



Highway Standards



Illinois Department of Transportation
Bureau of Design and Environment



Illinois Department of Transportation

Standards by Subject/Title

April 15, 2016

<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, 32 in. (815 mm) Height	637001
Barrier, Concrete, 42 in. (1065 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 Type B and Combination Curb and Gutter, Concrete	606001
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
D	
Decimal Equivalents of an Inch and Foot.....	001006
Delineators.....	635001
Depressed Corner for Sidewalks.....	424021
Detection Loops, Typical Layout	886006
Detector Loop Installations.....	886001
Ditch, Paved	606401
Ditch Check, Earth Median	202001
Drainage Structures, Type 1, 2 and 3	602101
Drainage Structures, Type 4, 5 and 6	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, for Pipe Arch	542406
End Section, Metal, for Pipe Culvert	542401

End Sections, Reinforced Concrete:

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
Skewed, for 15 in. (375 mm) thru 36 in. (900 mm) Diameter.....	542201
Skewed, for 42 in. (1050 mm) thru 60 in. (1500 mm) Diameter.....	542206
Erosion Control Systems, Temporary	280001

F

Fence, Chain Link	664001
Fence, Woven Wire	665001
Flashing Beacon Installation	880001
Flat Slab Top, Precast Reinforced Concrete	602601
Foundations, Details, Concrete	878001

Frames, Grates and Lids:

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.....	542311

Guardrail:

Long Span Over Culverts	630106
Mounted on Existing Culverts.....	630101
Steel Plate Beam,	630001
Steel Plate Beam, 29 in. (731 mm) Height	BLR 26
Steel Plate Beam, PCC/HMA Stabilization	630201

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
Islands, Concrete	606301

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
Lighting Controller, Pedestal Mounted, 480V	825016
Lighting Controller, Base Mounted, 240V	825021
Lighting Controller, Base Mounted, 480V	825026
Lighting Controller, Navigation Obstruction, 240V	826001
Lighting Controller, Navigation Obstruction, 480V	826006
Lighting, Underpass, Suspended	820006
Lighting, Underpass, Wall Mount	820001
Light Pole, Aluminum, Mast Arm	830001
Light Pole, Aluminum, Davit Arm	830006
Light Pole, Breakaway Devices	838001
Light Pole, Steel, Mast Arm	830011
Light Pole, Steel, Davit Arm	830016
Light Pole, Steel, Tenon Top	830021
Light Tower	835001
Light Pole Foundation	836001
Light Pole Foundation with 32 in. (815 mm) Concrete Median Barrier	836006
Light Pole Foundation with 42 in. (1065 mm) Concrete Median Barrier	836011
Light Tower Foundation	837001
Luminaire Wiring Diagram	821101

M

Mailbox Turnout, Local System	BLR-24
Mailbox Turnout, State System	406201
Manhole, Type A.....	602401
Manhole, Type A, 6 ft. (1.8 m) Diameter	602406
Manhole, Type A, 7 ft. (2.1 m) Diameter	602411
Manhole, Type A, 8 ft. (2.4 m) Diameter	602416
Manhole, Type A, 9 ft. (2.7 m) Diameter	602421
Manhole Steps	602701
Markers:	
Drainage	667001
Permanent Survey	667101
Right-of-Way.....	666001
Mast Arm Assembly and Pole 16' Through 55', Steel Combination.....	877011
Mast Arm Assembly and Pole 56' Through 75', Steel Combination.....	877012
Mast Arm Assembly and Pole, Steel, Dual Mast Arms	877006
Mast Arm Assembly and Pole 16' Through 55', Steel	877001
Mast Arm Assembly and Pole 56' Through 75', Steel	877002
Mast Arm Mounted Street Name Signs	720016
Median, Concrete.....	606301
Median, Concrete, Corrugated	606306

N

Name Plates for Bridges	515001
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O

Object and Terminal Markers.....	725001
Outlet:	
Inlet and entrance for Type A Gutter	606101
Type 1, for Type A Gutter.....	606106
Type 1, for Type B Gutter.....	606206
Type 2, for Type A Gutter.....	606111
Type 2, for Type B Gutter.....	606211
Type B-6.24 (B-15.60) for Concrete Curb and Gutter.....	606006
For Type B Gutter, Standard	606201

P/Q

Patching, Class A.....	442001
Patching, Class B.....	442101
Patching, Class C and D	442201
Pavement:	
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
24' (7.2 m) PCC	420601
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
Adjacent to Railroad Grade Crossing, PCC.....	420501

Connector (HMA) for Bridge Approach Slab.....	420406
Connector (PCC) for Bridge Approach Slab	420401
Nonreinforced PCC	BLR 14
Reinforcement for Continuously Reinforced PCC Pavement.....	421001
Roundouts, PCC	420111
Special, PCC.....	BLR 10
Welded Wire Reinforcement	420701
Pavement Markers, Raised Reflective, Applications	781001
Pavement Markings	780001
Pedestrian Crossings, Entrance / Alley	424026
Pedestrian Crossings, Median	424031
Phase Sequences.....	857001
Pipe Underdrains	601001
Posts, Metal, Applications for Type A and B	729001
Posts, Metal, for Signs, Markers and Delineators	720011
Push Button Post	876001

R

Raceway Embedded in Structure.....	812001
Ramp Closure, Freeway/Expressway	701451
Ramp Closure, Partial Exit, Freeway/Expressway.....	701456
Ramp Terminal:	
Entrance, Flexible Adjacent to Flexible Mainline Pavement.....	406001
Entrance, Jointed PCC Adjacent to CRC Mainline Pavement	420206
Entrance, Jointed PCC Adjacent to Jointed PCC Mainline Pavement	420201
Exit, Flexible Adjacent to Flexible Mainline Pavement	406101
Exit, Jointed PCC Adjacent to CRC Mainline Pavement.....	420306
Exit, Jointed PCC Adjacent to Jointed PCC Mainline Pavement.....	420301
Reflector Marker and Mounting Details	635011
Reflector Mounting Details, Guardrail and Barrier	782006
Reflectors, Prismatic Curb	782001
Reinforcement Bars, Areas, Weights and Spacing	001001
Revetment Mat, Fabric Formed Concrete	285001
Rumble Strips, Shoulder, 16 inch.....	642001
Rumble Strips, Shoulder, 8 inch.....	642006

S

Shoulder:	
Adjacent to Flexible Pavement, HMA	482001
Adjacent to Rigid Pavement, HMA	482006
PCC	483001
or Shoulder Strips With Resurfacing or Widening and Resurfacing Projects.....	482011
Sidewalks, Corner Parallel Curb Ramps for	424011
Sidewalks, Diagonal Curb Ramps for.....	424006
Sidewalks, Mid-block Curb Ramps for	424016
Sidewalks, Perpendicular Curb Ramps for.....	424001
Sight Screen, Chain Link Fence.....	640001
Sight Screen, Concrete Panel Wall, Precast Prestressed	639001
Sight Screen, Wood Fence, Cedar Stockade.....	641001
Sight Screen, Wood Fence, Wood Plank.....	641006

Sign Panel, Erection Details.....	720006
Sign Panel, Extruded Aluminum Type.....	720021
Sign Panel, Mounting Details	720001
Sign Support, Telescoping Steel.....	728001
Sign Support, Telescoping Steel, Base for.....	731001
Symbols, Abbreviations, and Patterns.....	000001

T

Tee, Concrete Pipe	542606
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Traffic Barrier Terminal:

Type 1.....	BLR-23
Type 1B.....	631006
Type 1 Special, Shoulder Widening for	630301
Type 2.....	631011
Type 5A.....	BLR 27
Type 5R	BLR 20
Type 6.....	631031
Type 6A.....	631032
Type 6B.....	631033
Type 10.....	631046
Type 11	631051

Traffic Control:

Devices	701901
Devices:	
Type 1A Barricade for Non-NHS Routes	BLR 25
Day Labor Construction.....	BLR 17
Day Labor Maintenance	BLR 18
Typical Application of, for Construction on Rural Local Highways	BLR 21
Typical Application of, for Construction on Rural Local Highways (Two-Lane Two Way Rural Traffic) (Road Closed to Thru Traffic).....	BLR 22

Lane Closure, 2L, 2W:

Bridge Repair, for Speeds \geq 45 MPH	701316
Bridge Repair with Barrier	701321
Day Only, for Speeds \geq 45 MPH.....	701201
Moving Operations - Day Only.....	701311
Night Only, for Speeds \geq 45 MPH.....	701206
Pavement Widening, for Speeds \geq 45 MPH	701326
Short Time Operations	701301
Slow Moving Operations Day Only, for Speeds \geq 45 MPH	701306
With Run-Around, for Speeds \geq 45 MPH.....	701331
Work Areas in Series, for Speeds \geq 45 MPH.....	701336

Lane Closure, Freeway/Expressway

Lane Closure, Freeway/Expressway:

Approach to	701400
Day Operations Only	701406
Sidewalk, Corner or Crosswalk Closure	701801
Two Lane Closure	701446
with Barrier	701402
with Crossover and Barrier	701416

Lane Closure, Multilane:

at Entrance or Exit Ramp, for Speeds \geq 45 MPH.....	701411
Day Operations Only, for Speeds \geq 45 MPH to 55 MPH.....	701421
for Speeds \geq 45 MPH to 55 MPH	701422
Intermittent or Moving Operation, for Speeds \geq 45 MPH	701426
Intermittent or Moving Operation, for Speeds \leq 40 MPH	701427
Undivided With Crossover, for Speeds \geq 45 MPH to 55 MPH.....	701431
with Barrier, for Speeds \geq 45 MPH to 55 MPH.....	701423
Lane Closure, Urban:	
2L, 2W, Undivided	701501
2L, 2W, with Bidirectional Left Turn Lane	701502
Multilane, 1W or 2W with Nontraversable Median	701601
Multilane, 2W with Bidirectional Left Turn Lane	701602
Multilane, Single Lane Closure, 2W with Mountable Median	701606
Multilane, Half Road, Closure, 2W with Mountable Median	701611
Multilane Intersection.....	701701
Off-Road Operations:	
2L 2W, 15 ft. (4.5 m) to 24 in (600 mm) From Pavement Edge	701006
2L 2W, More Than 15 ft. (4.5 m) Away.....	701001
Moving, 2L 2W, Day Only.....	701011
Multilane, 15 ft. (4.5 m) to 24 in. (600 mm) From Pavement Edge	701101
Multilane, More Than 15 ft. (4.5 m) Away	701106
Setup and Removal, Freeway/Expressway	701428
Traffic Signal Grounding & Bonding	873001
Traffic Signal Mounting Details, Post and Bracket Mounted.....	880006
Traffic Signal Mounting Details, Span Wire Mounted and Flashing Beacon.....	880001

U-Z

Uninterruptable Power Supply (UPS)	862001
Valve Vault, Type A	602501

April 15, 2016



**Illinois Department
of Transportation**

Standards by Division

DIVISION 000 MISCELLANEOUS TABLES

STD. NO. TITLE

000001-06	Standard Symbols, Abbreviations and Patterns
001001-02	Areas of Reinforcement Bars
001006	Decimal of an Inch and of a Foot

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

	Illinois Department of Transportation
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Michael Brand	1-1-57
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Stacy E. Smith	
ENGINEER OF DESIGN AND ENVIRONMENT	

DATE	REVISIONS	STANDARD SYMBOLS, ABBREVIATIONS AND PATTERNS (Sheet 1 of 8)
1-1-11	Updated abbreviations and symbols.	
1-1-08	Updated abbreviations and symbols.	
		STANDARD 000001-06

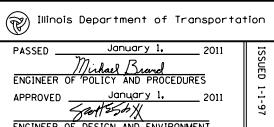
ADJUSTMENT ITEMS	EX	PR	ALIGNMENT ITEMS	EX	PR	CONTOUR ITEMS	EX	PR
Structure To Be Adjusted		[ADJ]	Baseline			Approx. Index Line		
Structure To Be Cleaned		[C]	Centerline	— — —	— — —	Approx. Intermediate Line	— — —	
Main Structure To Be Filled		[FM]	Centerline Break Circle	○	○	Index Contour	— — —	
Structure To Be Filled		[F]	Baseline Symbol	[B]	[B]	Intermediate Contour	— — —	
Structure To Be Filled Special		[FSP]	Centerline Symbol	[C]	[C]			
Structure To Be Removed		[R]	PI Indicator	△	△			
Structure To Be Reconstructed		[REC]	Point Indicator	○	○			
Structure To Be Reconstructed Special		[RSP]	Horizontal Curve Data (Half Size)	P.I. STA= Δ= D= R= T= L= E= e= T.R.= S.E. RUN= P.C. STA= P.T. STA=	CURVE P.I. STA= Δ= D= R= T= L= E= e= T.R.= S.E. RUN= P.C. STA= P.T. STA=			
Frame and Grate To Be Adjusted		[A]	BOUNDARIES ITEMS	EX	PR	DRAINAGE ITEMS	EX	PR
Frame and Lid To Be Adjusted		[A]	Dashed Property Line	— — — —		Channel or Stream Line	— — — —	
Domestic Service Box To Be Adjusted		[A]	Solid Property/Lot Line	— — — —		Culvert Line	— — — —	
Valve Vault To Be Adjusted		[A]	Section/Grant Line	— — — —		Grading & Shaping Ditches	— — — —	
Special Adjustment		[SP]	Quarter Section Line	— — — —		Drainage Boundary Line	— — — —	
Item To Be Abandoned		[AB]	Quarter/Quarter Section Line	— — — —		Paved Ditch	— — — —	
Item To Be Moved		[M]	County/Township Line	— — — —		Aggregate Ditch	— — — —	
Item To Be Relocated		[REL]	State Line	— — — —		Pipe Underdrain	— — — —	
Pavement Removal and Replacement		[Hatched]	Iron Pipe Found	○		Storm Sewer	— — — —	
			Iron Pipe Set	●		Flowline	[F] [F]	
			Survey Marker	[S]		Ditch Check	◆ ◆	
			Property Line Symbol	[P]		Headwall	—	—
			Same Ownership Symbol (Half Size)	↗		Inlet	□	—
			Northwest Quarter Corner (Half Size)	[NQ]		Manhole	○	○
			Section Corner (Half Size)	[SC]		Summit	↔ ↔	↔ ↔
			Southeast Quarter Corner (Half Size)	[SQ]		Roadway Ditch Flow	— ~ —	— ~ —
						Swale	— — — —	— — — —
						Catch Basin	○	●
						Culvert End Section	◀	◀
						Water Surface Indicator	▽	
						Riprap	[Riprap]	[Riprap]

	Illinois Department of Transportation
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Michael Brand	ISRSIG
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ENGINEER OF DESIGN AND ENVIRONMENT	

**STANDARD SYMBOLS,
ABBREVIATIONS
AND PATTERNS**

(Sheet 2 of 8)

STANDARD 000001-06





 Illinois Department of Transportation

PASSED January 1, 2011

Michael Brand

ENGINEER OF POLICY AND PROCEDURES

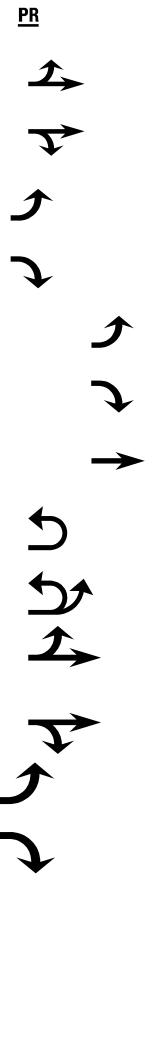
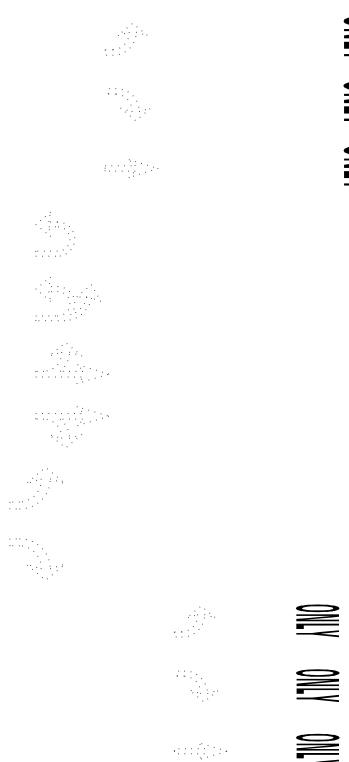
APPROVED January 1, 2011
Scott H. K.

2011-2012
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED
1-1-97

PAVEMENT MARKINGS
(contd.)

	EX	
Urban Combination Left		
Urban Combination Right		
Urban Left Turn Arrow		
Urban Right Turn Arrow		
Urban Left Turn Only		
Urban Right Turn Only		
Urban Thru Only		
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		
Rural Right Turn Only		
Rural 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		

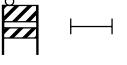
RIGHT OF WAY ITEMS

	EX	PR
Future ROW Corner Monument		
ROW Marker		
ROW Line		
Easement		
Temporary Easement		

**STANDARD SYMBOLS,
ABBREVIATIONS
AND PATTERNS**
(Sheet 5 of 8)

STANDARD 000001-06

	Illinois Department of Transportation
PASSED	January 1, 2011
Michael Brand	ISSUED
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APPROVED	January 1, 2011
John E. Saylor	
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1-1-97	

RIGHT OF WAY ITEMS <u>(contd.)</u>			ROADWAY PROFILES			SIGNING ITEMS <u>(contd.)</u>		
	<u>EX</u>	<u>PR</u>		<u>EX</u>	<u>PR</u>		<u>EX</u>	<u>PR</u>
Access Control Line	— AC —	— AC —	P.I. Indicator	▲	▲	Reverse Left W1-4L (Half Size)		
Access Control Line & ROW	— AC —	— AC —	Point Indicator	○	○	Reverse Right W1-4R (Half Size)		
Access Control Line & ROW with Fence	— AR —	— AC —	Earthworks Balance Point			Two Way Traffic Sign W6-3 (Half Size)		
Excess ROW Line	— XS —		Begin Point			Detour Ahead W20-2(0) (Half Size)		
ROADWAY PLAN ITEMS			Vert. Curve Data	VPI = ELEV = E =	VPI = ELEV = E =	Left Lane Closed Ahead W20-5L(0) (Half Size)		
Cable Barrier	— o — o —	— ■ — ■ —	Ditch Profile Left Side	— - - - -	— - - - -	Right Lane Closed Ahead W20-5R(0) (Half Size)		
Concrete Barrier	— ■ — ■ —	— ■ — ■ —	Ditch Profile Right Side	— - - - -	— — — — —	Road Closed Ahead W20-3(0) (Half Size)		
Edge of Pavement	— — — — —	— — — — —	Roadway Profile Line	— — — — —	— — — — —	Road Construction Ahead W20-1-(0) (Half Size)		
Bit Shoulders, Medians and C&G Line	— — — — —	— — — — —	Storm Sewer Profile Left Side	— - - - -	— - - - -	Single Lane Ahead (Half Size)		
Aggregate Shoulder	— - - - -	— — — — —	Storm Sewer Profile Right Side	— - - - -	— — — — —	Transition Left W4-2L (Half Size)		
Sidewalks, Driveways	— — — — —	— — — — —	SIGNING ITEMS			Transition Right W4-2R (Half Size)		
Guardrail	— n — n — n	— ■ — ■ — ■	Cone, Drum or Barricade	○		STANDARD SYMBOLS, ABBREVIATIONS AND PATTERNS		
Guardrail Post	○		Barricade Type II		— — — — —	(Sheet 6 of 8)		
Traffic Sign	■	■	Barricade Type III		TT	STANDARD 000001-06		
Corrugated Median			Barricade With Edge Line	○ — ○ — ○				
Impact Attenuator			Flashing Light Sign	○				
North Arrow with District Office (Half Size)	N		Panels I					
Match Line		STA. 45+00	Panels II					
Slope Limit Line	— - - - -		Direction of Traffic					
Typical Cross-Section Line	— — — — —		Sign Flag (Half Size)					

	Illinois Department of Transportation
PASSED	January 1, 2011
Michael Brand	ISRSIG
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2011
Stacy E. Saylor	1-1-57
ENGINEER OF DESIGN AND ENVIRONMENT	

<u>TRAFFIC SIGNAL ITEMS (contd.)</u>	<u>EX</u>	<u>PR</u>	<u>UNDERGROUND UTILITY ITEMS</u>	<u>EX</u>	<u>PR</u>	<u>ABANDONED</u>	<u>UTILITY ITEMS (contd.)</u>	<u>EX</u>	<u>PR</u>
Detector Raceway	—	—	Cable TV	— CTV —	— CTV —	/ CTV /	Traffic Signal	□	●
Aluminum Mast Arm	○—	●—	Electric Cable	— E —	— E —	/ E /	Traffic Signal Control Box	■	
Steel Mast Arm	○—	●—	Fiber Optic	— FO —	— FO —	/ FO /	Water Meter	□	
Veh. Detector Magnetic	—	—	Gas Pipe	— G —	— G —	/ G /	Water Meter Valve Box	○	●
Conduit Splice	●	●	Oil Pipe	— O —	— O —	/ O /	Profile Line	—	—
Controller	■	■	Sanitary Sewer	—>—>—>	—>—>—>	/—>/—>/—>/	Aerial Power Line	— A —	— A —
Gulfbx Junction	○	○	Telephone Cable	— T —	— T —	/ T /	<u>VEGETATION ITEMS</u>	<u>EX</u>	<u>PR</u>
Wood Pole	⊗	⊗	Water Pipe	— W —	— W —	/ W /	Deciduous Tree	○	
Temp. Signal Head	—	—	<u>UTILITIES ITEMS</u>	<u>EX</u>	<u>PR</u>		Bush or Shrub	○	
Handhole	□	□	Controller	■	■		Evergreen Tree	○	
Double Handhole	□	□	Double Handhole	□	□		Stump	■	
Heavy Duty Handhole	□	□	Fire Hydrant	○	●		Orchard/Nursery Line	— - - - -	
Junction Box	□	□	GuyWire or Deadman Anchor	→			Vegetation Line	~~~~~	
Ped. Pushbutton Detector	●	●	Handhole	□	□		Woods & Bush Line	~~~~~	
Ped. Signal Head	□	□	Heavy Duty Handhole	□	□		<u>WATER FEATURE ITEMS</u>	<u>EX</u>	<u>PR</u>
Power Pole Service	□	□	Junction Box	□	□		Stream or Drainage Ditch	— - - - -	
Priority Veh. Detector	□	□	Light Pole	○	□		Waters Edge	— - - - -	
Signal Head	—	—	Manhole	○	○		Water Surface Indicator	▽	
Signal Head w/Backplate	—	—	Pipeline Warning Sign	▷			Water Point	○	
Signal Post	○	●	Power Pole	□	□		Disappearing Ditch	<	
Closed Circuit TV	□	□	Power Pole with Light	○	○		Marsh		
Video Detector System	□	□	Sanitary Sewer Cleanout	○			Marsh/ Swamp Boundary	— — — —	
STANDARD SYMBOLS, ABBREVIATIONS AND PATTERNS									
(Sheet 8 of 8)									
STANDARD 000001-06									

	Illinois Department of Transportation
PASSED	January 1, 2011
Michael Brand	ISGSD
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2011
John E. Saylor	1-1-57
ENGINEER OF DESIGN AND ENVIRONMENT	

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)		
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 (1407)	0.656 (1290)	0.601 (120)
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 (3553)

 Illinois Department of Transportation
PASSED January 1, 2009
Signed: <i>[Signature]</i>
ENGINEER OF POLICY AND PROCEDURES
APPROVED January 1, 2009
EEO E. Khan
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

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	A	B	A	B	A	B	
1/64	0.0052 0.0104 0.015625 0.0208	1/16 1/8 3/16 1/4	0.171875 0.1771 0.1823 0.1875	2 1/16 2 1/8 2 3/16 2 1/4	1/32	0.3385 0.34375 0.3490 0.3542	4 1/16 4 1/8 4 3/16 4 1/4	1/64	0.5052 0.5104 0.515625 0.5208	6 1/16 6 1/8 6 3/16 6 1/4	1/32	0.6711 0.6823 0.6875	8 1/16 8 1/8 8 3/16 8 1/4	1/64	0.8385 0.84375 0.8490 0.8542	10 1/16 10 1/8 10 3/16 10 1/4	
1/32	0.0260 0.03125 0.0365 0.0417	5/16 7/16 7/16 1/2	0.1927 0.1979 0.203125 0.2083	2 5/16 2 7/16 2 7/16 2 1/2	2 1/32	0.359375 0.3646 0.3698 0.3750	4 1/16 4 1/8 4 1/4 4 1/2	1/32	0.5260 0.53125 0.5365 0.5417	6 1/16 6 1/8 6 1/4 6 1/2	1/32	0.6927 0.6979 0.703125 0.7083	8 1/16 8 1/8 8 3/16 8 1/2	1/64	0.859375 0.8646 0.8698 0.8750	10 5/16 10 7/16 10 1/4 10 1/2	
1/16	0.046875 0.0521 0.0573 0.0625	9/16 5/8 11/16 3/4	0.2135 0.21875 0.2240 0.2292	2 9/16 2 5/8 2 11/16 2 3/4	2 1/32	0.3802 0.3854 0.390625 0.3958	4 1/16 4 1/8 4 1/4 4 1/2	1/32	0.546875 0.5521 0.5573 0.5625	6 1/16 6 1/8 6 1/4 6 1/2	1/32	0.7135 0.71875 0.7240 0.7292	8 1/16 8 1/8 8 1/4 8 1/2	1/64	0.8802 0.8854 0.890625 0.8958	10 9/16 10 5/8 10 11/16 10 3/4	
5/64	0.0677 0.0729 0.078125 0.0833	13/16 7/8 9/16 1	0.234375 0.2396 0.2448 0.2500	2 13/16 2 7/8 2 9/16 3	1/32	0.4010 0.40625 0.4115 0.4167	4 1/16 4 1/8 4 1/4 5	1/64	0.5677 0.5729 0.578125 0.5833	6 1/16 6 1/8 6 1/4 7	1/32	0.734375 0.7396 0.7448 0.7500	8 1/16 8 1/8 8 1/4 9	1/64	0.9010 0.90625 0.9115 0.9167	10 13/16 10 7/8 10 9/16 11	
1/16	0.0885 0.09375 0.0990 0.1042	15/16 1 1/8 1 3/16 1 1/4	0.2552 0.2604 0.265625 0.2708	3 15/16 3 1/8 3 3/16 3 1/4	1/32	0.421875 0.4271 0.4323 0.4375	5 1/16 5 1/8 5 1/4 5 1/2	1/32	0.5885 0.59375 0.5990 0.6042	7 1/16 7 1/8 7 3/16 7 1/4	1/32	0.7552 0.7604 0.765625 0.7708	9 1/16 9 1/8 9 1/4 9 1/2	1/64	0.921875 0.9271 0.9323 0.9375	11 1/16 11 1/8 11 3/16 11 1/4	
1/8	0.109375 0.1146 0.1198 0.1250	17/16 1 3/8 1 1/16 1 1/2	0.2760 0.28125 0.2865 0.2917	3 17/16 3 3/8 3 1/16 3 1/2	2 1/32	0.4427 0.4479 0.453125 0.4583	5 1/16 5 1/8 5 1/4 5 1/2	1/32	0.609375 0.6146 0.6198 0.6250	7 1/16 7 1/8 7 1/4 7 1/2	1/32	0.7760 0.78125 0.7865 0.7917	9 1/16 9 1/8 9 1/4 9 1/2	1/64	0.9427 0.9479 0.953125 0.9583	11 5/16 11 7/16 11 11/16 11 1/2	
1/32	0.1302 0.1354 0.140625 0.1458	19/16 1 5/8 1 1/16 1 3/4	0.296875 0.3021 0.3073 0.3125	3 19/16 3 5/8 3 1/16 3 3/4	1/32	0.4635 0.46875 0.4740 0.4792	5 1/16 5 1/8 5 1/4 5 1/2	1/32	0.6302 0.6354 0.640625 0.6458	7 1/16 7 1/8 7 1/4 7 1/2	1/32	0.796875 0.8021 0.8073 0.8125	9 1/16 9 1/8 9 1/4 9 1/2	1/64	0.9635 0.96875 0.9740 0.9792	11 13/16 11 11/16 11 9/16 11 3/4	
5/32	0.1510 0.15625 0.1615 0.1667	21/16 1 7/8 1 1/16 2	0.3177 0.3229 0.328125 0.3333	3 21/16 3 7/8 3 15/16 4	3 1/32	0.484375 0.4896 0.4948 0.5000	5 1/16 5 1/8 5 1/4 6	1/2	0.6510 0.65625 0.6615 0.6667	7 1/16 7 1/8 7 1/4 8	1/32	0.8177 0.8229 0.828125 0.8333	9 1/16 9 1/8 9 1/4 10	1/64	0.984375 0.9896 0.9948 1.0000	11 1/16 11 7/16 11 11/16 12	

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

Illinois Department of Transportation
PASSED January 1, 1997
<i>[Signature]</i>
ENGINEER OR POLICY AND PROCEDURES APPROVED
January 1, 1997
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS	DECIMAL OF AN INCH AND OF A FOOT	STANDARD 001006
1-1-97	New Standard.		

April 15, 2016



**Illinois Department
of Transportation**

Standards by Division

DIVISION 200 EARTHWORK, LANDSCAPING, and EROSION CONTROL

STD. NO. TITLE

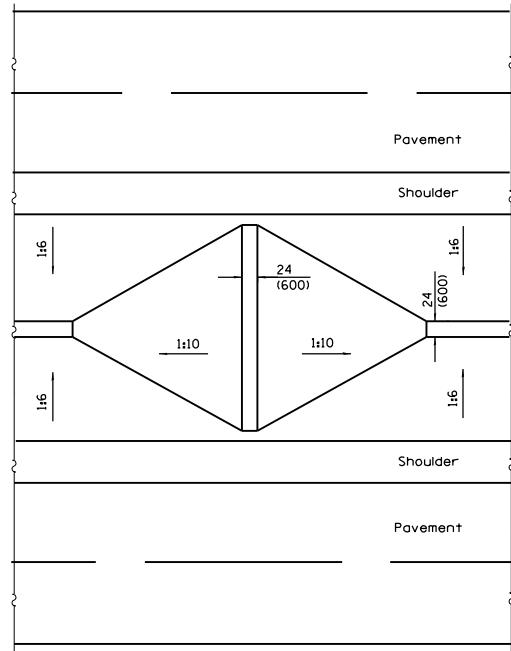
EARTHWORK

202001-01 Earth Median Ditch Check

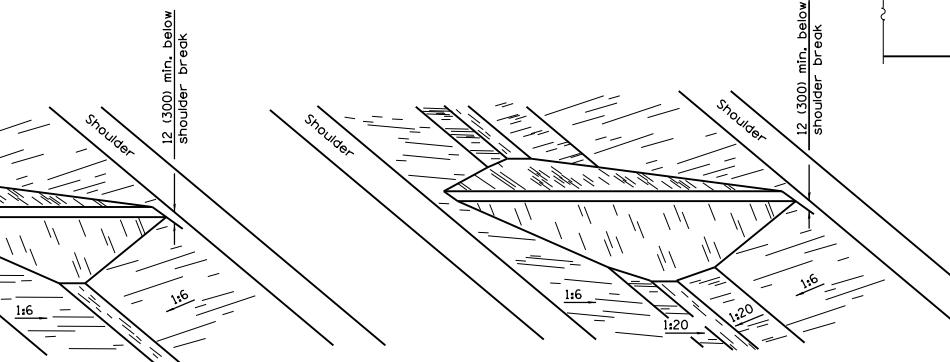
EROSION CONTROL

280001-07 Temporary Erosion Control Systems

285001-02 Fabric Formed Concrete Revetment Mats

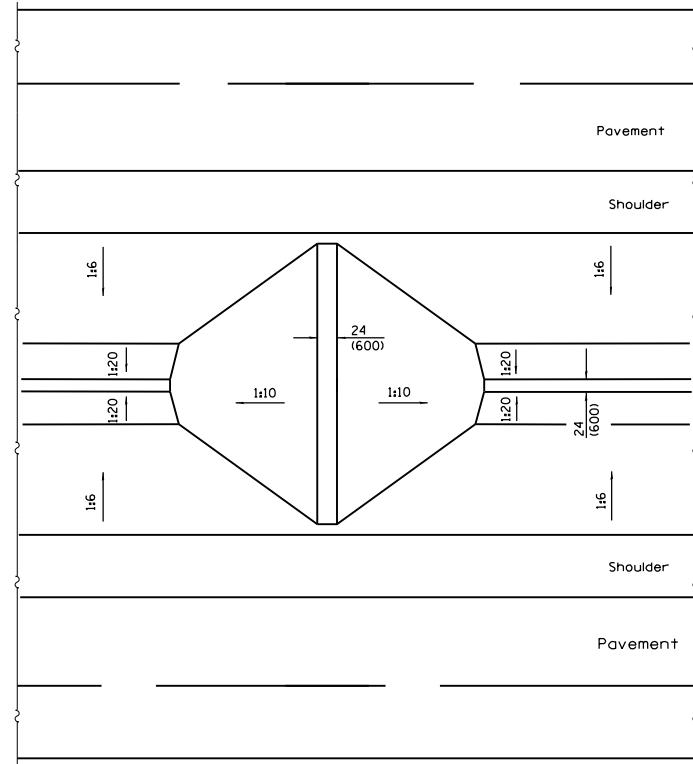


DITCH CHECK FOR NARROW MEDIAN



VIEW OF NARROW MEDIAN

VIEW OF WIDE MEDIAN



DITCH CHECK FOR WIDE MEDIAN

GENERAL NOTES

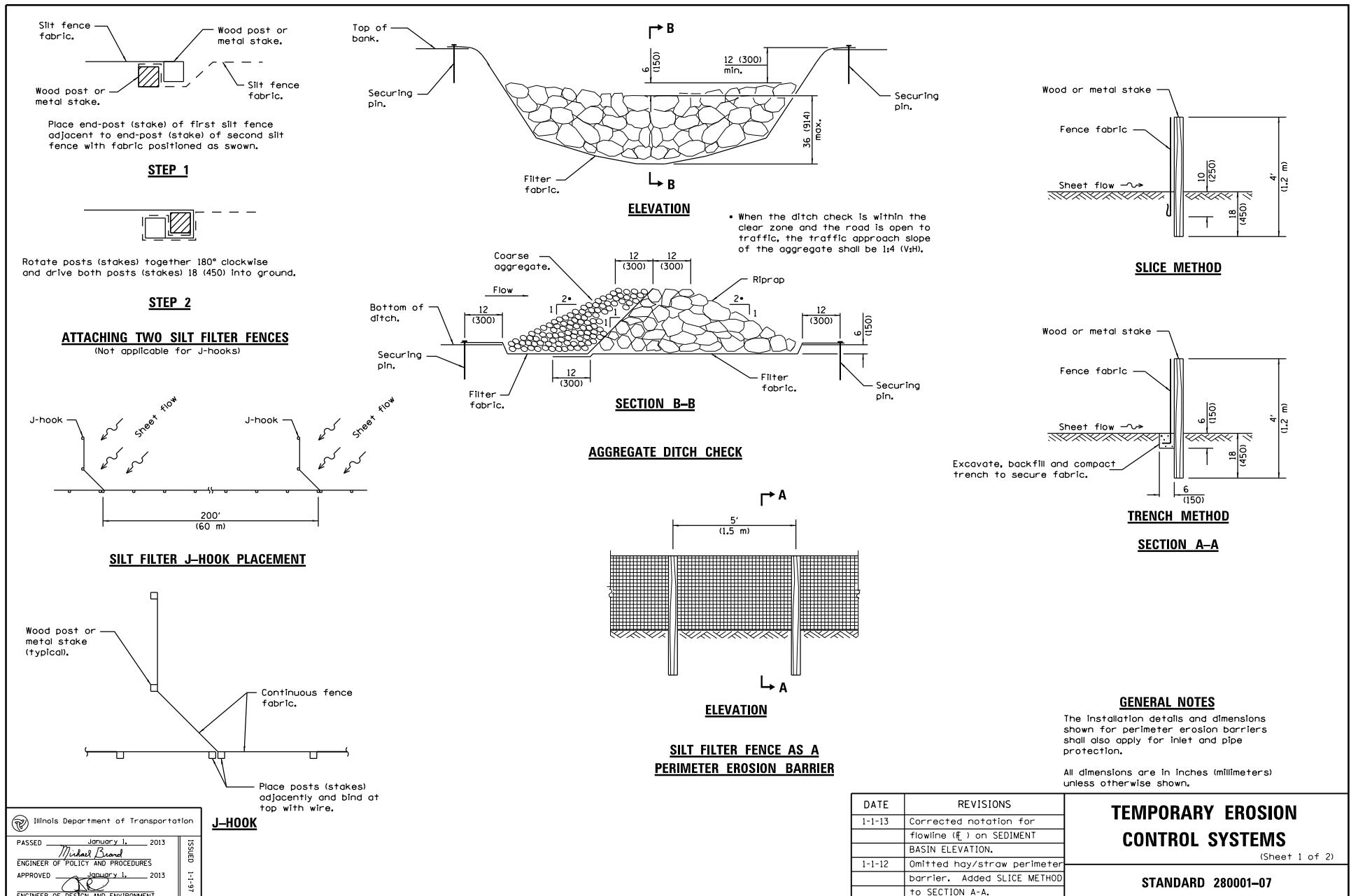
All slope ratios are expressed as units of vertical displacement to units of horizontal displacement ($V:H$).

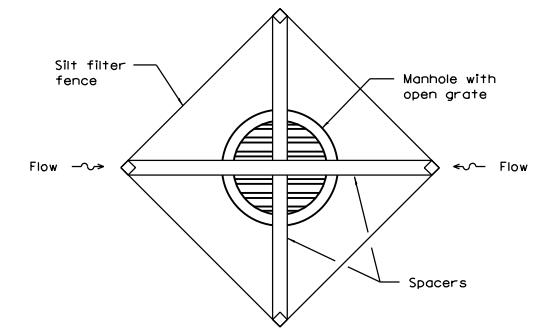
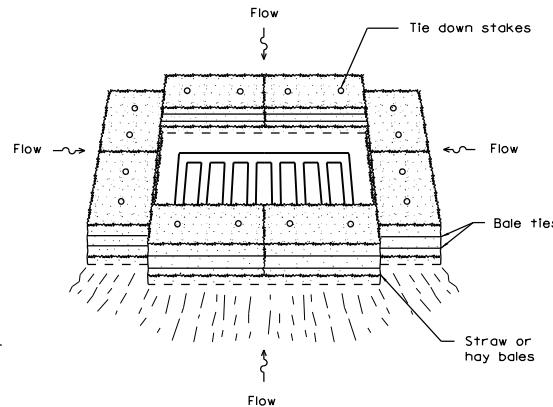
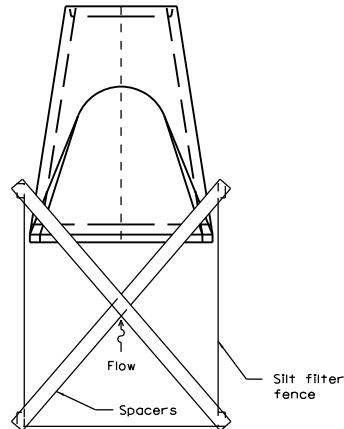
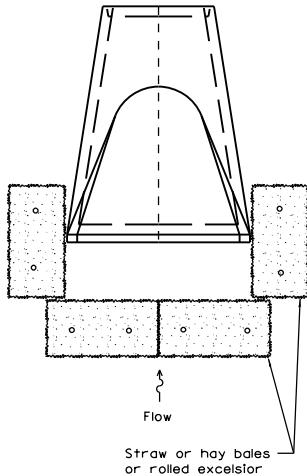
All dimensions are in inches (millimeters) unless otherwise shown.

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

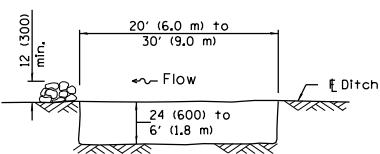
STANDARD 202001-01

	Illinois Department of Transportation
PASSED	January 1, 2008
<i>Santosh</i>	I-1-08
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2008
<i>Lee S. Thor</i>	I-1-97
ENGINEER OF DESIGN AND ENVIRONMENT	

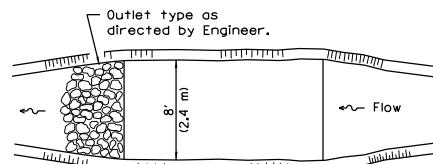




INLET AND PIPE PROTECTION



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

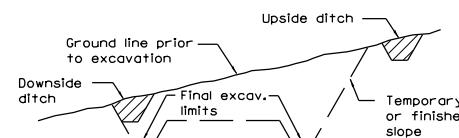


The long dimension should be parallel with the direction of the flow. Accumulated silt shall be removed anytime the basins become 75% filled.

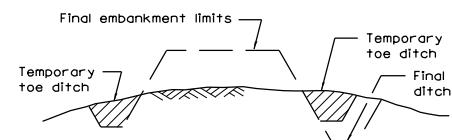
ELEVATION

PLAN

SEDIMENT BASIN



TYPICAL CUT CROSS-SECTION



TYPICAL FILL CROSS-SECTION

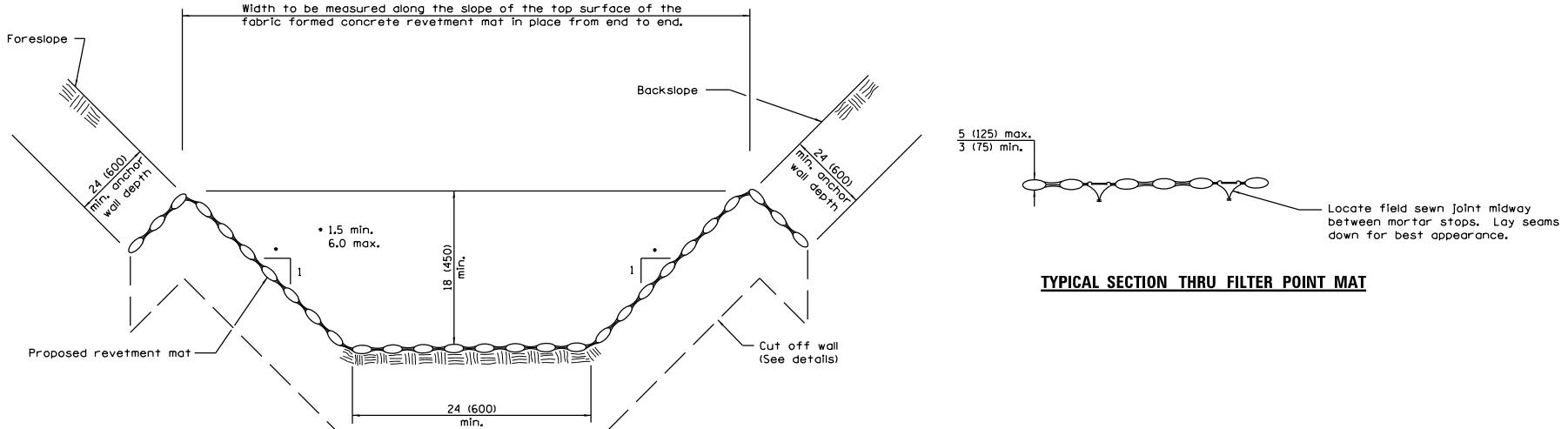
TEMPORARY DITCHES FOR CUT & FILL SECTIONS

	Illinois Department of Transportation
PASSED	January 1, 2013
Mihal Brand	1-1-13
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	JANUARY 1, 2013
CR	1-1-13
ENGINEER OF DESIGN AND ENVIRONMENT	

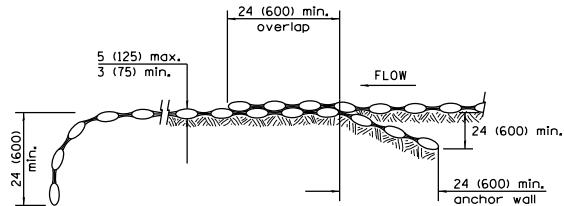
TEMPORARY EROSION CONTROL SYSTEMS

(Sheet 2 of 2)

STANDARD 280001-07

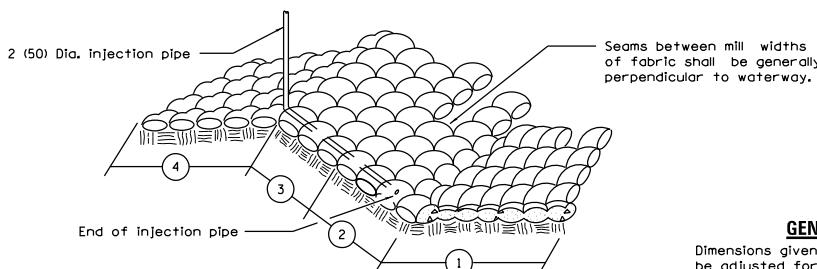


TYPICAL FABRIC FORMED CONCRETE REVETMENT MAT LINED DITCH



CUT OFF WALL DETAILS

TYPICAL LAP JOINTS W/ANCHOR WALL



GENERAL NOTES

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

All anchor walls on side 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
	1-1-08
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2008
	1-1-08
ENGINEER OF DESIGN AND ENVIRONMENT	

DATE	REVISIONS	FABRIC FORMED CONCRETE REVETMENT MATS
1-1-08	Switched units to English (metric).	
1-1-02	Revised second note.	STANDARD 285001-02

April 15, 2016



**Illinois Department
of Transportation**

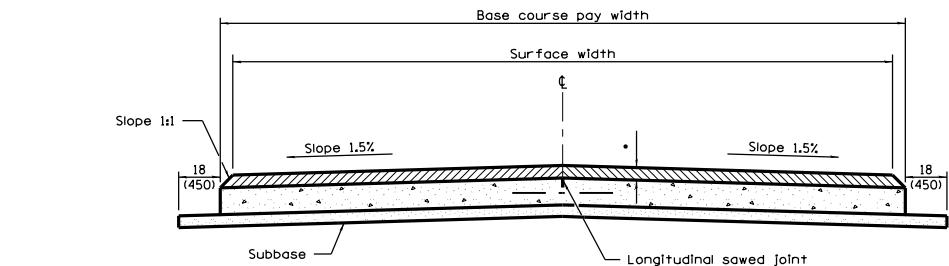
Standards by Division

DIVISION 300 SUBGRADES, SUBBASES, and BASE COURSES

STD. NO. TITLE

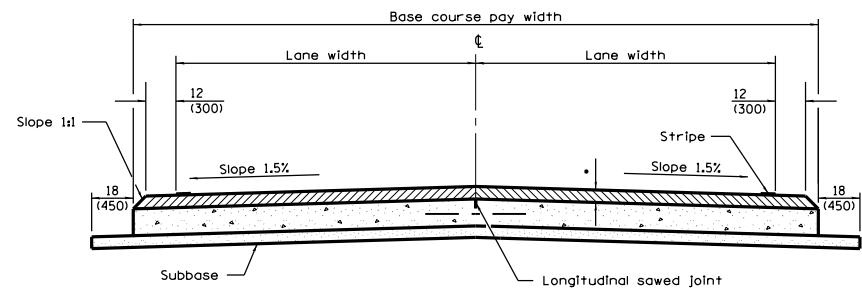
BASE COURSE

353001-04 PCC Base Course with HMA Binder and Surface Courses

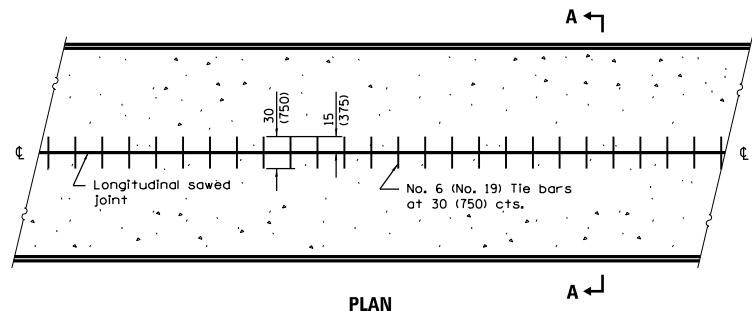


• HMA binder and surface courses

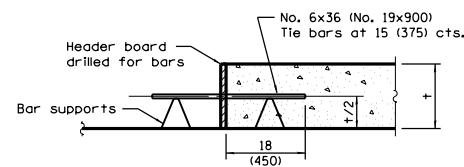
SECTION A-A
(TYPICAL 2 LANE WITH SHOULDER)



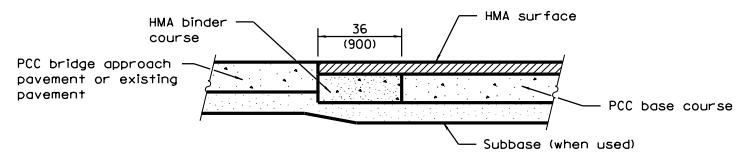
ALTERNATE SECTION A-A
(TYPICAL 2 LANE WITH SHOULDER)



PLAN



TRANSVERSE CONSTRUCTION JOINT



**LONGITUDINAL SECTION SHOWING
CONSTRUCTION ADJACENT
TO PCC BRIDGE APPROACH PAVEMENT
OR 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.

DATE	REVISIONS	PCC BASE COURSE WITH HMA BINDER AND SURFACE COURSES
1-1-08	Switched units to English (metric).	
I-1-07	Switched to Hot-Mix Asphalt (HMA)	
	terminology.	

STANDARD 353001-04

	Illinois Department of Transportation
PASSED	January 1, 2008
Signed	_____ S. E. Hansen
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2008
L. E. Hansen	_____ S. E. Hansen
ENGINEER OF DESIGN AND ENVIRONMENT	
	ISRS-1-1-07



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

PORTRLAND CEMENT CONCRETE PAVEMENTS AND SIDEWALKS

420001-08	Pavement Joints
420101-05	24' (7.2 m) Jointed PCC Pavement
420106-05	36' (10.8 m) Jointed PCC Pavement
420111-03	PCC Pavement Roundouts
420201-09	Entrance Ramp Terminal (Jointed PCC Ramp Pavement Adjacent to Jointed PCC Mainline Pav.)
420206-10	Entrance Ramp Terminal (Jointed PCC Ramp Pavement Adjacent to CRC Mainline Pavement)
420301-06	Exit Ramp Terminal (Jointed PCC Ramp Pavement Adjacent to Jointed PCC Mainline Pav.)
420306-08	Exit Ramp Terminal (Jointed PCC Ramp Pavement Adjacent to CRC Mainline Pavement)
420401-12	Pavement Connector (PCC) for Bridge Approach Slab
420406	Pavement Connector (HMA) for Bridge Approach Slab
420501-06	PCC Pavement and PCC Base Course Adjacent to Railroad Grade Crossing
420601-06	24' (7.2 m) PCC Pavement
420701-03	Pavement Welded Wire Reinforcement
421001-03	Bar Reinforcement for CRC Pavement
421101-09	24' (7.2 m) CRC Pavement (With Wide Flange Beam Terminal Joint)
421106-09	36' (10.8 m) CRC Pavement (With Wide Flange Beam Terminal Joint)
421201-06	24' (7.2 m) CRC Pavement (With Lug System)
421206-06	36' (10.8 m) CRC Pavement (With Lug System)
424001-08	Perpendicular Curb Ramps for Sidewalks
424006-02	Diagonal Curb Ramps for Sidewalks
424011-02	Corner Parallel Curb Ramps for Sidewalks
424016-02	Mid-block Curb Ramps for Sidewalks
424021-03	Depressed Corner for Sidewalks
424026-01	Entrance / Alley Pedestrian Crossings
424031-01	Median Pedestrian Crossings

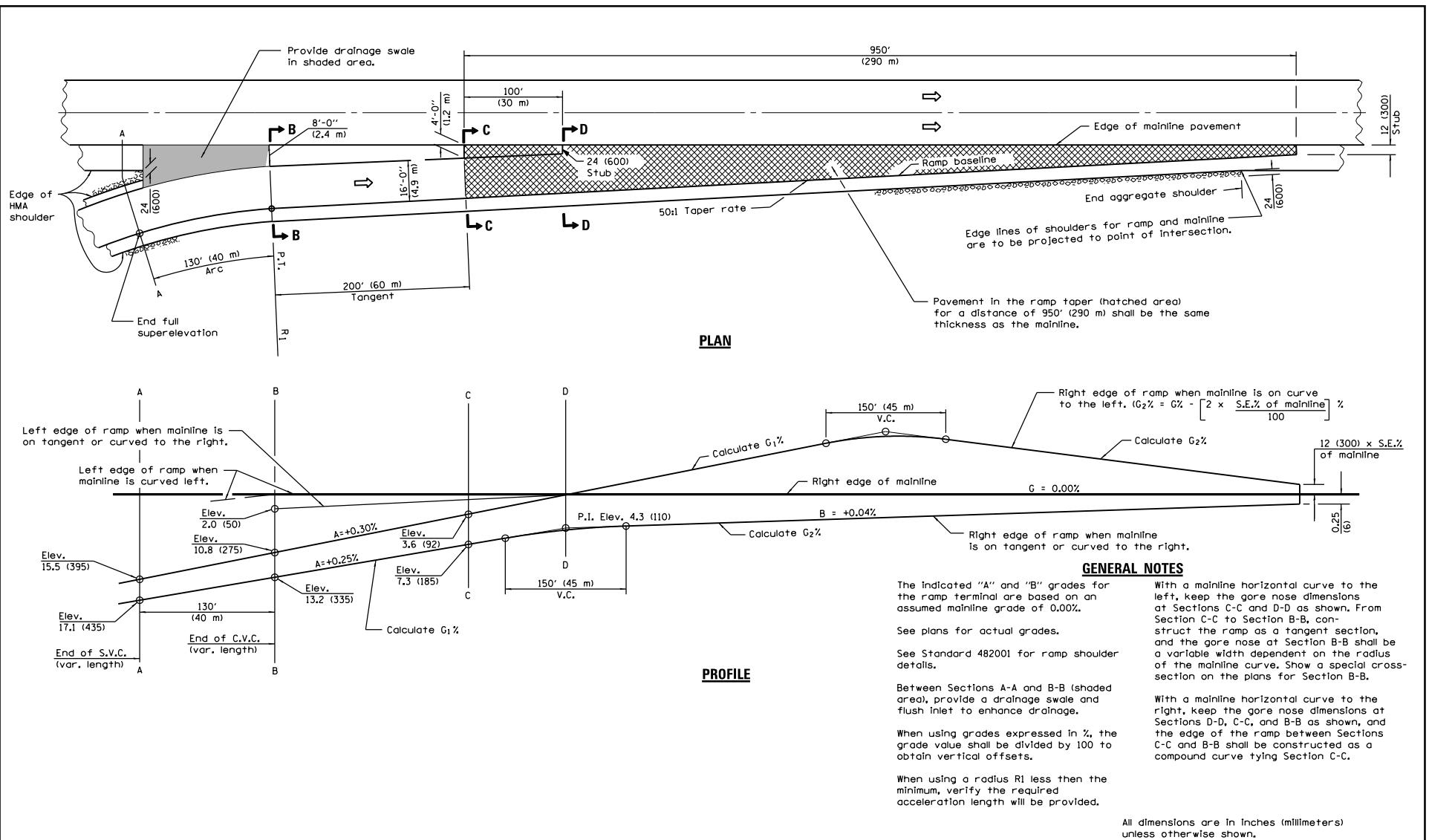
PAVEMENT REHABILITATION

442001-04	Class A Patches
442101-07	Class B Patches
442201-03	Class C and D Patches

SHOULDERS

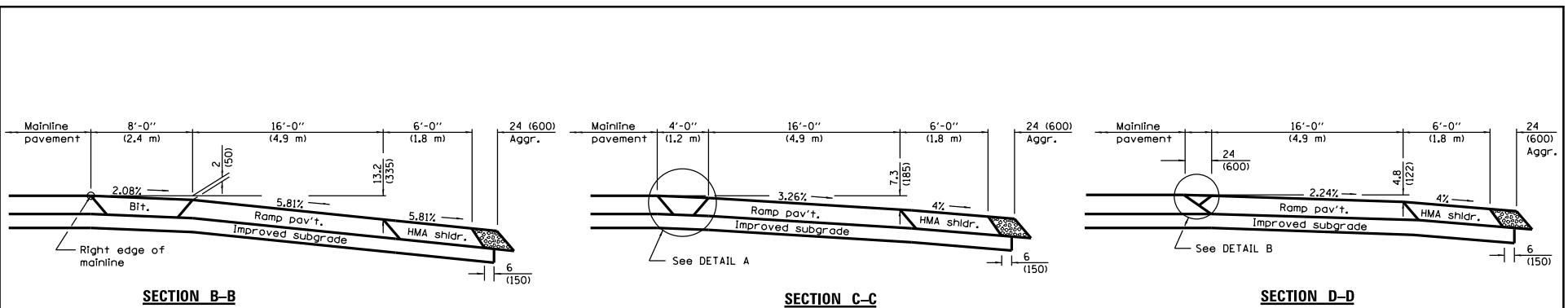
482001-02	HMA Shoulder Adjacent to Flexible Pavement
-----------	--

482006-03	HMA Shoulder Adjacent to Rigid Pavement
482011-03	HMA Shoulder Strips/Shoulders With Resurfacing or Widening and Resurfacing Projects
483001-04	PCC Shoulder

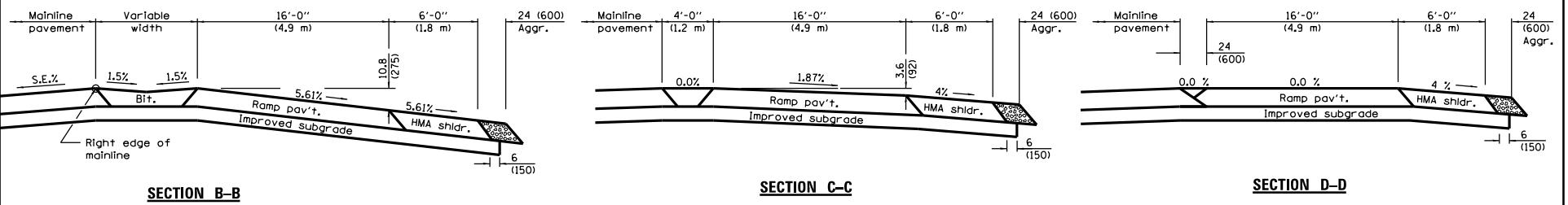


	Illinois Department of Transportation
PASSED	January 1, 2015
Michael Brand	ISSUED
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2015
RE	1-1-15
ENGINEER OF DESIGN AND ENVIRONMENT	

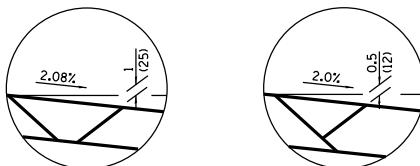
DATE	REVISIONS	ENTRANCE RAMP TERMINAL
1-1-15	Revised general note to be generic for RI.	(FLEXIBLE RAMP PAVEMENT ADJACENT TO FLEXIBLE MAINLINE PAVEMENT)
		(Sheet 1 of 2)
1-1-08	Switched units to English (metric).	
	Revised General Notes.	STANDARD 406001-06



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

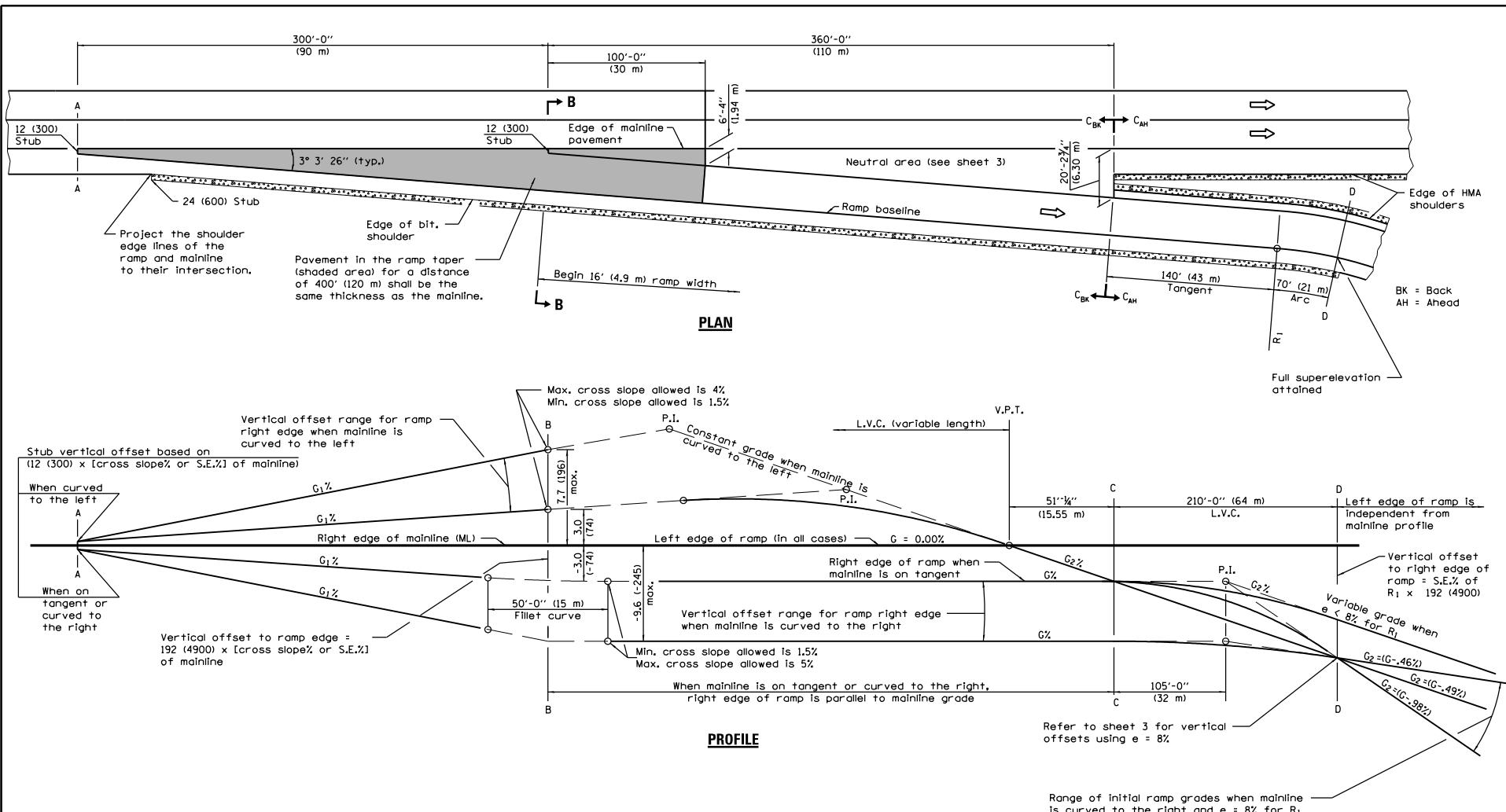


CROSS SECTIONS WHEN MAINLINE IS CURVED TO THE LEFT



	Illinois Department of Transportation
PASSED	January 1, 2015
Michael Brand	1-1-197
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2015
John R. [Signature]	
ENGINEER OF DESIGN AND ENVIRONMENT	

ENTRANCE RAMP TERMINAL	
(FLEXIBLE RAMP PAVEMENT ADJACENT TO FLEXIBLE MAINLINE PAVEMENT)	
(Sheet 2 of 2)	
STANDARD 406001-06	

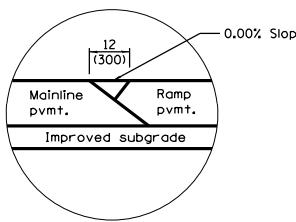
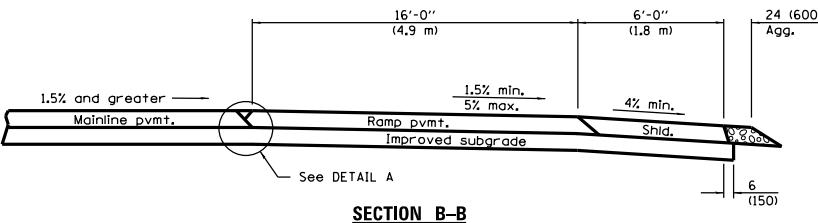


See Sheet 3 for GENERAL NOTES

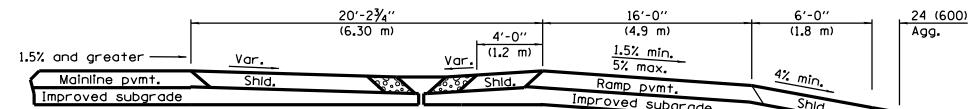
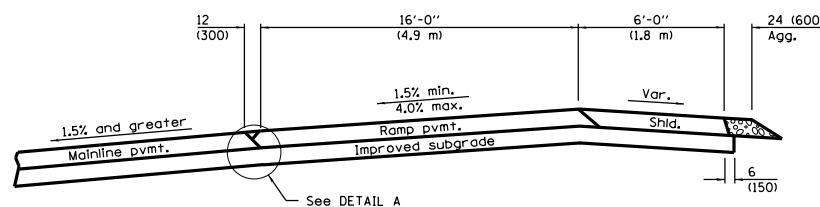
DATE	REVISIONS
1-1-15	Corrected divergence angle at taper. Based profile off of e-max instead of RI.
1-1-08	Switched units to English (metric).

EXIT RAMP TERMINAL
(FLEXIBLE RAMP PAVEMENT ADJACENT
TO FLEXIBLE MAINLINE PAVEMENT)
(Sheet 1 of 3)

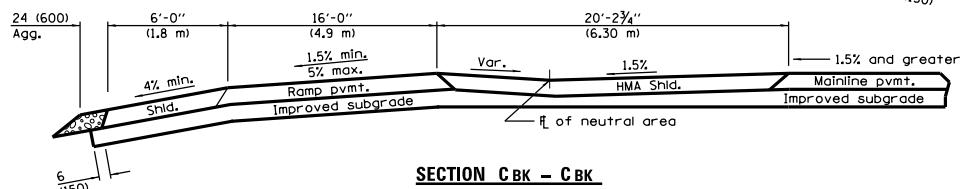
STANDARD 406101-05



DETAIL A

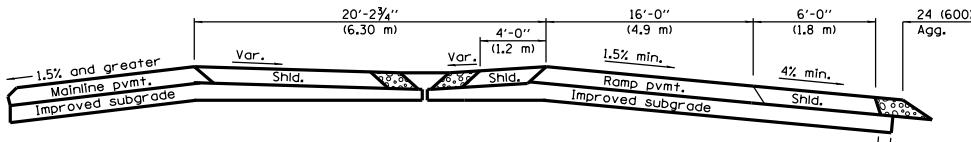


SECTION CAH - CAH

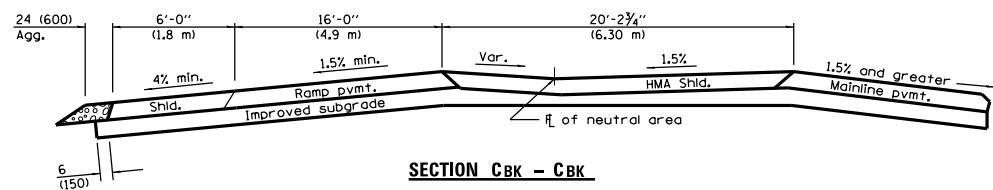


BK = Back
AH = Ahead

WHEN MAINLINE IS ON TANGENT OR CURVED TO THE RIGHT



SECTION CAH - CAH



WHEN MAINLINE IS CURVED TO THE LEFT

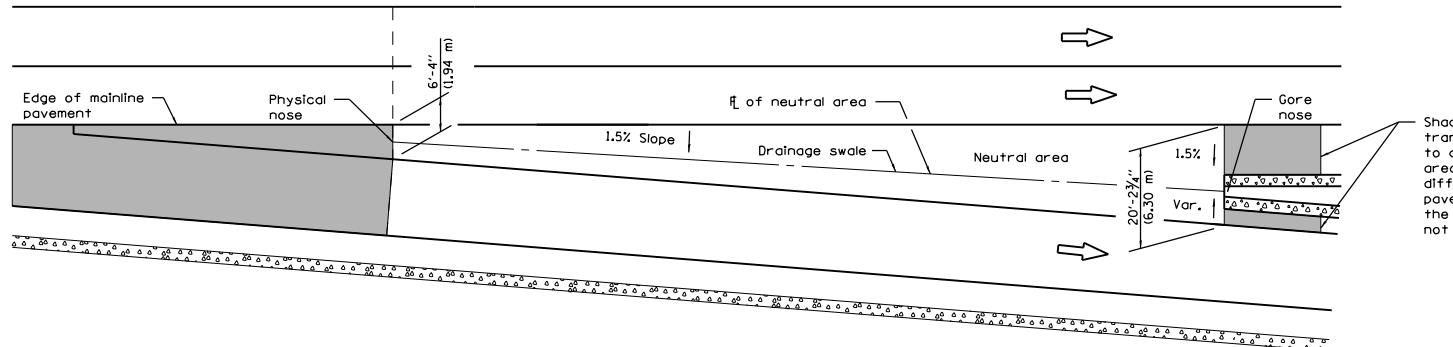
See Sheet 3 for GENERAL NOTES

	Illinois Department of Transportation
PASSED	January 1, 2015
Michael Brand	ISSUED
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	JANUARY 1, 2015
CR	1-1-197
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

GENERAL NOTES

The initial ramp grade (G_2) 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 $\frac{1}{100}$, 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_i , construct the ramp as a 140 ft. (43 m) tangent section.

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

Vertical offsets in inches for right ① edge of ramp, when $e = 8\%$			
Sections	Mainline on Tangent	Mainline Curved Right	Mainline Curved Left
A	- 0.18	S.E. $\frac{1}{2}$ ML $\times 12$	S.E. $\frac{1}{2}$ ML ②
B	- 3.0	S.E. $\frac{1}{2}$ ML $\times 192$	S.E. $\frac{1}{2}$ ML ②
C	- 3.0	S.E. $\frac{1}{2}$ ML $\times 192$	- 3.0
D	- 15.4	- 15.4	- 15.4

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

① Vertical offsets in mm for right edge of ramp, when $e = 8\%$			
Sections	Mainline on Tangent	Mainline Curved Right	Mainline Curved Left
A	- 5	S.E. $\frac{1}{2}$ ML $\times 300$	S.E. $\frac{1}{2}$ ML ② $\times 300$
B	- 74	S.E. $\frac{1}{2}$ ML $\times 4900$	S.E. $\frac{1}{2}$ ML ② $\times 4900$
C	- 74	S.E. $\frac{1}{2}$ ML $\times 4900$	- 74
D	- 392	- 392	- 392

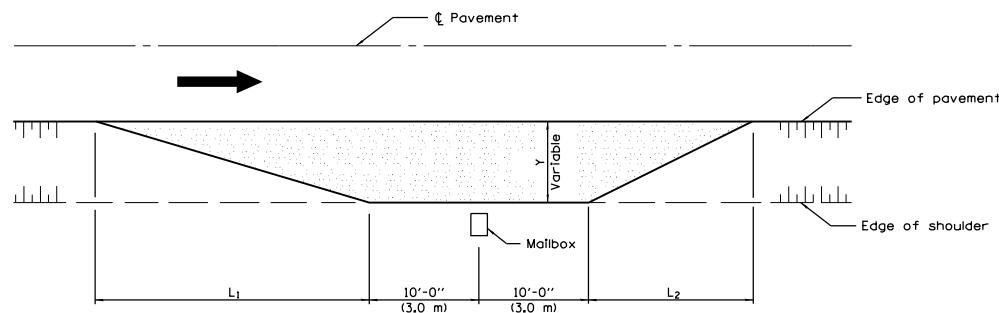
	Illinois Department of Transportation
PASSED	January 1, 2015
	Michael Brand
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2015
	Michael Brand
ENGINEER OF DESIGN AND ENVIRONMENT	
IS-100-1-1-197	

EXIT RAMP TERMINAL

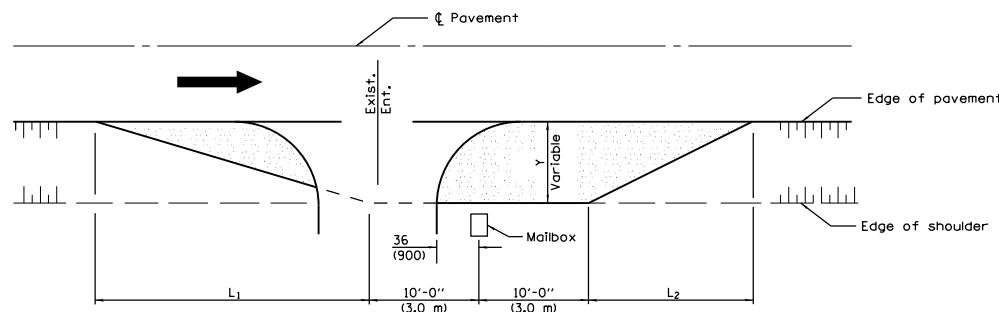
(FLEXIBLE RAMP PAVEMENT ADJACENT TO FLEXIBLE MAINLINE PAVEMENT)

(Sheet 3 of 3)

STANDARD 406101-05

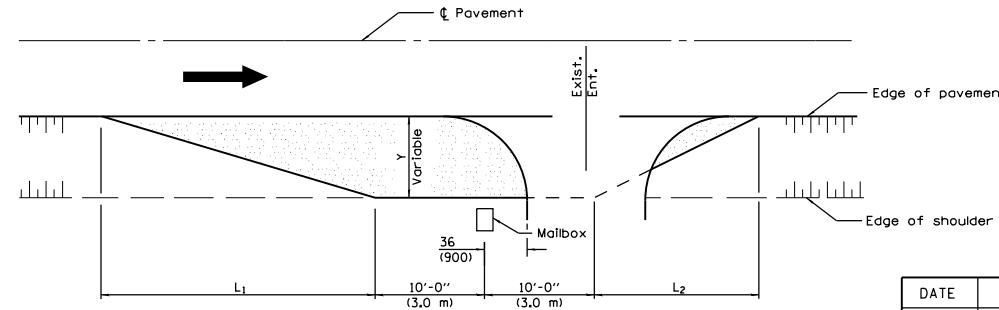


TYPICAL APPLICATION



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)
L1	32 (9.5)	32 (9.5)
L2	20 (6.0)	20 (6.0)

MAILBOX ON FAR SIDE OF ENTRANCE



GENERAL NOTES

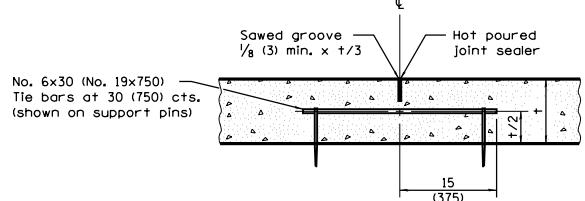
Mailboxes shall be mounted such that the face of the mailbox is 6 (150) to 12 (300), and the post a minimum of 24 (600), from the edge of the turnout surfacing.

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

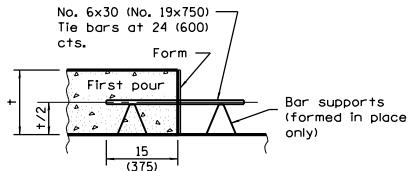
	Illinois Department of Transportation
PASSED	January 1, 2008
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2008
ENGINEER OF DESIGN AND ENVIRONMENT	
	1-1-97

MAILBOX ON NEAR SIDE OF ENTRANCE

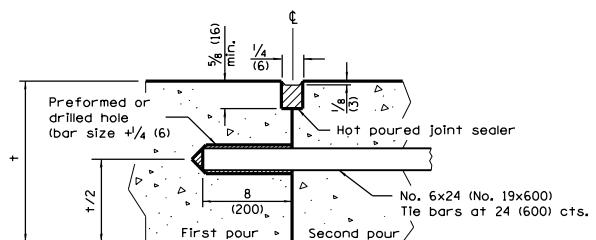
DATE	REVISIONS	MAILBOX TURNOUT
1-1-08	Switched units to English (metric).	
1-1-97	Renum. Standard 2171-1. Deleted note regarding Township & Dist. roads	
		STANDARD 406201-01



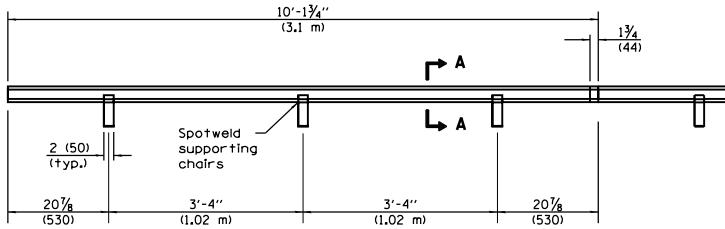
LONGITUDINAL SAWED JOINT



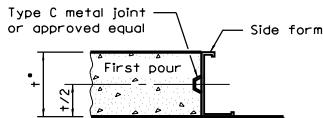
LONGITUDINAL
CONSTRUCTION JOINT
(TIE BAR FORMED IN PLACE
OR MECHANICALLY INSERTED)



LONGITUDINAL CONSTRUCTION JOINT
(TIE BAR GROUTED IN PLACE)

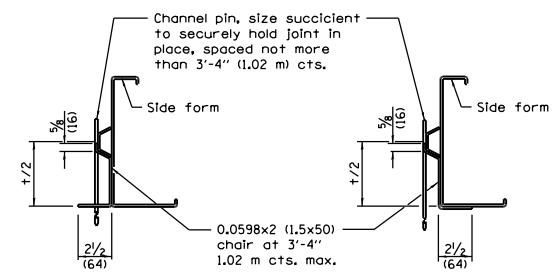


TYPE C METAL JOINT

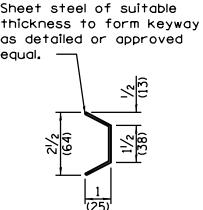


LONGITUDINAL KEYED
JOINT

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



SUPPORTING CHAIR
ALTERNATE



SECTION A-A

SUPPORTING CHAIR
ALTERNATE

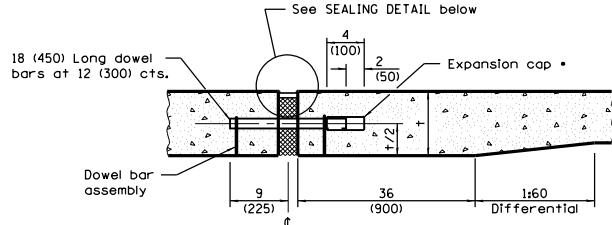
GENERAL NOTES
All slope ratios are expressed as units of vertical displacement to units of horizontal displacement ($V:H$).

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

	Illinois Department of Transportation
PASSED	January 1, 2015
	Michael Brand
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2015
	Michael Brand
ENGINEER OF DESIGN AND ENVIRONMENT	

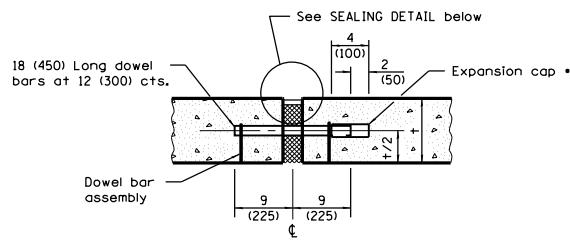
DATE	REVISIONS	PAVEMENT JOINTS (Sheet 1 of 2)
1-1-15	Added: opt. for mech.	
	Inserted tie bars, min. pvmnt.	
	thickness for keyed joints.	
1-1-08	Switched units to	
	English (metric).	

STANDARD 420001-08

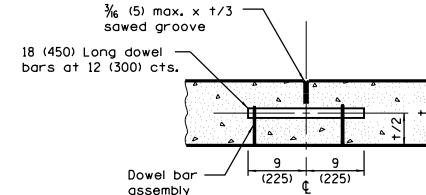


TRANSVERSE EXPANSION JOINT
(FOR PAVEMENTS WITH UNEQUAL THICKNESS)

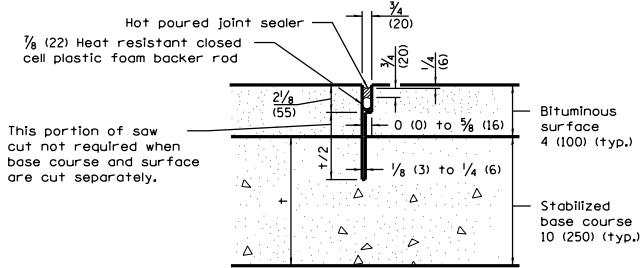
- Expansion caps shall be installed on the exposed end of each dowel bar once the header has been removed and the joint filler material has been installed.



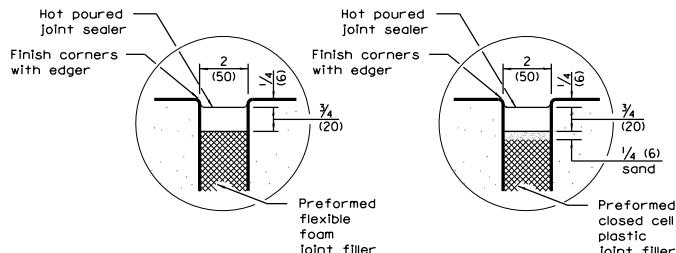
TRANSVERSE EXPANSION JOINT
(FOR PAVEMENTS WITH EQUAL THICKNESS)



TRANSVERSE CONTRACTION JOINT



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



SEALING DETAIL

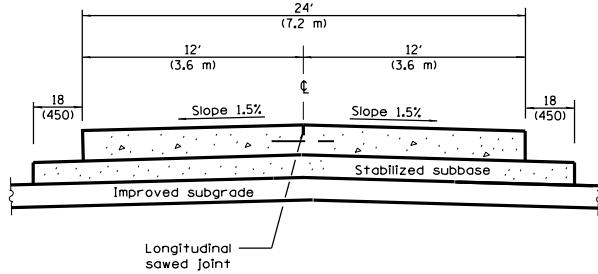
DOWEL BAR TABLE	
PAVEMENT THICKNESS	DOWEL BAR DIAMETER
8 (200) or greater	1 1/2 (38)
7 (175) thru 7.99 (199)	1 1/4 (32)
Less than 7 (175)	1 (25)

	Illinois Department of Transportation
PASSED	January 1, 2015
Michael Brand	Engineer of Policy and Procedures
APPROVED	January 1, 2015
	Engineer of Design and Environment
	1-1-19

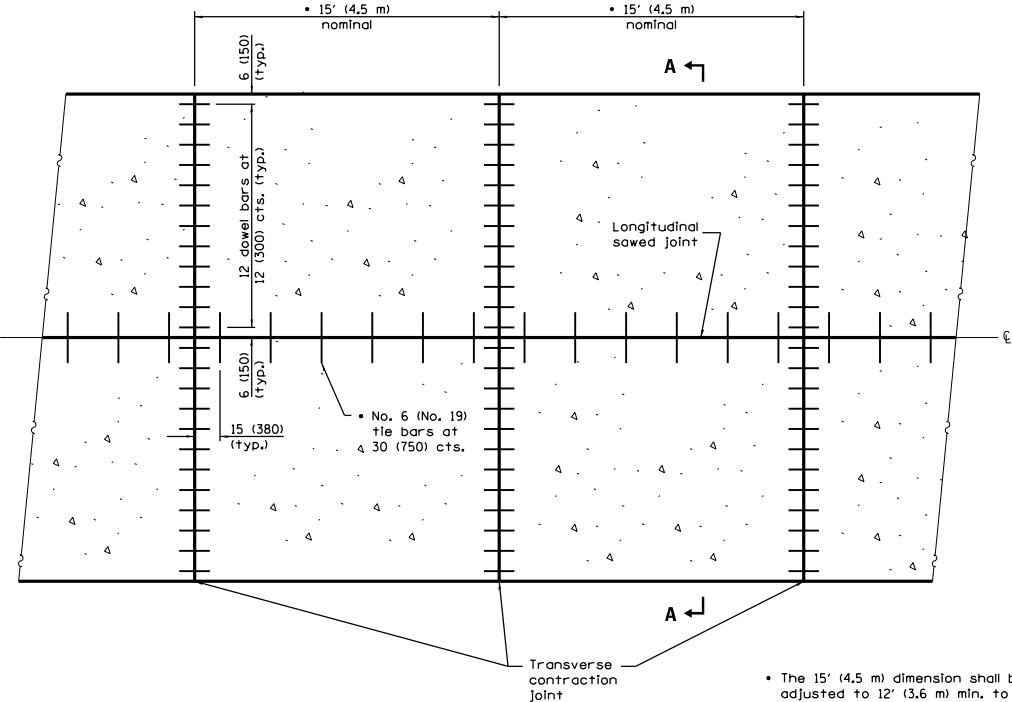
PAVEMENT JOINTS

(Sheet 2 of 2)

STANDARD 420001-08

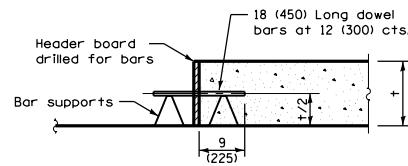


SECTION A-A
(TYPICAL 2-LANE WITH SHOULDERS)

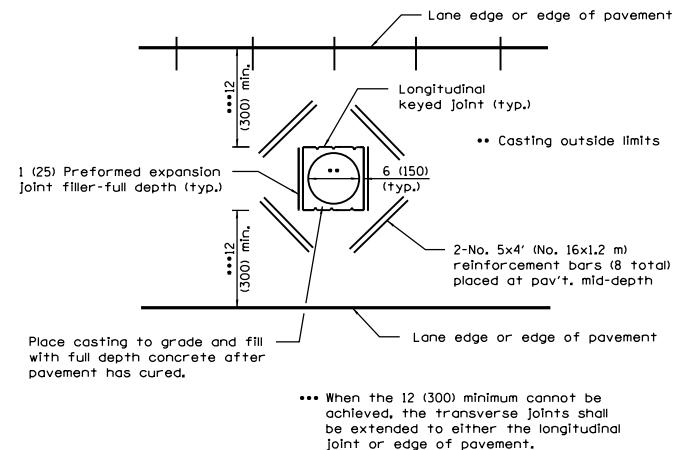


- The 15' (4.5 m) dimension shall be adjusted to 12' (3.6 m) min. to 18' (5.5 m) max. when placed adjacent to existing pcc pavement structure so that the joints are in prolongation. Adjust the tie bar spacing to maintain a clearance of 6 (150) from dowel bars.

PLAN



TRANSVERSE CONSTRUCTION JOINT



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

GENERAL NOTES

See Standard 420001 for details of joints not shown.

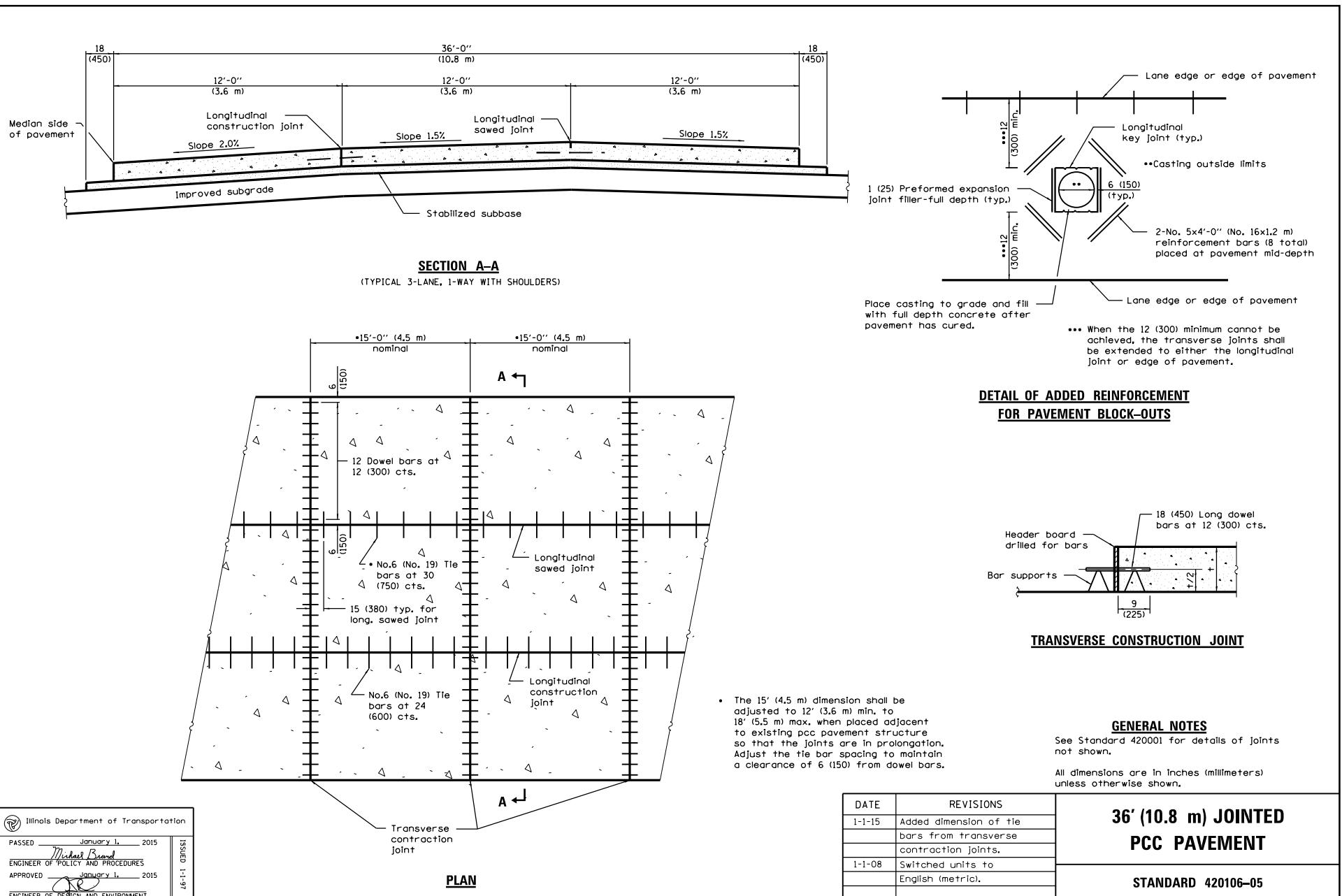
All dimensions are in inches (millimeters) unless otherwise shown.

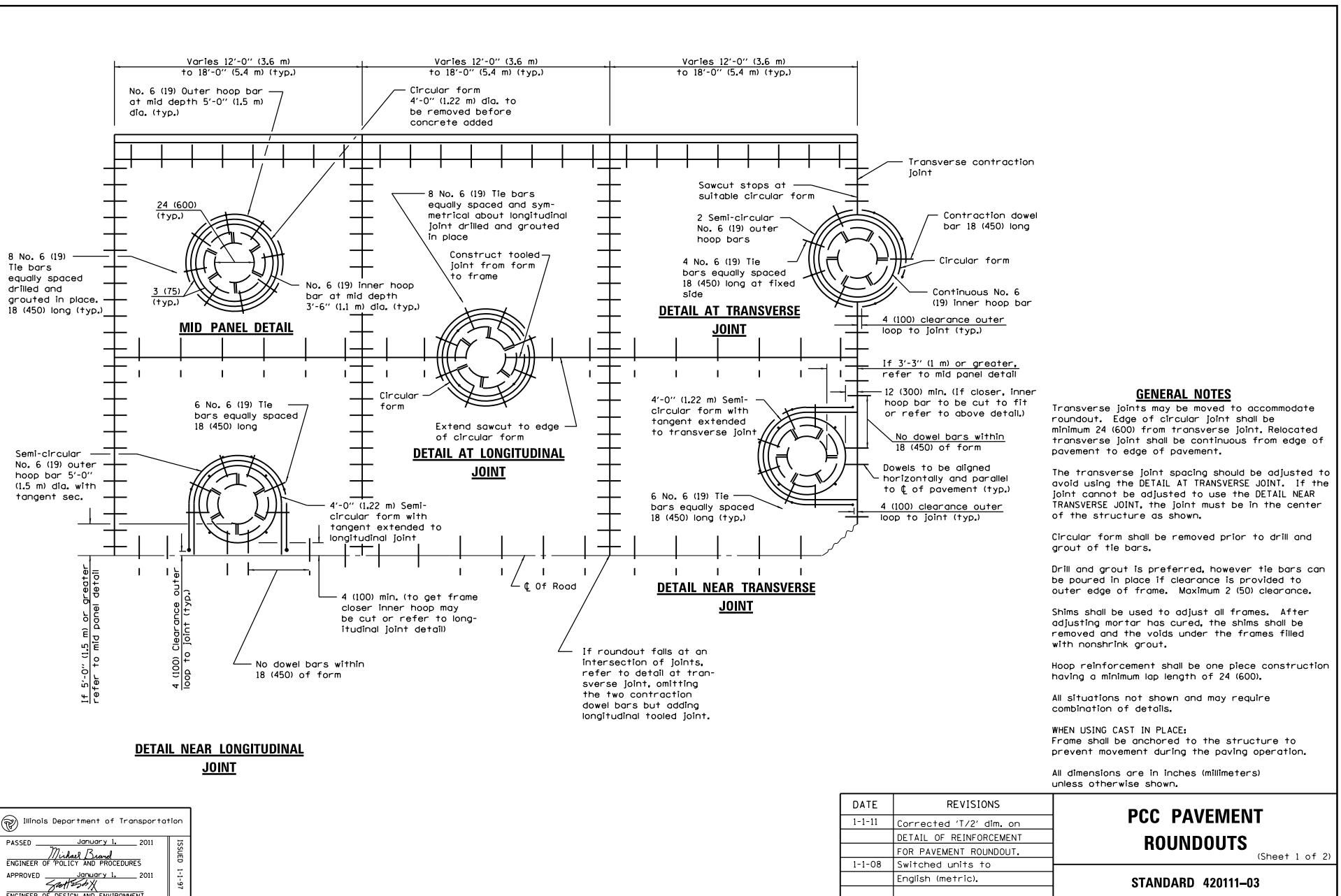
DATE	REVISIONS	24' (7.2 m) JOINTED PCC PAVEMENT
1-1-15	Added dimension of tie bars from transverse contraction joints	
1-1-08	Switched units to English (metric).	

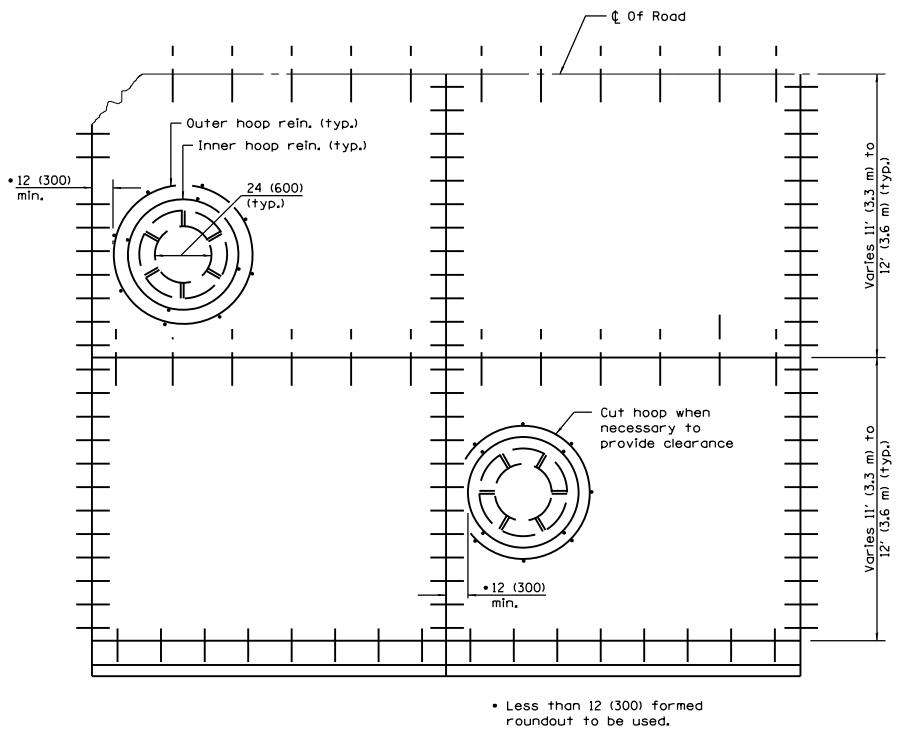
STANDARD 420101-05

Illinois Department of Transportation
PASSED January 1, 2015
Michael Brand
ENGINEER OF POLICY AND PROCEDURES
APPROVED January 1, 2015
John Doe
ENGINEER OF DESIGN AND ENVIRONMENT

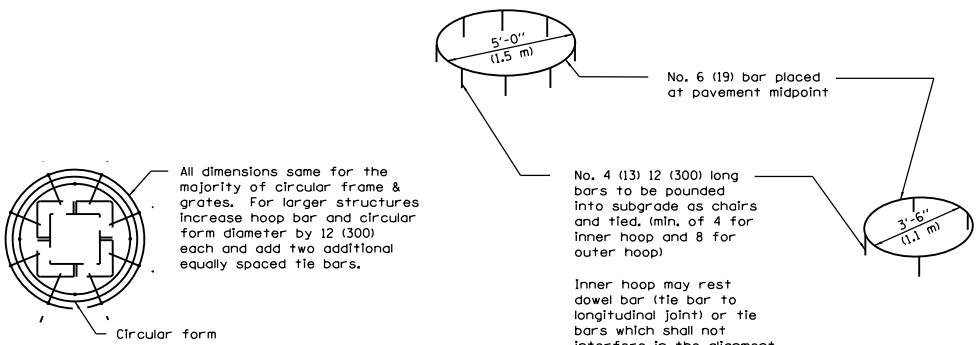
1-1-15-1



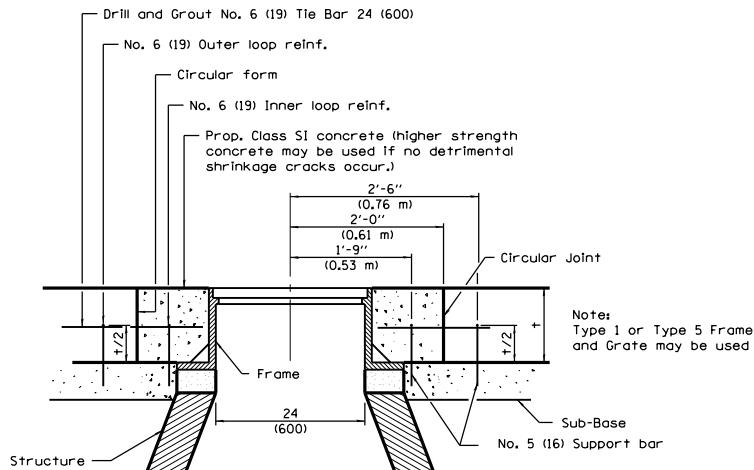




CAST IN PLACE DETAIL



ROUNDABOUT FOR SQUARE FRAME & GRATE AND MANHOLES



DETAIL OF REINFORCEMENT FOR PAVEMENT ROUNDOUT

	Illinois Department of Transportation
PASSED	January 1, 2011
Michael Brand	ISRS 1-1-97
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2011
Stefan S. K.	
ENGINEER OF DESIGN AND ENVIRONMENT	

PCC PAVEMENT ROUNDOUTS

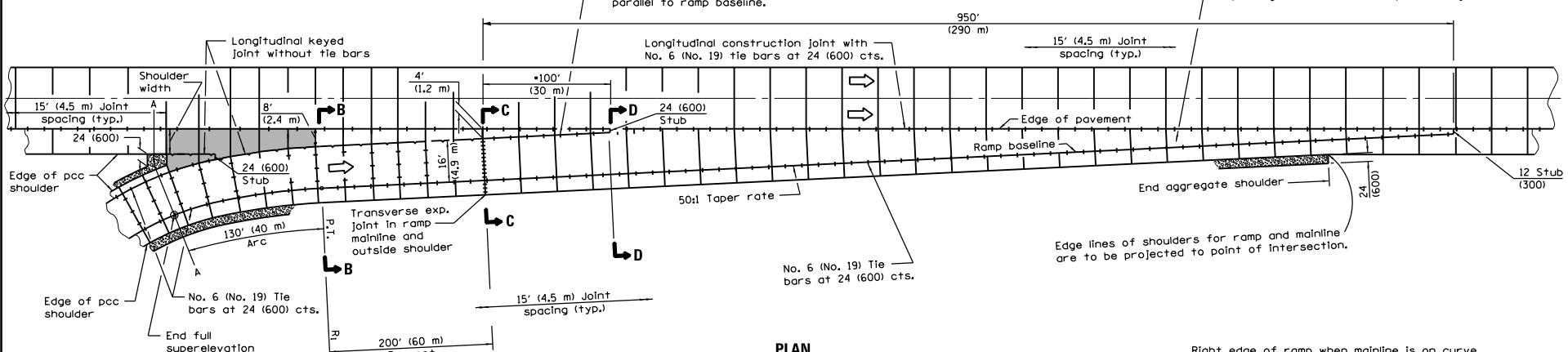
(Sheet 2 of 2)

STANDARD 42011-03

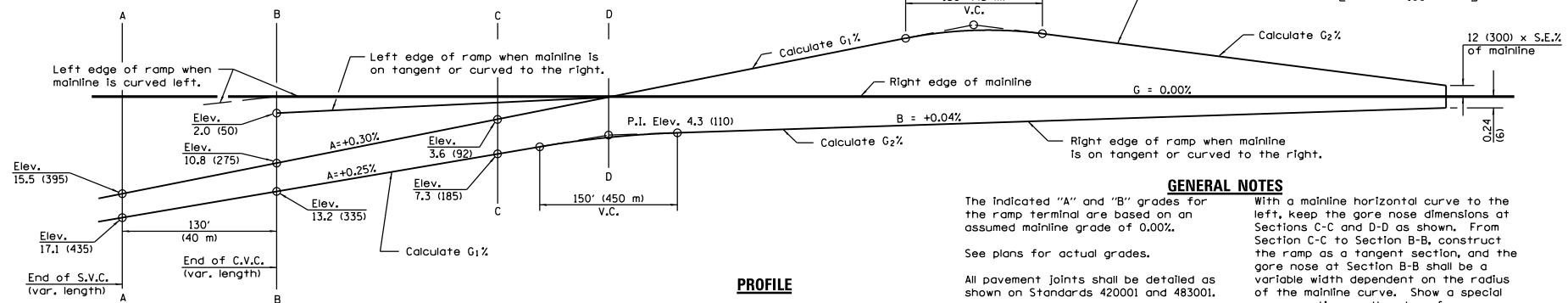
- This distance shall be adjusted to place the transverse expansion joint in prolongation with the existing joint in the mainline pavement.

- Longitudinal sawed joint or a longitudinal construction joint with No. 6 (No. 19) tie bars at 24 (600) cts. for a distance of 100' (30 m) beginning at the 24 (600) stub. Joint line is parallel to ramp baseline.

Pavement thickness and joint type in the ramp taper, for a distance of 950' (290 m), shall be the same as the mainline. Joints shall be in prolongation with mainline pavement joints.



PLAN



PROFILE

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.

Between Sections A-A and B-B (shaded area), provide a drainage swale and

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

When using radius R1 less than the minimum, verify the required acceleration length will be provided.

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

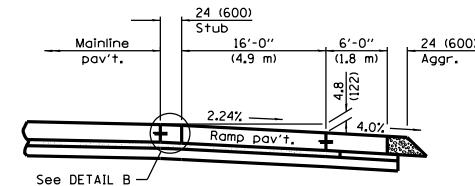
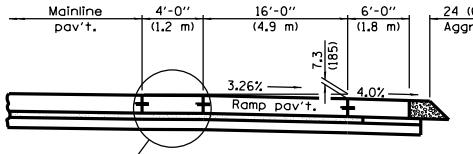
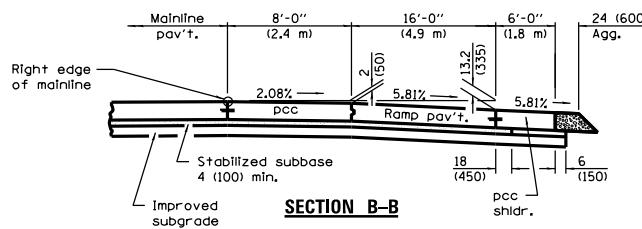
ENTRANCE RAMP TERMINAL

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

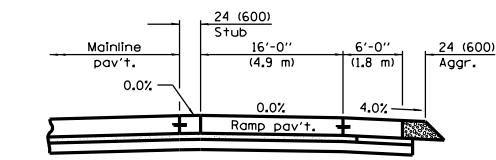
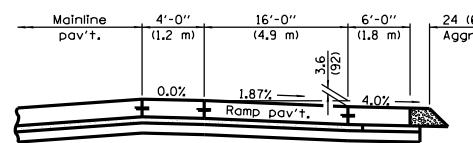
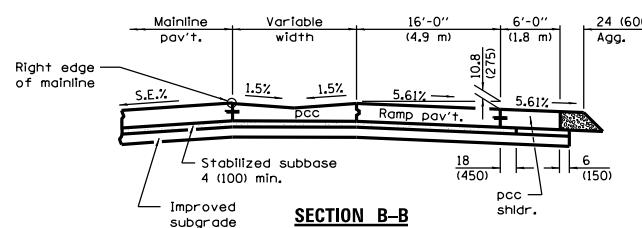
(Sheet 1 of 2)

DATE	REVISIONS	
1-1-15	Revised general note to be generic for R1.	
1-1-14	Now show transverse joint at sec. C-C extended through shoulder.	(Sheet 1 of 2)
		STANDARD 420201-09

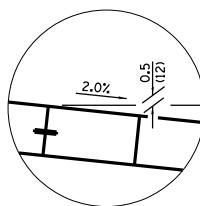
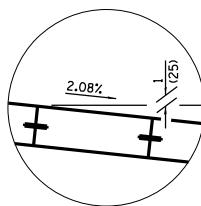
	Illinois Department of Transportation
PASSED	January 1, 2015
<i>Michael Beard</i>	
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2015
<i>[Signature]</i>	
ENGINEER OF POLICY AND ENVIRONMENT	



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

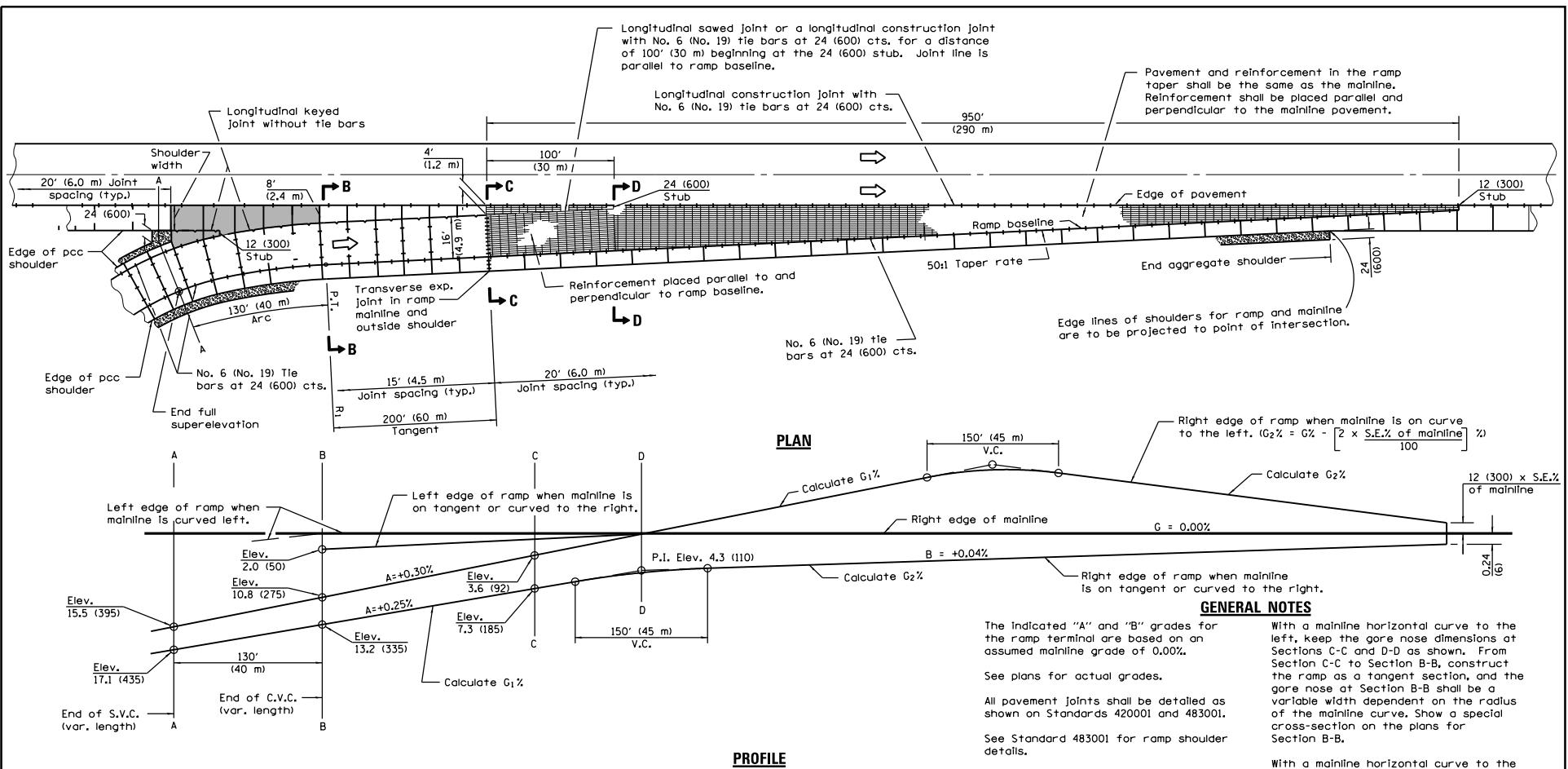


CROSS SECTIONS WHEN MAINLINE IS CURVED TO THE LEFT



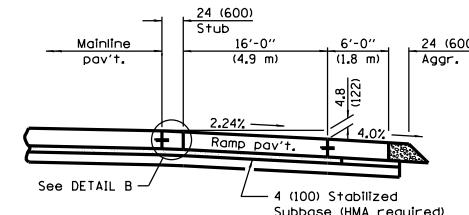
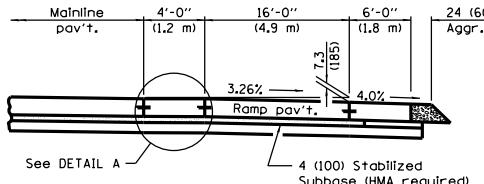
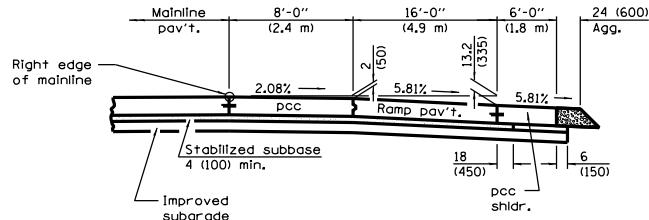
	Illinois Department of Transportation
PASSED	January 1, 2015
Michael Brand	Engineer of Policy and Procedures
APPROVED	January 1, 2015
	Engineer of Design and Environment
1-1-15	

ENTRANCE RAMP TERMINAL	
(JOINTED PCC RAMP PAVEMENT ADJACENT TO JOINTED PCC MAINLINE PAVEMENT)	
(Sheet 2 of 2)	
STANDARD 420201-09	

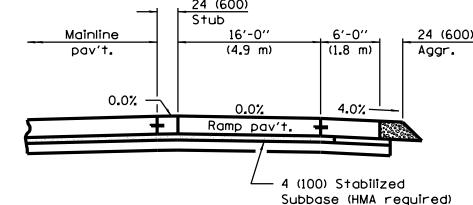
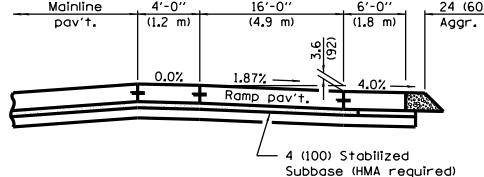
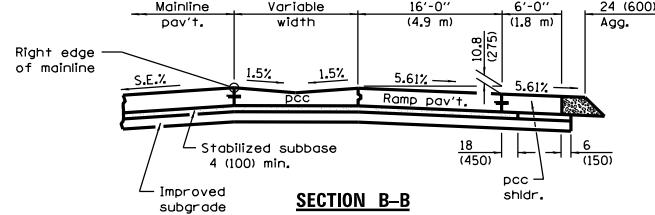


	Illinois Department of Transportation
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<i>Michael Beard</i>	
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2015
<i>R. J. S.</i>	
ENGINEER OF DESIGN AND ENVIRONMENT	
ISSUED 1-19-7	

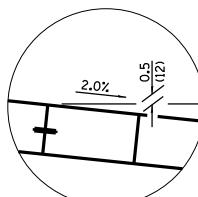
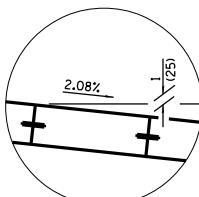
DATE	REVISIONS	ENTRANCE RAMP TERMINAL (JOINTED PCC RAMP PAVEMENT ADJACENT TO CRC MAINLINE PAVEMENT)
1-1-15	Revised general note to be generic for RI.	(Sheet 1 of 2)
1-1-14	Now show transverse joint at sec. C-C extended through shoulder.	STANDARD 420206-10



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



CROSS SECTIONS WHEN MAINLINE IS CURVED TO THE LEFT



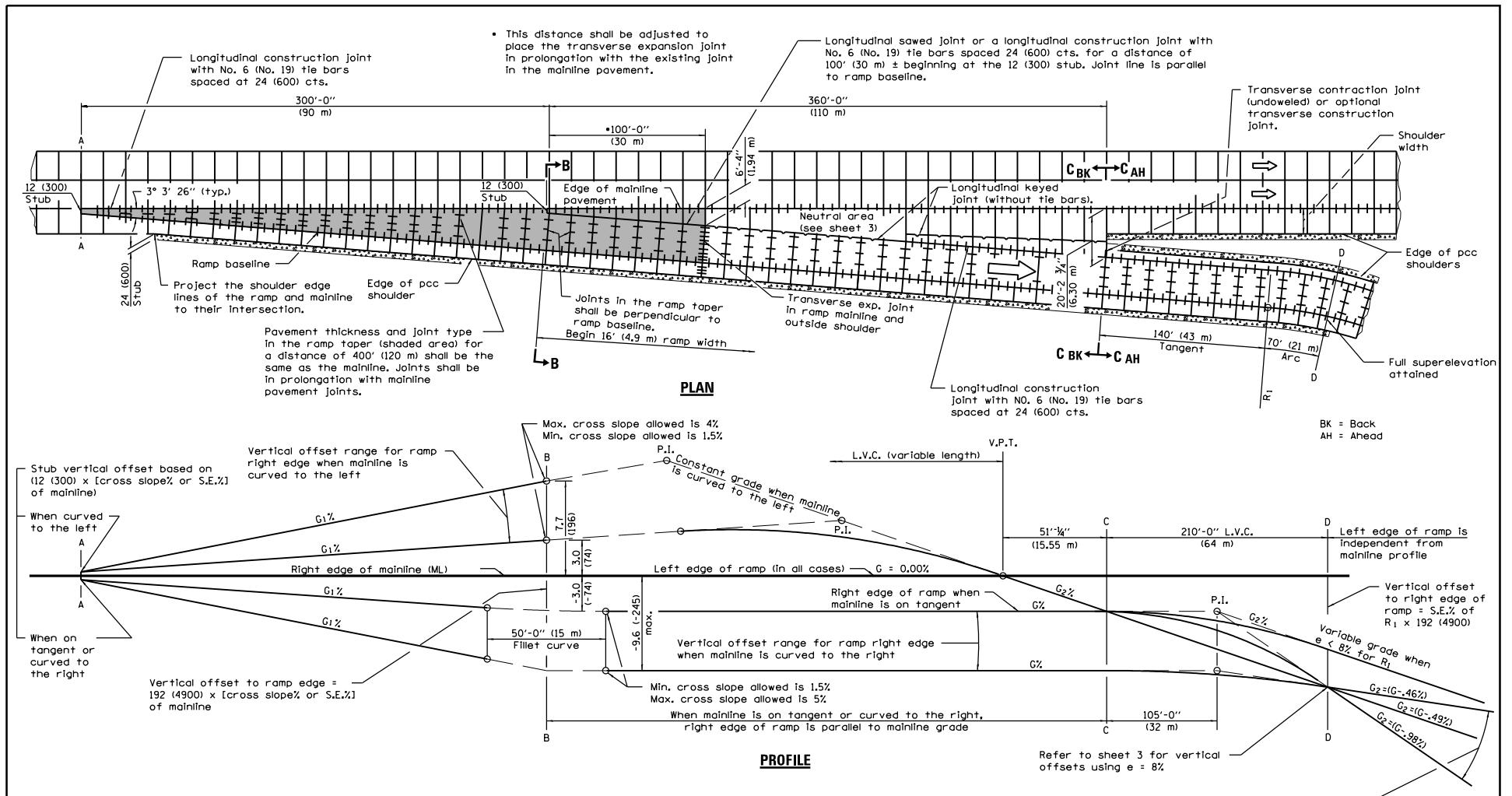
	Illinois Department of Transportation
PASSED	January 1, 2015
Michael Brand	1-1-15
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2015
John R. [Signature]	
ENGINEER OF DESIGN AND ENVIRONMENT	

ENTRANCE RAMP TERMINAL

(JOINTED PCC RAMP PAVEMENT
ADJACENT TO CRC MAINLINE PAVEMENT)

(Sheet 2 of 2)

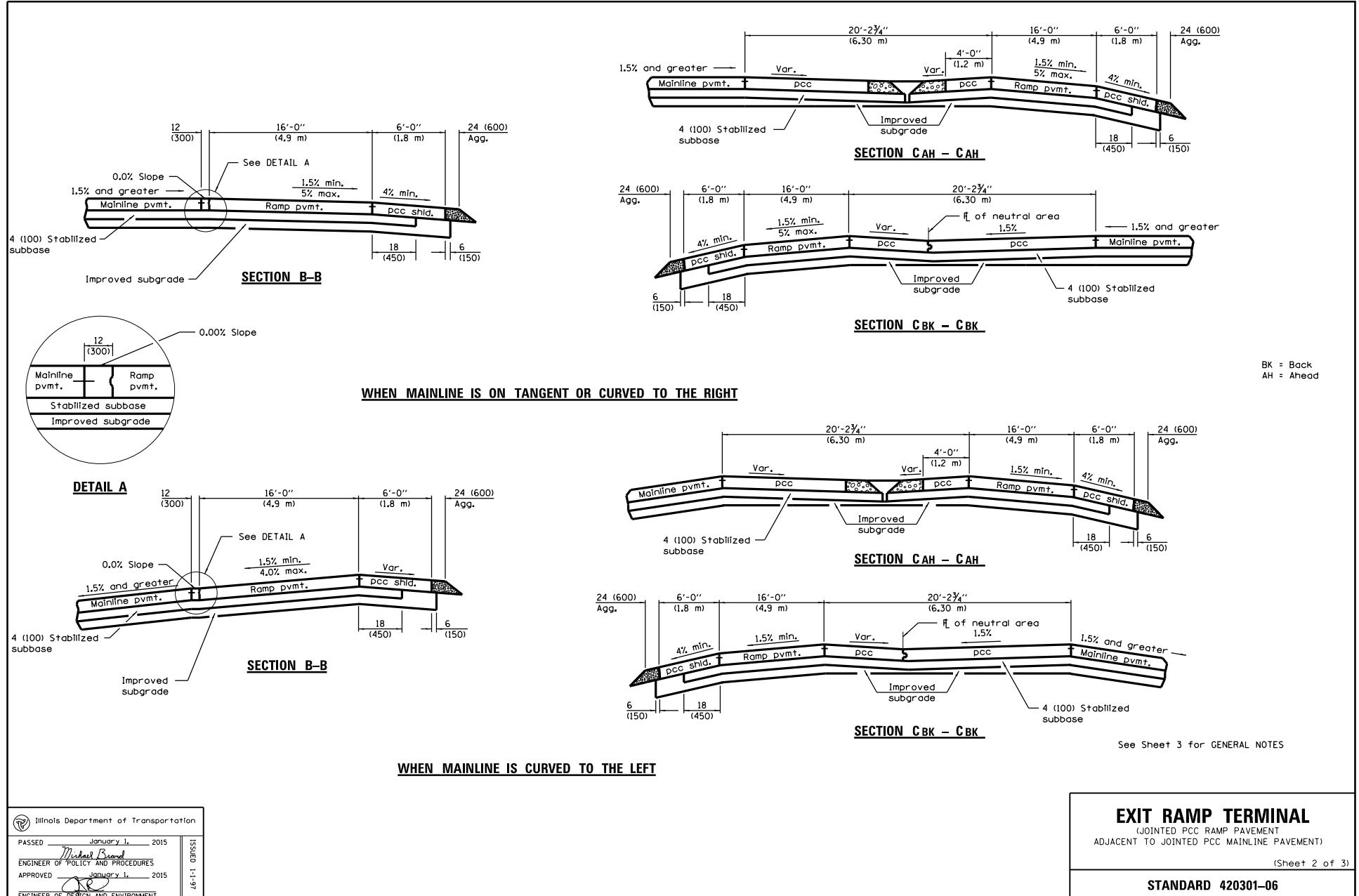
STANDARD 420206-10

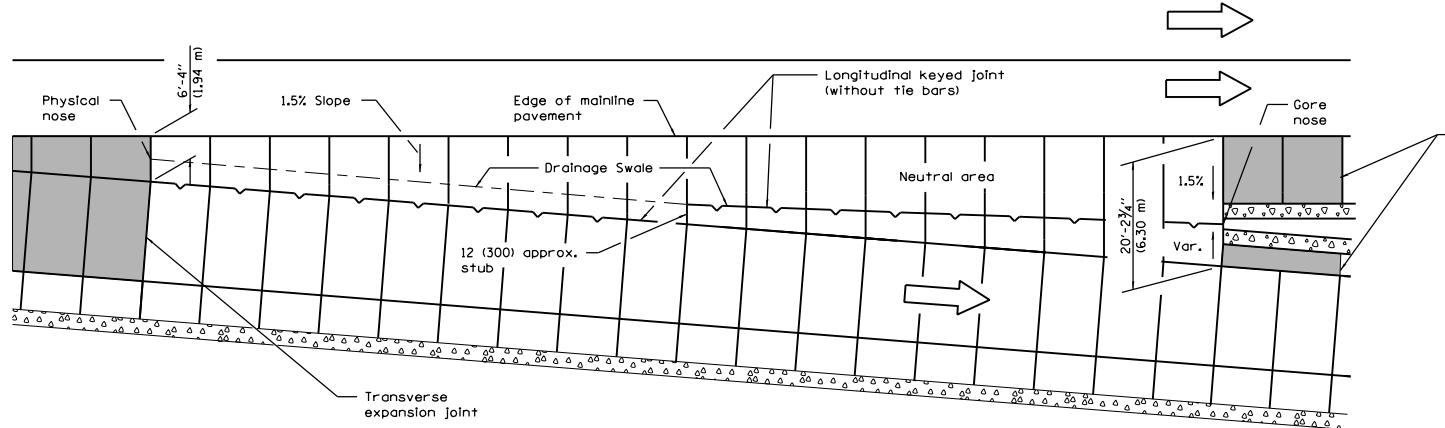


Range of initial ramp grades when mainline is curved to the right and $e = 8\%$ for R_1

See Sheet 3 for GENERAL NOTES

DATE	REVISIONS	
1-1-15	Corrected divergence angle at taper. Based profile off of e-max instead of RI.	EXIT RAMP TERMINAL (JOINTED PCC RAMP PAVEMENT ADJACENT TO JOINTED PCC MAINLINE PAVEMENT)
1-1-14	Now show transverse expansion joint extended through shoulder.	(Sheet 1 of 3)
		STANDARD 420301-06





DETAILS FOR DRAINAGE IN NEUTRAL AREA

Vertical offsets in inches for right edge of ramp, when $e = 8\%$		
Sections	Mainline on Tangent	Mainline Curved Right
A	- 0.18	S.E. % ML x 12 (2)
B	- 3.0	S.E. % ML x 192 (2)
C	- 3.0	S.E. % ML x 192
D	- 15.4	- 15.4

① Vertical offsets in mm for right edge of ramp, when $e = 8\%$		
Sections	Mainline on Tangent	Mainline Curved Right
A	- 5	S.E.% ML x 300 (2)
B	- 74	S.E.% ML x 4900 (2)
C	- 74	S.E.% ML x 4900
D	- 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

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%.

GENERAL NOTES

The initial ramp grade (G_2) 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.

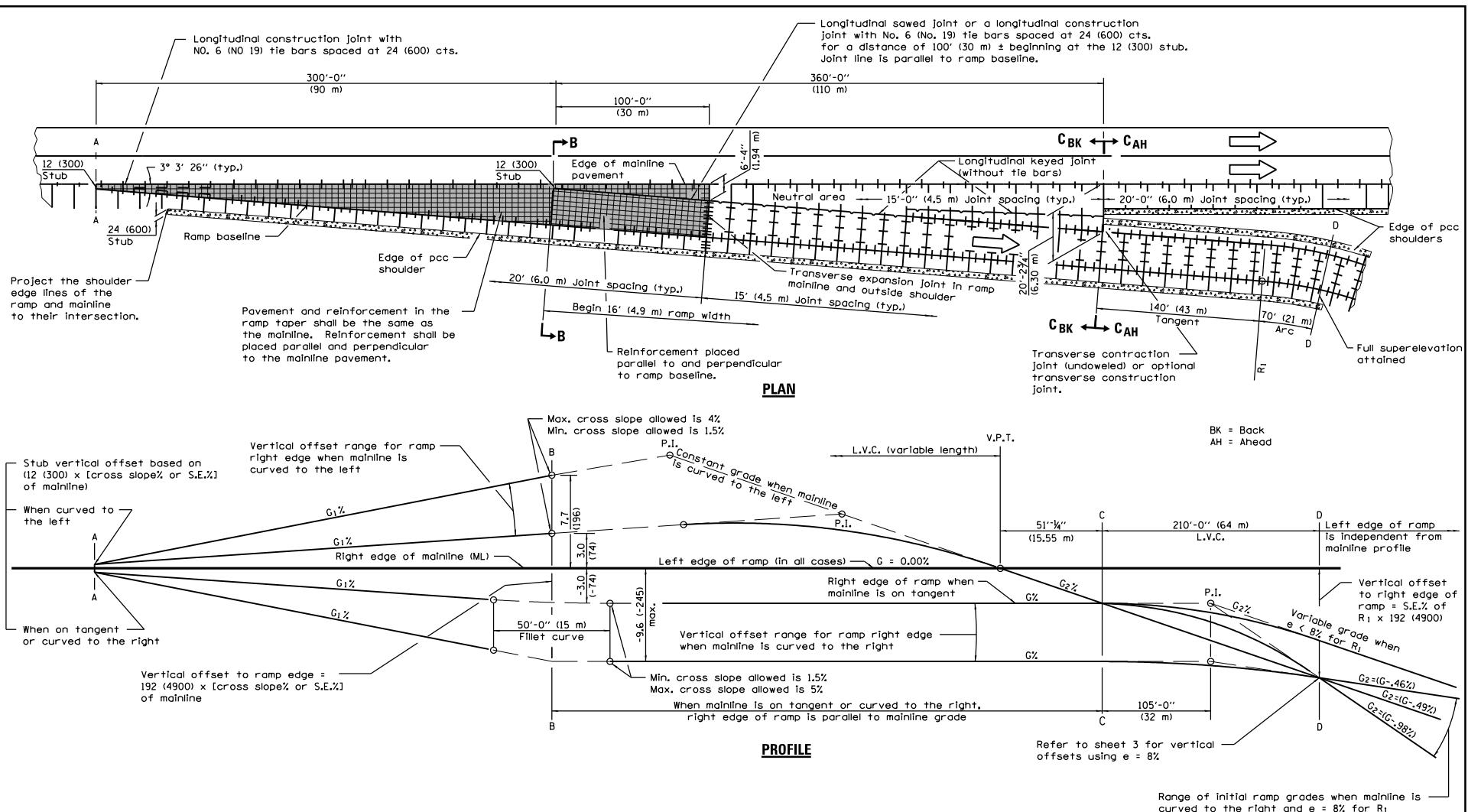
EXIT RAMP TERMINAL

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

(Sheet 3 of 3)

STANDARD 420301-06

	Illinois Department of Transportation
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	Michael Brand
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2015
	Michael Brand
ENGINEER OF DESIGN AND ENVIRONMENT	
ISSUED	1-1-17



	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	

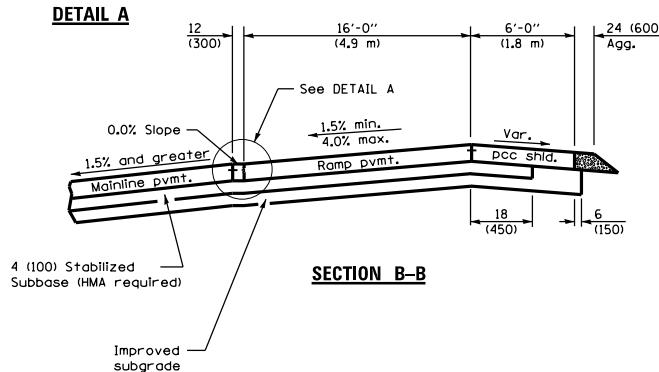
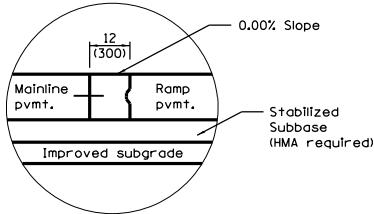
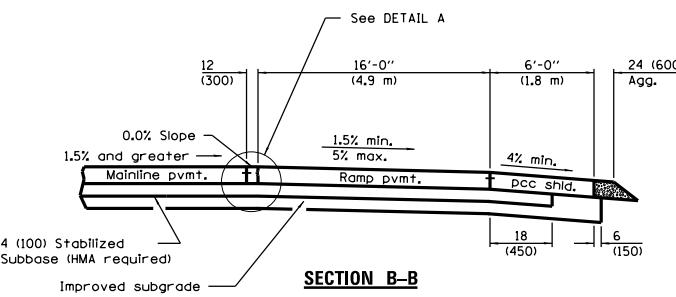
DATE	REVISIONS
1-1-15	Corrected divergence angle at taper. Based profile off of e-max instead of RI.
1-1-14	Now show transverse expansion joint extended through outside shoulder.

EXIT RAMP TERMINAL

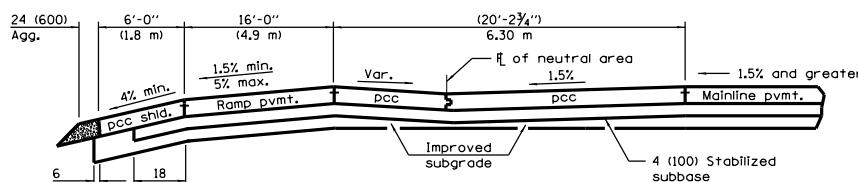
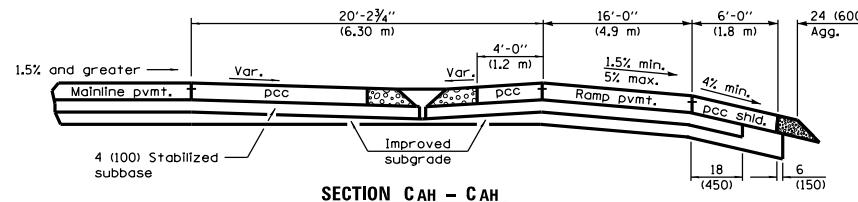
(JOINTED PCC RAMP PAVEMENT
ADJACENT TO CRC MAINLINE PAVEMENT)

(Sheet 1 of 3)

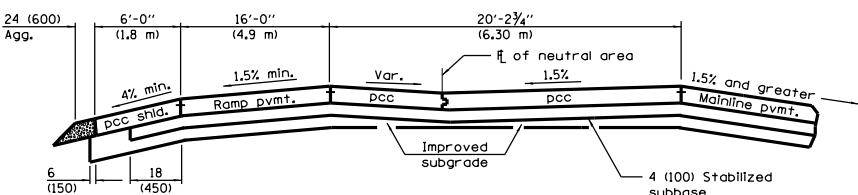
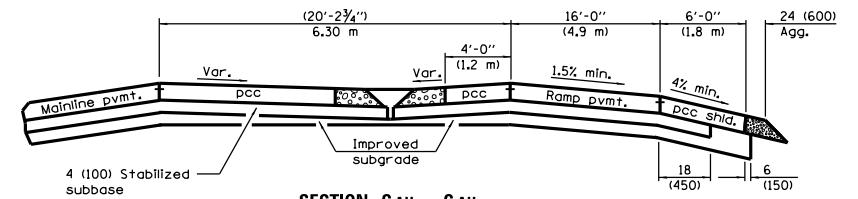
STANDARD 420306-08



WHEN MAINLINE IS ON TANGENT OR CURVED TO THE RIGHT



BK = Back
AH = Ahead



See Sheet 3 for GENERAL NOTES

WHEN MAINLINE IS CURVED TO THE LEFT

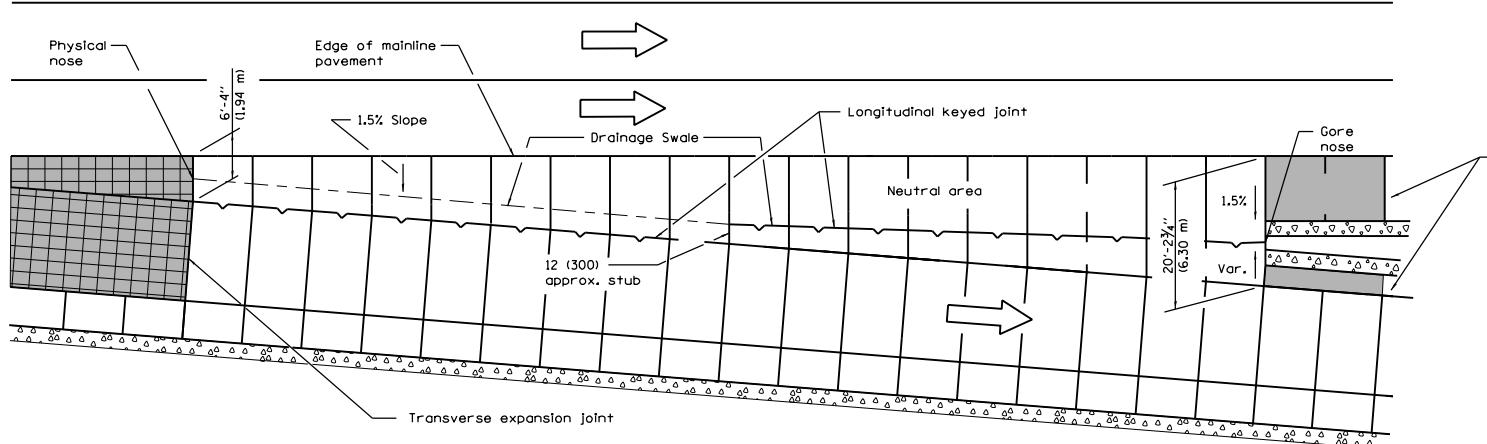
	Illinois Department of Transportation
PASSED	January 1, 2015
Michael Brand	1-1-15
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2015
CR	1-1-15
ENGINEER OF DESIGN AND ENVIRONMENT	

EXIT RAMP TERMINAL

(JOINTED PCC RAMP PAVEMENT
ADJACENT TO CRC MAINLINE PAVEMENT)

(Sheet 2 of 3)

STANDARD 420306-08



DETAILS FOR DRAINAGE IN NEUTRAL AREA

GENERAL NOTES

The initial ramp grade (G_2) 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_i , construct the ramp as a 141' (43 m) tangent section.

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

Vertical offsets in inches for right edge of ramp, when $e = 8\%$		
Sections	Mainline on Tangent	Mainline Curved Right
A	- 0.18 S.E. % ML $\times 12$	S.E. % ML $\times 12$ (2)
B	- 3.0 S.E. % ML $\times 192$	S.E. % ML $\times 192$ (2)
C	- 3.0 S.E. % ML $\times 192$	- 3.0
D	- 15.4	- 15.4

Vertical offsets in mm for right edge of ramp, when $e = 8\%$		
Sections	Mainline on Tangent	Mainline Curved Right
A	- 5 S.E. % ML $\times 300$	S.E. % ML $\times 300$ (2)
B	- 74 S.E. % ML $\times 4900$	S.E. % ML $\times 4900$ (2)
C	- 74 S.E. % ML $\times 4900$	- 74
D	- 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

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	Michael Brand
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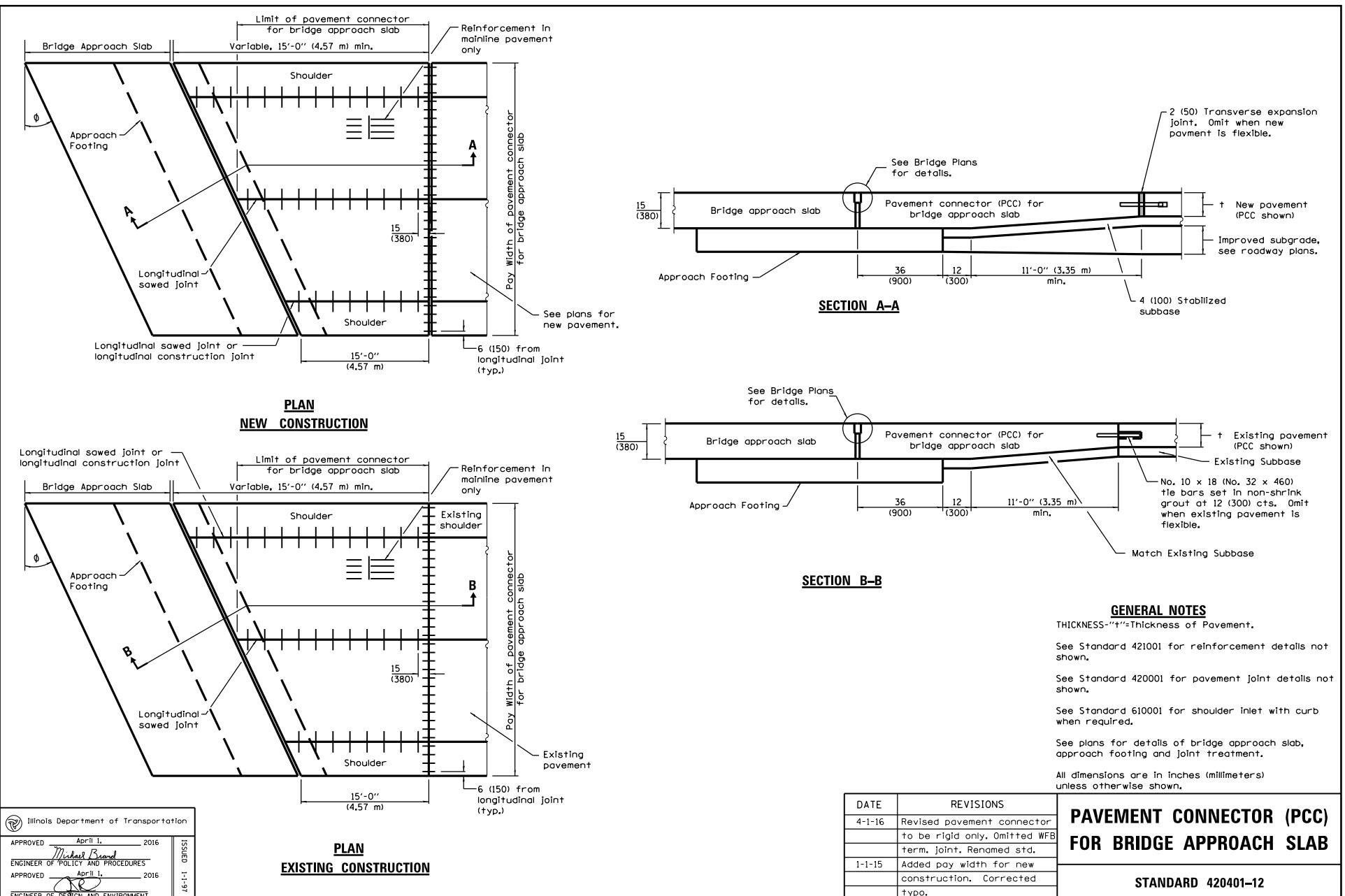
1-1-57

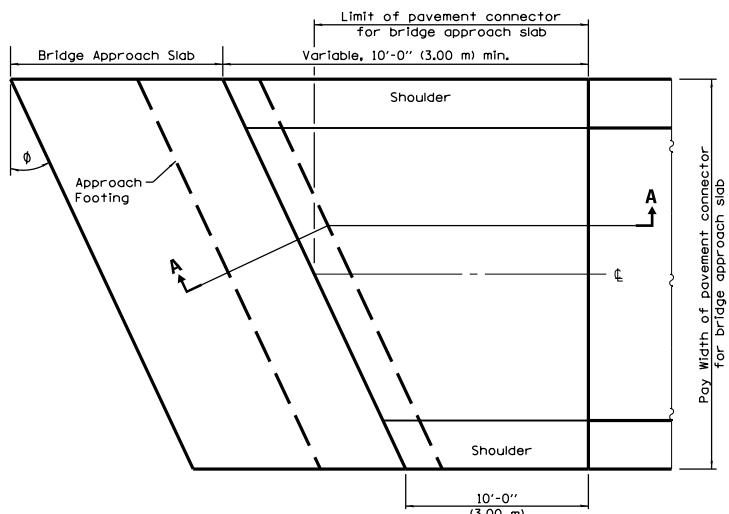
EXIT RAMP TERMINAL

(JOINTED PCC RAMP PAVEMENT
ADJACENT TO CRC MAINLINE PAVEMENT)

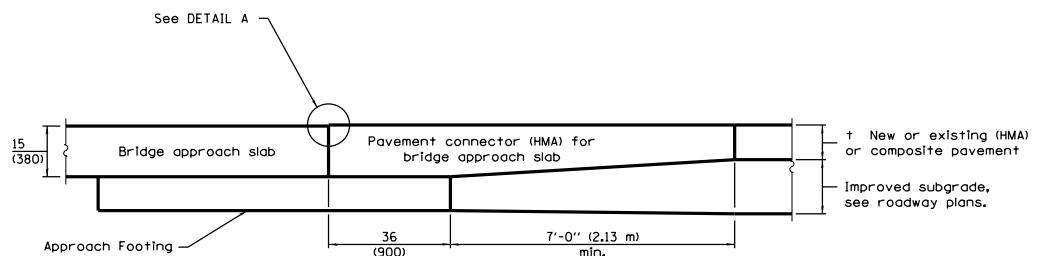
(Sheet 3 of 3)

STANDARD 420306-08

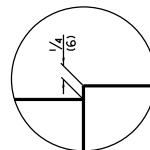




PLAN



SECTION A-A



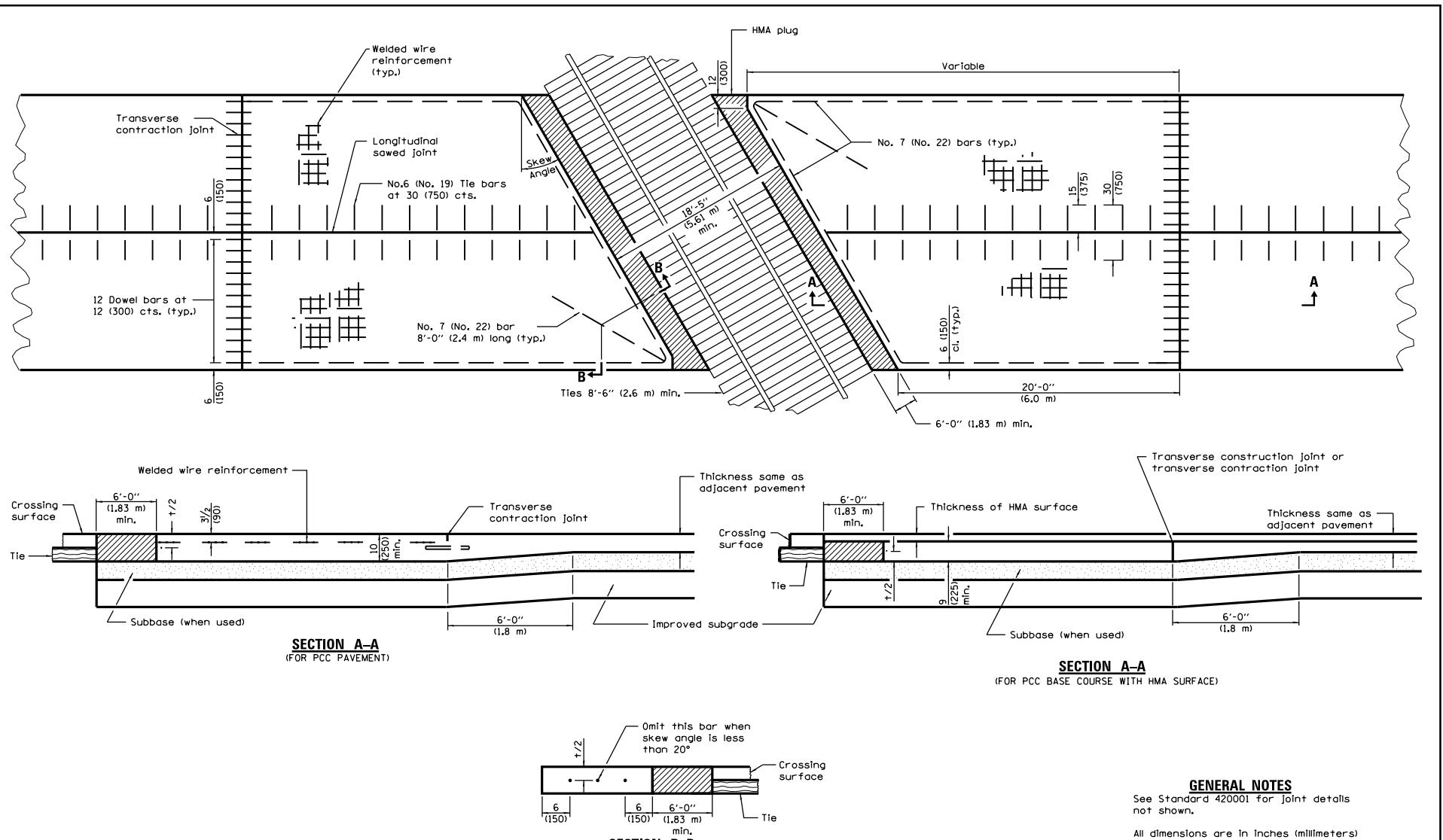
DETAIL A

GENERAL NOTES

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.



GENERAL NOTES
See Standard 420001 for joint details not shown.

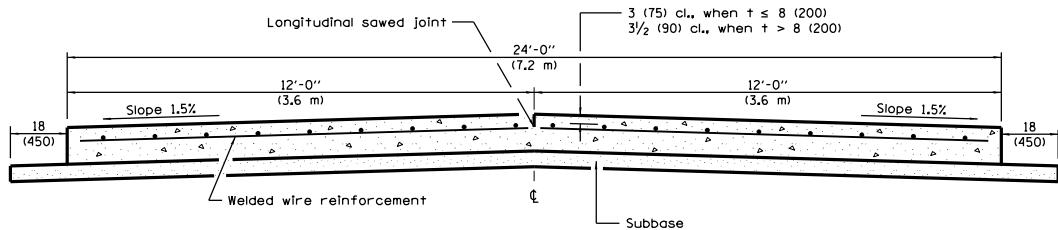
All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
4-1-16	Changed terminology to 'welded wire reinforcement'.
1-1-15	Increased width of HMA plugs to 6'-0" (1.83 m) minimum.

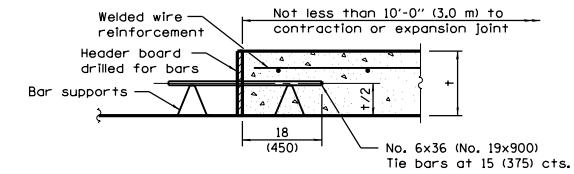
PCC PAVEMENT AND PCC BASE COURSE ADJACENT TO RAILROAD GRADE CROSSING

STANDARD 420501-06

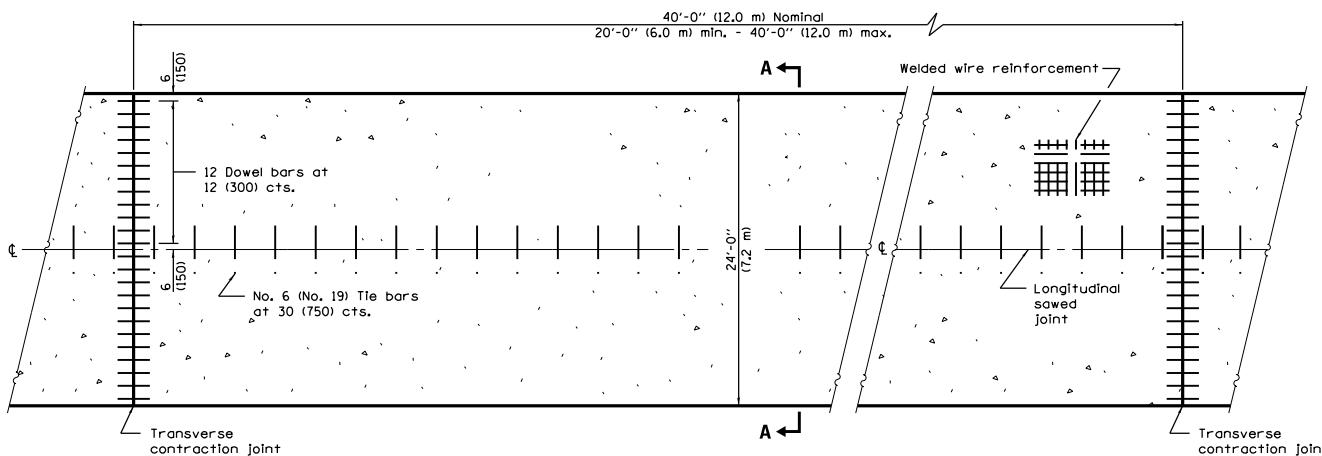
	Illinois Department of Transportation
PASSED	April 1, 2016
	Michael Brand
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	April 1, 2016
	Michael Brand
ENGINEER OF DESIGN AND ENVIRONMENT	
	14051-1-1-17



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



TRANSVERSE CONSTRUCTION JOINT



PLAN

GENERAL NOTES

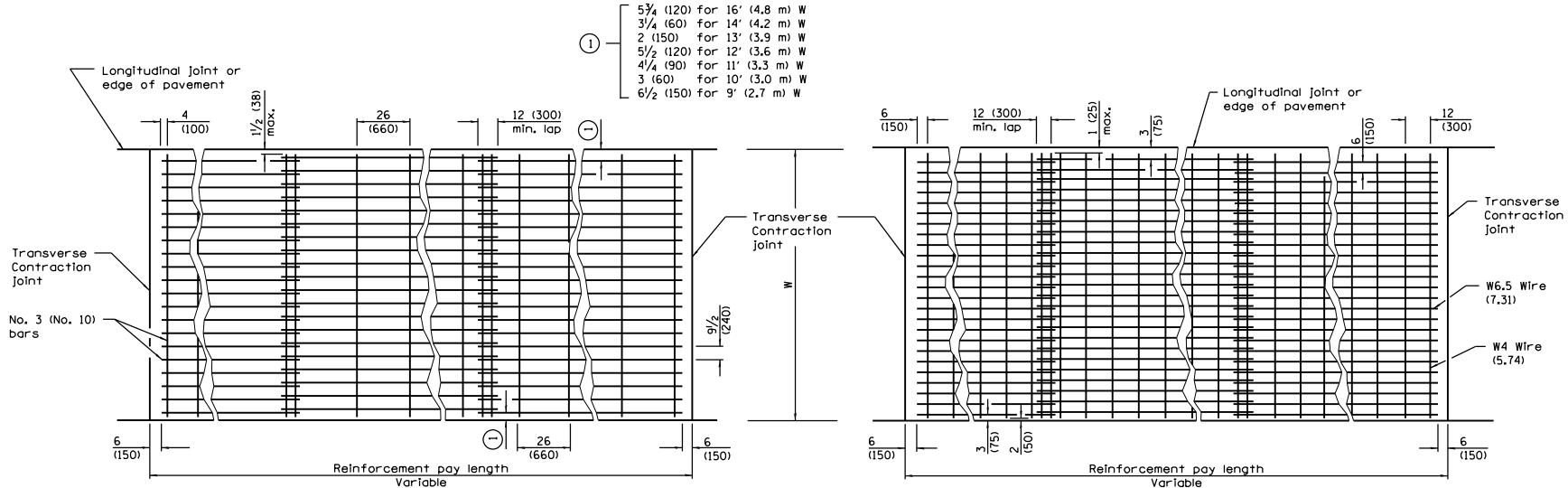
See Standard 420001 for details not shown.

See Standard 420701 for welded wire reinforcement details.

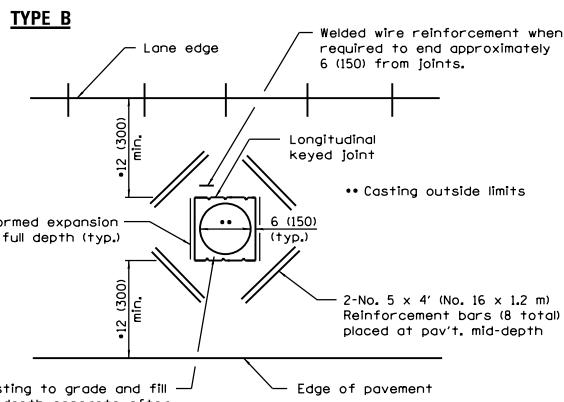
All dimensions are in inches (millimeters) unless otherwise shown.

	Illinois Department of Transportation
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Michael Brand	ENGINEER OF POLICY AND PROCEDURES
APPROVED	April 1, 2016
	ENGINEER OF DESIGN AND ENVIRONMENT
	1450-1-197

DATE	REVISIONS	24' (7.2 m) PCC PAVEMENT STANDARD 420601-06
4-1-16	Changed terminology to 'welded wire reinforcement'.	
1-1-08	Switched units to English (metric).	



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



DETAIL OF ADDED REINFORCEMENT FOR PAVEMENT BLOCKS-OUTS

	Illinois Department of Transportation
PASSED	April 1, 2016
Michael Beard	ENGINEER OF POLICY AND PROCEDURES
APPROVED	April 1, 2016
	ENGINEER OF DESIGN AND ENVIRONMENT
	ISSUED 1-1-97

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).

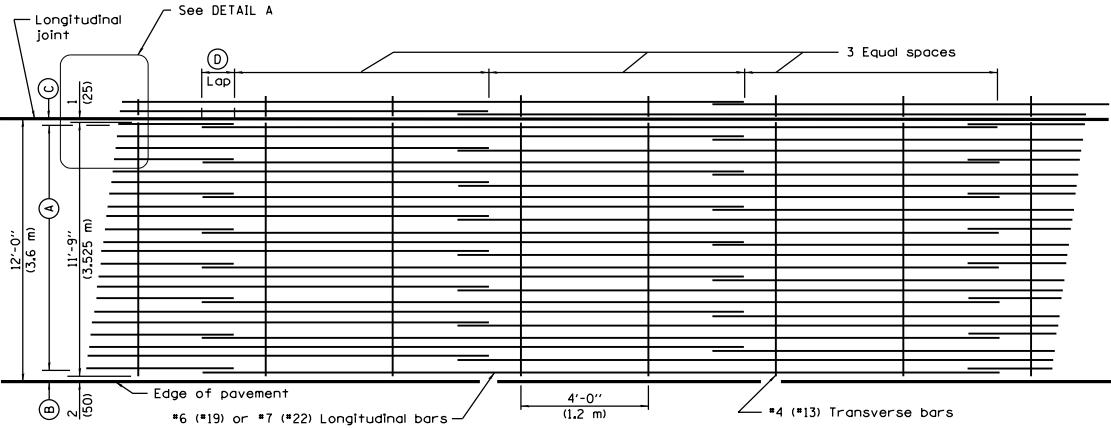
Welded wire reinforcement may be positioned with the transverse wires on top or bottom of the longitudinal wires.

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

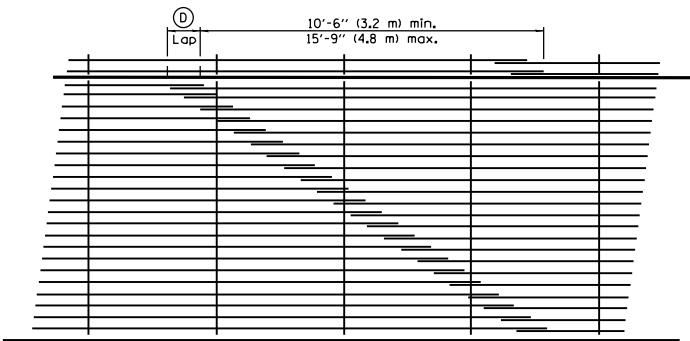
DATE	REVISIONS
4-1-16	Changed terminology to 'welded wire reinforcement'.
	Renamed standard.
1-1-08	Switched units to English (metric).

**PAVEMENT WELDED
WIRE REINFORCEMENT**

STANDARD 420701-03

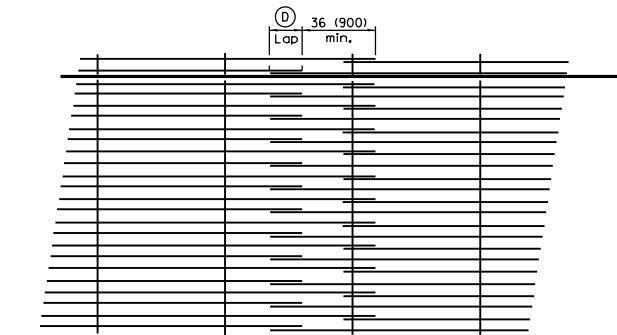


LAP DETAIL I



DETAIL A

LAP DETAIL II



LAP DETAIL III

	Illinois Department of Transportation
PASSED	April 1, 2016
Michael Brand	ISSUED
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	April 1, 2016
John R. [Signature]	1-1-16
ENGINEER OF DESIGN AND ENVIRONMENT	

ENGLISH (Inches)					
Bar Size	Pavement Thickness	(A) (Approx. Spacing)	(B)	(C)	(D)
*6	7 3/4 thru 8 1/2	18 spaces (19 bars) @ 7 5/8	3 1/2	3	22
*6	8 3/4 thru 9 1/2	20 spaces (21 bars) @ 6 7/8	3 1/2	3	22
*6	9 3/4 thru 10 1/2	22 spaces (23 bars) @ 6 1/4	3 1/2	3	22
*6	10 3/4 thru 11 1/2	24 spaces (25 bars) @ 5 3/4	3 1/2	3	22
*6	11 3/4 thru 12 1/2	27 spaces (28 bars) @ 5 1/8	3 1/2	3	22
*7	9 3/4 thru 10 1/2	16 spaces (17 bars) @ 8 5/8	3 1/2	3	26
*7	10 3/4 thru 11 1/2	18 spaces (19 bars) @ 7 1/2	3 1/2	3	26
*7	11 3/4 thru 12 1/2	19 spaces (20 bars) @ 7 1/4	3 1/2	3	26
*7	12 3/4 thru 13 1/2	21 spaces (22 bars) @ 6 1/2	3 1/2	3	26
*7	13 3/4 thru 14 1/2	23 spaces (24 bars) @ 6	3 1/2	3	26
*7	14 3/4 thru 15 1/2	24 spaces (25 bars) @ 5 3/4	3 1/2	3	26
*7	15 3/4 thru 16 1/2	26 spaces (27 bars) @ 5 1/4	3 1/2	3	26

METRIC (mm)					
Bar Size	Pavement Thickness	(A) (Approx. Spacing)	(B)	(C)	(D)
*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.

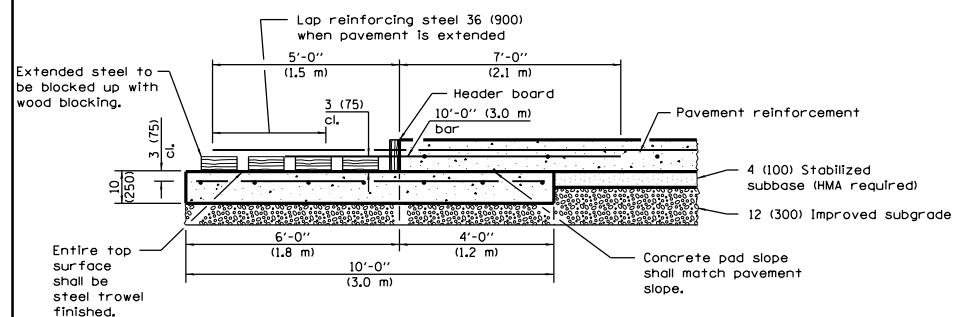
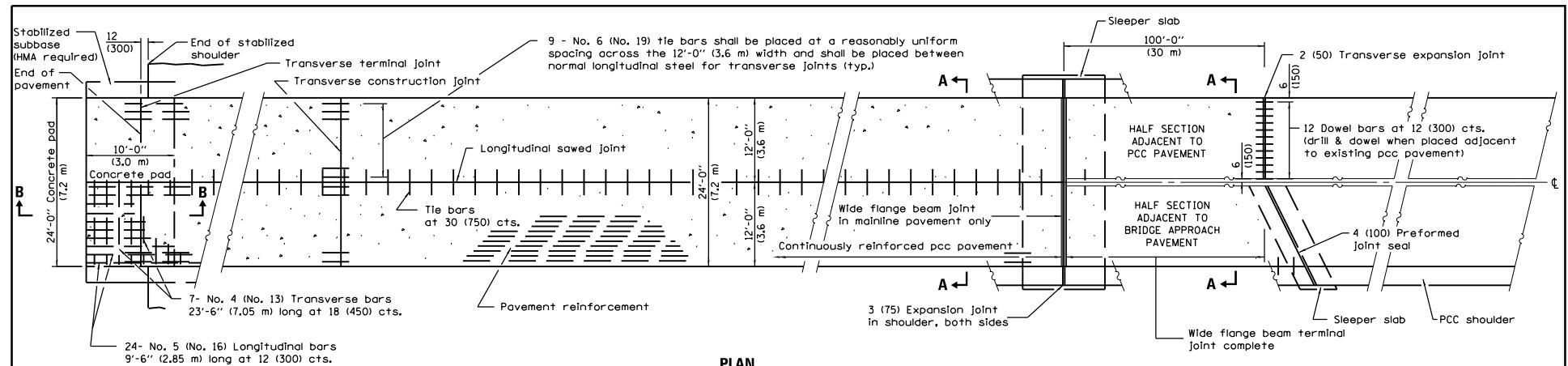
The (B) dimension and the distance from the end of the transverse bar to the edge of pavement may be increased by 1 (25) for slip form paving.

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.

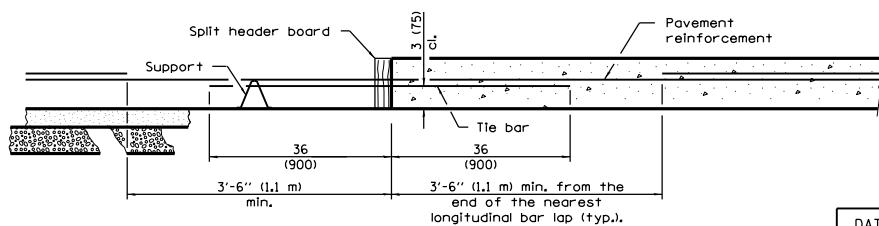
DATE	REVISIONS	BAR REINFORCEMENT FOR CRC PAVEMENT
4-1-16	Revised general notes	
	with respect to 30'	
	bar length.	
1-1-08	Switched units to	
	English (metric).	

STANDARD 421001-03

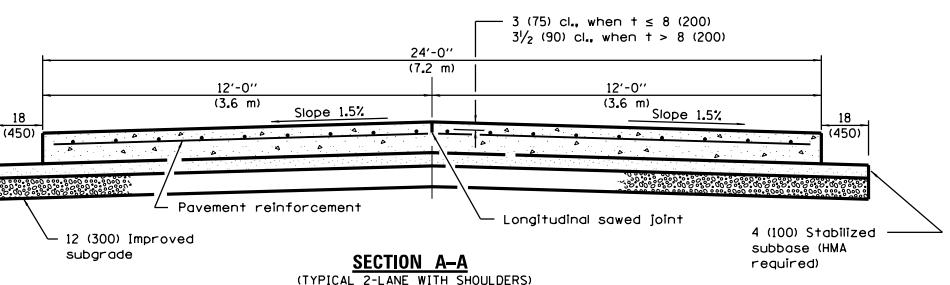


TRANSVERSE TERMINAL JOINT

SECTION B-B



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.

24' (7.2 m)

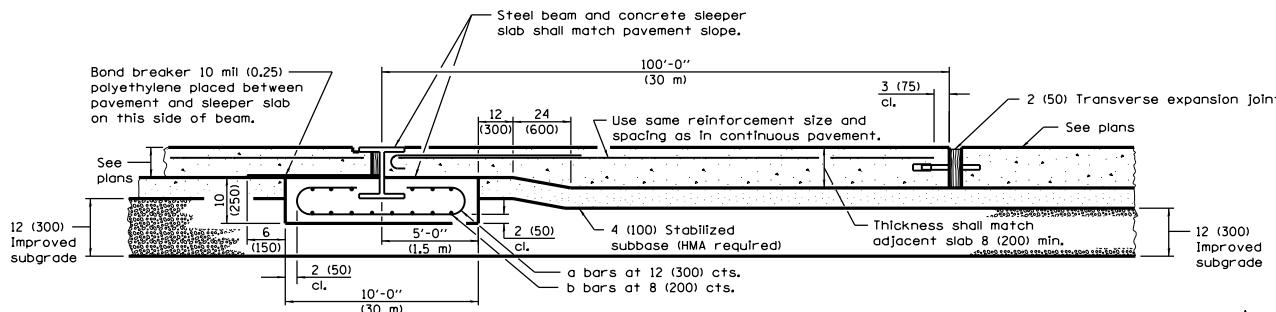
CRC PAVEMENT

(WITH WIDE FLANGE BEAM TERMINAL JOINT)
(Sheet 1 of 2)

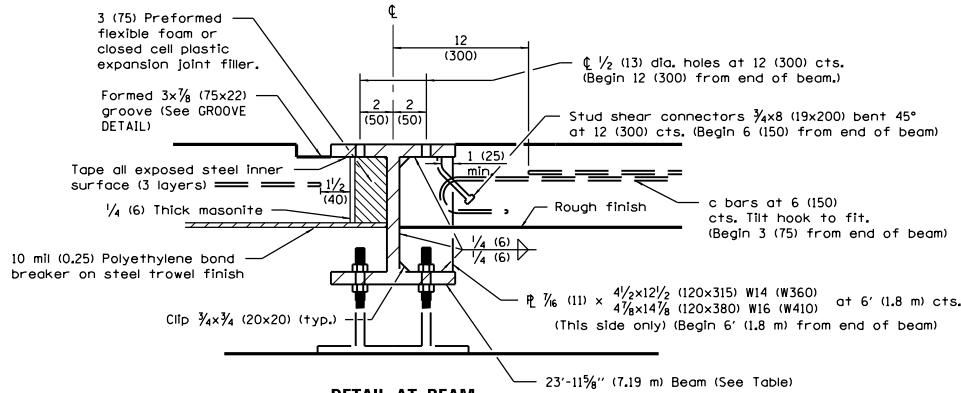
STANDARD 421101-09

	Illinois Department of Transportation
PASSED	January 1, 2014
	Michael Brand
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2014
	Michael Brand
ENGINEER OF DESIGN AND ENVIRONMENT	

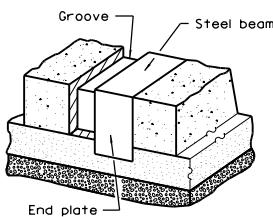
DATE	REVISIONS
1-1-14	Added exp. jnts. in shds. & omitted bars, cstn. jnt. over wide flange beam spjr slab.
1-1-11	Corrected weld symbol on OPTIONAL ADJUSTABLE CHAIR detail.



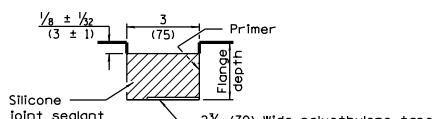
WIDE FLANGE BEAM TERMINAL JOINT



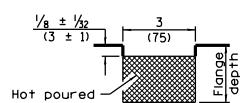
DETAIL AT BEAM



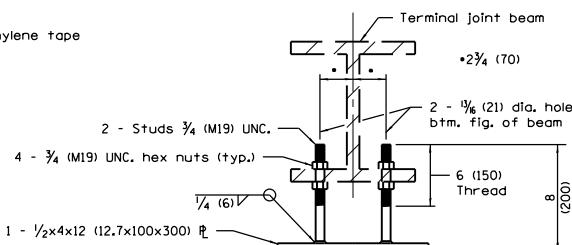
VIEW OF GROOVE AT EDGE OF PAVEMENT



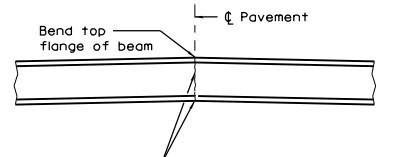
GROOVE DETAIL



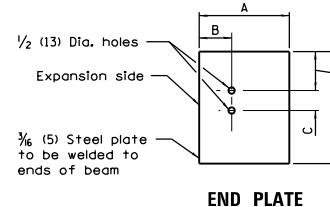
GROOVE DETAIL (OPTIONAL)



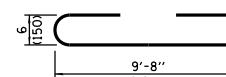
OPTIONAL ADJUSTABLE CHAIR



DETAIL OF CUTTING AND WELDING BEAM



END PLATE



BAR a



BAR c

PAVEMENT THICKNESS	<10 (250)	≥ 10 (250)
BEAM SIZE	W14x82 (W360x122)	W16x100 (W410x149)
A	10 1/8 (255)	10 1/8 (265)
B	4 1/8 (110)	4 1/8 (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)	7.4 (5.4)
Reinforcement bars, lbs. (kg)	348 (160)
Pavement reinforcement, sq. yds. (m²)	13.3 (10.8)

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)	U
b 29	No. 5 (No. 16)	23'-8" (7.1 m)	U
c 48	No. 6 (No. 19)	8'-6" (2.6 m)	U

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*)

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

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)

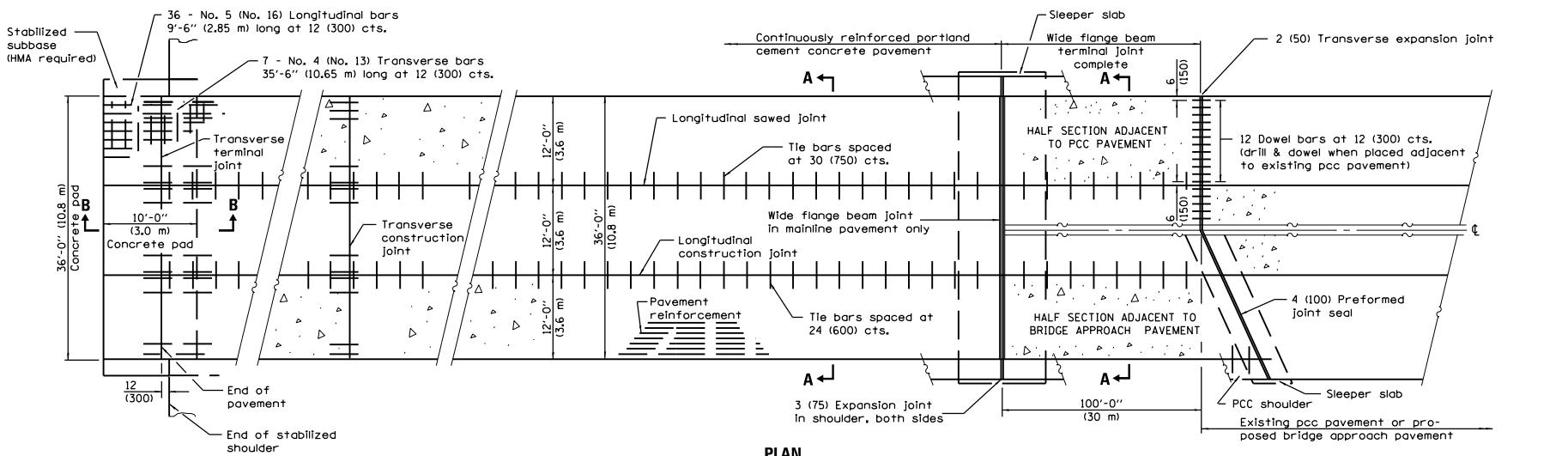
24' (7.2 m)

CRC PAVEMENT

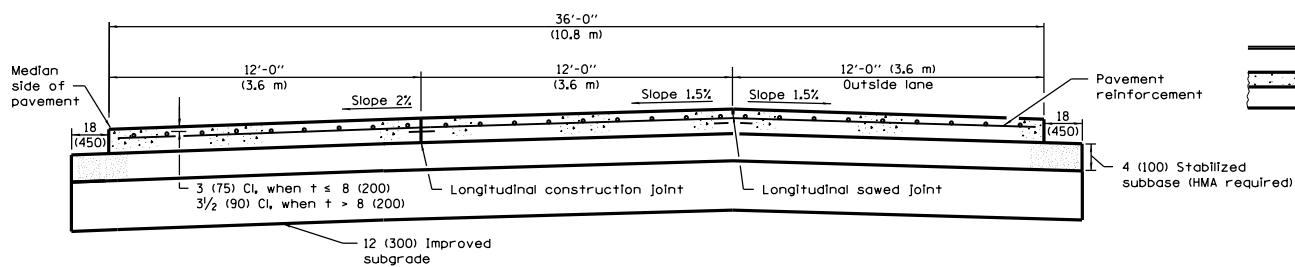
(WITH WIDE FLANGE BEAM TERMINAL JOINT)
(Sheet 2 of 2)

STANDARD 421101-09

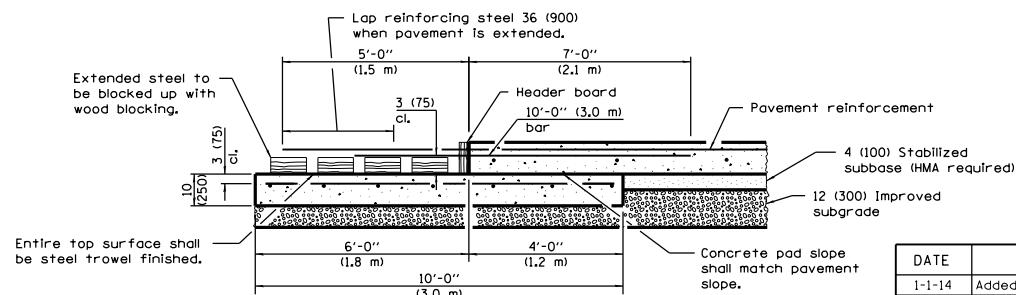
	Illinois Department of Transportation
PASSED	January 1, 2014
Michael Brand	Engineer of Policy and Procedures
APPROVED	January 1, 2014
	Engineer of Design and Environment
1-1-14	1-1-14



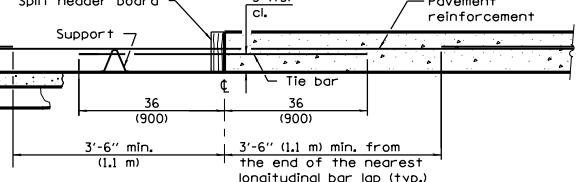
PLAN



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



TRANSVERSE TERMINAL JOINT
SECTION B-B



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.

36' (10.8 m)

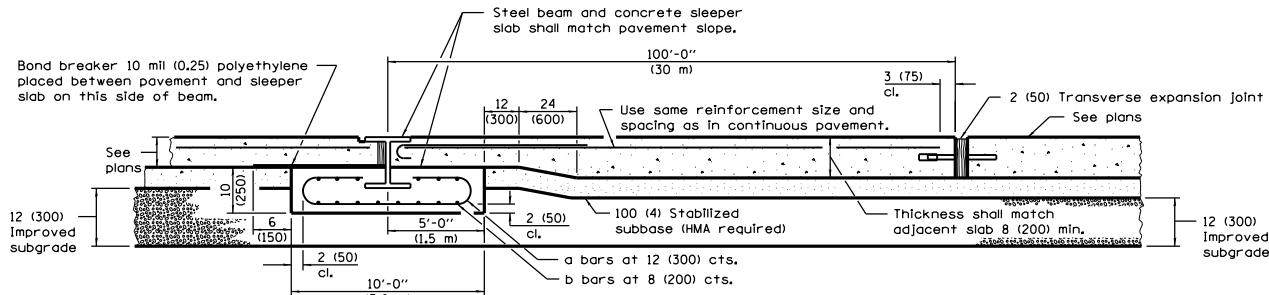
CRC PAVEMENT

(WITH WIDE FLANGE BEAM TERMINAL JOINT)
(Sheet 1 of 2)

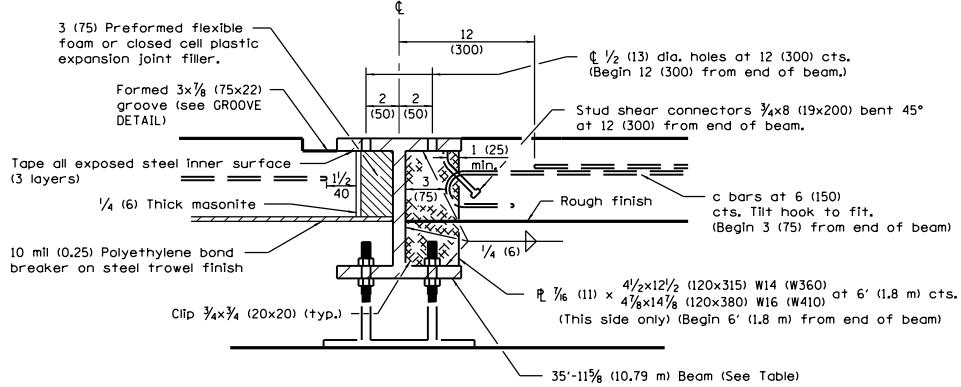
STANDARD 421106-09

Illinois Department of Transportation
PASSED January 1, 2014
Michael Brand
ENGINEER OF POLICY AND PROCEDURES
APPROVED January 1, 2014
John R. [Signature]
ENGINEER OF DESIGN AND ENVIRONMENT

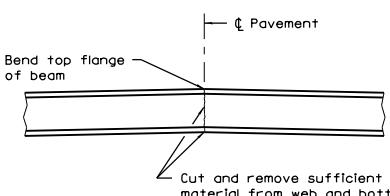
DATE	REVISIONS
1-1-14	Added exp. jnts. in shds. & omitted bars, cnst. jnt. over wide flange beam sbr. slab.
1-1-11	Corrected weld symbol on OPTIONAL ADJUSTABLE CHAIR detail.



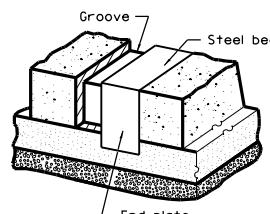
WIDE FLANGE BEAM TERMINAL JOINT



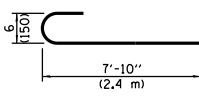
DETAIL AT BEAM



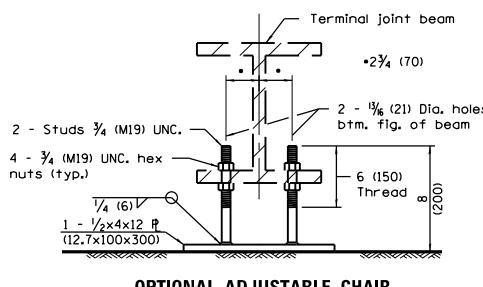
DETAIL OF CUTTING AND WELDING BEAM



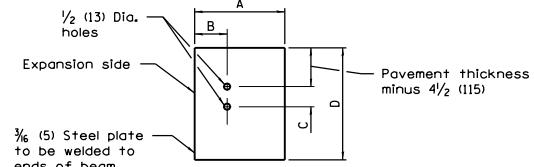
VIEW OF GROOVE AT EDGE OF PAVEMENT



BAR C



OPTIONAL ADJUSTABLE CHAIR



END PLATE

PAVEMENT THICKNESS	< 10 (250)	≥ 10 (250)
BEAM SIZE	W14X82 (W360X122) A 10 1/8 (255) B 4 1/8 (110) C 3 (75) D 14 1/4 (360)	w16x100 (W360X149) 10 1/8 (265) 4 1/8 (115) 4 (100) 17 (430)
A	10 1/8 (255)	10 1/8 (265)
B	4 1/8 (110)	4 1/8 (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) W16 (W410) 3710 (1655)

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

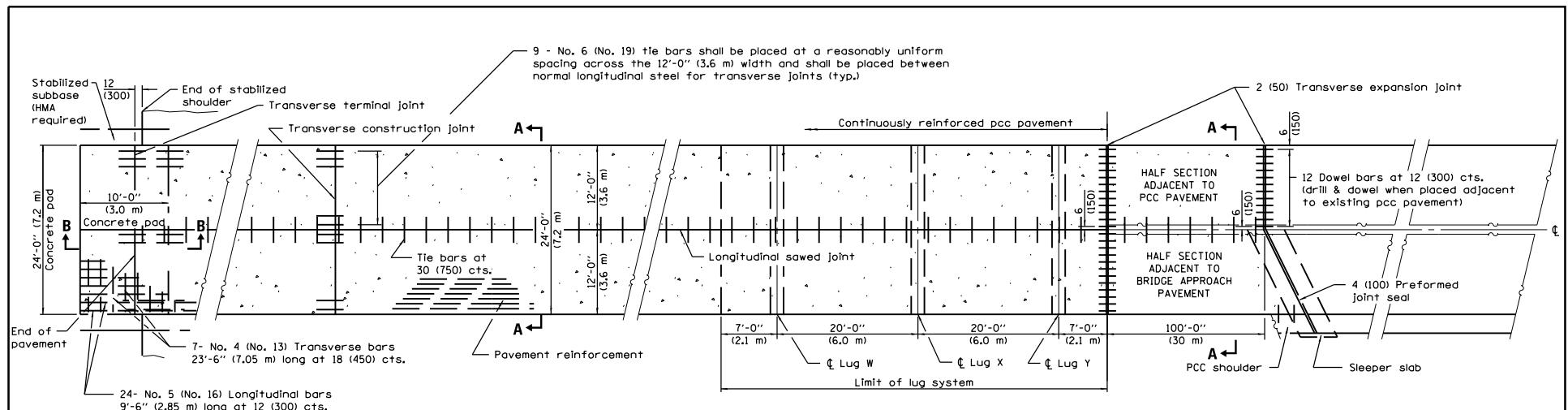
Pavement, sq. yds. (m²)	400 (324)
Pavement Reinforcement, sq. yds. (m²)	400 (324)
4 (100) Stabilized Subbase, sq. yds. (m²)	411.6 (333.5)
Improved Subgrade, sq. yds. (m²)	433.3 (351)

36' (10.8 m)

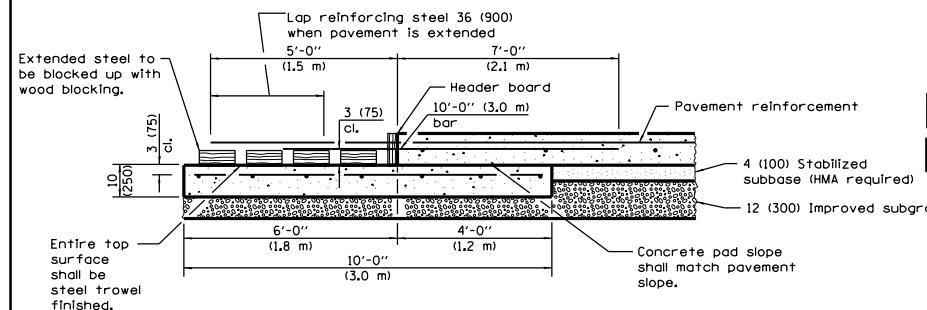
CRC PAVEMENT

(WITH WIDE FLANGE BEAM TERMINAL JOINT)
(Sheet 2 of 2)

STANDARD 421106-09

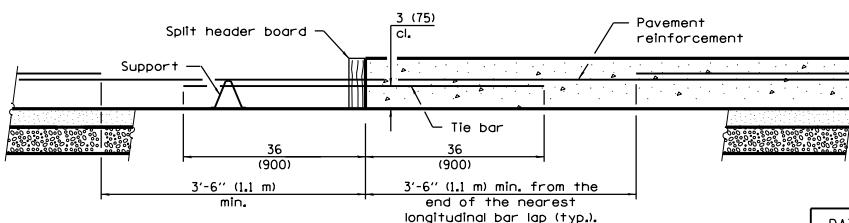


PLAN



TRANSVERSE TERMINAL JOINT

SECTION B-B



TRANSVERSE CONSTRUCTION JOINT

	Illinois Department of Transportation
PASSED	January 1, 2008
Sgt. S. S. S.	
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2008
E. S. T.	
ENGINEER OF DESIGN AND ENVIRONMENT	

1-1-08

1-1-07

GENERAL NOTES
See Standard 421001 for details of pavement reinforcement.

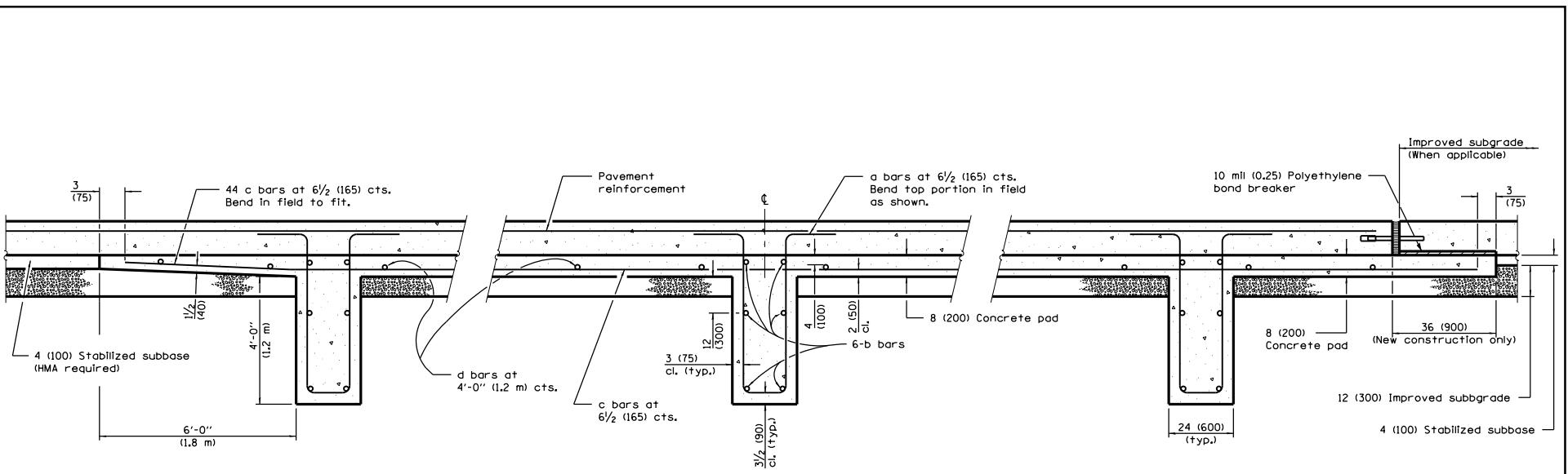
See Standards 420001 and 420401 for joint details not shown.

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

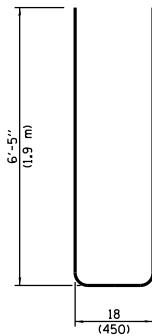
DATE	REVISIONS	CRC PAVEMENT (WITH LUG SYSTEM) (Sheet 1 of 2)
1-1-08	Switched units to English (metric). Revised	
	Lug. Sys. Table.	
1-1-07	Switched to Hot-Mix Asphalt (HMA)	
	terminology.	

24' (7.2 m)

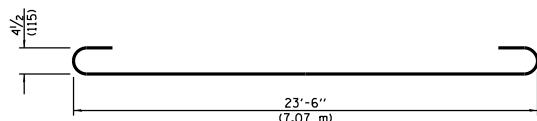
STANDARD 421201-06



SECTION AT LUG W



BAR a



BAR b

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

Bar	Oty.	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)	U
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. (m³)
Reinforcing Bars, lbs. (kg)
Concrete Pad, sq. yds. (m²)
Improved Subgrade, sq. yds. (m²)

64.0 (48.9)
8372 (3800)
144 (120)
162 (135)

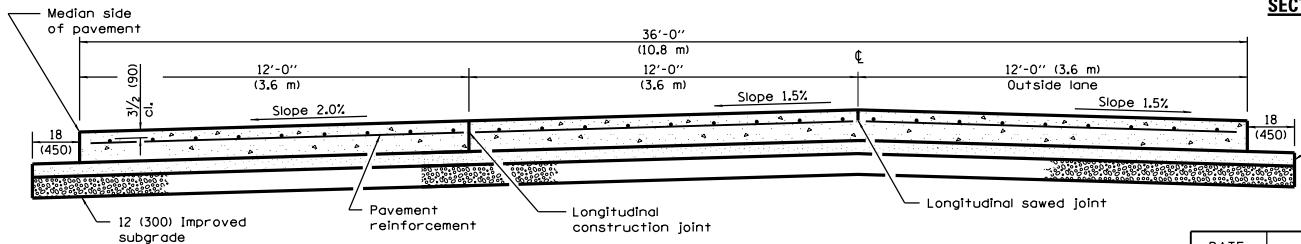
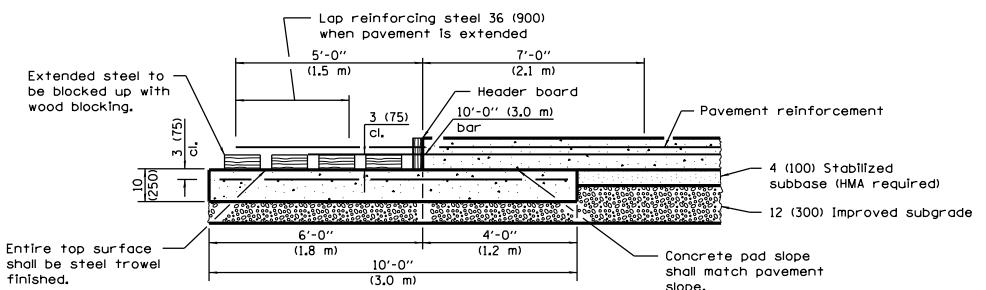
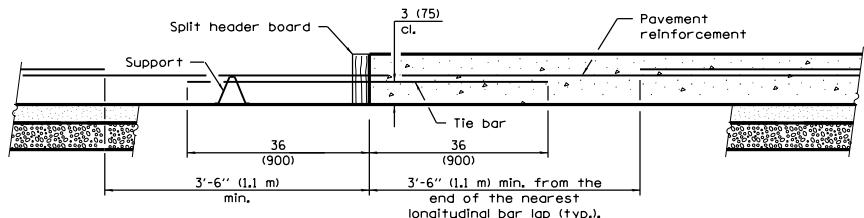
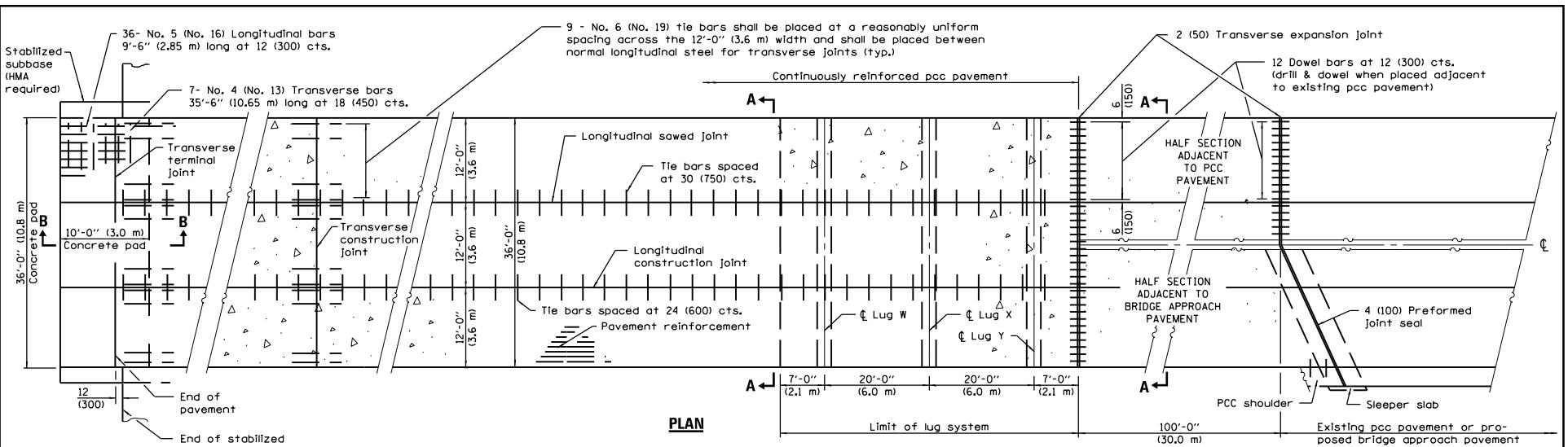
24' (7.2 m)
CRC PAVEMENT
(WITH LUG SYSTEM)

(Sheet 2 of 2)

STANDARD 421201-06

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

1-57



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

1-57

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

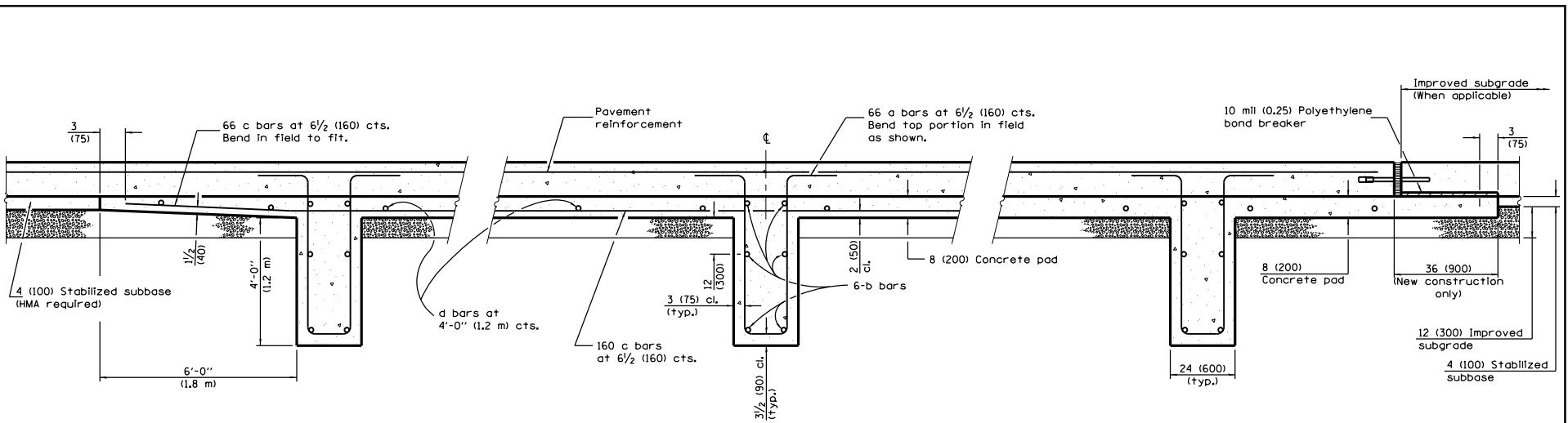
GENERAL NOTES
See Standard 421001 for details of pavement reinforcement.

See Standards 420001 and 420401 for joint details not shown.

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

DATE	REVISIONS	36' (10.8 m) CRC PAVEMENT (WITH LUG SYSTEM) <small>(Sheet 1 of 2)</small>
1-1-08	Switched units to English (metric). Revised Lug Sys. Table.	
I-1-07	Switched to Hot-Mix Asphalt (HMA) terminology.	

