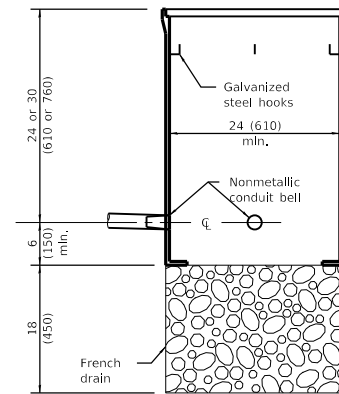


ELEVATION

**PORTLAND CEMENT CONCRETE
HEAVY DUTY**



PLAN



ELEVATION

COMPOSITE CONCRETE

All dimensions are in inches (millimeters) unless otherwise shown.

QUANTITIES

Depth	Concrete yd ³ (m ³)	
	Handhole	Heavy Duty Handhole
30 (762)	0,61 (0,47)	0,98 (0,75)
36 (914)	0,73 (0,56)	1,10 (0,84)

DATE	REVISIONS
1-1-15	Corrected dimension on heavy duty handhole. Added concrete quantities table.
1-1-09	Switched units to English (metric).

HANDHOLES

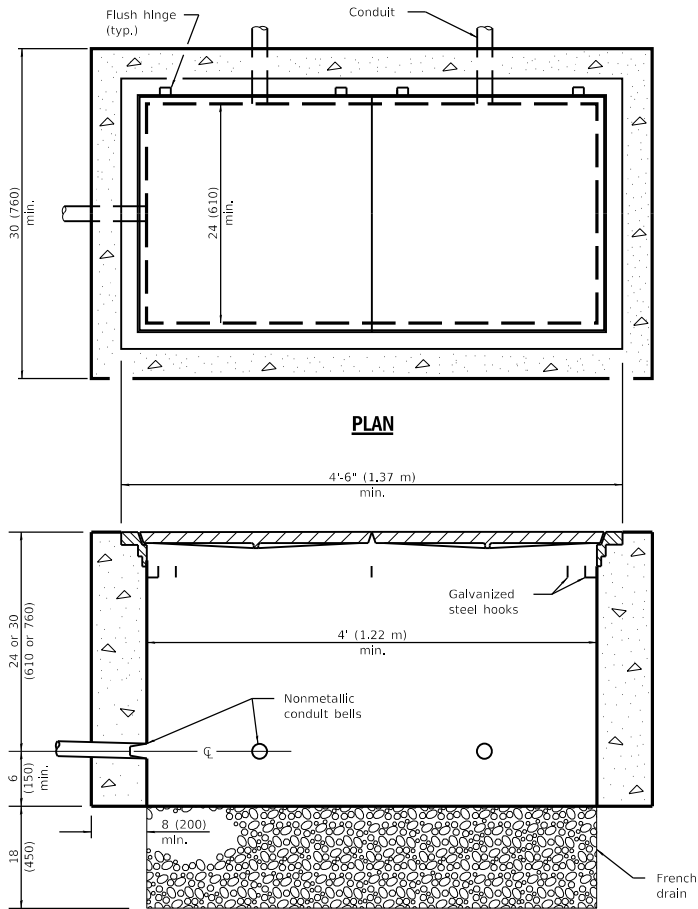
STANDARD 814001-03

Illinois Department of Transportation

PASSED January 1, 2015
Jim Allen
 ENGINEER OF OPERATIONS

APPROVED January 1, 2015
DR
 ENGINEER OF DESIGN AND ENVIRONMENT

464-C1 03/ISS/1

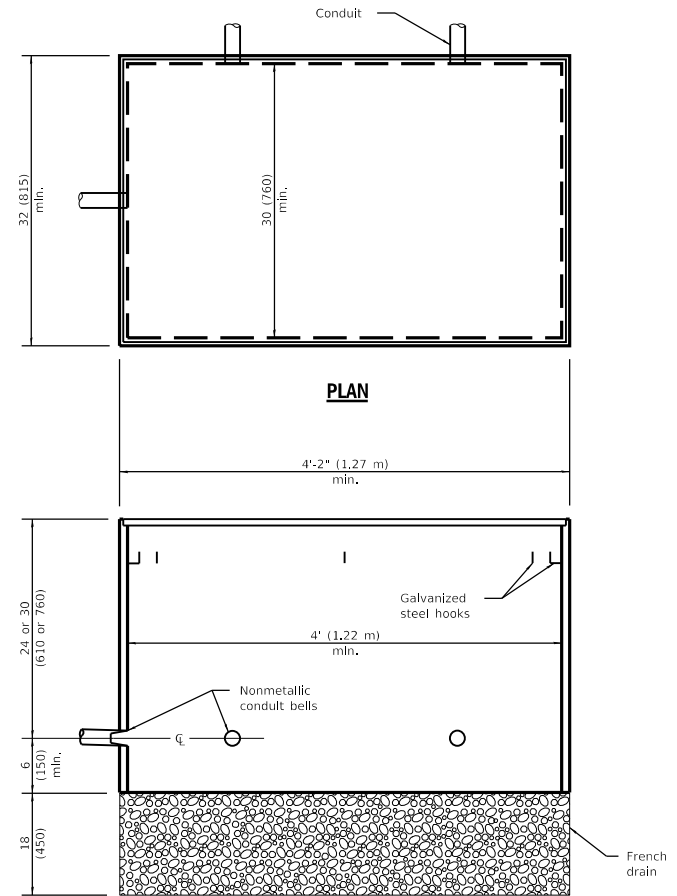


PLAN

4'-6" (1.37 m)
min.

ELEVATION

PORTLAND CEMENT CONCRETE



PLAN

4'-2" (1.27 m)
min.

ELEVATION

COMPOSITE CONCRETE

All dimensions are in inches (millimeters)
unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2009

ENGINEER OF OPERATIONS

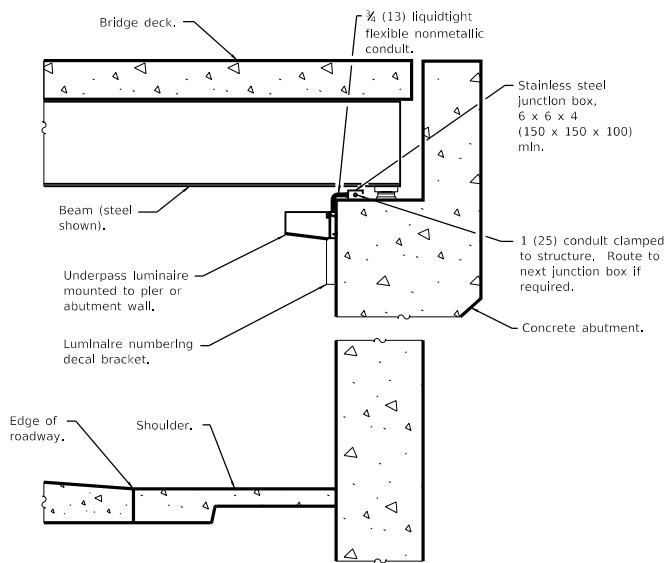
APPROVED January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

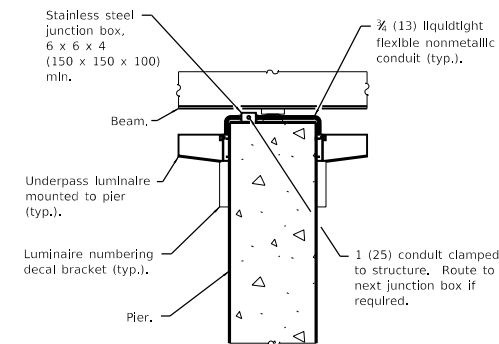
DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-07	Revised composite conc. handhole. Rem. weights of frames and covers.

DOUBLE HANDHOLES

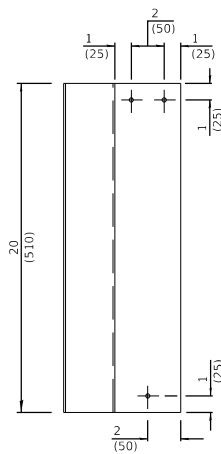
STANDARD 814006-02



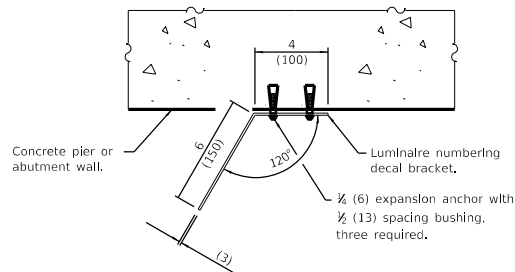
SECTION A-A



CENTER PIER DETAIL

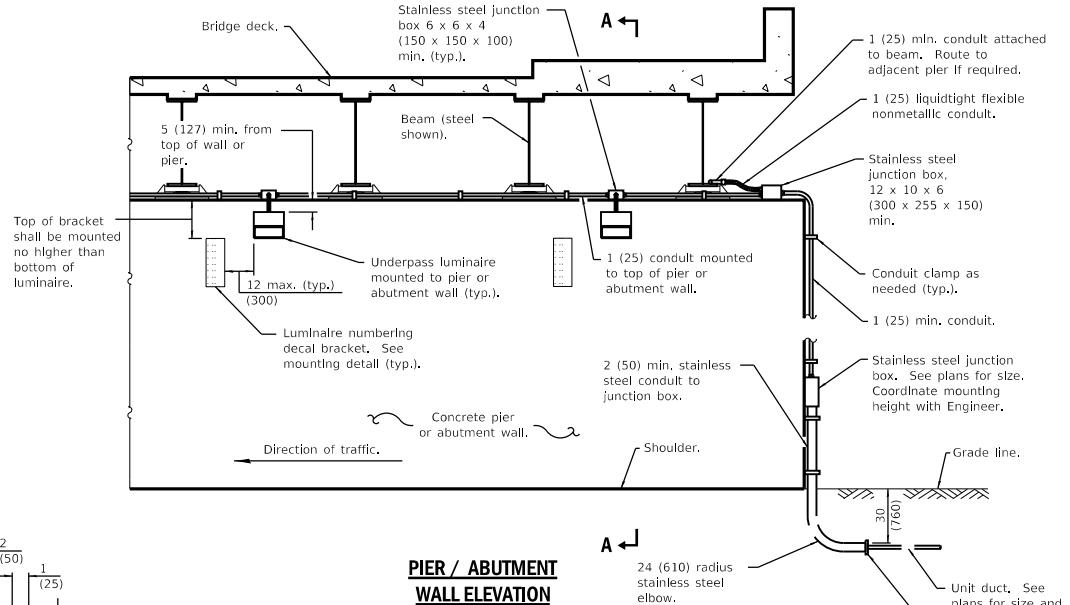


ELEVATION



TOP VIEW

LUMINAIRE NUMBERING DECAL BRACKET MOUNTING DETAIL



PIER / ABUTMENT WALL ELEVATION



CONDUIT BEAM CLAMP



CONDUIT CLAMP

GENERAL NOTES

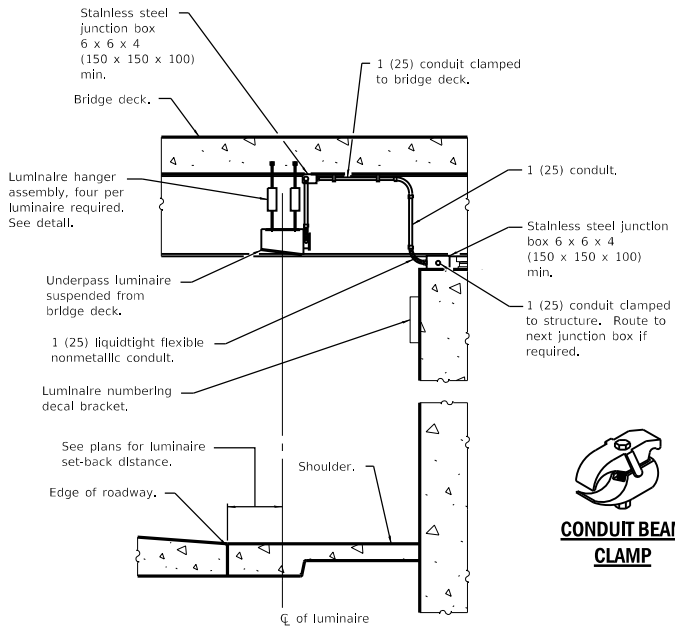
- See plans for underpass luminaire locations.
- Rigid conduit may be used in lieu of flexible conduit.
- Stainless steel conduit shall be used beneath any openings in the bridge deck.
- Branch circuits to luminaire shown routed from underground. Branch circuits may be routed from bridge parapet above.
- All dimensions are in Inches (millimeters) unless otherwise shown.

Illinois Department of Transportation	
PASSED April 1, 2016 	911-1-1 ENGINEER OF DESIGN AND ENVIRONMENT
APPROVED April 1, 2016 	

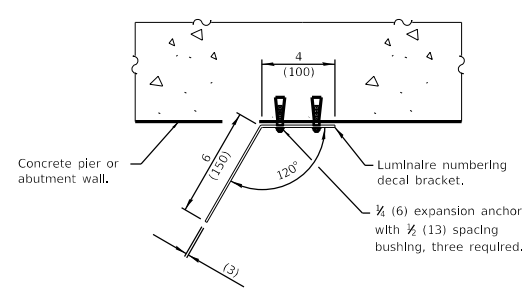
DATE	REVISIONS
4-1-16	New standard.

UNDERPASS LIGHTING WALL MOUNT

STANDARD 821001



SECTION A-A



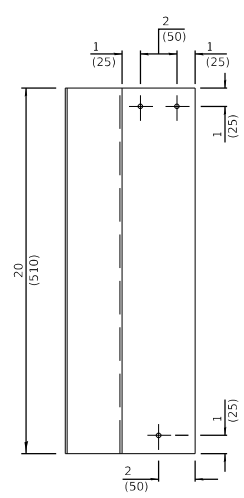
TOP VIEW



CONDUIT BEAM CLAMP

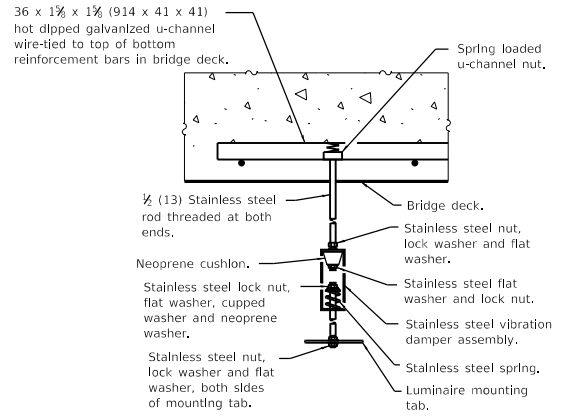


CONDUIT CLAMP

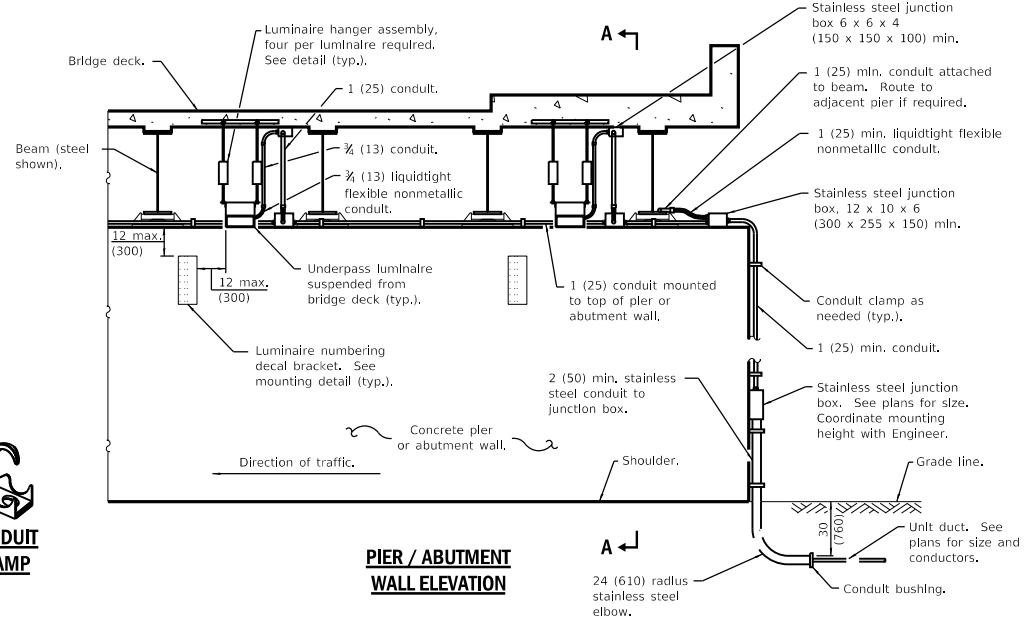


ELEVATION

LUMINAIRE NUMBERING DECAL BRACKET MOUNTING DETAIL



LUMINAIRE HANGER ASSEMBLY DETAIL



PIER / ABUTMENT WALL ELEVATION

GENERAL NOTES

- See plans for underpass luminaire locations.
- Underpass luminaires shall be centered between beams unless otherwise directed by the Engineer.
- Optics of underpass luminaires shall be installed 1 (25) above the bottom of the beams with no parts of the luminaire or attached conduit below the beams.
- Rigid conduit may be used in lieu of flexible conduit.
- Stainless steel conduit shall be used beneath any openings in the bridge deck.
- Branch circuits to luminaires shown routed from underground. Branch circuits may also be routed from bridge parapet above.
- All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED April 1, 2016

ENGINEER OF PRELIMINARY ENGINEERING

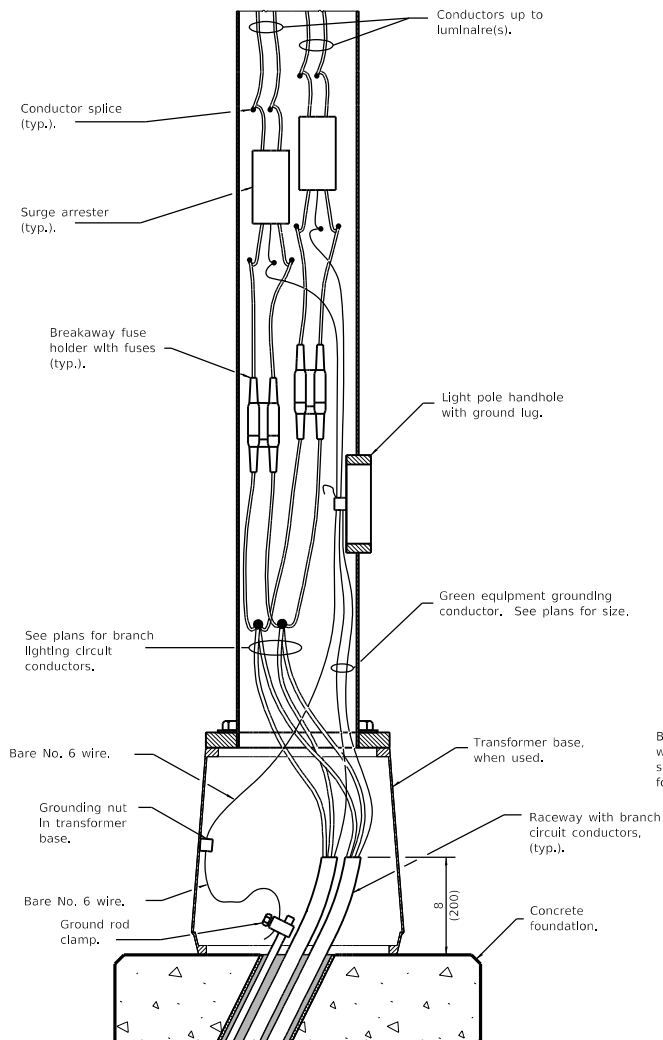
APPROVED April 1, 2016

ENGINEER OF DESIGN AND ENVIRONMENT

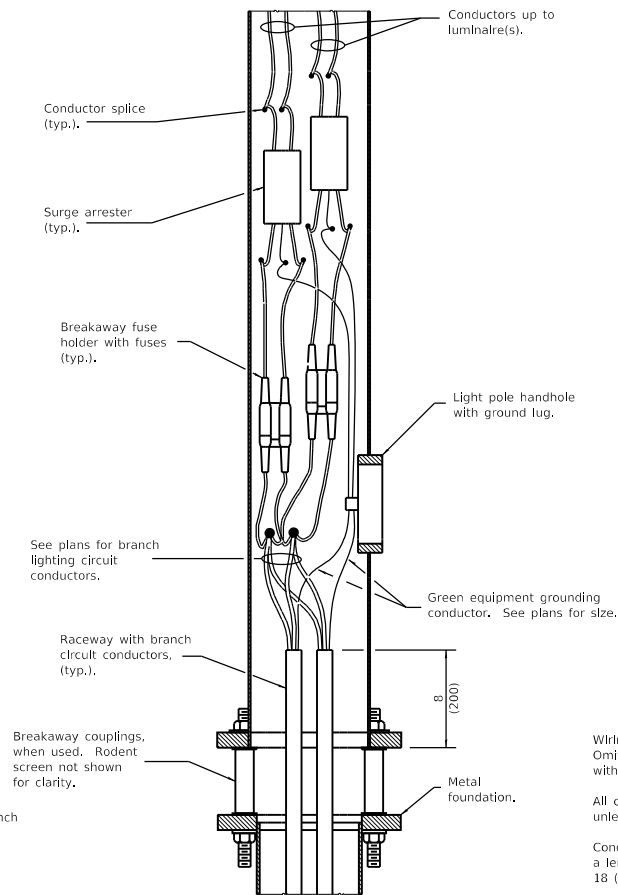
DATE	REVISIONS
4-1-16	New standard.

UNDERPASS LIGHTING SUSPENDED

STANDARD 821006



**ELEVATION AT POLE BASE
WITH CONCRETE FOUNDATION**



**ELEVATION AT POLE BASE
WITH METAL FOUNDATION**
(Rodent screen not shown)

GENERAL NOTES

Wiring for twin luminaire installation shown. Omit one fuse holder and one surge arrester with connections for single luminaire installation.

All conductors originating in pole shall be No. 10 unless noted otherwise.

Conductors extended into light poles shall be of a length sufficient for splices to be withdrawn 18 (450) out of pole handhole.

Any voids in the foundation shall be filled with fine aggregate.

See Standard 836001 for Light Pole Foundation and ground rod.

All dimensions are in Inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-17	Renamed standard.
1-1-15	Changed 'protector' to 'arrester'.

**LUMINAIRE WIRING
IN POLE**

STANDARD 821101-02

Illinois Department of Transportation

PASSED January 1, 2017

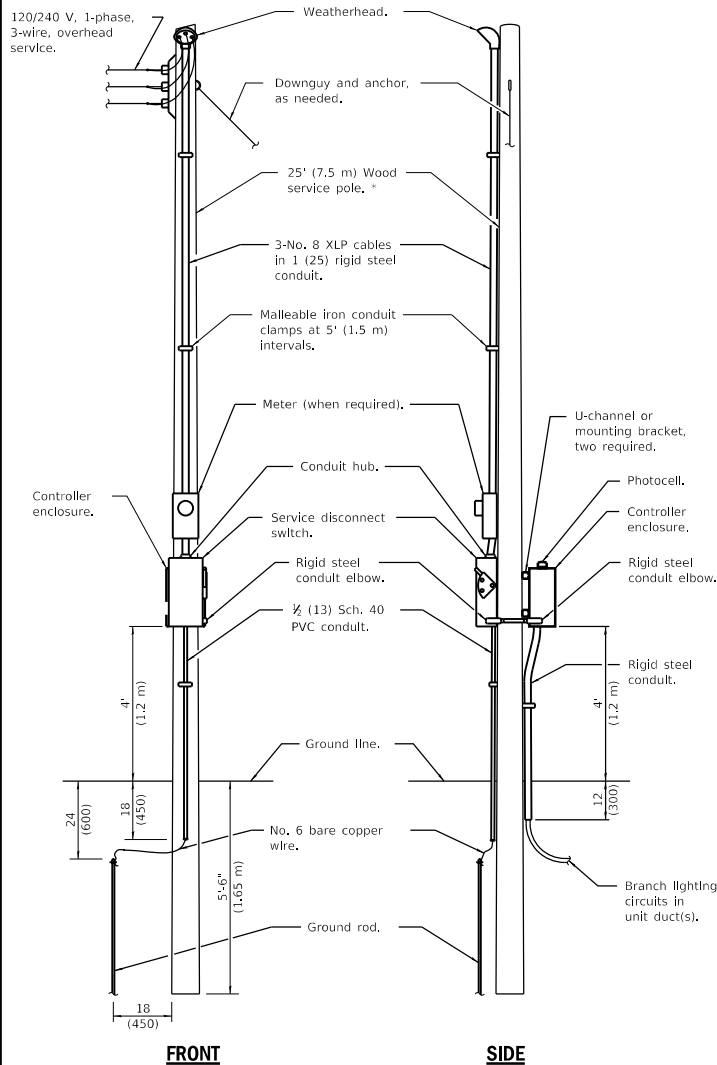
ISSUED

ENGINEER OF PRELIMINARY ENGINEERING

APPROVED January 1, 2017

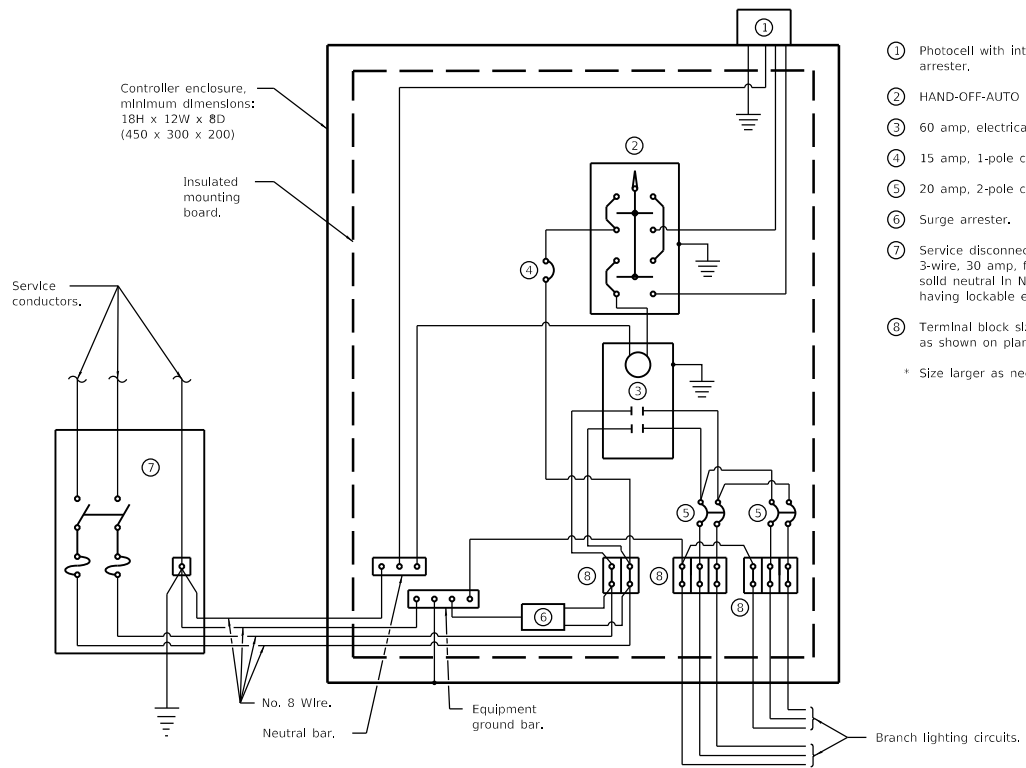
ENGINEER OF DESIGN AND ENVIRONMENT

30 AMP



ELECTRIC SERVICE INSTALLATION

(Typical overhead service shown. Cut pole off for underground service and treat cut surface with preservative. Consult utility company standards for exact requirements.)
 * Size larger as needed.



CONTROL SCHEMATIC

- ① Photocell with integral surge arrester.
 - ② HAND-OFF-AUTO selector switch.
 - ③ 60 amp, electrically held contactor.
 - ④ 15 amp, 1-pole circuit breaker.
 - ⑤ 20 amp, 2-pole circuit breaker.
 - ⑥ Surge arrester.
 - ⑦ Service disconnect switch - 2-pole, 3-wire, 30 amp, fused at 30 amp, solid neutral in NEMA 4X enclosure having lockable external handle.
 - ⑧ Terminal block sized for conductors as shown on plans.
- * Size larger as needed.

GENERAL NOTES

Provide 12x9x1 (305x225x25) watertight pouch mounted inside controller door with as-built plans and schematics.

Provide engraved nameplate on front of enclosure reading "LIGHTING".

Enclosure shall be mounted to pole with pole-bands and lag-bolts.

Work pad not shown.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2019

ME [Signature] ELECTRICAL AND MECHANICAL UNIT CHIEF

APPROVED January 1, 2019

[Signature] ENGINEER OF DESIGN AND ENVIRONMENT

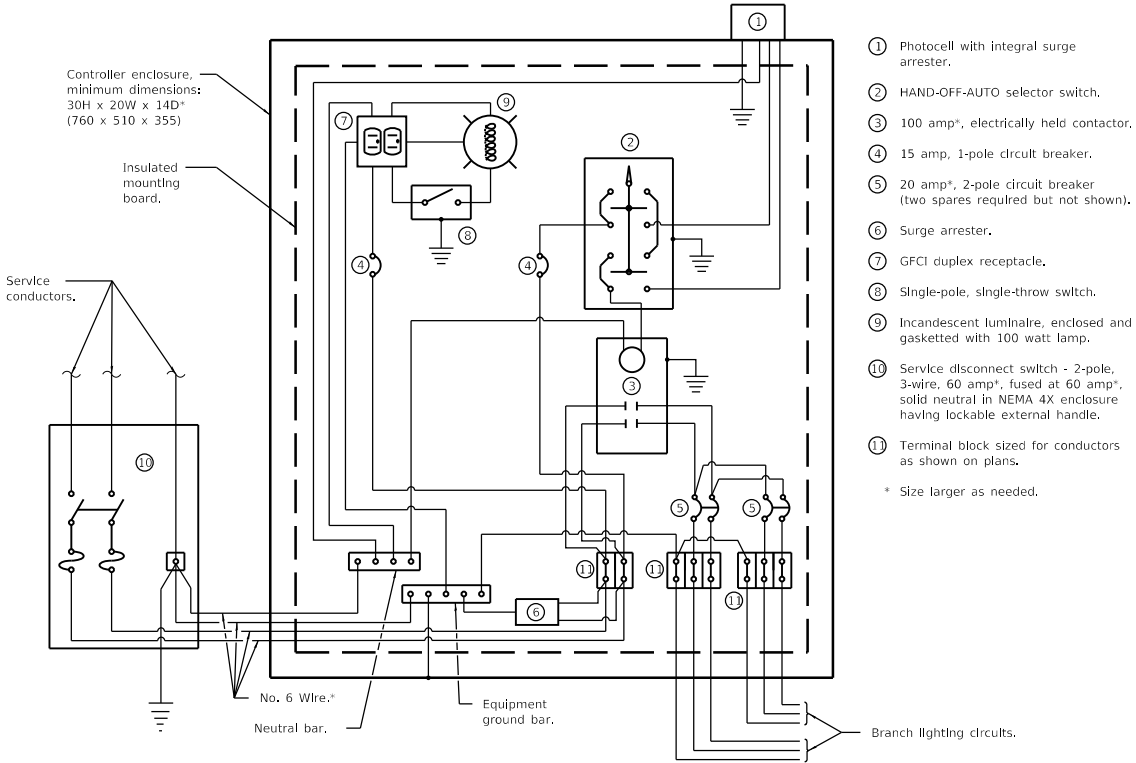
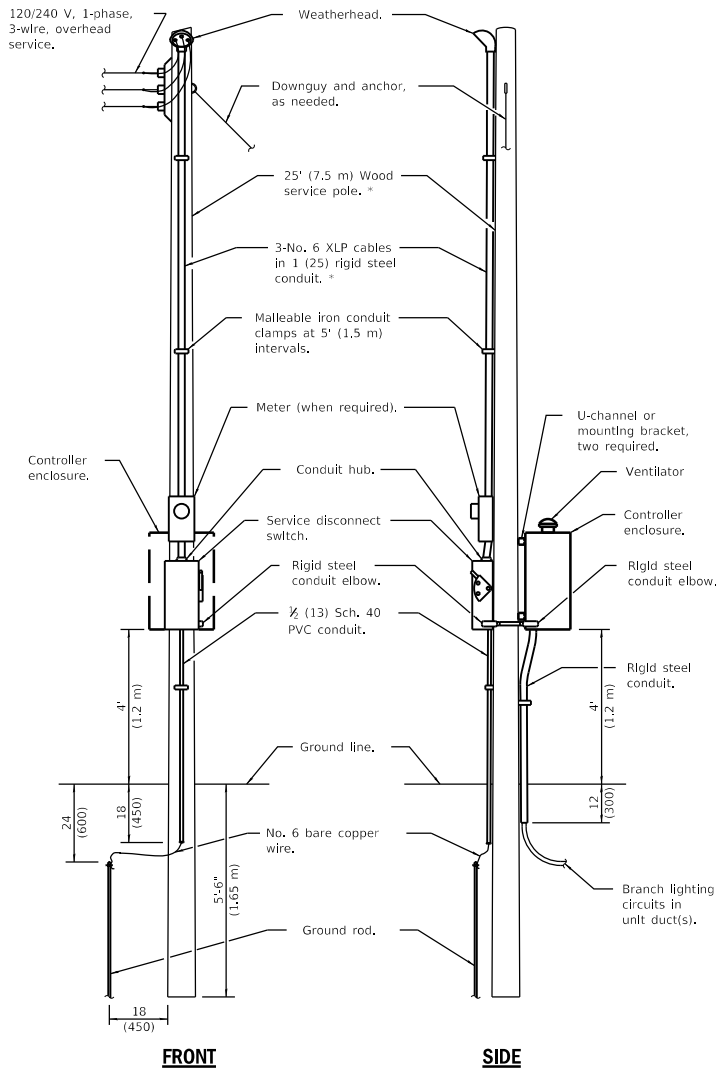
01-1-1 COMMISSION

DATE	REVISIONS
1-1-19	Replaced ** note with new note regarding consulting utility company standards for installation.
4-1-16	Corrected connection at terminal block.

LIGHTING CONTROLLER POLE MOUNTED, 240V

(Sheet 1 of 2)

STANDARD 825001-04



Illinois Department of Transportation

PASSED January 1, 2019

ME [Signature] ELECTRICAL AND MECHANICAL UNIT CHIEF

APPROVED January 1, 2019

[Signature] ENGINEER OF DESIGN AND ENVIRONMENT

01-1-1 03/15/11

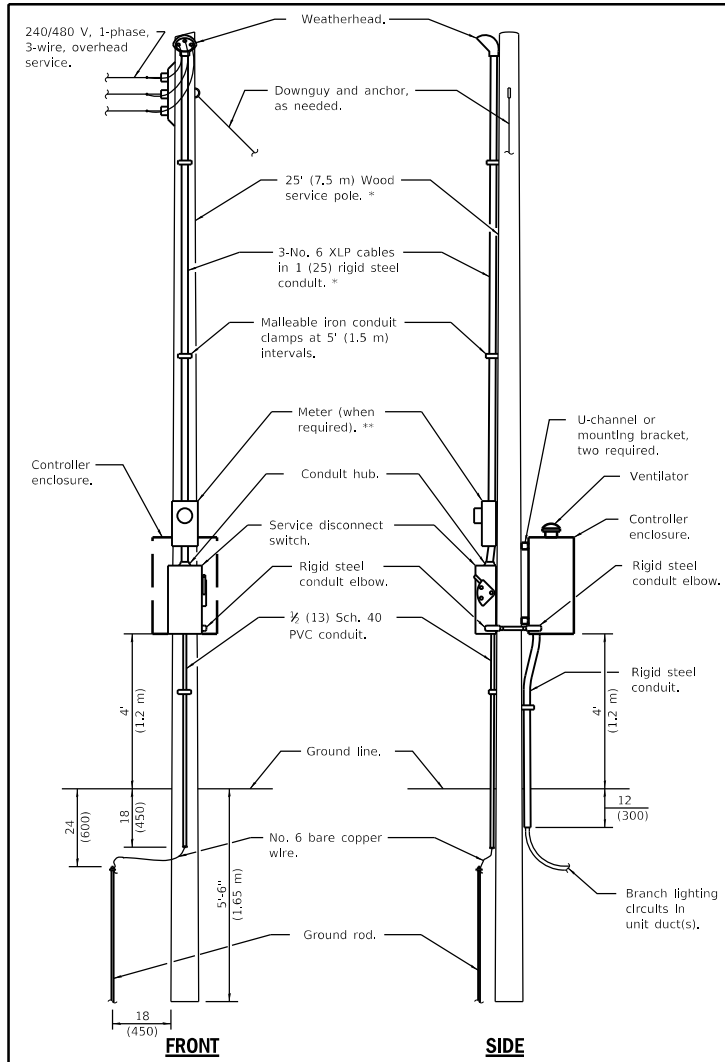
(Typical overhead service shown. Cut pole off for underground service and treat cut surface with preservative. Consult utility company standards for exact requirements.)

* Size larger as needed.

**LIGHTING CONTROLLER
POLE MOUNTED, 240V**

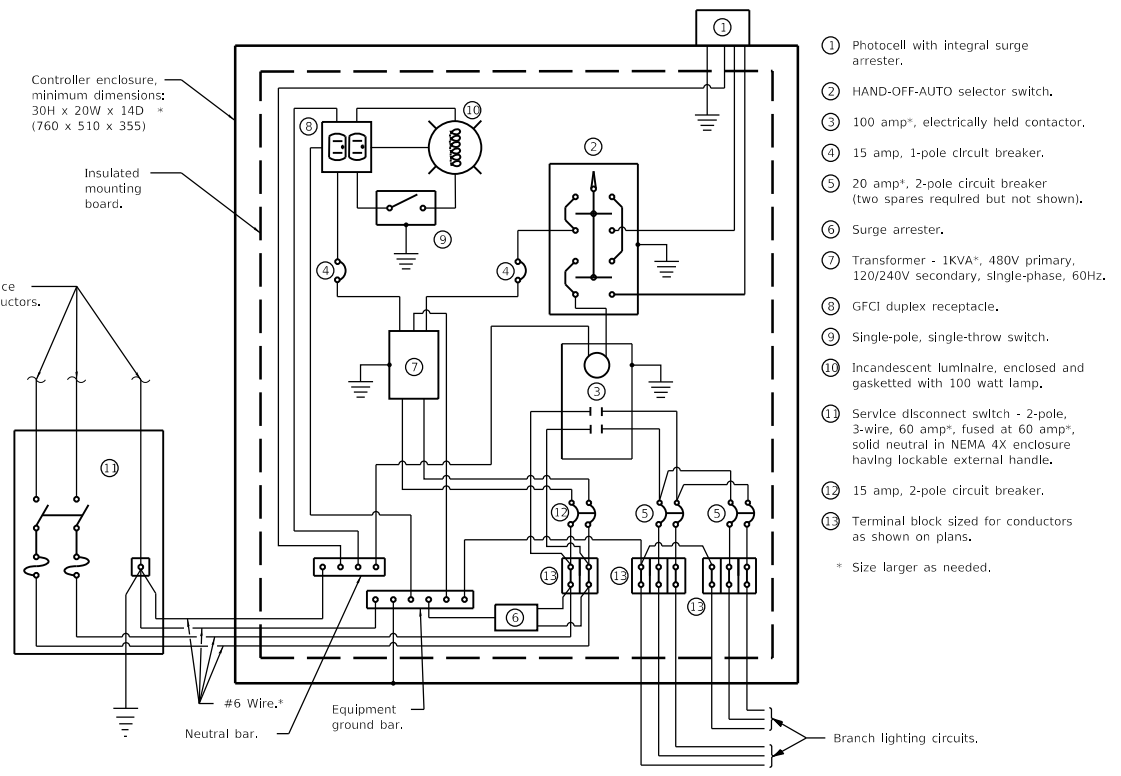
(Sheet 2 of 2)

STANDARD 825001-04



ELECTRIC SERVICE INSTALLATION

(Typical overhead service shown. Cut pole off for underground service and treat cut surface with preservative. Consult utility company standards for exact requirements.)
 * Size larger as needed.
 ** When cold sequencing is required, provide a meter disconnect switch as directed by Utility Company.



CONTROL SCHEMATIC

- ① Photocell with integral surge arrester.
 - ② HAND-OFF-AUTO selector switch.
 - ③ 100 amp*, electrically held contactor.
 - ④ 15 amp, 1-pole circuit breaker.
 - ⑤ 20 amp*, 2-pole circuit breaker (two spares required but not shown).
 - ⑥ Surge arrester.
 - ⑦ Transformer - 1KVA*, 480V primary, 120/240V secondary, single-phase, 60Hz.
 - ⑧ GFCI duplex receptacle.
 - ⑨ Single-pole, single-throw switch.
 - ⑩ Incandescent luminaire, enclosed and gasketed with 100 watt lamp.
 - ⑪ Service disconnect switch - 2-pole, 3-wire, 60 amp*, fused at 60 amp*, solid neutral in NEMA 4X enclosure having lockable external handle.
 - ⑫ 15 amp, 2-pole circuit breaker.
 - ⑬ Terminal block sized for conductors as shown on plans.
- * Size larger as needed.

GENERAL NOTES

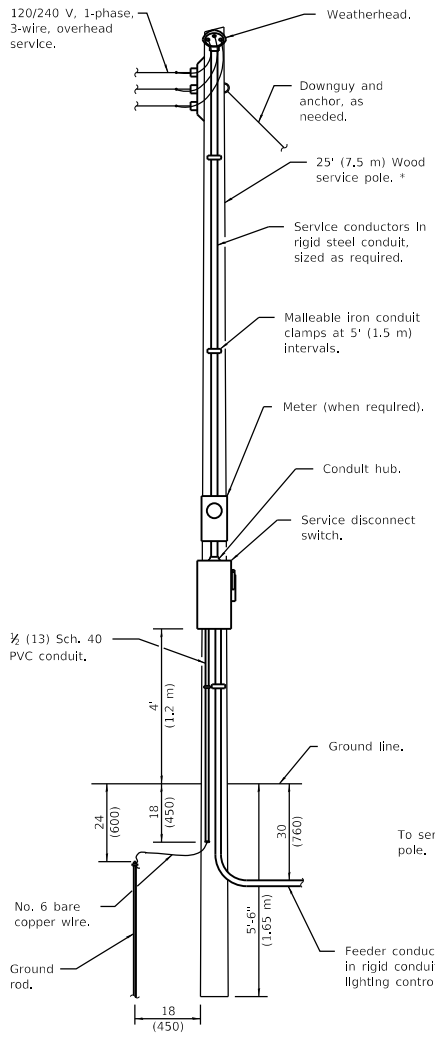
Provide 12x9x1 (305x225x25) watertight pouch mounted inside controller door with as-built plans and schematics.
 Provide engraved nameplate on front of enclosure reading "LIGHTING".
 Enclosure shall be mounted to pole with pole-bands and lag-bolts.
 Work pad not shown.
 All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation
 PASSED January 1, 2019
 ELECTRICAL AND MECHANICAL UNIT CHIEF
 APPROVED January 1, 2019
 ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-19	Replaced ** note with new note regarding utility company standards. Made *** the ** note.
1-1-15	Added note ⑬.

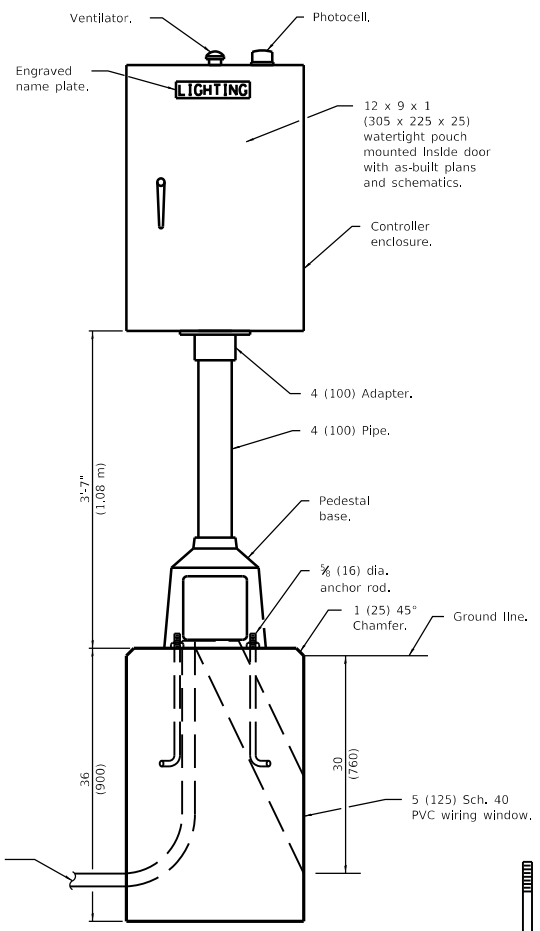
**LIGHTING CONTROLLER
 POLE MOUNTED, 480V**

STANDARD 825006-03

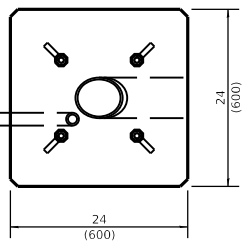


ELECTRIC SERVICE INSTALLATION

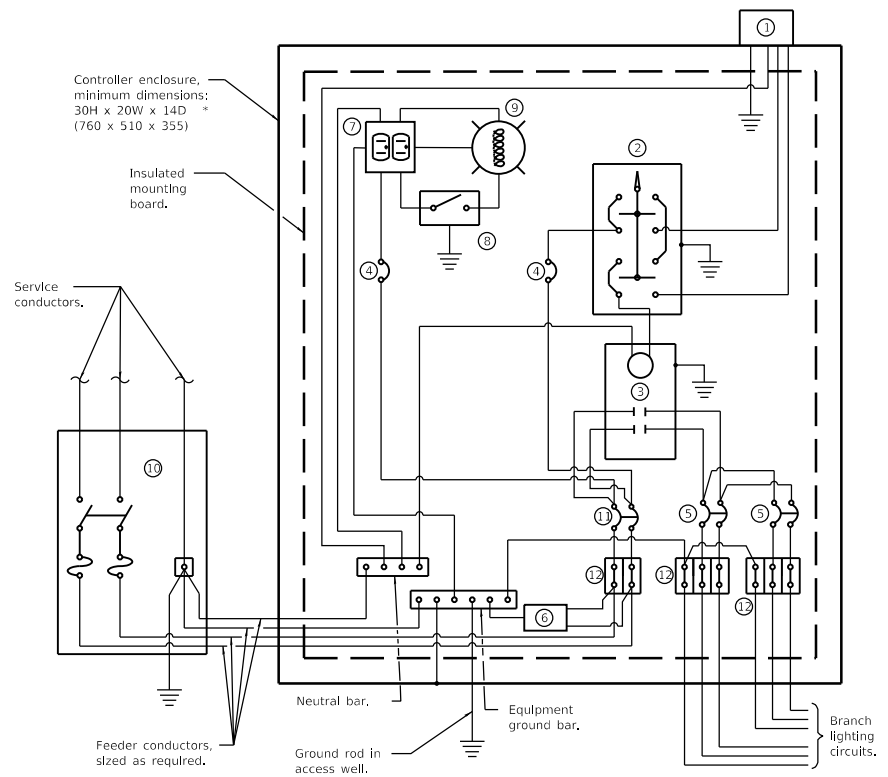
(Typical overhead service shown. Cut pole off for underground service and treat cut surface with preservative. Consult utility company standards for exact requirements.)
 * Size larger as needed.