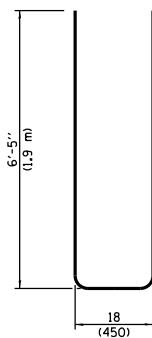
STANDARD 421206-06



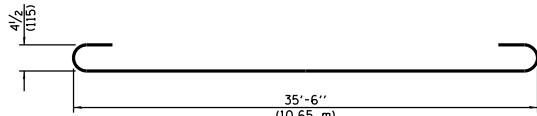
SECTION AT LUG W

SECTION AT LUG X

SECTION AT LUG Y



BAR a



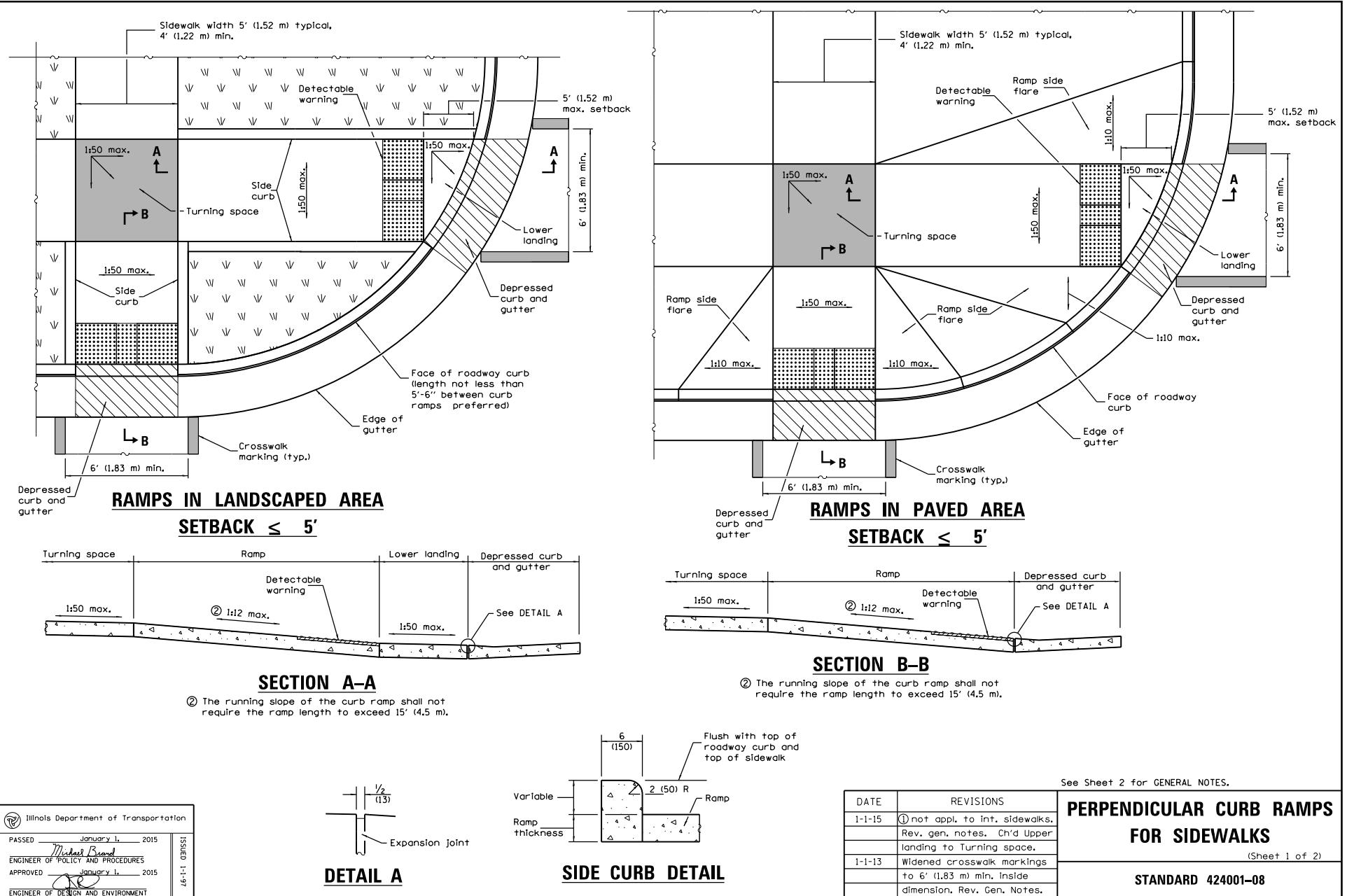
BAR b

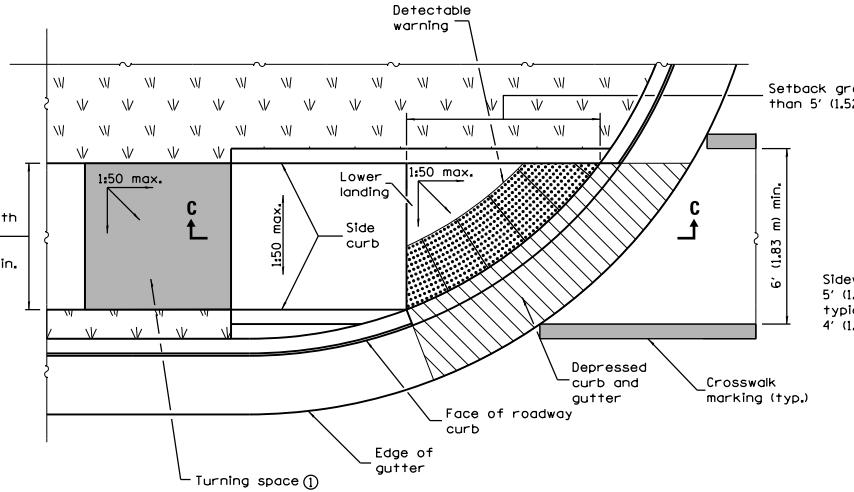
MATERIALS REQUIRED FOR (1) ONE LUG SYSTEM (Excluding Pavement Concrete and Pavement Reinforcement)				
Bar	No.	Size	Length	Shape
a	198	No. 8 (No. 25)	14'-0" (4.25 m)	—
b	18	No. 5 (No. 16)	36'-9" (11.30 m)	U
c	198	No. 5 (No. 16)	20'-0" (6.10 m)	U
d	42	No. 4 (No. 13)	11'-9" (3.52 m)	—

Concrete, cu. yds. (m³) 96.0 (73.4)
Reinforcing Bars, lbs. (kg) 12,550 (5695)
Concrete Pad, sq. yds. (m²) 216 (181)
Improved Subgrade, sq. yds. (m²) 208 (174)

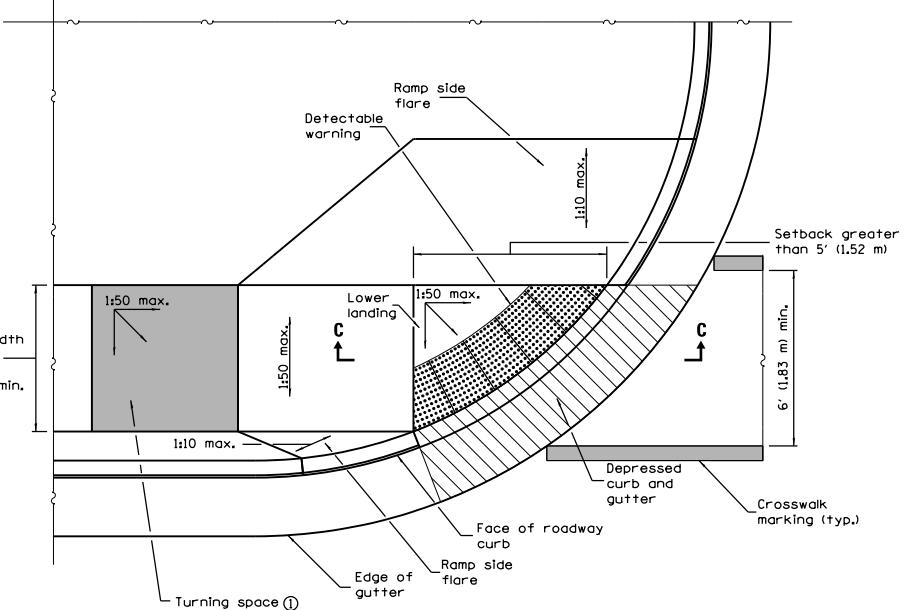
	Illinois Department of Transportation
PASSED	January 1, 2008
<i>[Signature]</i>	
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2008
<i>[Signature]</i>	
ENGINEER OF DESIGN AND ENVIRONMENT	
1-1-97	

36' (10.8 m) CRC PAVEMENT (WITH LUG SYSTEM)	
(Sheet 2 of 2)	
STANDARD 421206-06	

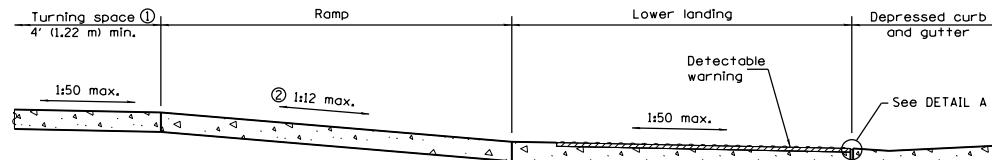




RAMP IN LANDSCAPED AREA
SETBACK > 5'



RAMP IN PAVED AREA
SETBACK > 5'



SECTION C-C

- ① Turning space not required for ramp slopes flatter than 1:20.
- ② The running slope of the curb ramp shall not require the ramp length to exceed 15' (4.5 m).

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.

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

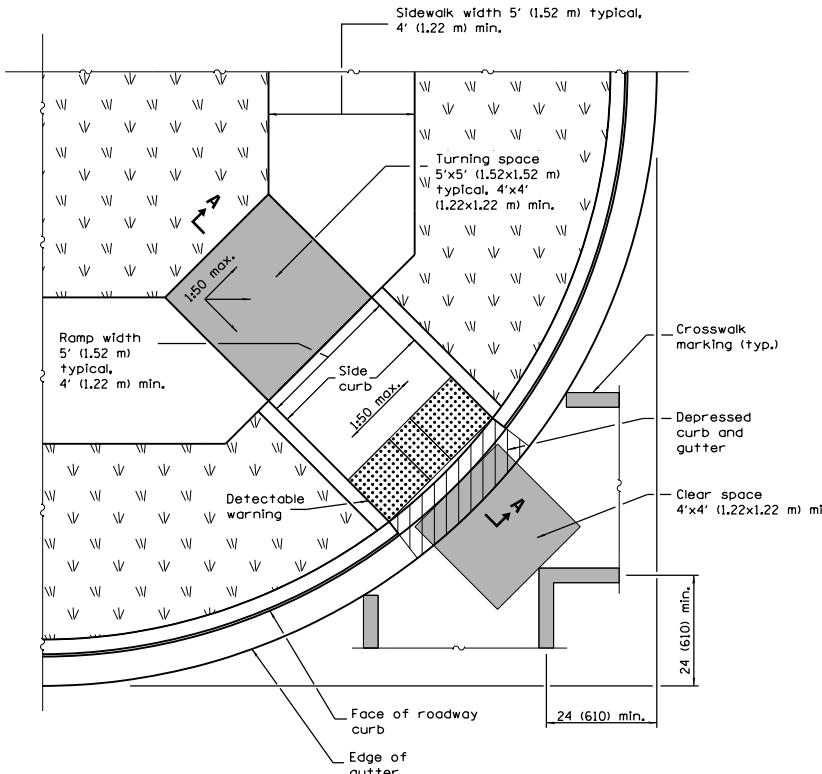
All dimensions are in inches (millimeters) unless otherwise shown.

PERPENDICULAR CURB RAMPS FOR SIDEWALKS

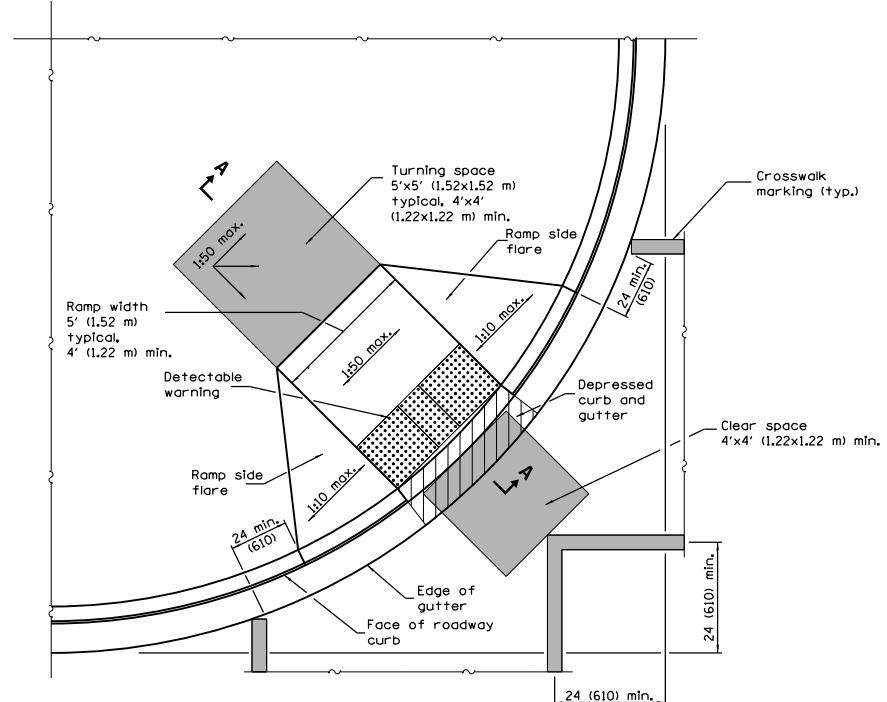
(Sheet 2 of 2)

STANDARD 424001-08

	Illinois Department of Transportation
PASSED	January 1, 2015
Michael Brand	ISSUED
ENGINEER OF POLICY AND PROCEDURES	1-1-197
APPROVED	JANUARY 1, 2015
John R. [Signature]	ENGINEER OF DESIGN AND ENVIRONMENT



RAMP IN LANDSCAPED AREA



GENERAL NOTES

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

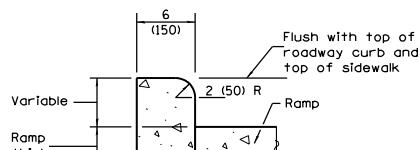
Where the turning space is constrained on a side opposite a ramp, the minimum length of the turning space in the direction of the ramp-run shall be 5' (1.52 m).

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

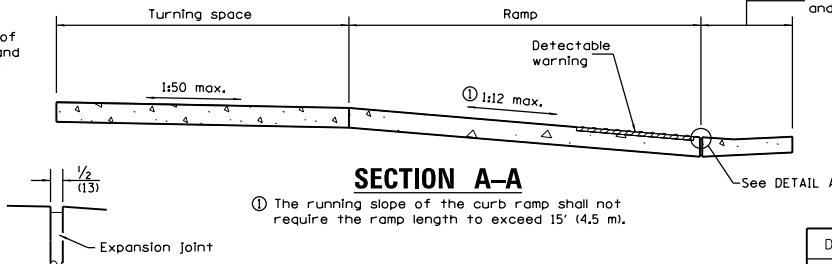
All slope ratios are expressed as units of vertical displacement to units of horizontal displacement ($V:H$).

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

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



SIDE CURB DETAIL



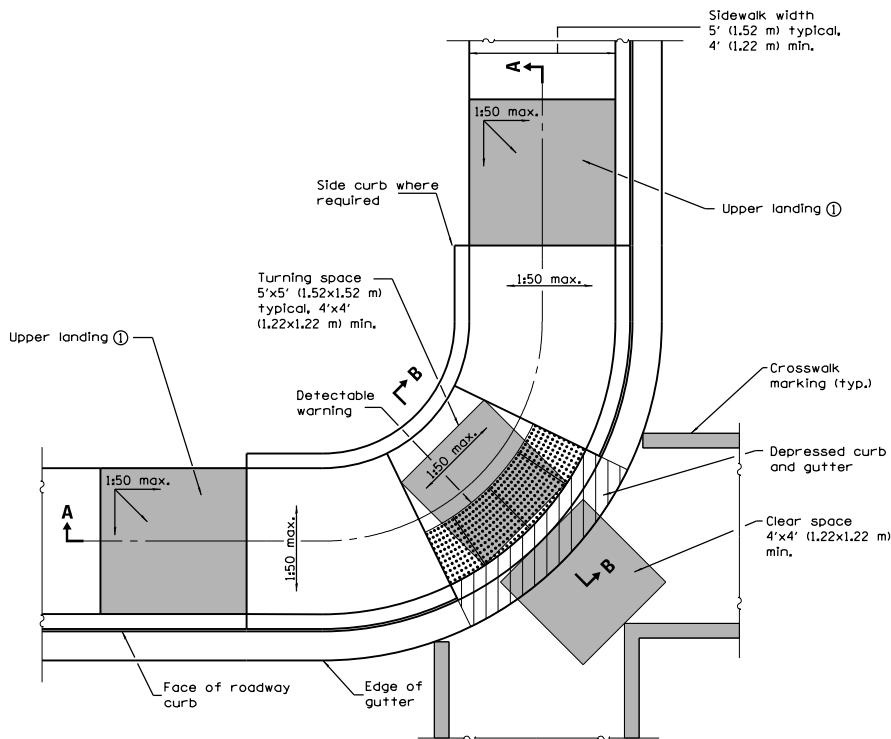
DETAIL A

① The running slope of the curb ramp shall not require the ramp length to exceed 15' (4.5 m).

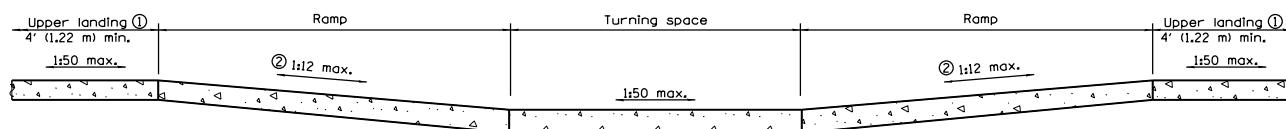
Illinois Department of Transportation
PASSED January 1, 2015
Michael Brand
ENGINEER OF POLICY AND PROCEDURES
APPROVED January 1, 2015
John Doe
ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS	DIAGONAL CURB RAMPS FOR SIDEWALKS
1-1-15	Changed 'Upper landing' to 'Turning space'. Added note reg. const. turning space.	
1-1-13	Revised General Notes.	

STANDARD 424006-02

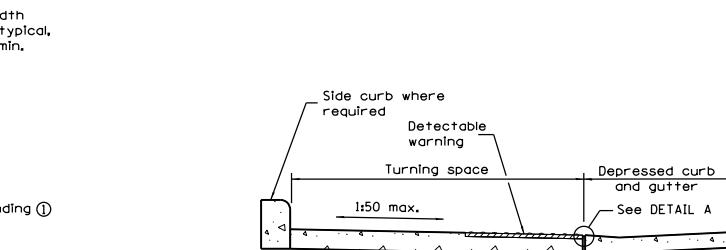


CORNER PARALLEL CURB RAMP

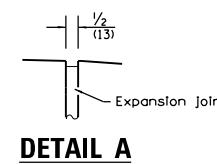


SECTION A-A

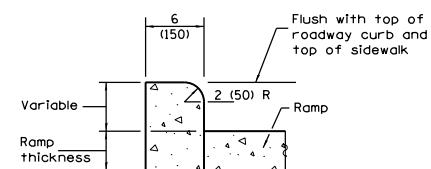
- ① Upper landing(s) not required for ramp slopes flatter than 1:20.
- ② The running slope of the curb ramp shall not require the ramp length to exceed 15' (4.5 m).



SECTION B-B



DETAIL A



SIDE CURB DETAIL

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.

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

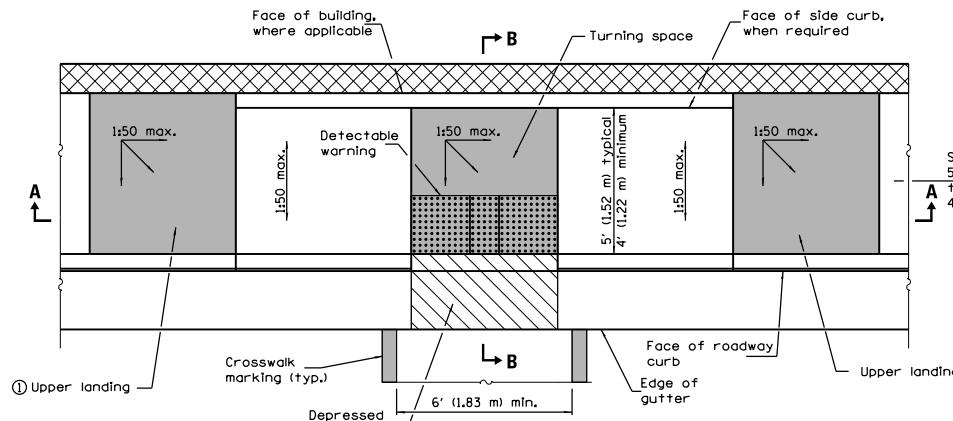
All dimensions are in inches (millimeters) unless otherwise shown.

	Illinois Department of Transportation
PASSED	January 1, 2015
	Michael Brand
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	JANUARY 1, 2015
	Michael Brand
ENGINEER OF DESIGN AND ENVIRONMENT	
	1-1-12

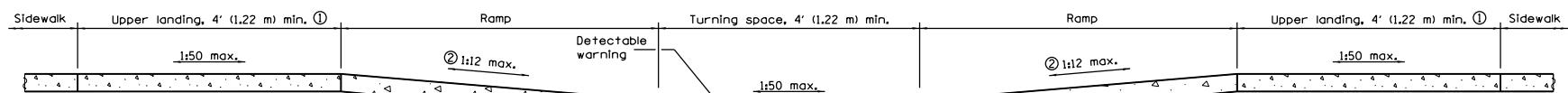
DATE	REVISIONS
1-1-15	Changed 'Lower landing' to 'Turning space'. Added x-walk markings. Added note ②.
1-1-13	Revised General Notes.

CORNER PARALLEL CURB RAMPS FOR SIDEWALKS

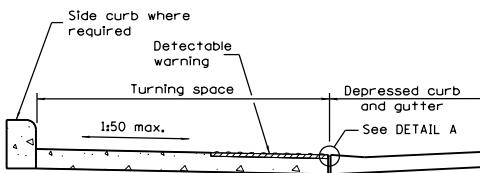
STANDARD 424011-02



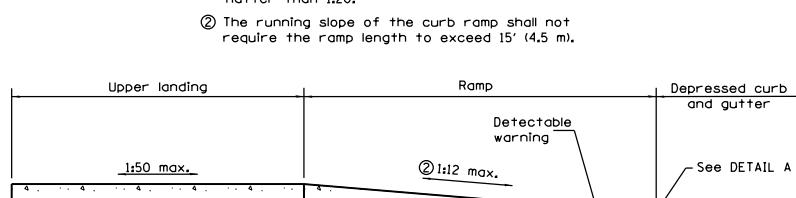
PARALLEL MID-BLOCK CURB RAMP



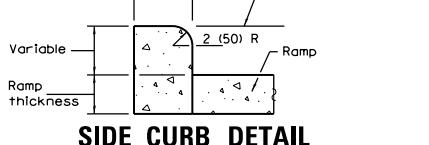
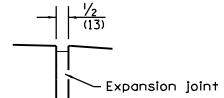
PERPENDICULAR MID-BLOCK CURB RAMP



SECTION B-B



SECTION C-C



DETAIL A

Illinois Department of Transportation
PASSED January 1, 2015
Michael Brand
ENGINEER OF POLICY AND PROCEDURES
APPROVED January 1, 2015
John Doe
ENGINEER OF DESIGN AND ENVIRONMENT

1-1-12

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

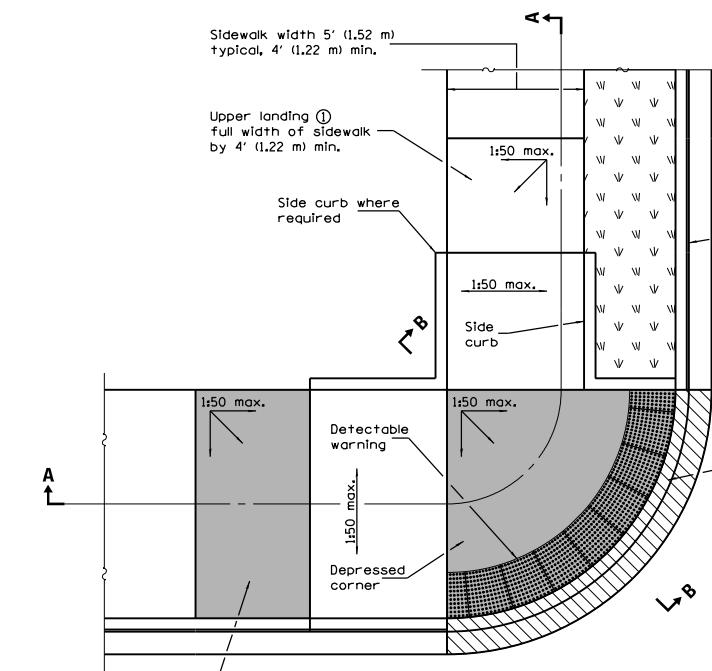
Where the turning space is constrained on a side opposite a ramp, the minimum length of the turning space in the direction of the ramp-run shall be 5' (1.52 m).

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

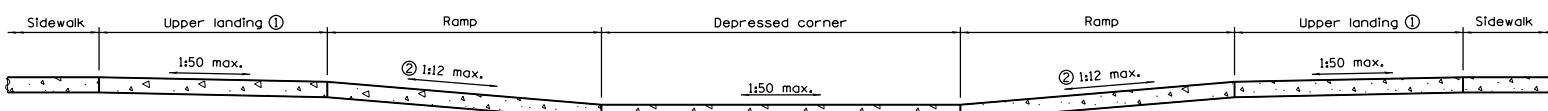
See Standard 606001 for details of depressed curb adjacent to curb ramp.

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

DATE	REVISIONS	MID-BLOCK CURB RAMPS FOR SIDEWALKS STANDARD 424016-02
1-1-15	Changed 'Lower landing' to 'Turning space'. Added note ②. Rev. Gen. Notes.	
1-1-13	Widened crosswalk markings to 6' (1.83 m) min. inside dimension. Rev. Gen. Notes.	

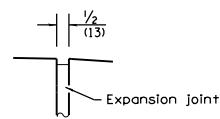


DEPRESSED CORNER

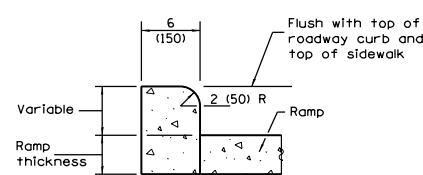


SECTION A-A

- ① Upper landing(s) not required for ramp slopes flatter than 1:20.
 - ② The running slope of the curb ramp shall not require the ramp length to exceed 15' (4.5 m).



DETAIL A

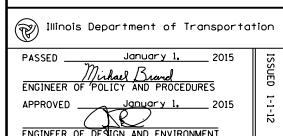


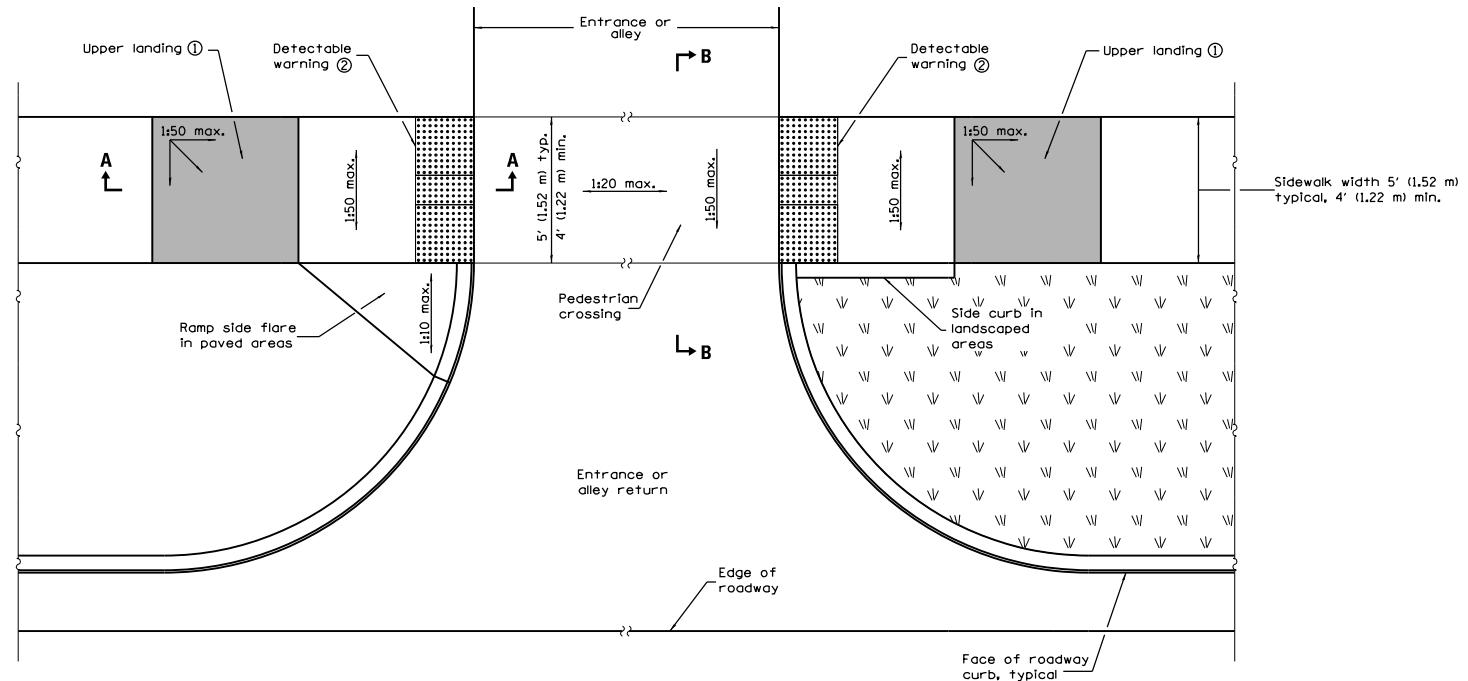
SIDE CURB DETAIL

DATE	REVISIONS
1-1-15	Added note ②.
1-1-14	Revised sidewalk width.
	Revised gen. notes to limit
	curb radii to 6' (1.83 m) min.

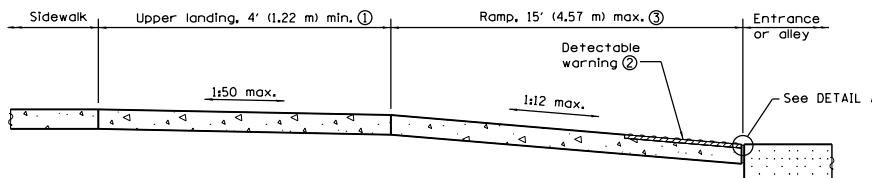
DEPRESSED CORNER FOR SIDEWALKS

STANDARD 424021-03



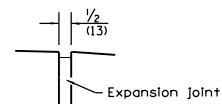


ENTRANCE / ALLEY PEDESTRIAN CROSSING

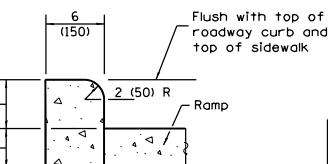


SECTION A-A

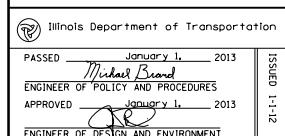
① Upper landing not required for ramp slopes flatter than 1:20.



DETAIL A



SIDE CURB DETAIL



GENERAL NOTES

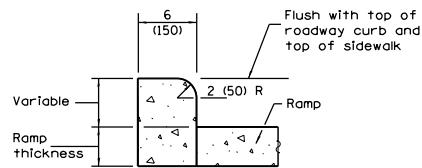
All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

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

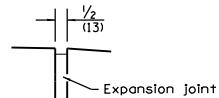
All dimensions are in inches (millimeters) unless otherwise shown.

ENTRANCE / ALLEY PEDESTRIAN CROSSINGS

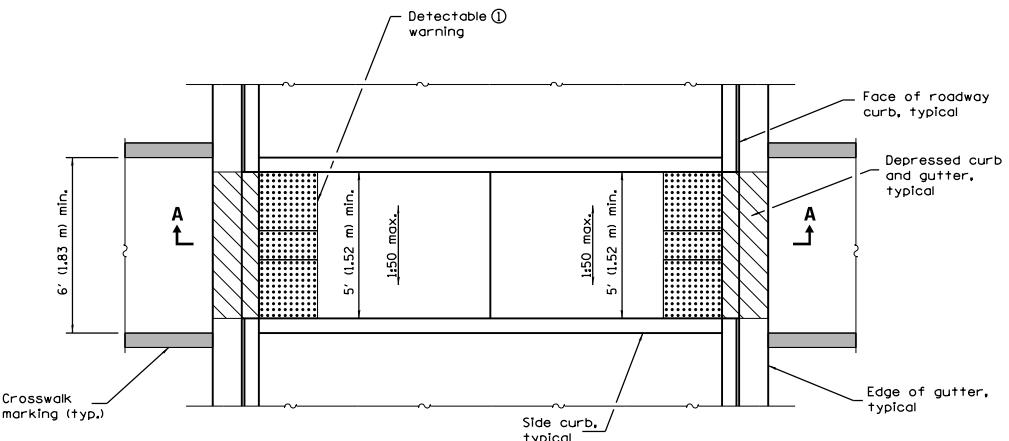
STANDARD 424026-01



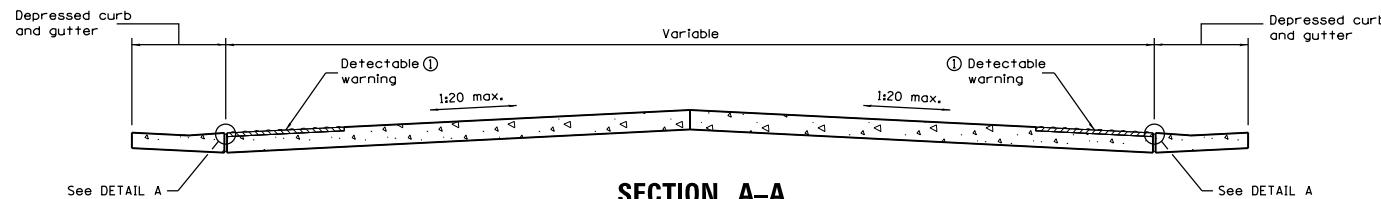
SIDE CURB DETAIL



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.

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

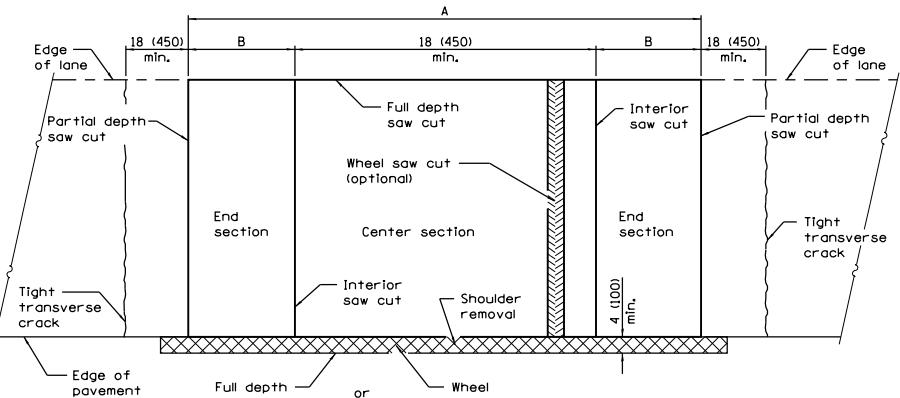
All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-12	Widened crosswalk to 6' (1.83 m) min. inside dimension.
	Revised General Notes.
1-1-12	New standard.

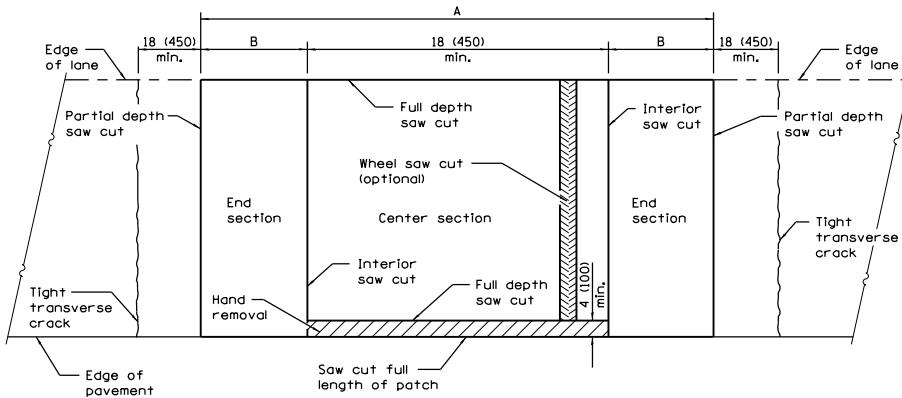
MEDIAN PEDESTRIAN CROSSINGS

STANDARD 424031-01

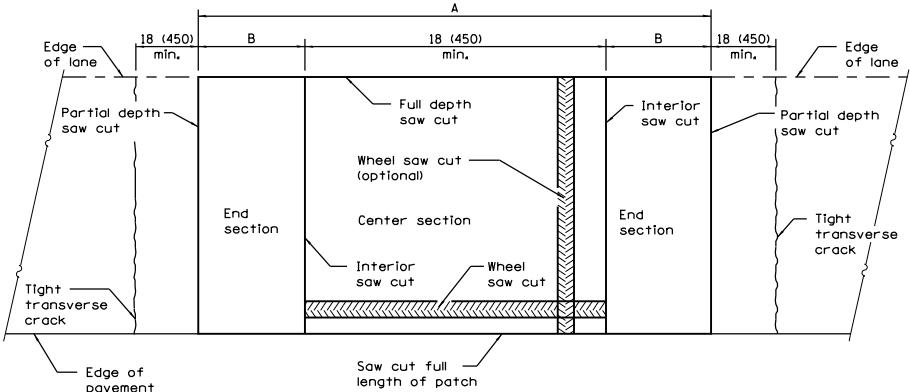
	Illinois Department of Transportation
PASSED	January 1, 2013
	Michael Brand
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2013
	John P. Kuehne
ENGINEER OF DESIGN AND ENVIRONMENT	
	ISGSD 1-1-12



PAVEMENT SAWING DETAIL
(HMA SHOULDER)



PAVEMENT SAWING DETAIL
(PCC SHOULDER)



ALTERNATE SAWING DETAIL
(PCC SHOULDER)

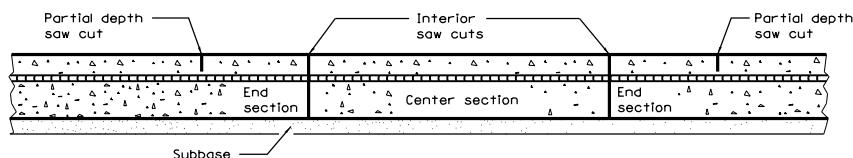
EXISTING REINFORCEMENT BARS	A (min.)	B (min.)	C (min.)
No. 5 (No. 16)	4'-6" (1.4 m)	18 (450)	16 (400)
No. 6 (No. 19)	5'-0" (1.5 m)	21 (525)	19 (475)
No. 7 (No. 22)	5'-6" (1.7 m)	24 (600)	22 (550)
Fabric	5'-0" (1.5 m)	21 (525)	18 (450)

GENERAL NOTES

When patching two adjacent lanes in one operation, the longitudinal joint shall be a longitudinal sawed joint as detailed on Standard 42001; however, the groove may be either preformed or sawed.

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

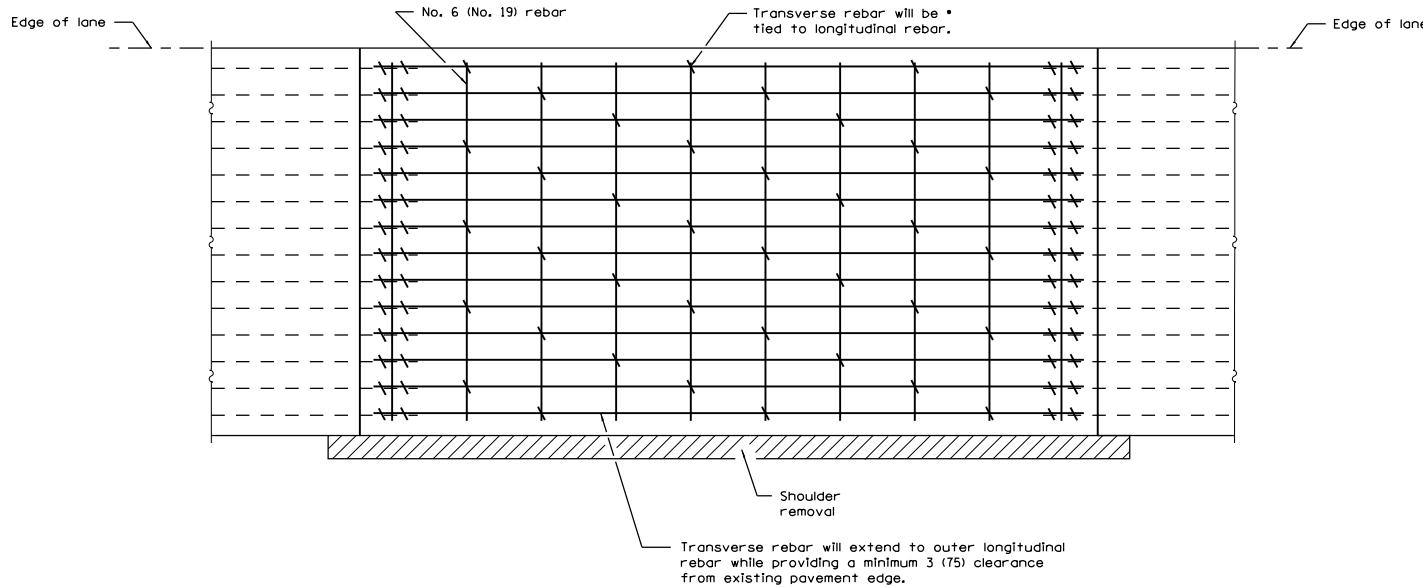
Illinois Department of Transportation
PASSED January 1, 2008
Sgt. [Signature]
ENGINEER OF POLICY AND PROCEDURES
APPROVED January 1, 2008
Eduardo [Signature]
ENGINEER OF DESIGN AND ENVIRONMENT



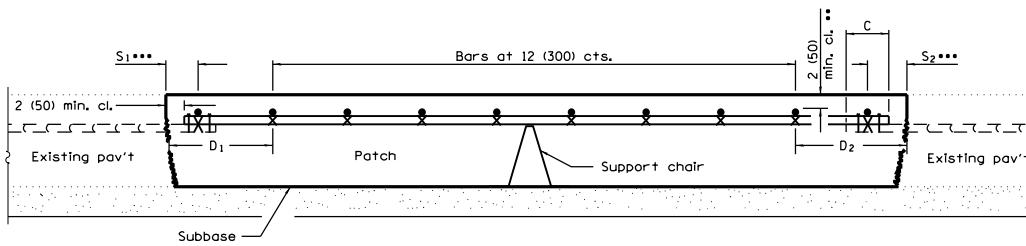
SAW CUT DETAIL

DATE	REVISIONS	CLASS A PATCHES
I-1-08	Switched units to English (metric).	
		(Sheet 1 of 2)
I-1-07	Revised General Notes.	

STANDARD 442001-04



PAVEMENT REINFORCEMENT DETAIL



PATCHING DETAIL

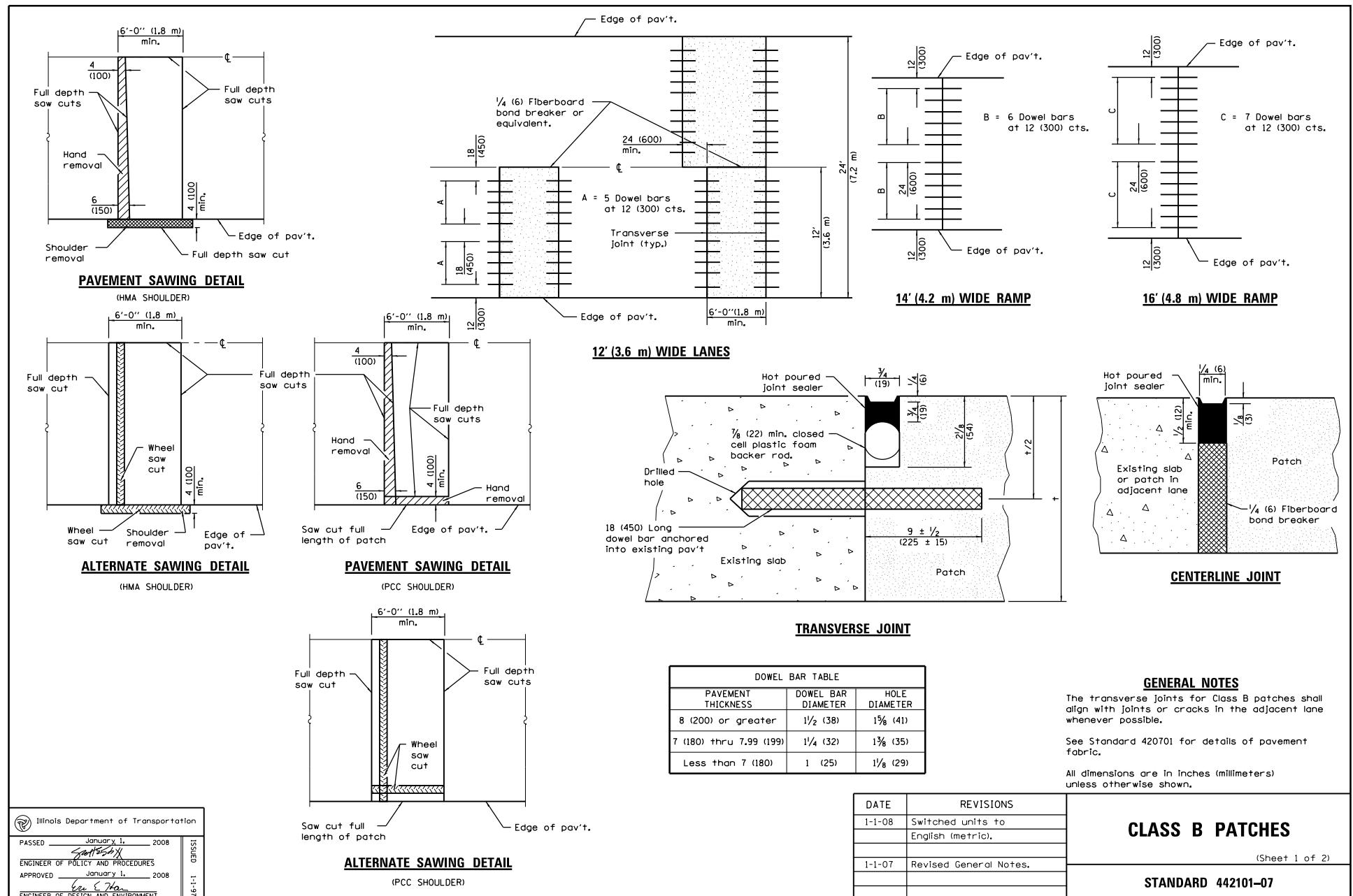
- Every 3rd intersection must be tied.
- When the minimum clearance cannot be obtained with the transverse bar on top then the transverse rebar shall be tied to the bottom of the longitudinal rebar.
- Variables: Where S_1 and S_2 are $2\frac{1}{2}$ (65) min. and 12 (300) max. $D_1 = 2(S_1)$ and $D_2 = 2(S_2)$.

	Illinois Department of Transportation
PASSED	January 1, 2008
<i>[Signature]</i>	
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2008
<i>[Signature]</i>	
ENGINEER OF DESIGN AND ENVIRONMENT	
	ISSUED 1-1-97

CLASS A PATCHES

(Sheet 2 of 2)

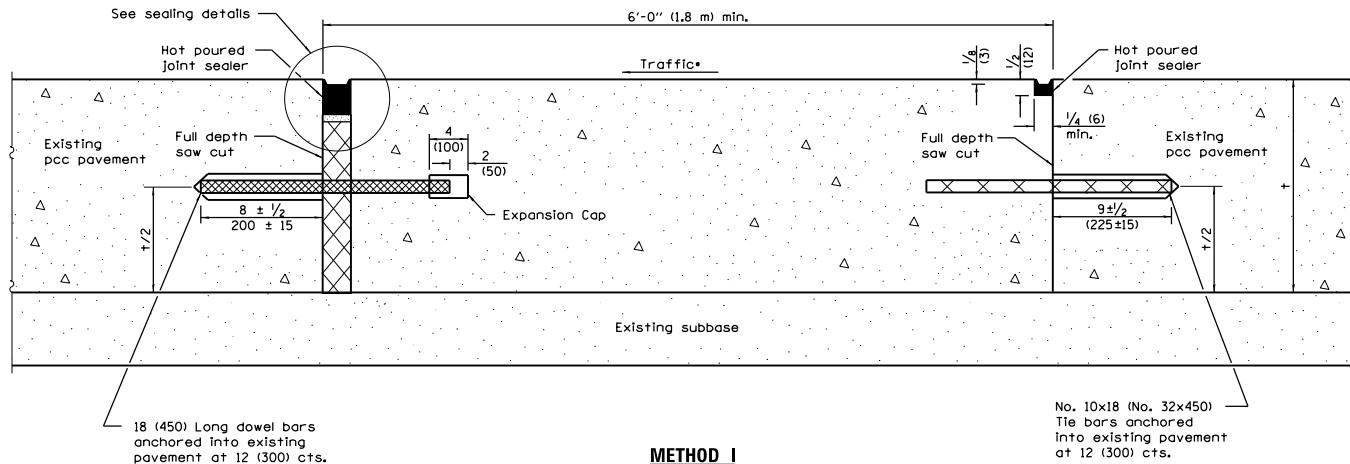
STANDARD 442001-04



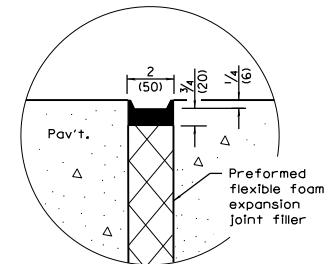
Illinois Department of Transportation
PASSED January 1, 2008
Sgt. [Signature]
ENGINEER OF POLICY AND PROCEDURES
APPROVED January 1, 2008
Lee S. [Signature]
ENGINEER OF DESIGN AND ENVIRONMENT

16-1-1 Q3531

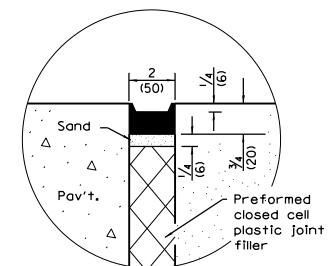
TRANSVERSE EXPANSION JOINTS



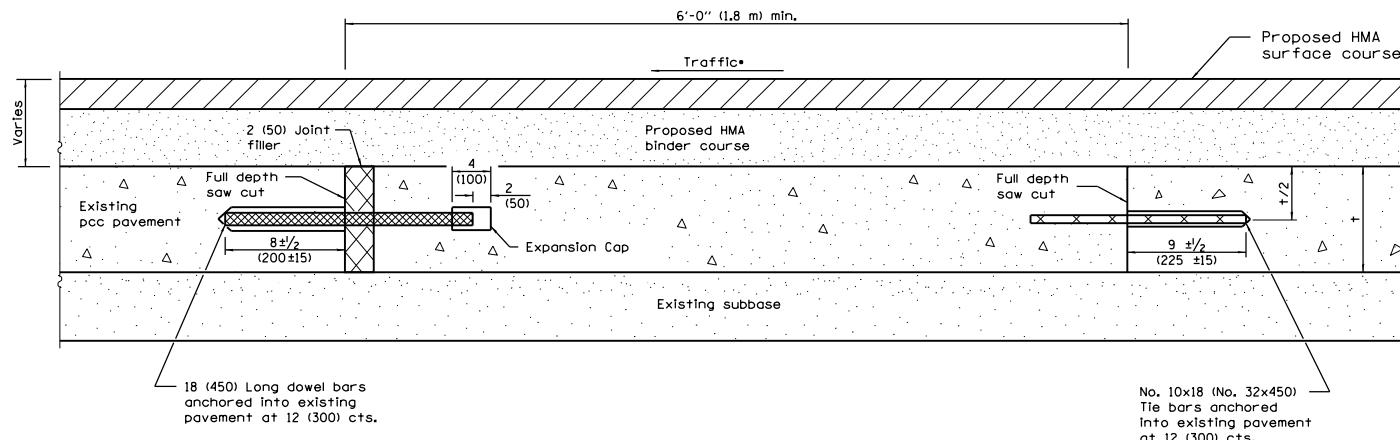
METHOD I
(Without Resurfacing)



SEALING DETAIL



SEALING DETAIL



METHOD II
(With Resurfacing)

NOTE

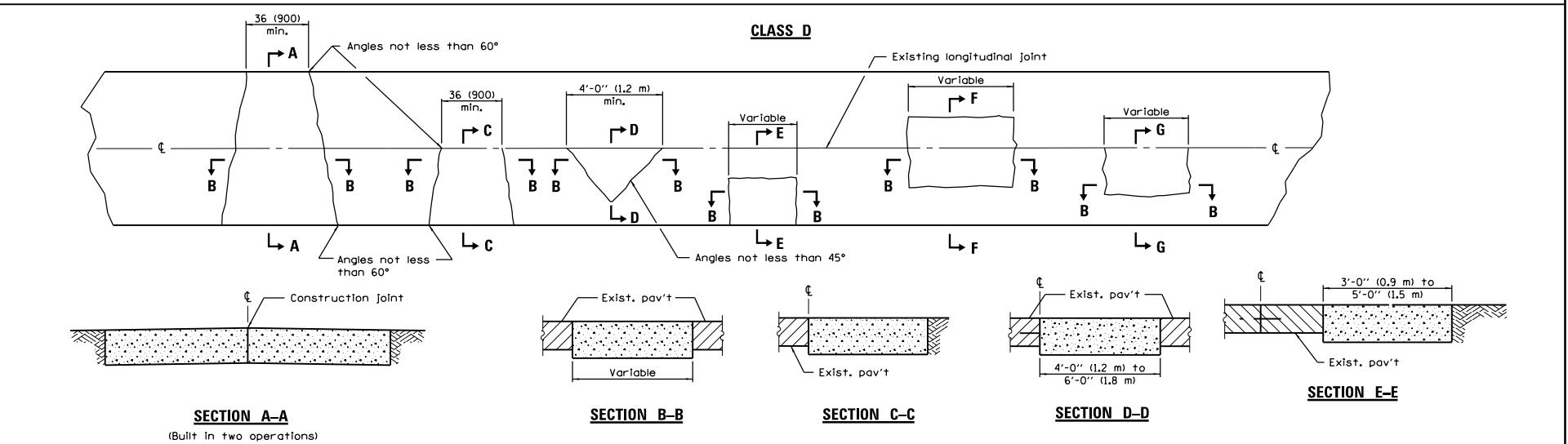
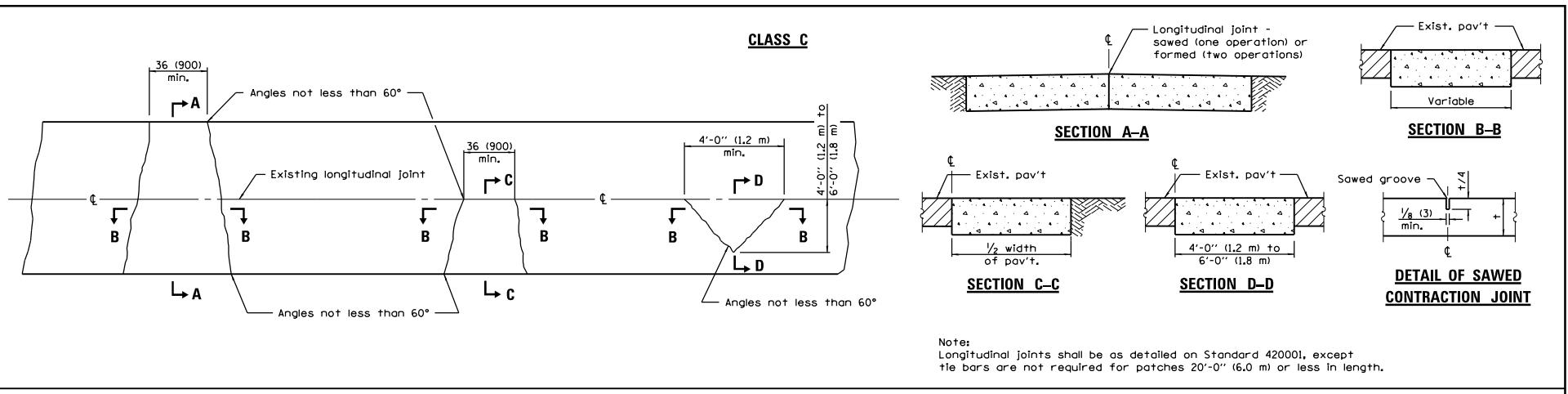
- When re-establishing a transverse expansion joint on a two-lane, two-way road, reverse the orientation of the dowel bars with respect to traffic for one of the patches such that the joint will be continuous across both lanes.

	Illinois Department of Transportation
PASSED	January 1, 2008
	Signature
ENGINEER OF POLICY AND PROCEDURES	1-1-08
APPROVED	January 1, 2008
	Signature
ENGINEER OF DESIGN AND ENVIRONMENT	1-1-08

CLASS B PATCHES

(Sheet 2 of 2)

STANDARD 442101-07



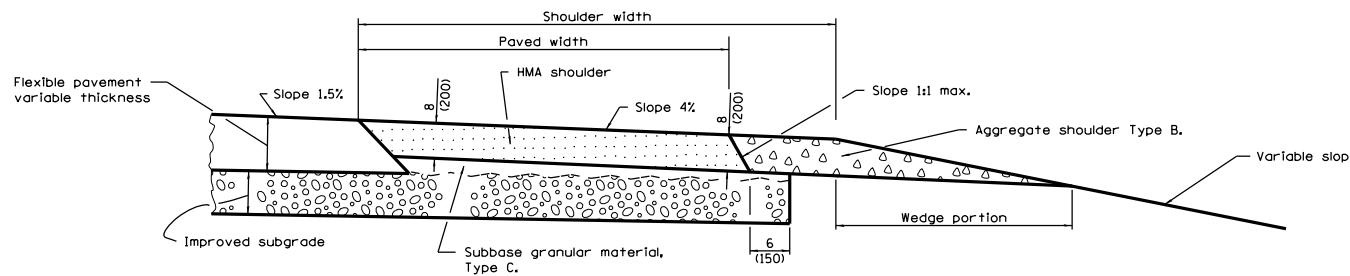
Illinois Department of Transportation

PASSED	January 1, 2008
Signed by _____	1-1-08
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2008
Signed by _____	1-1-08
ENGINEER OF DESIGN AND ENVIRONMENT	

GENERAL NOTES
Existing tie bars shall be either cut or removed.
Marginal bars shall be cut.

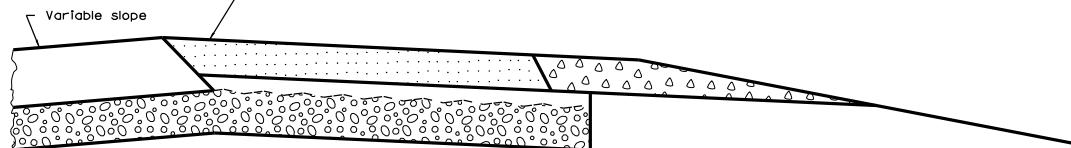
All dimensions are in inches (millimeters)
unless otherwise shown.

DATE	REVISIONS	CLASS C and D PATCHES
1-1-08	Switched units to English (metric).	
1-1-07	Revised Note for Class C patches.	STANDARD 442201-03



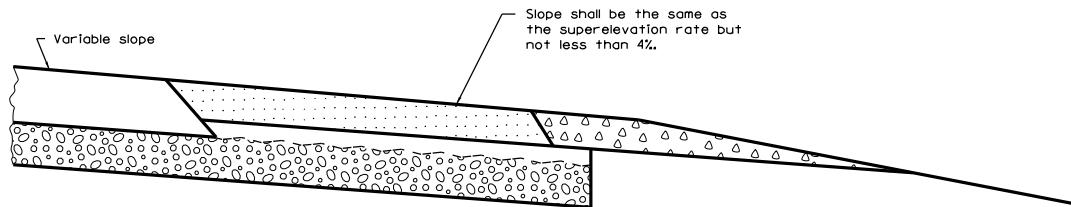
SHOULDER FOR TANGENT PAVEMENT

When the superelevation rate of the pavement is between 0% and 4%, the shoulder shall be sloped at 4%. When the superelevation rate of the pavement exceeds 4%, the shoulder shall be sloped so that the algebraic difference between pavement and shoulder will not be greater than 8%.



SHOULDER FOR SUPELEVATED PAVEMENT (OUTSIDE OF CURVE)

- Slope shall be the same as the superelevation rate but not less than 4%.

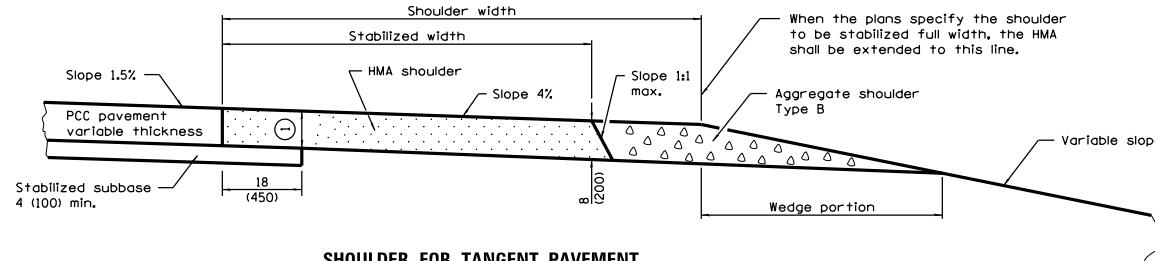


SHOULDER FOR SUPERELEVATED PAVEMENT (INSIDE OF CURVE)

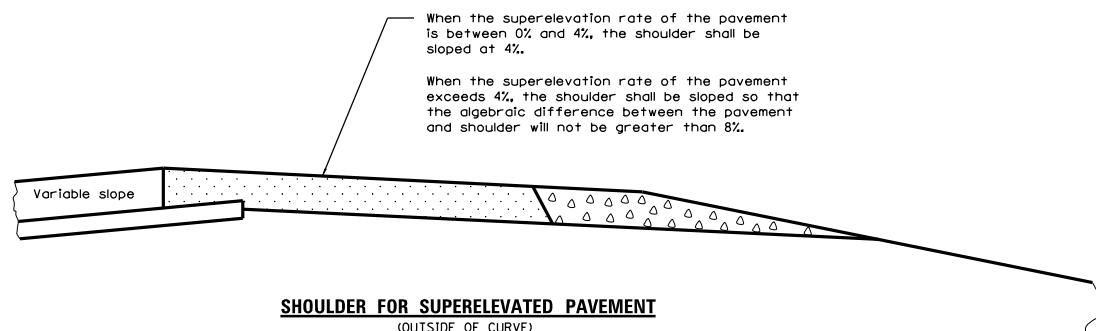
GENERAL NOTES

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

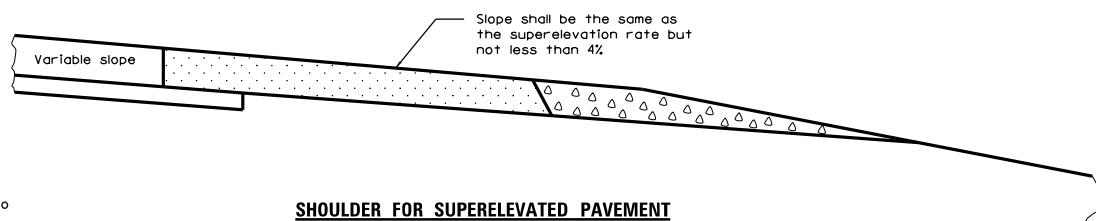
DATE	REVISIONS	
1-1-08	Switched units to English (metric).	HMA SHOULDER ADJACENT TO FLEXIBLE PAVEMENT
1-1-07	Switched to Hot-Mix Asphalt (HMA)	
	terminology.	STANDARD 482001-02



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).

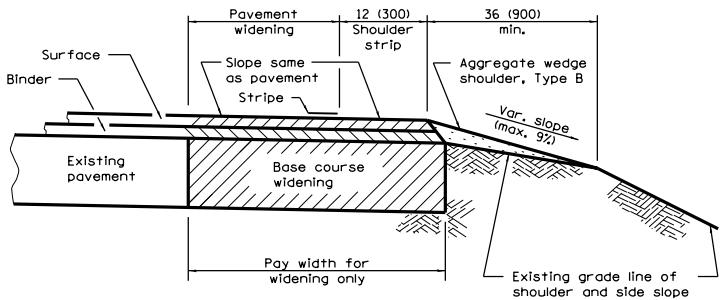
All dimensions are in inches (millimeters) unless otherwise shown.

	Illinois Department of Transportation
PASSED	January 1, 2008
<i>[Signature]</i>	
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2008
<i>[Signature]</i>	
ENGINEER OF DESIGN AND ENVIRONMENT	

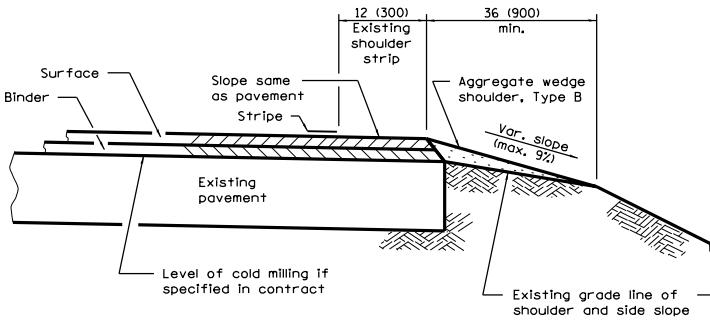
DATE	REVISIONS
I-1-08	Switched units to English (metric).
I-1-07	Switched to Hot-Mix Asphalt (HMA)
	terminology.

HMA SHOULDER ADJACENT TO RIGID PAVEMENT

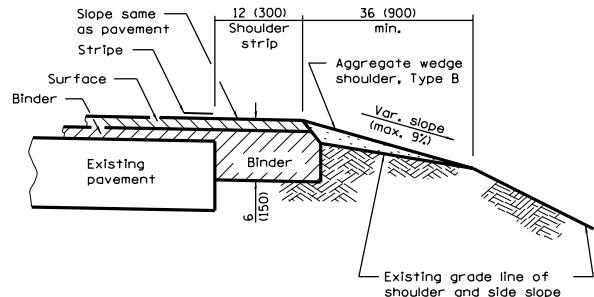
STANDARD 482006-03



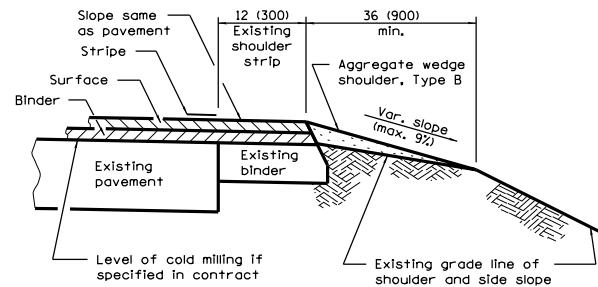
**HMA SHOULDER STRIP AND
AGGREGATE WEDGE WITH WIDENING**
(Cross-section A)



**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)

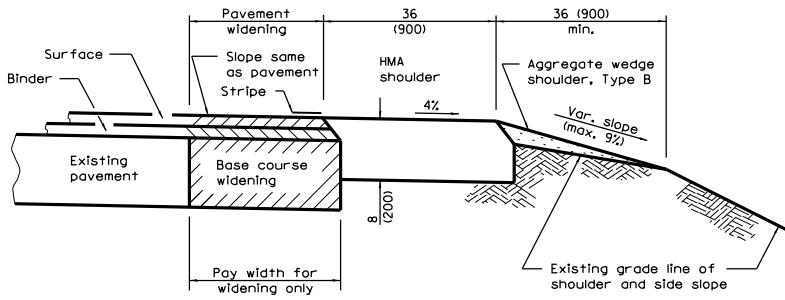
All dimensions are in inches (millimeters)
unless otherwise shown.

	Illinois Department of Transportation
PASSED	January 1, 2008
Sgt. E. S. [Signature]	I-1-197
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2008
E. S. [Signature]	I-1-197
ENGINEER OF DESIGN AND ENVIRONMENT	

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

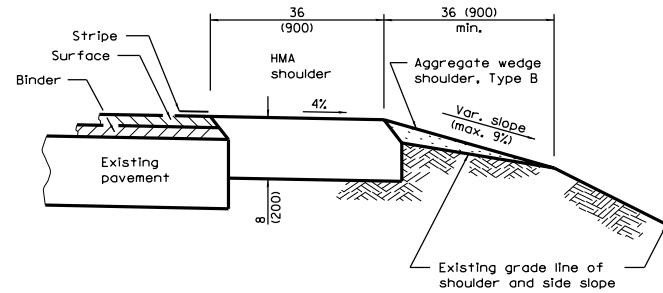
**HMA SHLD. STRIPS/SHLDS. WITH
RESURFACING OR WIDENING
AND RESURFACING PROJECTS**
(Sheet 1 of 2)

STANDARD 482011-03



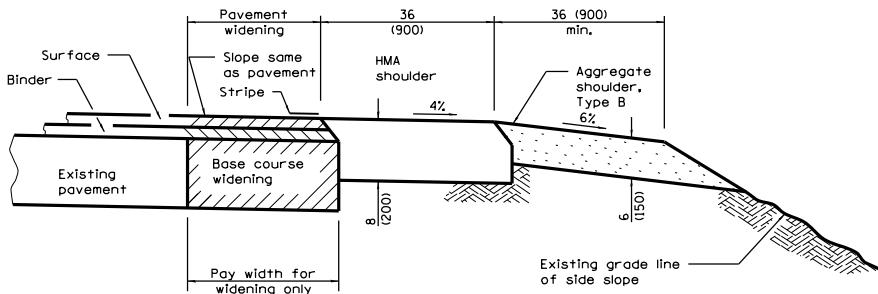
**HMA SHOULDER AND AGGREGATE
WEDGE WITH WIDENING**

(Cross-section E)



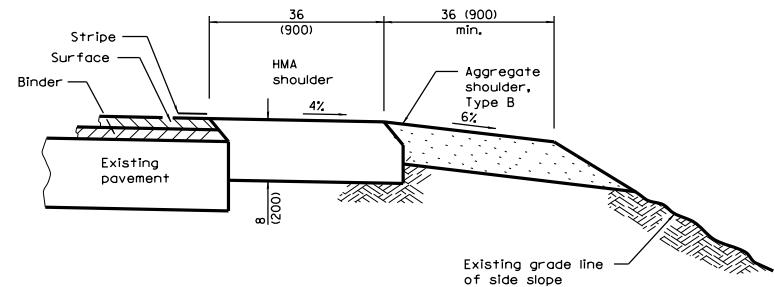
**HMA SHOULDER AND AGGREGATE
WEDGE WITH RESURFACING**

(Cross-section G)



**HMA AND AGGREGATE
SHOULDERS WITH WIDENING**

(Cross-section F)



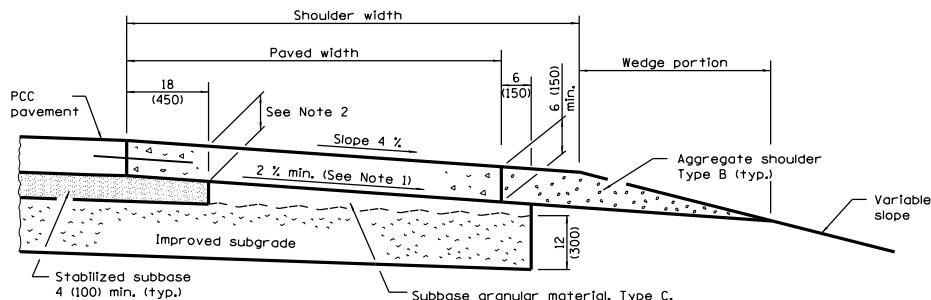
**HMA AND AGGREGATE SHOULDERS
WITH RESURFACING**

(Cross-section H)

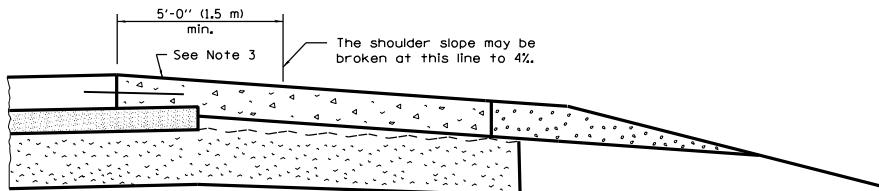
	Illinois Department of Transportation
PASSED	January 1, 2008
Sgt. J. S. [Signature]	ISRS 1-1-97
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2008
Edu. S. [Signature]	
ENGINEER OF DESIGN AND ENVIRONMENT	

**HMA SHLD. STRIPS/SHLDS. WITH
RESURFACING OR WIDENING
AND RESURFACING PROJECTS**
(Sheet 2 of 2)

STANDARD 482011-03

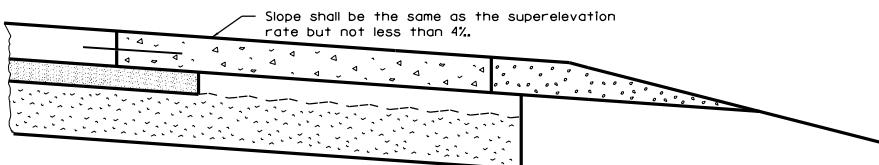


SHOULDER FOR TANGENT PAVEMENT



SHOULDER FOR SUPERELEVATED PAVEMENT

(Outside of curve)

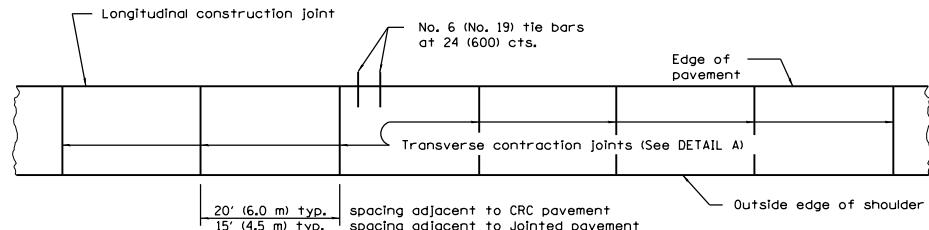


SHOULDER FOR SUPERELEVATED PAVEMENT

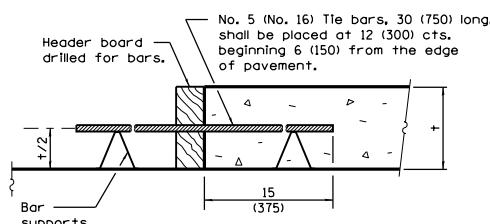
(Inside of curve)

NOTES

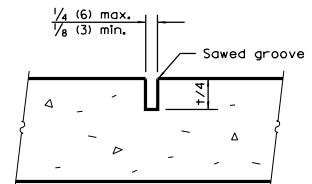
- Note 1: Does not apply when sub-surface drains are installed.
- Note 2: When the subbase is not removed, this thickness will vary with the thickness of pavement, extended length of subbase, and the slope of pavement. When this thickness is less than 6 (150), the paved shoulder shall be stepped down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



PLAN



TRANSVERSE CONSTRUCTION JOINT



DETAIL A

TRANSVERSE CONTRACTION JOINT

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.

DATE	REVISIONS	PCC SHOULDER
1-1-08	Switched units to English (metric).	
I-1-07	Required subbase gran. material, Type C under shoulder.	

STANDARD 483001-04

	Illinois Department of Transportation
PASSED	January 1, 2008
<i>[Signature]</i>	I-1-07
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2008
<i>[Signature]</i>	I-1-07
ENGINEER OF DESIGN AND ENVIRONMENT	

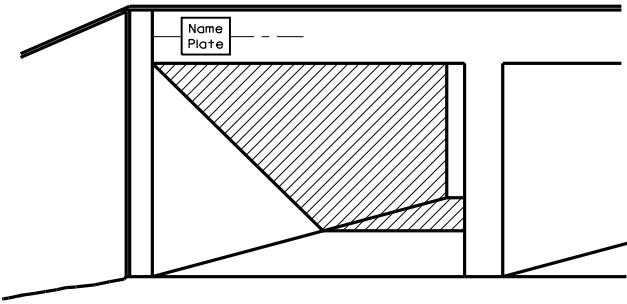

DIVISION 500 BRIDGES and CULVERTS

STD. NO. TITLE
BRIDGES

515001-03 Name Plate for Bridges

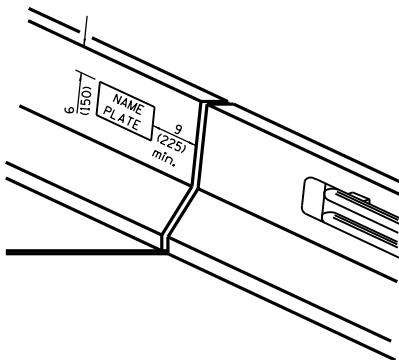
CULVERTS

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
542311-06	Traversable Pipe Grate
542401-02	Metal End Section for Pipe Culverts
542406-02	Metal End Section for Pipe Arches
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

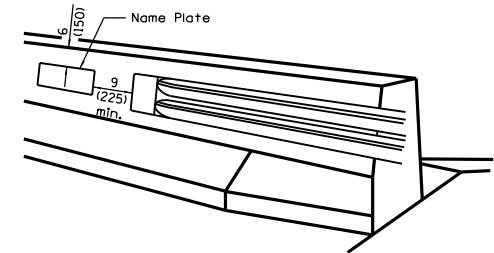


FOR MULTI-SPAN CULVERTS

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

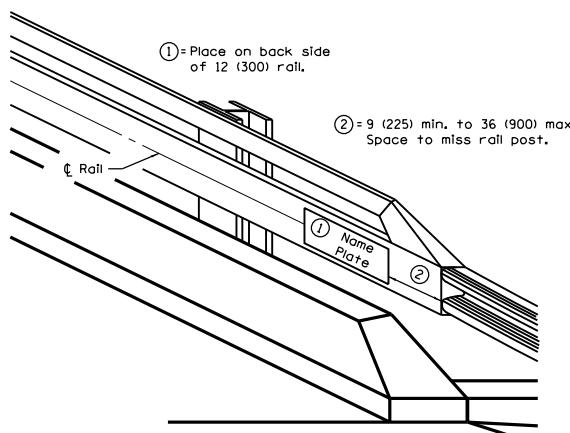


FOR PARAPET AND END POST MOUNTED

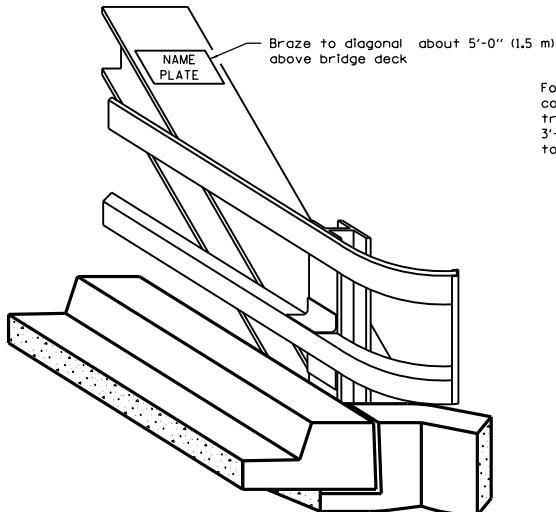


FOR PARAPET

(When Dog Ear Wing is used)

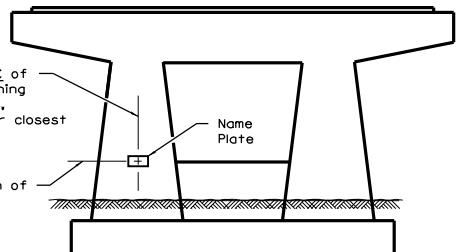


FOR STEEL RAILS



FOR TRUSSES

Braze to diagonal about 5'-0" (1.5 m)
above bridge deck
For column type piers, $\frac{1}{2}$ of column nearest approaching traffic. For solid piers,
3'-0" ± from end of pier closest to approaching traffic.
4'-0" ± above crown of roadway elevation.



FOR PIERS ON FAI ROUTES

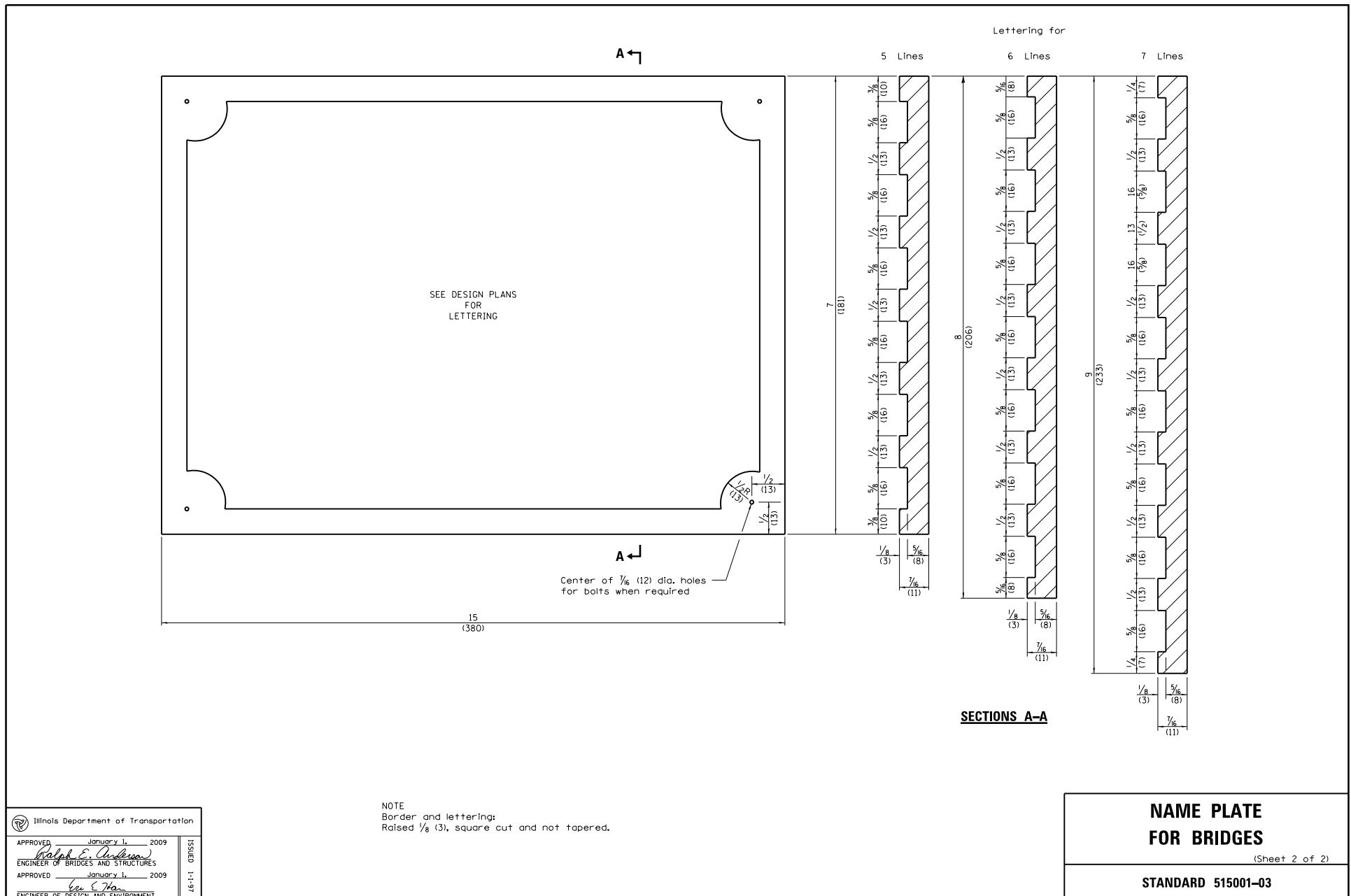
GENERAL NOTES

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
Eva E. Khan	Engineer of Design and Environment
1-1-09	

DATE	REVISIONS	NAME PLATE FOR BRIDGES <small>(Sheet 1 of 2)</small>
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.	
		STANDARD 515001-03



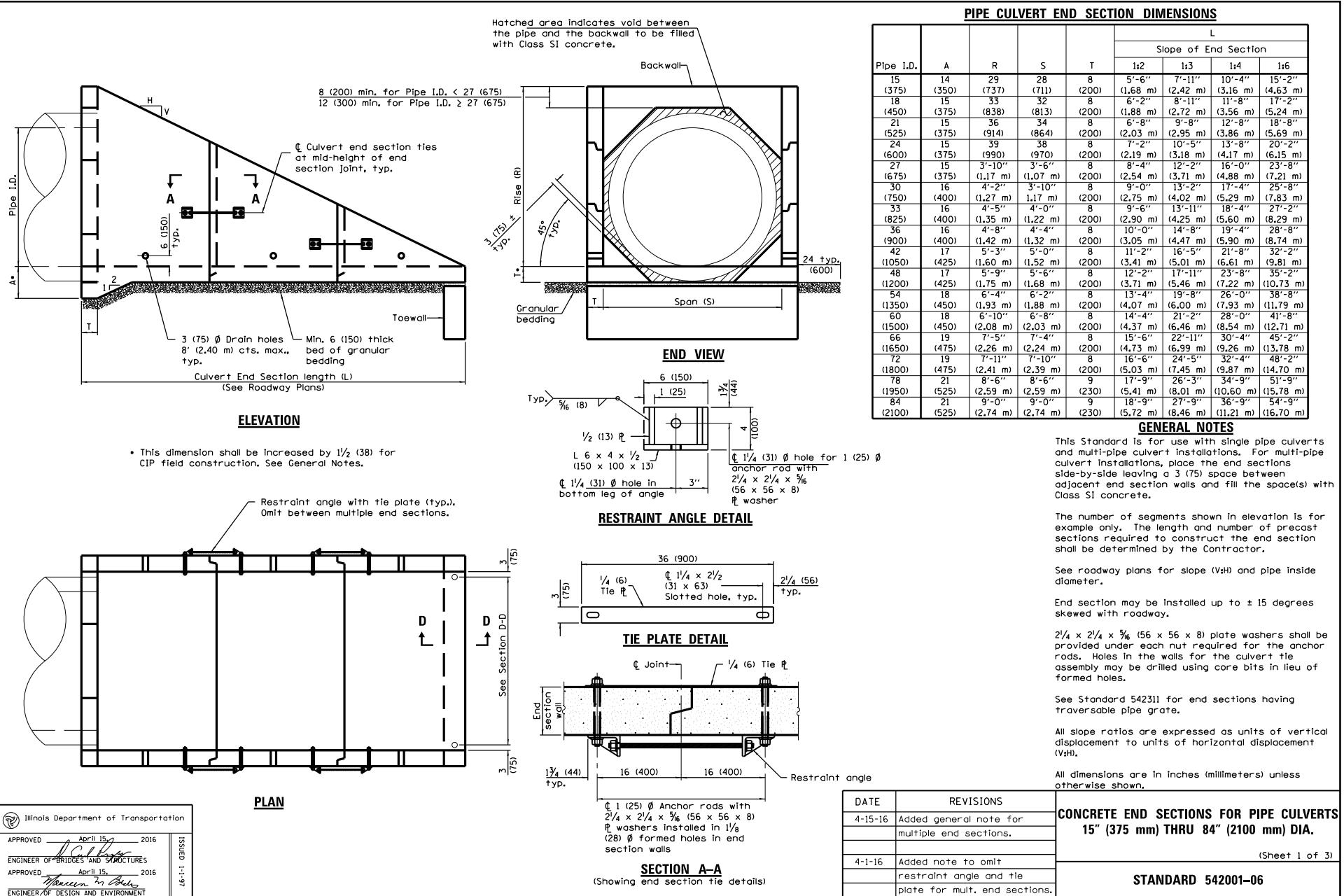
	Illinois Department of Transportation
APPROVED	January 1, 2009
<i>Ralph E. Anderson</i>	
ENGINEER OF BRIDGES AND STRUCTURES	
APPROVED	January 1, 2009
<i>Gen E. Hare</i>	
ENGINEER OF PEDESTRIAN AND ENVIRONMENT	

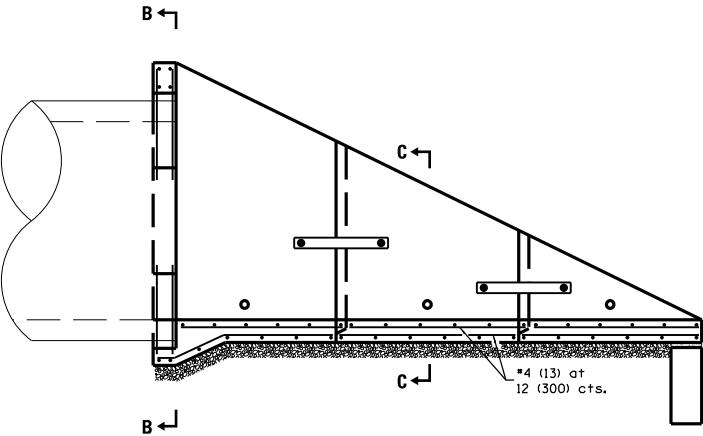
NOTE
Border and lettering:
Raised $\frac{1}{8}$ (3), square cut and not tapered.

NAME PLATE FOR BRIDGES

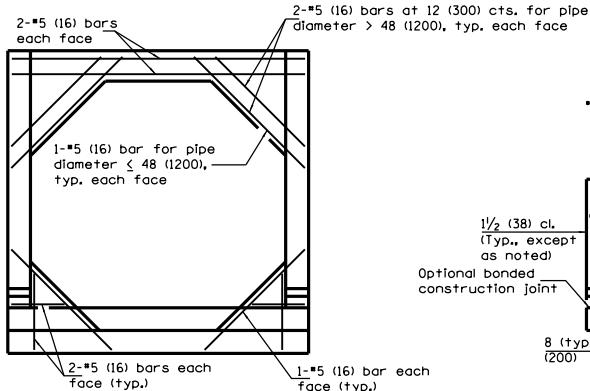
(Sheet 2 of 2)

STANDARD 515001-03

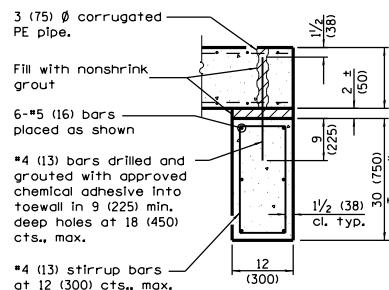




LONGITUDINAL SECTION
(Showing bottom slab and backwall reinforcement.)



SECTION B-B
(Showing backwall reinforcement only.)
(Pipe omitted for clarity.)

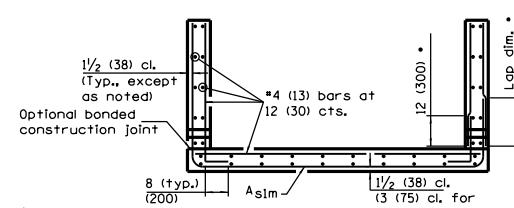


SECTION D-D

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

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)

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

(Sheet 2 of 3)

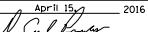
STANDARD 542001-06

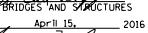
	Illinois Department of Transportation
APPROVED	April 15, 2016
ENGINEER OF BRIDGES AND STRUCTURES	
APPROVED	April 15, 2016
ENGINEER OF DESIGN AND ENVIRONMENT	
	ISSUED 1-1-97

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) (1.0)	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) (1.2)	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) (1.4)	1.8 (1.8)	2.3 (2.2)	2.9 (3.0)	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) (1.6)	2.1 (2.1)	2.7 (2.5)	3.3 (3.4)	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) (2.0)	2.6 (2.6)	3.4 (3.2)	4.2 (4.4)	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) (2.2)	2.9 (3.0)	3.9 (3.7)	4.9 (5.2)	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) (2.4)	3.2 (3.3)	4.3 (4.1)	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) (2.7)	3.5 (3.6)	4.7 (4.5)	5.9 (6.3)	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) (3.3)	4.3 (4.4)	5.8 (5.6)	7.3 (7.9)	10.3 (9.6)	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) (3.8)	5.0 (5.2)	6.8 (6.6)	8.6 (9.3)	12.2 (11.2)	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) (4.6)	6.0 (6.3)	8.2 (7.9)	10.3 (11.2)	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) (5.2)	6.8 (7.1)	9.3 (9.0)	11.8 (12.8)	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) (6.0)	7.9 (8.3)	10.9 (10.6)	13.8 (15.1)	19.7 (15.1)	1150 (519.0)	1570 (712.4)	2010 (911.1)	2880 (1305.8)	1260 (1761.3)	1730 (1007.9)	2220 (1384.8)	3190 (1449.3)
72 (1800) (6.7)	8.8 (9.3)	12.2 (11.9)	15.5 (17.0)	22.2 (17.0)	1520 (689.9)	2120 (962.1)	2690 (1222.5)	3880 (1761.3)	1770 (777.0)	2400 (1088.2)	3050 (1384.8)	4410 (2001.0)
78 (1950) (8.7)	11.4 (12.1)	15.8 (15.4)	20.1 (22.1)	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) (9.6)	12.6 (13.3)	17.4 (15.4)	22.3 (24.5)	32.1 (24.5)	1900 (862.7)	2680 (1217.4)	3430 (1558.6)	4960 (2254.4)	2120 (959.6)	3000 (1359.6)	3840 (1743.2)	5560 (2526.8)

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

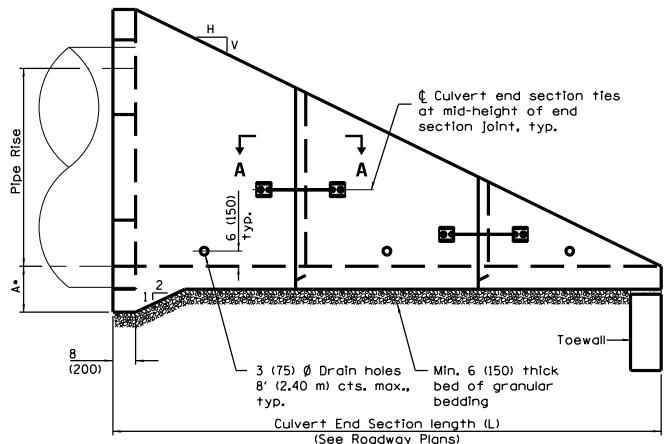
 Illinois Department of Transportation
APPROVED April 15, 2016

ENGINEER OF BRIDGES AND STRUCTURES
ISSUED 1-1-97

APPROVED April 15, 2016

ENGINEER OF DESIGN AND ENVIRONMENT

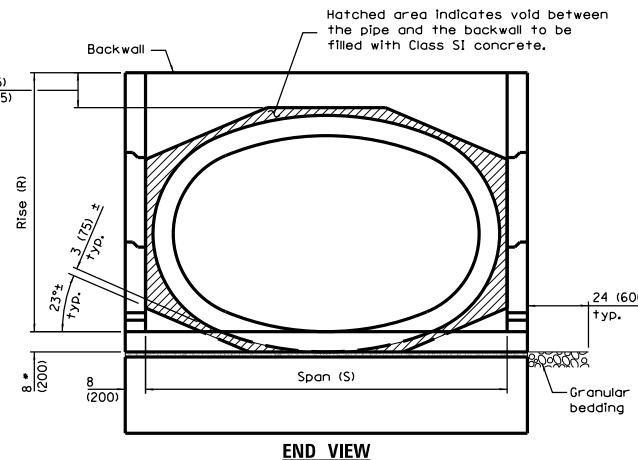
CONCRETE END SECTIONS FOR PIPE CULVERTS
15" (375 mm) THRU 84" (2100 mm) DIA.

(Sheet 3 of 3)

STANDARD 542001-06



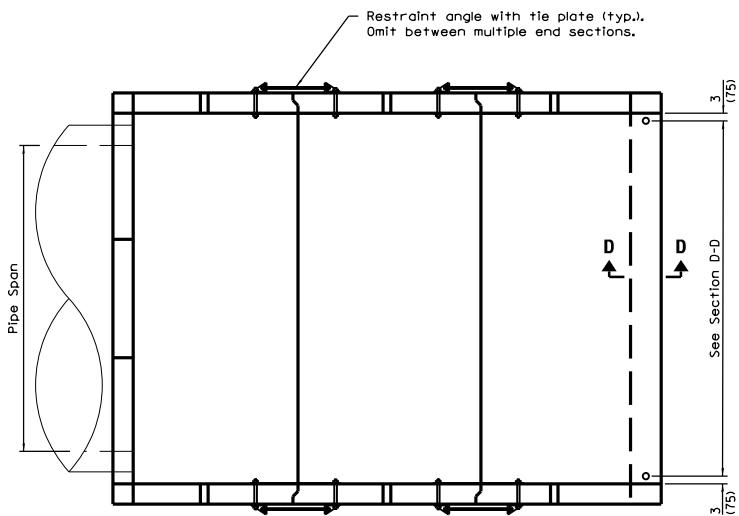
8 (200) min. for EO RS < 21 (525)
12 (300) min. for EO RS ≥ 21 (525)



END VIEW

ELEVATION

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



PLAN

Illinois Department of Transportation
APPROVED April 15, 2016
ENGINEER OF BRIDGES AND STRUCTURES
APPROVED April 15, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

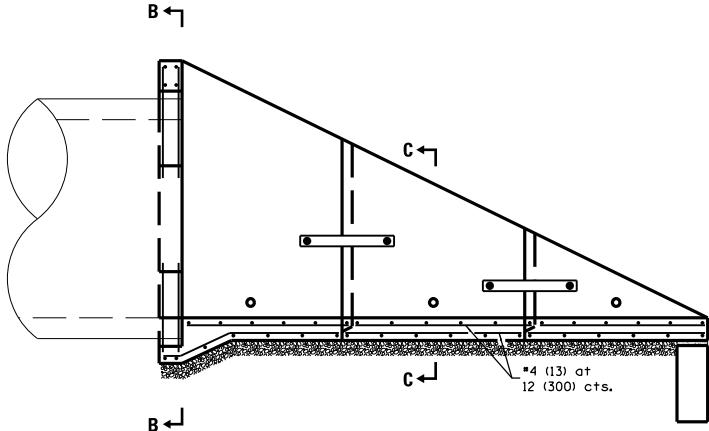
15-1-1-1-1

PIPE CULVERT END SECTION DIMENSIONS

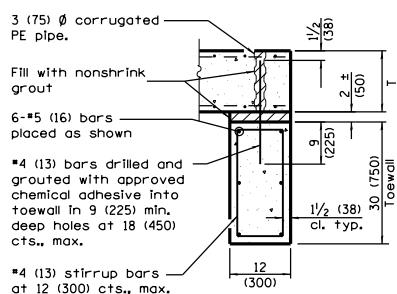
Equivalent Round Size Pipe I.D.	Pipe Span	Pipe Rise	A	R	S	L	Slope of End Section			
							1:2	1:3	1:4	1:6
							45°	55°	65°	75°
15 (375)	23 (575)	14 (350)	15 (375)	28 (711)	36 (914)	5' 4" (1,62 m)	7' 8" (2,34 m)	10' 0" (3,05 m)	14' 8" (4,47 m)	
18 (450)	23 (575)	14 (350)	15 (375)	28 (711)	36 (914)	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 (365)	3' 8" (1,12 m)	7' 0" (2,14 m)	10' 2" (3,10 m)	13' 4" (4,07 m)	19' 8" (6,00 m)	
24 (600)	30 (750)	19 (475)	15 (375)	38 (965)	3' 8" (1,12 m)	7' 0" (2,14 m)	10' 2" (3,10 m)	13' 4" (4,07 m)	19' 8" (6,00 m)	
27 (675)	34 (850)	22 (550)	15 (375)	3' 5" (1,04 m)	4' 0" (1,22 m)	7' 6" (2,29 m)	10' 11" (3,33 m)	14' 4" (4,38 m)	21' 2" (6,46 m)	
30 (750)	38 (950)	24 (600)	15 (375)	3' 7" (1,09 m)	4' 4" (1,32 m)	7' 10" (2,39 m)	11' 5" (3,48 m)	15' 0" (4,57 m)	22' 2" (6,75 m)	
36 (900)	45 (1125)	29 (725)	16 (400)	5' 1" (1,24 m)	5' 0" (1,52 m)	8' 10" (2,69 m)	12' 11" (3,94 m)	17' 0" (5,18 m)	25' 2" (7,67 m)	
42 (1050)	53 (1325)	34 (850)	16 (400)	5' 6" (1,37 m)	5' 10" (1,78 m)	9' 8" (2,95 m)	14' 2" (4,32 m)	18' 8" (5,63 m)	27' 8" (8,44 m)	
48 (1200)	60 (1500)	38 (950)	17 (425)	4' 11" (1,50 m)	6' 6" (1,98 m)	10' 6" (3,20 m)	15' 5" (4,71 m)	20' 4" (6,21 m)	30' 2" (9,21 m)	
54 (1350)	68 (1700)	43 (1075)	17 (425)	5' 4" (1,63 m)	7' 2" (2,18 m)	11' 4" (3,45 m)	16' 8" (5,08 m)	22' 0" (6,71 m)	32' 8" (9,96 m)	
60 (1500)	76 (1900)	48 (1200)	18 (450)	5' 10" (1,78 m)	8' 0" (2,44 m)	12' 4" (3,76 m)	18' 2" (5,54 m)	24' 0" (7,32 m)	35' 8" (10,87 m)	
66 (1650)	83 (2075)	53 (1325)	18 (450)	6' 3" (1,91 m)	8' 8" (2,64 m)	13' 2" (4,02 m)	19' 5" (5,92 m)	25' 8" (7,83 m)	38' 2" (11,64 m)	
72 (1800)	91 (2275)	58 (1450)	19 (475)	6' 9" (2,06 m)	9' 4" (2,84 m)	14' 2" (4,32 m)	20' 11" (6,38 m)	27' 8" (8,44 m)	41' 2" (12,56 m)	

See Sheet 3 for GENERAL NOTES.

DATE	REVISIONS	CONCRETE END SECTIONS FOR ELLIPTICAL PIPE CULVERTS 15" (375 mm) THRU 72" (1800 mm) EQUIVALENT DIAMETER
4-15-16	Added general note for multiple end sections.	(Sheet 1 of 3)
4-1-16	Added note to omit restraint angle and tie plate for mult. end sections.	STANDARD 542011-02

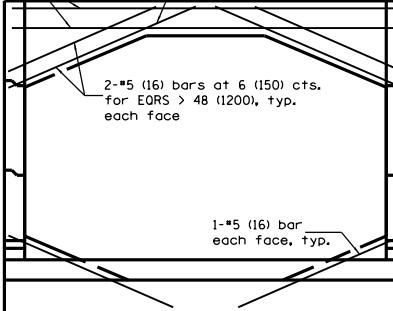


LONGITUDINAL SECTION
(Showing bottom slab and backwall reinforcement.)



SECTION D-D

2-*5 (16) bars each face
1-*5 (16) bar for EORS \leq 48 (1200), typ. each face



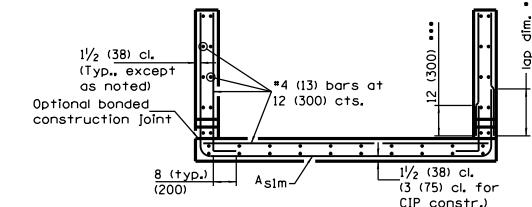
SECTION B-B

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

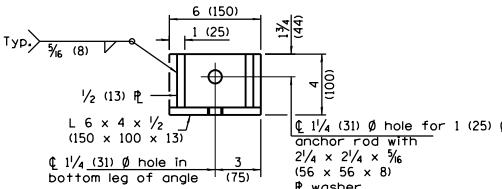
LAP DIMENSION

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

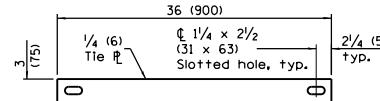
*** The Contractor may use lap splices for the sidewall reinforcement at the locations shown.



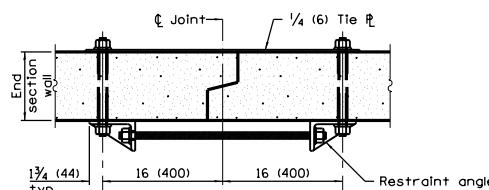
SECTION C-C



RESTRAINT ANGLE DETAIL



TIE PLATE DETAIL



SECTION A-A

(Showing end section tie details)

REINFORCEMENT SCHEDULE

Equivalent Round Size Pipe I.D.	A_{sim}	
	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 April 15, 2016
<i>[Signature]</i>
ENGINEER OF BRIDGES AND STRUCTURES
APPROVED April 15, 2016
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ENGINEER OF DESIGN AND ENVIRONMENT

15-1-1-1

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 $\frac{1}{4}$ x 2 $\frac{1}{4}$ x $\frac{5}{16}$ (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.

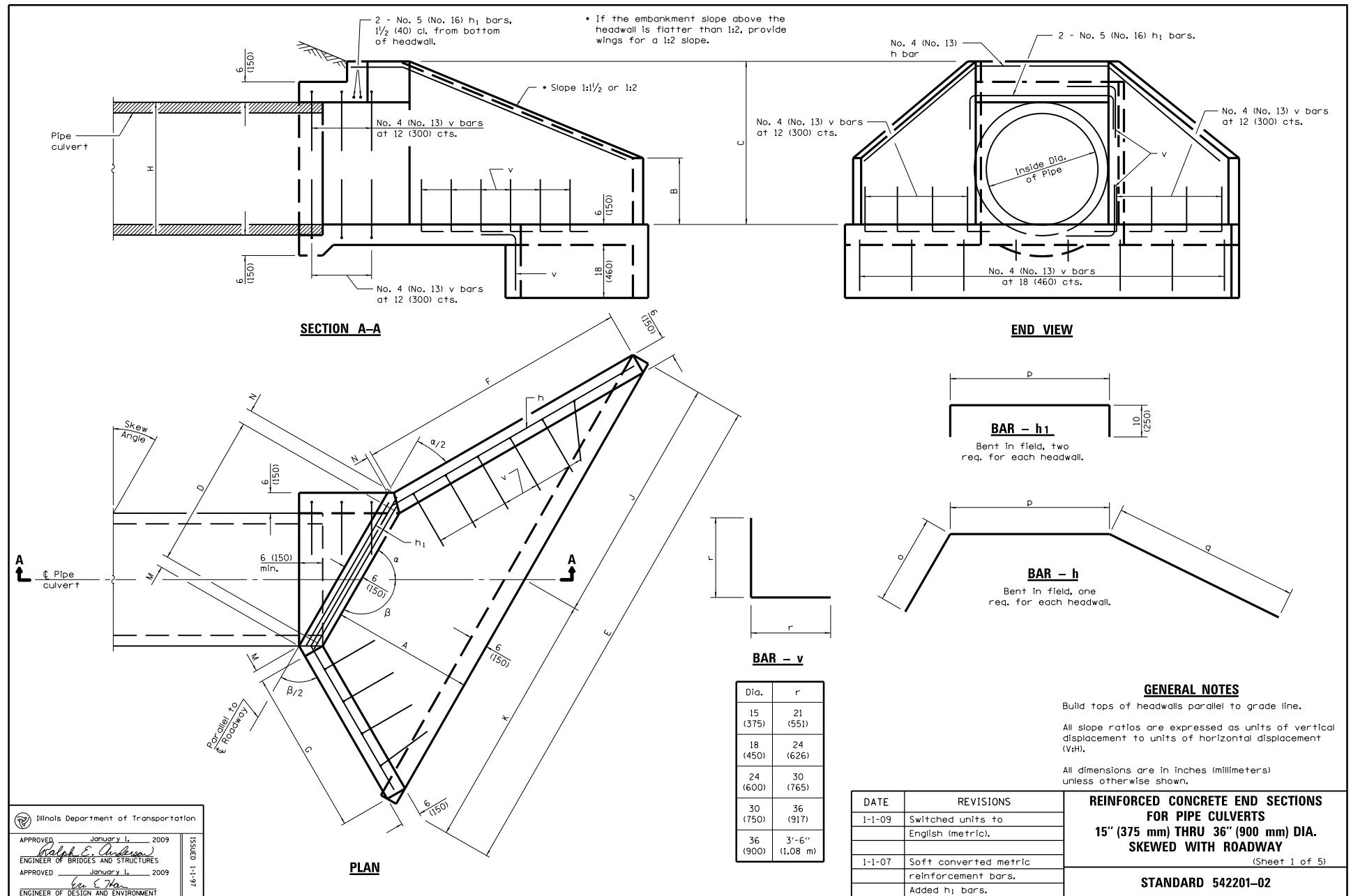
All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

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	April 15, 2016
	Engineering
ENGINEER OF BRIDGES AND STRUCTURES	
APPROVED	April 15, 2016
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ENGINEER OF DESIGN AND ENVIRONMENT	



WINGS FOR 1:1½ SLOPE

Skew Angle	Design No.	Nominal Pipe Dia.	DIMENSIONS FOR CONCRETE										Concrete 2 End Sections yd³ (m³)	Reinf. Bars - 2 End Sections						Bars for 2 End Sections lbs. (kg)				
														h - bars			h₁ - bars							
			A	B	C	D	E	F	G	H	J	K	M	N	o	p	q	Lgth.	p	Lgth.				
5°	DS 15-1½ (DS 375-1½)	15 (375)	28 (720)	10 (260)	29 (740)	19 (485)	6'-11 ¾"	3'-5 ½"	38 (980)	19 (483)	3'-5 ¾"	3'-6"	2 ¼" (70)	2 ¼" (60)	85° (1.1)	3'-6"	21 (1.01 m)	3'-9"	9'-0" (551)	21 (1.04 m)	3'-5" (551)	28 (41)		
	DS 18-1½ (DS 450-1½)	18 (450)	28 (720)	13 (330)	32 (810)	22 (561)	7'-2 ½"	3'-5 ½"	38 (980)	22 (559)	3'-7 ¼"	3'-7 ½"	2 ¼" (70)	2 ¼" (60)	85° (1.2)	3'-6"	24 (1.03 m)	3'-9"	9'-3" (626)	24 (1.12 m)	3'-8" (626)	28 (45)		
	DS 24-1½ (DS 600-1½)	24 (600)	34 (870)	16 (410)	39 (990)	30 (765)	8'-10 ¼"	4'-2 ¼"	3'-10" (1.07 m)	30 (762)	4'-5 ¼"	4'-5 ½"	2 ¼" (70)	2 ¼" (60)	85° (1.7)	4'-3"	32 (1.23 m)	4'-7"	11'-6" (832)	32 (1.33 m)	4'-4" (832)	32 (63)		
	DS 30-1½ (DS 750-1½)	30 (750)	39 (990)	19 (480)	39 (1140)	36 (917)	10'-3"	4'-9 ¾"	4'-5" (1.47 m)	36 (762)	5'-1 ¼"	5'-1 ½"	2 ¼" (70)	2 ¼" (60)	85° (2.1)	4'-10"	39 (1.39 m)	5'-2"	13'-3" (983)	39 (1.51 m)	4'-11" (983)	36 (81)		
	DS 36-1½ (DS 900-1½)	36 (900)	39 (1140)	22 (560)	36 (1320)	36 (1123)	3'-8 ¼"	11'-11"	5'-6 ½"	36 (1.69 m)	5'-11 ¼"	5'-11 ½"	2 ¼" (70)	2 ¼" (60)	85° (2.5)	5'-7"	32 (1.81 m)	5'-2"	13'-3" (1.56 m)	39 (1.73 m)	4'-11" (1.56 m)	36 (108)		
	DS 15-1½ (DS 375-1½)	15 (375)	28 (720)	10 (260)	29 (740)	19 (490)	7'-0 ½"	3'-7 ½"	36 ½" (2.17 m)	19 (940)	3'-6"	3'-6 ½"	2 ¼" (70)	2 ¼" (60)	80° (1.2)	3'-4"	22 (1.08 m)	3'-10"	9'-0" (557)	22 (1.14 m)	3'-6" (557)	28 (41)		
	DS 18-1½ (DS 450-1½)	18 (450)	28 (720)	13 (330)	32 (810)	22 ½" (568)	7'-3 ¾"	3'-7 ½"	36 ½" (2.24 m)	22 (940)	3'-7 ½"	3'-8 ¼"	2 ¼" (70)	2 ¼" (60)	80° (1.2)	1-6	25 (1.11 m)	3'-10"	9'-3" (633)	25 (1.17 m)	3'-9" (633)	28 (45)		
10°	DS 24-1½ (DS 600-1½)	24 (600)	34 (870)	16 (410)	39 (990)	30 ½" (774)	9'-0"	4'-5"	3'-8 ½"	30 (762)	4'-5 ¼"	4'-6 ½"	2 ¼" (70)	2 ¼" (60)	80° (1.7)	4'-1"	33 (1.39 m)	4'-8"	11'-6" (841)	33 (1.4 m)	4'-5" (841)	34 (68)		
	DS 30-1½ (DS 750-1½)	30 (750)	39 (990)	19 (480)	39 (1140)	36 ½" (928)	10'-4 ½"	5'-0 ¾"	4'-3" (1.54 m)	36 (762)	5'-2 ¼"	5'-2 ½"	2 ¼" (70)	2 ¼" (60)	80° (2.1)	4'-9"	39 (1.57 m)	5'-6"	13'-6" (993)	39 (1.58 m)	4'-11" (993)	36 (81)		
	DS 36-1½ (DS 900-1½)	36 (900)	39 (1140)	22 (560)	36 (1320)	36 (1136)	3'-8 ¼"	12'-0 ½"	5'-10" (3.67 m)	36 (1.78 m)	5'-10" (1.49 m)	5'-10" (1.119 m)	2 ¼" (70)	2 ¼" (60)	80° (2.7)	5'-6"	32 (1.83 m)	6'-0 ½"	15'-6" (1.54 m)	5'-7" (1.62 m)	5'-7" (1.54 m)	42 (108)		
	DS 15-1½ (DS 375-1½)	15 (375)	28 (720)	10 (260)	29 (740)	19 (500)	7'-2"	3'-10"	35 ¼" (2.2 m)	19 (940)	3'-6"	3'-7 ½"	2 ¼" (70)	2 ¼" (60)	80° (1.2)	3'-4"	22 (1.09 m)	3'-10"	9'-0" (557)	22 (1.14 m)	3'-6" (557)	28 (41)		
	DS 18-1½ (DS 450-1½)	18 (450)	28 (720)	13 (330)	32 (810)	22 ½" (579)	7'-5 ½"	3'-10"	35 ¼" (2.28 m)	22 (940)	3'-8"	3'-9 ¼"	2 ¼" (70)	2 ¼" (60)	80° (1.3)	3'-4"	25 (1.13 m)	3'-10"	9'-3" (644)	25 (1.17 m)	3'-9" (644)	28 (45)		
	DS 24-1½ (DS 600-1½)	24 (600)	34 (870)	16 (410)	39 (990)	31 (789)	9'-2"	4'-7 ¾"	3'-6 ¾" (2.8 m)	30 (762)	4'-6 ½"	4'-7 ½"	2 ¼" (70)	2 ¼" (60)	75° (1.8)	2.2	23 (1.39 m)	4'-1"	33 (1.41 m)	4'-8"	11'-6" (841)	33 (1.45 m)	4'-5" (841)	34 (68)
	DS 30-1½ (DS 750-1½)	30 (750)	39 (990)	19 (480)	39 (1140)	37 ¼" (946)	10'-6 ½"	5'-4 ¾"	4'-1 ¼" (3.21 m)	36 (762)	5'-2 ¼"	5'-3 ¾"	2 ¼" (70)	2 ¼" (60)	75° (2.2)	2.8	29 (1.62 m)	4'-2 ¼"	5'-3 ¾"	5'-6"	13'-6" (993)	39 (1.58 m)	4'-11" (993)	36 (81)
15°	DS 36-1½ (DS 900-1½)	36 (900)	39 (1140)	22 (560)	36 (1320)	36 (1158)	3'-9"	22 ¼" (573 m)	12'-3 ¼"	6'-2" (1.87 m)	4'-8 ¾"	3'-8"	2 ¼" (70)	2 ¼" (60)	80° (2.7)	5'-6"	32 (1.83 m)	6'-0 ½"	15'-9" (1.54 m)	5'-7" (1.62 m)	5'-7" (1.54 m)	42 (108)		
	DS 15-1½ (DS 375-1½)	15 (375)	28 (720)	10 (260)	29 (740)	19 (500)	7'-2"	3'-10"	35 ¼" (2.2 m)	19 (940)	3'-6"	3'-7 ½"	2 ¼" (70)	2 ¼" (60)	80° (1.2)	1.5	22 (1.09 m)	3'-10"	9'-0" (557)	22 (1.14 m)	3'-6" (557)	28 (41)		
	DS 18-1½ (DS 450-1½)	18 (450)	28 (720)	13 (330)	32 (810)	22 ½" (579)	7'-5 ½"	3'-10"	35 ¼" (2.28 m)	22 (940)	3'-8"	3'-9 ¼"	2 ¼" (70)	2 ¼" (60)	80° (1.3)	1.7	25 (1.13 m)	3'-10"	9'-3" (644)	25 (1.17 m)	3'-9" (644)	28 (45)		
	DS 24-1½ (DS 600-1½)	24 (600)	34 (870)	16 (410)	39 (990)	31 (789)	9'-2"	4'-7 ¾"	3'-6 ¾" (2.8 m)	30 (762)	4'-6 ½"	4'-7 ½"	2 ¼" (70)	2 ¼" (60)	75° (1.8)	2.3	23 (1.39 m)	4'-0"	34 (1.41 m)	4'-11"	11'-9" (857)	34 (1.47 m)	4'-6" (857)	34 (68)
	DS 30-1½ (DS 750-1½)	30 (750)	39 (990)	19 (480)	39 (1140)	37 ¼" (946)	10'-6 ½"	5'-4 ¾"	4'-1 ¼" (3.21 m)	36 (762)	5'-2 ¼"	5'-3 ¾"	2 ¼" (70)	2 ¼" (60)	75° (2.2)	2.9	29 (1.62 m)	4'-2 ¼"	5'-3 ¾"	5'-6"	13'-9" (993)	39 (1.63 m)	4'-0" (993)	40 (90)
	DS 36-1½ (DS 900-1½)	36 (900)	39 (1140)	22 (560)	36 (1320)	36 (1158)	3'-9"	22 ¼" (573 m)	12'-3 ¼"	6'-2" (1.87 m)	4'-8 ¾"	3'-8"	2 ¼" (70)	2 ¼" (60)	80° (2.9)	5'-3"	32 (1.83 m)	6'-0 ½"	15'-9" (1.63 m)	5'-7" (1.72 m)	5'-7" (1.63 m)	46 (117)		
	DS 15-1½ (DS 375-1½)	15 (375)	28 (720)	10 (260)	29 (740)	19 (514)	7'-2"	3'-10"	34 ¼" (2.26 m)	19 (880)	3'-6"	3'-7 ½"	2 ¼" (70)	2 ¼" (60)	80° (1.2)	1.6	39 (1.11 m)	3'-10"	9'-0" (557)	22 (1.17 m)	3'-6" (557)	28 (41)		
20°	DS 18-1½ (DS 450-1½)	18 (450)	28 (720)	13 (330)	32 (810)	23 ½" (595)	7'-7 ½"	4'-0 ¾"	34 ¼" (2.26 m)	22 (880)	3'-9"	3'-10"	2 ¼" (70)	2 ¼" (60)	70° (1.3)	1.7	39 (1.11 m)	3'-10"	9'-3" (644)	22 (1.17 m)	3'-6" (644)	28 (45)		
	DS 24-1½ (DS 600-1½)	24 (600)	34 (870)	16 (410)	39 (990)	32 (811)	9'-4 ¾"	4'-11 ¼"	3'-5 ½" (2.87 m)	30 (762)	4'-7 ½"	4'-9"	2 ¼" (70)	2 ¼" (60)	70° (1.8)	2.4	31 (1.42 m)	5'-2"	5'-2"	12'-0" (879)	35 (1.56 m)	4'-7" (879)	38 (72)	
	DS 30-1½ (DS 750-1½)	30 (750)	39 (990)	19 (480)	39 (1140)	39 ¼" (973)	10'-9 ¾"	5'-8"	3'-11 ½" (3.29 m)	36 (762)	5'-4 ¼"	5'-5 ½"	2 ¼" (70)	2 ¼" (60)	70° (2.4)	3.1	31 (1.63 m)	4'-5"	3'-5 ½"	5'-11"	13'-9" (883)	35 (1.67 m)	5'-1" (883)	42 (95)
	DS 36-1½ (DS 900-1½)	36 (900)	39 (1140)	22 (560)	36 (1320)	36 (1159)	3'-10 ¼"	12'-7"	6'-6 ½" (3.86 m)	4'-7" (762)	6'-2 ¼"	6'-3 ½"	2 ¼" (70)	2 ¼" (60)	70° (3.1)	4.0	4.0 (1.91 m)	5'-3"	4'-1"	6'-1 ½"	16'-3" (73 m)	4'-1" (1.26 m)	5'-9" (73 m)	50 (126)
	DS 15-1½ (DS 375-1½)	15 (375)	28 (720)	10 (260)	29 (740)	21 (533)	7'-7"	4'-4 ¾"	34 ¼" (2.33 m)	19 (860)	3'-8"	3'-10"	2 ¼" (70)	2 ¼" (60)	80° (1.2)	1.6	39 (1.14 m)	3'-10"	9'-0" (893)	23 (1.16 m)	3'-7" (893)	28 (41)		
	DS 18-1½ (DS 450-1½)	18 (450)	28 (720)	13 (330)	32 (810)	24 ¼" (617)	7'-10 ¼"	4'-4"	33 ¼" (2.42 m)	22 (860)	3'-10 ¼"	4'-0"	2 ¼" (70)	2 ¼" (60)	65° (1.4)	1.8	38 (1.14 m)	3'-10"	9'-0" (893)	27 (1.17 m)	3'-11" (893)	32 (54)		
	DS 24-1½ (DS 600-1½)	24 (600)	34 (870)	16 (410)	39 (990)	33 (841)	9'-4 ¾"	5'-3 ½"	33 ¼" (2.47 m)	30 (762)	4'-9 ¼"	4'-11 ¼"	2 ¼" (70)	2 ¼" (60)	65° (1.9)	2.5	31 (1.46 m)	3'-10"	9'-0" (909)	35 (1.66 m)	3'-12" (909)	38 (72)		
25°	DS 30-1½ (DS 750-1½)	30 (750)	39 (990)	19 (480)	39 (1140)	39 ¼" (1008)	11'-2"	6'-0 ¾"	33 ¼" (3.4 m)	36 (914)	5'-6"	5'-8"	2 ¼" (70)	2 ¼" (60)	65° (2.5)	3.3	3.3 (1.91 m)	4'-5"	3'-6"	6'-4 ½"	14'-3" (1.68 m)	3'-6" (1.68 m)	44 (99)	
	DS 36-1½ (DS 900-1½)	36 (900)	39 (1140)	22 (560)	36 (1320)	36 (1235)	4'-0 ½"	13'-0 ¼"	6'-11 ¼" (3.96 m)	36 (1.83 m)	5'-8"	5'-10" (3.19 m)	2 ¼" (70)	2 ¼" (60)	65° (3.3)	4.3	4.3 (1.41 m)	5'-0"	4'-3"	7'-3"	16'-6" (418 m)	5'-2" (418 m)	5'-2" (418 m)	50 (126)
	DS 15-1½ (DS 375-1½)	15 (375)	28 (720)	10 (260)	29 (740)	22 (558)	7'-10 ¼"	4'-8"	32 ¼" (2.43 m)	19 (830)	3'-10 ¼"	4'-0 ½%" (1.44 m)	2 ¼" (70)	2 ¼" (60)	60° (1.3)	1.7	37 (1.52 m)	3'-10 ¼%" (483)	24 (1.56 m)	4'-11" (483)	10'-0" (873)	24 (1.56 m)	4'-11" (873)	50 (126)
	DS 18-1½ (DS 450-1½)	18 (450)	28 (720)	13 (330)	32 (810)	25 ½" (645)	8'-2 ¼"	4'-8"	32 ¼" (2.52 m)	22 (830)	5'-11"	5'-12"	2 ¼" (70)	2 ¼" (60)	60° (1.5)	1.9	38 (1.75 m)	3'-11"	5'-12"	28 (1.75 m)	5'-0" (830)	4'-0" (830)	36 (122)	
	DS 24-1½ (DS 600-1½)	24 (600)	34 (870)	16 (410)	39 (990)	34 ¼" (880)	10'-1 ¼"	5'-8" (3.55 m)	34 ¼" (3.55 m)	30 (762)	5'-1 ¼"	5'-2 ¼"	2 ¼" (70)	2 ¼" (60)	60° (2.7)	2.7	38 (1.75 m)	3'-11"	5'-12"	28 (1.75 m)	5'-0" (830)	4'-0" (830)	36 (122)	
	DS 30-1½ (DS 750-1½)	30 (750)	39 (990)	19 (480)	39 (1140)	39 ¼" (1005)	11'-7 ¼"	6'-6"	36 (1.98 m)	36 (914)	5'-8 ¼%" (1.75 m)	5'-11" (1.75 m)	2 ¼" (70)	2 ¼" (60)	60° (2.7)	3.5	3.5 (1.75 m)	4'-4"	3'-8"	6'-9"	14'-9" (4.34 m)	5'-4" (4.34 m)	5'-4" (4.34 m)	46 (104)
	DS 36-1½ (DS 900-1½)	36 (900)	39 (1140)	22 (560)	36 (1320)	36 (1292)	13'-0 ¼"	7'-6"	36 (4.13 m)	36 (1.19 m)	5'-8"	6'-8 ¼%" (2.22 m)	2 ¼" (70)	2 ¼" (60)	60° (3.5)	4.6	4.6 (1.75 m)	5'-0"	4'-5"	7'-10"	17'-3" (5.05 m)	5'-6" (5.05 m)	5'-6" (5.05 m)	54 (135)
30°	DS 15-1½ (DS 375-1½)	15 (375)	28 (720)	10 (260)	29 (740)	22 (558)	7'-10 ¼"	4'-8"	32 ¼" (2.43 m)	19 (830)	3'-10 ¼%" (1.44 m)	3'-11 ¼%" (1.44 m)	2 ¼" (70)	2 ¼" (60)	60° (1.3)	1.7	37 (1.52 m)	3'-10 ¼%" (483)	24 (1.56 m)	4'-11" (483)	10'-0" (873)	24 (1.56 m)	4'-11" (873)	50 (126)
	DS 18-1½ (DS 450-1½)	18 (450)	28 (720)																					

WINGS FOR 1:1/2 SLOPE

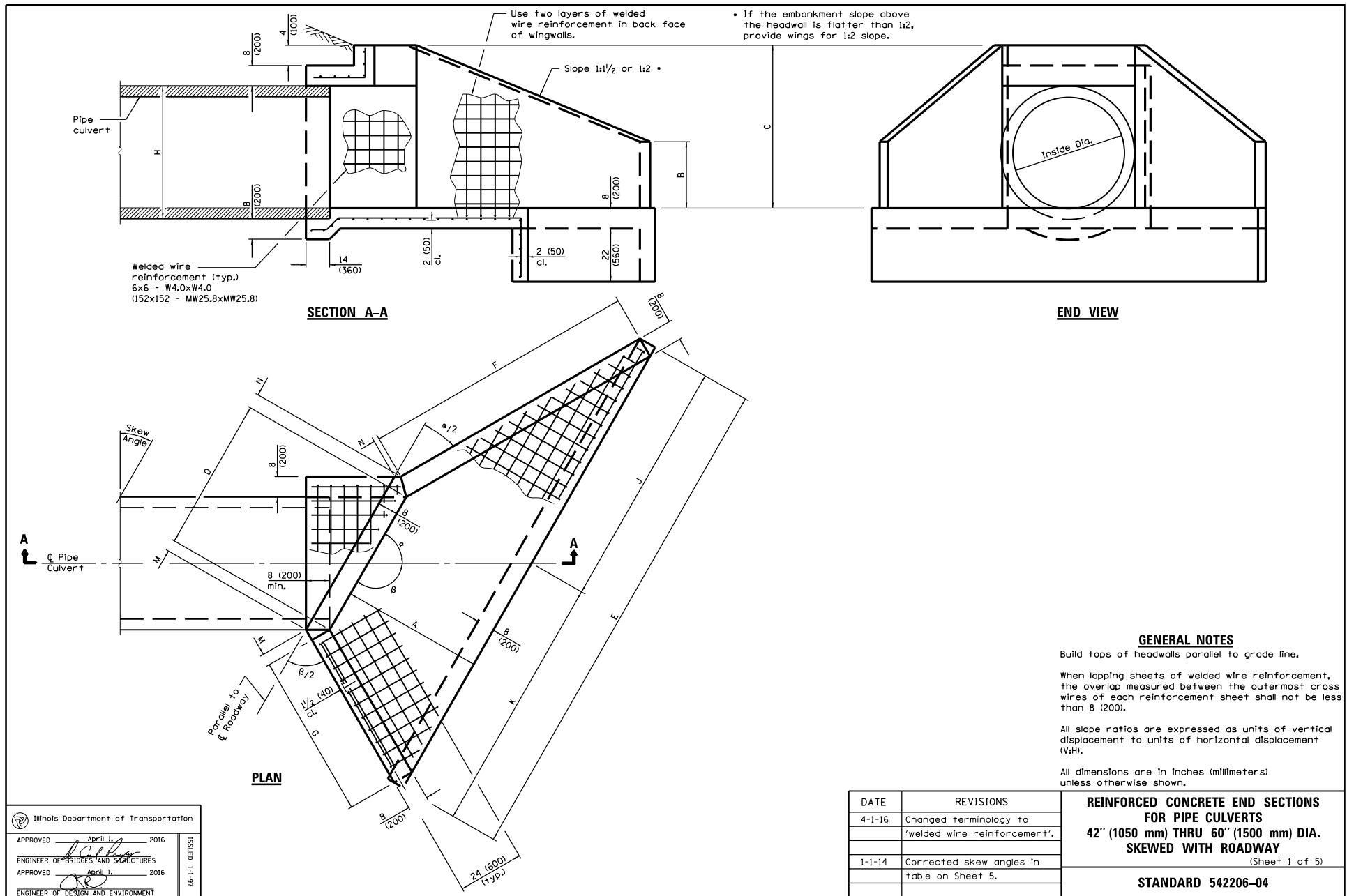
Skew Angle	Design No.	Nominal Pipe Dia.	DIMENSIONS FOR CONCRETE										Concrete 2 End Sections yd ³ (m ³)	Reinf. Bars - 2 End Sections						Bars for 2 End Sections lbs. (kg)			
														h - bars			h ₁ - bars						
			A	B	C	D	E	F	G	H	J	K	M	N	a	o	p	q	Lgth.	p	Lgth.	No.	
35°	DS 15-1/2 (DS 375-1/2)	15 (375)	28 (720)	10 (260)	29 (740)	23 1/4 (590)	8'-3 1/4" (2.55 m)	5'-0 3/4" (1.56 m)	31 1/2 (483)	19 (1.24 m)	4'-0 1/2" (1.31 m)	4'-3" (0.90 m)	3 3/4 (0.40 m)	1 1/2 (0.55 m)	55° (1.4 m)	37 (855)	26 (658)	5'-3" (1.57 m)	10'-6" (3.09 m)	26 (658)	3'-10" (1.17 m)	36 (110)	
	DS 18-1/2 (DS 450-1/2)	18 (450)	28 (720)	13 (330)	32 (810)	27 (682)	8'-7 1/4" (2.65 m)	5'-0 3/4" (1.56 m)	31 1/2 (559)	22 (1.29 m)	4'-2 1/2" (1.36 m)	4'-5" (0.90 m)	3 3/4 (0.40 m)	1 1/2 (0.55 m)	55° (1.5 m)	37 (876)	29 (750)	5'-3" (1.61 m)	10'-9" (3.24 m)	29 (750)	4'-1" (1.25 m)	36 (130)	
	DS 24-1/2 (DS 600-1/2)	24 (600)	34 (870)	16 (410)	39 (990)	36 1/2 (930)	10'-7 1/4" (3.26 m)	6'-1 1/4" (1.88 m)	38 1/4 (980)	30 (1.36 m)	5'-2 1/2" (1.36 m)	5'-5 1/4" (0.90 m)	3 3/4 (0.40 m)	1 1/2 (0.55 m)	55° (2.2 m)	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 (170)
	DS 30-1/2 (DS 750-1/2)	30 (750)	39 (990)	19 (480)	39 (1140)	11 (116 m)	12'-3 1/4" (2.15 m)	7'-0 1/2" (1.12 m)	36 (914)	36 (1.84 m)	6'-0 1/4" (1.9 m)	6'-3" (1.84 m)	3 3/4 (0.90 m)	1 1/2 (0.55 m)	55° (2.8 m)	3.7 (2.8)	4'-2" (1.17 m)	3'11" (2.18 m)	15'-3" (4.54 m)	3'-11" (1.18 m)	5'-7" (1.70 m)	240 (50)	
	DS 36-1/2 (DS 900-1/2)	36 (900)	39 (1140)	22 (560)	22 (1320)	4'-4" (1,366 m)	4'-5 1/4" (4.35 m)	14'-3 1/4" (2.47 m)	8'-1 1/2" (1.3 m)	38 (1119 m)	4'-2 1/2" (1.3 m)	4'-3 1/4" (2.14 m)	3 3/4 (0.90 m)	1 1/2 (0.55 m)	55° (3.8 m)	4.9 (3.8)	4'-11" (1.34 m)	4'8" (1.43 m)	18'-0" (5.29 m)	4'-8" (1.43 m)	6'-4" (1.93 m)	310 (56)	
	DS 15-1/2 (DS 375-1/2)	15 (375)	28 (720)	10 (260)	29 (740)	24 1/4 (631)	8'-10" (2.71 m)	5'-6 1/4" (1.71 m)	31 (780)	19 (1.32 m)	4'-3 1/2" (1.32 m)	4'-6 1/2" (1.39 m)	3 3/4 (0.90 m)	1 1/2 (0.55 m)	55° (1.5 m)	37 (840)	27 (700)	5'-8" (1.30 m)	11'-0" (3.25 m)	27 (700)	3'-11" (1.19 m)	38 (54)	
	DS 18-1/2 (DS 450-1/2)	18 (450)	28 (720)	13 (330)	32 (810)	28 3/4 (730)	9'-1 3/4" (2.81 m)	5'-6 1/4" (1.71 m)	31 (780)	22 (1.37 m)	4'-5 1/2" (1.44 m)	4'-8 1/4" (1.40 m)	3 3/4 (0.90 m)	1 1/4 (0.50 m)	50° (1.7 m)	2,2 (1.7)	36 (860)	31 (798)	5'-8" (1.76 m)	11'-3" (3.41 m)	31 (1.30 m)	4'-3" (1.30 m)	38 (130)
40°	DS 24-1/2 (DS 600-1/2)	24 (600)	34 (870)	16 (410)	39 (990)	3'-3 1/4" (3.47 m)	11'-4" (2.08 m)	6'-8 1/4" (1.96 m)	37 1/2 (762)	30 (1.7 m)	5'-6 1/2" (1.77 m)	5'-9 1/2" (1.00 m)	3 3/4 (0.90 m)	1 1/4 (0.50 m)	50° (2.4 m)	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)
	DS 30-1/2 (DS 750-1/2)	30 (750)	39 (990)	19 (480)	39 (1140)	3'-9" (1.193 m)	13'-0 1/4" (3.98 m)	7'-8 1/4" (2.35 m)	36 (914)	36 (1.95 m)	6'-5" (2.03 m)	6'-7 1/4" (2.03 m)	3 3/4 (0.90 m)	1 1/4 (0.50 m)	50° (3.1 m)	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)
	DS 36-1/2 (DS 900-1/2)	36 (900)	39 (1140)	22 (560)	22 (1320)	4'-4" (1,461 m)	4'-9 1/2" (4.64 m)	8'-10 1/2" (2.7 m)	3'-8" (1.26 m)	38 (1119 m)	4'-1 1/4" (2.7 m)	5'-7" (1.32 m)	3 3/4 (0.90 m)	1 1/4 (0.50 m)	50° (4.1 m)	5.3 (4.1)	4'-10" (1.32 m)	5'-0" (1.53 m)	9"-0" (1.53 m)	19'-0" (5.59 m)	5'-0" (1.53 m)	6'-8" (2.03 m)	340 (62)
	DS 15-1/2 (DS 375-1/2)	15 (375)	28 (720)	10 (260)	29 (740)	24 1/4 (683)	8'-10" (2.92 m)	6'-1 1/4" (1.88 m)	30 1/4 (780)	19 (1.42 m)	4'-7 1/2" (1.5 m)	4'-10 1/2" (1.5 m)	3 3/4 (1.00 m)	1 1/4 (0.50 m)	50° (1.6 m)	2.1 (1.6)	36 (829)	29 (753)	5'-8" (1.89 m)	11'-6" (3.47 m)	29 (1.25 m)	4'-1" (1.25 m)	40 (130)
	DS 18-1/2 (DS 450-1/2)	18 (450)	28 (720)	13 (330)	32 (810)	28 3/4 (791)	9'-10 1/4" (3.03 m)	6'-1 1/4" (1.88 m)	30 1/4 (780)	22 (1.47 m)	4'-9 1/2" (1.56 m)	5'-0 3/4" (1.00 m)	3 3/4 (1.00 m)	1 1/4 (0.50 m)	50° (1.8 m)	2.4 (1.8)	36 (847)	34 (859)	6'-2" (1.94 m)	12'-0" (3.64 m)	34 (1.37 m)	4'-6" (1.37 m)	44 (68)
	DS 24-1/2 (DS 600-1/2)	24 (600)	34 (870)	16 (410)	39 (990)	3'-6 1/2" (1,078 m)	12'-3 1/2" (3.74 m)	7'-4 1/2" (2.28 m)	36 3/4 (950)	30 (1.83 m)	5'-11 1/2" (1.91 m)	6'-3" (1.00 m)	3 3/4 (1.00 m)	1 1/4 (0.50 m)	50° (2.6 m)	3.4 (2.6)	3'8" (1.0 m)	3'6" (1.51 m)	6'-10" (2.31 m)	15'-0" (4.47 m)	3'-9" (1.51 m)	5'-5" (1.65 m)	50 (95)
	DS 30-1/2 (DS 750-1/2)	30 (750)	39 (990)	19 (480)	39 (1140)	3'-9" (1,293 m)	4'-3" (4.29 m)	8'-6 1/2" (2.59 m)	36 (914)	36 (1.24 m)	6'-11" (1.08 m)	7'-2" (2.1 m)	4'-1 1/2" (1.21 m)	4'-10" (1.21 m)	1 1/4 (0.50 m)	4.4 (4.4)	4'-2" (1.13 m)	4'-2" (1.36 m)	8'-8" (2.63 m)	17'-3" (5.12 m)	4'-5" (1.36 m)	6'-1" (1.86 m)	62 (300)
45°	DS 36-1/2 (DS 900-1/2)	36 (900)	39 (1140)	22 (560)	22 (1320)	4'-4" (1,583 m)	16'-5 1/4" (5.01 m)	9'-9 1/2" (2.98 m)	4'-0 3/4" (1.24 m)	38 (1119 m)	8'-1 1/2" (2.46 m)	8'-8 1/2" (2.55 m)	4'-4 1/4" (1.00 m)	4'-10" (1.00 m)	1 1/4 (0.50 m)	4.5 (4.4)	4'-10" (1.3 m)	5'-5" (1.65 m)	10'-0" (5.97 m)	20'-3" (1.65 m)	5'-5" (1.65 m)	7'-1" (2.16 m)	66 (167)
	DS 15-1/2 (DS 375-1/2)	15 (375)	28 (720)	10 (260)	29 (740)	29 1/2" (751)	10'-4 1/2" (3.18 m)	6'-10" (2.11 m)	29 1/2" (770)	19 (1.55 m)	5'-0 1/2" (1.64 m)	5'-4" (1.64 m)	4'-4 1/4" (1.10 m)	1 1/4 (0.50 m)	40° (1.8 m)	2.3 (1.8)	35 (817)	32 (822)	6'-11" (2.11 m)	12'-6" (3.25 m)	32 (1.32 m)	4'-4" (1.32 m)	46 (140)
	DS 18-1/2 (DS 450-1/2)	18 (450)	28 (720)	13 (330)	32 (810)	28 3/4" (870)	10'-9" (3.31 m)	6'-10" (2.11 m)	29 1/2" (770)	22 (1.61 m)	5'-2 1/2" (1.71 m)	5'-6 1/4" (1.71 m)	4'-4 1/4" (1.10 m)	1 1/4 (0.50 m)	40° (2.0 m)	2.6 (2.0)	36 (836)	37 (839)	6'-11" (2.16 m)	13'-0" (3.94 m)	37 (1.45 m)	4'-9" (1.45 m)	46 (160)
	DS 24-1/2 (DS 600-1/2)	24 (600)	34 (870)	16 (410)	39 (990)	3'-10 1/4" (990)	13'-4 1/4" (4.08 m)	8'-3 1/4" (2.55 m)	36 1/4 (930)	30 (2.0 m)	6'-6 1/4" (2.06 m)	6'-10 1/4" (2.06 m)	4'-4 1/4" (1.10 m)	1 1/4 (0.50 m)	40° (2.8 m)	3.7 (2.8)	3'7" (1.990)	4'1" (1.26 m)	6'-0" (2.58 m)	16'-0" (4.83 m)	4'-1" (1.26 m)	5'-9" (1.75 m)	56 (230)
	DS 30-1/2 (DS 750-1/2)	30 (750)	39 (990)	19 (480)	39 (1140)	3'-9" (1,422 m)	15'-5" (4.7 m)	9'-6" (2.9 m)	3'-5 1/2" (1.06 m)	36 (914)	7'-6 1/2" (2.3 m)	7'-10 1/4" (2.39 m)	4'-4 1/4" (1.10 m)	1 1/4 (0.50 m)	40° (3.7 m)	4.8 (3.7)	4'-1" (1.12 m)	4'-0" (1.49 m)	9'-7" (2.94 m)	18'-6" (5.54 m)	4'-10" (1.19 m)	6'-6" (1.98 m)	66 (144)
	DS 36-1/2 (DS 900-1/2)	36 (900)	39 (1140)	22 (560)	22 (1320)	4'-4" (1,741 m)	5'-8 1/2" (5.48 m)	18'-0 1/4" (3.34 m)	10'-11 1/2" (1.22 m)	38 (1119 m)	4'-0" (2.7 m)	3'-8" (2.78 m)	4'-10 1/2" (1.10 m)	1 1/4 (0.50 m)	40° (4.8 m)	6.3 (4.8)	4'-9" (1.28 m)	5'-11 1/2" (1.81 m)	11'-1" (3.38 m)	21'-9" (6.47 m)	5'-11" (1.81 m)	7'-7" (2.31 m)	410 (74)
	DS 15-1/2 (DS 375-1/2)	15 (375)	28 (720)	10 (260)	29 (740)	33 (842)	11'-6 1/4" (3.54 m)	7'-9" (2.4 m)	29 1/4 (760)	19 (1.72 m)	5'-7 1/4" (1.82 m)	5'-11 1/4" (1.82 m)	4'-1 1/2" (1.10 m)	1 1/4 (0.50 m)	40° (2.0 m)	2.6 (2.0)	35 (809)	36 (914)	7'-10" (2.4 m)	13'-9" (4.12 m)	36 (1.42 m)	4'-8" (1.42 m)	50 (168)
50°	DS 18-1/2 (DS 450-1/2)	18 (450)	28 (720)	13 (330)	32 (810)	38 1/4 (870)	11'-11 1/2" (3.68 m)	7'-9" (2.4 m)	29 1/4 (760)	22 (1.79 m)	5'-5 1/2" (1.89 m)	6'-1 1/4" (1.89 m)	4'-1 1/2" (1.10 m)	1 1/4 (0.50 m)	40° (2.2 m)	2.9 (2.2)	36 (827)	33 (827)	3'-5" (1.05 m)	7'-10" (2.46 m)	3'-5" (4.33 m)	10'-0" (1.05 m)	50 (104)
	DS 24-1/2 (DS 600-1/2)	24 (600)	34 (870)	16 (410)	39 (990)	3'-10 1/4" (990)	13'-4 1/4" (4.08 m)	8'-3 1/4" (2.55 m)	36 1/4 (930)	30 (2.0 m)	6'-6 1/4" (2.06 m)	6'-10 1/4" (2.06 m)	4'-4 1/4" (1.10 m)	1 1/4 (0.50 m)	40° (2.8 m)	3.7 (2.8)	3'7" (1.990)	4'1" (1.26 m)	6'-0" (2.58 m)	16'-0" (4.83 m)	4'-1" (1.26 m)	5'-9" (1.75 m)	56 (230)
	DS 30-1/2 (DS 750-1/2)	30 (750)	39 (990)	19 (480)	39 (1140)	3'-9" (1,422 m)	15'-5" (4.55 m)	9'-5" (2.9 m)	35 1/4 (910)	30 (2.23 m)	7'-3 1/4" (2.32 m)	7'-7 1/4" (2.32 m)	4'-2" (1.10 m)	1 1/4 (0.50 m)	40° (3.2 m)	4.2 (3.2)	3'6" (1.978)	4'1" (1.4 m)	9'-5" (2.94 m)	17'-6" (5.32 m)	10'-0" (1.4 m)	5'-11" (1.91 m)	62 (117)
	DS 36-1/2 (DS 900-1/2)	36 (900)	39 (1140)	22 (560)	22 (1320)	4'-4" (1,594 m)	5'-2 1/4" (5.24 m)	17'-2 1/4" (3.3 m)	10'-9 1/4" (1.04 m)	36 (914)	8'-5 1/4" (2.57 m)	8'-9" (2.67 m)	4'-2" (1.10 m)	1 1/4 (0.50 m)	40° (4.1 m)	5.4 (4.1)	4'-1" (1.1 m)	5'-6" (1.66 m)	11'-0" (3.33 m)	20'-6" (6.1 m)	5'-6" (1.66 m)	7'-2" (2.19 m)	74 (158)
	DS 15-1/2 (DS 375-1/2)	15 (375)	28 (720)	10 (260)	29 (740)	33 (842)	11'-6 1/4" (3.54 m)	7'-9" (2.4 m)	29 1/4 (760)	19 (1.72 m)	5'-7 1/4" (1.82 m)	5'-11 1/4" (1.82 m)	4'-1 1/2" (1.10 m)	1 1/4 (0.50 m)	40° (2.0 m)	2.6 (2.0)	35 (809)	36 (914)	7'-10" (2.4 m)	13'-9" (4.12 m)	36 (1.42 m)	4'-8" (1.42 m)	50 (168)
	DS 18-1/2 (DS 450-1/2)	18 (450)	28 (720)	13 (330)	32 (810)	38 1/4 (870)	11'-11 1/2" (3.68 m)	7'-9" (2.4 m)	29 1/4 (760)	22 (1.79 m)	5'-5 1/2" (1.89 m)	6'-1 1/4" (1.89 m)	4'-1 1/2" (1.10 m)	1 1/4 (0.50 m)	40° (2.2 m)	2.9 (2.2)	36 (827)	33 (827)	3'-5" (1.05 m)	7'-10" (2.46 m)	3'-5" (4.33 m)	10'-0" (1.05 m)	50 (104)
	DS 24-1/2 (DS 600-1/2)	24 (600)	34 (870)	16 (410)	39 (990)	3'-11 1/4" (990)	13'-4 1/4" (4.08 m)	8'-3 1/4" (2.55 m)	36 1/4 (930)	30 (2.0 m)	6'-6 1/4" (2.06 m)	6'-11 1/4" (2.06 m)	4'-2" (1.10 m)	1 1/4 (0.50 m)	40° (2.2 m)	3.2 (2.2)	3'3" (1.827)	4'1" (1.04 m)	9'-0" (2.78 m)	17'-6" (4.62 m)	10'-0" (1.04 m)	5'-11" (1.55 m)	50 (104)
55°	DS 30-1/2 (DS 750-1/2)	30 (750)	39 (990)	19 (480)	39 (1140)	3'-9" (1,594 m)	15'-5" (5.24 m)	9'-5" (3.3 m)	35 1/4 (914)	36 (2.57 m)	8'-5 1/4" (2.67 m)	8'-10 1/4" (2.67 m)	4'-2" (1.10 m)	1 1/4 (0.50 m)	40° (4.1 m)	5.4 (4.1)	3'6" (1.827)	5'1" (1.10 m)	11'-0" (3.33 m)	20'-6" (6.1 m)	5'-6" (1		

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)				
														h - bars			h ₁ - bars							
			A	B	C	D	E	F	G	H	J	K	M	N	a	o	p	q	Lgth.	p	Lgth.	v-bars No.		
5°	DS 15-2 (DS 375-2)	15 (375)	38 (960)	10 (260)	29 (740)	19 (485)	8'-7 1/4" (2.63 m)	4'-8 1/4" (1.42 m)	4'-5 1/2" (1.31 m)	19 (483)	4'-3 3/4" (1.31 m)	4'-4" (1.32 m)	2 1/4 (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 (551)	3'-5" (1.04 m)	34 (50)	
	DS 18-2 (DS 450-2)	18 (450)	38 (960)	13 (330)	32 (810)	22 (561)	8'-10 1/4" (2.71 m)	4'-8 1/4" (1.42 m)	4'-5 1/2" (1.31 m)	22 (559)	4'-5 1/4" (1.35 m)	4'-5 1/2" (1.35 m)	2 1/4 (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)	
	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 1/4" (1.65 m)	5'-5 1/4" (1.65 m)	2 1/4 (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)	
	DS 30-2 (DS 750-2)	30 (750)	4'-4" (1.32 m)	19 (480)	3'-14" (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 1/4" (1.89 m)	6'-2 1/4" (1.89 m)	2 1/4 (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)	
	DS 36-2 (DS 900-2)	36 (900)	5'-0" (1.52 m)	22 (560)	4'-4" (1.32 m)	3'-8 1/4" (1.23 m)	14'-5" (4.39 m)	7'-4 1/4" (2.25 m)	6'-9 1/4" (2.07 m)	3'-8" (1.19 m)	7'-2 1/4" (2.19 m)	7'-2 1/4" (2.19 m)	2 1/4 (70)	2 1/4 (60)	85°	4.5 (3.4)	7'-2" (2.12 m)	31 (119 m)	7'-8" (2.3 m)	18'-9" (5.6 m)	31 (1.19 m)	5'-7" (1.70 m)	54 (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" (1.33 m)	4'-5" (1.32 m)	2 1/4 (70)	2 1/4 (60)	80°	2.0 (1.5)	4'-4" (1.28 m)	22 (557)	5'-1" (1.52 m)	22'-3" (3.36 m)	22 (557)	3'-6" (1.07 m)	34 (50)	
10°	DS 18-2 (DS 450-2)	18 (450)	38 (960)	13 (330)	32 (810)	22 1/4 (568)	9'-0" (2.73 m)	4'-11" (1.5 m)	4'-1 1/2" (1.26 m)	22 (559)	4'-5 1/4" (1.36 m)	4'-6 1/4" (1.37 m)	2 1/4 (70)	2 1/4 (60)	80°	2.1 (1.6)	4'-4" (1.32 m)	25 (633)	5'-1" (1.55 m)	11'-6" (3.36 m)	25 (633)	3'-9" (1.14 m)	34 (54)	
	DS 24-2 (DS 600-2)	24 (600)	3'-10" (1.16 m)	16 (410)	39 (990)	30 1/2 (774)	11'-0 1/4" (3.34 m)	5'-1 1/2" (1.81 m)	5'-1 1/2" (1.52 m)	30 (762)	5'-5 1/4" (1.66 m)	5'-6 1/4" (1.68 m)	2 1/4 (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)	
	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 1/4" (3.82 m)	6'-9" (2.06 m)	6'-3" (1.73 m)	36 (914)	6'-3 1/4" (1.92 m)	6'-3 1/4" (1.92 m)	2 1/4 (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)	
	DS 36-2 (DS 900-2)	36 (900)	5'-0" (1.52 m)	22 (560)	4'-4" (1.32 m)	3'-8 1/4" (1.23 m)	14'-1" (4.44 m)	7'-9 1/4" (2.37 m)	6'-6 1/4" (1.99 m)	3'-8" (1.19 m)	7'-3" (2.21 m)	7'-3" (2.21 m)	2 1/4 (70)	2 1/4 (60)	80°	4.7 (3.6)	7'-0" (2.04 m)	31 (1.2 m)	8'-1" (2.42 m)	3'-11" (5.66 m)	31 (1.2 m)	5'-7" (1.70 m)	54 (135)	
	DS 15-2 (DS 375-2)	15 (375)	38 (960)	10 (260)	29 (740)	19 1/4 (500)	8'-10 1/4" (2.7 m)	5'-2 1/2" (1.58 m)	4'-0" (1.21 m)	19 (483)	4'-4 1/4" (1.34 m)	4'-6" (1.36 m)	3 (80)	2	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)	
	DS 18-2 (DS 450-2)	18 (450)	38 (960)	13 (330)	32 (810)	22 1/4 (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 (80)	2	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)	
15°	DS 24-2 (DS 600-2)	24 (600)	3'-10" (1.16 m)	16 (410)	39 (990)	31 (789)	11'-2 1/4" (3.4 m)	6'-3 1/2" (1.91 m)	4'-10" (1.47 m)	30 (762)	5'-5 1/4" (1.69 m)	5'-6 1/4" (1.72 m)	3 (80)	2	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)	
	DS 30-2 (DS 750-2)	30 (750)	4'-4" (1.32 m)	19 (480)	3'-9" (1.14 m)	37 1/4 (946)	12'-9 1/4" (3.89 m)	7'-1 1/2" (2.17 m)	5'-5 1/4" (1.67 m)	36 (914)	6'-4" (1.93 m)	6'-5 1/4" (1.96 m)	3 (80)	2	75°	3.9 (3.0)	5'-10" (1.72 m)	35 (1.01 m)	3'-4" (2.21 m)	7'-4" (4.94 m)	16'-6" (1.52 m)	35 (1.52 m)	5'-0" (1.13 m)	52 (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 (1.15 m)	14'-10 1/4" (4.52 m)	8'-2 1/2" (2.77 m)	6'-3 1/2" (1.63 m)	19 (483)	8'-2 1/2" (1.63 m)	8'-3 1/2" (1.63 m)	3 (80)	2	75°	5.0 (3.8)	6'-9" (1.97 m)	41 (1.22 m)	8'-6" (2.55 m)	19'-3" (5.74 m)	19'-3" (1.22 m)	4'-0" (1.73 m)	56 (140)	
	DS 15-2 (DS 375-2)	15 (375)	38 (960)	10 (260)	29 (740)	19' (514)	8'-10 1/4" (2.85 m)	5'-6 1/4" (2.77 m)	3'-10 1/2" (1.63 m)	19 (483)	4'-6 1/4" (1.61 m)	4'-7 1/2" (1.61 m)	2 1/4 (80)	2 1/4 (60)	80°	2.1 (1.6)	4'-2" (1.21 m)	23 (581)	5'-8" (1.69 m)	13'-4" (3.48 m)	13'-4" (581)	3'-7" (1.09 m)	36 (50)	
	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 1/4" (1.63 m)	3'-10 1/2" (1.63 m)	22 (559)	4'-7 1/2" (1.64 m)	4'-8 1/2" (1.64 m)	2 1/4 (80)	2 1/4 (60)	80°	2.3 (1.8)	4'-2" (1.24 m)	26 (661)	5'-8" (1.73 m)	12'-0" (3.63 m)	12'-0" (661)	3'-10" (1.17 m)	36 (59)	
	DS 24-2 (DS 600-2)	24 (600)	3'-10" (1.16 m)	16 (410)	39 (990)	32 (811)	11'-6 1/4" (3.49 m)	6'-8 1/4" (2.03 m)	4'-8 1/4" (1.42 m)	30 (762)	5'-8 1/2" (1.73 m)	5'-9 1/4" (1.76 m)	3 (80)	2	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)	48 (90)	
20°	DS 30-2 (DS 750-2)	30 (750)	4'-4" (1.32 m)	19 (480)	3'-9" (1.14 m)	38 1/4 (973)	13'-1'4" (3.99 m)	7'-6 1/4" (2.3 m)	5'-3 1/2" (1.61 m)	36 (914)	6'-6" (1.98 m)	6'-7 1/4" (2.01 m)	3 (80)	2	70°	4.1 (3.1)	5'-9" (1.67 m)	37 (1.04 m)	7'-10" (2.35 m)	17'-0" (5.05 m)	17'-0" (1.04 m)	5'-1" (1.55 m)	52 (113)	
	DS 36-2 (DS 900-2)	36 (900)	5'-0" (1.52 m)	22 (560)	4'-4" (1.32 m)	3'-10 1/4 (1.23 m)	15'-3" (4.64 m)	8'-8 1/4" (2.65 m)	6'-1'4" (1.86 m)	38 1/4 (1.19 m)	7'-6 1/4" (2.34 m)	7'-8 1/4" (2.34 m)	3 (80)	2	70°	5.3 (4.1)	6'-6" (1.91 m)	41 (1.26 m)	8'-11" (2.7 m)	19'-6" (5.87 m)	19'-6" (1.26 m)	4'-1" (1.75 m)	58 (144)	
	DS 15-2 (DS 375-2)	15 (375)	38 (960)	10 (260)	29 (740)	21 (533)	9'-5" (2.86 m)	5'-10 1/4" (2.86 m)	3'-9" (1.14 m)	19 (483)	4'-7 1/2" (1.41 m)	4'-9 1/2" (1.45 m)	3 1/4 (90)	3 1/4 (90)	65°	2.2 (1.7)	4'-1" (1.12 m)	23 (600)	6'-0" (1.8 m)	12'-0" (3.58 m)	12'-0" (600)	3'-7" (1.09 m)	38 (54)	
	DS 18-2 (DS 450-2)	18 (450)	38 (960)	13 (330)	32 (810)	24 1/4 (617)	9'-8 1/2" (2.95 m)	5'-10 1/4" (1.79 m)	3'-9" (1.14 m)	22 (559)	5'-8 1/2" (1.76 m)	5'-9 1/4" (1.76 m)	3 1/4 (90)	3 1/4 (90)	65°	2.4 (1.8)	4'-0" (1.2 m)	27 (683)	6'-10" (1.85 m)	14'-9" (3.73 m)	14'-9" (683)	4'-7" (1.19 m)	42 (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" (1.38 m)	30 (762)	5'-10 1/2" (1.78 m)	6'-0 1/2" (1.83 m)	3 1/4 (90)	3 1/4 (90)	65°	3.4 (2.6)	4'-11" (1.43 m)	35 (909)	7'-4" (2.2 m)	15'-3" (4.55 m)	15'-3" (909)	4'-7" (1.40 m)	48 (90)	
	DS 30-2 (DS 750-2)	30 (750)	4'-4" (1.32 m)	19 (480)	3'-9" (1.14 m)	37 1/4 (1,008 m)	13'-3 1/4" (4.13 m)	8'-0 1/4" (2.46 m)	5'-1'4" (1.57 m)	36 (914)	6'-8 1/2" (2.04 m)	6'-10 1/4" (2.04 m)	3 1/4 (90)	3 1/4 (90)	65°	4.3 (3.3)	5'-6" (1.62 m)	43 (1.08 m)	8'-3" (2.5 m)	17'-3" (5.2 m)	17'-3" (1.08 m)	5'-2" (1.58 m)	52 (113)	
	DS 36-2 (DS 900-2)	36 (900)	5'-0" (1.52 m)	22 (560)	4'-4" (1.32 m)	4'-0 1/4 (1,235 m)	15'-9 1/4" (4.8 m)	9'-3 1/4" (2.83 m)	5'-11 1/4" (1,81 m)	38 1/4 (1,19 m)	7'-9 1/4" (2.38 m)	7'-11 1/4" (2,42 m)	3 1/4 (90)	3 1/4 (90)	65°	5.6 (4.3)	6'-5" (1,86 m)	43 (1,3 m)	8'-3" (2,88 m)	9'-7" (6,04 m)	9'-7" (1,3 m)	5'-11" (1,80 m)	60 (149)	
30°	DS 15-2 (DS 375-2)	15 (375)	38 (960)	10 (260)	29 (740)	22 (558)	9'-5 1/4" (2.98 m)	6'-4" (1,92 m)	3'-8" (1,11 m)	19 (483)	4'-9 1/4" (1,46 m)	5'-0" (1,52 m)	3 1/2 (90)	3 1/2 (90)	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)	
	DS 18-2 (DS 450-2)	18 (450)	38 (960)	13 (330)	32 (810)	25 1/2 (645)	10'-1'6" (3.07 m)	6'-4" (1,92 m)	3'-8" (1,11 m)	22 (559)	5'-2" (1,51 m)	5'-2" (1,56 m)	3 1/2 (90)	3 1/2 (90)	60°	2.5 (1,9)	4'-0" (1,18 m)	28 (712)</						

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)		
														h - bars			h ₁ - bars					
			A	B	C	D	E	F	G	H	J	K	M	N	a	o	p	q	Lgth.	p	Lgth.	No.
35°	DS 15-2 (DS 375-2)	15 (375)	38 (960)	10 (260)	29 (740)	23 ¹ / ₄ (590)	10'-4" (2.08 m)	6'-10 ³ / ₄ " (1.08 m)	3'-6 ³ / ₄ " (0.98 m)	19 (485)	5'-0 ³ / ₄ " (1.54 m)	5'-3 ¹ / ₄ " (1.6 m)	3 ³ / ₄ (0.90 m)	1 ¹ / ₂ (0.40 m)	55° (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 " (2.08 m)	6'-10 ³ / ₄ " (1.05 m)	3'-6 ³ / ₄ " (0.95 m)	22 (559)	5'-2 ¹ / ₂ " (1.58 m)	5'-5 ¹ / ₄ " (1.65 m)	3 ³ / ₄ (0.90 m)	1 ¹ / ₂ (0.40 m)	55° (2.0)	3'-11" (1.15 m)	29 (750)	6'-11" (2.14 m)	13'-3" (4.04 m)	29 (750)	4'-1" (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 (3.97 m)	13'-1" (2.52 m)	4'-3 ³ / ₄ " (1.31 m)	30 (762)	6'-5 ¹ / ₄ " (1.95 m)	6'-7 ¹ / ₄ " (2.3 m)	3 ³ / ₄ (0.90 m)	1 ¹ / ₂ (0.40 m)	55° (2.9)	3'-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)	3'-8" (1.116 m)	14'-11" (4.54 m)	4'-10 ³ / ₄ " (2.86 m)	36 (914)	7'-4 ¹ / ₄ " (2.24 m)	7'-6 ³ / ₄ " (2.3 m)	3 ³ / ₄ (0.90 m)	1 ¹ / ₂ (0.40 m)	55° (3.7)	5'-4" (1.55 m)	31' (1.18 m)	3'-11" (1.64 m)	18'-9" (5.64 m)	28 (1.18 m)	5'-7" (1.31 m)	290 (131)	
	DS 36-2 (DS 900-2)	36 (900)	5'-0" (1.52 m)	22 (560)	4'-4" (1.32 m)	4'-5 ¹ / ₄ " (1.366 m)	17'-4 ¹ / ₄ " (5.28 m)	10'-10" (3.29 m)	5'-7 ³ / ₄ " (1.72 m)	38 (1.119 m)	8'-6 ¹ / ₄ " (2.61 m)	8'-9 ¹ / ₄ " (2.67 m)	3 ³ / ₄ (0.90 m)	1 ¹ / ₂ (0.40 m)	55° (4.8)	6'-1" (1.78 m)	48'-8" (1.43 m)	11'-0" (3.34 m)	21'-9" (6.55 m)	6'-4" (1.43 m)	380 (171)	
40°	DS 15-2 (DS 375-2)	15 (375)	38 (960)	10 (260)	29 (740)	34 ¹ / ₄ (6.31)	11'-0" (2.27 m)	7'-6" (1.06 m)	3'-6" (0.98 m)	19 (485)	5'-4 ¹ / ₂ " (1.63 m)	5'-7 ¹ / ₂ " (1.71 m)	3 ³ / ₄ (0.90 m)	1 ¹ / ₂ (0.40 m)	50° (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 / ₄ (3.44 m)	11'-4" (2.27 m)	7'-6" (1.08 m)	3'-6" (0.98 m)	22 (559)	5'-6 ¹ / ₂ " (1.68 m)	5'-9 ¹ / ₂ " (1.76 m)	3 ³ / ₄ (0.90 m)	1 ¹ / ₂ (0.40 m)	50° (2.1)	2.8 (1.13 m)	31 (798)	7'-7" (2.34 m)	14'-0" (4.26 m)	31 (798)	4'-3" (1.30 m)	160 (72)
	DS 24-2 (DS 600-2)	24 (600)	3'-10" (1.16 m)	16 (410)	39 (990)	3'-3 ¹ / ₄ (4.23 m)	13'-11 ¹ / ₄ " (2.75 m)	4'-2 ³ / ₄ " (1.28 m)	30 (762)	6'-10 ¹ / ₄ " (2.15 m)	7'-1" (1.00 m)	3 ³ / ₄ (0.90 m)	1 ¹ / ₂ (0.40 m)	50° (3.1)	4.1 (1.34 m)	48'-7" (1.07 m)	48'-6" (2.79 m)	17'-3" (5.2 m)	5'-6" (1.07 m)	52 (108)		
	DS 30-2 (DS 750-2)	30 (750)	4'-4" (1.32 m)	19 (480)	3'-9" (1.14 m)	3'-11 ¹ / ₄ " (1.193 m)	15'-10 ¹ / ₄ " (4.84 m)	10'-3" (3.12 m)	4'-9 ¹ / ₄ " (1.46 m)	36 (914)	7'-10" (2.38 m)	8'-0 ¹ / ₄ " (2.46 m)	3 ³ / ₄ (0.90 m)	1 ¹ / ₂ (0.40 m)	50° (4.0)	5.2 (1.52 m)	31' (1.26 m)	10'-4" (3.17 m)	5'-3" (0.95 m)	5'-10" (1.26 m)	310 (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)	5'-6 ¹ / ₂ " (3.6 m)	3'-8" (1.68 m)	21'-10" (1.119 m)	9'-1 ¹ / ₂ " (2.78 m)	9'-4 ¹ / ₂ " (2.85 m)	3 ³ / ₄ (0.90 m)	1 ¹ / ₂ (0.40 m)	50° (5.2)	6'-0" (1.74 m)	51' (1.53 m)	12'-0" (3.65 m)	23'-0" (6.92 m)	5'-0" (1.53 m)	420 (189)	
45°	DS 15-2 (DS 375-2)	15 (375)	38 (960)	10 (260)	29 (740)	34 ¹ / ₄ (6.31)	11'-0 ¹ / ₄ " (2.27 m)	8'-3 ¹ / ₄ " (1.04 m)	3'-5 ¹ / ₄ " (0.98 m)	19 (485)	5'-9 ¹ / ₂ " (1.76 m)	6'-0 ¹ / ₄ " (1.84 m)	3 ³ / ₄ (0.90 m)	1 ¹ / ₂ (0.40 m)	45° (2.1)	2.8 (1.09 m)	29 (753)	7'-7 ¹ / ₂ " (2.51 m)	14'-6" (4.35 m)	29 (753)	4'-1" (1.25 m)	150 (68)
	DS 18-2 (DS 450-2)	18 (450)	38 (960)	13 (330)	32 (810)	28 ¹ / ₄ (3.7 m)	11'-2 ¹ / ₂ " (2.27 m)	8'-3 ¹ / ₄ " (1.04 m)	3'-5 ¹ / ₄ " (0.98 m)	22 (559)	5'-11 ¹ / ₂ " (1.81 m)	6'-3" (1.89 m)	3 ³ / ₄ (0.90 m)	1 ¹ / ₂ (0.40 m)	45° (2.4)	3.1 (1.11 m)	34 (859)	8'-4" (2.58 m)	15'-0" (4.55 m)	34 (859)	4'-6" (1.37 m)	180 (81)
	DS 24-2 (DS 600-2)	24 (600)	3'-10" (1.16 m)	16 (410)	39 (990)	3'-6 ¹ / ₂ " (1.078 m)	15'-0 ¹ / ₄ " (4.56 m)	10'-0 ¹ / ₄ " (3.03 m)	4'-1 ¹ / ₄ " (1.26 m)	30 (762)	7'-4 ¹ / ₂ " (2.24 m)	7'-7 ¹ / ₂ " (2.32 m)	3 ³ / ₄ (0.90 m)	1 ¹ / ₂ (0.40 m)	45° (3.4)	4.4 (1.32 m)	46' (1.15 m)	10'-0" (3.08 m)	18'-3" (5.55 m)	3'-9" (1.15 m)	5'-5" (1.65 m)	250 (113)
	DS 30-2 (DS 750-2)	30 (750)	4'-4" (1.32 m)	19 (480)	3'-9" (1.14 m)	4'-3 ¹ / ₄ " (1.293 m)	17'-1 ¹ / ₄ " (5.23 m)	11'-4 ¹ / ₄ " (3.45 m)	4'-8 ¹ / ₄ " (1.43 m)	36 (914)	8'-5 ¹ / ₄ " (2.57 m)	8'-8 ¹ / ₄ " (2.66 m)	4 ¹ / ₄ (0.90 m)	1 ¹ / ₂ (0.40 m)	45° (4.3)	5.6 (1.49 m)	52' (1.36 m)	11'-5" (3.5 m)	18'-3" (6.35 m)	3'-9" (1.36 m)	5'-5" (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 / ₄ " (1.583 m)	19'-11 ¹ / ₄ " (6.08 m)	13'-0 ¹ / ₄ " (5.97 m)	5'-5" (1.65 m)	39 (1.119 m)	9'-10 ¹ / ₄ " (3.0 m)	10'-1 ¹ / ₂ " (3.08 m)	4 ¹ / ₄ (0.90 m)	1 ¹ / ₂ (0.40 m)	45° (5.7)	7.4 (1.71 m)	51' (1.65 m)	11'-2" (4.02 m)	18'-3" (7.39 m)	24'-6" (1.65 m)	5'-5" (2.16 m)	450 (203)
50°	DS 15-2 (DS 375-2)	15 (375)	38 (960)	10 (260)	29 (740)	29 ¹ / ₂ (6.31)	12'-11 ¹ / ₂ " (4.05 m)	9'-3" (2.81 m)	3'-4 ¹ / ₂ " (1.03 m)	19 (485)	6'-7 ¹ / ₂ " (1.92 m)	6'-10 ¹ / ₂ " (2.01 m)	1 ¹ / ₂ (0.40 m)	40° (2.4)	5.1 (1.07 m)	32' (822)	9'-4" (2.81 m)	15'-9" (4.7 m)	32' (822)	4'-4" (1.32 m)	170 (77)	
	DS 18-2 (DS 450-2)	18 (450)	38 (960)	13 (330)	32 (810)	34 ¹ / ₄ (7.07)	13'-4 ¹ / ₄ " (4.05 m)	9'-3" (2.81 m)	3'-4 ¹ / ₂ " (0.98 m)	22 (559)	6'-6 ¹ / ₄ " (1.98 m)	6'-10 ¹ / ₂ " (2.07 m)	1 ¹ / ₂ (0.40 m)	40° (2.6)	3.4 (1.1 m)	38' (839)	9'-3" (2.88 m)	16'-0" (4.92 m)	37' (3.93 m)	3'-9" (1.45 m)	190 (86)	
	DS 24-2 (DS 600-2)	24 (600)	3'-10" (1.16 m)	16 (410)	39 (990)	3'-10 ¹ / ₄ " (4.99 m)	16'-5 ¹ / ₂ " (3.39 m)	11'-2 ¹ / ₂ " (1.24 m)	4'-1" (0.98 m)	30 (762)	8'-1" (2.45 m)	8'-4 ¹ / ₂ " (1.26 m)	4 ¹ / ₄ (0.90 m)	1 ¹ / ₂ (0.40 m)	40° (3.7)	4.8 (1.3 m)	46' (1.26 m)	11'-1" (3.44 m)	19'-9" (6.0 m)	4'-1" (1.26 m)	280 (126)	
	DS 30-2 (DS 750-2)	30 (750)	4'-4" (1.32 m)	19 (480)	3'-9" (1.14 m)	3'-9 ¹ / ₄ " (1.422 m)	18'-9 ¹ / ₄ " (5.72 m)	12'-8 ¹ / ₄ " (3.86 m)	4'-7 ¹ / ₄ " (1.41 m)	36 (914)	9'-3" (2.82 m)	9'-6 ¹ / ₂ " (2.92 m)	4 ¹ / ₄ (0.90 m)	1 ¹ / ₂ (0.40 m)	40° (4.7)	6.2 (1.47 m)	55' (1.49 m)	10'-0" (3.91 m)	22'-9" (6.87 m)	4'-10" (1.49 m)	6'-6" (1.98 m)	370 (167)
	DS 36-2 (DS 900-2)	36 (900)	5'-0" (1.52 m)	22 (560)	4'-4" (1.32 m)	5'-2 ¹ / ₄ " (1.741 m)	21'-10 ¹ / ₄ " (6.45 m)	14'-7 ¹ / ₂ " (3.86 m)	5'-3 ¹ / ₄ " (1.62 m)	36 (914)	11'-1 ¹ / ₄ " (3.24 m)	11'-1 ¹ / ₄ " (3.38 m)	4 ¹ / ₄ (0.90 m)	1 ¹ / ₂ (0.40 m)	40° (6.2)	8.1 (1.49 m)	50' (1.81 m)	15'-10" (4.5 m)	26'-6" (8.0 m)	5'-11" (1.81 m)	7'-7" (1.81 m)	490 (221)
55°	DS 15-2 (DS 375-2)	15 (375)	38 (960)	10 (260)	29 (740)	33 (742)	14'-5" (4.38 m)	10'-6 ¹ / ₄ " (3.2 m)	3'-4" (1.01 m)	19 (485)	7'-0 ¹ / ₄ " (2.14 m)	7'-4 ¹ / ₂ " (2.24 m)	4 ¹ / ₂ (0.90 m)	1 ¹ / ₂ (0.40 m)	35° (2.6)	3.4 (1.06 m)	38' (914)	10'-7" (3.18 m)	17'-3" (5.17 m)	36 (914)	4'-8" (1.42 m)	180 (81)
	DS 18-2 (DS 450-2)	18 (450)	38 (960)	13 (330)	32 (810)	38 ¹ / ₄ (7.05)	14'-10 ¹ / ₄ " (5.2 m)	10'-6 ¹ / ₄ " (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 (0.90 m)	1 ¹ / ₂ (0.40 m)	35° (2.8)	3.7 (1.08 m)	35' (1.05 m)	10'-7" (3.27 m)	17'-9" (5.4 m)	3'-5" (1.05 m)	5'-1" (1.55 m)	210 (95)
	DS 24-2 (DS 600-2)	24 (600)	3'-10" (1.16 m)	16 (410)	39 (990)	3'-10 ¹ / ₄ " (6.35 m)	14'-10 ¹ / ₄ " (4.48 m)	12'-2 ¹ / ₂ " (3.71 m)	4'-0 ¹ / ₄ " (1.0 m)	30 (762)	9'-0 ¹ / ₄ " (2.44 m)	9'-4 ¹ / ₂ " (2.55 m)	4 ¹ / ₂ (0.90 m)	1 ¹ / ₂ (0.40 m)	35° (3.0)	4.2 (1.05 m)	48' (1.04 m)	10'-7" (3.7 m)	22'-9" (5.79 m)	4'-10" (1.04 m)	6'-6" (1.55 m)	300 (135)



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	a	
5°	42 (1050) (1.25 m)	4'-1"	26	4'-10 1/2"	4'-3 1/4"	13'-5"	6'-0 1/2"	5'-6 1/2"	4'-3"	6'-8 1/4"	6'-8 3/4"	3 1/2	3	85°	6.0 (4.6)
	48 (1200) (1.35 m)	4'-6"	29	5'-5"	4'-10 1/4"	14'-10"	6'-8"	6'-1 1/4"	4'-10"	7'-4 1/4"	7'-5 1/4"	3 1/2	3	85°	7.2 (5.5)
	54 (1350) (1.56 m)	4'-11"	32	5'-11 1/2"	5'-5 1/4"	16'-3"	7'-3 1/4"	6'-8"	5'-5"	8'-1 1/4"	8'-1 1/4"	3 1/2	3	85°	8.4 (6.4)
	60 (1500) (1.62 m)	5'-4"	35	6'-6"	6'-0 1/4"	17'-8"	7'-10 1/4"	7'-2 1/4"	6'-0"	8'-9 1/4"	8'-10 1/4"	3 1/2	3	85°	9.8 (7.5)
10°	42 (1050) (1.25 m)	4'-1"	26	4'-10 1/2"	4'-3 1/4"	13'-6 1/2"	6'-4 1/4"	5'-4"	4'-3"	6'-8 1/4"	6'-9 1/4"	3 1/4	3	80°	6.3 (4.8)
	48 (1200) (1.35 m)	4'-6"	29	5'-5"	4'-11"	15'-0"	7'-0"	5'-10 1/2"	4'-10"	7'-5 1/2"	7'-6 1/2"	3 1/4	3	80°	7.5 (5.7)
	54 (1350) (1.56 m)	4'-11"	32	5'-11 1/2"	5'-6"	16'-5"	7'-7 1/4"	6'-5"	5'-5"	8'-2"	8'-3"	3 1/4	3	80°	8.8 (6.7)
	60 (1500) (1.62 m)	5'-4"	35	6'-6"	6'-1"	17'-10 1/2"	8'-3 1/2"	6'-11 1/2"	6'-0"	8'-10 1/4"	8'-11 1/4"	3 1/4	3	80°	10.3 (7.9)
15°	42 (1050) (1.25 m)	4'-1"	26	4'-10 1/2"	4'-4 1/4"	13'-9 1/2"	6'-8 1/2"	5'-1 1/4"	4'-3"	6'-10"	6'-11 1/4"	4	2 1/4	75°	6.6 (5.0)
	48 (1200) (1.35 m)	4'-6"	29	5'-5"	5'-0"	15'-3"	7'-4 1/4"	5'-8"	4'-10"	7'-6 1/4"	7'-8 1/4"	4	2 1/4	75°	7.9 (6.0)
	54 (1350) (1.56 m)	4'-11"	32	5'-11 1/2"	5'-7 1/4"	16'-8 1/4"	8'-1"	6'-2 1/4"	5'-5"	8'-3 1/4"	8'-5"	4	2 1/4	75°	9.3 (7.1)
	60 (1500) (1.62 m)	5'-4"	35	6'-6"	6'-2 1/2"	18'-2 1/4"	8'-9 1/4"	6'-8 1/4"	6'-0"	9'-0 1/2"	9'-1 1/4"	4	2 1/4	75°	10.8 (8.3)
20°	42 (1050) (1.25 m)	4'-1"	26	4'-10 1/2"	4'-6 1/4"	14'-1 1/4"	7'-1 1/2"	4'-11 1/4"	4'-3"	7'-0"	7'-1 1/4"	4 1/4	2 1/2	70°	7.0 (5.4)
	48 (1200) (1.35 m)	4'-6"	29	5'-5"	5'-1 1/4"	15'-7 1/4"	7'-10 1/4"	5'-6"	4'-10"	7'-9"	7'-10 1/4"	4 1/4	2 1/2	70°	8.4 (6.4)
	54 (1350) (1.56 m)	4'-11"	32	5'-11 1/2"	5'-9 1/4"	17'-2"	8'-6 1/4"	6'-0"	5'-5"	8'-6"	8'-8"	4 1/4	2 1/2	70°	9.9 (7.6)
	60 (1500) (1.62 m)	5'-4"	35	6'-6"	6'-4 1/4"	18'-8"	9'-3 1/2"	6'-6 1/4"	6'-0"	9'-3"	9'-5"	4 1/4	2 1/2	70°	11.5 (8.8)
25°	42 (1050) (1.25 m)	4'-1"	26	4'-10 1/2"	4'-8 1/4"	14'-7 1/2"	7'-7 1/4"	4'-10"	4'-3"	7'-2 1/2"	7'-5"	4 1/2	2 1/4	65°	7.4 (5.7)
	48 (1200) (1.35 m)	4'-6"	29	5'-5"	5'-4"	16'-2 1/4"	8'-4 1/2"	5'-4"	4'-10"	8'-0"	8'-2 1/4"	4 1/2	2 1/4	65°	8.9 (6.8)
	54 (1350) (1.56 m)	4'-11"	32	5'-11 1/2"	5'-11 1/4"	17'-9"	9'-1 1/4"	5'-10"	5'-5"	8'-9 1/4"	8'-11 1/4"	4 1/2	2 1/4	65°	10.5 (8.0)
	60 (1500) (1.62 m)	5'-4"	35	6'-6"	6'-7 1/2"	19'-3 1/4"	9'-11"	6'-4"	6'-0"	9'-6 1/4"	9'-9"	4 1/2	2 1/4	65°	12.2 (9.3)
30°	42 (1050) (1.25 m)	4'-1"	26	4'-10 1/2"	4'-11"	15'-3"	8'-2"	4'-8 1/2"	4'-3"	7'-6"	7'-9"	4 1/2	2 1/4	60°	7.9 (6.0)
	48 (1200) (1.35 m)	4'-6"	29	5'-5"	5'-7"	16'-10 1/2"	9'-0"	5'-2 1/4"	4'-10"	8'-3 1/4"	8'-6 1/4"	4 1/2	2 1/4	60°	9.5 (7.3)
	54 (1350) (1.56 m)	4'-11"	32	5'-11 1/2"	6'-3"	18'-6 1/4"	9'-10"	5'-8"	5'-5"	9'-1 1/4"	9'-4 1/2"	4 1/2	2 1/4	60°	11.2 (8.6)
	60 (1500) (1.62 m)	5'-4"	35	6'-6"	6'-11 1/4"	20'-2"	10'-8"	6'-2"	6'-0"	9'-11 1/2"	10'-2 1/2"	4 1/2	2 1/4	60°	13.1 (10.0)

APPROVED	April 1, 2016	ISSUED	1-1-97
<i>[Signature]</i>			
ENGINEER OF BRIDGES AND STRUCTURES			
APPROVED	April 1, 2016		
<i>[Signature]</i>			
ENGINEER OF DESIGN AND ENVIRONMENT			

**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	a
35°	42 (1.25 m)	4'-1"	26 (1.66 m)	4'-10 1/2"	5'-2 1/4"	16'-0 1/4"	8'-10"	4'-7 1/4"	4'-3"	7'-10 1/4"	8'-2"	4 1/4	2 (120)	55° (6.5) (47)
	48 (1.35 m)	4'-6"	29 (1.74 m)	5'-5"	5'-10 3/4"	17'-9 1/2"	9'-9"	5'-1"	4'-10"	8'-9"	9'-0 1/2"	4 1/4	2 (120)	55° (7.8) (55)
	54 (1.56 m)	4'-11"	32 (1.81 m)	5'-11 1/2"	6'-7 1/4"	19'-6 1/4"	10'-7 1/4"	5'-6 1/2"	5'-5"	9'-7 1/2"	9'-10 1/4"	4 1/4	2 (120)	55° (9.2) (68)
	60 (1.62 m)	5'-4"	35 (1.89 m)	6'-6"	7'-4"	21'-3"	11'-6 1/2"	6'-0 1/4"	6'-0"	10'-5 1/4"	10'-9 1/4"	4 1/4	2 (120)	55° (10.8) (74)
	72 (1.90 m)	5'-11 1/2"	38 (2.232 m)	6'-2 1/4"	12'-2 1/4"	23'-3 1/2"	13'-3 1/2"	6'-1 1/2"	6'-0 1/2"	13'-2 1/2"	13'-3 1/2"	4 1/4	2 (120)	55° (12.7) (89)
40°	42 (1.25 m)	4'-1"	26 (1.66 m)	4'-10 1/2"	5'-6 1/2"	17'-1 1/4"	9'-8"	4'-6"	4'-3"	8'-4 1/2"	8'-8 1/2"	5 (130)	1 1/4 (50)	50° (7.0) (60)
	48 (1.35 m)	4'-6"	29 (1.74 m)	5'-5"	6'-3 3/4"	18'-11 1/4"	10'-7 1/4"	4'-11 1/2"	4'-10"	9'-3 1/2"	9'-7 1/2"	5 (130)	1 1/4 (50)	50° (8.4) (70)
	54 (1.56 m)	4'-11"	32 (1.85 m)	5'-11 1/2"	7'-0 1/4"	20'-9 1/2"	11'-7 1/2"	5'-5"	5'-5 1/2"	10'-2 1/4"	10'-6 1/2"	5 (130)	1 1/4 (50)	50° (9.9) (86)
	60 (1.62 m)	5'-4"	35 (1.97 m)	6'-6"	7'-10"	22'-7 1/4"	12'-7 1/2"	6'-0"	6'-0"	11'-2"	11'-5 1/2"	5 (130)	1 1/4 (50)	50° (11.6) (95)
	72 (1.90 m)	5'-11 1/2"	38 (2.387 m)	6'-2 1/4"	12'-2 1/4"	23'-3 1/2"	13'-3 1/2"	6'-1 1/2"	6'-0 1/2"	13'-2 1/2"	13'-3 1/2"	5 (130)	1 1/4 (50)	50° (12.8) (103)
45°	42 (1.25 m)	4'-1"	26 (1.66 m)	4'-10 1/2"	6'-0"	18'-5 1/4"	10'-8"	4'-5"	4'-3"	9'-0 1/2"	9'-4 1/2"	5/4 (140)	1 1/2 (40)	45° (7.6) (65)
	48 (1.35 m)	4'-6"	29 (1.74 m)	5'-5"	6'-10"	20'-5 1/4"	11'-9"	4'-10 1/2"	4'-10"	10'-0 1/2"	10'-4 1/2"	5/4 (140)	1 1/2 (40)	45° (9.2) (75)
	54 (1.56 m)	4'-11"	32 (1.85 m)	5'-11 1/2"	7'-8"	22'-5 1/4"	12'-10 1/4"	5'-3 1/2"	5'-5"	11'-0 1/2"	11'-4 1/2"	5/4 (140)	1 1/2 (40)	45° (10.9) (93)
	60 (1.62 m)	5'-4"	35 (1.97 m)	6'-6"	8'-5 1/4"	24'-5 1/4"	13'-11 1/4"	5'-9 1/4"	6'-0"	12'-0 1/2"	12'-4 1/4"	5/4 (140)	1 1/2 (40)	45° (12.8) (103)
	72 (1.90 m)	5'-11 1/2"	38 (2.586 m)	6'-2 1/4"	12'-2 1/4"	23'-3 1/2"	13'-3 1/2"	6'-1 1/2"	6'-0 1/2"	13'-2 1/2"	13'-3 1/2"	5/4 (140)	1 1/2 (40)	45° (14.1) (94)
50°	42 (1.25 m)	4'-1"	26 (1.66 m)	4'-10 1/2"	6'-7 1/4"	20'-2 1/2"	11'-11 1/4"	4'-4 1/4"	4'-3"	9'-10 1/2"	10'-3 1/2"	5/2 (140)	1 1/2 (40)	40° (8.4) (71)
	48 (1.35 m)	4'-6"	29 (1.74 m)	5'-5"	7'-6 1/4"	22'-4 1/2"	13'-2"	4'-9 1/2"	4'-10"	10'-11 1/4"	11'-4 1/2"	5/2 (140)	1 1/2 (40)	40° (10.2) (69)
	54 (1.56 m)	4'-11"	32 (1.85 m)	5'-11 1/2"	8'-5"	24'-7"	14'-4 1/2"	5'-2 1/2"	5'-5"	12'-1"	12'-6"	5/2 (140)	1 1/2 (40)	40° (12.1) (85)
	60 (1.62 m)	5'-4"	35 (1.97 m)	6'-6"	9'-4"	26'-9 1/4"	15'-7 1/4"	5'-8"	6'-0"	13'-2 1/2"	13'-7"	5/2 (140)	1 1/2 (40)	40° (14.1) (85)
	72 (1.90 m)	5'-11 1/2"	38 (2.845 m)	6'-2 1/4"	12'-2 1/4"	23'-3 1/2"	13'-3 1/2"	6'-1 1/2"	6'-0 1/2"	13'-2 1/2"	13'-7"	5/2 (140)	1 1/2 (40)	40° (14.1) (94)
55°	42 (1.25 m)	4'-1"	26 (1.66 m)	4'-10 1/2"	7'-5"	22'-5 1/4"	13'-7"	4'-3 1/2"	4'-3"	11'-0 1/4"	11'-5 1/2"	5/4 (150)	1 1/4 (30)	35° (9.4) (79)
	48 (1.35 m)	4'-6"	29 (1.74 m)	5'-5"	8'-5"	24'-11 1/2"	14'-11 1/2"	4'-8 1/2"	4'-10"	12'-3"	12'-8 1/2"	5/4 (150)	1 1/4 (30)	35° (11.4) (92)
	54 (1.56 m)	4'-11"	32 (1.85 m)	5'-11 1/2"	9'-5 1/4"	27'-5"	16'-4 1/4"	5'-1 1/2"	5'-5"	13'-6"	13'-11"	5/4 (150)	1 1/4 (30)	35° (13.5) (113)
	60 (1.62 m)	5'-4"	35 (1.97 m)	6'-6"	10'-5 1/2"	29'-10 1/4"	17'-8 1/4"	5'-7"	6'-0"	14'-8 1/4"	15'-2"	5/4 (150)	1 1/4 (30)	35° (15.9) (125)
	72 (1.90 m)	5'-11 1/2"	38 (3.188 m)	6'-2 1/4"	12'-2 1/4"	23'-3 1/2"	13'-3 1/2"	6'-1 1/2"	6'-0 1/2"	13'-2 1/2"	13'-7"	5/4 (150)	1 1/4 (30)	35° (16.2) (119)
60°	42 (1.25 m)	4'-1"	26 (1.66 m)	4'-10 1/2"	8'-6"	25'-7 1/4"	15'-9 1/4"	4'-2 1/2"	4'-3"	12'-7"	13'-0 1/4"	6/4 (160)	1 30° (10.8)	89 (75)
	48 (1.35 m)	4'-6"	29 (1.74 m)	5'-5"	9'-8"	28'-5 1/4"	17'-4 1/4"	4'-8"	4'-10"	14'-0"	14'-5 1/4"	6/4 (160)	1 30° (13.0)	104 (87)
	54 (1.56 m)	4'-11"	32 (1.85 m)	5'-11 1/2"	10'-10"	31'-3 1/4"	19'-0"	5'-1"	5'-5"	15'-5"	15'-10 1/4"	6/4 (160)	1 30° (15.5)	129 (108)
	60 (1.62 m)	5'-4"	35 (1.97 m)	6'-6"	12'-0"	34'-1 1/4"	20'-7 1/4"	5'-6 1/4"	6'-0"	16'-10"	17'-3 1/4"	6/4 (160)	1 30° (16.2)	142 (119)
	72 (1.90 m)	5'-11 1/2"	38 (3.658 m)	6'-2 1/4"	12'-2 1/4"	23'-3 1/2"	13'-3 1/2"	6'-1 1/2"	6'-0 1/2"	13'-2 1/2"	13'-7"	5/2 (160)	1 30° (18.2)	142 (119)

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	

	Illinois Department of Transportation
APPROVED	April 1, 2016
<i>[Signature]</i>	
ENGINEER OF BRIDGES AND STRUCTURES	
APPROVED	April 1, 2014
<i>[Signature]</i>	
ENGINEER OF DESIGN AND ENVIRONMENT	
ISSUED	1-1-17

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	a		
5°	42 (1050) (1.66 m)	5'-5"	26 (660)	4'-10 1/2"	4'-3 1/4"	16'-1"	8'-0 1/4"	7'-4 1/4"	4'-3"	8'-0 1/4"	8'-0 1/4"	3 1/2	3	85°	8.0 (6.1)	61 (51)
	48 (1200) (1.8 m)	6'-0"	29 (740)	5'-5"	4'-10 1/4"	17'-10"	8'-0 1/2"	8'-1 1/4"	1,473 m	8'-10 1/4"	8'-11 1/4"	3 1/2	3	85°	9.6 (7.3)	71 (59)
	54 (1350) (2.08 m)	6'-7"	32 (810)	5'-11 1/2"	5'-5 1/4"	19'-7"	9'-9"	8'-11 1/4"	1,651 m	9'-9 1/4"	9'-9 1/4"	3 1/2	3	85°	11.3 (8.6)	88 (74)
	60 (1500) (2.16 m)	7'-2"	35 (890)	6'-6"	6'-0 1/4"	21'-4 1/4"	10'-7 1/4"	9'-8 3/4"	1,829 m	10'-8"	10'-8 1/4"	3 1/2	3	85°	13.2 (10.1)	96 (80)
	42 (1050) (1.66 m)	5'-5"	26 (660)	4'-10 1/2"	4'-3 1/4"	16'-3"	8'-5"	7'-0 1/4"	1,295 m	8'-1"	8'-2"	3 1/4	3	80°	8.3 (6.3)	62 (52)
10°	48 (1200) (1.8 m)	6'-0"	29 (740)	5'-5"	4'-11"	18'-0 1/2"	9'-4"	7'-10"	1,473 m	8'-11 1/4"	8'-0 1/4"	3 1/4	3	80°	9.9 (7.6)	72 (60)
	54 (1350) (2.08 m)	6'-7"	32 (810)	5'-11 1/2"	5'-6"	19'-9 1/4"	10'-3"	8'-7 1/4"	1,651 m	9'-10 1/2"	9'-11 1/4"	3 1/4	3	80°	11.7 (8.9)	90 (75)
	60 (1500) (2.16 m)	7'-2"	35 (890)	6'-6"	6'-1"	21'-7"	11'-1 1/4"	9'-4 1/4"	1,829 m	10'-9"	10'-10 1/4"	3 1/4	3	80°	13.7 (10.5)	98 (82)
	42 (1050) (1.66 m)	5'-5"	26 (660)	4'-10 1/2"	4'-4 1/4"	16'-6 1/2"	8'-10 1/4"	6'-10"	1,295 m	8'-2 1/2"	8'-4"	4	2 1/4	75°	8.6 (6.6)	64 (53)
	48 (1200) (1.8 m)	6'-0"	29 (740)	5'-5"	5'-0"	18'-4 1/2"	9'-10 1/4"	7'-6 1/2"	1,473 m	9'-1 1/2"	9'-3"	4	2 1/4	75°	10.4 (8.0)	74 (62)
15°	54 (1350) (2.08 m)	6'-7"	32 (810)	5'-11 1/2"	5'-7 1/4"	20'-2"	10'-9 1/4"	8'-3 1/4"	1,651 m	10'-0 1/4"	10'-1 1/4"	4	2 1/4	75°	12.3 (9.4)	92 (77)
	60 (1500) (2.16 m)	7'-2"	35 (890)	6'-6"	6'-2 1/2"	21'-11 1/4"	11'-9 1/4"	9'-0 1/2"	1,829 m	10'-11 1/4"	11'-0 1/2"	4	2 1/4	75°	14.3 (10.9)	100 (84)
	42 (1050) (1.66 m)	5'-5"	26 (660)	4'-10 1/2"	4'-6 1/4"	16'-11 1/4"	9'-5 1/4"	6'-7 1/4"	1,295 m	8'-5"	8'-6 1/4"	4 1/4	2 1/2	70°	9.0 (6.9)	66 (55)
	48 (1200) (1.8 m)	6'-0"	29 (740)	5'-5"	5'-1 1/4"	18'-10"	10'-5 1/2"	7'-4"	1,473 m	9'-4"	9'-6"	4 1/4	2 1/2	70°	10.9 (8.3)	76 (64)
	54 (1350) (2.08 m)	6'-7"	32 (810)	5'-11 1/2"	5'-9 1/4"	20'-8 1/2"	11'-5 1/4"	8'-0 1/2"	1,651 m	10'-3 1/4"	10'-5 1/4"	4 1/4	2 1/2	70°	12.9 (9.9)	94 (79)
20°	60 (1500) (2.16 m)	7'-2"	35 (890)	6'-6"	6'-2 1/2"	21'-11 1/4"	11'-9 1/4"	9'-0 1/2"	1,829 m	10'-11 1/4"	11'-0 1/2"	4	2 1/4	70°	15.1 (11.5)	103 (86)
	42 (1050) (1.66 m)	5'-5"	26 (660)	4'-10 1/2"	4'-6 1/4"	16'-11 1/4"	9'-5 1/4"	6'-7 1/4"	1,295 m	8'-5"	8'-6 1/4"	4 1/4	2 1/2	70°	9.0 (6.9)	66 (55)
	48 (1200) (1.8 m)	6'-0"	29 (740)	5'-5"	5'-1 1/4"	18'-10"	10'-5 1/2"	7'-4"	1,473 m	9'-4"	9'-6"	4 1/4	2 1/2	70°	10.9 (8.3)	76 (64)
	54 (1350) (2.08 m)	6'-7"	32 (810)	5'-11 1/2"	5'-9 1/4"	20'-8 1/2"	11'-5 1/4"	8'-0 1/2"	1,651 m	10'-3 1/4"	10'-5 1/4"	4 1/4	2 1/2	70°	12.9 (9.9)	94 (79)
	60 (1500) (2.16 m)	7'-2"	35 (890)	6'-6"	6'-4 1/4"	22'-6 1/4"	12'-6"	8'-9"	1,829 m	11'-2 1/2"	11'-4 1/4"	4 1/4	2 1/2	70°	15.1 (11.5)	103 (86)
25°	42 (1050) (1.66 m)	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 1/4	65°	9.5 (7.3)	65 (55)
	48 (1200) (1.8 m)	6'-0"	29 (740)	5'-5"	5'-4"	19'-6"	11'-2"	7'-1 1/4"	1,473 m	9'-7 1/4"	9'-10 1/4"	4 1/2	2 1/4	65°	11.5 (8.8)	79 (66)
	54 (1350) (2.08 m)	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 1/4"	10'-9 1/4"	4 1/2	2 1/4	65°	13.6 (10.4)	98 (82)
	60 (1500) (2.16 m)	7'-2"	35 (890)	6'-6"	6'-7 1/2"	23'-4 1/4"	13'-4"	8'-6"	1,829 m	11'-7"	11'-9 1/4"	4 1/2	2 1/4	65°	15.9 (12.2)	107 (90)
	42 (1050) (1.66 m)	5'-5"	26 (660)	4'-10 1/2"	4'-11"	18'-4"	10'-10"	6'-3"	1,295 m	8'-0 1/2"	9'-3 1/2"	4 1/2	2 1/4	60°	10.1 (7.7)	71 (59)
30°	48 (1200) (1.8 m)	6'-0"	29 (740)	5'-5"	5'-7"	20'-4 1/4"	12'-0"	6'-11 1/4"	1,473 m	10'-0 1/4"	10'-3 1/2"	4 1/2	2 1/4	60°	12.2 (9.3)	82 (69)
	54 (1350) (2.08 m)	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 1/4"	11'-3 1/2"	4 1/2	2 1/4	60°	14.4 (11.0)	102 (86)
	60 (1500) (2.16 m)	7'-2"	35 (890)	6'-6"	6'-11 1/4"	24'-4 1/4"	14'-4"	8'-3 1/4"	1,829 m	12'-1"	12'-3 1/4"	4 1/2	2 1/4	60°	16.9 (12.9)	112 (93)
	42 (1050) (1.66 m)	5'-5"	26 (660)	4'-10 1/2"	4'-11"	18'-4"	10'-10"	6'-3"	1,295 m	8'-0 1/2"	9'-3 1/2"	4 1/2	2 1/4	60°	10.1 (7.7)	71 (59)
	48 (1200) (1.8 m)	6'-0"	29 (740)	5'-5"	5'-7"	20'-4 1/4"	12'-0"	6'-11 1/4"	1,473 m	10'-0 1/4"	10'-3 1/2"	4 1/2	2 1/4	60°	12.2 (9.3)	82 (69)

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

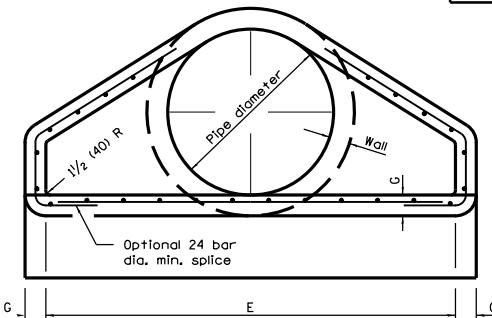
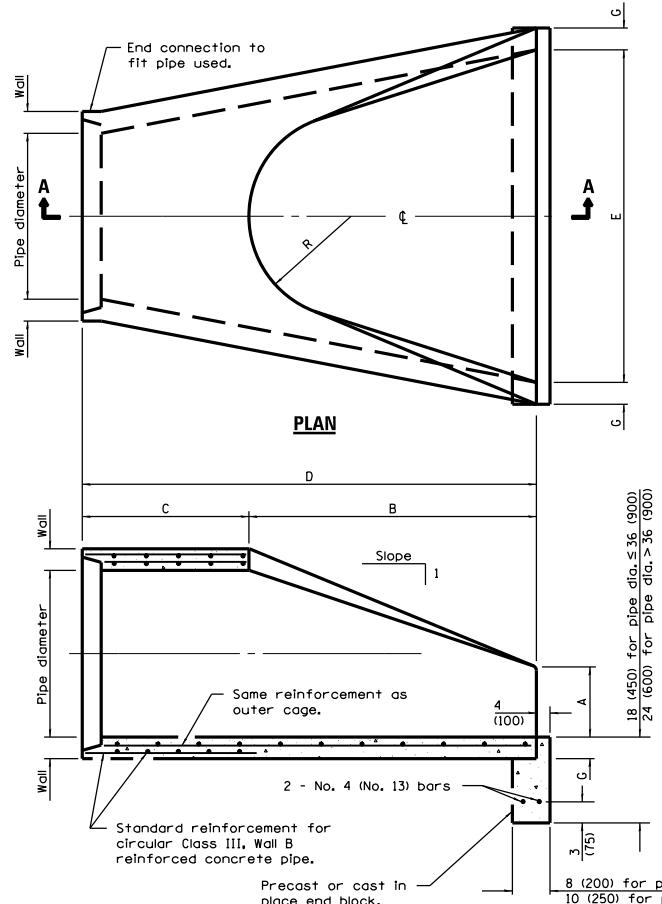
APPROVED	April 1, 2016	ISSUED	1-1-17
ENGINEER OF BRIDGES AND STRUCTURES			
APPROVED	April 1, 2016		
ENGINEER OF DESIGN AND ENVIRONMENT			

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	a
35°	42 (1050) (1.66 m)	5'-5"	26 (660) (1.49 m)	4'-10 1/2"	5'-2 1/4"	19'-3 3/4"	11'-8 1/4"	6'-1 1/4"	4'-3"	9'-6 1/4"	9'-9 1/2"	4 1/4	2 (120) (50)	55° (8.3) (63)
	48 (1200) (1.80 m)	6'-0"	29 (740) (1.64 m)	5'-5"	5'-10 3/4"	21'-5 1/2"	13'-0"	6'-9 1/4"	4'-10"	10'-7"	10'-10 1/2"	4 1/4	2 (120) (50)	55° (9.9) (73)
	54 (1350) (2.08 m)	6'-7"	32 (810) (1.85 m)	5'-11 1/2"	6'-7 1/4"	23'-7"	14'-3"	7'-5"	5'-5"	11'-7 1/4"	11'-11 1/4"	4 1/4	2 (120) (50)	55° (11.8) (90)
	60 (1500) (2.16 m)	7'-2"	35 (890) (1.97 m)	6'-6"	7'-4"	25'-8 3/4"	15'-6 1/4"	8'-1"	6'-0"	12'-8 1/4"	13'-0"	4 1/4	2 (120) (50)	55° (13.8) (99)
40°	42 (1050) (1.66 m)	5'-5"	26 (660) (1.49 m)	4'-10 1/2"	5'-6 1/2"	20'-7"	12'-9 1/4"	5'-11 1/4"	4'-3"	10'-1 1/2"	10'-5 1/2"	5 1/4	5 (130) (50)	50° (8.9) (67)
	48 (1200) (1.80 m)	6'-0"	29 (740) (1.64 m)	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 1/4	5 (130) (50)	50° (10.7) (77)
	54 (1350) (2.08 m)	6'-7"	32 (810) (1.85 m)	5'-11 1/2"	7'-0 1/4"	25'-1 1/4"	15'-1"	7'-3 1/4"	5'-5"	12'-5"	12'-8 1/4"	5 1/4	5 (130) (50)	50° (12.8) (96)
	60 (1500) (2.16 m)	7'-2"	35 (890) (1.97 m)	6'-6"	7'-10"	27'-5 1/4"	16'-1 1/2"	7'-1 1/2"	6'-0"	13'-6 1/4"	13'-10 1/2"	5 1/4	5 (130) (50)	50° (14.9) (105)
45°	42 (1050) (1.66 m)	5'-5"	26 (660) (1.49 m)	4'-10 1/2"	6'-0"	22'-2 1/2"	14'-1 1/4"	5'-10 1/4"	4'-3"	10'-11"	11'-3 1/2"	5 1/4	1/2 (140) (40)	45° (9.6) (72)
	48 (1200) (1.80 m)	6'-0"	29 (740) (1.64 m)	5'-5"	6'-10"	24'-8 1/4"	15'-8 1/4"	6'-6"	4'-10"	12'-2"	12'-6 1/4"	5 1/4	1/2 (140) (40)	45° (12.0) (83)
	54 (1350) (2.08 m)	6'-7"	32 (810) (1.85 m)	5'-11 1/2"	7'-8"	27'-1 1/4"	17'-2 1/2"	7'-1 1/2"	5'-5"	13'-4 1/4"	13'-9"	5 1/4	1/2 (140) (40)	45° (13.9) (104)
	60 (1500) (2.16 m)	7'-2"	35 (890) (1.97 m)	6'-6"	8'-5 3/4"	29'-7 1/2"	18'-8 3/4"	7'-9"	6'-0"	14'-7 1/2"	15'-0"	5 1/4	1/2 (140) (40)	45° (16.3) (114)
50°	42 (1050) (1.66 m)	5'-5"	26 (660) (1.49 m)	4'-10 1/2"	6'-7 1/4"	24'-3 3/4"	15'-10"	5'-9 1/4"	4'-3"	11'-11 1/2"	12'-4 1/4"	5 1/2	1/2 (150) (40)	40° (10.6) (78)
	48 (1200) (1.80 m)	6'-0"	29 (740) (1.64 m)	5'-5"	7'-0 1/2"	27'-0 1/2"	17'-6 1/2"	6'-4 1/2"	4'-10"	13'-3 1/4"	13'-8 1/4"	5 1/2	1/2 (150) (40)	40° (12.8) (91)
	54 (1350) (2.08 m)	6'-7"	32 (810) (1.85 m)	5'-11 1/2"	8'-5"	29'-9 1/4"	19'-3"	7'-0"	5'-5"	14'-8 1/4"	15'-1"	5 1/2	1/2 (150) (40)	40° (15.3) (113)
	60 (1500) (2.16 m)	7'-2"	35 (890) (1.97 m)	6'-6"	9'-4"	32'-3 1/4"	20'-1 1/2"	7'-7 1/2"	6'-0"	16'-5 1/4"	16'-5 1/4"	5 1/2	1/2 (150) (40)	40° (18.0) (124)
55°	42 (1050) (1.66 m)	5'-5"	26 (660) (1.49 m)	4'-10 1/2"	7'-5"	27'-1 1/2"	18'-0 1/4"	5'-8 1/4"	4'-3"	13'-4 1/4"	13'-9 1/4"	5 1/4	1/4 (150) (30)	35° (11.9) (87)
	48 (1200) (1.80 m)	6'-0"	29 (740) (1.64 m)	5'-5"	8'-5"	30'-2 1/4"	19'-1 1/2"	6'-3 1/2"	4'-10"	14'-10 1/2"	15'-3 1/4"	5 1/4	1/4 (150) (30)	35° (14.4) (101)
	54 (1350) (2.08 m)	6'-7"	32 (810) (1.85 m)	5'-11 1/2"	9'-5 3/4"	33'-2 1/4"	21'-10 1/4"	6'-10 1/4"	5'-5"	16'-4 1/4"	16'-10"	5 1/4	1/4 (150) (30)	35° (17.1) (125)
	60 (1500) (2.16 m)	7'-2"	35 (890) (1.97 m)	6'-6"	10'-5 1/4"	36'-3 1/2"	23'-10"	7'-6 1/4"	6'-0"	17'-11 1/4"	18'-4 1/4"	5 1/4	1/4 (150) (30)	35° (20.2) (138)
60°	42 (1050) (1.66 m)	5'-5"	26 (660) (1.49 m)	4'-10 1/2"	8'-6"	30'-1 1/4"	20'-1 1/4"	5'-7 1/4"	4'-3"	15'-3"	15'-8 1/4"	6 1/4	1 (160) (30)	30° (13.5) (98)
	48 (1200) (1.80 m)	6'-0"	29 (740) (1.64 m)	5'-5"	9'-8"	34'-5 1/4"	23'-2 1/4"	6'-2 1/2"	4'-10"	17'-0"	17'-5 1/4"	6 1/4	1 (160) (30)	30° (16.4) (115)
	54 (1350) (2.08 m)	6'-7"	32 (810) (1.85 m)	5'-11 1/2"	10'-10"	37'-1 1/4"	25'-5 1/4"	6'-9 1/4"	5'-5"	18'-9"	19'-2 1/4"	6 1/4	1 (160) (30)	30° (19.6) (142)
	60 (1500) (2.16 m)	7'-2"	35 (890) (1.97 m)	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 (160) (30)	30° (23.1) (157)

**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

APPROVED	April 1, 2016	ISSUED	1-1-17
<i>[Signature]</i>			
ENGINEER OF BRIDGES AND STRUCTURES			
APPROVED	April 1, 2016		
<i>[Signature]</i>			
ENGINEER OF DESIGN AND ENVIRONMENT			



END VIEW

PIPE DIA.	APPROX. OTY. IBS. (KG.)	WALL	A	B	C	D	E	G	R	APPROX. SLOPE
12 (300)	530 (240)	2 (51)	4 (102)	24 (610)	4'-0 1/8"	6'-0 7/8"	24 (610)	2 (51)	9 (229)	1:2.4
15 (375)	740 (335)	2 1/4 (57)	6 (152)	27 (686)	3'-10"	6'-1"	30 (762)	2 1/4 (57)	11 (280)	1:2.4
18 (450)	990 (450)	2 1/2 (64)	9 (229)	27 (686)	3'-10"	6'-1"	36 (914)	2 1/2 (64)	12 (305)	1:2.4
21 (525)	1280 (580)	2 3/4 (70)	9 (229)	35 (889)	38 (965)	6'-1"	3'-6"	2 3/4 (70)	13 (330)	1:2.4
24 (600)	1520 (690)	3 (76)	9 1/2 (241)	3'-7 1/2"	30 (1,105 m)	6'-1 1/2"	4'-0"	3 (76)	14 (356)	1:2.5
27 (675)	1930 (875)	3 1/4 (83)	10 1/2 (267)	4'-0"	25 1/2 (1,219 m)	6'-1 1/2"	4'-6"	3 1/4 (83)	14 1/2 (368)	1:2.4
30 (750)	2190 (995)	3 1/2 (89)	12 (305)	12 (1,375 m)	19 1/4 (502)	6'-1 1/4"	5'-0"	3 1/2 (89)	15 (381)	1:2.5
33 (825)	3200 (1450)	3 3/4 (95)	13 1/2 (343)	4'-10 1/2"	39 1/4 (1,486 m)	8'-1 1/4"	5'-6"	3 3/4 (95)	17 1/2 (445)	1:2.5
36 (900)	4100 (1860)	4 (102)	15 (381)	5'-3"	34 1/4 (1,6 m)	8'-1 1/4"	6'-0"	4 (102)	20 (508)	1:2.5
42 (1050)	5380 (2440)	4 1/2 (114)	21 (533)	5'-3"	35 (1,6 m)	8'-2"	6'-6"	4 1/2 (114)	22 (559)	1:2.5
48 (1200)	6550 (2970)	5 (127)	24 (610)	6'-0"	26 (1,829 m)	8'-2"	7'-0"	5 (127)	22 (559)	1:2.5
54 (1350)	8240 (3740)	5 1/2 (140)	27 (686)	5'-5"	35 (1,651 m)	8'-4"	7'-6"	5 1/2 (140)	24 (610)	1:2.0
60 (1500)	8730 (3960)	6 (152)	35 (889)	5'-0"	39 (1,524 m)	8'-3"	8'-0"	5 (127)	•	1:1.9
66 (1650)	10710 (4860)	6 1/2 (165)	30 (762)	6'-0"	27 (1,829 m)	8'-3"	8'-6"	5 1/2 (140)	•	1:1.7
72 (1800)	12520 (5680)	7 (178)	36 (914)	6'-6"	21 (1,981 m)	8'-3"	9'-0"	6 (152)	•	1:1.8
78 (1950)	14770 (6700)	7 1/2 (191)	36 (914)	7'-6"	21 (2,286 m)	9'-3"	9'-6"	6 1/2 (165)	•	1:1.8
84 (2100)	18160 (8240)	8 (203)	36 (914)	7'-6 1/2"	21 (2,299 m)	9'-3 1/2"	10'-0"	6 1/2 (165)	•	1:1.6

* Radius as furnished by manufacturer

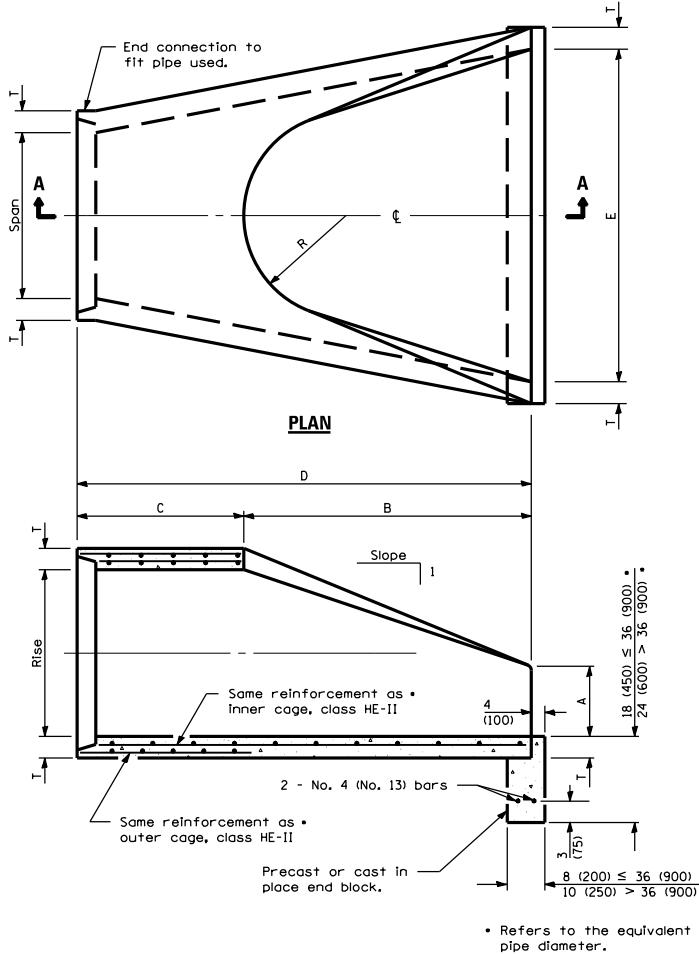
GENERAL NOTES

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

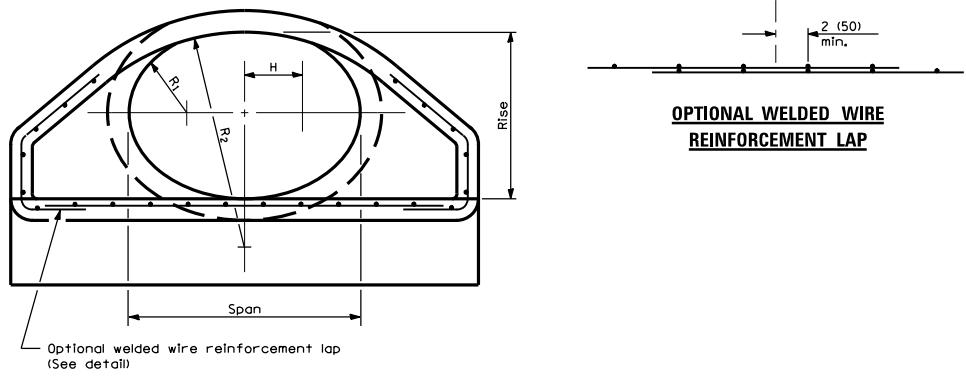
All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS	PRECAST REINFORCED CONCRETE FLARED END SECTION STANDARD 542301-03
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).	