LIGHTING CONTROLLER



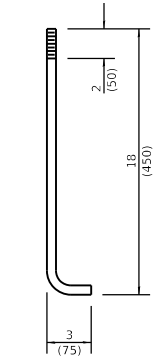
FOUNDATION (PLAN)
(Work pad not shown.)



CONTROL SCHEMATIC

- ① Photocell with integral surge arrester.
 - ② HAND-OFF-AUTO selector switch.
 - ③ 100 amp*, electrically held contactor.
 - ④ 15 amp, 1-pole circuit breaker.
 - ⑤ 20 amp*, 2-pole circuit breaker (two spares required but not shown).
 - ⑥ Surge arrester.
 - ⑦ GFCI duplex receptacle.
 - ⑧ Single-pole, single-throw switch.
 - ⑨ Incandescent luminaire, enclosed and gasketed with 100 watt lamp.
 - ⑩ Service disconnect switch - 2-pole, 3-wire, 60 amp*, fused at 60 amp*, solid neutral in NEMA 4X enclosure having lockable external handle.
 - ⑪ 60 amp*, 2-pole circuit breaker.
 - ⑫ Terminal block sized for conductors as shown on plans.
- * Size larger as needed.

All dimensions are in inches (millimeters) unless otherwise shown.



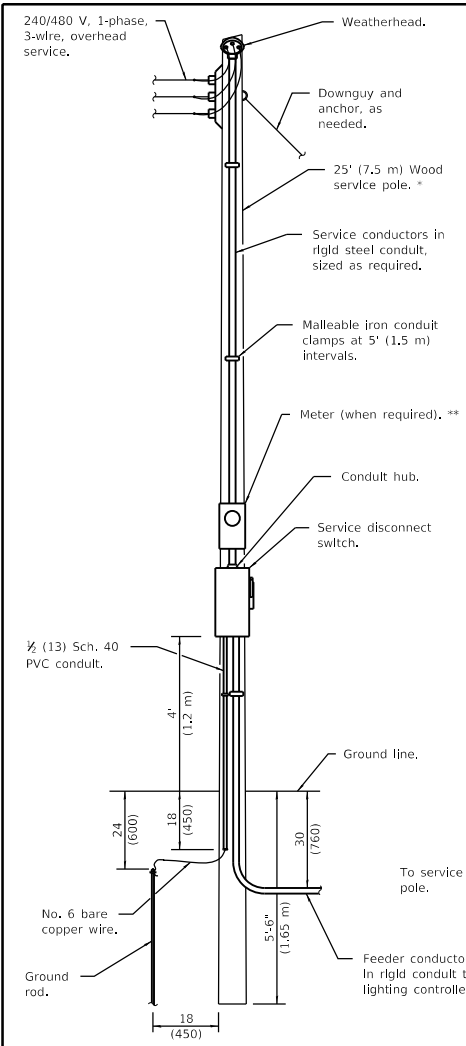
ANCHOR ROD DETAIL

Illinois Department of Transportation
 PASSED January 1, 2019
 ME S. S. S. S. S.
 ELECTRICAL AND MECHANICAL UNIT CHIEF
 APPROVED January 1, 2019
 ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-19	Replaced ** note with new note regarding consulting utility company standards for installation.
1-1-15	Added note ⑫.

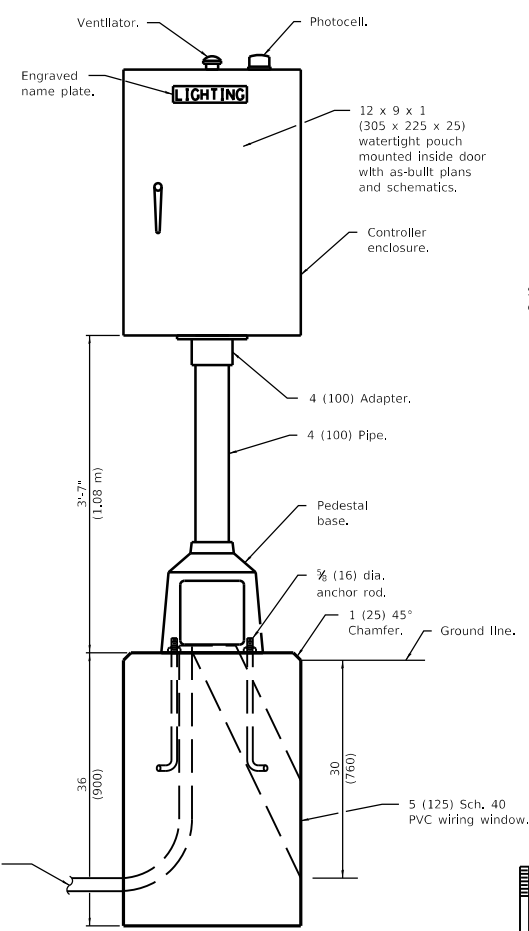
**LIGHTING CONTROLLER
 PEDESTAL MOUNTED, 240V**

STANDARD 825011-04

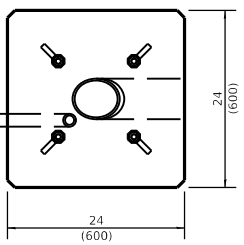


ELECTRIC SERVICE INSTALLATION

(Typical overhead service shown. Cut pole off for underground service and treat cut surface with preservative. Consult utility company standards for exact requirements.)
 *Size larger as needed.
 **When cold sequencing is required, provide a meter disconnect switch as directed by Utility Company.

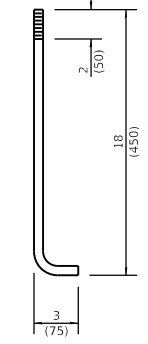


LIGHTING CONTROLLER

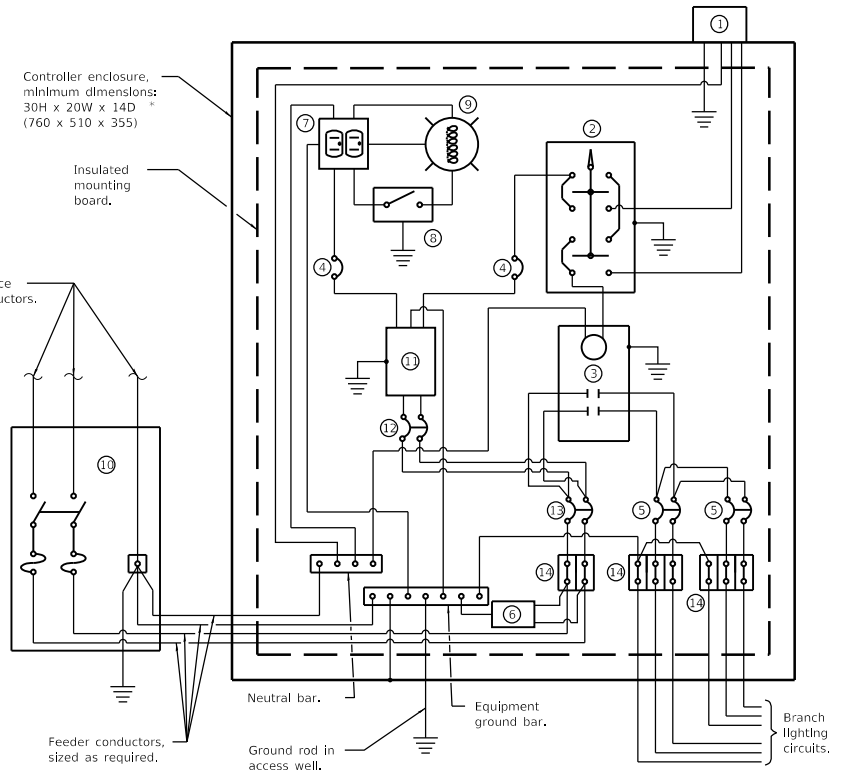


FOUNDATION (PLAN)

(Work pad not shown.)



ANCHOR ROD DETAIL



CONTROL SCHEMATIC

- ① Photocell with integral surge arrester.
- ② HAND-OFF-AUTO selector switch.
- ③ 100 amp*, electrically held contactor.
- ④ 15 amp, 1-pole circuit breaker.
- ⑤ 20 amp*, 2-pole circuit breaker (two spares required but not shown).
- ⑥ Surge arrester.
- ⑦ GFCI duplex receptacle.
- ⑧ Single-pole, single-throw switch.
- ⑨ Incandescent luminaire, enclosed and gasketed with 100 watt lamp.
- ⑩ Service disconnect switch - 2-pole, 3-wire, 60 amp*, fused at 60 amp*, solid neutral in NEMA 4X enclosure having lockable external handle.
- ⑪ Transformer - 1KVA*, 480V primary, 120/240V secondary, single-phase, 60Hz.
- ⑫ 15 amp, 2-pole circuit breaker.
- ⑬ 60 amp*, 2-pole circuit breaker.
- ⑭ Terminal block sized for conductors as shown on plans.

* Size larger as needed.

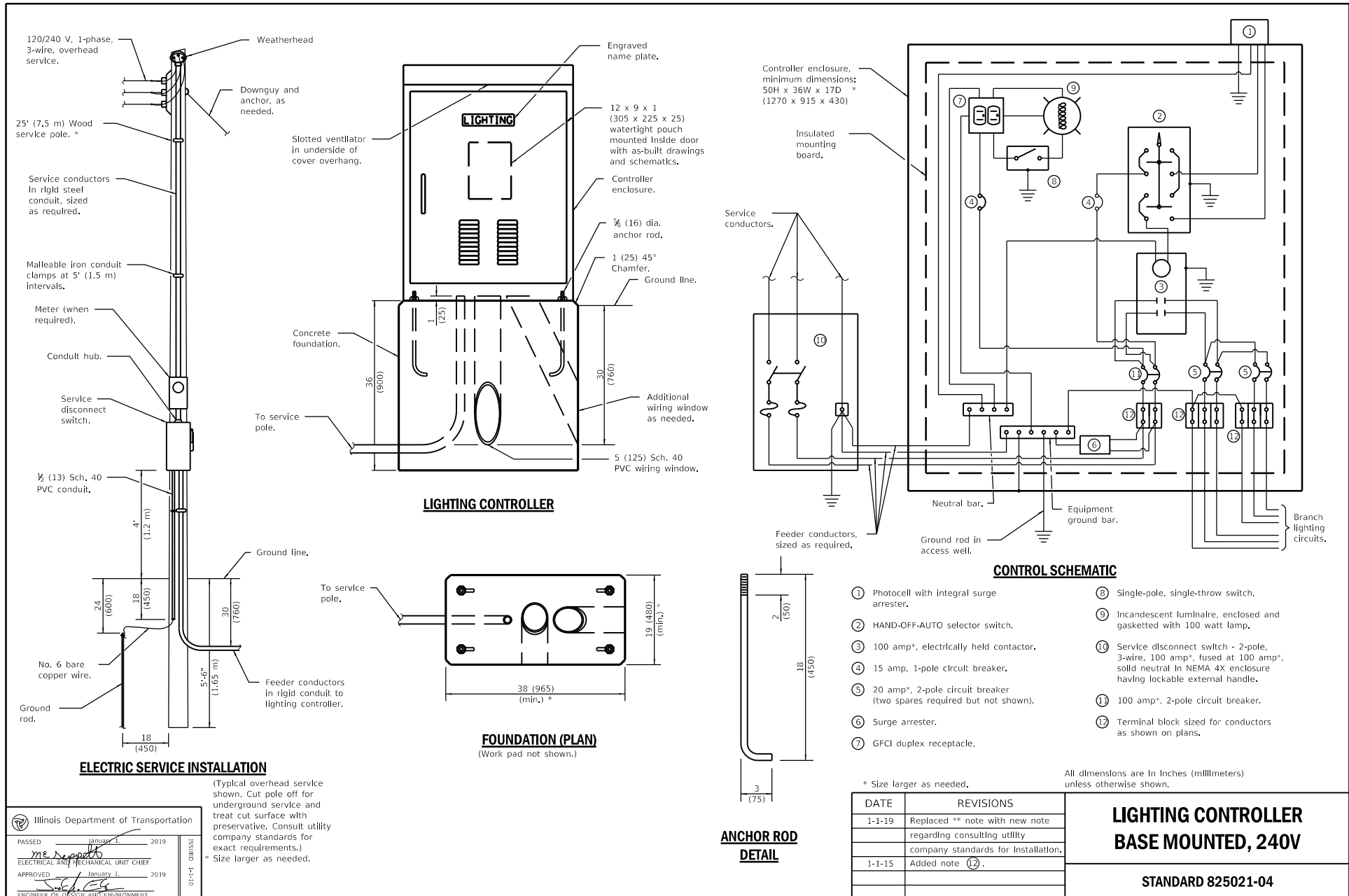
All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation
 PASSED January 1, 2019
 ELECTRICAL AND MECHANICAL UNIT CHIEF
 APPROVED January 1, 2019
 ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-19	Replaced ** note with new note regarding utility company standards. Made *** the ** note.
1-1-15	Added note ⑭.

**LIGHTING CONTROLLER
 PEDESTAL MOUNTED, 480V**

STANDARD 825016-04



120/240 V, 1-phase, 3-wire, overhead service.

Weatherhead

Engraved name plate.

25' (7.5 m) Wood service pole. *

Downguy and anchor, as needed.

Slotted ventilator in underside of cover overhang.

12 x 9 x 1 (305 x 225 x 25) watertight pouch mounted inside door with as-built drawings and schematics.

Service conductors in rigid steel conduit, sized as required.

Controller enclosure.

Malleable iron conduit clamps at 5' (1.5 m) intervals.

5/8 (16) dia. anchor rod.

1 (25) 45° Chamfer.

Ground line.

Meter (when required).

Concrete foundation.

Additional wiring window as needed.

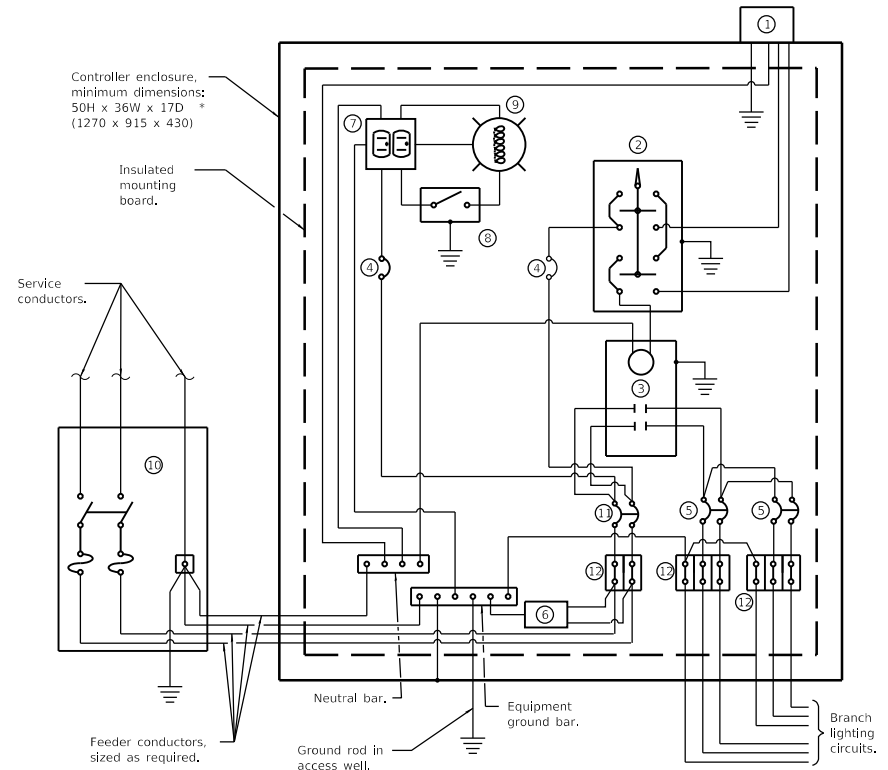
5 (125) Sch. 40 PVC wiring window.

Conduit hub.

Service disconnect switch.

1/2 (13) Sch. 40 PVC conduit.

LIGHTING CONTROLLER



CONTROL SCHEMATIC

- ① Photocell with integral surge arrester.
- ② HAND-OFF-AUTO selector switch.
- ③ 100 amp*, electrically held contactor.
- ④ 15 amp, 1-pole circuit breaker.
- ⑤ 20 amp*, 2-pole circuit breaker (two spares required but not shown).
- ⑥ Surge arrester.
- ⑦ GFCI duplex receptacle.
- ⑧ Single-pole, single-throw switch.
- ⑨ Incandescent luminaire, enclosed and gasketed with 100 watt lamp.
- ⑩ Service disconnect switch - 2-pole, 3-wire, 100 amp*, fused at 100 amp*, solid neutral in NEMA 4X enclosure having lockable external handle.
- ⑪ 100 amp*, 2-pole circuit breaker.
- ⑫ Terminal block sized for conductors as shown on plans.

* Size larger as needed.

All dimensions are in inches (millimeters) unless otherwise shown.

ELECTRIC SERVICE INSTALLATION

(Typical overhead service shown. Cut pole off for underground service and treat cut surface with preservative. Consult utility company standards for exact requirements.)
* Size larger as needed.

FOUNDATION (PLAN)

(Work pad not shown.)

ANCHOR ROD DETAIL

DATE	REVISIONS
1-1-19	Replaced ** note with new note regarding consulting utility company standards for installation.
1-1-15	Added note ⑫.

**LIGHTING CONTROLLER
BASE MOUNTED, 240V**

STANDARD 825021-04

Illinois Department of Transportation

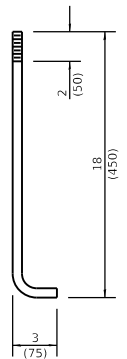
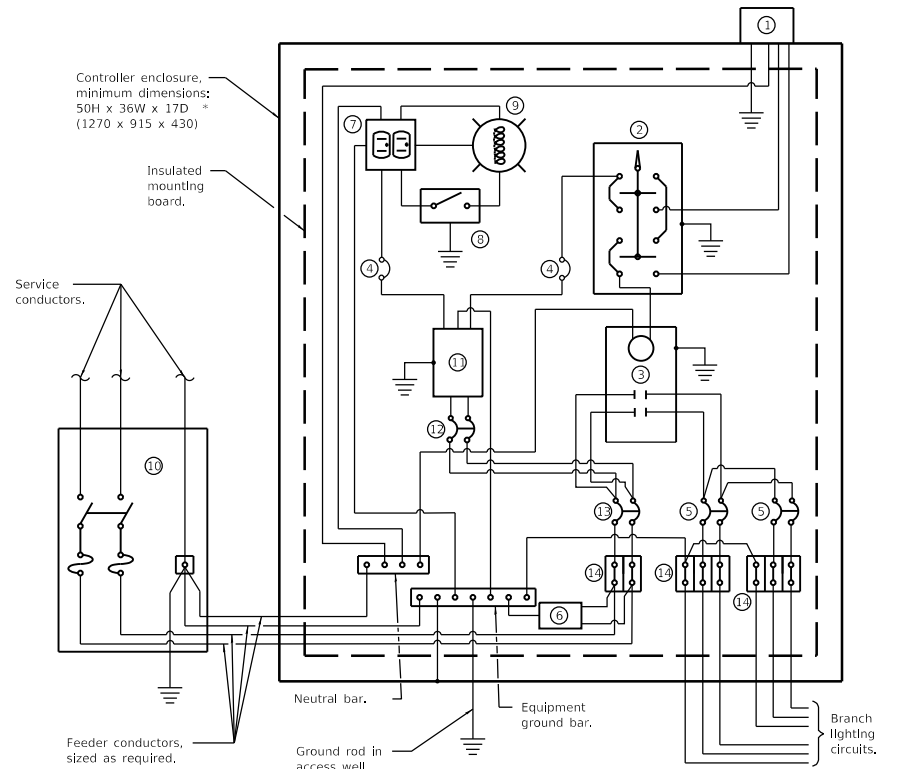
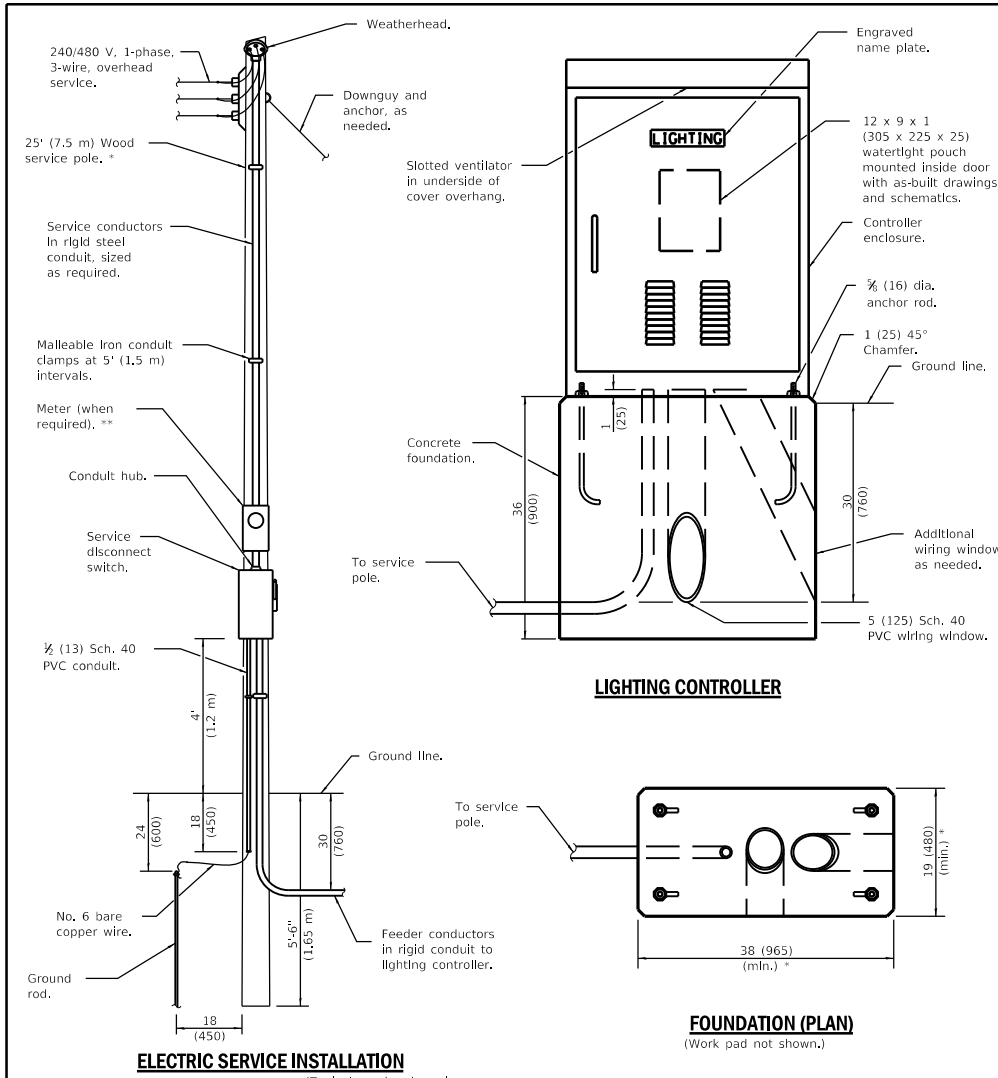
PASSED January 1, 2019

ME [Signature] ELECTRICAL AND MECHANICAL UNIT CHIEF

APPROVED January 1, 2019

[Signature] ENGINEER OF DESIGN AND ENVIRONMENT

01-H-1 CH/ISS/1



- ① Photocell with integral surge arrester.
- ② HAND-OFF-AUTO selector switch.
- ③ 100 amp*, electrically held contactor.
- ④ 15 amp, 1-pole circuit breaker.
- ⑤ 20 amp*, 2-pole circuit breaker (two spares required but not shown).
- ⑥ Surge arrester.
- ⑦ GFCI duplex receptacle.
- ⑧ Single-pole, single-throw switch.
- ⑨ Incandescent luminaire, enclosed and gasketed with 100 watt lamp.
- ⑩ Service disconnect switch - 2-pole, 3-wire, 100 amp*, fused at 100 amp*, solid neutral in NEMA 4X enclosure having lockable external handle.
- ⑪ Transformer - 1KVA*, 480V primary, 120/240V secondary, single-phase, 60Hz.
- ⑫ 15 amp, 2-pole circuit breaker.
- ⑬ 100 amp*, 2-pole circuit breaker.
- ⑭ Terminal block sized for conductors as shown on plans.

* Size larger as needed.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-19	Replaced ** note with new note regarding utility company
1-1-15	Added note ⑩.

**LIGHTING CONTROLLER
BASE MOUNTED, 480V**

STANDARD 825026-04

Illinois Department of Transportation

PASSED January 1, 2019

APPROVED January 1, 2019

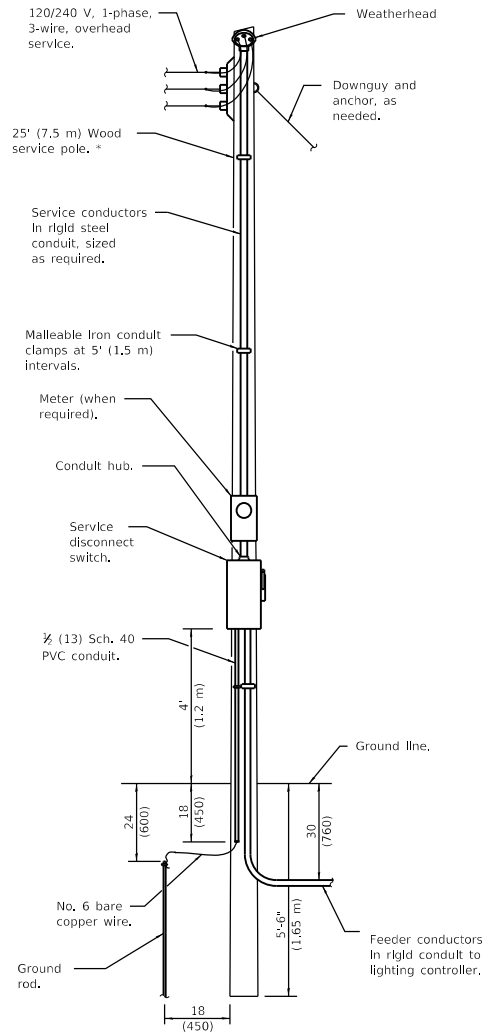
01-1-1 CH/ISS/

ENGINEER OF DESIGN AND ENVIRONMENT

(Typical overhead service shown. Cut pole off for underground service and treat cut surface with preservative. Consult utility company standards for exact requirements.)

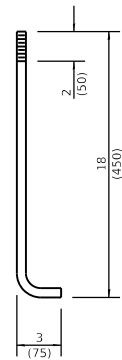
** Size larger as needed.

*** When cold sequencing is required, provide a meter disconnect switch as directed by Utility Company.

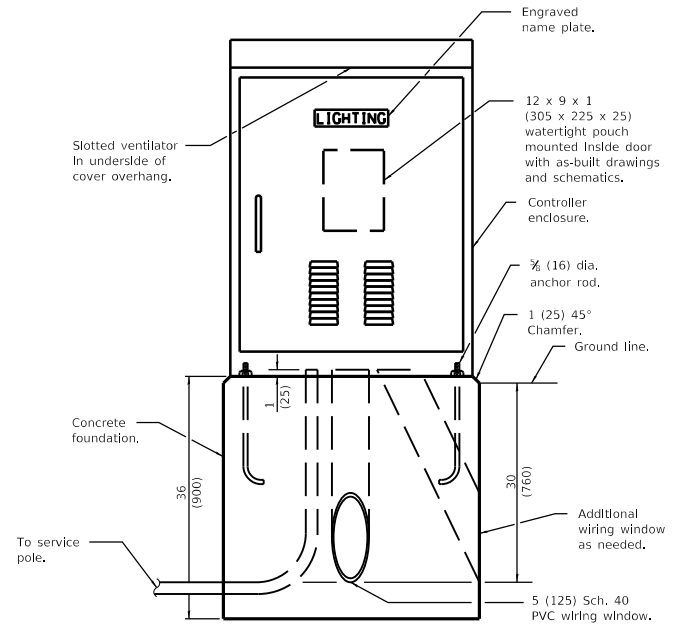


ELECTRIC SERVICE INSTALLATION

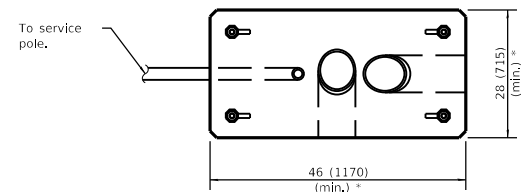
(Typical overhead service shown. Cut pole off for underground service and treat cut surface with preservative. Consult utility company standards for exact requirements.)
 * Size larger as needed.



**ANCHOR ROD
DETAIL**



LIGHTING CONTROLLER



FOUNDATION (PLAN)

(Work pad not shown.)
 * Size larger as needed.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

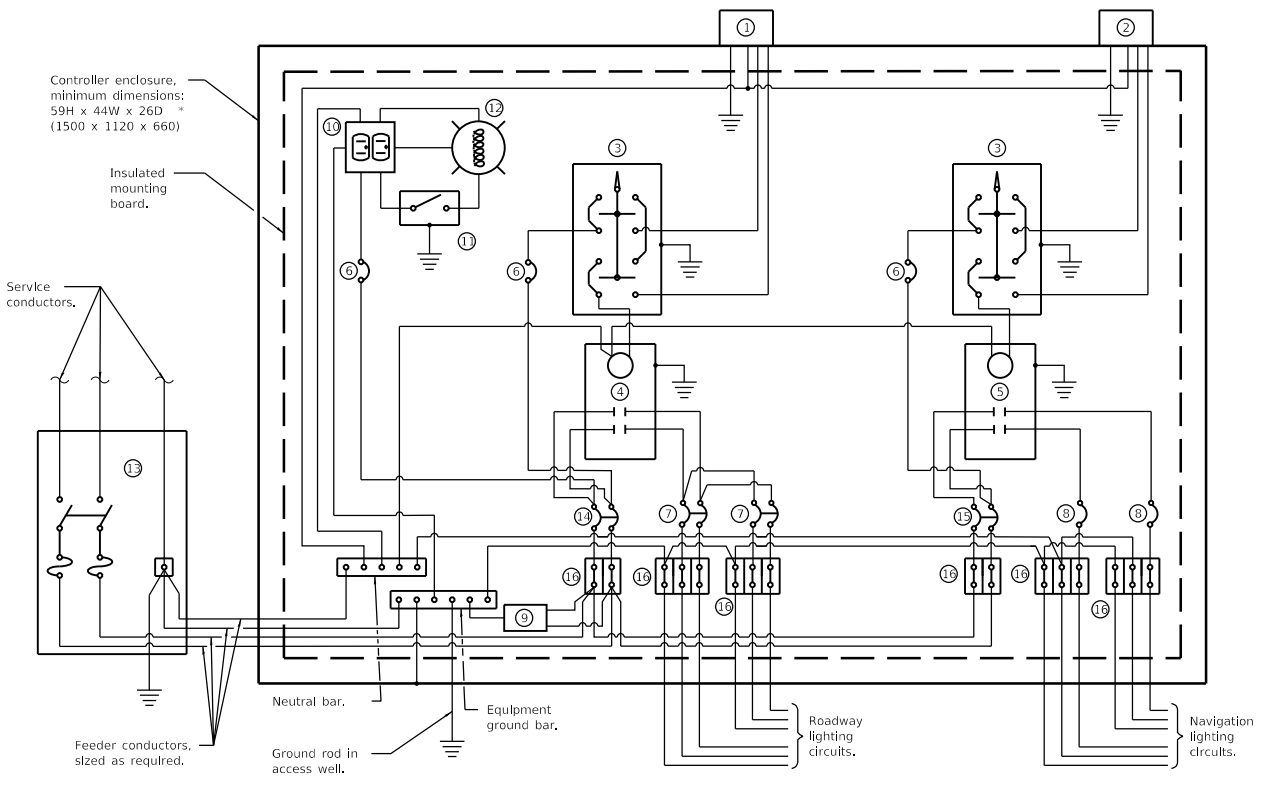
PASSED January 1, 2019
 ELECTRICAL AND MECHANICAL UNIT CHIEF
 APPROVED January 1, 2019
 ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12

DATE	REVISIONS
1-1-19	Replaced ** note with new note regarding consulting utility company standards for installation.
1-1-15	Added note (16).

**NAVIGATION OBSTRUCTION
LIGHTING CONTROLLER, 240V**
 (Sheet 1 of 2)

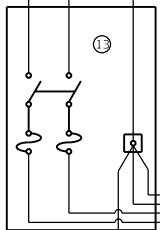
STANDARD 826001-02



Controller enclosure, minimum dimensions: 59H x 44W x 26D * (1500 x 1120 x 660)

Insulated mounting board.

Service conductors.



Feeder conductors, sized as required.

Neutral bar.

Ground rod in access well.

Equipment ground bar.

Roadway lighting circuits.

Navigation lighting circuits.

- ① Photocell with integral surge arrester for roadway lighting.
- ② Photocell with Integral surge arrester for navigation lighting.
- ③ HAND-OFF-AUTO selector switch.
- ④ 100 amp*, electrically held contactor.
- ⑤ 60 amp*, electrically held contactor.
- ⑥ 15 amp, 1-pole circuit breaker.
- ⑦ 20 amp*, 2-pole circuit breaker (two spares required but not shown).
- ⑧ 20 amp*, single-pole circuit breaker (two shown, quantity as required).
- ⑨ Surge arrester.
- ⑩ GFCI duplex receptacle.
- ⑪ Single-pole, single-throw switch.
- ⑫ Incandescent luminaire, enclosed and gasketed with 100 watt lamp.
- ⑬ Service disconnect switch - 2-pole, 3-wire, 100 amp*, fused at 100 amp*, solid neutral in NEMA 4X enclosure having lockable external handle.
- ⑭ 60 amp*, 2-pole circuit breaker.
- ⑮ 30 amp*, 2-pole circuit breaker.
- ⑯ Terminal block sized for conductors as shown on plans.

* Size larger as needed.

CONTROL SCHEMATIC

Illinois Department of Transportation

PASSED January 3, 2019

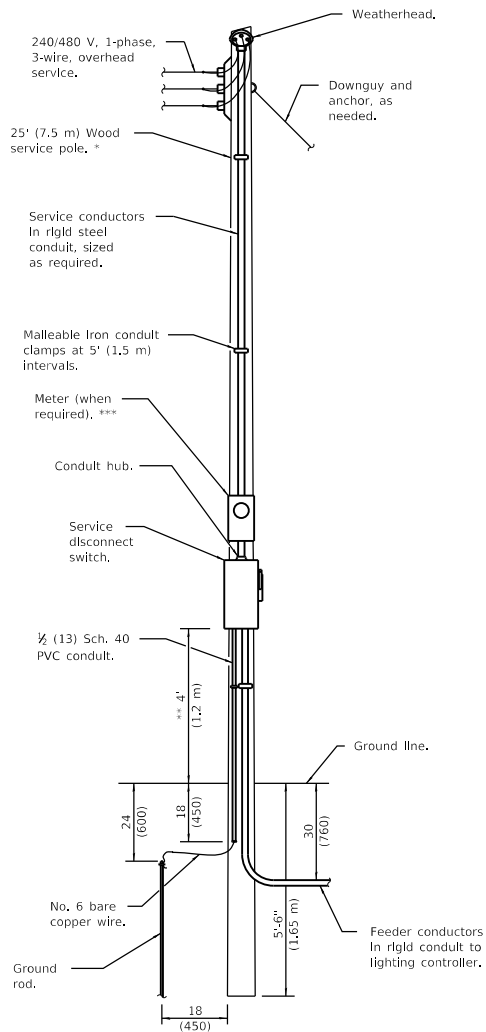
ISSUED 1-1-12

APPROVED January 3, 2019

ENGINEER OF DESIGN AND ENVIRONMENT

NAVIGATION OBSTRUCTION LIGHTING CONTROLLER, 240V
(Sheet 2 of 2)

STANDARD 826001-02

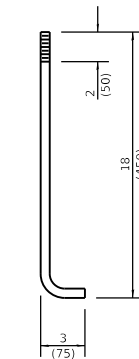


ELECTRIC SERVICE INSTALLATION

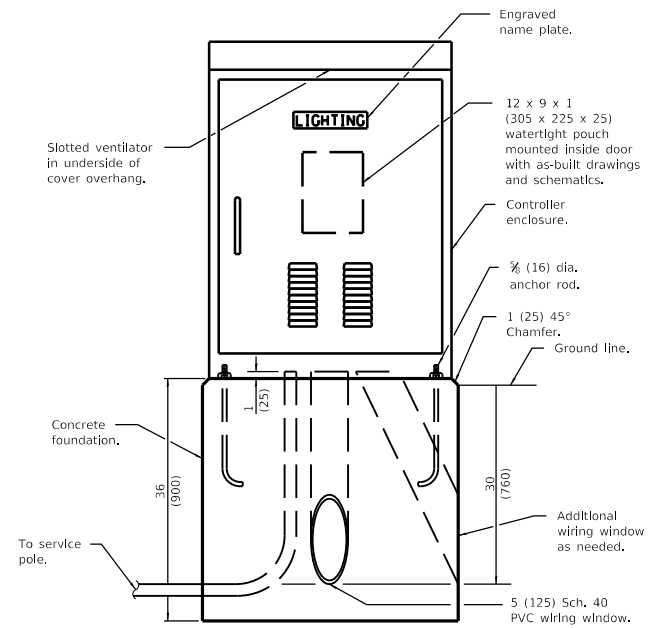
(Typical overhead service shown. Cut pole off for underground service and treat cut surface with preservative. Consult utility company standards for exact requirements.)

* Size larger as needed.

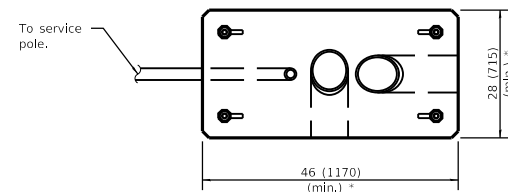
** When cold sequencing is required, provide a meter disconnect switch as directed by Utility Company.



**ANCHOR ROD
DETAIL**



LIGHTING CONTROLLER



FOUNDATION (PLAN)
(Work pad not shown.)

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-19	Replaced ** note with new note regarding utility company standards. Made *** the ** note.
1-1-15	Added note 18.

**NAVIGATION OBSTRUCTION
LIGHTING CONTROLLER, 480V**
(Sheet 1 of 2)

STANDARD 826006-02

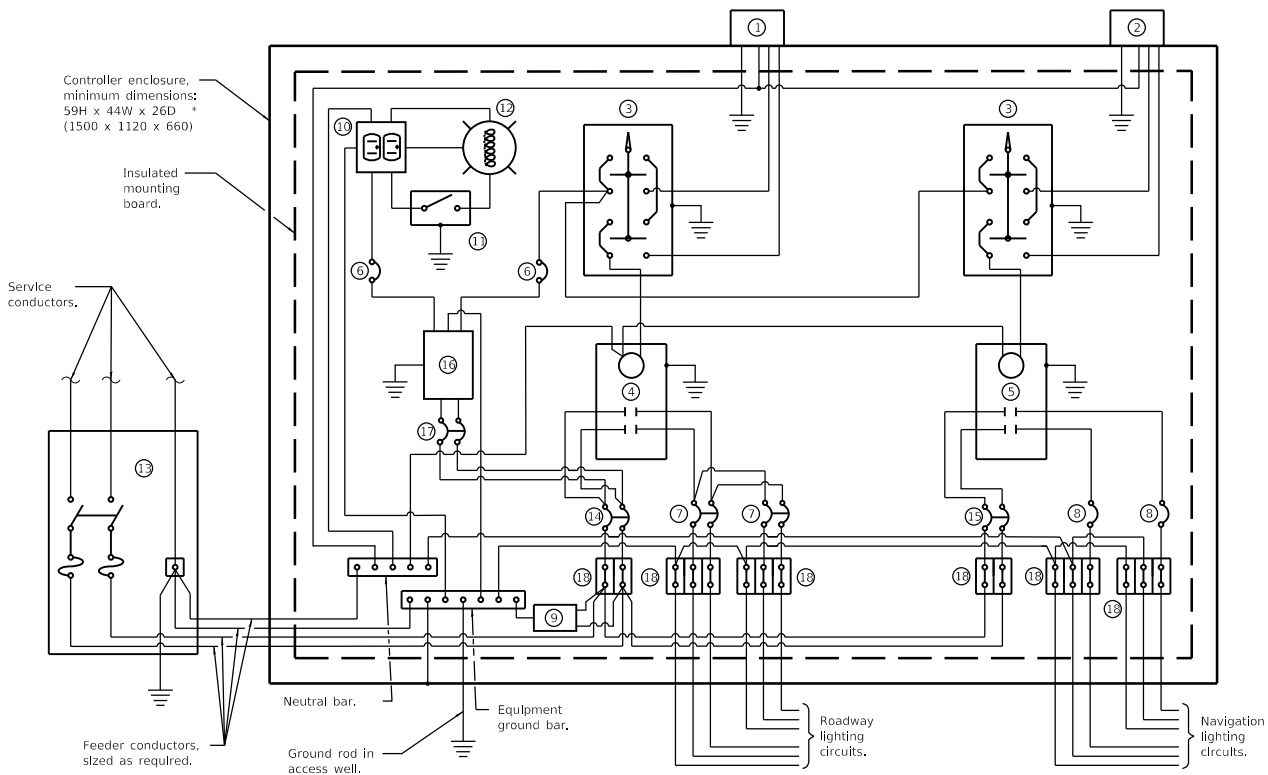
Illinois Department of Transportation

PASSED January 1, 2019

ISSUED 1-1-12

APPROVED January 1, 2019

ENGINEER OF DESIGN AND ENVIRONMENT



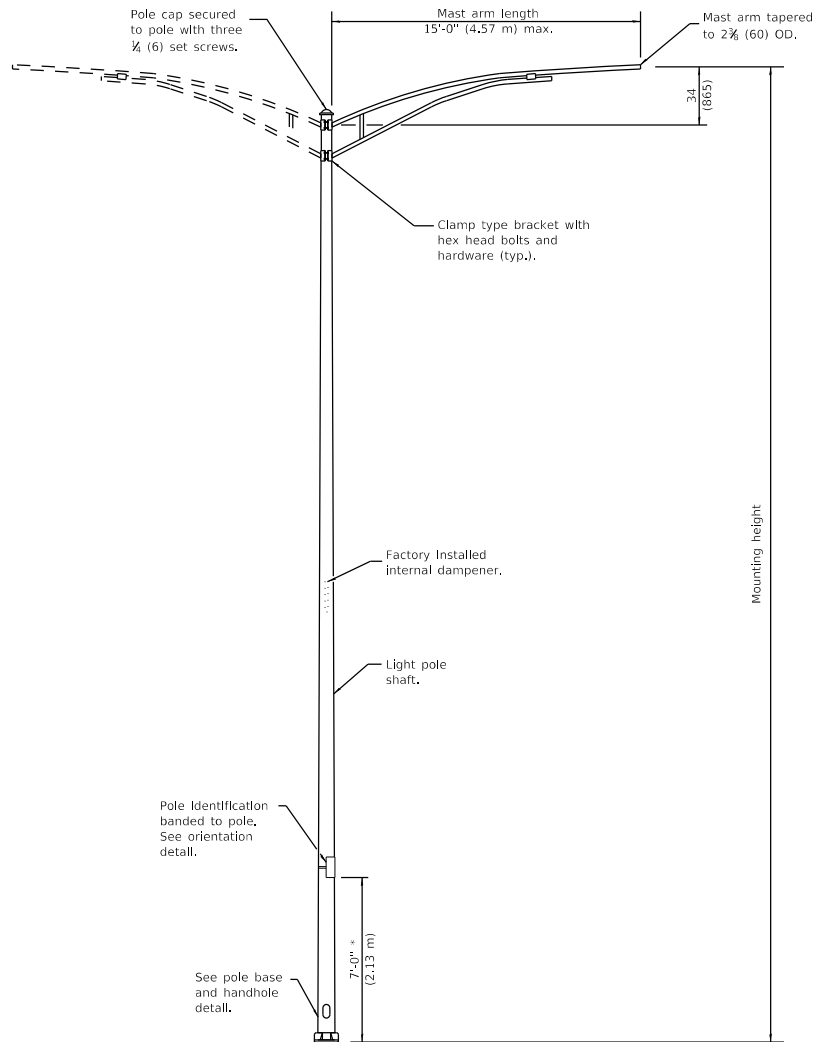
- ① Photocell with integral surge arrester for roadway lighting.
- ② Photocell with integral surge arrester for navigation lighting.
- ③ HAND-OFF-AUTO selector switch.
- ④ 100 amp*, electrically held contactor.
- ⑤ 60 amp*, electrically held contactor.
- ⑥ 15 amp, 1-pole circuit breaker.
- ⑦ 20 amp*, 2-pole circuit breaker (two spares required but not shown).
- ⑧ 20 amp*, single-pole circuit breaker (two shown, quantity as required).
- ⑨ Surge arrester.
- ⑩ GFCI duplex receptacle.
- ⑪ Single-pole, single-throw switch.
- ⑫ Incandescent luminaire, enclosed and gasketed with 100 watt lamp.
- ⑬ Service disconnect switch - 2-pole, 3-wire, 100 amp*, fused at 100 amp*, solid neutral in NEMA 4X enclosure having lockable external handle.
- ⑭ 60 amp*, 2-pole circuit breaker.
- ⑮ 30 amp*, 2-pole circuit breaker.
- ⑯ Transformer - 1 KVA*, 480V primary, 120/240V secondary, single phase, 60 Hz.
- ⑰ 15 amp, 2-pole circuit breaker.
- ⑱ Terminal block sized for conductors as shown on plans.

* Size larger as needed.

CONTROL SCHEMATIC

Illinois Department of Transportation
 PASSED January 1, 2019
 ISSUED 1-1-12
 ELECTRICAL AND MECHANICAL UNIT CHIEF
 APPROVED January 1, 2019
 ENGINEER OF DESIGN AND ENVIRONMENT

NAVIGATION OBSTRUCTION LIGHTING CONTROLLER, 480V
 (Sheet 2 of 2)
STANDARD 826006-02



POLE		
MOUNTING HEIGHT	MINIMUM SHAFT DIAMETER	MINIMUM WALL THICKNESS
35' (10.7 m) or less	8 tapered to 4 1/2" (200 to 114)	0.25 (6)
Greater than 35' (10.7 m) to 45' (13.7 m)	10 tapered to 6" (250 to 150)	0.25 (6)
Greater than 45' (13.7 m) to 50' (15.2 m)	10 tapered to 6" (250 to 150)	0.312 (8)

POLE BASE	
MOUNTING HEIGHT	BOLT CIRCLE DIAMETER
35' (10.7 m) or less	11 1/2" (290)
Greater than 35' (10.7 m) to 50' (15.2 m)	15" (380)

GENERAL NOTES

See Standard 836001 for Light Pole Foundation and grounding electrode.

See Standard 720001 for pole identification banding to pole.

VOIDS in light pole base shall be sealed to prevent rodent entry.

Provide breakaway devices where required.

Where anchor rods on existing bridge parapets are too short to mount poles as shown, install leveling plate directly on concrete and level with stainless steel washers.

All dimensions are in inches (millimeters) unless otherwise shown.

MAST ARM LIGHT POLE

(Single or twin mount)

* Unless directed otherwise by the Engineer.

DATE	REVISIONS
1-1-15	Revised note on HANDHOLE DETAIL.
1-1-14	Added pole mounted on bridge parapet. Modified attachment of screen.

**LIGHT POLE
ALUMINUM MAST ARM**

(Sheet 1 of 2)

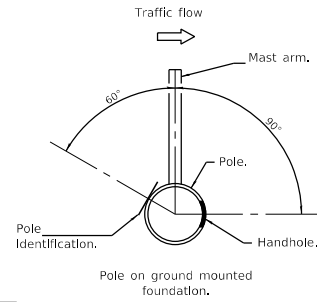
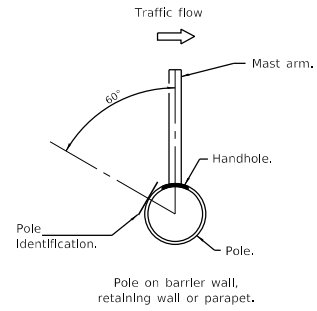
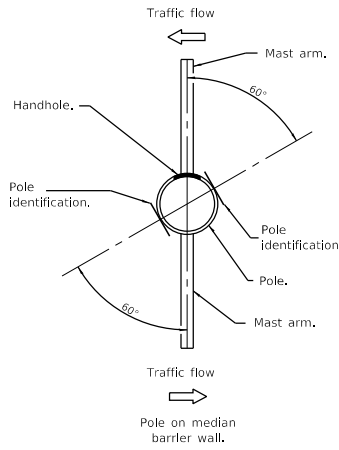
STANDARD 830001-03

Illinois Department of Transportation

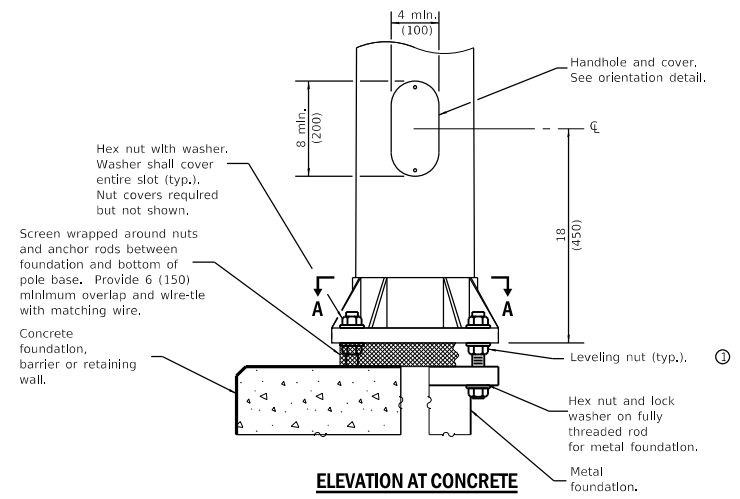
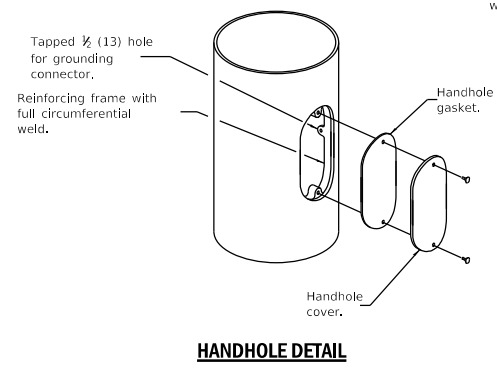
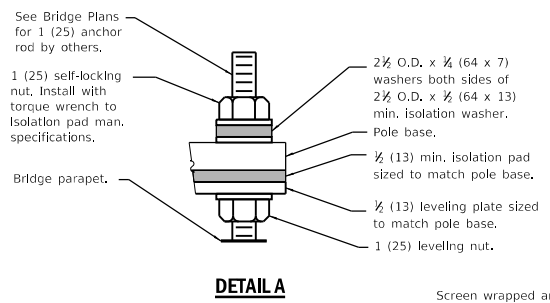
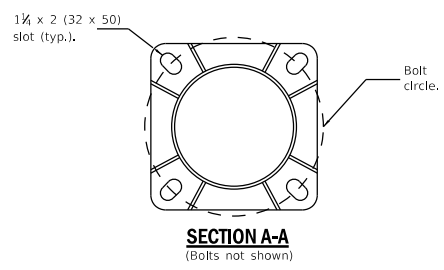
APPROVED January 1, 2015
David G. [Signature]
 ENGINEER OF PRELIMINARY ENGINEERING

ISSUED 1-1-12

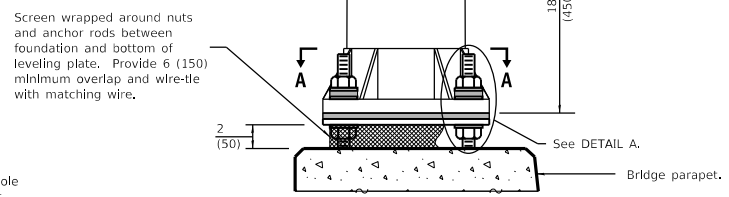
APPROVED January 1, 2015
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 ENGINEER OF DESIGN AND ENVIRONMENT



HANDHOLE / IDENTIFICATION ORIENTATION DETAIL



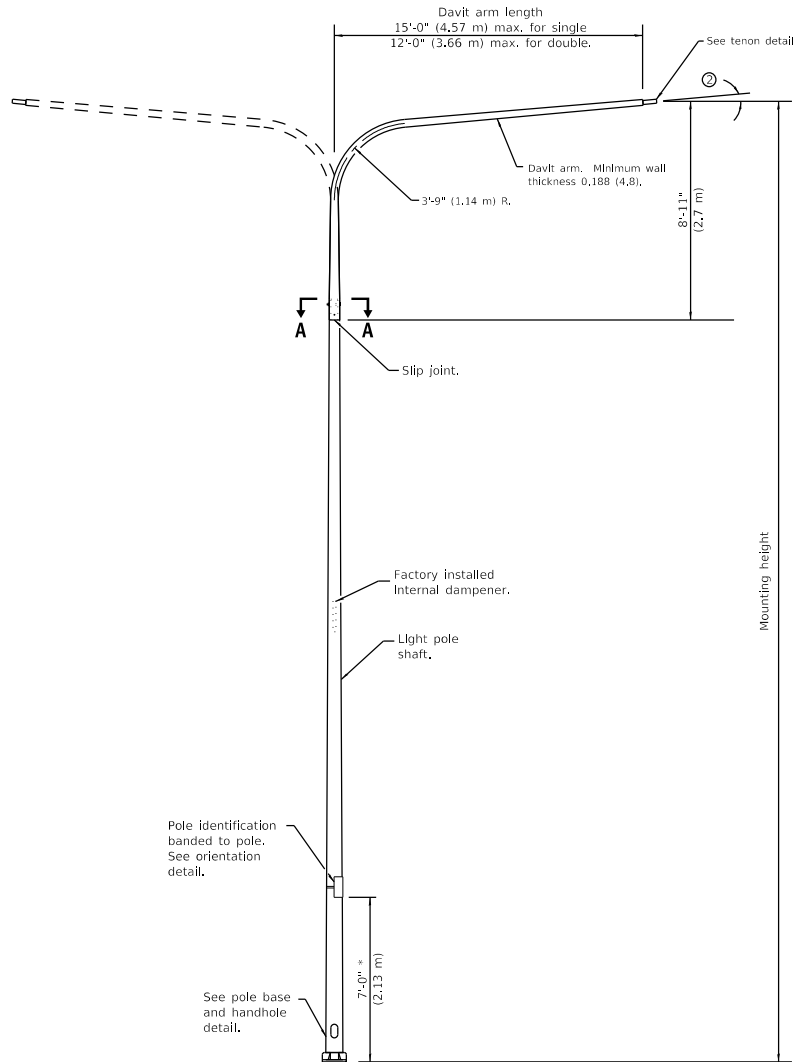
Ⓢ Omit leveling nuts when breakaway devices are required.



POLE BASE DETAILS

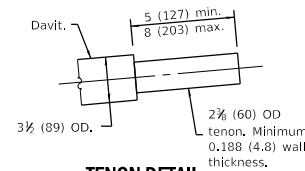
Illinois Department of Transportation
 APPROVED January 1, 2015
 ENGINEER OF PRELIMINARY ENGINEERING
 APPROVED January 1, 2015
 ENGINEER OF DESIGN AND ENVIRONMENT

LIGHT POLE ALUMINUM MAST ARM
 (Sheet 2 of 2)
STANDARD 830001-03

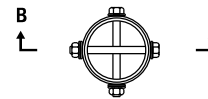


POLE BASE	
MOUNTING HEIGHT	BOLT CIRCLE DIAMETER
35' (10.7 m) or less	11½ (290)
Greater than 35' (10.7 m) to 50' (15.2 m)	15 (380)

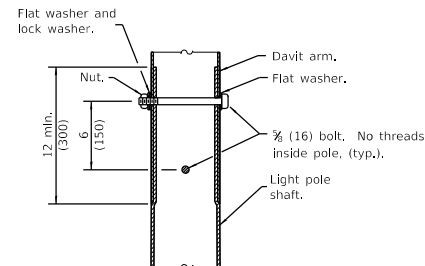
POLE LOWER SHAFT			
MOUNTING HEIGHT	LOWER SHAFT LENGTH ①	MINIMUM SHAFT DIAMETER	MINIMUM WALL THICKNESS
30' (9.1 m)	21'-1" (6.4 m)	8 tapered to 6 (200 to 114)	0.25 (6)
35' (10.7 m)	26'-1" (7.9 m)	8 tapered to 6 (200 to 114)	0.25 (6)
40' (12.2 m)	31'-1" (9.5 m)	10 tapered to 6 (250 to 150)	0.25 (6)
45' (13.7 m)	36'-1" (11.0 m)	10 tapered to 6 (250 to 150)	0.25 (6)
50' (15.2 m)	41'-1" (12.5 m)	10 tapered to 6 (250 to 150)	0.312 (8)



TENON DETAIL



SECTION A-A



SECTION B-B

- ① Lower shaft length shall be from the bottom of the pole base to the bottom of the slip joint.
- ② 5° max. for unloaded pole, 1.5° max. for loaded pole.

GENERAL NOTES

See Standard 836001 for Light Pole Foundation and grounding electrode.

See Standard 720001 for pole identification banding to pole.

Voids in light pole base shall be sealed to prevent rodent entry.

Provide breakaway devices where required.

Where anchor rods on existing bridge parapets are too short to mount poles as shown, install leveling plate directly on concrete and level with stainless steel washers.

All dimensions are in inches (millimeters) unless otherwise shown.

DAVIT LIGHT POLE

(Single or twin mount)

* Unless directed otherwise by the Engineer.

Illinois Department of Transportation

PASSED January 1, 2019
me. S. Wood
 ELECTRICAL AND MECHANICAL UNIT CHIEF

APPROVED January 1, 2019
S. C. E.
 ENGINEER OF DESIGN AND ENVIRONMENT

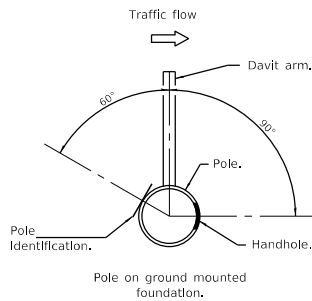
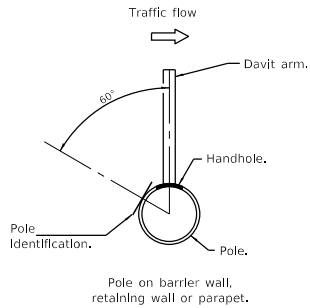
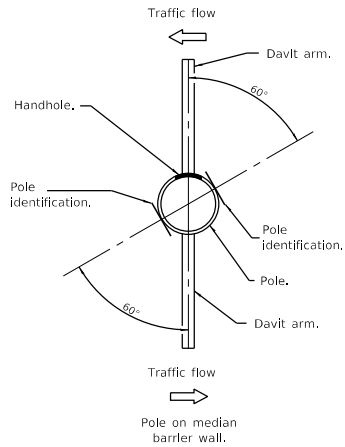
ISSUED 1-1-12

DATE	REVISIONS
1-1-19	Revised standard to comply with the 2013 version of AASHTO.
1-1-17	Added notes ③ and ④.

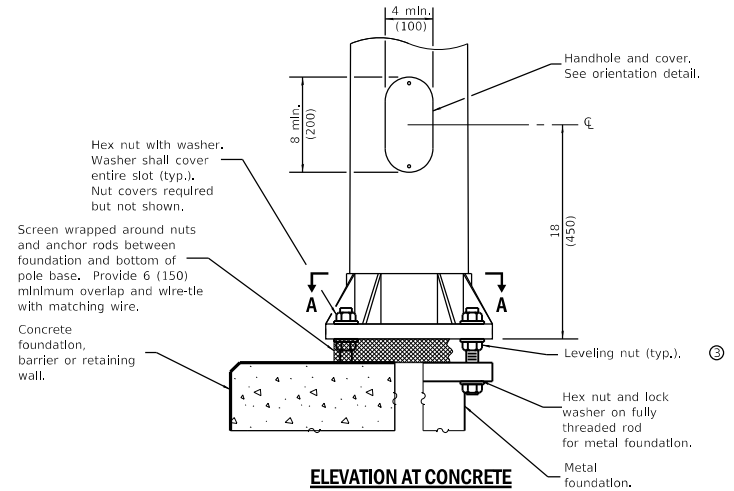
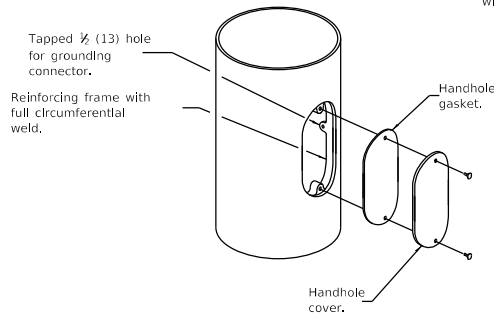
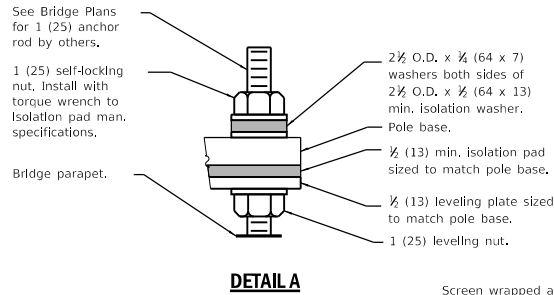
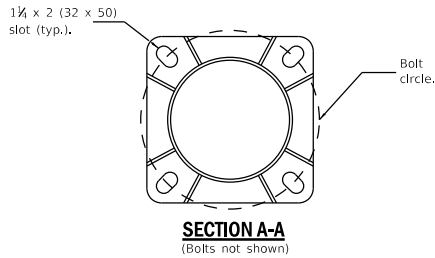
**LIGHT POLE
ALUMINUM DAVIT ARM**

(Sheet 1 of 2)

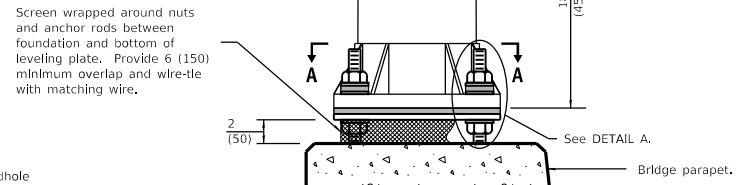
STANDARD 830006-05



HANDHOLE / IDENTIFICATION ORIENTATION DETAIL



ⓐ Omit leveling nuts when breakaway devices are required.



POLE BASE DETAILS

LIGHT POLE ALUMINUM DAVIT ARM

(Sheet 2 of 2)

STANDARD 830006-05

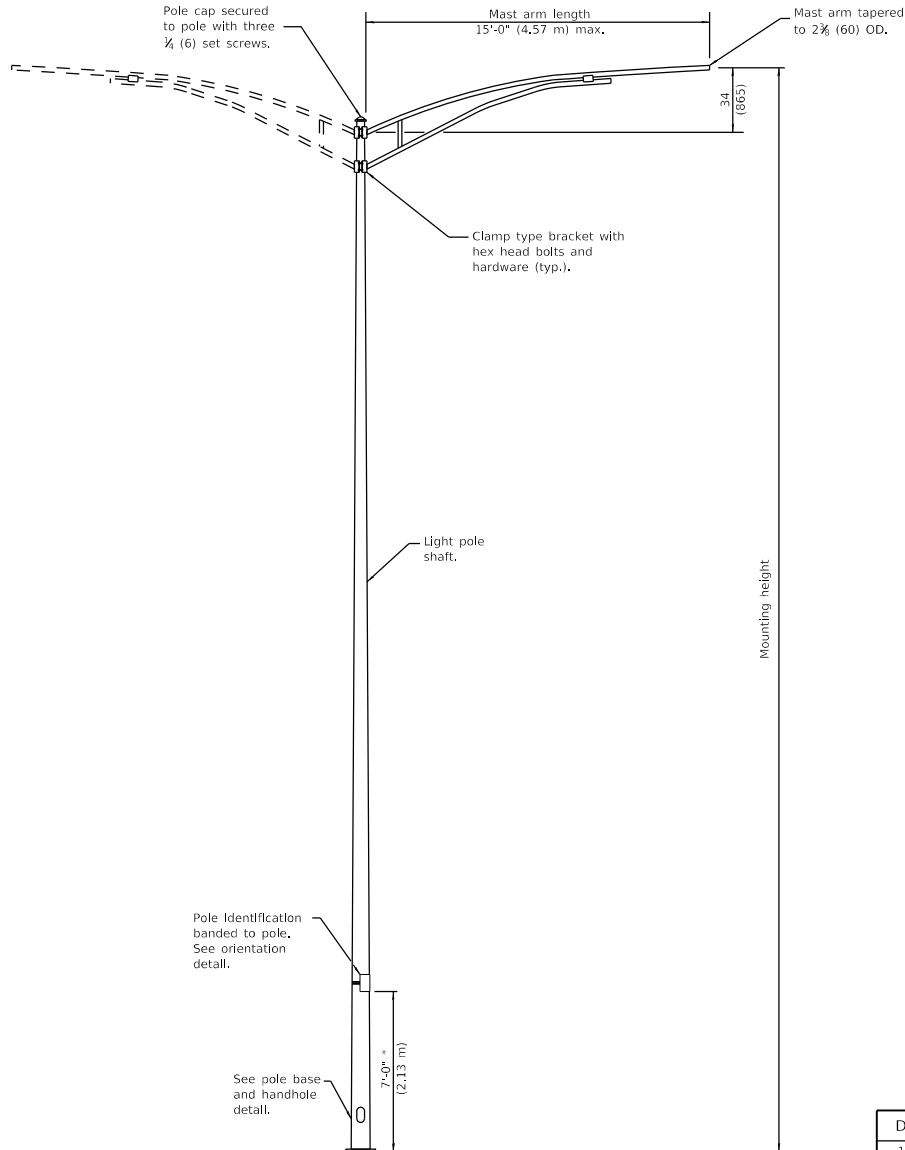
Illinois Department of Transportation

PASSED January 1, 2019

ISSUED 1-1-12

APPROVED January 1, 2019

ENGINEER OF DESIGN AND ENVIRONMENT



POLE		
MOUNTING HEIGHT	MINIMUM SHAFT DIAMETER	MINIMUM WALL THICKNESS
35' (10.7 m) or less	8 tapered to 4 (200 to 100)	10 gauge
Greater than 35' (10.7 m) to 50' (15.2 m)	10 tapered to 4 (250 to 100)	7 gauge

BASE PLATE		
MOUNTING HEIGHT	BOLT CIRCLE DIAMETER	BASE PLATE THICKNESS
35' (10.7 m) or less	11 1/2 (290)	1 (25)
Greater than 35' (10.7 m) to 50' (15.2 m)	15 (380)	1 1/2 (32)

GENERAL NOTES

See Standard 836001 for Light Pole Foundation and grounding electrode.

See Standard 720001 for pole identification banding to pole.

Provide breakaway devices where required.

Where anchor rods on existing bridge parapets are too short to mount poles as shown, install leveling plate directly on concrete and level with stainless steel washers.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-19	Revised POLE and BASE POLE tables.
1-1-14	Added pole mounted on bridge parapet. Modified attachment of screen.

**LIGHT POLE
STEEL MAST ARM**

(Sheet 1 of 2)

STANDARD 830011-03

Illinois Department of Transportation

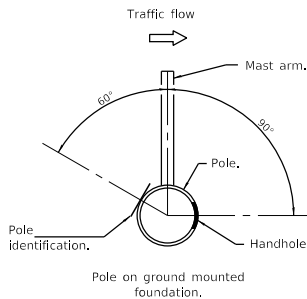
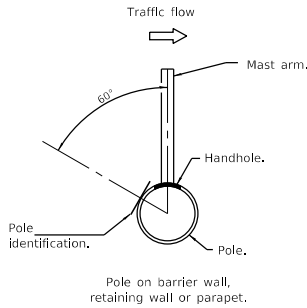
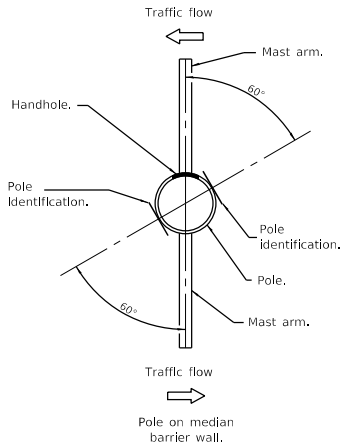
PASSED January 1, 2019
ELECTRICAL AND MECHANICAL UNIT CHIEF
APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-12

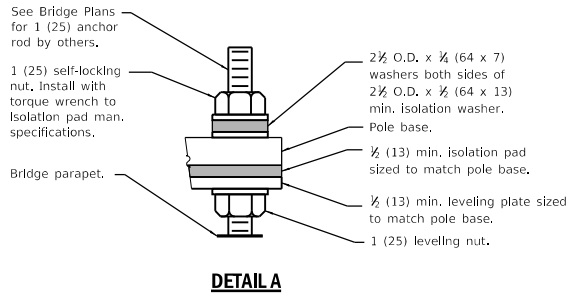
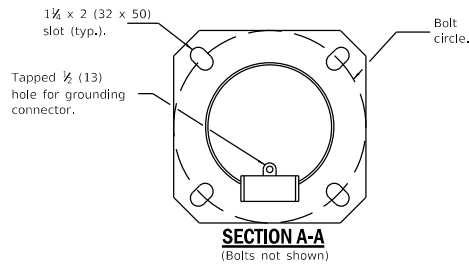
**MAST ARM
LIGHT POLE**

(Single or twin mount)

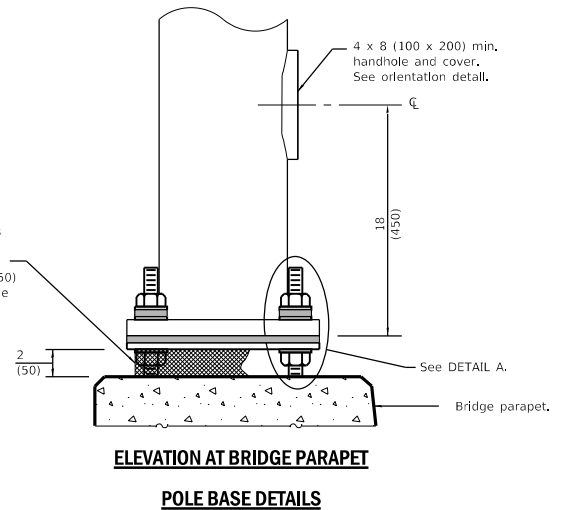
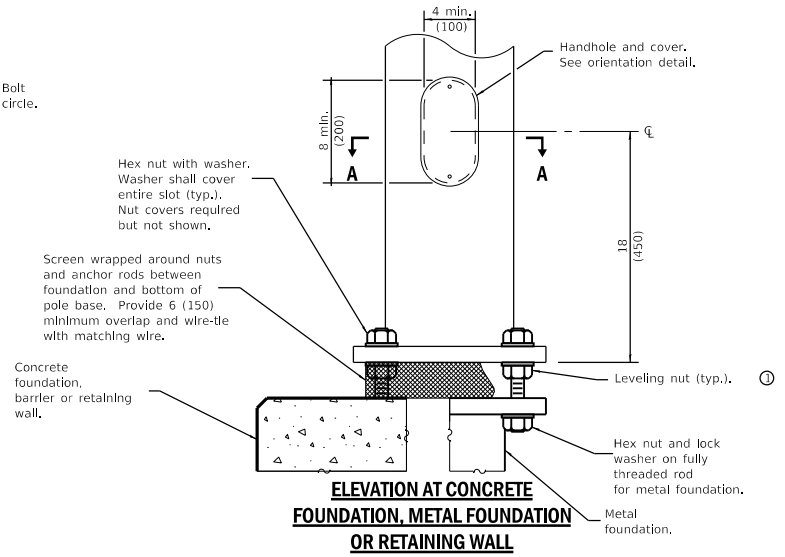
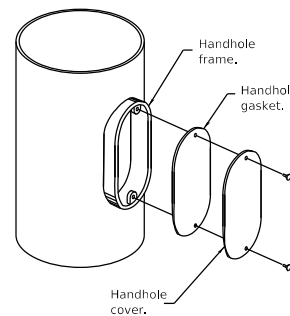
* Unless directed otherwise by the Engineer.



HANDHOLE / IDENTIFICATION ORIENTATION DETAIL



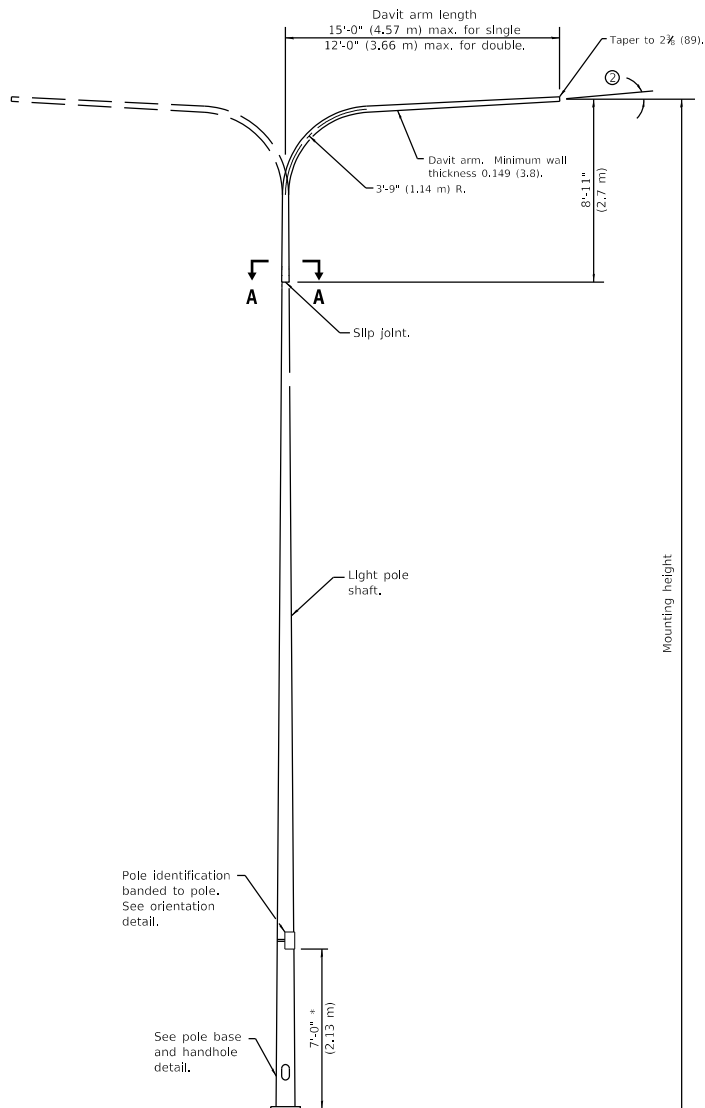
HANDHOLE DETAIL



POLE BASE DETAILS

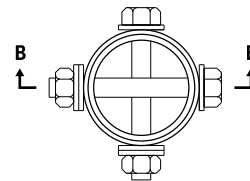
Illinois Department of Transportation
 PASSED January 1, 2019
 ELECTRICAL AND MECHANICAL UNIT CHIEF
 APPROVED January 1, 2019
 ENGINEER OF DESIGN AND ENVIRONMENT

LIGHT POLE STEEL MAST ARM
 (Sheet 2 of 2)
STANDARD 830011-03

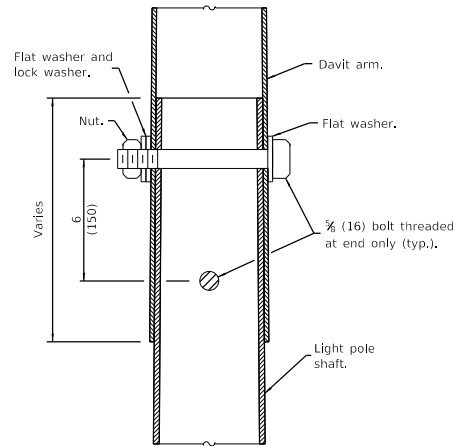


BASE PLATE		
MOUNTING HEIGHT	BOLT CIRCLE DIAMETER	BASE PLATE THICKNESS
35' (10.7 m) or less	11 1/2 (290)	1 (25)
Greater than 35' (10.7 m) to 50' (15.2 m)	15 (380)	1 1/2 (32)

POLE LOWER SHAFT			
MOUNTING HEIGHT	LOWER SHAFT LENGTH ①	MINIMUM SHAFT DIAMETER	MINIMUM WALL THICKNESS
30' (9.1 m)	21'-1" (6.4 m)	8 tapered to 6 (200 to 114)	10 gauge
35' (10.7 m)	26'-1" (7.9 m)	8 tapered to 6 (200 to 114)	10 gauge
40' (12.2 m)	31'-1" (9.5 m)	10 tapered to 6 (250 to 150)	7 gauge
45' (13.7 m)	36'-1" (11.0 m)	10 tapered to 6 (250 to 150)	7 gauge
50' (15.2 m)	41'-1" (12.5 m)	10 tapered to 6 (250 to 150)	7 gauge



SECTION A-A



SECTION B-B

- ① Lower shaft length shall be from the bottom of the pole base to the bottom of the slip joint.
- ② 3° max. for unloaded pole, 1.5° max. for loaded pole.

GENERAL NOTES

See Standard 836001 for Light Pole Foundation and grounding electrode.

See Standard 720001 for pole identification banding to pole.

Provide breakaway devices where required.

Where anchor rods on existing bridge parapets are too short to mount poles as shown, install leveling plate directly on concrete and level with stainless steel washers.

All dimensions are in inches (millimeters) unless otherwise shown.

DAVIT LIGHT POLE

(Single or twin mount)

* Unless directed otherwise by the Engineer.

Illinois Department of Transportation

PASSED January 1, 2019
me. [signature]
 ELECTRICAL AND MECHANICAL UNIT CHIEF

APPROVED January 1, 2019
[signature]
 ENGINEER OF DESIGN AND ENVIRONMENT

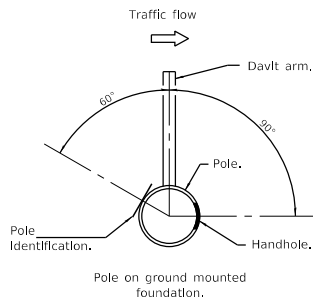
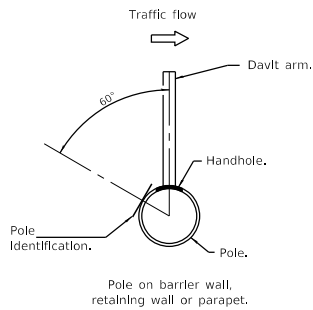
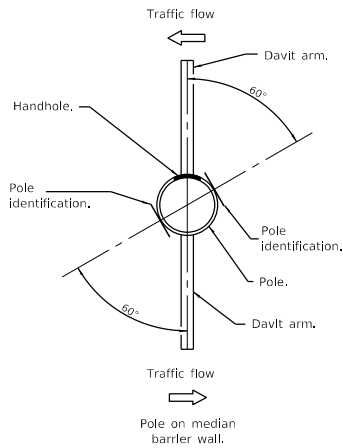
ISSUED 1-1-12

DATE	REVISIONS
1-1-19	Revised BASE PLATE table.
1-1-14	Added pole mounted on bridge parapet. Modified attachment of screen.

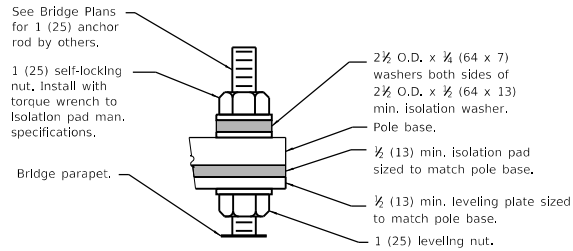
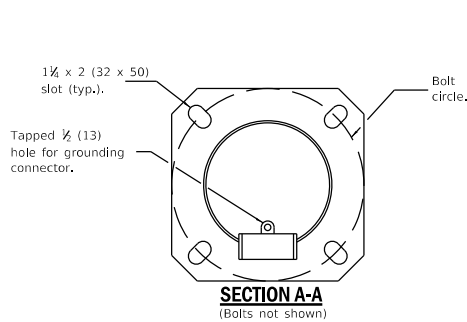
**LIGHT POLE
STEEL DAVIT ARM**

(Sheet 1 of 2)

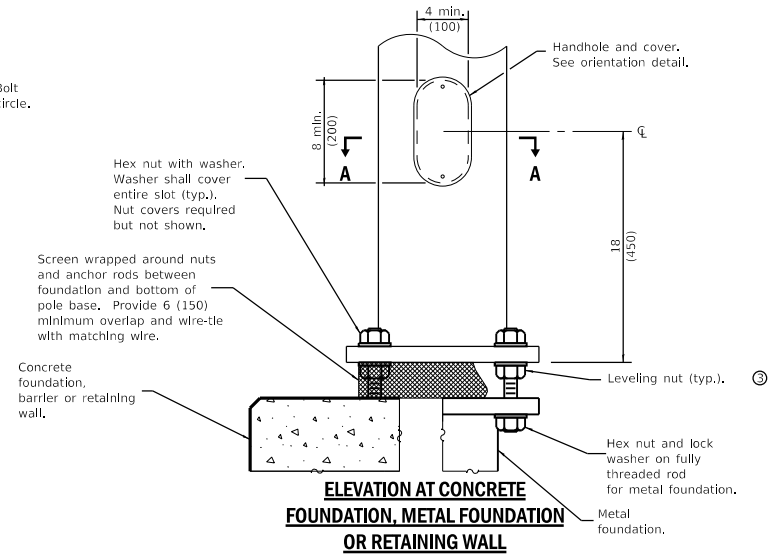
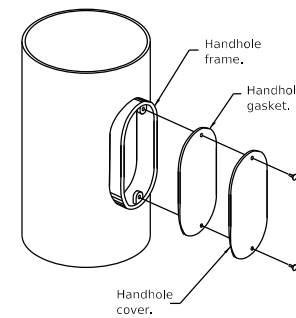
STANDARD 830016-03



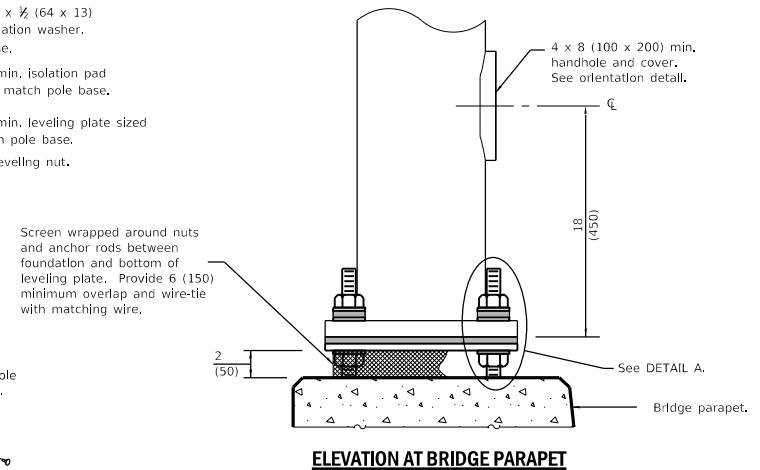
HANDHOLE / IDENTIFICATION ORIENTATION DETAIL



DETAIL A



③ Omit leveling nuts when breakaway devices are required.



POLE BASE DETAILS

LIGHT POLE STEEL DAVIT ARM

(Sheet 2 of 2)

STANDARD 830016-03

Illinois Department of Transportation

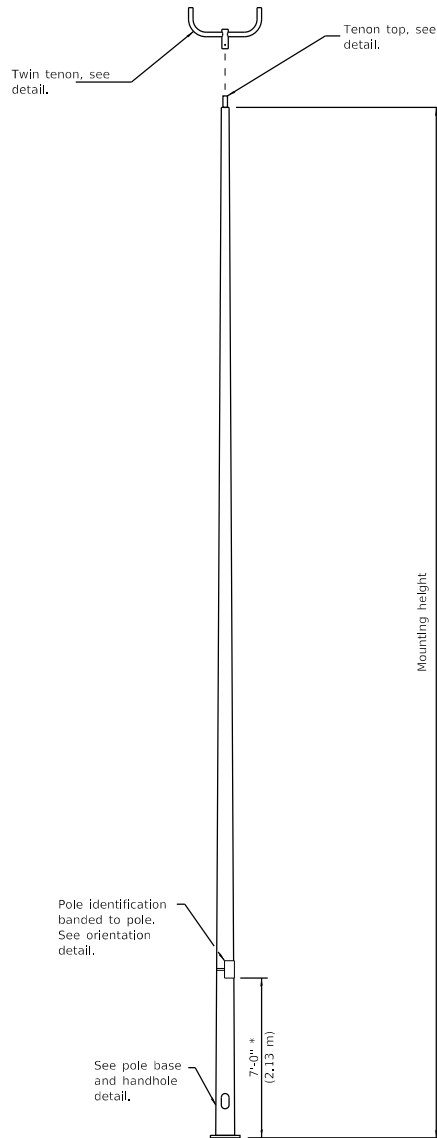
PASSED January 3, 2019

ISSUED 1-1-12

ME [Signature] ELECTRICAL AND MECHANICAL UNIT CHIEF

APPROVED January 3, 2019

[Signature] ENGINEER OF DESIGN AND ENVIRONMENT



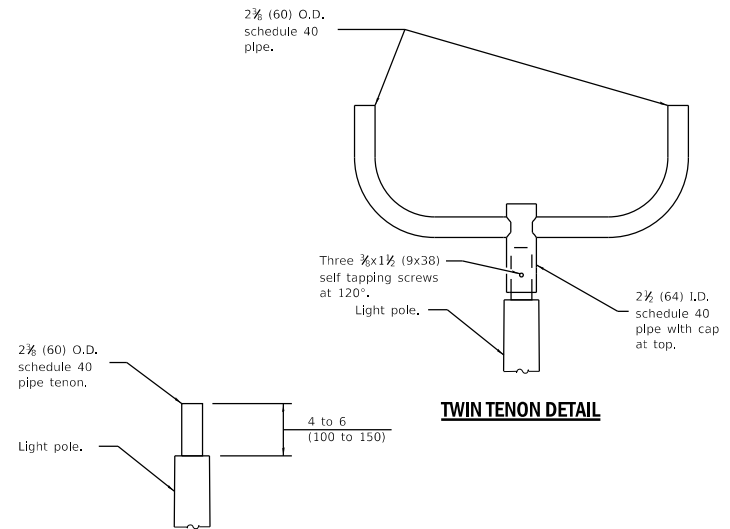
TENON TOP LIGHT POLE

(Single or twin mount)

* Unless directed otherwise by the Engineer.

BASE PLATE		
MOUNTING HEIGHT	BOLT CIRCLE DIAMETER	BASE PLATE THICKNESS
35' (10.7 m) or less	11½ (290)	1 (25)
Greater than 35' (10.7 m) to 50' (15.2 m)	15 (380)	1½ (32)

LIGHT POLE		
MOUNTING HEIGHT	MINIMUM SHAFT DIAMETER	MINIMUM WALL THICKNESS
35' (10.7 m) or less	8 tapered to 4 (200 to 100)	10 gauge
Greater than 35' (10.7 m) to 50' (15.2 m)	10 tapered to 4 (250 to 100)	7 gauge



TENON DETAIL

TWIN TENON DETAIL

GENERAL NOTES

See Standard 836001 for Light Pole Foundation and grounding electrode.

See Standard 720001 for pole identification banding to pole.

Provide breakaway devices where required.

Where anchor rods on existing bridge parapets are too short to mount poles as shown, install leveling plate directly on concrete and level with stainless steel washers.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-19	Revised BASE PLATE and LIGHT POLE tables.
1-1-14	Added pole mounted on bridge parapet. Modified attachment of screen.

**LIGHT POLE
STEEL TENON TOP**

(Sheet 1 of 2)

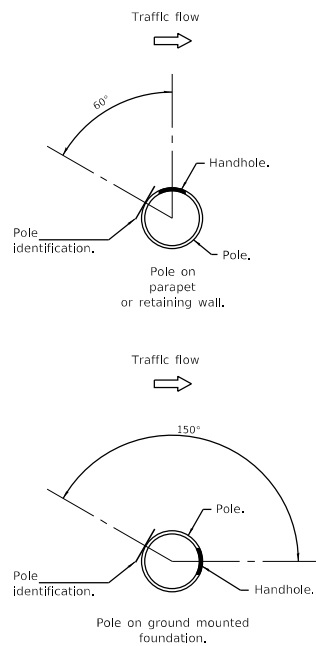
STANDARD 830021-03

Illinois Department of Transportation

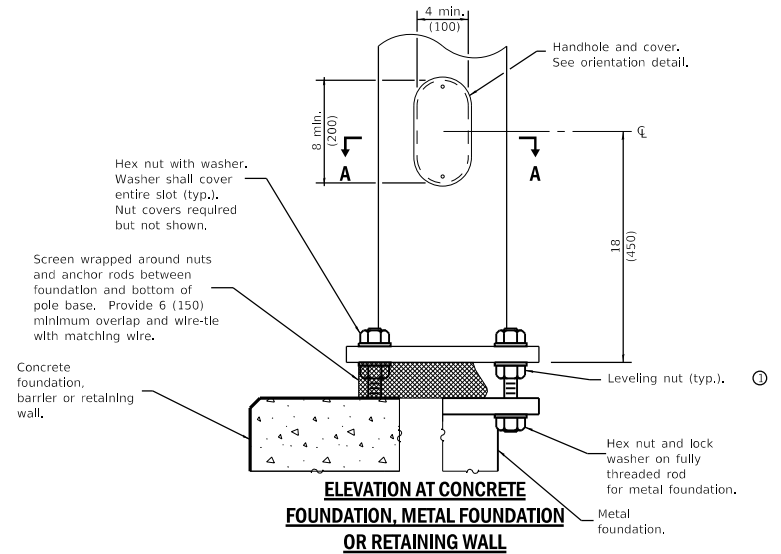
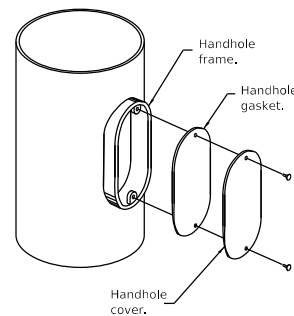
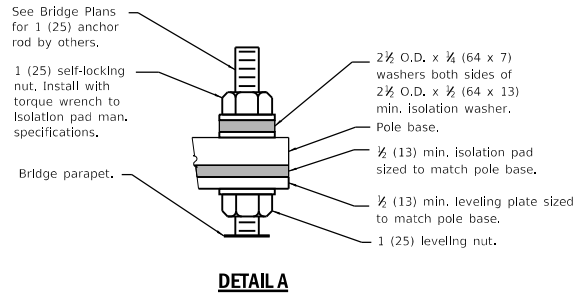
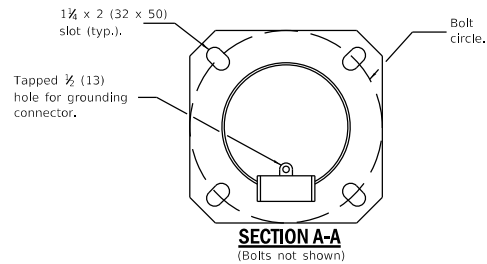
PASSED January 1, 2019
me. S. Smith
 ELECTRICAL AND MECHANICAL UNIT CHIEF

APPROVED January 1, 2019
[Signature]
 ENGINEER OF DESIGN AND ENVIRONMENT

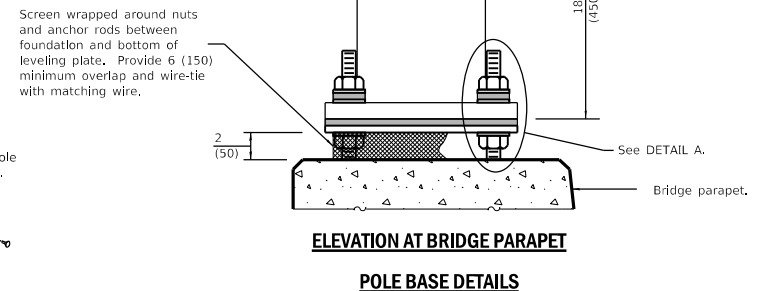
ISSUED 1-1-12



HANDHOLE / IDENTIFICATION ORIENTATION DETAIL



① Omit leveling nuts when breakaway devices are required.