	Illinois Department of Transportation
APPROVED	January 1, 2011
	Ralph E. Anderson
ENGINEER OF BRIDGES AND STRUCTURES	
APPROVED	January 1, 2011
	John J. Gossi
ENGINEER OF DESIGN AND ENVIRONMENT	



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)	2 3/4 (70)	8	27	3'-9"	6'-0"	36 (914)	5 3/8 (137)	6 (152)	6 (152)	20 (508)	1:3.1
30 (762)	19 (483)	24 (600)	3 1/4 (83)	8 1/2 (216)	39	33 (838)	6'-0"	4'-0"	6 1/8 (175)	7 (178)	8 1/4 (210)	26 1/4 (667)	1:2.8
34 (864)	22 (559)	27 (675)	3 1/2 (89)	9 (229)	4'-0"	24 (1,219 m)	6'-0"	4'-6"	7 3/4 (197)	8 (203)	9 1/4 (235)	29 1/4 (743)	1:2.9
38 (965)	24 (610)	30 (750)	3 1/2 (95)	9 1/2 (241)	4'-6"	18 (1,272 m)	6'-0"	5'-0"	8 5/8 (219)	9 (229)	10 1/4 (260)	32 3/4 (832)	1:2.9
45 (1143)	29 (737)	36 (900)	4 1/2 (114)	11 1/4 (286)	5'-0"	36 (1,524 m)	8'-0"	6'-0"	10 1/2 (267)	12 (305)	12 1/4 (311)	39 1/4 (997)	1:2.7
53 (1346)	34 (864)	42 (1050)	5 (127)	15 3/4 (400)	5'-0"	36 (1,524 m)	8'-0"	6'-6"	12 1/8 (308)	13 (330)	14 1/2 (368)	3' 10" (1,168 m)	1:2.6
60 (1524)	38 (965)	48 (1200)	5 1/2 (140)	21 (533)	5'-0"	36 (1,524 m)	8'-0"	7'-0"	13 1/2 (343)	14 (356)	16 1/2 (419)	4' 3 1/2" (1,308 m)	1:2.7
68 (1727)	43 (1092)	54 (1350)	6 (152)	26 (660)	5'-0"	36 (1,524 m)	8'-0"	7'-6"	15 1/4 (387)	16 (406)	18 3/4 (476)	4' 10 1/2" (1,486 m)	1:2.6
76 (1930)	48 (1219)	60 (1500)	6 1/2 (165)	31 (787)	5'-0"	36 (1,524 m)	8'-0"	8'-0"	17 (432)	18 (457)	20 1/4 (527)	5'-5" (1,651 m)	1:2.6



OPTIONAL WELDED WIRE REINFORCEMENT LAP

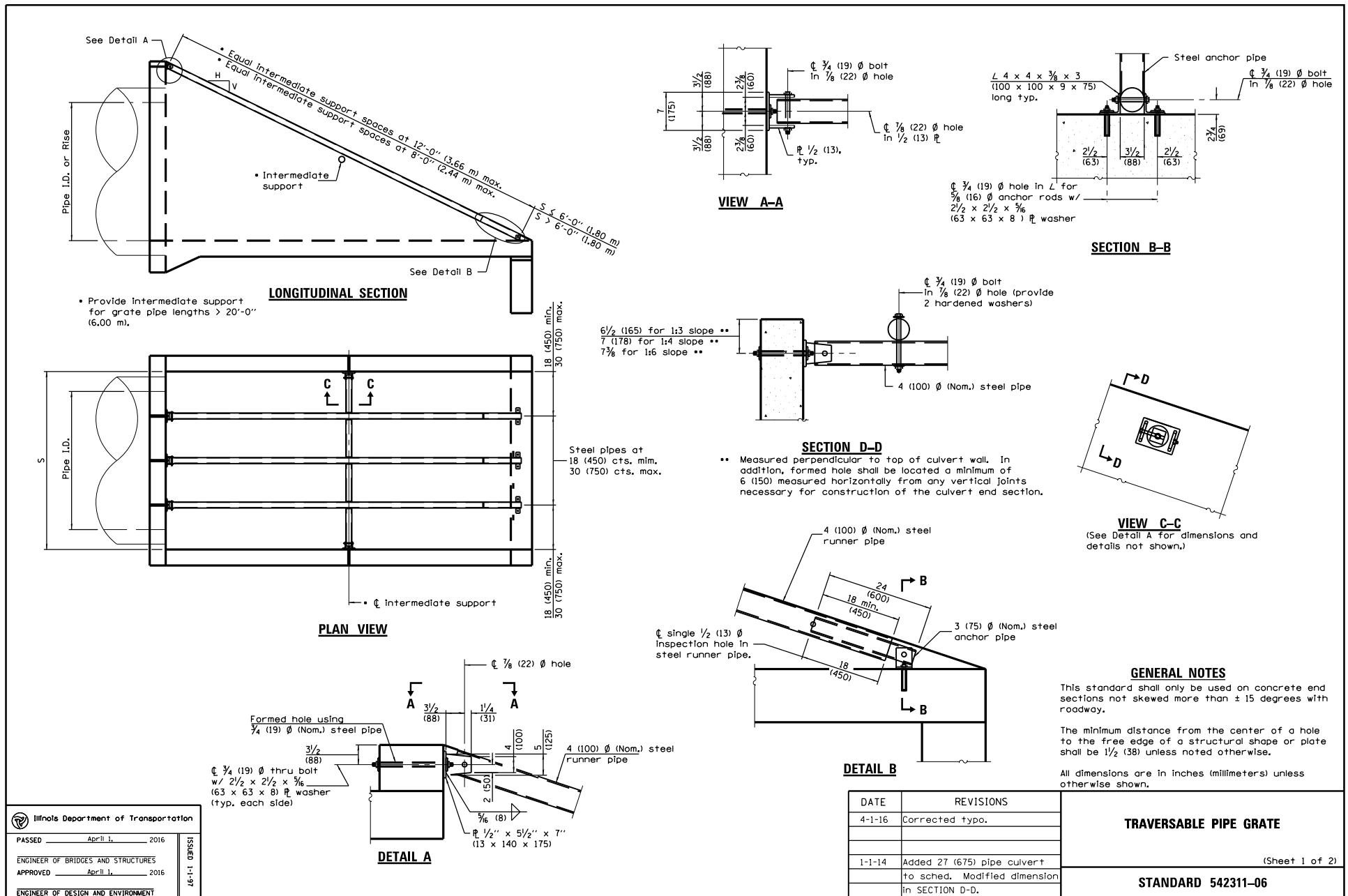
GENERAL NOTES
All slope ratios are expressed as units of vertical displacement to units of horizontal displacement ($V:H$).
All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
4-1-16	Changed terminology to 'welded wire reinforcement'.
	Corrected min. lap dimension.
I-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
ENGINEER OF BRIDGES AND STRUCTURES
APPROVED April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

1-1-197



PIPE-GRADE 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"		9'-8"	1 ♂ 12'-11"		12'-11"	1 ♂ 19'-7"		19'-7"			
30 (750)	1 ♂ 11'-4"		11'-4"	1 ♂ 14'-10"		14'-10"	1 ♂ 21'-0"		1 ♂ 3'-6"	25'-4"		
33 (825)	1 ♂ 12'-1"		12'-1"	1 ♂ 15'-10"		15'-10"	1 ♂ 23'-5"		1 ♂ 3'-7"	27'-0"		
36 (900)	1 ♂ 12'-10"		12'-10"	1 ♂ 16'-10"		16'-10"	1 ♂ 24'-11"		2 ♂ 3'-11"	32'-9"		
42 (1050)	2 ♂ 14'-9"		29'-6"	2 ♂ 19'-3"		38'-6"	2 ♂ 28'-6"		2 ♂ 4'-7"	66'-2"		
48 (1200)	2 ♂ 16'-4"		32'-8"	2 ♂ 21'-4"	1 ♂ 5'-1"	47'-9"	2 ♂ 31'-6"		2 ♂ 5'-1"	73'-2"		
54 (1350)	2 ♂ 18'-2"		36'-4"	2 ♂ 23'-9"	2 ♂ 5'-9"	59'-0"	2 ♂ 35'-1	4 ♂ 5'-9"	93'-2"			
60 (1500)	2 ♂ 19'-9"		39'-6"	2 ♂ 25'-10"	3 ♂ 6'-3"	70'-5"	2 ♂ 38'-1"	4 ♂ 6'-3"	101'-2"			
66 (1650)	2 ♂ 21'-7"	2 ♂ 6'-11"	57'-0"	2 ♂ 28'-2"	3 ♂ 6'-11"	77'-1"	2 ♂ 41'-11"	5 ♂ 6'-11"	127'-5"			
72 (1800)	3 ♂ 23'-2"	2 ♂ 7'-5"	84'-4"	3 ♂ 30'-3"	3 ♂ 7'-5"	113'-0"	3 ♂ 44'-8"	5 ♂ 7'-5"	171'-1"			
78 (1950)	3 ♂ 25'-0"	3 ♂ 8'-1"	99'-3"	3 ♂ 32'-8"	4 ♂ 8'-1"	130'-4"	3 ♂ 48'-3"	6 ♂ 8'-1"	193'-3"			
84 (2100)	3 ♂ 26'-7"	3 ♂ 8'-7"	105"-6"	3 ♂ 34'-9"	4 ♂ 8'-7"	138'-7"	3 ♂ 51'-3"	6 ♂ 8'-7"	206'-3"			

PIPE-GRADE 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"		8'-2"	1 ♂ 11'-2"		11'-2"	1 ♂ 17'-5"		17'-5"			
24 (600)	1 ♂ 8'-2"		8'-2"	1 ♂ 11'-2"		11'-2"	1 ♂ 17'-5"		17'-5"			
27 (675)	1 ♂ 8'-11"		8'-11"	1 ♂ 12'-2"		12'-2"	1 ♂ 18'-11"		18'-11"			
30 (750)	1 ♂ 9'-5"		9'-5"	1 ♂ 12'-11"		12'-11"	1 ♂ 19'-11"		19'-11"			
36 (900)	2 ♂ 11'-0"		22'-0"	2 ♂ 14'-11"		29'-10"	2 ♂ 22'-11"	1 ♂ 4'-7"	50'-5"			
42 (1050)	2 ♂ 12'-4"		24'-8"	2 ♂ 16'-8"		33'-4"	2 ♂ 25'-6"	2 ♂ 5'-5"	61'-10"			
48 (1200)	2 ♂ 13'-8"		27'-4"	2 ♂ 18'-5"		36'-10"	2 ♂ 28'-0"	3 ♂ 6'-1"	64'-3"			
54 (1350)	2 ♂ 15'-0"		30'-0"	2 ♂ 20'-1"	2 ♂ 6'-9"	53'-8"	2 ♂ 30'-7"	3 ♂ 6'-9"	81'-5"			
60 (1500)	3 ♂ 16'-7"		49'-9"	3 ♂ 22'-2"	2 ♂ 7'-7"	81'-8"	3 ♂ 33'-7"	4 ♂ 7'-7"	131'-1"			
66 (1650)	3 ♂ 17'-11"		53'-9"	3 ♂ 23'-11"	2 ♂ 8'-3"	88'-3"	3 ♂ 36'-2"	4 ♂ 8'-3"	141'-6"			
72 (1800)	3 ♂ 19'-6"		58'-6"	3 ♂ 25'-11"	3 ♂ 8'-11"	104'-6"	3 ♂ 39'-2"	4 ♂ 8'-11"	153'-2"			

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

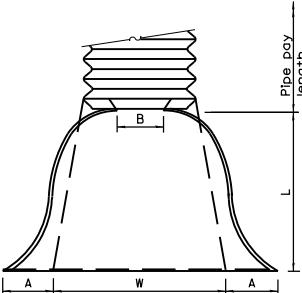
ISSUED 1-1-97

TRaversable Pipe Grate

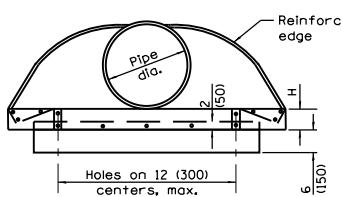
(Sheet 2 of 2)

STANDARD 542311-06

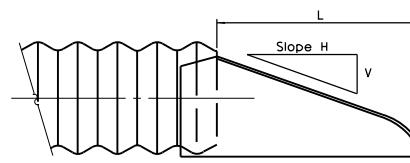
PIPE DIA.	THICK- NESS	DIMENSIONS						SLOPE (Approx.) (V:H)	BODY
		A	B	H	L	1/2 ±	W		
		1 ± (25)	(max.)	1 ± (25)	1/2 ± (38)	2 ± (50)			
12 (300)	0.064 (1.63)	6 (150)	6 (150)	6 (150)	21 (535)	24 (610)		1:2/2	1 P.c.
15 (375)	0.064 (1.63)	7 (180)	8 (205)	6 (205)	26 (660)	30 (760)		1:2/2	1 P.c.
18 (450)	0.079 (2.01)	8 (205)	10 (255)	6 (255)	31 (785)	36 (915)		1:2/2	1 P.c.
21 (525)	0.079 (2.01)	9 (230)	12 (305)	6 (305)	36 (915)	42 (1,065 m)		1:2/2	1 P.c.
24 (600)	0.079 (2.01)	10 (255)	13 (330)	6 (350)	41 (1,040 m)	48 (1,220 m)		1:2/2	1 P.c.
30 (750)	0.109 (2.77)	12 (305)	16 (405)	8 (405)	51 (1,295 m)	60 (1,525 m)		1:2/2	1 P.c.
36 (900)	0.109 (2.77)	14 (355)	19 (480)	9 (480)	60 (1,525 m)	72 (1,830 m)		1:2/2	2 P.c.
42 (1050)	0.079 (2.01)	16 (405)	22 (560)	11 (560)	69 (1,750 m)	84 (2,135 m)		1:2/2	2 P.c.
48 (1200)	0.109 (2.77)	18 (455)	27 (685)	12 (685)	78 (1,980 m)	90 (2,285 m)		1:2/4	2 P.c.
54 (1350)	0.109 (2.77)	18 (455)	30 (760)	12 (760)	84 (2,135 m)	102 (2,590 m)		1:2	2 P.c.
60 (1500)	0.109 (2.77)	18 (455)	33 (840)	12 (840)	87 (2,210 m)	114 (2,895 m)		1:1 1/4	3 P.c.
66 (1650)	0.109 (2.77)	18 (455)	36 (915)	12 (915)	87 (2,210 m)	120 (3,050 m)		1:1 1/2	3 P.c.
72 (1800)	0.138 (3.51)	18 (450)	39 (990)	12 (990)	87 (2,210 m)	126 (3,200 m)		1:1 1/3	3 P.c.
78 (1950)	0.168 (4.27)	18 (455)	42 (1,065 m)	12 (1,065 m)	87 (2,210 m)	132 (3,355 m)		1:1 1/4	3 P.c.
84 (2250)	0.168 (4.27)	18 (455)	45 (1,145 m)	12 (1,145 m)	87 (2,210 m)	138 (3,505 m)		1:1 1/6	3 P.c.



PLAN

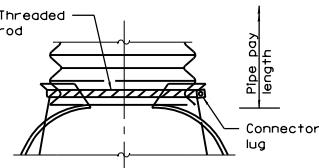


END VIEW

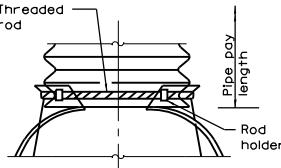


SIDE VIEW

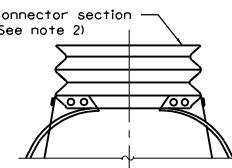
END SECTION



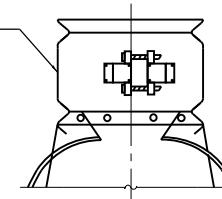
TYPE 1



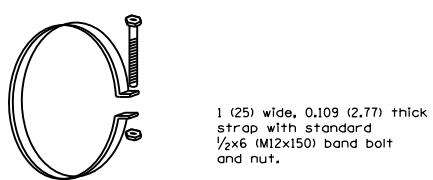
TYPE 2



TYPE 3



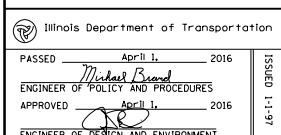
TYPE 4



ALTERNATE STRAP CONNECTOR

(For Type 1 only)

CONNECTIONS OF END SECTIONS



For 60 (1500) thru 84 (2250) sizes, reinforced edges shall be supplemented with stiffener angles. The angles shall be $2 \times 2\frac{1}{2} \times \frac{1}{4}$ (51x5x6.4) for 60 (1500) thru 72 (1800) diameter and $2 \frac{1}{2} \times 2\frac{1}{2} \times \frac{1}{4}$ (64x64x6.4) for 78 (1950) thru 84 (2250) diameter. The angles shall be attached by $\frac{3}{8}$ (M10) rivets or bolts.

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

NOTES

1. Types 1 and 2 for pipes with annular ends only.
 2. 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 $2\frac{1}{2}$ (68) pitch x $1\frac{1}{2}$ (13) depth or 3 (75) pitch x 1 (25) depth annular corrugated pipe.
 3. Type 4 connection can be used for all pipe sizes. Coupler shall be $2\frac{1}{2}$ x $1\frac{1}{2}$ (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.

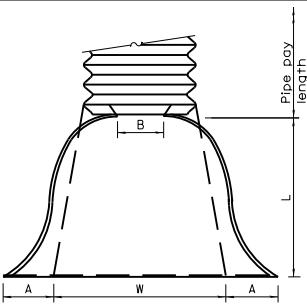
All dimensions are in inches (millimeters unless otherwise shown).

DATE	REVISIONS
4-1-16	Revised THICKNESS value in table.
1-1-09	Switched units to English (metric).

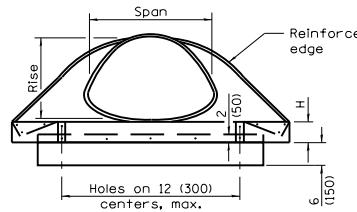
METAL END SECTION FOR PIPE CULVERTS

STANDARD 542401-02

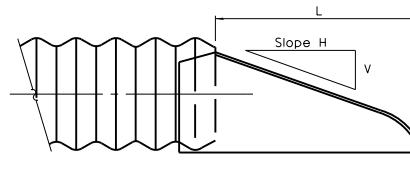
PIPE ARCH DIMENSIONS		THICKNESS	DIMENSIONS					SLOPE (Approx.) (V:H)	BODY
SPAN	RISE		A	B	H	L	W		
17 (432)	13 (330)	0.064	7 (25)	9 (28)	6 (25)	19 (485)	30 (760)	1:2½	1 Pc.
21 (533)	15 (381)	0.064	7 (20)	10 (230)	6 (150)	23 (585)	36 (915)	1:2½	1 Pc.
24 (610)	18 (457)	0.064	8 (205)	12 (305)	6 (150)	28 (710)	42 (1,065 m)	1:2½	1 Pc.
28 (711)	20 (508)	0.079	9 (230)	14 (355)	6 (150)	32 (815)	48 (1,220 m)	1:2½	1 Pc.
35 (889)	24 (610)	0.079	10 (255)	16 (405)	6 (150)	39 (990)	60 (1,525 m)	1:2½	1 Pc.
42 (1067)	29 (737)	0.079	12 (305)	18 (460)	8 (205)	53 (1,170 m)	75 (1,905 m)	1:2½	1 Pc.
49 (1245)	33 (838)	0.109	13 (330)	21 (535)	9 (230)	46 (1,345 m)	85 (2,160 m)	1:2½	2 Pcs.
57 (1448)	38 (965)	0.109	18 (460)	26 (660)	12 (305)	63 (1,600 m)	90 (2,285 m)	1:2½	2 Pcs.
64 (1626)	43 (1092)	0.109	18 (460)	30 (760)	12 (305)	70 (1,780 m)	102 (2,590 m)	1:2¼	2 Pcs.
71 (1803)	47 (1194)	0.138	18 (460)	33 (840)	12 (305)	77 (1,955 m)	114 (2,895 m)	1:2¼	3 Pcs.
77 (1956)	52 (1321)	0.168	18 (460)	36 (915)	12 (305)	77 (1,955 m)	126 (3,200 m)	1:2	3 Pcs.
83 (2106)	57 (1448)	0.168	18 (460)	39 (990)	12 (305)	77 (1,955 m)	138 (3,505 m)	1:2	3 Pcs.



PLAN

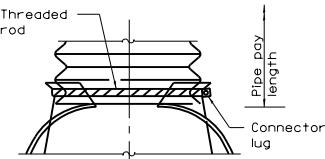


END VIEW



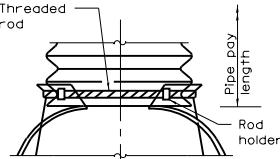
SIDE VIEW

END SECTION



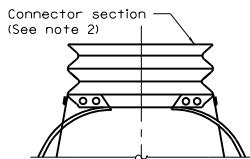
TYPE 1

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



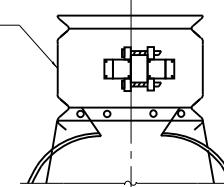
TYPE 2

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



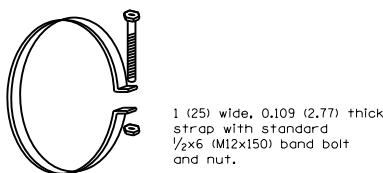
TYPE 3

(See Note 2)



TYPE 4

(See Note 3)



1 (25) wide, 0.109 (2.77) thick
strap with standard
 $\frac{1}{2} \times 6$ (M12x150) band bolt
and nut.

ALTERNATE STRAP CONNECTOR

(For Type 1 only)

CONNECTIONS OF END SECTIONS

NOTES
For the 77x52 (1956x1321) and 83x57 (2108x1448) sizes, reinforced edges shall be supplemented with $2 \times 2 \frac{1}{4}$ (51x51x6.4) stiffener angles. The angles shall be attached by $\frac{3}{8}$ (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).

NOTES

1. Type 1 and 2 connection shall be used only with pipes with annular ends.

2. 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.

3. 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 allowed.

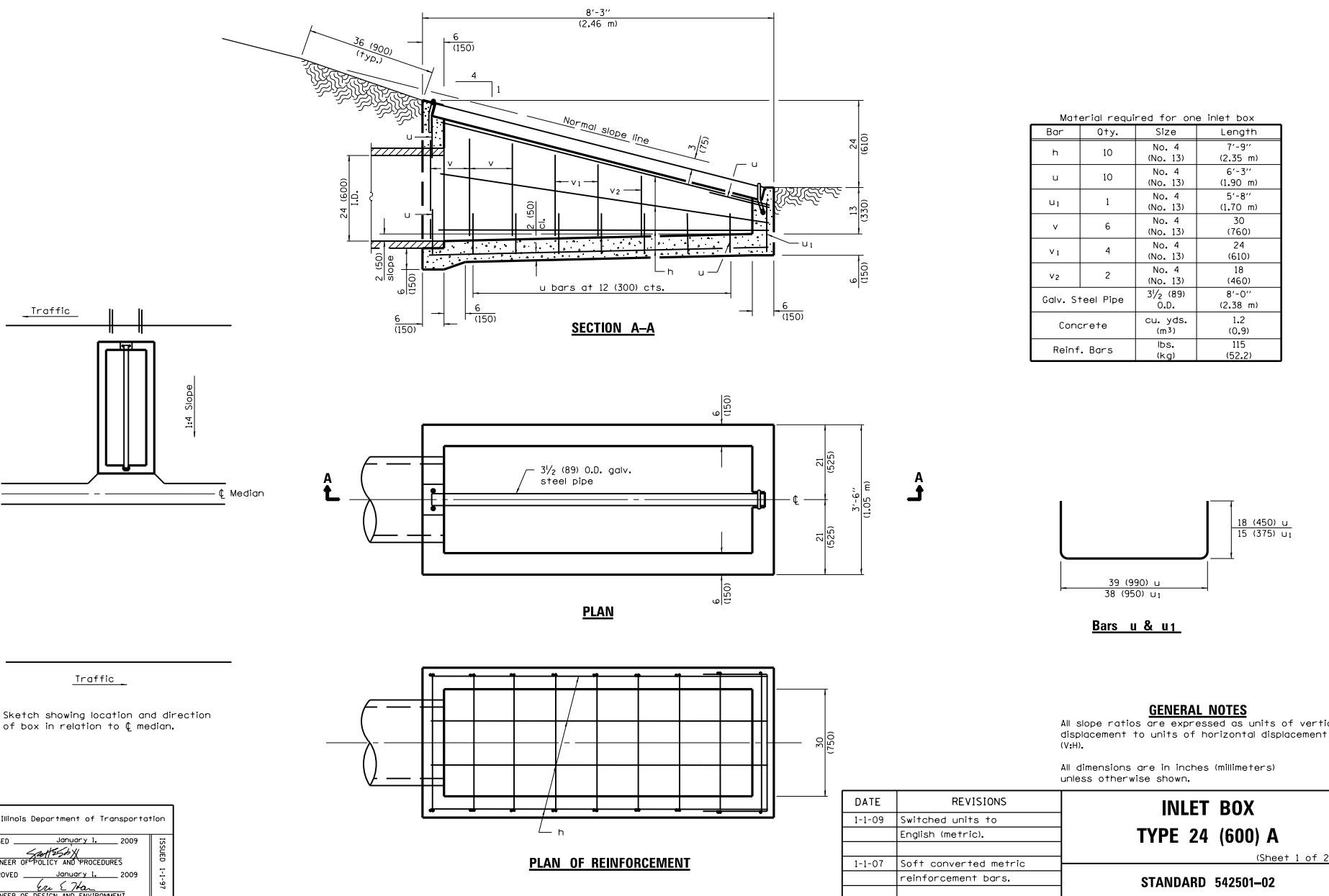
All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS	METAL END SECTIONS FOR PIPE ARCHES
4-1-16	Revised THICKNESS values	
	In table.	
1-1-09	Switched units to	
	English (metric).	

STANDARD 542406-02

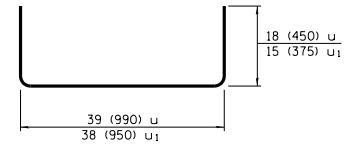
	Illinois Department of Transportation
PASSED	April 1, 2016
	Michael Brand
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT	

4-1-16-02



Material required for one inlet box

Bar	Oty.	Size	Length
h	10	No. 4 (No. 13)	7'-9" (2.35 m)
u	10	No. 4 (No. 13)	6'-3" (1.90 m)
u ₁	1	No. 4 (No. 13)	5'-8" (1.70 m)
v	6	No. 4 (No. 13)	30 (760)
v ₁	4	No. 4 (No. 13)	24 (610)
v ₂	2	No. 4 (No. 13)	18 (460)
Galv. Steel Pipe		3½" (89) O.D.	8'-0" (2.38 m)
Concrete		cu. yds. (m ³)	1.2 (0.9)
Reinf. Bars		lbs. (kg)	115 (52.2)



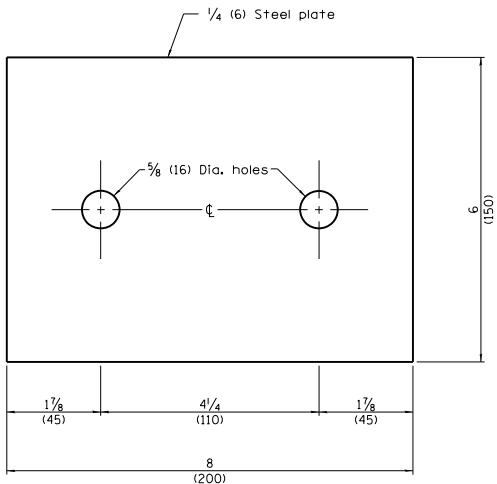
Bars u & u1

GENERAL NOTES

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

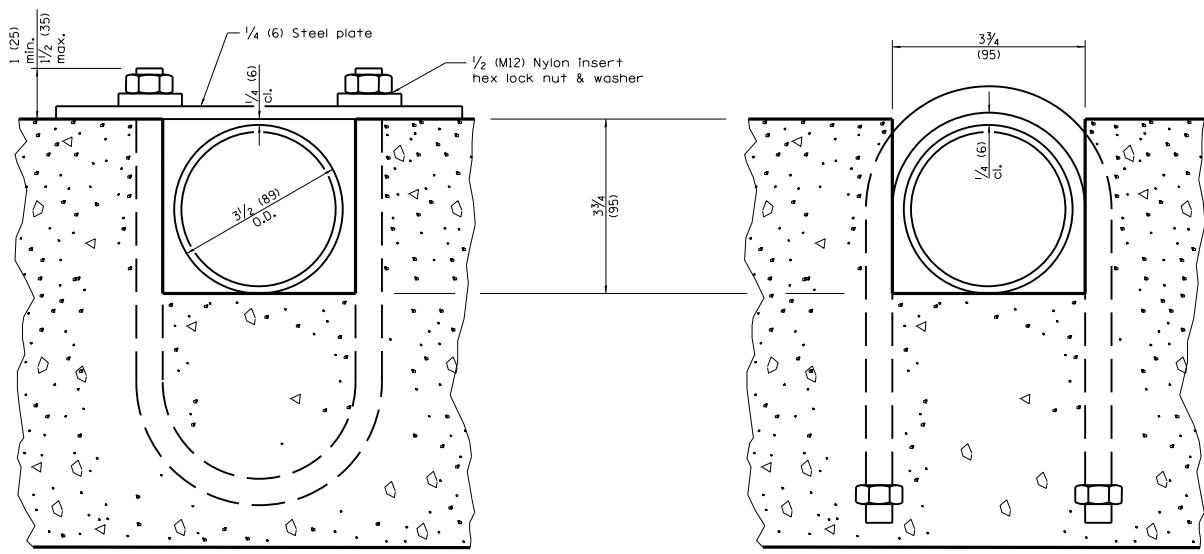
All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS	
1-1-09	Switched units to English (metric).	INLET BOX
		TYPE 24 (600) A
1-1-07	Soft converted metric reinforcement bars.	(Sheet 1 of 2)
		STANDARD 542501-02



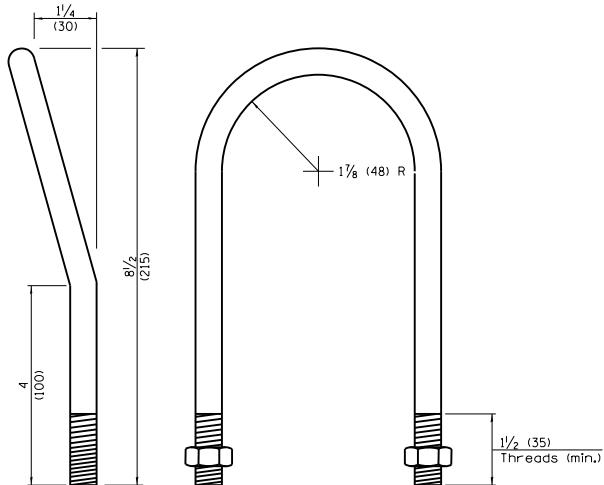
TOP ANCHOR PLATE

(1 - required)



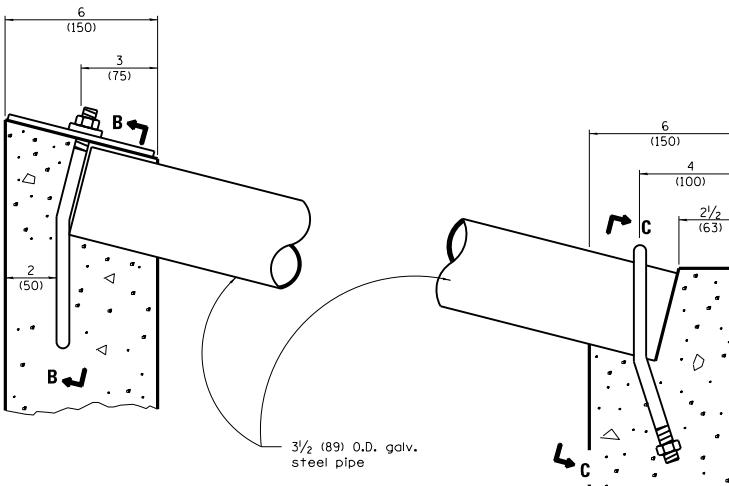
SECTION B-B

SECTION C-C



1/2 (M12) U BOLT

(2 - required)



DETAIL AT BLOCKOUTS

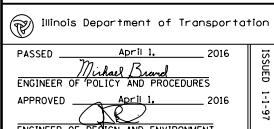
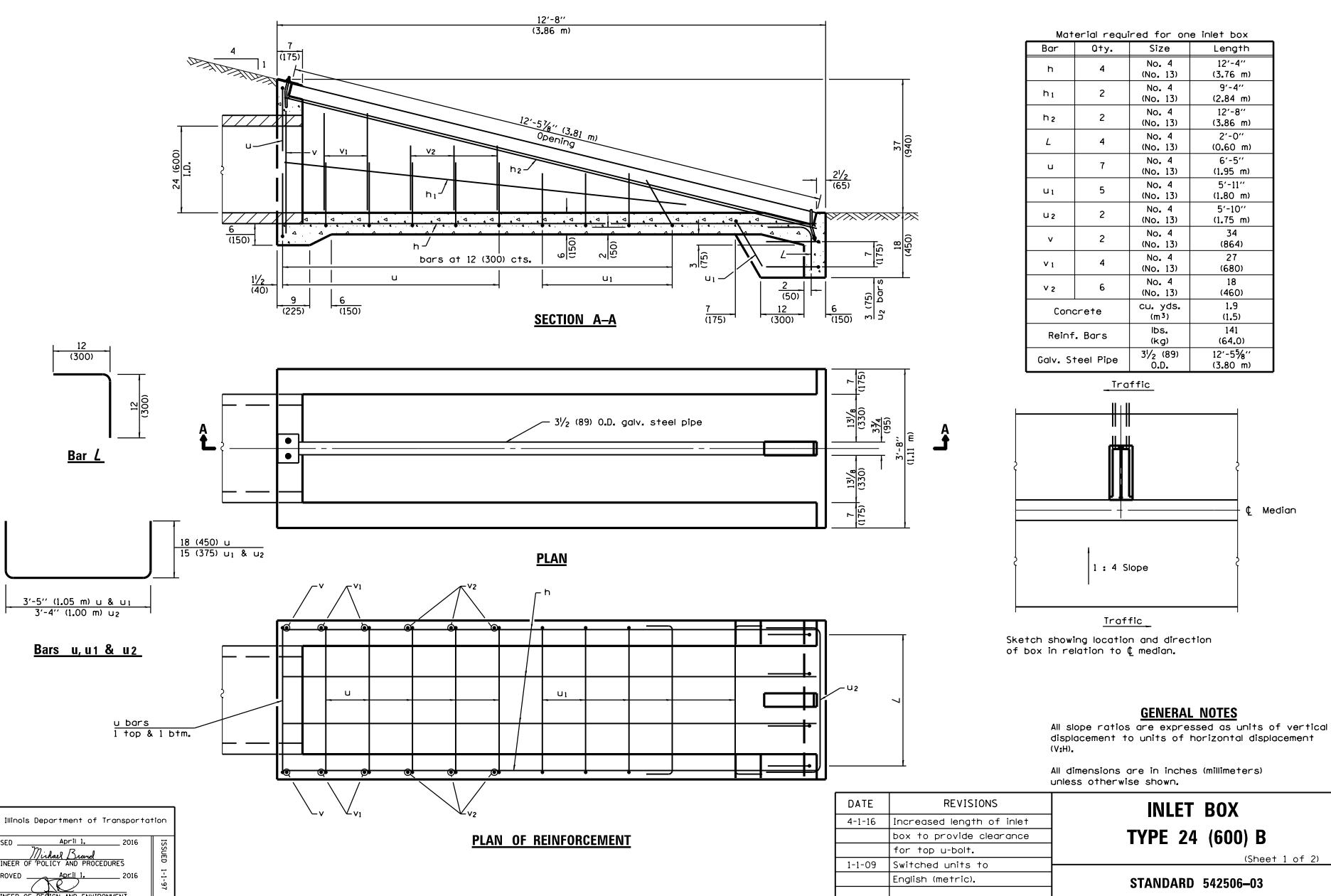
Illinois Department of Transportation
PASSED January 1, 2009
Sgt. S. Shy
ENGINEER OF POLICY AND PROCEDURES
APPROVED January 1, 2009
Edu. S. Shy
ENGINEER OF DESIGN AND ENVIRONMENT

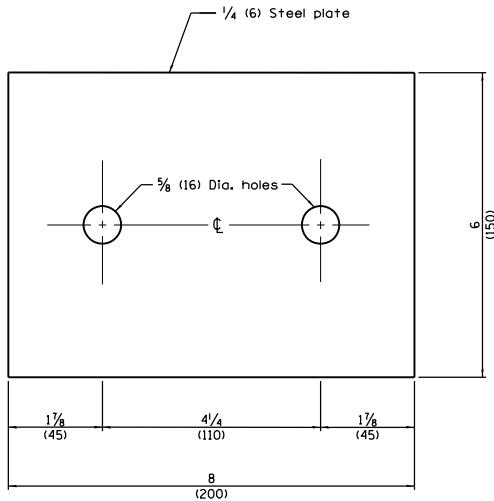
1-1-09

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

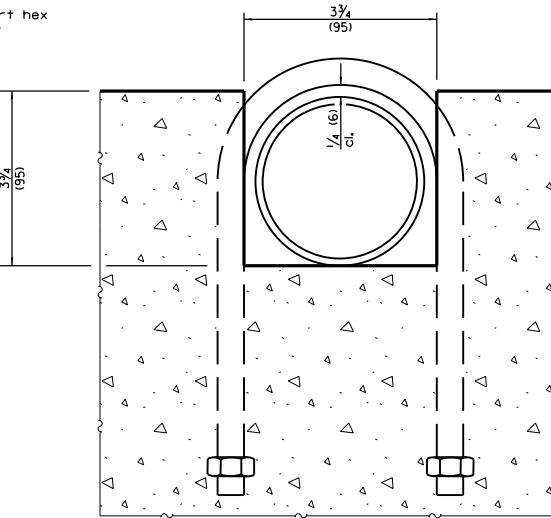
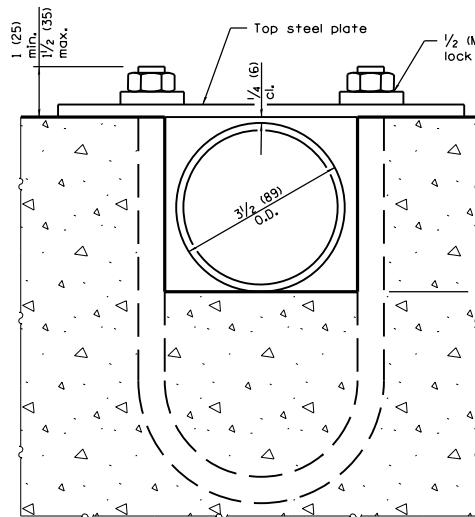
(Sheet 2 of 2)

STANDARD 542501-02

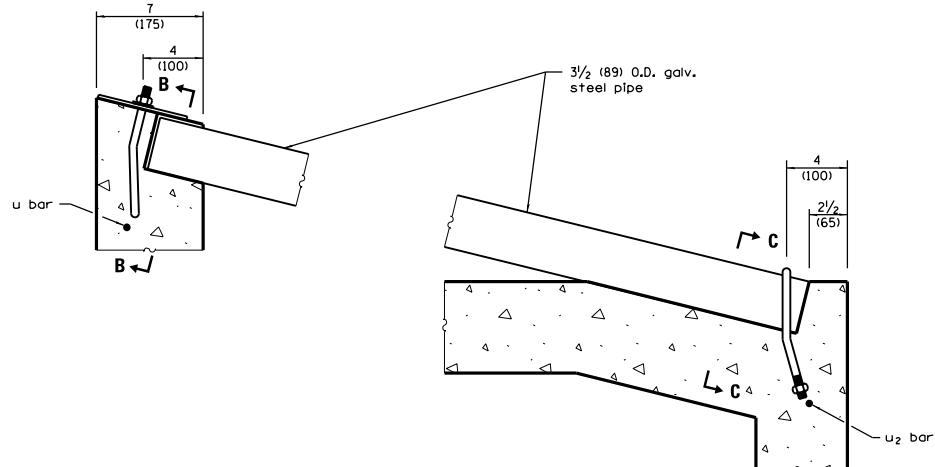




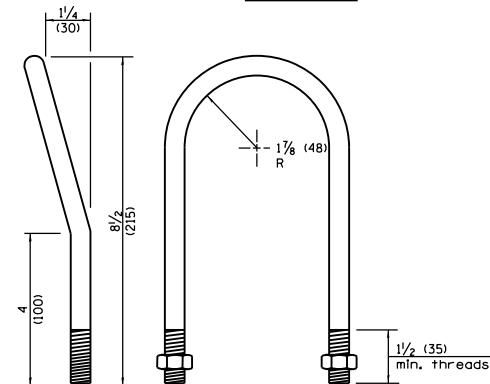
TOP ANCHOR PLATE
(1 - required)



SECTION C-C



DETAIL AT BLOCKOUTS



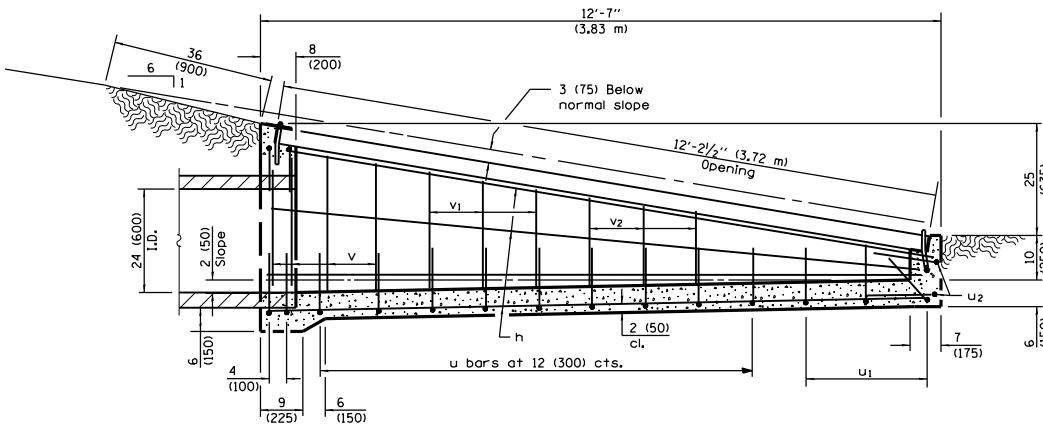
1/2 (M12) U BOLT
(2 - required)

	Illinois Department of Transportation
PASSED	April 1, 2016
Michael Brand	ISRS 1-1-197
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	April 1, 2016
John R. [Signature]	
ENGINEER OF DESIGN AND ENVIRONMENT	

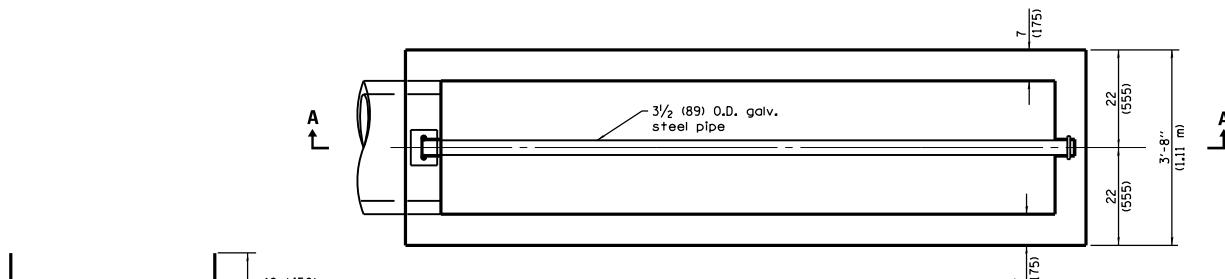
**INLET BOX
TYPE 24 (600) B**

(Sheet 2 of 2)

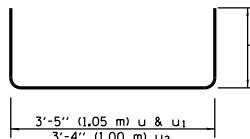
STANDARD 542506-03



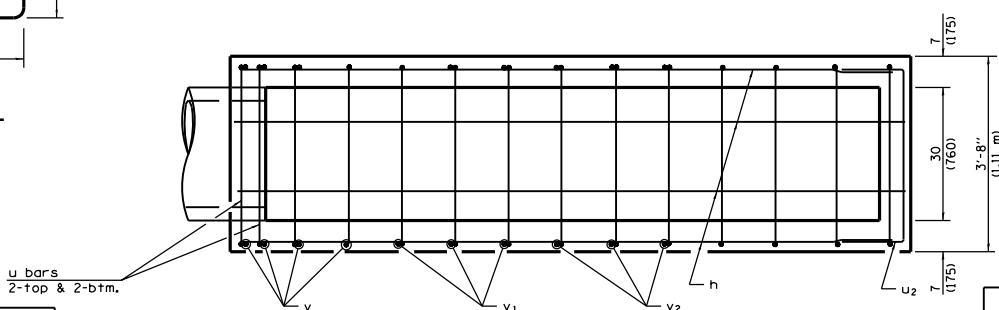
SECTION A-A



PLAN

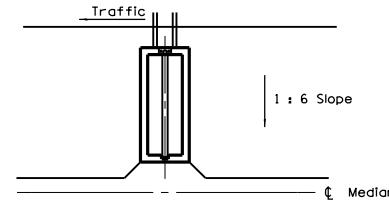


Bars u, u1 & u2



PLAN OF REINFORCEMENT

Material required for one inlet box			
Bar	Oty.	Size	Length
h	10	No. 4 (No. 13)	12'-0" (3.65 m)
u	13	No. 4 (No. 13)	6'-5" (1.95 m)
u ₁	3	No. 4 (No. 13)	5'-11" (1.80 m)
u ₂	2	No. 4 (No. 13)	5'-10" (1.75 m)
v	8	No. 4 (No. 13)	30 (760)
v ₁	6	No. 4 (No. 13)	24 (610)
v ₂	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 1/4" (3.71 m)	



Traffic

Sketch showing location and direction of box in relation to ℓ 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, 2009
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT	

1-1-09

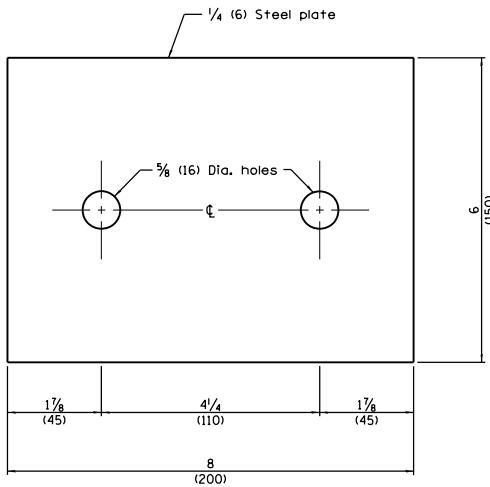
1-1-07

INLET BOX TYPE 24 (600) C

(Sheet 1 of 2)

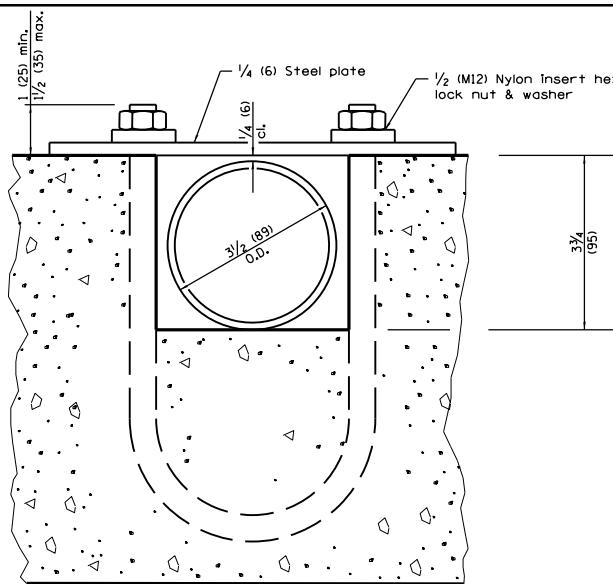
STANDARD 542511-02

DATE	REVISIONS	INLET BOX TYPE 24 (600) C (Sheet 1 of 2)
1-1-09	Switched units to English (metric).	
1-1-07	Soft converted metric reinforcement bars.	

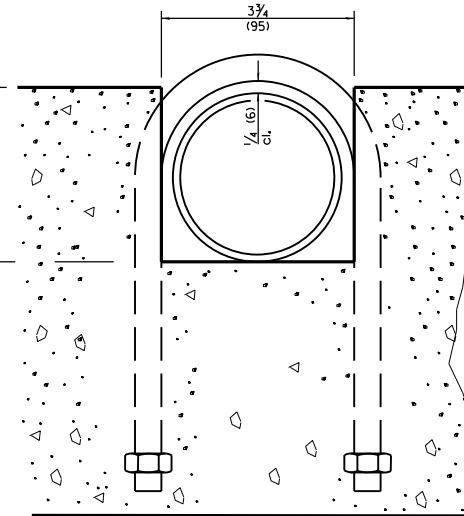


TOP ANCHOR PLATE

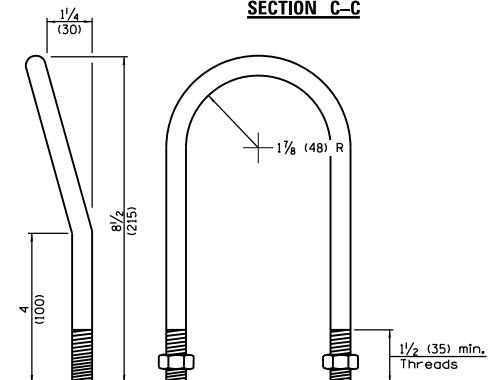
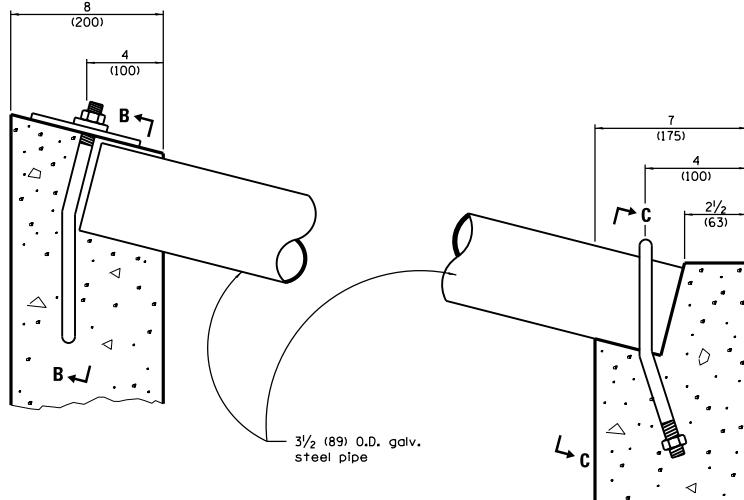
(1 - required)



SECTION B-B



SECTION C-C



1/2 (M12) U BOLT

(2 - required)

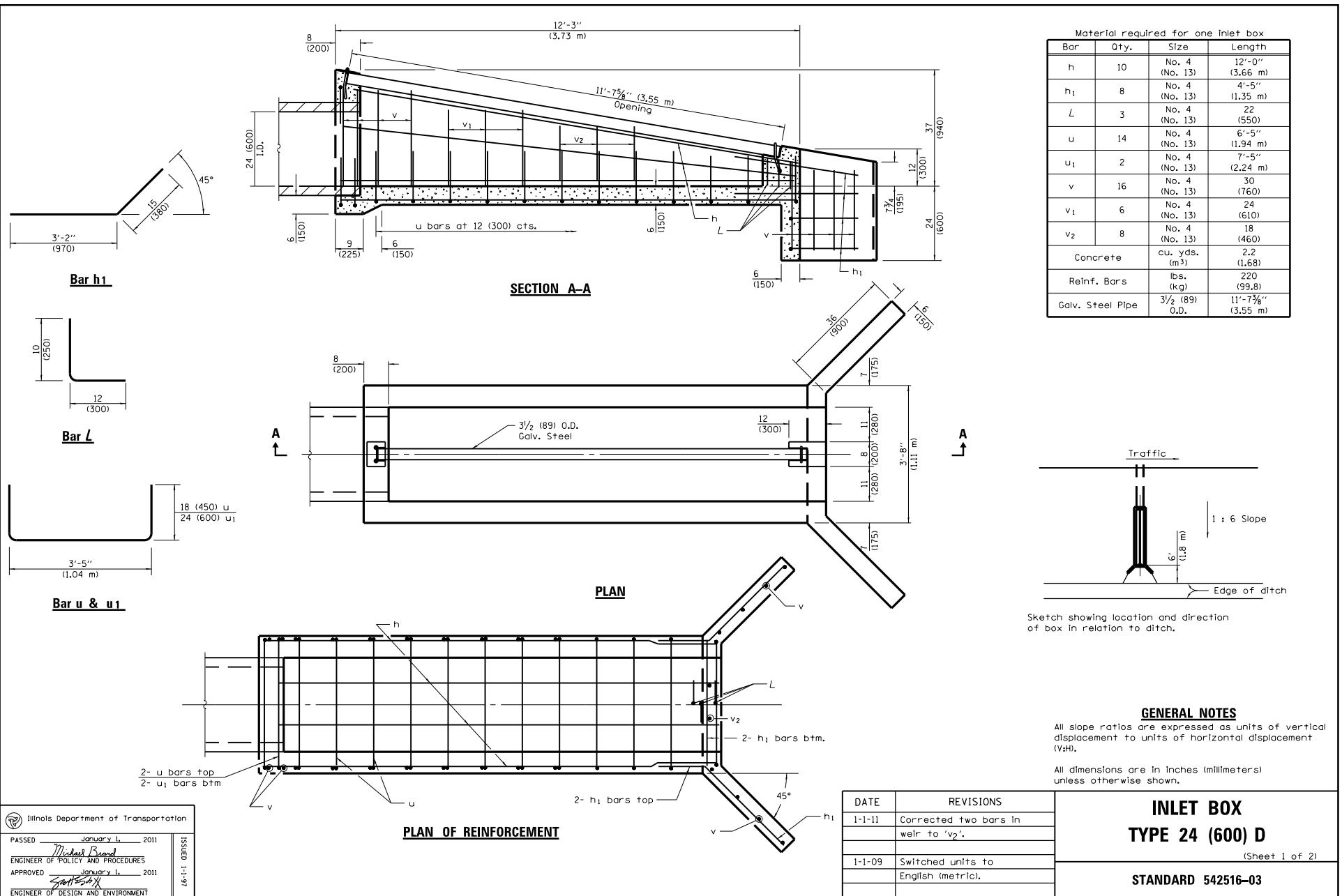
**INLET BOX
TYPE 24 (600) C**

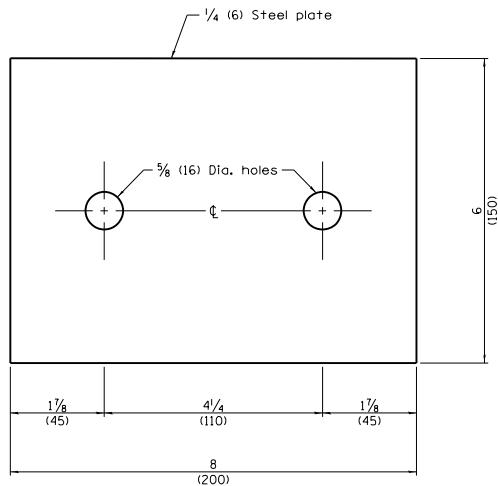
(Sheet 2 of 2)

STANDARD 542511-02

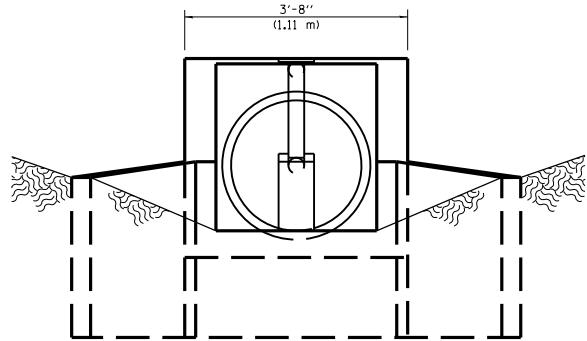
Illinois Department of Transportation
PASSED January 1, 2009
Sgt. E. D. S. X
ENGINEER OF POLICY AND PROCEDURES
APPROVED January 1, 2009
E. S. Khan
ENGINEER OF DESIGN AND ENVIRONMENT

1-1-97

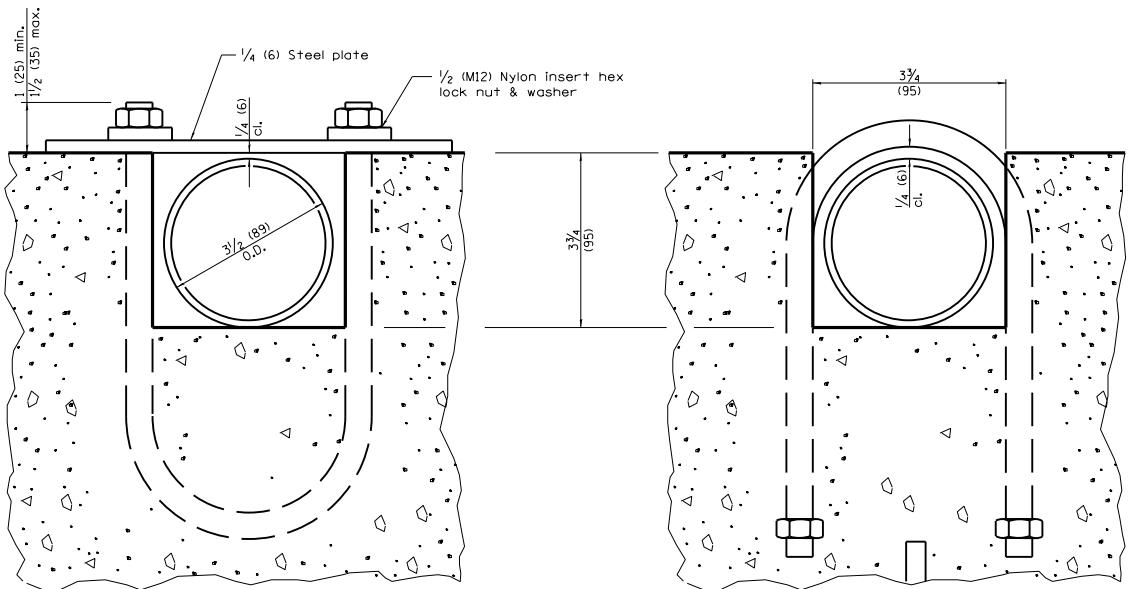




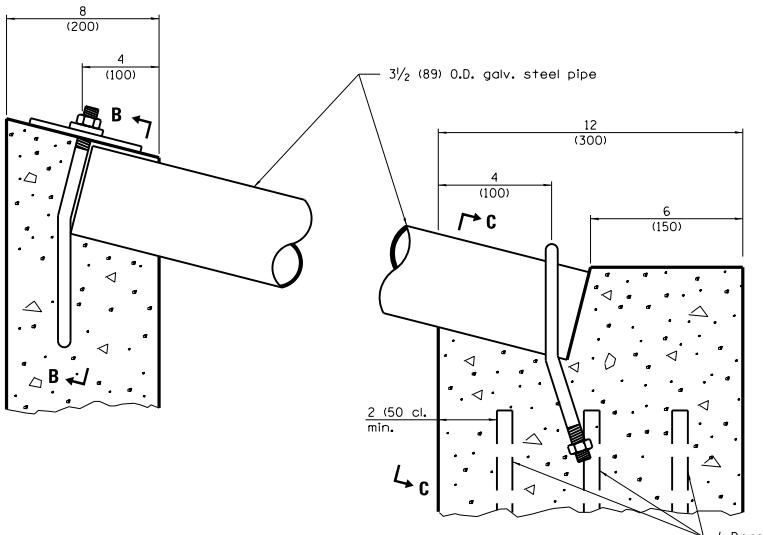
TOP ANCHOR PLATE
(1-required)



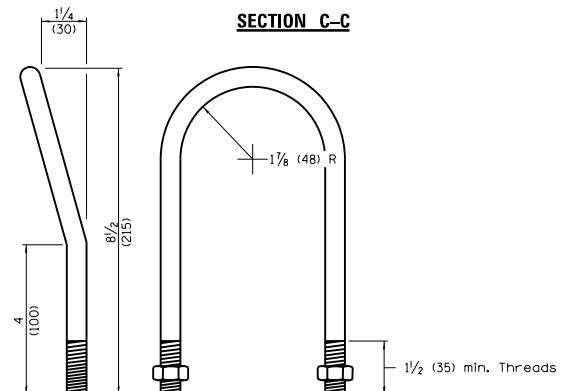
END VIEW



SECTION B-B



SECTION C-C

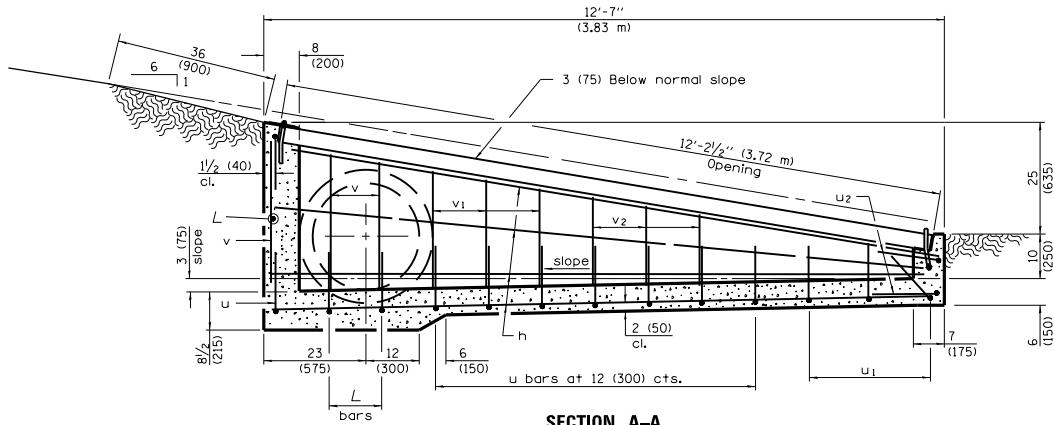


	Illinois Department of Transportation
PASSED	January 1, 2011
Michael Brand	1-1-10-197
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2011
Stefan S. K.	
ENGINEER OF DESIGN AND ENVIRONMENT	

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

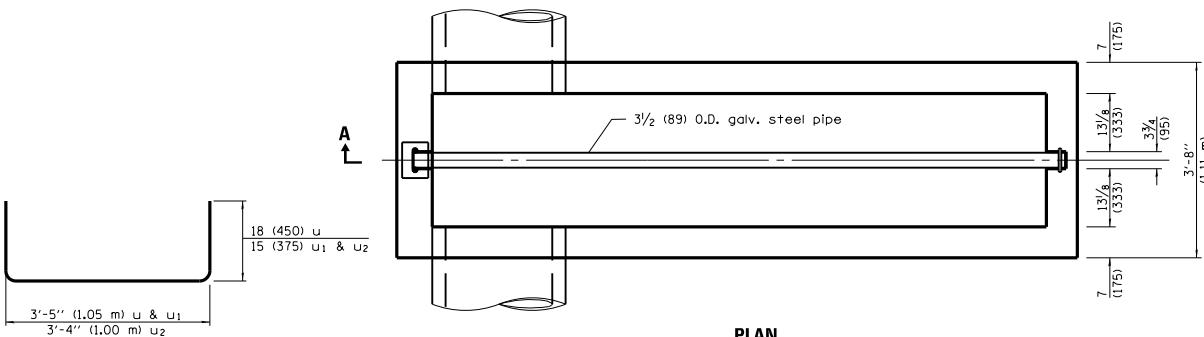
(Sheet 2 of 2)

STANDARD 542516-03

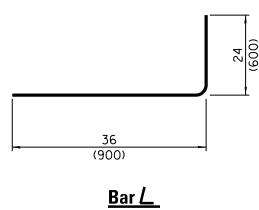


SECTION A-A

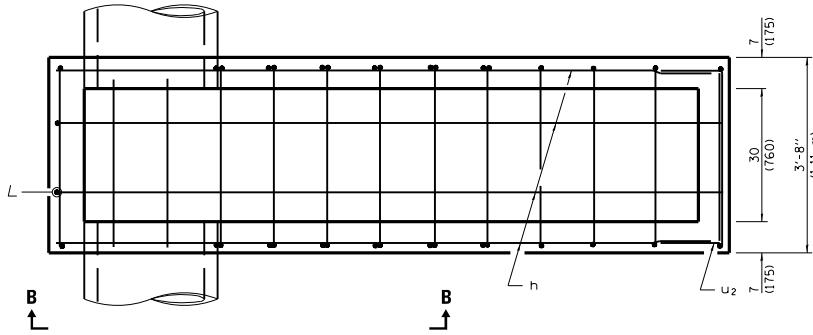
Material required for one inlet box			
Bar	Oty.	Size	Length
h	8	No. 4 (No. 13)	12'-0" (3.66 m)
h ₁	2	No. 4 (No. 13)	9'-0" (2.75 m)
L	5	No. 4 (No. 13)	5'-0" (1.50 m)
u	9	No. 4 (No. 13)	6'-5" (1.95 m)
u ₁	3	No. 4 (No. 13)	5'-1 1/2" (1.80 m)
u ₂	2	No. 4 (No. 13)	5'-10" (1.75 m)
v	6	No. 4 (No. 13)	30 (760)
v ₁	6	No. 4 (No. 13)	24 (610)
v ₂	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 1/4" (3.71 m)	



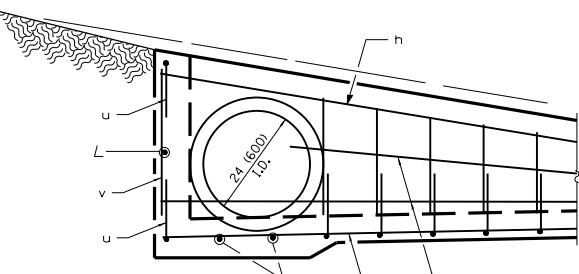
PLAN



Bar L



PLAN OF REINFORCEMENT



SECTION B-B

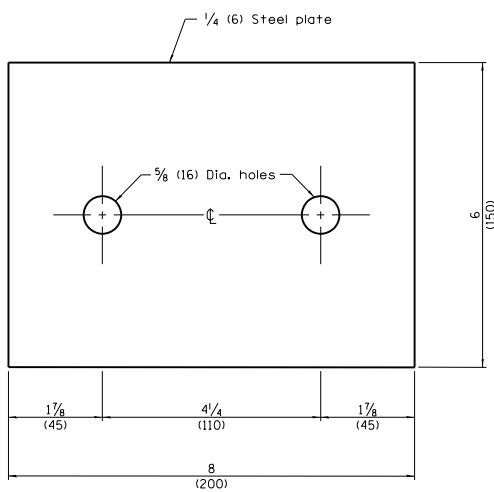
GENERAL NOTES

All slope ratios are expressed as units of vertical displacement to units of horizontal displacement ($V_2:H$).

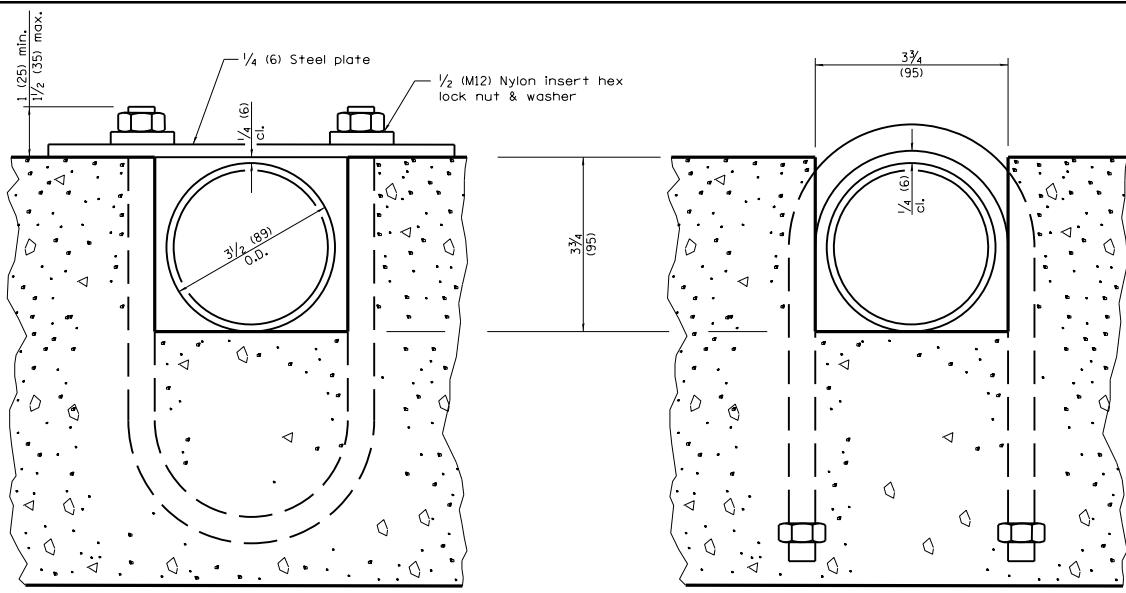
All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS	INLET BOX
1-1-09	Switched units to English (metric).	TYPE 24 (600) E
		(Sheet 1 of 2)
1-1-07	Soft converted metric reinforcement bars.	
		STANDARD 542521-02

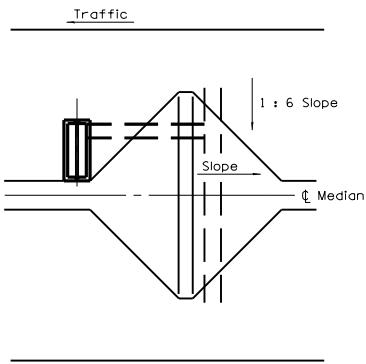
Illinois Department of Transportation
PASSED January 1, 2009
<i>[Signature]</i>
ENGINEER OF POLICY AND PROCEDURES
APPROVED January 1, 2009
<i>[Signature]</i>
ENGINEER OF DESIGN AND ENVIRONMENT



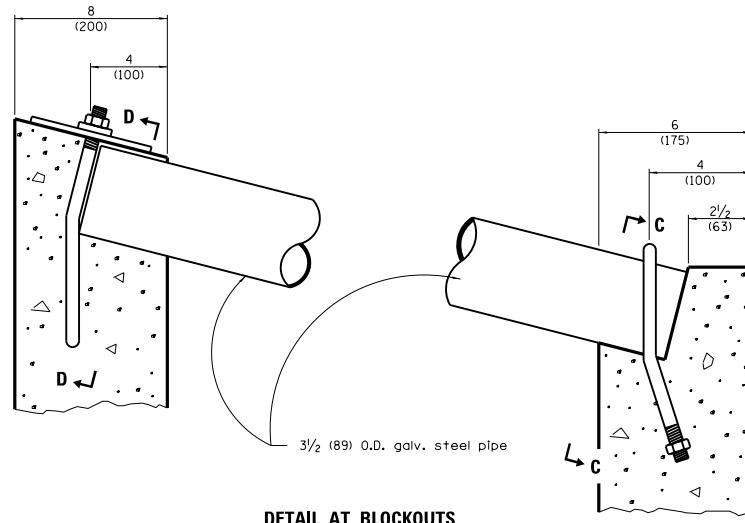
TOP ANCHOR PLATE
(1 - required)



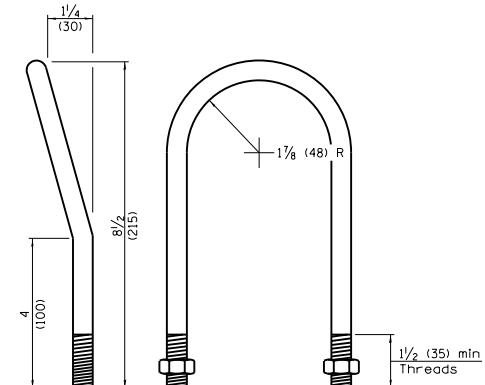
SECTION C-C



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



DETAIL AT BLOCKOUTS



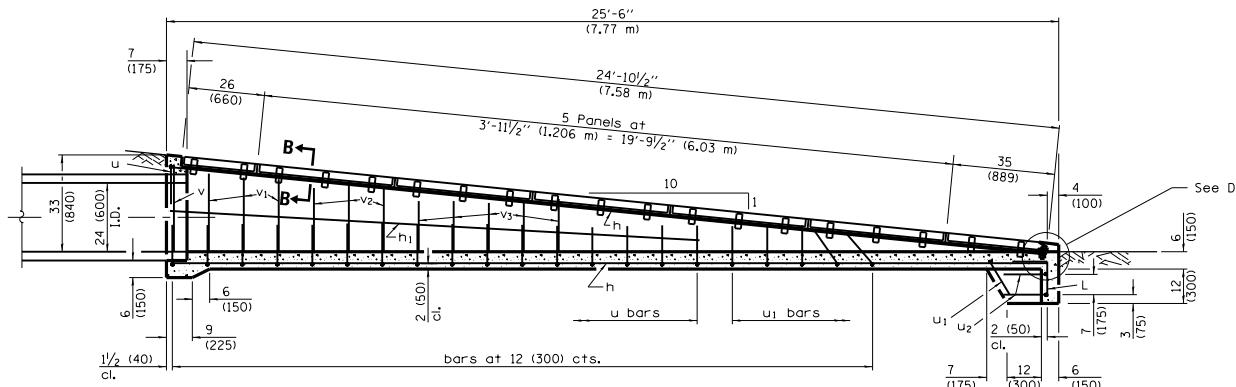
1/2 (M12) U BOLT
(2- required)

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

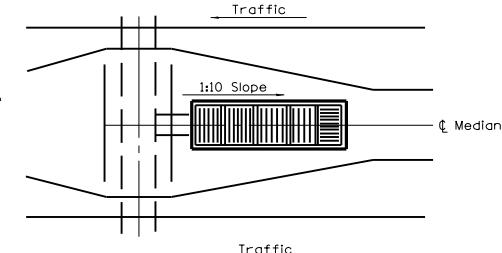
(Sheet 2 of 2)

STANDARD 542521-02

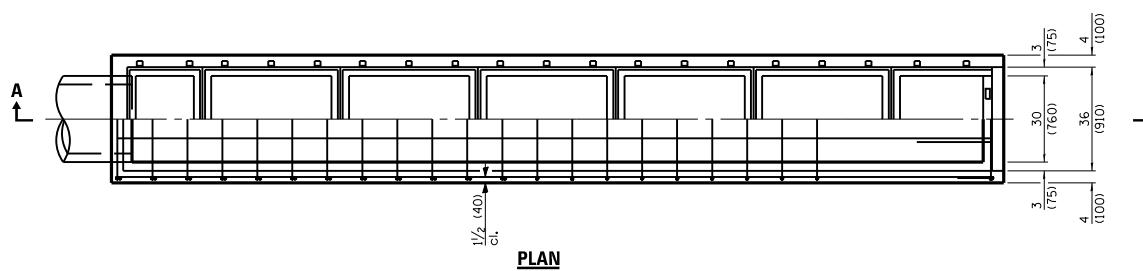
Illinois Department of Transportation
PASSED January 1, 2009
Santosh S. [Signature]
ENGINEER OF POLICY AND PROCEDURES
APPROVED January 1, 2009
Eduardo S. [Signature]
ENGINEER OF DESIGN AND ENVIRONMENT



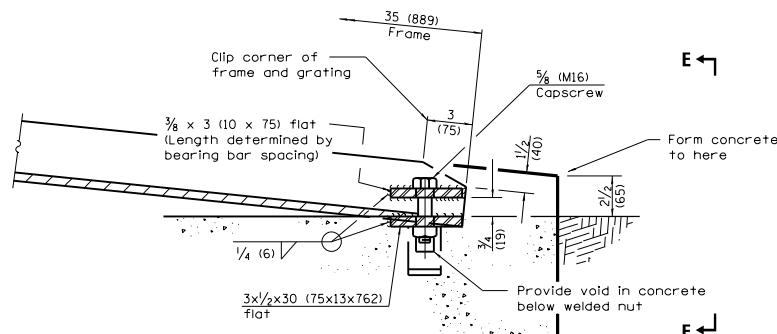
SECTION A-A



Sketch showing location and direction of main bearing bars in relation to the 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.

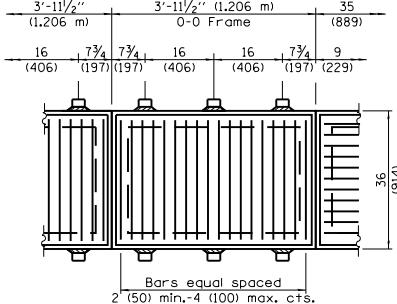
INLET BOX

TYPE 24 (600) F

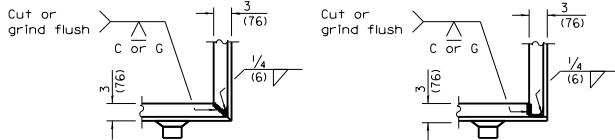
(Sheet 1 of 2)

STANDARD 542526-03

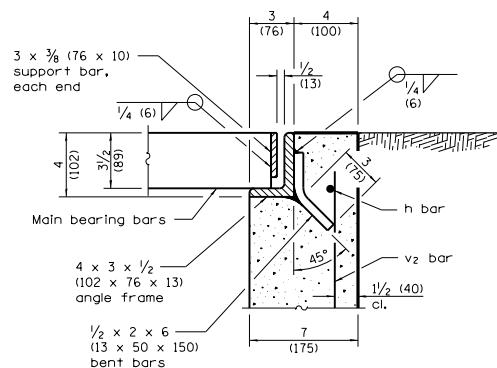
	Illinois Department of Transportation
PASSED	January 1, 2011
Michael Brand	Engineer of Policy and Procedures
APPROVED	January 1, 2011
ENGINEER OF DESIGN AND ENVIRONMENT	1-1-11-97



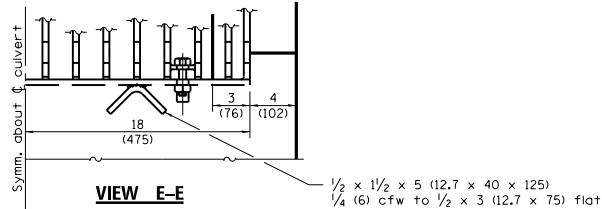
TYPICAL STEEL GRATING



**TYPICAL CORNER OF
STEEL GRATING FRAME**

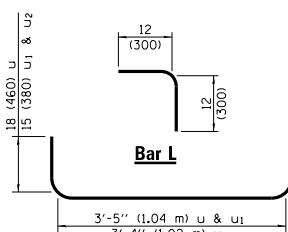


SECTION B-B

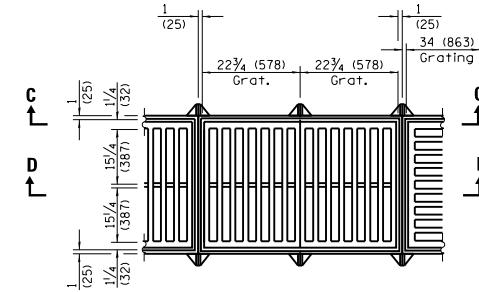


Material Required for One Inlet Box

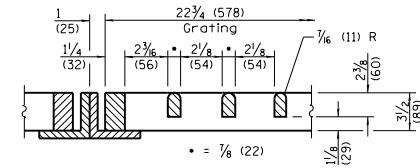
Bar	No.	Size	Length
h	6	No. 4 (No. 13)	25'-0" (7.62 m)
h ₁	2	No. 4 (No. 13)	11'-0" (3.35 m)
L	4	No. 4 (No. 13)	24 (6.00)
u	17	No. 4 (No. 13)	6'-5" (1.96 m)
u ₁	6	No. 4 (No. 13)	5'-11" (1.80 m)
u ₂	2	No. 4 (No. 13)	5'-10" (1.78 m)
v	2	No. 4 (No. 13)	30 (7.60)
v ₁	6	No. 4 (No. 13)	27 (6.90)
v ₂	6	No. 4 (No. 13)	24 (6.10)
v ₃	10	No. 4 (No. 13)	18 (4.60)
Concrete	cu. yds. (m ³)	3.4 (2.6)	
Reinf. Bars	lbs. (kg)	250 (113)	
Grating	(sq. ft.) (m ²)	70.4 (6.54)	



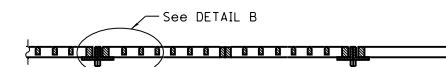
BARS u, u₁ & u₂



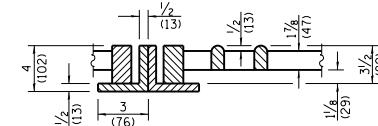
TYPICAL CAST GRATING



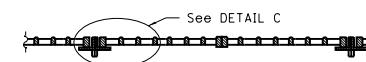
DETAIL B



SECTION C-C



DETAIL C



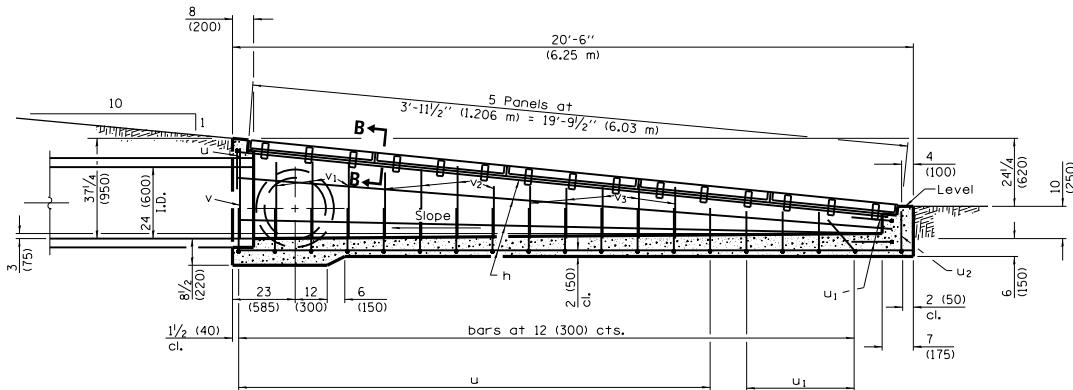
SECTION D-D

	Illinois Department of Transportation
PASSED	January 1, 2011
Michael Brand	Engineer of Policy and Procedures
APPROVED	January 1, 2011
Signature	Date
ENGINEER OF DESIGN AND ENVIRONMENT	

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

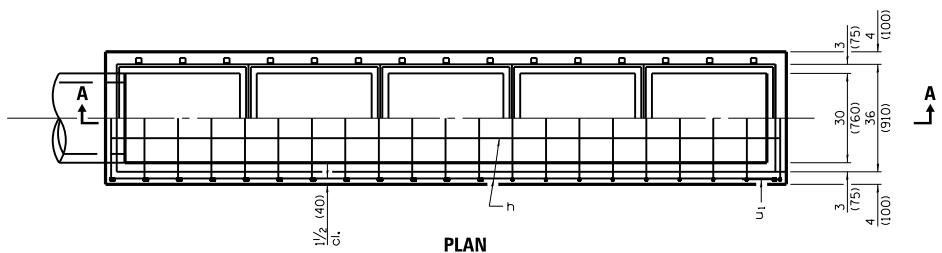
(Sheet 2 of 2)

STANDARD 542526-03

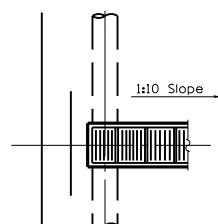


SECTION A-A

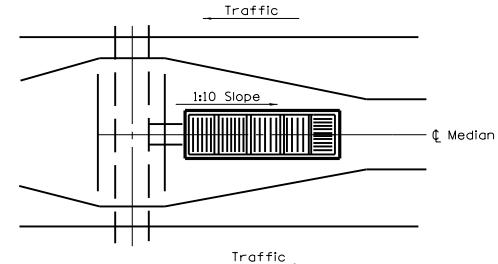
NOTE:
Culvert pipe may exit from the side (or sides) by changing
reinforcement bars in that area and in the headwall end of box.



PLAN



Detail showing exit
from side (or sides)



Sketch showing location and direction of main
bearing bars in relation to $\frac{1}{2}$ median
(showing exit from end)

GENERAL NOTES

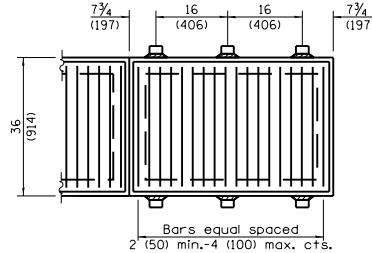
If field conditions will permit, bottom of inlet box
shall have 2 (50) slope.

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

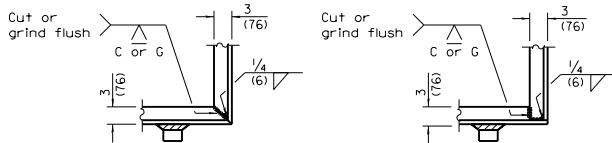
All dimensions are in inches (millimeters)
unless otherwise shown.

DATE	REVISIONS	INLET BOX TYPE 24 (600) G (Sheet 1 of 2)
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.	

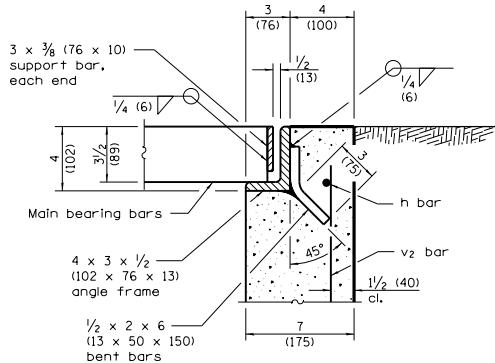
	Illinois Department of Transportation
PASSED	January 1, 2011
<i>Michael Brand</i>	Michael Brand
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2011
<i>John E. Smith</i>	John E. Smith
ENGINEER OF DESIGN AND ENVIRONMENT	
	1-1-11-09



TYPICAL STEEL GRATING



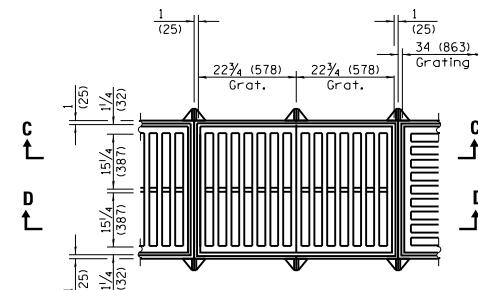
**TYPICAL CORNER OF
STEEL GRATING FRAME**



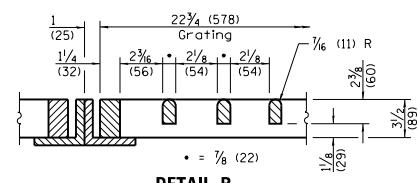
SECTION B-B

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)
u ₁	6	No. 4 (No. 13)	5'-11" (1.80 m)
u ₂	1	No. 4 (No. 13)	5'-6" (1.68 m)
v	2	No. 4 (No. 13)	33 (840)
v ₁	6	No. 4 (No. 13)	30 (760)
v ₂	10	No. 4 (No. 13)	24 (610)
v ₃	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)

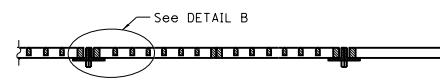
BARS u, u₁ & u₂



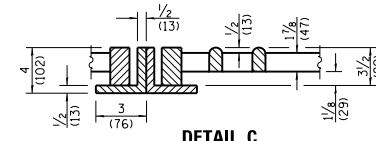
TYPICAL CAST GRATING



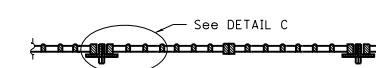
DETAIL B



SECTION C-C



DETAIL C



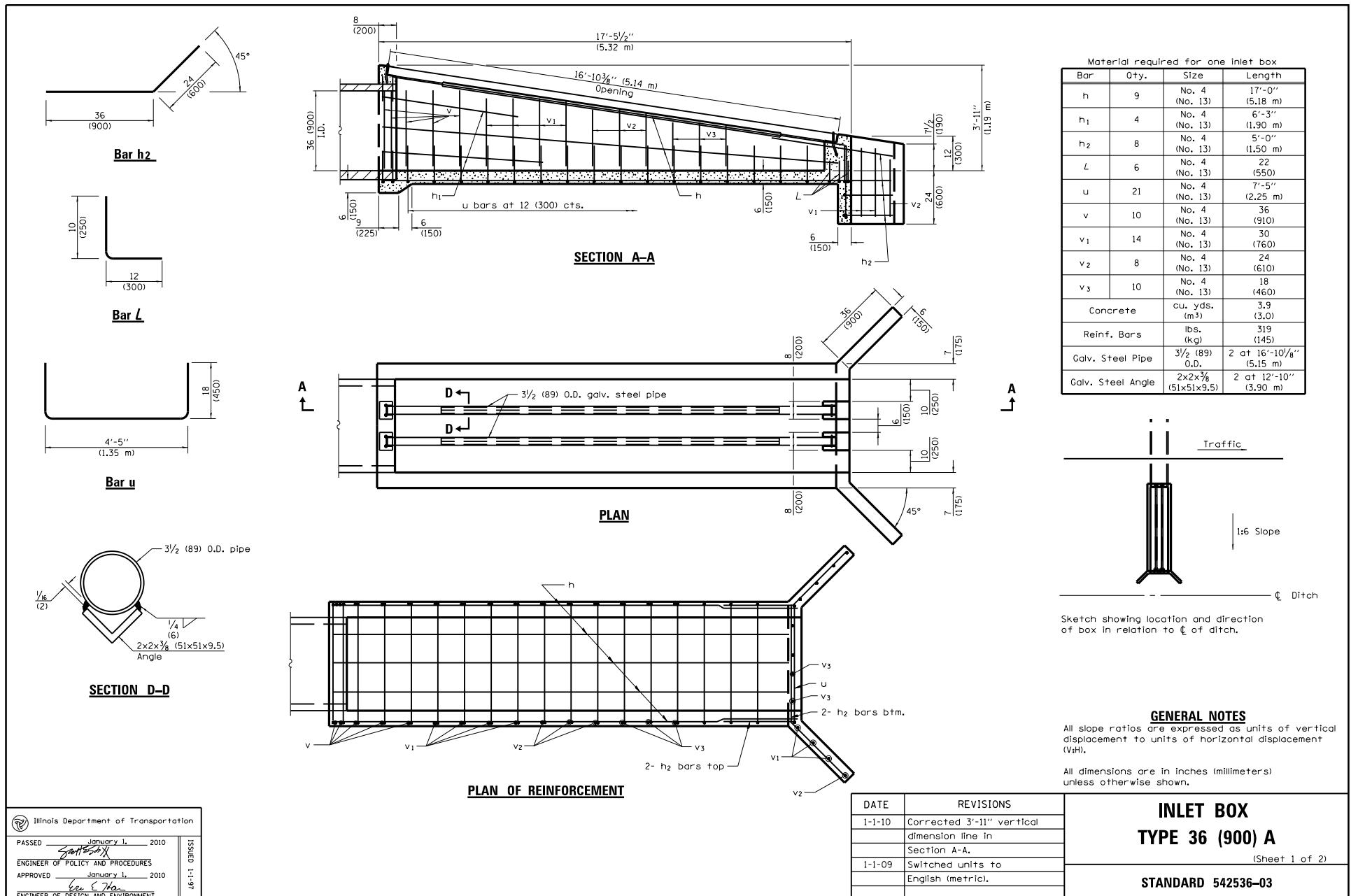
SECTION D-D

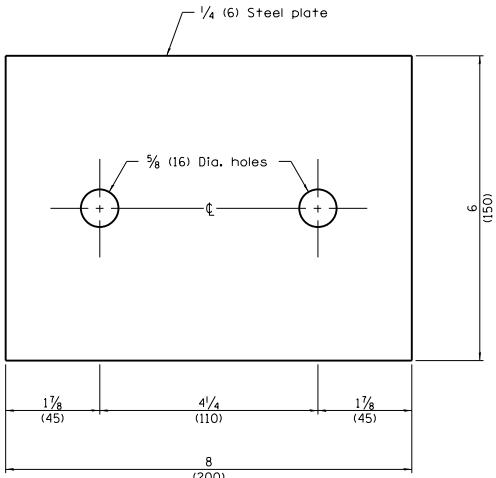
**INLET BOX
TYPE 24 (600) G**

(Sheet 2 of 2)

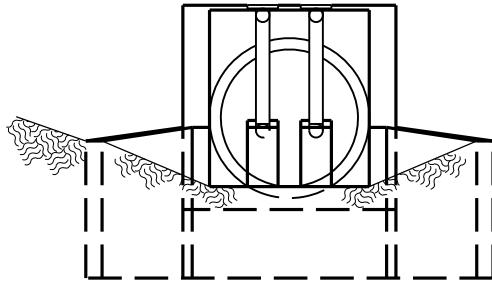
STANDARD 542531-04

	Illinois Department of Transportation
PASSED	January 1, 2011
Michael Brand	100-11-197
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2011
John E. Smith	
ENGINEER OF DESIGN AND ENVIRONMENT	

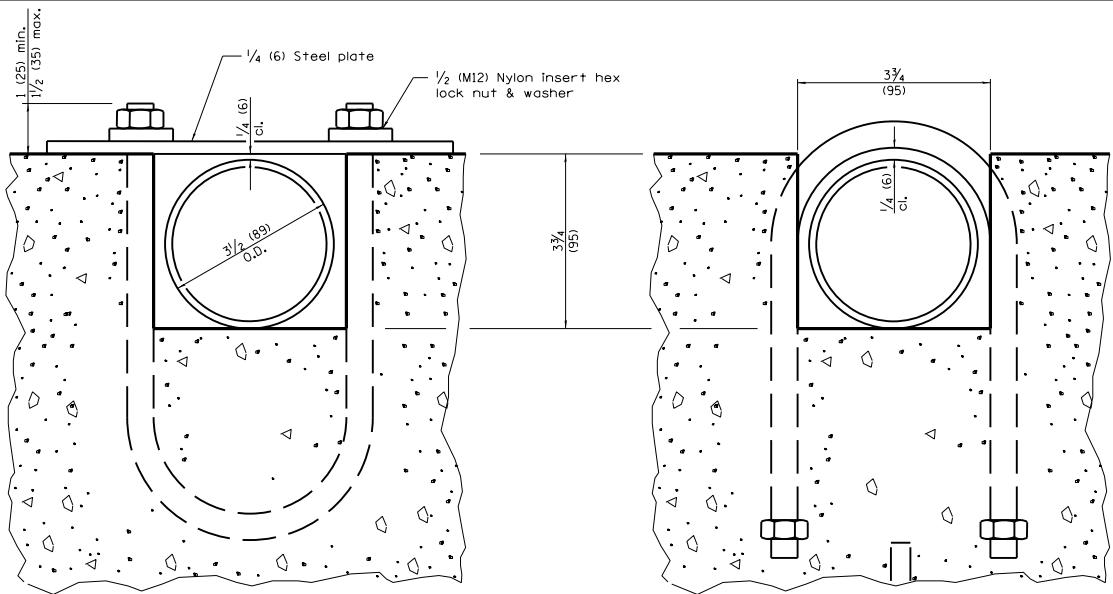




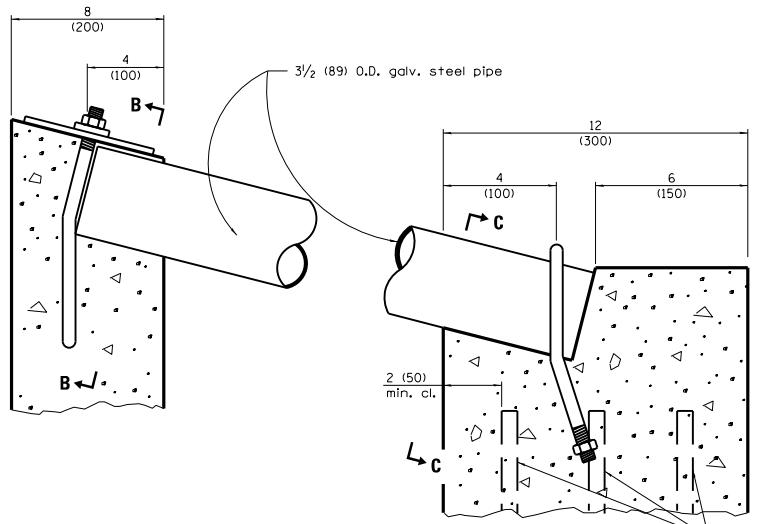
TOP ANCHOR PLATE
(2 - required)



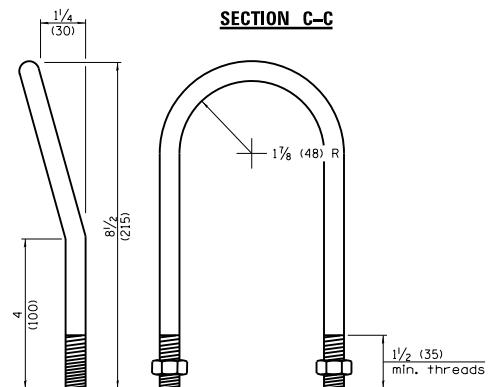
END VIEW



SECTION B-B



DETAIL AT BLOCKOUTS



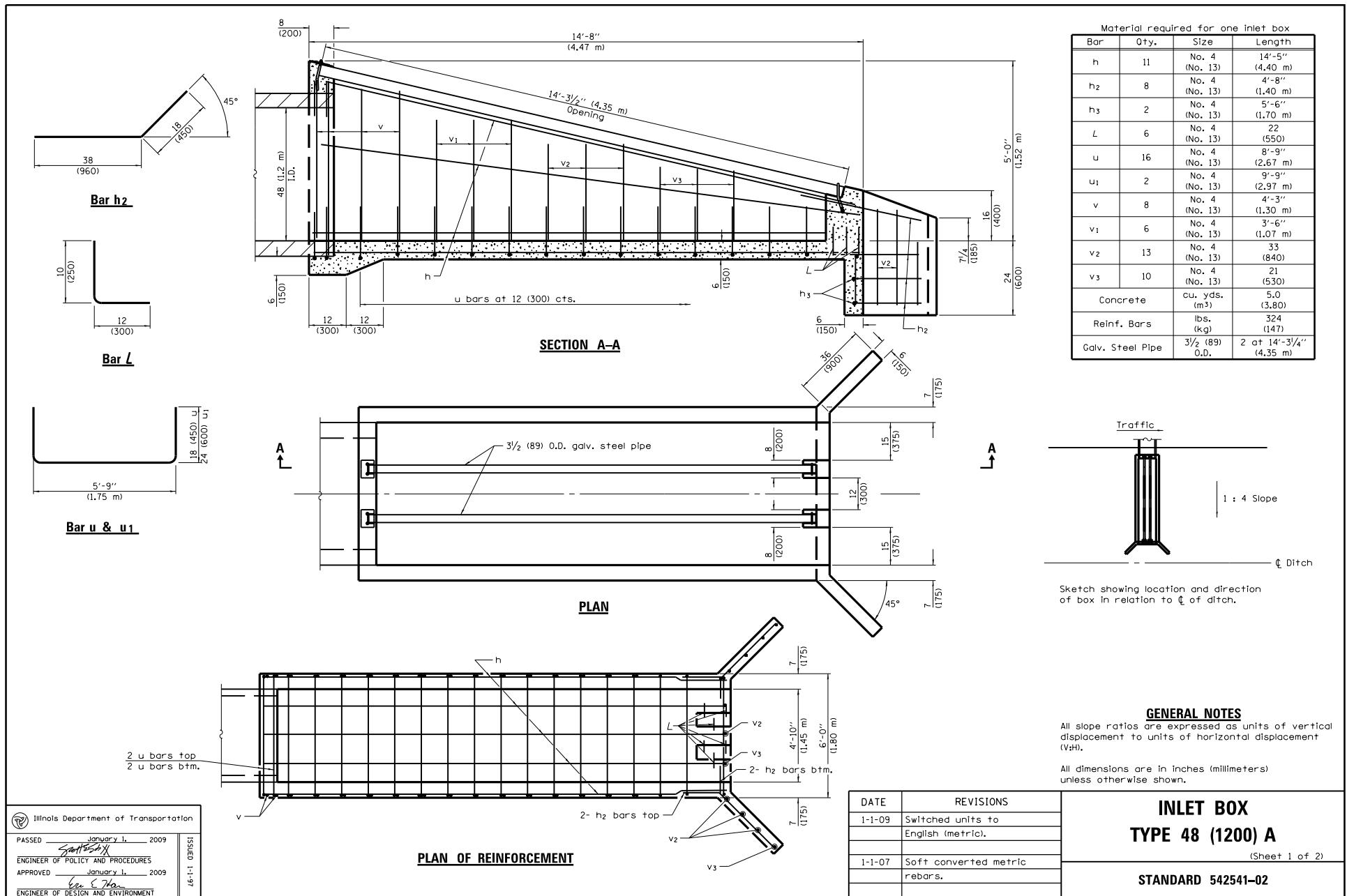
1/2 (M12) U BOLT
(4 - required)

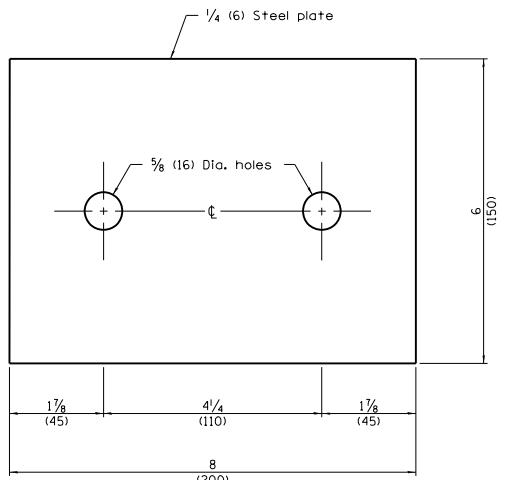
INLET BOX
TYPE 36 (900) A

(Sheet 2 of 2)

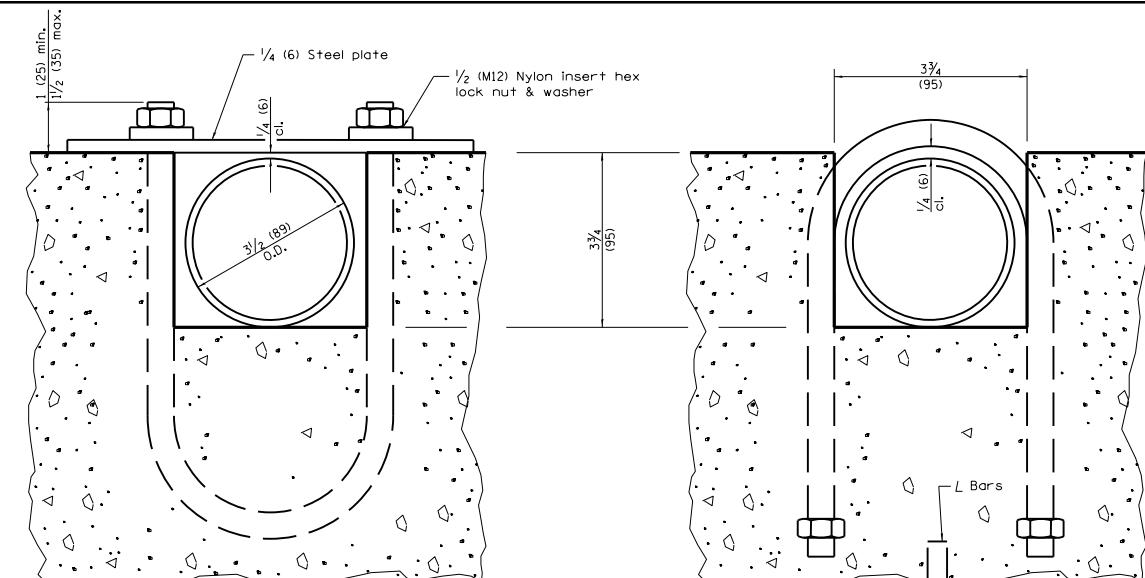
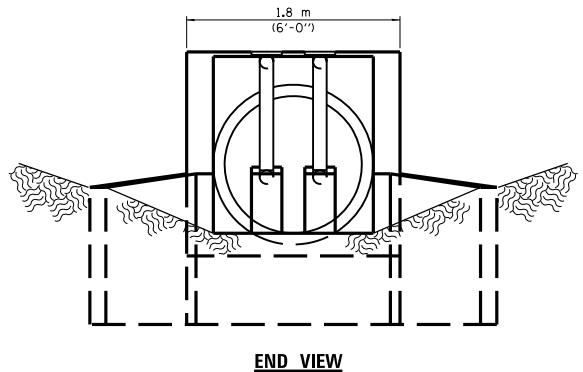
STANDARD 542536-03

	Illinois Department of Transportation
PASSED	January 1, 2010
Sgt. [Signature]	1-1-197
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2010
Edu E. [Signature]	
ENGINEER OF DESIGN AND ENVIRONMENT	

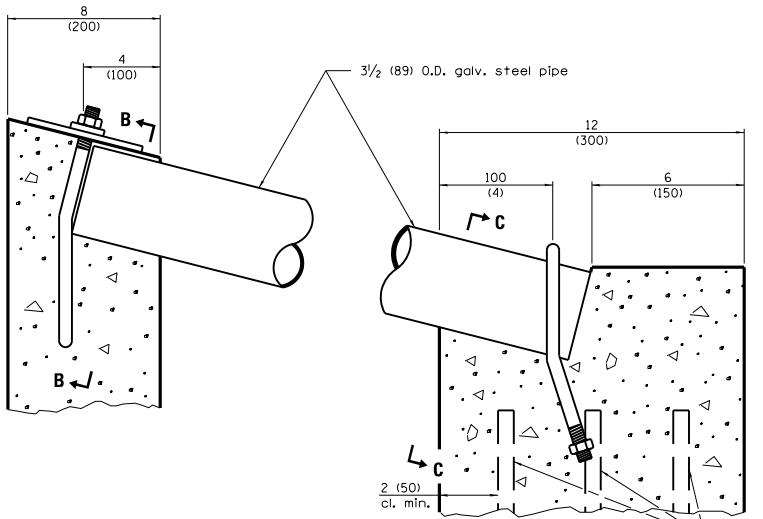




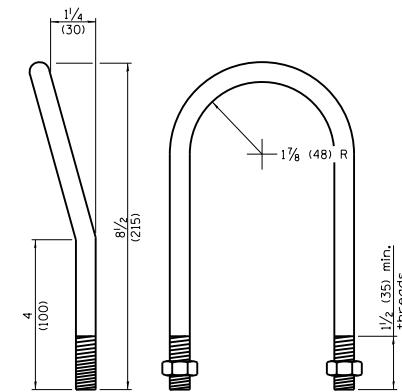
TOP ANCHOR PLATE
(2 - required)



SECTION B-B



DETAIL AT BLOCKOUTS



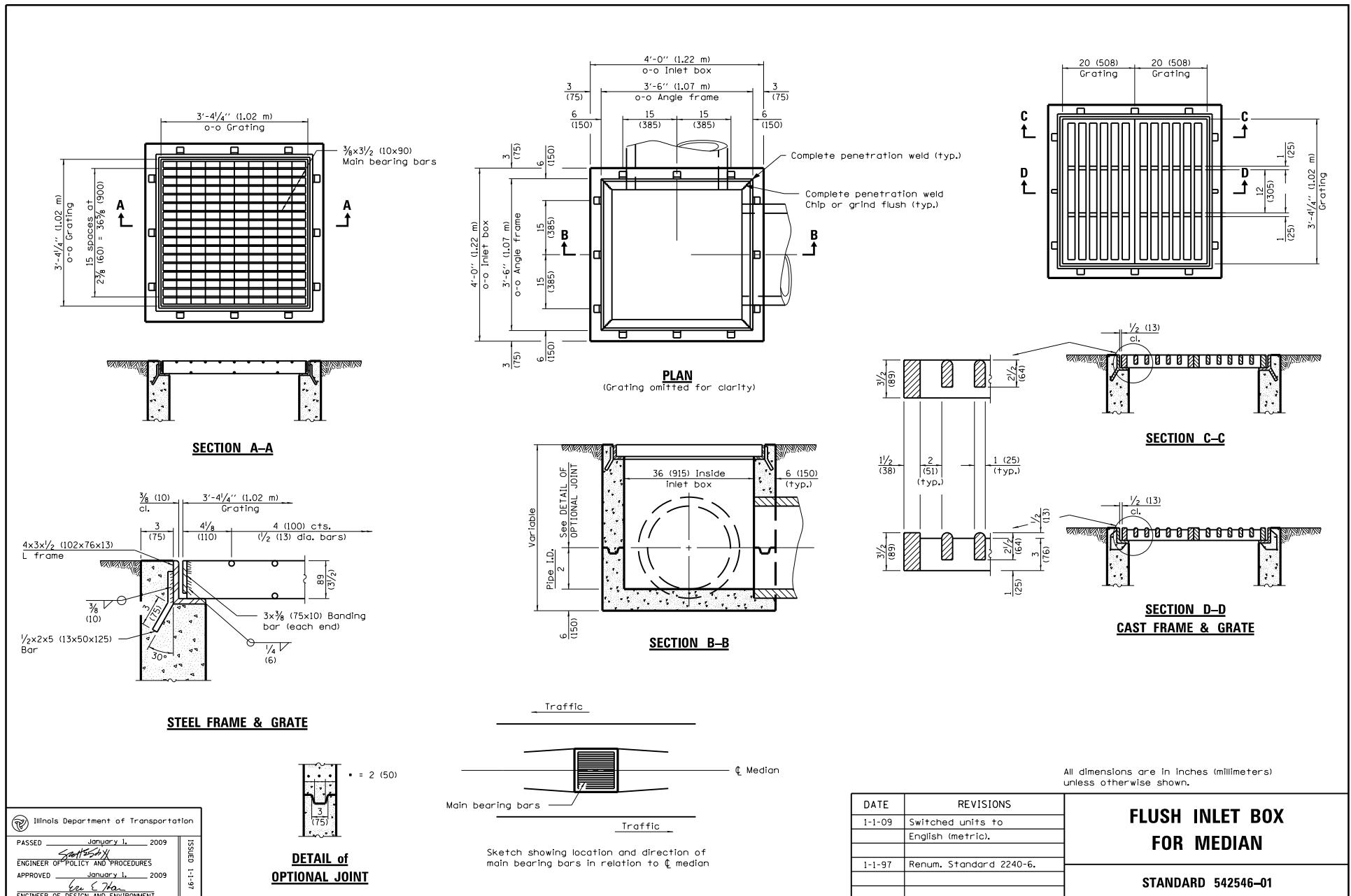
1/2 (M12) U BOLT
(4 - required)

INLET BOX
TYPE 48 (1200) A

(Sheet 2 of 2)

STANDARD 542541-02

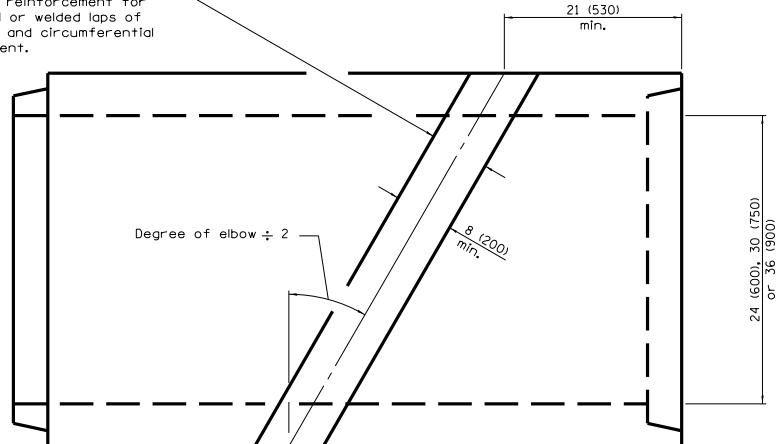
Illinois Department of Transportation
PASSED January 1, 2009
Santosh K. Saha
ENGINEER OF POLICY AND PROCEDURES
APPROVED January 1, 2009
Lee E. Shan
ENGINEER OF DESIGN AND ENVIRONMENT



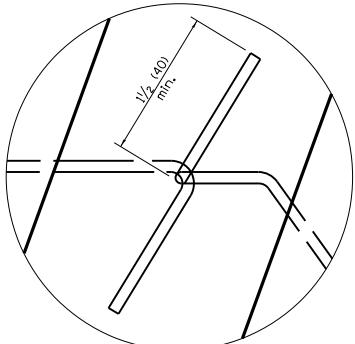
All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS	
1-1-09	Switched units to English (metric).	FLUSH INLET BOX FOR MEDIAN
1-1-97	Renum. Standard 2240-6.	STANDARD 542546-01

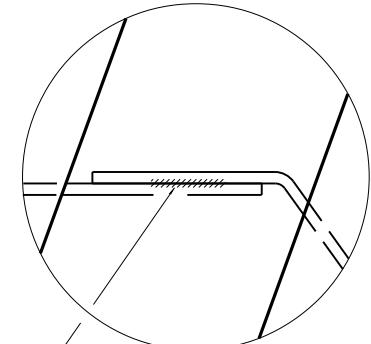
Remove concrete along these lines. Clean reinforcement for either tied or welded laps of longitudinal and circumferential reinforcement.



PLAN
(Reinforced concrete pipe)



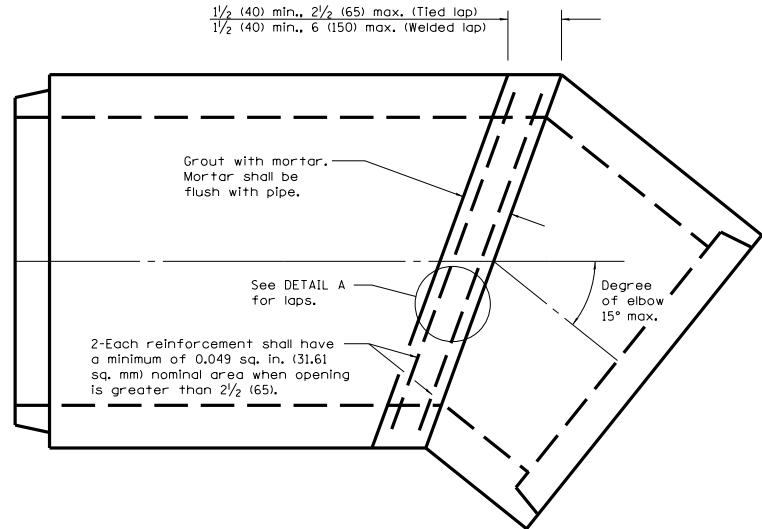
TIED LAP



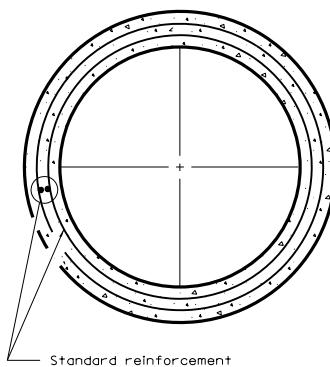
WELDED LAP

DETAIL A

For wire dia. W14 - W6 (10.72 - 7.01),
length of weld shall be $\frac{3}{4}$ (20) min.
For wire dia. W5.5 - W2.9 (6.73 - 4.88),
length of weld shall be $\frac{3}{8}$ (10) min.
Other wire dia. shall be tied per detail.



PLAN
(Reinforced concrete pipe elbow)



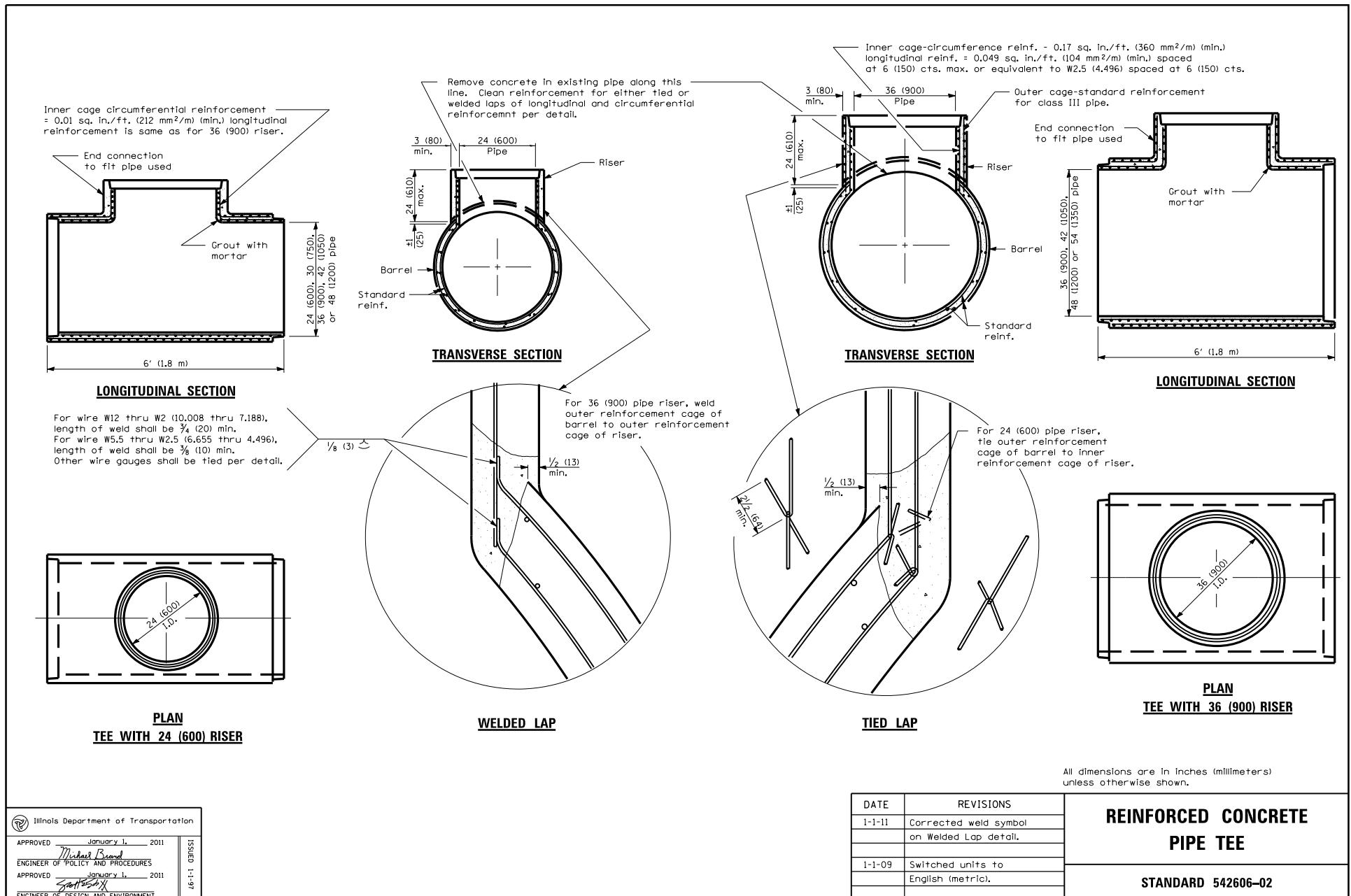
TRANSVERSE SECTION

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

DATE	REVISIONS	REINFORCED CONCRETE PIPE ELBOW 24", 30" OR 36" (600 mm, 750 mm OR 900 mm)
1-1-11	Corr. weld sym. on WELDED	
	LAP def. Added pipe dia. to	
	title. Set elbow to 15° max.	
1-1-10	Corrected pipe diameter	
	dimension lines.	
		STANDARD 542601-03

	Illinois Department of Transportation
APPROVED	January 1, 2011
<i>Michael Brand</i>	
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2011
<i>Scott E. Saylor</i>	
ENGINEER OF DESIGN AND ENVIRONMENT	

ISSUED 1-1-11



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

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


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
602101-02	Drainage Structures, Types 1, 2 & 3
602106-01	Drainage Structures, Types 4, 5 & 6
602301-04	Inlet, Type A
602306-03	Inlet, Type B
602401-03	Manhole, Type A
602406-07	Manhole, Type A, 6' (1.8 m) Diameter
602411-05	Manhole, Type A, 7' (2.1 m) Diameter
602416-05	Manhole, Type A, 8' (2.4 m) Diameter
602421-05	Manhole, Type A, 9' (2.7 m) Diameter
602501-02	Valve Vault, Type A
602601-04	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

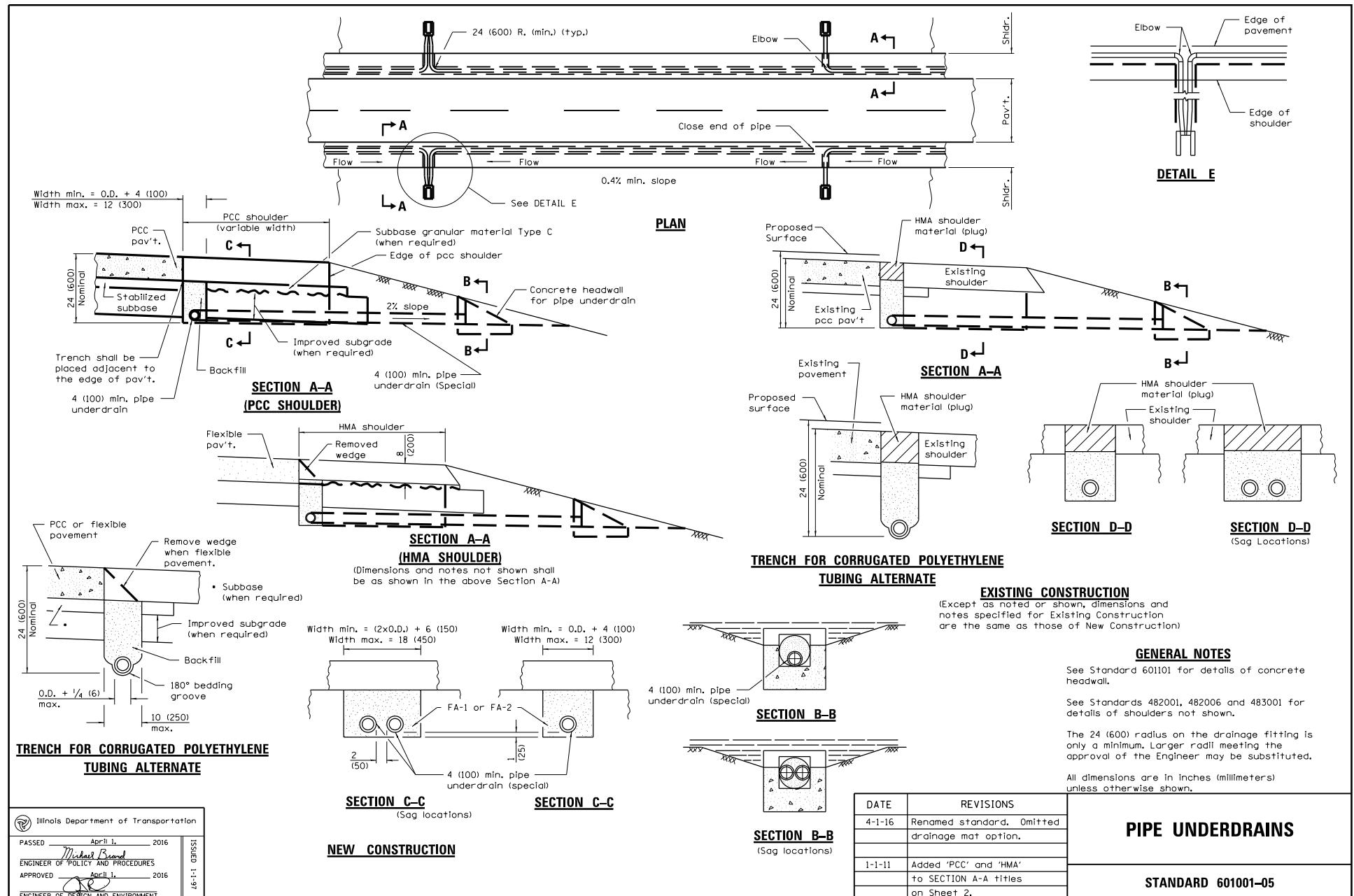
604106-01	Median Inlet for 36" (900 mm) Reinforced Concrete Pipe
606001-06	Concrete Curb Type B and Combination Concrete Curb and Gutter
606006-03	Outlet for Concrete Curb and Gutter, Type B-6.24 (B-15.60)
606101-05	Type A Gutter (Inlet, Outlet, and Entrance)
606106-04	Outlet, Type I for Type A Gutter
606111-03	Outlets, Type 2 for Type A Gutter
606201-03	Type B Gutter (Inlet, Outlet, and Entrance)
606206-03	Outlet, Type 1 for Type B Gutter
606211-03	Outlets, Type 2 for Type B Gutter
606301-04	PC Concrete Islands And Medians
606306-04	Corrugated PC Concrete Medians
606401-02	Paved Ditch
610001-06	Shoulder Inlet With Curb

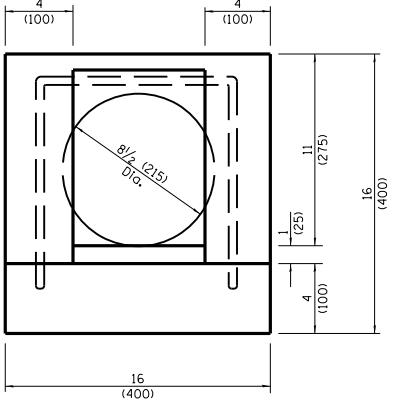
SAFETY RELATED ITEMS

630001-10	Steel Plate Beam Guardrail
630101-09	Guardrail Mounted on Existing Culverts
630106-01	Long-Span Guardrail Over Culvert
630201-06	PCC/HMA Stabilization at Steel Plate Beam Guardrail
630301-06	Shoulder Widening for Type 1 (Special) Guardrail Terminals
631006-08	Traffic Barrier Terminal, Type 1B
631011-09	Traffic Barrier Terminal, Type 2
631026-06	Traffic Barrier Terminal, Type 5
631031-14	Traffic Barrier Terminal, Type 6
631032-08	Traffic Barrier Terminal, Type 6A
631033-06	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
637001-05	Concrete Barrier 32 in. (815 mm) Height
637006-03	Concrete Barrier 42 in. (1065 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

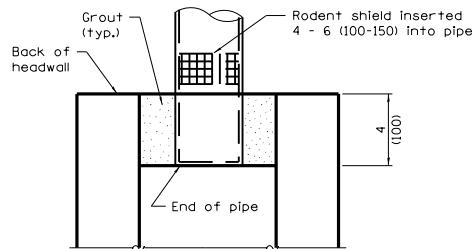
OTHER ITEMS

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

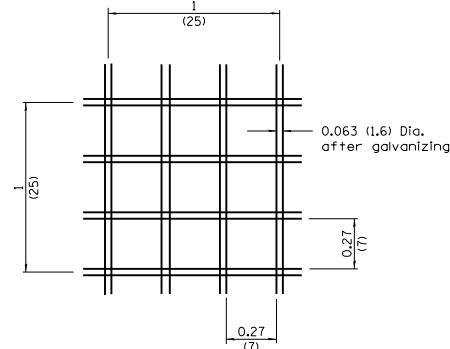




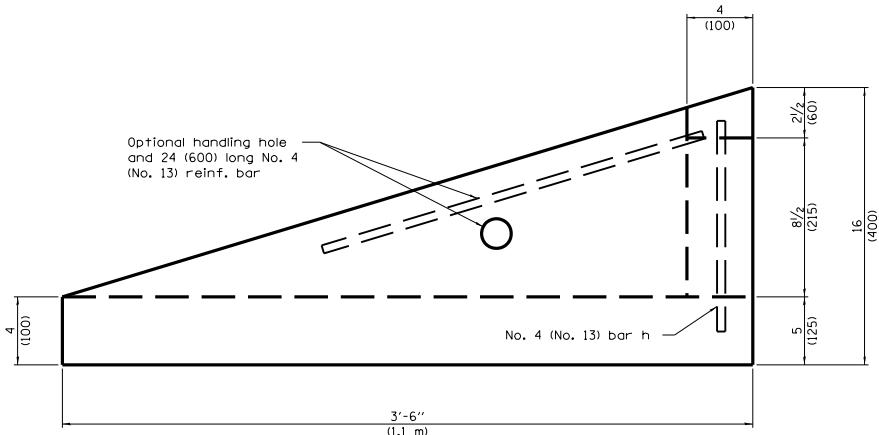
FRONT VIEW



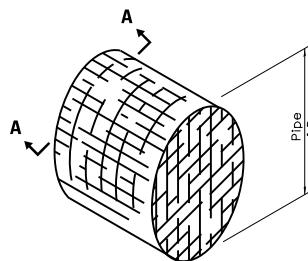
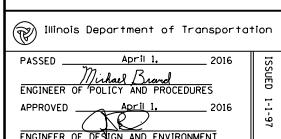
RODENT SHIELD PLACEMENT



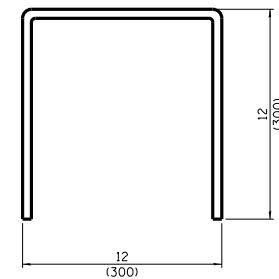
SECTION A-A



SIDE VIEW



DETAIL OF RODENT SHIELD



BAR h

GENERAL NOTES

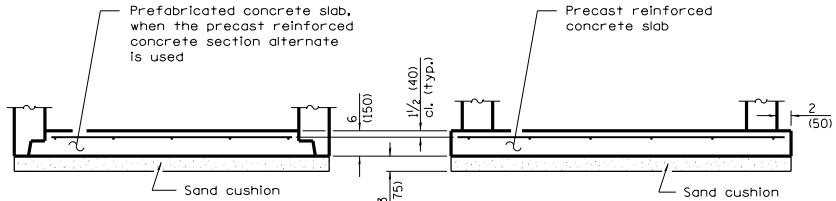
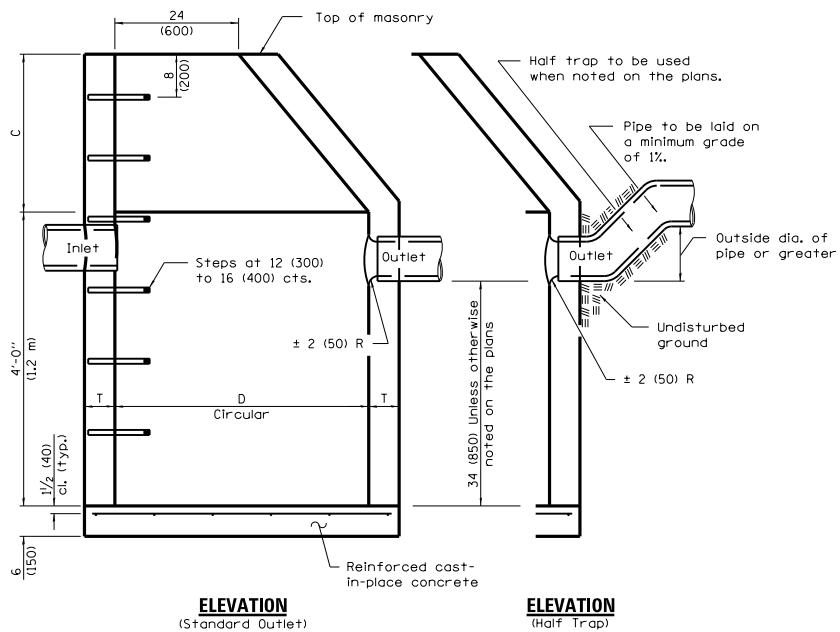
An alternate paved invert meeting the approval of the Engineer may be substituted for that shown in side view.

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

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



ALTERNATE BOTTOM SLAB

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

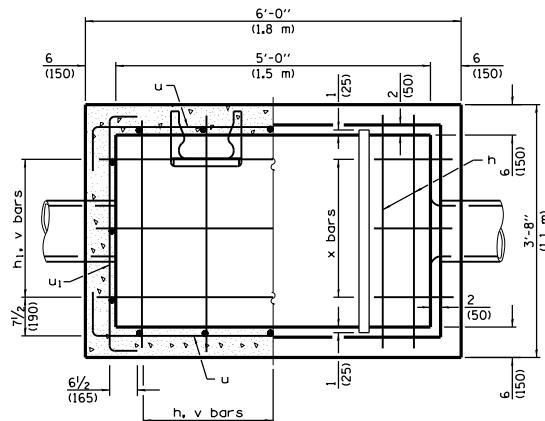
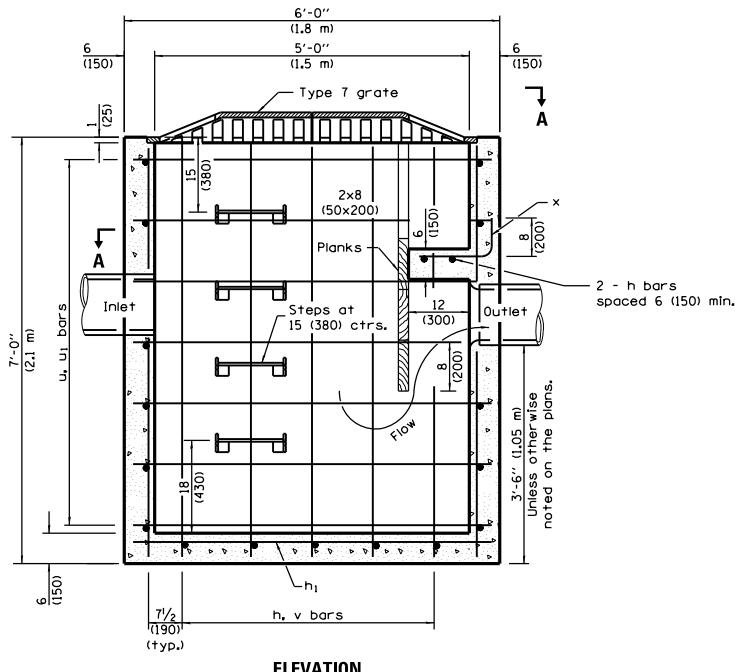
See Standard 602601 for optional precast reinforced concrete flat slab top.

See Standard 602701 for details of steps.

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

DATE	REVISIONS	CATCH BASIN TYPE A STANDARD 602001-02
1-1-11	Added 'Outside' to half trap note. Detail rein. in slabs.	
	Revised general notes.	
1-1-09	Switched units to English (metric).	

	Illinois Department of Transportation
PASSED	January 1, 2011
<i>Michael Brand</i>	I-1-11-097
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2011
<i>Scott E. S.</i>	
ENGINEER OF DESIGN AND ENVIRONMENT	



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

Bar	Oty.	Size	Shape	Length
h	7	No. 4 (No. 13)	—	3'-5" (1.02 m)
h ₁	3	No. 4 (No. 13)	—	5'-9" (1.72 m)
u	14	No. 4 (No. 13)	U	7'-0" (2.10 m)
u ₁	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)

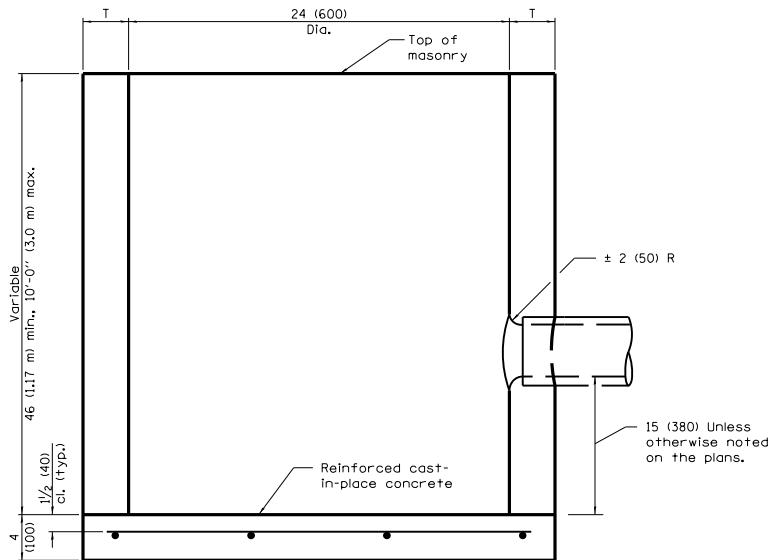
All bars shall be at 12 (300) centers unless otherwise shown. Reinforcement bar clearance shall be 1½ (40).

	Illinois Department of Transportation
PASSED	January 1, 2013
	Michael Brand
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2013
	JR. Goss
ENGINEER OF DESIGN AND ENVIRONMENT	

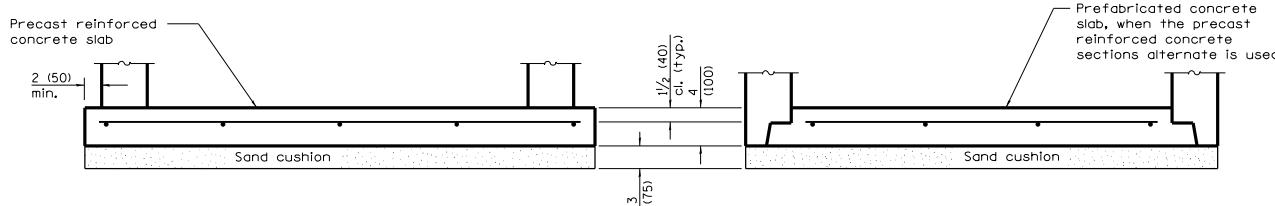
GENERAL NOTES
See Standard 602701 for details of steps.

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

DATE	REVISIONS	CATCH BASIN TYPE B
1-1-13	Revised and relocated steps.	
1-1-11	Added additional bar identification.	STANDARD 602006-04



ELEVATION

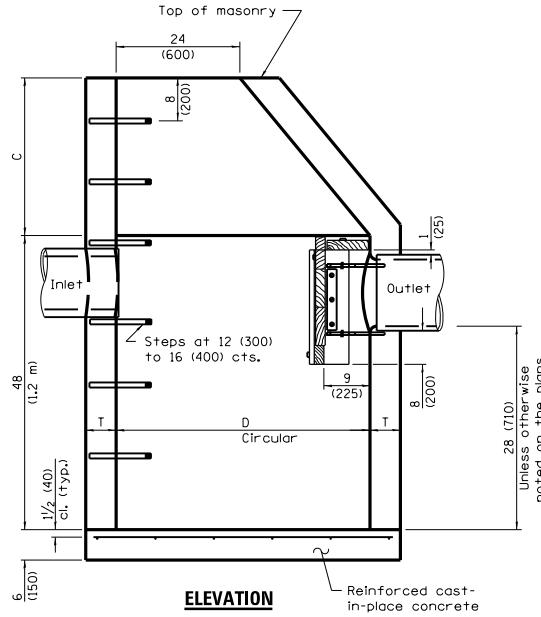


ALTERNATE BOTTOM SLAB

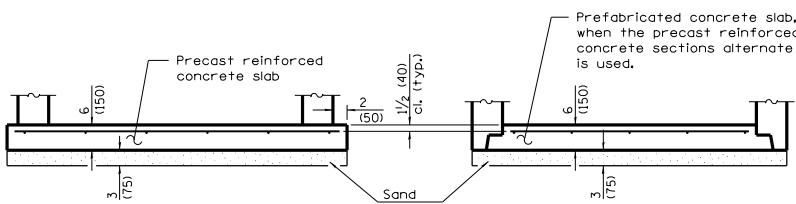
DATE	REVISIONS
1-1-11	Detailed rein. in slabs. Added max. limit to height. Added general notes.
1-1-09	Switched units to English (metric).

CATCH BASIN TYPE C

STANDARD 602011-02



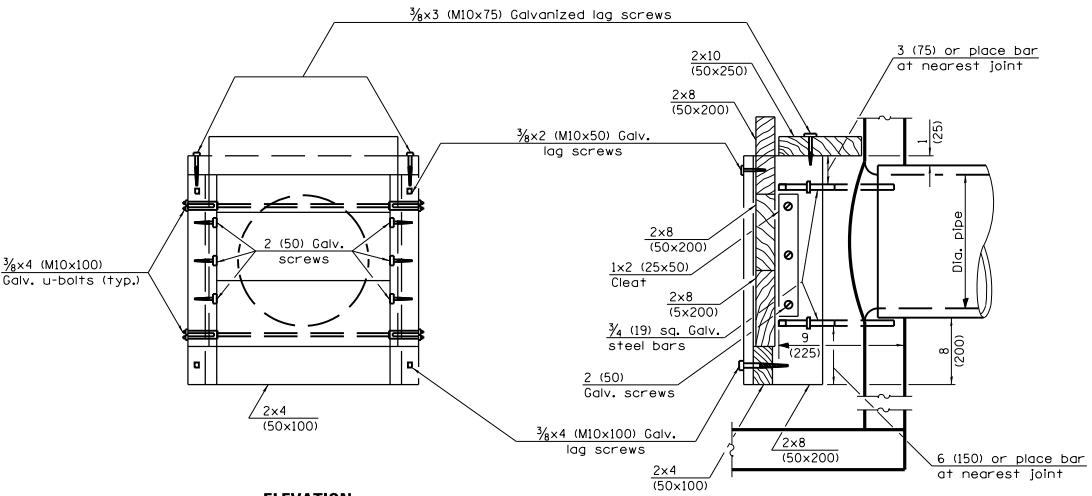
ELEVATION



ALTERNATE BOTTOM SLAB

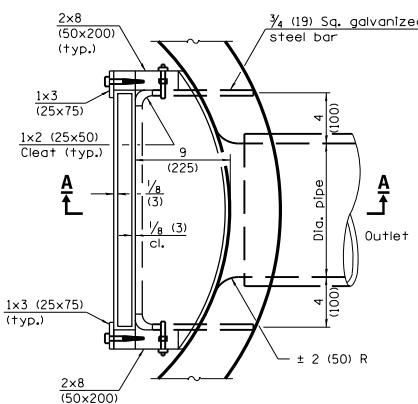
ALTERNATE MATERIALS FOR WALLS	D	C*	T (min.)
Concrete Masonry Unit 4'-0" (1.20 m)	36 (900) 30 (760)	15 (380) 5 (125)	5 (125)
Brick Masonry 4'-0" (1.20 m)	36 (900) 30 (760)	15 (380) 8 (200)	8 (200)
Precast Reinforced Concrete Section 4'-0" (1.20 m)	36 (900) 30 (760)	15 (380) 4 (100)	3 (75)
Cast-in-Place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

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



ELEVATION

SECTION A-A



PLAN

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.

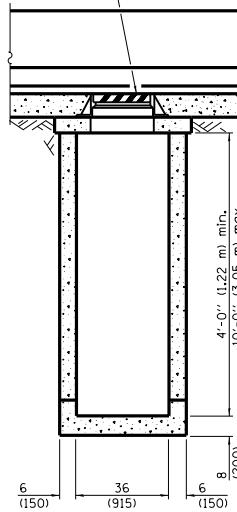
See Standard 602601 for optional precast reinforced concrete flat slab top.

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

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

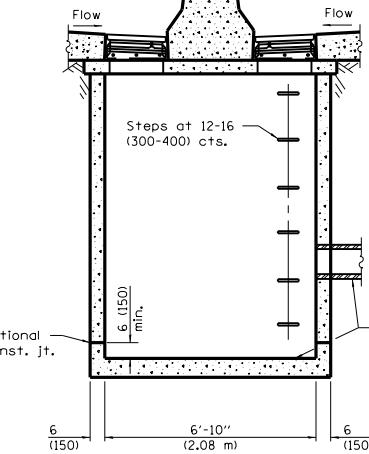
STANDARD 602016-02

Type 20 frame & grate



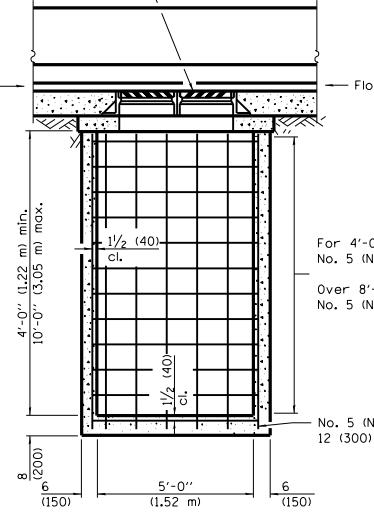
FRONT ELEVATION – TYPE 1

Concrete barrier



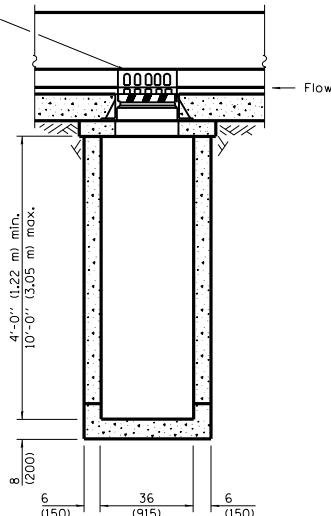
SIDE ELEVATION – TYPE 1 & 2

Type 22 frames & grates

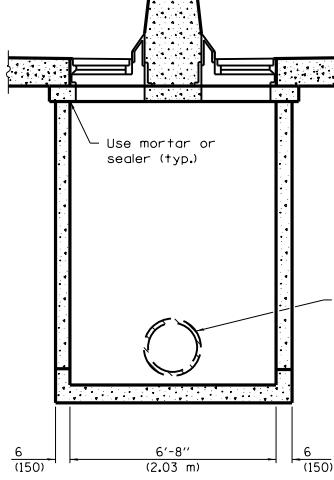


FRONT ELEVATION – TYPE 2

Type 21 frame & grate



FRONT ELEVATION – TYPE 3



SIDE ELEVATION – TYPE 3

	Illinois Department of Transportation
PASSED	January 1, 2009
	1-1-1-199
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2009
	EE
ENGINEER OF DESIGN AND ENVIRONMENT	

GENERAL NOTES

These structures are for use with concrete barrier, double face, 32 (815) height (Standard 637001).

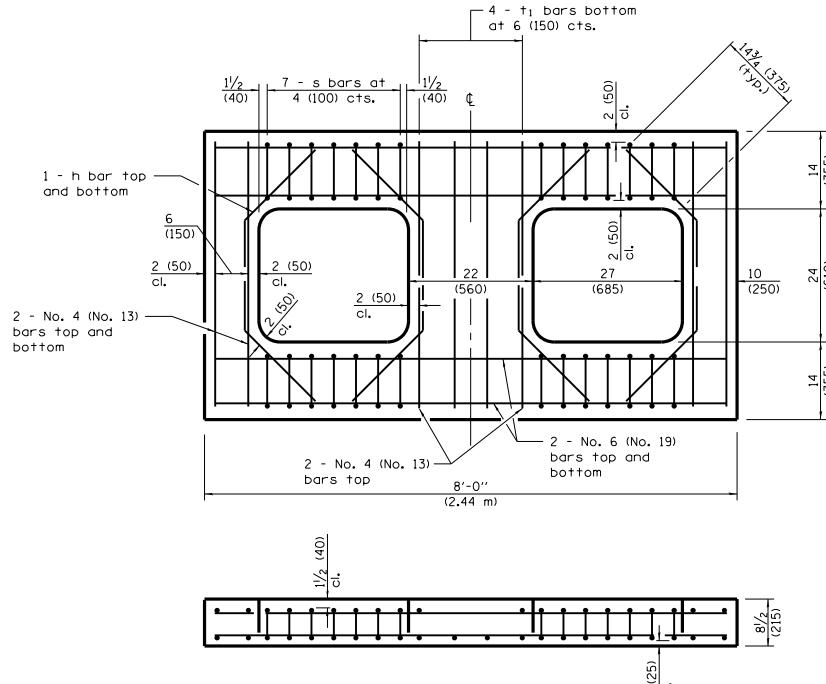
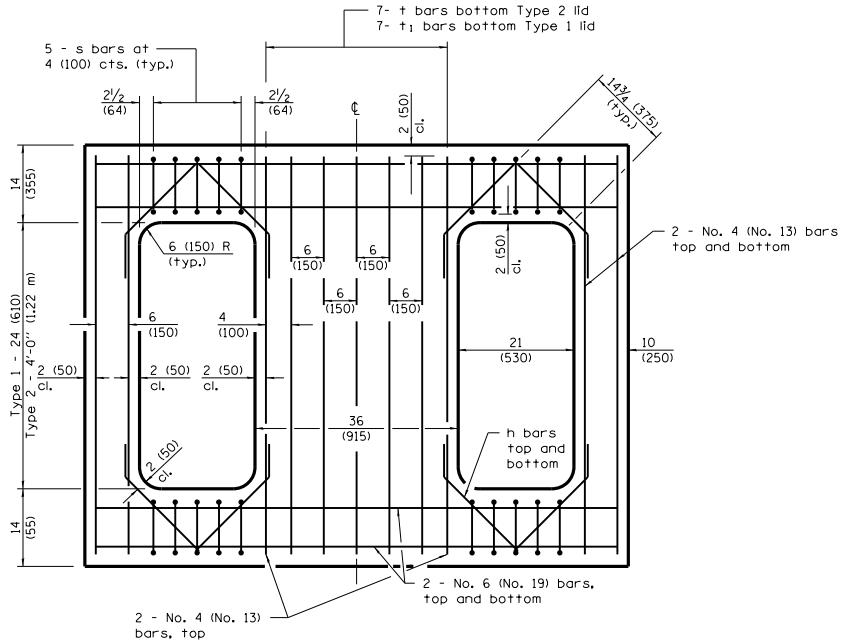
The reinforcement shown in the front elevation of the Type 2 is typical for both elevations of all types.

See Standard 602701 for details of steps.

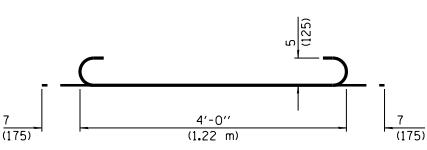
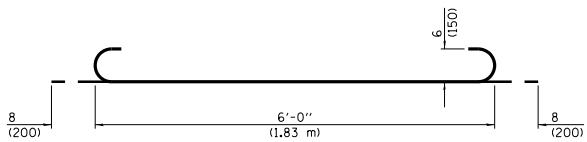
Exposed edges shall be beveled $\frac{3}{4}$ (19).

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

DATE	REVISIONS	DRAINAGE STRUCTURES TYPES 1, 2 & 3 (Sheet 1 of 2)
1-1-09	Switched units to English (metric).	
4-1-04	Revised to fit F shape barrier.	STANDARD 602101-02



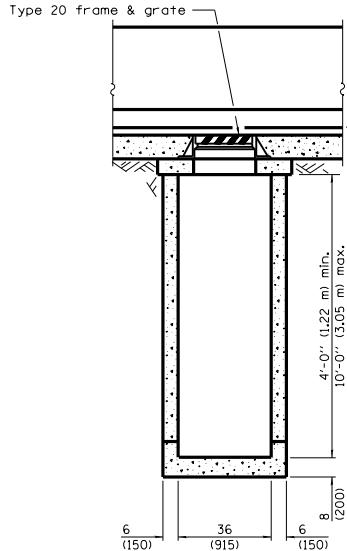
Illinois Department of Transportation
PASSED January 1, 2009
Sgt. S. Shy
ENGINEER OF POLICY AND PROCEDURES
APPROVED January 1, 2009
E. S. Khan
ENGINEER OF DESIGN AND ENVIRONMENT



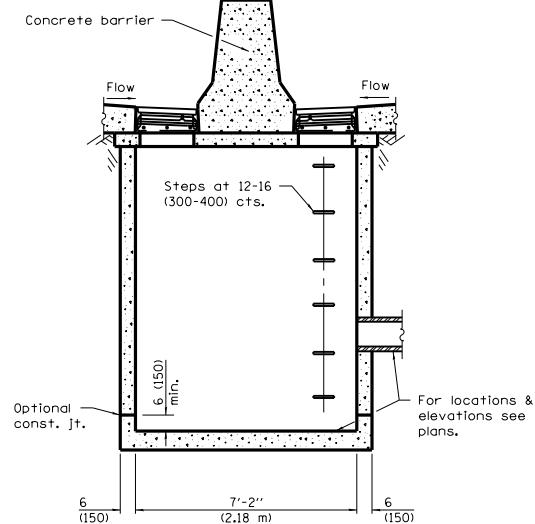
DRAINAGE STRUCTURES TYPES 1, 2 & 3

(Sheet 2 of 2)

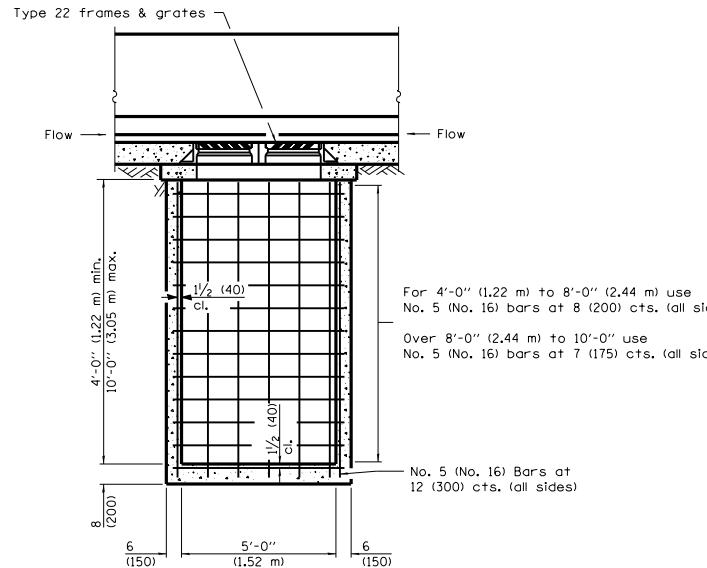
STANDARD 602101-02



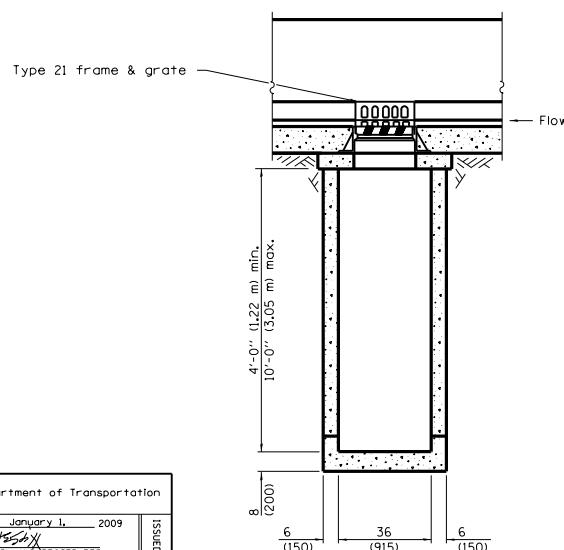
FRONT ELEVATION – TYPE 4



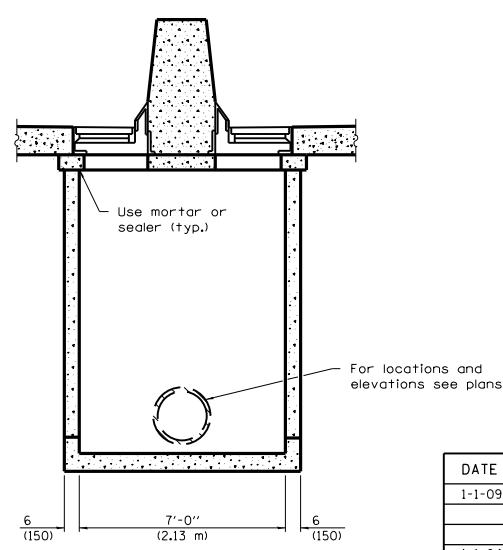
SIDE ELEVATION – TYPE 4 & 5



FRONT ELEVATION – TYPE 5



FRONT ELEVATION – TYPE 6



SIDE ELEVATION – TYPE 6

GENERAL NOTES

These structures are for use with concrete barrier, double face, 42 (1065) height (Standard 637006).

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

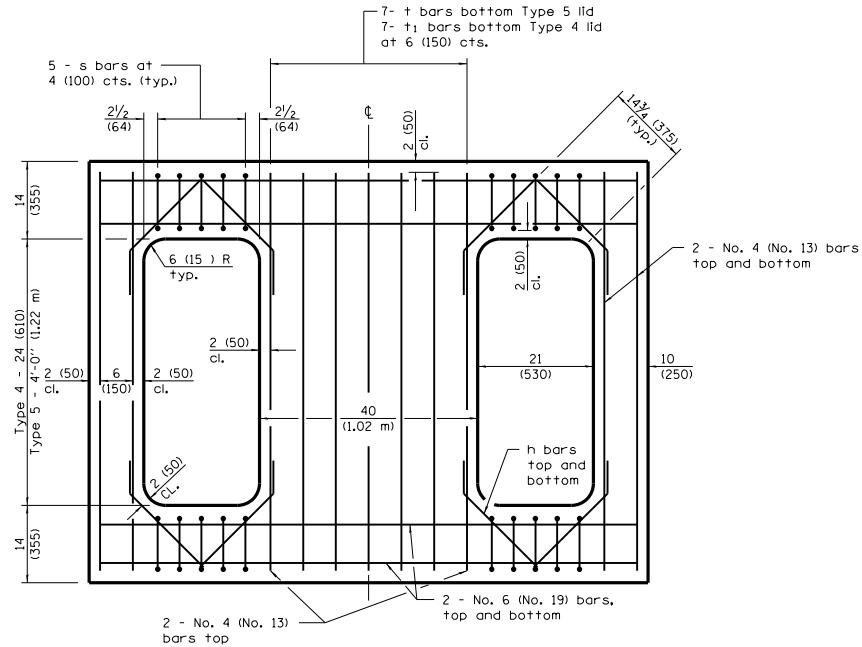
See Standard 602701 for details of steps.

Exposed edges shall be beveled $\frac{3}{4}$ (19).

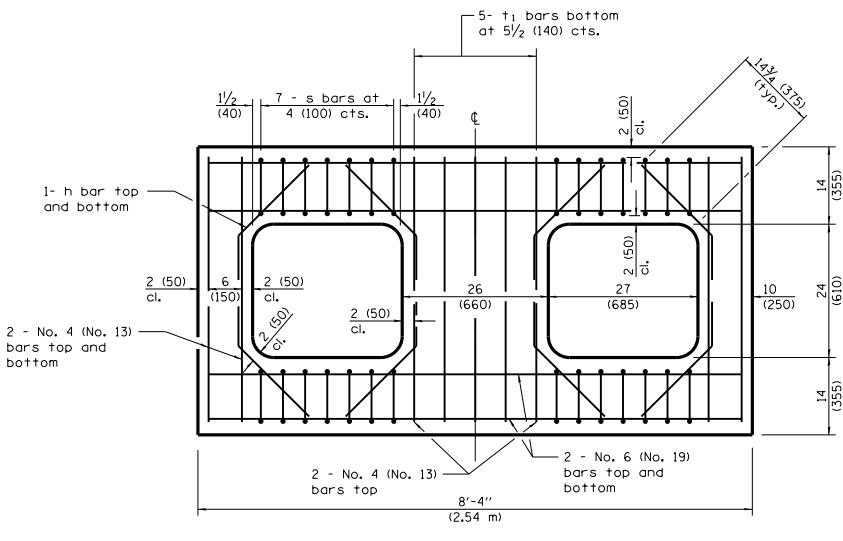
All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS	DRAINAGE STRUCTURES TYPES 4, 5 & 6 (Sheet 1 of 2)
1-1-09	Switched units to English (metric).	
1-1-04	New standard	
		STANDARD 602106-01

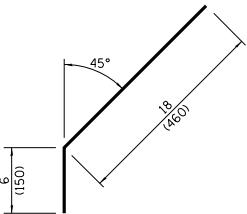
Illinois Department of Transportation
PASSED January 1, 2009
<i>[Signature]</i>
ENGINEER OF POLICY AND PROCEDURES
APPROVED January 1, 2009
<i>[Signature]</i>
ENGINEER OF DESIGN AND ENVIRONMENT



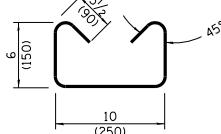
REINFORCED LID – TYPE 4 & 5



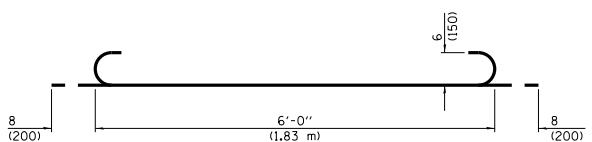
REINFORCED LID – TYPE 6



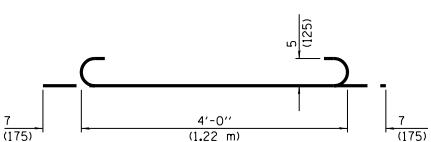
No. 4 (No. 13) Bar h



No. 3 (No. 10) Bars



No. 6 (No. 19) Bart



No. 5 (No. 16) Bar t1

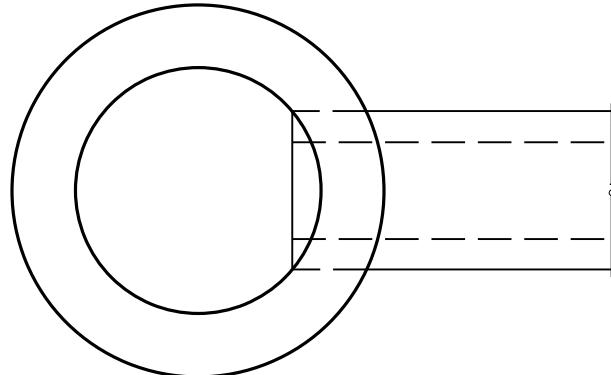
	Illinois Department of Transportation
PASSED	January 1, 2009
Santosh K. Patel	
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2009
Eric E. Hahn	
ENGINEER OF DESIGN AND ENVIRONMENT	
ISSUED 4-1-04	

DRAINAGE STRUCTURES

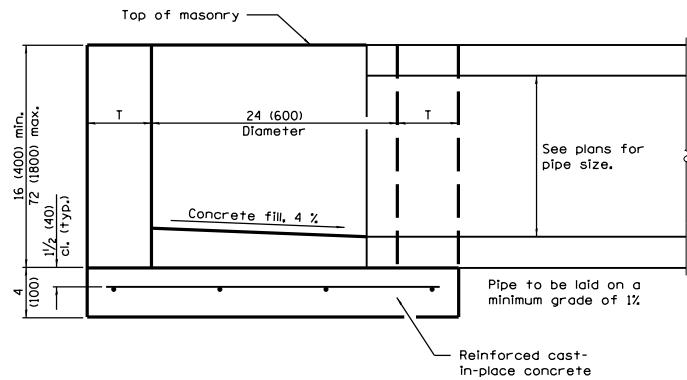
TYPES 4 5 & 6

(Sheet 2 of 2)

STANDARD 602106-01

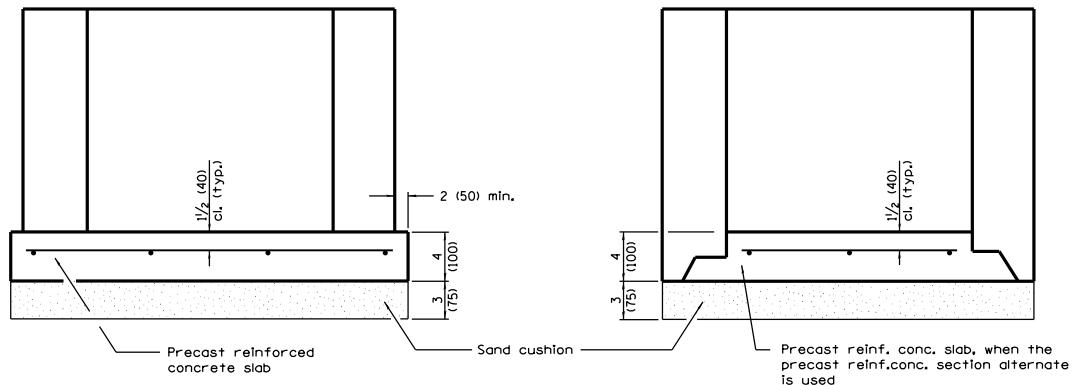


PLAN



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.

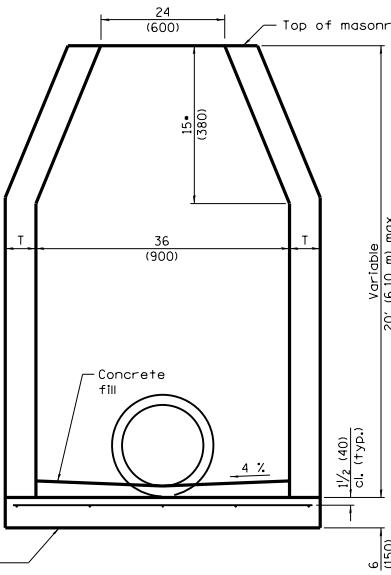
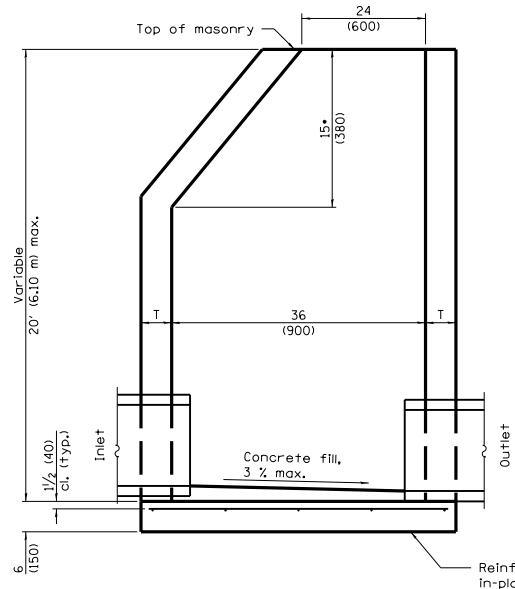
All dimensions are in inches (millimeters) unless otherwise shown.

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

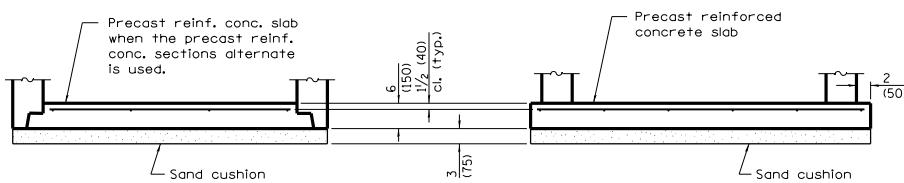
STANDARD 602301-04

	Illinois Department of Transportation
PASSED	January 1, 2014
<i>Michael Brand</i>	1-1-14
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	JANUARY 1, 2014
<i>[Signature]</i>	1-1-14
ENGINEER OF DESIGN AND ENVIRONMENT	

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



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

	Illinois Department of Transportation
PASSED	January 1, 2011
Michael Brand	1-1-11-97
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2011
Scott E. Saylor	
ENGINEER OF DESIGN AND ENVIRONMENT	

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).

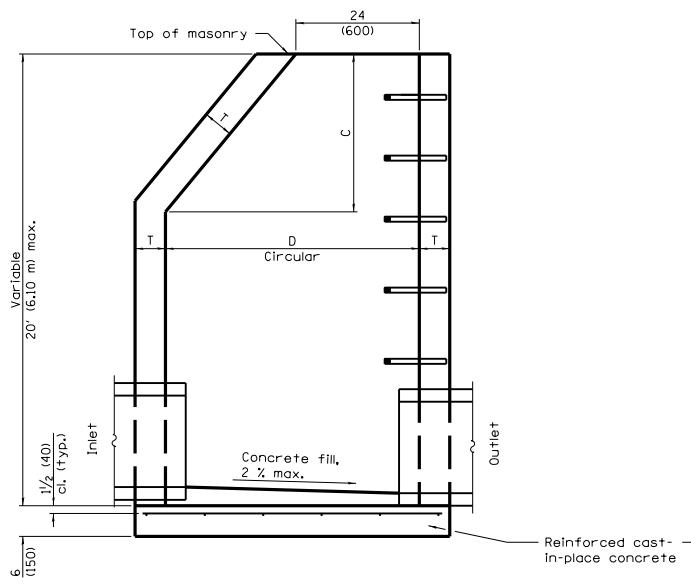
Bottom slabs may be connected to the riser as determined by the fabricator; however, only a single row of reinforcement around the perimeter may be utilized.

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

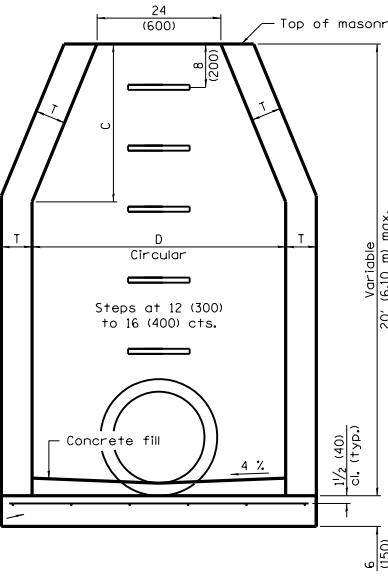
All dimensions are in inches (millimeters) unless otherwise shown.

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

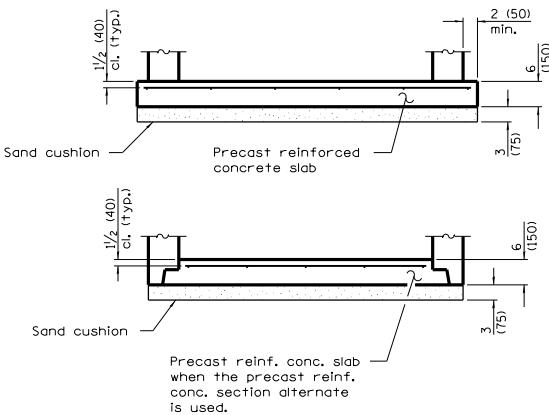
STANDARD 602306-03



ELEVATION – ECCENTRIC



ELEVATION – CONCENTRIC



ALTERNATE BOTTOM SLAB

ALTERNATE MATERIALS FOR WALLS	D	C*	T (min.)
Concrete Masonry Unit	4'-0" (1.2 m) 5'-0" (1.5 m)	30 (750) 3'-9" (1.15 m)	5 (125) 5 (125)
Brick Masonry	4'-0" (1.2 m) 5'-0" (1.5 m)	30 (750) 3'-9" (1.15 m)	8 (200) 8 (200)
Precast Reinforced Concrete Section	4'-0" (1.2 m) 5'-0" (1.5 m)	30 (750) 3'-9" (1.15 m)	4 (100) 5 (125)
Cast-in-place Concrete	4'-0" (1.2 m) 5'-0" (1.5 m)	30 (750) 3'-9" (1.15 m)	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 0.31 sq. in./ft. (660 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.

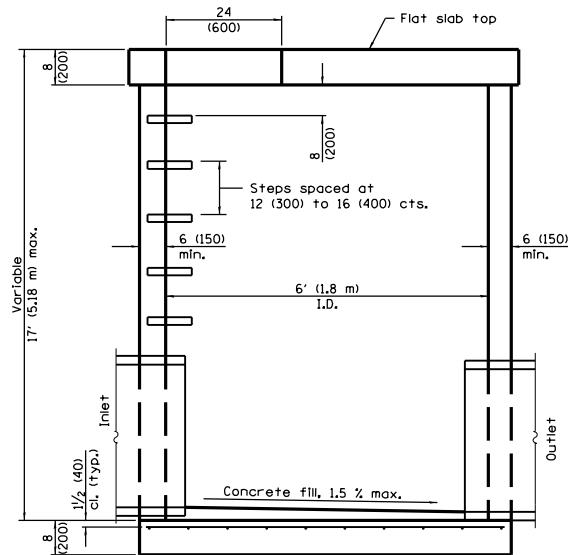
See Standard 602701 for details of steps.

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

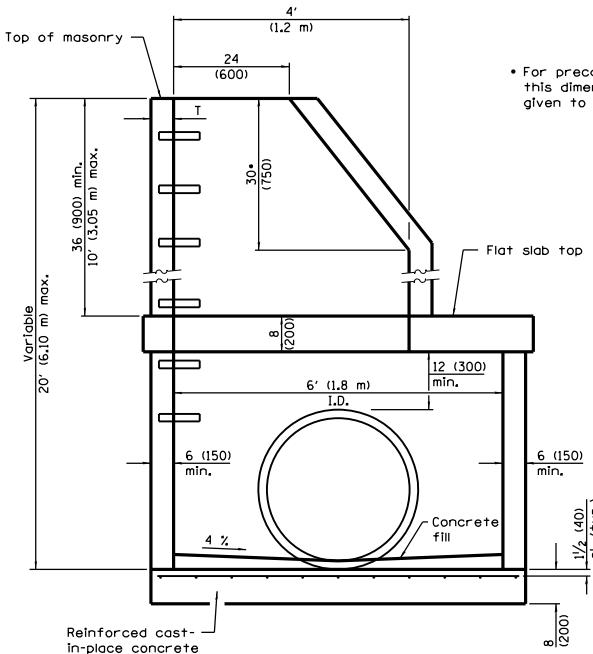
All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS	MANHOLE TYPE A STANDARD 602401-03
1-1-11	Detailed rein. in slabs.	
	Added max. limit to height.	
	Revised general notes.	
1-1-09	Switched units to	
	English (metric).	

	Illinois Department of Transportation
PASSED	January 1, 2011
Michael Brand	1-1-11-197
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2011
Stefan S. S. S. S.	
ENGINEER OF DESIGN AND ENVIRONMENT	

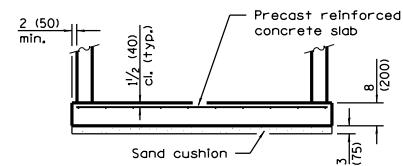
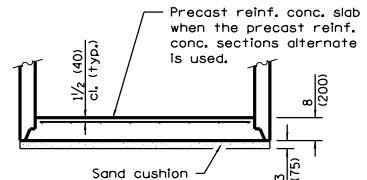


ELEVATION
(with flat slab top only)

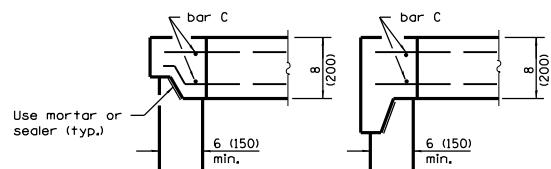


ELEVATION
(with flat slab top and riser)

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



ALTERNATE BOTTOM SLABS



ALTERNATE JOINT CONFIGURATIONS

ALTERNATE MATERIALS FOR WALLS	
Concrete Masonry Units	5 (125)
Precast Reinforced Concrete Sections	4 (100)
Cast-in-Place Concrete	6 (150)

GENERAL NOTES
Joint configuration and dimensions of flat slab top shall match and fit the riser joint detail.

Bottom slabs shall be reinforced for a minimum of 0.29 sq. in./ft. (610 sq. mm /m) in both directions with a maximum spacing of 13 (330).

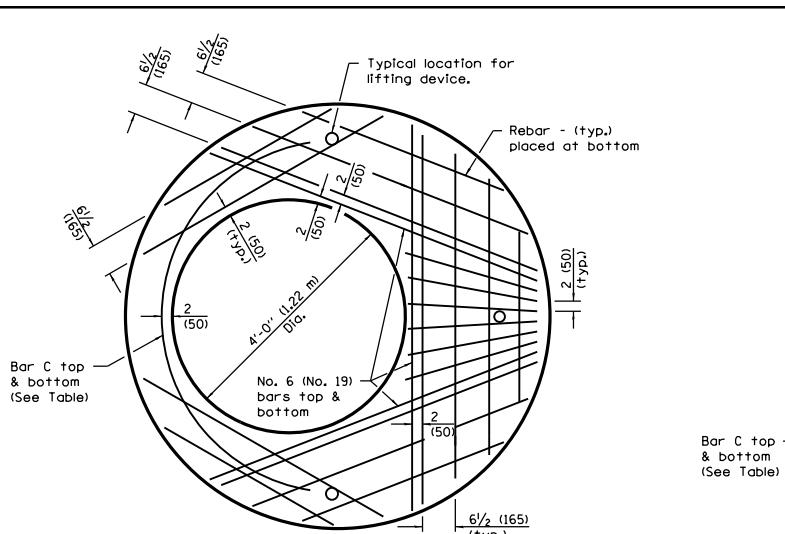
Bottom slabs may be connected to the riser as determined by the fabricator; however, only a single row of reinforcement around the perimeter may be utilized.

See Standard 602701 for details of manhole steps.
All dimensions are in inches (millimeters) unless otherwise shown.

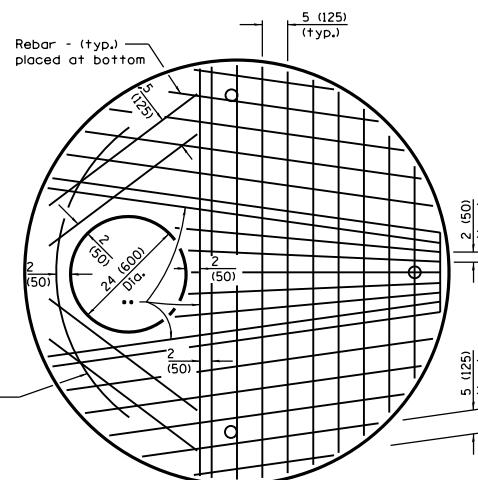
	Illinois Department of Transportation
PASSED	April 1, 2016
Michael Brand	Inspected
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	April 1, 2016
John Doe	Revised
ENGINEER OF DESIGN AND ENVIRONMENT	

DATE	REVISIONS
4-1-16	Changed terminology to 'welded wire reinforcement'.
1-1-14	Increased maximum heights.
	Revised General Notes.