Illinois Department of Transportation

PASSED January 3, 2019

ISSUED 1-1-12

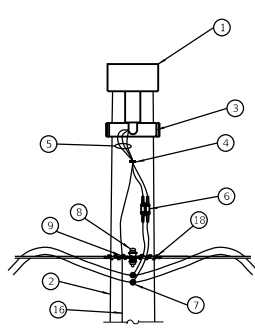
APPROVED January 3, 2019

ENGINEER OF DESIGN AND ENVIRONMENT

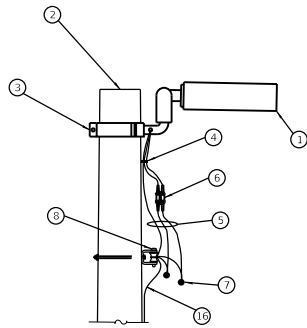
LIGHT POLE STEEL TENON TOP

(Sheet 2 of 2)

STANDARD 830021-03

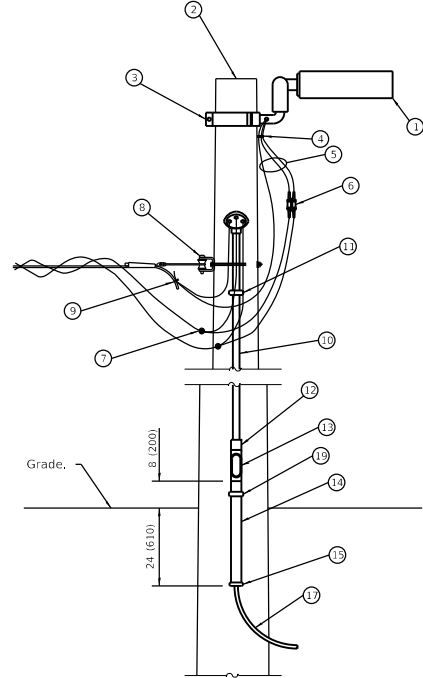


FACING VIEW



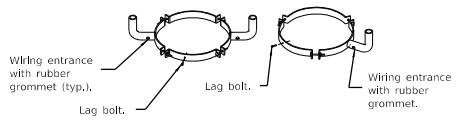
SIDE VIEW

LUMINAIRE MOUNTING DETAILS
 43' - 44' (13.1 m - 13.4 m) mounting height unless noted otherwise on plans.



LIGHT POLE WITH CIRCUIT ROUTED UNDERGROUND

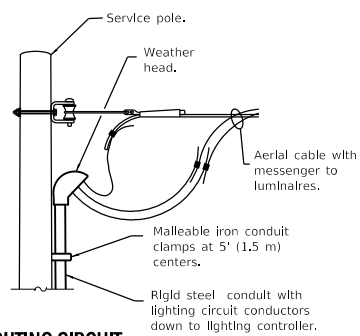
- ① Luminaire.
 - ② Wood light pole, 50' (15.2 m), class 3 (typ). *
 - ③ Luminaire mounting bracket.
 - ④ Cable clamps on 24 (600) centers.
 - ⑤ Three #10 XLP-USE cable.
 - ⑥ Waterproof, two-pole fuse holder with fuses.
 - ⑦ Waterproof insulation piercing tap connector.
 - ⑧ Heavy duty insulated pulley clevis with mounting bolt and hardware.
 - ⑨ Ground clamp.
 - ⑩ 1 (25) rigid steel conduit. *
 - ⑪ Malleable iron conduit clamps, 5' (1.5 m) intervals.
 - ⑫ Threaded conduit reducer.
 - ⑬ "C" conduit, threaded.
 - ⑭ 1½ (40) rigid steel conduit. *
 - ⑮ Conduit bushing.
 - ⑯ #6 Bare copper ground wire to 10 ft. ground rod, every third light pole.
 - ⑰ Unit duct.
 - ⑱ Wire tie.
 - ⑲ Malleable iron conduit clamp below "C" conduit.
- * Size larger as needed.



TWIN

SINGLE

MOUNTING BRACKET DETAILS



LIGHTING CIRCUIT AT SERVICE/CONTROLLER

See standard 825001 for service installation.

GENERAL NOTES

See plans for wire and unit duct sizes and pole locations not shown.
 Provide guy wires with strain insulators and anchors, as needed.
 All dimensions are in Inches (millimeters) unless otherwise shown.

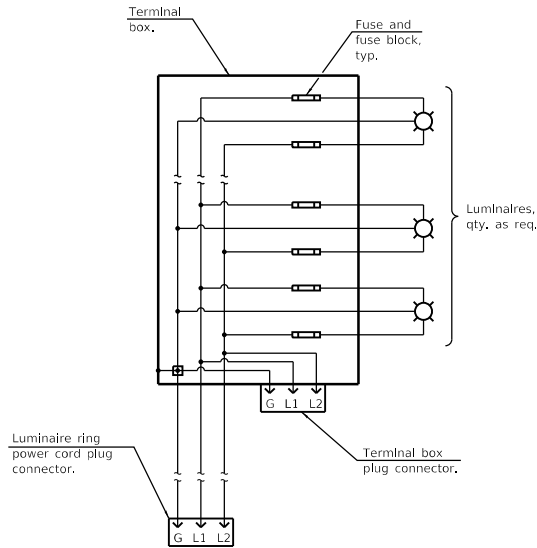
Illinois Department of Transportation

PASSED January 1, 2019
 ELECTRICAL AND MECHANICAL UNIT CHIEF
 APPROVED January 1, 2019
 ENGINEER OF DESIGN AND ENVIRONMENT

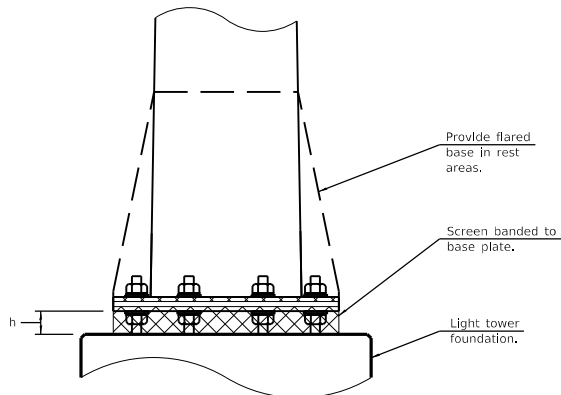
DATE	REVISIONS
1-1-19	Revised Luminaire to be horizontal.
1-1-13	New standard.

TEMPORARY ROADWAY LIGHTING

STANDARD 830026-01

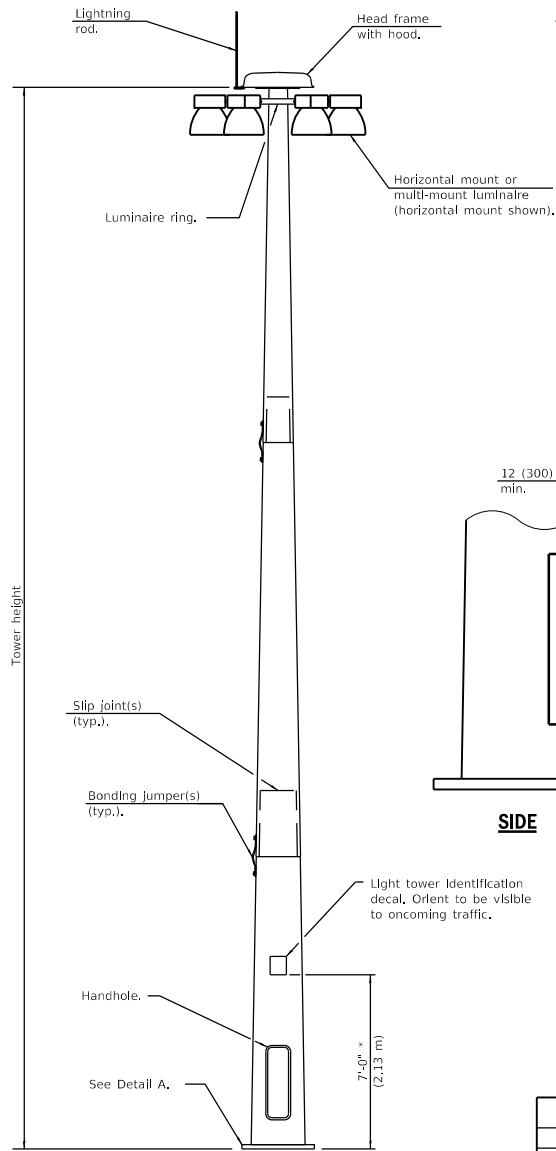


LUMINAIRE RING WIRING DIAGRAM



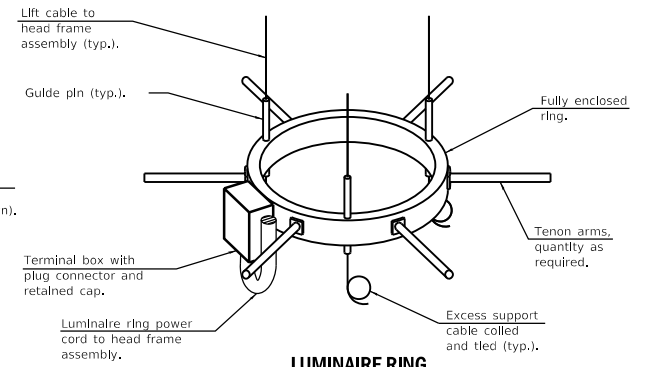
DETAIL A

h = Anchor rod dia. + leveling nut and washer thickness.



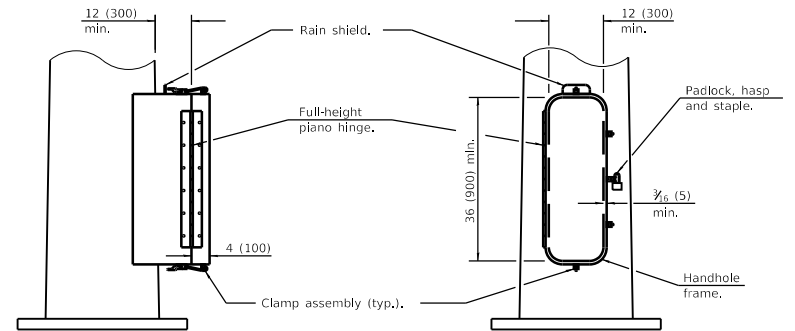
LIGHT TOWER

* Unless directed otherwise by the Engineer.



LUMINAIRE RING

(Two or three lift cable system permitted, three lift cable type shown.)



SIDE

FRONT

HANDHOLE

GENERAL NOTES

See Standard 837001 for High Mast Tower Foundation and grounding electrode.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-15	Added light tower identification decal.
1-1-11	Modified Detail A.
1-1-11	New Standard.

LIGHT TOWER

(Sheet 1 of 2)

STANDARD 835001-01

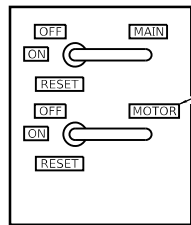
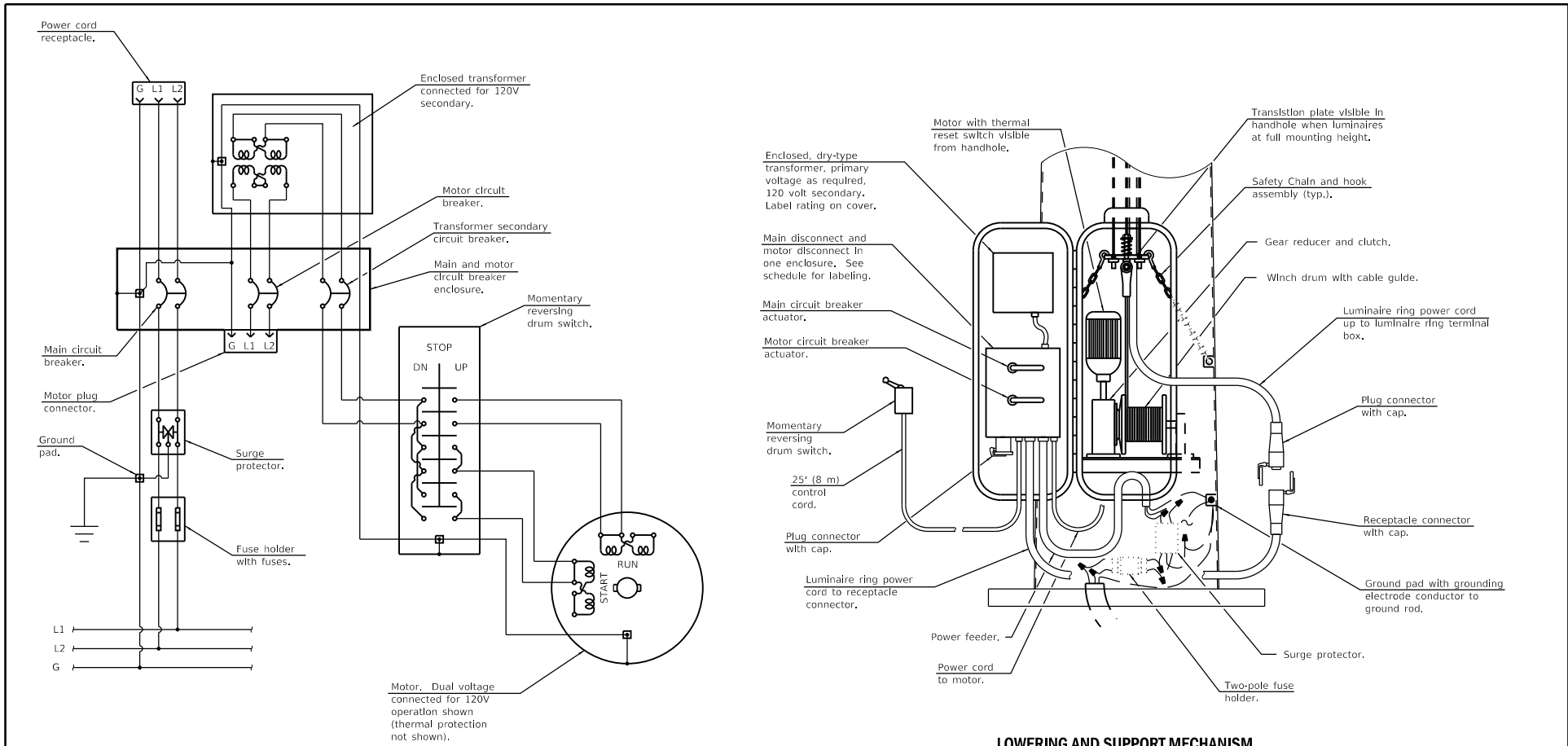
Illinois Department of Transportation

APPROVED January 1, 2015

ENGINEER OF PRELIMINARY ENGINEERING

APPROVED January 1, 2015

ENGINEER OF DESIGN AND ENVIRONMENT



DISCONNECT SCHEDULE

Illinois Department of Transportation

APPROVED January 1, 2015

ENGINEER OF PRELIMINARY ENGINEERING

APPROVED January 1, 2015

ENGINEER OF DESIGN AND ENVIRONMENT

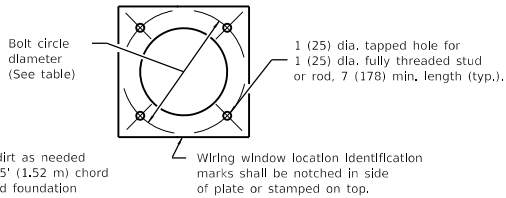
LIGHT TOWER

(Sheet 2 of 2)

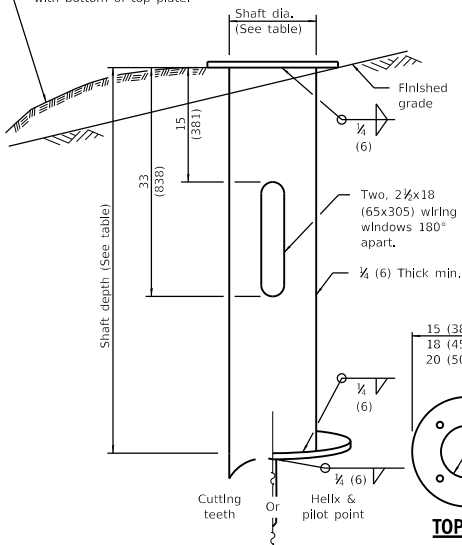
STANDARD 835001-01

LIGHT POLE MOUNTING HEIGHT	METAL FOUNDATION				CONCRETE FOUNDATION		
	BOLT CIRCLE DIAMETER	SHAFT DIAMETER	SHAFT DEPTH	TOP PLATE (min)	SHAFT DIAMETER	SHAFT DEPTH	ANCHOR ROD LENGTH
≤30' (9.1 m)	11½ (292)	8¾ (220)	6' (1.83 m)	12 x 12 x 1 (300 x 300 x 25)	24 (610)	5'-0" (1.52 m)	4'-9" (1.45 m)
31'-35' (9.4 m - 10.7 m)	11½ (292)	8¾ (220)	6' (1.83 m)	12 x 12 x 1 (300 x 300 x 25)	24 (610)	5'-6" (1.67 m)	5'-3" (1.60 m)
36'-40' (10.9 m - 12.2 m)	15 (381)	8¾ (220)	6' (1.83 m)	15 x 15 x 1¼ (375 x 375 x 31)	30 (762)	6'-0" (1.83 m)	5'-9" (1.75 m)
41'-45' (12.5 m - 13.7 m)	15 (381)	8¾ (220)	6' (1.83 m)	15 x 15 x 1¼ (375 x 375 x 31)	30 (762)	6'-6" (1.98 m)	6'-3" (1.90 m)
46'-50' (14.0 m - 15.2 m)	15 (381)	8¾ (220)	8' (2.44 m)	15 x 15 x 1¼ (375 x 375 x 31)	30 (762)	7'-0" (2.13 m)	6'-9" (2.00 m)

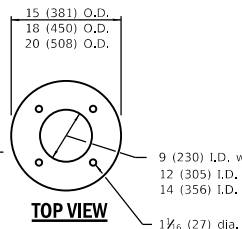
- ① 8¾ x 8'-0" (220 x 2.44 m) for twin luminaires.
- ② Bolt circle diam. shall be 17 (430) when a transformer base is used.



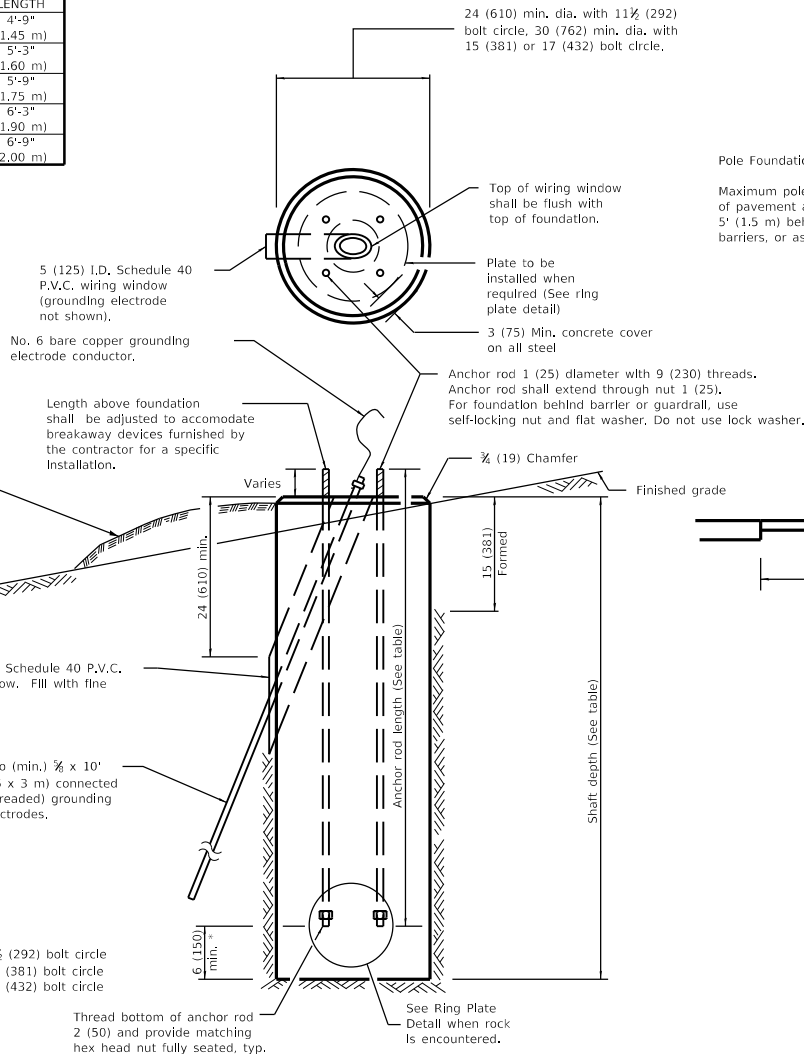
Provide dirt as needed to meet 5' (1.52 m) chord fill around foundation top. Grade dirt level with bottom of top plate.



METAL FOUNDATION

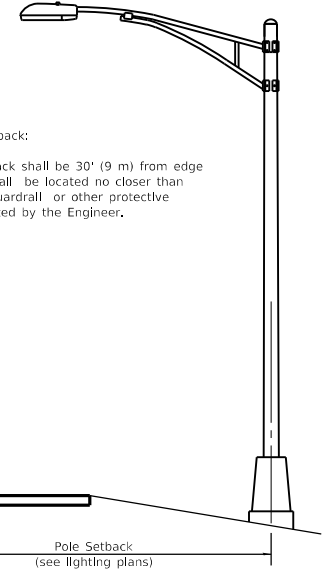


RING PLATE DETAIL



CONCRETE FOUNDATION

* If the required anchor rod length above top of foundation is less than 3 (75), anchor rods may be lowered below 6 (150).



GENERAL NOTES

All foundations are designed to be located on slopes not exceeding 2:1 where soils have an unconfined compressive strength of at least 1.0 TSF. The Contractor shall verify the soil strength during drilling for concrete foundations or by monitoring installation resistance of metal foundations and notify the Engineer if other conditions are encountered.

When rock is encountered the foundation depth may be reduced 6 (150) for every 12 (300) of embedment in rock. The minimum foundation depth shall be 4'-6" (1.37 m) with cut anchor rods 6 (150) above bottom of excavated hole. See ring plate detail.

Anchor rods shall be increased in diameter as needed for 50' (15.2 m) mounting height or above. The Contractor shall match the breakaway device size or slotted hole size in the pole base plate to accommodate larger rod sizes.

Transformer bases shall not be used on metal foundations.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-19	Omitted multimount luminaire to agree with BDE Manual.
1-1-18	Replaced rod hooks with nuts.

LIGHT POLE FOUNDATION

STANDARD 836001-04

Illinois Department of Transportation

PASSED January 1, 2019

ME [Signature]

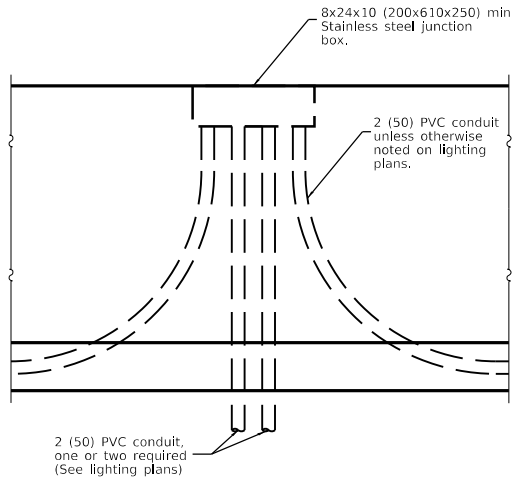
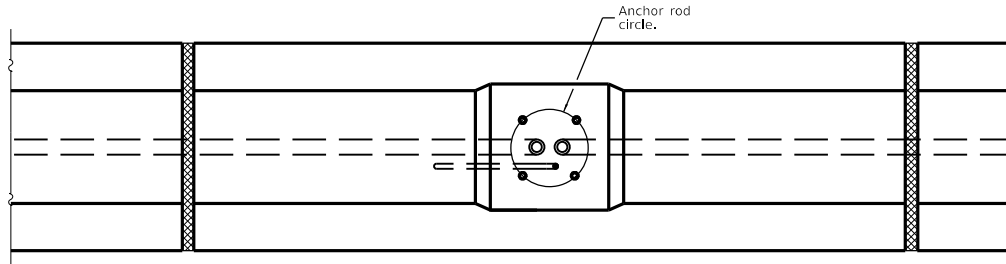
ELECTRICAL AND MECHANICAL UNIT CHIEF

APPROVED January 1, 2019

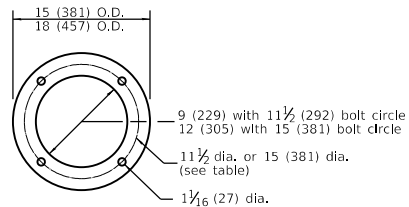
ENGINEER OF DESIGN AND ENVIRONMENT

01-1-C 03/15/11

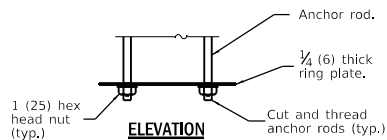
FOUNDATION TABLE				
LIGHT POLE MOUNTING HEIGHT	SHAFT DIAMETER	SHAFT DEPTH	ANCHOR ROD LENGTH	ANCHOR ROD CIRCLE DIA.
≤30' (9.1 m)	24 (610)	36 (914)	6'-2" (1.88 m)	11½ (292)
31'-35' (9.4 m - 10.7 m)	24 (610)	3'-6" (1.06 m)	6'-8" (2.03 m)	11½ (292)
36'-40' (10.9 m - 12.2 m)	30 (762)	4'-0" (1.22 m)	7'-2" (2.18 m)	15 (381)
41'-45' (12.5 m - 13.7 m)	30 (762)	4'-6" (1.37 m)	7'-8" (2.34 m)	15 (381)
46'-50' (14.0 m - 15.2 m)	30 (762)	5'-0" (1.52 m)	8'-2" (2.49 m)	15 (381)



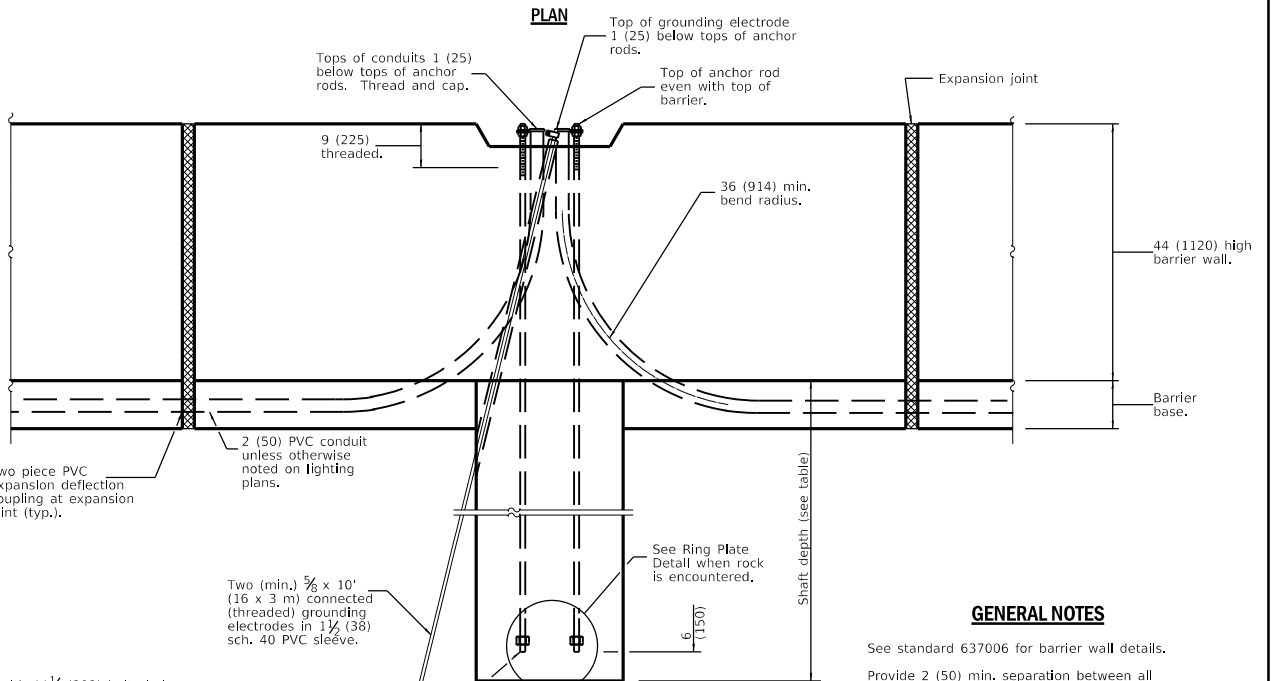
JUNCTION BOX ELEVATION



PLAN



RING PLATE DETAIL ELEVATION



ELEVATION

LIGHT POLE FOUNDATION

GENERAL NOTES

See standard 637006 for barrier wall details.
Provide 2 (50) min. separation between all conduits.

When rock is encountered the foundation depth may be reduced 6 (150) for every 12 (300) of embedment in rock. The minimum foundation depth shall be 30 (760) with cut anchor rods 6 (150) above bottom of excavated hole. See ring plate detail.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2019
ME Sappelt
ELECTRICAL AND MECHANICAL UNIT CHIEF

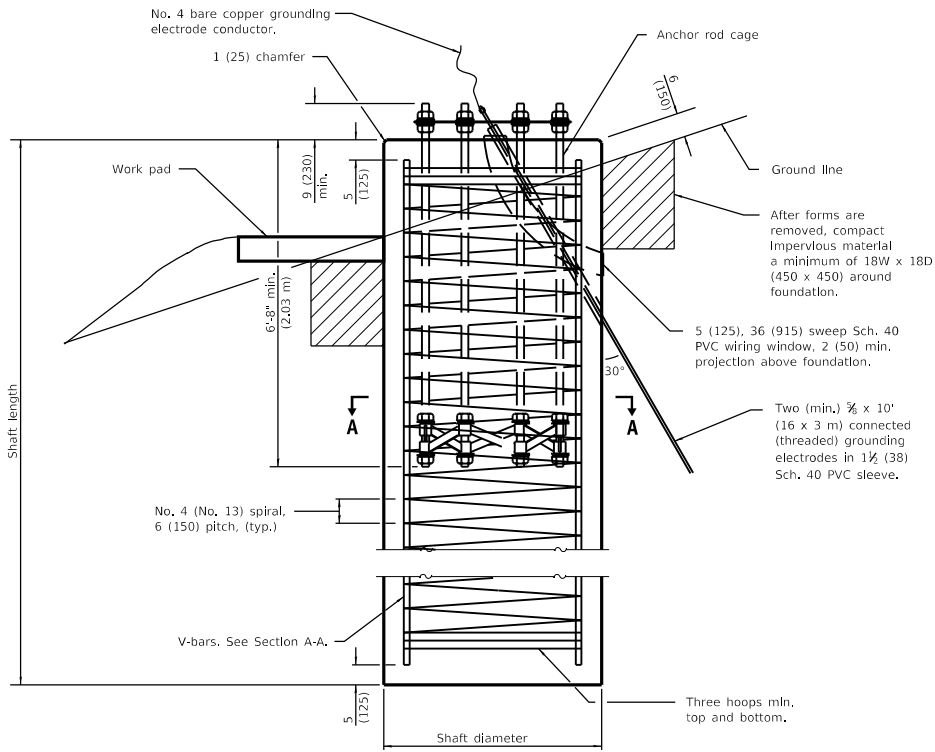
APPROVED January 1, 2019
S. C. Schlegel
ENGINEER OF DESIGN AND ENVIRONMENT

DESIGNED
CHECKED
DATE

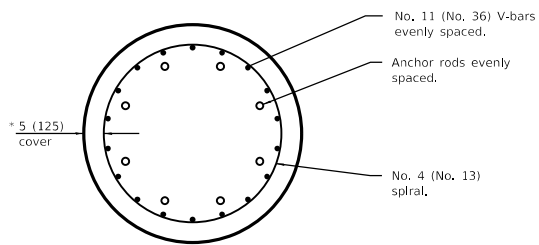
DATE	REVISIONS
1-1-19	Revised standard for new constant slope median barrier.
	Renamed standard.
1-1-14	Modified grounding method.
	Revised general notes.

LIGHT POLE FOUNDATION WITH 44 IN. (1120 mm) CONCRETE BARRIER

STANDARD 836011-02



**FOUNDATION
ELEVATION**



SECTION A-A

* See Rod and Reinforcement Table.

		SHAFT LENGTH TABLE									
SOIL CONSISTENCY	AVERAGE STRENGTH	LIGHT TOWER HEIGHT									
	Qu in tsf (Qu In kPa)	80' (24 m)	90' (27 m)	100' (30 m)	110' (34 m)	120' (37 m)	130' (40 m)	140' (43 m)	150' (46 m)	160' (49 m)	
Cohesive	SOFT < 0.5 (< 50)	20'-6" (6.2 m)	21'-6" (6.5 m)	22'-6" (6.9 m)	24'-0" (7.2 m)	25'-0" (7.6 m)	26'-6" (8.0 m)	27'-6" (8.3 m)	28'-6" (8.7 m)	30'-0" (9.1 m)	
	MEDIUM 0.5 to 1 (50 to 100)	17'-0" (5.1 m)	17'-6" (5.3 m)	18'-6" (5.6 m)	19'-0" (5.8 m)	20'-6" (6.2 m)	21'-6" (6.4 m)	22'-0" (6.7 m)	23'-6" (7.0 m)	24'-0" (7.3 m)	
	STIFF 1 to 2 (100 to 200)	14'-6" (4.4 m)	15'-0" (4.5 m)	15'-6" (4.7 m)	16'-0" (4.8 m)	17'-6" (5.2 m)	18'-0" (5.4 m)	18'-6" (5.5 m)	19'-6" (5.9 m)	20'-0" (6.1 m)	
	VERY STIFF 2 to 4 (200 to 400)	13'-0" (3.8 m)	13'-0" (3.9 m)	13'-6" (4.1 m)	14'-0" (4.2 m)	15'-0" (4.5 m)	15'-6" (4.6 m)	16'-0" (4.7 m)	17'-0" (5.1 m)	17'-6" (5.2 m)	
	HARD > 4 (> 400)	11'-6" (3.5 m)	12'-0" (3.5 m)	12'-0" (3.6 m)	12'-6" (3.7 m)	13'-6" (4.0 m)	13'-6" (4.1 m)	14'-0" (4.2 m)	15'-0" (4.5 m)	15'-6" (4.6 m)	
	N in BLOWS/FT. (N in BLOWS/0.3m)										
Granular	VERY LOOSE < 5 (< 5)	16'-6" (5.0 m)	17'-6" (5.2 m)	18'-0" (5.4 m)	18'-6" (5.6 m)	19'-0" (5.8 m)	20'-0" (6.0 m)	20'-6" (6.2 m)	21'-0" (6.3 m)	21'-6" (6.5 m)	
	LOOSE 5 to 10 (5 to 10)	15'-0" (4.6 m)	16'-0" (4.8 m)	16'-6" (4.9 m)	17'-0" (5.1 m)	17'-6" (5.3 m)	18'-0" (5.5 m)	18'-6" (5.7 m)	19'-0" (5.9 m)	19'-6" (5.9 m)	
	MEDIUM 10 to 25 (10 to 25)	14'-6" (4.4 m)	15'-0" (4.5 m)	15'-6" (4.7 m)	16'-0" (4.9 m)	16'-6" (5.0 m)	17'-0" (5.2 m)	17'-6" (5.3 m)	18'-0" (5.5 m)	18'-6" (5.6 m)	
	DENSE 25 to 50 (25 to 50)	14'-0" (4.1 m)	14'-6" (4.3 m)	15'-0" (4.5 m)	15'-6" (4.6 m)	15'-6" (4.7 m)	16'-6" (4.9 m)	16'-6" (5.0 m)	17'-0" (5.2 m)	17'-6" (5.3 m)	
	VERY DENSE > 50 (> 50)	13'-0" (3.9 m)	13'-6" (4.1 m)	14'-0" (4.2 m)	14'-6" (4.4 m)	15'-0" (4.5 m)	15'-6" (4.7 m)	16'-0" (4.8 m)	16'-6" (4.9 m)	17'-0" (5.1 m)	

See Sheet 2 for GENERAL NOTES.

Illinois Department of Transportation

APPROVED January 1, 2015

ENGINEER OF PRELIMINARY ENGINEERING

APPROVED January 1, 2015

ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-15	Added 6'-8" min. anchor rod embedment in foundation.
1-1-14	Revised diameter of grd. electrode sleeve.

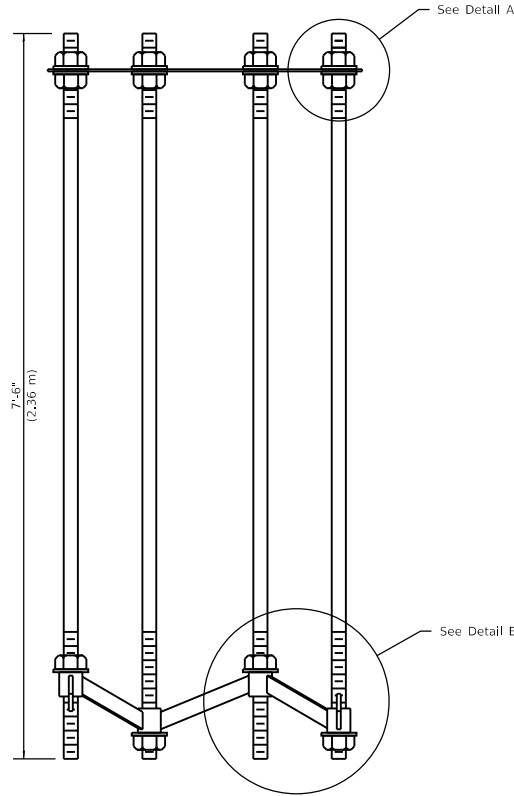
**LIGHT TOWER
FOUNDATION**

(Sheet 1 of 2)

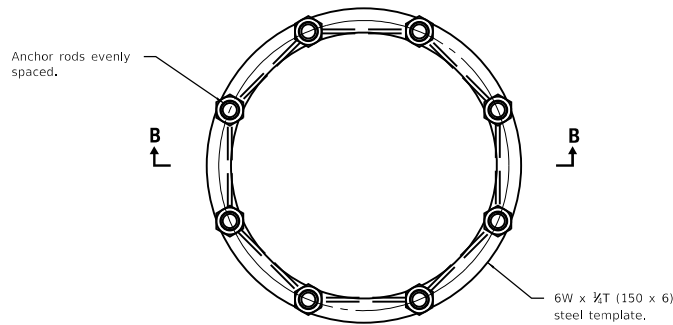
STANDARD 837001-04

ROD AND REINFORCEMENT TABLE					
TOWER HEIGHT	ANCHOR ROD DIAM. (MIN)	ROD CIRCLE DIAM. (MIN)	TOWER BASE DIAM. (MIN)	DRILLED SHAFT DIAM. ①	V BAR QTY.
80' (25 m)	1½ (38)	30 (760)	24 (610)	4'-0" (1.2 m)	14
90' (27 m)	1½ (38)	30 (760)	24 (610)	4'-0" (1.2 m)	14
100' (30 m)	1½ (38)	30 (760)	24 (610)	4'-0" (1.2 m)	14
110' (34 m)	1½ (38)	30 (760)	24 (610)	4'-0" (1.2 m)	14
120' (37 m)	1¾ (44)	36 (915)	26 (660)	4'-6" (1.4 m)	18
130' (40 m)	1¾ (44)	36 (915)	28 (710)	4'-6" (1.4 m)	18
140' (43 m)	1¾ (44)	36 (915)	28 (710)	4'-6" (1.4 m)	18
150' (46 m)	2¼ (57)	38 (965)	30 (760)	5'-0" (1.5 m)	22
160' (49 m)	2¼ (57)	38 (965)	32 (810)	5'-0" (1.5 m)	22

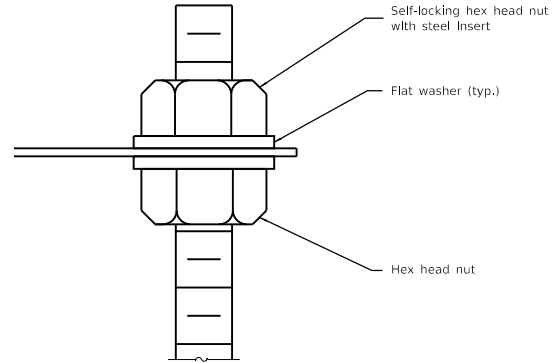
① Diameter based on a 5 (125) conc. cover. The min. cover shall be 3 (75) in dry shaft excavation and 4 (100) in a wet hole. When rock is encountered a 5 (125) cover against soil and a 2 (50) cover against rock shall be required.



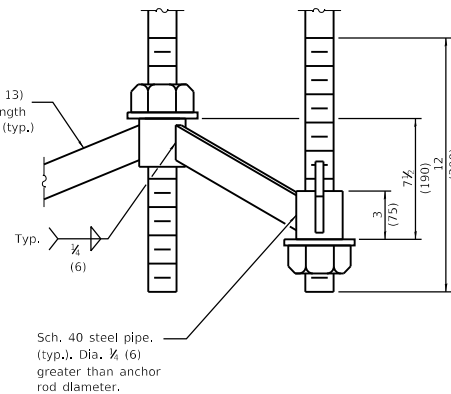
SECTION B-B



ANCHOR ROD CAGE (PLAN)



DETAIL A



DETAIL B

GENERAL NOTES

The shaft length(s) are based on soil borings in the plans. If different soils are encountered, the engineer shall be notified to provide a revised length.

Anchor rod quantity, diameter, and length shall be determined by the tower manufacturer and approved by the Engineer. Each foundation shall have a minimum of 8 anchor rods.

All foundation reinforcement steel shall be epoxy coated.

The cost of reinforcement shall be included in the cost of the foundation.

Steel anchor rod forms shall not be removed for a minimum of 3 days after concrete is poured. The tower shall not be set for a minimum of 7 days or as approved by the Engineer.

Coordinate the rod circle diameter of the tower with the diameter of the anchor rod cage.

The foundation shall be poured monolithically and shall have no construction joints.