MANHOLE TYPE A
6' (1.8 m) DIAMETER
(Sheet 1 of 2)
STANDARD 602406-07

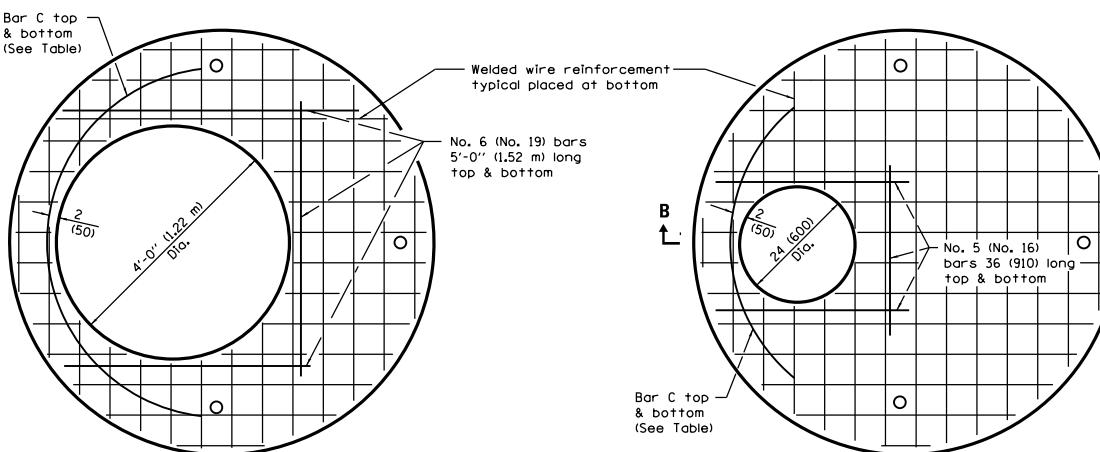


PLAN

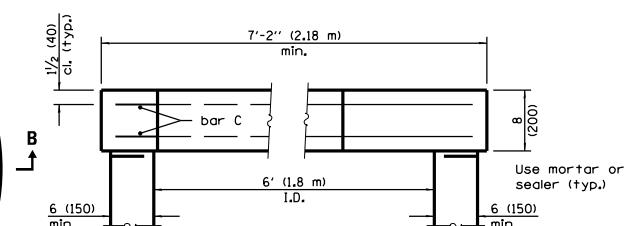
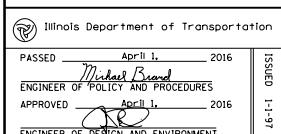


•• No. 6 (No. 19) bars
top & bottom

Diameter of opening	Thickness	Reinforcement "AS" WWR Each direction	Bar Size	No. 4 (No. 13) Bar C
24 (600)	8 (200)	1.06 sq. in./ft. (2244 sq. mm/m)	No. 6 (No. 19)	6'-0" (1.83 m) 38 (965)
4'-0" (1.2 m)	8 (200)	0.82 sq. in./ft. (1734 sq. mm/m)	No. 6 (No. 19)	7.24 (2.24 m) 38 (965)



PLAN

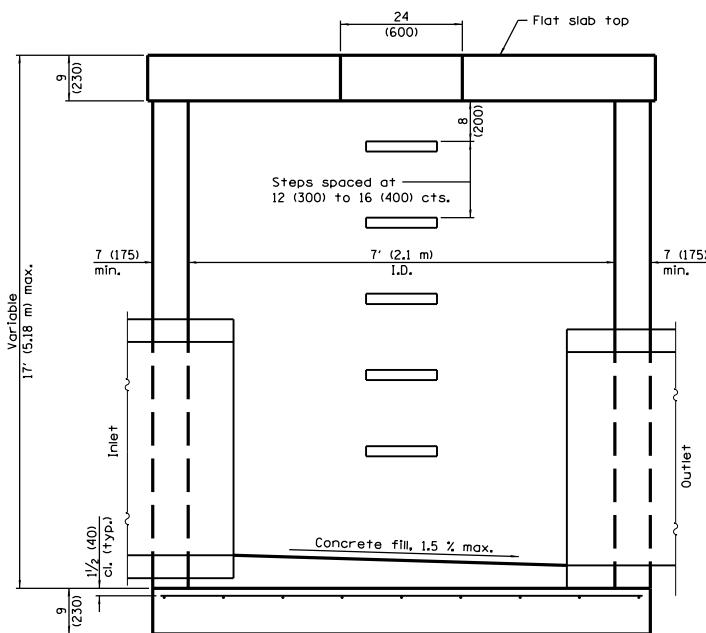


SECTION B-B

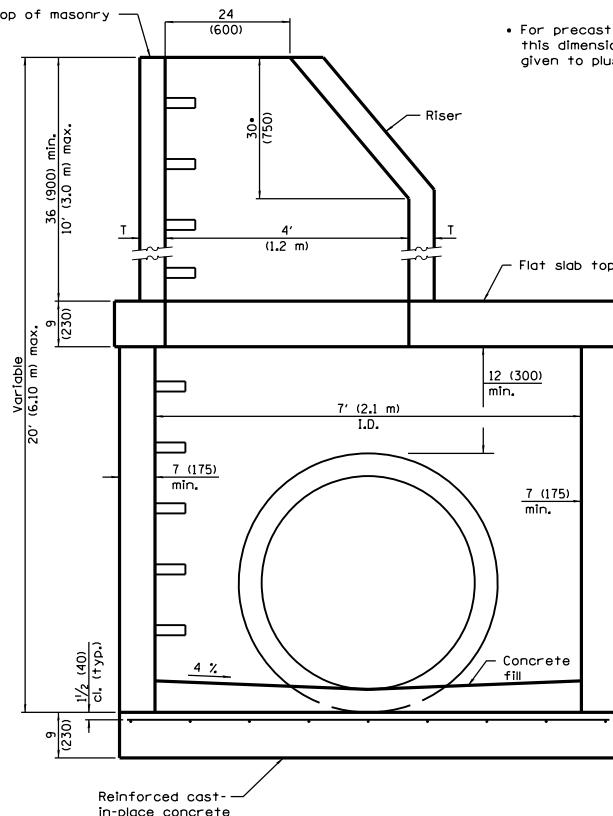
**MANHOLE TYPE A
6' (1.8 m) DIAMETER**

(Sheet 2 of 2)

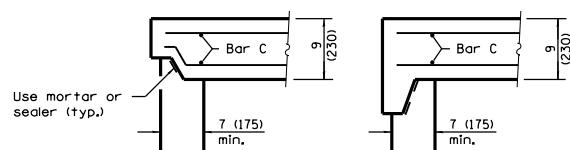
STANDARD 602406-07



ELEVATION
(With Flat Slab Top Only)



ELEVATION
(With Flat Slab Top and Riser)



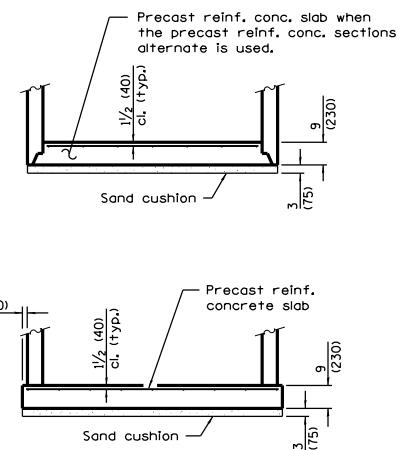
ALTERNATE JOINT CONFIGURATIONS

ALTERNATE MATERIALS FOR RISER WALLS	T (min)
Concrete Masonry Units	5 (125)
Precast Reinforced Concrete Sections	4 (100)
Cast-in-Place Concrete	6 (150)

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

96-1-4

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



ALTERNATE BOTTOM SLABS

GENERAL NOTES

Joint configuration and dimensions of flat slab top shall match and fit the riser joint detail.

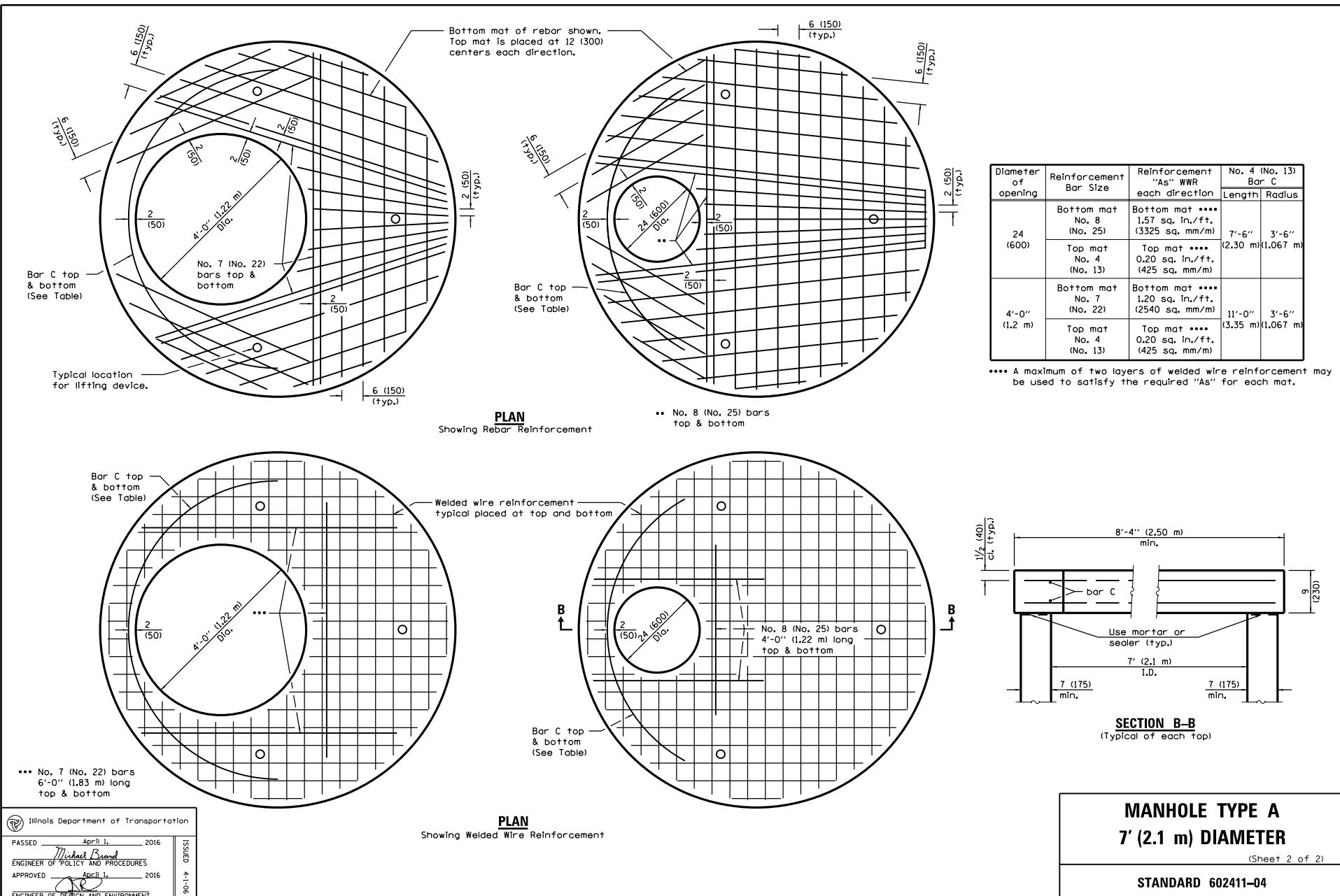
Bottom slabs shall be reinforced with a minimum of 0.31 sq. in./ft. (660 sq. mm/m) in both directions with a maximum spacing of 12 (300).

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.

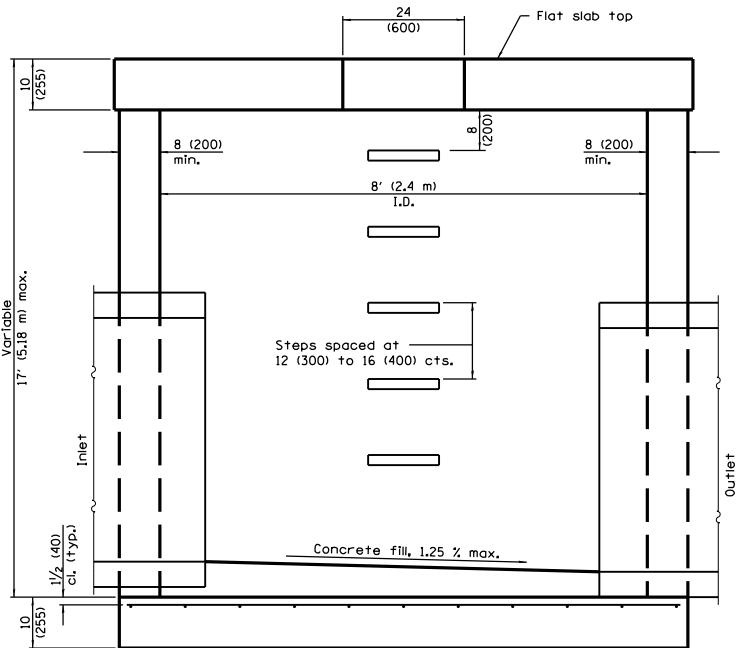
See Standard 602701 for details of manhole steps.

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

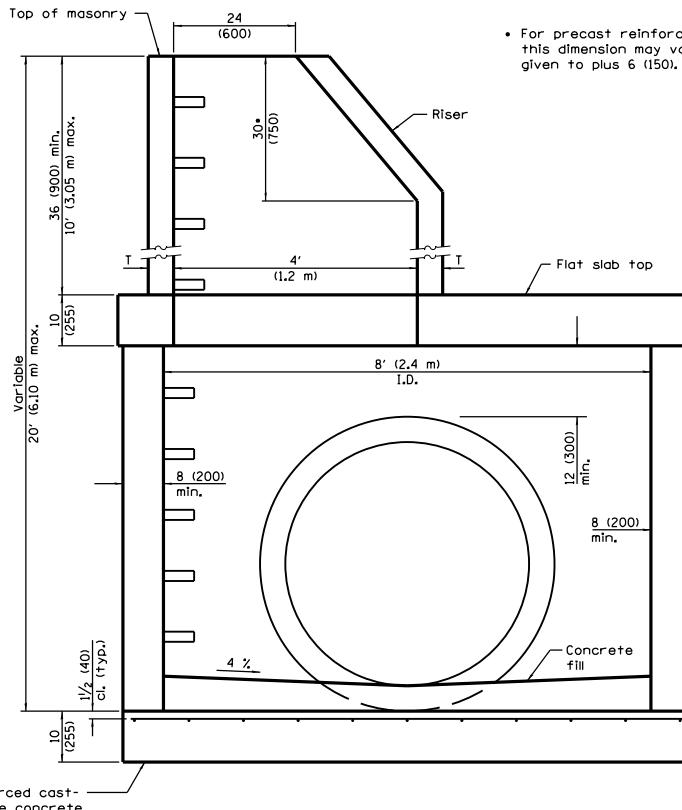
DATE	REVISIONS	MANHOLE TYPE A 7' (2.1 m) DIAMETER (Sheet 1 of 2)
4-1-16	Changed terminology to 'welded wire reinforcement'.	
1-1-14	Increased maximum heights. Revised General Notes.	
		STANDARD 602411-05



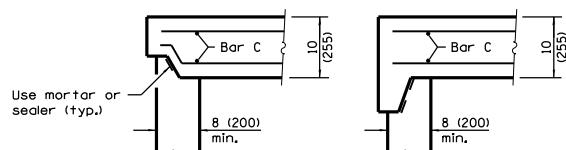
	Illinois Department of Transportation
PASSED	April 1, 2016
<i>Michael Brand</i>	
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	April 1, 2016
<i>[Signature]</i>	
ENGINEER OF DESIGN AND ENVIRONMENT	



ELEVATION
(With Flat Slab Top Only)

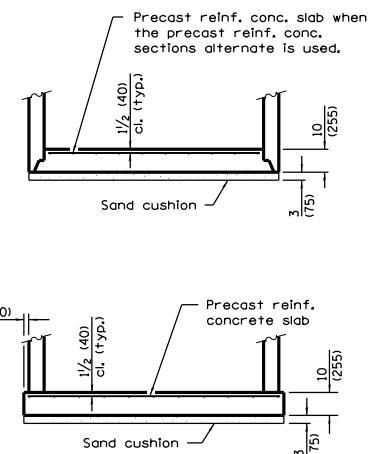


ELEVATION
(With Flat Slab Top and Riser)



ALTERNATE JOINT CONFIGURATIONS

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



ALTERNATE BOTTOM SLABS

GENERAL NOTES

Joint configuration and dimensions of flat slab top shall match and fit the riser joint detail.

Bottom slabs shall be reinforced with a minimum of 0.34 sq. in./ft. (720 sq. mm/m) in both directions, with a maximum spacing of 11 (280).

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.

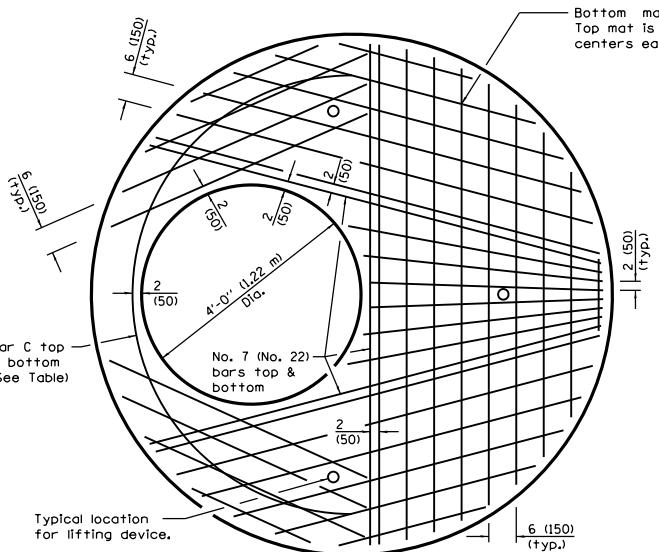
See Standard 602701 for details of manhole steps.

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

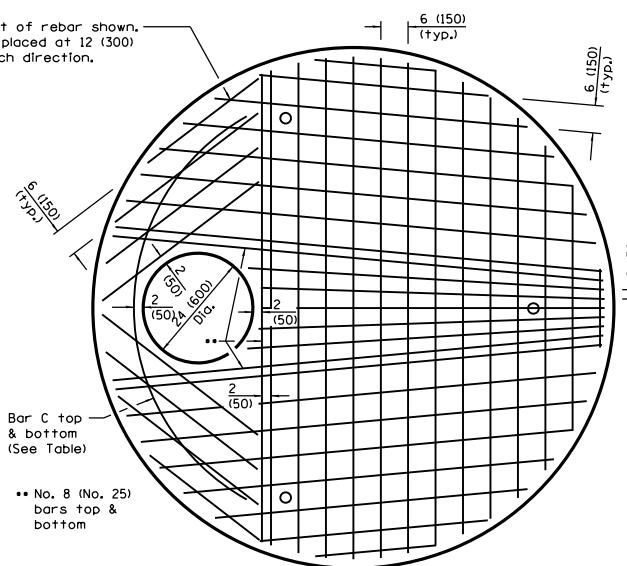
ALTERNATE MATERIALS FOR RISER WALLS	T (min)
Concrete Masonry Units	5 (125)
Precast Reinforced Concrete Sections	4 (100)
Cast-in-Place Concrete	6 (150)

DATE	REVISIONS	MANHOLE TYPE A 8' (2.4 m) DIAMETER (Sheet 1 of 2)
4-1-16	Changed terminology to 'welded wire reinforcement'.	
1-1-14	Increased maximum heights.	
	Revised General Notes.	
		STANDARD 602416-05

	Illinois Department of Transportation
PASSED	April 1, 2016
	Michael Brand
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	April 1, 2016
	Michael Brand
ENGINEER OF DESIGN AND ENVIRONMENT	
90-1-4	90-1-4

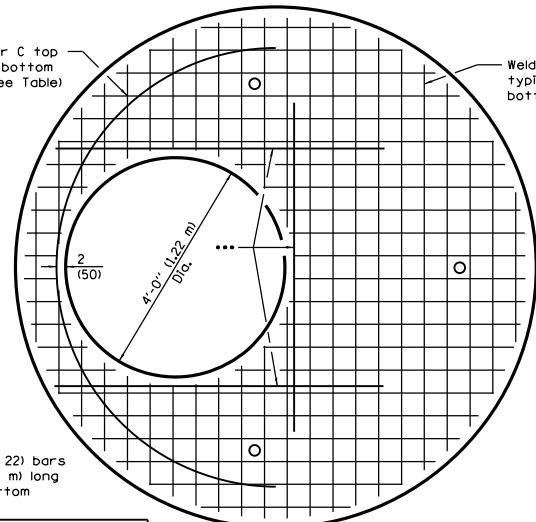


PLAN
Showing Rebar Reinforcement

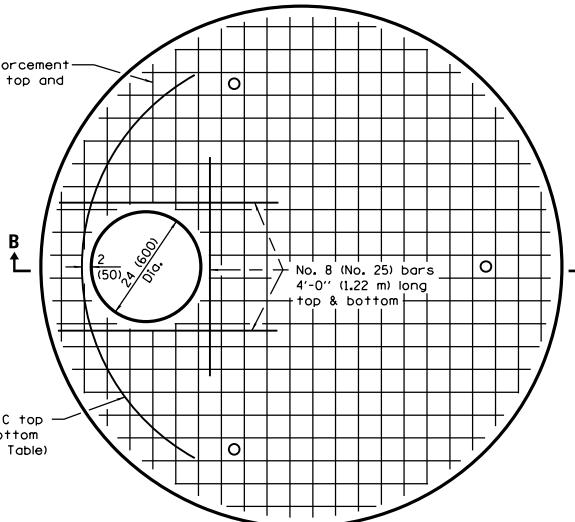


Diameter of opening	Reinforcement Bar Size	Reinforcement "As" WWR each direction	No. 4 (No. 13) Bar C	
			Length	Radius
24 (600)	Bottom mat No. 8 (No. 25)	Bottom mat **** 1.57 sq. in./ft. (3325 sq. mm/m)	8'-6" (2.60 m)	4'-0" (1.219 m)
	Top mat No. 4 (No. 13)	Top mat **** 0.22 sq. in./ft. (470 sq. mm/m)		
4'-0" (1.2 m)	Bottom mat No. 7 (No. 22)	Bottom mat **** 1.20 sq. in./ft. (2540 sq. mm/m)	12'-6" (3.80 m)	4'-0" (1.219 m)
	Top mat No. 4 (No. 13)	Top mat **** 0.22 sq. in./ft. (470 sq. mm/m)		

••• A maximum of two layers of welded wire reinforcement may be used to satisfy the required "As" for each mat.



PLAN



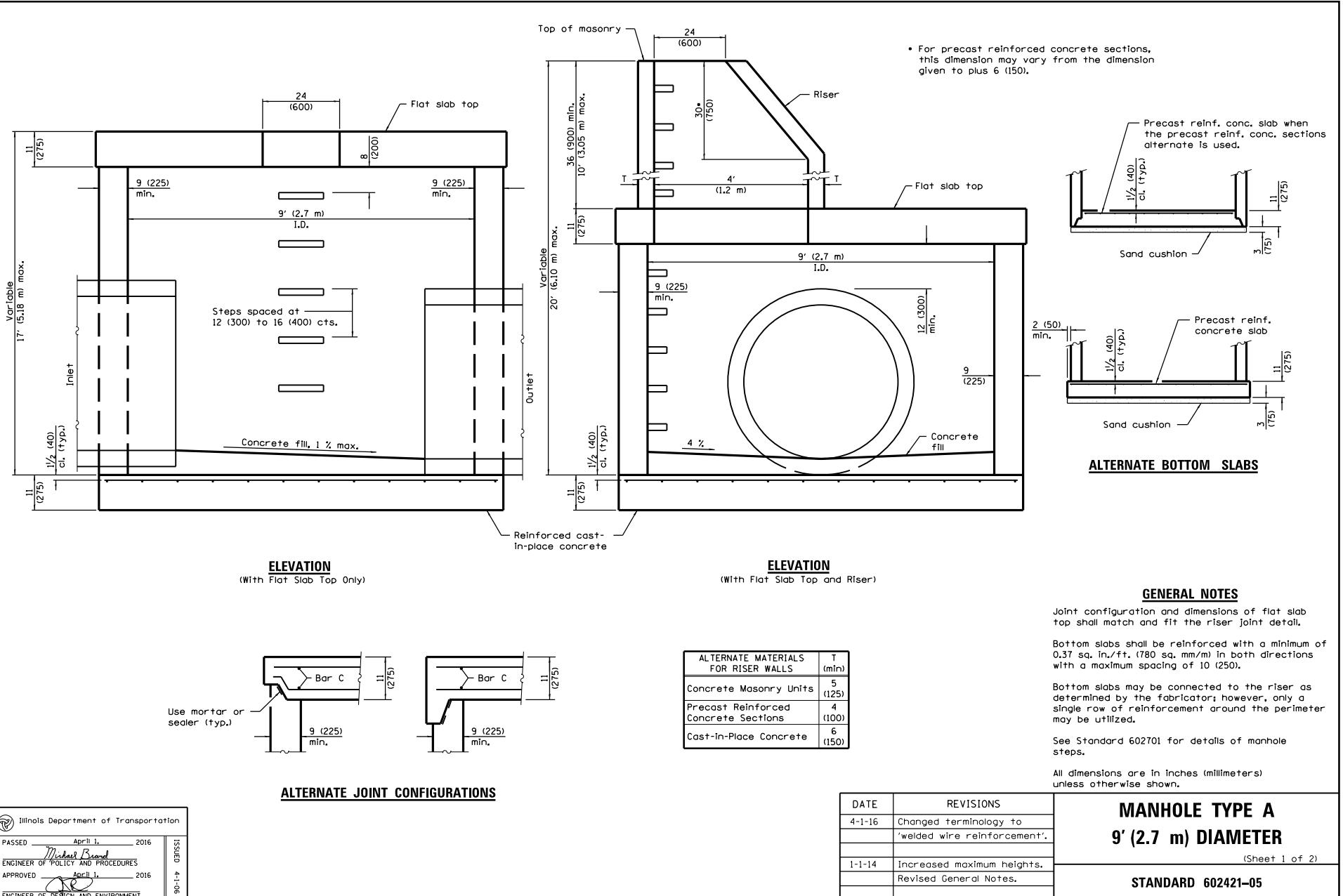
SECTION B-B

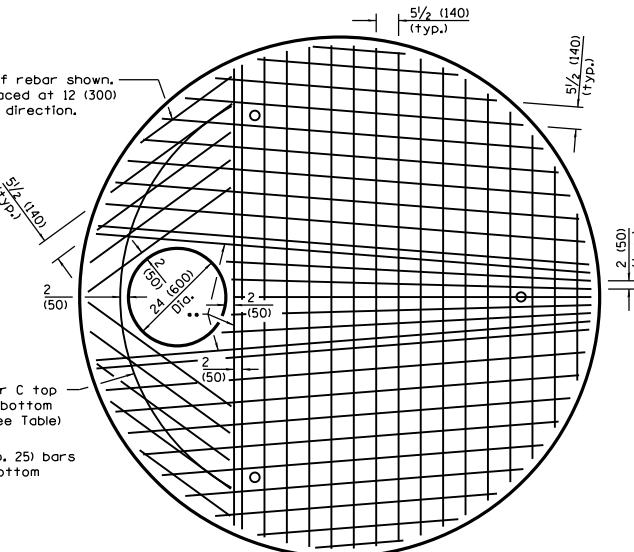
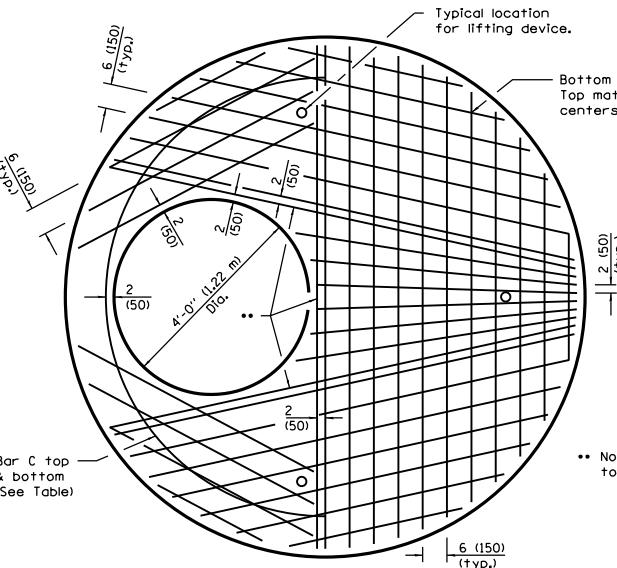
MANHOLE TYPE A

(Sheet 2 of 2)

STANDARD 602416-05

	Illinois Department of Transportation
PASSED	April 1, 2016
<i>Michael Beard</i>	
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	April 1, 2016
<i>[Signature]</i>	
ENGINEER OF DESIGN AND ENVIRONMENT	
ISSUED	4-1-96

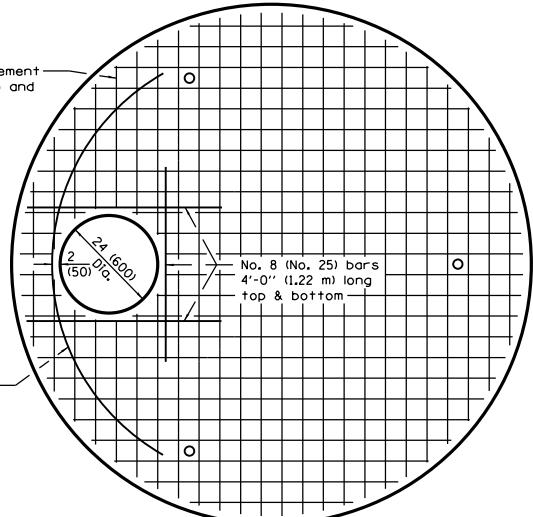
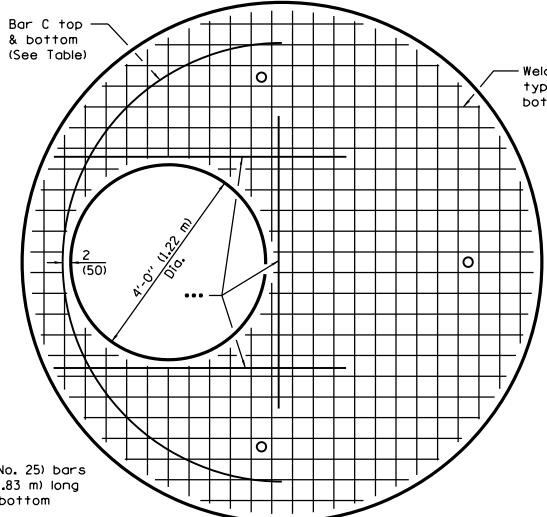




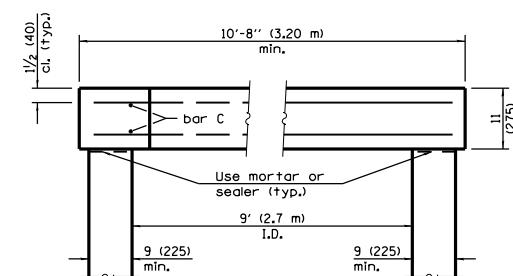
PLAN
Showing Rebar Reinforcement

Diameter of opening	Reinforcement Bar Size	Reinforcement "As" WWR each direction	No. 4 (No. 13) Bar C Length	Radius
24 (600)	Bottom mat No. 8 (No. 25)	Bottom mat 1.71 sq. in./ft. (3620 sq. mm/m)	9'-6" (2,90 m) (1,372 m)	4'-6" (1,372 m)
	Top mat No. 4 (No. 13)	Top mat 0.24 sq. in./ft. (510 sq. mm/m)		
24 (600)	Bottom mat No. 8 (No. 25)	Bottom mat 1.57 sq. in./ft. (3325 sq. mm/m)	14'-2" (4,30 m) (1,372 m)	4'-6" (1,372 m)
	Top mat No. 4 (No. 13)	Top mat 0.24 sq. in./ft. (510 sq. mm/m)		

**** A maximum of two layers of welded wire reinforcement may be used to satisfy the required "As" for each mat.



PLAN
Showing Welded Wire Reinforcement



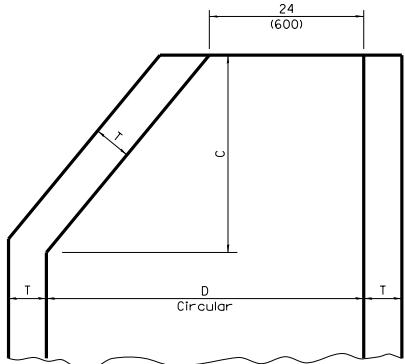
SECTION B-B

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

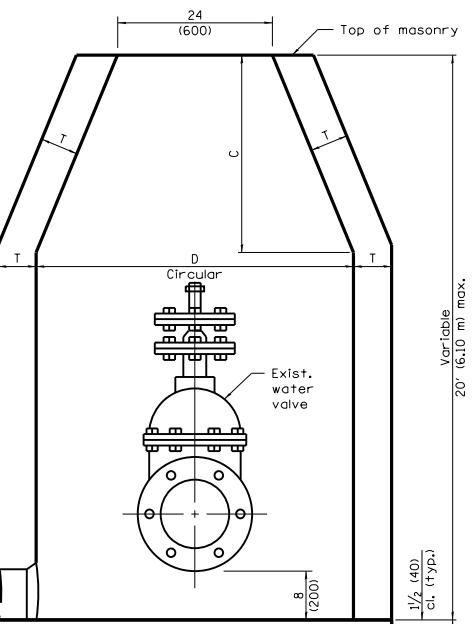
**MANHOLE TYPE A
9' (2.7 m) DIAMETER**

(Sheet 2 of 2)

STANDARD 602421-05



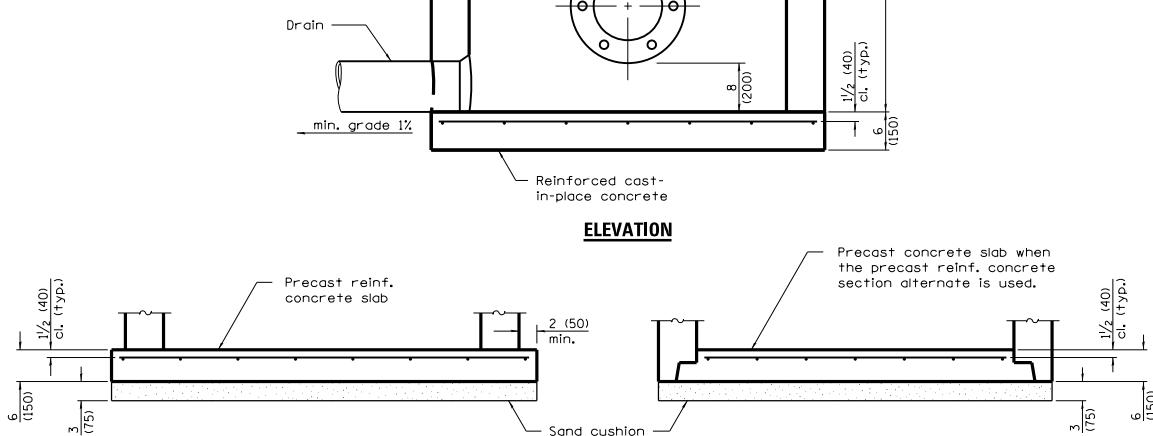
The cone of the valve vault shall be constructed as shown above only when there is interference with underground conditions and those conditions cannot be altered.



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

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

DIAMETER OF WATER MAIN	D
8 (200) and under	4'-0" (1.2 m)
10 (250) and over	5'-0" (1.5 m)



ALTERNATE METHODS

	Illinois Department of Transportation
PASSED	January 1, 2011
	Michael Brand
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2011
	Scott E. Saylor
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).

VALVE VAULT TYPE A

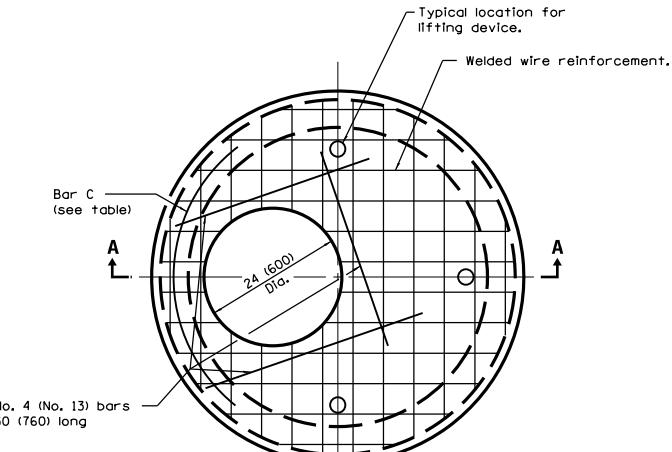
STANDARD 602501-02

GENERAL NOTES
Bottom slabs shall be reinforced with a minimum of 0.31 sq. in./ft. (660 sq. mm/m) in both directions with a maximum spacing of 12 (300).

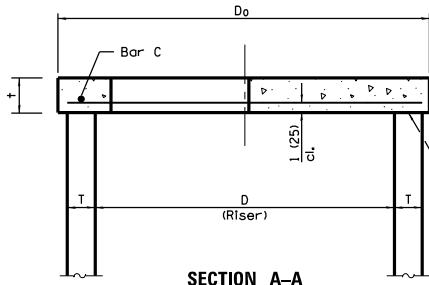
Bottom slabs may be connected to the riser as determined by the fabricator; however, only a single row of reinforcement around the perimeter may be utilized.

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

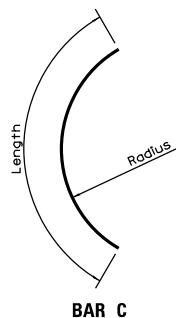
All dimensions are in inches (millimeters) unless otherwise shown.



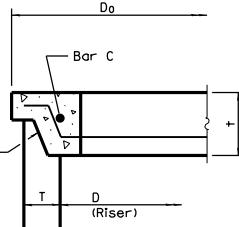
PLAN
(WELDED WIRE FABRIC)



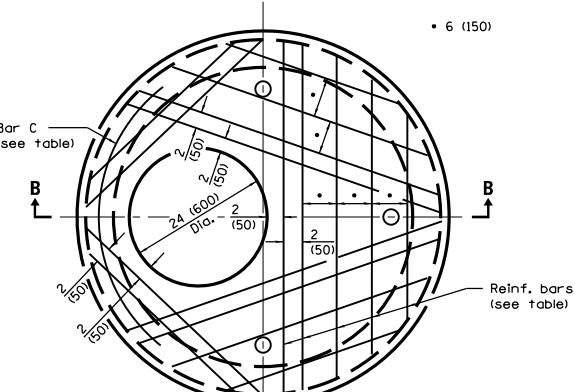
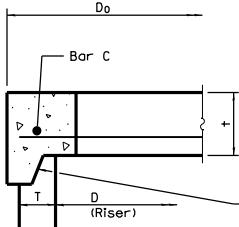
SECTION A-A



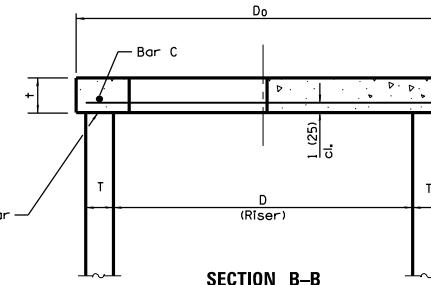
BAR C



ALTERNATE JOINT CONFIGURATIONS



PLAN
(REINFORCEMENT BARS)



SECTION B-B

GENERAL NOTES

The flat slab top may be used in lieu of the tapered tops shown on Standards 602001, 602011, 602016, 602306, 602401, or 602501 at the option of the Contractor or when field conditions prohibit the use of tapered tops.

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

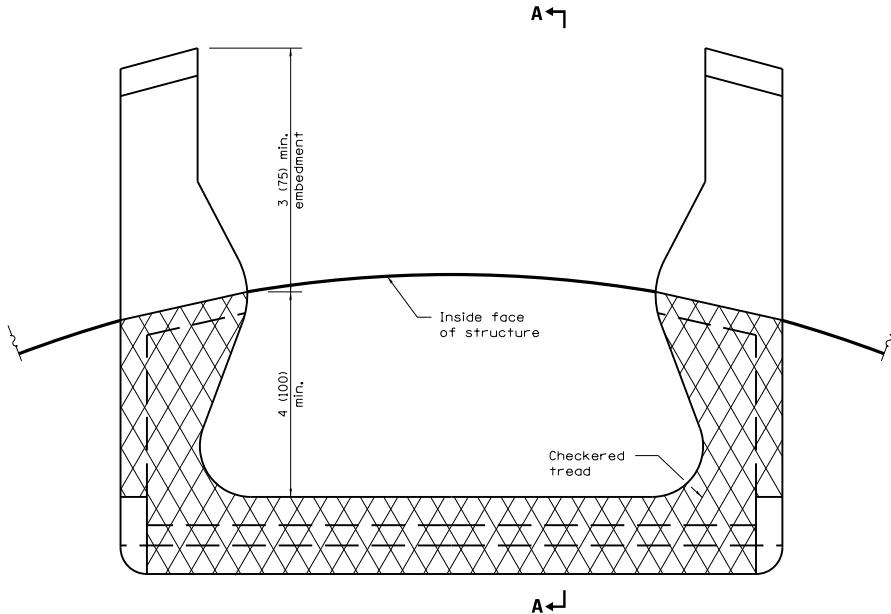
TABLE

D	T	D _o (min.)	†	Reinforcement		No. 4 (No. 13) Bar C Length	Radius
				"As" W.W.R.	OR Bar size		
36 (900)				6 (150)	0.20 sq. in./ft. (425 sq. mm/m)	No. 4 (No. 13) (1.2 m) (480)	
4'-0" (1.2 m)	See applicable Standards		D + 2T	6 (150)	0.35 sq. in./ft. (740 sq. mm/m)	No. 5 (No. 16) (1.35 m) (660)	4'-0" (1.2 m) (26)
5'-0" (1.5 m)				8 (200)	0.35 sq. in./ft. (740 sq. mm/m)	No. 5 (No. 16) (1.5 m) (810)	5'-0" (1.5 m) (32)

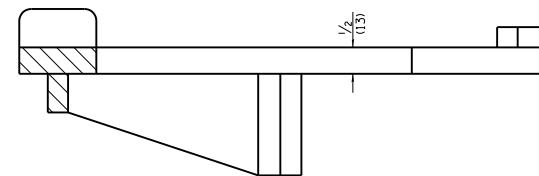
Illinois Department of Transportation
PASSED April 1, 2016
Michael Brand
ENGINEER OF POLICY AND PROCEDURES
APPROVED April 1, 2016
John R. Goss
ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS	PRECAST REINFORCED CONCRETE FLAT SLAB TOP
4-1-16	Changed terminology to 'welded wire reinforcement'.	
1-1-14	Omitted detail for lifting hole or lifting loop.	STANDARD 602601-04

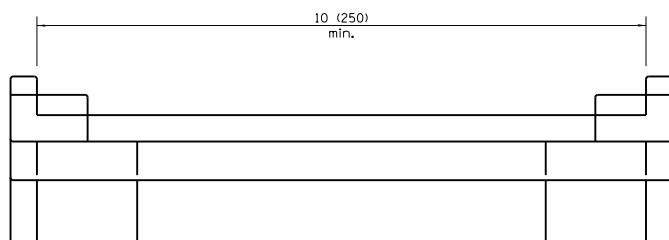
CAST IRON STEPS



PLAN VIEW



SECTION A-A



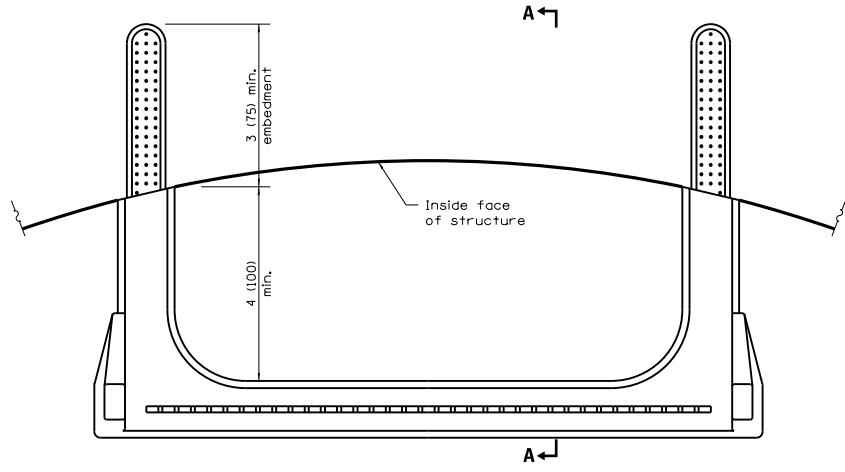
ELEVATION VIEW

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

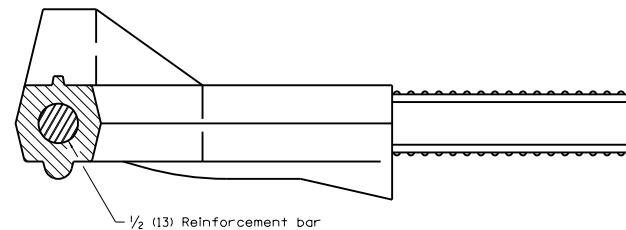
	Illinois Department of Transportation
PASSED	January 1, 2009
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT	

DATE	REVISIONS	MANHOLE STEPS
1-1-09	Switched units to English (metric).	
4-1-06	Revised title, drawings, and added plastic steps on sheet 2.	(Sheet 1 of 2)
		STANDARD 602701-02

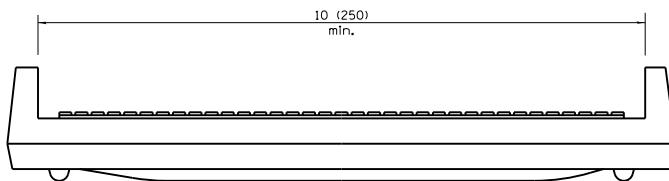
PLASTIC STEPS



PLAN VIEW



SECTION A-A



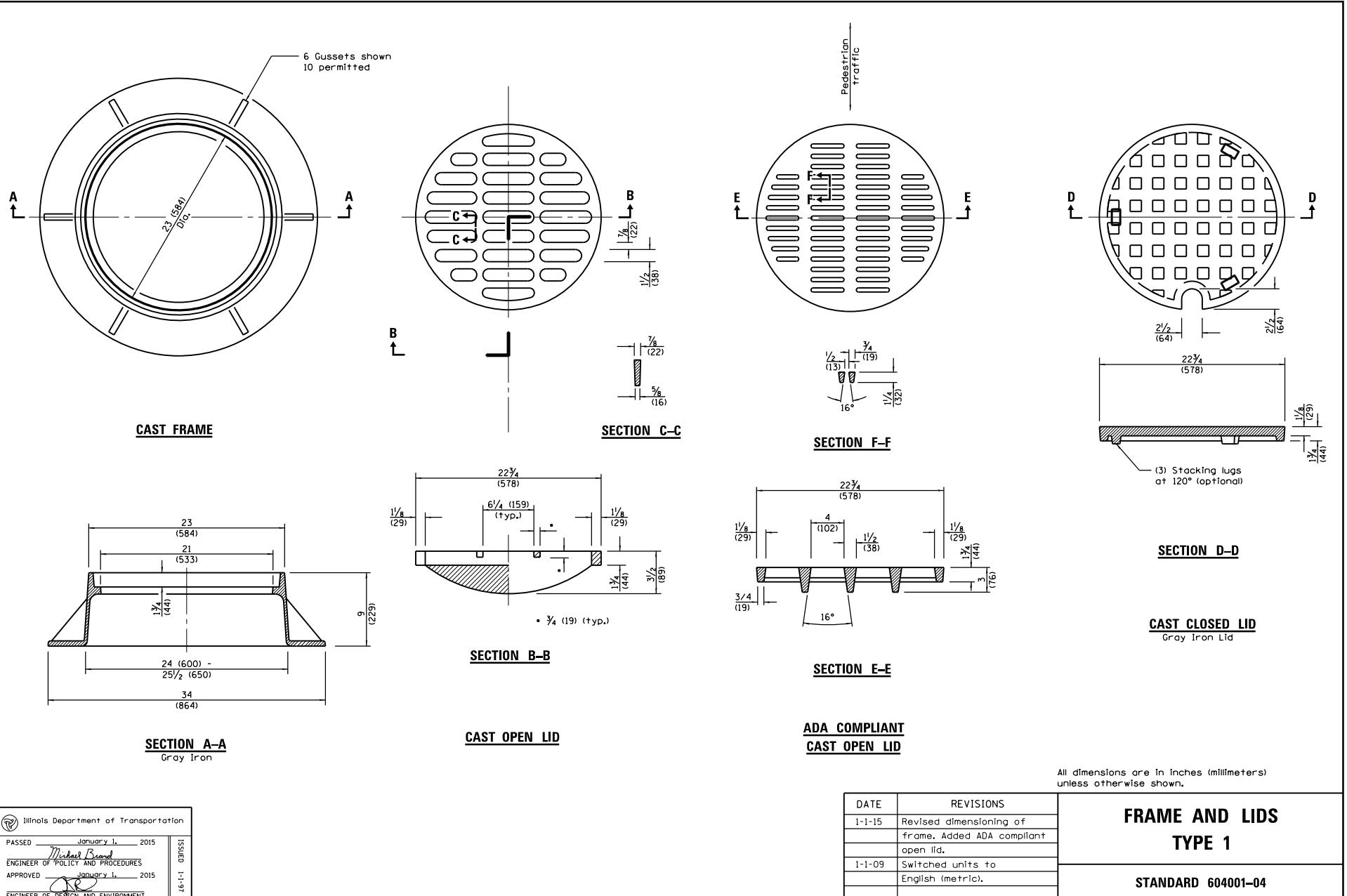
ELEVATION VIEW

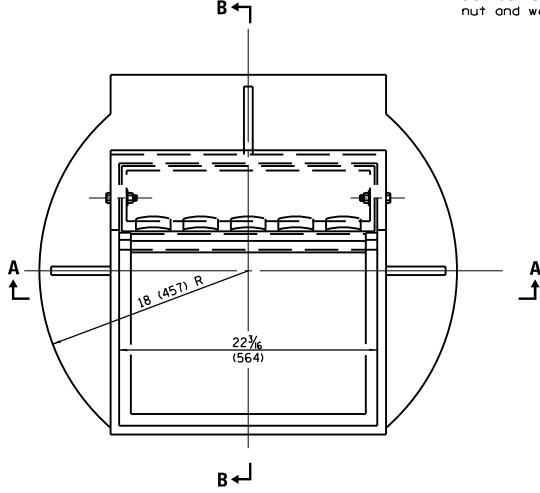
	Illinois Department of Transportation
PASSED	January 1, 2009
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT	

MANHOLE STEPS

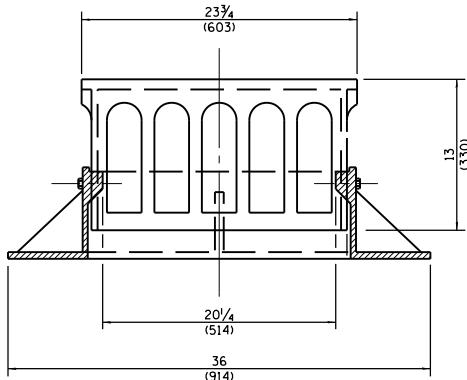
(Sheet 2 of 2)

STANDARD 602701-02

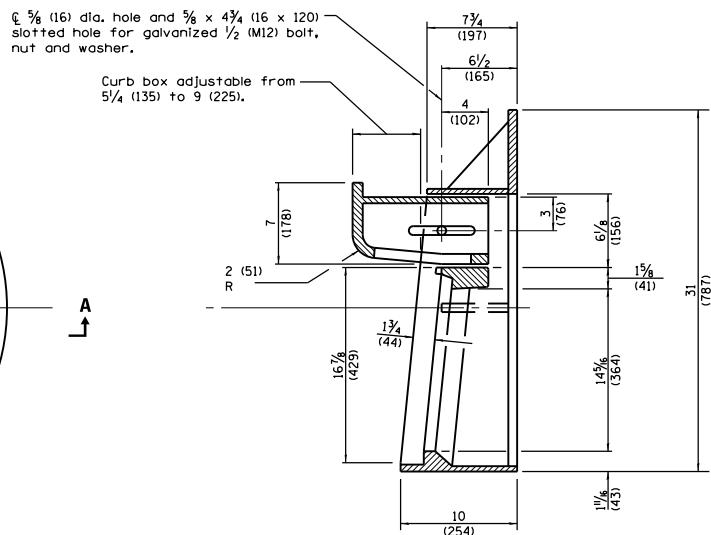




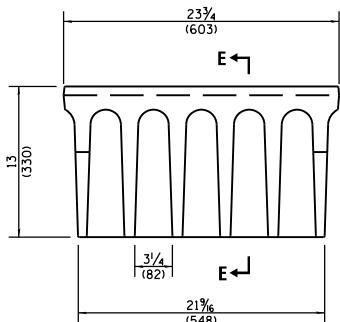
CAST FRAME



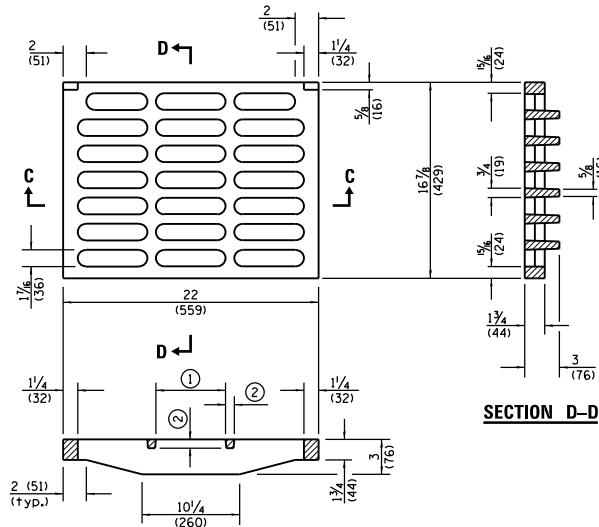
SECTION A-A



SECTION B-B

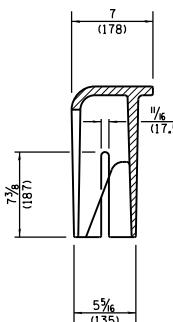


ALTERNATE CURB BOX



SECTION C-C

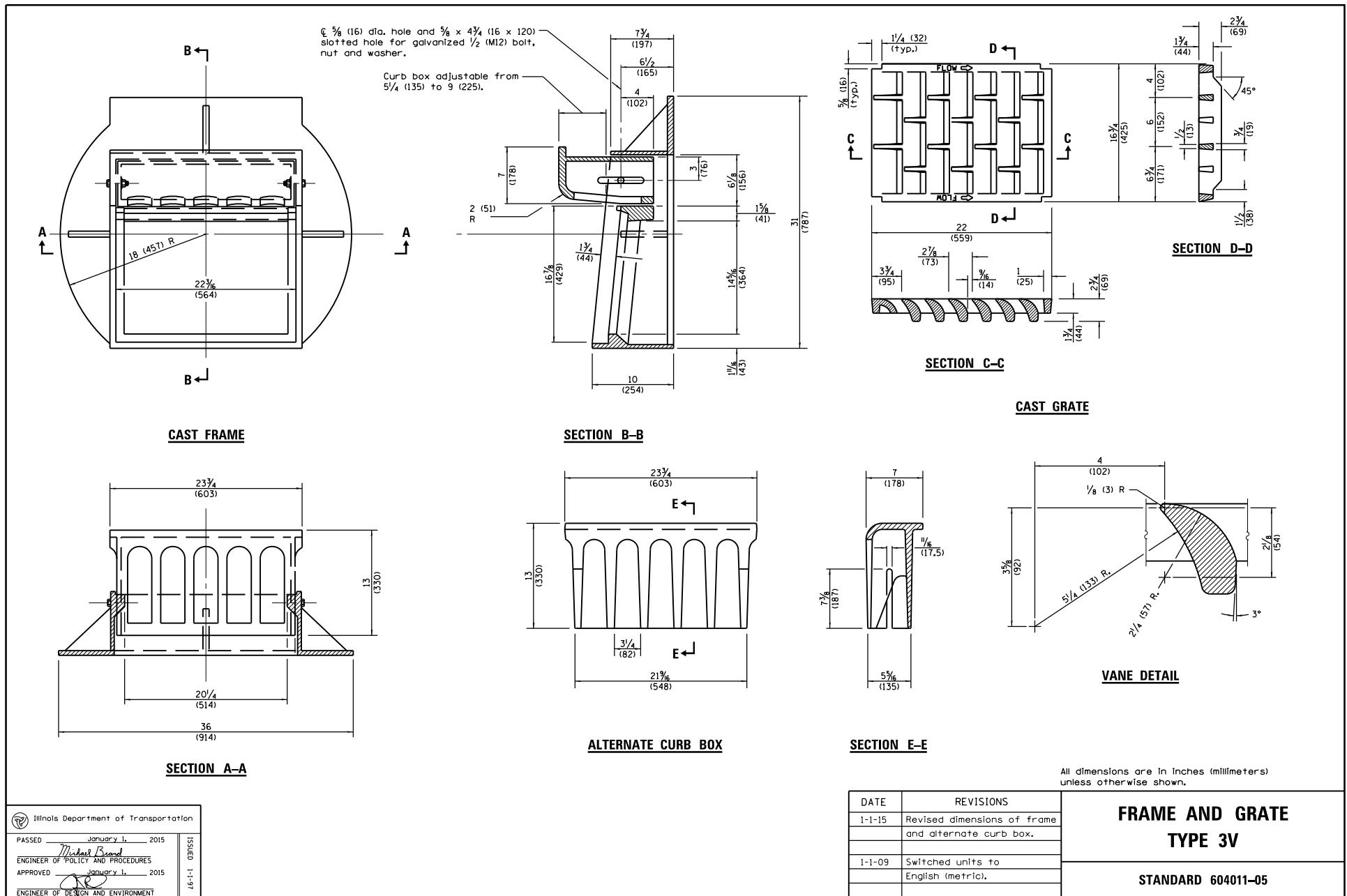
$$\textcircled{1} = 6 \text{ (152) typ.}$$



CAST GRATE

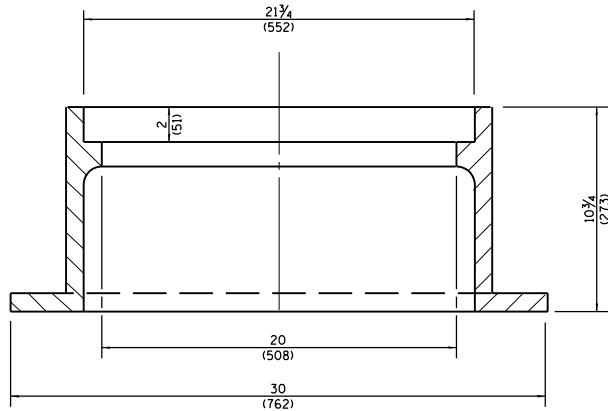
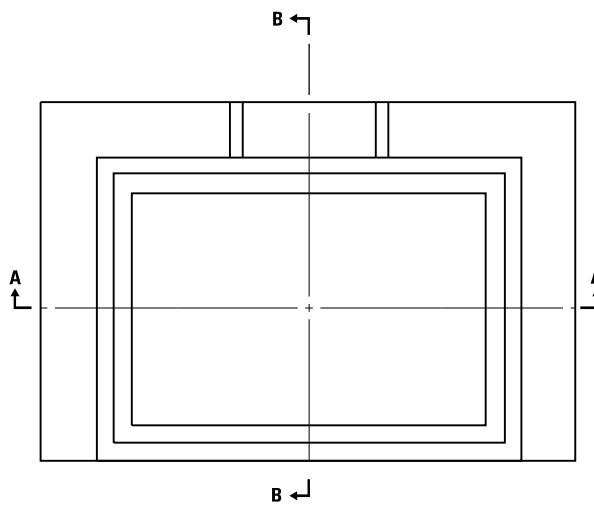
All dimensions are in inches (millimeters) unless otherwise shown.

REVISIONS		unless otherwise shown.
1-1-15	Revised dimensions of frame and alternate curb box.	FRAME AND GRATE
1-1-09	Switched units to English (metric).	TYPE 3
		STANDARD 604006-05



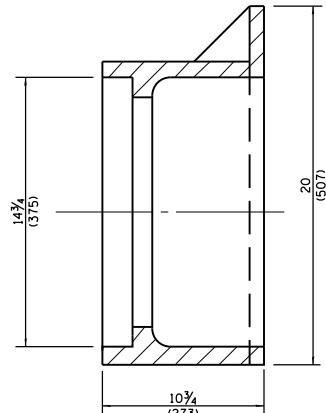
All dimensions are in inches (millimeters) unless otherwise shown.

DATE		REVISIONS	
1-1-15		Revised dimensions of frame and alternate curb box.	FRAME AND GRATE
			TYPE 3V
1-1-09		Switched units to English (metric).	STANDARD 604011-05

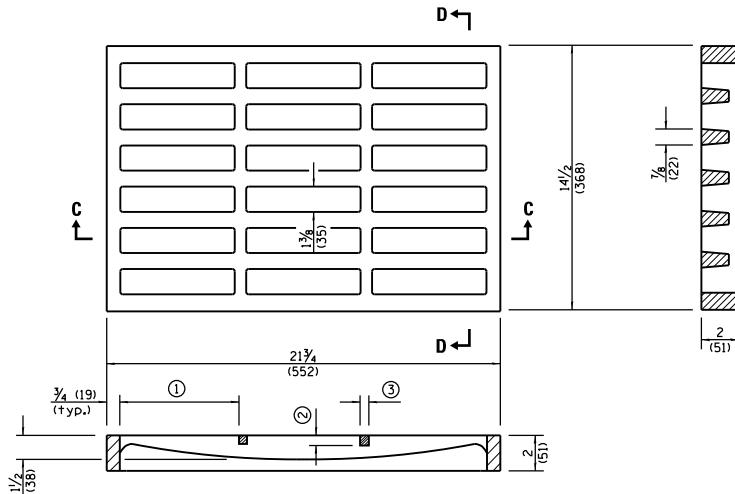


SECTION A-A

CAST FRAME



SECTION B-B



SECTION C-C

- ① = 6 1/4 (159) (+typ.)
- ② = 3/4 (19) (+typ.)
- ③ = 5/8 (16) (+typ.)

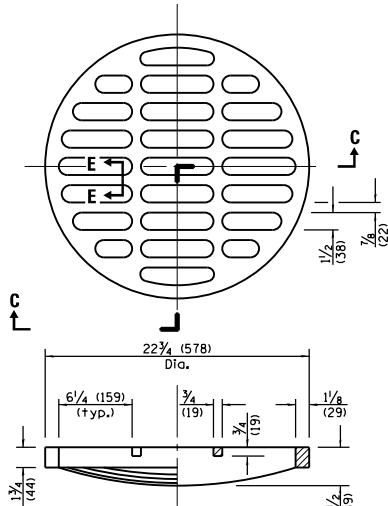
CAST GRATE

SECTION D-D

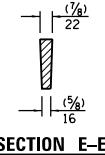
All dimensions are in inches (millimeters)
unless otherwise shown.

DATE	REVISIONS	FRAME AND GRATE TYPE 4
4-1-16	Corrected dimension on SECTION A-A.	
1-1-15	Revised dimensions of frame and grate.	
STANDARD 604016-03		

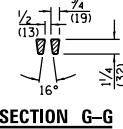
	Illinois Department of Transportation
PASSED	April 1, 2016
	Michael Brand
ENGINEER OF POLICY AND PROCEDURES	I-1-1-197
APPROVED	April 1, 2016
	Michael Brand
ENGINEER OF DESIGN AND ENVIRONMENT	



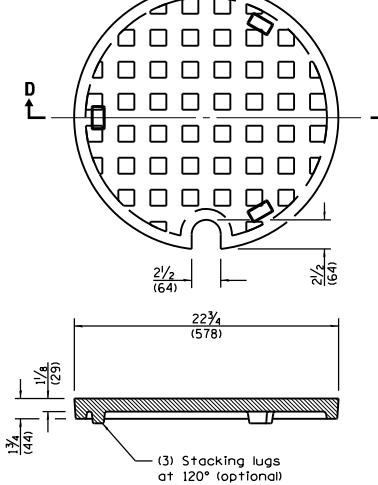
SECTION C-C
CAST OPEN LID



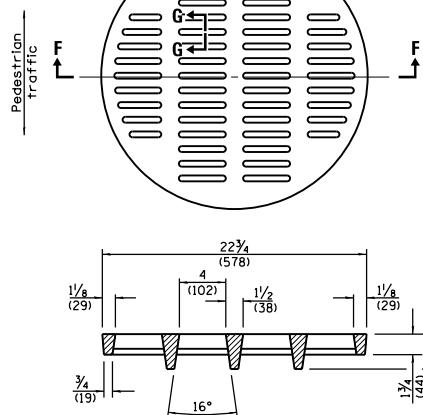
SECTION E-E



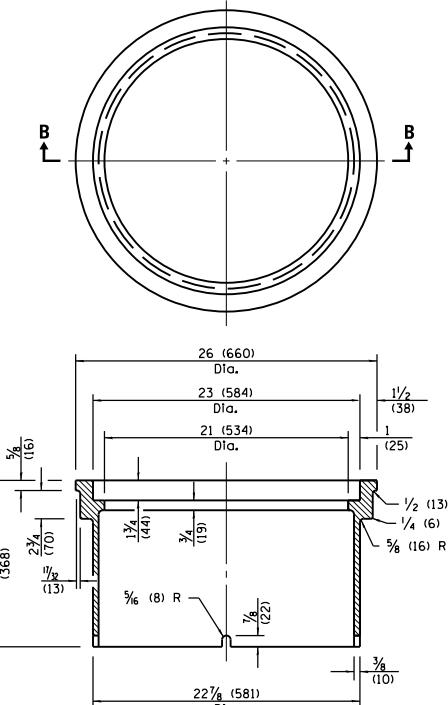
SECTION G-G



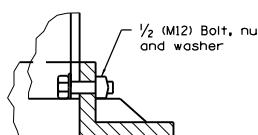
SECTION D-D
CAST CLOSED LID
Gray Iron



SECTION F-F
ADA COMPLIANT
CAST OPEN LID



SECTION B-B
CAST FRAME
Gray Iron



DETAIL OF BOLTING
FRAME TO BASE

NOTE: Bolts shall be removed after pavement has been placed.

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.

DATE	REVISIONS	STANDARD 604021-03
1-1-15	Added ADA compliant open lid.	
1-1-09	Switched units to English (metric).	

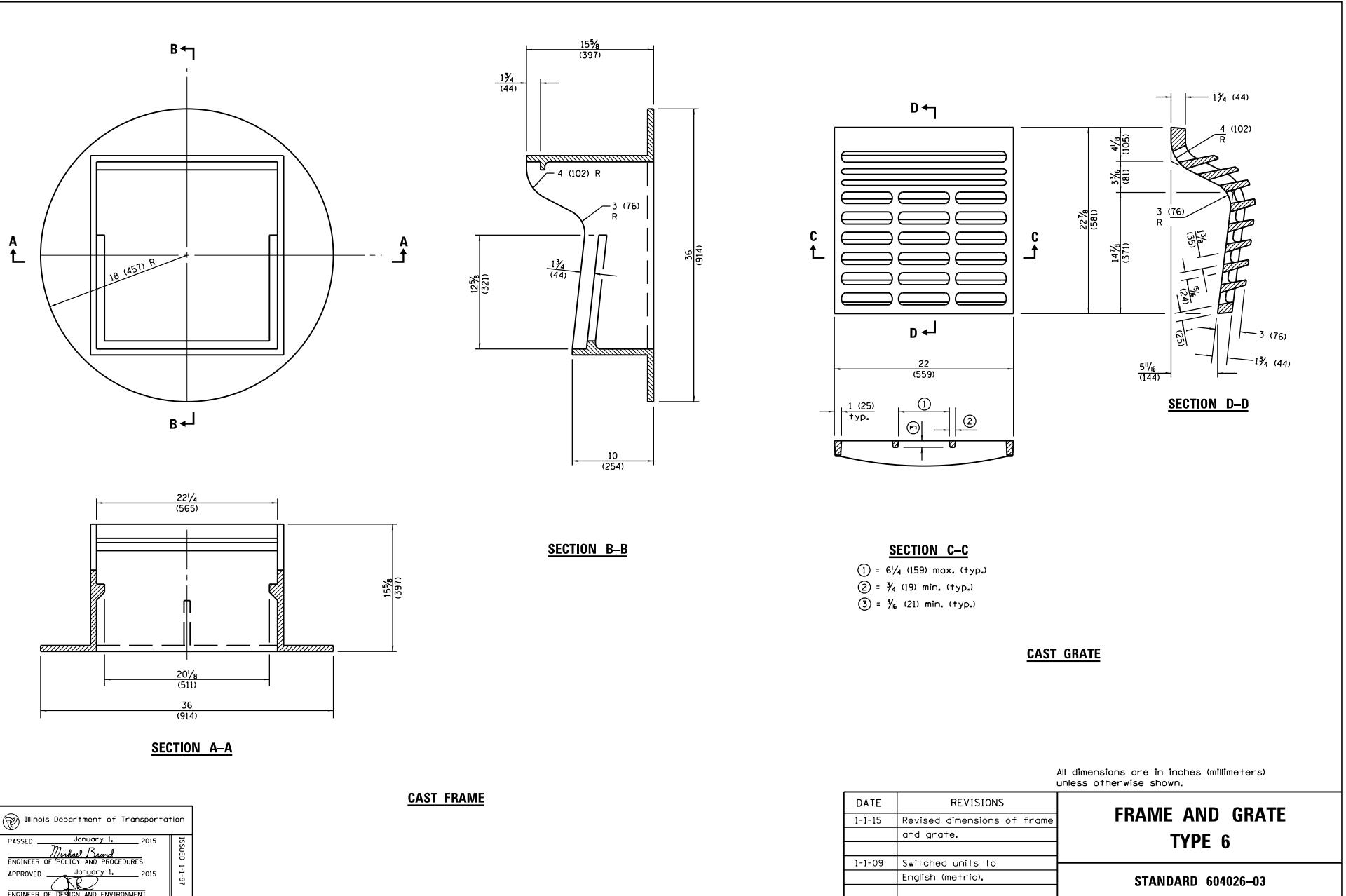
BASE, FRAME AND LIDS TYPE 5

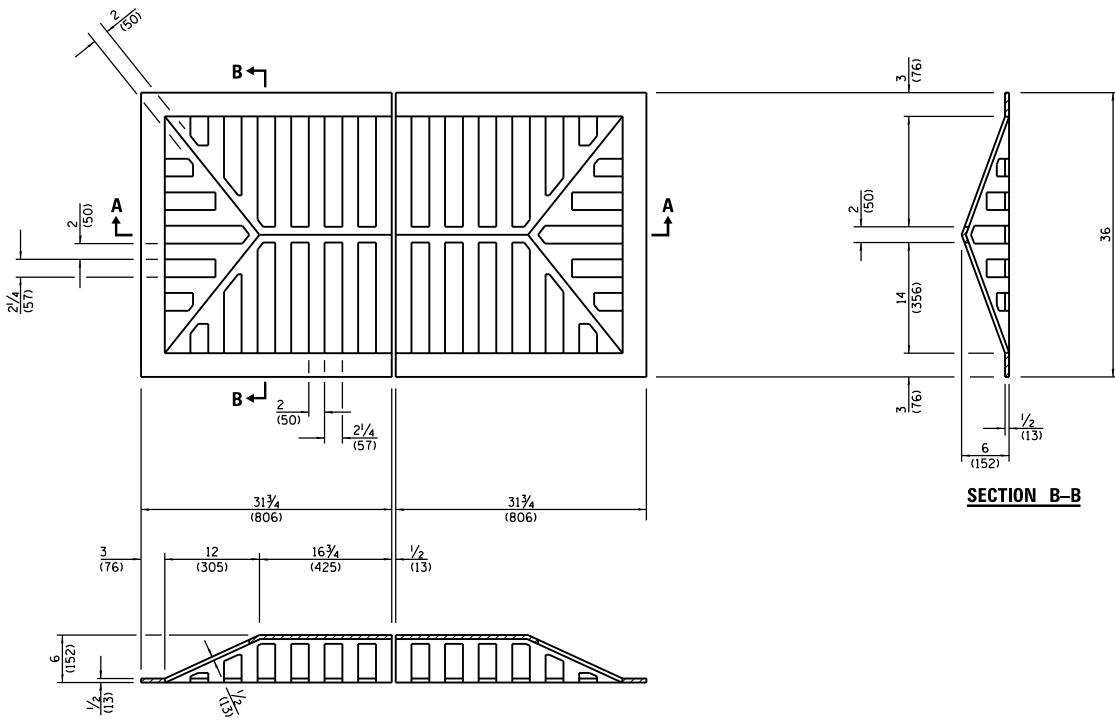
The four holes in the cast base may be rotated 45° from the position shown in section A-A

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

GENERAL NOTES

Illinois Department of Transportation
PASSED January 1, 2015
Michael Brand
ENGINEER OF POLICY AND PROCEDURES
APPROVED January 1, 2015
John J. Giassi
ENGINEER OF DESIGN AND ENVIRONMENT





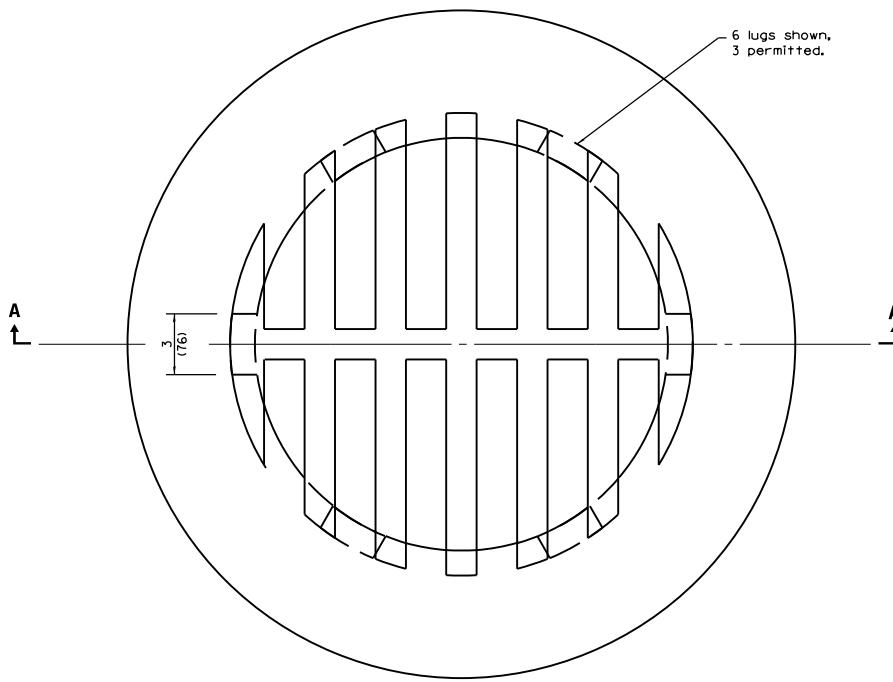
SECTION A-A

CAST GRATE

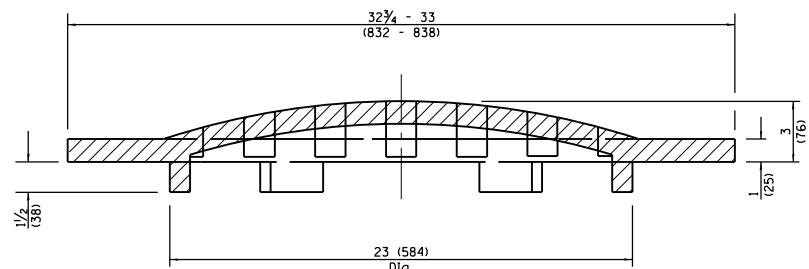
All dimensions are in inches (millimeters)
unless otherwise shown.

	Illinois Department of Transportation
PASSED	January 1, 2015
Michael Brand	16-1 GRASSI
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2015
John R. [Signature]	
ENGINEER OF DESIGN AND ENVIRONMENT	

DATE	REVISIONS	GRATE TYPE 7
1-1-15	Revised grate thickness.	
1-1-09	Switched units to English (metric).	STANDARD 604031-03



CAST GRATE

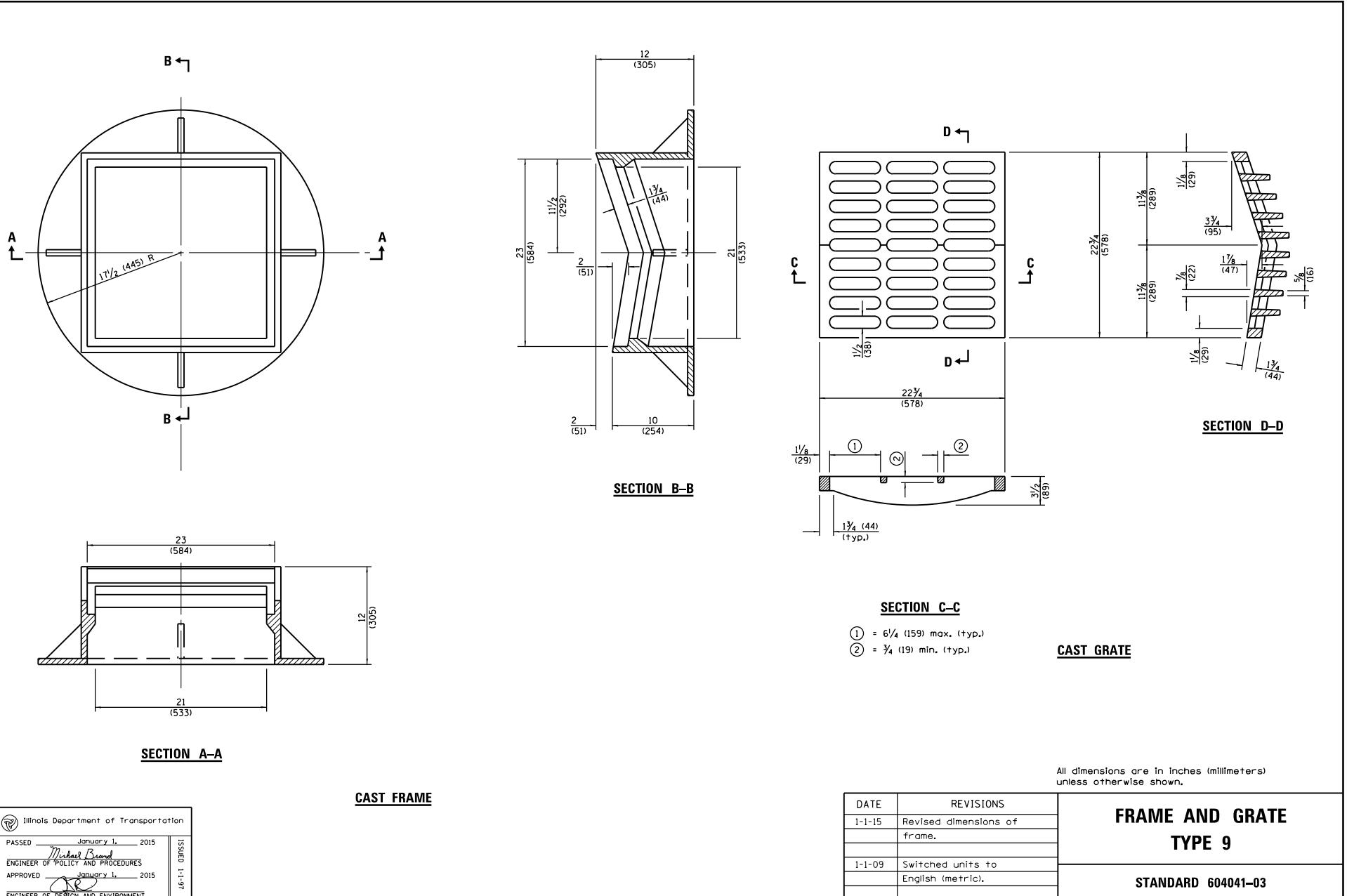


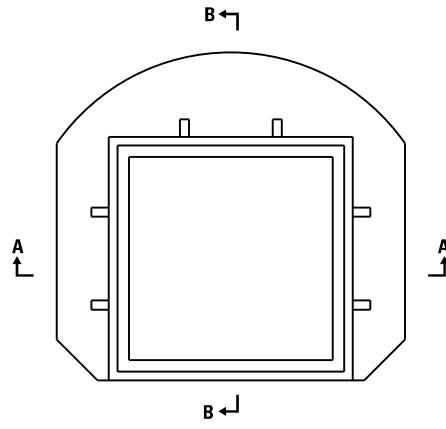
SECTION A-A

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

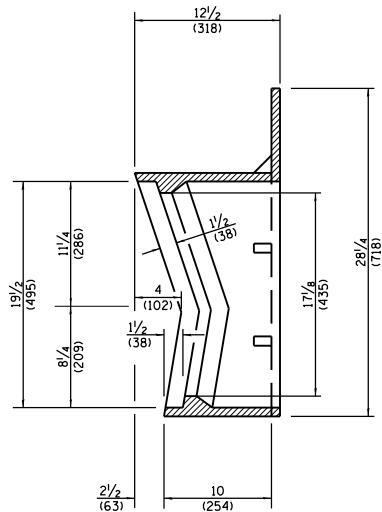
DATE	REVISIONS	GRATE TYPE 8
1-1-15	Revised dimensions.	
1-1-09	Switched units to English (metric).	
		STANDARD 604036-03

	Illinois Department of Transportation
PASSED	January 1, 2015
<i>Michael Brand</i>	GRISSI
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2015
<i>DR</i>	
ENGINEER OF DESIGN AND ENVIRONMENT	

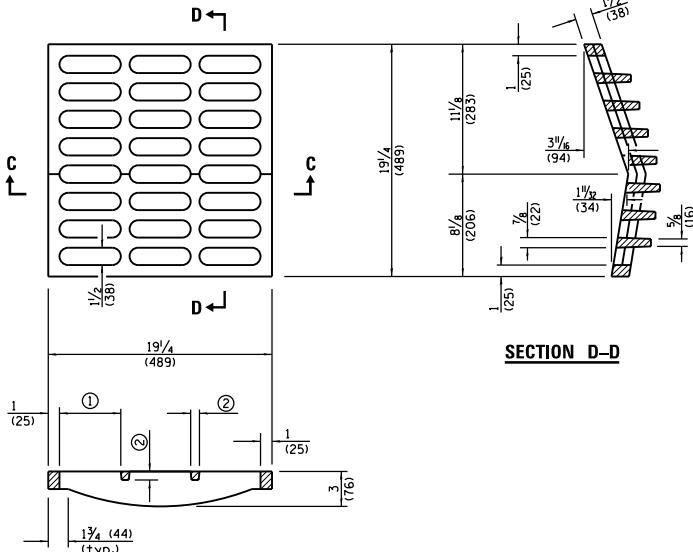




SECTION B-B



SECTION D-D



SECTION C-C

$$\begin{aligned} \textcircled{1} &= 6\frac{1}{4} \text{ (159) max. (typ.)} \\ \textcircled{2} &= \frac{3}{4} \text{ (19) min. (typ.)} \end{aligned}$$

CAST GRATE

A technical drawing of a rectangular frame structure. The top horizontal dimension is labeled as $19\frac{1}{2}$ inches (495 mm). The right vertical dimension is labeled as $12\frac{1}{2}$ inches (318 mm). The bottom horizontal dimension is labeled as $17\frac{7}{8}$ inches (443 mm). The bottom center is marked with the number 30 and (762). The left side shows a hatched area at the bottom, and the right side shows a hatched area at the top.

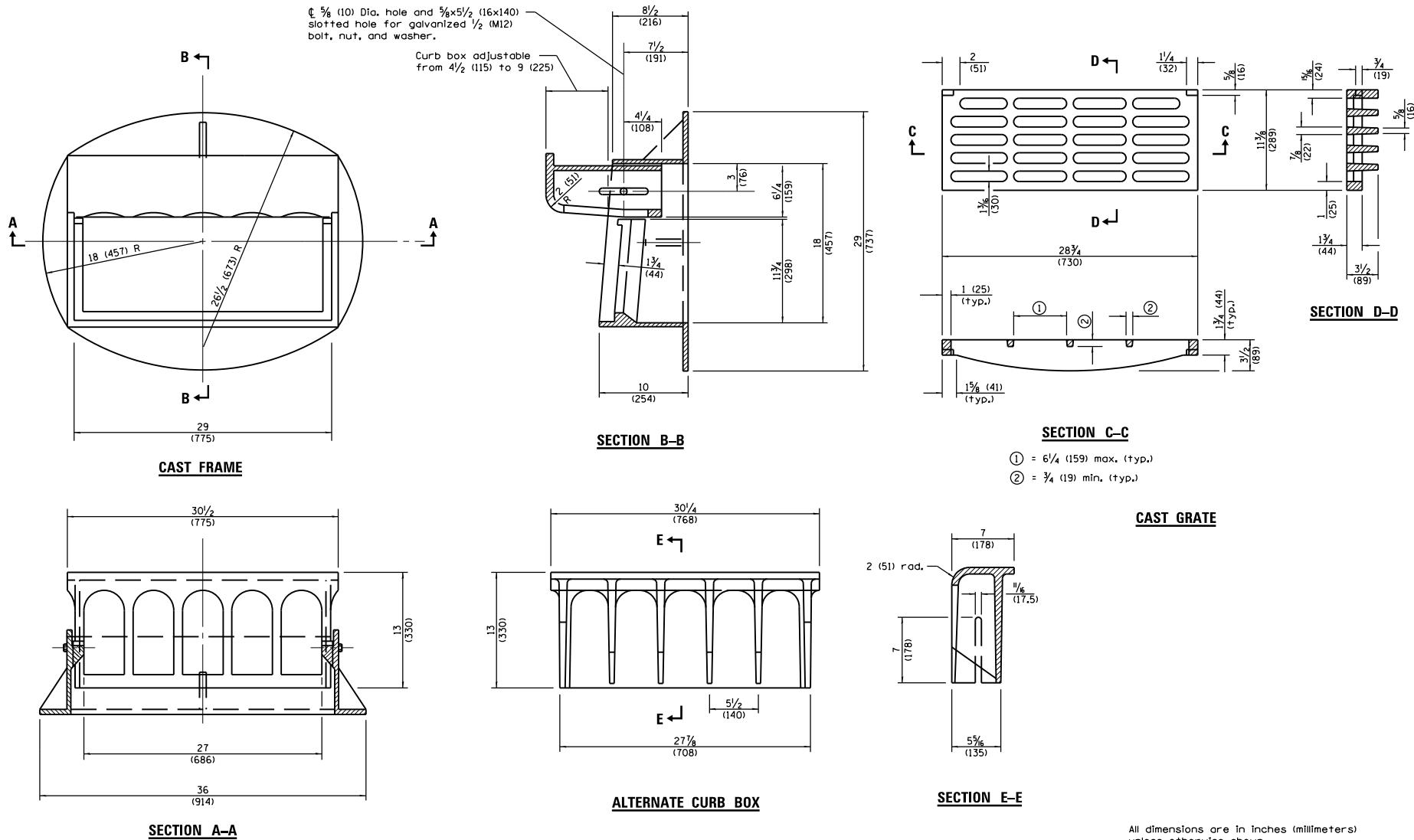
SECTION A-A

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

CAST FRAME

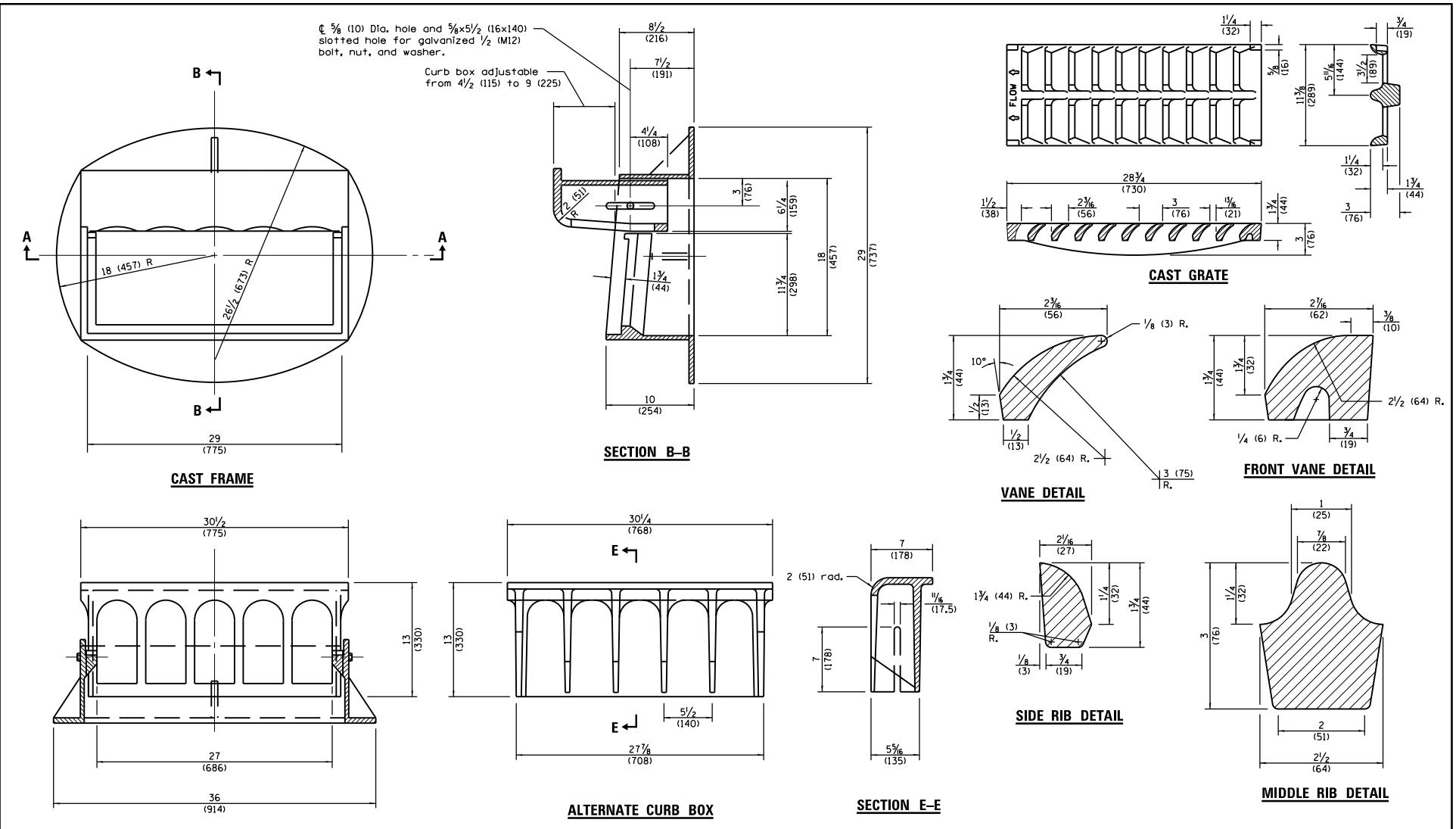
	Illinois Department of Transportation
PASSED	January 1, 2015
<i>Michael Beard</i>	
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2015
<i>R. J. K.</i>	
ENGINEER OF DESIGN AND ENVIRONMENT	
ISSUE DATE 1-1-97	

DATE		REVISIONS	FRAME AND GRATE TYPE 10
1-1-15		Revised dimensions of frame.	
1-1-09		Switched units to English (metric).	



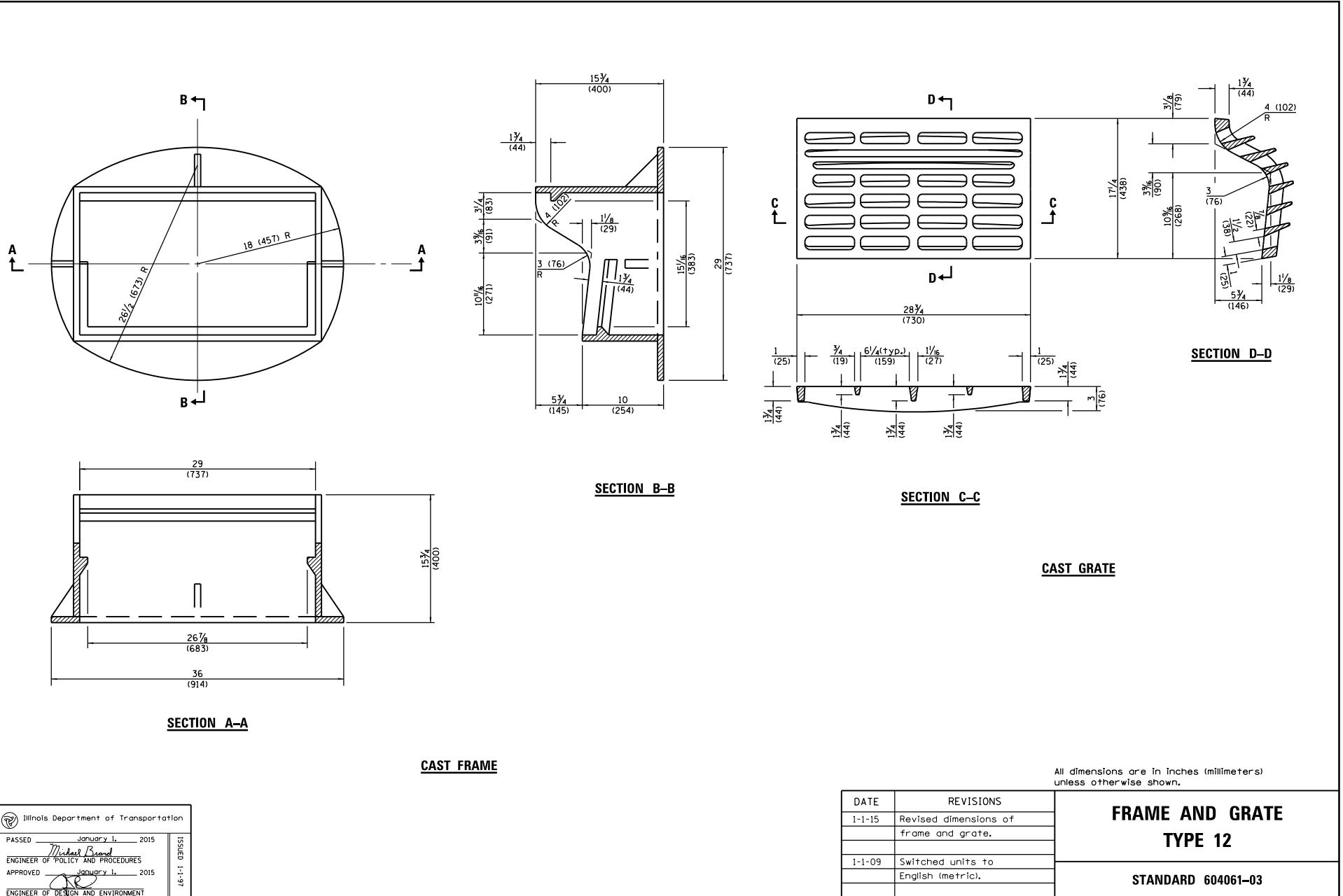
	Illinois Department of Transportation
PASSED	January 1, 2015
Michael Brand	1-1-1-0351
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	JANUARY 1, 2015
John R. [Signature]	1-1-1-0351
ENGINEER OF DESIGN AND ENVIRONMENT	

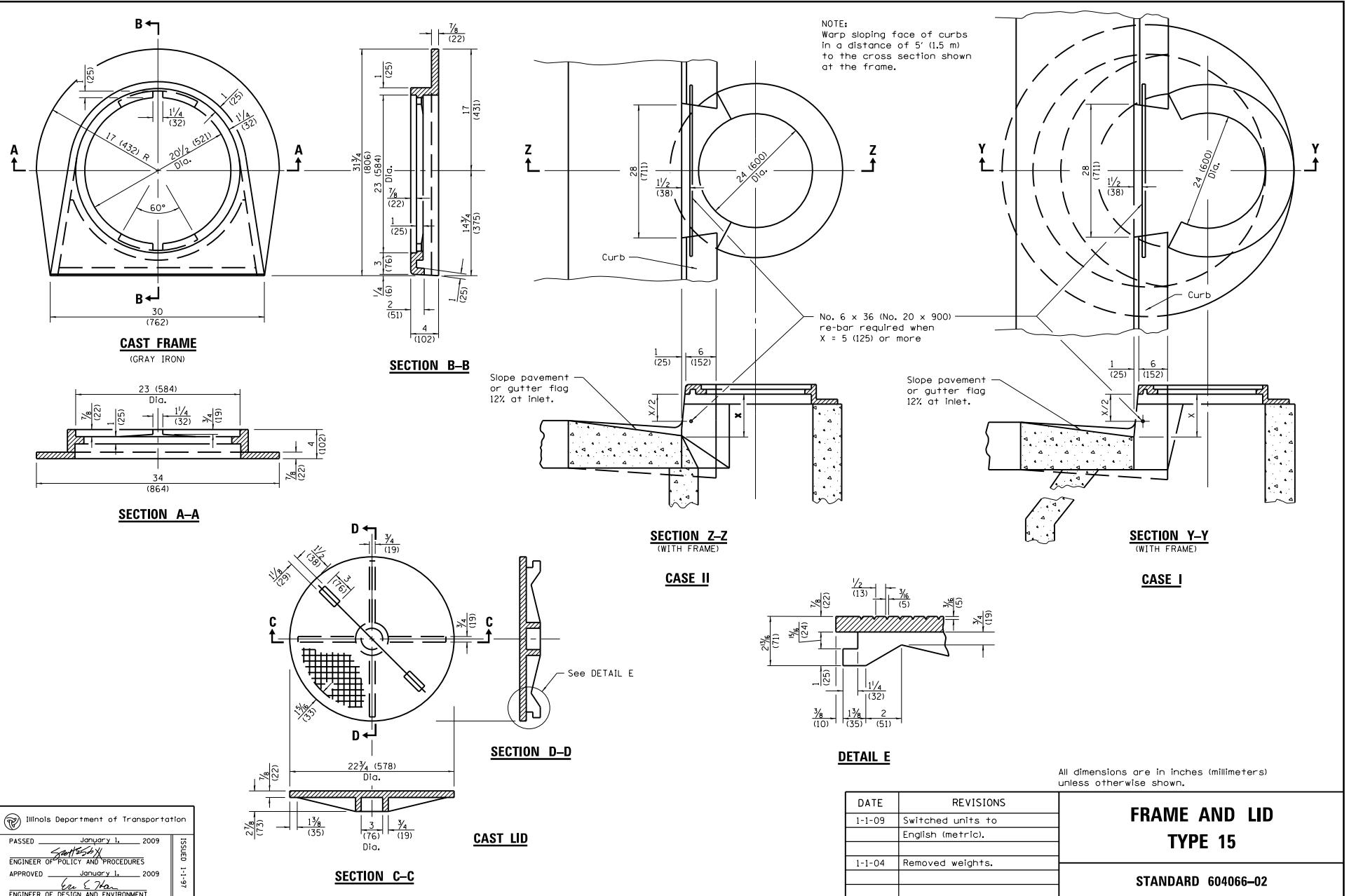
DATE	REVISIONS	FRAME AND GRATE TYPE 11
1-1-15	Revised dimensions of frame and alternate curb box.	
4-1-09	Switched units to English (metric).	STANDARD 604051-04

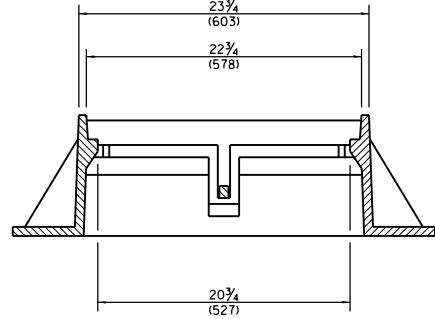
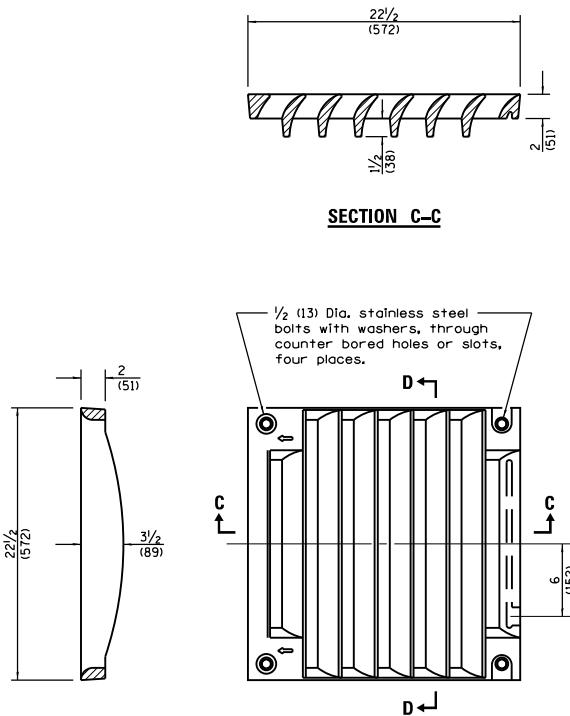
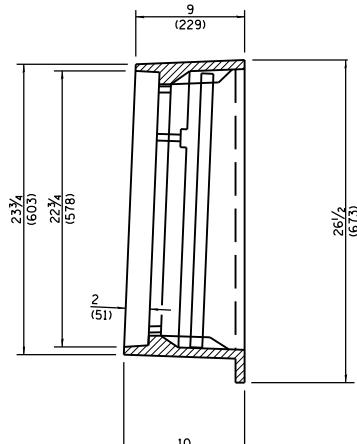
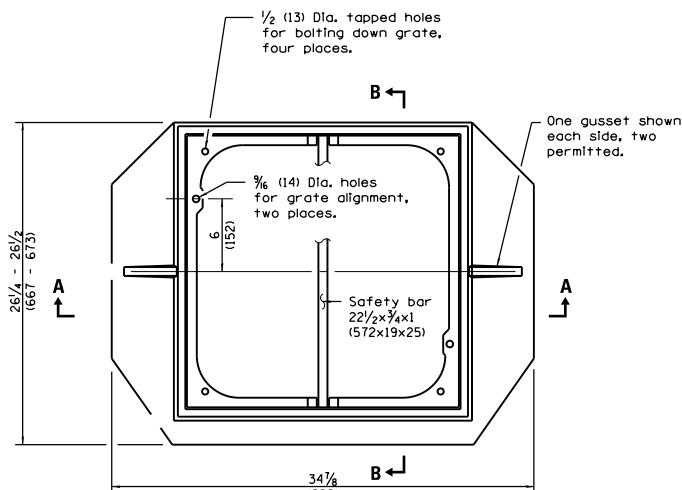


	Illinois Department of Transportation
PASSED	January 1, 2015
Michael Brand	1-1-1 Q353
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	JANUARY 1, 2015
John R. [Signature]	1-1-1 Q353
ENGINEER OF DESIGN AND ENVIRONMENT	

DATE	REVISIONS	FRAME AND GRATE TYPE 11V
1-1-15	Revised dimensions of frame and alternate curb box.	
1-1-09	Switched units to English (metric).	STANDARD 604056-04



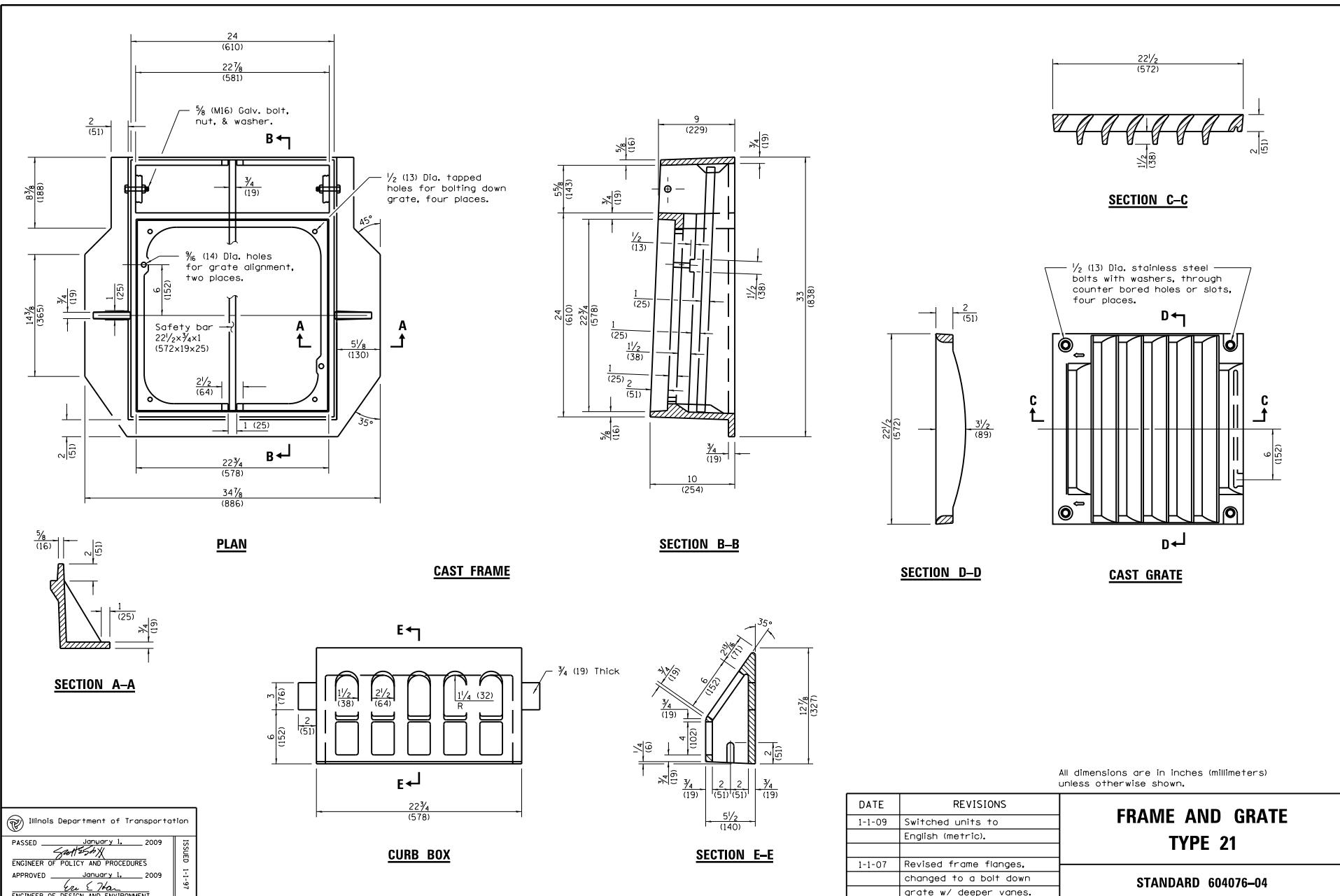




All dimensions are in inches (millimeters) unless otherwise shown.

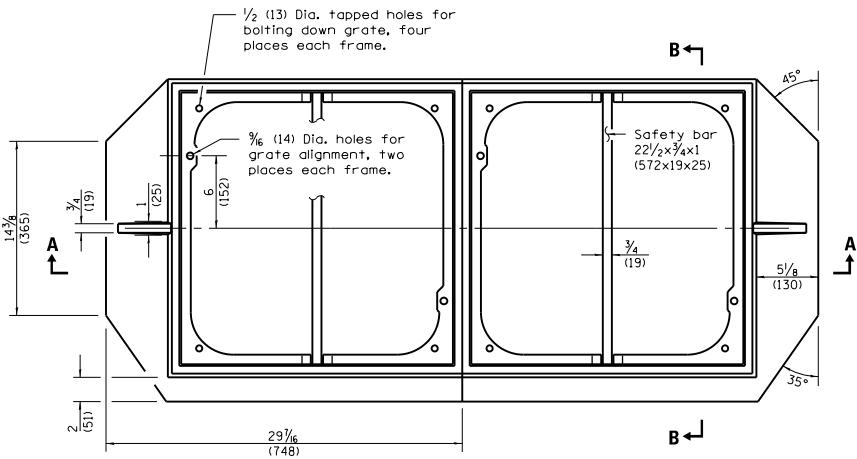
DATE	REVISIONS	FRAME AND GRATE TYPE 20
1-1-15	Revised dimensions of frame.	
1-1-09	Switched units to English (metric).	STANDARD 604071-05

	Illinois Department of Transportation
PASSED	January 1, 2015
	Michael Brand
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2015
	Michael Brand
ENGINEER OF DESIGN AND ENVIRONMENT	
	1-1-15

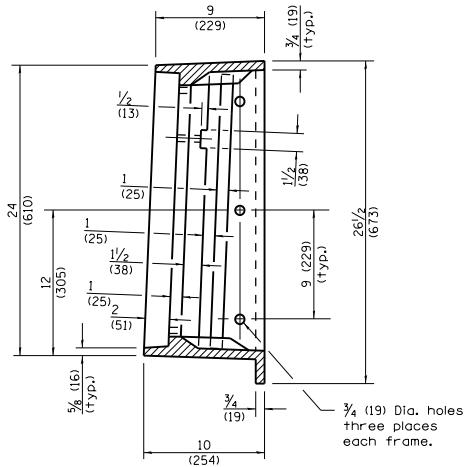


All dimensions are in inches (millimeters) unless otherwise shown.

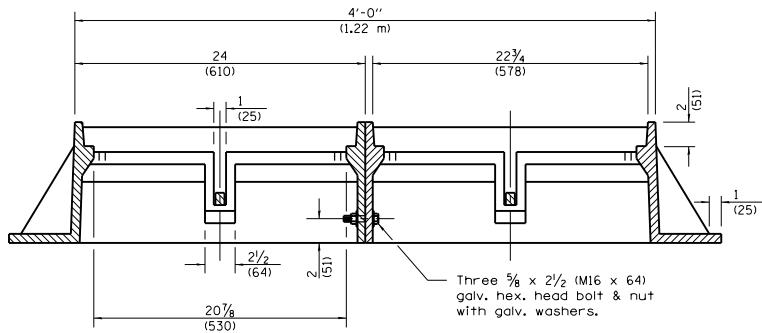
DATE	REVISIONS	FRAME AND GRATE TYPE 21
1-1-09	Switched units to English (metric).	
1-1-07	Revised frame flanges, changed to a bolt down grate w/ deeper vanes.	
		STANDARD 604076-04



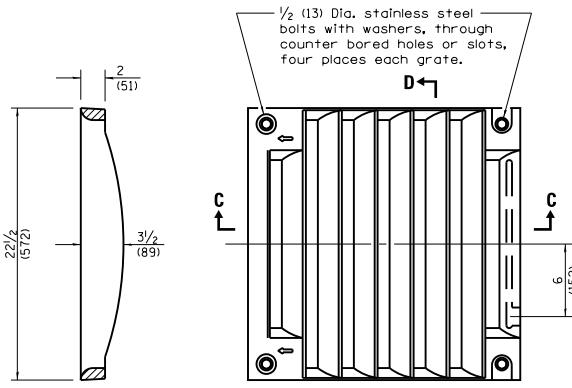
PLAN



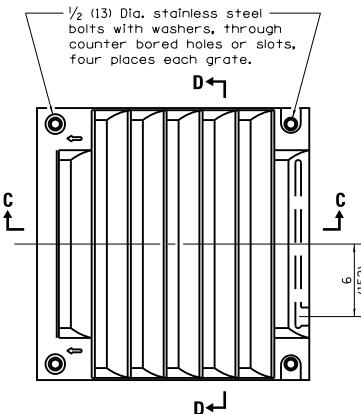
SECTION B-B



SECTION A-A



SECTION D-D

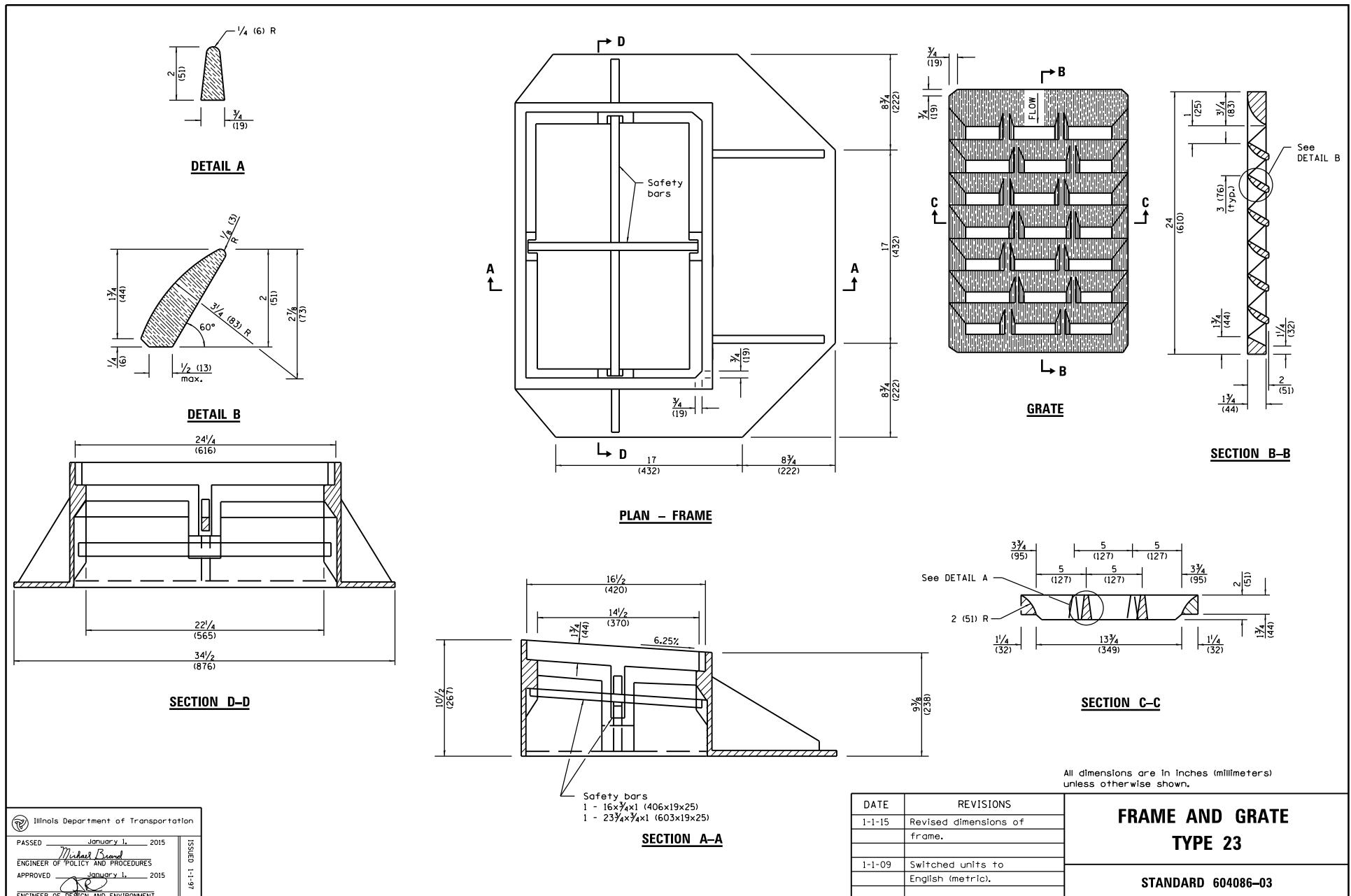


CAST GRADE

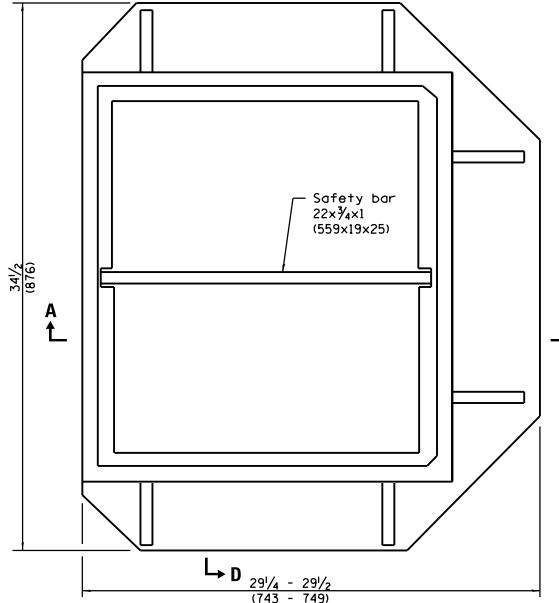
All dimensions are in inches (millimeters) unless otherwise shown.

	Illinois Department of Transportation
PASSED	January 1, 2009
	1-1-09
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2009
	1-1-09
ENGINEER OF DESIGN AND ENVIRONMENT	

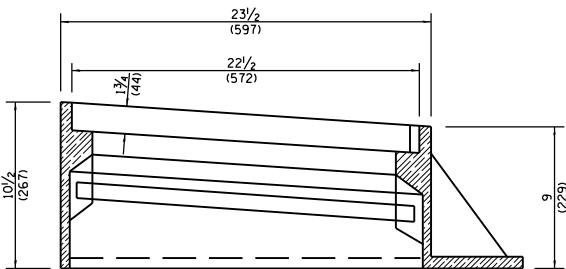
DATE	REVISIONS	FRAMES AND GRATES TYPE 22
1-1-09	Switched units to English (metric).	
1-1-07	Revised frame flanges, changed to a bolt down grate w/ deeper vanes.	STANDARD 604081-04



	Illinois Department of Transportation
PASSED	January 1, 2015
	Michael Brand
ENGINEER OF POLICY AND PROCEDURES	I-1-15-97
APPROVED	January 1, 2015
	Michael Brand
ENGINEER OF DESIGN AND ENVIRONMENT	I-1-15-97

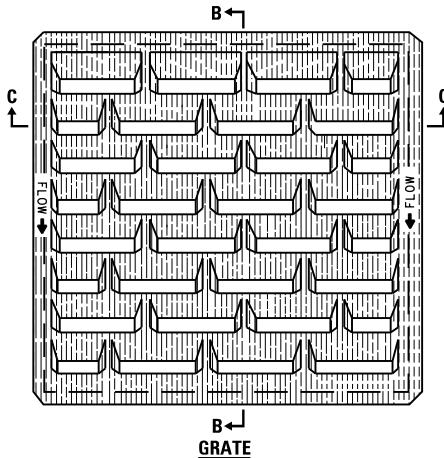


PLAN - FRAME

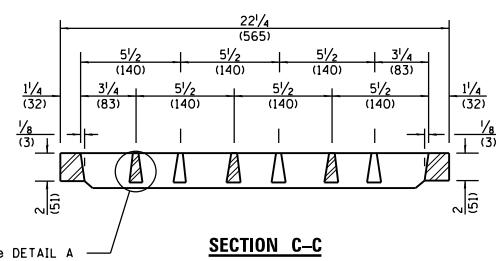


SECTION A-A

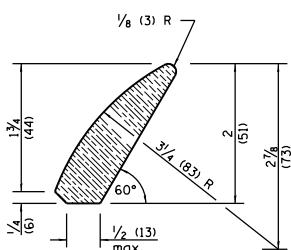
	Illinois Department of Transportation
PASSED	January 1, 2015
Michael Brand	ENGINEER OF POLICY AND PROCEDURES
APPROVED	JANUARY 1, 2015
	ENGINEER OF DESIGN AND ENVIRONMENT
	ISSUED 1-1-17



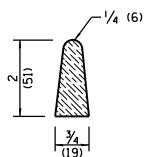
SECTION B-B



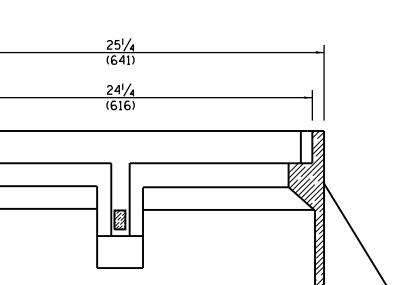
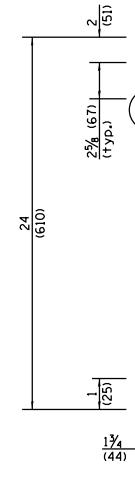
SECTION C-C



DETAIL A



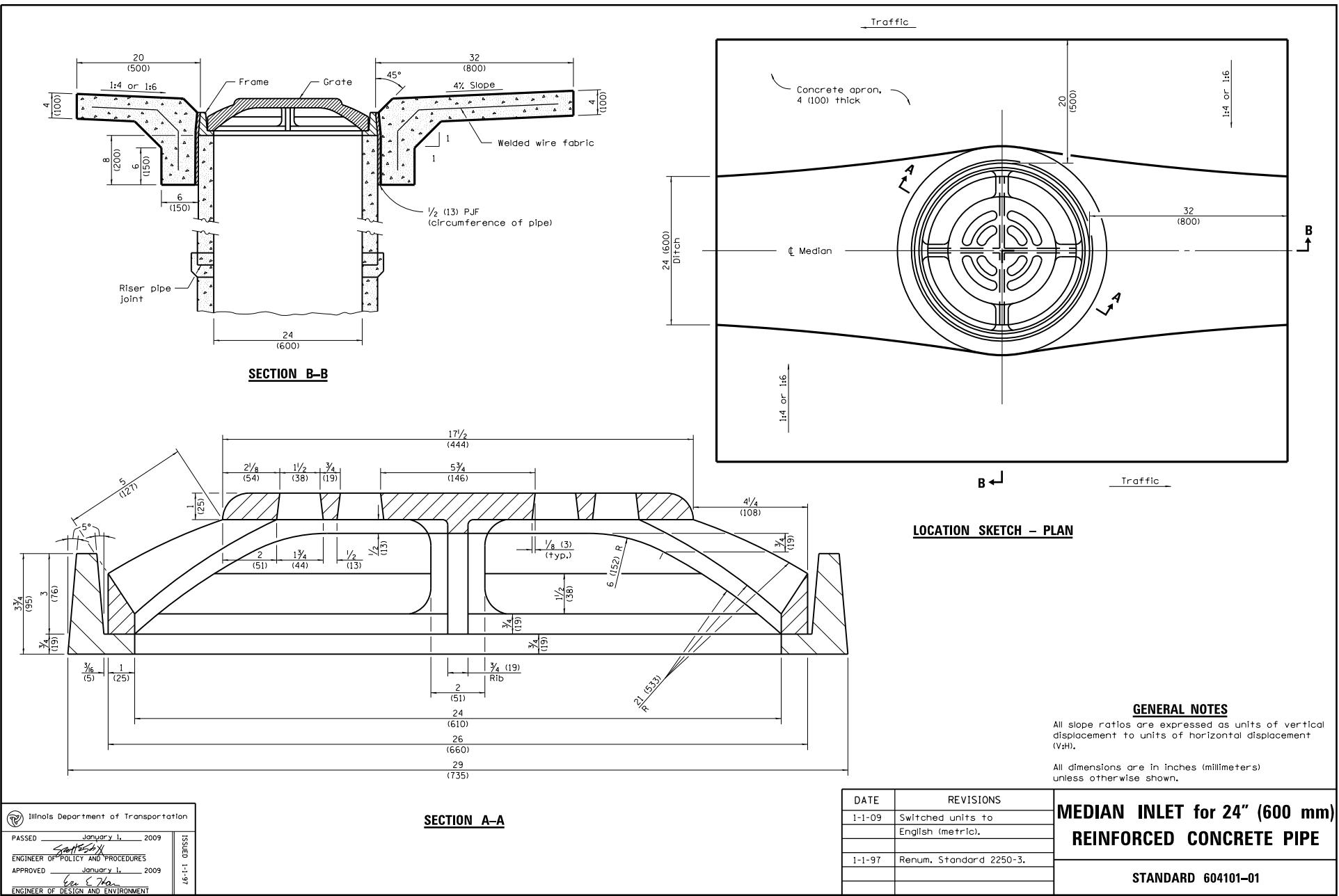
DETAIL B



SECTION D-D

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

DATE	REVISIONS	FRAME AND GRATE TYPE 24
1-1-15	Revised dimensions of frame.	
1-1-09	Switched units to English (metric).	STANDARD 604091-03

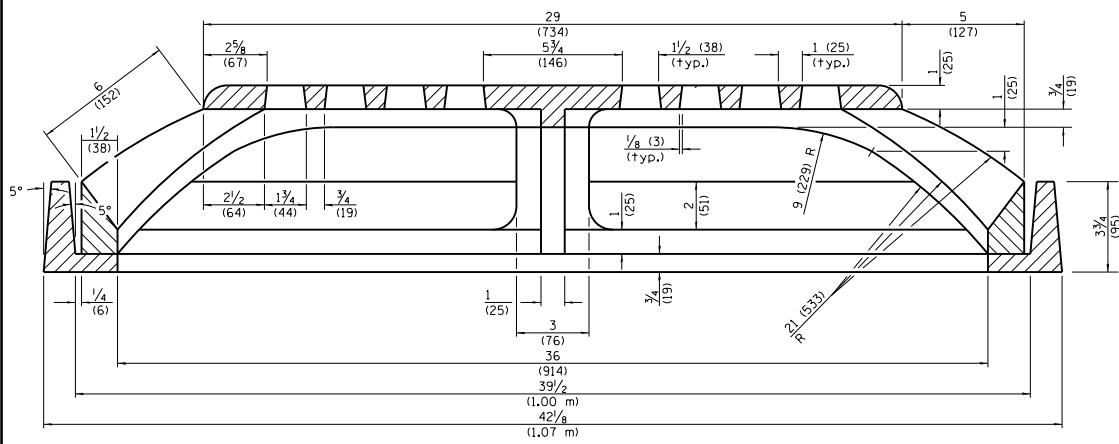
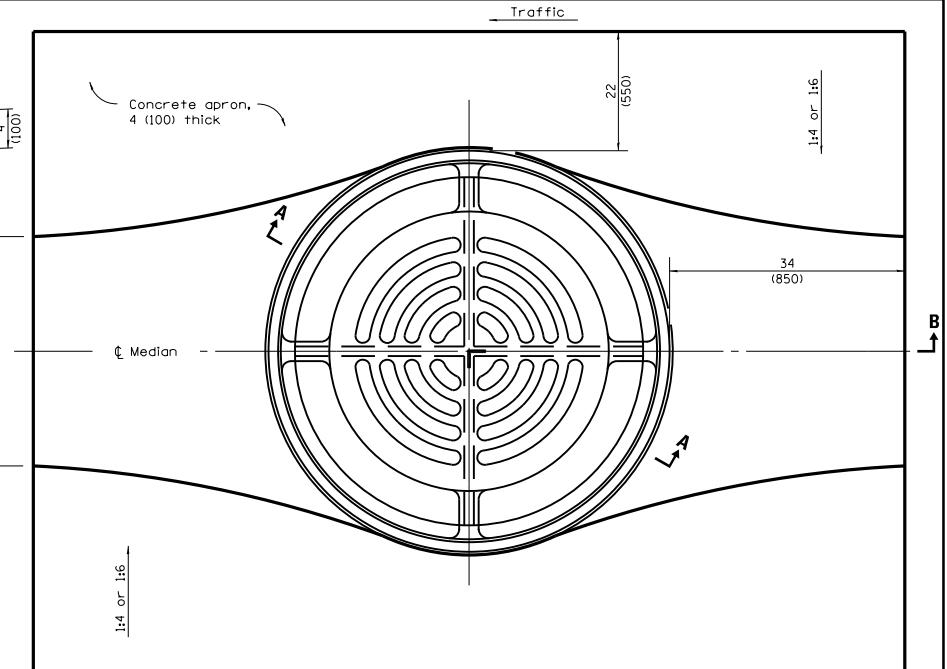
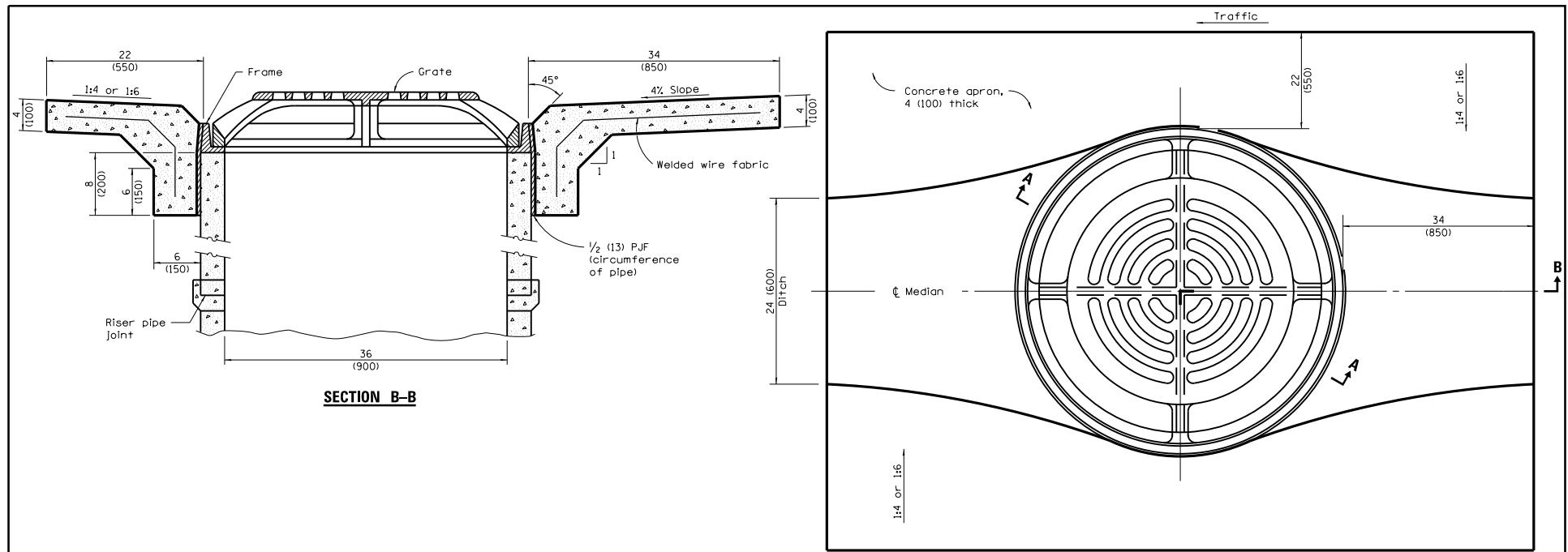


GENERAL NOTES

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).	MEDIAN INLET for 24" (600 mm) REINFORCED CONCRETE PIPE
1-1-97	Renum. Standard 2250-3.	
		STANDARD 604101-01



	Illinois Department of Transportation
PASSED	January 1, 2009
S. M. Shaboty	1-1-09
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2009
E. S. Khan	1-1-09
ENGINEER OF DESIGN AND ENVIRONMENT	

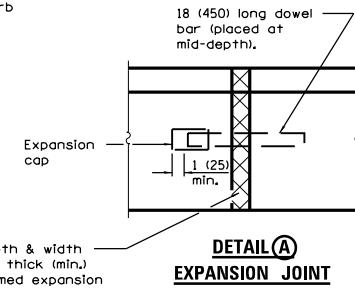
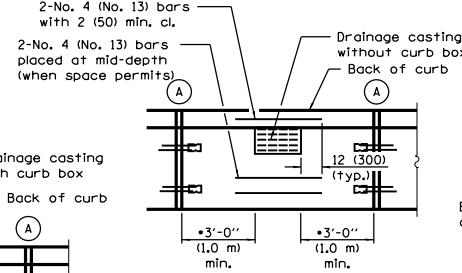
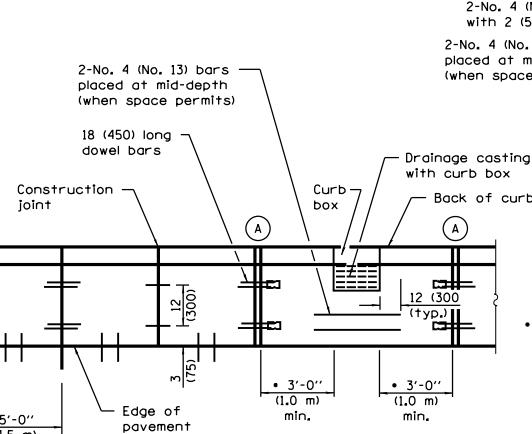
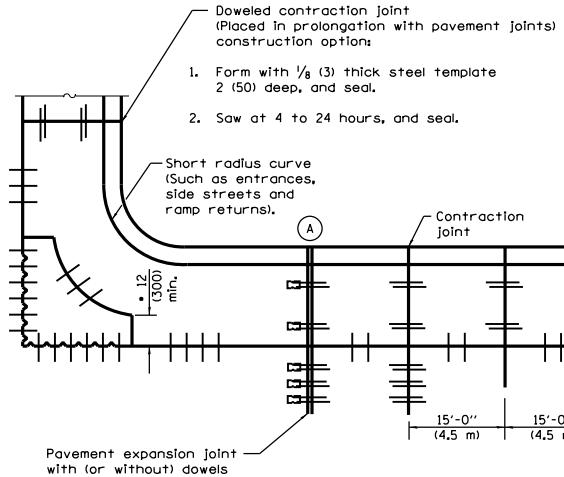
DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-97	Renum. Standard 2251-2.

**MEDIAN INLET for 36" (900 mm)
REINFORCED CONCRETE PIPE**

STANDARD 604106-01

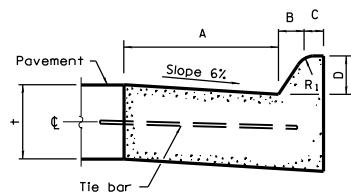
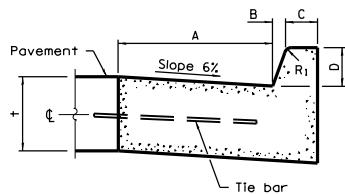
GENERAL NOTES
All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

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



DETAIL A
EXPANSION JOINT

PLAN
ADJACENT TO PCC PAVEMENT OR PCC BASE COURSE



BARRIER CURB

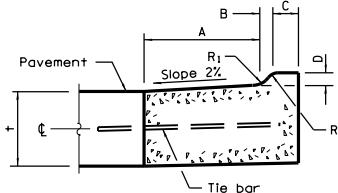
**TABLE OF DIMENSIONS
MOUNTABLE CURB**

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

* For corner islands only.

Illinois Department of Transportation
PASSED January 1, 2015
Michael Brand
ENGINEER OF POLICY AND PROCEDURES
APPROVED January 1, 2015
John J. Brand
ENGINEER OF DESIGN AND ENVIRONMENT

**ADJACENT TO PCC BASE COURSE
WITH HMA SURFACING**



M-2.06 (M-5.15) and M-2.12 (M-5.30)

DATE	REVISIONS	CONCRETE CURB TYPE B AND COMBINATION CONCRETE CURB AND GUTTER
1-1-15	Added B-6.06 (B-15.15) barrier curb and gutter to table (corner islands only).	(Sheet 1 of 2)
1-1-13	Added general note regarding requirement for dowel bars.	
		STANDARD 606001-06

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.

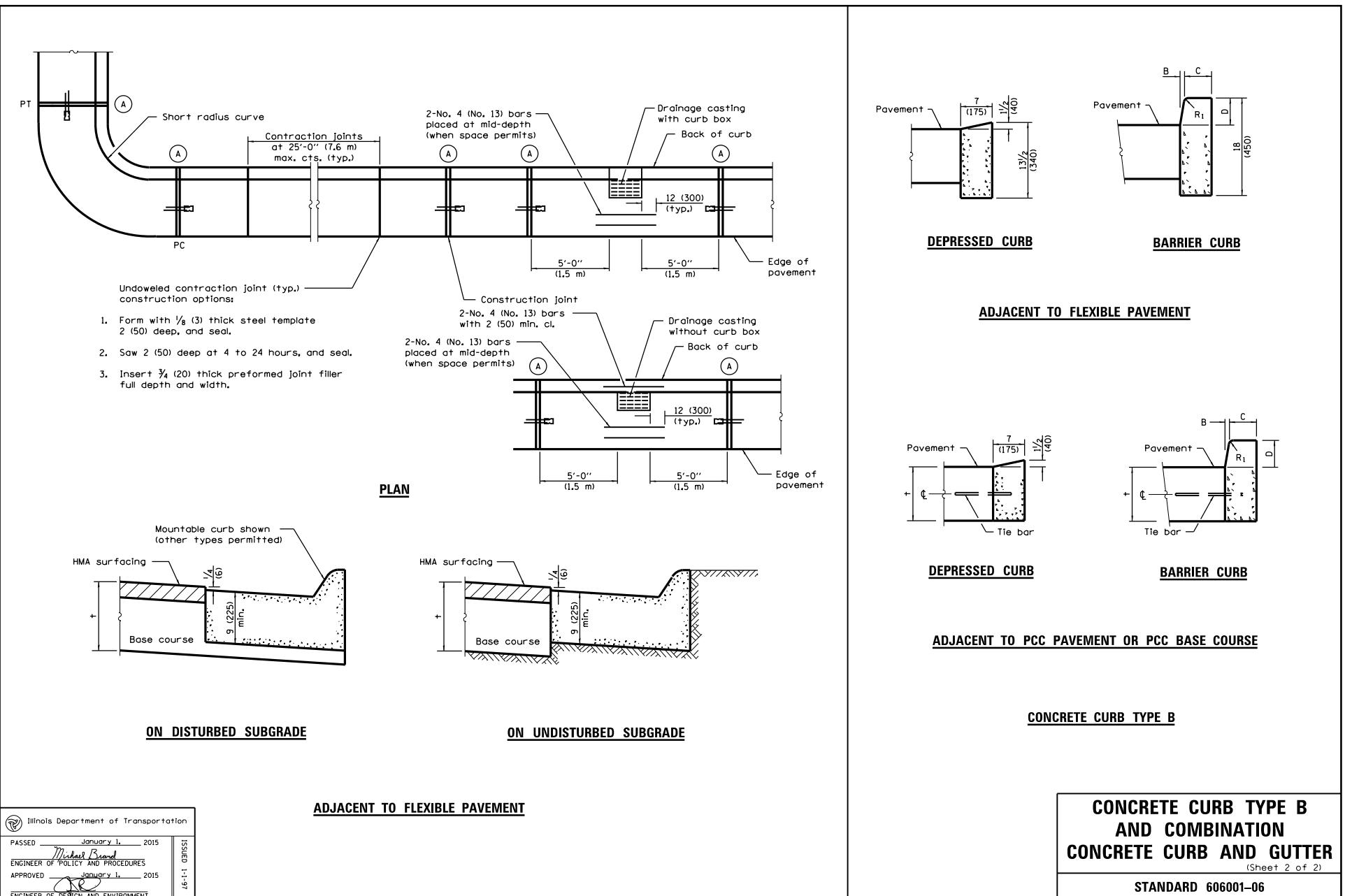
Longitudinal joint tie bars shall be No. 6 (No. 19) at 24 (600) centers in accordance with details for longitudinal construction joint shown on Standard 420001.

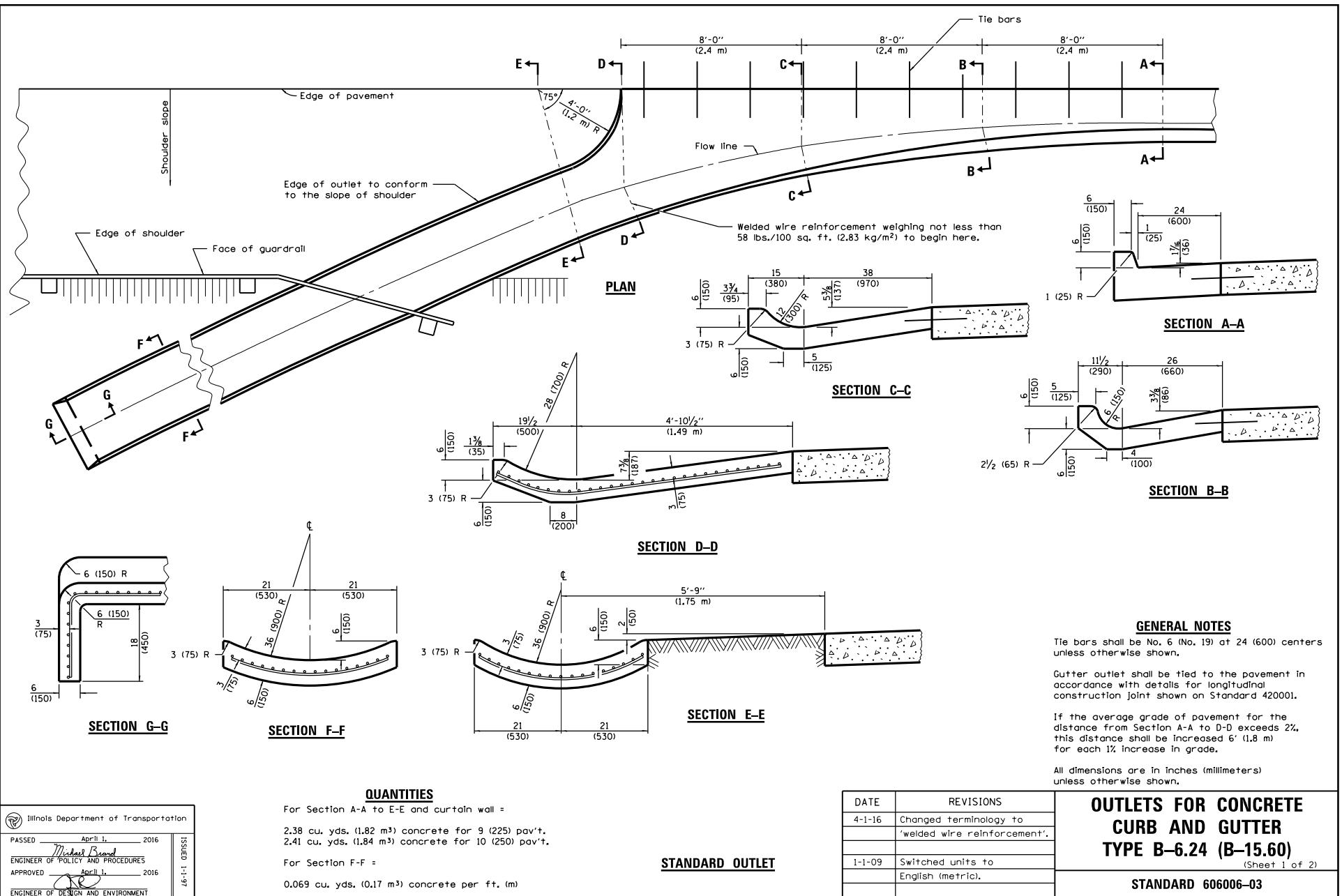
A minimum clearance of 2 (50) between the end of the tie bar and the back of the curb shall be maintained.

The dowel bars shown in contraction joints will only be required for monolithic construction.

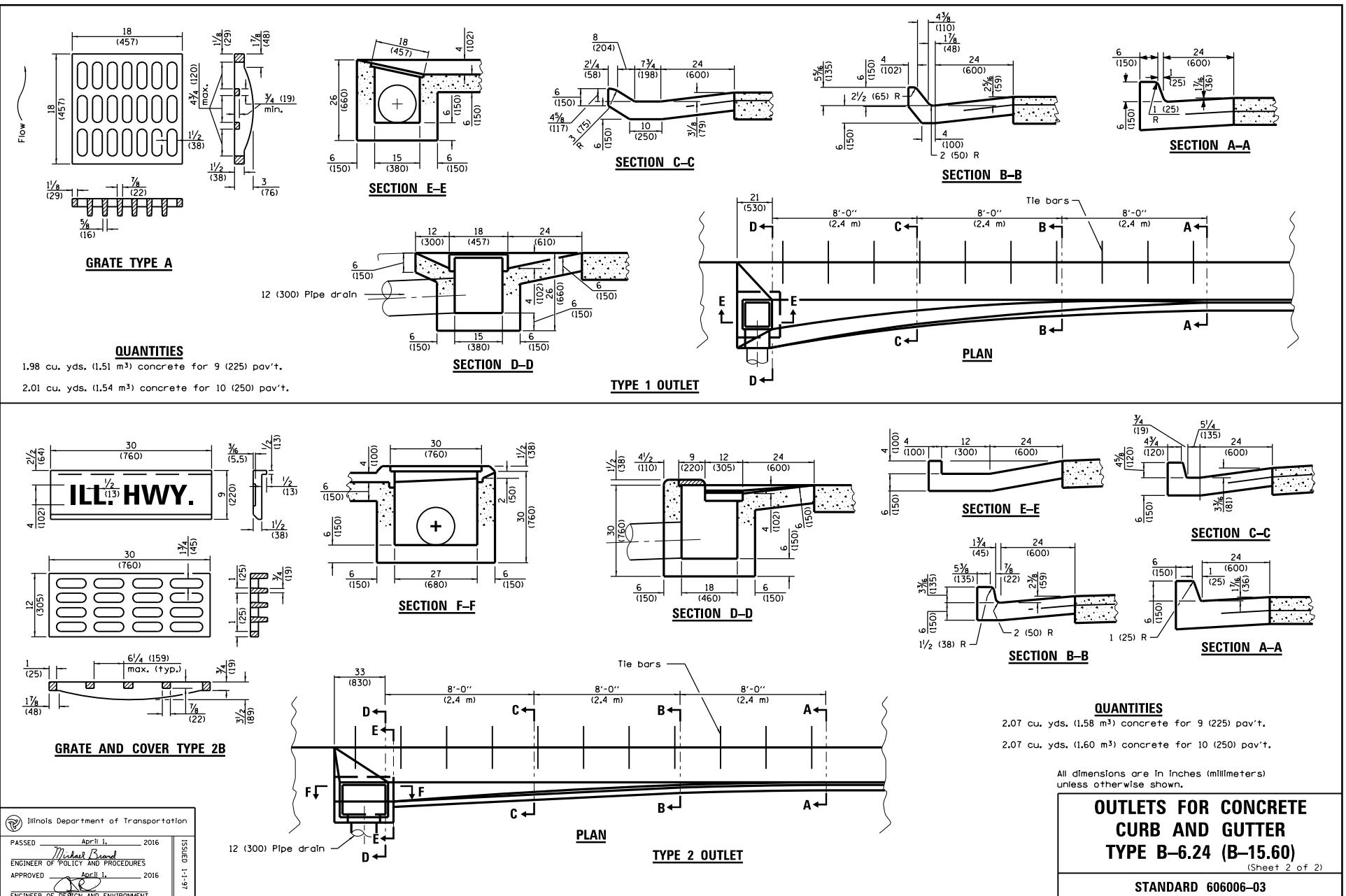
See Standard 606301 for details of corner islands.

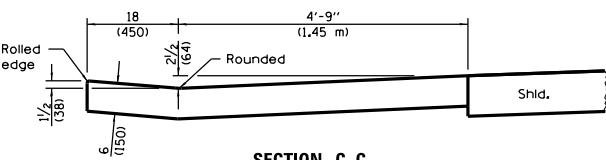
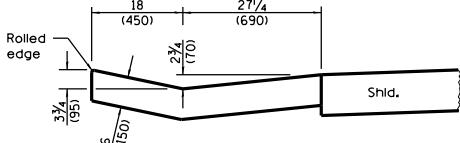
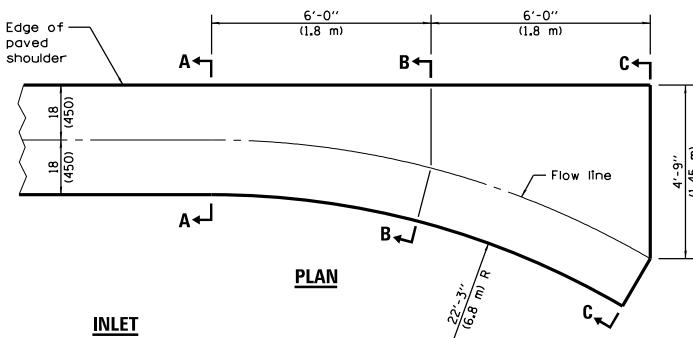
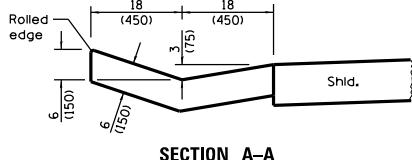
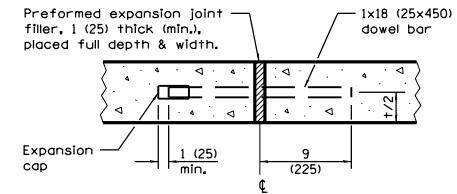
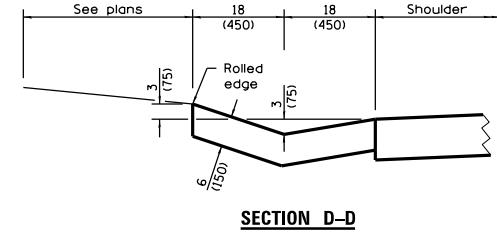
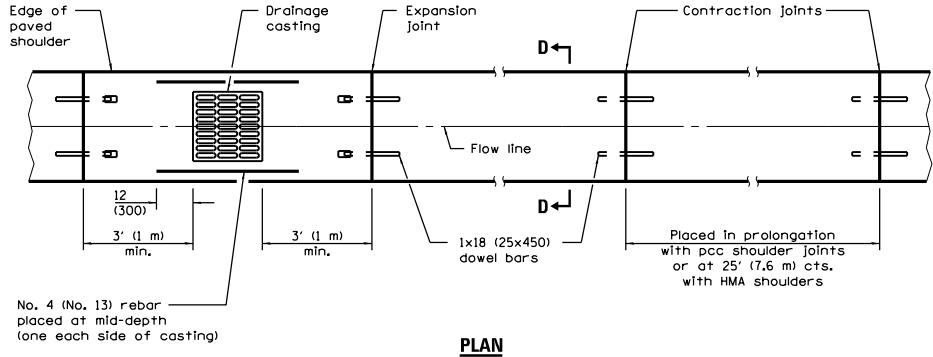
All dimensions are in inches (millimeters) unless otherwise shown.





Illinois Department of Transportation
PASSED April 1, 2016
Michael Brand
ENGINEER OF POLICY AND PROCEDURES
APPROVED April 1, 2016
John J. Goss
ENGINEER OF DESIGN AND ENVIRONMENT



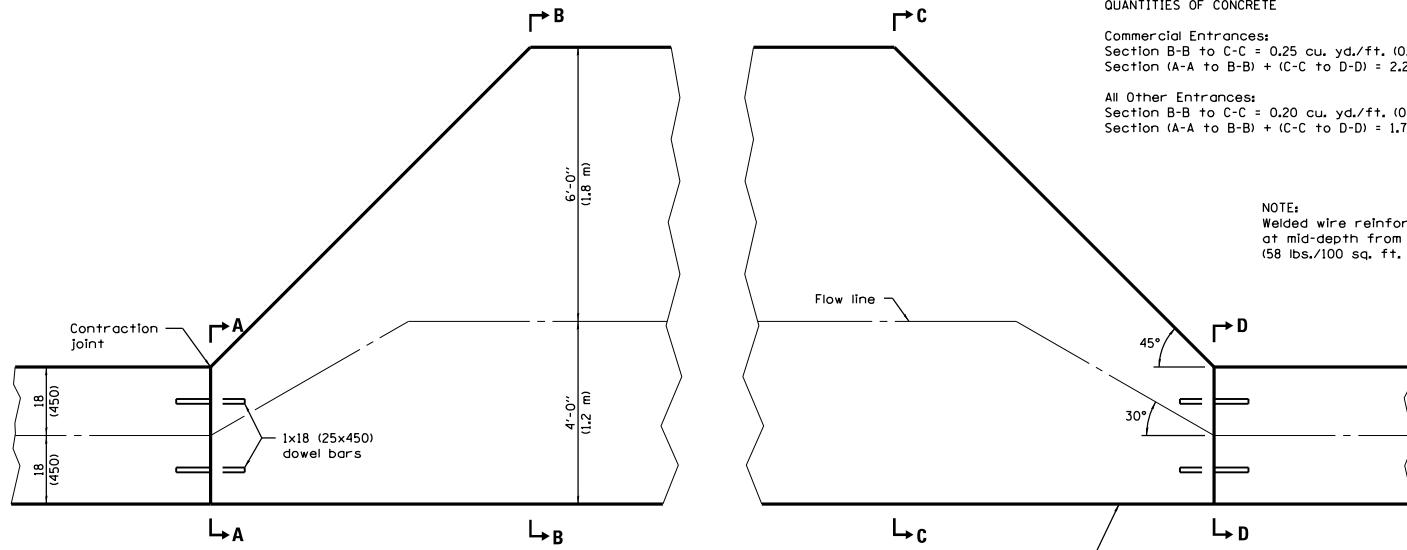


QUANTITY OF CONCRETE
Section A-A to C-C
0.93 cu. yd. (0.71 m³)

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

DATE	REVISIONS	TYPE A GUTTER (INLET, OUTLET & ENTRANCE) (Sheet 1 of 3)
4-1-16	Changed terminology to 'welded wire reinforcement'.	
1-1-09	Switched units to English (metric). Changed radii, adjusted qty's.	
		STANDARD 606101-05

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

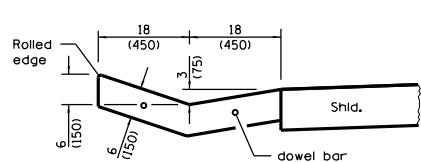


QUANTITIES OF CONCRETE

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))



SECTIONS A-A & D-D



SECTIONS B-B & C-C

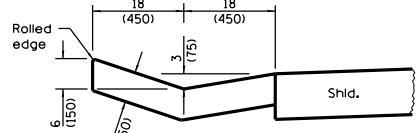
- 8 (200) for commercial entrances and 6 (150) for all others.

	Illinois Department of Transportation
PASSED	April 1, 2016
<i>Michael Brand</i>	Engineer of Policy and Procedures
APPROVED	April 1, 2016
<i>[Signature]</i>	Engineer of Design and Environment
LS-1-1	Q3153

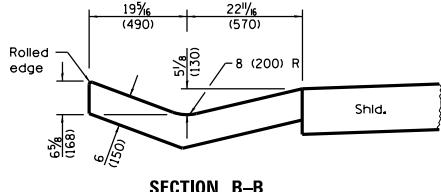
**TYPE A GUTTER
(INLET, OUTLET & ENTRANCE)**

(Sheet 2 of 3)

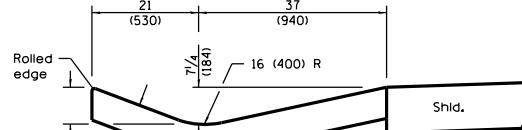
STANDARD 606101-05



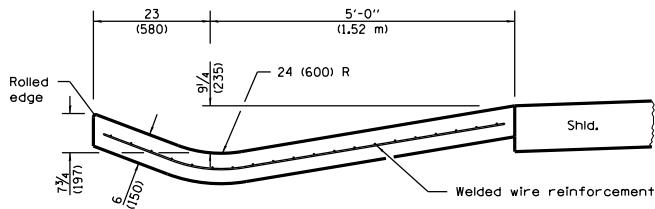
SECTION A-A



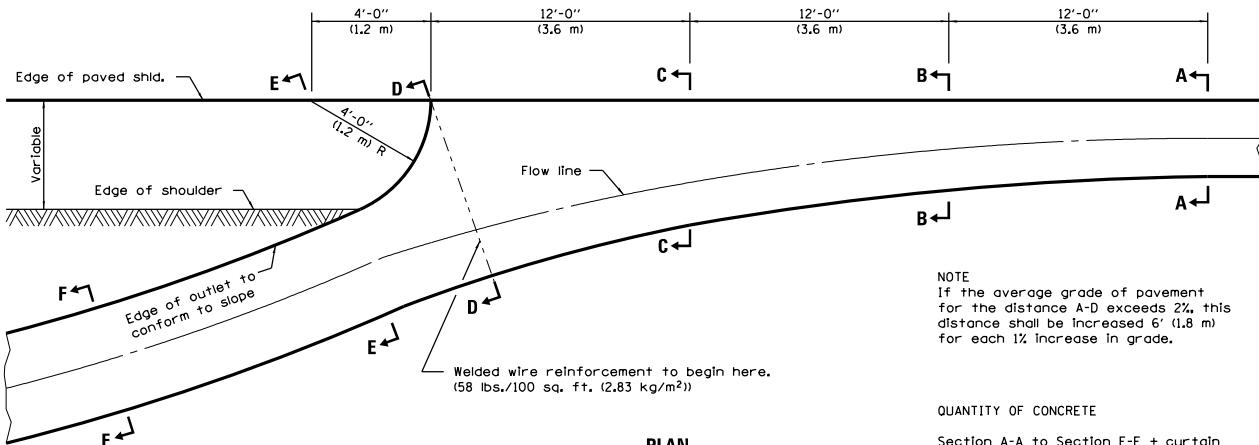
SECTION B-B



SECTION C-C

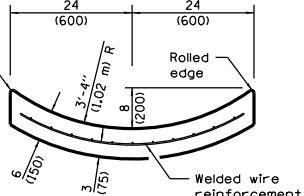


SECTION D-D

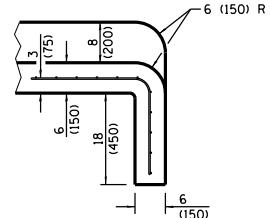
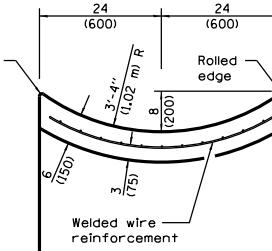


PLAN

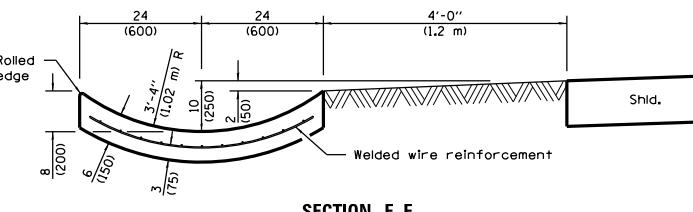
OUTLET



SECTION F-F



SECTIONS AT END OF OUTLET

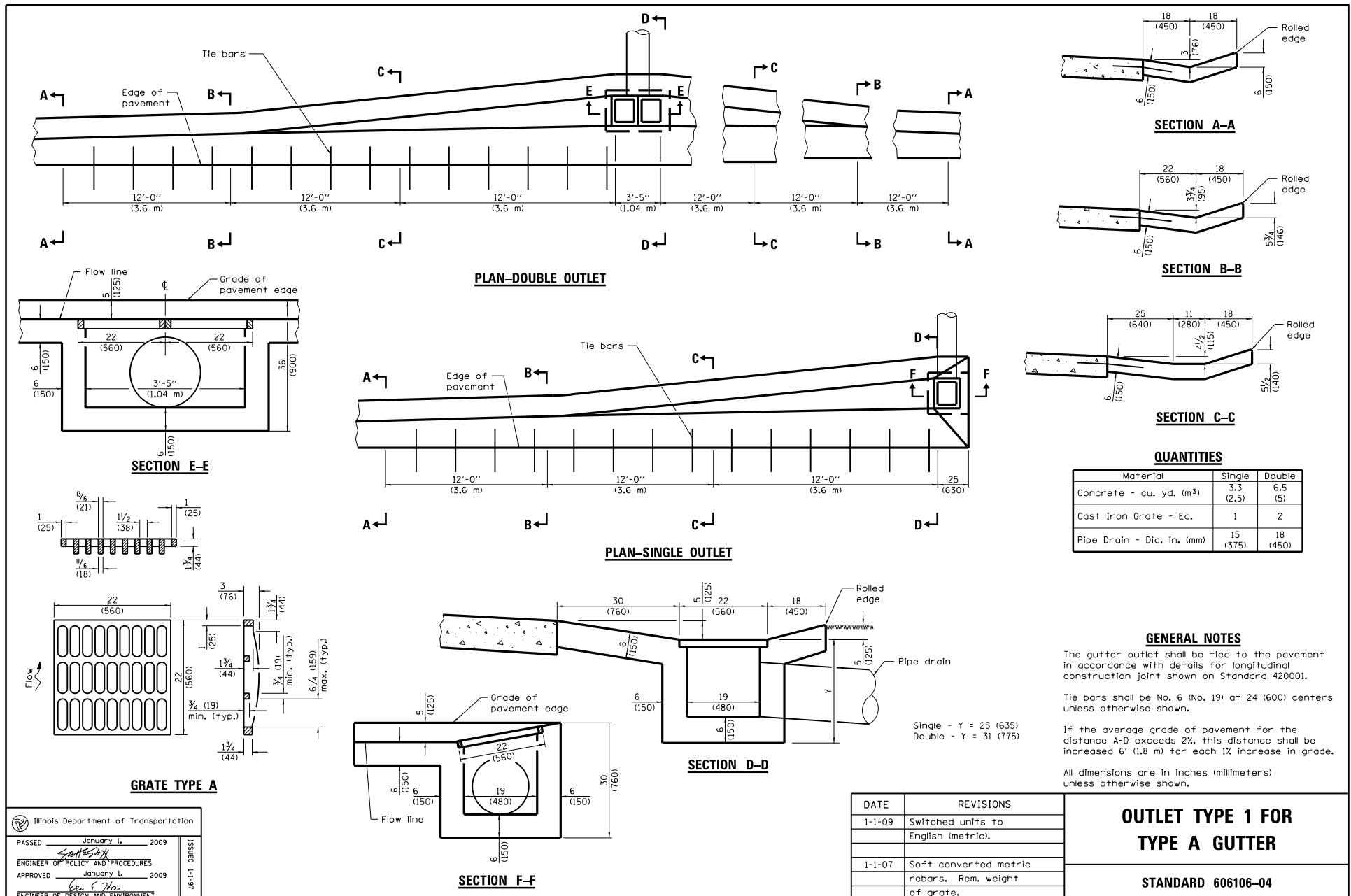


SECTION E-E

	Illinois Department of Transportation
PASSED	April 1, 2016
Michael Brand	Engineer of Policy and Procedures
APPROVED	April 1, 2016
John Doe	Engineer of Design and Environment
LS-1-1 Q3153	

**TYPE A GUTTER
(INLET, OUTLET & ENTRANCE)**
(Sheet 3 of 3)

STANDARD 606101-05

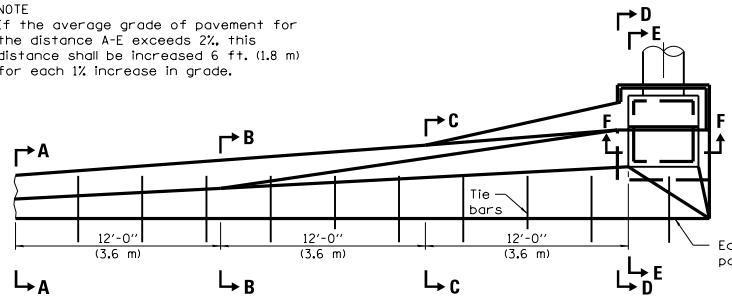


Illinois Department of Transportation
PASSED January 1, 2009
Santosh
ENGINEER OF POLICY AND PROCEDURES
APPROVED January 1, 2009
Lee S. Khan
ENGINEER OF DESIGN AND ENVIRONMENT

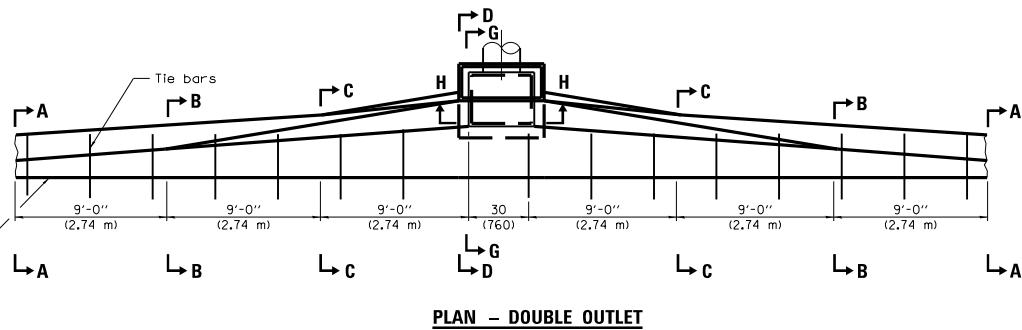
1-1-10-04531

NOTE

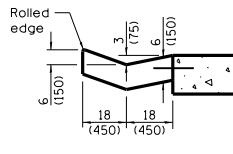
If the average grade of pavement for the distance A-E exceeds 2%, this distance shall be increased 6 ft. (1.8 m) for each 1% increase in grade.



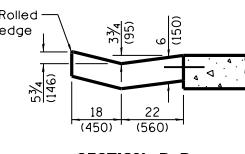
PLAN - SINGLE OUTLET



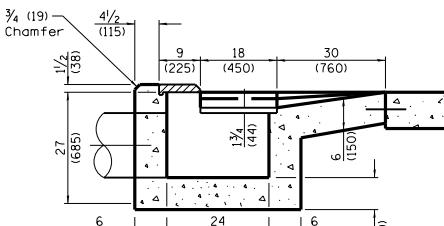
PLAN - DOUBLE OUTLET



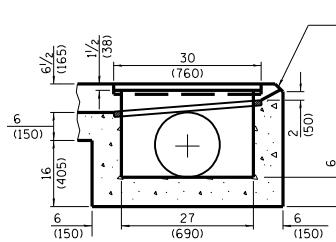
SECTION A-A



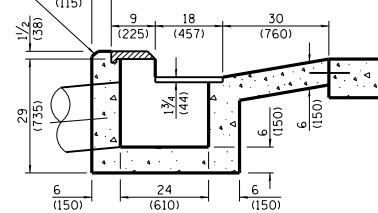
SECTION B-B



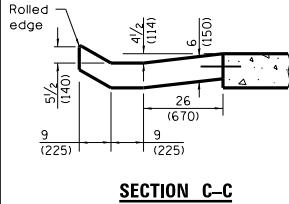
SECTION E-E



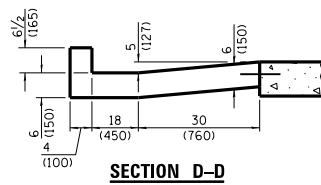
SECTION F-F



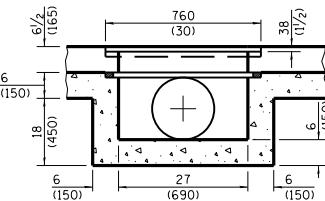
SECTION G-G



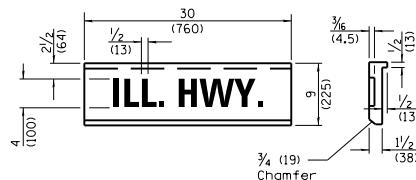
SECTION C-C



SECTION D-D



SECTION H-H



GRATE AND COVER TYPE 2A

	Illinois Department of Transportation
PASSED	January 1, 2009
Santosa	
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2009
Eduardo	
ENGINEER OF DESIGN AND ENVIRONMENT	

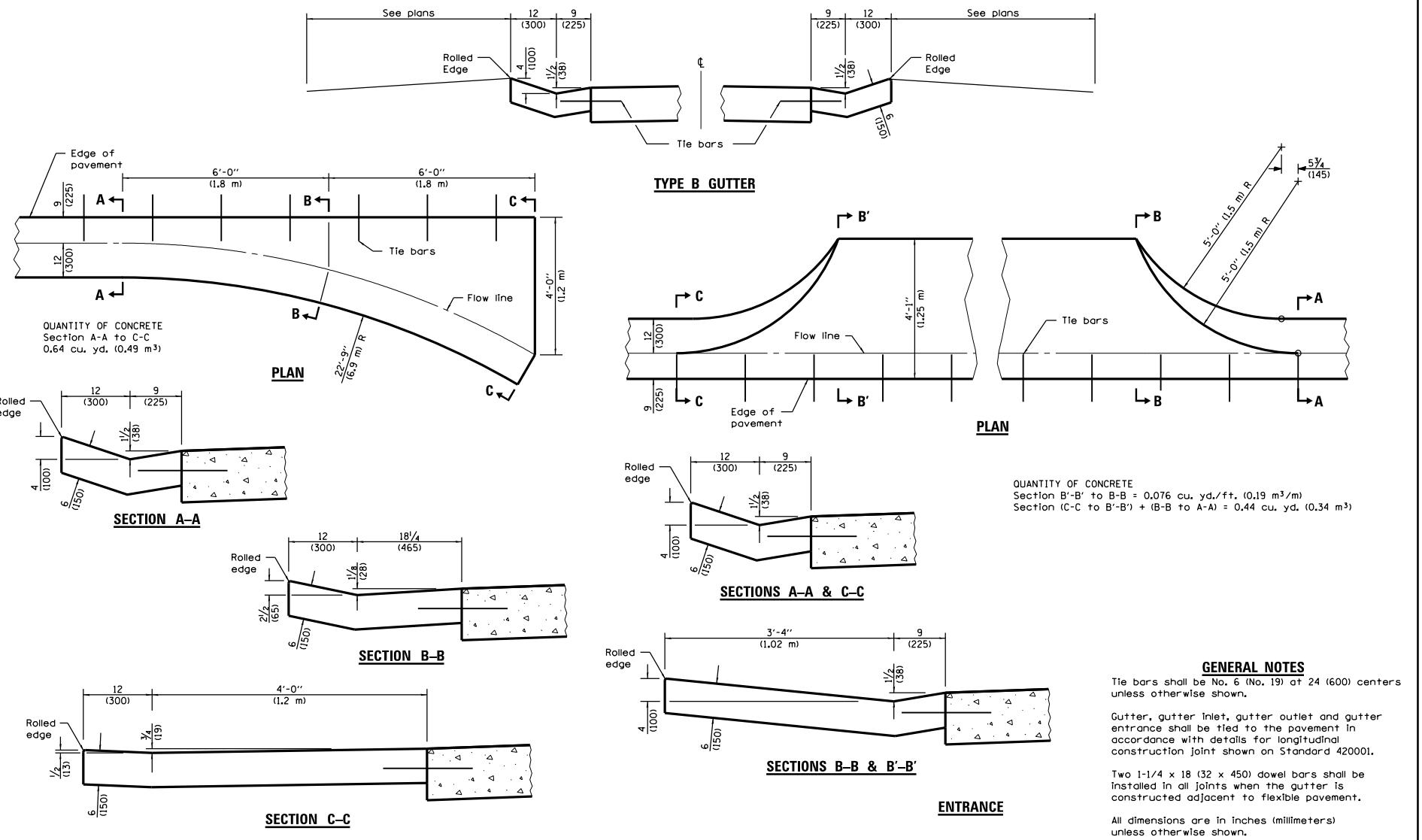
Material	Single	Double
Concrete - cu. yd. (m³)	3.07 (2.35)	4.33 (3.31)
Cast Iron Grate - Ea.	1	1
Cast Iron Cover - Ea.	1	1
Pipe Drain - Dia. in. (mm)	15 (375)	18 (450)

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.

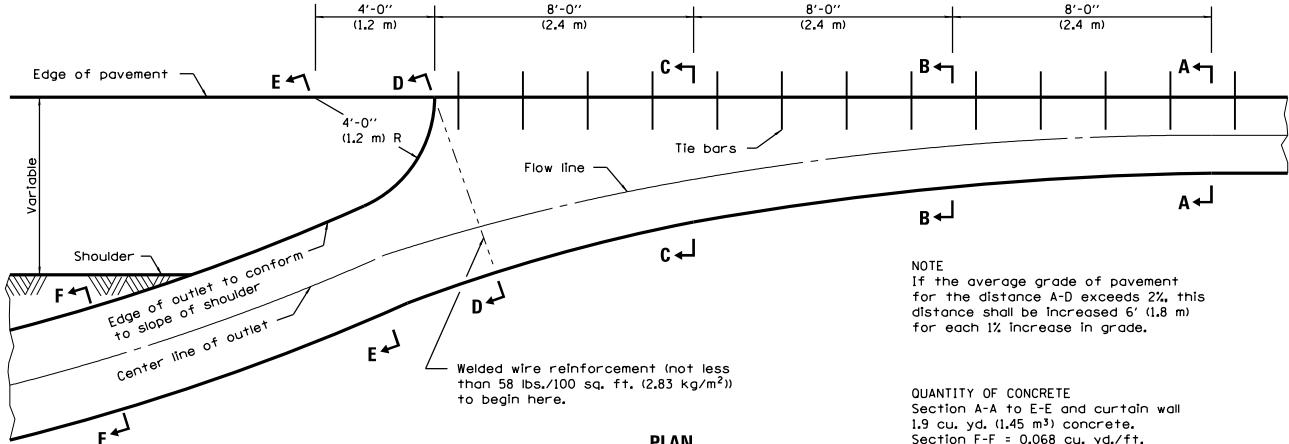
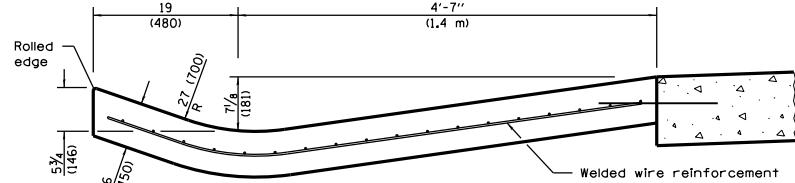
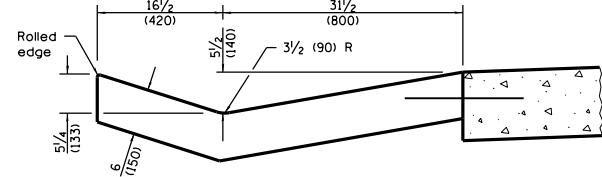
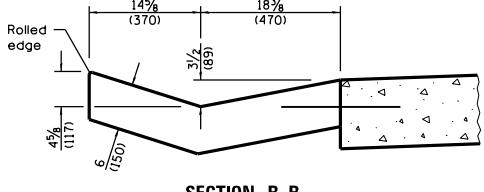
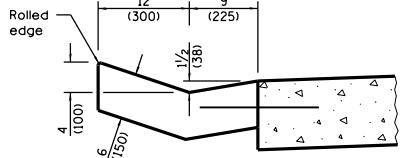
DATE	REVISIONS	OUTLETS TYPE 2 FOR TYPE A GUTTER STANDARD 60611-03
1-1-09	Switched units to English (metric).	
1-1-07	Removed weight of grate and cover.	



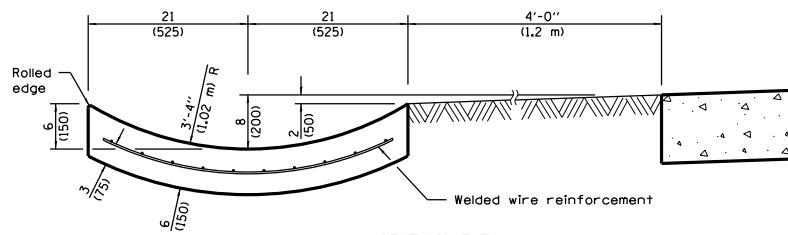
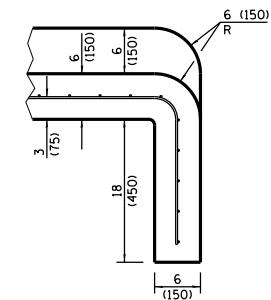
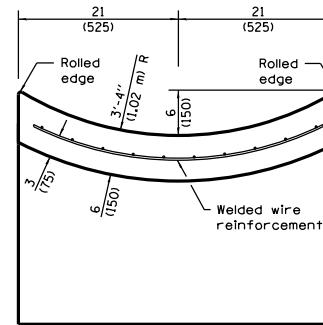
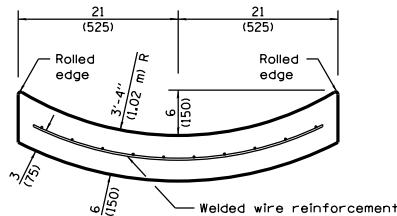
	Illinois Department of Transportation
PASSED	April 1, 2016
Michael Brand	Engineer of Policy and Procedures
APPROVED	April 1, 2016
CR	Engineer of Design and Environment
	Q3RSI
	1-1-16

DATE	REVISIONS	TYPE B GUTTER (INLET, OUTLET & ENTRANCE) (Sheet 1 of 2)
4-1-16	Changed terminology to 'welded wire reinforcement'.	
1-1-09	Switched units to English (metric). Changed radii, adjusted qty's.	

STANDARD 606201-03



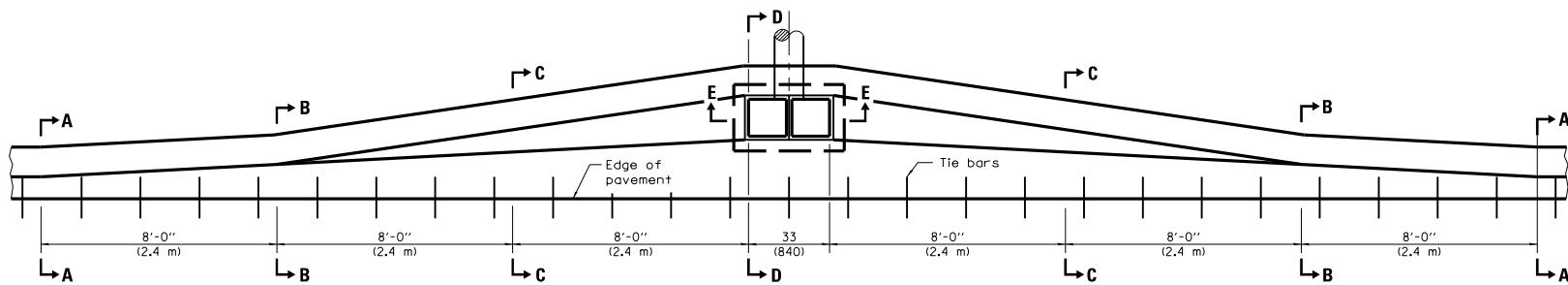
OUTLET



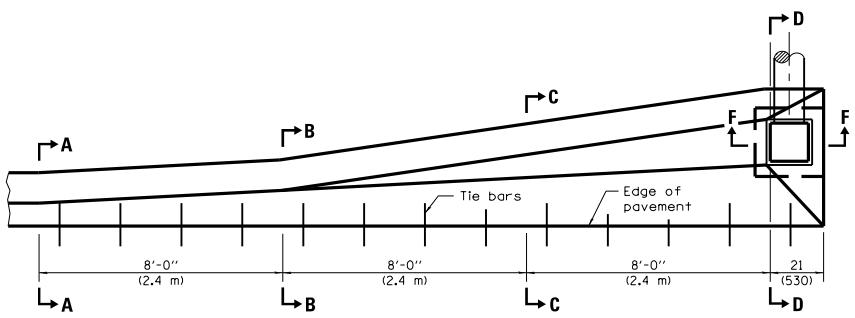
STANDARD 606201-03

Illinois Department of Transportation
PASSED April 1, 2016
Michael Brand
ENGINEER OF POLICY AND PROCEDURES
APPROVED April 1, 2016
John J. Goss
ENGINEER OF DESIGN AND ENVIRONMENT

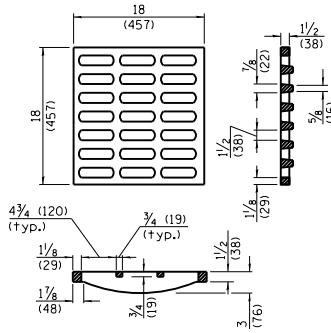
(Sheet 2 of 2)



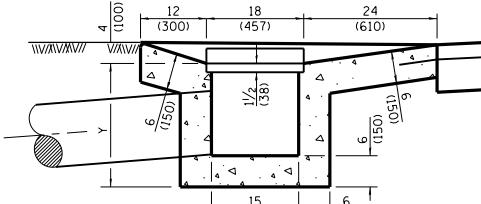
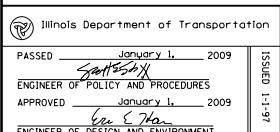
PLAN – DOUBLE OUTLET



PLAN – SINGLE OUTLET



GRADE TYPE B



SECTION D-D

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)

QUANTITIES

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 24 (600) centers unless otherwise shown.

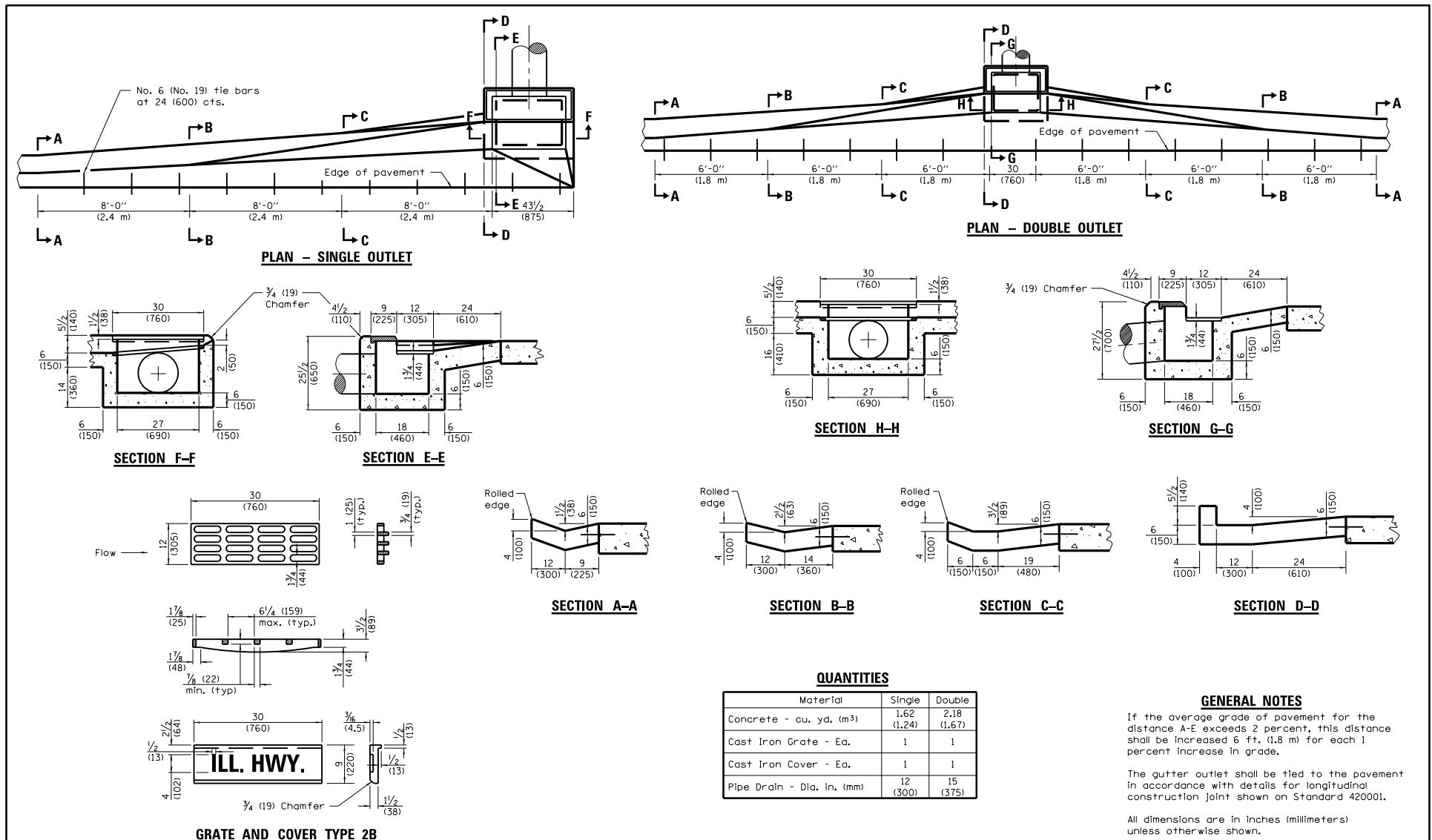
If the average grade of the pavement for the distance A-D exceeds 2%, this distance shall be increased 6'-0" (1.8 m) for each 1% increase in grade.

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

DATE	REVISIONS	OUTLET TYPE 1 FOR TYPE B GUTTER
1-1-09	Switched units to English (metric).	
1-1-00	Soft converted metric	
	rebar. Rem. weight of grate.	
		STANDARD 606206-03

OUTLET TYPE 1 FOR TYPE B GUTTER

STANDARD 606206-03



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)

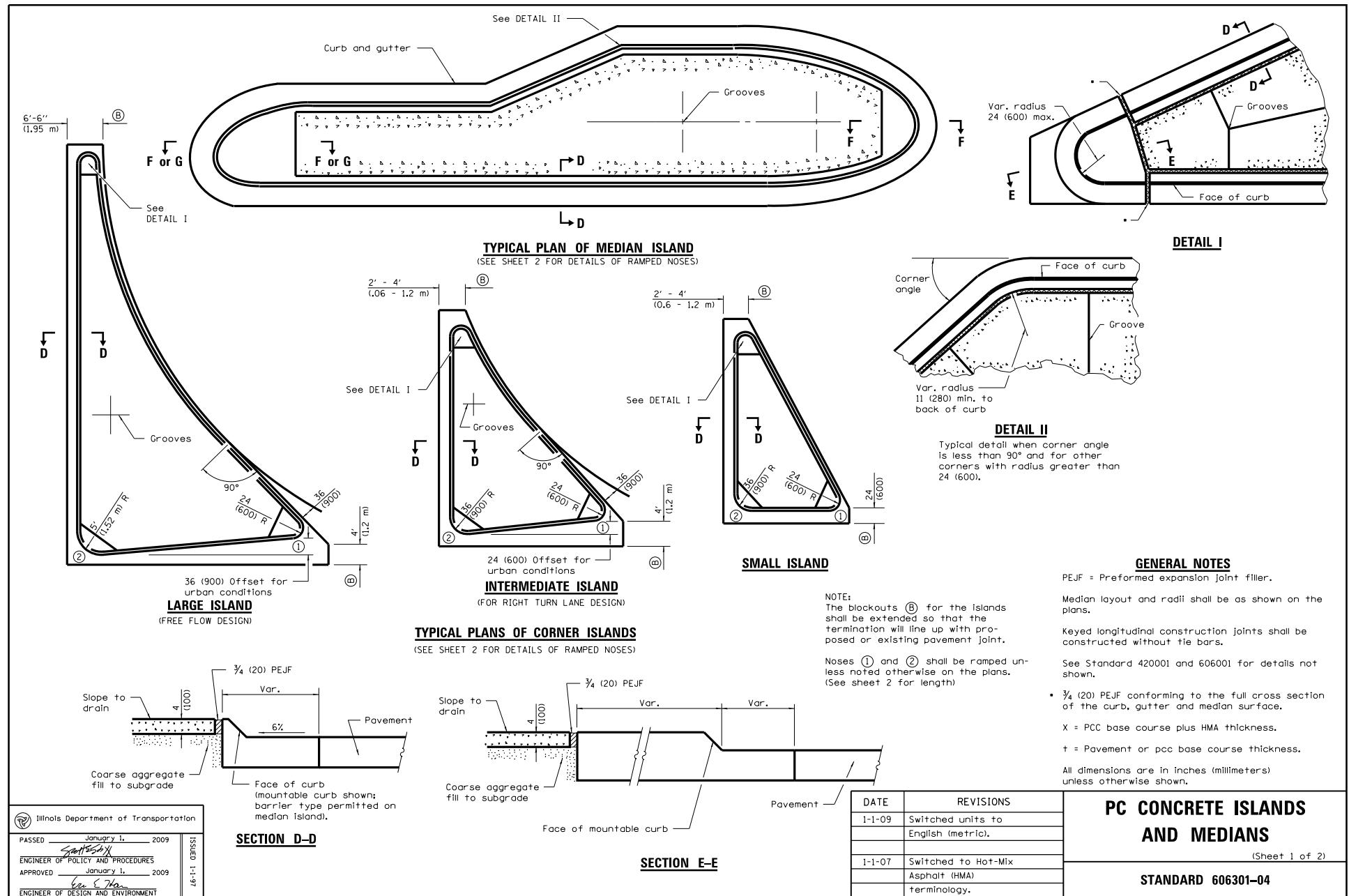
GENERAL NOTES

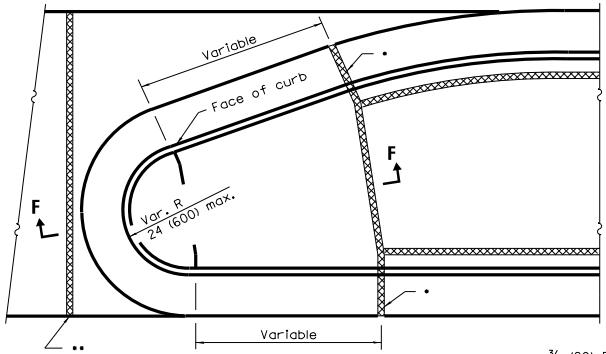
If the average grade of pavement for the distance A-E exceeds 2 percent, this distance shall be increased 6 ft. (1.8 m) for each 1 percent increase in grade.

The gutter outlet shall be tied to the pavement in accordance with details for longitudinal construction joint shown on Standard 420001.

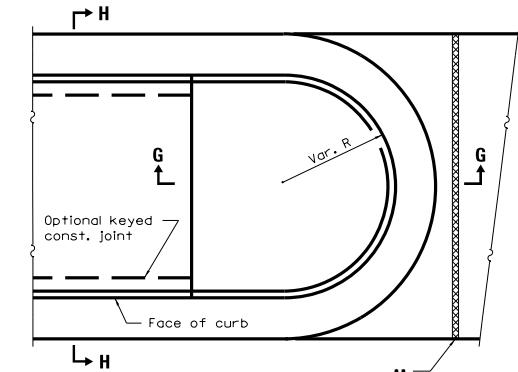
All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS	OUTLETS TYPE 2 FOR TYPE B GUTTER
1-1-09	Switched units to English (metric).	
1-1-07	Soft converted metric rebars. Rem. weights of grate & cover.	
		STANDARD 606211-03





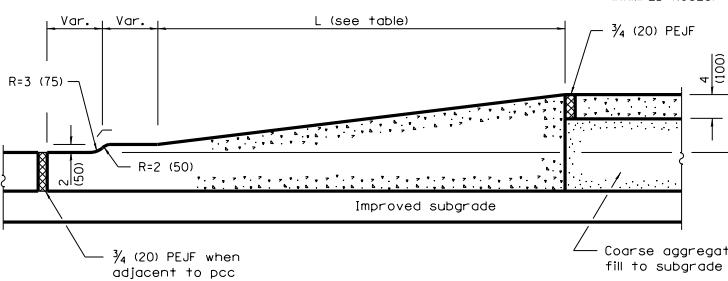
TYPE P MEDIAN SURFACE



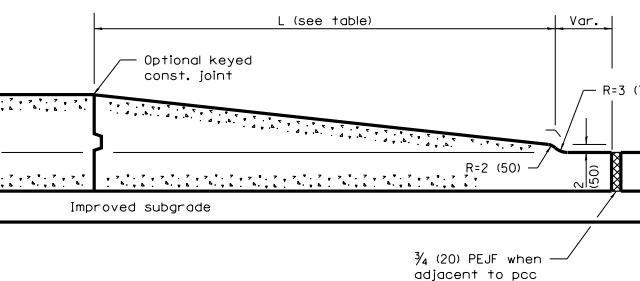
SOLID MEDIAN

TABLE OF DIMENSIONS					
TYPE SB MEDIAN					
TYPE	A	B	C	D	R ₁
SB-6.06 (SB-15.15)	6 (150)	1 (25)	6 (150)	6 (25)	1
SB-6.12 (SB-15.30)	12 (300)	1 (25)	6 (150)	6 (25)	1
SB-6.18 (SB-15.45)	18 (450)	1 (25)	6 (150)	6 (25)	1
SB-6.24 (SB-15.60)	24 (600)	1 (25)	6 (150)	6 (25)	1
SB-9.06 (SB-22.15)	6 (150)	2 (50)	5 (125)	9 (225)	1 (25)
SB-9.12 (SB-22.30)	12 (300)	2 (50)	5 (125)	9 (225)	1 (25)
SB-9.18 (SB-22.45)	18 (450)	2 (50)	5 (125)	9 (225)	1 (25)
SB-9.24 (SB-22.60)	24 (600)	2 (50)	5 (125)	9 (225)	1 (25)

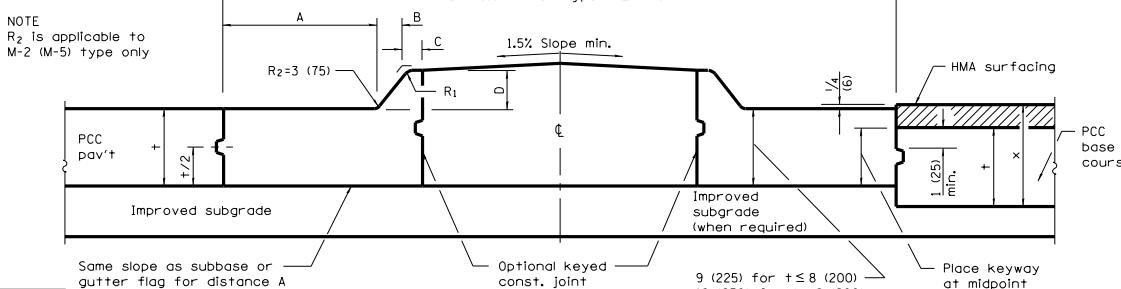
TABLE OF DIMENSIONS					
TYPE M AND SM MEDIAN					
TYPE	A	B	C	D	R ₁
M-2.06 (M-5.15)	6 (150)	2 (50)	4 (100)	2 (50)	2 (50)
M-2.12 (M-5.30)	12 (300)	2 (50)	4 (100)	2 (50)	2 (50)
SM-4.06 (SM-10.15)	6 (150)	4 (100)	3 (75)	4 (100)	3 (75)
SM-4.12 (SM-10.30)	12 (300)	4 (100)	3 (75)	4 (100)	3 (75)
SM-4.18 (SM-10.45)	18 (450)	4 (100)	3 (75)	4 (100)	3 (75)
SM-4.24 (SM-10.60)	24 (600)	4 (100)	3 (75)	4 (100)	3 (75)
SM-6.06 (SM-15.15)	6 (150)	6 (150)	2 (50)	6 (150)	2 (50)
SM-6.12 (SM-15.30)	12 (300)	6 (150)	2 (50)	6 (150)	2 (50)
SM-6.18 (SM-15.45)	18 (450)	6 (150)	2 (50)	6 (150)	2 (50)
SM-6.24 (SM-15.60)	24 (600)	6 (150)	2 (50)	6 (150)	2 (50)



SECTION F-F



SECTION G-G

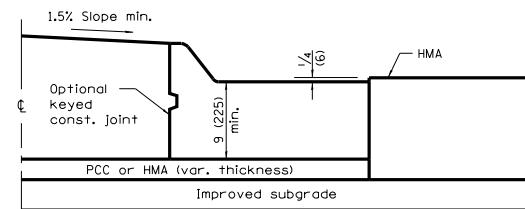


HALF SECTION FOR PCC PAVEMENT

HALF SECTION FOR PCC BASE COURSE

SECTION H-H

(TYPE SM, SB & M-5 (M-2) MEDIAN)



HALF SECTION FOR FLEXIBLE PAVEMENT

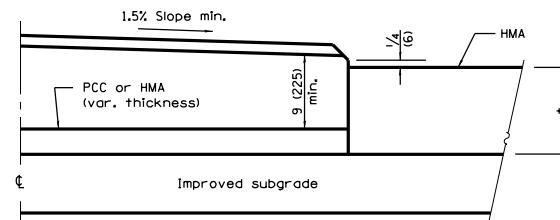
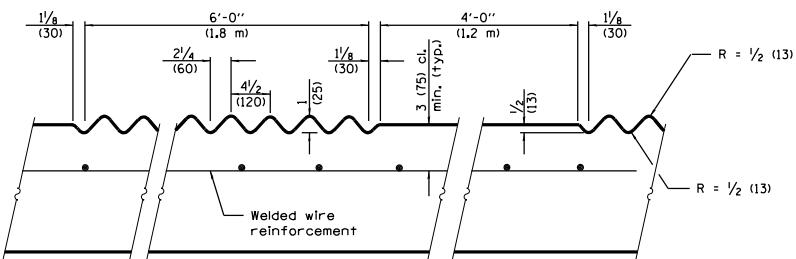
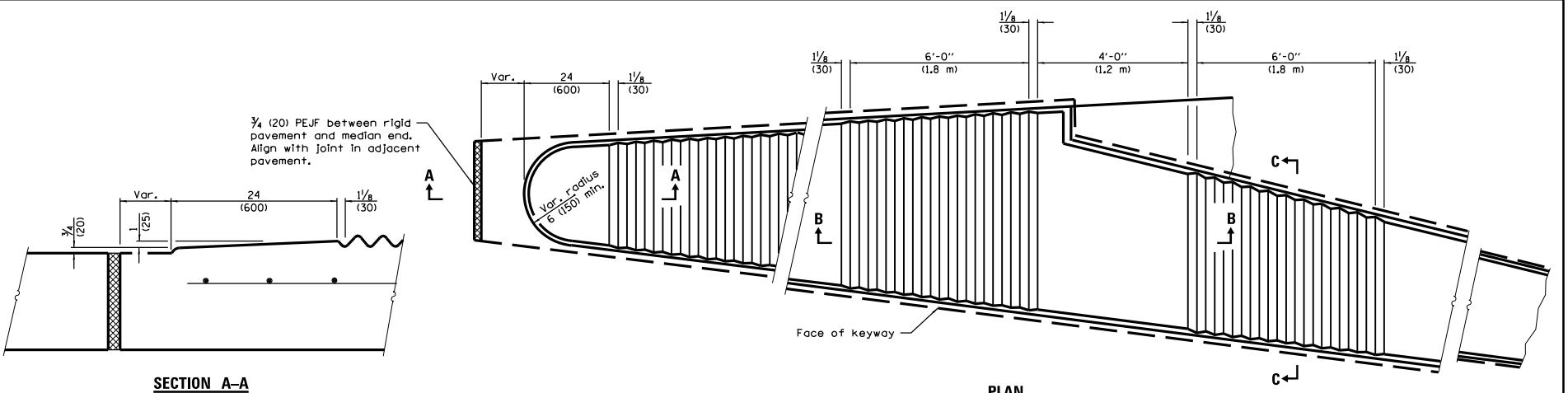
Illinois Department of Transportation
PASSED January 1, 2009
<i>[Signature]</i>
ENGINEER OF POLICY AND PROCEDURES
APPROVED January 1, 2009
<i>[Signature]</i>
ENGINEER OF DESIGN AND ENVIRONMENT

1-1-1-97

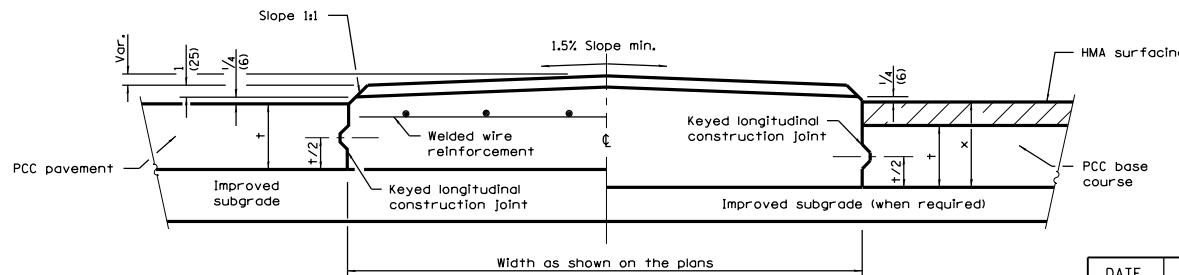
PC CONCRETE ISLANDS AND MEDIAN

(Sheet 2 of 2)

STANDARD 606301-04



SECTION C-C



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 42001 and 420701 for details not shown.

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

Illinois Department of Transportation
PASSED April 1, 2016
Michael Brand
ENGINEER OF POLICY AND PROCEDURES
APPROVED April 1, 2016
John J. Goss
ENGINEER OF DESIGN AND ENVIRONMENT

**HALF SECTION FOR
PCC PAVEMENT**

SECTION C-C

**HALF SECTION FOR
PCC BASE COURSE**

DATE	REVISIONS	CORRUGATED PC CONCRETE MEDIANS
4-1-16	Changed terminology to 'welded wire reinforcement'.	
1-1-09	Switched units to English (metric).	

STANDARD 606306-04

Top of anchor wall shall conform to the slope of the earth.

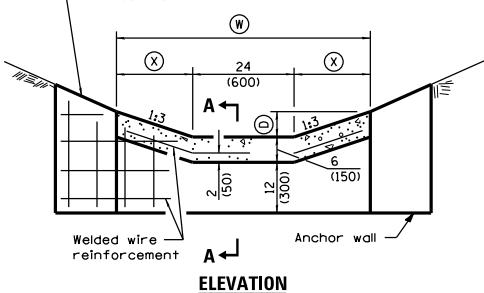


TABLE FOR PAVED DITCH TYPE A

TYPE	(D)	(W)	(X)	Flow Area sq. ft. (m ²)	Conc. Area sq. yd. (m ²)
A-15	6 (150)	5'-0" (450)	18 (450)	1.75 (0.175)	0.278 (0.225)
A-22	9 (225)	6'-6" (675)	27 (675)	3.19 (0.287)	0.361 (0.293)
A-30	12 (300)	8'-0" (900)	36 (900)	5.00 (0.450)	0.444 (0.360)
A-37	15 (375)	9'-6" (1,120)	3'-9" (900)	7.19 (0.645)	0.528 (0.426)
A-45	18 (450)	11'-0" (1,350)	4'-6" (1,120)	9.75 (0.877)	0.611 (0.495)
A-52	21 (525)	12'-6" (1,350)	5'-3" (1,140)	12.69 (1.144)	0.694 (0.564)
A-60	24 (600)	14'-0" (1,440)	6'-0" (1,440)	16.00 (1,440)	0.778 (0.630)

Top of anchor wall shall conform to the slope of the earth.

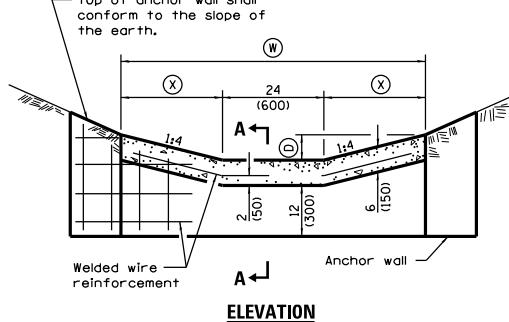
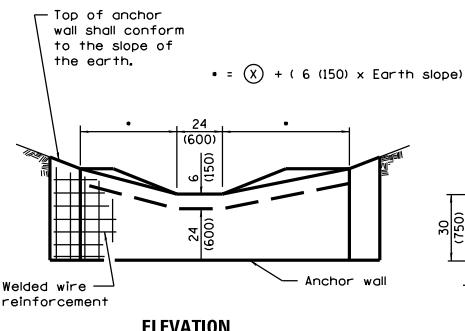


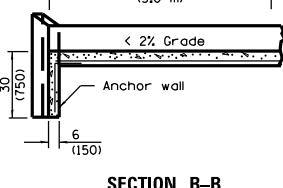
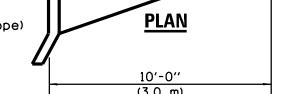
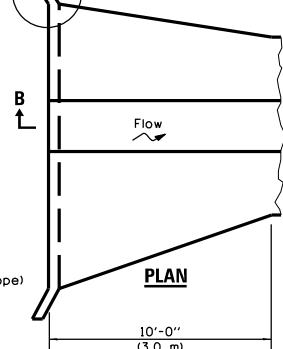
TABLE FOR PAVED DITCH TYPE B

TYPE	(D)	(W)	(X)	Flow Area sq. ft. (m ²)	Conc. Area sq. yd. (m ²)
B-15	6 (150)	6'-0" (1,800)	24 (600)	2.00 (0.180)	0.333 (0.270)
B-22	9 (225)	8'-0" (2,400)	36 (900)	3.75 (0.337)	0.444 (0.360)
B-30	12 (300)	10'-0" (3,000)	48 (1,200)	6.00 (0.540)	0.555 (0.450)
B-37	15 (375)	12'-0" (3,600)	5'-0" (1,500)	8.75 (0.787)	0.667 (0.540)
B-45	18 (450)	14'-0" (4,200)	6'-0" (1,800)	12.00 (1,080)	0.778 (0.630)
B-52	21 (525)	16'-0" (4,800)	7'-0" (2,100)	15.75 (1,417)	0.889 (0.720)
B-60	24 (600)	18'-0" (5,400)	8'-0" (2,400)	20.00 (1,800)	1.000 (0.810)

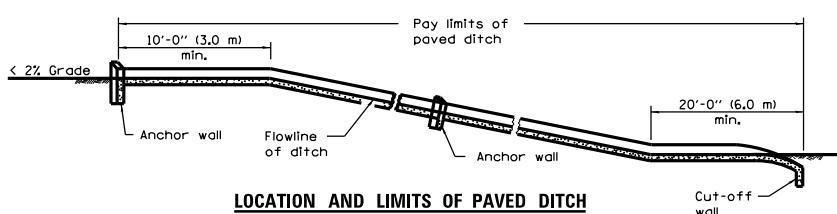
PAVED DITCH TYPE A



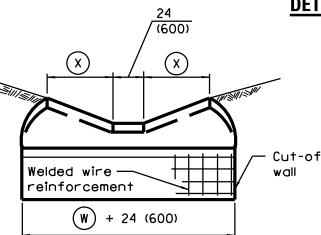
See DETAIL A



DETAIL OF UPSTREAM END



DETAIL OF DOWNSTREAM END



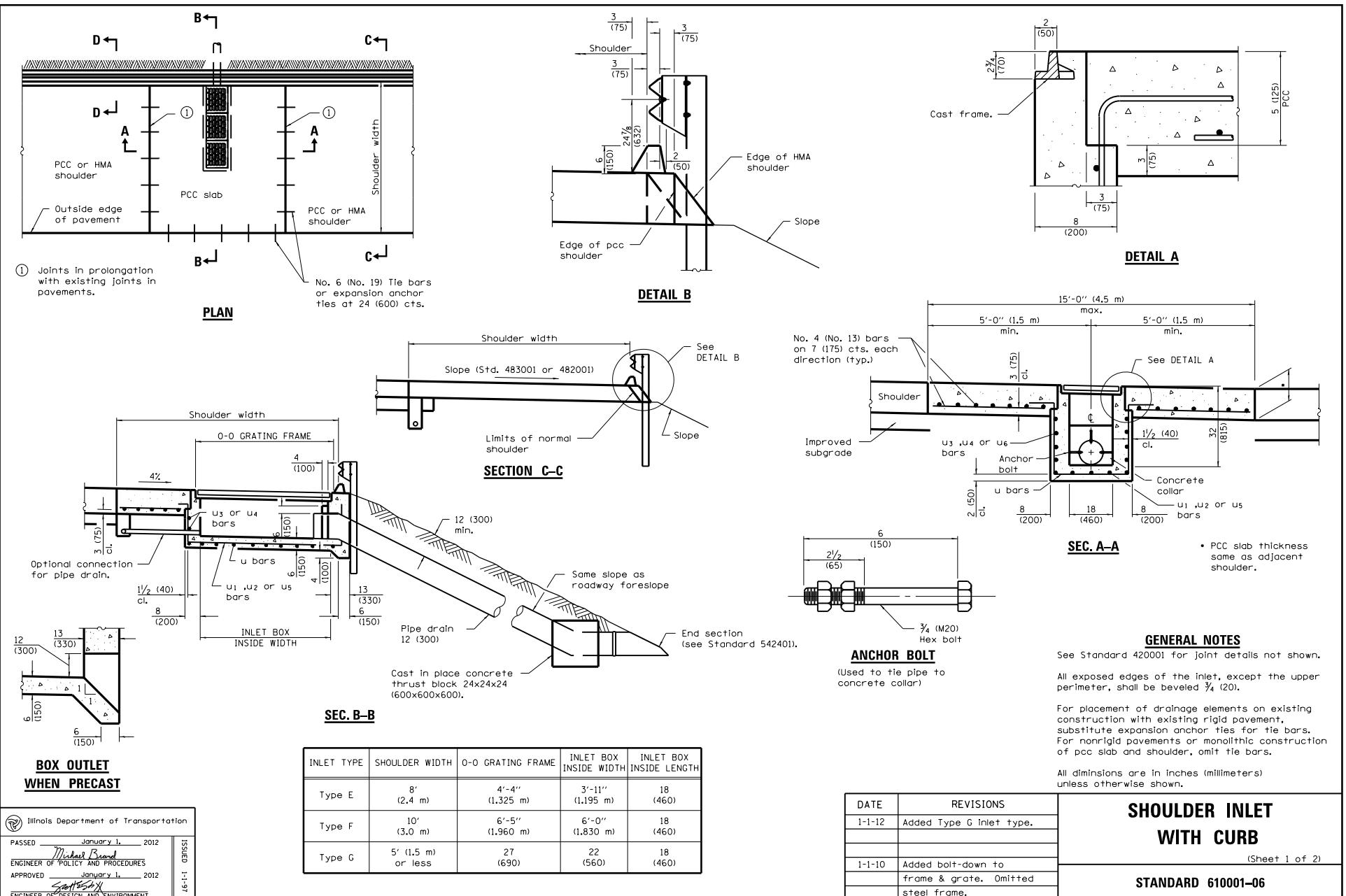
ELEVATION

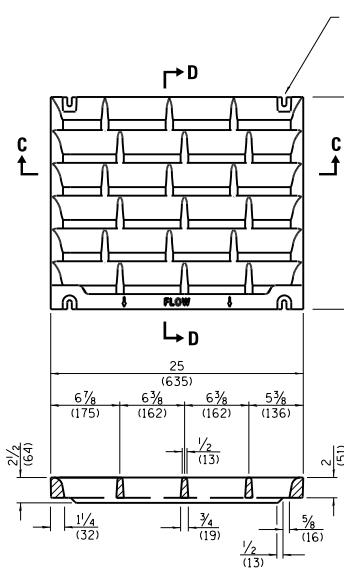
GENERAL NOTES

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

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

DATE	REVISIONS	PAVED DITCH
4-1-16	Changed terminology to 'welded wire reinforcement'.	
1-1-09	Switched units to English (metric).	
		STANDARD 606401-02

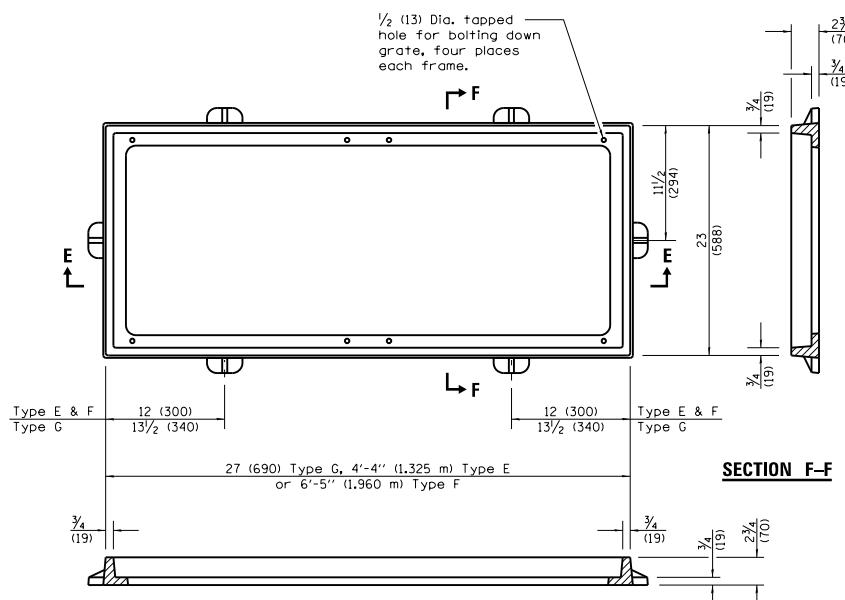




SECTION C-C

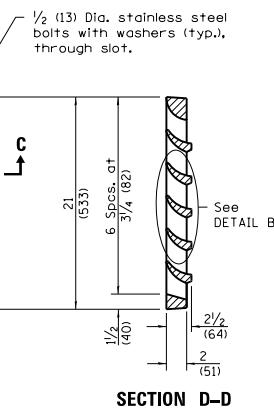
DETAIL OF CAST GRATE

Type G requires 1 grate
Type E requires 2 grates
Type F requires 3 grates

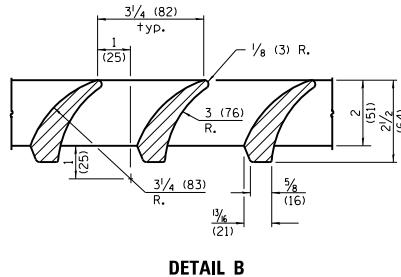


SECTION E-E

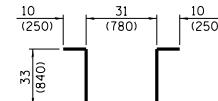
DETAIL OF CAST FRAME
(Type E shown)



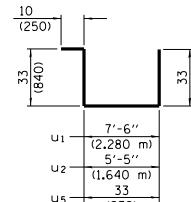
SECTION D-D



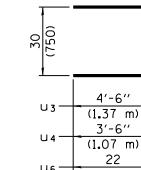
DETAIL B



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. (m³)	1.7 (1.3)
Reinf. bars		lbs. (kg)	126 (57.2)
Grating		sq. ft. (m²)	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. (m³)	1.3 (1.0)
Reinf. bars		lbs. (kg)	101 (45.8)
Grating		sq. ft. (m²)	7.3 (0.68)

TYPE G

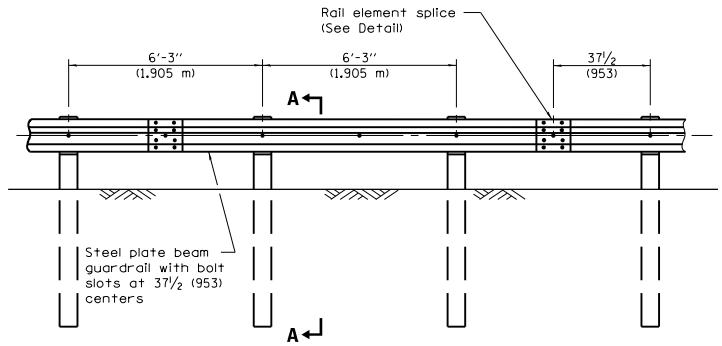
Bar	Qty.	Size	Length
u	4	No. 4 (No.13)	9'-9" (2.69 m)
u5	3	No. 4 (No.13)	9'-1" (2.78 m)
u6	4	No. 4 (No.13)	6'-2" (1.87 m)
Concrete		cu. yds. (m³)	0.5 (0.4)
Reinf. bars		lbs. (kg)	55 (25.0)
Grating		sq. ft. (m²)	3.6 (0.34)

	Illinois Department of Transportation
PASSED	January 1, 2010
Michael Brand	Engineer of POLICY AND PROCEDURES
APPROVED	January 1, 2010
Santosh S. Sankar	Engineer of DESIGN AND ENVIRONMENT
1-1-6	Q315

**SHOULDER INLET
WITH CURB**

(Sheet 2 of 2)

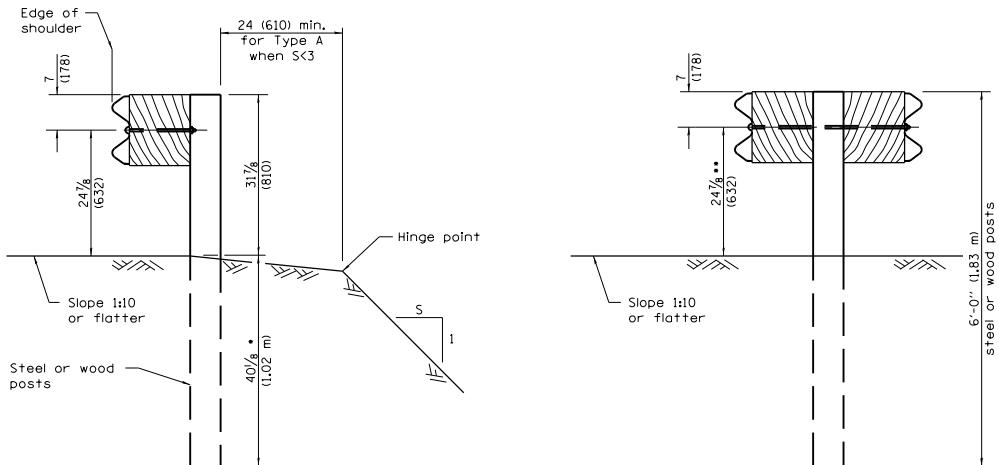
STANDARD 610001-06



ELEVATION

TYPE A

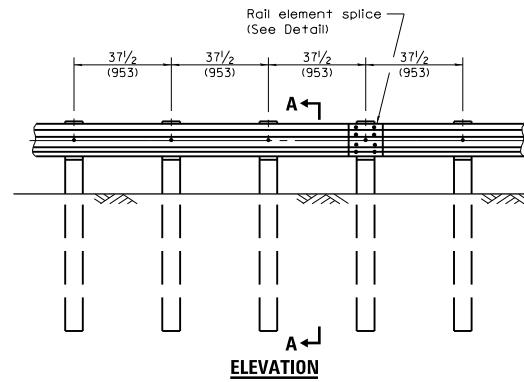
6'-3" (1.905 m) Typical post spacing



SECTION A-A

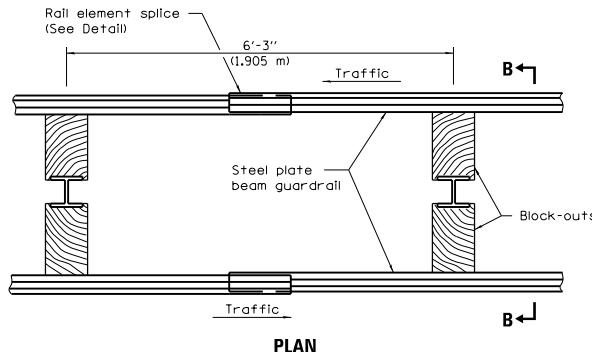
- When "S" is less than 3 and the distance from the back of post is less than 24 (610), the post shall be steel and the embedment shall be 76 5/8" (1934).

Illinois Department of Transportation
PASSED January 1, 2012
Michael Brand
ENGINEER OF POLICY AND PROCEDURES
APPROVED January 1, 2012
Santosh Singh
ENGINEER OF DESIGN AND ENVIRONMENT



TYPE B

37 1/2 (953) Closed post spacing



PLAN

TYPE D

Double steel plate beam guardrail
6'-3" (1.905 m) typical post spacing

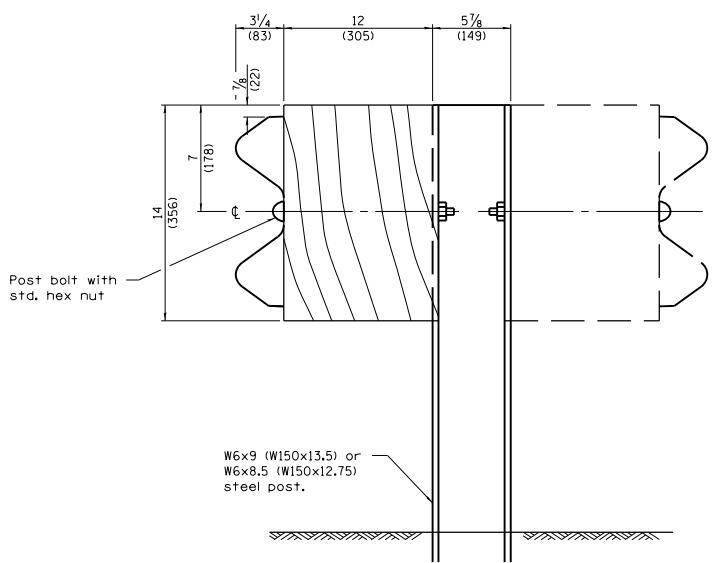
GENERAL NOTES

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

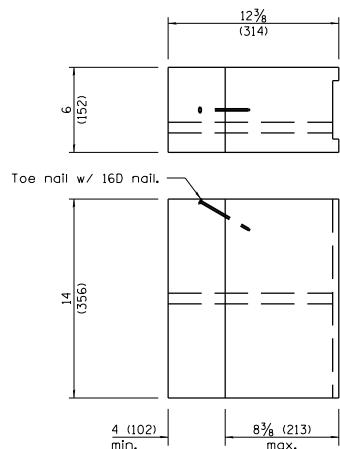
All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS	STEEL PLATE BEAM GUARDRAIL (Sheet 1 of 4)
1-1-12	Added req. for 9 ft. posts	
	to be steel. Modified set	
	back of g'rail behind curb.	
1-1-11	Added note to Section B-B	
	for conn. to impact att.	
	Revised table on Sheet 4.	

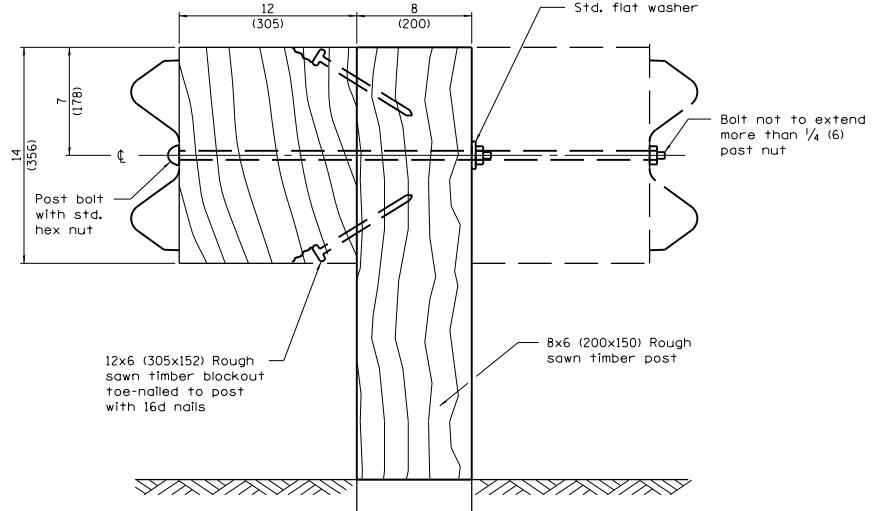
STANDARD 630001-10



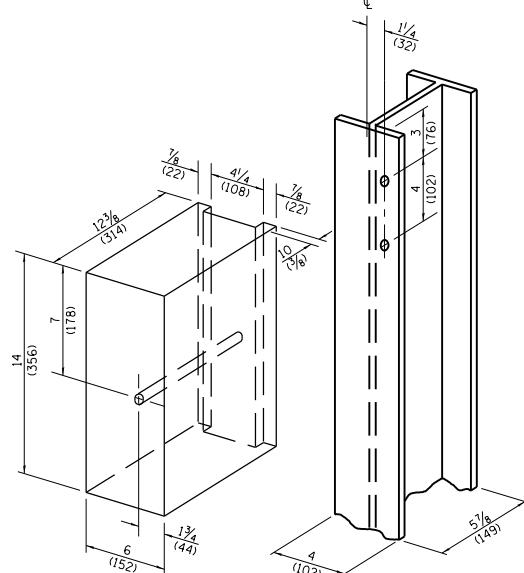
STEEL POST CONSTRUCTION



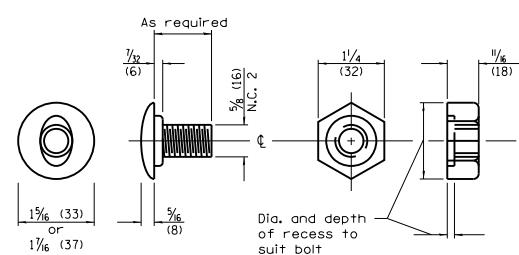
TWO-PIECE WOOD BLOCKOUT OPTION



WOOD POST CONSTRUCTION



WOOD BLOCK-OUT AND STEEL POST DETAILS



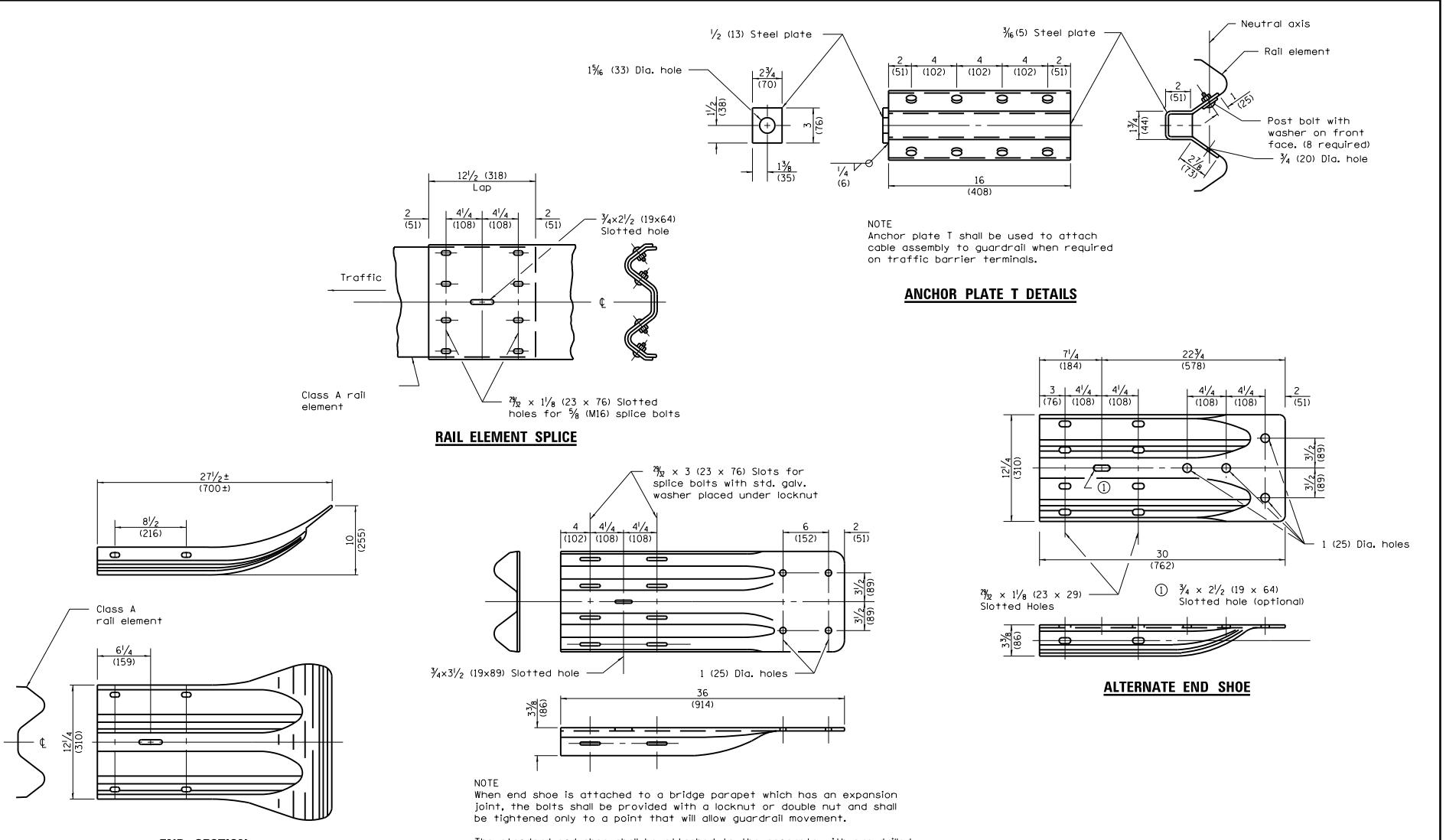
POST OR SPLICE BOLT & NUT

STEEL PLATE BEAM GUARDRAIL

(Sheet 2 of 4)

STANDARD 630001-10

	Illinois Department of Transportation
PASSED	January 1, 2012
Michael Brand	Issued
ENGINEER OF POLICY AND PROCEDURES	1-1-12
APPROVED	January 1, 2012
Santosh Singh	1-1-12
ENGINEER OF DESIGN AND ENVIRONMENT	1-1-12



	Illinois Department of Transportation
PASSED	January 1, 2012
Michael Brand	1-1-17
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2012
Santosh S. Sankar	
ENGINEER OF DESIGN AND ENVIRONMENT	

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.

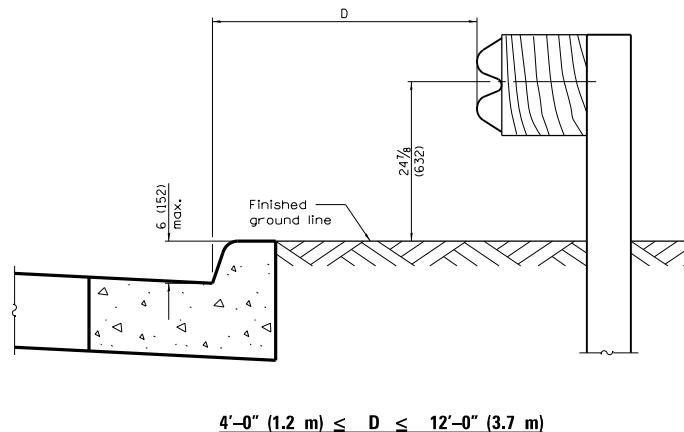
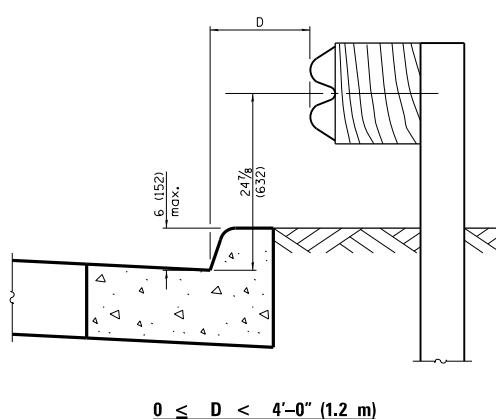
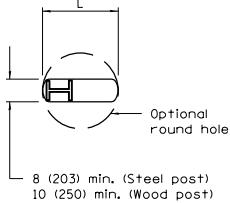
Externally threaded studs protruding from the surface of the concrete will not be permitted.

END SHOE

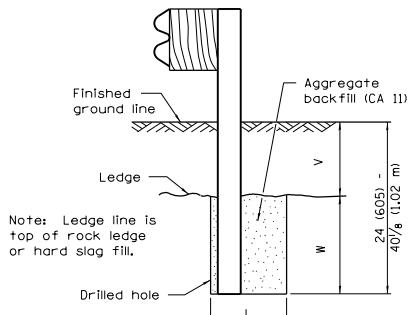
STEEL PLATE BEAM GUARDRAIL

(Sheet 3 of 4)

STANDARD 630001-10



PLAN



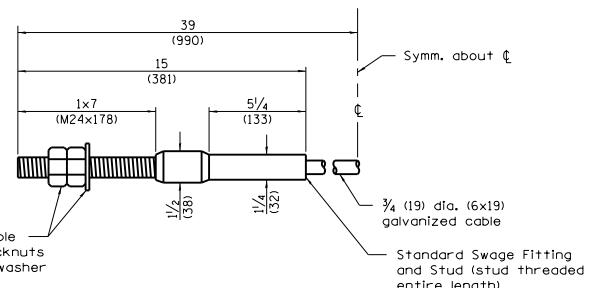
ELEVATION

FOOTING FOR POST WHEN IMPERVIOUS MATERIAL IS ENCOUNTERED

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 1/8 (> 787 - 1,02 m)	12 - 0 (305 - 0)	8 (203)	10 (250)

GUARDRAIL PLACED BEHIND CURB

Note: 'D' shall not exceed 6 (152) for design speeds greater than 45 mph.



CABLE ASSEMBLY

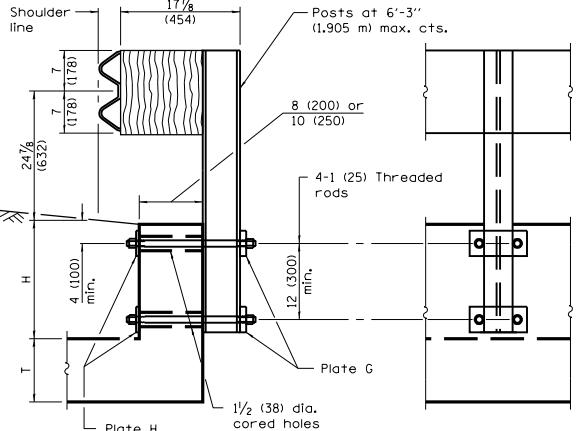
(40,000 lbs. (18,100 kg) min. breaking strength)
Tighten to taut tension.

STEEL PLATE BEAM GUARDRAIL

(Sheet 4 of 4)

STANDARD 630001-10

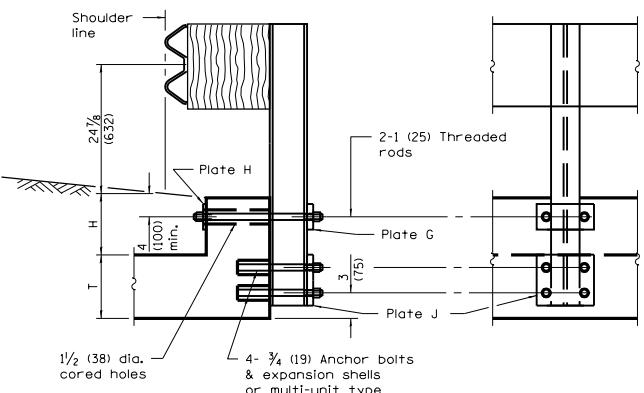
	Illinois Department of Transportation
PASSED	January 1, 2012
Michael Brand	1-1-17
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2012
Santosh Singh	
ENGINEER OF DESIGN AND ENVIRONMENT	



CROSS SECTION

ELEVATION

CONDITION H > 18 (450)

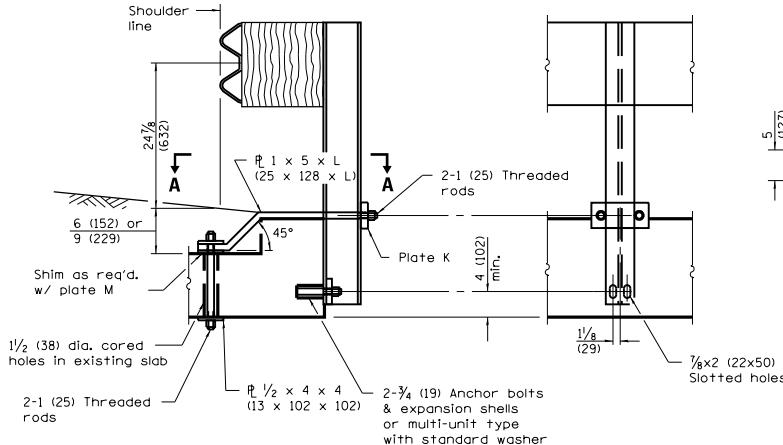


CROSS SECTION

ELEVATION

CONDITION H < 18 (450) & H + T ≥ 20 (510)

**CASE I
MOUNTED ON
RAISED HEADWALL**



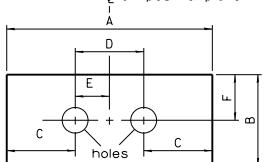
CROSS SECTION

ELEVATION

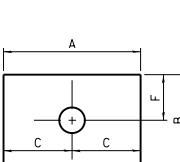
**CASE II
MOUNTED ON TOP HEADWALL
WITH SQUARE TIP**

PLATE DIMENSIONS							
Type	A	B	C	D	E	F	Hole Dia.
G	9 (230)	4 (100)	1 1/2 (40)	6 (150)	3 (75)	2 (50)	1 1/8 (29) 1 (25)
H	9 (230)	4 (100)	1 1/2 (40)	6 (150)	3 (75)	2 (50)	1 1/8 (29) 1 1/2 (33)
J	9 (230)	5 (127)	1 1/2 (40)	6 (150)	3 (75)	1 1/4 (32)	7/8 (22) 1 (25)
K	9 (230)	4 (100)	1 1/2 (40)	6 (150)	3 (75)	2 (50)	1 1/8 (29) 1 1/4 (32)
M	4 (100)	4 (100)	2 (50)	N/A	N/A	2 (50)	1 1/4 (32) 1/2 (13)

$\frac{C}{A}$ of post & plate



$\frac{C}{A}$ of post & plate



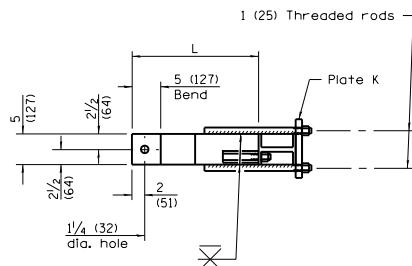
	Illinois Department of Transportation
PASSED	January 1, 2011
Michael Brand	Inspected
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2011
Stefan S. [Signature]	
ENGINEER OF DESIGN AND ENVIRONMENT	

PLATES G, H & K

PLATE M

DATE	REVISIONS
1-1-11	Revised weld detail for Case IV.
1-1-09	Switched units to English (metric). Added fillet weld to Case IV.

**GUARDRAIL MOUNTED
ON EXISTING CULVERTS**
(Sheet 1 of 2)
STANDARD 630101-09



SECTION A-A

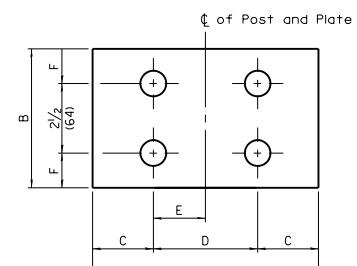


PLATE J

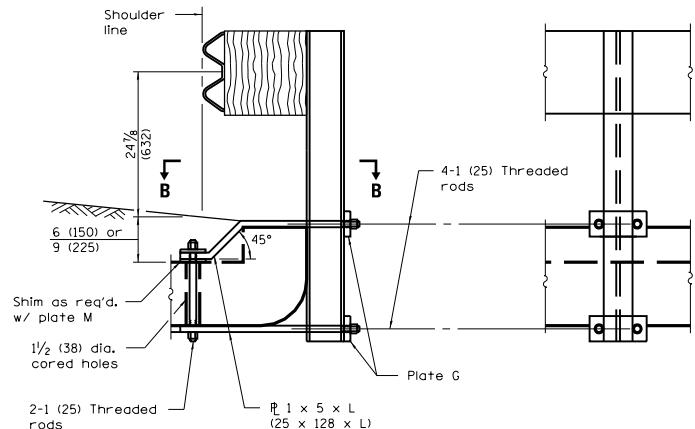
GENERAL NOTES

Except as noted, dimensions and notes specified for cases II, III, and IV are the same as specified for case I.

For details of guardrail elements not shown, see Standard 630001.

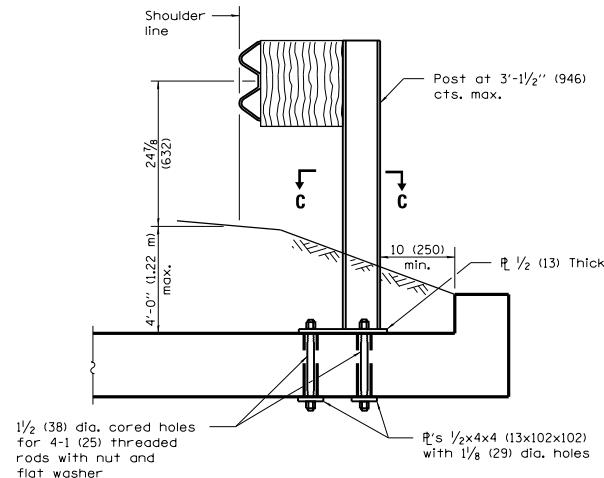
All threaded rods shall be installed with heavy hex nuts and standard washers.

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

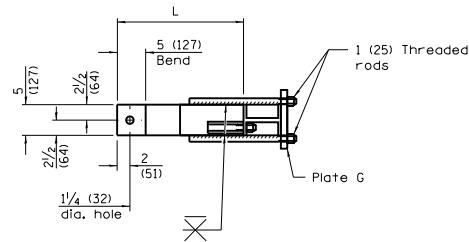


CROSS SECTION

ELEVATION

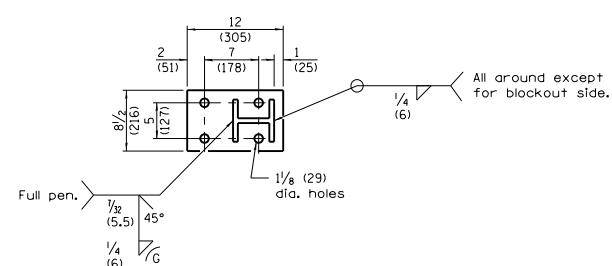


CROSS SECTION



SECTION B-B

CASE III
MOUNTED ON HEADWALL
WITH CURVED OR DEMOLISHED TIP



SECTION C-C

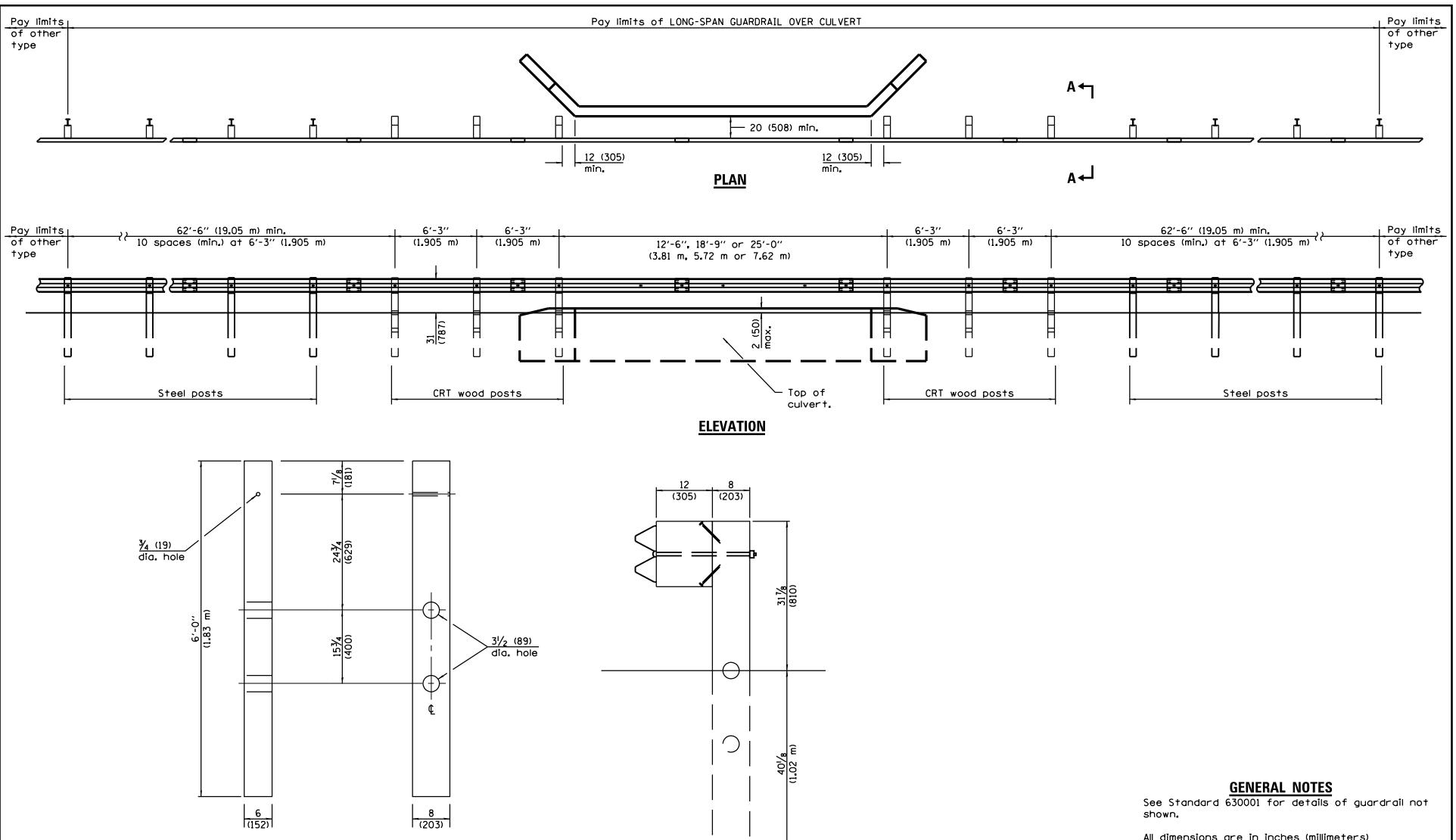
CASE IV
MOUNTED ON SLAB

	Illinois Department of Transportation
PASSED	January 1, 2011
Michael Brand	1-1-57
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2011
Stefan S. K.	
ENGINEER OF DESIGN AND ENVIRONMENT	

**GUARDRAIL MOUNTED
ON EXISTING CULVERTS**

(Sheet 2 of 2)

STANDARD 630101-09



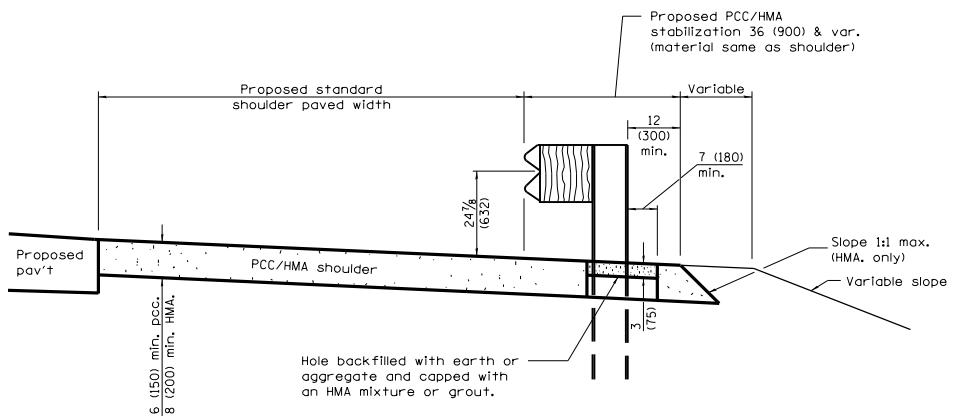
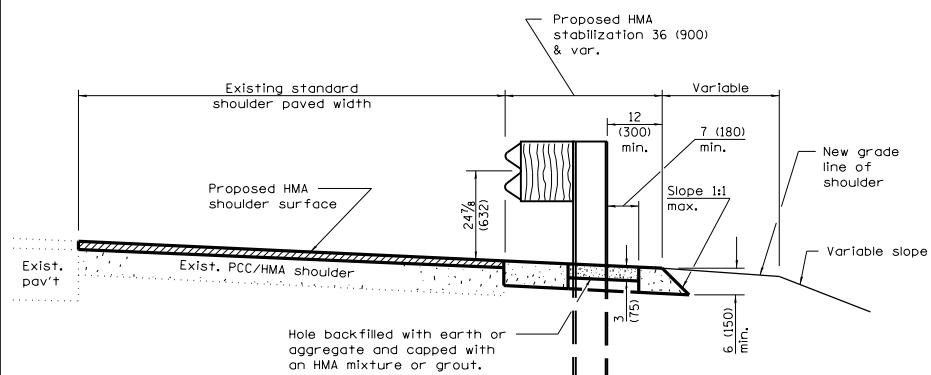
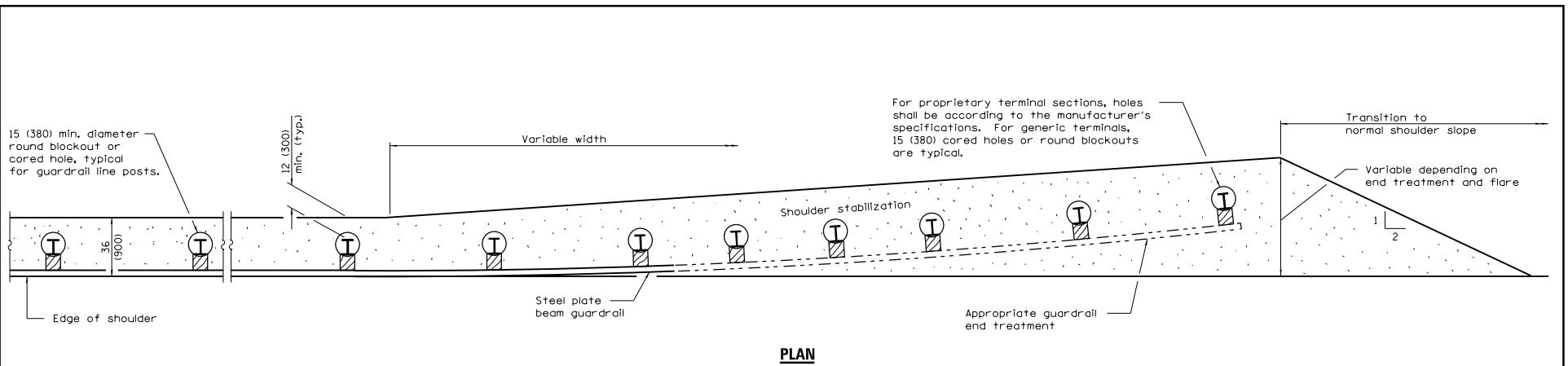
	Illinois Department of Transportation
PASSED	January 1, 2013
Michael Brand	
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2013
John Doe	
ENGINEER OF DESIGN AND ENVIRONMENT	

1-1-1 GMSI

CRT WOOD POST

DATE	REVISIONS	LONG-SPAN GUARDRAIL OVER CULVERT
1-1-13	Added min. dim. from guardrail to headwall. Added dim. to section A-A.	
1-1-11	New standard.	

STANDARD 630106-01



GENERAL NOTES

See Standard 482001, 482006, or 483001 for details not shown.

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

DATE	REVISIONS	PCC / HMA STABILIZATION AT STEEL PLATE BEAM GUARDRAIL
1-1-09	Switched units to English (metric).	
1-1-08	Removed reference to "bituminous mixture or grout".	

STANDARD 630201-06

	Illinois Department of Transportation
PASSED	January 1, 2009
<i>[Signature]</i>	ISSUED 1-1-09
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2009
<i>[Signature]</i>	EE-1-09
ENGINEER OF DESIGN AND ENVIRONMENT	



Edge of pavement

Edge of shoulder and guardrail extruder head

6:1 Taper

Slope 1:10
or flatter

4'-0"
(1.2 m)

10'-0"
(3.0 m)

50:1 Taper (pay limits)

37'-6" (11.4 m) min. length of need

Pay limits of
other type

A

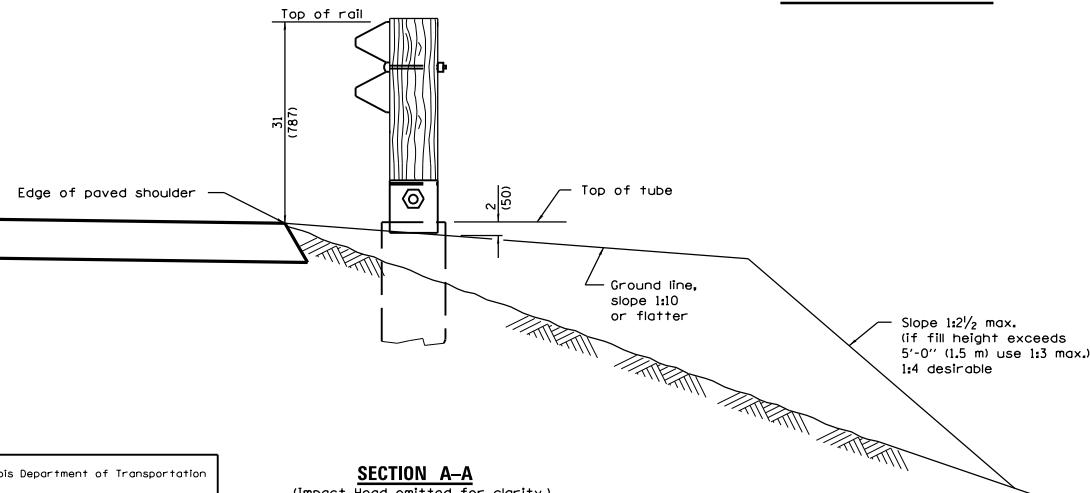
12'-6" (3.8 m)

25'-0"
(7.6 m)

Taper
Length of need point set by
manufacturer instructions

2'-0"
(60)
min.

SHOULDER WIDENING TRANSITION FOR TANGENT TERMINAL



	Illinois Department of Transportation
PASSED	January 1, 2013
Michael Brand	Engineer of Policy and Procedures
APPROVED	January 1, 2013
John Doe	Engineer of Design and Environment
00-1-1-00000	

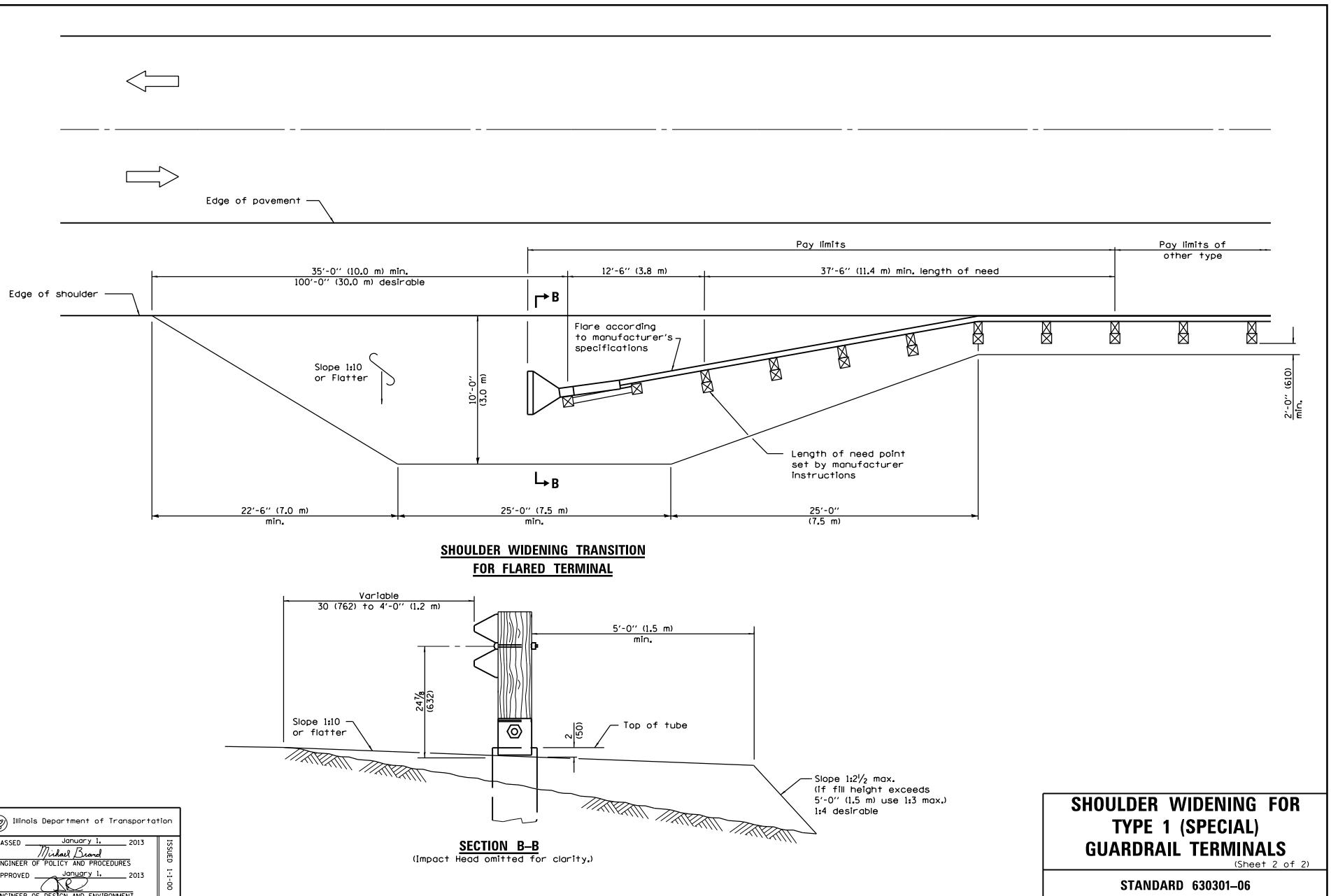
SECTION A-A
(Impact Head omitted for clarity.)

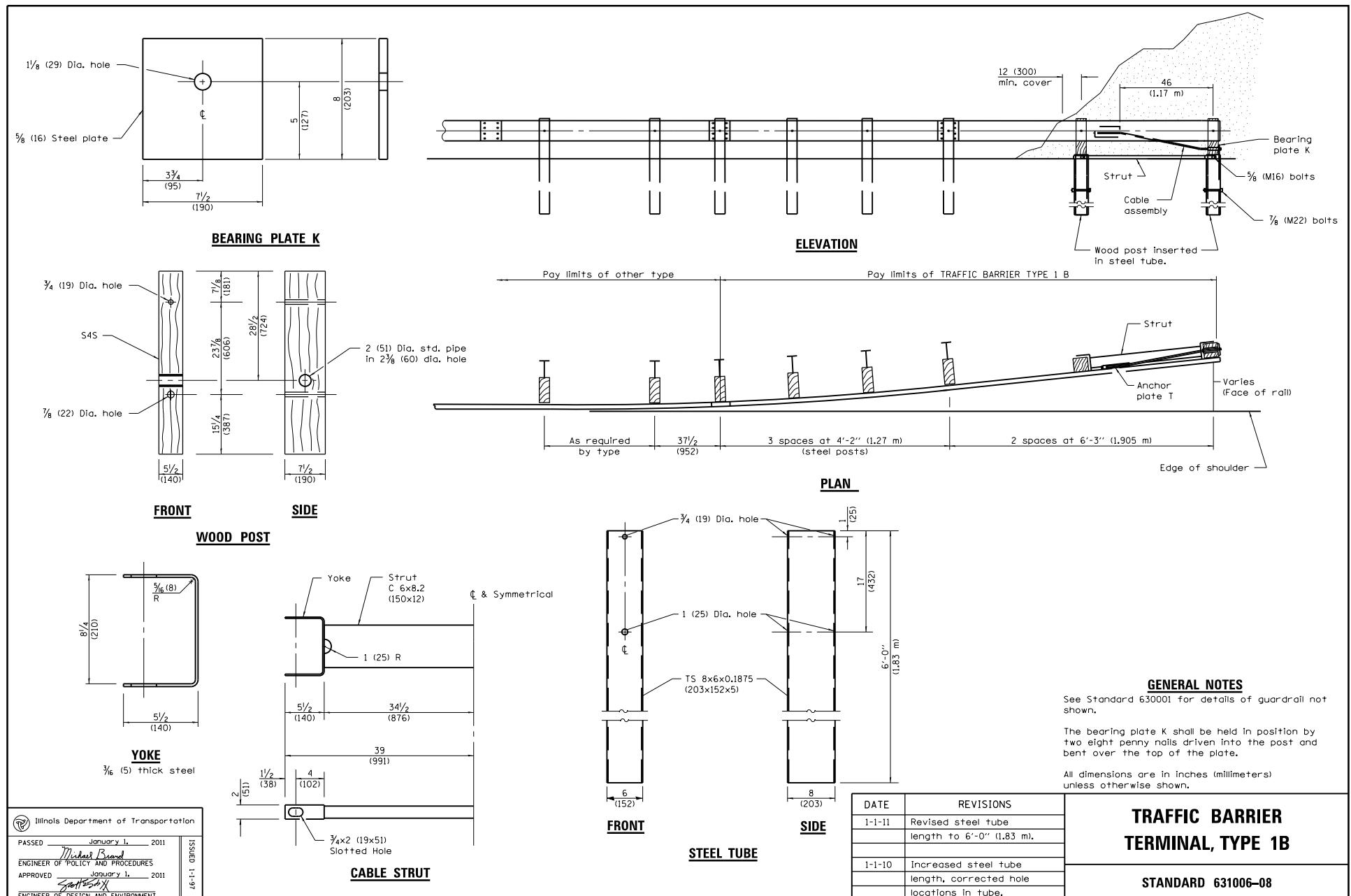
GENERAL NOTES
50:1 Taper required so the guardrail head will not encroach on the shoulder.

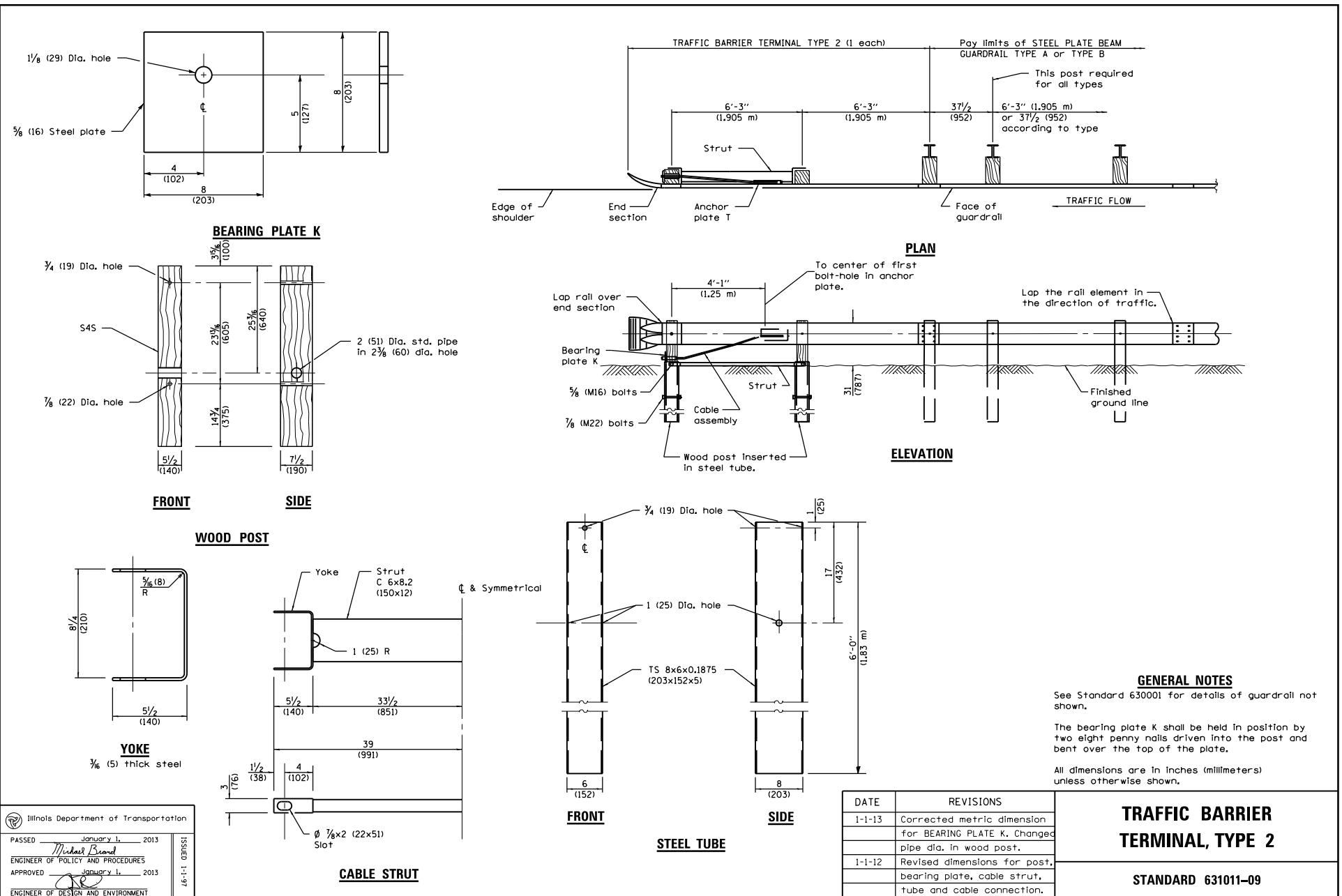
All slope ratios are expressed as units of vertical displacement to units of horizontal displacement (V:H).

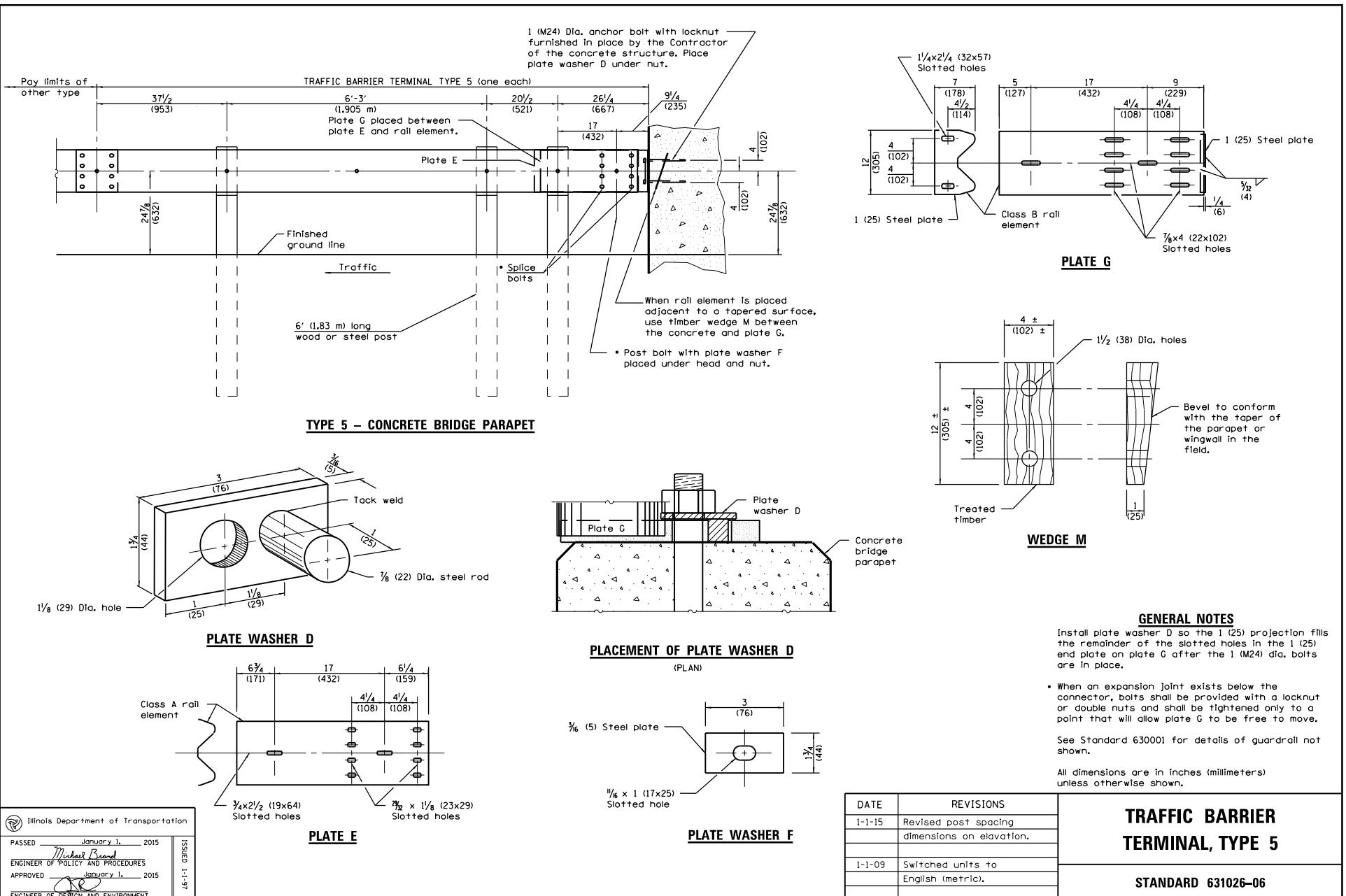
All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS	SHOULDER WIDENING FOR TYPE 1 (SPECIAL) GUARDRAIL TERMINALS (Sheet 1 of 2)
1-1-13	Modified dimensioning of terminal.	
1-1-09	Switched units to English (metric).	
		STANDARD 630301-06

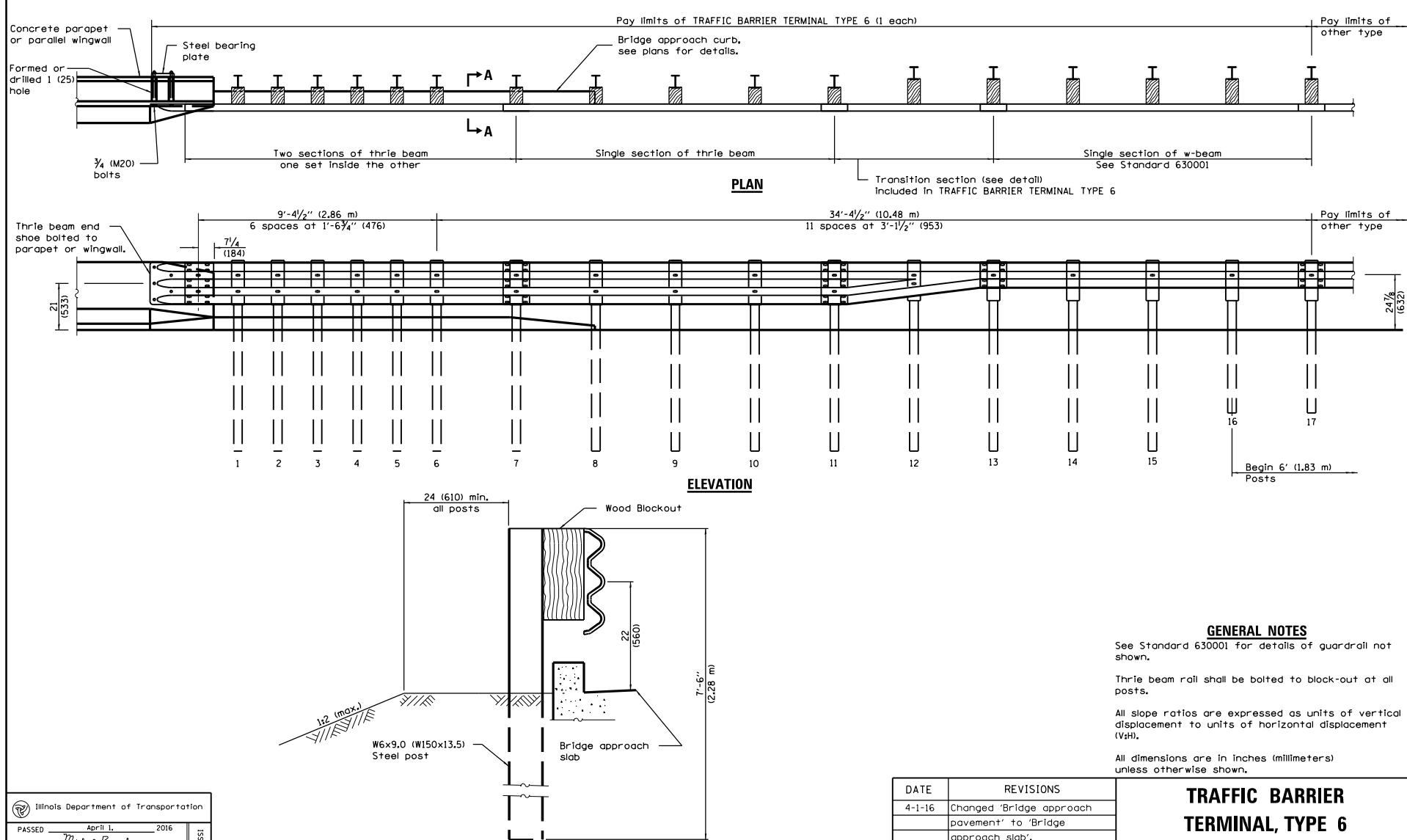








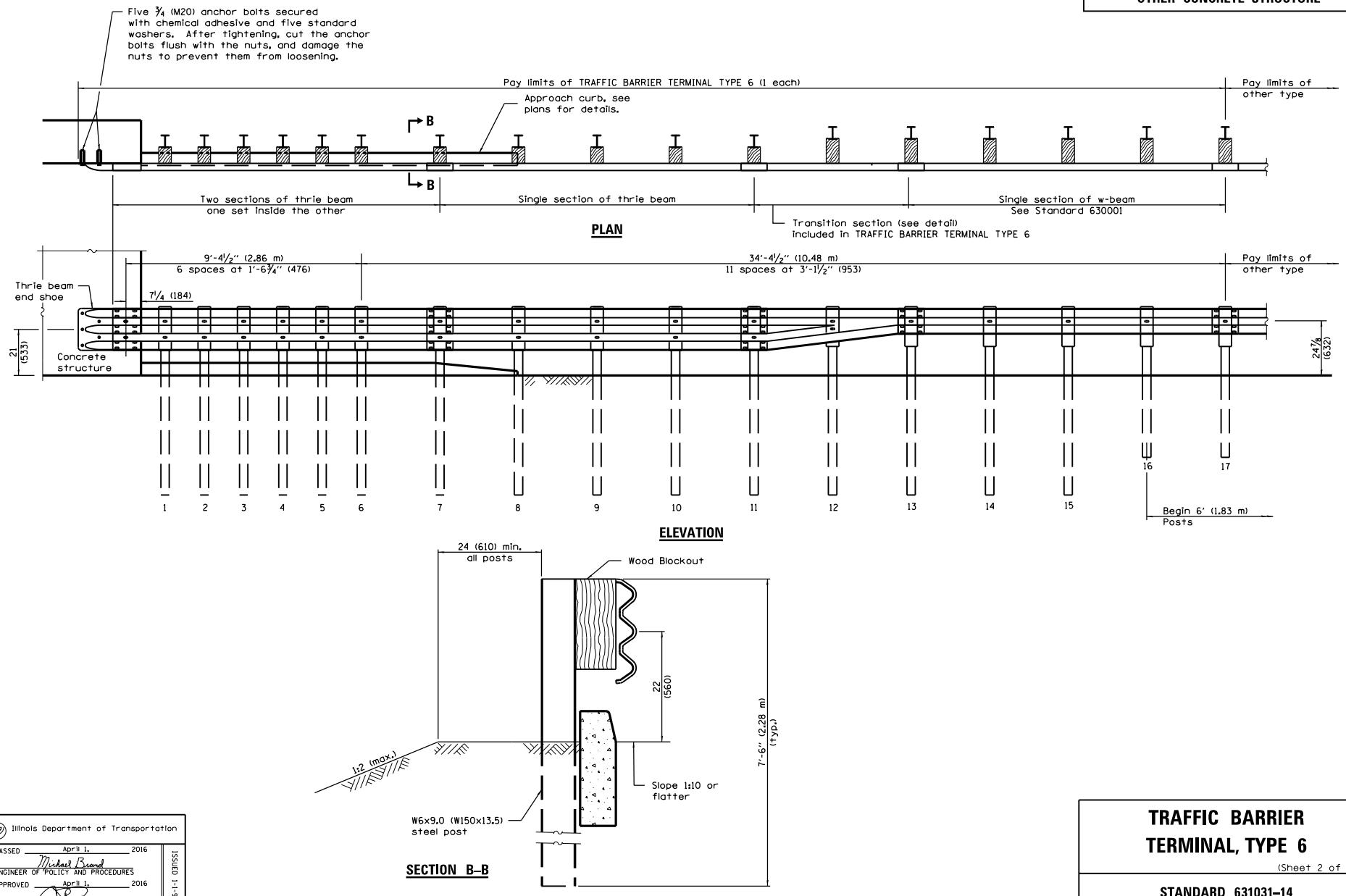
PARAPET OR WINGWALL

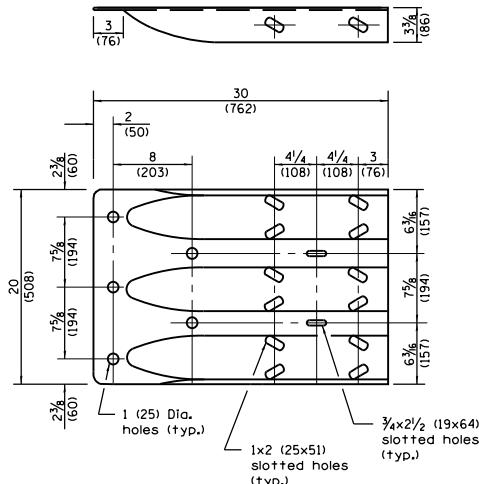


	Illinois Department of Transportation
PASSED	April 1, 2016
Michael Brand	ENGINEER OF POLICY AND PROCEDURES
APPROVED	April 1, 2016
John R. Goss	ENGINEER OF DESIGN AND ENVIRONMENT

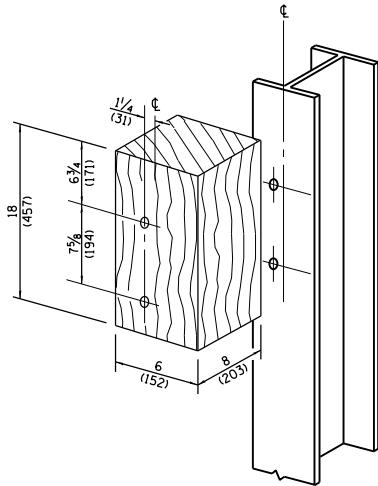
DATE	REVISIONS	TRAFFIC BARRIER TERMINAL, TYPE 6
4-1-16	Changed 'Bridge approach pavement' to 'Bridge approach slab'.	(Sheet 1 of 3)
1-1-15	Revised note for attachment to concrete structure.	
		STANDARD 631031-14

OTHER CONCRETE STRUCTURE

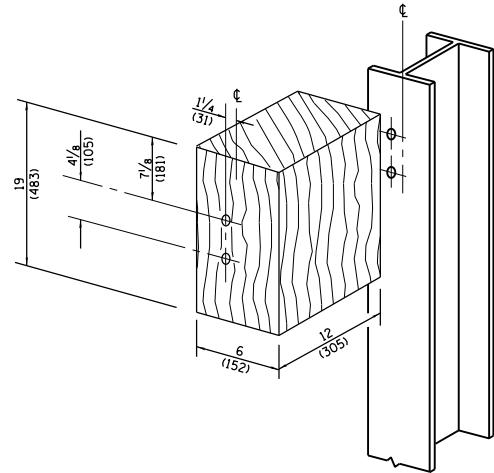




THRIE BEAM END SHOE DETAIL

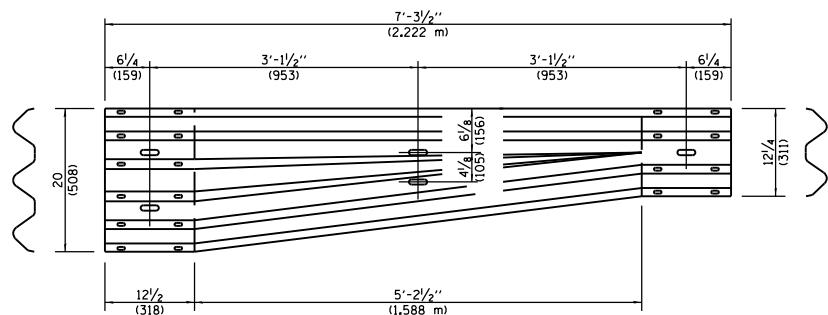


POSTS 1–11 WOOD BLOCKOUT DETAIL

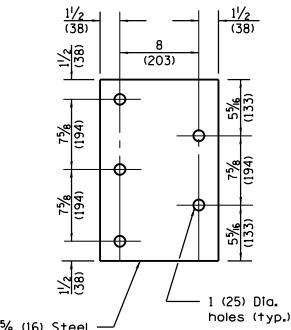


POST 12 WOOD BLOCKOUT DETAIL

(See Standard 630001 for post 13-17 blockouts.)



TRANSITION SECTION



PARAPET STEEL BEARING PLATE DETAIL

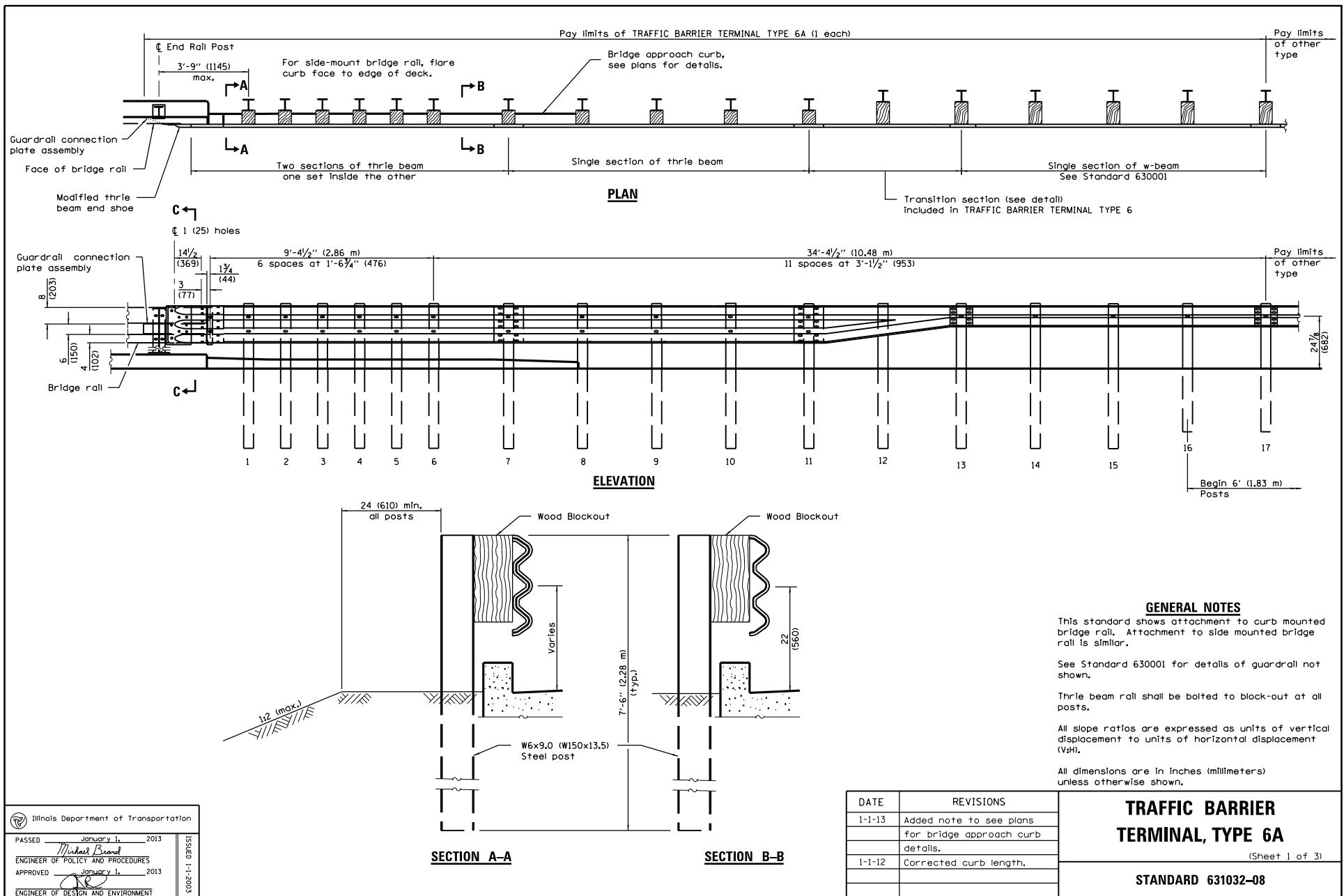
(5 each individual 5x5x $\frac{5}{8}$ (125x125x16) steel plates with centered 1 (25) holes may be substituted for the plate shown.)

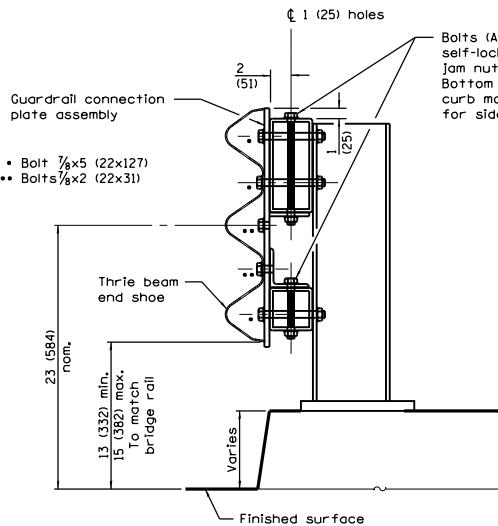
	Illinois Department of Transportation
PASSED	April 1, 2016
<i>Michael Brand</i>	
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	April 1, 2016
<i>[Signature]</i>	
ENGINEER OF DESIGN AND ENVIRONMENT	

TRAFFIC BARRIER TERMINAL TYPE 6

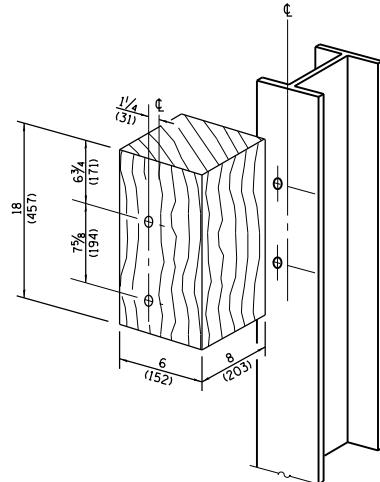
(Sheet 3 of 3)

STANDARD 631031-14



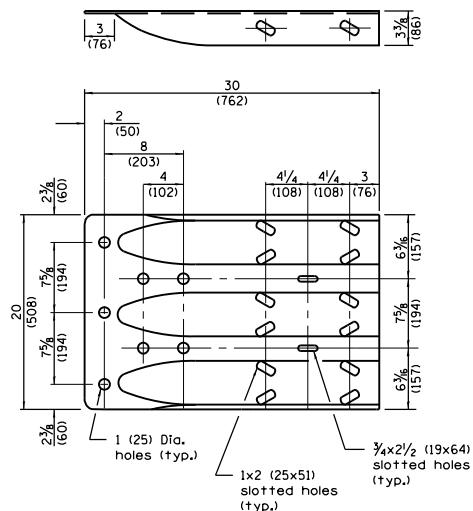
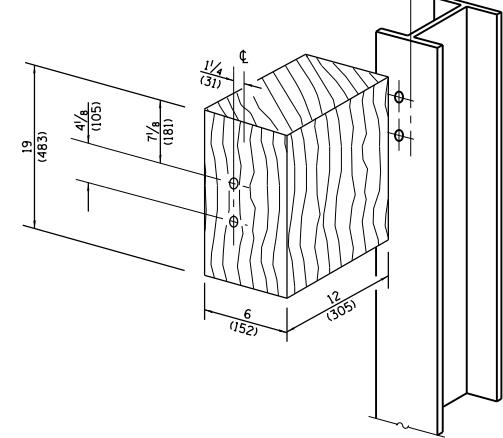


SECTION C-C

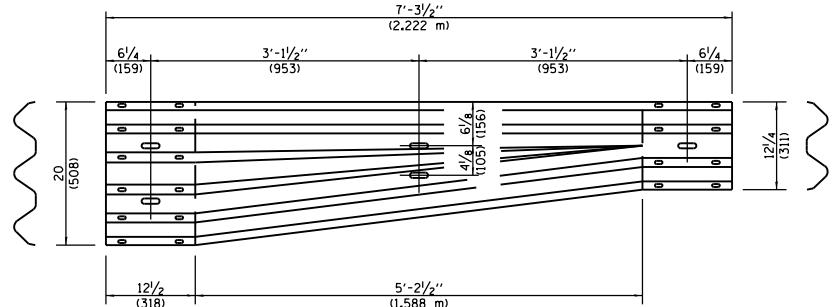


POSTS 1-11 WOOD BLOCKOUT DETAIL

POST 12 WOOD BLOCKOUT DETAIL
(See Standard 630001 for post 13-17 blockouts.)



MODIFIED THREE BEAM END SHOE DETAIL



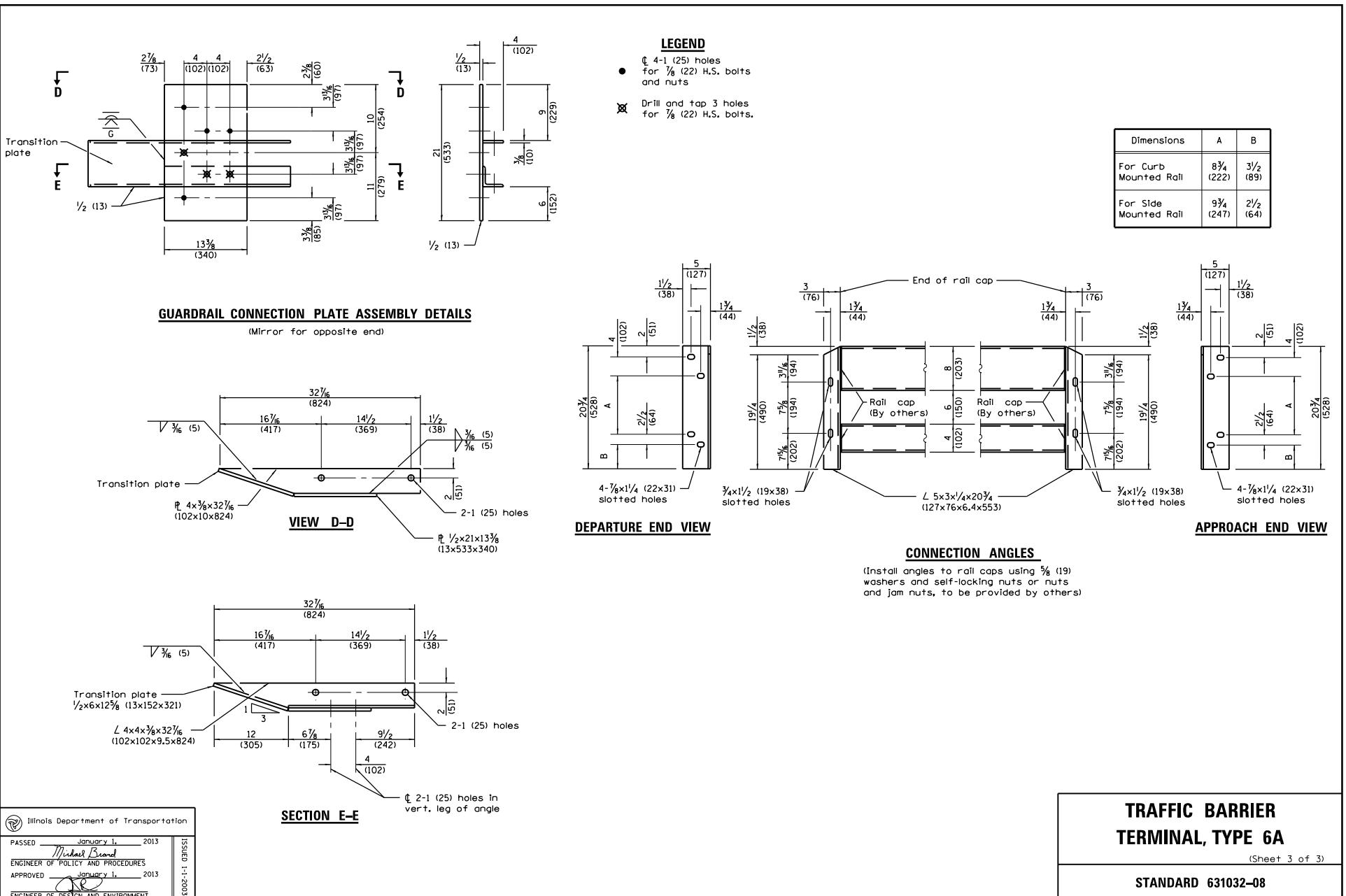
TRANSITION SECTION
(10 gauge (3,4) rail element)

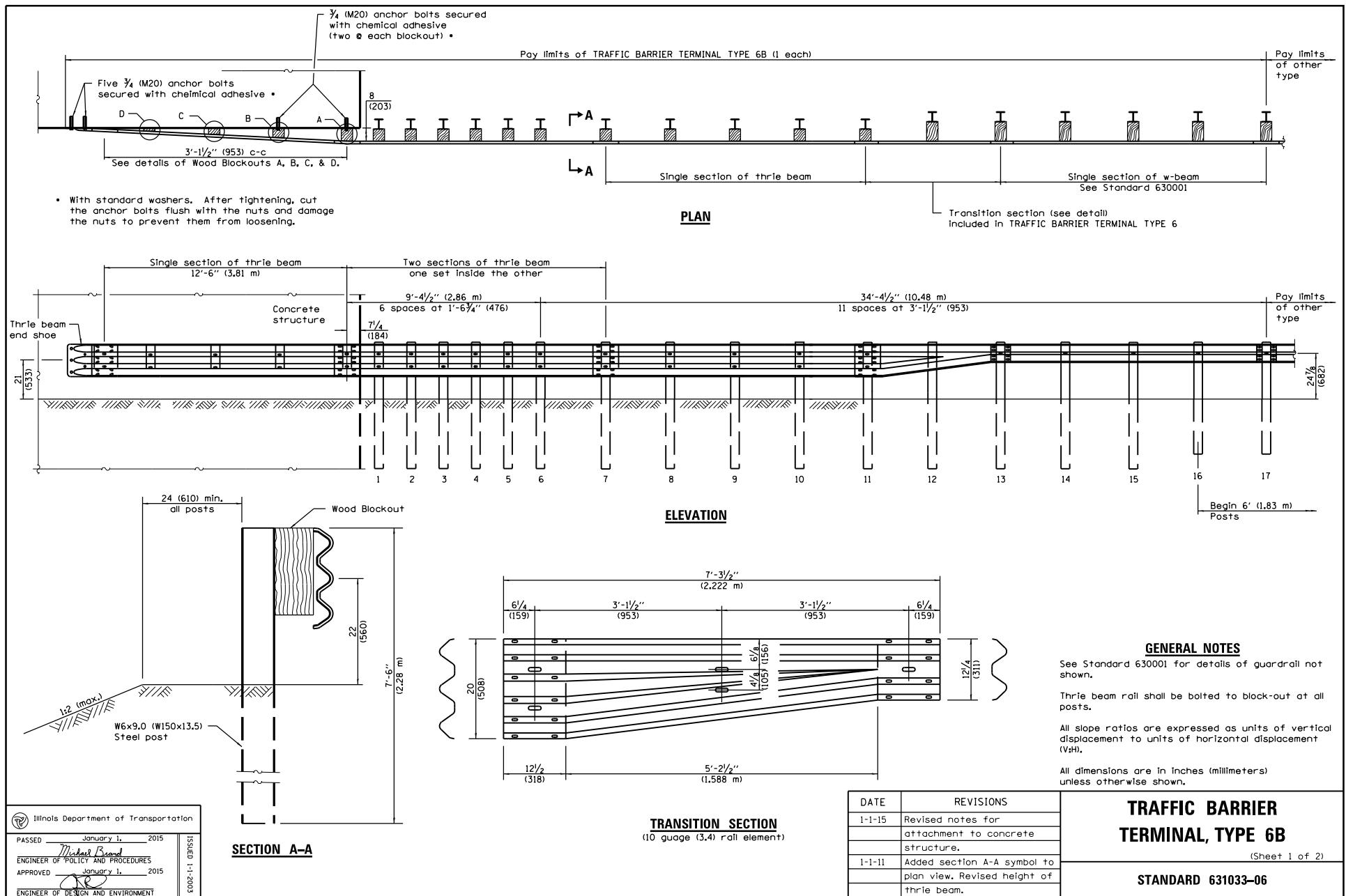
	Illinois Department of Transportation
PASSED	January 1, 2013
Michael Brand	EE02-1-1 CLASSI
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2013
ENGINEER OF DESIGN AND ENVIRONMENT	

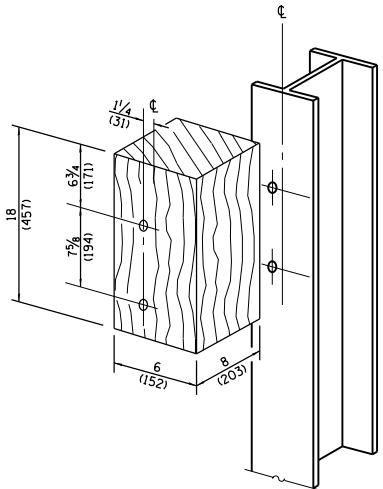
**TRAFFIC BARRIER
TERMINAL, TYPE 6A**

(Sheet 2 of 3)

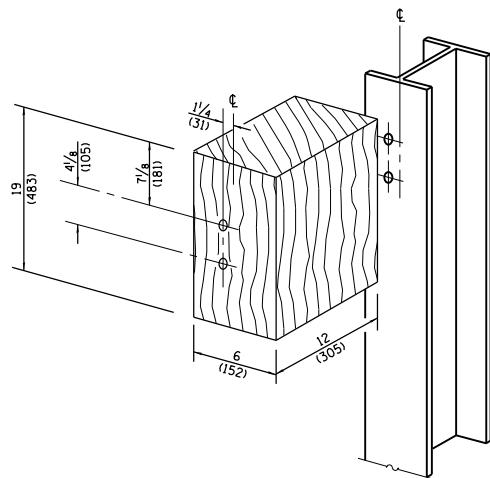
STANDARD 631032-08



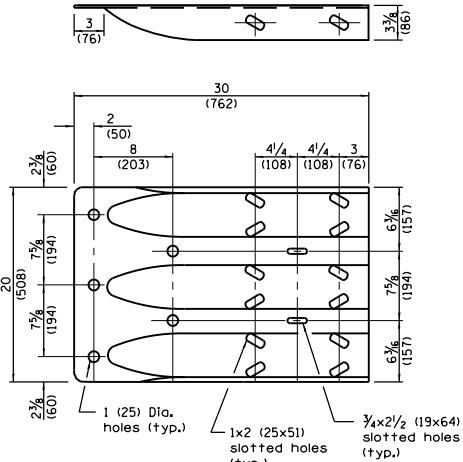




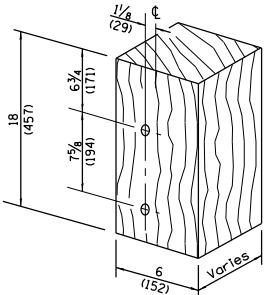
POSTS 1-11 WOOD BLOCKOUT DETAIL



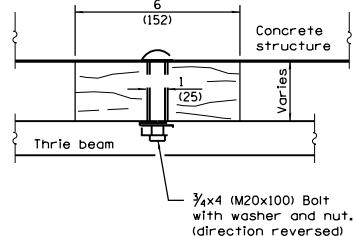
POST 12 WOOD BLOCKOUT DETAIL
(See Standard 630001 for post 13-17 blockouts.)



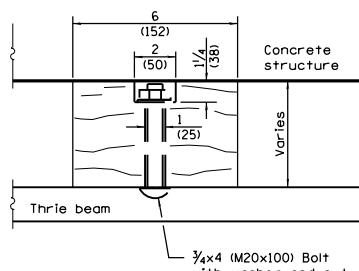
THRIE BEAM END SHOE DETAIL



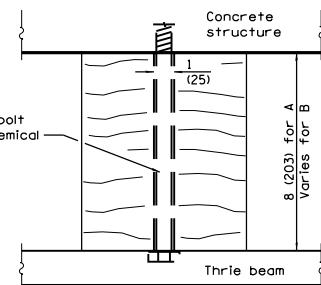
**MODIFIED THICKNESS DETAIL
WOOD BLOCKOUTS A, B, C, & D**



WOOD BLOCKOUT D



WOOD BLOCKOUT C



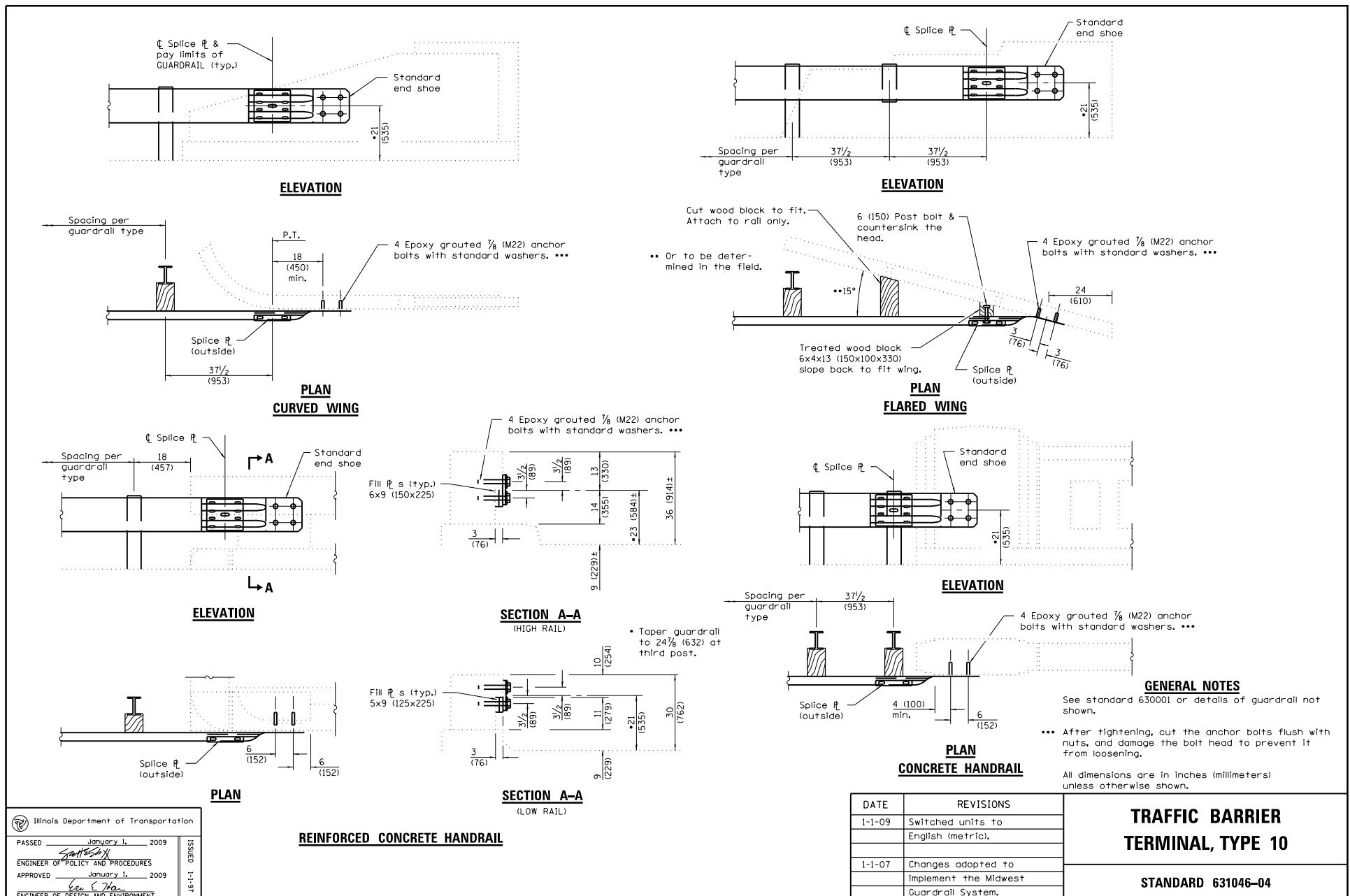
WOOD BLOCKOUT A & B

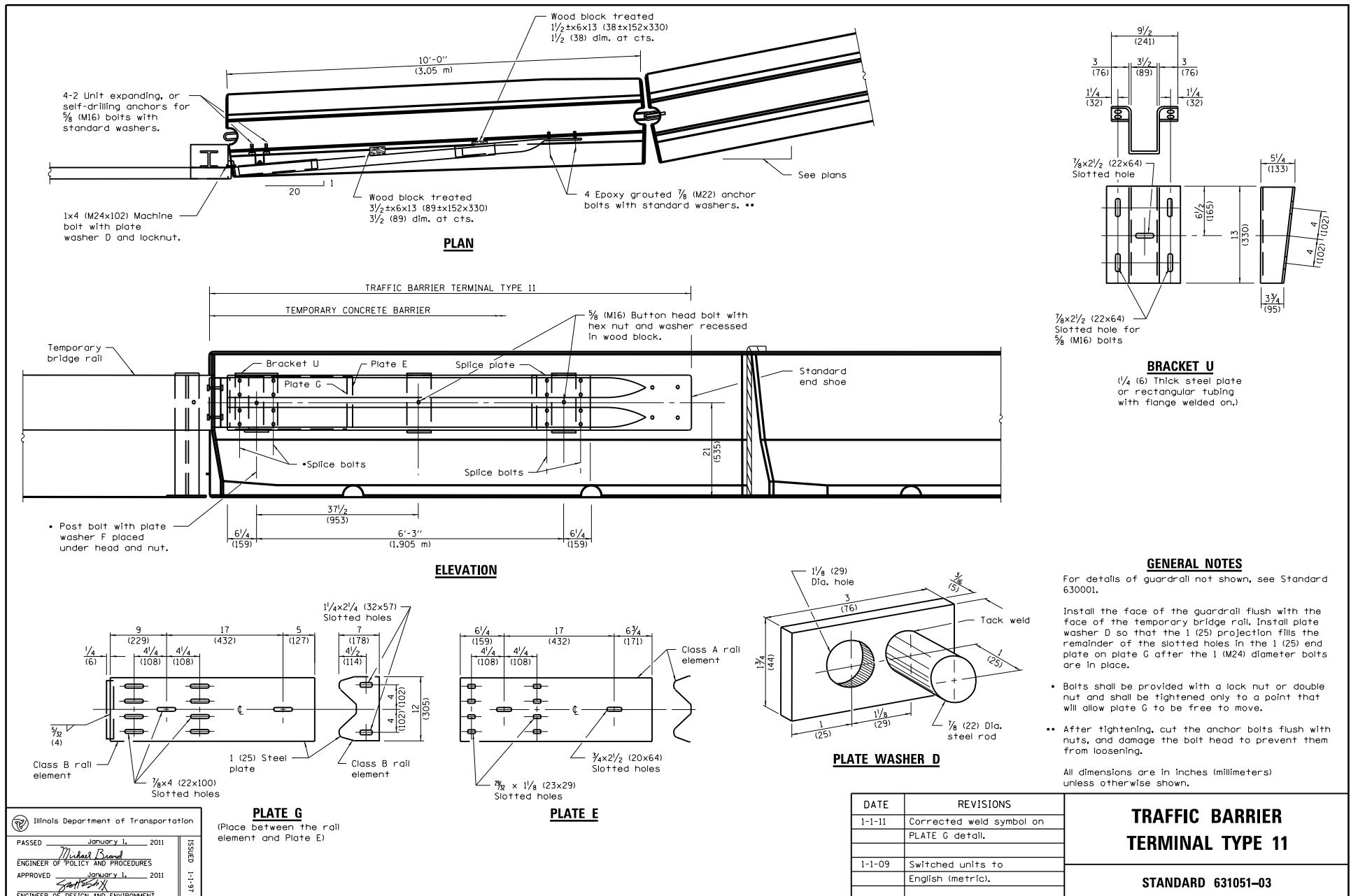
	Illinois Department of Transportation
PASSED	January 1, 2015
Michael Brand	EE02-1-1 CLASSI
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2015
DR	EE02-1-1 CLASSI
ENGINEER OF DESIGN AND ENVIRONMENT	

**TRAFFIC BARRIER
TERMINAL, TYPE 6B**

(Sheet 2 of 2)

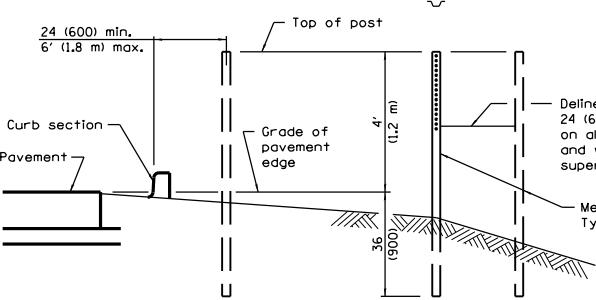
STANDARD 631033-06



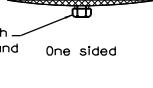
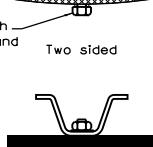


Illinois Department of Transportation	
PASSED	January 1, 2011
<i>Michael Brand</i>	
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2011
<i>Scott Sizemore</i>	
ENGINEER OF DESIGN AND ENVIRONMENT	

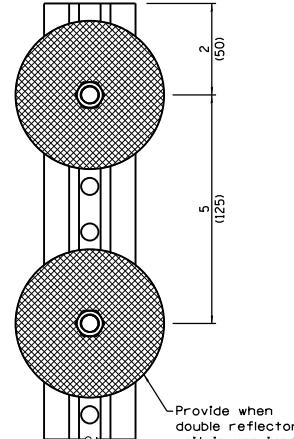
DATE	REVISIONS	
1-1-11	Corrected weld symbol on PLATE G detail.	TRAFFIC BARRIER TERMINAL TYPE 11
1-1-09	Switched units to English (metric).	STANDARD 631051-03



Delineators shall be placed 24 (600) from break point on all interchange ramps and whenever pavement super-elevation exceeds 6%.

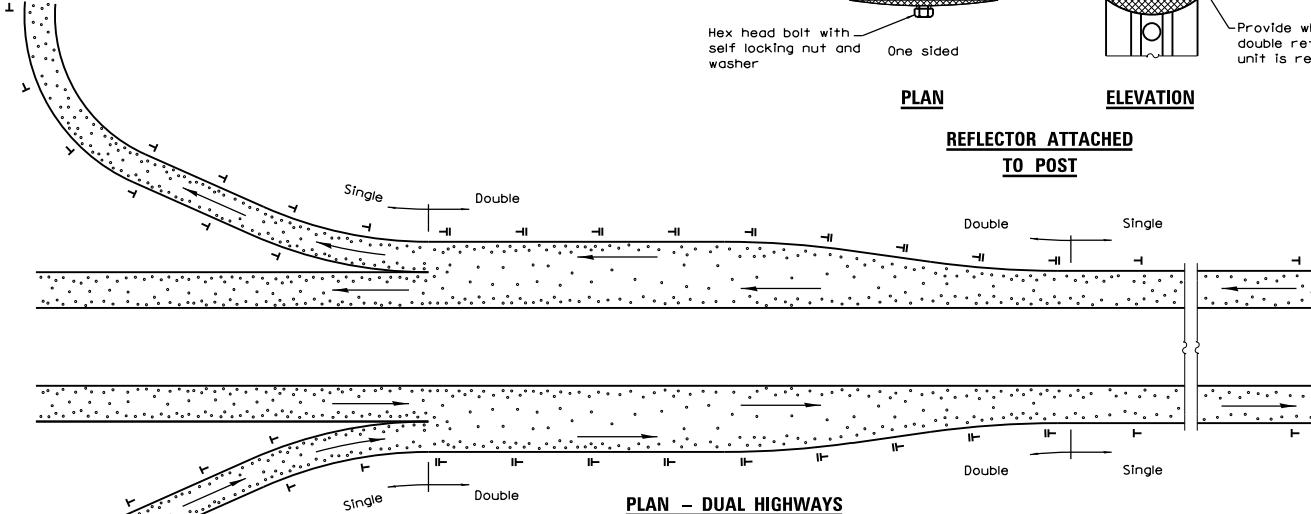


PLAN



ELEVATION

REFLECTOR ATTACHED
TO POST



**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	40	65	125
100 - 174 (30 - 54)	(5)	(10)	(20)	(40)
175 - 224 (55 - 69)	30	60	90	180
225 - 274 (70 - 84)	35	70	110	200
275 - 349 (85 - 104)	40	85	125	200
350 - 449 (105 - 134)	50	95	145	200
(125)	(15)	(30)	(45)	(60)
450 - 549 (135 - 164)	65	125	190	200
550 - 649 (165 - 199)	70	140	200	200
650 - 749 (200 - 229)	75	150	200	200
750 - 849 (230 - 259)	80	165	200	200
850 - 949 (260 - 289)	85	175	200	200
950 - 1049 (290 - 319)	90	185	200	200
(290)	(25)	(55)	(60)	(60)
1050 - 1299 (320 - 394)	100	200	200	200
1300 - 1999 (395 - 609)	125	200	300	300
2000 - 2999 (610 - 914)	150	200	200	300
3000 - 3999 (915 - 1219)	175	200	300	300
4000 or greater (1220)	400	400	400	400
	(120)	(120)	(120)	(120)

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 T20011 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.

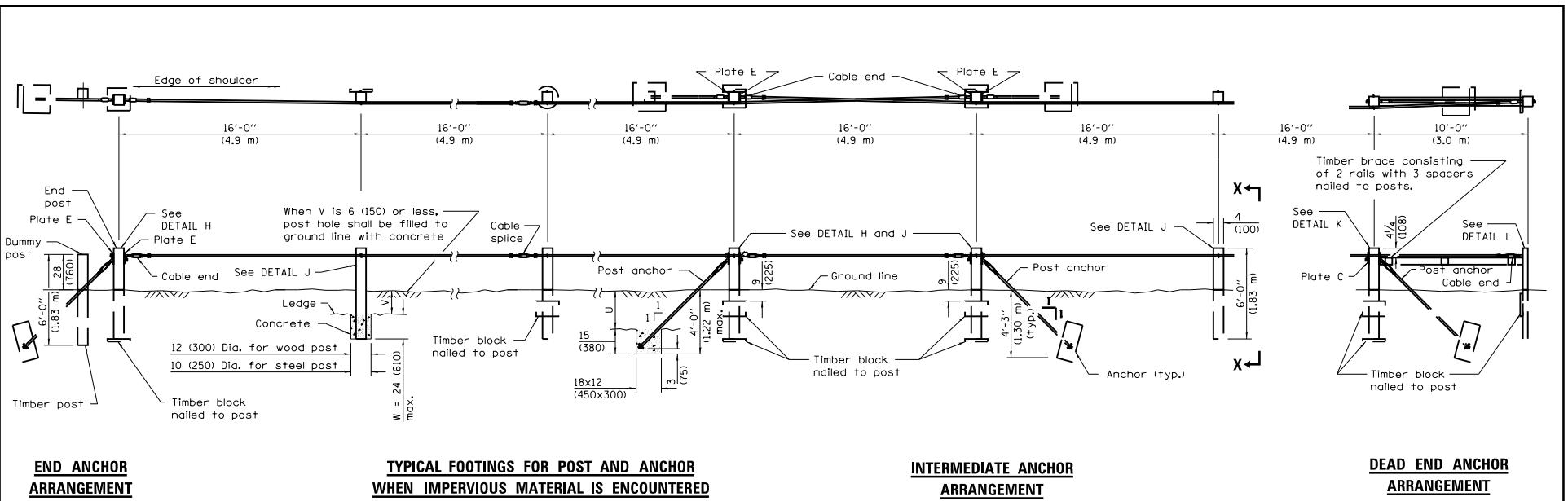
All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation
PASSED April 1, 2009
<i>Jay Eber</i>
ENGINEER OF OPERATIONS
APPROVED April 1, 2009
<i>DR</i>
ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS	STANDARD 635001-02
4-1-16	Added detail of reflector attached to post. Revised signature block.	
1-1-09	Switched units to English (metric).	
	Revised notes.	

DELINATEATORS

STANDARD 635001-02



**END ANCHOR
ARRANGEMENT**

**TYPICAL FOOTINGS FOR POST AND ANCHOR
WHEN IMPERVIOUS MATERIAL IS ENCOUNTERED**

**INTERMEDIATE ANCHOR
ARRANGEMENT**

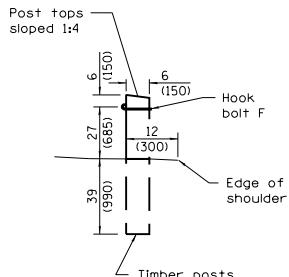
**DEAD END ANCHOR
ARRANGEMENT**

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" (100x100x1.83 m)
Block	2x12x18 (50x300x450)
Rail	2x6 (50x150)
Spacer	2x6x6 (50x150x150)

GENERAL NOTES

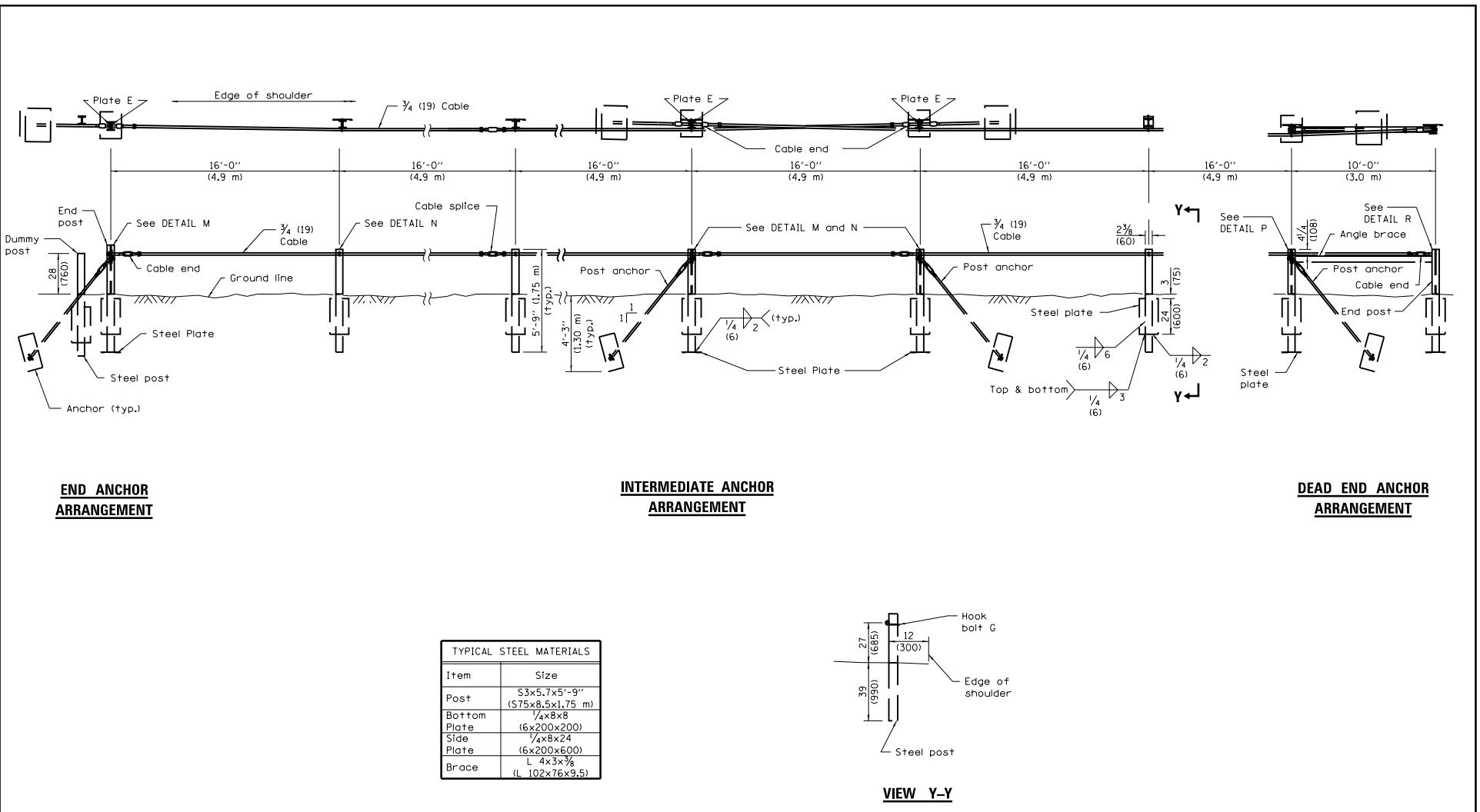
The Engineer will determine the stability of the impervious material for anchoring.

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.

DATE	REVISIONS	CABLE ROAD GUARD SINGLE STRAND <small>(Sheet 1 of 3)</small>
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.	

	Illinois Department of Transportation
PASSED	January 1, 2009
<i>[Signature]</i>	1-1-09
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2009
<i>[Signature]</i>	1-1-09
ENGINEER OF DESIGN AND ENVIRONMENT	



Illinois Department of Transportation
PASSED January 1, 2009
Signed _____
ENGINEER OF POLICY AND PROCEDURES
APPROVED January 1, 2009
Edu S. Khan
ENGINEER OF DESIGN AND ENVIRONMENT

CABLE ROAD GUARD SINGLE STRAND
(Sheet 2 of 3)

STANDARD 636001-02

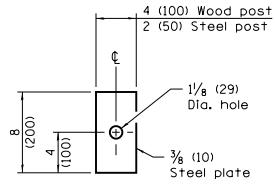


PLATE C

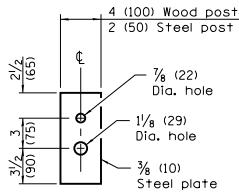
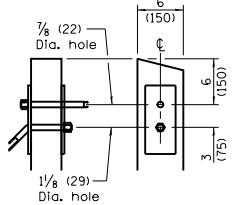
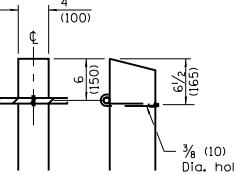


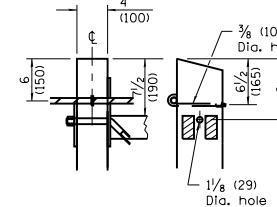
PLATE E



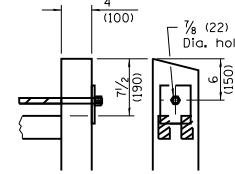
DETAIL H



DETAIL J



DETAIL K



DETAIL L

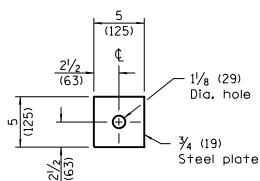


PLATE B

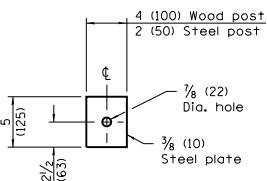
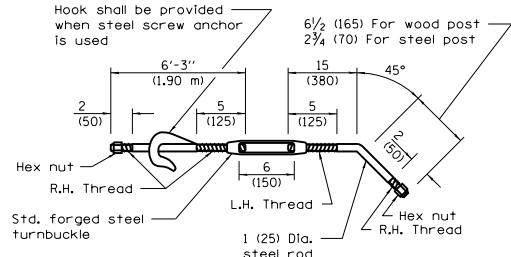
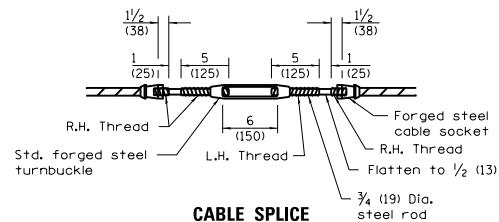


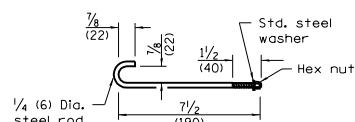
PLATE D



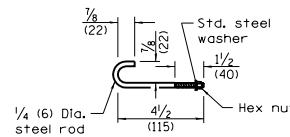
POST ANCHOR



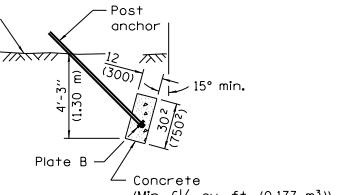
CABLE SPLICE



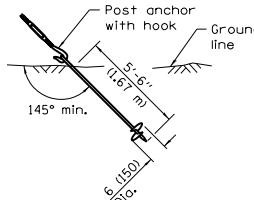
HOOK BOLT F



HOOK BOLT G



CAST IN PLACE DEADMAN



STEEL SCREW

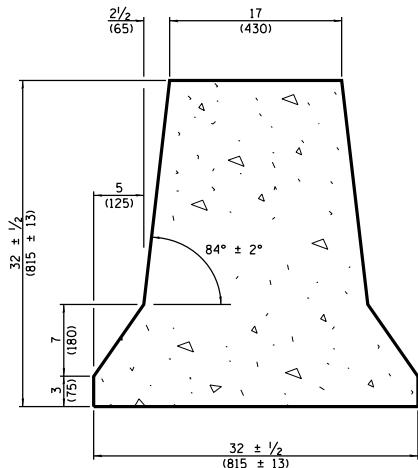
ALTERNATE – ANCHORS

CABLE ROAD GUARD SINGLE STRAND

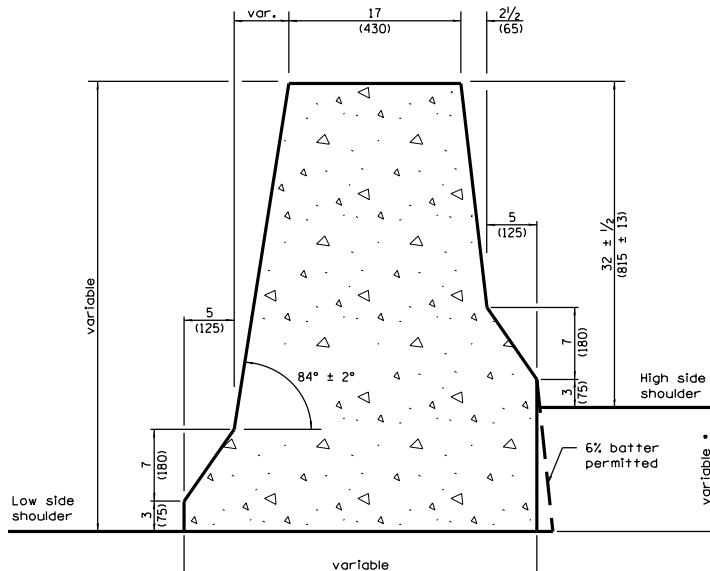
(Sheet 3 of 3)

STANDARD 636001-02

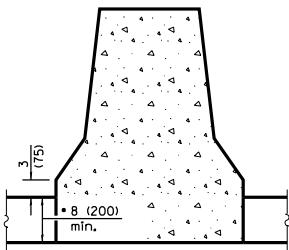
	Illinois Department of Transportation
PASSED	January 1, 2009
Sgt. S. Shy	16-1-1 QRS
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2009
Edu. S. Khan	
ENGINEER OF DESIGN AND ENVIRONMENT	



TYPICAL CROSS-SECTION

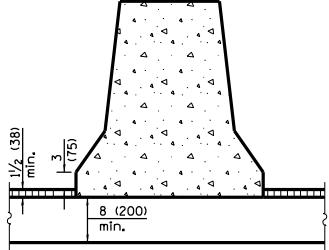


VARIABLE CROSS-SECTION

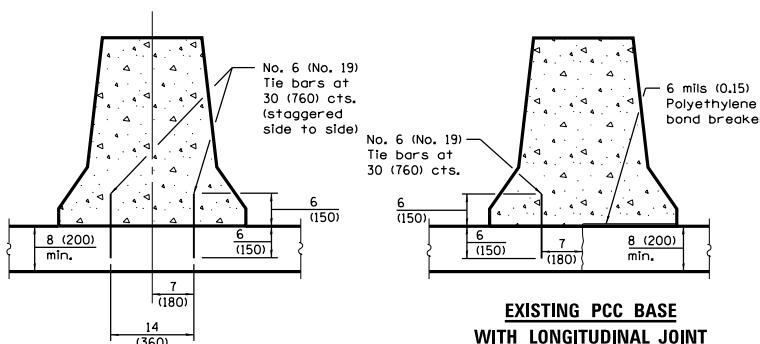


NEW MONOLITHIC
PCC BASE

- This dimension shall be 10 (250) minimum when the barrier is confined by earth.



NEW OR EXISTING
BIT./PCC BASE
WITH OVERLAY CONFINEMENT



EXISTING PCC BASE
WITH LONGITUDINAL JOINT

The Variable Cross-Section shall be used when there is a difference in elevation between the two sides of the barrier.

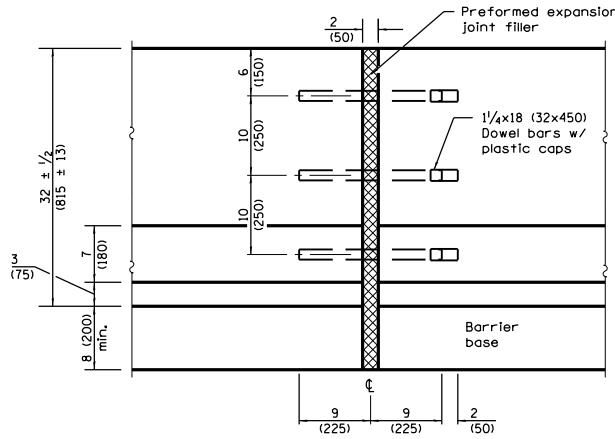
See standard 836006 for light pole foundation details where required in concrete barrier.

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

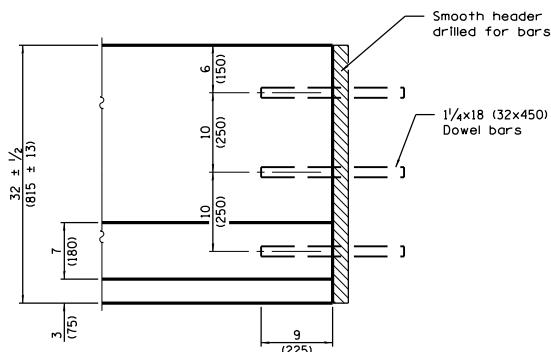
ANCHORING METHODS

DATE	REVISIONS	CONCRETE BARRIER, DOUBLE FACE, 32 in. (815 mm) HEIGHT (Sheet 1 of 2)
1-1-13	Revised general note to reference standard 836006 for light pole foundation.	
1-1-09	Switched units to English (metric).	
		STANDARD 637001-05

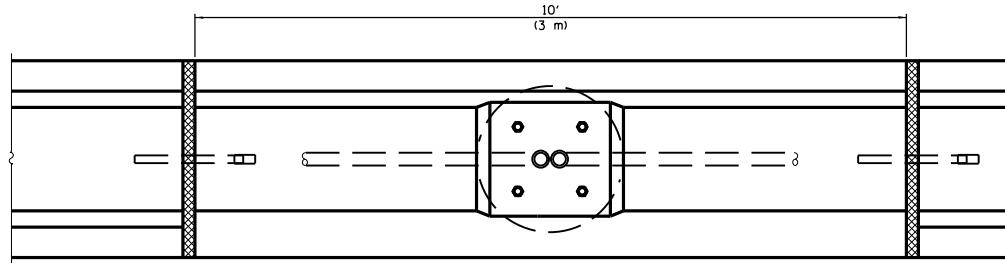
	Illinois Department of Transportation
PASSED	January 1, 2013
Mihal Brand	
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2013
JR	
ENGINEER OF DESIGN AND ENVIRONMENT	



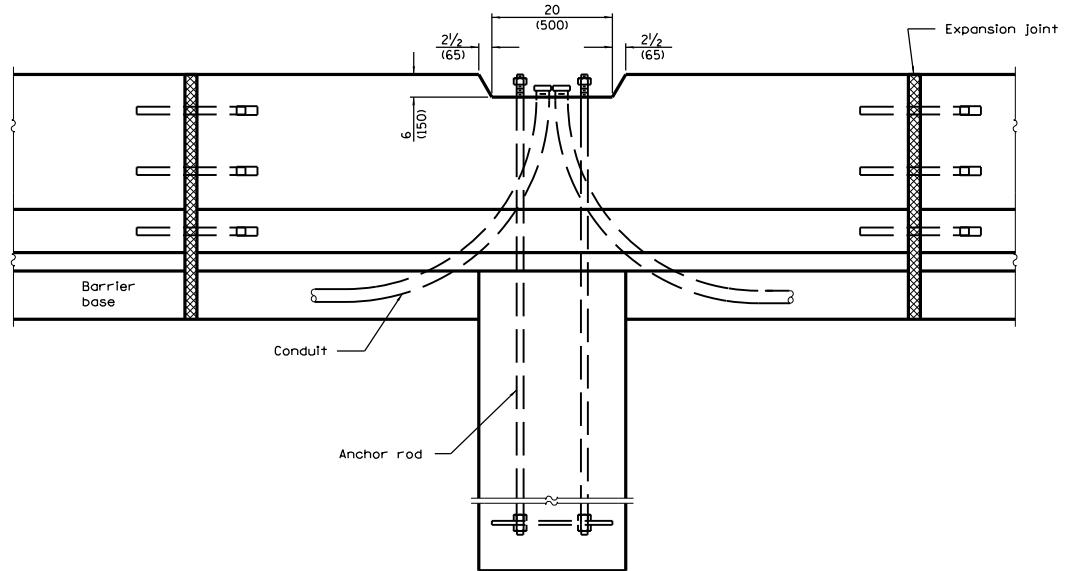
EXPANSION JOINT



CONSTRUCTION JOINT



PLAN AT LIGHTING FOUNDATION

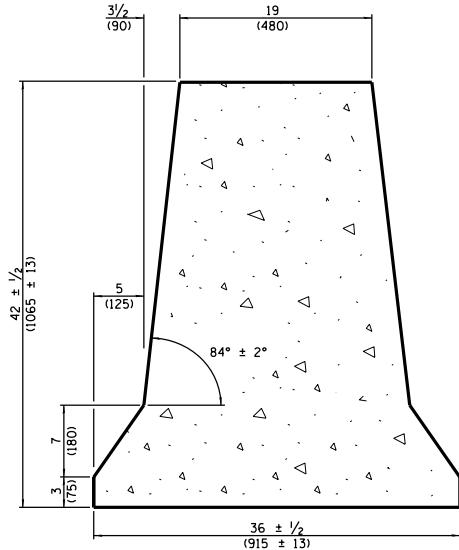


ELEVATION AT LIGHTING FOUNDATION

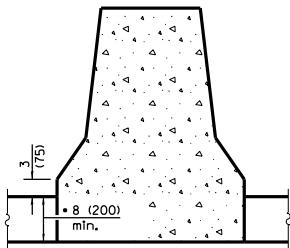
	Illinois Department of Transportation
PASSED	January 1, 2013
<i>Michael Beard</i>	
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2013
<i>R. J. S.</i>	
ENGINEER OF DESIGN AND ENVIRONMENT	

**CONCRETE BARRIER,
DOUBLE FACE,
32 in (815 mm) HEIGHT**

STANDARD 637001-05

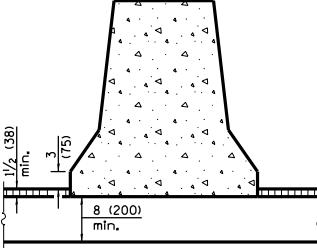


TYPICAL CROSS-SECTION

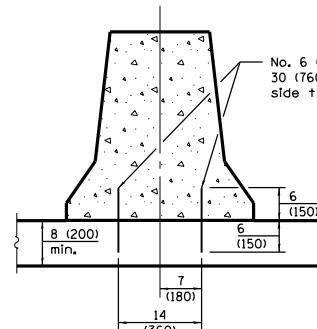


**NEW MONOLITHIC
PCC BASE**

- This dimension shall be 10 (250) minimum when the barrier is confined by earth.

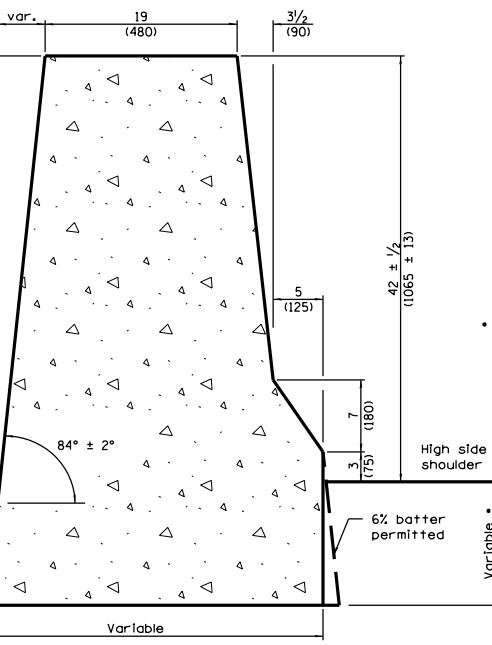


**NEW OR EXISTING
BIT./PCC BASE
WITH OVERLAY CONFINEMENT**

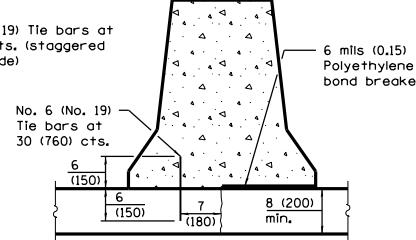


**NEW OR EXISTING
PCC BASE**

ANCHORING METHODS



VARIABLE CROSS-SECTION



**EXISTING PCC BASE
WITH LONGITUDINAL JOINT**

GENERAL NOTES

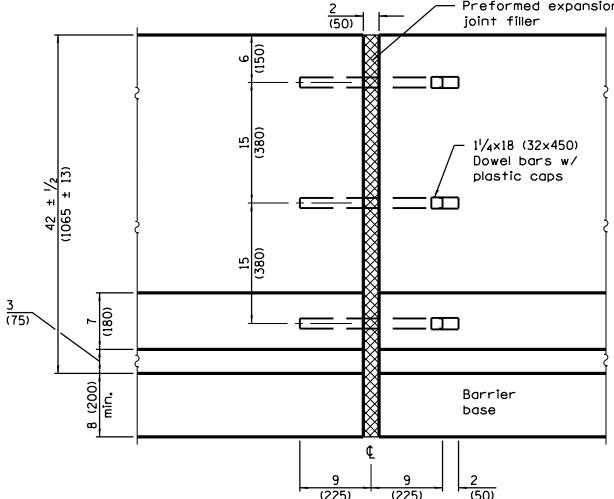
The Variable Cross-Section shall be used when there is a difference in elevation between the two sides of the barrier.

See standard 836011 for light pole foundation details where required in concrete barrier.

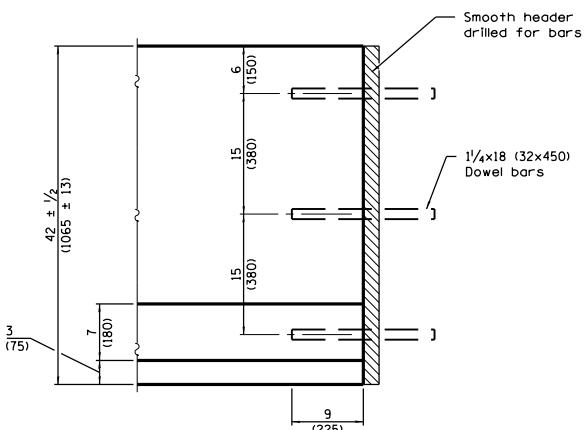
All dimensions are in Inches (millimeters) unless otherwise shown.

DATE	REVISIONS	CONCRETE BARRIER, DOUBLE FACE, 42 in. (1065 mm) HEIGHT (Sheet 1 of 2)
1-1-13	Revised general note to reference standard 836011 for light pole foundation.	
1-1-09	Switched units to English (metric).	
		STANDARD 637006-03

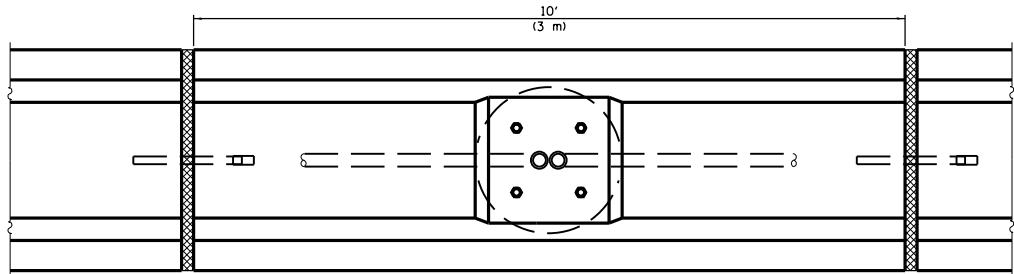
Illinois Department of Transportation
PASSED <u>January 1, 2013</u>
Engineer of Policy and Procedures <u>Michael Brand</u>
Approved <u>January 1, 2013</u>
Engineer of Design and Environment <u>[Signature]</u>



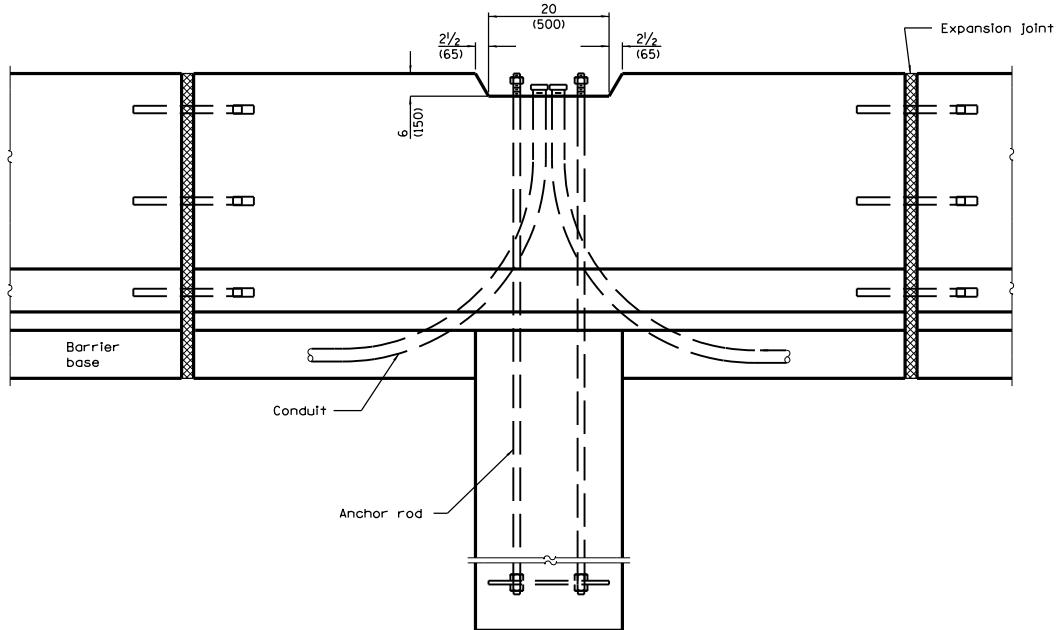
EXPANSION JOINT



CONSTRUCTION JOINT



PLAN AT LIGHTING FOUNDATION

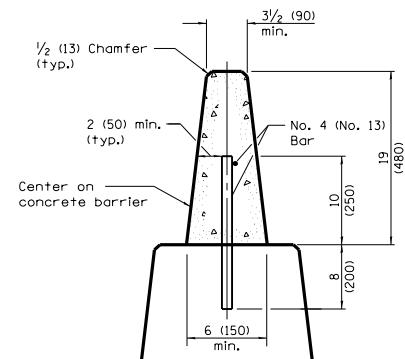
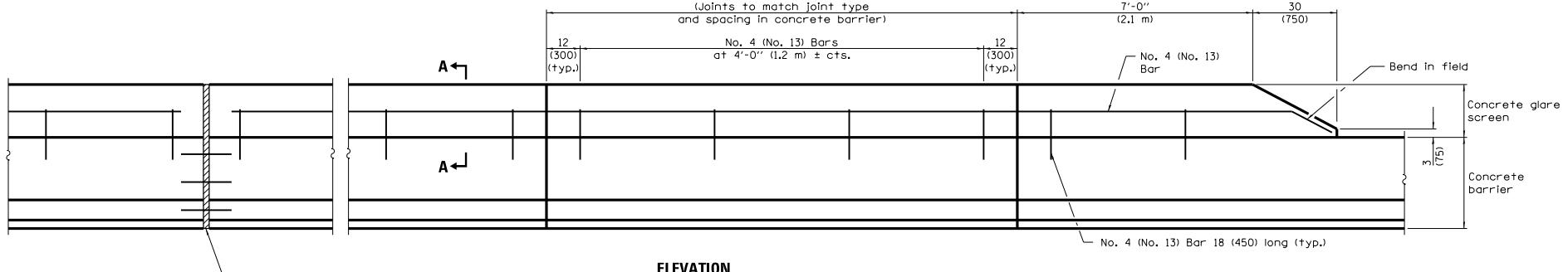


ELEVATION AT LIGHTING FOUNDATION

	Illinois Department of Transportation
PASSED	January 1, 2013
Mihal Brand	Engineer of Policy and Procedures
APPROVED	January 1, 2013
CR	Engineer of Design and Environment
40-1-1 QRSI	

**CONCRETE BARRIER,
DOUBLE FACE,
42 in. (1065 mm) HEIGHT**
(Sheet 2 of 2)

STANDARD 637006-03

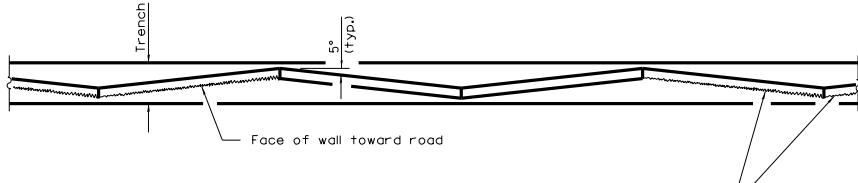


TYPICAL APPLICATION AT MEDIAN OBSTRUCTIONS

	Illinois Department of Transportation
PASSED	January 1, 2009
S. M. S. [Signature]	ISSUED 1-1-09
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2009
E. S. [Signature]	
ENGINEER OF DESIGN AND ENVIRONMENT	

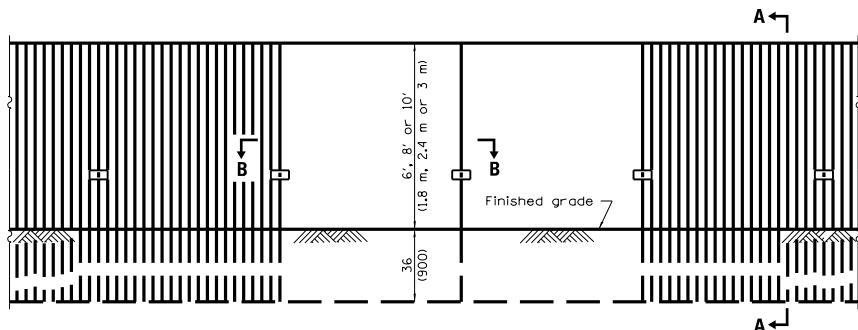
All dimensions are in inches (millimeters)
unless otherwise shown.

DATE	REVISIONS	CONCRETE GLARE SCREEN
1-1-09	Switched units to English (metric).	
1-1-04	Revised for F shape barrier.	
		STANDARD 638101-02

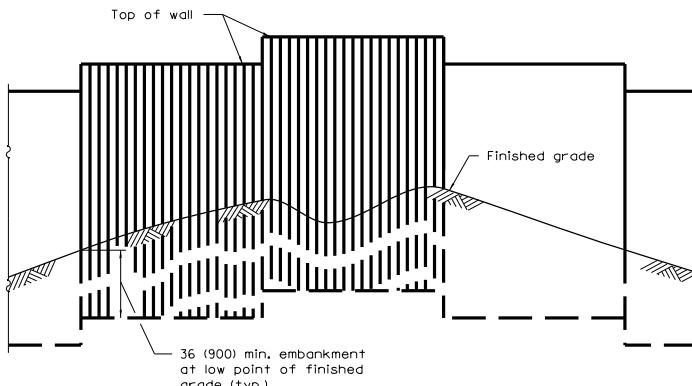


Each alternate pair of panels shall have a textured surface finish as shown, and shall be alternated with pairs having a smooth finish. The intersection of every two panels having the same finish shall point toward the road as shown.

PLAN



ELEVATION



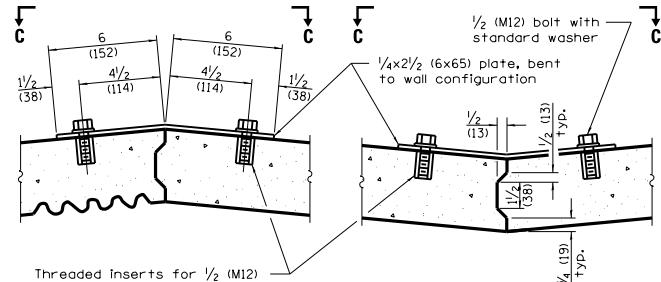
ELEVATION

(Showing installation of wall in irregular ground)

Illinois Department of Transportation	
APPROVED	January 1, 2009
<i>Ralph E. Anderson</i>	
ENGINEER OF BRIDGES AND STRUCTURES	
APPROVED	January 1, 2009
<i>Lee S. Khan</i>	
ENGINEER OF DESIGN AND ENVIRONMENT	

1-1-09

1-1-07

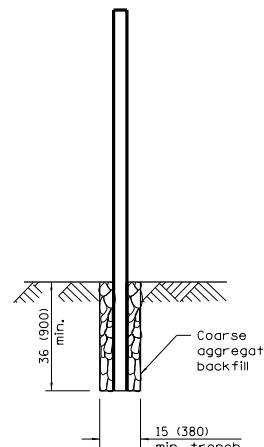


Threaded inserts for $\frac{1}{2}$ (M12) bolts, precast or field drilled, as necessary, into panels.

Showing typical metal band connector dimensions

Showing typical shear key dimensions

SECTION B-B



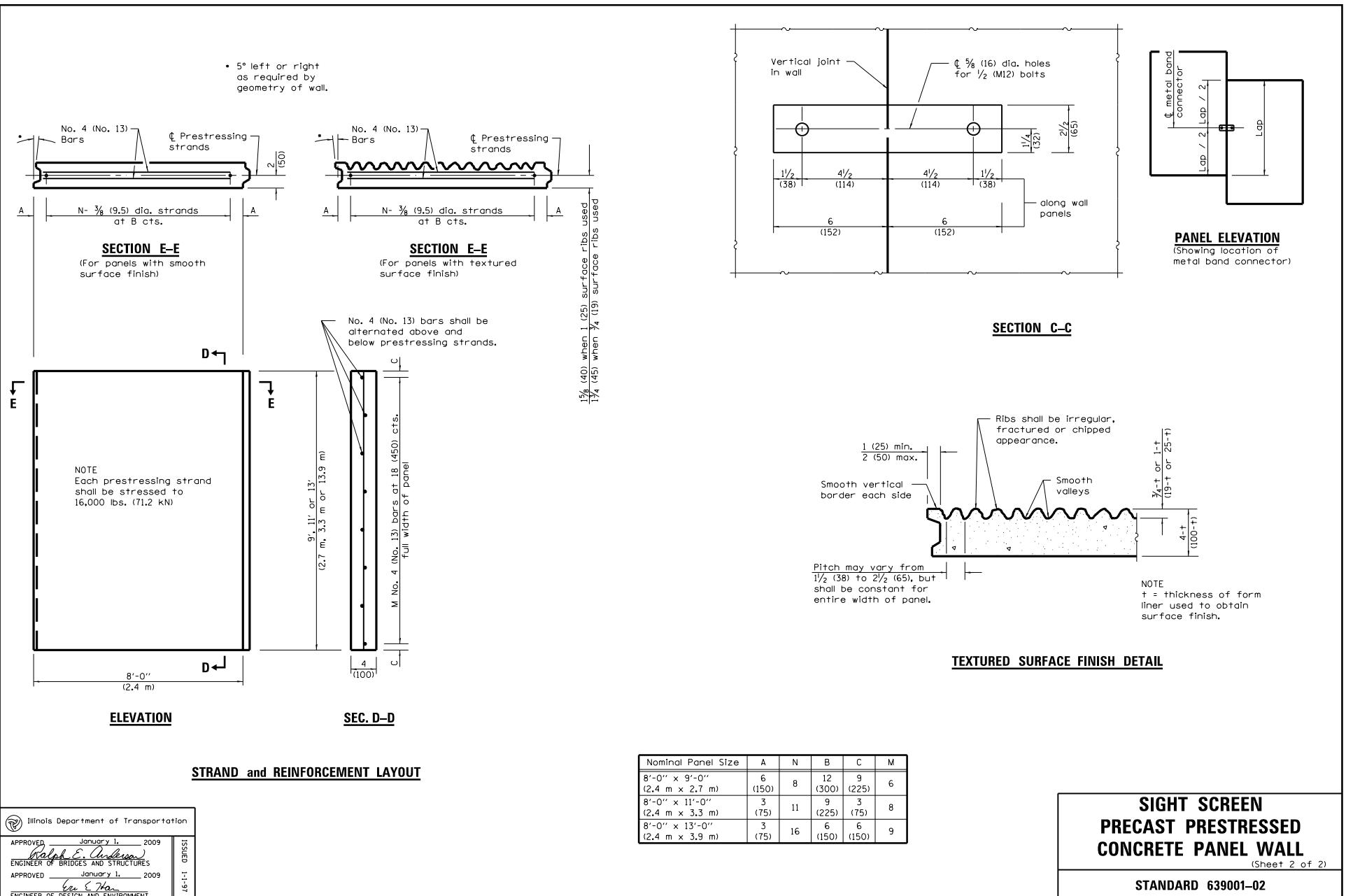
SECTION A-A

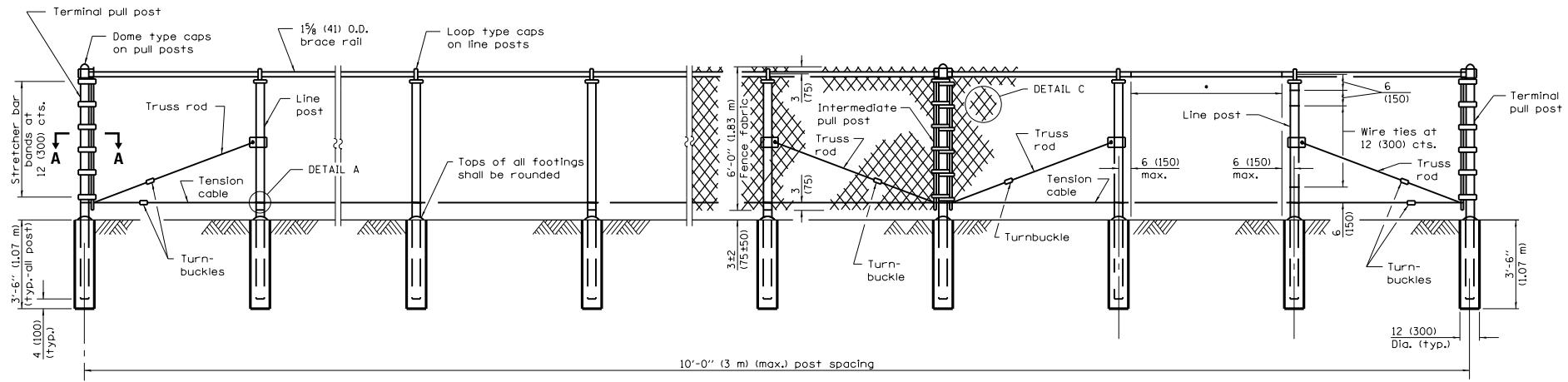
GENERAL NOTES
Loading for 80 mph (130 km/h) wind with 30% gust factor, normal to wall.

ALLOWABLE STRESSES:
Concrete: $f'_c = 3,500 \text{ psi (24 MPa)}$
 $f'_c f_c = 2,250 \text{ psi (15 MPa)}$
Prestressing Steel: $f'_s = 270,000 \text{ psi (1860 MPa)}$
 $f_s = 189,000 \text{ psi (1300 MPa)}$
Reinforcing Steel: $f_y = 40,000 \text{ psi min. (270 MPa)}$
Structural Steel: $f_s = 20,000 \text{ psi (138 MPa)}$
Minimum allowable soil bearing pressure: $= 1.25 \text{ tsf (120 kPa)}$

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

DATE	REVISIONS	SIGHT SCREEN PRECAST PRESTRESSED CONCRETE PANEL WALL (Sheet 1 of 2)
1-1-09	Switched units to English (metric).	
1-1-07	Soft converted metric reinforcement bars & corrected dimensions.	STANDARD 639001-02





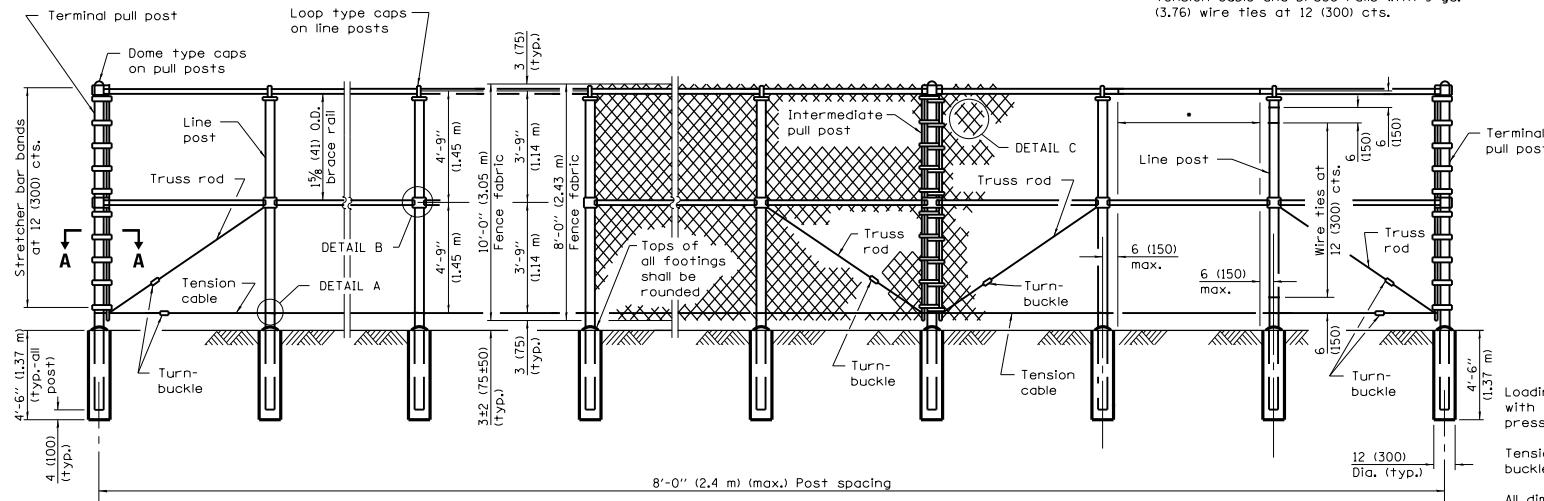
ELEVATION - 6' (1.83 m) FENCE

(Looking toward highway)

- 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.

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)

Post sizes other than those shown may be used subject to approval by the Engineer.



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.

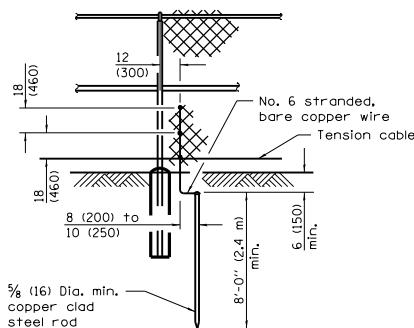
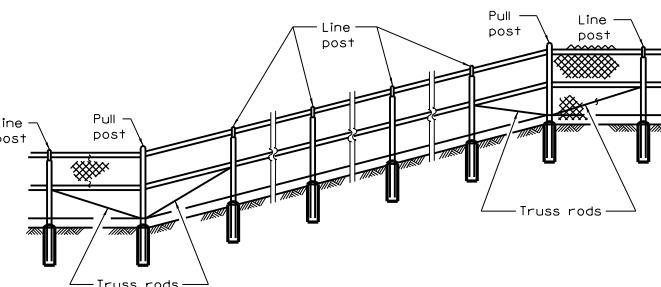
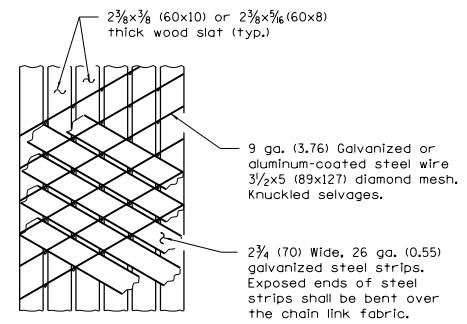
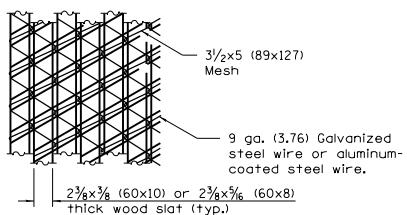
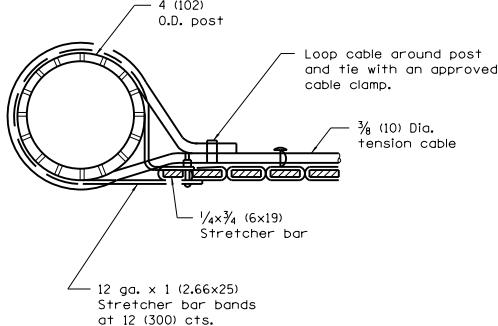
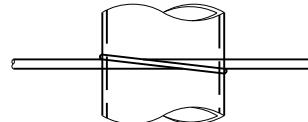
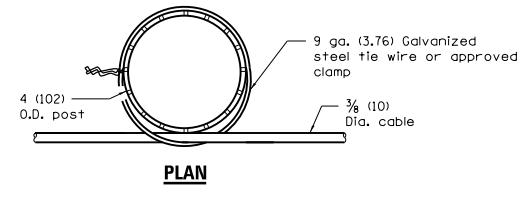
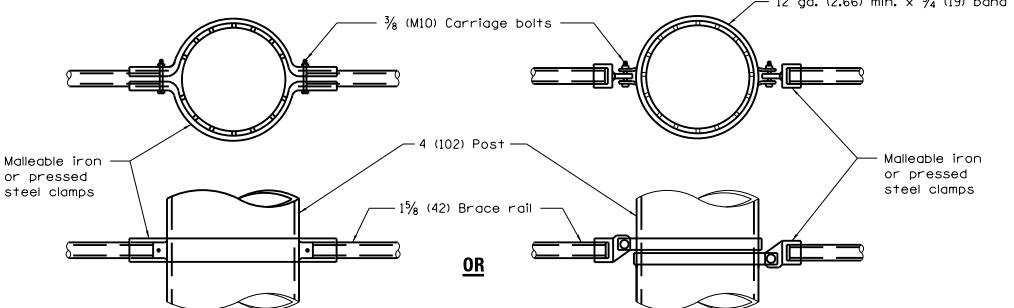
All dimensions are in inches (millimeters) unless otherwise shown.

	Illinois Department of Transportation
APPROVED	January 1, 2009
Ralph E. Anderson	Engineer of Bridges and Structures
APPROVED	January 1, 2009
Lee S. Ybarra	Engineer of Design and Environment
16-1-1	QNSNS

ELEVATION - 8' (2.43 m) & 10' (3.05 m) FENCES

(Looking toward highway)

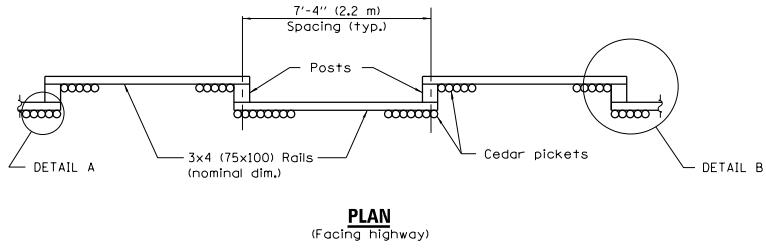
DATE	REVISIONS	SIGHT SCREEN CHAIN LINK FENCE (Sheet 1 of 2)
1-1-09	Switched units to English (metric).	STANDARD 640001-01
	Revised General Notes.	
1-1-97	Renum. Standard 2365-6.	



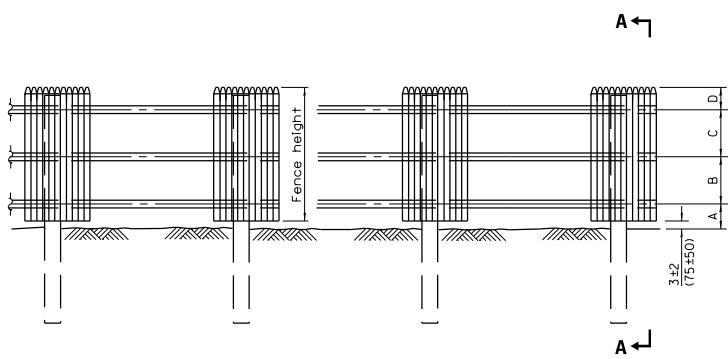
Illinois Department of Transportation
APPROVED January 1, 2009
Ralph E. Anderson
ENGINEER OF BRIDGES AND STRUCTURES
APPROVED January 1, 2009
Lee E. Ybarra
ENGINEER OF DESIGN AND ENVIRONMENT

1-1-09

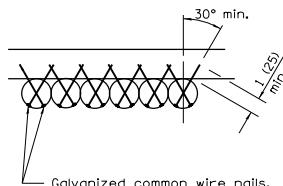
**SIGHT SCREEN
CHAIN LINK FENCE**
(Sheet 2 of 2)
STANDARD 640001-01



PLAN
(Facing highway)

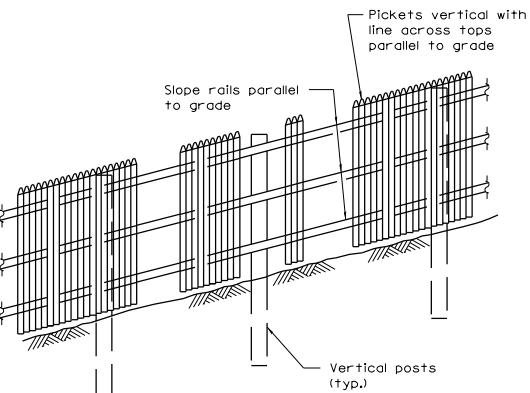


ELEVATION

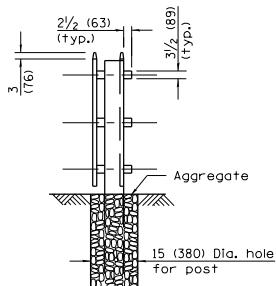


DETAIL A
(Showing typical picket
to rail attachment)

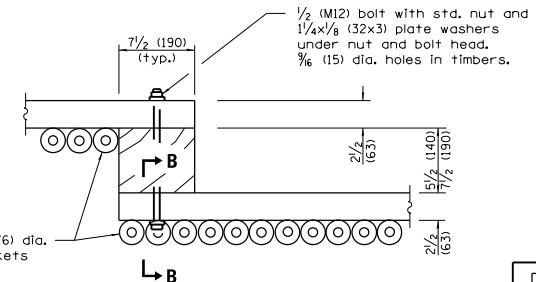
FENCE HEIGHT		
	6'-0" (1.8 m)	8'-0" (2.4 m)
Post Size (nominal dim.)	6x8 (150x200)	8x8 (200x200)
Post Length	10'-0" (3.0 m)	14'-0" (4.3 m)
Post Embedment	4'-0" (1.2 m)	6'-0" (1.8 m)
A	15 (380)	18 (460)
B	24 (600)	33 (870)
C	24 (600)	33 (870)
D	12 (300)	15 (380)



ELEVATION
(Showing treatment with sloping ground)



SEC. A-A



SECTION B-B
(Notch pickets when required
to clear washer and bolt head.)

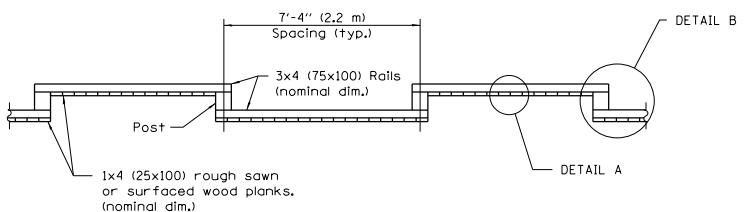
GENERAL NOTES
Loading is based on 80 mph (130 km/h) with 30% gust factor. Minimum allowable soil pressure = 1.25 tsf (120 kPa).

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

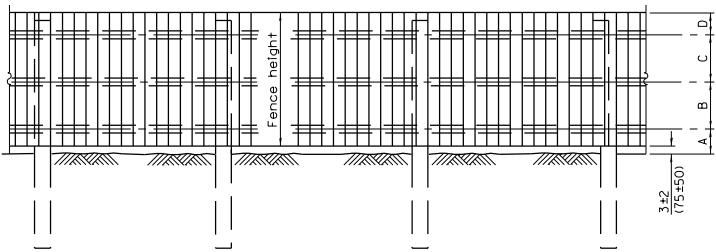
DETAIL B
(Showing typical panel to post
connection at each rail.)

DATE	REVISIONS	SIGHT SCREEN CEDAR STOCKADE FENCE TYPE S STANDARD 641001-01
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.	

	Illinois Department of Transportation
APPROVED	January 1, 2009
Ralph E. Anderson	1-1-09
ENGINEER OF BRIDGES AND STRUCTURES	
APPROVED	January 1, 2009
Lee E. Shan	1-1-97
ENGINEER OF DESIGN AND ENVIRONMENT	

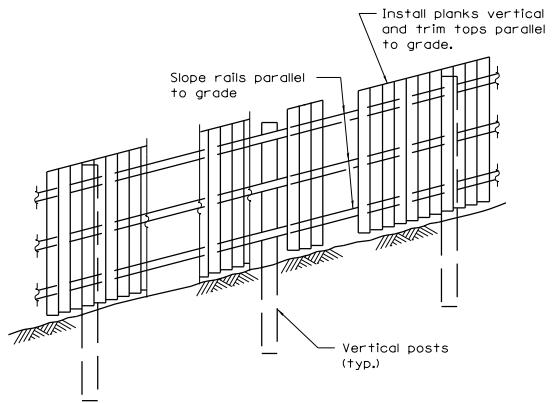


PLAN
(Facing highway)

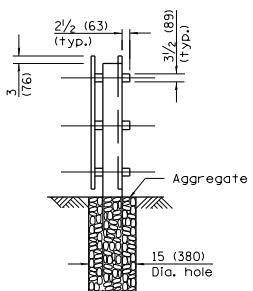


ELEVATION

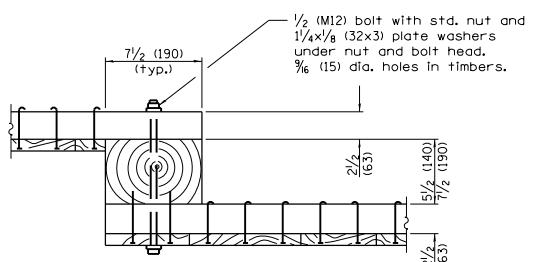
FENCE HEIGHT	
6'-0"	8'-0"
(1.8 m)	(2.4 m)
Post Size (nominal dim.)	6x8 (150x200)
Post Length	10'-0" (3.0 m)
Post Embedment	14'-0" (4.3 m)
A	6'-0" (1.8 m)
B	15 (380)
C	18 (460)
D	24 (600)
	33 (870)
	24 (600)
	33 (870)
	12 (300)
	15 (380)



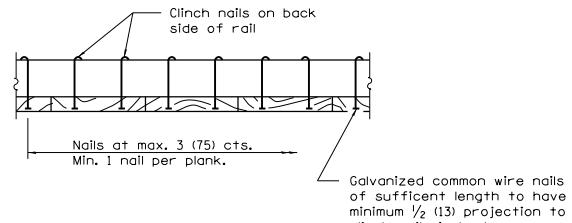
ELEVATION
(Showing treatment with sloping ground)



SEC. A-A



DETAIL B
(Showing typical panel to post connection details)



DETAIL A
(Showing typical plank to rail attachment each rail)

GENERAL NOTES
Loading was based on 80 mph (130 km/h) with 30% gust factor. Minimum allowable soil pressure = 1.25 tsf (120 kPa).

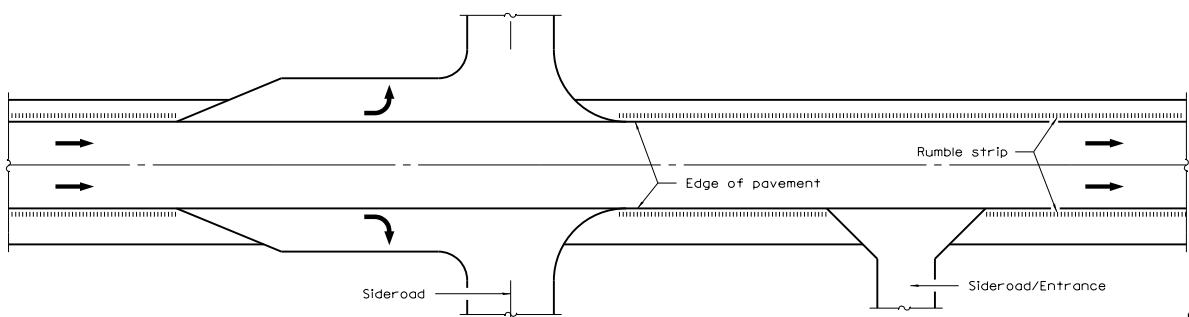
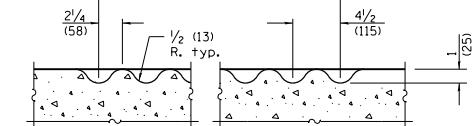
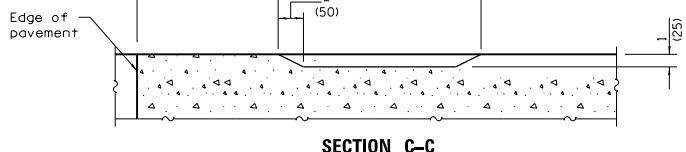
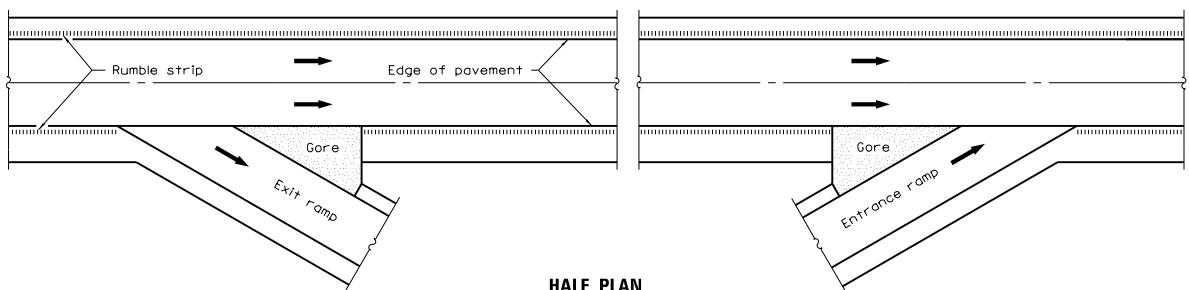
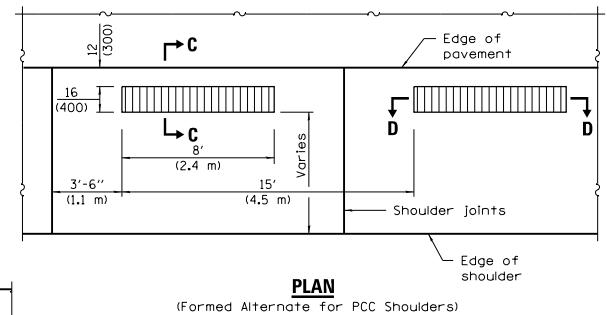
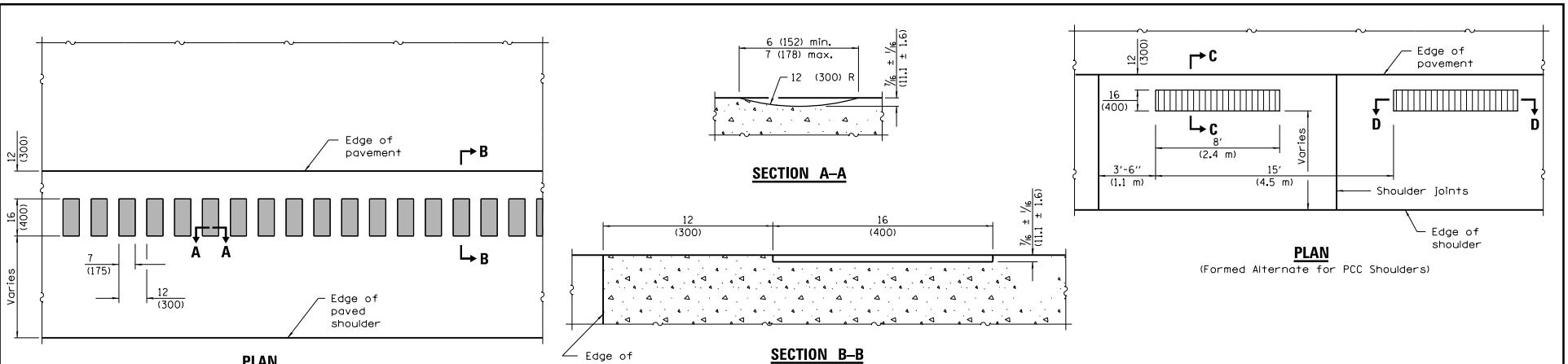
All dimensions are in inches (millimeters) unless otherwise shown.

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**

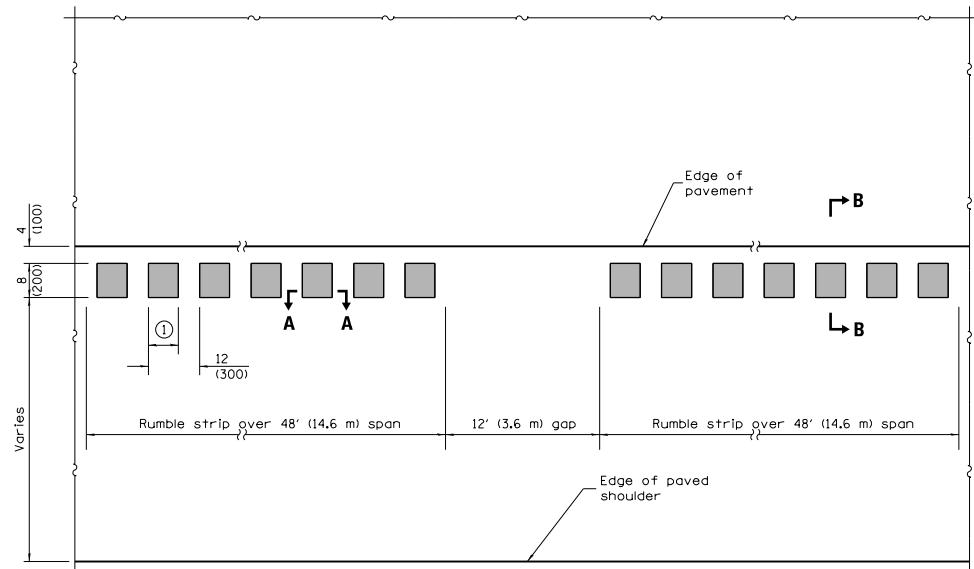
STANDARD 641006-01

	Illinois Department of Transportation
APPROVED	January 1, 2009
Ralph E. Anderson	ISRS 1-1-09
ENGINEER OF BRIDGES AND STRUCTURES	
APPROVED	January 1, 2009
Lee S. Ybarra	
ENGINEER OF DESIGN AND ENVIRONMENT	



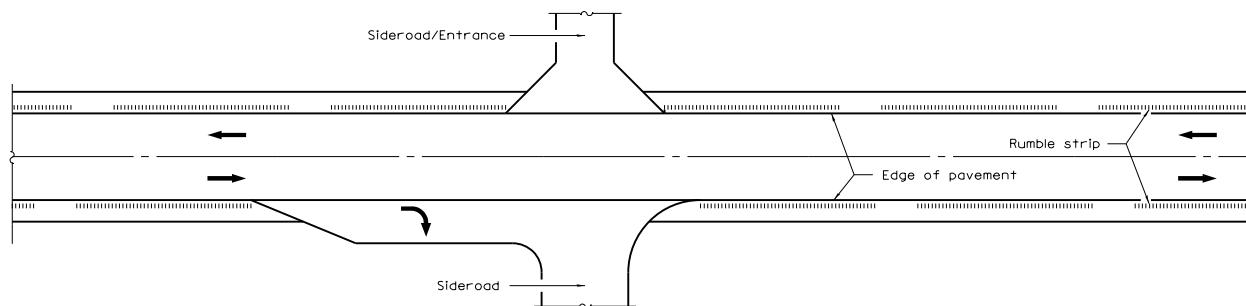
GENERAL NOTES
On Portland cement concrete shoulders, no shoulder rumble strip shall be located closer than 6 (150) to a transverse joint.
Omit shoulder rumble strips across structures.
All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS	SHOULDER RUMBLE STRIPS, 16 in. STANDARD 642001-02
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).	



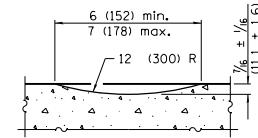
PLAN

① See Section A-A.

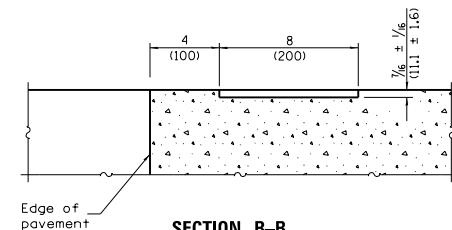


TYPICAL APPLICATION AT AN INTERSECTION OR ENTRANCE

	Illinois Department of Transportation
PASSED	January 1, 2012
Michael Brand	201-1000
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2012
Scott Sestok	201-1000
ENGINEER OF DESIGN AND ENVIRONMENT	



SECTION A-A



SECTION B-B

GENERAL NOTES

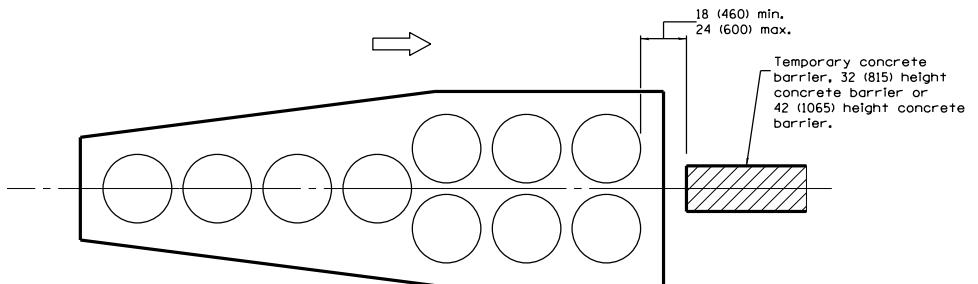
Omit shoulder rumble strips across structures and at mailbox turnouts.

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

DATE	REVISIONS
1-1-12	New standard.

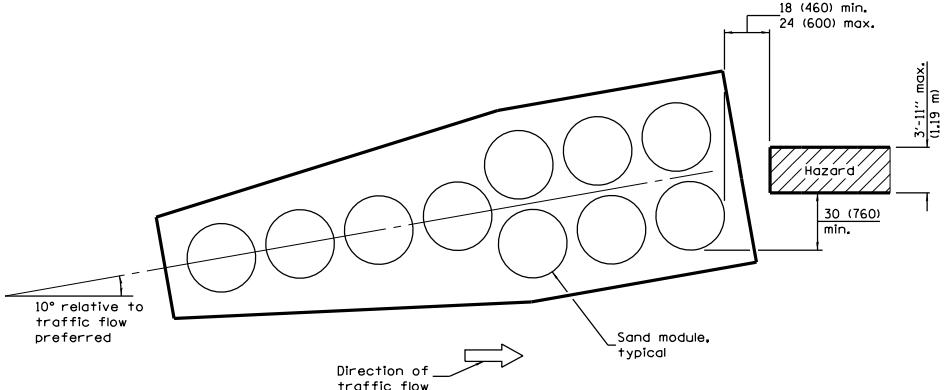
SHOULDER RUMBLE STRIPS, 8 in.

STANDARD 642006



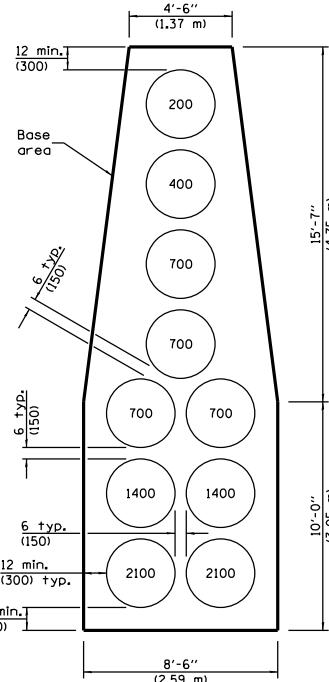
GORE INSTALLATION

(Traffic approaches on both sides)
(Test Level 2 array shown)



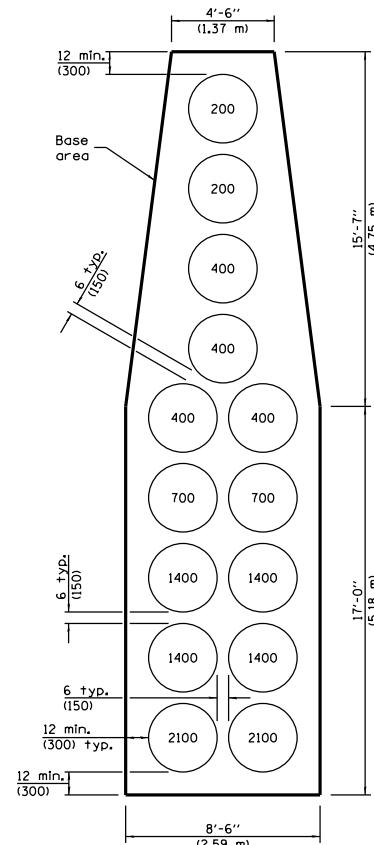
ROADSIDE INSTALLATION

(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.)

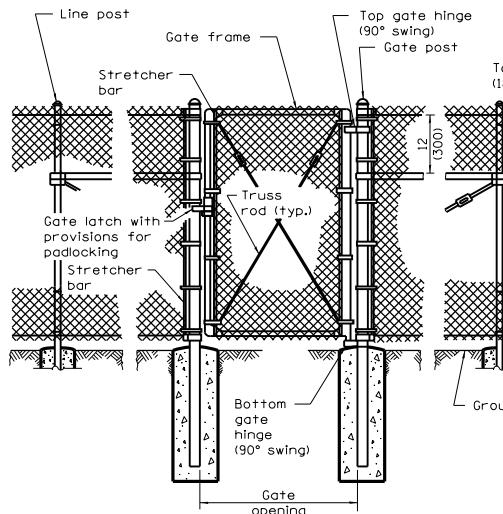
GENERAL NOTES

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

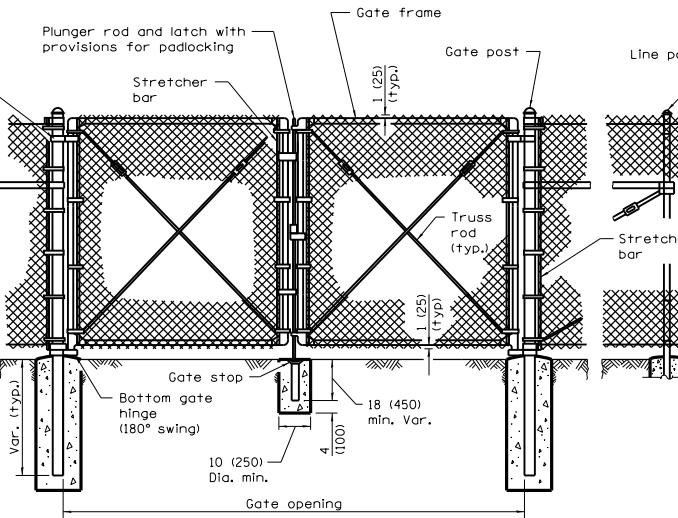
DATE	REVISIONS
1-1-14	Revised distance from barrels to hazard.
1-1-13	Changed 'posted speed' to 'design speed'.

**SAND MODULE
IMPACT ATTENUATORS**
STANDARD 643001-02

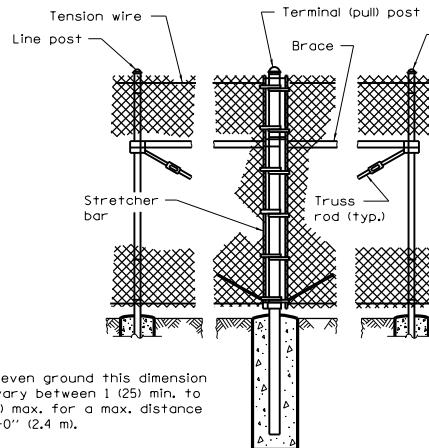
	Illinois Department of Transportation
PASSED	January 1, 2014
Michael Brand	Engineer of Policy and Procedures
APPROVED	January 1, 2014
John R. [Signature]	Engineer of Design and Environment
	1-1-14



PEDESTRIAN GATE ARRANGEMENT

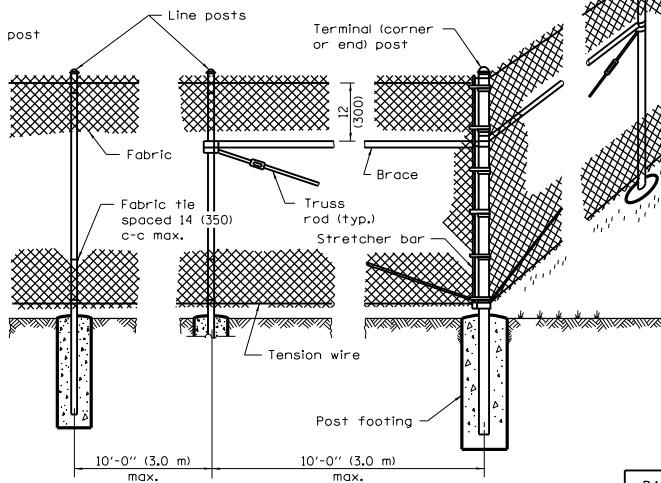


VEHICLE GATE ARRANGEMENT



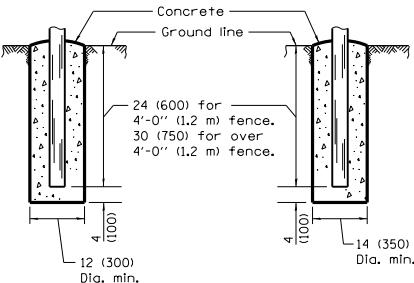
- On uneven ground this dimension may vary between 1 (25) min. to 5 (125) max. for a max. distance of 8'-0" (2.4 m).

PULL POST ARRANGEMENT

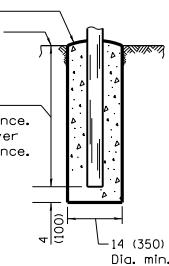


LINE POST ARRANGEMENT

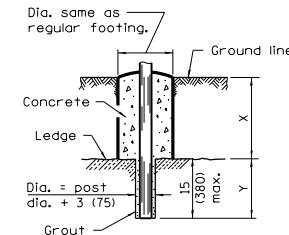
CORNER OR END POST ARRANGEMENT



FOOTING FOR LINE POST



FOOTING FOR GATE & TERMINAL POST



FOOTING FOR POST IN ROCK LEDGE

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
Sgt. S. S. [Signature]
ENGINEER OF POLICY AND PROCEDURES
APPROVED January 1, 2009
Eduardo [Signature]
ENGINEER OF DESIGN AND ENVIRONMENT

PULL POST ARRANGEMENT

LINE POST ARRANGEMENT

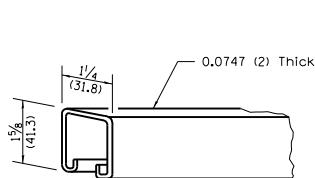
CORNER OR END POST ARRANGEMENT

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-99	Rev. "plans" to "plans" in LINE POST ARRANGEMENT.

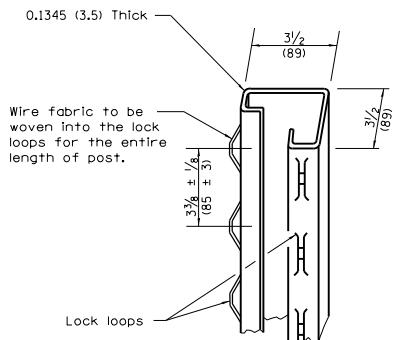
CHAIN LINK FENCE

(Sheet 1 of 3)

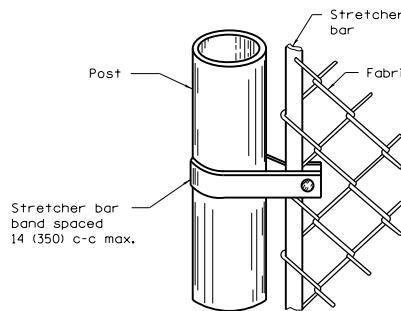
STANDARD 664001-02



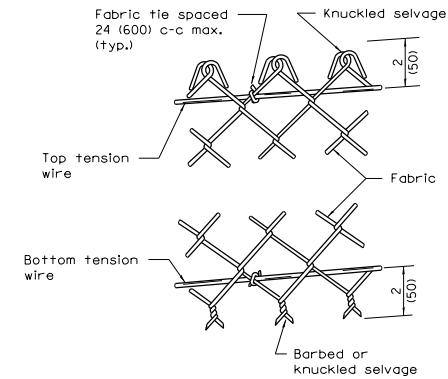
**ROLL FORMED
SECTION OF BRACE**



**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 1/2x3 1/2 (89.0x89.0)	See detail
Sq. Tubing 2 1/2x2 1/2 (63.5x63.5)	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 5/8x1 1/4 (41.3x31.8)	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	lbs./ft. (kg/m)
Up to 4 (1.2)	Up to 8 (2.5)	2.375 (60.3)	3.65 (5.43)	2 1/2 (63.5)	4.32 (6.43)
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)	5.78 (8.60)
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)	8.80 (13.10)

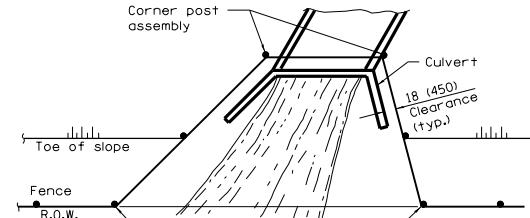
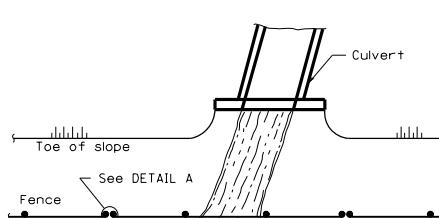
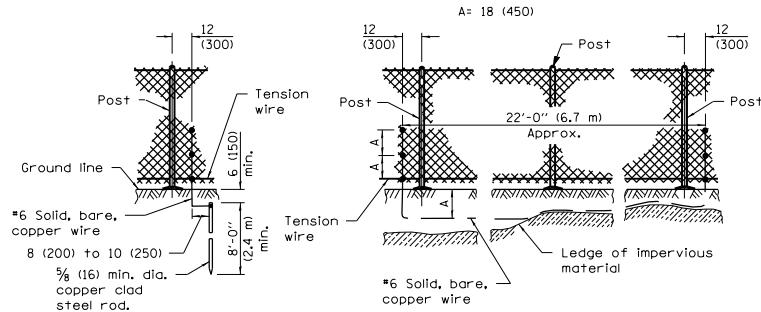
* The 3 1/2 x 3 1/2 (89.0 x 89.0) roll formed section as detailed may be used as gate posts for single gate up to 6' (1.8 m) and double gate up to 12' (3.6 m).

	Illinois Department of Transportation
PASSED	January 1, 2009
	Engineer of POLICY AND PROCEDURES
APPROVED	January 1, 2009
	Engineer of DESIGN AND ENVIRONMENT
1-1-09	1-1-09

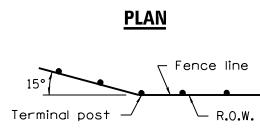
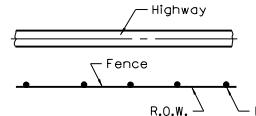
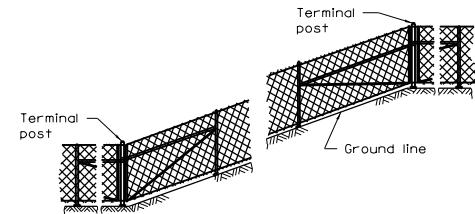
CHAIN LINK FENCE

(Sheet 2 of 3)

STANDARD 664001-02



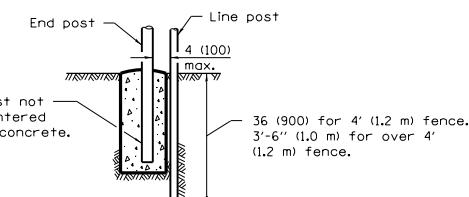
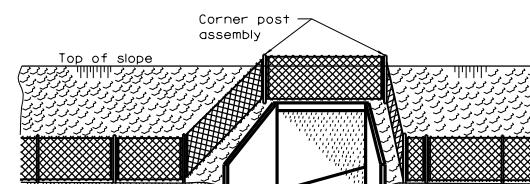
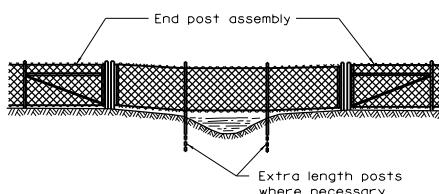
PROTECTIVE ELECTRICAL GROUNDS



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



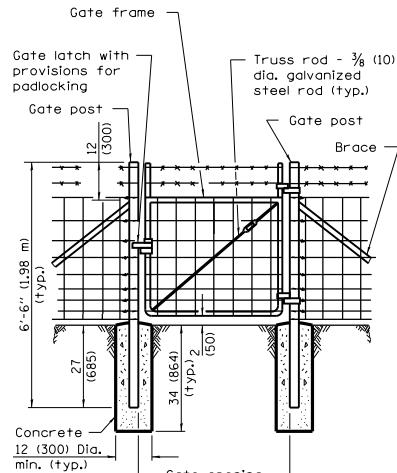
	Illinois Department of Transportation
PASSED	January 1, 2009
Sgt. S. S. S.	IS-197
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2009
E. S. H.	IS-197
ENGINEER OF DESIGN AND ENVIRONMENT	

CHAIN LINK FENCE

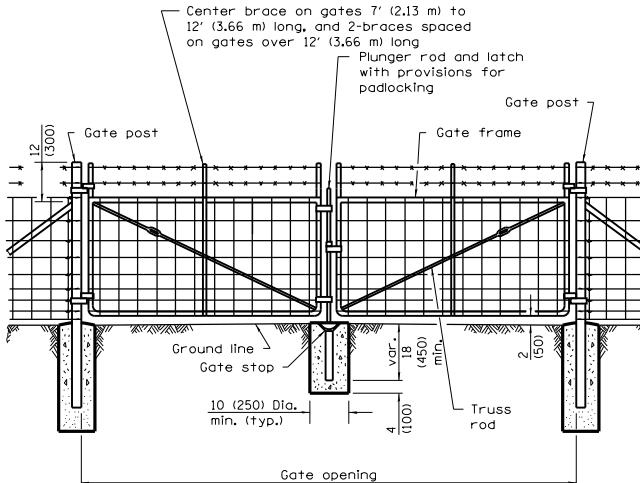
(Sheet 3 of 3)

STANDARD 664001-02

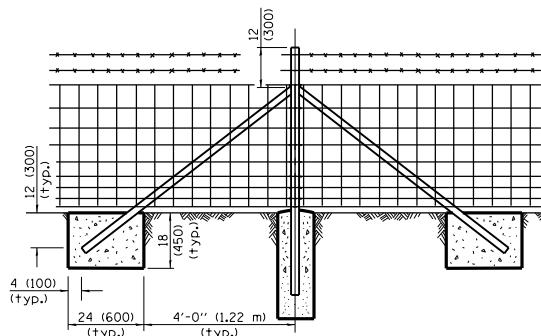
FENCE USING METAL POSTS



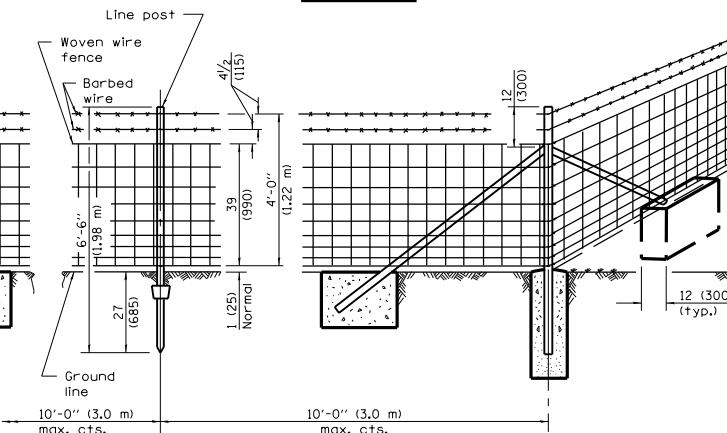
SINGLE GATE



DOUBLE GATE

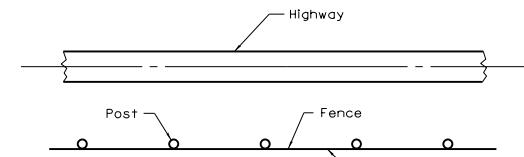


PULL POST



LINE POST

CORNER OR END POST



PLAN

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.