Grounding electrodes shall be installed in an access well when there is a conflict in using the method shown.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

APPROVED January 1, 2015

ENGINEER OF PRELIMINARY ENGINEERING

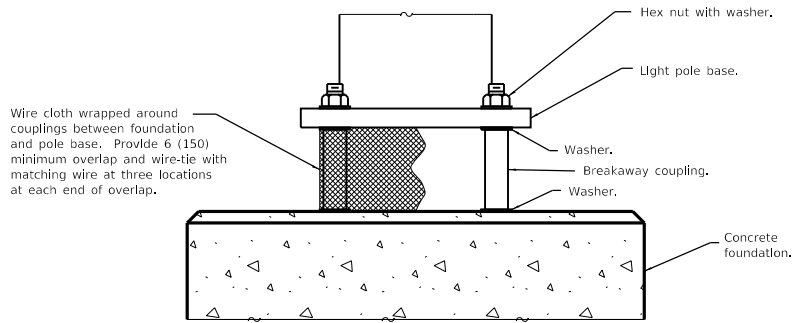
APPROVED January 1, 2015

ENGINEER OF DESIGN AND ENVIRONMENT

LIGHT TOWER FOUNDATION

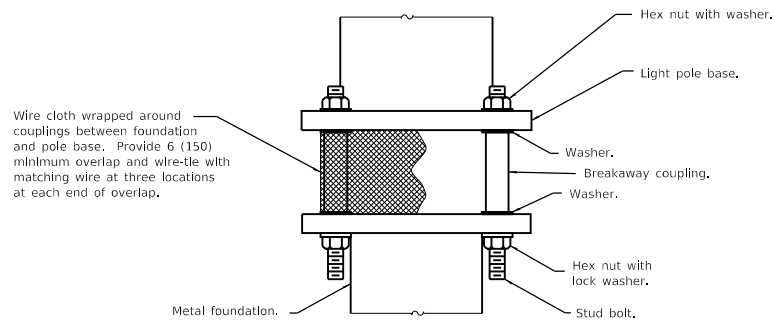
(Sheet 2 of 2)

STANDARD 837001-04



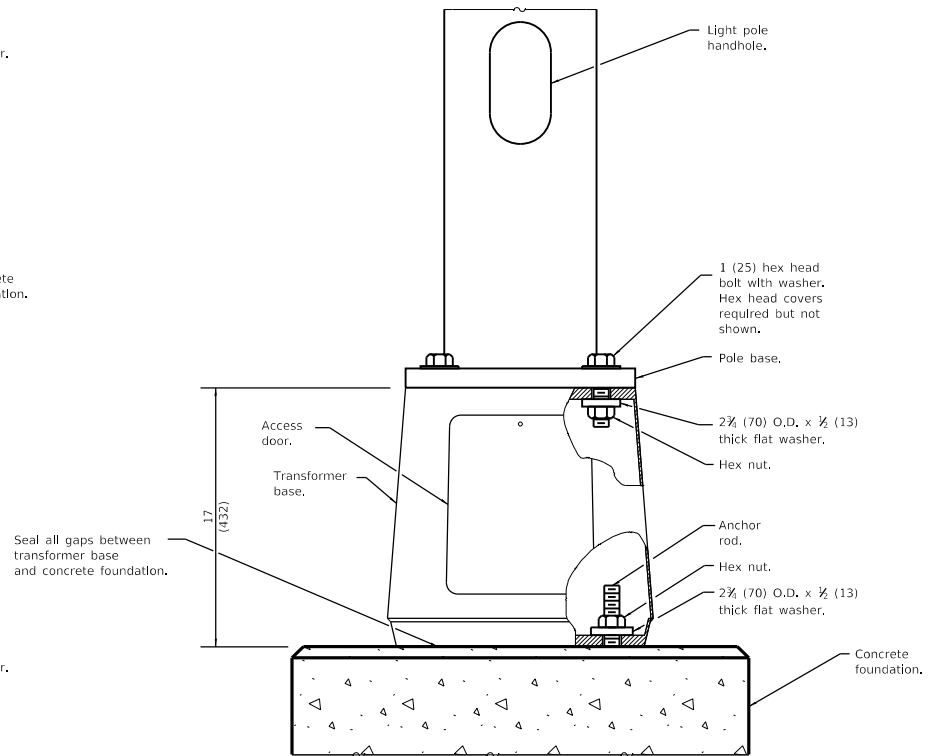
**BREAKAWAY COUPLINGS ON CONCRETE
FOUNDATION FOR STEEL LIGHT POLE**

(Provide pole base skirt around wire cloth when required.)



**BREAKAWAY COUPLINGS ON METAL
FOUNDATION FOR STEEL POLE**

(Provide pole base skirt around wire cloth when required.)



**BREAKAWAY TRANSFORMER BASE FOR
STEEL OR ALUMINUM POLE**

(Steel pole shown)

See Sheet 2 for GENERAL NOTES.

Illinois Department of Transportation

PASSED January 1, 2018

ENGINEER OF PRELIMINARY ENGINEERING

APPROVED January 1, 2018

ENGINEER OF DESIGN AND ENVIRONMENT

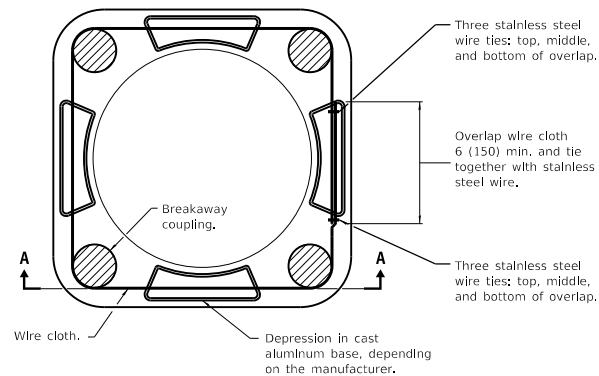
ISSUED 1-1-12

DATE	REVISIONS
1-1-18	Revised to show rodent shield installation for aluminum poles.
1-1-14	New Standard.

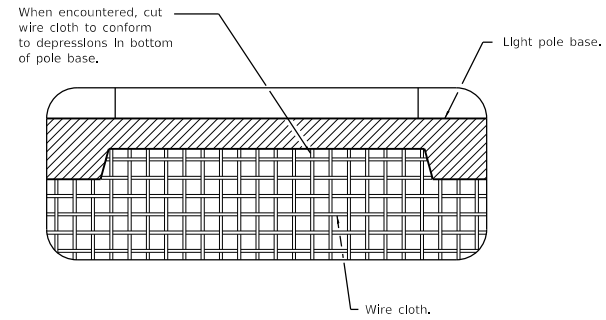
BREAKAWAY DEVICES

(Sheet 1 of 2)

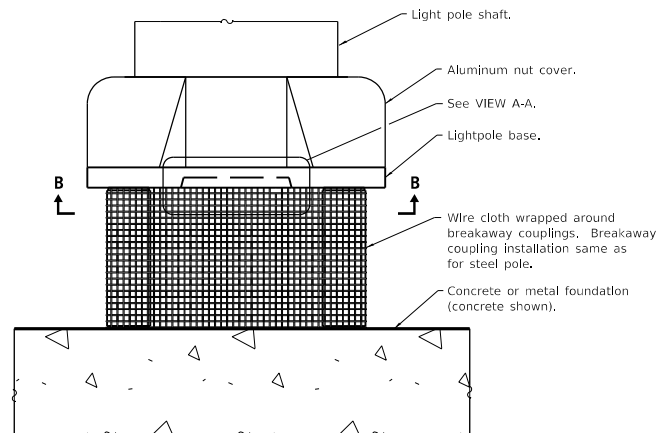
STANDARD 838001-01



VIEW B-B



VIEW A-A



BREAKAWAY COUPLINGS FOR ALUMINUM POLES

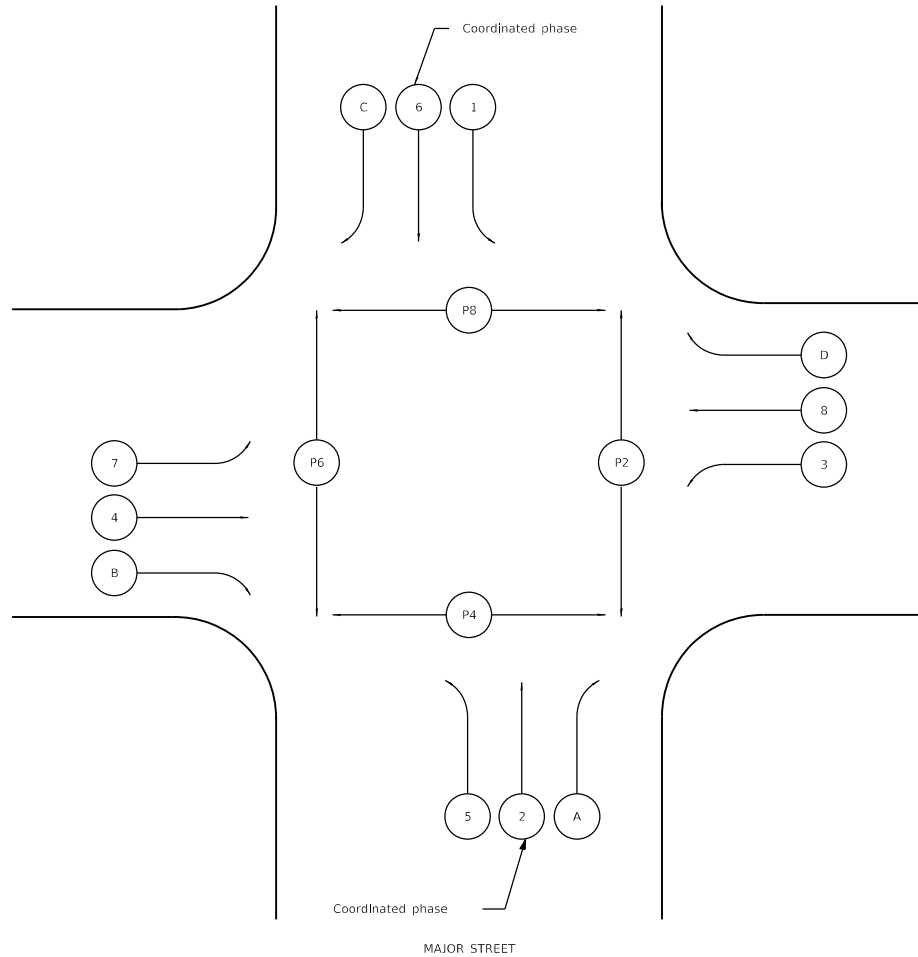
(Provide pole base skirt around wire cloth when required.)

GENERAL NOTES

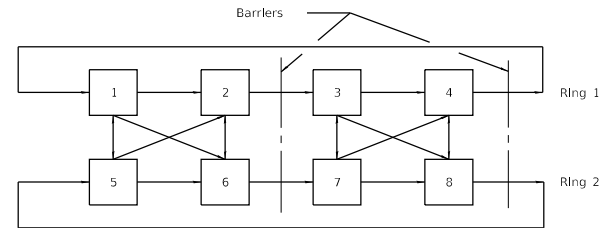
- See light pole standard for details not shown.
- Use largest transformer base bolt circle possible.
- Transformer bases shall not be installed on metal foundations.
- Washers on top of pole base shall cover the entire bolt slot.
- See Standard 836001 for Light Pole Foundation.
- Wire cloth shall be stainless steel, have a maximum opening of $\frac{1}{4}$ (6), and have a minimum wire size of AWG No. 16 (1.6).
- All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation	
PASSED <i>[Signature]</i> January 1, 2018 ENGINEER OF PRELIMINARY ENGINEERING	ISSUED 1-1-12
APPROVED <i>[Signature]</i> January 1, 2018 ENGINEER OF DESIGN AND ENVIRONMENT	

BREAKAWAY DEVICES (Sheet 2 of 2)
STANDARD 838001-01



STANDARD PHASE DESIGNATION DIAGRAM (NEMA)



**NEMA EIGHT PHASE DUAL RING
ACTUATED CONFIGURATION**

LEGEND

- (X) , [X] Vehicular phase no. x
 - (PX) Pedestrian phase no. x
 - (A) , (B) , (C) , (D) Right turn overlaps where:
 - (A) = (2) + (3)
 - (B) = (4) + (5)
 - (C) = (6) + (7)
 - (D) = (8) + (1)
- NEMA National Electrical Manufacturers Association

Illinois Department of Transportation

PASSED January 1, 2009

ENGINEER OF OPERATIONS

APPROVED January 1, 2009

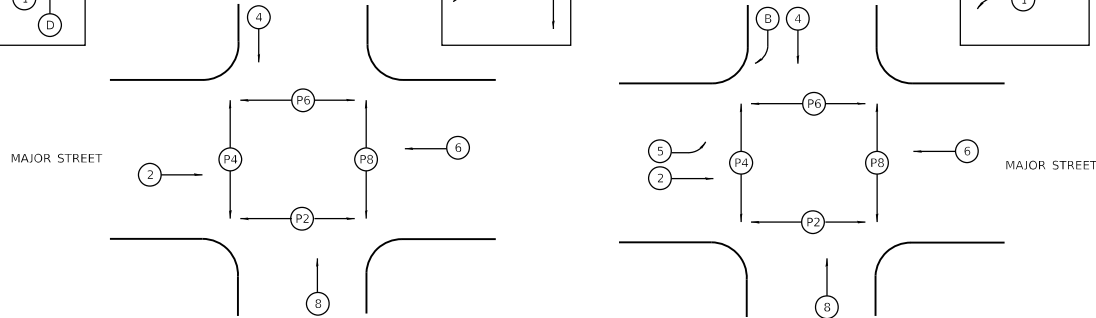
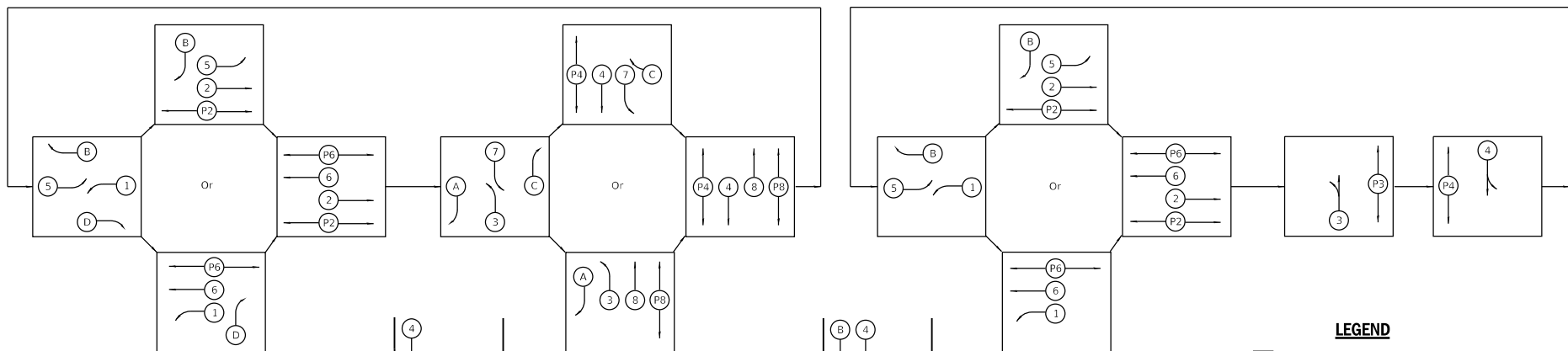
ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-09	Omitted note regarding units of length.
1-1-97	Renum. Standard 2393-2.

**STANDARD PHASE
DESIGNATION DIAGRAMS
AND PHASE SEQUENCES**

(Sheet 1 of 2)

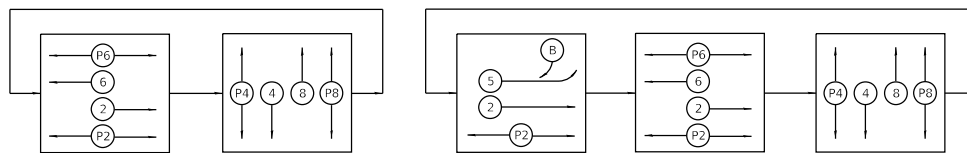
STANDARD 857001-01



LEGEND

(X) (X) Vehicular phase no. x
 (PX) Pedestrian phase no. x
 (A) (B) (C) (D) Right turn overlaps where:
 A = 2 + 3
 B = 4 + 5
 C = 6 + 7
 D = 8 + 1

NEMA National Electrical Manufacturers Association



PHASE DESIGNATION DIAGRAMS AND CORRESPONDING PHASE SEQUENCES

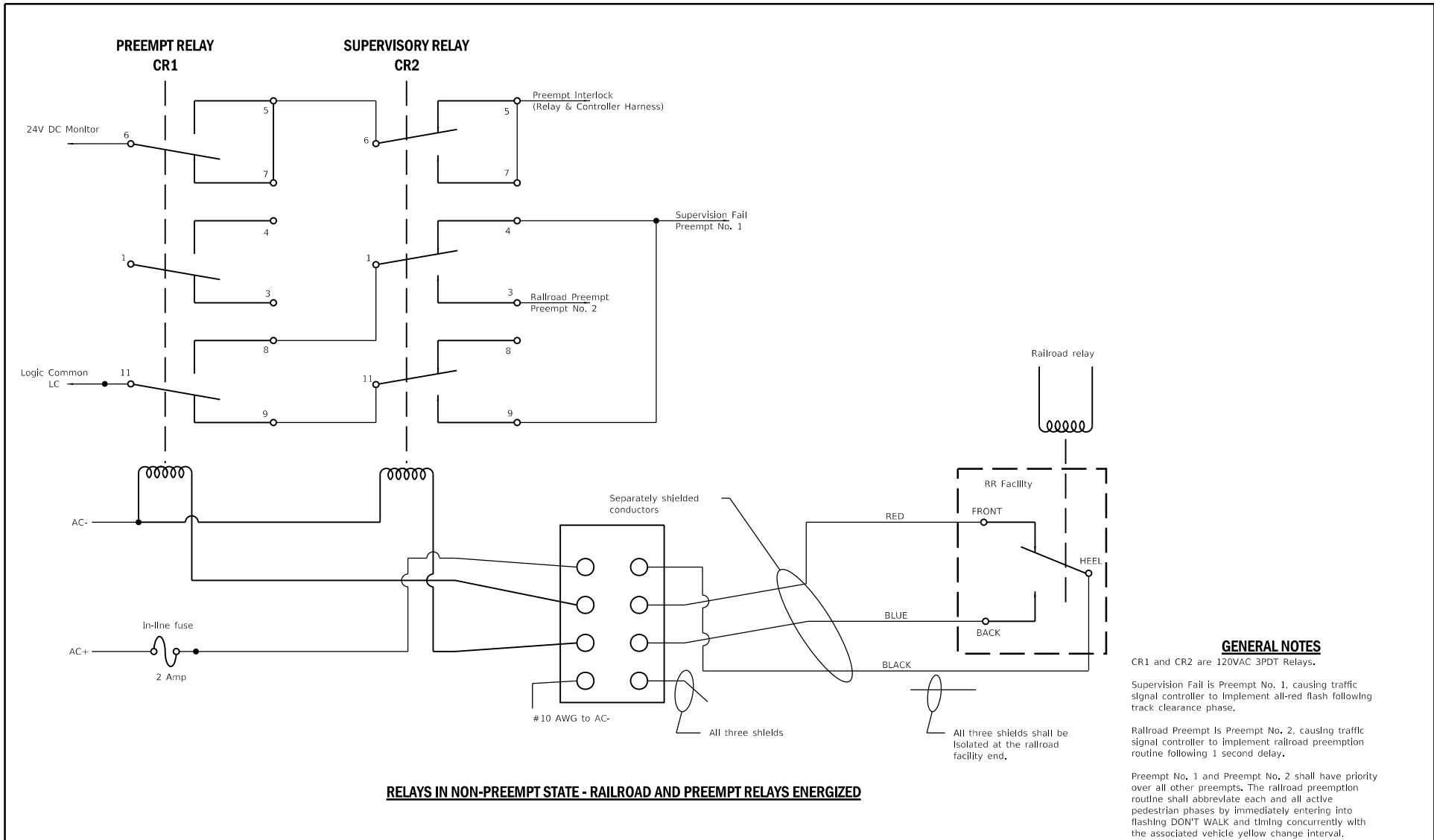
STANDARD PHASE DESIGNATION DIAGRAMS AND PHASE SEQUENCES

(Sheet 2 of 2)

STANDARD 857001-01

Illinois Department of Transportation

PASSED January 1, 2009
 ENGINEER OF OPERATIONS
 APPROVED January 1, 2009
 ENGINEER OF DESIGN AND ENVIRONMENT



Illinois Department of Transportation

PASSED January 1, 2009

ENGINEER OF OPERATIONS

APPROVED January 1, 2009

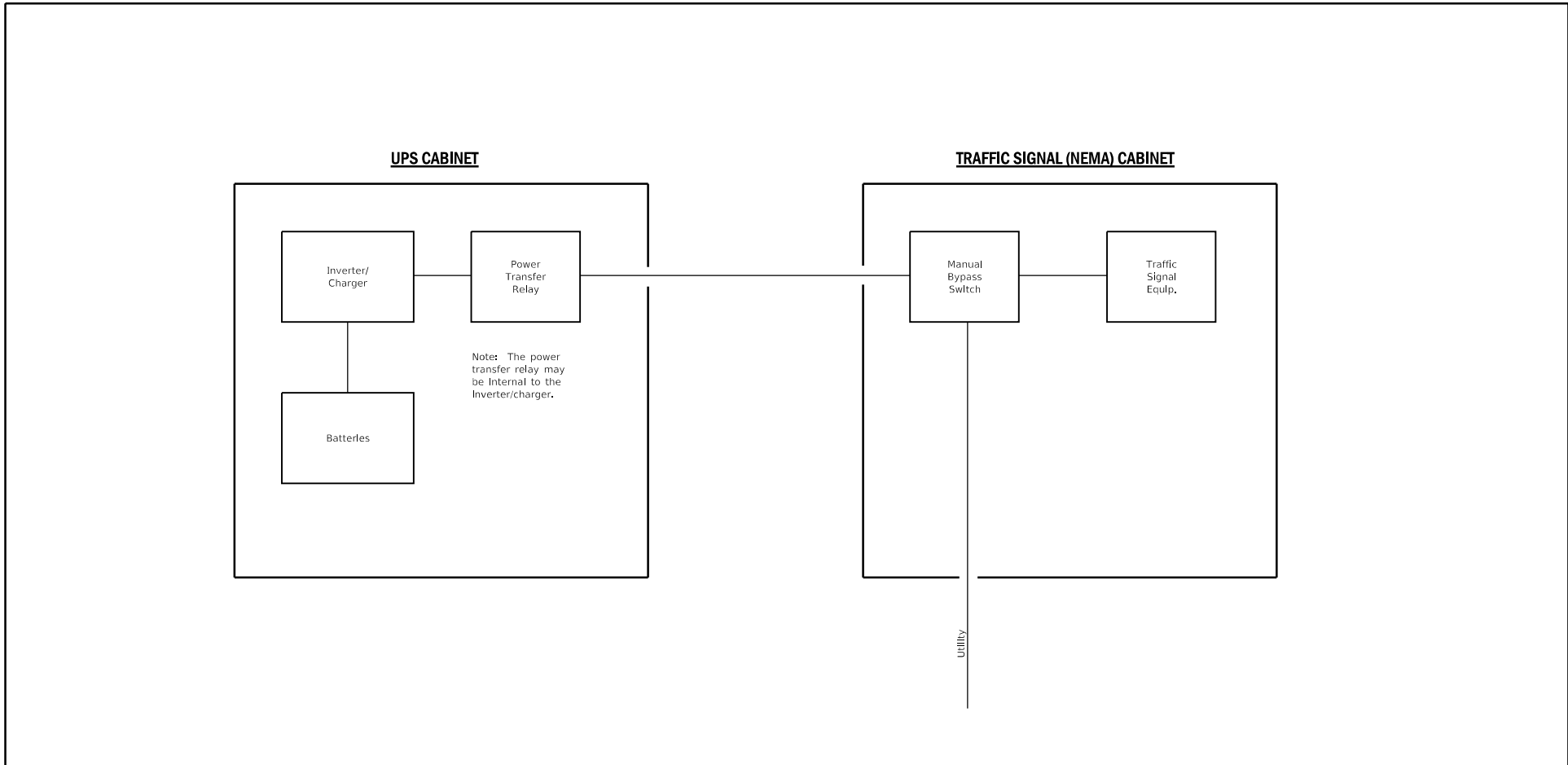
ENGINEER OF DESIGN AND ENVIRONMENT

15213/ISS/08/01

DATE	REVISIONS
1-1-09	Omitted note regarding units of length.
1-1-04	New Standard.

SUPERVISED RAILROAD INTERCONNECT CIRCUIT

STANDARD 857006-01

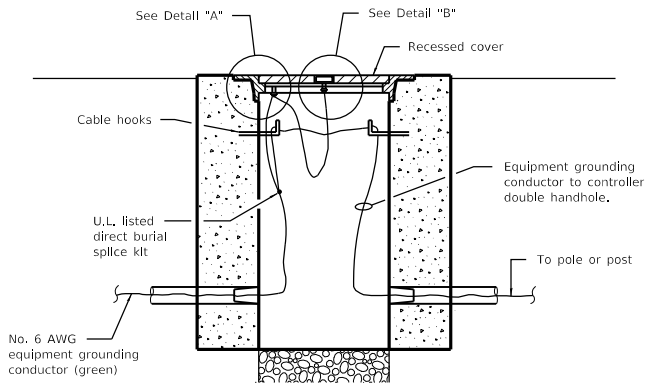


SINGLE LINE BLOCK DIAGRAM

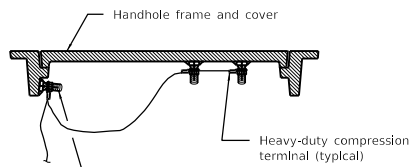
Illinois Department of Transportation	
PASSED <u> </u> January 1, <u> </u> 2009 	ISSUED 3-1-06
ENGINEER OF OPERATIONS	
APPROVED <u> </u> January 1, <u> </u> 2009 	
ENGINEER OF DESIGN AND ENVIRONMENT	

DATE	REVISIONS
1-1-09	Omitted note regarding units of length.
4-1-06	New Standard

<p>UNINTERRUPTABLE POWER SUPPLY (UPS)</p>
<p>STANDARD 862001-01</p>



BONDING A HANDHOLE COVER & FRAME

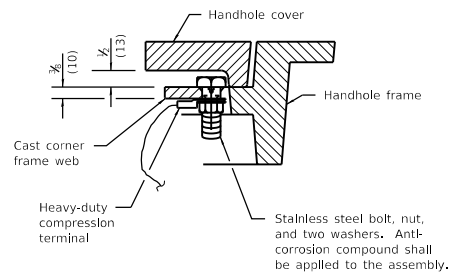


$\frac{1}{2} \times 1\frac{1}{2}$ (13 x 31) stainless steel bolt with split lock washer and nylon insert lockout welded to frame and to cover (typical). Anti-corrosion compound shall be applied to each assembly.

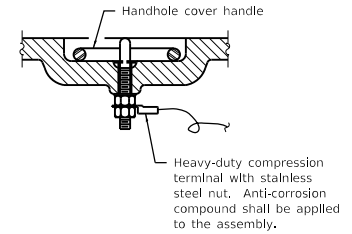
BONDING AN EXISTING HANDHOLE COVER & FRAME



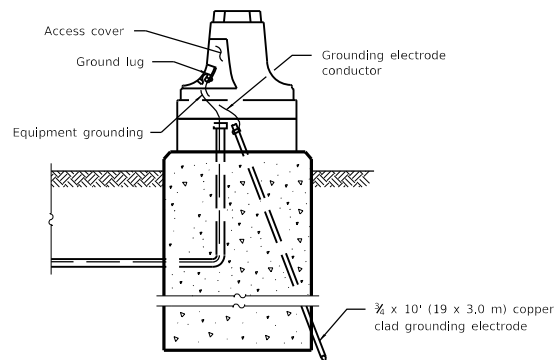
HEAVY-DUTY COMPRESSION TERMINAL



DETAIL "A"



DETAIL "B"



GROUNDING A MAST ARM POLE/POST



$\frac{3}{4}$ (19) Clamp Size

HEAVY-DUTY GROUND ROD CLAMP

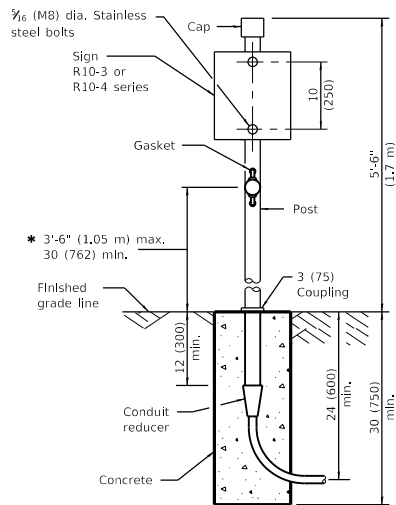
All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation	
PASSED	January 1, 2009
ENGINEER OF OPERATIONS	<i>[Signature]</i>
APPROVED	January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT	<i>[Signature]</i>

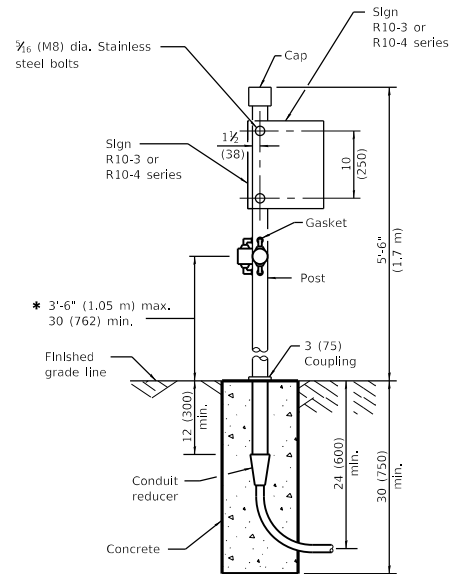
DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-07	Revised terminology.

**TRAFFIC SIGNAL
GROUNDING & BONDING**

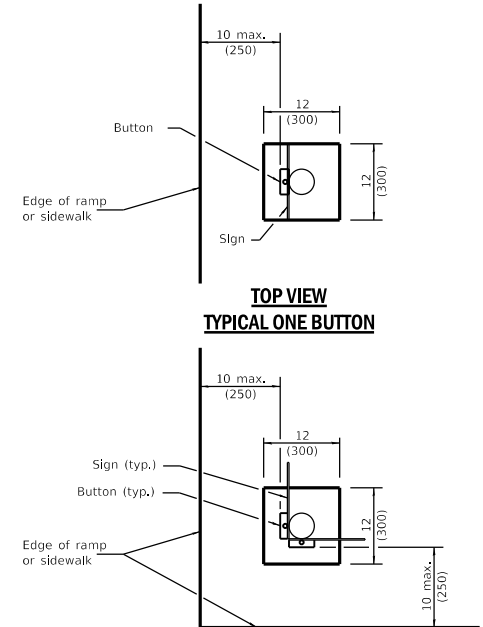
STANDARD 873001-02



PEDESTRIAN ONE PUSH BUTTON POST



PEDESTRIAN TWO PUSH BUTTON POST



**TOP VIEW
TYPICAL ONE BUTTON**

**TOP VIEW
TYPICAL TWO BUTTONS**

* 36 (914) preferred

All dimensions are in inches (millimeters) unless otherwise shown.

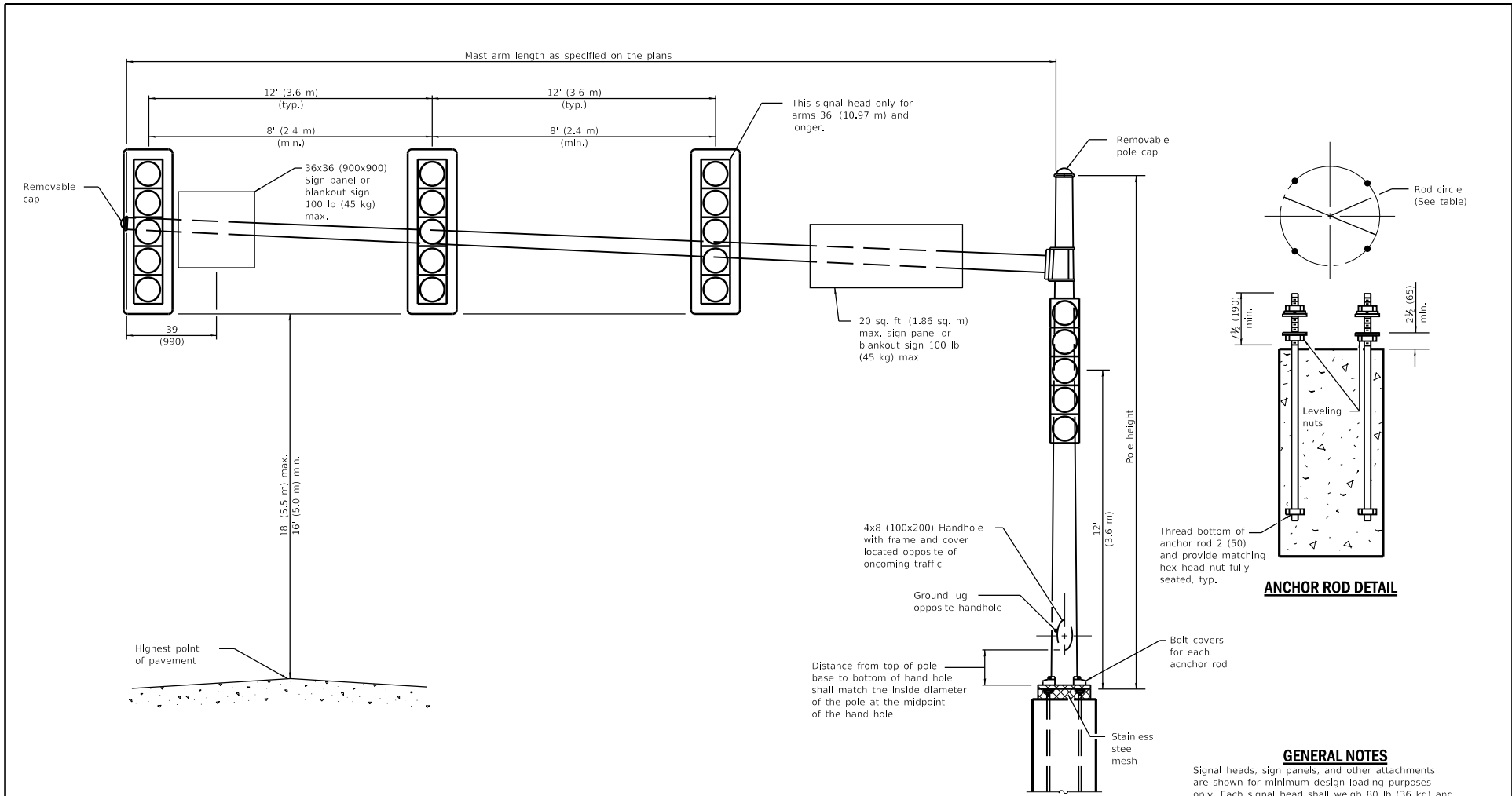
Illinois Department of Transportation

PASSED April 1, 2016
 ENGINEER OF OPERATIONS
 APPROVED April 1, 2016
 ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
4-1-16	Revised sign numbers for consistency with current MUTCD.
1-1-14	Revised and added dimensions for PROWAG reach range requirements.

**PEDESTRIAN PUSH
BUTTON POST**

STANDARD 876001-04



ANCHOR ROD DETAIL

GENERAL NOTES

Signal heads, sign panels, and other attachments are shown for minimum design loading purposes only. Each signal head shall weigh 80 lb (36 kg) and have a projected area of 14.7 sq. ft. (1.37 sq. m).
See Standard 720016 for location of sign panel or blankout sign closest to pole.
All dimensions are in inches (millimeters) unless otherwise shown.

MAST ARM LENGTH	ANCHOR ROD CIRCLE	ANCHOR ROD SIZE
16' thru 20' (4.87 m thru 6.10 m)	18 (450)	1 3/8 x 7' (44 x 2.10 m)
42' thru 55' (12.80 m thru 16.80 m)	21 (535)	1 3/8 x 7' (44 x 2.10 m)

DATE	REVISIONS
1-1-18	Revised table for RLF reqs.
	Revised GEN. NOTES for sign location. Rep. rod hooks with nuts.
4-1-16	Changed sign panel to 36x36.
	Added max. weight of 100 lb.
	Modified dim. to outer signal.

STEEL MAST ARM ASSEMBLY AND POLE 16' THROUGH 55'

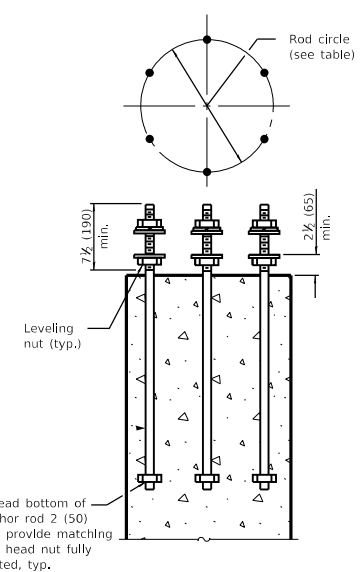
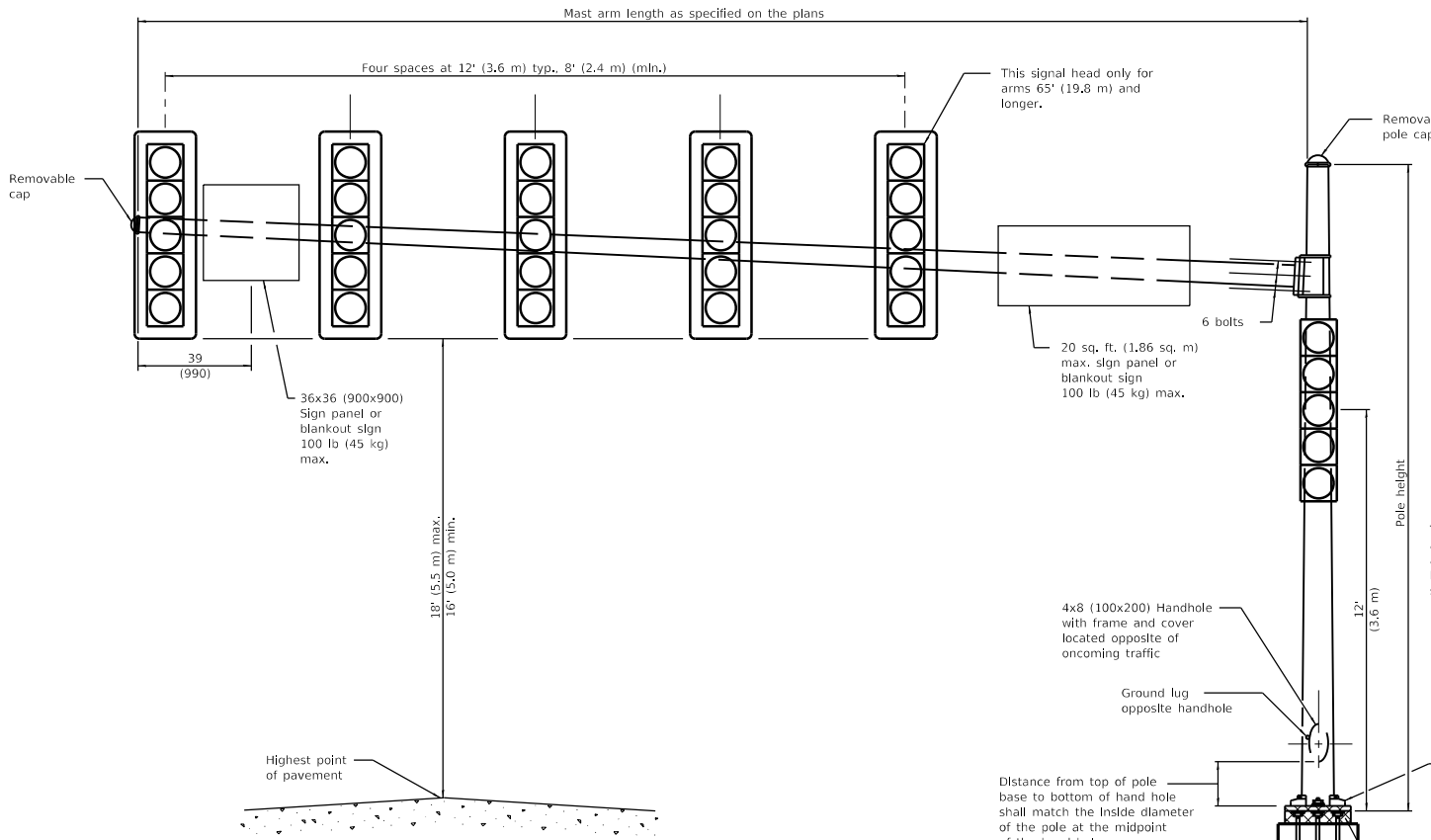
STANDARD 877001-07

Illinois Department of Transportation

PASSED January 1, 2018
Jim Allen
 ENGINEER OF OPERATIONS

APPROVED January 1, 2018
Maureen M. O'Brien
 ENGINEER OF DESIGN AND ENVIRONMENT

DESIGNER



ANCHOR ROD DETAIL

MAST ARM LENGTH	ANCHOR ROD CIRCLE	ANCHOR ROD SIZE
56' thru 64' (17.07 m thru 19.51 m)	24 (610)	1 1/2 x 7' (44 x 2.10 m)
65' thru 75' (19.81 m thru 22.86 m)	27 (685)	2 x 7'-6" (51 x 2.29 m)

GENERAL NOTES
 Signal heads, sign panels, and other attachments are shown for minimum design loading purposes only. Each signal head shall weigh 80 lbs. (36 kg) and have a projected area of 14.7 sq. ft. (1.37 sq. m).
 See Standard 720016 for location of sign panel or blankout sign closest to pole.
 All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-18	Rev. hand hole loc. Rev. Gen. Notes for sign loc. Replaced rod hooks with nuts.
4-1-16	Changed sign panel to 36x36 and 100 lb max.

STEEL MAST ARM ASSEMBLY AND POLE 56' THROUGH 75'

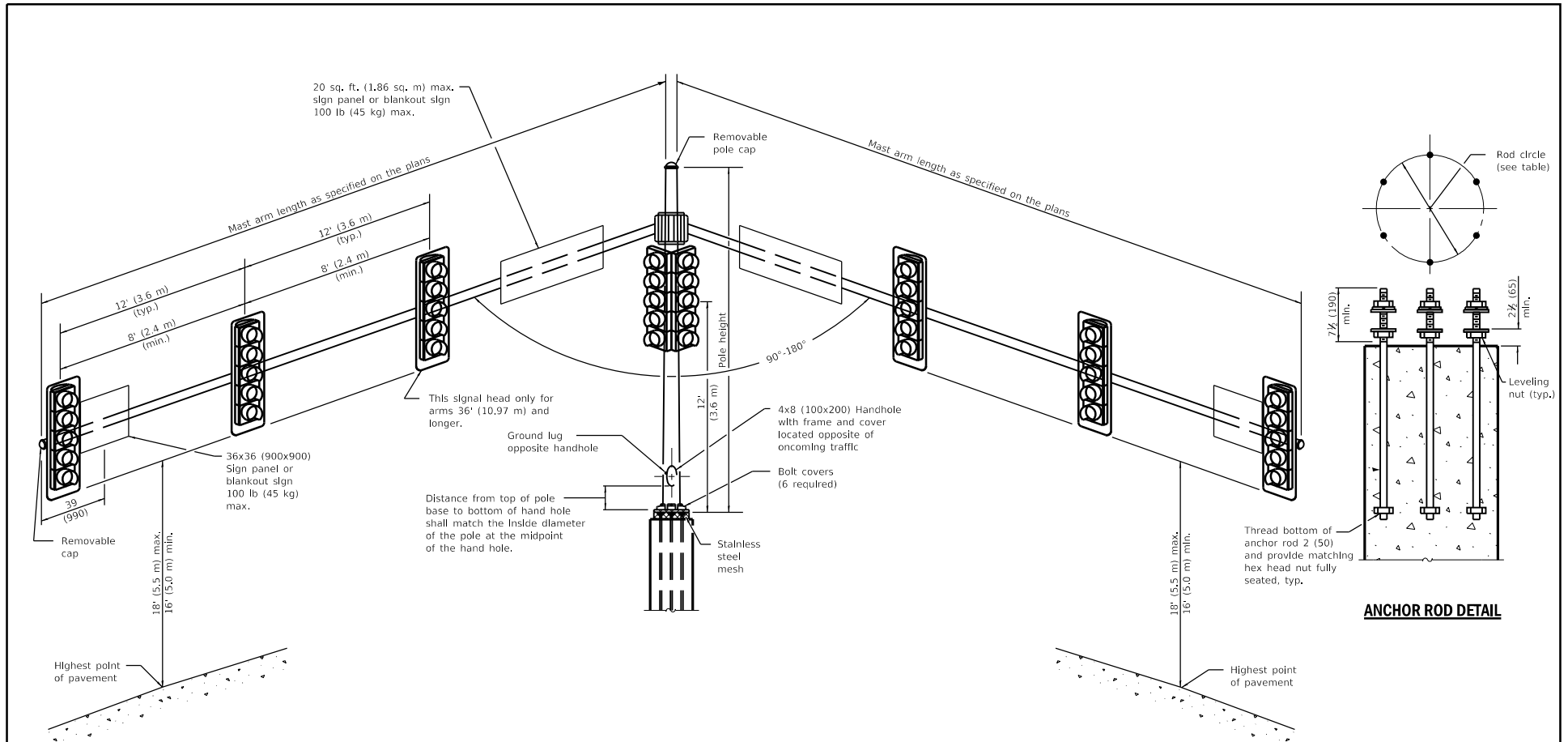
STANDARD 877002-04

Illinois Department of Transportation

PASSED January 1, 2018
Jim Allen
 ENGINEER OF OPERATIONS

APPROVED January 1, 2018
Maureen M. O'Connell
 ENGINEER OF DESIGN AND ENVIRONMENT

BMH-CT 03/11/SSZ



ANCHOR ROD DETAIL

GENERAL NOTES

Signal heads, sign panels, and other attachments are shown for minimum design loading purposes only. Each signal head shall weigh 80 lb (36 kg) and have a projected area of 14.7 sq. ft. (1.37 sq. m).
 See Standard 720016 for location of sign panels or blankout signs closest to pole.
 All dimensions are in inches (millimeters) unless otherwise shown.

MAST ARM LENGTH	ANCHOR ROD CIRCLE	ANCHOR ROD SIZE
16' thru 30' (4.87 m thru 9.14 m)	18 (450)	1 3/4 x 7" (44 x 2.10 m)
32' thru 50' (9.75 m thru 15.24 m)	21 (535)	2 x 7'-6" (51 x 2.29 m)

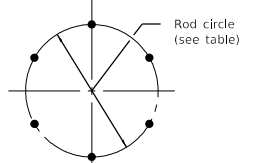
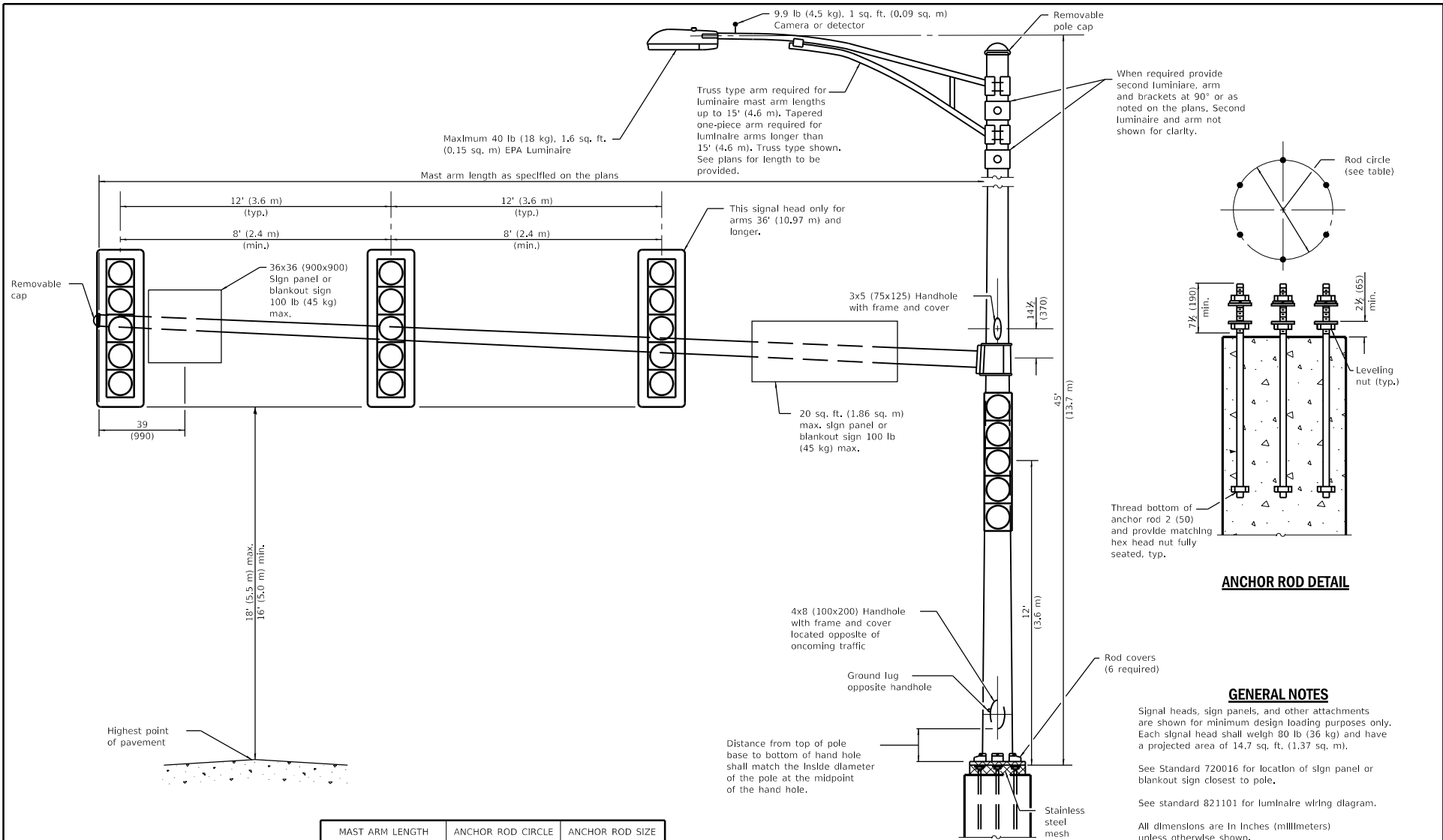
Illinois Department of Transportation

PASSED January 1, 2018
 ENGINEER OF OPERATIONS
 APPROVED January 1, 2018
 ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-18	Revised for RLFD reqs. Revised GEN. NOTES for sign location. Revised ANCHOR ROD DETAIL.
4-1-16	Changed sign panel to 36x36. Added max weight of 100 lb. Modified dim. to outer signal.

STEEL MAST ARM ASSEMBLY AND POLE WITH DUAL MAST ARMS

STANDARD 877006-06



ANCHOR ROD DETAIL

GENERAL NOTES

Signal heads, sign panels, and other attachments are shown for minimum design loading purposes only. Each signal head shall weigh 80 lb (36 kg) and have a projected area of 14.7 sq. ft. (1.37 sq. m).

See Standard 720016 for location of sign panel or blankout sign closest to pole.

See standard 821101 for luminaire wiring diagram.

All dimensions are in Inches (millimeters) unless otherwise shown.

MAST ARM LENGTH	ANCHOR ROD CIRCLE	ANCHOR ROD SIZE
16' thru 35' (4.87 m thru 10.67 m)	18 (450)	1 3/4 x 7' (44 x 2.10 m)
36' thru 55' (10.97 m thru 16.80 m)	21 (535)	1 3/4 x 7' (44 x 2.10 m)

DATE	REVISIONS
1-1-19	Remove tenon top info. Rev. luminaire arm info. Rev. second luminaire Info.
1-1-18	Revised for RLFD reqs. Revised GEN. NOTES for sign location. Revised ANCHOR ROD DETAIL.

**STEEL COMB. MAST ARM
ASSEMBLY AND POLE
16' THROUGH 55'**

STANDARD 877011-10

Illinois Department of Transportation

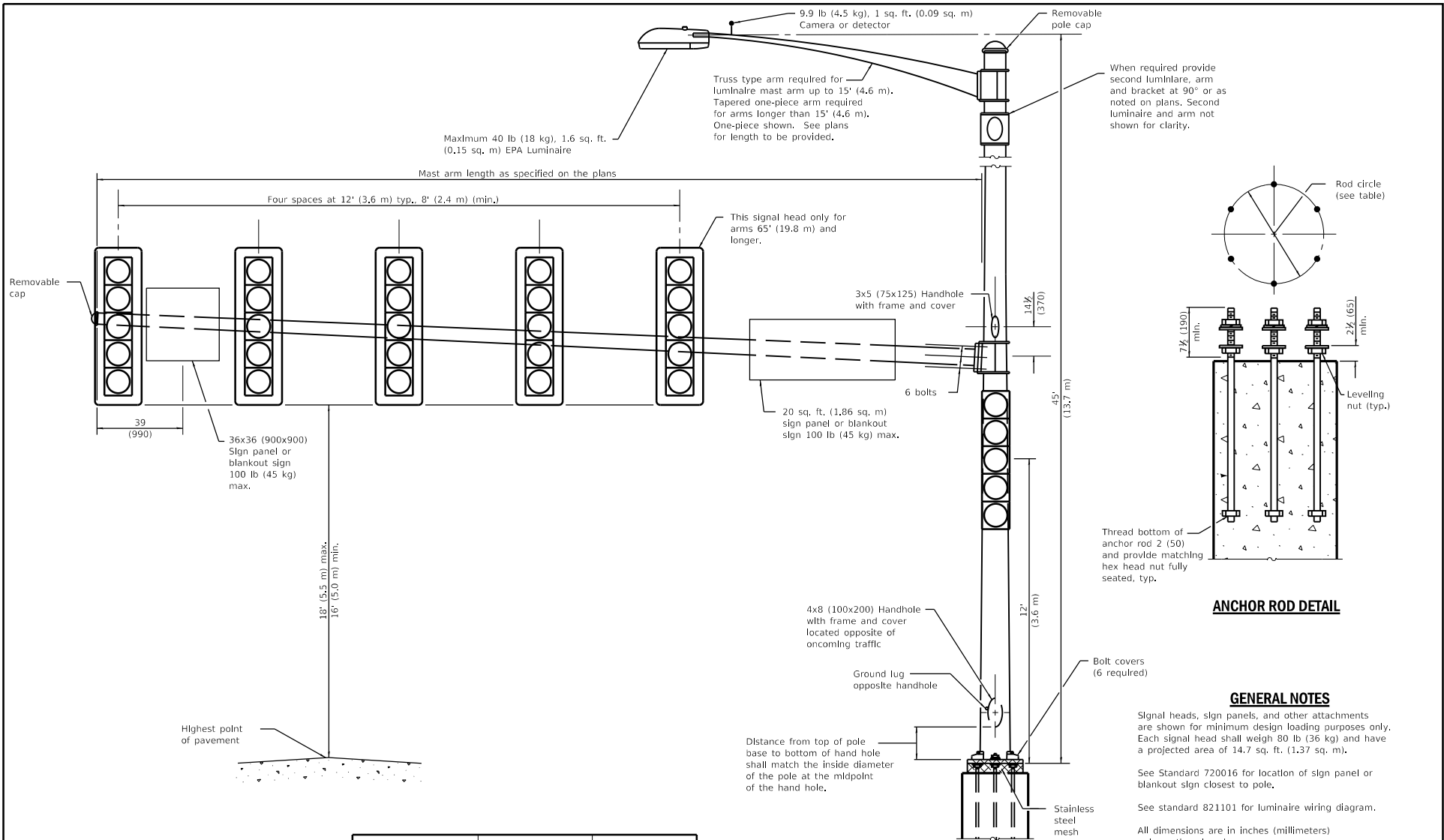
APPROVED January 1, 2019

 ENGINEER OF OPERATIONS

ISSUES: 0
 2019-1-1

APPROVED January 1, 2019

 ENGINEER OF DESIGN AND ENVIRONMENT



ANCHOR ROD DETAIL

GENERAL NOTES

Signal heads, sign panels, and other attachments are shown for minimum design loading purposes only. Each signal head shall weigh 80 lb (36 kg) and have a projected area of 14.7 sq. ft. (1.37 sq. m).

See Standard 720016 for location of sign panel or blankout sign closest to pole.

See standard 821101 for luminaire wiring diagram.

All dimensions are in inches (millimeters) unless otherwise shown.

MAST ARM LENGTH	ANCHOR ROD CIRCLE	ANCHOR ROD SIZE
56' thru 64' (17.07 m thru 19.51 m)	24 (610)	1 1/2 x 7' (44 x 2.10 m)
65' thru 75' (19.81 m thru 22.86 m)	27 (685)	2 x 7'-6" (51 x 2.29 m)

DATE	REVISIONS
1-1-19	Remove tenon top info.
	Rev. luminaire arm info.
	Rev. second luminaire info.
1-1-18	Rev. hand hole location, Rev.
	Gen. Notes for sign location,
	Replaced rod hooks with nuts.

STEEL COMB. MAST ARM ASSEMBLY AND POLE 56' THROUGH 75'

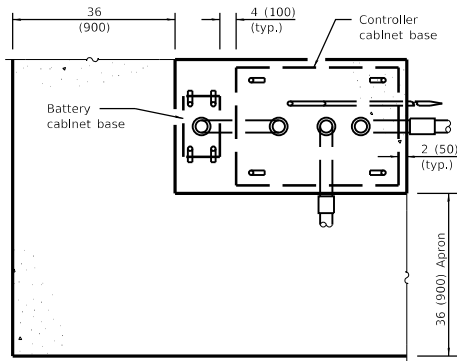
STANDARD 877012-07

Illinois Department of Transportation

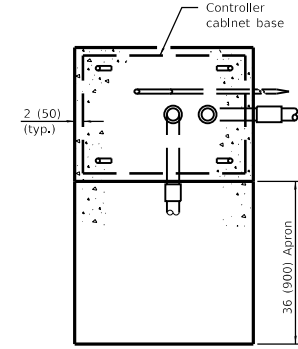
APPROVED January 1, 2019
ENGINEER OF OPERATIONS

APPROVED January 1, 2019
ENGINEER OF DESIGN AND ENVIRONMENT

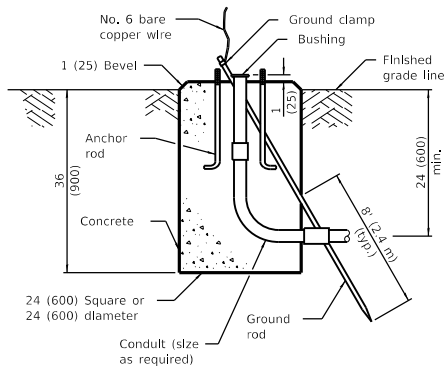
ISSUES
877012



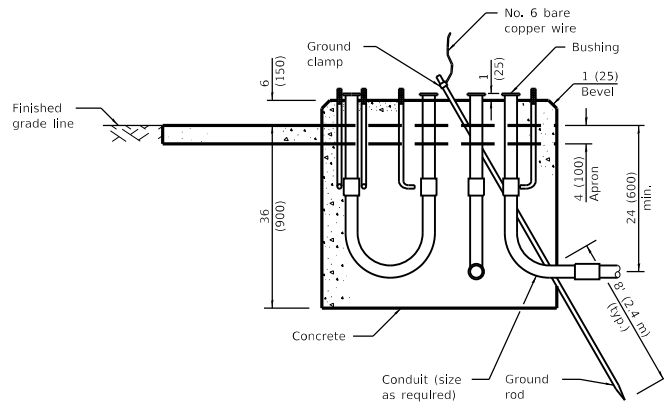
TOP VIEW



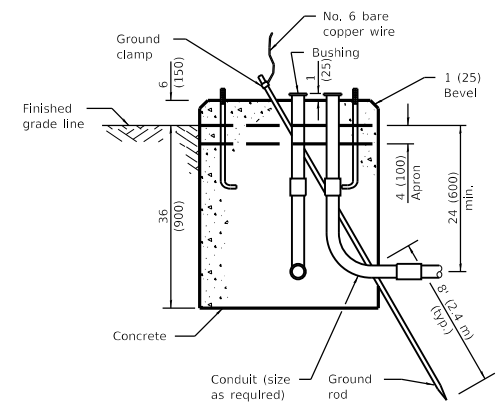
TOP VIEW



TYPE A



**TYPE C
FOR GROUND MOUNTED
CONTROLLER CABINET
AND UPS BATTERY CABINET**



**TYPE D
FOR GROUND MOUNTED
CONTROLLER CABINET**

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2015

ENGINEER OF OPERATIONS

APPROVED January 1, 2015

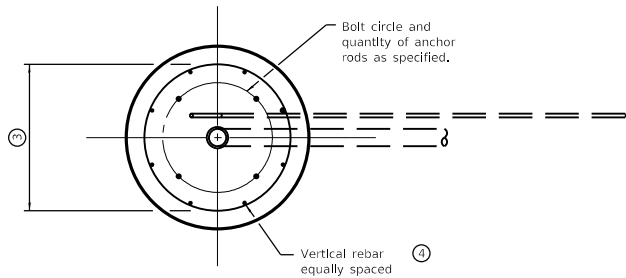
ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-15	Revised TYPE E detail.
1-1-12	Replaced rebar No.'s with 'vertical' for TYPE E foundation detail.

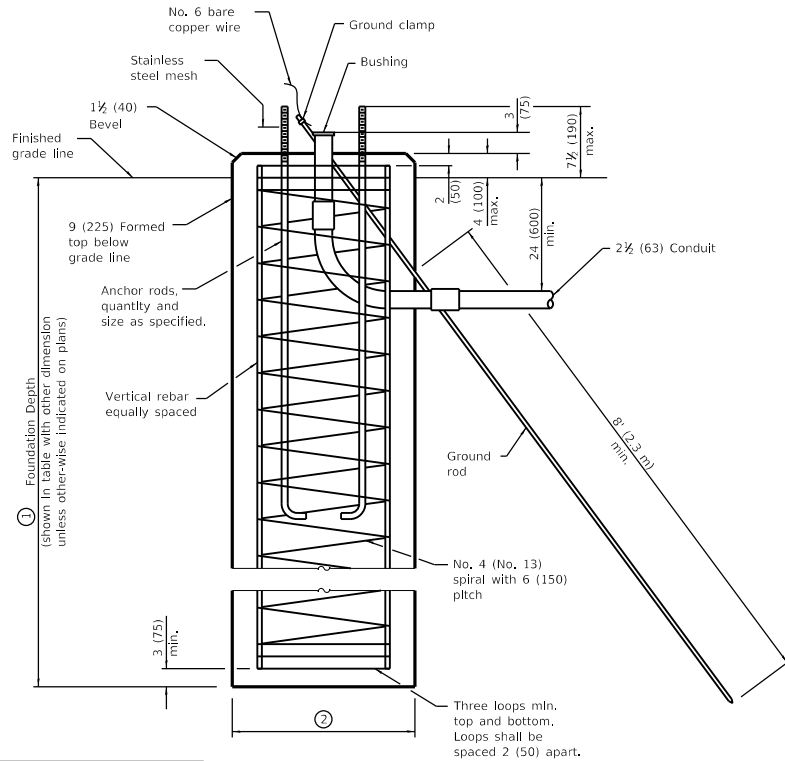
**CONCRETE
FOUNDATION DETAILS**

(Sheet 1 of 2)

STANDARD 878001-10



TOP VIEW



TYPE E

Mast Arm Length	① Foundation Depth *	② Foundation Diameter	③ Spiral Diameter	④ Quantity of Rebars	Size of Rebars
Less than 30' (9.1 m)	10'-0" (3.0 m)	30 (750)	24 (600)	8	6 (19)
Greater than or equal to 30' (9.1 m) and less than 40' (12.2 m)	13'-6" (4.1 m)	30 (750)	24 (600)	8	6 (19)
	11'-0" (3.4 m)	36 (900)	30 (750)	12	7 (22)
Greater than or equal to 40' (12.2 m) and less than 50' (15.2 m)	13'-0" (4.0 m)	36 (900)	30 (750)	12	7 (22)
	15'-0" (4.6 m)	36 (900)	30 (750)	12	7 (22)
Greater than or equal to 50' (15.2 m) and up to 55' (16.8 m)	21'-0" (6.4 m)	42 (1060)	36 (900)	16	8 (25)
Greater than or equal to 55' (16.8 m) and less than 65' (19.8 m)	25'-0" (7.6 m)	42 (1060)	36 (900)	16	8 (25)
Greater than or equal to 65' (19.8 m) and up to 75' (22.9 m)					

* For standard and combination mast arm assemblies. Foundation depths for standard dual mast arms with the longest arm length upto and including 55' (16.8 m) shall be increased by 1' (0.3 m) of that shown in the table, based on the longer of the two arms.

These foundation depths are for sites which have cohesive soils (clayey silt, sandy clay, etc.) along the length of the shaft, with an average Unconfined Compressive Strength (Qu) > 1.0 tsf (100 kpa). This strength shall be verified by boring data prior to construction or with testing by the Engineer during foundation drilling. The Bureau of Bridges & Structures should be contacted for a revised design if other conditions are encountered.

Illinois Department of Transportation

PASSED January 1, 2015
[Signature]
 ENGINEER OF OPERATIONS

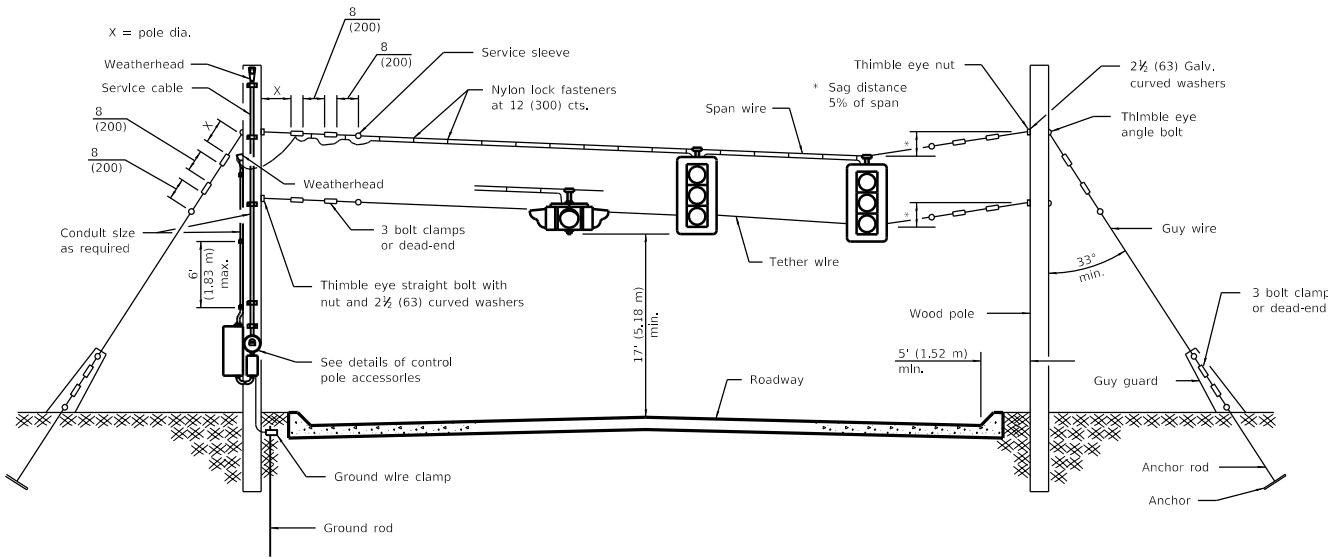
APPROVED January 1, 2015
[Signature]
 ENGINEER OF DESIGN AND ENVIRONMENT

2011-11 03/15/15

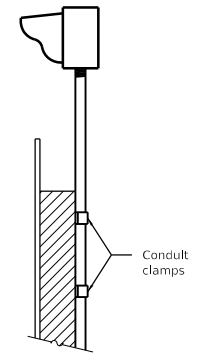
**CONCRETE
FOUNDATION DETAILS**

(Sheet 2 of 2)

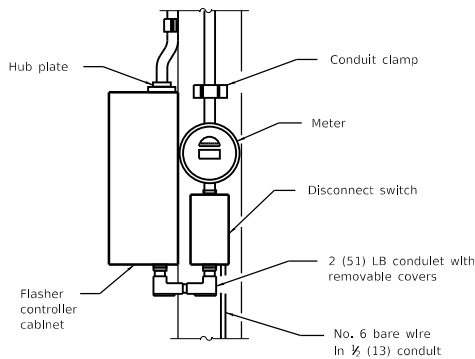
STANDARD 878001-10



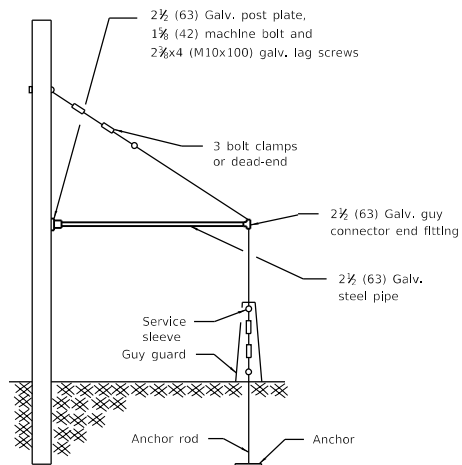
SPAN WIRE MOUNTED SIGNALS AND FLASHING BEACON



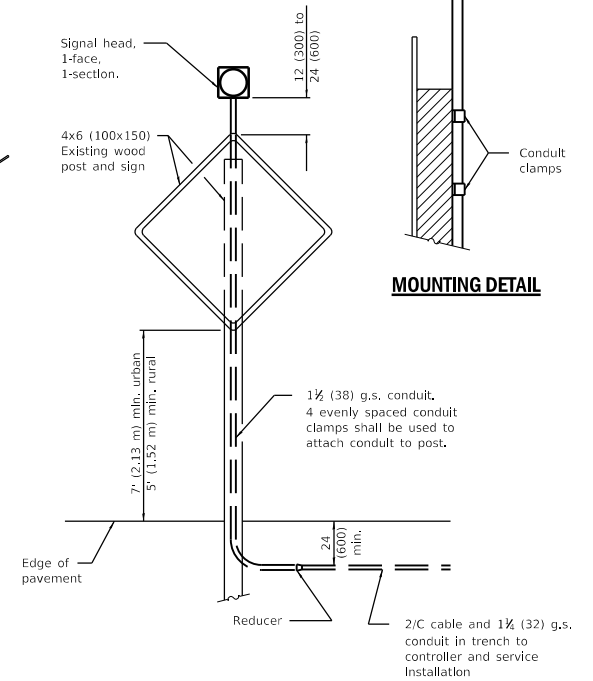
MOUNTING DETAIL



CONTROL POLE DETAIL



SIDEWALK GUY DETAIL



POST MOUNTED FLASHING BEACON

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2009

ENGINEER OF OPERATIONS

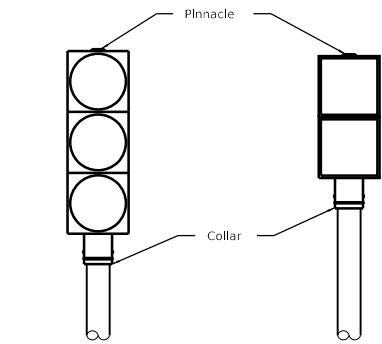
APPROVED January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-02	Renum. Standard 840001.

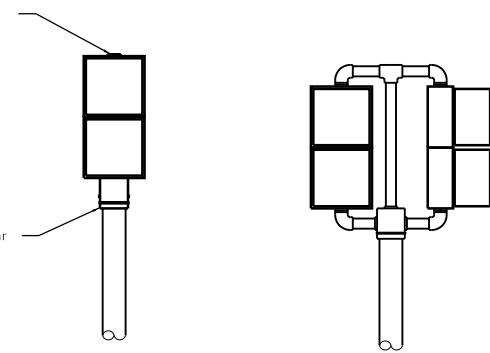
SPAN WIRE MOUNTED SIGNALS AND FLASHING BEACON INSTALLATION

STANDARD 880001-01



**POST MOUNTED
TRAFFIC SIGNAL HEAD**

ONE WAY

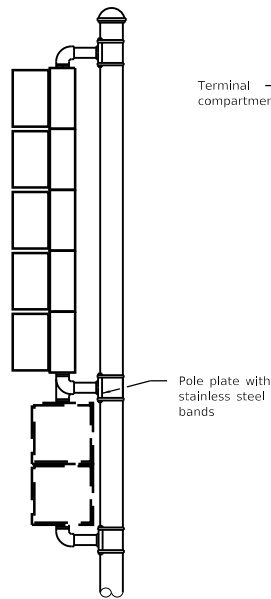


**POST MOUNTED
PEDESTRIAN SIGNAL HEAD**

ONE WAY

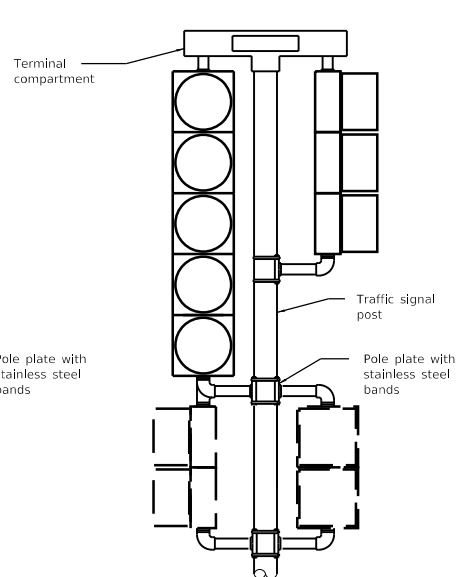
**POST MOUNTED
PEDESTRIAN SIGNAL HEAD**

TWO WAY



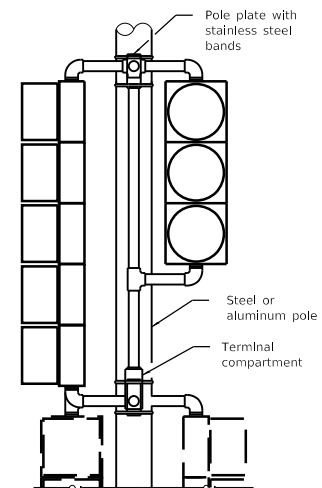
**BRACKET MOUNTED
TRAFFIC SIGNAL HEAD**

ONE WAY

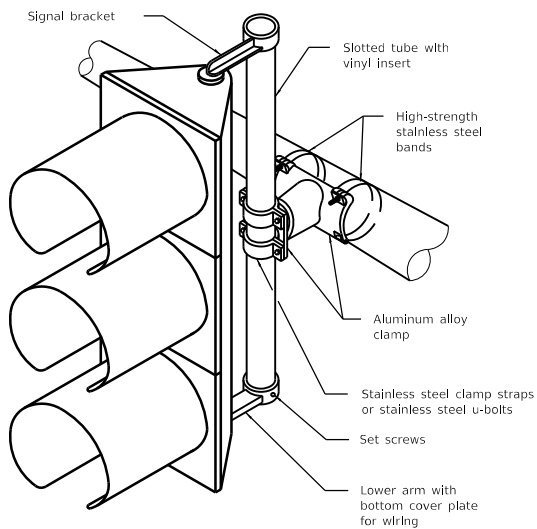


**BRACKET MOUNTED
TRAFFIC SIGNAL HEAD**

TWO WAY



**BRACKET MOUNTED
TRAFFIC SIGNAL HEAD**



STEEL MAST ARM MOUNTING

Illinois Department of Transportation

PASSED January 1, 2009

ENGINEER OF OPERATIONS

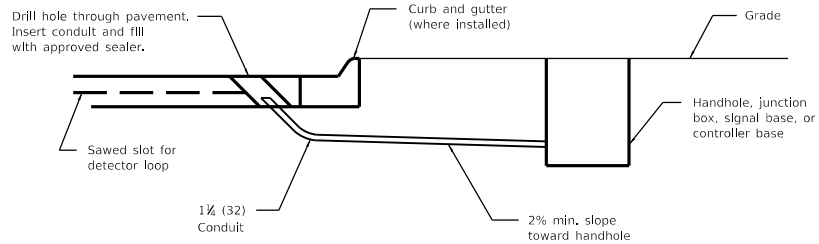
APPROVED January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

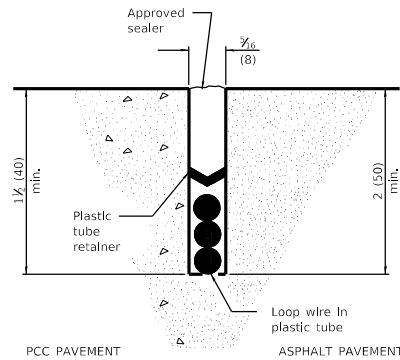
DATE	REVISIONS
1-1-09	Omitted note regarding units of length.
1-1-02	Renum. Standard 840006.

TRAFFIC SIGNAL MOUNTING DETAILS

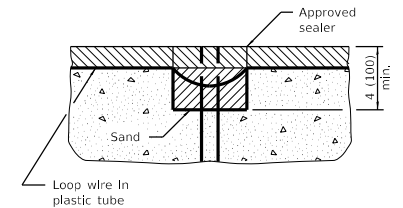
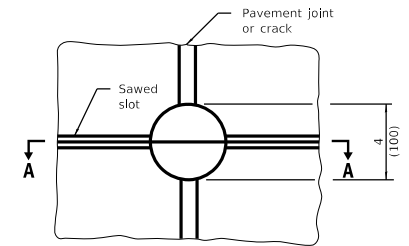
STANDARD 880006-01



DETECTOR LOOP LEAD-IN

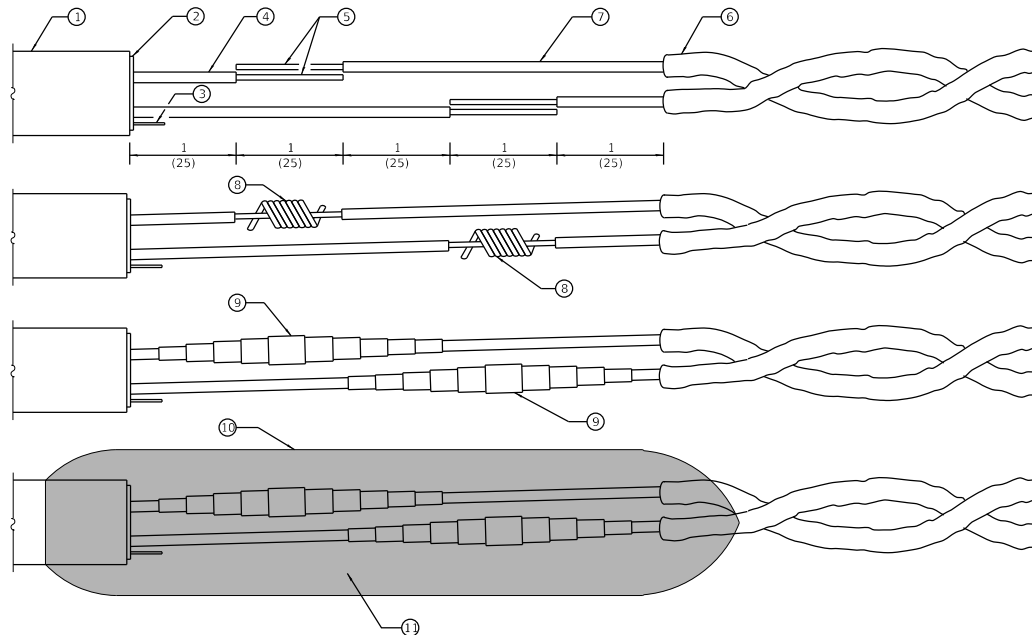


DETECTOR LOOP INSTALLATION



NOTE
Loop wire shall follow saw cut to bottom, forming slack section at joint.

DETECTOR LOOP AT PAVEMENT JOINT OR PAVEMENT CRACK



LOOP WIRE AND LEAD-IN CABLE SPLICE

- ① = Lead-in cable (single pair or multipair)
- ② = Lead-in cable shield
- ③ = Lead-in cable shield drain-wire
- ④ = Lead-in cable insulated conductor
- ⑤ = Bare conductor
- ⑥ = Loop wire in tube
- ⑦ = Loop wire insulated conductor
- ⑧ = Twisted and resin soldered conductor
- ⑨ = Electrical tape insulated splice
- ⑩ = Rigid mold
- ⑪ = Waterproof and dielectric resin

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2009

ENGINEER OF OPERATIONS

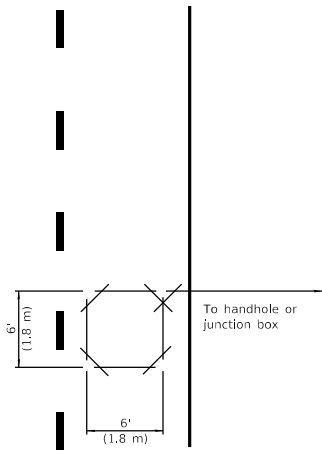
APPROVED January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

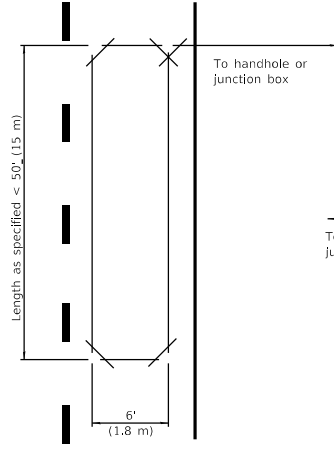
DATE	REVISIONS
1-1-09	Switched units to English (metric)
1-1-02	Renum. Standard 846001.

DETECTOR LOOP INSTALLATIONS

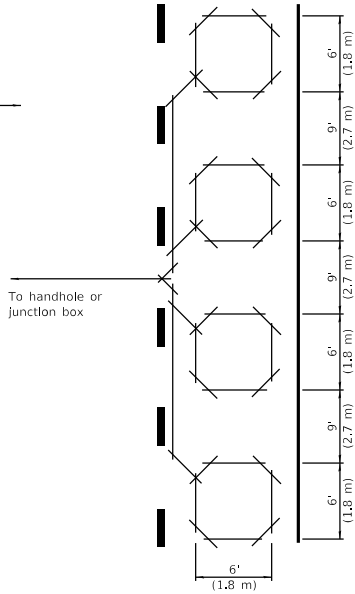
STANDARD 886001-01



FOR POINT DETECTION
SHORT LOOP

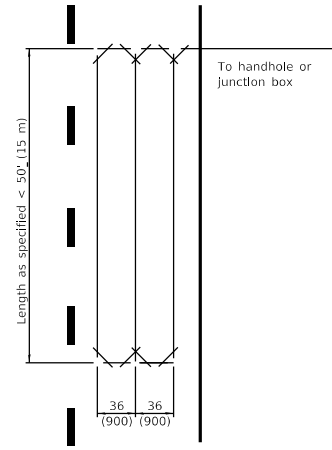


FOR PRESENCE DETECTION
LONG LOOP

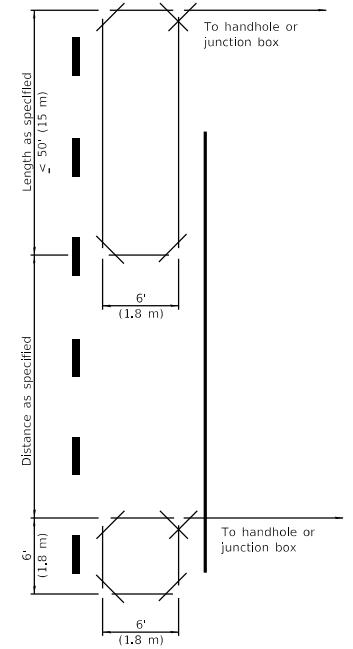


FOR PRESENCE DETECTION
MULTIPLE LOOP IN SERIES

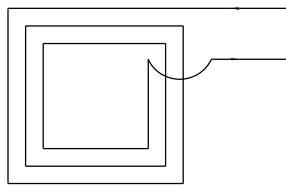
SLOT PLAN



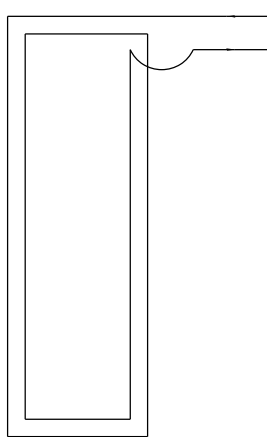
FOR PRESENCE DETECTION
QUADRUPOLE LOOP



FOR EXTENDED-CALL DETECTION

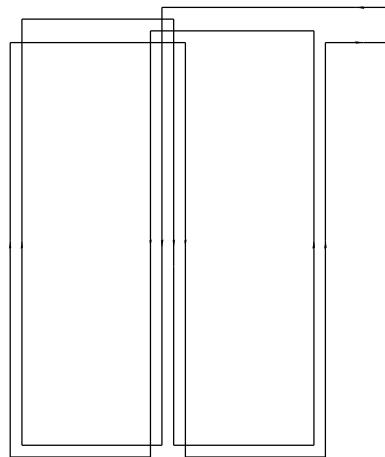


SHORT LOOP



LONG LOOP

WIRING DIAGRAM



QUADRUPOLE LOOP

All dimensions are in inches (millimeters)
unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2009

ENGINEER OF OPERATIONS

APPROVED January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-09	Switched units to English (metric)
1-1-02	Renum. Standard 846006.

**TYPICAL LAYOUTS
FOR DETECTION LOOPS**

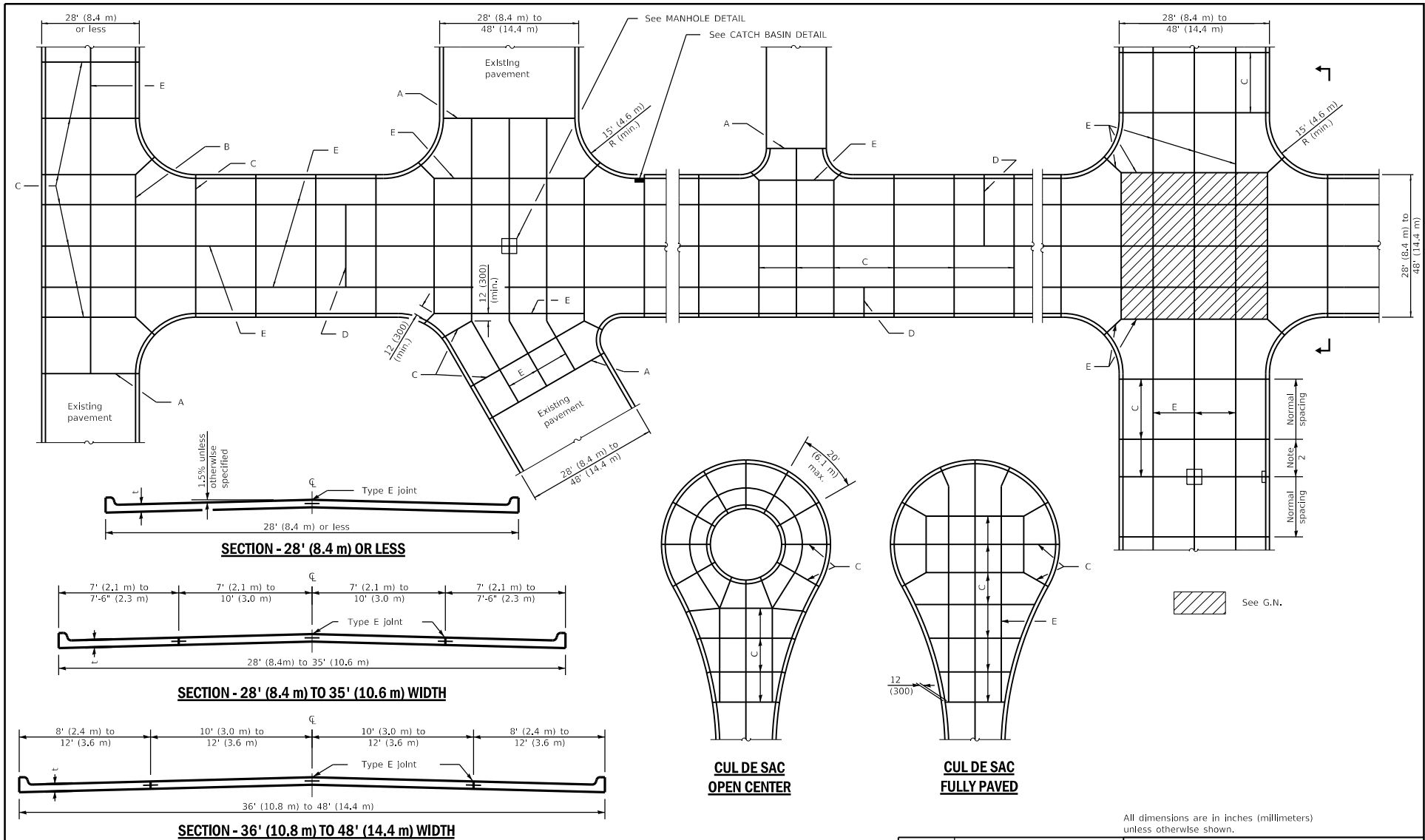
STANDARD 886006-01



Standards by Division

DIVISION BLR LOCAL ROADS

STD. NO.	TITLE
BLR 10-7	PCC Pavement Special
BLR 14-12	Portland Cement Concrete Pavement (Nonreinforced)
BLR 17-4	Traffic Control Devices - Day Labor Construction
BLR 18-6	Traffic Control Devices - Day Labor Maintenance
BLR 20-7	Traffic Barrier Terminal - Type 5R
BLR 21-9	Typical Application of Traffic Control Devices for Construction on Rural Local Highways
BLR 22-7	Typ. Appl. of T.C.D. for Rural Loc. Hwys. (2-Lane 2 Way Rural Traff.) (Rd. Closed to Thru Traff.)
BLR 23-4	Traffic Barrier Terminal Type 1
BLR 24-2	Mailbox Turnout for Local Roads
BLR 25-1	Type 1A Barricade for Non-NHS Routes
BLR 26-3	Steel Plate Beam Guardrail 29 in. (731 mm) Height
BLR 27-1	Traffic Barrier Terminal Type 5A
BLR 28	Concrete Curb Type B and Combination Concrete Curb and Gutter



All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

APPROVED January 1, 2018
M. E. D.
 ENGINEER OF LOCAL ROADS AND STREETS

APPROVED January 1, 2018
Maureen M. Behr
 ENGINEER OF DESIGN AND ENVIRONMENT

464-C 03/15/11

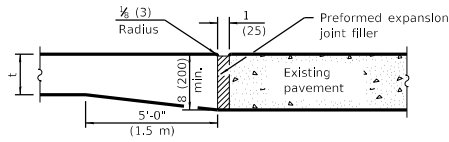
t = See typical cross section on plans for thickness

DATE	REVISIONS
1-1-18	Changed No. 6 (No. 19) bars to No. 5 (No. 16) bars.
1-1-09	Switched units to English (metric).

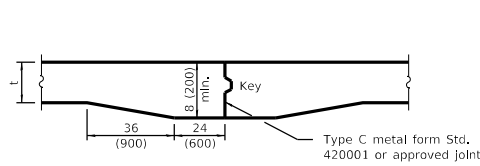
PCC PAVEMENT SPECIAL (NONREINFORCED)

(Sheet 1 of 2)

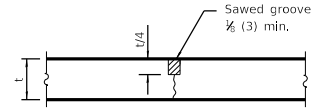
STANDARD B.L.R. 10-7



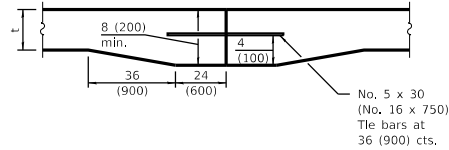
**TYPE A
EXPANSION JOINT**



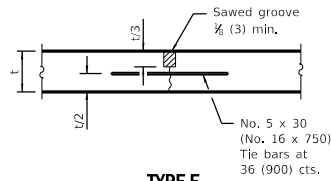
**TYPE B
KEYED JOINT**



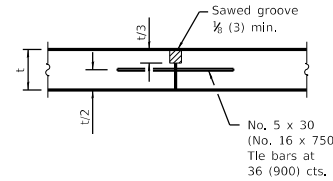
**TYPE C
SAWED TRANSVERSE JOINT**



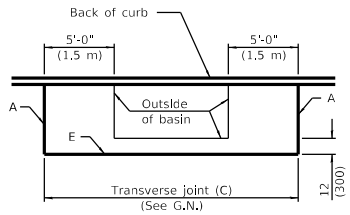
**TYPE D
TIED TRANSVERSE CONSTRUCTION JOINT**



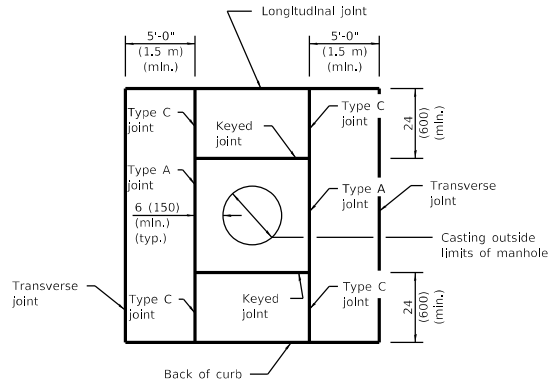
**TYPE E
SAWED LONGITUDINAL JOINT**



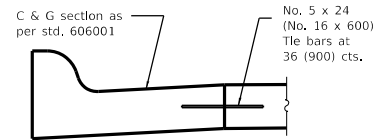
**TYPE E
LONGITUDINAL CONSTRUCTION JOINT**



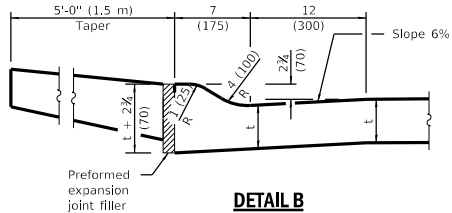
CATCH BASIN DETAIL



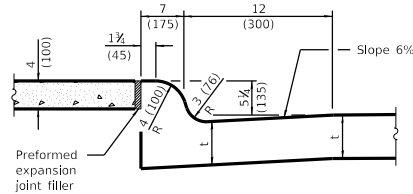
**MANHOLE DETAIL
Showing Joint types**



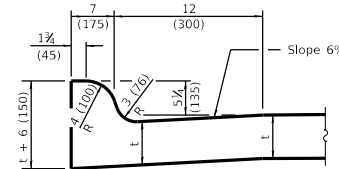
**COMB. CURB & GUTTER DETAIL
Alt. const. see G.N.**



DETAIL B



DETAIL A



INTEGRAL CURB

See DETAIL A for crosswalks and DETAIL B for driveways.