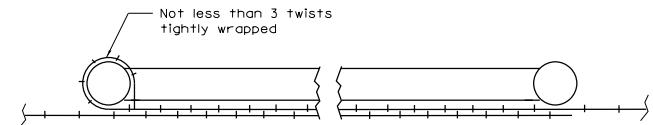
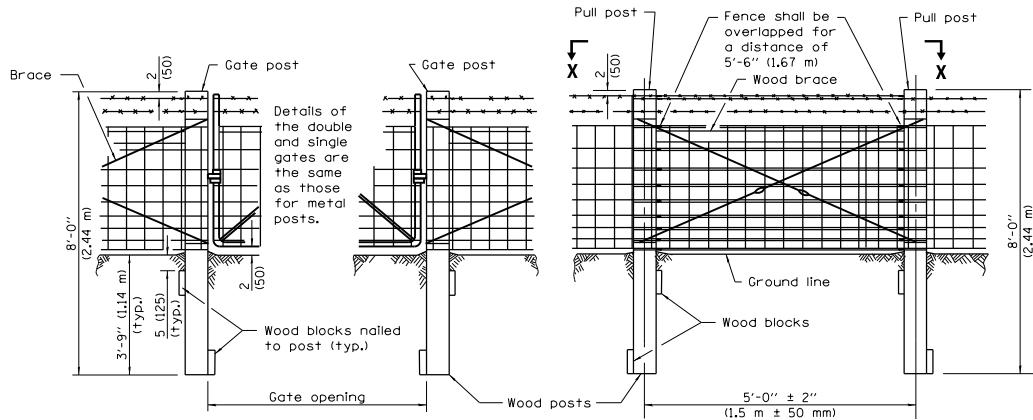
The clearance between the bottom fence wire and the ground may be up to 3' (75 mm) for a maximum distance of 8' (2.4 m) when uneven ground is encountered.

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

	Illinois Department of Transportation
PASSED	January 1, 2009
<i>[Signature]</i>	1-1-09
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2009
<i>[Signature]</i>	1-1-09
ENGINEER OF DESIGN AND ENVIRONMENT	

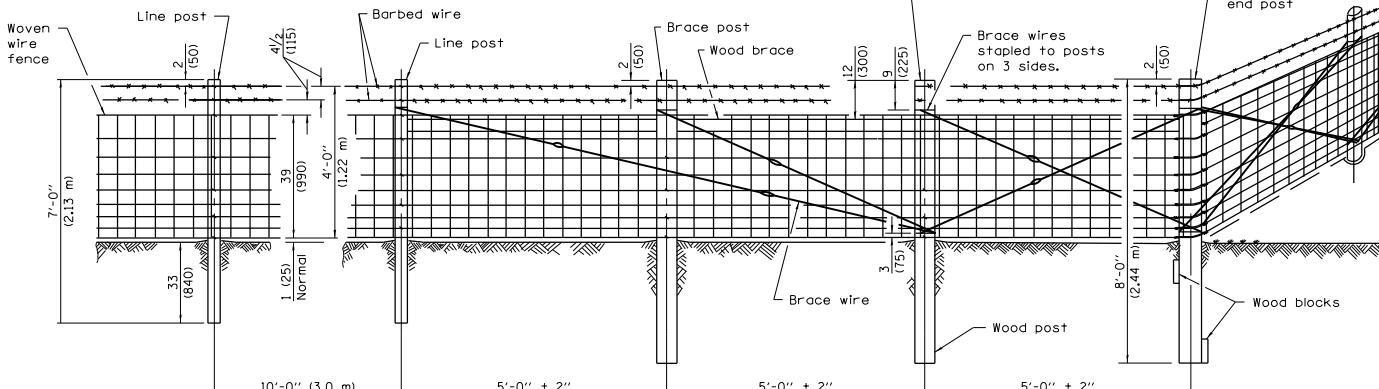
DATE	REVISIONS	WOVEN WIRE FENCE <small>(Sheet 1 of 4)</small>
1-1-09	Switched units to English (metric).	
1-1-02	Corrected dimensions on sheet 3 and 4.	
		STANDARD 665001-02

FENCE USING WOOD POSTS



SINGLE OR DOUBLE GATE

PULL POST



LINE 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.

Two bays of bracing for run of fence 150' (46 m)
to less than 300' (92 m) to corner, end or gate post.

Three bays of bracing for run of fence 300' (92 m)
or more to corner, end, gate or pull post.

	Illinois Department of Transportation
PASSED	January 1, 2009
<i>[Signature]</i>	
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2009
<i>[Signature]</i>	
ENGINEER OF DESIGN AND ENVIRONMENT	

CORNER OR END POST

WOVEN WIRE FENCE

(Sheet 2 of 4)

STANDARD 665001-02

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 2 $\frac{1}{2}$ x2 $\frac{1}{2}$ x $\frac{1}{4}$ (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)	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. L, C, T, U, Y or other approved structural shapes	1.68 (2.50) 1.34 (1.99) 1.33 (1.98) 1.41 (2.10) 1.33 (1.98) min.	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 2 $\frac{1}{2}$ x2 $\frac{1}{2}$ x $\frac{1}{4}$ (64x64x6.4) or other approved structural shapes	2.27 (3.38) 1.83 (2.72) 1.82 (2.71) 3.19 (4.75) 3.1 (4.61) min.

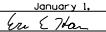
METAL ITEMS

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)	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 2 $\frac{1}{2}$ x2 $\frac{1}{2}$ x $\frac{1}{4}$ (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. 3x3x $\frac{3}{8}$ (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. 3 $\frac{1}{2}$ x3 $\frac{1}{2}$ x $\frac{3}{8}$ (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)

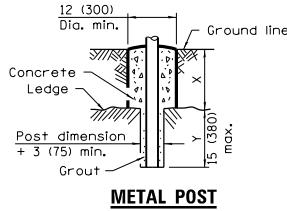
GATE, CORNER, END or PULL POSTS	BRACES and LINE POSTS	BLOCKS
6 to 7 (150 to 175) Top dia. 6x6 (150x150)	4 to 5 (100 to 125) Top dia. 4x4 (100x100)	2x8x18 (50x200x450)

	Illinois Department of Transportation
PASSED	January 1, 2009
	Signature
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2009
	Signature
ENGINEER OF DESIGN AND ENVIRONMENT	

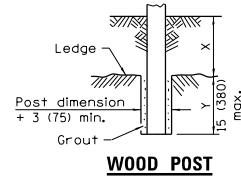
WOVEN WIRE FENCE

(Sheet 3 of 4)

STANDARD 665001-02



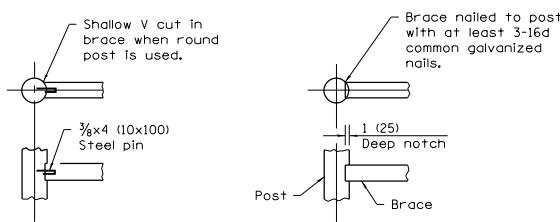
METAL POST



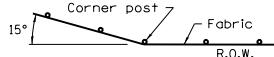
WOOD POST

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**

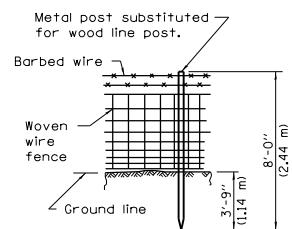


ALTERNATE DETAILS FOR FASTENING **WOOD BRACE TO WOOD POST**

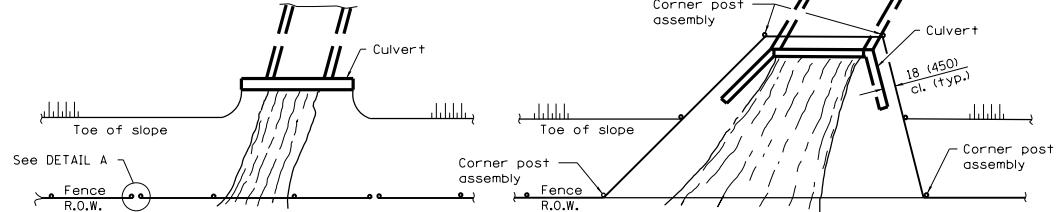


NOTE
Where fence line has a change in direction of 15° or more, a corner post with bracing as required shall be placed as shown above. Where angle is less than 15° and existing conditions require a corner post, they shall be placed as directed by the Engineer.

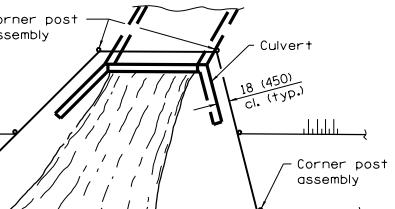
INSTALLATION AT CORNERS



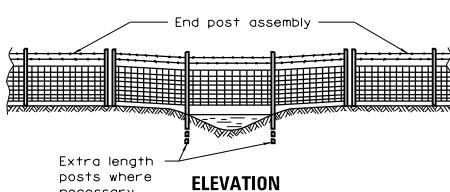
PROTECTIVE ELECTRICAL GROUNDING **FOR WOOD POST FENCE INSTALLATION**



PLAN AT STREAM CROSSING



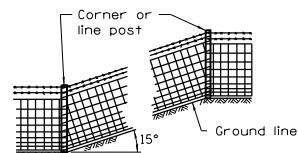
PLAN AT HEADWALL



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.

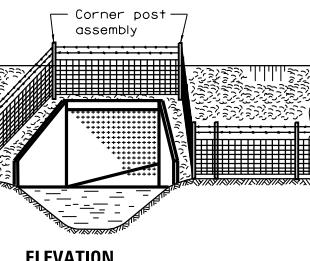
INSTALLATION OVER STREAM



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.

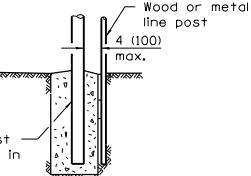
INSTALLATION ON SLOPES



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



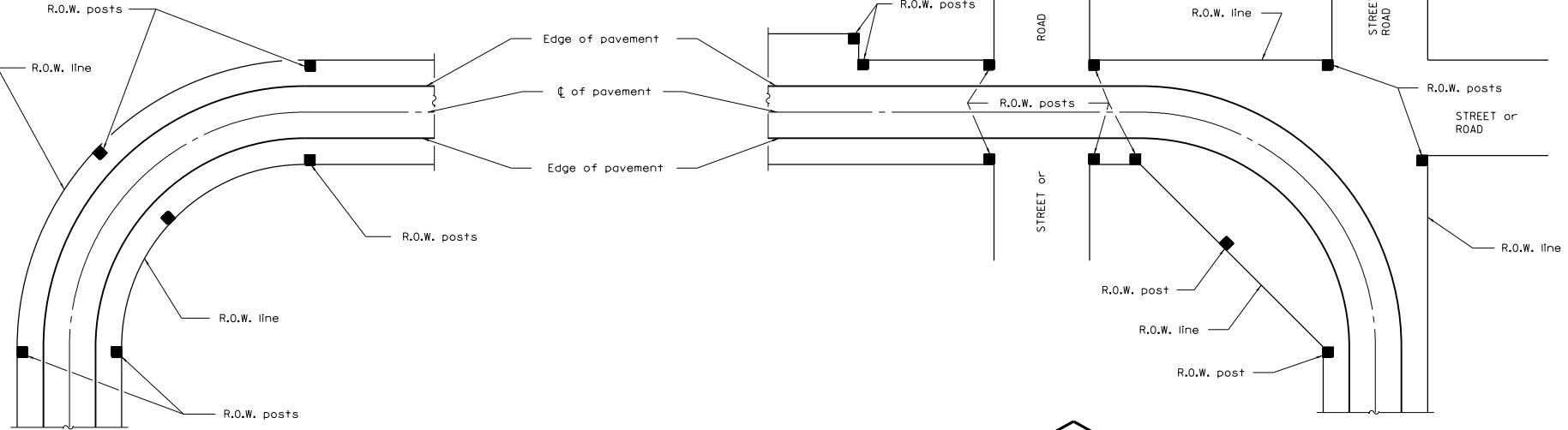
DETAIL A

	Illinois Department of Transportation
PASSED	January 1, 2009
S. H. Sherry	ISSUED
ENGINEER OF POLICY AND PROCEDURES	1-1-09
APPROVED	January 1, 2009
E. S. Shan	STANDARD 665001-02
ENGINEER OF DESIGN AND ENVIRONMENT	

(Sheet 4 of 4)

WOVEN WIRE FENCE

STANDARD 665001-02

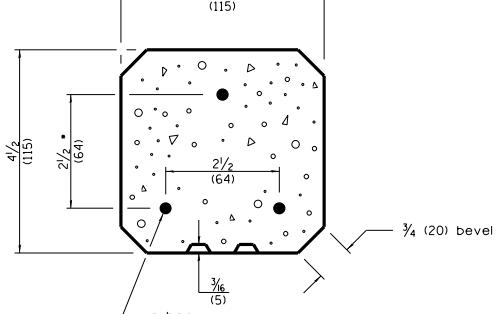


A vertical diagram of a concrete column section. At the top, there is a horizontal line with two tick marks. The distance between these tick marks is labeled '(25)'. Below this line, there is a vertical line segment with a horizontal tick mark near its top. This tick mark is labeled 'R'. To the right of this tick mark, there is another vertical line segment with a horizontal tick mark near its top. This tick mark is labeled 'O'. Below these tick marks, there is a horizontal line with a vertical tick mark near its center. This tick mark is labeled 'W'. A vertical line segment connects the 'R' and 'O' tick marks to this central tick mark. Below the 'W' tick mark, there is a horizontal line with a vertical tick mark near its center. This tick mark is labeled '15'. To the right of this tick mark, there is another horizontal line with a vertical tick mark near its center. This tick mark is labeled '21'. Below the '15' tick mark, there is a horizontal line with a vertical tick mark near its center. This tick mark is labeled '(380)'. Below the '21' tick mark, there is another horizontal line with a vertical tick mark near its center. This tick mark is labeled '(555)'. At the very bottom of the column, there is a horizontal line with a vertical tick mark near its center. This tick mark is labeled '37'. To the right of this tick mark, there is another horizontal line with a vertical tick mark near its center. This tick mark is labeled '(940)'.

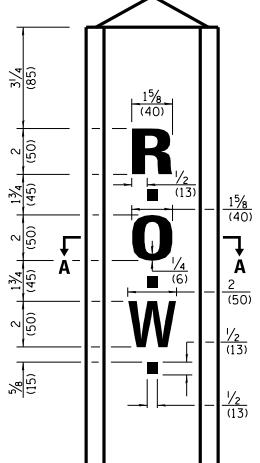
A technical drawing of a rectangular concrete pier. The pier has a height of 18' (4500 mm) and a thickness of 18" (450 mm). It features vertical reinforcement bars labeled 'R' and 'S' on the right side. A horizontal reinforcement bar labeled 'W' runs across the top. The pier is supported by a base plate with dimensions 33' (8400 mm) and 36' (9150 mm). The pier is set on a foundation with a thickness of 18" (450 mm) and a height of 4'-7" (1390 mm).

METHOD B

METHOD A



SECTION A-A



GENERAL NOTE

Reinforcement bars shall be No. 3 (No. 10) unless otherwise specified.

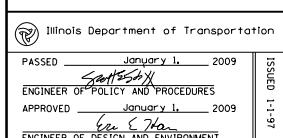
A $2\frac{3}{4} \times 12\frac{1}{8}$ (70x310) shadow box with beveled edges, and a $\frac{3}{16}$ (5) thick indentation may be used with the standard lettering shown.

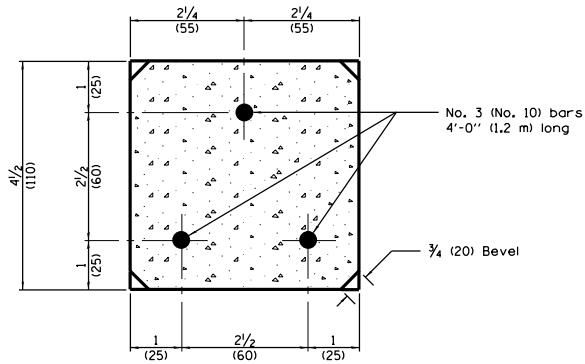
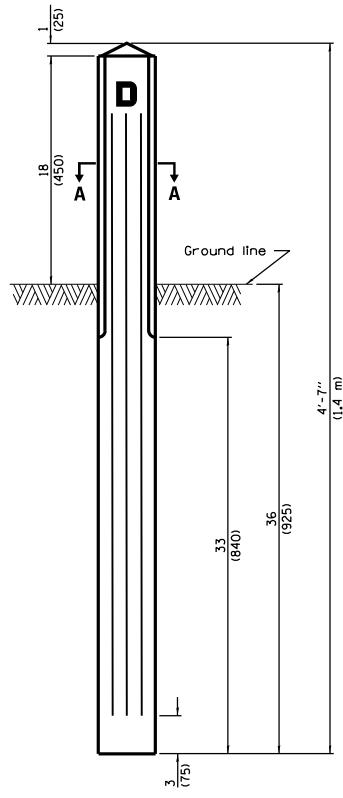
All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS	RIGHT OF WAY MARKERS
1-1-09	Switched units to English (metric).	
1-1-97	Renum. Standard 1744-6.	

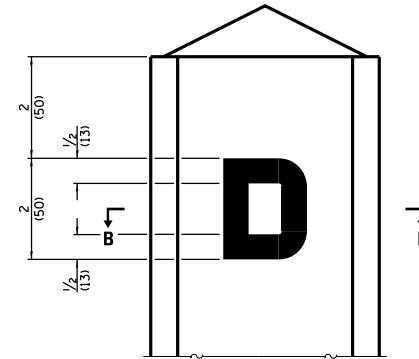
RIGHT OF WAY MARKERS

STANDARD 666001-01

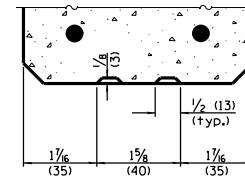




SECTION A-A



DETAIL OF LETTER

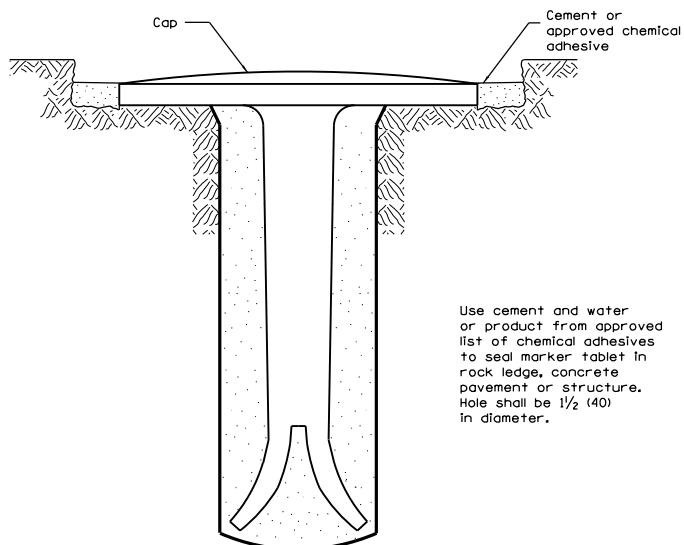
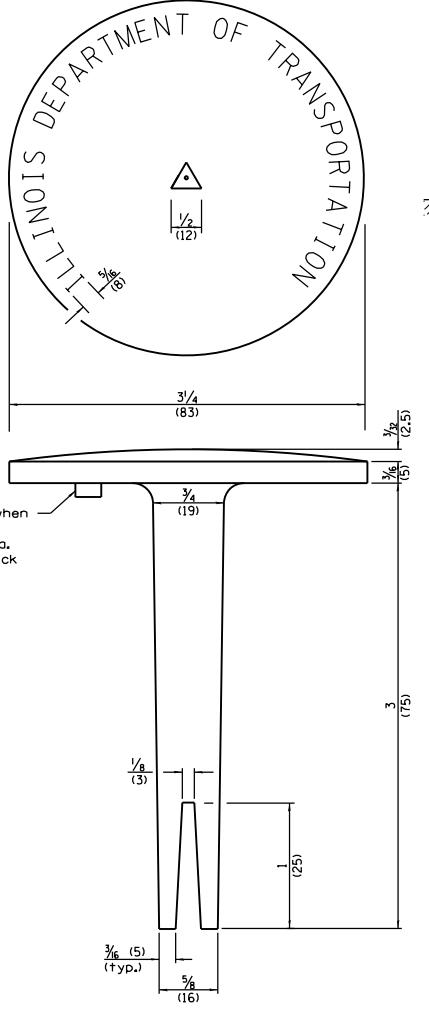


SECTION B-B

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

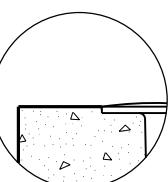
	Illinois Department of Transportation
PASSED	January 1, 2009
	State Engineer
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2009
	Engineer of Design and Environment

DATE	REVISIONS	DRAINAGE MARKERS
1-1-09	Switched units to English (metric).	
1-1-97	Renum. Standard 1999-4.	STANDARD 667001-01

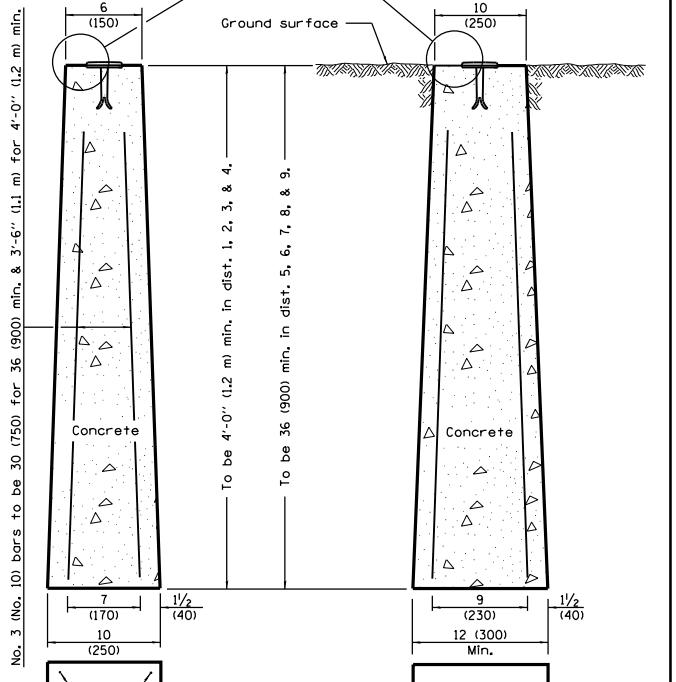


Tablet constructed in rock ledge or concrete.

TYPE I



DETAIL A



PRECAST MARKER

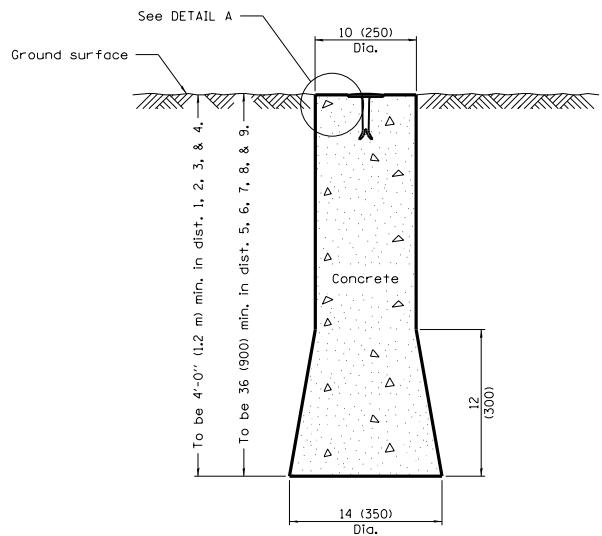
CAST-IN-PLACE MARKER

TYPE II

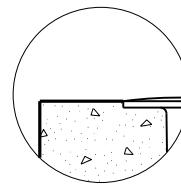
All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS	PERMANENT SURVEY MARKERS
I-1-12	Changed 'epoxy' references to 'chemical adhesives'.	
I-1-09	Switched units to English (metric).	STANDARD 667101-02

	Illinois Department of Transportation
PASSED	January 1, 2012
Michael Brand	1-1-12
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2012
Santosh Singh	1-1-12
ENGINEER OF DESIGN AND ENVIRONMENT	



ELEVATION



DETAIL A

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

	Illinois Department of Transportation
PASSED	January 1, 2009
<i>Santosh</i>	1-1-09
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2009
<i>Lee S. Thor</i>	1-1-09
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



**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
701201-04	Lane Closure, 2L, 2W, Day Only, for Speeds \geq 45 MPH
701206-03	Lane Closure, 2L, 2W, Night Only, for Speeds \geq 45 MPH
701301-04	Lane Closure, 2L, 2W, Short Time Operations
701306-03	Lane Closure, 2L, 2W, Slow Moving Operations Day Only, for Speeds \geq 45 MPH
701311-03	Lane Closure, 2L, 2W, Moving Operations - Day Only
701316-10	Lane Closure, 2L, 2W, Bridge Repair, for Speeds \geq 45 MPH
701321-15	Lane Closure, 2L, 2W, Bridge Repair with Barrier
701326-04	Lane Closure, 2L, 2W, Pavement Widening, for Speeds \geq 45 MPH
701331-04	Lane Closure, 2L, 2W, With Run-Around, for Speeds \geq 45 MPH
701336-06	Lane Closure, 2L, 2W, Work Areas in Series, for Speeds \geq 45 MPH
701400-08	Approach to Lane Closure, Freeway/Expressway
701401-09	Lane Closure, Freeway/Expressway
701402-11	Lane Closure, Freeway/Expressway, with Barrier
701406-10	Lane Closure, Freeway/Expressway, Day Operations Only
701411-09	Lane Closure, Multilane, at Entrance or Exit Ramp, for Speeds \geq 45 MPH
701416-09	Lane Closure, Freeway/Expressway, with Crossover and Barrier
701421-07	Lane Closure, Multilane, Day Operations Only, for Speeds \geq 45 MPH to 55 MPH
701422-08	Lane Closure, Multilane, for Speeds \geq 45 MPH to 55 MPH
701423-09	Lane Closure, Multilane, with Barrier, for Speeds \geq 45 MPH to 55 MPH
701426-08	Lane Closure, Multilane, Intermittent or Moving Operation, for Speeds \geq 45 MPH
701427-04	Lane Closure, Multilane, Intermittent or Moving Operation, for Speeds \leq 40 MPH
701428-01	Traffic Control, Setup and Removal, Freeway/Expressway
701431-11	Lane Closure, Multilane, Undivided with Crossover, for Speeds \geq 45 MPH to 55 MPH
701446-07	Two Lane Closure, Freeway/Expressway
701451-03	Ramp Closure Freeway/Expressway
701456-03	Partial Exit Ramp Closure Freeway/Expressway
701501-06	Urban Lane Closure, 2L, 2W, Undivided
701502-06	Urban Lane Closure, 2L, 2W, with Bidirectional Left Turn Lane
701601-09	Urban Lane Closure, Multilane, 1W or 2W with Nontraversable Median
701602-07	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

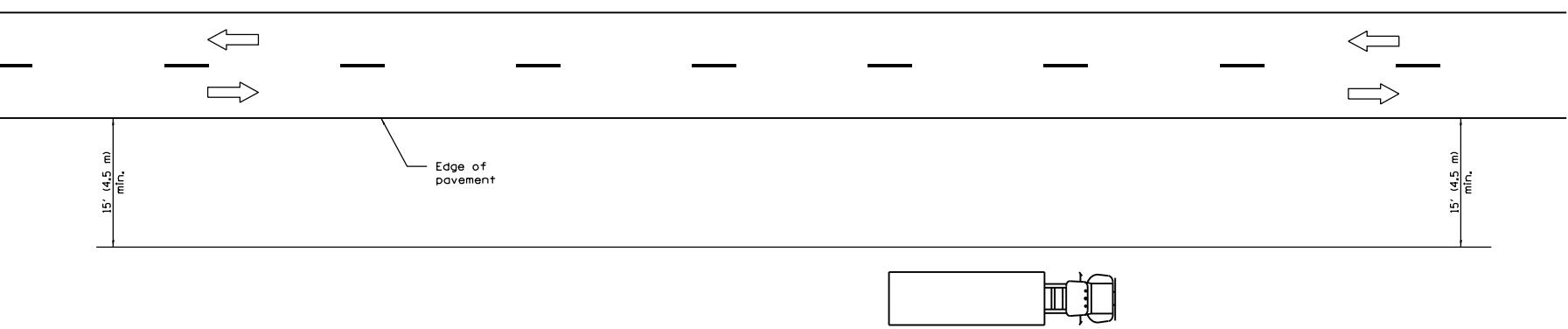
701701-10 Urban Lane Closure, Multilane Intersection
701801-06 Sidewalk, Corner or Crosswalk Closure
701901-05 Traffic Control Devices
704001-08 Temporary Concrete Barrier

SIGNING

720001-01 Sign Panel Mounting Details
720006-04 Sign Panel Erection Details
720011-01 Metal Posts for Signs, Markers and Delineators
720016-03 Mast Arm Mounted Street Name Signs
720021-02 Sign Panels, Extruded Aluminum Type
725001 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.

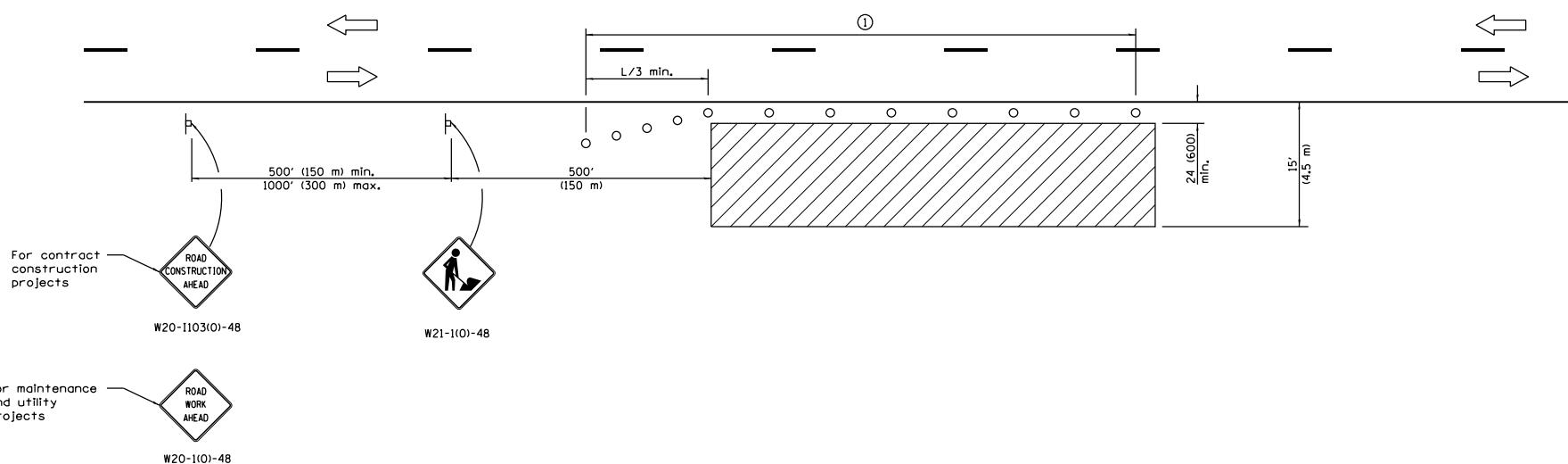
When the work operation requires that two or more work vehicles cross the 15' (4.5 m) clear zone in any one hour, traffic control shall be according to Standard 701006.

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

	Illinois Department of Transportation
APPROVED	January 1, 2009
	I-1-09
ENGINEER OF OPERATIONS	
APPROVED	January 1, 2009
	I-1-09
ENGINEER OF DESIGN AND ENVIRONMENT	

DATE	REVISIONS	OFF-RD OPERATIONS, 2L, 2W, MORE THAN 15' (4.5 m) AWAY
1-1-09	Switched units to English (metric).	
1-1-05	Revised title and notes.	

STANDARD 701001-02



TYPICAL APPLICATIONS

- Utility operations
- Culvert extensions
- Side slope changes
- Guardrail installation and maintenance
- Delineator installation
- Landscaping 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 L/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 mm) 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).

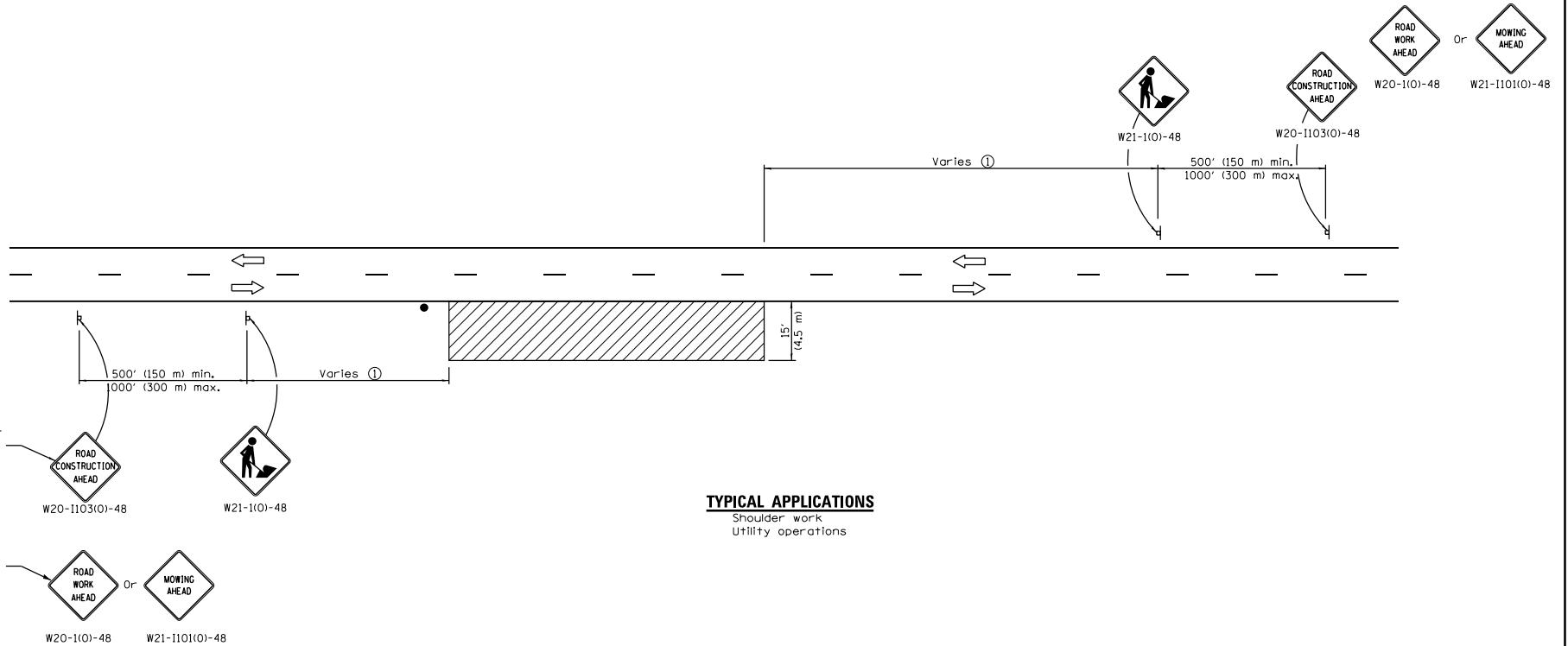
All dimensions are in inches (millimeters)
unless otherwise shown.

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

	Illinois Department of Transportation
APPROVED <i>[Signature]</i> January 1, 2014	ISSUED 1-1-14
ENGINEER OF SAFETY ENGINEERING	
APPROVED <i>[Signature]</i> January 1, 2014	
ENGINEER OF DESIGN AND ENVIRONMENT	



TYPICAL APPLICATIONS

Shoulder work
Utility operations

For contract construction projects

ROAD CONSTRUCTION AHEAD

W20-1103(O)-48

ROAD CONSTRUCTION AHEAD

W21-1101(O)-48

For maintenance and utility projects

ROAD WORK AHEAD

W20-1101(O)-48

MOWING AHEAD

W21-1101(O)-48

SYMBOLS



Work area



Sign

● Flagger with traffic control sign when required

	Illinois Department of Transportation
APPROVED <i>[Signature]</i>	January 1, 2014
ENGINEER OF SAFETY ENGINEERING	
APPROVED <i>[Signature]</i>	JANUARY 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT	

ISSUED 1-1-17

- ① Minimum distance is 200' (60 m). Maximum distance to be determined by the Engineer but should not exceed $\frac{1}{2}$ 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.

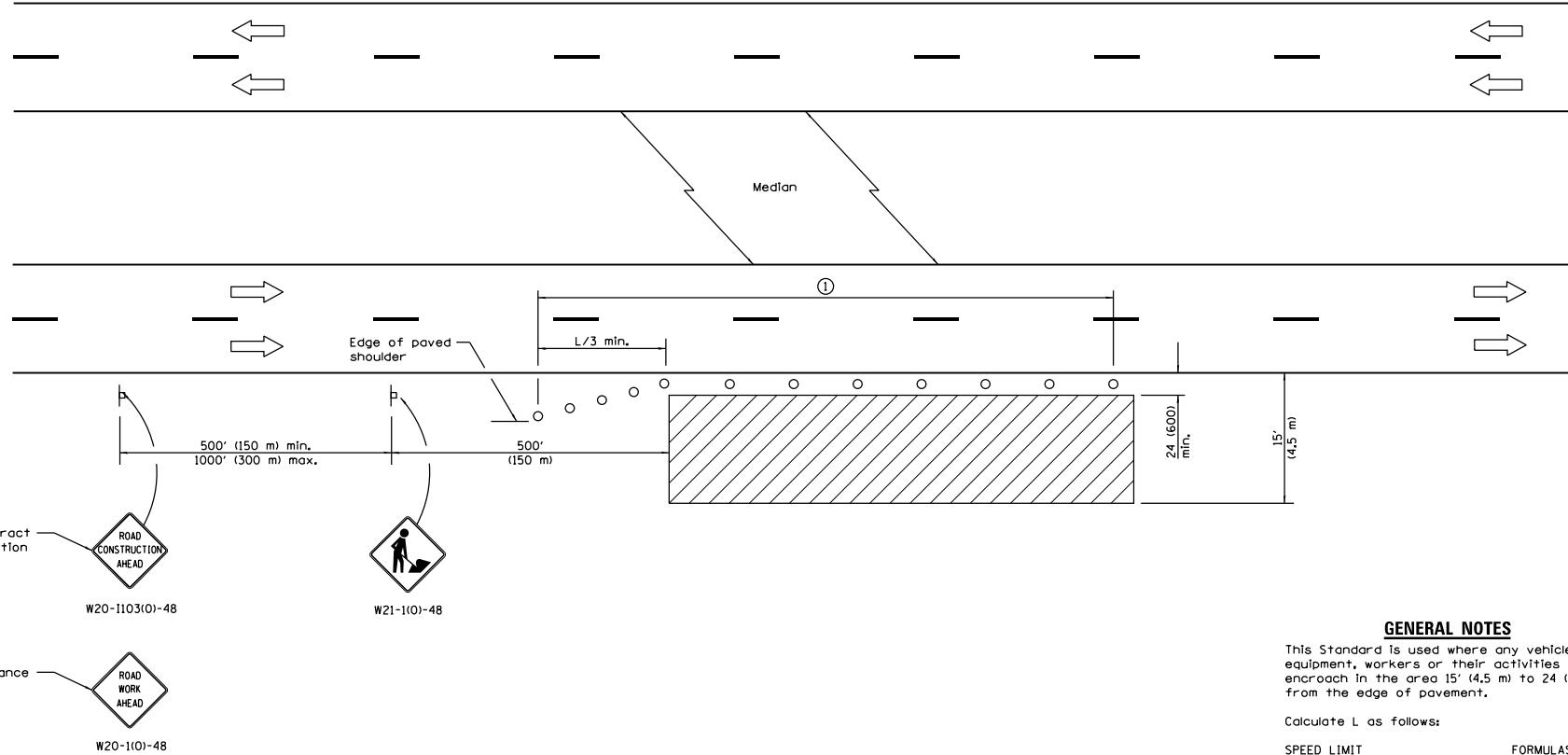
When the work operation does not exceed 60 minutes, traffic control may be according to Standard 701301.

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-RD MOVING OPERATIONS,
2L, 2W, DAY ONLY**

STANDARD 701011-04



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

Illinois Department of Transportation
APPROVED April 1, 2016
ENGINEER OF SAFETY ENGINEERING
APPROVED April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

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 mm) from the edge of pavement.

Calculate L as follows:

SPEED LIMIT	FORMULAS
English	Metric
40 mph (70 km/h) or less:	$L = \frac{WS^2}{60}$
45 mph (80 km/h) or greater:	$L = (W)(S)$

$$L = \frac{WS^2}{150}$$

W = Width of offset
in feet (meters).

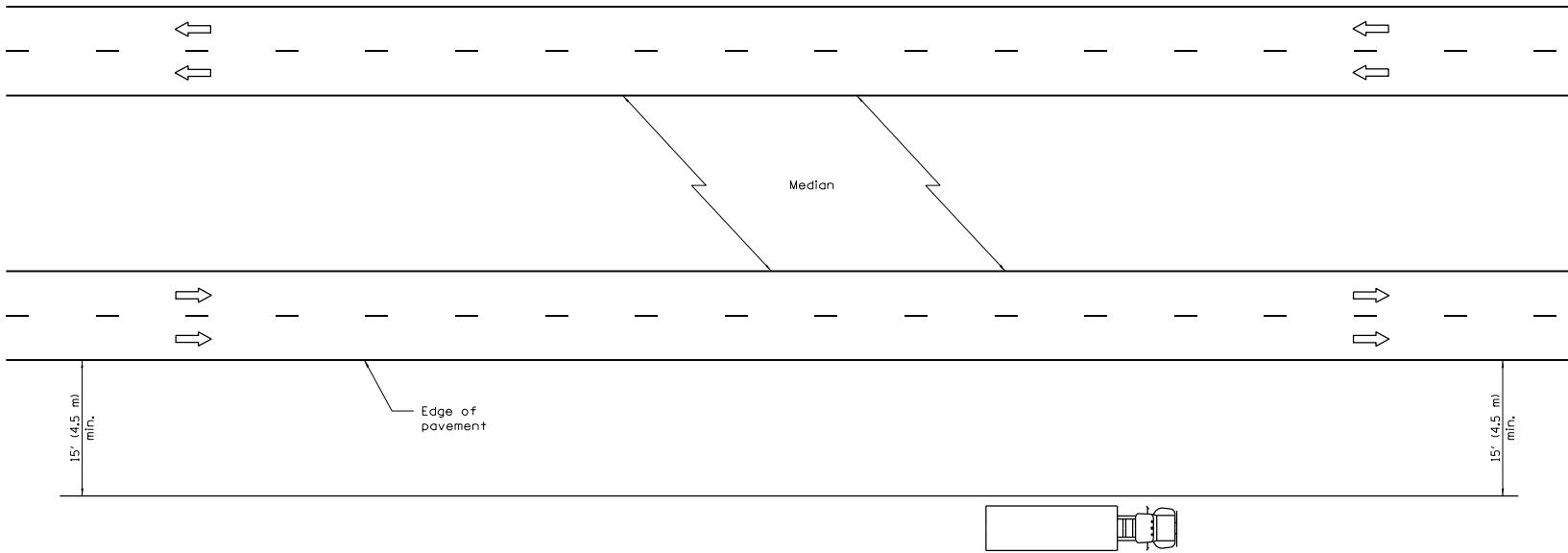
S = Normal posted speed
mph (km/h).

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

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



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 70110.

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.

TYPICAL APPLICATIONS

- Landscape work
- Utility work
- Fencing contracts

	Illinois Department of Transportation
APPROVED	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.

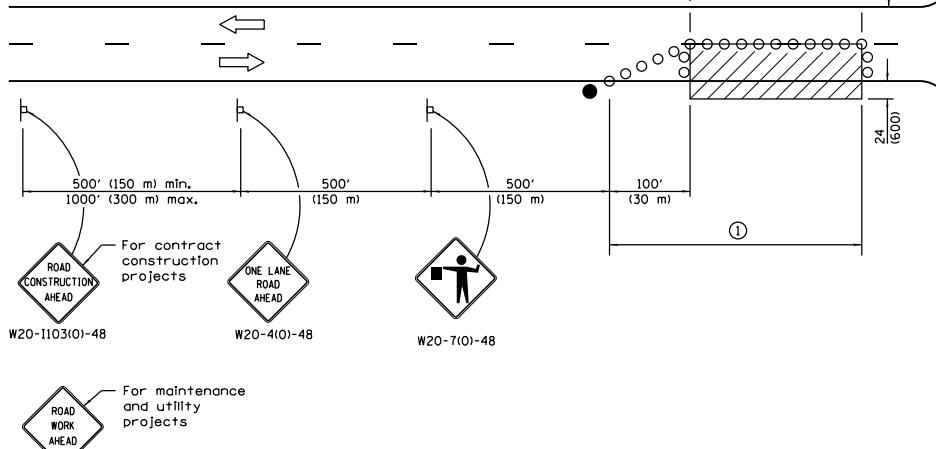
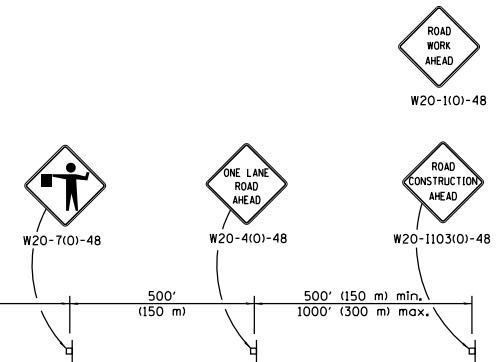
OFF-RD OPERATIONS, MULTILANE, MORE THAN 15' (4.5 m) AWAY

STANDARD 701106-02

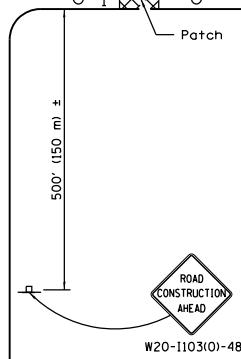
① Cones at 25' (8 m) centers for 250' (75 m). Additional cones may be placed at 50' (15 m) centers. When drums or barricades are used, the interval between devices may be doubled.



500' (150 m) ±
1 mile (1600 m)
max.



Sideroad



SYMBOLS

- Work area
- Sign
- Barricade or drum
- Cone, drum or barricade
- Flagger with traffic control sign

TYPICAL APPLICATIONS

- Isolated patching
- Utility operations
- Storm sewer
- Culverts
- Cable placement

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.

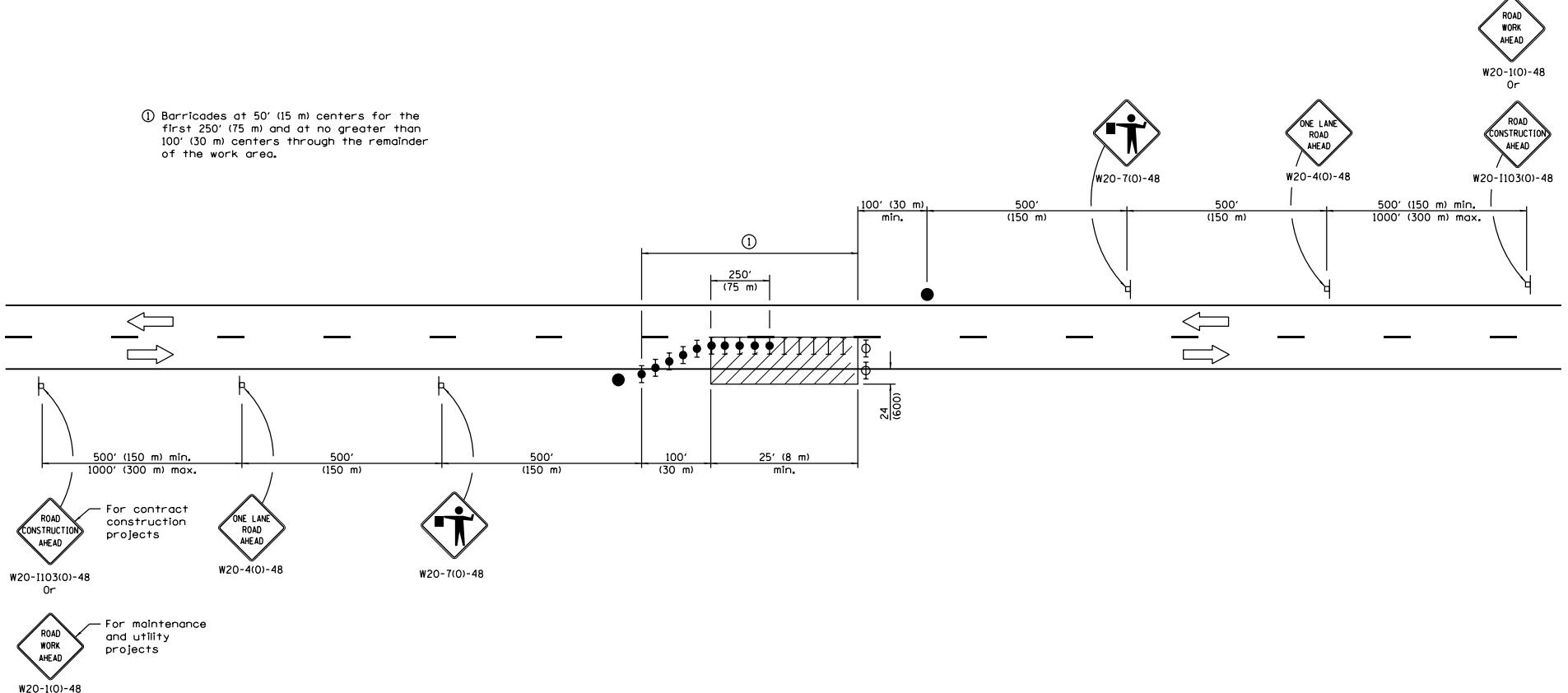
DATE	REVISIONS	LANE CLOSURE, 2L, 2W, DAY ONLY, FOR SPEEDS ≥ 45 MPH
I-1-11	Revised flagger sign.	
I-1-09	Switched units to English (metric).	
	Corrected sign No.'s.	

STANDARD 701201-04

	Illinois Department of Transportation
APPROVED	January 1, 2011
ENGINEER OF SAFETY ENGINEERING	
APPROVED	January 1, 2011
ENGINEER OF DESIGN AND ENVIRONMENT	

ISSUED 1-1-07

① Barricades at 50' (15 m) centers for the first 250' (75 m) and at no greater than 100' (30 m) centers through the remainder of the work area.



TYPICAL APPLICATIONS

Isolated patch
Installation of drainage structure
Utility operations

SYMBOLS

- Work area
- Sign
- Flagger with traffic control sign
- Barricade or drum
- Barricade or drum with flashing light
- Barricade or drum with steady burning light

	Illinois Department of Transportation
APPROVED	January 1, 2011
ENGINEER OF SAFETY ENGINEERING	
APPROVED	January 1, 2011
ENGINEER OF DESIGN AND ENVIRONMENT	

ISSUE 1-1-97

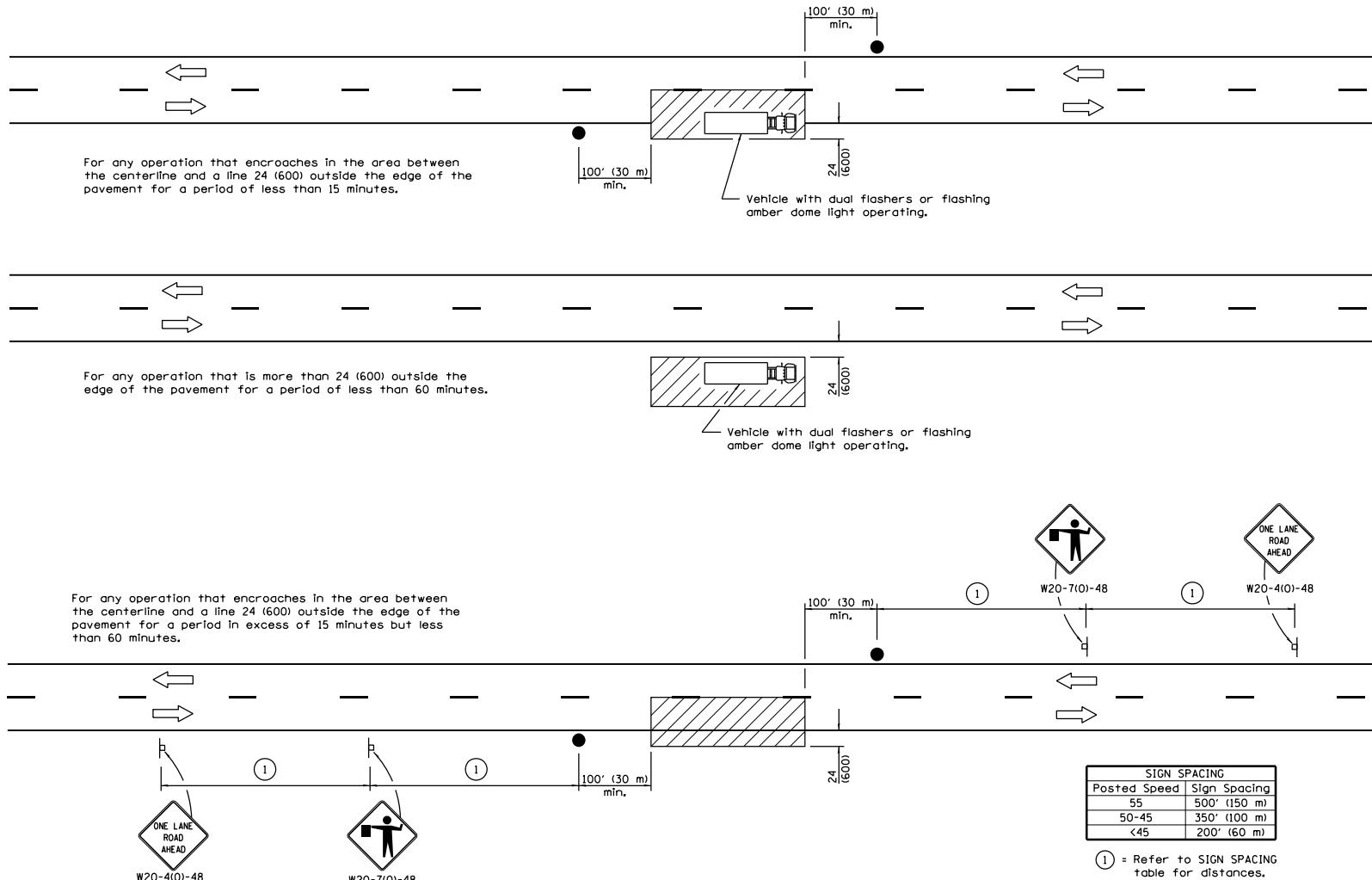
GENERAL NOTES

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
1-1-11	Revised flagger sign.
1-1-09	Switched units to English (metric).
	Corrected sign No.'s.

**LANE CLOSURE, 2L, 2W,
NIGHT ONLY,
FOR SPEEDS \geq 45 MPH**
STANDARD 701206-03



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

	Illinois Department of Transportation
APPROVED <i>[Signature]</i> January 1, 2011	1-1-11
ENGINEER OF SAFETY ENGINEERING <i>[Signature]</i>	1-1-11-97
APPROVED <i>[Signature]</i> January 1, 2011	
ENGINEER OF DESIGN AND ENVIRONMENT <i>[Signature]</i>	

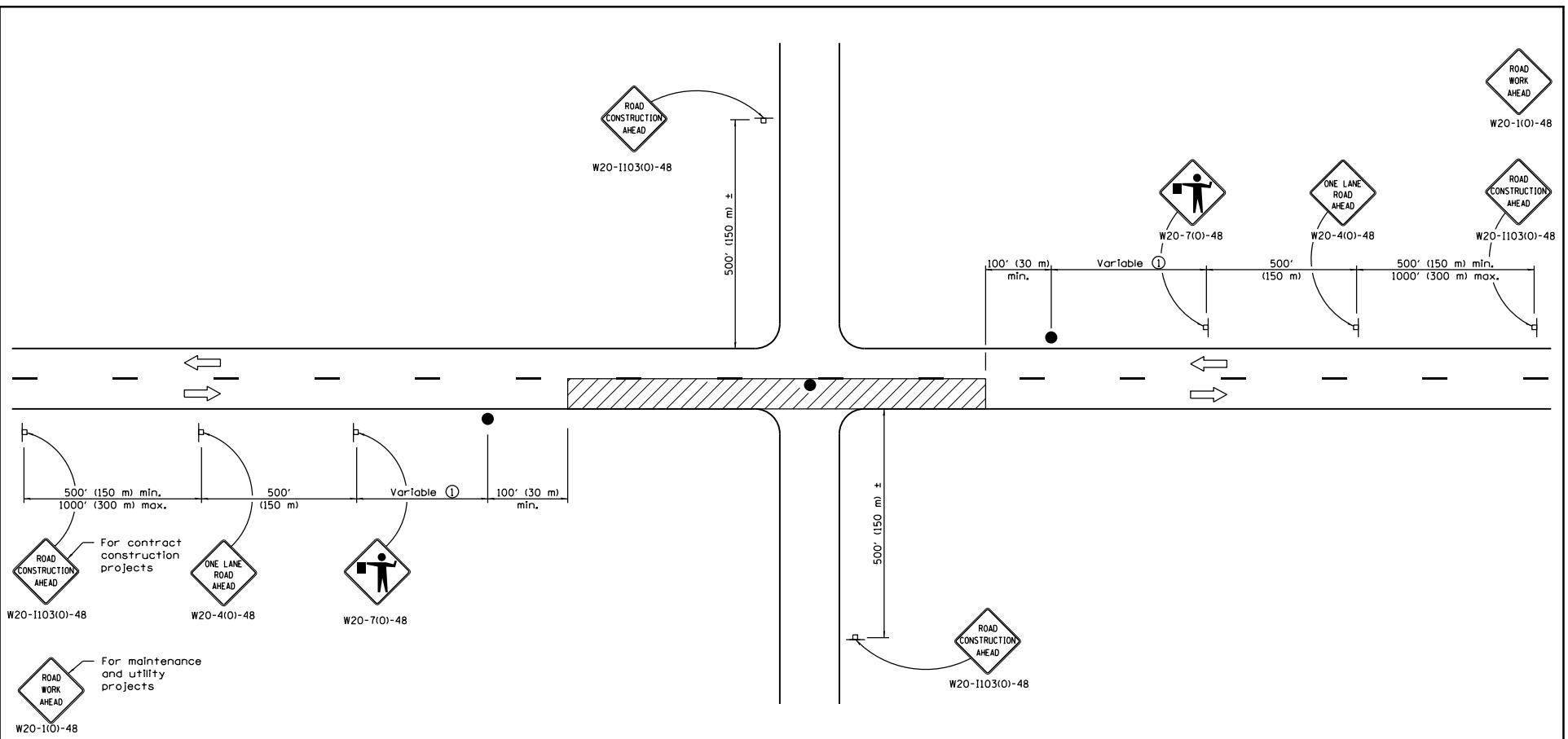
TYPICAL APPLICATIONS

- 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

DATE	REVISIONS	LANE CLOSURE, 2L, 2W, SHORT TIME OPERATIONS STANDARD 701301-04
1-1-11	Revised flagger sign.	
1-1-09	Switched units to English (metric).	



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 ½ 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 mph (2 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.

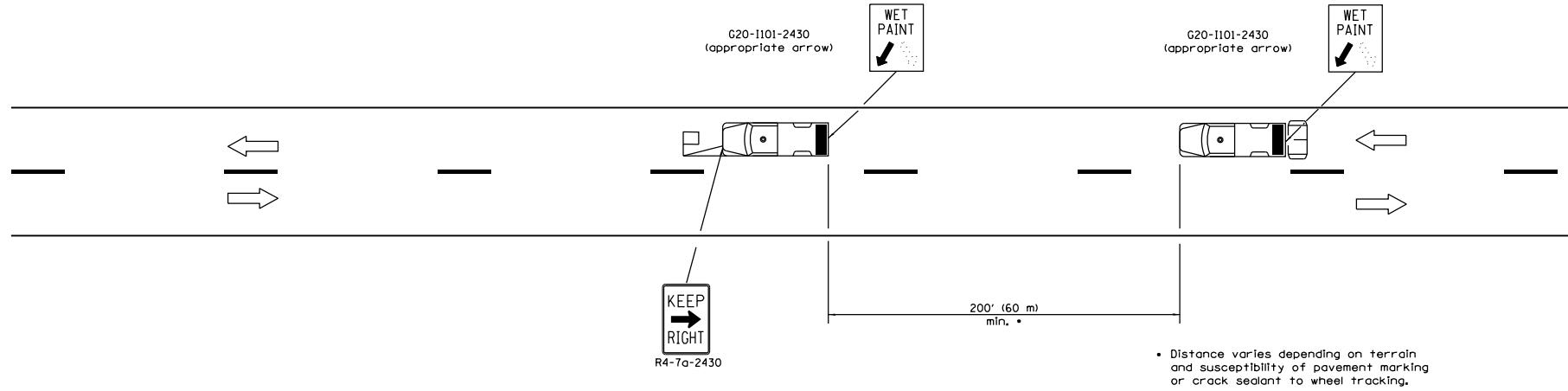
All dimensions are in inches (millimeters) unless otherwise shown.

LANE CLOSURE, 2L, 2W, SLOW MOVING OPERATIONS DAY ONLY, FOR SPEEDS \geq 45 MPH

STANDARD 701306-03

	Illinois Department of Transportation
APPROVED <i>[Signature]</i>	January 1, 2011
ENGINEER OF SAFETY ENGINEERING	
APPROVED <i>[Signature]</i>	January 1, 2011
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.



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).

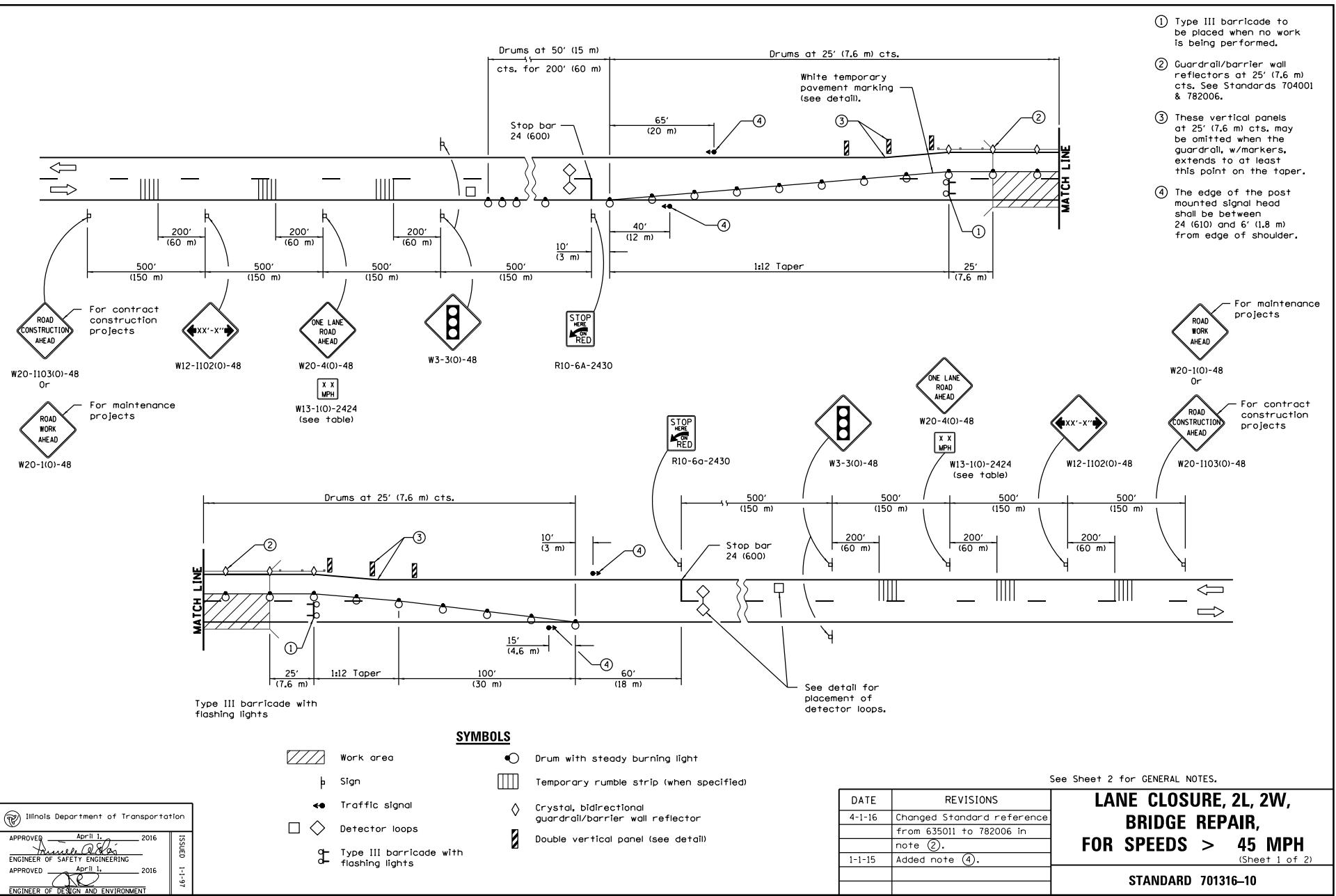
For shoulder operations not encroaching on the pavement, use DETAIL A, Standard 701426.

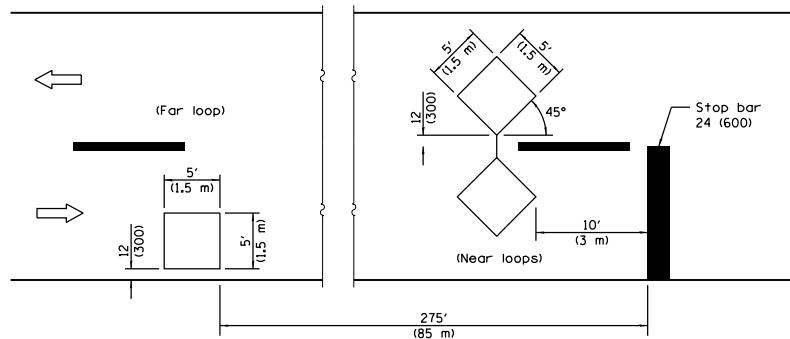
All dimensions are in inches (millimeters) unless otherwise shown.

	Illinois Department of Transportation
APPROVED	January 1, 2009
ENGINEER OF OPERATIONS	
APPROVED	January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT	

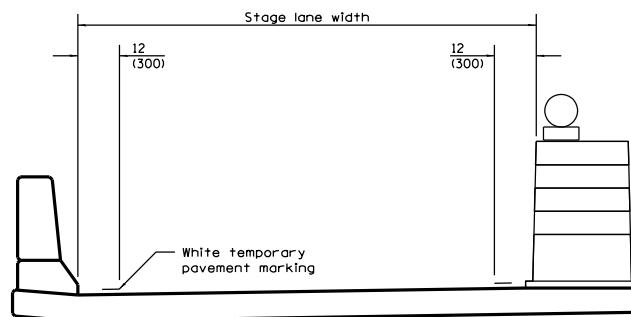
ISSUED 1-1-97

DATE	REVISIONS	LANE CLOSURE 2L, 2W MOVING OPERATIONS— DAY ONLY STANDARD 701311-03
1-1-09	Switched units to English (metric). Omitted Pass With Care sign.	
	Elim. speed restrictions in Standard title.	
1-1-00		





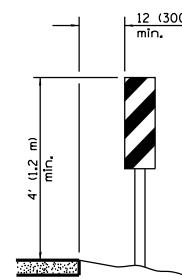
DETECTOR LOOPS



TEMPORARY PAVEMENT MARKING

TRAFFIC SIGNAL SEQUENCE						
PHASE	A		B			
	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.

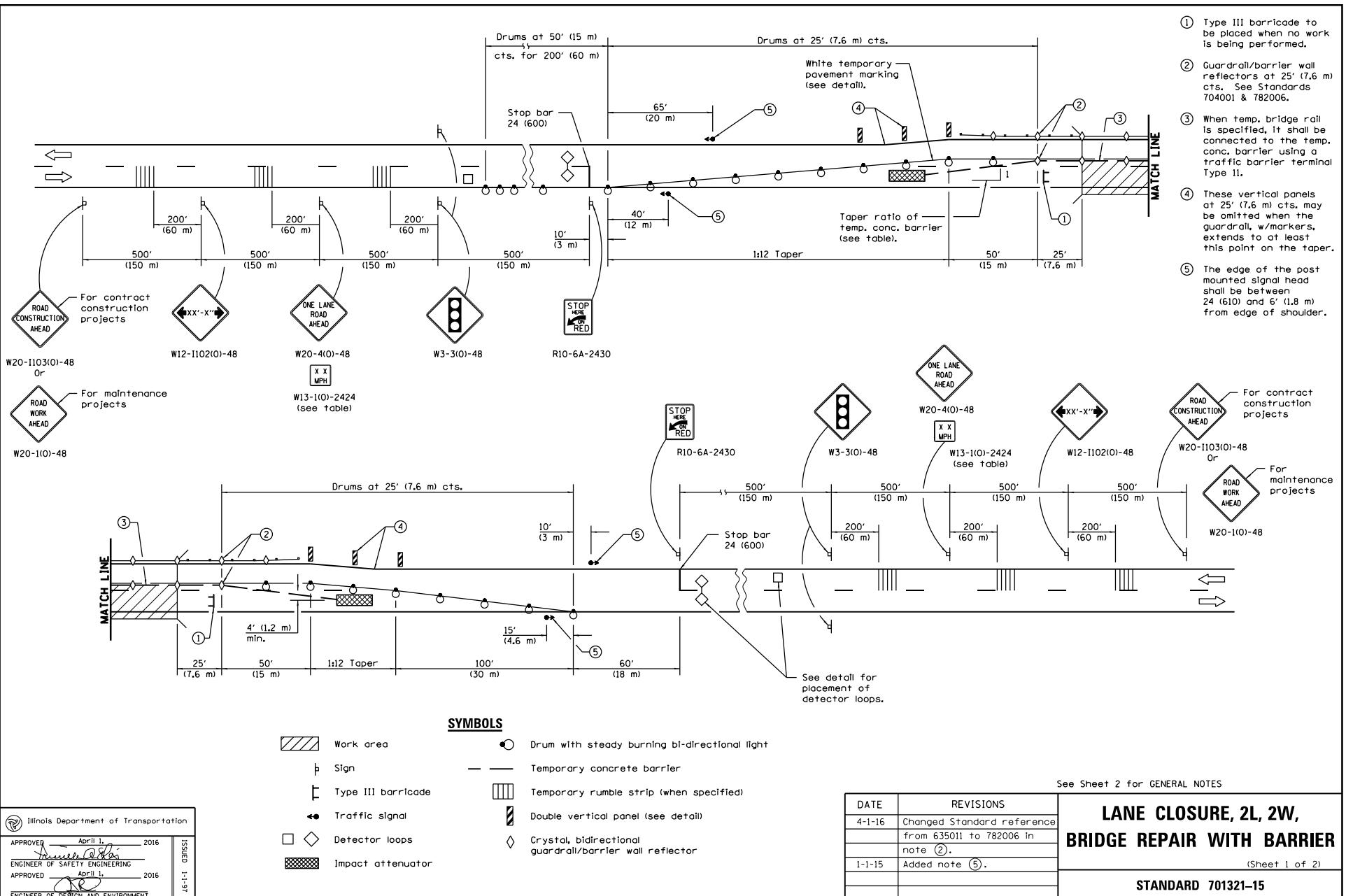
Existing or temporary pavement markings shall be on both sides of open lane from stop bar to stop bar.

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

**LANE CLOSURE, 2L, 2W,
BRIDGE REPAIR,
FOR SPEEDS > 45 MPH**
(Sheet 2 of 2)

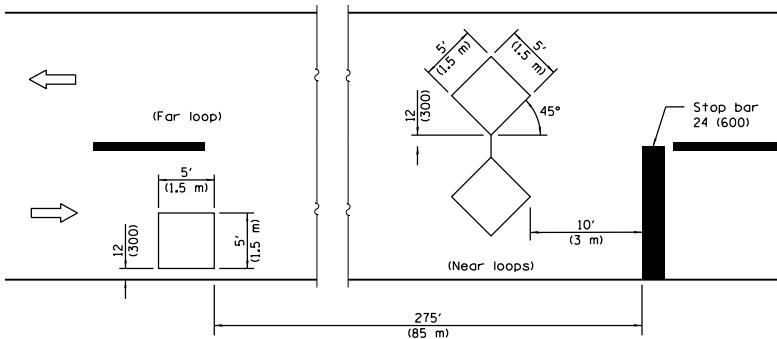
STANDARD 701316-10

	Illinois Department of Transportation
APPROVED	April 1, 2016
ENGINEER OF SAFETY ENGINEERING	
APPROVED	April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT	
1-1-97	

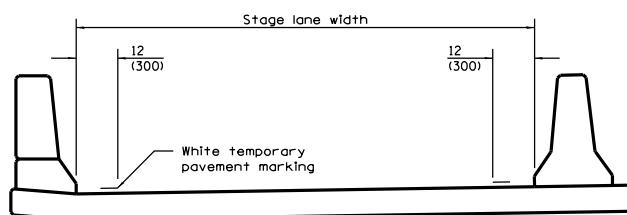


Illinois Department of Transportation

APPROVED <i>[Signature]</i> April 1, 2016	ISSUED <i>[Signature]</i> 1-1-16
ENGINEER OF SAFETY ENGINEERING	
APPROVED <i>[Signature]</i> April 1, 2016	
ENGINEER OF DESIGN AND ENVIRONMENT	



DETECTOR LOOPS

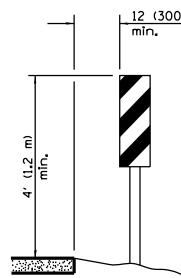


TEMPORARY PAVEMENT MARKING

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.

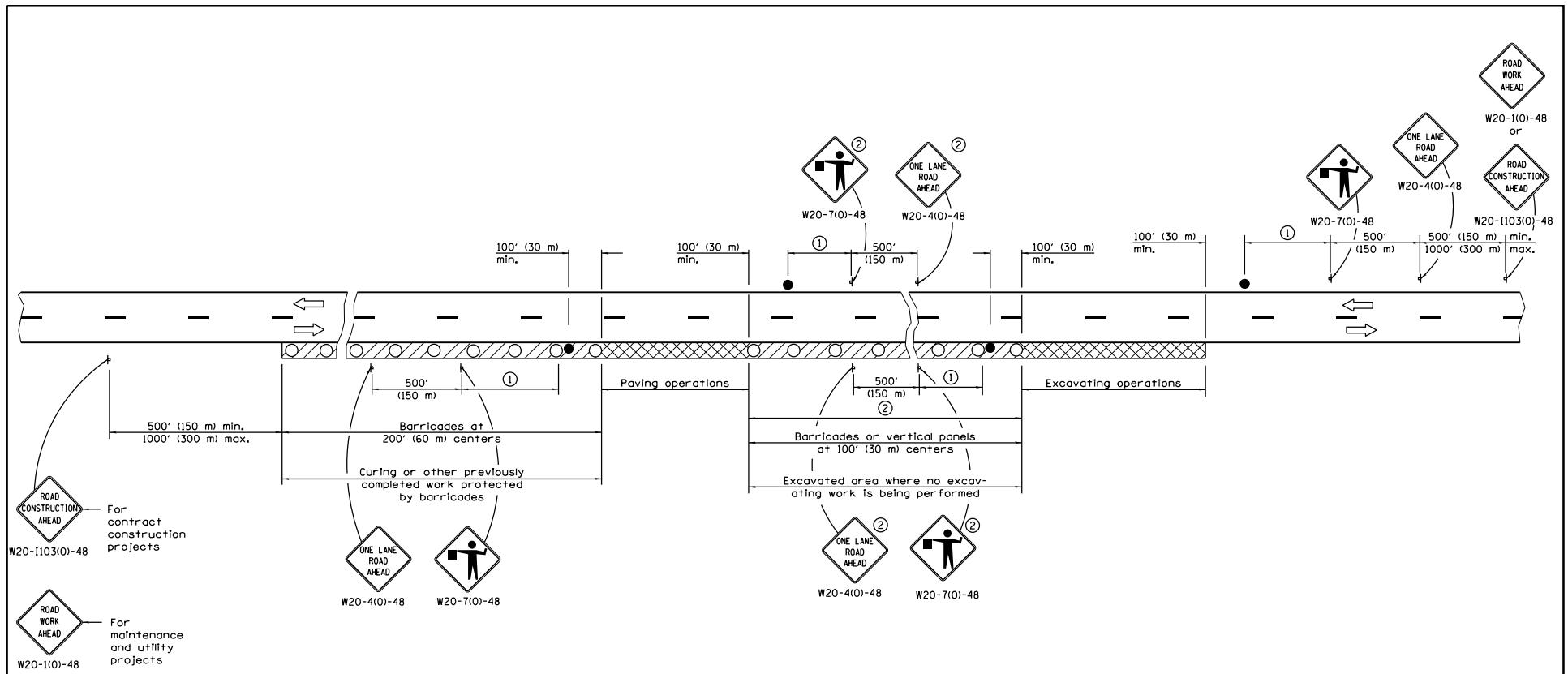
Temporary concrete barrier shall be according to Standard 704001.

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 701321-15	

	Illinois Department of Transportation
APPROVER	April 1, 2016
ENGINEER OF SAFETY ENGINEERING	
APPROVED	April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT	
1-1-97	



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 $\frac{1}{2}$ 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.

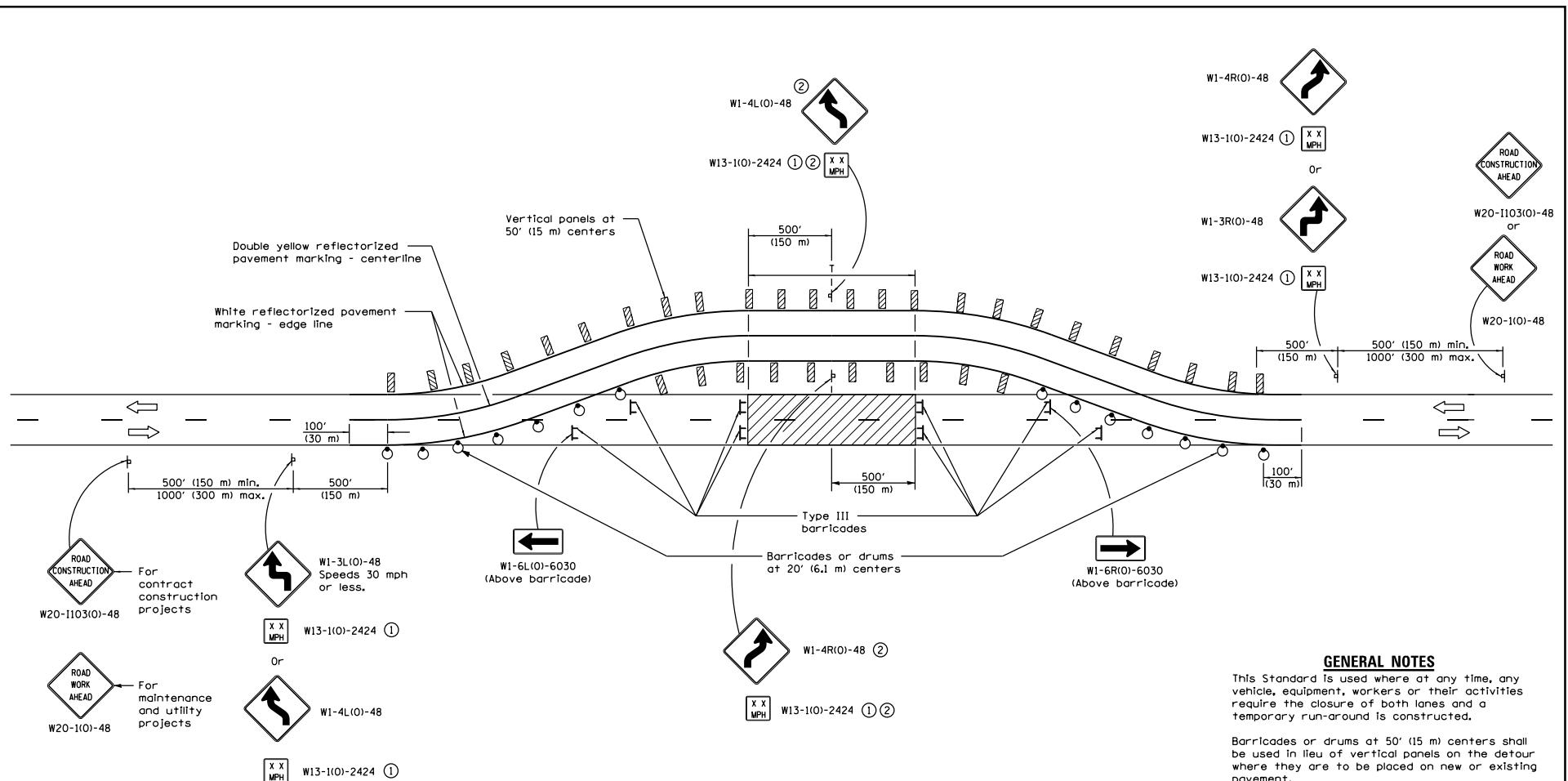
Two flaggers are required for each separate operation.

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

	Illinois Department of Transportation
APPROVED January 1, 2011	ISSUED 1-1-11
ENGINEER OF SAFETY ENGINEERING January 1, 2011	
APPROVED January 1, 2011	
ENGINEER OF DESIGN AND ENVIRONMENT	

DATE	REVISIONS	LANE CLOSURE, 2L, 2W, PAVEMENT WIDENING, FOR SPEEDS \geq 45 MPH
1-1-11	Revised flagger sign.	
1-1-09	Switched units to English (metric).	
	Corrected sign No.'s.	

STANDARD 701326-04



TYPICAL APPLICATIONS

Bridge construction
Culvert construction

SYMBOLS

- Work area
- Sign
- Barricade or drum with monodirectional steady burning 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).

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.

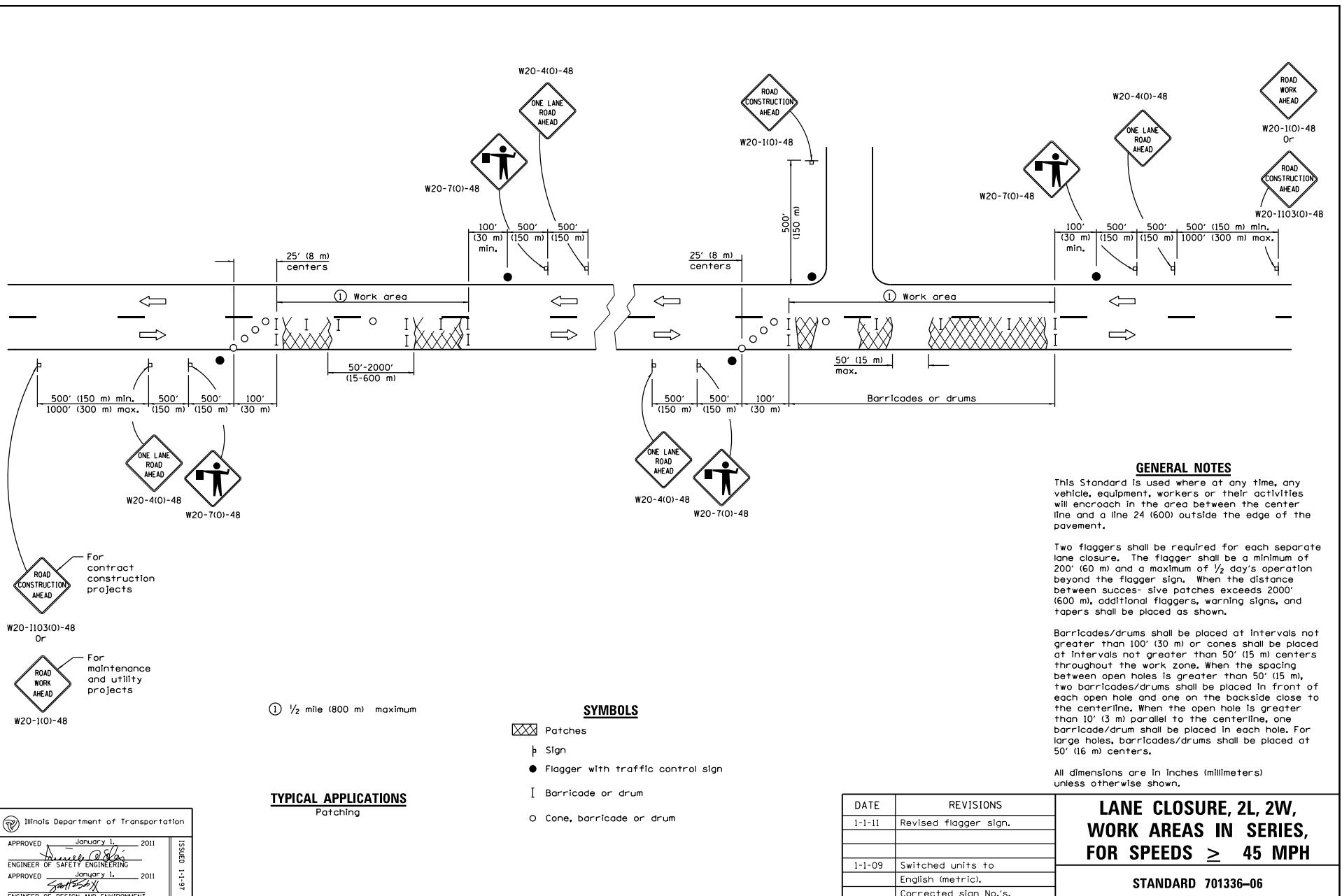
Where the tangent distance on the temporary run-around exceeds 600' (180 m), crystal delineators at 50' (15 m) centers may be substituted for the vertical panels, or the spacing between vertical panels may be increased to 100' (30 m) within the limits of the tangent.

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

	Illinois Department of Transportation
APPROVED <i>[Signature]</i>	January 1, 2011
ENGINEER OF SAFETY ENGINEERING	
APPROVED <i>[Signature]</i>	January 1, 2011
ENGINEER OF DESIGN AND ENVIRONMENT	

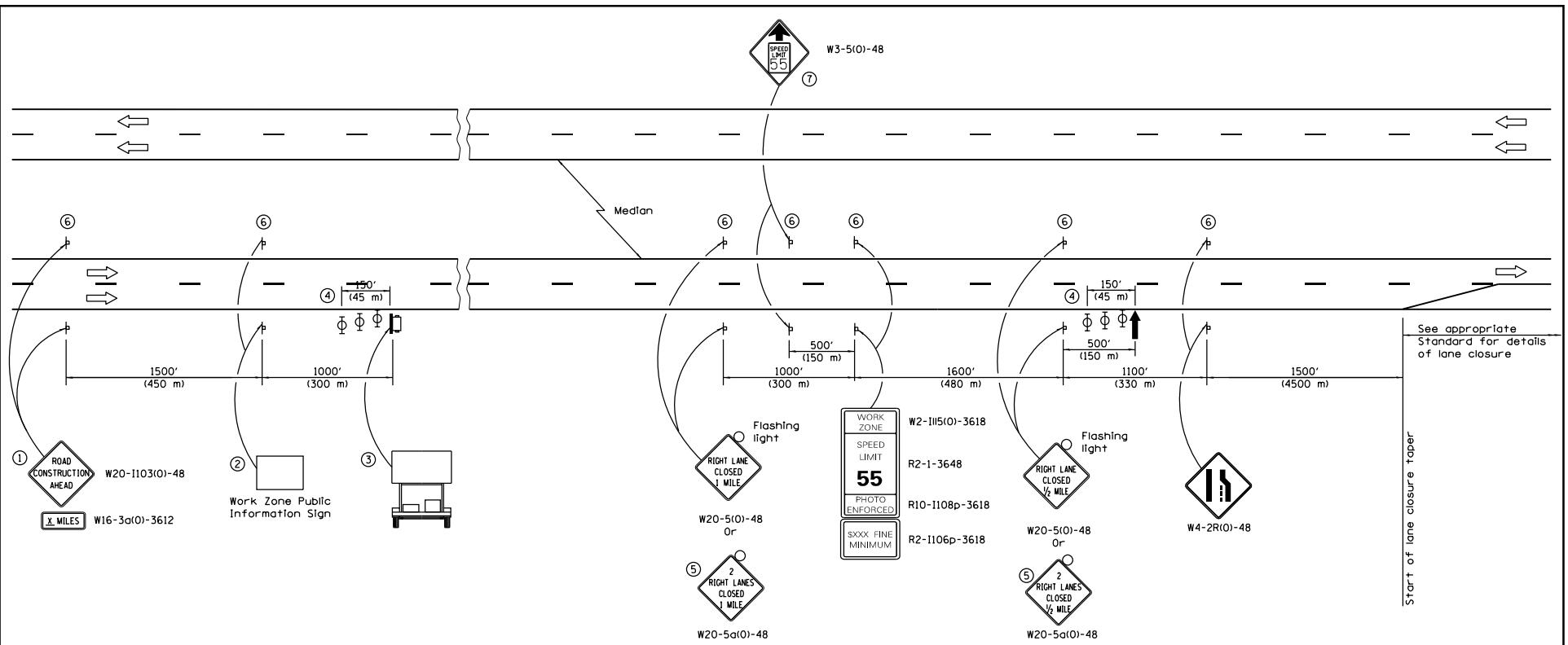
DATE	REVISIONS	LANE CLOSURE, 2L, 2W, WITH RUN-AROUND, FOR SPEEDS \geq 45 MPH
1-1-11	Changed vertical panel to double vertical panel.	
1-1-09	Switched units to English (metric).	
	Corrected sign No.'s.	

STANDARD 701331-04



Illinois Department of Transportation

APPROVED January 1, 2011 <i>[Signature]</i>	ISSUED 1-1-97
ENGINEER OF SAFETY ENGINEERING	
APPROVED January 1, 2011 <i>[Signature]</i>	
ENGINEER OF DESIGN AND ENVIRONMENT	



SYMBOLS

- ↑ Arrow board
- Portable changeable message 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 50' (15 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.

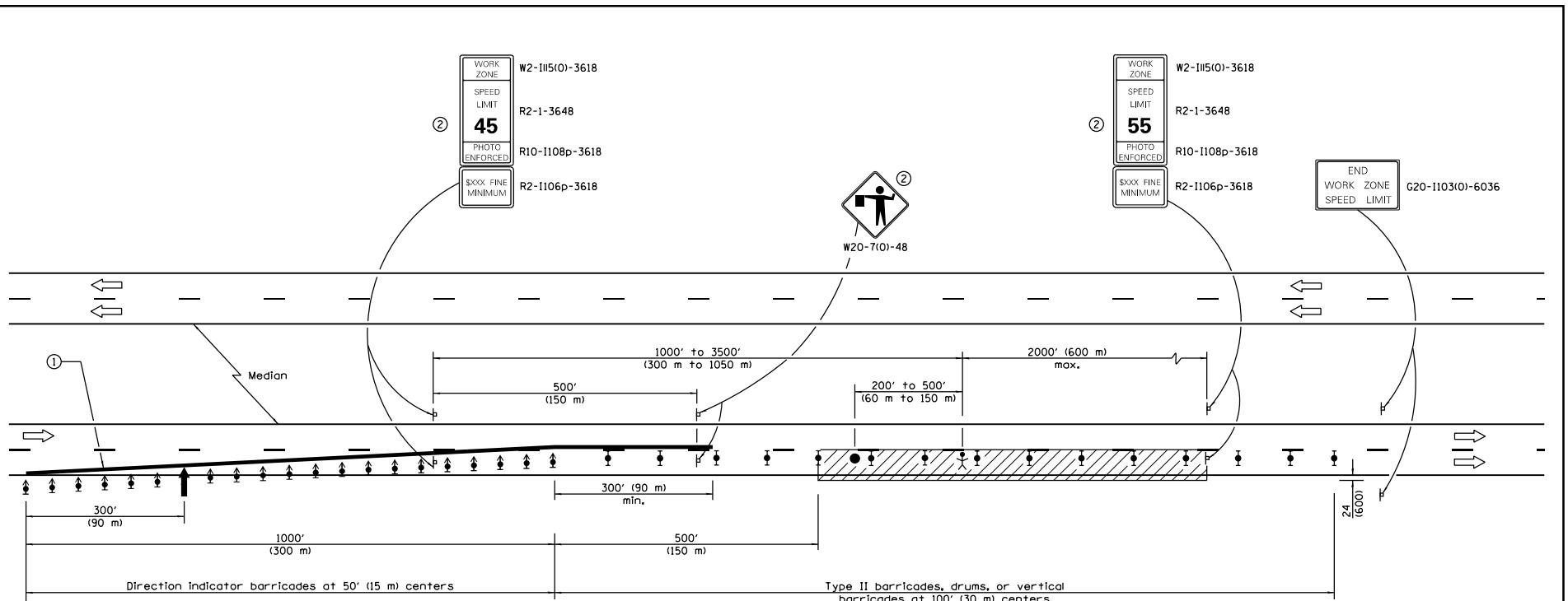
The last four signs and arrow board shall be moved as necessary to maintain the required distance from the start of the lane closure taper(s).

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

	Illinois Department of Transportation
APPROVED	January 1, 2015
ENGINEER OF SAFETY ENGINEERING	
APPROVED	January 1, 2015
ENGINEER OF DESIGN AND ENVIRONMENT	

DATE	REVISIONS
1-1-15	Revised '2 RIGHT LANES'
	CLOSED X MILE' sign
	number.
1-1-14	Added adv. warning speed
	reduction sign. Revised
	PHOTO ENFORCED sign no.

**APPROACH TO
LANE CLOSURE,
FREWAY/EXPRESSWAY**
STANDARD 701400-08



See Standard 701400 for approach
Start of lane closure taper

SYMBOLS

- ↑ Arrow board
- ▨ Work area
- worker 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

- (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 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 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.

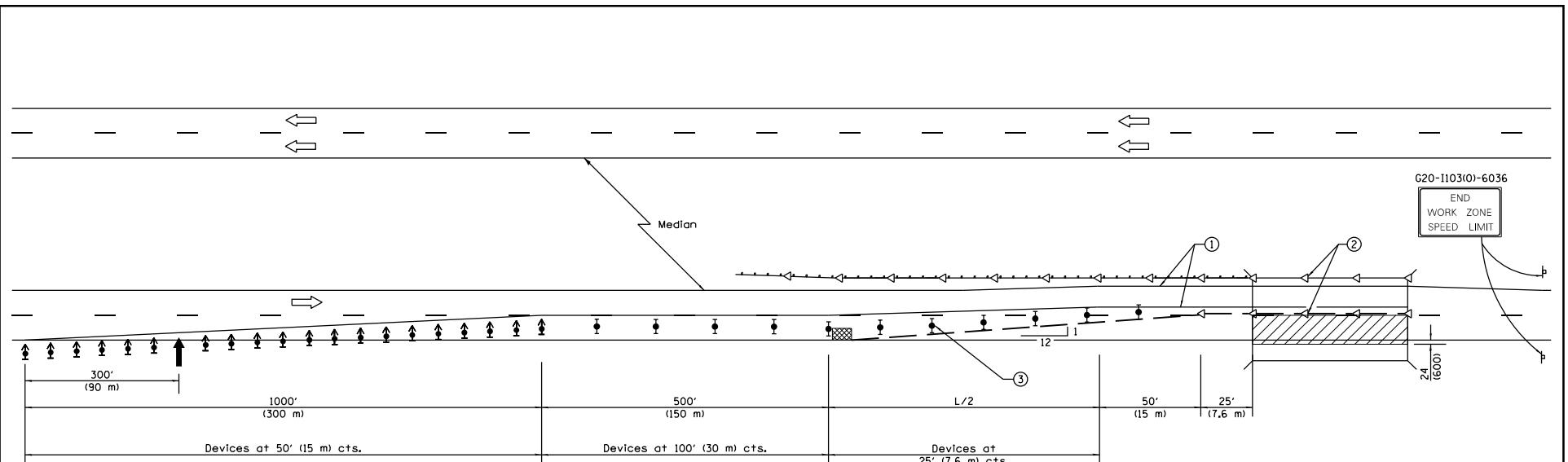
All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
1-1-15	Revised END WORK ZONE
	SPEED LIMIT sign dimensions.
1-1-14	Revised PHOTO ENFORCED
	sign number, Relocated
	sign at end of work area.

**LANE CLOSURE,
FREEWAY / EXPRESSWAY**
STANDARD 701401-09

Illinois Department of Transportation
APPROVED <i>[Signature]</i> January 1, 2015
ENGINEER OF SAFETY ENGINEERING
APPROVED <i>[Signature]</i> January 1, 2015
ENGINEER OF DESIGN AND ENVIRONMENT

I-11-197



See Standard 701400 for approach
Start of lane closure taper

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.

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	ENGLISH (Metric)
45 mph (80 km/h) or more	L = (W)(S) L = 0.65(W)(S)

W = Width of offset
in feet (meters).

S = Normal posted speed
in mph (km/h).

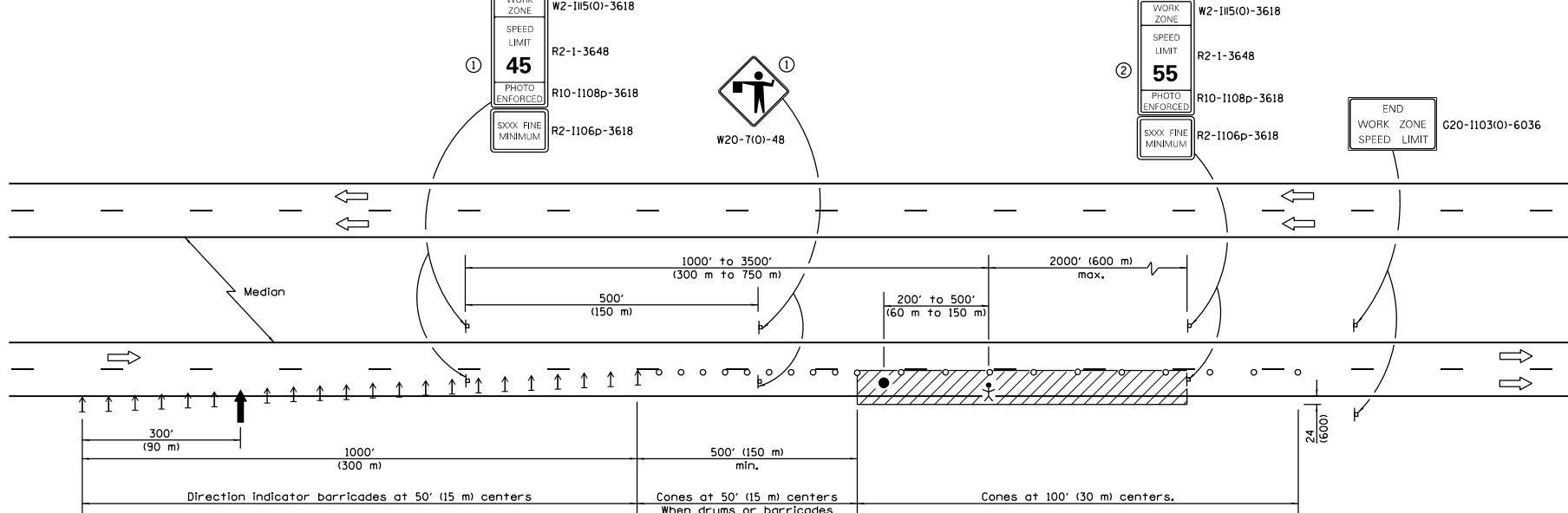
All dimensions are in inches (millimeters)
unless otherwise shown.

	Illinois Department of Transportation
APPROVED	April 1, 2016
ENGINEER OF SAFETY ENGINEERING	
APPROVED	April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT	

00-1-1-0353

DATE	REVISIONS
4-1-16	Added reference to Standards 704001 and 782006 in note ②.
1-1-15	Revised END WORK ZONE SPEED LIMIT sign dimensions.

**LANE CLOSURE,
FREEWAY/EXPRESSWAY,
WITH BARRIER**
STANDARD 701402-11



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
- Flagger with traffic control sign

(1) Work zone speed limit 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.

(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.

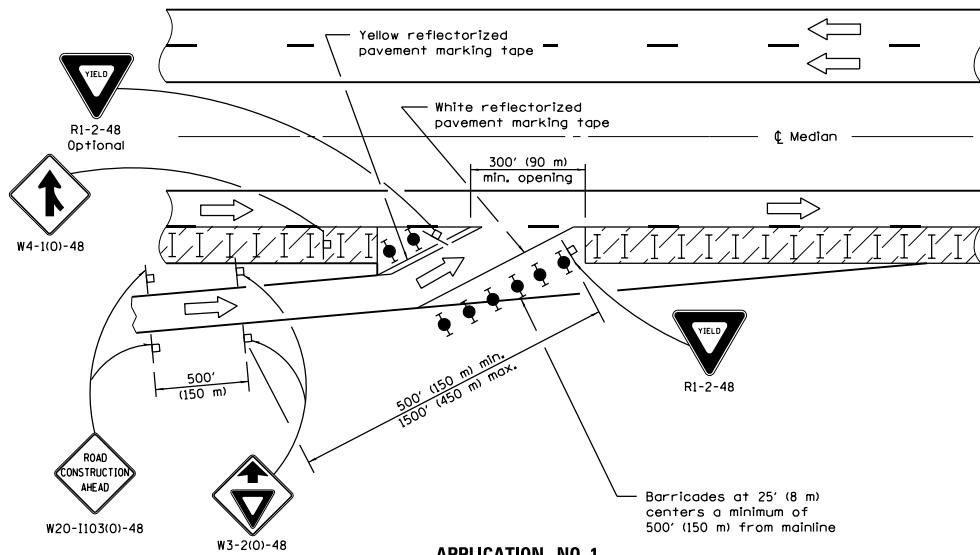
All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
4-1-16	Rev. dist. between wz speed limit sign and worker for consistency with other stds.
1-1-15	Revised END WORK ZONE SPEED LIMIT sign dimensions.

**LANE CLOSURE,
FREEWAY/EXPRESSWAY,
DAY OPERATIONS ONLY**
STANDARD 701406-10

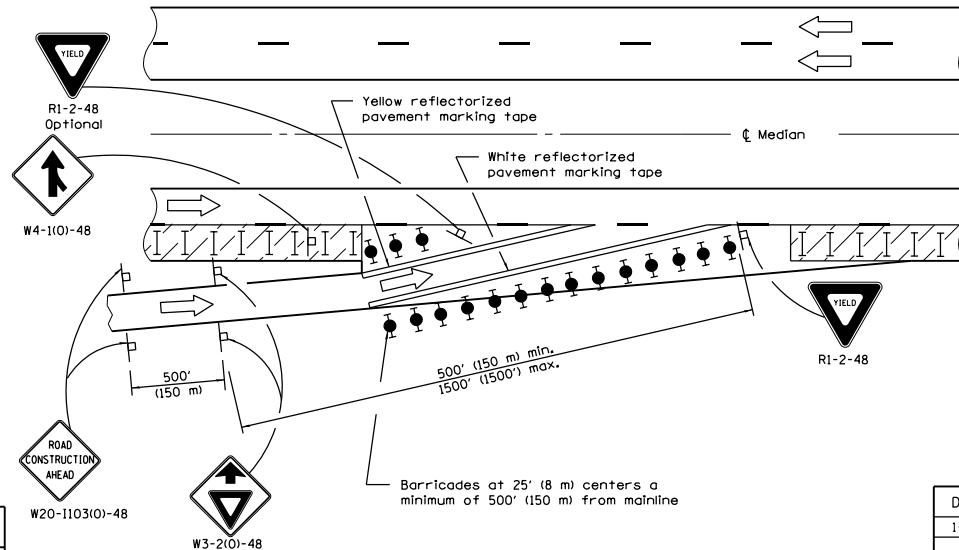
Illinois Department of Transportation
APPROVED April 1, 2016
Engineer of Safety Engineering
APPROVED April 1, 2016
Engineer of Design and Environment

I-1-197



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.

	Illinois Department of Transportation
APPROVED	January 1, 2015
ENGINEER OF SAFETY ENGINEERING	
APPROVED	January 1, 2015
ENGINEER OF DESIGN AND ENVIRONMENT	

ISSUE DATE
1-1-15

SYMBOLS	
	Work area
	Sign
	Type II barricades or drums with steady burning monodirectional light
	Type II 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.

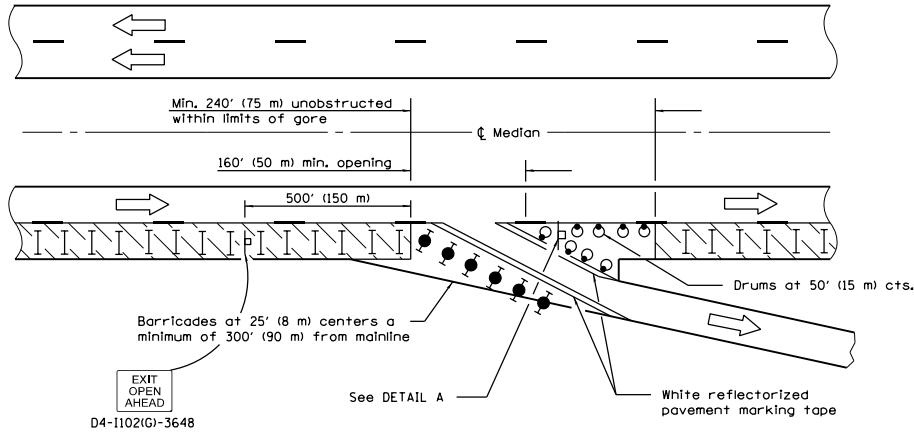
Cones may be utilized during daylight operations, at one half the spacing of drums/barricades.

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.

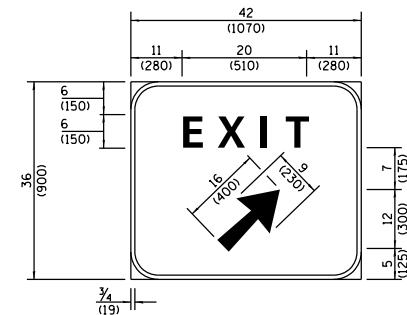
All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS	LANE CLOSURE, MULTILANE, AT ENTRANCE OR EXIT RAMP, FOR SPEEDS \geq 45 MPH (Sheet 1 of 2)
1-1-15	Revised gen. notes to limit App's 1 and 3 to five days, omit pvt. tape for \leq 5 days.	
I-1-12	Revised merge sign to agree with MUTCD, Dimensioned EXIT	
	OPEN AHEAD sign.	
		STANDARD 701411-09



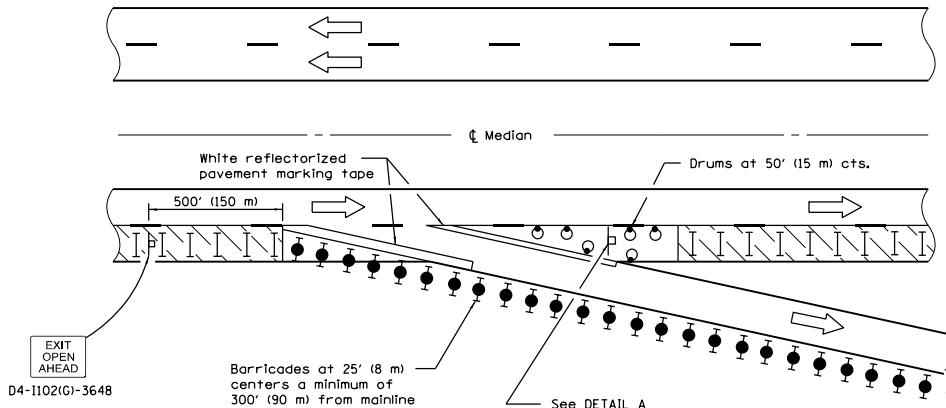
APPLICATION NO. 3

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.



DETAIL A

(To be utilized where distance between the two rows of channelizing devices is 6' (1.8 m) in width.)



APPLICATION NO. 4

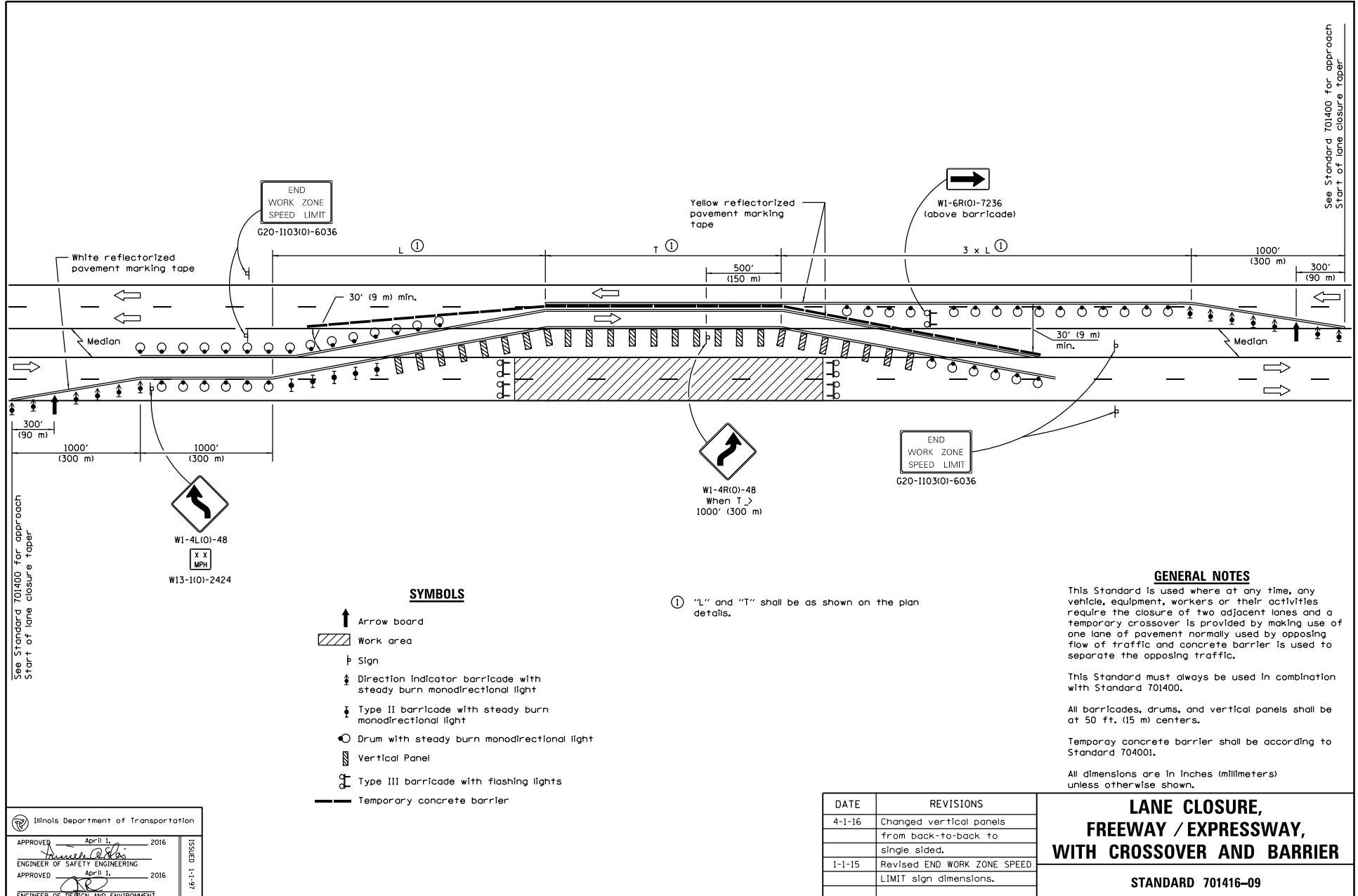
Application No. 4 depicts an extension of the normal exit ramp. This method shall be used whenever existing geometrics can be retained. Consideration should be given to the exiting motorist's line of sight through, between or over the delineation devices.

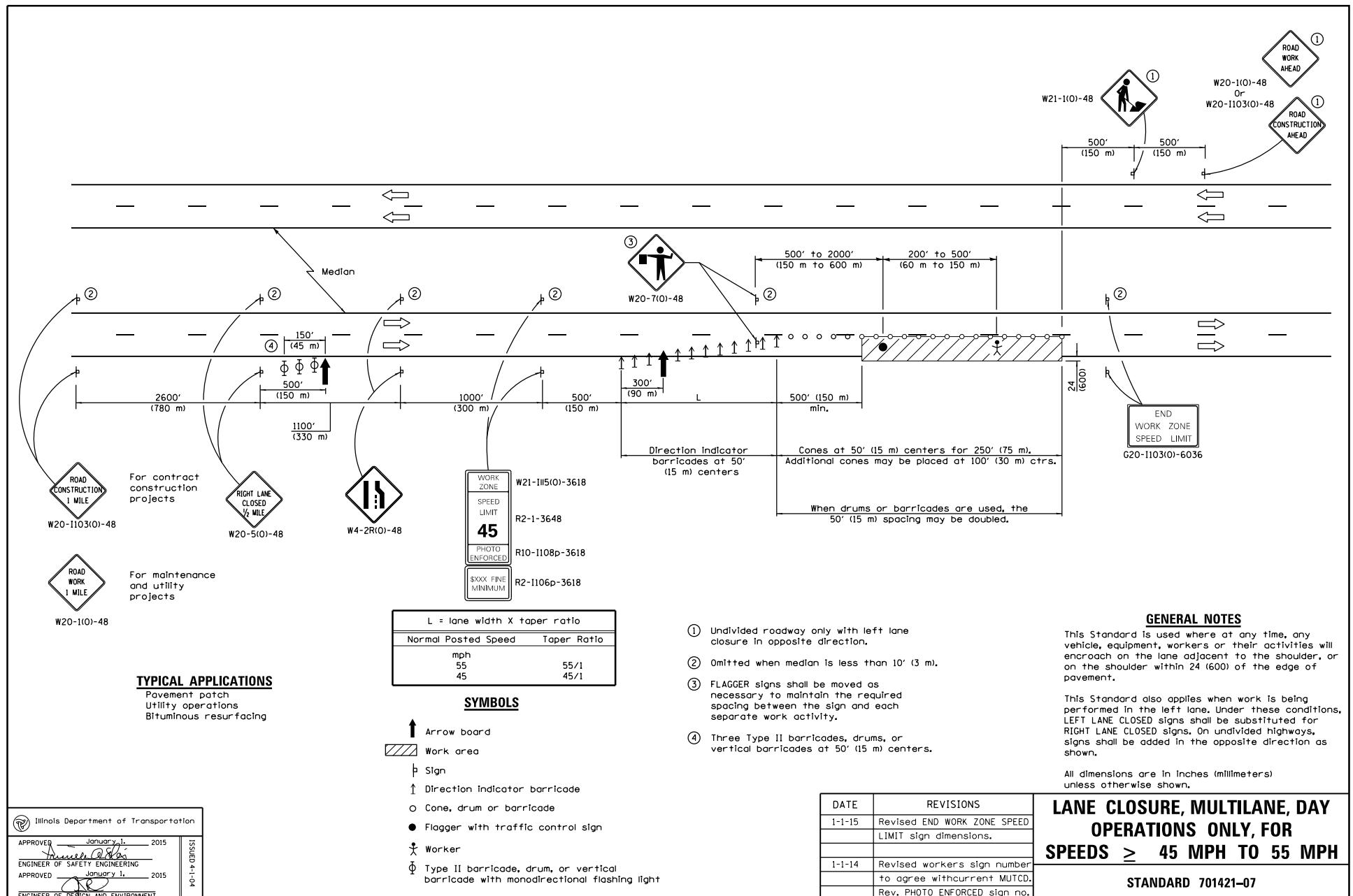
**LANE CLOSURE, MULTILANE,
AT ENTRANCE OR EXIT RAMP,
FOR SPEEDS \geq 45 MPH**

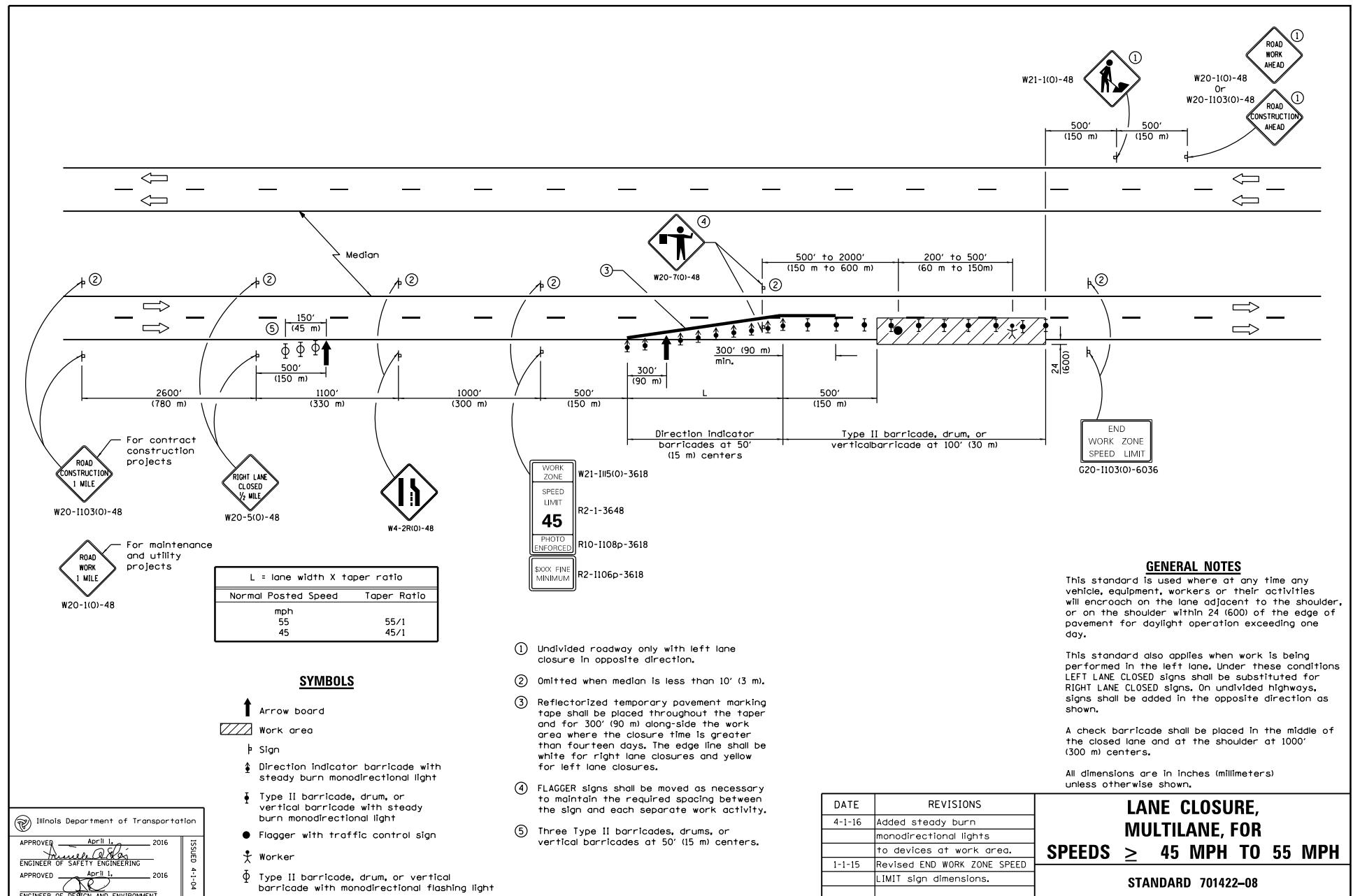
(Sheet 2 of 2)

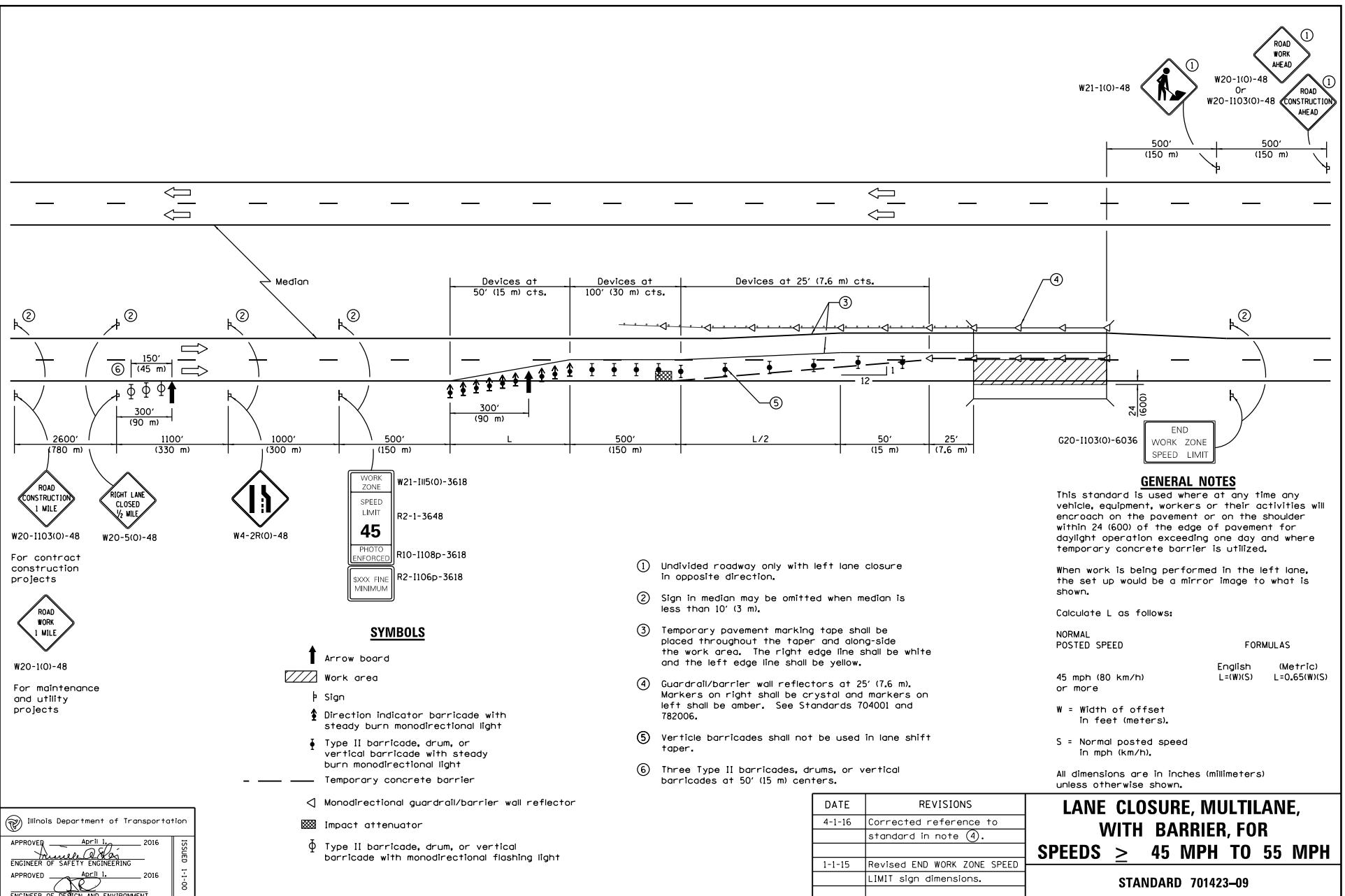
STANDARD 701411-09

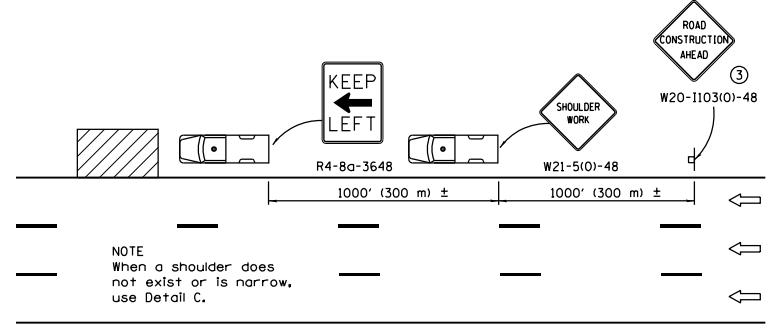
	Illinois Department of Transportation
APPROVED	January 1, 2015
ENGINEER OF SAFETY ENGINEERING	ISGSE 1-1-97
APPROVED	January 1, 2015
ENGINEER OF DESIGN AND ENVIRONMENT	



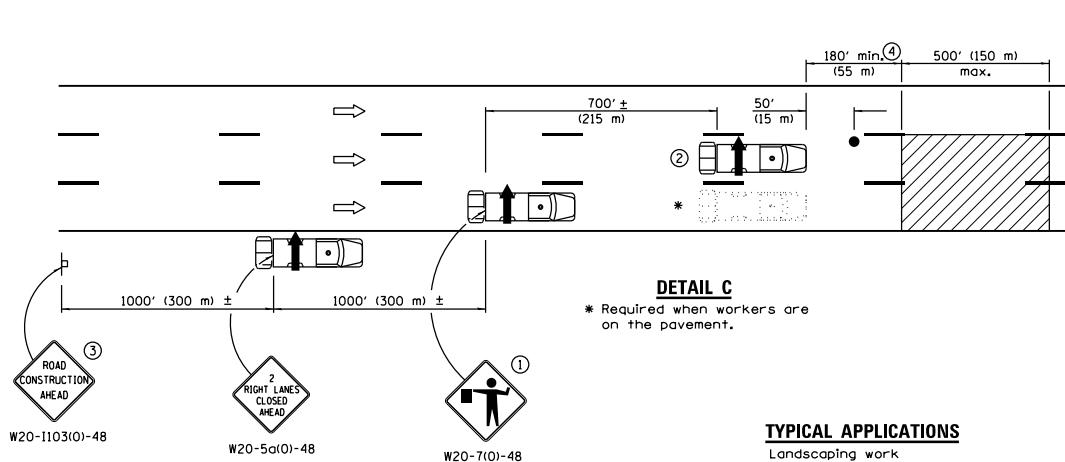








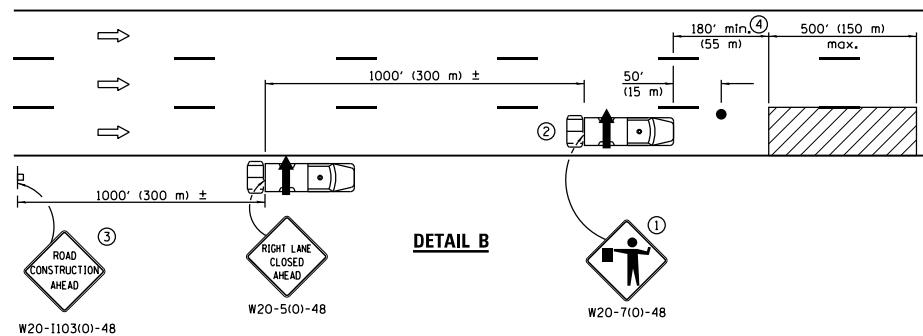
DETAIL A



DETAIL C
* Required when workers are on the pavement.

TYPICAL APPLICATIONS

Landscape 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 The distance between the work and the lead truck may vary according to terrain or paint/crack sealing drying time.



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 LEFT 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



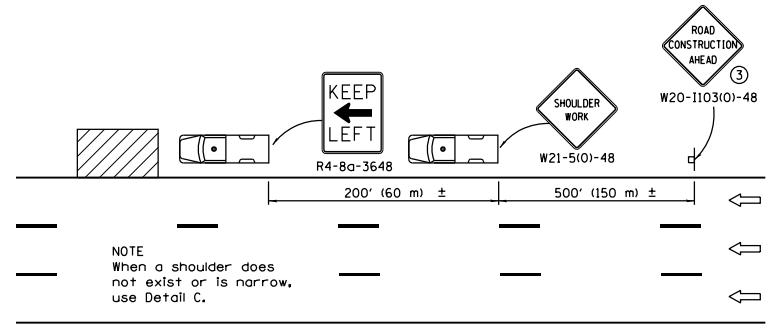
Sign

DATE	REVISIONS
4-1-16	Added trailer option for attenuator symbol. Added note ④. Revised gen. notes.
1-1-15	Added general note regarding vehicle spacing.
	Corr. KEEP LEFT sign no.

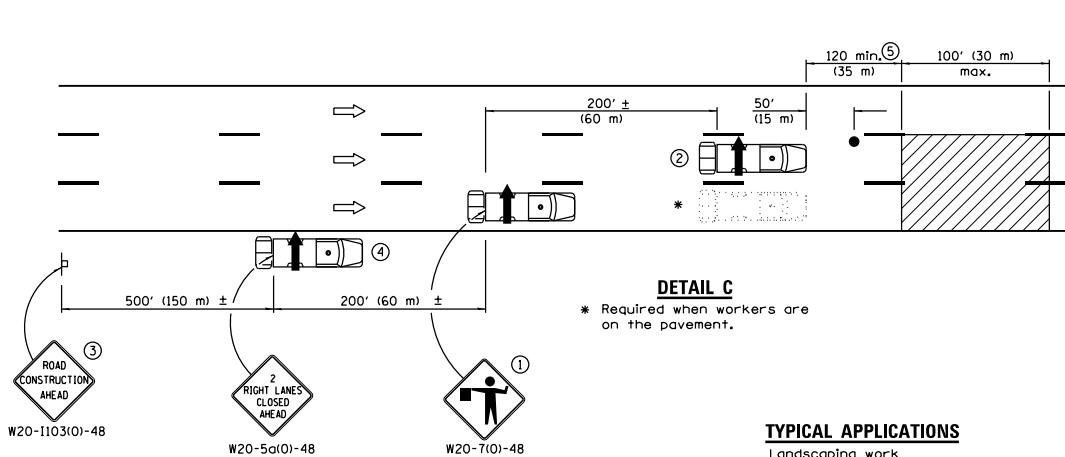
LANE CLOSURE, MULTILANE, INTERMITTENT OR MOVING OPER., FOR SPEEDS \geq 45 MPH

STANDARD 701426-08

APPROVED	April 1, 2016	ISSUED
Engineer of Safety Engineering		1-1-17
APPROVED	April 1, 2016	
Engineer of Design and Environment		

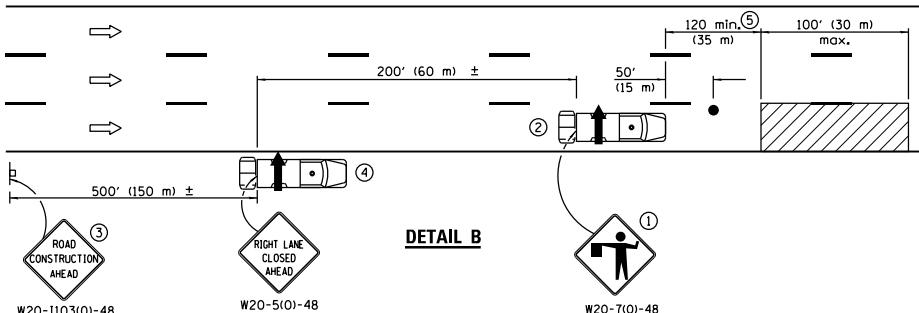


DETAIL A



DETAIL C

* Required when workers are on the pavement.



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.



G20-II01-2430
(appropriate arrow)
(2)(when striping only)

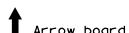
GENERAL NOTES

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.

SYMBOLS



Arrow board



Work area



Truck with flashing amber light



Truck/Trailer mounted attenuator



Flagger with traffic control sign



Sign

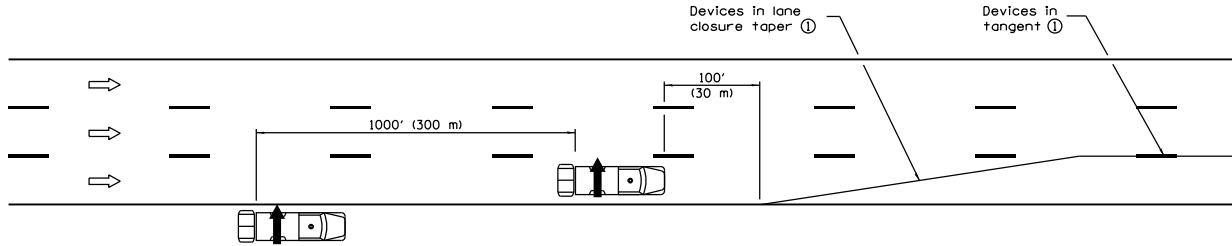
DATE	REVISIONS
4-1-16	Rev. gen. notes. Added note ⑤. Rev. dist. between work and lead truck.
	1-1-15
	Added general note regarding vehicle spacing.
	Corr. KEEP LEFT sign no.

LANE CLOSURE, MULTILANE, INTERMITTENT OR MOVING OPER., FOR SPEEDS \leq 40 MPH

STANDARD 701427-04

	Illinois Department of Transportation
APPROVED	April 1, 2016
ENGINEER OF SAFETY ENGINEERING	
APPROVED	April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT	

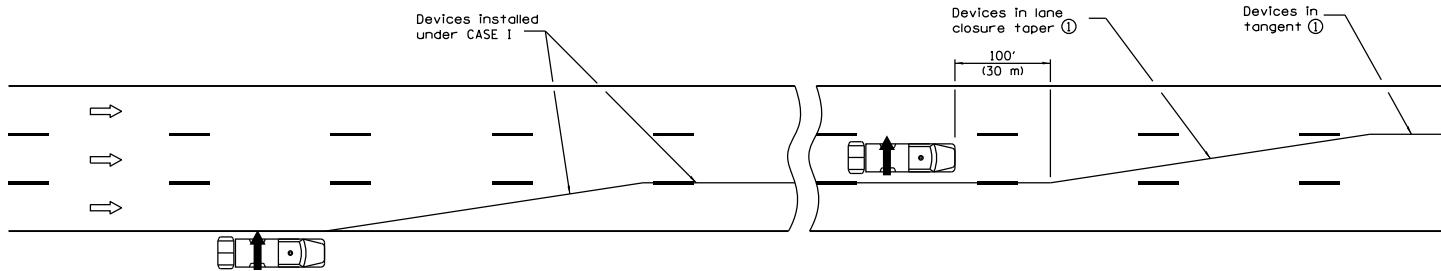
11-1-16 ISS



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

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

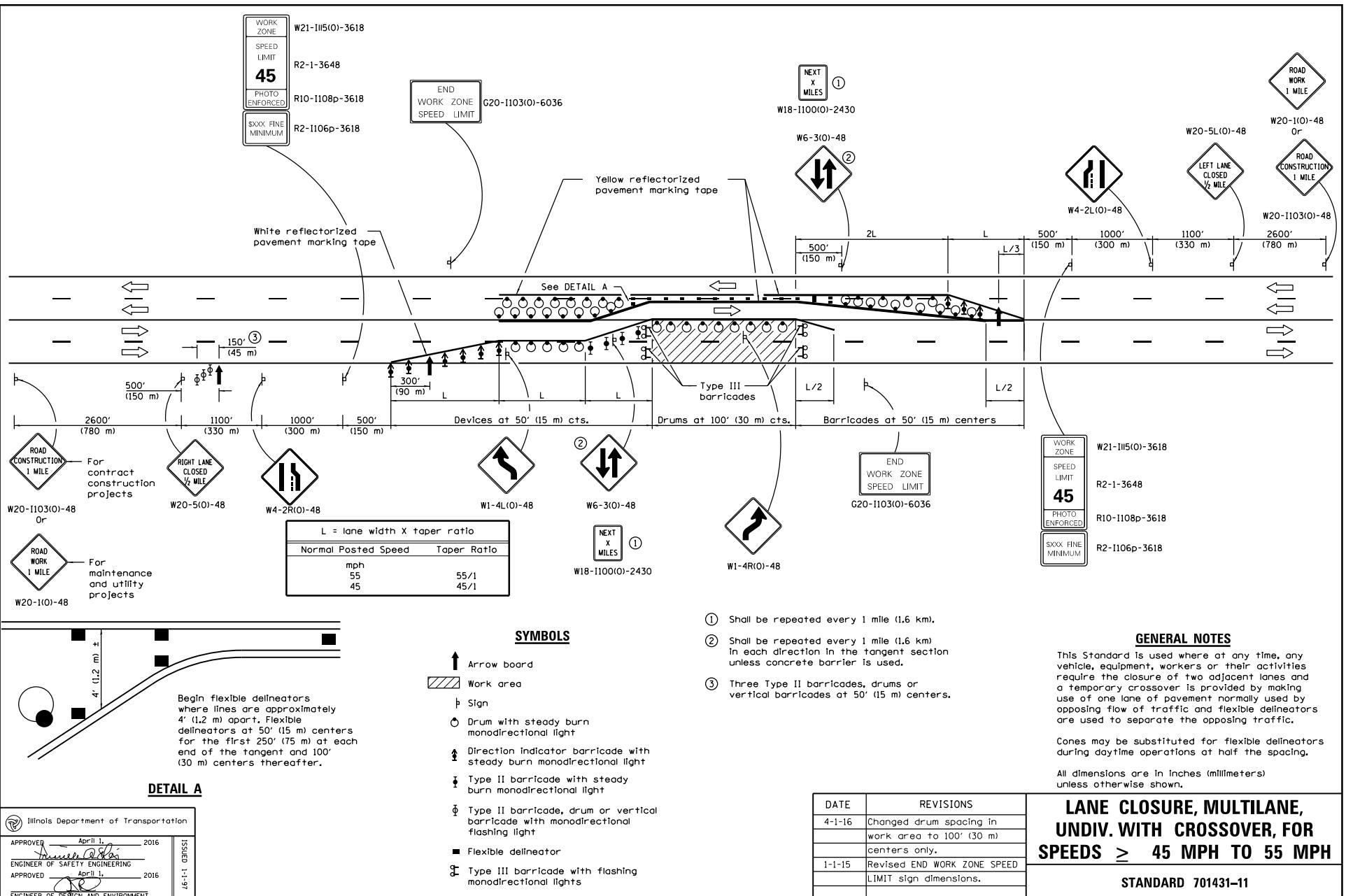
	Illinois Department of Transportation
APPROVED	April 1, 2016
ENGINEER OF SAFETY ENGINEERING	
APPROVED	April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT	

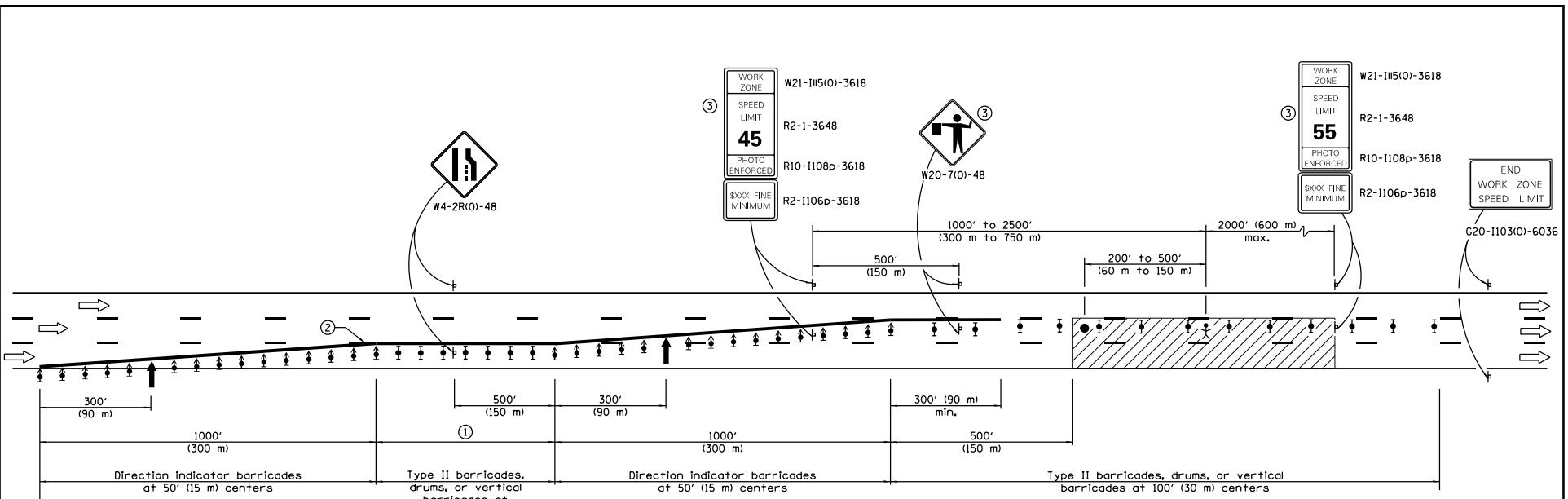
GENERAL NOTES
This Standard is used for setup and removal of lane closures on freeways/expressways having ADT greater than 25,000.

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.





See Standard 701400 for approach
Start of lane closure taper

SYMBOLS

- ↑ Arrow board
- ▨ Work area
- worker 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

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.

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.

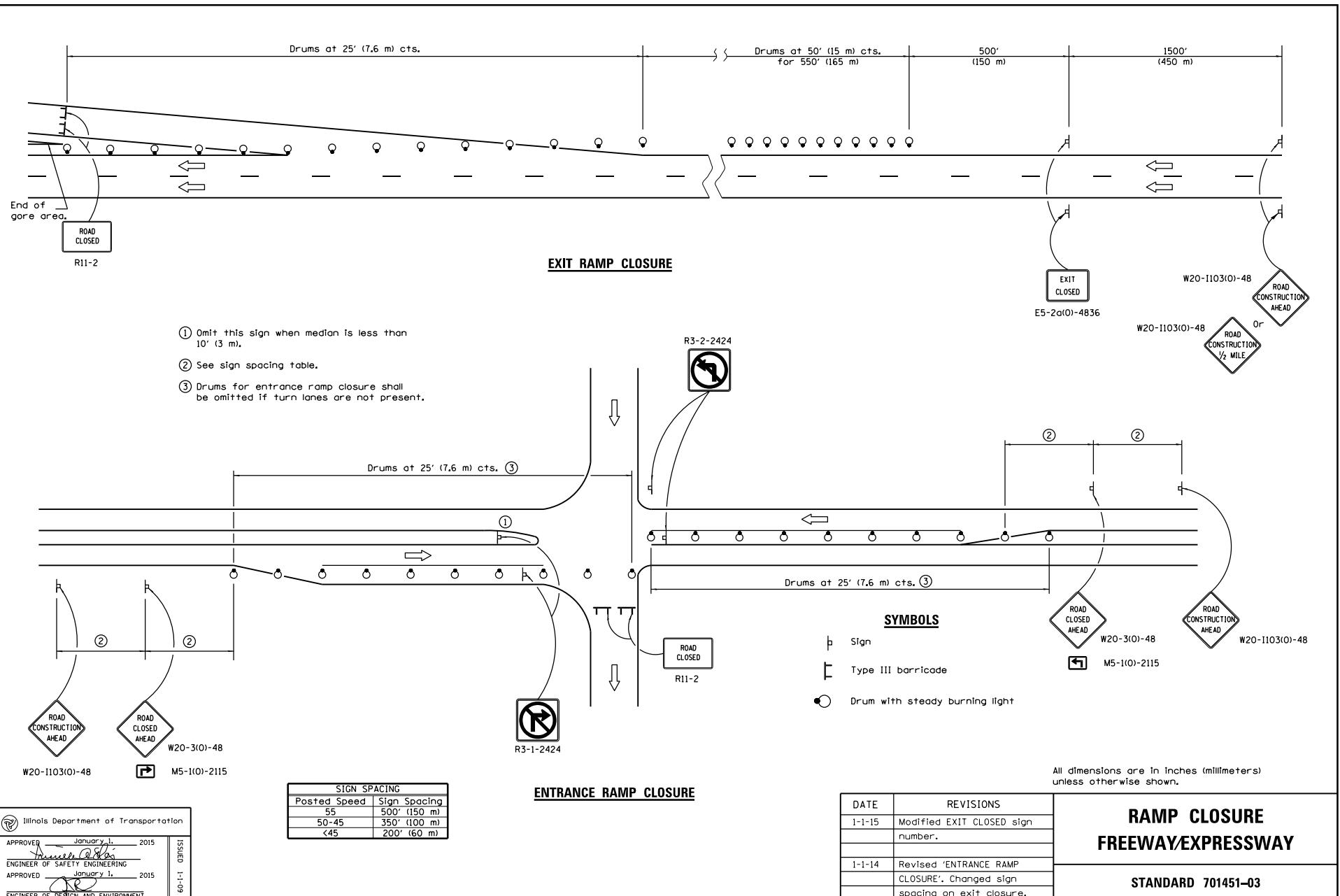
Check barricades shall be placed in the middle of the closed lanes at 1000' (300 m) centers.

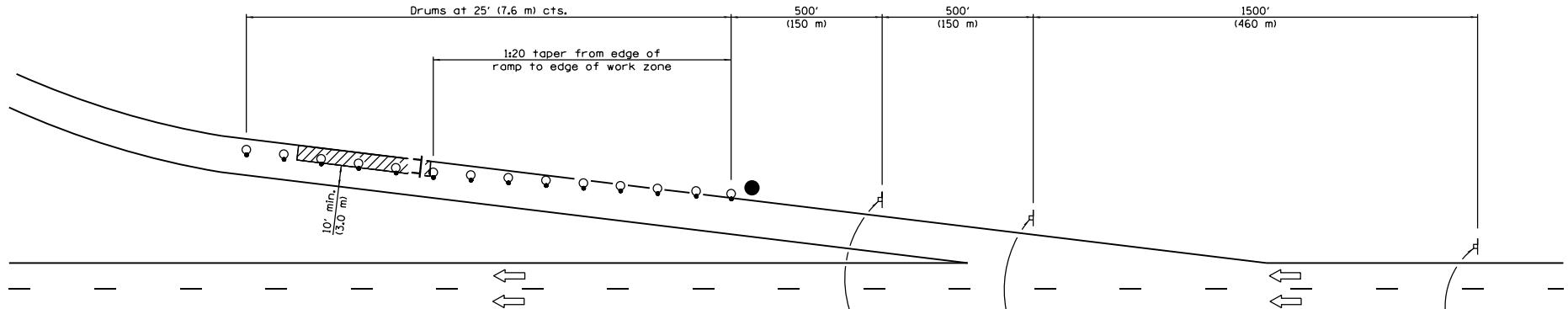
All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS	TWO LANE CLOSURE, FREEWAY / EXPRESSWAY
4-1-16	Revised note ① to always require tangent. Added dimension to lane drop sign.	
1-1-15	Revised END WORK ZONE SPEED LIMIT sign dimensions.	
		STANDARD 701446-07

Illinois Department of Transportation
APPROVED <i>[Signature]</i> April 1, 2016
ENGINEER OF SAFETY ENGINEERING
APPROVED <i>[Signature]</i> April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

SP-1-003





PARTIAL EXIT RAMP CLOSURE



W20-7(O)-48



W5-4(O)-48

W20-I103(O)-48



W13-4p-3636



W20-I103(O)-48



W13-4p-3636



SYMBOLS

- ▢ Sign
- ─ Type III barricade
- Drum with steady burning light
- ▨ Work area
- Flagger with traffic control sign

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

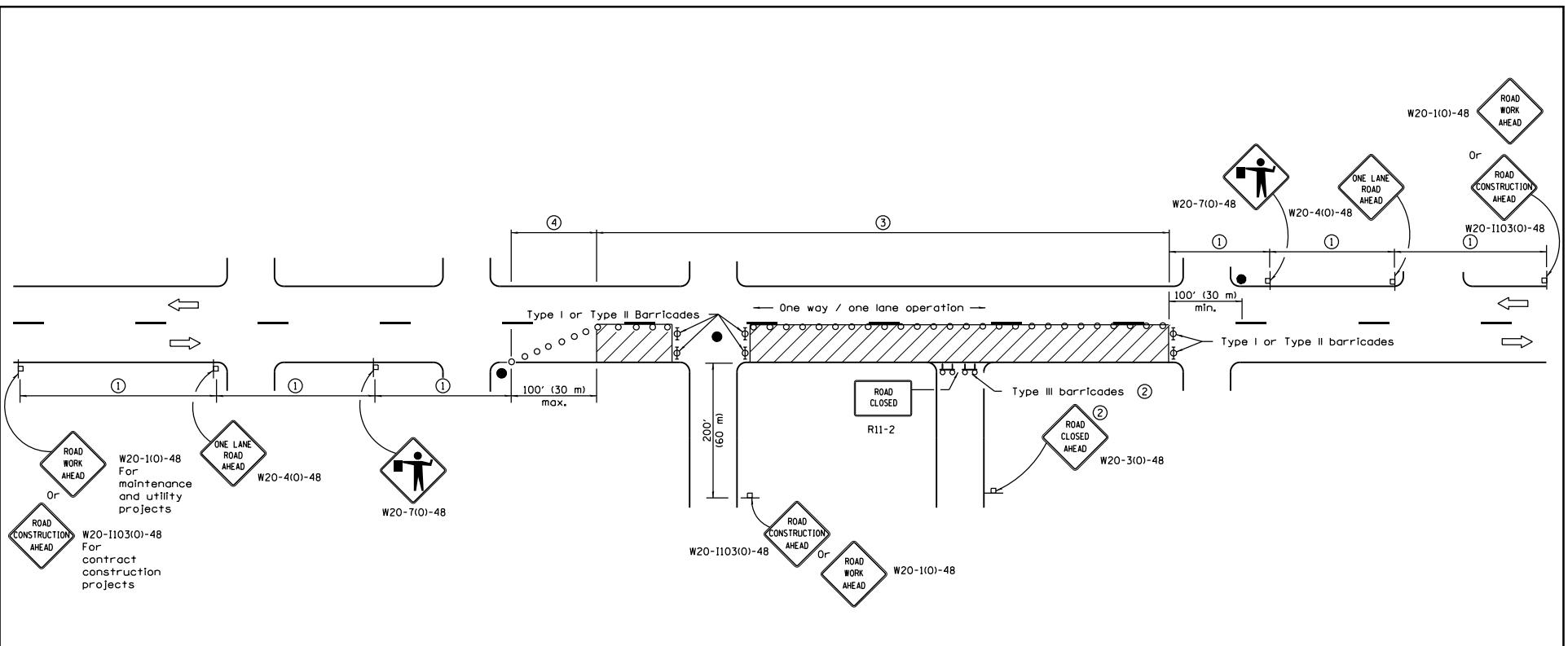
	Illinois Department of Transportation
APPROVER 	January 1, 2014
ENGINEER OF SAFETY ENGINEERING 	January 1, 2012
APPROVED 	January 1, 2012
ENGINEER OF DESIGN AND ENVIRONMENT	

I-1-1-69

DATE	REVISIONS
1-1-14	ON RAMP sign now 36x36.
	Del. G20-2 & W13-1 signs.
	Added dim. at work area.
1-1-12	Changed 'Work zone' to 'Work area' in symbol
	legend.

**PARTIAL EXIT RAMP CLOSURE
FREEWAY /EXPRESSWAY**

STANDARD 701456-03



SIGN SPACING		
Posted Speed	Sign Spacing	
55	500' (150 m)	
50-45	350' (100 m)	
<45	200' (60 m)	

SYMBOLS

-  Work area

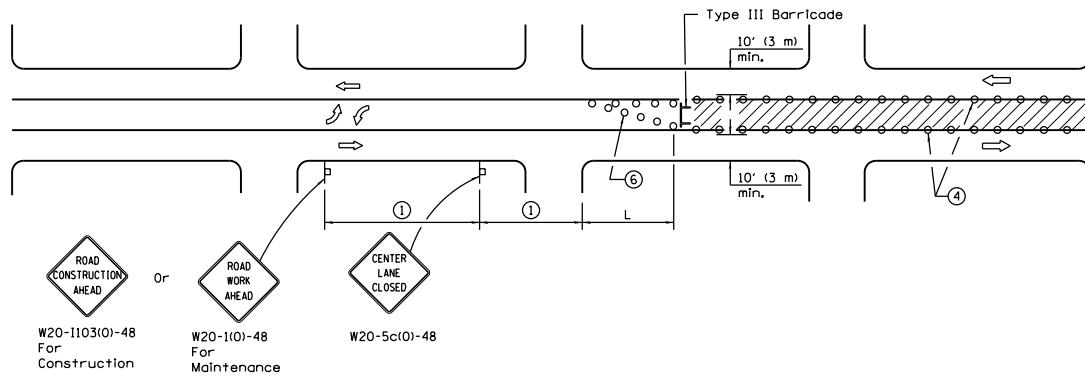
 - Cone, drum or barricade
(not required for moving operations)
 - ▢ Sign on portable or permanent support
 - Flagger with traffic control sign
 - ∅ Barricade or drum with flashing light
 - ▢ Type III barricade with flashing lights

- ① Refer to SIGN SPACING TABLE for distances.
 - ② For approved sideroad 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

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

DATE	REVISIONS	
1-1-11	Revised flagger sign.	URBAN LANE CLOSURE, 2L, 2W, UNDIVIDED
1-1-09	Switched units to English (metric).	STANDARD 701501-06
	Corrected sign No.'s.	



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 (Cones for daytime use only)
- ▢ Sign on portable or permanent support

	Illinois Department of Transportation
APPROVED	January 1, 2014
ENGINEER OF SAFETY ENGINEERING	
APPROVED	January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT	

10-1-101

- 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). Additional cones may be placed at 15 m (50') 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)

$$40 \text{ mph (70 km/h)} \quad L = \frac{WS^2}{60} \quad L = \frac{WS^2}{150}$$

$$45 \text{ mph (80 km/h)} \quad L = (W)(S) \quad L = 0.65(W)(S)$$

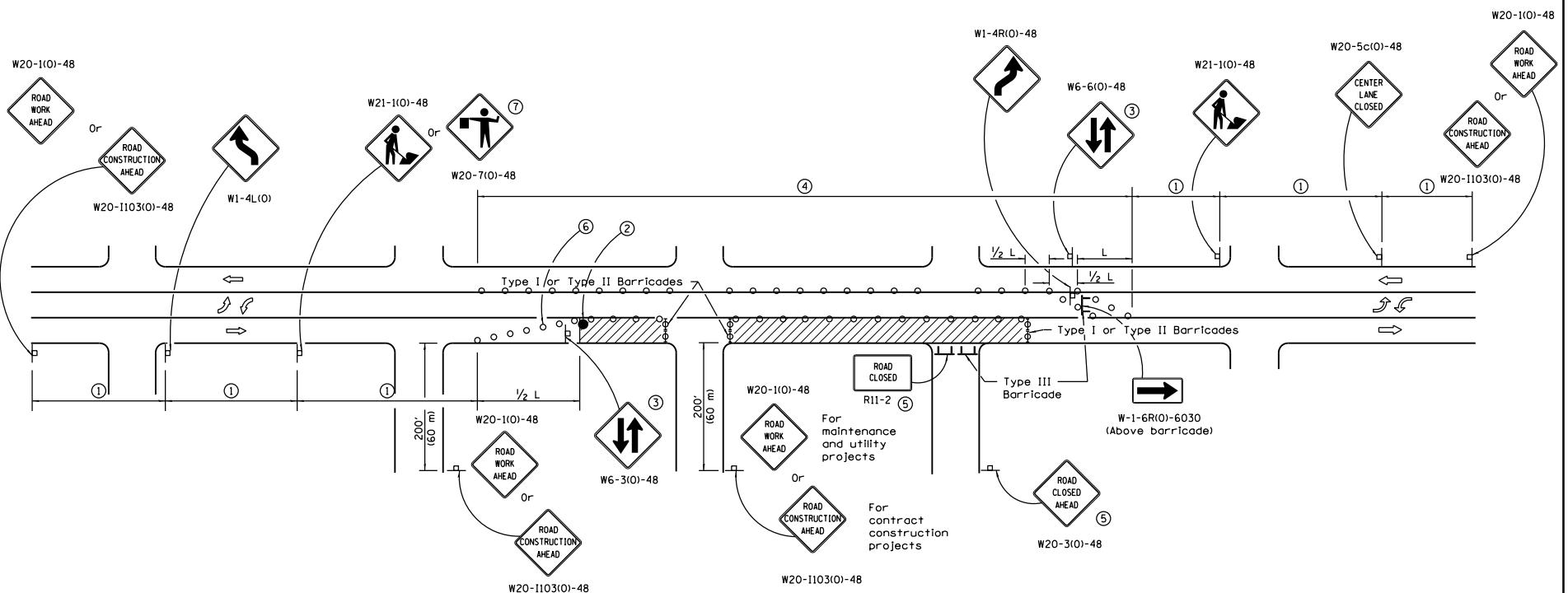
W = Width of offset in feet (meters).

S = Normal posted speed mph (km/h).

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

DATE	REVISIONS	URBAN LANE CLOSURE, 2L, 2W, WITH BIDIRECTIONAL LEFT TURN LANE (Sheet 1 of 2)
1-1-14	Omitted original note ④.	
	Rev. workers sign no. to agree with current MUTCD.	
1-1-13	Omitted text 'WORKERS' sign.	

STANDARD 701502-06

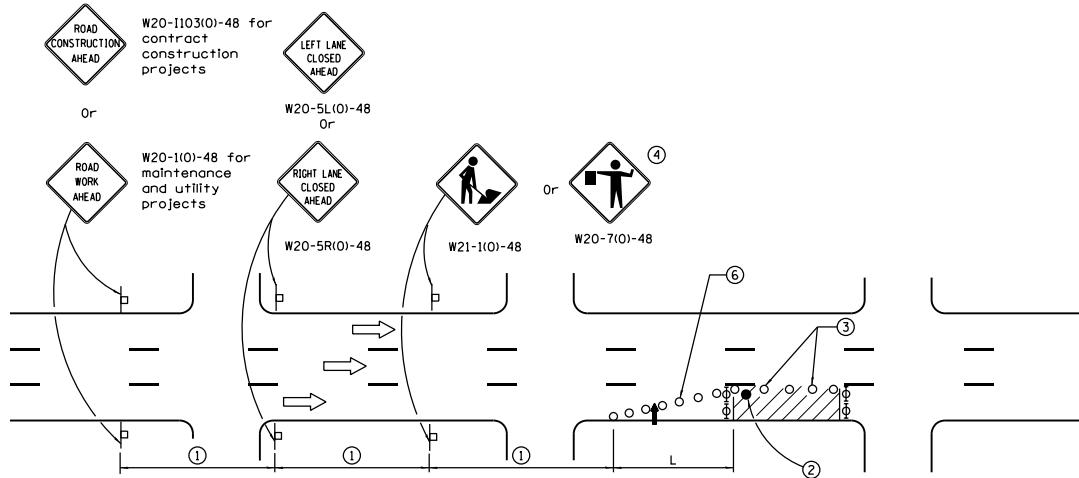


CASE II

	Illinois Department of Transportation
APPROVED 	January 1, 2014
ENGINEER OF SAFETY ENGINEERING 	
APPROVED 	January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT 	

**URBAN LANE CLOSURE,
2L, 2W, WITH BIDIRECTIONAL
LEFT TURN LANE**
(Sheet 2 of 2)

STANDARD 701502-06



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:

$$L = (W)(S) \quad L = 0.65(W)(S)$$

W = Width of offset
in feet (meters).

S = Normal posted speed
mph (km/h).

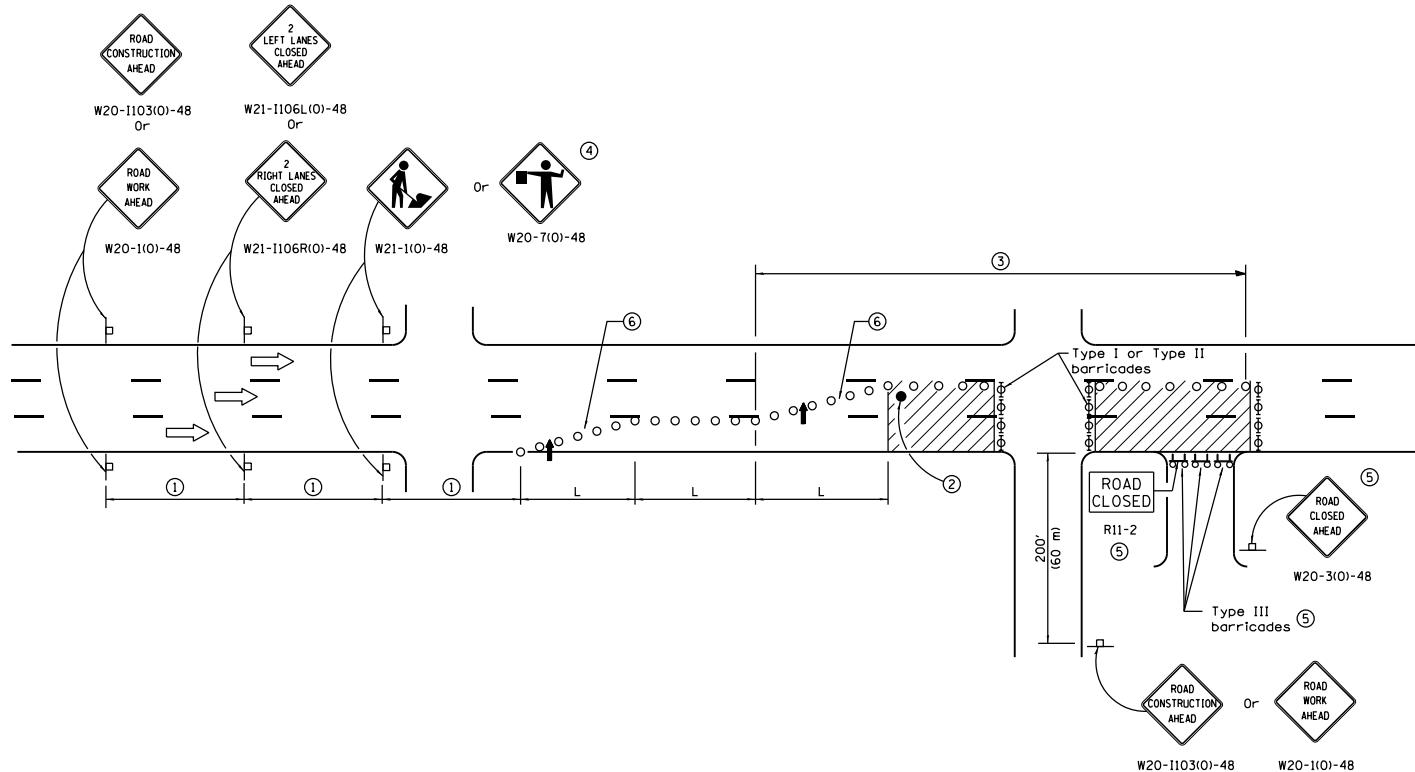
All dimensions are in inches (millimeters)
unless otherwise shown.

	Illinois Department of Transportation
APPROVED	January 1, 2014
<i>[Signature]</i>	
ENGINEER OF SAFETY ENGINEERING	
APPROVED	January 1, 2014
<i>[Signature]</i>	
ENGINEER OF DESIGN AND ENVIRONMENT	
	ISSUED 1-1-97

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)

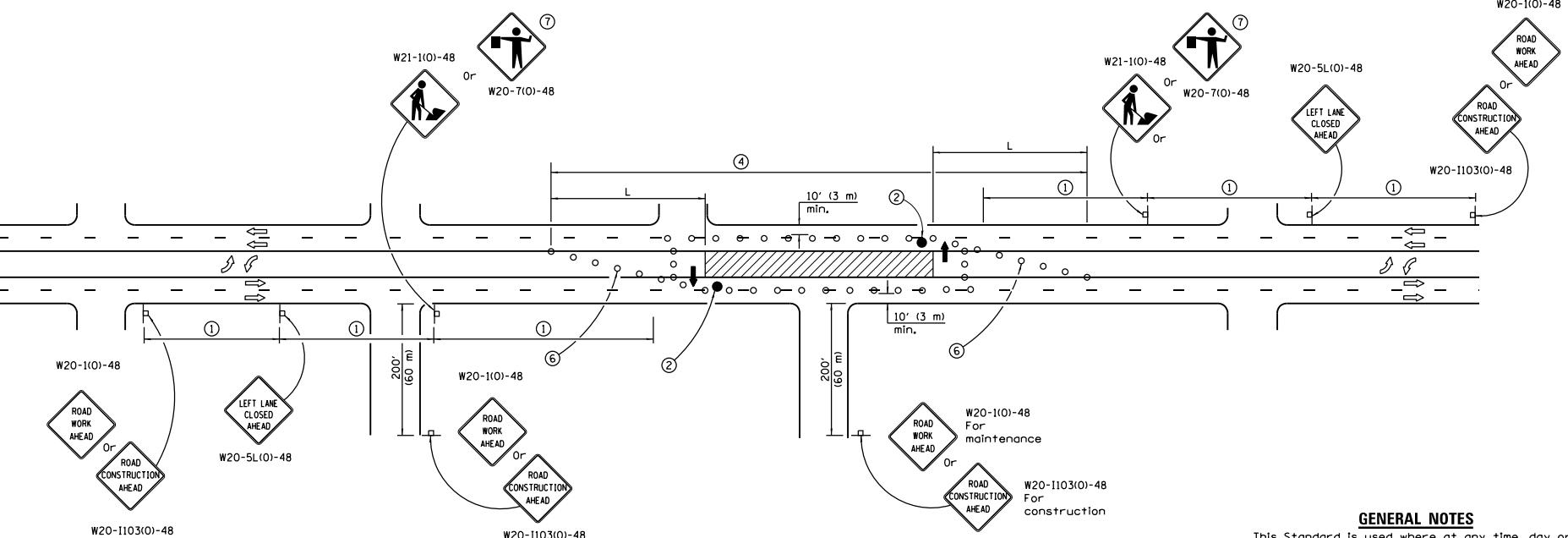
STANDARD 701601-09



	Illinois Department of Transportation
APPROVED	January 1, 2014
ENGINEER OF SAFETY ENGINEERING	
APPROVED	January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT	
	ISSUED 1-1-97

**URBAN LANE CLOSURE,
MULTILANE, 1W OR 2W WITH
NONTRAVERSABLE MEDIAN**
(Sheet 2 of 2)

STANDARD 701601-09



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). 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.

SIGN SPACING	
Posted Speed	Sign Spacing
55	500' (150 m)
50-45	350' (100 m)
<45	200' (60 m)

SYMBOLS

- ↑ Arrow board
- ▨ Work area
- Φ Barricade or drum with steady burning nondirectional light
- Flagger with traffic control sign
- Cone, drum or barricade (Cones for daytime use only)
- ▢ Sign on portable or permanent support
- Type III Barricade

	Illinois Department of Transportation
APPROVED	January 1, 2014
ENGINEER OF SAFETY ENGINEERING	
APPROVED	January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT	
10-1-1	10-1-1

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).

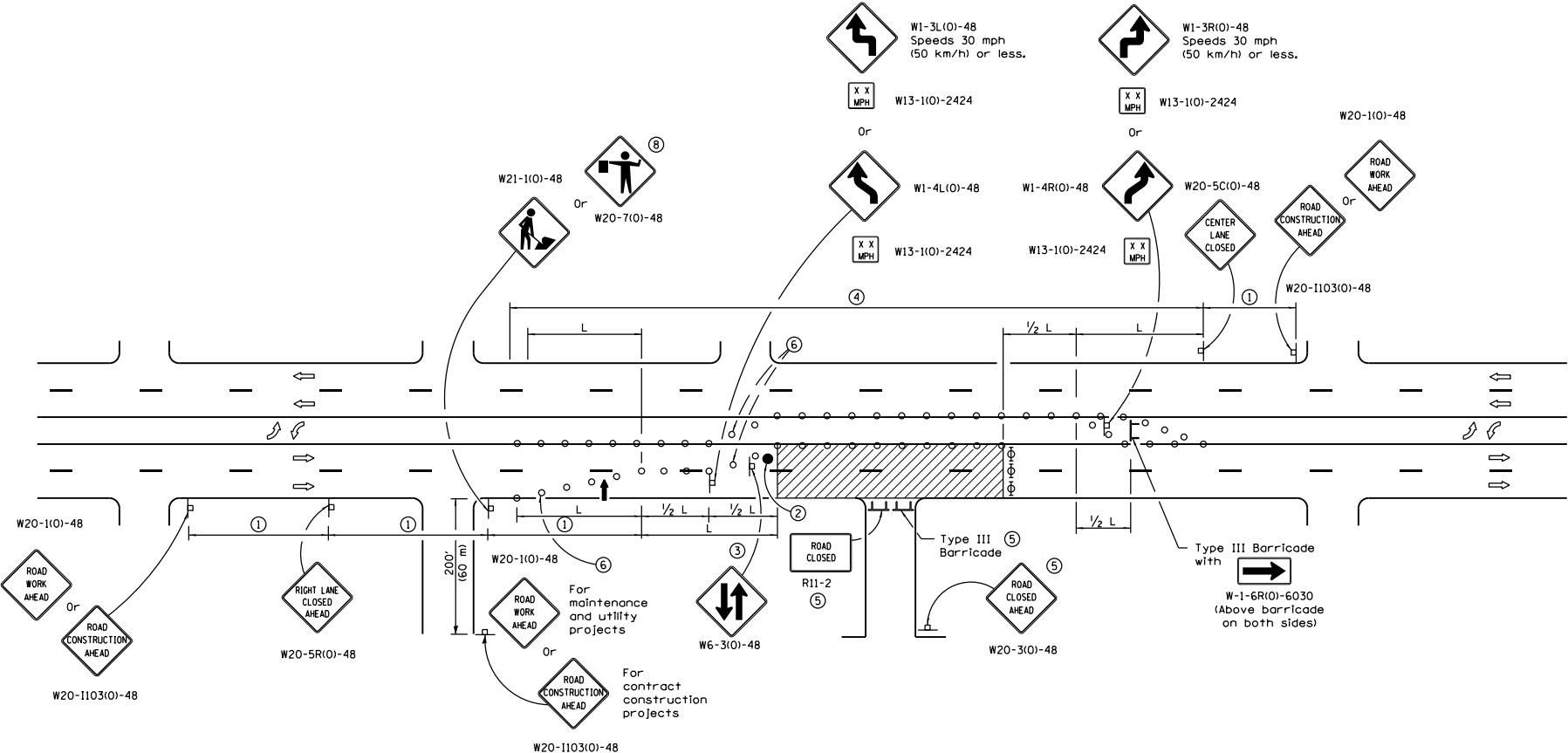
All dimensions are in inches (millimeters)
unless otherwise shown.

DATE	REVISIONS
1-1-14	Omitted original note ④.
	Rev. workers sign no. to agree with current MUTCD.
1-1-13	Omitted text 'WORKERS'
	sign.

URBAN LANE CLOSURE, MULTILANE, 2W WITH BIDIRECTIONAL LEFT TURN LANE

(Sheet 1 of 4)

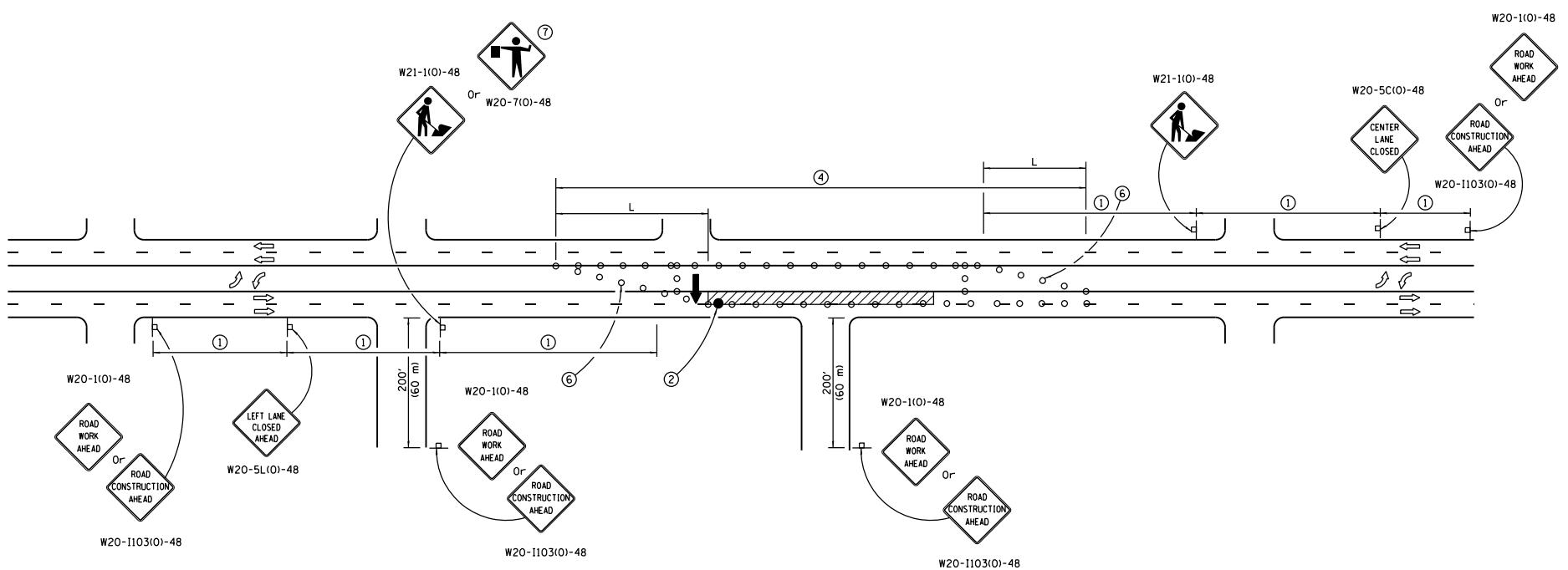
STANDARD 701602-07



	Illinois Department of Transportation
APPROVED <i>[Signature]</i>	January 1, 2014
ENGINEER OF SAFETY ENGINEERING <i>[Signature]</i>	January 1, 2014
APPROVED <i>[Signature]</i>	January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT <i>[Signature]</i>	January 1, 2014
10-1-1	10-1-1

**URBAN LANE CLOSURE,
MULTILANE, 2W WITH
BIDIRECTIONAL LEFT TURN LANE**
(Sheet 2 of 4)

STANDARD 701602-07



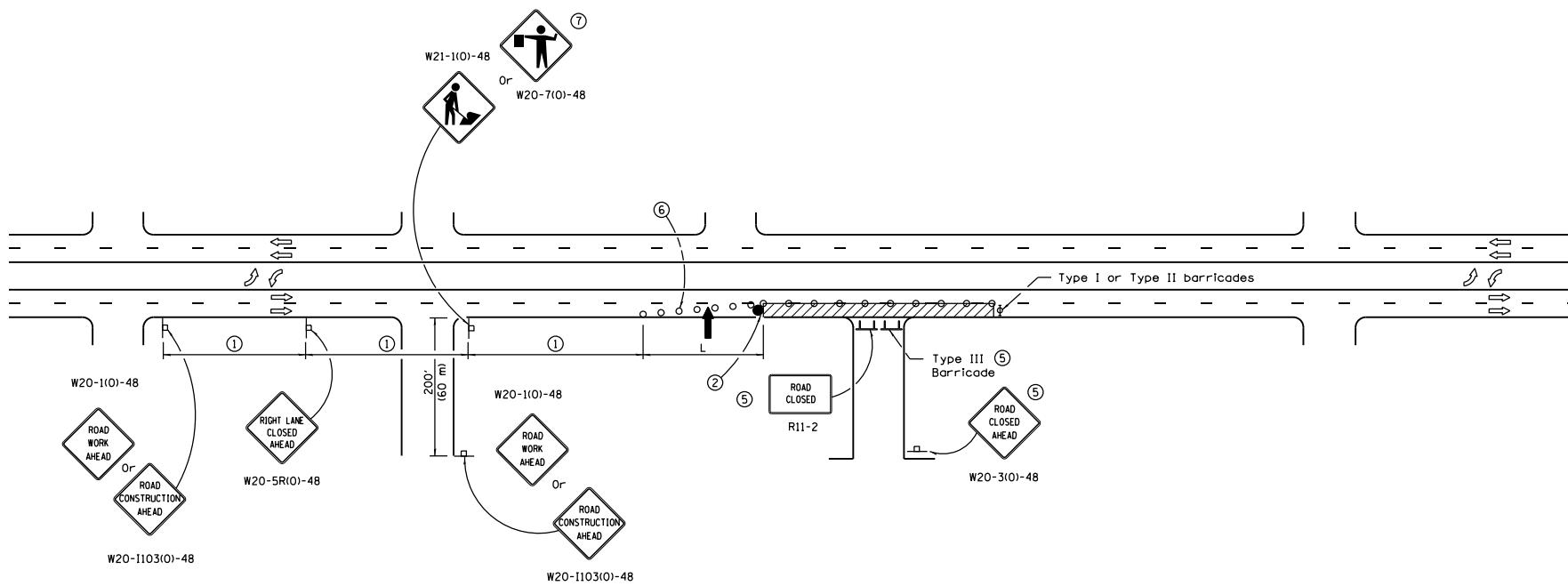
CASE III

	Illinois Department of Transportation
APPROVED	January 1, 2014
ENGINEER OF SAFETY ENGINEERING	
APPROVED	January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT	

10-1-1 QRS

**URBAN LANE CLOSURE,
MULTILANE, 2W WITH
BIDIRECTIONAL LEFT TURN LANE**
(Sheet 3 of 4)

STANDARD 701602-07

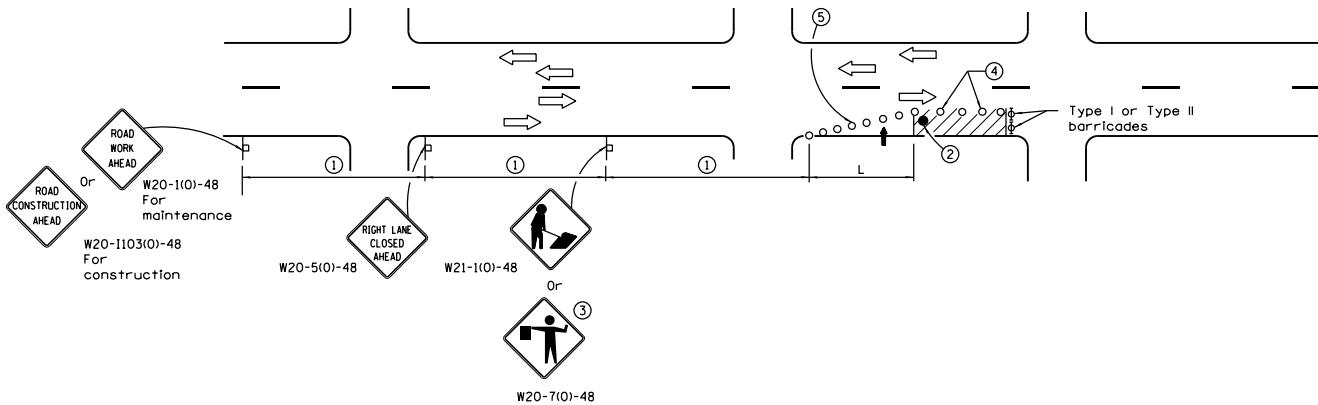


CASE IV

	Illinois Department of Transportation
APPROVED	January 1, 2014
<i>Douglas D. Blair</i>	
ENGINEER OF SAFETY ENGINEERING	
APPROVED	January 1, 2014
<i>Douglas D. Blair</i>	
ENGINEER OF DESIGN AND ENVIRONMENT	
ISSUED	10-1-1

**URBAN LANE CLOSURE,
MULTILANE, 2W WITH
BIDIRECTIONAL LEFT TURN LANE**

STANDARD 701602-07



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
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).

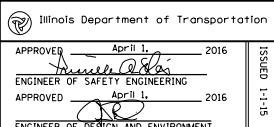
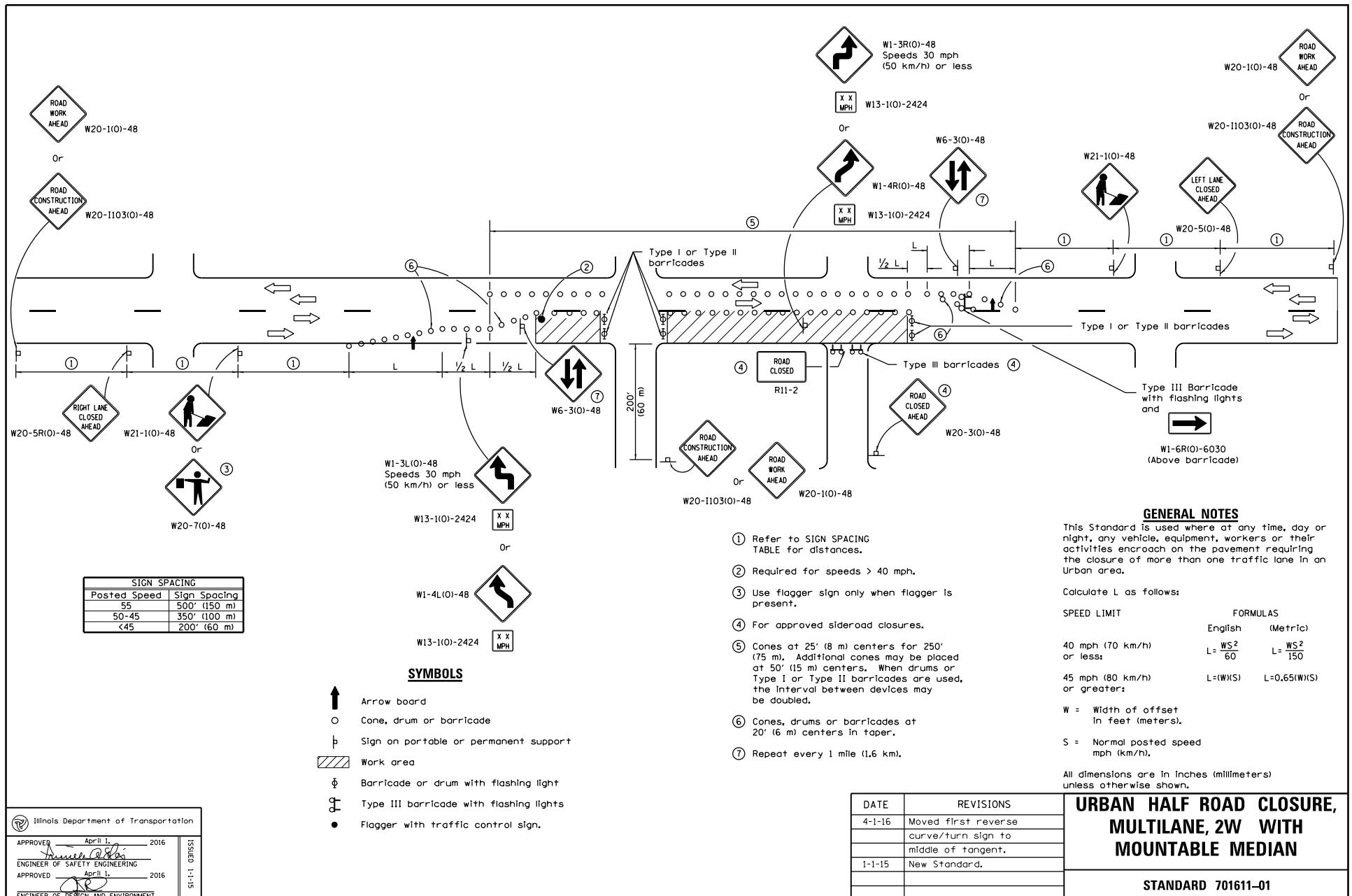
S = Normal posted speed
mph (km/h).

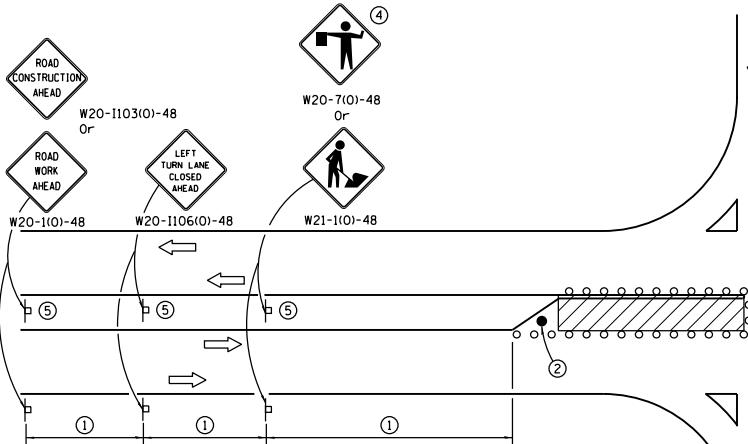
All dimensions are in inches (millimeters)
unless otherwise shown.

	Illinois Department of Transportation
APPROVED	January 1, 2015
<i>[Signature]</i>	
ENGINEER OF SAFETY ENGINEERING	
APPROVED	January 1, 2015
<i>[Signature]</i>	
ENGINEER OF DESIGN AND ENVIRONMENT	
	ISSUED 1-1-97

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





LEFT TURN LANE OR CENTER MEDIAN OPERATIONS

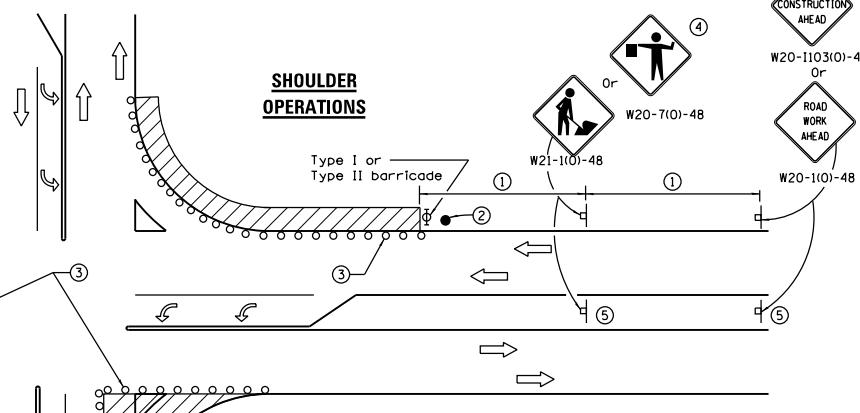
- ① Refer to SIGN SPACING TABLE for distance.
- ② Required for speed > 40 mph.
- ③ Cones at 25' (8 m) centers for 250' (75 m). Additional cones may be placed at 50' (15 m) centers. When drums or Type I or Type II barricades are used, the interval between devices may be doubled.
- ④ Use flagger sign only 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.

SIGN SPACING	
Posted Speed	Sign Spacing
55	500' (150 m)
50-45	350' (100 m)
<45	200' (60 m)

SYMBOLS

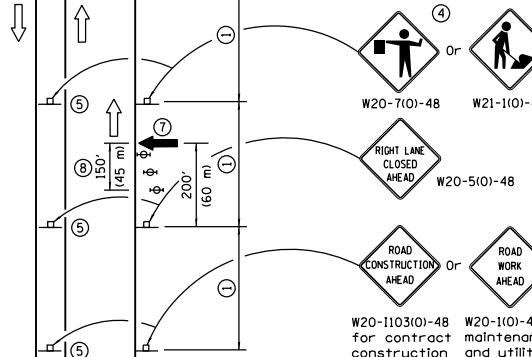
- ▨ Work area
- Cone, drum or barricade
- ▢ Sign on portable or permanent support
- Arrow board
- ∅ Barricade or drum with flashing light
- Flagger with traffic control sign

	Illinois Department of Transportation
APPROVED	April 1, 2016
ENGINEER OF SAFETY ENGINEERING	
APPROVED	April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT	



SHOULDER OPERATIONS

CORNER ISLAND OPERATIONS



W20-1103(O)-48 for contract construction and utility projects
W20-1(O)-48 for normal posted speed mph (km/h).

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
40 mph (70 km/h) or less:	$L = \frac{WS^2}{60}$ $L = \frac{WS^2}{150}$

45 mph (80 km/h) or greater:	$L = (W)(S)$ $L = 0.65(W)(S)$
------------------------------	-------------------------------

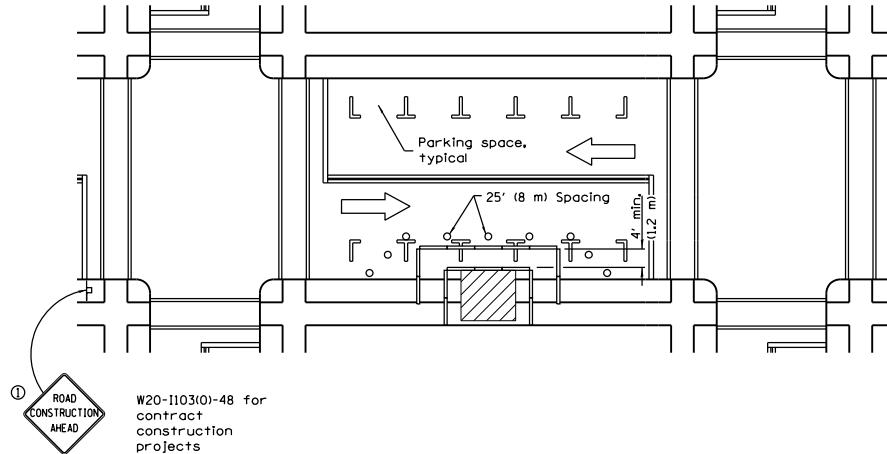
W = Width of offset in feet (meters).

S = Normal posted speed mph (km/h).

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

DATE	REVISIONS	URBAN LANE CLOSURE, MULTILANE INTERSECTION
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.	

STANDARD 701701-10

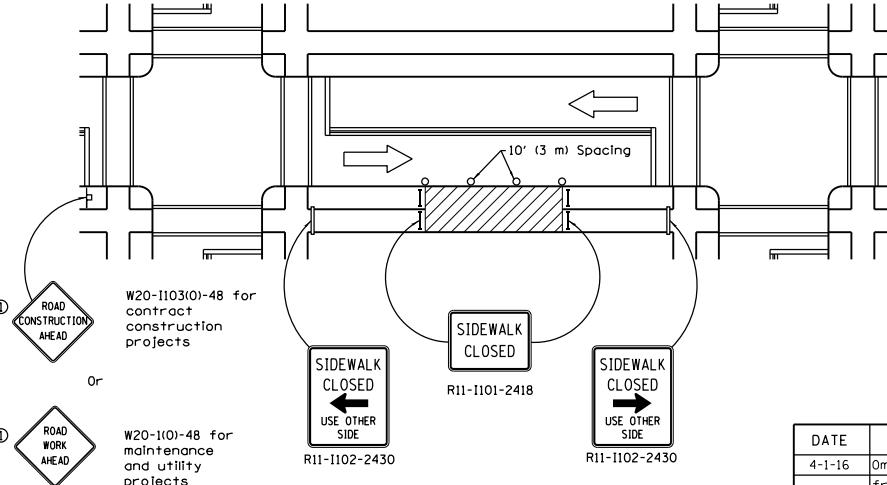


① ROAD CONSTRUCTION AHEAD
W20-I103(O)-48 for contract construction projects

Or
① ROAD WORK AHEAD
W20-I10(O)-48 for maintenance and utility projects

SIDEWALK DIVERSION

① Omit whenever duplicated by road work traffic control.



① ROAD CONSTRUCTION AHEAD
W20-I103(O)-48 for contract construction projects

Or
① ROAD WORK AHEAD
W20-I10(O)-48 for maintenance and utility projects

SIDEWALK CLOSURE

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 RII-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.

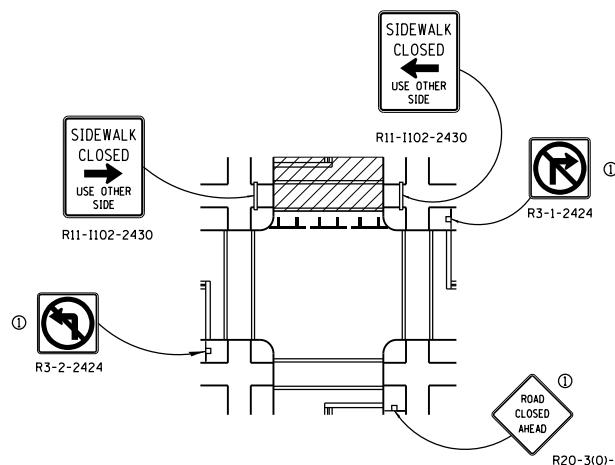
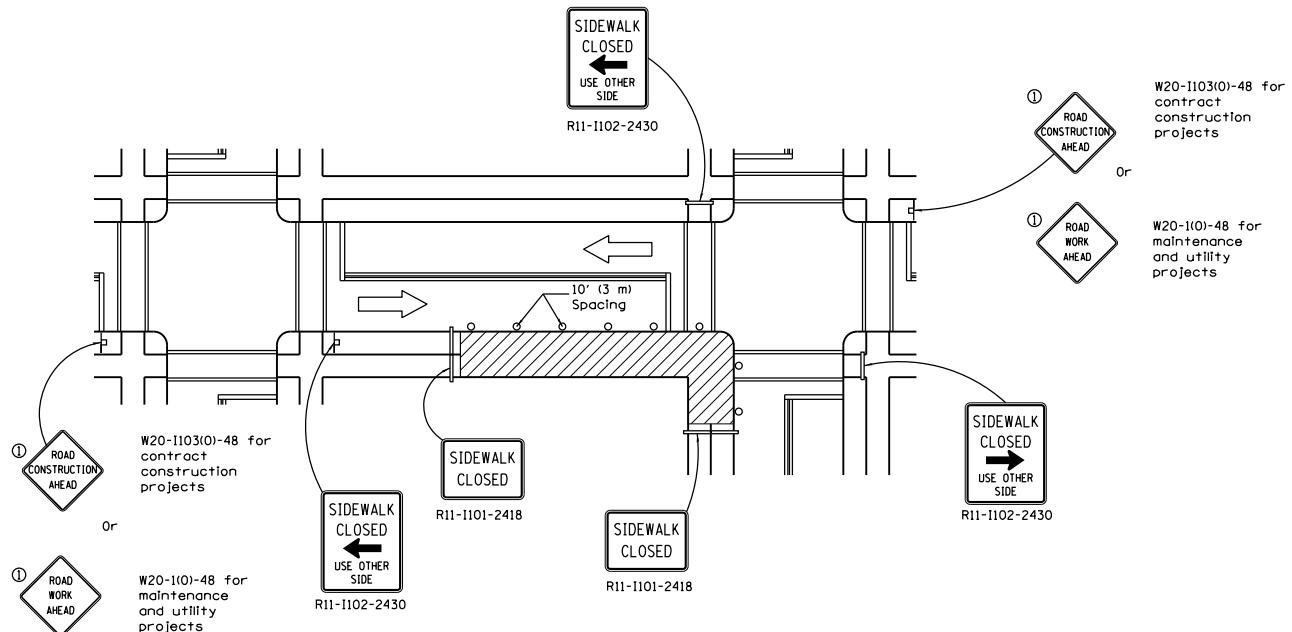
DATE	REVISIONS
4-1-16	Omitted orange safety fence from standard as this is covered in the std. spec.
1-1-12	Added SIDEWALK DIVERSION.
	Modified appearance of plan views. Renamed Std.