GENERAL NOTES

All catch basins shall be separated from the pavement and curb by boxing out as shown in the detail. Manhole castings within the pavement limits shall be boxed in a like manner except when telescoping type castings are used.

When a joint falls within 5 ft. (1.5 m) of or contacts basins, manholes, or other structures, shorten one or more panels either side of opening to permit joint to fall at the corners of the box out.

When specified, roundouts as shown on Standard 420111 shall be used in lieu of the manhole detail shown herein except No. 5 (No. 16) bars shall be used in lieu of No. 6 (No. 19) bars.

All transverse joints must extend through curbs and be continuous across pavement, except tied transverse construction joints. Expansion joints will be required as shown on the plans.

When specified, the pavement structure thickness at intersections shall be increased. This requirement generally will occur when the design traffic through the intersection exceeds the typical design of the pavement structure either side of the intersection.

Joints shall be sawed to a depth of 1/4 for transverse joints and 1/3 for longitudinal joints. Saw joints shall be sealed with material meeting the requirements of Section 1050 of the Standard Specifications.

This alternate construction is at the Contractor's option and shall be constructed in accordance with Section 606 of the Standard Specifications. The combination concrete curb and gutter shall be measured in place and the area computed in sq. yards (sq. meters). This work will be paid for at the contract unit price per sq. yards (sq. meters) for portland cement concrete pavement special with integral curb of the thickness specified and shall include all materials and labor.

Transverse joint spacing shall not exceed 15 ft. (4.6 m).

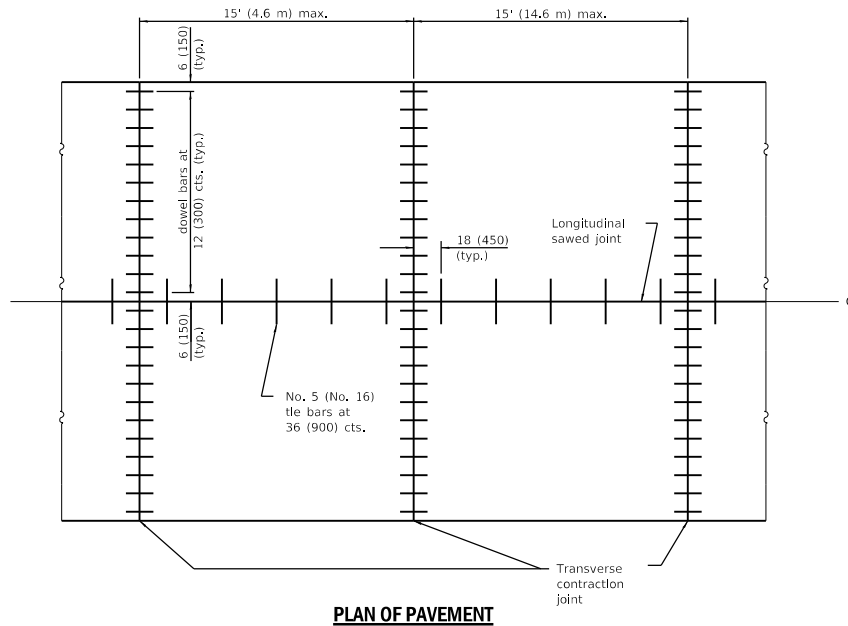
Construct TYPE D tied transverse construction joint when construction joint does not fall at a TYPE C sawed transverse joint.

**PCC PAVEMENT SPECIAL
(NONREINFORCED)**

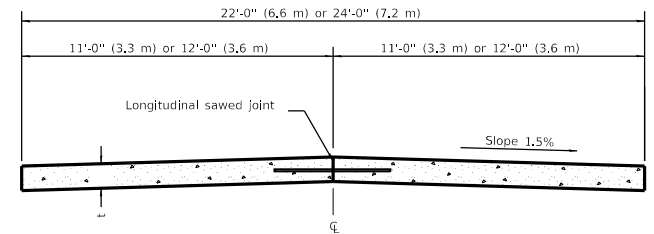
(Sheet 2 of 2)

STANDARD B.L.R. 10-7

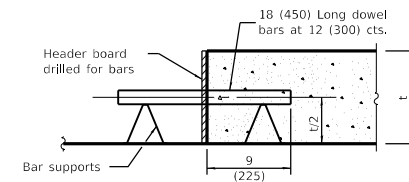
Illinois Department of Transportation
 APPROVED January 1, 2018
 ENGINEER OF LOCAL ROADS AND STREETS
 APPROVED January 1, 2018
 ENGINEER OF DESIGN AND ENVIRONMENT



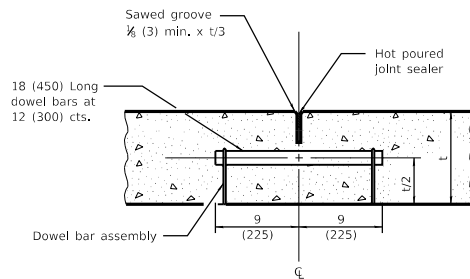
PLAN OF PAVEMENT



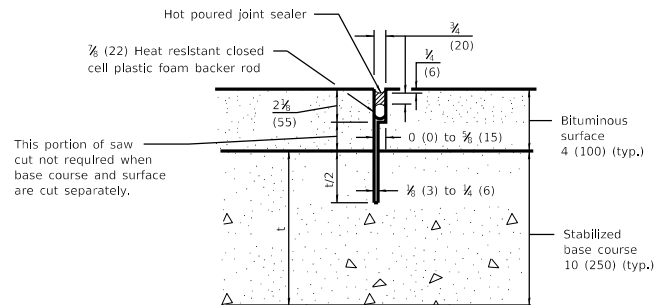
CROSS SECTION OF PAVEMENT



TRANSVERSE CONSTRUCTION JOINT



TRANSVERSE CONTRACTION JOINT



TRANSVERSE CONTRACTION JOINT
(For CAM, CFA and LFA Base Course Mixtures)

GENERAL NOTES

See Standard 420001 for details of Transverse Expansion Joints, Longitudinal Sawed Joints and Longitudinal Construction Joints.

Dowel bars are only required for Class I, II, or III Roads and Streets having pavement thickness of 7 (175) or greater.

t = Pavement thickness (See Typical Cross Section)

All dimensions are in inches (millimeters) unless otherwise shown.

DOWEL BAR TABLE

PAVEMENT THICKNESS	DOWEL BAR DIAMETER
10 (250) or greater	1 1/2 (38)
8 (200) thru 9.99 (249)	1 1/4 (32)
Less than 8 (200)	1 (25)

DATE	REVISIONS
1-1-18	Revised dowel and tie bar sizes. Increased tie bar spacing.
	Eliminated skewed joint.
1-1-15	Added general note regarding dowel bars.

PORTLAND CEMENT CONCRETE PAVEMENT (NONREINFORCED)

STANDARD B.L.R. 14-12

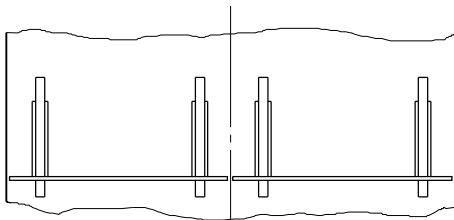
Illinois Department of Transportation

PASSED January 1, 2018

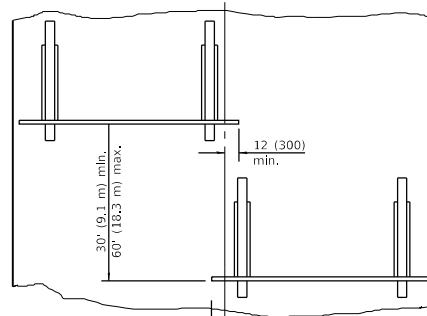
ENGINEER OF LOCAL ROADS AND STREETS

APPROVED January 1, 2018

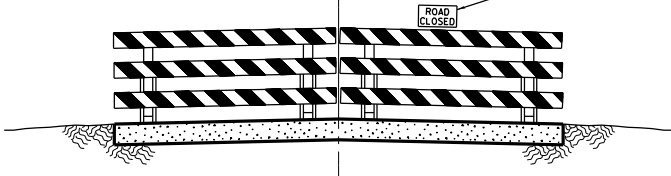
ENGINEER OF DESIGN AND ENVIRONMENT



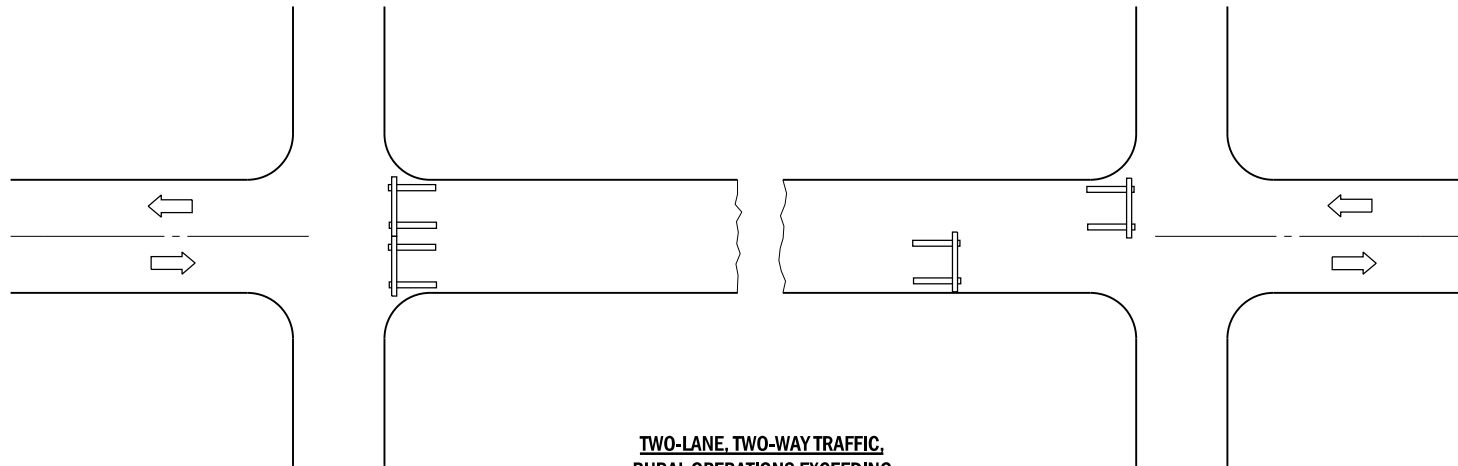
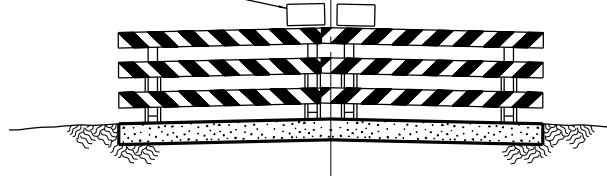
Type III Barricades with Standard Sign R11-2 or R11-4 mounted as shown.



Use when shoulders are too narrow for passage of traffic.



Resident traffic and day labor force's equipment to use road shoulder for passing barricade.



**TWO-LANE, TWO-WAY TRAFFIC,
RURAL OPERATIONS EXCEEDING
ONE DAYLIGHT PERIOD**

GENERAL NOTES

Type III barricades to be width of pavement only.

ReflectORIZED striping shall appear on both sides of barricades. Barricades shall be positioned so that stripes slope downward toward the side on which traffic is to pass.

Although not shown, advance warning signs with minimum dimensions of 36x36 (900x900) and black legends on orange reflectORIZED backgrounds shall be utilized where needed.

This case is for use on rural local roads where the local authority considers this protection to be appropriate for the specific job conditions.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-98	Rev. "R11-1" to "R11-4".
	Rev. 4th General Note.

**TRAFFIC CONTROL DEVICES -
DAY LABOR CONSTRUCTION**

STANDARD B.L.R. 17-4

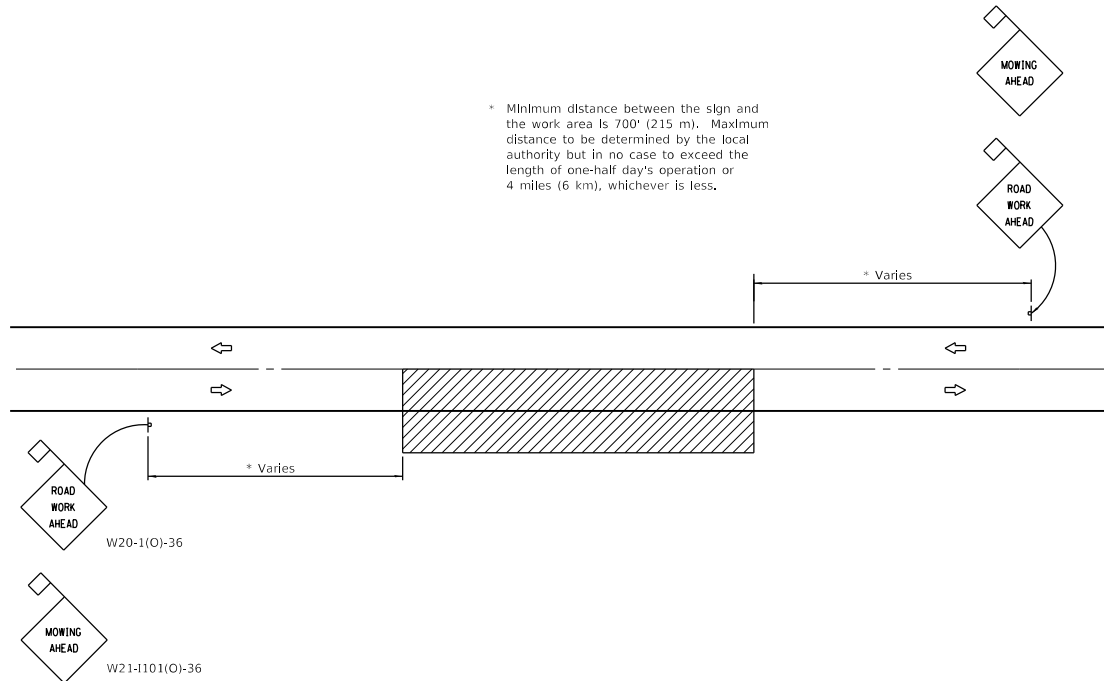
Illinois Department of Transportation

PASSED January 1, 2009
Charles P. Roswell
 ENGINEER OF LOCAL ROADS AND STREETS

APPROVED January 1, 2009
Lee E. Han
 ENGINEER OF DESIGN AND ENVIRONMENT



469-1-1 Q311/52

* Minimum distance between the sign and the work area is 700' (215 m). Maximum distance to be determined by the local authority but in no case to exceed the length of one-half day's operation or 4 miles (6 km), whichever is less.



TWO-LANE, TWO-WAY TRAFFIC
RURAL OPERATIONS
DAY OPERATIONS ONLY

SYMBOLS

-  Work area
-  Sign with 18x18 (450x450) min. orange flag attached.

TYPICAL APPLICATIONS

- MOWING
- SPREADING AGGREGATE
- WEED SPRAYING
- SURFACE MAINTENANCE
- BITUMINOUS RESURFACING
- CRACK POURING
- SHOULDER REPAIR
- CLEANING DITCHES

GENERAL NOTES

Maintenance operations shall be confined to one traffic lane, leaving the opposite lane open to traffic. At least 500' (150 m) of both traffic lanes shall be available for traffic movement between work areas at intervals not greater than 1000' (300 m).

When operations are on the pavement and stationary or moving at a speed less than 4 mph (6 kph), a ONE LANE AHEAD, or other appropriate sign, shall be installed in each direction between the ROAD WORK AHEAD sign and the work area. The distance between this sign and the work area shall be a minimum of 400' (120 m) but in no case to exceed the length of one-half day's operation or 4 miles (6 km), whichever is less. The distance between the two signs shall be approximately 400' (120 m).

All signs are to be removed at completion of the day's operation.

Any unattended obstacle, excavation, or pavement drop off greater than 3 (75) in the work area shall be protected by Type I or Type II barricades with flashing lights.

Longitudinal dimensions may be adjusted slightly to fit field conditions.

All vehicles, equipment, men, and their activities are restricted at all times to one side of the pavement.

Flashing lights or rotating beacons are required for all maintenance vehicles while in operation.

Applicable operations illustrated in Standard 701301 may be used when operations do not exceed 15 minutes on the pavement or 60 minutes on the shoulder respectively.

All warning signs shall have minimum dimensions of 36x36 (900x900) and have black legend on an orange reflectorized background.

When fluorescent signs are used, orange flags are not required.

This case is for use on rural local roads where the local authority considers this protection to be appropriate for the specific job conditions.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2015
James K. Bean
 ENGINEER OF LOCAL ROADS AND STREETS

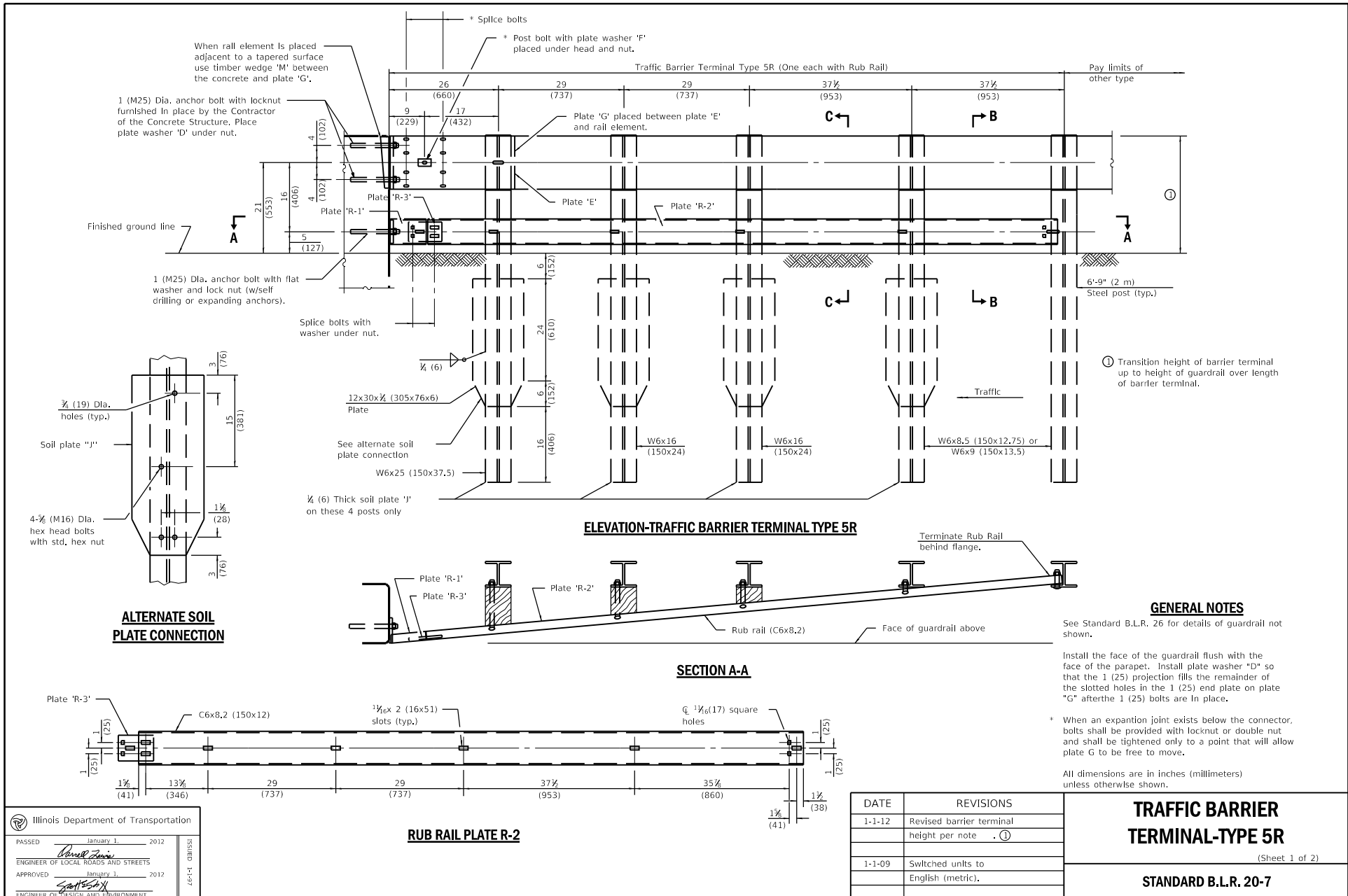
APPROVED January 1, 2015
RE
 ENGINEER OF DESIGN AND ENVIRONMENT

169-1-1 03/15/15

DATE	REVISIONS
1-1-15	Corrected RWA sign number.
1-1-09	Switched units to English (metric). Moved one General Note.

**TRAFFIC CONTROL DEVICES-
DAY LABOR MAINTENANCE**

STANDARD B.L.R. 18-6



Illinois Department of Transportation

PASSED January 1, 2012

APPROVED January 1, 2012

ENGINEER OF LOCAL ROADS AND STREETS

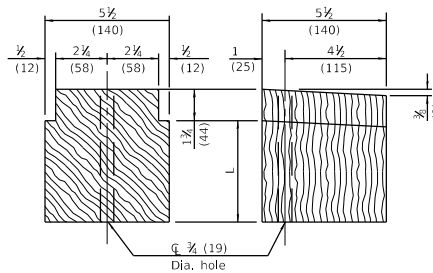
ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-12	Revised barrier terminal height per note ①
1-1-09	Switched units to English (metric).

TRAFFIC BARRIER TERMINAL-TYPE 5R

(Sheet 1 of 2)

STANDARD B.L.R. 20-7

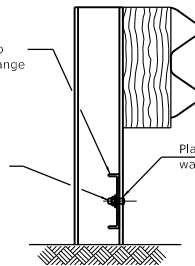


TREATED TIMBER BLOCKING

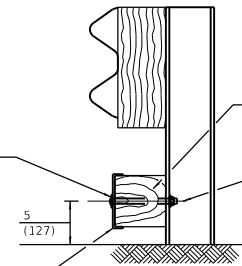
** Approximate Lengths Field Verify

7 3/4	(187)
5 3/4	(143)
3 3/4	(98)

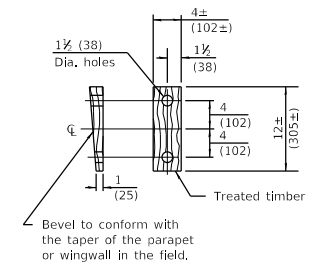
1/2 (16) Dia. post bolt with 3/8 (19) Dia. hole in post



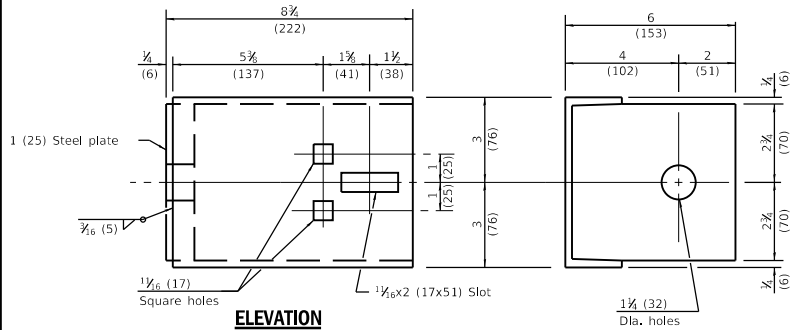
SECTION B-B



SECTION C-C

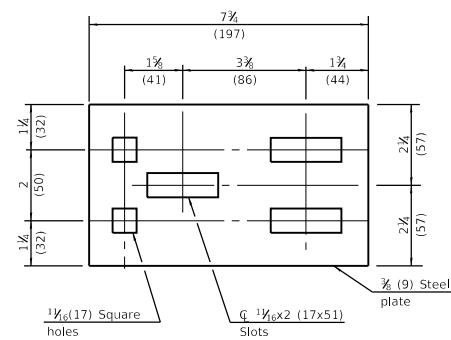


WEDGE M



ELEVATION

END VIEW



SPLICE PLATE 'R-3'

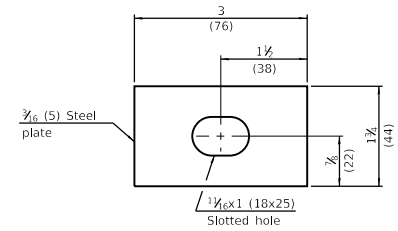
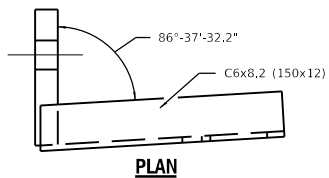


PLATE WASHER F



PLAN

RUB RAIL PLATE R-1

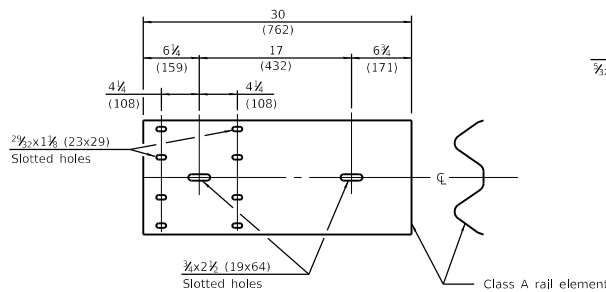


PLATE E

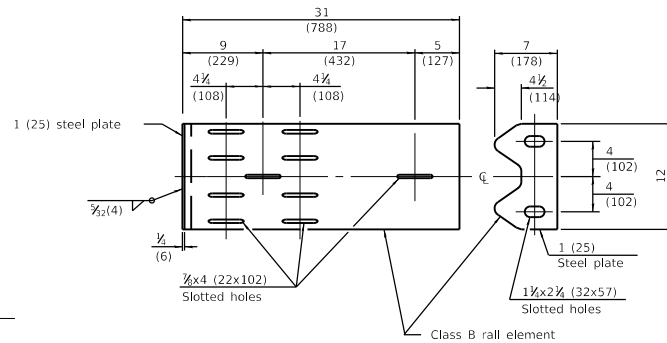


PLATE G

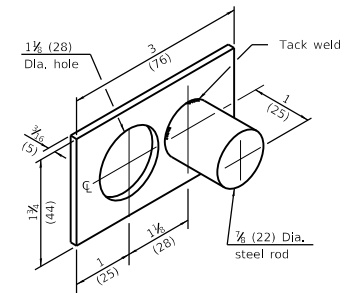


PLATE WASHER D

**TRAFFIC BARRIER
TERMINAL-TYPE 5R**

(Sheet 2 of 2)

STANDARD B.L.R. 20-7

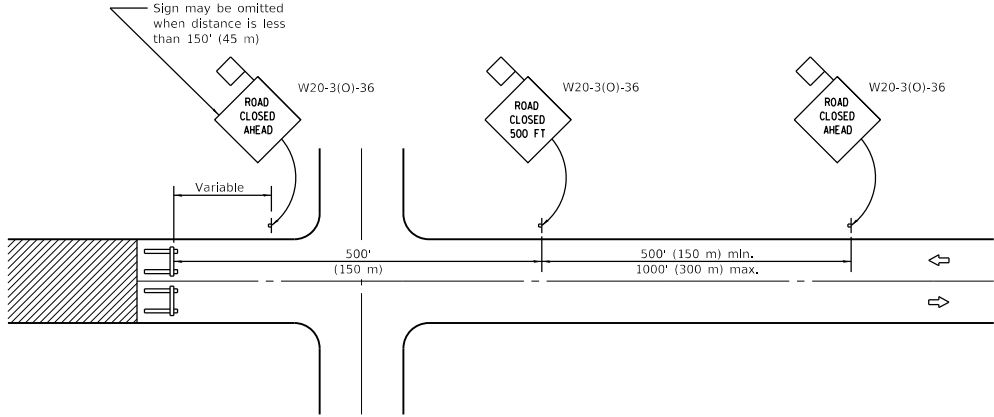
Illinois Department of Transportation

PASSED January 1, 2012

APPROVED January 1, 2012

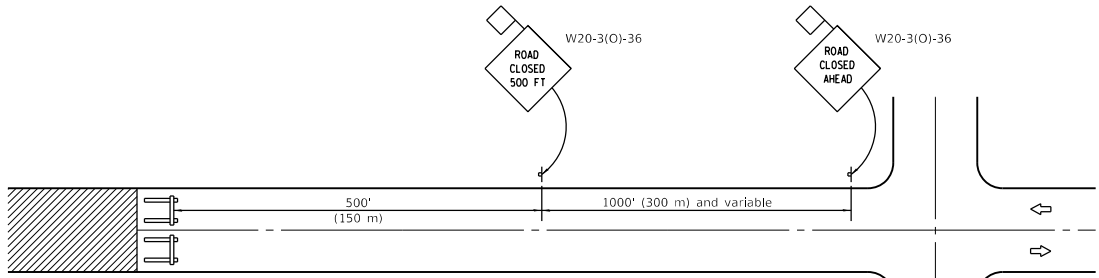
ENGINEER OF LOCAL ROADS AND STREETS

ENGINEER OF DESIGN AND ENVIRONMENT



CONDITION I

When distance from closure to crossroad is less than 1500' (450 m)



CONDITION II

When distance from closure to crossroad is greater than 1500' (450 m)

SYMBOLS



Work area



Type III Barricade



Sign with 18x18 (450x450) min. orange flag attached

GENERAL NOTES

Type III Barricades and R11-2-4830 signs shall be positioned as shown in "Road Closed To All Traffic" detail on Highway Standard 701901.

Two Type A Low Intensity Flashing Lights shall be used on each approach in advance of the work area during hours of darkness. One light shall be installed above the barricades and the other above the first advance warning sign.

All warning signs shall have minimum dimensions of 36 x 36 (900 x 900) and have a black legend on an orange reflectorized background.

When fluorescent signs are used, orange flags are not required.

Longitudinal dimensions may be adjusted to fit field conditions.

When the distance between the barricade and the Intersection is between 1500' (450 m) and 2000' (600 m), the advance sign shall be placed at the Intersection. When the distance between the barricade and the Intersection is over 2000' (600 m), an additional sign shall be placed at the Intersection. The additional sign shall give the distance to the barricade in miles or fractions of a mile.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-12	Omitted two notes from GENERAL NOTES.
1-1-09	Switched units to English (metric).

TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES FOR CONSTRUCTION ON RURAL LOCAL HIGHWAYS

STANDARD B.L.R. 21-9

Illinois Department of Transportation

PASSED January 1, 2012

APPROVED January 1, 2012

ENGINEER OF LOCAL ROADS AND STREETS

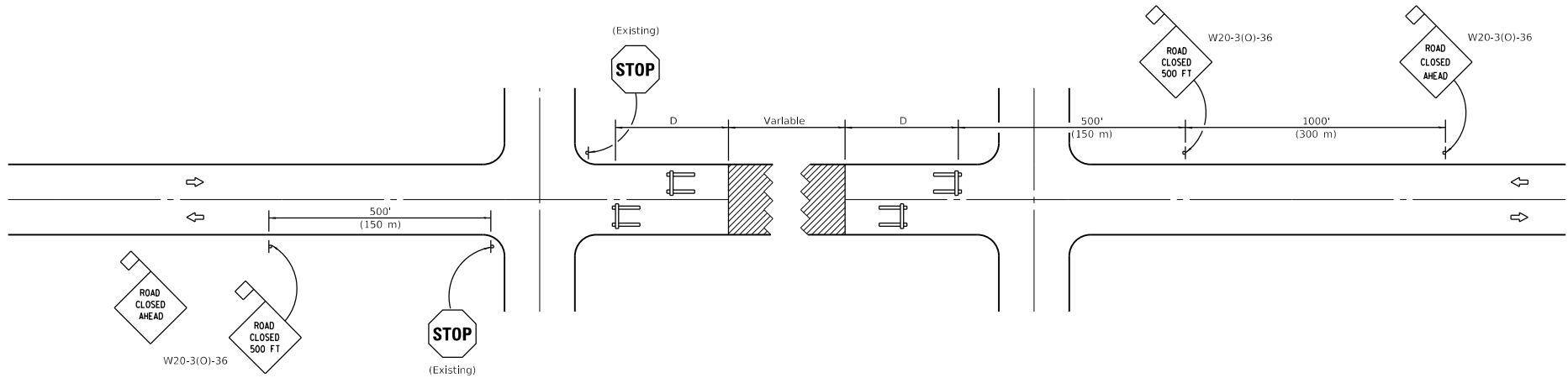
ENGINEER OF DESIGN AND ENVIRONMENT

DESIGNED BY: *David Zorn*




CHECKED BY: *Scott Smith*

**CONDITION I
APPROACH TRAFFIC STOPPED**

**CONDITION II
APPROACH TRAFFIC
DOES NOT STOP**



SYMBOLS

-  Work area
-  Type III Barricade
-  Sign with 18x18 (450x450) mm, orange flag attached

GENERAL NOTES

Type III Barricades and R11-4-6030 signs shall be positioned as shown in the "Road Closed To All Traffic" detail on Highway Standard 701901. If the distance "D" exceeds 2000' (600 m), an additional set of barricades and R11-4-6030 shall be placed at each end of the work area.

Two Type A Low Intensity Flashing Lights shall be used on each approach in advance of the work area. One light shall be installed above each barricade. If only one barricade is required, the other light shall be installed above the first advance warning sign.

All warning signs shall have minimum dimensions of 36 x 36 (900 x 900) and have a black legend on an orange reflectorized background.

When fluorescent signs are used, orange flags are not required.

Longitudinal dimensions may be adjusted to fit field conditions.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-12	Omitted two notes from GENERAL NOTES.
1-1-09	Revised General Notes and switched units to English (metric).

TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES FOR CONSTRUCTION ON RURAL LOCAL HIGHWAYS
(TWO-LANE TWO WAY RURAL TRAFFIC)
(ROAD CLOSED TO THRU TRAFFIC)

STANDARD B.L.R. 22-7

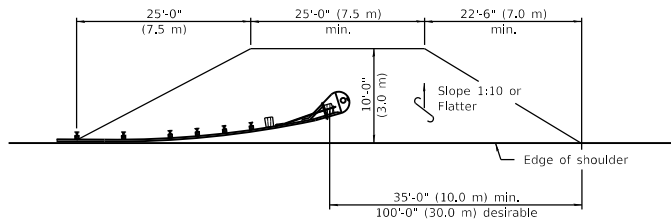
Illinois Department of Transportation

PASSED January 1, 2012
David Jones
ENGINEER OF LOCAL ROADS AND STREETS

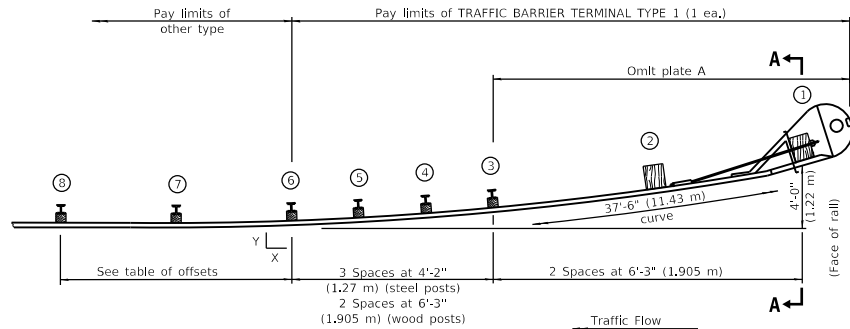
APPROVED January 1, 2012
Scott Smith
ENGINEER OF DESIGN AND ENVIRONMENT

LEG-C1 02/11/02

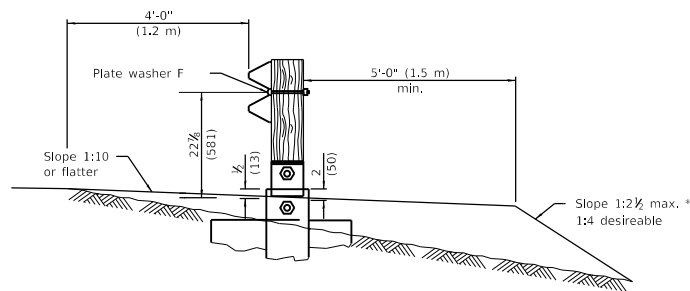
OFFSETS TO FACE OF RAIL		
Post	X ft (m)	Y ft (m)
①	37.22 (11.345)	4.0 (1.22)
②	31.09 (9.475)	2.79 (0.850)
③	24.92 (7.595)	1.79 (0.545)
④	20.79 (6.325)	1.25 (0.380)
⑤	16.64 (5.070)	0.80 (0.245)
⑥	12.49 (3.805)	0.45 (0.135)
⑦	6.25 (1.905)	0.11 (0.035)
⑧	0.00 (0.00)	0.00 (0.00)



SHOULDER WIDENING TRANSITION

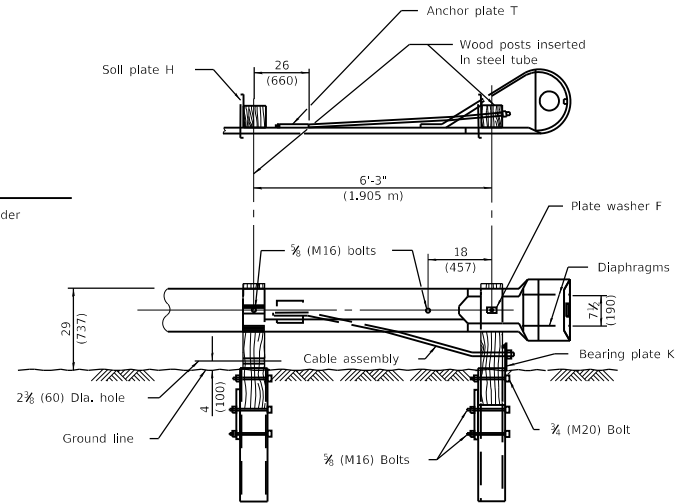


PLAN



SECTION A-A

* If fill height exceeds 5'-0" (1.5 m) use 1:3 max.



**WOOD BREAKAWAY POSTS
TUBULAR STEEL FOUNDATIONS**

GENERAL NOTES

See Standard B.L.R. 26 for details of guardrail not shown.

Posts at location 1 & 2 shall be wood breakaway posts. Posts other than 1 & 2 may be either standard wood posts or steel posts, at the option of the Contractor. If standard wood posts are used, one post shall be located midway between and in lieu of posts 4 & 5. The offset (Y) for this post shall be 12 (300).

A two-piece assembly may be substituted for the one piece nose shown above.

The bearing plate K shall be held in position by (2) two eightpenny nails driven into the post and bent over the top of the plate.

When this terminal is used with Standard 630001, the guardrail shall transition down to the height of the terminal prior to post 8.

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in Inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-12	Revised barrier terminal height and wood breakaway post.
1-1-09	Switched units to English (metric).

**TRAFFIC BARRIER
TERMINAL TYPE 1**

(Sheet 1 of 2)

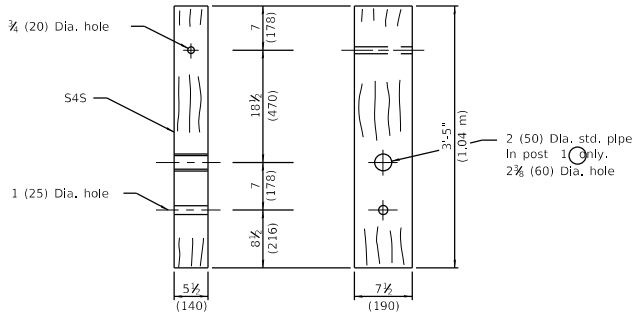
STANDARD B.L.R. 23-4

Illinois Department of Transportation

PASSED January 1, 2012
David J. Davis
ENGINEER OF LOCAL ROADS AND STREETS

APPROVED January 1, 2012
Scott A. Smith
ENGINEER OF DESIGN AND ENVIRONMENT

BM-11 02/15/12



WOOD BREAKAWAY POST
(2 ea.)

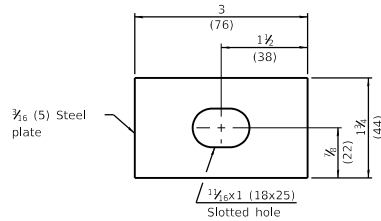
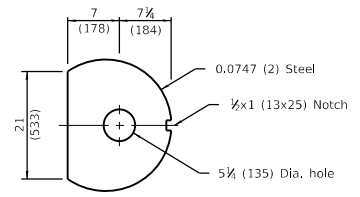
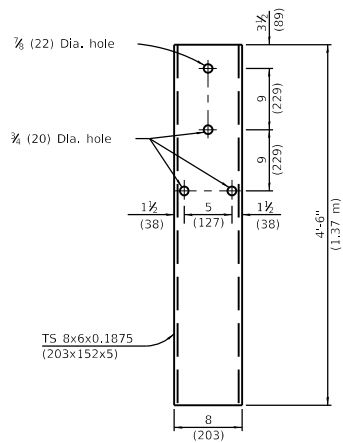


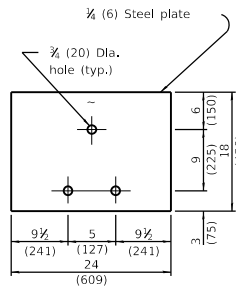
PLATE WASHER F
(1 ea.)



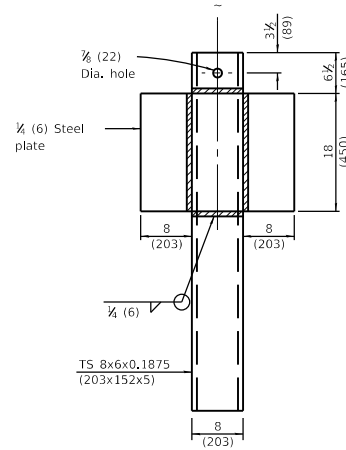
DIAPHRAGM
(2 ea.)



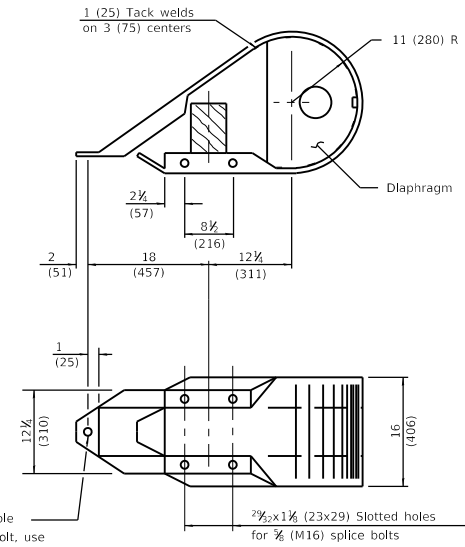
STEEL TUBE
(2 ea.)



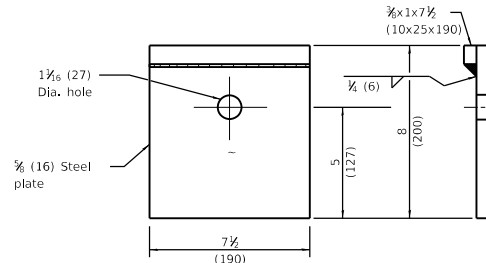
SOIL PLATE H
(2 ea.)



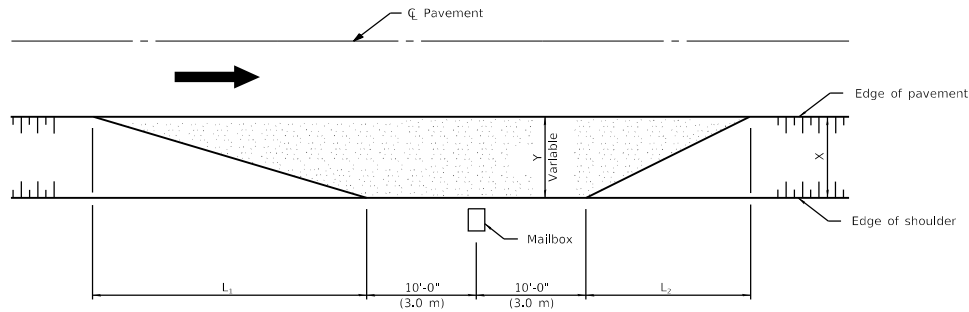
ALTERNATE SOIL PLATE CONNECTION



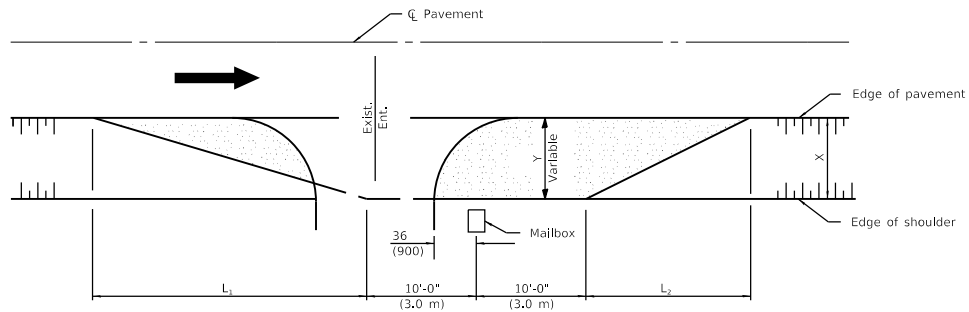
NOSE
(1 ea.)



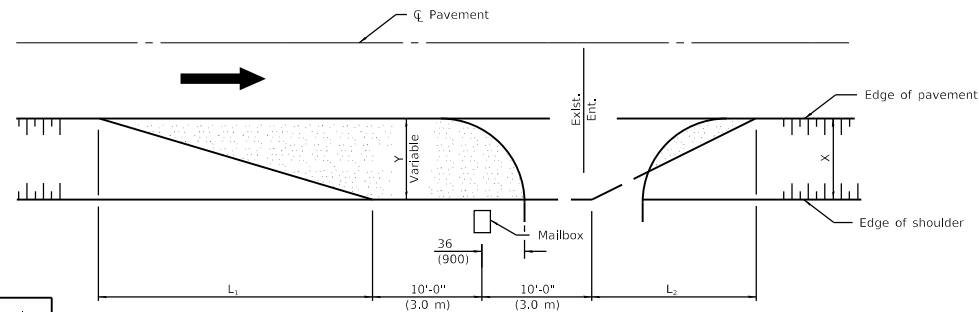
BEARING PLATE K
(1 ea.)



TYPICAL APPLICATION



MAILBOX ON FAR SIDE OF ENTRANCE



MAILBOX ON NEAR SIDE OF ENTRANCE

DIMENSIONS - ft. (m)						
Width of Shoulder (X)	12 (3,6)	10 (3,0)	8 (2,4)	6 (1,8)	5 (1,5)	4 (1,2)
Width of Turnout (Y)	8 (2,4)	8 (2,4)	6 (1,8)	4 (1,2)	4 (1,2)	4 (1,2)
L ₁	30 (9,0)	30 (9,0)	23 (6,9)	15 (4,5)	15 (4,5)	15 (4,5)
L ₂	20 (6,0)	20 (6,0)	15 (4,5)	10 (3,0)	10 (3,0)	10 (3,0)

Note:
Dimensions for Township and District Roads may vary from the above dimensions.

GENERAL NOTES

Mailboxes shall be mounted such that the face of the mailbox is 6 (150) to 12 (300) and the post a minimum of 24 (600) from the edge of the turnout surfacing.

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-99	Add width of shoulder X.

MAILBOX TURNOUT FOR LOCAL ROADS

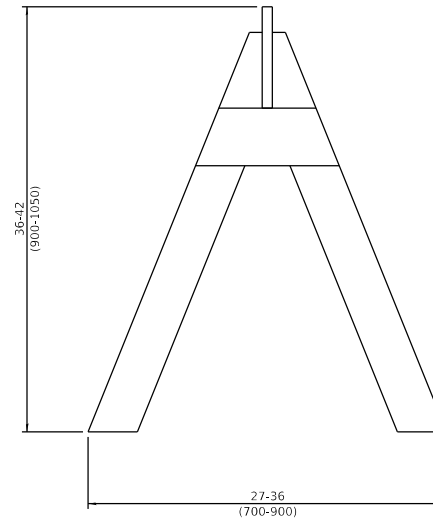
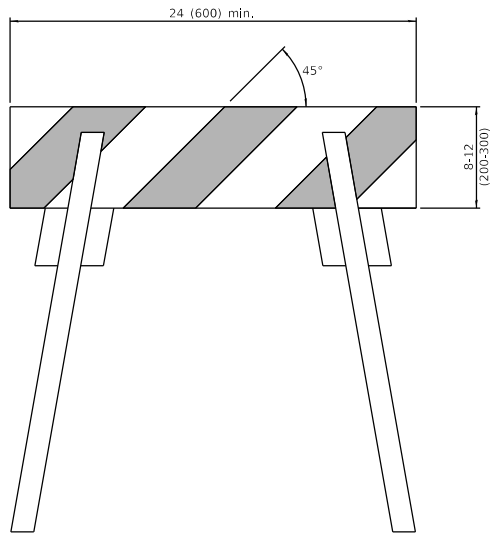
STANDARD B.L.R. 24-2

Illinois Department of Transportation

PASSED January 1, 2009
Charles P. Roswell
ENGINEER OF LOCAL ROADS AND STREETS

APPROVED January 1, 2009
Lee E. Han
ENGINEER OF DESIGN AND ENVIRONMENT

469-1-03/ISS/1



All dimensions are in inches (millimeters)
unless otherwise shown.

Illinois Department of Transportation

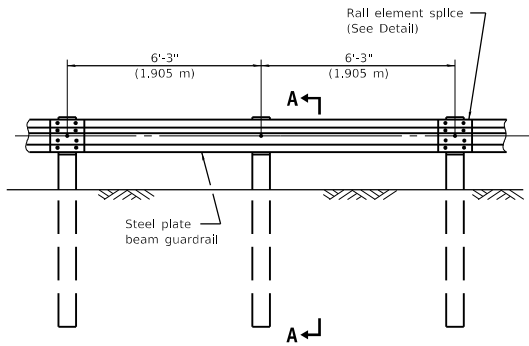
PASSED January 1, 2009
Charles P. Roswell
ENGINEER OF LOCAL ROADS AND STREETS
APPROVED January 1, 2009
Ken E. Han
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED
EPM-1

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-03	New standard from 702001-02

TYPE 1A BARRICADE FOR NON-NHS ROUTES

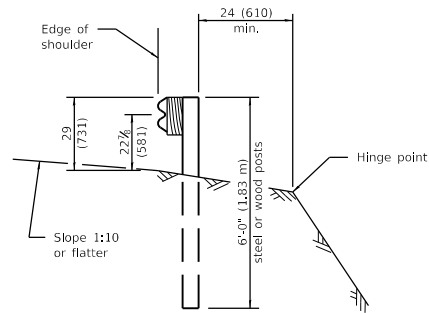
STANDARD B.L.R. 25-1



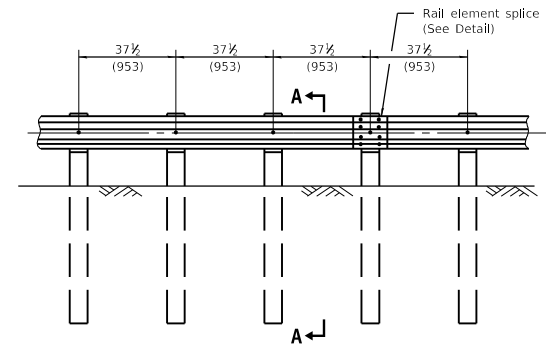
ELEVATION

TYPE A

6'-3" (1.905 m) Typical post spacing



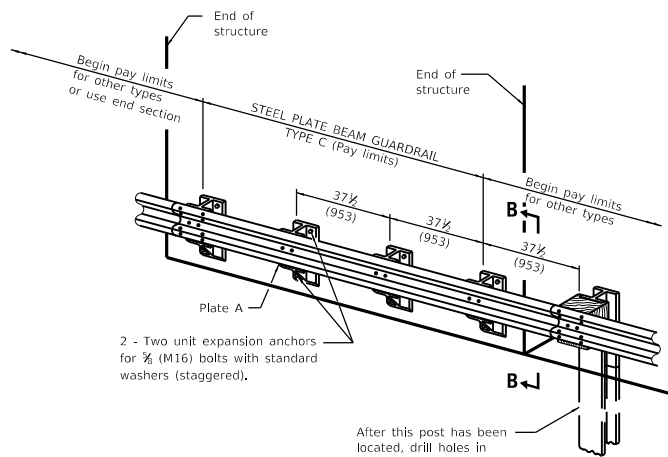
SECTION A-A



ELEVATION

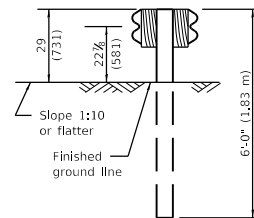
TYPE B

37 1/2 (953) Closed post spacing

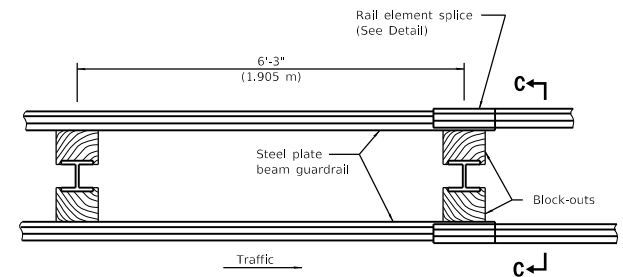


TYPE C

37 1/2 (953) Block-out spacing



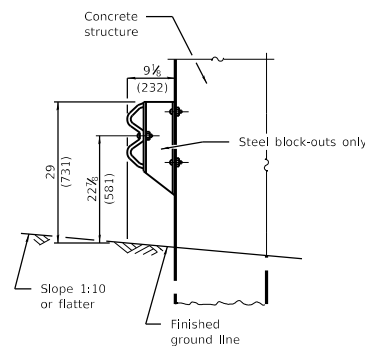
SECTION C-C



PLAN

TYPE D

Double steel plate beam guardrail
6'-3" (1.905 m) typical post spacing



SECTION B-B

GENERAL NOTES

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-12	Revised guardrail height.
	Modified table on sh. 4.
	Renamed standard.
1-1-10	Changed post length
	from 6'-9" to 6'-0".
	Modified table on sh. 4.

STEEL PLATE BEAM GUARDRAIL
29" (731mm) HEIGHT

(Sheet 1 of 4)

STANDARD B.L.R. 26-3

Illinois Department of Transportation

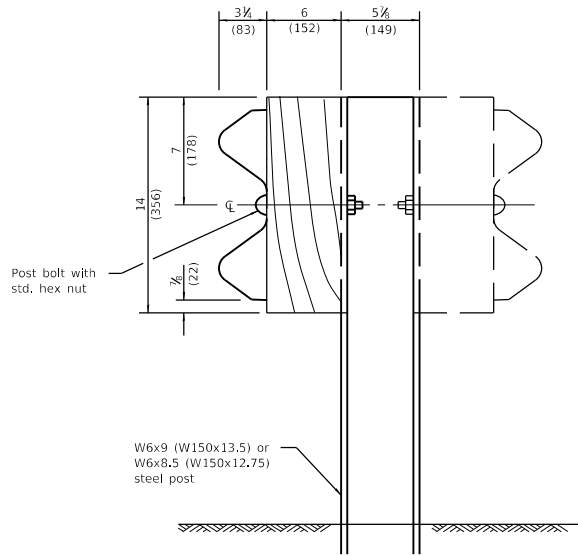
PASSED January 1, 2012

APPROVED January 1, 2012

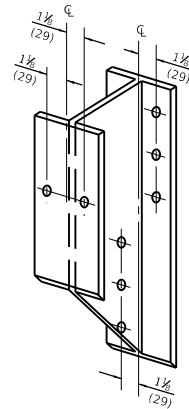
ENGINEER OF LOCAL ROADS AND STREETS

ENGINEER OF DESIGN AND ENVIRONMENT

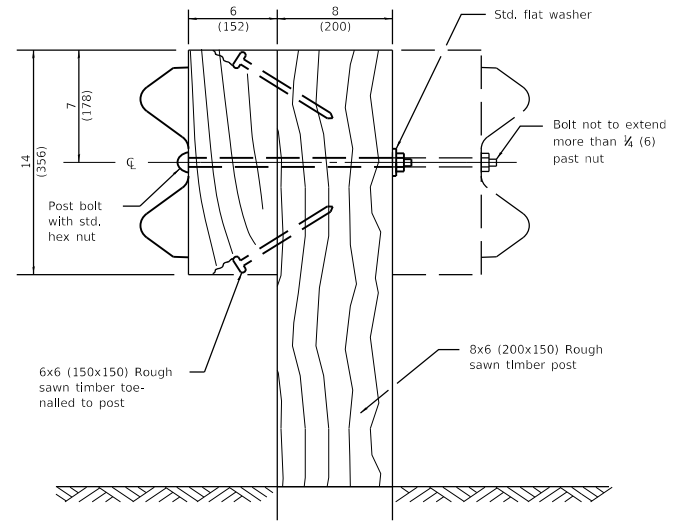
804-C1 03/11/SSZ



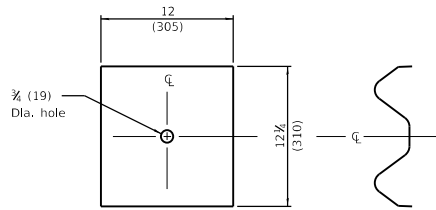
STEEL POST CONSTRUCTION



STEEL BLOCK-OUT DETAIL

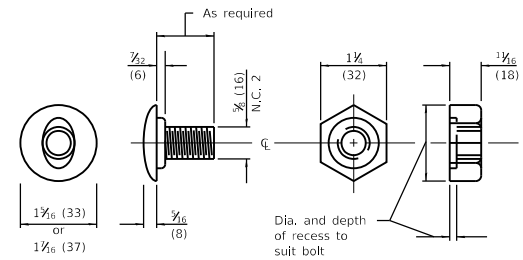


WOOD POST CONSTRUCTION



NOTE
Plate A shall be placed between rail element and block-out at non-splice mounting points only when steel block-outs are used.

PLATE A



POST OR SPLICE BOLT & NUT

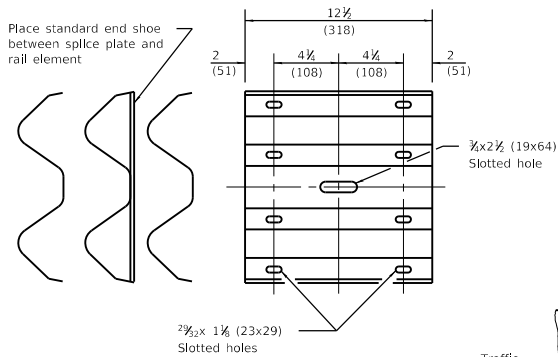
Illinois Department of Transportation

PASSED January 1, 2012
David Zani
ENGINEER OF LOCAL ROADS AND STREETS

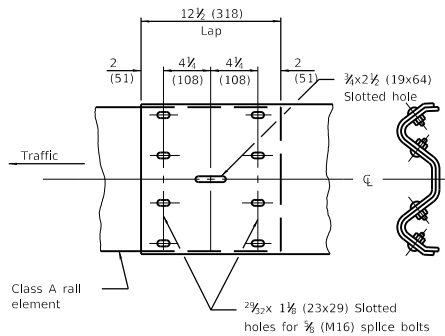
APPROVED January 1, 2012
Spencer
ENGINEER OF DESIGN AND ENVIRONMENT

BMH-1 03/11/12

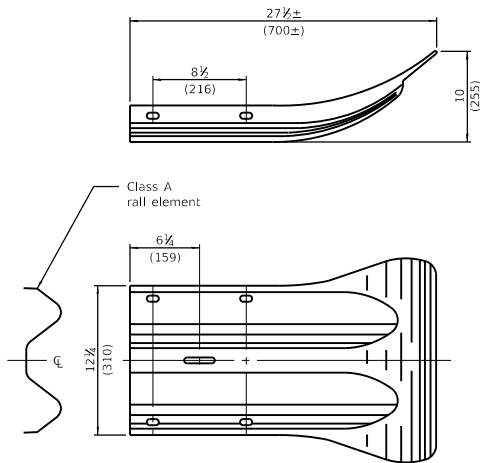
STEEL PLATE BEAM GUARDRAIL
29" (731mm) HEIGHT
(Sheet 2 of 4)
STANDARD B.L.R. 26-3



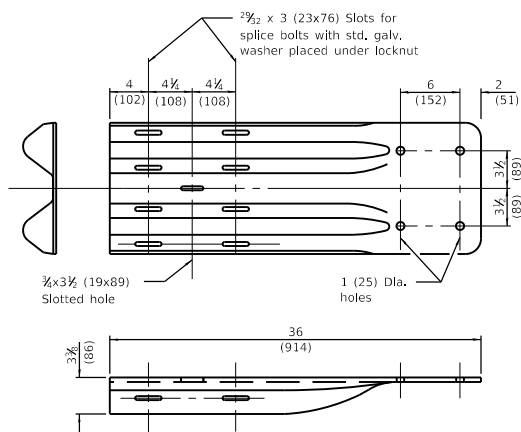
SPLICE PLATE



RAIL ELEMENT SPLICE



END SECTION

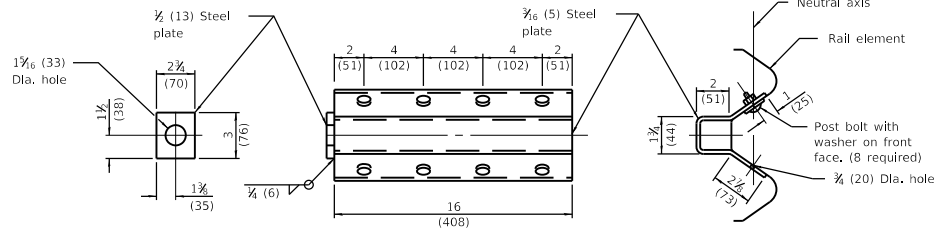


NOTE
When end shoe is attached to a bridge parapet which has an expansion joint, the bolts shall be provided with a locknut or double nut and shall be tightened only to a point that will allow guardrail movement.

The standard end shoe shall be attached to the concrete with pre-drilled or self-drilling anchor bolts. The anchor cone shall be set flush with the surface of the concrete.

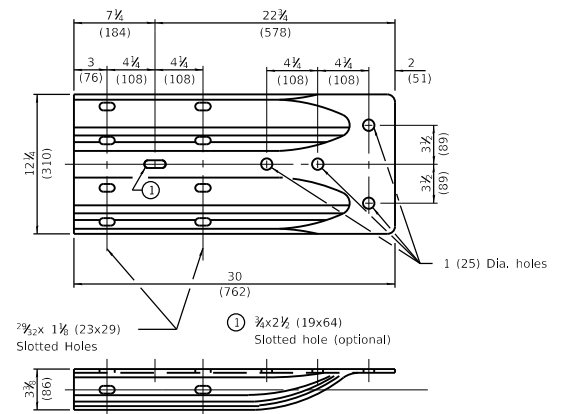
Externally threaded studs protruding from the surface of the concrete will not be permitted.

END SHOE



NOTE
Anchor plate T shall be used to attach cable assembly to guardrail when required on traffic barrier terminals.

ANCHOR PLATE T DETAILS



ALTERNATE END SHOE

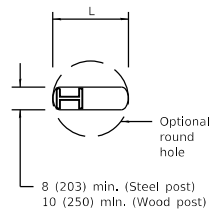
Illinois Department of Transportation

PASSED January 1, 2012
David J. Jones
ENGINEER OF LOCAL ROADS AND STREETS

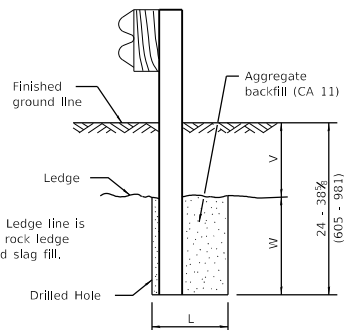
APPROVED January 1, 2012
Scott A. Jones
ENGINEER OF DESIGN AND ENVIRONMENT

BP-1-C 03/11/12

STEEL PLATE BEAM GUARDRAIL
29" (731mm) HEIGHT
(Sheet 3 of 4)
STANDARD B.L.R. 26-3

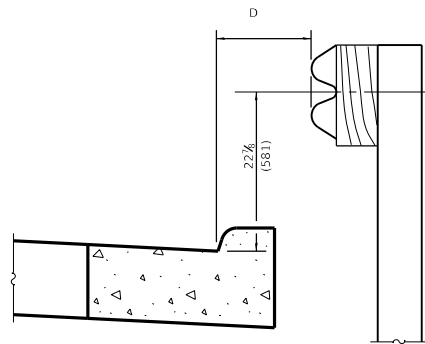


PLAN



ELEVATION

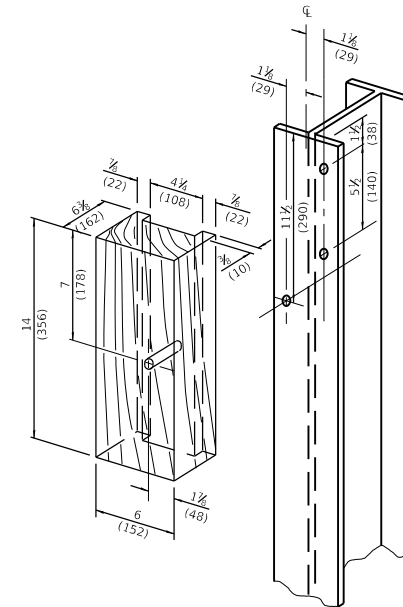
FOOTING FOR POST WHEN IMPERVIOUS MATERIAL IS ENCOUNTERED



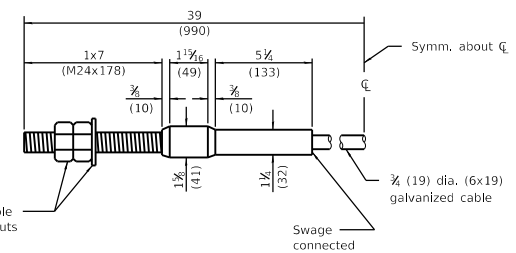
Note:
If it is necessary for D to be more than 12 (300) and less than 10'-0" (3.0 m) Type M-2 (M-5) curb and gutter (Std. 606001) shall be used in front of and in advance of the guardrail.

**GUARDRAIL PLACED BEHIND CURB
(D = 0 desirable to 12 (300) maximum)**

V	W	L	
		Steel Post	Wood Post
0 - 16 1/2 (0 - 410)	24 (610)	21 (530)	23 (580)
>16 1/2 - 28 3/4 (>410 - 714)	12 (305)	8 (203)	10 (250)
>28 3/4 - 38 1/2 (>714 - 981)	12 - 0 (305 - 0)	8 (203)	10 (250)



**WOOD BLOCK-OUT AND
STEEL POST DETAILS**



CABLE ASSEMBLY
(40,000 lbs. (18,100 kg) min. breaking strength)
Tighten to taut tension.

Illinois Department of Transportation

PASSED January 1, 2012

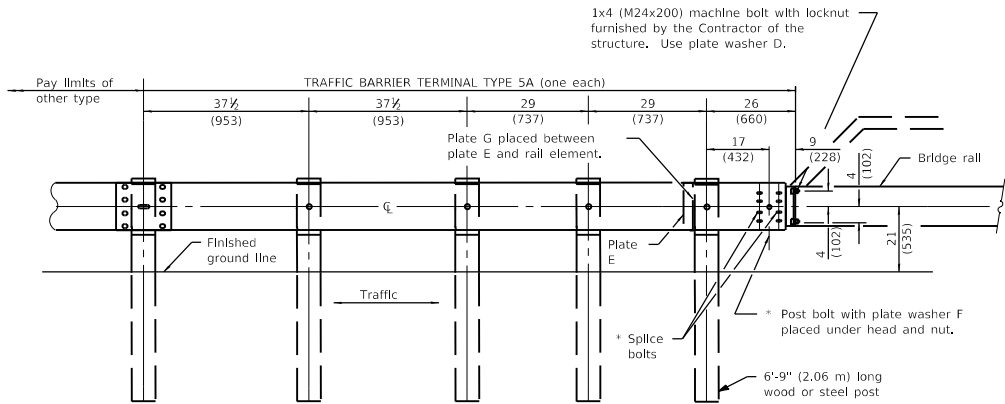
ENGINEER OF LOCAL ROADS AND STREETS

APPROVED January 1, 2012

ENGINEER OF DESIGN AND ENVIRONMENT

STEEL PLATE BEAM GUARDRAIL
29" (731mm) HEIGHT
(Sheet 4 of 4)

STANDARD B.L.R. 26-3



TYPE 5A - STEEL BRIDGE RAIL

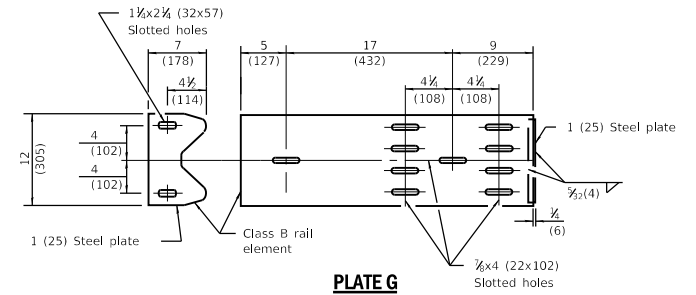


PLATE G

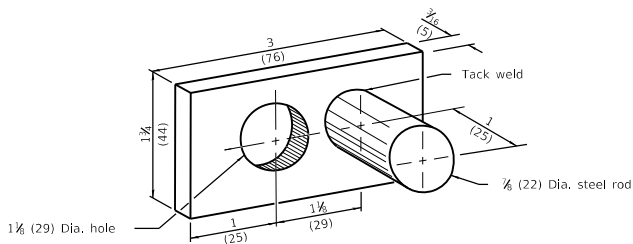
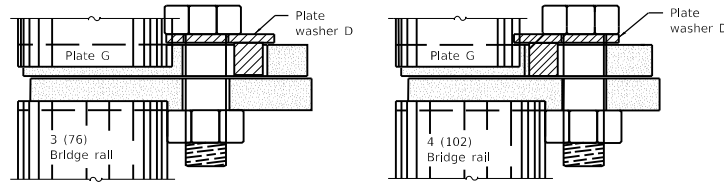


PLATE WASHER D



PLACEMENT OF PLATE WASHER D

(PLAN)

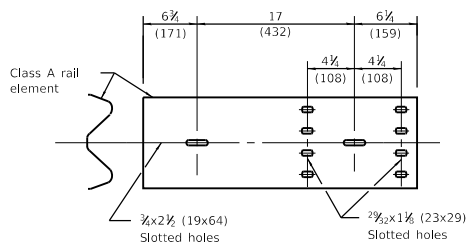


PLATE E

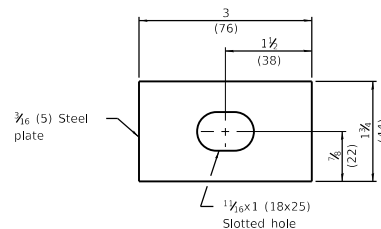


PLATE WASHER F

GENERAL NOTES

See Standard B.L.R. 26 for details of guardrail not shown.

Install plate washer D so the 1 (25) projection fills the remainder of the slotted holes in the 1 (25) end plate on plate G after the 1 (M24) dia. bolts are in place.

When an expansion joint exists below the connector, bolts shall be provided with a locknut or double nuts and shall be tightened only to a point that will allow plate G to be free to move.

The face of the guardrail shall be installed flush with the face of the bridge rail.

When this terminal is used with Standard 630001, the guardrail shall transition down to the height of the terminal.

All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation

PASSED January 1, 2009

ENGINEER OF LOCAL ROADS AND STREETS

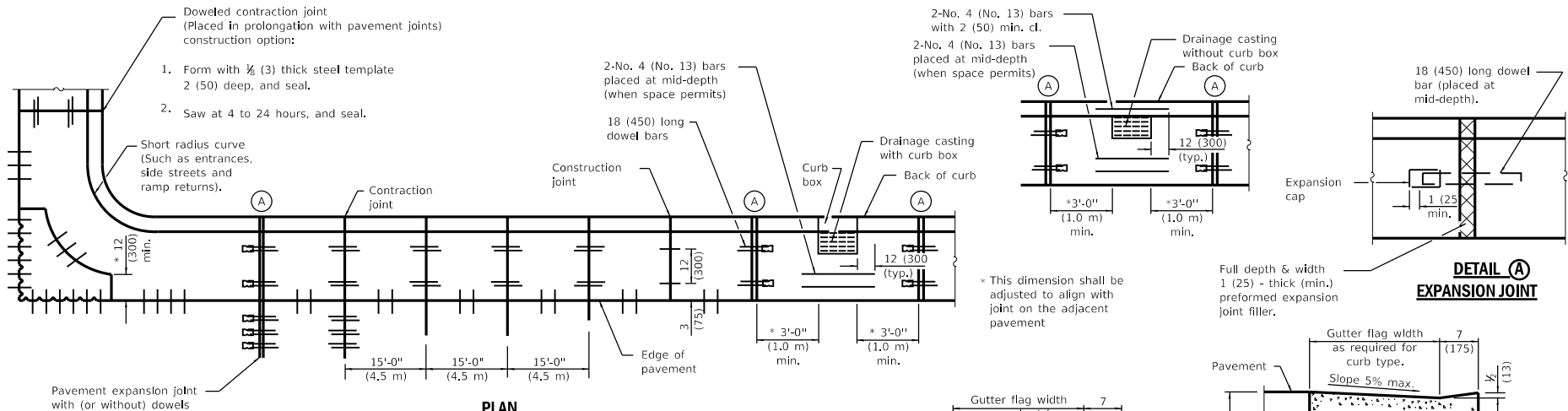
APPROVED January 1, 2009

ENGINEER OF DESIGN AND ENVIRONMENT

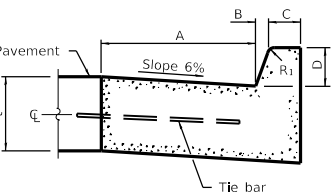
DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-08	New Standard. Was part of Std. 631026 prior to January 1, 2007.

TRAFFIC BARRIER TERMINAL TYPE 5A

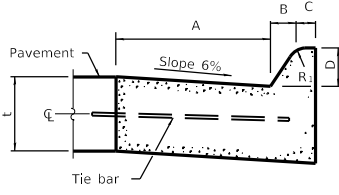
STANDARD B.L.R. 27-1



PLAN
ADJACENT TO PCC PAVEMENT OR PCC BASE COURSE



BARRIER CURB

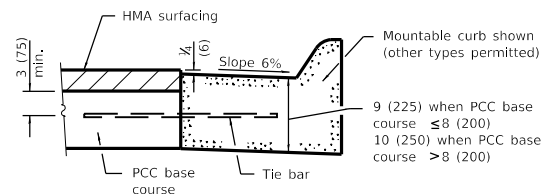


MOUNTABLE CURB

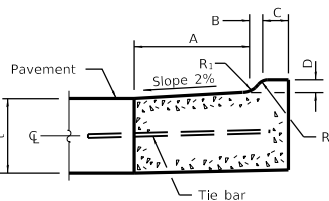
TABLE OF DIMENSIONS BARRIER CURB					
TYPE	A	B	C	D	R ₁
B-6.06 *	6	1	6	6	1
(B-15.15)	(150)	(25)	(150)	(150)	(25)
B-6.12	12	1	6	6	1
(B-15.3)	(300)	(25)	(150)	(150)	(25)
B-6.18	18	1	6	6	1
(B-15.45)	(450)	(25)	(150)	(150)	(25)
B-6.24	24	1	6	6	1
(B-15.60)	(600)	(25)	(150)	(150)	(25)
B-9.12	12	2	5	9	1
(B-22.30)	(300)	(50)	(125)	(225)	(25)
B-9.18	18	2	5	9	1
(B-22.45)	(450)	(50)	(125)	(225)	(25)
B-9.24	24	2	5	9	1
(B-22.60)	(600)	(50)	(125)	(225)	(25)

* For corner islands only.

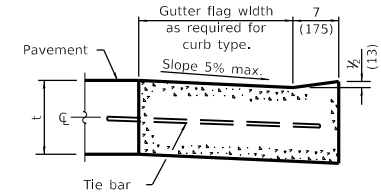
TABLE OF DIMENSIONS MOUNTABLE CURB						
TYPE	A	B	C	D	R ₁	R ₂
M-2.06	6	2	4	2	3	2
(M-5.15)	(150)	(50)	(100)	(50)	(75)	(50)
M-2.12	12	2	4	2	3	2
(M-5.30)	(300)	(50)	(100)	(50)	(75)	(50)
M-4.06	6	4	3	4	3	NA
(M-10.15)	(150)	(100)	(75)	(100)	(75)	NA
M-4.12	12	4	3	4	3	NA
(M-10.30)	(300)	(100)	(75)	(100)	(75)	NA
M-4.18	18	4	3	4	3	NA
(M-10.45)	(450)	(100)	(75)	(100)	(75)	NA
M-4.24	24	4	3	4	3	NA
(M-10.60)	(600)	(100)	(75)	(100)	(75)	NA
M-6.06	6	6	2	6	2	NA
(M-15.15)	(150)	(150)	(50)	(150)	(50)	NA
M-6.12	12	6	2	6	2	NA
(M-15.30)	(300)	(150)	(50)	(150)	(50)	NA
M-6.18	18	6	2	6	2	NA
(M-15.45)	(450)	(150)	(50)	(150)	(50)	NA
M-6.24	24	6	2	6	2	NA
(M-15.60)	(600)	(150)	(50)	(150)	(50)	NA



ADJACENT TO PCC BASE COURSE WITH HMA SURFACING



DEPRESSED CURB (TYPICAL)



DEPRESSED CURB ADJACENT TO CURB RAMP ACCESSIBLE TO THE DISABLED

GENERAL NOTES

The bottom slope of combination curb and gutter constructed adjacent to pcc pavement shall be the same slope as the subbase or 6% when subbase is omitted.

t = Pavement thickness.

Longitudinal joint tie bars shall be No. 5 (No. 16) at 24 (600) centers in accordance with details for longitudinal construction joint shown on Standard 420001.

A minimum clearance of 2 (50) between the end of the tie bar and the back of the curb shall be maintained.

The dowel bars shown in contraction joints will only be required for monolithic construction.

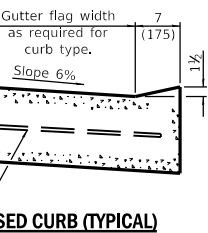
See Standard 606301 for details of corner islands except reference to Standard 606001 does not apply.

All dimensions are in inches (millimeters) unless otherwise shown.

* This dimension shall be adjusted to align with joint on the adjacent pavement

Full depth & width 1 (25) - thick (min.) preformed expansion joint filler.

DETAIL A
EXPANSION JOINT



DOWEL BAR TABLE

PAVEMENT THICKNESS	DOWEL BAR DIAMETER
10 (250) or greater	1 1/2 (38)
8 (200) thru 9.99 (249)	1 1/4 (32)
Less than 8 (200)	1 (25)

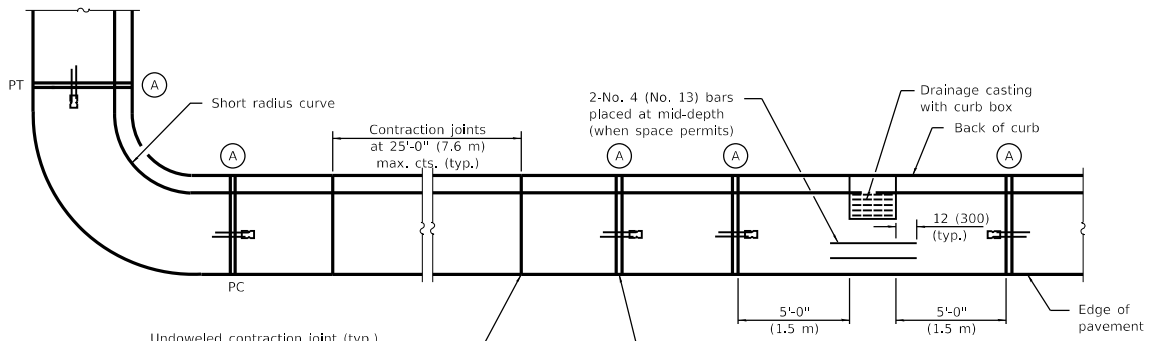
DATE	REVISIONS
1-1-18	New standard.

M-2.06 (M-5.15) and M-2.12 (M-5.30)

CONCRETE CURB TYPE B AND COMBINATION CONCRETE CURB AND GUTTER
(Sheet 1 of 2)

B.L.R. 28

Illinois Department of Transportation
PASSED January 1, 2018
ENGINEER OF LOCAL ROADS AND STREETS
APPROVED January 1, 2018
ENGINEER OF DESIGN AND ENVIRONMENT

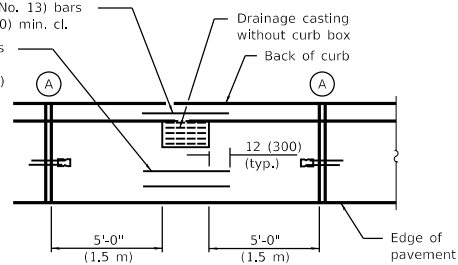


Undoweled contraction joint (typ.) construction options:

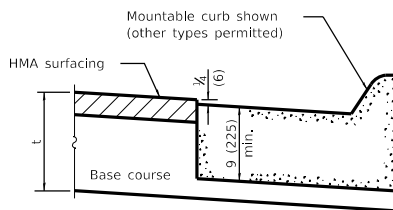
1. Form with $\frac{3}{8}$ (3) thick steel template 2 (50) deep, and seal.
2. Saw 2 (50) deep at 4 to 24 hours, and seal.
3. Insert $\frac{3}{4}$ (20) thick preformed joint filler full depth and width.

Construction joint
2-No. 4 (No. 13) bars
with 2 (50) min. cl.

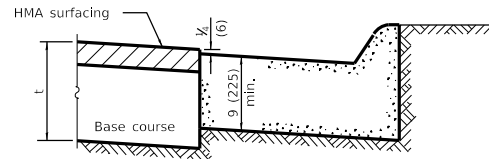
2-No. 4 (No. 13) bars
placed at mid-depth
(when space permits)



PLAN

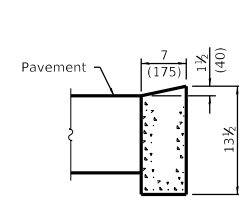


ON DISTURBED SUBGRADE

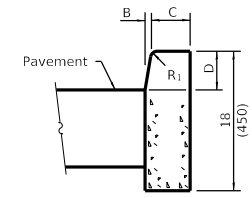


ON UNDISTURBED SUBGRADE

ADJACENT TO FLEXIBLE PAVEMENT

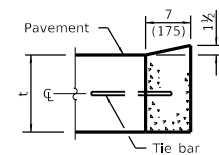


DEPRESSED CURB

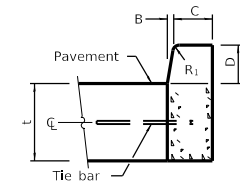


BARRIER CURB

ADJACENT TO FLEXIBLE PAVEMENT



DEPRESSED CURB



BARRIER CURB

ADJACENT TO PCC PAVEMENT OR PCC BASE COURSE

CONCRETE CURB TYPE B

**CONCRETE CURB TYPE B
AND COMBINATION
CONCRETE CURB AND GUTTER**
(Sheet 2 of 2)

B.L.R. 28

Illinois Department of Transportation

PASSED January 1, 2018

ENGINEER OF LOCAL ROADS AND STREETS

APPROVED January 1, 2018

ENGINEER OF DESIGN AND ENVIRONMENT



<u>SUBJECT/TITLE</u>	<u>STD. NO.</u>
A	
Abbreviations, Symbols and Patterns.....	000001
B	
Barricade, Type 1A for Non-NHS Routes.....	BLR 25
Barrier, Concrete, Double Face, 44 in. (1120 mm) Height	637006
Barrier, Concrete, Temporary	704001
Base Course, PCC with HMA Binder and Surface Courses	353001
Benchmarks, Method of Resetting.....	668001
C	
Cable, Road Guard, Single Strand.....	636001
Catch Basin, Type A	602001
Catch Basin, Type B	602006
Catch Basin, Type C	602011
Catch Basin, Type D	602016
Circuit, Supervised Railroad Interconnect	857006
Curb, Concrete Type B and Combination Concrete Curb and Gutter.....	606001
Curb, Concrete Type B and Combination Concrete Curb and Gutter.....	BLR 28
Curb Ramps for Sidewalks, Corner Parallel	424011
Curb Ramps for Sidewalks, Diagonal.....	424006
Curb Ramps for Sidewalks, Mid-block	424016
Curb Ramps for Sidewalks, Perpendicular.....	424001
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Decimal Equivalents of an Inch and Foot.....	001006
Delineators.....	635001
Depressed Corner for Sidewalks.....	424021
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Detector Loop Installations.....	886001
Ditch, Paved	606401
Ditch Check, Earth Median	202001
Drainage Structures, Types 4 & 5	602106
E	
Elbow, Concrete Pipe, 24 in. (600 mm), 30 in. (750 mm) or 36 in. (900) Diameter	542601
Electrical Service Installation Details.....	805001
End Section, Flared, Precast Reinforced Concrete, Elliptical	542306
End Section, Flared, Precast Reinforced Concrete, Round.....	542301
End Section, Metal Flared, for Pipe Arches.....	542406
End Section, Metal Flared, for Pipe Culverts.....	542401
End Sections, Sloped Metal, for Pipe Culverts 15" (375 mm) thru 60" (1500 mm) Dia.	542411

End Sections, Sloped Metal, for Pipe Arch Culverts 15" (375 mm) thru 72" (1800 mm) Dia....	542416
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Pipe Culverts, 15 in. (375 mm) thru 84 in. (2100 mm) Diameter.....	542001
Pipe Culverts, Elliptical, 15 in. (375 mm) thru 72 in. (1800 mm) Equivalent Diameter	542011
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Skewed, for 42 in. (1050 mm) thru 60 in. (1500 mm) Diameter.....	542206
Erosion Control Systems, Temporary	280001

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Fence, Woven Wire	665001
Flashing Beacon Installation	880001
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Type 1 Frame and Lids	604001
Type 3 Frame and Grate.....	604006
Type 3V Frame and Grate.....	604011
Type 4 Frame and Grate.....	604016
Type 5 Base, Frame and Lids	604021
Type 6 Frame and Grate.....	604026
Type 7 Grate.....	604031
Type 8 Grate.....	604036
Type 9 Frame and Grate.....	604041
Type 10 Frame and Grate.....	604046
Type 11 Frame and Grate.....	604051
Type 11V Frame and Grate.....	604056
Type 12 Frame and Grate.....	604061
Type 15 Frame and Lid.....	604066
Type 20 Frame and Grate.....	604071
Type 21 Frame and Grate.....	604076
Type 22 Frames and Grates	604081
Type 23 Frame and Grate.....	604086
Type 24 Frame and Grate.....	604091

G

Glare Screen, Concrete	638101
Grate, Traversable Pipe for Concrete End Section.	542311
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Steel Plate Beam, 29 in. (731 mm) Height	BLR 26
Steel Plate Beam, Non-Blocked	630006
Steel Plate Beam, PCC/HMA Stabilization	630201
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Weak Post, Attached to Culvert	630111

H

Handholes, Concrete and Polymer Concrete, Double	814006
Handholes, Polymer Concrete, Single.....	814001
Headwall for Pipe Underdrains, Concrete	601101

I

Impact Attenuators, Sand Module	643001
Inlet:	
For 24 in. (600 mm) Reinforced Concrete Pipe in Median.....	604101
For 36 in. (900 mm) Reinforced Concrete Pipe in Median.....	604106
For Shoulder With Curb	610001
For Type B Gutter	606201
Outlet & Entrance for Type A Gutter	606101
Type A	602301
Type B	602306
Inlet Box:	
Flush for Median	542546
Type 24 (600) A	542501
Type 24 (600) B	542506
Type 24 (600) C	542511
Type 24 (600) D.....	542516
Type 24 (600) E	542521
Type 24 (600) F	542526
Type 24 (600) G.....	542531
Type 24 (900) A	542536
Type 48 (1200) A	542541
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J/K

Joints, Pavement	420001
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L

Lane Closure	(see Traffic Control and Protection)
Lighting Controller, Pole Mounted, 240V.....	825001
Lighting Controller, Pole Mounted, 480V.....	825006
Lighting Controller, Pedestal Mounted, 240V	825011
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Light Pole, Breakaway Devices.....	838001
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Light Pole, Steel, Tenon Top.....	830021

Light Tower	835001
Light Pole Foundation	836001
Light Pole Foundation with 44 in. (1120 mm) Concrete Barrier	836011
Light Tower Foundation	837001
Luminaire Wiring in Pole	821101

M

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Mailbox Turnout, State System	406201
Manhole, Precast, Type A, 4 ft. (1.22 m) Diameter	602401
Manhole, Precast, Type A, 5 ft. (1.52 m) Diameter	602402
Manhole, Precast, Type A, 6 ft. (1.83 m) Diameter	602406
Manhole, Precast, Type A, 7 ft. (2.13 m) Diameter	602411
Manhole, Precast, Type A, 8 ft. (2.44 m) Diameter	602416
Manhole, Precast, Type A, 9 ft. (2.74 m) Diameter	602421
Manhole, Precast, Type A, 10 ft. (3.05 m) Diameter	602426
Manhole Steps	602701
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Mast Arm Assembly and Pole 56' Through 75', Steel Combination.....	877012
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Median, Concrete.....	606301
Median, Concrete, Corrugated.....	606306

N

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O

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Inlet and entrance for Type A Gutter	606101
Type 1, for Type A Gutter.....	606106
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Type 2, for Type A Gutter.....	606111
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24' (7.2 m) Continuously Reinforced PCC With Lug System	421201
24' (7.2 m) Continuously Reinforced PCC With Wide Flange Beam Term. Joint.....	421101
24' (7.2 m) Jointed PCC	420101
36' (10.8 m) Continuously Reinf. PCC With Wide Flange Beam Term. Joint.....	421106
36' (10.8 m) Continuously Reinforced PCC With Lug System	421206
36' (10.8 m) Jointed PCC	420106
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Connector (PCC) for Bridge Approach Slab	420401
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Push Button Post	876001

R

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Ramp Closure, Partial Exit, Freeway/Expressway.....	701456
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Exit, Jointed PCC Adjacent to Jointed PCC Mainline Pavement.....	420301
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S

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T

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Type 2.....	631011
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Type 6.....	631031
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