SIDEWALK, CORNER OR CROSSWALK CLOSURE

(Sheet 1 of 2)

STANDARD 701801-06

Illinois Department of Transportation
APPROVER <i>[Signature]</i> April 1, 2016
ENGINEER OF SAFETY ENGINEERING
APPROVED <i>[Signature]</i> April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT
11-1-197

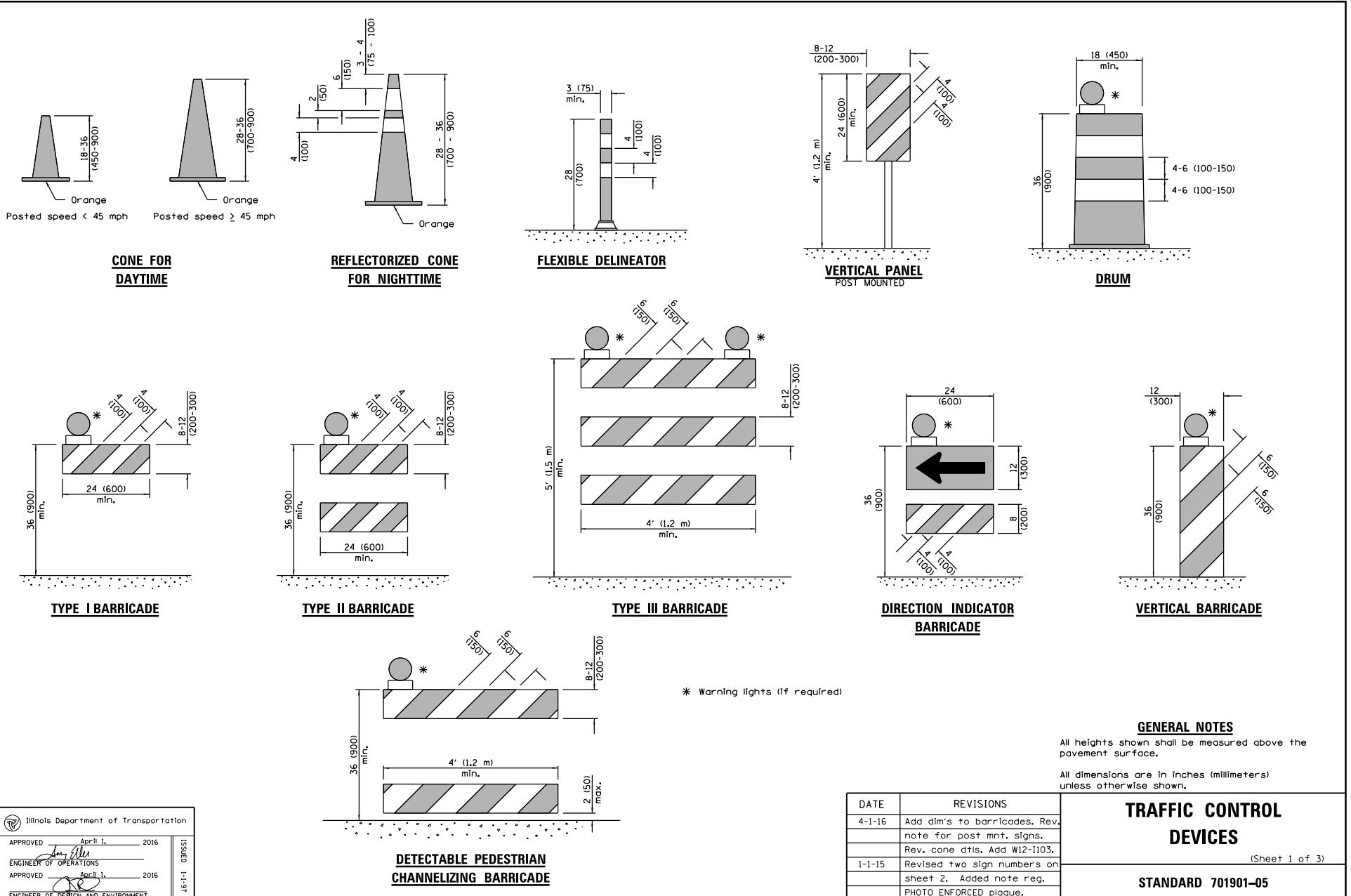


**SIDEWALK, CORNER OR
CROSSWALK CLOSURE**

(Sheet 2 of 2)

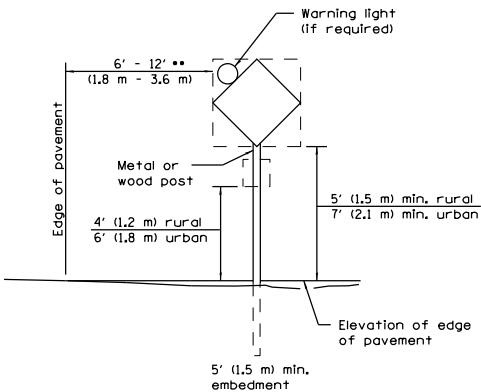
STANDARD 701801-06

Illinois Department of Transportation	
APPROVER	April 1, 2016
<i>[Signature]</i>	
ENGINEER OF SAFETY ENGINEERING	
APPROVED	April 1, 2016
<i>[Signature]</i>	
ENGINEER OF DESIGN AND ENVIRONMENT	
ISGSD 1-1-97	



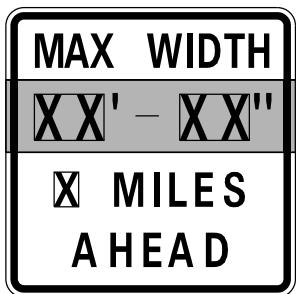
Illinois Department of Transportation

APPROVED April 1, 2016	ISSUED
<i>Jay Eber</i>	
ENGINEER OF OPERATIONS	
APPROVED April 1, 2016	
<i>DR</i>	
ENGINEER OF DESIGN AND ENVIRONMENT	



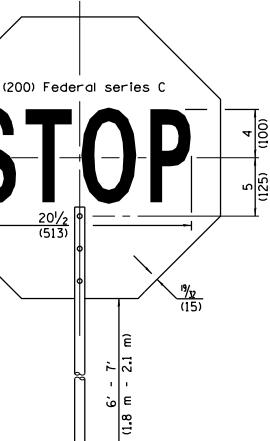
POST MOUNTED SIGNS

** 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.

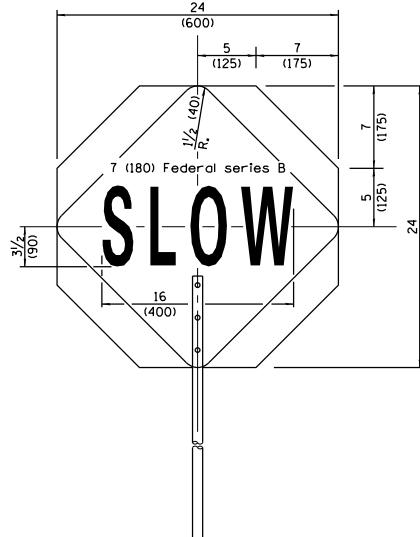


W12-I103-4848

WIDTH RESTRICTION SIGN
XX'-XX" width and X miles are variable.

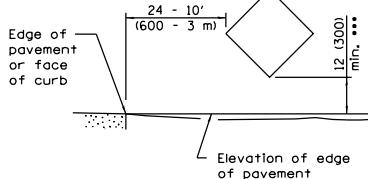


FRONT SIDE



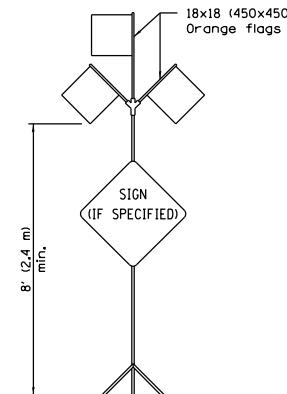
REVERSE SIDE

FLAGGER TRAFFIC CONTROL SIGN



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-I104(O)-6036

END CONSTRUCTION

G20-I105(O)-6024

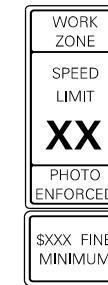
This signing is required for all projects 2 miles (3200 m) or more in length.

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-I115(O)-3618

R2-1-3648

R10-I108p-3618 ****

R2-I106p-3618

Sign assembly as shown on Standards or as allowed by District Operations.



G20-I103(O)-6036

This sign shall be used when the above sign assembly is used.

HIGHWAY CONSTRUCTION SPEED ZONE SIGNS

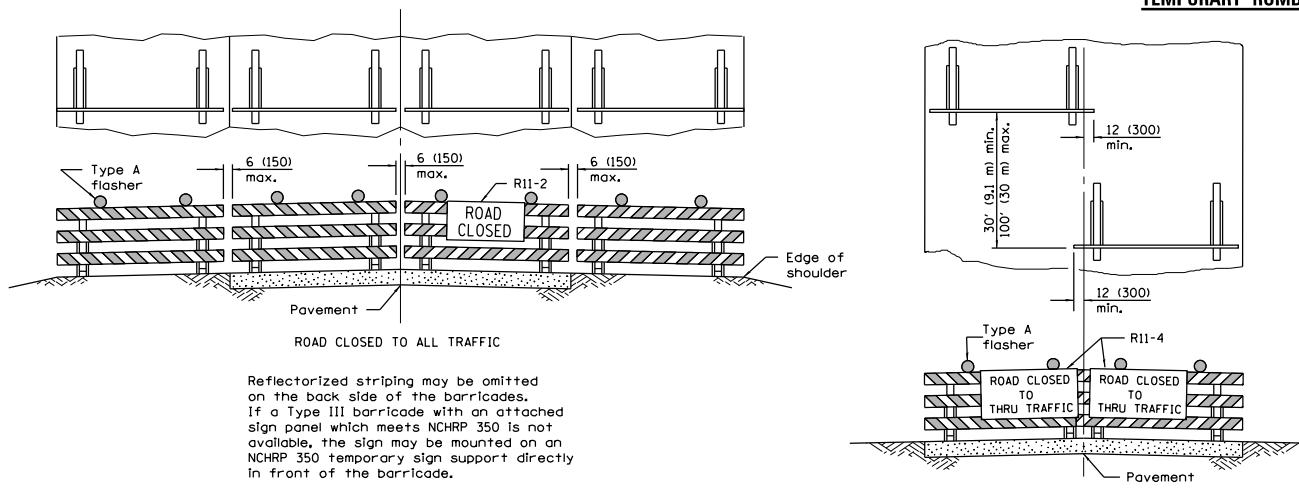
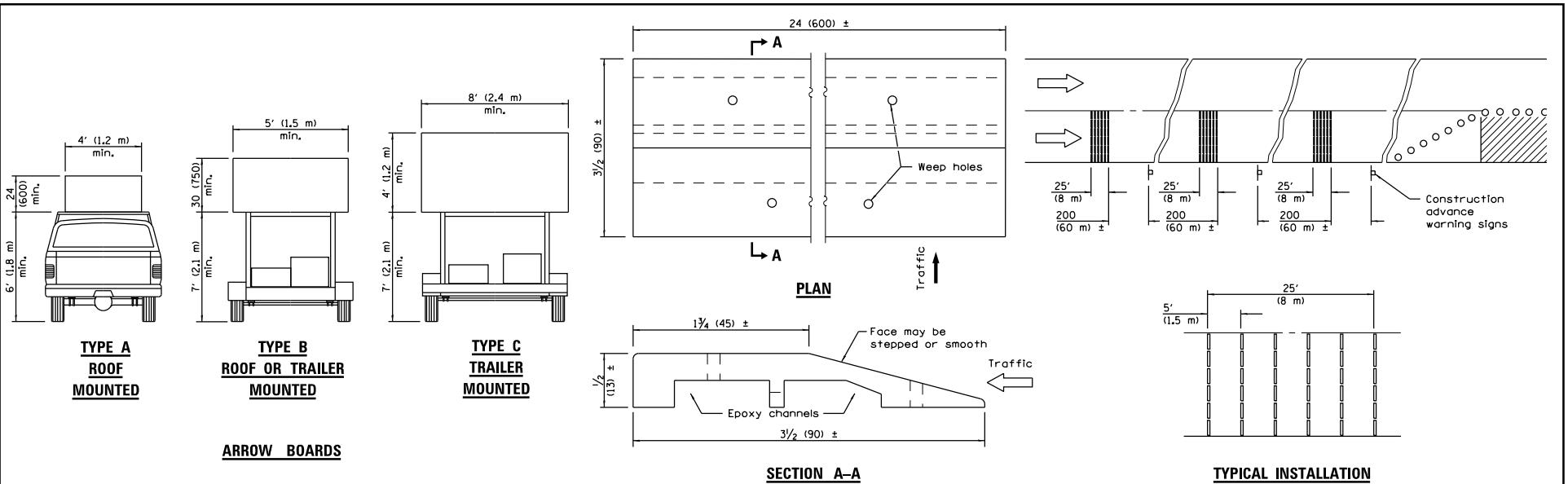
**** R10-I108p shall only be used along roadways under the jurisdiction of the State.

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

TRAFFIC CONTROL DEVICES

(Sheet 2 of 3)

STANDARD 701901-05



	Illinois Department of Transportation
APPROVED <i>[Signature]</i> April 1, 2016	1-1-16
ENGINEER OF OPERATIONS <i>[Signature]</i>	1-1-16
APPROVED <i>[Signature]</i> April 1, 2016	1-1-16
ENGINEER OF DESIGN AND ENVIRONMENT	

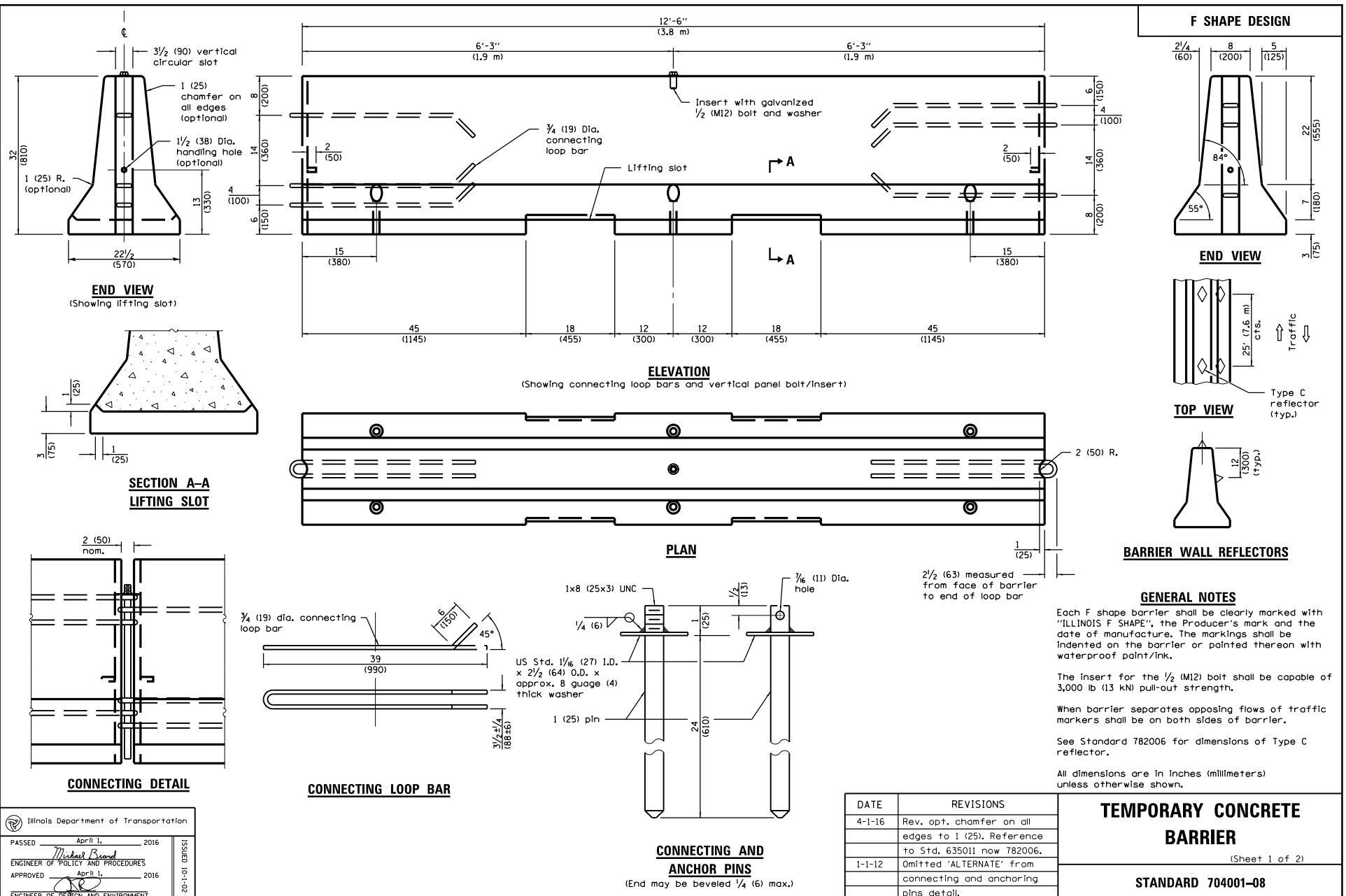
TYPICAL APPLICATIONS OF TYPE III BARRICADES CLOSING A ROAD

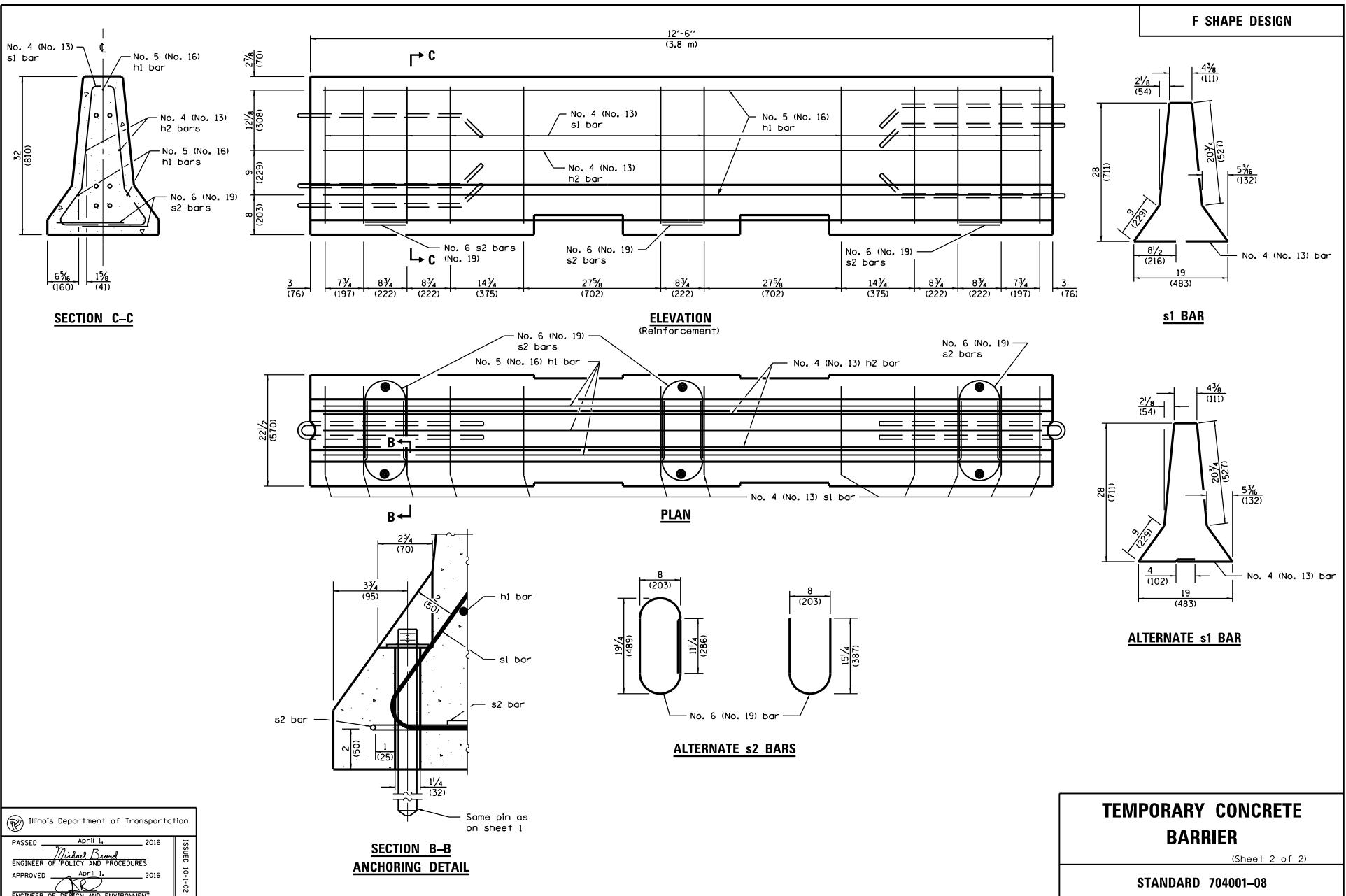
ReflectORIZED striping shall appear on both sides of the barricades. If a Type III barricade with an attached sign panel which meets NCHRP 350 is not available, the signs may be mounted on an NCHRP 350 temporary sign supports directly in front of the barricade.

TRAFFIC CONTROL DEVICES

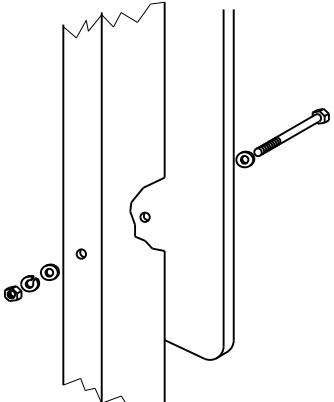
(Sheet 3 of 3)

STANDARD 701901-05

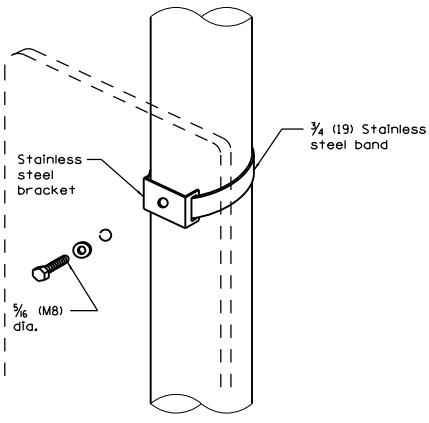




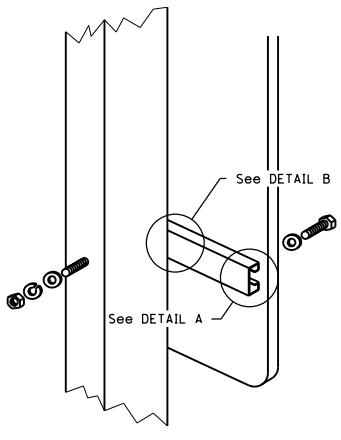
	Illinois Department of Transportation
PASSED	April 1, 2016
<i>Michael Beard</i>	
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	April 1, 2016
<i>John S. O'Neil</i>	
ENGINEER OF DESIGN AND ENVIRONMENT	
20-1-01100	



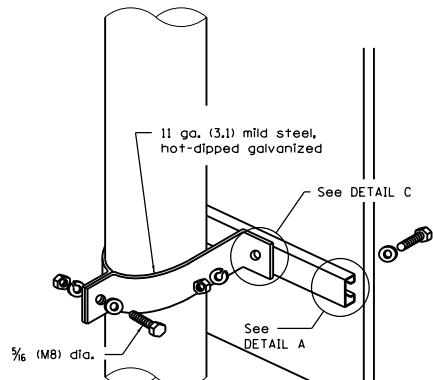
Sign panel 36 (900) wide or less



Sign panel 36 (900) wide or less

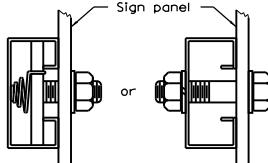


Sign panel over 36 (900) wide

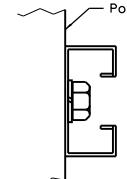


Sign panel over 36 (900) wide

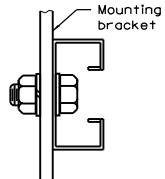
WOOD OR TELESCOPING STEEL POSTS



DETAIL A

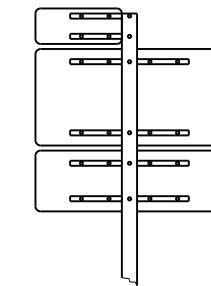
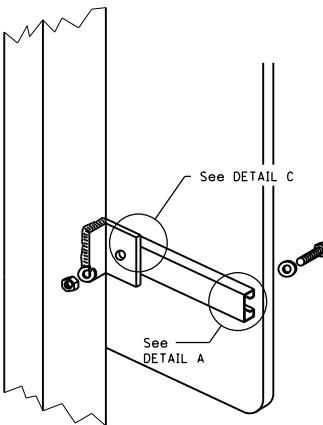


DETAIL B



DETAIL C

LIGHT OR SIGNAL STANDARDS



ROUTE MARKER ASSEMBLY

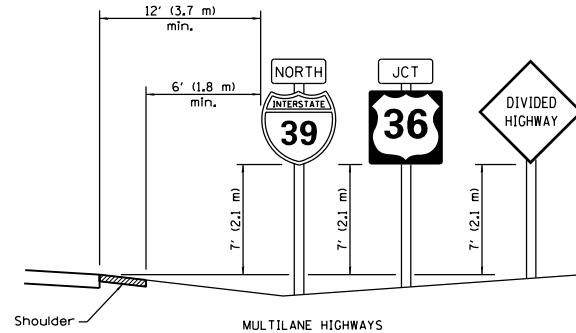
BREAKAWAY STEEL TUBING POSTS (All sign panel sizes)

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

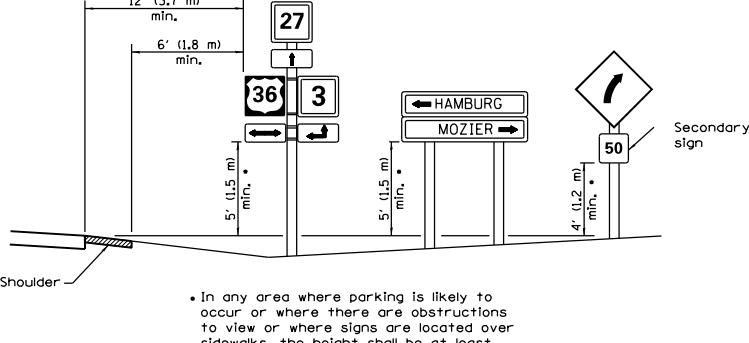
DATE	REVISIONS	SIGN PANEL MOUNTING DETAILS
1-1-09	Switched units to English (metric).	
1-1-97	Renum. Standard 2319-6.	STANDARD 720001-01

	Illinois Department of Transportation
APPROVED	January 1, 2009
ENGINEER OF OPERATIONS	
APPROVED	January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT	

ISSUED 1-1-97

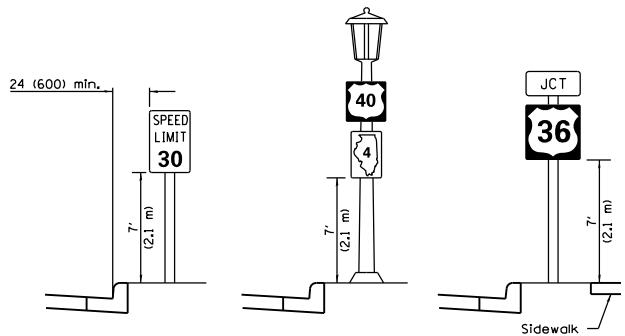


MULTILANE HIGHWAYS



- 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).

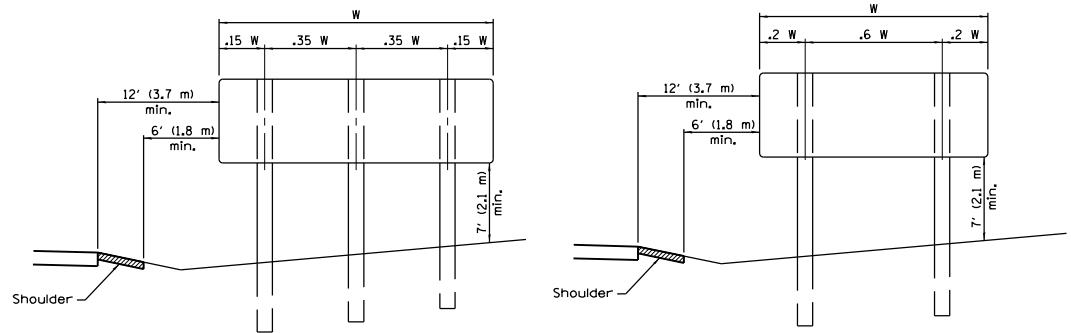
TWO LANE RURAL HIGHWAYS



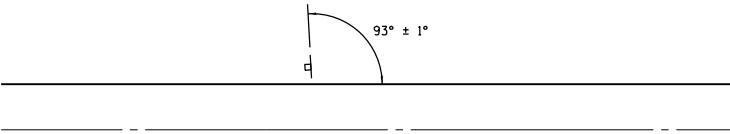
URBAN LOCATIONS

TYPICAL INSTALLATIONS

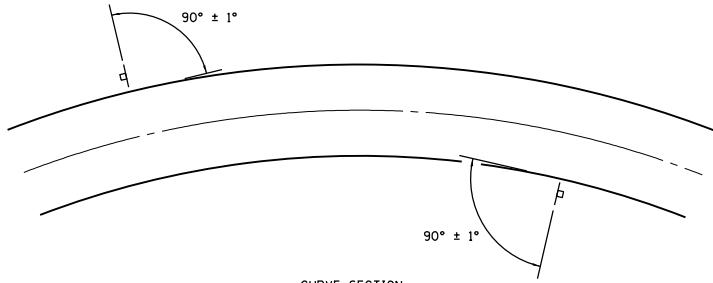
Signs in any area shall be erected to a uniform height above the edge of the pavement.



POST SPACING FOR NON-FREEWAY SIGN PANELS



TANGENT SECTION



CURVE SECTION

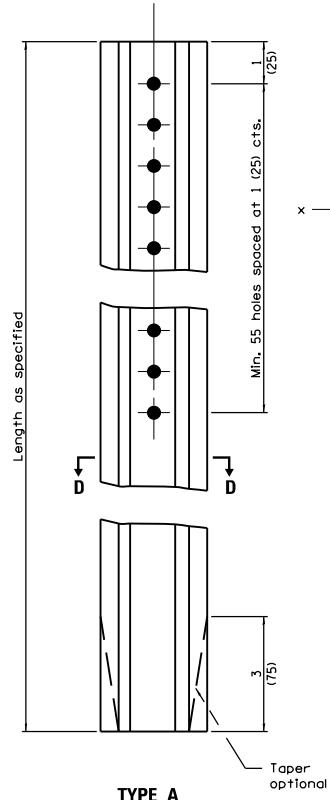
GROUND MOUNT SIGN POSITIONING

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

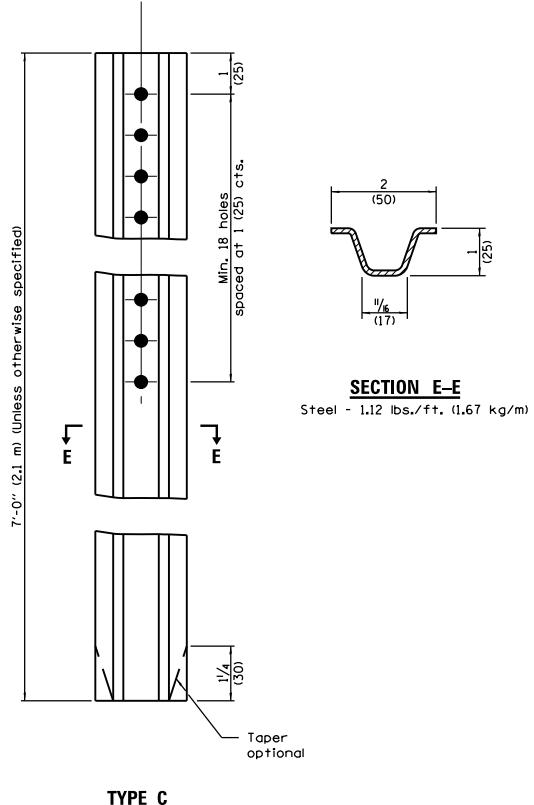
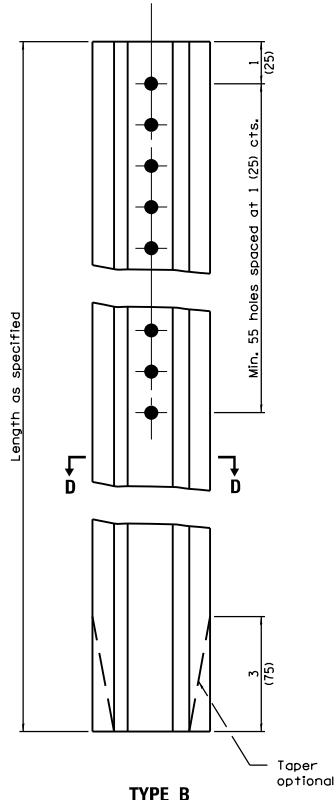
DATE	REVISIONS	SIGN PANEL ERCTION DETAILS
1-1-14	Added shoulders and slopes.	
	Changed sign distances from roadway and shoulder.	
1-1-12	Rev. sign elev. for multilane hwy's. Revised sign elev. and dist. to curb for rural loc.	

STANDARD 72006-04

	Illinois Department of Transportation
APPROVED <i>[Signature]</i> January 1, 2014	1-1-14
ENGINEER/OF OPERATIONS <i>[Signature]</i>	
APPROVED <i>[Signature]</i> January 1, 2014	
ENGINEER OF DESIGN AND ENVIRONMENT <i>[Signature]</i>	



SECTION D-D



		a	b	c	Sx-x in. ³ (mm ³)	lbs./ft. (kg/m)
TYPE A	Steel	3/8 (18)	1/4 (32)	1 1/8 (37)	0.223 (3,654)	2.00 (2.98)
	Aluminum	3/8 (18)	1 1/8 (41)	1 1/8 (48)	0.435 (7,128)	0.80 (1.34)
TYPE B	Steel	3 1/8 (81)	1 1/4 (32)	1 1/2 (38)	0.341 (5,588)	3.00 (4.46)
	Aluminum	4 1/8 (108)	2 1/4 (57)	2 1/8 (60)	0.888 (14,552)	1.30 (1.93)

	Illinois Department of Transportation
PASSED	January 1, 2009
<i>[Signature]</i>	J. G. Rossi
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2009
<i>[Signature]</i>	E. S. Khan
ENGINEER OF DESIGN AND ENVIRONMENT	

GENERAL NOTES

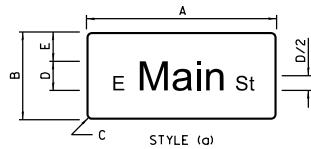
Dimensions shown for cross sections are minimum.

All holes are 3/8 (10).

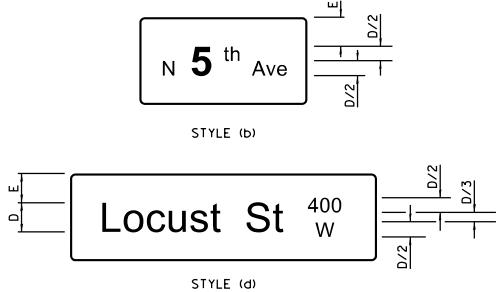
Sx-x is the minimum section modulus about the x-x axis of the post as shown. For posts in which holes are punched or drilled for more than half their length, Sx-x shall be computed for the net section.

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

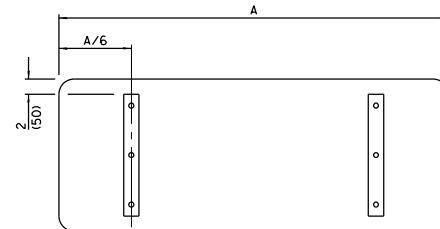
DATE	REVISIONS	METAL POSTS FOR SIGNS, MARKERS & DELINEATORS
1-1-09	Switched units to English (metric).	
1-1-97	Renum. Standard 2350-4.	
		STANDARD 720011-01



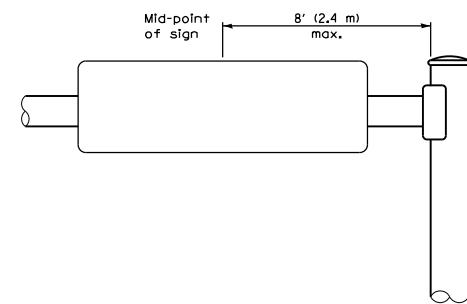
When road classification only
is on the second line, it should
not be abbreviated.



TYPICAL SIGN STYLES



SUPPORTING CHANNELS



MOUNTING LOCATION

SIGN STYLE	DIMENSIONS								LETTER SIZE UC/LC PRIMARY			BORDER
	A	B	C	D	E	F	G	H	I	2	•	
a,b,d	Var. (300)	12 (40)	1½ (40)	6 (150)	3 (75)	-	-	-	6 4½ (150/115)	-	-	¾ (10)
	Var. (450)	18 (40)	1½ (200)	8 (125)	5 (125)	-	-	-	8 6 (200/150)	-	-	¾ (15)
	Var. (600)	24 (40)	1½ (250)	10 (175)	7 (175)	-	-	-	10 7½ (250/190)	-	-	¾ (15)
	Var. (750)	30 (45)	1½ (300)	12 (225)	9 (225)	-	-	-	12 9 (400/300)	-	-	¾ (20)
	Var. (900)	36 (60)	2 ¼ (250)	10 (190)	7 (190)	-	-	-	10 7½ (250/190)	-	-	¾ (20)
c,e	Var. (600)	24 (40)	1½ (150)	6 -	-	5½ (140)	4 (100)	6 4½ (150/115)	-	3 (75)	¾ (15)	
	Var. (750)	30 (45)	1½ (200)	8 -	-	7 (175)	4½ (115)	8 6 (200/150)	-	4 (100)	¾ (20)	
	Var. (900)	36 (60)	2 ¼ (250)	10 -	-	7½ (190)	6 (150)	10 7½ (250/190)	-	5 (125)	¾ (20)	
	Var. (1050)	42 (75)	3 (300)	12 -	-	8½ (215)	7 (175)	12 9 (400/300)	-	6 (150)	1 (25)	
f	Var. (600)	24 (40)	1½ (150)	6 (100)	4 (100)	4 -	-	6 4½ (150/115)	6 4½ (150/115)	-	¾ (15)	
	Var. (750)	30 (45)	1½ (200)	8 (115)	4½ (125)	5 -	-	8 6 (200/150)	8 6 (200/150)	-	¾ (20)	
	Var. (900)	36 (60)	2 ¼ (250)	10 -	-	7½ (190)	6 (150)	10 7½ (250/190)	10 7½ (250/190)	-	1 (25)	
	Var. (1050)	42 (75)	3 (250)	12 (190)	7½ (175)	-	-	12 9 (400/300)	12 9 (400/300)	-	1 (25)	
	Var. (1200)	48 (75)	3 (300)	12 (190)	7½ (200)	-	-	12 9 (400/300)	12 9 (400/300)	-	1 (25)	

* Supplemental Messages

	Illinois Department of Transportation
APPROVED <i>[Signature]</i> January 1, 2012	1-1-12
ENGINEER OF OPERATIONS <i>[Signature]</i>	1-1-12
APPROVED <i>[Signature]</i> January 1, 2012	1-1-12
ENGINEER OF DESIGN AND ENVIRONMENT <i>[Signature]</i>	1-1-12

GENERAL NOTES

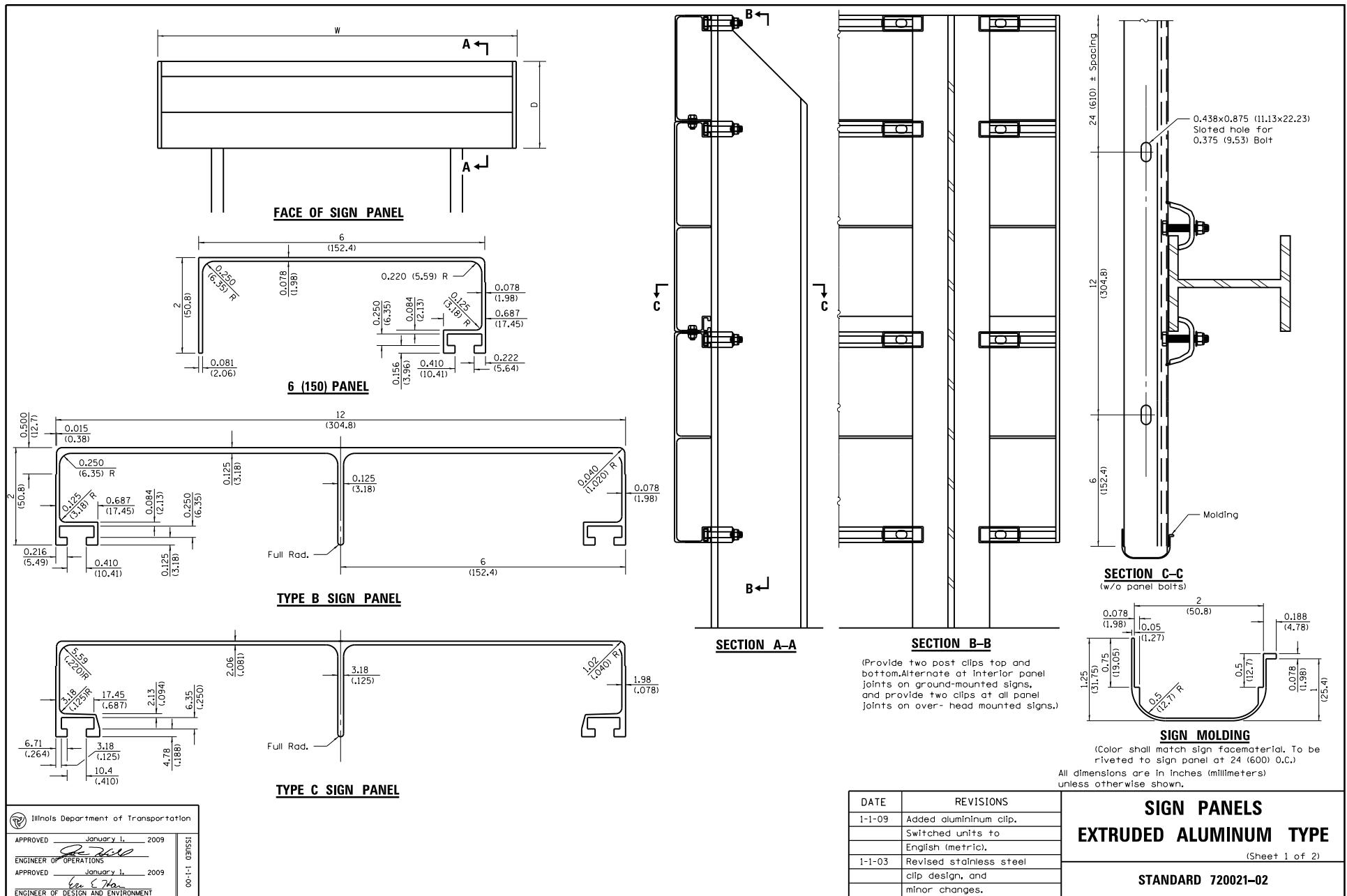
All signs shall have a white reflectorized legend and border on a green reflectorized background.

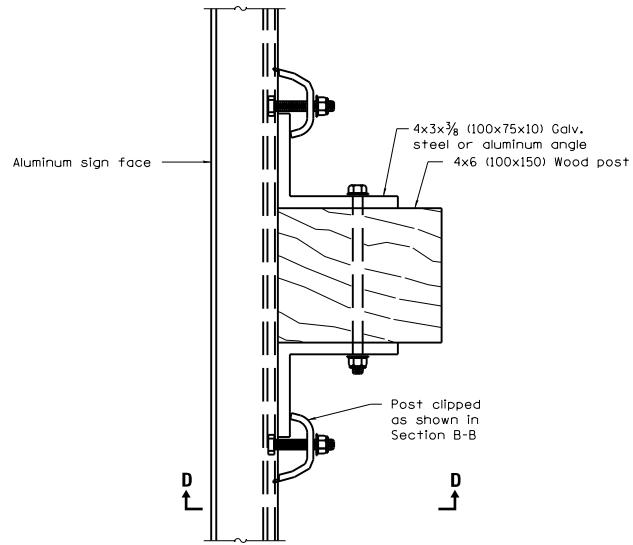
The sign panels shall be mounted as shown on Standard 720001 or as specified in the plans.

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

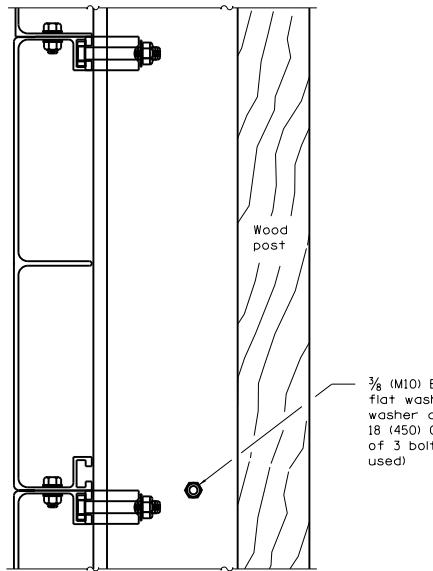
DATE	REVISIONS	MAST ARM MOUNTED STREET NAME SIGNS
1-1-12	Revised table and lettering to upper/lower case per current MUTCD.	
1-1-09	Switched units to English (metric).	

STANDARD 720016-03

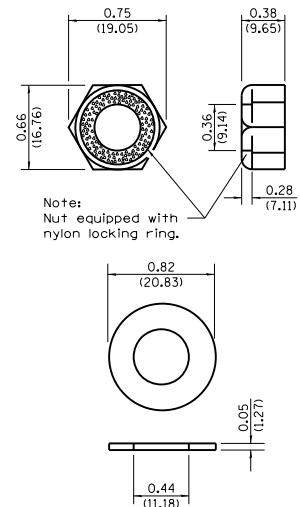
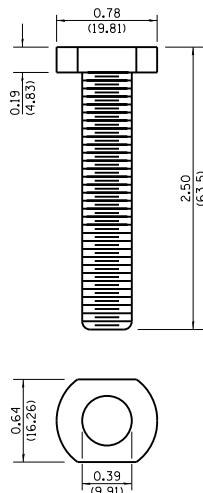




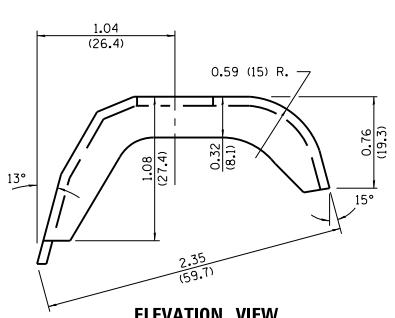
**SIGN PANEL ATTACHMENT
TO WOOD POST**



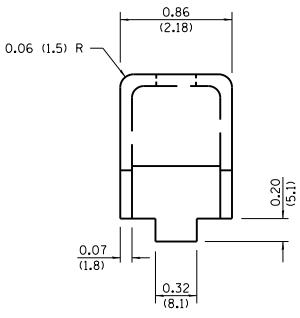
3/8 (M10) Bolt with
flat washer, lock
washer and nut
18 (450) O.C. (min.
of 3 bolts to be
used)



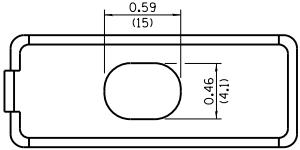
**STAINLESS STEEL CLIP
NUT, BOLT AND WASHER ASSEMBLY**



ELEVATION VIEW



END VIEW

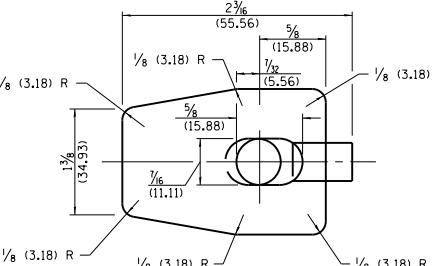


PLAN VIEW

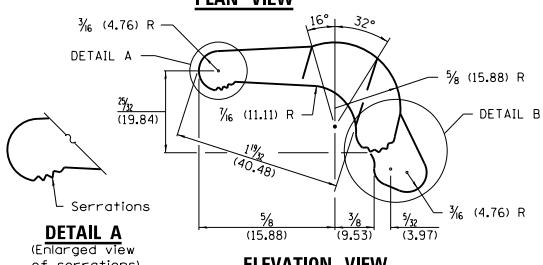
STAINLESS STEEL CLIP

Illinois Department of Transportation
APPROVED January 1, 2009
ENGINEER OF OPERATIONS
APPROVED January 1, 2009
EE&E
ENGINEER OF DESIGN AND ENVIRONMENT

00-1-1 GRSI

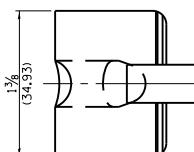


PLAN VIEW

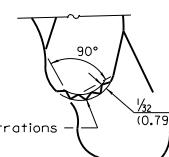


ELEVATION VIEW

DETAIL A
(Enlarged view
of serrations)



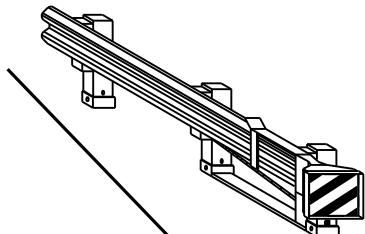
END VIEW



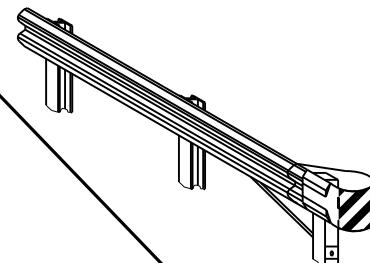
DETAIL B
(Enlarged detail
of serrations)

ALUMINUM CLIP

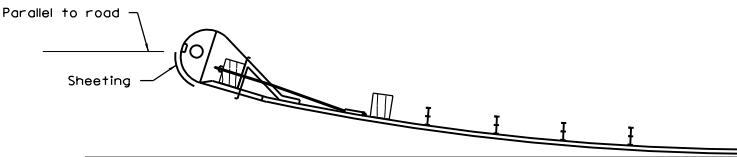
**SIGN PANELS
EXTRUDED ALUMINUM TYPE**
(Sheet 2 of 2)
STANDARD 720021-02



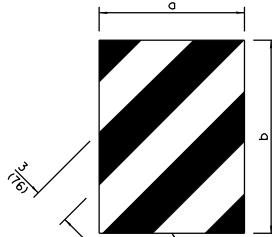
CASE I



CASE II



SHEETING POSITION: CASE II



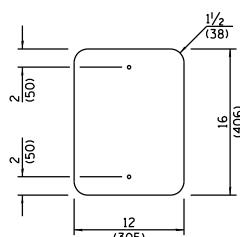
Alternating black and yellow stripes.

DIRECT APPLIED

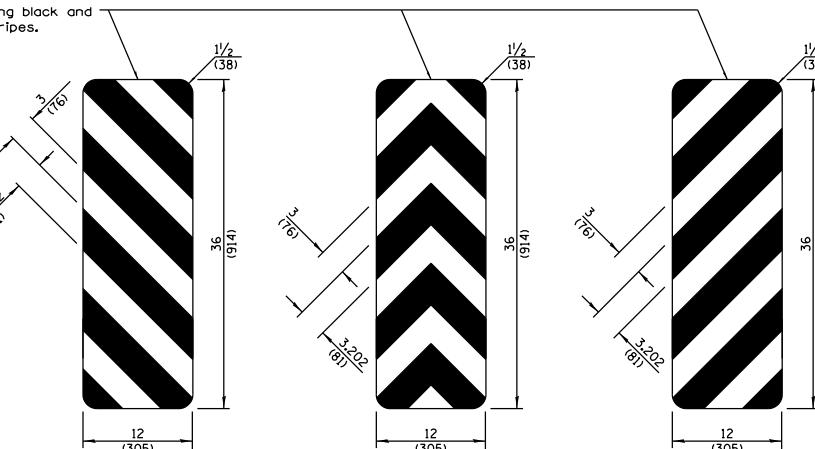
TERMINAL MARKER DETAILS

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, with a minimum reflective area of 288 sq. in. (0.18 m^2).



POST MOUNTED



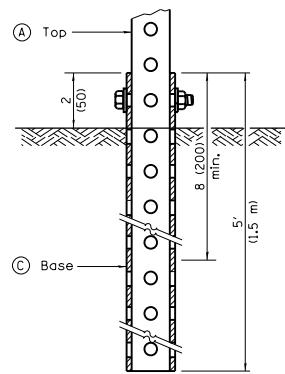
OBJECT MARKER DETAILS

GENERAL NOTES

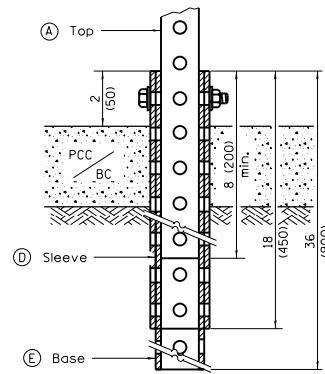
See detail on Standard 729001 for mounting
markers to posts.

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

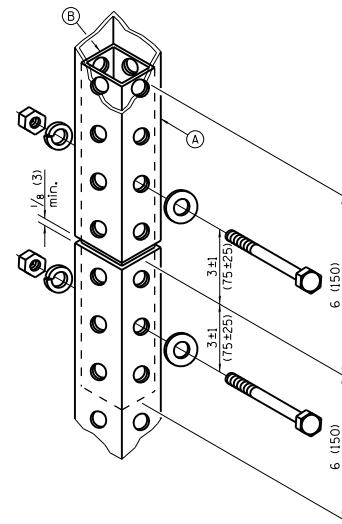
DATE	REVISIONS	OBJECT AND TERMINAL MARKERS
4-1-16	Renumbered standard from 635006.	
1-1-09	Switched units to English (metric). Changed 'white' to 'crystal' ref.	STANDARD 725001



GROUND MOUNT DETAIL



PAVEMENT MOUNT DETAIL



SPLICE DETAIL

(A)	2 x 2 x var. (51 x 51 var.)
(B)	1 3/4 x 1 3/4 x 12 (44 x 44 x 300)
(C)	2 1/4 x 2 1/4 x 60 (57 x 57 x 1500)
(D)	2 1/2 x 2 1/2 x 18 (64 x 64 x 450)
(E)	2 1/4 x 2 1/4 x 36 (57 x 57 x 900)

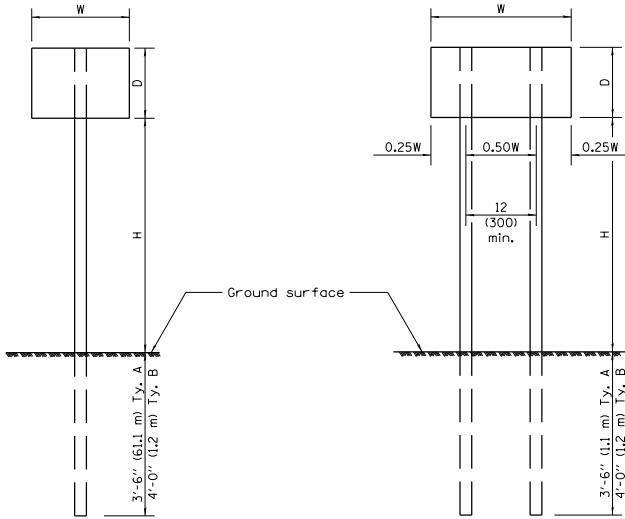
GENERAL NOTES

All bolts $\frac{3}{8}$ (M10) hex head zinc or cadmium plated.

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

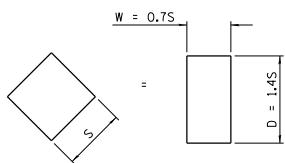
	Illinois Department of Transportation
APPROVED	January 1, 2009
ENGINEER OF OPERATIONS	
APPROVED	January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT	
	ISSUED 1-1-07

DATE	REVISIONS	TELESCOPING STEEL SIGN SUPPORT STANDARD 728001-01
1-1-09	Switched units to English (metric).	
1-1-07	New Standard. Used to be part of Standard	
	720006.	



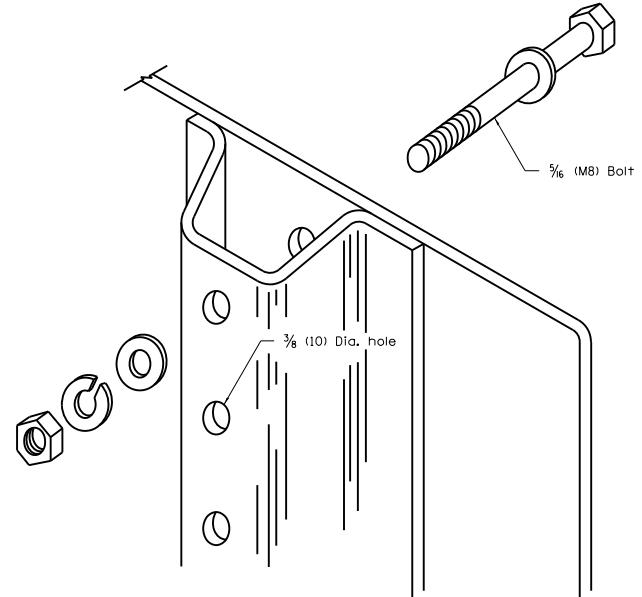
ONE POST INSTALLATION

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	B	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	2A	2A
	9'-0" (2.7 m)	A	A	B	2A	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, Luminaire 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).

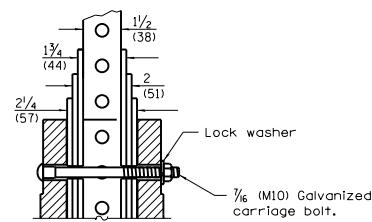
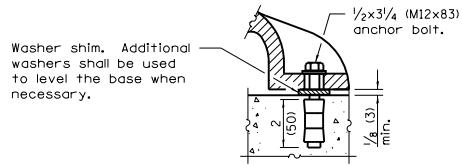
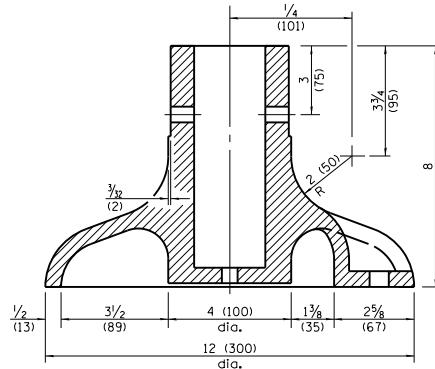
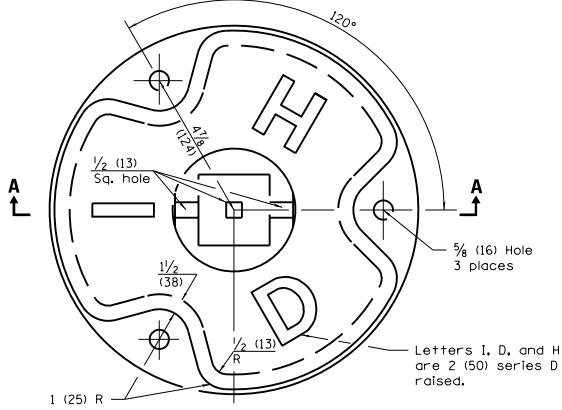
See Standard 7200II for details of Types A and B posts.

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

DATE	REVISIONS	APPLICATIONS OF TYPES A & B METAL POSTS (FOR SIGNS & MARKERS)	STANDARD 729001-01
1-1-09	Switched units to English (metric).		
I-1-97	Renum. Standard 2363-2.		

	Illinois Department of Transportation
PASSED	January 1, 2009
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT	

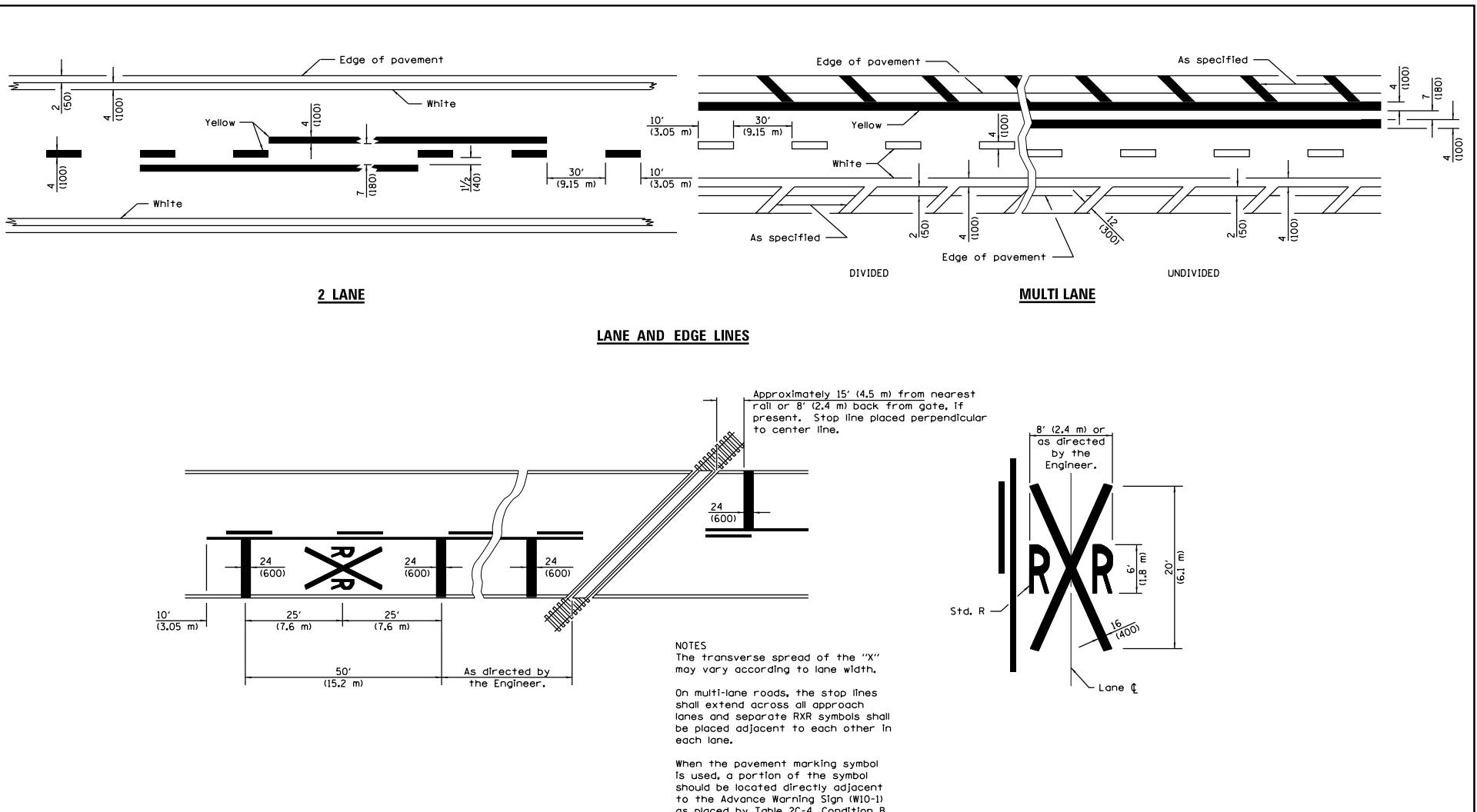
1-1-97



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

DATE	REVISIONS	BASE FOR TELESCOPING STEEL SIGN SUPPORT
1-1-09	Switched units to English (metric).	
1-1-07	New Standard. Used to be part of Standard	STANDARD 731001-01
	720006.	

	Illinois Department of Transportation
APPROVED	January 1, 2009
ENGINEER OF OPERATIONS	
APPROVED	January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT	
	ISSUE 1-1-07

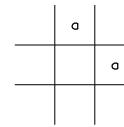
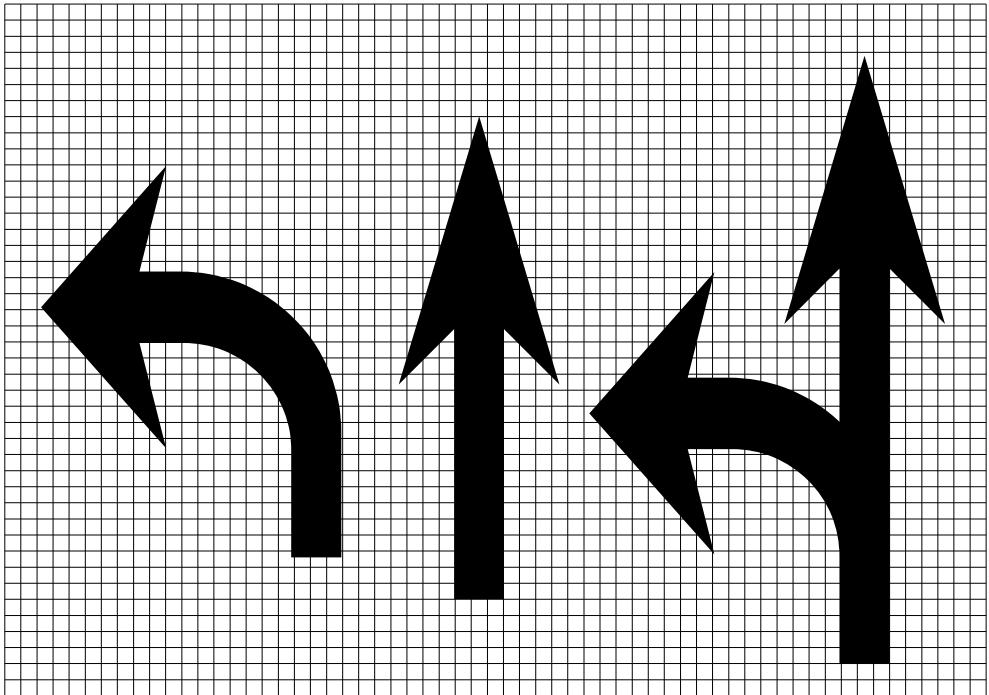
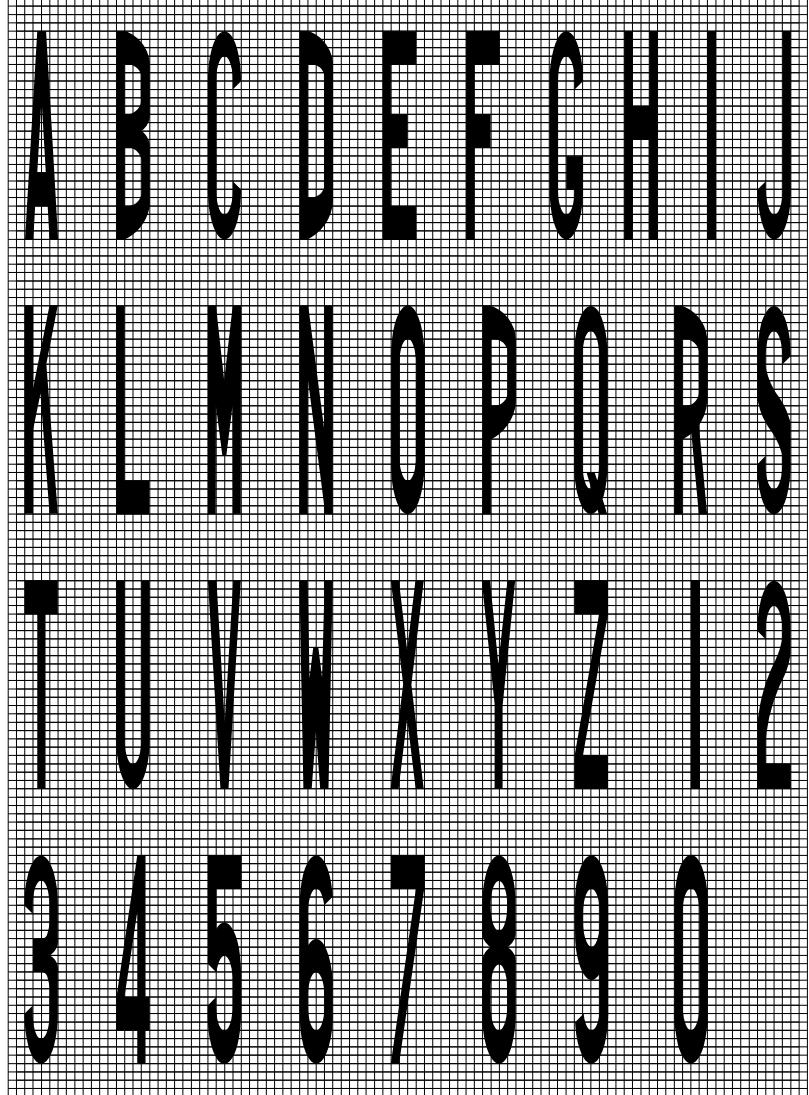


	Illinois Department of Transportation
APPROVED <i>[Signature]</i>	January 1, 2015
ENGINEER OF OPERATIONS	
APPROVED <i>[Signature]</i>	January 1, 2015
ENGINEER OF DESIGN AND ENVIRONMENT	

**PAVEMENT MARKINGS AT
RAILROAD-HIGHWAY GRADE CROSSING**

DATE	REVISIONS	TYPICAL PAVEMENT MARKINGS (Sheet 1 of 3)
1-1-15	Added symbols. Revised bike symbol. Revised note for stop line at RR crossing.	
I-1-14	Added bike symbol. Renamed 'LANE DROP ARROW' detail to 'LANE-REDUCTION ARROW'.	

STANDARD 78001-05



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.

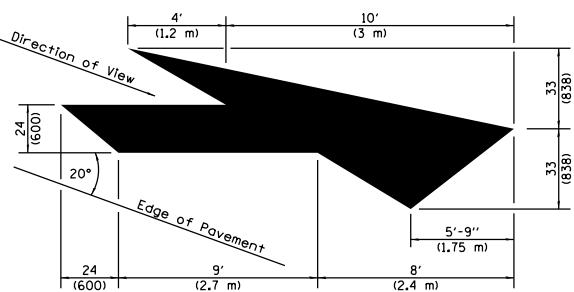
LETTER AND ARROW GRID SCALE

	Illinois Department of Transportation
APPROVED	January 1, 2015
ENGINEER OF OPERATIONS	
APPROVED	January 1, 2015
ENGINEER OF DESIGN AND ENVIRONMENT	

TYPICAL PAVEMENT MARKINGS

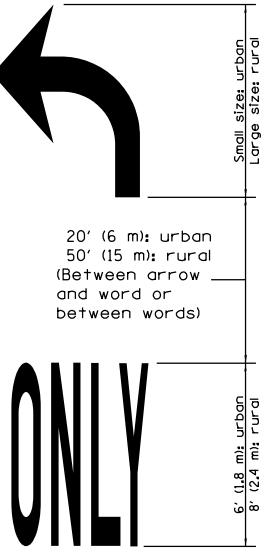
(Sheet 2 of 3)

STANDARD 780001-05

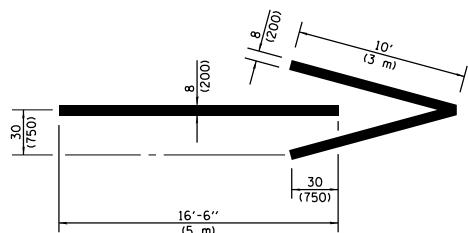


LANE-REDUCTION ARROW

Right lane-reduction arrow shown.
Use mirror image for left lane.



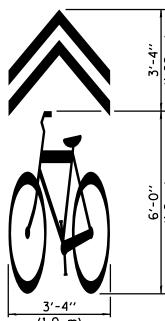
WORD AND ARROW LAYOUT



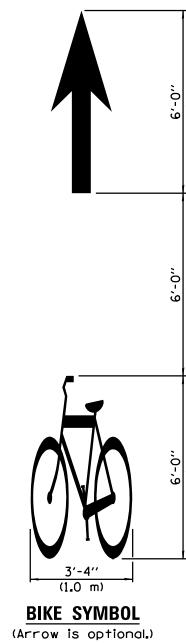
WRONG WAY ARROW



**INTERNATIONAL
SYMBOL OF
ACCESSIBILITY**



**SHARED LANE
SYMBOL**



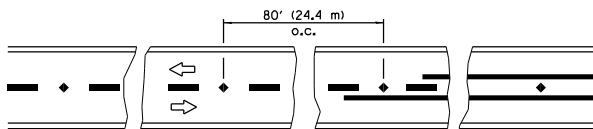
BIKE SYMBOL
(Arrow is optional.)

	Illinois Department of Transportation
APPROVED	January 1, 2015
ENGINEER OF OPERATIONS	I-94-1-1-1-1-1
APPROVED	January 1, 2015
ENGINEER OF DESIGN AND ENVIRONMENT	CR

TYPICAL PAVEMENT MARKINGS

(Sheet 3 of 3)

STANDARD 780001-05

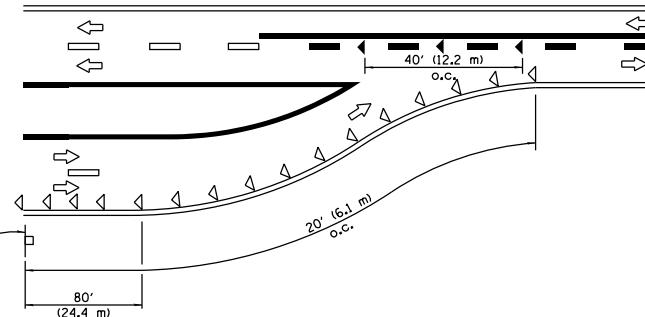


Reduce to 40' (12.2 m) o.c. on curves with posted or advisory speeds of 45 mph (70 km/h) or less.

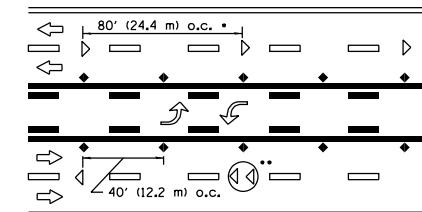
TWO-LANE / TWO-WAY



W4-2

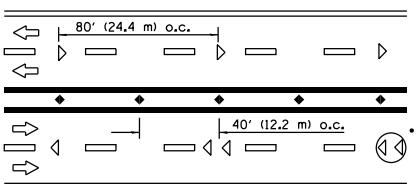


LANE REDUCTION TRANSITION



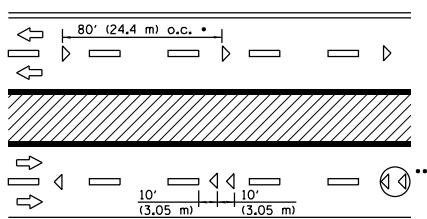
*** See MULTI LANE DIVIDED detail for lane marker notes.

TWO-WAY LEFT TURN



*** See MULTI LANE DIVIDED detail for lane marker notes.

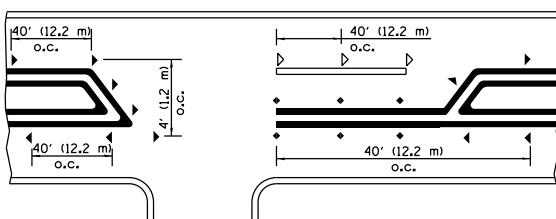
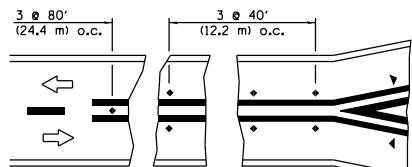
MULTI-LANE UNDIVIDED



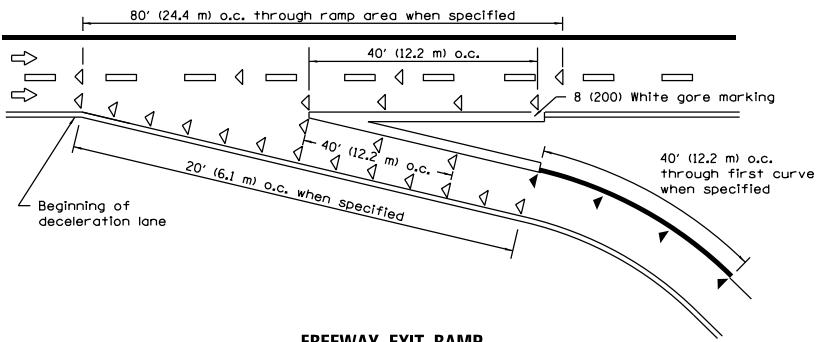
- Reduce to 40' (12.2 m) o.c. on curves where advisory speeds are 10 mph (15 km/h) lower than posted speeds.

- Where double lane line markers are specified, they shall be spaced as shown.

MULTI-LANE DIVIDED



RURAL LEFT TURN



FREEWAY EXIT RAMP

SYMBOLS

- Yellow stripe
- White stripe
- One-way amber marker
- One-way crystal marker
- ◆ Two-way amber marker

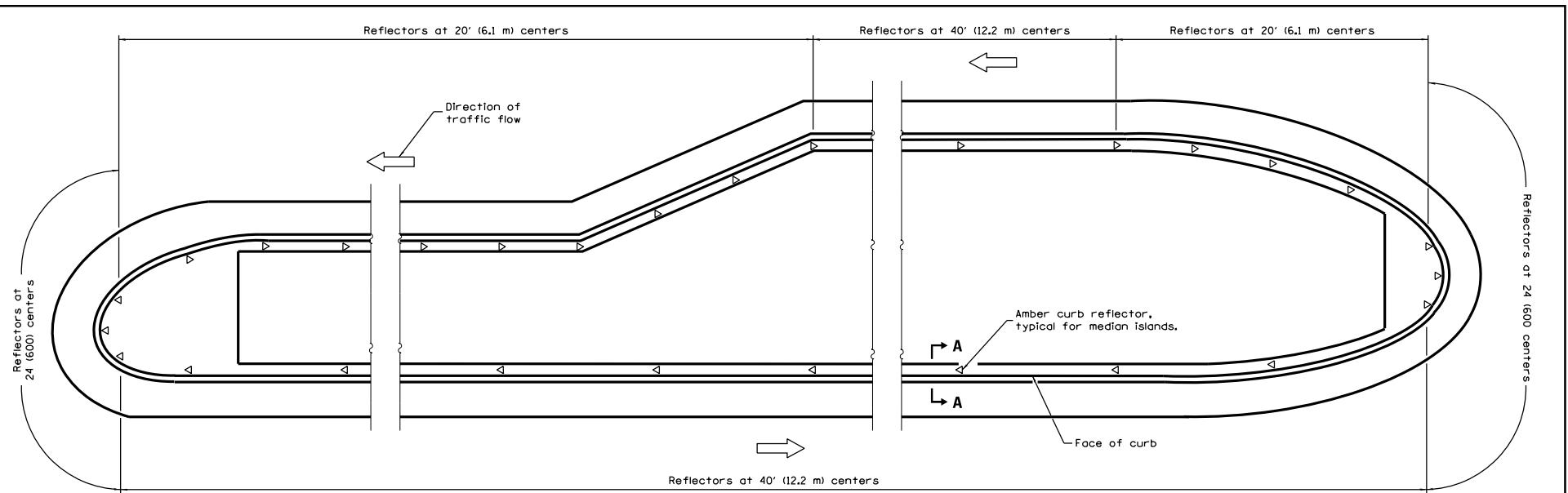
All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS
4-1-16	Revised LANE ENDS sign
	W4-2 to agree with current
	MUTCD.
1-1-09	Switched units to English (metric).

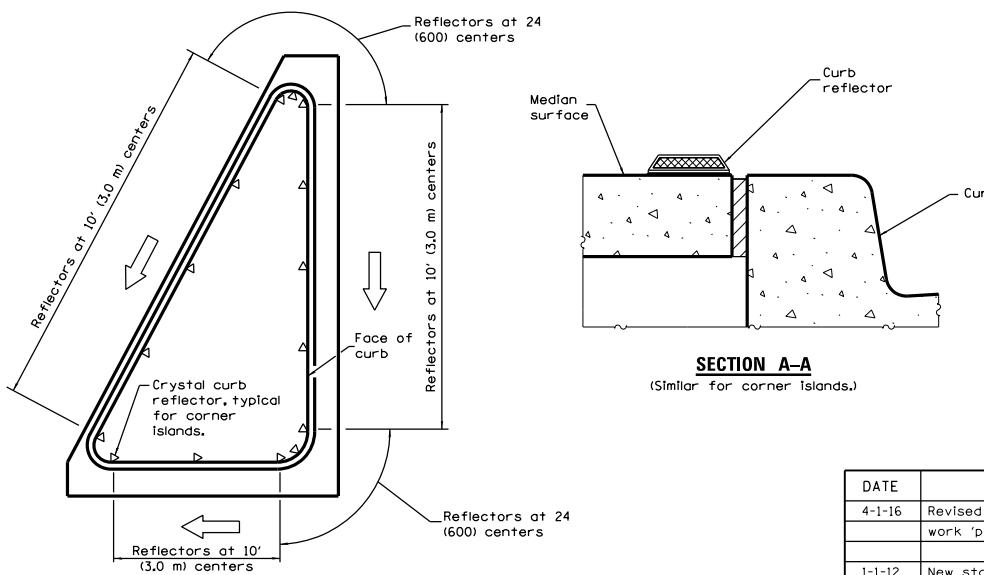
TYPICAL APPLICATIONS RAISED REFLECTIVE PAVEMENT MARKERS

STANDARD 781001-04

	Illinois Department of Transportation
APPROVED	April 1, 2016
ENGINEER OF OPERATIONS	
APPROVED	April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT	
	11-1-16

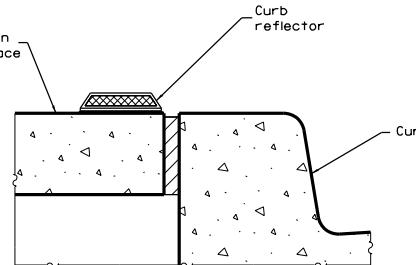


MEDIAN ISLAND



SECTION A-A

(Similar for corner islands.)



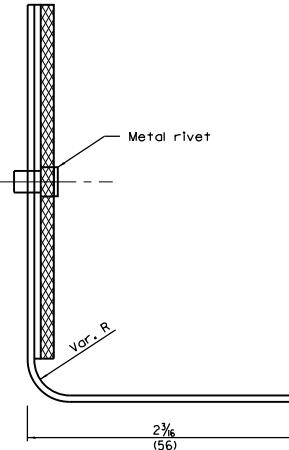
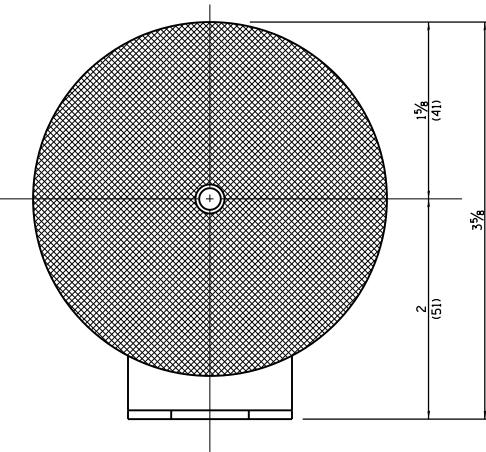
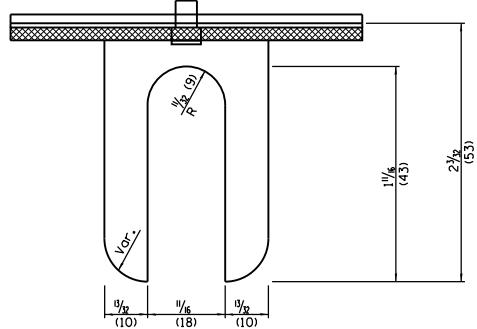
GENERAL NOTES

Curb reflectors shall be monodirectional and oriented with the reflective face toward approaching traffic.

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

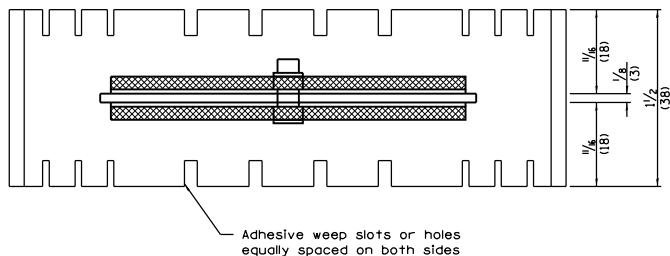
	Illinois Department of Transportation
PASSED	April 1, 2016
ENGINEER OF OPERATIONS	
APPROVED	April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT	
	ISSUE DATE 4-1-16

DATE	REVISIONS	CURB REFLECTORS
4-1-16	Revised title and removed work 'prismatic'.	
1-1-12	New standard.	
		STANDARD 782001-01

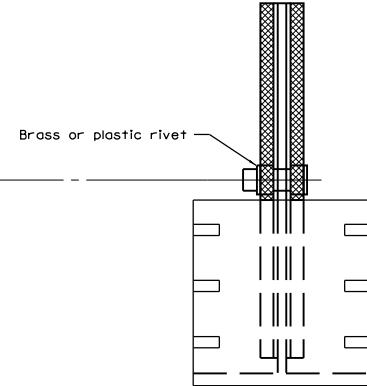
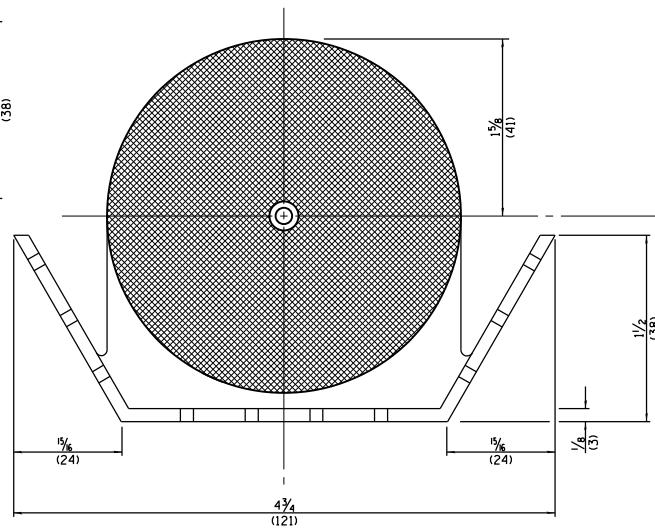


REFLECTOR TYPE A

(monodirectional shown)



Adhesive weep slots or holes
equally spaced on both sides



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

REFLECTOR TYPE B

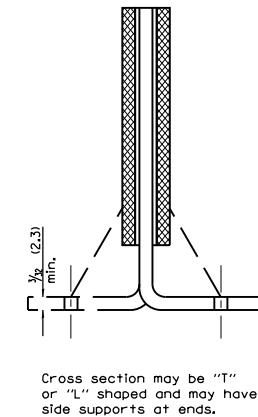
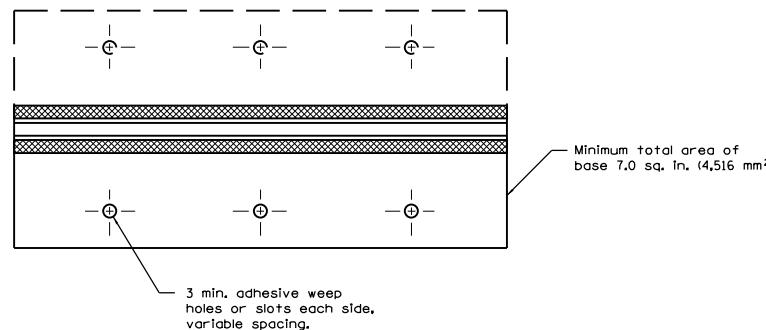
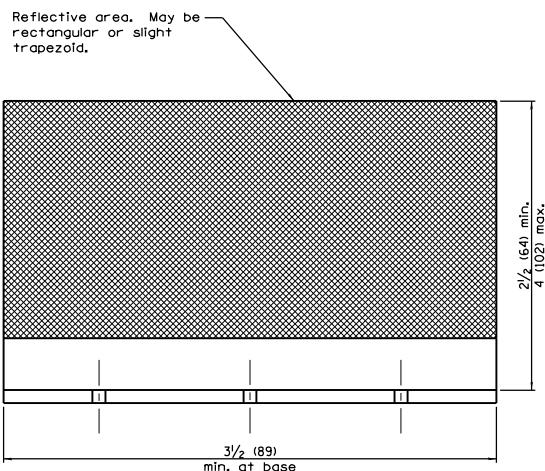
(bidirectional shown)

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

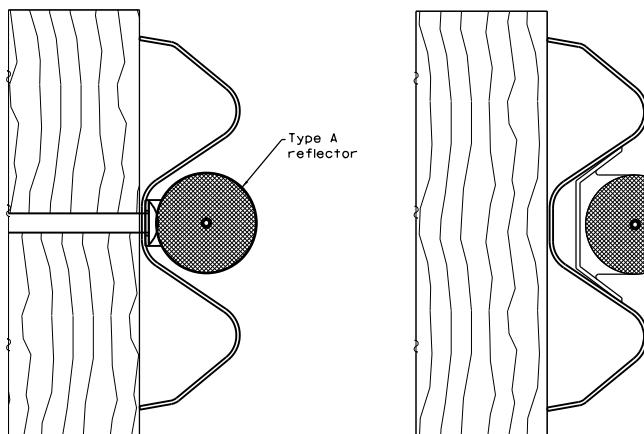
0002-1-0393

DATE	REVISIONS	GUARDRAIL AND BARRIER WALL REFLECTOR MOUNTING DETAILS (Sheet 1 of 3)
4-1-16	Added reflector spacing detail, Moved TERMINAL	
	MARKER to std. 725001.	
1-1-09	Switched units to English (metric).	

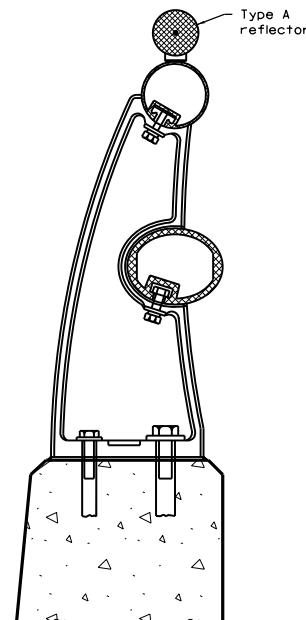
STANDARD 782006



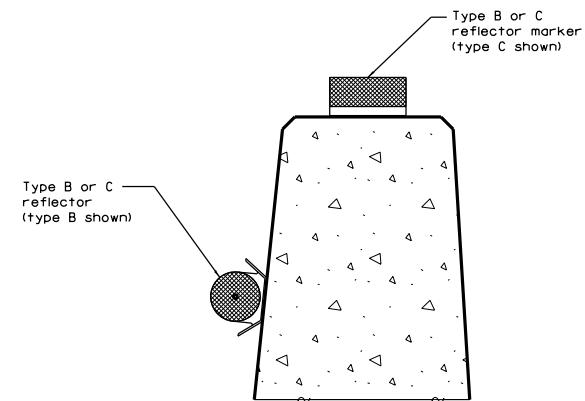
REFLECTOR TYPE C



**TYPICAL MOUNTING DETAIL
FOR GUARDRAIL REFLECTOR**



**TYPICAL MOUNTING DETAIL
FOR BRIDGE RAIL REFLECTOR**



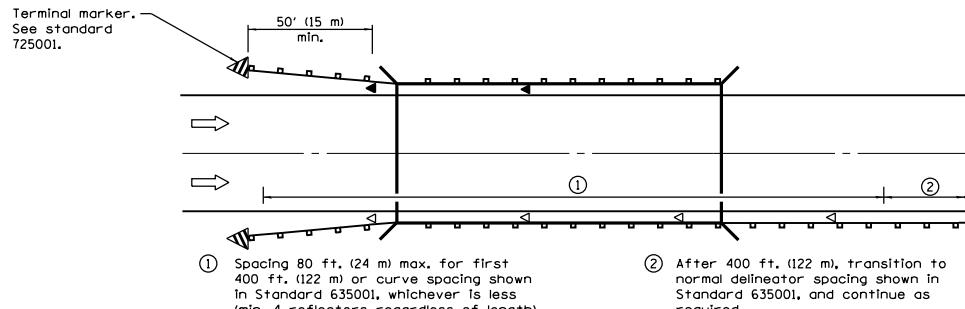
**TYPICAL MOUNTING DETAIL
FOR BARRIER WALL REFLECTOR**

	Illinois Department of Transportation
APPROVED	April 1, 2016
<i>Jerry Eber</i>	
ENGINEER OF OPERATIONS	
APPROVED	April 1, 2016
<i>DR</i>	
ENGINEER OF DESIGN AND ENVIRONMENT	
	0002-1-0393

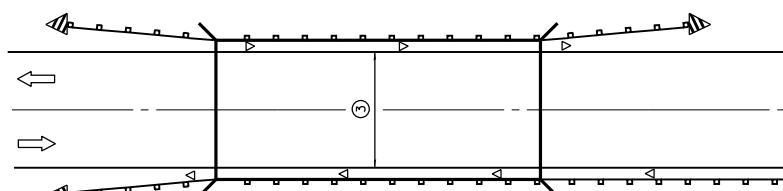
GUARDRAIL AND BARRIER WALL REFLECTOR MOUNTING DETAILS

(Sheet 2 of 3)

STANDARD 782006



ONE-WAY TRAFFIC



▷ Monodirectional crystal
◀ Monodirectional amber

TWO-WAY TRAFFIC

GUARDRAIL /BARRIER WALL REFLECTOR PLACEMENT DETAIL

	Illinois Department of Transportation
APPROVED	April 1, 2016
ENGINEER OF OPERATIONS	
APPROVED	April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT	
IS-10301-1-2006	

GUARDRAIL AND BARRIER WALL REFLECTOR MOUNTING DETAILS

(Sheet 3 of 3)

STANDARD 782006



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

821101-01 Luminaire Wiring Diagram

LIGHTING – CONTROLLERS

825001-03 Lighting Controller, Pole Mounted, 240V

825006-02 Lighting Controller, Pole Mounted, 480V

825011-03 Lighting Controller, Pedestal Mounted, 240V

825016-03 Lighting Controller, Pedestal Mounted, 480V

825021-03 Lighting Controller, Base Mounted, 240V

825026-03 Lighting Controller, Base Mounted, 480V

826001-01 Navigation Obstruction Lighting Controller, 240V

826006-01 Navigation Obstruction Lighting Controller, 480V

LIGHTING – POLES

830001-03 Light Pole Aluminum Mast Arm

830006-03 Light Pole Aluminum Davit Arm

830011-02 Light Pole Steel Mast Arm

830016-02 Light Pole Steel Davit Arm

830021-02 Light Pole Steel Tenon Top

830026 Temporary Roadway Lighting

LIGHTING – TOWERS

835001-01 Light Tower

LIGHTING – FOUNDATIONS

836001-02 Light Pole Foundation

836006-01 Light Pole Foundation with 32 in. (815 mm) Concrete Median Barrier

836011-01 Light Pole Foundation with 42 in. (1065 mm) Concrete Median Barrier

837001-04 Light Tower Foundation

LIGHTING – BREAKAWAY DEVICES

838001 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

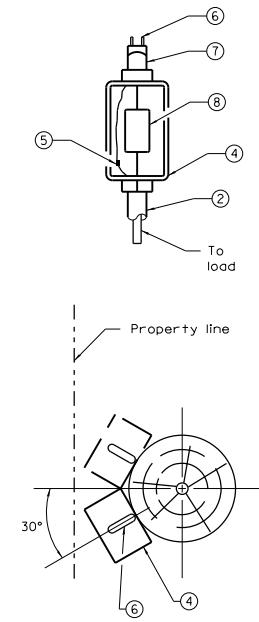
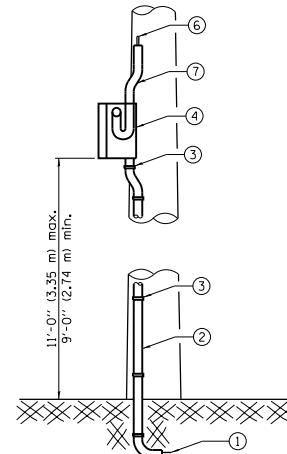
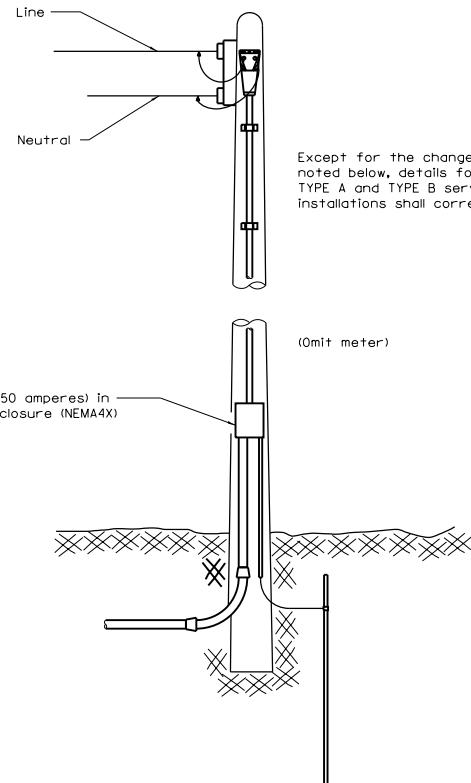
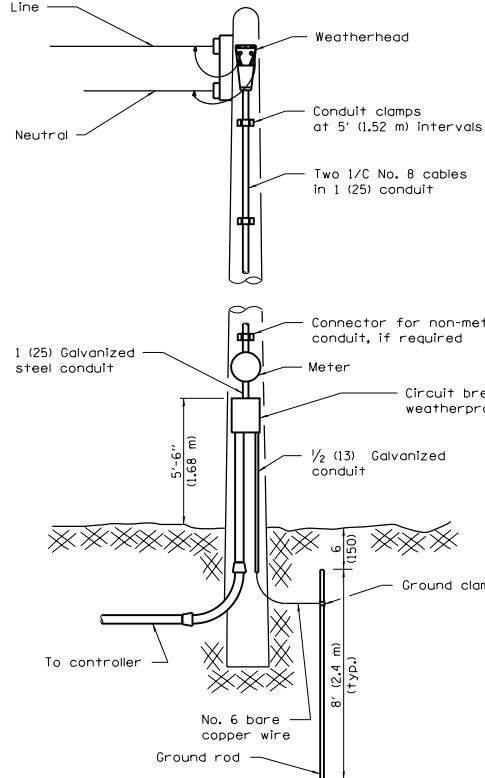
876001-04 Pedestrian Push Button Post
877001-06 Steel Mast Arm Assembly and Pole 16' Through 55'
877002-03 Steel Mast Arm Assembly and Pole 56' Through 75'
877006-05 Steel Mast Arm Assembly and Pole with Dual Mast Arms
877011-07 Steel Combination Mast Arm Assembly and Pole 16' Through 55'
877012-04 Steel 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
880006-1 Traffic Signal Mounting Details

TRAFFIC SIGNALS - DETECTION

886001-01 Detector Loop Installations
886006-01 Typical Layout for Detection Loops



TYPE A

TYPE B

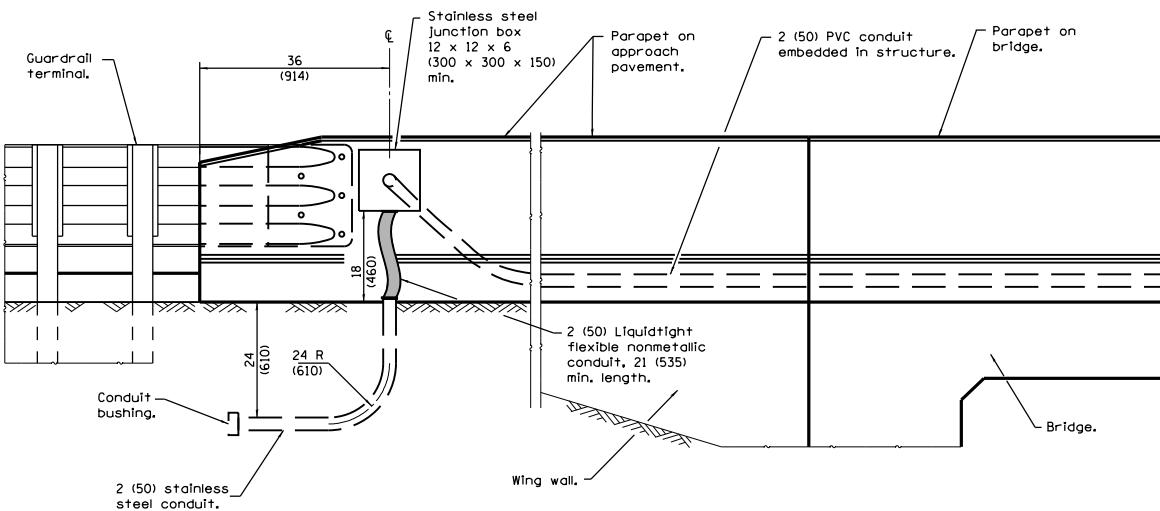
TYPE C

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

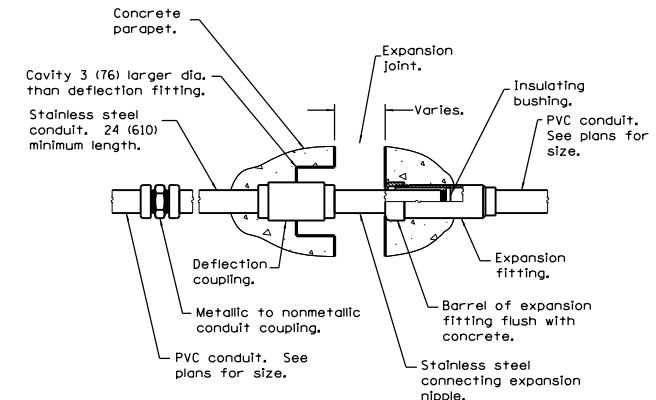
	Illinois Department of Transportation
APPROVED	January 1, 2009
ENGINEER OF OPERATIONS	
APPROVED	January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT	
20-1-1	20-1-1

DATE	REVISIONS	ELECTRICAL SERVICE INSTALLATION DETAILS
1-1-09	Switched units to English (metric).	
1-1-02	Renum. Standard 2373-1.	

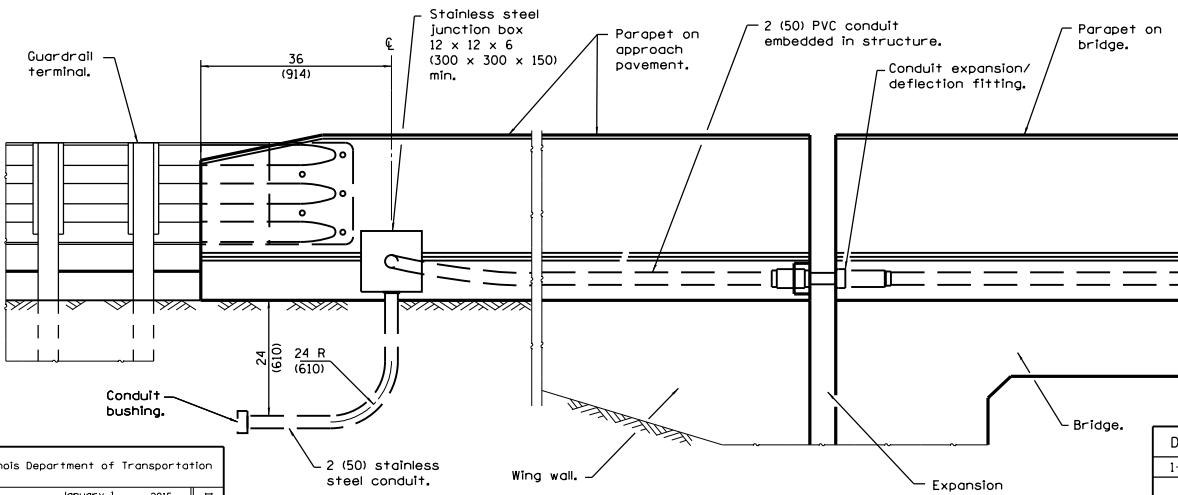
STANDARD 805001-01



**INTEGRAL/SEMI-INTEGRAL ABUTMENT WITH
PARAPET ON APPROACH PAVEMENT**



COMBINATION EXPANSION/DEFLECTION FITTING



**JOINTED ABUTMENT WITH
PARAPET ON APPROACH PAVEMENT**

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

SI-1-1-1

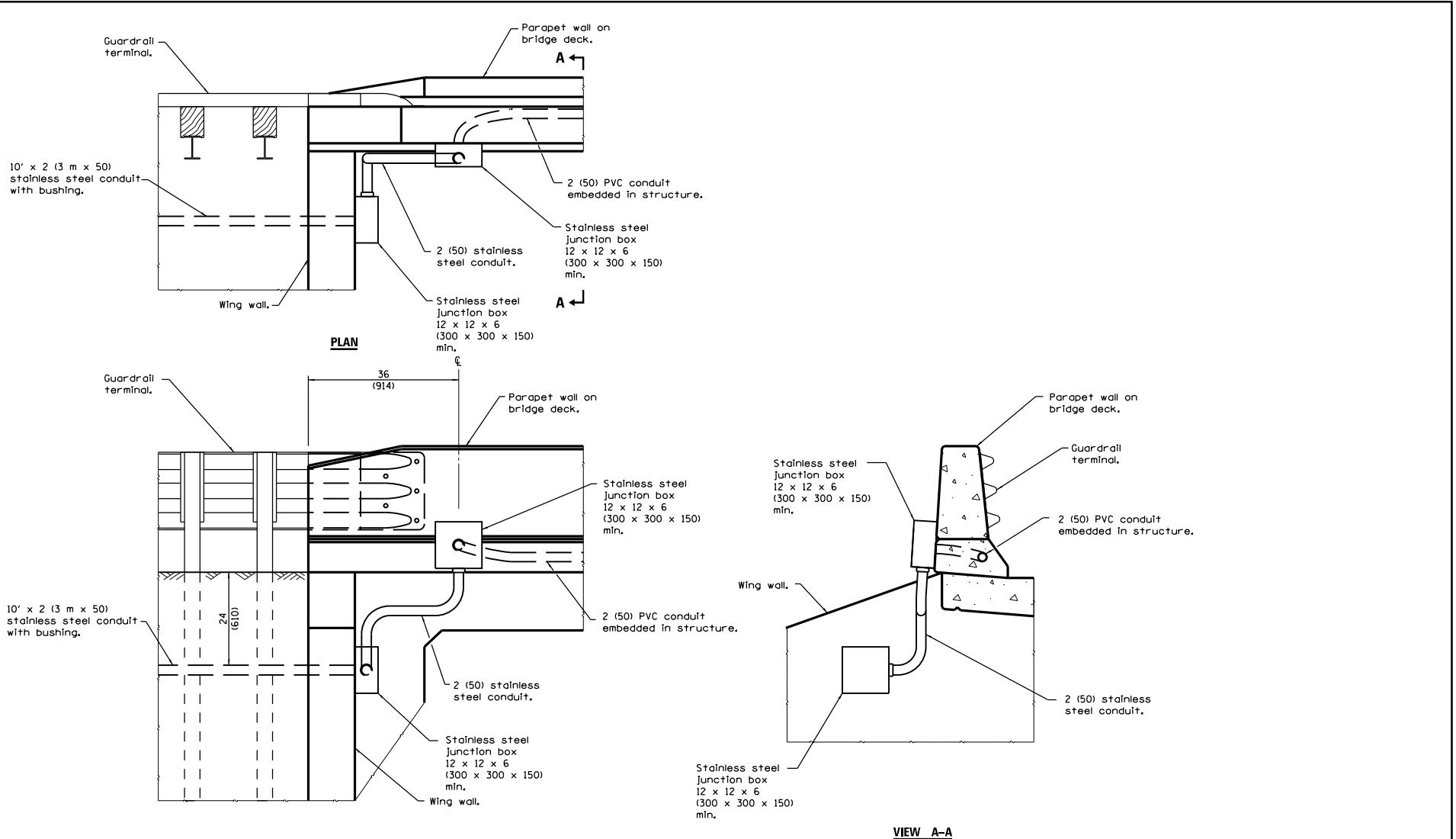
The barrel in the expansion fitting shall be fully embedded in the concrete on one side of the expansion joint. One half the length of the deflection fitting shall be embedded in the concrete on the other side of the expansion joint.

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.

DATE	REVISIONS	RACEWAY EMBEDDED IN STRUCTURE
I-1-15	New standard.	
		(Sheet 1 of 3)
		STANDARD 812001



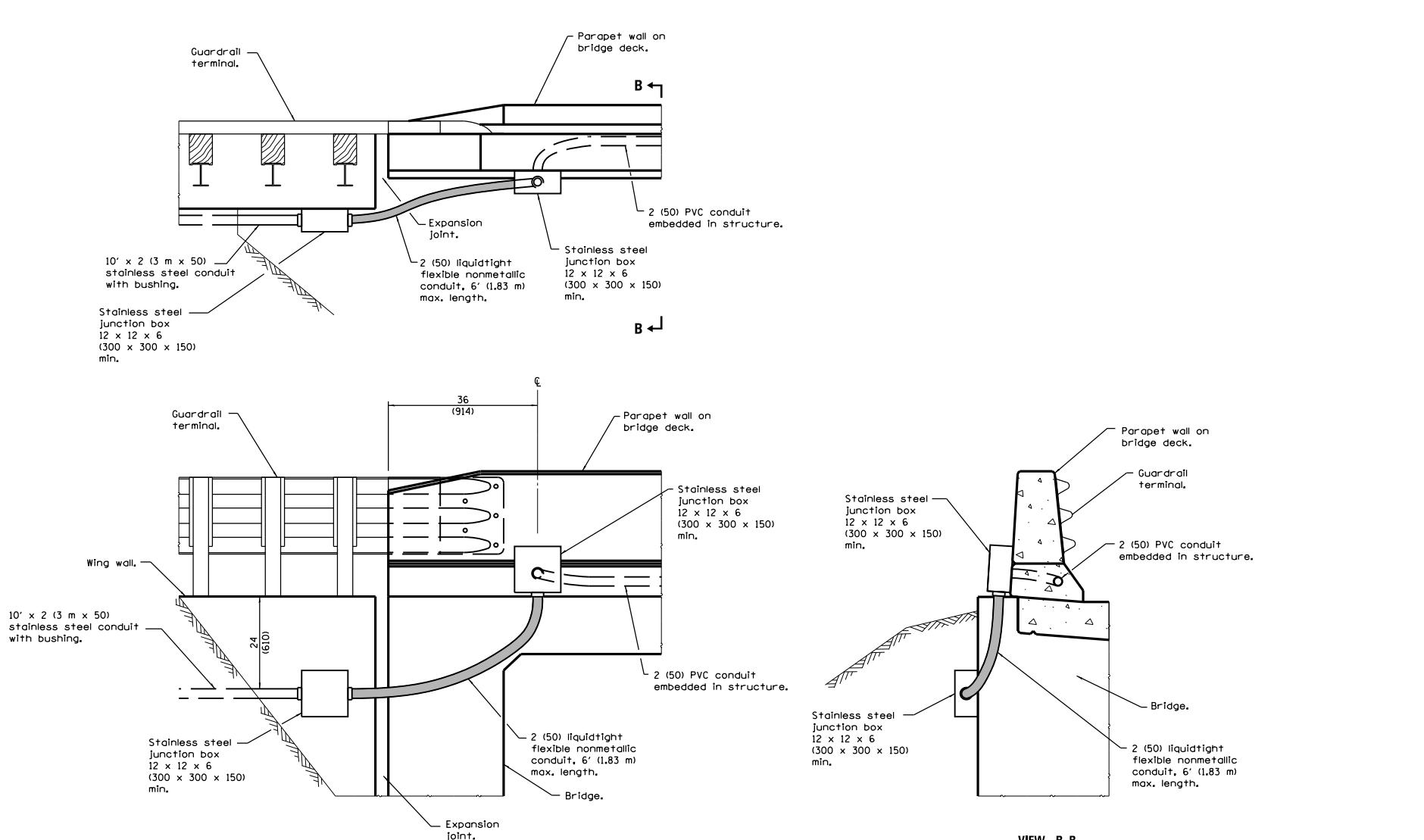
	Illinois Department of Transportation
PASSED	January 1, 2015
	General Engineer
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2015
	Engineer of Design and Environment
ST-1-1 GRS	

**INTEGRAL/SEMI-INTEGRAL ABUTMENT WITH
PARAPET ENDING ON BRIDGE DECK**

**RACEWAY EMBEDDED
IN STRUCTURE**

(Sheet 2 of 3)

STANDARD 812001



ELEVATION

**JOINTED ABUTMENT WITH
PARAPET ENDING ON BRIDGE DECK**

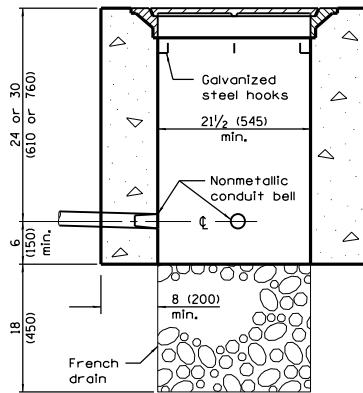
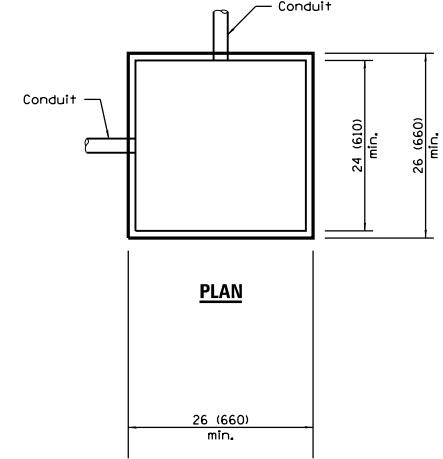
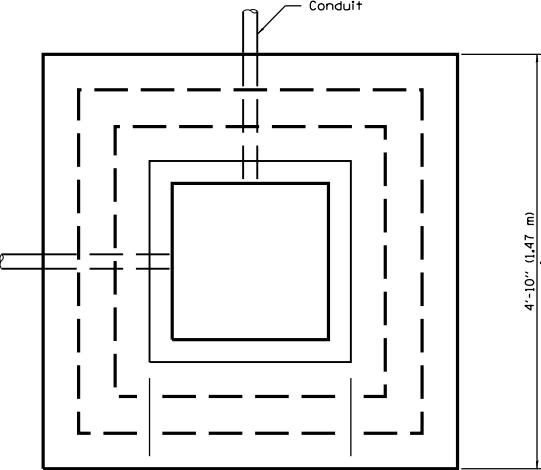
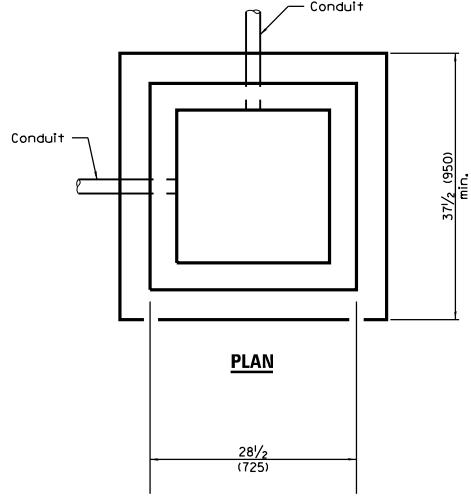
	Illinois Department of Transportation
PASSED	January 1, 2015
	Engineer of Policy and Procedures
APPROVED	January 1, 2015
	Engineer of Design and Environment
SI-1-1 GRS	

VIEW B-B

**RACEWAY EMBEDDED
IN STRUCTURE**

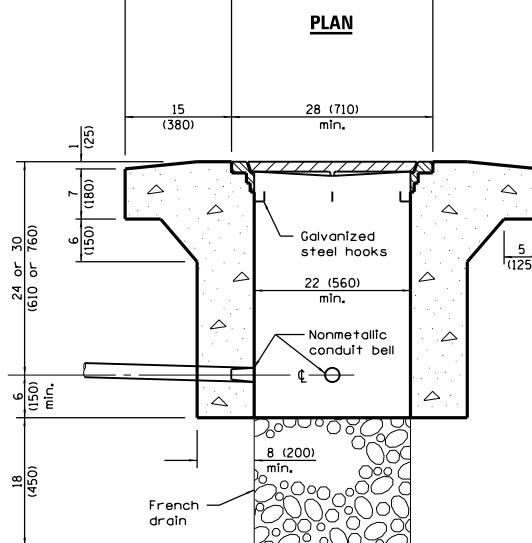
(Sheet 3 of 3)

STANDARD 812001



ELEVATION

PORLTAND CEMENT CONCRETE



ELEVATION

COMPOSITE CONCRETE

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

	Illinois Department of Transportation
APPROVED	January 1, 2015
ENGINEER OF OPERATIONS	
APPROVED	January 1, 2015
ENGINEER OF DESIGN AND ENVIRONMENT	

16-1-1 QRS/SS

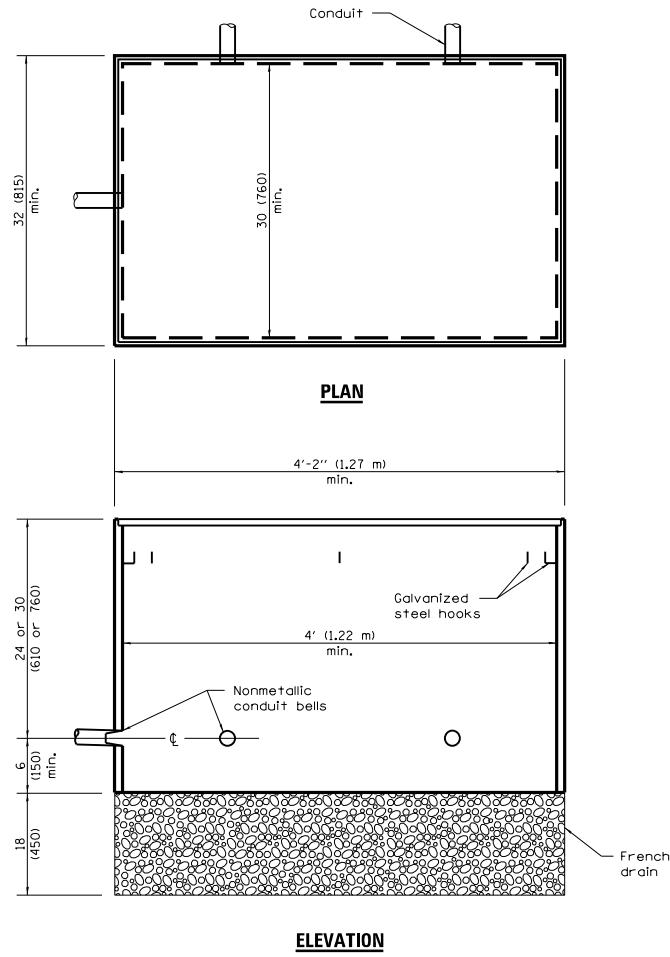
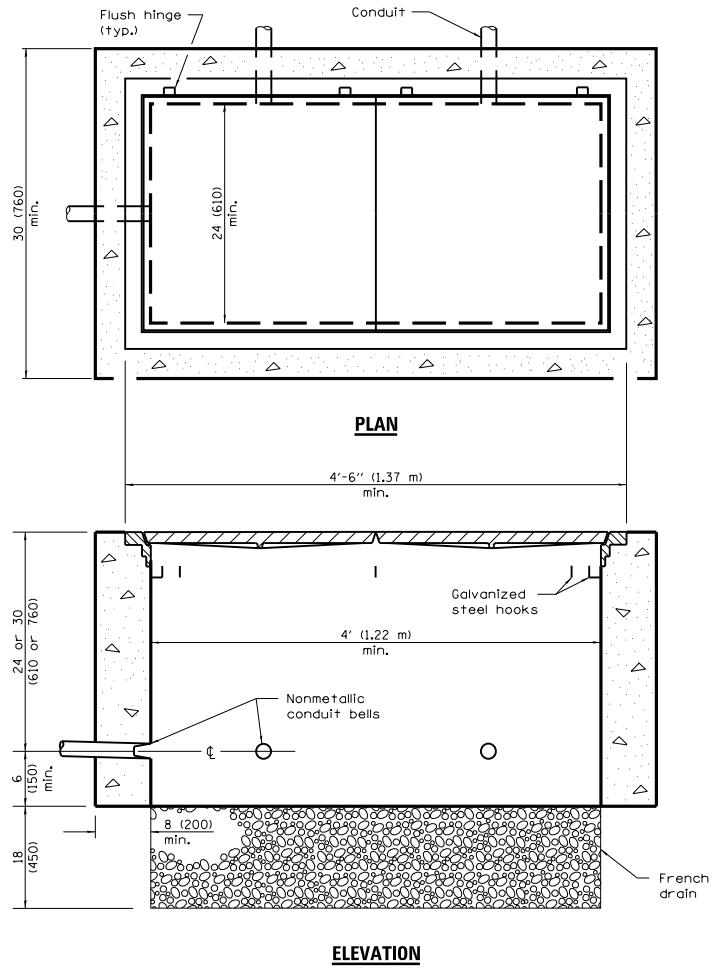
QUANTITIES

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)

ELEVATION
PORLTAND CEMENT CONCRETE
HEAVY DUTY

DATE	REVISIONS	HANDHOLES
1-1-15	Corrected dimension on heavy duty handhole. Added concrete quantities table.	
1-1-09	Switched units to English (metric).	

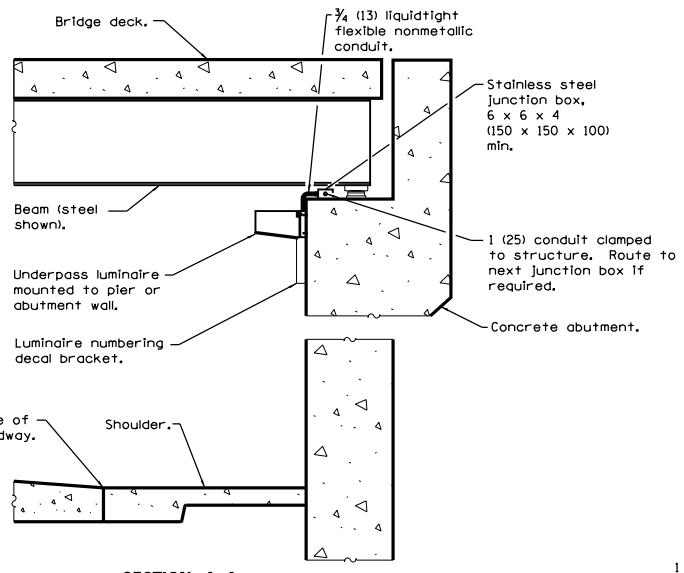
STANDARD 814001-03



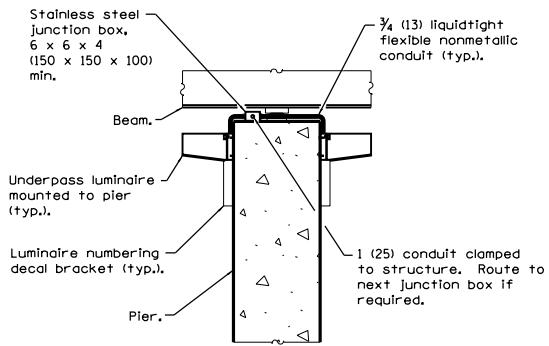
All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS	DOUBLE HANDHOLES
1-1-09	Switched units to English (metric).	
1-1-07	Revised composite conc. handhole. Rem. weights of frames and covers.	STANDARD 814006-02

	Illinois Department of Transportation
APPROVED	January 1, 2009
	1-1-09
ENGINEER OF OPERATIONS	
APPROVED	January 1, 2009
	1-1-09
ENGINEER OF DESIGN AND ENVIRONMENT	

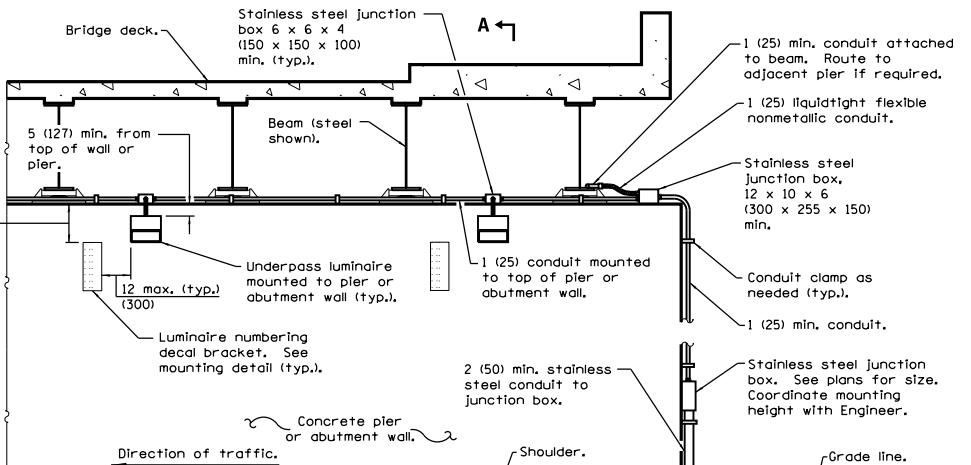


SECTION A-A

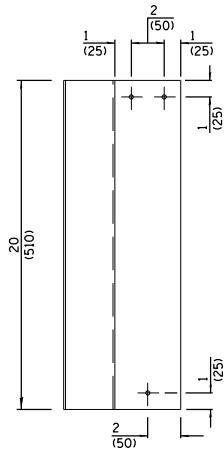


**CENTER PIER
DETAIL**

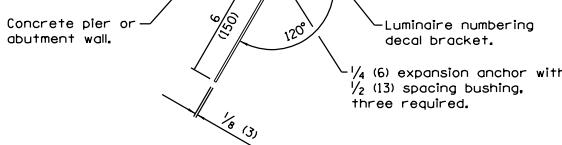
**LUMINAIRE NUMBERING DECAL
BRACKET MOUNTING DETAIL**



**PIER / ABUTMENT
WALL ELEVATION**



ELEVATION



TOP VIEW

**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.

DATE	REVISIONS
4-1-16	New standard.

UNDERPASS LIGHTING WALL MOUNT

STANDARD 821001

Illinois Department of Transportation
PASSED <i>[Signature]</i> April 1, 2016
ENGINEER OF PRELIMINARY ENGINEERING
APPROVED <i>[Signature]</i> April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

191-1-19

SECTION A-A

TOP VIEW

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 parts 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.

DATE	REVISIONS
4-1-16	New standard.

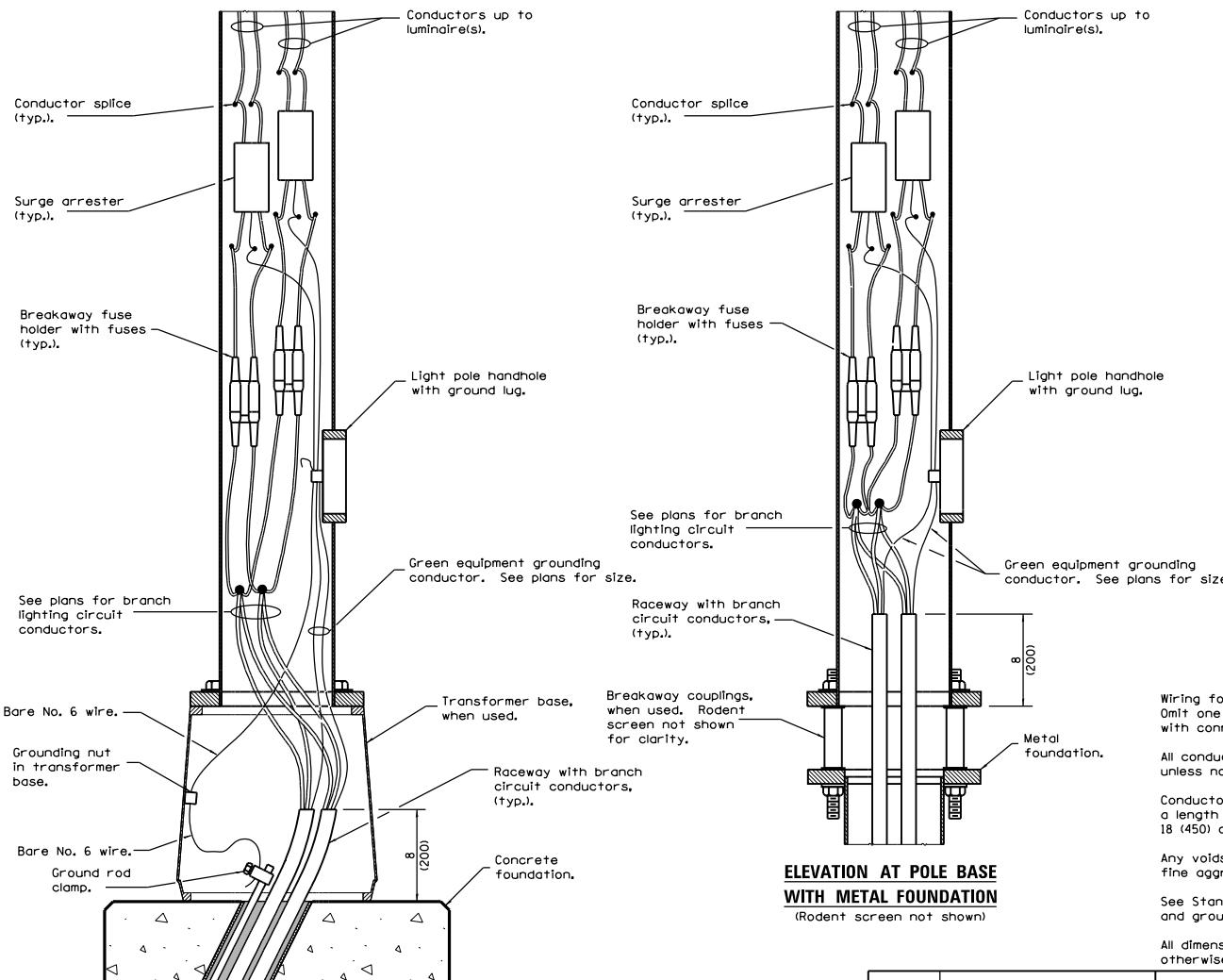
UNDERPASS LIGHTING SUSPENDED

STANDARD 821006

Illinois Department of Transportation

PASSED April 1, 2016
S. J. [Signature]
ENGINEER OF PRELIMINARY ENGINEERING
APPROVED April 1, 2016
C. R. [Signature]
ENGINEER OF DESIGN AND ENVIRONMENT

91-1-1 DRAFT



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 handle.

Any voids in the foundation shall be filled with fine aggregate.

See Standard 836001 for Light Pole Foundation and ground rod.

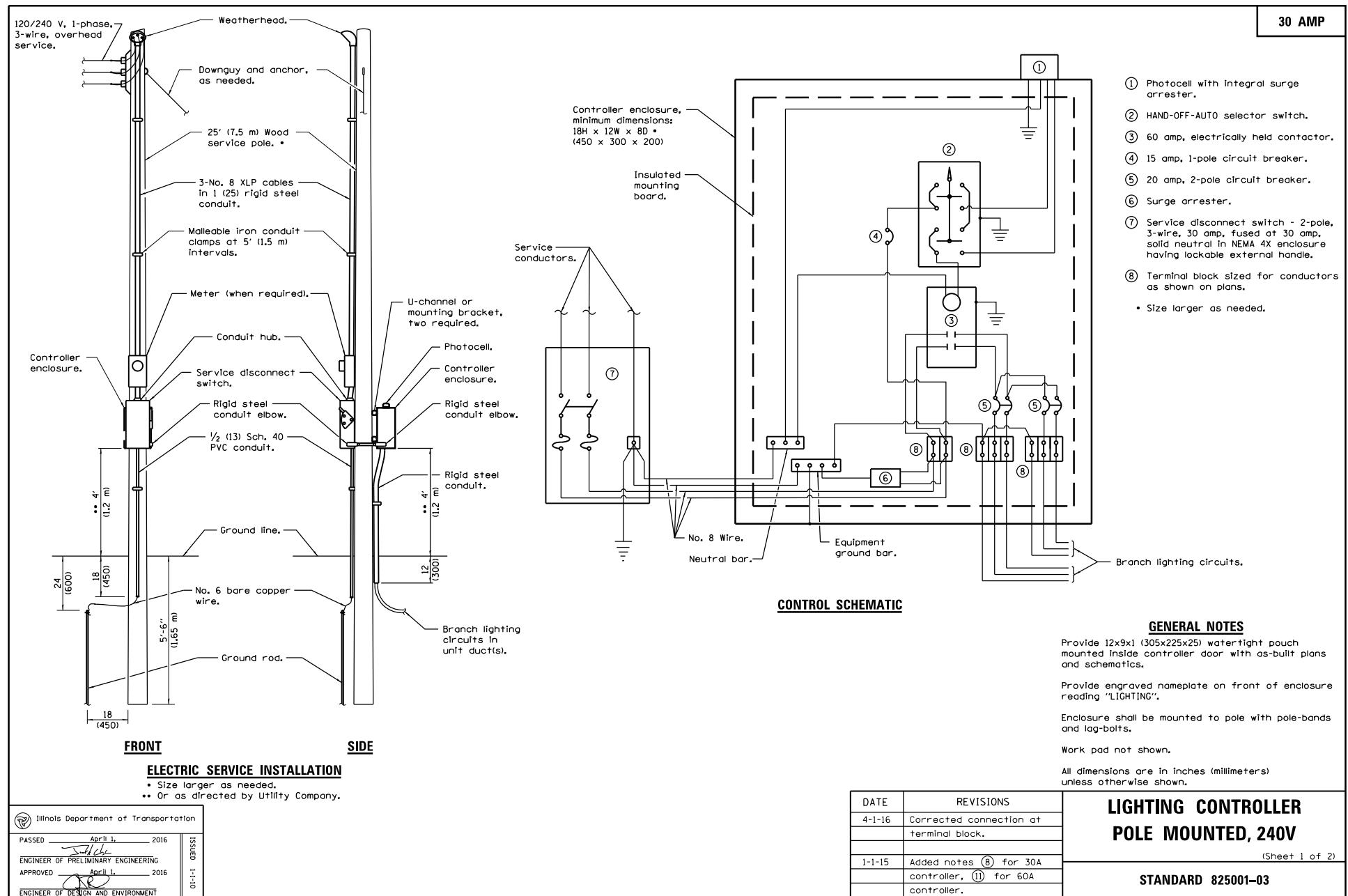
All dimensions are in inches (millimeters) unless otherwise shown.

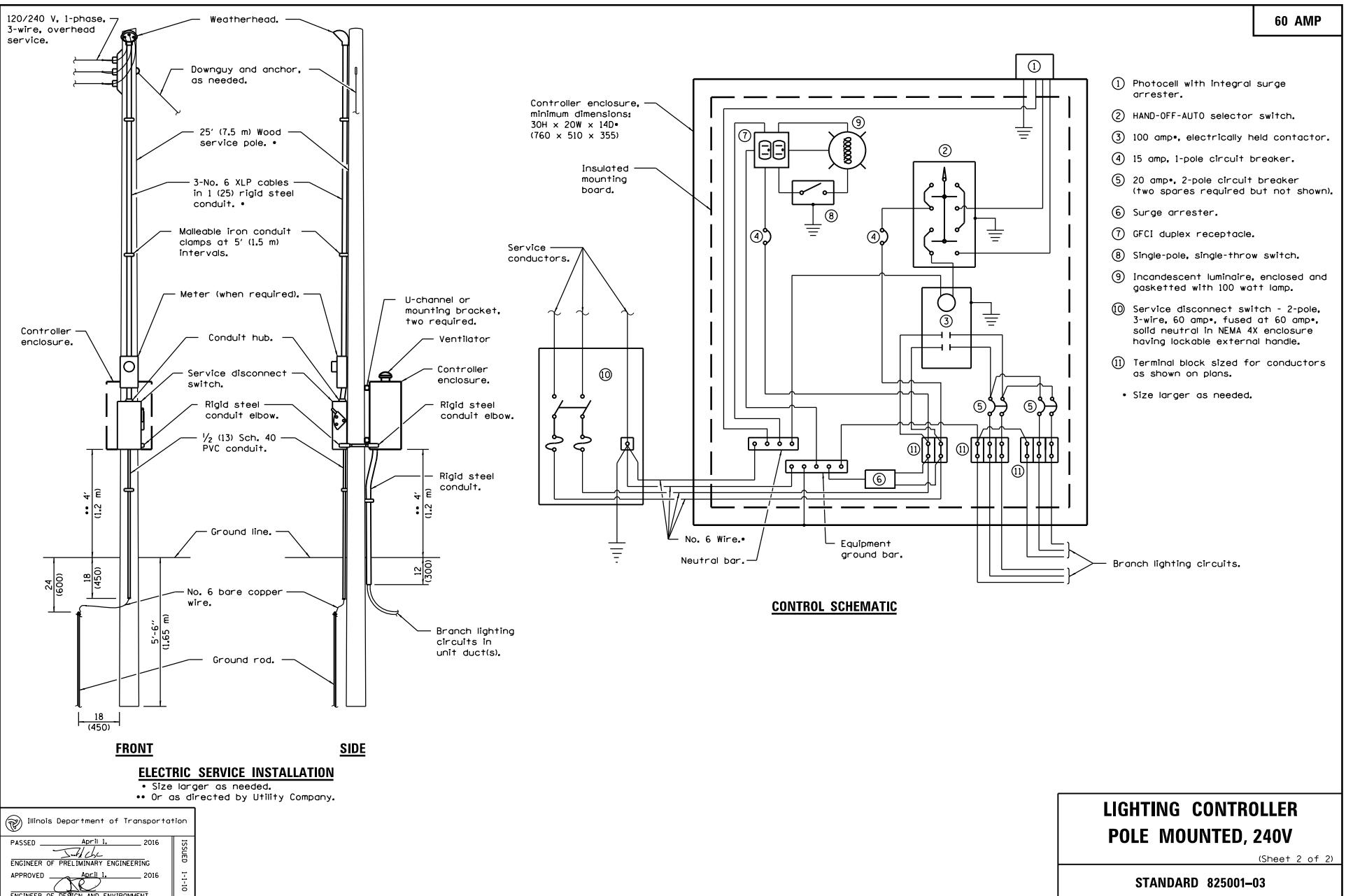
DATE	REVISIONS
1-1-15	Changed 'protector' to 'arrester'.
1-1-14	New standard.

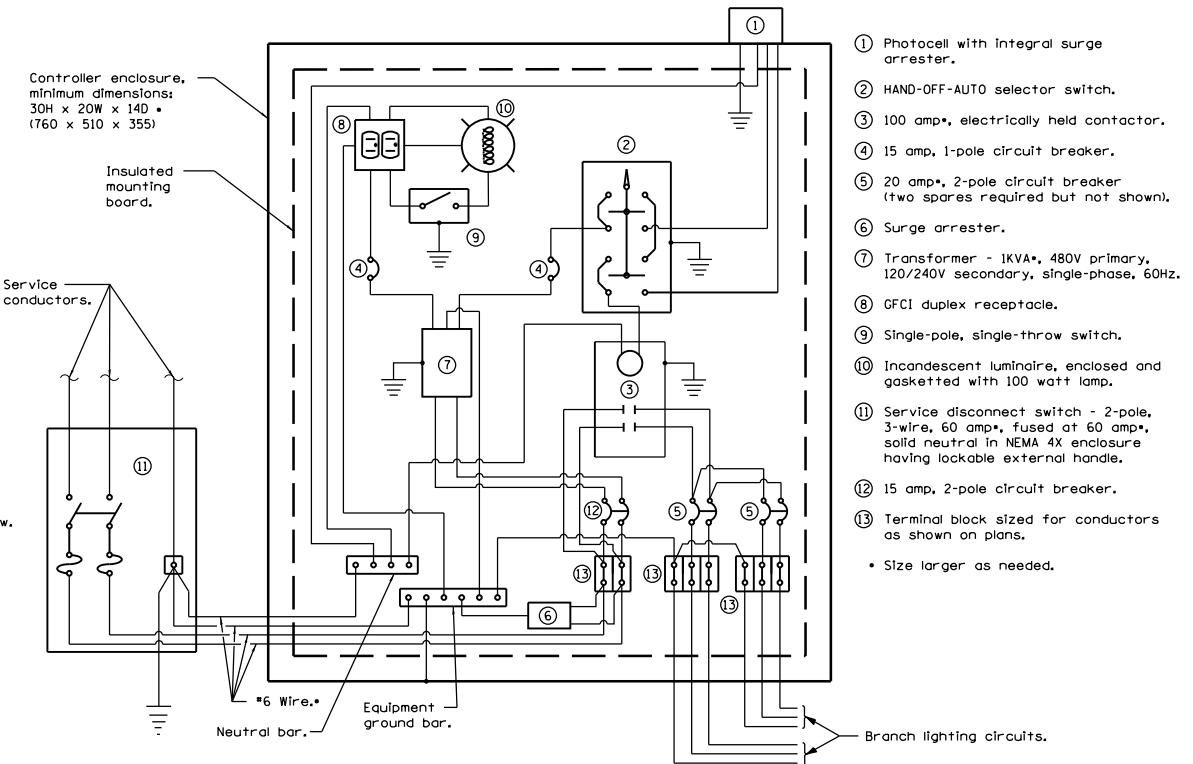
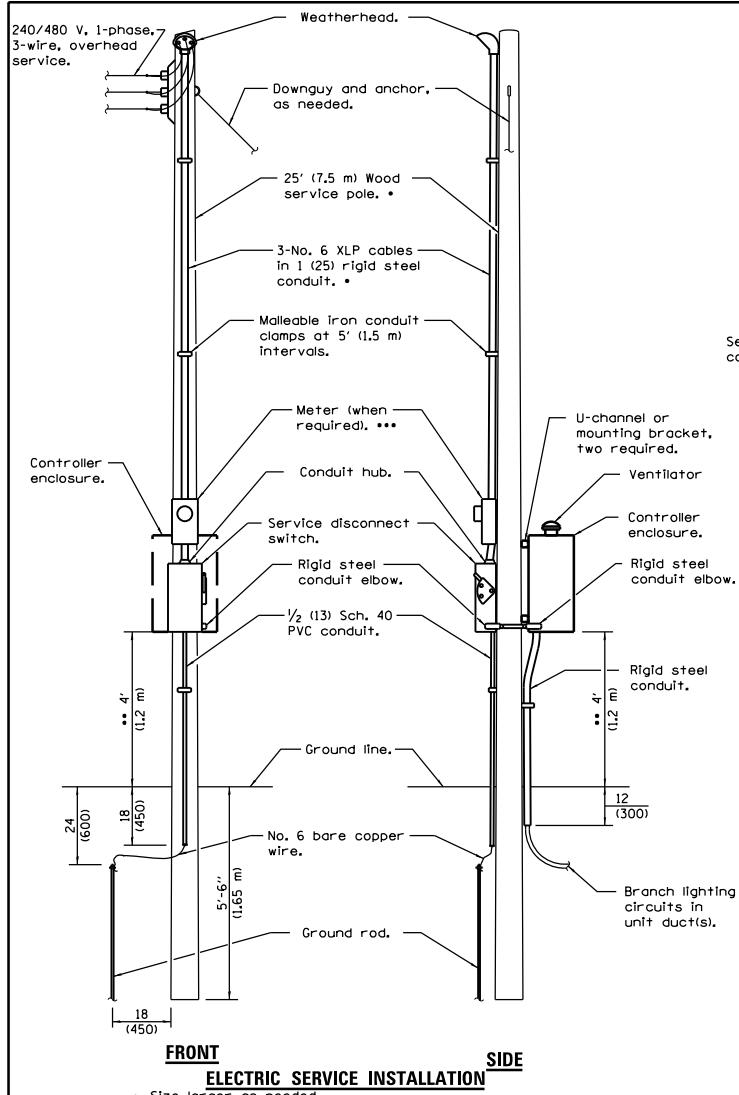
LUMINAIRE WIRING DIAGRAM

STANDARD 821101-01

	Illinois Department of Transportation
PASSED	January 1, 2015
	Engineer of Preliminary Engineering
APPROVED	January 1, 2015
	Engineer of Design and Environment
K-1-1	DRSS







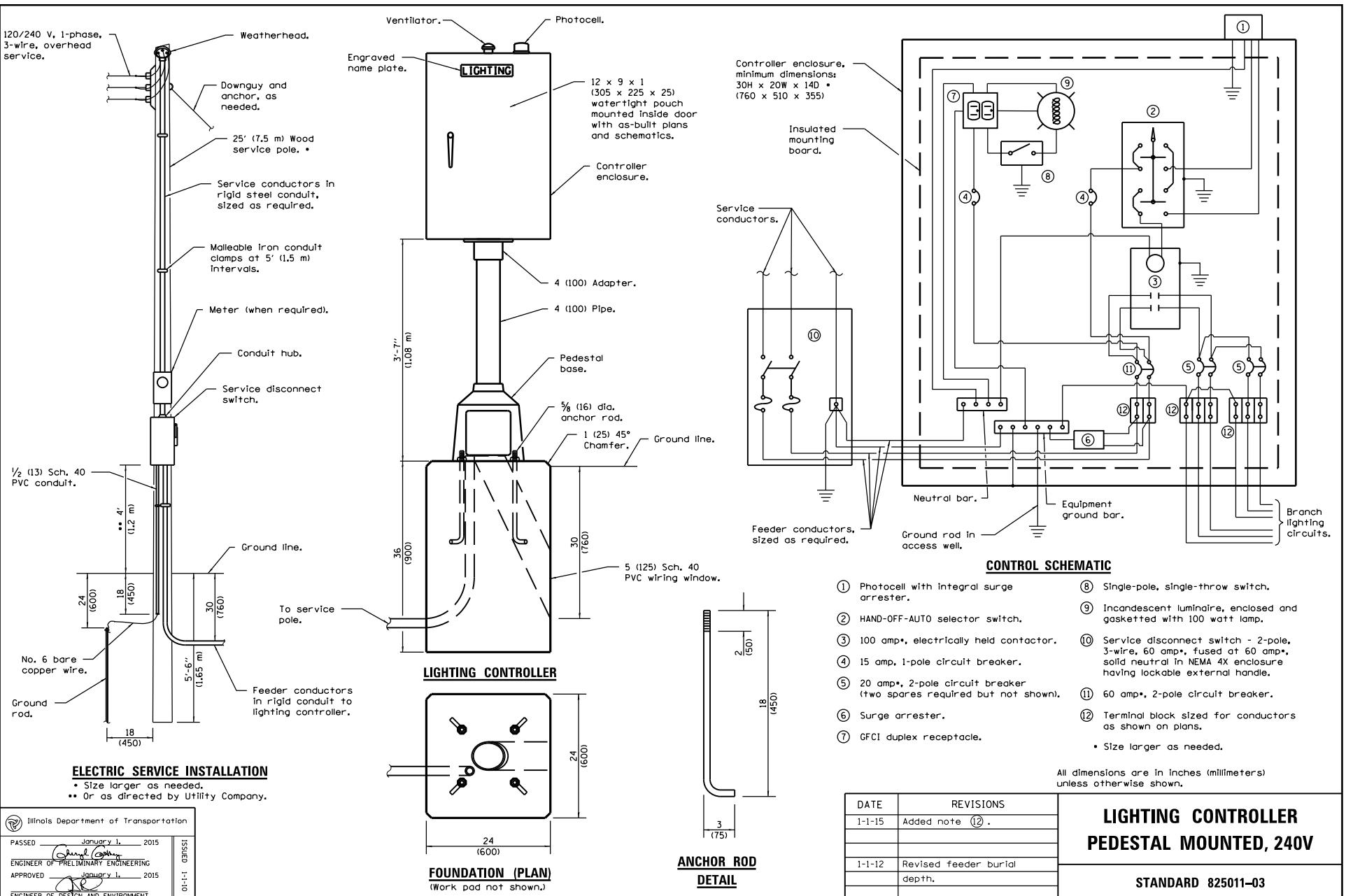
CONTROL SCHEMATIC

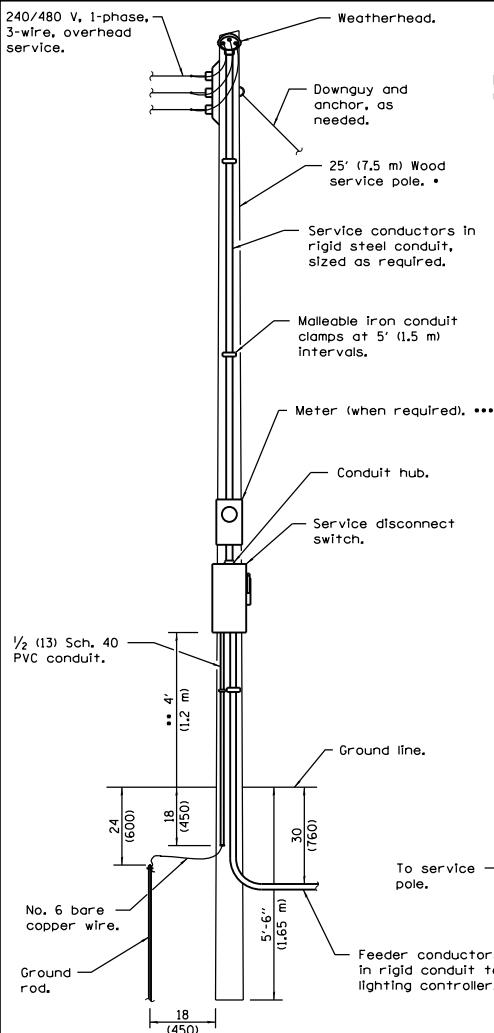
FRONT **SIDE**
ELECTRIC SERVICE INSTALLATION

- Size larger as needed.
 - Or as directed by Utility Company.
 - When cold sequencing is required, provide a meter disconnect switch as directed by Utility Company.

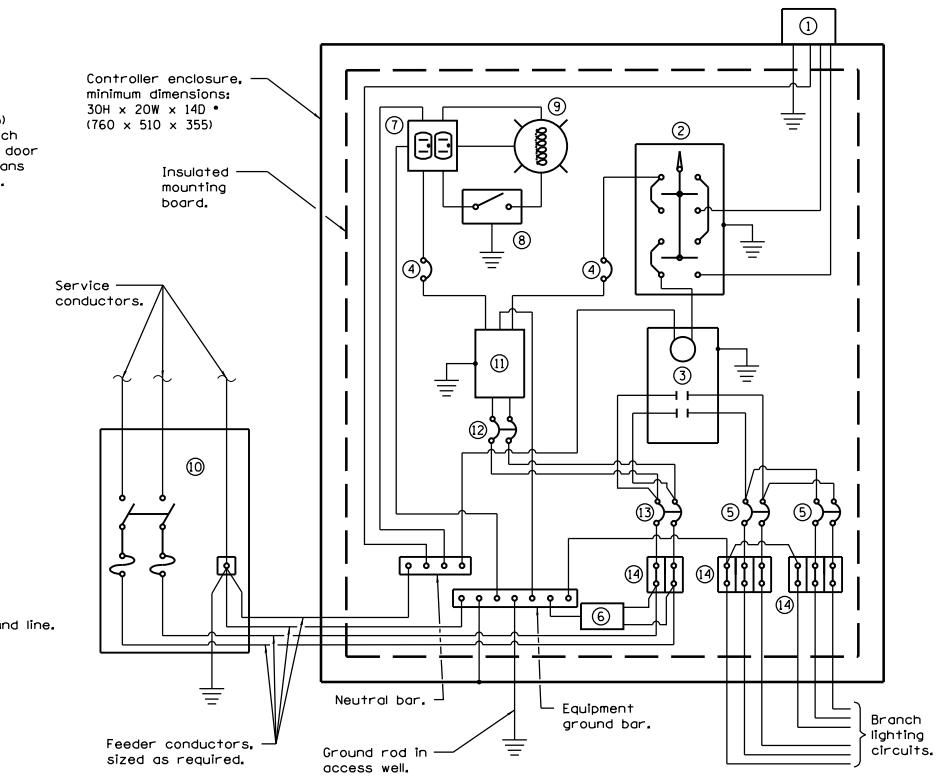
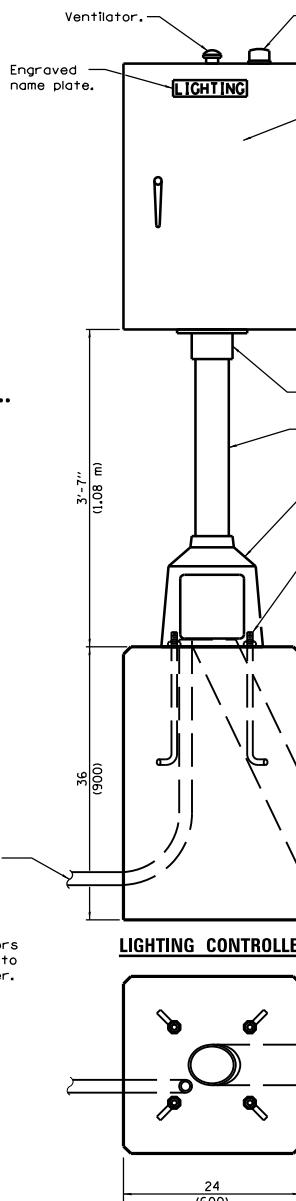
	Illinois Department of Transportation
PASSED	January 1, 2015
ENGINEER OF PRELIMINARY ENGINEERING	
APPROVED	January 1, 2015
ENGINEER OF DESIGN AND ENVIRONMENT	

DATE	REVISIONS	LIGHTING CONTROLLER POLE MOUNTED, 480V
1-1-15	Added note ⑯.	
1-1-11	Renamed Standard, Modified	
	service disconnect and	
	contactor.	

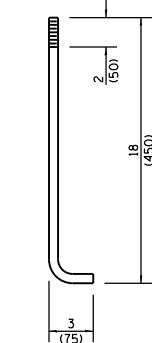




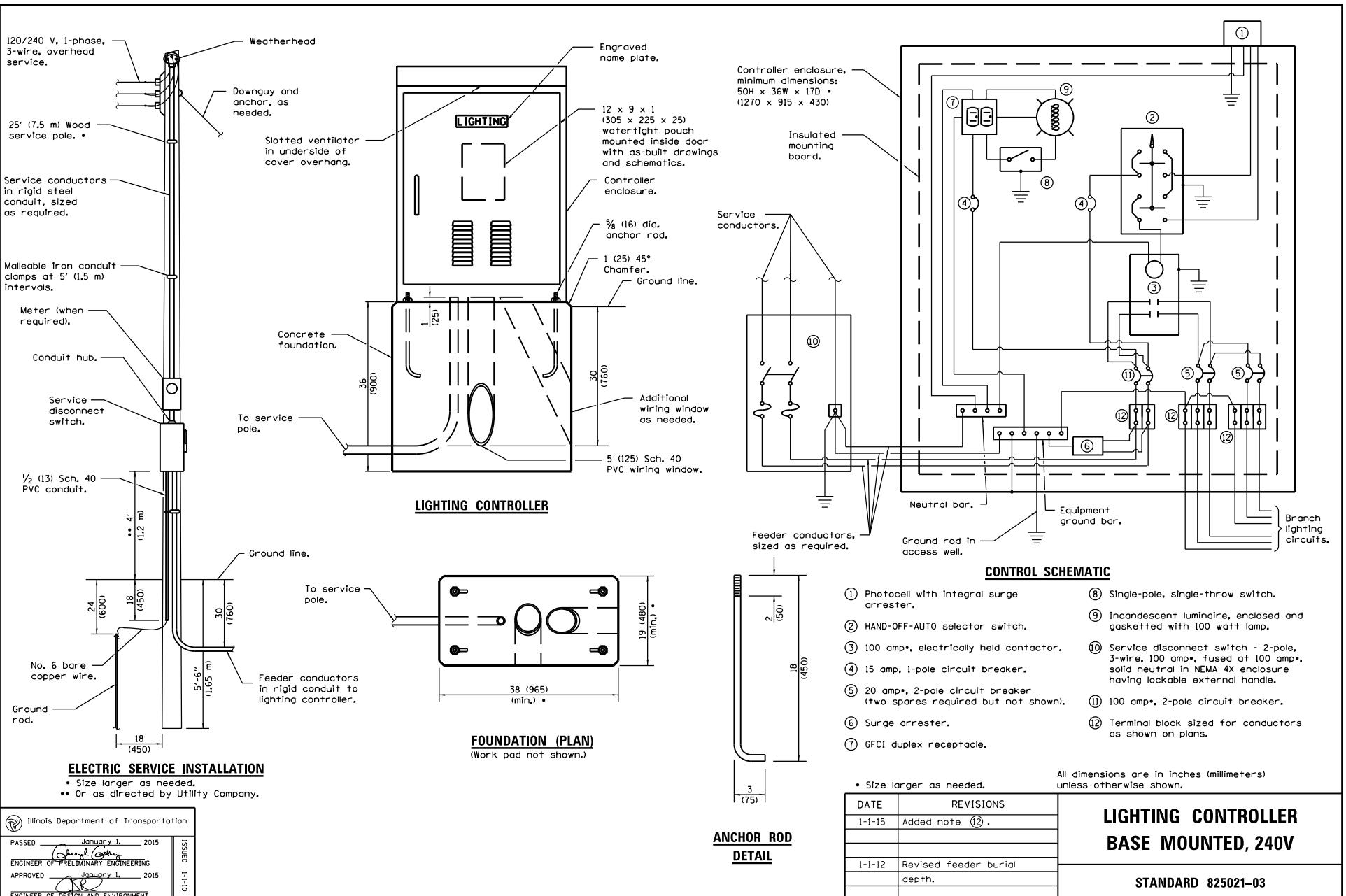
Illinois Department of Transportation	
PASSED	January 1, 2015
Engineer of Preliminary Engineering	John Gandy
Approved	January 1, 2015
Engineer of Design and Environment	JR

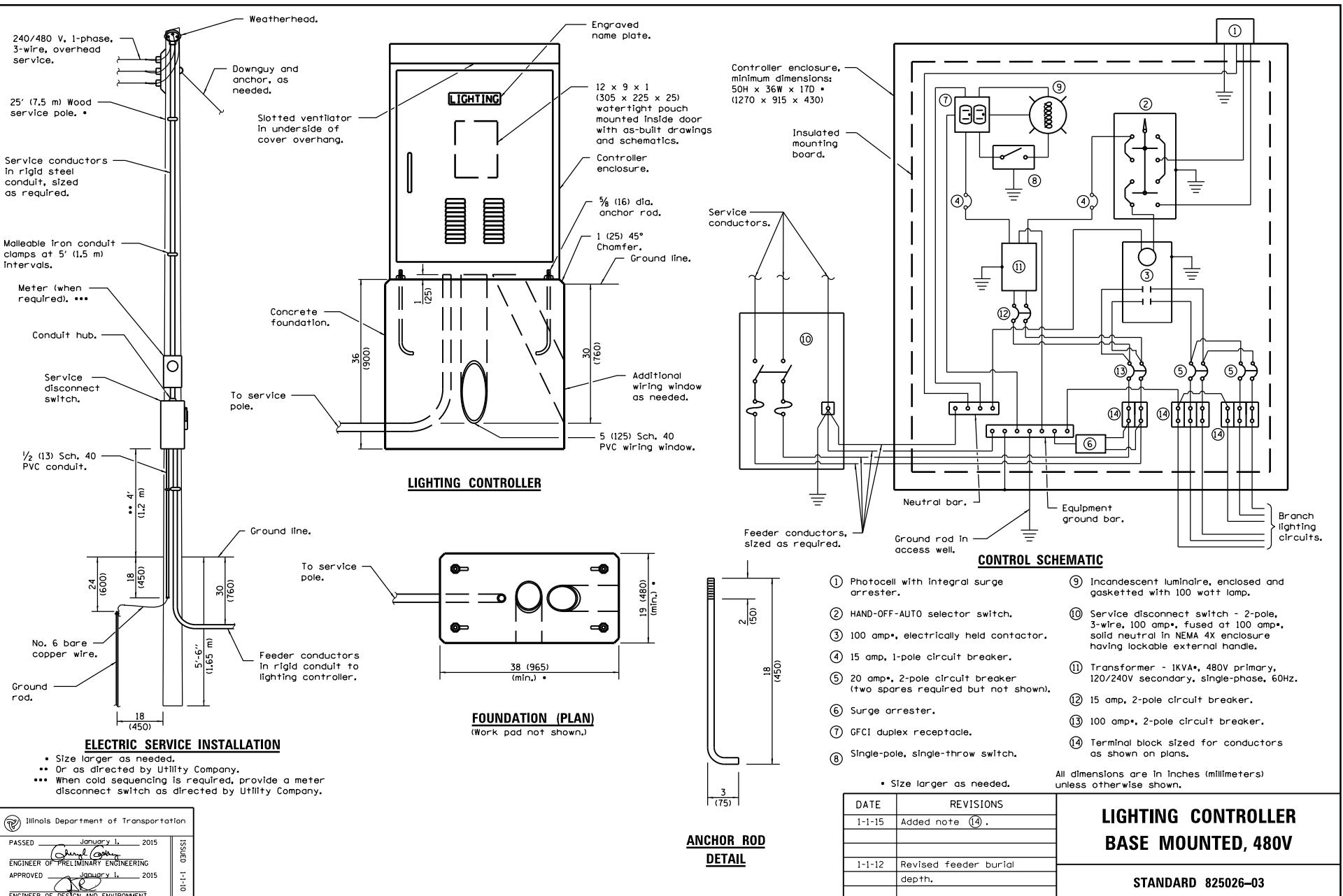


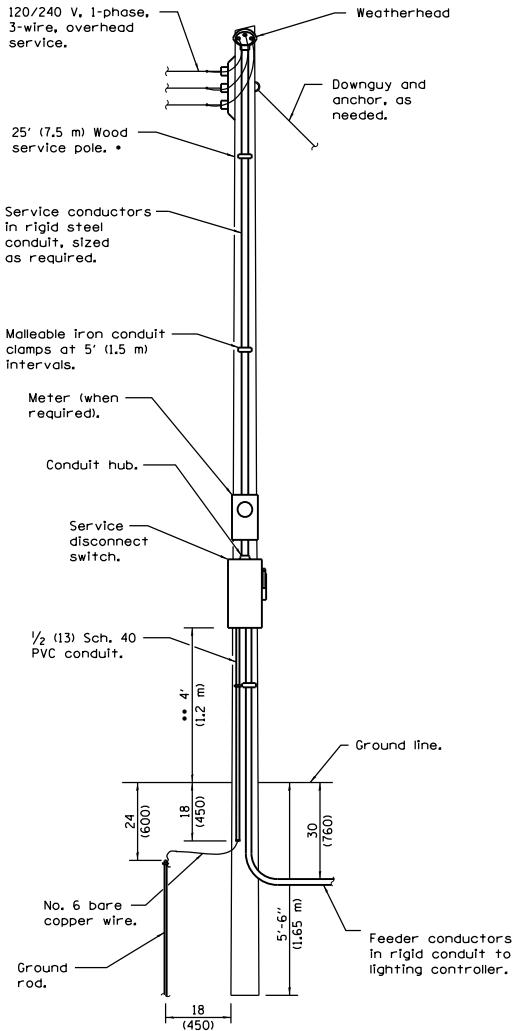
- ① Photocell with integral surge arrester.
 - ② HAN-D OFF-AUTO selector switch.
 - ③ 100 amp, electrically held contactor.
 - ④ 15 amp, 1-pole circuit breaker.
 - ⑤ 20 amp, 2-pole circuit breaker (two spares required but not shown).
 - ⑥ Surge arrester.
 - ⑦ GFCI duplex receptacle.
 - ⑧ Single-pole, 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.



DATE	REVISIONS	LIGHTING CONTROLLER PEDESTAL MOUNTED, 480V
1-1-15	Added note ⑭.	
1-1-12	Revised feeder burial depth.	STANDARD 825016-03



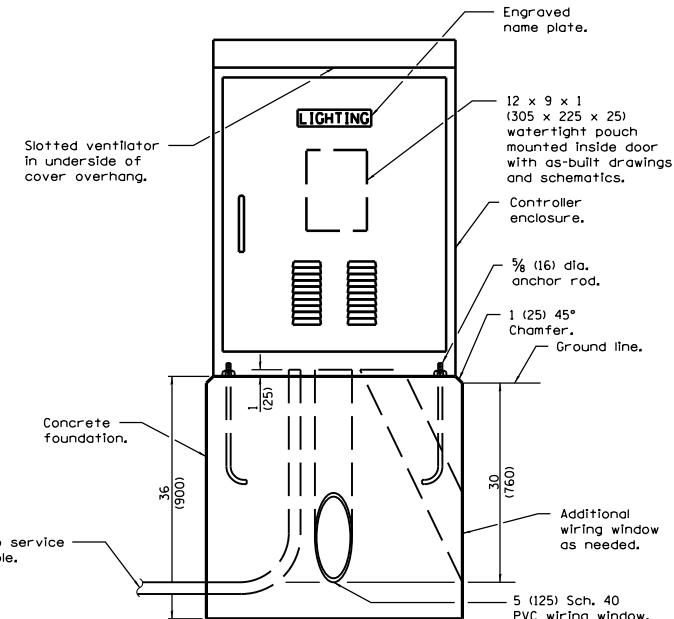




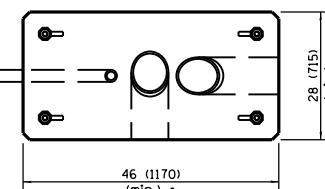
ELECTRIC SERVICE INSTALLATION

- * Size larger as needed.
- ** Or as directed by Utility Company.

ANCHOR ROD DETAIL



LIGHTING CONTROLLER



FOUNDATION (PLAN)

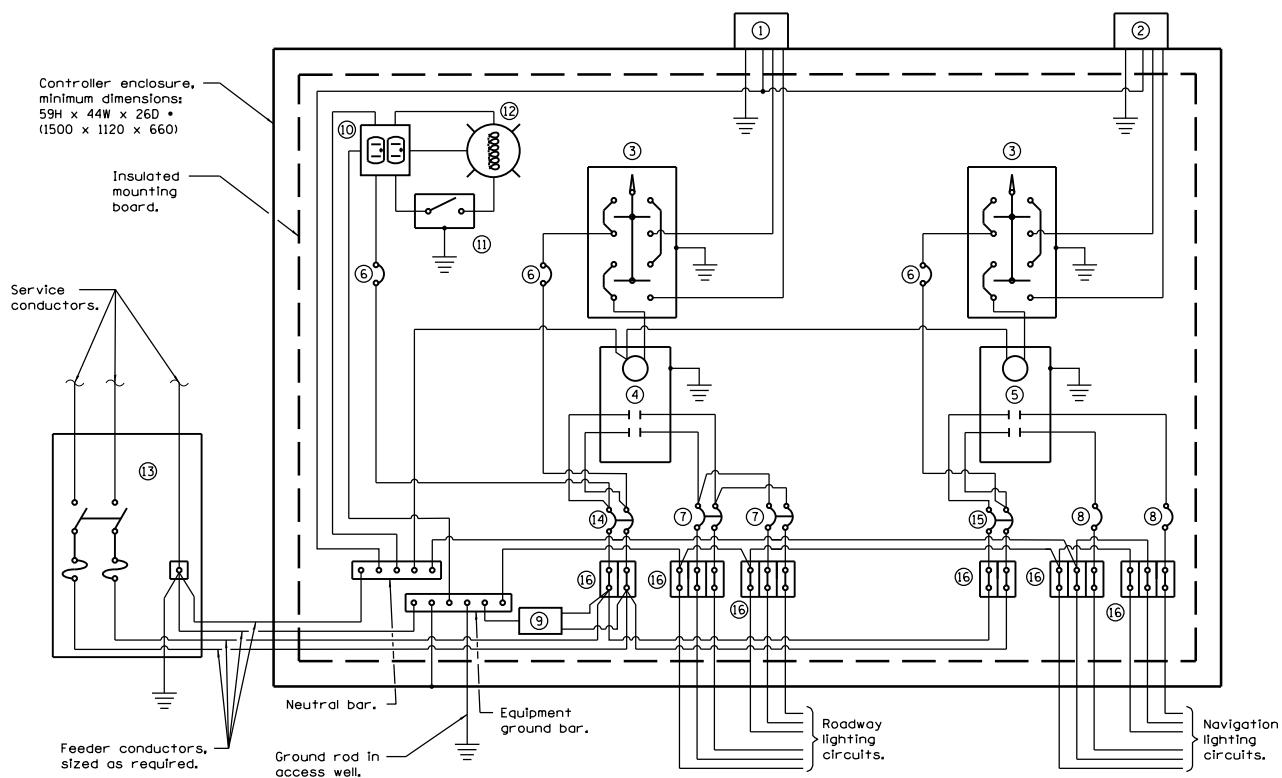
(Work pad not shown.)

* Size larger as needed.

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

DATE	REVISIONS	NAVIGATION OBSTRUCTION LIGHTING CONTROLLER, 240V (Sheet 1 of 2)
1-1-15	Added note ⑯.	
1-1-12	New Standard.	
		STANDARD 826001-01

	Illinois Department of Transportation
PASSED	January 1, 2015
	Engineer of Preliminary Engineering
APPROVED	January 1, 2015
	Engineer of Design and Environment
ISSUED	1-1-12

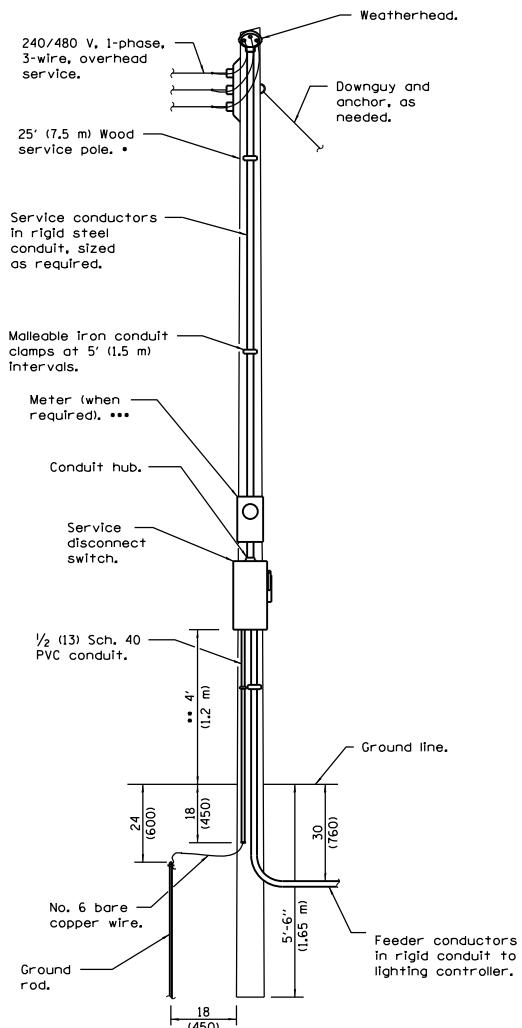


CONTROL SCHEMATIC

	Illinois Department of Transportation
PASSED	January 1, 2015
	Engineer of Preliminary Engineering
APPROVED	January 1, 2015
	Engineer of Design and Environment
IS-2015-1-12	

**NAVIGATION OBSTRUCTION
LIGHTING CONTROLLER, 240V**
(Sheet 2 of 2)

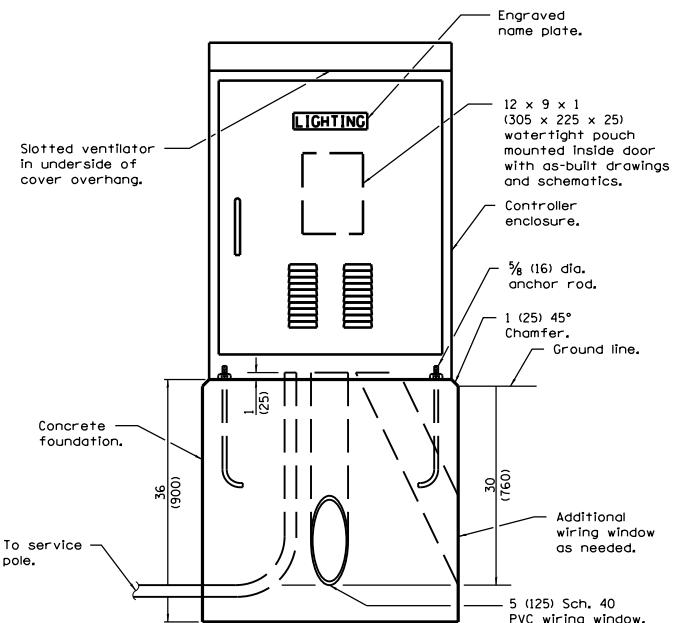
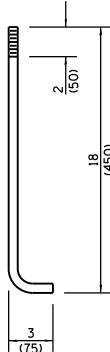
STANDARD 826001-01



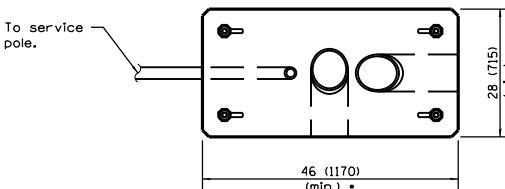
ELECTRIC SERVICE INSTALLATION

- Size larger as needed.
- Or as directed by Utility Company.
- When cold sequencing is required, provide a meter disconnect switch as directed by Utility Company.

**ANCHOR ROD
DETAIL**



LIGHTING CONTROLLER

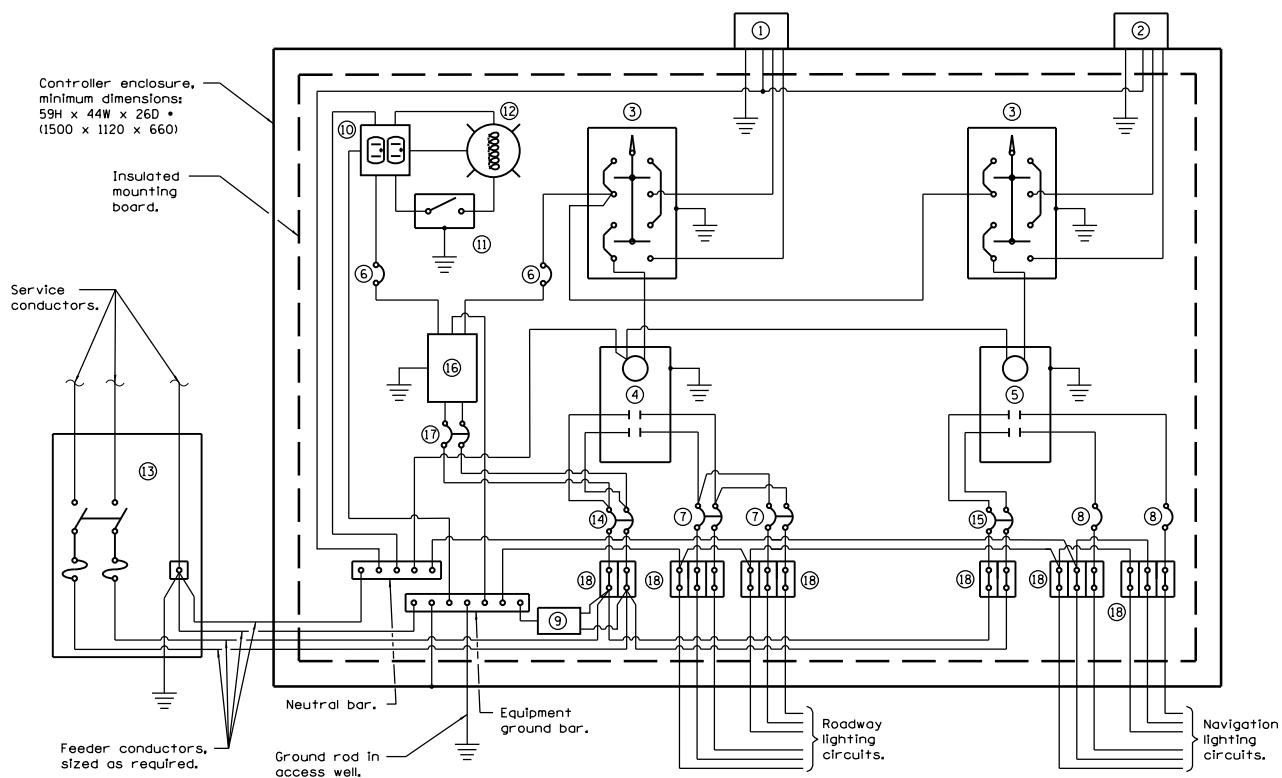


FOUNDATION (PLAN)
(Work pad not shown.)

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

DATE	REVISIONS	NAVIGATION OBSTRUCTION LIGHTING CONTROLLER, 480V (Sheet 1 of 2)
1-1-15	Added note ⑯.	
1-1-10	New Standard.	
		STANDARD 826006-01

	Illinois Department of Transportation
PASSED	January 1, 2015
SIGNED	1-1-12
ENGINEER OF PRELIMINARY ENGINEERING	
APPROVED	January 1, 2015
ENGINEER OF DESIGN AND ENVIRONMENT	

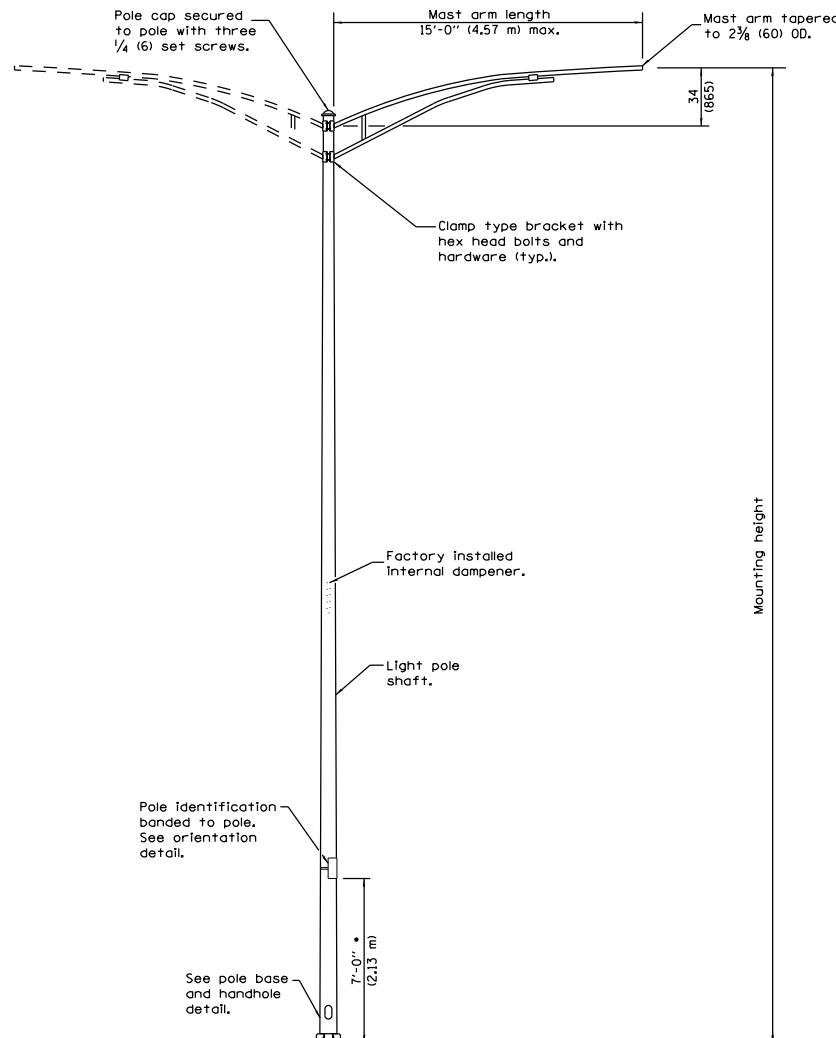


CONTROL SCHEMATIC

	Illinois Department of Transportation
PASSED	January 1, 2015
	Engineer of Preliminary Engineering
APPROVED	January 1, 2015
	Engineer of Design and Environment
IS-120 1-1-12	

**NAVIGATION OBSTRUCTION
LIGHTING CONTROLLER, 480V**
(Sheet 2 of 2)

STANDARD 826006-01



MAST ARM LIGHT POLE

(Single or twin mount)

- Unless directed otherwise by the Engineer.

	Illinois Department of Transportation
PASSED	January 1, 2015
	Engineer of PRELIMINARY ENGINEERING
APPROVED	January 1, 2015
	Engineer of DESIGN AND ENVIRONMENT
	ISSUED
	1-1-12

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.

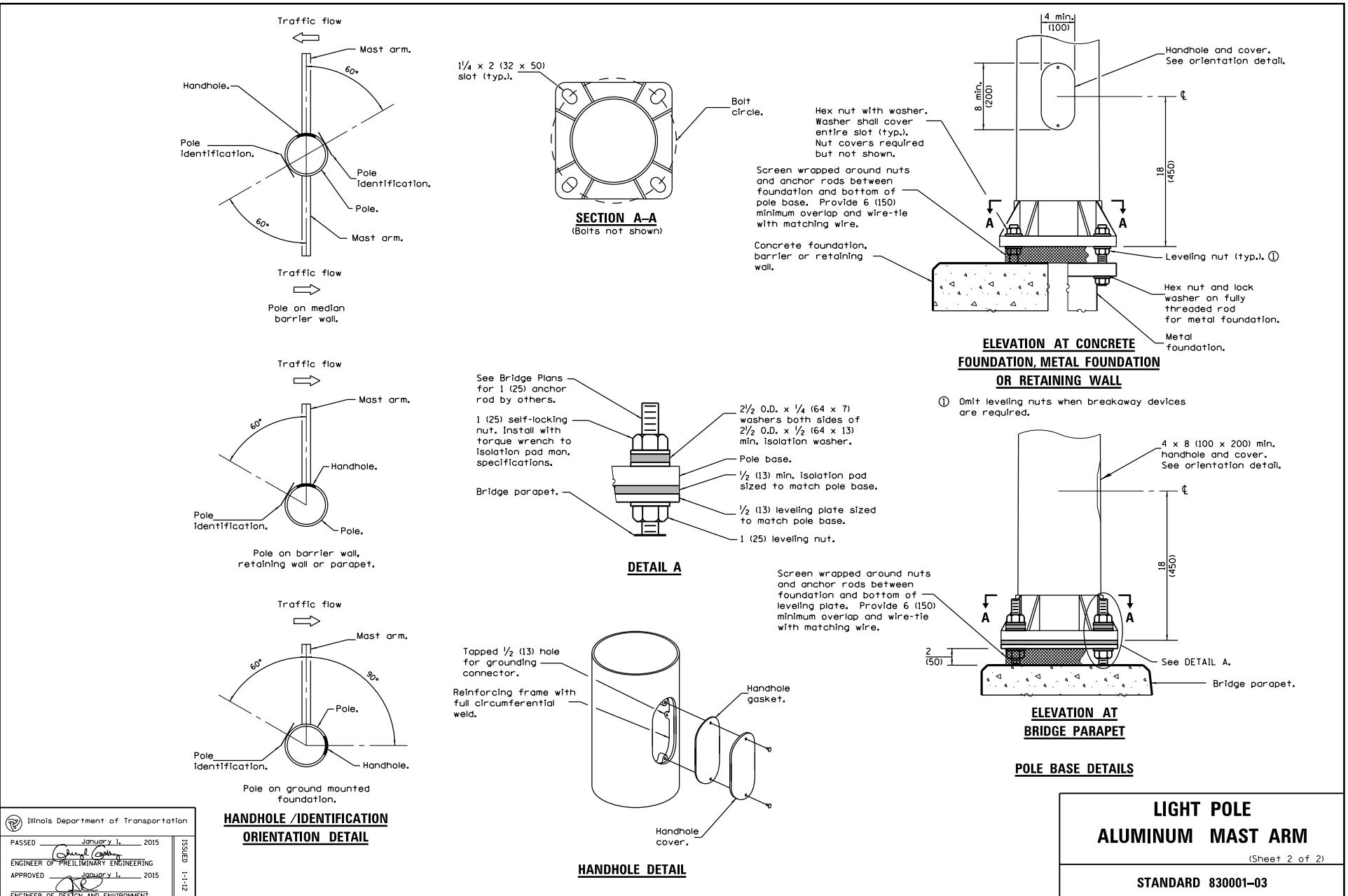
Voids in light pole base shall be sealed to prevent rodent entry.

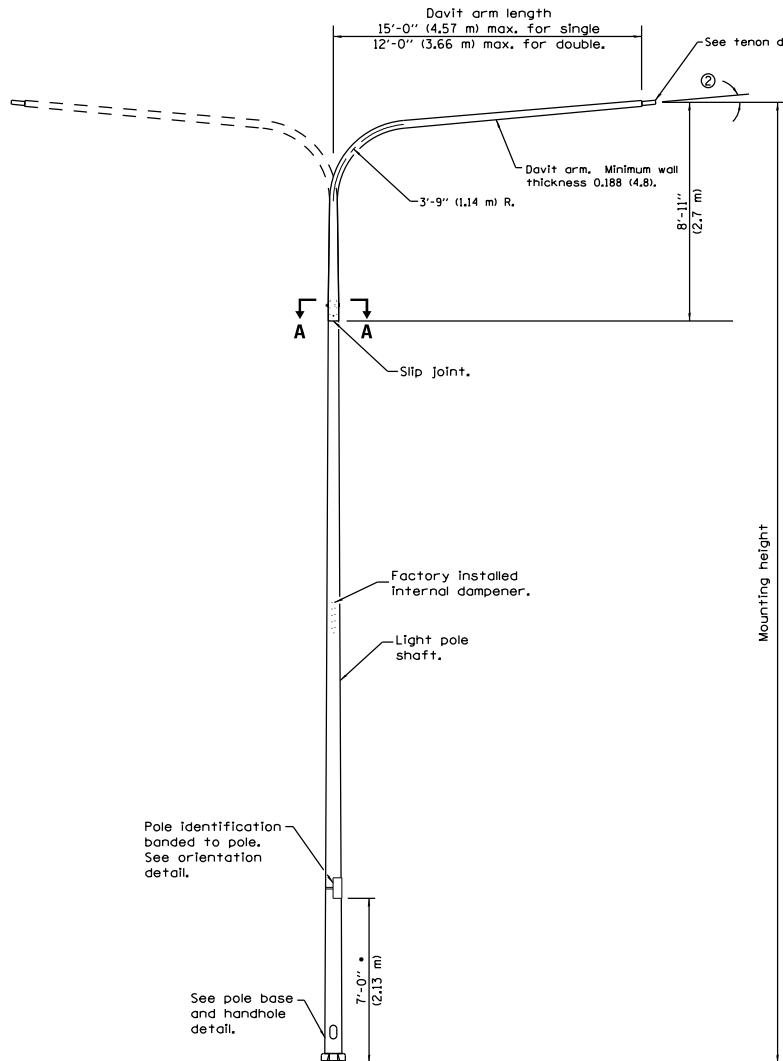
Provide breakaway devices where required.

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.

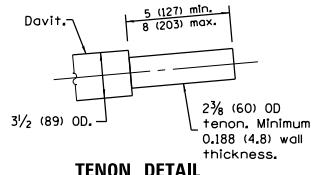
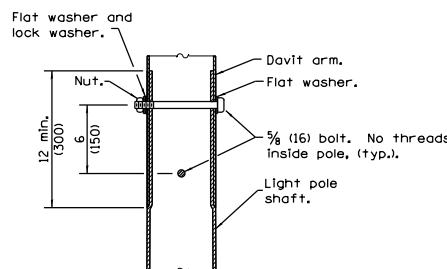
DATE	REVISIONS	LIGHT POLE ALUMINUM MAST ARM (Sheet 1 of 2) STANDARD 830001-03
1-1-15	Revised note on	
	HANDHOLE DETAIL.	
1-1-14	Added pole mounted on	
	bridge parapet. Modified	
	attachment of screen.	





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)

POLE LOWER SHAFT			
MOUNTING HEIGHT	LOWER SHAFT LENGTH ①	MINIMUM SHAFT DIAMETER	MINIMUM WALL THICKNESS
30'	21'-1" (6.4 m)	8 tapered to 6 (200 to 114)	0.25 (6)
35'	26'-1" (7.9 m)	8 tapered to 6 (200 to 114)	0.25 (6)
40'	31'-1" (9.5 m)	10 tapered to 6 (250 to 150)	0.25 (6)
45'	36'-1" (11.0 m)	10 tapered to 6 (250 to 150)	0.25 (6)
50'	41'-1" (12.5 m)	10 tapered to 6 (250 to 150)	0.312 (8)



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.

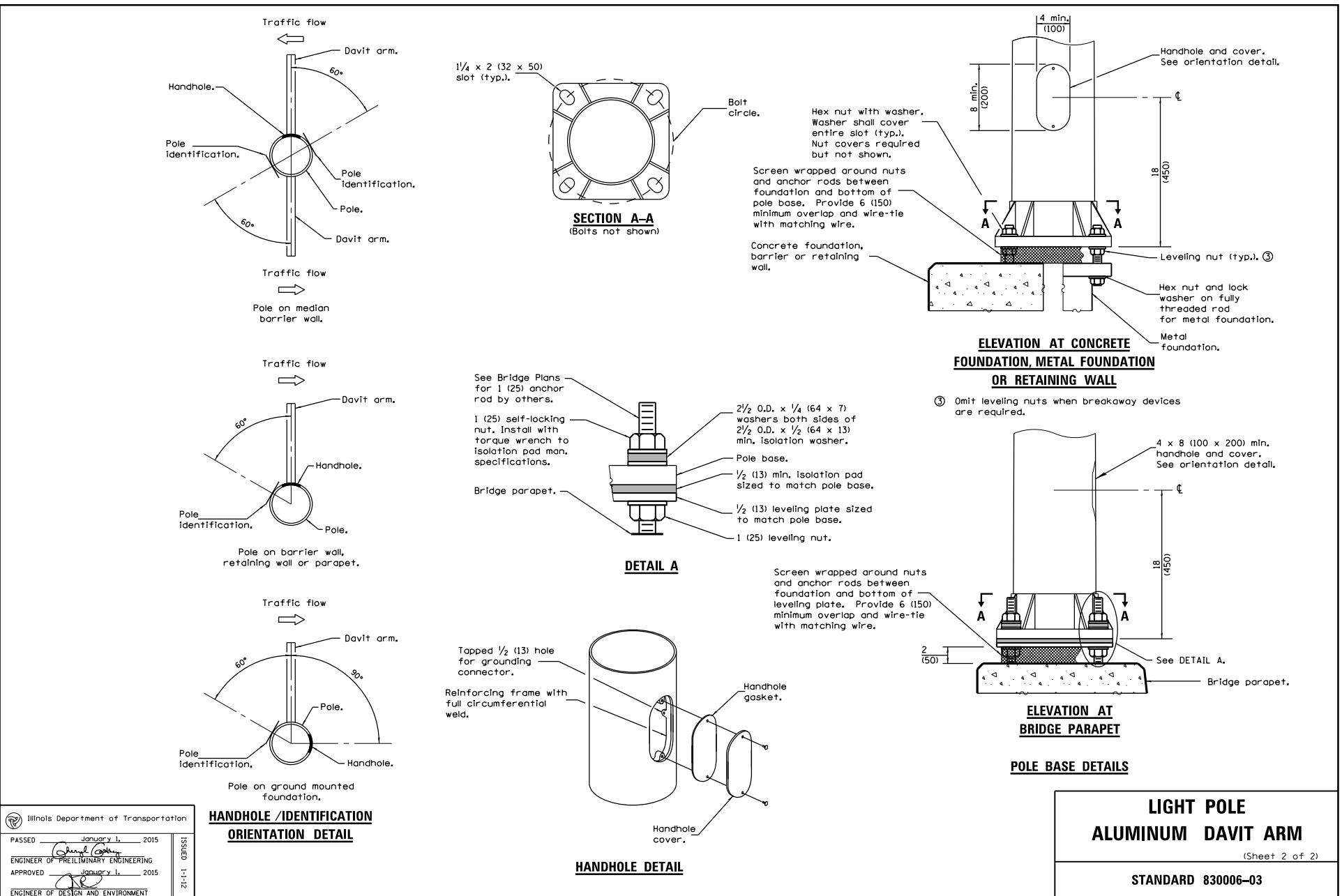
Illinois Department of Transportation
PASSED January 1, 2015
Engineer of Preliminary Engineering
APPROVED January 1, 2015
Engineer of Design and Environment

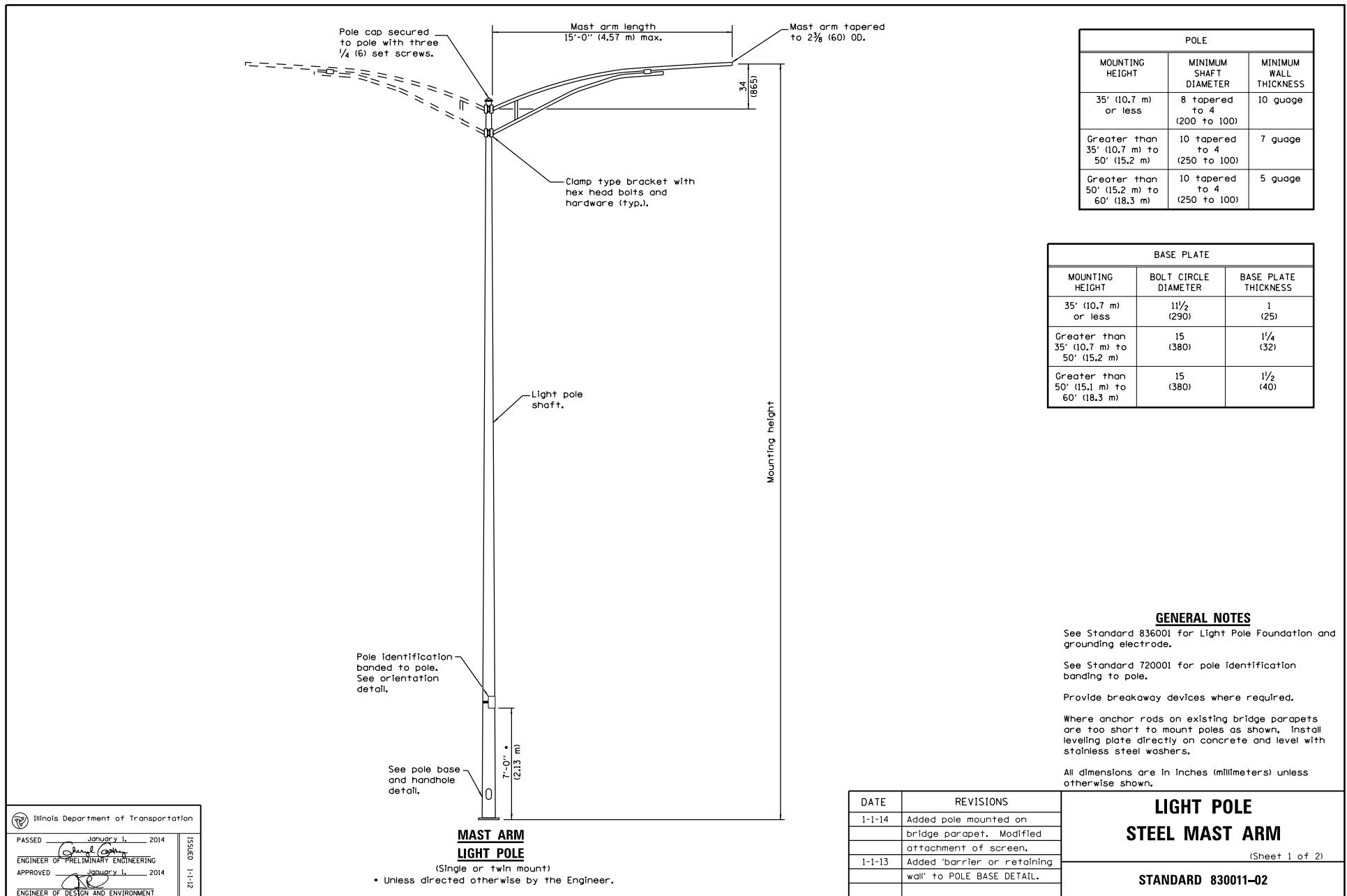
DAVIT LIGHT POLE
(Single or twin mount)

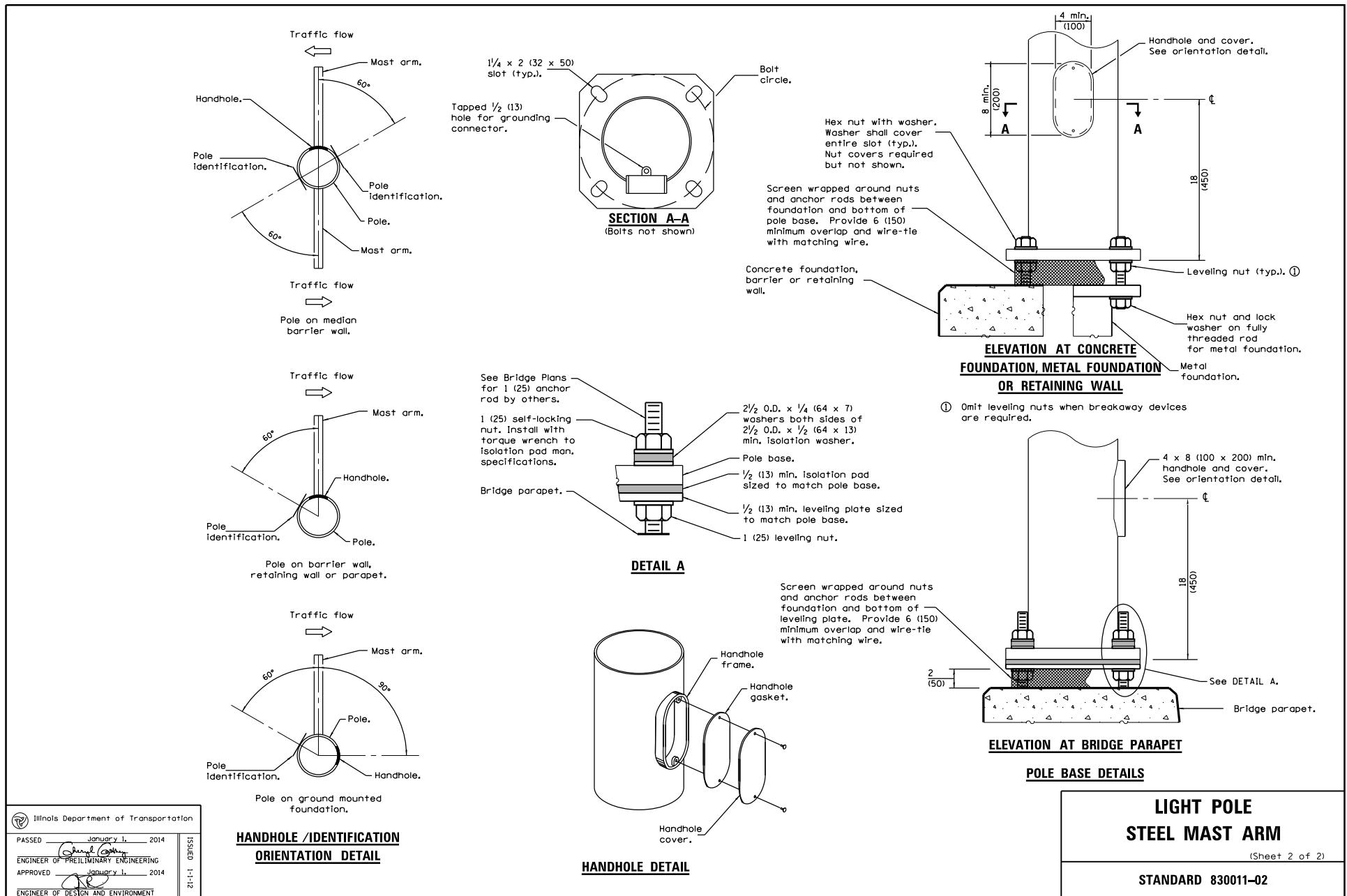
Unless directed otherwise by the Engineer.

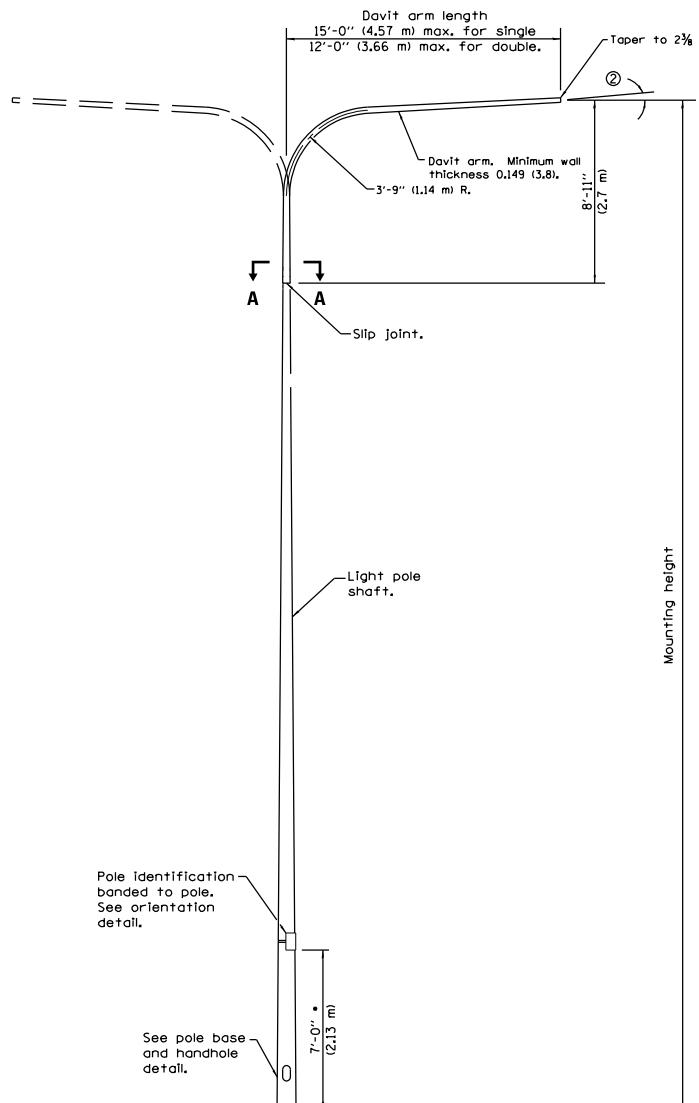
DATE	REVISIONS
1-1-15	Revised note on
	HANDHOLE DETAIL.
1-1-14	Added pole mounted on
	bridge parapet. Modified
	attachment of screen.

LIGHT POLE
ALUMINUM DAVIT ARM
(Sheet 1 of 2)
STANDARD 83006-03









DAVIT LIGHT POLE

(Single or twin mount)

- Unless directed otherwise by the Engineer.

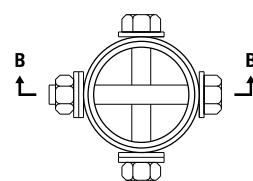
	Illinois Department of Transportation
PASSED	January 1, 2014
	Engineer of PRELIMINARY ENGINEERING
APPROVED	January 1, 2014
	Engineer of DESIGN AND ENVIRONMENT
1-1-14	1-1-12

BASE PLATE		
MOUNTING HEIGHT	BOLT CIRCLE DIAMETER	BASE PLATE THICKNESS
35' (10.7 m) or less	1 1/2" (290)	1" (25)
Greater than 35' (10.7 m) to 50' (15.2 m)	15" (380)	1 1/4" (32)
Greater than 50' (15.1 m) to 60' (18.3 m)	15" (380)	1 1/2" (40)

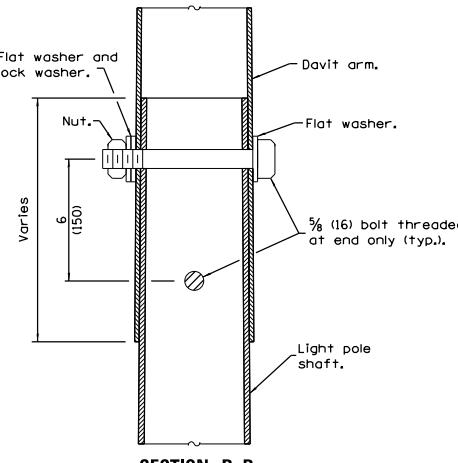
POLE LOWER SHAFT			
MOUNTING HEIGHT	LOWER SHAFT LENGTH ①	MINIMUM SHAFT DIAMETER	MINIMUM WALL THICKNESS
30' (9.1 m)	21'-1" (6.4 m)	8 tapered to 6 (200 to 114)	10 gauge
35' (10.7 m)	26'-1" (7.9 m)	8 tapered to 6 (200 to 114)	10 gauge
40' (12.2 m)	31'-1" (9.5 m)	10 tapered to 6 (250 to 150)	7 gauge
45' (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

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.



SECTION A-A



GENERAL NOTES

See Standard 836001 for Light Pole Foundation and grounding electrode.

See Standard 720001 for pole identification banding to pole.

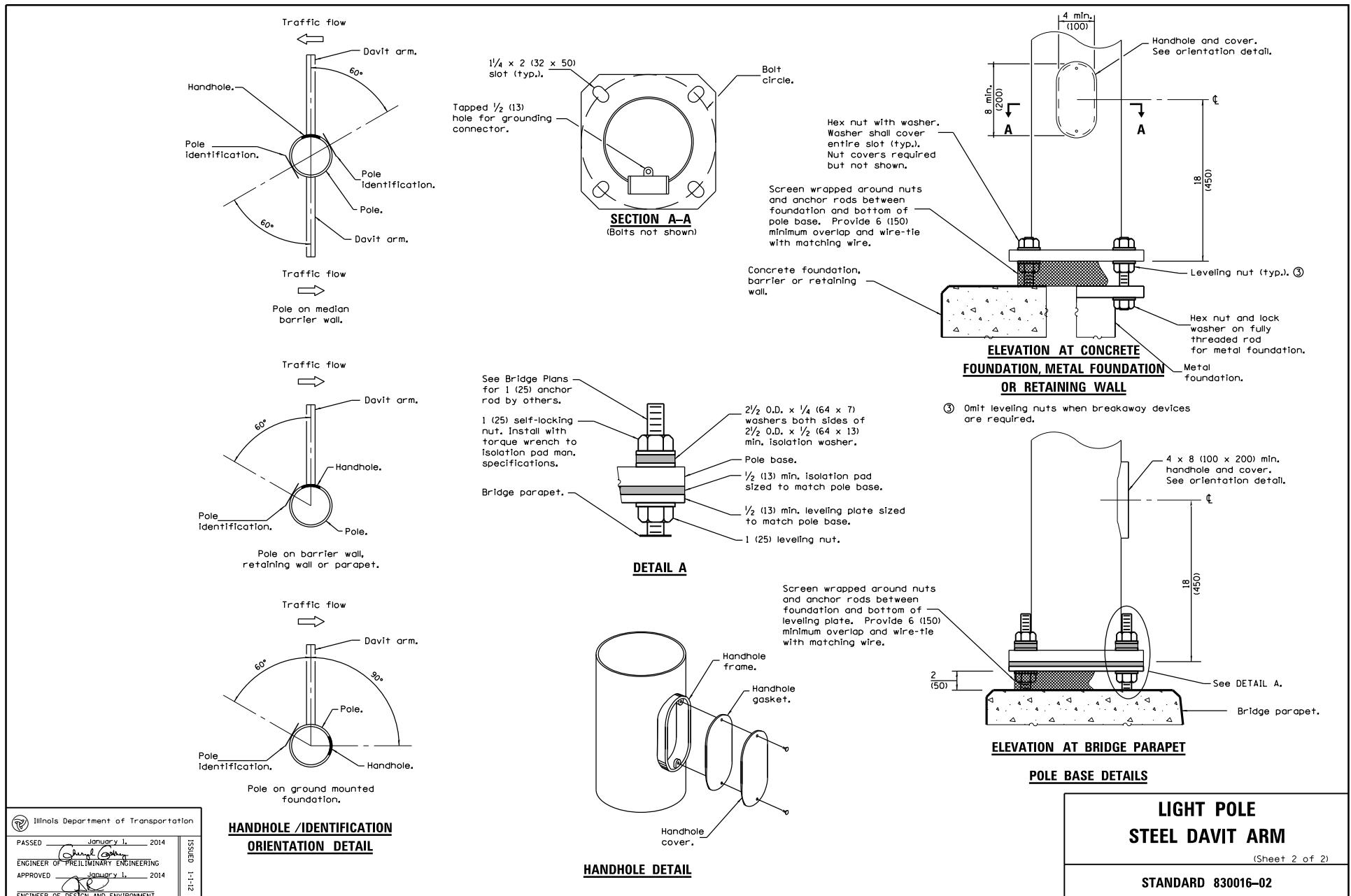
Provide breakaway devices where required.

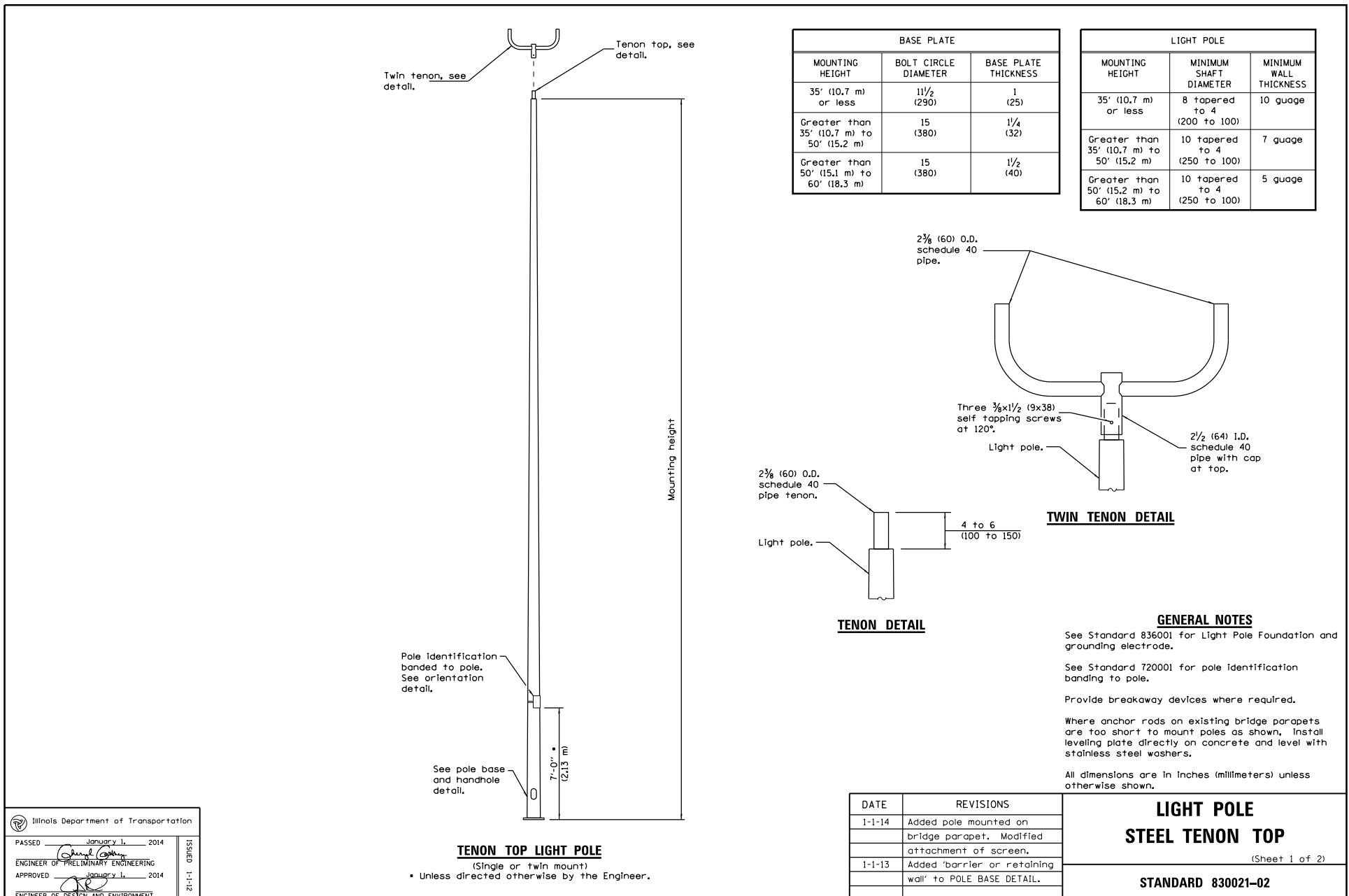
Where anchor rods on existing bridge parapets are too short to mount poles as shown, install leveling plate directly on concrete and level with stainless steel washers.

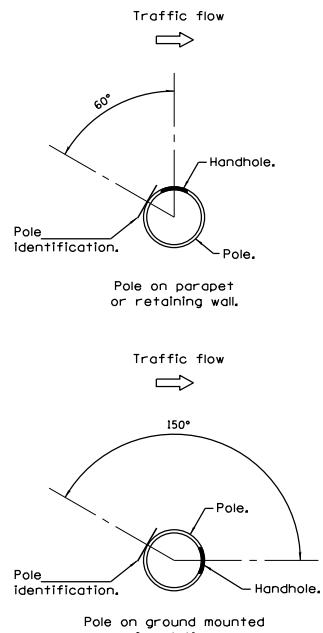
All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS	LIGHT POLE STEEL DAVIT ARM (Sheet 1 of 2)
1-1-14	Added pole mounted on bridge parapet. Modified attachment of screen.	
I-1-13	Added 'barrier or retaining wall' to POLE BASE DETAIL.	

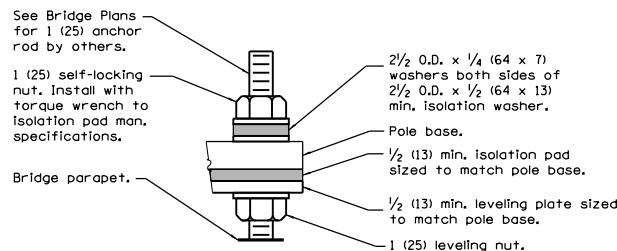
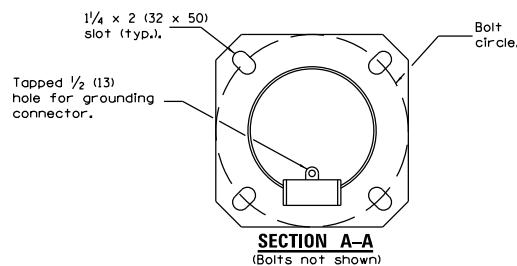
STANDARD 830016-02



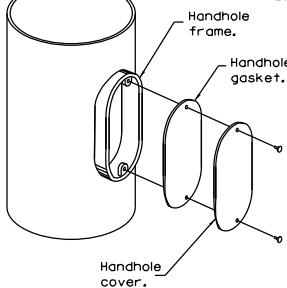




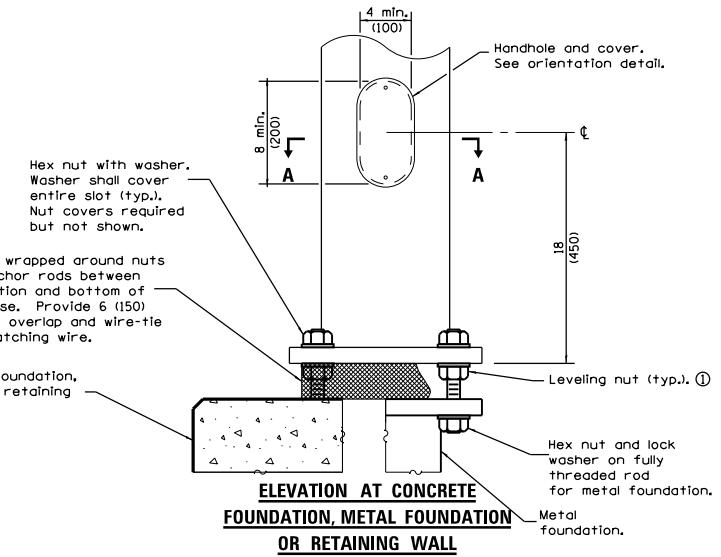
HANDHOLE / IDENTIFICATION ORIENTATION DETAIL



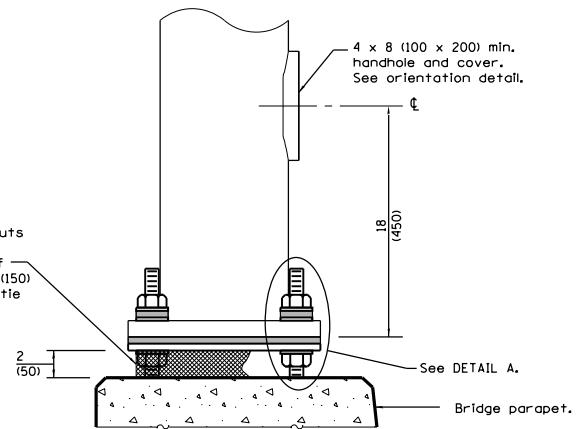
DETAIL A



HANDHOLE DETAIL



① Omit leveling nuts when breakaway devices are required.



ELEVATION AT BRIDGE PARAPET

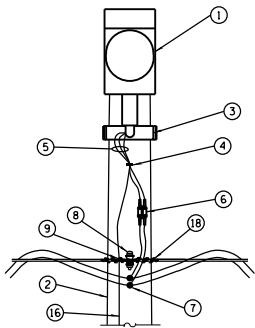
POLE BASE DETAILS

LIGHT POLE STEEL TENON TOP

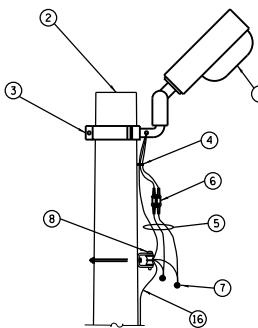
(Sheet 2 of 2)

STANDARD 830021-02

	Illinois Department of Transportation
PASSED	January 1, 2014
	Engineer of Preliminary Engineering
APPROVED	January 1, 2014
	Engineer of Design and Environment
1-12	



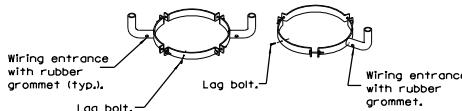
FACING VIEW



SIDE VIEW

LUMINAIRE MOUNTING DETAILS

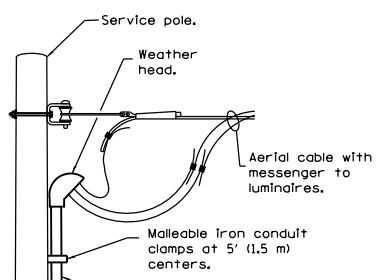
43' - 44' (13.1 m - 13.4 m) mounting height unless noted otherwise on plans.



TWIN

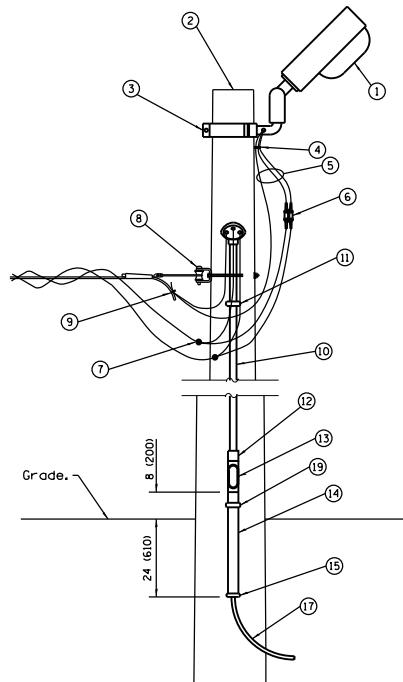
SINGLE

MOUNTING BRACKET DETAILS



LIGHTING CIRCUIT AT SERVICE/CONTROLLER

See standard 825001 for service installation.



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" conductel, 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" conductel.
- Size larger as needed.

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.

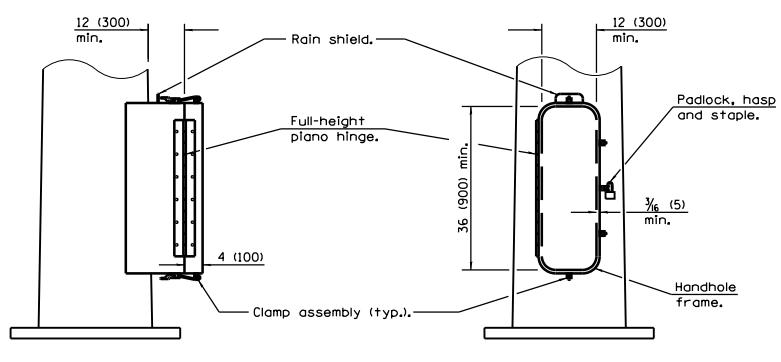
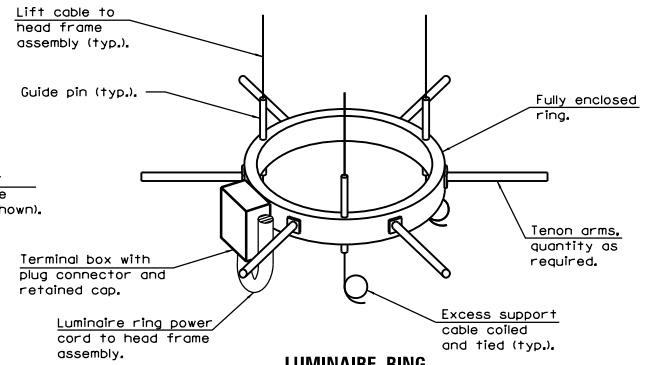
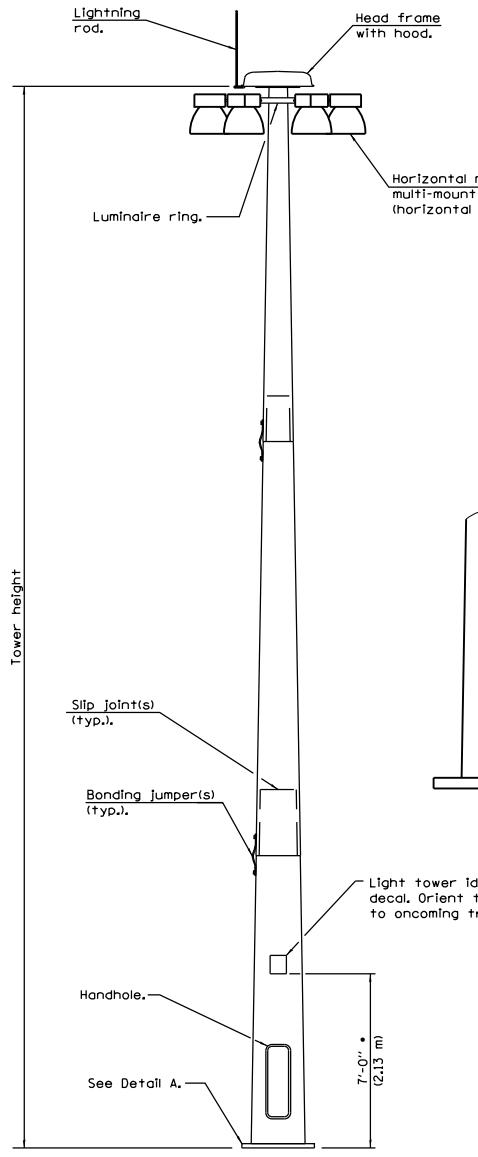
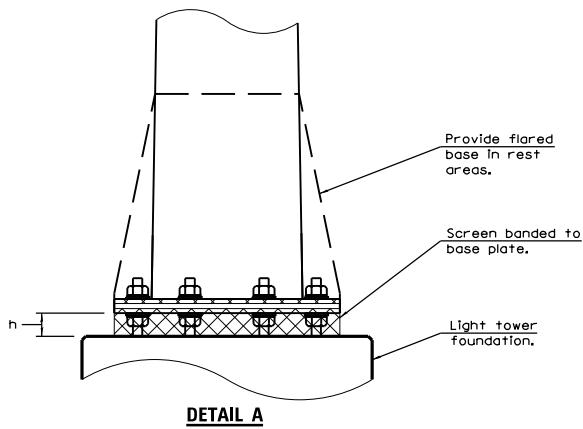
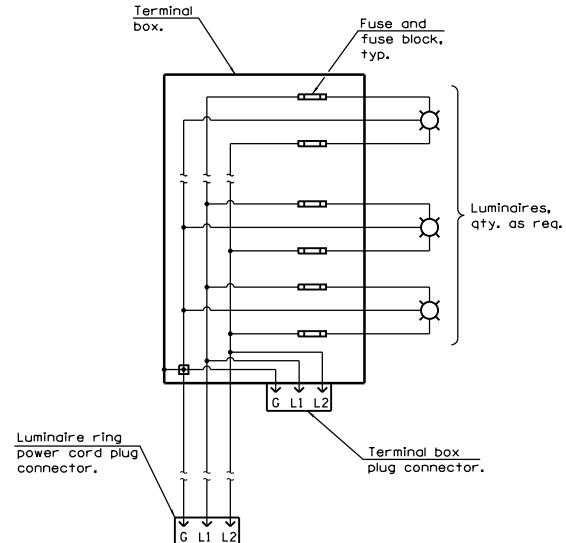
All dimensions are in inches (millimeters) unless otherwise shown.

	Illinois Department of Transportation
APPROVED	January 1, 2013
	(Acting)
ENGINEER PRELIMINARY ENGINEERING	
APPROVED	January 1, 2013
ENGINEER OF DESIGN AND ENVIRONMENT	

DATE	REVISIONS
1-1-13	New standard.

TEMPORARY ROADWAY LIGHTING

STANDARD 830026



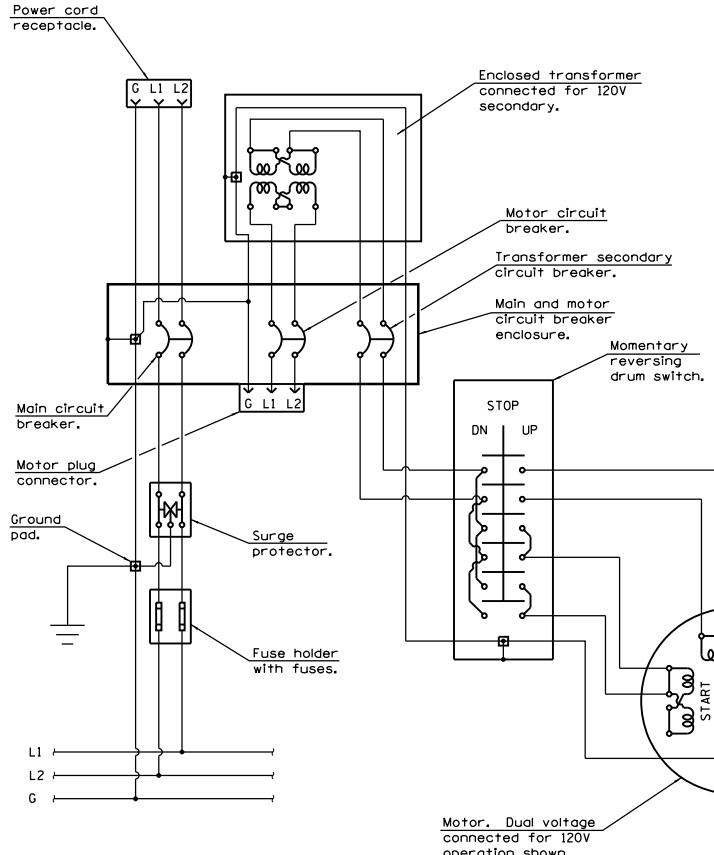
GENERAL NOTES
See Standard 837001 for High Mast Tower Foundation and grounding electrode.

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

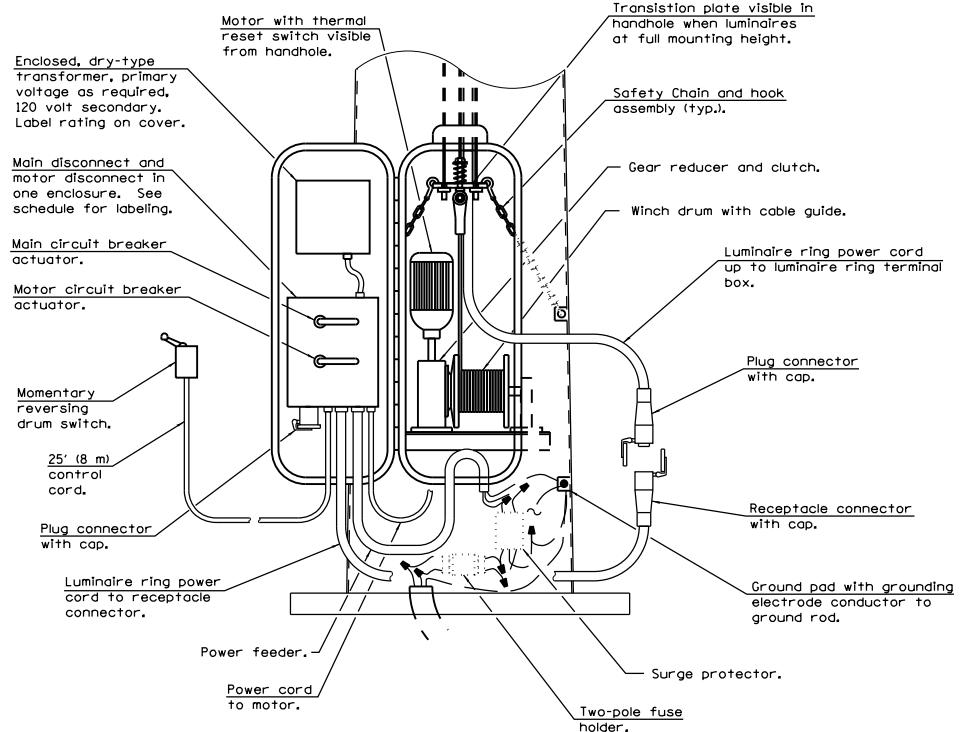
DATE	REVISIONS	LIGHT TOWER (Sheet 1 of 2)
1-1-15	Added light tower	
	Identification decal.	
	Modified Detail A.	
1-1-11	New Standard.	

STANDARD 835001-01

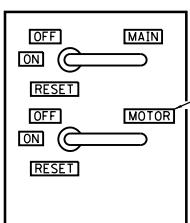
Illinois Department of Transportation
PASSED <i>John Gandy</i> January 1, 2015
ENGINEER OF PRELIMINARY ENGINEERING
APPROVED <i>John Gandy</i> January 1, 2015
ENGINEER OF DESIGN AND ENVIRONMENT



LOWERING SYSTEM WIRING DIAGRAM



LOWERING AND SUPPORT MECHANISM



Engraved plate secured to cover (typ.).

**DISCONNECT
SCHEDULE**

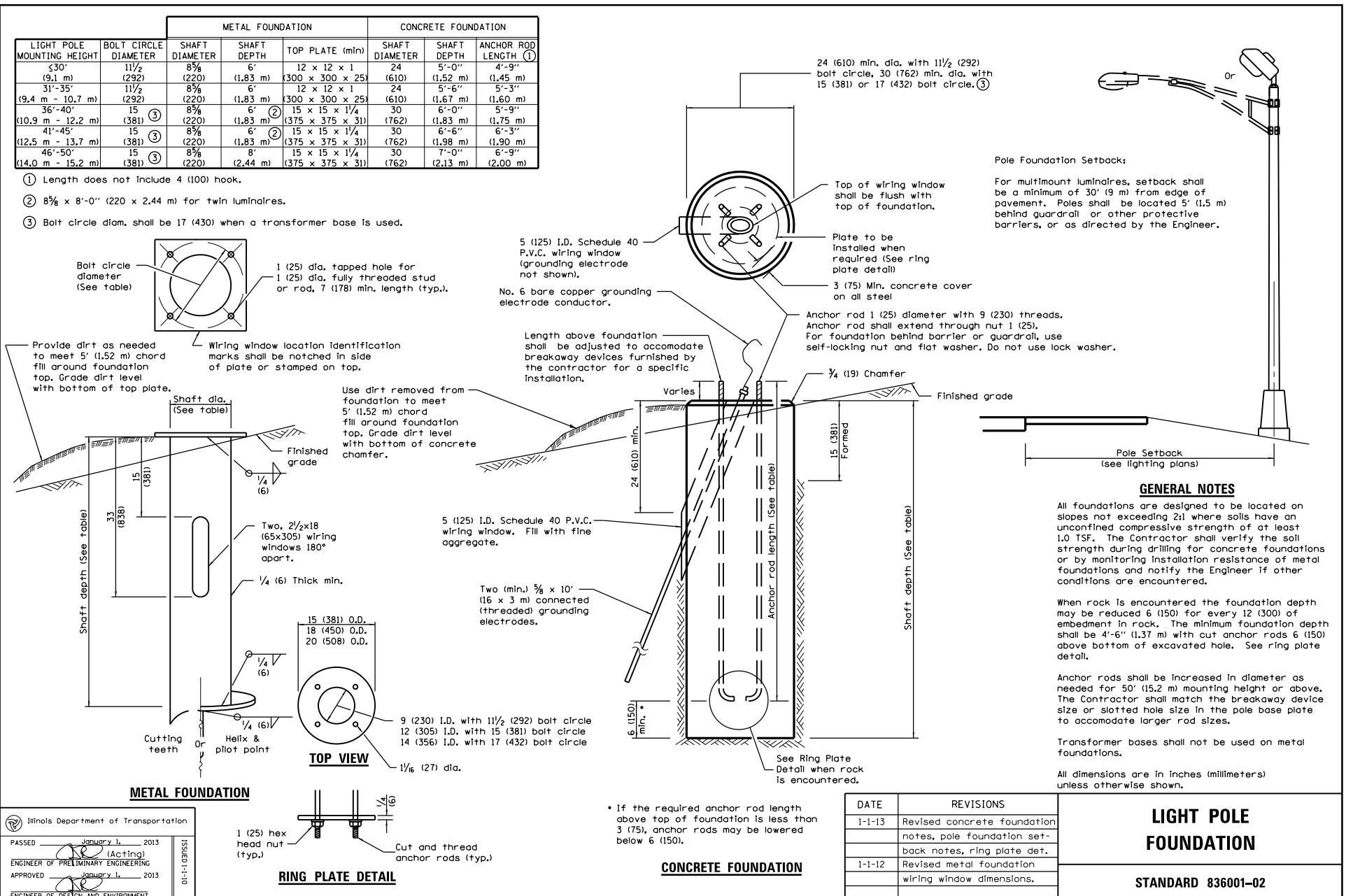
	Illinois Department of Transportation
PASSED	January 1, 2015
	Engineer of Preliminary Engineering
APPROVED	January 1, 2015
	Engineer of Design and Environment

11-1-1

LIGHT TOWER

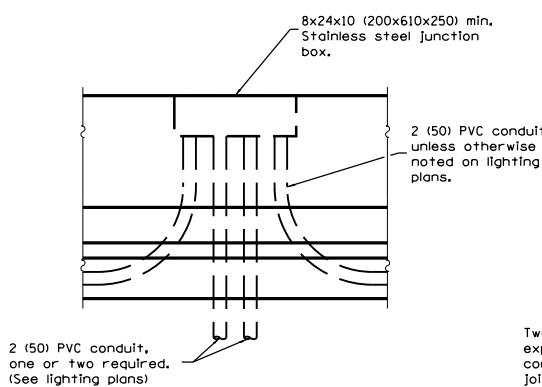
(Sheet 2 of 2)

STANDARD 835001-01

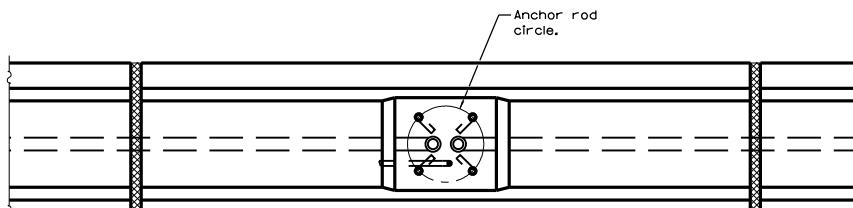


FOUNDATION TABLE				
LIGHT POLE MOUNTING HEIGHT	SHAFT DIAMETER	SHAFT DEPTH	ANCHOR ROD LENGTH ①	ANCHOR ROD CIRCLE DIA.
≤30' (9.1 m)	24 (610)	36 (914)	5'-2" (1,57 m)	11½ (292)
31'-35' (9.4 m - 10.7 m)	24 (610)	3'-6" (1,06 m)	5'-8" (1,73 m)	11½ (292)
36'-40' (10.9 m - 12.2 m)	30 (762)	4'-0" (1,22 m)	6'-2" (1,88 m)	15 (381)
41'-45' (12.5 m - 13.7 m)	30 (762)	4'-6" (1,37 m)	6'-8" (2,03 m)	15 (381)
46'-50' (14.0 m - 15.2 m)	30 (762)	5'-0" (1,52 m)	7'-2" (2,18 m)	15 (381)

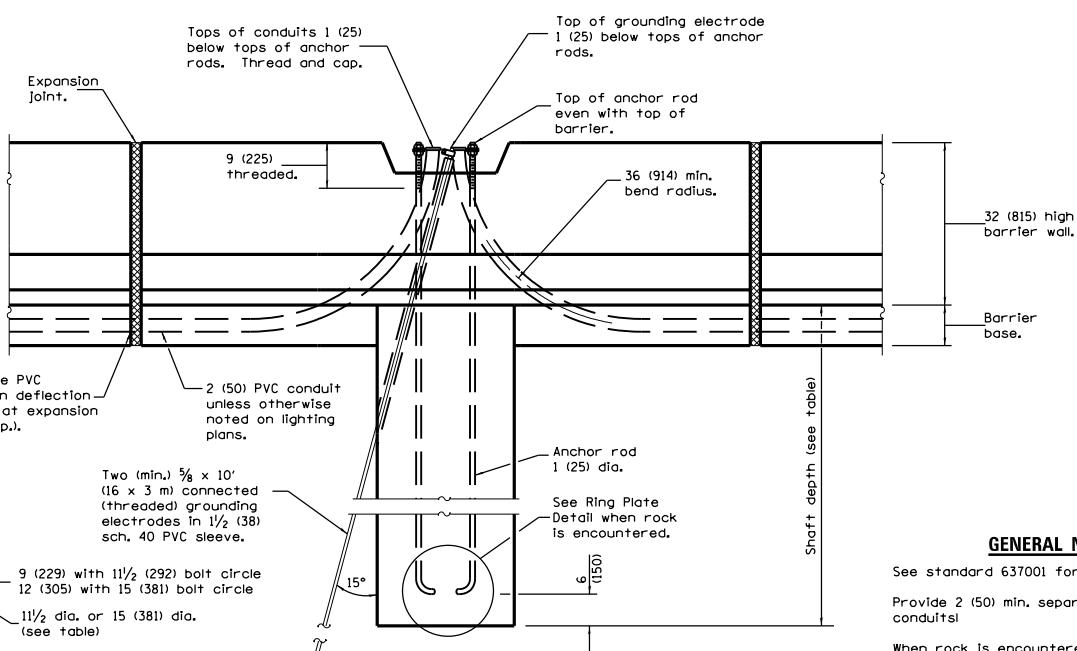
① Length does not include 4 (100) hook.



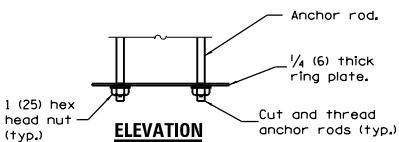
JUNCTION BOX ELEVATION



PLAN



LIGHT POLE FOUNDATION
ELEVATION



RING PLATE DETAIL

Illinois Department of Transportation
PASSED <i>John G.</i> January 1, 2013
ENGINEER OF PRELIMINARY ENGINEERING
APPROVED <i>John G.</i> January 1, 2013
ENGINEER OF DESIGN AND ENVIRONMENT

1-1-14

DATE	REVISIONS	LIGHT POLE FOUNDATION WITH 32 in. (815 mm) CONCRETE MEDIAN BARRIER
1-1-14	Modified grounding method. Revised general notes.	
1-1-13	New standard.	

STANDARD 836006-01

GENERAL NOTES

See standard 637001 for barrier wall details.

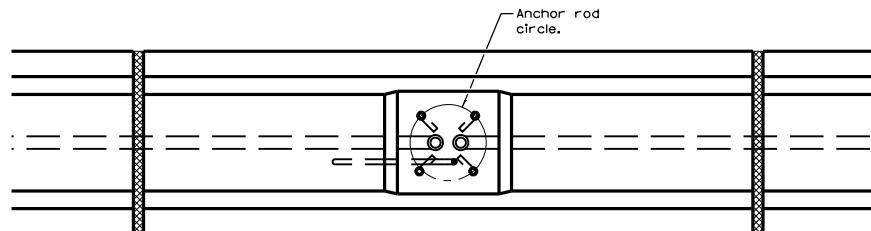
Provide 2 (50) min. separation between all conduits.

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.

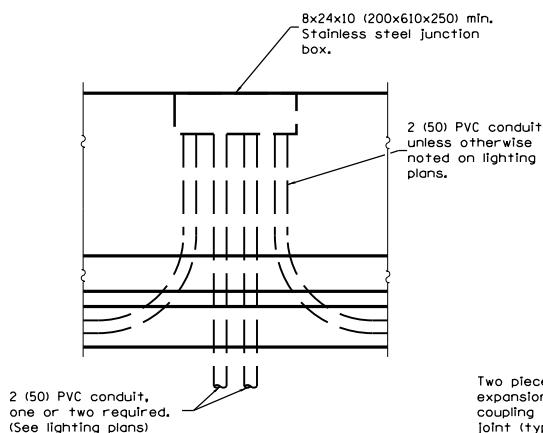
All dimensions are in inches (millimeters) unless otherwise shown.

FOUNDATION TABLE				
LIGHT POLE MOUNTING HEIGHT	SHAFT DIAMETER	SHAFT DEPTH	ANCHOR ROD LENGTH ①	ANCHOR ROD CIRCLE DIA.
≤30' (9.1 m)	24 (610)	36 (914)	6'-0" (1,83 m)	1½ (292)
31'-35' (9.4 m - 10.7 m)	24 (610)	3'-6" (1.06 m)	6'-6" (1.98 m)	1½ (292)
36'-40' (10.9 m - 12.2 m)	30 (762)	4'-0" (1.22 m)	7'-0" (2.13 m)	15 (381)
41'-45' (12.5 m - 13.7 m)	30 (762)	4'-6" (1.37 m)	7'-6" (2.29 m)	15 (381)
46'-50' (14.0 m - 15.2 m)	30 (762)	5'-0" (1.52 m)	8'-0" (2.44 m)	15 (381)

① Length does not include 4 (100) hook.



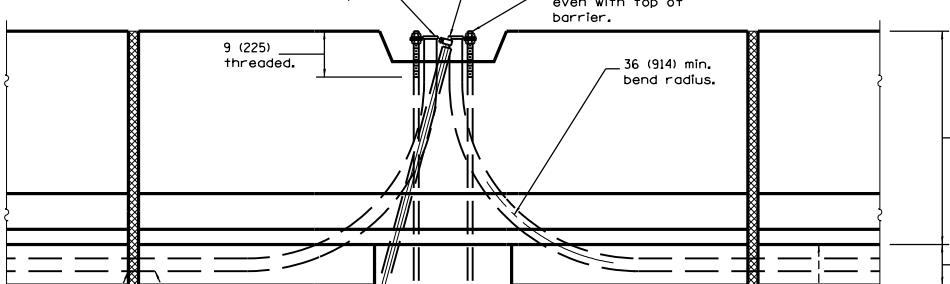
PLAN



JUNCTION BOX
ELEVATION

Bx24x10 (200x610x250) min.
Stainless steel junction
box.

2 (50) PVC conduit
unless otherwise
noted on lighting
plans.



42 (1065) high
barrier wall.

Barrier
base.

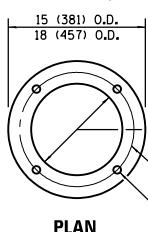
Two piece PVC
expansion deflection
coupling at expansion
joint (typ.).

Two (min.) 5/8" x 10'
(16 x 3 m) connected
(threaded) grounding
electrodes in 1½ (38)
sch. 40 PVC sleeve.

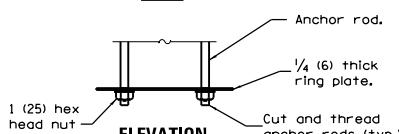
Anchor rod
1 (25) dia.

See Ring Plate
Detail when rock
is encountered.

Shaft depth (see table)



PLAN



ELEVATION

1 (25) hex
head nut
(typ.)

¼ (6) thick
ring plate.
Cut and thread
anchor rods (typ.)

LIGHT POLE
FOUNDATION

ELEVATION

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.

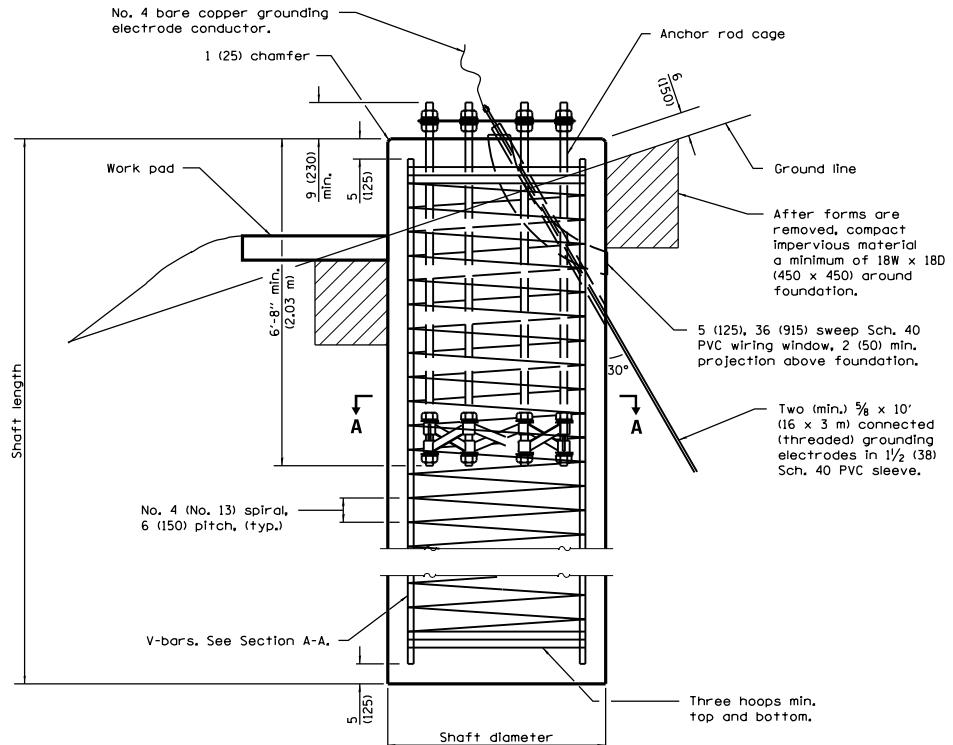
All dimensions are in inches (millimeters) unless
otherwise shown.

LIGHT POLE FOUNDATION WITH 42 in. (1065 mm) CONCRETE MEDIAN BARRIER

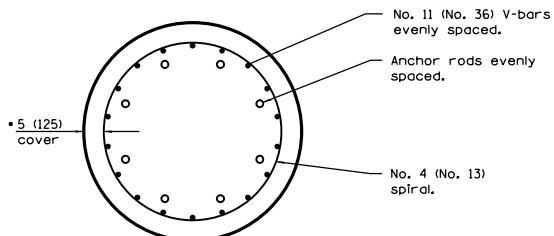
STANDARD 836011-01

	Illinois Department of Transportation
PASSED	January 1, 2014
ENGINEER OF POLICY AND PROCEDURES	
APPROVED	January 1, 2014
ENGINEER OF DESIGN AND ENVIRONMENT	

I-1-1-1-1-1



FOUNDATION ELEVATION



SECTION A-A

• See Rod and Reinforcement Table.

SOIL CONSISTENCY	AVERAGE STRENGTH (Qu in tsf (Qu in kPa))	LIGHT TOWER HEIGHT							
		80' (24 m)	90' (30 m)	100' (34 m)	110' (37 m)	120' (40 m)	130' (43 m)	140' (46 m)	150' (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)
	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)
	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)
	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)
	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)
N IN BLOWS/FT. (N IN BLOWS/0.3m)									
Granular	VERY LOOSE < 5 (K 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)
	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" (5.6 m)	19'-0" (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)
	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)
	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)

See Sheet 2 for GENERAL NOTES.

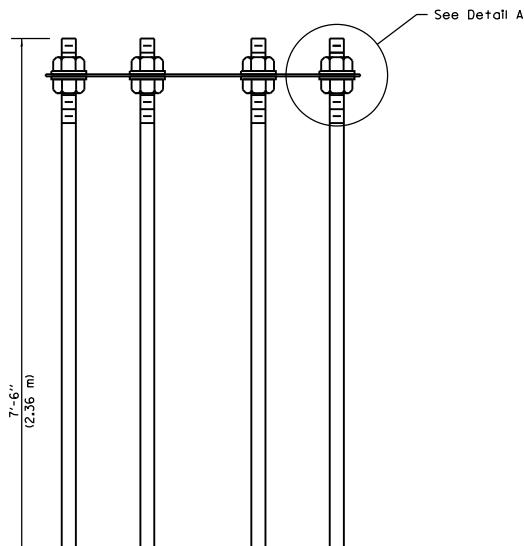
DATE	REVISIONS	LIGHT TOWER FOUNDATION (Sheet 1 of 2)
1-1-15	Added 6'-8" min. anchor rod embedment in	
	foundation.	
1-1-14	Revised diameter of grd. electrode sleeve.	

STANDARD 837001-04

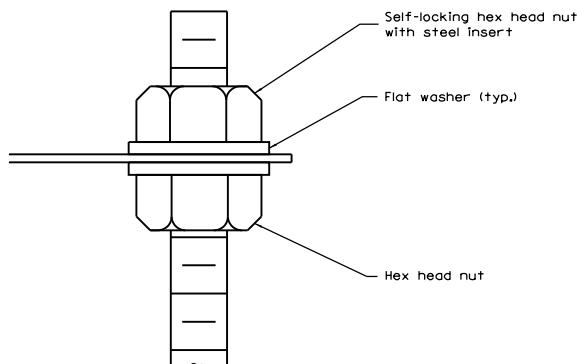
Illinois Department of Transportation
PASSED <i>[Signature]</i> January 1, 2015
ENGINEER OF PRELIMINARY ENGINEERING <i>[Signature]</i>
APPROVED <i>[Signature]</i> January 1, 2015
ENGINEER OF DESIGN AND ENVIRONMENT <i>[Signature]</i>
01-1-1

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)	1/2 (38)	30 (760)	24 (610)	4'-0" (1.2 m)	14	
90' (27 m)	1/2 (38)	30 (760)	24 (610)	4'-0" (1.2 m)	14	
100' (30 m)	1/2 (38)	30 (760)	24 (610)	4'-0" (1.2 m)	14	
110' (34 m)	1/2 (38)	30 (760)	24 (610)	4'-0" (1.2 m)	14	
120' (37 m)	1 1/4 (44)	36 (915)	26 (660)	4'-6" (1.4 m)	18	
130' (40 m)	1 1/4 (44)	36 (915)	28 (710)	4'-6" (1.4 m)	18	
140' (43 m)	1 1/4 (44)	36 (915)	28 (710)	4'-6" (1.4 m)	18	
150' (46 m)	2 1/4 (57)	38 (965)	30 (760)	5'-0" (1.5 m)	22	
160' (49 m)	2 1/4 (57)	38 (965)	32 (810)	5'-0" (1.5 m)	22	

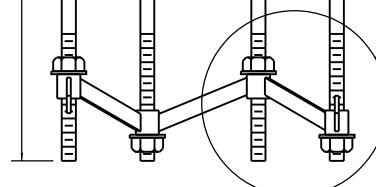
① Diameter based on a 5 (125) conc. cover. The min. cover shall be 3 (75) in dry shaft excavation and 4 (100) in a wet hole. When rock is encountered a 5 (125) cover against soil and a 2 (50) cover against rock shall be required.



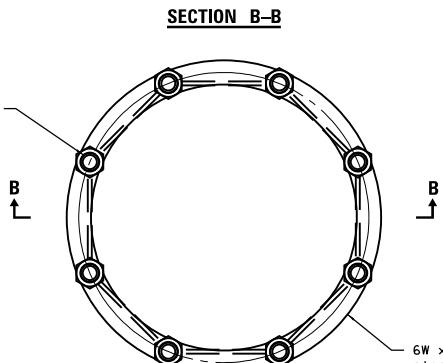
See Detail A



DETAIL A

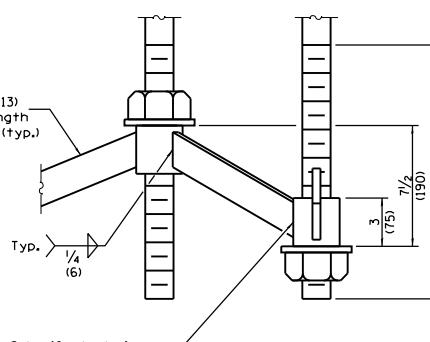


See Detail B



6W x 1/4T (150 x 6)
steel template.

ANCHOR ROD CAGE (PLAN)



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.

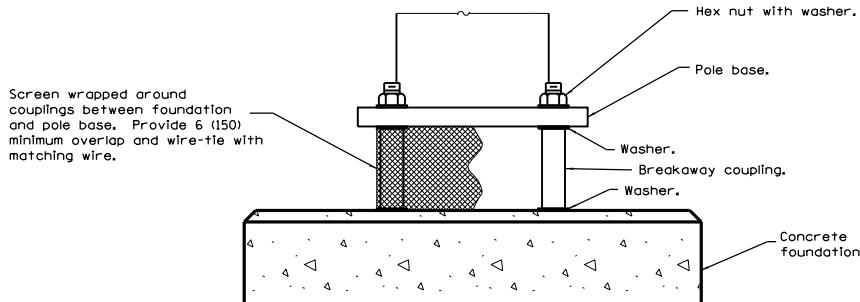
LIGHT TOWER FOUNDATION

(Sheet 2 of 2)

STANDARD 837001-04

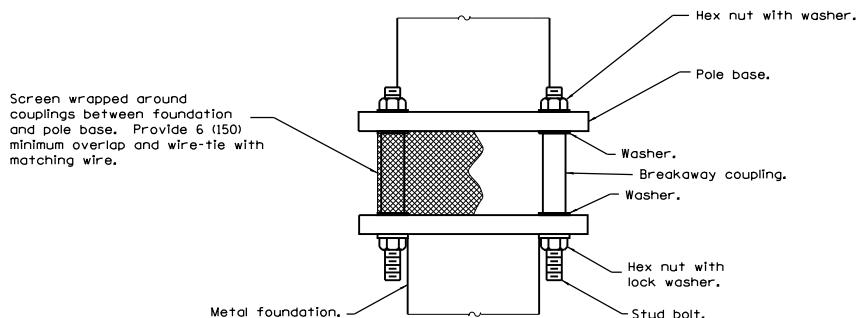
Illinois Department of Transportation
PASSED <i>John G.</i> January 1, 2015
ENGINEER OF PRELIMINARY ENGINEERING
APPROVED <i>John G.</i> January 1, 2015
ENGINEER OF DESIGN AND ENVIRONMENT

10-1-10



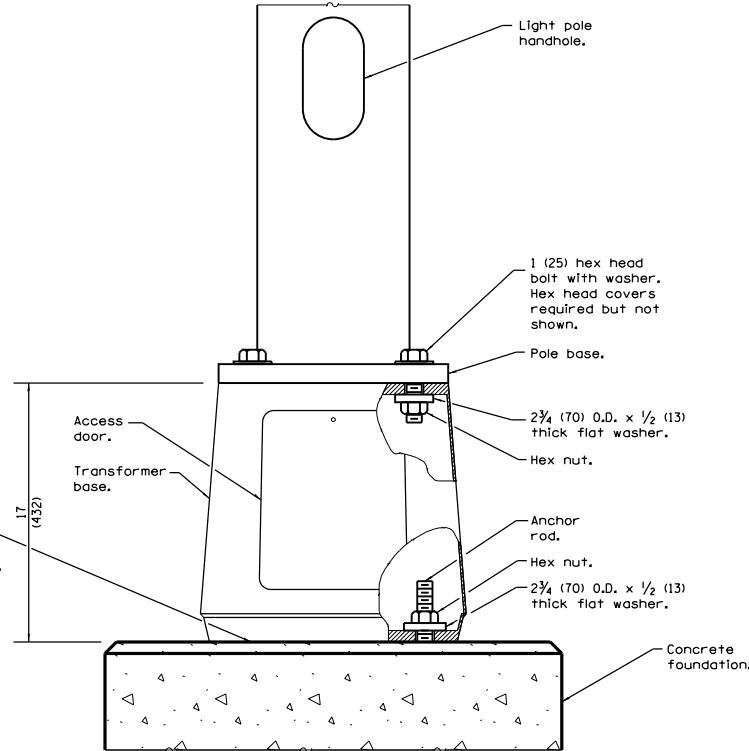
BREAKAWAY COUPLINGS **ON CONCRETE FOUNDATION**

(Provide pole base skirt around screen when required.)



BREAKAWAY COUPLINGS ON METAL FOUNDATION

(Provide pole base skirt around screen when required.)



BREAKAWAY TRANSFORMER BASE

GENERAL NOTES

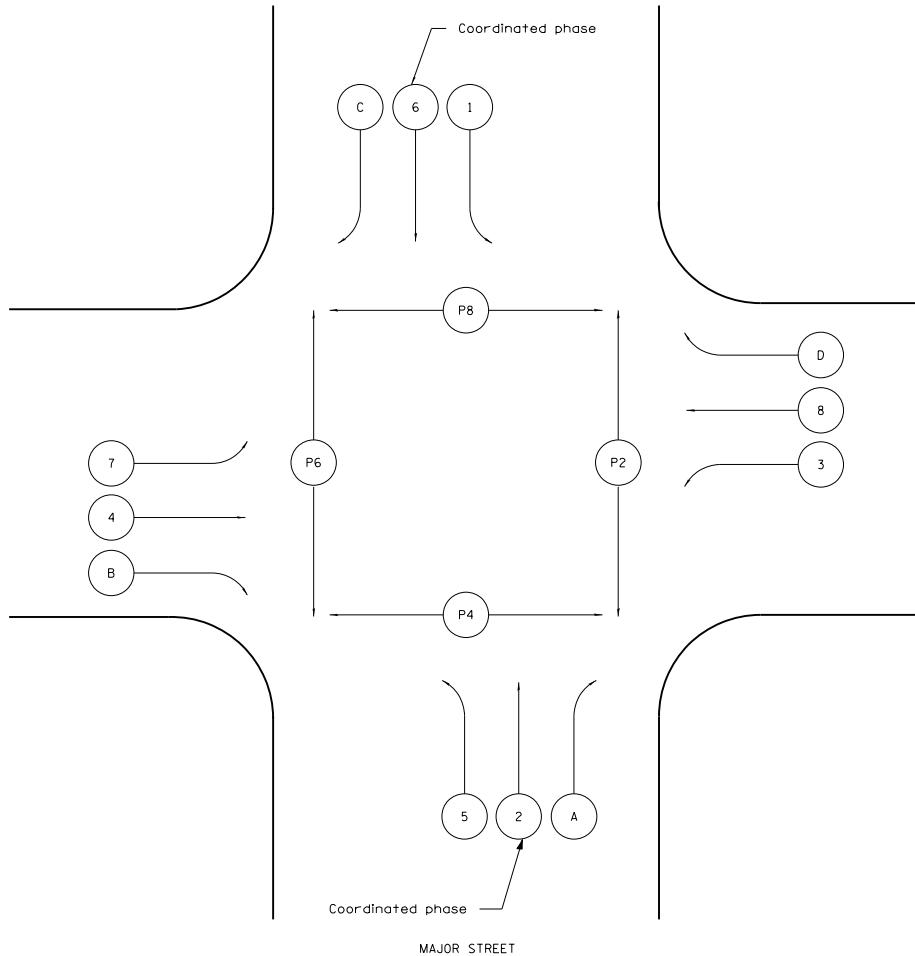
See light pole standard for details not shown.

Use largest transformer base bolt circle possible.

Transformer bases shall not be installed on metal foundations.

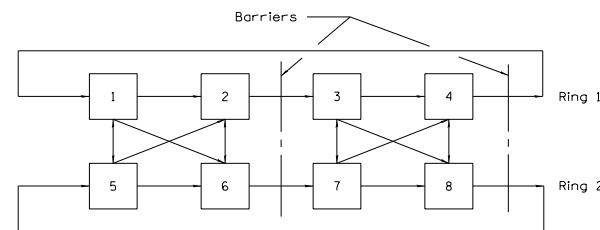
Washers on top of pole base shall cover the entire bolt slot.

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



STANDARD PHASE DESIGNATION DIAGRAM (NEMA)

	Illinois Department of Transportation
APPROVED	January 1, 2009
ENGINEER OF OPERATIONS	
APPROVED	January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT	
	ISSUED 1-1-97



NEMA EIGHT PHASE DUAL RING
ACTUATED CONFIGURATION

LEGEND

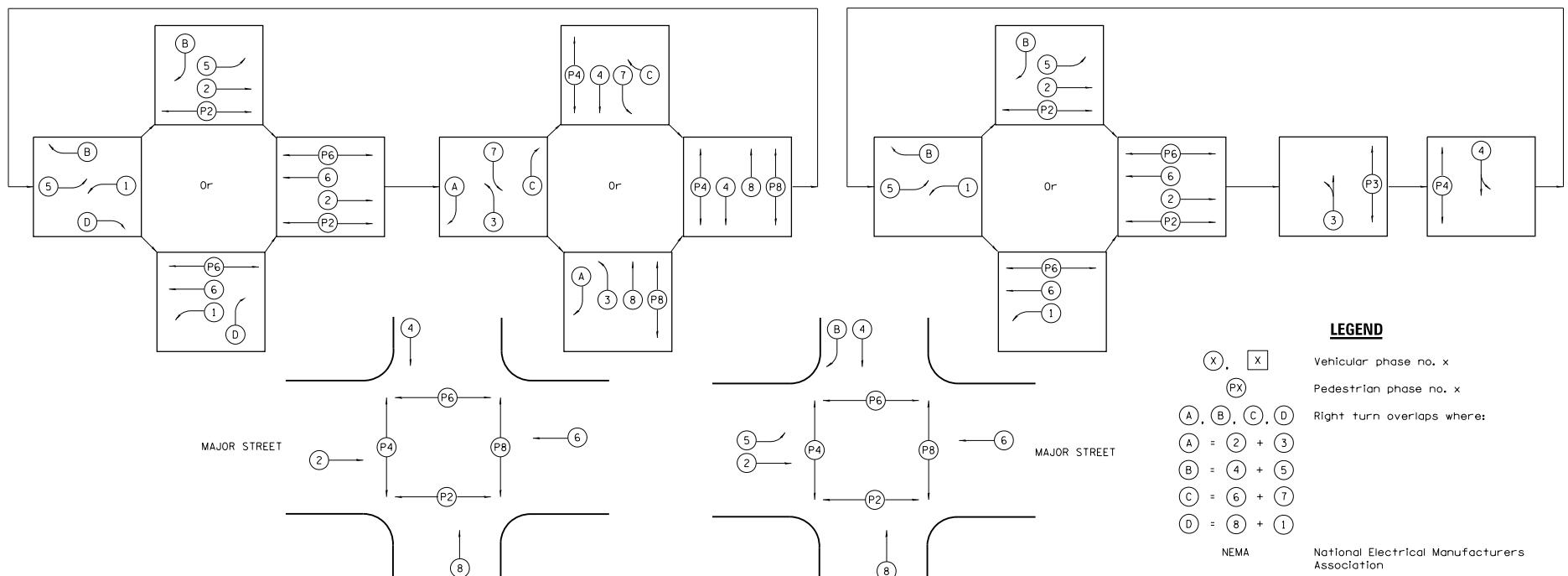
- (X), [X] Vehicular phase no. x
- (PX) Pedestrian phase no. x
- (A), (B), (C), (D) Right turn overlaps where:
- (A) = (2) + (3)
- (B) = (4) + (5)
- (C) = (6) + (7)
- (D) = (8) + (1)

NEMA

National Electrical Manufacturers Association

DATE	REVISIONS	STANDARD PHASE DESIGNATION DIAGRAMS AND PHASE SEQUENCES (Sheet 1 of 2)
1-1-09	Omitted note regarding units of length.	
1-1-97	Renum. Standard 2393-2.	

STANDARD 857001-01



LEGEND

(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
APPROVED January 1, 2009
ENGINEER OF OPERATIONS
APPROVED January 1, 2009
EE & Enviro
ENGINEER OF DESIGN AND ENVIRONMENT

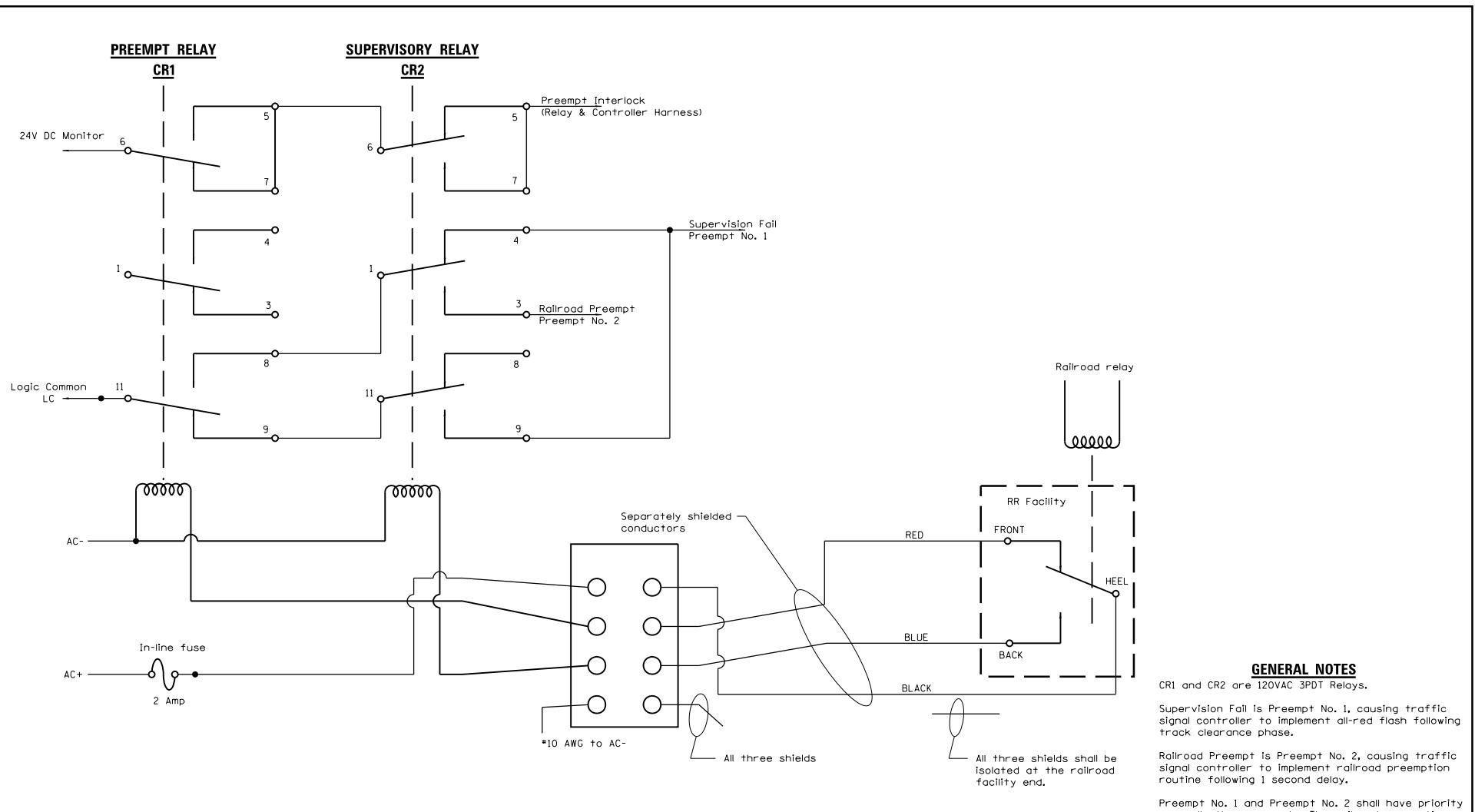
ISG-1-1-97

PHASE DESIGNATION DIAGRAMS AND CORRESPONDING PHASE SEQUENCES

**STANDARD PHASE
DESIGNATION DIAGRAMS
AND PHASE SEQUENCES**

(Sheet 2 of 2)

STANDARD 857001-01

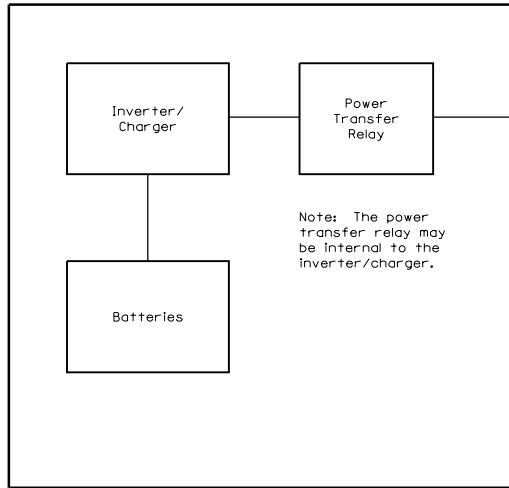


	Illinois Department of Transportation
APPROVED	January 1, 2009
ENGINEER OF OPERATIONS	
APPROVED	January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT	

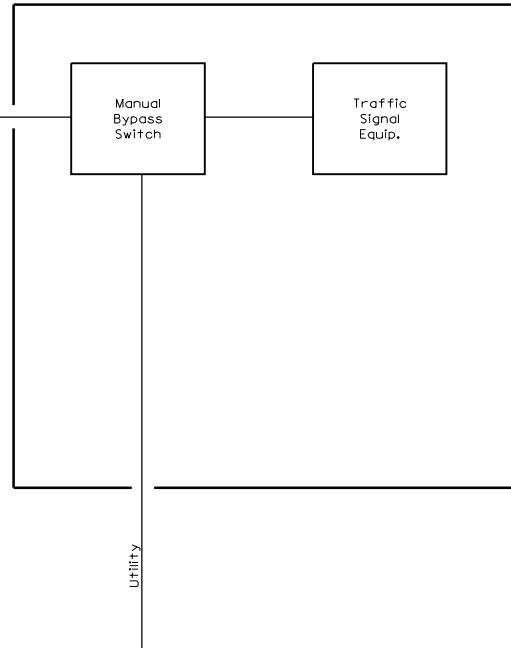
DATE	REVISIONS	SUPERVISED RAILROAD INTERCONNECT CIRCUIT
1-1-09	Omitted note regarding units of length.	
1-1-04	New Standard.	

STANDARD 857006-01

UPS CABINET



TRAFFIC SIGNAL (NEMA) CABINET



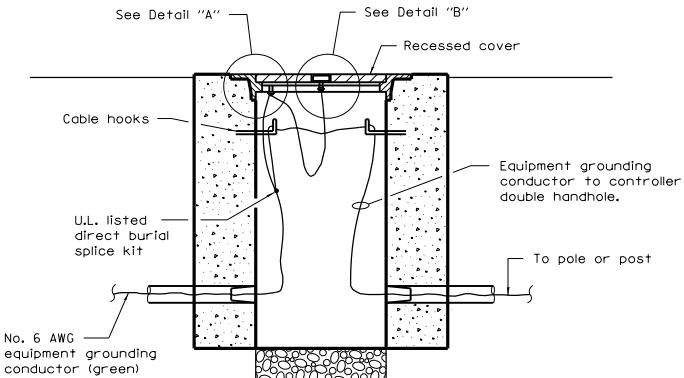
Utility

SINGLE LINE BLOCK DIAGRAM

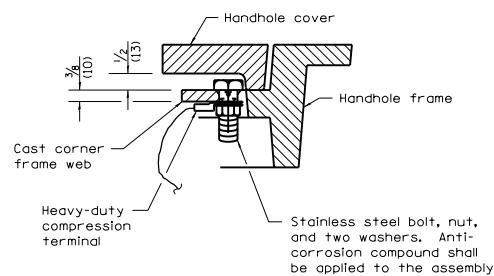
	Illinois Department of Transportation
APPROVED	January 1, 2009
ENGINEER OF OPERATIONS	
APPROVED	January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT	
4-1-06	IS-06

DATE	REVISIONS	UNINTERRUPTABLE POWER SUPPLY (UPS)
1-1-09	Omitted note regarding units of length.	
4-1-06	New Standard	

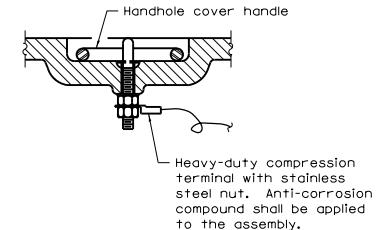
STANDARD 862001-01



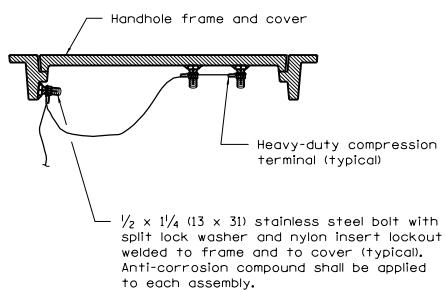
**BONDING A HANDHOLE
COVER & FRAME**



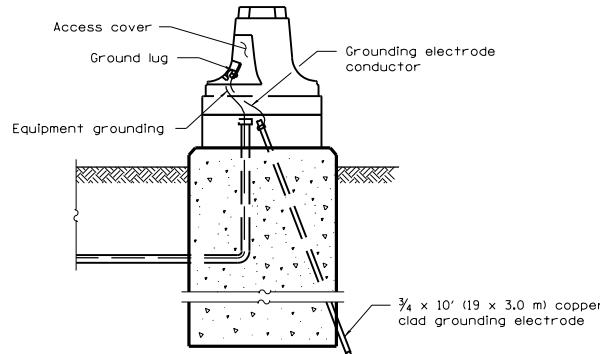
DETAIL "A"



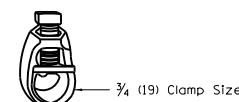
DETAIL "B"



**BONDING AN EXISTING
HANDHOLE COVER & FRAME**



GROUNDING A MAST ARM POLE/POST



**HEAVY-DUTY
COMPRESSION TERMINAL**

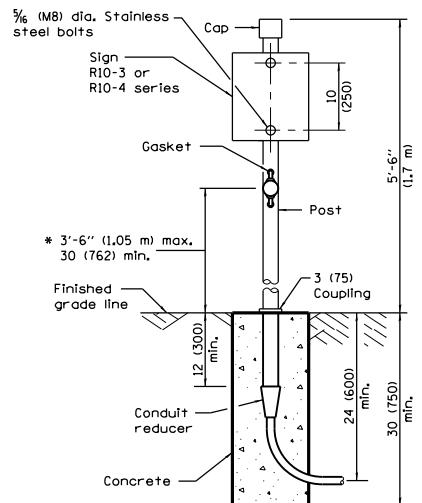
**HEAVY-DUTY
GROUND ROD CLAMP**

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

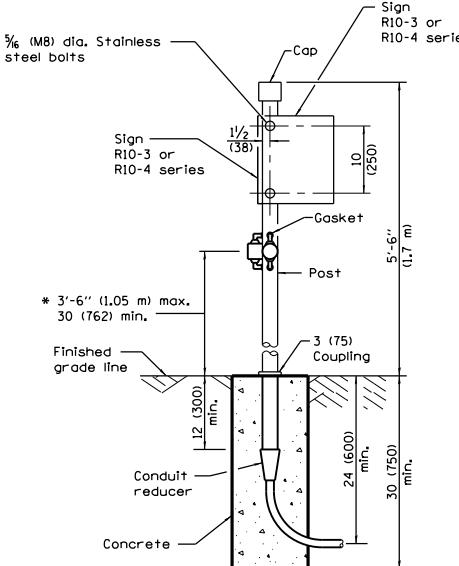
	Illinois Department of Transportation
APPROVED	January 1, 2009
ENGINEER OF OPERATIONS	<i>[Signature]</i>
APPROVED	January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT	<i>[Signature]</i>

IS-1-4-96

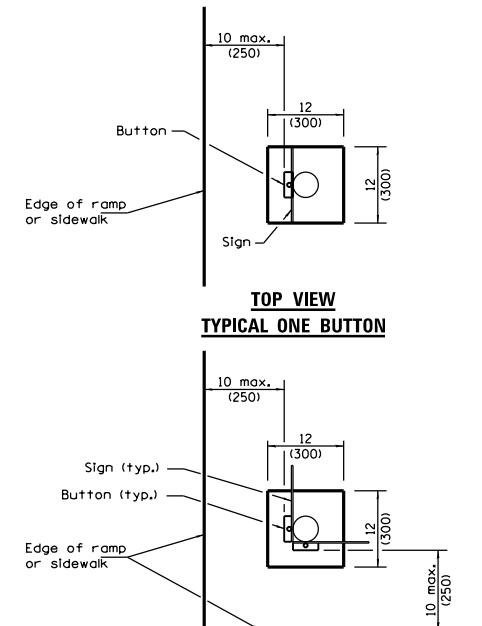
DATE	REVISIONS	TRAFFIC SIGNAL GROUNDING & BONDING
1-1-09	Switched units to English (metric).	
1-1-07	Revised terminology.	STANDARD 873001-02



PEDESTRIAN ONE PUSH BUTTON POST



PEDESTRIAN TWO PUSH BUTTON POST



TOP VIEW
TYPICAL ONE BUTTON

TOP VIEW
TYPICAL TWO BUTTONS

* 36 (914) preferred

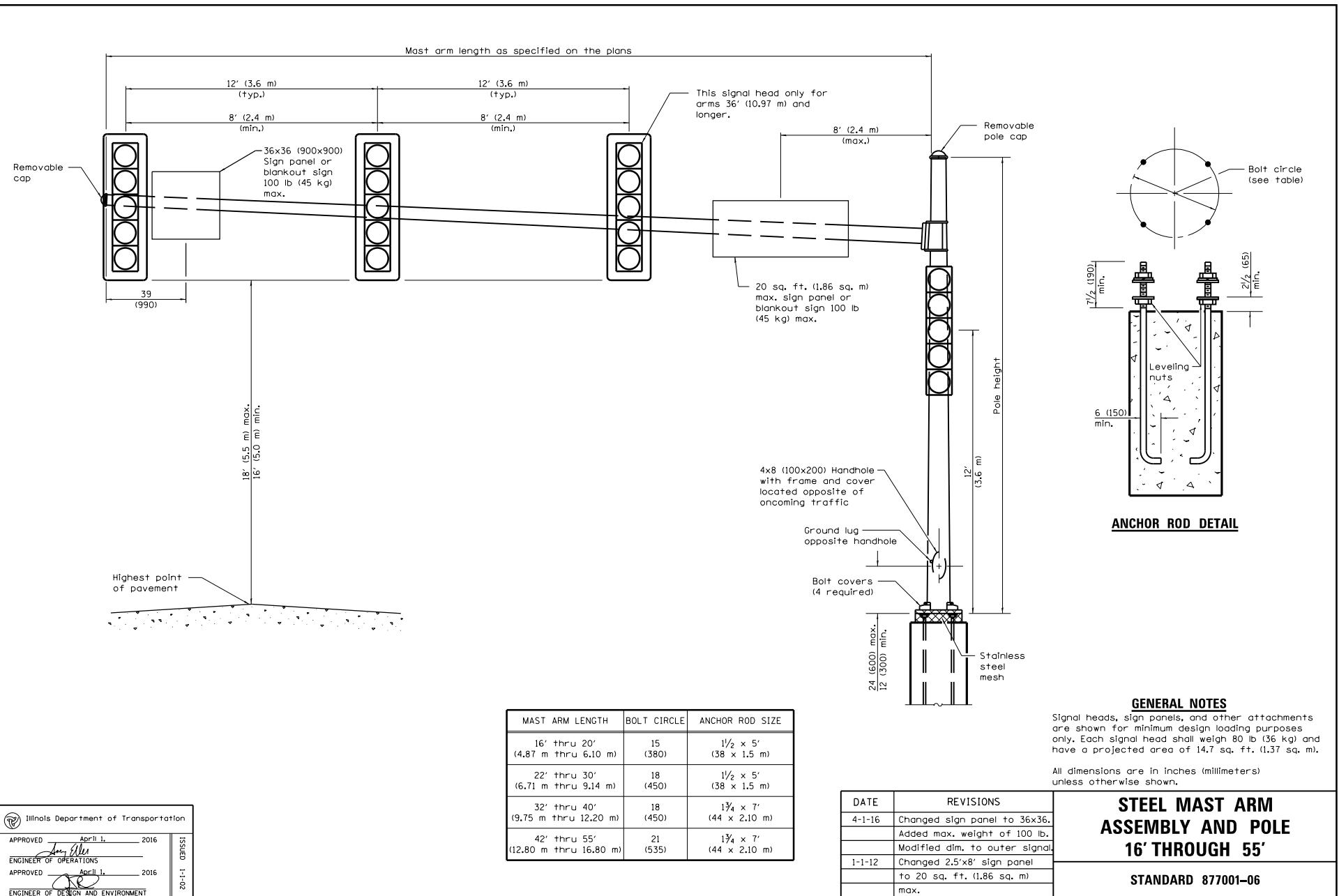
All dimensions are in inches (millimeters) unless otherwise shown.

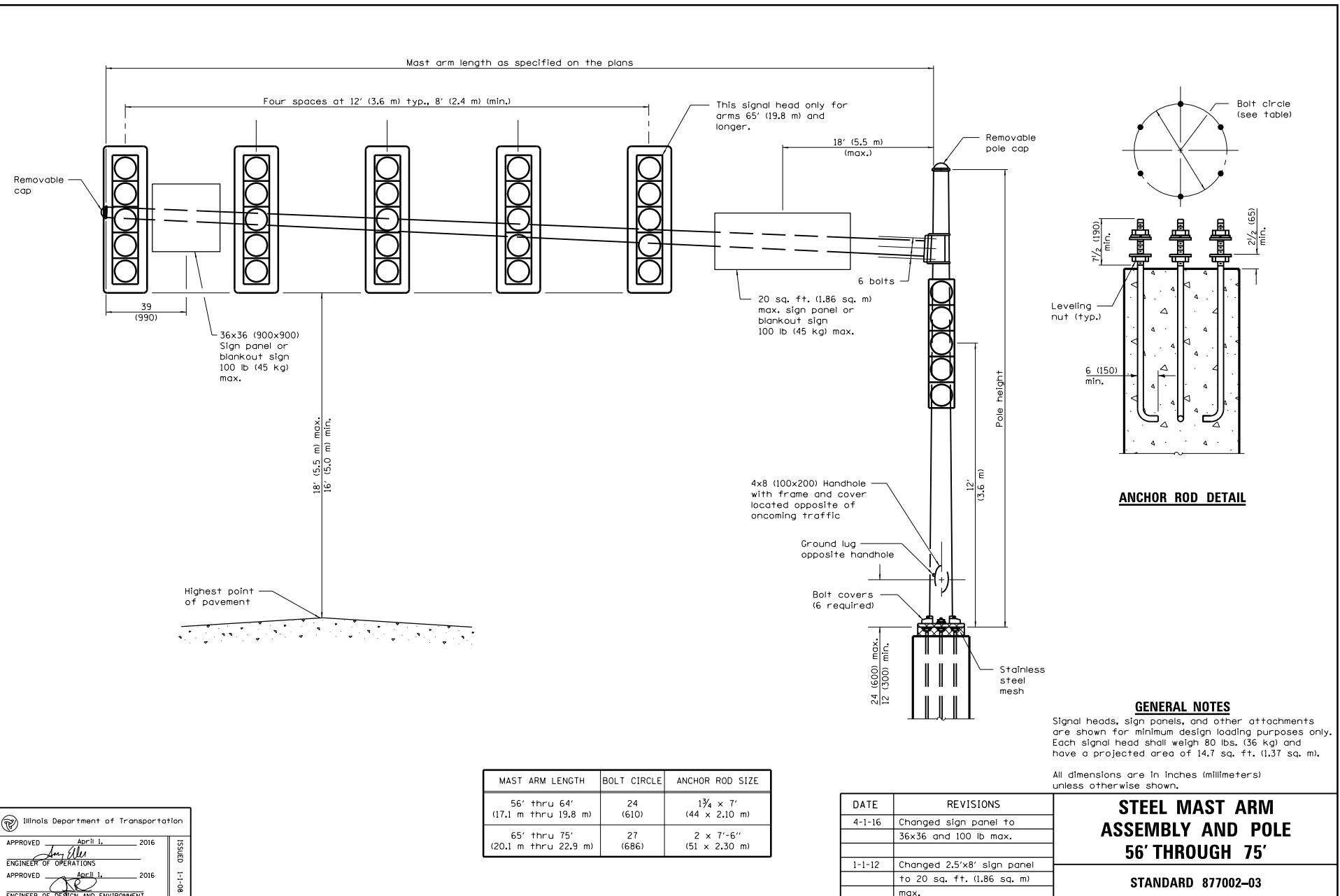
	Illinois Department of Transportation
APPROVED	April 1, 2016
ENGINEER OF OPERATIONS	
APPROVED	April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT	
	FD-350 1-1-07

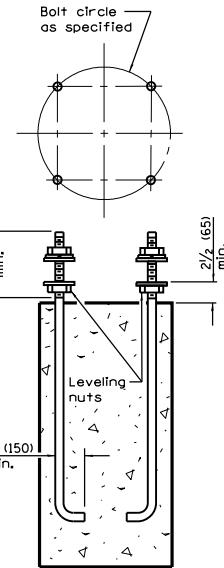
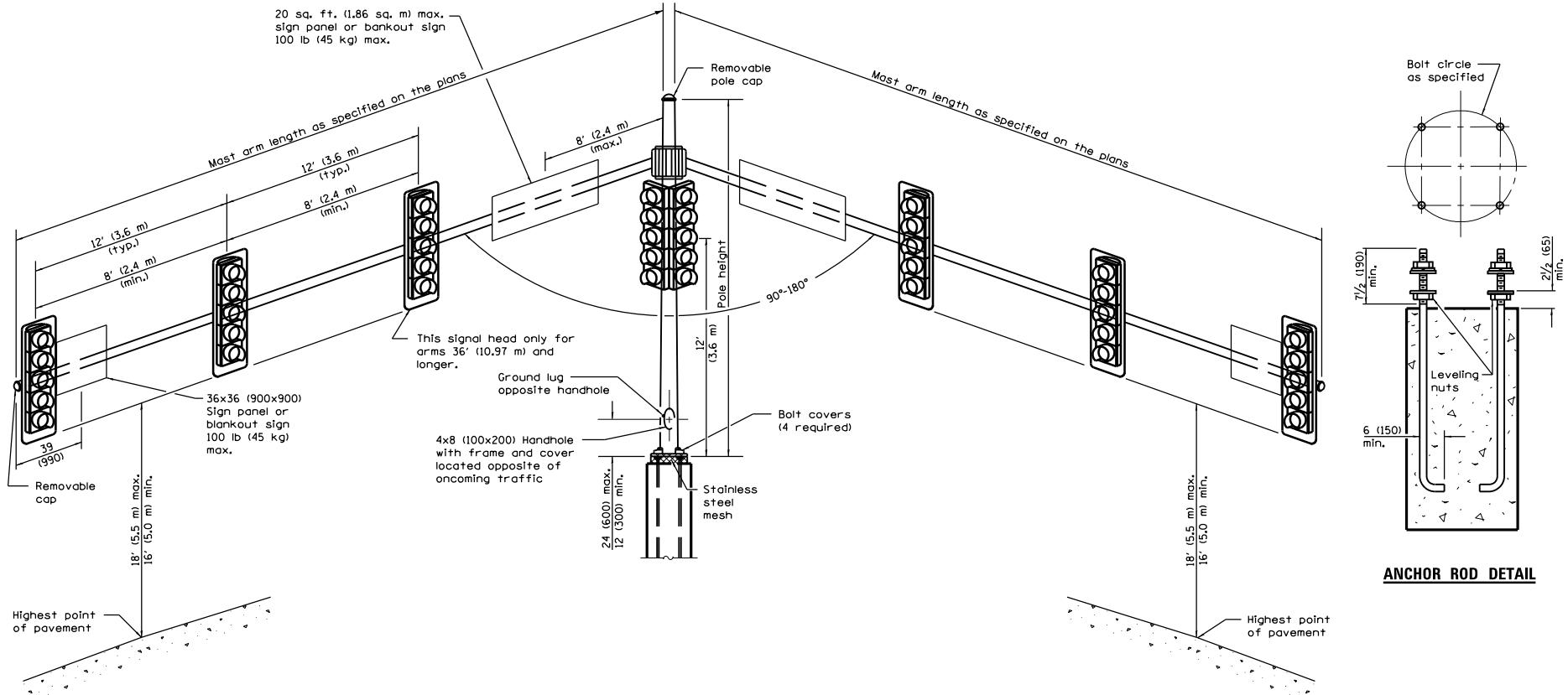
REVISIONS	
4-1-16	Revised sign numbers for consistency with current MUTCD.
1-1-14	Revised and added dimensions for PROWAG reach range requirements.

**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).

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

MAST ARM LENGTH	BOLT CIRCLE	ANCHOR ROD SIZE
16' thru 20' (4.87 m thru 6.10 m)	18 (450)	1 1/2 x 5' (38 x 1.5 m)
22' thru 30' (6.71 m thru 9.14 m)	18 (450)	1 3/4 x 7' (44 x 2.10 m)
32' thru 38' (9.75 m thru 11.60 m)	18 (450)	2 x 7'-6" (51 x 2.30 m)
40' thru 55' (12.20 m thru 16.80 m)	21 (535)	2 x 7'-6" (51 x 2.30 m)

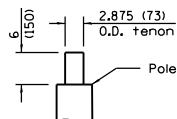
Illinois Department of Transportation
APPROVED <i>[Signature]</i> April 1, 2016
ENGINEER OF OPERATIONS
APPROVED <i>[Signature]</i> April 1, 2016
ENGINEER OF DESIGN AND ENVIRONMENT

20-1-1 QRS

DATE	REVISIONS
4-1-16	Changed sign panel to 36x36.
	Added max weight of 100 lb.
	Modified dim. to outer signal.
1-1-12	Changed 2.5'x8' sign panel to 20 sq. ft. (1.86 sq. m) max.

**STEEL MAST ARM
ASSEMBLY AND POLE
WITH DUAL MAST ARMS**

STANDARD 877006-05

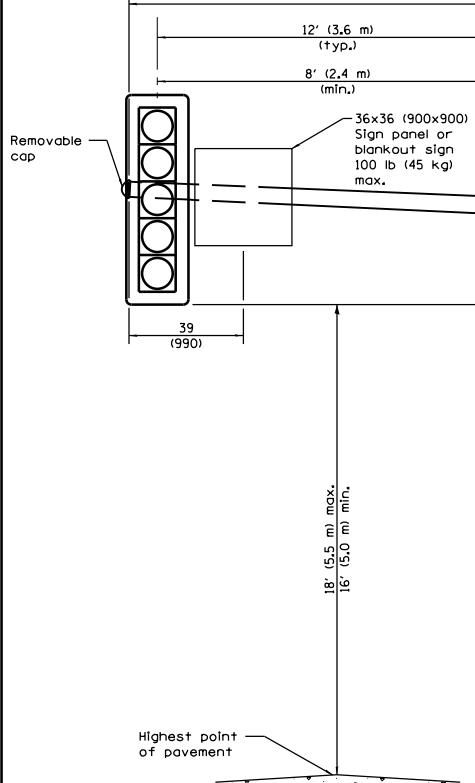


TENON TOP FOR VERTICAL MOUNTED LUMINAIRES

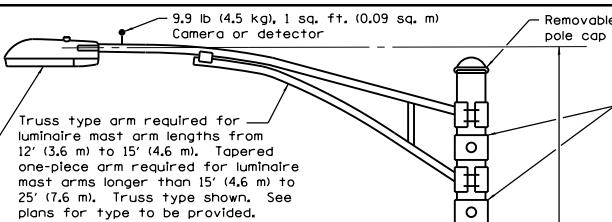
Note: The tenon top shall support a bullhorn fitting with two (twin) vertically mounted luminaires (clamp-mounted bullhorn assembly with removable pole cap acceptable). Each luminaire shall weigh 100 lb (45 kg) and have an effective projected (EPA) area of 3.85 sq. ft. (0.36 sq. m).

55 lb (25 kg), 1.6 sq. ft. (0.15 sq. m)
EPA Luminaire

Mast arm length as specified on the plans



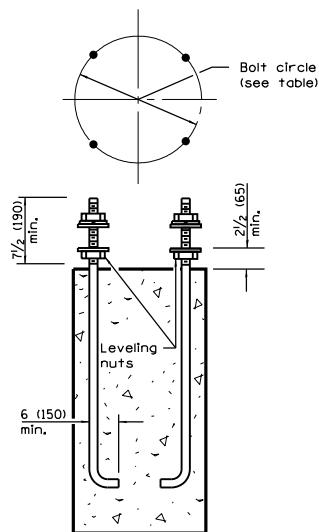
Highest point
of pavement



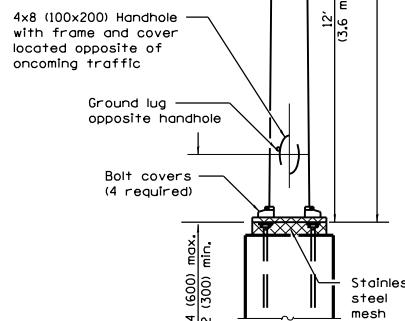
This signal head only for
arms 36' (10.97 m) and
longer.

8' (2.4 m)
(max.)
3x5 (75x125) Handhole
with frame and cover
20 sq. ft. (1.86 sq. m)
max. sign panel or
blankout sign 100 lb
(45 kg) max.

Provide second luminaire,
arm and brackets at 90°
when required. Luminaire
and arm not shown for
clarity.



ANCHOR ROD DETAIL



MAST ARM LENGTH	BOLT CIRCLE	ANCHOR ROD SIZE
16' thru 20' (4.87 m thru 6.10 m)	15 (380)	1 1/2 x 5' (38 x 1.5 m)
22' thru 30' (6.71 m thru 9.14 m)	18 (450)	1 1/2 x 5' (38 x 1.5 m)
32' thru 40' (9.75 m thru 12.20 m)	18 (450)	1 3/4 x 7' (44 x 2.10 m)
42' thru 55' (12.80 m thru 16.80 m)	21 (535)	1 3/4 x 7' (44 x 2.10 m)

	Illinois Department of Transportation
APPROVED	April 15, 2016
ENGINEER OF OPERATIONS	
APPROVED	April 15, 2016
ENGINEER OF DESIGN AND ENVIRONMENT	
20-1-1	20-1-1

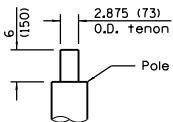
GENERAL NOTES

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 821101 for luminaire wiring diagram.

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

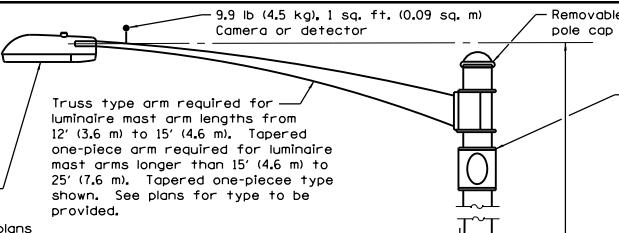
DATE	REVISIONS	STEEL COMB. MAST ARM ASSEMBLY AND POLE 16' THROUGH 55'
4-15-16	Added sec. lum. with arm and brackets when req. Added ref. to std. 821101.	
4-1-16	Modified luminaire arm note. Changed sign panel to 36x36 and 100 lb max.	
		STANDARD 877011-07



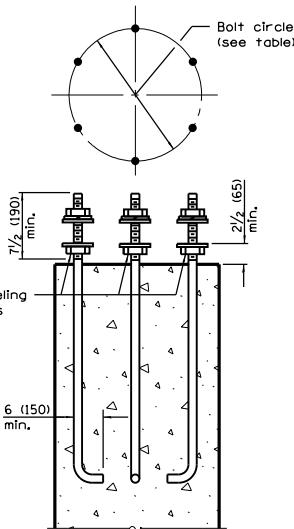
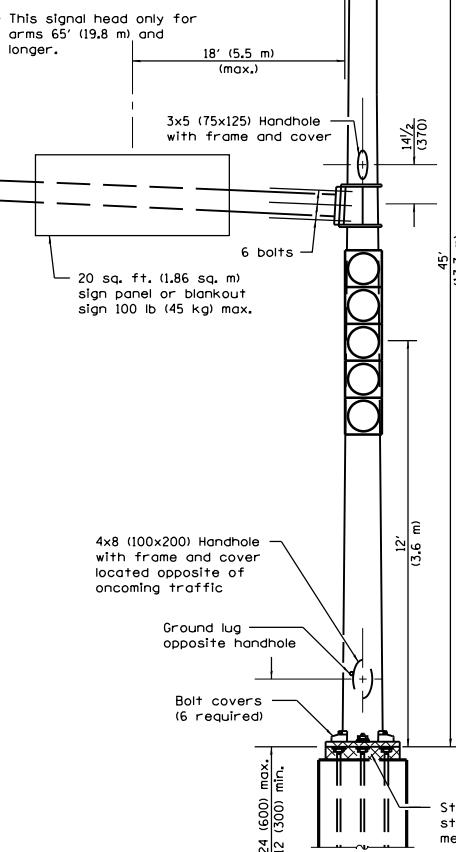
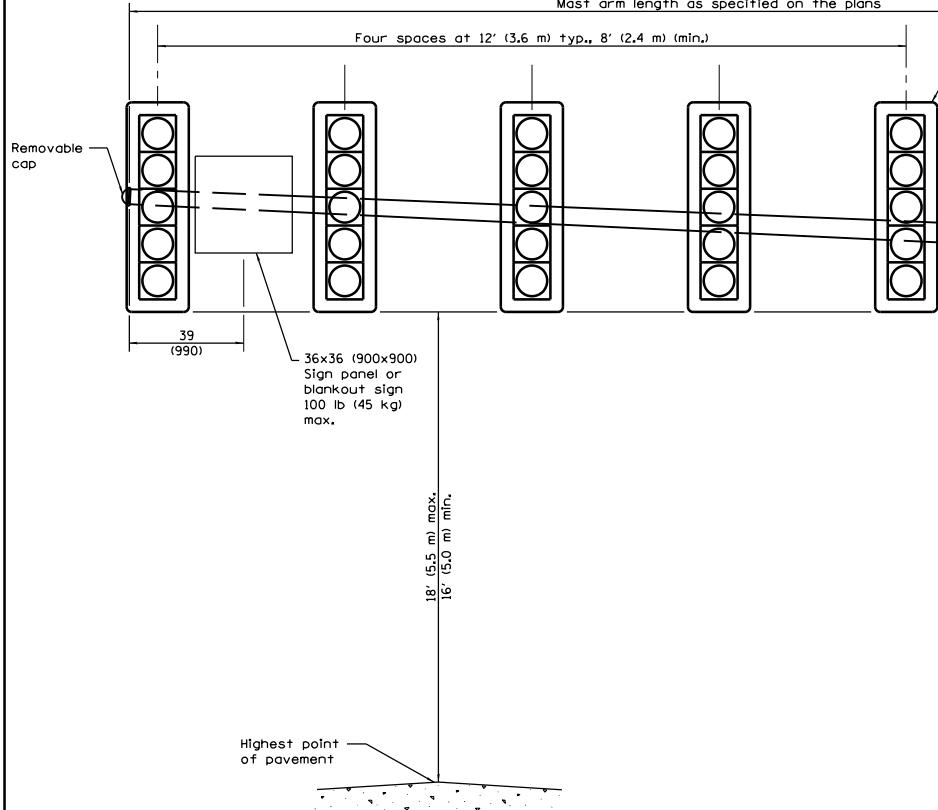
TENON TOP FOR VERTICAL MOUNTED LUMINAIRES

Note: The tenon top shall support a bullhorn fitting with two (twin) vertically mounted luminaires (clamp-mounted bullhorn assembly with removable pole cap acceptable). Each luminaire shall weigh 100 lb (45 kg) and have an effective projected (EPA) area of 3.85 sq. ft. (0.36 sq. m).

55 lb (25 kg), 1.6 sq. ft. (0.15 sq. m)
EPA Luminaire
Mast arm length as specified on the plans



Provide second luminaire, arm and bracket at 90° when required. Luminaire and arm not shown for clarity.



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).

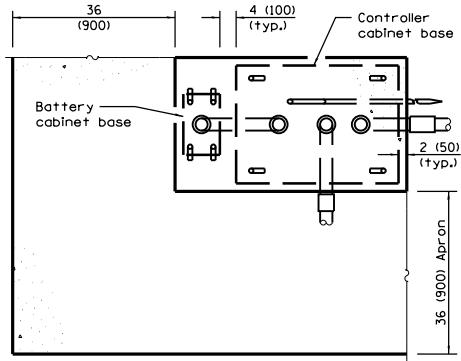
See standard 821101 for luminaire wiring diagram.

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

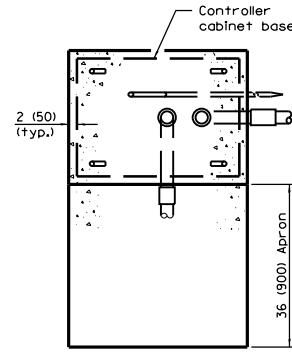
MAST ARM LENGTH	BOLT CIRCLE	ANCHOR ROD SIZE
56' thru 64' (17.1 m thru 19.8 m)	24 (610)	1 3/4 x 7' (44 x 2.10 m)
65' thru 75' (20.1 thru 22.9 m)	27 (686)	2 x 7'-6" (51 x 2.30 m)

	Illinois Department of Transportation
APPROVED	April 15, 2016
	Amy Eber
ENGINEER OF OPERATIONS	
APPROVED	April 15, 2016
	Marlene M. Bales
ENGINEER OF DESIGN AND ENVIRONMENT	
80-1-1	80-1-1

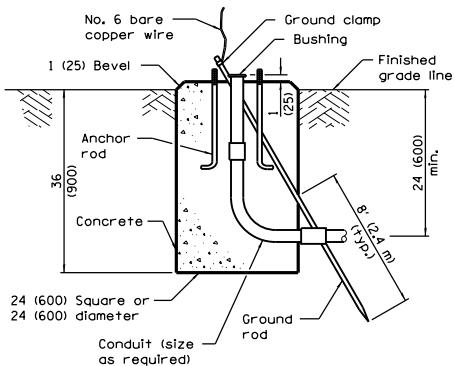
DATE	REVISIONS	STEEL COMB. MAST ARM ASSEMBLY AND POLE 56' THROUGH 75' STANDARD 877012-04
4-15-16	Added sec. lum. with arm and bracket when req.	
	Added ref. to std. 821101.	
4-1-16	Modified luminaire arm note.	
	Changed sign panel to 36x36 and 100 lb. max.	



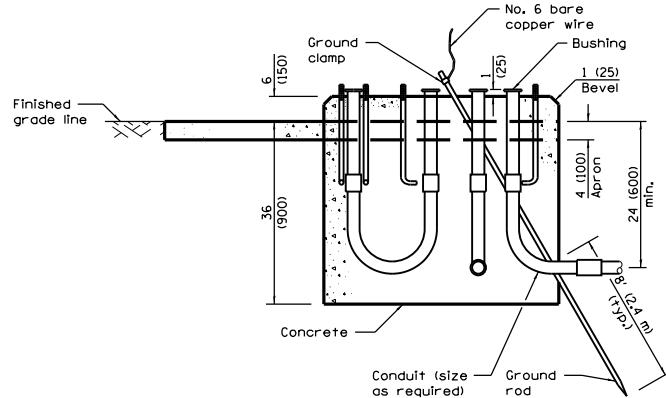
TOP VIEW



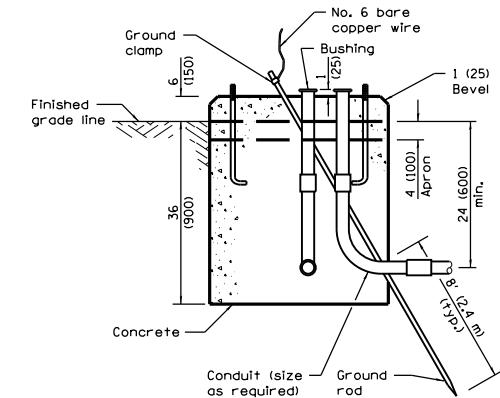
TOP VIEW



TYPE A



TYPE C
FOR GROUND MOUNTED
CONTROLLER CABINET
AND UPS BATTERY CABINET



TYPE D
FOR GROUND MOUNTED
CONTROLLER CABINET

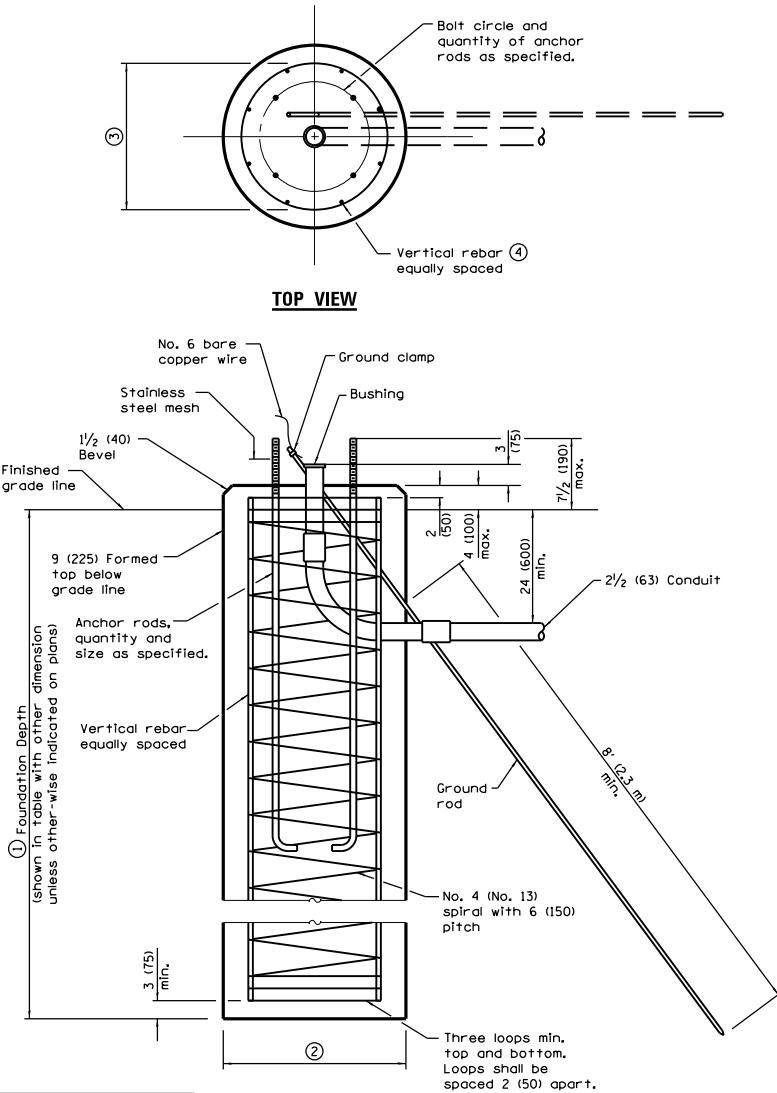
All dimensions are in inches (millimeters)
unless otherwise shown.

	Illinois Department of Transportation
APPROVED	January 1, 2015
ENGINEER OF OPERATIONS	
APPROVED	January 1, 2015
ENGINEER OF DESIGN AND ENVIRONMENT	
20-1-1	03553

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



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)
Greater than or equal to 50' (15.2 m) and up to 55' (16.8 m)	15'-0" (4.6 m)	36 (900)	30 (750)	12	7 (22)
Greater than or equal to 56' (16.8 m) and less than 65' (19.8 m)	21'-0" (6.4 m)	42 (1060)	36 (900)	16	8 (25)
Greater than or equal to 65' (19.8 m) and up to 75' (22.9 m)	25'-0" (7.6 m)	42 (1060)	36 (900)	16	8 (25)

- 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.

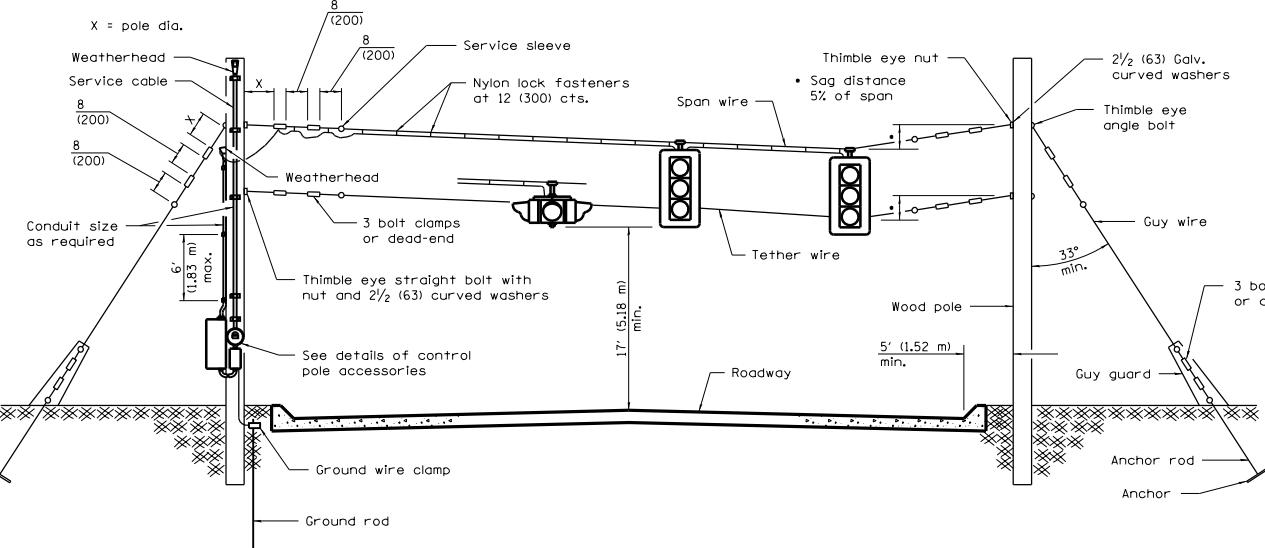
These foundation depths are for sites which have cohesive soils (clayey silt, sandy clay, etc.) along the length of the shaft, with an average Unconfined Compressive Strength (σ_u) > 1.0 tsf (100 kpa). This strength shall be verified by boring data prior to construction or with testing by the Engineer during foundation drilling. The Bureau of Bridges & Structures should be contacted for a revised design if other conditions are encountered.

	Illinois Department of Transportation
APPROVED	January 1, 2015
ENGINEER OF OPERATIONS	
APPROVED	January 1, 2015
ENGINEER OF DESIGN AND ENVIRONMENT	
20-1-1	Goss

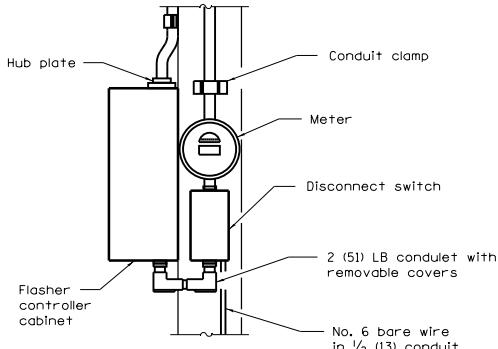
CONCRETE FOUNDATION DETAILS

(Sheet 2 of 2)

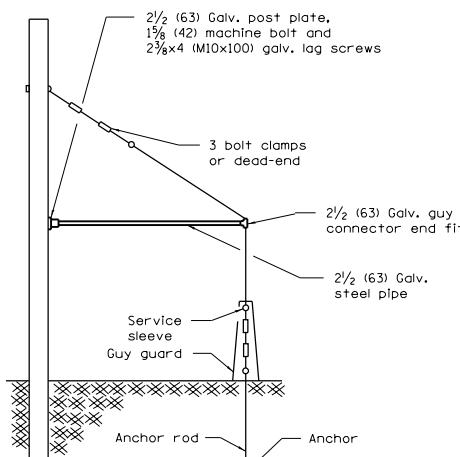
STANDARD 878001-10



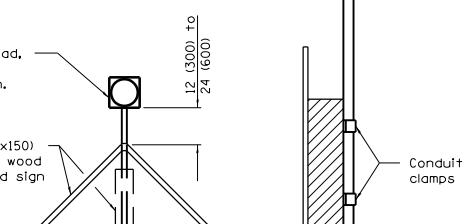
SPAN WIRE MOUNTED SIGNALS AND FLASHING BEACON



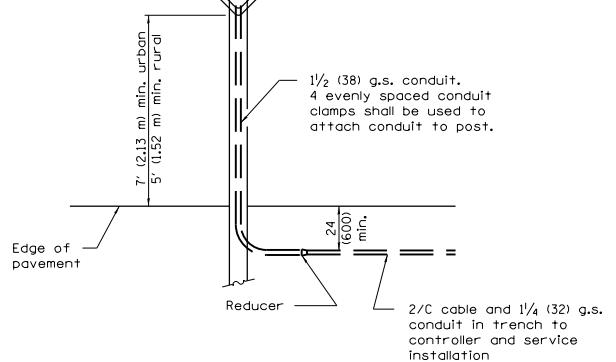
CONTROL POLE DETAIL



SIDEWALK GUY DETAIL



MOUNTING DETAIL



POST MOUNTED FLASHING BEACON

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

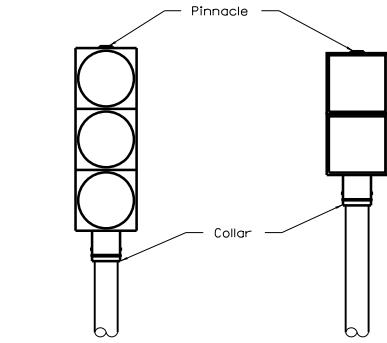
DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-02	Renum, Standard 840001.

SPAN WIRE MOUNTED SIGNALS AND FLASHING BEACON INSTALLATION

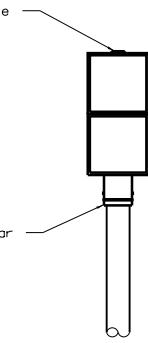
STANDARD 880001-01

	Illinois Department of Transportation
APPROVED	January 1, 2009
ENGINEER OF OPERATIONS	
APPROVED	January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT	

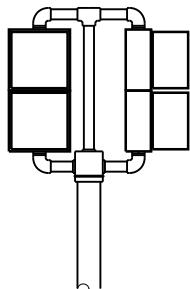
20-1-1



POST MOUNTED
TRAFFIC SIGNAL HEAD



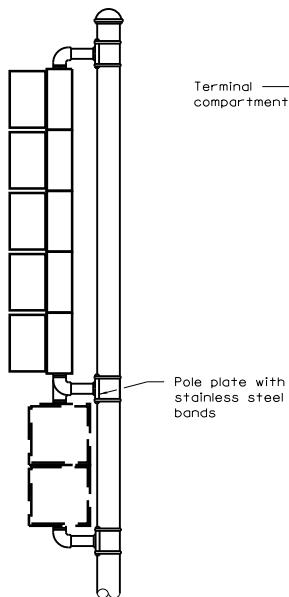
POST MOUNTED
PEDESTRIAN SIGNAL HEAD



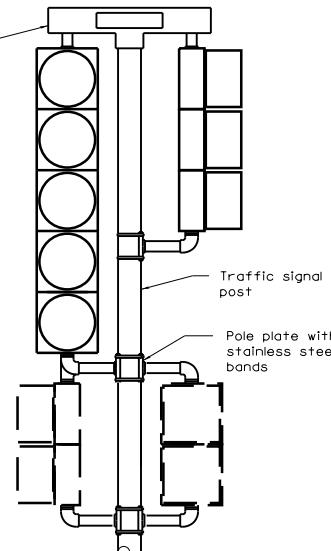
POST MOUNTED
PEDESTRIAN SIGNAL HEAD

ONE WAY

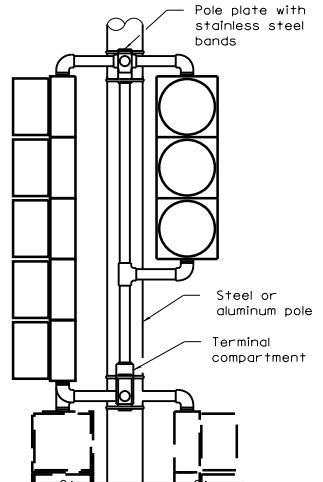
TWO WAY



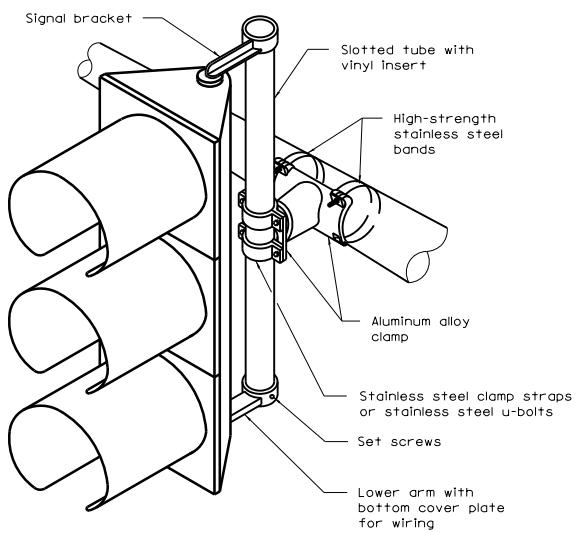
BRACKET MOUNTED
TRAFFIC SIGNAL HEAD



BRACKET MOUNTED
TRAFFIC SIGNAL HEAD



BRACKET MOUNTED
TRAFFIC SIGNAL HEAD

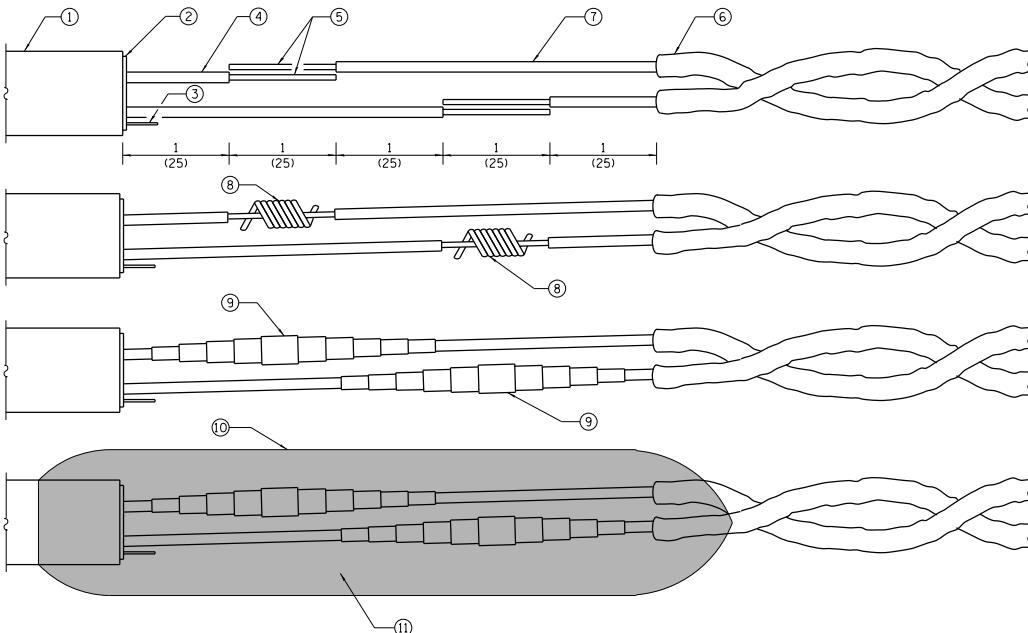
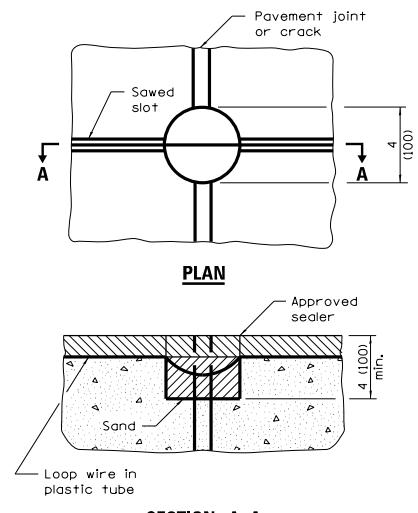
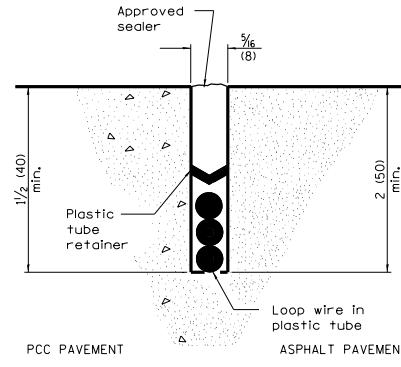
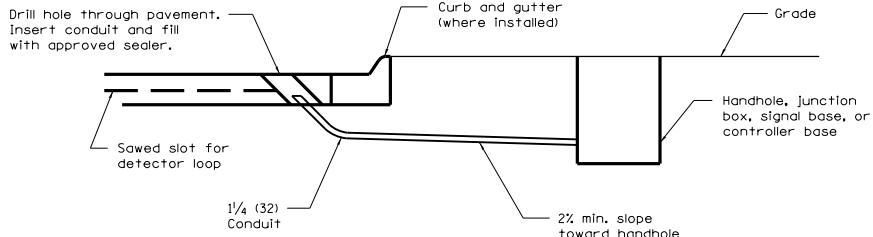


STEEL MAST ARM MOUNTING

	Illinois Department of Transportation
APPROVED	January 1, 2009
ENGINEER OF OPERATIONS	
APPROVED	January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT	

ZS-1-1

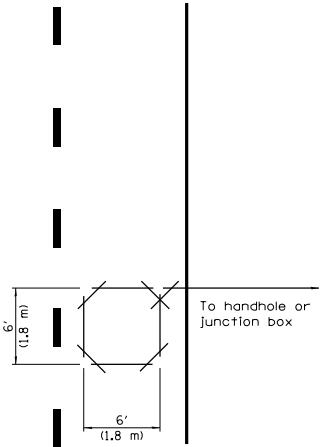
DATE	REVISIONS	TRAFFIC SIGNAL MOUNTING DETAILS
1-1-09	Omitted note regarding units of length.	
1-1-02	Renum. Standard 840006.	STANDARD 880006-01



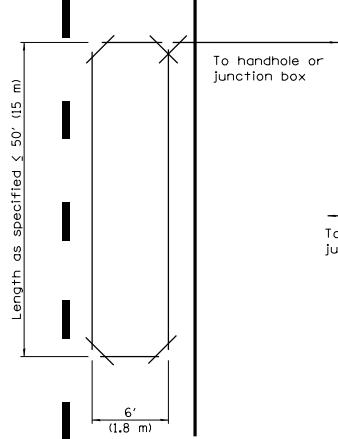
	Illinois Department of Transportation
APPROVED	January 1, 2009
	Engineer of Operations
APPROVED	January 1, 2009
	Engineer of Design and Environment
1-1-09	

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

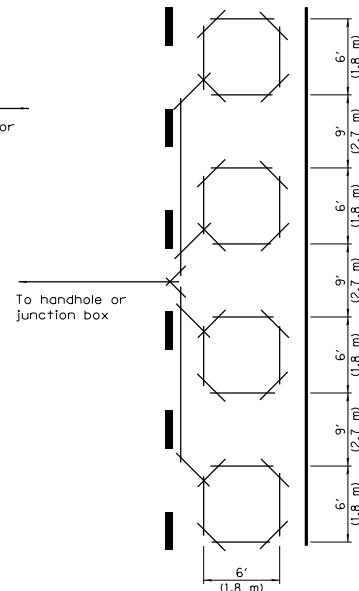
DATE	REVISIONS	DETECTOR LOOP INSTALLATIONS
1-1-09	Switched units to English (metric)	
1-1-02	Renum. Standard 846001.	STANDARD 886001-01



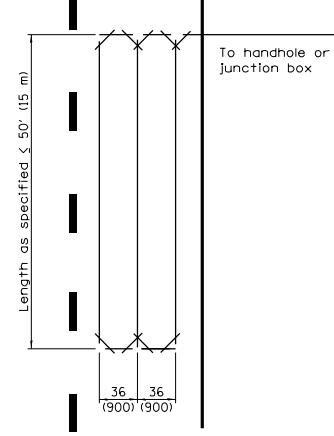
FOR POINT DETECTION
SHORT LOOP



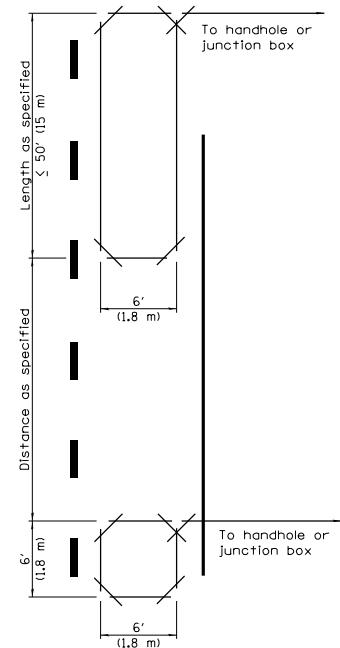
FOR PRESENCE DETECTION
LONG LOOP



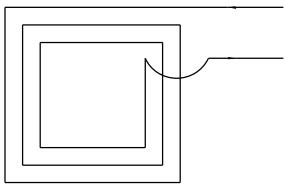
FOR PRESENCE DETECTION
MULTIPLE LOOP IN SERIES



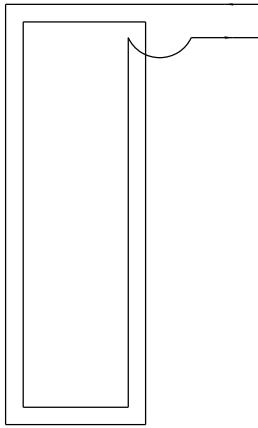
FOR PRESENCE DETECTION
QUADRUPOLE LOOP



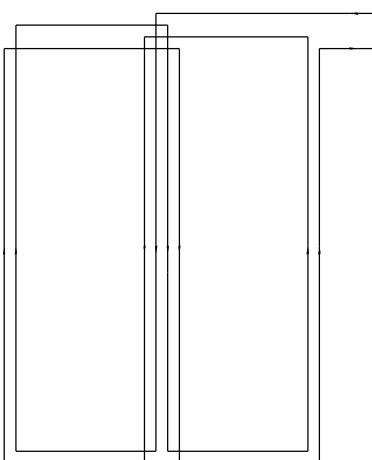
FOR EXTENDED-CALL DETECTION



SHORT LOOP



LONG LOOP



QUADRUPOLE LOOP

WIRING DIAGRAM

	Illinois Department of Transportation
APPROVED	January 1, 2009
ENGINEER OF OPERATIONS	
APPROVED	January 1, 2009
ENGINEER OF DESIGN AND ENVIRONMENT	
20-1-1 QRS	

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

DATE	REVISIONS	TYPICAL LAYOUTS FOR DETECTION LOOPS
1-1-09	Switched units to English (metric)	
1-1-02	Renum. Standard 846006.	STANDARD 886006-01

April 15, 2016



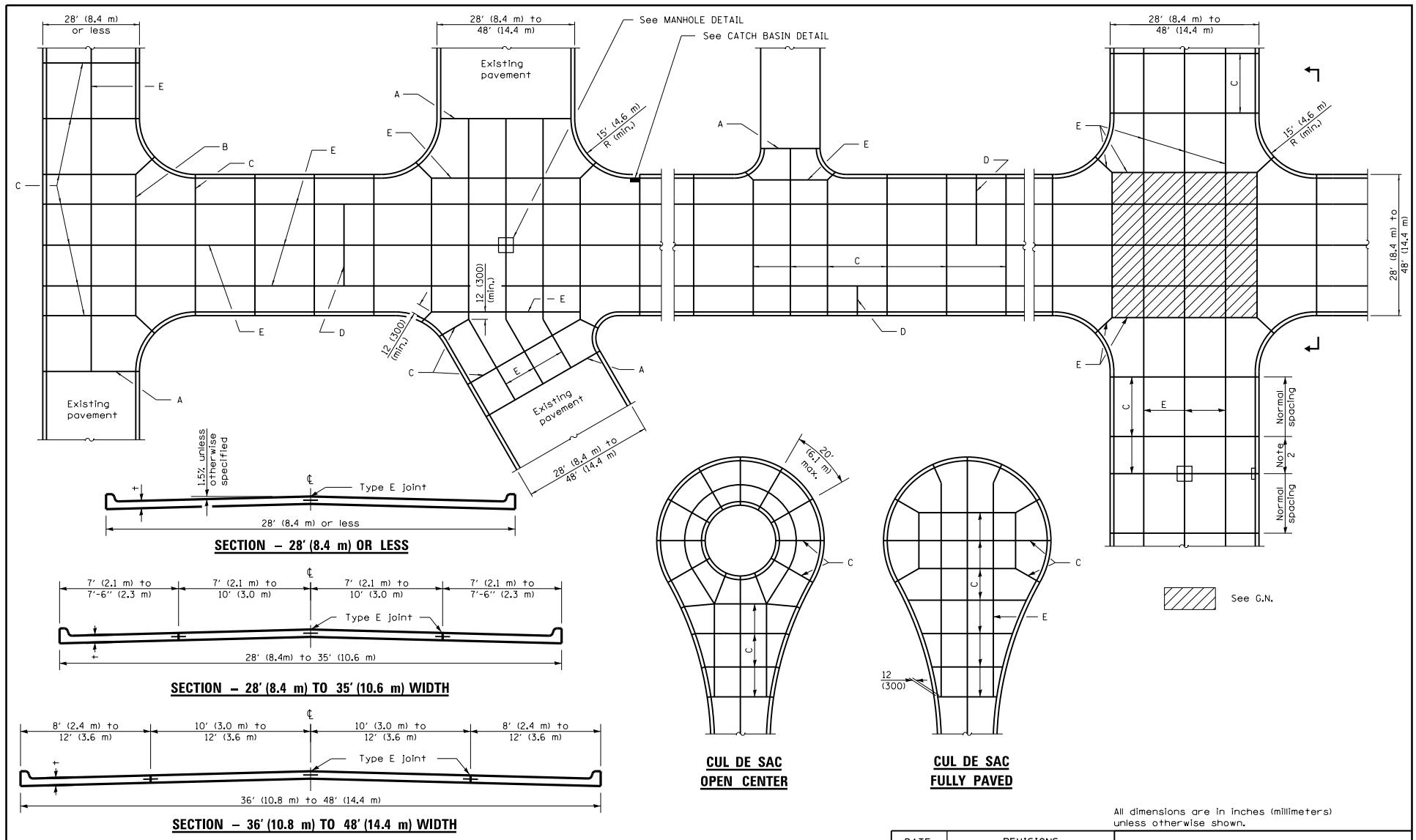
**Illinois Department
of Transportation**

Standards by Division

DIVISION BLR LOCAL ROADS

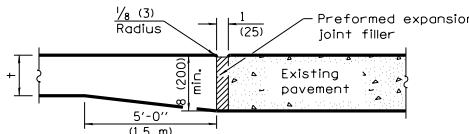
STD. NO. TITLE

BLR 10-6	PCC Pavement Special
BLR 14-11	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

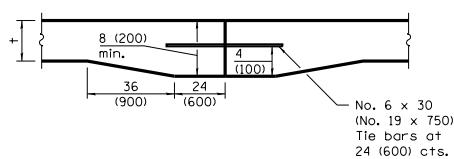


All dimensions are in inches (millimeters) unless otherwise shown.

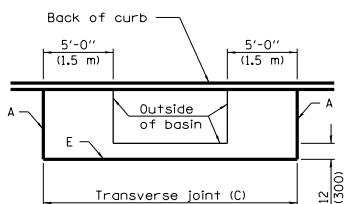
DATE		REVISIONS	PCC PAVEMENT SPECIAL (NONREINFORCED)
1-1-09		Switched units to English (metric).	
8-1-05		Corrected manhole and catch basin notes on Sheet 1.	
			(Sheet 1 of 2)
			STANDARD B.L.R. 10-6



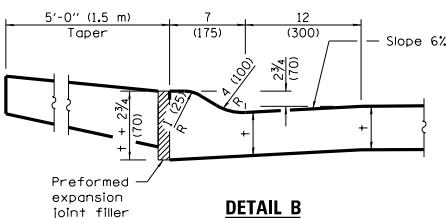
**TYPE A
EXPANSION JOINT**



**TYPE D
TIED TRANSVERSE CONSTRUCTION JOINT**

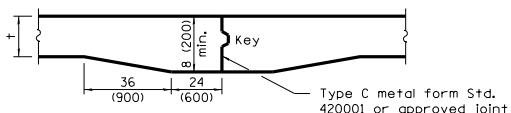


CATCH BASIN DETAIL

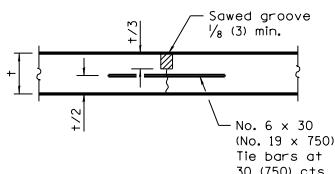


DETAIL B

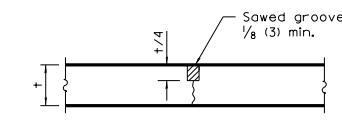
Illinois Department of Transportation
APPROVED January 1, 2009
Charles J. Ingall
ENGINEER OF LOCAL ROADS AND STREETS
APPROVED January 1, 2009
Lee S. Ybarra
ENGINEER OF DESIGN AND ENVIRONMENT



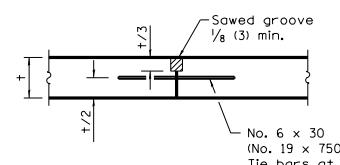
**TYPE B
KEYED JOINT**



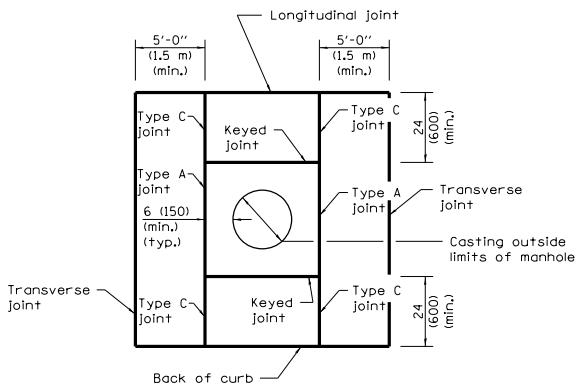
**TYPE E
SAWED LONGITUDINAL JOINT**



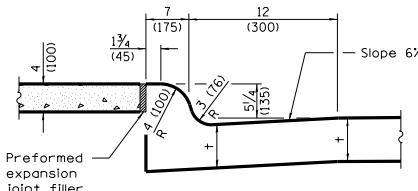
**TYPE C
SAWED TRANSVERSE JOINT**



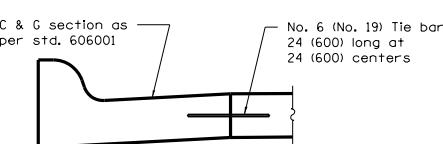
**TYPE E
LONGITUDINAL CONSTRUCTION JOINT**



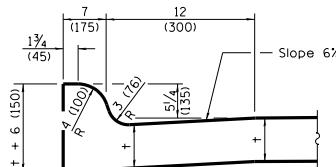
MANHOLE DETAIL
Showing Joint types



DETAIL A



COMB. CURB & GUTTER DETAIL
Alt. const. see G.N.



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.

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 $t/4$ for transverse joints and $t/3$ 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.

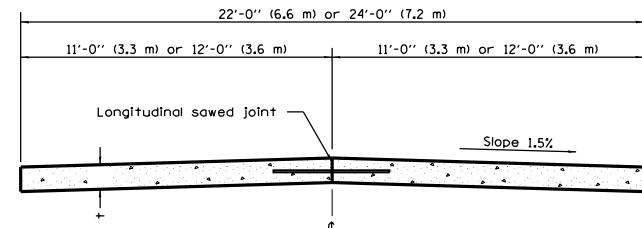
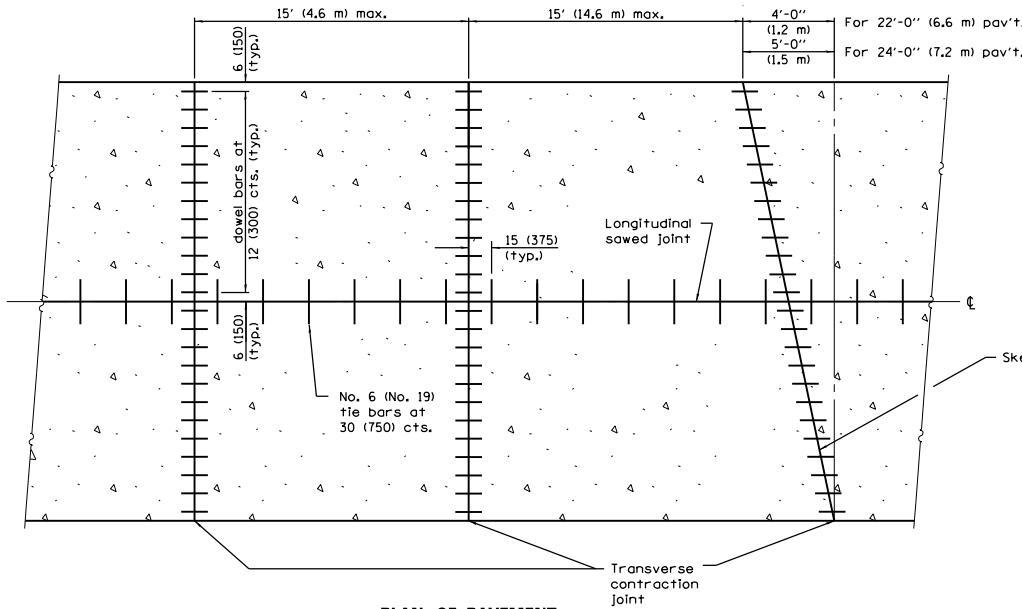
Transverse joint spacing shall not exceed 15 ft. (4.6 m).

Construct TYPE D tied transverse construction joint when construction joint does not fall at a TYPE C sawed transverse joint.

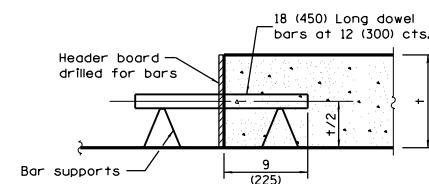
PCC PAVEMENT SPECIAL (NONREINFORCED)

(Sheet 2 of 2)

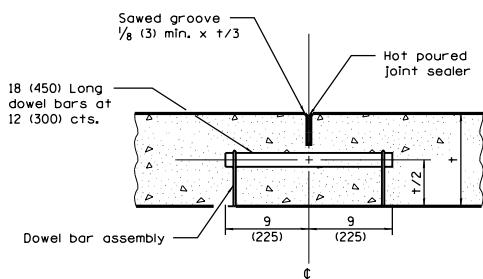
STANDARD B.L.R. 10-6



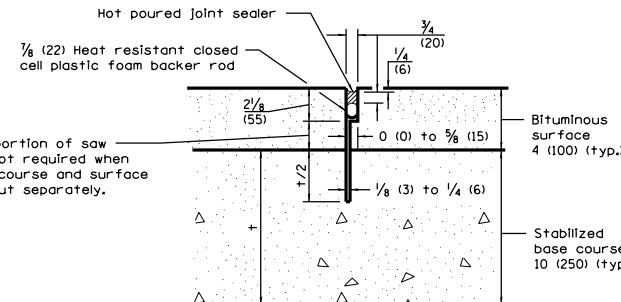
CROSS SECTION OF PAVEMENT



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.

Skewed joints shall be used when specified by Special Provisions.

Dowel bars are only required for pavements having a design traffic factor of 3.0 or greater.

t = Pavement thickness (See Typical Cross Section)

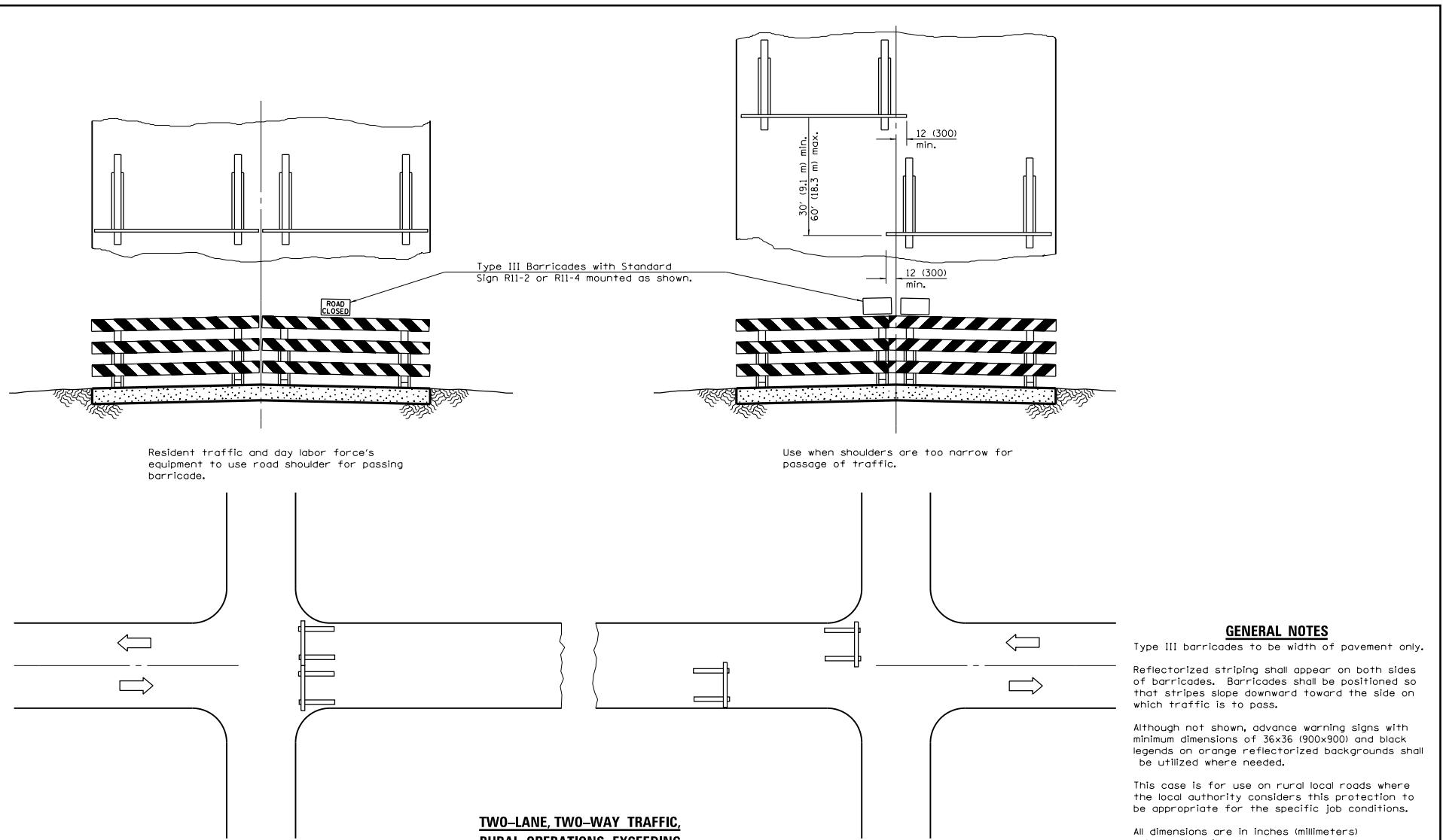
All dimensions are in inches (millimeters) unless otherwise shown.

Illinois Department of Transportation
APPROVED January 1, 2015
<i>[Signature]</i>
ENGINEER OF LOCAL ROADS AND STREETS
APPROVED January 1, 2015
<i>[Signature]</i>
ENGINEER OF DESIGN AND ENVIRONMENT

PAVEMENT THICKNESS	DOWEL BAR DIAMETER
8 (200) or greater	1 1/2 (38)
7 (175) thru 7.99 (199)	1 1/4 (32)
Less than 7 (175)	1 (25)

DATE	REVISIONS
1-1-15	Added general note regarding dowel bars.
1-1-09	Switched units to English (metric).

PORTLAND CEMENT CONCRETE PAVEMENT (NONREINFORCED)
STANDARD B.L.R. 14-11



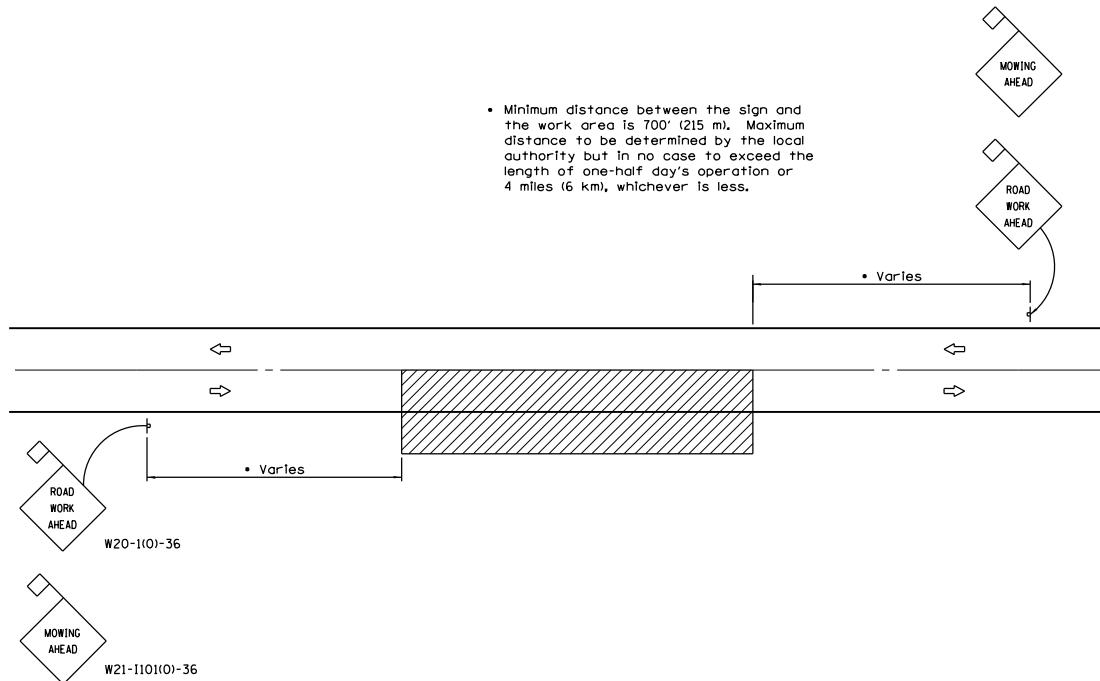
	Illinois Department of Transportation
APPROVED	January 1, 2009
<i>Charles O. Ingwall</i>	Signature
ENGINEER OF LOCAL ROADS AND STREETS	1-1-98
APPROVED	January 1, 2009
<i>Lee S. Thor</i>	Signature
ENGINEER OF DESIGN AND ENVIRONMENT	1-1-97

DATE	REVISIONS
1-1-09	Switched units to English (metric).
1-1-98	Rev. "RII-1" to "RII-4".
	Rev. 4th General Note.

**TRAFFIC CONTROL DEVICES –
DAY LABOR CONSTRUCTION**

STANDARD B.L.R. 17-4

- 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.

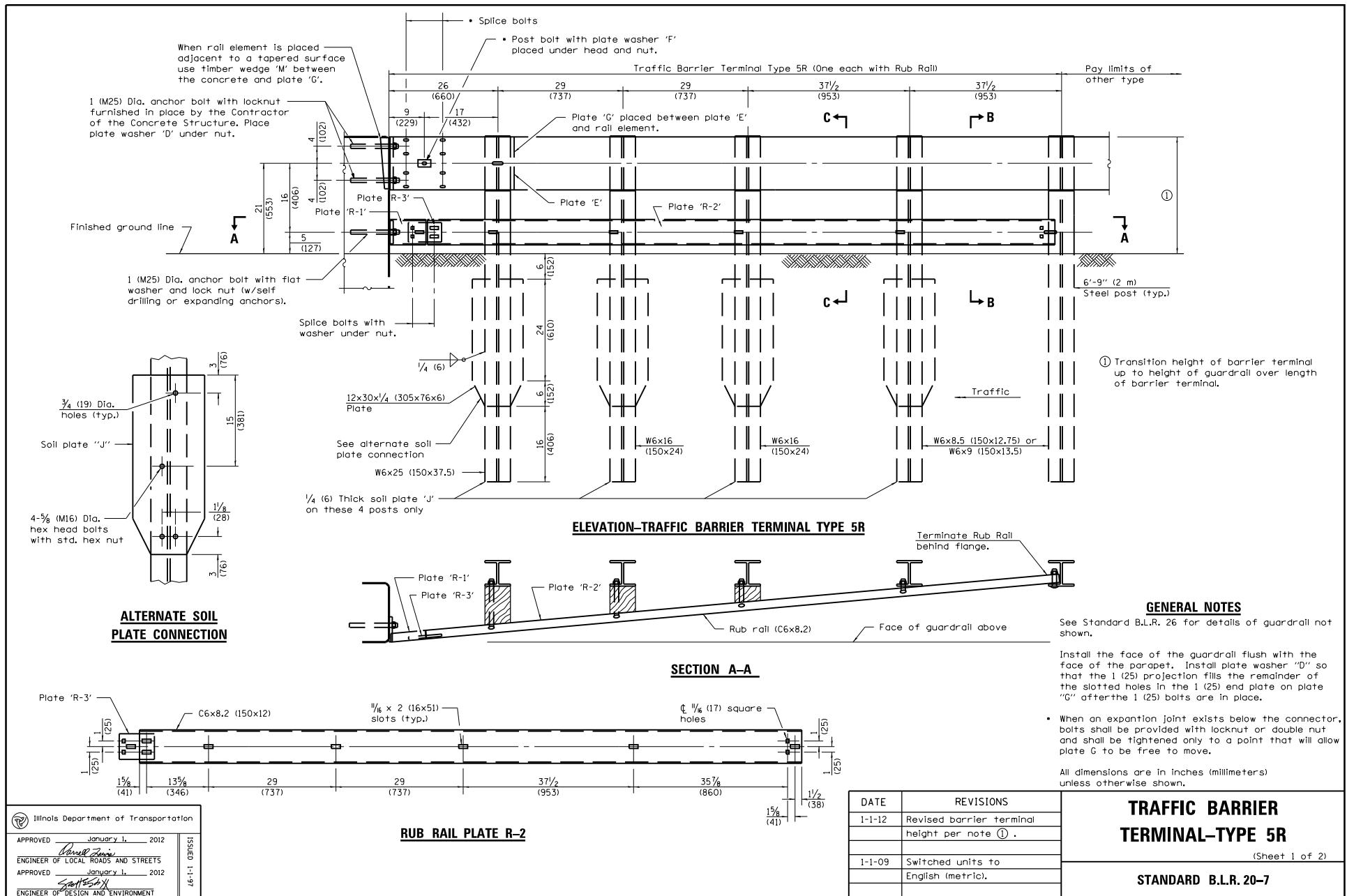
This case is for use on rural local roads where the local authority considers this protection to be appropriate for the specific job conditions.

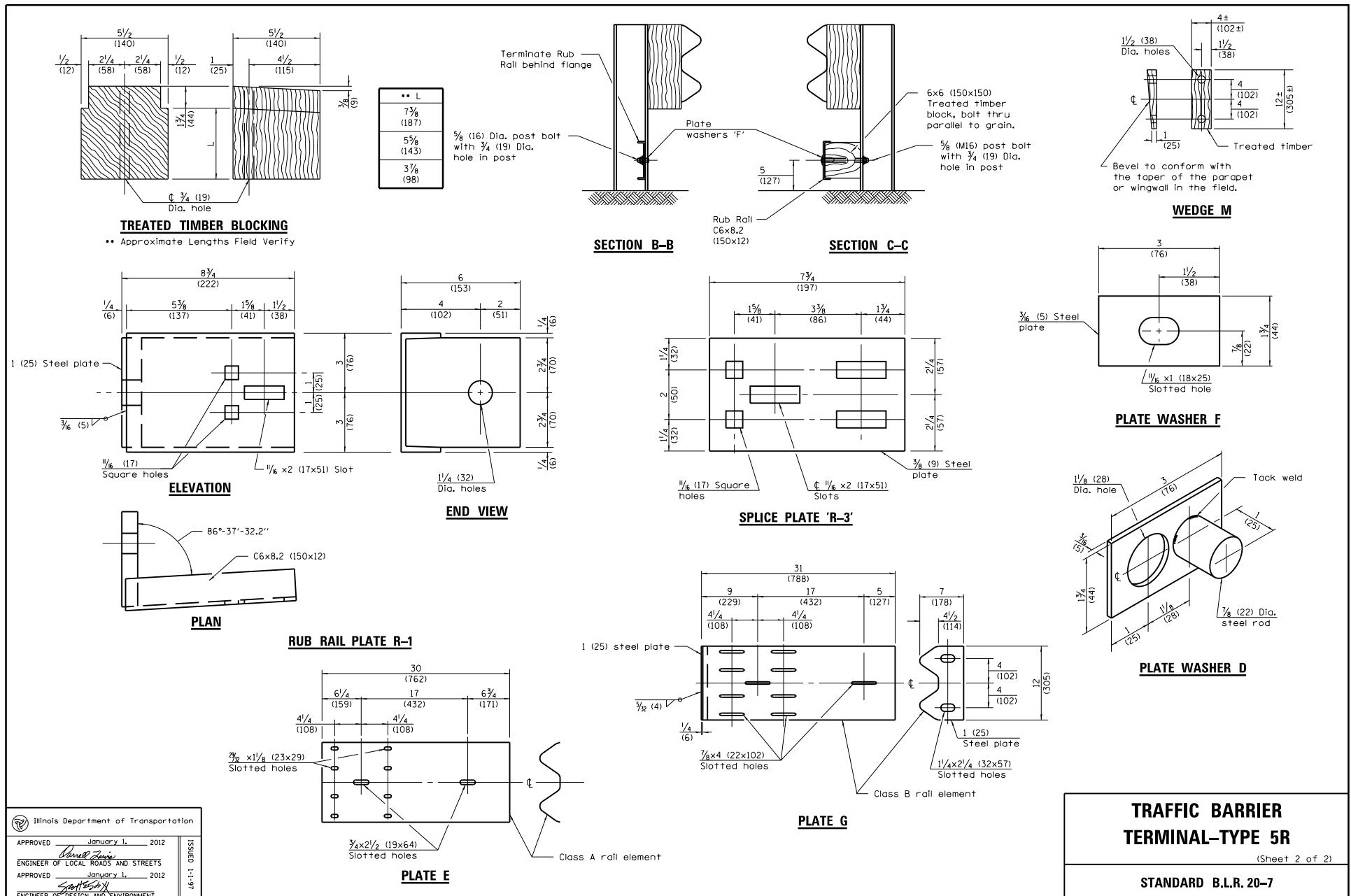
All dimensions are in inches (millimeters) unless otherwise shown.

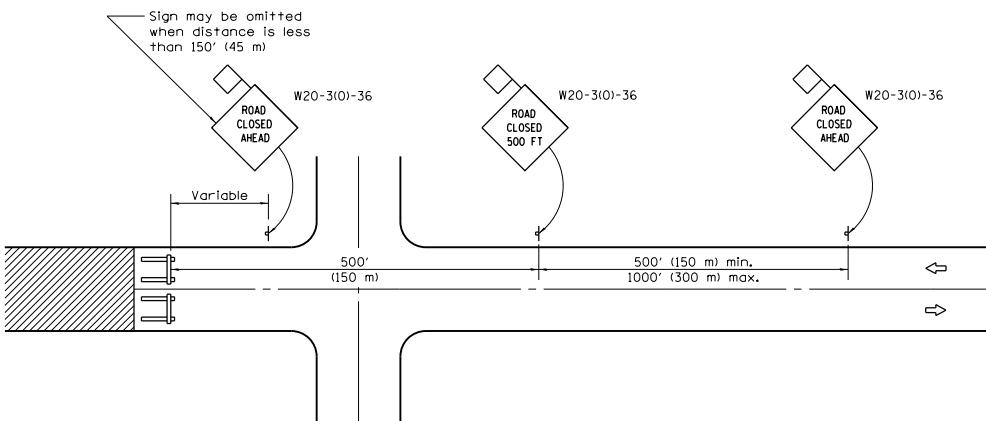
	Illinois Department of Transportation
APPROVED	January 1, 2015
	Dennis K. Keen
ENGINEER OF LOCAL ROADS AND STREETS	
APPROVED	January 1, 2015
	Dennis K. Keen
ENGINEER OF DESIGN AND ENVIRONMENT	

DATE	REVISIONS
I-1-15	Corrected RWA sign number.
I-1-09	Switched units to
	English (metric). Moved
	one General Note.

**TRAFFIC CONTROL DEVICES—
DAY LABOR MAINTENANCE**
STANDARD B.L.R. 18-6

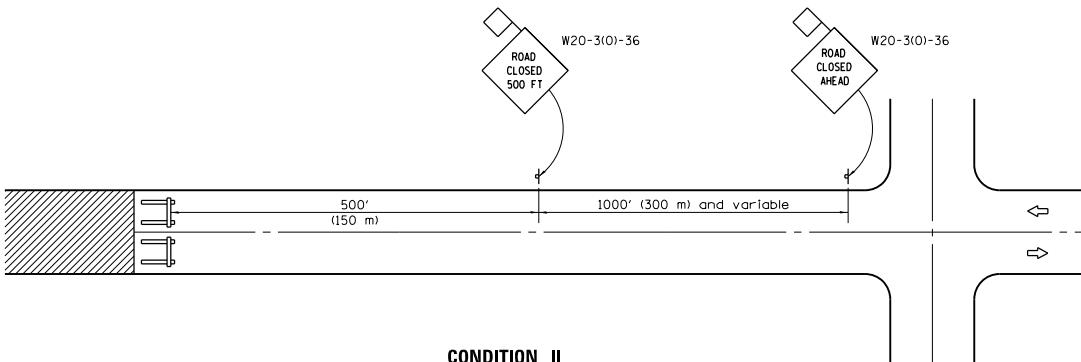






CONDITION I

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)

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.

SYMBOLS



Work area



Type III Barricade



Sign with 18x18 (450x450) min. orange flag attached

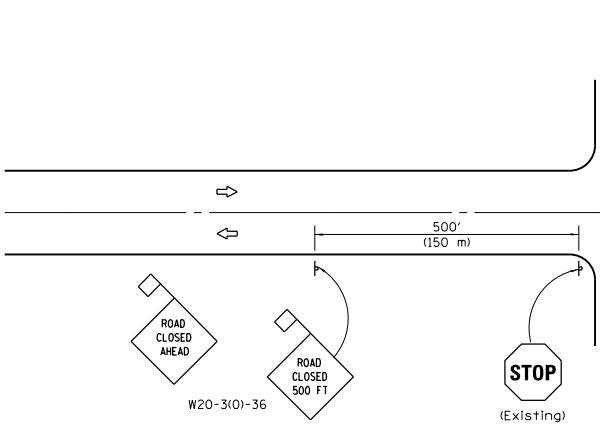
DATE	REVISIONS
I-1-12	Omitted two notes from GENERAL NOTES.
I-1-09	Switched units to English (metric).

TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES FOR CONSTRUCTION ON RURAL LOCAL HIGHWAYS

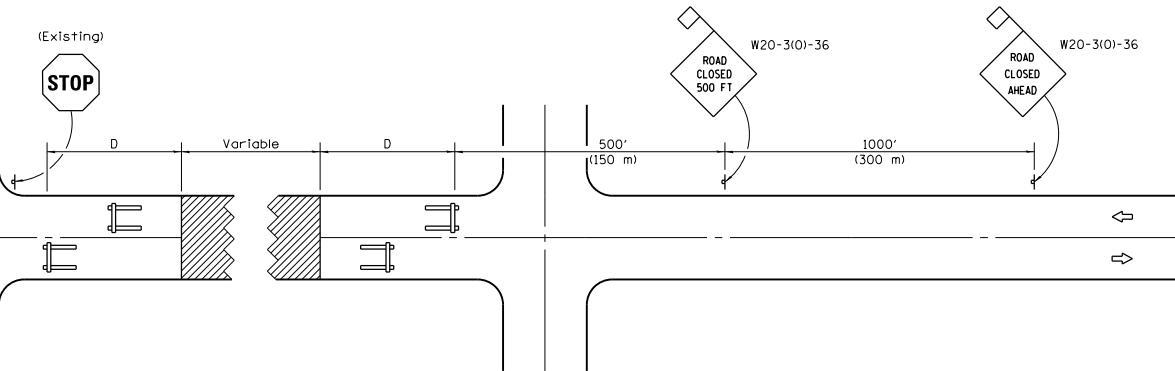
STANDARD B.L.R. 21-9

	Illinois Department of Transportation
APPROVED	January 1, 2012
ENGINEER OF LOCAL ROADS AND STREETS	
APPROVED	January 1, 2012
ENGINEER OF DESIGN AND ENVIRONMENT	
	ISSUED 1-1-97

CONDITION I
APPROACH TRAFFIC STOPPED



CONDITION II
APPROACH TRAFFIC DOES NOT STOP



SYMBOLS

- Work area
- Type III Barricade
- Sign with 18x18 (450x450) min. 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.

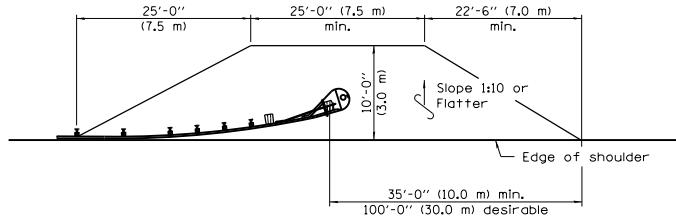
All dimensions are in inches (millimeters) unless otherwise shown.

	Illinois Department of Transportation
APPROVED	January 1, 2012
	Daniel J. Lewis
ENGINEER OF LOCAL ROADS AND STREETS	IS-1197
APPROVED	January 1, 2012
	Scott S. Saylor
ENGINEER OF DESIGN AND ENVIRONMENT	IS-1197

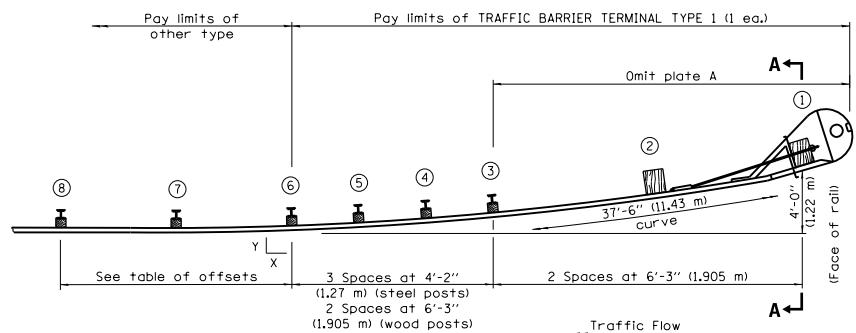
DATE	REVISIONS	TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES FOR CONSTRUCTION ON RURAL LOCAL HIGHWAYS (TWO-LANE TWO WAY RURAL TRAFFIC) (ROAD CLOSED TO THRU TRAFFIC)
1-1-12	Omitted two notes from GENERAL NOTES.	
1-1-09	Revised General Notes and switched units to English (metric).	

STANDARD B.L.R. 22-7

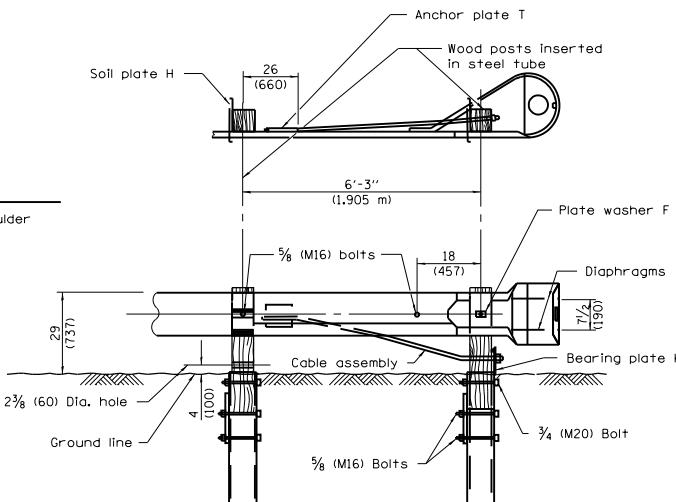
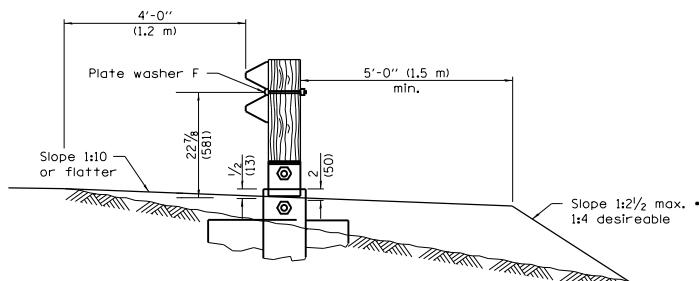
OFFSETS TO FACE OF RAIL		
Post	X ft (m)	Y ft (m)
(1)	37.22 (11.345)	4.0 (1.22)
(2)	31.09 (9.475)	2.79 (0.850)
(3)	24.92 (7.595)	1.79 (0.545)
(4)	20.79 (6.335)	1.25 (0.380)
(5)	16.64 (5.070)	0.80 (0.245)
(6)	12.49 (3.805)	0.45 (0.135)
(7)	6.25 (1.905)	0.11 (0.035)
(8)	0.00 (0.00)	0.00 (0.00)



SHOULDER WIDENING TRANSITION



PLAN



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.

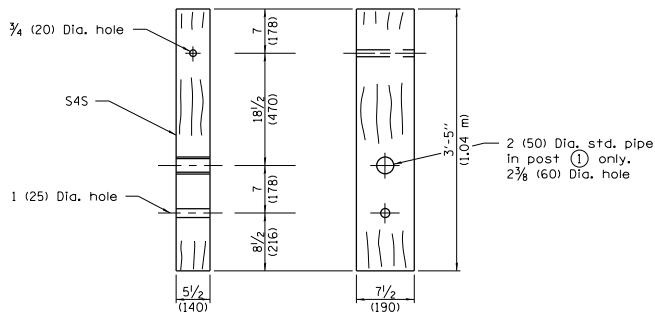
When this terminal is used with Standard 630001, the guardrail shall transition down to the height of the terminal prior to post 8.

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

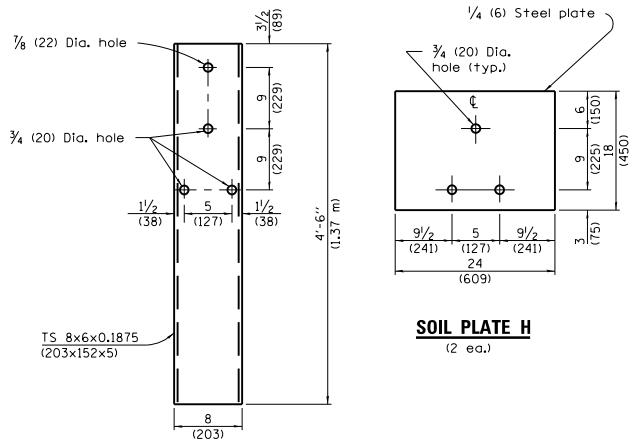
All dimensions are in inches (millimeters) unless otherwise shown.

DATE	REVISIONS	TRAFFIC BARRIER TERMINAL TYPE 1 (Sheet 1 of 2)
1-1-12	Revised barrier terminal	
	height and wood	
	breakaway post.	
1-1-09	Switched units to	
	English (metric).	

STANDARD B.L.R. 23-4



WOOD BREAKAWAY POST
(2 ea.)



STEEL TUBE
(2 ea.)

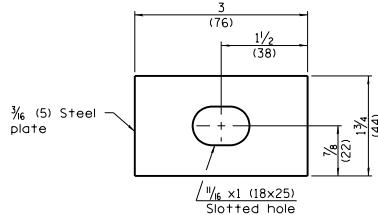
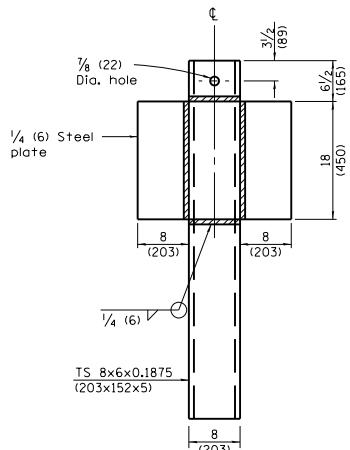
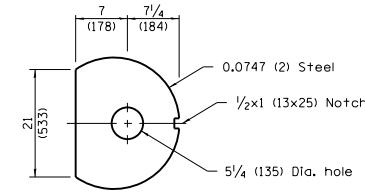


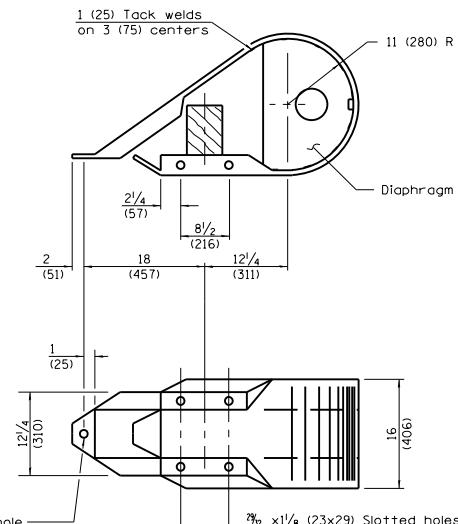
PLATE WASHER F
(1 ea.)



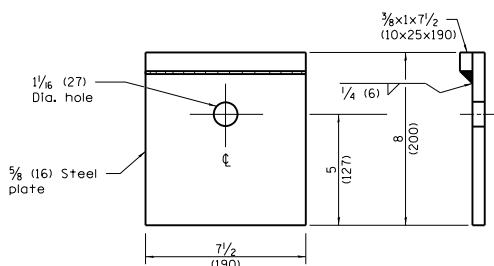
**ALTERNATE SOIL
PLATE CONNECTION**



DIAPHRAGM
(2 ea.)



NOSE
(1 ea.)



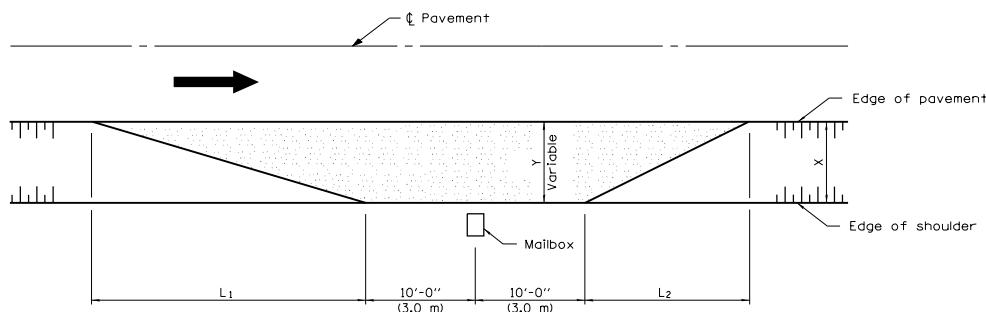
BEARING PLATE K
(1 ea.)

	Illinois Department of Transportation
APPROVED	January 1, 2012
	Senni
ENGINEER OF LOCAL ROADS AND STREETS	SD-1 CLASS
APPROVED	January 1, 2012
	Schreyer
ENGINEER OF DESIGN AND ENVIRONMENT	SD-1 CLASS

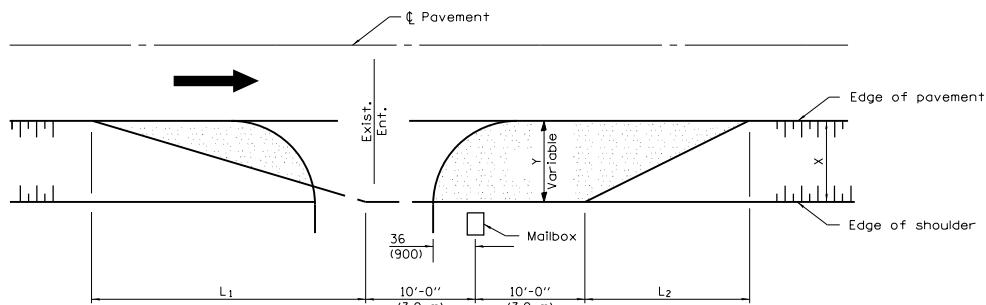
TRAFFIC BARRIER TERMINAL TYPE 1

(Sheet 2 of 2)

STANDARD B.L.R. 23-4



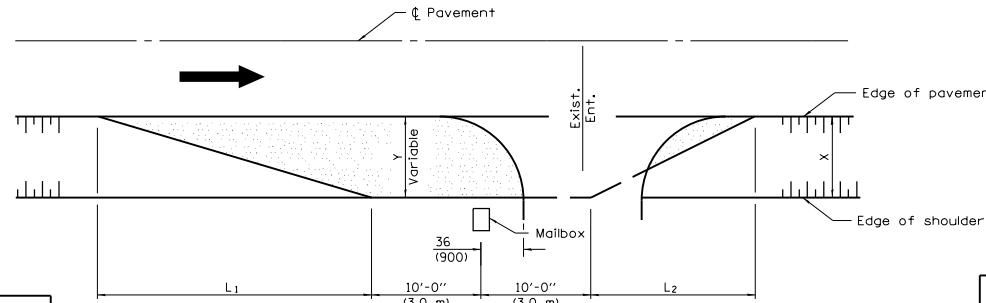
TYPICAL APPLICATION



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)

MAILBOX ON FAR SIDE OF ENTRANCE

Note:
Dimensions for Township and District Roads may vary from the above dimensions.



MAILBOX ON NEAR SIDE OF ENTRANCE

GENERAL NOTES

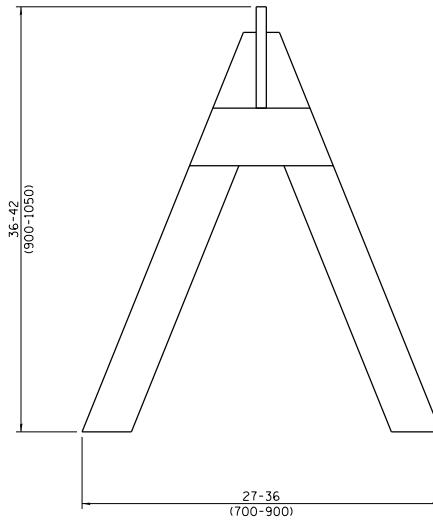
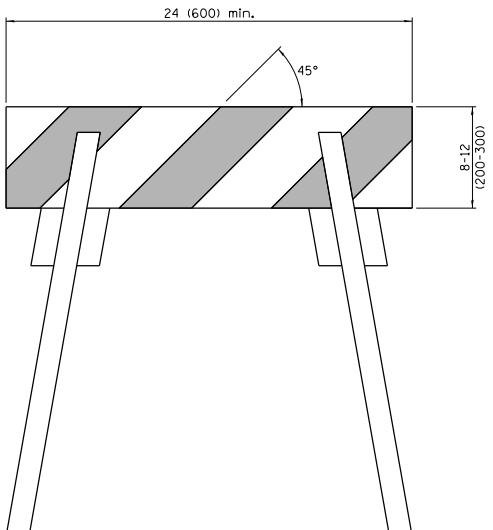
Mailboxes shall be mounted such that the face of the mailbox is 6 (150) to 12 (300) and the post a minimum of 24 (600) from the edge of the turnout surfacing.

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

DATE	REVISIONS	MAILBOX TURNOUT FOR LOCAL ROADS
1-1-09	Switched units to English (metric).	
I-1-99	Add width of shoulder X.	STANDARD B.L.R. 24-2

	Illinois Department of Transportation
APPROVED	January 1, 2009
	Charles O. Ingall
ENGINEER OF LOCAL ROADS AND STREETS	
APPROVED	January 1, 2009
	Lee S. Khan
ENGINEER OF DESIGN AND ENVIRONMENT	

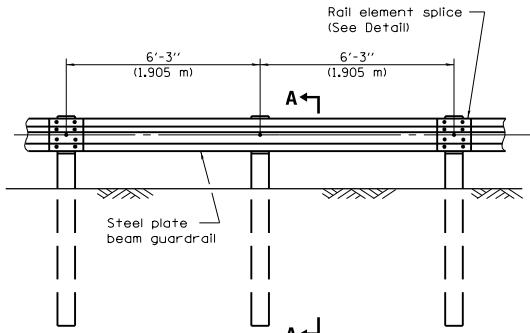
1-1-97



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

	Illinois Department of Transportation
APPROVED	January 1, 2009
<i>Charles J. Ingwall</i>	Engineer of LOCAL ROADS AND STREETS
APPROVED	January 1, 2009
<i>Lee S. Yar</i>	Engineer of DESIGN AND ENVIRONMENT
1-1-03	ISSUED

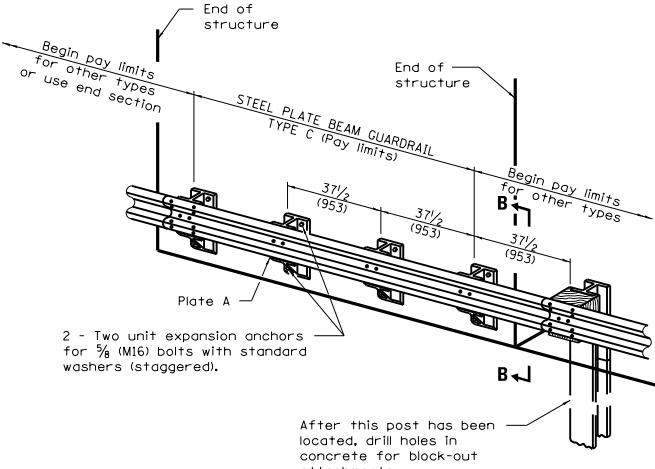
DATE	REVISIONS	TYPE 1A BARRICADE FOR NON-NHS ROUTES
1-1-09	Switched units to English (metric).	
1-1-03	New standard from 702001-02	STANDARD B.L.R. 25-1



ELEVATION

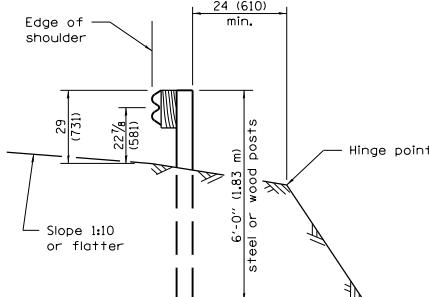
TYPE A

6'-3" (1.905 m) Typical post spacing

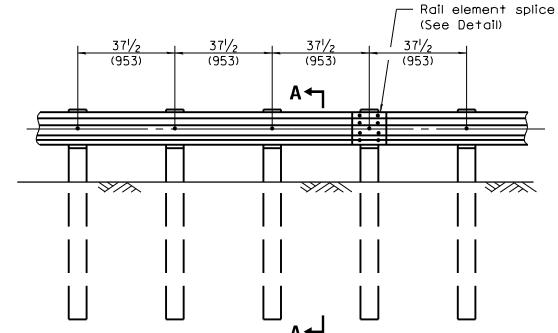


TYPE C

37 1/2 (953) Block-out spacing



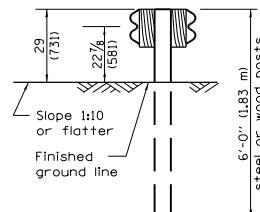
SECTION A-A



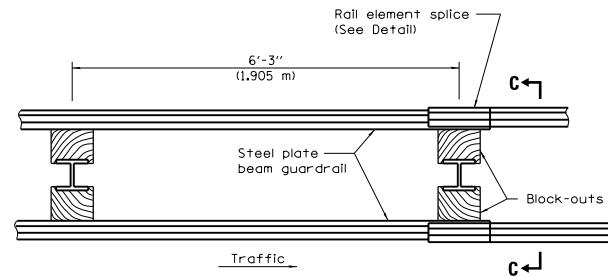
ELEVATION

TYPE B

37 1/2 (953) Closed post spacing



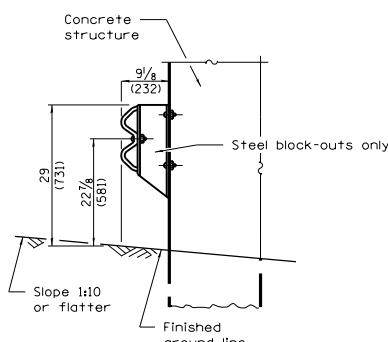
SECTION C-C



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.

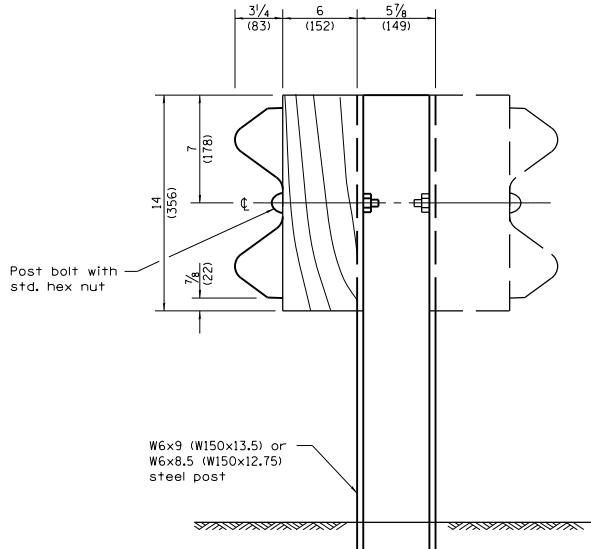
DATE	REVISIONS
I-1-12	Revised guardrail height.
	Modified table on sh. 4.
	Renamed standard.
I-1-10	Changed post length from 6'-9" to 6'-0".
	Modified table on sh. 4.

**STEEL PLATE BEAM GUARDRAIL
29" (731mm) HEIGHT**
(Sheet 1 of 4)

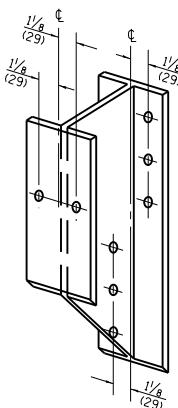
STANDARD B.L.R. 26-3

Illinois Department of Transportation
APPROVED January 1, 2012
<i>Douglas R. Lewis</i>
ENGINEER OF LOCAL ROADS AND STREETS
APPROVED January 1, 2012
<i>Santosh S. Sathyanarayana</i>
ENGINEER OF DESIGN AND ENVIRONMENT

80-1-0003



STEEL POST CONSTRUCTION

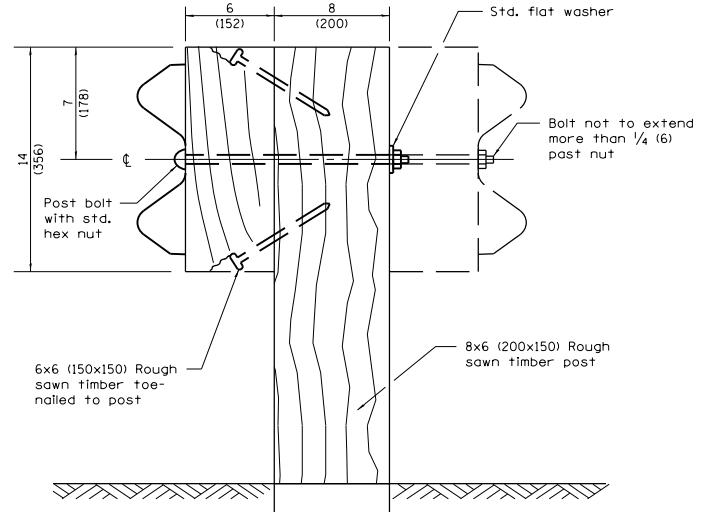


STEEL BLOCK-OUT DETAIL

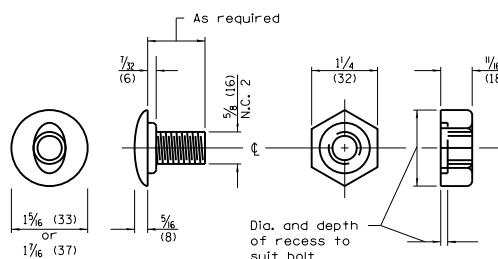
NOTE
Plate A shall be placed between rail element and block-out at non-splice mounting points only when steel block-outs are used.

PLATE A

	Illinois Department of Transportation
APPROVED	January 1, 2012
	Daniel Lewis
ENGINEER OF LOCAL ROADS AND STREETS	SO-1-1 CLASSI
APPROVED	January 1, 2012
	Scott Selsky
ENGINEER OF DESIGN AND ENVIRONMENT	



WOOD POST CONSTRUCTION

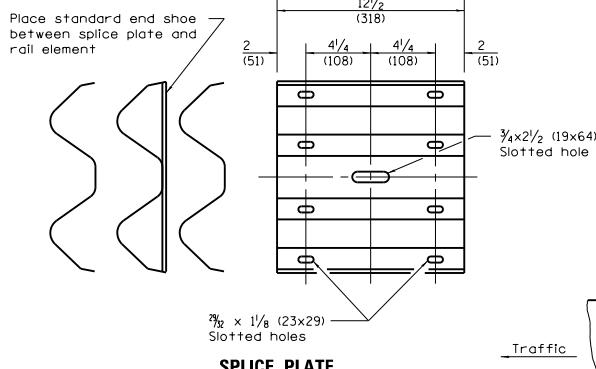


POST OR SPLICE BOLT & NUT

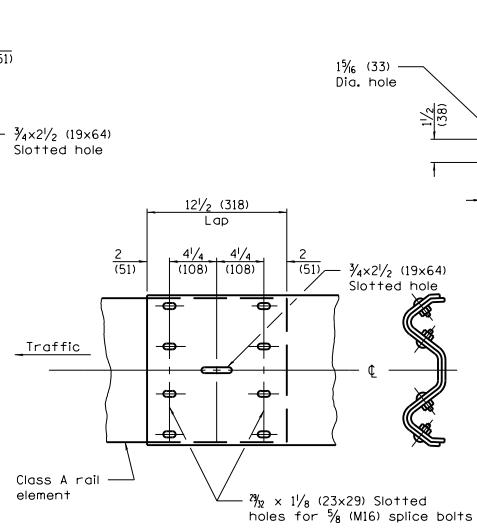
**STEEL PLATE BEAM GUARDRAIL
29" (731mm) HEIGHT**

(Sheet 2 of 4)

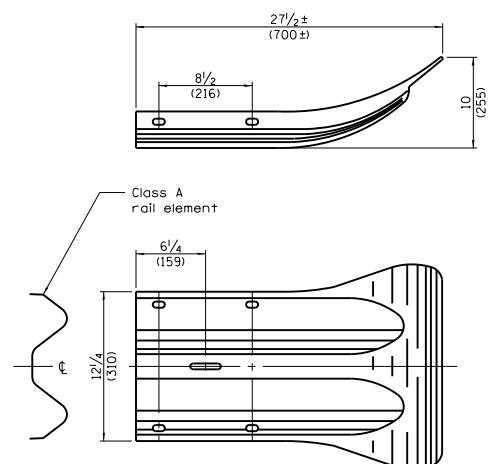
STANDARD B.L.R. 26-3



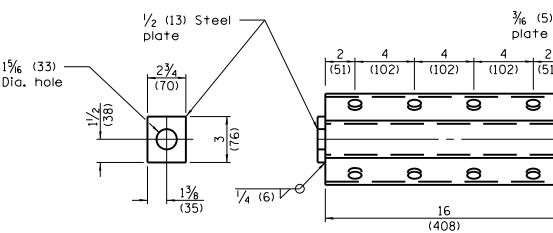
SPLICE PLATE



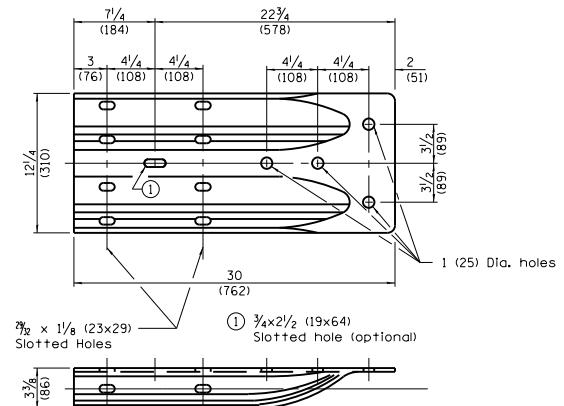
RAIL ELEMENT SPLICE



END SECTION



ANCHOR PLATE T DETAILS



ALTERNATE END SHOE

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

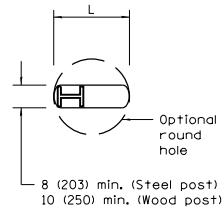
Illinois Department of Transportation
APPROVED January 1, 2012
<i>Douglas J. Goss</i>
ENGINEER OF LOCAL ROADS AND STREETS
APPROVED January 1, 2012
<i>Samuel S. Sosa</i>
ENGINEER OF DESIGN AND ENVIRONMENT

SD-1 CLASS

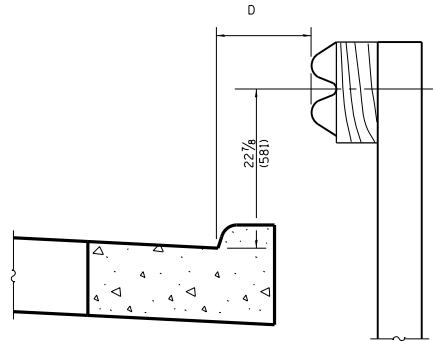
STEEL PLATE BEAM GUARDRAIL 29" (731mm) HEIGHT

(Sheet 3 of 4)

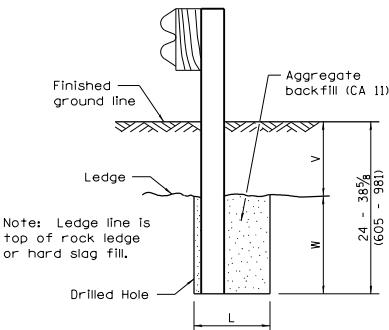
STANDARD B.L.R. 26-3



PLAN



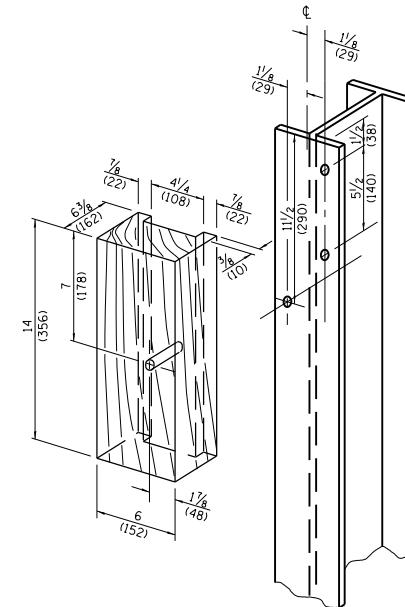
Note:
If it is necessary for D to be more than 12 (300) and less than 10'-0" (3.0 m) Type M-2 (M-5) curb and gutter (Std. 606001) shall be used in front of and in advance of the guardrail.



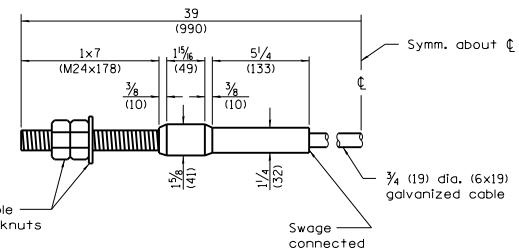
ELEVATION

FOOTING FOR POST WHEN IMPERVIOUS MATERIAL IS ENCOUNTERED

V	W	L	
		Steel Post	Wood Post
0 - 16 1/8 (0 - 410)	24 (610)	21 (530)	23 (580)
>16 1/8 - 28 1/8 <td>12 (305)</td> <td>8 (203)</td> <td>10 (250)</td>	12 (305)	8 (203)	10 (250)
>28 1/8 - 38 1/8 <td>12 - 0 (305 - 0)</td> <td>8 (203)</td> <td>10 (250)</td>	12 - 0 (305 - 0)	8 (203)	10 (250)



WOOD BLOCK-OUT AND STEEL POST DETAILS



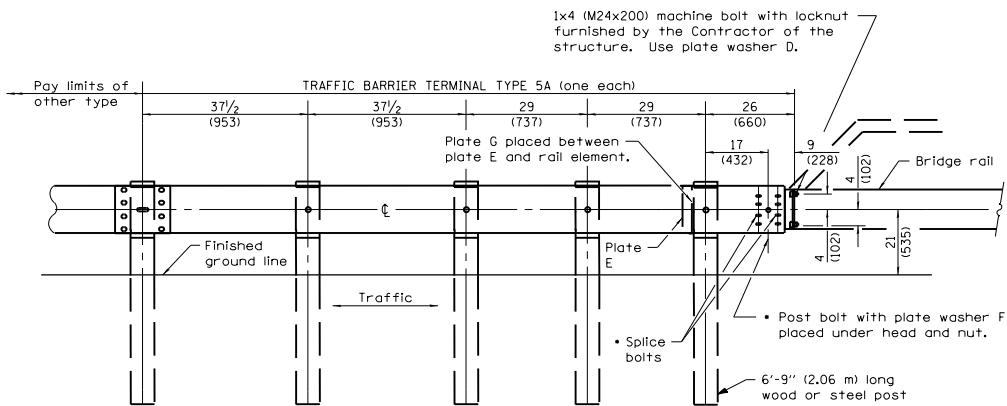
CABLE ASSEMBLY
(40,000 lbs. (18,100 kg) min. breaking strength)
Tighten to taut tension.

**STEEL PLATE BEAM GUARDRAIL
29" (731mm) HEIGHT**

(Sheet 4 of 4)

STANDARD B.L.R. 26-3

	Illinois Department of Transportation
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	Daniel J. Gossi
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APPROVED	January 1, 2012
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TYPE 5A – STEEL BRIDGE RAIL

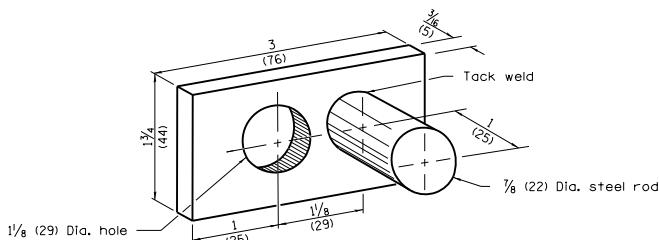
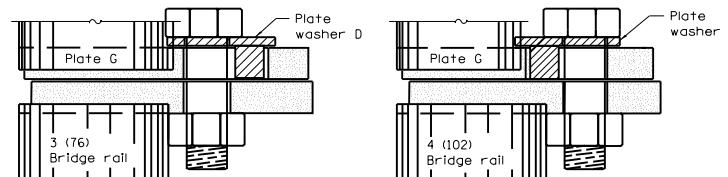


PLATE WASHER D



PLACEMENT OF PLATE WASHER D

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.

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.

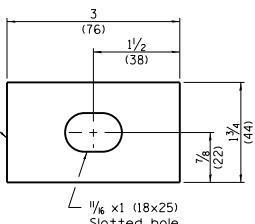


PLATE WASHER F

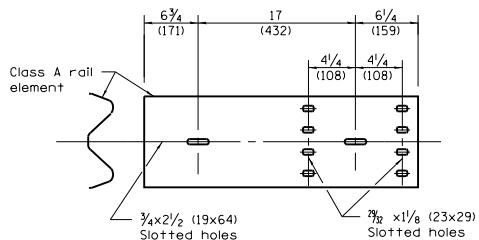


PLATE E

	Illinois Department of Transportation
APPROVED	January 1, 2009
<i>Charles J. Ingwall</i>	
ENGINEER OF LOCAL ROADS AND STREETS	
APPROVED	January 1, 2009
<i>Eve E. Hart</i>	
ENGINEER OF DESIGN AND ENVIRONMENT	
ISSUED	1-1-08

DATE	REVISIONS	TRAFFIC BARRIER TERMINAL TYPE 5A
1-1-09	Switched units to English (metric).	
1-1-08	New Standard. Was part of Std. 631026 prior to January 1, 2007.	
		STANDARD B.L.R. 27-1